

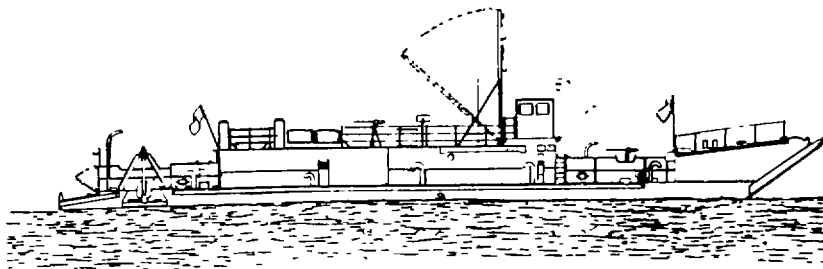
TECHNICAL MANUAL

**OPERATOR'S, ORGANIZATIONAL,
DIRECT SUPPORT, AND GENERAL SUPPORT
MAINTENANCE MANUAL**

**LANDING CRAFT UTILITY
LCU 1667-1670
(1905-00-168-5764)**

**OPERATION UNDER
USUAL CONDITIONS**

**OPERATION UNDER
UNUSUAL CONDITIONS**



**HEADQUARTERS, DEPARTMENT OF THE ARMY
7 DECEMBER 1983**

CHANGE
NO 2

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 27 APRIL 1992

OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT,
AND GENERAL SUPPORT MAINTENANCE MANUAL

**LANDING CRAFT UTILITY
LCU 1667-1670
(1905-00-168-5764)**

Approved for public release; distribution is unlimited

TM 55-1905-219-14-2, 7 December 1983, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
i and ii	i and ii
2-241 and 2-242	2-241 and 2-242
2-303 through 2-320	2-303 through 2-320
2-323 through 2-328	2-323 through 2-328
2-351 and 2-352	2-351 and 2-352
2-361 and 2-362	2-361 and 2-362
2-365 and 2-366	2-365 and 2-366
2-369 through 2-372	2-369 through 2-372
2-389 through 2-392	2-389 through 2-392
2-395 and 2-396	2-395 and 2-396
2-403 and 2-404	2-403 and 2-404
---	2-404.1 and 2-404.2
2-405/(2-406 blank)	2-405 and 2-406
---	2-406 1/(2-406 2 blank)
2-407 and 2-408	2-407 and 2-408
2-425 and 2-426	2-425 and 2-426
2-429 through 2-436	2-429 through 2-436
2-465 and 2-466	2-465 and 2-466
2-475 and 2-476	2-475 and 2-476
2-495 through 2-512	2-495 through 2-512
---	2-512.1 and 2-512.2
2-513 and 2-514	2-513/(2-514 blank)
2-515 through 2-520	(2-519 blank)/2-520
2-521 through 2-524	2-521 through 2-524
2-533 and 2-534	2-533 and 2-534
2-537 through 2-540	2-537 through 2-540
2-543 and 2-544	2-543 and 2-544
---	2-544.1 through 2-544.4
2-601 through 2-612	2-601 through 2-612
---	2-612.1/(2-612.2 blank)
---	2-618.1 through 2-618.7/(2-618.8 blank)
2-621 and 2-622	2-621 and 2-622

Remove pages

2-627 and 2-628
2-632 through 2-636
2-47 and 2-648
2-665 and 2-666
2-711 and 2-712
2-715 and 2-716
2-719 through 2-726
Index 1 through Index 6
Index 9 and Index 10
FO-34
FO-36
FO-38
FO-39
FO-40.1
FO-40.2
FO-41
FO-42
FO-43
FO-44
FO-45
FO-46
FO-47
FO-48
FO-49
FO-59
FO-61.1
FO-62
FO-63
FO-64
FO-65
FO-66
FO-67

Insert pages

2-627 and 6-628
2-632 through 2-636
2-647 and 2-648
2-665 and 2-666
2-711 and 2-712
2-715 and 2-716
2-719 through 2-726
Index-1 through Index-6
Index-9 and Index-10
FO-34
FO-36
FO-38
FO-39
FO-40.1
FO-40.2
FO-41
FO-42
FO-43
FO-44
FO-45
FO-46
FO-47
FO-48
FO-49
FO-59
FO-61.1
FO-62
FO-63
FO-64
FO-65
FO-66
FO-67

2. Retain this sheet in front of manual for reference purposes.

By Order of the Secretary of the Army:

Official:

MILTON H HAMILTON
Administrative Assistant to the
Secretary of the Army
01064

GORDON R SULLIVAN
General, United States Army
Chief of Staff

DISTRIBUTION:

To be distributed in accordance with DA Form 12-25E, (qty rqr block no. 1057)

URGENT

TM 55-1905-219-14-2
C 1

CHANGE }
NO. 1 }

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 28 June 1984

Operator's Organizational,
Direct Support, and General Support
Maintenance Manual

LANDING CRAFT UTILITY
LCU 1667-1670
(1905-00-168-5764)

TM 55-1905-219-14-2, 7 December 1983, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages

Insert pages

c and d

2. Retain this sheet in front of manual for reference purposes.

By Order of the Secretary of the Army:

JOHN H. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

ROBERT M. JOYCE
Major General, United States Army
The Adjutant General

DISTRIBUTION:

To be distributed in accordance with DA Form 12-25D, Operator Maintenance requirements for Marine Equipment, All.

URGENT

WARNING

DEATH

OR SEVERE INJURY MAY RESULT IF PERSONNEL FAIL TO OBSERVE THE GENERAL SAFETY PRECAUTIONS BELOW, AND THE SPECIFIC PRECAUTIONS CONTAINED IN THE TEXT.

- Wear safety glasses, safety shoes, and a hard hat to provide adequate protection.
- Death or severe injury may result if personnel fail to use a lifting device that is adequate for the item to be lifted.
- Ear protection must be worn when engines or machinery is in operation.
- Use care when using power tools.
- If cleaning agents are used, be sure area is adequately ventilated, and use protective gloves and goggles, or face shield and apron.
- Avoid excessive injection of ether into an engine during starting attempts. Follow the instructions on the container or by the manufacturer of the starting aid.
- Use the recommended air pressure when using compressed air to clean components. Too much air pressure can rupture or in some way damage a component and create a hazardous situation that can lead to personal injury.
- When working on an engine that is running, accidental contact with the hot exhaust manifold can cause severe burns.

WARNING

(Cont)

- Use extreme care when near rotating fans, belts and pulleys.
- Avoid making contact across the terminals of the batteries and do not spill the contents of the battery.
- Keep clear of the Anchor Winch or Bow Ramp Winch while it is in operation.
- During any removal, disassembly, assembly, or installation of an electrical device, make sure all electrical power is disconnected, and tagged. (Circuit breaker in the OFF position and tagged).
- Improper functioning of Engine Exhaust System can cause injury or death.
- Personnel should know the location and operation of all equipment for emergency use.
- Before attempting to operate any equipment, read the instructions completely. Then, return to the appropriate section and follow the instructions.
- Do not enter a Winch Compartment alone.
- If the Halon System is activated (horn sounds), leave the compartment immediately. Check that no one is left, and then close and dog the hatch.
- Use extreme care when handling gasoline for the Salvage Pump.
- Store all flammable material in the Flammable Storage Compartment.

WARNING

(Cont)

- When cutting with a torch, or when welding, always station fire watches, ready with fire extinguishers, in the vicinity on both sides of the plate that is being cut or welded.
- Prior to cutting or welding on the ramp, remove drain plugs on both sides of the ramp and check if ramp interior is primer coated. If primer coated, flush thoroughly with steam, carbon dioxide, or water. Do not reinstall drain plugs until the cutting and/or welding operation is completed. Failure to take this precaution may result in explosion of accumulated primer vapors.
- When refueling, shut down the electrical system. Observe the no smoking rule. Do not permit anyone to operate tools or equipment which may produce sparks near the refueling operation. Sparks or fire may ignite the diesel fuel and produce an explosion.
- Fuel oil and other petroleum products are highly volatile in extreme heat. To minimize the possibility of explosion, wipe up all spills at once, see that fuel lines and valves are not leaking and pump bilges regularly.
- Before attempting to remove any compressed air system lines or components, relieve air pressure from system. Failure to do so may result in injury or possible death to maintenance personnel.
- Before disconnecting a line in the hydraulic system, bleed the pressure from that portion of the line. Failure to do so may result in injury or possible death to maintenance personnel.
- When working inside the hydraulic oil supply tank, a portable-type circulating blower should be used to prevent vapor accumulation. For extended work periods inside the tank, an air line tube respirator should be worn. Station an observer outside tank in case worker is overcome by fumes.

WARNING

(Cont)

- Acids can cause serious burns or blindness. Avoid contact with eyes, skin, or clothing. Do not breathe vapors. Wear rubber gloves, goggles, and a rubber apron when handling them. When diluting acids, do not add water to acid; the acid must be added to the mixture slowly and with constant mixing. In case of contact with acid, flush the affected area with plenty of water and obtain medical aid immediately.
- Ramp hinge pins must be replaced one at a time, allowing three remaining pins to support ramp. Removal of two or more hinge pins may result in the weight of the ramp misaligning the remaining hinges, resulting in damage to ramp and possible injury or death to maintenance personnel.

TECHNICAL MANUAL }
NO. 55-1905-219-14-2 }

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 7 December 1983

OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT,
AND GENERAL SUPPORT MAINTENANCE MANUAL

LANDING CRAFT UTILITY

LCU 1667-1670
(1905-00-168-5764)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistake or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to Commander, U S Army Troop Support Command, ATTN AMSTR-MMTS, 4300 Goodfellow Boulevard, St Louis, MO 63120-1798. A reply will be furnished directly to you.

TABLE OF CONTENTS

	Page
CHAPTER 2. OPERATING INSTRUCTIONS (Continued)	
Section III. Operation Under Usual Conditions	2-235
Section IV. Operation Under Unusual Conditions	2-687

* This manual supersedes TM 55-1905-219-14-2, 24 July 1980.

LIST OF ILLUSTRATIONS

<u>FIGURE</u>		<u>PAGE</u>
FO-34	Fuel System Piping	FO-34
FO-35	Engine Lube Oil System	FO-35
FO-36	Central Hydraulic System	FO-36
FO-37	Fresh Water System Piping	FO-37
FO-38	Fire System Piping	FO-38
FO-39	Draining The Fire Main System (Reefer Room 2-23-0-A)	FO-39
FO-40.1	Bilge Draining Using Bilge Pump (Sheet 1 of 2)	FO-40.1
FO-40.2	Bilge Draining Using Bilge Pump (Sheet 2 of 2)	FO-40.2
FO-41	Bilge Draining Using The Fire Pump	FO-41
FO-42	Draining The Bilge With Fire Pump	FO-42
FO-43	Draining The Fire Main System (Reefer Room 2-28-0-A)	FO-43
FO-44	Bilge Draining Using Fire Pump and Eductor	FO-44
FO-45	Draining The Bilge With Fire Pump and Eductor	FO-45
FO-46	Filling Ballast Tanks - Using Gravity	FO-46
FO-47	Draining Ballast Tanks - Using Gravity	FO-47
FO-48	Filling Ballast Tanks - Using Fire Pump	FO-48
FO-49	Draining Ballast Tanks - Using Fire Pump	FO-49
FO-50	Preliminary Adjustments - Oil/Water Separator System Piping	FO-50
FO-51	Bilge Draining - Oil/Water Separator System Piping	FO-51
FO-52	Used Engine Oils - Oil/Water Separator System Piping	FO-52
FO-53	Emptying Holding Tank - Oil/Water Separator System Piping	FO-53
FO-54	Normal Operation Sewage System	FO-54
FO-55	Overboard Discharge - Holding Tank	FO-55
FO-56	Overboard Discharge Shutdown	FO-56
FO-57	Overboard Discharge - Macerator Pumps	FO-57
FO-58	Air Conditioning System	FO-58
FO-59	Halon System	FO-59
FO-60	Deleted	FO-60
FO-61.1	Intercommunication Station (Sheet 1 of 2)	FO-61.1
FO-61.2	Intercommunication Station (Sheet 2 of 2)	FO-61.2
FO-62	Night Vision Lights	FO-62
FO-63	Dry Dock Plan	FO-63
FO-64	Stanchion Location	FO-64
FO-65	Location of Emergency Hand Lanterns	FO-65
FO-66	Watertight Integrity	FO-66
FO-67	General Alarm Arrangement	FO-67

CHAPTER 2

(CONTINUED)

SECTION III. OPERATION UNDER USUAL CONDITIONS

2-19. GENERAL.

a. The instructions in this section are for the personnel who operate the various systems of the landing craft. The instructions for each component of a system are as follows:

- (1) Preliminary Adjustments - Settings for valves or switches that must be checked prior to initial starting of a device.
- (2) Local Start - Starting from the physical location of the device. Warm and cold weather starting is also included.
- (3) Remote Start - Starting the device from a remote location.
- (4) Local Stop - Stopping at the physical location of the device.
- (5) Remote Stop - Stopping the device from a remote location.

b. The following is an index to the procedures for operation under usual conditions:

<u>DESCRIPTION</u>	<u>PARAGRAPH</u>
Air Conditioning System	2-105
Alarm System	2-110
Anchor Winch and "A" Frame	2-46
Bow Ramp Winch	2-52
Central Hydraulic System including Main Mast and Stern Gate	2-63
Fire, Bilge and Ballast System	2-75
Fresh Water Pressure System	2-73
Galley and Mess Equipment	2-129
Generating System	2-34
Halon System	2-115
Heaters	2-121
Hydraulic Starting System	2-20
Interior Communications	2-147
Lighting	2-122
Lube Oil Transfer System	2-62
Night Vision Lights	2-151
Oil/Water Separator System	2-96

2-19. GENERAL (Cont).

<u>DESCRIPTION</u>	<u>PARAGRAPH</u>
Pilot House Equipment	2-123
Preparation for Movement	2-152
Propulsion System	2-28
Sewage System	2-101
Signaling Searchlight	2-142
Standby Lube Oil System	2-70
Steering	2-57
Tank Level Indicating System	2-74
Ventilating Fans	2-120
Wash Room, Water Closet, and Shower Equipment	2-138

- c. Before you operate. Always keep in mind the CAUTIONS and WARNINGS.
- d. Before you operate. Perform the PMCS(s) in Chapter 2, Section II.

2-20. HYDRAULIC STARTING SYSTEM.

- a. The following paragraphs contain the procedures that must be performed prior to starting the propulsion engines, generator engines or anchor winch engine.
- b. The hydraulic starting system located in the forward engine room is for the port main engine and generator engine.
- c. The hydraulic starting system located in the aft engine room is for the starboard main engine and generator engine.
- d. The hydraulic starting system for the anchor winch engine is located in the anchor winch compartment.
- e. The following is an index to the procedures:

DESCRIPTION	PARAGRAPH
(1) Forward Engine Room - Preliminary Adjustments	2-21
Shut Down	2-22
(2) Aft Engine Room - Preliminary Adjustments	2-23
Shut Down	2-24
(3) Anchor Winch Compartment - Preliminary Adjustments	2-25
Shut Down	2-26

2-21. HYDRAULIC STARTING SYSTEM - FORWARD ENGINE ROOM

Preliminary Adjustments.

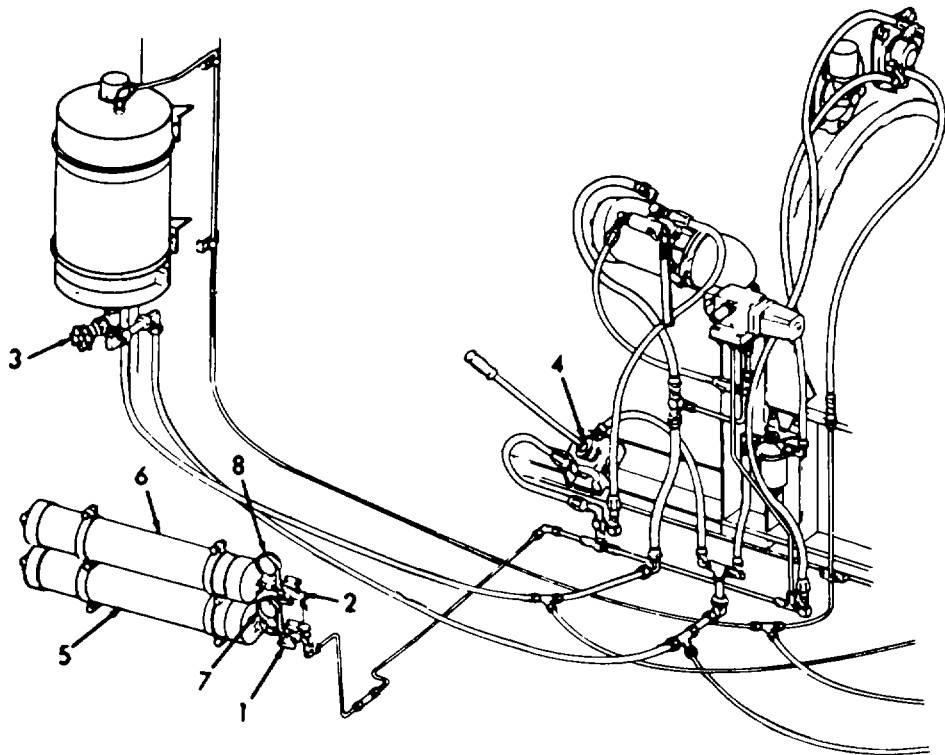
- a. Open shut off valves (1 and 2) by rotating valves counter-clockwise.
- b. Open shut off valve (3) by rotating valve counter-clockwise.
- c. Operate hand pump (4) to charge accumulators (5 and 6).
- d. Pressure gages (7 and 8) should read:

AMBIENT TEMPERATURE

Above 40°F (4.4°)
 40 F to 0°F (4.4° C to -17.8°C)
 Below 0°F (-17.8°C)

GAGE READING

1500 psi (1054.5 kg sq cm)
 2500 psi (1757.5 kg sq cm)
 3300 psi (2319.9 kg sq cm)



2-22. HYDRAULIC STARTING SYSTEM - FORWARD ENGINE ROOM - SHUT DOWN.

In usual operating conditions, the hydraulic starting system should not be shut down. The engines, when running, maintain a constant pressure in the system.

- a. Close all valves by rotating clockwise.
- b. Note the pressure on the gages will remain constant.

2-23. HYDRAULIC STARTING SYSTEM - AFT ENGINE ROOM

Preliminary Adjustments.

- a. Open shut off valves (1 and 2) by rotating valves counter-clockwise.
- b. Open shut off valve (3) by rotating valve counter-clockwise.
- c. Operate hand pump (4) to charge accumulators (5 and 6).
- d. Pressure gages (7 and 8) should read:

AMBIENT TEMPERATURE

GAGE READING

Above 40°F (4.4°)

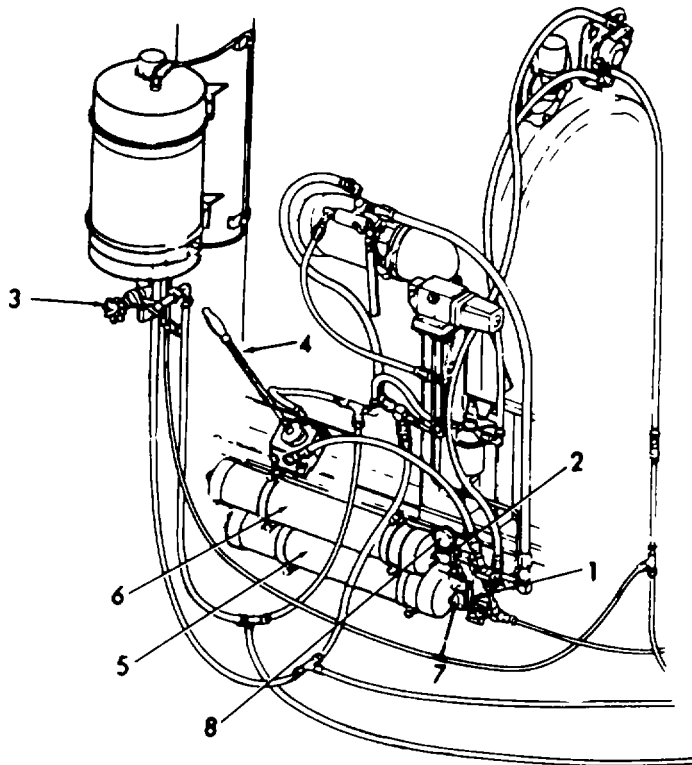
1500 psi (1054.5 kg sq cm)

40° F to 0° F (4.4° C to -17.8° C)

2500 psi (1757.5 kg sq cm)

Below 0°F (-17.8°C)

3300 psi (2319.9 kg sq cm)



2-24. HYDRAULIC STARTING SYSTEM - AFT ENGINE ROOM - SHUT DOWN.

In usual operating conditions, the hydraulic starting system should not be shut down. The engines, when running, maintain a constant pressure in the system.

- a. Close all valves by rotating clockwise.
- b. Note the pressure on the gages will remain constant.

2-25. HYDRAULIC STARTING SYSTEM - ANCHOR WINCH COMPARTMENT.

Preliminary Adjustments.

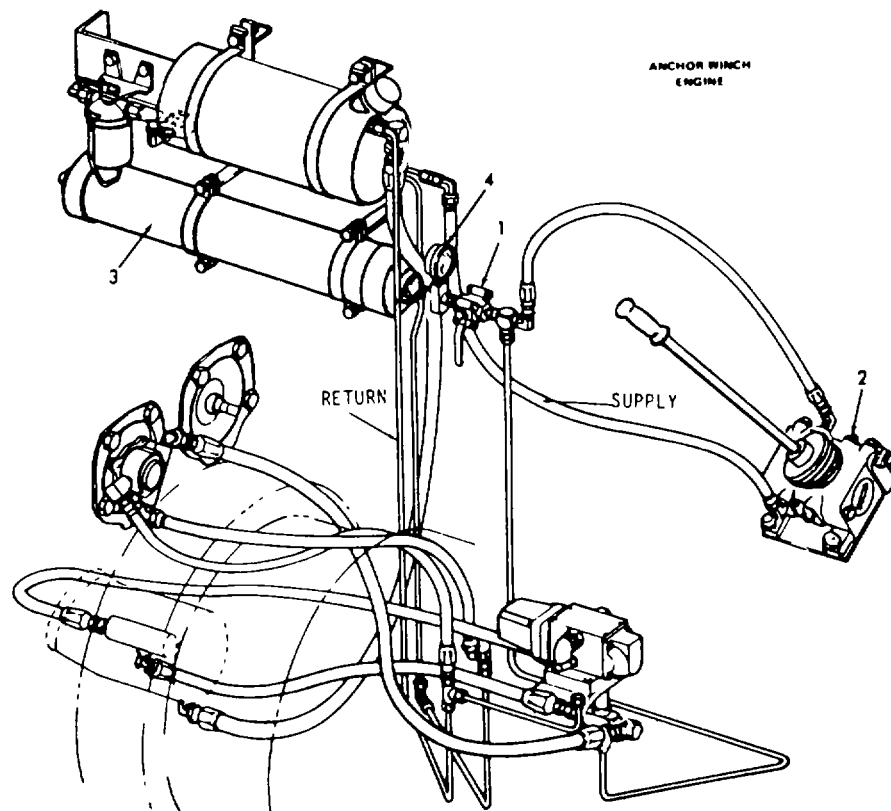
- a. Open shut off valve (1) by rotating valve counter-clockwise.
- b. Operate hand pump (2) to charge accumulator (3).
- c. Pressure gage (4) should read:

AMBIENT TEMPERATURE

Above 40°F (4.4°C)
 40°F to 0°F (4.4°C to -17.8°C)
 Below 0°F (-17.8°C)

GAGE READING

1500 psi (1054.5 kg sq cm)
 2500 psi (1757.5 kg sq cm)
 3300 psi (2319.9 kg sq cm)



2-26. HYDRAULIC STARTING SYSTEM - ANCHOR WINCH COMPARTMENT-SHUT DOWN.

In usual operating conditions, the hydraulic starting system should not be shut down. The engines, when running, maintain a constant pressure in the system.

- a. Close valve by rotating clockwise.
- b. Note the pressure on the gage will remain constant.

2-27. FUEL SYSTEM.

a. The procedure contained in this paragraph must be performed prior to starting the propulsion engines, generator engines, or anchor winch engine. Refer to Figure FO-34 for orientation.

- (1) Open supply valves (1) in the forward engine room by rotating valve counter-clockwise.

NOTE

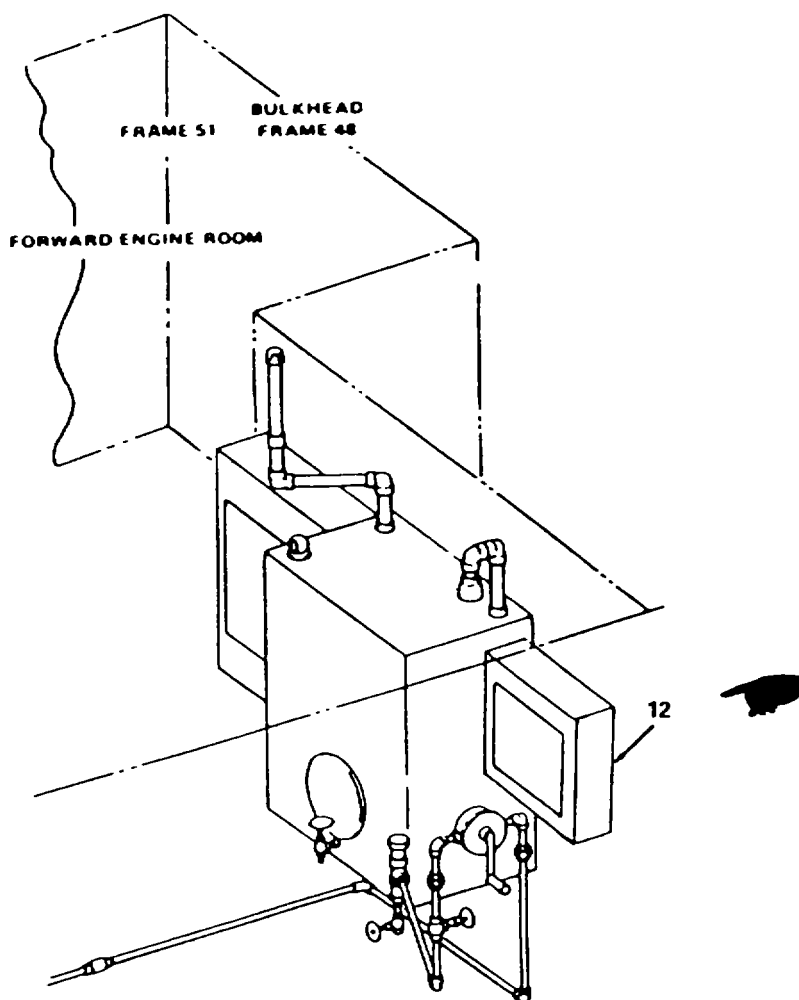
The supply valves can be opened by rotating the reach rods (2) counter-clockwise.

- (2) Remove deck plates in forward engine room at frame 49 1/2 Starboard, 2 feet 9 inches (83.8 cm) from centerline.
- (3) Place crossover valve (3) as follows:
- (a) Starboard - Fuel oil will be taken from starboard tank and returned to the starboard tank.
 - (b) Port - Fuel oil will be taken from the port tank and returned to the port tank.
- (4) Open shut off valves as follows:
- (a) Port Propulsion Engine - Open valve (4) by rotating counter clockwise.
 - (b) Starboard Generator Engine - Open valve (5) by rotating counter-clockwise.
 - (c) Isolation Valve - Open valve (6) by rotating counter-clockwise.
 - (d) Starboard Propulsion Engine - Open valve (7) by rotating counter-clockwise.
 - (e) Port Generating Engine - Open valve (8) by rotating counter-clockwise.
 - (f) Anchor Winch Engine - Open valve (9) by rotating counter-clockwise.
- (5) The return line can operate in either of two modes.
- (a) Direct:
- 1 Open bypass valve (10) by rotating counter-clockwise.
 - 2 Close shut off valves (11) by rotating clock-wise.

2-27. FUEL SYSTEM (Cont).

(b) Heat Exchanger:

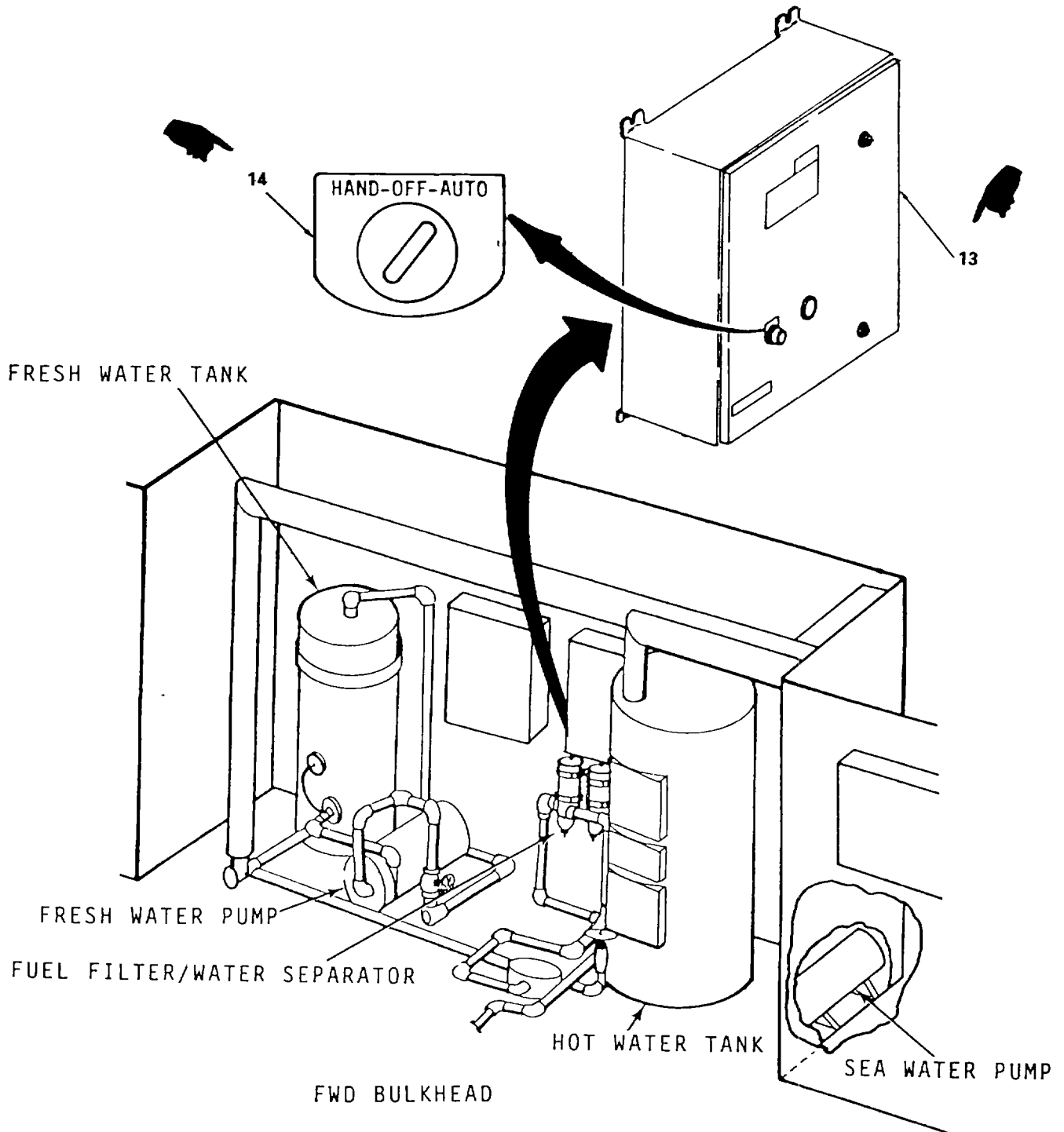
1. Close bypass valve (10) by rotating clockwise.
2. Open shut off valves (11) by rotating counter-clockwise.
3. On power distribution panel P-408, (12) place circuit breaker #5 in the ON position.



4951-234

2-27. FUEL SYSTEM (Cont).

5. In the fwd engine room; at controller (13), place selector switch (14) in the ON position.
6. Shut-Down - Place the selector switch (14) on the controller (13) in the OFF position.



b. The various valves in the system can be left as initially set.

2-28. PROPULSION SYSTEM.

- a. The procedures contained in these paragraphs apply to both the starboard and port propulsion engines.
- b. Prior to starting the propulsion system, the fuel system must be turned on. See paragraph 2-27.
- c. The following is an index to the procedures:

DESCRIPTION	PARAGRAPH
Propulsion Engine - Warm Weather - Local Starting.	2-29
Propulsion Engine - Cold Weather - Local Starting.	2-30
Propulsion Engine - Local Stop.	2-31
Propulsion Engine - Remote Starting.	2-31
Propulsion Engine - Remote Stop.	2-33

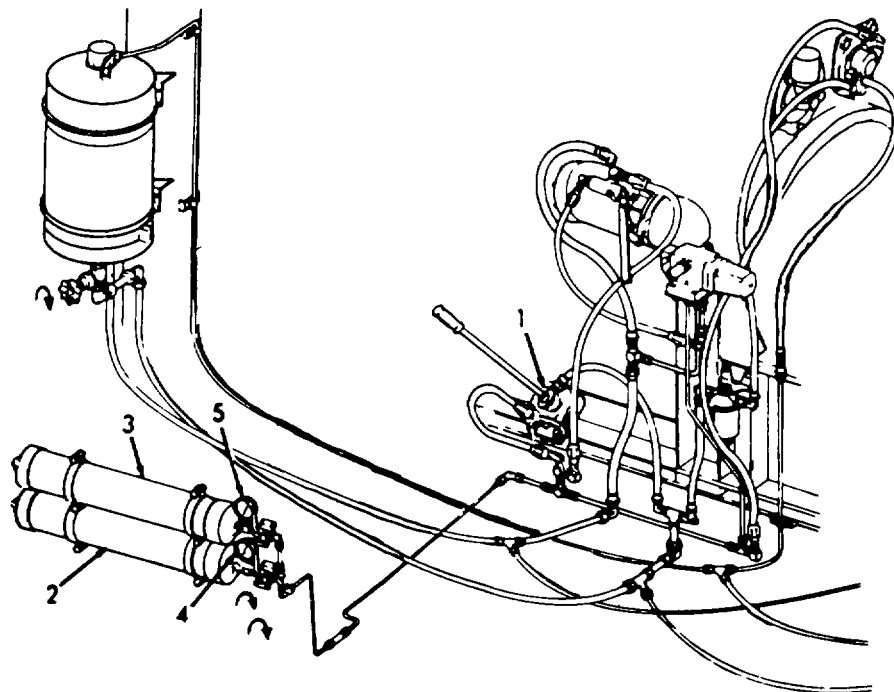
2-29. PROPULSION ENGINE - WARM WEATHER - LOCAL STARTING

- a. Perform all before operations on the Preventive Maintenance Checks and Services Chart.

NOTE

Position all shut off valves open (counter-clockwise).

- b. Operate hand pump (1) on hydrostarter in forward engine room to charge accumulators (2 and 3).



2-29. PROPULSION ENGINE - WARM WEATHER - LOCAL STARTING (Cont).

c. Pressure gages (4 and 5) should read:

AMBIENT TEMPERATURE

Above 40°F (4.4°C)
 40°F to 0°F (4.4°C to -17.8°C)
 Below 0°F (-17.8°C)

GAGE READING

1500 psi (1054.5 kg sq cm)
 2500 psi (1757.5 kg sq cm)
 3300 psi (2319.9 kg sq cm)

d. Operate hand pump (6) on hydrostarter in aft engine room to change accumulators (7 and 8).

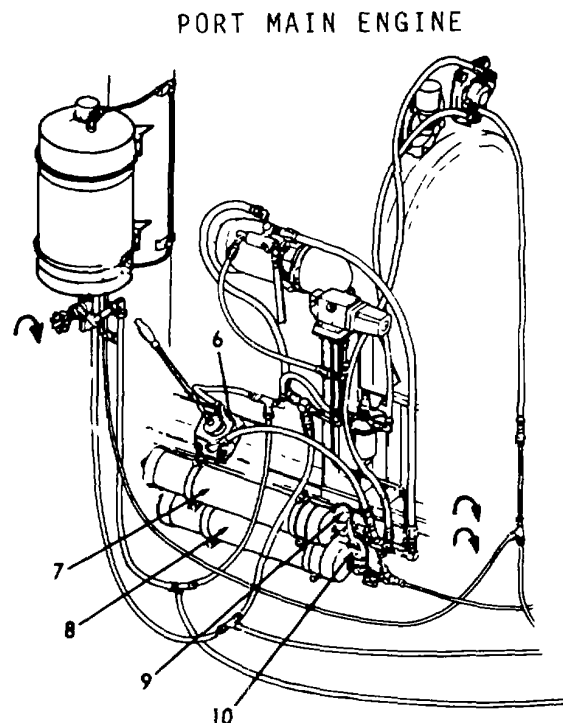
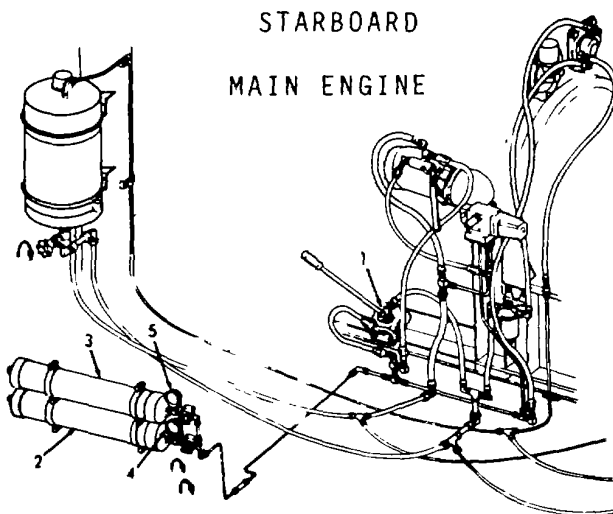
e. Pressure gages (9 and 10) should read:

AMBIENT TEMPERATURE

Above 40°F (4.4°C)
 40°F to 0°F (4.4°C to -17.8°C)
 Below 0°F (-17.8°C)

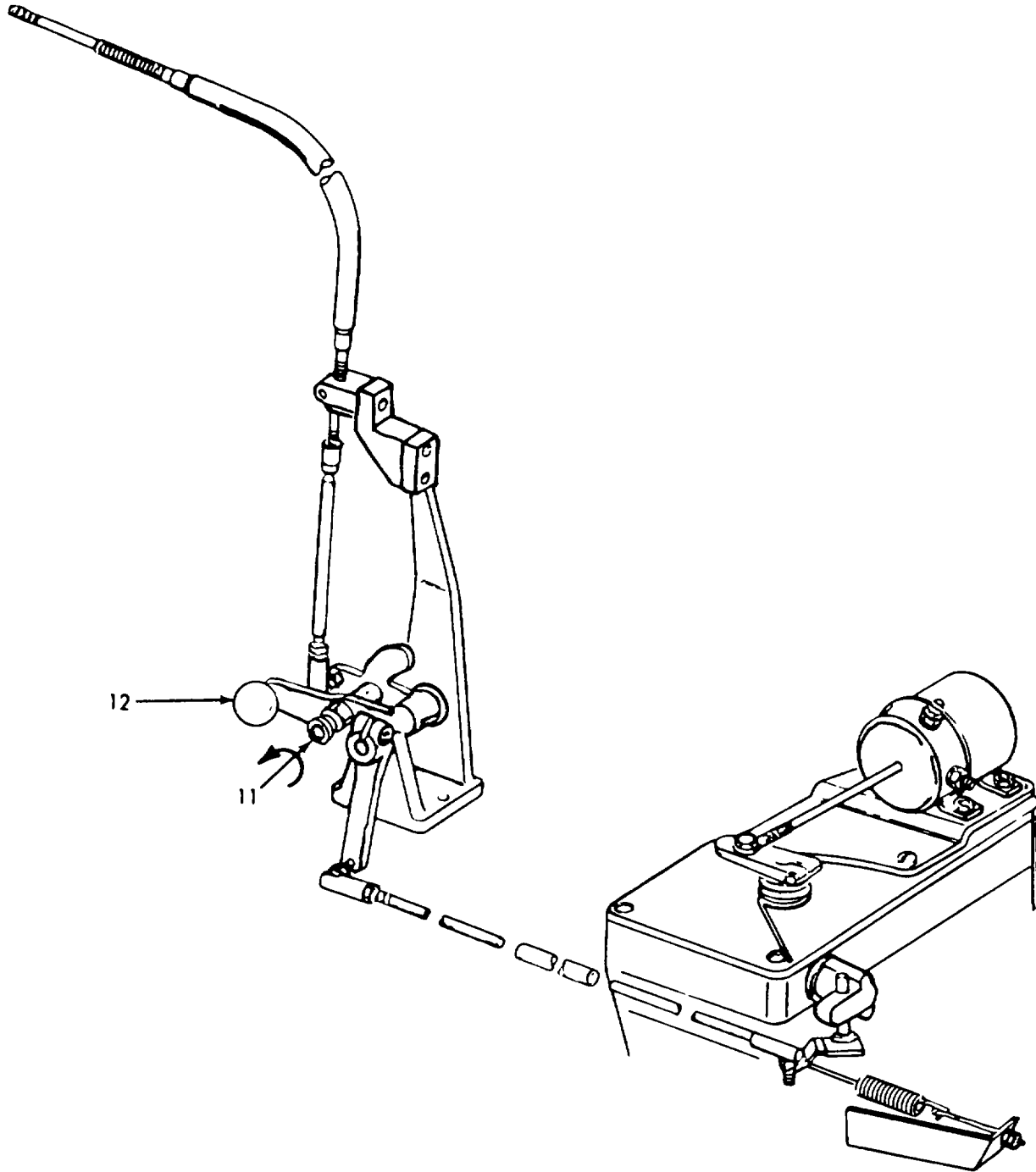
GAGE READING

1500 psi (1054.5 kg sq cm)
 2500 psi (1757.5 kg sq cm)
 3300 psi (2319.9 kg sq cm)



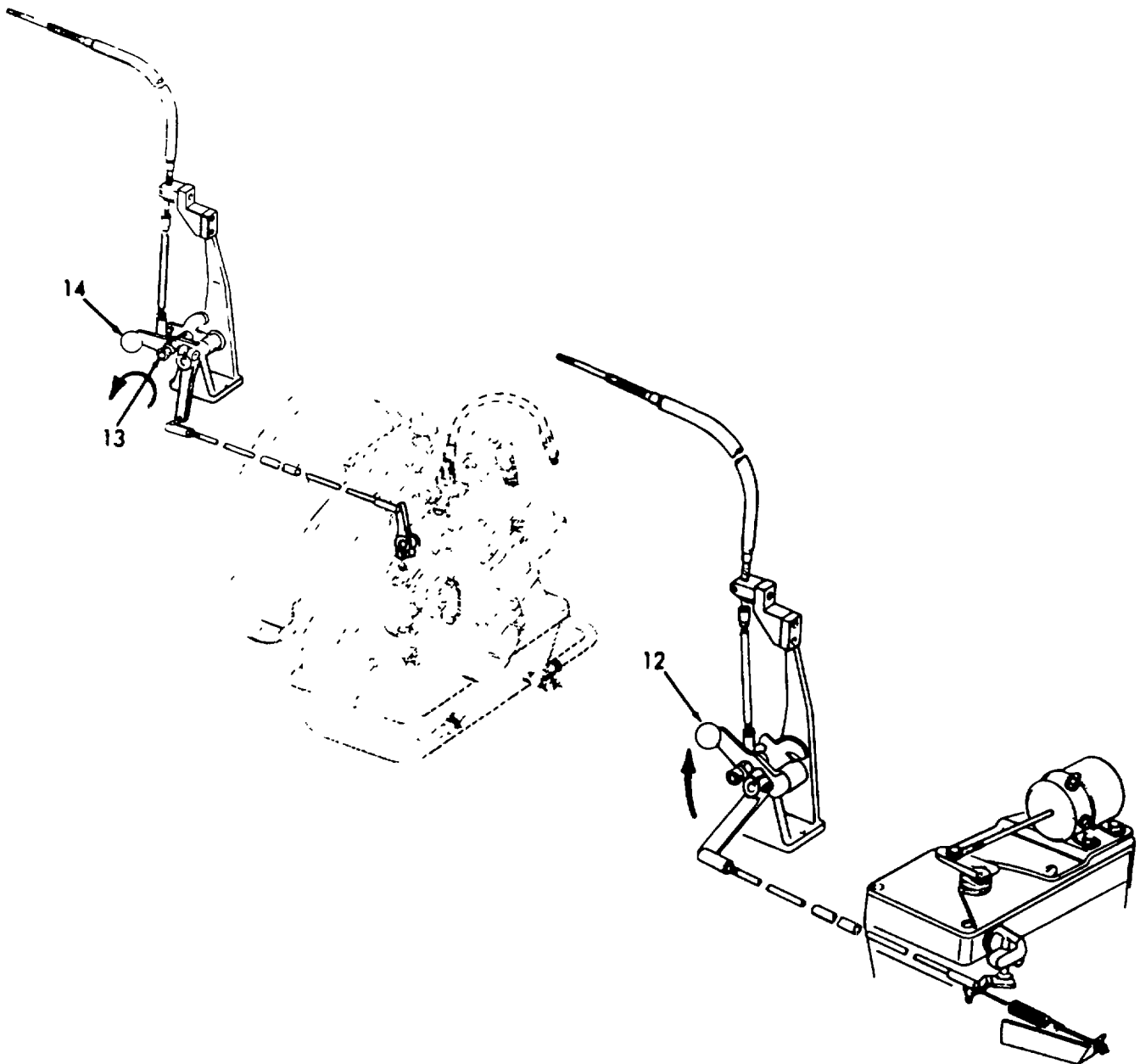
2-29. PROPULSION ENGINE - WARM WEATHER - LOCAL STARTING (Cont).

- f. Pull out knob (11) on local throttle control (12).
- g. Rotate knob (11) one-quarter turn counter-clockwise.



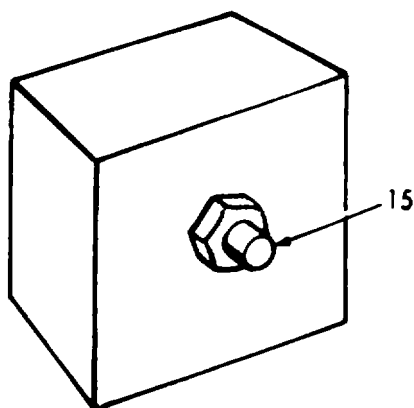
2-29. PROPULSION ENGINE - WARM WEATHER - LOCAL STARTING (Cont).

- h. Pull out knob (13) on local clutch control (14).
- i. Rotate knob (13) one-quarter turn counter-clockwise.
- j. Place clutch control (14) in neutral.
- k. Set throttle control (12) to one-half open.



2-29. PROPULSION ENGINE - WARM WEATHER - LOCAL STARTING (Cont).

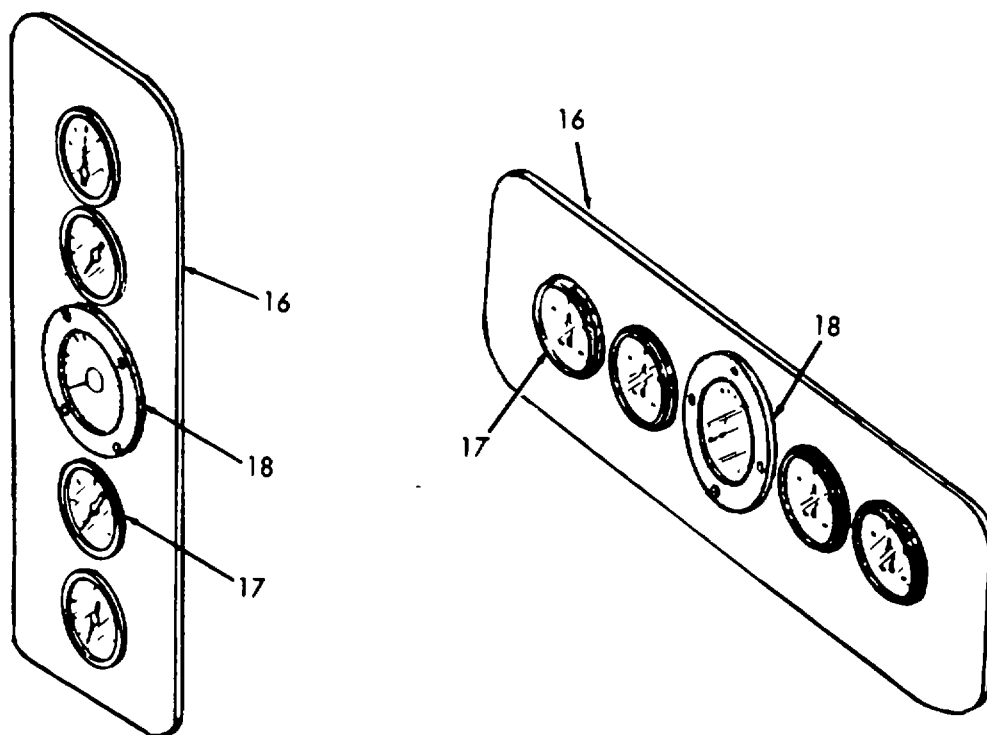
- I. Push local start button (15) located next to the hydrostarter.



NOTE

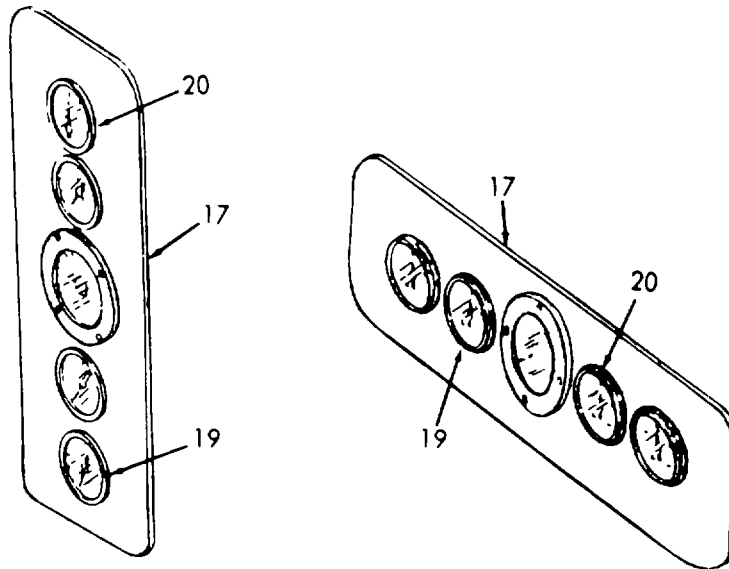
Alarm may sound in the pilothouse indicating low oil pressure.

- m. Release start button (15) as soon as engine starts.
- n. Observe oil pressure gage (16) on instrument panel (17). If no pressure is indicated within 10 to 15 seconds, STOP. Check lubrication system. Minimum oil pressure is 25 psi (1757.7 gm sq cm) at 1200 RPM (18).

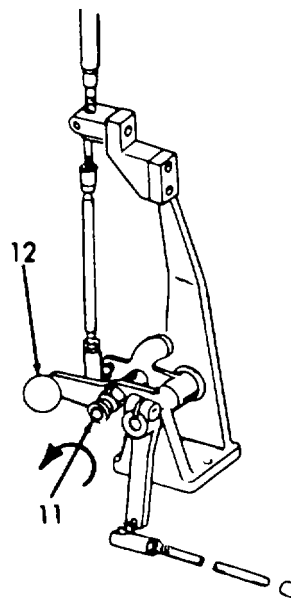


2-29. PROPULSION ENGINE - WARM WEATHER - LOCAL STARTING (Cont).

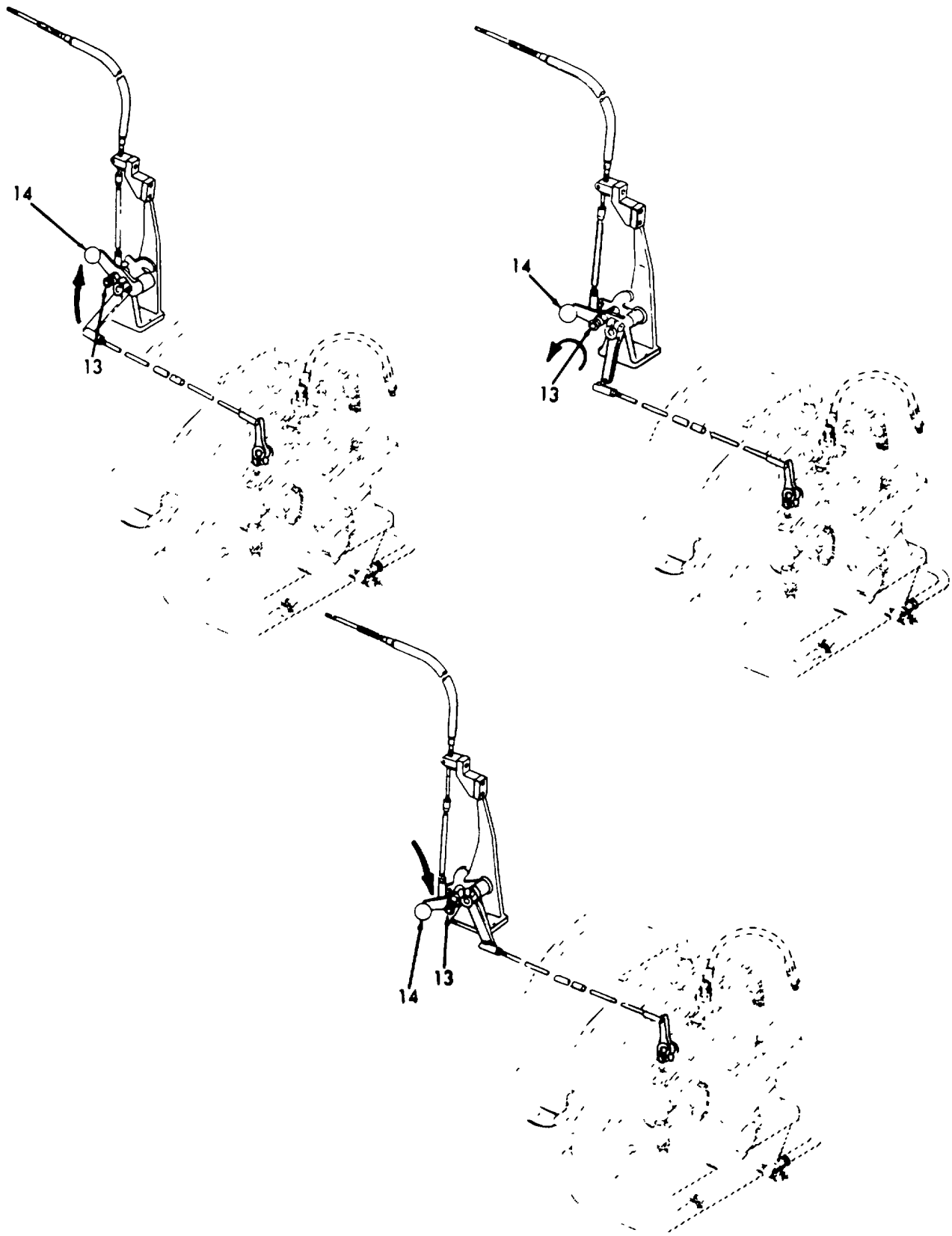
- o. Observe drive oil pressure gage (19) on instrument panel (17). Oil pressure is 40-42 psi (2812.2 to 2952.9 gm sq cm) at 1200 RPM.



- p. Warm up at part throttle, no-load for about 5 minutes, before loading engine. Norm I coolant temperature on temperature gage (20) is 160° F to 185° F, (71.1° C to 85.0° C).
- q. Engage clutch (14) at less than 850 RPM.
- r. When prolonged idling is needed, maintain at least 800 RPM minimum.
- s. To transfer control to the pilothouse, push in knob (11) on the throttle control (12), and push in knob (13) on the clutch control (14).



2-29. PROPULSION ENGINE - WARM WEATHER - LOCAL STARTING (Cont).



2-30. PROPULSION ENGINE - COLD WEATHER - LOCAL STARTING.

- a. Perform all before operations on the Preventive Maintenance Checks and Services Chart.

NOTE

Position all shut off valves open (counter-clockwise).

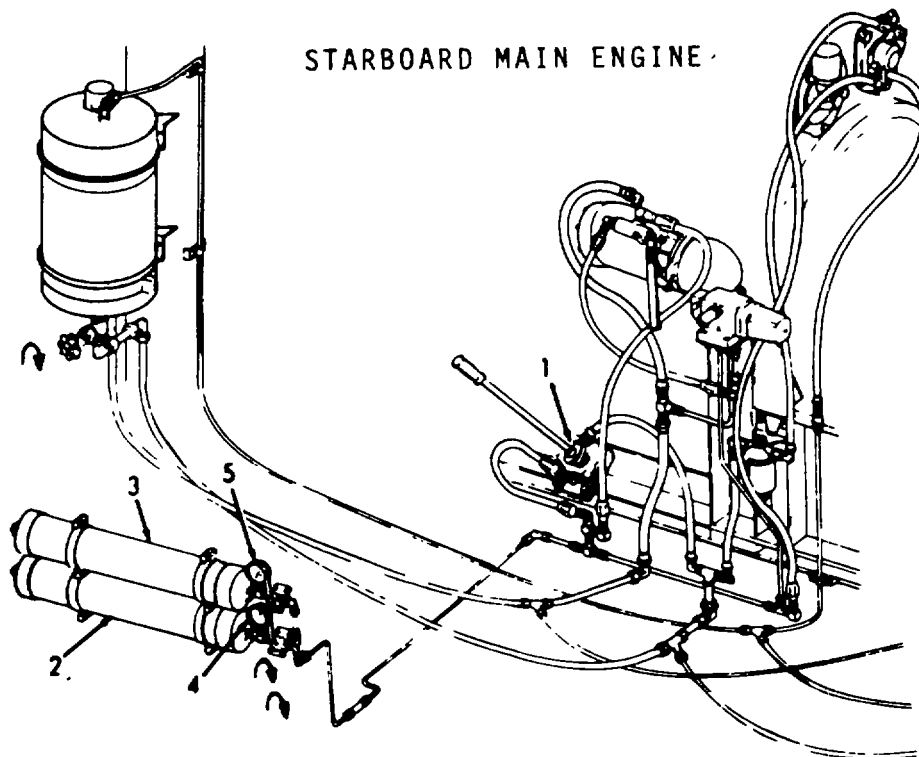
- b. Operate hand pump (1) on hydrostarter in forward engine room to charge accumulators (2 and 3).
 c. Pressure gages (4 and 5) should read:

AMBIENT TEMPERATURE	GAGE READING
Above 40°F (4.4°C)	1500 psi (1054.5 kg sq cm)
40°F to 0°F (4.4°C to -17.8°C)	2500 psi (1757.5 kg sq cm)
Below 0°F (-17.8°C)	3300 psi (2319.9 kg sq cm)

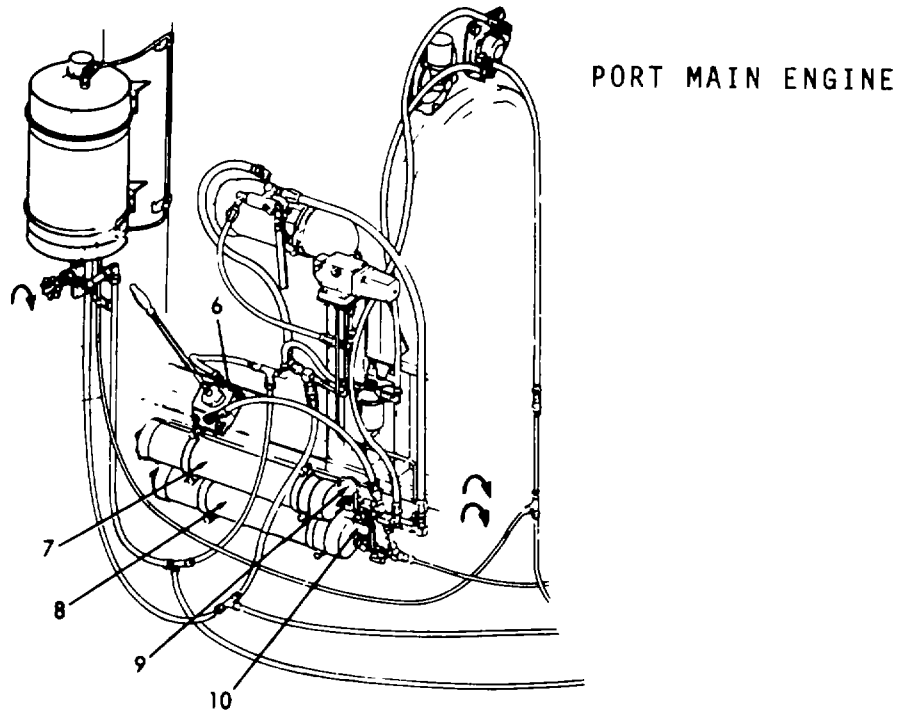
- d. Operate hand pump (6) on hydrostarter in aft engine room to charge accumulators (7 and 8).

- e. Pressure gages (9 and 10) should read:

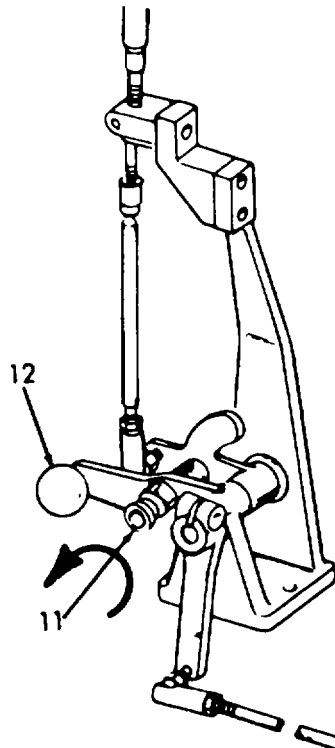
AMBIENT TEMPERATURE	GAGE READING
Above 40°F (4.4°C)	1500 psi (1054.5 kg sq cm)
40°F to 0°F (4.4°C to -17.8°C)	2500 psi (1757.5 kg sq cm)
Below 0°F (-17.8°C)	3300 psi (2319.9 kg sq cm)



2-30. PROPULSION ENGINE - COLD WEATHER - LOCAL STARTING (Cont).

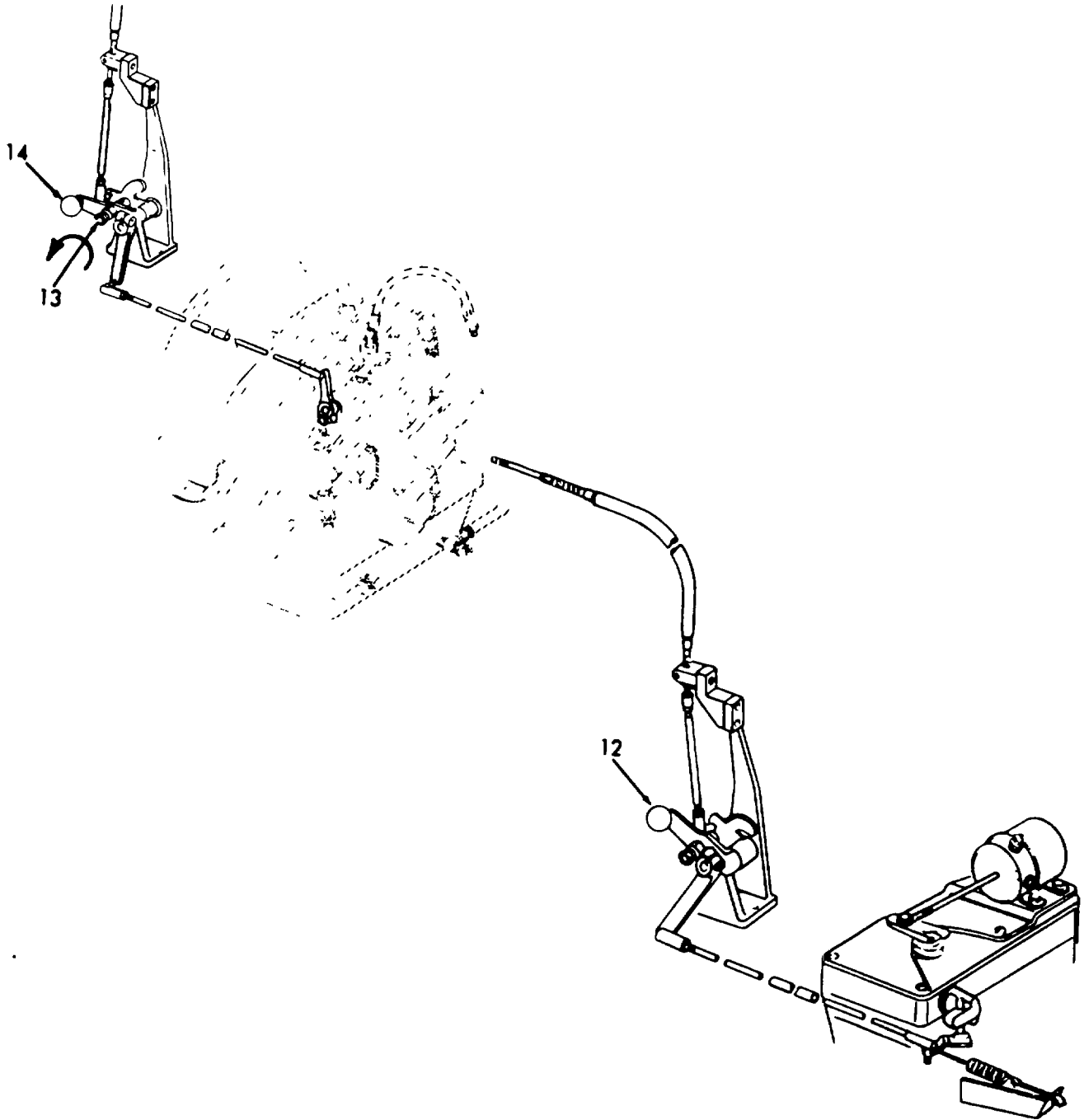


- f. Pull out knob (11) on local throttle control (12).
- g. Rotate knob (11) one-quarter turn counter-clockwise.



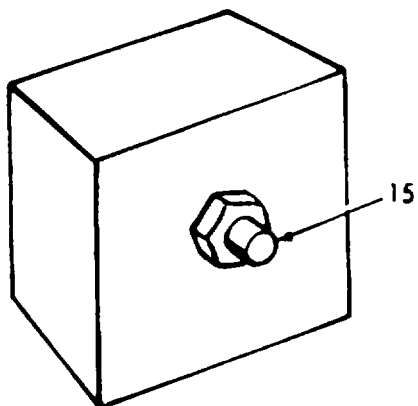
2-30. PROPULSION ENGINE - COLD WEATHER - LOCAL STARTING (Cont).

- h. Pull out knob (13) on local clutch control (14).
- i. Rotate knob (13) one-quarter turn counter-clockwise.
- j. Place clutch control (14) in neutral.
- k. Set throttle control (12) to one-half open.



2-30. PROPULSION ENGINE - COLD WEATHER - LOCAL STARTING (Cont).

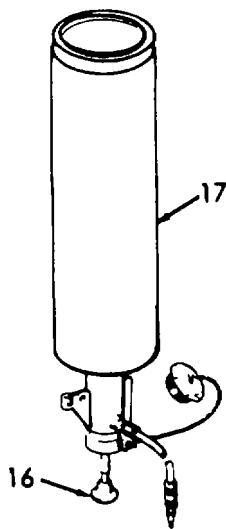
- I. Push local start button (15) located next to the hydrostarter.



- m. Pull out the "Quick Start" knob (16) on starting aid (17) for one or two seconds; then release it.

CAUTION

Do not use the starting aid more than once with the engine stopped. Over-loading the engine air box with the fluid could result in a minor explosion.



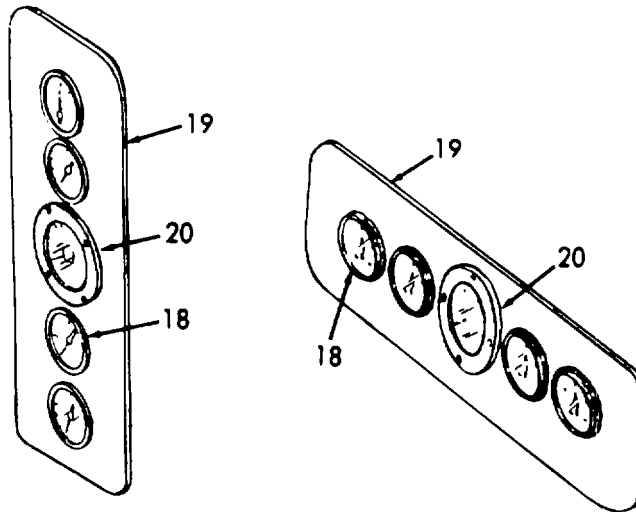
2-30. PROPULSION ENGINE - COLD WEATHER - LOCAL STARTING (Cont).

- n. Repeat the procedure if the engine does not start on the first attempt.

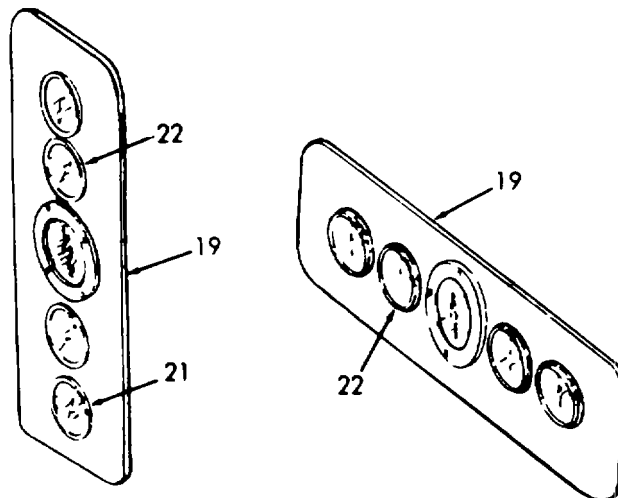
NOTE

Alarm may sound in the pilothouse indicating low oil pressure.

- o. Release start button (15) as soon as engine starts.
- p. Observe oil pressure gage (18) on instrument panel (19). If no pressure is indicated within 10 to 15 seconds, STOP. Check lubrication system. Minimum oil pressure is 25 psi (1757.7 gm sq cm) at 1200 RPM (20).



- q. Observe drive oil pressure gage (21) on instrument panel (19). Oil pressure is 40-42 psi (2812.2 to 2952.9 gm sq cm) at 1200 RPM.



- r. Warm up at part throttle, no-load for about 5 minutes, before loading engine. Normal coolant temperature on gage (22) is 160° F to 185° F, (71.1°C to 85.0°C).

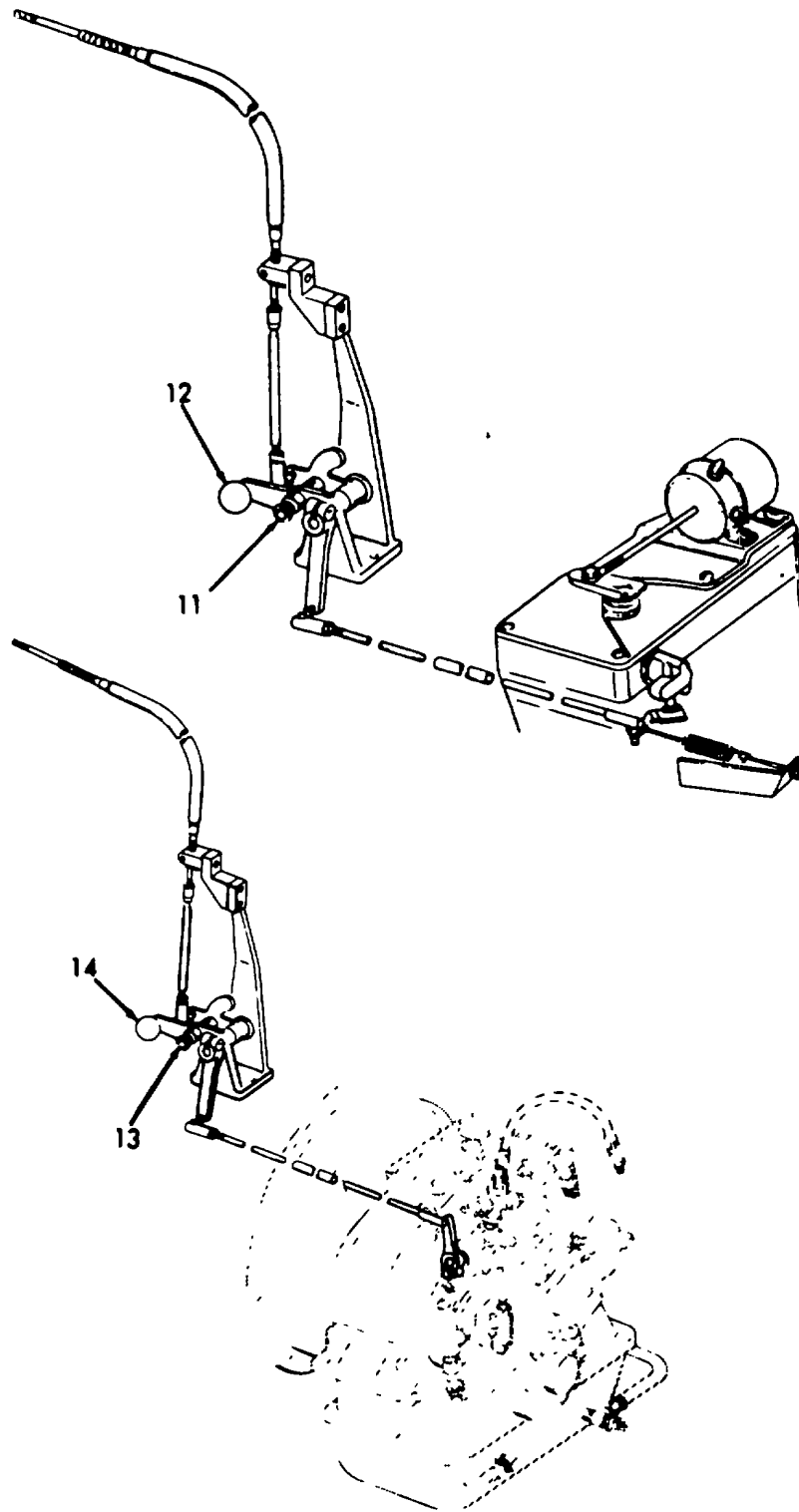
2-30. PROPULSION ENGINE - COLD WEATHER - LOCAL STARTING (Cont).

- s. Engage clutch (14) at less than 850 RPM.
- t. When prolonged idling is needed, maintain at least 800 RPM minimum.



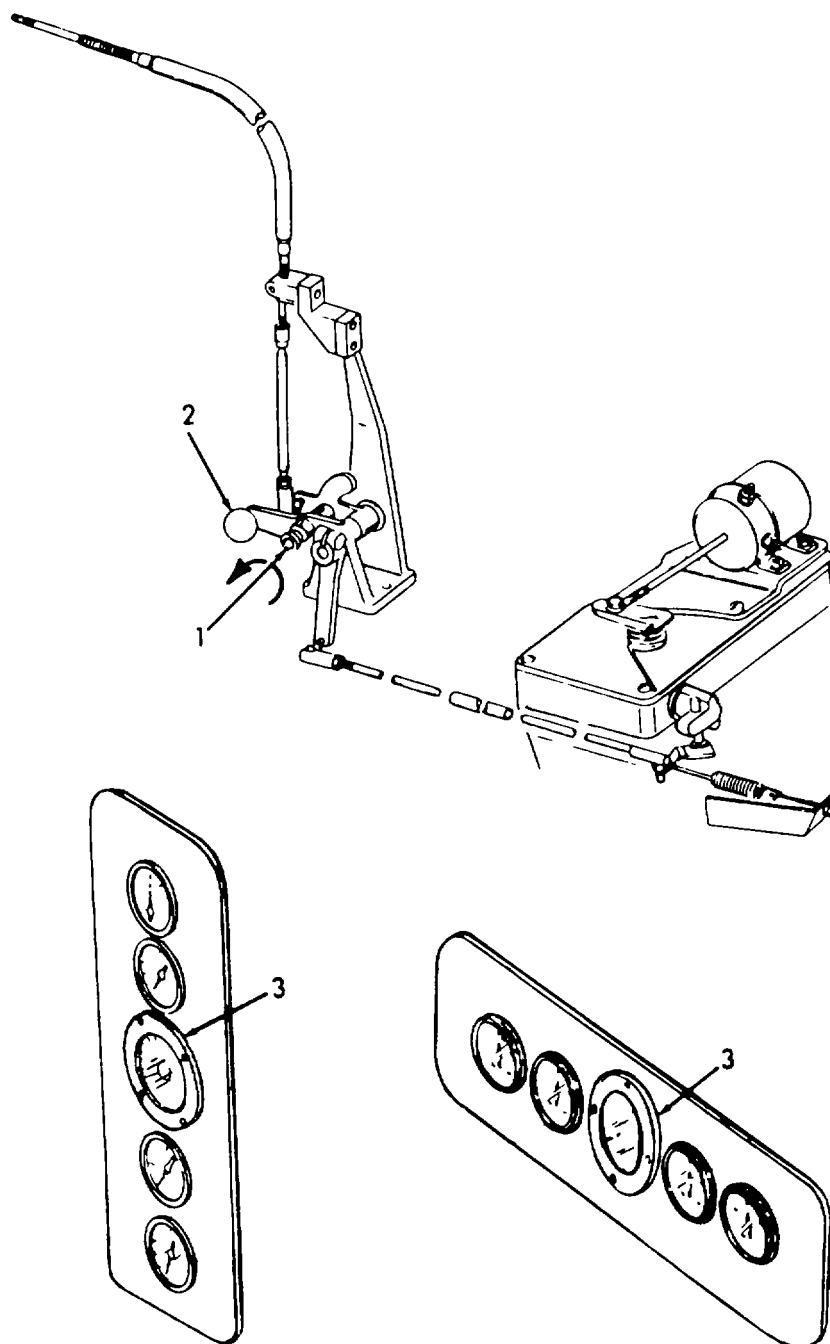
2-30. PROPULSION ENGINE - COLD WEATHER - LOCAL STARTING (Cont).

- u. To transfer control to the pilohouse, push in knob (11) on the throttle control (12), and push in knob (13) on the clutch control (14).



2-31. PROPULSION ENGINE - LOCAL STOP.

- a. Obtain permission to transfer control from the pilothouse to the engine room.
- b. Pull out knob (1) on local throttle control (2).
- c. Rotate knob (1) one-quarter turn counter-clockwise.
- d. Adjust local throttle control (2) until tachometer (3) indicates 800 RPM.

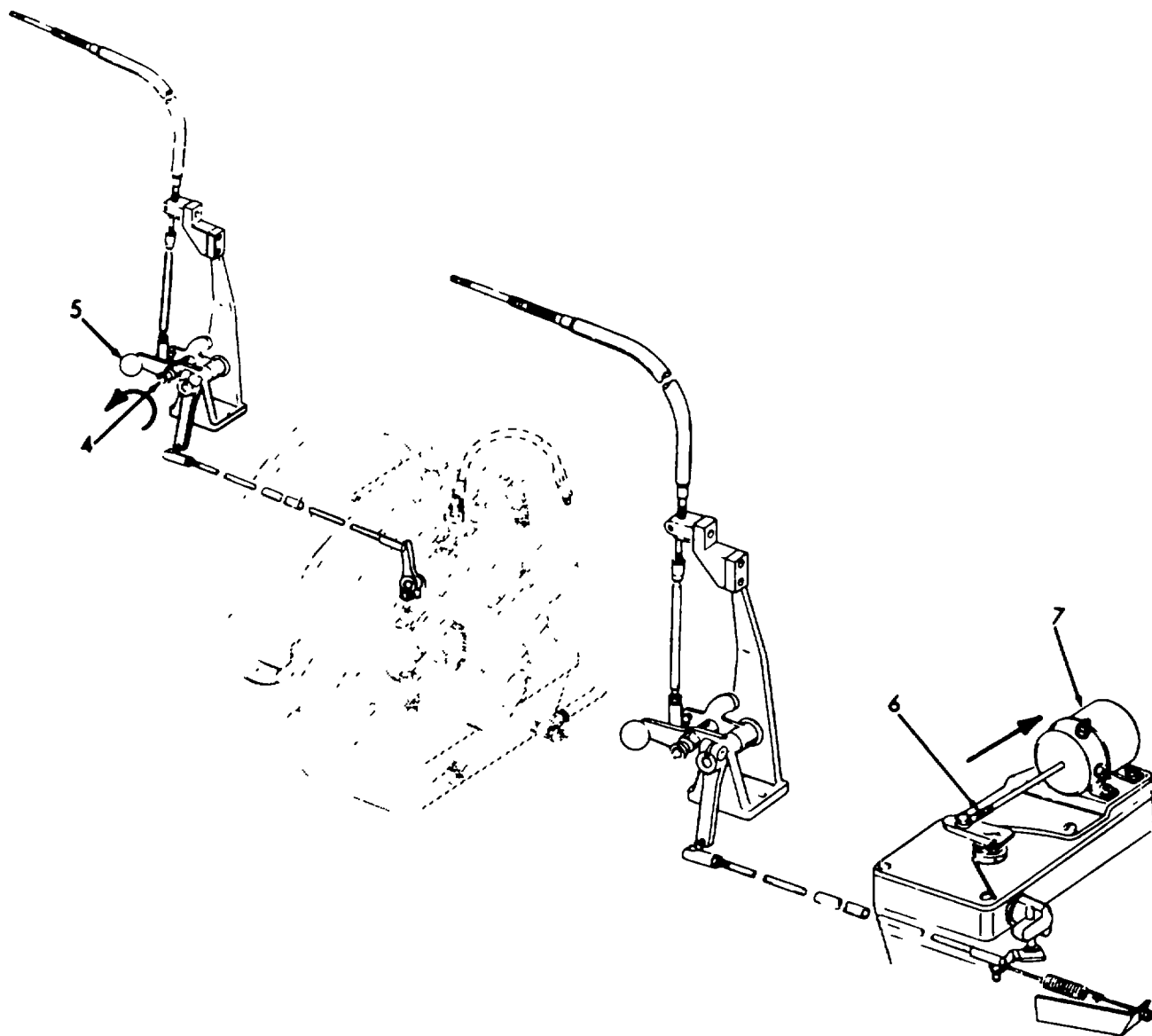


2-31. PROPULSION ENGINE - LOCAL STOP (Cont).

- e. Pull out knob (4) on local clutch control (5).
- f. Rotate knob (4) one-quarter turn counter-clockwise.
- g. Place local clutch control (5) in neutral.
- h. Wait 5 minutes before proceeding.
- i. Push in rod (6) on stop solenoid (7).

NOTE

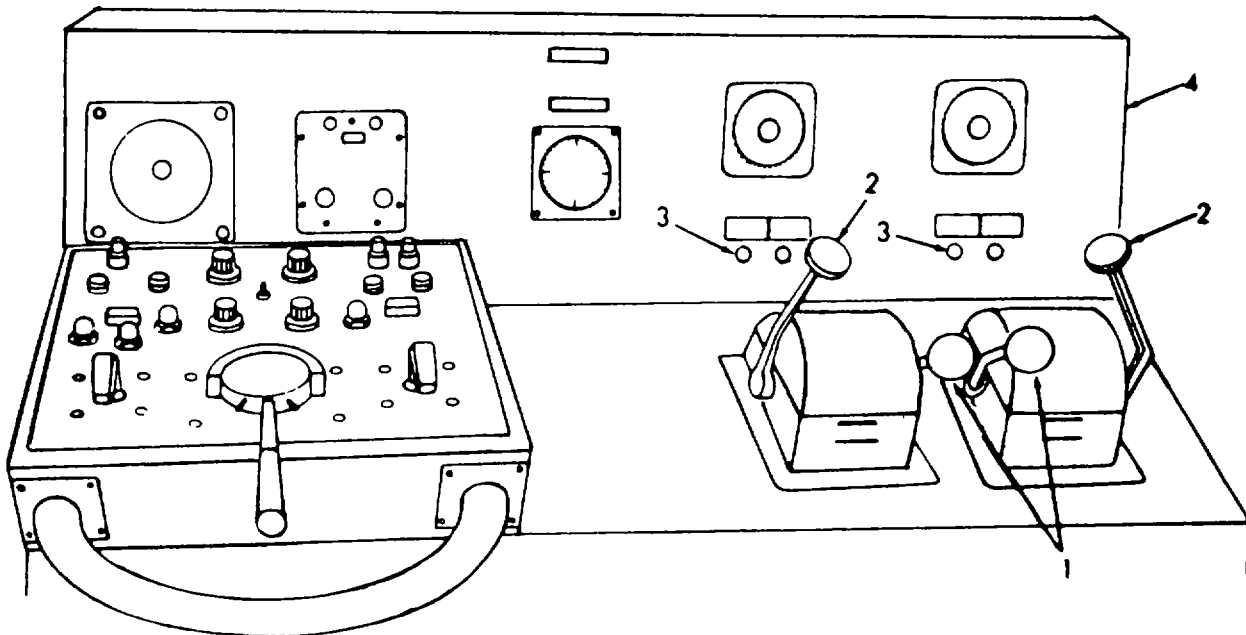
An alarm will sound in the pilothouse indicating low oil pressure.



2-32. PROPULSION ENGINE - REMOTE STARTING.**NOTE**

Before starting the engines from the pilothouse, they must have already been started locally from the engine rooms.

- a. Set throttle control (1) to one-half open.
- b. Place clutch control (2) in neutral.
- c. Push start button (3) on engine control panel (4) located in the pilothouse.

**NOTE**

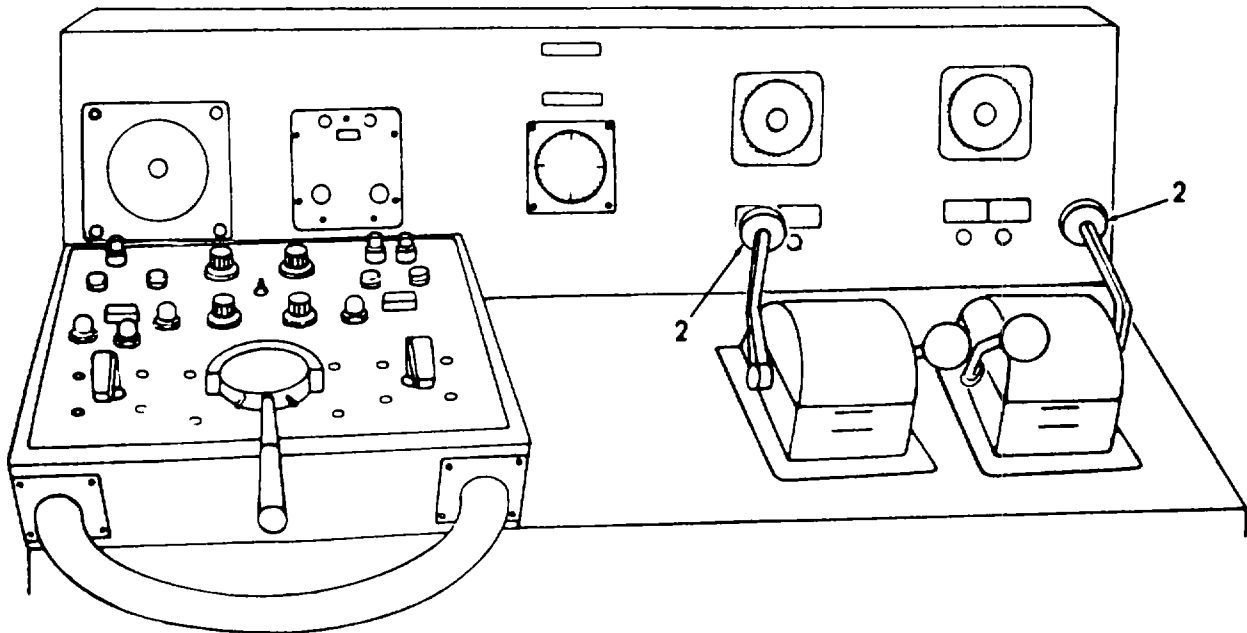
Alarm may sound in the pilothouse indicating low oil pressure.

- d. Release start button (3) as soon as engine starts.

2-32. PROPULSION ENGINE - REMOTE STARTING (Cont).**CAUTION**

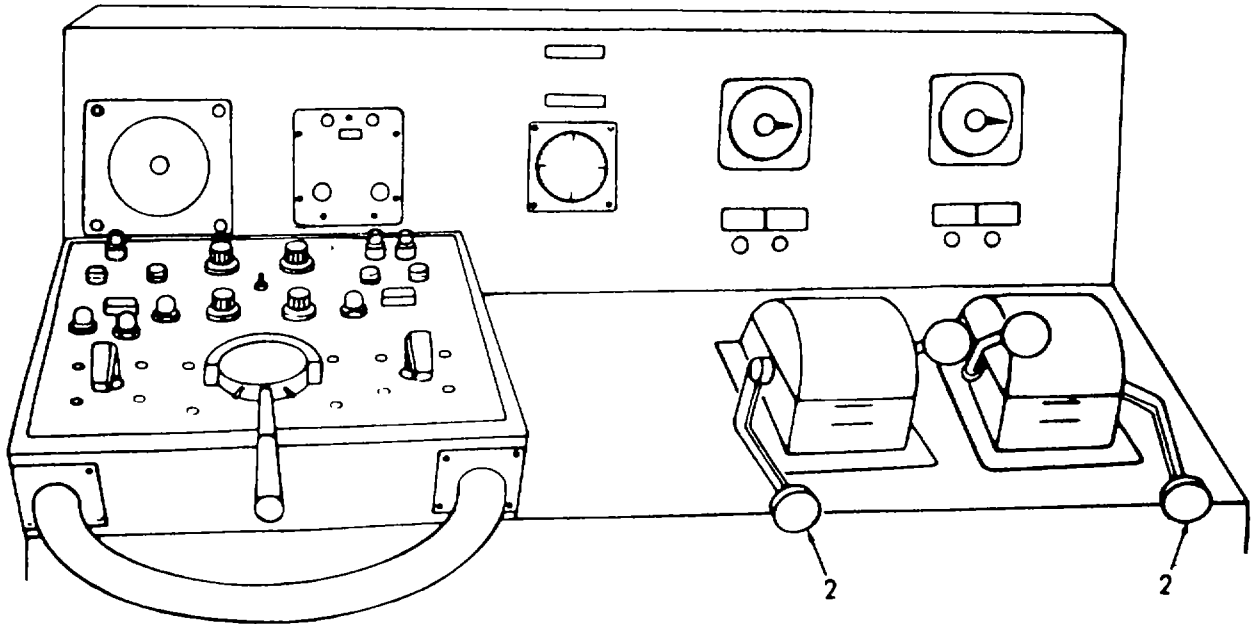
If alarm continues to ring, STOP. Check lubrication system. Minimum oil pressure is 25 psi (1757.7 gm sq cm) at 1200 RPM.

- e. Warm-up at part throttle, no load for about 5 minutes, before loading engine. Normal coolant temperature is 160° to 185° F (71.1° to 85.0° C).
- f. Engage clutch (2) at less than 850 RPM.



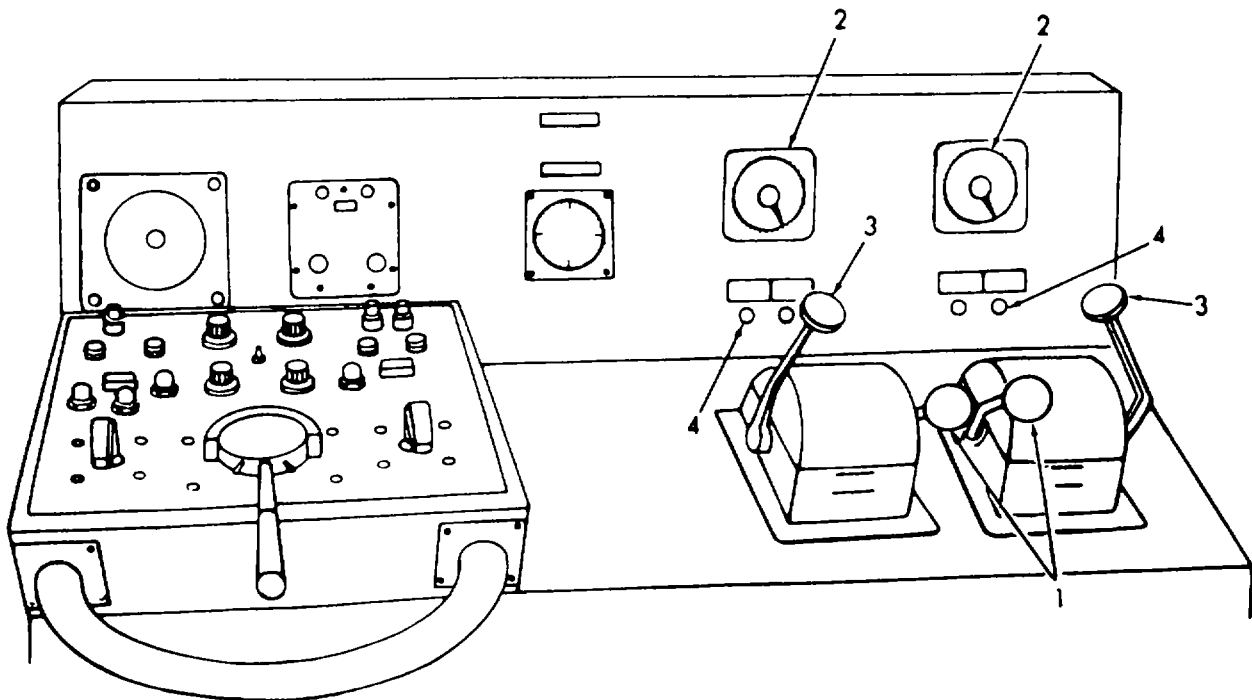
- g. When prolonged idling is needed, maintain at least 800 RPM minimum.

2-32. PROPULSION ENGINE - REMOTE STARTING (Cont).



2-33. PROPULSION ENGINE - REMOTE STOP.

- a. Move throttle control (1) until engine RPM (2) is 850 RPM.
- b. Place clutch control (3) in neutral.
- c. Press STOP button (4).



2-34. GENERATING SYSTEMS.

- a. The procedures contained in these paragraphs apply to both the starboard and port generating engines. Both generators are controlled by a switch board located in the engine access room.
- b. When the ship is in port, shore power to the vessel is inputted through the switchboard.
- c. The following is an index to the procedures:

<u>Description</u>	<u>Paragraph</u>
Shore Power	2-35
Preliminary Adjustments	2-36
Generator Engine - Local Start	2-37
Generator Engine - Cold Weather Start	2-38
Remote Operation - Generator #1	2-39
Remote Operation - Generator #2	2-40
Paralleling Generator	2-41
Stopping Generator - Operating Non-Parallel	2-42
Stopping Generator - Operating Parallel	2-43
Generator Engine - Local Stop	2-44
Ground Detector Lights	2-45

2-35. SHORE POWER.

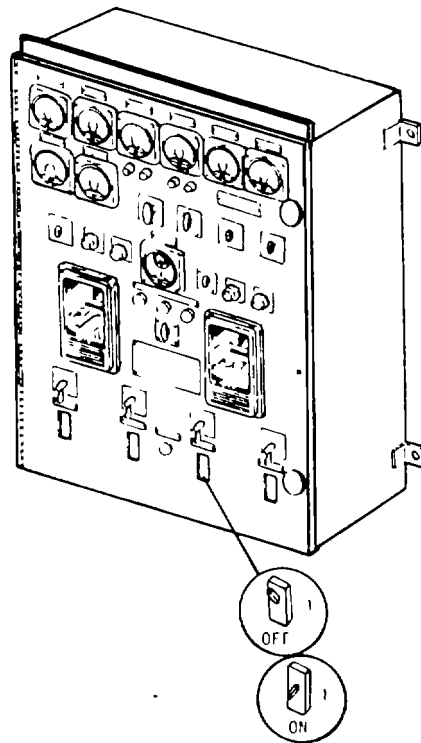
- a. This paragraph contains the initial procedure for providing shore power to a vessel. A vessel tied up outboard of a vessel receiving shore power, can receive power from that vessel.
- b. Shore power to the landing craft must be available in order to start all engines. Refer to Chapter 2 Section IV for emergency starting procedures.
- c. The following procedure must be followed when connecting the vessel to shore power.

WARNING

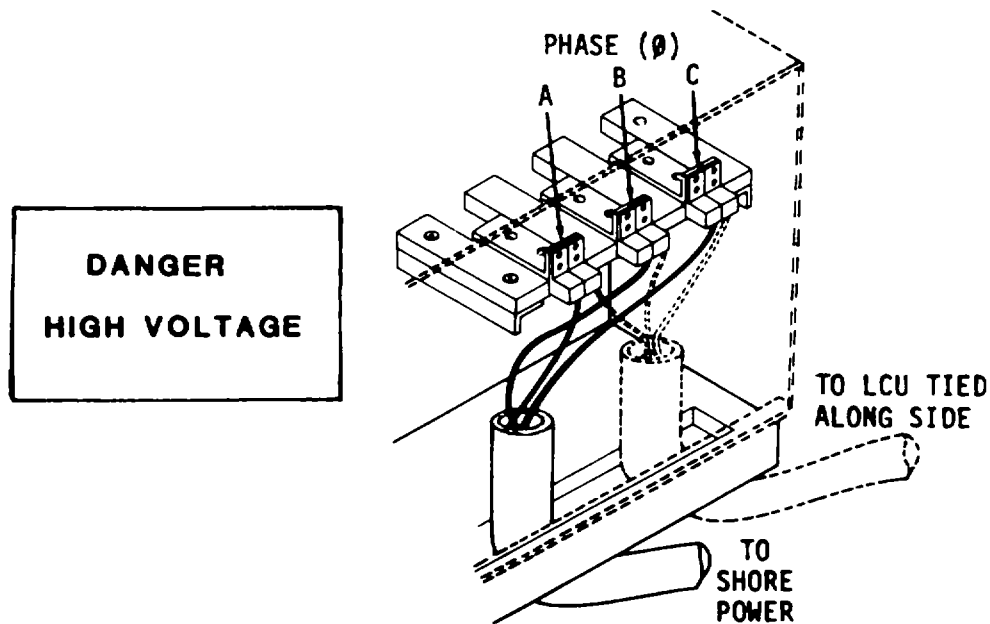
- Shore power can cause death or serious injury. Do not plug cable into power source until all connections are made.
- When tying the shore power of your vessel to another. Disconnect the other vessel from the source of shore power at the source.

2-35. SHORE POWER (Cont).

- (1) Place the shore power circuit breaker (1) in the OFF position.



- (2) Connect the incoming power cable to the shore power connection box.
- (3) Connect the shore power cable to the source of shore power.



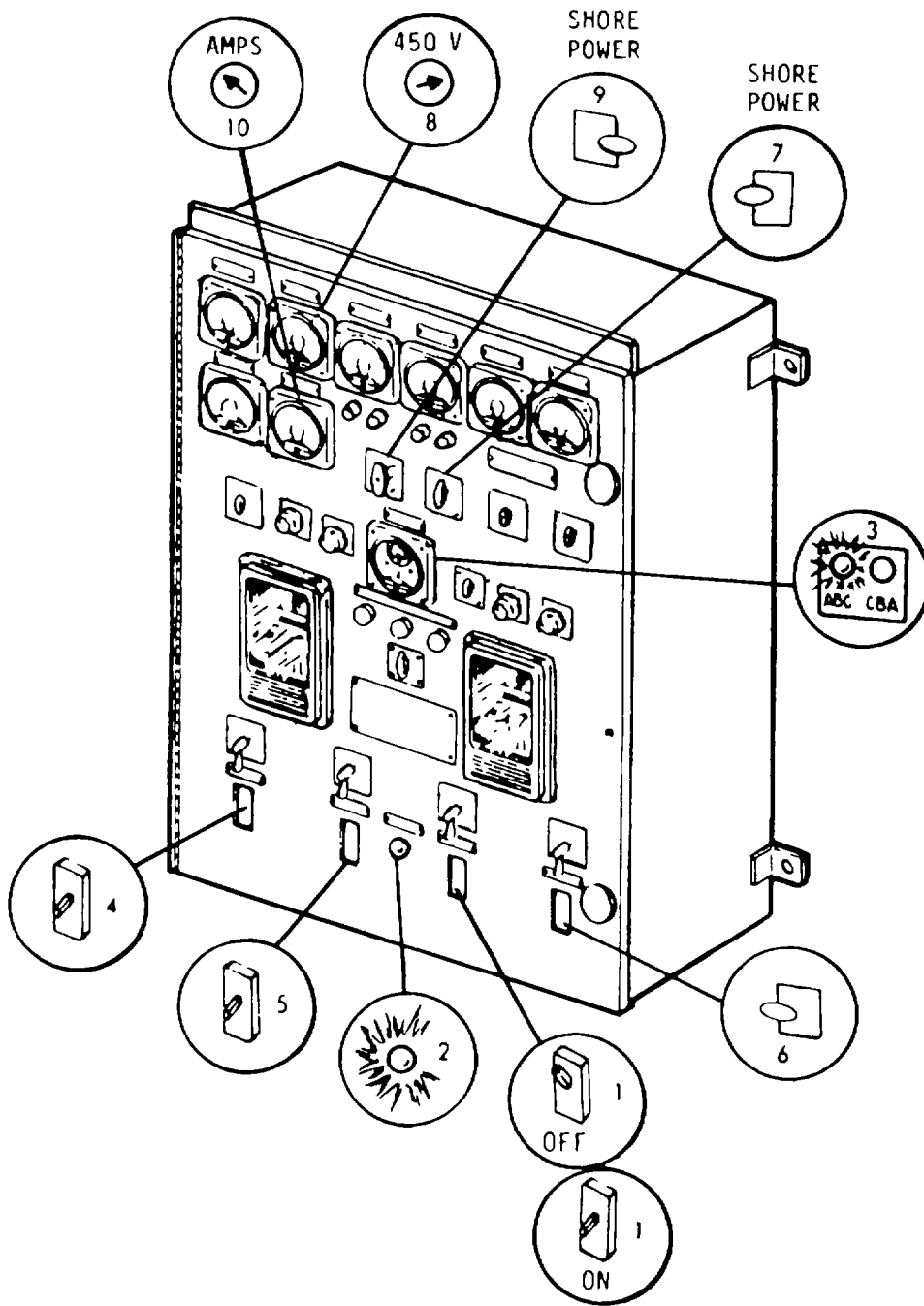
2-35. SHORE POWER (Cont).

- (4) The shore power available indicator (2) should be lit.
- (5) The shore power phase sequence indicator (3) labeled ABC should be lit.

CAUTION

- If CBA is lit in the shore power phase indicator (3), STOP - the incoming wiring is reversed. Remove the shore power cable from the source of shore power. Check all wiring connections. When the ABC lamp is lit proceed.

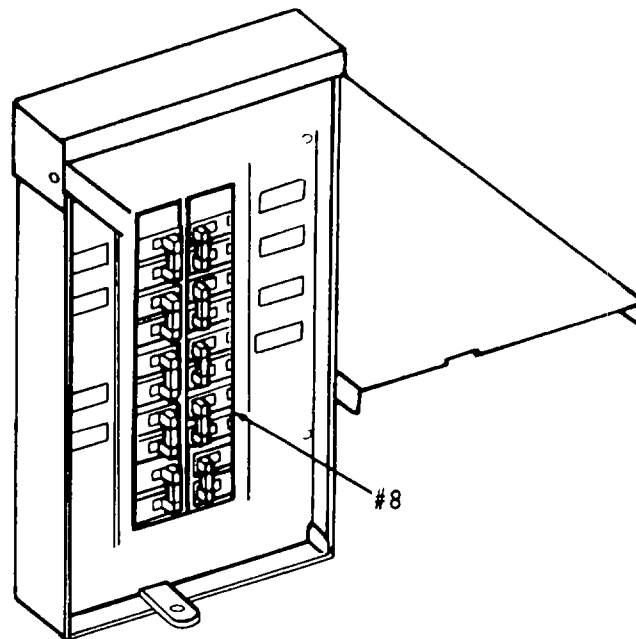
 - Shore power and ships generator loads must be parallel before transfer of power source.
- (6) Check that generator #1 and generator #2 main circuit breakers (4 and 5) are in the OFF position.
 - (7) Place the shore power circuit breaker (1) in the ON position.
 - (8) Place the distribution main circuit breaker (6) in the ON position.
 - (9) Place the generator #2/shore power voltmeter switch (7) in the SHORE POWER position. The generator #2/shore power voltmeter (8) should read 450V.
 - (10) Place the generator #2/shore power ammeter switch (9) in the SHORE POWER position. The generator #2/shore power ammeter (10) should indicate the amperage drawn.



SHORE POWER

2-35. SHORE POWER (Cont).

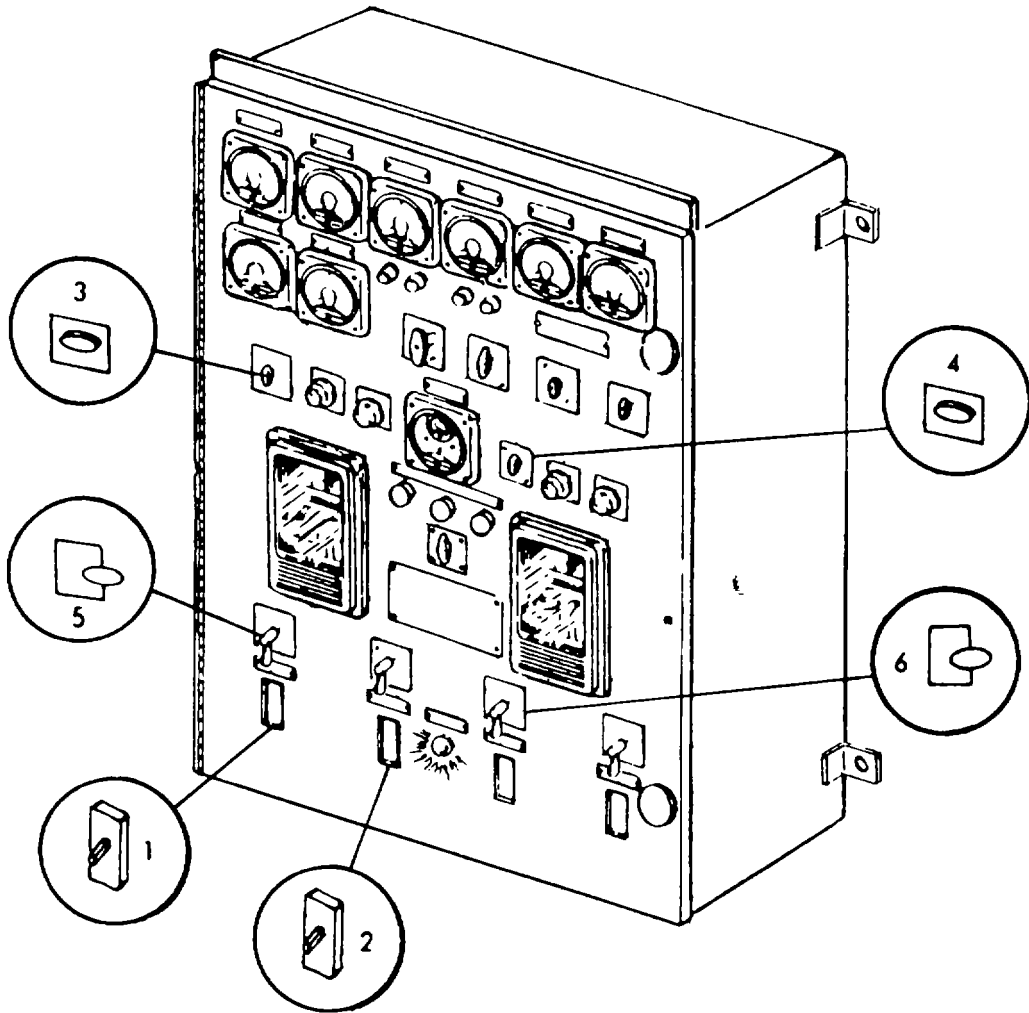
(11) In the forward engine room - at lighting distribution panel L-107 - place circuit breaker 8 in the ON position.

**2-36. PRELIMINARY ADJUSTMENTS**

Prior to starting either generator the following steps must be performed.

- a. Place generator #1 circuit breaker (1) in the OFF position.
- b. Place generator #2 circuit breaker (2) in the OFF position.
- c. Place the integral switch (3) for generator #1 in the UNIT position.
- d. Place the integral switch (4) for generator #2 in the UNIT position.
- e. Place the Auto-Manual switch (5) for generator #1 in the MAN position.
- f. Place the Auto-Manual switch (6) for generator #2 in the MAN position.
- g. Proceed to start a generator locally.

2-36. PRELIMINARY ADJUSTMENTS (Cont).



2-37. GENERATOR ENGINE - LOCAL START.

CAUTION

Before starting engines, generator circuit breakers on control panel must be open.

- a. Perform all before and daily operations on the Preventive Maintenance Checks and Services Chart.

NOTE

Position all shut off valves open (counter-clockwise).

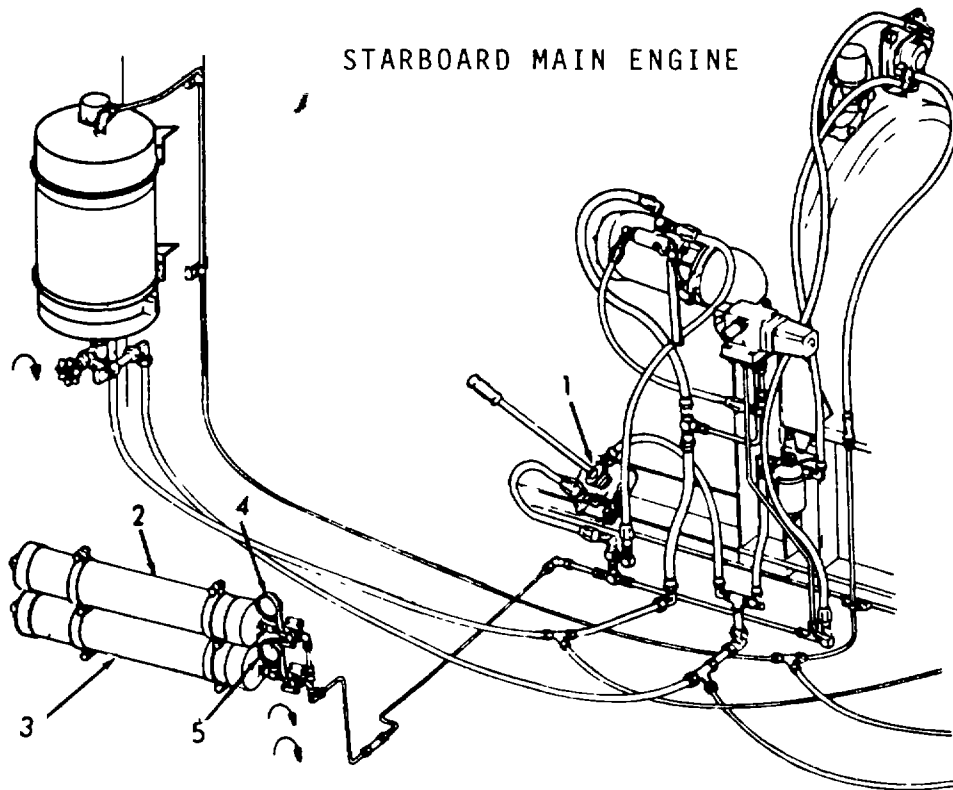
- b. Operate hand pump (1) on hydrostarter in forward engine room to charge accumulator (2 and 3).
- c. Pressure gage (4 and 5) should read:

AMBIENT TEMPERATURE

Above 40°F (4.4°C)
 40°F to 0°F (4.4°C to -17.8°C)
 Below 0°F (-17.8°C)

GAGE READING

1500 psi (1054.5 kg sq cm)
 2500 psi (1757.5 kg sq cm)
 3300 psi (2319.9 kg sq cm)



2-37. GENERATOR ENGINE - LOCAL START (Cont).

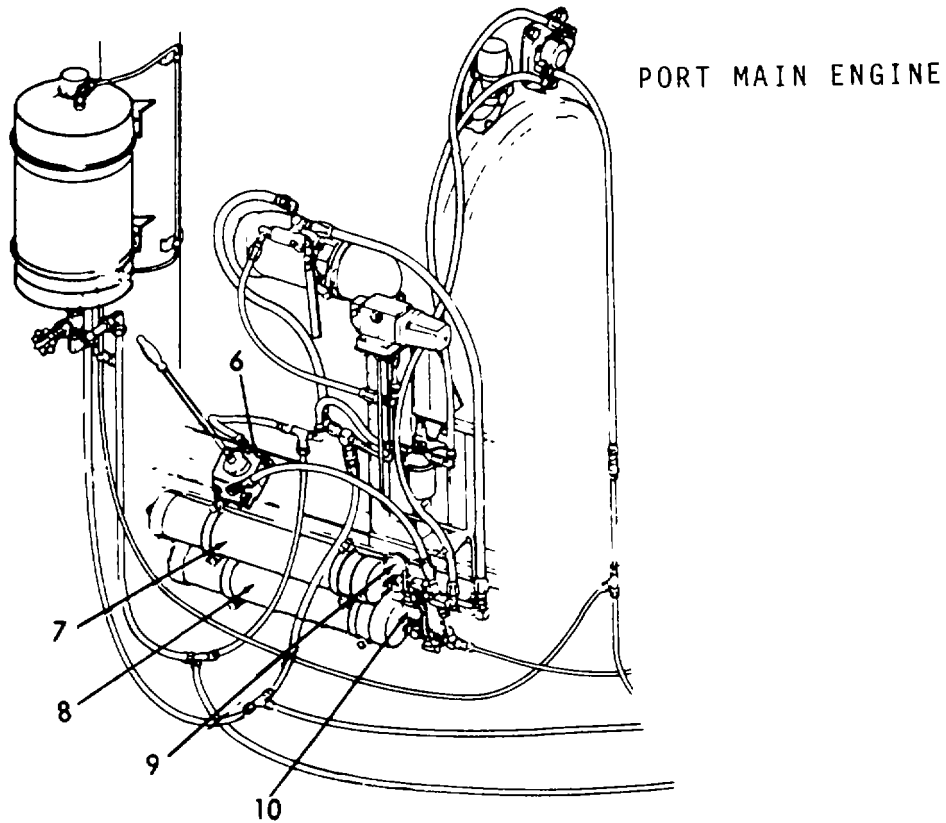
- d. Operate hand pump (6) on hydrostarter in aft engine room to charge accumulator (7 and 8).
- e. Pressure gage (9 and 10) should read:

AMBIENT TEMPERATURE

Above 40°F (4.4°C)
 40°F to 0°F (4.4°C to -17.8°C)
 Below 0°F (-17.8°C)

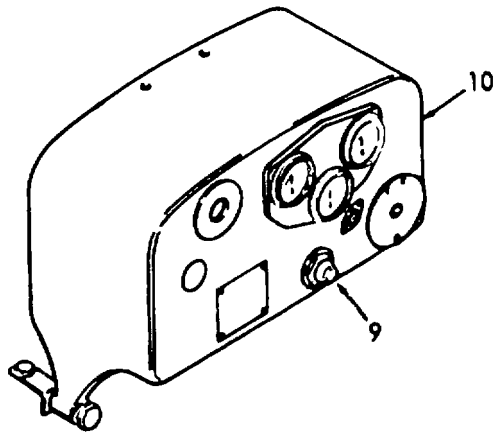
GAGE READING

1500 psi (1054.5 kg sq cm)
 2500 psi (1757.5 kg sq cm)
 3300 psi (2319.9 kg sq cm)

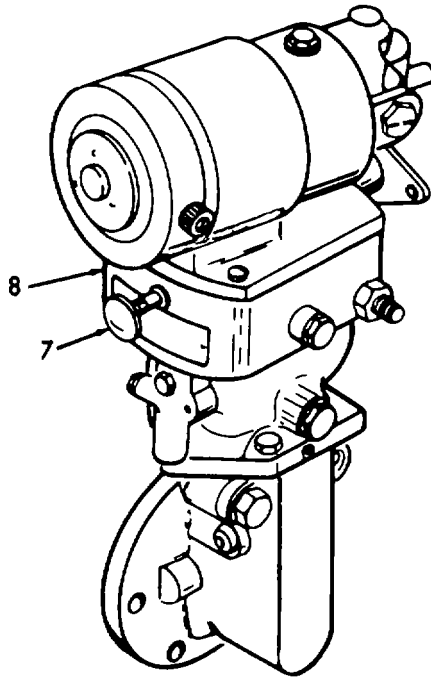


2-37. GENERATOR ENGINE - LOCAL START.

- f. Push in fuel rod knob (7) on hydraulic governor (8).

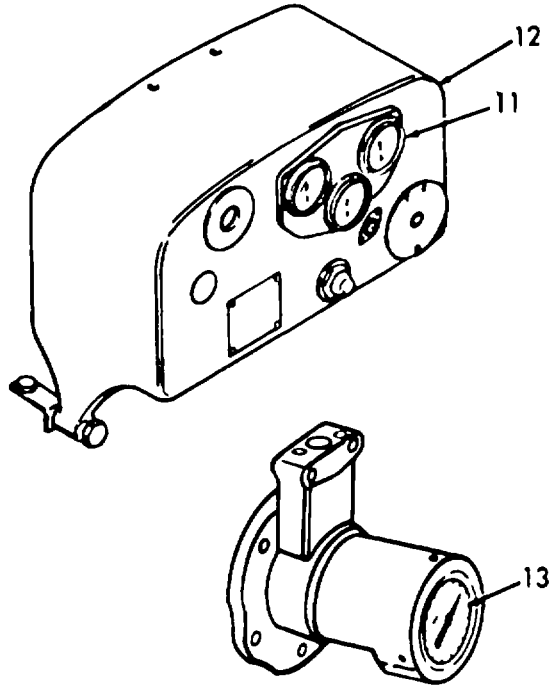


- g. Push local start button (9) on instrument panel (10).

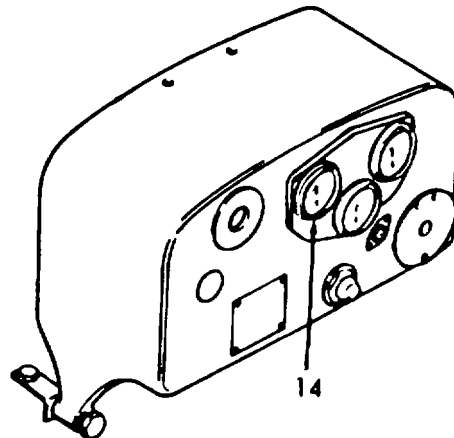


2-37. GENERATOR ENGINE - LOCAL START (Cont).

- h. Release start button (9) as soon as engine starts.
- i. Observe oil pressure gage (11) on instrument panel (12). If no pressure is indicated within 10 to 15 seconds, STOP. Check lubrication system. Minimum pressure is 25 psi (1757.7 gm sq cm) at 1200 RPM (13).

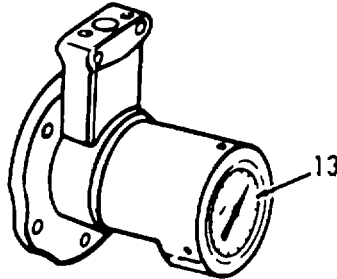


- j. Warm-up at part throttle, no load, for about 5 minutes before loading engine. Normal coolant temperature (14) is 160°F, (71.1°C).



2-37. GENERATOR ENGINE - LOCAL START (Cont).

- k. When prolonged idling is needed, maintain at least 800 RPM minimum.
- l. Advance the throttle until the tachometer (13) indicates 1800 RPM.



- m. Assume control of the generator at the switchboard located in the engine access room.

NOTE

The voltage can be adjusted by rotating the manual control rheostat on the switchboard located in the engine access room.

2-38. GENERATOR ENGINE - COLD WEATHER START.



Before starting engines, generator circuit breakers on control panel must be open.

- a. Perform all before operations on the Preventive Maintenance Checks and Services chart.

NOTE

Position all shut off valves open (counter-clockwise).

- b. Operate hand pump (1) on hydrostarter in forward engine room to charge accumulator (2 and 3).
- c. Pressure gage (4 and 5) should read:

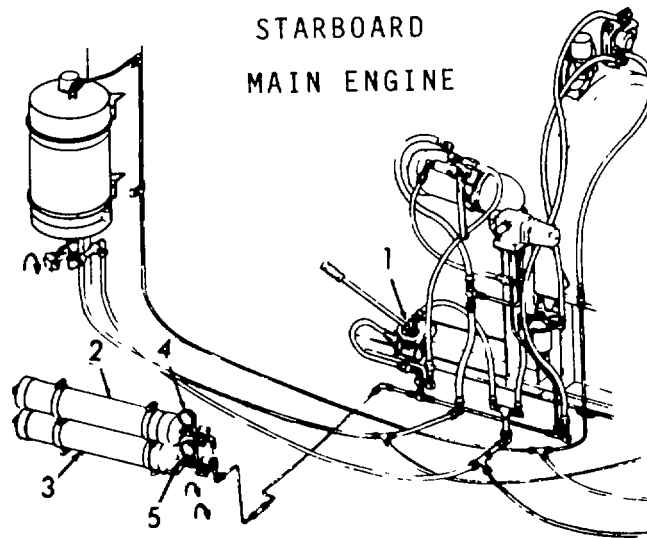
AMBIENT TEMPERATURE

Above 40°F (4.4°C)
 40°F to 0°F (4.4°C to -17.8°C)
 Below 0°F (-17.8°C)

GAGE READING

1500 psi (1054.5 kg sq cm)
 2500 psi (1757.5 kg sq cm)
 3300 psi (2319.9 kg sq cm)

2-38. GENERATOR ENGINE - COLD WEATHER START (Cont).



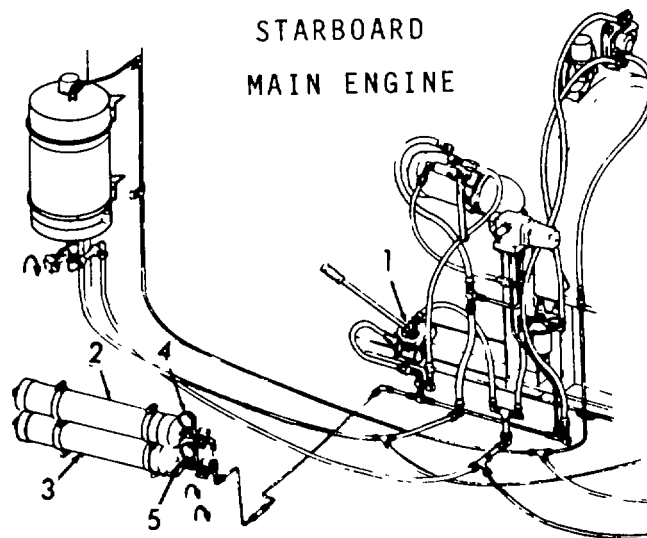
- d. Operate hand pump (6) on hydrostarter in aft engine room to charge accumulator (7 and 8).
- e. Pressure gage (9 and 10) should read:

AMBIENT TEMPERATURE

Above 40°F (4.4°C)
 40°F to 0°F (4.4°C to -17.8°C)
 Below 0°F (-17.8°C)

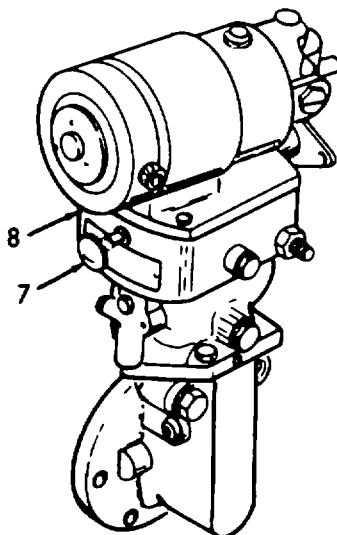
GAGE READING

1500 psi (1054.5 kg sq cm)
 2500 psi (1757.5 kg sq cm)
 3300 psi (2319.9 kg sq cm)

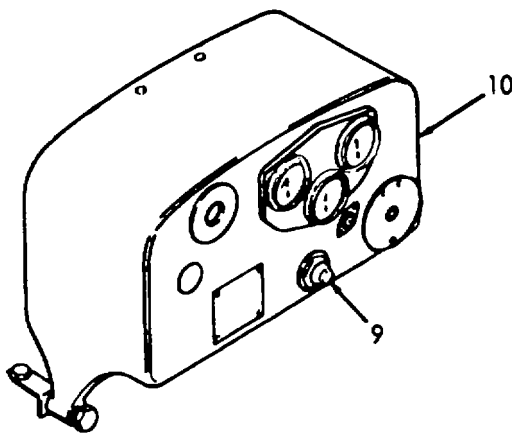


2-38. GENERATOR ENGINE - COLD WEATHER START (Cont)..

- f. Push in fuel rod knob (7) on hydraulic governor (8).



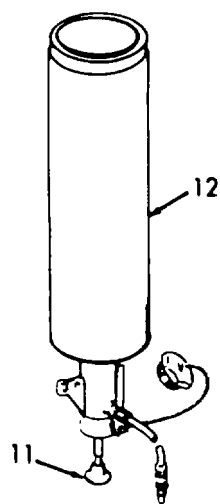
- g. Push local start button (9) on instrument panel (10).



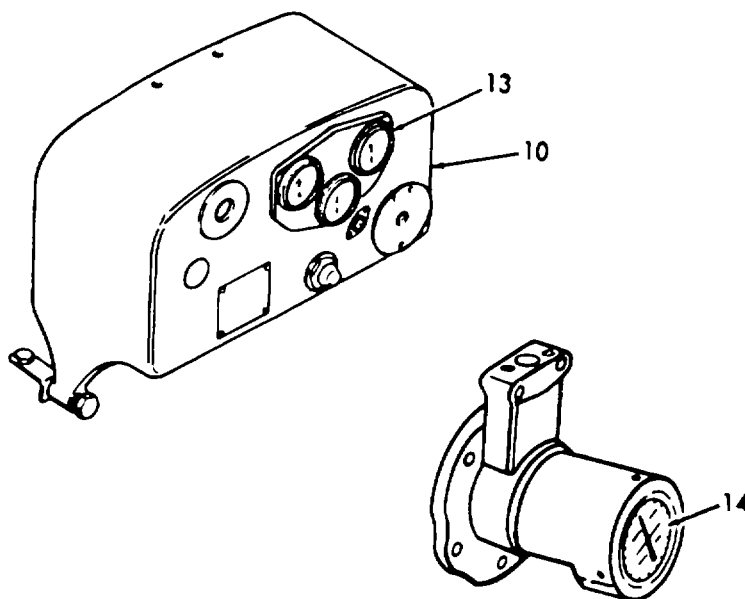
- h. Pull out the "Quick Start" knob (11) on starting aid (12) for one or two seconds, then release it.

CAUTION

Do not use the Starting Aid more than once with the engine stopped. OVERLOADING THE ENGINE AIR BOX WITH THE FLUID COULD RESULT IN A MINOR EXPLOSION.

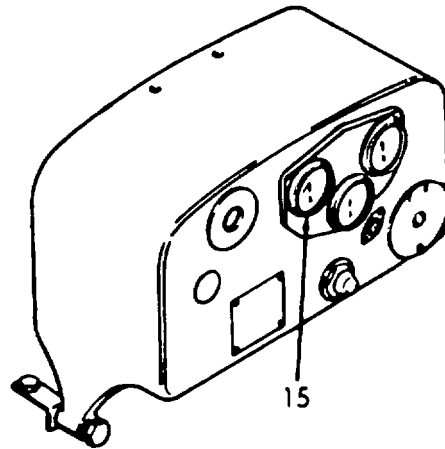
2-38. GENERATOR ENGINE - COLD WEATHER START (Cont)..

- i. Repeat the procedure if the engine does not start on the first attempt.
- j. Release start button (9) as soon as engine starts.
- k. Observe oil pressure gage (13) on instrument panel (10). If no pressure is indicated within 10 to 15 seconds, STOP. Check lubrication system. Minimum oil pressure is 25 psi (1757.7 gm sq cm) at 1200 RPM (14).

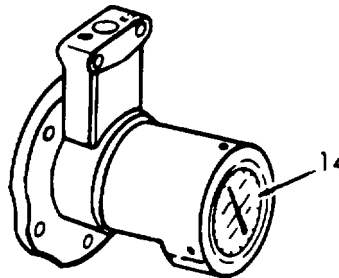


2-38. GENERATOR ENGINE - COLD WEATHER START (Cont).

- I. Warm-up at part throttle, no load, for about 5 minutes before loading engine. Normal coolant temperature (15) is 160°F, (71.1°C).



- m. Advance the throttle until the tachometer (14) indicates 1800 RPM.



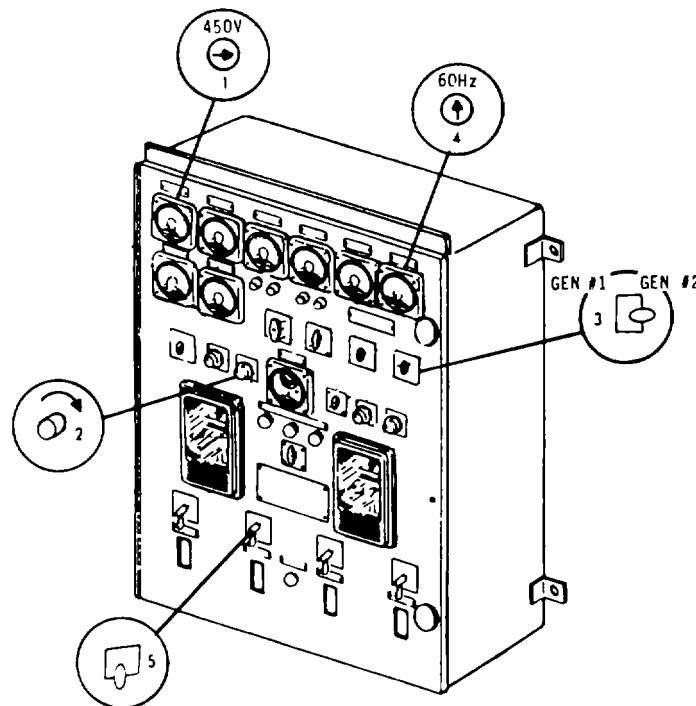
- n. Assume transfer control of the generator at the switchboard located in the engine access room.
- o. When prolonged idling is needed, maintain at least 800 RPM minimum.

2-39. REMOTE OPERATION - GENERATOR #1.

- a. The previous procedures, preliminary adjustments and generator engine-local start, must be completed prior to performing the following:

CAUTION

- To avoid the possibility of damage to the generator, do not operate the generating system at reduced speeds for an extended period of time with the voltage regulator in operation.
 - Shore power is being fed from the switchboard to the vessel.
- b. The following procedure is for generator #1 only. Refer to paragraph 2-40 for generator #2.
- (1) Observe voltmeter (1). It should read 450V. If not, adjust the voltage adjust rheostat (2).
 - (2) Place the frequency meter switch (3) in the generator #1 position.
 - (3) Observe frequency meter (4). It should read 60hz. If not, adjust the governor motor switch (5).



GENERATOR #1 - REMOTE

2-39. REMOTE OPERATION - GENERATOR #1 (Cont).**CAUTION**

To avoid the possibility of damage to the generator, when indicator (6) is lit: circuit breaker (7) must be in the OFF position, before placing circuit breakers (8 and 9) in the ON position.

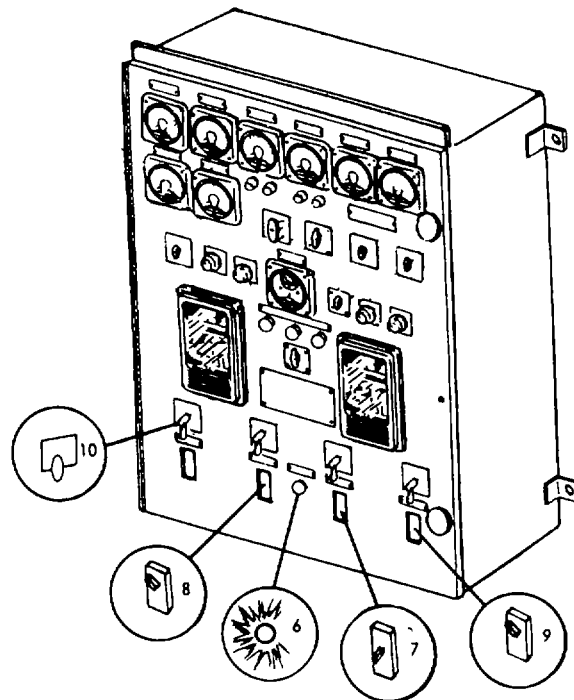
Shore power is being supplied to the vessel. Shore power indicator (6) is lit, and circuit breaker (7) is in the ON position.

- (4) Place the shore power circuit breaker (7) in the OFF position.

NOTE

Shore power indicator (6) will remain lit.

- (5) When the generator is at 450V and 60 hz, place the generator #1 main circuit breaker (8) in the ON position.
- (6) Place the distribution bus circuit breaker (9) in the ON position.
- (7) Place the auto/manual switch (10) in the AUTO position.

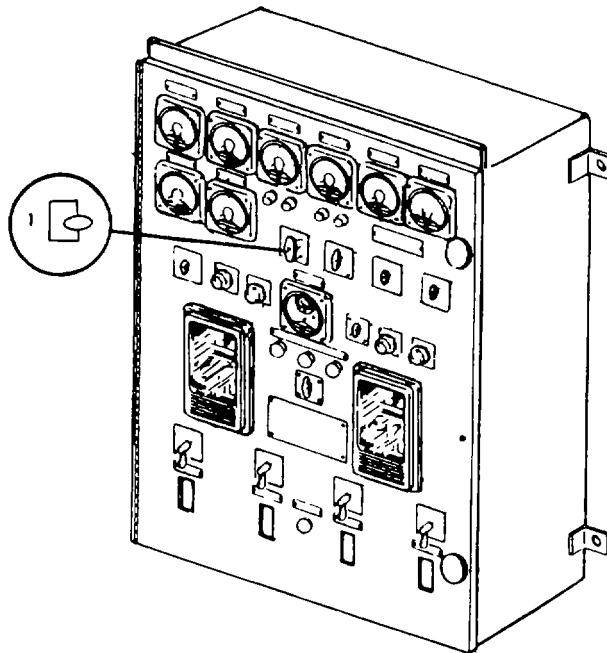
**GENERATOR #1 - REMOTE**

2-40. REMOTE OPERATION - GENERATOR #2.

- a. The previous procedures, preliminary adjustments and generator engine-local start must be completed prior to performing the following:

CAUTION

- To avoid the possibility of damage to the generator do not operate the generating system at reduced speeds for an extended period of time with the voltage regulator in operation.
 - Shore power is being fed from the switchboard to the vessel.
- b. The following procedure is for generator #2 ONLY.
- (1) Place generator 2/shore power ammeter switch (1) in the GEN 2 position.

**GENERATOR #2 - REMOTE**

2-40. REMOTE OPERATION - GENERATOR #2 (Cont)

- (2) Place generator 2/shore power voltmeter switch (2) in the GEN 2 position.
- (3) Observe voltmeter (3). It should read 450V. If not adjust the voltage adjust rheostat (4).
- (4) Place the frequency meter switch (5) in the generator #2 position.
- (5) Observe frequency meter (6). It should read 60 hz. If not adjust the governor motor switch (7).

CAUTION

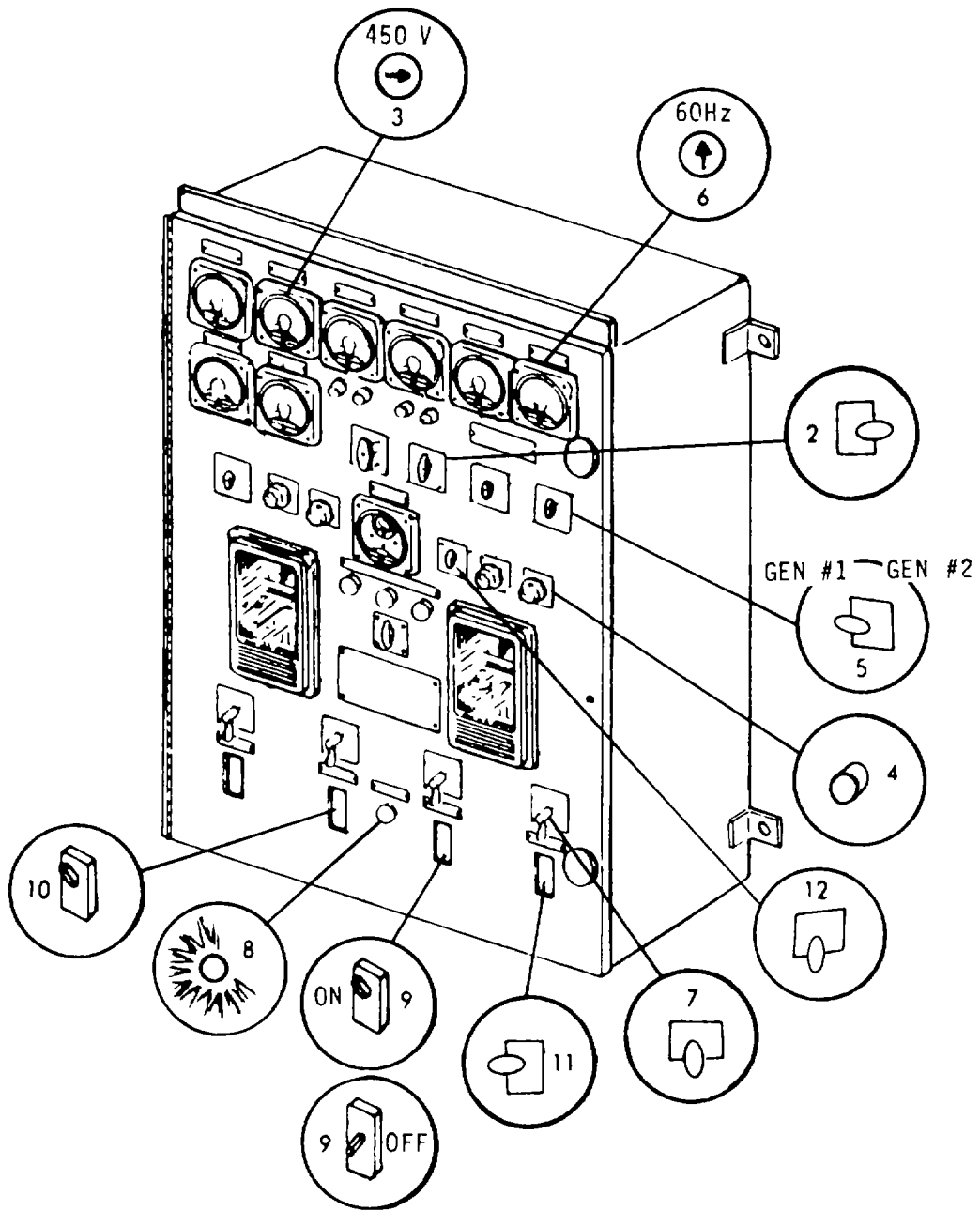
- Shore power is being supplied to the vessel. Shore power indicator (8) is lit and circuit breaker (9) is in the ON position.
 - To avoid the possibility of damage to the generator, when indicator (8) is lit: Circuit breaker (9) must be in the OFF position, before placing circuit breaker (10 and 11) in the ON position.
- (6) Place the shore power circuit breaker (9) in the OFF position.

NOTE

Shore power indicator (8) will remain lit.

- (7) When the generator is at 450V and 60 hz, place the generator 2 main circuit breaker (10) in the ON position.
- (8) Place the distribution bus circuit breaker (11) in the ON position.
- (9) Place the auto/manual switch (12) in the AUTO position.

2-40. REMOTE OPERATION - GENERATOR #2 (Cont).



GENERATOR #2 - REMOTE

2-41. PARALLELING GENERATORS.

Prior to paralleling generators #1 and #2, the previous procedures, preliminary adjustment, generator local/start, remote operation generator #1 and remote operation generator #2 must be completed.

CAUTION

To avoid possibility of damage to the generator, shore power cannot be paralleled to the ship's generators.

Only one of the ship's generators can be supplying power to the distribution main breaker.

NOTE

In this procedure, generator #1 is being paralleled to generator #2. If generator #2 is to be paralleled to generator #1, reverse the procedure.

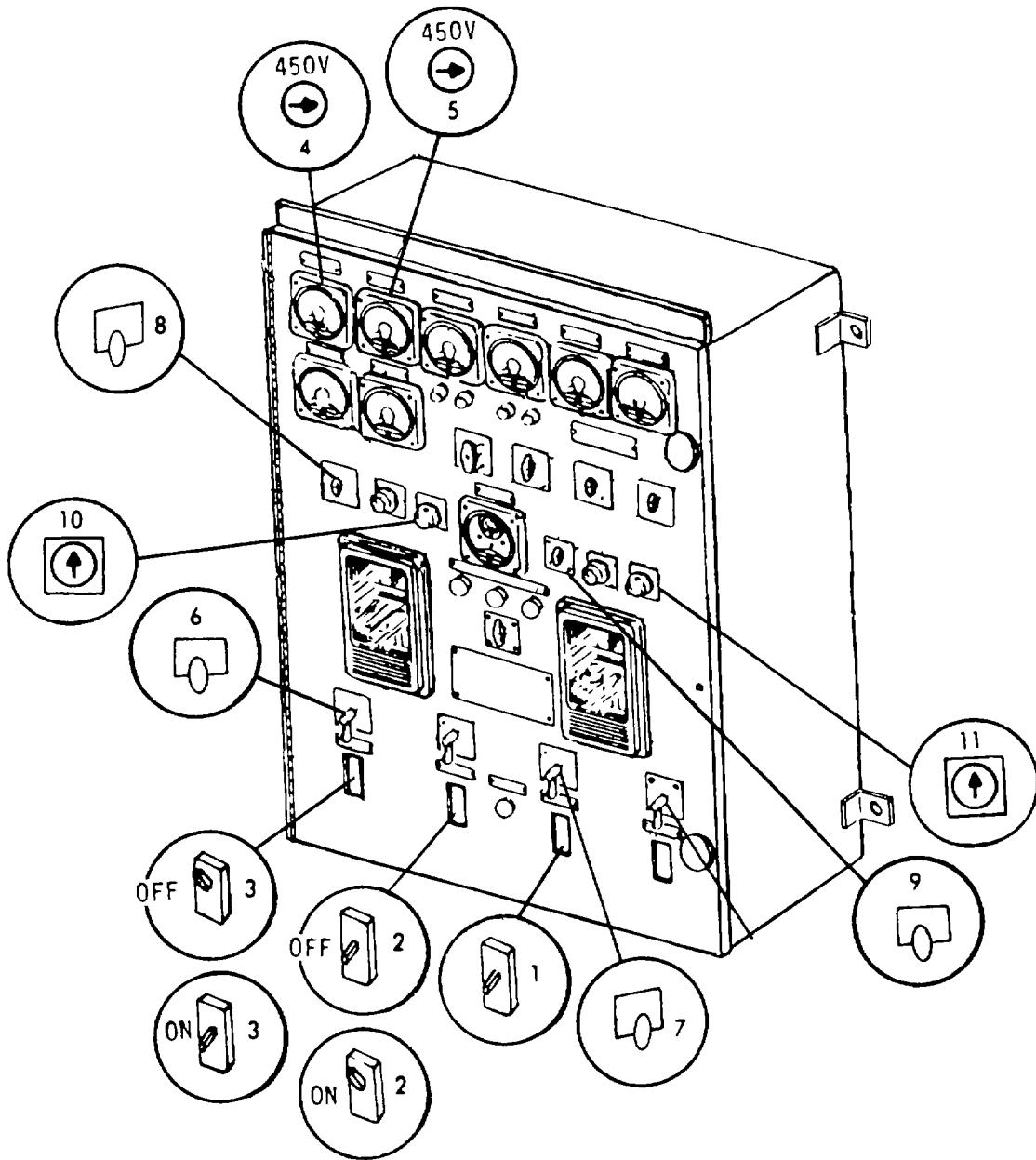
- a. Shore power main circuit breaker (1) must be in the OFF position.
- b. Generator #2 main circuit breaker (2) must be in the OFF position.
- c. Generator #1 main circuit breaker (3) must be in the ON position.
- d. Generator #1 voltmeter (4) should read 450V.
- e. Generator #2 voltmeter (5) should read 450V.
- f. Place the auto/manual switches (6 and 7) in the AUTO position.
- g. The integral switches (8 and 9) should be in the OFF position.

NOTE

Both voltmeters should read the same.

- h. If the shore power circuit breaker (1) is in the ON position, place in the OFF position.
- i. Place the generator #1 main circuit breaker (3) in the ON position.
- j. Set the droop rheostats (10 and 11) to the center positions.

2-41. PARALLELING GENERATORS (Cont).



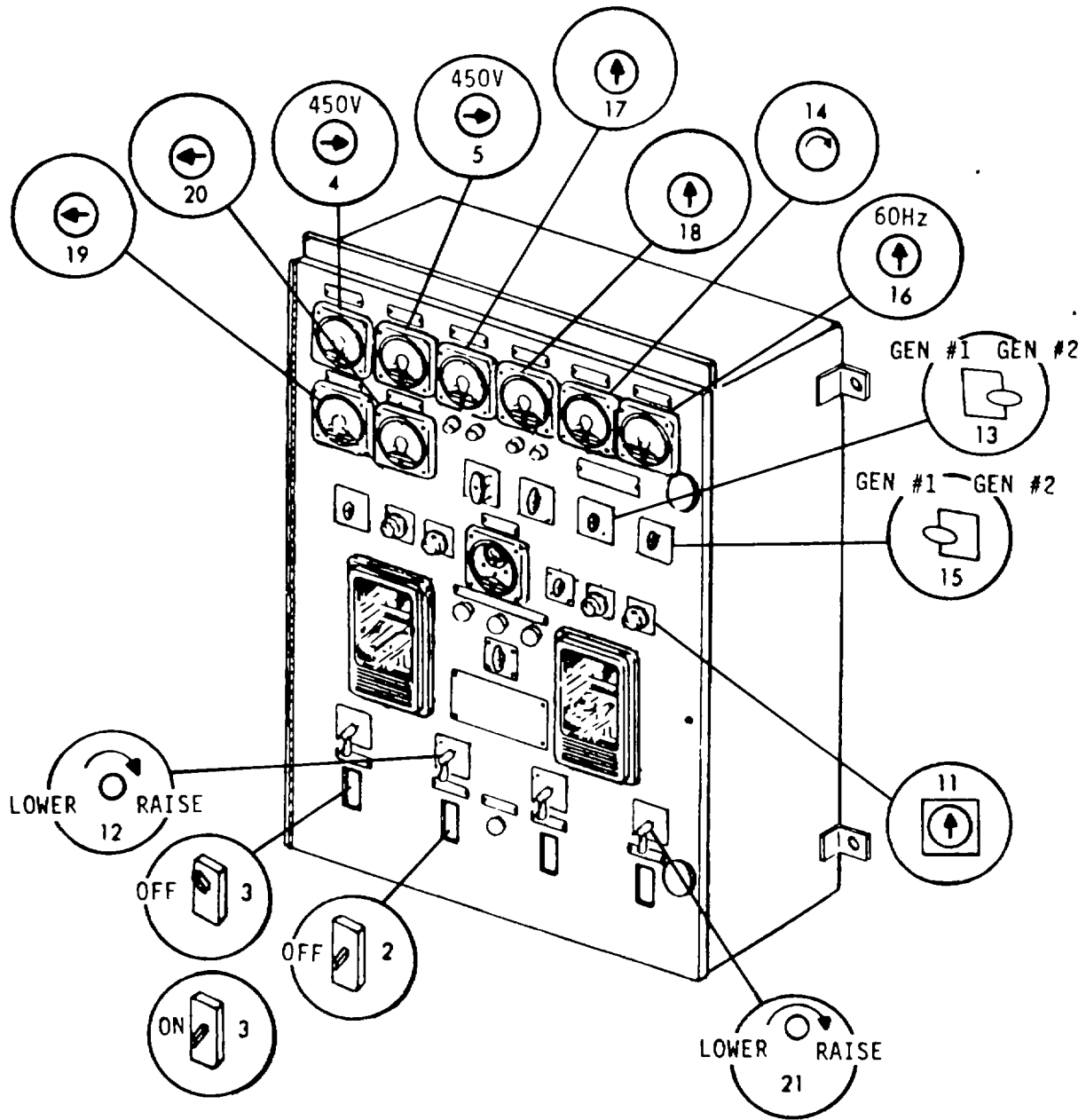
2-41. PARALLELING GENERATORS (Cont).

- k. Place a load of about 60% of full load on the generator. Turn on fans, motors, etc. Note the voltage droop on voltmeter (4).
- l. Place the generator #1 circuit breaker (3) in the OFF position.
- m. Place the generator #2 circuit breaker (2) in the ON position.
- n. Adjust generator #2 droop rheostat (11) so that the voltage on generator (5) reads the same as that noted on generator #1 voltmeter (4).

NOTE

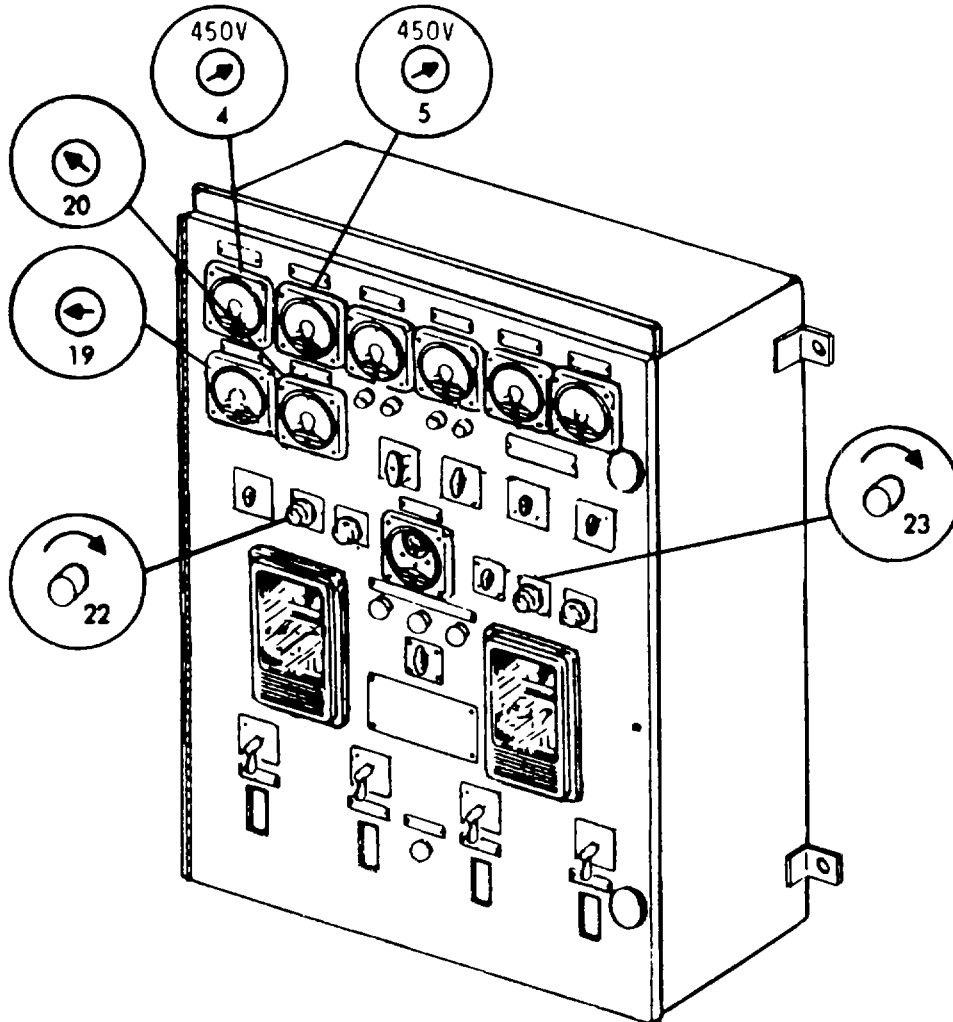
- The voltage and frequency load characteristics on both generators must be the same, before any attempt to parallel is made.
 - Generator #2 is supplying power to the vessel.
- o. Adjust the speed of generator #1 to slightly more than generator #2. Rotate governor motor switch (12) to raise.
 - p. Place the synchronizing slope switch (13) in generator #1 in the ON position.
 - q. Observe the rotation of the pointer on the synchroscope (14). Adjust the speed of generator #1 by rotating the governor motors switch (12). The pointer should rotate very slowly clockwise. If the synchroscope pointer rotates rapidly in a clockwise direction, the speed of generator #1 is too fast and should be lowered. If the pointer is rotating at any speed in the counter-clockwise direction, the speed is too slow and must be increased.
 - r. The synchroscope (14) is rotating very slowly in the clockwise direction. When the pointer passes the 12 O' Clock position, place the generator #1 main circuit breaker (3) in the ON position.
 - s. Place the frequency meter switch (15) on generator #1. Make note of the reading on the frequency meter (16).
 - t. Repeat step s above using generator #2.
 - u. Observe the wattmeters (17 and 18) and the ammeters (19 and 20) and adjust as follows:
 - (1) If the frequency is too high or low - adjust either generator #1 or #2 governor motor switches (12 or 21), until the frequency meter (16) indicates both generators the same: also the wattmeters (17 and 18) are the same.

2-41. PARALLELING GENERATORS (Cont).



2-41. PARALLELING GENERATORS (Cont).

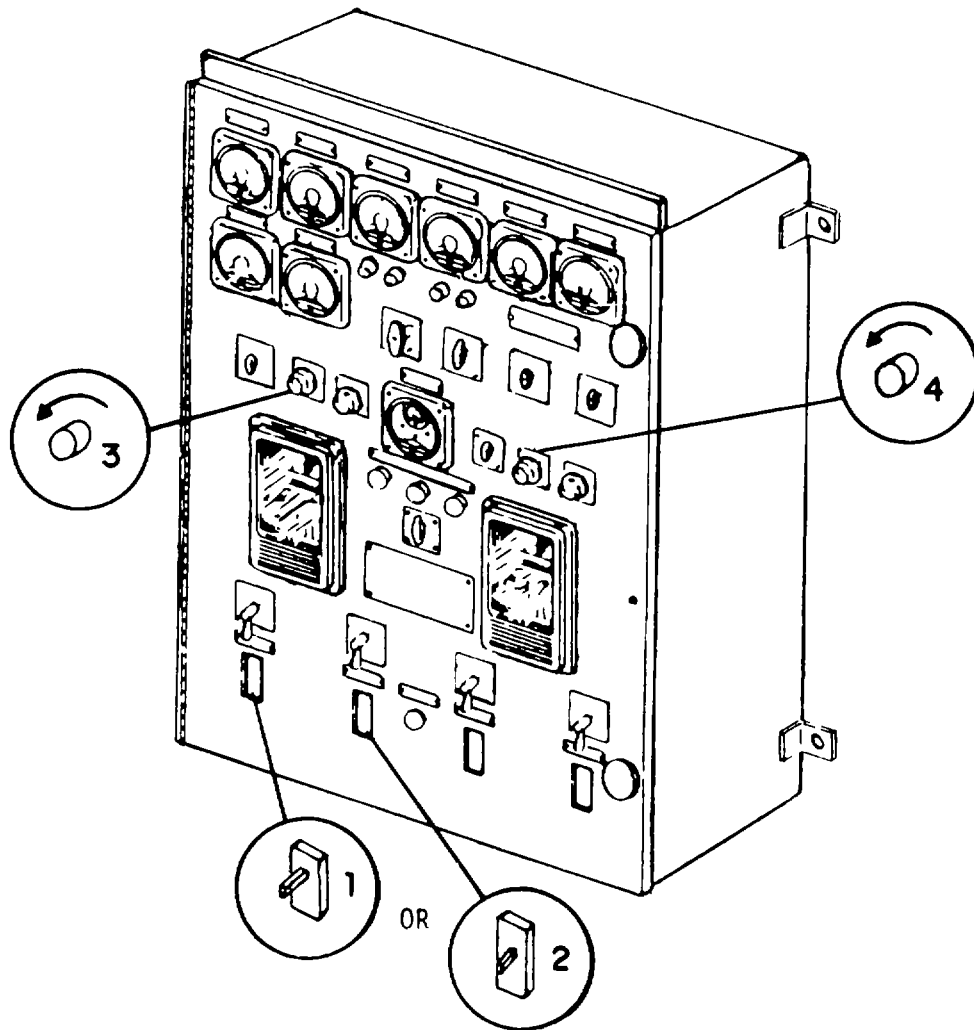
- (2) If the voltage on meters (4 and 5) is either too high or too low, carefully adjust either or both automatic voltage control rheostats (22 or 23) until the desired voltage is obtained and the amperage on meters (19 and 20) is a minimum.
- v. In the engine rooms, check the temperatures on both generators after one-half hour. If one of the engines is either too hot or too cold, notify the person in charge.



2-42. STOPPING GENERATOR OPERATING - NON PARALLEL.

The following procedures applies to either generator #1 or generator #2 operating by itself (non-parallel).

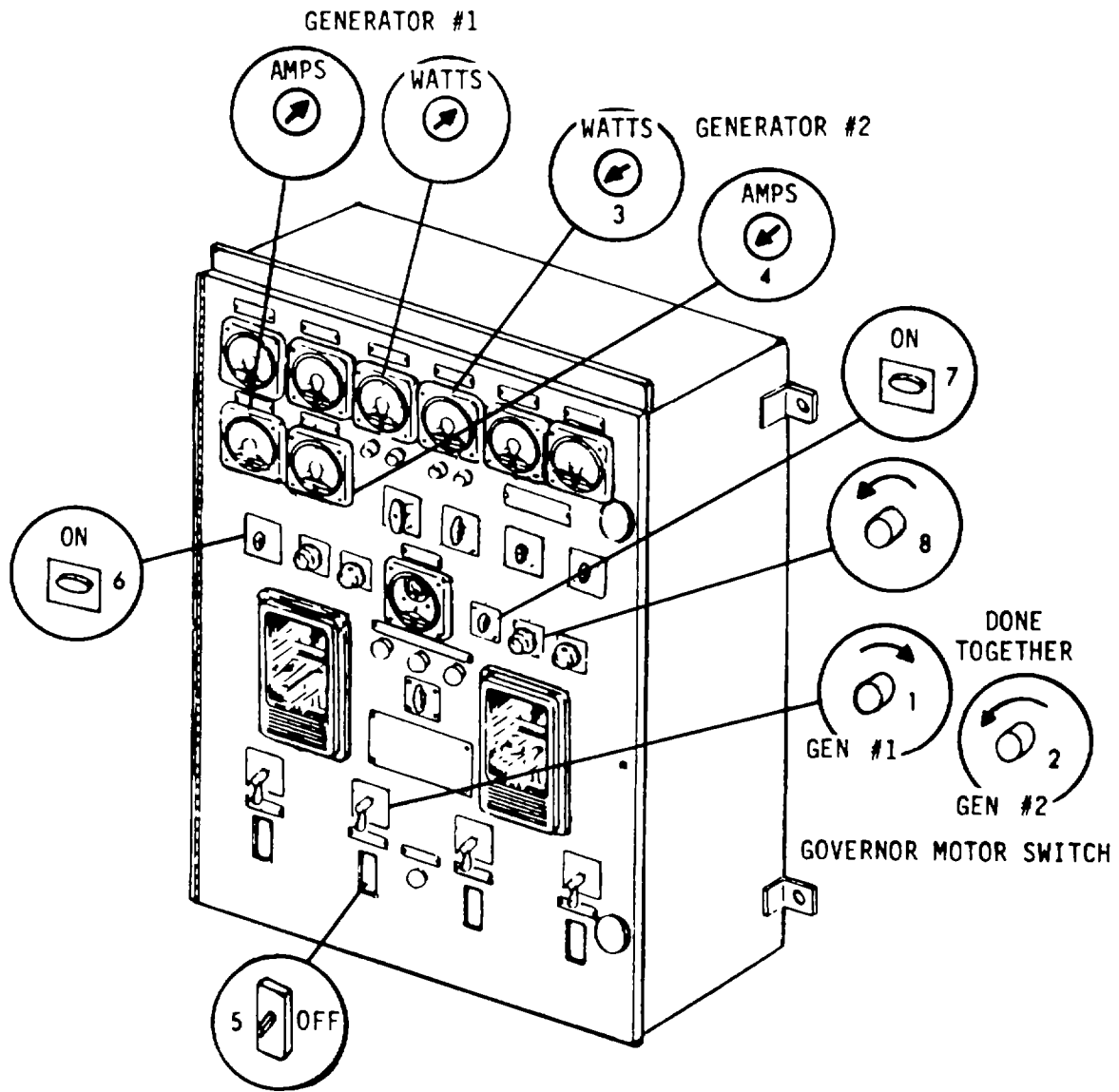
- a. Reduce the load as much as possible by placing circuit breakers on the power distribution panels in the OFF position.
- b. Place the generator main circuit breaker (1 or 2) in the OFF position.
- c. Turn the voltage regulator rheostat (3 or 4) to decrease.
- d. Shut down the generator as per paragraph 2-43.



2-43. STOPPING GENERATOR OPERATING - PARALLEL.

- a. The following procedure applies to either generator 1 or 2 operating in parallel.
- b. This procedure will transfer the load to generator #1, and shutdown generator #2. The procedure for shutting down generator #1 is the REVERSE of the following procedure.
 - (1) Transfer the load to generator #1 as follows:
 - (a) Do both parts of this step simultaneously. Rotate the generator #1 governor motor switch (1) to RAISE. Rotate the generator #2 governor motor switch (2) to LOWER.
 - (b) Observe generator #2 wattmeter (3) and ammeter (4). As the governor motor switches (1 and 2) are rotated, the meter readings will decrease.
 - (c) When the readings on generator #2 wattmeter (3) and ammeter (4) are zero - proceed as follows:
 - (2) Place the generator #2 main circuit breaker (5) in the OFF position.
 - (3) Place the unit parallel switches (6 and 7) in the ON position.
 - (4) Rotate the generator #2 voltage adjust rheostat (8) to the DECREASE position.
 - (5) Proceed with local shut down of the generator as per paragraph 2-44.

2-43. STOPPING GENERATOR OPERATING - PARALLEL (Cont).



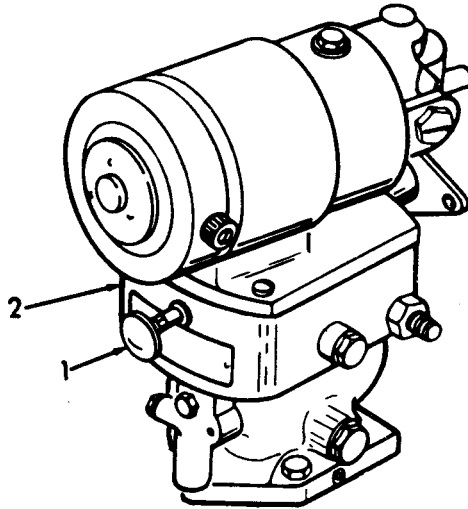
2-44. GENERATOR ENGINE - LOCAL STOP.

The local stop procedure for either generator #1 or generator #2 must be done after stopping generator operating parallel or nonparallel.

NOTE

Before shutting down engines, be sure to open generator circuit breaker.

Pull out fuel rod knob (1) on hydraulic governor (2).

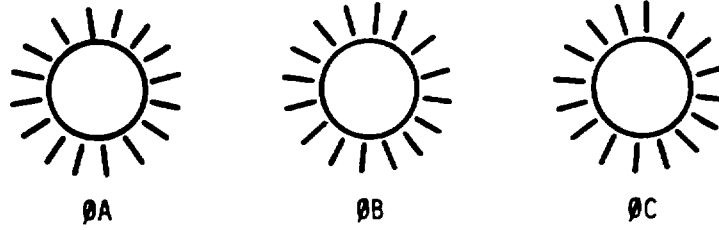
**2-45. GROUND DETECTOR LIGHTS.**

a. Three indicator lights are connected to provide a phase to ground potential across each lamp. When a normal condition (no ground) exists, an equal voltage is impressed on each of the three lamps causing them to glow with equal intensity.

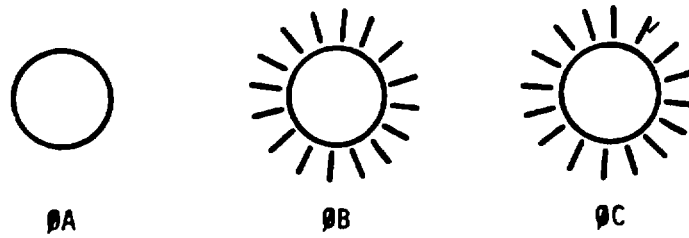
b. Should a ground occur on any of the three phases, the voltage across that particular lamp is decreased and the light intensity decreases. The voltage to the other two lamps is increased and, as a result, these lamps increase in brightness. This relationship creates the following conditions:

2-45. GROUND DETECTOR LIGHTS (Cont).

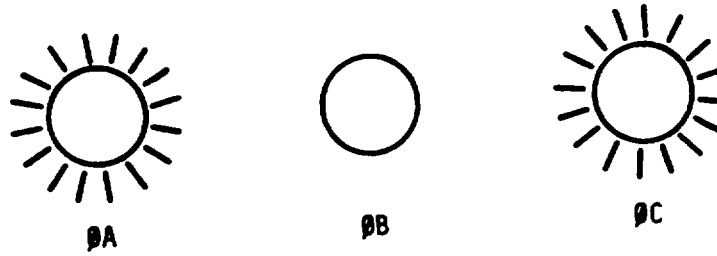
NORMAL



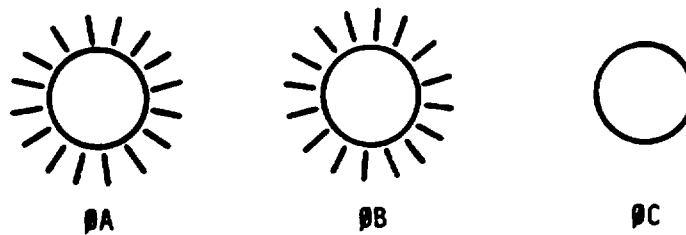
PHASE A GROUND



PHASE B GROUND



PHASE C GROUND



- c. Obtain maintenance help if any lamp is not lit.
- d. The ground test switch, when pressed, will cause all lamps to be dimly lit.

2-46. ANCHOR WINCH AND "A" FRAME.

- a. The procedures in these paragraphs are: Starting and stopping the anchor winch engine both locally and remote, pay-out and in-haul of the anchor.
- b. Shore power, or ships power to the landing craft, must be available in order to start the engine. Refer to Chapter 2, Section IV for emergency starting procedures.
- c. The following is an index to the procedures:

DESCRIPTION	PARAGRAPH
Anchor Winch Engine-Local-Start/Stop-Warm Weather	2-47
Anchor Winch Engine-Local-Start/Stop-Cold Weather	2-48
Anchor Winch-Remote Operation and Payout	2-49
Anchor Winch-Inhaul	2-50
Anchor Winch-Stop	2-51

2-47. ANCHOR WINCH ENGINE - LOCAL-START/STOP-WARM WEATHER.

NOTE

Shore power or ships power is required.

- a. Perform all before operations on the Preventive Maintenance Checks and Services Chart.

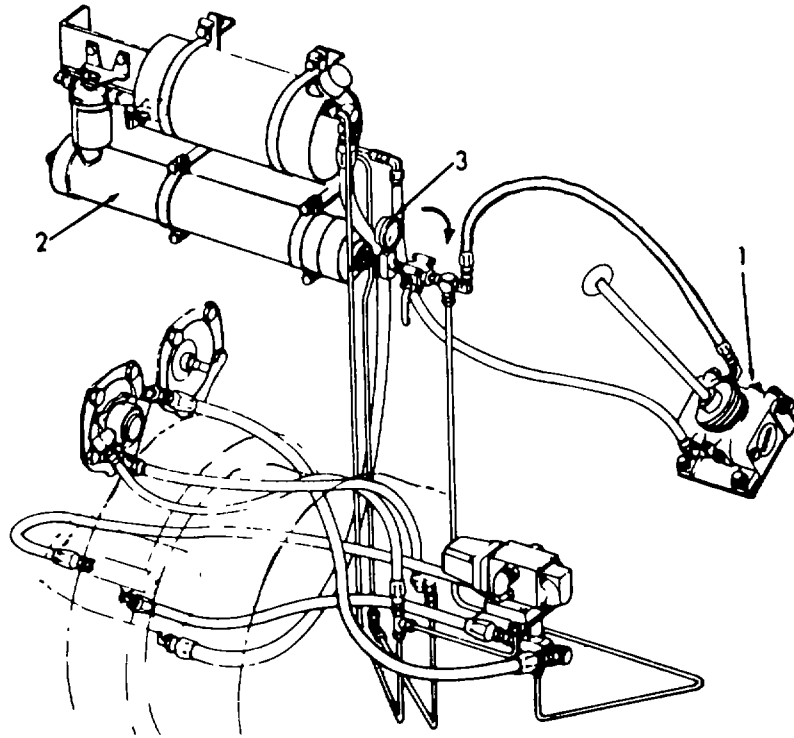
NOTE

Position all shut off valves open (counter-clockwise).

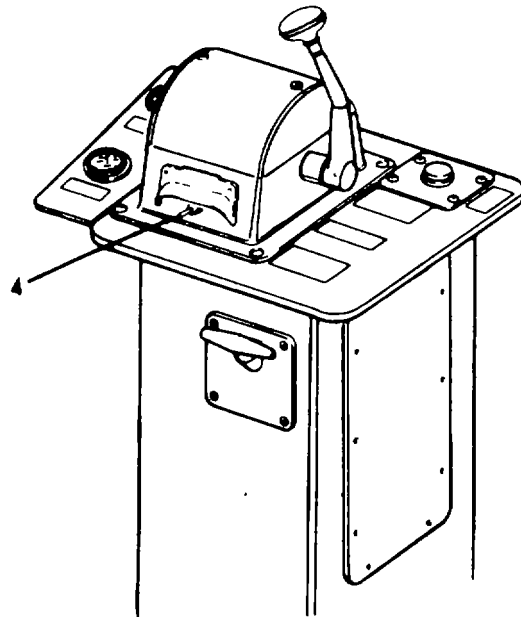
- b. Operate hand pump (1) on hydrostarter in anchor winch compartment to charge accumulator (2).
- c. Pressure gage (3) should read:

AMBIENT TEMPERATURE	GAGE READING
Above 40°F (4.4°C)	1500 psi (1054.5 kg sq cm)
40°F to 0°F (4.4°C to -17.8°C)	2500 psi (1757.5 kg sq cm)
Below 0°F (-17.8°C)	3300 psi (2319.9 kg sq cm)

2-47. ANCHOR WINCH ENGINE - LOCAL-START/STOP-WARM WEATHER (Cont).

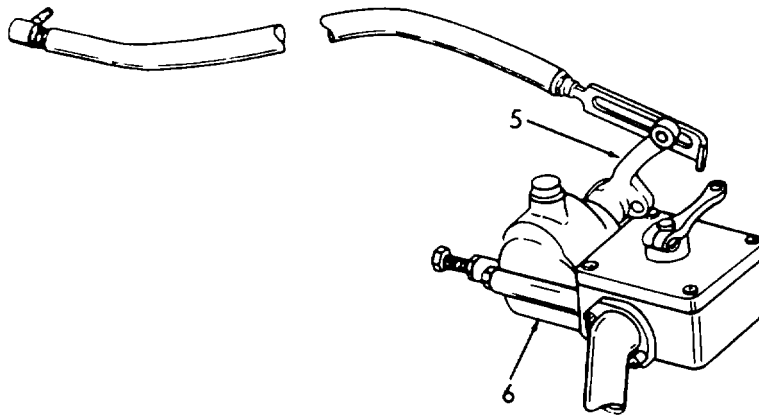


d. Place mainline switch (4) in OFF position.

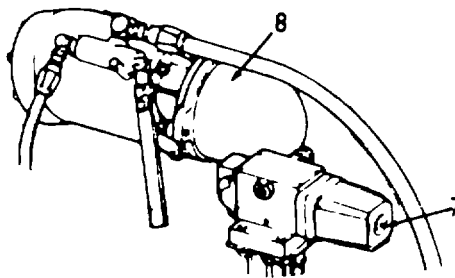


2-47. ANCHOR WINCH ENGINE - LOCAL-START/STOP -WARM WEATHER (Cont).

- e. Place lever (5) on local throttle control (6) in neutral.



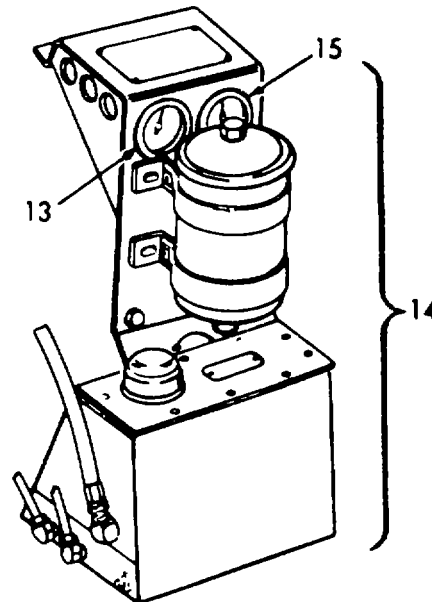
- f. Push start button (7) located next to hydrostarter (8).



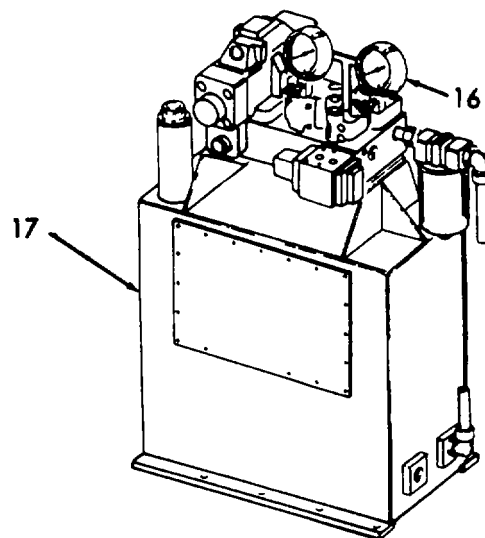
- g. Release start button (7) as soon as engine starts.
- h. Observe oil pressure gage (9) on instrument panel (10). If no pressure is indicated within 10 to 15 seconds, STOP. Check lubrication system. Normal oil pressure is 40 to 55 psi (2824.3 to 3883.4 gm sq cm) at 1200 RPM (11). Minimum oil pressure is 25 psi (1757.7 gm sq cm).
- i. Warmup at part throttle, no load for about 5 minutes before loading engine. Normal coolant temperature (12) is 175° to 185°F (79.4° to 85.°C). Maximum allowable temperature is 200°F (93.3°C).

2-47. ANCHOR WINCH ENGINE - LOCAL-START/STOP-WARM WEATHER (Cont).

- j. Observe oil pressure gage (13) on torque converter (14). Normal oil pressure is 40 to 65 psi (2824.3 to 4589.5 gm sq cm).
- k. Observe oil temperature gage (15) on torque converter (14). Normal oil temperature is 160° to 220°F (71.1° to 104.4°C). Maximum allowable temperature is 250°F (121.1°C).

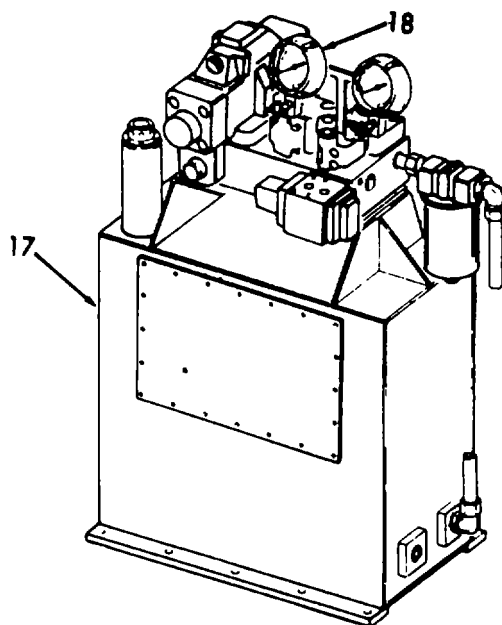


- l. Observe the control pressure gage (16) on the hydraulic tank assembly (17). Normal control pressure is 365 to 370 psi (25771.6 to 26124.6 gm sq cm). Minimum allowable pressure is 350 psi (24712.5 gm sq cm).

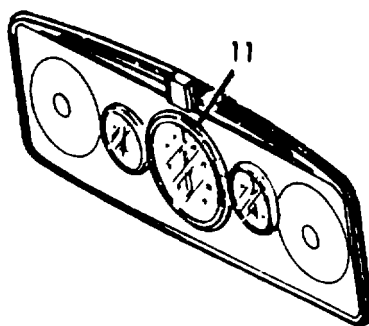


2-47. ANCHOR WINCH ENGINE - LOCAL-START/STOP-WARM WEATHER (Cont).

- m. Observe operating pressure gage (18) on hydraulic tank assembly (17). Normal operating pressure is 600 to 800 psi (42364.2 to 56485.6 gm sq cm). Minimum allowable pressure is 600 psi (42364.2 gm sq cm).



- n. When prolonged idling is needed, maintain at least 800 RPM (11) minimum.

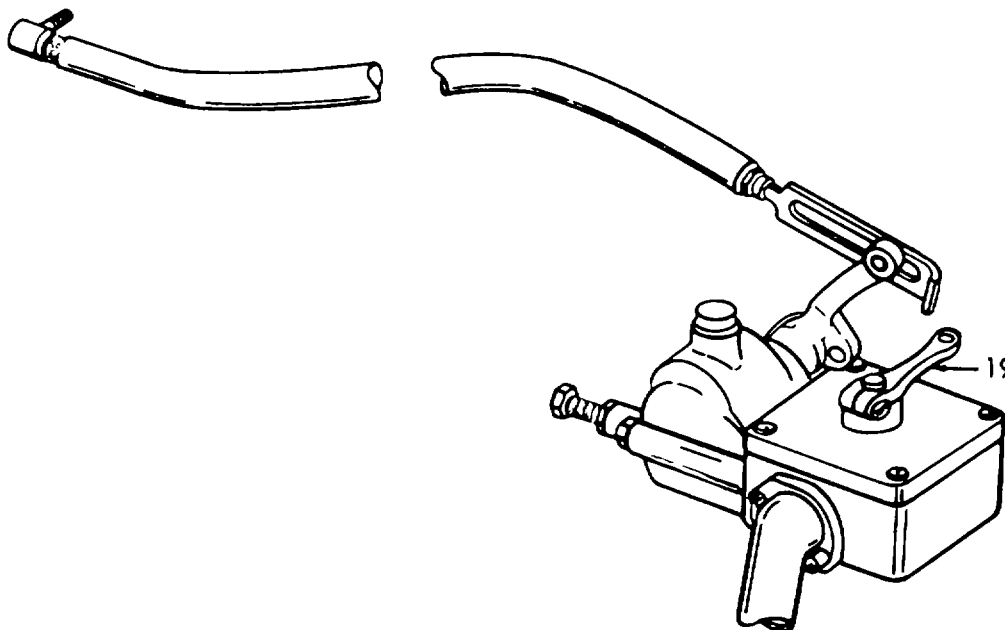


- o. Engine is ready to be run by remote operation.

TO STOP.

Rotate lever (19).

2-47. ANCHOR WINCH ENGINE - LOCAL-START/STOP-WARM WEATHER (Cont).



2-48. ANCHOR WINCH ENGINE-LOCAL-START/STOP-COLD WEATHER.

NOTE

Shore power or ships power is required.

- a. Perform all before operations on the Preventive Maintenance Checks and Services Chart.

NOTE

Position all shutoff valves clockwise.

2-48. ANCHOR WINCH ENGINE-LOCAL-START/STOP-COLD WEATHER (Cont).

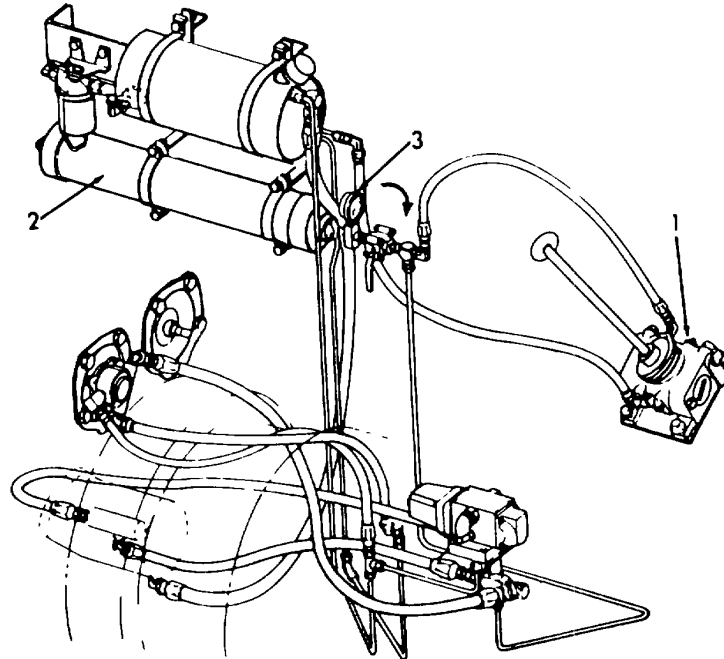
- b. Operate hand pump (1) on hydrostarter in anchor winch compartment to charge accumulator (2).
- c. Pressure gage (3) should read:

AMBIENT TEMPERATURE

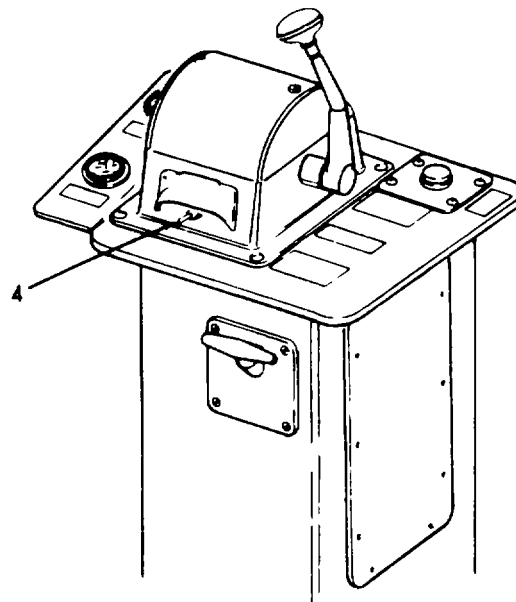
Above 40°F (4.4°C)
 40°F to 0°F (4.4°C to -17.8°C)
 Below 0°F (-17.8°C)

GAGE READING

1500 psi (1054.5 kg sq cm)
 2500 psi (1757.5 kg sq cm)
 3300 psi (2319.9 kg sq cm)

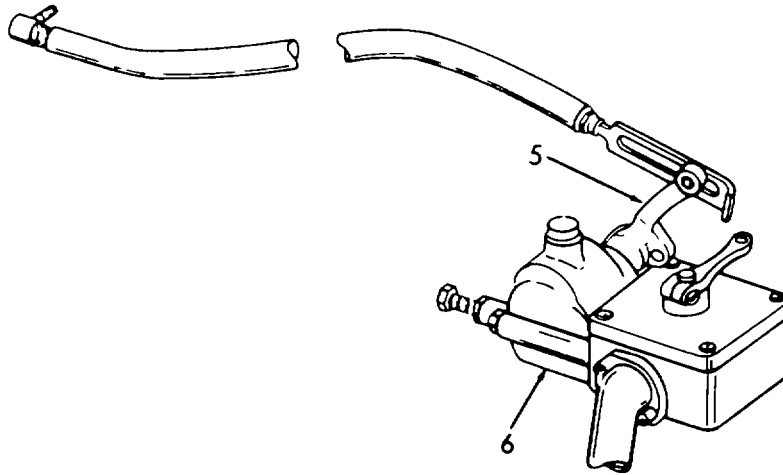


- d. Place mainline switch (4) in OFF position.

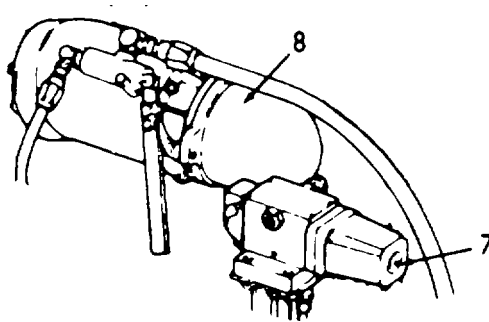


2-48. ANCHOR WINCH ENGINE-LOCAL-START/STOP-COLD WEATHER (Cont).

- e. Place lever (5) on local throttle control (6) in neutral.



- f. Push start button (7) located next to the hydrostarter (8).

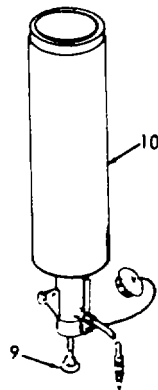


- g. Pull out the "Quick Start" knob (9) on starting aid (10) for one or two seconds; then release it.

CAUTION

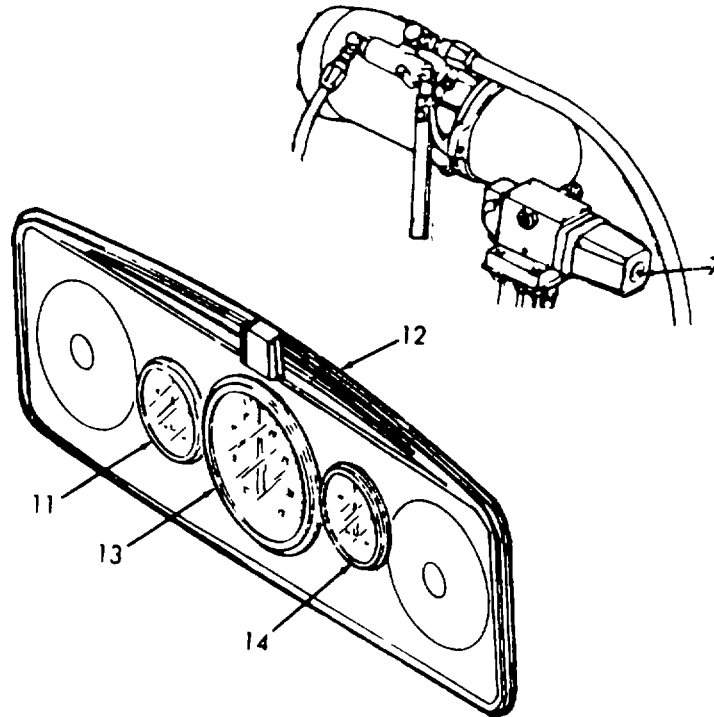
Do not use the starting aid more than once with the engine stopped. Over loading the engine air box with the fluid could result in a minor explosion.

- h. Repeat the procedure if the engine does not start on the first attempt.



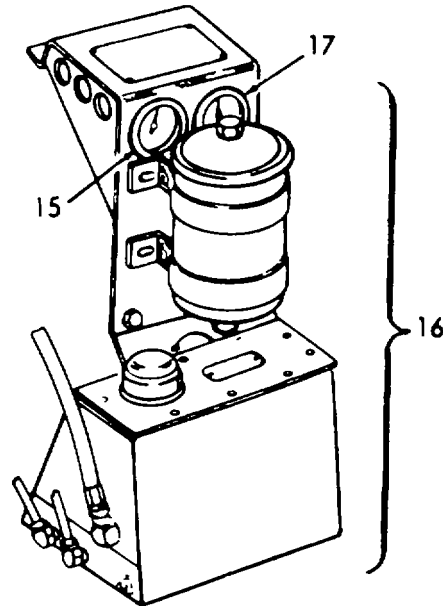
2-48. ANCHOR WINCH ENGINE - LOCAL-START/STOP -COLD WEATHER (Cont).

- i. Release start button (7) as soon as engine starts.
- j. Observe oil pressure gage (11) on instrument panel (12). If no pressure is indicated within 10 to 15 seconds, STOP. Check lubrication system. Normal oil pressure is 40 to 55 psi (2824.3 to 3883.4 gm sq cm) at 1200 RPM (13). Minimum oil pressure is 25 psi (1757.7 gm sq cm).

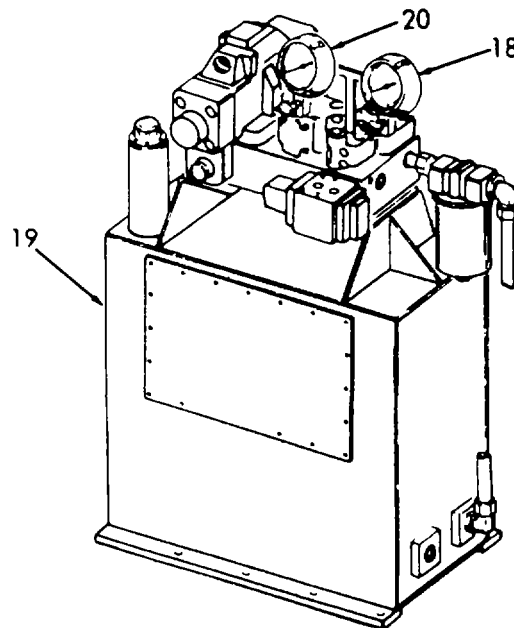


- k. Warmup at part throttle no load, for about 5 minutes before loading engine. Normal coolant temperature (14) is 17° to 185°F (79.4° to 85.0°C). Maximum allowable temperature is 200°F (93.3°C).
- l. Observe oil pressure gage (15) on torque converter (16). Normal oil pressure is 40 to 65 psi (2824.3 to 4589.5 gm sq cm) .
- m. Observe oil temperature gage (17) on torque converter (16). Normal oil temperature is 160° to 220°F (71.1° to 104.4°C). Maximum allowable temperature is 250°F (121.1°C).

2-48. ANCHOR WINCH ENGINE-LOCAL-START/STOP-COLD WEATHER (Cont).

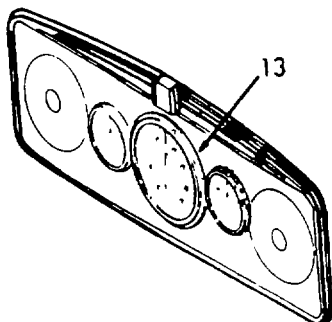


- n. Observe the control pressure gage (18) on the hydraulic tank assembly (19). Normal control pressure is 365 to 370 psi (25771.6 to 26124.6 gm sq cm). Minimum allowable pressure is 350 psi (24712.5 gm sq cm).
- o. Observe operating pressure gage (20) on hydraulic tank assembly (19). Normal operating pressure is 600 to 800 psi (42364.2 to 56485.6 gm sq cm). Minimum allowable pressure is 600 psi (42364.2 gm sq cm).



2-48. ANCHOR WINCH ENGINE - LOCAL-START/STOP -COLD WEATHER (Cont).

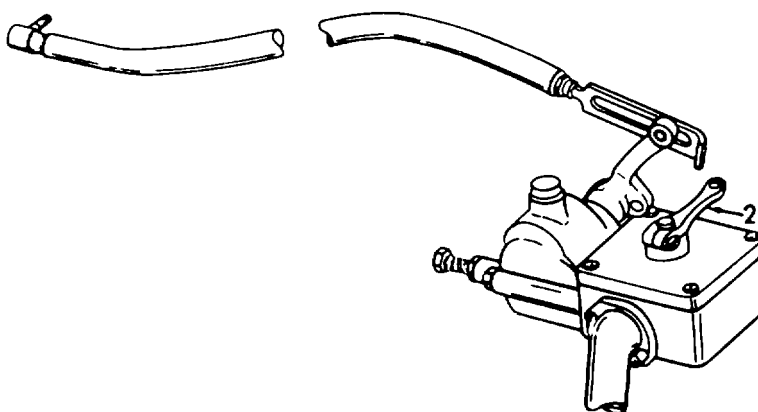
- p. When prolonged idling is needed, maintain at least 800 RPM (23) minimum.



- q. Engine is ready to be run by remote operation.

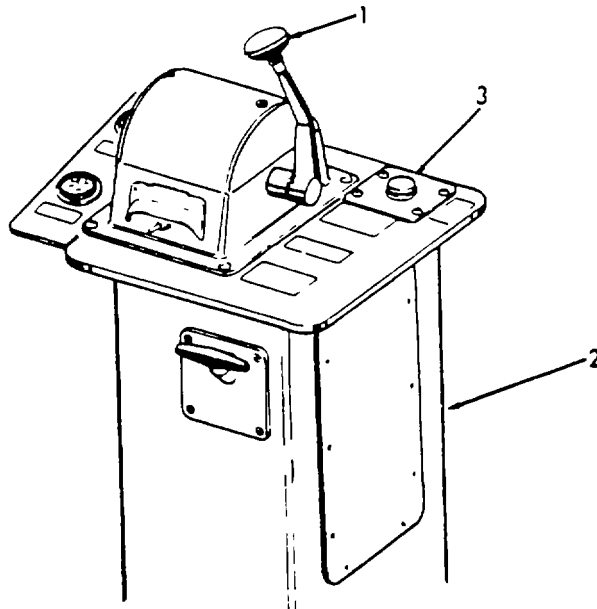
TO STOP.

Rotate lever (21).

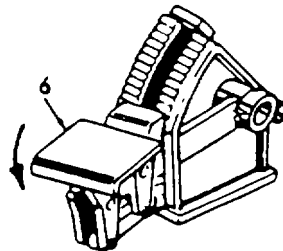
**2-49. ANCHOR WINCH - REMOTE OPERATION AND PAYOUT.**

- a. Place throttle control (1) on anchor winch control stand (2) in neutral.
- b. Press start button (3) on anchor winch control stand (2) to start engine.
- c. Check engine temperature gage (4) on anchor winch control stand (2). Normal coolant temperature is 175° to 185°F (79.4° to 85.0°C). Maximum allowable temperature is 200°F (93.3°C).
- d. Check engine oil pressure gage (5) on anchor winch control stand (2). If no pressure is indicated within 10 to 15 seconds; STOP. Check lubrication system. Normal oil pressure is 40 to 45 psi (2824.3 to 3883.4 gm sq cm) at 1200 RPM. Minimum oil pressure is 25 psi (1757.7 gm sq cm).

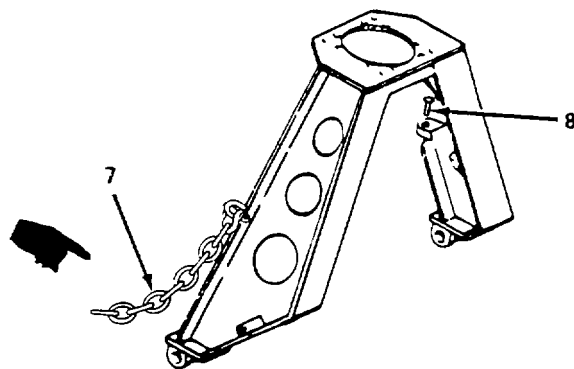
2-49. ANCHOR WINCH - REMOTE OPERATION AND PAYOUT (Cont).



- e. Start central hydraulic system by pressing start button in engine access room or aft engine room. Refer to paragraph 2-48 for complete starting procedure.
- f. Depress foot brake (6) to the right of control stand..



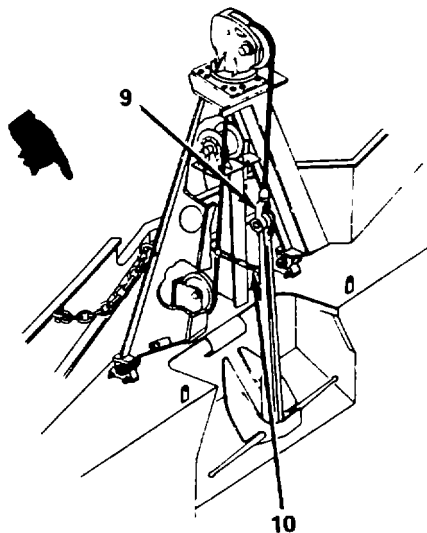
- g. Grasp safety chain (7).
- h. Release pin (8).



4951-135

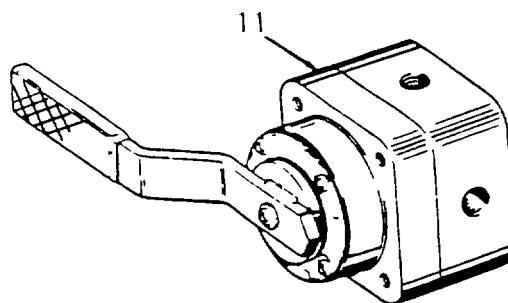
2-49. ANCHOR WINCH - REMOTE OPERATION AND PAYOUT (Cont).

- i. Release pelican hook (9).



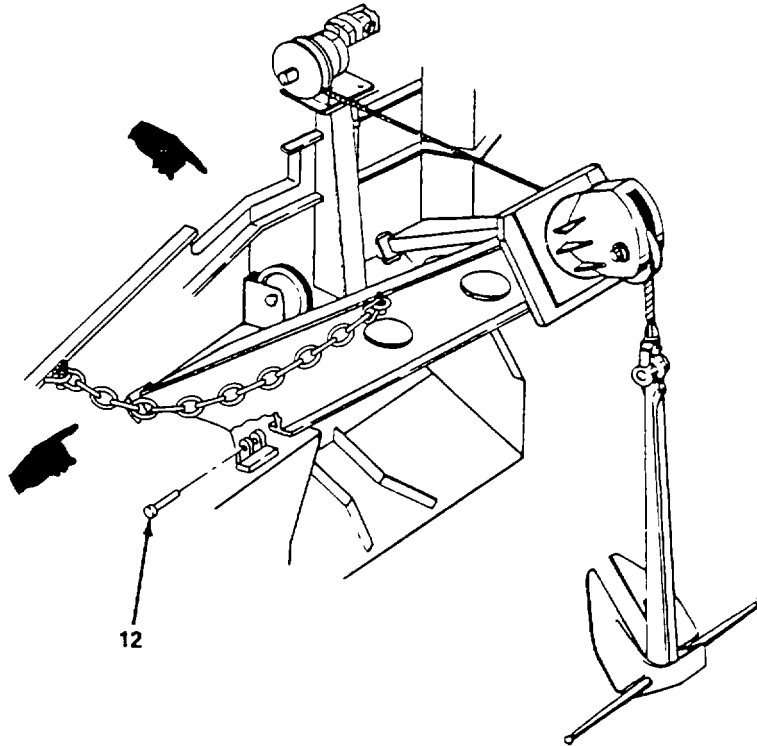
4951-136

- j. Release pelican hook (10).
- k. Place directional control valve (11) in LOWER position.



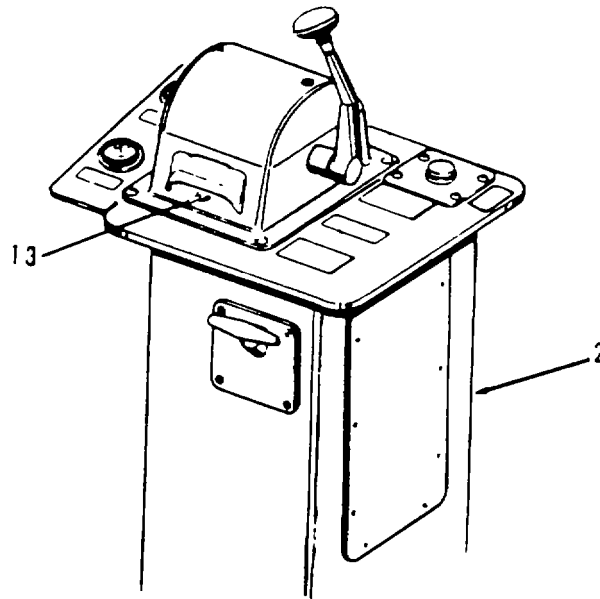
- l. Place pin (12) in base of "A" frame when "A" frame is fully lowered.

2-49. ANCHOR WINCH-REMOTE OPERATION AND PAYOUT (Cont).



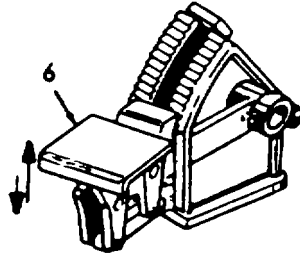
4951-137

- m. Set main line switch (13) on anchor winch control stand (2) to the ON position.

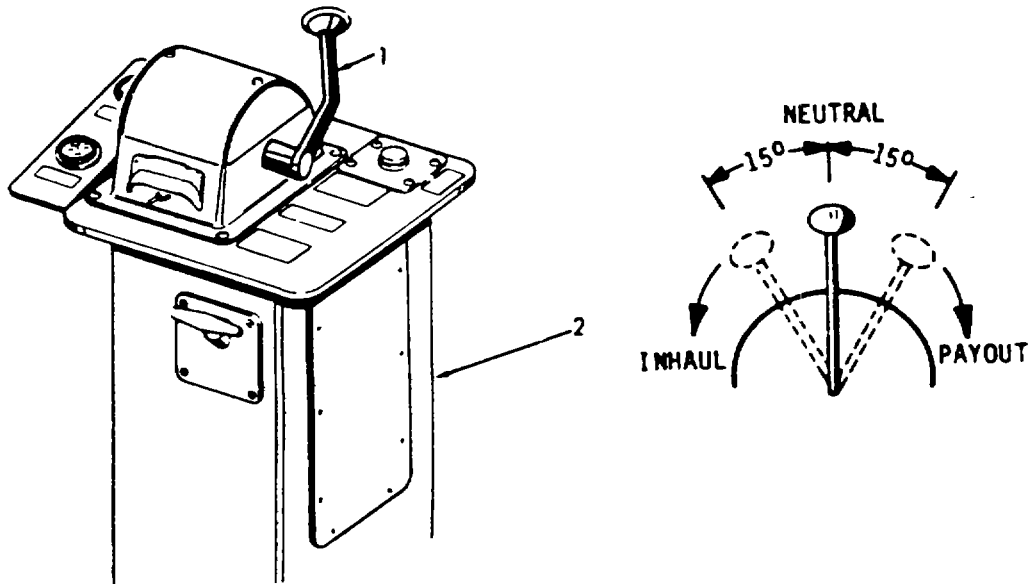


2-49. ANCHOR WINCH-REMOTE OPERATION AND PAYOUT (Cont).

- n. Release foot brake (6). Heavy brake pressure will retard, and possibly stop, motion of anchor cable.



- o. Place throttle/clutch control (1) on anchor winch control (2) in payout position.



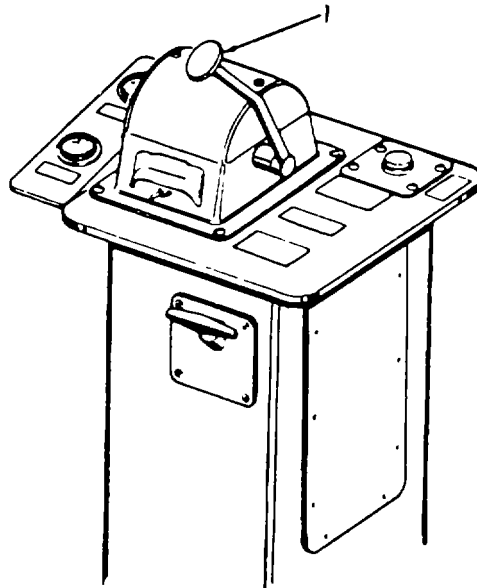
- p. Anchor will now lower.

NOTE

In the event engine is stopped, the spring set hydraulic release brake will hold.

2-49. ANCHOR WINCH-REMOTE OPERATION AND PAYOUT (Cont).

- q. In the event momentary hauling-in is required during setting of the anchor, this can be accomplished by moving the control (1) to in-haul position, thus engaging the clutch and providing the desired speed. ■



CAUTION

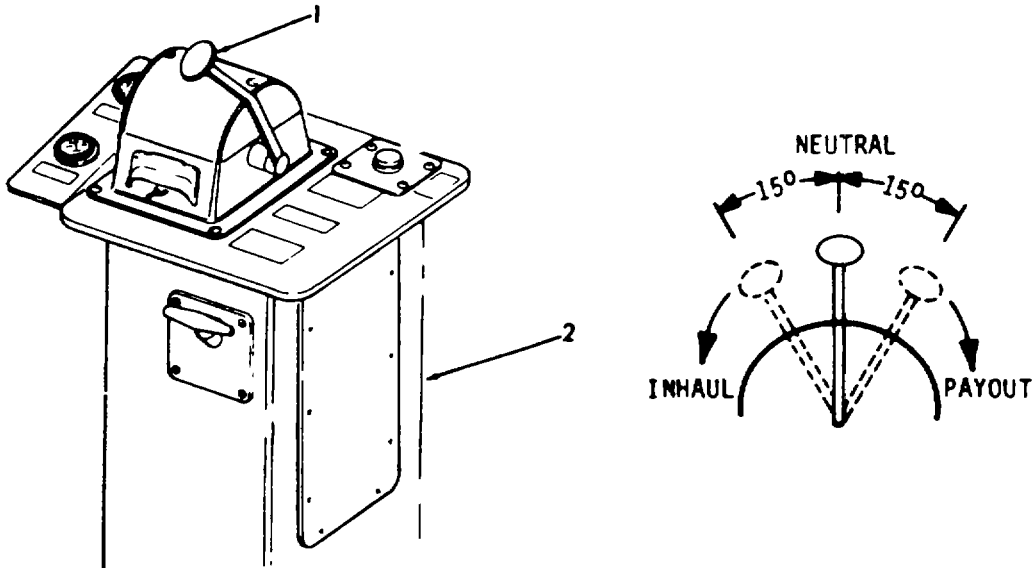
Never permit slack in the cable to endanger the rudders and screws. When the clutch is disengaged and the engine is running, always be prepared to operate the foot brake. The anchor cable will not pay-out unless the engine is running or safety brake is manually released.

2-50. ANCHOR WINCH-ANCHOR INHAUL.

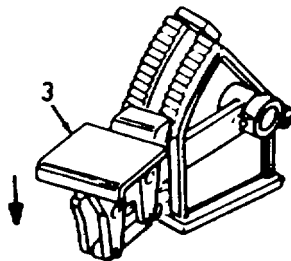
NOTE

Engine is already running.

- a. Place throttle/clutch control (1) on anchor winch control stand (2) in inhaul position.

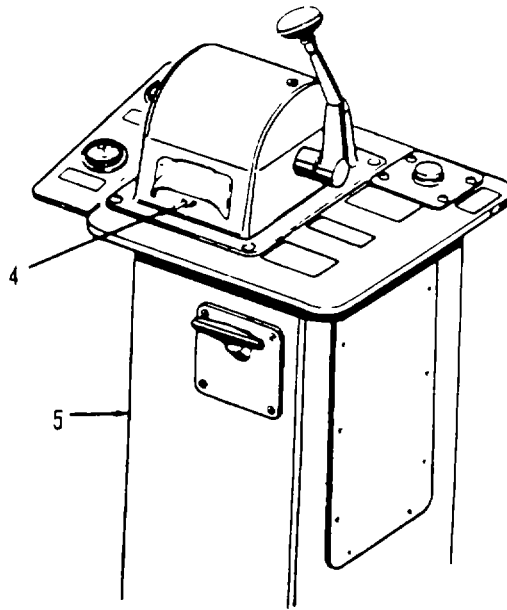


- b. Anchor will now raise.
- c. Depress foot brake (3).

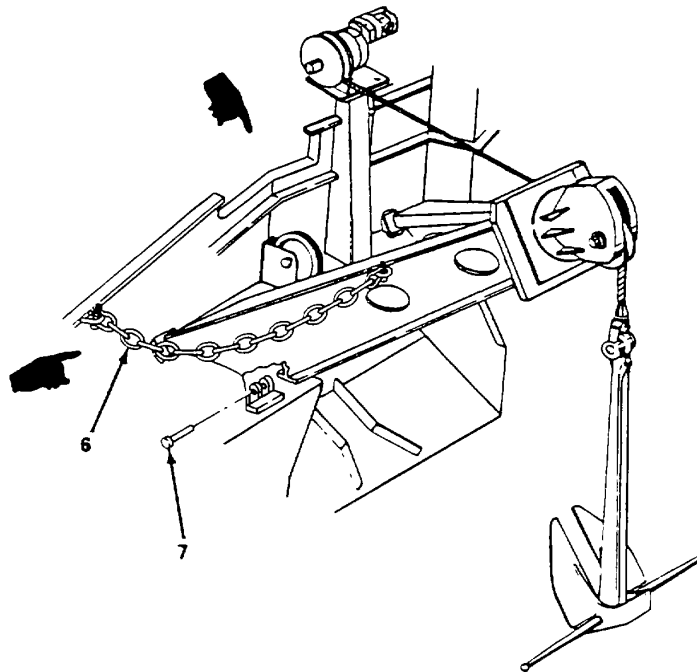


- d. Set main line switch (4) on anchor winch control stand (5) to the OFF position.

2-50. ANCHOR WINCH-ANCHOR INHAUL (Cont).

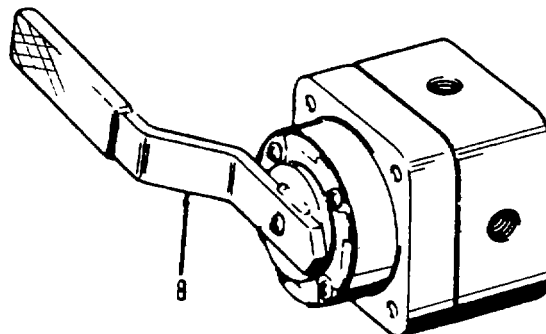


- e. Grasp safety chain (6)
- f. Remove pin (7) from base of "A" frame.

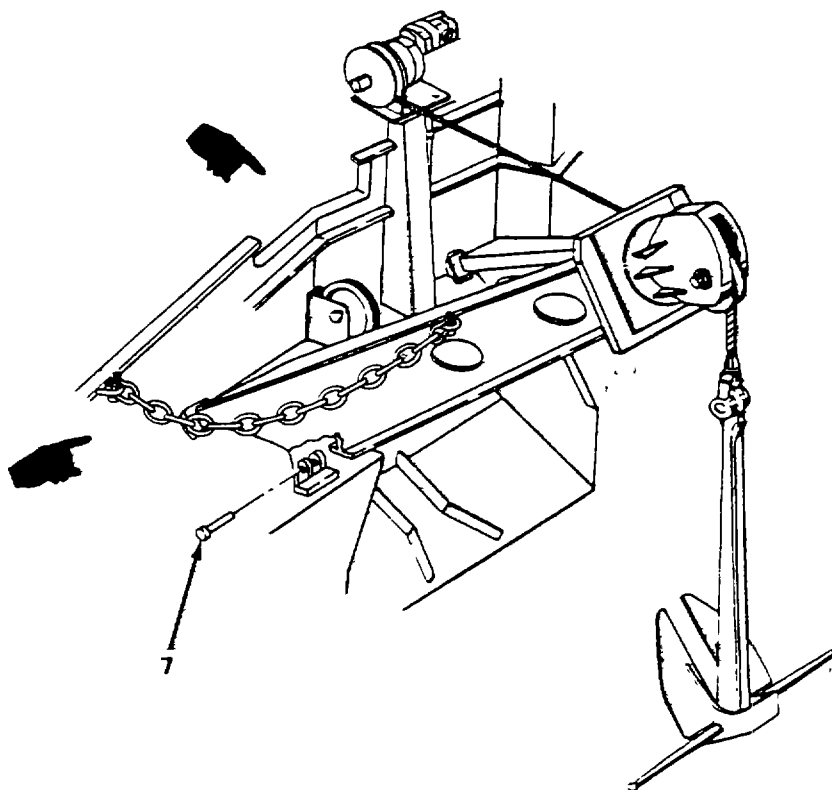


2-50. ANCHOR WINCH-ANCHOR INHAUL (Cont).

- g. Place directional control valve (8) in inhaul position.



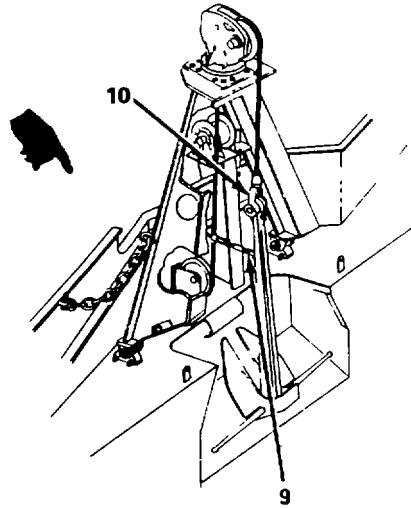
- h. Replace pin (7) in base of "A" frame when base of "A" frame is fully raised.



4951-139

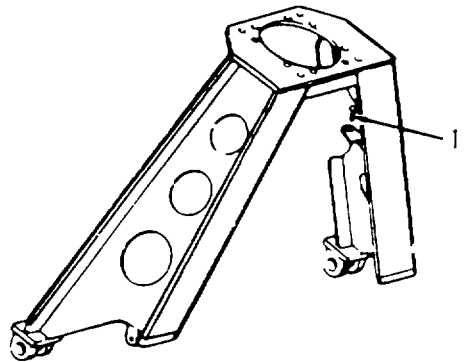
- i. Connect pelican hook (9).
- j. Connect pelican hook (10).

2-50. ANCHOR WINCH-ANCHOR INHAUL (Cont).

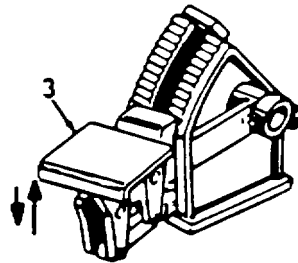


4951-140

k. Insert pin (11)

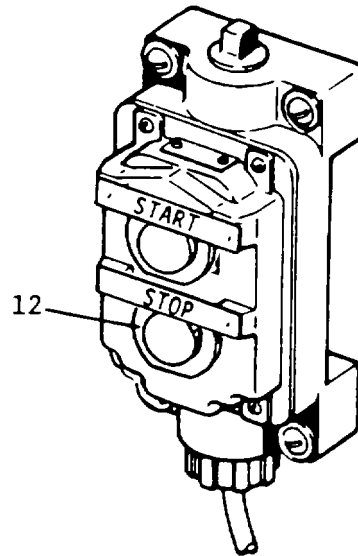


l. Release foot brake (3) to the right of control stand.



2-50. ANCHOR WINCH-ANCHOR INHAUL (Cont).

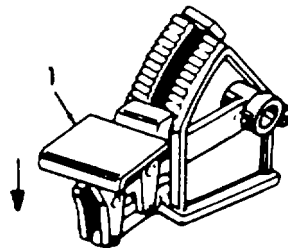
- m. Stop central hydraulic system by pressing stop button (12) in engine access room or aft engine room.



ENGINE ACCESS ROOM

2-51. ANCHOR WINCH-STOP.

- a. Depress brake (1).

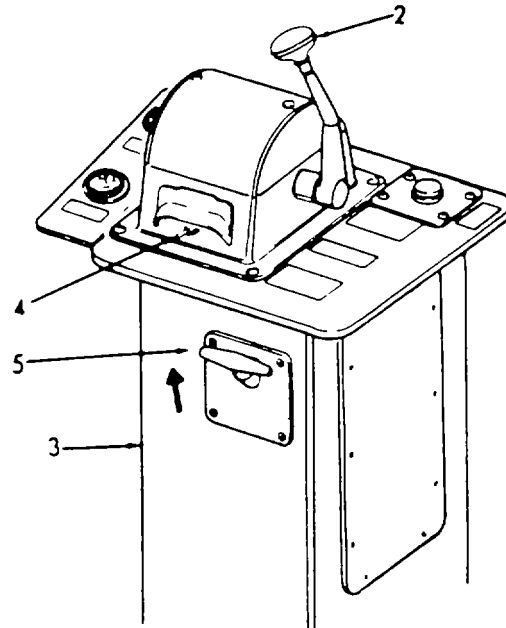


- b. Set clutch/throttle control (2) on anchor winch control stand (3) to neutral.
- c. Place main line switch (4) on the anchor winch control stand (3) in the OFF position.
- d. Pull tee handle (5) of engine stop control located on side of anchor winch control stand.

NOTE

Be certain tee handle is returned to original position after engine has stopped.

2-51. ANCHOR WINCH-STOP (Cont).



2-52 BOW RAMP

The bow ramp is provided with an Elastomeric Compensating Winch designed to maintain tension on the ramp cables during beaching operations. Its contents are packaged inside the existing drum, so that no parts are visible. The total compensating displacement of the winch is 30 inches with a maximum load capacity of 22,000 pounds.

The winch design has two load paths. The primary load path is through the elastomeric spring. The secondary load path is a mechanical back-up system which is used during high loads or the event of elastomeric failure.

The bow ramp can be operated from three locations; one local station and two remote stations. The local station is located in the bow ramp winch compartment. The remote stations are in the pilothouse and outside the starboard forecastle.

WARNING

- Never enter the winch compartment alone.
- Do not enter or attempt to move around in the winch compartment with the winch running. There is always danger of becoming entangled in the wire rope or machinery.
- Whenever working on the ramp gate, the wire rope, or in the vicinity of the winch in the winch room, the power to the winch must be disconnected.
- The winch operation is provided with two safety switches. One safety switch will prevent accidental electrical operations if the hand crank is engaged.
- The second safety switch will prevent a snarl in the wire or possible injury if the ramp suddenly frees.

2-52. BOW RAMP (Cont).

The following is an index to the procedures

DESCRIPTION	PARAGRAPH
Lowering Bow Ramp-Remote	2-53
Raising Bow Ramp-Remote	2-54
Lowering Bow Ramp-Local	2-55
Raising Bow Ramp-Local	2-56

2-53. LOWERING BOW RAMP-REMOTE.

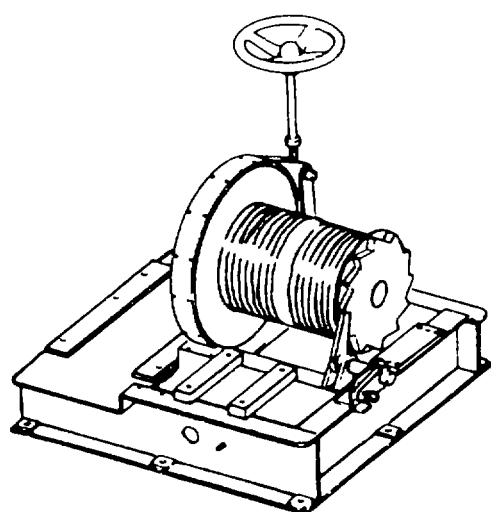
Remote operation from the pilothouse. To operate the winch and lower the bow ramp proceed as follows:

NOTE

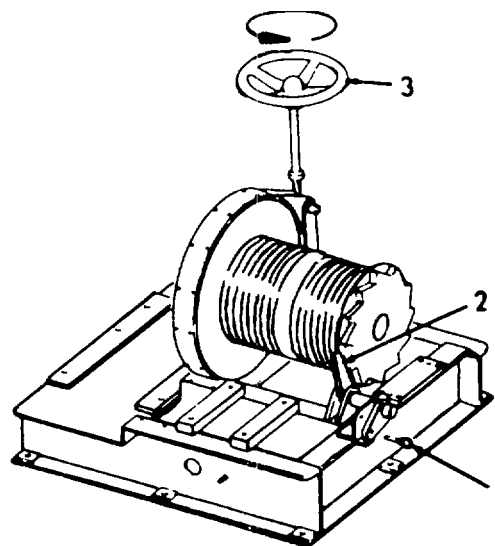
Perform all before and daily operations on the Preventive Maintenance Checks and Services Chart.

a. Winch Compartment.

- (1) Remove pawl locking pin (1) and place pawl (2) in the disengaged position. Pawl must be open before winch is started.
- (2) Turn mechanical brake wheel (3) counter clockwise to unlock winch.
- (3) Place lever on disconnect switch (4) in the ON position.
- (4) Turn local/remote switch (5) to remote position on the local control switch.
- (5) Check that the hand crank (6) has been removed and hand crank switch (7) is locked in position for electrical operation.

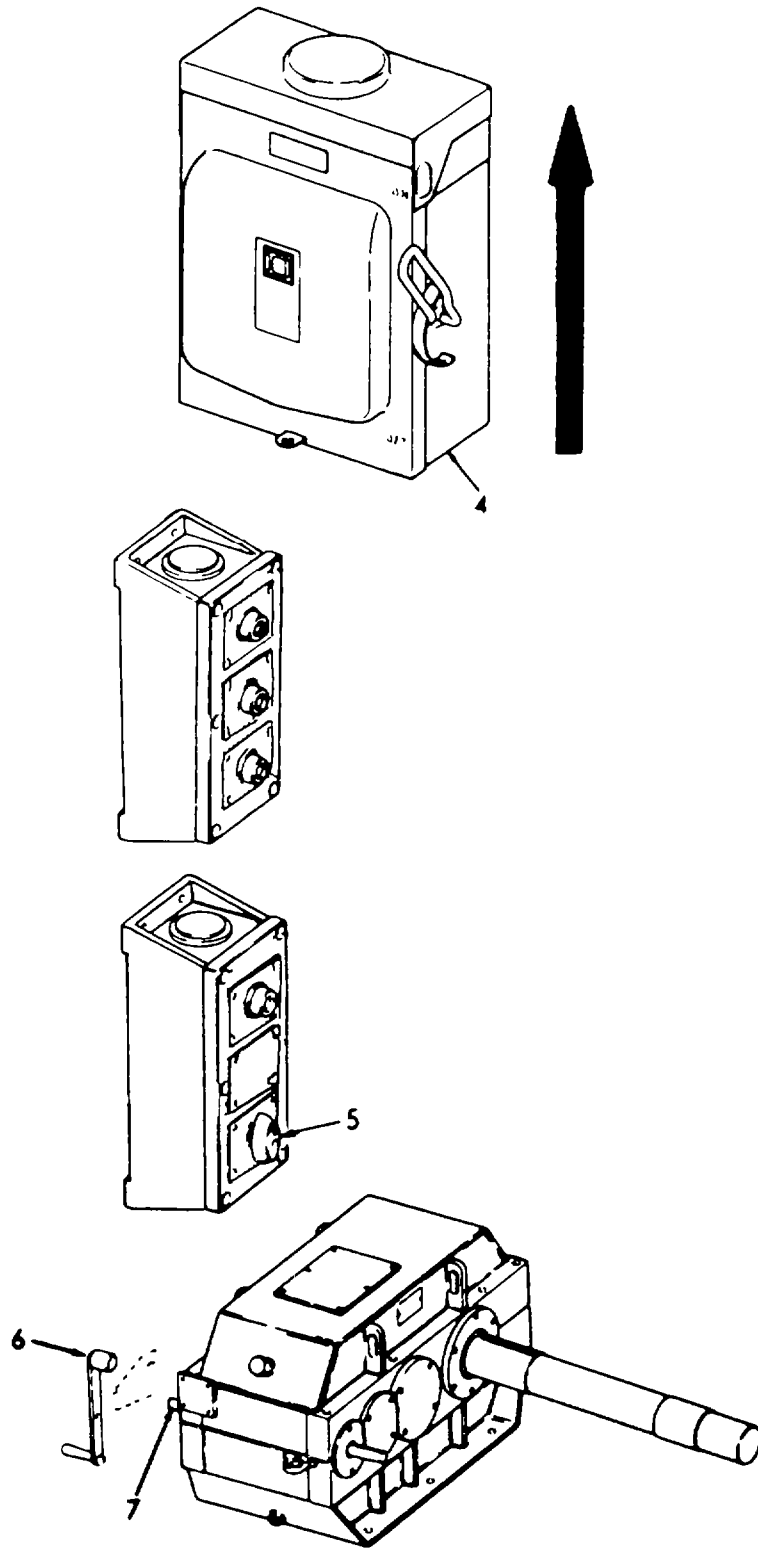


ENGAGED



DISENGAGED

2-53. LOWERING BOW RAMP-REMOTE (Cont).

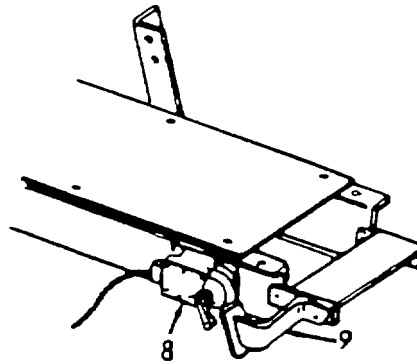


2-53. LOWERING BOW RAMP-REMOTE (Cont).

- (6) Check that slack cable limit switch (8) and slack cable limit lever (9) are engaged.

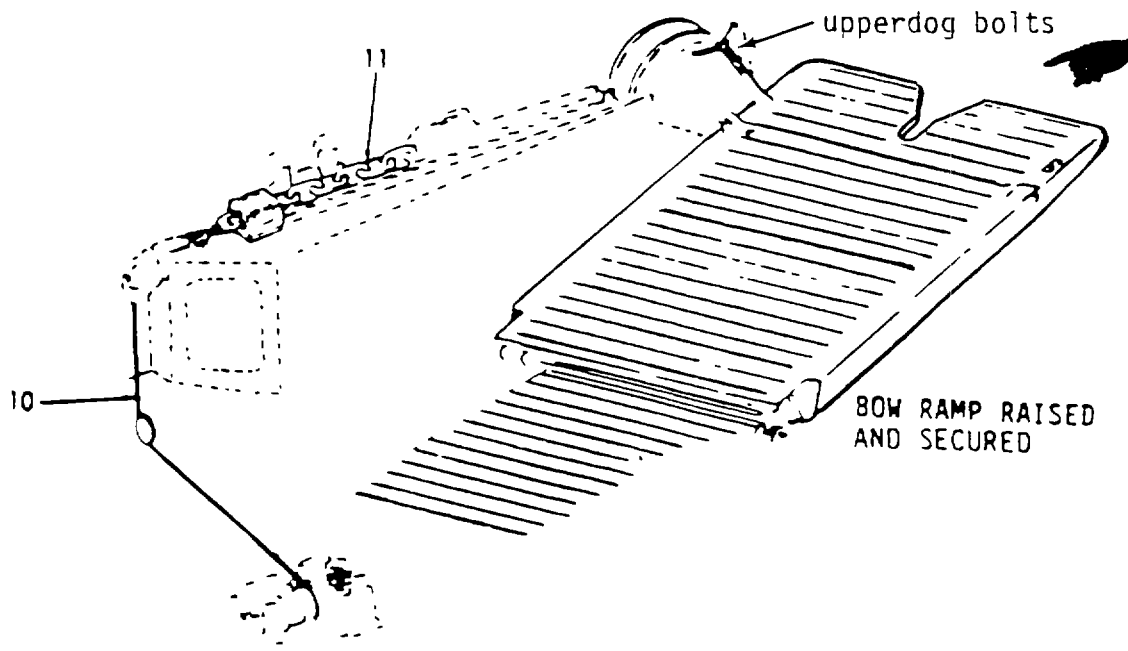
NOTE

Slack cable limit switch will automatically de-energize winch motor should cable go slack or "hang up" during lowering or raising.



- b. Port and Starboard Bow.

Check wire cable (10) and cable chain (11). Make sure cables are not fouled.



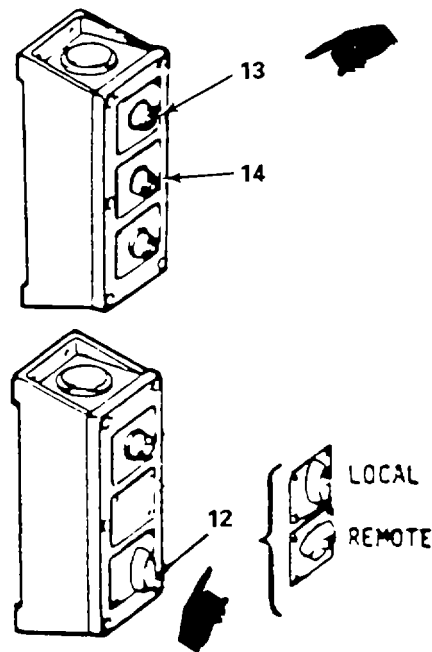
2-53. LOWERING BOW RAMP-REMOTE (Cont).

CAUTION

Failure to follow instructions may damage the Elastomeric Winch and bow ramp.

c. Pilothouse.

- (1) Turn the bow winch control box local/remote switch (12) to the REMOTE position.
- (2) Push the "RAISE" control (13) until a strain is taken on the ramp chain and ramp. Release button to stop ramp.
- (3) Loosen upperdog bolts on the ramp and swing upperdog bolts clear from craft sides. (see Illustration on page 2-316).
- (4) Push the "LOWER" control (14) to lower the ramp into position. Release button to stop ramp.



4951-141

CAUTION

The winch wire rope is capable of raising and lowering the ramp alone but is not capable of supporting the ramp during loading or unloading operations. Normally, the ramp will be supported on the forward end and the cable and chain will be slack. If the ramp must be suspended from the chains; the chain stopper must be set against the chain guide to prevent overloading of the cables.

2-53.1 ADJUSTING UPWARD COMPENSATION-REMOTE.

- a. For full upward compensation, push the "LOWER" control until slack is visible in the ramp chain.
- b. Push the "RAISE" control until the slack is out of the ramp chain and the ramp is riding on the chain.

2-53.2 ADJUSTING DOWNWARD COMPENSATION-REMOTE.

- a. For full downward compensation, push the "LOWER" control until the ramp chain is slack.
- b. Push the "RAISE" control until the slack is eliminated. (The ramp should not be riding on the chain.)

2-54. RAISING BOW RAMP-REMOTE.

Remote operation from the pilothouse. To operate the winch and raise the bow ramp, proceed as follows:

- Do not enter or attempt to move around in the winch compartment with the winch running. There is always danger of becoming entangled in the wire rope.
- Never enter the winch compartment alone.
- Whenever working on the ramp gate, the wire rope, or in the vicinity of the winch in the winch room, the power to the winch must be disconnected.
- Keep clear while winch is in operation.

NOTE

Both generators should be operating in parallel.

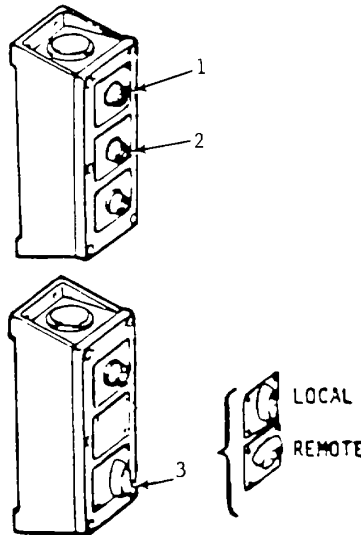
- a. Pilothouse.
 - (1) Press the RAISE pushbutton control (1) until the ramp is against the gasket stop.
 - (2) Release button to stop ramp.
 - (3) Replace dogs on ramp and latch securely (see Illustration page 2-316).
 - (4) Push the "LOWER" control (2) until the ramp chain and cable are slack. The slack cable switch may shut off the motor.
 - (5) Release button to stop ramp.

2-54. RAISING BOW RAMP-REMOTE (Cont)

- (6) Place the local/remote switch (3) in the "LOCAL" position.

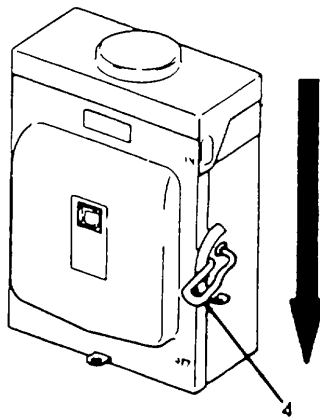


When the ramp is up and secured or otherwise not in operation the ramp cable and chain must be slack to relax the elastomeric unit.



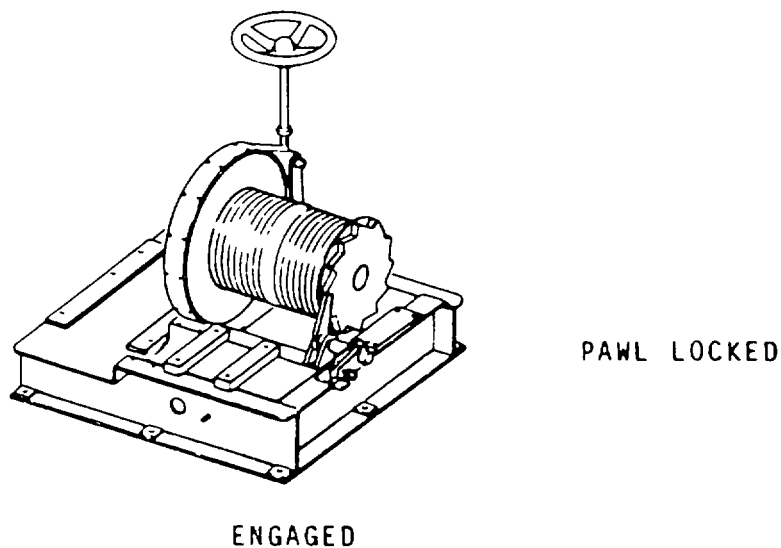
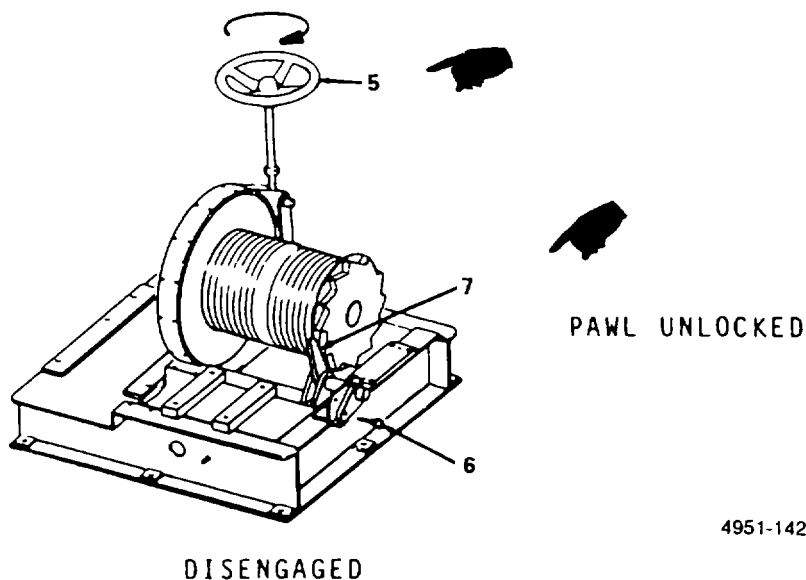
b. Winch Compartment.

- (1) Place power disconnect lever (4) to OFF.



2-54. RAISING BOW RAMP-REMOTE (Cont).

- (2) Turn mechanical brake wheel (5) clockwise to lock winch.
- (3) Remove pawl locking pin (6) and place pawl (7) in the engaged position. Pawl is locked.



2-55. LOWERING BOW RAMP-LOCAL.

Local operation from the winch compartment or starboard bow area. To operate the winch and lower the bow ramp proceed as follows:

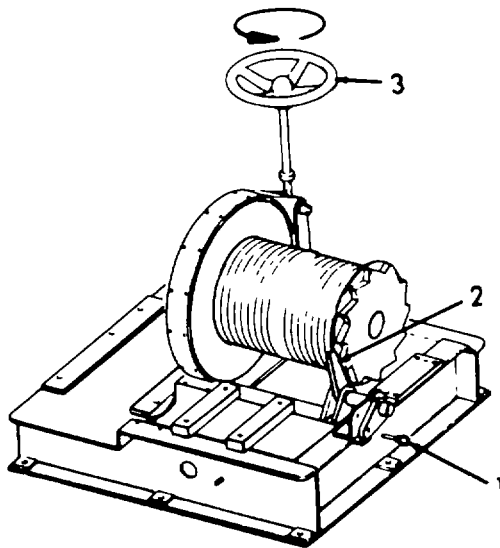
2-55. LOWERING BOW RAMP-LOCAL (Cont).

WARNING

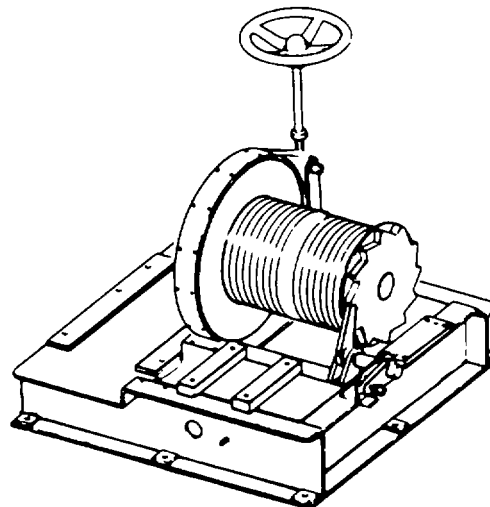
- Do not enter or attempt to move around in the winch compartment with the winch running. There is always danger of becoming entangled in the wire rope.
- Never enter the winch compartment alone.
- Whenever working on the ramp gate, the wire rope, or in the vicinity of the winch in the winch room, the power to the winch must be disconnected.
- Keep clear while winch is in operation.

a. Winch Compartment.

- (1) Remove pawl locking pin (1) and position pawl (2) in disengaged position.
- (2) Turn mechanical brake wheel (3) counter-clockwise to unlock winch.



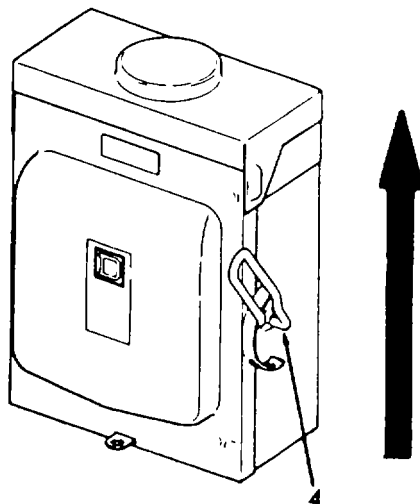
DISENGAGED



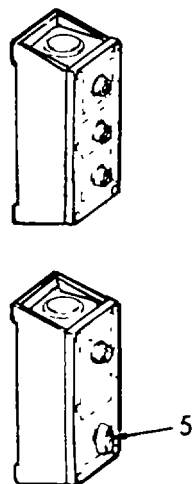
ENGAGED

2-55. LOWERING BOW RAMP-LOCAL (Cont).

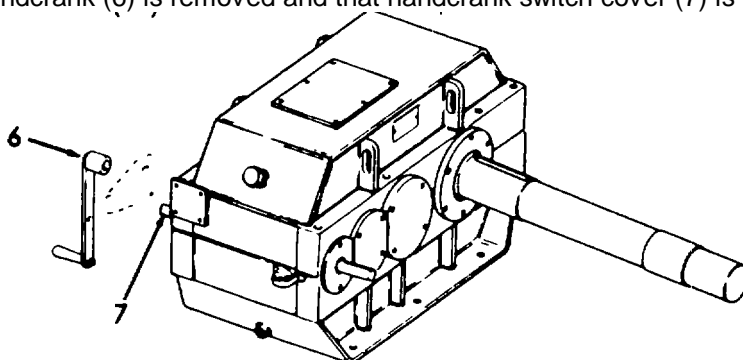
- (3) Place power disconnect lever (4) to ON.



- (4) Turn local/remote switch (5) to LOCAL on the bow ramp controller.



- (5) Check that handcrank (6) is removed and that handcrank switch cover (7) is locked in place.

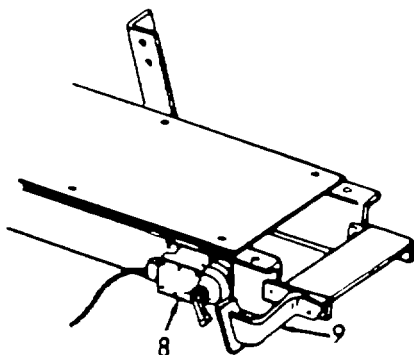


2-55. LOWERING BOW RAMP-LOCAL (Cont).

- (6) Check that slack cable limit switch (8) and slack cable limit lever (9) are engaged.

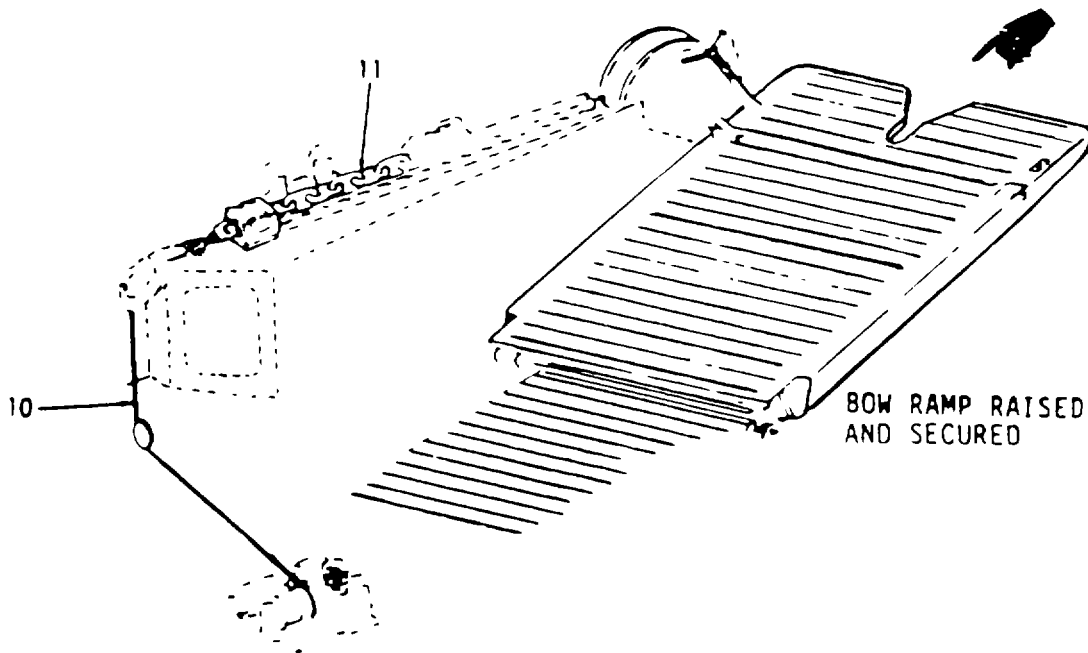
NOTE

Slack cable limit switch will automatically de-energize winch motor should cable go slack or "hang up" during lowering or raising.



- b. Port and Starboard Bow.

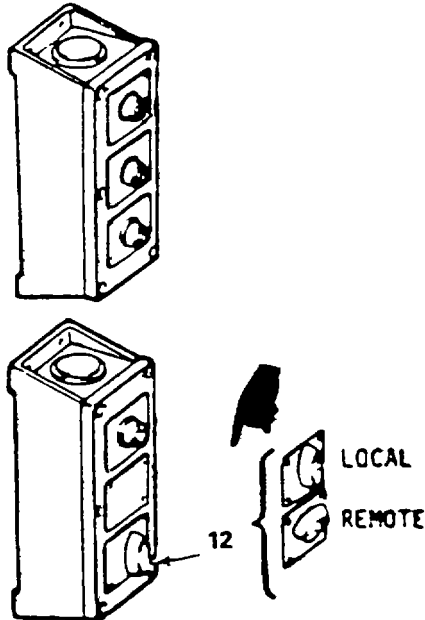
Check wire cable (10) and chain (11). Make sure all cables are not fouled.



2-55. LOWERING BOW RAMP-LOCAL (Cont).

c. Pilothouse.

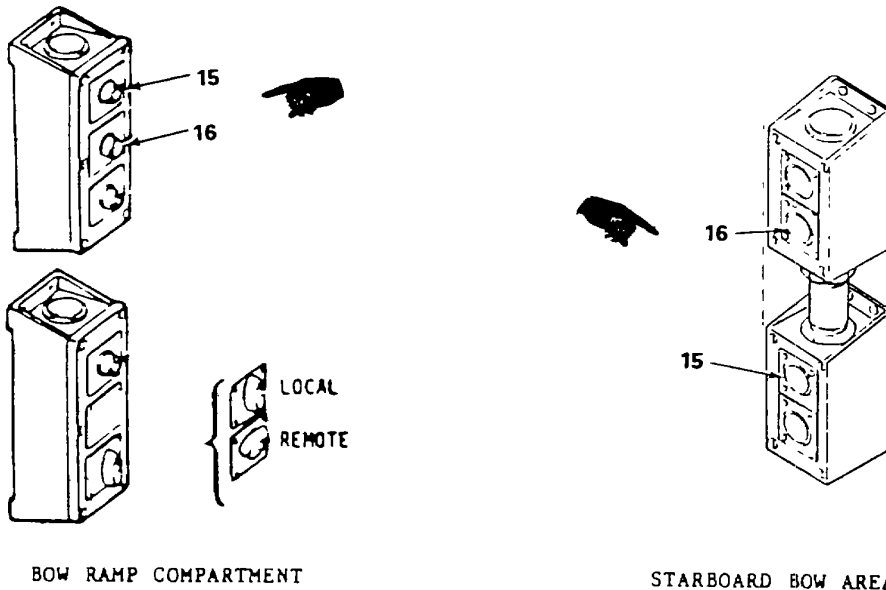
Place local/remote switch (12) in the LOCAL position.



4951-143

d. Winch Compartment or Starboard bow area.

- (1) Push the "RAISE" control (15) until a strain is taken on the ramp chain and ramp. Release button to stop ramp.
- (2) Loosen upperdog bolts on the ramp and swing upperdog bolts clear from craft sides (see Illustration on page 2-325).
- (3) Push the "LOWER" control (16) to lower the ramp into position. Release button to stop ramp.



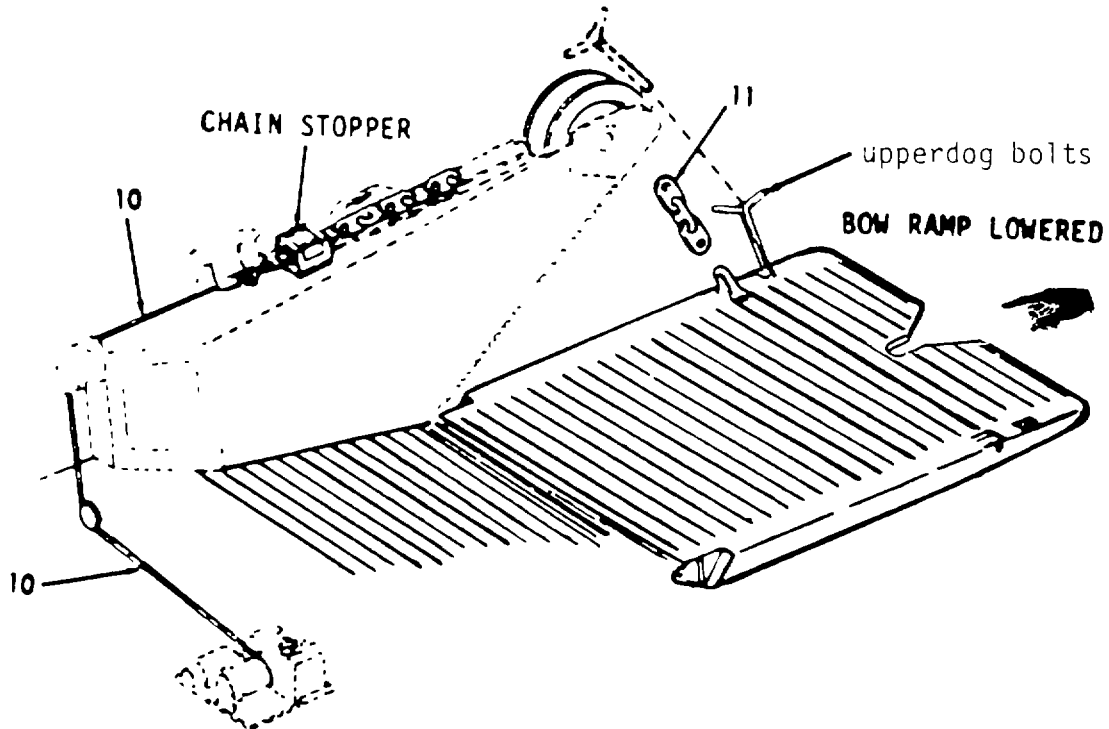
BOW RAMP COMPARTMENT

STARBOARD BOW AREA

4951-144

2-55. LOWERING BOW RAMP-LOCAL (Cont).**CAUTION**

The winch wire rope is capable of raising and lowering the ramp. The winch wire rope is capable of raising and lowering the ramp alone, but is not capable of supporting the ramp during loading or unloading operations. Normally, the ramp will be supported on the forward end and the cable and chain will be slack. If the ramp must be suspended from the chains, the chain stopper must be set against the chain guide to prevent overloading of the cable.



4951-106

2-55.1 ADJUSTING UPWARD COMPENSATION-LOCAL.

- For full upward compensation, push the "LOWER" control until slack is visible in the ramp chain.
- Push the "RAISE" control until the slack is out of the ramp chain and the ramp is riding on the chain.

2-55.2 ADJUSTING DOWNWARD COMPENSATION-LOCAL.

- For full downward compensation, push the "LOWER" control until the ramp chain is slack.
- Push the "RAISE" control until the slack is eliminated. (The ramp should not be riding on the chain.)

2-56. RAISING BOW RAMP-LOCAL.

Local operation from winch compartment or starboard bow area. To operate the winch and raise the bow ramp, proceed as follows:

WARNING

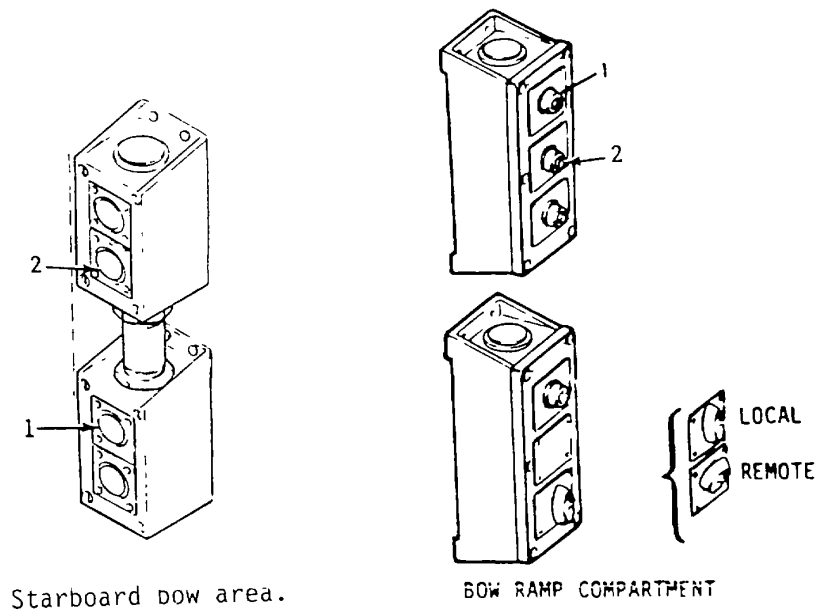
- Do not enter or attempt to move around in the winch compartment with the winch running. There is always danger of becoming entangled in the wire rope.
- Never enter the winch compartment alone.
- Whenever working on the ramp gate, the wire rope, or in the vicinity of the winch in the winch room, the power to the winch must be disconnected.
- Keep clear while winch is in operation.

NOTE

Both generators should be operating in parallel.

a. Winch Compartment or Starboard bow area.

- (1) Press the RAISE pushbutton control (1) until the ramp is against the gasket stop.
- (2) Release button to stop ramp.
- (3) Replace dogs on ramp and latch securely (see Illustration page 2-325).
- (4) Push the "LOWER" control (2) until the ramp chain and cable are slack. The slack cable switch may shut off the motor.
- (5) Release button to stop ramp.



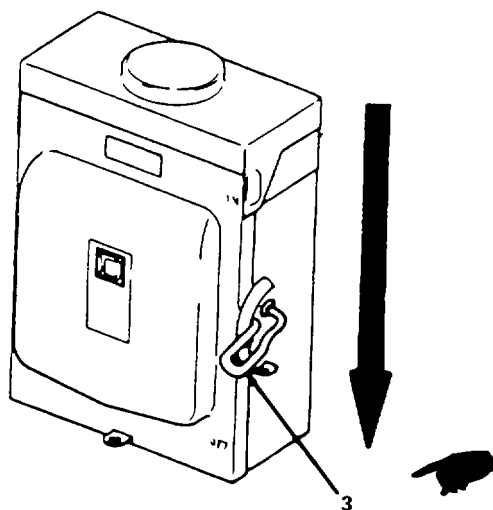
2-56. RAISING BOW RAMP-LOCAL (Cont).

CAUTION

When the ramp is up and secured or otherwise not in operation the ramp cable and chain must be slack to relax the elastomeric unit.

b. Winch Compartment

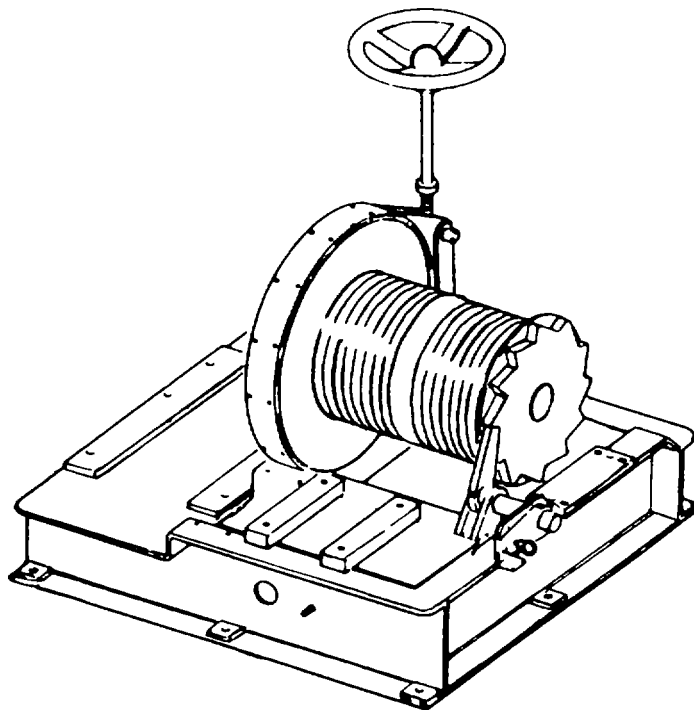
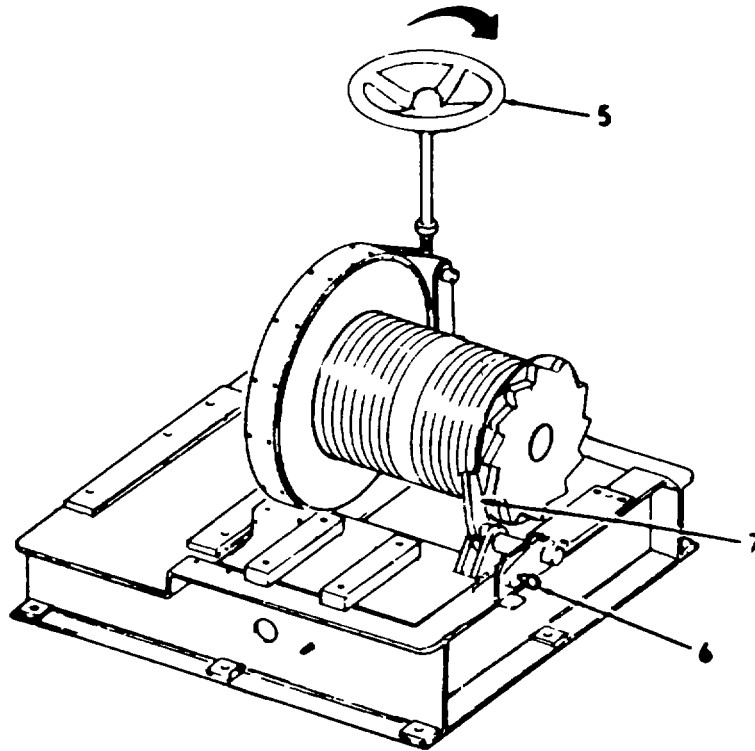
- (1) Place power disconnect lever (3) to OFF.



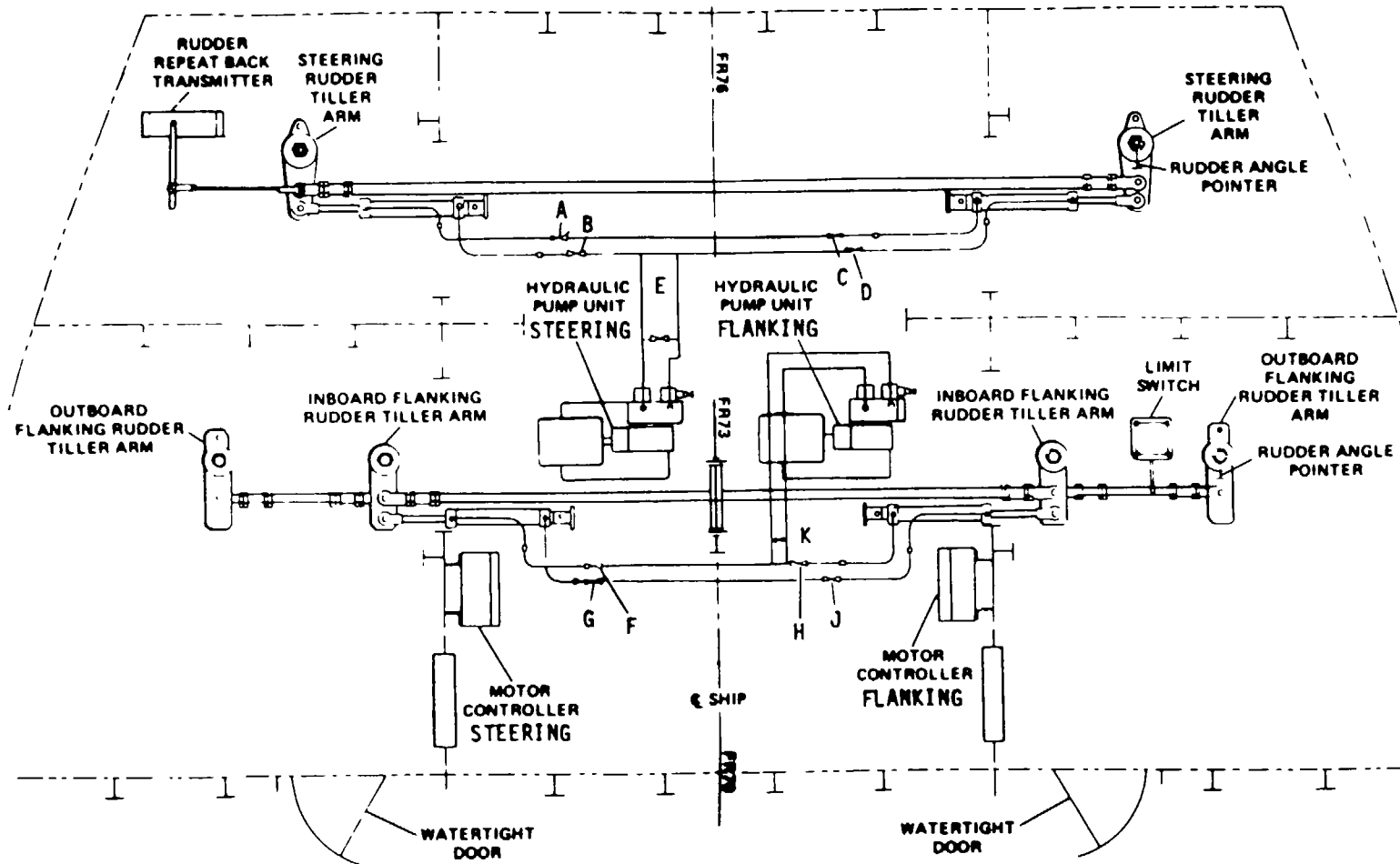
4951-097

2-56. RAISING BOW RAMP-LOCAL (Cont).

- (2) Turn mechanical brake wheel (5) clockwise to lock winch.
- (3) Remove pawl locking pin (6) and place pawl (7) in the engaged position. Pawl is locked.



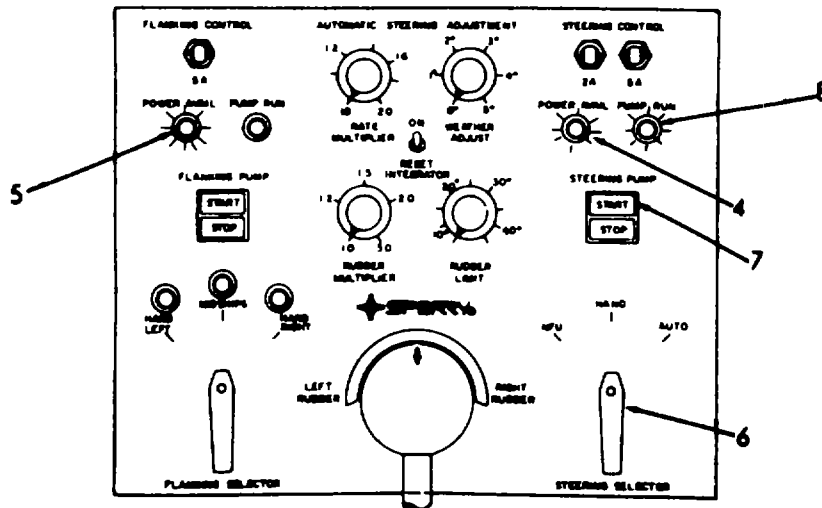
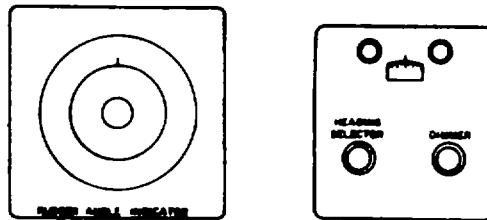
2-58. NORMAL STEERING (Cont).



2-58. NORMAL STEERING (Cont).

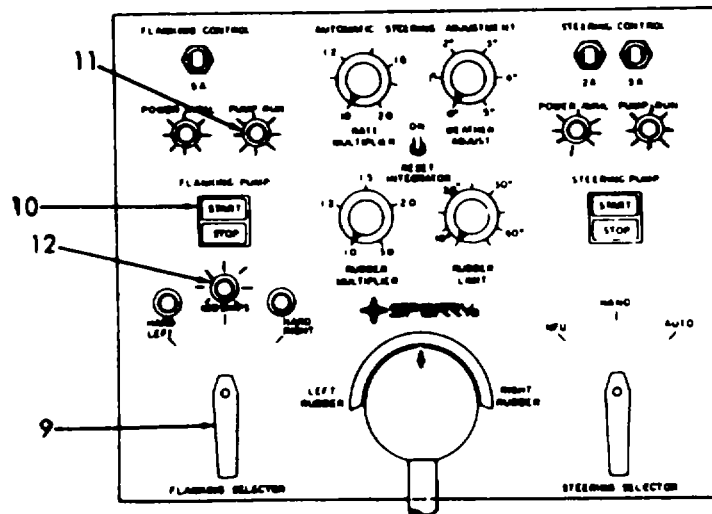
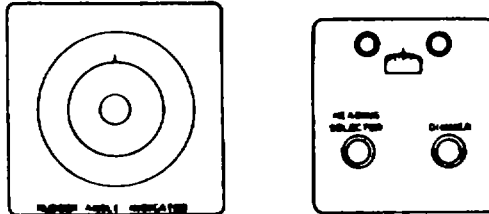
c. Pilot House.

- (1) Steering control POWER AVAIL lamp (4) is lit.
- (2) Flanking control POWER AVAIL lamp (5) is lit.
- (3) Place steering selector (6) in the HAND position.
- (4) Press steering pump START switch (7). Pump run lamp (8) will light.



2-58. NORMAL STEERING (Cont).

- (5) Place flanking selector (9) in the MIDSHIPS position.
- (6) Press flanking pump START switch (10). Pump run lamp (11) will light.
- (7) Midships lamp (12) will light.



2-58. NORMAL STEERING (Cont).

(8) The craft is now ready for maneuvering as follows:

(a) Reverse-Back to starboard.

- 1 Place the flanking selector (9) in the HARD RIGHT position. The hard right lamp (13) will light.
- 2 Place either or both engine shift control(s) (14) in reverse.
- 3 The craft will back to starboard.

(b) Reverse-Back to port.

- 1 Place the flanking selector (9) in the HARD LEFT position. The hard left lamp (15) will light.
- 2 Place either or both engine shift control(s) (14) in reverse.
- 3 The craft will back to port.

(c) Reverse-Back dead astern.

- 1 Place the flanking selector (9) in the MIDSHIPS position.
The MIDSHIPS lamp (12) will light.
- 2 Place either or both engine shift controls (14) in reverse.
- 3 The craft will back-dead astern.

(d) Reverse-Turn off.

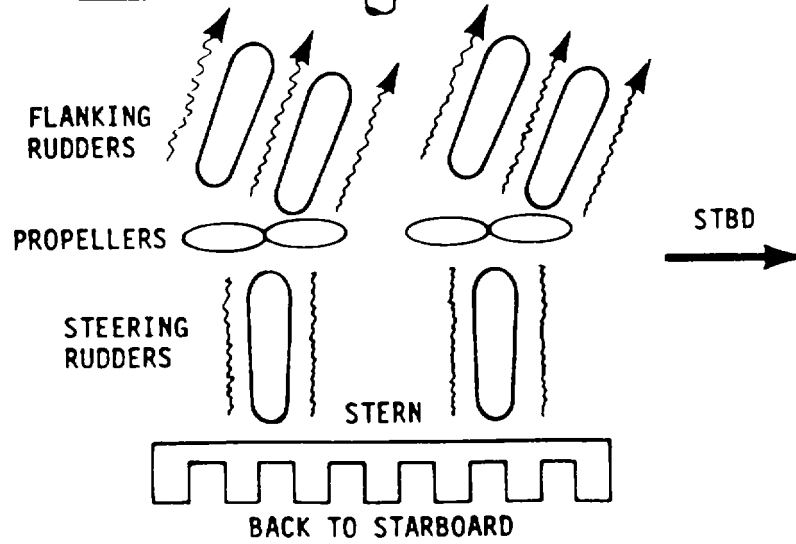
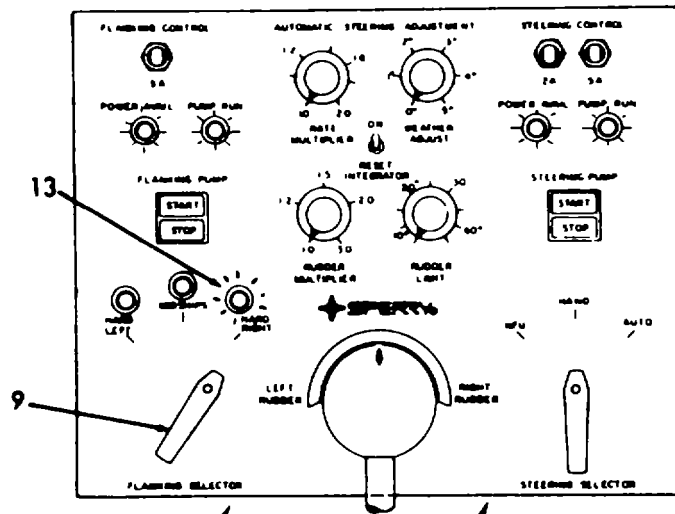
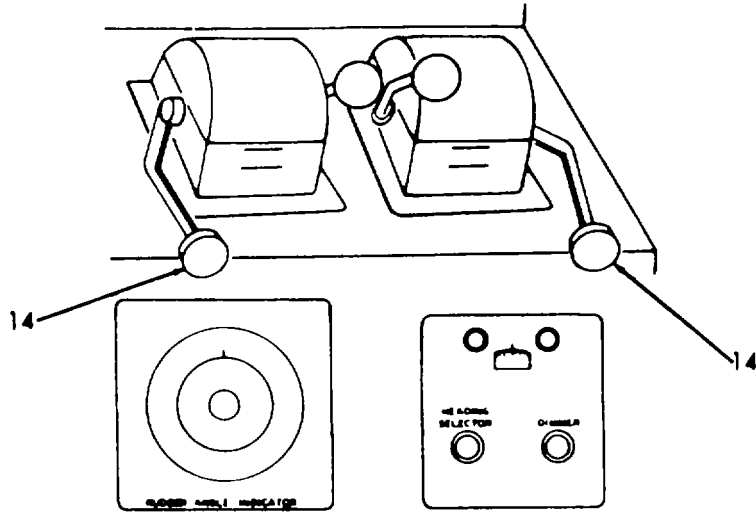
- 1 Press the flanking pump STOP switch (16). The pump run lamp (11) will be off.

NOTE

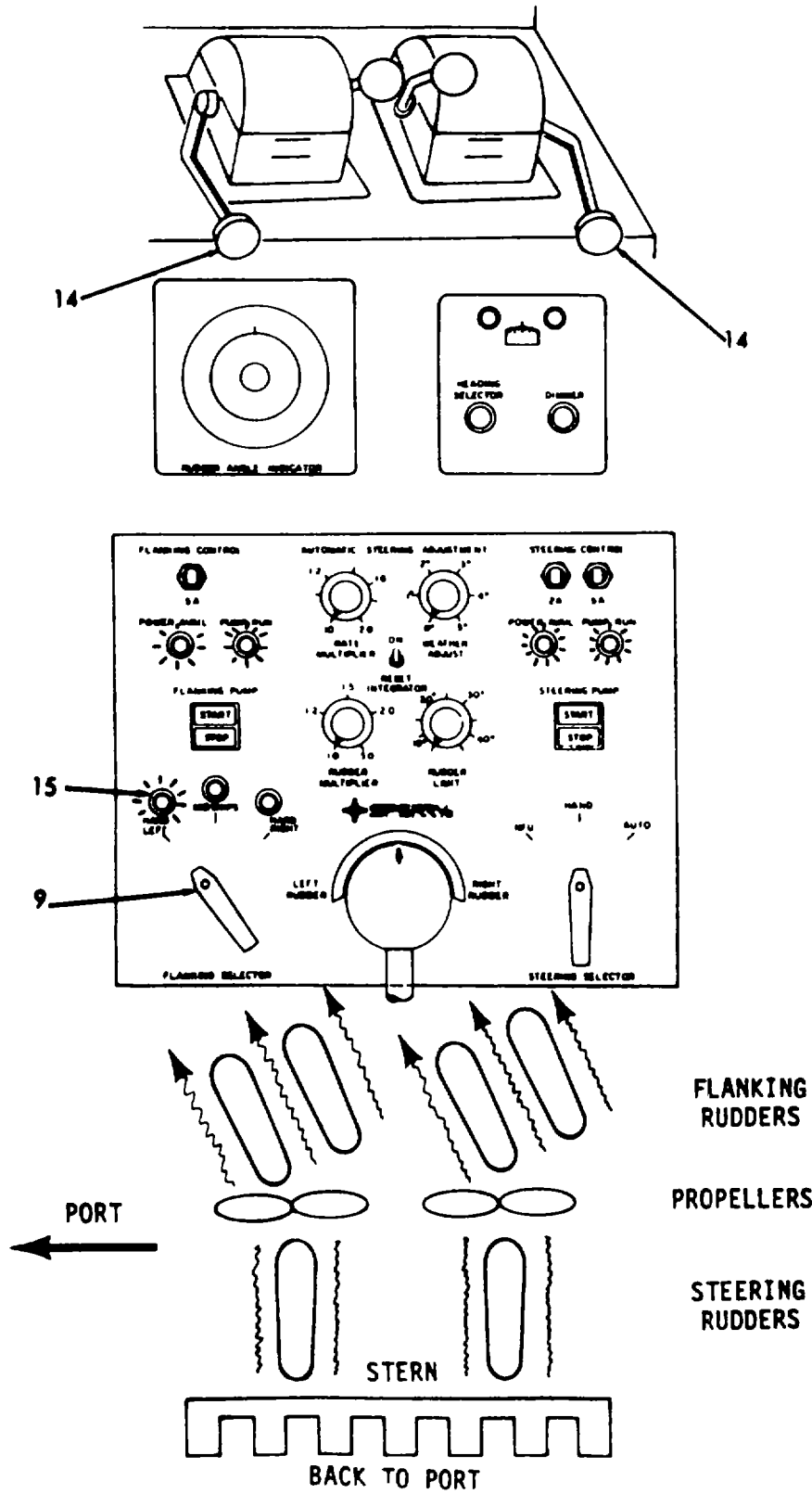
The flanking selector (9) must be in the MIDSHIPS position.

- 2 Place both shift controls (14) in neutral.

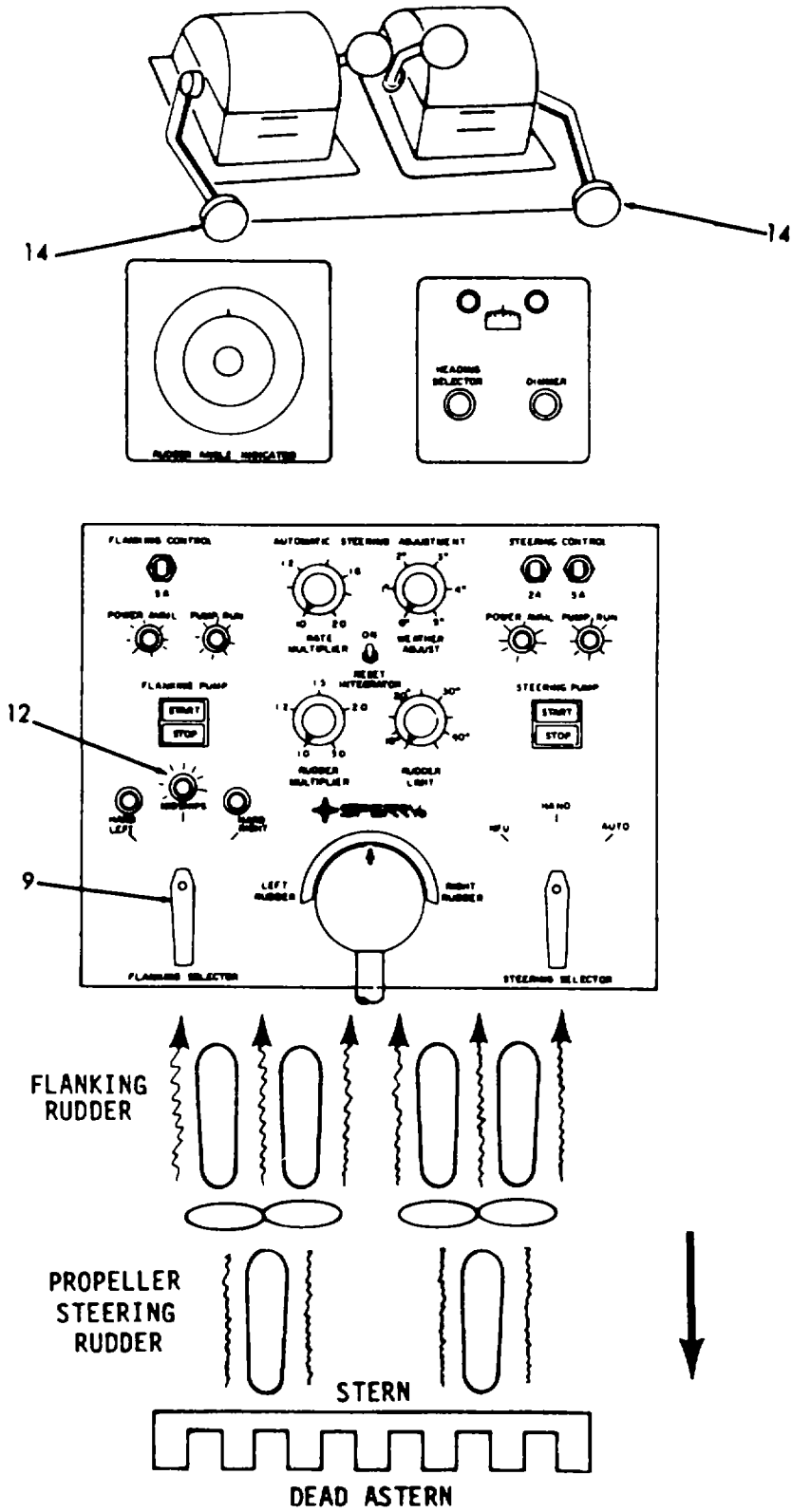
2-58. NORMAL STEERING (Cont).



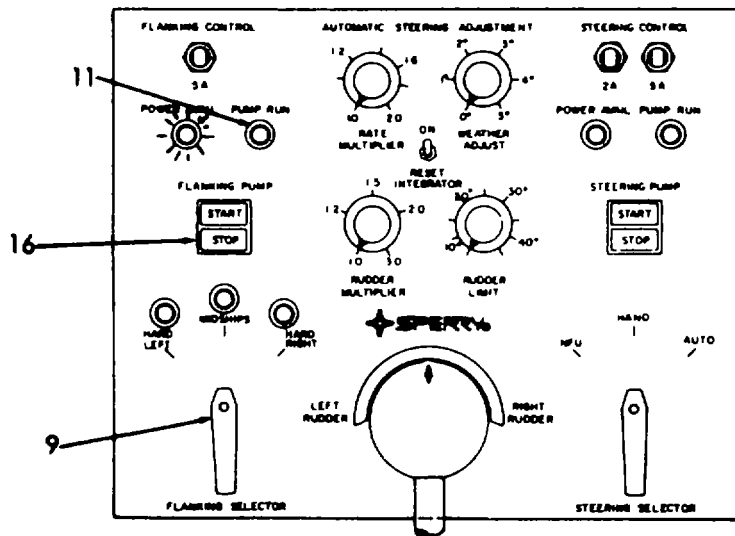
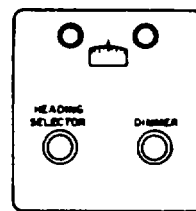
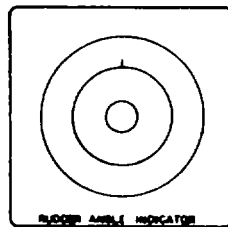
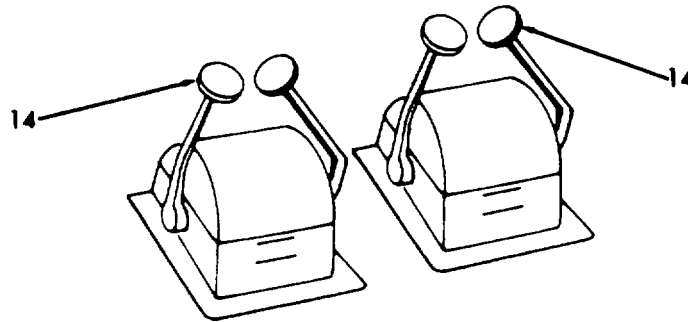
2-58. NORMAL STEERING (Cont).



2-58. NORMAL STEERING (Cont).



2-58. NORMAL STEERING (Cont).



FLANKING CONTROL TURN-OFF

2-58. NORMAL STEERING (Cont).

(e) Forward-Turn to starboard.

- 1 Place the steering lever (17) to any desired RIGHT RUDDER position.
- 2 Place either or both engine shift controls (14) in forward.
- 3 The craft will steer to starboard.
- 4 The rudder angle indicator (18) will show position of rudder.

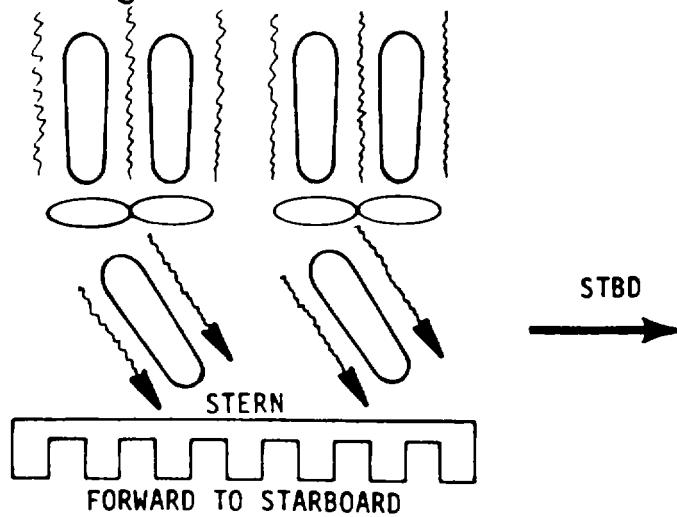
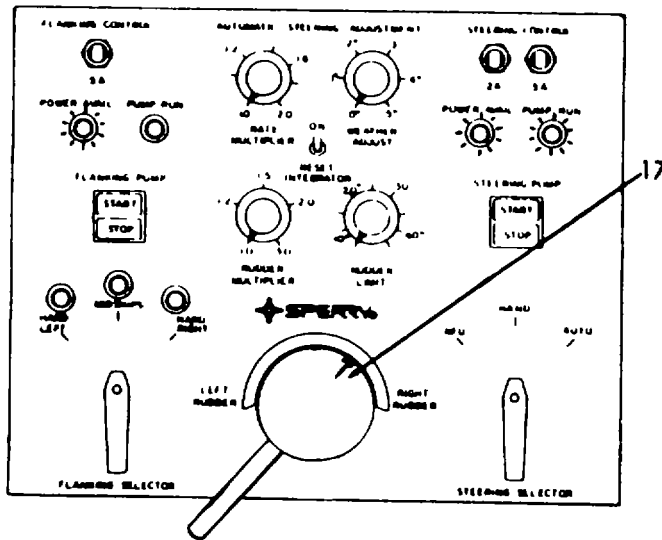
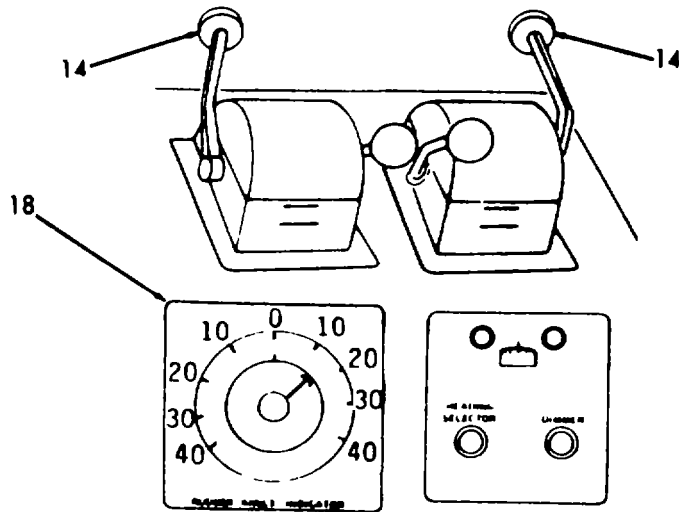
(f) Forward-Turn to port.

- 1 Place the steering lever (17) to any desired LEFT RUDDER position.
- 2 Place either or both engine shift controls (14) in forward.
- 3 The craft will steer to port.
- 4 The rudder angle indicator (18) will show position of rudder.

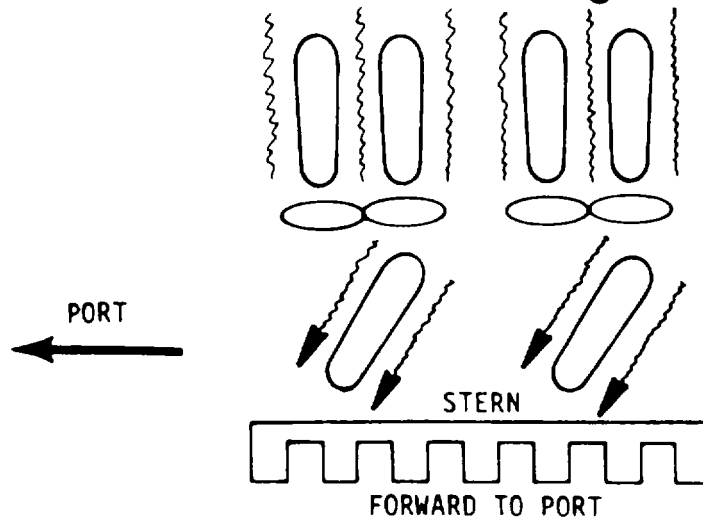
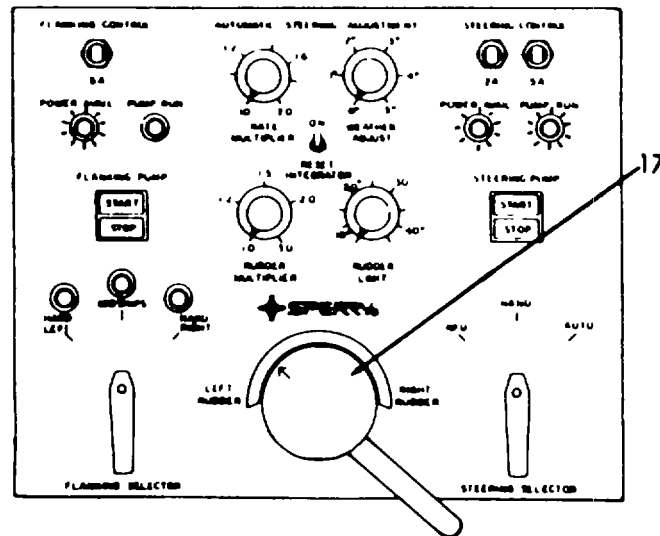
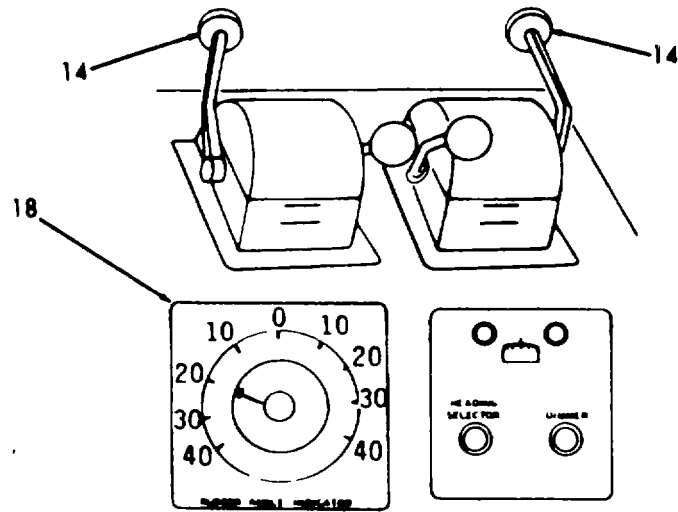
(g) Forward-

- 1 Place the steering lever (17) in the center position.
- 2 Place either or both engine shift controls (14) in forward.
- 3 The craft will steer straight ahead.
- 4 The rudder angle indicator (18) will indicate zero.

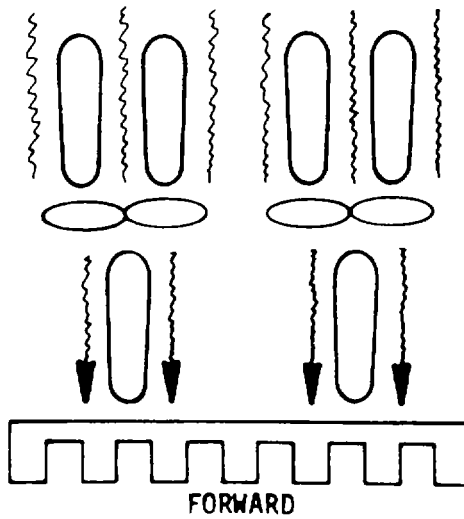
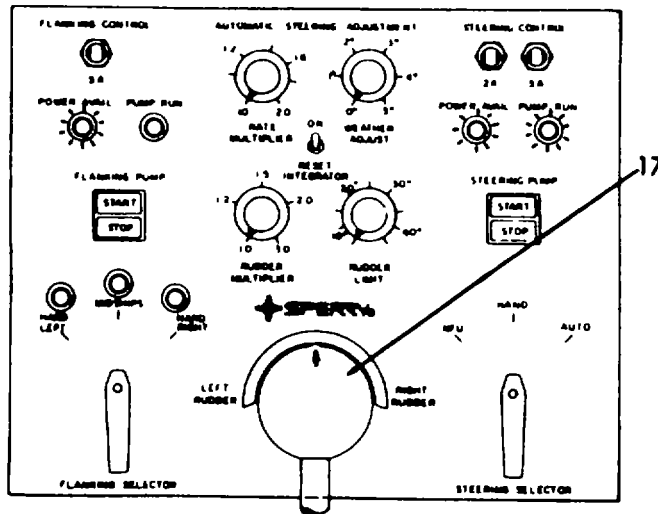
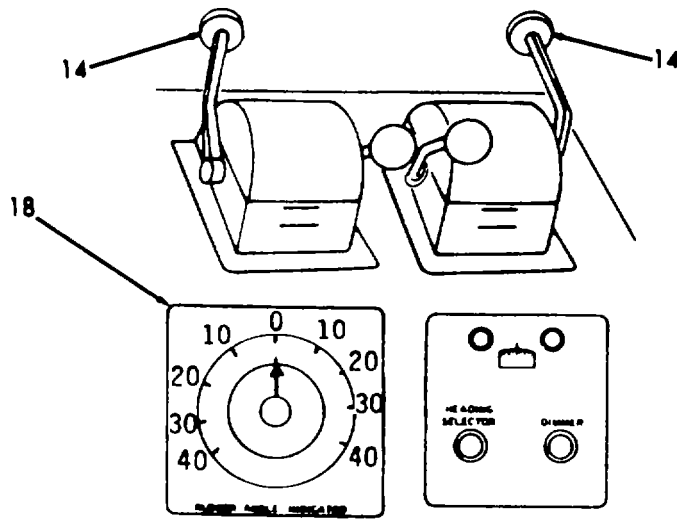
2-58. NORMAL STEERING (Cont).



2-58. NORMAL STEERING (Cont).



2-58. NORMAL STEERING (Cont).



2-59. NON-FOLLOW-UP STEERING.

- a. The non-follow-up (NFU) steering mode is an auxiliary method of controlling the steering pump.
- b. Placing the steering lever either right or left actuates the steering pump. The rudder will move until a limit stop is reached or the steering lever is placed in the center.



Rudder angle indicator should indicate zero before placing steering selector in the NFU position.

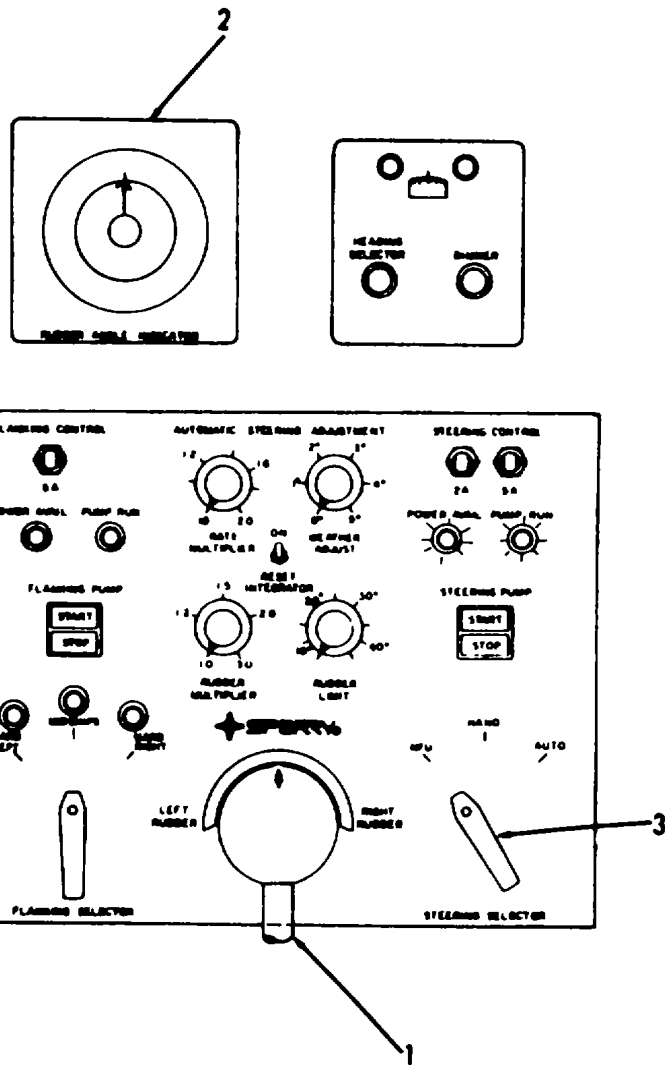
(1) Steer to Right.

- (a) Place steering lever (1) in the center position.
- (b) Wait until the rudder angle indicator (2) reaches zero.
- (c) Place the steering selector (3) in the NFU position.
- (d) Move the steering lever toward the RIGHT RUDDER position and hold. The pump run light will be lit.
- (e) Observe the rudder angle indicator.
- (f) When the desired heading is obtained, move the steering lever to the center position.
- (g) The pump run light will be out.

(2) Steer to Left.

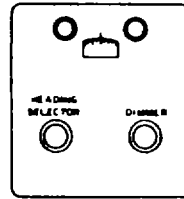
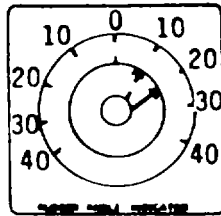
- (a) Move the steering lever toward the LEFT RUDDER position and hold. The pump run light will be lit.
- (b) Observe the rudder angle indicator.
- (c) When the desired heading is obtained, move the steering lever to the center position.
- (d) The pump run light will be out.

2-59. NON-FOLLOW-UP STEERING (Cont).

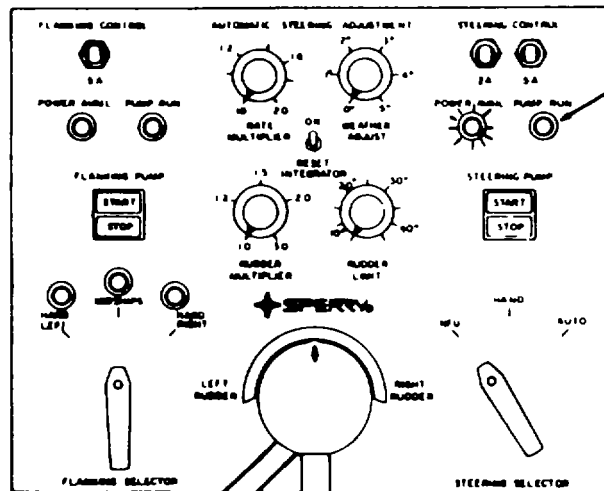


2-59. NON-FOLLOW-UP STEERING (Cont).

DESIRED HEADING



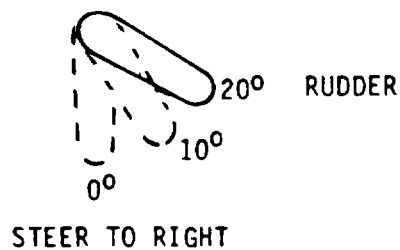
NOTE
THE RUDDER
WILL REMAIN
ON THE DESIRED
HEADING



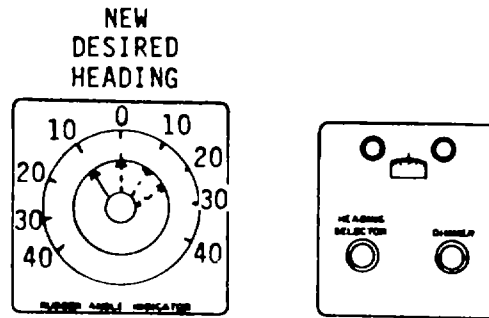
LAMP LIT
WHILE LEVER
IS BEING HELD
AND RUDDER
IS MOVING
LAMP OUT
WHEN LEVER
IS IN THE
CENTER

HOLD TO
LEFT UNTIL
DESIRED HEADING
IS OBTAINED

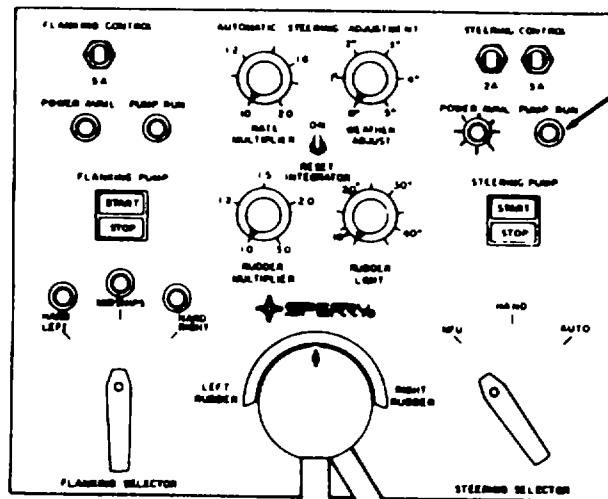
MOVE TO CENTER
TO STOP RUDDER
MOTION



2-59. NON-FOLLOW-UP STEERING (Cont).



NOTE
THE RUDDER
WILL CHANGE TO
NEW HEADING
AND REMAIN
THERE.

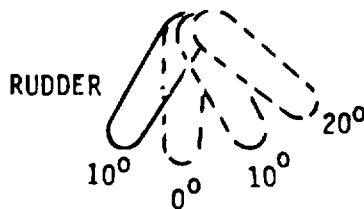


LAMP LIT
WHILE LEVER
IS BEING HELD
AND RUDDER
IS MOVING.

LAMP OUT
WHEN LEVER
IS IN THE
CENTER.

MOVE TO CENTER
TO STOP RUDDER
MOTION.

HOLD TO RIGHT UNTIL
DESIRED HEADING IS
OBTAINED.



STEER TO LEFT

2-60. AUTOMATIC STEERING.

a. Automatic steering uses a gyropilot computer to steer the vessel on a predetermined course in both calm and rough seas. In rough seas allowances can be made for yaw and rudder response.

b. Prior to commencing automatic steering the normal steering procedure should be performed.

- (1) The POWER AVAIL lamp (1) is lit.
- (2) The PUMP RUN lamp (2) is lit.
- (3) Place STEERING SELECTOR (3) in the AUTO position.
- (4) Rotate HEADING SELECTOR (4) until the desired heading is shown on scale (5).
- (5) Set the AUTOMATIC STEERING ADJUSTMENTS as required.

(a) INTEGRATOR switch (6).

ON - Computes a continuous average heading error signal.

RESET - Resets integral function. When heading changes greater than 10° are made, the switch should be in the RESET position. This prevents overshooting the new course and then switch returned to ON.

(b) WEATHER ADJ potentiometer (7).

Controls the sensitivity, amount of heading error permitted before the rudder ratio is increased.

Zero degrees (0°) setting provides maximum sensitivity. In calm seas set to zero degrees (0°) for best course keeping.

In rough seas, (considerable yaw), set to the approximate number of degrees of yaw motion from the base heading.

(c) RUDDER MULTIPLIER potentiometer (8).

1.0 minimum rudder ratio.

3.0 maximum rudder ratio.

The higher setting causes the ship to respond more quickly to course error by ordering larger rudder angles.

(d) RATE MULTIPLIER potentiometer (9).

1.0 minimum sensitivity (50% of maximum).

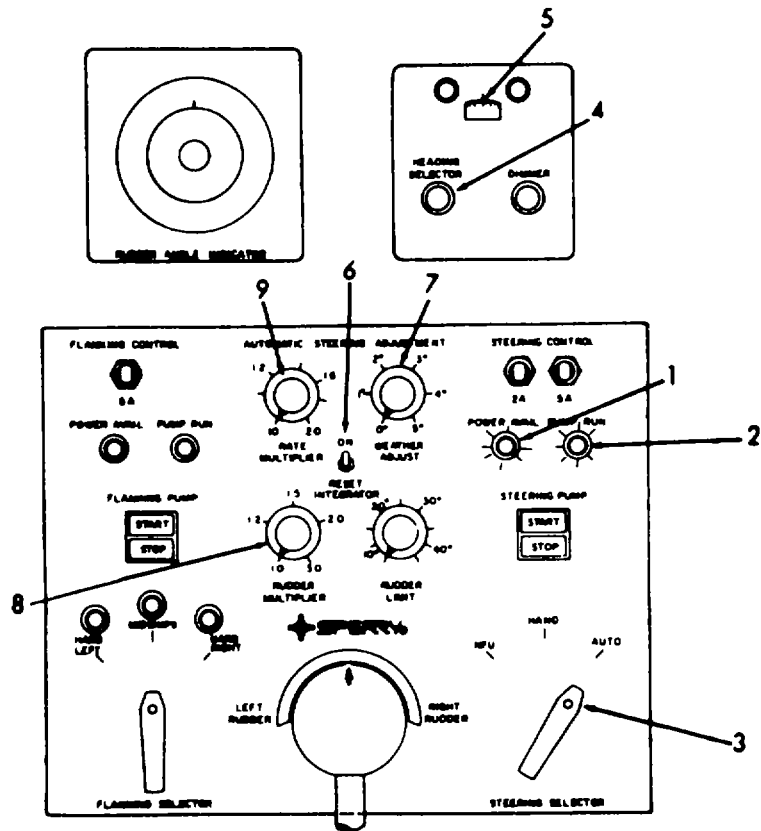
2.0 maximum sensitivity.

Controls sensitivity to changes in heading.

(e) RUDDER LIMIT potentiometer (10).

Sets limits of rudder movement, right or left, between 5 and 45 degrees.

2-60. AUTOMATIC STEERING (Cont).



2-61. STEERING SHUTDOWN.

To shutdown the steering system proceed as follows:

a. Pilot House.

(1) Press the FLANKING PUMP STOP switch (1). The PUMP RUN lamp (2) will go out.

(2) Press the STEERING PUMP STOP switch (3). The PUMP RUN lamp (4) will go out.

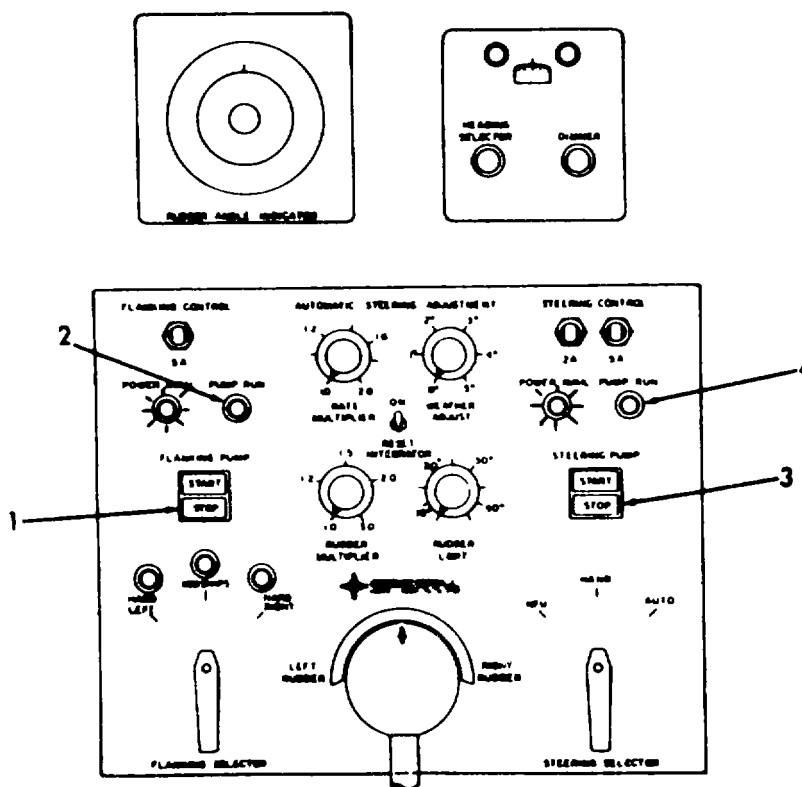
b. Steering Compartment.

(1) Place the steering controller (5) LOCAL-OFF-REMOTE switch (6) in the OFF position.

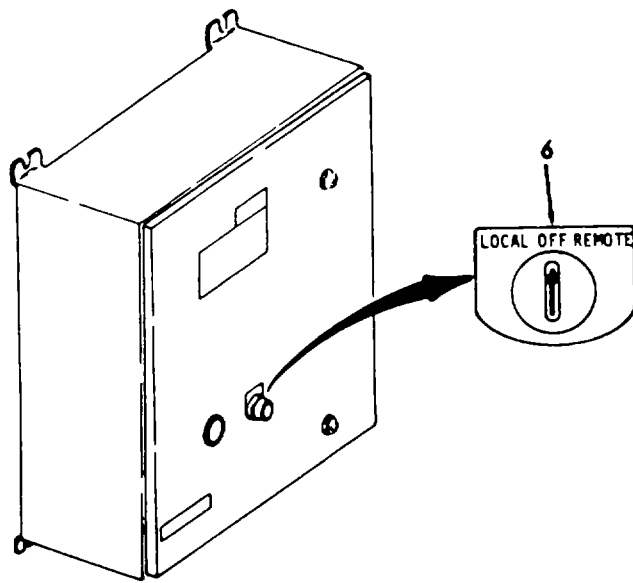
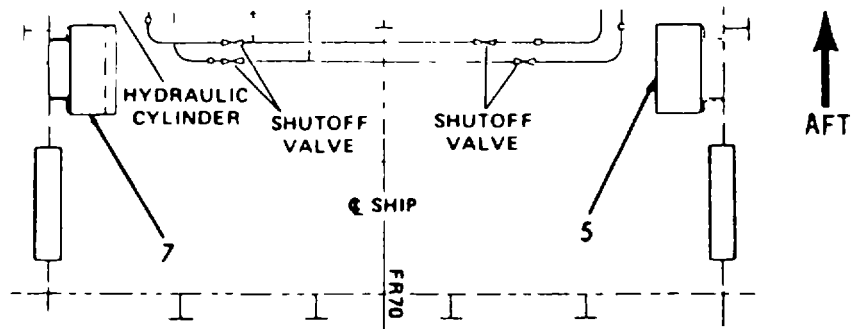
NOTE

The POWER AVAIL lamps in the pilot house will go out.

(2) Place the flanking controller (7) LOCAL-OFF- REMOTE switch (6) in the OFF position.



2-61. STEERING SHUTDOWN (Cont).



2-62. LUBE OIL TRANSFER SYSTEM.

a. An engine lube oil tank is located in the forward engine room. The lube oil tank contains 198.6 gallons (751.7 liters) at 95% capacity. The oil contained in the tank is pumped by hand through pipes to supply valves. At each supply valve is a service hose that is used to fill an engine.

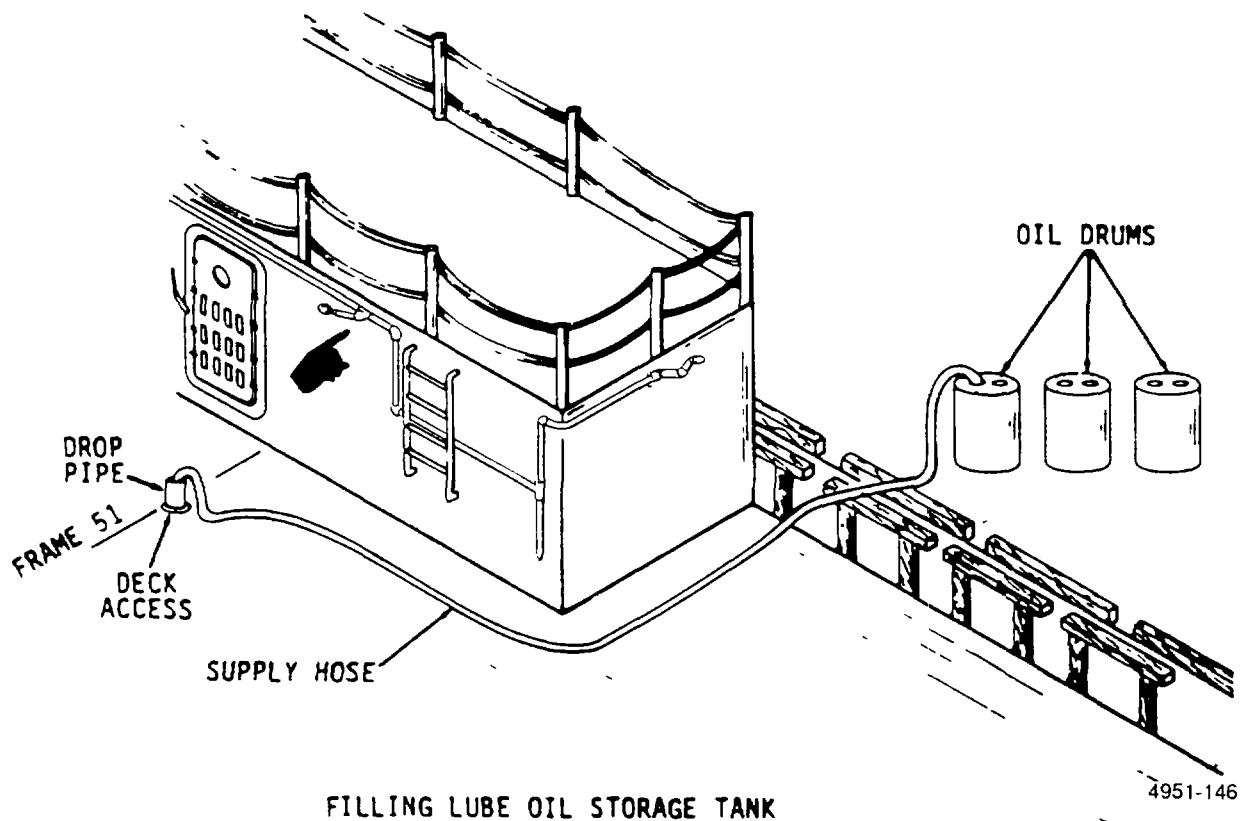
b. To operate the lube oil transfer system refer to Figure FO-35 and proceed as follows:

(1) Forward Engine Room.

- (a) Check that drain valve-(1) is closed.
- (b) Check that check valve (2) is closed.
- (c) Check oil level on gauge (3).

(2) On Deck - Frame 51 Inboard of Deckhouse.

- (a) Remove deck access.
- (b) Install drop pipe and hoses.
- (c) Connect to oil barrels located on the dock.



2-62. LUBE OIL TRANSFER SYSTEM (Cont).**NOTE**

The lube oil storage tank capacity is 198.6 gallons (751.7 liters).

- (d) Fill the lube oil storage tank.
- (e) Remove hose and drop pipe.
- (f) Close deck access.
- (g) Wipe up any spilled oil.

WARNING

Dispose of oil soaked rags in flammable waste cans.

- (3) Forward Engine Room, Aft Engine Room, or Anchor Winch Compartment.
 - (a) Use a manual pump to remove oil from the dipstick pipe on the engine.
 - (b) Discharge oil into a suitable container.
 - (c) Use the oil/water separator to remove oil (para 2-96).
 - (d) Connect service hose to supply valve.
 - (e) Remove engine oil fill cap.
 - (f) Place service hose in engine oil fill.
- (4) Forward Engine Room.
 - (a) Open suction valve (4).
 - (b) Rotate lube oil transfer pump (5) lever clockwise.
 - (c) Transfer the required amount of oil to the engine.
 - (d) Use the dipstick to check oil level.

2-62. LUBE OIL TRANSFER SYSTEM (Cont).

- (5) Forward Engine Room, Aft Engine Room, or Anchor Winch Compartment.
 - (a) Shut off supply valve.
 - (b) Remove hose from engine.
 - (c) Remove hose from supply valve.
 - (d) Replace oil fill cap on engine.
 - (e) Drain hose and place on hose rack.
 - (f) Clean up spilled oil.



Dispose of oil soaked rags in flammable waste cans.

2-63. CENTRALIZED HYDRAULIC SYSTEM.

a. The centralized hydraulic system supplies the hydraulic power required to operate the main mast, anchor "A" frame, and the stern gate. Refer to Figure FO-36.

b. The system consists of a hydraulic pump and reservoir located below deck. In addition there are directional control valves located close to the item to be controlled.

c. The following is an index to the procedures:

<u>Description</u>	<u>Paragraph</u>
Preliminary Adjustments	2-64
Main Mast - Raising	2-65
Main Mast - Lowering	2-66
Anchor "A" Frame	2-67
Stern Gate - Lowering	2-68
Stern Gate - Raising	2-69

d. Before operating, perform all required PMCS.



Check that no one is working on or near any of the components of the hydraulic system.



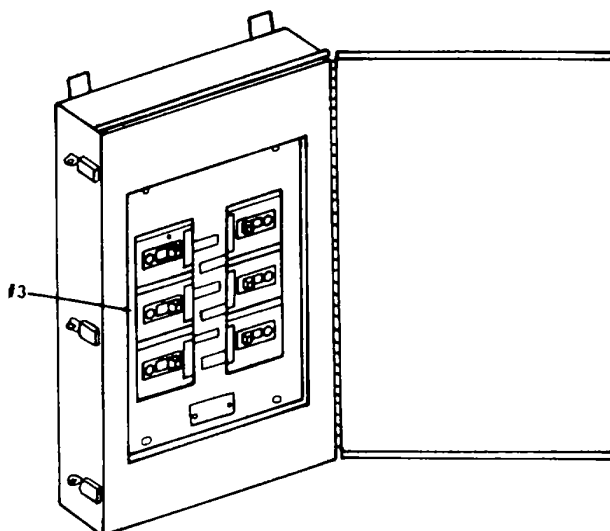
Check all directional control valves to be sure they are in the OFF position.

2-64. PRELIMINARY ADJUSTMENTS.

The following adjustments should be performed prior to operation of the main mast, anchor "A" frame, and the stern gate.

- a. Forward Engine Room.

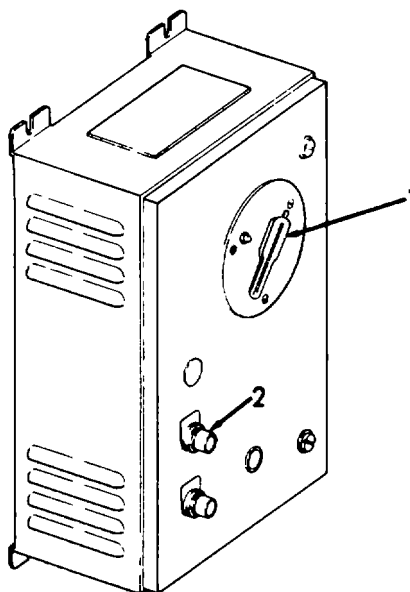
At power distribution panel (P-408A) place circuit breaker #3 in the ON position.



- b. Anchor Winch Compartment

(1) Place the disconnect switch (1) to the ON position.

(2) Press the START switch (2).



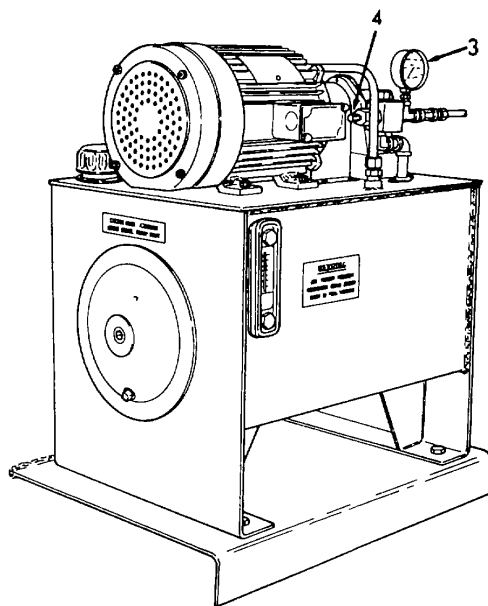
2-64. PRELIMINARY ADJUSTMENTS (Cont).

(3) Observe the pressure gage (3). It should read 850 psi (5860.8 RPA).

(4) Adjust pressure regulating valve (4) if the pressure is incorrect.

clockwise - increase pressure

counter - clockwise - reduce pressure



(5) Adjust shut off valves as follows:

- (a) Valve (5) return from anchor "A" frame.
- (b) Valve (6) return from main mast.
- (c) Valve (7) supply to stern gate and anchor "A" frame.
- (d) Valve (8) supply to main mast.

NOTE

- Valves 5 and 7 can be closed if the main mast is to be operated, while the stern gate or anchor "A" frame, is being serviced.
- Valve 6 and 8 can be closed if the stern gate or anchor "A" frame is to be operated, while the main mast is being serviced.

2-64. PRELIMINARY ADJUSTMENTS (Cont).

(6) Operate directional control valves as required:



- Do not operate directional control valves until after securing devices have been released.
- Refer to the following paragraphs to operate the following:

Main mast valve (9) refer to para 2-65 and 2-66. Anchor "A" frame valve (10) refer to para 2-67. Stern gate valve (11) refer to para 2-68 and 2-78. (7) Flow control valves can be adjusted to control the speed of operation.

- (a) Valve (12) Main mast raising or lowering speed.
- (b) Valve (13) Anchor "A" frame swing in.
- (c) Valve (14) Anchor "A" frame swing out.
- (d) Valve (15) Stern Gate - starboard raising or lowering speed.
- (e) Valve (16) Stern Gate - port raising or lowering speed.

NOTE

Valves (15) and (16) must be balanced so that both sides of the stern gate raise and lower together.

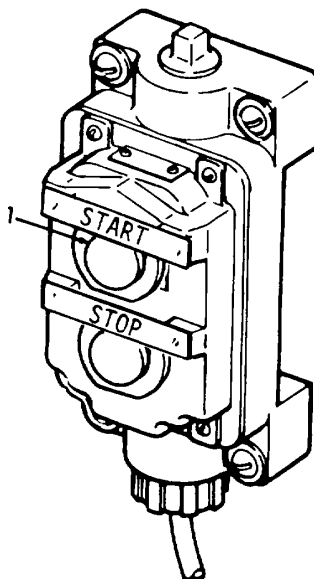
2-65. MAIN MAST - RAISING.

To raise the main mast proceed as follows after the preliminary procedures have been completed.

CAUTION

- Do not attempt to raise main mast before energizing the central hydraulic system.
 - Check hydraulic system, make sure it is not in operation and no other work is being performed anywhere on the system.
- a. Engine Access Room.

Press the START switch (1) on the centralized hydraulic remote control.



- b. Port Side of Deckhouse Aft of Pilot House.

(1) Remove stanchions life lines as required.

WARNING

Safety devices are removed, so that the yardarm can be rotated, and mast raised.

2-65. MAIN MAST - RAISING (Cont).

- (2) Loosen clamp on yardarm stowage bracket (2).
- (3) Remove tie down on mast pillow block (3).
- (4) Remove bolt in aft strut pad (4).
- (5) Remove nuts, washers, and bolts in yardarm pivot bracket (5).
- (6) Place the directional control valve (6) momentarily in the RAISE position. Raise the mast so that the yardarm clears the yardarm stowage bracket (2).
- (7) Rotate the yardarm counter-clockwise.
- (8) Reinstall the bolts, washers, and nuts through the yardarm and the yardarm pivot bracket (5).
- (9) Install signal halyard lines (7).
- (10) Install light hoist line and guides (8).
- (11) Install any lights or antennae that have been removed.

NOTE

Check operation of all mast lights and repair as required.

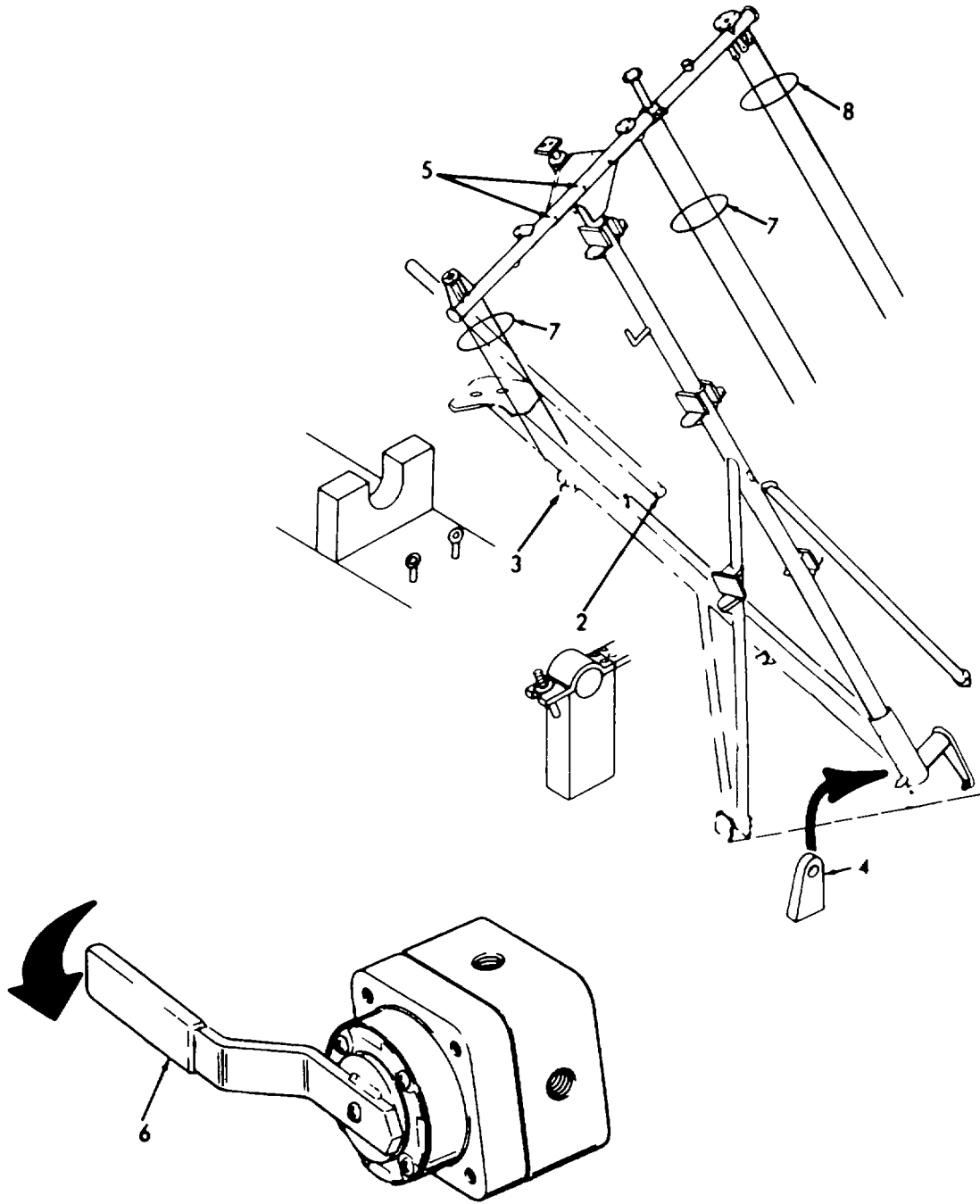
- (12) Place the directional control valve (6) in the RAISE position.

WARNING

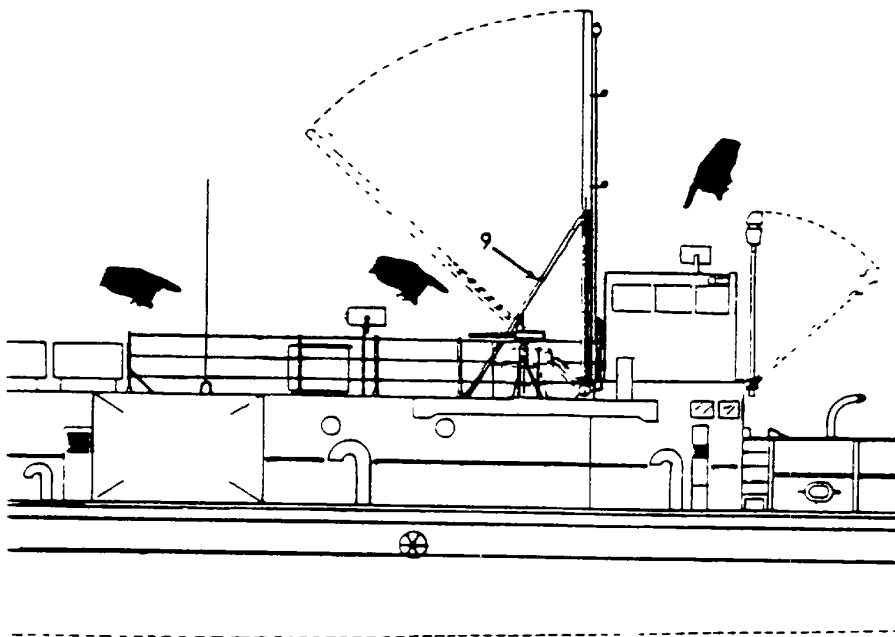
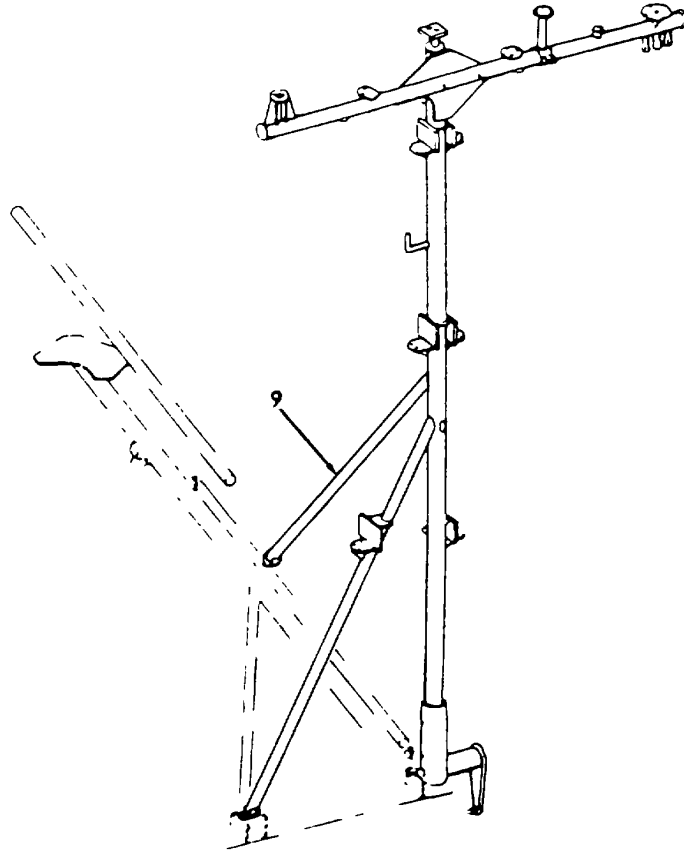
Stay clear of the mast while it is being raised.

- (13) When raised, move aft strut (9) and install to pad with bolt, washer, and nut.
- (14) Secure signal halyard lines (7).
- (15) Secure light hoist line and guides (8).
- (16) Replace stanchions, life lines as required.

2-65. MAIN MAST - RAISING (Cont).



2-65. MAIN MAST - RAISING (Cont).

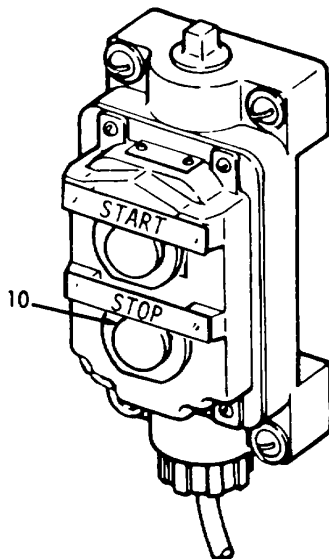


4954-058

2-65. MAIN MAST - RAISING (Cont).

c. Engine Access Room.

Press the STOP switch (10) on the centralized hydraulic remote control.

**2-66. MAIN MAST-LOWERING.**

To lower the main mast proceed as follows after the preliminary procedures have been completed.

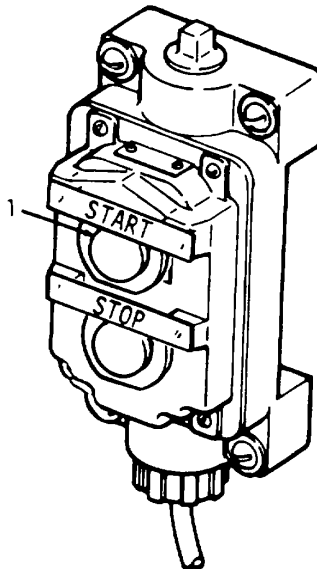
CAUTION

- Do not attempt to lower main mast before energizing the central hydraulic system.
- Check hydraulic system make sure it is not in operation and no other work is being performed anywhere on the system.

2-66. MAIN MAST-LOWERING (Cont).

- a. Engine Access Room.

Press the START switch (1) on the centralized hydraulic system.



- b. Port Side of Deckhouse Aft of Pilot House.

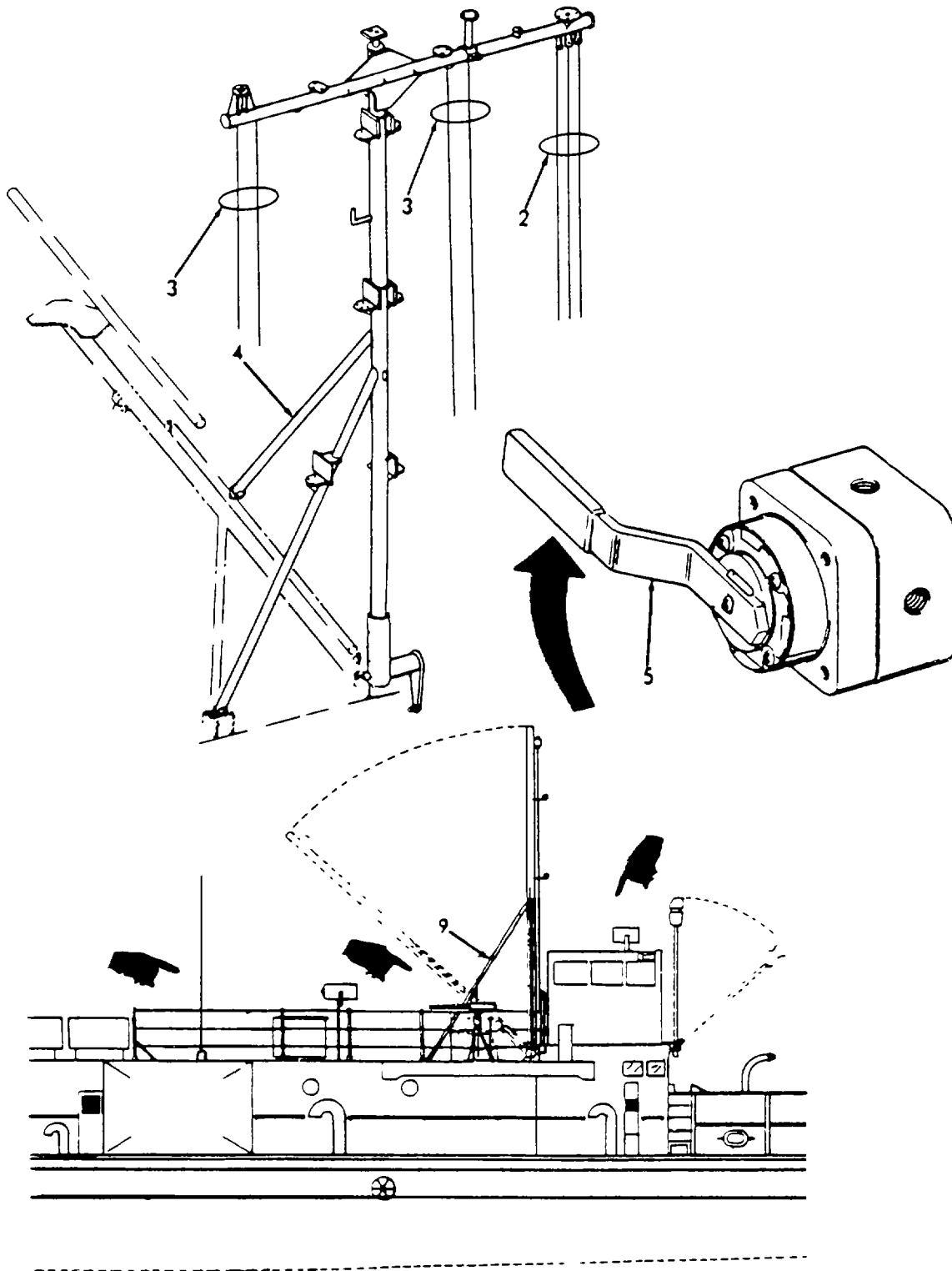
- (1) Release light hoist line and guides (2).
- (2) Release signal halyard lines (3).
- (3) Remove stanchions and life lines as required.

WARNING

Safety devices are removed, so that mast can be lowered, and the yardarm rotated.

- (4) Remove nut, washer, and bolt that secure aft strut (4) to pad.
- (5) Place the directional control valve (5) in the lower position.

2-66. MAIN MAST-LOWERING (Cont).



4951-145

2-66. MAIN MAST-LOWERING (Cont).**WARNING**

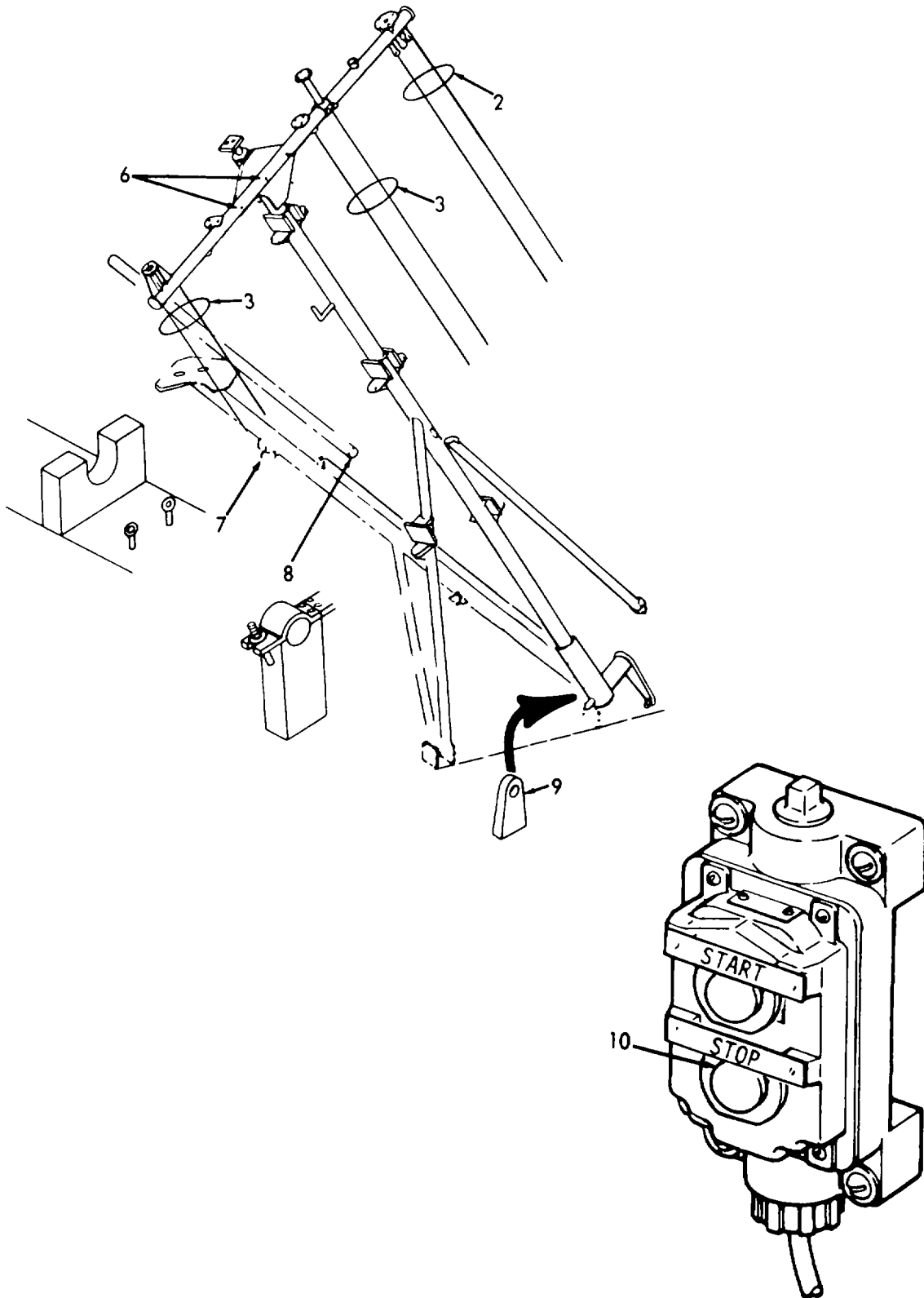
Stay clear of the mast while it is being lowered.

- (6) Lower the mast until it is almost horizontal.
- (7) Remove signal halyard lines (3).
- (8) Remove light hoist line and guides (2).
- (9) Remove the nuts, washers, and bolts that attach the yardarm to the yardarm pivot bracket (6).
- (10) Rotate the yardarm clockwise.
- (11) Place the directional control valve (5) in the lower position. Lower the mast until it is completely lowered.
- (12) Replace the bolts, washers, and nuts in the yard arm pivot bracket (6).
- (13) Install the tie down on the mast pillow block (7).
- (14) Secure yardarm to yardarm stowage bracket (8).
- (15) Secure aft strut (9) to pad.
- (16) Replace stanchions and life lines as required.

c. Engine Access Room.

Press the STOP switch (10) on the centralized hydraulic system.

2-66. MAIN MAST-LOWERING (Cont).



2-67. ANCHOR "A" FRAME.

a. The anchor "A" frame is powered by the centralized hydraulic system. Prior to operation the preliminary adjustments in paragraph 2-64 must be performed.

b. The anchor "A" frame is one of many components required for payout and inhaul of the anchor. Refer to paragraph 2-46 for operator instructions.

2-68. STERN GATE LOWERING.

The stern gate is a hydraulically operated hinged gate which can be lowered to form a causeway between vessels for moving cargo. To lower the stern gate proceed as follows:

NOTE

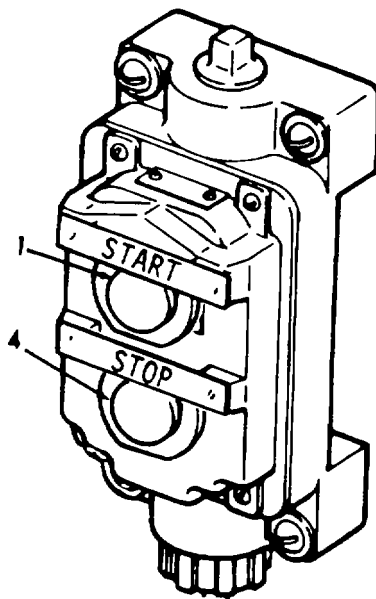
Prior to operation the preliminary procedures in paragraph 2-64 must be performed.

CAUTION

- Do not attempt to lower the stern gate before energizing the central hydraulic system.
- Check hydraulic system, make sure it is not in operation and no other work is being performed anywhere on the system.

a. Engine Access Room.

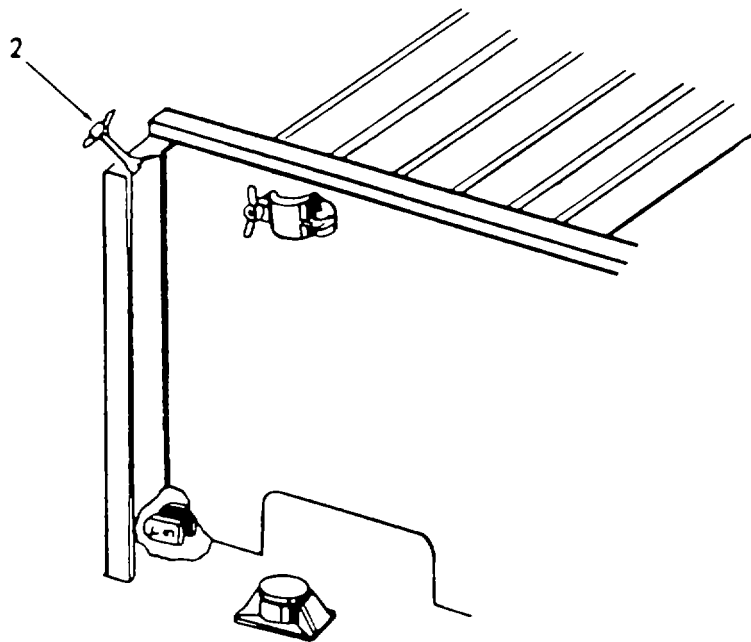
Press the START switch (1) on the centralized hydraulic system.



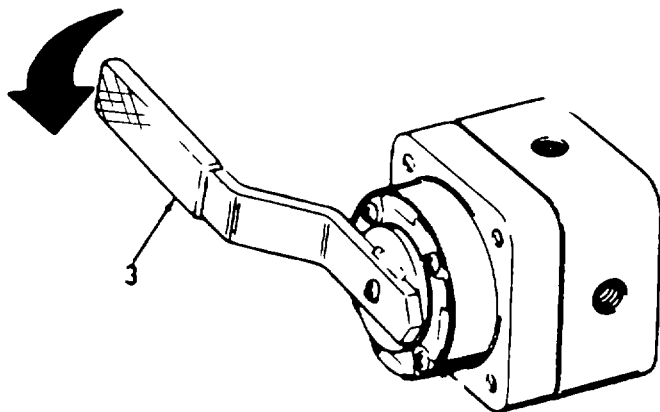
2-68. STERN GATE LOWERING (Cont).

b. Starboard Side at Stern.

(1) Release and swing out dog bolts (2) on port and starboard sides of the stern gate.



(2) Place directional control valve (3) in lower position.



c. Bulwark, Starboard Side
Press the STOP switch (4).



2-69. STERN GATE - RAISING.

To raise the stern gate proceed as follows.

NOTE

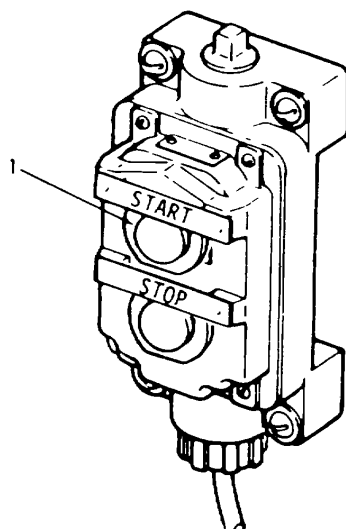
Prior to operation the preliminary adjustments in paragraph 2-64 must be performed.

CAUTION

- Do not attempt to raise the stern gate before energizing the central hydraulic system.
- Check hydraulic system, make sure it is not in operation and no other work is being performed anywhere on the system.

a. Engine Access Room.

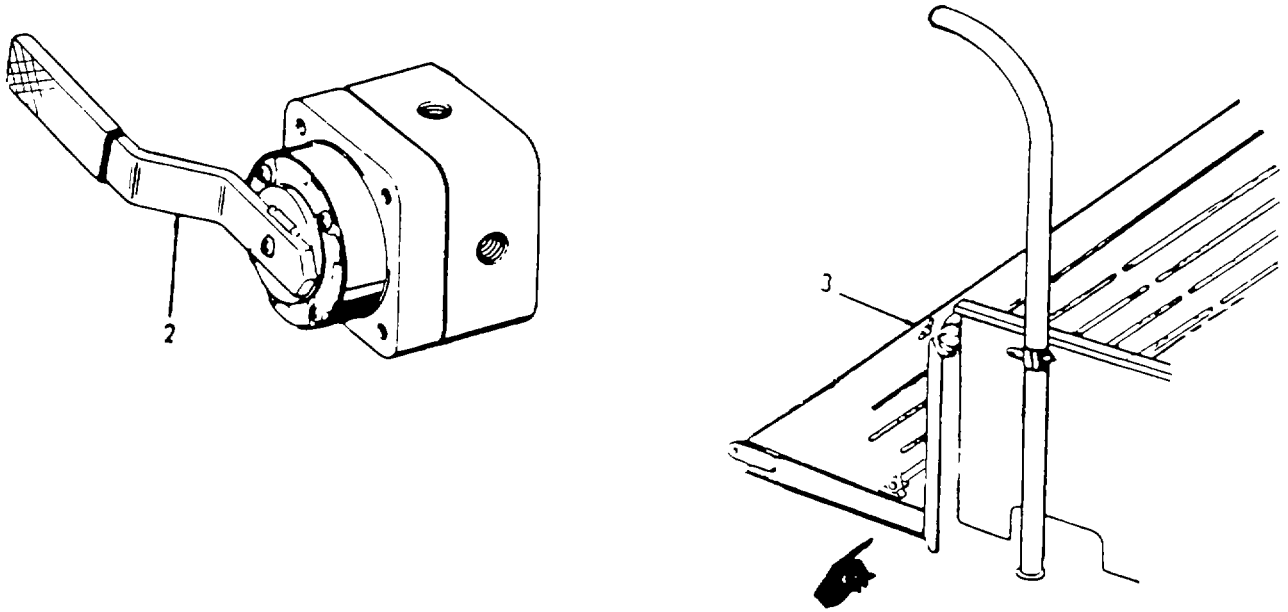
Press the START switch (1) on the centralized hydraulic system.

**b. Starboard Side at Stern.**

(1) Place directional control valve (2) in the raise position.

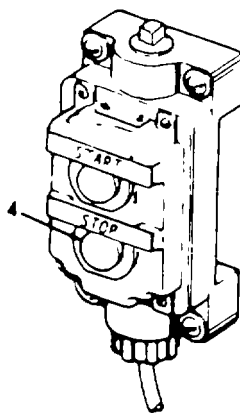
(2) Secure the stern gate with dog bolts (3), on both the starboard and port sides.

2-69. STERN GATE - RAISING (Cont).



4951-198

- C. Bulwark, Starboard Side
Press the STOP switch (4).



2-70. STANDBY LUBE OIL SYSTEM.

- a. The standby lube oil system consists of a pump. The pump circulates lubricating oil through the marine gear on the propulsion engines. The system is to be operated when an engine(s) is not operating and the craft is moving. This can happen when the craft is being towed or operating on one engine.
- b. The lube oil system is not required if the propeller shaft is locked. This prevents the propeller from windmilling.
- c. The following is an index to the procedures:

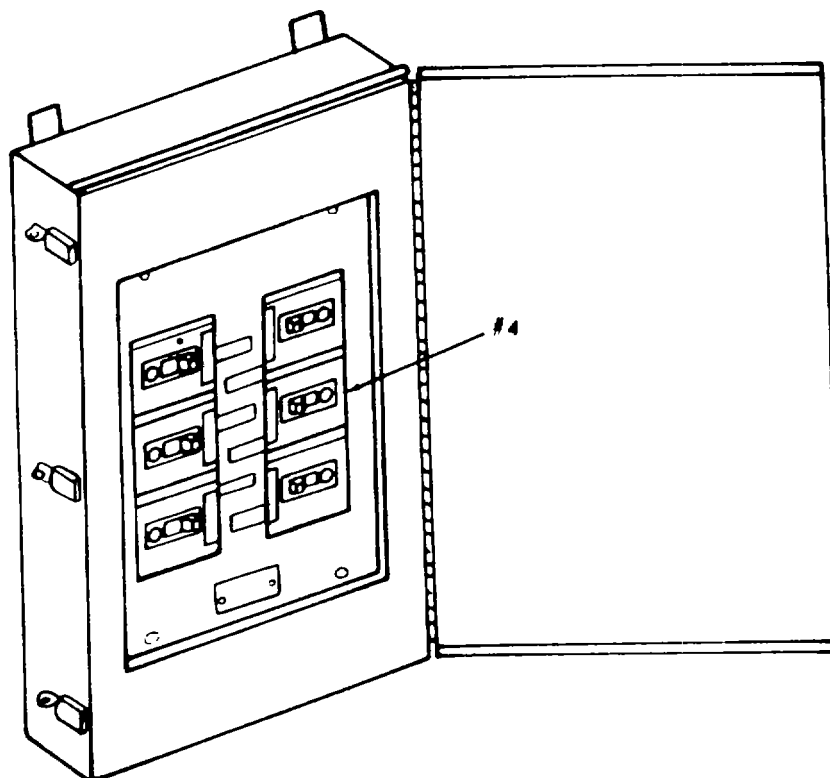
<u>Description</u>	<u>Paragraph</u>
Standby Lube Oil System - Starboard Engine	2-71
Standby Lube Oil System - Port Engine	2-72

2-71 STANDBY LUBE OIL SYSTEM - STARBOARD ENGINE.

The turn-on/turn-off procedure for the starboard engine standby lube oil system is as follows:

- a. Starting System:
 - (1) Forward Engine Room.

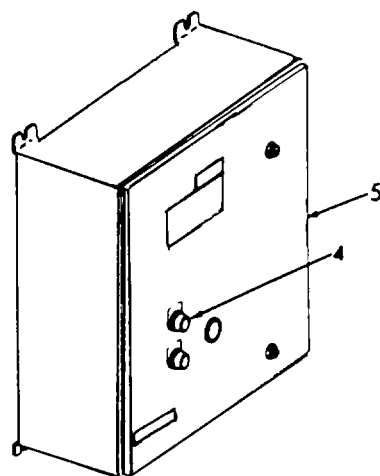
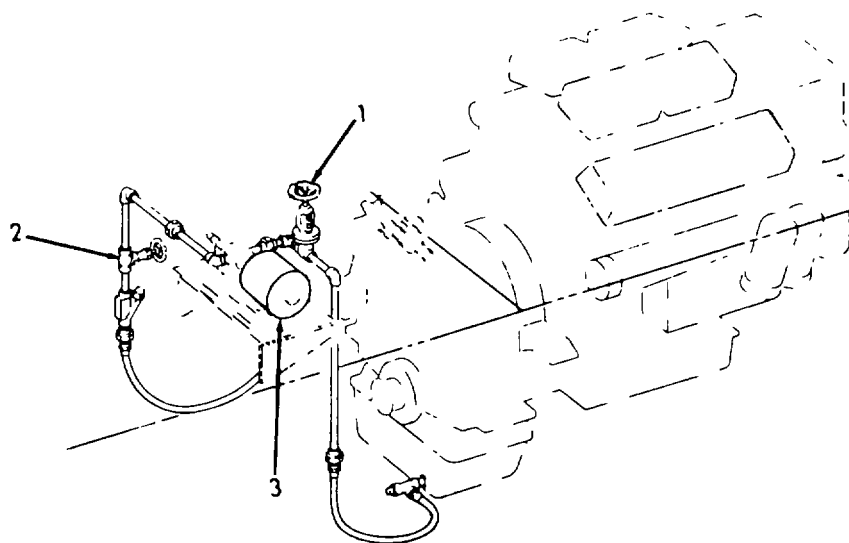
Place circuit breaker #4, on power distribution panel P408A, in the ON position.



2-71. STANDBY LUBE OIL SYSTEM - STARBOARD ENGINE (Cont).

(2) Aft Engine Room.

- (a) Open suction valve (1) by rotating valve counter-clockwise.
- (b) Open discharge valve (2) by rotating valve counter-clockwise.
- (c) Start pump motor (3) by pressing START switch (4) on controller (5).

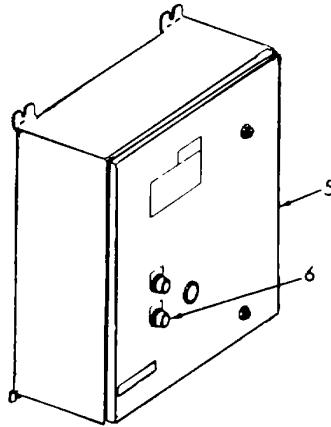


2-71. STANDBY LUBE OIL SYSTEM - STARBOARD ENGINE (Cont).

b. Stopping System:

(1) Aft Engine Room.

- (a) Press STOP switch (6) on controller (5).
- (b) Close suction valve (1) by rotating valve clockwise.
- (c) Close discharge valve (2) by rotating valve clockwise.



2-72. STANDBY LUBE OIL SYSTEM - PORT ENGINE

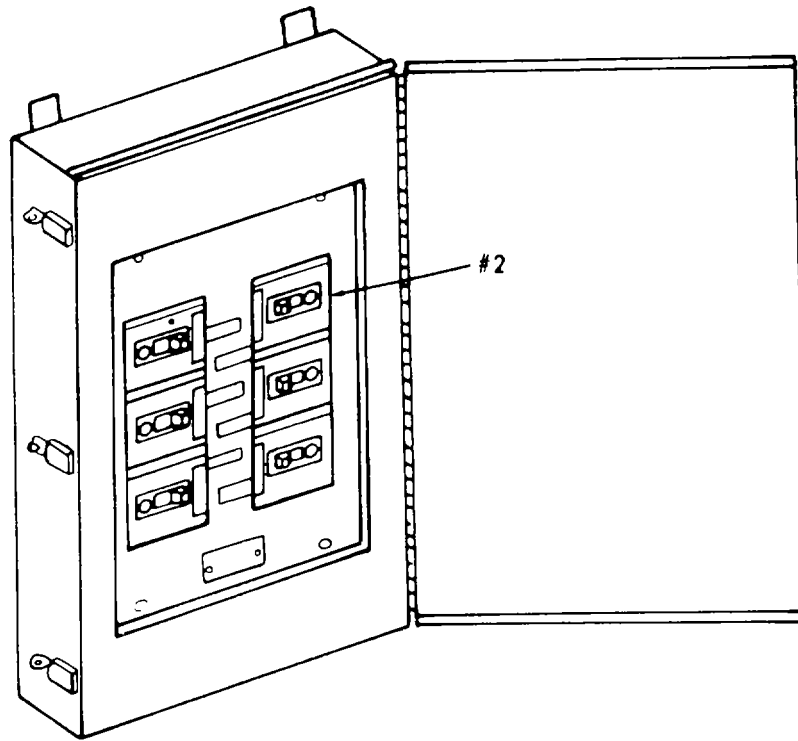
The turn-on/turn-off procedure for the port engine standby lube oil system is as follows

a. Starting System

(1) Forward Engine Room

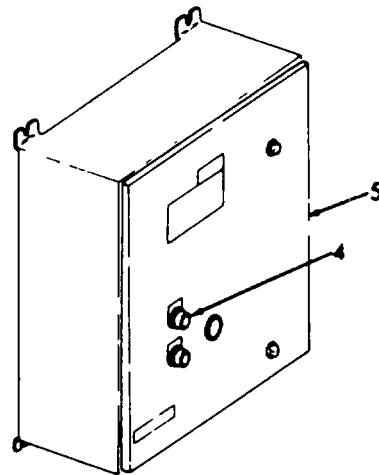
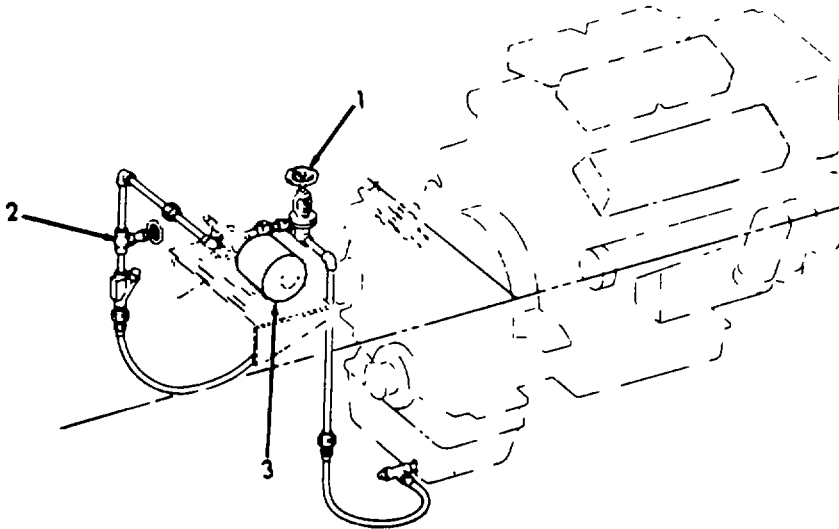
- (1) Place circuit breaker #2, on power distribution panel P408A, in the ON position.

2-72. STANDBY LUBE OIL SYSTEM - PORT ENGINE (Cont).



2-72. STANDBY LUBE OIL SYSTEM - PORT ENGINE (Cont).

- (2) Open suction valve (1) by rotating valve counterclockwise.
- (3) Open discharge valve (2) by rotating valve counterclockwise.
- (4) Start pump motor (3) by pressing START switch (4) on controller (5).

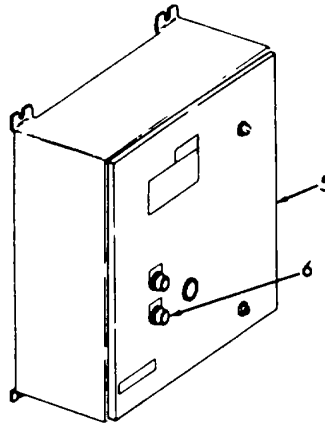


2-72. STANDBY LUBE OIL SYSTEM - PORT ENGINE (Cont).

b. Stopping System

(1) Forward Engine Room

- (a) Press STOP switch (6) on controller (5).
- (b) Close suction valve (1) by rotating valve clockwise.
- (c) Close discharge valve (2) by rotating valve clockwise.

**2-73. FRESH WATER SYSTEM.**

a. The fresh water system consists of a pressure pump, pressure tank, and a hot water tank. The pressure pump will operate only when there is a need for water.

b. The Fresh Water System supplies cold water to the following:

- sinks (lavatory and galley)
- water fountain
- shower
- washer
- shaft seal water tanks (propulsion engines)
- hose connections (water for expansion tanks or engines, and keel cooling)

c. The Fresh Water System supplies hot water to the following:

- sinks (lavatory and galley)
- shower
- washer

2-73. FRESH WATER SYSTEM (Cont).

d. The procedure consists of:

- filling the system
- placing system in operation (automatically)
- operating the system on dockside water
- shutting off the system

e. The system overview Figure FO-37 shows the relationship of the various components. In addition the lettered points are to clarify the various figures in the text.

f. To Fill System with Water:

(1) Port Side (Frame 44).

(a) Attach hose (1) located in hose cabinet (2) on the side of the bulkhead to fill valve (3).

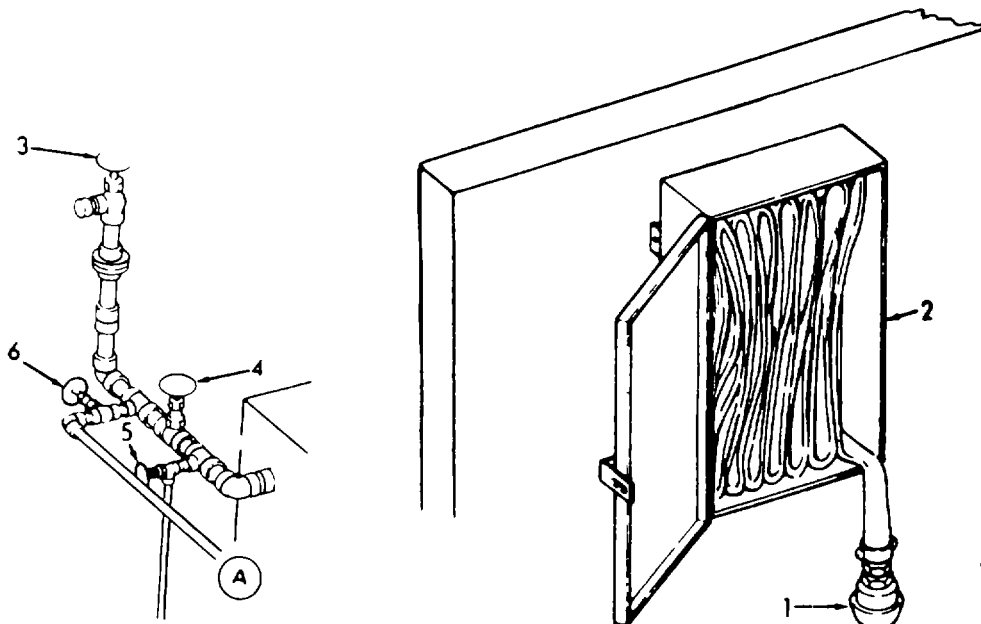
(b) Open fill valve (3) by rotating valve counter-clockwise.

(2) Tank and Auxiliary Machinery Compartment.

(a) Open shut off valve (4) by rotating valve counter-clockwise.

(b) Check that multi relief valve (5) is closed (full clock-wise).

(c) Check that dockside water valve (6) is closed (full clock-wise).



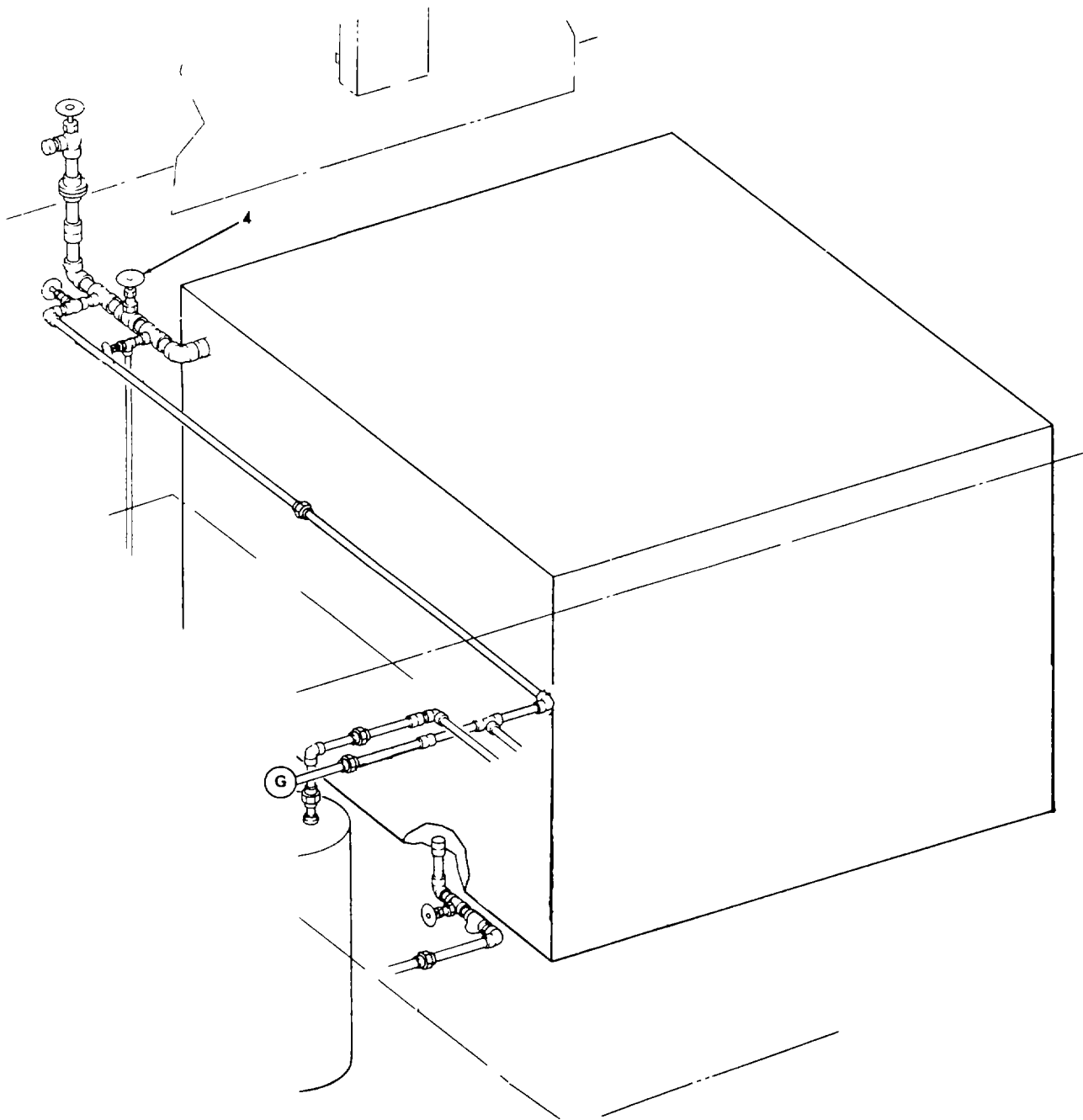
2-73. FRESH WATER SYSTEM (Cont).

- (d) Fill tank with water. At 95% capacity the tank holds 3, 958 gallons (14981 liters) of water.

NOTE

Water level can be determined by the fresh water indicator on the tank level indicator in the engine access room.

- (e) Close shut off valve (4) by rotating valve clockwise when system is filled.



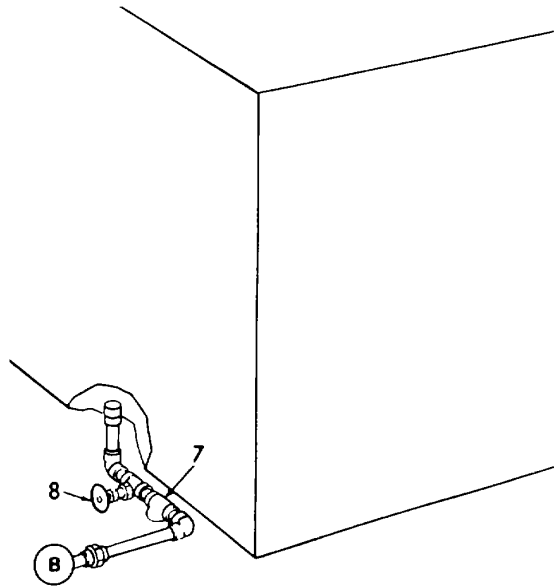
2-73. FRESH WATER SYSTEM (Cont).

g. To Start Up System:

(1) Tank and Machinery Compartment.

(a) Clean suction strainer basket (7).

(b) Open supply valve (8) at the bottom of the tank by turning valve counter-clockwise. This supplies water to motor at point B.



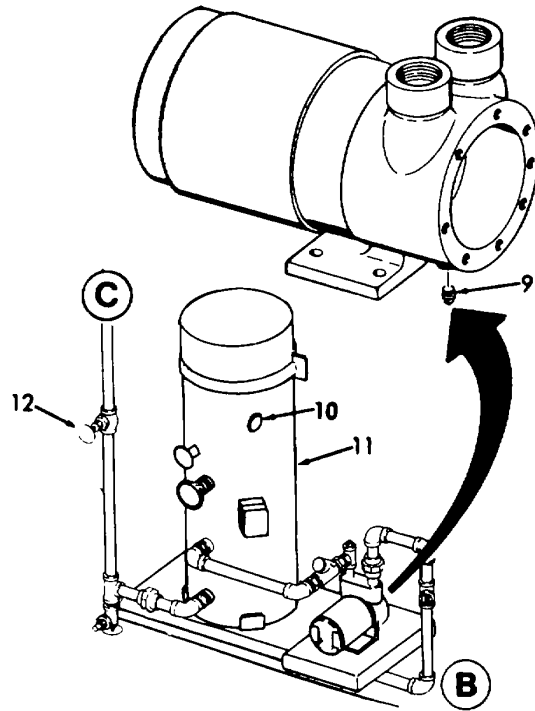
(2) Forward Engine Room.

(a) Remove plug (9) on bottom of pump motor to bleed air from the water lines.

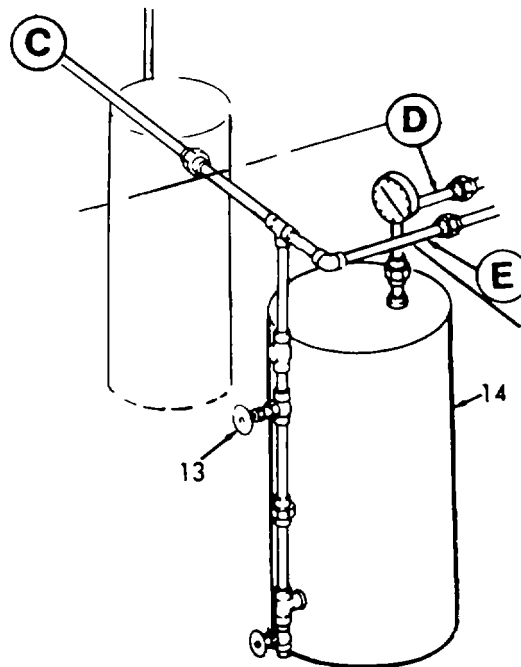
(b) Connect a hand air charging pump to sniffer valve (10) to initially pressurize the fresh water tank (11) with air.

(c) Open suction valve (12).

2-73. FRESH WATER SYSTEM (Cont)



(d) Open isolation valve (13) to supply water to hot water heater (14).



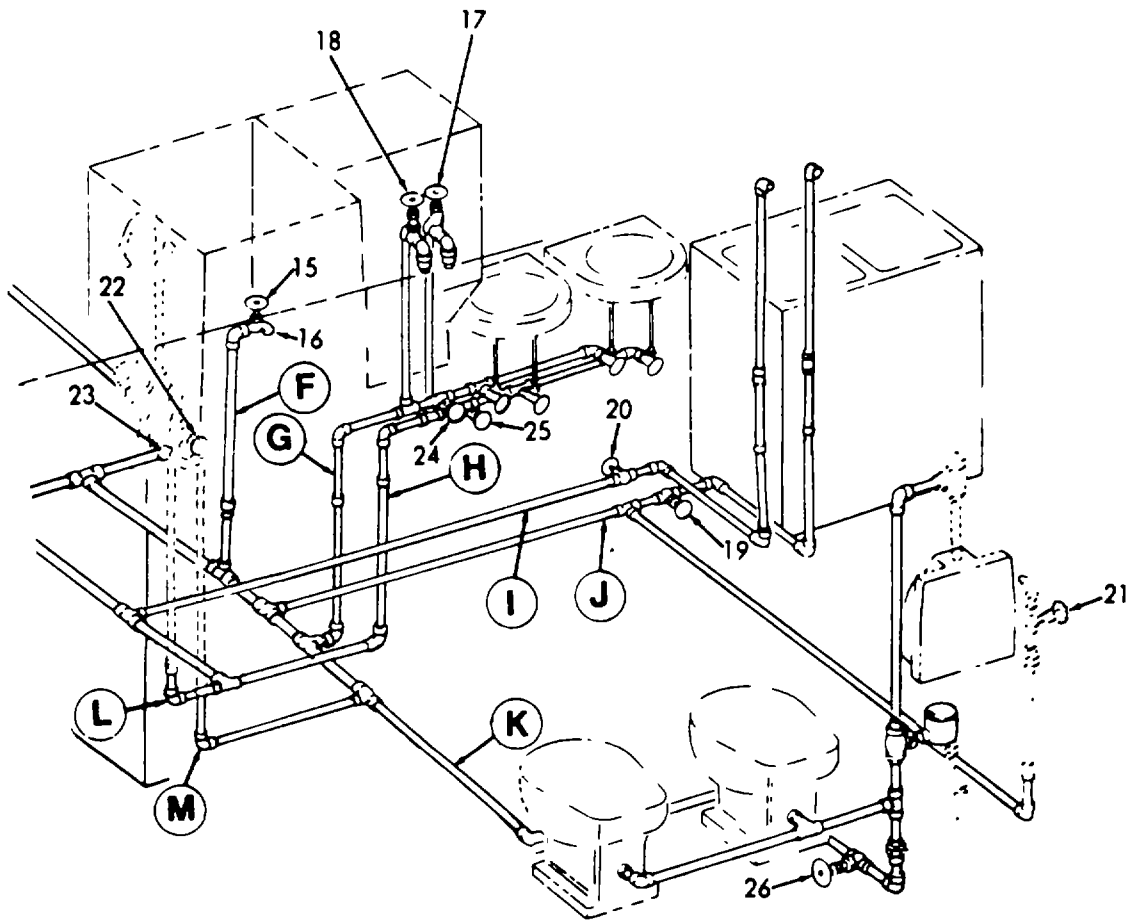
2-73. FRESH WATER SYSTEM (Cont).

- (3) Wash Room, Water Closet and Shower.
 - (a) Close supply valve (15) by rotating valve clockwise on the cold water hose connection (16).
 - (b) For washer/dryer cold water - rotate supply valve (17) counter-clockwise.
 - (c) For washer/dryer hot water - rotate supply valve (18) counter-clockwise.
 - (d) For galley sink cold water - rotate supply valve (19) counter-clockwise.
 - (e) For galley sink hot water - rotate supply valve (20) counter-clockwise.
 - (f) Drinking fountain water - rotate supply valve (21) counter-clockwise.
 - (g) For shower cold water - rotate supply valve (22) counter-clockwise.
 - (h) For shower hot water - rotate supply valve (23) counter-clockwise.
 - (i) For lavatory sinks cold water - rotate supply valve (24) counter-clockwise.
 - (j) For lavatory sinks hot water - rotate supply valve (25) counter-clockwise.
 - (k) For water closets and urinal - rotate supply valve (26) counter-clockwise.

NOTE

Check that all spigots and hose connections are closed. To operate the system automatically.

2-73. FRESH WATER SYSTEM (Cont).

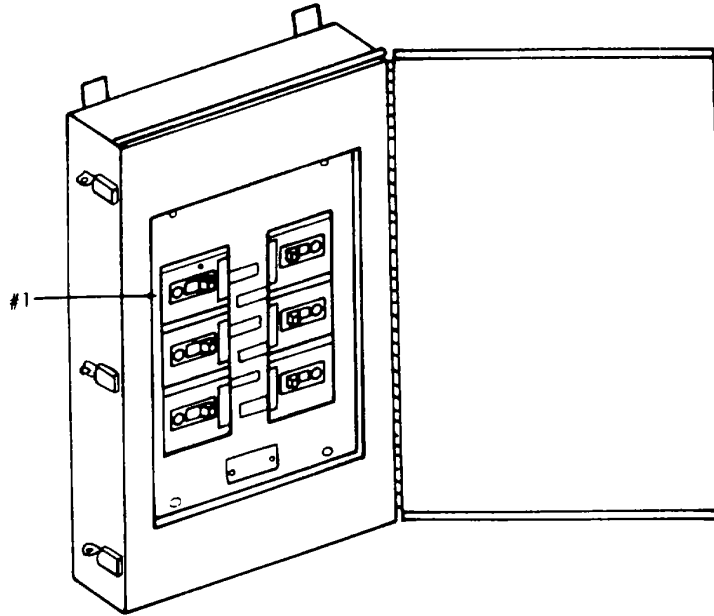


2-73. FRESH WATER SYSTEM (Cont).

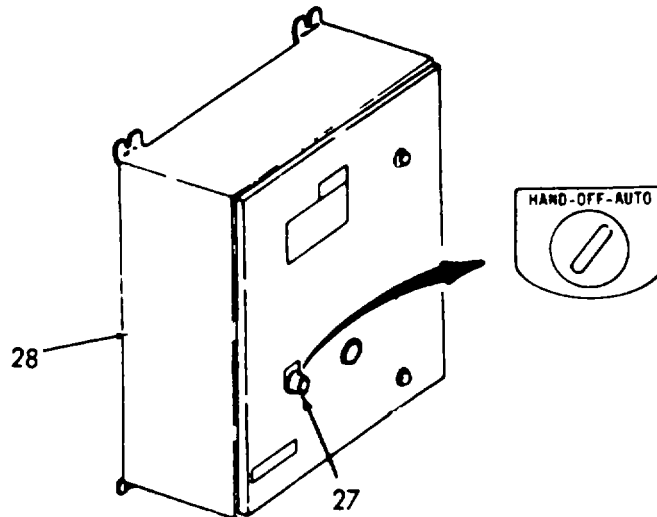
(4) Forward Engine Room.

(a) To start the pressure pump.

1 Place circuit breaker #1 on power distribution panel (P-408A) in the ON position.



2 Place switch (27) on the fresh water pump controller (28) in the AUTO position.



2-73. FRESH WATER SYSTEM (Cont).

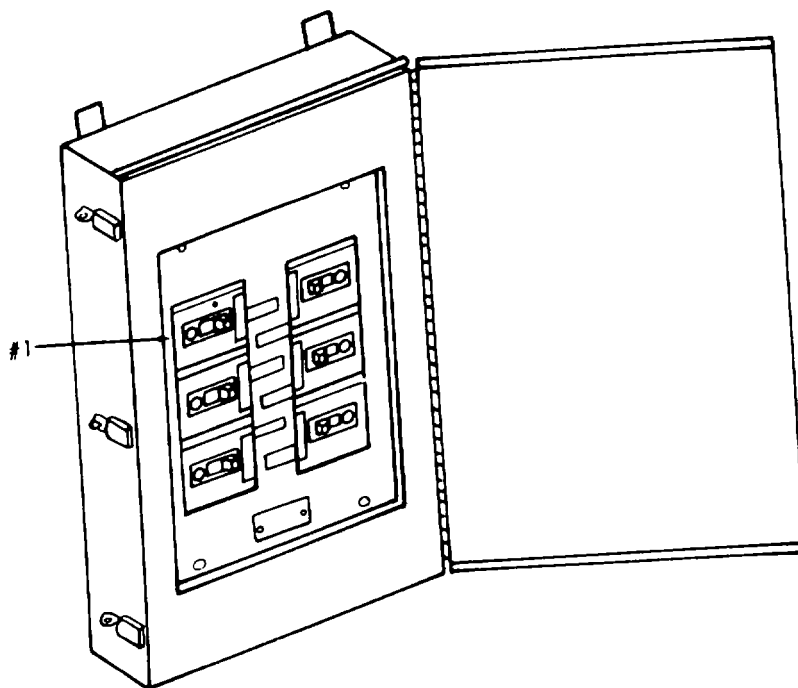
- 3 The pump will run.
- 4 Check the system for open spigots, hose connections and leaks.
- 5 Both the cold water and hot water tanks will fill.
- 6 Open each spigot and hose connection. Let any trapped air escape. When water runs shut the spigot or hose connection.
- 7 Observe the pump. An automatic control will shut the pump off.

NOTE

The pump should run only when a tank requires filling or a spigot or hose connection is open. If the pump does not shut off, check the system.

(b) To Start the Hot Water Heater:

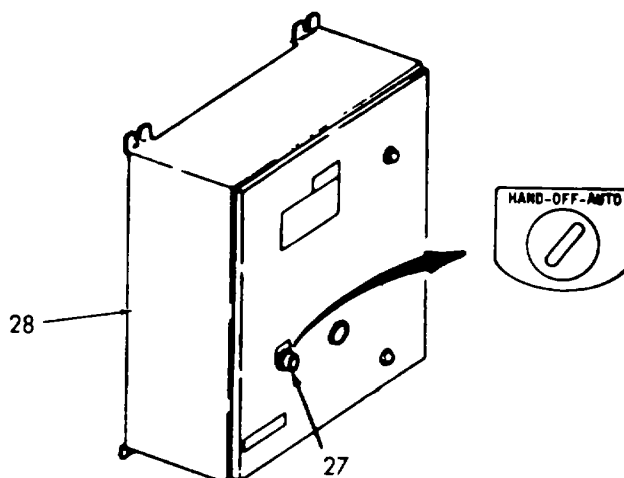
Place circuit breaker #1 on power distribution panel (P408) in the ON position.



2-73. FRESH WATER SYSTEM (Cont).**(5) To Operate the System on Dockside Water:**

The system can be operated on dockside water while in port. The procedure is the same as the previous procedure with the following exceptions:

- (a) Place switch (27) on controller (28) in the OFF position.

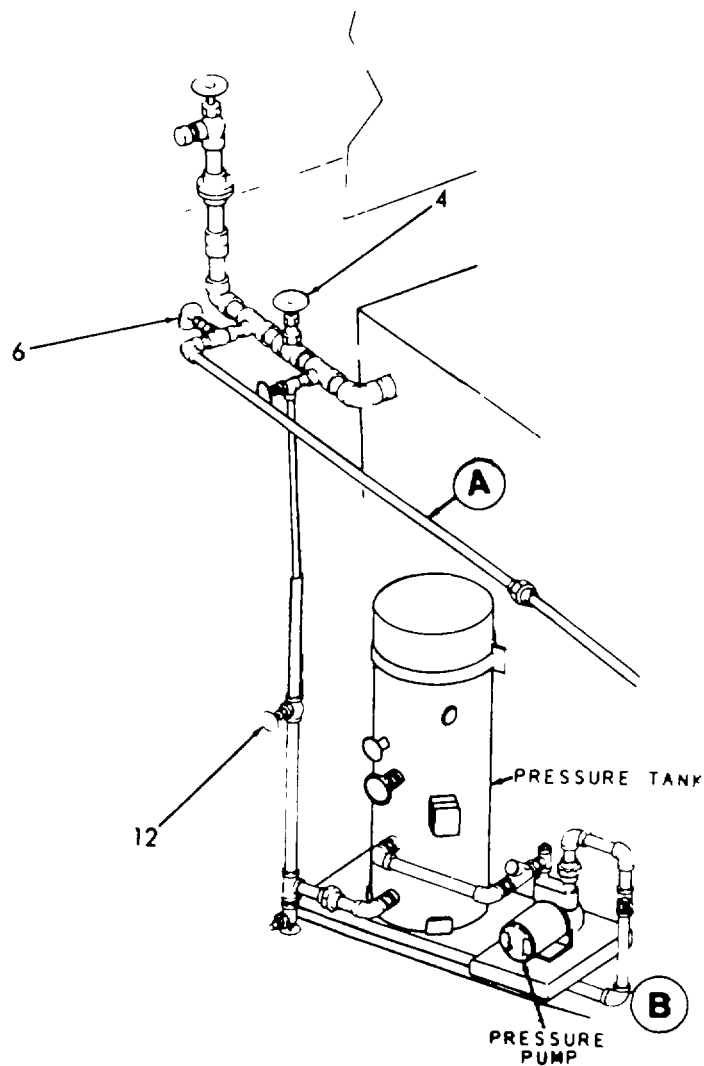


- (b) Close shut off valve (4) by rotating valve clockwise.
- (c) Close pressure tank shut off valve (12) by rotating the valve clockwise.
- (d) Open dockside water valve (6) by rotating valve counter-clockwise.



Check the dockside water pressure. Too much pressure could break the fill hose, or blow a fitting, gasket or washer.

2-73. FRESH WATER SYSTEM (Cont).



(6) To Shut the System Off:

- (a) Place circuit breaker #1 on power distribution panel P408 in the OFF position.
- (b) Place switch (27) on the fresh water pump controller (28) in the OFF position.
- (c) Place circuit breaker #1 on power distribution panel P408A in the OFF position.
- (d) Close supply valves as required.

2-74. TANK LEVEL INDICATING SYSTEM.

a. The landing craft has two tank level indicating systems as follows:

Engine Access Room.

- Port Diesel Fuel Tank.
- Starboard Diesel Fuel Tank.
- Fresh Water Tank.
- Aft Engine Room.

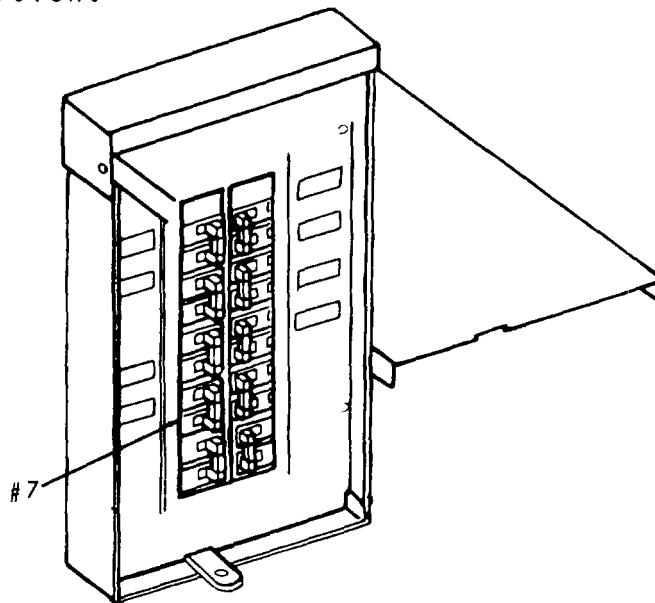
Aft Sea Water Ballast Tank.

- Port Sea Water Ballast Tank.
- Starboard Sea Water Ballast Tank.
- Forward Sea Water Ballast Tank.

b. To operate either system, proceed as follows:

(1) Forward Engine Room.

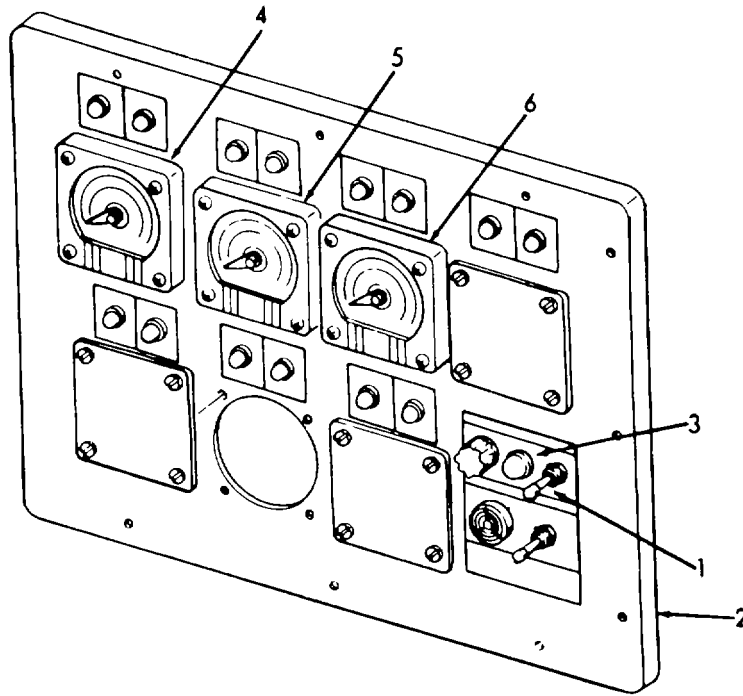
Place circuit breaker #7 on power distribution panel (L-107) in the ON position.



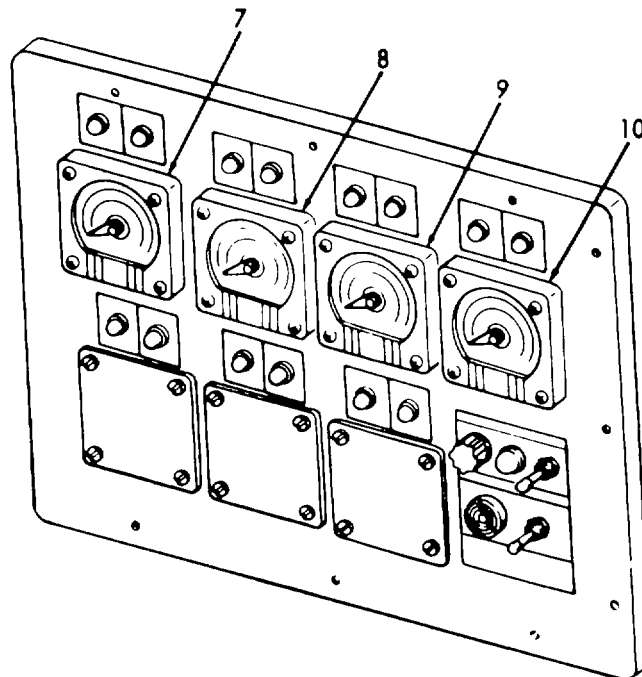
(2) Engine Access Room or Aft Engine Room.

- (a) Place ON-OFF switch (1) on receiver panel (2) to the ON position.
- (b) The power lamp (3) on the receiver panel (2) will light. This indicates that the receiver panel is energized.
- (c) The fluid level meters in the engine access room indicate the fluid level in the port diesel tank (4), the starboard diesel tank (5), and the fresh water tank (6).

2-74. TANK LEVEL INDICATING SYSTEM (Cont).

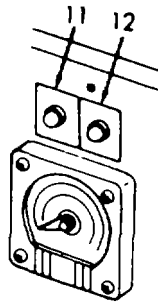


(d) The fluid level meters in the aft engine room indicate the fluid level in the aft sea water ballast tank (7), the port sea water ballast tank (8), the starboard sea water ballast tank (9) and the forward sea water ballast tank (10).

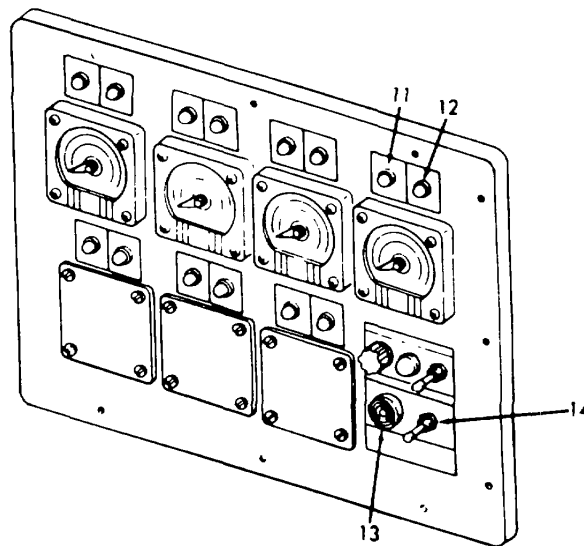


2-74. TANK LEVEL INDICATING SYSTEM (Cont).

- (e) Lamp (11) above the meters will light if the fluid level in the tank is too high.
- (f) Lamp (12) above the meter will light if the fluid level in the tank is too low.



- (g) An audible alarm (13) will sound if the alarm silence switch (14) is placed in the ON position and either lamp (11 or 12) is lit.



2-75. FIRE, BILGE, AND BALLAST SYSTEM.

- a. The fire, bilge, and ballast system is used to supply sea water for fighting fires, filling or emptying the ballast tanks, to wet down the weather decks and super-structure, and for bilge draining. The systems are interconnected with the main components a fire pump and a bilge pump.

2-75. FIRE, BILGE, AND BALLAST SYSTEM (Cont).

- b. The following is an index to the systems.

<u>DESCRIPTION</u>	<u>PARAGRAPH</u>
Fire System	2-76
Bilge System	2-82
Ballast System	2-91

- c. The oil/water separation system (para 2-96) must be used for normal bilge draining.



Federal law prohibits the dumping of oily substances into restricted waters.

2-76. FIRE SYSTEM.

- a. The fire system on the landing craft is used for the following

<u>DESCRIPTION</u>	<u>PARAGRAPH</u>
Firemains and Fire Plugs	2-77
Magazine Sprinkler	2-80
Peak Ballast Tank Filling	2-8]
Washdown countermeasures sprinkling system	2-81-1

- b. The fire fighting system can be operated from either the aft engine room or the engine access room.

- c. The fire system consists of the following:

- Fire pump (250 gallons per minute).
- Four fire stations with hoses and nozzles.
- Flow control valves.
- Magazine sprinkler
- Magazine alarm in the pilot house.
- Washdown system of 6 fixed spray and 2 portable nozzles.

- d. All valves in the fire fighting system are painted red for ease of identification.

- e. These paragraphs do not include procedures for the following

- Fixed Halon System
- Portable Halon Extinguishers
- Portable Dry Chemical Extinguishers
- Portable Fire Pump and Liquid Foam

2-76. FIRE SYSTEM (Cont).

WARNING

Do not use water on CLASS C (electrical) fires. Use either dry chemical, Halon, or liquid foam.

- f. The shutdown procedures for the fire pump is as follows:

DESCRIPTION

PARAGRAPH

Fire Pump Shutdown
Draining the Fire Main System

2-78
2-79

2-77. FIREMAINS AND FIRE PLUGS.

- a. Proceed as follows to fight fires on the landing craft.

WARNING

Do not use water on CLASS C (electrical fires). Use either Halon, or dry chemical extinguishers, or liquid foam.

- b. To operate the fire pump for fire fighting refer to figure FO-38.

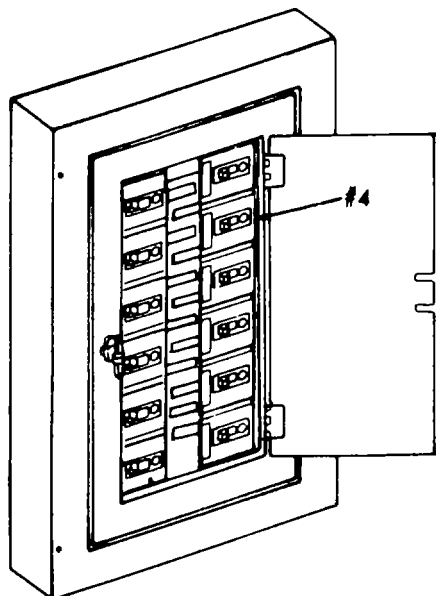
- (1) Aft Engine Room.

- (a) Rotate vent valve (1) in sea chest counter-clockwise.
- (b) Place flow control valve (2) lever in the off position.
- (c) Rotate valve (3) lever counter-clockwise.
- (d) Place flow control valve (4) lever in the off position.
- (e) Rotate suction valve (5) clockwise.
- (f) Place check valve (6) lever in the off position.
- (g) Rotate shutoff valve (7) counter-clockwise.
- (h) Rotate shutoff valve (8) counter-clockwise.
- (i) Rotate shutoff valve (9) counter-clockwise.
- (j) Rotate shutoff valve (10) counter-clockwise.
- (k) Any air trapped in the pump should bleed off.

2-77. FIREMAINS AND FIRE PLUGS (Cont).

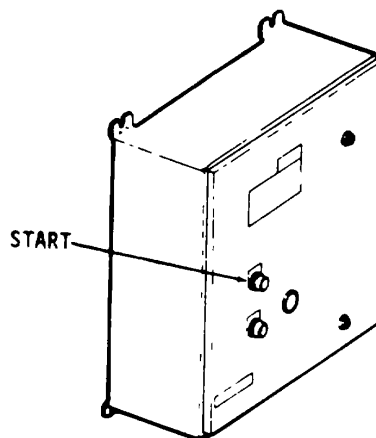
(2) Engine Access Room.

Place circuit breaker #4 on power distribution panel (P-400) in the ON position.



(3) Aft Engine Room.

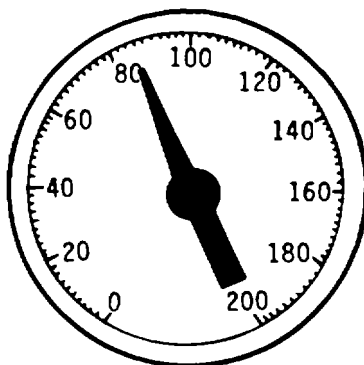
(a) Press the START switch on the fire pump controller. The pump will run.



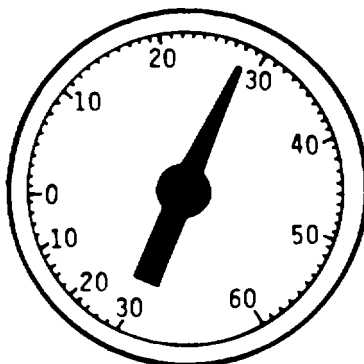
(b) When the fire pump is at operating speed, place check valve (6, Figure FO-38) lever in the on position.

2-77. FIREMAINS AND FIRE PLUGS (Cont).

- (c) The red gauge (11) should read a minimum of 85 psi (59.8 kg/cm).



- (d) Vacuum gauge (12) should read 28 Hg. (inches of vacuum).

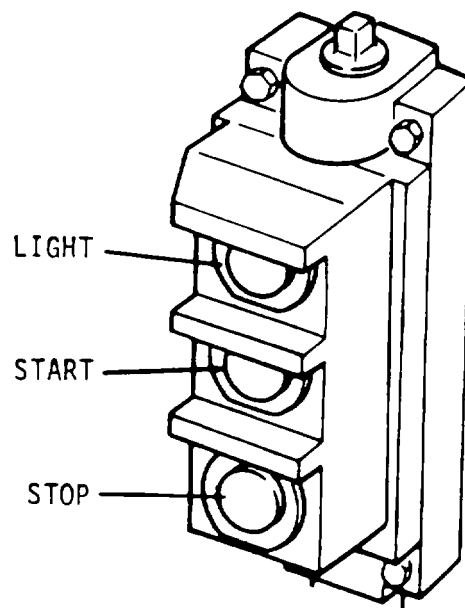


- (4) Engine Access Room.

For remote operation of the fire pump press the START switch. The light will go on.

NOTE

Initial starting of the fire pump must be done in the aft engine room.

2-77. FIREMAINS AND FIRE PLUGS (Cont).

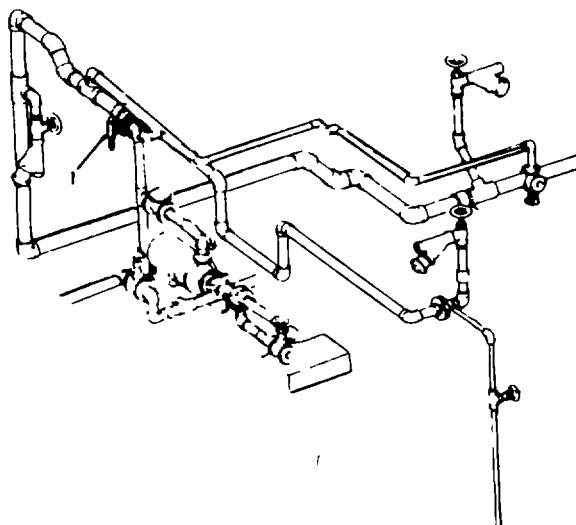
- (5) Aft Engine Room.
Check that flow control valve (15, Figure FO-38) is in the on position.
- (6) Air Conditioning Room.
 - (a) Check that flow control valve (13, Figure FO-38) is in the on position.
 - (b) The fire pump is supplying water to the fire plugs, they are located as follows:
 - Vehicle Deck Forward frame 21.
 - Forward Engine Room frame 56.
 - Aft Engine Room frame 62 1/2.
 - Vehicle Deck Aft frame 63.

2-78. FIRE PUMP - SHUTDOWN.

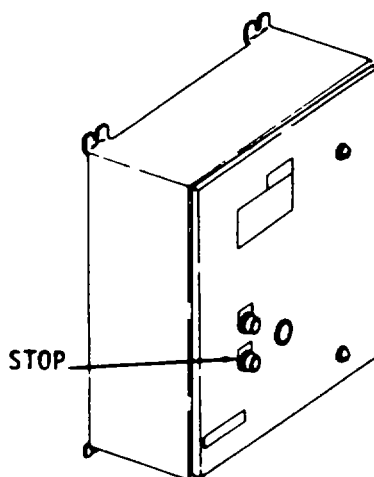
To stop the fire pump refer to Figure FO-33 and proceed as follows:

a. Aft Engine Room.

- (1) Place check valve (1) lever in the off position.



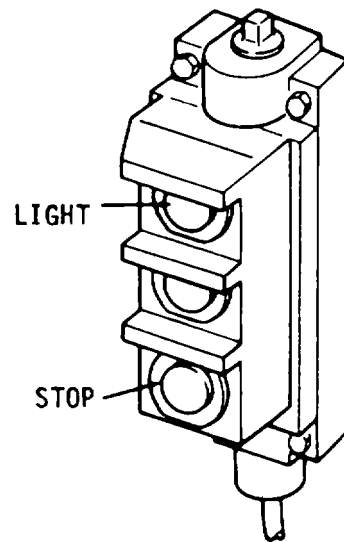
- (2) Press the STOP switch on the fire pump controller.



b. Engine Access Room (Remote).

- (1) Press the STOP switch.
- (2) The light will go out.

2-78. FIRE PUMP - SHUTDOWN (Cont).



c. Fire Plug (s).

- (1) Clean wye strainers as follows:
 - (a) Remove pipe plug (2) to drain strainer.
 - (b) Remove cover (3) and gasket (4).

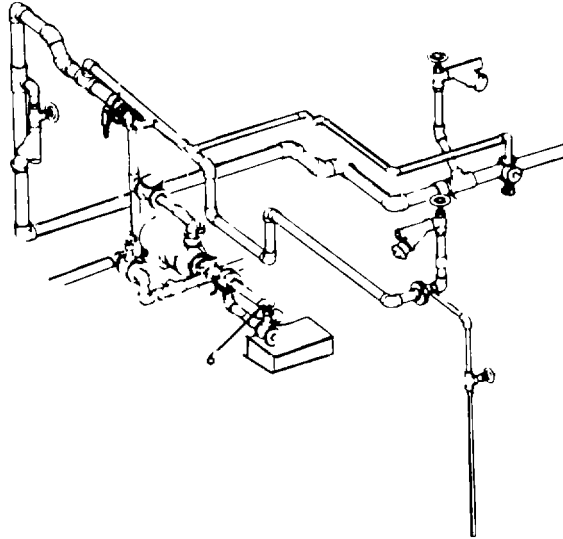
WARNING

Use eye protection when using compressed air.

- (c) Remove screen (5), rinse with clean water and blow dry with compressed air.
- (d) Replace screen (5), gasket (4), cover (3), and pipe plug (2).

2-78. FIRE PUMP - SHUTDOWN (Cont).

- d. Aft Engine Room.
(1) Check valve (6) lever in full clockwise.



- (2) Clean the simplex strainer as follows:

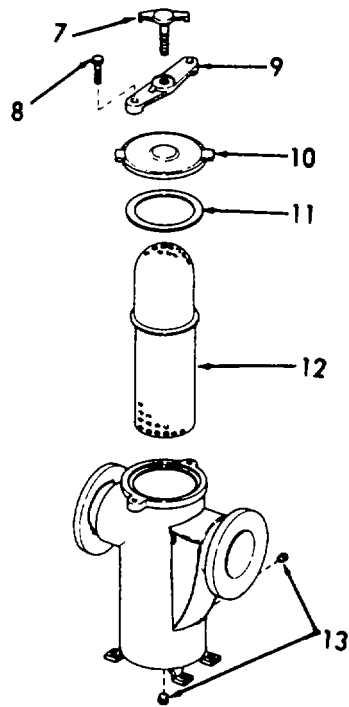
- (a) Loosen yoke screw (7).
(b) Remove bolts (8), yoke (9), cover (10), and gasket (11).

WARNING

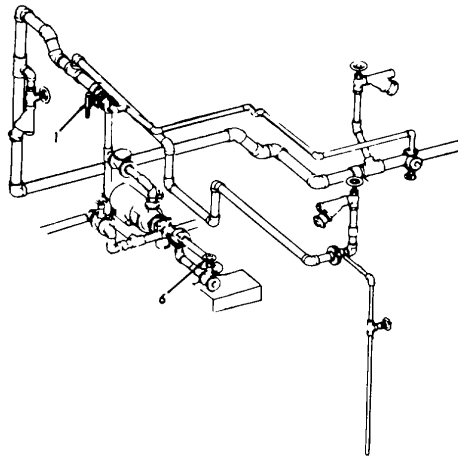
Use eye protection when using compressed air.

- (c) Remove strainer (12), clean with clean water and dry with compressed air.
(d) The strainer (12) can be drained by removing pipe plugs (13).
(e) Replace pipe plugs (13), strainer (12), gasket (11), cover (10), yoke (9) and bolts (8).
(f) Tighten yoke screw (7).

2-78. FIRE PUMP - SHUTDOWN (Cont).



- (3) Rotate valve (6) lever counter-clockwise.
- (4) Place check valve (1) lever in the on position.
- (5) The fire pump is now available for fire fighting.



2-79. DRAINING THE FIREMAIN SYSTEM.

a. The firemain system must be drained after use in freezing temperatures.

b. Refer to figure FO-39 and open drain valves as follows:

(1) Reefer Room (2-23-0-A).

Rotate valve (1) counter-clockwise.

(2) Aft Engine Room (2-56-0-E)

(a) Rotate valve (2) counter-clockwise.

(b) After draining is complete, rotate valves (1 and 2) clock-wise.

2-80. MAGAZINE SPRINKLER.

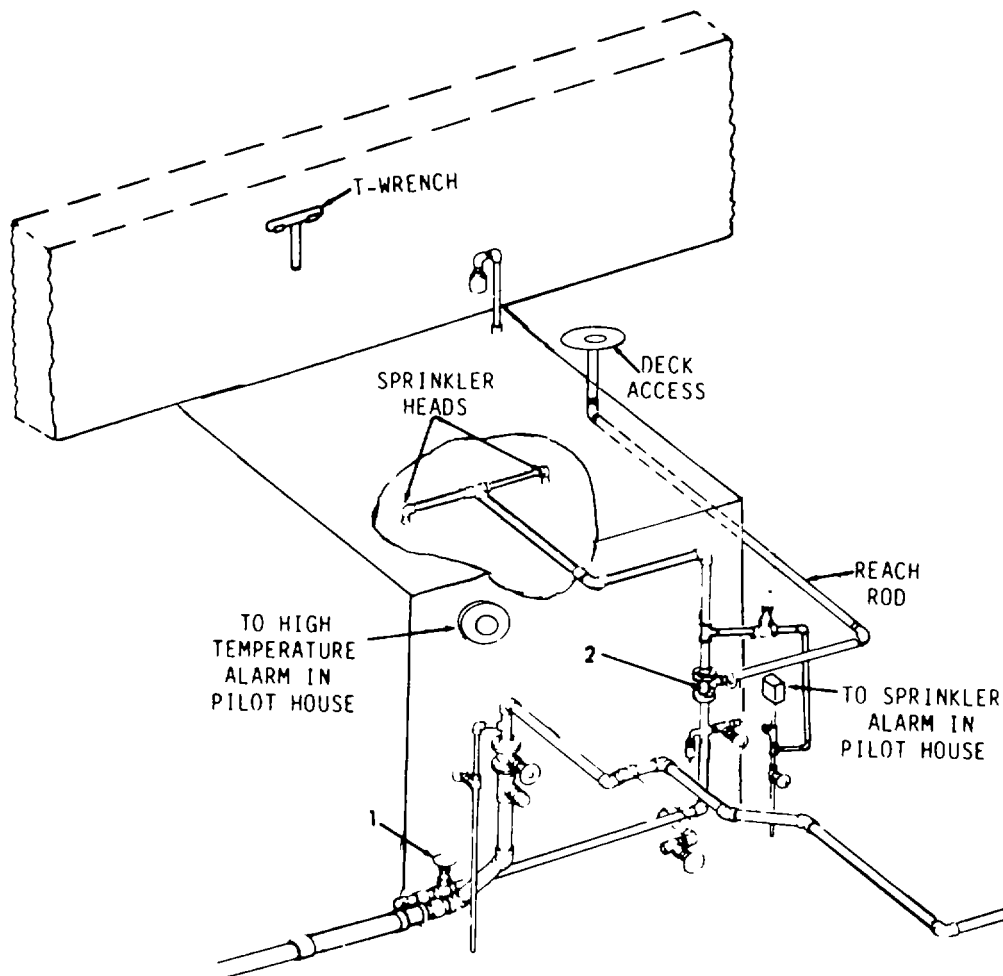
a. The magazine sprinkler is supplied with sea water from the firemain. In order to obtain sea water the fire pump must be in operation. The sprinkler heads will operate when the temperature is high. In the pilot house on the alarm panel are two magazine alarms. Sprinkler alarm will sound when there is no water available to the sprinkler heads. High temperature alarm will sound when the temperature is high and the sprinkler heads are supplying water.

WARNING

The fire pump must be supplying water to the fire-mains. Refer to paragraph 2-77 for fire pump operating instructions.

b. Reefer Room (2-23-0-A).

- (1) Rotate valve (1) counter-clockwise.
- (2) Remote control shutoff valve (2) is locked open (counter-clockwise).



2-401

2-80. MAGAZINE SPRINKLER (Cont).**NOTE**

The remote control shutoff valve (2) is connected by a reach rod to an access plate on the vehicle deck.

- (3) Supply valve (3) must be rotated clockwise.

NOTE

The supply valve (3) is used for auxiliary source of raw water.

- (4) Rotate the shutoff valve (4) counter-clockwise.

c. Pilot House.

- (1) Place the alarm switchboard in operation (refer to paragraph 2-110).
 (2) Supervisory targets

gray - normal
 yellow - off

- (3) Alarm targets

gray - normal
 red - trouble in magazine ALARM BELL WILL RING

d. Reefer Room (2-23-0-A).

- (1) To test the sprinkler alarm, rotate test drain valve (5) counter-clockwise.
 (2) To drain the magazine, rotate drain valve (6) counter-clockwise.

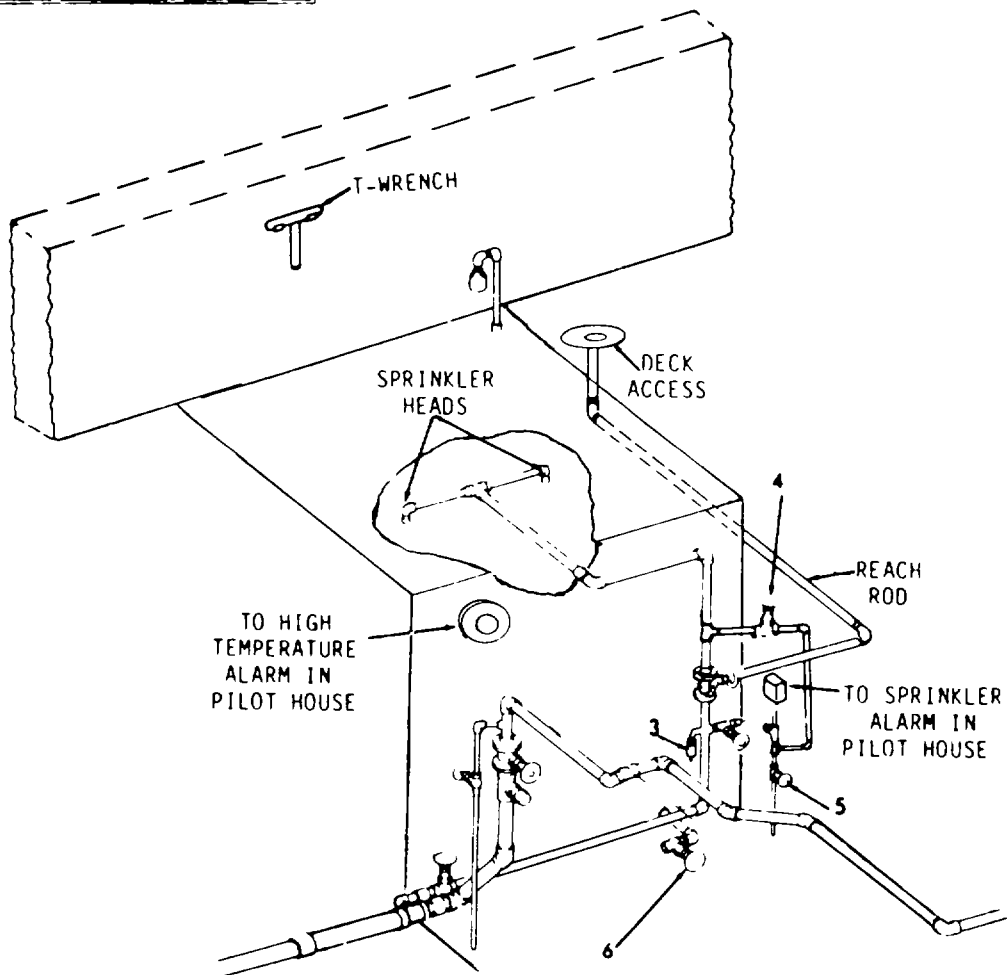
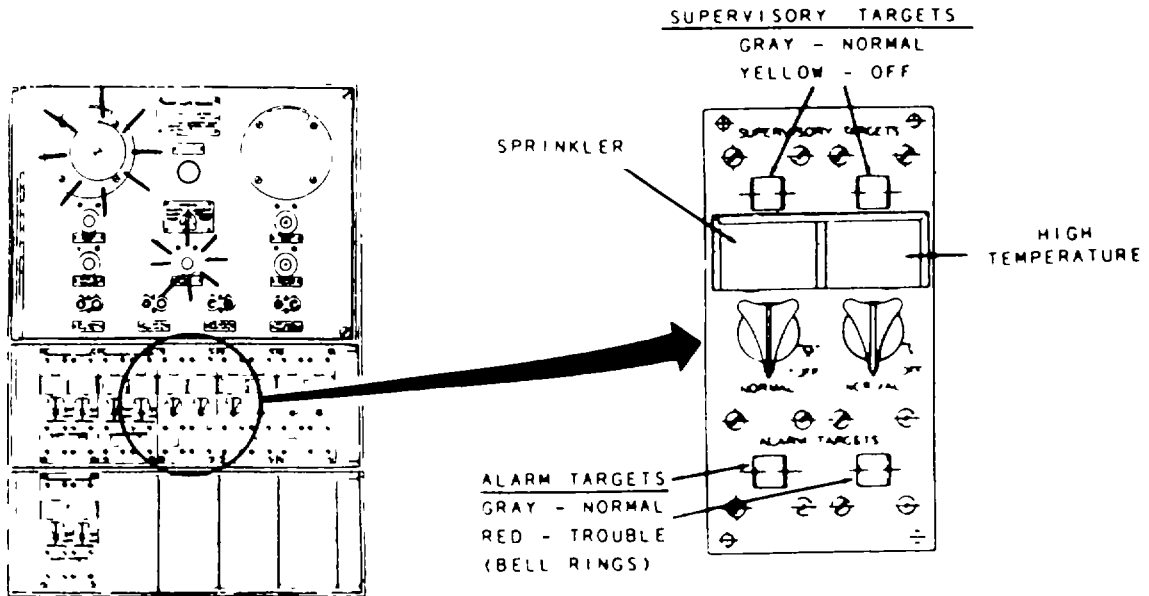
e. Remote Shutoff - Vehicle Deck.

- (1) Remove cover on deck access plate.
 (2) Insert "T" wrench and rotate clockwise.

NOTE

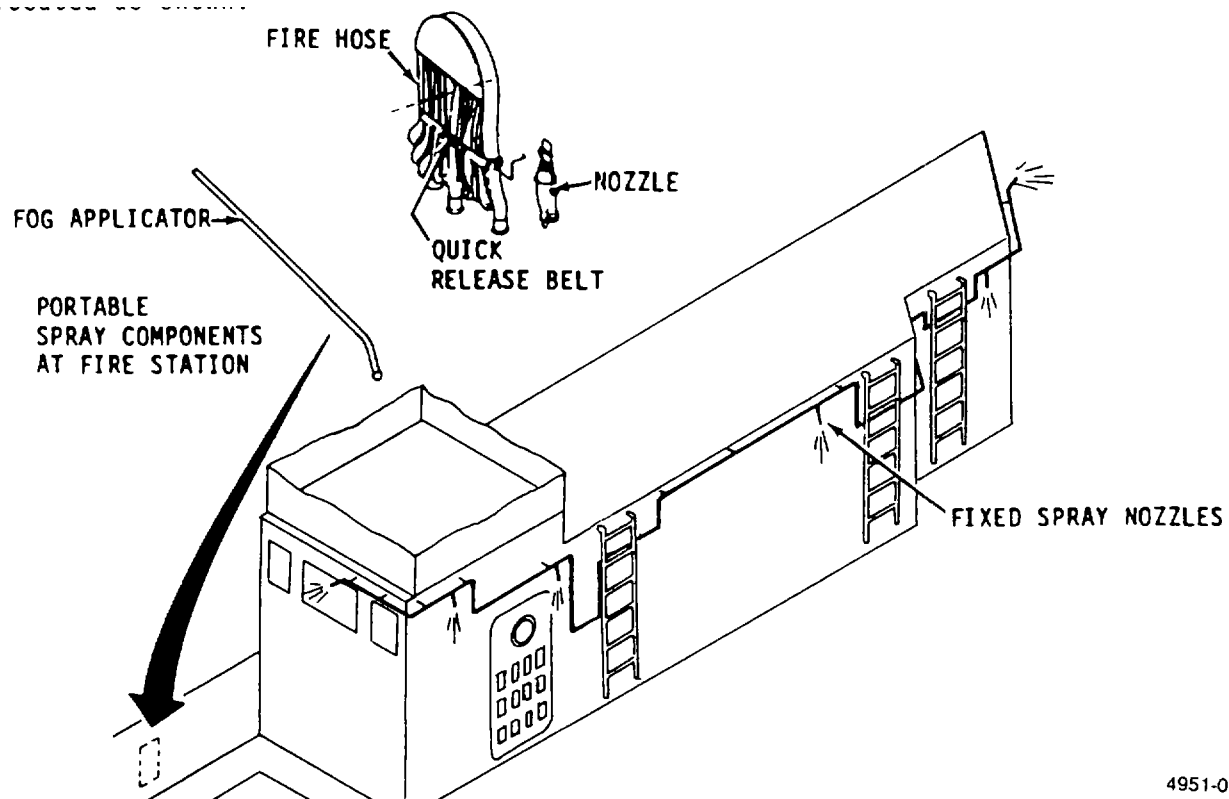
The remote shutoff valve (2) is locked in the open position. This lock is in the reefer room (2-23-0-A).

2-80. MAGAZINE SPRINKLER (Cont).



2-80.1 WASHDOWN COUNTER-MEASURE SPRINKLER SYSTEM.

a. A salt water washdown counter-measure sprinkling system is provided to thoroughly wet down the weather decks and super-structure. Spray nozzles are located as shown



4951-036

b. The fire stations located on the vehicle deck have portable fog applicators for washdown.



The fire pump must be supplying water to the firemain.
Refer to paragraph 2-77 for fire pump operating procedures.

c. Operating the washdown countermeasure sprinkling system.

(1) Reefer room (2-28-0-A).

Lock valve (1) in the open position.

(2) Pilot house.

(a) Drain valve (2) must be in the clockwise (closed) position.

(b) Rotate control valve (3) clockwise to open.

(c) Water will now be spraying on the weather decks and superstructure.

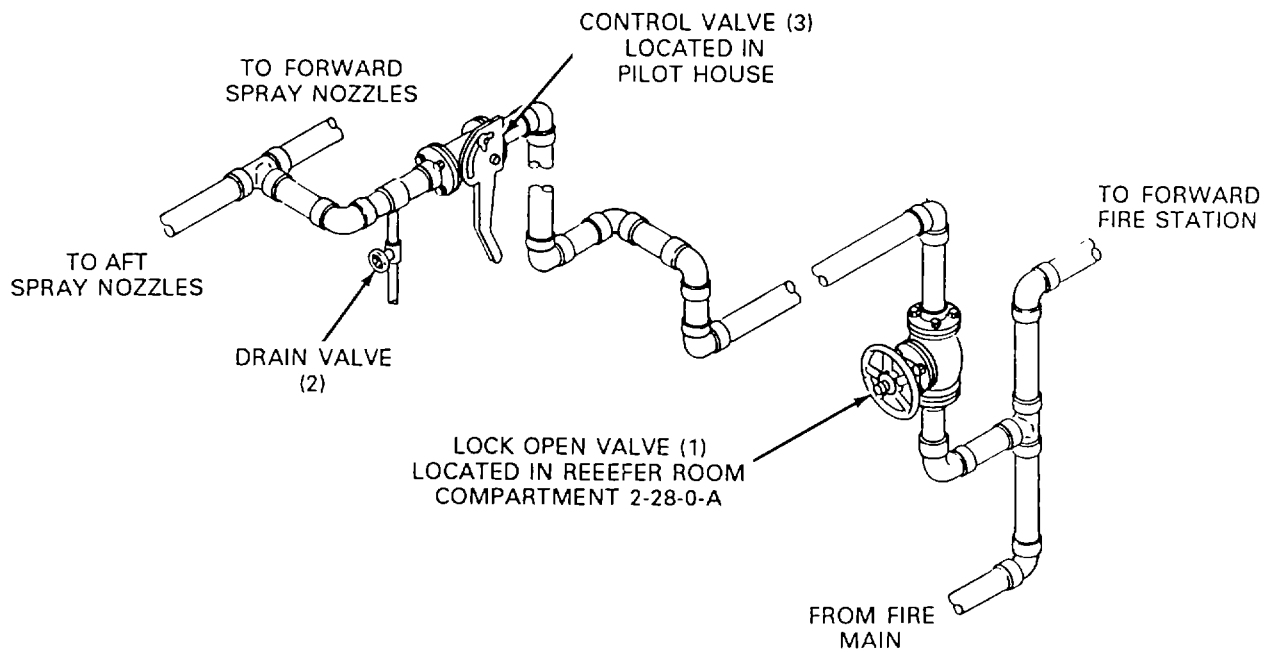
2-80.1 WASHDOWN COUNTER-MEASURE SPRINKLER SYSTEM (Cont).

- d. Draining the washdown counter-measure sprinkling system.

NOTE

The sprinkling system must be drained after use in freezing temperatures.

- (1) Shut down the fire pump. Refer to paragraph 2-77.
- (2) Rotate drain valve (2) in the pilot house counter-clockwise to open.
- (3) Water will drain to the outside of the pilot house.



4951-037

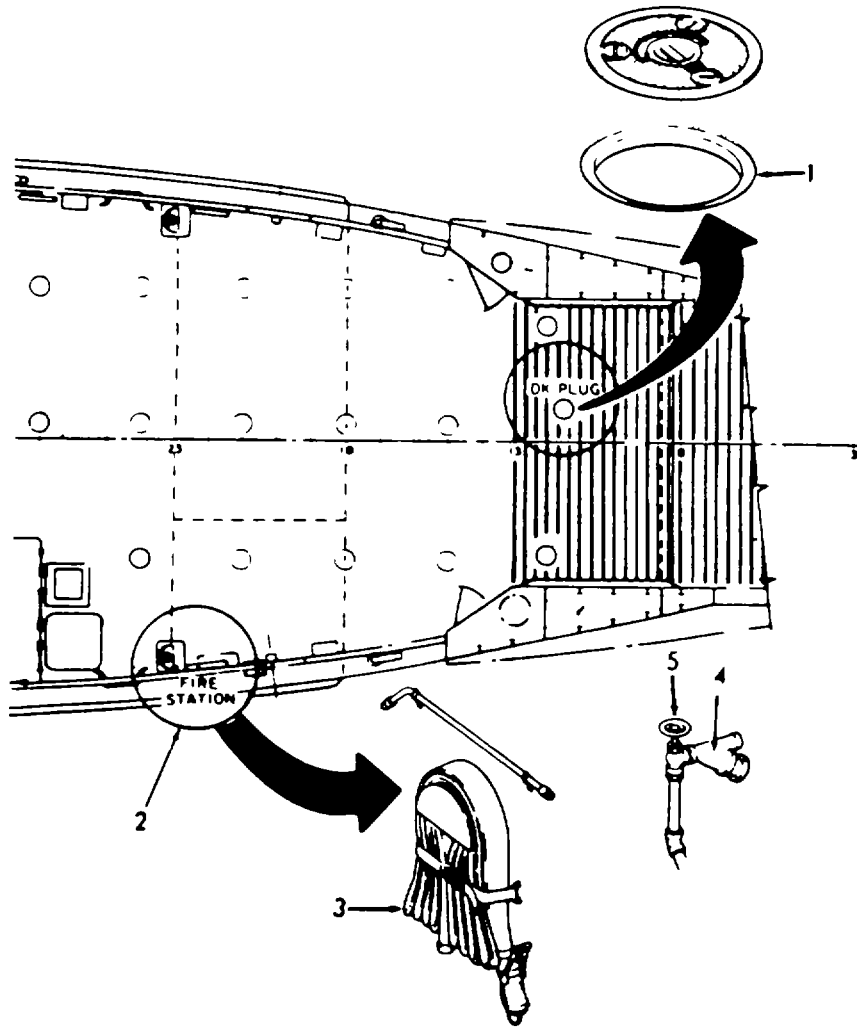
2-81. PEAK BALLAST FILLING.

- a. Filling of the peak sea water ballast tank may be accomplished by using the fire pump, and the forward fire station.
- b. The fire pump must be in operation to fill the peak ballast tank. Refer to paragraph 2-77 for operating instructions.
- c. To empty the peak ballast tank, the portable fire pump *may* be used. Refer to paragraph 2-199 for operating instructions.
- d. To fill the peak ballast tank proceed as follows:
 - (1) On Deck - Forward.
 - (a) Remove deck access plate (1) at frame 11 1/2.
 - (b) At forward fire station (2), attach hose (3) to fire plug (4).
 - (c) Insert hose (3) in deck access (1).
 - (d) Open valve (5) at fire station (2).
 - (e) Fill tank as required.

NOTE

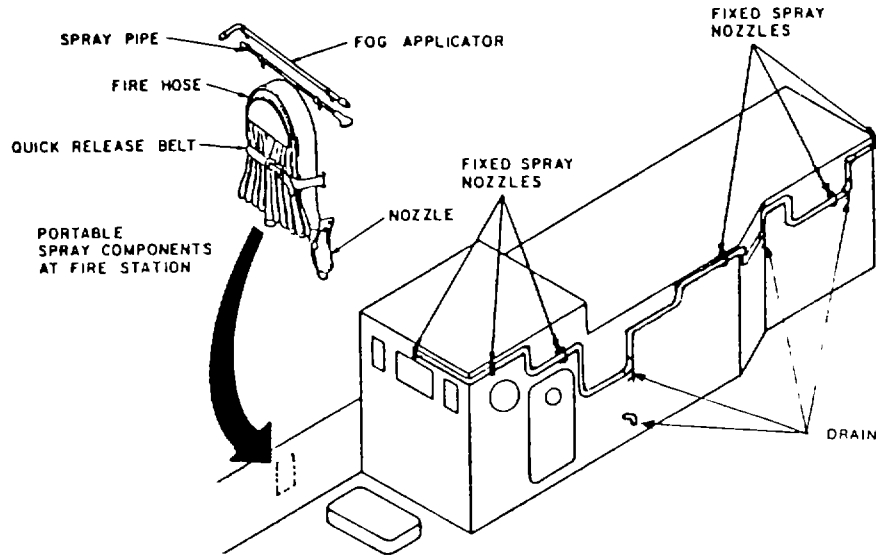
The peak ballast tank capacity is 2830 gallons (10711.6 liters).

2-81. PEAK BALLAST FILLING (Cont).



2-81.1. WASHDOWN COUNTER-MEASURE SPRINKLER SYSTEM.

a. A salt water washdown counter-measure sprinkling system is provided to thoroughly wet down the weather decks and super-structure. Spray nozzles are located as shown.



b. The fire stations located on the vehicle deck have portable fog applicators for washdown.



The fire pump must be supplying water to the fire-mains. Refer to paragraph 2-77 for fire pump operating procedures.

- (1) Equipment Repair Parts and Stores (2-28-0-A).
 - (a) Valve (1) is locked in the open position,
 - (b) Drain valve (2) must be in closed position.
- (2) Pilot house.
 - (a) Rotate control valve (3) in open position.
 - (b) Water will now be spraying on the weather decks and uperstructure.
- (3) Vehicle Deck. Portable washdown spray pipes located at ends of deck house at fire plug.

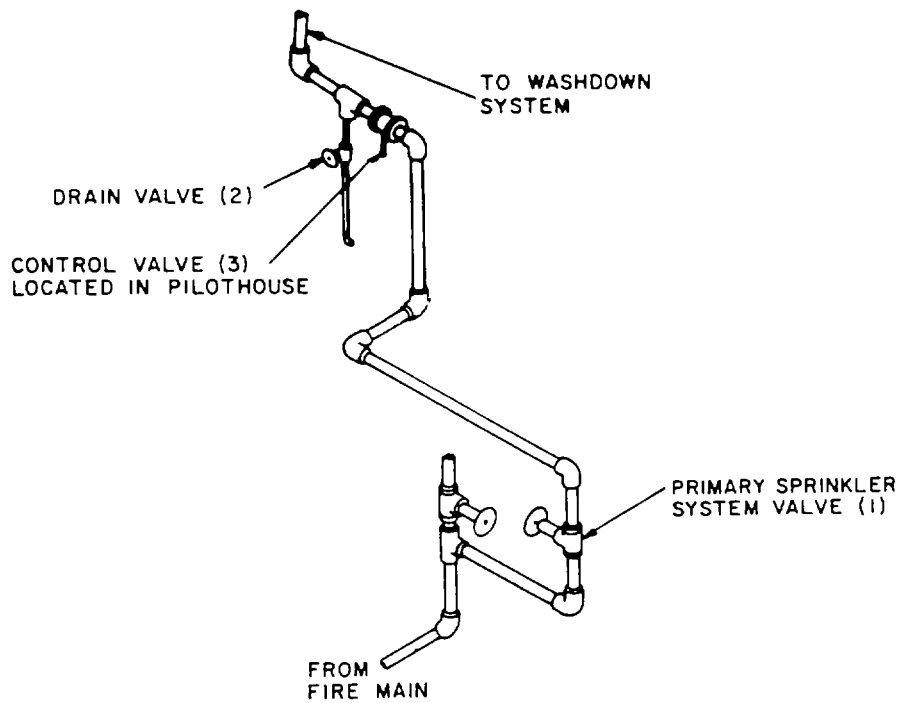
2-81-1 WASHDOWN COUNTER-MEASURE SPRINKLER SYSTEM (Cont).

c. Draining the washdown counter-measure sprinkling system.

The sprinkling system must be drained after use in freezing temperatures.

d. Equipment Repair Parts and Stores (2-28-0-A).

- (1) Shut down the fire pump. Refer to paragraph 2-78.
- (2) Rotate the drain valve (2) counter-clockwise.
- (3) Water will drain onto the deck and into the bilges.
- (4) Disconnect portable spray pipes from fire plugs.



2-82. BILGE DRAINING.

- a. The bilges in the landing craft can be drained in any of the following methods:
- | <u>DESCRIPTION</u> | <u>PARAGRAPH</u> |
|--|------------------|
| Draining Bilge with Bilge Pump | 2-83 |
| Draining Bilge with Fire Pump | 2-85 |
| Draining Bilge with Fire Pump and Eductor | 2-88 |
| Draining Bilge with Bilge Pump and Fire Pump 2 | 2-90 |
- b. Stopping the emptying of the bilge is as follows:
- | <u>DESCRIPTION</u> | <u>PARAGRAPH</u> |
|------------------------------------|------------------|
| Bilge Pump Shutdown | 2-84 |
| Fire Pump, Bilge Draining Shutdown | 2-86 |
| Draining the Firemain System | 2-87 |
| Fire Pump and Eductor Shutdown | 2-89 |

WARNING

In restricted waters use the oil/water separator method of draining the bilges only.

- c. The bilge system consists of the following:
- Bilge pump (150 gallons per minute) (568 liters)
 - Fire pump (250 gallons per minute) (946 liters)
 - Ten suction strainers and check valves
 - Flow control valves
 - Eductor (150 gallons per minute) (568 liters)
 - Suction hose connections
- d. All valves in the bilge system are painted green for ease of identification.

2-83. DRAINING BILGE WITH BILGE PUMP.

- a. The bilge pump is belt driven by the port propulsion engine. For the operating procedure of a propulsion engine refer to paragraph 2-18. This method will drain the bilges at 150 gallons (568 liters) per minute.

WARNING

Do not operate this system in restricted waters.

NOTE

All valves are green.

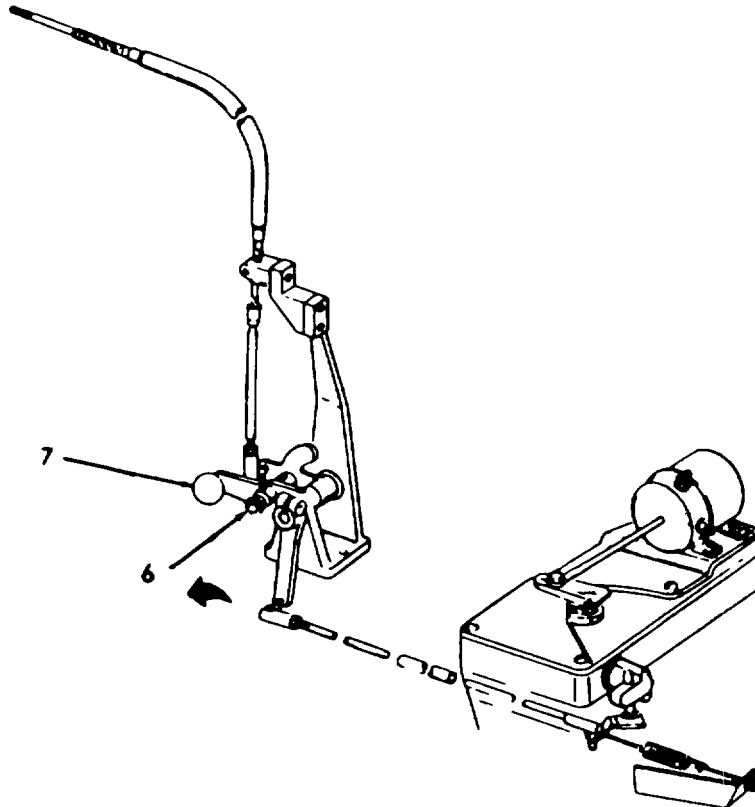
2-83. DRAINING BILGE WITH BILGE PUMP (Cont).

- b. Refer to paragraph 2-90 for the method of draining the bilge using both the bilge pump and the fire pump.
- c. To operate the bilge pump refer to figure FO-40 and proceed as follows:
 (1) Aft Engine Room.

Place flow control valve (1) in the closed position.

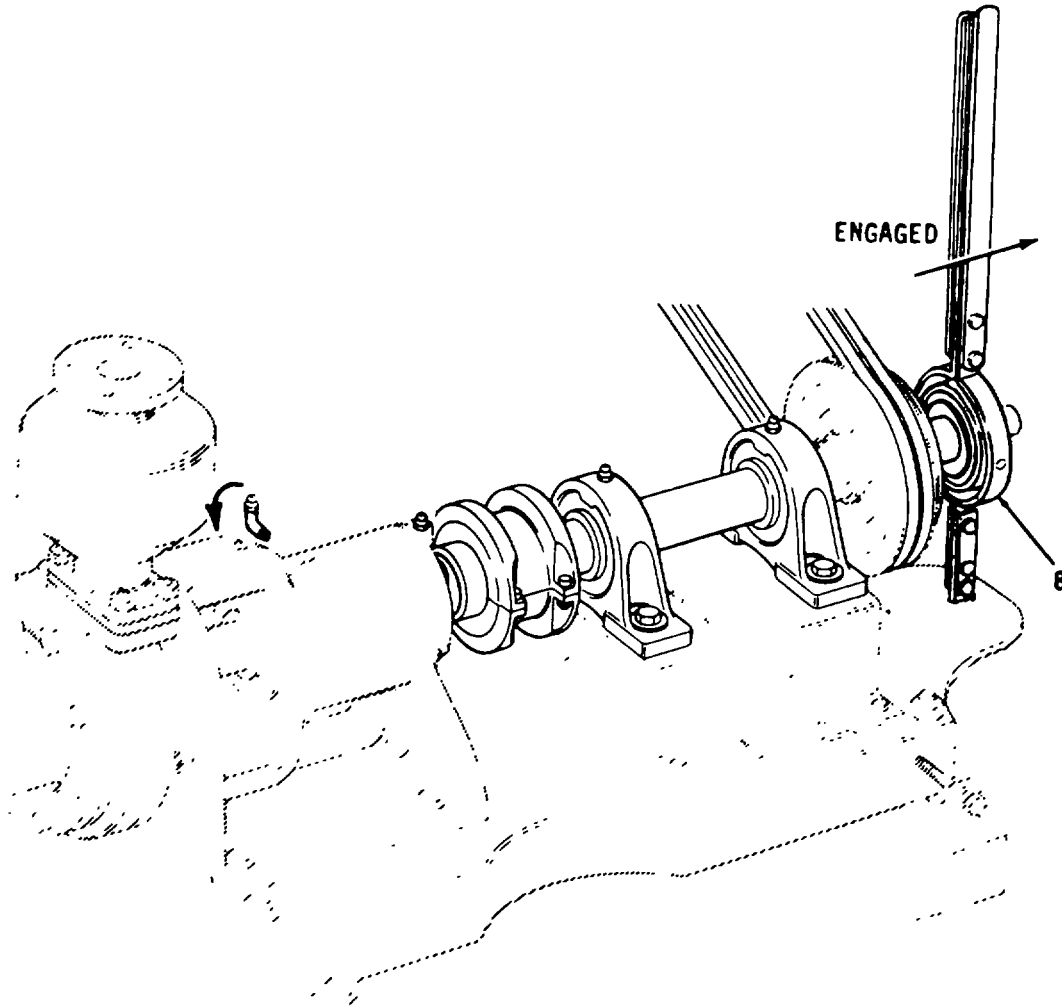
- (2) Forward Engine Room.

- (a) Place flow control valve (2) in the open position.
- (b) Place flow control valve (3) in the open position.
- (c) Rotate the overboard discharge check valve (4) clockwise.
- (d) Rotate the remote control valve (5) counter-clockwise.
- (e) The port propulsion engine must be running. The clutch on the marine gear does not need to be in either forward or reverse.
- (f) Pull out knob (6) on local throttle control (7).
- (g) Rotate knob (6) one-quarter turn counter-clockwise.



2-83. DRAINING BILGE WITH BILGE PUMP (Cont).

- (h) Engage the bilge pump clutch (8) by pulling lever forward.

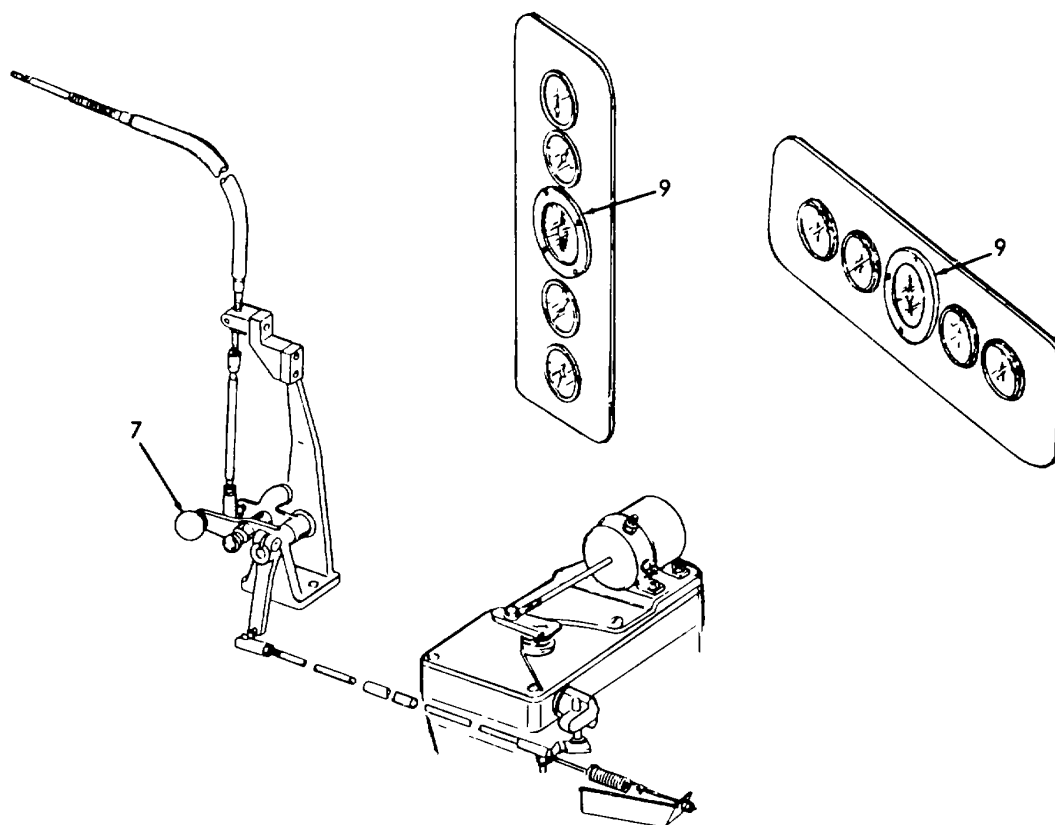


2-83. DRAINING BILGE WITH BILGE PUMP (Cont).

- (i) Increase speed of engine by moving lever (7) until engine speed on tachometer (9) indicates 2000 RPM.

CAUTION

Do not exceed 2000 RPM. Greater speed will damage bilge pump.



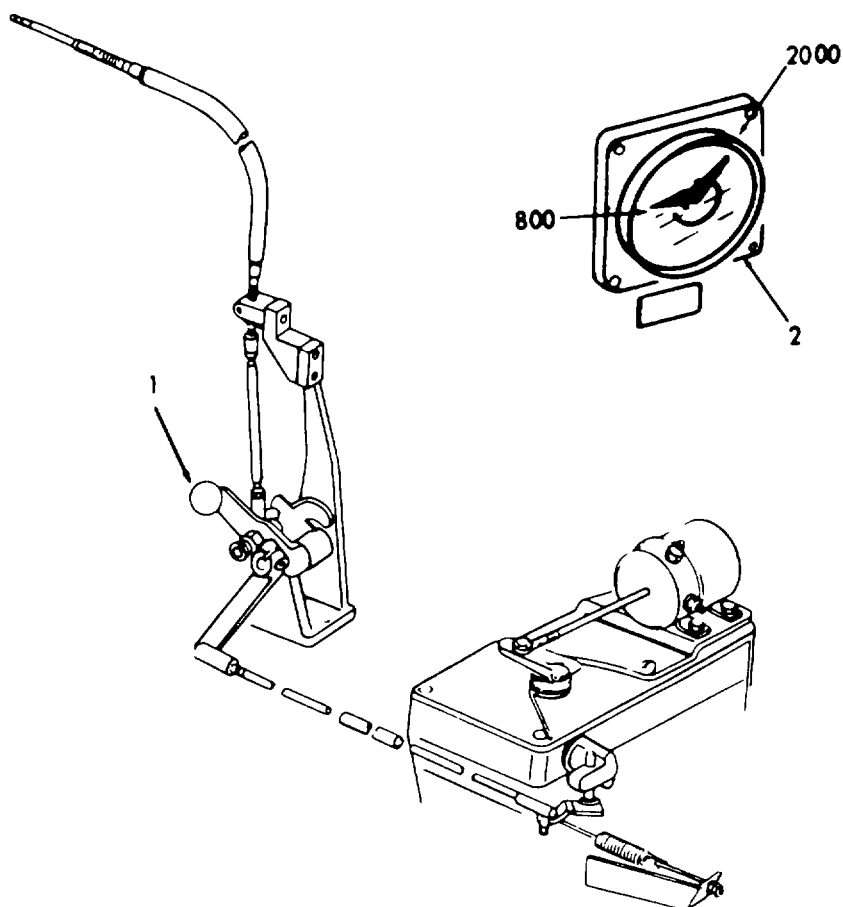
- (j) Check bilge pump vacuum gauge (10) and pressure gauge (11) to determine that the pump is running.

(3) Compartment Draining.

To drain any compartment refer to table 2-18. (Figure FO-40).

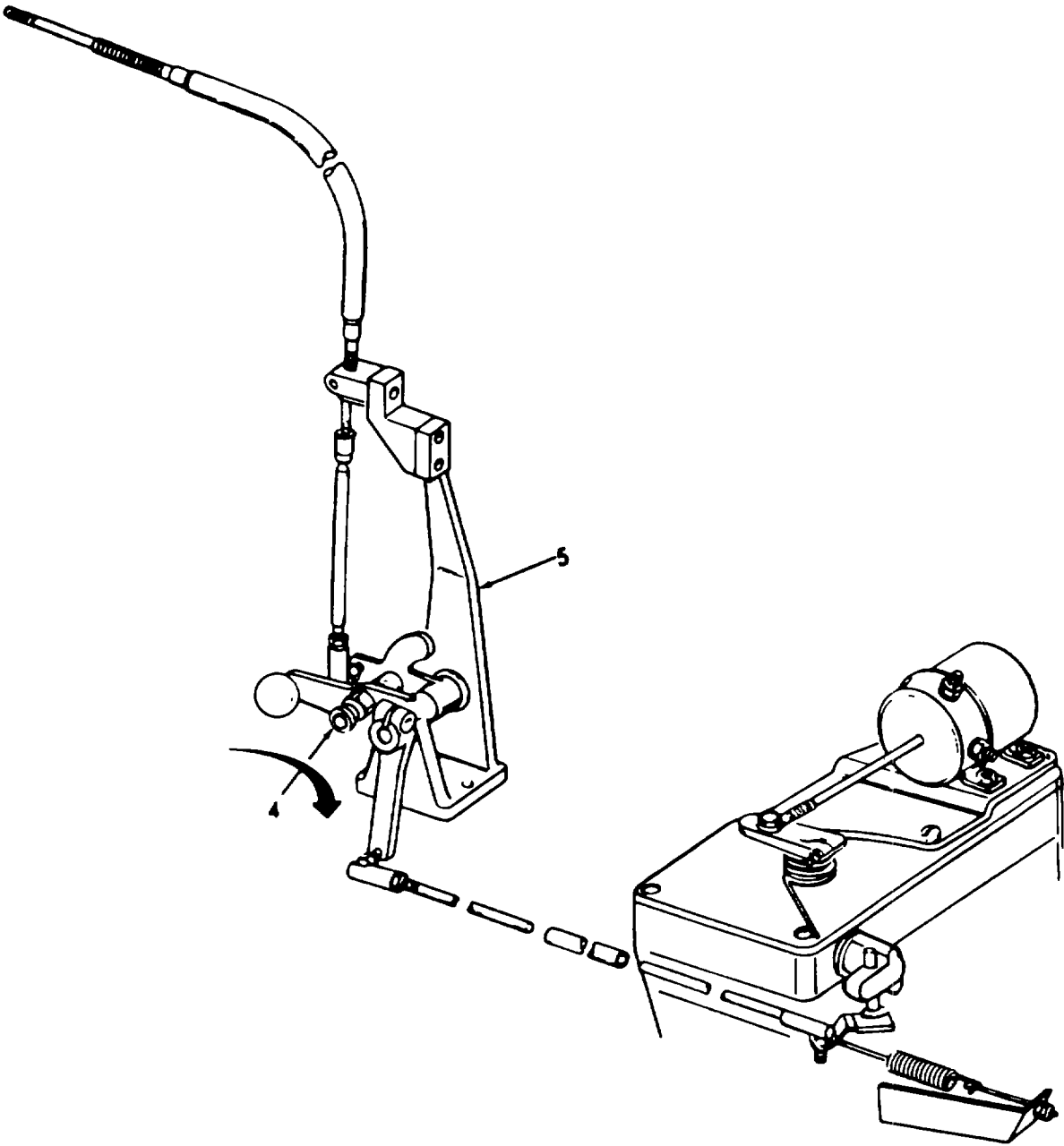
2-84. BILGE PUMP SHUTDOWN.

- a. To stop the bilge pump's draining of the bilges, proceed as follows:
- b. Aft Engine Room
 - (1) Decrease speed of engine by moving lever (1) until engine speed on tachometer (2) is at idle (approximately 800 RPM).

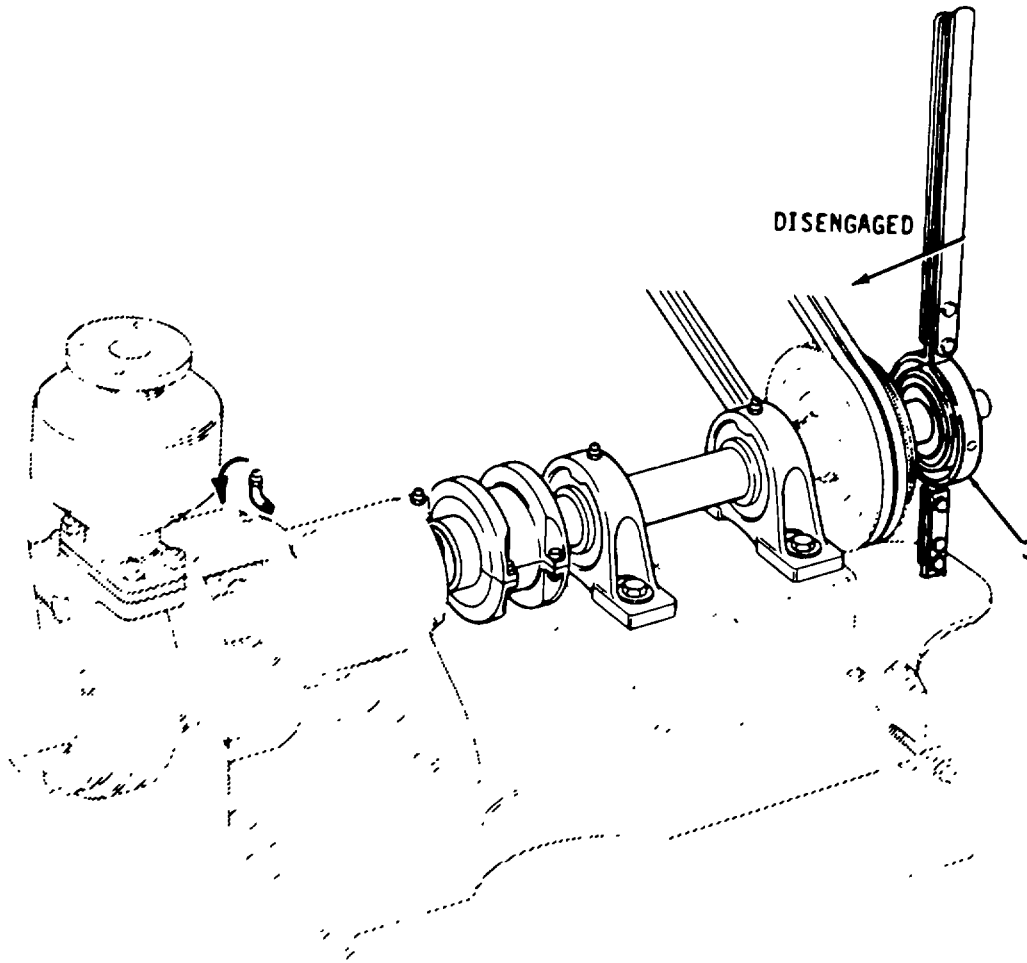


2-84. BILGE PUMP SHUTDOWN (Cont).

- (2) Disengage bilge pump clutch (3), by pushing lever backward.
- (3) Rotate knob (4) one quarter turn clockwise on local throttle control (5).

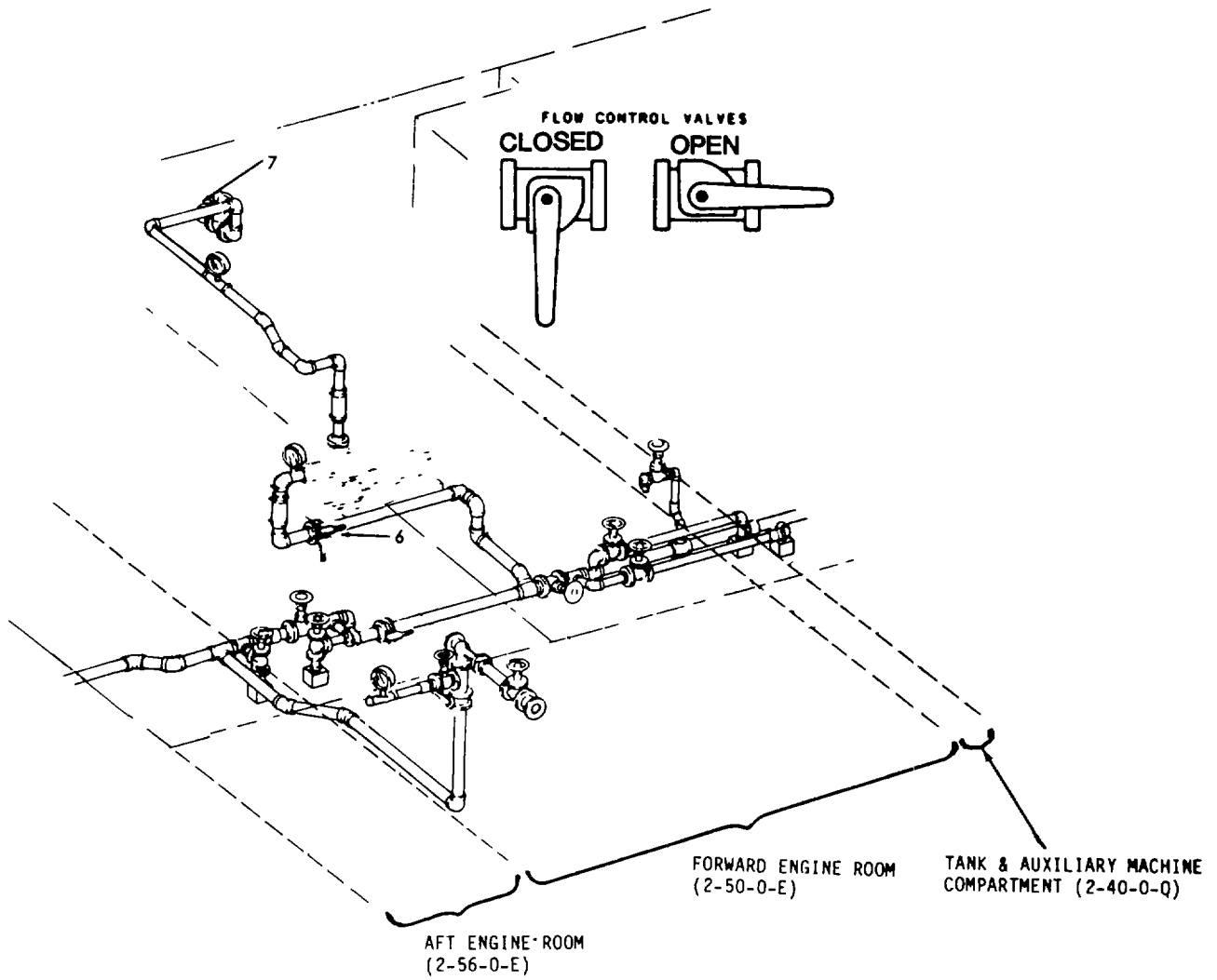


2-84. BILGE PUMP SHUTDOWN (Cont).



2-84. BILGE PUMP SHUTDOWN (Cont).

- (4) Place flow control valve (6) in the closed position.
- (5) Rotate over-board discharge valve (7) clockwise.



2-85. DRAINING BILGE WITH FIRE PUMP.

a. This method of draining the bilges uses the fire pump. This method will drain the bilges at 250 gallons per minute (946 liters per minute).

WARNING

Do not operate this system in restricted waters.

NOTE

All valves on bilge system are green, except as noted.

b. To operate the fire pump to drain the bilges refer to figure FO-41 and proceed as follows:

(1) Forward Engine Room.

- (a) Place flow control valve (1) lever in the off position.
- (b) Place flow control valve (2) lever in the on position.
- (c) Rotate the remote control valve (3) counter-clockwise.
- (d) Rotate the remote control valve (4) counter-clockwise.

(2) Bosun's Stores (2-23-0-A).

Rotate the ballast tank supply and drain valve (5) clockwise.

(3) Storeroom (2-23-2-A).

Rotate ballast tank supply and drain valve (6) clockwise.

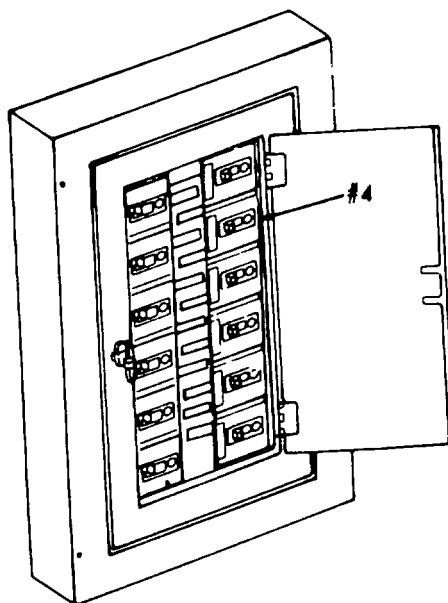
(4) Aft Engine Room.

- (a) Place flow control valve (7) in the on position.
- (b) Place vent valve (8) in the on position.
- (c) Place flow control valve (9) in the on position.
- (d) Rotate valve (10) clockwise.
- (e) Rotate aft sea water ballast tank discharge valve (11) clockwise.
- (f) Rotate overboard discharge valve (12) clockwise.
- (g) Rotate suction valve (13) clockwise.

2-85. DRAINING BILGE WITH FIRE PUMP (Cont).

- (h) Place (red) check valve (14) lever in the off position.
 - (i) Rotate valve (15) counter-clockwise. Any air trapped in the pump should bleed off.
 - (j) Rotate valve (16) clockwise.
 - (k) Rotate valve (17) clockwise.
 - (l) Rotate valve (18) clockwise.
- (5) Engine Access Room.

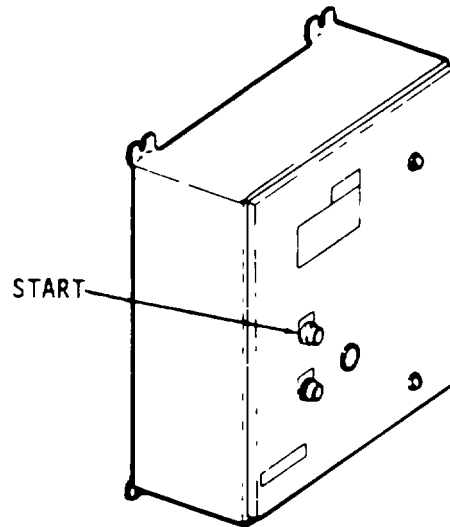
Place circuit breaker #4 on power distribution panel (P-400) in the ON position.



2-85. DRAINING BILGE WITH FIRE PUMP (Cont).

(6) Aft Engine Room.

(a) Press the START switch on the fire pump controller. The fire pump will run.



(b) When the fire pump is at operating speed, place (red) check valve (14) lever in the on position.

(c) The fire pump will be pumping bilge water through the fire main system.

(d) Fire pump pressure gauge (19) should read 110 psi.

(e) Fire pump suction vacuum gauge (20) should read 28 Hg.(inches of water).

(7) On Deck.

Open the valve on one or more fire plugs.

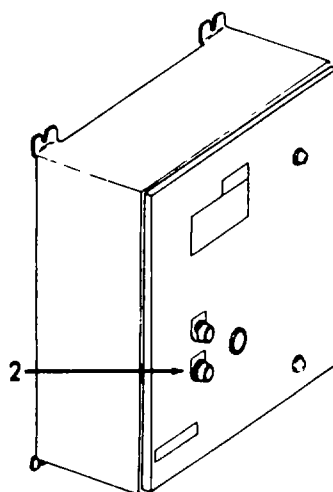
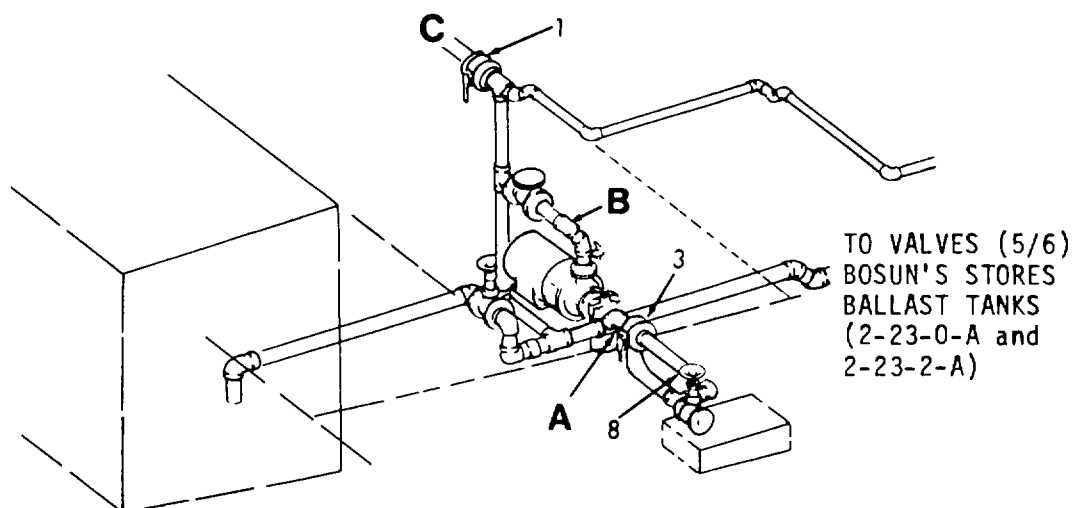
(8) Compartment Draining.

To drain any compartment refer to table 2-19 (Figure FO-42) and Figure FO-41.

2-86. FIRE PUMP - BILGE DRAINING - SHUTDOWN.

To stop the fire pump's draining of the bilges, proceed as follows:

- a. Aft Engine Room.
 - (1) Place (red) check valve (1) lever in the closed position.
 - (2) Press the STOP switch (2) on the fire pump controller.
 - (3) Place flow control valve (3) in the closed position.



2-90. FIRE PUMP - BILGE DRAINING - SHUTDOWN (Cont).

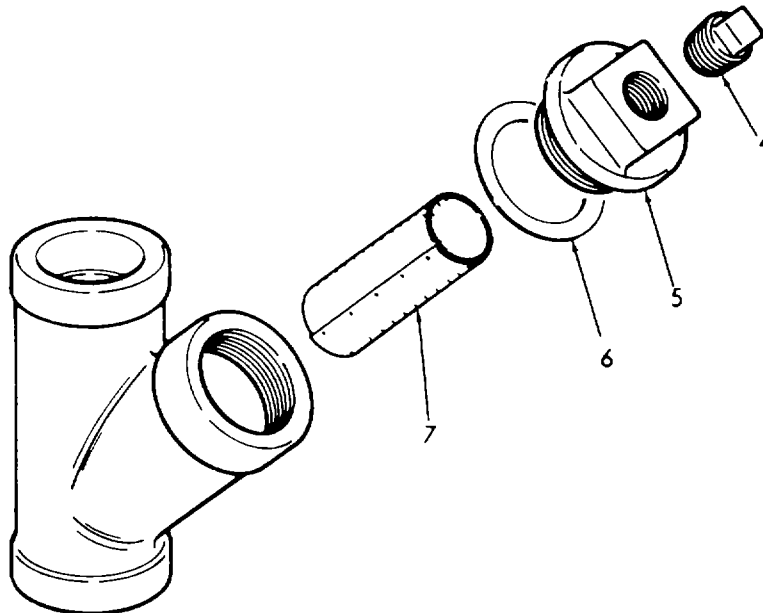
b. On Deck.

- (1) Close the valve (s) on the firemain that was used to drain the bilge.
- (2) Clean wye strainers as follows:
 - (a) Remove pipe plug (3) to drain strainer.
 - (b) Remove cover (4) and gasket (5).

WARNING

Use eye protection when using compressed air.

- (c) Remove screen (6), rinse in clean water and blow dry with compressed air.
- (d) Replace screen (6), gasket (5), cover (4), and pipe plug (3),



2-86. FIRE PUMP - BILGE DRAINING - SHUTDOWN (Cont).

c. Aft Engine Room.

(1) Check that valve (8) lever is full clockwise.

(2) Clean the simplex strainer as follows:

(a) Loosen yoke screw (9).

(b) Remove bolts (10), yoke (11), cover (12) and gasket (13).

WARNING

Wear eye protection when using compressed air.

(c) Remove strainer (14), clean with clear water and dry with compressed air.

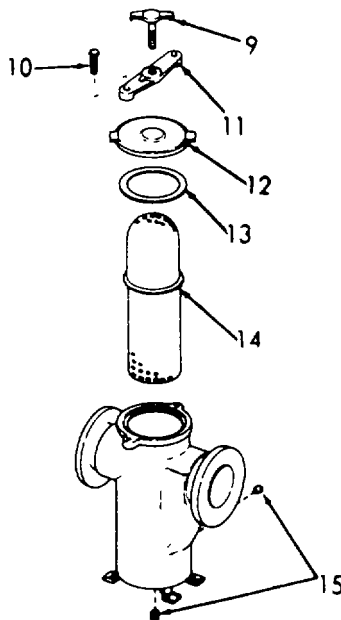
(d) The strainer can be drained by removing pipe plugs (15).

(e) Replace pipe plugs (15), strainer (14), gasket (13), cover (12), yoke (11) and bolts (10).

(f) Tighten yoke screw (9).

(3) Place flow control valve (8) lever in the on position.

(4) The fire pump is now available for fire -fighting.



2-420

2-87. DRAINING THE FIREMAIN SYSTEM.

- a. The firemain system must be drained after use in freezing weather. Refer to Figure FO-43.
- b. Open drain valves as follows:
 - (1) Reefer Room (2-28-0-A).
Rotate valve (1) counter-clockwise.
 - (2) Aft Engine Room (2-56-0-E).
Rotate valve (2) counter-clockwise.
- c. After draining is complete
Rotate valves (1 and 2) clockwise.

2-88. DRAINING BILGE WITH FIRE PUMP AND EDUCTOR.

a. This method of draining the bilge uses the fire pump and an eductor. The method is for EMERGENCY USE ONLY. The eductor works on a venturi principal; water from the fire pump creates a suction. This suction drains the bilges. This method will drain the bilges at 150 gallons per minute (568 liters per minute).

WARNING

Do not operate this system in restricted waters.

NOTE

All valves on the bilge system are green, except as noted.

b. To operate the fire pump to drain the bilges refer to Figure FO-44 and proceed as follows:

(1) Forward Engine Room.

- (a) Place flow control valve (1) lever in the off position.
- (b) Place flow control valve (2) lever in the on position.
- (c) Rotate the remote control valve (3) counter-clockwise.
- (d) Rotate the remote control valve (4) counter-clockwise.

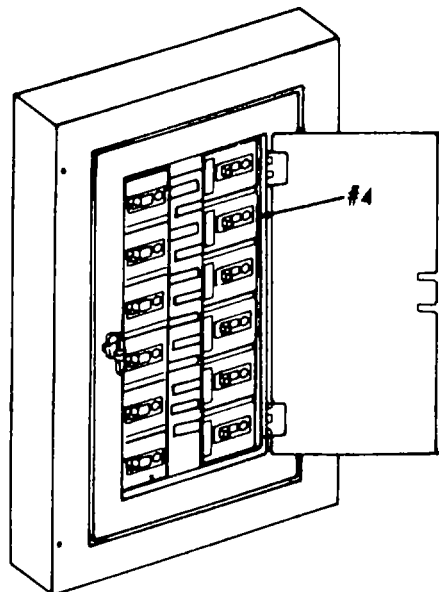
(2) Aft Engine Room.

- (a) Place flow control valve (5) lever in the off position.
- (b) Place flow control valve (6) lever in the off position.
- (c) Rotate the sea chest vent valve (7) counter-clockwise.
- (d) Rotate shutoff valve (8) counter-clockwise.
- (e) Rotate pump suction flow control valve (9) clockwise. Any air trapped in the pump should bleed off.
- (f) Place (red) check valve (10) lever in the off position.
- (g) Rotate overboard discharge valve (11) counter-clockwise.

2-88. DRAINING BILGE WITH FIRE PUMP AND EDUCTOR (Cont).

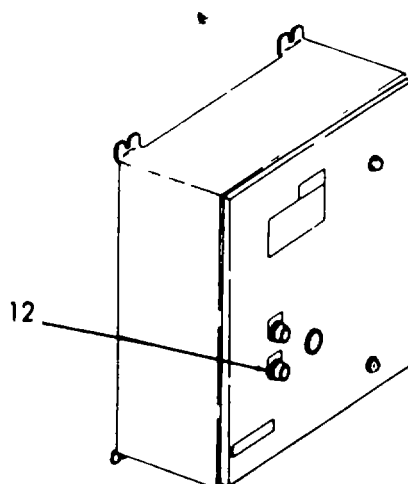
- (3) Engine Access Room.

Place circuit breaker #4 on power distribution panel (P-400) in the ON position.



- (4) Aft Engine Room.

- (a) Press the START switch (12) on the fire pump controller. The fire pump will run.



2-88. DRAINING BILGE WITH FIRE PUMP AND EDUCTOR (Cont).

- (b) When the fire pump is at operating speed, rotate suction valve (13, Figure FO-44) counter-clockwise.
- (c) The fire pump is pumping water through the eductor and out the overboard discharge valve.
- (d) Rotate valve (14, Figure FO-44) counter-clockwise.
- (e) Eductor suction vacuum gauge (15, Figure FO-44) should read approximately 28 Hg. (inches of water).

**CAUTION**

To prevent backflooding - DO NOT open flow control valve (5, Figure FO-44) until vacuum gauge (15, Figure FO-44) indicates a vacuum in eductor suction valve.

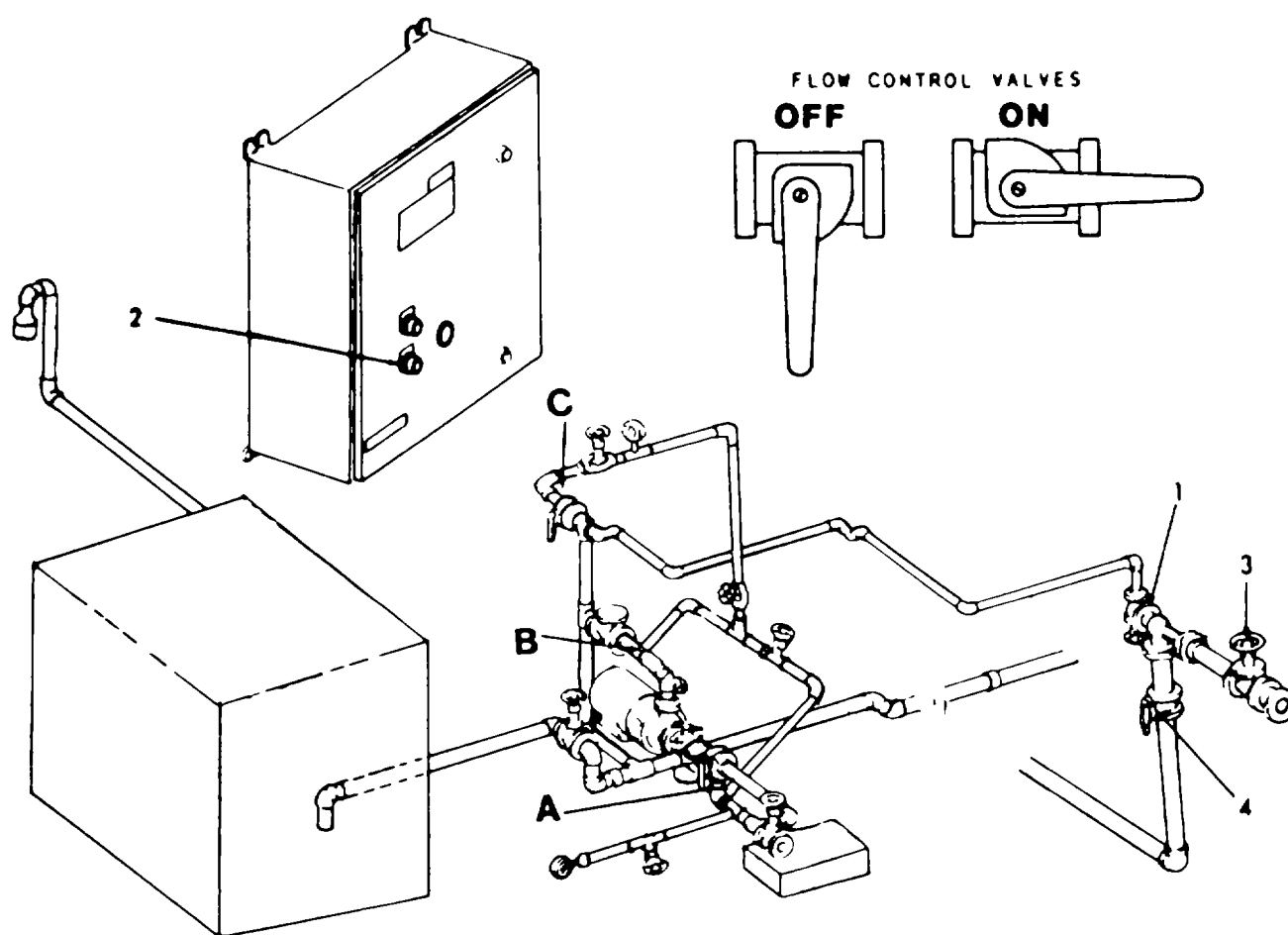
- (f) Place flow control valve (5, Figure FO-44) lever in the on position.
 - (g) Rotate valve (16, Figure FO-44) counter-clockwise.
 - (h) Eductor supply gauge (17, Figure FO-44) should read 90 psi (620.5 kPa).
- c. To drain any compartment refer to table 2-20 (Figure FO-45) and figure FO-44.

2-89. FIRE PUMP AND EDUCTOR SHUT DOWN.

a. To stop the fire pump and eductor draining of the bilge proceed as follows:

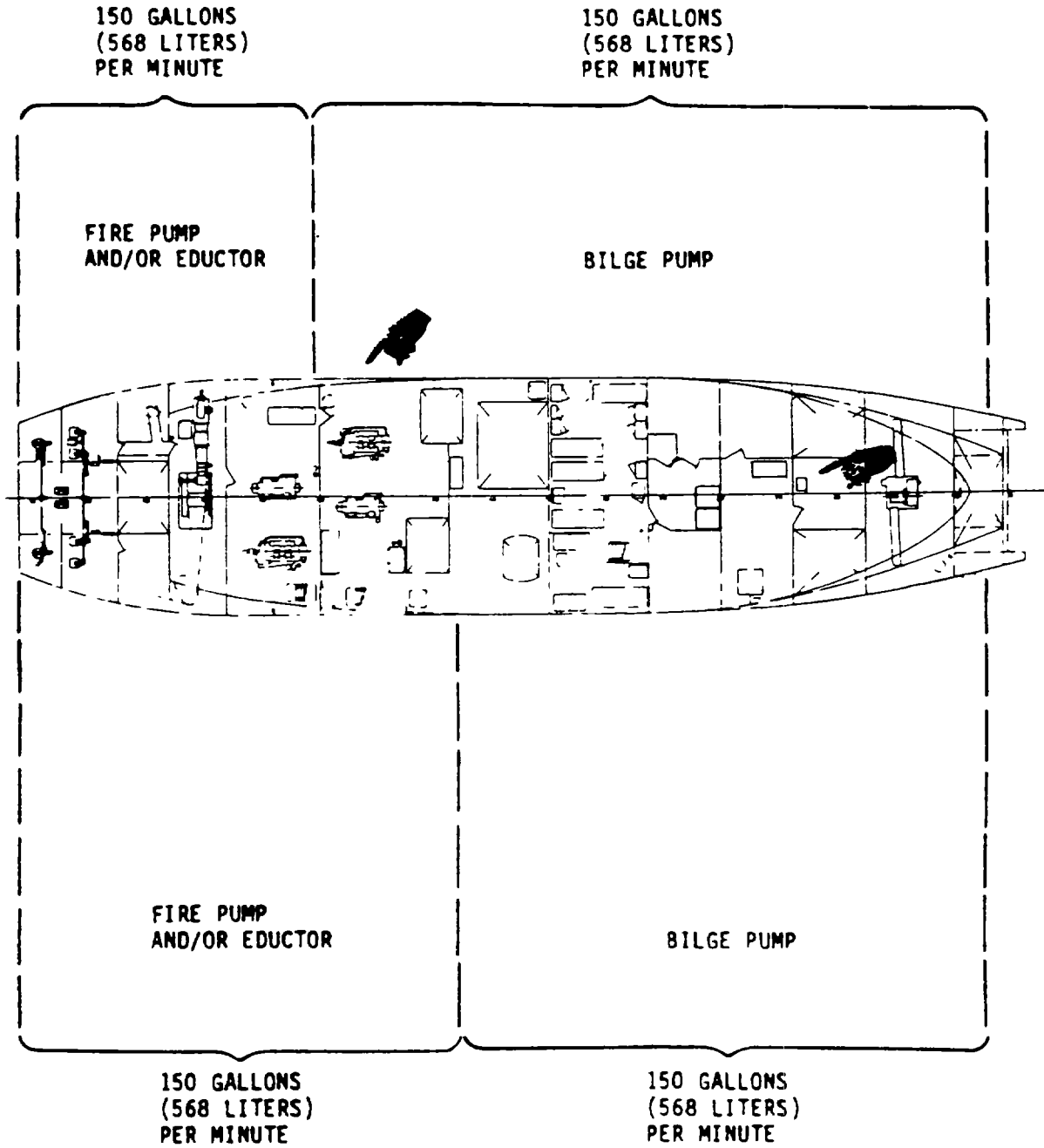
b. Aft Engine Room.

- (1) Rotate the suction valve (1) clockwise.
- (2) Press the STOP switch (2) on the fire pump controller.
- (3) Rotate the overboard discharge valve (3) clockwise.
- (4) Place the (red) check valve (4) lever in the open position.
- (5) The fire pump is now available for fire fighting.



2-90. BILGE DRAINING WITH BILGE PUMP AND FIRE PUMP.

a. The bilges can be drained by using both the bilge pump and the fire pump. Note the areas that can be drained by each pump and proceed as follows-



4954-210

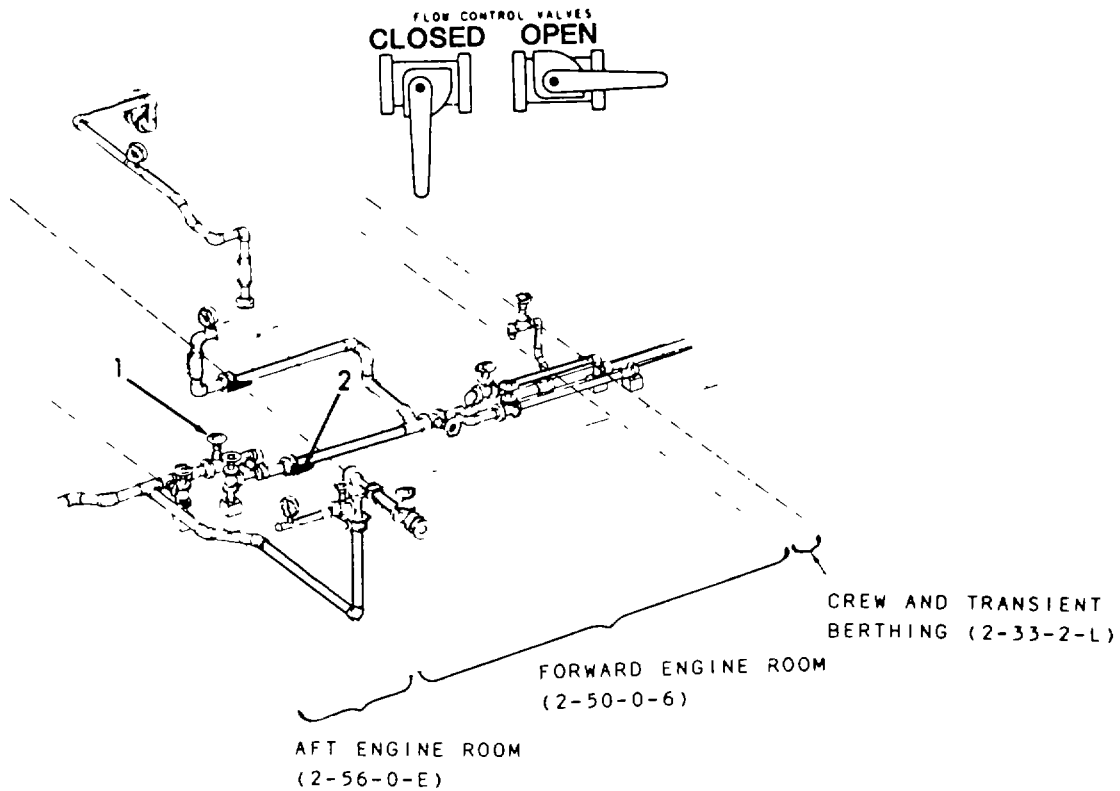
2-90. BILGE DRAINING WITH BILGE PUMP AND FIRE PUMP Cont).

a. Forward Engine Room.

- (1) Place the bilge pump in operation. Refer to paragraph 2-83 for procedure.
- (2) If the section forward of frame 56 is to be drained:
 - (a) Rotate remote control valve (1) clockwise.
 - (b) Place flow control valve (2) in the on position.
- (3) If the section forward of frame 48 is to be drained:
 - (a) Rotate remote control valve (1) counter-clockwise.
 - (b) Place flow control valve (2) in the off position.

b. Aft Engine Room.

- (1) Place the fire pump in operation.
 - (a) Refer to paragraph 2-85 for operation of the fire pump.
 - (b) Refer to paragraph 2-88 for operation of the fire pump and eductor.



2-427/(2-428 Blank)

2-91. BALLAST SYSTEM.

- a. The landing craft has four sea water ballast tanks. Refer to table 2-21 for description, location, and capacities.

Table 2-21. Ballast Tank Description.

Description	Location	Capacity	
		Gallons	Liters
Peak	2-8-0-W	2830	10711.6
Starboard	2-18-1-W	3190	12074.2
Port	2-18-2-W	3190	12074.2
Aft	2-66-0-W	2563	9701.0

- b. All the ballast tanks are connected to the ballast piping system. The peak tank also may be filled as per paragraph 2-81, or emptied according to paragraph 2-199.
- c. The contents of the ballast tanks is indicated on the tank level indicator (aft engine room) and ballast tank sounds on the vehicle deck. The sounds are located as follows:
 - Peak- none
 - Starboard-frame 23-10 feet 4 inches off center
 - Port-frame 23-10 feet 4 inches off center
 - Aft-frame 66-1/2 16 1/2 inches off center
- d. The ballast tanks can be filled or drained by either of two methods: using the fire pump or by gravity.
- e. The following are the procedures for filling and draining the ballast tanks.

<u>DESCRIPTION</u>	<u>PARAGRAPH</u>
Filling Ballast Tanks - Using Gravity	2-92
Draining Ballast Tanks - Using Gravity	2-93
Filling Ballast Tanks - Using Fire Pump	2-94
Draining Ballast Tanks - Using Fire Pump	2-95

- f. The contents of the ballast tanks cannot be equalized.

NOTE

No means of ballast transfer is provided on the landing craft.

2-92. FILLING BALLAST TANKS - USING GRAVITY.

- a. The ballast tanks can be filled by gravity as follows (refer to Figure FO-46).

NOTE

The tanks will fill to the depth of the water line.

- b. Aft Engine Room

- (1) Rotate vent valve (1, Figure FO-46) in sea chest, clockwise.
- (2) Place flow control valve (2, Figure FO-46) lever in the on position.
- (3) Rotate valve (3, Figure FO-46) counter-clockwise.
- (4) Rotate suction valve (4, Figure FO-46) clockwise to fill the aft ballast tank.

- c. Crew and Transient Berthing (2-33-2-L).

Rotate drain valve(s) (5, Figure FO-46) clockwise to fill the starboard, port or peak ballast tank.

- d. Reefer Room (2-28-0-A).

Rotate fill valve (6, Figure FO-46) counterclockwise to fill the peak ballast tank.

2-93. DRAINING BALLAST TANKS - USING GRAVITY.

- a. The ballast tanks can be drained by gravity, as follows (refer to Figure FO-47).

NOTE

The tanks will empty to the depth of the water line.

- b. Aft Engine Room.

- (1) Rotate vent (1, Figure FO-47) in sea chest, clockwise.
- (2) Place flow control valve (2, Figure FO-47) lever in the on position.
- (3) Rotate valve (3, Figure FO-47) counter-clockwise.
- (4) Rotate suction valve (4, Figure FO-47) clockwise to drain the aft ballast tank.

- c. Crew and Transient Berthing (2-33-2-L).

Rotate drain valve(s) (5, Figure FO-47) clockwise to drain the starboard, port or peak ballast tank.

2-93. DRAINING BALLAST TANKS - USING GRAVITY (Cont).

- d. Reefer Room (2-28-0-A).

Rotate drain valve(s) (6, Figure FO-47) counterclockwise to drain the peak ballast tank.

2-94. FILLING BALLAST TANKS - USING FIRE PUMP.

- a. To fill a ballast tank using the fire pump proceed as follows (refer to figure FO-48):

- (1) Crew and Transient Berthing (2-33-2-L).

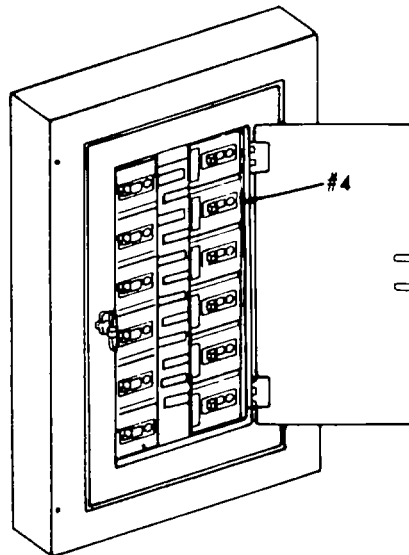
(a) To fill the starboard ballast tank, rotate supply valve (1) counter-clockwise.

(b) To fill the port ballast tank, rotate supply valve (2) counter-clockwise.

(c) To fill the peak ballast tank, rotate supply valve (3) counterclockwise.

- (2) Engine Access Room.

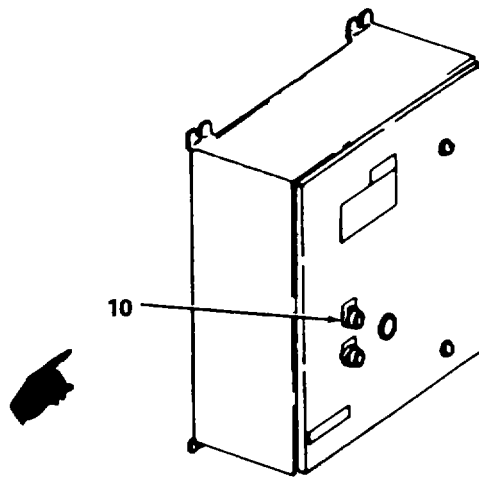
Place circuit breaker #4 on power distribution panel (p-400) in the ON position.



2-94. FILLING BALLAST TANKS - USING FIRE PUMP (Cont).

(3) Aft Engine Room.

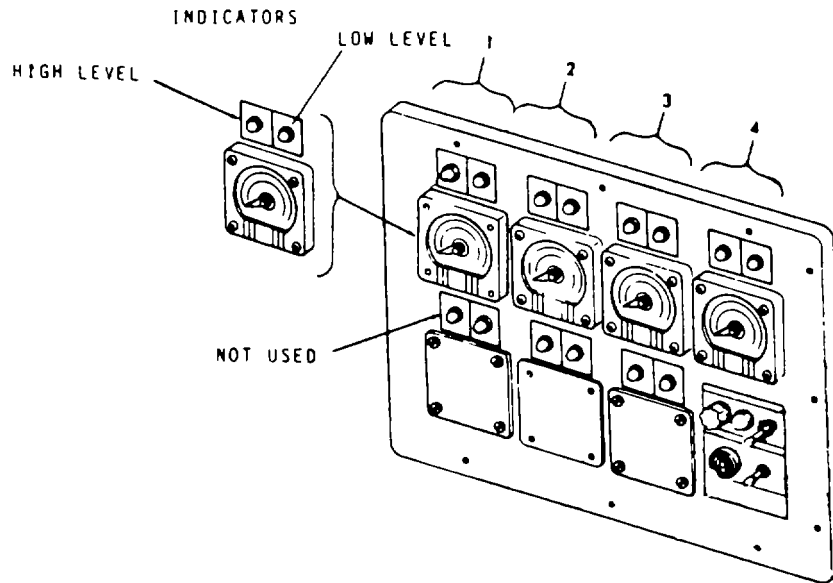
- (a) Rotate the vent valve (4) counter-clockwise.
- (b) Place flow control valve (5) lever in the off position.
- (c) Place (red) check valve (6) lever in the off position.
- (d) Rotate suction valve (7) counter-clockwise.
- (e) Rotate valve (8) counter-clockwise.
- (f) If the aft ballast tank is to be filled, rotate suction valve (9) counter-clockwise.
- (g) Press the START switch (10) on the fire pump controller. The fire pump will run.
- (h) Fire pump suction vacuum gauge (11) should read 28 Hg. (inches of water).



4951-096

2-94. FILLING BALLAST TANKS - USING FIRE PUMP (Cont).

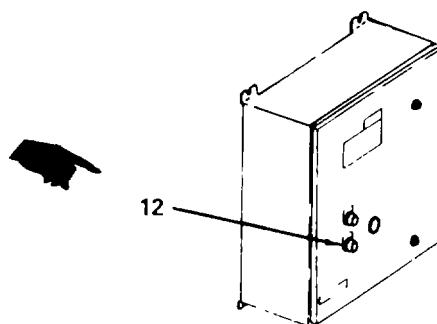
- (i) During the filling of ballast tanks, refer to the tank level Indicator (TLI) to determine the contents of the ballast tanks. Refer to paragraph 2-74 for TLI operating instructions.



- 1 S.W. Ballast (2-66-0-W) - Contents of seawater ballast tank in the stern.
- 2 S.W. Ballast (2-18-2-W) - Contents of seawater ballast Port side.
- 3 S.W. Ballast (2-18-1-W) - Contents of seawater ballast tank starboard side.
- 4 S.W. Ballast (2-8-0-W) - Contents of seawater ballast tank in the bow.

b. To stop the filling of the ballast tanks.

- (1) When the desired ballast levels are obtained, stop the fire pump by pressing the STOP switch (12) on the fire pump controller.



4951-095

2-94. FILLING BALLAST TANKS - USING FIRE PUMP (Cont).

- (2) Rotate the suction valve (6) clockwise.
- (3) Place the (red) check valve (5) lever in the on position.
- (4) The fire pump is now available to fight fires.

2-95. DRAINING BALLAST TANKS - USING THE FIRE PUMP.

a. To drain a ballast tank using the fire pump proceed as follows (refer to figure FO-49)}

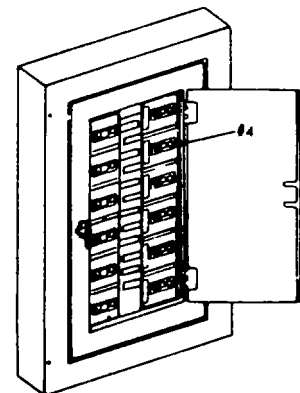
- (1) Aft Engine Room.
 - (a) Rotate valve (1) clockwise.
 - (b) Place flow control valve (2) lever in the open position.
 - (c) Place flow control valve (3) lever in the closed position.
 - (d) Place (red) check flow control valve (4) in the closed position.
 - (e) Rotate overboard discharge valve (5) counter-clockwise.
 - (f) Rotate suction valve (6) clockwise.
 - (g) To drain the aft ballast tank, rotate suction valve (7) counter-clockwise.
- (2) Bosun's Stores (2-23-0-A).
 - (a) To drain the starboard ballast tank, rotate drain valve (8) counter-clockwise.
 - (b) To drain the port ballast tank, rotate drain valve (9) counter-clockwise.

(3) Ramp Winch Room.

To drain the peak ballast tank, rotate drain valve [12] counterclockwise.

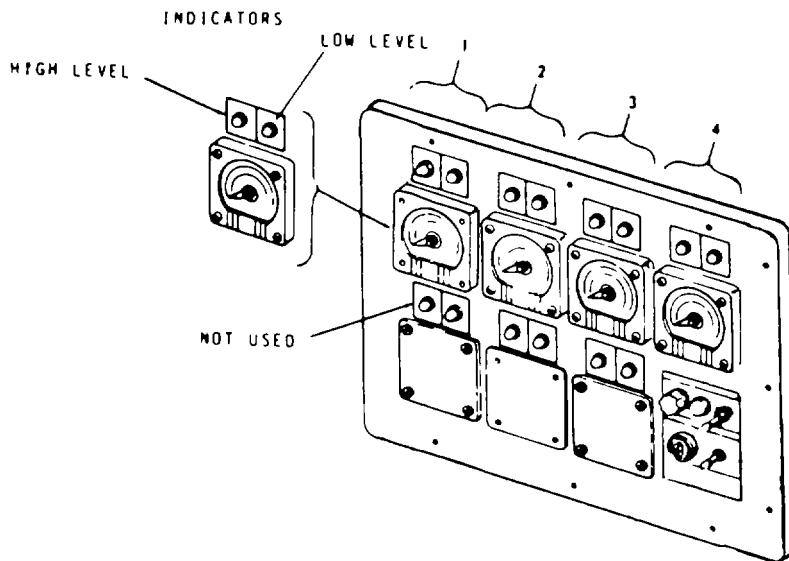
(4) Engine Access Room.

Place circuit breaker #4 on power distribution panel (P400) in the ON position.



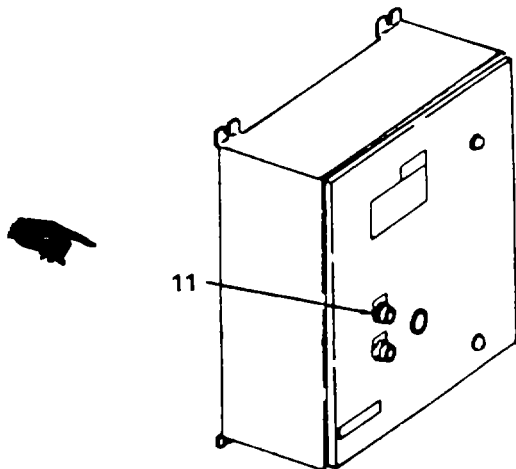
2-95. DRAINING BALLAST TANKS - USING THE FIRE PUMP (Cont).

(5) Aft Engine Room.



- 1 S.W. BALLAST (2-66-0-W) - Contents of sea water ballast tank in the stern.
- 2 S.W. BALLAST (2-18-2-W) - Contents of sea water ballast tank port side.
- 3 S.W. BALLAST (2-18-1-W) - Contents of sea water ballast tank starboard side.
- 4 S.W. BALLAST (2-8-0-W) - Contents of sea water ballast tank in the bow.

(a) Press the START switch (11) on the fire pump controller. The fire pump will run.



4951-147

(b) The fire pump is pumping water through the eductor and out the overboard discharge valve.

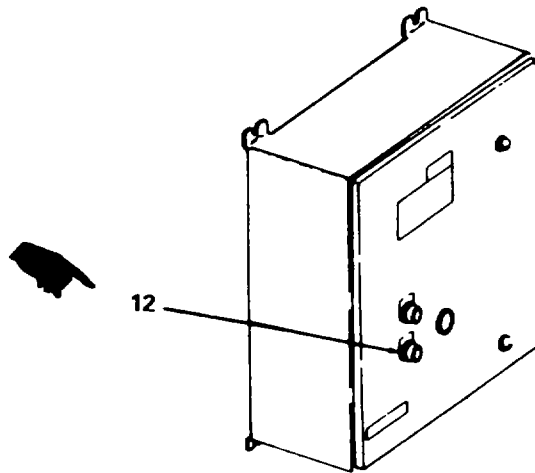
2-95. DRAINING BALLAST TANKS - USING THE FIRE PUMP (Cont).

b. To stop the fire pump and eductor draining of the ballast tanks proceed as follows:

(1) Aft Engine Room.

(a) Rotate the suction valve (6) clockwise.

(b) Press the STOP switch (12) on the fire pump controller.



4951-148

(c) Place flow control valve (3) lever in the closed position.

(d) Rotate the overboard discharge valve (5) clockwise.

(e) Place the (red) check valve (4) lever in the open position.

(f) Rotate valve (1) counter-clockwise.

(g) Place flow control valve (2) lever in the off position.

(h) The fire pump is now available to fight fires.

2-96. OIL/WATER SEPARATION SYSTEM.

a. The oil/water separator removes non-soluble oil, solids and trapped air from an oil/water solution. Normally, all bilge water is fed into the separator.



WARNING

Federal law prohibits the dumping of oily substances into restricted waters.



CAUTION

The system may not produce a legally acceptable oil-free water effluent if the water to be processed is contaminated with soap, detergents, bilge cleaners, protein foam, or similar surfactants.

b. The oil that has been separated from the water is held in a 25 gallon (94.6 liter) tank. The water is discharged overboard.

c. The oil/water separator is also used to pump used engine oil into the holding tank, or a separate container.

d. The following is an index of the operating procedures:

<u>DESCRIPTION</u>	<u>PARAGRAPH</u>
Prestart Adjustments	2-97
Bilge Draining	2-98
Used Engine Oils	2-99
Emptying Holding Tank	2-100

2-97. PRESTART ADJUSTMENTS.

The following adjustments should be performed prior to starting the system. Refer to figure FO-50 for component locations.

- a. Forward Engine Room.
 - (1) Close sample/drain valve (1) at base of prefilter separator.
 - (2) Close sample/drain valve (2) at base of 2nd stage separator.
 - (3) Close sample/drain valve (3) at base of 3rd stage separator.
 - (4) Close manual oil discharge valve (4).
 - (5) Close manual bypass shut off valve (5).
 - (6) Open manual shutoff valve (6).
 - (7) Open intervessel shutoff valve (7).
 - (8) Open intervessel shutoff valve (8).

NOTE

The following procedures, steps (9) thru (15), need be performed only when the equipment is to be operated for the first time.

CAUTION

When removing covers, be careful not to damage the float of the air eliminator valve (9) on the bottom of the cover.

- (9) Lift cam bar (10) and remove cover (11).
- (10) Lift cam bar (12) and remove cover (13).

2-97. PRESTART ADJUSTMENTS (Cont).

- (11) Lift cam bar (14) and remove cover (15).
- (12) Tighten wing nuts securing elements.

CAUTION

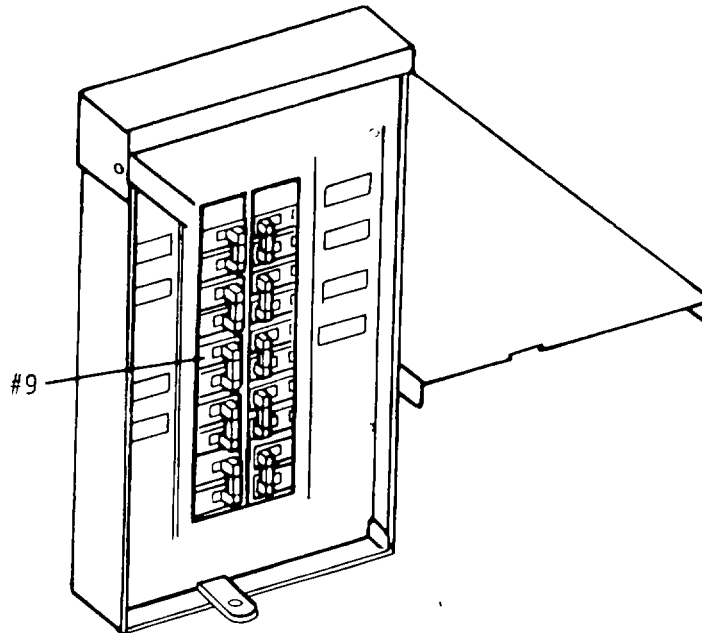
Do not use a wrench to tighten wing nuts or the filter elements may be damaged.

- (13) Close Intervessel shutoff valve (7).
- (14) Fill prefilter primary separator (16) one-half to three-fourths full of clean water.

CAUTION

The pump (17) should contain water prior to initial startup. Water from separator (16) will drain into pump.

- (15) Replace covers (11, 13 and 15), secure with cam bars (10, 12, and 14).
- (16) Place circuit breaker #9 on lighting distribution panel L-107 in the ON position.



2-97. PRESTART ADJUSTMENTS (Cont).

(17) Place the AUTO-CONTROLS switch (18) in the ON position.

(18) Lamp (19) will be lit.

(19) Close strainer valve (20).

(20) Close on-deck valve (21).

b. Forward Engine Room.

(1) Close strainer valves (22 and 23).

(2) Close on-deck valve (24).

c. Aft Engine Room.

CAUTION

For initial system start-up connect the system to a source of clean water. DO NOT connect to pressurized source of water. Use a tank filled with clean water.

(1) Place service hose in a tank of clean water.

(2) Open on-deck valve (21).

(3) Open intervessel shutoff valve (7).

(4) Place the SUPPLY PUMP switch (25) in the ON position. This fills the system.

(5) Lamp (26) will be lit.

(6) Observe sight glasses (27, 28 and 29) for water level.

(7) Place the SUPPLY PUMP switch (25) in the OFF position.

(8) Lamp (26) will go out.

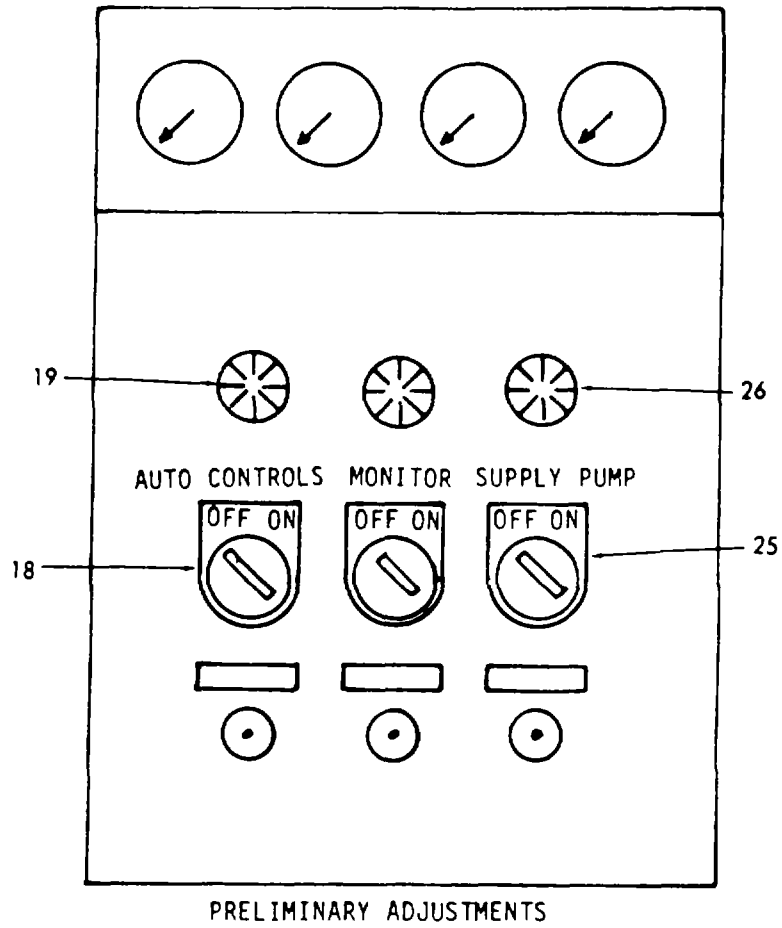
(9) Close on-deck valve (21).

(10) Remove service hose from tank of water.

(11) Place the AUTO-CONTROL switch (18) in the OFF position.

(12) Lamp (19) will go out.

2-97. PRESTART ADJUSTMENTS (Cont).



2-98. BILGE DRAINING.

- a. The normal method of draining the bilge using the oil/water separator is as follows (refer to Figure FO-51):

CAUTION

The system may not produce a legally acceptable oil-free water effluent if the water to be processed is contaminated with soap, detergents, bilge cleaners, protein foam, or similar surfactants.

- b. Prior to performing this procedure perform the preliminary adjustments in paragraph 2-97.

(1) On Deck, (Port Side).

Close the on-deck discharge valve (1).

(2) Aft Engine Room.

(a) Rotate the overboard discharge valve (2) counter-clockwise.

(b) Open the tank inlet valve (3).

(c) Check that the tank suction valve (4) is closed (clock-wise).

(d) Open strainer valves as required.

- Anchor winch compartment valve (5).
- Aft engine room valve (6).
- Forward engine room valve (7).

(e) Open on-deck valves to remove pockets of bilge water using service hose, as follows:

- Aft engine room valve (8).
- Forward engine room valve (9).

(f) Place manual shutoff valve (10) in the on position.

(g) Place manual shutoff valve (11) in the off position.

(h) Place the AUTO-CONTROLS switch (12) in the on position.

(i) Lamp (13) will be lit.

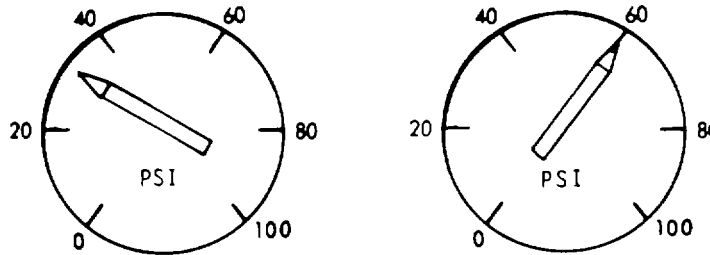
(j) Place the SUPPLY PUMP switch (14) in the on position. Lamp (15) will be lit.

(k) Check the sight glass (16). If oil is present a filter could be ruptured. Shut the system off.

2-98. BILGE DRAINING (Cont).

- (1) Observe the pressure gauges. If there is a differential pressure of 30 psi between gauges 17 and 18, 18 and 19, 19 and 20, there is a clogged filter problem as follows:

- 17 and 18 - First Stage (prefilter)
- 18 and 19 - Second Stage
- 19 and 20 - Third Stage



DIFFERENCE IN PRESSURE IS
30 PSI - INDICATES CLOGGED
FILTER

DIFFERENTIAL PRESSURE

- (m) When the desired level in the bilges is reached,

- 1 Place the SUPPLY PUMP switch (14) in the OFF position.
- 2 Lamp (15) will go out.
- 3 Place the AUTO-CONTROLS switch (12) in the OFF position.
- 4 Lamp (13) will go out.

2-99. USED ENGINE OIL.

- a. The oil/water separator is used to remove oil pumped from the diesel engines, and oil drained from other devices. The oil is removed by hoses located in both the forward and aft engine rooms. A holding tank located in the aft engine room holds 25 gallons (94.6 liters) of used oil. If the used oil will overflow the holding tank, the used oil can be pumped into a container located on the deck. To remove used engine oil refer to Figure FO-52 and proceed as follows'

2-99. USED ENGINE OIL (Cont).

b. Forward Engine Room

- (1) Place manual shutoff valve (1) in the off position.
- (2) Place manual shutoff valve (2) in the on position.
- (3) Open on-deck valves as required.
 - o Aft engine room valve (3).
 - o Forward engine room valve (4).
- (4) Attach service hose as required.
- (5) Place service hose in container of used oil.
- (6) Check that suction valve (5) is closed (clockwise).
- (7) Determine amount of used oil to be removed.
- (8) Check sight glass (6) on holding tank.

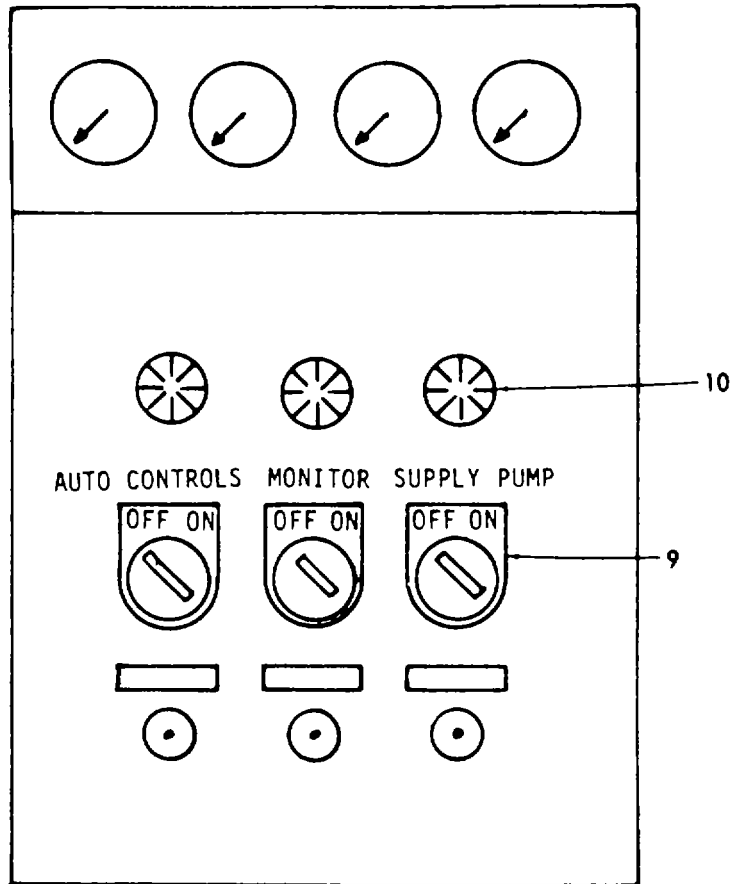
NOTE

Holding tank will hold 25 gallons (94.6 liters).

- (9) If used oil will fit in holding tank proceed as follows-
 - (a) Open inlet valve (7).
 - (b) Close on-deck discharge valve (8).
- (10) If used oil will not fit in holding tank proceed as follows:
 - (a) Close inlet valve (7).
 - (b) Open on deck discharge valve (8).
 - (c) Place a suitable container under valve.

2-99. USED ENGINE OIL (Cont).

- (11) Place the SUPPLY PUMP switch (9) in the ON position.
- (12) Lamp (10) will light.
- (13) When all used oil is removed, place the SUPPLY PUMP switch (9) in the OFF position.
- (14) Lamp (10) will go out.



USED ENGINE OIL

2-100. EMPTYING HOLDING TANK.

The oil/water separator is used to empty the used oil holding tank. Refer to Figure FO-53 and proceed as follows:

a. Aft Engine Room.

Check sight glass (1) on holding tank.

NOTE

Holding tank will hold 25 gallons (94.6 liters).

b. On Deck (Port Side).

(1) Open on-deck discharge valve (2).

(2) Place a suitable container under valve.

c. Aft Engine Room.

(1) Close Inlet valve (3).

(2) Check that valves (4, 5, 6, 7 and 8) are closed.

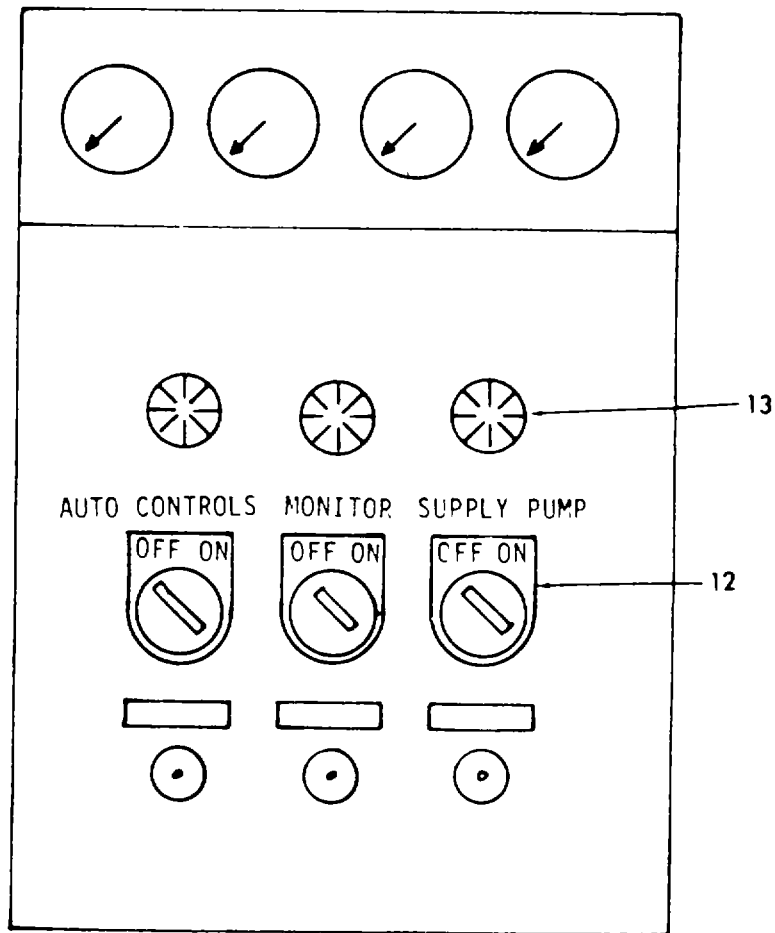
(3) Open suction valve (9).

(4) Place manual shutoff valve (10) in the OFF position.

(5) Place manual shutoff valve (11) in the ON position.

2-100. EMPTYING HOLDING TANK (Cont).

- (6) Place the SUPPLY PUMP switch (12) in the ON position.
- (7) Lamp (13) will light.
- (8) When the holding tank is empty, place the SUPPLY PUMP switch (12) in the OFF position.
- (9) Lamp (13) will go out.



EMPTYING HOLDING TANK

2-101. SEWAGE SYSTEM.

- a. The sewage system consists of the following:
 - o Urinal
 - o Two water closets
 - o Overboard discharge
 - o Two discharge pumps
 - o Two macerator pumps
 - o Air pump and
 - o Associated valves and piping

- h. The urinal and water closets are flushed with fresh water. Refer to paragraph 2-73 for operation of the fresh water system.



Federal law prohibits discharge of sewage into restricted water.

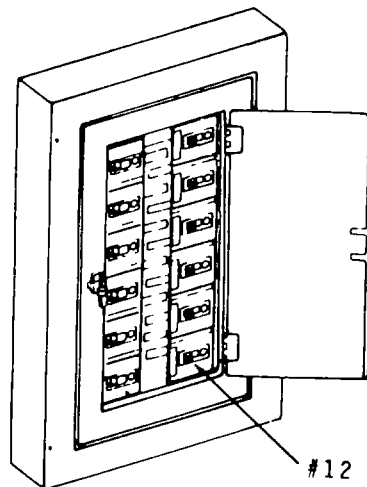
- c. Refer to the following procedures for operating the sewage system:

<u>DESCRIPTION</u>	<u>PARAGRAPH</u>
Normal Operation	2-102
Overboard Discharge Holding Tank	2-103
Overboard Discharge - Macerator Pump	2-104

2-102. SEWAGE SYSTEM - NORMAL OPERATION.

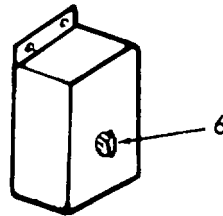
The procedure for initial start-up and normal operation (Figure FO-54) of the sewage system is as follows:

- a. Engine Access Room.
 - (1) Place circuit breaker #12 on power distribution panel (P-400) in the ON position.

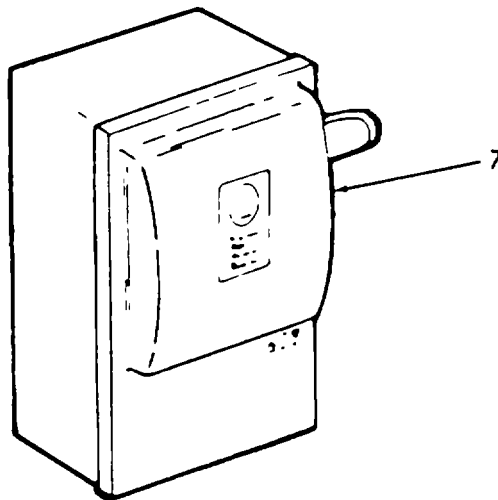


2-102. SEWAGE SYSTEM - NORMAL OPERATION (Cont).

- b. Tank and Auxiliary Machinery Compartment (2-40-0-Q).
- (1) Check that overboard discharge valve (1, Figure 2-117) is full clockwise.
 - (2) Place flow control valve (2, Figure FO-54) lever in the tank position.
 - (3) Check that the ball valve (3, Figure FO-54) lever is in the off position. This valve connects sink drains to the holding tank.
 - (4) If macerator pump #1 is to be used, proceed as follows:
 - (a) Place ball valve (4, Figure FO-54) lever in the open position.
 - (b) Place ball valve (5, Figure FO-54) lever in the closed position.
 - (c) Place macerator pump selector switch (6) to PUMP 1.

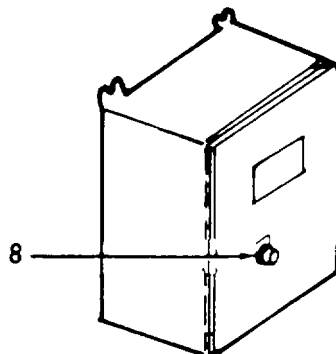


- (d) Place macerator pump #1 disconnect switch (7) in the ON position.



2-102. SEWAGE SYSTEM - NORMAL OPERATION (Cont).

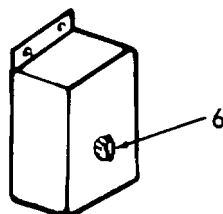
- (e) Press switch (8) on the macerator #1 controller.



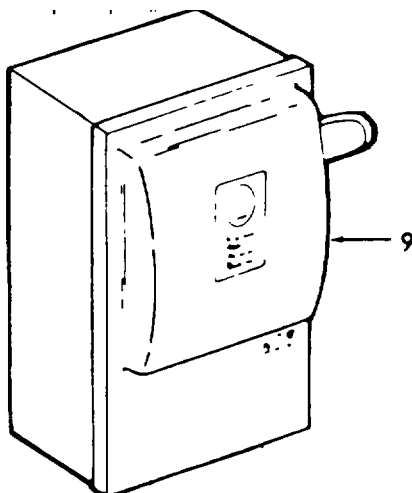
- (f) The macerator pump #1 will run. After a pre-determined amount of time the pump will stop.

- (5) If macerator pump #2 is to be used, proceed as follows:

- (a) Place ball valve (4, Figure FO-54) lever in the closed position.
(b) Place ball valve (5, Figure FO-54) lever in the open position.
(c) Place macerator pump selector switch (6) to PUMP 2.

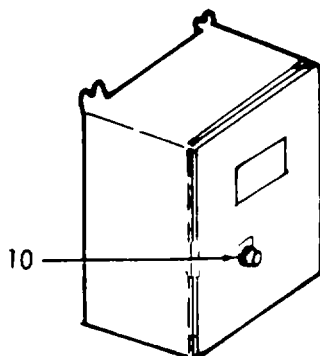


- (d) Place macerator pump #2 disconnect switch (9) in the ON position.



2-102. SEWAGE SYSTEM - NORMAL OPERATION (Cont).

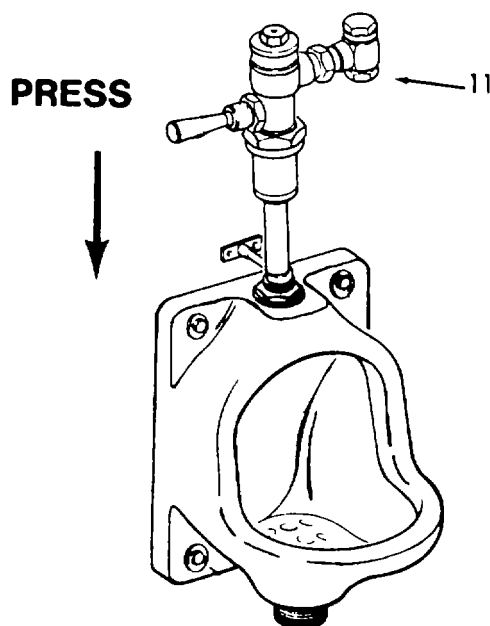
(e) Press switch (10) on the macerator #2 controller.



(f) The macerator pump #2 will run. After a pre-determined amount of time, the pump will stop.

c. Wash Room, Water Closet and Shower (1-44-1-L).

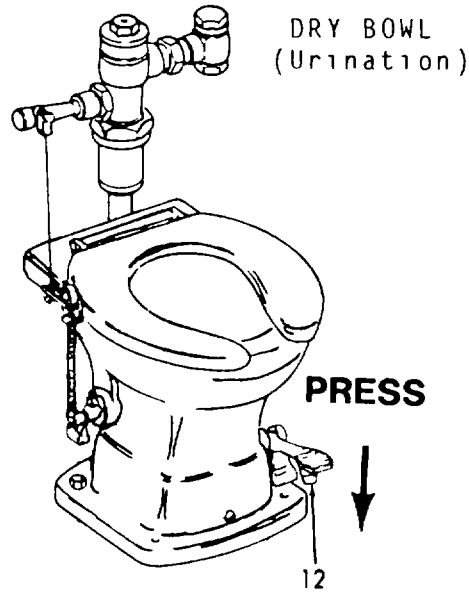
(1) Urinal operation - Press the flush valve (11). A macerator pump will run and then time itself out.



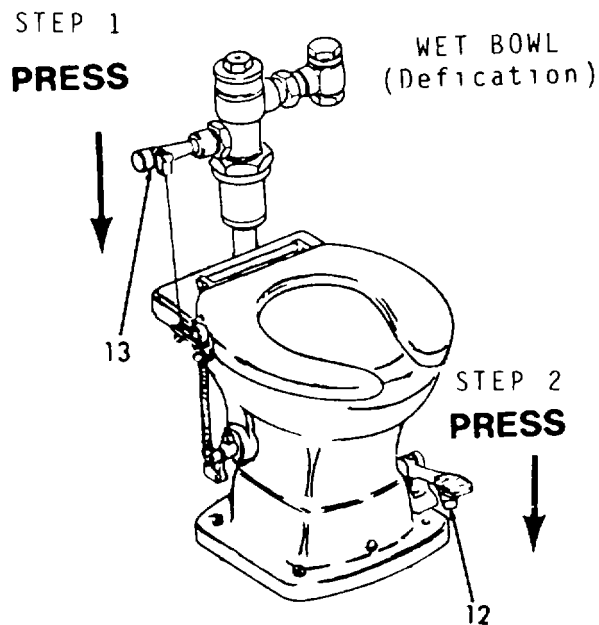
2-102. SEWAGE SYSTEM - NORMAL OPERATION (Cont).

(2) Commode operation is as follows:

(a) Dry bowl - urination - Press foot pedal (12). The bowl will drain and the flush valve will operate.



(b) Wet bowl - defecation - Prior to use, press flush valve (13). Extra water will fill bowl. After use, press foot pedal (12). The bowl will drain and the flush valve will operate.



2-102. SEWAGE SYSTEM - NORMAL OPERATION (Cont).

d. Pilot House.

(1) When the contents of the holding tank reaches 90% of the full mark, the following occurs:

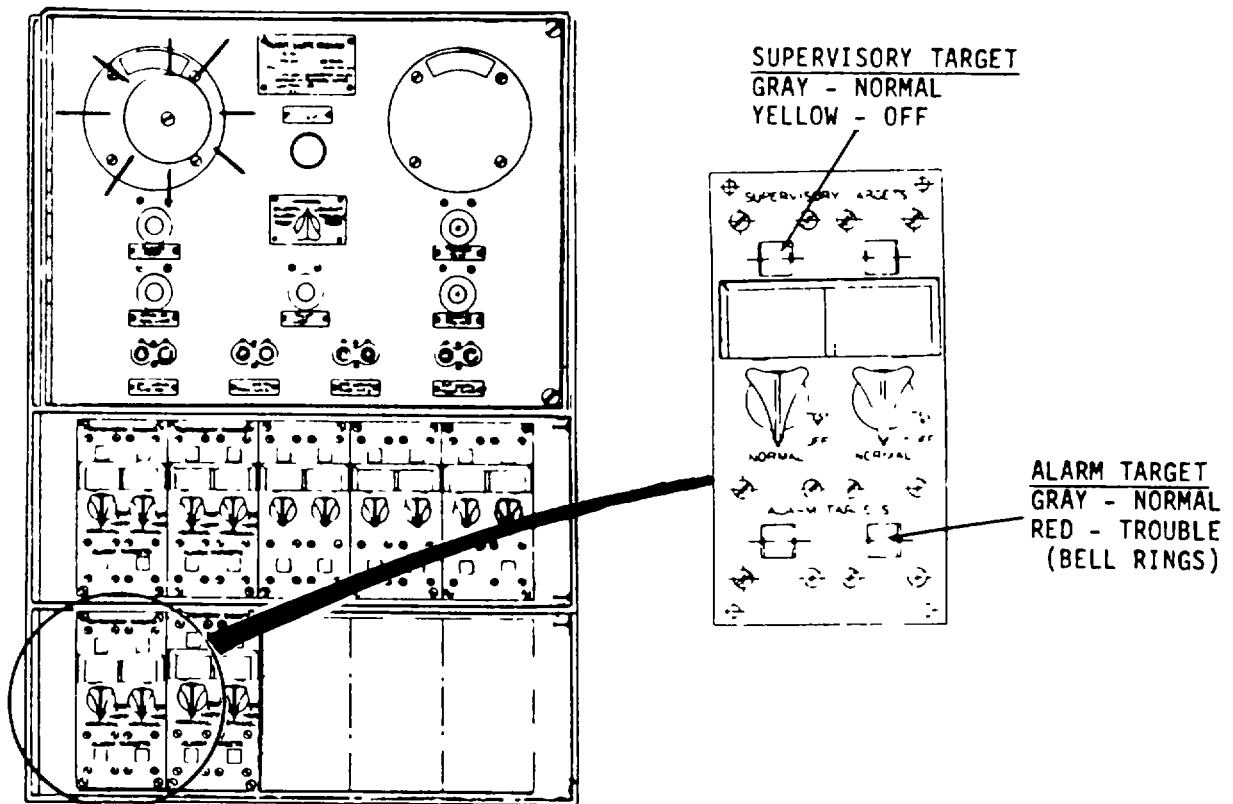
(a) Place the alarm switchboard in operation. (Refer to paragraph 2-110).

(b) Supervisory targets:

gray - normal
yellow - off

(c) Alarm targets:

gray - normal
red - trouble at sewage tank- ALARM BELL WILL RING.



2-102. SEWAGE SYSTEM - NORMAL OPERATION (Cont).

- (d) On the alarm switchboard:
- 1 Bell will ring.
 - 2 Alarm target will be red.
- (2) During normal operation of the sewage system, the need to shut down the system is minimal. Usually, one of the macerator pumps is shut down: not both. To shut down a macerator pump, place the disconnect switch in the OFF position. Place the lever on the input ball valve in the OFF position.

2-103. OVERBOARD DISCHARGE - HOLDING TANK.

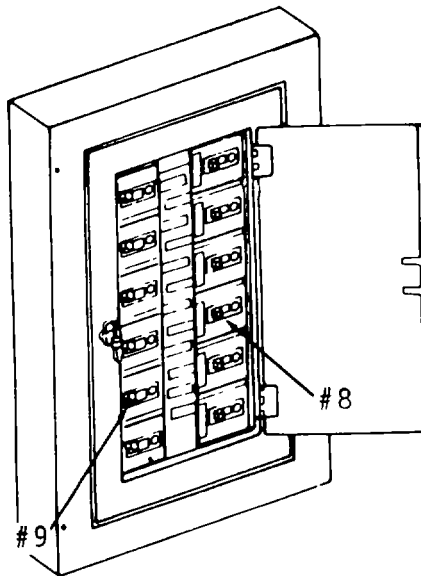
- a. When the holding tank is full, the contents should be discharged to a dock side tank. Refer to Figure FO-55 and proceed as follows:

WARNING

Federal law prohibits dumping of raw sewage in restricted waters.

- (1) Engine Access Room.

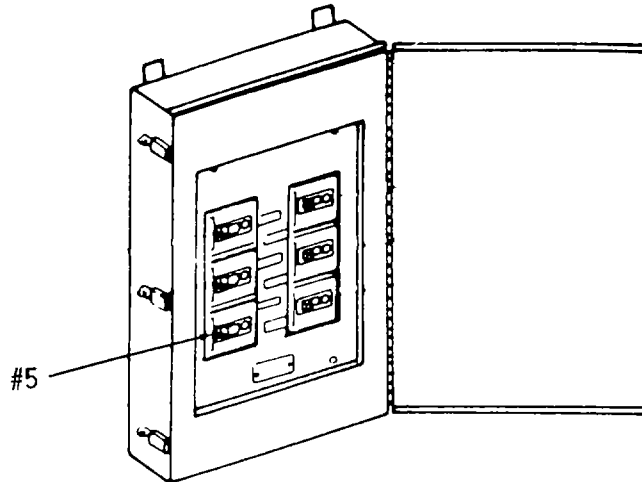
Place circuit breakers #8 and 9 on power distribution panel (P-400) in the ON position.



2-103. OVERBOARD DISCHARGE - HOLDING TANK (Cont).

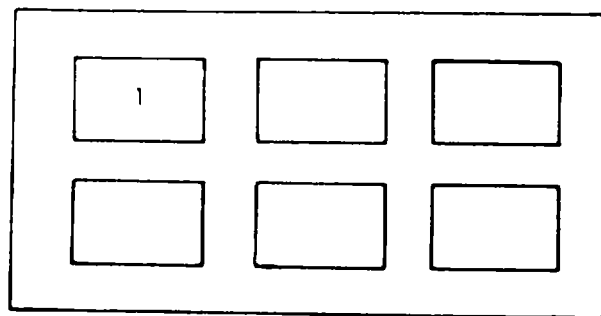
(2) Forward Engine Room.

Place circuit breaker #5 on power distribution panel (P-408) in the ON position.



(3) Crew and Transient Berthing - (2-33-2-L).

Make sure fuse #1 on power distribution panel (P-409) is not blown.

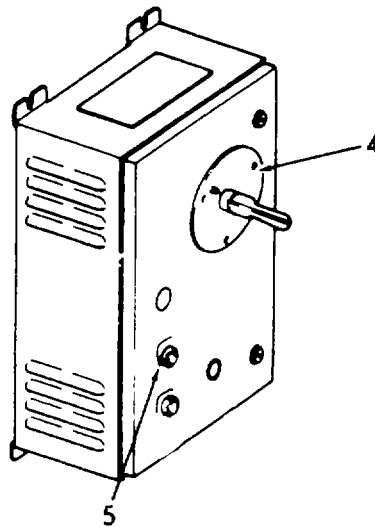


(4) On Deck - (Port Frame 44).

(a) Connect the sewage discharge hose to the sewage discharge deck connection.

2-103. OVERBOARD DISCHARGE - HOLDING TANK (Cont).

- (b) Connect the other end of the hose to the dock sewage system.
 - (c) Place port discharge valve (1, Figure FO-55) lever in the on position.
- (5) Tank and Auxiliary Machinery Compartment - (2-40-0-Q).
- (a) If sewage discharge pump #1 is to be used, proceed as follows:
 - 1 Place ball valve (2, Figure FO-55) lever in the open position.
 - 2 Place ball valve (3, Figure FO-55) lever in the closed position.
 - 3 Place disconnect switch (4) on sewage pump #1 controller in the ON position.

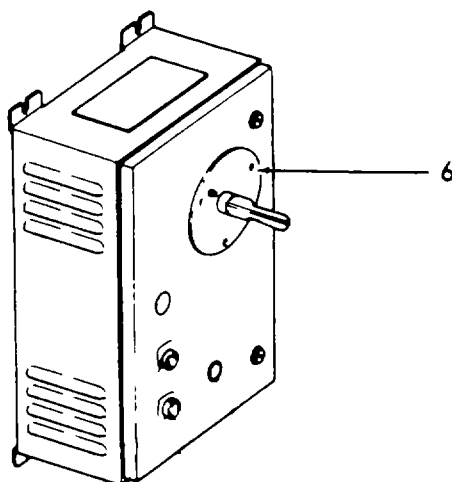


- 4 Press the START switch (5) on the controller.

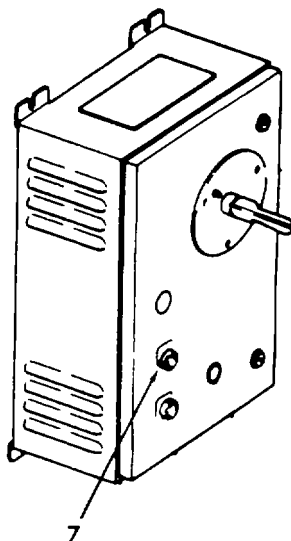
2-103. OVERBOARD DISCHARGE - HOLDING TANK (Cont).

(b) If sewage discharge pump #2 is to be used, proceed as follows:

- 1 Place ball valve (2, Figure FO-55) lever in the closed position.
- 2 Place ball valve (3, Figure FO-55) lever in the open position.
- 3 Place disconnect. switch (6) in the ON position.



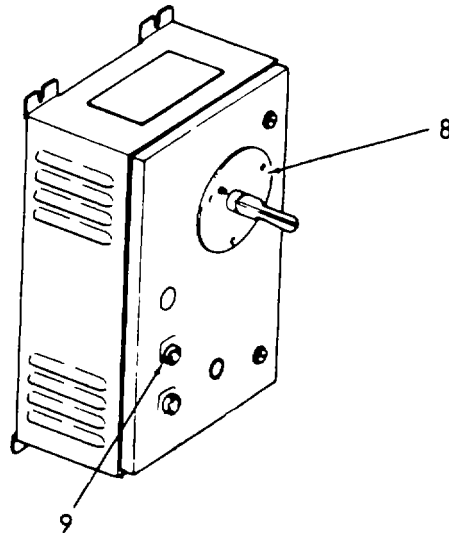
- 4 Press the START switch (7) on the controller.



2-103. OVERBOARD DISCHARGE - HOLDING TANK (Cont).

(c) To start the sewage tank air pump, proceed as follows:

- 1 Place the disconnect switch (8) on the controller in the ON position.
- 2 Press the START switch (9).

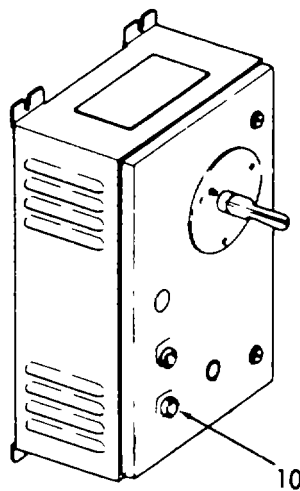


3 The air pump will start blowing air into the holding tank.

b. When the holding tank is empty, refer to figure FO-56 and proceed as follows:

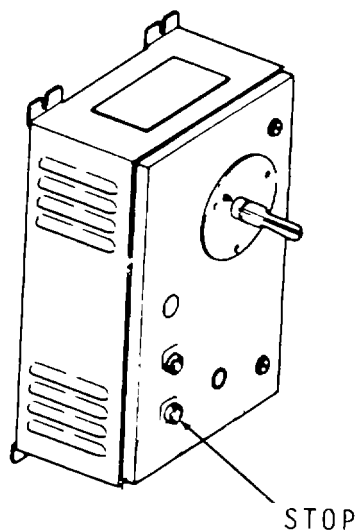
(1) Tank and Auxiliary Machinery Compartment - (2-40-0-Q).

(a) Press the STOP switch (1n) on the sewage air pump controller.

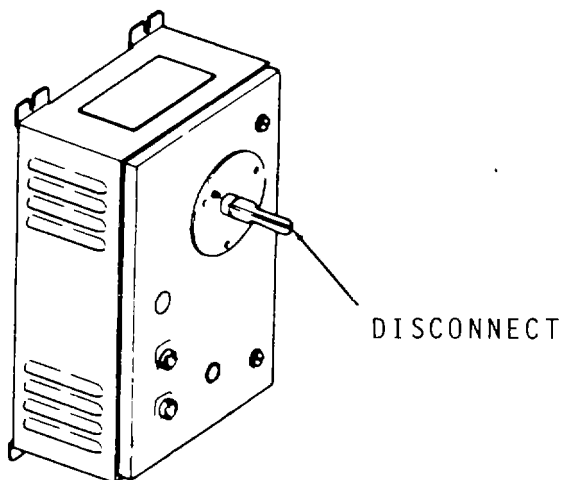


2-103. OVERBOARD DISCHARGE - HOLDING TANK (Cont).

- (b) Press the STOP switch on either or both sewage discharge pump controllers.



- (c) Place the disconnect switch on all controllers in the OFF position.



- (d) Place ball valve (1, Figure FO-56) in the closed position.

- (e) Place ball valve (2, figure FO-56) in the closed position.

2-103. OVERBOARD DISCHARGE - HOLDING TANK (Cont).

- (2) On Deck - (Port Side - Frame 44).
 - (a) Place discharge valve (3, Figure FO-56) lever in the closed position.
 - (b) Disconnect the sewage discharge hose from the dock sewage system.
 - (c) Disconnect the hose from the sewage discharge deck connect on.

2-104. OVERBOARD DISCHARGE - MACERATOR PUMP (s).

- a. Overboard discharge of sewage from the macerator pumps can be done when at sea. Refer to Figure FO-57.

**WARNING**

Federal law prohibits dumping of sewage in restricted waters.

- b. This procedure should be used only when the holding tank, discharge pumps or air pumps are inoperable.
- c. Perform the normal operation procedure in paragraph 2-102.
- d. Tank and Auxiliary Machinery Compartment - (2-40-0-Q).
 - (1) Place flow control valve (1, Figure FO-57) in the over-board discharge position.
 - (2) Rotate valve (2, Figure FO-57) counter-clockwise.
- e. To stop the overboard discharge from the macerator pumps, place flow control valve (2, Figure FO-57) in the to tank position.

2-105. AIR CONDITIONING SYSTEM.

a. The air conditioning system consists of three major components:

- Sea Water Cooling Pump
- Circulating Fans
- Air Conditioning Unit

b. The following is an index to the operating procedures:

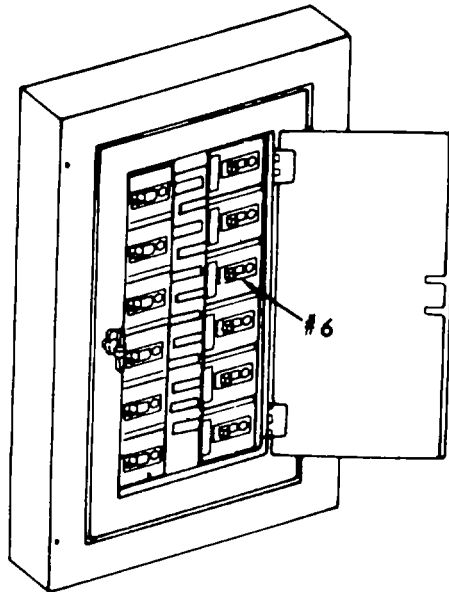
<u>DESCRIPTION</u>	<u>PARAGRAPH</u>
Sea Water Cooling Pump	2-106
Circulating Fans	2-107
System Start-Up	2-108
System Shut-Down	2-109

2-106. AIR CONDITIONING SEA WATER COOLING PUMP.

To start the air conditioning sea water cooling pump, proceed as follows:

a. Engine Access Room (1-50-1-Q).

Place circuit breaker #6 on power distribution panel (P-400) in the ON position.

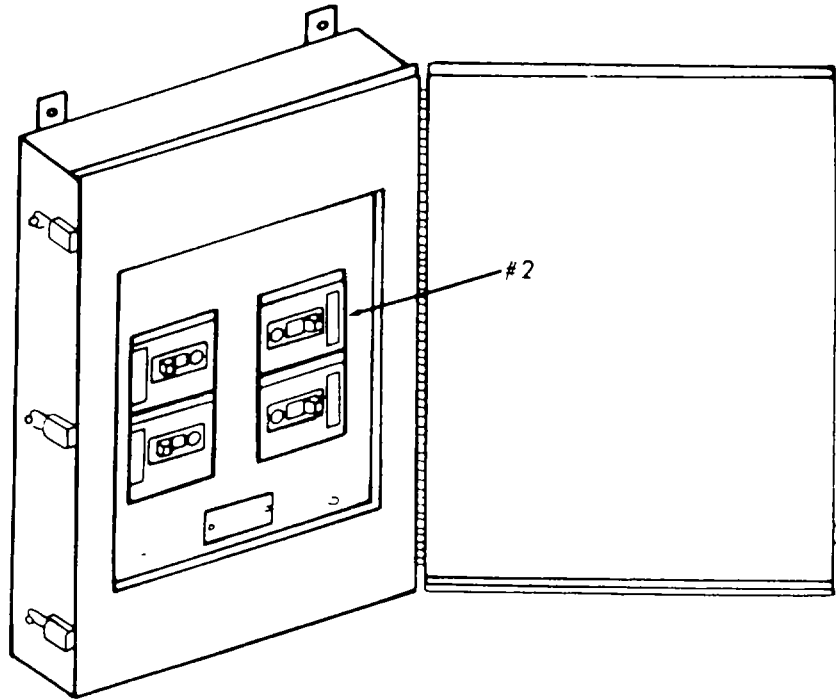


2-462

2-106. AIR CONDITIONING SEA WATER COOLING PUMP (Cont).

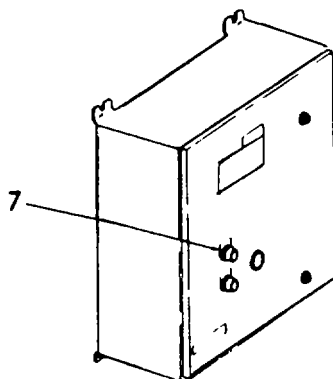
b. Air Conditioning Room.

- (1) Place circuit breaker #2 on power distribution panel (P406) in the ON position.

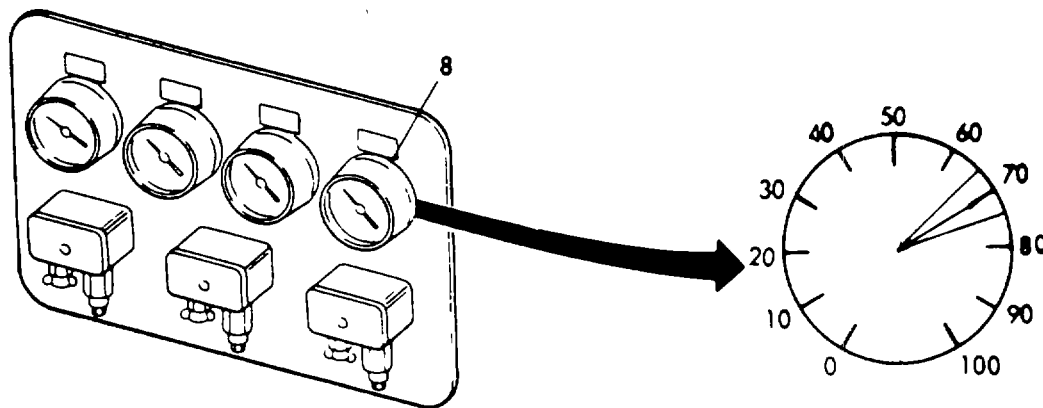


2-106. AIR CONDITIONING SEA WATER COOLING PUMP (Cont).

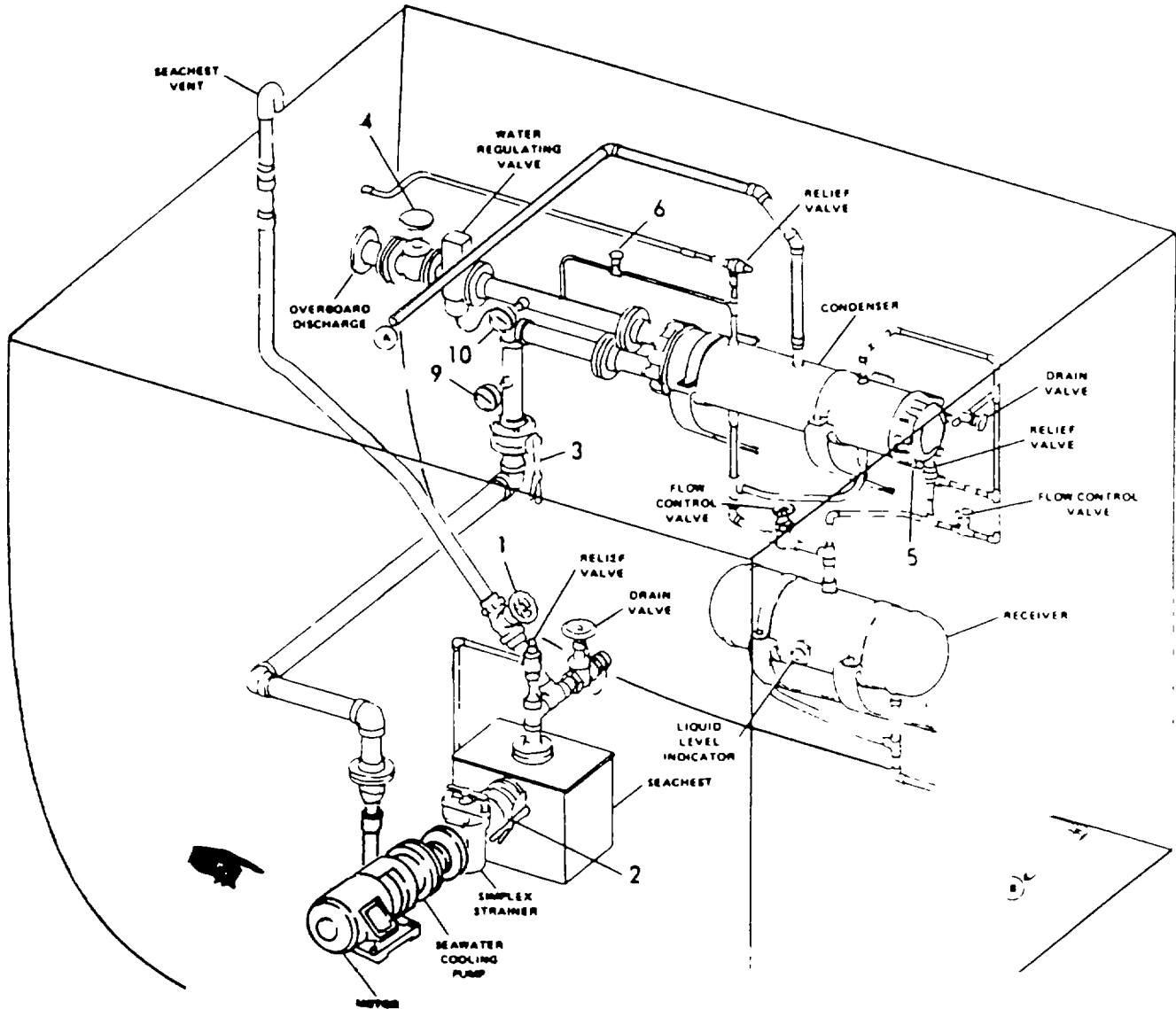
- (2) Rotate vent shutoff valve (1) counter-clockwise.
- (3) Place flow control valve (2) in the open position.
- (4) Place flow control valve (3) in the open position.
- (5) Rotate overboard discharge shutoff valve (4) counterclockwise.
- (6) Open drain valves (5).
- (7) Rotate shutoff valve (6) counter-clockwise.
- (8) Press the START switch (7) on the sea water pump controller.



- (9) The sea water pump will now run.
- (10) Air will escape from drain valves (5). Close when sea water is present.
- (11) Observe sea water cooling gauge (8). The pressure should be 70 to 75 psi (482.6 to 517.1 kPa).



2-106. AIR CONDITIONING SEA WATER COOLING PUMP (Cont).



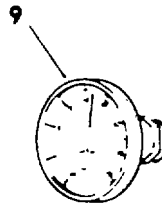
4954-033

(12) If the pressure is incorrect, adjust flow control valve.

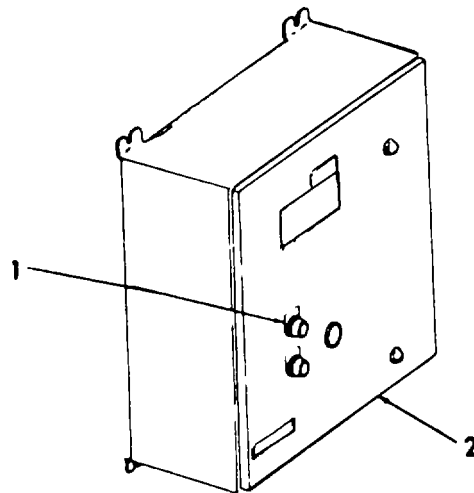
Change 2 2-465

2-106. AIR CONDITIONING SEA WATER COOLING PUMP (Cont).

(13) Thermometer (9) indicates incoming sea water temperature.



(14) Thermometer (10) indicates temperature of discharge water.



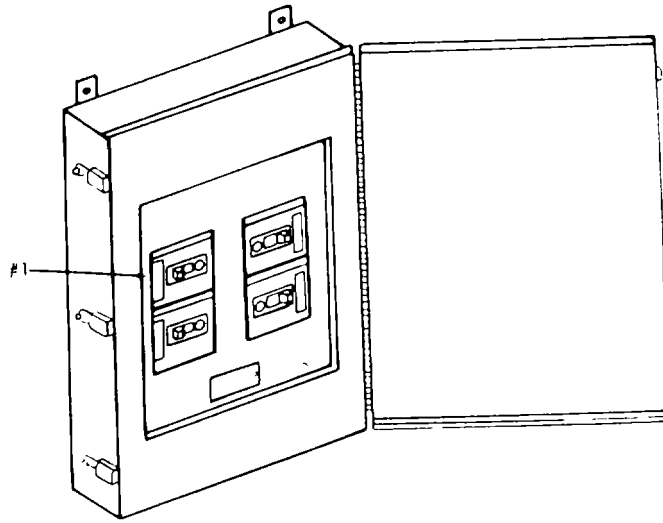
2-107. AIR CONDITIONING CIRCULATING FANS.

To start the air conditioning circulating fans, proceed as follows:

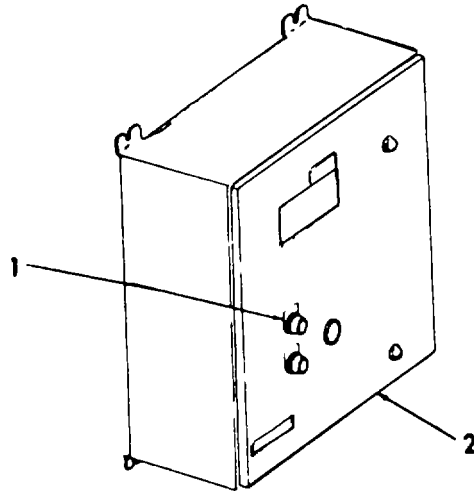
Air Conditioning Room.

- a. Place circuit breaker #1 on power distribution panel (P406) in the ON position.

2-107. AIR CONDITIONING CIRCULATING FANS (Cont).



- b. Press the START switch (1) on the fan controller (2).



2-108. AIR CONDITIONING SYSTEM START-UP.

To start the air conditioning system, (Figure FO-58), proceed as follows:

- a. Crew and Transient Berthing.

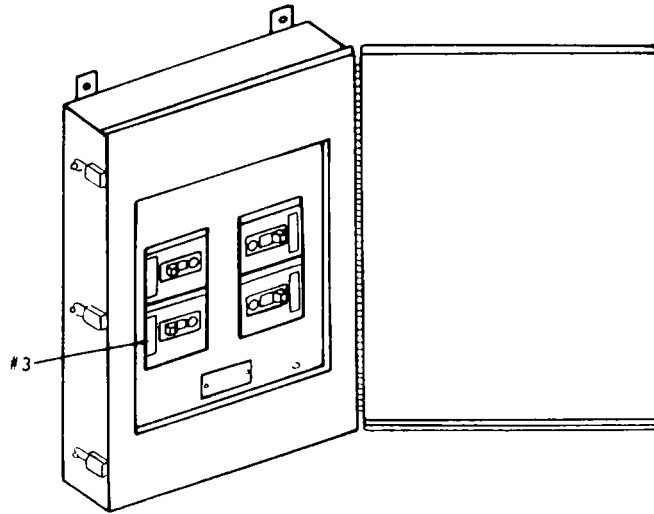
Place circuit breaker #3 on power distribution panel (P406) in the ON position.

- b. Air Conditioning Compartment (2-28-1-A).

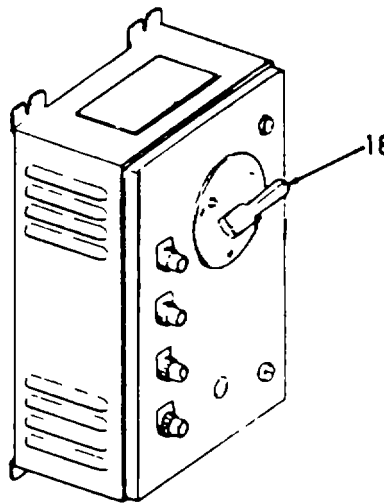
- (1) Rotate condenser outlet flow control valve (1) counter-clockwise.
- (2) Rotate condenser-receiver equalizing line flow control valve (2) counter-clockwise.
- (3) Rotate heat exchanger liquid inlet shutoff valve (3) counter-clockwise.
- (4) Rotate charge and drain valve (4) clockwise.
- (5) Rotate drain valve (5) clockwise.
- (6) Rotate heat exchanger liquid bypass shutoff valve (6) clockwise.
- (7) Rotate dryer bypass valve (7) counter-clockwise.
- (8) Rotate dryer output valve (8) clockwise.
- (9) Rotate dryer input valve (9) clockwise.
- (10) Rotate thermal expansion valve (10) counter-clockwise.
- (11) Rotate liquid solenoid shutoff valve (11) counter-clockwise.
- (12) Rotate thermal expansion shutoff valve (12) counter-clockwise.
- (13) Rotate compressor stop suction shutoff valve (13) clockwise.
- (14) Rotate hand expansion valve (14) clockwise.
- (15) Rotate lube oil gauge valve (15) counter-clockwise.
- (16) Rotate compressor suction gauge valve (16) counter-clockwise.
- (17) Rotate compressor discharge gauge valve (17) counter-clockwise.

2-108. AIR CONDITIONING SYSTEM START-UP (Cont).

(18) Place circuit breaker #3 on power distribution panel (P409) in the ON position.



(19) Place disconnect switch (18) on the compressor controller in the ON position.



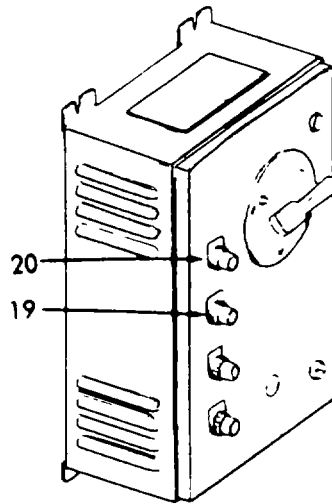
(20) Check that the sea water cooling pump is operating (paragraph 2-106).

(21) Check that the circulating fans are operating (paragraph 2-107).

(22) Rotate compressor stop suction shut off valve (13) approximately one full turn counter-clockwise.

2-108. AIR CONDITIONING SYSTEM START-UP (Cont).

- (23) Do the following together:
- (a) Press START switch (19) and,
 - (b) Press and hold L.P. BYPASS switch (20).
- (24) When compressor motor is running at full speed-release L.P. BYPASS switch (20). Proceed to step (25) immediately.

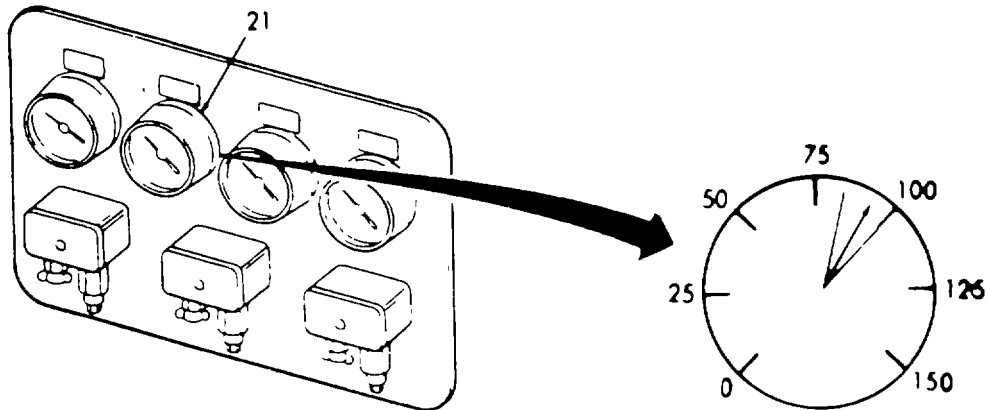


CAUTION

Open compressor suction stop shut off valve (13) slowly.
This will prevent pumping oil out of compressor.

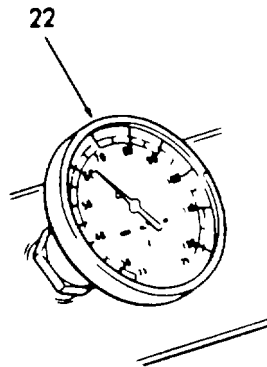
- (25) Start rotating the compressor suction stop shut off valve (13) counter-clockwise.
- (26) Observe compressor suction gage (21). Normal reading should be between 80 to 100 psi (551.6 to 689.5 kPa).
- (27) Stop rotating valve (13), when normal reading on gage (19) is reached.

2-108. AIR CONDITIONING SYSTEM START-UP (Cont).

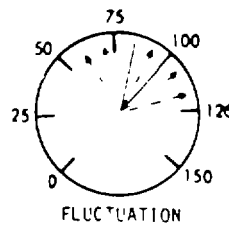
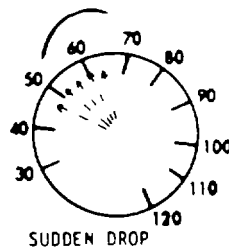


(28) Observe air conditioning system for 5 minutes. Check for the following:

- (a) Compressor suction temperature gage (22) should read 65°F (18.3°C).



- (b) Compressor suction gage (21) should read 80 to 100 psi (551.6 to 689.5 kPa).
- (c) If the compressor suction temperature gage (22) shows a sudden drop in temperature, or,
- (d) If the compressor suction gage (21) fluctuates rapidly-



2-108. AIR CONDITIONING SYSTEM START-UP (Cont).

- (e) Rotate the compressor suction stop shut-off valve (13) slowly clockwise until the proper compressor suction pressure is reached.

CAUTION

If the compressor starts knocking, or the compressor suction gauge continues to fluctuate, STOP the compressor immediately, and rotate the compressor suction stop shut-off valve (13) clockwise. Wait five minutes and attempt a restart, with the compressor suction stop shut-off valve (13) partially open.

- (29) Check the following gages.

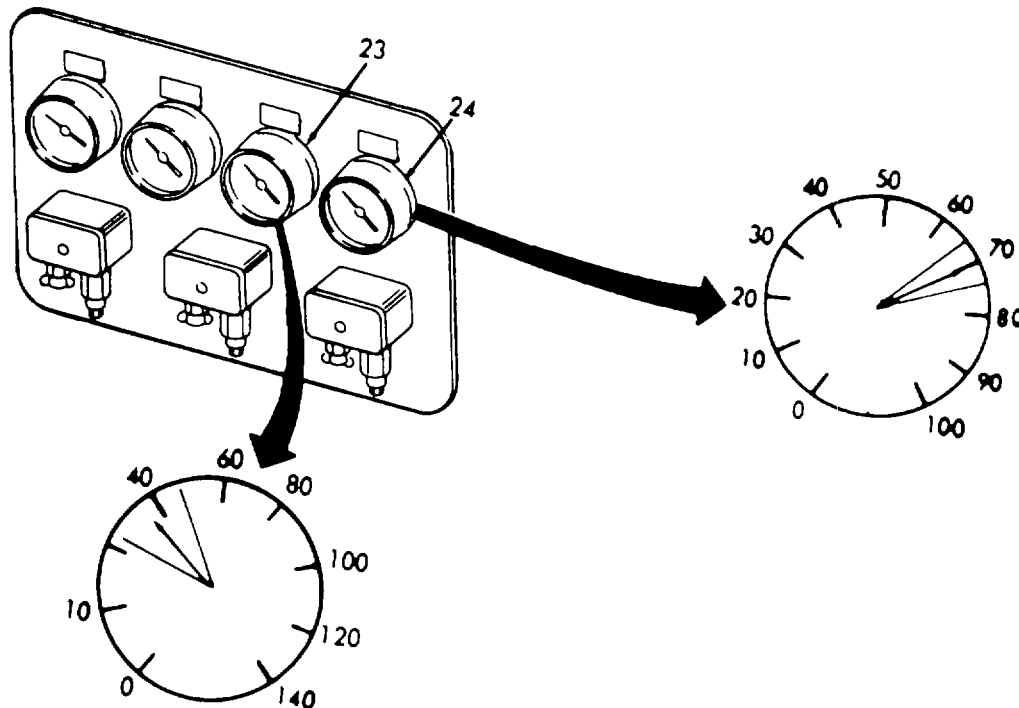
Compressor Suction Temperature (22)-65°F (17.8°C).

Compressor Suction (21)-80 to 100 psi (551.6 to 689.5 kPa).

- (30) Rotate the compressor suction stop shut-off valve (13) full counter-clockwise.

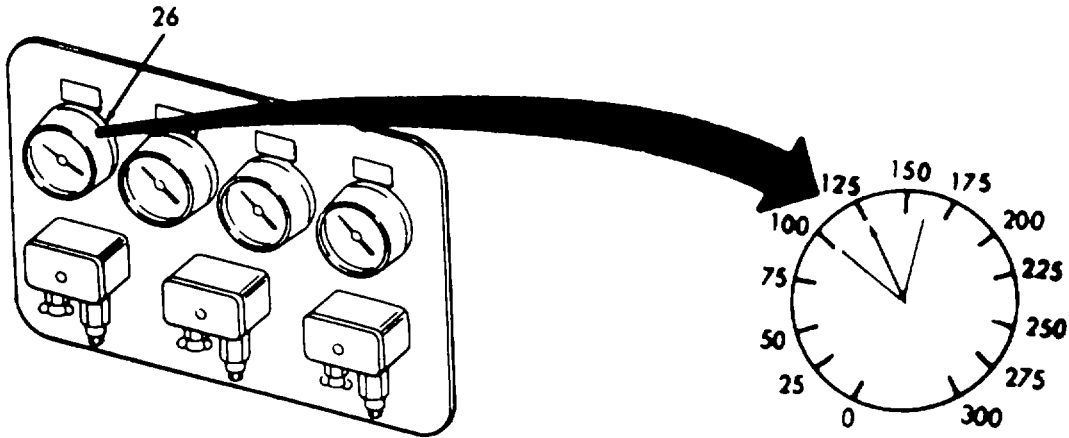
- (31) Check the lube oil pressure gage (23). The pressure should be 20 to 55 psi (137.9 to 379.2 kPa).

- (32) Check the sea water cooling pressure gage (24). The pressure should be 70 to 75 psi (482.6 to 517.1 kPa).

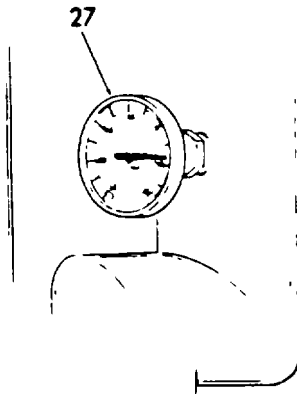


2-108. AIR CONDITIONING SYSTEM START-UP (Cont).

- (33) Adjust flow control valve (25) to obtain required pressure.
- (34) Check the compressor discharge pressure gauge (26). The pressure should be 100 to 135 psi (689.5 to 930.8 kPa).



- (35) Check the compressor discharge temperature (27). The temperature should not exceed 240°F (115.6°C).



- (36) If the temperature in step (35) exceeds 240°F (115.6°C), do the following:
 - (a) Rotate heat exchanger liquid inlet shut-off valve (3) clockwise.

2-108. AIR CONDITIONING SYSTEM START-UP (Cont).

- (b) Rotate heat exchanger liquid bypass shutoff valve (6) counter-clockwise.
- (37) Rotate hand expansion valve (14) counter-clockwise 1/4 turn at a time.
- (38) Check liquid indicator (28) for moisture.

Blue-Acceptable level of moisture.
 Pink-Excessive level of moisture.

If pink, perform step (39). If not, skip to step (40).

- (39) To place the dryer in use, proceed as follows:
 - (a) Rotate dryer output valve (8) counter-clockwise.
 - (b) Rotate dryer input valve (9).
 - (c) Rotate dryer bypass valve (7) clockwise.

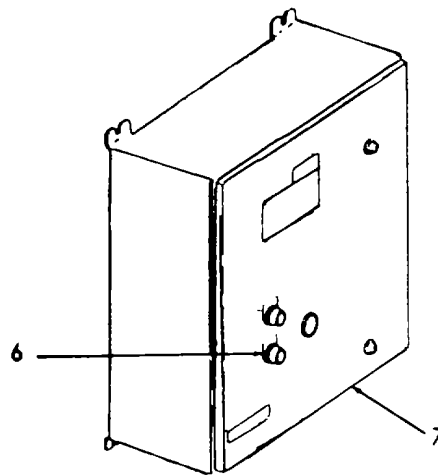
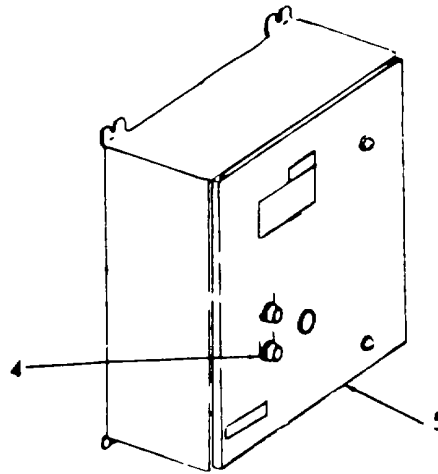
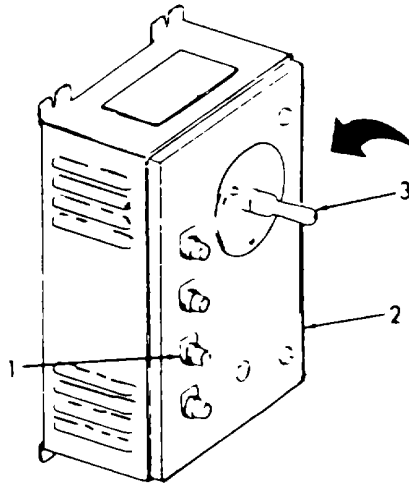
- (40) Check liquid level indicator (29):

Bubbles-system needs refrigerant. Refer-problem to maintenance.
 Liquid-system satisfactory.

2-109. AIR CONDITIONING SYSTEM SHUT-DOWN.

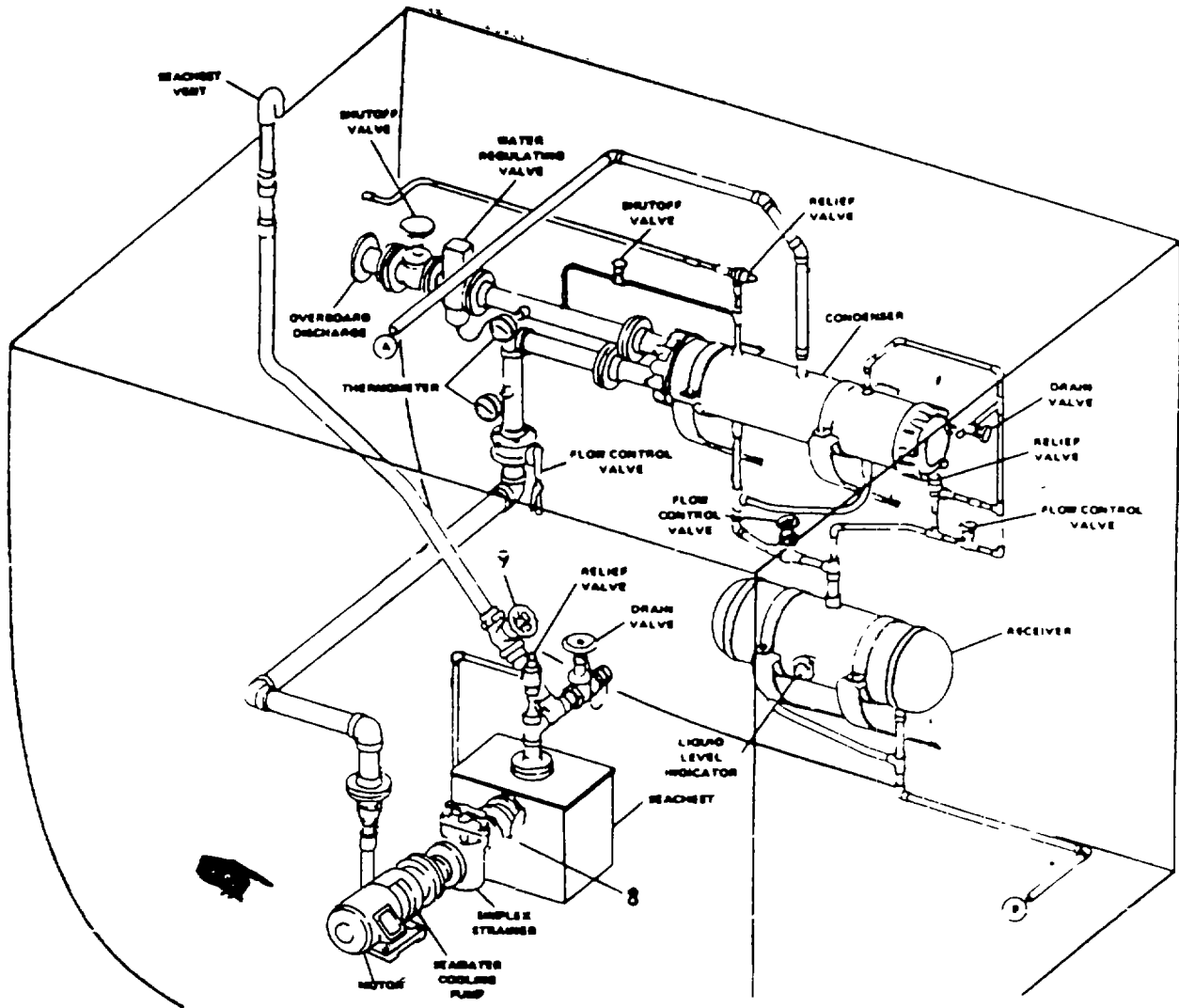
- a. The following procedure is for stopping the air conditioning system for a limited period of time.
- b. Air Conditioning Compartment-(2-28-1-A).
 - (1) Press the STOP switch (1) on the air compressor controller (2).
 - (2) Place the disconnect switch (3) in the OFF position.
 - (3) Press the STOP switch (4) on the fan controller (5).
 - (4) Press the STOP switch (6) on the sea water cooling pump controller (7).

2-109. AIR CONDITIONING SYSTEM SHUT-DOWN (Cont).



2-109. AIR CONDITIONING SYSTEM SHUT-DOWN (Cont).

- (5) Place the flow control valve (8) In the OFF position.
- (6) Rotate shut valve (9) clockwise.



4954-032

2-110. ALARM SYSTEM.

a. The alarm system is for the detection and warning for the following:

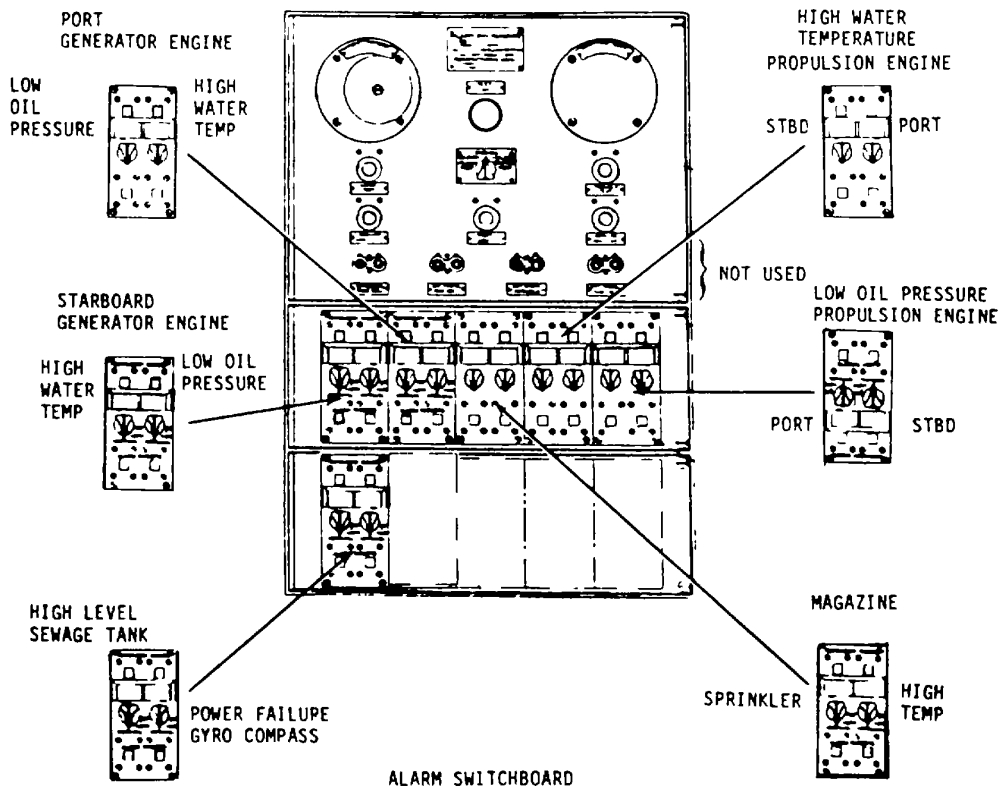
- Propulsion engine low oil pressure
- Propulsion engine high temperature
- Generator engine low oil pressure
- Generator engine high temperature
- Magazine high temperature
- Magazine sprinkler
- Sewage tank-high level
- Gyro Compass-power failure.

NOTE

Prior to starting a propulsion engine or a generator- shut off the low oil pressure alarm. This will keep the alarm bell from ringing.

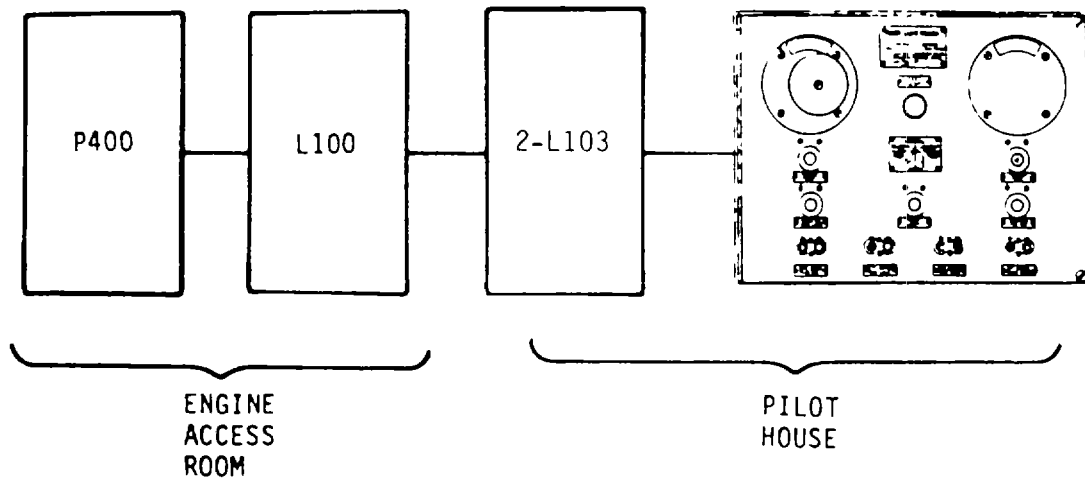
b. The following is an index to the operating procedures:

<u>DESCRIPTION</u>	<u>PARAGRAPH</u>
Alarm System Turn-On	2-111
System Alarms	2-112
Alarm System Test	2-113
Alarm System Turn-Off	2-114



2-111. ALARM SYSTEM TURN-ON.

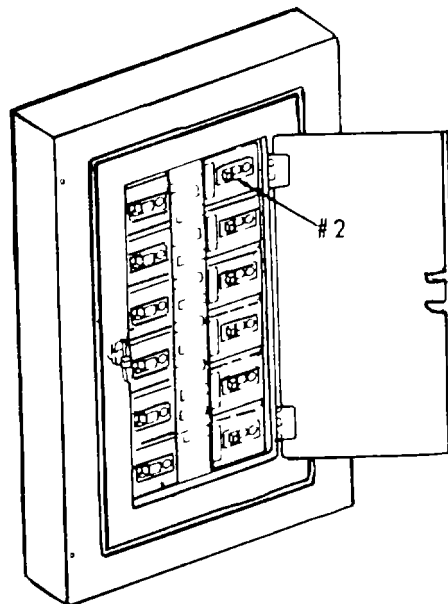
a. This procedure turns on the alarm system switchboard. Below is a block diagram of the power inputs to the alarm switchboard. For alarm indications, refer to paragraph 2-112.



b. To turn on the alarm switchboard proceed as follows

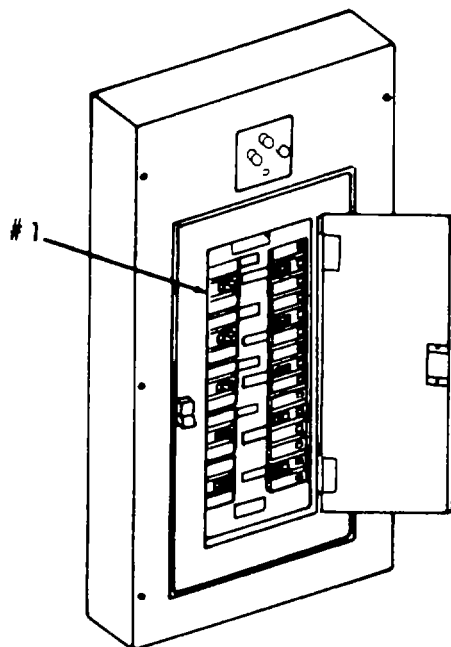
(1) Engine Access Room.

(a) Place circuit breaker #2 on power distribution panel (P-400) in the ON position.



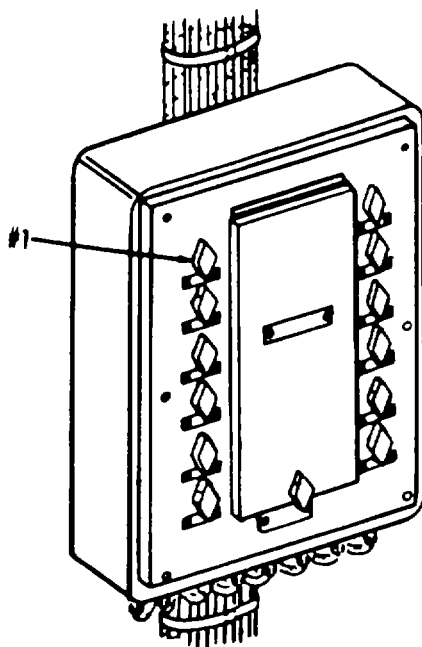
2-111. ALARM SYSTEM TURN-ON (Cont).

- (b) Place circuit breakers #7 on lighting distribution panel (L-100) in the ON position.



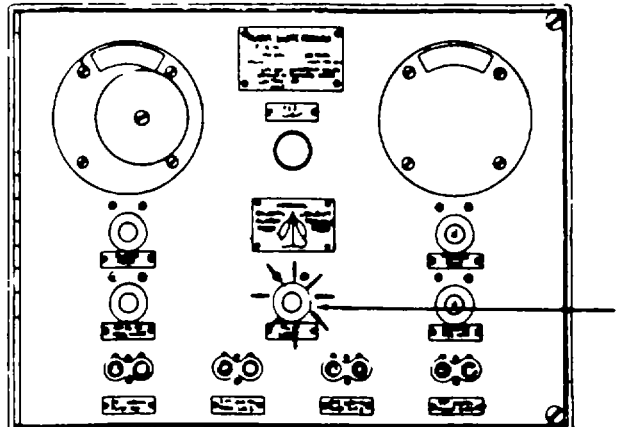
- (2) Pilot House.

- (a) Place switch circuit breaker #1 on distribution box (2-L103) in the ON position.



2-111. ALARM SYSTEM TURN-ON (Cont).

- (b) The PILOT LIGHT (1) will be lit.



WARNING

Failure of the PILOT LIGHT should be checked immediately. Failure indicates either a defective lamp or the source of supply has failed. The alarm system is out of service.

- (c) Place the silent test switch (2) in the NORMAL position.
- (d) Place all switches (3) on the alarm units in the NORMAL position

2-111. ALARM SYSTEM TURN-ON (Cont).

(e) The alarm system is operational.

NOTE

If the alarm system is being turned on for the first time, or after being serviced-perform the tests in paragraph 2-113.

2-112. SYSTEM ALARMS.

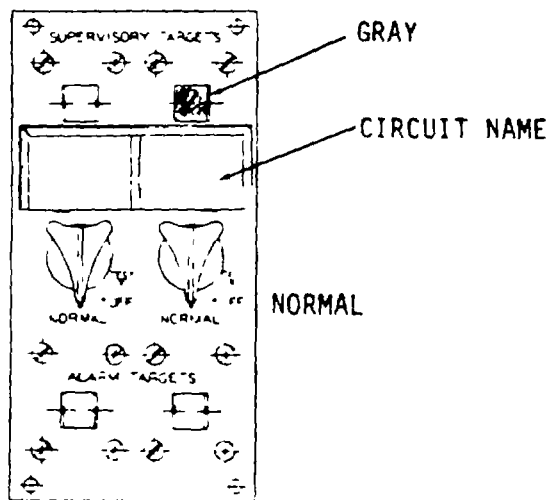
a. The alarm system switchboard gives audible and visual alarms as follows:

- SUPERVISORY-Trouble in the circuit. A buzzer will sound. A yellow target is visible. There is a problem in the sensing device, or the wiring to the alarm switchboard.
- ALARM-Dangerous situation. A bell will ring. A red target is visible. There is a problem in the following: propulsion engine, generator engine, sewage tank, magazine, or gyro compass.

b. The alarms are as follows:

(1) SUPERVISORY ALARMS-The target is as follows:

Gray-normal
Yellow-OFF BUZZER will sound

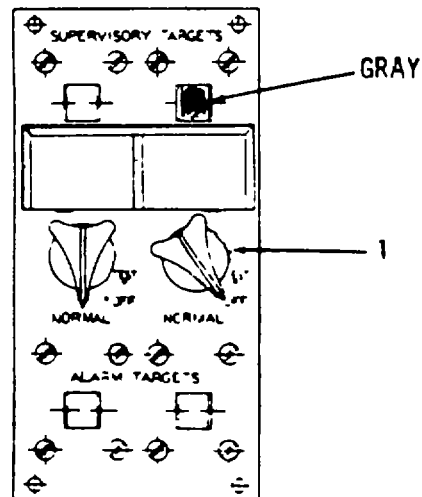
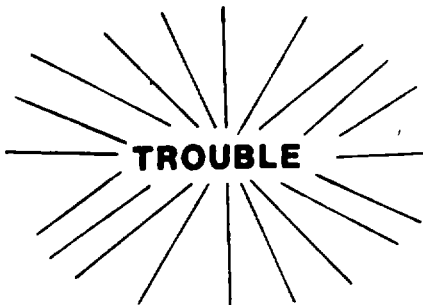
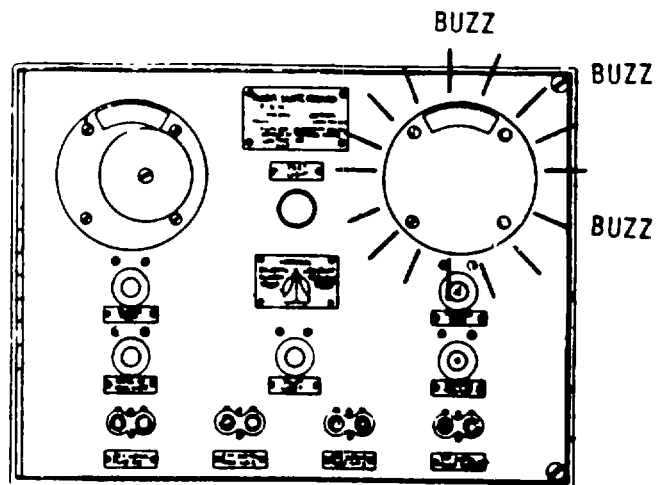
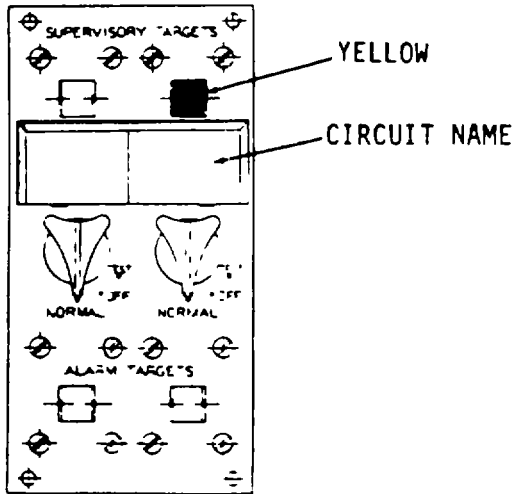


2-112. SYSTEM ALARMS (Cont).

The yellow target and buzzing indicates trouble in the indicated circuit:

To stop the buzzing:

- 1 Place switch (1) in the OFF position.
- 2 The SUPERVISORY TARGET will indicate gray.

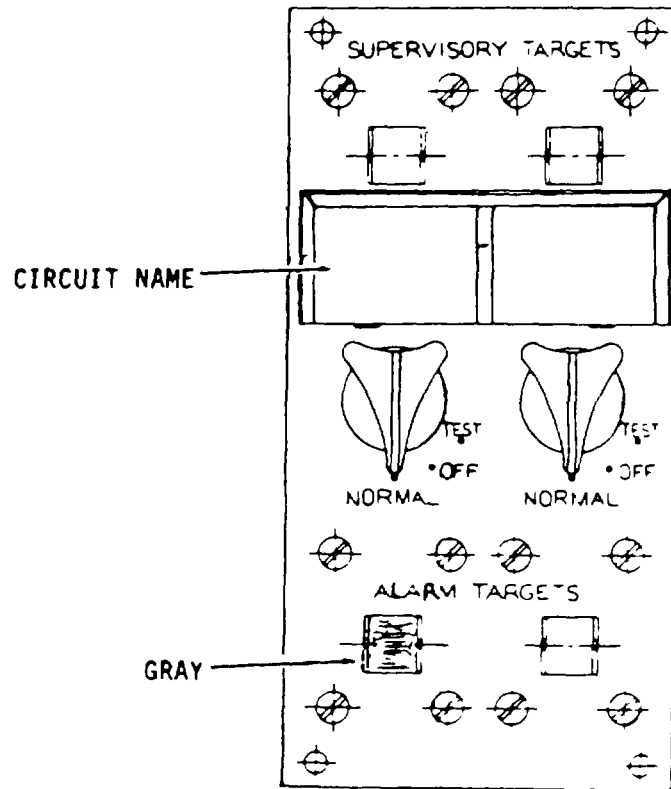


2-112. SYSTEM ALARMS (Cont).

(2) ALARM-The target is as follows:

Gray-normal

Red-alarm-BELL WILL RING



2-112. SYSTEM ALARMS (Cont).

The red target and bell Indicates alarm in area Indicated.

- c. To stop the bell, proceed as follows:



WARNING

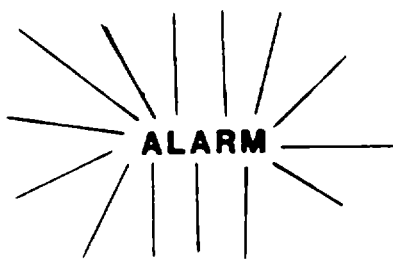
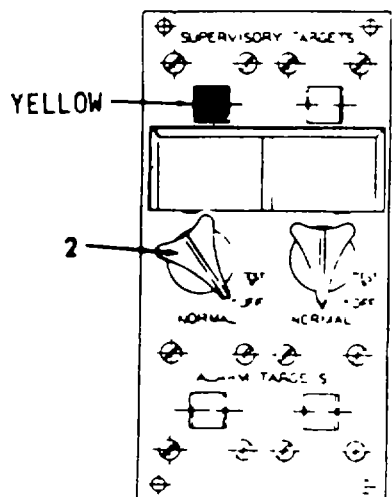
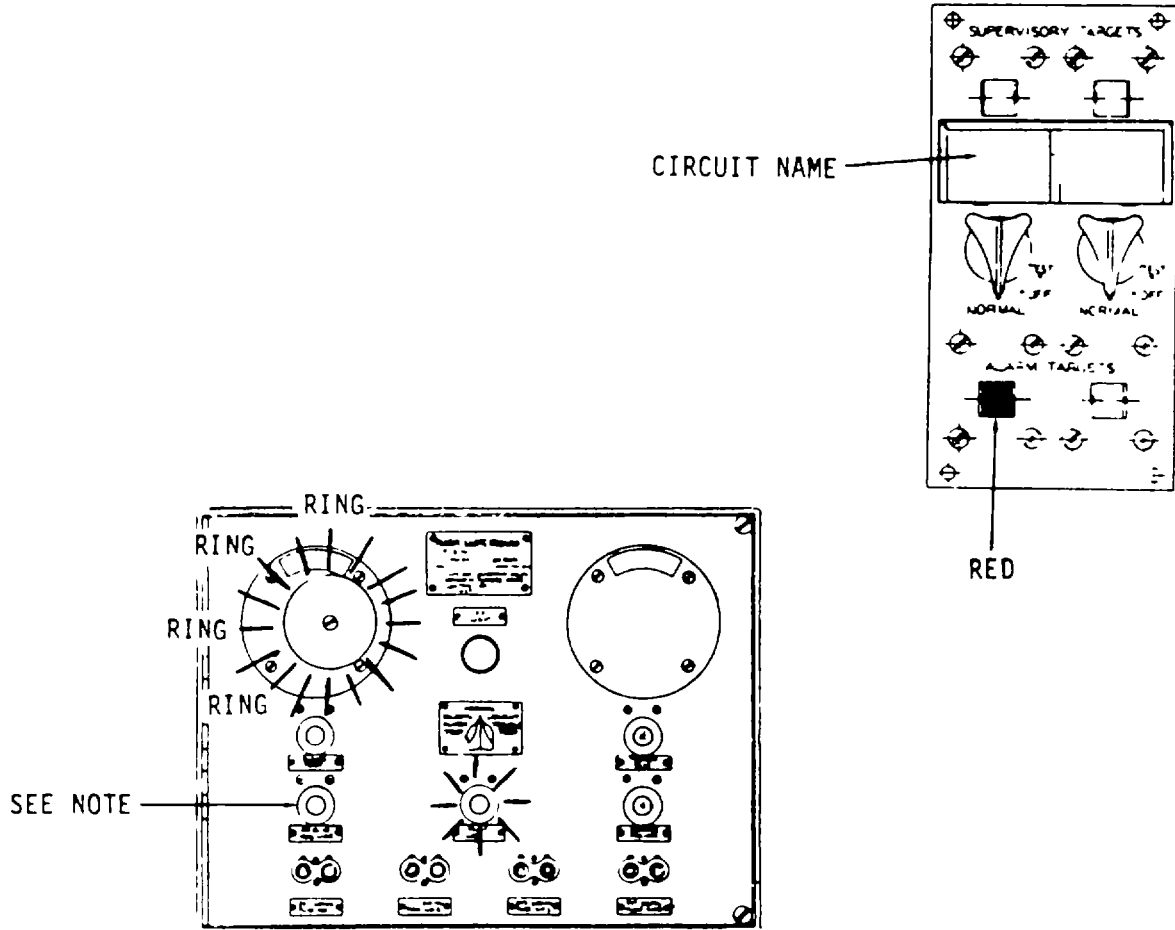
After an alarm-Turn the circuit OFF as soon as possible. This will restore the alarm system to normal. If not, the next alarm will show only the RED indicator. This Indication might be overlooked in time of stress or excitement.

- (1) Place switch (2) in the OFF position.
 - (2) The bell will stop ringing.
 - (3) The SUPERVISORY TARGET will indicate yellow.
 - (4) The ALARM TARGET will indicate gray.
- d. When the alarm has been corrected:
- (1) Place switch (2) in the NORMAL position.
 - (2) The SUPERVISORY TARGET will indicate gray.
 - (3) The alarm system has been restored to normal operation.

NOTE

If the switch is placed in the OFF position and the GROUND NEG LINE lamp is lit-there is a ground. Request assistance.

2-112. SYSTEM ALARMS (Cont).



NOTE

IF THE GROUND NEG LINE LAMP IS LIT - THERE IS A GROUND - REQUEST ASSISTANCE.

2-113. ALARM SYSTEM TEST.

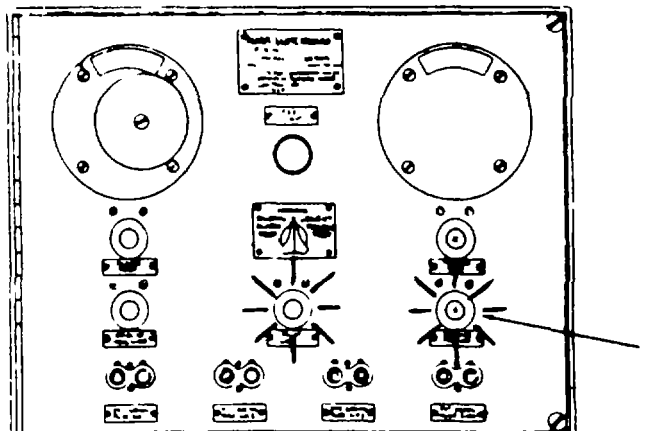
- a. The alarm system should be tested as follows:
 - initial turn-on
 - after service
 - as required
- b. There are three types of tests:
 - ground test
 - alarm test
 - trouble test
- c. The alarm system must be turned on and the PILOT LIGHT is lit. (Refer to paragraph 2-111). To test the alarm system proceed as follows:

(1) Ground test.

(a) Positive Ground-

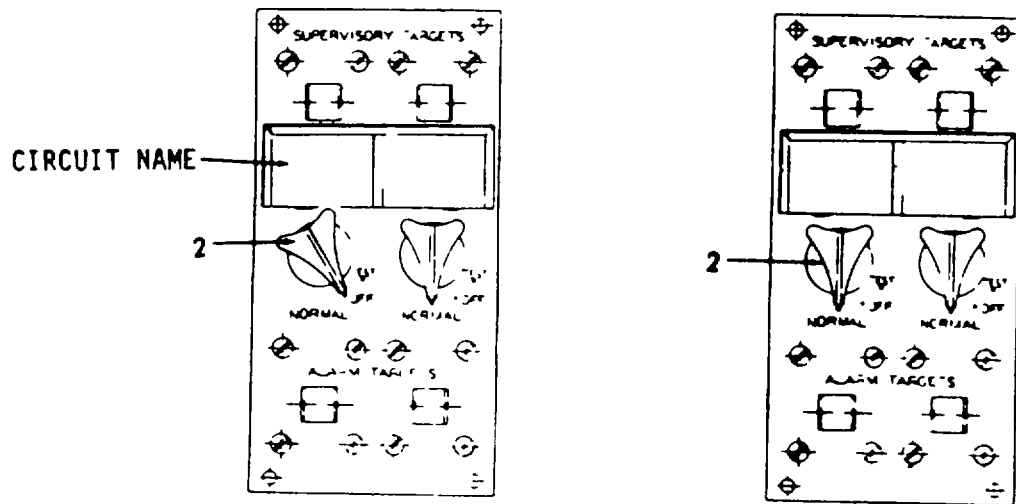
- 1 The GROUND POS. LINE lamp (1) is brightly lit. A ground is present in one or more of positive wires to a sensing device.

the



- 2 One at a time-Place switch (2) in the OFF position. If the light goes out, the positive ground is in the indicated circuit.
- 3 Place each switch (2) in the NORMAL position. If either ground light (1 or 3) is lit, there is a ground in that circuit also.

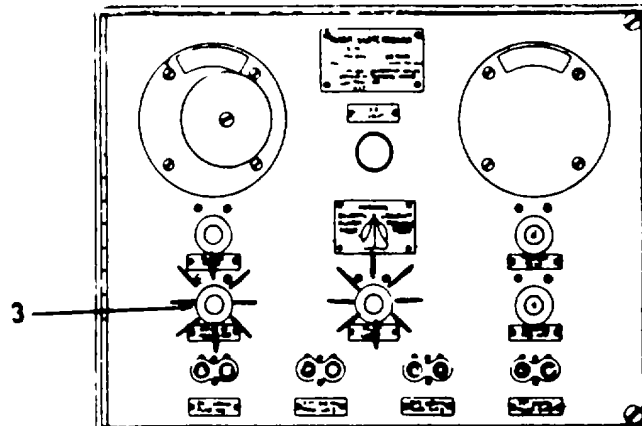
2-113. ALARM SYSTEM TEST (Cont).



4 Request assistance to correct problem.

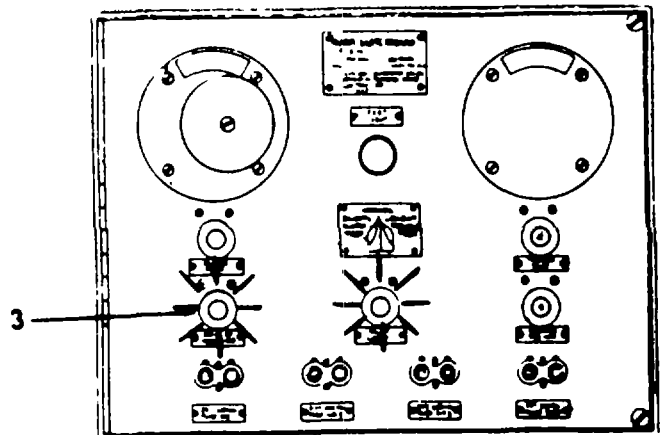
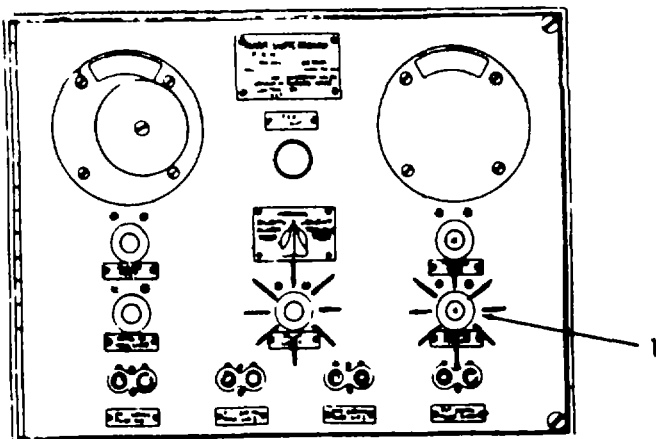
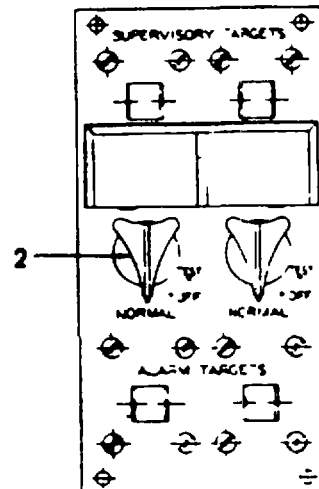
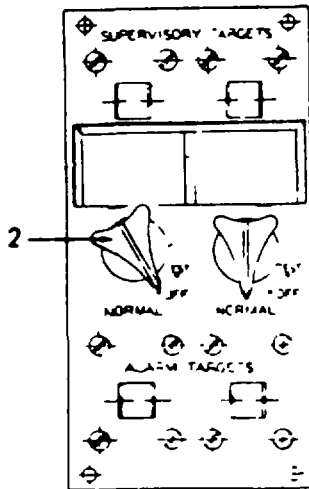
(b) Negative Ground-

1 The GROUND NEG. LINE lamp (3) is brightly lit. A ground is present in one or more of the negative wires to a sensing device.



2-113. ALARM SYSTEM TEST (Cont).

- 2 One at a time-Place switch (2) in the OFF position. If the light (3) goes out, the negative ground is in the indicated circuit.
- 3 Place each switch (2) in the NORMAL position if either ground light (1 or 3) is lit. There is a ground in that circuit also.



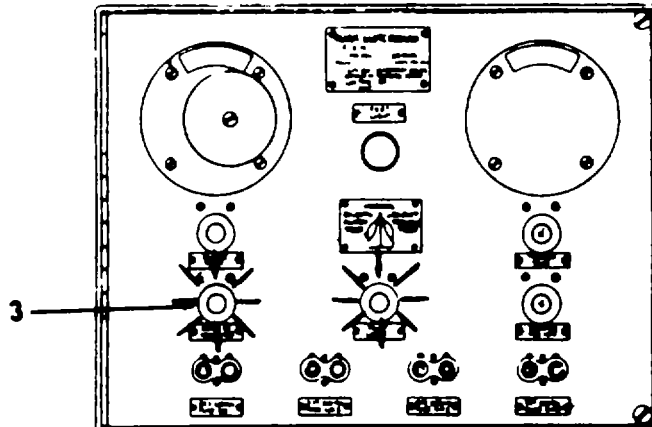
- 4 Request assistance to correct problem.

2-113. ALARM SYSTEM TEST (Cont).

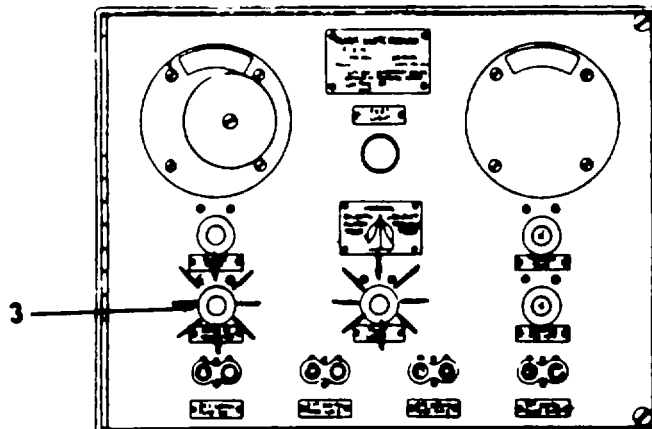
(c) Simultaneous Grounds-

Simultaneous grounds have no immediate ground lamp indication. These grounds create a false alarm.

- 1 Place switch (2) in the OFF position.



- 2 If the GROUND NEG. LINE lamp (3) is brightly lit, a simultaneous ground is indicated.



- 3 Request assistance to correct the problem.

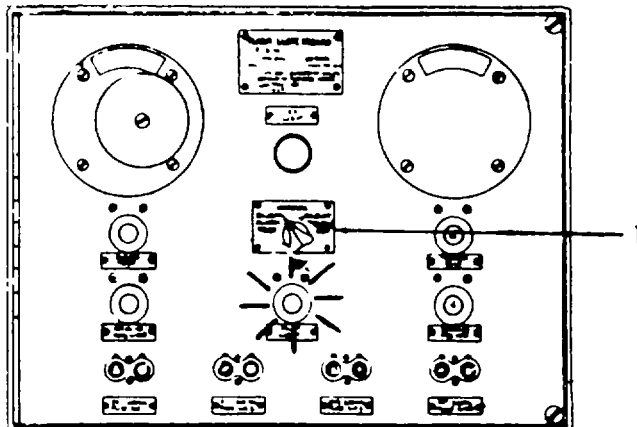
2-113. ALARM SYSTEM TEST (Cont).

(d) Alarm Switchboard Ground.

If either ground lamp (GROUND NEG. LINE or GROUND POS. LINE) continues to glow after testing for grounds, there is a ground internal to the switchboard. Request assistance.

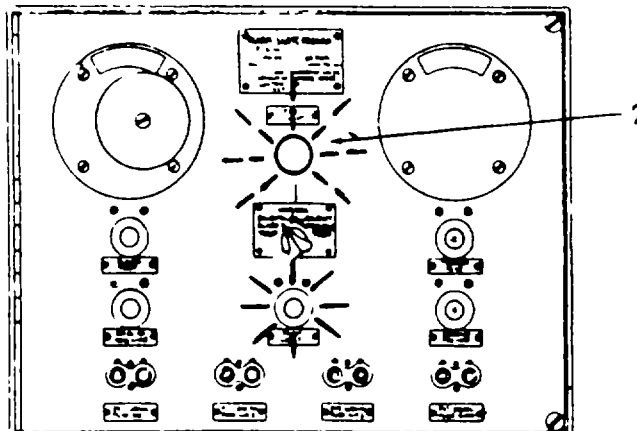
(2) ALARM TEST.

(a) Place switch (1) in the SILENT ALARM TEST position.



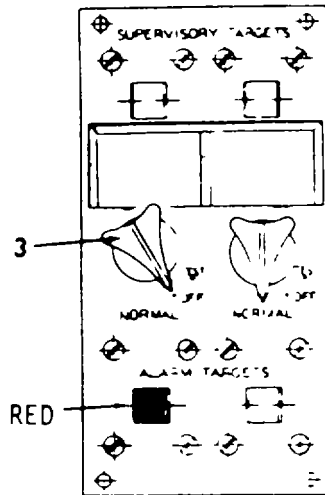
(b) The bell will not ring.

(c) The TEST LIGHT (2) will flash.

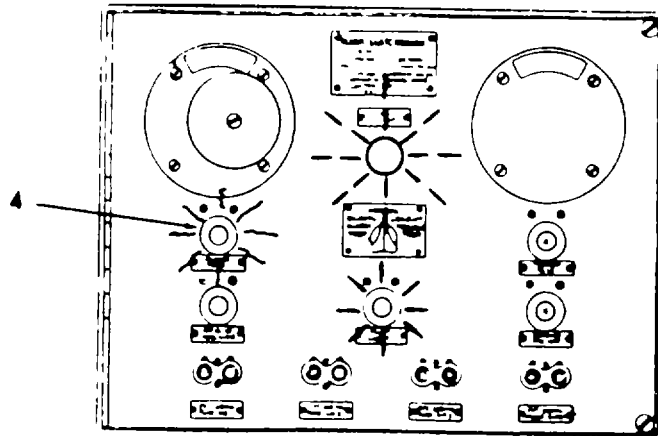


2-113. ALARM SYSTEM TEST (Cont).

- (d) Place switch (3) in the TEST position.

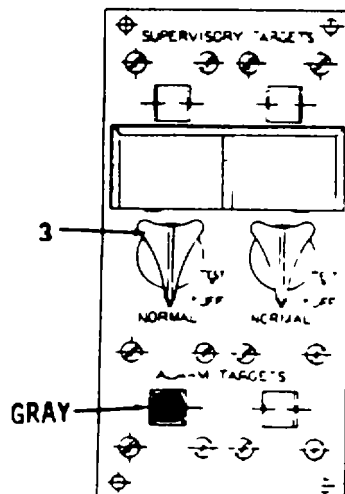


- (e) The alarm target will be red.
- (f) The ALARM TEST lamp (4) will glow.



2-113. ALARM SYSTEM TEST (Cont).

- (g) If the ALARM TEST lamp (4) does not glow-there is a problem. Request assistance.
- (h) Place switch (3) in the NORMAL position.

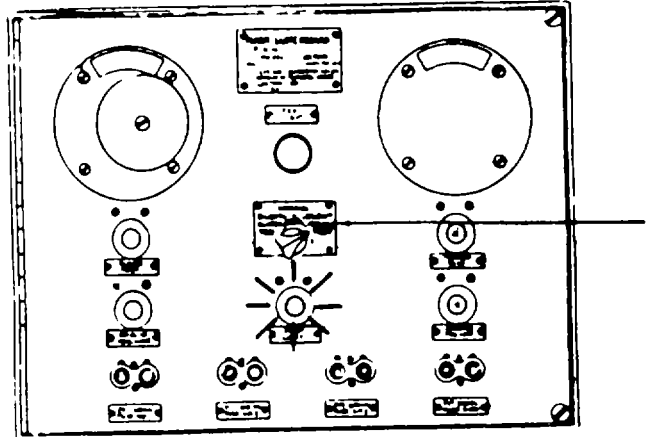


- (i) The ALARM TARGET will be gray.
- (j) Test the next circuit.
- (k) When complete, place switch (1) in the NORMAL position.
- (l) The TEST LIGHT (2) will not be lit.

2-113. ALARM SYSTEM TEST (Cont).

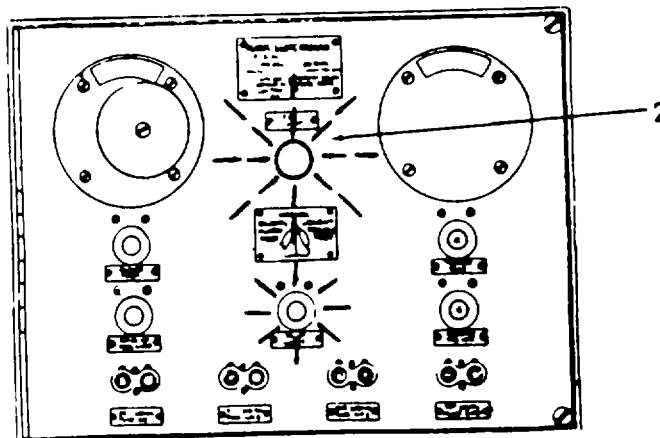
(3) SUPERVISORY TEST.

(a) Place switch (1) in the SILENT TROUBLE TEST position.



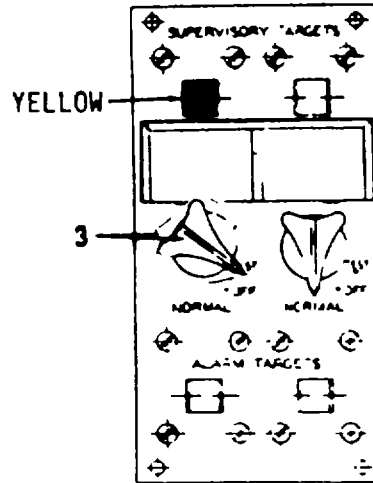
(b) The buzzer will not buzz.

(c) The TEST LIGHT (2) will flash.



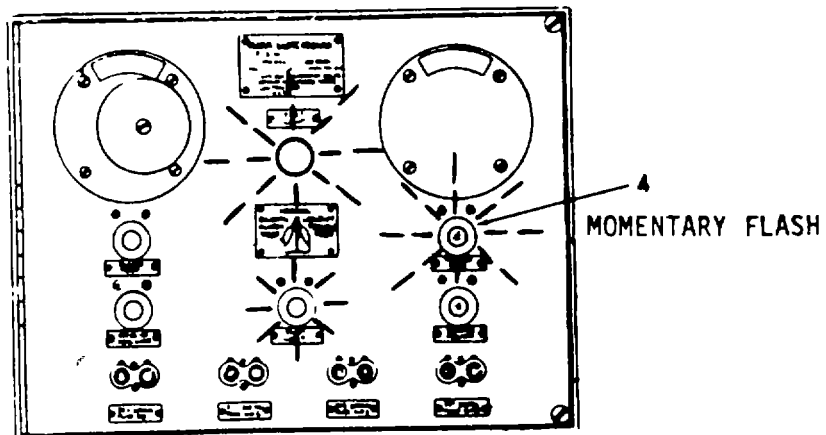
2-113. ALARM SYSTEM TEST (Cont).

- (d) Place switch (3) in the TEST position.



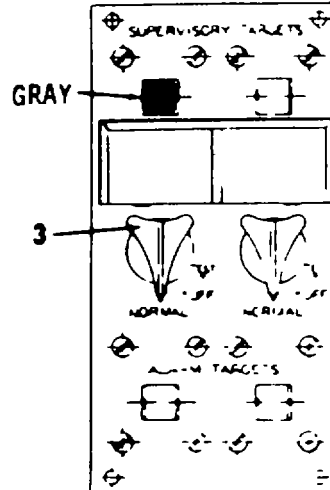
- (e) The SUPERVISORY TARGET will be yellow.

- (f) The TROUBLE TEST lamp (4) will flash momentarily.

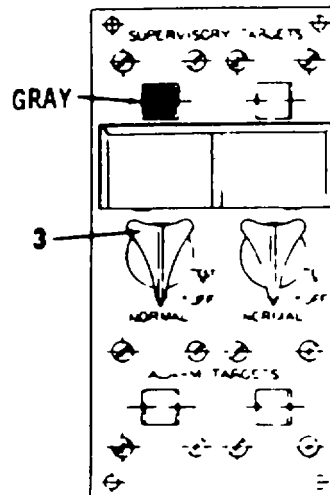


2-113. ALARM SYSTEM TEST (Cont).

- (g) If the SUPERVISORY TARGET does not show yellow-request assistance.
- (h) Place switch (3) in the NORMAL position.



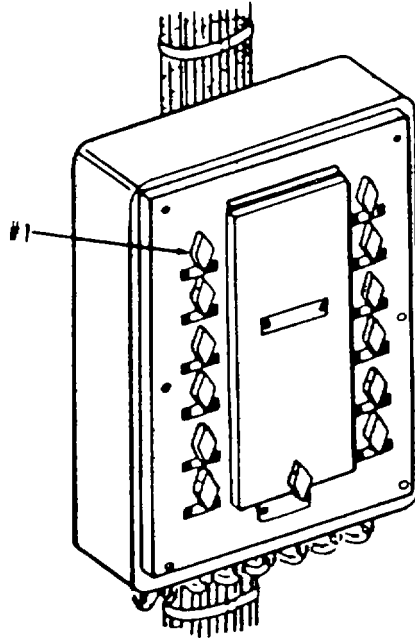
- (i) The SUPERVISORY TARGET will be gray.
- (j) Test the next circuit.
- (k) When complete, place switch (1) in the NORMAL position.
- (l) The TEST LIGHT (2) will not be lit.



2-114. ALARM SYSTEM TURN-OFF.

- a. To turn off the alarm system, proceed as follows:
- b. Pilothouse.

Place circuit breaker #1 on distribution panel L-107 in the OFF position .

**2-115. HALON SYSTEM.**

- a. The Halon system is an automatic fire detection and extinguishing system, using flashing lights and horns to alert personnel. The system is located in the following areas:
 - aft engine room
 - forward engine room
 - flammable liquids storeroom
- b. When a fire is detected, the following will occur:
 - light(s) in engine room(s) will flash
 - horn(s) in the engine room(s) will sound
 - location lights on the fire alarm panel will light (for aft and forward engine rooms)
 - ventilator fans will stop
 - extinguishing agent will discharge from halon extinguishers
- c. Figure FO-59 shows the Halon system components and compartment access devices.

2-115. HALON SYSTEM (Cont).

- d. When the alarms sound and you are in a Halon-protected compartment'

WARNING

- Horn sounds-leave the room at once. Fire extinguishing agent is hazardous and toxic to humans.

A 30 second discharge delay occurs after Halon system has been activated; all personnel to evacuate area immediately.

NOTE

- When alert conditions exist, dog forward and aft engine room hatches. Open scuttles to leave area, then close and secure.
 - During non-alert conditions, forward and aft engine room hatches are normally braced open. Remove braces, close and dog the hatches.
- (1) Forward Engine Room.
- (a) Close and dog engine room hatch (1) and door (2) between the two engine rooms.
- (b) Emergency escape scuttle (3) on port side.
- 1 Climb ladder.
- 2 Open scuttle and climb out.
- 3 Close and dog scuttle.
- (2) Aft Engine Room.
- (a) Close and dog engine room hatch (4).
- (b) Close and dog aft engine room door (5) to anchor winch compartment and door (2) between the two engine rooms.
- (c) Emergency escape scuttle on port side (6) of aft engine room and void.
- 1 Climb ladder.
- 2 Open scuttle and climb out.
- 3 Close and dog scuttle.

2-115. HALON SYSTEM (Cont).

- (3) Flammable Liquid Storeroom (1-4-2-A).

Close and dog door (7).

WARNING

Halon fire extinguishing agent is hazardous and toxic to humans.

- (4) The following is an index to the operating procedures:

<u>DESCRIPTION</u>	<u>PARAGRAPH</u>
Halon System-Turn-on	2-116
Halon System-Alarms (automatic-manual-remote manual)	2-117
Halon System-Reactivation	2-118
Halon System-Testing	2-119

2-116. HALON WARNING SYSTEM TURN-ON.

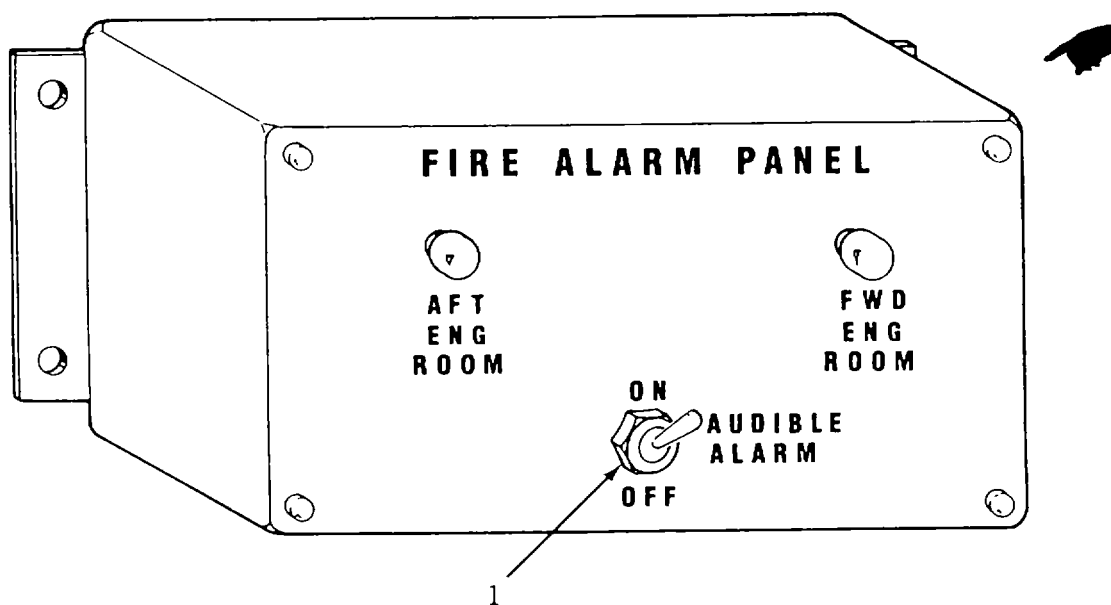
To turn on the Halon warning system in the pilothouse, proceed as follows:

CAUTION

Batteries must be kept charged at all times. Failure to keep batteries charged will cause system to fall.

a. The batteries should be fully charged-check PMCS table 2-4. Refer to paragraph 2-127 for battery charging.

b. Place the AUDIBLE ALARM switch (1) on the HALON CONTROL PANEL in the ON position. It is recommended that this switch be kept in ON position at all times.



2-117. HALON SYSTEM ALARMS.

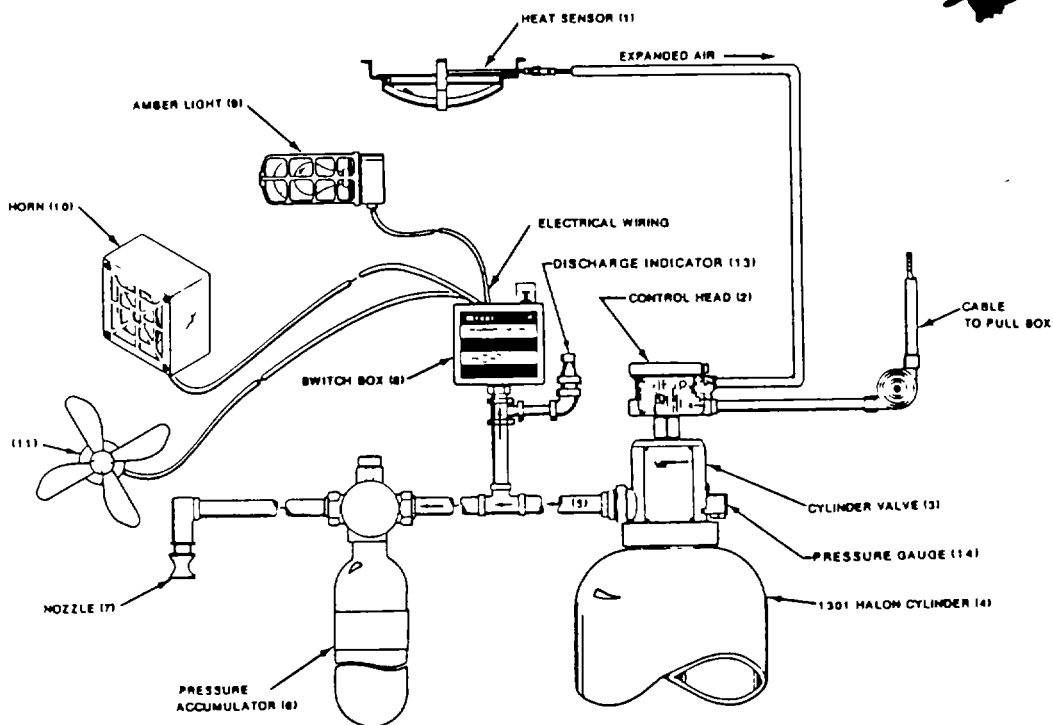
- a. The Halon system gives audible and visual alarms for fire in the following compartments
 - aft engine room
 - forward engine room
- b. A fire is detected by the heat detectors located in the aft and forward engine rooms.
- c. The Halon control panel in the pilot house should have the audible alarm switch on. Refer to paragraph 2-116 for turn-on procedure.
- d. The Halon system can be operated in the following modes:
 - automatic
 - manual
 - remote manual
- e. Automatic Mode-

The following will occur automatically when a fire is detected in either the forward or aft engine room compartments.

- (1) Forward or Aft Engine Room:
 - (a) Heat sensor (1) will sense fire, and heat up and expand the air contained within.
 - (b) The heated air will rush down tube to control head (2).
 - (c) Pressure of heated air, will then trip indicator located in control head (2).
 - (d) Tripped indicator activates cylinder valve (3), will cause Halon to discharge from cylinder (4) through valve (3), pipe (5), and into the pressure accumulator (6).
 - (e) Pressure accumulator serves as a Halon discharge delay, allowing personnel 30 seconds to exit.
 - (f) After pressure accumulator fill-up, Halon will travel to nozzle (7) and discharge.

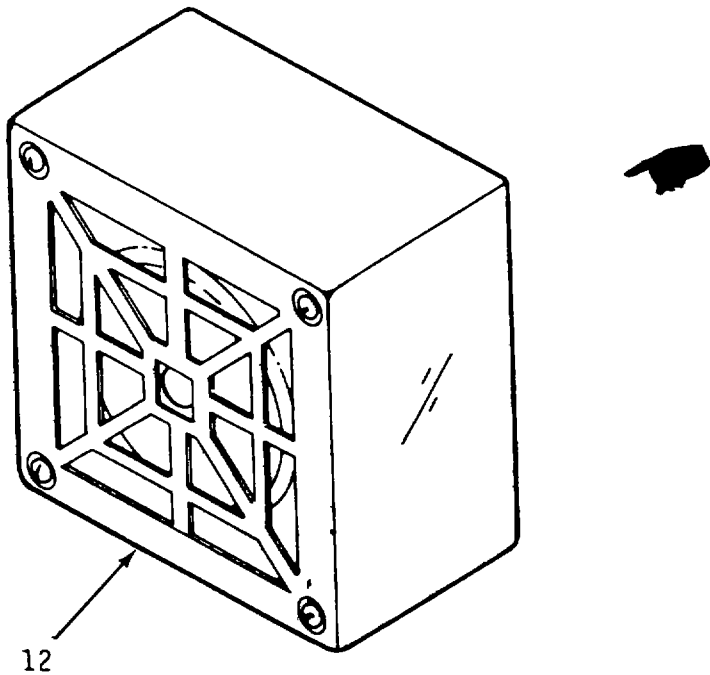
2-117. HALON SYSTEM ALARMS (Cont).

(g) The halon also will enter pipe to switch box (8), and force plunger to close electrical contacts, activating the amber light (9), horn (10), and shut off the fans to the room.

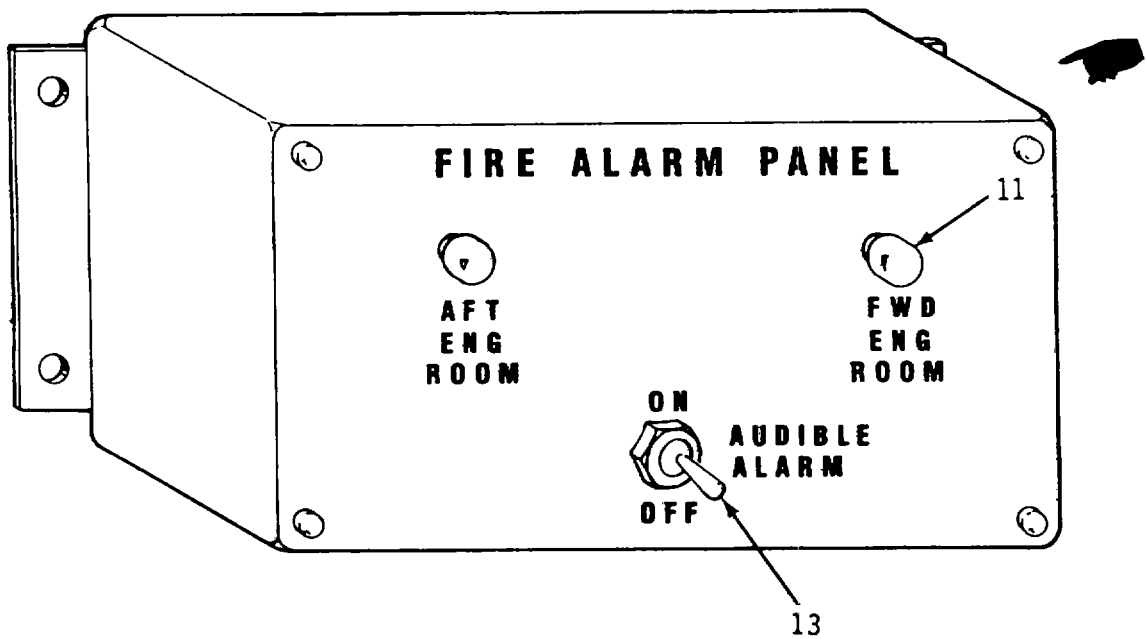


2-117. HALON SYSTEM ALARMS (Cont).

- (h) Light (11) on fire alarm panel will come on.
- (i) Horn (12) in pilothouse will sound.



- (j) To turn off horn, move switch (13) on Fire Alarm Panel to OFF position.



2-117. HALON SYSTEM ALARMS (Cont).

(2) Flammable Liquids Storeroom.

(a) Heat sensor senses fire and triggers Halon system, in the same fashion as described above, for the forward and aft engine rooms.

(b) Halon will be discharged at nozzle.

(c) This Halon system is independent of the one in the engine rooms. There are no switchboxes, lights, horns, or pressure accumulators associated with this system.

f. Manual Mode -

In case of a fire in the forward or aft engine room or the flammable liquids storeroom, and the automatic mode of extinguishing is not a practical solution, proceed as follows to put out the fire.

(1) Forward or aft engine room:

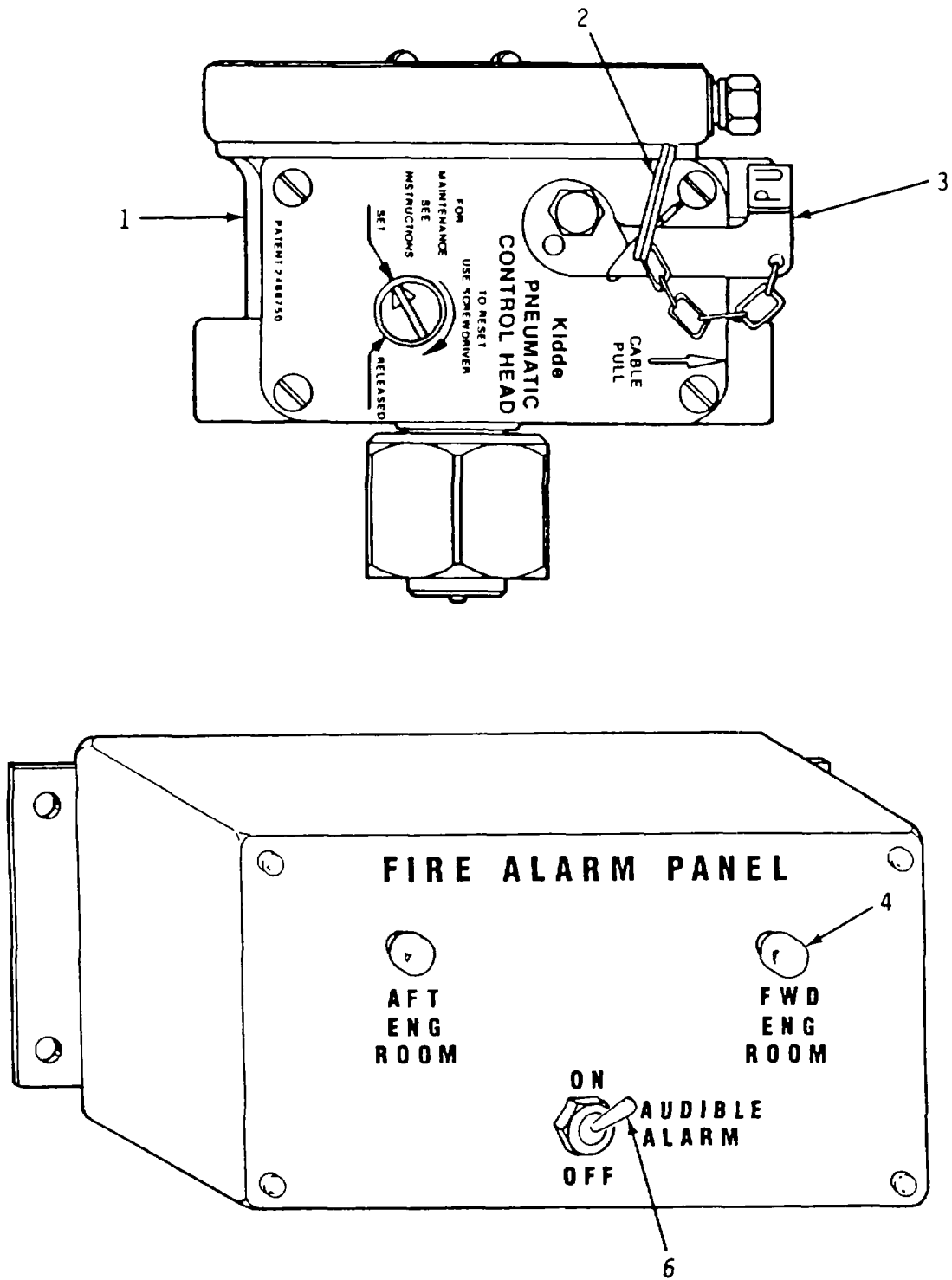
(a) Go to the pneumatic control head (1) located on top of cylinder and cylinder valve.

(b) Remove locking pin (2) and operate local manual release lever (3). This will cause the Halon system to discharge as described above for the automatic system.

(c) The amber light(s) will flash and the horn(s) will sound in the engine room(s).

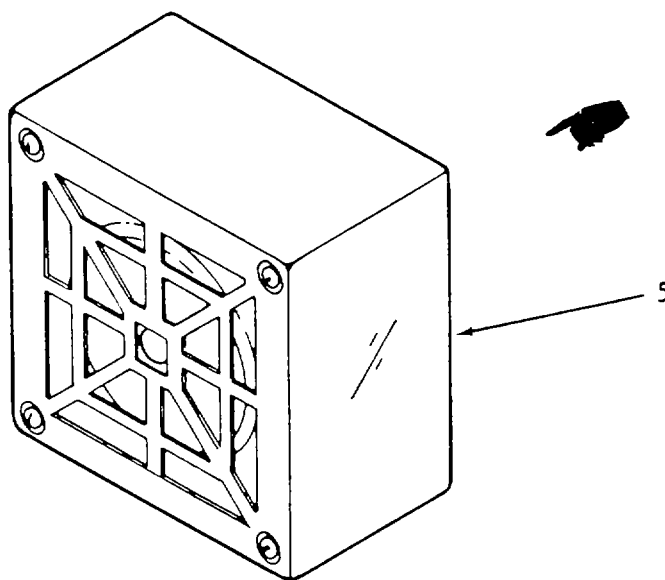
(d) Light (4) will light up on the fire alarm panel.

2-117. HALON SYSTEM ALARMS (Cont).



2-117. HALON SYSTEM ALARMS (Cont).

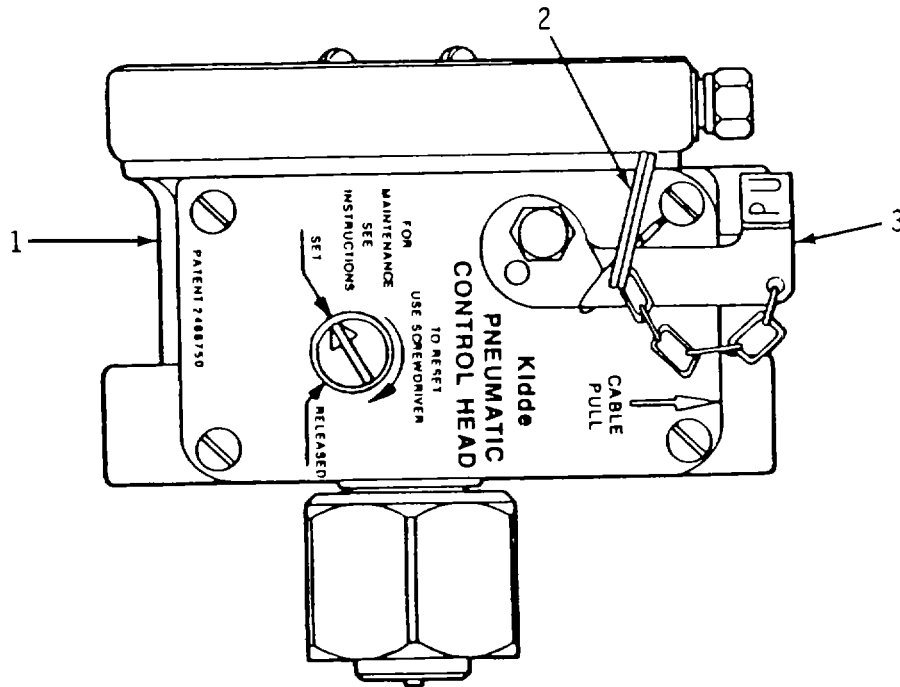
(e) Horn (5) will sound if audible alarm switch (6) is in the ON position.



(2) Flammable liquids storeroom:

(a) Go to the pneumatic control head (1), located on top of Halon cylinder.

2-117. HALON SYSTEM ALARMS (Cont).



(b) Remove locking pin (2) and operate local manual release lever

(3). This will cause the Halon system to discharge.

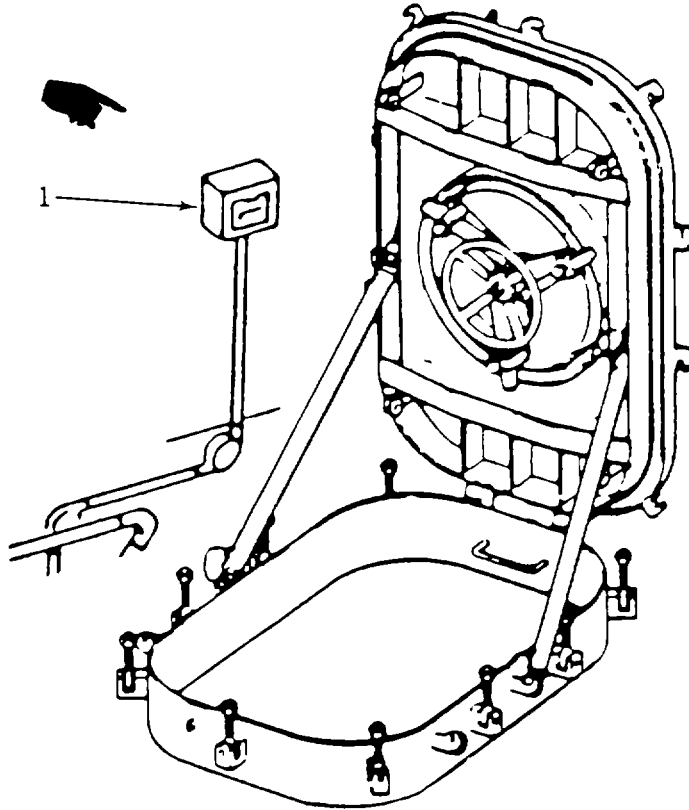
g. Remote Manual Mode -

If a fire is discovered in the forward or aft engine room or the flammable liquids storeroom, and relying upon the automatic or manual modes are not practical solutions, proceed as follows to put out the fire.

(1) Forward or Aft Engine Room:

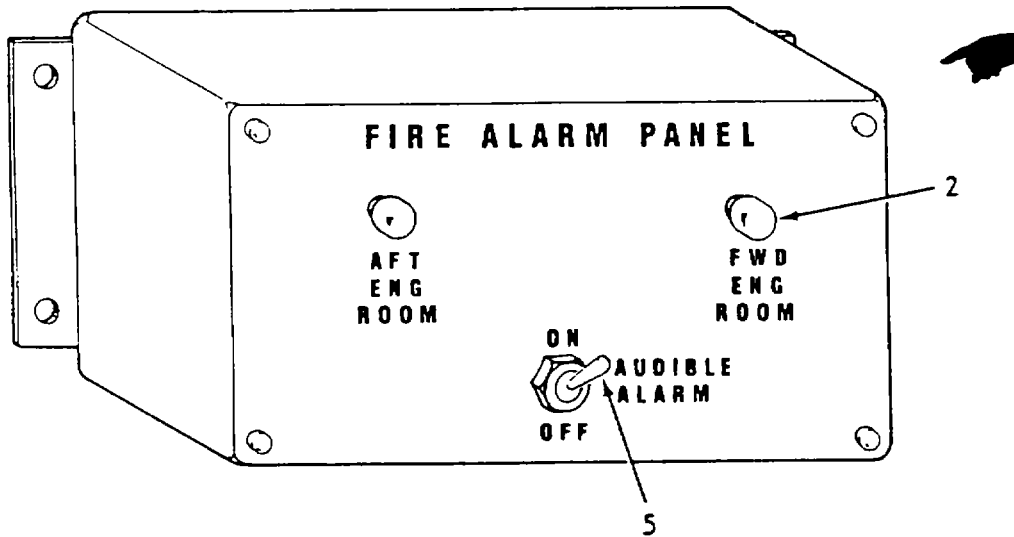
- (a) Go to the engine room access, break glass at appropriate manual release station, and pull handle (1).
- (b) Halon system will discharge as described above for the automatic mode.
- (c) Lights and horns in the engine room will activate as warning devices.
- (d) Light (2) will light up on the fire alarm panel

2-117. HALON SYSTEM ALARMS (Cont).

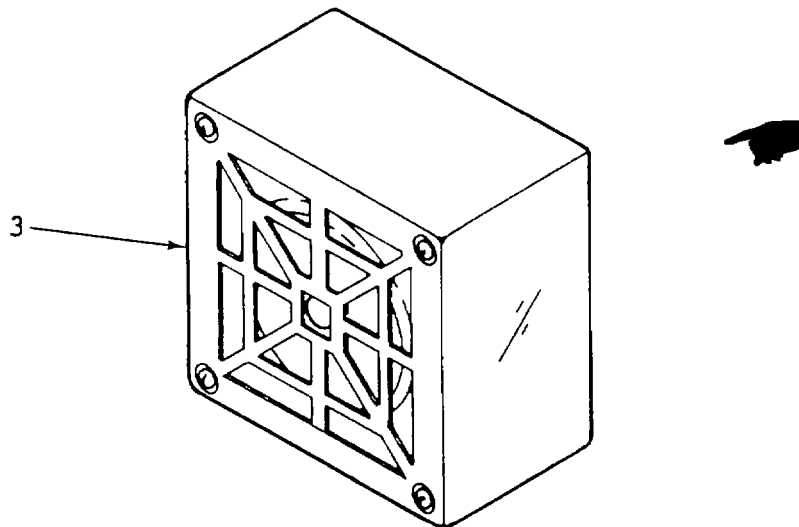


ACCESS HATCH TO
FWD OR AFT ENG
ROOM.

2-117. HALON SYSTEM ALARMS (Cont).

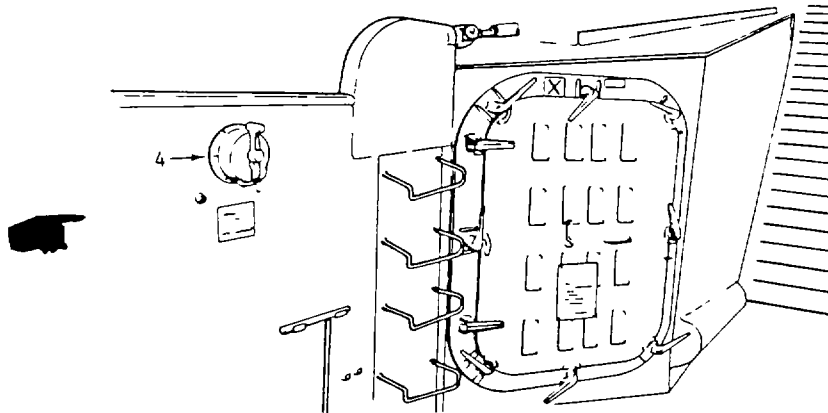


(e) Horn (3) will sound if audible alarm switch (5) is in the ON



(2) Flammable Liquids Storeroom:

- (a) Go to bulwark, port side, slightly aft of the storeroom to Manual Release station.
- (b) Open weather cover, break glass, and pull emergency release handle (4).
- (c) Halon system in storeroom will activate.

2-117. HALON SYSTEM ALARMS (C ont).**2-118. HALON SYSTEM - REACTIVATION.**

The following procedure is for clean up and reactivation of the Halon system after a fire.

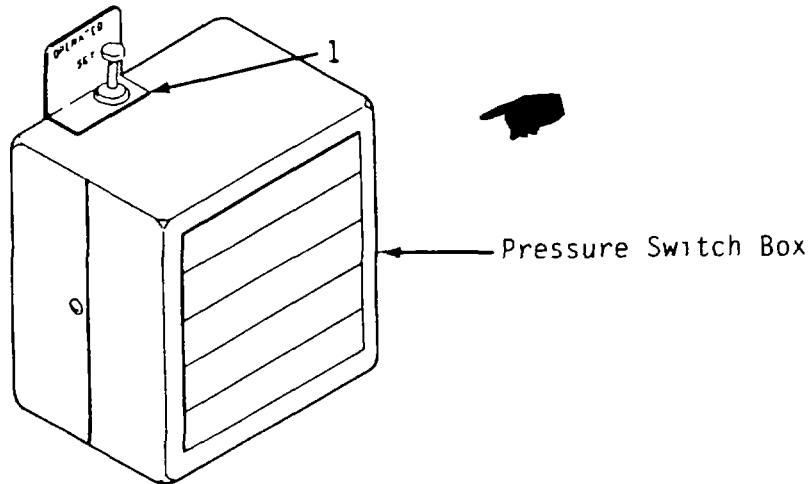
WARNING

- Do not enter compartment if hatch or bulkhead feels hot to the touch, as fire might be smoldering.
 - Before entering compartment, put on oxygen breathing apparatus.
 - Before clean-up can be started, make sure Halon extinguishing agent is exhausted from the area.
- a. Open engine room access hatch.
 - b. Open engine room scuttle.
 - c. Open flammable liquids storeroom door.
 - d. Check all electrical wiring in the damaged compartment for breaks, bare spots, or charred insulation. Replace if physical damage is present.
 - e. Check plumbing in compartment for breaks, loose connections, and general usability. Replace plumbing that is damaged.
 - f. Replace damaged heat detectors.
 - g. Replace damaged components of hand-operated cables to the pull boxes.
 - h. Replace other damaged equipment.

2-118. HALON SYSTEM - REACTIVATION (Cont).

i. Procedure for reactivating Halon system in forward and aft engine rooms.

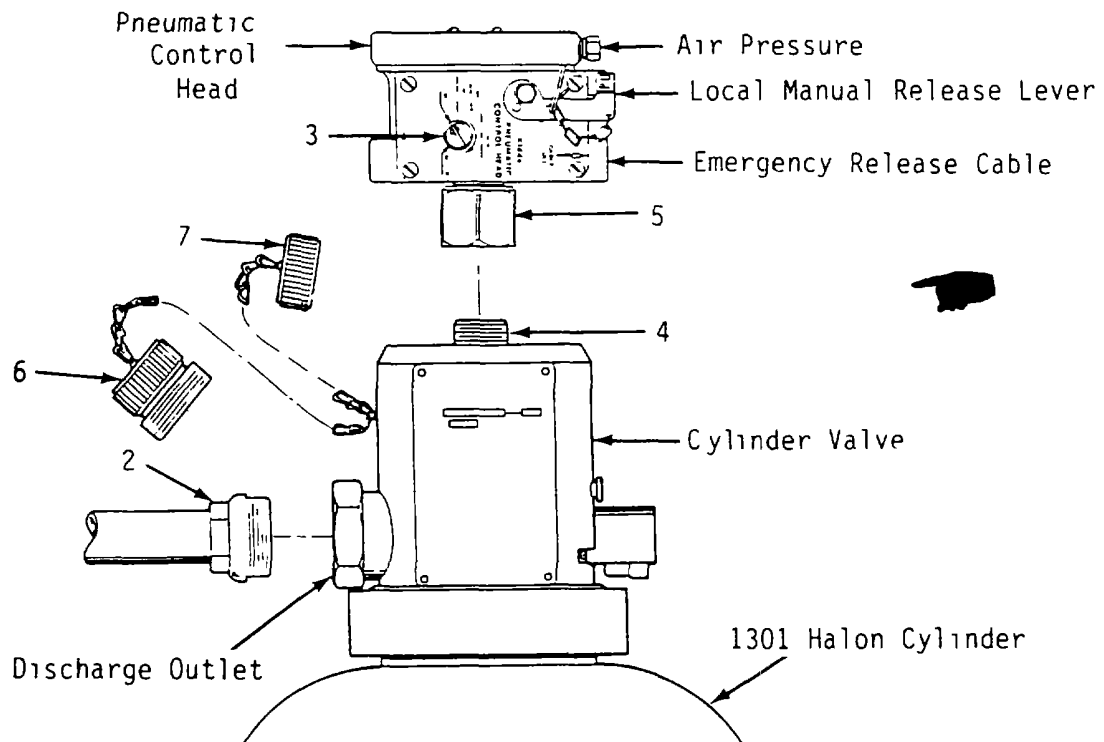
(1) Press pressure reset button (1) on pressure switch boxes.



(2) Separate pneumatic control head from cylinder valve.

WARNING

Reset indicator switch (3) on pneumatic control head to SET, before attaching to cylinder valve.



2-118. HALON SYSTEM - REACTIVATION (Cont).

- (a) Unscrew pipe connection (2) from discharge outlet of cylinder valve.
- (b) Attach anti-recoil plug (6) to discharge outlet.
- (c) Unscrew swivel nut (5) from cylinder valve (4).
- (d) Attach protective cap (7) to top of cylinder valve (4).
- (e) Remove cylinder strap holding cylinder in place.
- (f) Remove empty cylinder and cylinder valve as a unit.
- (g) Replace empty cylinder with recharged or new Halon 1301 cylinder and cylinder valve.
- (h) Replace cylinder strap holding cylinder in place.
- (i) Remove anti-recoil plug (6) from the cylinder valve and attach Halon discharge pipe (2) to the discharge outlet.
- (j) Reset indicator switch (3) on pneumatic control head to SET, before attaching to cylinder valve.

NOTE

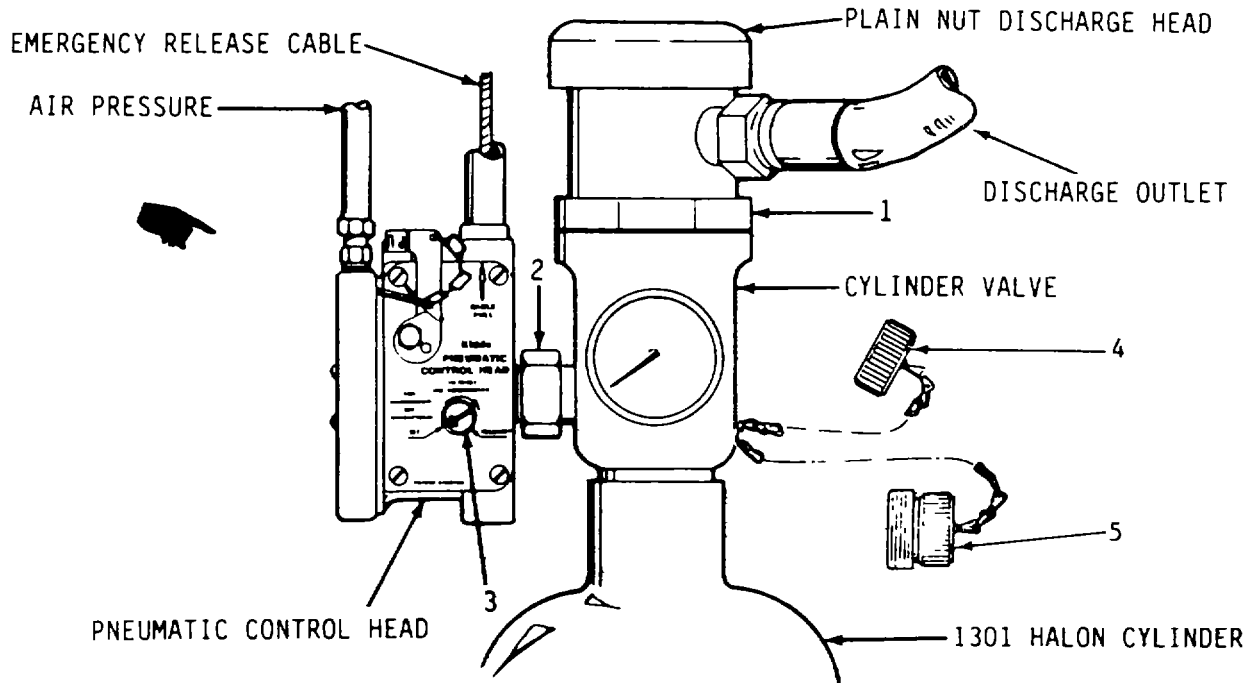
Swivel nut (5) has play, and care must be used not to let edge of swivel nut drop into opening of cylinder valve.

- (k) Remove protective cap (7) and attach pneumatic control head to cylinder valve (4) by tightening swivel nut (5).
- j. Procedure for reactivating Halon system in the flammable liquids storeroom.
 - (1) To separate pneumatic control head and plain nut discharge head from cylinder valve.

2-118. HALON SYSTEM - REACTIVATION (Cont)

WARNING

Reset indicator switch (3) on pneumatic control head to SET, before attaching to new cylinder valve.



- (a) Unscrew swivel nut (1) and separate plain nut discharge head from cylinder valve.
- (b) Attach protective cap (4) to cylinder valve at main discharge.
- (c) Unscrew swivel nut (2) and separate pneumatic control head from cylinder valve.
- (d) Attach anti-recoil plug (5) to pilot port.
- (e) Remove cylinder straps holding cylinder in place.
- (f) Remove empty Halon cylinder and cylinder valve as a unit.
- (g) Replace empty cylinder with recharged or new 600 PSI 1301 Halon cylinder and cylinder valve.

2-118. HALON SYSTEM - REACTIVATION (Cont).

- (h) Replace cylinder straps holding cylinder in place.
- (i) Remove protective cap (4) from top of cylinder valve and attach plain nut discharge head by tightening swivel nut (1).
- (j) Reset Indicator switch (3) on pneumatic control head to SET, before attaching to cylinder valve.
- (k) Remove anti-recoil plug (5) from side of cylinder valve and attach pneumatic control head by tightening swivel nut (2).

2-119. HALON SYSTEM TESTING.

a. The Halon system is to be tested by shipboard personnel and a qualified Fire/Safety Prevention Team. Refer to nameplate on cylinder for details on maintenance of the system.

(1) The shipboard personnel will test the following items:

- Pressure operated switchbox, lights, horns, and exhaust fans
- Halon fire alarm panel and horn
- Pressure gauge and Halon cylinder
- Discharge indicator

(2) The Fire/Safety Prevention Team will test the following items:

- Pneumatic control heads
- Actuators and system tubing
- any and all items deemed necessary and appropriate to assure that the Halon system will function properly when needed.

b. The shipboard personnel will test the following components of the Halon system.

(1) Pressure operated switchbox, lights, horns, and exhaust.

(a) Pull up on stem of pressure switchbox (1) in aft and forward engine rooms to make electrical contact with amber lights, horns, and exhaust fan circuitry.

(b) If amber lights come on, horns sound, and exhaust fans shut down, all of these components and the switchbox pass the test.

(2) Fire alarm panel.

If the light indicators (2) on the panel located in the pilothouse come on and the audible alarm switch (3) functions to activate the pilothouse horn, then the panel and horn pass the test.

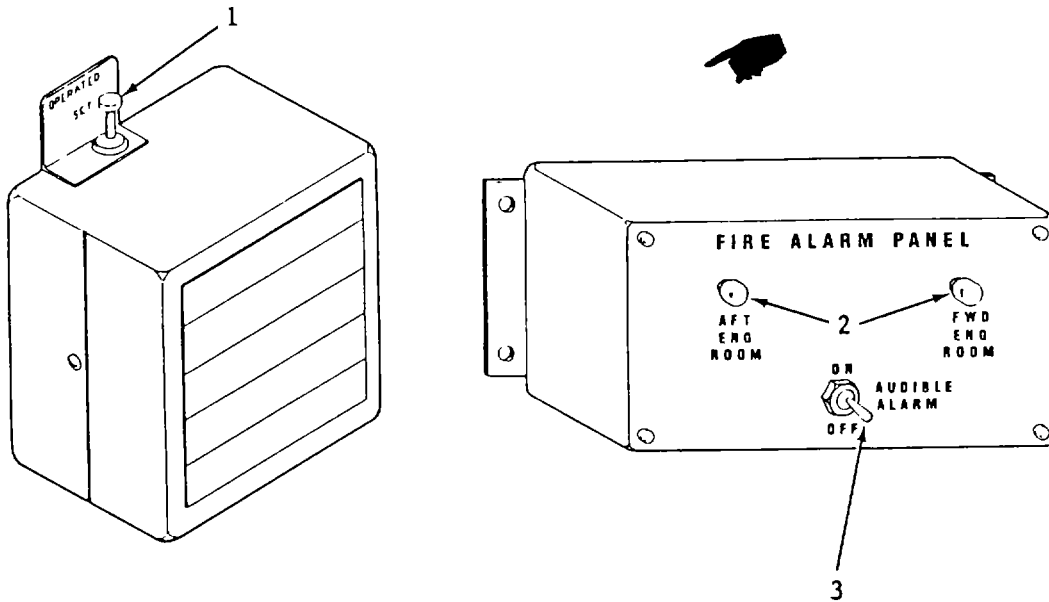
(3) Reset pressure switch on pressure switchbox.

(4) Reset audible alarm switch on fire alarm panel to ON or OFF, as required.

(5) Pressure gauge and Halon cylinder.

Visibly inspect pressure gauge, comparing readings with gauge calibration table values. If readings are within the values shown, then the pressure gauge and Halon cylinder pass the test.

2-119. HALON SYSTEM TESTING (Cont).



GAUGE CALIBRATION			
°F	°C	PSI	BARS
-10	-23	180	12.4
10	-12	212	14.6
30	-1	253	17.4
50	10	301	20.8
70	21	360	24.8
90	32	429	29.6
110	43	511	35.2
130	54	609	42.0

(6) Discharge indicator.

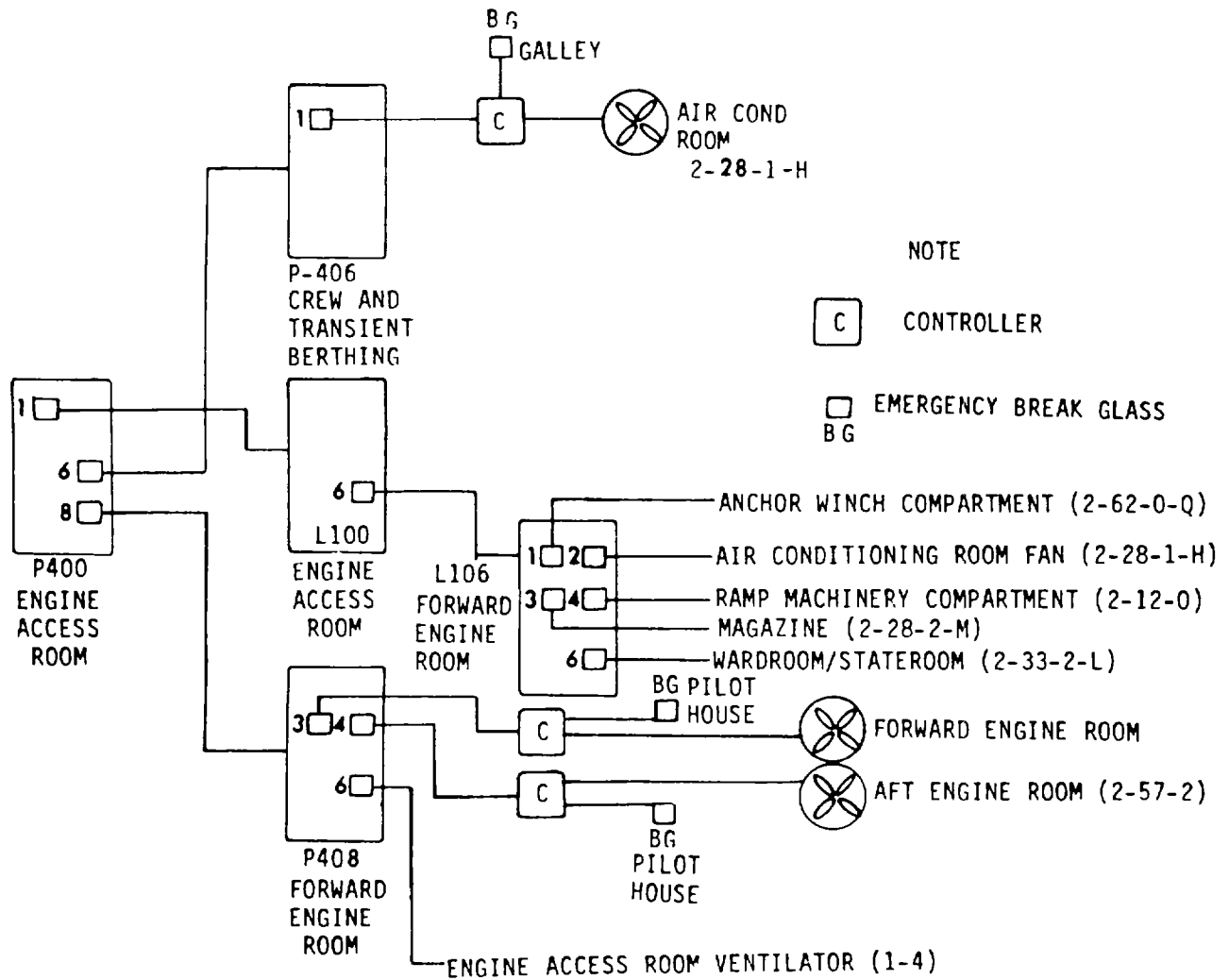
- (a) Visibly inspect discharge Indicators to determine if there is a loss of Halon.
- (b) If Indicator is in normal position, it passes the test.

All data on pages 2-514 thru 2-519 deleted.

Change 2 2-513/(2-514 blank)

2-120. VENTILATION FANS.

The ventilation fans circuits in the landing craft are shown below. To turn on/off any fan proceed from left to right. Turn on/off circuit breakers, disconnect switches and controllers as required.



NOTE



CONTROLLER



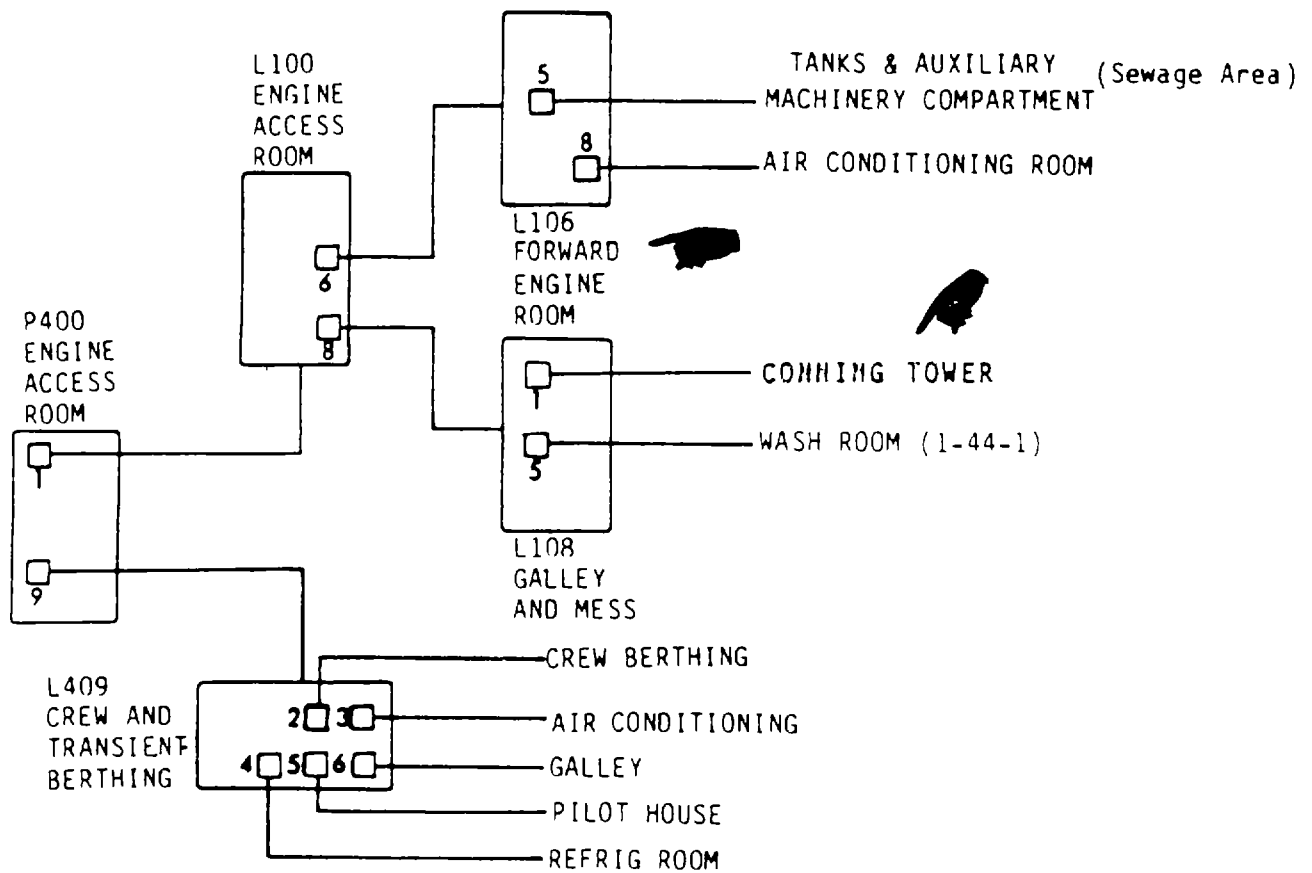
EMERGENCY BREAK GLASS

NOTE

In an emergency, there are break-glass devices in the pilot house and galley.

2-121. HEATERS.

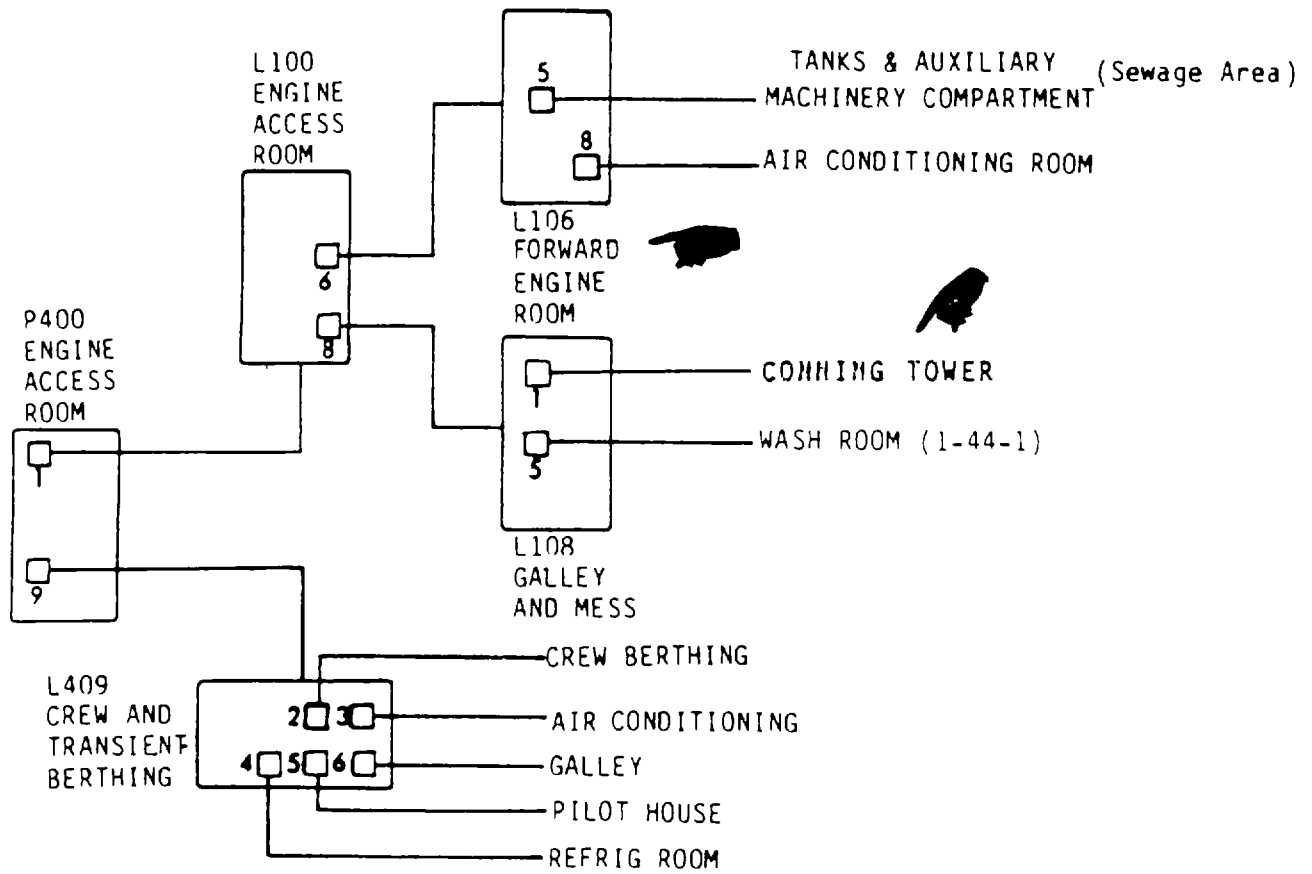
The heater circuits in the landing craft are shown below. To turn on/off any heater, proceed from left to right. Turn on/off circuit breakers as required. Adjust heat with thermostats.



4951-034

2-122. LIGHTING.

The lighting circuits in the landing craft are shown below. To turn on/off any light proceed from left to right. Turn on/off circuit breakers as required.



4951-034

2-123. PILOT HOUSE EQUIPMENT.

The operating procedures for equipment located in the pilot house are as follows:

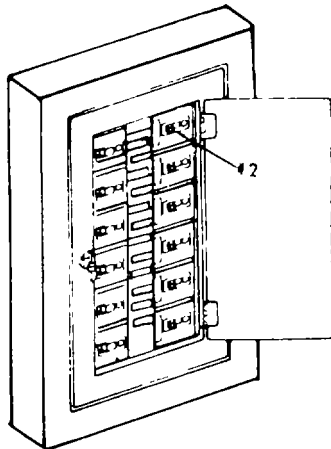
<u>DESCRIPTION</u>	<u>PARAGRAPH</u>
Windshield Wiper	2-124
Navigation Lights	2-125
Darken Ship	2-126
Battery Charger/Exhaust	2-127
Electronic Devices	2-128
Fire Alarm Switch Box	2-128.1

2-124. WINDSHIELD- WIPER.

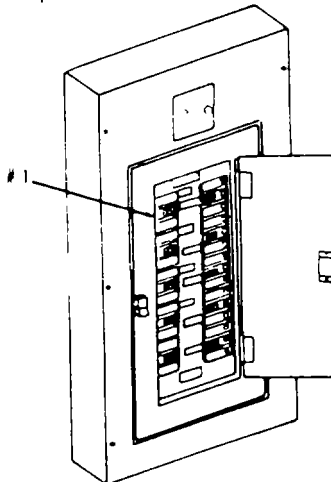
The operating procedures for the windshield wiper are as follows:

a. Engine Access Room.

(1) Place circuit breaker #2 on power distribution panel (P400) in the ON position.



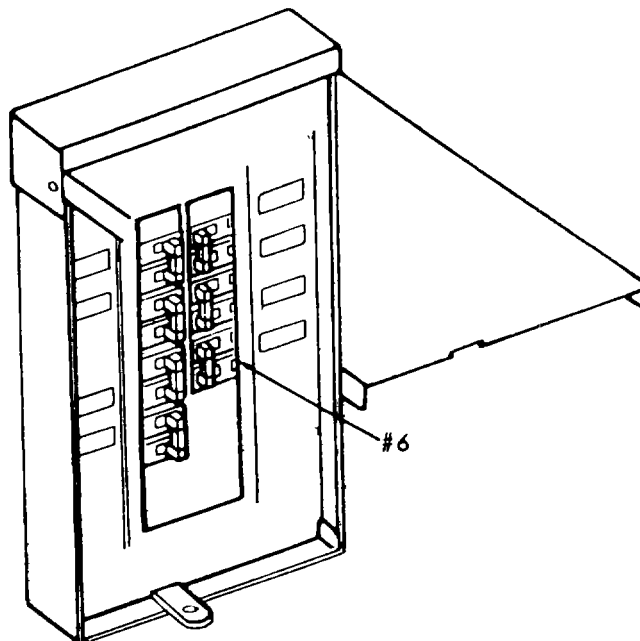
(2) Place circuit breaker #1 on lighting distribution panel (L-100) in the ON Position.



2-124. WINDSHIELD WIPER (Cont).

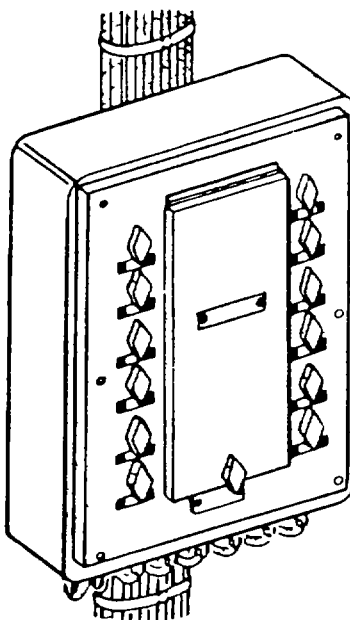
- b. Crew and Transient Berthing.

Place circuit breaker #6 on lighting distribution panel (1104) in the ON position.

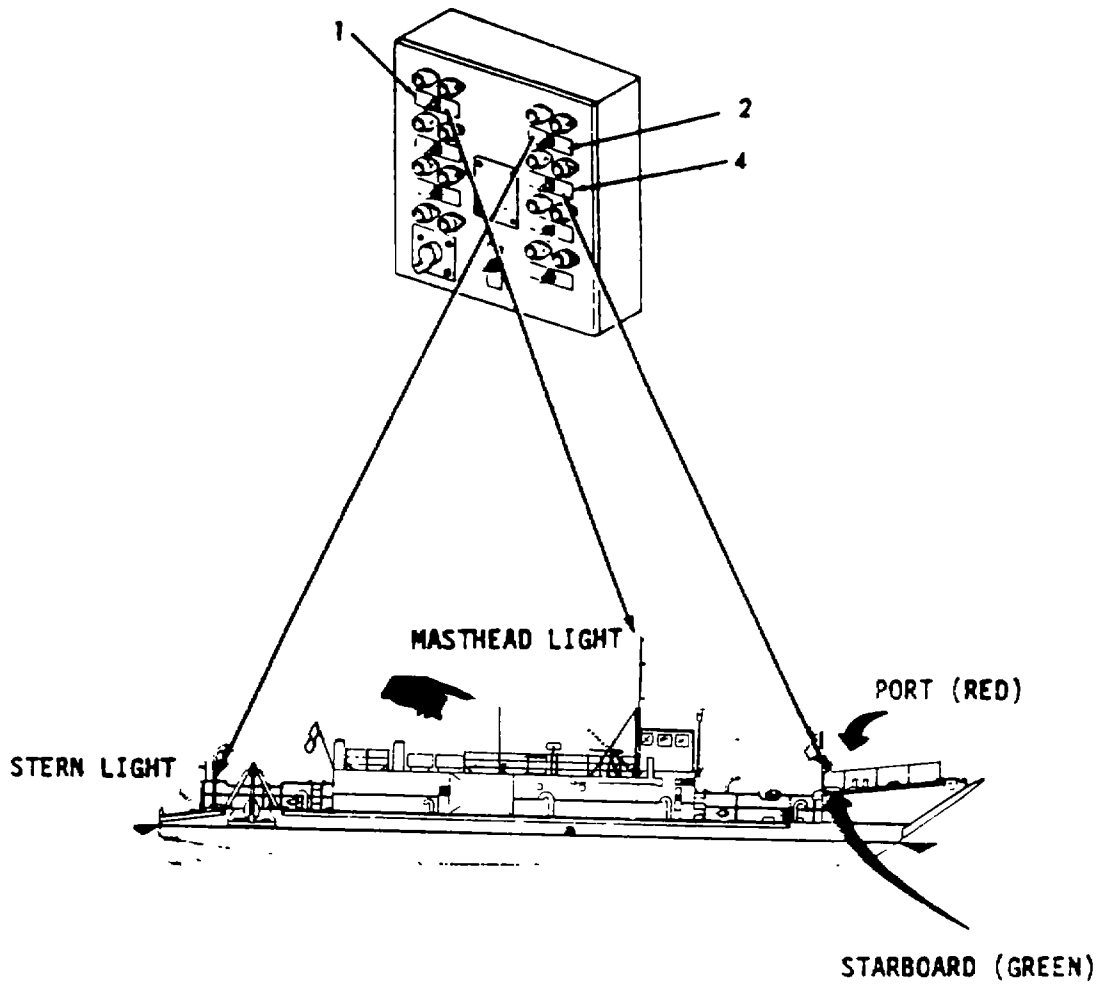


- c. Pilot House.

(1) Place switch on distribution panel (2L-103) in the ON position.



2-125. NAVIGATION LIGHTS (Cont.)



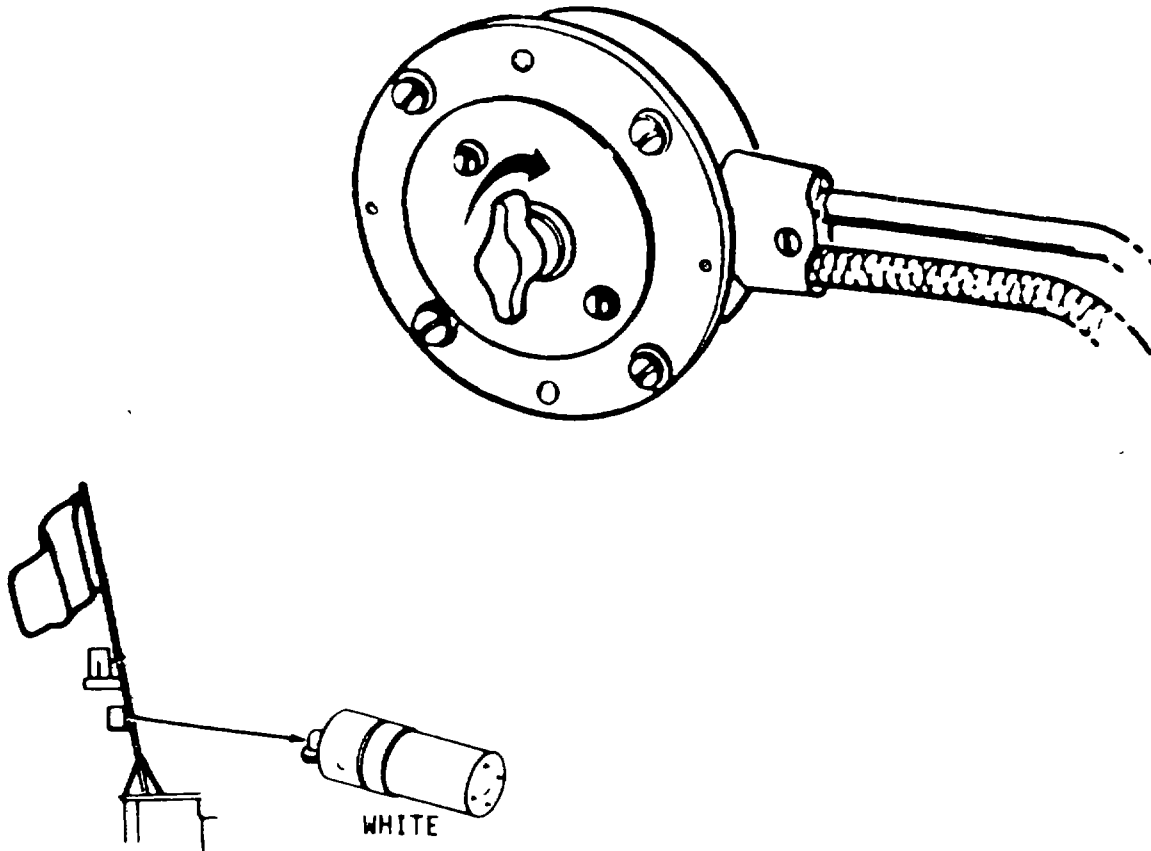
4951-128

2-125. NAVIGATION LIGHTS (Cont.)

- (d) Wake light (white), turn switch to the ON position (clockwise).

NOTE

The wake light switch is separate from the navigation light panel.



- b. To turn off the navigation lights proceed as follows:
- (1) Pilot House - Navigation Light Control Panel - Running Lights.
 - (a) Wake light, turn switch to OFF position (counter-clockwise).

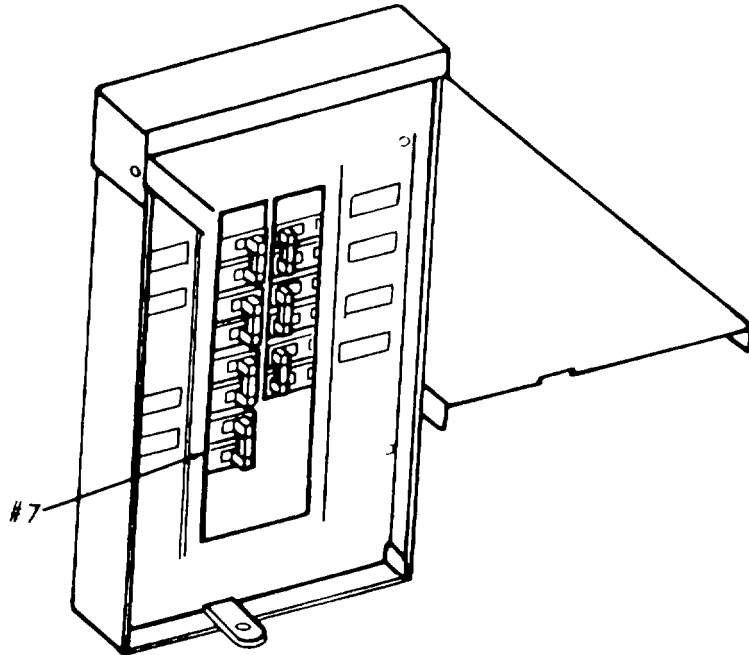
NOTE

Wake light control switch is separate from navigation light control panel.

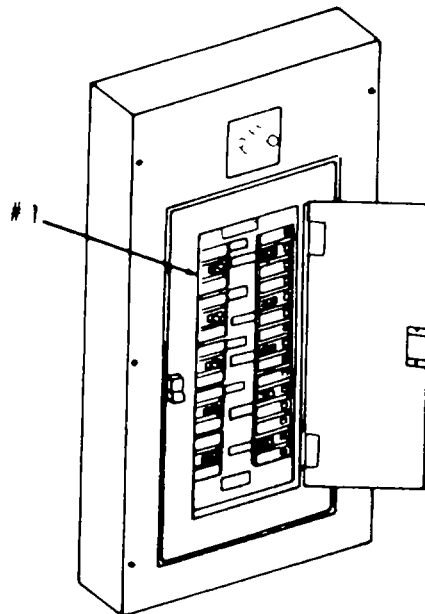
2-125. NAVIGATION LIGHTS (Cont.)

(4) Engine Access Room.

(a) Place circuit breaker #7 on the lighting distribution panel (L-110) in the OFF position.

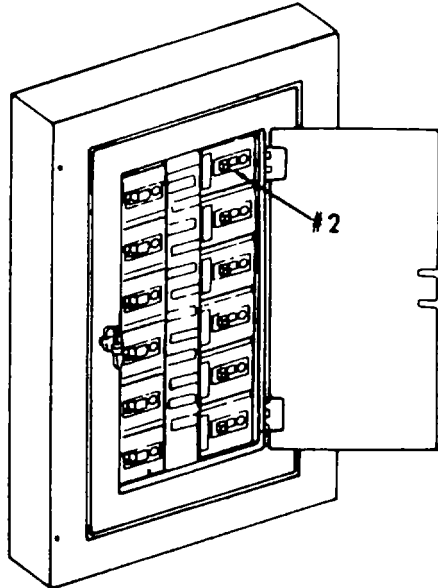


(b) Place circuit breaker #1 on lighting distribution panel (L-100) in the OFF position.



2-125. NAVIGATION LIGHTS (Cont).

(c) Place circuit breaker #2 on the power distribution panel (P400) in the OFF position.

**2-126. DARKEN SHIP.**

To darken ship, the following steps must be done.

a. Pilot House.

- (1) Place the darken ship switch in the OFF position.
- (2) Place all switches on the Navigation Light Panel in the OFF position.
- (3) Turn off any other lights as required.

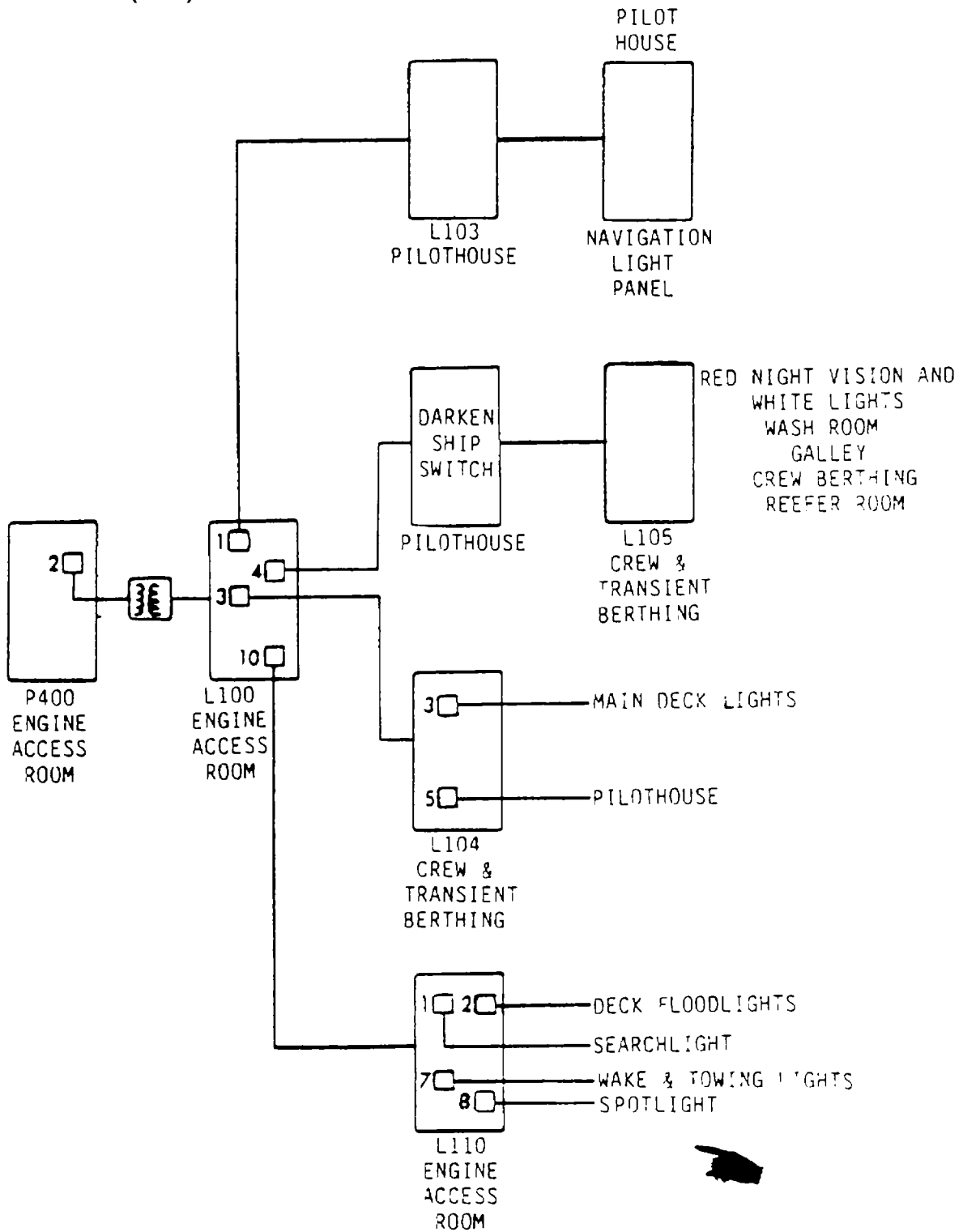
b. Engine Access Room.

■ Place circuit breaker #1, 2, 7 and 8 on lighting distribution panel (L110) in the OFF position.

c. Crew and Transient Berthing.

Place circuit breaker #3 on lighting distribution panel (L104) in the OFF position.

2-126. DARKEN SHIP (Cont)



DARKEN SHIP
Change 2 2-539

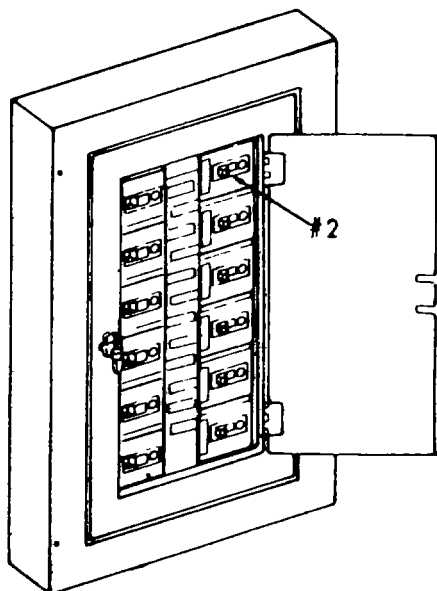
4951-055

2-127. BATTERY CHARGER/EXHAUST.

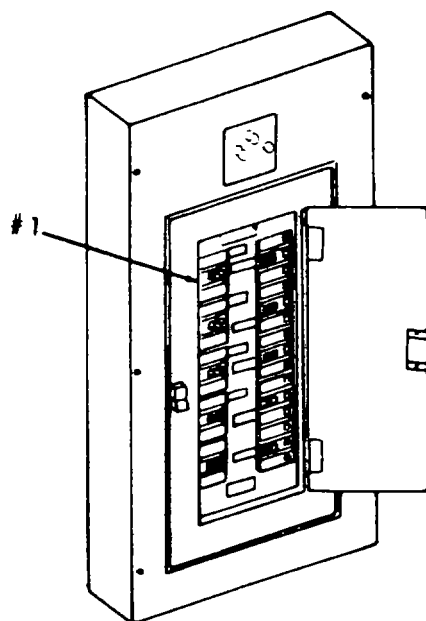
The batteries are located in the pilot house deck. The batteries are charged by a battery charger.

a. Engine Access Room.

- (1) Place circuit breaker #2 on power distribution panel (P-400) in the ON position.



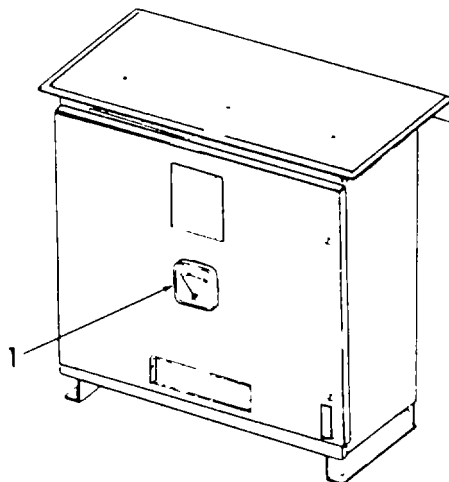
- (2) Place circuit breaker #1 on lighting distribution panel (L-100) in the ON position.



2-127. BATTERY CHARGER/EXHAUST (Cont).

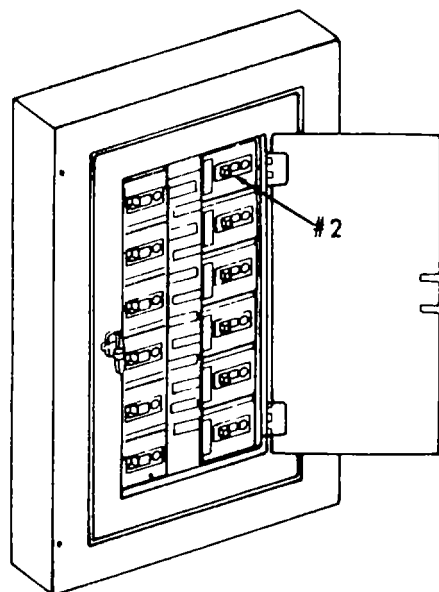
b. Pilot House.

- (1) The battery charger is turned on.
- (2) The meter (1) indicates rate of charge.



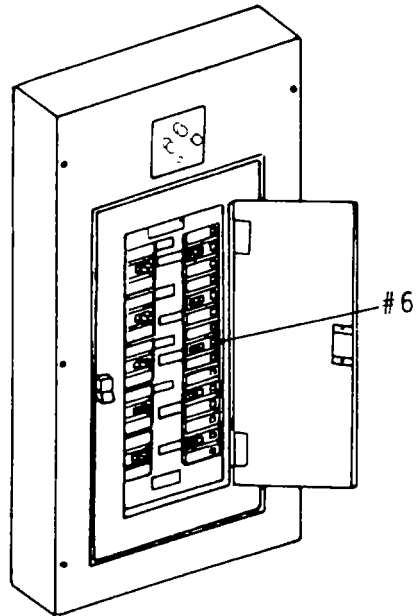
c. Battery Compartment Vent Fan

- (1) Engine Access Room.
 - (a) Place circuit breaker #2 on power distribution panel (P400) in the ON position.



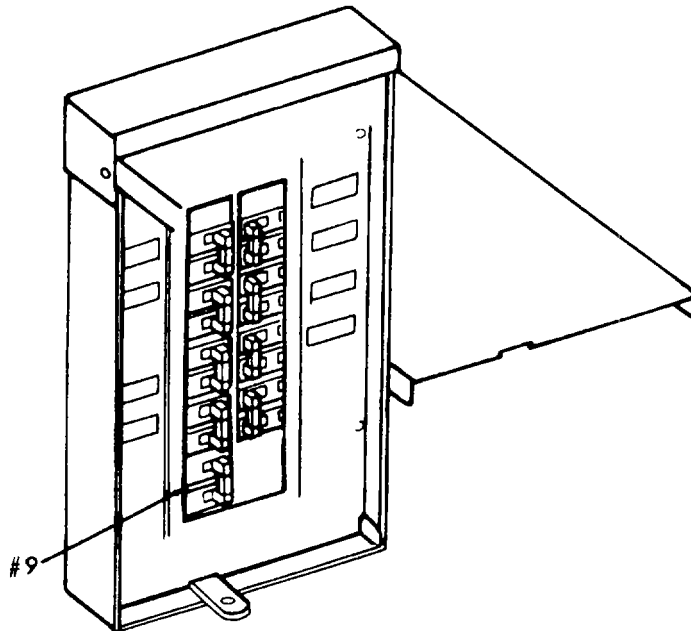
2-127. BATTERY CHARGER/EXHAUST (Cont).

(b) Place circuit breaker #6 on lighting distribution box (L100) in the ON position.



(2) Forward Engine Room.

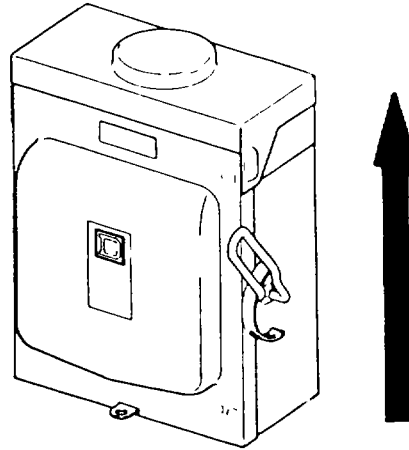
Place circuit breaker #9 on power distribution panel (L106) in the ON position.



2-127. BATTERY CHARGER/EXHAUST (Cont).

(3) Pilot House.

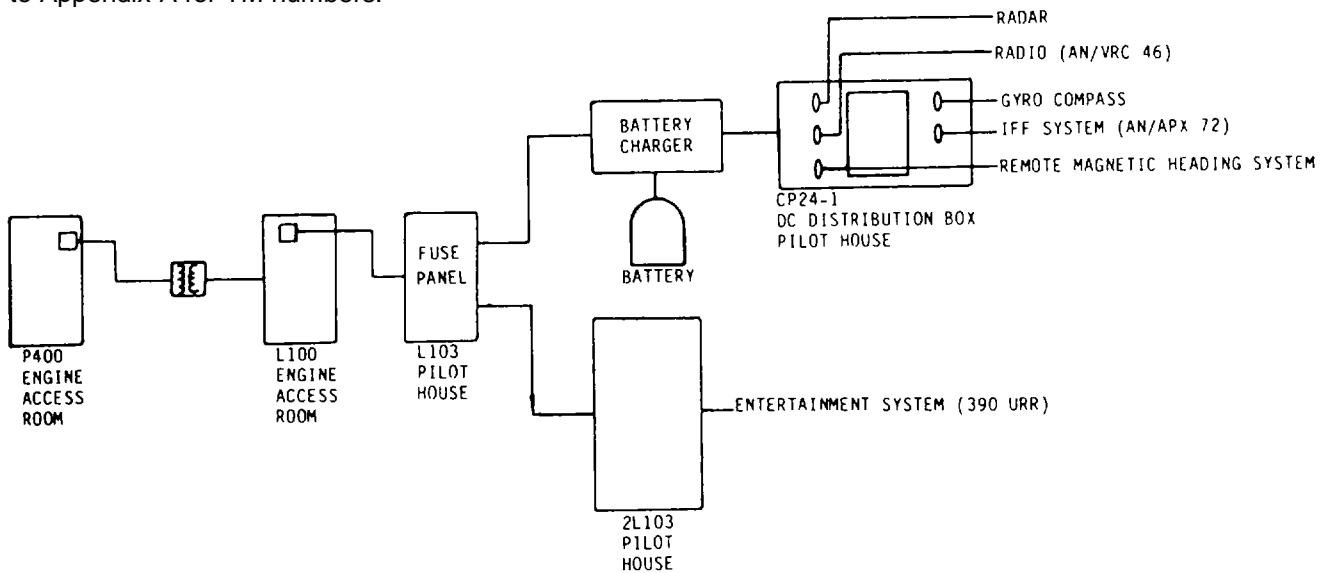
Place battery exhaust disconnect switch in the ON position.



2-128. ELECTRONIC DEVICES.

- a. The turn-on procedure for electronic devices are shown below.
- b. The operating procedures for the following are contained in technical manuals:
 - o Radar.
 - o Gyro Compass.
 - o Radio (Communications).
 - o Radio (Entertainment).
 - o IFF System.

Refer to Appendix A for TM numbers.



2-128.1 CONNING TOWER EQUIPMENT.

The operating procedures for equipment located in the pilot house are as follows:

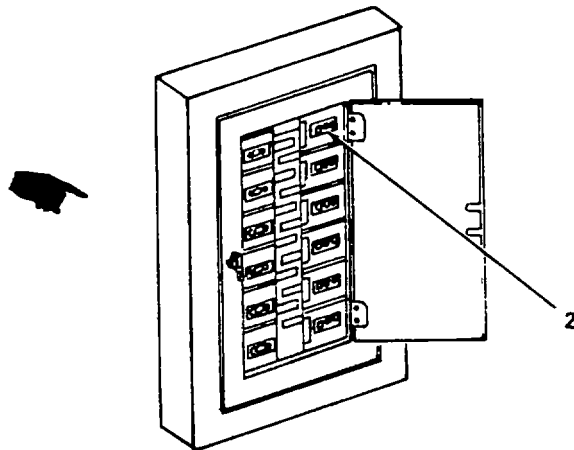
DESCRIPTION	PARAGRAPH
Windshield Wiper Electronic Devices	2-128.2 2-128

2-128.2 WINDSHIELD WIPER.

The operating procedures for the windshield wiper are as follows:

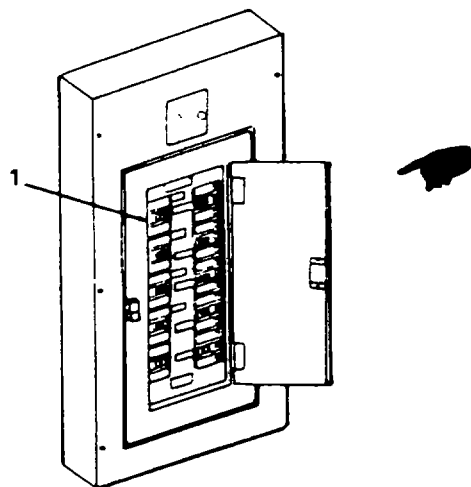
a. Engine Access Room

- (1) Place circuit breaker #2 on power distribution panel (P400) in the ON position.



4951-022

- (2) Place circuit breaker #3 on lighting distribution panel (L-100) in the ON position.

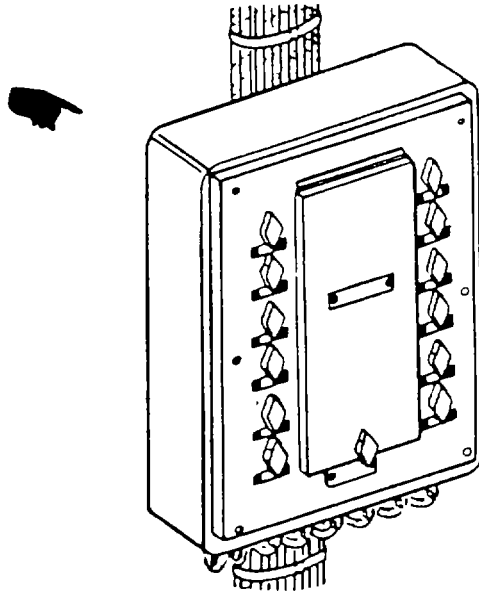


4951-023

2-128.2 WINDSHIELD WIPER (Cont).

b. Pilot House

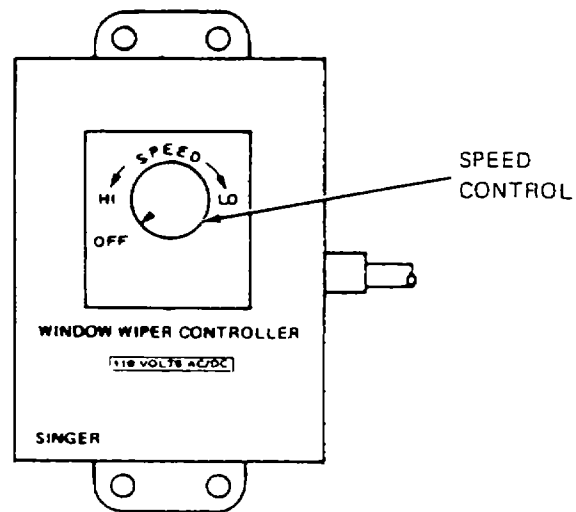
- (1) Place wiper (CONN. TWR) switch on distribution panel (L-103) in the ON position.



4951-024

2-128.2 WINDSHIELD WIPER (Cont).

- (2) Wiper operation is as follows:
 - (a) Rotate SPEED control knob clockwise from the OFF position.
 - (b) The wiper will move.
 - (c) Adjust SPEED control as required.
- (3) To stop the wiper, rotate SPEED control knob counterclockwise to OFF.

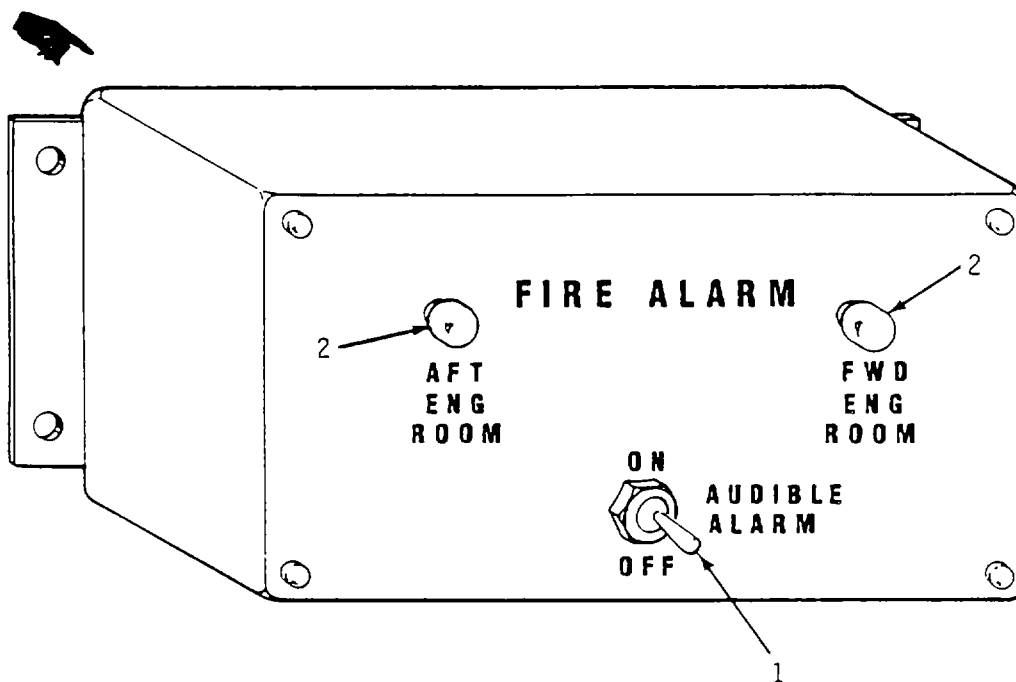


4951-025

2-128.3 FIRE ALARM SWITCH BOX.

The operating procedures for the fire alarm switch box are as follows:

- a. Set toggle switch (1) to ON position.
- b. When a fire is detected in either the aft engine room or forward engine room the appropriate lamp (2) will light.
- c. To turn off the pilot house fire warning system set toggle switch (1) to OFF position.



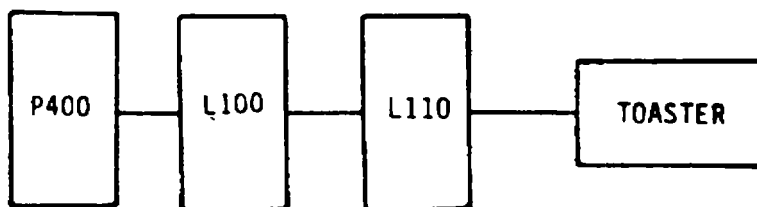
4951-111

2-129. GALLEY AND MESS.

The following paragraphs contain the operating instructions for the following:

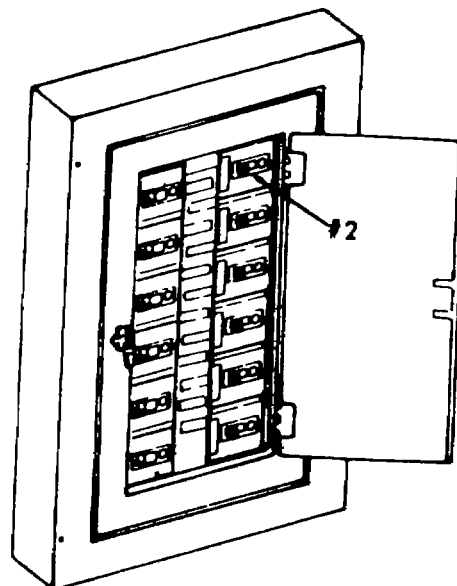
<u>DESCRIPTION</u>	<u>PARAGRAPH</u>
Toaster	2-130
Entertainment Amplifier	2-131
Electric Range	2-132
Coffee Maker	2-133
Milk Dispenser	2-134
Refrigerator/Freezer	2-135
Drinking Fountain	2-136
Sanitizing Sink Heater	2-137

2-130. THE TOASTER.



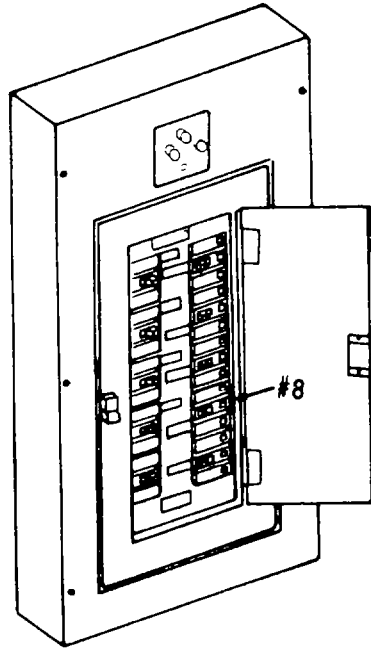
a. Engine Access Room.

- (1) Place circuit breaker t2 on power distribution panel (P-400) in the ON position.

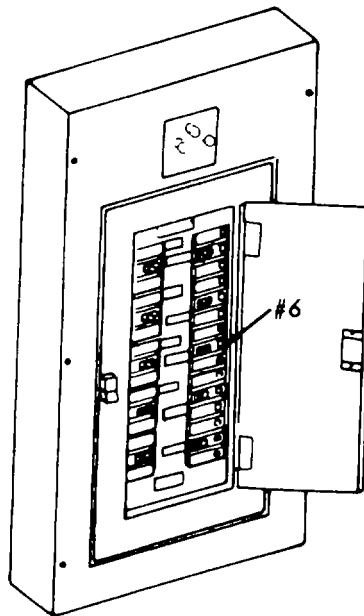


2-130. THE TOASTER (Cont).

(2) Place circuit breaker #8 on lighting distribution panel (L-100) in the ON position.



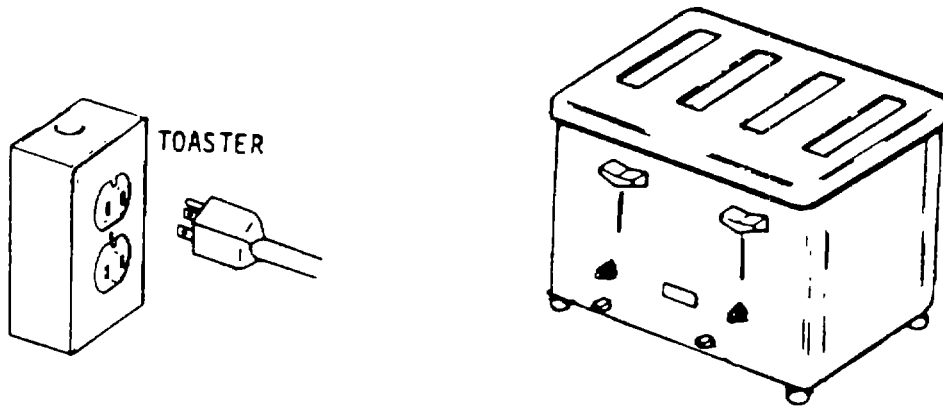
(3) Place circuit breaker #6 on lighting distribution panel (L-110) in the ON position.



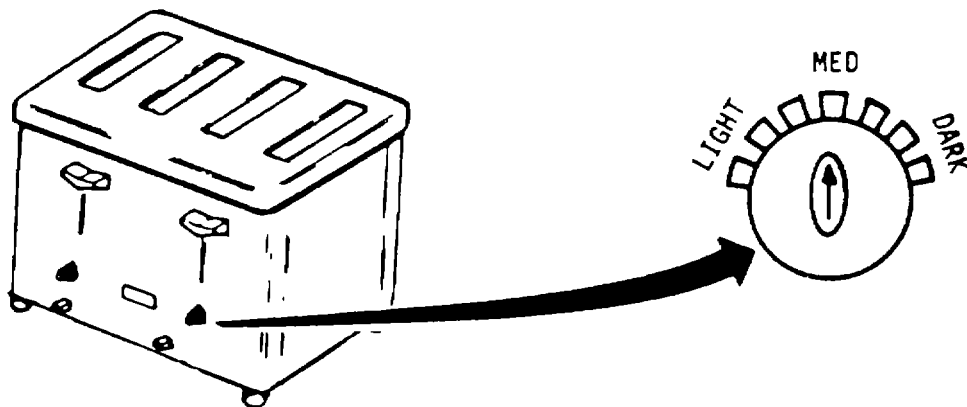
2-130. THE TOASTER (Cont).

b. Galley/Mess.

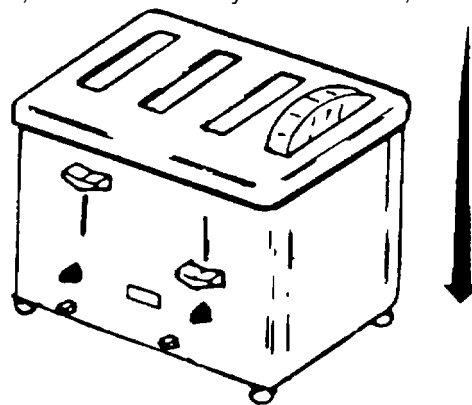
(1) Plug toaster into wall socket marked TOASTER.



(2) Position temperature/adjusting control knob to the desired toasting (light/dark) level of bread.



(3) Depress front/insert lever down, this automatically lowers bread, turns on current and starts toasting.

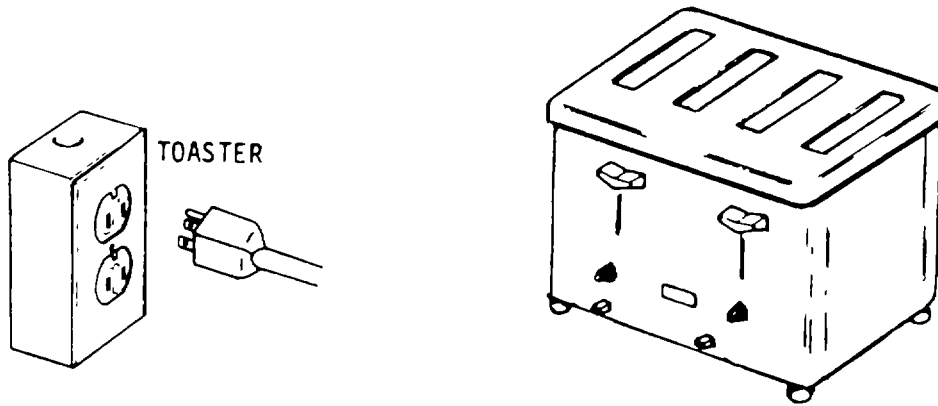


2-130. THE TOASTER (Cont).

(4) When finished toasting, bread will pop up automatically and turn current off.

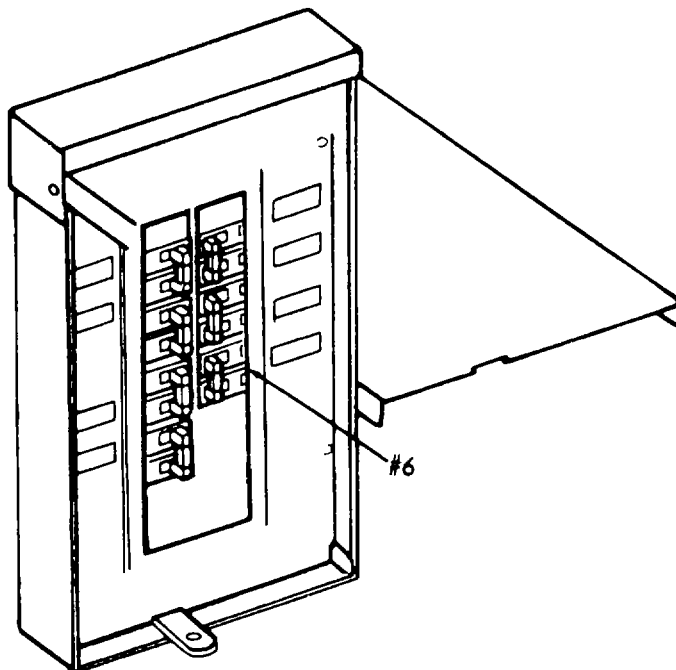
c. Galley/Mess.

Remove toaster plug from wall socket marked TOASTER.



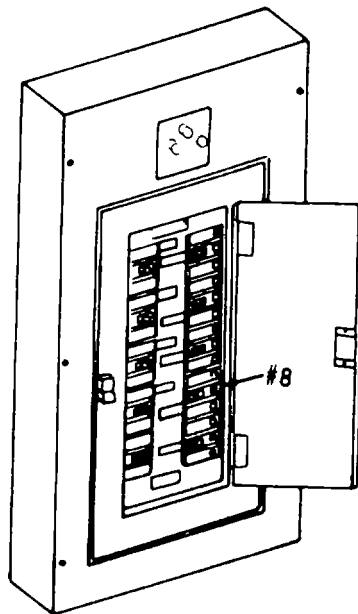
d. Engine Access Room.

(1) Place circuit breaker #6 on lighting distribution panel (L-110) in the OFF position.

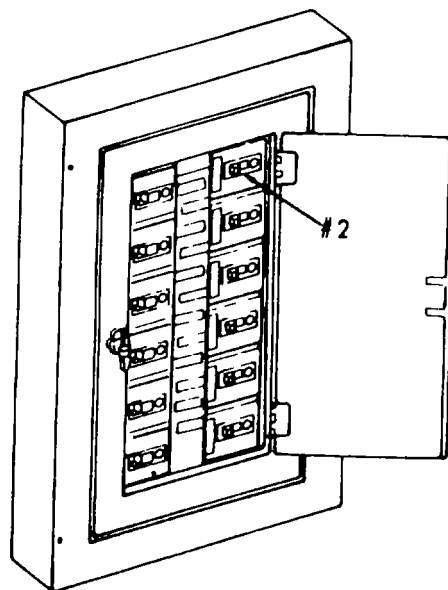


2-130. THE TOASTER (Cont).

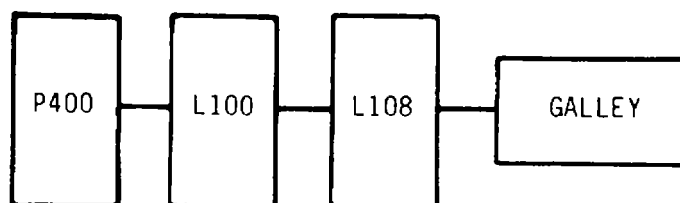
(2) Place circuit breaker #8 on lighting distribution panel (L-100) in the OFF position.



(3) Place circuit breaker #2 on power distribution panel (P-400) in the OFF position.



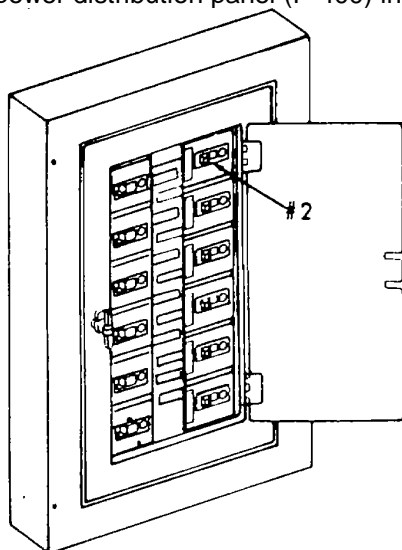
2-131. ENTERTAINMENT AMPLIFIER.



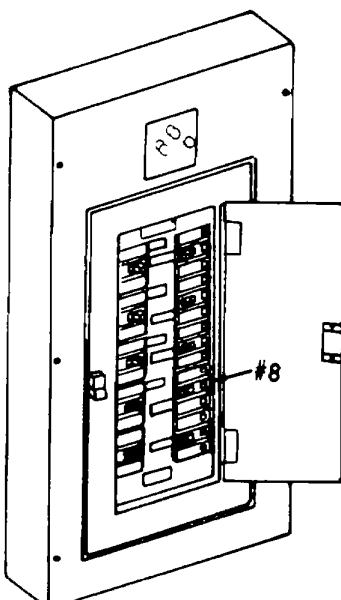
a. Turn-on Procedure.

(1) Engine Access Room.

(a) Place circuit breaker #2 on power distribution panel (P-400) in the ON Position.



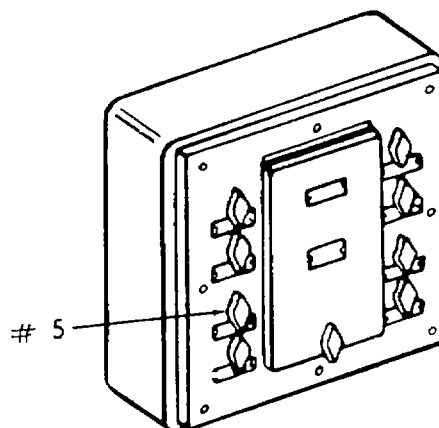
(b) Place circuit breaker #8 on lighting distribution panel (L-100) in the ON position.



2-131. ENTERTAINMENT AMPLIFIER (Cont).

(2) Galley/Mess

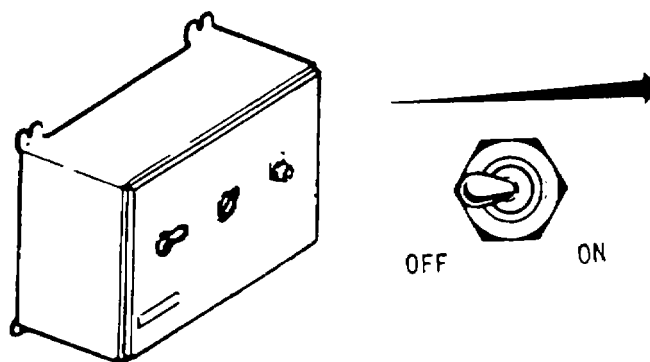
(a) Place switch #5 on distribution panel (L- 108) in the ON position.



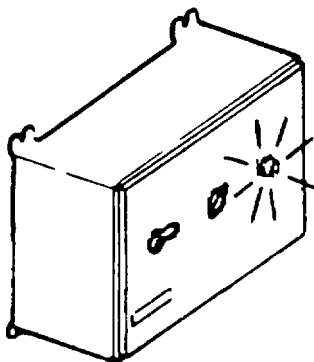
NOTE

The multi-purpose receiver must be turned on in the pilot house before the entertainment amplifier is turned on.

(b) Place ON/OFF switch in the ON position.

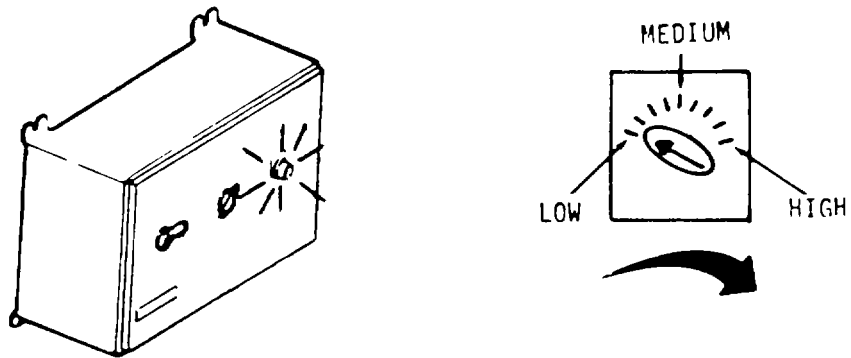


(c) Lamp will turn on indicating power to the unit.



2-131. ENTERTAINMENT AMPLIFIER (Cont).

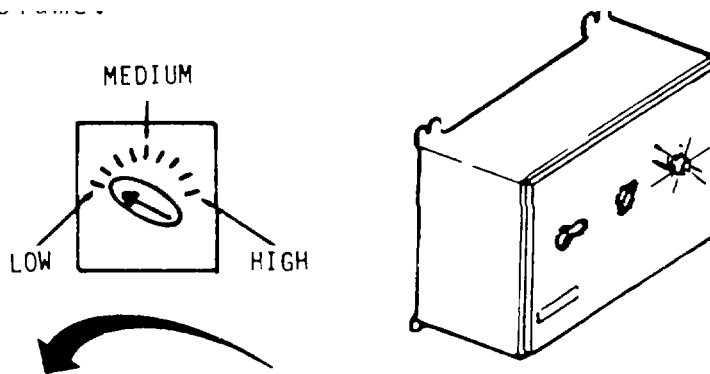
(d) Adjust volume control knob to desired listening volume (clockwise).



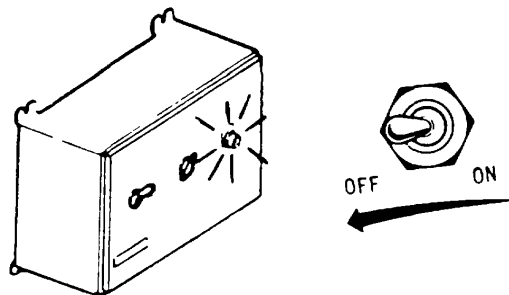
b. Turn-off procedures.

(1) Galley/Mess.

(a) Turn volume control knob counter-clockwise to shut off volume.

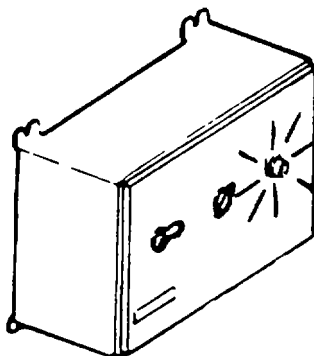


(b) Place on/off switch in the off position.

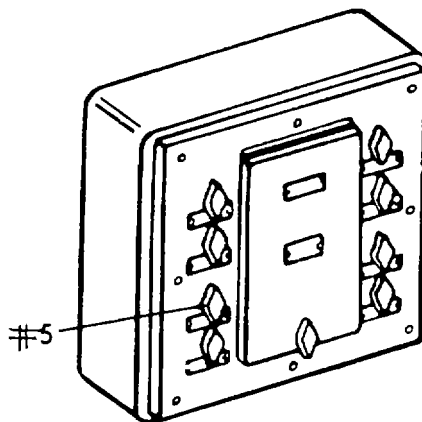


2-131. ENTERTAINMENT AMPLIFIER (Cont).

(c) Lamp indicating power to the unit will go out.



(d) Place circuit breaker #5 on the distribution panel (L-108) in the OFF position.

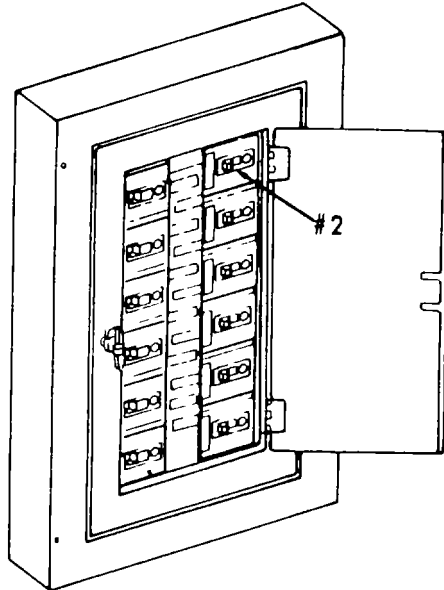


(2) Engine Access Room.

(a) Place circuit breaker #8 on lighting distribution panel (P-100) in the OFF position.

2-131. ENTERTAINMENT AMPLIFIER (Cont).

(b) Place circuit breaker #2 on power distribution panel(P-400) in the OFF position.



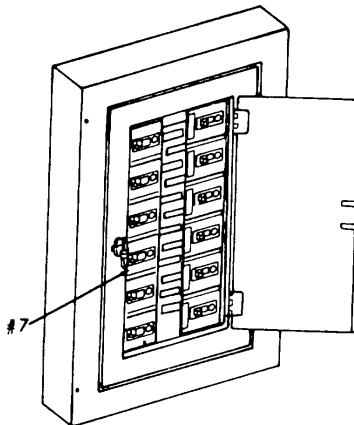
2-132. ELECTRIC RANGE.



a. Turn-on Procedure.

(1) Engine Access Room.

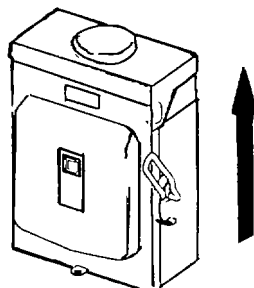
Place circuit breaker #7 on power distribution panel (P-400) in the ON position.



2-132. ELECTRIC RANGE (Cont).

(2) Galley/Mess.

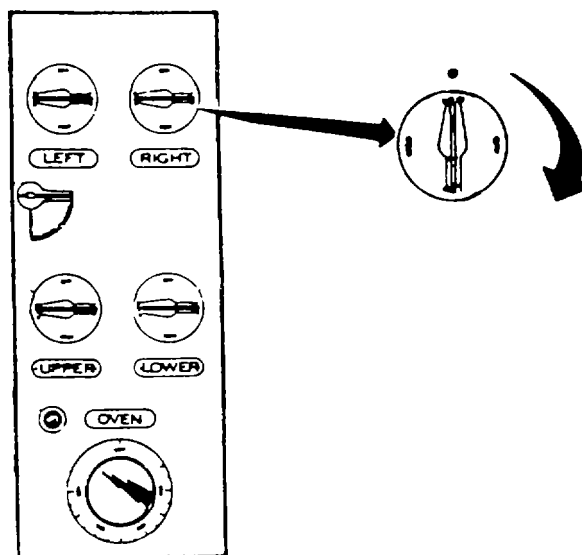
Place power disconnect switch (P-407) in the ON position.



b Galley/Mess - Oven Hot Plate.

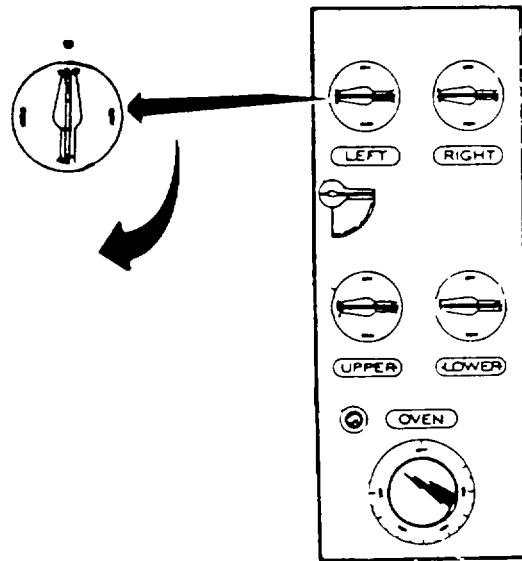
There are two rotary switches to operate the hot plate griddle top for right and left sides.

(1) Turn the right rotary switch clockwise to select and adjust hot plate temperature.



(2) Turn the left rotary switch clockwise to select and adjust hot plate temperature.

2-132. ELECTRIC RANGE (Cont).



(3) Pre-heat hot plate griddles 10 minutes before setting cold utensils on hot plate.

NOTE

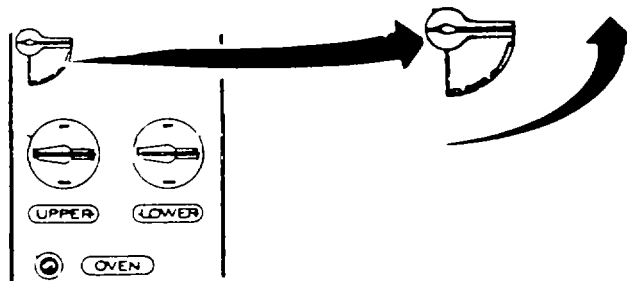
In heavy seas, sea-rail must be attached to the oven top while cooking.

(4) Preheat hot plate griddle 30 minutes with cooking oil before starting to fry.

c. Galley/Mess - Oven Operation.

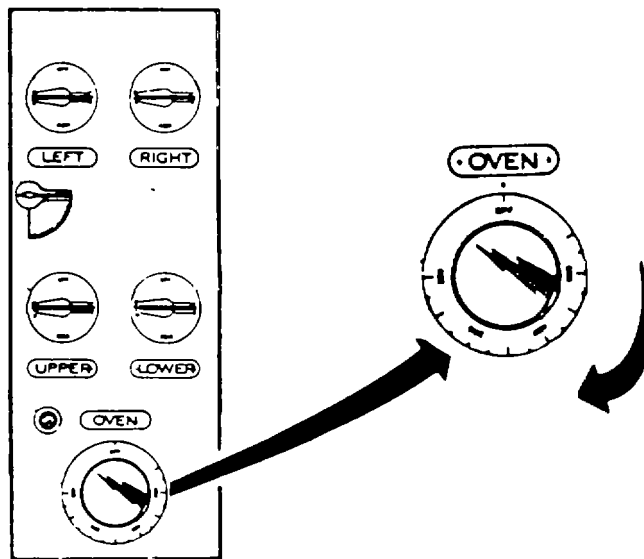
(1) For baking or roasting.

(a) Turn oven damper counter-clockwise to open damper. Controls al r flow into oven.



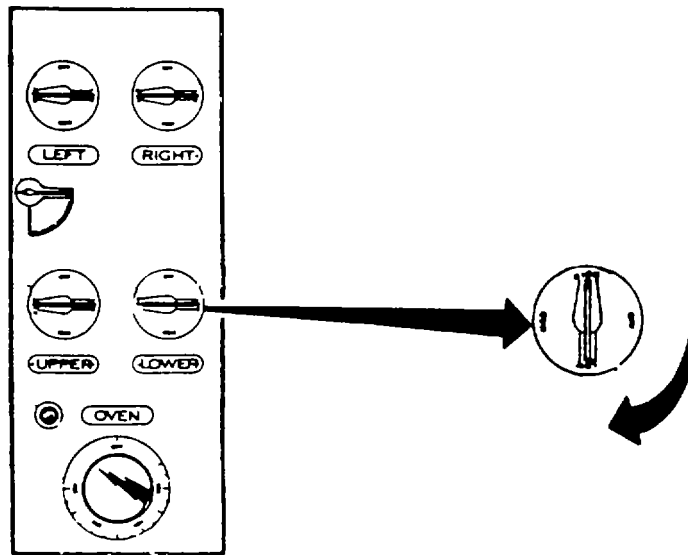
2-132. ELECTRIC RANGE (Cont).

(b) Turn oven thermostat clockwise to desired cooking temperature.

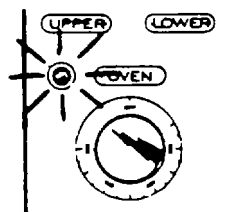


(c) Turn upper oven element switch clockwise to "High".

(d) Turn lower oven element switch clockwise to "High".

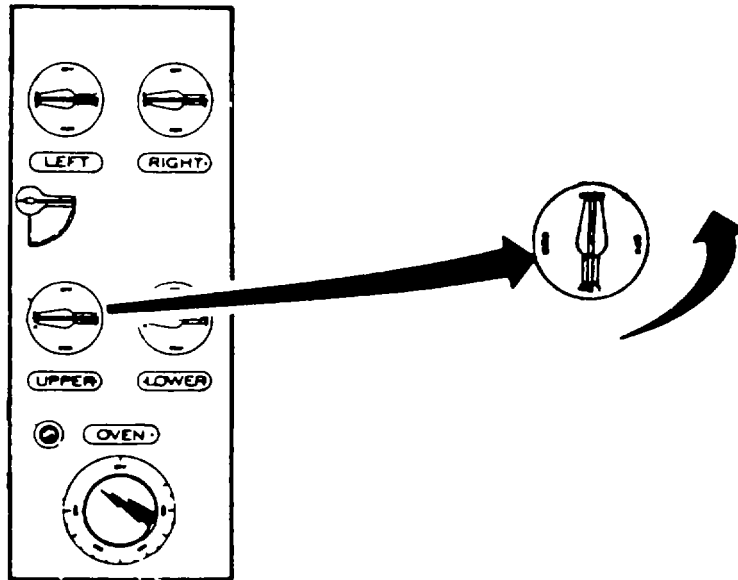


(e) Thermostat pilot light (red) lights.



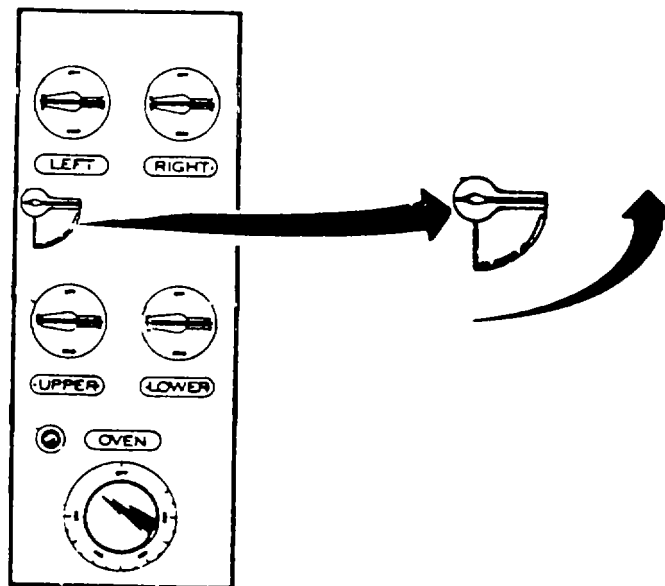
2-132. ELECTRIC RANGE (Cont).

- (f) When thermostat pilot light goes out turn upper oven element counter-clockwise to off.



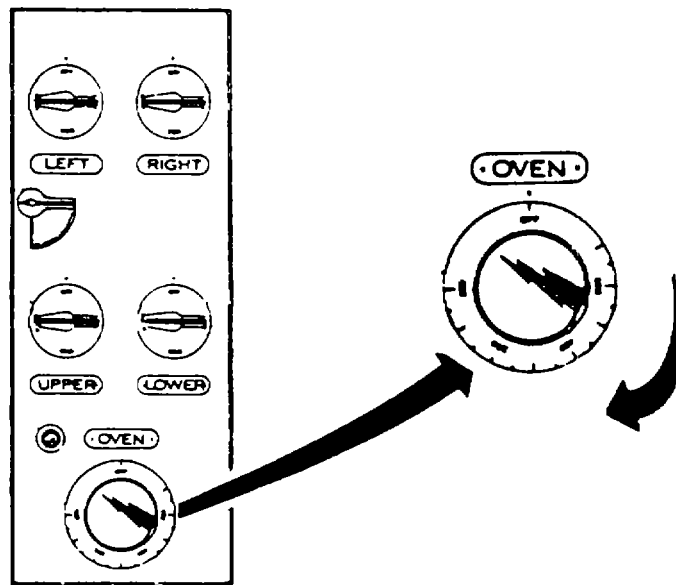
- (2) For broiling.

- (a) Turn oven damper counter-clockwise to open damper, controls air flow to oven.

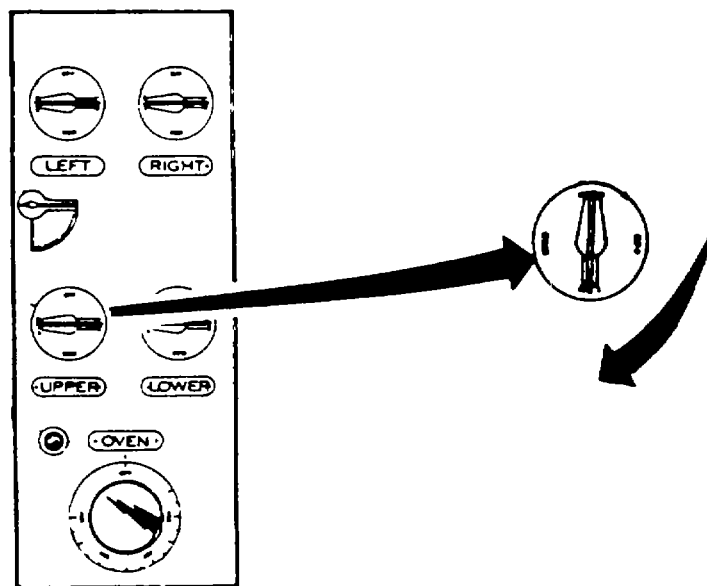


2-132. ELECTRIC RANGE (Cont).

(b) Turn oven thermostat clockwise to broil.



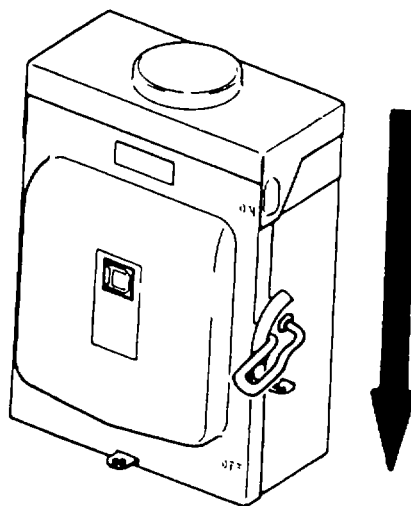
(c) Turn upper oven element switch clockwise to "High".



(d) Keep oven door slightly ajar while broiling.

2-132. ELECTRIC RANGE (Cont).

- d. In case of fire.
- (1) Cooking surface/hot plate griddle fire.
- (a) Place disconnect switch (P407) in the OFF position.



- (b) Cover affected area with a heavy canvas or blanket.



Do not attempt to fight a grease fire by playing the nozzle of the extinguisher directly on the burning grease. The force will cause the burning grease to be sprayed on adjoining units making it difficult to contain the fire.

- (c) Play the fire extinguisher nozzle over the canvas or blanket to seal off air.
- (2) Oven fire.
- (a) Place disconnect switch in the OFF position.

2-132. ELECTRIC RANGE (Cont).

- (b) Close oven door.

CAUTION

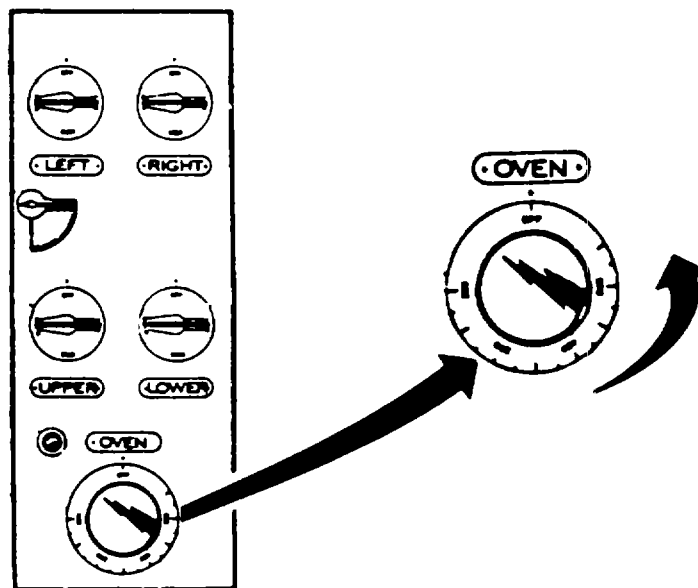
Do not attempt to fight a grease fire by playing the nozzle of the extinguisher directly on the burning grease. The force will cause the burning grease to be sprayed on adjoining units making it difficult to contain the fire.

- (c) Play the fire extinguisher nozzle over the opening around the door.

- e. Oven turn off procedure:

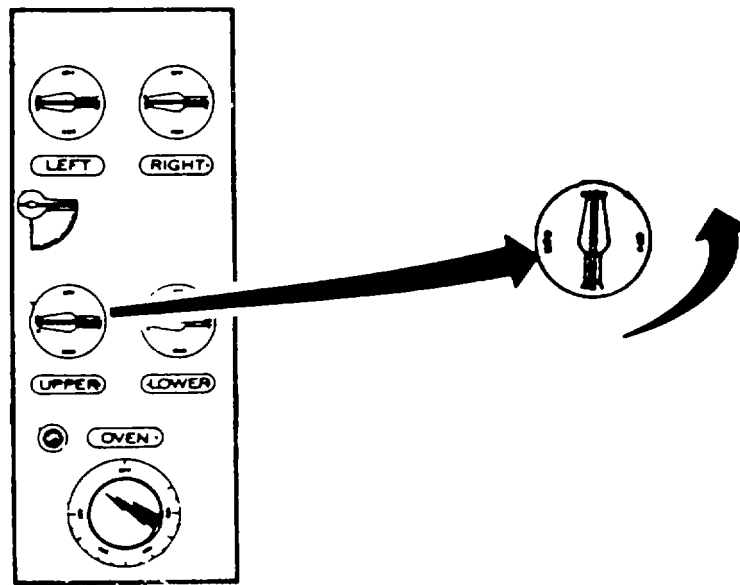
- (1) For broiling.

- (a) Turn oven thermostat counter-clockwise to OFF.

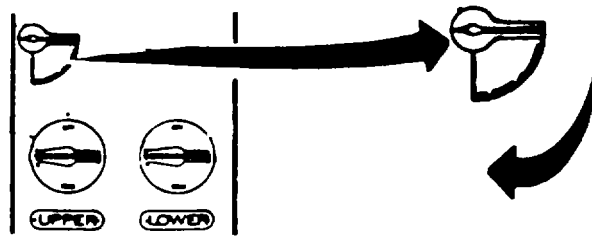


- (b) Turn upper oven element counter-clockwise to OFF.

2-132. ELECTRIC RANGE (Cont).

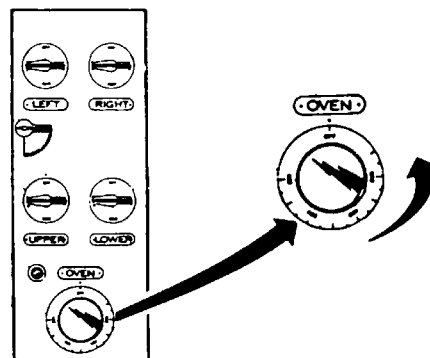


(c) Turn damper control knob clockwise to close.



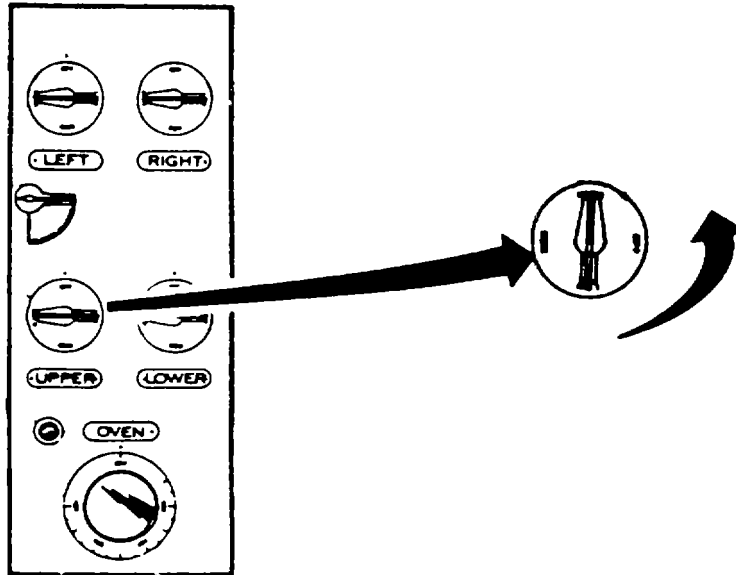
(2) For baking or roasting.

(a) Turn oven thermostat counter-clockwise to OFF.

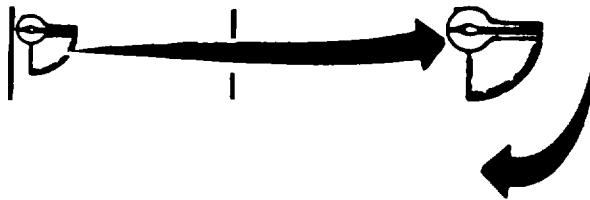


2-132. ELECTRIC RANGE (Cont).

- (b) Turn lower oven element counter-clockwise to OFF.
- (c) If In use, turn upper oven element counter-clockwise to OFF.

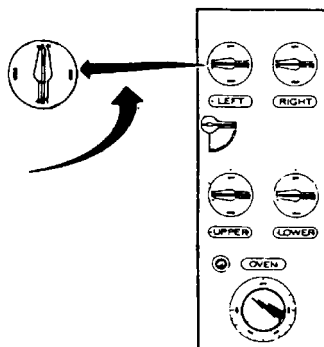


- (d) Turn damper control knob clockwise to close.



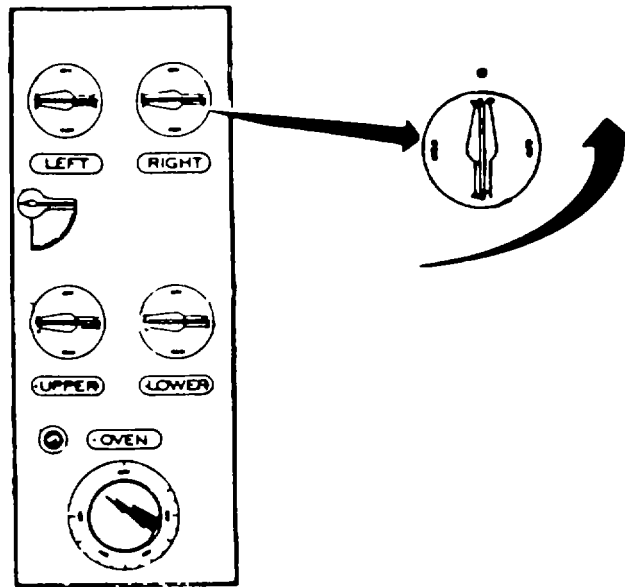
f. Hot Plate Griddle Turn Off.

- (1) Turn left selector switch counter-clockwise to OFF.



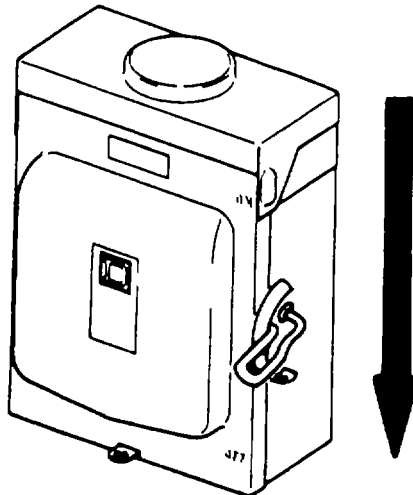
2-132. ELECTRIC RANGE (Cont).

(2) Turn right selector switch counter-clockwise to OFF.



g. Galley/Mess.

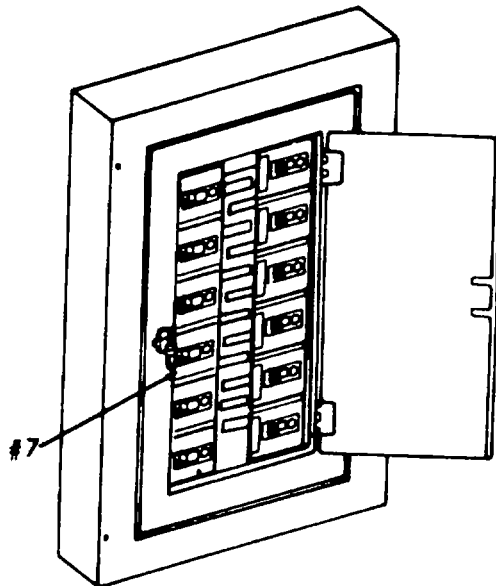
Place power disconnect switch (P407) in the OFF position.



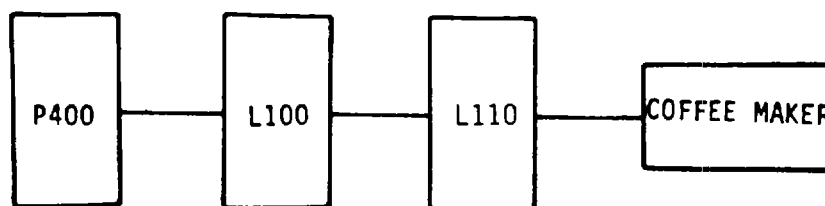
2-132. ELECTRIC RANGE (Cont).

h. Engine Access Room.

Place circuit breaker #7 on power distribution panel (P-400) in the OFF position.



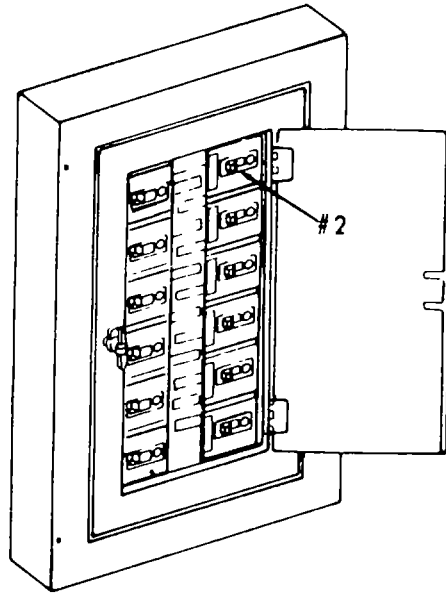
2-133. COFFEE MAKER.



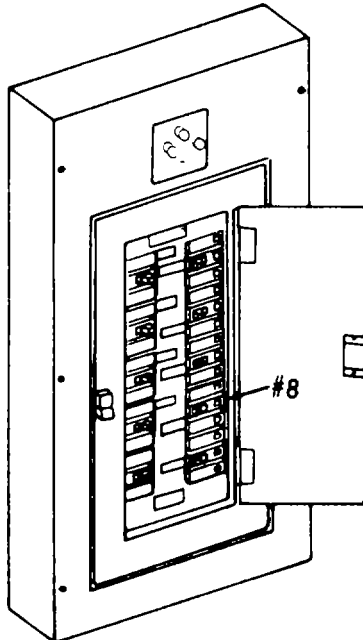
a. Engine Access Room.

(1) Place circuit breaker #2 on power distribution panel (P-400) in the ON position

2-133. COFFEE MAKER (Cont).

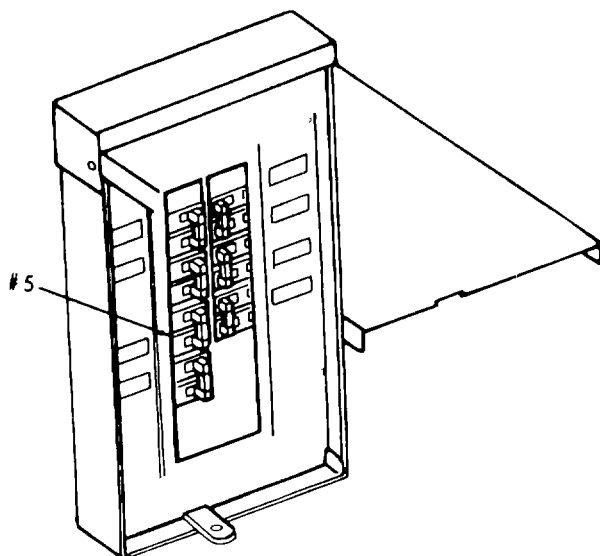


(2) Place circuit breaker #8 on lighting distribution panel (L-100) in the ON position.



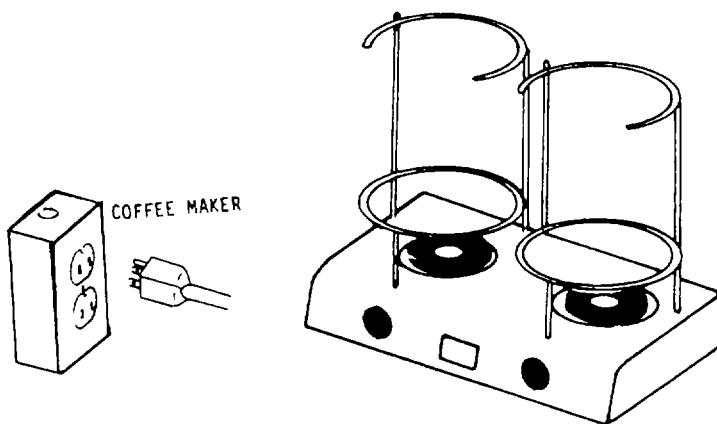
2-133. COFFEE MAKER (Cont).

- (3) Place circuit breaker #5 on lighting distribution panel (L-110) in the ON position.



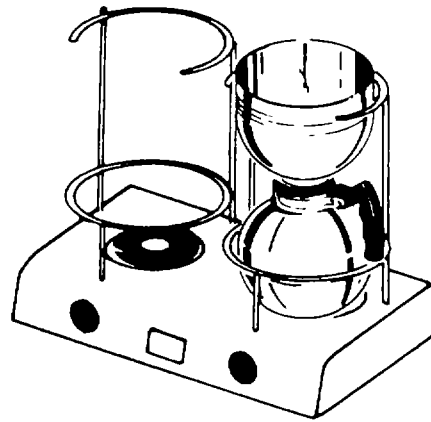
b. Galley/Mess.

- (1) Plug coffee maker in wall socket marked COFFEE MAKER.

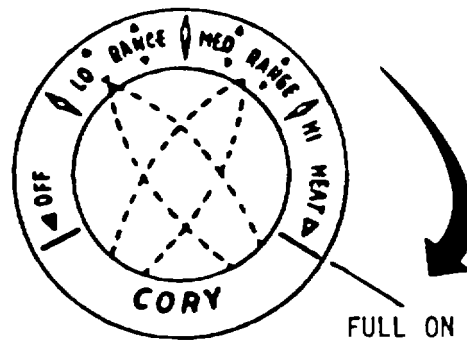


- (2) Place filled coffee pot on top of coffee maker.

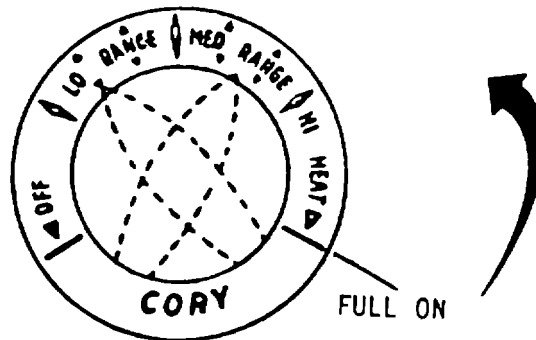
2-133. COFFEE MAKER (Cont).



- (3) Turn temperature control knob clockwise to high heat/full on range to perk coffee.



- (4) Once coffee has been brewed, turn temperature control knob counter-clockwise to desired temperature to keep coffee hot.



NOTE

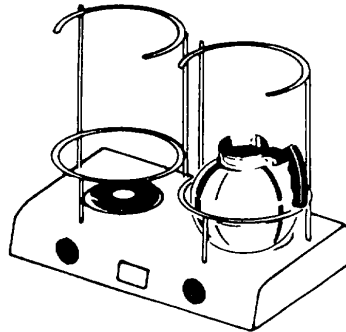
Temperature ranges:

Low ranges	125° to 170°F
Medium ranges	170° to 190°F
H1 Heat	190° to 225°F

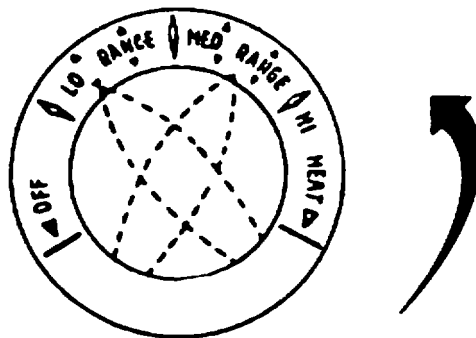
2-133. COFFEE MAKER (Cont).

c. Turn Off Procedure.

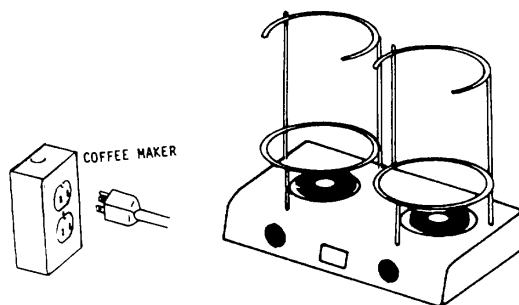
(1) Remove coffee pot from coffee maker.



(2) Turn temperature control knob counter-clockwise to the OFF position.



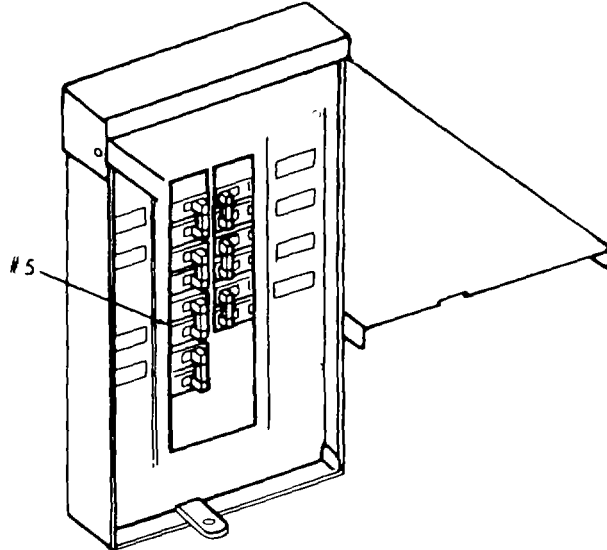
(3) Unplug coffee maker from wall socket marked COFFEE MAKER.



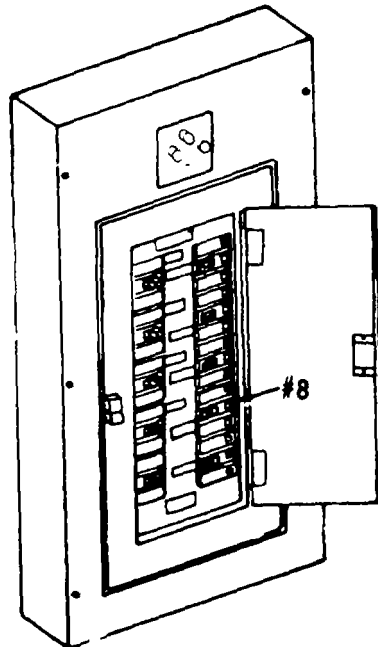
2-133. COFFEE MAKER (Cont).

d. Engine Access Room.

(1) Place circuit breaker #5 on lighting distribution panel (L-110) in the OFF position.

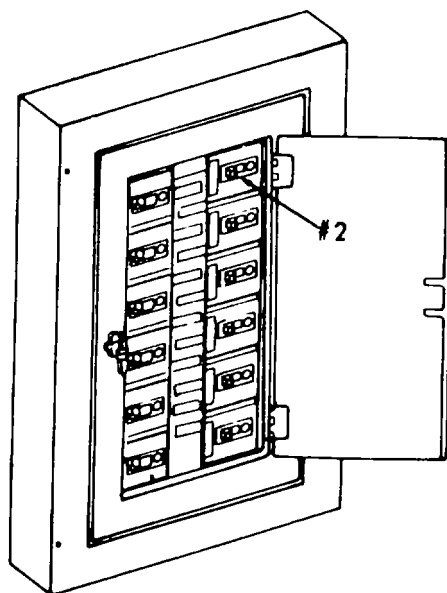
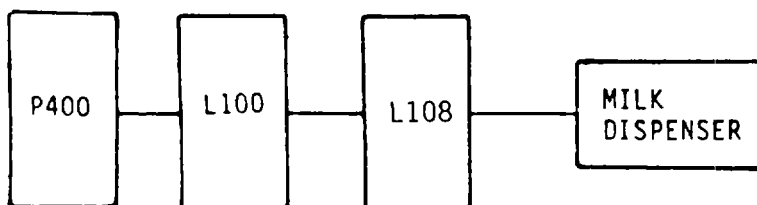


(2) Place circuit breaker #8 on lighting distribution panel(L-100) in the OFF position.



2-133. COFFEE MAKER (Cont).

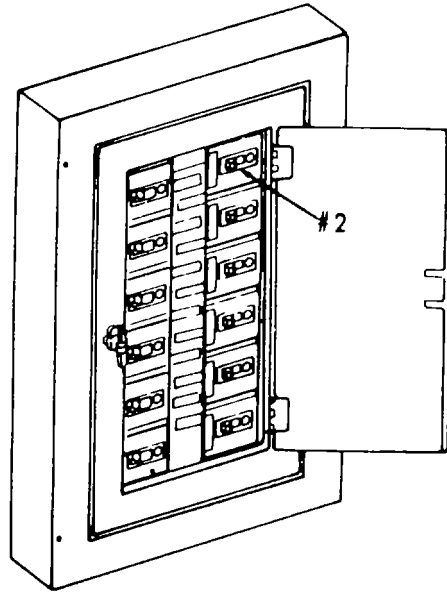
- (3) Place circuit breaker #2 on power distribution panel (P-400) in the OFF position.

**2-134. THE MILK DISPENSER.**

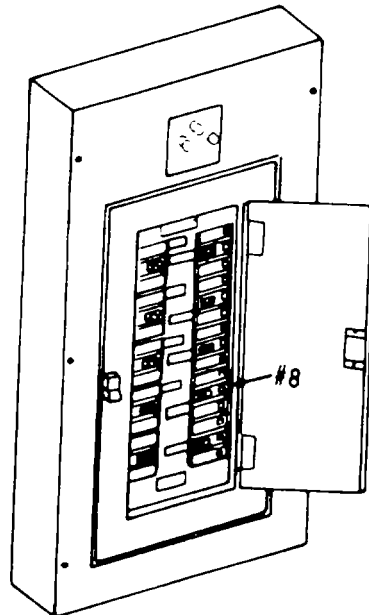
- a. Engine Access Room.

- (1) Place circuit breaker #2 on power distribution panel (P-400) in the ON position.

2-134. THE MILK DISPENSER (Cont).



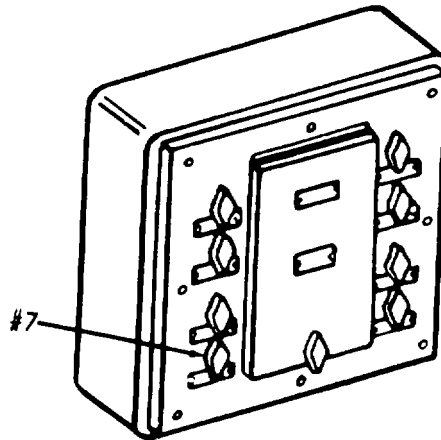
(2) lace circuit breaker #8 on lighting distribution panel(L-100) in the ON position.



2-134. THE MILK DISPENSER (Cont).

b. Galley/Mess.

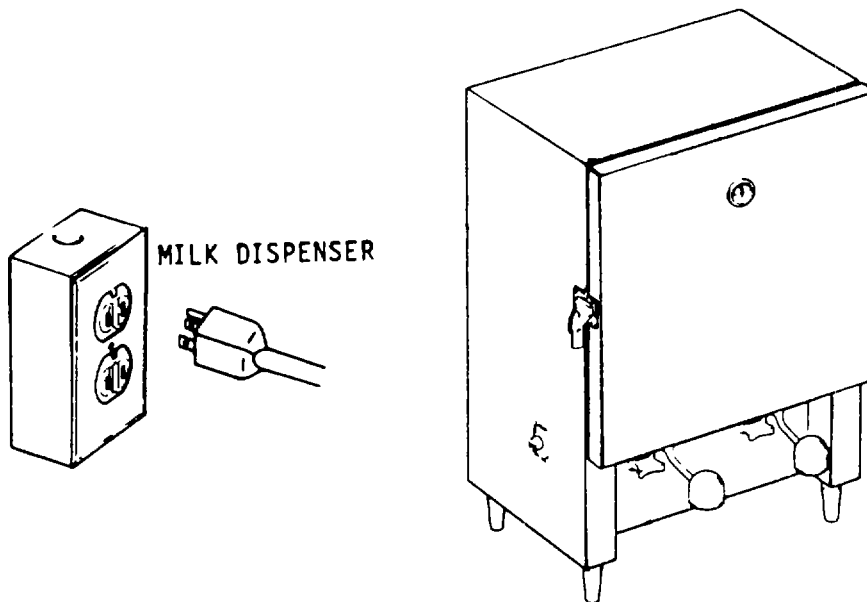
(1) Place switch #7 on distribution panel (L-108) in the ON position.



NOTE

Electric current must be maintained to milk dispenser except during an emergency or when ship is not in use.

(2) Plug milk dispenser into electric outlet.



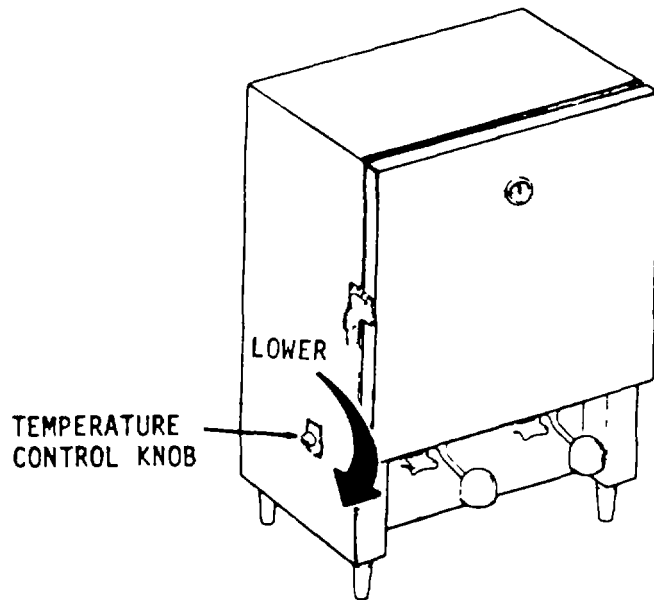
2-134. THE MILK DISPENSER (Cont).**NOTE**

Allow milk dispenser to operate about one (1) hour to reach proper operating temperature before placing cans of milk in the dispenser.

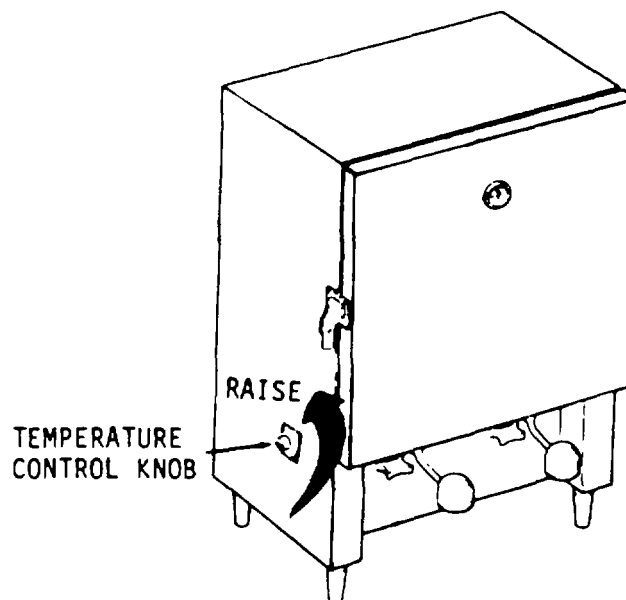
(3) Temperature is factory preset and adjusted for an average interior temperature of 35° to 38°F (16.1° to 21°C).

(a) Additional adjustment of temperature in cabinet.

1 Turn temperature control knob to the right (clockwise) to lower temperature.

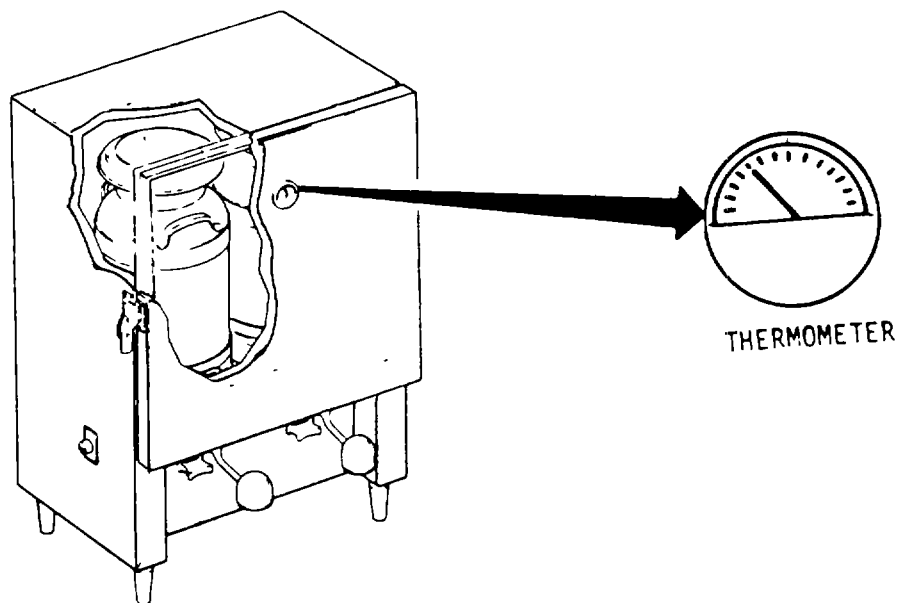


2 Turn temperature control knob to the left (counter-clockwise) to raise temperature.

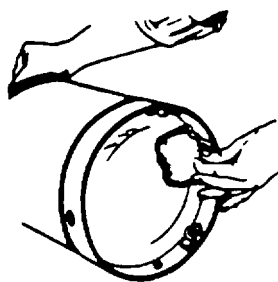


2-134. THE MILK DISPENSER (Cont).

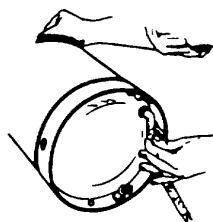
- (b) After adjustments to temperature, allow refrigeration unit to cycle normally for one hour.
- (c) Check interior temperature thermometer before making more adjustments.



- (4) Wipe off bottom of milk cans before placing in dispenser.

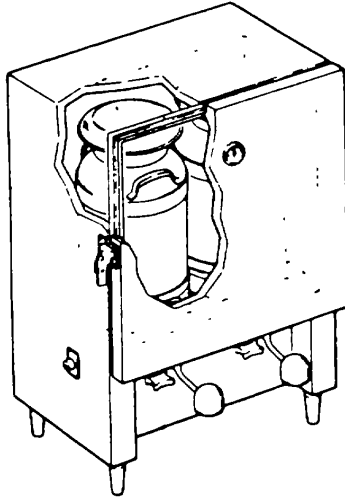


- (5) Slip the ploffilm-covered tube from the two carrying hooks on the bottom of the can.

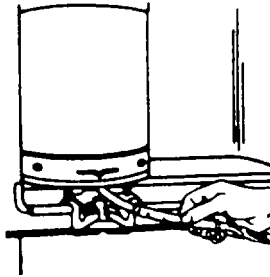


2-134. THE MILK DISPENSER (Cont).

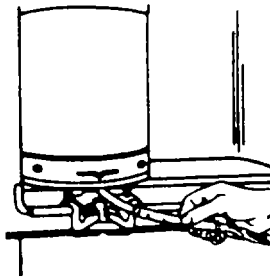
- (6) Open dispenser door and place milk can in dispenser.



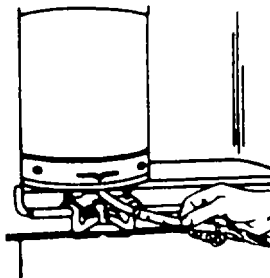
- (7) Remove pliofilm cover, being careful not to pull tube from can nipple.



- (8) Remove left valve from plastic wells.

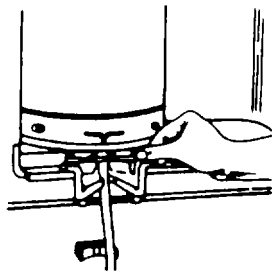


- (9) Lay (do not pull or stretch) tube down into white plastic well.

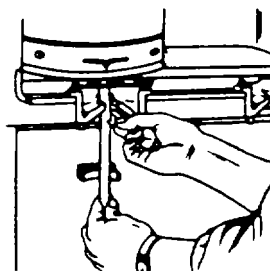


2-134. THE MILK DISPENSER (Cont).

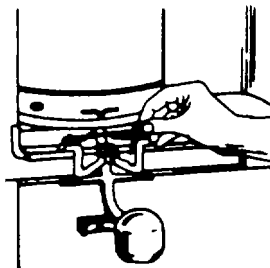
(10) Using tube clamp, pinch off tube by swinging it against the tube and locking it over the pin provided.



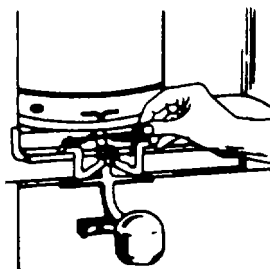
(11) Sever sealed end of the tube, cutting tube approximately 1/4 inch (0.635 cm) below the pinch off point, with clean razor blade.



(12) Replace lift valve.

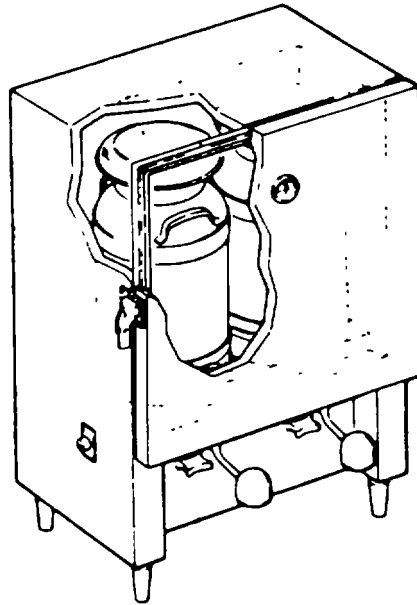


(13) Release flow of milk by unlocking tube clamp from pin.



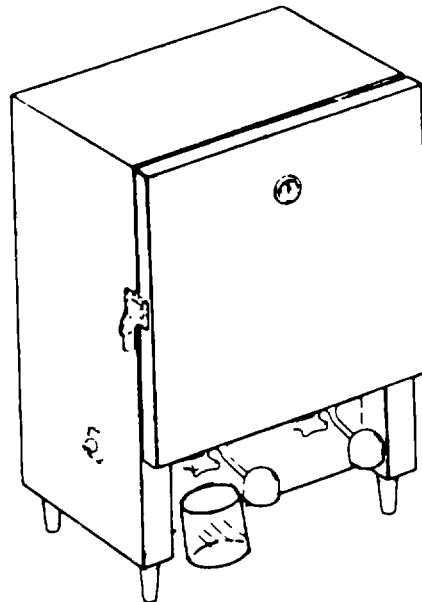
(14) Close dispenser door after second can of milk has been placed in the dispenser in the same manner as above.

2-134. THE MILK DISPENSER (Cont).



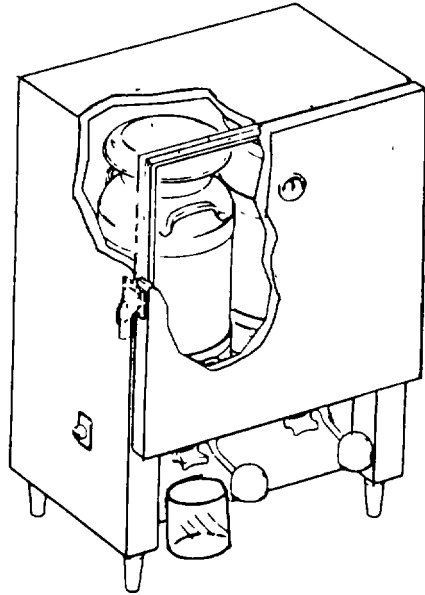
c. Removing milk cans from the dispenser.

- (1) Place container under valve. Open dispenser door.

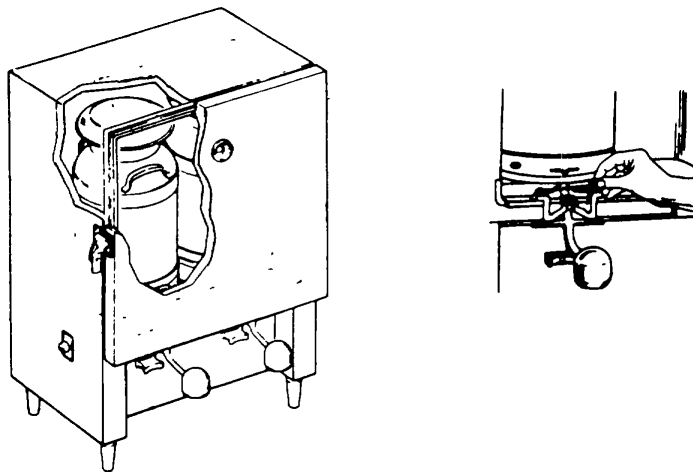


2-134. THE MILK DISPENSER (Cont).

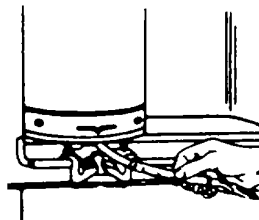
- (2) Open valve and tip can forward to drain remaining few ounces of milk from the can.



- (3) After milk has been drained, tip can back into dispenser, remove container and remove lift valve.

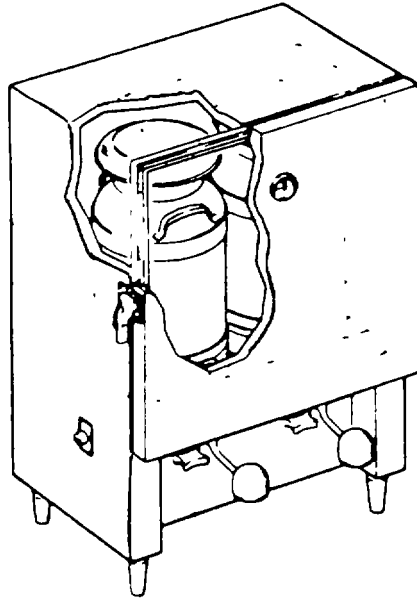


- (4) Remove tube from well.



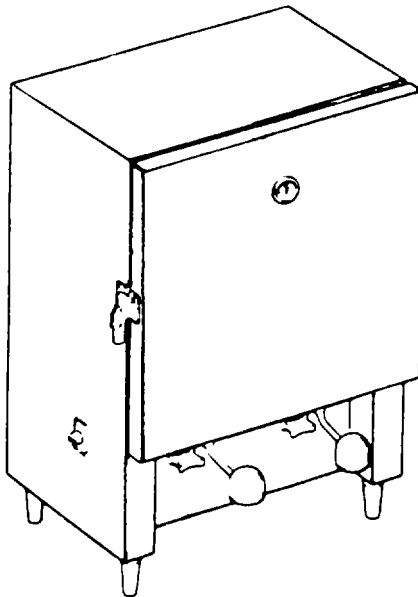
2-134. THE MILK DISPENSER (Cont).

- (5) Remove milk can from dispenser.



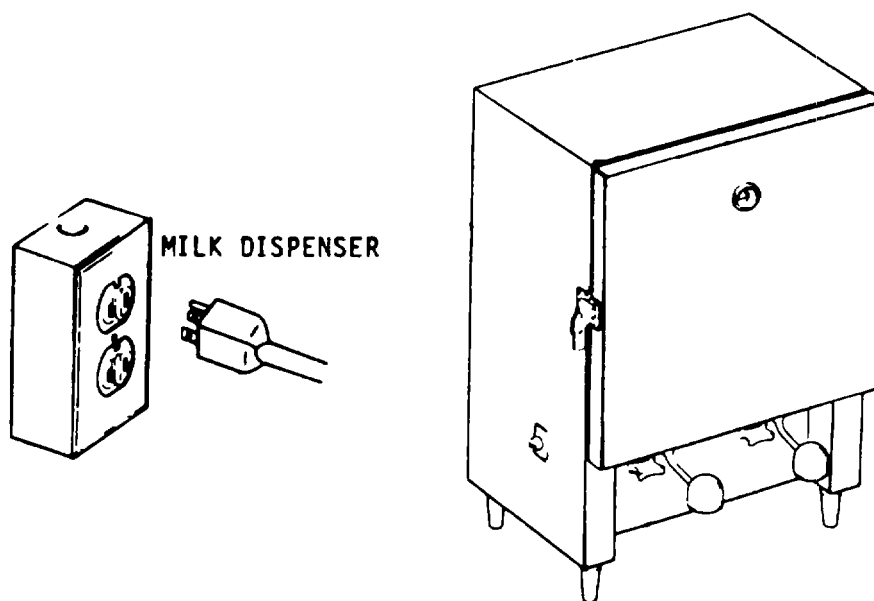
Remove second can of milk in same manner.

- (6) Replace lift valve lever and close dispenser door.

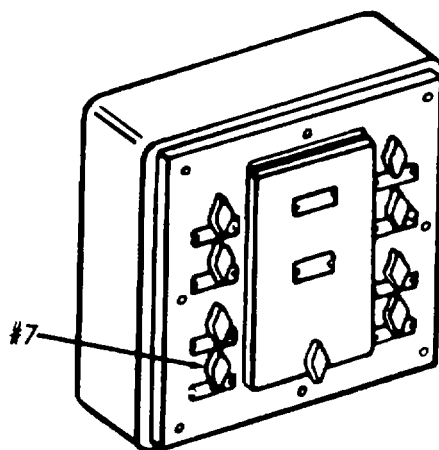


2-134. THE MILK DISPENSER (Cont).

- (7) Unplug milk dispenser from wall socket.



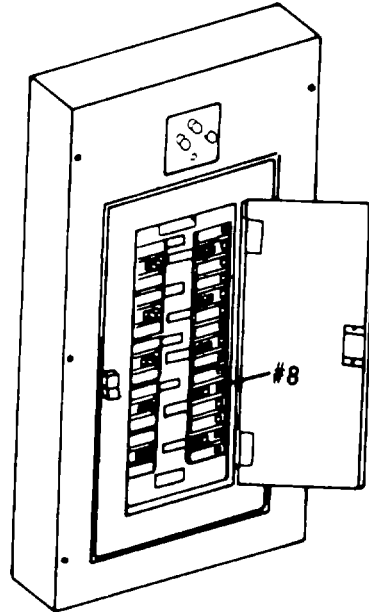
- (8) Place switch #7 on distribution panel (L-108) in the OFF position.



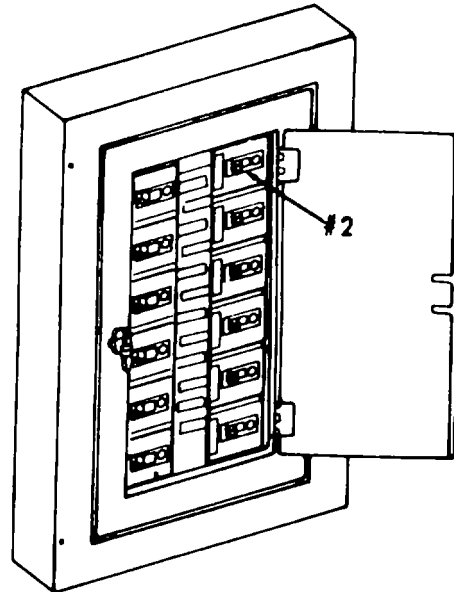
d. Engine Access Room.

- (1) Place circuit breaker #8 on lighting distribution panel (L-100) in the OFF position.

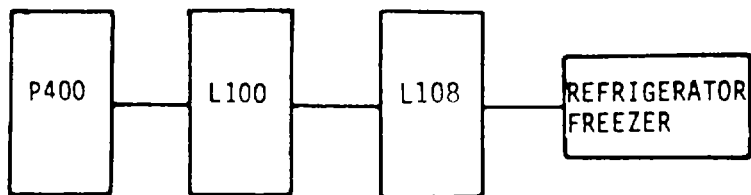
2-134. THE MILK DISPENSER (Cont).



(2) Place circuit breaker #2 on power distribution panel (P-400) in the OFF position.

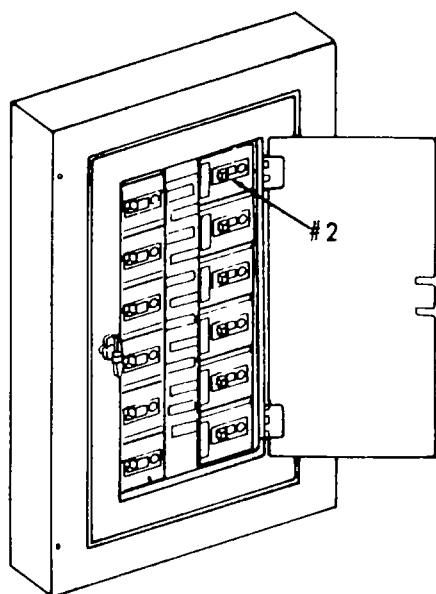


2-135. COMBINATION REFRIGERATOR/FREEZER.

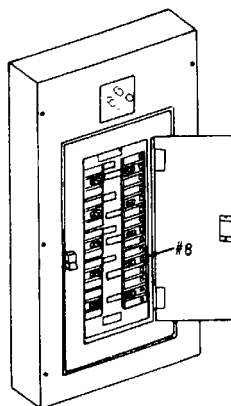


a. Engine Access Room.

- (1) Place circuit breaker #2 on power distribution panel (P-400) in the ON position.



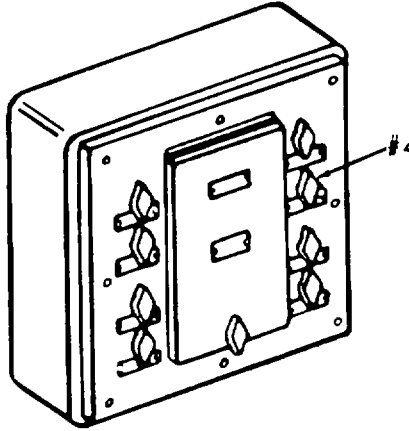
- (2) Place circuit breaker #8 on lighting distribution panel (L-100) in the ON position.



2-135. COMBINATION REFRIGERATOR/FREEZER (Cont).

b. Galley/Mess.

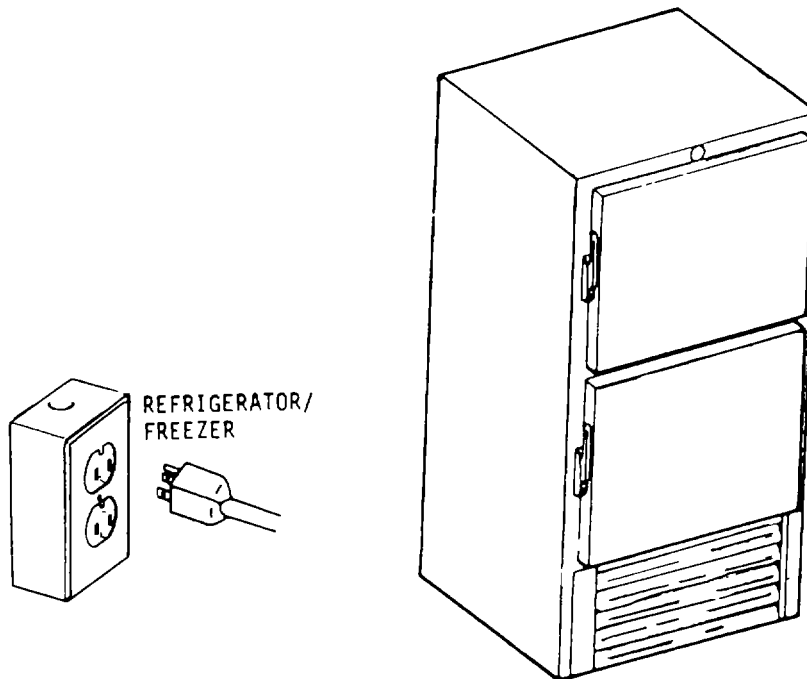
- (1) Place switch #4 on lighting distribution panel (L-108) in the ON position.



NOTE

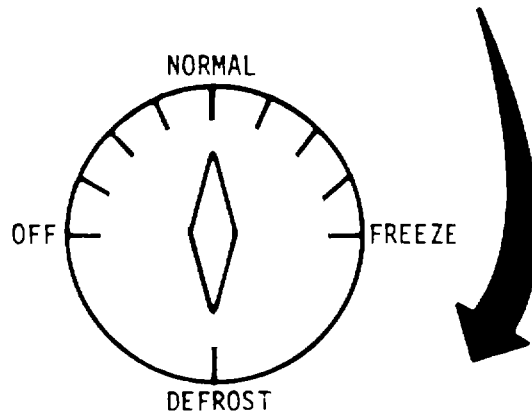
Electric current must be maintained to refrigerator, except during an emergency in the galley or when ship is not in use.

- (2) Plug refrigerator/freezer into wall socket marked REFRIGERATOR/FREEZER.

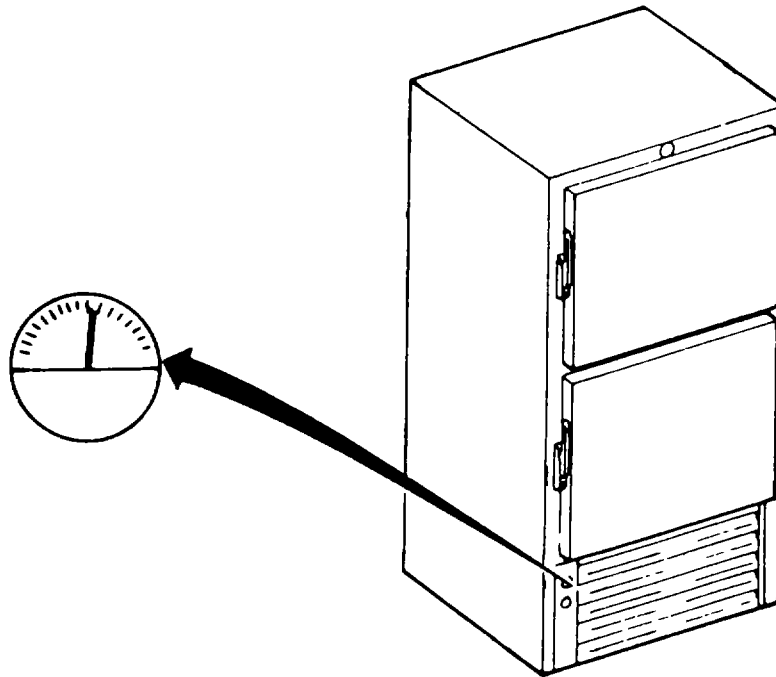


2-135. COMBINATION REFRIGERATOR/FREEZER (Cont).

- (3) Set temperature control knob to NORMAL (clockwise).

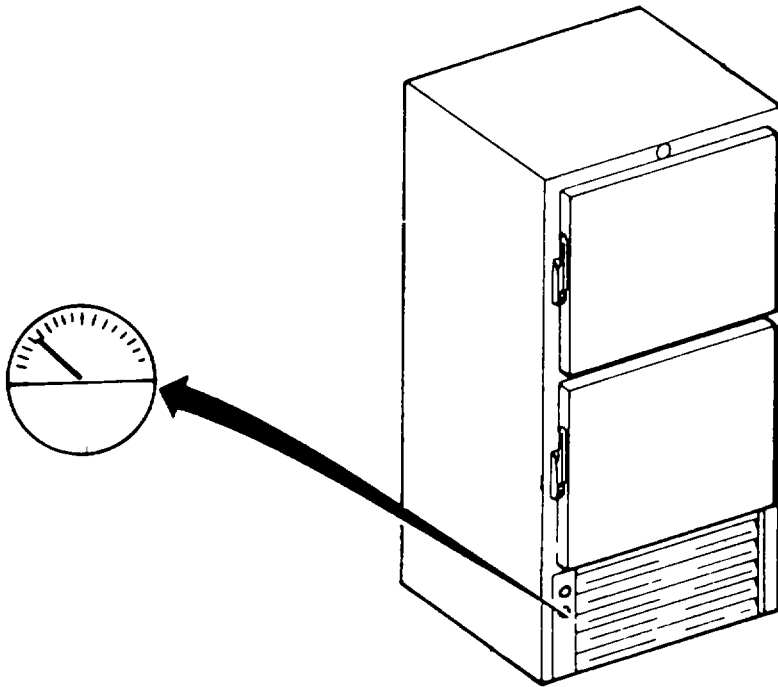


- (4) Allow refrigerator to run for three hours then:
 - (a) Check refrigerator dial thermometer.



- (b) Check freezer dial thermometer.

2-135. COMBINATION REFRIGERATOR/FREEZER (Cont).



(c) Temperature in refrigerator/freezer are in the normal range proceed to load unit.

NOTE

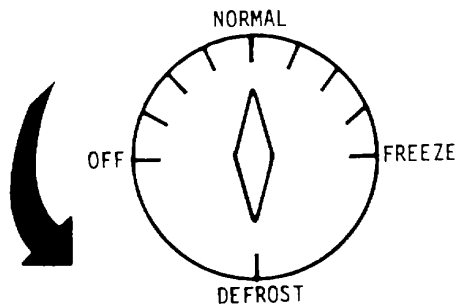
Recommended temperatures:

Refrigerators-between	37°	to	43°F.
Freezer-between	0°	to	5°F.

c. Turn off Procedure.

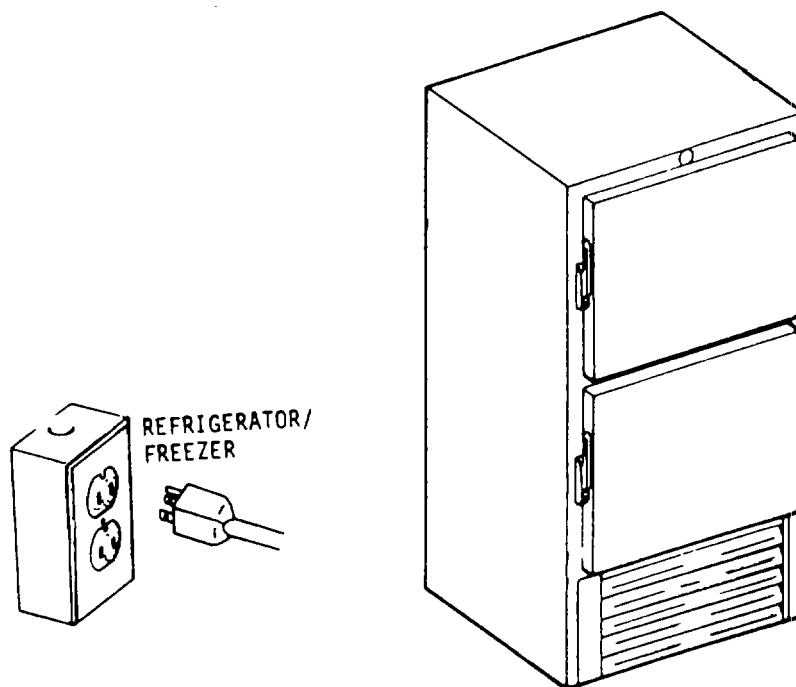
(1) Galley/Mess

(a) Turn temperature control knob counter-clockwise to OFF.

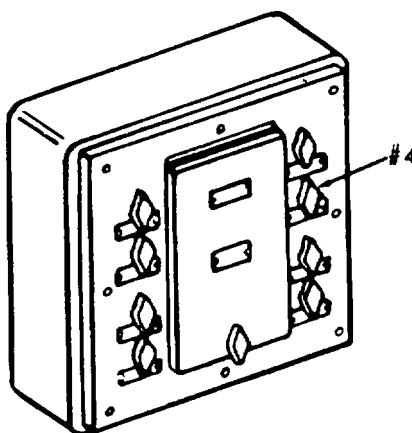


2-135. COMBINATION REFRIGERATOR/FREEZER (Cont).

- (b) Unplug refrigerator/freezer from wall socket marked REFRIGERATOR/FREEZER.



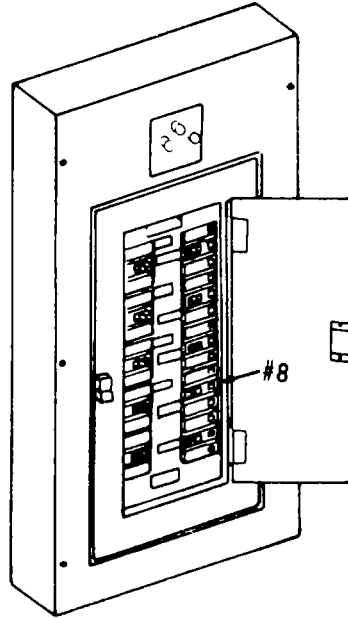
- (c) Place switch #4 on distribution panel (L108) in the OFF position.



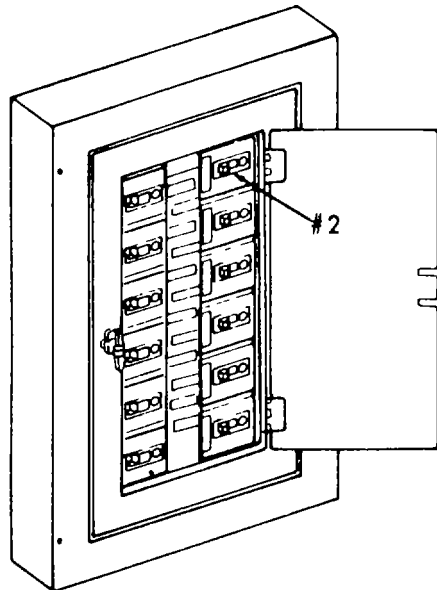
- (2) Engine Access Room.

- (a) Place circuit breaker #8 on lighting distribution panel (L100) in the OFF position.

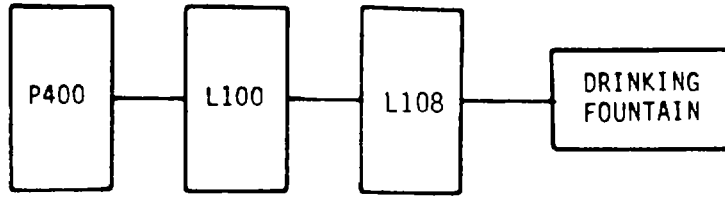
2-135. COMBINATION REFRIGERATOR/FREEZER (Cont).



(b) Place circuit breaker #2 on power distribution panel (P400) in the OFF position.

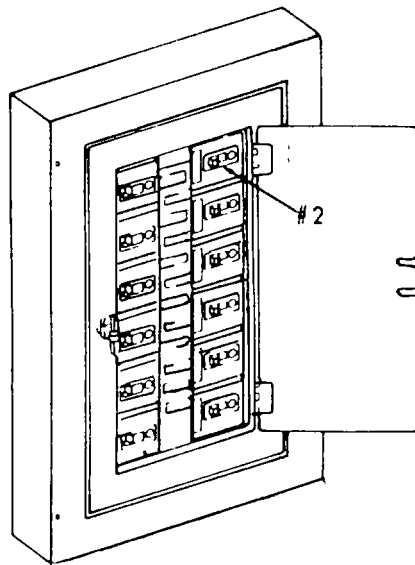


2-136. DRINKING FOUNTAIN.

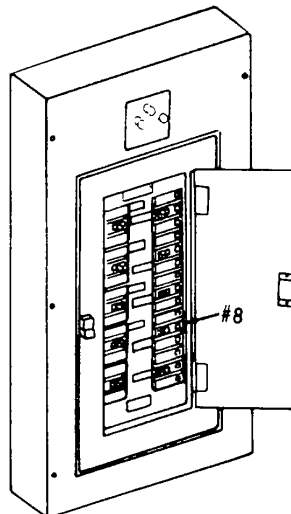


a. Engine Access Room.

(1) Place circuit breaker #2 on power distribution panel (P-400) in the ON position.



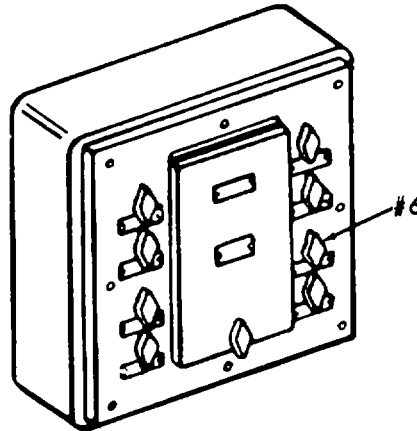
(2) Place circuit breaker #8 on lighting distribution panel (L-100) in the ON position.



2-136. DRINKING FOUNTAIN (Cont).

b. Galley/Mess.

(1) Place circuit breaker #6 on lighting distribution panel (L-105) in the ON position.

**NOTE**

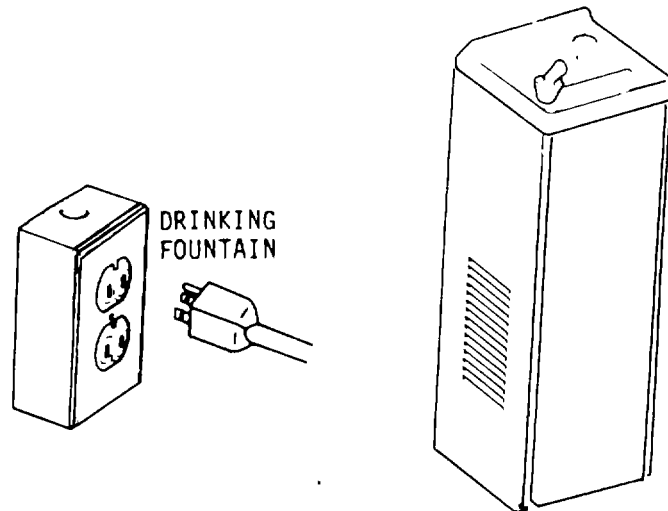
Electrical current must be maintained to drinking fountain except during an emergency in galley, or when ship is not in use.

CAUTION

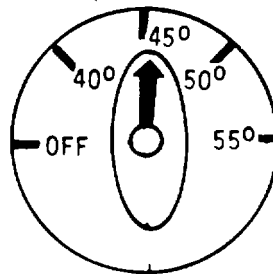
Electric current must be the same voltage, cycle and phase as indicated on nameplate. If they are not identical, DO NOT PLUG IN THE ELECTRICAL CORD.

2-136. DRINKING FOUNTAIN (Cont).

- (2) Plug drinking fountain in wall socket marked DRINKING FOUNTAIN after checking electrical connection.



- (3) Check water temperature. If desired temperature has not been reached, turn temperature control clockwise to lower temperature.

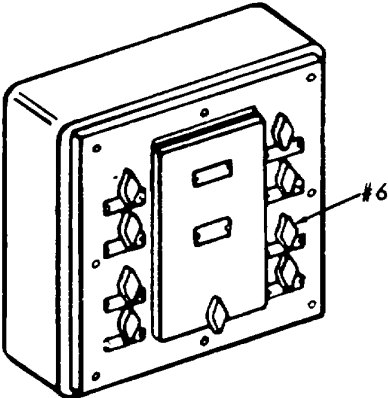
**NOTE**

Temperature is factory preset and should not need readjustment.

c. TURN OFF procedure.

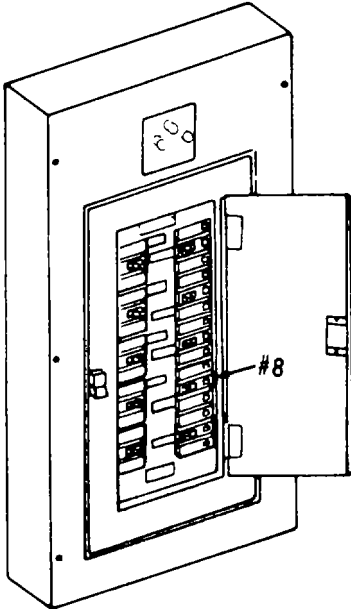
- (1) Galley/Mess.
- (a) Unplug drinking fountain from its wall socket.
 - (b) Place circuit breaker #6 on lighting distribution panel (L-105) in the OFF position.

2-136. DRINKING FOUNTAIN (Cont).



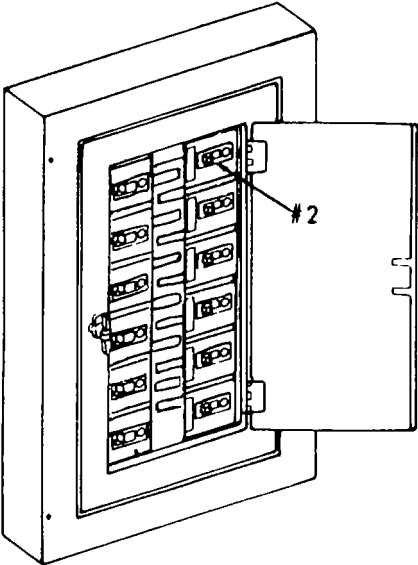
(2) Engine Access Room.

- (a) Place circuit breaker #8 on lighting distribution panel (L-100) in the OFF position.

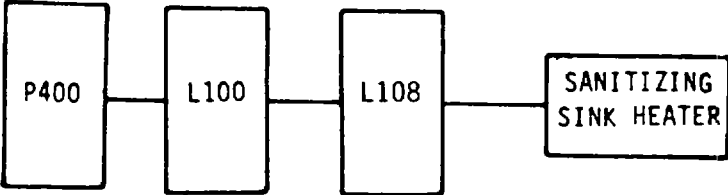


2-136. DRINKING FOUNTAIN (Cont).

- (b) Place circuit breaker #2 on power distribution panel (P-400) in the OFF position.

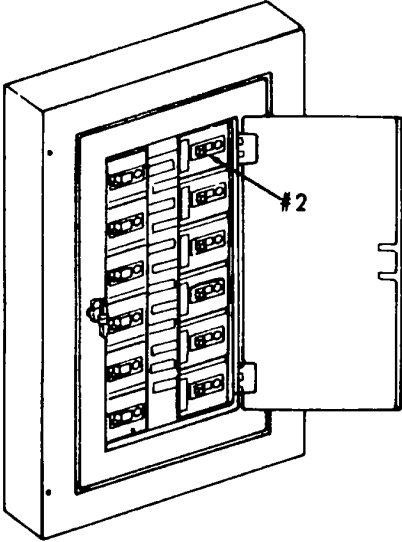


2-137. SANITIZING SINK HEATER.



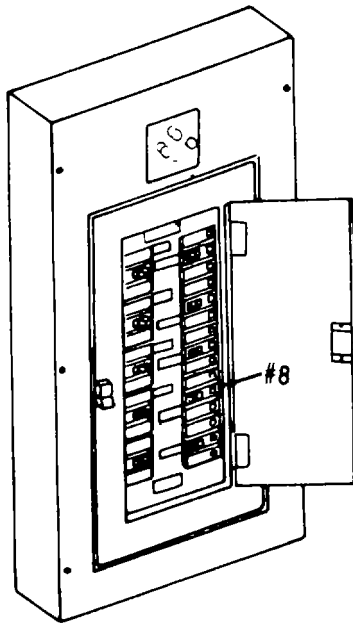
- a. Engine Access Room.

- (1) Place circuit breaker #2 on power distribution panel (P-400) in the ON position.



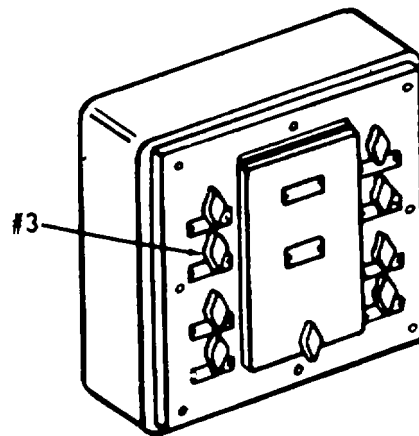
2-137. SANITIZING SINK HEATER (Cont).

- (2) Place circuit breaker #8 on lighting distribution panel (L-100) in the ON position.



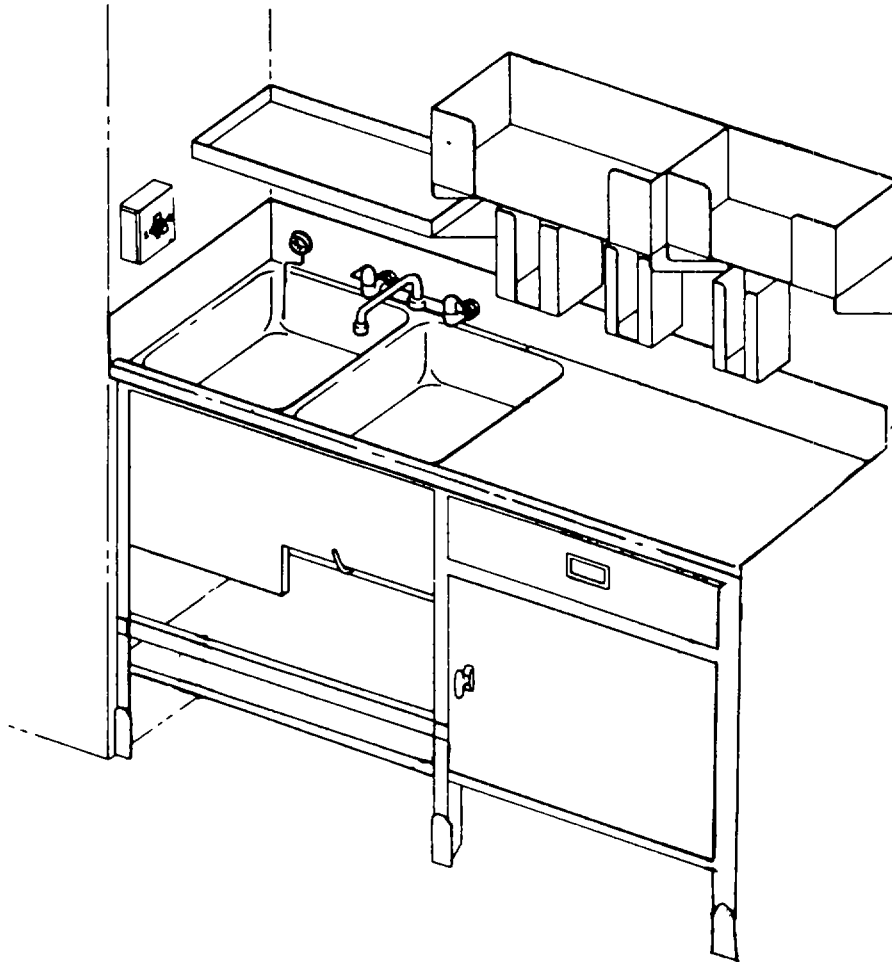
b Galley/Mess.

- (1) Place switch #3 on lighting distribution panel (L-108) in the ON position.



2-137. SANITIZING SINK HEATER (Cont).

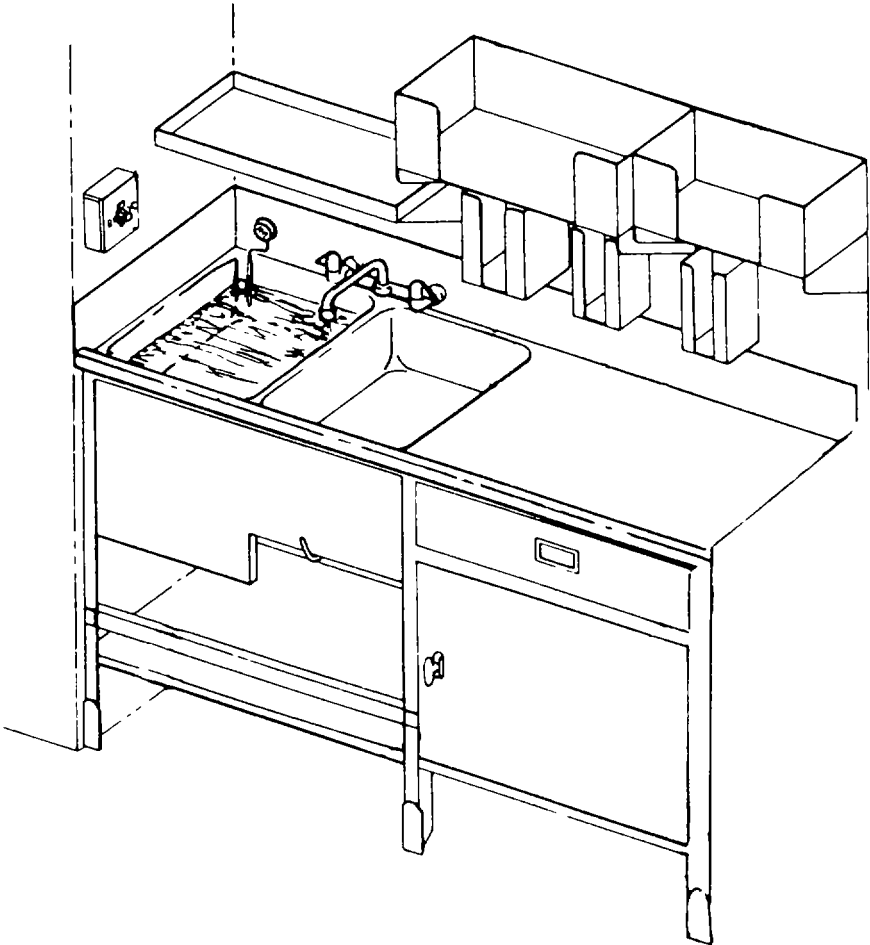
- (2) Place drain stopper in galley sink.



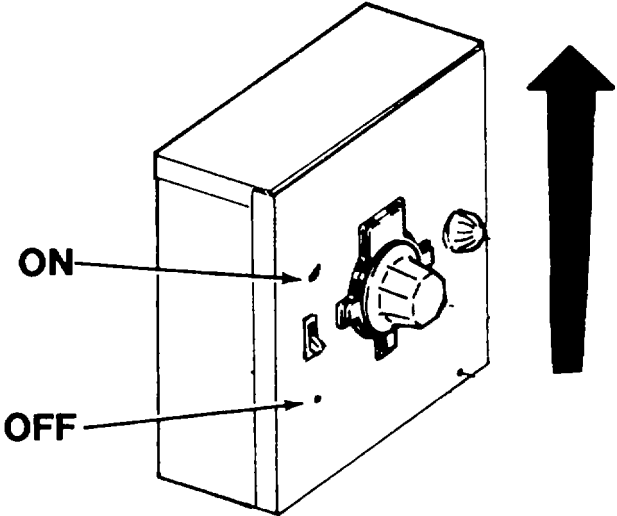
Make sure water can not run out.

- (3) Fill galley sink with at least seven (7) inches of hot water from ships hot water heater.

2-137. SANITIZING SINK HEATER (Cont).

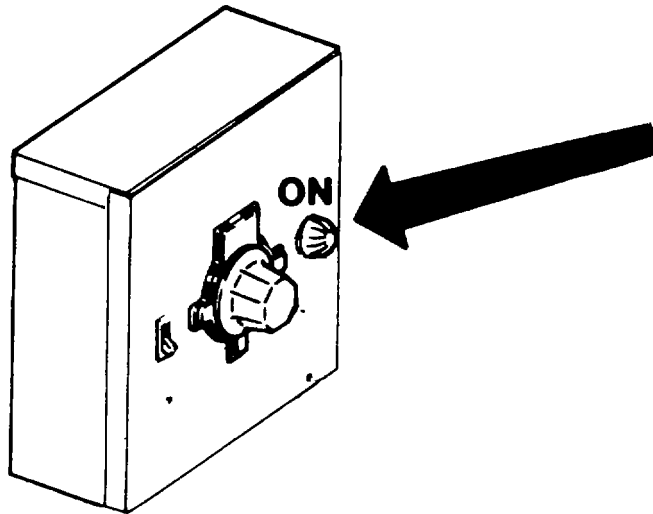


(4) Place sanitizing sink heater ON/OFF switch in the ON position.

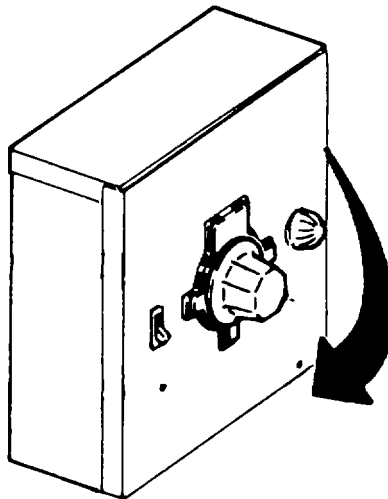


2-137. SANITIZING SINK HEATER (Cont).

(5) Light will go on.

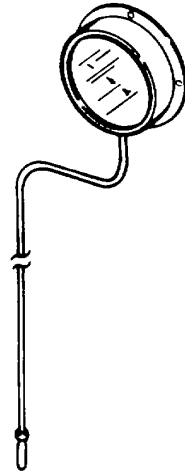


(6) Turn sanitizing sink heater temperature control knob clockwise. This will raise the water's temperature to 180° and maintain it there.



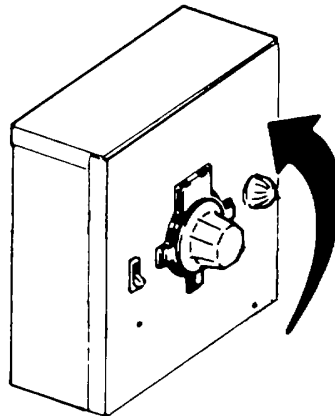
(7) The sink heater thermometer will show the rise in water temperature.

2-137. SANITIZING SINK HEATER (Cont).

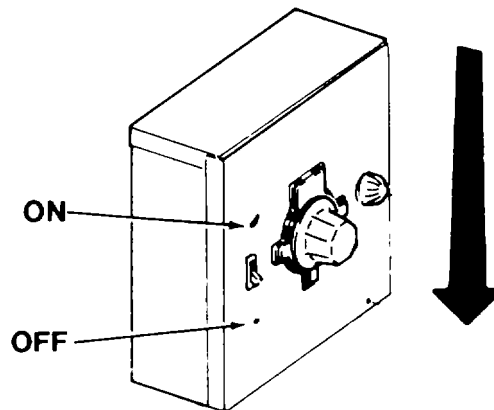


c. Galley/Mess - Turn off procedures

- (1) Turn sanitizing sink heater temperature control knob counter-clockwise.

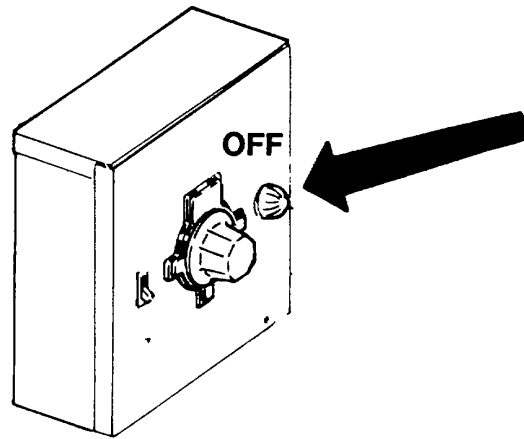


- (2) Place ON/OFF switch in the OFF position.

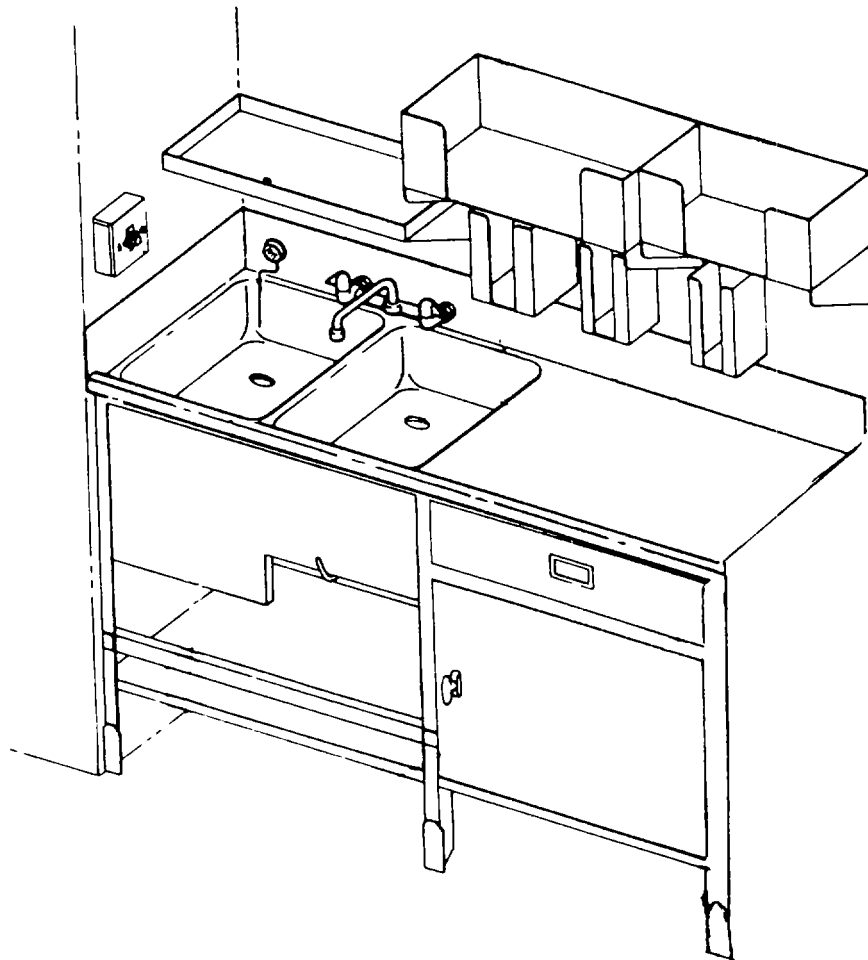


2-137. SANITIZING SINK HEATER (Cont).

- (3) Light will go out.

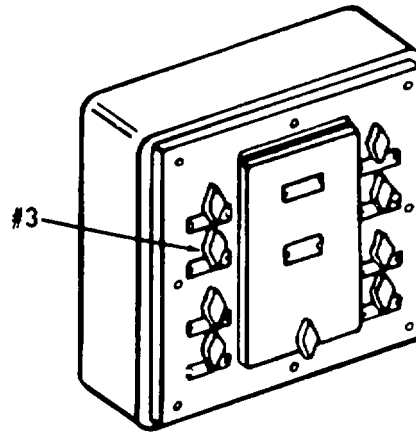


- (4) Pull drain stopper and drain water from galley sink.



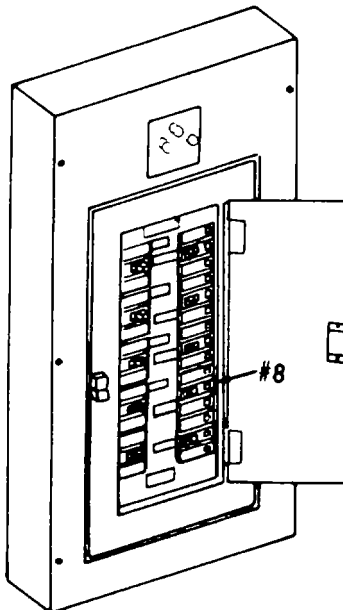
2-137. SANITIZING SINK HEATER (Cont).

- (5) Place circuit breaker #3 on distribution panel (L108) in the OFF position.



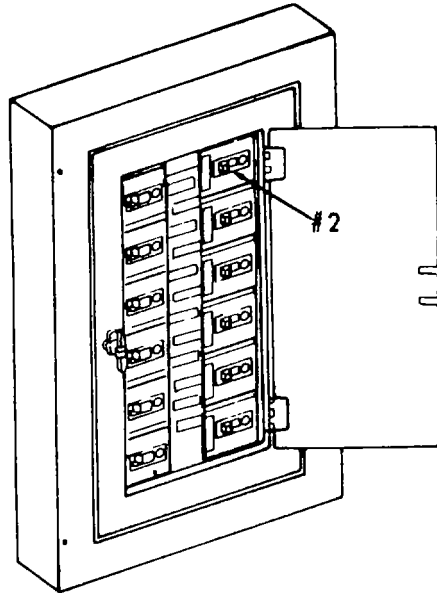
d. Engine Access Room.

- (1) Place circuit breaker #8 on lighting distribution panel (L100) in the OFF position.



2-137. SANITIZING SINK HEATER (Cont).

- (2) Place circuit breaker #2 on power distribution panel (P400) in the OFF position.



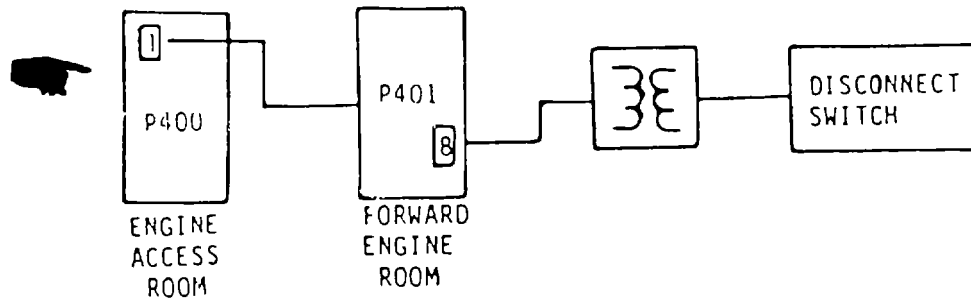
2-138. WASHROOM, WATER CLOSET, URINAL AND SHOWER.

- a. A washer/dryer is located in the washroom, water closet, urinal and shower compartment.
- b. The following is an index to the operating procedures:

Washer/Dryer Turn On/Off	2-139
Washer Operation	2-140
Dryer Operation	2-141

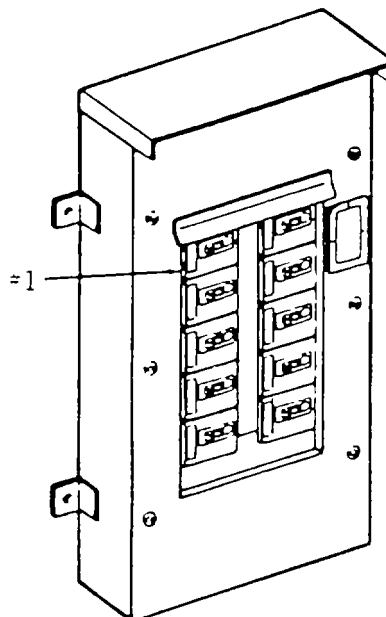
2-139. WASHER/DRYER - TURN ON/OFF.

To turn on/off the washer/dryer, refer to block diagram, and proceed as follows:



- a. Engine Access Room.

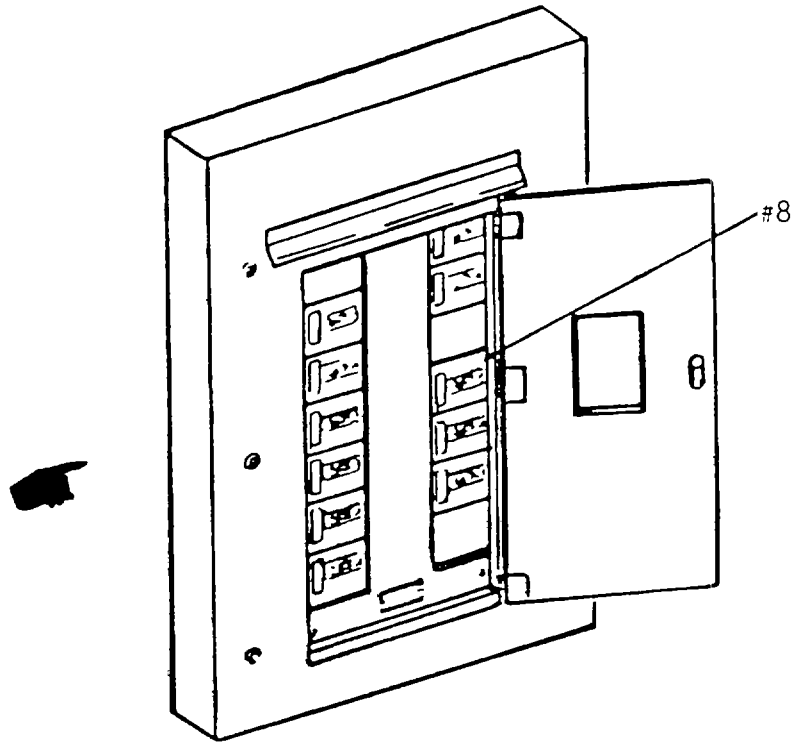
Place circuit breaker #1 on power distribution panel (P400) in the ON position.



2-139. WASHER/DRYER - TURN ON/OFF (Cont'd).

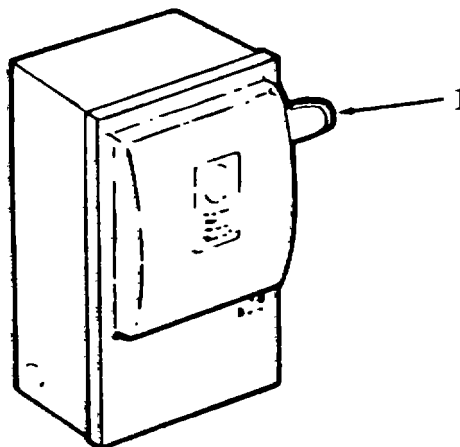
b. Forward Engine Room.

Place circuit breaker #8 on power distribution panel (P401) in the ON position.



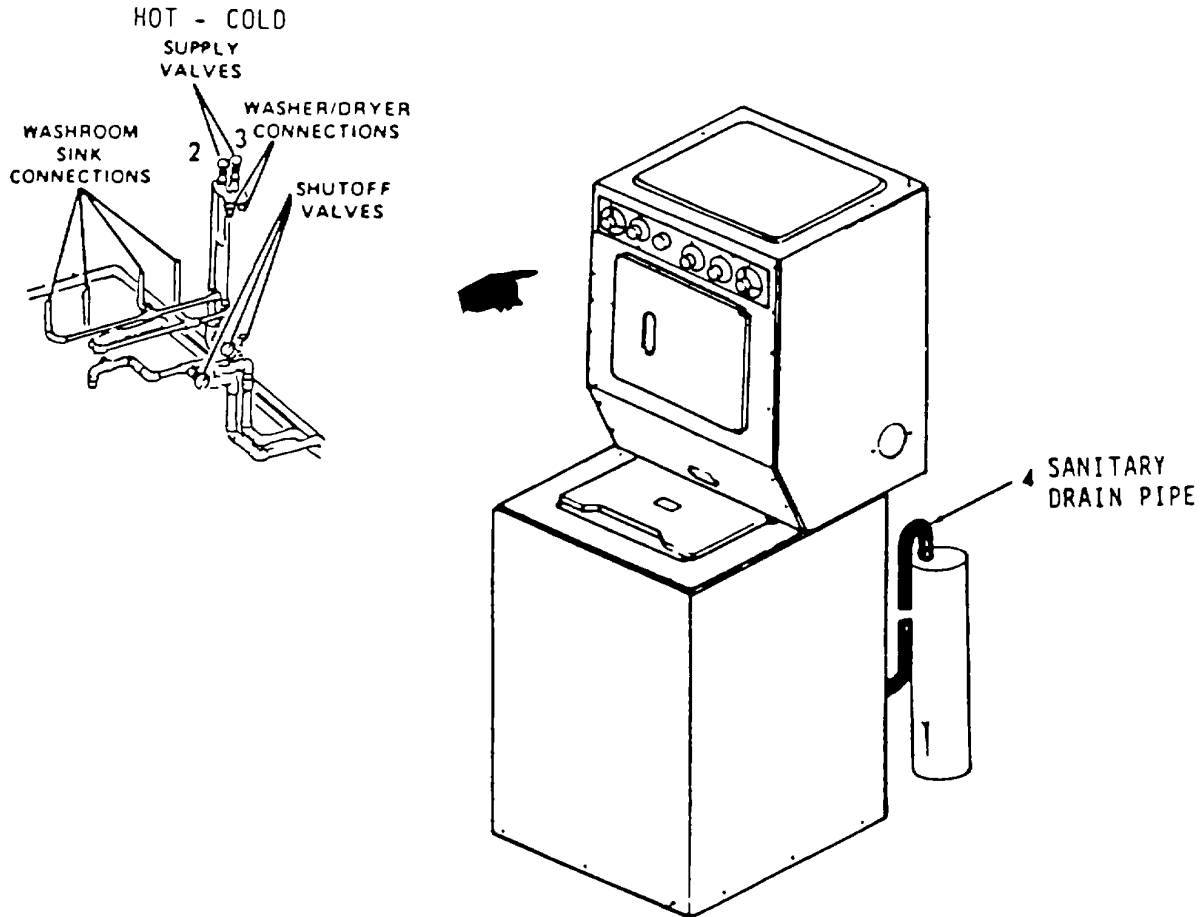
c. Washroom, Water Closet, Urinal and Shower.

(1) Place disconnect switch (1) in the ON position.



2-139. WASHER/DRYER - TURN ON/OFF (Cont'd).

- (2) Check the hot and cold water connections and hoses.
- (3) Turn on supply valves (2 & 3).
- (4) Check that drain hose (4) is in drain pipe.



WASHER/DRYER TURN ON

2-140. WASHER OPERATION.

a. The Washing Action. Because of the design of the washer, the washing action is unique. The currents of water are created by the movement of the tub and agitator, and the action ribs on the side of the tub. The currents of water move through the clothes to wash out the dirt and soil. The action provides thorough washing but is gentle and safe for all clothes. See Table 18a for types of loads and wash settings.

b. Using the Laundry Center Washer. Since the Laundry Center is new and there have been many changes in laundry aids and fabrics, let's review a few facts and tips that will help you to better understand use of the Laundry Center.

(1) What size load can be washed? The following are typical loads that can be washed and dried in the Laundry Center. This should be used only as a guide.

(a) LOAD A. Four permanent press sheets, two pillow cases, two bath towels, two hand towels and two wash cloths.

(b) LOAD B. Three twin cotton sheets, three pillow cases, two bath towels, two hand towels, and four wash cloths.

(c) LOAD C. Five bath towels, three T-shirts, three knit undershorts, four or five wash cloths.

(d) LOAD D. Six men's shirts, four pairs slacks, one woman's skirt, two coveralls.

(2) There are a few items which should not be washed in this washer because of the size of the tub.

(a) Pillows

(b) Large bulky blankets

(3) How should the washer be loaded? The clothes should be loaded loosely in the tub and only to the top of the agitator. Do not wind clothes around the agitator.

(4) How should the laundry aids be added?

(a) Detergent should be put in the bottom of the tub before the clothes are loaded or poured down the side of the agitator so it will go to the bottom of the tub. If the detergent is in the bottom of the tub, it will dissolve as the washer is filling with water and start to soak and loosen the soil in the clothes. If the detergent is poured on top of the clothes, it may not dissolve easily and quickly at the beginning of the wash cycle. This could result in part of the detergent being caught in folds of clothes.

2-140. WASHER OPERATION (CONT'D)

(b) USE ENOUGH DETERGENT TO DO A GOOD JOB. For normally soiled clothes generally 3/4-cup of granular (either high or low sudsing) is a minimum requirement. At least 1/2-cup of liquid detergent should be used per load of clothes. For heavier soil, increase amount of detergent used.

(c) MORE COMPLAINTS CAN BE TRACED TO INSUFFICIENT DETERGENT THAN TO TOO MUCH. If enough high sudsing detergent cannot be used in soft water without oversudsing, recommend low sudsers such as Ajax, All, Bold, or Dash.

(d) Some liquid detergents may leave blue stains on the clothes which are difficult to remove in subsequent washings. Bleach must be used to remove stain.

(e) Although cold water detergents are being heavily promoted we still believe that they give better results in hot water. Cold water washing is not recommended for anything but very lightly soiled garments.

(f) CHLORINE BLEACH should be added to the washer only after the tub has filled with water and agitated for several minutes. IT IS IMPORTANT THAT THE CHLORINE BLEACH BE DILUTED BEFORE IT IS ADDED TO THE WASH. Use 1/4 to 1/3 cup liquid chlorine bleach for a normal load but dilute it with at least one quart of water. Bleach burns occur when concentrated chlorine bleach comes in direct contact with the fabric or is not completely rinsed out. The damage may show up as holes or tears on the clothes immediately; or it may not show up for several washings depending on the extent of the damage. However, each time the fabric is laundered, the fibers become weaker and finally break.

(g) FABRIC SOFTENER should be added only to the rinse. If it is added with detergent or other laundry aids, a greasy stain may result. Concentrated blue fabric softeners should not be poured directly on the fabric as they may stain the clothes. These can be added to the rinse water after agitation has started.

c. Cleaning the Washer.

(1) Washer Lid. To clean the washer lid, use liquid detergent and a little water. For stubborn soil and dirt, it may be necessary to use a small brush. If laundry aids, such as fabric softeners, stain the washer lid, clean the lid with diluted solution of chlorine bleach (1/2-cup in one quart water). Rinse the lid several times with clean water.

(2) Washer Tub. The washer tub is generally self-cleaning. Occasionally bright colored or dark clothes such as bath towels or blue jeans may stain the tub. In this case the tub should be cleaned by adding one cup liquid chlorine bleach to the tub, setting the water temperature controls for a HOT WASH and COLD RINSE. Allow the washer to fill and go through a complete cycle.

2-140. WASHER OPERATION (CONT'D).

Refer to table 2-18 for an explanation of laundry aids and their uses.

TABLE 2-18. Laundry Aids and Their Uses.

LAUNDRY AID	USE	CAUTIONS
AMMONIA	<ul style="list-style-type: none"> • Use in Soak or Wash cycle with detergent or soap for greasy soil. • Can also be used with enzymes or water conditioners. • Can be used on all types of fibers but check color first. 	<ul style="list-style-type: none"> • DO NOT USE WITH CHLORINE BLEACH.
BLEACH Chlorine	<ul style="list-style-type: none"> • Use in Soak and Wash to whiten clothes and to remove some stains. • Can be used on most fibers. • Dilute before adding to soak or wash. • Can be used with detergents, soaps and water conditioners. 	<ul style="list-style-type: none"> • Never use in rinse. Bleach must be rinsed out. • DO NOT USE ON WOOL, SILK, OR SPANDEX. Chlorine bleach will turn wool and silk , yellow and will damage the fibers causing holes in the fabric. • Some spandex fibers will yellow, but otherwise will not be damaged. This yellowing cannot be removed. • Concentrated chlorine bleach will damage fibers, even cause holes. • Do not use with enzymes. Enzymes will be deactivated by chlorine bleach.

2-140. WASHER OPERATION (Cont'd).

TABLE 2-18. Laundry Aids and Their Uses (Continued)

LAUNDRY AID	USE	CAUTIONS
Oxygen-type	<ul style="list-style-type: none"> • Use in Soak or Wash. • Safe for all fibers but check color. • Can be used with detergents, soaps, water conditioners and enzymes. 	<ul style="list-style-type: none"> • Never use in rinse. • May damage color if put directly onto fabric.
DETERGENTS	<ul style="list-style-type: none"> • Use in Soak or Wash to remove dirt and soil. • Can be used on all types of fibers. Will not cause fiber damage. • Can be used with bleaches, water conditioners and enzymes. Brands can be used interchangeably or mixed. 	<ul style="list-style-type: none"> • If too little is used will cause cloth to become yellow or gray. Follow package instructions for amount. • Do not use with fabric softeners. Grayish greasy stains will result.
ENZYMES or Detergent with Enzymes	<ul style="list-style-type: none"> • Use in Soak or Wash to loosen protein type stains. • Can be used with detergent, oxygen type bleaches, water conditioners, or ammonia. • Can be used on all fabrics. Enzymes will not damage fibers. 	<ul style="list-style-type: none"> • Do not use with chlorine bleach. Enzymes will be deactivated. • Add chlorine bleach last 5 minutes of wash cycle. • Check dyes to be sure they are stable to longer soaking times.

2-140. WASHER OPERATION (CONT'D).

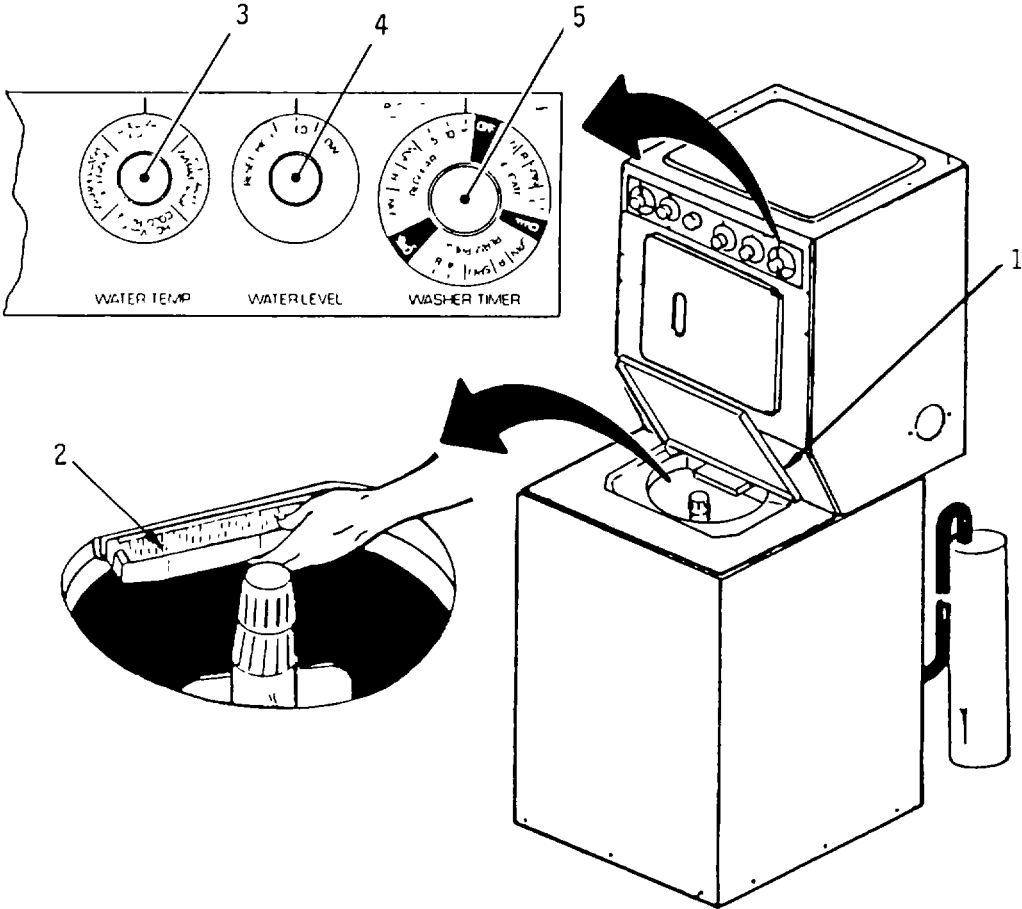
TABLE 2-18. Laundry Aids and Their Uses (Continued).

LAUNDRY AID	USE	CAUTIONS
FABRIC SOFTENERS	<ul style="list-style-type: none"> • Use in rinse to soften bath towels, etc. And to reduce static electricity in man-made fibers. 	<ul style="list-style-type: none"> • Do not use with detergent, bleach or water conditioners. Greasy curd or fabric stain will result. • Do not pour directly onto fabric. Some may cause blue stain.
WATER CONDITIONERS	<ul style="list-style-type: none"> • Use in Wash to reduce amount of detergent or soap required. • Must be used with soap to prevent soap curd. • Use in rinse to aid in removing soap. • Use in detergent, soaps, and bleaches. 	<ul style="list-style-type: none"> • Do not use with fabric softeners in the rinse. Greasy curd will be formed which can stain clothes.
SOAP	<ul style="list-style-type: none"> • Use in Soak and Wash to remove soil. • Use with bleach or water conditioners. 	<ul style="list-style-type: none"> • Must be used in soft water or with water conditioner to prevent soap curd.

2-140. WASHER OPERATION (Cont'd).

To operate washer proceed as follows:

- 1. Lift door (1).
- 2. Remove lint filter (2) and clean.
- 3. Pour in correct amount of detergent.
- 4. Insert soiled Clothes. Close door (1).
- 5. Select water temperature (3).
- 6. Select water level (4).
- 7. Place washer timer (5) on the desired setting. Pull to start.
- 8. When the washing cycle is complete - Remove clothes and place in dryer.



2-141. DRYER OPERATION. Using the Laundry Center Dryer.

a. Generally, items that have been washed in the Laundry Center washer can be dried together in the dryer.

b. Drying timetables are contained in table 2-18a. They are intended only as a guide to drying times. Individual loads will vary depending on the garments included, the weight of the fabric and the size of the load.

c. Is there any item that should not be dried in the dryer?

(1) In addition to the pillows or large bulky blankets, STIFF ITEMS SUCH AS SNEAKERS SHOULD NOT BE DRIED IN THIS DRYER.

(2) ALSO, A LARGE LOAD OF ONLY TERRY TOWELS OR SIMILAR WEIGHT FABRICS SHOULD NOT BE DRIED. Mix other items with the bath towels.

d. Are there different instructions for different fabrics?

(1) UNTREATED COTTON, LINEN, NYLON. In fact, most clothes except Permanent Press should be removed from the dryer while slightly moist. Remove the garment from the dryer to test for dryness since it will feel damper in the warm moist air of the dryer than at room temperature.

(2) PERMANENT PRESS garments and linens should be completely and thoroughly dried. For them to come out ready to wear, the fabric must be heated to about 140 to 160 degrees F and immediately cooled to set the press. Overcrowding the dryer can cause wrinkling; generally, a smaller load than average will give better results. Most garments require 45 to 60 minutes in the compact dryer. See the Use and Care for special items.

(3) SYNTHETIC KNITS can be turned inside out to prevent pilling. Dry small loads. These knits should complete the cool-down for best results. Remove as soon as tumbling stops to prevent wrinkling.

(4) COTTON KNITS should be removed from the dryer while slightly damp, stretched into shape and left on a flat surface to finish drying.

(5) PLASTICS that are soft and pliable can be tumbled in the dryer with no heat. Add a few bath towels to absorb moisture and help tumbling. Hard plastics should not be put in the dryer.

(6) WOOLENS that have a special finish are marked machine washable and generally have instructions for laundering. Other sturdy wools that have been machine washed can be dried in the dryer if special care is taken. Preheat the dryer to avoid overtumbling; add a few bath towels to act as buffers.

2-141. DRYER OPERATION. Using the Laundry Center Dryer (Continued).

Table 2-18a. Types of Loads and Washer/Dryer Settings.

TYPE OF LOAD	WASHER			DRYER		
	WASH TEMP	RINSE TEMP	WASH CYCLE	DRYER TEMPERATURE SETTING	TIMED (minutes)	AUTOMATIC
Baby Clothes Plastic lined items Diapers Man-made Mixed cottons	Warm Hot Warm Warm	Cold Cold Cold Cold	Delicate Regular Delicate Perm Press	No-Heat Regular (High) Delicate (Low) Perm Press (Med)	15-20 45-60 25-40 35-45	Use TIMED cycle only Midpoint Less Dry Less Dry
Bedspreads	Follow label directions					
Blankets Electric Man-made Woolen**	Warm Warm Warm	Cold Cold Cold	Delicate Delicate Delicate	Delicate (Low) Delicate (Low) Delicate (Low)	85-95 65-85 15	Use TIMED cycle Use TIMED cycle Use TIMED cycle
Cottons & Linens Colorfast White Non-Colorfast	Hot Warm	Cold Cold	Regular Regular	Regular (High) Regular (High)	Full loads 65-75 Small loads 35-45	Midpoint Midpoint
Curtains Cotton Man-made Sheers Permanent Press	Hot or Warm Warm Warm	Cold Cold Cold	Regular Delicate Perm Press	Regular (High) Delicate (Low) Perm Press (Med)	25-35 5-10 25-35	Midpoint Less Dry Less Dry
Delicates Lingerie Knits	Warm	Cold	Delicate	Delicate (Low)	20-30	Less Dry
Foundation Garments *See Caution	Warm	Cold	Delicate	Delicate (Low)	30-40	Less Dry
Glass Fiber	Follow manufacturer's instructions. Always wipe out washer tub with damp cloth to remove traces of fibers.					
Permanent Press Curtains Draperies Dresses sportswear Knits man-made Lingerie White shirts blouses Sheets & pillowcases Work clothes Heavy slacks	Warm Warm Warm Warm Warm Hot Hot Hot Hot	Cold Cold Cold Cold Cold Cold Cold Cold Cold	Perm Press Delicate Perm Press Delicate Delicate Perm Press Perm Press Perm Press Perm Press	Perm Press (Med) Perm Press (Med) Perm Press (Med) Delicate (Low) Delicate (Low) Perm Press (Med) Perm Press (Med) Perm Press (Med) Perm Press (Med)	25-35 45-65 25-35 25-35 20-30 25-35 25-35 55-75 55-75	Less Dry Midpoint Midpoint Midpoint Less Dry Midpoint Midpoint More Dry More Dry
Plastic	Warm	Cold	Delicate	No-Heat	15-20	Use TIMED cycle
Quilted Items	Follow label directions					
Swim Suits *See Caution	Warm	Cold	Delicate	Delicate (Low)	35-45	Use TIMED cycle
Sweaters Man-made Woolen (Regular finish) Woolen (Machine wash & dry finish)	Warm Warm	Cold Cold	Delicate Delicate	Delicate (Low) Delicate (Low)	40-55 5-15	Midpoint Use TIMED cycle
Woolens	Warm	Cold	Delicate	Delicate (Low)	5-15	Use TIMED cycle
Work Clothes	Hot	Cold	Regular	Regular (High)	65-85	More Dry

CAUTION: Never dry foam rubber or similarly textured rubber-like materials except on NO HEAT-AIR FLUFF. Man-Made fibers (synthetics) such as polyester, acrylics must be dried on Low heat.

2-141. DRYER OPERATION. Using the Laundry Center Dryer (Continued).

(7) FIBER GLASS should be dryer dried only if the manufacturer recommends it. Different processes are used in producing these fibers and some are damaged by abrasion in tumbling. If fiber glass items are put in the dryer, the drum should be wiped with a damp cloth after the cycle to remove any of the fiber glass that might remain.

e. Cleaning the Dryer.

(1) Cleaning the lint screen after every use is important to good drying.

(2) Normally, wiping the cabinet with a damp, sudsy cloth is enough to remove surface dust.

(3) The dryer door is plastic and can be wiped clean. The inner panel of the door might become slightly discolored by brightly colored or dark clothes such as bath towels or jeans. The dye stains can be removed with paste of powdered Bon Ami and water. This discoloration will not rub off on other wash loads.

(4) The sorting vanes in the dryer are polypropylene and normally require no special care.

2-141. DRYER OPERATION. Using the Laundry Center Dryer (Continued).

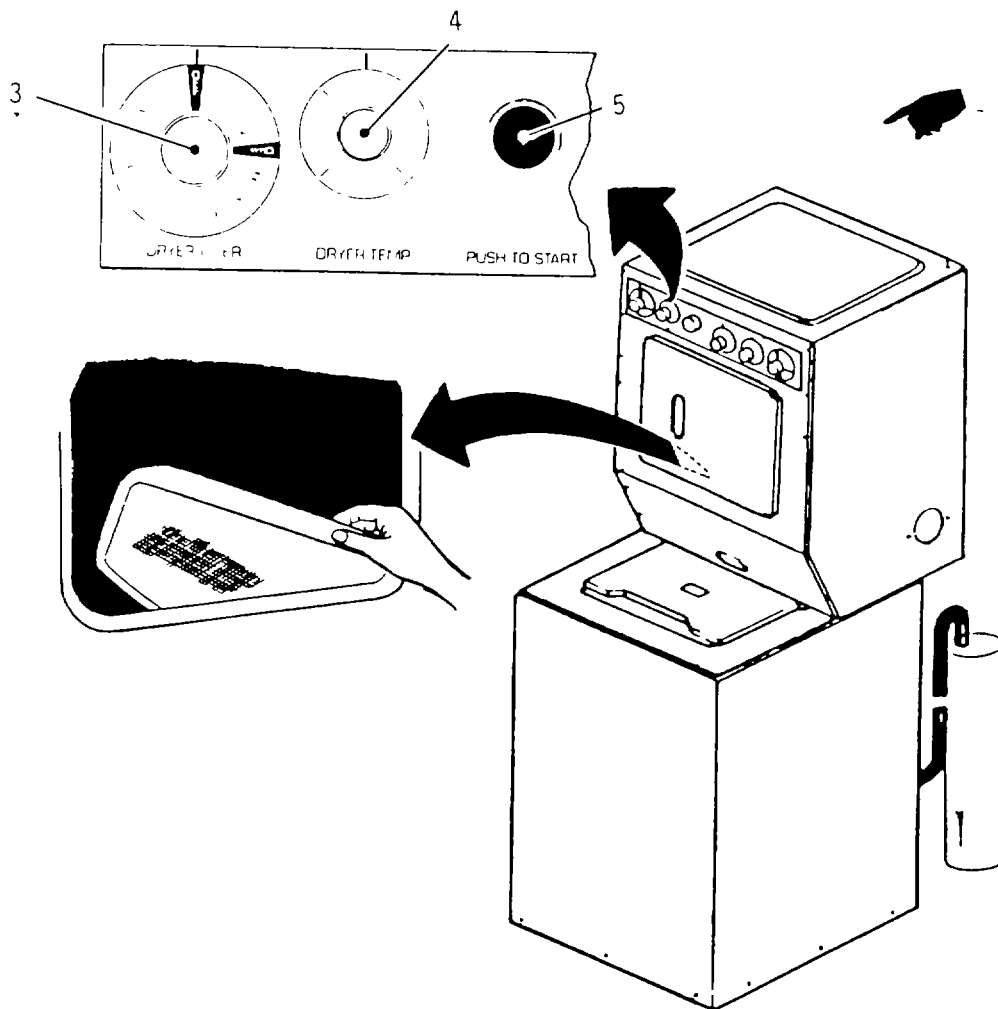
To operate the dryer, proceed as follows.

1. Open door (1).
2. Remove lint screen (2), and clean.
3. Replace lint screen (2).
4. Place clothes to be dried in dryer.
5. Select drying time (3).
6. Select dryer temperature (4).
7. Close dryer door (1).
8. Press start button (5).

NOTE

If dryer door is opened during operation, dryer will stop. Restart by pressing start button (5).

9. When dryer has completed its cycle and stops, remove clothes.



2-142. SIGNALING SEARCHLIGHT.

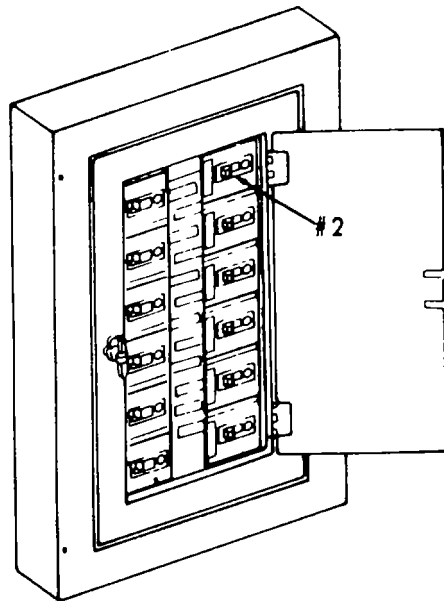
- a. A signaling searchlight is on the pilot house top side deck.
- b. The following is an index to operating procedures:

DESCRIPTION	PARAGRAPH
Searchlight Turn On/Off	2-143
Signaling	2-144
Searchlight - Navigational	2-145
Hood Assembly	2-146

2-143. SEARCHLIGHT TURN ON/OFF.

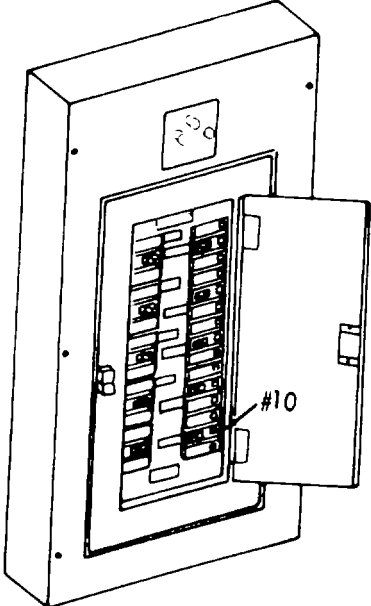
To turn on/off the signaling searchlight proceed as follows:

- a. Engine Access Room.
 - (1) Place circuit breaker #2 on power distribution panel (P400) in the ON position.

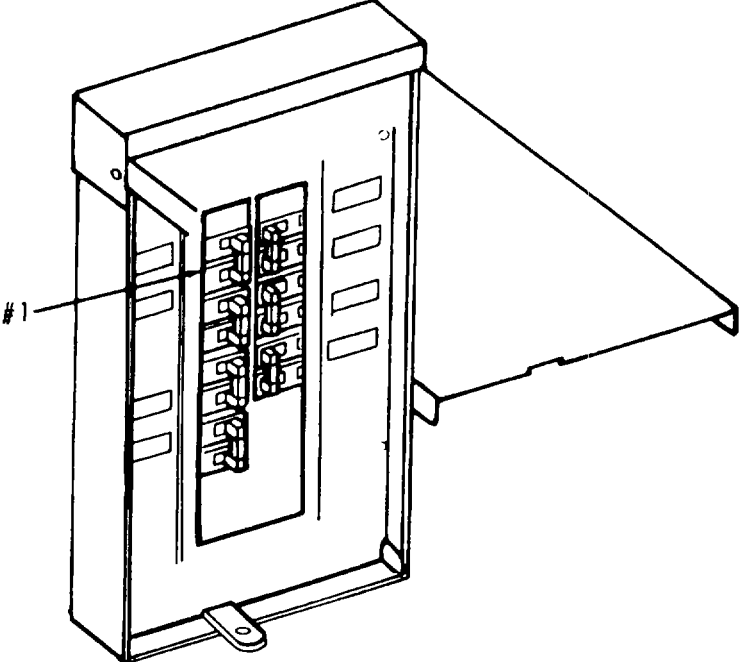


2-143. SEARCHLIGHT TURN ON/OFF (Cont).

- (2) Place circuit breaker #10 on lighting distribution panel (L-100) in the ON position.



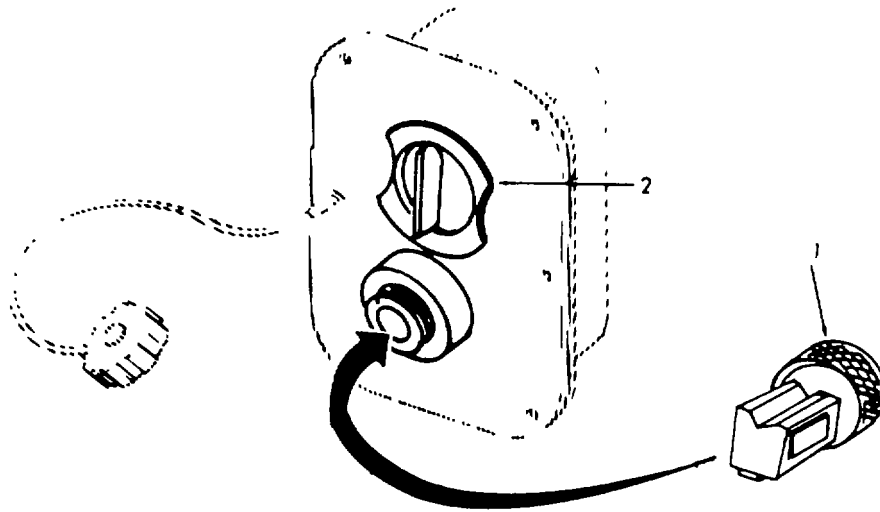
- (3) Place circuit breaker #1 on lighting distribution panel (L-110) in the ON position.



2-143. SEARCHLIGHT TURN ON/OFF (Cont).

b. Upper Deck.

- (1) Check that power plug (1) on pedestal is plugged in.
- (2) Rotate switch (2) to turn on searchlight.



2-144. SIGNALING.

- a. To use the searchlight for signaling proceed as follows:



The searchlight becomes very hot with prolonged use. Touch it on heat-insulated training and shutter handles, or use gloves.

- b. The beam is highly directional and the searchlight must be carefully aimed at target especially for long range daylight signaling.

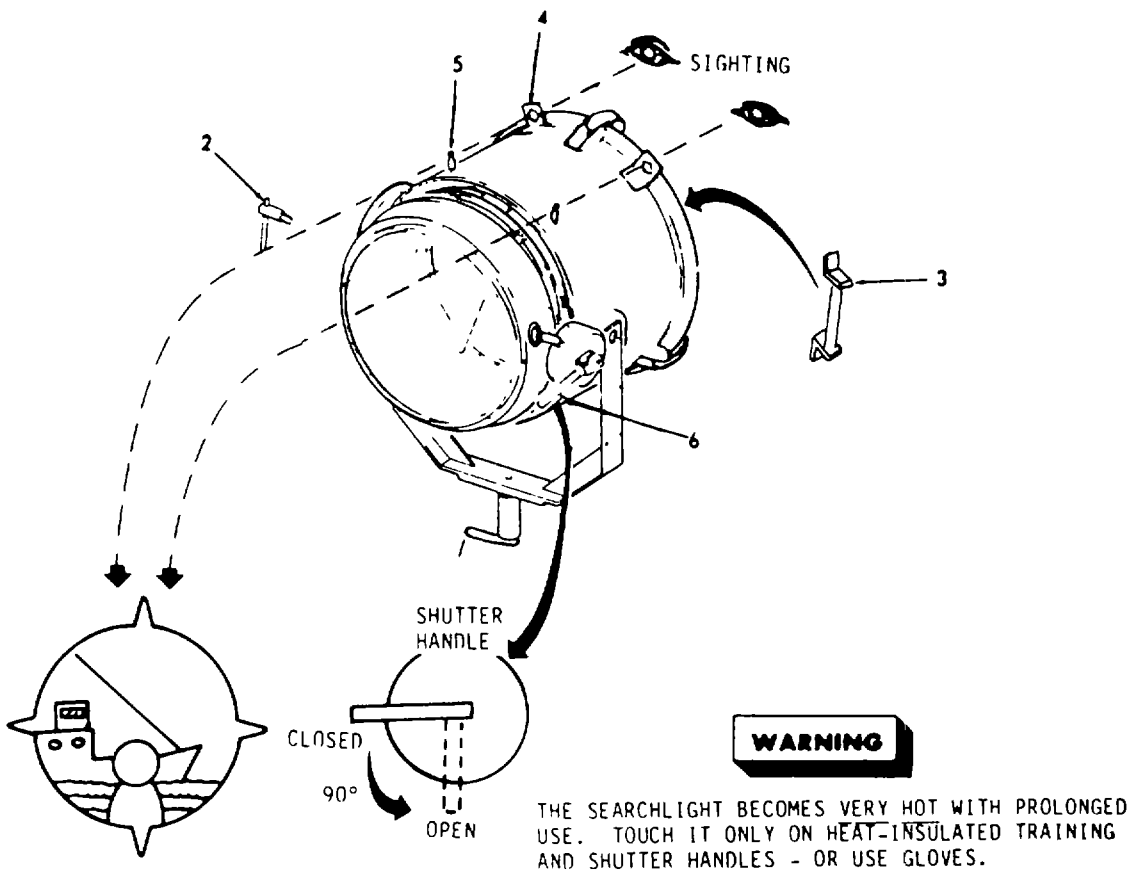
2-144. SIGNALING (Cont).

- (1) Loosen horizontal clamp (1).
- (2) Loosen vertical clamp (2).
- (3) Using handle (3) on back.
- (4) Sight through rear sight ring (4) and align front sight (5) in center of ring and on target.

NOTE

Contrary to use with weapons, no allowance in vertical aiming need be made for long distances. The beam is straight and parallel to the sights at all times.

- (5) Press shutter handle (6) down until it stops (approximately 900).
- (6) Release shutter handle.
- (7) For faster signaling - raise the shutter handle.



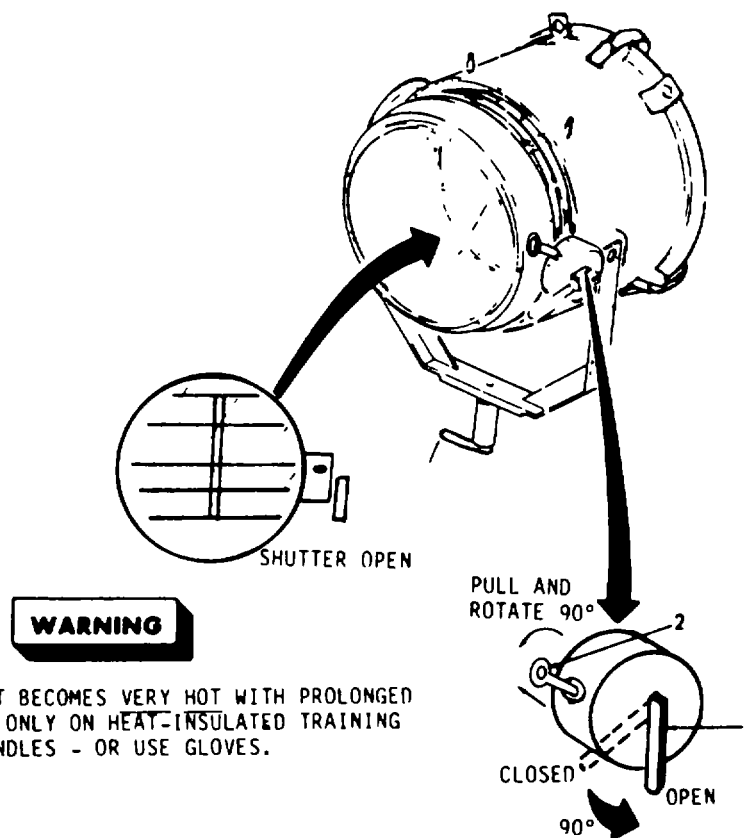
2-145. SEARCHLIGHT - NAVIGATIONAL.

a. The searchlight can be used as a navigational searchlight as follows:

WARNING

The searchlight becomes very hot with prolonged use. Touch it on heat-insulated training and shutter handles, or use gloves.

1. Perform all steps in paragraph 2-144.
 2. Press shutter handle (1) down until it stops (approximately 90°).
 3. Pull shutter lock (2) out and rotate 90° - The shutter handle will remain down. The shutter will remain open.
- b. When navigational use is complete:
1. Pull shutter lock (2) out and rotate 90°.
 2. The shutter handle (1) will spring up.
 3. The shutter will close.



2-146. HOOD ASSEMBLY.

a. The hood assembly can be placed on the signaling searchlight as follows:

- (1) Place hood assembly (1) over end of searchlight (2).
- (2) Engage slots on hood with knobs (3).
- (3) Rotate hood assembly (1) clockwise.
- (4) Tighten knobs (3).

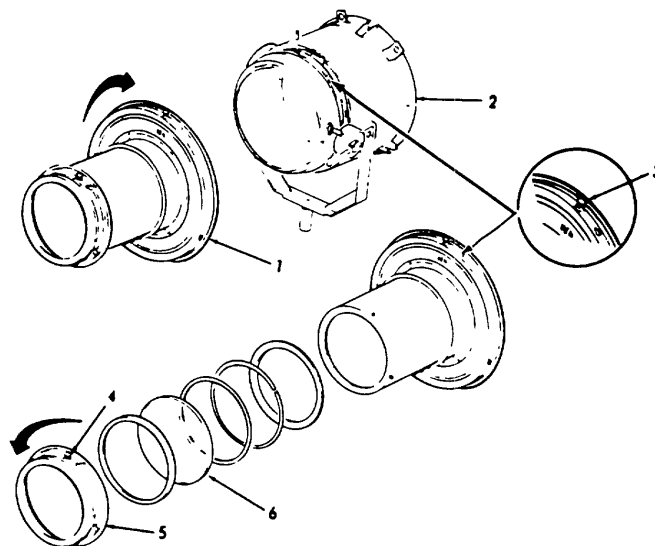
b. To change lens in hood proceed as follows:

- (1) Loosen knobs (4).
- (2) Rotate cap (5) counter-clockwise.



Glass lens, gaskets, etc. can fall.

- (3) Remove lens (6).
- (4) Replace with lens:
 - red
 - green
 - amber
 - clear
- (5) Reassemble.



2-146.1 SPOTLIGHT.

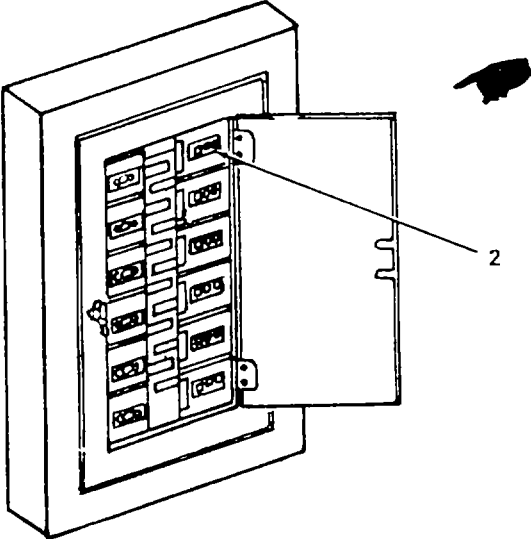
- a. A spotlight is on the conning tower top. starboard side.
- b. The following is an index to operating procedures:

<u>DESCRIPTION</u>	<u>PARAGRAPH</u>
Spotlight Turn On/Off	2-146.2
Spotlight Operation	2-146.3

2-146.2 SPOTLIGHT TURN ON/OFF.

To turn on/off the signaling searchlight proceed as follows:

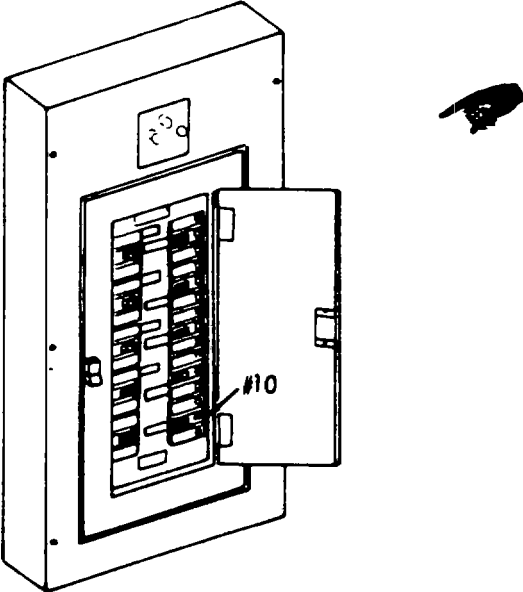
- a. Engine Access Room
 - (1) Place circuit breaker #2 on power distribution panel (P400) in the ON position.



4951-027

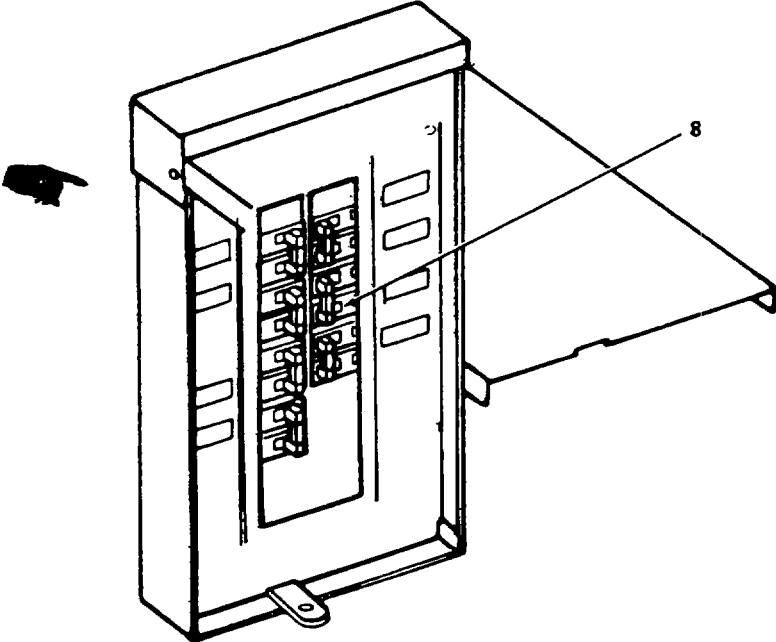
2-146.2 SPOTLIGHT TURN ON/OFF (Cont).

(2) Place circuit breaker #10 on lighting distribution panel (L-100) in the ON position.



4951-029

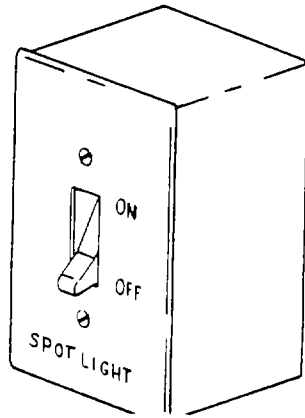
(3) Place circuit breaker #8 on lighting distribution panel (L-110) in the ON position.



4954-112

2-146.2 SPOTLIGHT TURN ON/OFF.

- (4) Place spotlight on/off toggle switch on starboard wall of conning tower to the ON (up) position.

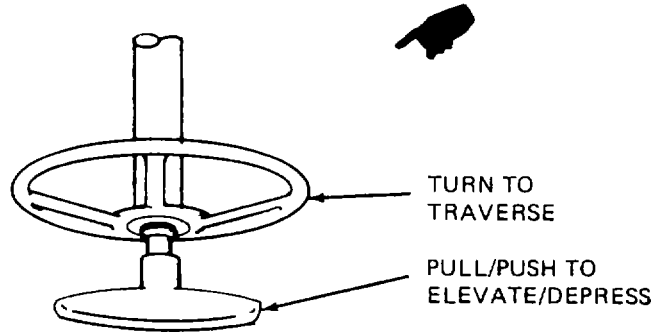


4951-113

2-146.3 SPOTLIGHT OPERATION.

a. To traverse the spotlight, rotate the large wheel in the roof of the conning tower clockwise or counterclockwise.

b. To elevate or depress the spotlight, pull (to elevate) or push (to depress) the hand knob extending through the center of the wheel.



4951-028

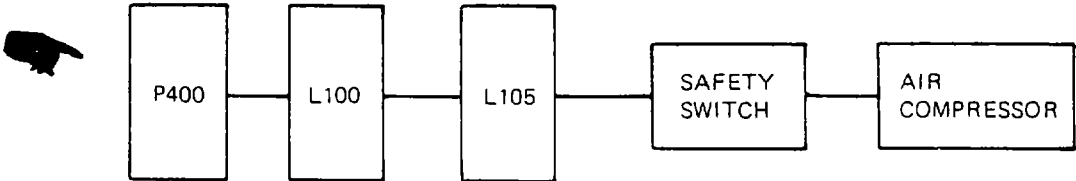
2-146.4 AIR HORN AIR COMPRESSOR SYSTEM.

a. The following is an index to operating procedures:

DESCRIPTION	PARAGRAPH
Air Compressor Turn On/Off	2-150.5
Air Horn Operation	2-150.6

2-146.5 AIR COMPRESSOR TURN ON/OFF.

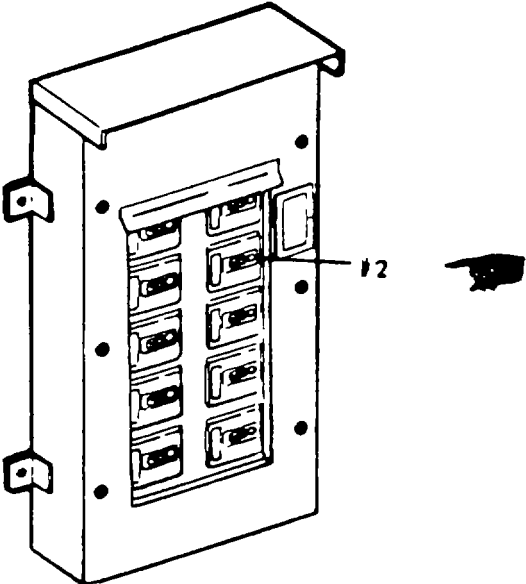
To turn on/off the air compressor proceed as follows:



4951-031

a. Engine Access Room

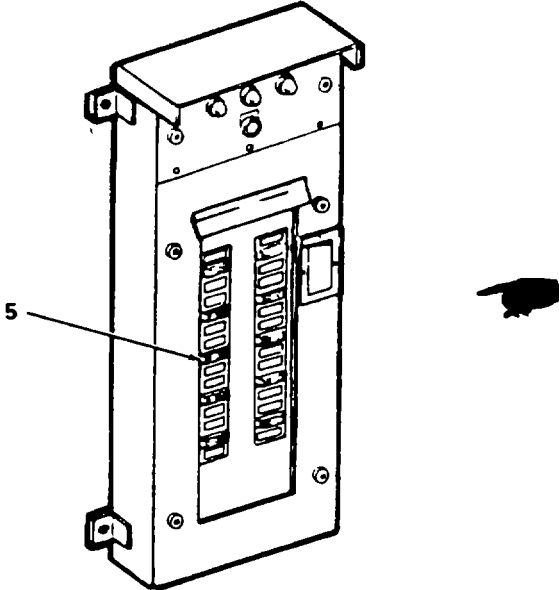
(1) Place circuit breaker #2 on power distribution panel (P400) in the ON position.



4951-030

2-146.5 AIR COMPRESSOR TURN ON/OFF (Cont).

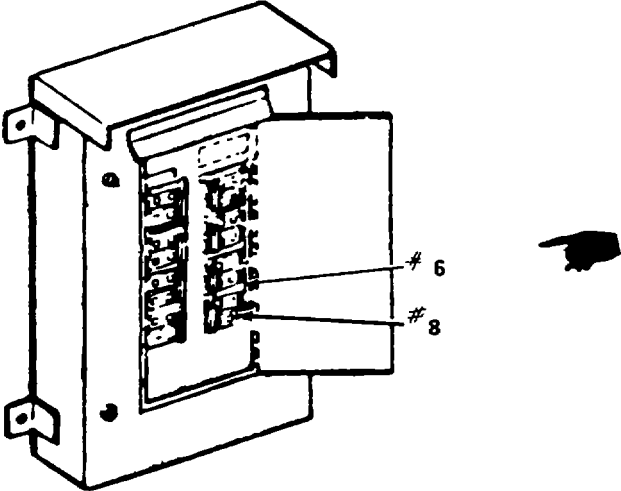
(2) Place circuit breaker #5 on lighting distribution panel (L-100) in the ON position



4951-114

b. Galley/Mess.

Place circuit breaker #8 on distribution panel (L-105) in the ON position.

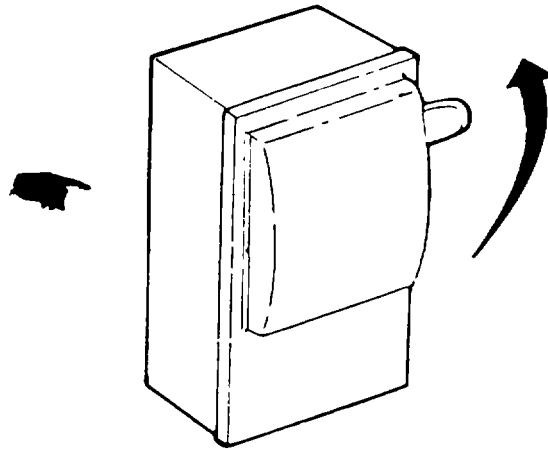


4951-115

2-146.7 AIR COMPRESSOR (Cont).

- c. BOSN's Locker.

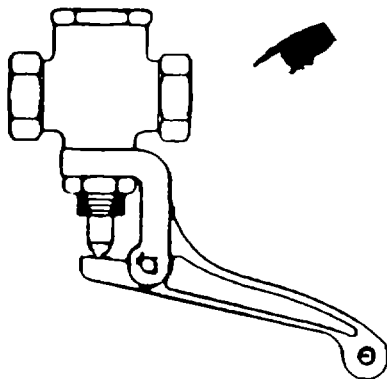
Place disconnect switch in the ON position.



4951-116

2-146.6 AIR HORN OPERATION.

- a. To operate the air horn pull down on manual valve.



4951-117

2-147. INTERIOR COMMUNICATIONS.

The interior communication systems consist of the following circuits:

CIRCUIT	DESCRIPTION
1JV	- Sound powered telephone system, steering type maneuvering and docking circuit.
E	- E call bell circuit for sound powered telephone stations.
ECW3	- Low lube oil pressure and high water temperature alarm for port (forward) main propulsion unit. (see alarm switchboard -paragraph 2-113)
ECW6	- Low lube oil pressure and high water temperature alarm for starboard (aft) main propulsion unit. (see alarm switchboard - paragraph 2-113)
ECW5	- Low lube oil pressure and high water temperature alarm for port (aft) generator diesel engine. (see alarm switchboard -paragraph 2-113)
ECW4	- Low lube oil pressure and high water temperature alarm for starboard (forward) generator diesel engine. (see alarm switchboard - paragraph 2-113)
F	- High temperature magazine alarm. (see magazine sprinkler -paragraph 2-110)
FH	- Magazine sprinkling alarm. (see magazine sprinkler - paragraph 2-110)
FR	- Fixed Halon fire detection and extinguishing system. (see halon system - paragraph 2-115)
NH	- Navigation horn operating system.
KM	- Propulsion engine revolution indicator system. (see propulsion system - paragraph 2-19)
LC	- Gyro compass system. (see pilot house - paragraph 2-123)
1N	- Rudder angle indicator system. (see steering system - paragraph 2-58)
5T	- Sewage tank high level alarm. (see sewage system - paragraph 2-104)
5U	- Cease fire signaling system.
TL	- Tank level indicating system. (see tank level indicating system - paragraph 2-75)

2-147. INTERIOR COMMUNICATIONS (Cont).

RMHS - Remote magnetic heading system. (see pilot house equipment -paragraph 2-123)

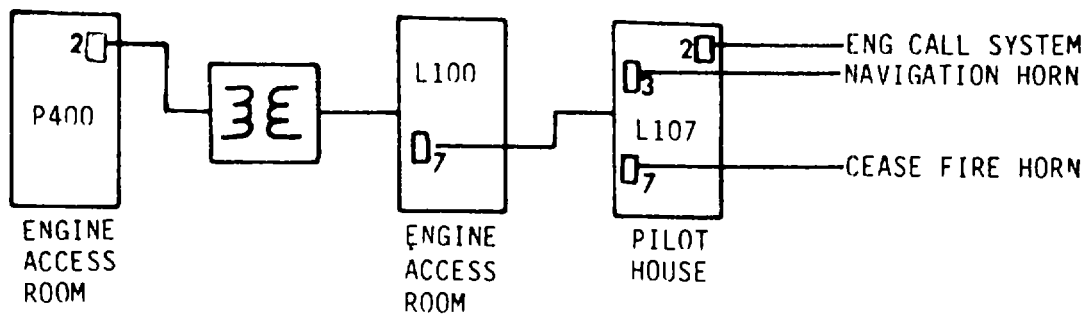
SE - Ship's entertainment system. (see galley and mess - paragraph 2-131)

The following is an index to operating procedures:

<u>DESCRIPTION</u>	<u>PARAGRAPH</u>
Interior Communications Turn On/Off	2-148
Communications (1JV and E)	2-149
Horns (NH and 5U)	2-150

2-148 INTERIOR COMMUNICATION TURN ON/OFF.

The turn on/off procedure for interior communication is shown below. To turn on/off any system proceed from left to right. Turn on/off circuit breakers as required.



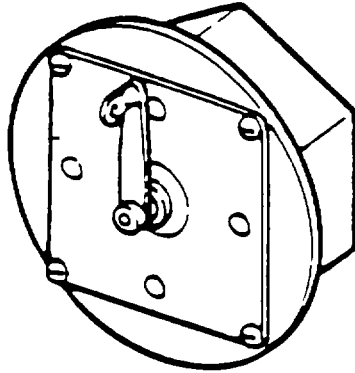
INTERIOR COMMUNICATION TURN ON/OFF

2-149. COMMUNICATIONS (1JV and E).

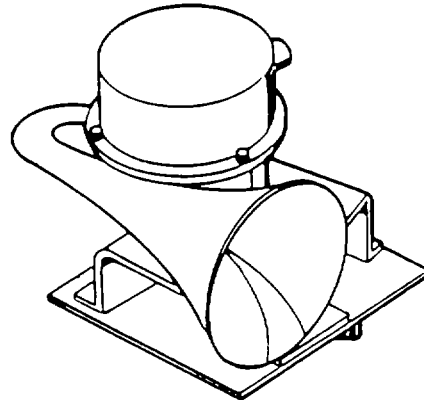
The sound powered phone (1JV) and E call bell circuit (E) stations are shown in Figure FO-61. Refer to paragraph 2-148 for turn on/off procedure.

2-150. HORNS (NH and 5U).

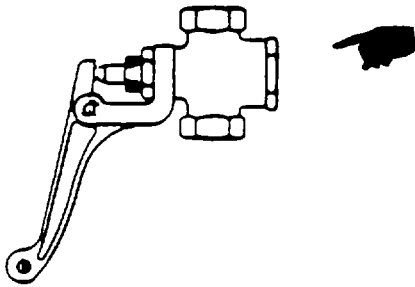
The navigation horns (NH), cease fire horn (5U), and circuits/valves are as follows:



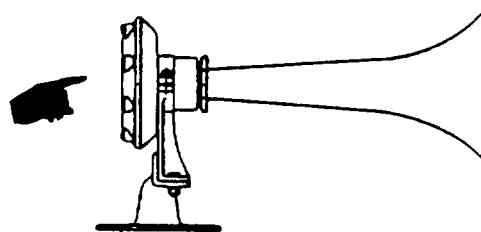
NAVIGATION HORN
SWITCH (ELECTRIC)
(PILOTHOUSE)



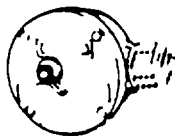
NAVIGATION HORN
(ELECTRIC)



VALVE ASSEMBLY
NAVIGATION HORN (AIR)
(CONNING STATION)

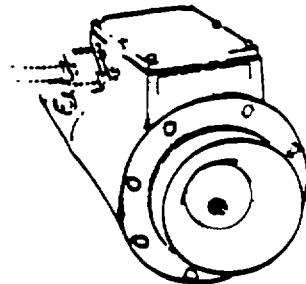


NAVIGATION HORN
(AIR)



CEASE FIRE
SWITCH

CEASE FIRE SWITCH
(PILOTHOUSE)



CEASE FIRE HORNS
(ALL MACHINE GUN
STATIONS)

2-151. NIGHT VISION LIGHTS.

- a. Night vision (red) lights are located in the following areas:
 - engine access room.
 - vestibule.
 - washroom, water closet and shower.
 - galley and mess.
 - crew and transient berthing.
 - reefer room.
- b. The lights in the crew and transient berthing and reefer room are controlled by switches in each compartment.
- c. The lights in the remaining compartments are controlled by Individual switches and door switches. The door switches are as follows:
 - vestibule door to vehicle deck.
 - pilot house sliding door to galley.
- d. When a door is opened-all white lights go out, and the red lights are lit.
- e. When a door is closed-the red lights go out and the white lights go on.
- f. Refer to Figure FO-62 for location of lights and door switches.
- g. To deactivate a door switch, proceed as follows:
 - (1) Pull lock out and-
 - (2) Rotate lever clockwise.

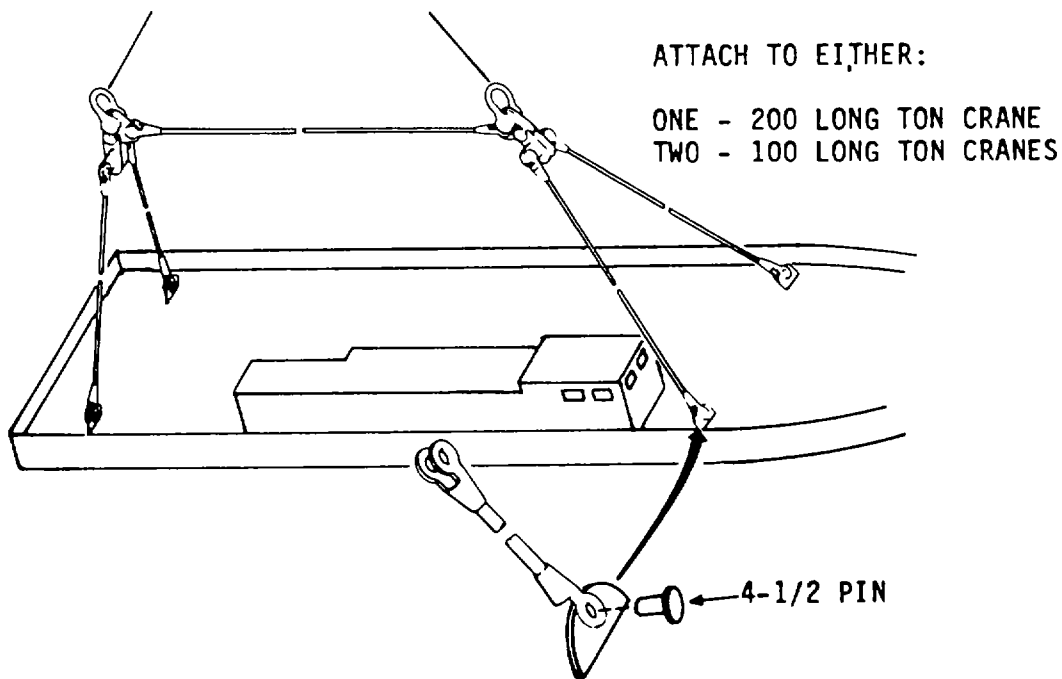
2-152. PREPARATION FOR MOVEMENT.

- a. The landing craft can be moved on various types of crafts.
- b. The craft can be lifted for transport on a major cargo ship.
- c. The craft can be docked in a conventional dry dock, or a landing ship dock (LSD).
- d. The following is an index to the procedures:

<u>DESCRIPTION</u>	<u>PARAGRAPH</u>
Lifting of Land Craft	2-153
Docking	2-154

2-153. LIFTING OF LANDING CRAFT.

- a. Lifting of the landing craft can be done by either:
 - a 200 long ton (203 metric ton) crane.
 - two 100 long ton (101.5 metric ton) cranes.
- b. Attach lifting sling as shown using 4-1/2 diameter pins in the deck lifting pads.



2-154. DOCKING.

The landing craft is designed to be docked in an LSD. The height limitation is 17 feet 9 inches (541 cm). The height is from the bottom of the keel and skegs and a projection of that line. All items above this line are to be removed and stowed. All equipment removed or stowed for LSD docking must be replaced after removal of the LCU from the LSD. The following is an index to the procedures:

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>PARAGRAPH</u>
1	Main Mast	2-66
2	Radar Mast	2-155
3	Whip Antennas	2-156
4	Voice Tube	2-157
5	Lifeboats	2-158
6	Windscreen and Railings	2-159
7	Machine Gun Tri-pod Mount	2-160
8	Ready Service Locker	2-161
9	Aircraft Float Light	2-162
10	Searchlight	2-163
11	Ships Course Indicator and Peloris	2-164
12	Stern Gate Davits	2-165
13	Jack and Ensign Staff, Signal Flag	2-166
14	Floodlight	2-167
15	Exhaust Stacks	2-168

Refer to Figure FO-63 for dry dock plan.

2-155. RADAR MAST.

a. To lower the radar mast, proceed as follows:

- (1) Rotate antenna fore and aft.

**WARNING**

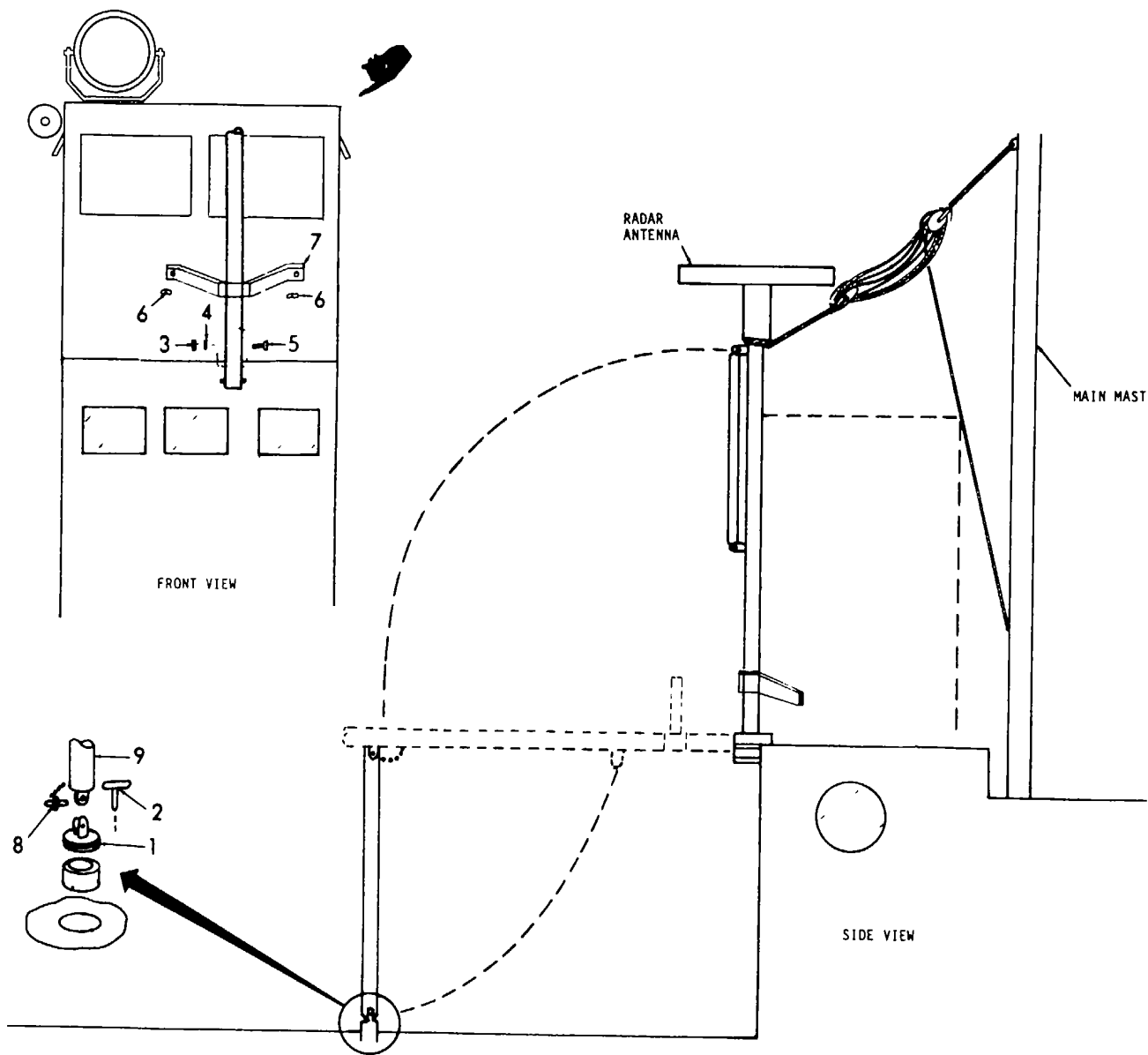
Make sure all power to the radar system is off.

- (2) Rig the block and tackle to main mast.
- (3) Screw stowage deck socket (1) into deck, using Tee wrench (2).
- (4) Remove nut (3) washers (4), and bolt (5).
- (5) Remove thumbscrews (6) from mast support (7).
- (6) Lower mast.
- (7) Remove toggle pin (8) from mast stowage brace (9).
- (8) Lower mast stowage brace (9).
- (9) Insert mast stowage brace (9) in stowage deck socket (1), in stall toggle pin (8).
- (10) Remove block and tackle.
- (11) Replace thumbscrews (6).
- (12) Replace bolt (5), washer (4), and nut (3).

b. To raise the radar mast, proceed as follows:

- (1) Remove nut (3), washer (4), and bolt (5).
- (2) Remove thumbscrews (6).
- (3) Install block and tackle.
- (4) Remove toggle pin (8) from stowage deck socket (1).
- (5) Raise mast to verticle position.
- (6) Install thumbscrews (6) into mast support (7).
- (7) Install bolt (5), washer (4), and nut (3).
- (8) Install toggle pin (8) into mast stowage brace (9).
- (9) Remove stowage deck socket (1), using a Tee wrench (2).
- (10) Remove block and tackle.

2-155. RADAR MAST (Cont).



Change 2 2-627

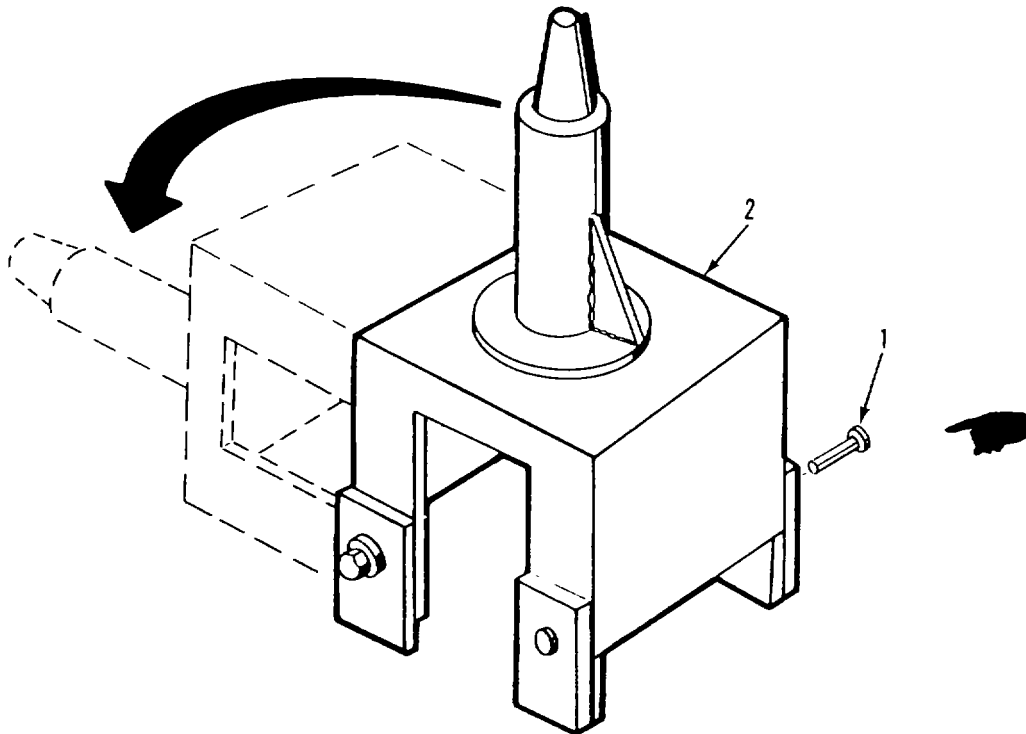
2-156. WHIP ANTENNAS.

To lower the whip radio antennas, proceed as follows:

WARNING

Make sure all power to the radios are turned off.

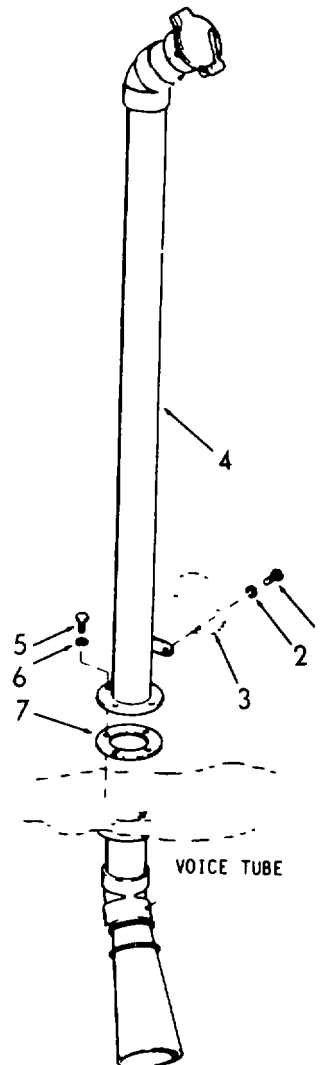
1. Remove pins (1) from antenna base (2).
2. Lower antenna to deck.

**2-157. VOICE TUBE-REMOVAL/INSTALLATION.**

- a. To remove the voice tube, proceed as follows:
 - (1) Remove screws (1) and washers (2) that attach cover (3) to voice tube (4).
 - (2) Install screws (1) and washer (2) into voice tube (4).
 - (3) Remove screws (5) and washers (6) that attach voice tube (4) to deck.
 - (4) If gasket (7) is stuck to voice tube (4) remove.
 - (5) Install cover (3) and gasket (7) using screws (1) and washers (2).
 - (6) Stow voice tube below deck.

Change 2 2-628

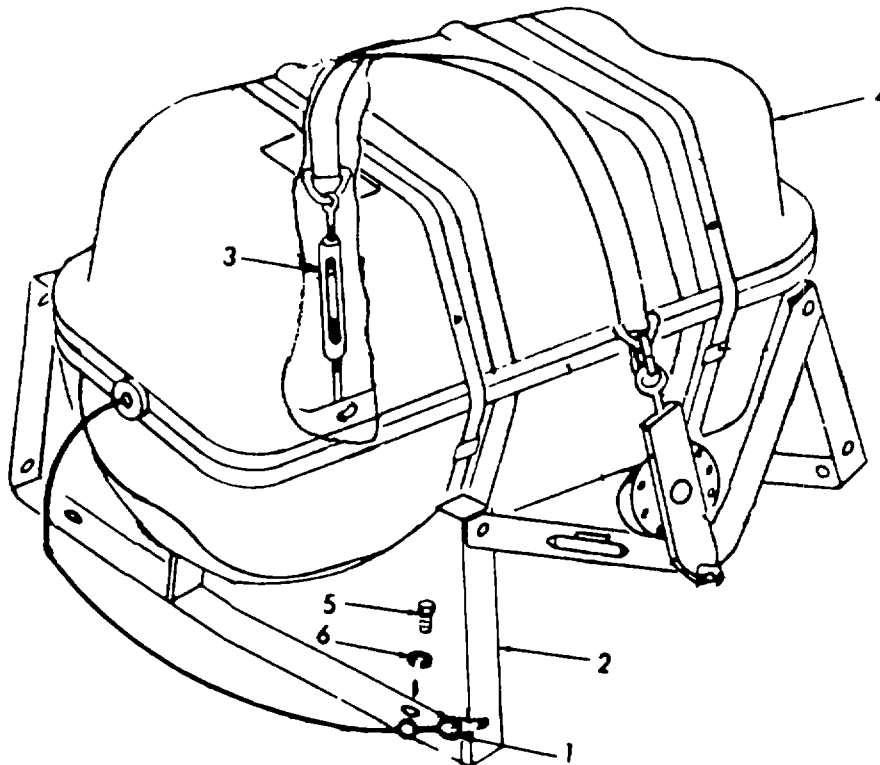
2-157. VOICE TUBE-REMOVAL/INSTALLATION (Cont).



- b. To install the voice tube, perform the following procedures:
- (1) Remove screws (5) and washers (6).
 - (2) Remove cover (3).
 - (3) If gasket (7) is stretch to cover (3). Remove.
 - (4) Install voice tube (4) and gasket (7) with screws (5), and washers (6).
 - (5) Attach cover (3) to voice tube (4) with screws (1), and washers (2).

2-158. LIFE BOATS-REMOVAL/INSTALLATION.

- a. To remove the lifeboat and cradle, proceed as follows:
- (1) Remove painter (1) from cradle (2).
 - (2) Loosen turnbuckle (3) and unhook.
 - (3) Remove container (4) from cradle (2).
 - (4) Remove bolt (5) and washer (6) that secure cradle (2) to deck.
 - (5) Stow life boats and cradles on deck.



- b. To install life boat and cradle, proceed as follows:
- (1) Install cradle (2) to deck with bolts (5) and washers (6).
 - (2) Place life boat container (4) in cradle (2).
 - (3) Install and tighten turnbuckle (3).
 - (4) Install painter (1) to cradle (2).

2-159. CONNING TOWER AND RAILINGS

The procedures for removing and installing the conning tower and railing are contained in this paragraph. Refer to paragraph 2-167 for removal of floodlight mounted on roof of conning tower. The removal of the floodlight should precede all other activity.

a. CONNING TOWER REMOVAL AND INSTALLATION.

- (1) Proceed as follows to remove the conning tower.

WARNING

As soon as the last screw has been removed disconnecting the conning tower to the pilot- house roof, all personnel must clear the immediate area.

CAUTION

Do not attempt to remove the conning tower in high wind. It may be damaged.

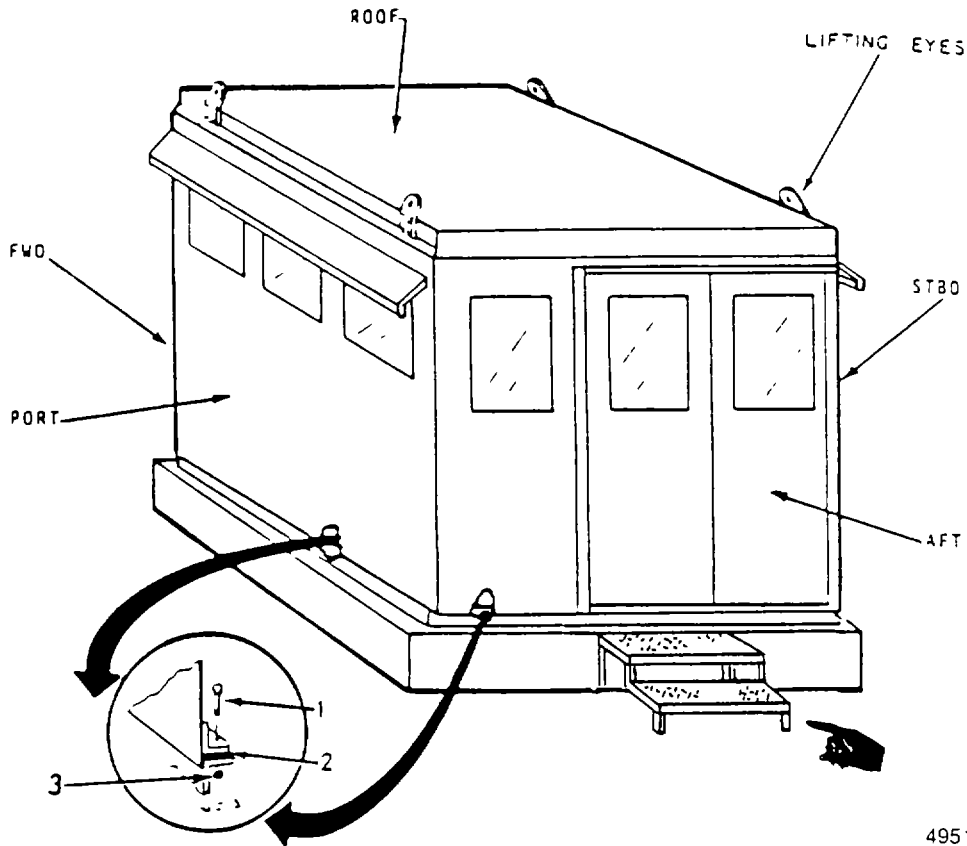
NOTE

This procedure requires 2 men.

- (a) Prepare a place on the vehicle deck to receive the conning tower when removed.
- (b) Disconnect the electrical wiring and ducting to and within the conning tower.
- (c) Connect cabling to each lifting eye on top of the tower.
- (d) Attach other end of cables to lifting crane.
- (e) Keep cabling under slight tension.
- (f) Remove 32 nuts and screws (1) holding conning tower to pilothouse roof. As soon as the last screw has been removed, immediately clear the area to safe location.
- (g) Lift the conning tower off its base and place on prepared location on the vehicle deck.
- (h) Secure in place using tiedown cabling, rope, etc, and peck and hole gear. Also place protective material between tiedown cabling and top of the tower to protect from possible damage.

2-159. CONNING TOWER AND RAILINGS (CONT)

- (i) Remove gasket (2) from base of Join of tower to house top. Stow.
- (j) Protect navigation horn on starboard side of tower from accidental damage.



4951-149

- (2) To install the conning tower, proceed as follows.

WARNING

As soon as the securing cabling has been removed and the lifting cabling attached, all personnel in the vicinity must clear the area.

CAUTION

Do not attempt to install conning tower in the wind. It may be damaged.

NOTE

This procedure requires 2 men.

- (a) Attach cabling to each lifting eye on top of the conning tower.

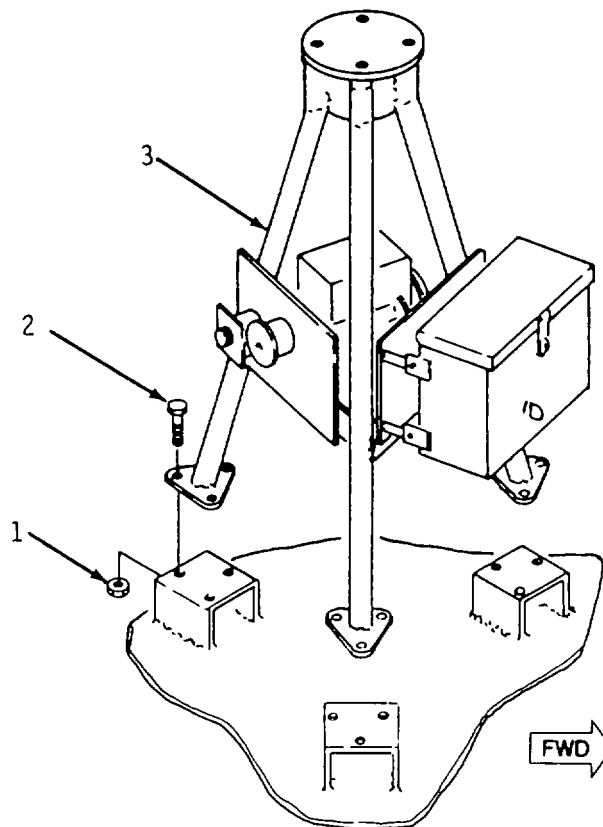
Change 2 2-633

2-159. CONNING TOWER AND RAILING (CONT)

- (b) Attach other end of cables to the lifting crane.
- (c) Keep cabling under slight tension during next step.
- (d) Loosen and remove the tiedown cabling and all protective material under the cables. Clear the area to a safe location.
- (e) With the crane, lift the conning tower and place on top of pilothouse, with sliding doors facing astern.
- (f) Line up the screw holes on bottom of tower with screw holes on pilothouse, first having placed the gasket (2) between the screw holes of the tower and the pilothouse.
- (g) Secure tower to pilothouse with the 32 screws and nuts (1).(3)
- (h) Remove cables from lifting eyes and crane from tower area.
- (i) Reinstall searchlight to roof of conning tower by referring to paragraph 2-163.
- (j) Connect electrical wiring and ducting to the outlets of tower.
- (k) Remove protective covering from navigation horn on starboard side of tower.

2-160. MACHINE GUN-TRIPOD MOUNT-REMOVAL/INSTALLATION.

- a. To remove the tripod machine gun mount, proceed as follows:
- (1) Remove machine gun and store in armory.
 - (2) Remove nuts (1) and bolts (2) from each leg of tripod (3).
 - (3) Remove tripod (3).

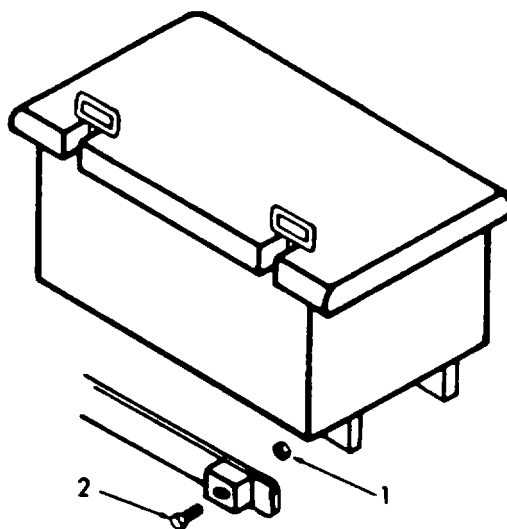


4954-211

- b. To install the machine gun mount, proceed as follows:
- (1) Locate tripod (3) on deck..
 - (2) Install bolts (2), and nuts (1) on each leg of tripod (3).

2-161. READY SERVICE LOCKER-REMOVAL/INSTALLATION.

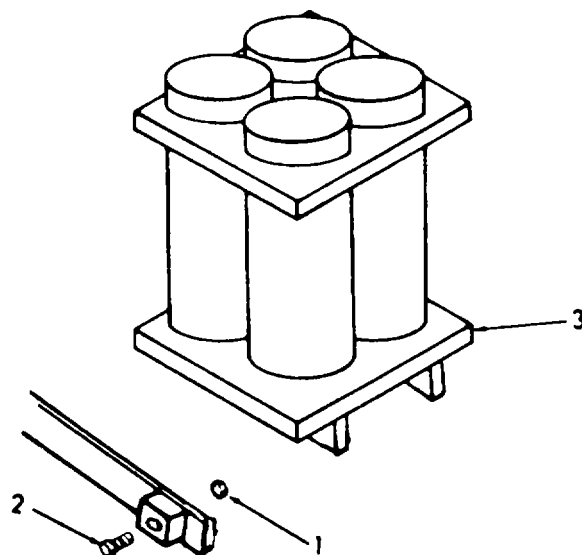
- a. To remove the ready service lockers, proceed as follows:
- (1) Remove contents of ready service locker and stow in magazine.
 - (2) Remove nuts (1) and bolts (2).
 - (3) Remove ready service locker and stow on vehicle deck.



- b. To install the ready service locker, proceed as follows:
- (1) Locate ready service locker on mounting.
 - (2) Install bolts (2) and nuts (1).

2-162. AIRCRAFT FLOAT LIGHT LOCKER-REMOVAL/INSTALLATION.

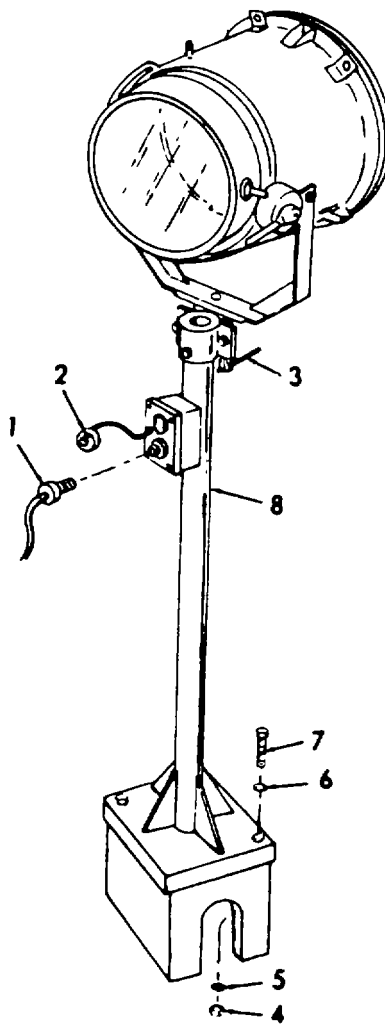
- a. To remove the aircraft float light locker, proceed as follows:
- (1) Remove nuts (1) and bolts (2).
 - (2) Remove aircraft float light locker (3) and stow on vehicle deck.



- b. To install the aircraft float light locker, proceed as follows:
- (1) Locate float light locker on mounting.
 - (2) Install bolts (2) and nuts (1).

2-163. SEARCHLIGHT-REMOVAL/INSTALLATION.

- a. To remove the searchlight and pedestal, proceed as follows:
- (1) Remove power plug (1) from receptacle.
 - (2) Install cover (2) on receptacle.
 - (3) Rotate searchlight locking arm (3) to loosen base of searchlight.
 - (4) Remove searchlight and stow in storeroom.
 - (5) Remove nuts (4), lockwashers (5), washers (6), and bolts (7).
 - (6) Lower pedestal (8) to the deck.



2-638

2-163. SEARCHLIGHT-REMOVAL/INSTALLATION (Cont).

- b. To install the searchlight, proceed as follows:
- (1) Align pedestal (8) with mounting holes.
 - (2) Install bolts (7), washers (6), lockwashers (5), and nuts (4).
 - (3) Install searchlight.
 - (4) Tighten searchlight locking arm (3).
 - (5) Remove cover (2) on receptacle.
 - (6) Install power plug (1) in receptacle.

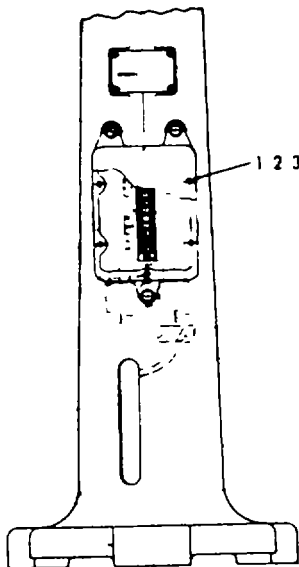
2-164. SHIP'S COURSE INDICATOR AND PELORIS.

- a. To remove the ship's course indicator, peloris and pedestal, proceed as follows:
- (1) Remove the peloris from the ship's course indicator.



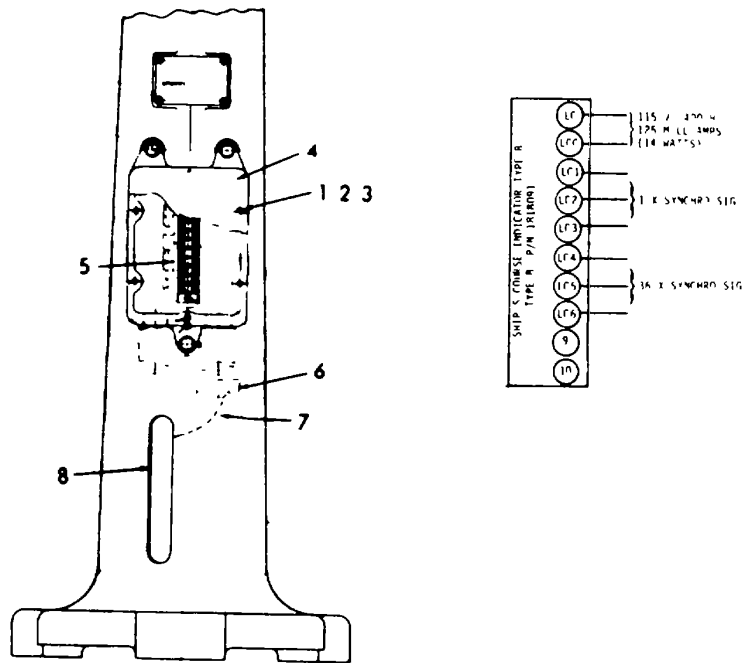
The ship's course indicator is a delicate device.
Avoid mishandling during removal and storage.

- (2) Remove six screws (1), flat washers (2) and lockwashers (3).



2-164. SHIP'S COURSE INDICATOR AND PELORIS (Cont).

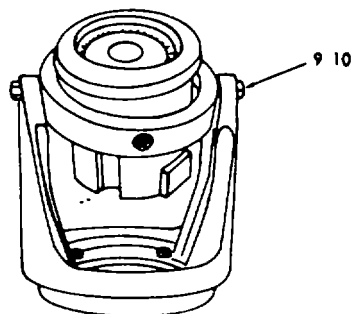
- (3) Remove cover (4).
- (4) Tag and disconnect wiring to terminal strip (5).
- (5) Loosen knurled cap (6).
- (6) Remove cable harness (7).
- (7) Feed through elongated hole (8).
- (8) Reassemble cover (4) using screws (1), flat washers (2) and lockwashers (3).



- (9) Loosen nut (9), and backout studs (10).

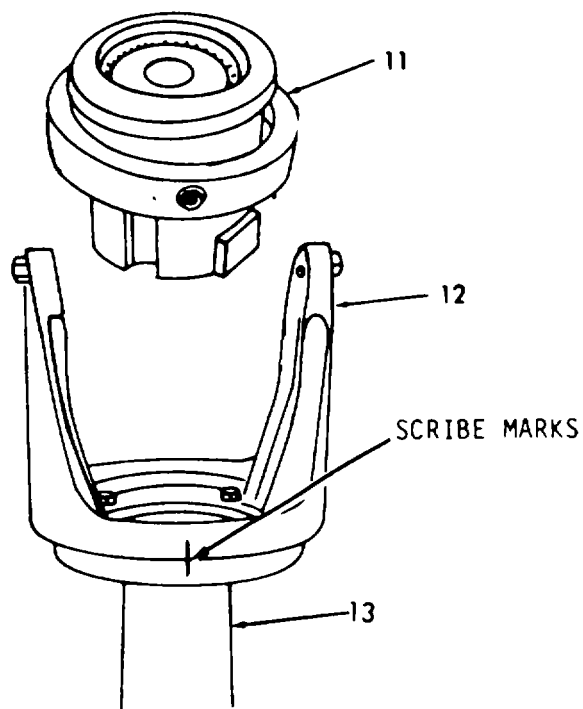
NOTE

Do not remove studs.



2-164. SHIP'S COURSE INDICATOR AND PELORIS (Cont).

- (10) Remove the ship's course indicator (11) from the gimbal bracket (12).



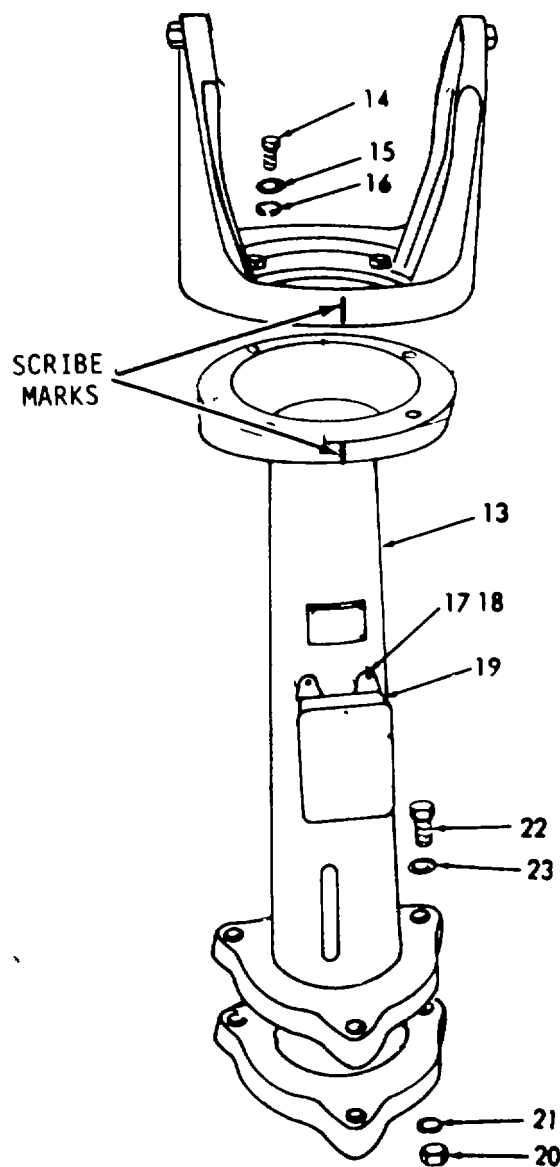
- (11) Place ship's course Indicator in the storeroom.
 (12) Scribe or mark the bracket (12) and the pedestal (13).

NOTE

The scribe mark must be accurate and permanent.
 This is a critical reassembly requirement.

2-164. SHIP'S COURSE INDICATOR AND PELORIS (Cont).

- (13) Remove bolts (14) washer (15) and lock washers (16).
- (14) Place bracket in storeroom.
- (15) Remove screws (17) and lockwashers (18).
- (16) Rotate terminal box (19) to the deck.
- (17) Remove nuts (20), lockwashers (21), bolts (22) and washers (23).
- (18) Remove pedestal (13).
- (19) Place pedestal in storeroom.



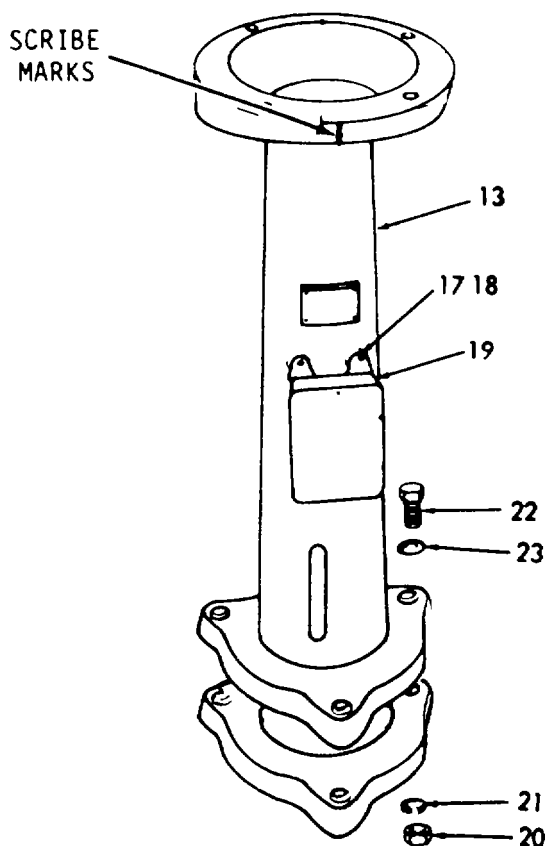
2-164. SHIP'S COURSE INDICATOR AND PELORIS (Cont).

- b. To install the ship's course indicator and pedestal, proceed as follows:

CAUTION

The ship's course indicator is a delicate device.
Avoid mishandling during movement and assembly.

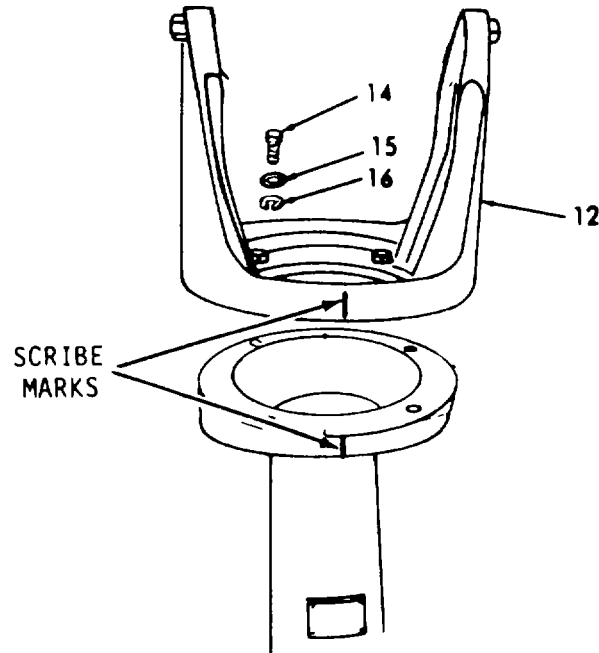
- (1) Remove the pedestal, bracket, and ship's course indicator from the storeroom.
- (2) Place pedestal (13) on base.
- (3) Install bolts (22), washers (23), lockwashers (21) and nuts (20).
- (4) Install terminal box (19), using screws (17) and lockwashers (18).



2-643

2-164. SHIP'S COURSE INDICATOR AND PELORIS (Cont).

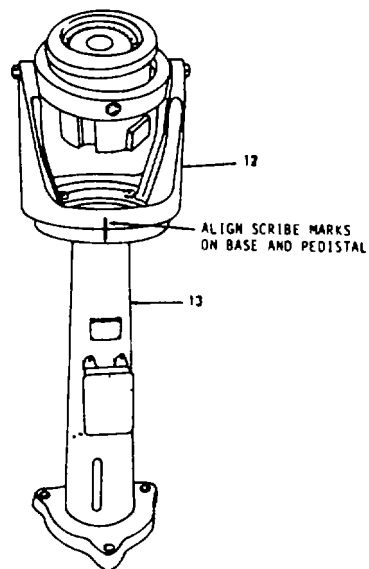
- (5) Place bracket (12) on pedestal.
- (6) Install bolts (14), washers (15) and lockwashers (16). Do not tighten.



- (7) Rotate bracket on pedestal to line up scribe marks. Tighten bolts (14).

NOTE

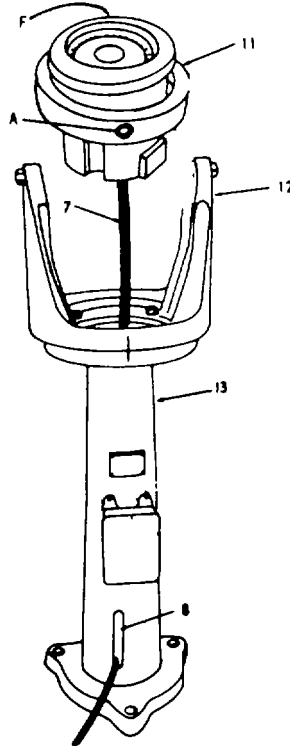
If scribe marks are missing, continue assembly.



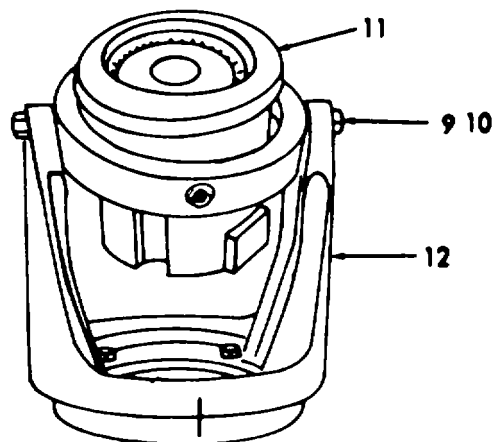
2-164. SHIP'S COURSE INDICATOR AND PELORIS (Cont).

- (8) Feed cable (7) on ship's course indicator (11) through the base of the bracket (12) and the pedestal (13).
- (9) Feed cable through elongated hole (8) at base of pedestal.

NOTE
 POSITION THE F ON THE
 INDICATOR FORWARD, THE
 A WILL BE AFT.



- (10) Position ship's course indicator (11) in bracket (12).
- (11) Tighten studs (9) sufficiently to prevent lateral motion, but not tight enough to prevent the indicator from swinging freely.
- (12) Tighten nuts (10).



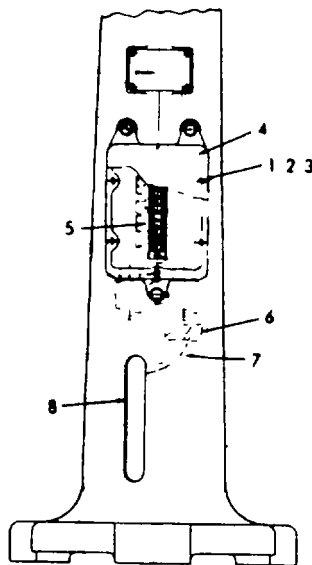
2-164. SHIP'S COURSE INDICATOR AND PELORIS (Cont).

- (13) Remove screws (1), flatwashers (2) and lockwashers (3).
- (14) Remove terminal box cover (4).
- (15) Place knurled cap (6) over end of cable (7).
- (16) Insert cable through stuffing tube.

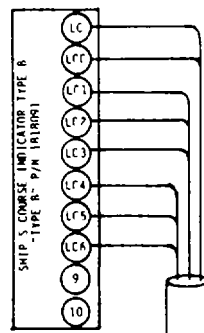
NOTE

Pack stuffing tube in accordance with standard procedures.

- (17) Tighten knurled cap (6).

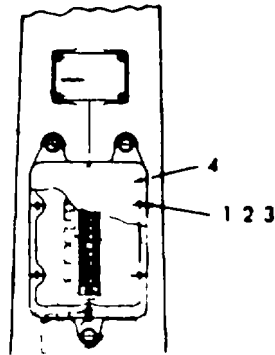


- (18) Attach cable as shown.



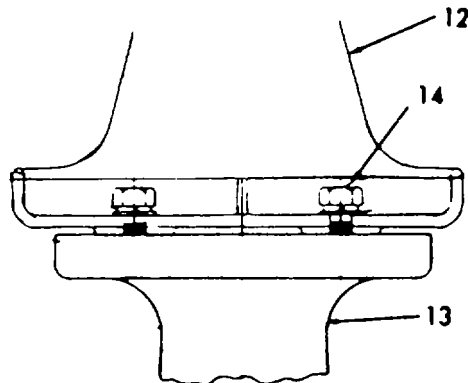
- (19) Replace terminal box cover (4), screws (1), flatwashers (2) and lockwashers (3).

2-164. SHIP'S COURSE INDICATOR AND PELORIS (Cont).

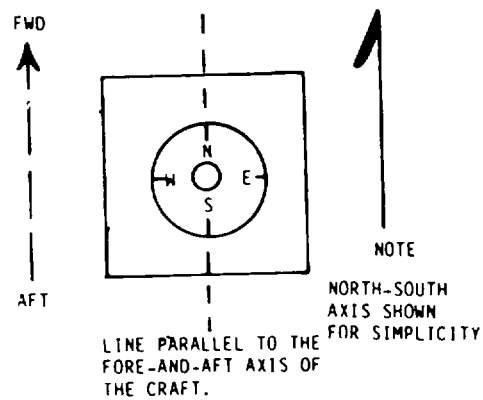


(20) If the scribe marks on the bracket and pedestal are missing proceed as follows:

(a) The screws (14) that attach the bracket (12) to the pedestal (13) must be loose.



(b) Rotate the bracket (12) until the North-South axis of the indicator is parallel with the fore-and-aft axis of the craft. This alignment must be exact.



(c) Tighten screws (14).

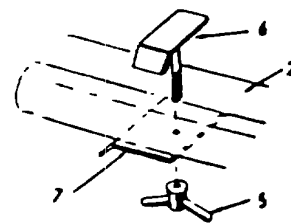
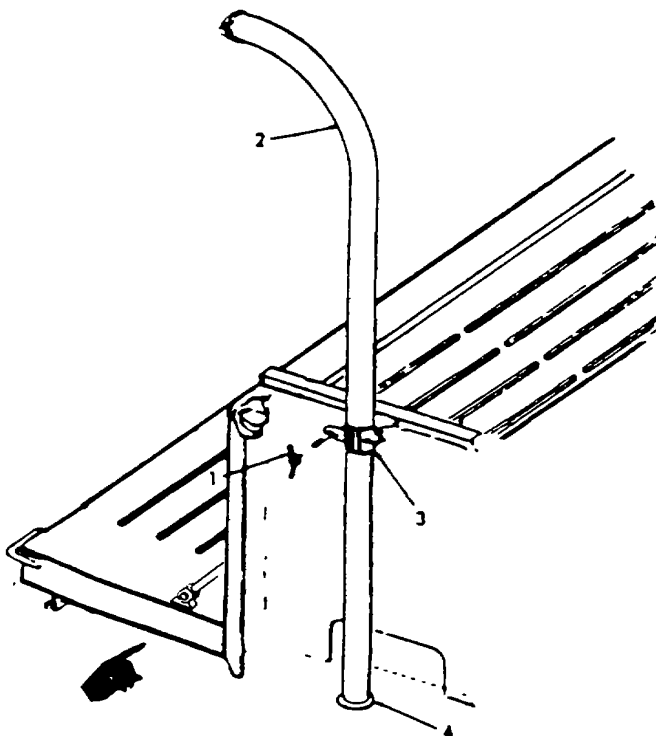
2-165. STERN GATE DAVITS.

To remove and store the stern gate davits, proceed as follows

CAUTION

This procedure requires four men to support and lift the davits.

- a. Loosen dog bolt (1).
- b. Support davit (2).
- c. Swing clamp (3) open.
- d. Lift davit from base (4).
- e. Move davit (2) to port side.
- f. Remove dog bolt handle (5).
- g. Remove stowage bracket (6).
- h. Place davit on bracket (7).
- i. Replace stowage bracket (6).
- j. Replace dog bolt handle (5).



Change 2 2-648

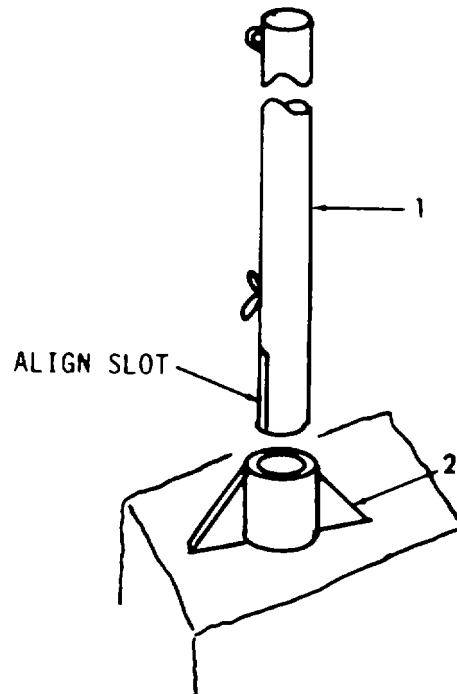
4951-199

2-166. JACK STAFF, ENSIGN STAFF, AND SIGNAL FLAG.

To remove the jack staff, ensign staff, and signal flag proceed as follows:

a. JACK STAFF

- (1) To remove the jack staff (1).
 - (a) Lift from socket (2).
 - (b) Stow jack staff on vehicle deck.

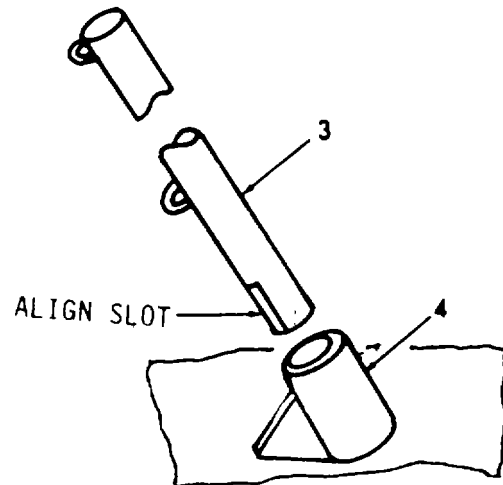


- (2) To install the jack staff.
 - (a) Insert staff (1) in socket (2).
 - (b) Rotate to align slot.
 - (c) Push staff to bottom of socket.

2-166. JACK STAFF, ENSIGN STAFF, AND SIGNAL FLAG (Cont).

b. ENSIGN STAFF

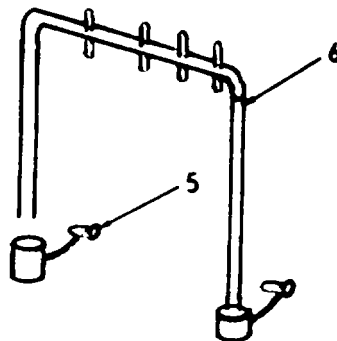
- (1) To remove the ensign staff (3).
 - (a) Lift from socket (4).
 - (b) Stow staff on vehicle deck.



- (2) To install the ensign staff.
 - (a) Insert staff (3) in socket (4).
 - (b) Rotate to align slot.
 - (c) Push staff to bottom of socket.

c. SIGNAL FLAG

- (1) To remove the signal flag tie down, proceed as follows:
 - (a) Remove pins (5).
 - (b) Lift tie down assembly (6) from deck sockets.



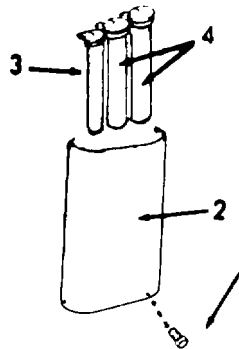
- (c) Stow assembly (6) on the vehicle deck.

2-167. FLOODLIGHT.

The floodlight is installed on the windshield overhead. The type and installation varies depending on the vessel.

2-168. EXHAUST STACKS-REMOVAL/INSTALLATION.

- a. To remove the exhaust stacks, proceed as follows:
- (1) Remove ten cap head screws (1).
 - (2) Remove exhaust stack (2).
 - (3) Lift exhaust pipes (3 and 4).
 - (4) Stow all parts on the vehicle deck.
 - (5) Repeat above procedure for the other exhaust stack.



- b. To install the exhaust stacks, proceed as follows:
- (1) Place exhaust pipe (3 and 4).
 - (2) Replace exhaust stack (2) and screws (1).
 - (3) Repeat the above for the other exhaust stack.

2-169. OPERATING INSTRUCTIONS ON DECALS AND INSTRUCTION PLATES.

The following decals and instruction plates are found on the bulkheads next to the equipment.

OPERATING INSTRUCTIONS FOR MAIN PROPULSION ENGINES

PRESTART

1. Perform all daily operations on the lubrication and maintenance chart, applicable.
2. Use the priming pump to make sure the fuel filter, fuel lines, manifolds and injectors are full.
3. Follow operating instruction explicitly.

LOCAL START

1. Raise hydrostarter accumulator pressure with hand pump until gage reads:

<u>AMBIENT TEMPERATURE</u> -Above 40°F	<u>PRESSURE GAGE</u> -1500 PSI
40°F to 0°F	2500 PSI
Below 0° F	3300 PSI

2. Set throttle at least half open.
3. Push start button located on local gage box.
4. Release start button as soon as engine starts.

NOTE If electrical power is not available the engine may be started by manually opening the hydrostarted solenoid control valve. Close valve when engine starts.

5. Observe oil gage. If no pressure indicated within 10 to 15 seconds, STOP. Check lubrication system. Minimum oil pressure is 25 PSI @ 1200 RPM.
6. Warmup at part throttle, no load for about five minutes, before loading engine. Normal coolant temperature is 160°to 185° F.
7. Engage clutch at less than 850 RPM.
8. When prolonged idling needed, maintain at least 800 RPM minimum.

LOCAL STOP

1. Release load-decrease engine RPM.
2. Continue at half speed or lower with no load for five minutes prior to stopping the engine. (To stop, pull gov..Shutdown Knobs).
3. Check crankcase for proper oil level.
4. Clean and check engine to be sure it will be ready for next use.

EMERGENCY SHUTDOWN

1. Pull out Emergency Shutdown Knobs, which are bulkhead mounted inboard of Forward Engine Room Hatch, Vehicle Deck Level. Be sure knobs stay out before leaving Emergency Shutdown Station. NOTE: Release Catches on air box before trying to start engines after using emergency stops.

OPERATING INSTRUCTIONS FOR MAIN PROPULSION ENGINES

SAFETY PRECAUTIONS

1. When starting engines, do not open starting lever longer than 30 seconds at a time.
2. In case of a false start, do not open lever until after cranking motor stops rotating.
3. If engine does not start after four periods of cranking, investigate.
4. Never accelerate a cold engine under any circumstances.
5. If engine is subject to freezing temperatures and no anti-freeze is used, drain all water when engine is shut down.
6. Shut engine down immediately if low Oil Pressure Alarm rings.
7. Shut engine down immediately if Coolant Temperature Alarm rings.

FOR DETAILED INSTRUCTIONS AND MAINTENANCE SCHEDULE, SEE "DETROIT" DIESEL OPERATOR'S MANUAL, NAVSHIPS 0941-008-9010

OPERATING INSTRUCTIONSSHIP SERVICE GENERATOR AND CONTROL SWITCHBOARD

- STEP 1. Before starting engines, Generator Circuit Breakers must be open.
- STEP 2. Place INTEGRAL (unit parallel) SWITCH in the ON (unit) position.
- STEP 3. Place the AUTO-MANUAL SWITCH in the AUTO position.
- STEP 4. Check engines for readiness for operation; oil, water, fuel, etc.
- STEP 5. Start engines and adjust frequency to 60 Hertz (with governor switch) and voltage to 450 volts (with voltage adjust rheostat).
- STEP 6. Close Generator Circuit Breaker.

TO PARALLEL SHIP'S SERVICE GENERATORS

- STEP 1. Start second generator according to STEPS 1, 3, 4 and 5 above.
- STEP 2. Place the INTEGRAL (unit parallel) SWITCHES of both generators in the OFF (parallel) position.
- STEP 3. Place the SYNCHRONIZING SWITCH in the ON position and adjust the speed of the incoming generator slightly faster than the machine on the line (synchroscope should have slow clockwise rotation).
- STEP 4. When the synchroscope pointer passes through the 12 o'clock position, close the incoming generator circuit breaker.
- STEP 5. Divide load between generators by adjusting generator governor control and adjust voltage to divide current.

GENERATOR MANUAL OPERATION

- STEP 1. Place the AUTO-MANUAL SWITCH in the MANUAL POSITION.
- STEP 2. Start engine.
- STEP 3. Adjust voltage for 450 volts using the MANUAL VOLTAGE CONTROL RHEOSTAT.

GENERATOR SHUTDOWN

- STEP 1. If generators are operating in parallel, transfer the entire load to one generator and open the no-load generator circuit breaker.
- STEP 2. Reduce generator load as much as possible by opening feeder circuit breakers.
- STEP 3. Open the generator circuit breaker.
- STEP 4. Shut down the generator engines (in engine room).

OPERATING INSTRUCTIONS AND SAFETY PRECAUTIONS

FOR

FIRE PUMP

SAFETY PRECAUTIONS

1. Do not wipe unit in vicinity of moving parts.
2. Do not Jack a bound pump by hand when motor is energized.
3. Use only CO2 on electrical fires.
4. Do not tighten any Joints if Joint is under pressure.
5. Before performing maintenance on the unit, close all pump valves, open motor circuit breaker, and tag preceding items with appropriate warnings to prevent unauthorized openings of valves or energizing of circuits.

PRESTART

1. Only use strainer having a net opening area of three (3) times the suction line cross sectional area.

START

1. Open pump suction valve.
2. Open bleed line valve.
3. Open pump casing vent valve.
4. Vent all air until pump is primed full of water; Start.
5. When pump reaches operating speed, open the discharge valve.

STOP

1. Close the pump discharge valve.
2. Stop motor.
3. Close the pump suction valve.
4. Clean strainer baskets in preparation for next start.

FIRE PUMPMODES OF OPERATION

1. Supply Sea Water to Fire Stations.
 - a. Close valve to ballast line.
 - b. Close overboard discharge valve.
 - c. Close valve to bilge suction line.
 - d. Open supply valve to fire main.
 - e. Open supply valves to main deck fire stations at BHID 33 and 62.
 - f. Start pump as per start instructions.
 - g. Open desired fire station in the engine rooms or on main deck.

2. Supply Sea Water to Ammunition Sprinkler
 - a. Pressurize fire main as per Item I, a, b, c, d, and f.
 - b. Open sprinkler valve.

3. Filling Ballast Tanks
 - a. Close valve to fire main.
 - b. Close valve to bilge suction line.
 - c. Close overboard discharge valve.
 - d. Open desired ballast tank supply valve.
 - e. Start pump as per start instructions.
 - f. Tanks can also be gravity filled.

4. Deballasting
 - a. Close sea chest suction valve.
 - b. Open ballast line suction valve.
 - c. Close ballast line supply valve.
 - d. Open overboard discharge valves.
 - e. Start pump as per start instructions 2-4.

5. Bilge Eductor Actuating Water Supply
 - a. Close valve to fire main.
 - b. Close valve to ballast line.
 - c. Open bilge suction line valve.
 - d. Open desired bilge suction valve.
 - e. Open overboard discharge valve.
 - f. Start pump as per start instructions.
 - g. See instruction plates at eductor suction and discharge valves for operating the eductor.

OPERATING INSTRUCTIONS AND SAFETY PRECAUTIONS

FOR

BILGE PUMP

The port propulsion unit outboard engine must be running before pump can be operated.

SAFETY PRECAUTIONS

1. Never install or adjust drive belts when propulsion engine is running.
2. Do not work in vicinity of moving parts.
3. Do not tighten any joints if under pressure.
4. Before performing maintenance on the unit, close all pump valves, secure the propulsion engine and post appropriate warning to prevent tampering by unauthorized personnel.

PRESTART

1. Check to ensure that drive belts are properly adjusted.
2. Check to ensure that clutch is disengaged.
3. Rotate pump shaft by hand to make sure it rotates freely.

TO OPERATE PUMP

1. Open suction valves.
2. Open discharge valve.
3. Engage pump drive clutch.

TO SECURE PUMP

1. Disengage clutch.
2. Close suction valves.
3. Close discharge valve.

OPERATING INSTRUCTIONS AND SAFETY PRECAUTIONS

FOR

FRESH WATER PUMP

SAFETY PRECAUTIONS

1. Do not work in vicinity of moving parts.
2. Do not jack a bound pump when the motor is energized.
3. Use only CO₂ on electrical fires.
4. Do not tighten joints that are under pressure.
5. Before performing maintenance on the unit, close all pump valves, open motor circuit breaker, and tag these items with appropriate warnings to prevent tampering by un- authorized personnel.
6. Stop pump immediately if pressure tank relief valve opens.

PRESTART

1. Clean suction strainer basket.

START

1. Open suction valve.
2. Open discharge valve.
3. Start pump motor by placing switch in "AUTO" position.
4. Observe unit for one complete cycle to ensure that the automatic control is operating properly.

STOP

1. Normally the unit will automatically stop and start to suit the system demand.
2. Secure the unit by placing the switch in the "OFF" position and closing the suction and the discharge valves.

OPERATING INSTRUCTIONS AND SAFETY PRECAUTIONS

FOR

FLUSHING WATER PUMP

SAFETY PRECAUTIONS

1. Do not work in vicinity of moving parts.
2. Do not jack bound pump when the motor is energized.
3. Use only CO₂ on electrical fires.
4. Do not tighten joints that are under pressure.
5. Before performing maintenance on the unit, close all pump valves, open motor circuit breaker, and tag these items with appropriate warnings to prevent tampering by unauthorized personnel.
6. Stop pump immediately if pressure tank relief valve opens.

PRESTART

1. Clean suction strainer basket.

START

1. Open suction valve.
2. Open discharge valve.
3. Start pump motor by placing switch in "AUTO" position.
4. Observe unit for one complete cycle to ensure that the automatic control is operating properly.

STOP

1. Normally the unit will automatically stop and start to suit the system demand.
2. Secure the unit by placing the switch in the "OFF" position and closing the sea suction and the discharge valves.

Pump is to start at 30 PSI and stop at 40 PSI, when on automatic.

OPERATING INSTRUCTIONS AND SAFETY PRECAUTIONS

FOR

FIRE AND SALVAGE PUMP MODEL P-250PRESTART

1. Mix the proper fuel mixture and fill tank.
2. Connect the hose assembly from the fuel tank to the plug provided on the control panel.
3. Remove thread protectors and attach suction, exhaust, three-way gate valve and suction hoses. Make sure the suction hose slopes continuously downward from the pump intake.
4. Mount foot valve on the end of the suction hose. Make certain the foot valve is completely submerged during the entire period the pump is to be operated.

START

1. Pump fuel to carburetor by pressing the pushbutton on the tank several times until resistance is felt. Do not pump after resistance is felt, as damaged diaphragm may result.
2. Place the water outlet valve in the closed position.
3. Pull the choke knob to the extended position. Turn the high and low speed knobs on the control panel three-quarters of a turn to the left from the closed position.
4. Pull the starting rope rapidly. After the engine starts and runs a few seconds, push the choke in toward the control panel.
5. Check the pressure gage to be sure water pressure is building up. This will occur approximately 20 seconds after the pump has been started, at a suction lift of sixteen feet.

"CAUTION" - Do not run pump more than forty-five seconds unless pressure shows on the gage. If pump is not primed in forty-five seconds, stop engine, tighten all suction connections and hose couplings, and try priming again.

6. When pressure shows on gage, open up gate valve slowly, allowing water to enter discharge hose.
7. Adjust carburetor high speed dial to the best operating position. For slow speed adjustment, slow engine to idle by partially closing throttle with stop button.
8. Adjust water pressure with screw driver (see technical manual).
9. While the engine is running, occasionally check water pressure.

STOP

1. Press the "STOP" button on the control panel.
2. See technical manual for storage instructions.

OPERATING AND TESTING PROCEDURE

FOR

MAGAZINE SPRINKLER

1. Operating
 - a. Pressurize fire main as per Item 2 of Fire Pump Modes of Operation.
 - b. Open sprinkler valve to wet down magazine.
2. Testing
 - a. Pressurize fire main as per Item 2 of Fire Pump Modes of Operation.
 - b. Attach fire hose to angle hose valve and run it overboard or in bilge.
 - c. Close gate valve in line above sprinkler valve.
 - d. Open angle hose valve.
 - e. Test sprinkler valve for operation. This should also sound alarm with water switch.
 - f. After test, drain water flow switch and pipe down below sprinkler valve.
 - g. Close sprinkler valve and angle hose valve and open the gate valve in the line above the sprinkler valve.

OPERATING AND TESTING PROCEDURE
FOR
RETURN FUEL SALTWATER COOLING PUMP

1. Check to see if strainer at the sea chest is clean.
2. Open valve at the sea chest.
3. Open inlet valve to oil cooler.
4. Open overboard discharge valve.
5. Start pump at the panel.

OPERATING INSTRUCTIONS AND SAFETY PRECAUTIONS

FOR

REDUCTION GEAR STANDBY LUBE OIL PUMP

SAFETY PRECAUTIONS

1. Do not work in vicinity of moving parts.
2. Do not Jack a bound pump when the motor is energized.
3. Use only CO2 on electrical fires.
4. Do not tighten joints that are under pressure.
5. Before performing maintenance on the unit, close all pump valves, open motor circuit breaker and tag these items with appropriate warnings to prevent tampering by unauthorized personnel.

PRESTART

1. Clean suction strainer.
2. Rotate pump shaft by hand to ensure that it turns freely.

START

1. Open suction valve.
2. Open discharge valve.
3. Start motor.

STOP.

1. Stop motor.
2. Close discharge valve.
3. Close suction valve.

OPERATING INSTRUCTIONS**FOR****AIR CONDITIONING UNIT AND SEA WATER PUMP**

For the initial start up, see the "CARRIER TRANSICOLD AIR CONDITIONING" Manual.

PRESTART AFTER THE INITIAL START UP

1. Check strainer on suction side of salt water cooling pump.
2. Open salt water cooling valves at the sea chest, inlet to condenser and the overboard discharge.
3. Inspect oil level in compressor crankcase.
4. Open any stop valve in refrigerant, oil and sea water lines to pressure gages and control switches.
5. Make sure vents and drains are closed.

START

1. Start sea water pump at control panel.
2. Start air circulation fan at control panel.
3. Start compressor motor at control panel by putting selector switch in the auto position, momentarily push start button while holding in the L..P. bypass button continuously. When motor is running at full speed, release L..P. bypass button.

SECURING

1. Stop compressor at motor controller by depressing the stop button.
2. Close salt water cooling valves at the sea chest, inlet to condenser and the overboard discharge.
3. If there is any danger of freezing the water in the condenser tubes, open the vents on top and the drains at the bottom of the water heads to drain the condenser.
4. See the manual for shutting down the compressor for an extended period.

OPERATING INSTRUCTIONS**HALON FIRE DETECTION AND SUPPRESSION SYSTEM**

NOTE: Read Technical Manual before operating.

Operating Procedures

1. Put audible alarm switch in the "ON" position.
2. When fire is detected, a light on the control panel will illuminate and a horn will sound.
3. If auto operation is not desired, the agent can be released manually by removing locking pin on pneumatic control valve on halon cylinder and activating manual release lever.
4. In case of electrical failure or if visual detection of a fire is noted before the detectors sense it, a mechanical-manual release is provided. For the flammable liquid store room, it is located. Aft of flammable liquid store room door.
5. When the extinguishing agent is released, the Pressure Accumulator will be activated to shut down ventilation blowers, activate amber lights and alarm.
6. After the fire has been extinguished, the pressure switch in the compartment must be manually reset to start vent fans.
7. To put the system back into operation after a fire, see the Tech Manual.
8. For test procedures, see the Tech Manual.

OPERATING INSTRUCTIONS
FOR
RAISING AND LOWERING MAST

STARTING PROCEDURES

1. Check the level of the hydraulic oil in the reservoir of the central hydraulic power unit, located on the starboard side in the forward engine room. Add oil if necessary.
2. Energize power unit by pushing the "start" button on the panel in the engine room access.

OPERATING PROCEDURE

1. Operate the control valve, located in the recess on the inboard side of the pilot house, in the desired direction.
2. **NOTE:** When mast is raised, install and secure aft and outboard stays to padeyes. Before lowering, disconnect stays.

SECURING PROCEDURE

1. Stop system by centering the control valve.
2. Stop hydraulic pump at the controller.

OPERATING INSTRUCTIONS

FOR

STERN GATE**STARTING PROCEDURE**

1. Check the level of the hydraulic oil in the reservoir of the central hydraulic power unit, located on the starboard side in the anchor winch room. Add oil if necessary.
2. Energize power unit by pushing the "start" button on the panel in the engine room access.

LOWERING GATE

1. Release dog bolts on gate.
2. Lower stern gate by operating the control valve located on the starboard bulwark inboard side.

RAISING GATE

1. Raise gate by operating the control valve.

NOTE: When manually raising the stern gate, the control valve must be held open to relieve hydraulic pressure. As a second option, the quick release pins on the hydraulic cylinders may be disconnected to avoid any hydraulic pressure.

2. Install the two aft dog bolts.
3. De-energize stern gate hydraulic and electrical system.

MANUAL STERN GATE OPERATION

1. Install portable davits, located on port bulwark, port and starboard in deck sockets and bulwark brackets provided.
2. Use 1-ton chain hoist to raise and lower gate.

OPERATING INSTRUCTIONS FOR ANCHOR WINCH**PRESTART**

1. Cooling System
 - A.) Vent Air from circulating pump suction line.
 - B.) Check water level in #2 (port) main propulsion engine expansion tank.

START UP

1. Check throttle clutch control, in neutral position.
2. Start engine (refer to Operator's Manual).
 - A.) Observe lube oil pressure (Normal 40-55 PSIG)
 - B.) Observe cooling water temperature (Normal 175-185 degrees F.). Maximum temperature 200 degrees, allowable.
 - C.) Observe torque converter oil pressure (Normal 40-65 PSIG) and oil temperature (Normal 160-220 degrees F.- Max. 250 degrees).
 - D.) Observe hydraulic control pressure (Minimum 350 PSIG-Normal 365-370 PSIG).
 - E.) Observe hydraulic operating pressure (Minimum 600-PSIG-Normal 600-800 PSIG).
3. If lube oil pressure or cooling water high temperature, exceed Normals, stop engine by pulling emergency stop located on control stand.

NORMAL SECURING OF STERN ANCHOR WINCH DIESEL ENGINE

1. Stop engine at control stand or local control, after idling engine to cool down.

OPERATING INSTRUCTIONS

FOR

EMERGENCY STEERING

1. Two men are required for operating of emergency steering gear.
2. Remove deck plug over either port or starboard rudder stock.
3. Lubricate emergency tiller bearing and extend tiller through deck hole onto square head of rudder stock.
4. Install two portable fairlead rollers on top of stern gate.
5. Install two "block and tackle" rigging, one each side of tiller arm and to deck padeyes.

NOTE: See NavShips drawing #518-4634415 for rigging arrangement.

6. Open manual by-pass valve in ahead steering gear hydraulic system.
7. Maintain communications with pilothouse by means of sound powered telephone.

OPERATING INSTRUCTIONS AND SAFETY PRECAUTIONS FOR BOW RAMP WINCH**STARTING WINCH**

1. Lock pawl in the disengaged position and release the mechanical brake.
2. Turn power cut off switch in the pilot house to the "ON" position.
3. Hand crank and slack cable limit switches must be closed.
4. To operate from the station at the winch, turn the selector switch to "LOCAL".
5. For remote operation, turn the selector switch to "REMOTE".

LOWERING RAMP

1. Energize ramp winch electrical system.
2. Release upper dog bolts on ramp and check lines to see they are clear.
3. Lower ramp by pressing the "DOWN" button. Stop winch by pushing the "STOP" button. Set chain stopper so as to rest against chain guide casting.

RAISING RAMP

1. Raise ramp by pressing the "RAISE" button. **NOTE:** It may be necessary to have both generators operating in parallel to raise the ramp.
2. Install the two forward dog bolts.
3. De-energize ramp winch electrical system.

MANUAL RAMP WINCH OPERATION

1. To lower ramp by hand, the hand crank is not needed; see warning below:

WARNING: When lowering the ramp manually, be sure the hand crank is not mounted on the high speed shaft as injury may be caused by the spinning crank.

- a.) Set the mechanical drum brake by turning the handwheel clockwise.
- b.) Be sure the pawl is locked in the disengaged position.
- c.) Release the electric brake.
- d.) Lower the ramp under control of the drum brake.

MANUAL RAMP WINCH OPERATION (continued)

2. To raise ramp by hand operation:

WARNING: Be sure the pawl is against a ratchet tooth before releasing crank handle.

- a.) Remove cover from high speed shaft stub.
- b.) Remove the pawl locking pin so that the ratchet can be engaged.
- c.) Release the electric brake and mechanical drum brake.
- d.) Mount crank on high speed shaft stub and turn clock-wise to raise ramp.

OPERATING INSTRUCTIONS

FOR

GALLEY SINK HEATER

1. Close drain valve under sink.
2. Close drain valve from sink heater.
3. Fill sink with at least 7" of hot water.
4. Turn on current to the heater, amber light should be on. If red light appears, turn power off and re-set manual re-set on heating element, then turn power on.

5. When water is raised to 180°, a green light will appear on the panel.

BACKFLUSHING

1. De-energize heater at the panel.
2. Open drain valve from the sink.
3. Open drain valve from sink heater.
4. Connect the flushing hose to the galley sink faucet and put the other end into the heater outlet in the sink.
5. Turn the galley sink faucet on full force until the heater is clean.

DRAINING HEATER

1. Open drain valve from the heater to the plumbing drains.

OPERATING INSTRUCTIONS

AN/URC-80 (V) RADIO SET

These instructions are not intended to replace Instruction Books, but to provide ready reference to standard operating procedure.

Read your Instruction Book.

Power distribution panel is located in the Pilot House.

I STARTING THE EQUIPMENT

- | | | | |
|--------|------------------------------------|--------|--|
| STEP 1 | Rotate VOLUME CONTROLS fully CCW. | STEP 3 | Turn POWER SWITCH, locate on receiver/transmitter, ON. |
| STEP 2 | Rotate SQUELCH CONTROLS fully CCW. | | |

II OPERATING ADJUSTMENTS

- | | | | |
|--------|--|--------|---|
| STEP 1 | Adjust MAIN RCVR VOLUME CW until noise or signal is audible through loudspeaker. | STEP 7 | Operation of AUX RCVR CONTROLS is the same as MAIN RCVR SQUELCH and VOLUME CONTROLS. |
| STEP 2 | Adjust MAIN RCVR VOLUME CONTROL as needed. | STEP 8 | Adjust volume of loudspeaker connected to junction box J-3319 through VOLUME CONTROL mounted on Junction box. |
| STEP 3 | Adjust MAIN RCVR SQUELCH. | | |
| STEP 4 | Turn CHANNEL SELECTOR CONTROLS to desired channel. | STEP 9 | Adjust volume of remote C-3319 through VOLUME CONTROL mounted on remote unit. |
| STEP 5 | Set TRANSMITTER POWER SWITCH to HIGH or LOW as needed. | | |
| STEP 6 | To transmit, press the PUSH-TO-TALK SWITCH on handset. | | |

III STOPPING THE EQUIPMENT

- | | |
|--------|---------------------------|
| STEP 1 | Turn POWER SWITCH to OFF. |
|--------|---------------------------|

OPERATING INSTRUCTIONS

RADIO RECEIVER R-390A/URR

These instructions are not intended to replace Instruction Books, but to provide ready reference to standard operating procedure.

Read your Instruction Book

Power distribution panel is located in the Pilot House.

I STARTING THE EQUIPMENT

STEP 1 Turn FUNCTION SWITCH to AGC.

II PREPARING RECEIVER FOR RECEPTION

STEP 1 Turn BFO SWITCH TO OFF.

STEP 6 Turn AUDIO RESPONSE SWITCH to WIDE.

STEP 2 Turn LINE GAIN to 0.

STEP 7 Turn AGC SWITCH to MED.

STEP 3 Turn RF GAIN to 10.

STEP 8 Turn LIMITER SWITCH to OFF.

STEP 4 Turn LOCAL GAIN to 6.

STEP 9 Turn DIAL LOCK to left until it stops.

STEP 5 Turn BANDWIDTH SWITCH to 8.

III OPERATING ADJUSTMENTS

STEP 1 Turn MEGACYCLE and KILOCYCLE CONTROLS to tune desired signal and adjust for max. carrier level.

STEP 3 Turn DIAL LOCK to right until it stops.

STEP 4 Adjust volume with LOCAL GAIN.

STEP 2 Adjust ANTENNA TRIM for max. carrier level.

IV STOPPING THE EQUIPMENT

STEP 1 Turn FUNCTION SWITCH to OFF.

OPERATING INSTRUCTIONS**VHF RADIO SET AN/VRC-47**

These instructions are not intended to replace Instruction Books, but to provide ready reference to standard operating procedure.

Read your Instruction Book.

Power distribution panel is located in the Pilot House.

TRANSCEIVER RT-524/VRC OPERATION**I STARTING THE EQUIPMENT**

- | | | | |
|--------|---------------------------------------|--------|----------------------------|
| STEP 1 | Turn SQUELCH SWITCH to OFF. | STEP 3 | Turn POWER SWITCH to LOW. |
| STEP 2 | Set LIGHT SWITCH to desired position. | STEP 4 | Turn SPEAKER SWITCH to ON. |

II OPERATING ADJUSTMENTS

- | | | | |
|--------|--|--------|--|
| STEP 1 | Adjust VOLUME CONTROL until background noise is heard. | STEP 5 | Adjust VOLUME CONTROL for desired receiver volume. |
| STEP 2 | If squelch is to be used, turn SQUELCH SWITCH to ON. | STEP 6 | To transmit, press the PUSH-TO-TALK SWITCH. |
| STEP 3 | Set BAND SWITCH to desired band. | STEP 7 | When high transmitter power output is required, turn POWER SWITCH to HIGH. |
| STEP 4 | Turn MC-TUNE and KC-TUNE KNOBS so desired channel appears on CHANNEL DIAL. | | |

III STOPPING THE EQUIPMENT

- STEP 1 Turn POWER SWITCH to OFF.

RECEIVER R-442/VRC OPERATION**IV STARTING THE EQUIPMENT**

- | | | | |
|--------|---------------------------------------|--------|-------------------------------|
| STEP 1 | Turn the SQUELCH SWITCH to OFF. | STEP 3 | Set POWER SWITCH to ON-RESET. |
| STEP 2 | Set LIGHT SWITCH to desired position. | | |

V OPERATING ADJUSTMENTS

- STEP 1 Follow STEP 1 thru 5 as listed for the transceiver RT-524/VRC.

VI STOPPING THE EQUIPMENT

- STEP 1. Turn POWER SWITCH to OFF.

OPERATING INSTRUCTIONS**IFF SYSTEM-AN/APX-72**

These instructions are not intended to replace Instruction Books, but to provide ready reference to standard operating procedure. Read your Instruction Book.

Power distribution panel is located in the Pilot House.
24 VDC DIST. PANEL.

I STARTING THE EQUIPMENT

- STEP 1 Set MASTER CONTROL to OFF.
- STEP 2 Set IDENT-MIC SWITCH to OUT.
- STEP 3 Set M-1, M-2, M-3/A, M-C and MODE 4 SWITCHES to OUT.
- STEP 4 Set AUDIO-LIGHT SWITCH to OUT.
- STEP 5 Set RAD TEST-MON SWITCH to OUT.
- STEP 6 Set MODE 1 and MODE 3/A CODE SELECT SWITCHES to OPERATIONAL CODE REQUIRED.
- STEP 7 Set MODE 4 CODE SWITCH to OPERATIONAL CODE REQUIRED.
- STEP 8 Set MODE 2A CODE SELECT SWITCH on RT-859 to OPERATIONAL CODE REQUIRED.
- STEP 9 Turn POWER SWITCH on 24VDC Dist. Panel ON.

II OPERATING PROCEDURES

- STEP 1 Set MASTER CONTROL to STBY- Allow one minute to warm up.
- STEP 2 Set M-1, M-2, M-3/A, M-C and MODE 4 ENABLE SWITCHES to ON (as required)
- STEP 3 Set IDENT-MIC SWITCH to OUT.
- STEP 4
- STEP 5 Set RAD TEST-MON SWITCH to MON.
- STEP 6 Set MASTER CONTROL to LOW or NORMAL (as required)
- STEP 7 Set RAD TEST-MON SWITCH to OUT.

III IDENTIFICATION OF POSITION

(I/P) OPERATION

- STEP 1 The TRANSPONDER SYSTEM will transmit position Identifying signals to all interrogating stations on MODES 1, 2, and 3/A when the IDENT-SWITCH is energized.
- STEP 2 Momentarily hold the IDENT-MIC SWITCH in the IDENT POSITION and then release. (This will transmit the I/P signal for a period of 15 to 30 seconds.)
- STEP 3 Repeat as required.

IV EMERGENCY OPERATION

- STEP 1 Specially coded emergency signals on MODES 1,2,and 3/A may be transmitted during an emergency condition.
- STEP 2 Pull the MASTER CONTROL knob OUTWARD and rotate to the EMER. POSITION.
- STEP 3 Let the MASTER CONTROL remain in the EMER. POSITION for the duration of the emergency.
- STEP 4 Return the MASTER CONTROL to the NORMAL or LOW POSITION when the emergency is over.

V MODE 4 MONITORING

- STEP 1 Set the AUDIO-LIGHT SWITCH to the LIGHT POSITION.
- STEP 2 MODE 4 replies will cause the REPLY LIGHT to illuminate.

VI STOPPING THE EQUIPMENT

- STEP 1 Set MASTER CONTROL to OFF.
- STEP 2 Set IDENT-MIC SWITCH to OUT.
- STEP 3 Set M-1,M-2, M-3/A, M-C and MODE 4 SWITCHES to OUT.
- STEP 4 Set AUDIO-LIGHT SWITCH to OUT.
- STEP 5 Turn POWER SWITCH on 24VDC Dist. Panel OFF.

OPERATING INSTRUCTIONS**KARR RADAR -- MODEL LN-66**

These instructions are not intended to replace Instruction Books, but, to provide ready reference to standard operating procedure.

Read your Instruction Book

Power distribution panel is located in the Pilot House.

I STARTING THE EQUIPMENT

- | | | | |
|--------|-----------------------|--------|--|
| STEP 1 | Turn POWER SWITCH ON. | STEP 2 | Turn SCANNER SWITCH ON.
Allow a 3 minute warm-up. |
|--------|-----------------------|--------|--|

II OPERATING ADJUSTMENTS

- | | | | |
|--------|--|---------|--|
| STEP 1 | Set SEA CLUTTER, RAIN/FTC and WIDE PULSE CONTROLS to OFF. | STEP 7 | Turn GAIN CONTROL CW until receiver noise is just visible. |
| STEP 2 | Turn INTENSITY and GAIN CONTROLS FULL CCW. | STEP 8 | Adjust TUNE CONTROL for main reading on TUNE METER. |
| STEP 3 | Set the PANEL LIGHT CONTROL and RANGE RINGS SWITCH to desired position. | STEP 9 | Readjust GAIN and INTENSITY CONTROLS for best definition of targets. |
| STEP 4 | Wait Three (3) minutes for TIME DELAY RELAY to be energized.
Turn TRANSMIT SWITCH ON. | STEP 10 | Adjust SEA CLUTTER CONTROL if required. |
| STEP 5 | Turn INTENSITY CONTROL CW until SWEEPLINE is just visible. | STEP 11 | Set RAIN/FTC to desired position (normally OFF) |
| STEP 6 | Adjust both SHIFT CONTROLS until the SWEEPLINE is centered. | STEP 12 | Set WIDE PULSE SWITCH to desired position (normally OFF). |

III MEASURING DISTANCE AND BEARING

- | | | | |
|--------|---|--------|---|
| STEP 1 | Turn RANGE RINGS and HEADING MARKER ON. | STEP 3 | Switch RANGE MARKER to appropriate range. |
| STEP 2 | Rotate CURSOR KNOB to bring CURSOR LINE over desired echo and read bearing of target relative to the ship's head. | STEP 4 | Rotate VARIABLE RANGE KNOB to bring RANGE RING over desired target and READ RANGE directly on the indicator,. |

IV STOPPING THE EQUIPMENT

- | | | | |
|--------|---------------------------|--------|------------------------------------|
| STEP 1 | Turn TRANSMIT SWITCH OFF. | STEP 2 | Turn POWER and SCANNER SWITCH OFF. |
|--------|---------------------------|--------|------------------------------------|

NOTE: When not in Immediate use, keep the TRANSMIT SWITCH OFF to increase the life of the magnetron.

OPERATING INSTRUCTIONS

ALARM SWITCHBOARD TYPE IC/S

These Instructions are not intended to replace Instruction Books, but to provide ready reference to standard operating procedures.

Read your Instruction Book.

I STARTING THE EQUIPMENT

- | | | | |
|--------|--|--------|----------------------------------|
| STEP 1 | Close the circuit breaker on the L-103 panel located in the Pilot House. | STEP 2 | The PILOT LIGHT will illuminate. |
|--------|--|--------|----------------------------------|

II NORMAL OPERATION

- | | | | |
|--------|---|--------|---|
| STEP 1 | If the ALARM BELL rings, a red ALARM TARGET will indicate the alarmed circuit. | STEP 5 | Throw the troubled circuit TEST SWITCH to the OFF position to silence the alarm. |
| STEP 2 | Throw the alarmed circuit TEST SWITCH to the OFF position to silence the alarm. | STEP 6 | Once the circuit trouble has been cleared, return the circuit TEST SWITCH to the NORMAL position. |
| STEP 3 | Once the alarm condition has been cleared, return the circuit TEST SWITCH to the NORMAL position. | STEP 7 | An illuminated GROUND LIGHT indicates a ground on that line. |
| STEP 4 | If the TROUBLE BUZZER operates, a yellow SUPERVISORY TARGET will indicate the troubled circuit. | | |

III SILENT ALARM TEST

- | | | | |
|--------|--|--------|---|
| STEP 1 | To test a circuit ALARM function, throw the SILENT TEST SWITCH to the SILENT ALARM TEST position. The TEST LAMP will flash. | STEP 5 | SLOWLY throw the circuit TEST SWITCH to the off position. The circuit yellow SUPERVISORY TARGET will be displayed and the TROUBLED TEST LIGHT will flash momentarily. |
| STEP 2 | Throw the circuit TEST SWITCH to the TEST position. The circuit red ALARM TARGET will be displayed and the ALARM TEST light will illuminate. | STEP 6 | Return TEST SWITCH to NORMAL position and repeat STEP 5 for all circuits to be tested. |
| STEP 3 | Return TEST SWITCH to the NORMAL position and repeat STEP 2 for all circuits to be tested. | STEP 7 | When testing is completed, return all switches to the NORMAL position. |
| STEP 4 | To test a circuit TROUBLE function, throw the SILENT TEST SWITCH to the SILENT ALARM TEST position. The TEST LAMP will flash. | | |

IV STOPPING THE EQUIPMENT

- STEP 1 Open the circuit breaker on the L-103 panel.

OPERATING INSTRUCTIONS

FOR

PROPELLER SHAFT LOCKING

Shaft locking plates are stowed on Fwd. side of Bhd. 62-1/2 in Aft engine room.

1. Fasten locking plate to aft surface of engine shaft coupling flange using three 3/4" x 1-1/2" socket head bolts into the tapped holes in coupling flange.

NOTE: For emergency towing the shaft may be left unlocked only if the standby lube oil pump is activated to lubricate the reverse gear.

OPERATING INSTRUCTIONS
FOR
SEWAGE TREATMENT PLANT

STARTING SYSTEM

1. Close ball valves at overboard discharge pumps.
2. Close port valve leading to overboard discharge line.
3. Open ball valve from plumbing drains to inlet to tank.
4. Set timing control and pump selector switch.
5. Close disconnect switch on side of electrical panel.
6. Press the system start pushbutton on front of panel.

System is now ready for normal flushing operations of urinal and toilets.

NORMAL OPERATION

System will operate automatically until high water alarm system activates, at 90% of tank capacity or 450 gallons, audible and visual alarms installed in pilot house. The tank will then have to be pumped out.

PUMPING OUT TANK

CAUTION- Do not pump out tank into restricted waters.

1. Air compressor valves to tank bottom to be opened, air compressor to be activated prior to discharging overboard.
2. Open appropriate valves to the overboard discharge pumps leading to the on deck sewage discharge connection on port side. Connect sewage hose to discharge connection.
3. Open disconnect switch of overboard sewage discharge pump; press the pump start pushbutton on front of panel.
4. Close disconnect switch when tank is empty.
5. Close switch to air compressor.

TO SECURE SYSTEM

1. Open disconnect switch on side of electrical panel.
2. Close all outlet and inlet valves to tank.

PREPARATION REQUIRED TO ENTER AN "LSD"

1. Remove and stow the following:
 - A. Portable davits
 - B. Railing on house top and fcsle deck
 - C. Machine gun tripod on upper deck
 - D. Ensign staff on house top stbd aft.
 - E. Jack staff on fcsle deck
 - F. Life rafts
 - G. Ready service locker on house top
 - H. Pelorus and stand W/AN/URC-80 radio set remote conn. attached
 - I. Signal searchlight
 - J. Voice tube
 - K. Aircraft float lights
 - L. Wind screen sections
 - M. Magnetic compass and stanchion
 - N. Alum exhaust stacks and exhaust pipe extensions
 - O. Flag bag locker
2. **FOLD DOWN THE FOLLOWING TO THEIR POSITIONS:**
 - A. Radar antenna
 - B. Main mast (remove and stow round antenna ground plane)
 - C. Whip antenna

OPERATING INSTRUCTIONS

FOR

"A" FRAME WINCH

STARTING PROCEDURE

1. Check the level of the hydraulic oil in the reservoir of the central hydraulic power unit located on the starboard side in the forward engine room. Add oil if necessary.
2. Energize power unit by pushing the "start" button on the panel in the engine room access.

OPERATING PROCEDURE

1. Operate the control valve, located inside the starboard side bulwark, in the desired direction.
2. NOTE: When moving "A" Frame in or out, first disconnect locking lugs on "A" Frame and locking bar.

SECURING PROCEDURE

1. Stop system by centering control valve.
2. Stop hydraulic pump at controller.

DRAINAGE SYSTEM

PREVENT BACKFLOODING

1. DO NOT OPEN UNTIL GAGE INDICATES A VACUUM IN EDUCTOR SUCTION LINE.

DRAINAGE SYSTEM

PREVENT BACKFLOODING

1. DO NOT OPEN ACTUATING WATER VALVE UNTIL OVERBOARD VALVE IS OPEN.
2. IF VACUUM DOES NOT DEVELOP IN SUCTION PIPING, CLOSE ACTUATING WATER VALVE IMMEDIATELY.
3. WHEN SECURING EDUCTORS, CLOSE SUCTION VALVE AND ACTUATING WATER VALVE BEFORE CLOSING OVERBOARD DISCHARGE VALVE.

SECTION IV. OPERATION UNDER UNUSUAL CONDITIONS

2-170. GENERAL.

a. The operating instructions in this section pertain to the operation of the landing craft under unusual conditions.

b. The unusual conditions are as follows.

(1) Emergency Procedures:

- Propulsion Engine - Stopping/Starting
- Generator Engine - Stopping/Starting
- Anchor Winch Engine - Stopping/Starting
- Steering
- Anchor Handling

(2) Damage Control Procedures:

- Fire Fighting
- Emergency Lighting
- Breakglass Shutdown Stations
- Salvage Pump
- Watertight Integrity

(3) Life Saving Equipment:

- Life Jackets
- Life Rings
- Life Boats
- Stokes Litter

c. The following is an index to the procedures:

<u>DESCRIPTION</u>	<u>PARAGRAPH</u>
Emergency Procedures	2-171
Damage Control Procedures	2-191
Life Saving Equipment	2-206

2-171. EMERGENCY PROCEDURES.

- a. The emergency procedures contained in this section should be performed in conjunction with damage control procedures (paragraph 2-191).
- b. The following is an index to the procedures:

<u>DESCRIPTION</u>	<u>PARAGRAPH</u>
Anchor Winch System	2-181
Bow Ramp System	2-187
Emergency Steering	2-186
Generating System	2-177
Propulsion System	2-172
Stern Gate	2-190

2-172. PROPULSION SYSTEM.

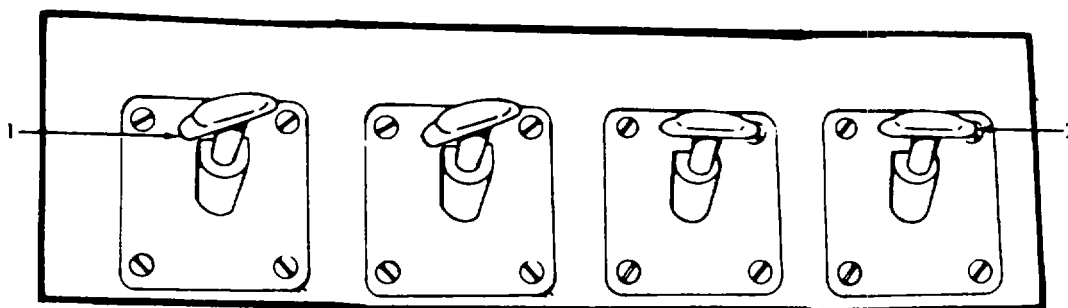
- a. The procedures contained in these paragraphs are for emergency situations only. These procedures apply to both the starboard and port propulsion engines.
- b. The following is an index to the procedures:

<u>DESCRIPTION</u>	<u>PARAGRAPHS</u>
Propulsion Engine - Emergency Stop	2-173
Propulsion Engine - Reset After	
Emergency Stop	2-174
Propulsion Engine - Emergency Start	2-175
Marine Gear - Come-Home	2-176

2-173. PROPULSION ENGINE - EMERGENCY STOP.

To stop the propulsion engine in an emergency:

- a. Pull up lever (1) located at Frame 54 1/2 starboard side of vehicle deck to stop the aft engine.
- b. Pull up lever (2) to stop the forward engine.

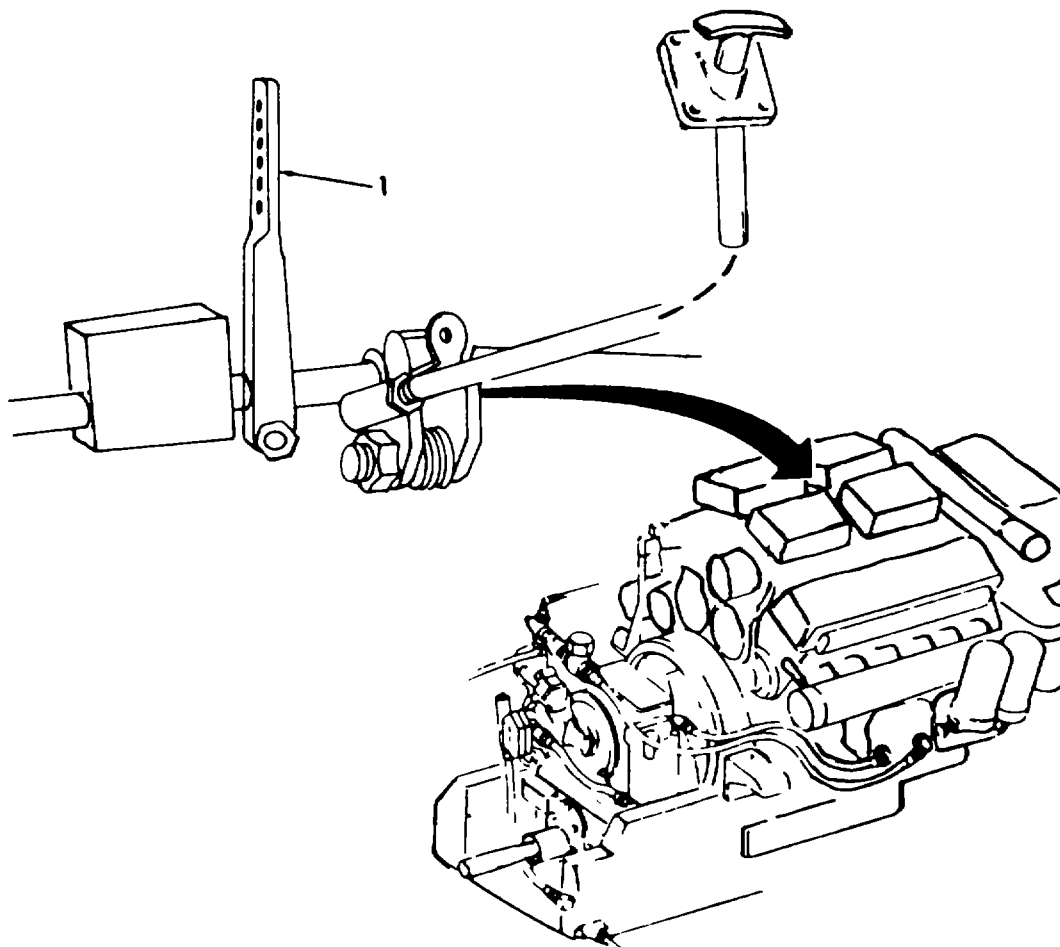


2-688

2-174. PROPULSION ENGINE - RESTART AFTER EMERGENCY STOP.

To restart a propulsion engine after an emergency stop, proceed as follows:

- a. Operate lever (1) on top of the engine to reset after an emergency stop.



- b. Start engine according to local or remote procedures.

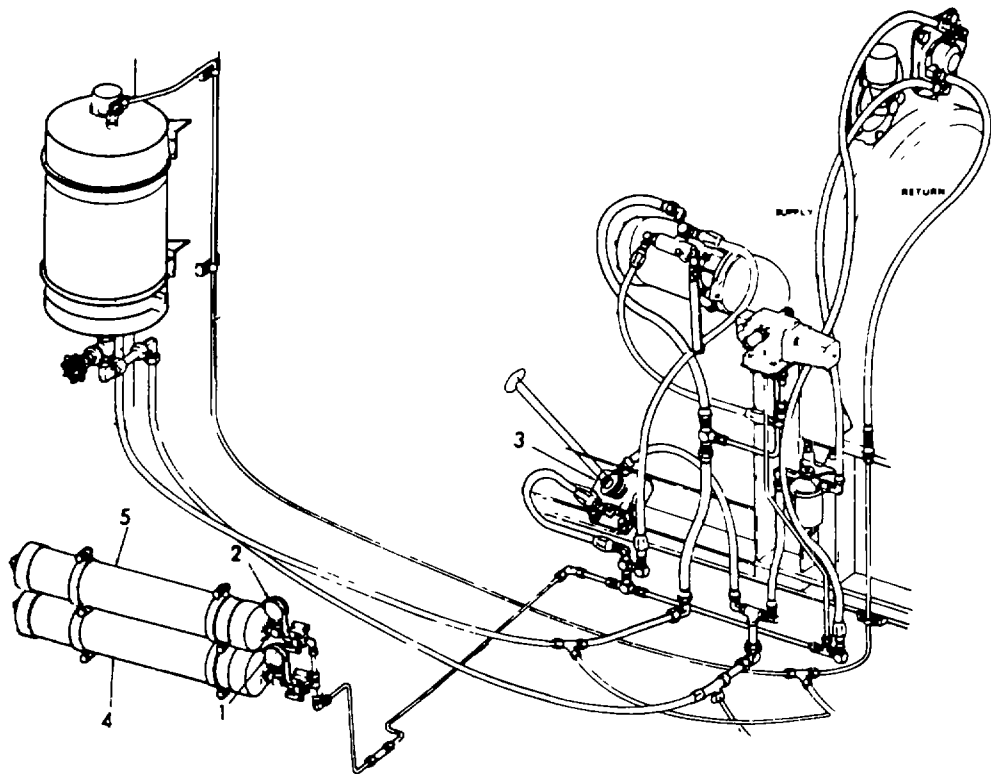
2-175. PROPULSION ENGINE - EMERGENCY STARTING.

To start a propulsion engine in an emergency, proceed as follows:

- a. Read pressure gages (1 and 2), they should read:

AMBIENT TEMPERATURE	GAGE READING
Above 40°F (4.4°C)	1500 psi (1054.5 kg sq cm)
40°F to 0°F (4.4°C to -17.8°C)	2500 psi (1757.5 kg sq cm)
Below 0°F (-17.8°C)	3300 psi (2319.9 kg sq cm)

If not perform step b.

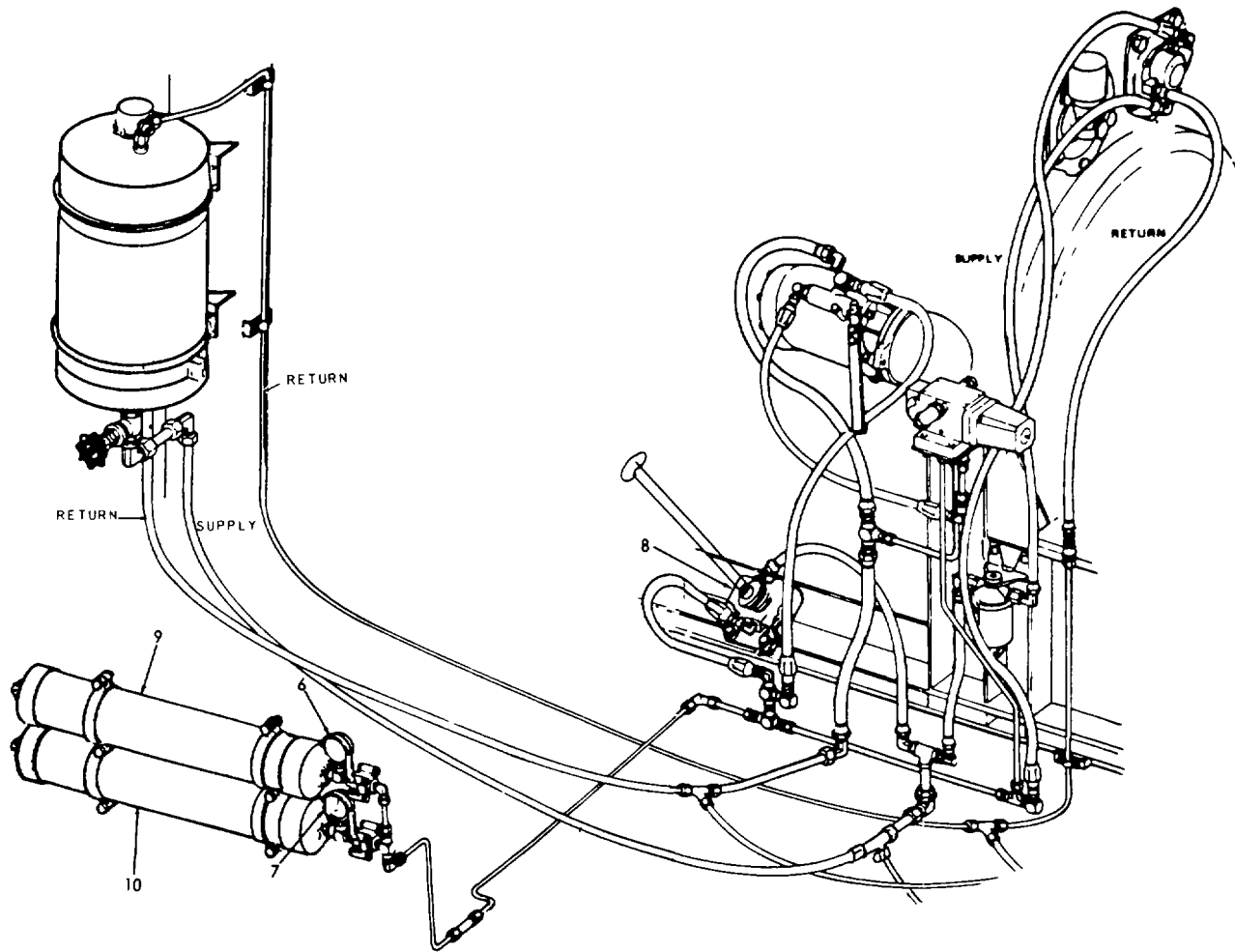


- b. Operate hand pump (3) on hydrostarter in forward engine room to charge accumulators (4 and 5).
- c. Pressure gages (6 and 7) should read:

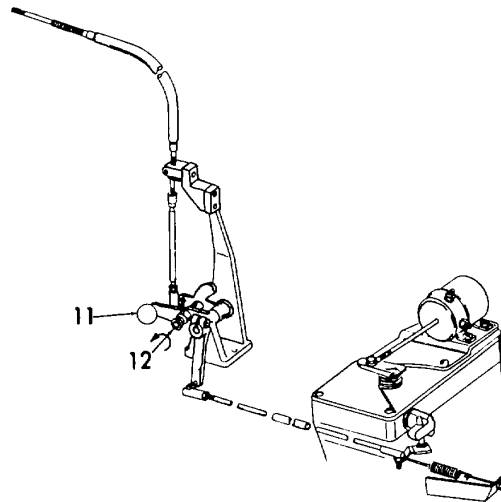
AMBIENT TEMPERATURE	GAGE READING
Above 40°F (4.4°C)	1500 psi (1054.5 kg sq cm)
40°F to 0°F (4.4°C to -17.8°C)	2500 psi (1757.5 kg sq cm)
Below 0°F (-17.8°C)	3300 psi (2319.9 kg sq cm)

If not perform step d.

2-175. PROPULSION ENGINE - EMERGENCY STARTING.

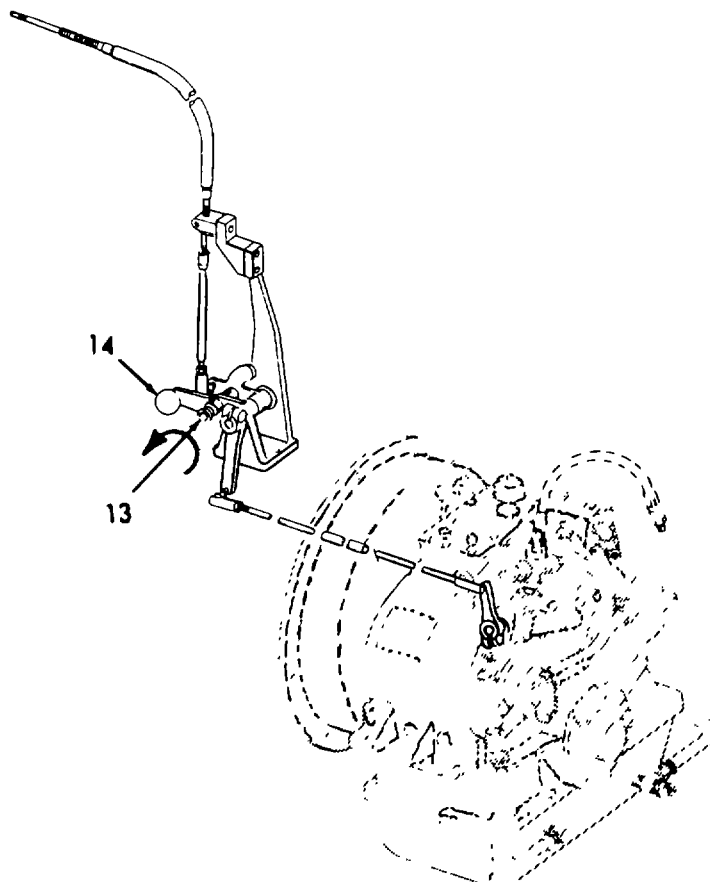


- d. Operate hand pump (8) on hydrostarter in aft engine room to charge accumulators (9 and 10).
- e. Pull out knob (11) on local throttle control (12).
- f. Rotate knob (11) one-quarter turn counter-clockwise.



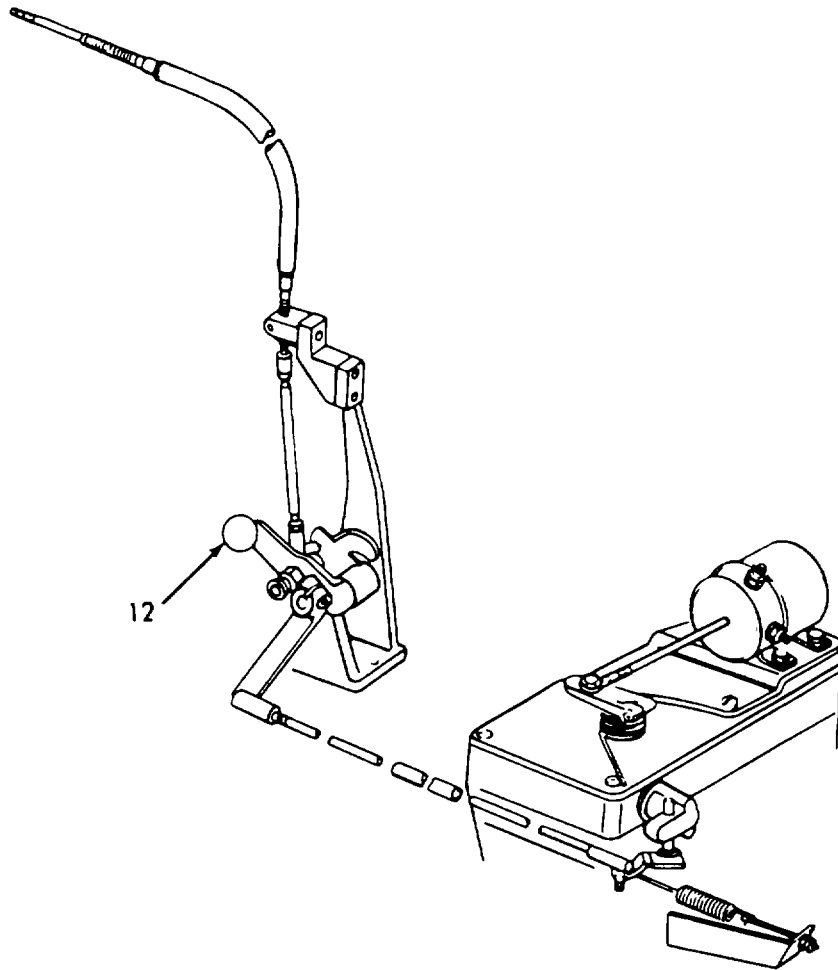
2-175. PROPULSION ENGINE - EMERGENCY STARTING (Cont).

- g. Pull out knob (13) on local clutch control (14).
- h. Rotate knob (13) one-quarter turn counter-clockwise.
- i. Place clutch control (14) in neutral.

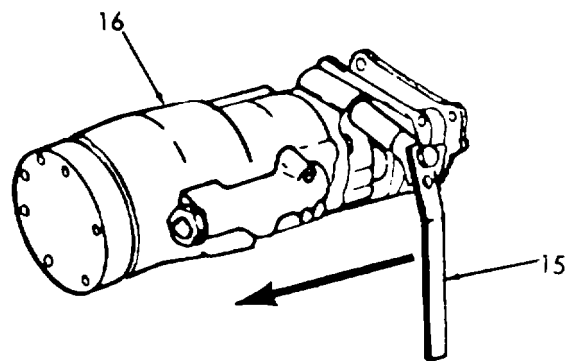


- j. Set throttle control (12) to one-half open.

2-175. PROPULSION ENGINE - EMERGENCY STARTING (Cont).

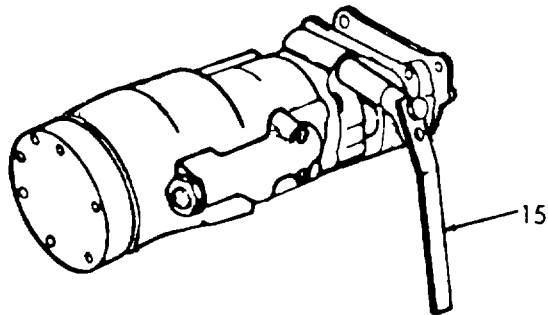


- k. Move control lever (15) on hydrostarter (16) to mechanically push the starter pinion into engagement with the engine flywheel.



2-175. PROPULSION ENGINE - EMERGENCY STARTING (Cont).

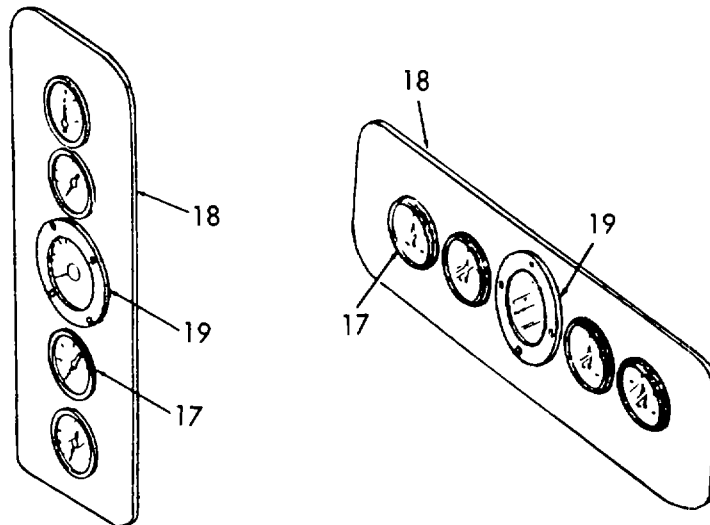
- I. Release control lever (15) as soon as engine starts.



NOTE

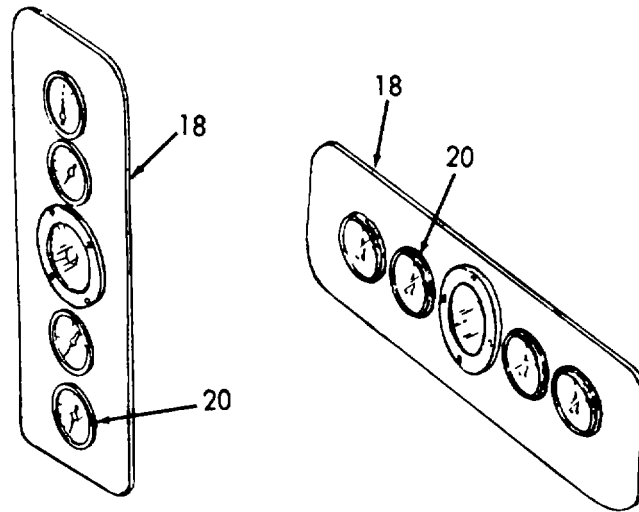
Alarm may sound in the pilot house indicating low oil pressure.

- m. Observe oil pressure gage (17) on instrument panel (18). If no pressure is indicated within 10 to 15 seconds, STOP. Check lubrication system. Minimum oil pressure is 25 psi (1757.7 gm sq cm at 1200 RPM (19).

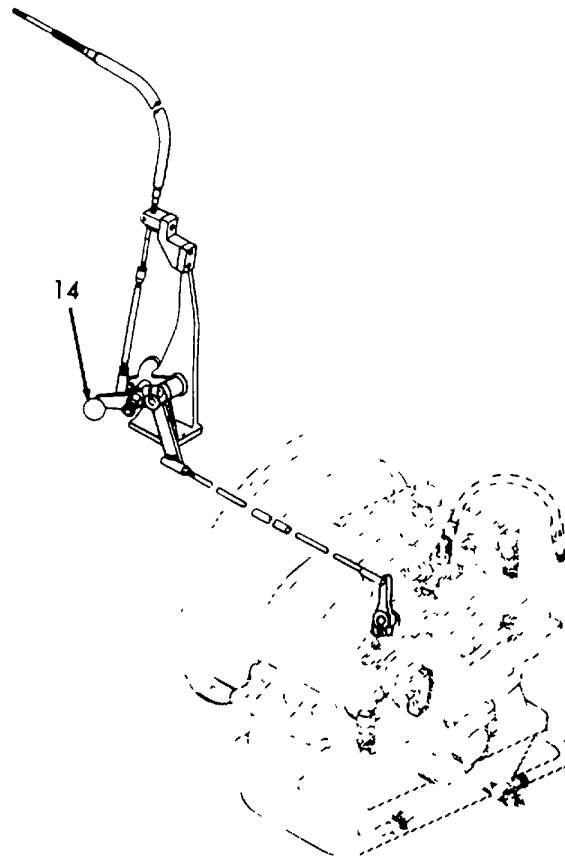


- n. Observe drive oil pressure gage (20) on instrument panel (18). Oil pressure is 40-42 psi (2812.2 to 2952.9 gm sq cm) at 1200 RPM.

2-175. PROPULSION ENGINE - EMERGENCY STARTING (Cont).

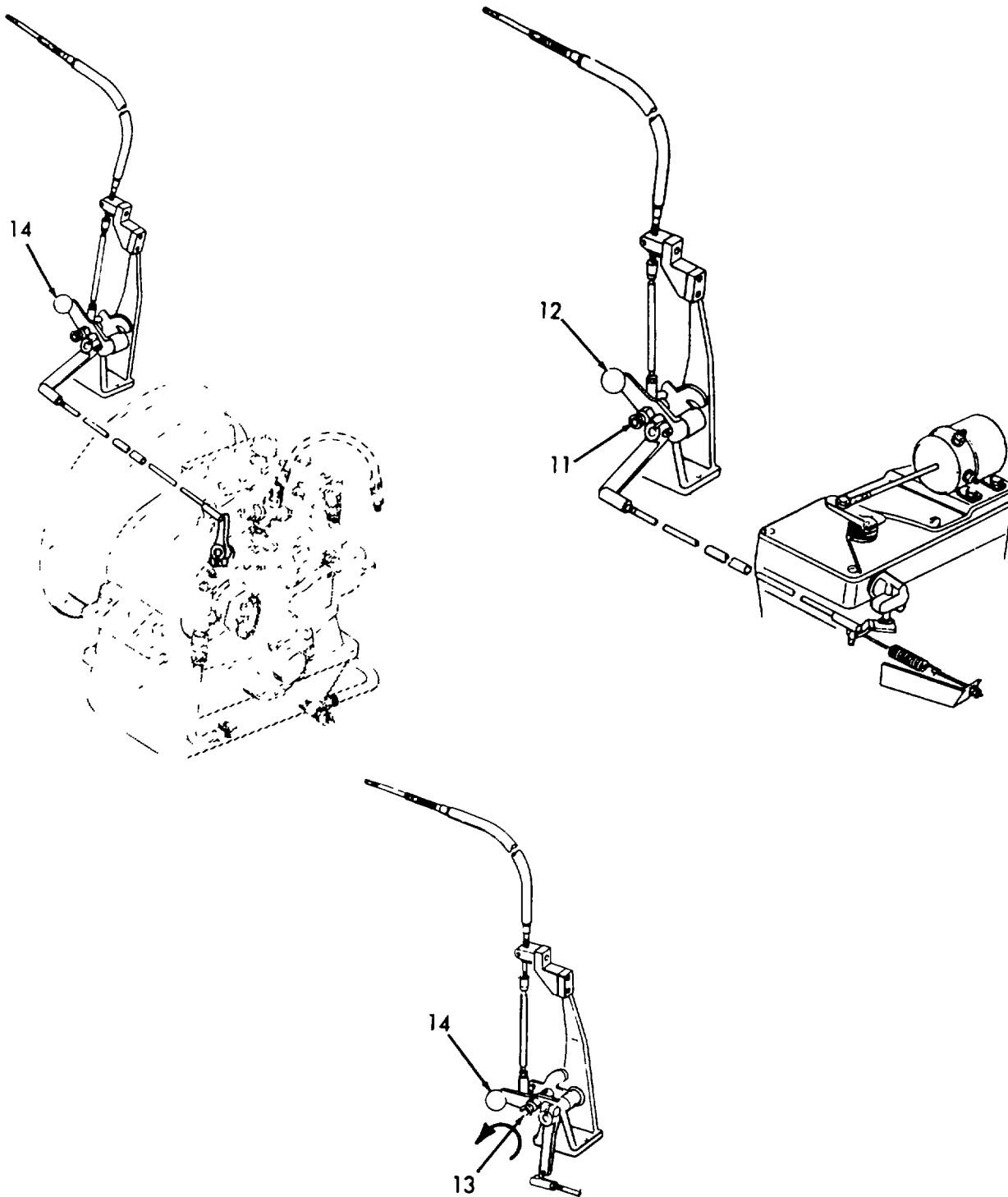


- o. Warmup at part-throttle, no load, for about 5 minutes before loading engine. Normal coolant temperature is 160° to 185°F (71.1° to 85.0°C).
- p. Engage clutch (14) at less than 850 RPM.



2-175. PROPULSION ENGINE - EMERGENCY STARTING (Cont).

- q. When prolonged idling is needed, maintain at least 800 RPM minimum.
- r. To transfer control to the pilot house, push in knob (11) on the throttle control (12) and push in knob (13) on the clutch control (14).



2-176. MARINE GEAR - COME HOME.

a. A come-home feature has been designed into each clutch in the event of the failure of the hydraulic system. The come-home feature is a mechanical lock-up of either clutch to enable the craft to return to port.

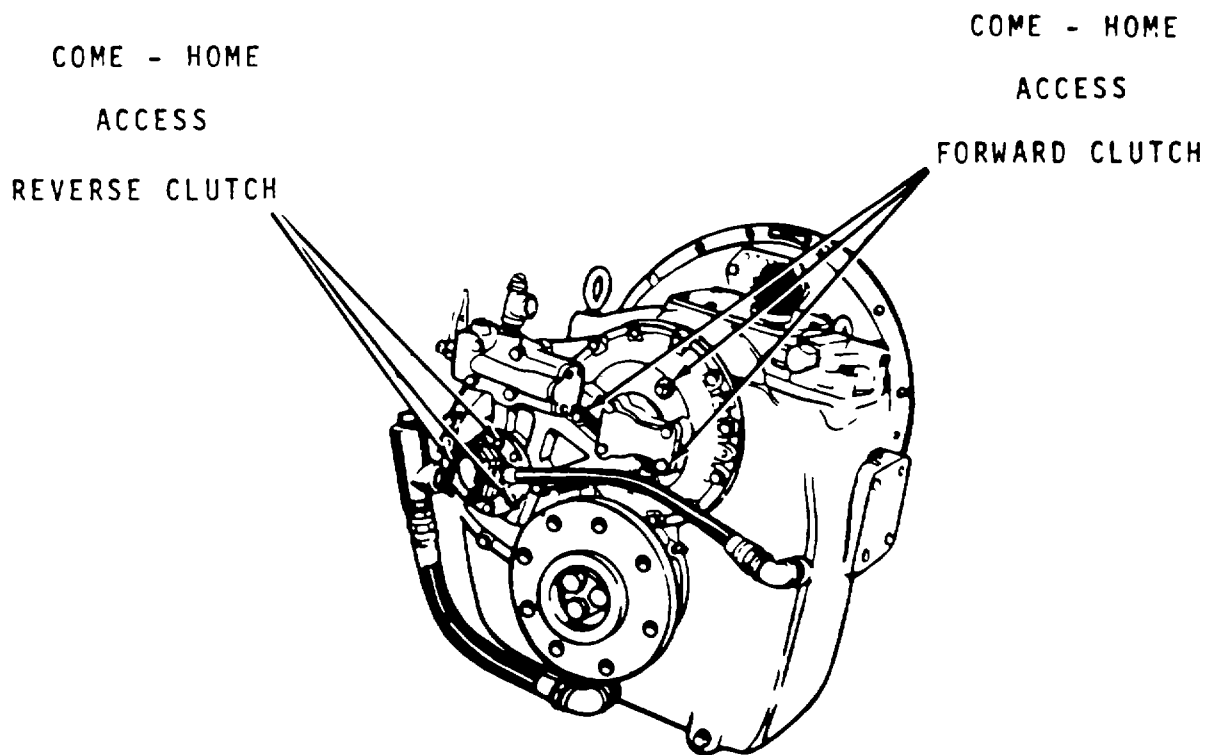
WARNING

Turn off the engine. Serious injury to personnel may result if the engine is left running.

b. Remove the three come-home access plugs (forward or reverse) from the manifold over the clutch location. Use a 3/16 inch hex allen wrench and alternately tighten the come-home setscrews in a clockwise direction until mechanical lock-up of the clutch is attained.

CAUTION

Do not lock-up both clutches at the same time.



2-177. GENERATING SYSTEM.

a. The procedures contained in these paragraphs are for emergency situations only. These procedures apply to both the starboard and port generator engines.

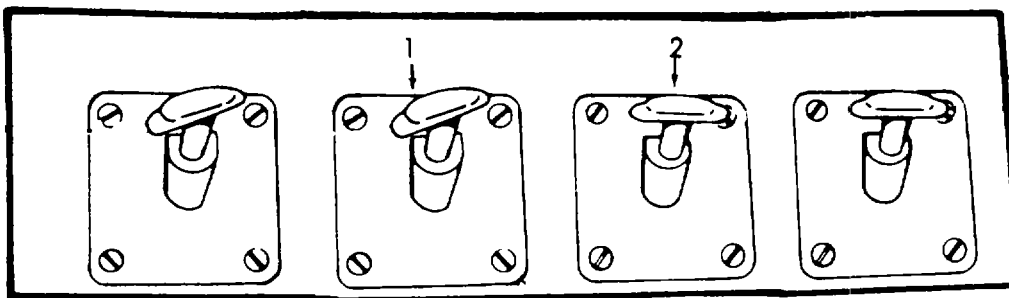
b. The following is an index to the procedures'

<u>DESCRIPTION</u>	<u>PARAGRAPHS</u>
Generator Engine - Emergency Stop	2-178
Generator Engine - Reset After Emergency Stop	2-179
Generator Engine - Emergency Start	2-180

2-178. GENERATOR ENGINE - EMERGENCY STOP.

To stop a generator engine in an emergency:

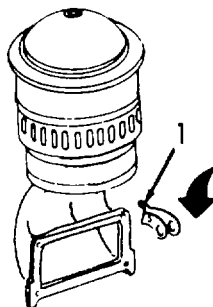
1. Pull up lever (1) located on the starboard side of the vehicle deck (Frame 54), to stop the starboard generator engine.
2. Pull up lever (2) to stop the port generator engine.



2-179. GENERATOR ENGINE - RESET AFTER EMERGENCY STOP.

To reset a generator engine after an emergency stop, proceed as follows:

- a. Push down lever (1) to reset the emergency stop.



- b. Start engine according to local procedure.

2-180. GENERATOR ENGINE - EMERGENCY START.

To start a generator engine in an emergency, proceed as follows:

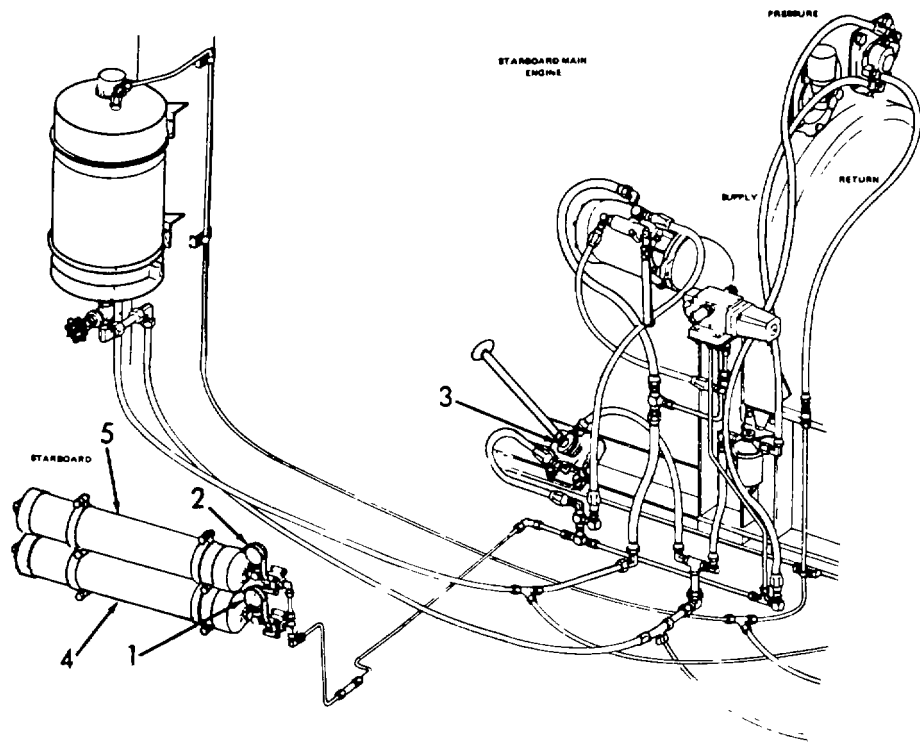


Before starting engines, generator circuit breakers on control panel must be open.

- a. Read pressure gages (1 and 2), they should read:

AMBIENT TEMPERATURE	GAGE READING
Above 40°F (4.4°C)	1500 psi (1054.5 kg sq cm)
40°F to 0°F (4.4°C to -17.8°C)	2500 psi (1757.5 kg sq cm)
Below 0°F (-17.8°C)	3300 psi (2319.9 kg sq cm)

If not perform step b.



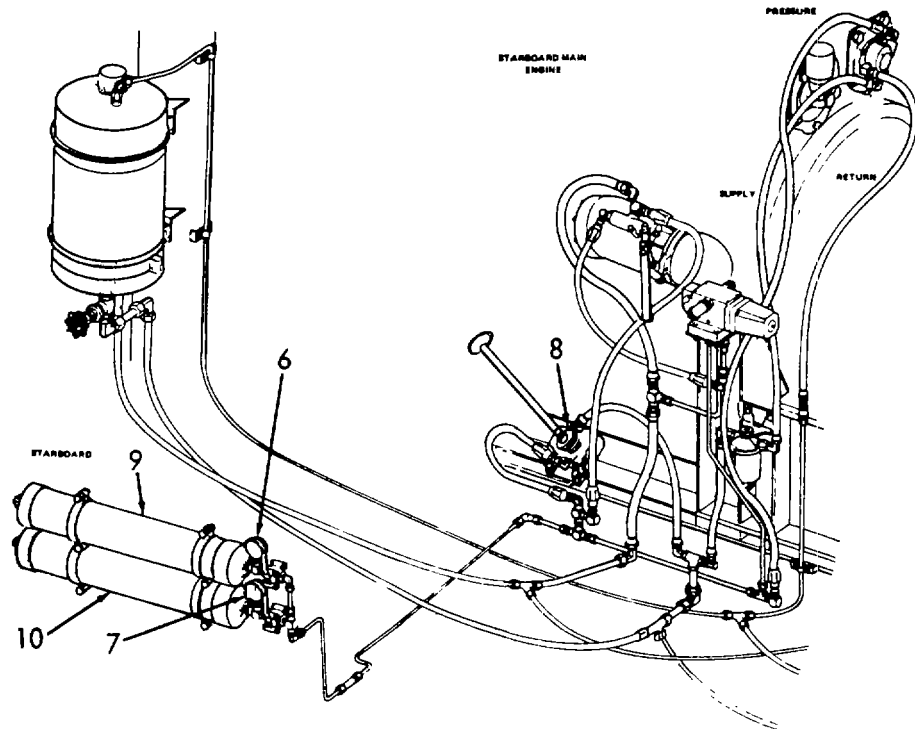
- b. Operate hand pump (3) on hydrostarter in forward engine room to charge accumulators (4 and 5).

2-180. GENERATOR ENGINE - EMERGENCY START. (Cont)

c. Read pressure gages (6 and 7), they should read:

AMBIENT TEMPERATURE	GAGE READING
Above 40°F (4.4°C)	1500 psi (1054.5 kg sq cm)
40°F to 0°F (4.4°C to -17.8°C)	2500 psi (1757.5 kg sq cm)
Below 0°F (-17.8°C)	3300 psi (2319.9 kg sq cm)

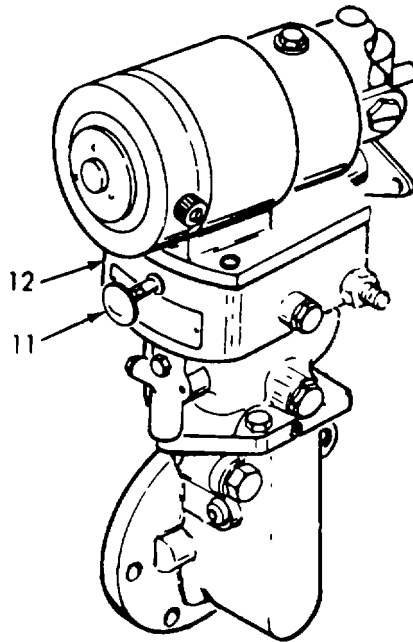
If not perform step d.



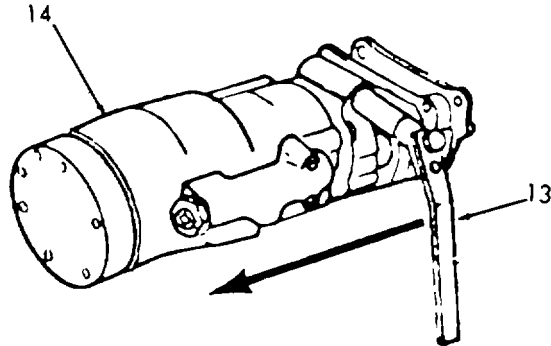
d. Operate hand pump (8) on hydrostarter in aft engine room to charge accumulators (9 and 10).

e. Push in fuel rod knob (11) on hydraulic governor (12).

2-180. GENERATOR ENGINE - EMERGENCY START (Cont).



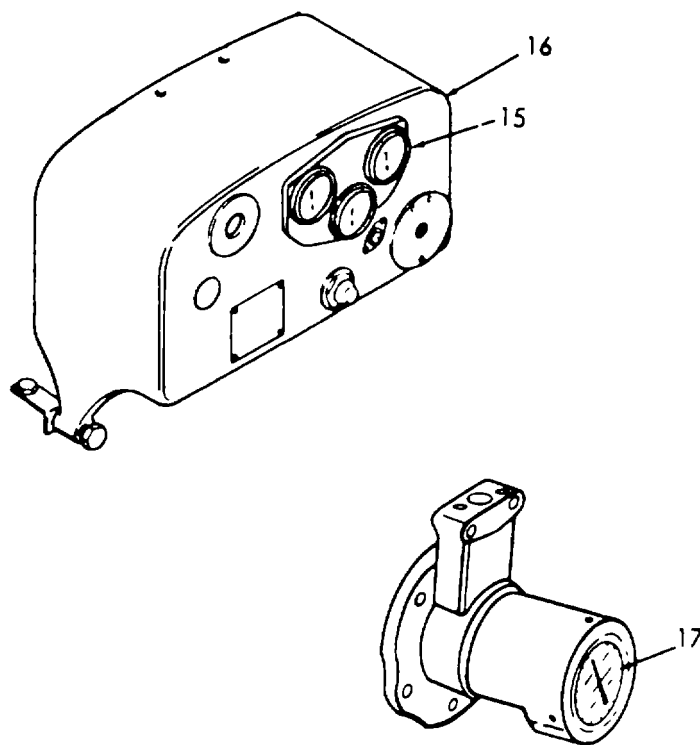
f. Move control lever (13) on hydrostarter (14) to mechanically by push the starter pinion into engagements with the engine fly- wheel.



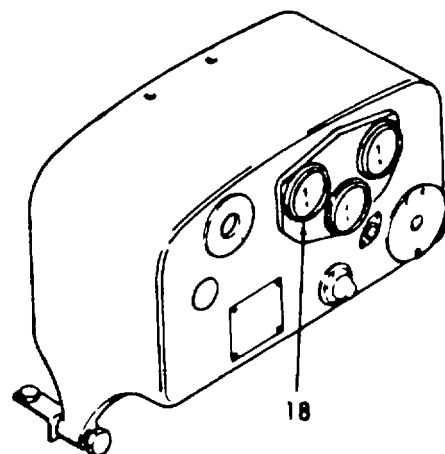
g. Release control lever (13) as soon as engine starts.

2-180. GENERATOR ENGINE - EMERGENCY START. (Cont)

h. Observe oil pressure gage (15) on instrument panel (16). If no pressure is indicated within 10 to 15 seconds, STOP. Check lubrication system. Minimum oil pressure is 25 psi (1757.7 gm sq cm) at 1200 RPM (17).



i. Warmup at part throttle, no load, for about 5 minutes, before loading engine. Normal coolant temperature (18) is 160°F to 185°F (71.1°C to 85.0°C).



j. When prolonged idling is needed, maintain at least 800 RPM minimum.

2-181. ANCHOR WINCH SYSTEM.

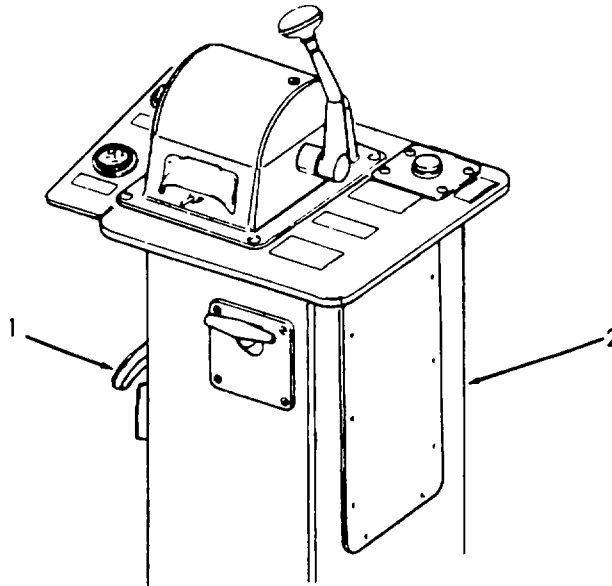
- a. The procedures contained in these paragraphs are for emergency situations only.
- b. The following is an index to the procedures

<u>DESCRIPTION</u>	<u>PARAGRAPHS</u>
Anchor Winch Engine - Emergency Stop	2-182
Anchor Winch Engine - Reset After Emergency Stop	2-183
Anchor Winch Engine - Emergency Start	2-184
Cutting Anchor Cable	2-185

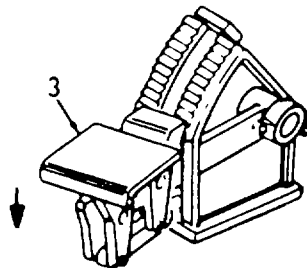
2-182. ANCHOR WINCH - EMERGENCY STOP.

To stop the anchor winch In an emergency, proceed as follows:

- a. Pull tee handle (1) of emergency stop control located on side of the anchor winch control stand (2).

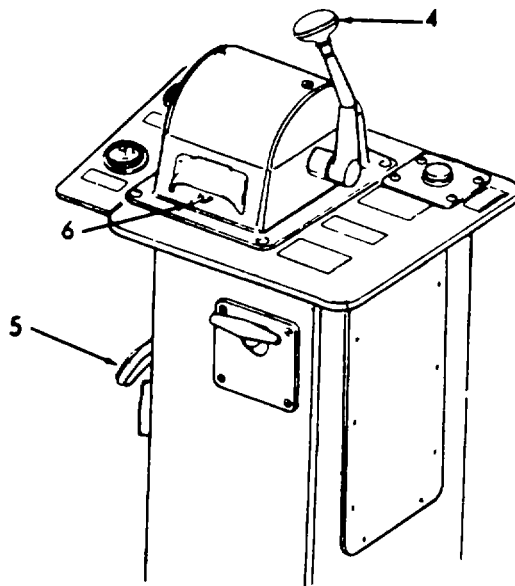


- b. Depress brake (3).



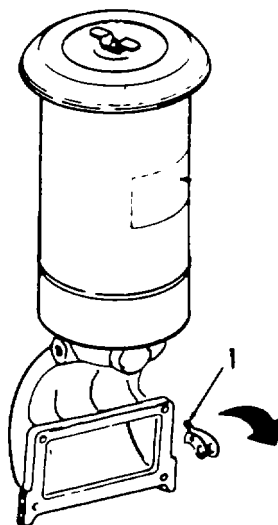
2-182. ANCHOR WINCH - EMERGENCY STOP (Cont).

- c. Set clutch/throttle control (4) on anchor winch control stand (5) to neutral.
- d. Place main line switch (6) on the anchor winch control stand (5) in the OFF position.

**2-183. ANCHOR WINCH - RESET AFTER EMERGENCY STOP.**

To reset the anchor winch engine after an emergency stop, proceed as follows:

- a. Push down lever (1) to reset the emergency stop.



- b. Start engine according to local procedure.

2-184. ANCHOR WINCH - EMERGENCY STARTING.

To start the anchor winch engine in an emergency, proceed as follows:

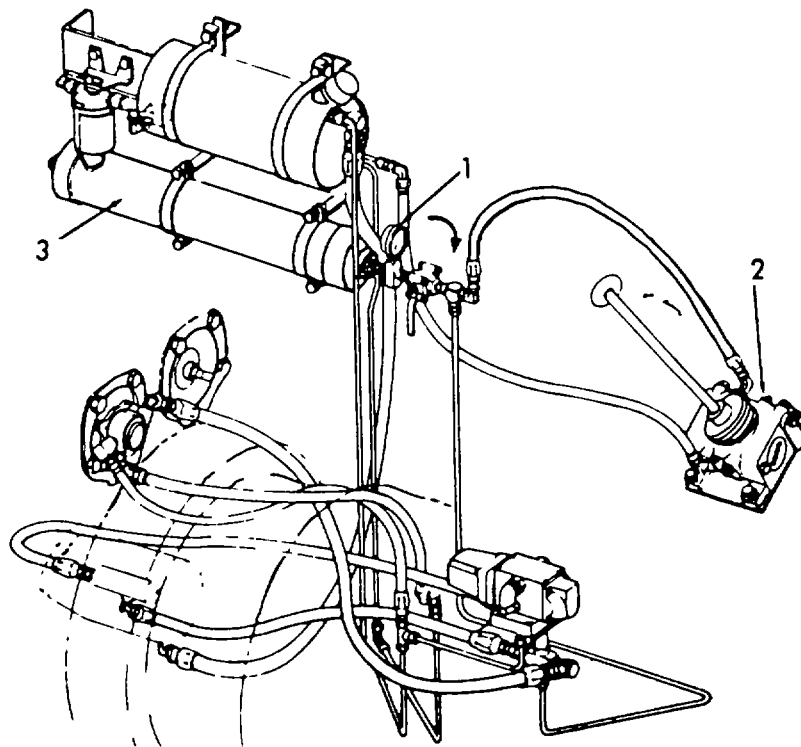
- a. Read pressure gage (1), it should read:

AMBIENT TEMPERATURE

Above 40°F (4.4°C)
 40°F to 0°F (4.4°C to -17.8°C)
 Below 0°F (-17.8°C)
 If not perform step b.

GAGE READING

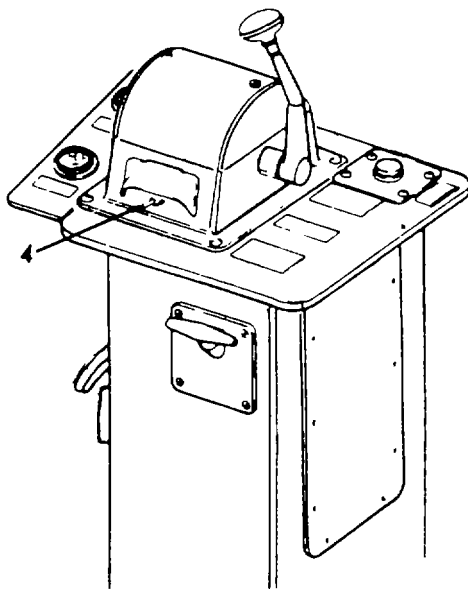
1500 psi (1054.5 kg sq cm)
 2500 psi (1757.5 kg sq cm)
 3300 psi (2319.9 kg sq cm)



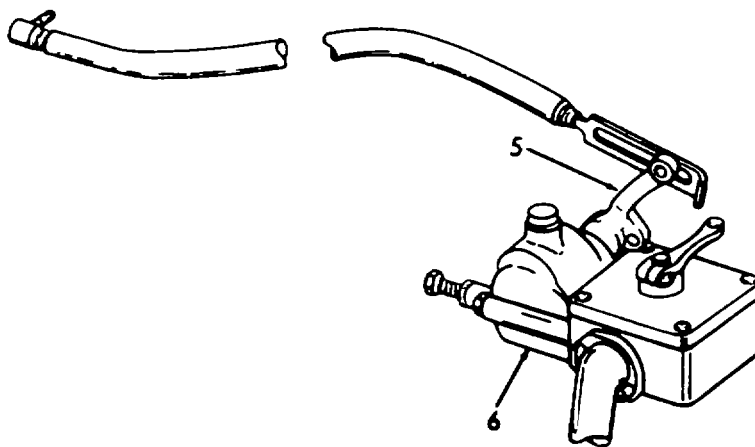
- b. Operate hand pump (2) on hydrostarter in anchor winch compartment to charge accumulator (3).

2-184. ANCHOR WINCH - EMERGENCY STARTING (Cont).

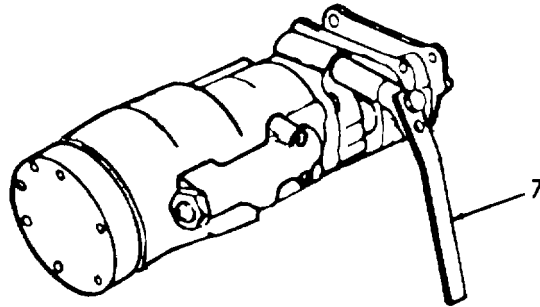
- c. Place main line switch (4) in OFF position.



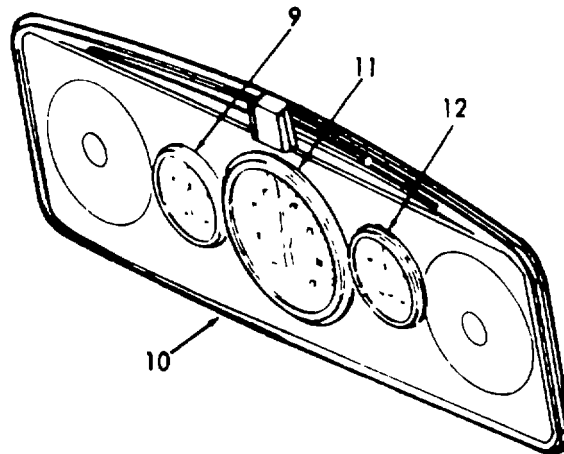
- d. Place lever (5) on local throttle control (6) in neutral.



- e. Move control lever (7) on hydrostarter (8) to mechanically push the starter pinion into engagement with the engine fly-wheel.

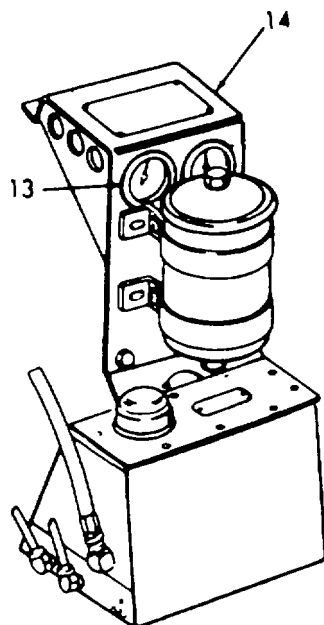
2-184. ANCHOR WINCH - EMERGENCY STARTING (Cont).

- f. Release control lever (7) as soon as engine starts.
- g. Observe oil pressure gage (9) on instrument panel (10). If no pressure is indicated within 10 to 15 seconds, STOP. Check lubrication system. Normal oil pressure is 40 to 55 psi. (2824.3 to 3883.4 gm sq cm) at 1200 RPM (11). Minimum oil pressure is 25 psi (1757.7 gm sq cm).
- h. Warmup at part throttle, no load, for about 5 minutes before loading engine. Normal coolant temperature (12) is 175°F to 185°F (79.4°C to 85.0°C). Maximum allowable temperature is 200°F (93.3°C).

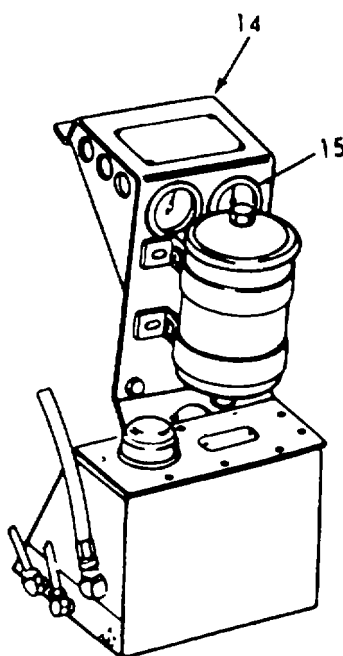


2-184. ANCHOR WINCH - EMERGENCY STARTING (Cont).

i. Observe oil pressure gage (13) on torque converter (14). Normal oil pressure is 40 to 65 psi (2824.3 to 4589.5 gm sq cm).

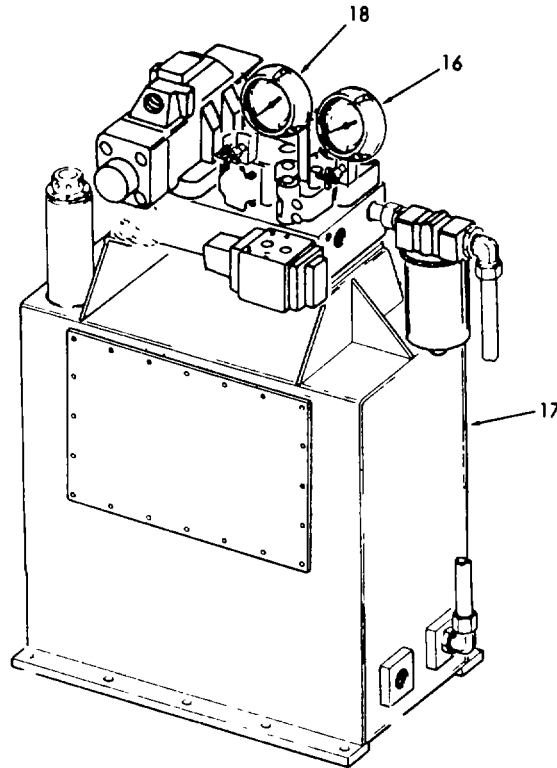


J. Observe oil temperature gage (15) on torque converter (14). Normal oil temperature is 160°F to 220°F (71.1°C to 104.4°C). Maximum allowable temperature is 250°F (121.1°C).



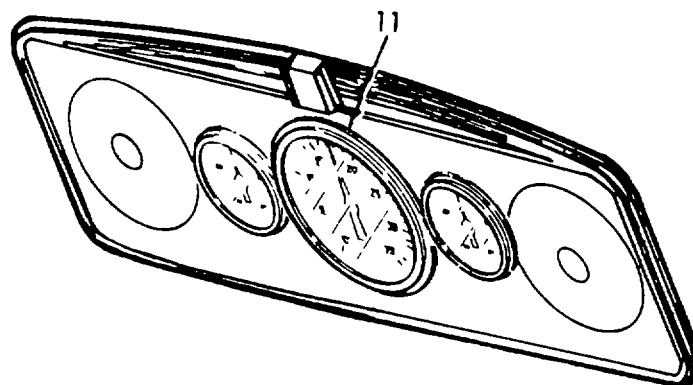
2-184. ANCHOR WINCH - EMERGENCY STARTING (Cont).

- k. Observe the control pressure gage (16) on the hydraulic tank assembly (17). Normal control pressure is 365 to 370 psi (25771.6 to 26124.6 gm sq cm). Minimum allowable pressure is 350 psi (24712..5 gm sq cm).



- l. Observe operating pressure gage (18) on hydraulic tank assembly (17). Normal operating pressure is 600 to 800 psi (42364.2 to 56485.6 gm sq cm). Minimum allowable pressure is 600 psi (42364.2 gm sq cm).

- m. When prolonged idling is needed, maintain at least 800 RPM (11) minimum.

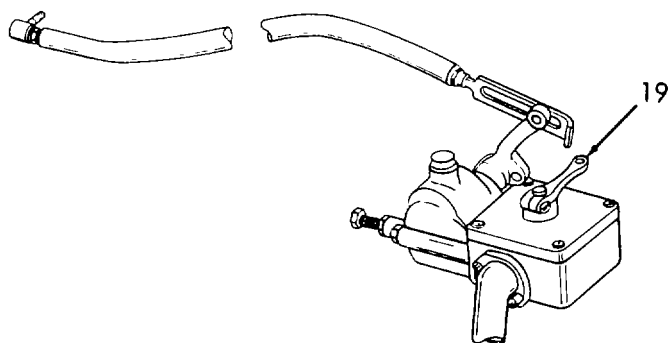


- n. Engine is ready to be run by remote operation.

2-184. ANCHOR WINCH - EMERGENCY STARTING (Cont).

- o. TO STOP

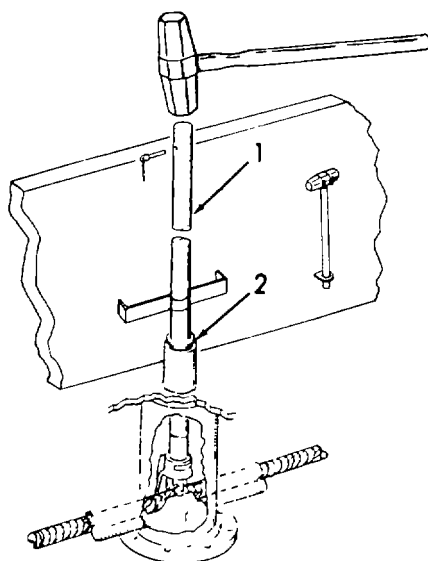
Rotate lever (19).



2-185. CUTTING ANCHOR CABLE.

To cut the anchor cable in an emergency, proceed as follows:

- a. Remove sledge hammer from bracket.
- b. Check that cutter extension (1) is installed in deck fitting (2).
- c. Hit cutter extension (1) with sledge hammer until cable is cut.
- d. Replace sledge hammer in bracket.



2-186. EMERGENCY STEERING.

To rig the landing craft for emergency steering, proceed as follows:

NOTE

The following procedure requires two men.

d. Ordnance Stores (2-40-0-a).

(1) Obtain the following components:

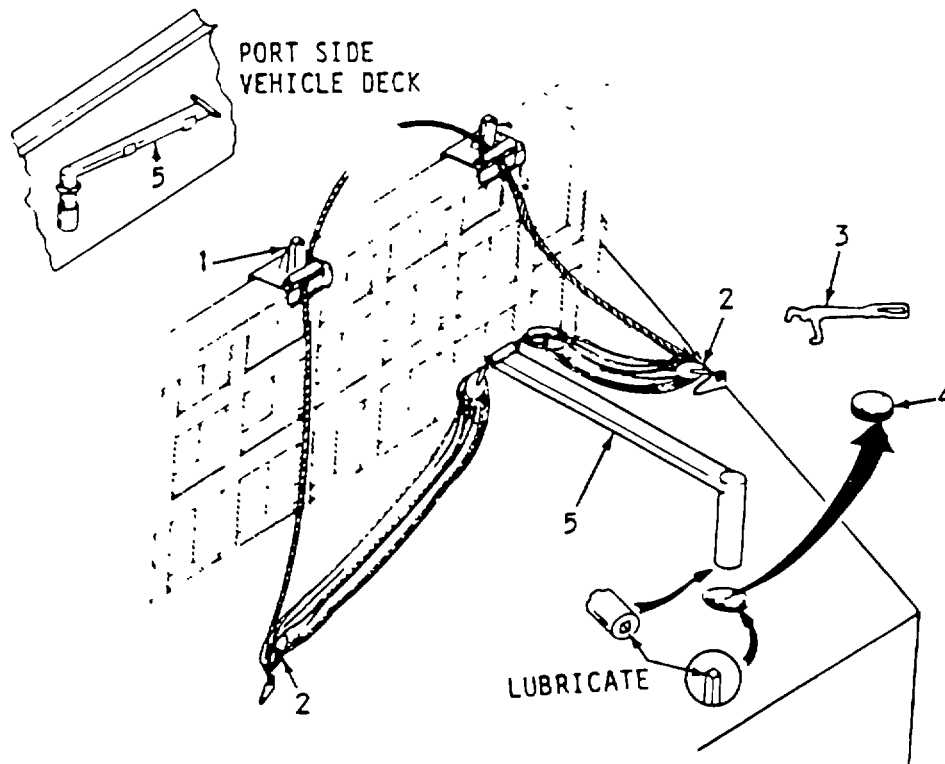
- roller assemblies (1) - two required
- block and tackle (2), (5 inch triple blocks, 5/8" diameter rope) - two required.
- spanner wrench (3)

(2) Take to deck aft of stern gate.

b. Aft Deck.

This applies to either port or starboard side.

(1) Use spanner wrench (3) to remove deck plug (4).



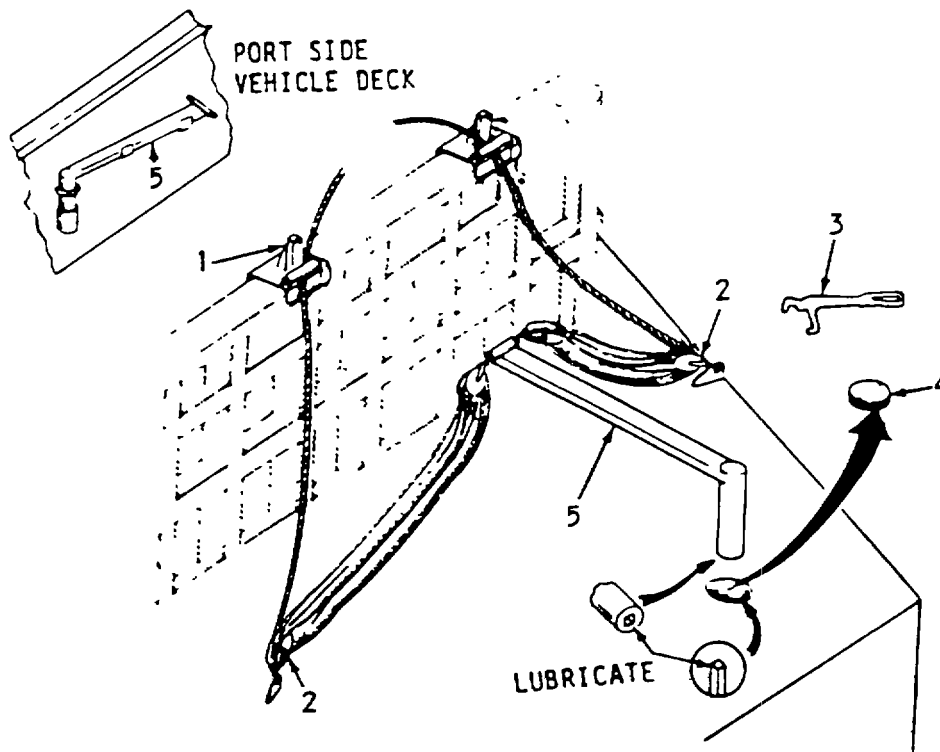
2-186. EMERGENCY STEERING (Cont).

- (2) Remove tiller (5) from port side of vehicle deck.
- (3) Take to deck aft of stern gate.
- (4) Move tiller (5) aft of stern gate.
- (5) Lubricate either the end of the tiller or the protruding square in the deck access.

NOTE

Use grease - Auto and Artillery (MIL-C-10924 Symbol GAA).

- (6) Place tiller (5) in deck access.
- (7) Place roller assemblies (1) on stern gate.
- (8) Assemble block and tackles (2) to deck pad eyes and tiller arm.
- (9) Route rope as shown.



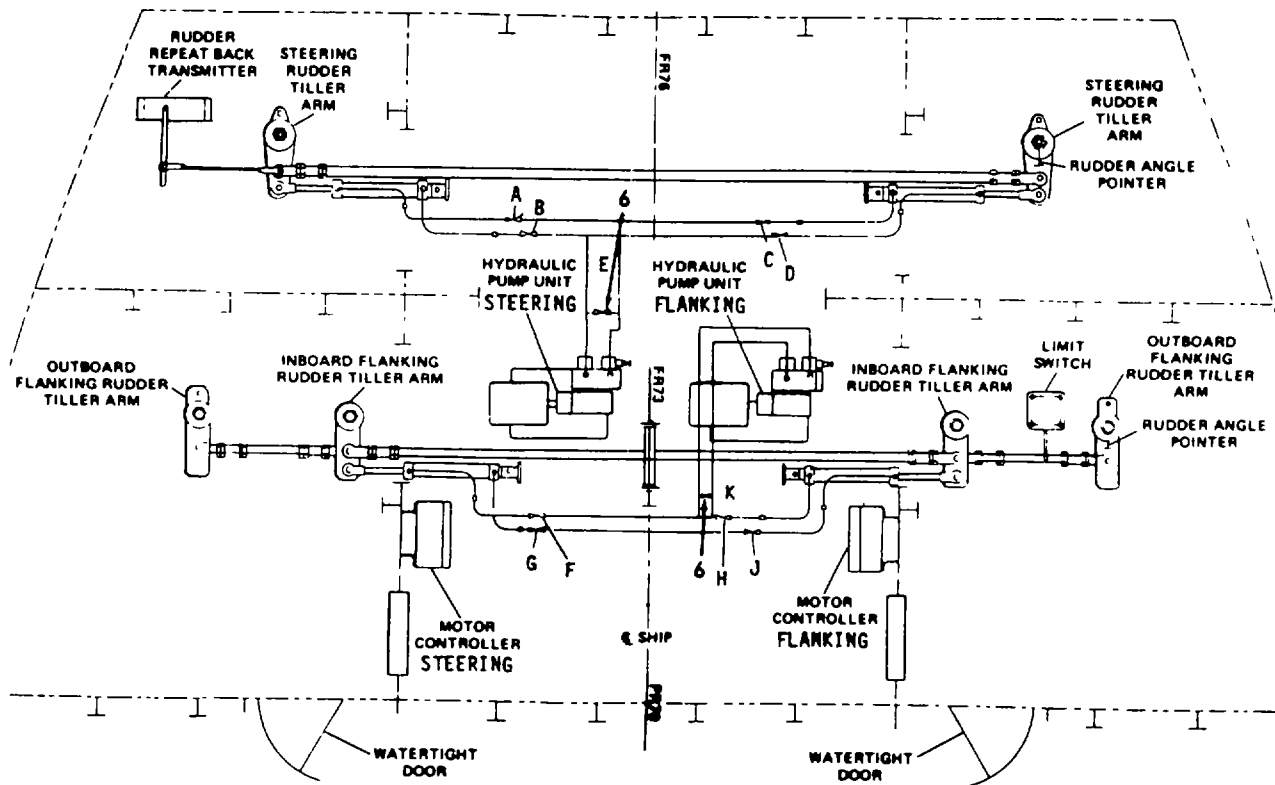
2-186. EMERGENCY STEERING (Cont).

c. STEERING COMPARTMENT (2-70-0-Q).

- (1) At frame 73 - locate bypass shutoff valve (6).
- (2) Rotate bypass shutoff valve (6) counter-clockwise.

d. Aft Deck.

- (1) Establish communication with the pilot house. Use sound-powered phone system.
- (2) Place one man on each rope.
- (3) Pull ropes as directed.



2-187. BOW RAMP.

- a. The bow ramp can be either lowered or raised in an emergency.
- b. The following is an index to the procedures:

<u>DESCRIPTION</u>	<u>PARAGRAPH</u>
Bow Ramp - Lowering	2-188
Bow Ramp - Raising	2-189

2-188. BOW RAMP - LOWERING.

- a. The bow ramp can be lowered manually. This occurs when no electrical power is available, or in an emergency.
- b. To lower the ramp manually, proceed as follows:



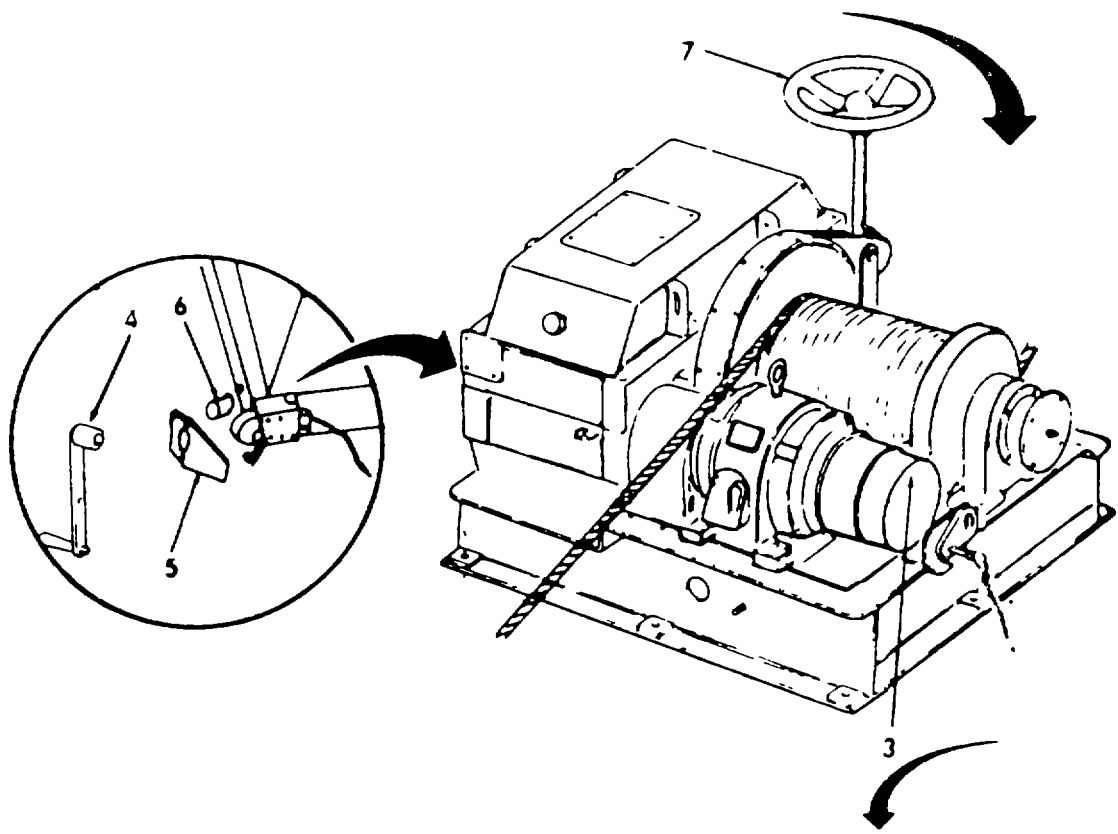
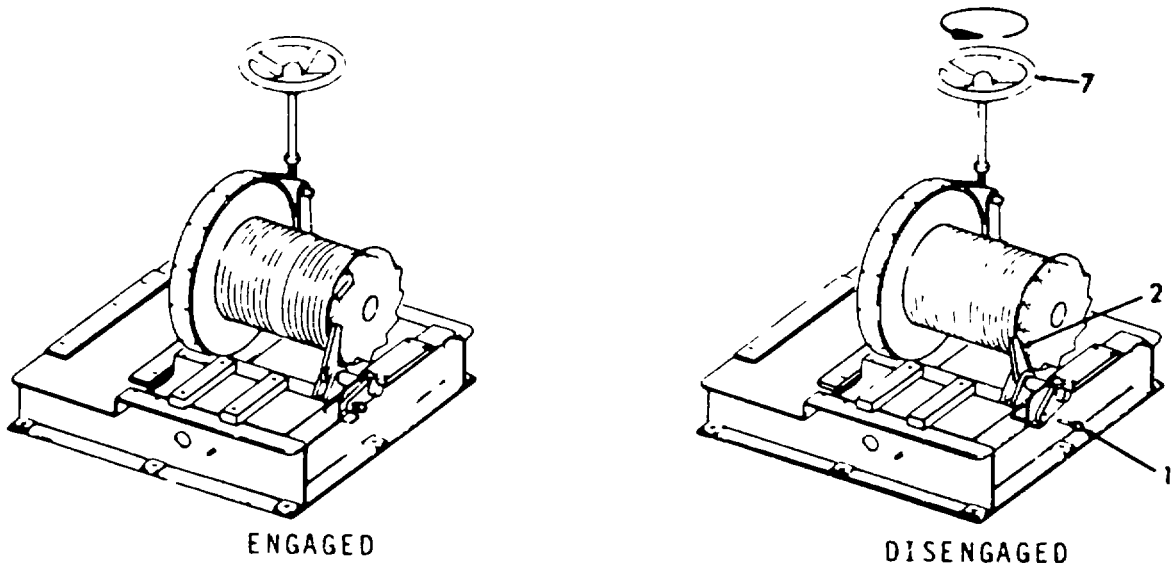
When lowering the ramp manually, be sure the hand- crank is not mounted on the high speed shaft, as injury may be caused by the spinning crank.

- c. Winch Compartment.
 - (1) Remove pawl locking pin (1), and place pawl (2) in the disengage position.
 - (2) Make sure pawl is unlocked and ratchet is engaged on winch drum.
 - (3) Release the electric brake (3) by turning screw counter-clockwise.
 - (4) Remove hand crank (4) and store on the outside of the bed-frame.
 - (5) Remove hand crank switch cover (5) from the high speed shaft stub (6). This disengages the electrical override and permits manual operation.



Keep mechanical brake (7) engaged to prevent accidental slippage of winch before manual lowering of ramp.

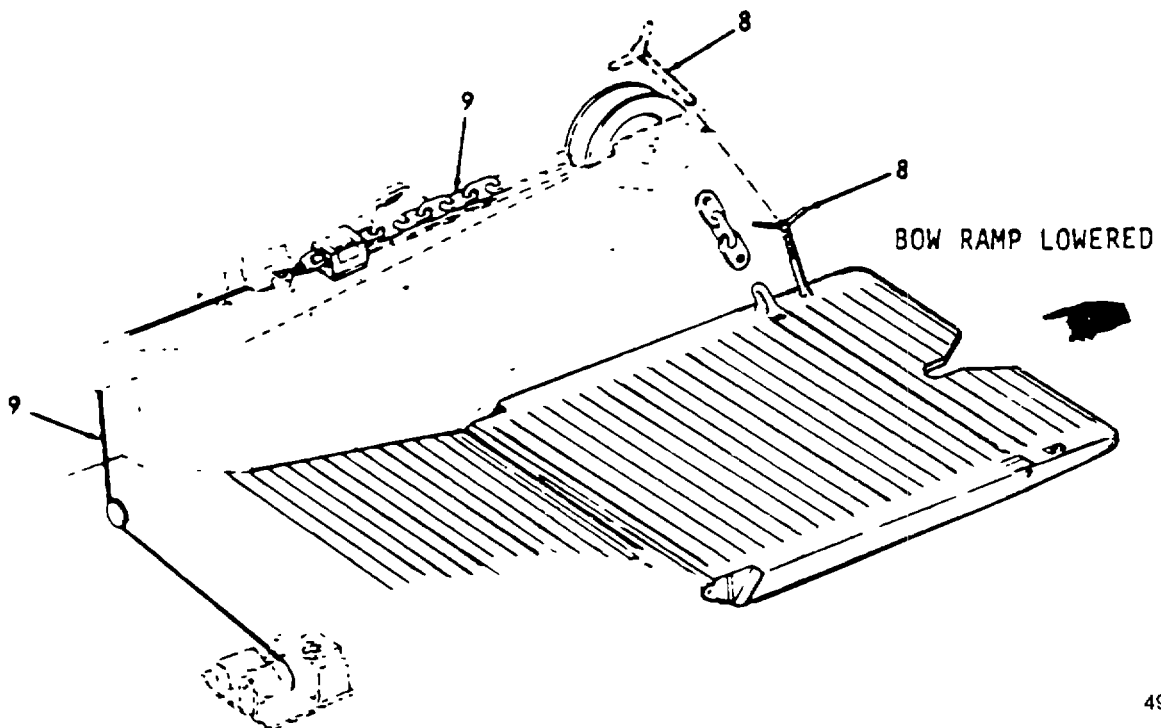
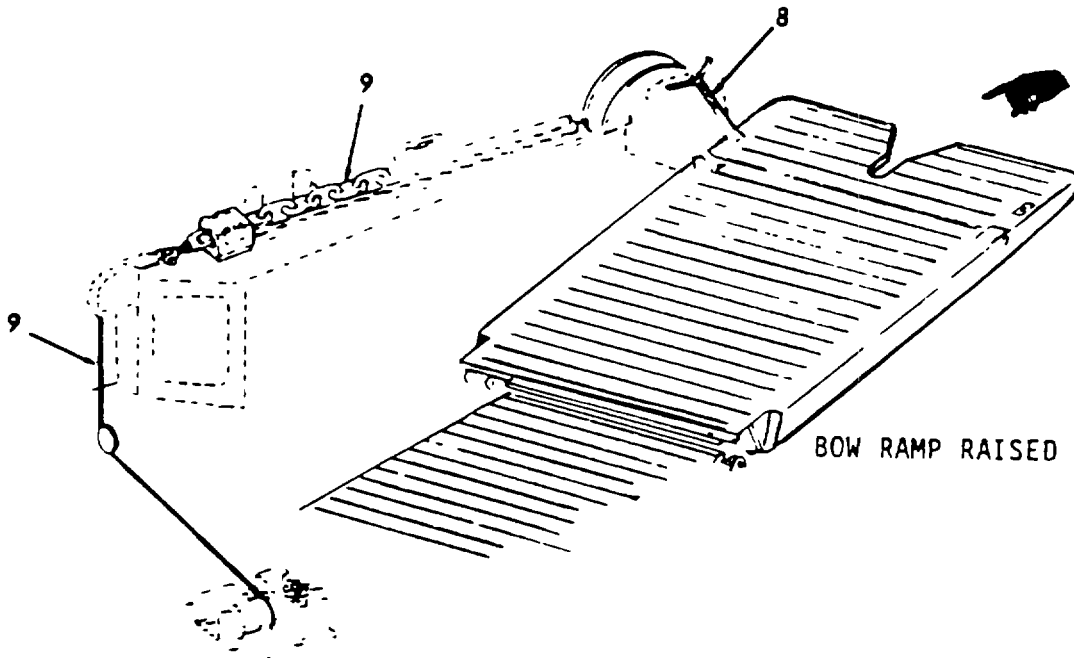
2-188. BOW RAMP - LOWERING (Cont).



2-188. BOW RAMP - LOWERING (Cont).

d. Port and Starboard Bow.

- (1) Loosen upper dog bolts (8) and swing dog bolts clear from craft sides.
- (2) Check cable (9) to make sure cables are not fouled.



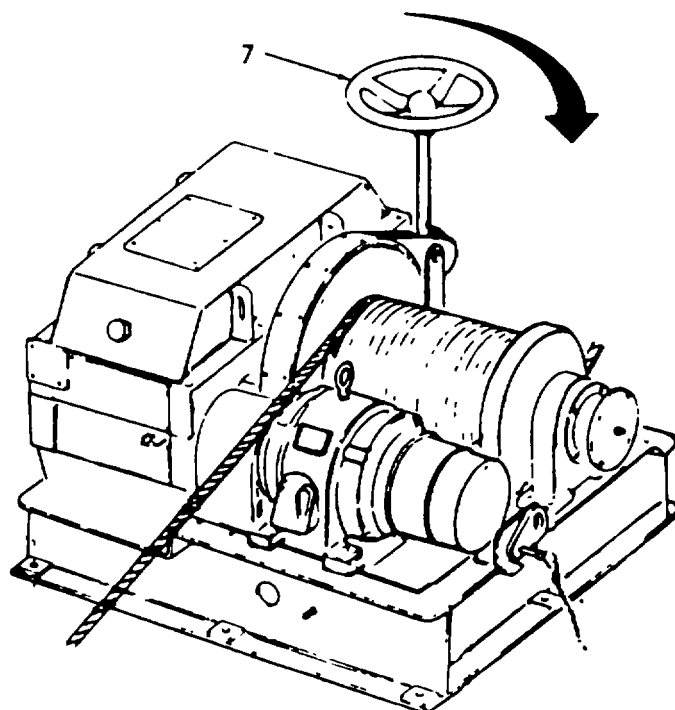
2-188. BOW

- e. Winch Compartment.

Turn mechanical brake wheel (7) clockwise in a controlled descent of bow ramp.

CAUTION

Turn mechanical brake slowly clockwise to prevent the ramp from dropping suddenly.

**2-189. BOW RAMP - RAISING.**

a. The bow ramp can be raised manually. This occurs when no electrical power is available, or in an emergency.

- b. To raise the ramp manually, proceed as follows:

WARNING

Be sure the pawl is against a ratchet tooth before releasing crank handle.

2-189. BOW RAMP - RAISING (Cont).

c. Winch Compartment.

(1) Remove hand crank switch cover (1) from the high speed shaft stub (2), this disconnects the electrical current to the winch.

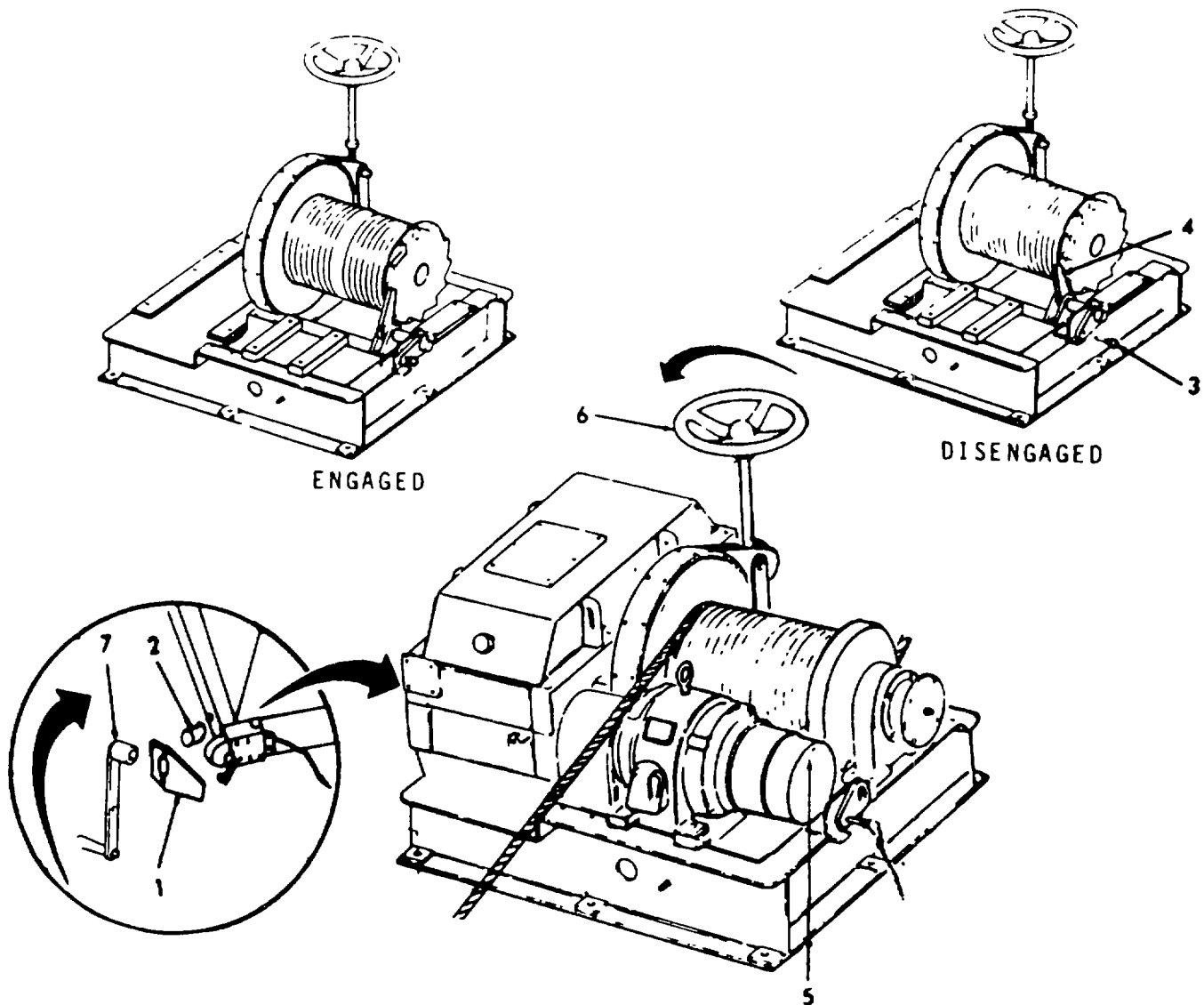
(2) Remove pawl locking pin (3). Check that the ratchet (4) is engaged.

(3) Release electrical brake (5), and turn screw counter-clockwise.

(4) Release mechanical brake (6), and turn counter-clockwise.

(5) Remove hand crank (7) from storage. Install hand crank (7) on high speed shaft stub (2).

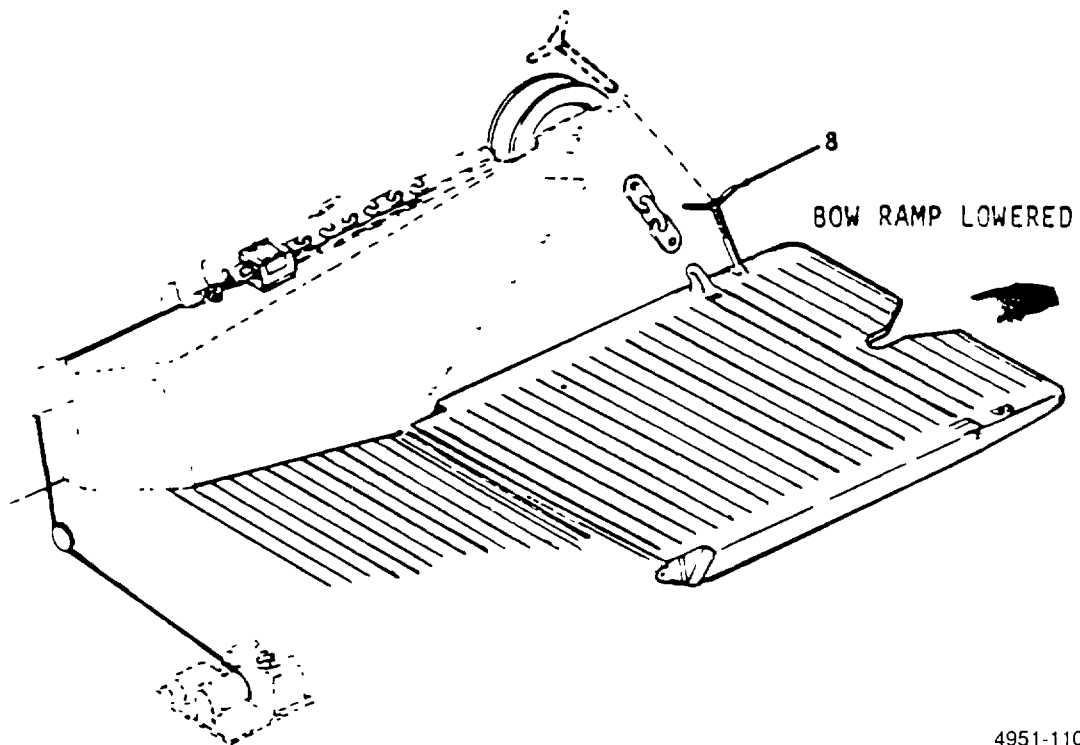
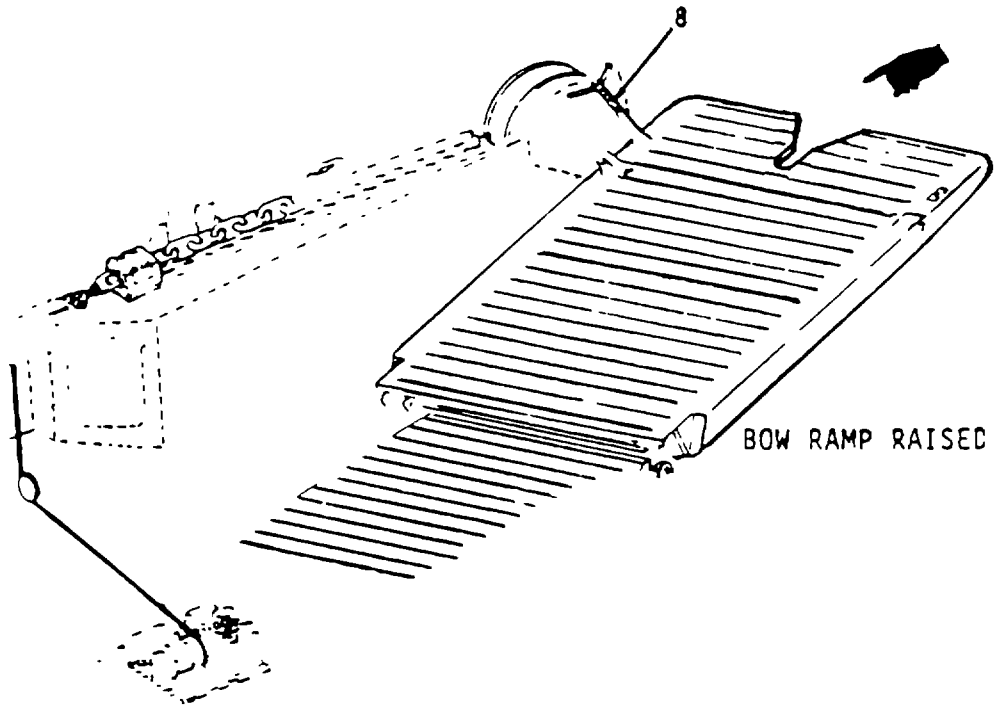
(6) Turn hand crank (7) clockwise to raise the ramp.



2-189. BOW RAMP - RAISING (Cont).

d. Port and Starboard Bow.

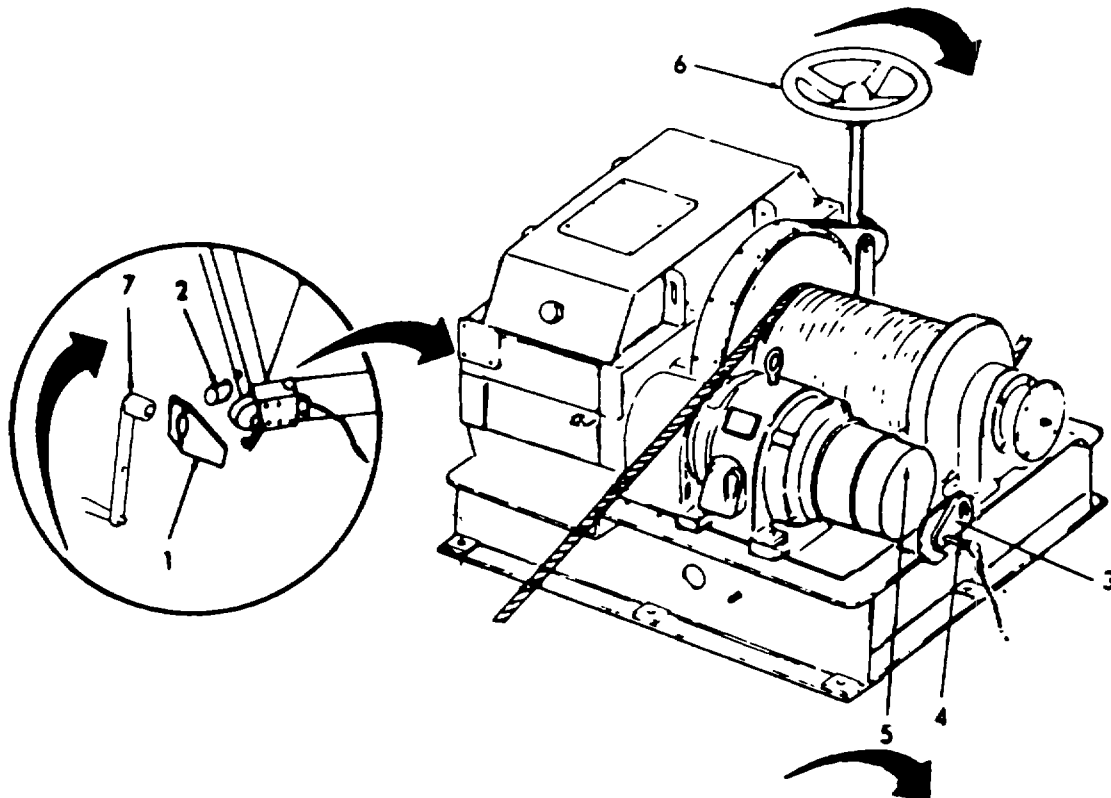
Swing upper dog bolts (8) into place and tighten. Secure bow ramp to craft sides.



2-189. BOW RAMP - RAISING (Cont).

e. Winch Compartment.

- (1) Turn mechanical brake wheel (6) clockwise to lock winch. Turn electrical brake screw (5) clockwise to engage.
- (2) Install pawl (3) and pawl locking pin (4) in the engage position.
- (3) Remove hand crank (7) and store.
- (4) Install hand crank switch cover (1) to the high speed shaft stub (2), engaging the electrical current to the winch.



2-190. STERN GATE.

- a. The stern gate can be either raised or lowered manually.

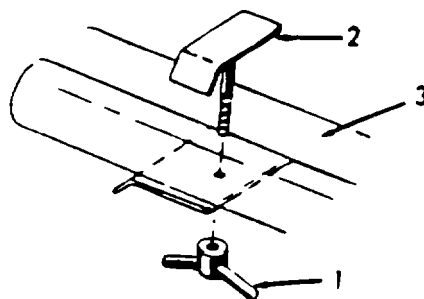
NOTE

This procedure requires two persons.

- b. To raise the stern gate proceed as follows:

- (1) Port Side Vehicle Deck.
 - (a) Remove dog bolt (1) and clamp (2).
 - (b) Remove davit (3).

2-190. STERN GATE (Cont).



(c) Replace clamp (2) and dog bolt (1).

(2) Stern Gate.

NOTE

The davit can be used either on the port or starboard side.

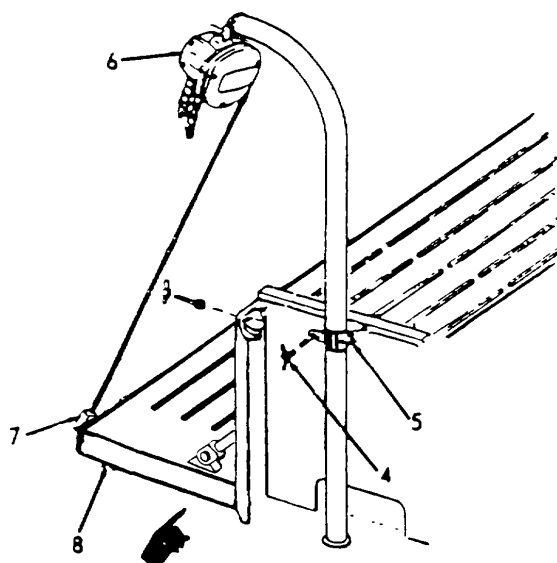
(a) Loosen dog bolt (4) and swing clamp (5) outboard.

(b) Place davit in place.

(c) Close clamp (5) and tighten dog bolt (4).

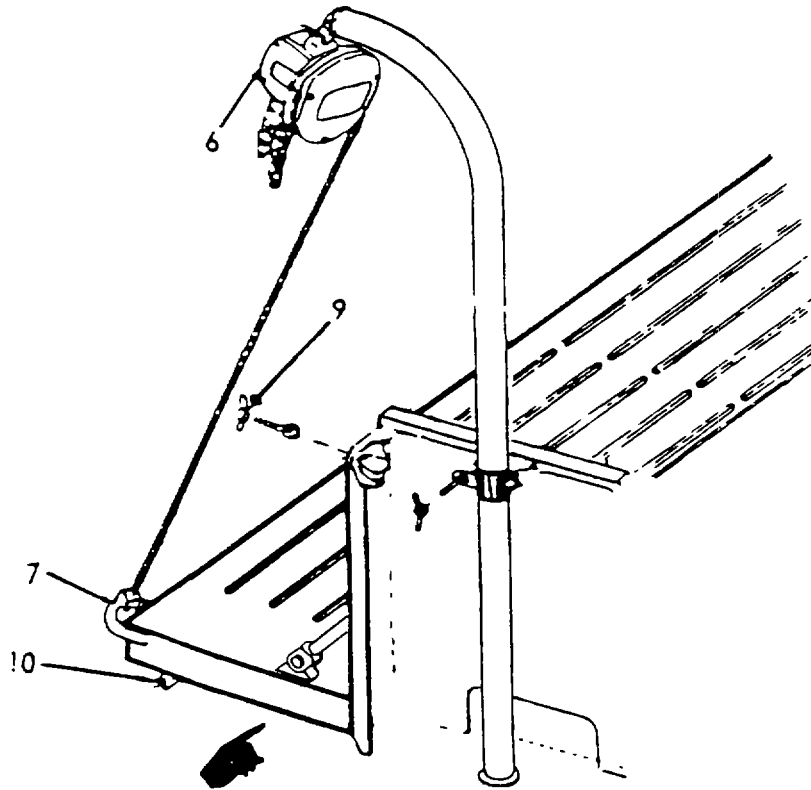
(d) Install chain hoist (6).

(e) Attach chain hook (7) to stern gate (8).



2-190. STERN GATE (Cont).

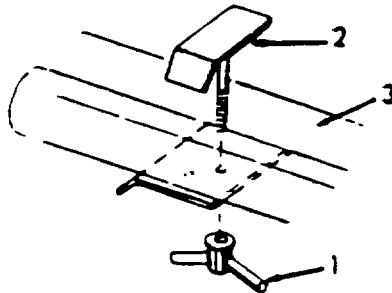
- (f) Operate chain hoist to raise stern gate.
- (g) When stern gate is in an upright position, position the dog bolt (9) in clamp (10).
- (h) Tighten dog bolt (9).
- (I) Disconnect chain hook (7).
- (J) Remove chain hoist (6) and stow.



4951-201

c. To lower the stern gate manually proceed as follows:

- (1) Port Side Vehicle Deck.
 - (a) Remove dog bolt (1) and clamp (2).
 - (b) Remove davit (3).



2-190. STERN GATE (Cont).

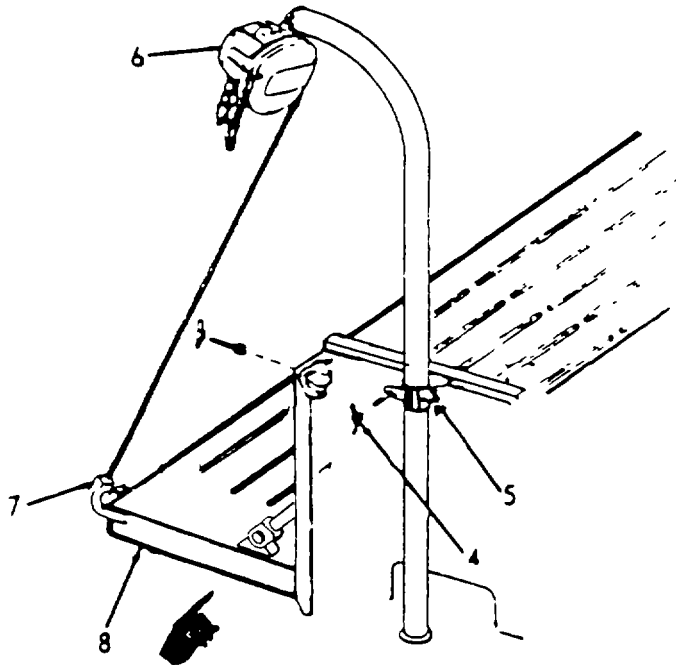
- (c) Replace clamp (2) and dog bolt (1).

(2) Stern Gate

NOTE

The davit can be used either on the port or star-board side.

- (a) Loosen dog bolt (4), and swing clamp (5) outboard.
- (b) Place davit in place.
- (c) Close clamp (5), and tighten dog bolt (4).
- (d) Install chain hoist (6).
- (e) Attach hook (7) to stern gate (8).

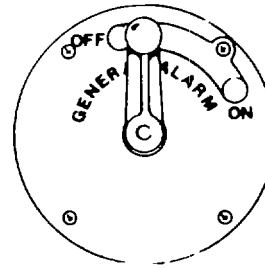
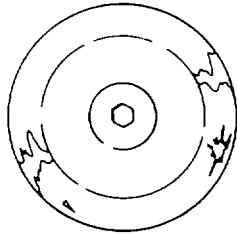


4954-202

- (f) Loosen dog bolt (9) and swing it free of clamp (10).
- (g) Operate chain hoist to lower stern gate.

2-191. DAMAGE CONTROL.

a. General alarm system consists of bells and lights located throughout the vessel (see FO-68) to alert the vessel crew of fire and emergencies. The controls for this system are located in the pilothouse and the vestibule leading to the engine rooms (Frame 2-50-1-Q).



b. The damage control procedures contained in the following paragraphs should be used in conjunction with the emergency procedures in paragraph 2-171.

c. The following is an index to the procedures:

<u>DESCRIPTION</u>	<u>PARAGRAPH</u>
Fire Fighting	2-192
Emergency Lighting	2-202
Break-glass Shut-down Stations	2-203
Salvage Pump	2-204
Watertight Integrity	2-205

2-192. FIRE FIGHTING.

a. This section contains information on fire fighting.

b. The general recommendations for fire fighting are as follows:

- (1) A definite fire fighting plan should be established. The plan should be general in nature and should assign personnel to specific tasks.
- (2) Each crew member should be briefed on location and use of portable fire pump, portable Halon extinguishers, dry chemical extinguishers and liquid foam cans.
- (3) Each crew member should be familiarized with the firemain system and location of fire stations.
- (4) The crew should know location of manual pull cable handles for the Halon flooding system.
- (5) Each crew member should know where the emergency fuel shutoff T-handles for each diesel engine are located.
- (6) Establish a housekeeping plan. If the plan is maintained, unnecessary fire hazards such as fuel and oil spills, flammable debris, etc., should be eliminated.

2-192. FIPE FIGHTING (Cont).

c. The following is an index to the procedures:

<u>DESCRIPTION</u>	<u>PARAGRAPH</u>
Fire Main System	2-193
Halon Fixed System	2-194
Portable Extinguishers	2-195
Portable Fire Pump	2-196
Liquid Foam	2-201

2-193. FIRE MAIN SYSTEM.

The operating procedures for the fire main system are as follows:

<u>DESCRIPTION</u>	<u>PARAGRAPH</u>
Fire Mains and Fire Plugs	2-77
Fire Pump - Shutdown	2-78
Draining the Firemain System	2-79

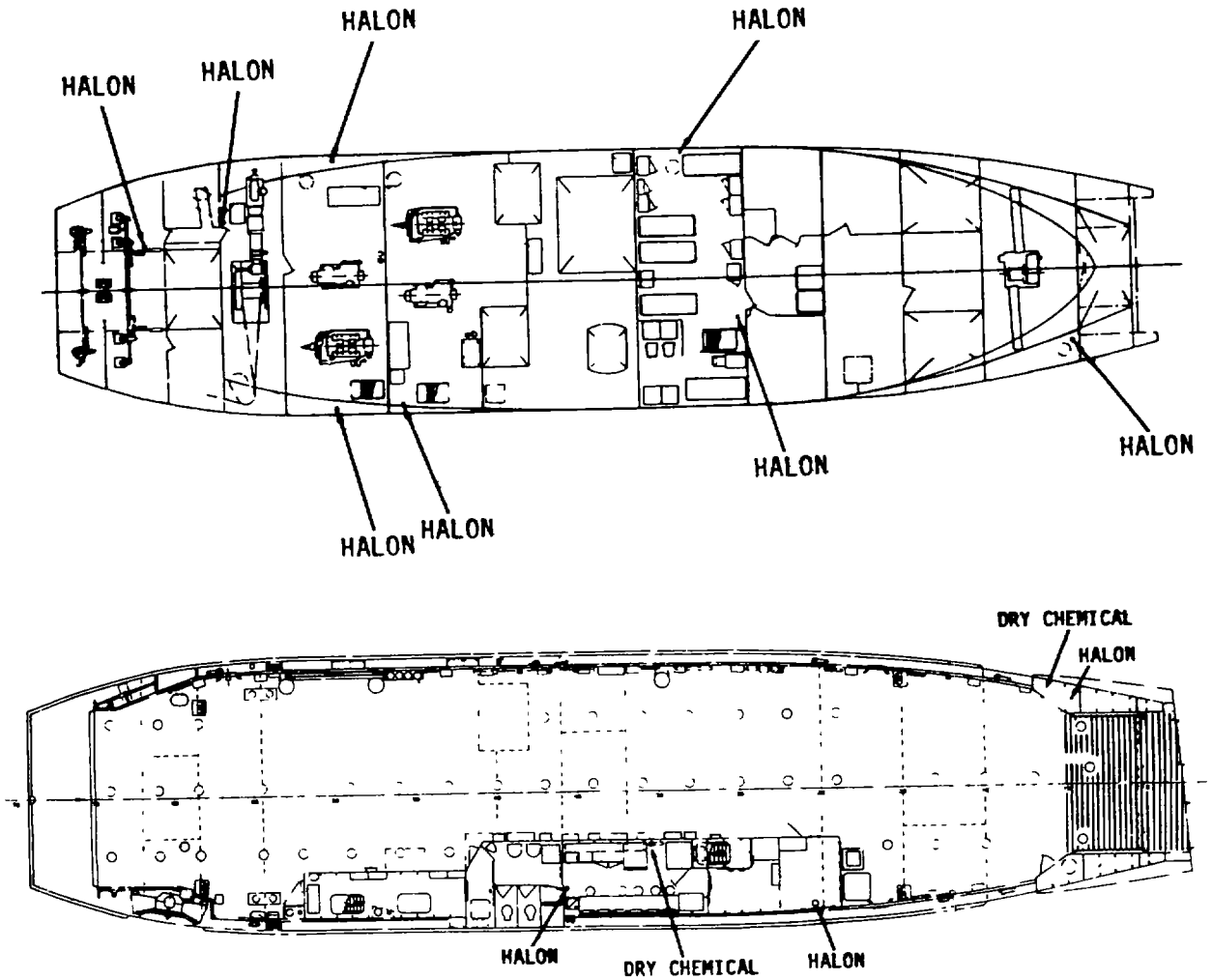
2-194. HALON FIXED SYSTEM.

The operating procedures for the fixed Halon system are as follows:

<u>DESCRIPTION</u>	<u>PARAGRAPH</u>
Halon System	2-115
Halon Warning System Turn - On	2-116
Halon System Alarms	2-117
Halon System Reactivation	2-118
Halon System Testing	2-119

2-195. PORTABLE FIRE EXTINGUISHERS.

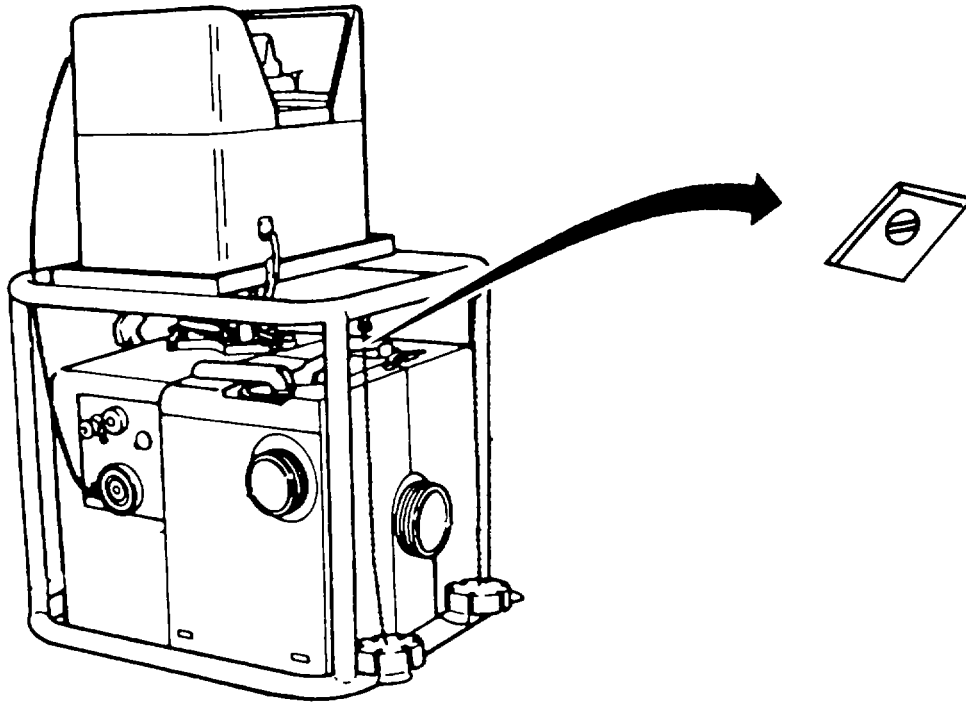
There are two types of portable fire extinguishers on the landing craft. The location of the fire extinguishers is shown below:



2-196. PORTABLE FIRE PUMP.

a. The portable fire pump is stored in the flammable liquid store- room (1-4-2-A). The pump is a 2-cylinder, 2-cycle, 25 horsepower engine driven pump. The major components are as follows:

- engine
- pump
- foot valve
- fuel tank
- eductor, and
- hoses



b. The following is an index to the operating procedures:

<u>DESCRIPTION</u>	<u>PARAGRAPH</u>
Preliminary Adjustments (fuel and assembly)	2-197
Starting	2-198
Applications	2-199
Stopping and Storage	2-200

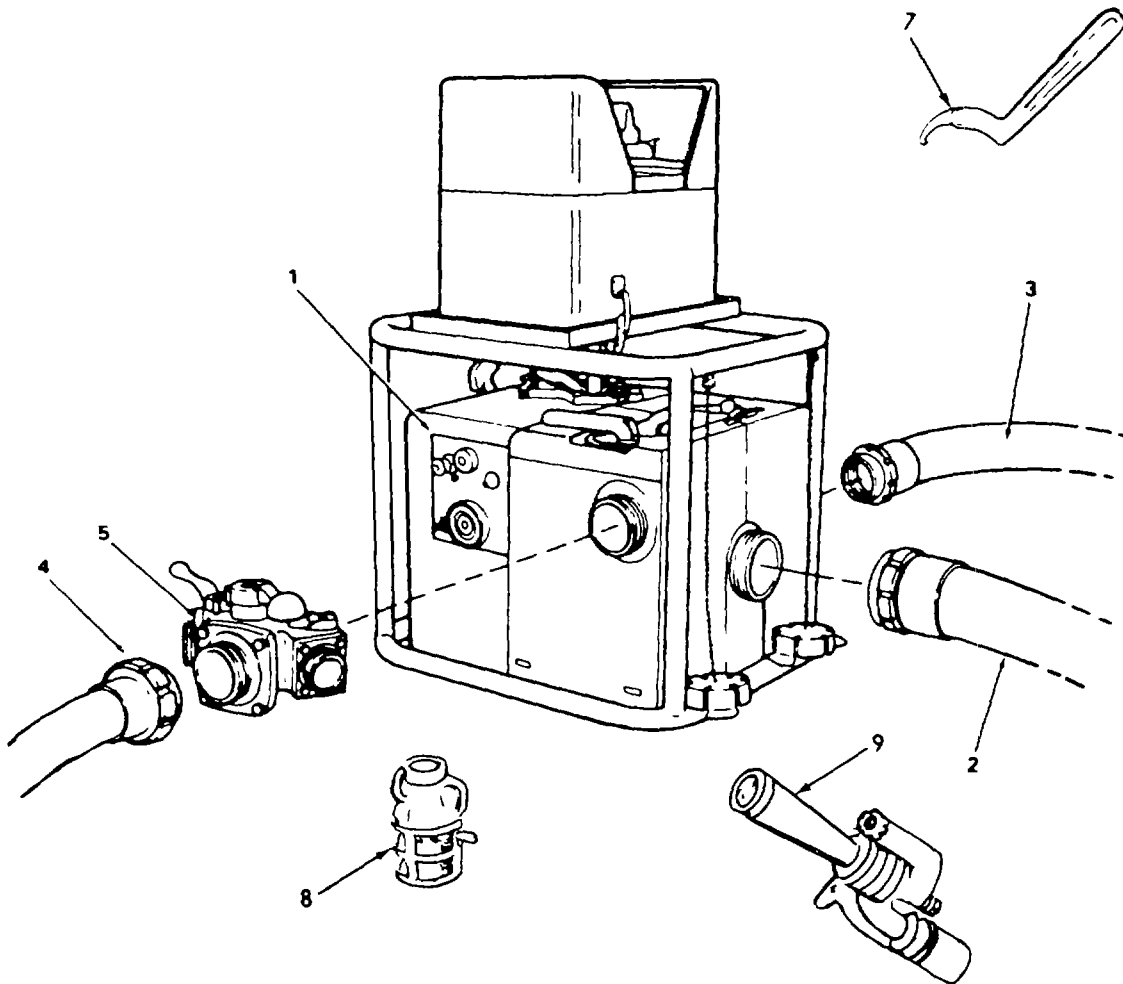
2-197. PRELIMINARY ADJUSTMENTS - PORTABLE FIRE PUMP.

The preliminary adjustments to the portable fire pump are as follows:

CAUTION

Do not refuel tank when engine is running.

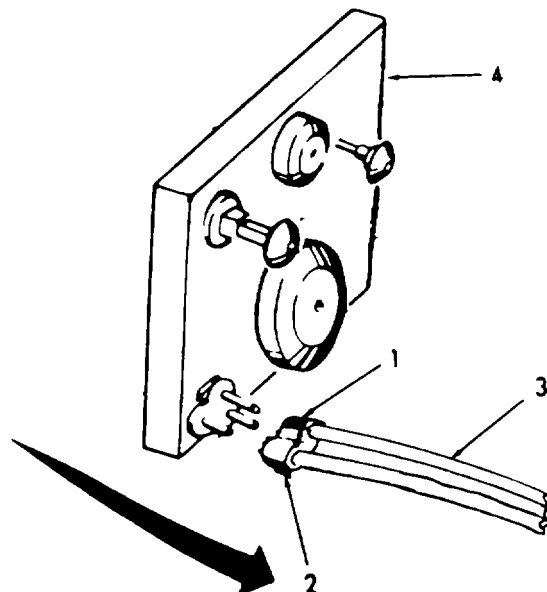
- a. Remove the portable fire pump from the flammable liquid store room (1-4-2-A).
- b. Check for missing or damaged components.



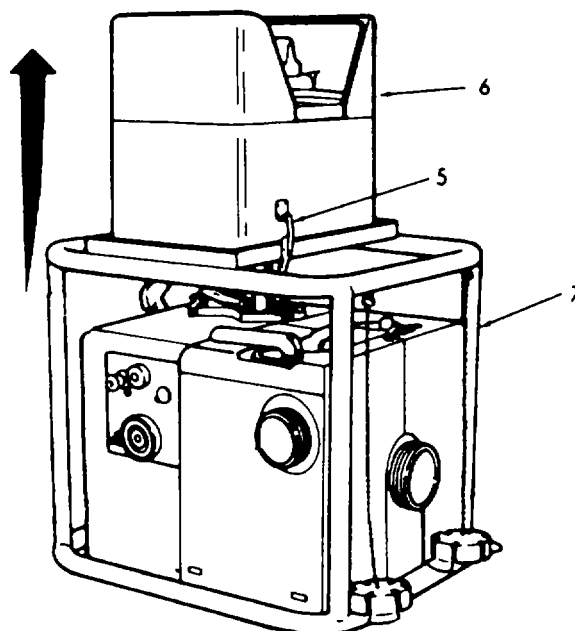
- | | |
|-------------------------|-------------------|
| 1. Fire pump | 6. Fuel tank |
| 2. Intake hose | 7. Spanner wrench |
| 3. Exhaust hose | 8. Foot valve |
| 4. Adapter | 9. Eductor |
| 5. Three-way gate valve | |

2-197. PRELIMINARY ADJUSTMENTS - PORTABLE FIRE PUMP (Cont).

- c. Press release (1) on fuel line connector (2).
- d. Remove connector (2) from control panel (4) and fuel line (3).

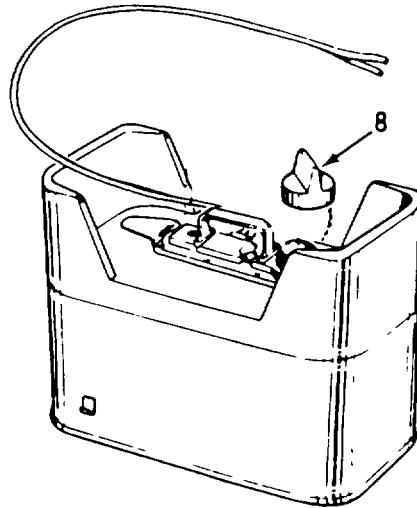


- e. Wrap fuel line around brackets on top of fuel tank.
- f. Release latches (5) that secure fuel tank (6) to fire pump (7).
- g. Lift fuel tank (6) from fire pump (7).



2-197. PRELIMINARY ADJUSTMENTS - PORTABLE FIRE PUMP (Cont).

- h. Move fuel tank away from a source of fire.
- i. Remove cap (8) from fuel tank.



WARNING

An explosion or fire can result from improper handling of the gasoline used as fuel in the fire pump.

- j. Mix gasoline (80 to 100 octane) and two cycle engine oil (NSN 9150-00-117-8791) in fuel tank as follows:

NOTE

Fuel tank holds six gallons (22.71 liters) when empty.

	GASOLINE		OIL	
	Gallons	Liters	Pints	Milliliters
1		3.79	1/2	0.237
2		7.57	1	0.473
3		11.36	1 1/2	0.710
4		15.14	2	0.946
5		18.93	2 1/2	1.183
6		22.71	3	1.419

- k. Replace cap (8) on fuel tank. Tighten securely.
- l. Shake vigorously, until oil and gasoline are thoroughly mixed.

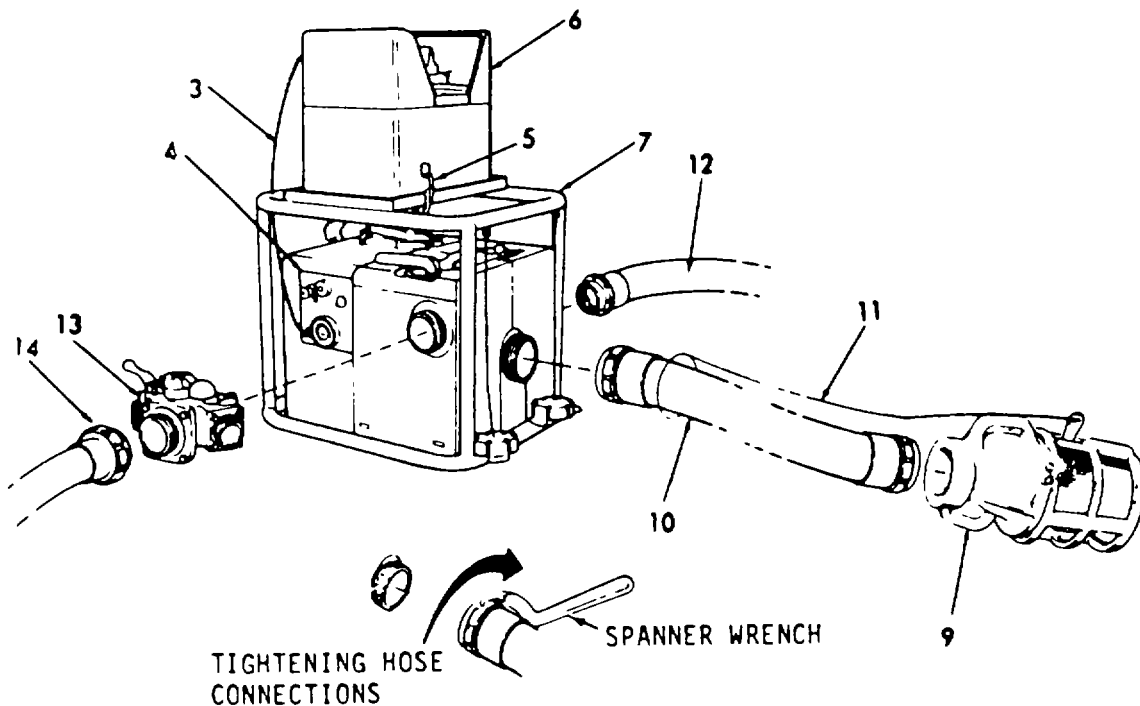
2-197. PRELIMINARY ADJUSTMENTS - PORTABLE FIRE PUMP (Cont).

- m. Place fuel tank (6) on fire pump (7), and secure with latches (5).
- n. Reconnect fuel line (3) to control panel (4).
- o. Install foot valve (9) to intake hose (10) by rotating valve counter-clockwise.
- p. Install a small diameter line (11) on the foot valve. Route the line through a valve handle and secure near the top of the intake hose (9).
- q. Using spanner wrench, attach intake hose (10).
- r. Using spanner wrench, attach exhaust hose (12).

WARNING

Make sure exhaust connection is tight, and that exhaust gases are discharged into an outside atmosphere. These gases contain carbon monoxide, and will endanger personnel if discharged in an enclosed space.

- s. Using a spanner wrench, attach the three-way-gate valve (13). Valve levers should be on the top.
- t. Install fire hoses (14) as required to three-way-gate-valve (13).



2-198. STARTING - PORTABLE FIRE PUMP.

- a. To start the portable fire pump, proceed as follows:

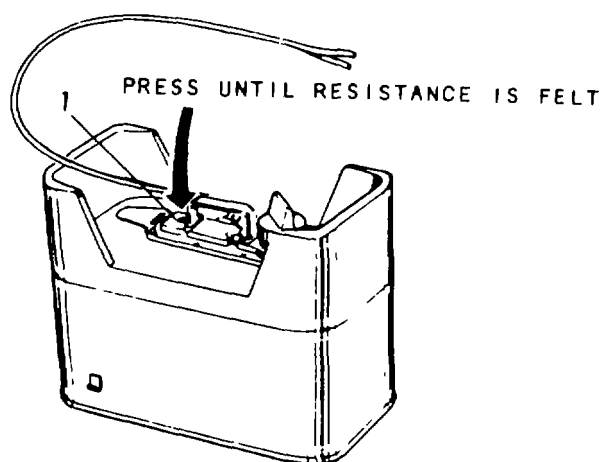
NOTE

Perform all preliminary adjustments (para 2-197).

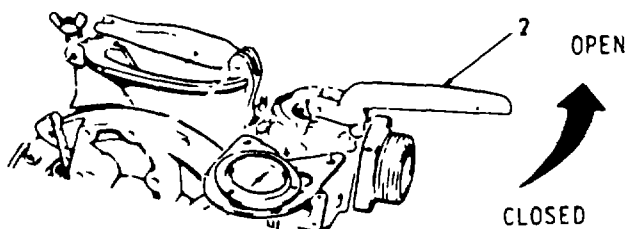
- (1) On fuel tank, press push button (1) several times, until resistance is felt.

CAUTION

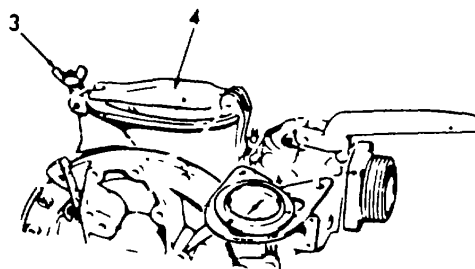
Do not continue to press button after resistance is felt. Damage to a diaphragm may result.



- (2) Place water outlet valve (2) in the closed position.

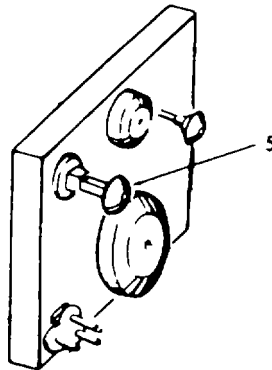


- (3) Check that wing nut (3) on hand priming filler bowl (4) is tight.

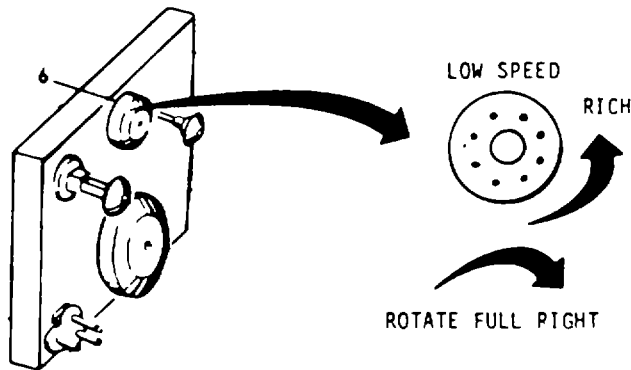


2-198. STARTING - PORTABLE FIRE PUMP (Cont).

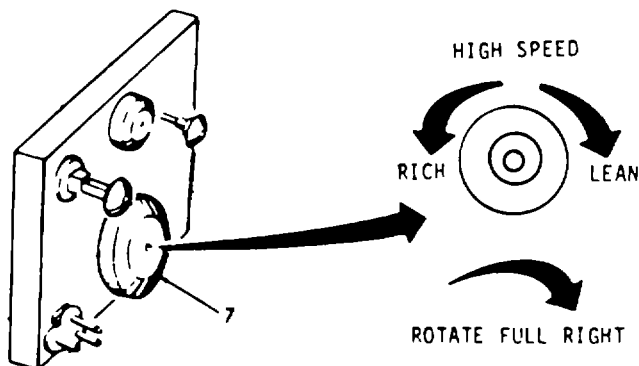
(4) Pull the choke knob (5) out.



(5) Rotate LOW SPEED knob (6) full clockwise.

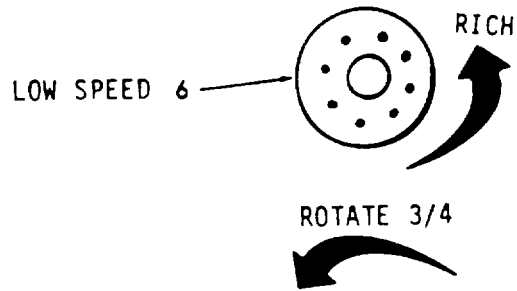


(6) Rotate HIGH SPEED knob (7) to full LEAN.

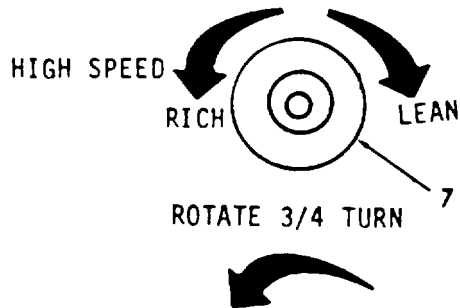


2-198. STARTING - PORTABLE FIRE PUMP (Cont).

(7) Rotate LOW SPEED knob (6) three-fourths turn to left.



(8) Rotate HIGH SPEED knob (7) three-fourths turn to RICH.

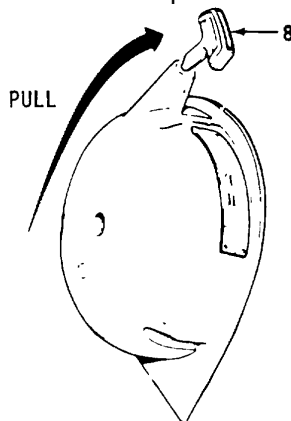


(9) Check that foot valve is completely submerged.



Make certain that foot valve is completely submerged during the entire period the pump is operating. Severe damage to the pump may result otherwise.

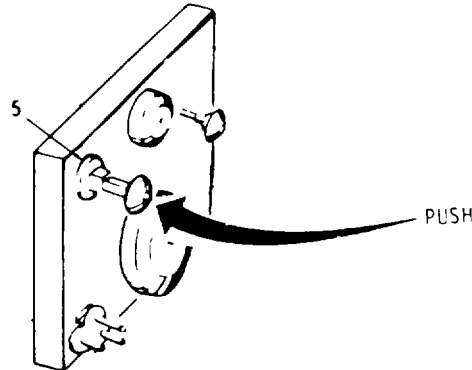
(10) Pull the starting rope (8) rapidly. Do not Jerk the rope.



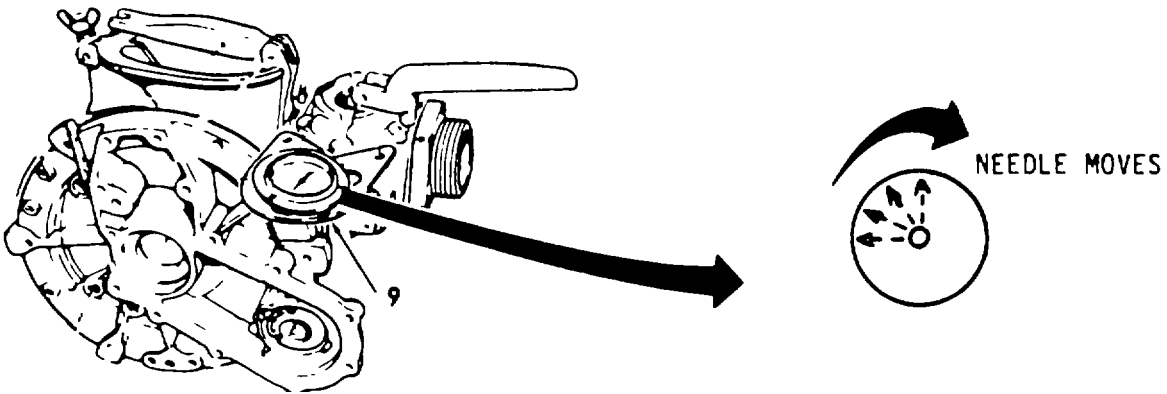
2-198. STARTING - PORTABLE FIRE PUMP (Cont).

(11) Let the rope (8) go. It will rewind automatically.

(12) After the engine starts and runs a few seconds, push the choke knob (5) in.



(13) Check pressure gage (9) to be sure water pressure is building up. This will occur approximately 20 seconds after the pump has been started, at a suction lift of 16 feet (5 meters).



CAUTION

Do not run pump more than forty-five seconds unless pressure shows on the gage. If pump is not primed in forty-five seconds, stop engine, tighten all suction connections and hose couplings and try again.

(14) If the pressure gage (9) does not show a pressure buildup - repeat steps through 13.

(15) If the pressure gage (9) still does not show a pressure build up, perform steps 16 through 21.

(16) If the pump does not prime and the suction lift is less than 16 to 20 feet (4.9 to 6.1 meters), manually prime.

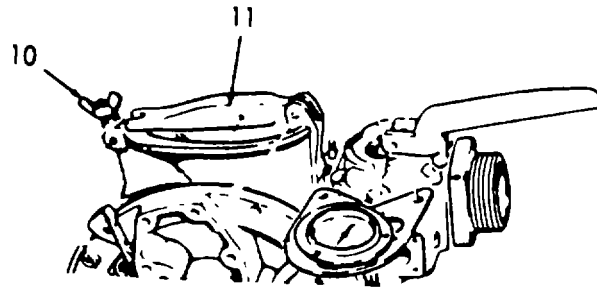
2-198. STARTING - PORTABLE FIRE PUMP (Cont).

NOTE

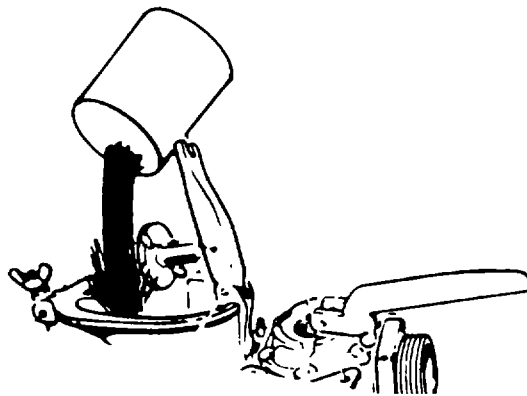
If the suction lift is greater than 20 feet (6.1 meters) use the eductor in place of the foot valve, and manually prime.

(17) Loosen wingnut (10).

(18) Lift manual priming lever (11).



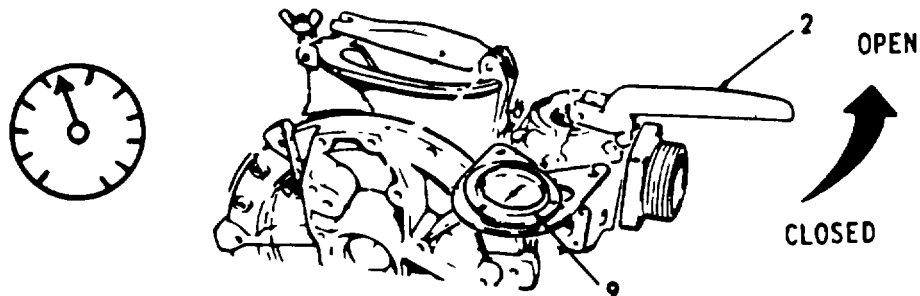
(19) Fill with water.



(20) Close lever (11) and secure with wingnut (10).

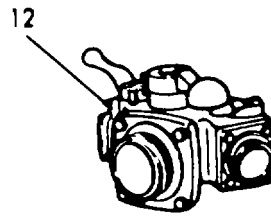
(21) Repeat steps 1 through 13.

(22) When the pressure gage (9) shows pressure -, rotate water outlet valve (2) to the OPEN position.

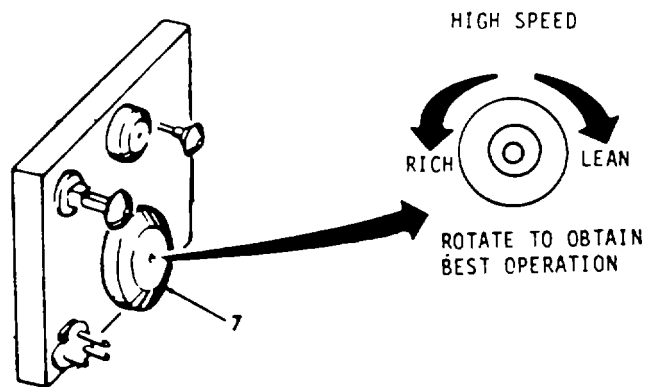


(23) Open either gate valve on the three-way-gate valve (12). Water will be coming out of discharge hose(s).

2-198. STARTING - PORTABLE FIRE PUMP (Cont).

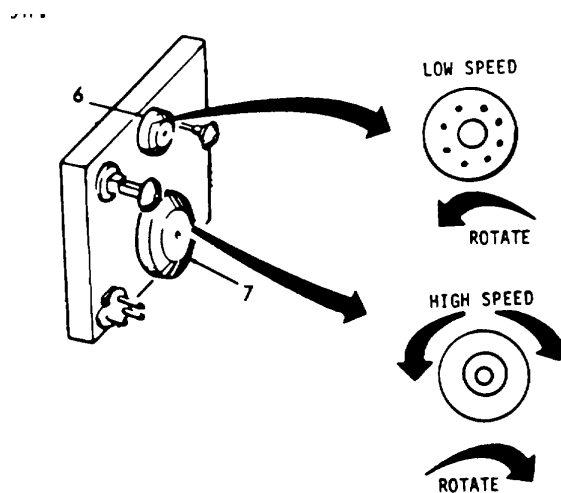


(24) Adjust HIGH SPEED knob (7) to obtain the best operation.



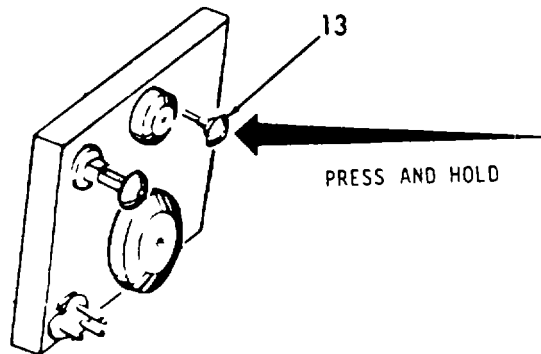
(25) For slow speed operation -

- (a) Rotate the HIGH SPEED knob (7) clockwise.
- (b) Rotate the LOW SPEED knob (6) to obtain the best operation



2-198. STARTING - PORTABLE FIRE PUMP (Cont).

(26) To stop the pump - press and hold the STOP button (13).



CAUTION

If-pump is operated for more than 15 to 20 seconds with the outlet valves (water outlet or three-way-gate valve) closed, the pump may speed up due to trapped air. Open both valves momentarily to let the trapped air escape.

b. To restart the fire pump while it is still warm, proceed as follows:

(1) Pull the starter rope.

NOTE

Choking is not necessary.

(2) If the engine does not start Immediately, -use the choke. Avoid flooding.

(3) If the engine floods, proceed as follows:

- (a) Rotate the SLOW SPEED knob full clockwise.
- (b) Rote the HIGH SPEED knob full clockwise.
- (c) Pull the starter rope until the engine starts.

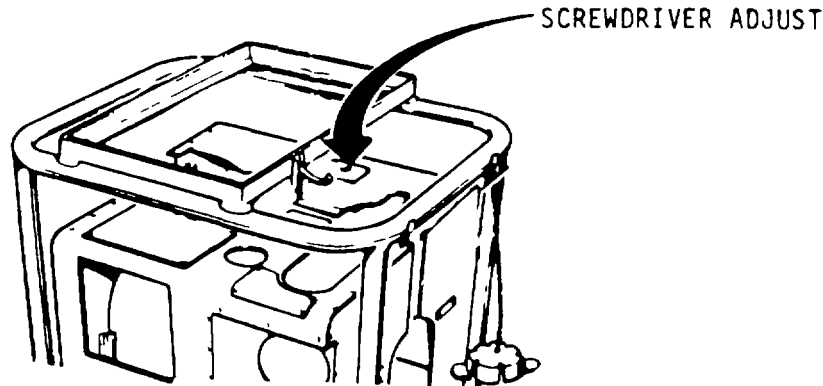
CAUTION

Do not refuel tank when engine is running.

2-198. STARTING - PORTABLE FIRE PUMP (Cont).

- c. To adjust water pressure, proceed as follows:

Using a screwdriver, adjust screw. Maximum pressure is limited by number and size of nozzles used.

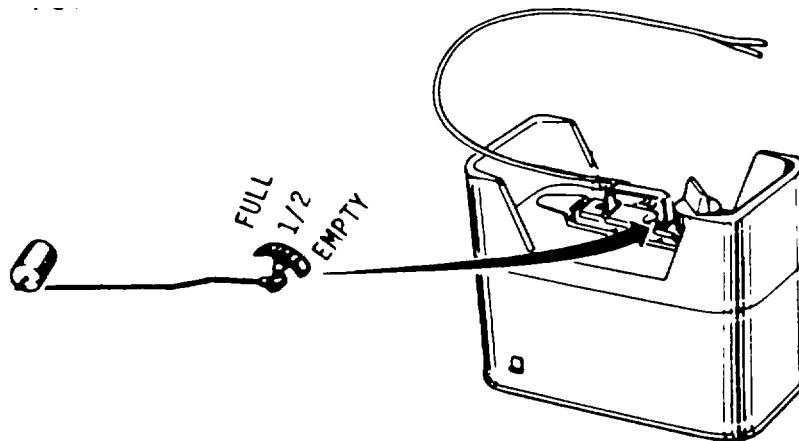


- d. To check the level of fuel in the tank:

Observe fuel gage.

WARNING

An explosion or fire can result from improper handling of gasoline. Stop pump - remove fuel tank - refill in a well ventilated area.



2-199. APPLICATIONS - PORTABLE FIRE PUMP.

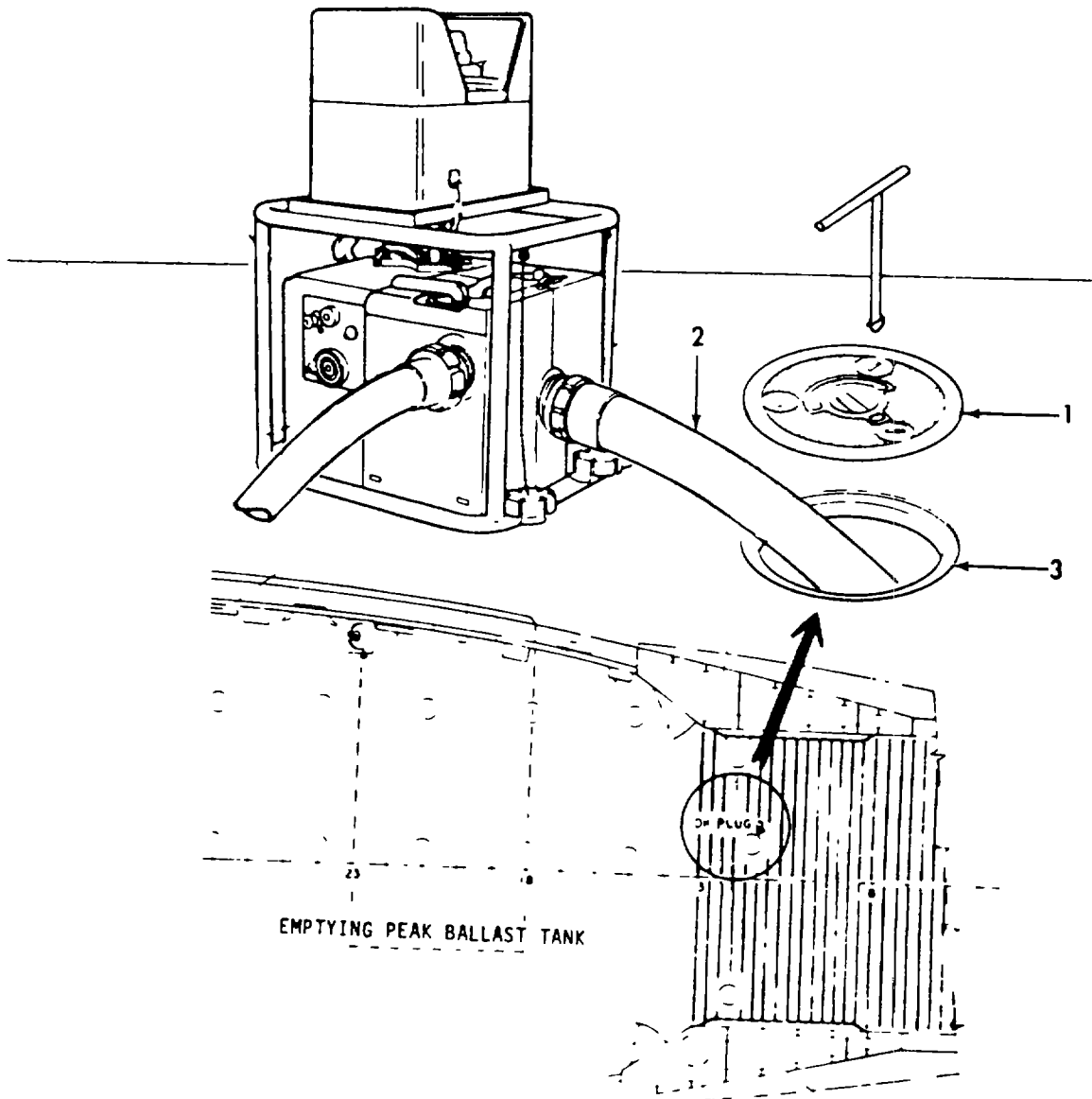
- a. The fire pump can be used for the following:
- emptying peak ballast tank
 - fighting fires
 - salvage
- b. The fire pump can lift water:
- 16 to 20 feet (4.9 to 6.1 meter) using foot valve.
 - greater than 20 feet (6.1 meters) using eductor.

2-199. APPLICATIONS - PORTABLE FIRE PUMP (Cont).

c. Refer to paragraph 2-197 for preliminary adjustments, and to paragraph 2-198 for starting procedures.

(1) Emptying peak ballast tank -

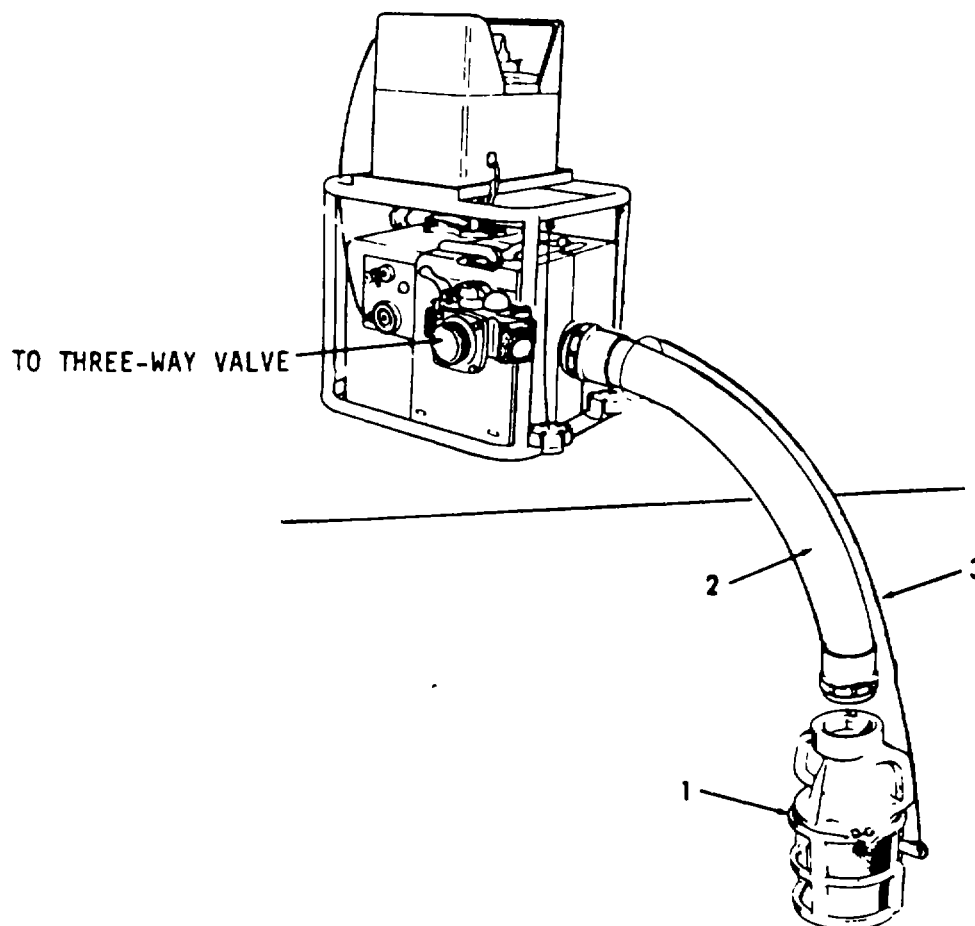
- (a) Remove deck plug (1) on vehicle deck (frame 11 1/2).
- (b) Place intake hose (2) (without foot valve) in deck access (3).
- (c) Operate fire pump.



2-199. APPLICATIONS - PORTABLE FIRE PUMP (Cont).

(2) Fighting Fires.

(a) Place intake hose (1) with foot valve attached, over side of craft.



CAUTION

Make certain that foot valve is completely submerged during the entire period the pump is operating. Severe damage to the pump may result.

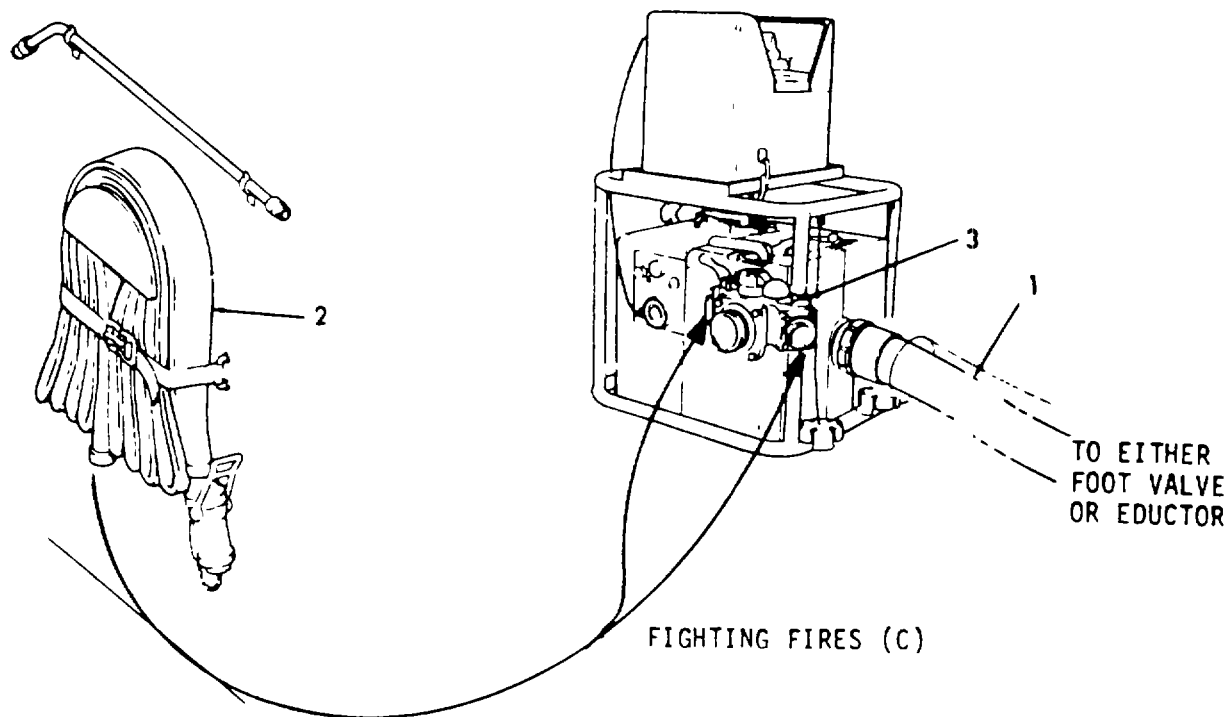
(b) Attach hose(s) (2) from fire station(s) to three-way-gate valve (3).

(c) Operate fire pump.

2-199. APPLICATIONS - PORTABLE FIRE PUMP (Cont).

(3) Water lift 16 to 20 feet (4.9 to 6.1 meters).

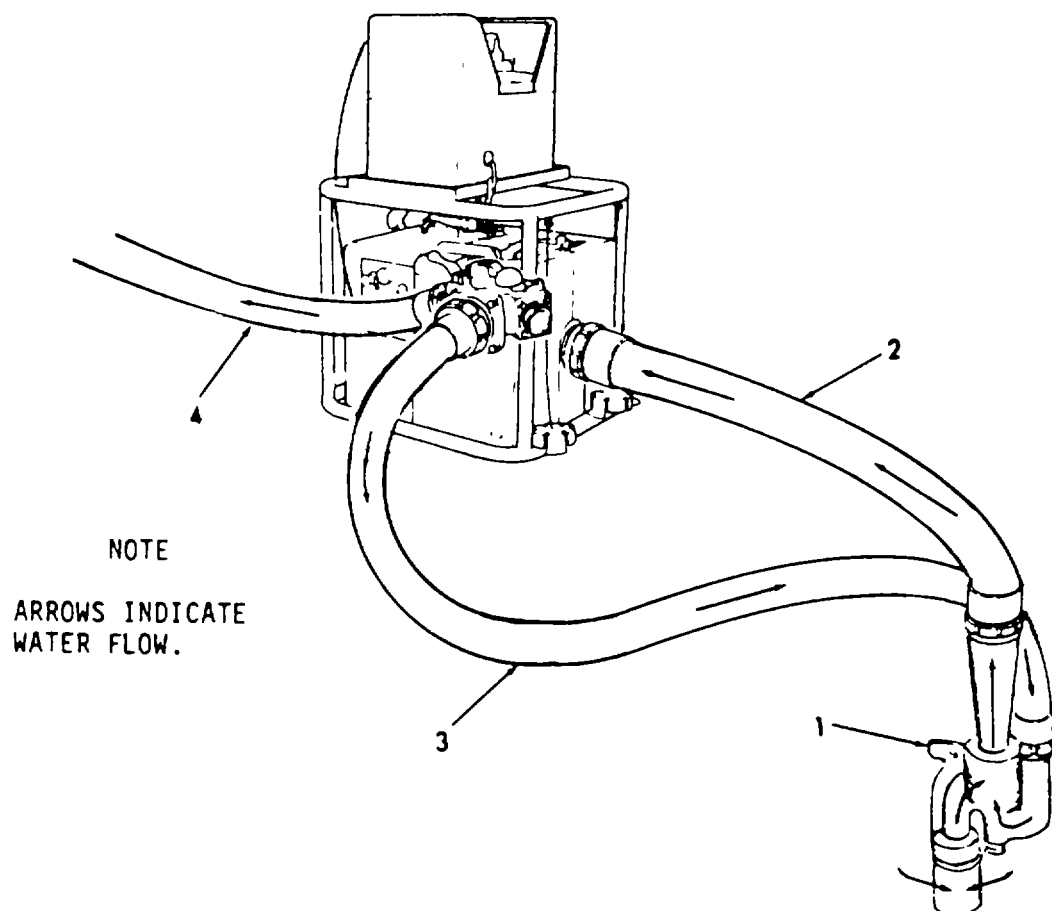
- (a) Install foot valve (1) on intake hose (2),
- (b) Attach line (3) to foot valve (1).
- (c) Operate fire pump.



(4) Water lift greater than 20 feet (6.1 meters):

- (a) Install educator (1) to intake hose (2).
- (b) Install discharge hose (3) to educator (1).
- (c) Install discharge hose (4).

2-199. APPLICATIONS - PORTABLE FIRE PUMP (Cont).



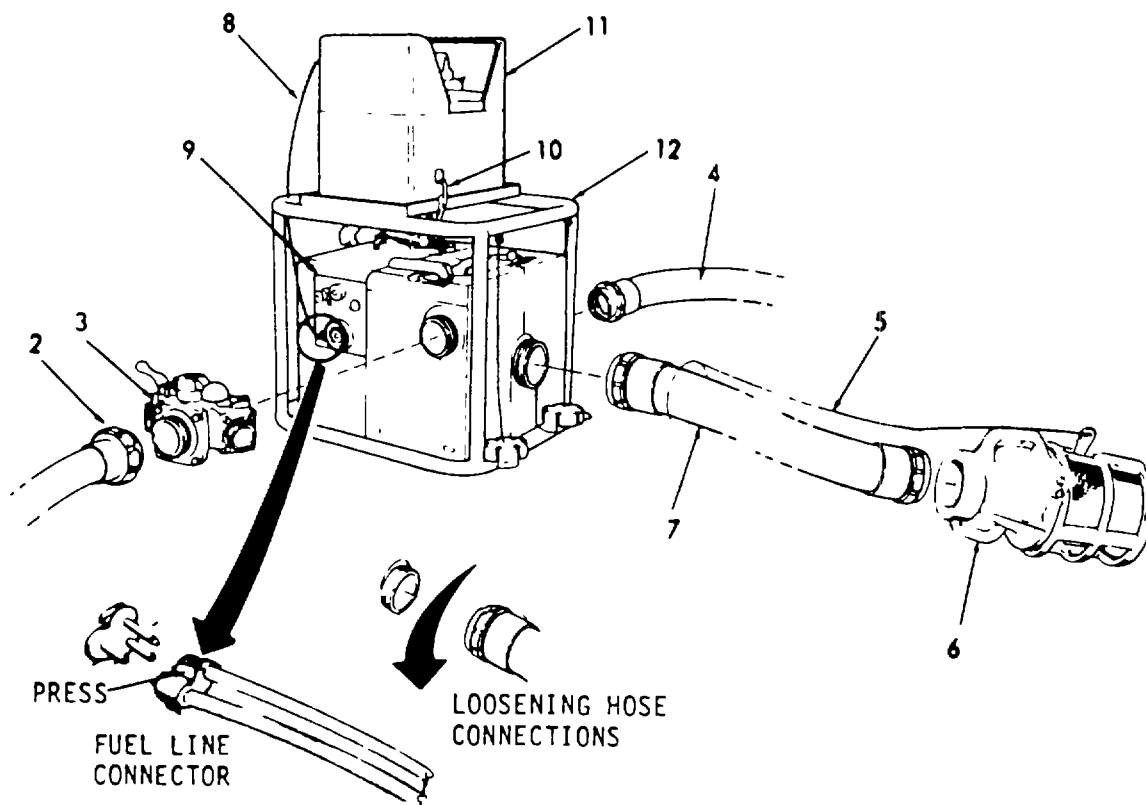
2-200. STOPPING AND STORAGE - PORTABLE FIRE PUMP.

a. To stop the fire pump, proceed as follows:

(1) Push the PUSH TO STOP ENGINE button (1).

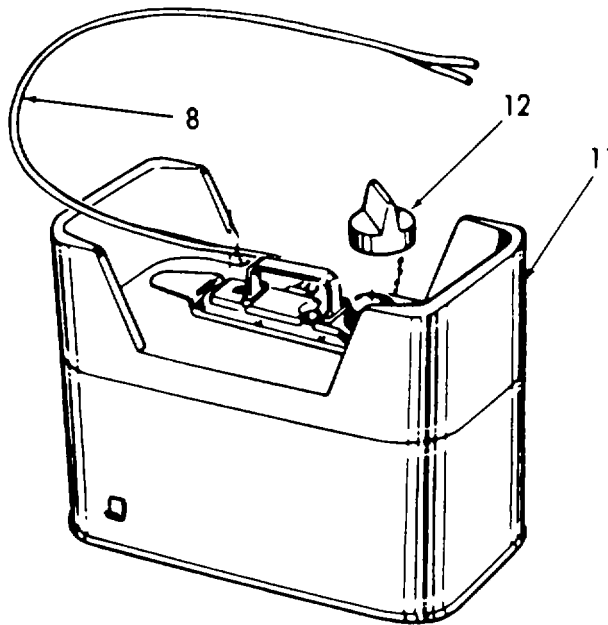
2-200. STOPPING AND STORAGE - PORTABLE FIRE PUMP (Cont).

- (2) Disconnect discharge hose(s) (2) and drain water.
- (3) Disconnect three-way-gate valve (3).
- (4) Disconnect exhaust hose (4).
- (5) Pull line (5) to release water trapped in foot valve (6).
- (6) Raise intake hose (7) and foot valve (6) to deck.
- (7) Disconnect foot valve (6) from intake hose (7). Drain hose.
- (8) Remove fuel line (8) from control panel (9).
- (9) Release catches (10) that attaches fuel tank (11) to pump (12).
- (10) Remove fuel tank (11).



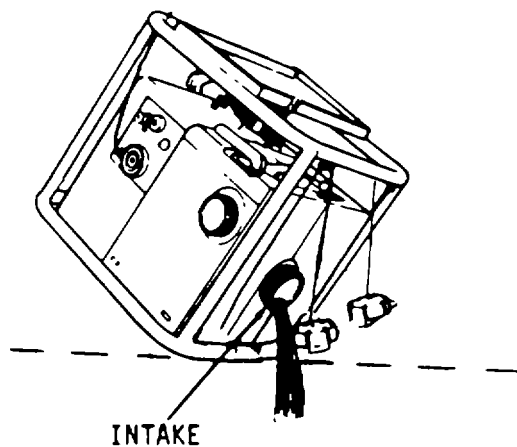
2-200. STOPPING AND STORAGE - PORTABLE FIRE PUMP (Cont).

- (11) Release tank pressure by loosening cap (12).
- (12) When tank pressure is released, tighten cap (12).
- (13) Wrap hose (8) around top of tank.



b. To prepare the portable fire pump for storage, proceed as follows:

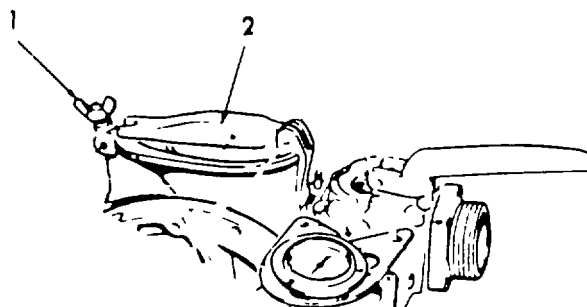
- (1) Tilt the fire pump so that the intake is down.
- (2) Tilt back and forth until all water is drained.
- (3) Repeat step 2 several times, each time returning the pump to its base, for about 10 seconds. This will allow more water to drain internally.



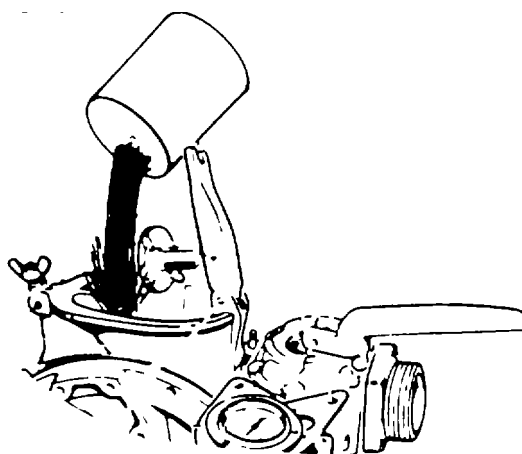
2-200. STOPPING AND STORAGE - PORTABLE FIRE PUMP (Cont).

(4) Loosen wingnut (1).

(5) Lift manual priming lever (2).



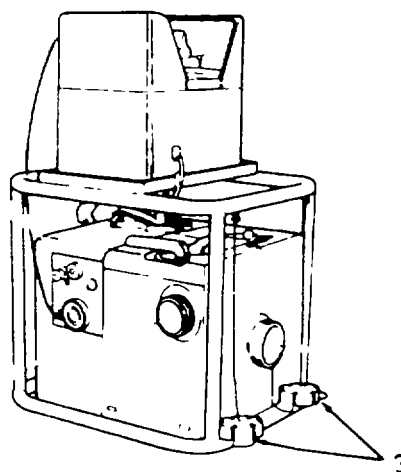
(6) Fill with water.



(7) Close lever (2) and secure with wingnut (1).

(8) Repeat steps (1 through 3).

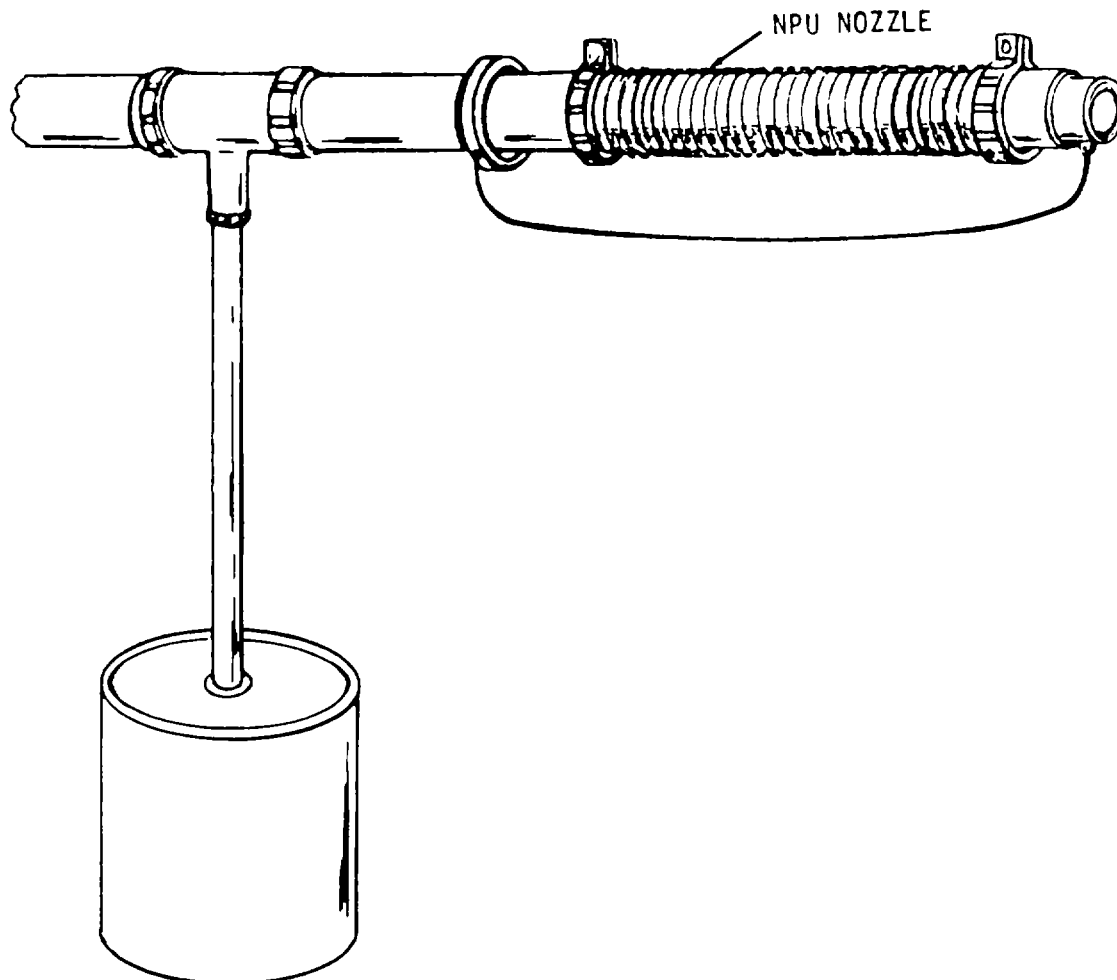
(9) Place protector caps (3) on the intake, discharge and exhaust connections.



(10) Place the portable fire pump and all of its component parts in the flammable liquid storeroom (1-4-2-A).

2-201. LIQUID FOAM.

- a. Liquid foam is contained in twelve, five-gallon cans. Eight cans are located on the port bulkhead between frames 52 and 55. Four cans are located in the vestibule (1-48-1-L).
- b. The liquid foam is mixed with water in a ratio of 6% foam and 94% water.
- c. The foam is mixed in a Navy Pick Up (NPU) nozzle that picks up the foam from the foam can.



2-202. EMERGENCY LIGHTING.

a. The emergency lighting consists of four types of hand lanterns.

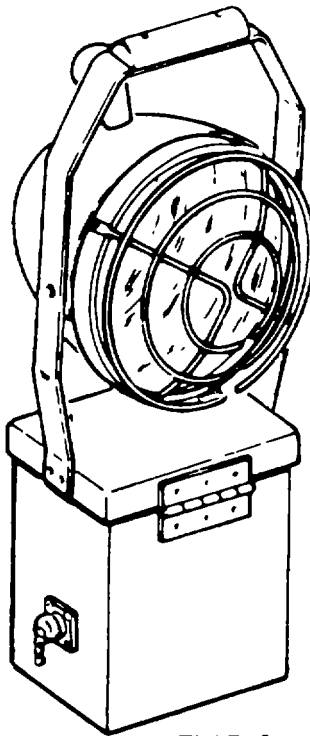
Type 1. portable high Intensity - rechargeable

Type 2. emergency without relay

Type 3. emergency without relay - with red lens.

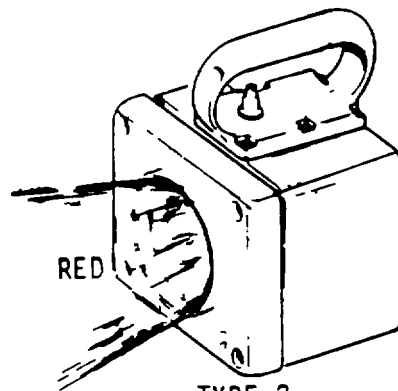
Type 4. emergency with relay.

b. The Type 1 (portable high intensity lantern) is used as a portable spot light.



TYPE 1

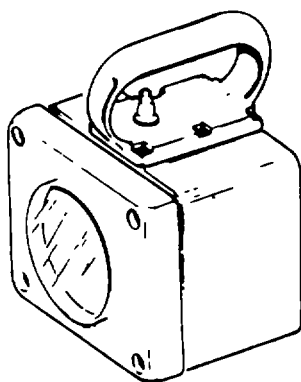
c. The Type 2 (emergency hand lantern with red lens) are located in areas where night vision is needed. They are turned on manually.



TYPE 2

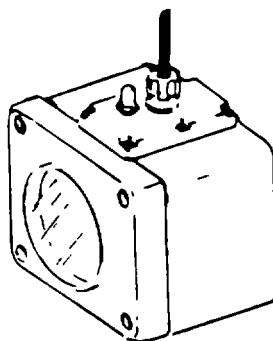
2-202. EMERGENCY LIGHTING (Cont).

- d. The Type 3 (emergency hand lanterns without relays) are portable and must be turned on manually.



TYPE 3

- e. The Type 4 lantern (emergency hand lanterns with a relay), operate automatically. When the compartment lights fall, the lantern will come on automatically. These lanterns are not portable.

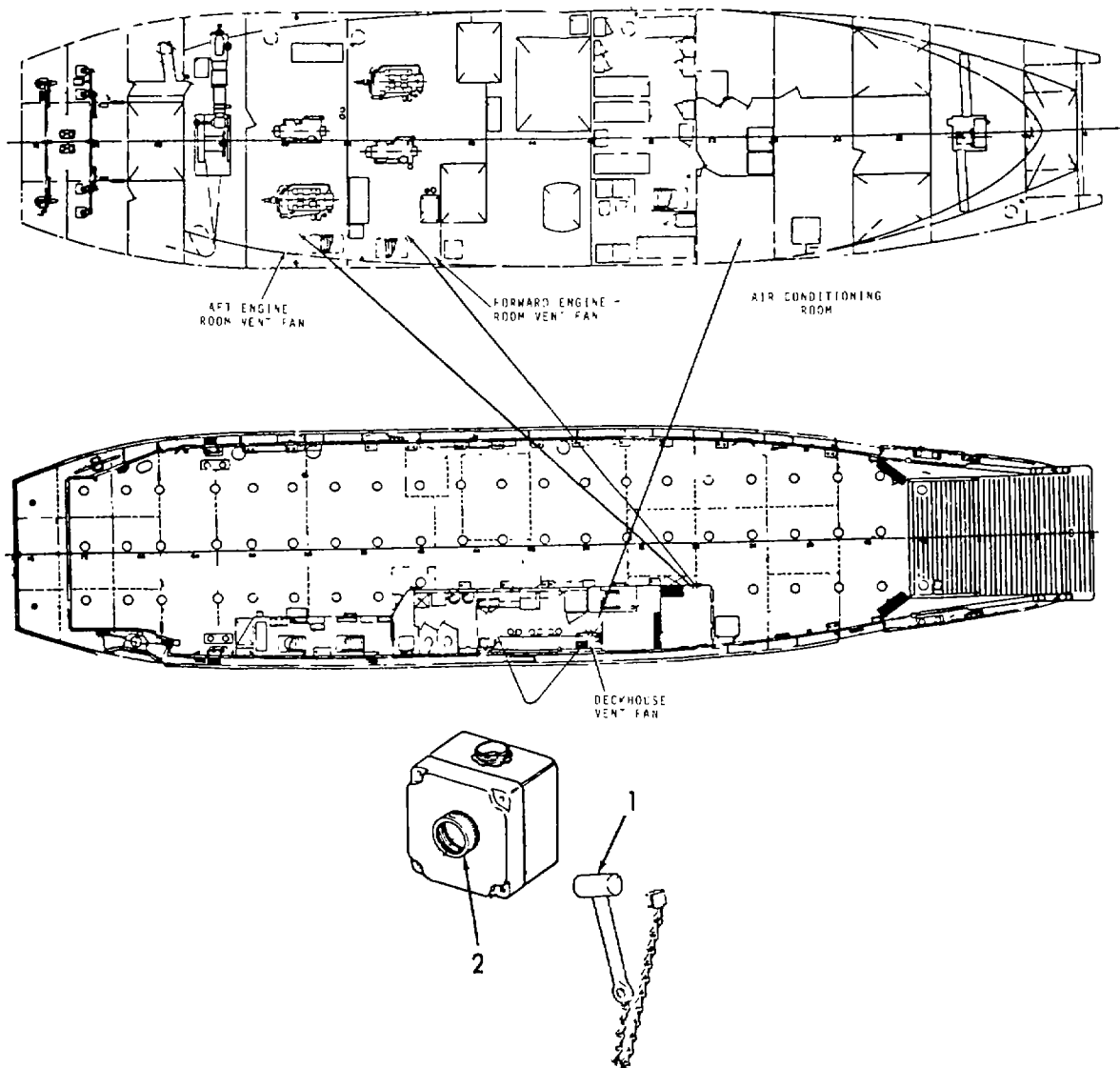


TYPE 4

- f. The emergency hand lantern locations are shown in Figure FO-65

2-203. BREAK-GLASS - SHUTDOWN STATIONS.

- a. The break-glass emergency shut down stations are used to shutdown ventilation fans in the following areas:
 - Bosun's Stores (2-20-0-A).
 - Deck House
 - Forward Engine Room
 - Aft Engine Room
 - Anchor Winch Room
- b. In addition, the air conditioner system can be shut down by an emergency breakglass station.
- c. The break-glass station locations are shown below.
- d. To operate a break-glass station, remove the hammer (1) and break the glass (2). The device will stop.



EMERGENCY STOP (BREAK-GLASS)

2-204. SALVAGE PUMP.

- a. The salvage pump is the portable fire pump. Refer to paragraph 2-196 for operating Instructions.
- b. When the portable fire pump is used in salvage work, a maximum discharge of water is required. This is obtained by the use of a combination of nozzles that produce a pressure of 40 to 45 psi. This is the lowest pressure that will produce the greatest discharge of water.

2-205. WATERTIGHT INTEGRITY.

- a. The watertight integrity on the landing craft consists of closing and securing the following:
 - hatches
 - scuttles
 - doors
 - manholes
- b. Figure FO-66 shows the location, and type of watertight devices.

2-206. LIFESAVING EQUIPMENT.

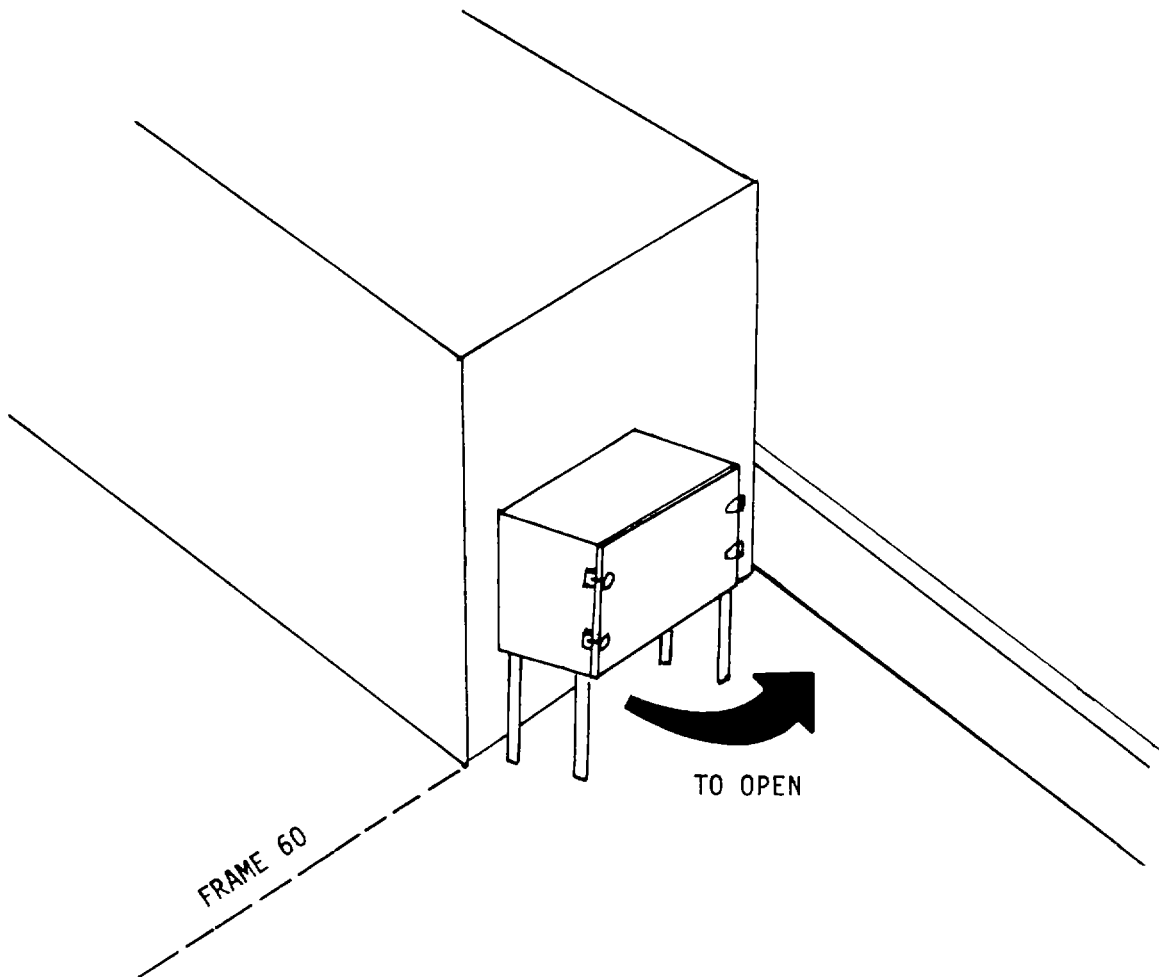
The following is an index to the lifesaving equipment contained on the landing craft.

<u>DESCRIPTION</u>	<u>PARAGRAPH</u>
Life Preservers	2-207
Life Rings	2-208
Life Boats	2-209
Oxygen Breathing Apparatus	2-210
Pyrotechnic	2-211

2-207. LIFE PRESERVERS.

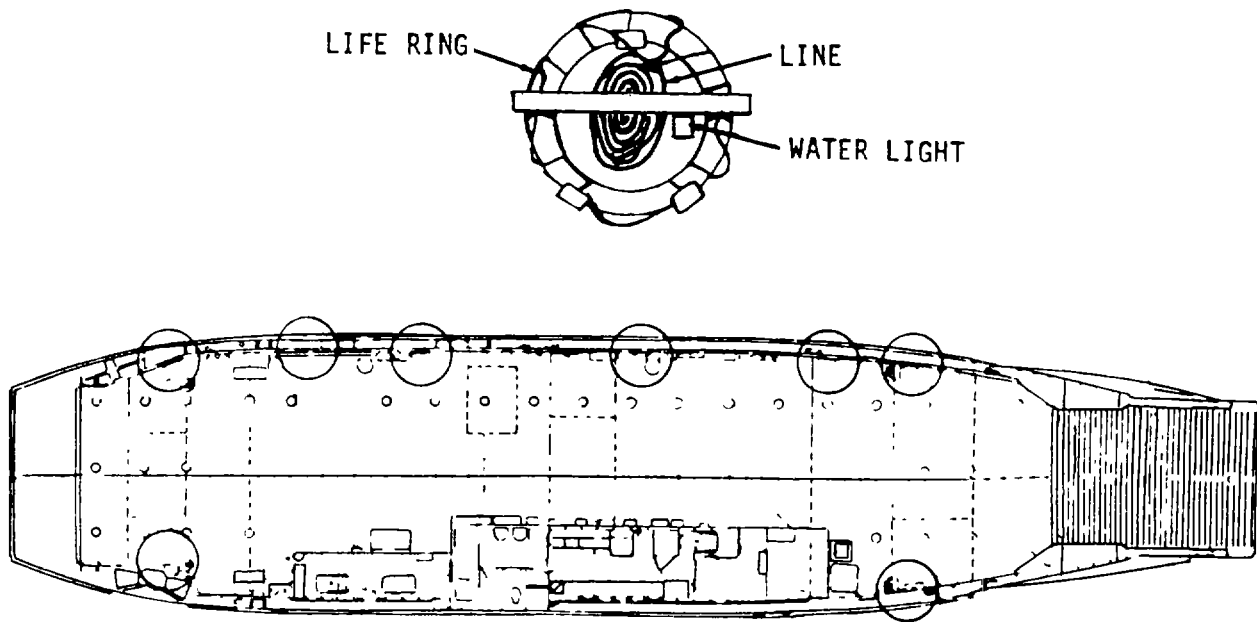
a. A stowage box for 15 life preservers is located at frame 60 portside cargo deck. To remove the life preservers, rotate the dogs and open the door.

b. The life preservers should be worn in accordance with standard practices



2-208. LIFE RINGS.

- a. Life rings locations are shown below.
- b. Suggested use is as follows:
 - (1) Attach a line to the life ring.
 - (2) Secure the other end to the vessel.
 - (3) Throw life ring in front of the person in the water.

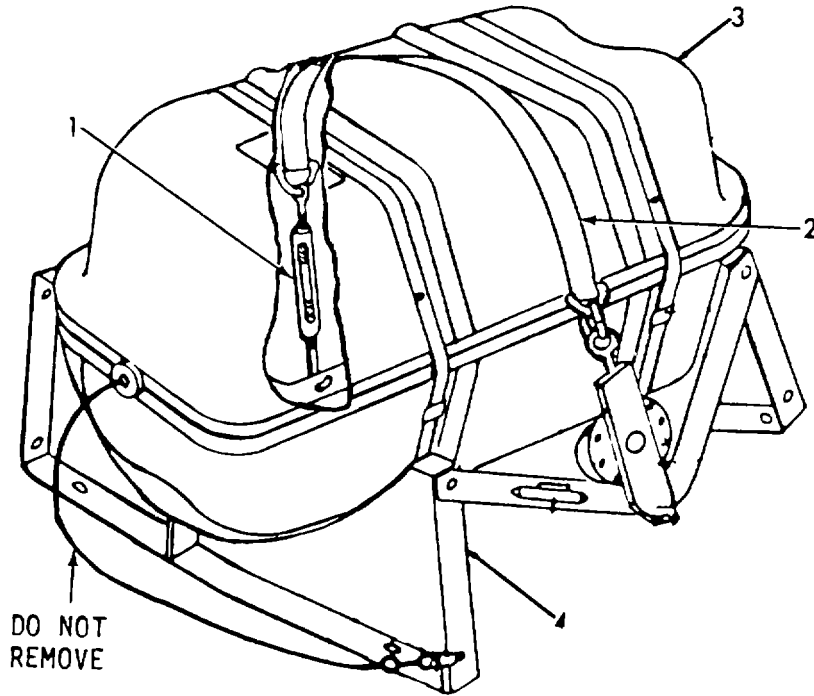


2-209. LIFE BOATS.

- a. Two inflatable 15 man life boats are stowed on top of the deck house.
- b. The operation of the lifeboat is as follows:
 - (1) MANUAL
 - (a) Rotate turnbuckle (1) to release strap tension.

2-209. LIFE BOATS (Cont).

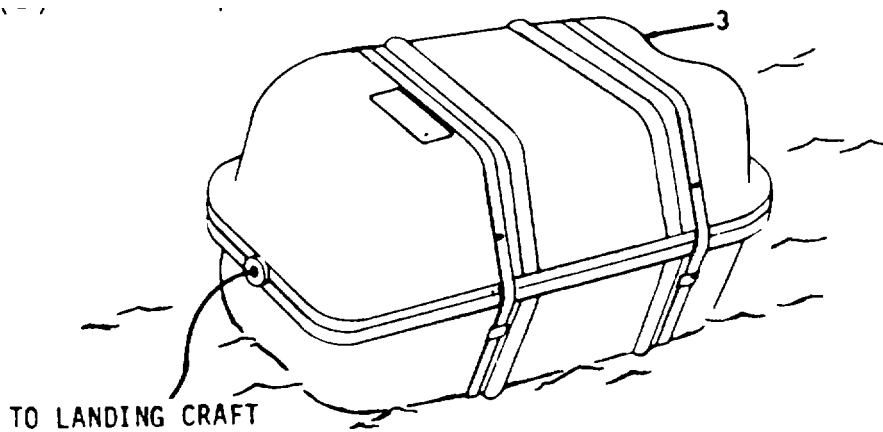
- (b) Remove retaining strap (2).
- (c) Remove canister (3) from cradle (4).



WARNING

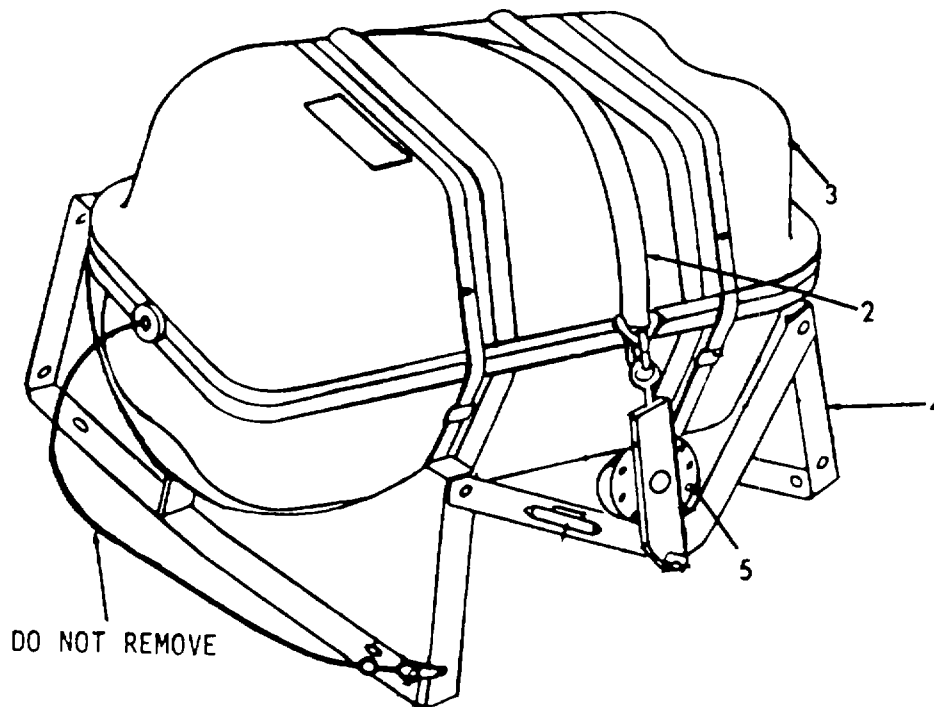
Do not remove painter that connects the canister to the cradle. The painter activates an automatic inflation device.

- (d) Place the canister in the water.
- (e) The sequence becomes automatic - see step (2)(a).



2-209. LIFE BOATS (Cont).**(2) AUTOMATIC.**

- (a) When the hydro release (5) is immersed in water, it will automatically release.
- (b) Strap (2) will release.
- (c) The canister (3) will float free of cradle (4).
- (d) The canister (3) will float until 100 feet of painter is released.

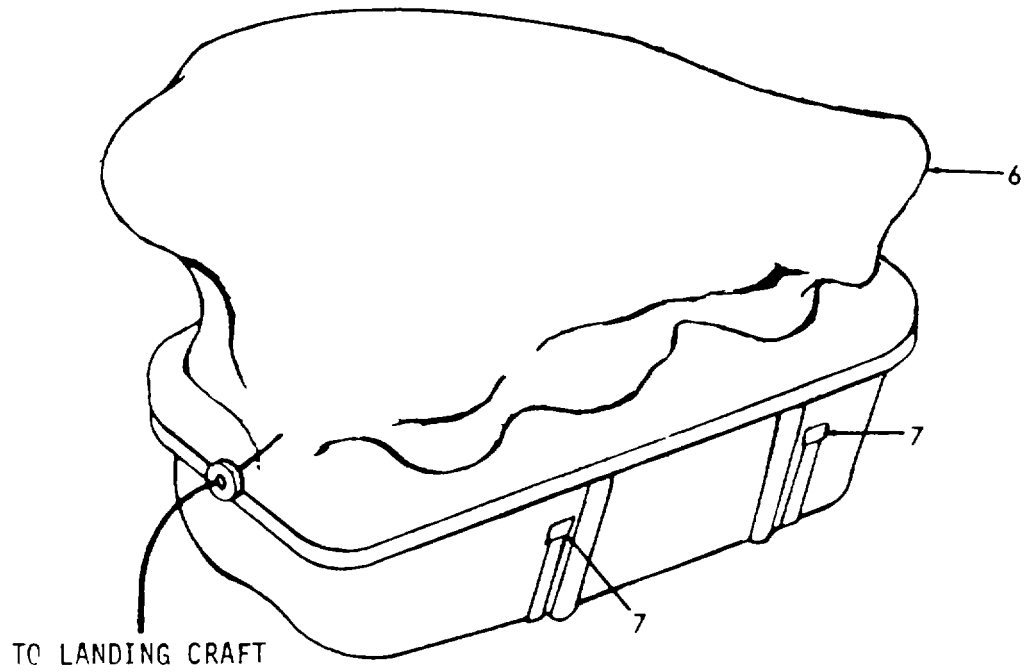


- (e) The life boat (6) in the canister starts to inflate.
- (f) The canister cover sealing strips (7) break.
- (g) The life raft expands until it is fully inflated.

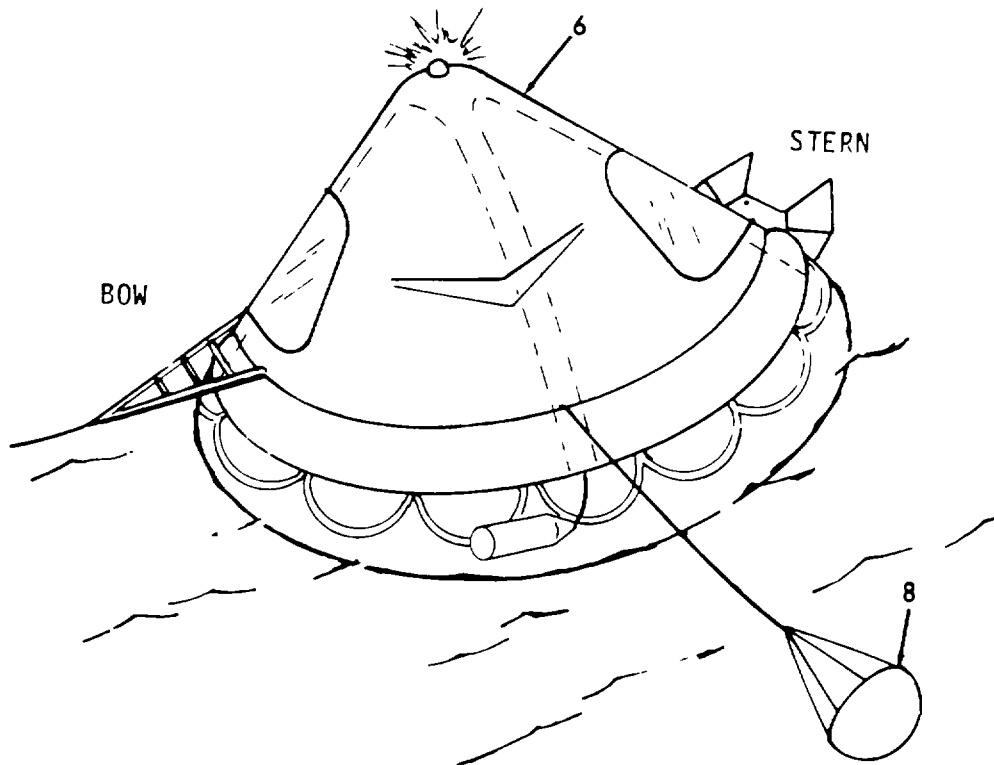
NOTE

The raft is inflated with CO₂. The CO₂ cylinder contains 20% more gas than is required to inflate the boat. The excess will escape from a relief valve.

2-209. LIFE BOATS (Cont).



(h) A sea anchor (8) is automatically released.



2-209. LIFE BOATS (Cont).

(3) The following is the operating and use of the lifeboat.

INTRODUCTION

The lifeboat you have boarded is made of neoprene proofed nylon fabric. It is immensely strong and will stand up to severe buffeting and weather conditions. It is important that you understand a few simple things about the boat to ensure your survival and early rescue.

The boat is circular in shape to give maximum stability but in order to help locate equipment, this manual will refer to a bow end and stern end. The bow end is where the painter is attached, is fitted with the gas cylinder and has no boarding ramp, whilst the stern is fitted with a boarding ramp.

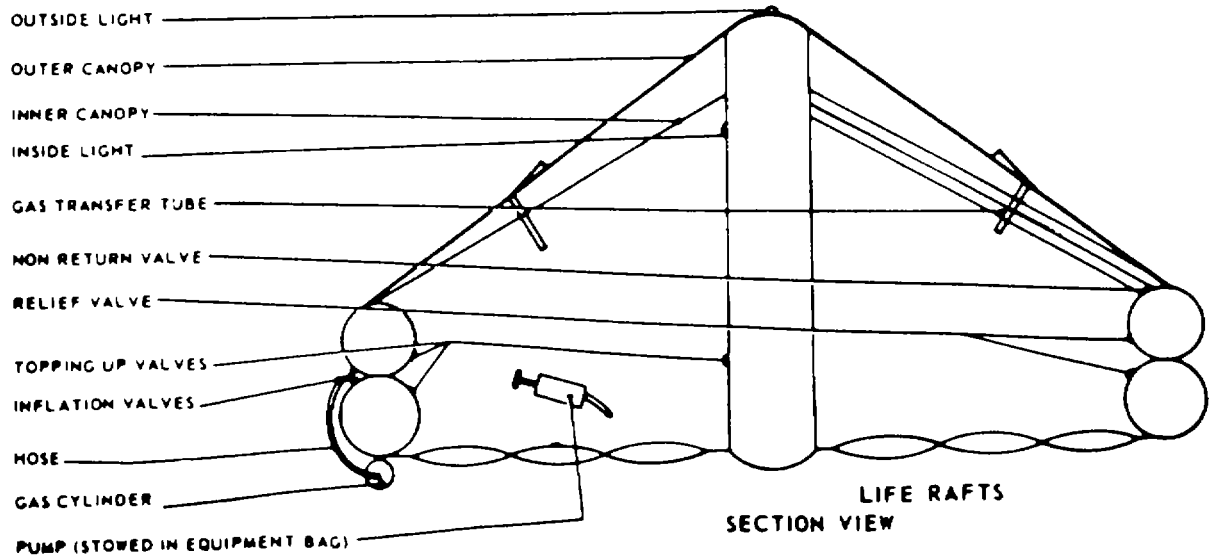
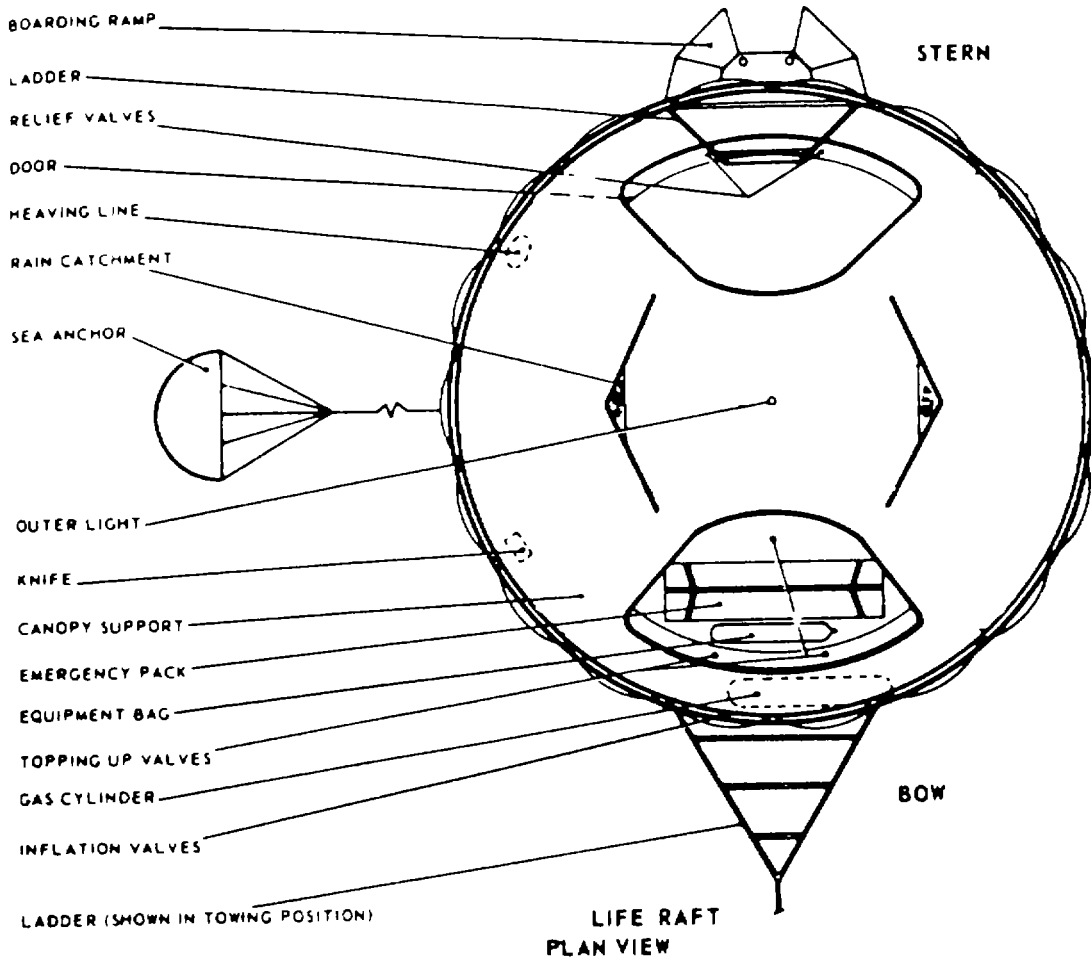
INFLATION

The boat is inflated with carbon dioxide gas, and to ensure rapid inflation even at low temperatures, more than sufficient gas is allowed. This extra gas will escape from the relief valves located in the stern doorway and may flow for over an hour depending on the temperature.

CLEARING SHIP

Make certain everyone has boarded a boat. Use the heaving line to assist survivors towards your boat. As soon as everyone has boarded the boat, get clear of the ship. Cut the painter with as much rope left on the boat as possible, as the rope may come in useful later on. A knife will be found in a special pocket inside the forward entrance. Pull the lanyard and the knife will follow. Use the paddles stowed in a bag in the stern entrance, to propel the raft away from the ship. After the painter has been cut a sea anchor will stream automatically to prevent drift in a wind. If the sea anchor is obviously not working, haul it and the painter in and separate the two as they are probably fouled. The sea anchor will not stream until the painter is cut, as a trip line is attached from the top of the sea anchor to a small ring allowed to run on the painter. The sea anchor will do nothing to prevent drift in a tideway and will hang limply if there is no wind. If, for any reason, you want the raft to move in the direction of the wind, haul in the sea anchor. It can be reached by crawling on the canopy to reach its attachment point on the life- line, half way between the two doors.

2-209. LIFE BOATS (Cont).



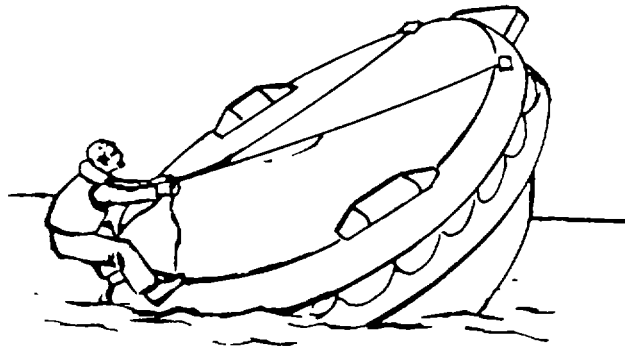
INFLATION SYSTEM AND LOCATION OF EQUIPMENT

2-209. LIFE BOATS (Cont).**TOWING**

Should it become necessary for the raft to be towed, use the ladder at the bow entrance as a towing bridle. The ladders at each entrance are attached to strong patches under the raft and will withstand towing loads without damaging the boat. Undo the ladder from its securing patch inside the boat and from the two tie tapes which furl the lower door, and attach the tow rope to the top of the ladder. Alternatively, limited towing may be undertaken using the painter if a sufficient length was retained when casting off from the vessel.

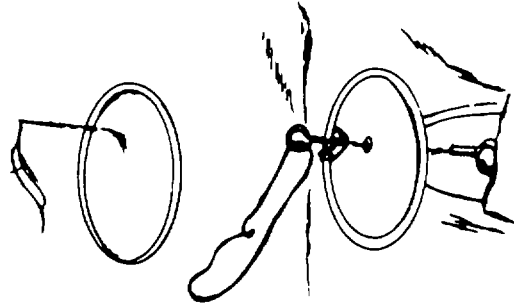
FLOTATION

This is the most Important aspect of survival. Get rid of sharp objects which may puncture the raft. In heavy weather spread out - don't all stand in the entrances but sit on the floor with backs to the buoyancy tubes and arms linked through the internal lifelines. With the survivors spread out in this way capsizing is almost impossible. Should the raft capsize, it can be righted even by one man as shown below.



Keep the sea anchor streamed. A spare sea anchor is stowed in the equipment bag inside the forward entrance, but do not stream two sea anchors at the same time. Stability can be increased and drift reduced by streaming unwanted gear over the side on the end of a length of painter rope or heaving line. Inflate the floor at the earliest opportunity unless you want to cool the raft. Pump it up with the hand pump located in the equipment bag until the two layers of floor are separated to give insulation. The buoyancy tubes can be topped up in the same way as inflating the floor. To use the pump simply push the adaptor on the pump hose into the topping up valve orifice. After completing topping up, pull the pump hose out and the valve will seal automatically.

Repair clamps will be found in the equipment bag and also in the repair kit in the emergency pack. These should be used as shown below. Use smallest clamp that will cover the damage and enlarge the hole if necessary to get the lower plate inside. This will effectively seal a cut or tear in the fabric.

2-209. LIFE BOATS (Cont).

Small areas of damage which are dry, or can be dried, may be repaired with the repair kit. Use the cement as a solvent to clean the area and then apply at least three coats of cement to both faces to be joined. Allow each coat to become tacky before applying the next and before joining. Press the joined parts into firm contact.

PROTECTION

Having made certain that all survivors are in the boat, the next step is to provide protection, especially if it is cold. Check, or carry out the following:

Inflate the floor.

Close the doorways, especially at the weather end. Follow instruction label at each door and close the outer, upper door first.

Ball any water out of the boat and sponge it dry. Bailer and sponge are located in emergency pack, or equipment bag.

In hot weather deflate the floor and close the entrance at the sunny side only if extra shade is required. (Floor can be deflated by depressing the valve with the pump adaptor or finger.)

LOCATION

Post a lookout as soon as possible. A lookout can still be maintained with both doors closed by using the gusset at one side of the inner door and leaving the outer door slack at one side. In this way the lookout will keep warmer and less heat will be lost from the raft. Do not attempt to paddle your way to land, unless it is very close. Conserve your energy for survival. The chances are that someone knows roughly where you are and it eases the search problem if you stay there. During daylight the lookout should have the signaling mirror handy and use it whenever possible since reflection from it can be seen up to 10 miles (16.1 km) away.

2-209. LIFE BOATS (Cont).

Instructions for use are printed on the back of the mirror. Read the instructions supplied with the distress signals. Do not use distress signals too soon; wait until the search ship or aircraft is the nearest it is likely to be on its present course. The combination flare and smoke signals can each be used twice, once during daylight when the flare end may be used. After using one end, douse the signal to cool it before storing away. An illustrated table of international lifesaving signals is included in the equipment bag. When you are located, stay in the raft, don't be tempted to swim to the rescue ship. The light on top of the boat will help but it is provided primarily to assist survivors in finding the raft at the time of the casualty. During daytime the lights can be conserved by removing the water activated cells and shaking them dry. The cells are located at the forward entrance just under the waterline. Use the flashlight at night to attract attention; the beam will be seen for many miles if aimed at a ship or aircraft.

INTERNATIONAL MORSE CODE

A . -	J . - - -	S . . .	1 . - - - -
B - ...	K - . -	T -	2 . . - - -
C - . - .	L . - . .	U . . -	3 . . . - -
D - . .	M - - -	V . . . -	4 -
E .	N - .	W . - - -	5
F . . - .	O - - -	X - . . -	6 -
G - - .	P . - - .	Y - . - -	7 - - . . .
H	Q - - . -	Z - - . .	8 - - - . .
I . .	R . - .		9 - - - - .
			0 - - - - -

INTERNATIONAL DISTRESS CALL

SOS ... - - - ...

SURVIVAL

Hope for rescue. Plan to stay alive.

Do not give up hope if you are not rescued immediately. Your raft is comparatively small and may take time to find, especially in a rough sea. It is, therefore, vital that you should plan for one thing above everything else - stay alive.

2-209. LIFE BOATS (Cont).

Water is most essential for survival. Unless there is abundant fresh water from rainfall, you must reduce to a minimum the output of water from your body as only in this way can you reduce the amount you drink safely. Reduce output of water by laying still to reduce sweating. Do not drink alcohol in any form. Eat only the food provided in the emergency pack - other food takes water from the body to aid in digestion. Bathe in sea water to reduce sweating if hot, but on no account drink sea water - even diluted. When it rains, drink all the water you can and store the rest in anything that can be used; emergency pack bags, sponges, etc. Some water can be collected in the sponge from condensation off the inside canopy or morning dew on the outside canopy.

USE OF DISTRESS SIGNALS

Like most man-made devices there is a right way and a wrong way to use distress signals.

The following hints are intended to assist you to obtain the maximum benefit from your distress signals should you be in the unfortunate position of having to use them.

SIGNALING BY NIGHT

The maximum ranges at which distress signals can be seen at night in good visibility conditions are as follows:

Rocket Parachute Signals	25-35 miles (40 to 56 km)
Hand Flares	5-10 miles (8 to 16 km)

NOTE

Remember that these ranges will be reduced considerably in poor visibility conditions such as usually exist when distress signals are required to be used.

In view of the above it is obviously a waste of valuable signals to display them unless the following conditions exist:

- (a) PARACHUTE SIGNALS. You have good reasons to believe that a possible rescue ship, or an aircraft, or an inhabited shore, is within the estimated visibility range of your signals.
- (b) HAND FLARES. The lights of a ship or aircraft or lights on shore are visible to you.

To Save Your Signals May Save Your Life.

2-209. LIFE BOATS (Cont).**USE OF DISTRESS SIGNALS (Cont)****SIGNALING BY DAY.**

The official daylight signal is the Buoyant Orange Smoke Signal. These, however, have a very limited visibility range especially in a stiff breeze.

Many tests have shown that in normal daylight conditions a hand flare or a rocket parachute signal can be seen at a greater range than can an orange smoke signal. The ideal combination, therefore, is smoke and flare.

RADAR REFLECTIVE ROCKET SIGNALS

These signals, not widely used as yet, eject a cloud of radar reflective material which produces a distinctive echo on a ship or aircraft radar for a period of 10 to 20 minutes and from a considerable range.

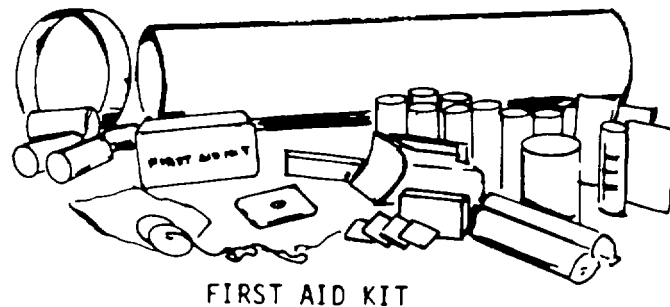
They can therefore be used both by day and night when it is considered that a search for survivors is in progress.

READ THE INSTRUCTIONS

Whatever the signals, always carefully read the Instructions affixed to them before attempting to fire them and follow those instructions precisely.

FIRST AID

The following instructions are also included in the first aid kit with Illustrations of use on each package.



FIRST AID KIT

2-209. LIFE BOATS (Cont).**INSTRUCTIONS FOR USE OF CONTENTS FOR INFLATABLE LIFE BOAT FIRST AID KIT**

ITEM	NO. PER PKG.	SIZE OF PKG.	DIRECTIONS FOR USE
Bandage Compress - 4" Bandage Compress - 2"	1 4	1 1	Apply as a dressing over wound. Do not touch part that comes in contact with wound.
Adhesive Compress - 1"	16	1	Apply as dressing over small wounds. Don't touch part that comes in contact with wound.
Eye dressing packet- 1/8 oz. Ophthalmic Ointment, Cotton Pads and Adhesive	3 of each	1	Apply as dressing over inflamed or injured eye. Apply in space formed by pulling lower eyelid down once daily, for inflamed or injured eyes. Don't touch eyeball with tube.
Gauze Bandage Compress 2" x 6 yds	2	1	For securing splints, dressings, etc.
Tourniquet, Forceps, Scissors & Safety pins	1, 1, 12 resp.	2	For control of hemorrhage. Loosen for a few seconds every 5 minutes. Use to remove splinters or foreign bodies. Don't dig.
Wire Splints	1	1	Pad with gauze and mold to the body to immobilize broken bones. Hold in place with bandage. Do not attempt to set bond.
Ammonia Inhalants fainting or collapse.	10	1	Break one end and inhale for faintness,
Iodine Swabs, 1/2 ml.	10	1	Remove protective sleeve, crush tube and apply with swab. Don't use in or around eyes.
Aspirin, Phenacetin Caffeine Comp. 6-1/2 gr. tablets	40	1	Chew up and swallow 2 tablets every 3 hours for headache, colds, minor aches, pains and fever. Maximum of 8 in 24 hours.

2-209. LIFE BOATS (Cont).

INSTRUCTIONS FOR USE OF CONTENTS FOR INFLATABLE LIFE BOAT FIRST AID KIT (Cont)

ITEM	NO. PER PKG.	SIZE OF PKG.	DIRECTIONS FOR USE
Sterile Petrolatum Gauze	4	1	Petrolatum gauze bandage is applied in at least 2 layers over the burned surface and an area extending 2" beyond it. The first dressing should be allowed to remain in place, changing only the outer, dry bandage as needed, for at least 10 days, unless signs of infection develop after several days, in which case the dressing should be removed and the burn treated as an infected wound. Watch for blueness or coldness of the skin beyond the dressing if they appear.

ARTIFICIAL RESPIRATION

If any survivor is apparently drowned, carry out the following procedure, known as insufflation, rescue breathing, or mouth to mouth resuscitation:

1. If air passage is blocked, clear at once by striking victim sharply on back, by dislodging the obstruction with your fingers, or by drawing it out by suction.
2. Start insufflation Immediately - The first several seconds are vitally important. Do not delay resuscitation.
3. Place victim on his back with neck fully extended (head back). A coat or something placed beneath his shoulders will help maintain this position.
4. Elevate victim's jaw by inserting your thumb between his teeth, grasping the lower jaw and lifting it forcefully upward until the lower teeth are higher than the upper teeth.
5. Close victim's nose by pinching the nose between the finger and thumb.
6. Cover victim's mouth by placing your mouth completely over his with airtight contact.
7. Blow air into the victim's lungs until you see the chest rise (less forcefully for children); remove your mouth and let him exhale. If chest does not rise, check the position of his head and jaw (steps 3 and 4); check for air passage obstructions.

2-209. LIFE BOATS (Cont).

8. Repeat the above steps 12 times a minute until victim revives (20 times a minute for children).

RADIO

If the boat carries a voice radio, the International Distress Call is the word MAYDAY, repeated three times, followed by the message, also repeated three times.

FURTHER MEDICAL ASPECTS OF SURVIVAL

As a survivor, you will find it difficult to get dry after you get aboard a lifeboat from the sea. It is more difficult to remain so because of almost continuous condensation of moisture on the inner surface of the canopy and on the buoyancy tubes. The air inside becomes saturated to almost 100 percent relative humidity. The canopies, tubes, and floor condense the moisture and water drips like rain. The bottom of the boat and the buoyancy tubes are from 5 to 15 degrees below air temperature. Frequent massage and warming of the feet in your shipmate's lap or under his arms are measures which should be taken to prevent immersion foot. Sleeping in a loaded boat is next to impossible because of the crowded quarters, the changes in temperature, and the tossing and pitching of the boat. You will lose some weight but the loss should not be excessive. Your urine output will be greater in cold weather than in warm because in warm climates more water is lost by evaporation. In cold weather there will be an increase of oxygen consumption and in warm weather a decrease. The effect that food has on dehydration is difficult to measure. However, proteins use more water than carbohydrates. Because of need for water conservation, protein foods are not included in the rations. There should be very little decrease in strength with the rations on hand.

EXPOSURE TO COLD

In northern waters your greatest danger after abandoning ship will be from the various effects of cold, the most serious immediate effect being excessive body cooling which may result in death caused by a failure of the heart. Fatal cooling is more apt to occur in water than in air because wetting greatly decreases the insulating effect of clothing and because water displaces the layers of still air that normally surrounds the body and holds the heat inside. Therefore, ordinary clothing gives you no protection against cold if you are immersed in water.

The secondary but still serious danger is that of local injury by cold (frostbite, immersion foot, etc.).

Death from immersion in very cold water at 50°F (10°C) and below has been reported to occur within a very few minutes after abandoning ship. Possibly cold causes death in these cases by some mechanism other than the generalized body cooling that has been studied in laboratories.

2-209. LIFE BOATS (Cont).

Even when the water temperature is as high as 70°F (21°C), a man may remain in the water for a limited time only. A gradual fall in body temperature will take place, and the blood volume will decrease because of the transmission of blood fluid to the tissues when the temperature falls. If not enough clothing is worn or if the clothing becomes wet, all possible measures should be improvised on the boat to try and keep clothing dry in cool weather. When you abandon ship, take with you as much clothing as possible, especially waterproof clothing and heavy undergarments. Huddle together for warmth. Water on the floor of the boat should be carefully sponged out whenever practicable.

Food and exercise increase body heat production and are of value in protection against cold. Alcoholic beverages should not be consumed for their use causes loss of body heat; and the blood vessels at the surface of the skin dilate, which allows the heat to escape.

Alcohol also causes the loss of body water as urine, and the endeavor aboard a raft is to conserve the water supply. Even in tropical waters with the temperature above 80°F (26°C) aboard a life boat you will feel cold at night if your clothing is wet, and this chilling will interfere with your sleep and accelerate exhaustion. Therefore, every effort must be made to dry clothing before nightfall. You are advised to exercise if you cannot keep warm otherwise.

Even though the body may be protected sufficiently to combat generalized chilling, the hands or feet of survivors may be damaged. Frost-bite and immersion foot are the common types of serious injury resulting from such over-exposure. Survivors whose body temperatures have been lowered to levels which can be fatal should be rapidly rewarmed.

IMMERSION FOOT - Immersion foot is the swelling of the feet accompanied by numbness and pallor or purplish discoloration; it may finally lead to gangrene and loss of part of the foot. The hands may be affected by the same disease; however, this is less common. The manner in which this injury is caused is not completely understood, but an important cause is interference with blood circulation in the legs due to the combination of cold and cramped position. With ordinary foot gear, which does not protect the feet from wetting, the condition commonly occurs when temperatures of the water are below 50°F, (10°C). The lower the temperature the more rapidly it occurs.

Generally, rapid injury to the feet occurs only in water at below 50°F (10°C), but occasionally injury occurs to feet that have been immersed for long periods of time (many days) in water of considerably higher temperatures (as high as 70°F (21°C). If you wish to prevent Immersion foot, promote circulation of the blood and keep the feet warm. Exercise the ankles and toes for several minutes, several times a day. Keep the feet elevated as much as is possible. Avoid constriction of the limbs by tight clothing. If shoes become too tight, unlace them. If necessary, take them off. The feet should, of course, be kept out of water for it is of the greatest importance to keep the feet dry to prevent cooling.

2-209. LIFE BOATS (Cont).

Everything that can be wrapped about the feet to keep them warm should be used. Every effort should be made to keep this insulation dry. If available, dry socks should replace those which become wet and the wet ones should be dried for future use.

If no extra clothing or wrapping is available and the feet get cold, put them under the arms or in the lap of a companion. Keeping the body warm also aids in keeping the feet warm. Immersion foot should never be treated by rapid heating. No rubbing should be used for either Immersion foot or frostbite.

FROSTBITE - Frostbite, resulting from freezing of the tissues, ordinarily will not occur in parts of the body that are immersed in sea water. Sea water freezes at about 28°F (2°C), and a temperature below that is necessary to cause frostbite; however, in the vicinity of land masses with temperatures below zero, the hands, face and feet may freeze in the air - particularly if there is a high wind. Frostbite occurs in temperatures as high as 10°F (-12°C), when it is windy. Survivors who are chilled, malnourished and wet may suffer frostbite in still higher temperatures because their normal circulation is curtailed. Measures of preventing frostbite are similar to those for preventing immersion foot. You must keep the body and exposed parts as warm as possible and avoid interference with the circulation. Since severity of the damage depends upon the duration and extent of freezing, survivors should examine the suspected parts, such as an unusually pale ear, for evidence of frostbite. If frostbite has occurred, the part should be thawed by placing it in contact with a warm part of the body. Friction should not be employed to induce thawing since it may cause further damage to the frozen tissue.

It is important that, even after rescue, neither immersion foot nor frostbite be treated by friction, by rapid rewarming of the affected part with hot water, by exposure to hot surfaces, or by other similar means.

DRINKING WATER - In tropical waters dehydration is the principal cause of exhaustion and death of survivors. Under the most favorable circumstances a man can survive without water for only 8 to 10 days on the average. A man without food, but supplied with water, may live for 30 days or more. When sweating is held to a minimum, as in semifasting, men who are sitting still and consuming a small amount of food, the daily requirement of water necessary to prevent the deterioration of the body's performance is between 16 to 32 ounces (473 to 946 ml). An intake of 16 ounces (473 ml), or a pint of water a day is regarded as the absolute minimum; however, this is likely to be insufficient to meet the water needs of some men.

Maximum air temperature of between 85° and 95°F (29° to 35°C), will be encountered in tropical ocean areas. Under such conditions, the heating of the body by direct rays of the tropical sun causes loss of the heat from the body by increased evaporation of perspiration. Even in cool climates some water is inevitably lost from the body as moisture in the exhaled breath and as water evaporated from the skin.

2-209. LIFE BOATS (Cont).

In the warm climates, unless the body is kept cool by other means, a great amount of water is lost automatically by evaporation from the skin in order to prevent the body temperature from rising. This extra loss can increase the daily requirement of water from the 24 ounces (710 ml) average need in cool climates to as much as 80 ounces (2366 ml). The extra loss may occur even though no perspiration is actually observed on the skin; therefore, when in the tropics every effort should be made to use other measures that will cool the body.

It is better to conserve the water in the body by decreasing its loss through evaporation than by increasing the amount consumed. It is emphasized that excessive sweating must be avoided. Procedures to control sweating are: During the heat of the day in hot climates the clothing should be kept wet; however, an hour before sundown the clothes should be allowed to dry thoroughly. Utilize the wind for this, but keep in the shade of the canopy. The wind is cooler, generally speaking, than the direct rays of the sun and, therefore, should be used at every opportunity.

HAZARDS - Fear is a normal reaction to a lonely and relatively dangerous situation. At times it may seem that there is no hope of rescue. Hunger, fatigue, thirst, and exposure may increase this fear. Hopefulness and rest are the only cure. Remember that many men have been in your same predicament, lived, and recovered fully from the experience. Occupy your waking hours with talking and singing. Get as much rest and sleep as possible. It is normal to see mirages; they are optical effects and not symptoms of physical or mental disturbance. If you can be cheerful, it will be a tonic to you and an encouragement to your companions.

MORALE - One of the most important factors affecting your well-being and your chances of survival when you are in a life boat is your morale. It is essential that you plan activities carefully so that you get adequate rest, but at the same time, keep busy a good part of the time. Try to work out some kind of a schedule of activity which includes rest, securing fresh water, and so on. You will find that keeping yourself occupied according to schedule will not only help you take care of your needs better but will also keep your in good spirits.

LEADERSHIP - In the life boat, experience shows that a group with a capable leader will not only be happier but will be more skillful in coping with environmental problems of food, water, and shelter. As a leader, or as one who wishes to cooperate, watch out for the man who becomes excessively noisy, especially if he then becomes depressed and withdraws from the group. Some men may imagine things, such as people on an imaginary island nearby. Such men may attack others or steal all the rations or water. Sleeplessness, pain, fear, hunger, and thirst are often factors in these cases. The problem is to try to prevent this sort of degeneration of character.

2-209. LIFE BOATS (Cont).

The leader must organize and plan the daily regime aboard the boat. He must arbitrate disputes. He must be willing to hear the opinions of the minority. Simple devices such as joking, storytelling, recounting events from the past lives of each survivor, prayer, and singing will serve to offset the dreaming and brooding brought on by the environment. The leader should also educate his crew. If the entire group is checked out on search and rescue techniques and facilities, they may realize that their situation is not so hopeless as their ignorance had suggested. The fact that most survivors from ships have been rescued, usually within a few days or less, will alleviate fears. Training or a review of survival procedures and equipment will pass time which might otherwise be spent by some men in moody thought.

KEEP A LOG

2-210. OXYGEN BREATHING APPARATUS.

- a. The oxygen breathing apparatus (OBA) is located in the following areas:
 - Engine Access Room
 - Crew and Transient Berthing
- b. The OBA equipment should be used in accordance with standard practices.

2-211. PYROTECHNIC.

- a. The pyrotechnic devices are as follows:
 - fluorescent sea markers
 - pistol
 - smoke and illumination distress signals
- b. The above items are located in the pyrotechnic locker on the vehicle deck, forward of the deck house.
- c. In addition, there are aircraft lights located on the deck house roof.

INDEX

Paragraph

A

Air Compressor Turn ON/OFF	2-146.5
Air Conditioning System	2-109
Circulating Fans	2-111
Sea Water Cooling Pump	2-110
System Shut-down	2-113
System Start-up	2-112
Aircraft Flood Lights	2-166
Air Horn Air Compressor System	2-146.4
Air Horn Operation	2-146.6
Alarms - Hal on System	2-117
Alarm System	2-110
Alarm System - Test	2-113
- Turn - Off	2-114
- Turn - On	2-111
System Alarms	2-112
Anchor "A" Frame	2-67
Anchor Inhaul - Anchor Winch	2-50
Anchor Winch and "A" Frame	2-46
Anchor Winch - Anchor Inhaul	2-50
Anchor Winch Engine - Local Start/Stop Cold Weather	2-48
- Local Start/Stop Warm Weather	2-47
Anchor Winch - Remote Operation and Payout	2-49
Anchor Winch - Stop	2-51
Anchor Winch Engine - Emergency Start	2-184
- Emergency Stop	2-182
- Local Start/Stop Cold Weather	2-48
- Local Start/Stop Warm Weather	2-47
- Restart After Emergency Stop	2-183
Anchor Winch - Stop	2-51
Anchor Winch System - Emergency Procedures	2-181
Anchor Winch Engine - Emergency Start	2-184
- Emergency Stop	2-182
- Restart After Emergency Stop	2-183
Cutting Anchor Cable	2-185
Applications - Portable Fire Pump	2-199
Automatic Steering	2-60

B

Ballast System	2-91
Draining Ballast Tanks - Using Fire Pump	2-95
- Using Gravity	2-93
Filling Ballast Tanks - Using Fire Pump	2-94
- Using Gravity	2-92
Battery Charger/Exhaust	2-127
Bilge Draining	2-82, 2-98
Bilge Pump Shutdown	2-84

INDEX (Continued)

Paragraph

B (continued)

Bilge Draining	2-82
Bilge Pump Shutdown	2-84
Draining Bilge with Bilge Pump and Fire Pump	2-90
Draining Bilge with Bilge Pump	2-83
Draining Bilge with Fire Pump and Eductor	2-88
Draining Bilge with Fire Pump	2-85
Draining the Firemain System	2-87
Fire Pump, Bilge Draining Shutdown	2-86
Fire Pump and Eductor Shutdown	2-89
Bow Ramp	2-52
Lowering Bow Ramp - Local	2-55
- Remote	2-53
Raising Bow Ramp - Local	2-56
- Remote	2-54
Bow Ramp System - Emergency Procedures	2-187
Bow Ramp - Lowering	2-188
- Raising	2-189
Break-glass, Shut-down Stations	2-203

C

Centralized Hydraulic System	2-63
Anchor "A" Frame	2-67
Main Mast - Lowering	2-66
- Raising	2-65
Preliminary Adjustments	2-64
Stern Gate - Lowering	2-68
- Raising	2-69
Circulating Fans	2-107
Coffee Maker	2-133
Communications (1JV and E)	2-149
Conning Tower	2-159
Conning Tower Equipment	2-128.1
Cutting Anchor Cable	2-185

D

Damage Control	2-191
Break-glass, Shut-down Stations	2-203
Emergency Lighting	2-202
Fire Fighting	2-192
Salvage Pump	2-204
Watertight Integrity	2-205
Darken Ship	2-126

INDEX (Continued)

Paragraph

D (continued)

Docking	2-154
Aircraft Flood Lights	2-162
Exhaust Stacks	2-168
Floodlight	2-167
Jack and Ensign Staff, Signal Flag	2-166
Lifeboats	2-158
Machine Gun Tripod Mount	2-160
Main Mast	2-66
Radar Mast	2-155
Ready Service Locker	2-161
Searchlight	2-163
Ships Course Indicator and Peloris	2-164
Stern Gate Davits	2-165
Voice Tube	2-157
Whip Antennas	2-156
Windscreen and Railings	2-159
Draining Ballast Tanks - Using Fire Pump	2-95
- Using Gravity	2-93
Draining Bilge with Bilge Pump and Fire Pump	2-90
Draining Bilge with Bilge Pump	2-83
Draining Bilge with Fire Pump and Eductor	2-88
Draining Bilge with Fire Pump	2-85
Draining the Fire Main System	2-79, 2-87
Drinking Fountain	2-136
Dryer Operation	2-141

E

Electric Range	2-132
Electronic Devices	2-128
Emergency Lighting	2-202
Emergency Procedures	2-171
Anchor Winch System	2-181
Bow Ramp System	2-187
Emergency Steering	2-186
Generating System	2-177
Propulsion System	2-172
Stern Gate	2-190
Emergency Steering	2-186
Emptying Holding Tank	2-100
Entertainment Amplifier	2-131
Exhaust Stacks	2-168

INDEX (Continued)

Paragraph

F

Filling Ballast Tanks - Using Fire Pump	2-94
- Using Gravity	2-92
■ Fire Alarm Switch Box	2-128.1
Fire, Bilge, and Ballast System	2-75
Ballast System	2-91
Bilge System	2-82
Fire System	2-76
Fire Fighting	2-192
Fire Main System	2-193
Halon Fixed System	2-194
Liquid Foam	2-201
Portable Extinguishers	2-195
Portable Fire Pump.....	2-196
Fire Mains and Fire Plugs	2-77
Fire Main System	2-193
Draining the Firemain System	2-79
Fire Mains and Fire Plugs	2-77
Fire Pump - Shutdown	2-78
Fire Pump, Bilge Draining Shutdown	2-86
Fire Pump and Eductor Shutdown	2-89
Fire Pump - Shutdown.....	2-78
Fire System	2-76
Draining the Fire Main System	2-79
Fire Mains and Fire Plugs	2-77
Fire Pump - Shutdown	2-78
Magazine Sprinkler	2-80
Peak Ballast Tank Filling	2-81
Floodlight.....	2-167
Fresh Water System	2-73
Fuel System	2-27

G

Galley and Mess	2-129
Coffee Maker	2-133
Drinking Fountain	2-136
Electric Range	2-132
Entertainment Amplifier	2-131
Milk Dispenser	2-134
Refrigerator/Freezer	2-135
Sanitizing Sink Heater	2-137
Toaster	2-131
General	
Operations Under Unusual Conditions	2-170
Operations Under Usual Conditions	2-19

INDEX (Continued)

Paragraph

G (continued)

Generator Engine - Cold Weather Start	2-38
- Emergency Start	2-180
- Emergency Stop	2-178
- Local Start	2-37
- Local Stop	2-44
Generating System - Emergency Procedures	2-177
Generator Engine - Emergency Start	2-180
- Emergency Stop	2-178
- Reset After Emergency Stop	2-179
Generating System	2-34
Generator Engine - Cold Weather Start	2-38
- Local Starting	2-37
- Local Stop	2-44
Ground Detector Lights	2-45
Paralleling Generator	2-41
Preliminary Adjustments	2-36
Remote Operation - Generator #1	2-39
- Generator #2	2-40
Shore Power	2-35
Stopping Generator - Operating Non-Parallel	2-42
- Operating Parallel	2-43
Ground Detector Lights	2-45

H

Halon Fixed System	2-194
Alarms	2-117
Halon System	2-115
Reactivation	2-118
Testing	2-119
Halon Warning System Turn-On	2-116
Heaters	2-121
Hood Assembly	2-146
Horns (NH and 5U)	2-151
Hydraulic Starting System	2-20
Aft Engine Room - Preliminary Adjustments	2-23
- Shut Down	2-24
Anchor Winch Compartment - Preliminary Adjustments	2-25
- Shut Down	2-26
Forward Engine Room - Preliminary Adjustments	2-21
- Shut Down	2-22

INDEX (Continued)

	Paragraph
I	
Interior Communications	2-147
Communications (1JV and E)	2-149
Horns (NH and 5U)	2-150
Interior Communications Turn ON/OFF	2-148
Interior Communications Turn ON/OFF	2-148
L	
Life Boats	2-158,2-209
Life Preservers	2-207
Life Rings	2-208
Life Saving Equipment	2-206
Life Boats	2-209
Life Preservers	2-207
Life Rings	2-208
Oxygen Breathing Apparatus	2-210
Pyrotechnic	2-211
Lighting	2-122
Liquid Foam	2-201
Lowering Bow Ramp - Emergency Procedures	2-188
- Local	2-55
- Remote	2-53
Lube Oil Transfer System	2-62
M	
Machine Gun Tripod Mount	2-160
Magazine Sprinkler	2-80
Main Mast - Lowering	2-66
- Raising	2-65
Marine Gear - Come Home	2-176
Milk Dispenser	2-134
N	
Navigation Lights	2-125
Navigational - Searchlight	2-145
Night Vision Lights	2-151
Non-follow-up Steering	2-59
Normal Operation - Sewage System	2-102
Normal Steering	2-58

INDEX (Continued)

Paragraph

O

Oil/Water Separation System	2-96
Bilge Draining	2-98
Emptying Holding Tank	2-100
Pre-start Adjustments	2-97
Used Engine Oils	2-99
Operating Instructions on Decals and Instruction Plates	2-169
Operation Under Unusual Conditions	2-170
Damage Control Procedures	2-191
Emergency Procedures	2-171
Life Saving Equipment	2-197
Operation Under Usual Conditions	2-19
Air Conditioning System	2-105
Alarm System	2-110
Anchor Winch "A" Frame	2-46
Bow Ramp Winch	2-52
Central Hydraulic System - including Main Mast and Stern Gate	2-63
Fire, Bilge and Ballast System	2-75
Fresh Water Pressure System	2-73
Galley and Mess Equipment	2-129
Generating System	2-34
Halon System	2-115
Heaters	2-121
Hydraulic Starting System	2-20
Interior Communications	2-147
Lighting	2-122
Lube Oil Transfer System	2-62
Night Vision Lights	2-151
Oil/Water Separator System	2-96
Pilot House Equipment	2-123
Preparation for Movement	2-152
Propulsion System	2-28
Sewage System	2-101
Signaling Searchlight	2-142
Stand-by Lube Oil System	2-70
Steering	2-57
Tank Level Indicating System	2-74
Ventilating Fans	2-120
Wash Room , Water Closet, and Shower Equipment	2-138
Over-board Discharge - Holding Tank	2-103
Over-board Discharge - Macerator Pump(s)	2-104
Oxygen Breathing Apparatus	2-211

INDEX (Continued)

Paragraph

P

Paralleling Generator	2-41
Peak Ballast Tank Filling	2-81
Pilot House Equipment ..,	2-123
Battery Charger/Exhaust	2-127
Darken Ship	2-126
Electronic Devices	2-128
Navigation Lights	2-125
Windshield Wiper	2-124
Port Engine - Stand-by Lube Oil System .	2-72
Portable Extinguishers	2-195
Portable Fire Pump	2-196
Applications	2-199
Preliminary Adjustments (Fuel and Assembly)	2-197
Starting	2-198
Stopping and Storage	2-200
Preliminary Adjustments - Centralized Hydraulic System	2-64
Preliminary Adjustments - Generating System	2-36
Preliminary Adjustments - Portable Fire Pump	2-197
Preparation for Movement	2-152
Docking	2-154
Lifting.....	2-153
Pre-Start Adjustments - Oil/Water Separator System	2-97
Propulsion Engine - Cold Weather - Local Starting ,	2-30
- Emergency Start	2-175
- Emergency Stop	2-173
- Local Stop	2-31
- Remote Starting	2-32
- Remote Stop .	2-33
- Reset After Emergency Stop	2-174
- Warm Weather - Local Starting	2-29
Propulsion System - Emergency Procedures	2-172
Marine Gear - Come Home	2-176
Propulsion Engine - Emergency Start	2-175
- Emergency Stop	2-173
- Reset After Emergency Stop	2-174
Propulsion System	2-28
Propulsion Engine - Cold Weather - Local Starting .	2-30
- Local Stop .	2-31
- Remote Starting	2-32
- Remote Stop	2-33
Warm Weather - Local Starting	2-29
Pyrotechic	2-211

R

Radar Mast	2-155
Raising Bow Ramp-Emergency Procedures	2-189
-Local	2-56
-Remote	2-54
Reactivation-Halon System	2-118
Ready Service Locker	2-161
Refrigerator/Freezer	2-135
Remote Operation-Generator #1	2-39
-Generator #2	2-40
Remote Operation and Payout-Anchor Winch	2-49
Reset After Emergency Stop-Anchor Winch Engine	2-183
-Generator Engine	2-179
-Propulsion Engine	2-174

S

Salvage Pump	2-204
Sanitizing Sink Heater	2-137
Searchlight	2-163
Searchlight-Navigational	2-145
-Turn ON/OFF	2-143
Sea Water Cooling Pump	2-106
Sewage System	2-101
Normal Operation	2-102
Over-board Discharge Holding Tank	2-103
Over-board Discharge-Macerator Pump(s)	2-104
Ships Course Indicator and Peloris	2-164
Shore Power	2-35
Signalling Searchlight	2-142
Hood Assembly	2-146
Searchlight-Navigational	2-145
Searching Turn ON/OFF	2-143
Signalling	2-144
Spotlight	2-146.1
Spotlight Turn ON/OFF	2-146.2
Spotlight Operation	2-146.3
Stand-by Lube Oil System	2-70
Stand-by Lube 101 System-Port Engine	2-72
-Starboard Engine	2-71
Starboard Engine-Stand-by Lube Oil System	2-71
Starting-Portable Fire Pump	2-198
Steering	2-57
Automatic Steering	2-60
Non-follow-up Steering	2-59
Normal Steering	2-58
Steering Shutdown	2-61
Steering Shutdown	2-61

INDEX (Continued)

Paragraph

S (continued)

Stern Gate-Davits 2-165
 -Emergency Procedures 2-190
 -Lowering 2-68
 -Raising 2-69
 Stopping Generator-Operating Non-Parallel 2-42
 -Operating Parallel 2-43
 Stopping and Storage-Portable Fire Pump 2-200
 System Alarms 2-112
 System Shutdown-Air Conditioning 2-109
 System Startup-Air Conditioning 2-108

T

Tank Level Indicating System..... 2-74
 Toaster 2-131

U

Used Engine Oils 2-99

V

Ventilating Fans 2-120
 Voice Tube 2-157

W

Washdown Countermeasure Sprinkling System 2-82
 Washer/Dryer Turn ON/OFF 2-139
 Washer Operation 2-140
 Wash Room, Water Closet and Shower 2-138
 Dryer Operation 2-141
 Washer/Dryer Turn ON/OFF 2-139
 Washer Operation 2-140
 Watertight Integrity 2-205
 Whip Antennas 2-156
 Windshield Wiper 2-124

*U. S. GOVERNMENT PRINTING OFFICE 1992-654-028/60086

By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

ROBERT M. JOYCE
Major General, United States Army
The Adjutant General

DISTRIBUTION:

To be distributed in accordance with DA Form 12-25D, Operator Maintenance requirements for Marine Equipment,
All.

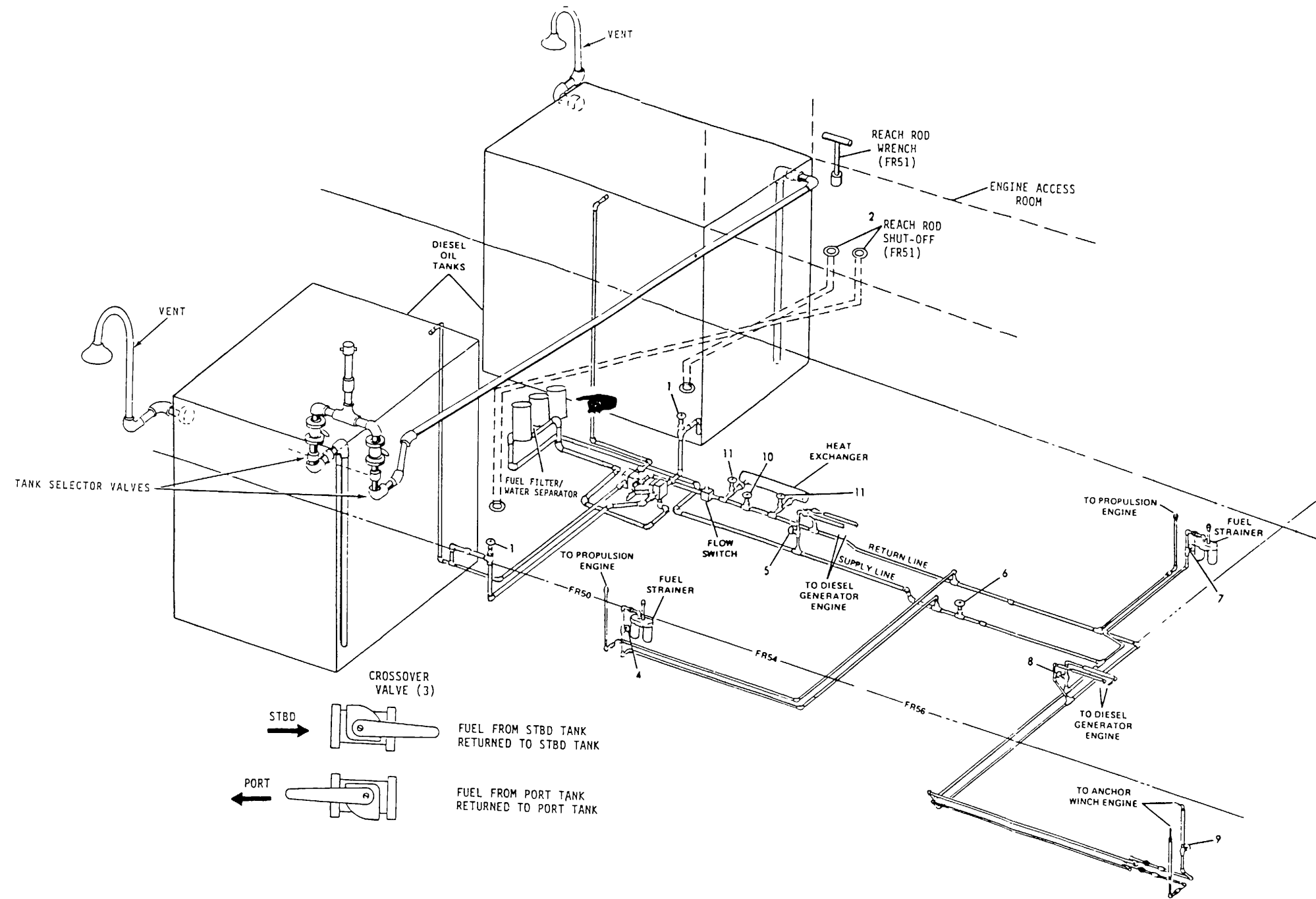


Figure FO-34. Fuel System Piping

Change 2 FO-34

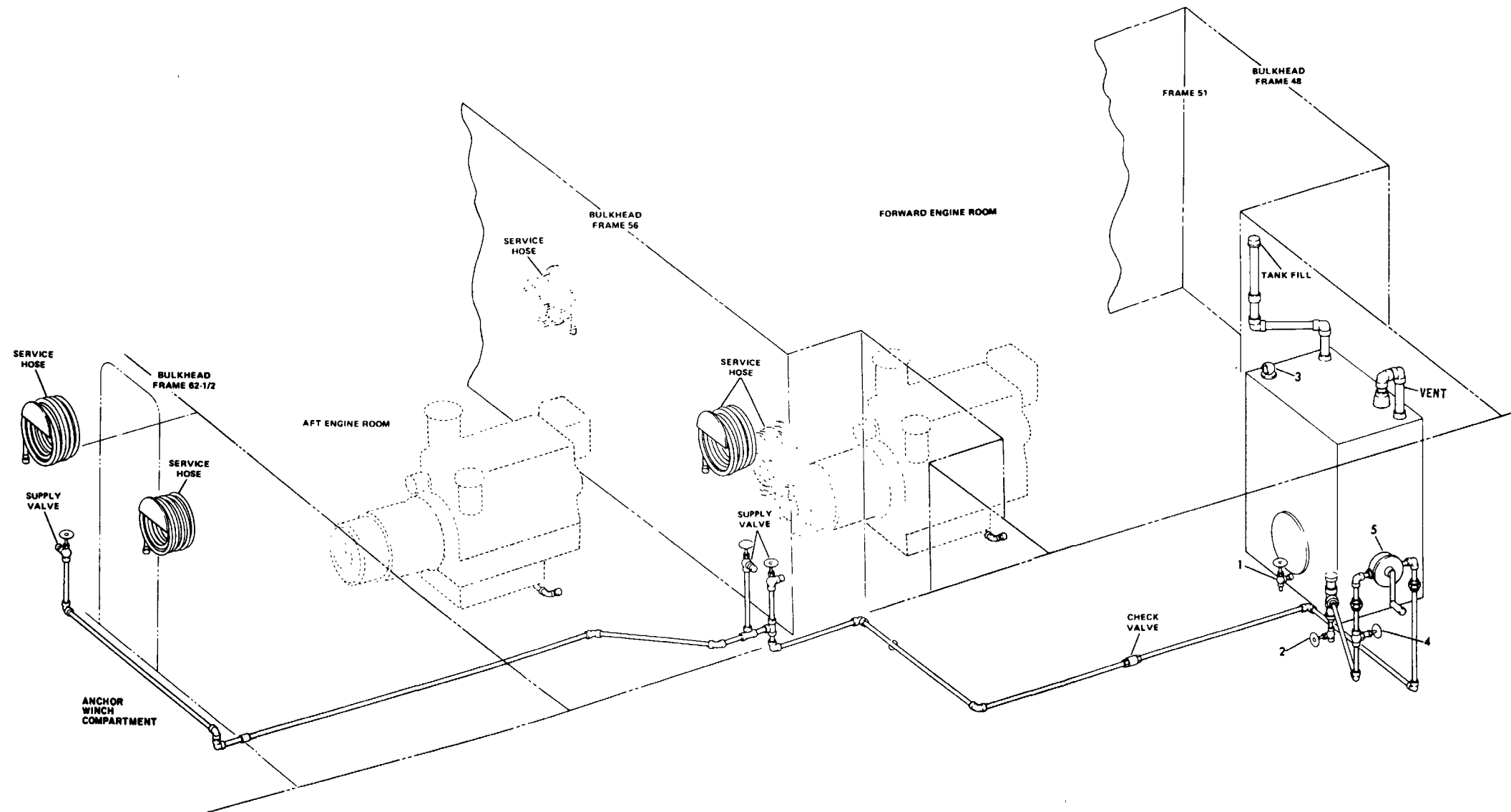
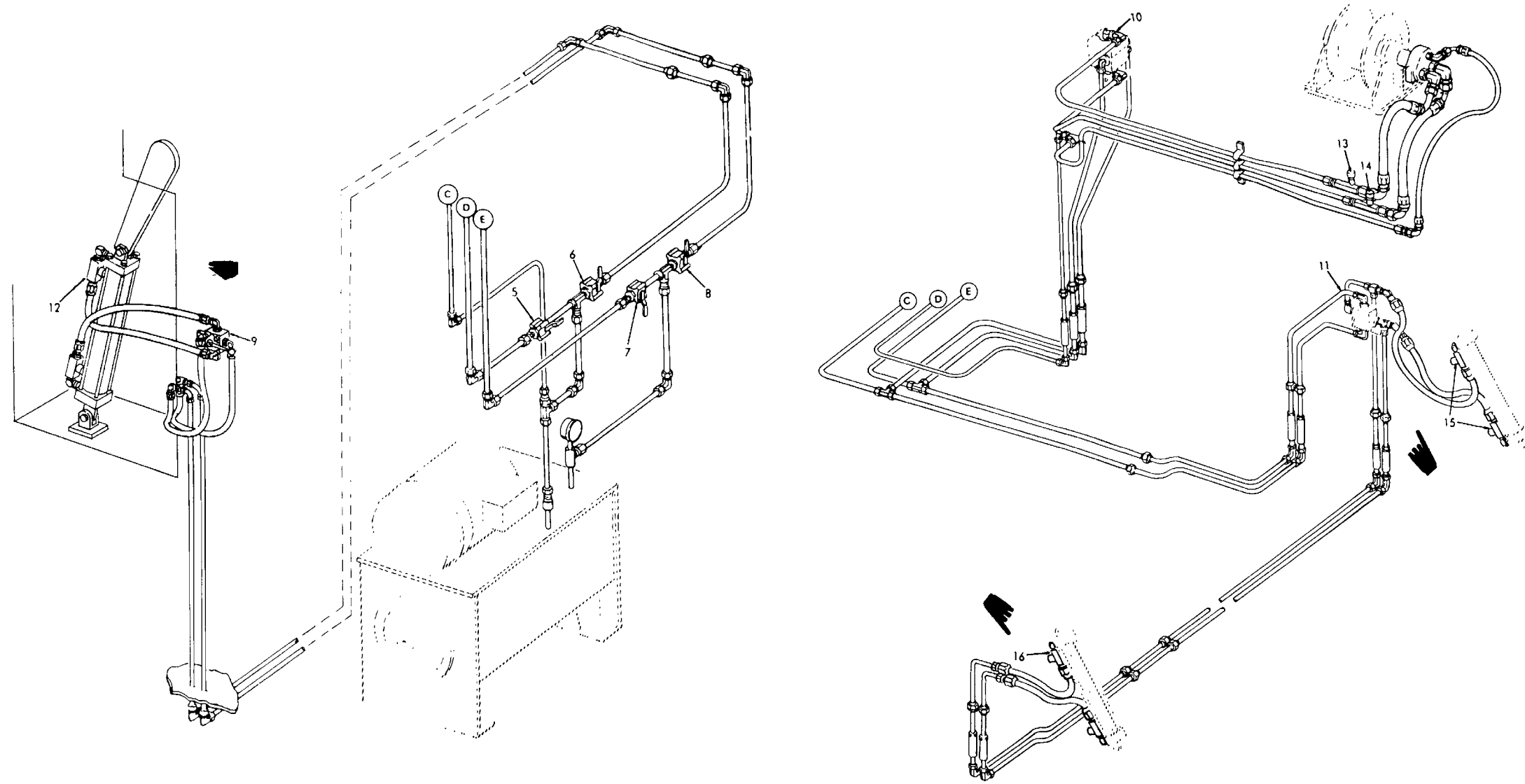


Figure FO-35. Engine Lube Oil System

FO-35



4854-07G

Figure FO-36. Central Hydraulic System

Change 2 FO-36

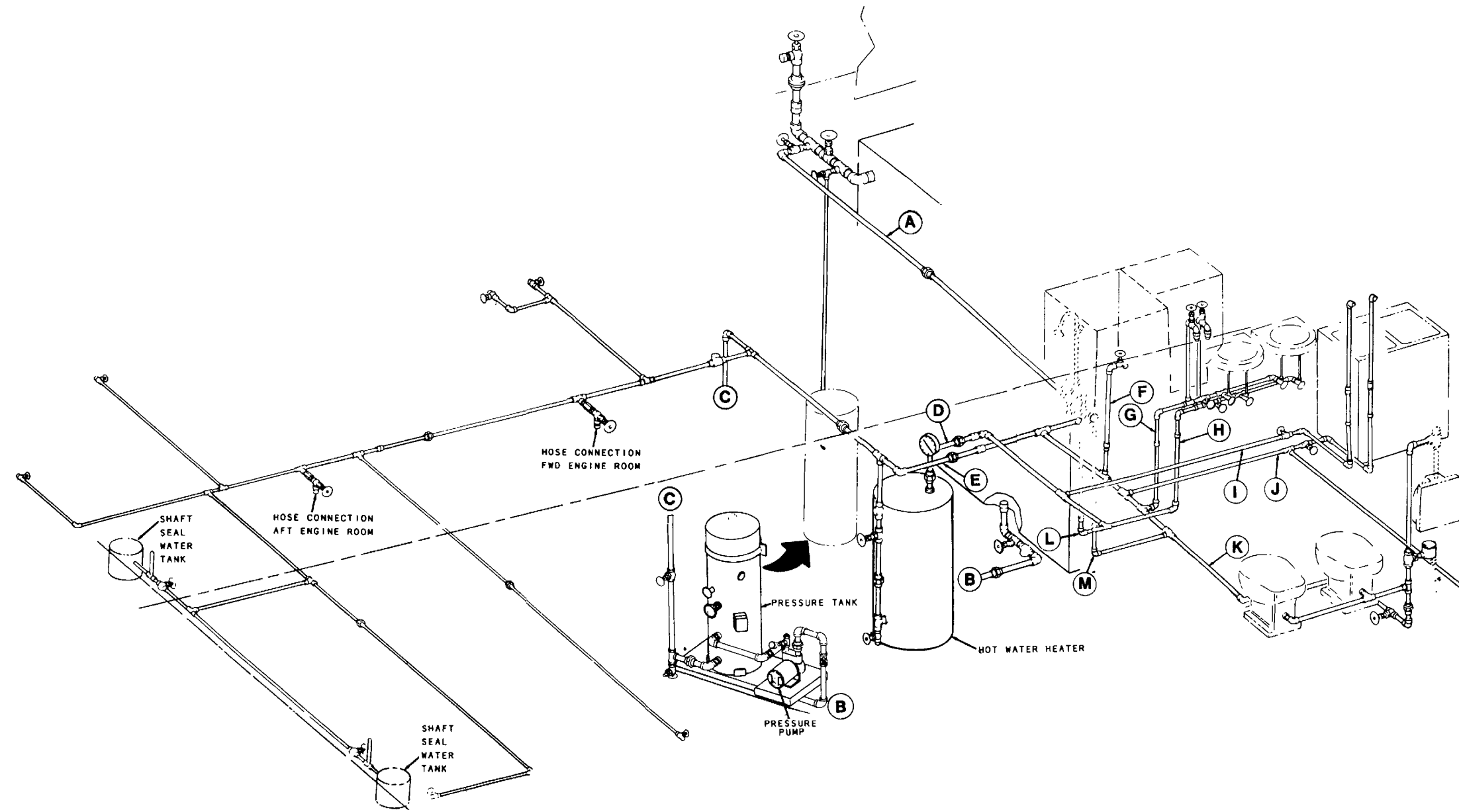


Figure FO-37. Fresh Water System Piping

FO-37

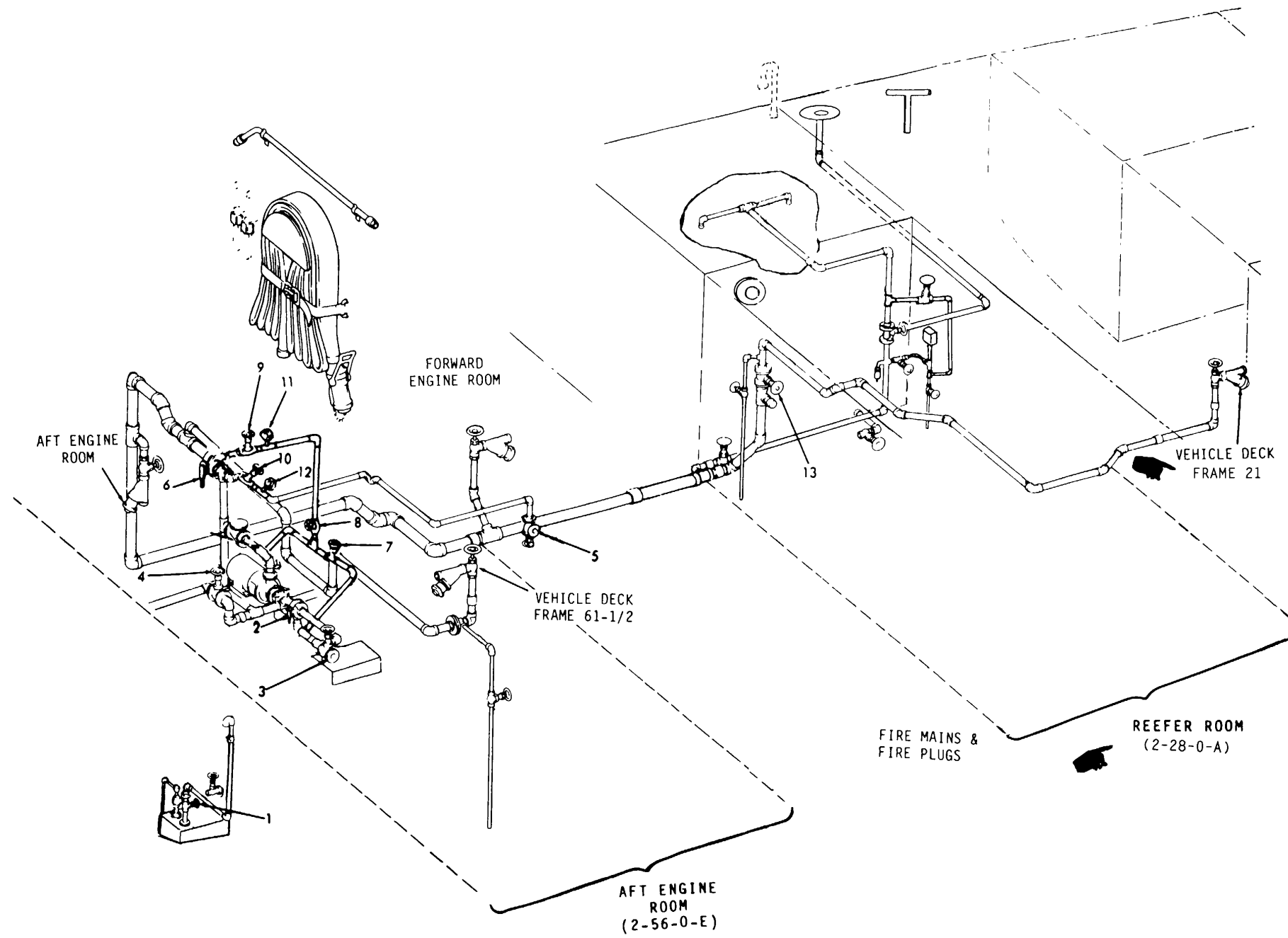


Figure FO-38. Fire System Piping

Change 2 FO-38

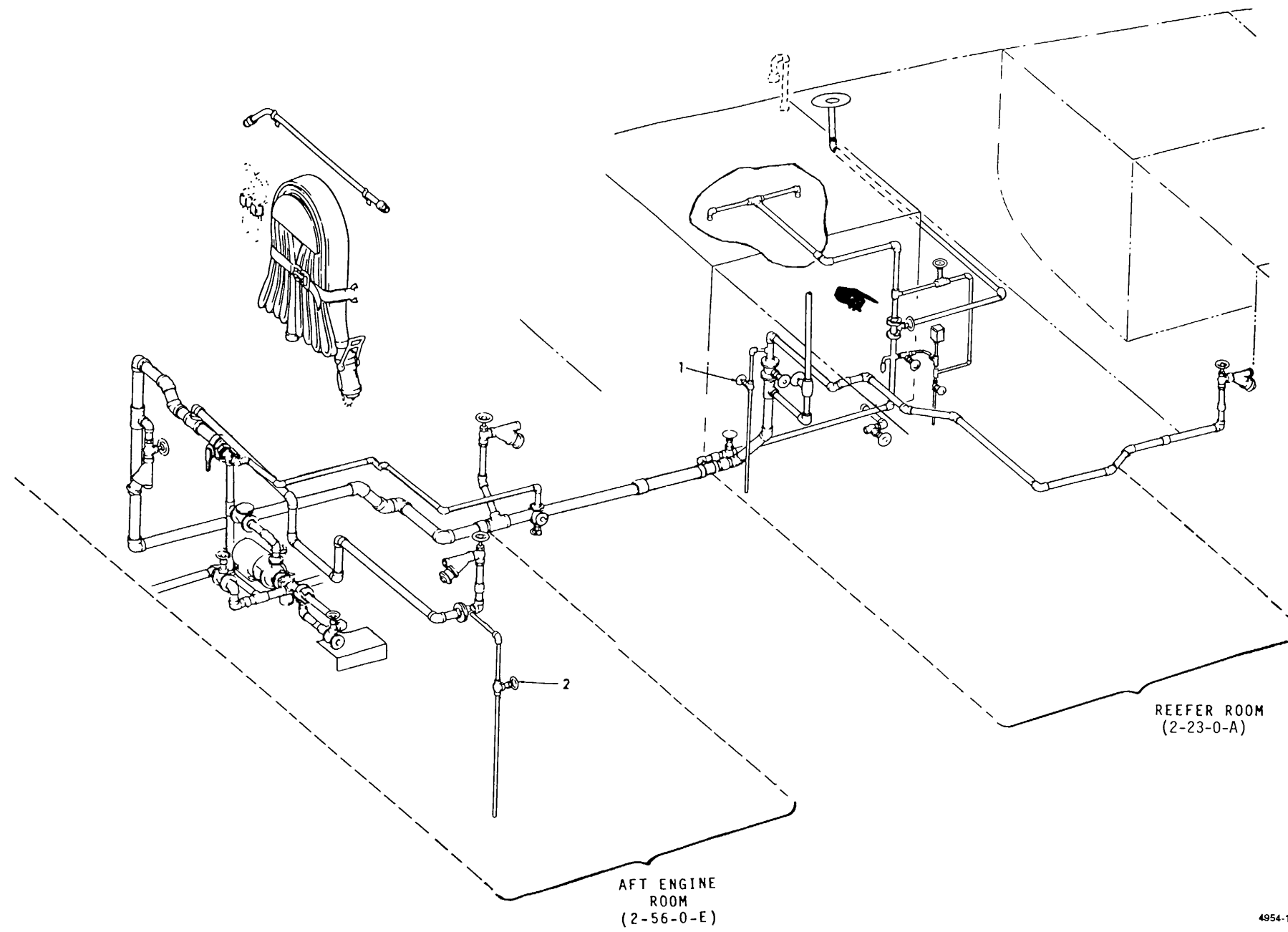


Figure FO-39. Draining The Fire Main System
(Reefer Room 2-23-0-A)

Change 2 FO-39

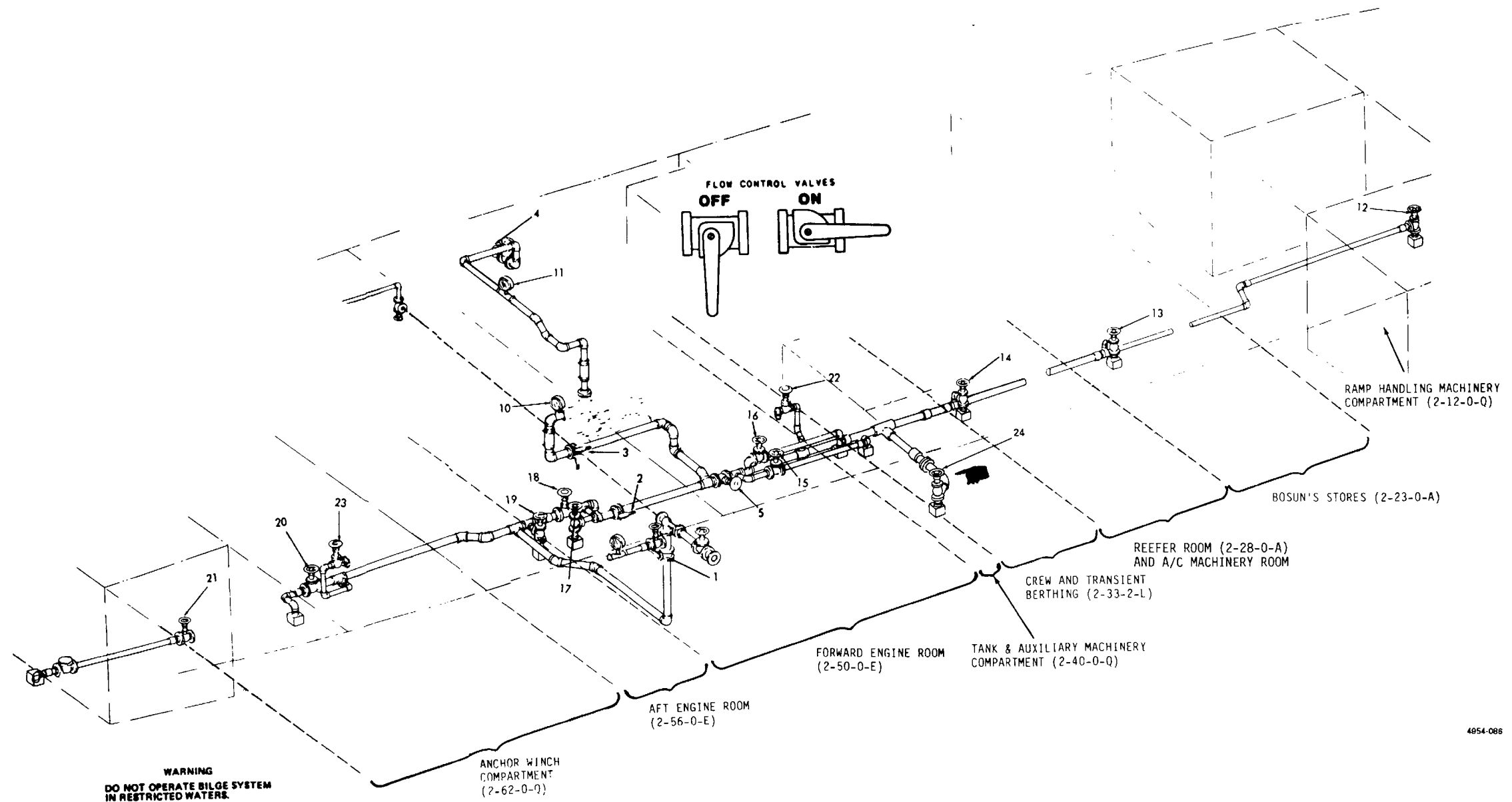


Figure FO-40.1 Bilge Draining Using Bilge Pump
(Sheet 1 of 2)

Change 2 FO-40.1

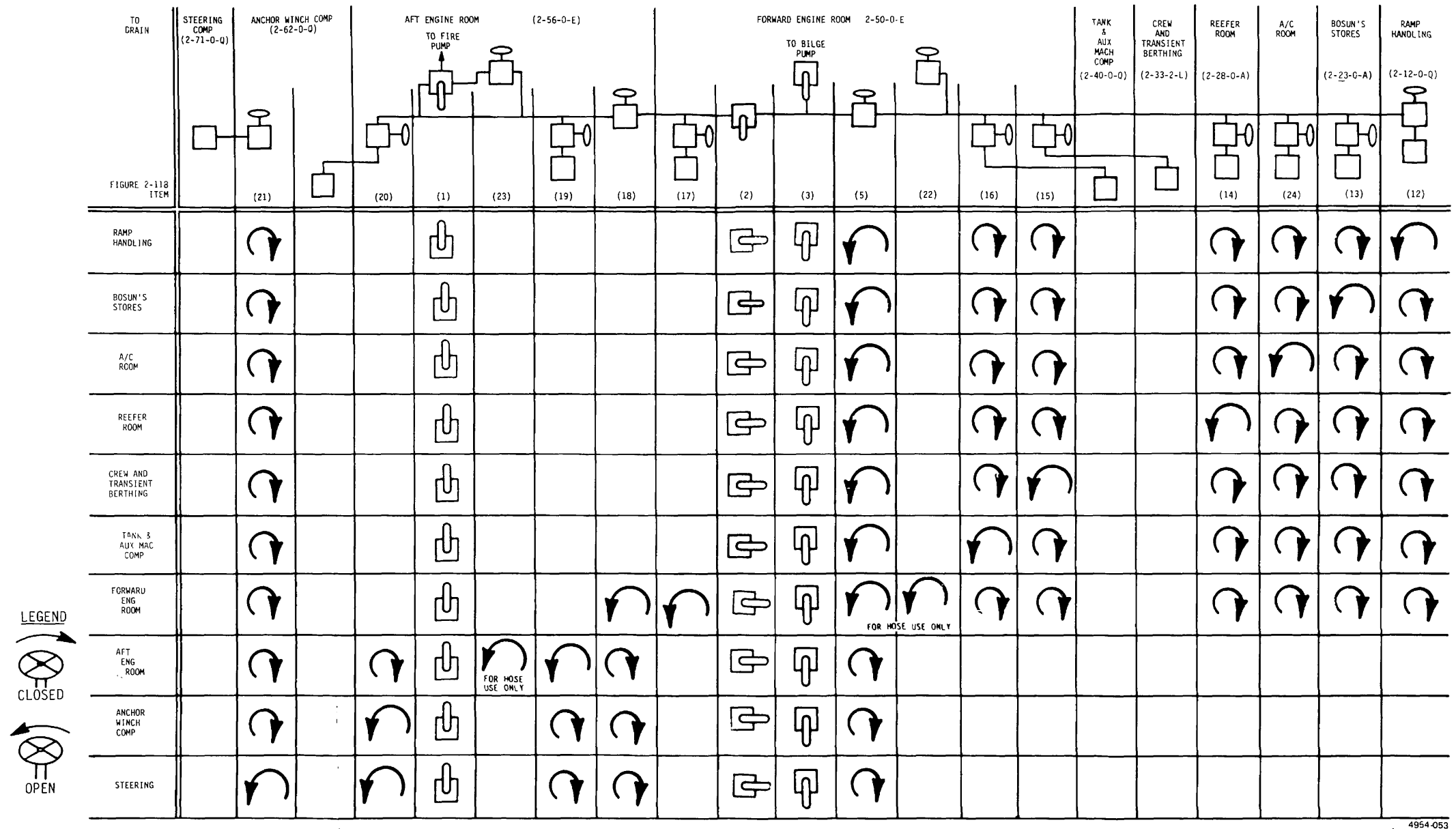


Figure FO-40.2 Bilge Draining using Bilge Pump
(Sheet 2 of 2)

Change 2 FO-40.2

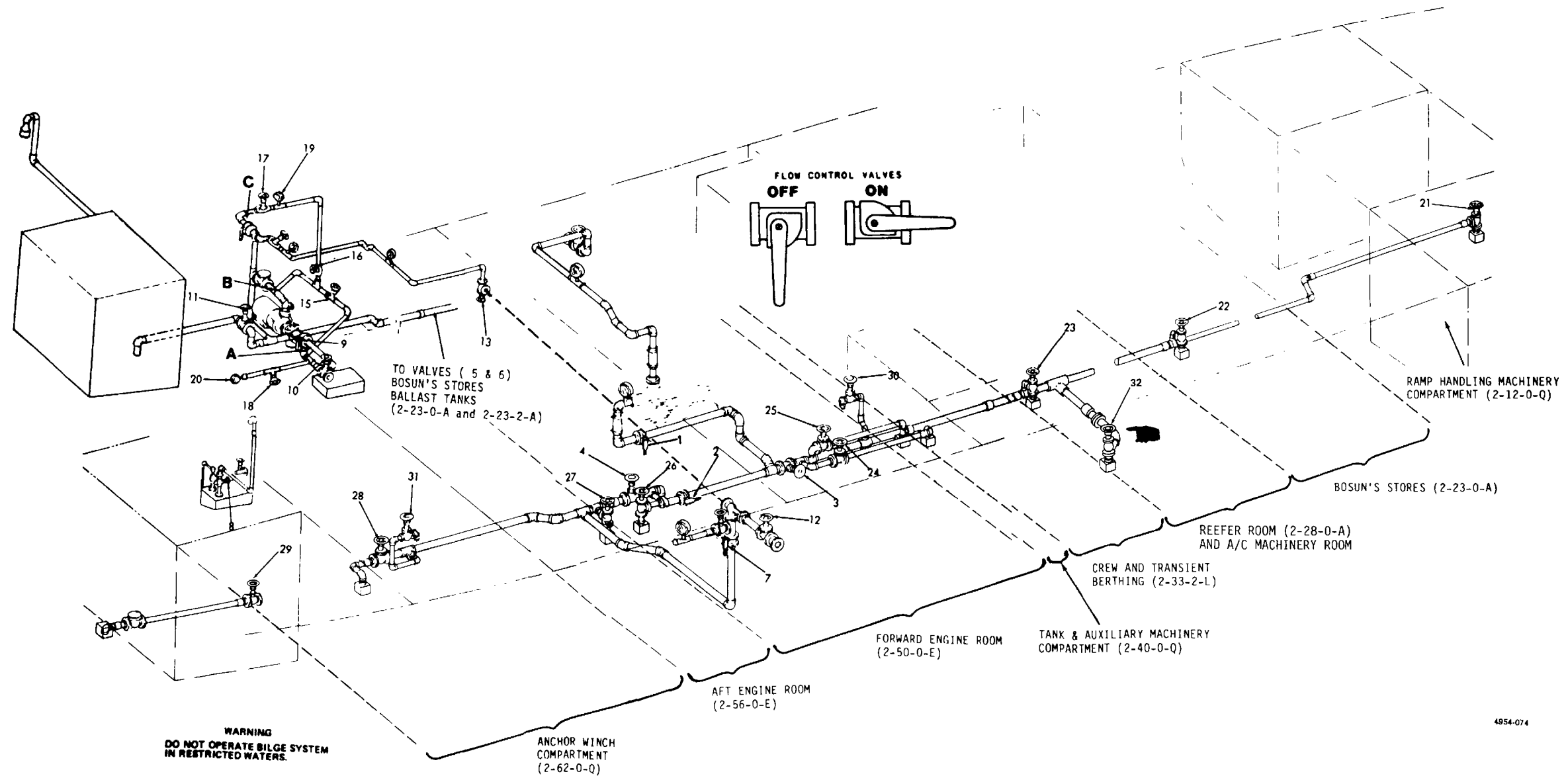


Figure FO-41. Bilge Draining Using The Fire Pump

Change 2 FO-41

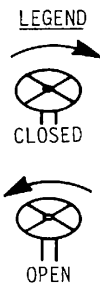
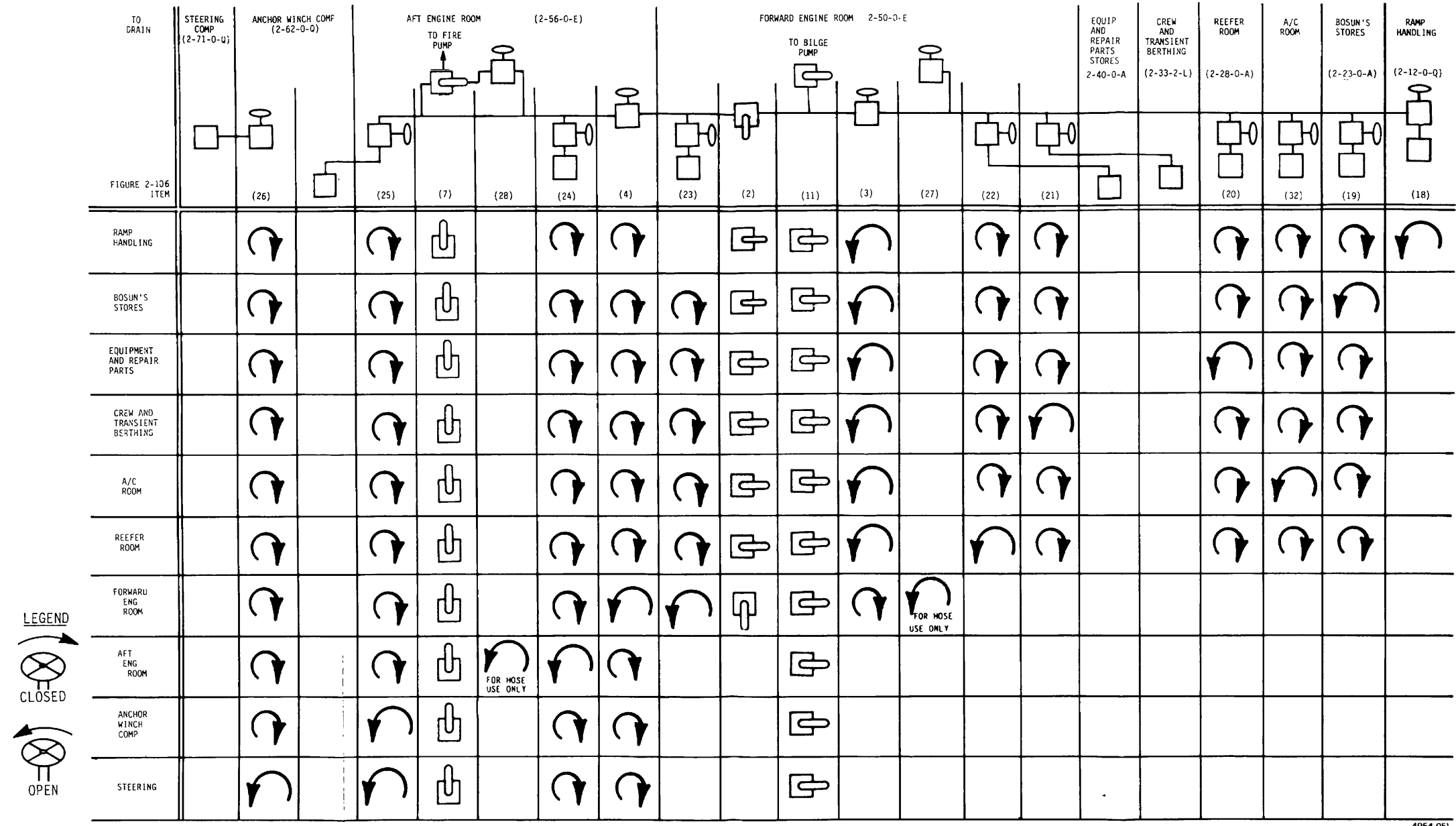


Figure FO-42. Draining the Bilge with Fire Pump

Change 2 FO-42

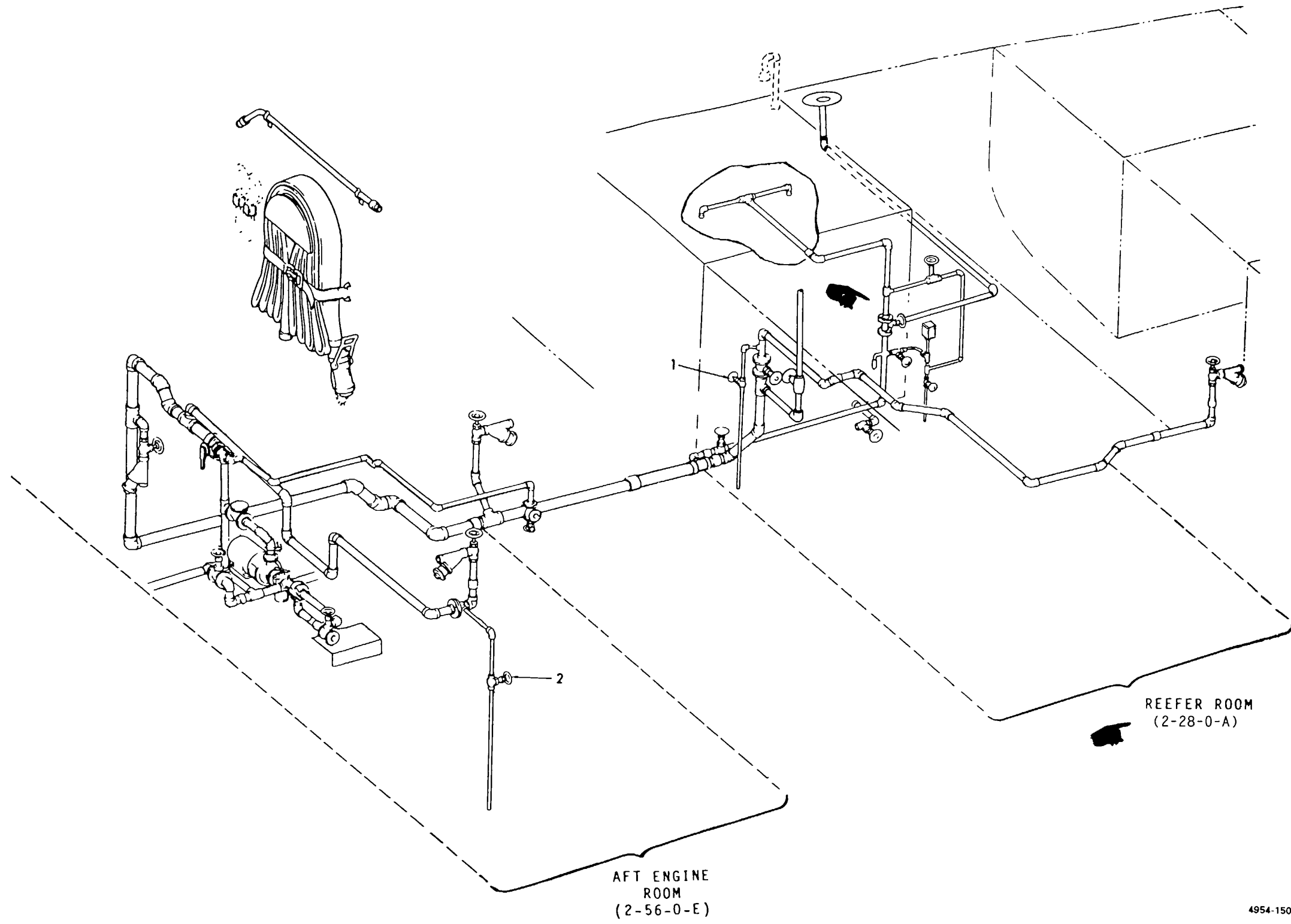


Figure FO-43. Draining The Fire Main System
(Reefer Room 2-28-0-A)

F0-43 Change 2

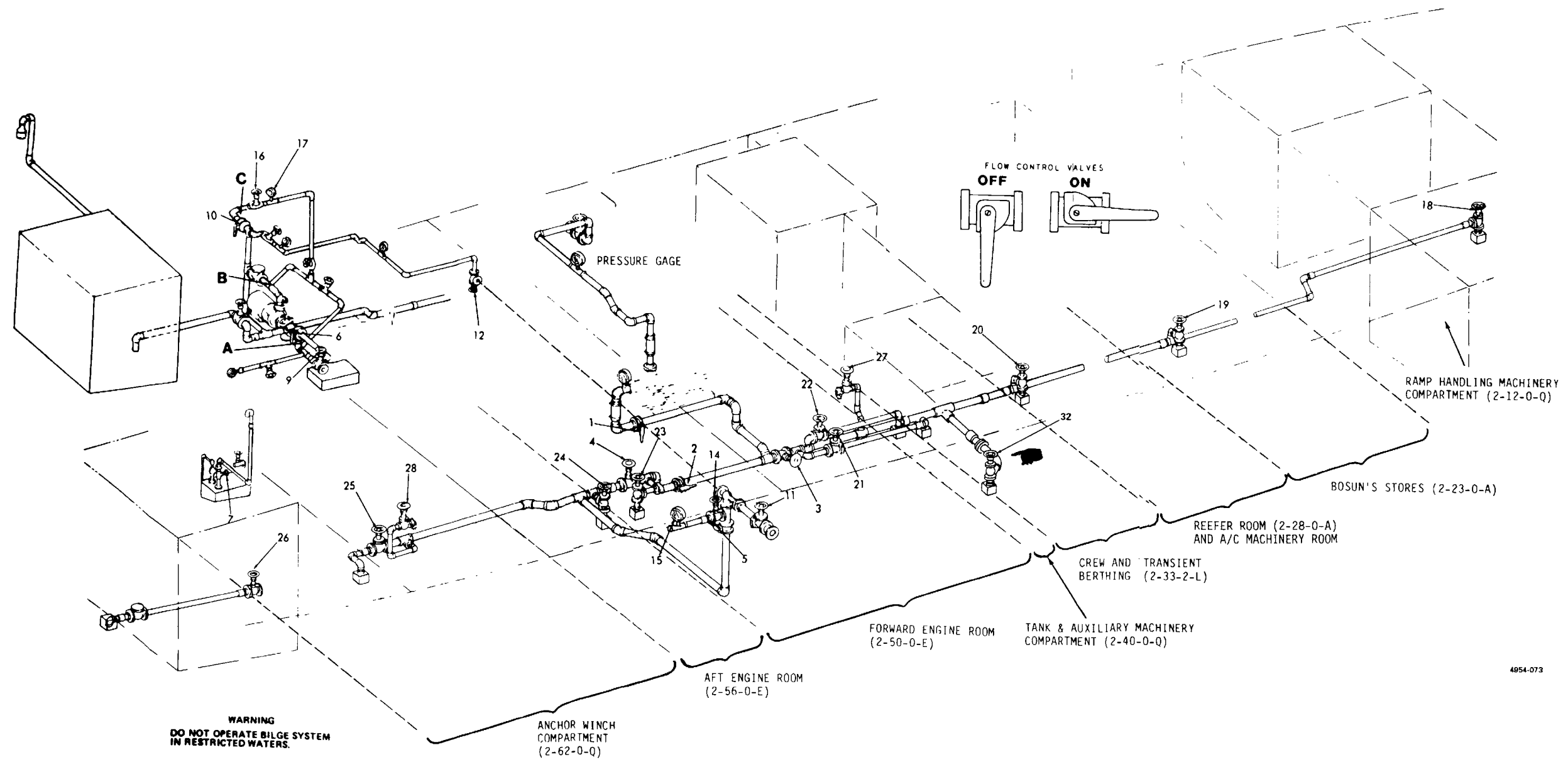


Figure F0-44. Bilge Draining Using Fire Pump and Eductor
Change 2 F0-44

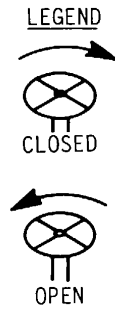
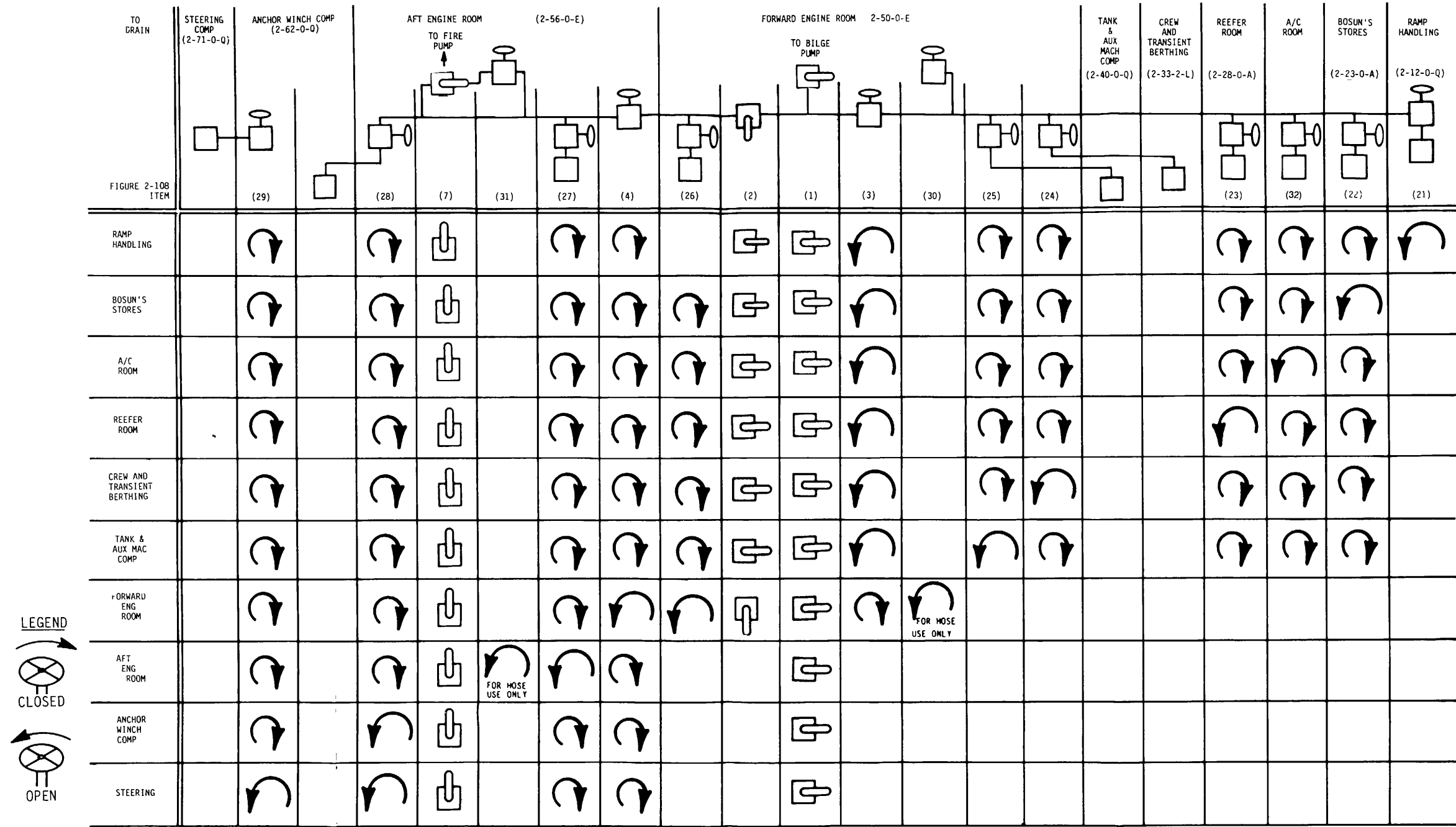
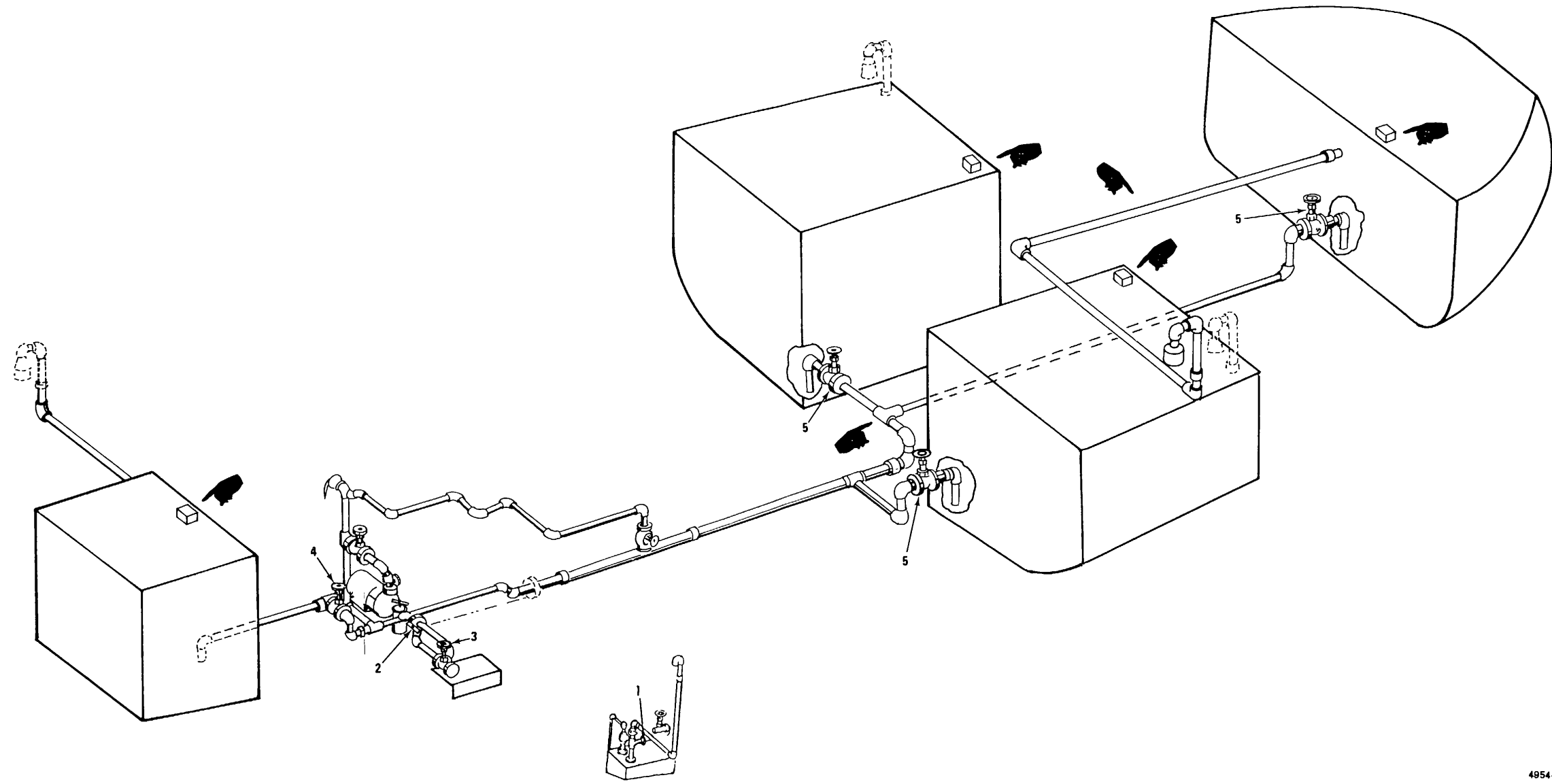
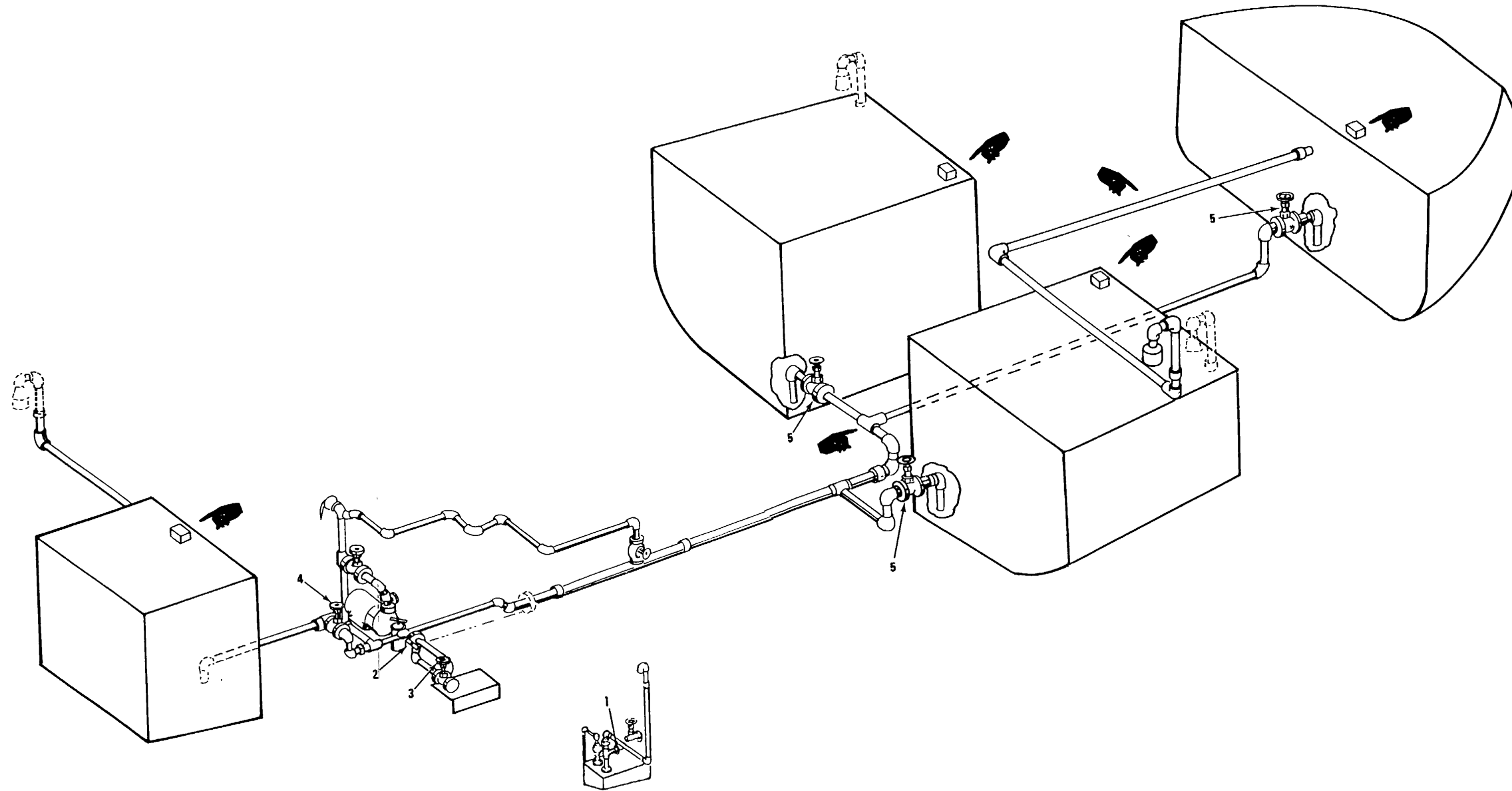


Figure F0-45. Draining the Bilge with Fire Pump and Eductor



4954-077

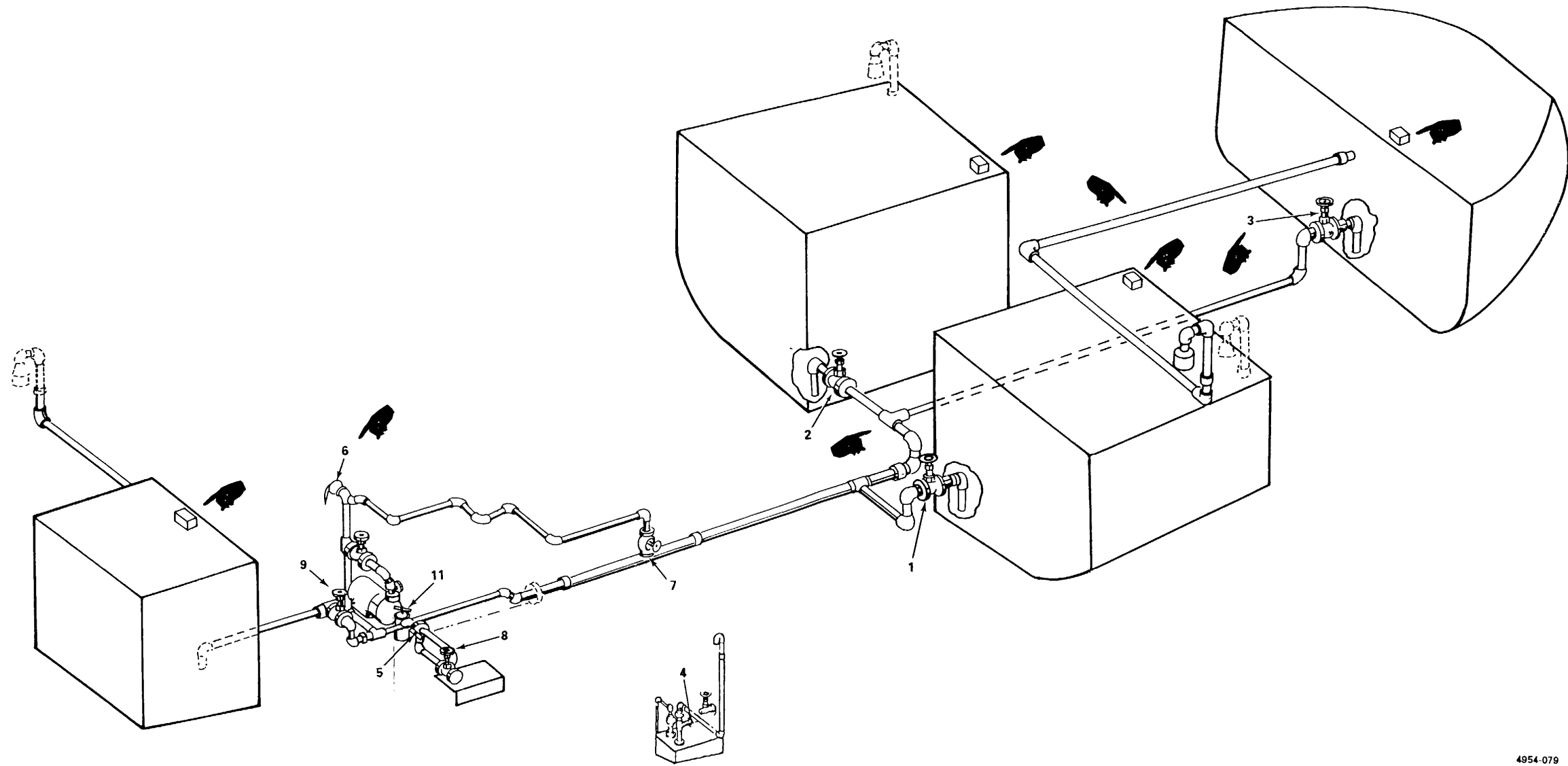
Figure F0-46. Filling Ballast tanks - Using Gravity



4954-078

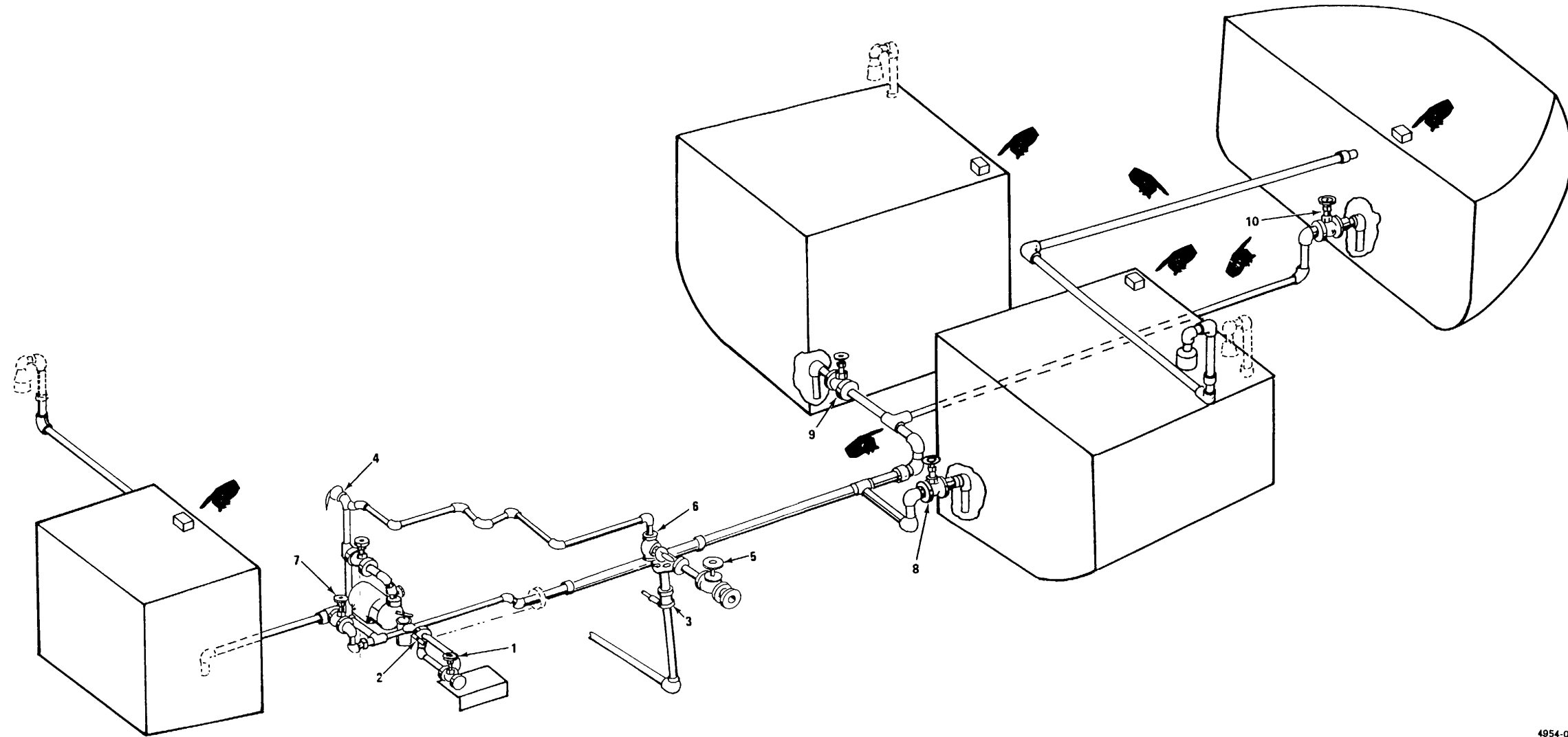
Figure F0-47. Draining Ballast Tanks - Using Gravity

Change 2 F0-47



4954-079

Figure F0-48. Filling Ballast Tanks - Using Fire Pump
Change 2 F0-48



4954-080

Figure F0-49. Draining Ballast Tanks - Using Fire Pump

Change 2 F0-49

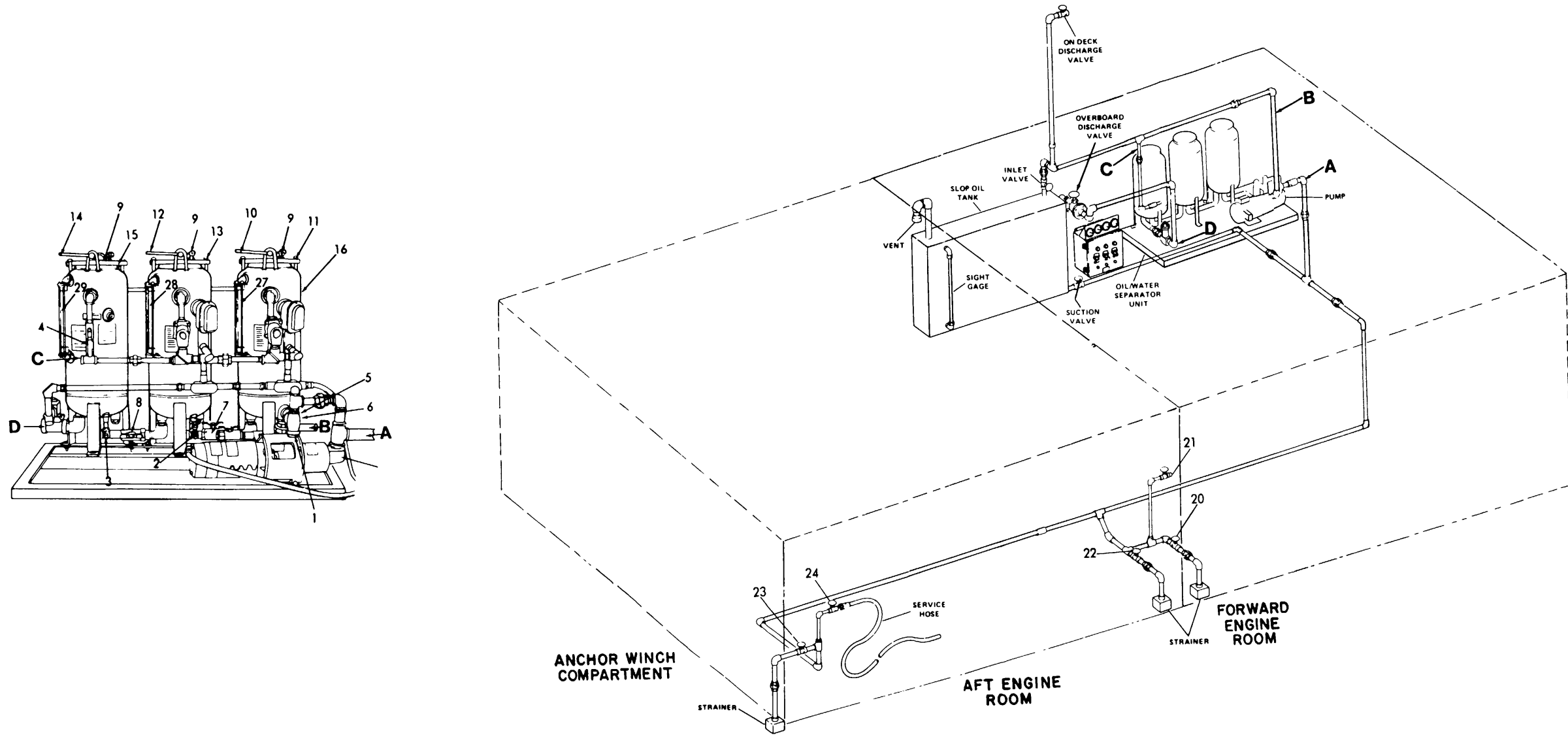


Figure F0-50. Preliminary Adjustments - Oil/Water Separator System Piping

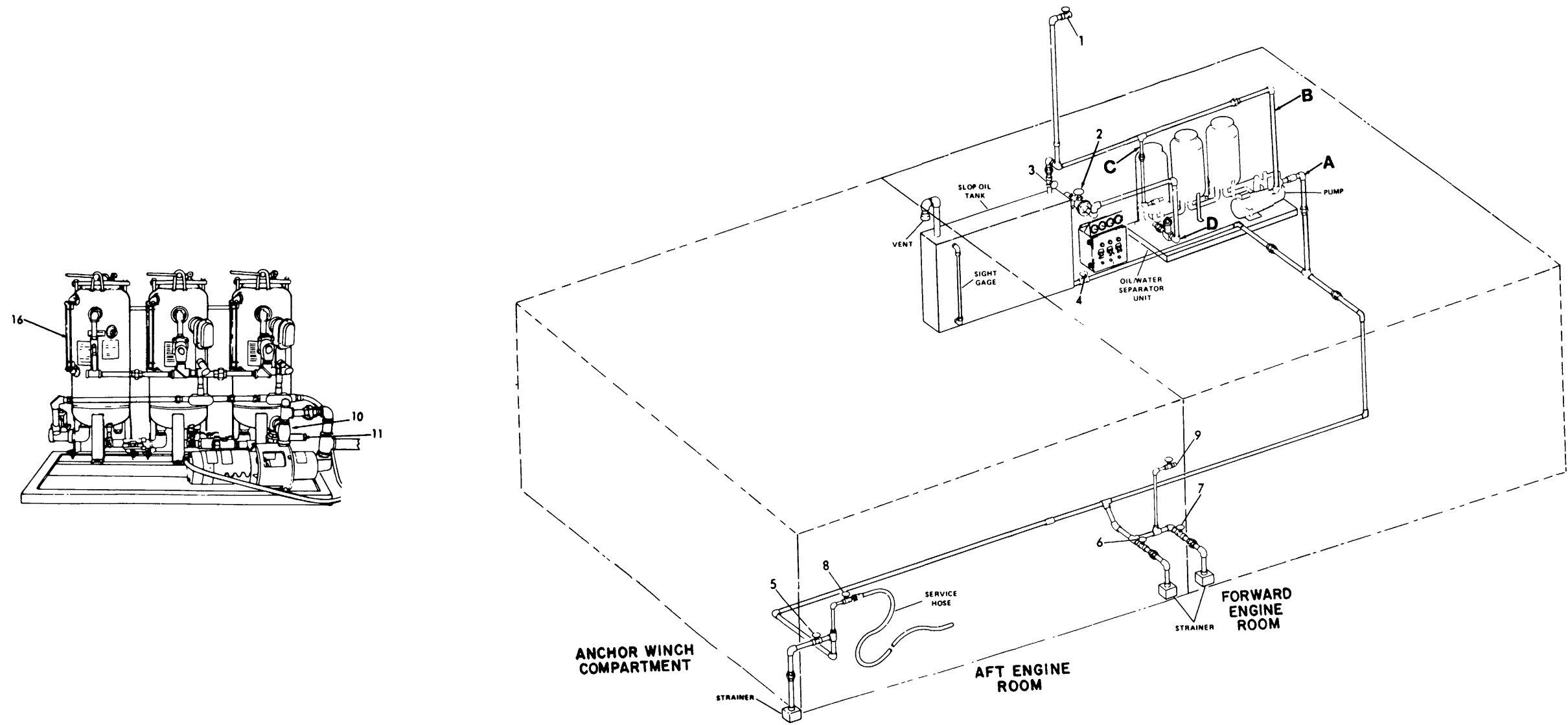


Figure F0-51. Bilge Draining - Oil/Water Separator System Piping

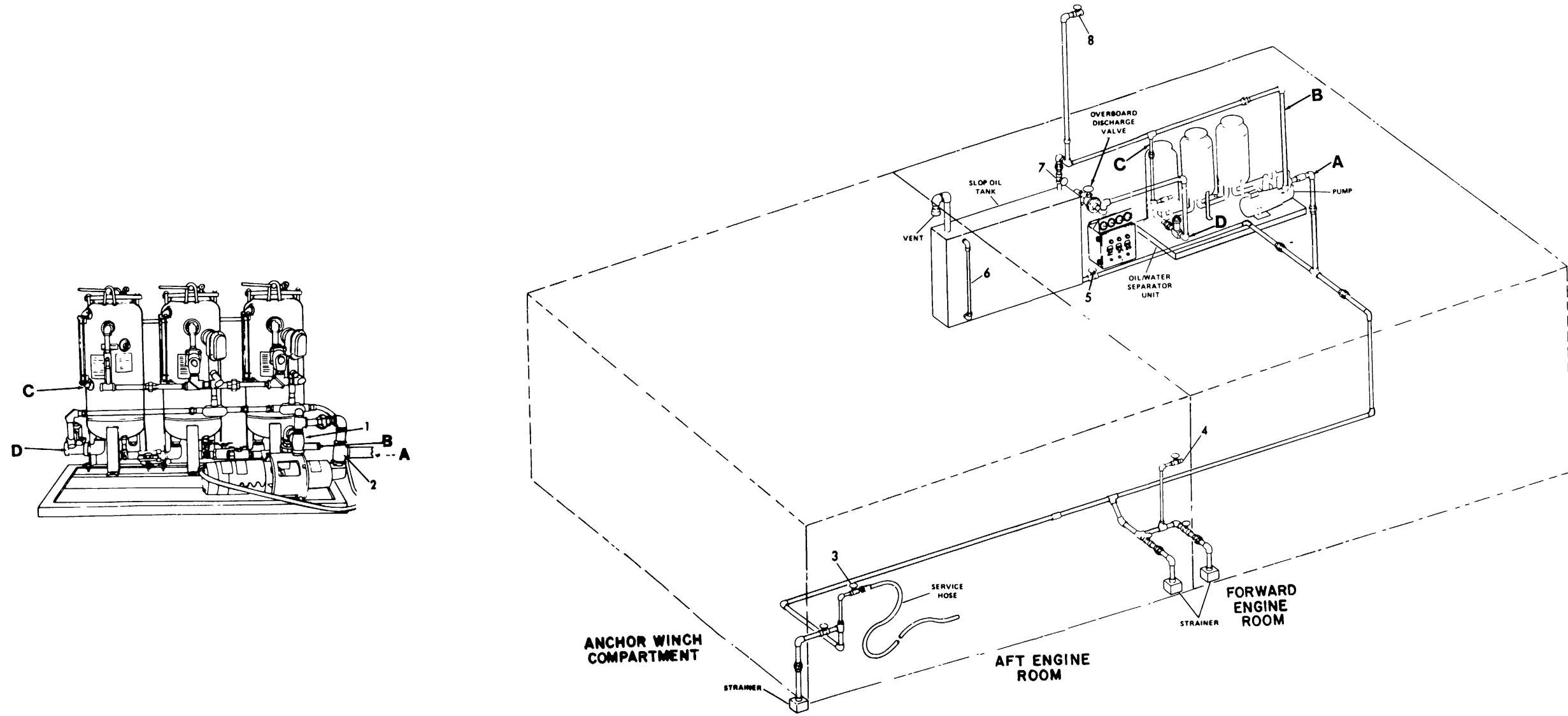


Figure F0-52. Used Engine Oils - Oil/Water Separator System Piping

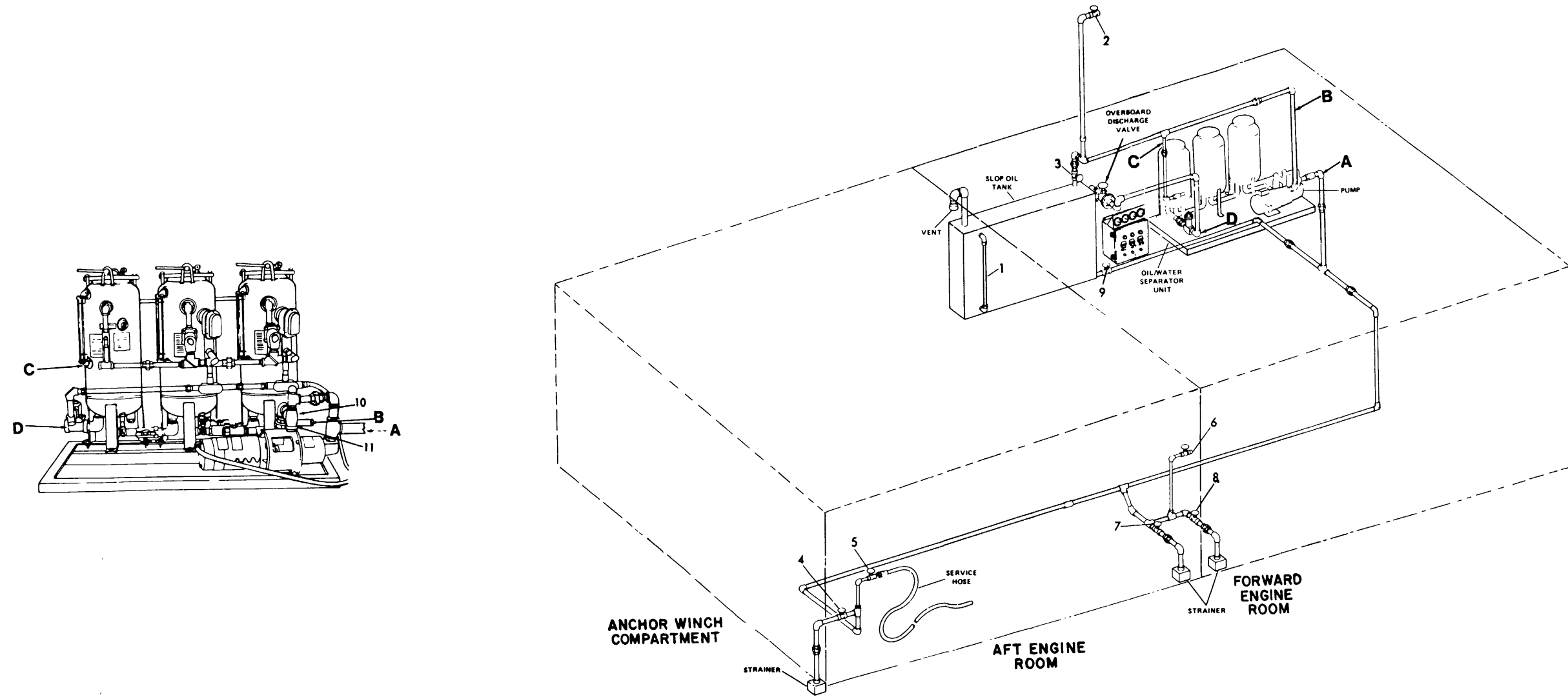


Figure F0-53. Emptying Holding Tank - Oil/Water Separator System Piping

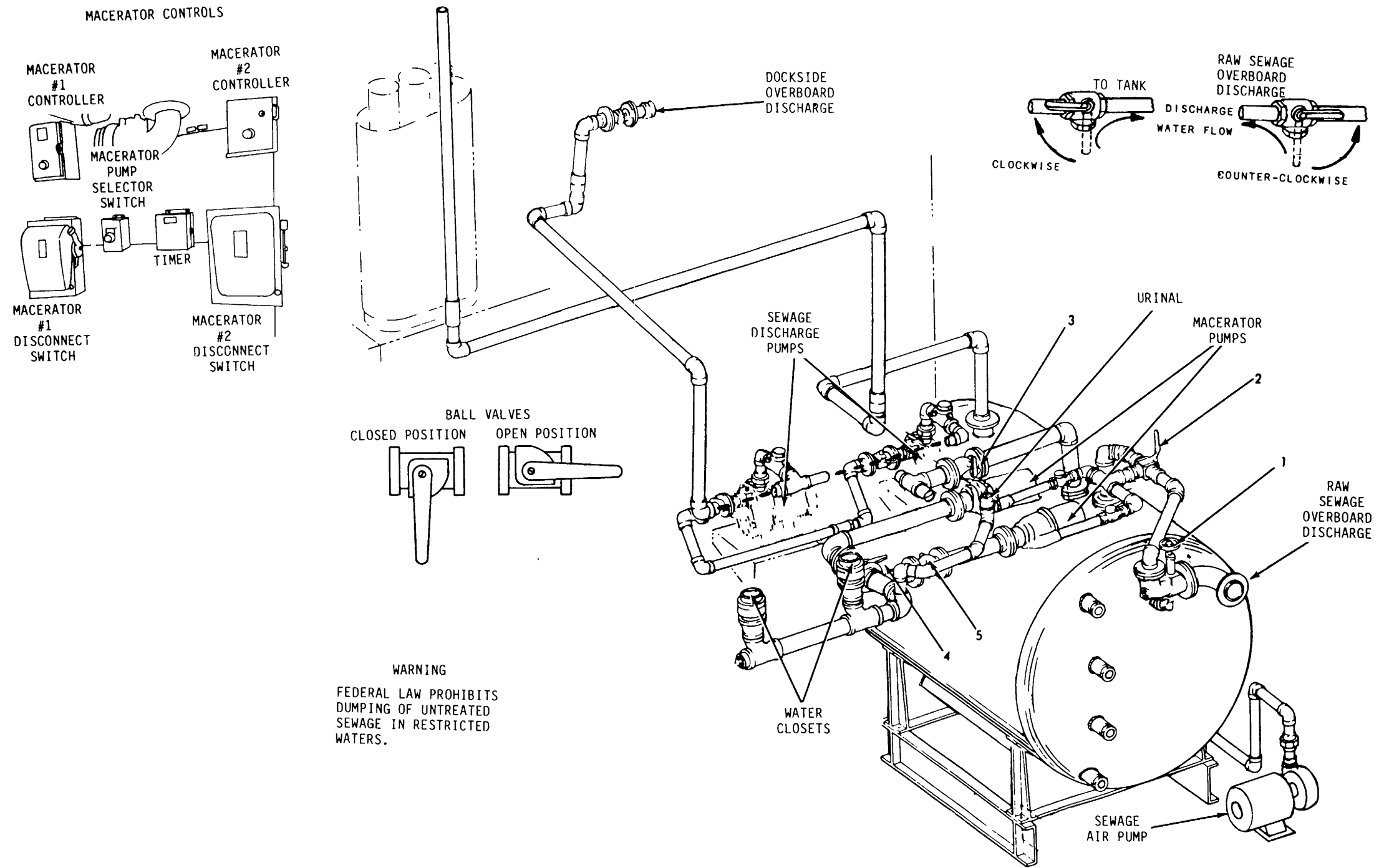


Figure F0-54. Normal Operation Sewage System

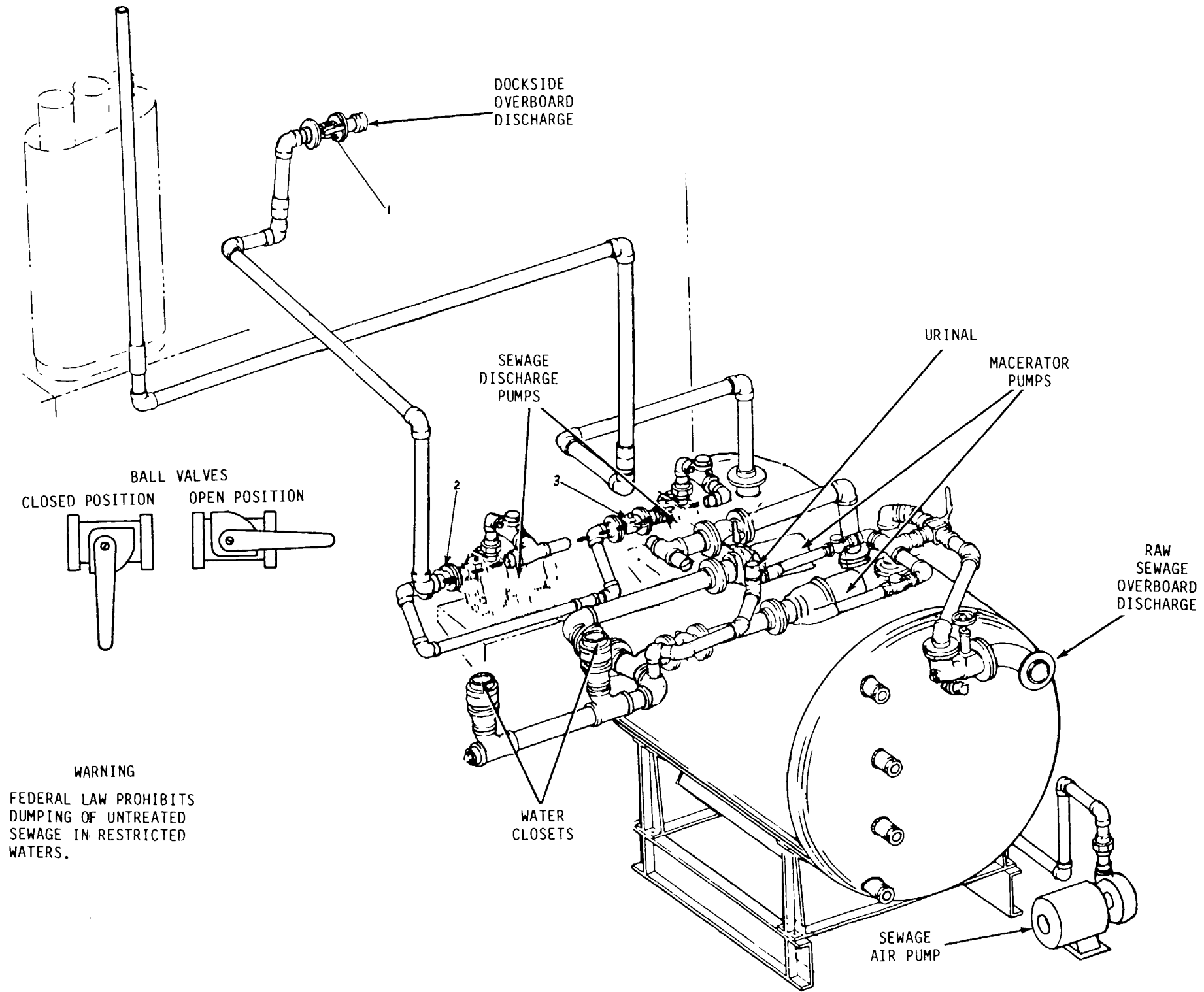


Figure FO-55. Overboard Discharge - Holding Tank

FO-55

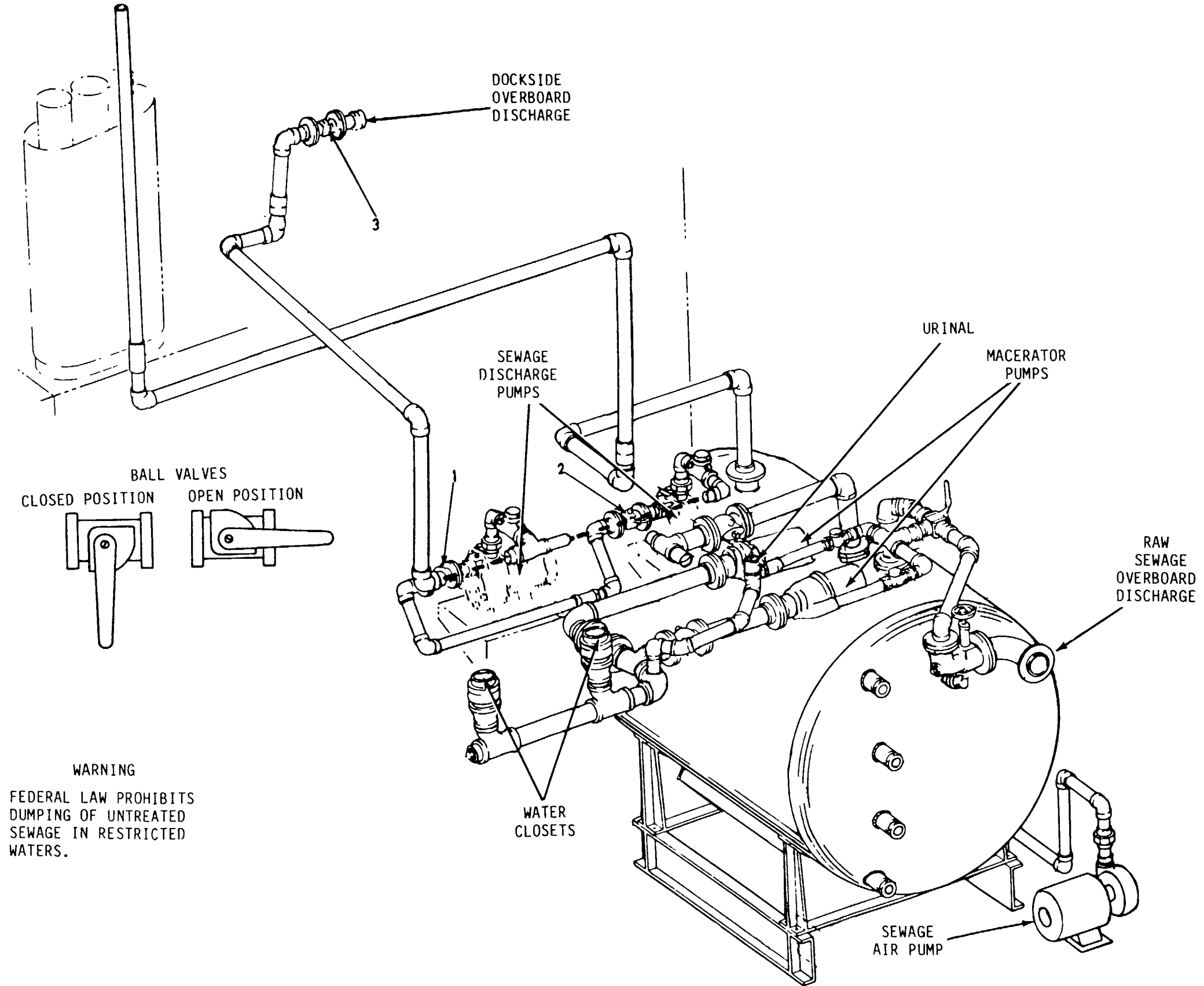


Figure FO-56. Overboard Discharge Shutdown

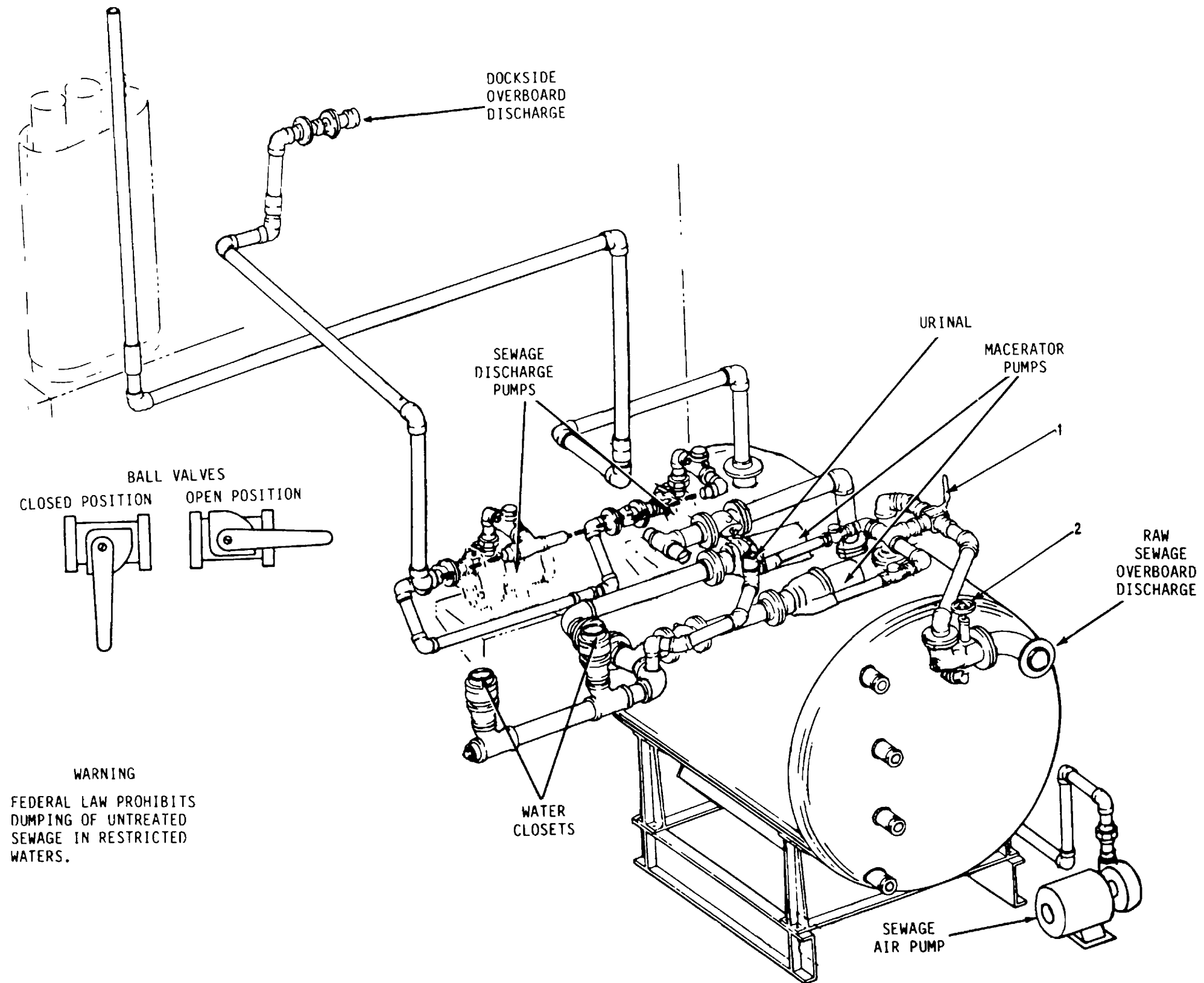


Figure FO-57. Overboard Discharge - Macerator Pumps

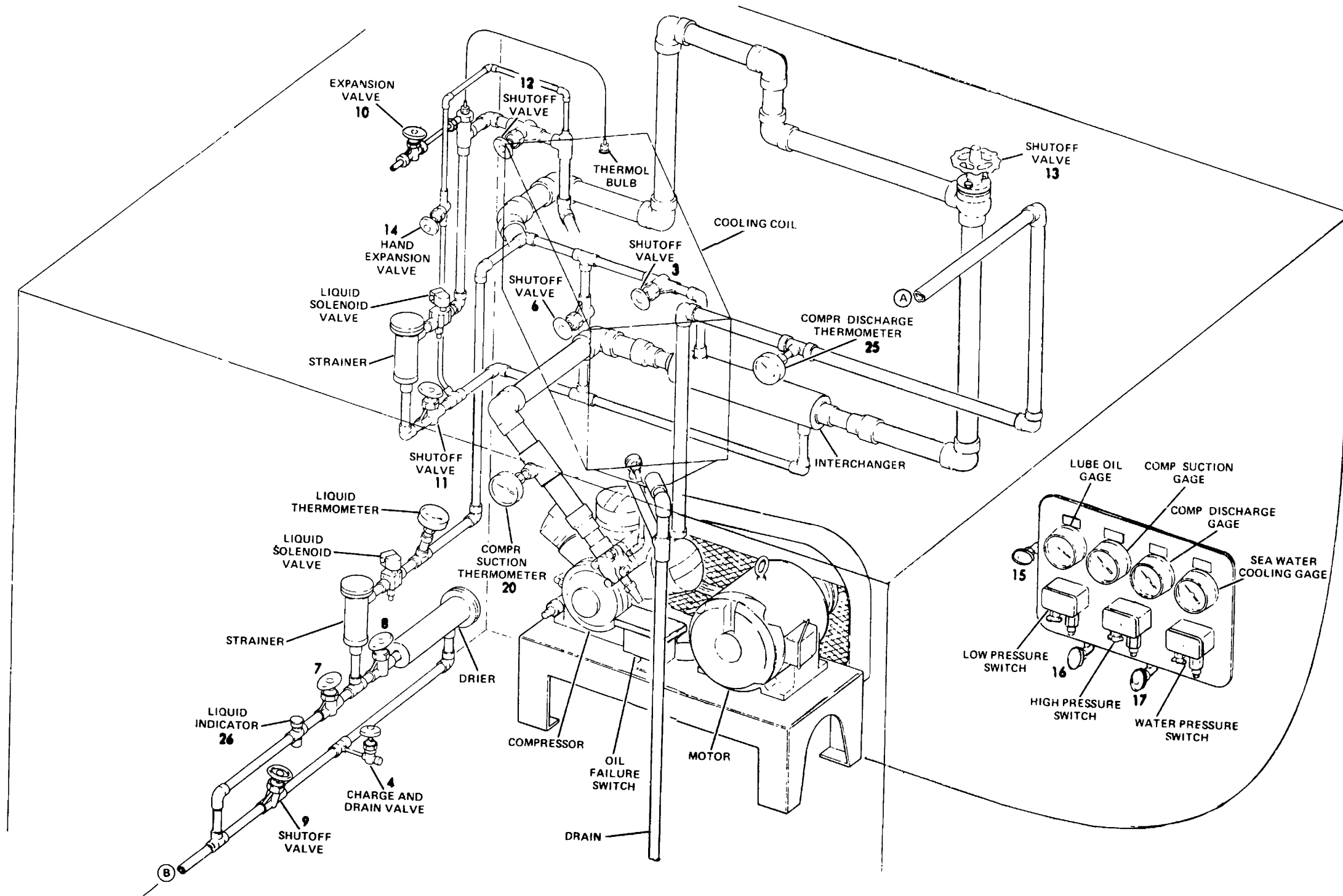


Figure FO-58. Air Conditioning System

FO-58

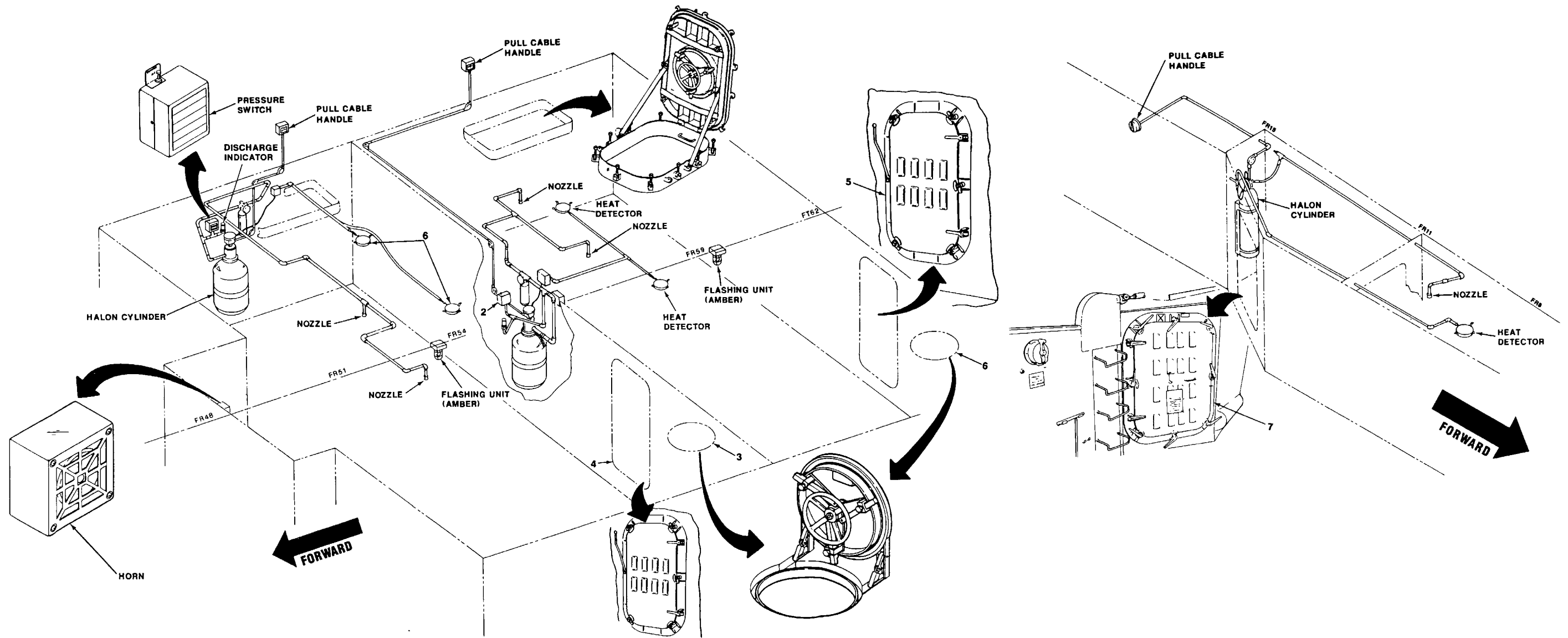


Figure FO-59. Halon System

Change 2 FO-59

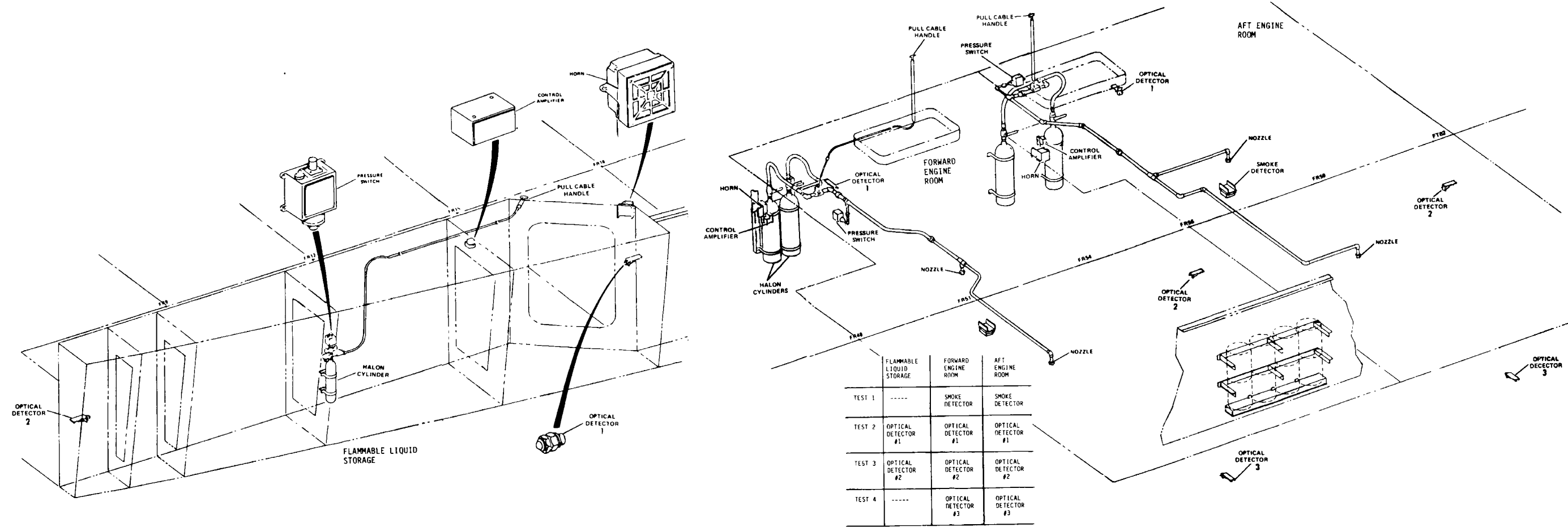
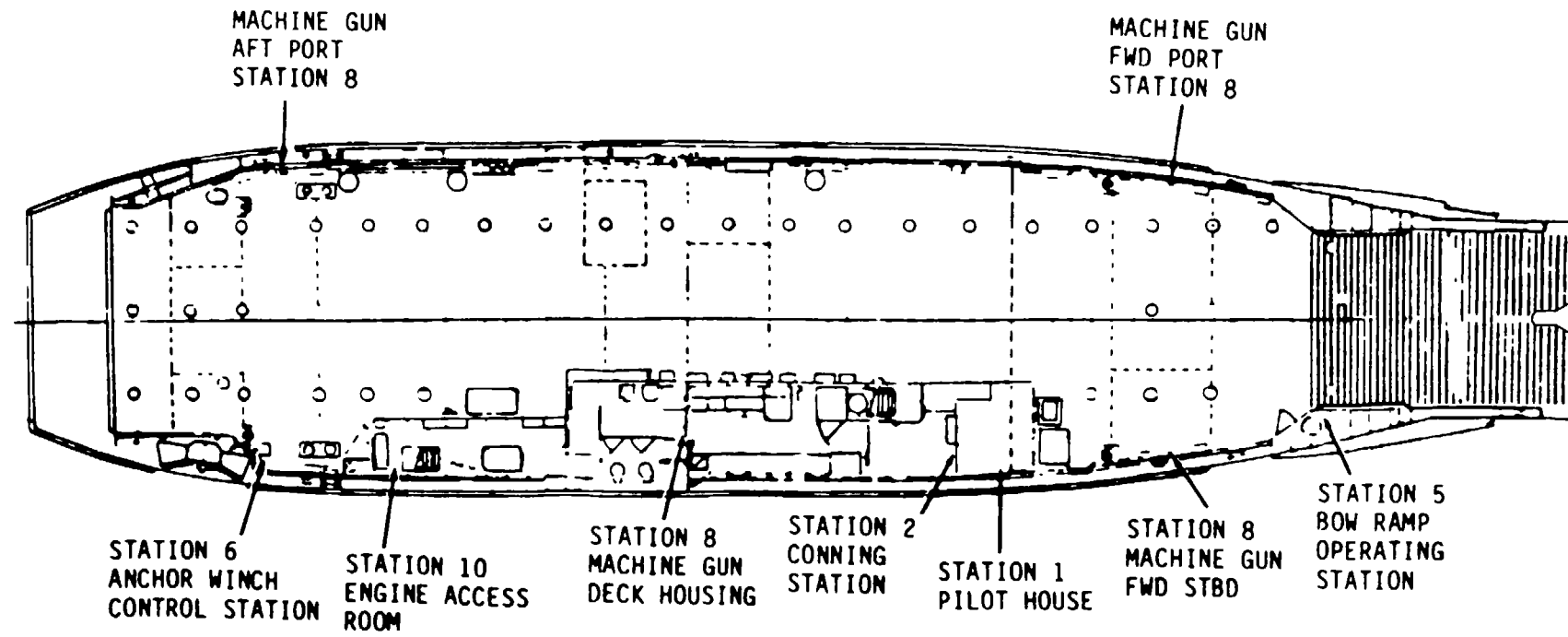
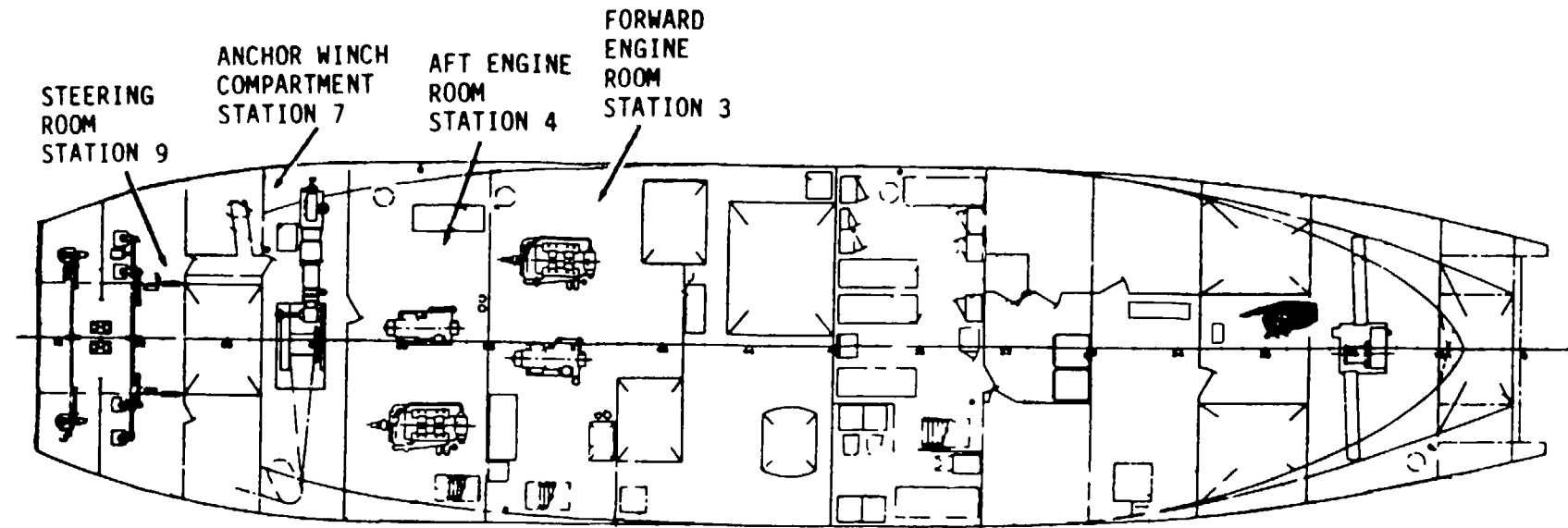


Figure FO-60. Halon System Testing

FO-60



4954-151

Figure FO-61.1 Intercommunication Station (Sheet 1 of 2)

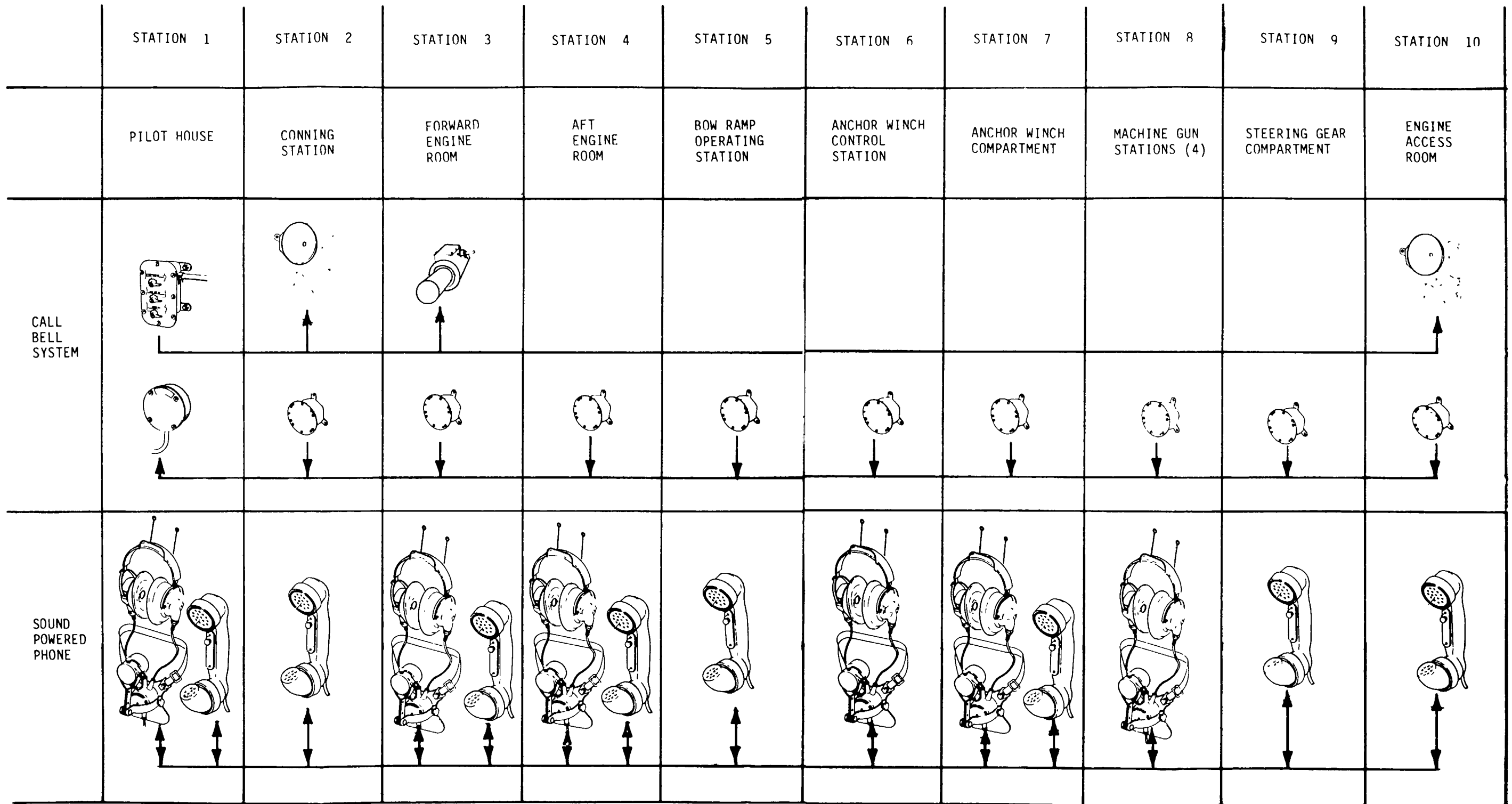


Figure FO-61.2 Intercommunication Station (Sheet 2 of 2)

FO-61.2

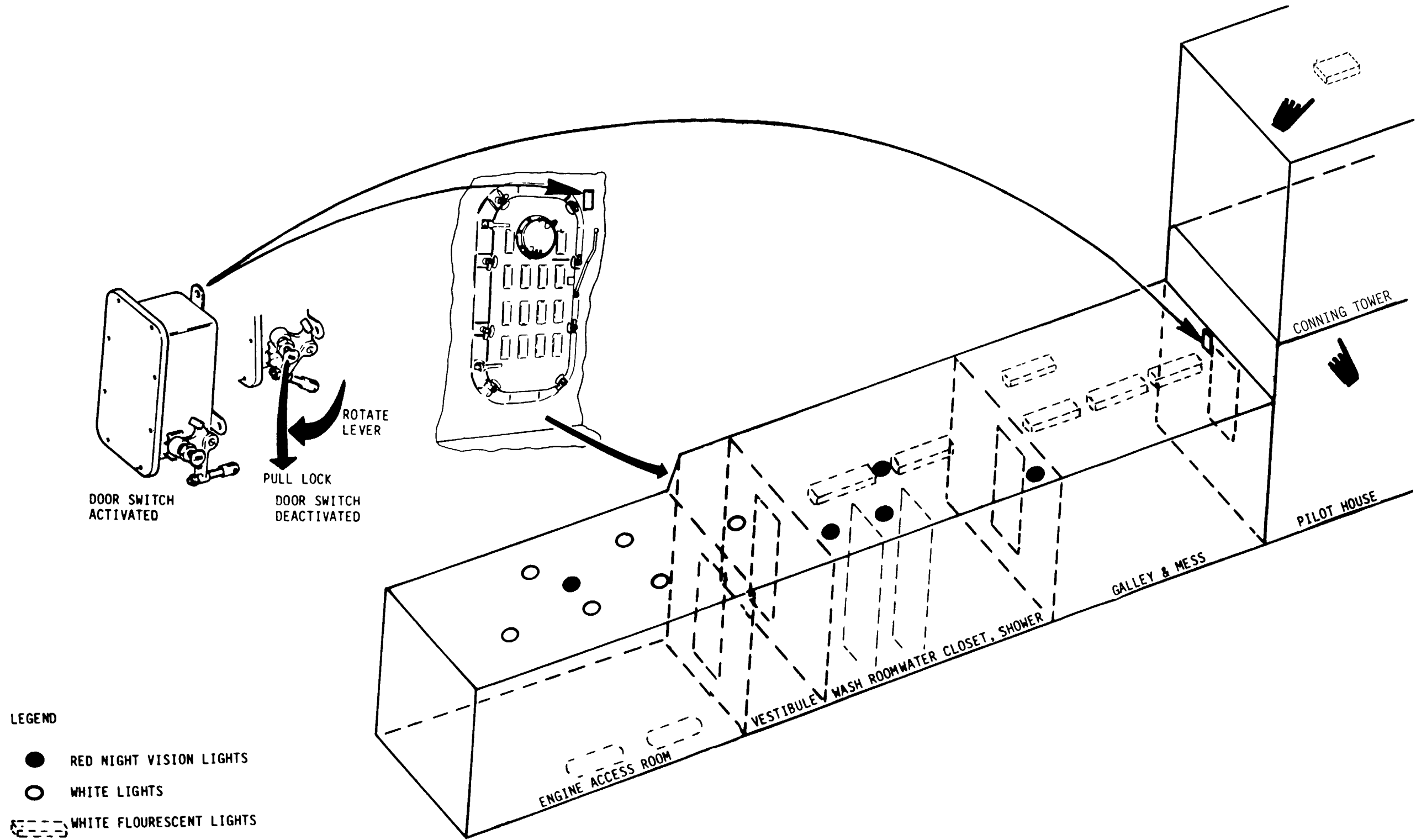
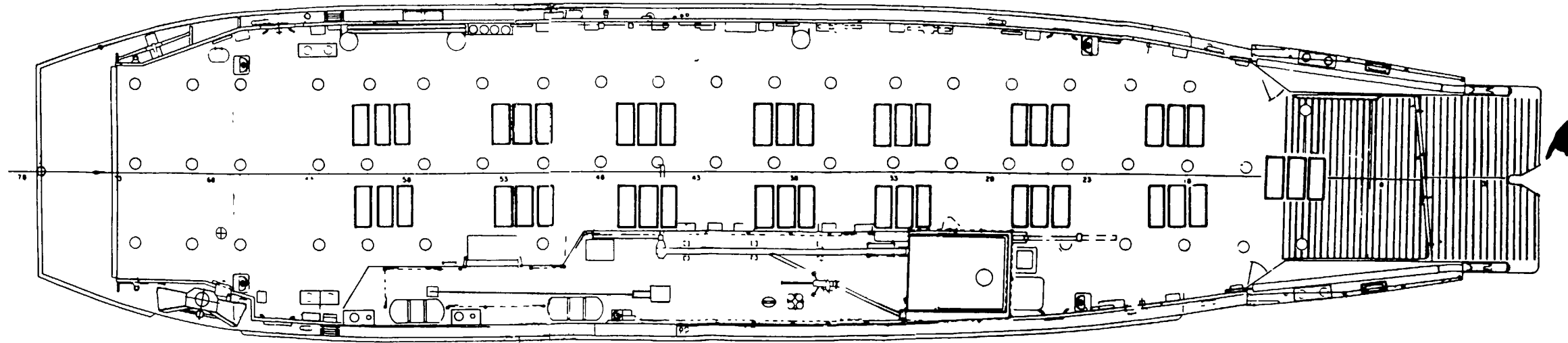
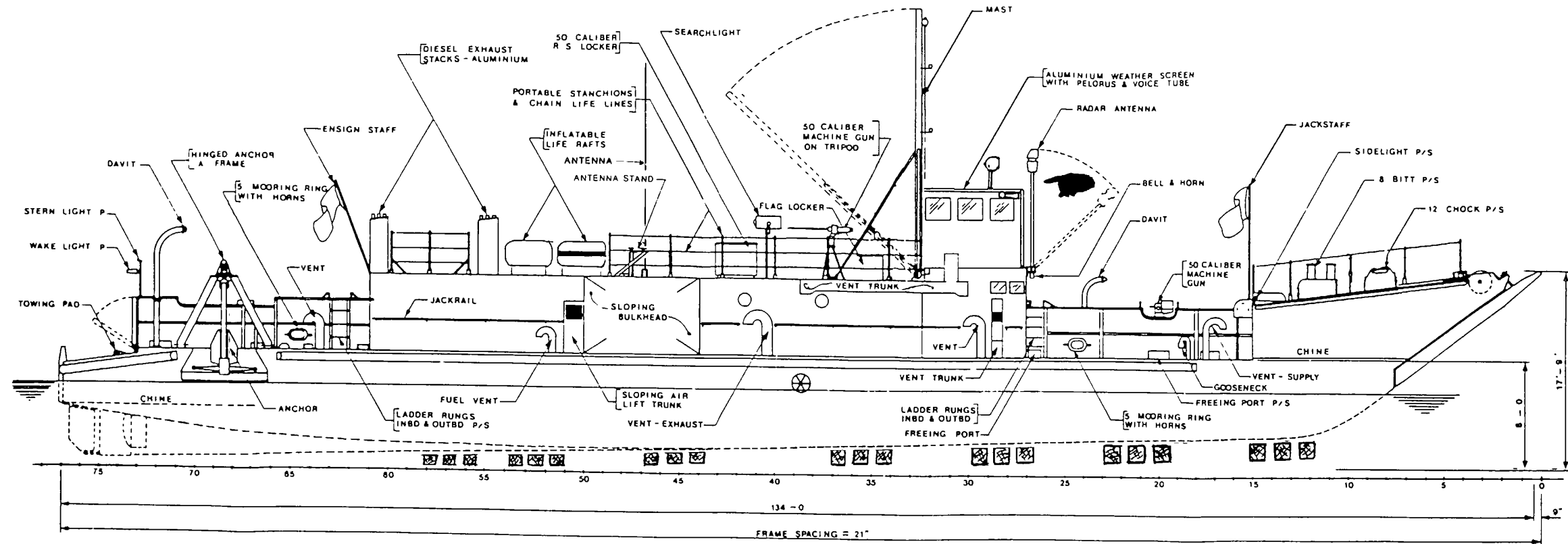


Figure FO-62. Night Vision Lights

Change 2 FO-62



NOTE
REFER TO NAVSEA PLAN NUMBER
LCU 1671-845-4661629 FOR
DETAILS -

4954-014A

Figure FO-63. Dry Dock Plan

Change 2 FO-63

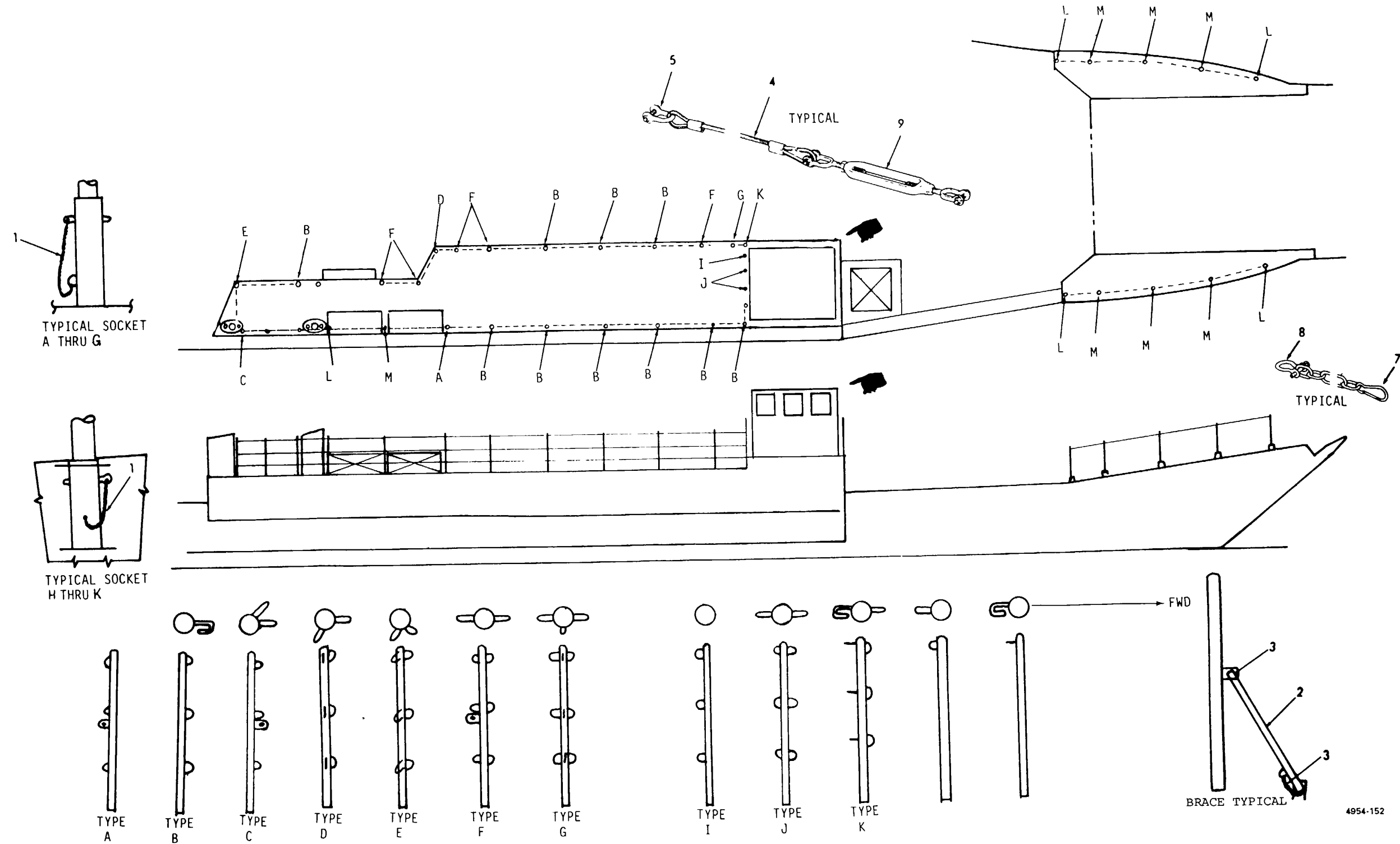
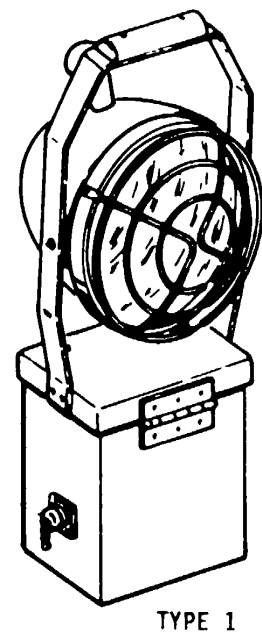
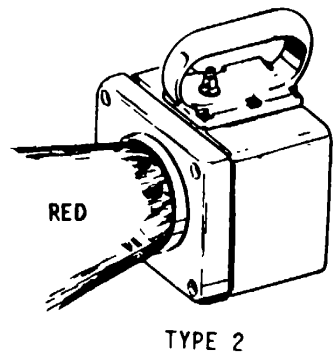


Figure FO-64. Stanchion Location

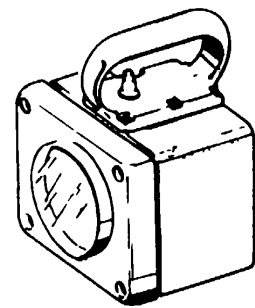
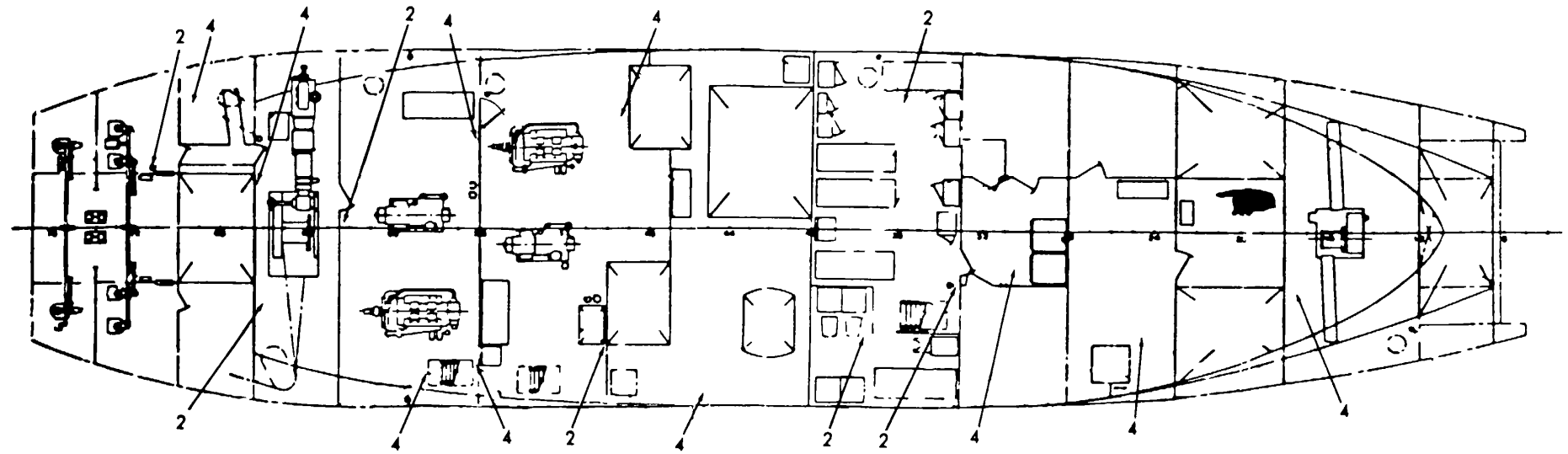
Change 2 FO-64



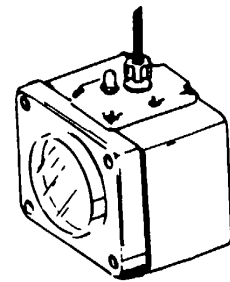
TYPE 1



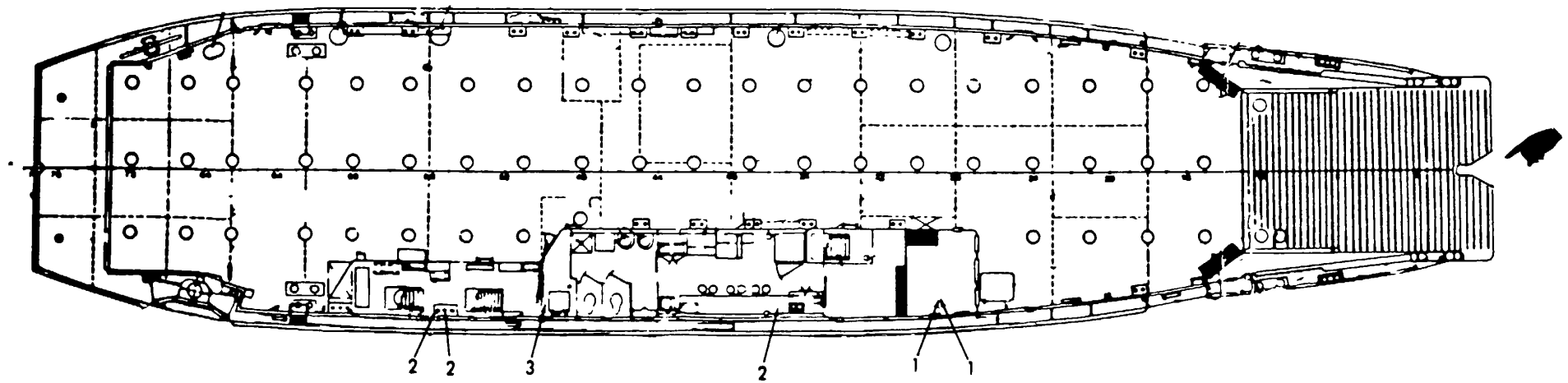
TYPE 2



TYPE 3



TYPE 4



4954-153

Figure FO-65. Location of Emergency Hand Lanterns

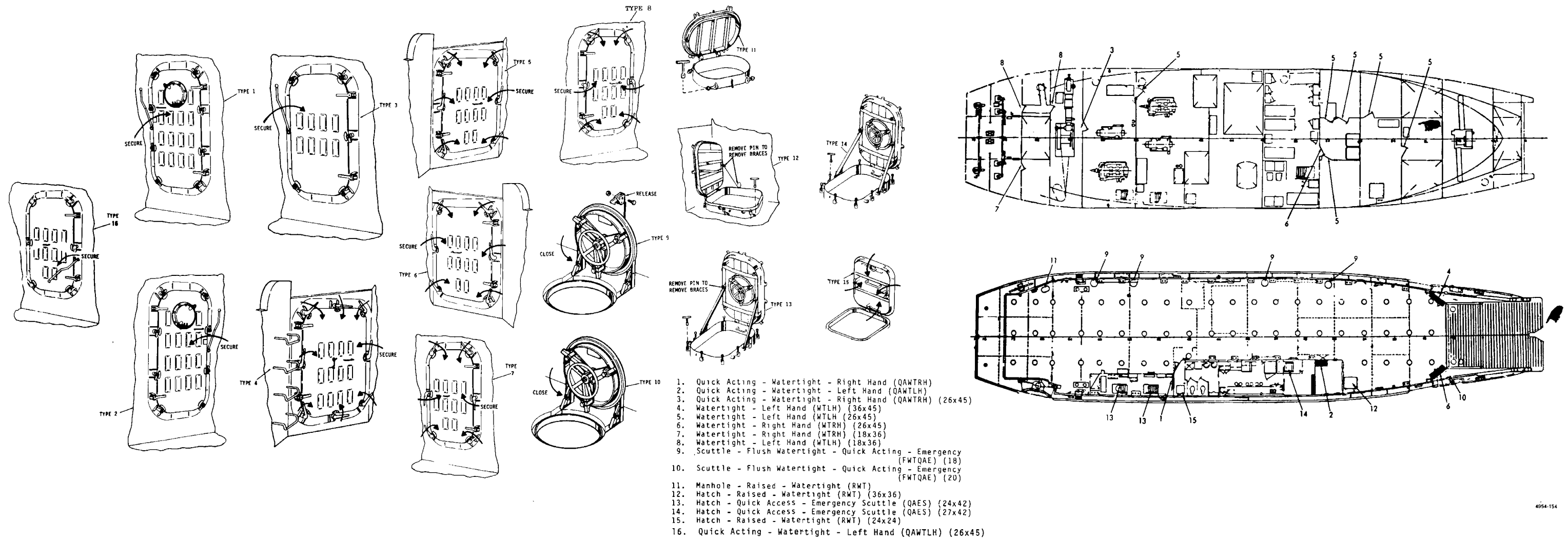
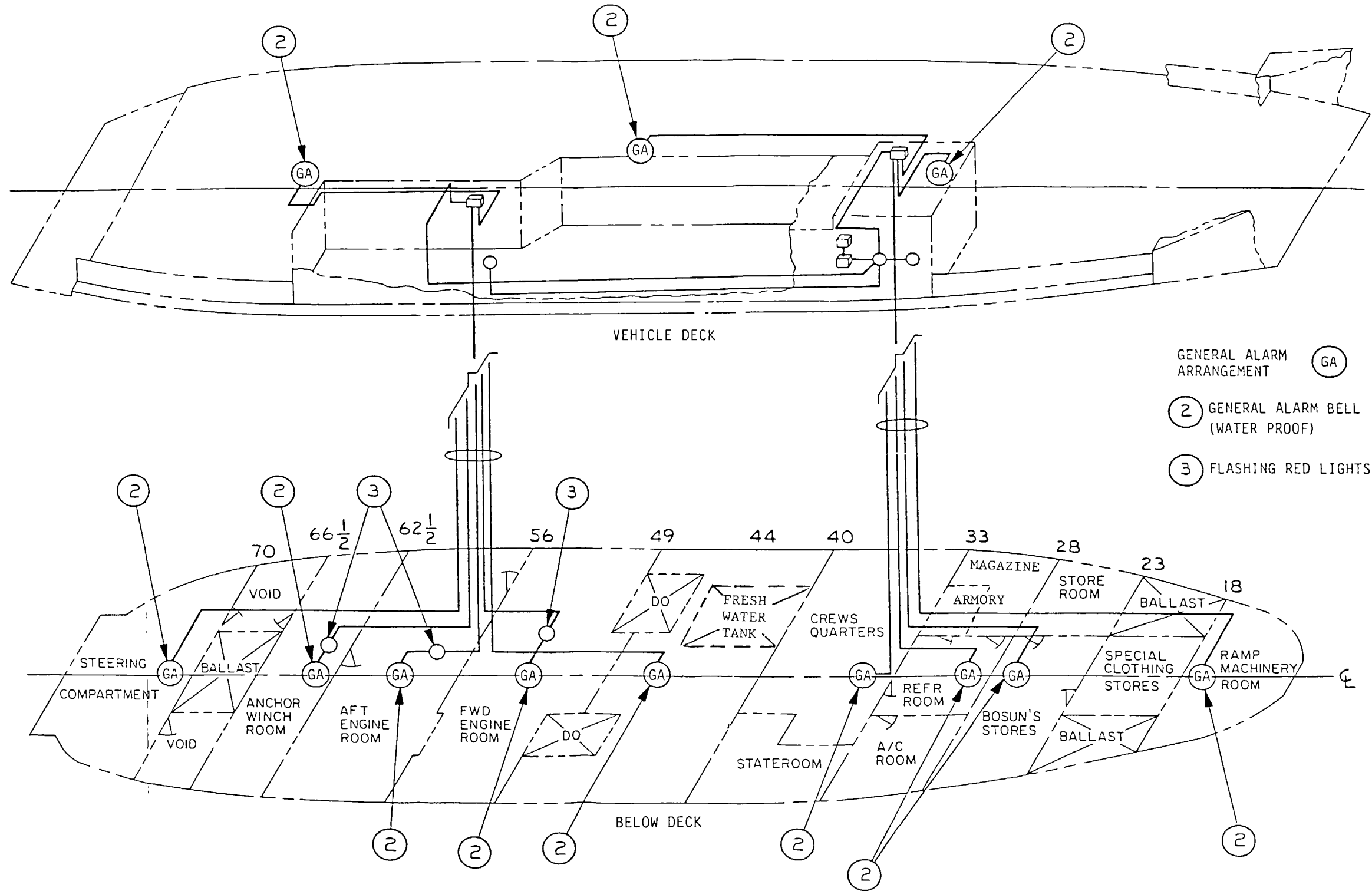


Figure FO-66. Watertight Integrity

Change 2 FO-66



FO-67. General Alarm Arrangement.

Change 2 FO-67

The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
 1 decimeter = 10 centimeters = 3.94 inches
 1 meter = 10 decimeters = 39.37 inches
 1 dekameter = 10 meters = 32.8 feet
 1 hectometer = 10 dekameters = 328.08 feet
 1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
 1 decigram = 10 centigrams = 1.54 grains
 1 gram = 10 decigram = .035 ounce
 1 decagram = 10 grams = .35 ounce
 1 hectogram = 10 decagrams = 3.52 ounces
 1 kilogram = 10 hectograms = 2.2 pounds
 1 quintal = 100 kilograms = 220.46 pounds
 1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce
 1 deciliter = 10 centiliters = 3.38 fl. ounces
 1 liter = 10 deciliters = 33.81 fl. ounces
 1 dekaliter = 10 liters = 2.64 gallons
 1 hectoliter = 10 dekaliters = 26.42 gallons
 1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
 1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
 1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
 1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
 1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
 1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
 1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
 1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

<i>To change</i>	<i>To</i>	<i>Multiply by</i>	<i>To change</i>	<i>To</i>	<i>Multiply by</i>
inches	centimeters	2.540	ounce-inches	Newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29.573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	Newton-meters	1.356	metric tons	short tons	1.102
pound-inches	Newton-meters	.11296			

Temperature (Exact)

°F	Fahrenheit	5/9 (after	Celsius	°C
	temperature	subtracting 32)	temperature	

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS



THEN...JOT DOWN THE
DOPE ABOUT IT ON THIS FORM.
CAREFULLY TEAR IT OUT, FOLD IT
AND DROP IT IN THE MAIL.

SOMETHING WRONG WITH PUBLICATION

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER

PUBLICATION DATE

PUBLICATION TITLE

BE EXACT PIN-POINT WHERE IT IS

PAGE
NO.

PARA-
GRAPH

FIGURE
NO.

TABLE
NO.

IN THIS SPACE, TELL WHAT IS WRONG
AND WHAT SHOULD BE DONE ABOUT IT.

PRINTED NAME, GRADE OR TITLE AND TELEPHONE NUMBER

SIGN HERE

