TECHNICAL MANUAL

OPERATOR'S, UNIT, AND DIRECT SUPPORT

MAINTENANCE MANUAL

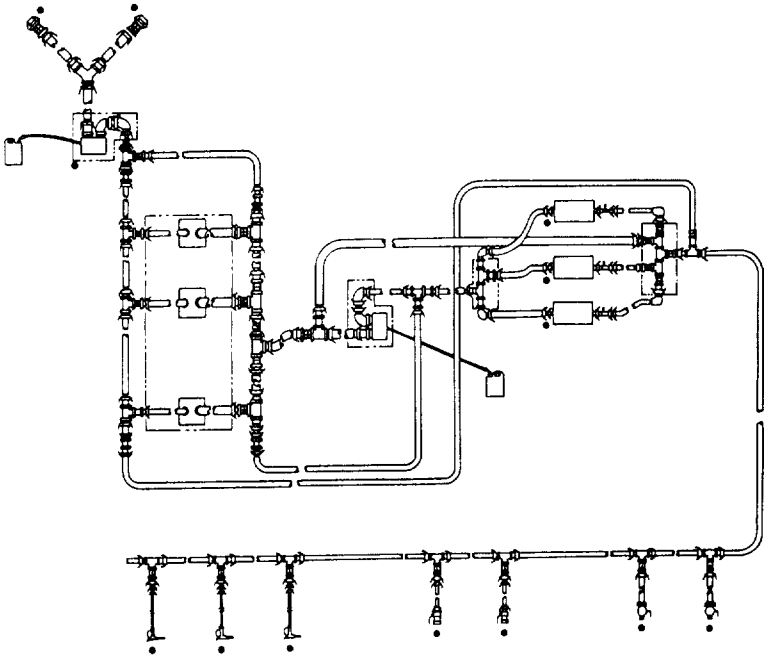
FOR

ARCTIC FUEL SYSTEM SUPPLY

POINT (AFSSP)

MODEL: AFSSP100

NSN: 4930-01-355-9582



HOW TO USE THIS MANUAL	iii
EQUIPMENT DESCRIPTION AND DATA	1-3
OPERATION UNDER USUAL CONDITIONS	2-35
OPERATOR TROUBLESHOOTING PROCEDURES	3-1
UNIT MAINTENANCE PROCEDURES	4-6
MAINTENANCE ALLOCATION CHART	B-1
COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LIST	C-1
EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST	E-1
ALPHABETICAL INDEX	Index-1

HEADQUARTERS, DEPARTMENT OF THE ARMY
26 JULY 1995

WARNINGS

Pay particular attention to specific WARNINGS AND CAUTIONS throughout this manual. DEATH or serious injury may result if personnel fail to observe safety precautions.

Do not touch cold metal parts with bare hands when operating under arctic conditions. Frostbite can cause permanent injury.

Lifting or moving heavy equipment incorrectly can cause serious injury. Do not try to lift or move more than 50 pounds by yourself. Get an assistant. Bend legs while lifting. Do not support weight with your back.

DEATH or serious injury may result if personnel fail to observe the following safety precautions.

FLAMMABLE FUEL

- Do not breathe fuel vapors. Vapors are toxic and can cause serious illness or death. If dizziness occurs, leave area and get fresh air.

- Before operation be certain all system components are securely connected to avoid fuel spills. If fuel spill occurs, cover the area with dry soil to reduce rate of vaporization. During operation avoid fuel spills as much as possible. Be certain a suitable fire extinguisher is charged and readily available in case of fire.

- Fuel vapors are extremely flammable. Do not allow smoking within 100 feet of the AFSSP. Post NO SMOKING signs around the areas. Do not operate system or components near open flame or excessive heat. Death or personnel injury could result from exploding or burning fuel. Be certain a suitable and properly charged fire extinguisher is available at all times.

SOLVENT HAZARD

- Drycleaning solvent, P-D-680, Type III, used to clean parts, is potentially dangerous to personnel and property. Eye protection required. Avoid repeated and prolonged skin contact by wearing rubber or nonporous gloves when handling solvents or material wet with drycleaning solvent. Wash hands immediately after exposure with soap and water and use a lanolin based skin cream to prevent skin drying.

- Do not use near open flame or excessive heat. Do not work with solvent in a closed room. Be sure there is good ventilation or the solvent vapors will build up in the air and become a poisonous mixture which can cause physical injury or even death.

- Do not breathe dry cleaning solvent vapors for long periods of time or allow solvent to come into contact with skin for an extended time. DO NOT use solvent near open flames or excessive heat.

STATIC DISCHARGE

- Static discharge could ignite the fuel or cause an explosion of the fuel vapor. Do not operate the system until properly grounded or bonded.

- Be certain the nozzles are properly bonded to the vehicle being filled. The vehicle being filled and the dispensing pump must be grounded.

ARCING

Radio transmitters can cause an arc at antennas. Do Not ground equipment to a radio antenna. Do not transmit during fueling operations.

WARNINGS - cont.

FUEL SPILLS ON PERSONNEL

- Avoid getting fuel on your body or clothing. If clothing becomes saturated with fuel, remove clothing immediately and wash your body with hot soapy water.

- Wear protective goggles and refuel only in well-ventilated area. Use fuel resistant gloves when handling system components due to toxic effects of some fuel additives. Avoid contact with skin, eyes, and clothes. If fuel contacts eyes, flush eyes with clean fresh water and get medical attention immediately.

FIRST AID

FIRST AID instructions are given in FM 21-11, First Aid For Soldiers.

TECHNICAL MANUAL

NO: 10-4930-241-13

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C. 26 July1995

OPERATOR'S, UNIT, AND DIRECT SUPPORT MAINTENANCE MANUAL for ARCTIC FUEL SYSTEM SUPPLY POINT (AFSSP)

MODEL AFSSP100
NSN: 4930-01-355-9582

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve these procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual directly to: Commander, US Army Aviation and Troop Command, ATTN: AMSAT-I-MP, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798, or you may submit your recommended changes by E-mail directly to <daf2028@st-louis-emh7.army.mil> A reply will be furnished directly to you.

TABLE OF CONTENTS

		PAGE
HOW TO USE THIS MANUAL		iii
CHAPTER 1.	**INTRODUCTION**	
Section I.	General Information	1-1
Section II.	Equipment Description and Data	1-3
Section III.	Principles of Operation	1-10
CHAPTER 2.	**OPERATING INSTRUCTIONS**	
Section I.	Description and Use of Operator's Controls and Indicators	2-2
Section II.	Operator's Preventive Maintenance Checks and Services (PMCS)	2-18
Section III.	Operation Under Usual Conditions	2-35
Section IV.	Operation Under Unusual Conditions	2-118
CHAPTER 3.	**OPERATOR MAINTENANCE INSTRUCTIONS**	
Section I.	Lubrication Instructions	3-1
Section II.	Operator Troubleshooting	3-1
Section III.	Operator Maintenance Procedures	3-17
CHAPTER 4.	**UNIT MAINTENANCE INSTRUCTIONS**	
Section I.	Repair Parts, Special Tools, Test, Measurement and Diagnostic Equipment (TMDE), and Support Equipment	4-2
Section II.	Service Upon Receipt	4-3
Section III.	Unit Preventive Maintenance Checks and Services	4-4
Section IV.	Unit Maintenance Procedures	4-6
Section V.	Preparation for Storage or Shipment	4-6

TABLE OF CONTENTS - cont

		PAGE
CHAPTER 5.	**DIRECT SUPPORT MAINTENANCE**	
	Direct Support Maintenance Procedures	5-1
APPENDICES		
Appendix A.	References	A-1
Appendix B.	Maintenance Allocation Chart	B-1
Appendix C.	Components of End Item and Basic Issue Items List	C-1
Appendix D.	Additional Authorization List	D-1
Appendix E.	Expendable and Durable Items List	E-1
Appendix F.	**Lubrication Instructions**	F-1
Appendix G.	Illustrated List of Manufactured Items	G-1
Appendix H.	Torque Limits	H-1
Appendix I.	Mandatory Replacement Parts	I-1
Alphabetical Index		Index 1

HOW TO USE THIS MANUAL

Be sure to read all Warnings before using your equipment.

This manual incorporates a quick reference tab feature that allows you to quickly locate the most often I referenced subjects and topics appearing in this manual. The reference tab feature is comprised of the following components:

Cover Page Index

Index boxes are located on the right-hand edge of the cover page. Each index box contains a subject title, page number, and black index tab.

Table of Contents

The Table of Contents lists all the major subjects contained in this manual. Subjects that are surrounded by a black box correspond to those that appear on the cover page index.

Page Numbers and Index Tabs

Each page of this manual is identified with a page number. Pages that contain the subjects identified on the cover page index also contain a black tab on the right edge of the page that alines with the cover page index tab

To use the quick reference tab feature, select the title of the subject you are trying to find from the cover page index. You can turn to the indicated page number or bend the pages back and locate the page tab that alines with the over index tab.

If the cover page is lost or badly worn, page numbers and index tabs can be located by referring to the Table of Contents.

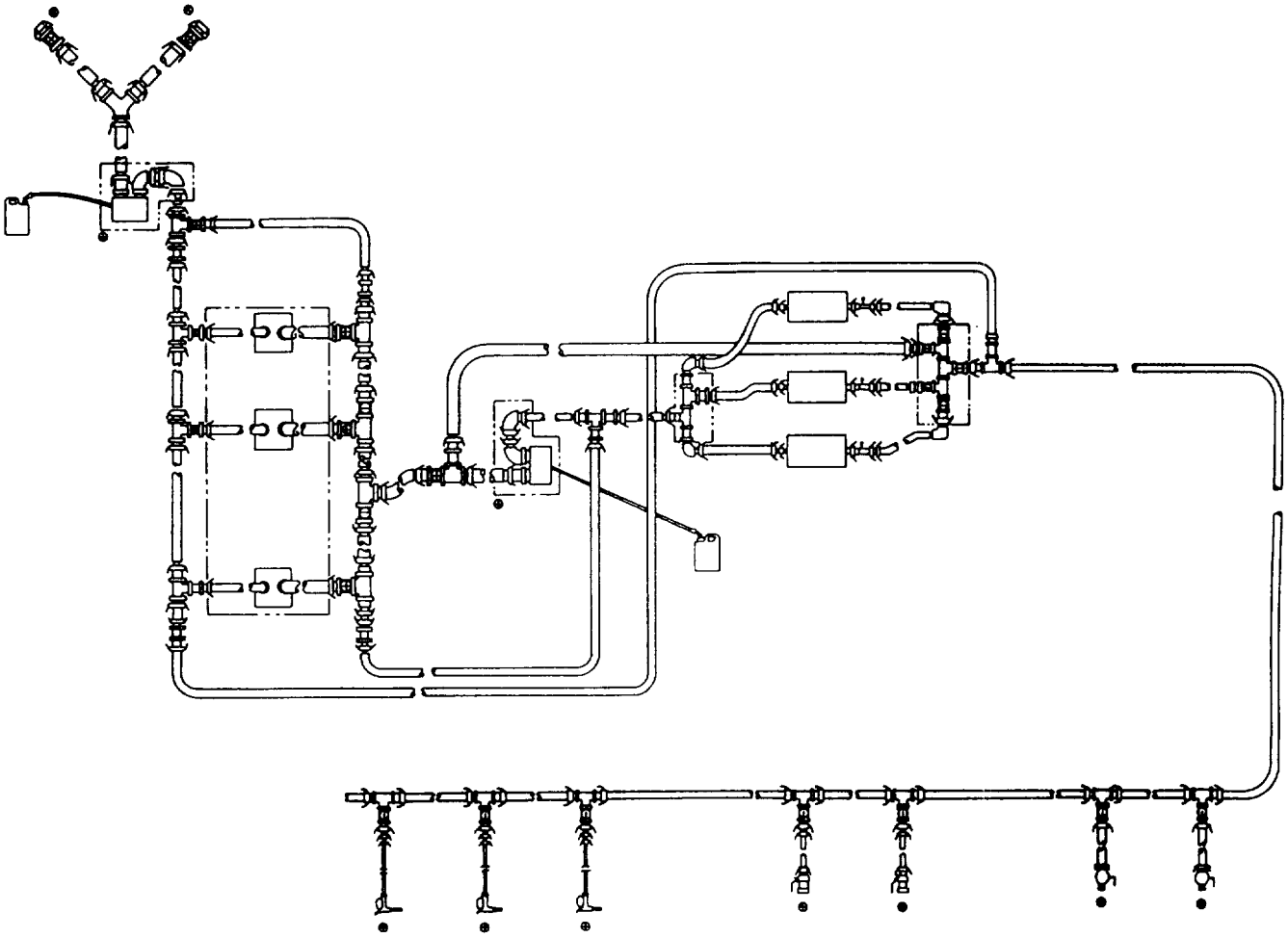


Figure 1-0 . Arctic Fuel System Supply Point (AFSSP), Model AFSSP100 .

CHAPTER 1

INTRODUCTION

Paragraph	Title	Page
Section I	**General Information**	1-1
1-1	Scope	1-1
1-2	Maintenance Forms Records and Reports	1-1
1-3	Corrosion Prevention and Control (CPC)	1-2
1-4	Destruction of Army Materiel to Prevent Enemy Use	1-2
1-5	Reporting of Equipment Improvement Recommendations (EIR)	1-2
1-6	Nomenclature Cross Reference List	1-2
1-7	List of Abbreviations	1-2
1-8	Glossary	1-3
Section II	**Equipment Description and Data**	1-3
1-9	Equipment Characteristics and Features	1-3
1-10	Location and Description of Major Components	1-4
1-11	Equipment Data	1-8
Section III	**Principles of Operation**	1-10
1-12	System Technical Principles of Operation	1-10

Section I. GENERAL INFORMATION

1-1. SCOPE.

This manual contains operating instructions and Unit, and Direct Support maintenance procedures required to operate and maintain the Arctic Fuel System Supply Point (AFSSP). The purpose of the AFSSP is to refuel equipment operating in all environments, including low arctic temperatures.

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

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750 (The Army Maintenance Management System (TAMMS)).

1-3. CORROSION PREVENTION AND CONTROL.

a. Corrosion Prevention and Control (CPC) of Army Materiel is a continuing concern. It is important that any corrosion problems with this item be reported so that the problem can be corrected and improvements can be made to prevent the problem in future items.

1-3. CORROSION PREVENTION AND CONTROL cont.

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

c. If a corrosion problem is identified, it can be reported using Standard Form 368, Product Quality Deficiency Report. Using key words such as "rust", "deterioration", or "cracking" will insure that the information is identified as a CPC problem. The form should be submitted to the address specified in DA Pam 738-750.

1-4. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE.

Methods and procedures for destruction of Army materiel to prevent enemy use are covered in TM 750-244-3.

1-5. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIRs).

If your AFSSP needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on an SF 368 (Quality Deficiency Report). Mail to: Commander, U.S. Army Aviation and Troop Command, ATTN: AMSAT-I-MOF, 4300 Goodfellow Boulevard, St. Louis, MO 63120-1798. We'll send you a reply.

1-6. NOMENCLATURE CROSS REFERENCE LIST.

Common Name	Official Nomenclature
AFSSP	Arctic Fuel System Supply Point
CCR Nozzle	Closed Circuit Refueling Nozzle
D1 Nozzle	Single Point Refueling Nozzle

1-7. LIST OF ABBREVIATIONS.

Abbreviation	Nomenclature
Assy	Assembly
In.	Inch
°C	Degrees Centigrade
GPM	Gallons Per Minute
K	Kilo (Thousand)
°F	Degrees Fahrenheit
Ft	Feet or Foot
PSI	Pounds Per Square Inch
PSIG	Pounds Per Square Inch Gage
PMCS	Preventive Maintenance Checks and Services
TM	Technical Manual
DP	Differential Pressure

1-8. GLOSSARY.

Term	Description
Interchangeable	Two or more like parts with the same function and features that can be exchanged one for the other without changing parts or selecting size to obtain correct fit.
Plenum	Collection Point For Exhaust Gases

Section II. EQUIPMENT DESCRIPTION AND DATA

1-9. EQUIPMENT CHARACTERISTICS, CAPABILITIES AND FEATURES.

a. Characteristics.

(1) Turbine powered pump provides maximum pumping capacity of 600 gallons per minute (GPM).

(2) Maximum fuel storage capacity of 60,000 gallons per module.

(3) Quick disconnect cam-locking couplings on all components allow rapid system assembly and disassembly.

(4) System can be configured to meet varying mission and site requirements.

(5) Major operating assemblies are skid mounted to aid movement in arctic conditions.

(6) No external electrical power source required.

b. Capabilities and Features.

(1) System operating range: -60°F to + 95°F (-51°C to + 35°C).

(1) Seven equipment refueling points per module. Each point independently controlled by a refueling nozzle or valve. 50 GPM minimum fuel flow.

(2) Hand operated valves control fuel flow through the system.

(4) 3,000 to 60,000 gallon fuel storage capacity provided by one to three collapsible fuel tanks per module. Tanks can be transported by truck or aircraft.

(5) Turbine powered, 600 GPM pump operates off of system fuel supply.

1-10. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS.|

Refer to figure 1-1.

The AFSSP system consists of two AFSSP modules. The AFSSP module consists of collapsible fuel tanks, a turbine powered fuel pumps, filter separators, fueling manifolds, refueling nozzles and the necessary hoses, tees and couplings required to assemble the system. The following paragraphs describe a typical AFSSP module. Your mission and operating environment may require connecting the components in a different configuration than the one shown. All components are interchangeable.

a. 6-inch Valve Section (1). Two 6-inch valve sections are supplied. The valve sections is comprised of hand operated gate valves and couplings.

b. Wves (2). Wyes are used to assemble the AFSSP system and are installed where fuel distribution must be split between two hoses. All wyes are equipped with 6-inch quick disconnect couplings.

c. 600 GPM Pump Assembly (3). The pump assembly is a self contained, skid mounted unit powered by a turbine engine. The pump assembly provides the force required to distribute fuel from the 3,000, 10,000 or 20,000 gallon tanks to the fuel dispensing nozzles. For location and description of major components on the 600 GPM pump assembly, refer to **TM 10-4320-342-10**.

d. 4-inch Hoses (4). Collapsible (discharge) 4-inch hoses are used to distribute fuel from one component to the other. Hoses are equipped with quick disconnect couplings at both ends.

e. 4-inch Manifold (5). The four inch manifold contains a gate valve and tee. The manifold is used to assemble the AFSSP system and provide control of fuel flow. The manifold is equipped with quick disconnect couplings.

f. Tank Assemblies (6). Three collapsible tanks are supplied. The tanks serve as the primary fuel source for operating the system. The tanks are pillow-shaped and are equipped with 90° elbows for use in connecting the tank to system hoses. The tanks may be refilled or replaced when empty. For location and description of major components on the 3,000, 10,000 or 20,000 gallon tanks, refer to **TM 10-5430-231-12.**

g. 6-inch Manifold (7). The fueling manifold is comprised of hand operated valves, tees and couplings. The manifold is supplied with 6-inch quick disconnect couplings.

h. 6-inch Hoses (8). Non-collapsible (suction) 6-inch hoses are used to distribute fuel from one component to the other and are equipped with quick disconnect couplings at both ends.

i. Elbows (9). **Elbows are used to assemble the AFSSP system and prevent sharp bends in fuel** hoses. All elbows are equipped with 4-inch quick disconnect couplings.

1-10. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - cont. I

j. 200 GPM Filter Separator Assembly (10). The filter separators are skid mounted units containing a separator tank and various valves, gages and piping. The filter separators are installed downline of the 600 GPM pump to remove water and particle contaminants from the fuel. For location and description of major components on the filter separator, refer to **TM 10-4330-23613**

k. Arctic Nozzle (11). Arctic nozzles are supplied with AFSSP for refueling. The hand operated arctic nozzle is supplied with 1f-inch quick disconnect couplings.

l. Tank Coupler (12). **Tank couplers are supplied with AFSSP for refueling at drum** .filling points. The hand operated coupler is supplied with 3-inch quick disconnect couplings.

m. Ball Valve (13). Ball valves are supplied with AFSSP for refueling at bottom loading points. The hand operated ball valve is supplied with 4-inch quick disconnect couplings.

n. Single Point Refueling Nozzle (Type D1) (14). D1 nozzles are supplied with the AFSSP accessory kit for refueling equipment with pressurized fuel systems. The D1 nozzles are non-regulating, so fuel pressure must be controlled by the fuel manifold. For location and description of major components of the D1 nozzle, refer to **TM 10-4930-242-13&P**

o. Closed Circuit Refueling (CCR) Nozzle with Gravity Fill Adapter (15). The CCR nozzles and gravity fill adapters supplied with the AFSSP accessory kit and are used to connect the fuel system to the equipment. The hand operated CCR Nozzle locks onto the equipment refueling adapter and regulates fuel pressure to the equipment. Nozzles are supplied with a ground clamp and bonding plug for electrical connection of the nozzle to the equipment. Refueling equipment with gravity feed fuel tanks requires connection of the gravity fill adapter to the CCR Nozzle. For location and description of major components of the CCR nozzle and gravity fill adapter, refer to **TM 10-4930-243-13&P**

p. Ground Rods (16). The fourteen ground rods provide grounding for fueling points, filter separators and 600 GPM pumps.

1-10. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - cont.

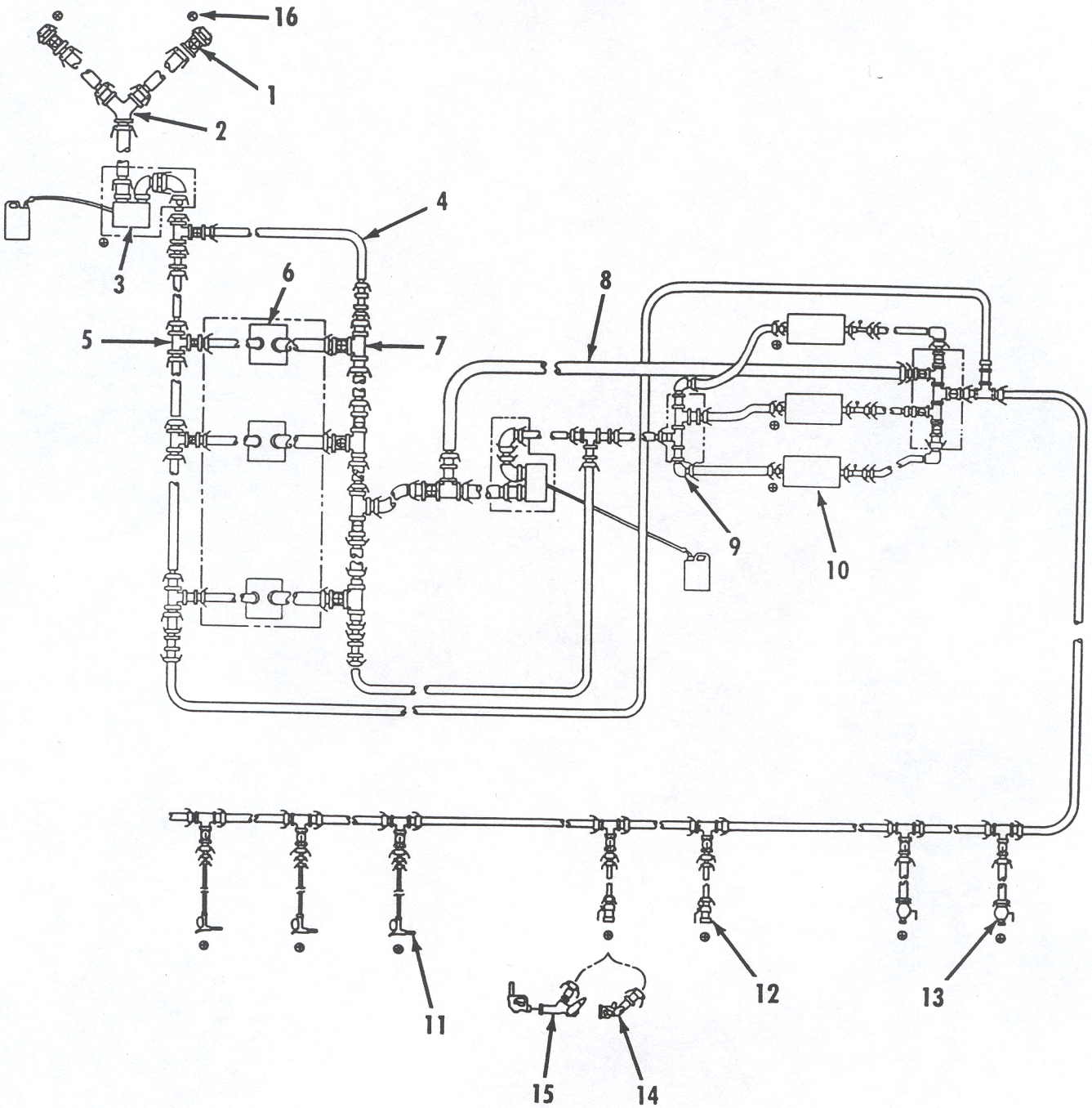


Figure 1-1. Arctic Fuel System Supply Point (AFSSP).

1-11. EQUIPMENT DATA.

The following table provides information pertaining to major components of the AFSSP.

Refer to the applicable technical manual for additional equipment data on the following equipment:

600 GPM Pump Assembly	**TM 10-4320342-10**
Closed Circuit Refueling (CCR) Nozzle and Gravity Fill Adapter	**TM 10-4930243-13&P**
Single Point Refueling Nozzle (D-1)	**TM 10-4930-242-13&P**
Collapsible Fabric Tank, Low Temperature	**TM 10-5430-231-12**
200 GPM Filter-Separator	**TM 10-4330-236-13**

Table 1-1. Equipment Data

SINGLE POINT REFUELING NOZZLE (D1)	
Length	17 in. (43 cm)
Width (across handles)	13 in. (33 cm)
Height	11 in. (28 cm)
Weight	9.25 lbs. (4.2 kg)
Coupling	2 in. (5 cm) quick disconnect
CLOSED CIRCUIT REFUELING (CCR) NOZZLE	
Length	16 in. (41 cm)
Width	6 in. (15 cm)
Height	11 in. (28 cm)
Weight	8.5 lbs. (3.8 kg)
Coupling	2 in. (5 cm) quick disconnect
GRAVITY FIUL ADAPTIR NOZZLE	
Length	18 in. (46 cm)
Width	2.5 in. (6.4 cm)
Height	16 in. (41 cm)
Weight	4.1 lbs. (1.8 kg)
Coupling	self-sealing poppet
D-1 NOZZLE	
Length	17 in. (43 cm)
Width	6 in. (15 cm)
Height	13 in.(38 cm)
Weight	6.9 lbs. (3.1 kg)
Coupling	1+ in. (4 cm) quick disconnect
TANK COUPLER	
Length	13 in. (33 cm)
Width	9 in. (23 cm)
Height	9 in. (23 cm)
Weight	14.2 lbs. (6.4 kg)
Coupling	3 in. (8 cm) quick disconnect

1-11. EQUIPMENT DATA - cont.

BALL VALVE

Length	24 in. (61 cm)
Width	9 in. (23 cm)
Height	12 in. (30 cm)
Coupling	4 in. (10 cm) quick disconnect
Weight	57.6 lbs. (26 kg)

FILTER SEPARATOR

Length	40.34 in. (102.46 cm)
Width	77.38 in. (196.54 cm)
Height (wheels down)	54.37 in. (137.16 cm)
Weight (empty)	475 lbs. (214 kg)
Operating Pressure	150 psi (10.5 kg/cm2)
Couplings	3 in. (7.7 cm) quick disconnect

600 GPM PUMP ASSEMBLY

Length	76 in. (193 cm)
Width	43 in. (109 cm)
Height (Wheels down)	46 in. (117 cm)
Fuel	JP4, JP5, JP8, DFA, DFI or DF2
Weight	1103 lbs. (496 kg)
Coupling (Inlet)	6 in. (15 cm) quick disconnect
Coupling (Outlet)	4 in. (10 cm) quick disconnect

COLLAPSIBLE FUEL TANKS (including ground cloth, accessories, and repair items)

3,000 Gallon Tank

Tank Dimensions (Empty)	14 x 14 feet (427 x 427 cm)
Tank Dimensions (Full)	12.5 x 12.5 x 4 ft. (381 x 381 x 122 cm)
Tank Weight (Empty)	436 lbs. (196 kg)

10,000 Gallon Tank

Tank Dimensions (Empty)	22 x 22 feet (671 x 671 cm)
Tank Dimensions (Full)	20.5 x 20.5 x 4 ft. (624.8 x 624.8 x 121.9 cm)
Tank Weight (Empty)	532 lbs. (239 kg)

20,000 Gallon Tank

Tank Dimensions (Empty)	24 x 28 feet (732 x 853 cm)
Tank Dimensions (Full)	23.5 x 27.5 x 5 6 in. (716.2 x 838.2 x 170.6 cm)
Tank Weight (Empty)	676 lbs. (304 kg)

Section III. PRINCIPLES OF OPERATION

1-12. SYSTEM TECHNICAL PRINCIPLES OF OPERATION.

NOTE

The AFSSP module described in this manual is configured for a typical mission. Your specific mission and operating requirements will determine how many of the system components must be connected and in what configuration. The type of fuel nozzle used at the offloading points will be determined by the type of equipment being refueled.

a. The Arctic Fuel System Supply Point (AFSSP) module is comprised of three tanks, manifolds, two turbine powered fuel pump, three 200 GPM filter separators, pressure reducing valves, five types of refueling nozzles and the necessary hoses and valves required to assemble and distribute fuel through the system. Fuel is received from tank trucks to fill the storage tanks. Fuel is removed from the 3,000, 10,000 or 20,000 gallon tanks and delivered to the required equipment. Fuel offloading can be accomplished at the refueling, drum filling or bottom loading points. Fuel can bypass the storage tanks and pump directly from the tank trucks to the dispensing points.

b. Fuel required to operate the AFSSP is stored in three collapsible tanks. The tanks expand as they are filled and collapse as they empty. Each tank is connected to the AFSSP module by two manifolds. As the manually operated gate valve is opened, fuel is allowed to flow to or from the tank. For additional information on principles of operation for the collapsible tanks, refer to **TM 10-5430-231-12**.

c. Fuel flows from the 3,000, 10,000 or 20,000 gallon tanks, through 6-inch hoses, to the manifold. One or two hand operated valves are installed on the manifold to direct fuel flow through the manifold. The manifold directs fuel from the 3,000, 10,000 or 20,000 gallon tanks to the 600 GPM pump for distribution to the equipment.

d. The turbine powered 600 GPM pump supplies fuel to the tanks and supplies fuel under pressure to the skid mounted filter separator. For additional information on principles of operation for the 600 GPM pump, refer to **TM 10-4320-342-10**.

e. Fuel from the 600 GPM pump is processed by the filter separators to remove solid contaminants and water from the fuel before delivery to the equipment. For additional information on principles of operation for the filter separator, refer to **TM 10-4330-236-13**.

f. Clean fuel from the filter separator is distributed through 1½, 3 or 4-inch discharge hoses to the Arctic Nozzle, Tank Coupler or a Ball Valve. A Closed Circuit Refueling Nozzle (CCR) with gravity fill adapter and a Single Point Refueling Nozzle (D1) are also provided as accessories to further enhance the versatility of the system.

1-12. SYSTEM TECHNICAL PRINCIPLES OF OPERATION - cont.

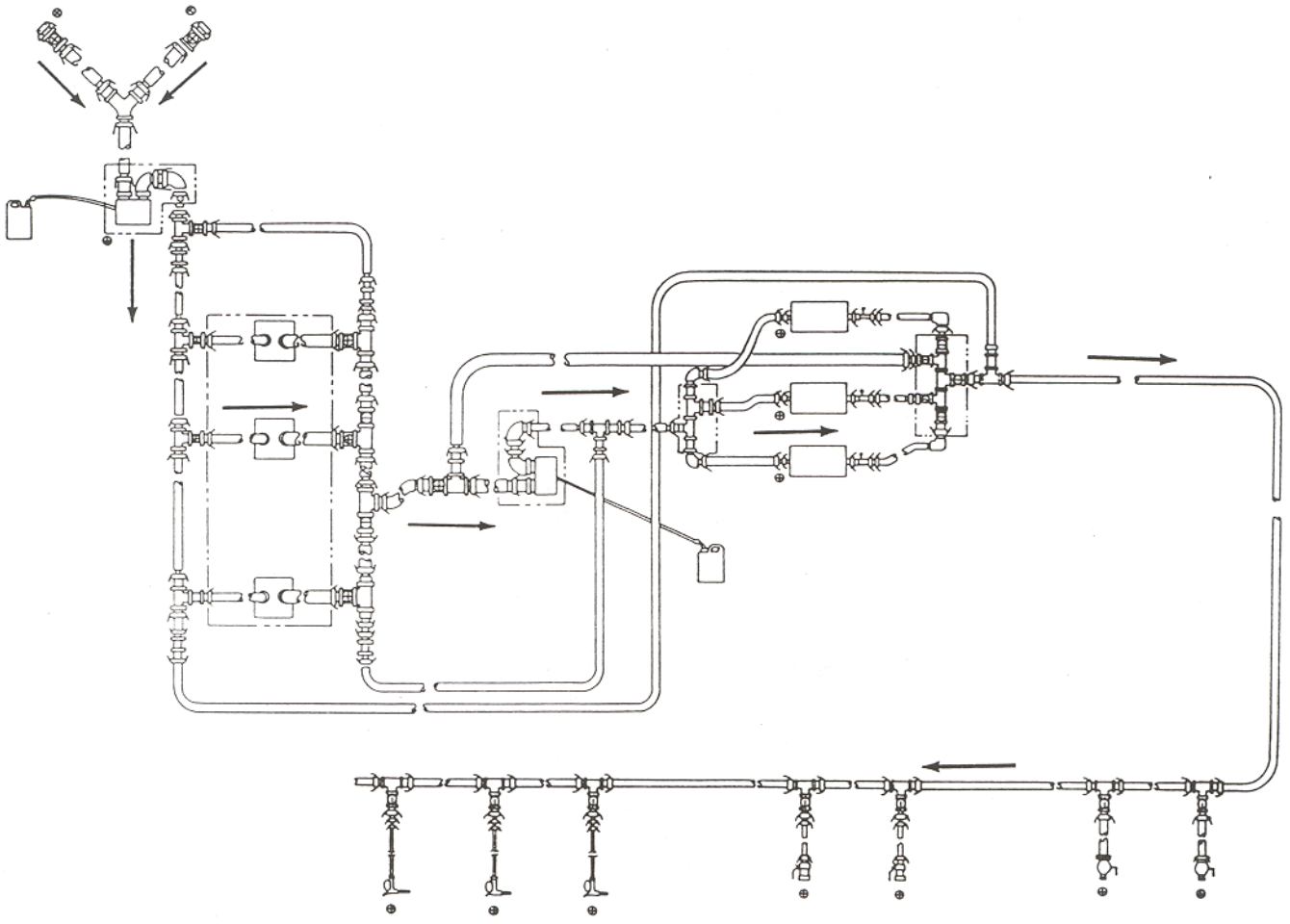


Figure 1-2. AFSSP Flow Diagram.

1-12. SYSTEM TECHNICAL PRINCIPLES OF OPERATION - cont.

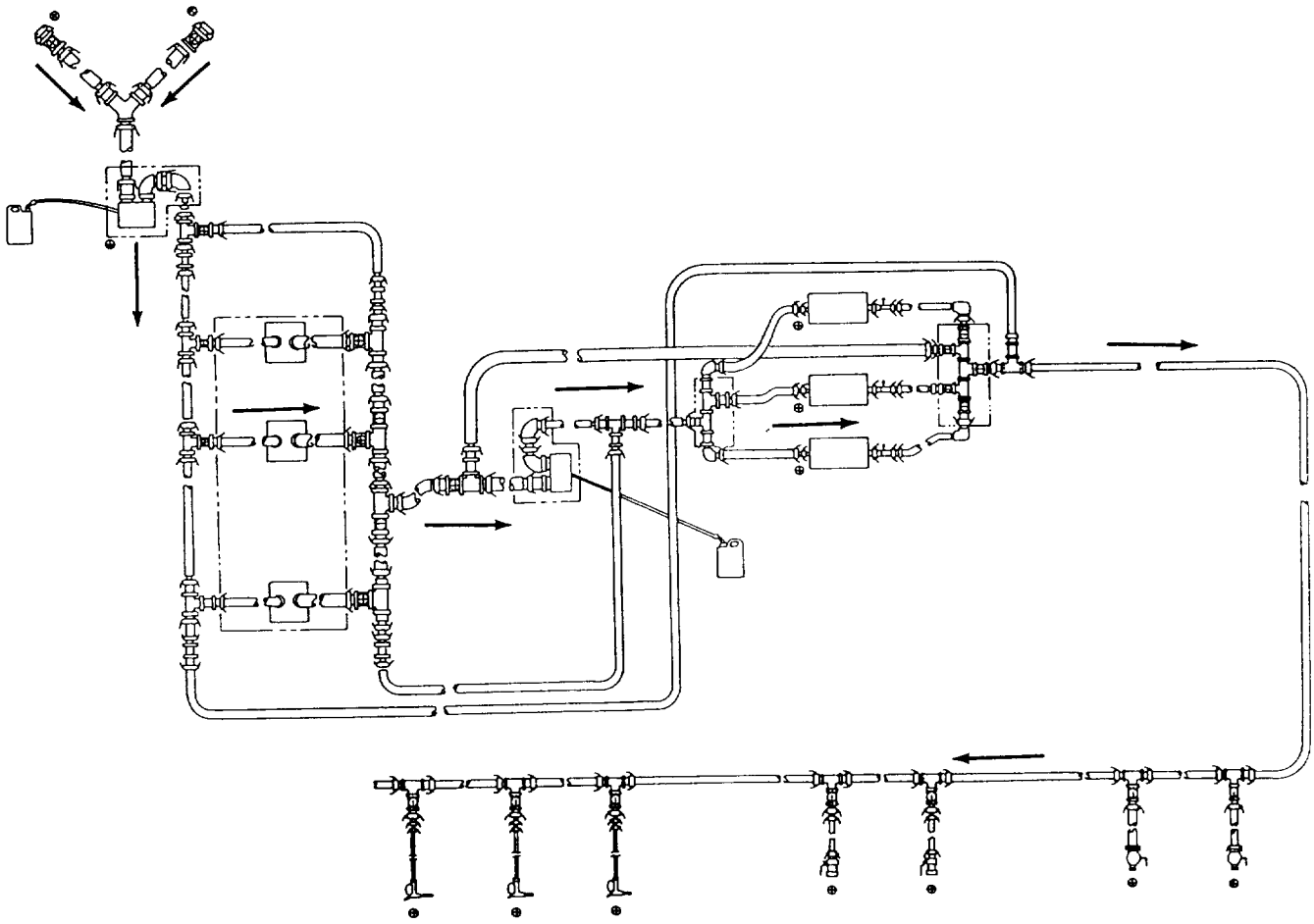


Figure 1-3 . AFSSP Flow Diagram (Bypassing Tanks thru Filter Separators) .

1-12. SYSTEM TECHNICAL PRINCIPLES OF OPERATION - cont.

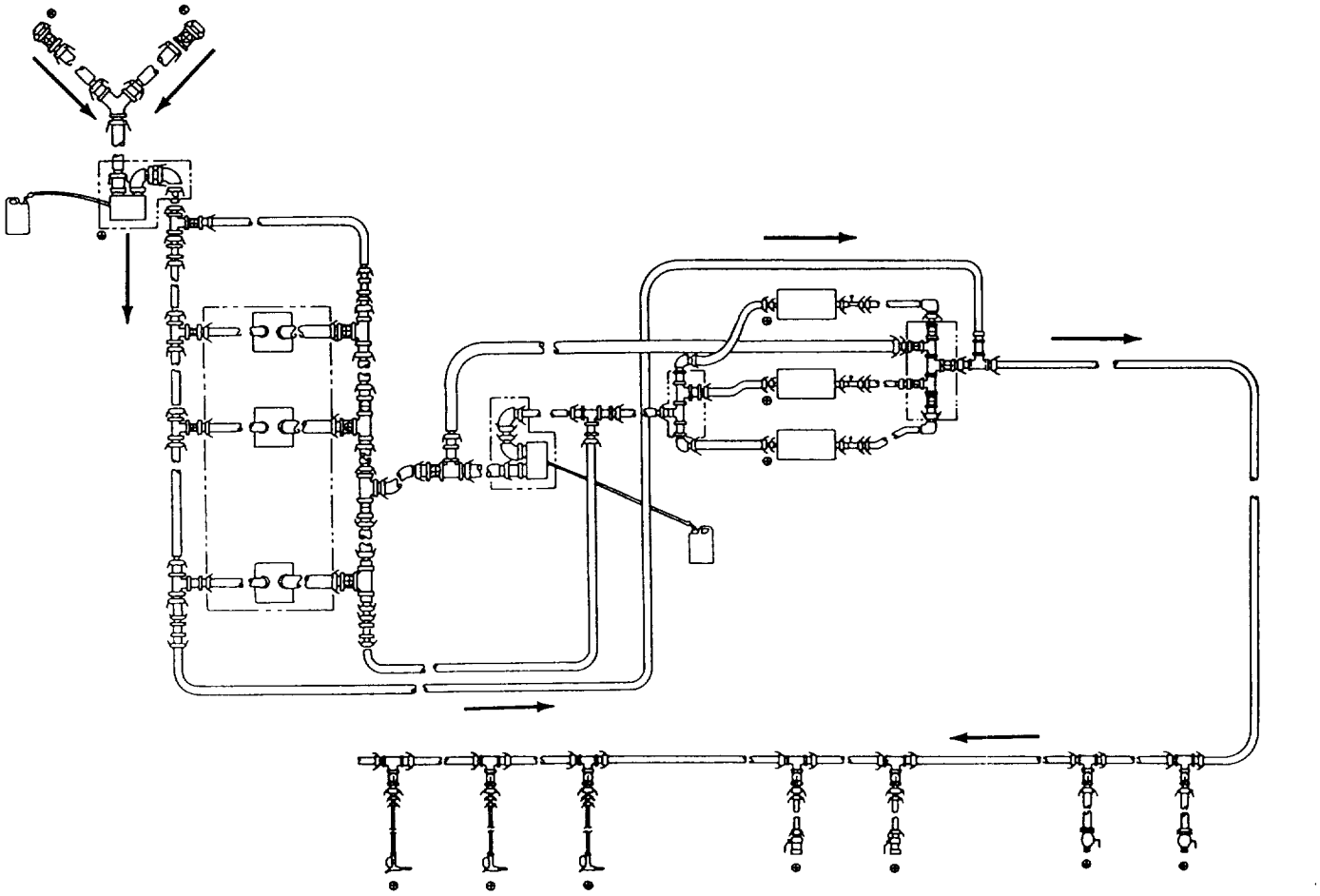


Figure 1-4 . AFSSP Flow Diagram (Bypassing Tanks and Filter Separators) .

1-12. SYSTEM TECHNICAL PRINCIPLES OF OPEIATION - cont.

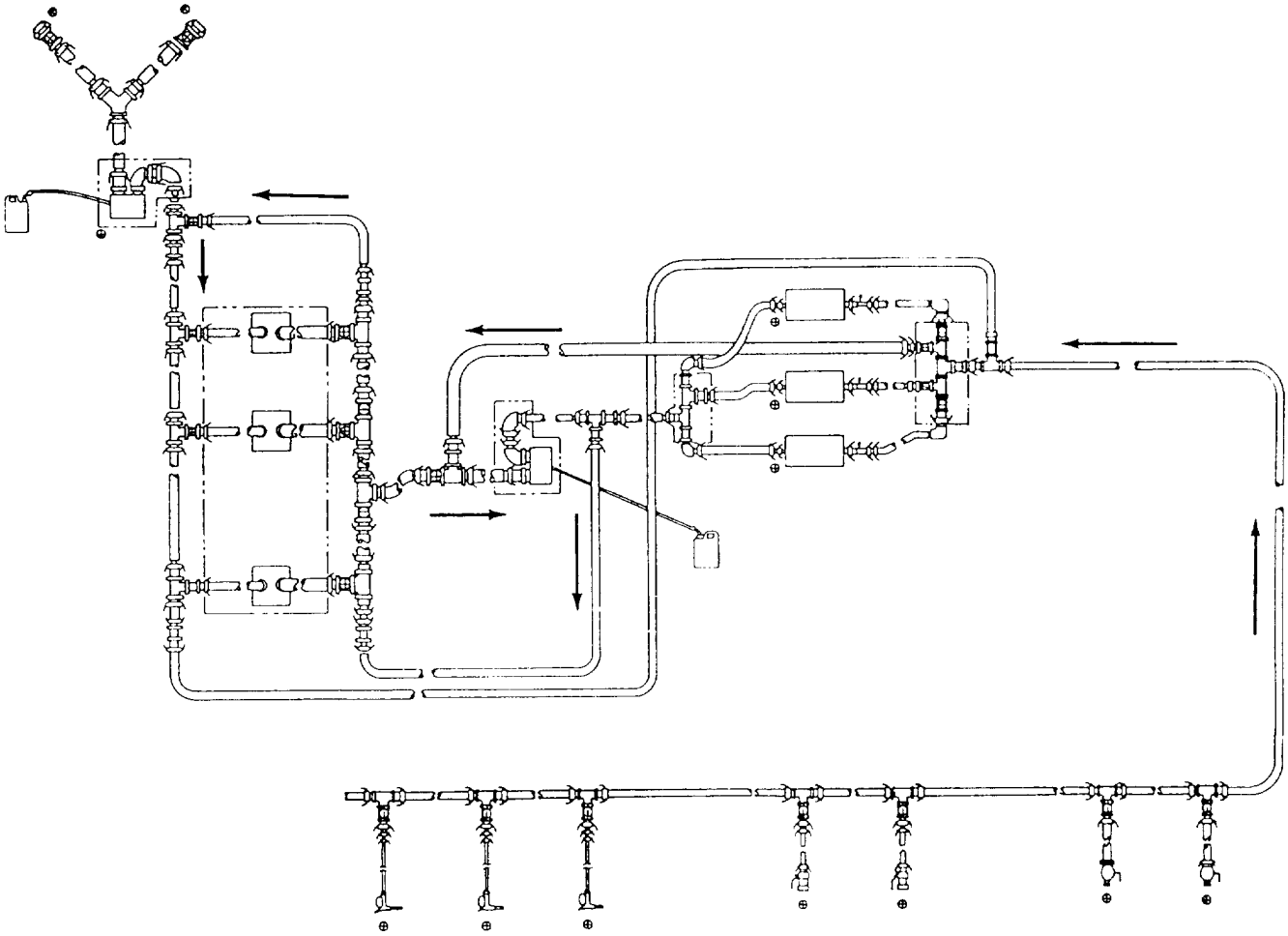


Figure 1-5 . AFSSP Flow Diagram (Defueling Mode from Bottom Loading and Drum Filling Points) .

CHAPTER 2

OPERATING INSTRUCTIONS

Paragraph	Title	Page
Section I	**Description and Use of Operator's Controls and Indicators**	2-2
2-1	Single Point Refueling Nozzle (D1) Controls	2-3
2-2	Gravity Fill Adapter Nozzle Controls	2-4
2-3	Closed Circuit Refueling (CCR) Nozzle Controls	2-5
2-4	Filter Separator Controls and Indicators	2-6
2-5	600 GPNM Pump Assembly Controls and Indicators	2-8
2-6	4-Inch and 6-Inch Valve Section Controls	2-12
2-7	4-Inch and 6-Inch Fueling Manifold Controls	2-13
2-8	Collapsible Tank Controls	2-14
2-9	3-Inch Coupler Controls	2-15
2-10	4-Inch Ball Valve Controls	2-16
2-11	Arctic Nozzle Fuel and Oil Servicing Controls	2-17
Section II	**Operator's Preventive Maintenance Checks and Services (PMCS)**	2-18
2-12	General	2-18
2-13	PMCS Procedures	2-18
2-14	Leakage Criteria	2-19
2-15	Operator Preventive Maintenance Checks and Services	2-20
Section III	**Operation Under Usual Conditions**	2-35
2-16	Assembly and Preparation for Use	2-35
2-17	Initial Adjustment	2-72
2-18	Operating Procedures	2-72
2-19	Decals and Instruction Plates	2-91
2-20	Operating Auxiliary Equipment	2-91
2-21	Preparation for Movement	2-91
Section IV	**Operation Under Unusual Conditions**	2-118
2-22	Operation in Extreme Heat	2-118
2-23	Operation in Dusty or Sandy Areas	2-118
2-24	Operation in Saltwater Area	2-119
2-25	Emergency Procedures	2-120
2-26	Decontamination Procedures	2-120

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

This section provide the operator with information needed to locate, identify, and use the controls and indicators on the Arctic Fuel System Supply Point (AFSSP). The components and controls identified in this section are applicable to the entire system. Many of the controls are used repeatedly throughout the system.

Refer to the applicable technical manuals 'or specific operating information on the following equipment:

600 GPM Pump Assembly	**TM 10-4320-342-10**
Closed Circuit Refueling (CCR) Nozzle and Gravity Fill Adapter	**TM 10-4930-243-13&P**
Single Point Refueling Nozzle (D-1)	**TM 10-4930-242-13&P**
Collapsible Fabric Tank, Low Temperature	**TM 10-5430-231-12**
200 Gpm Filter-Separator	**TM 10-4330-23613**

2-1. SINGLE POINT REFUELING NOZZLE (DI) CONTROLS.

Refer to figure 2-1.

The Single Point Refueling Nozzle (D1) is supplied as an accessory item.

Locking Handles (1).
Two locking handles on the nozzle body aid positioning and connection of the nozzle to the equipment refueling adapter. The handles are turned to the right to connect the nozzle; left to disconnect.

Control Lever (2).
The control lever has two positions, OPEN and CLOSE. When the nozzle is connected to the equipment refueling adapter, rotating the crank handle to OPEN allows fuel flow through the nozzle. When set to CLOSE, fuel flow is stopped. Mechanical locks prevent setting the crank handle to OPEN when the nozzle is not connected or disconnecting the nozzle before the lever is set to CLOSE.

Refer to TM 10-4930-242-13&P for additional information, description and use of the operator's controls and indicators on the D1 nozzle.

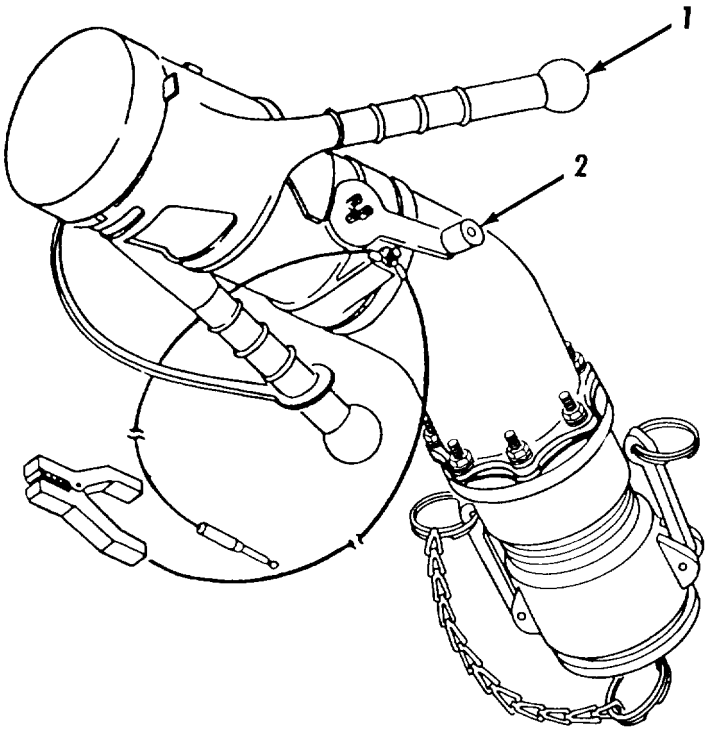


Figure 2-1 . Single Point Refueling Nozzle (D1) Controls .

2-2. GRAVITY FILL ADAPTER NOZZLE CONTROLS.

Refer to figure 2-2.

The Gravity Fill Adapter Nozzle is supplied as an accessory item.

Handle (1).
The handle on the gravity fill adapter nozzle is sized to permit control of the nozzle by an operator wearing arctic mittens. Pushing forward on the handle opens an internal poppet valve and allows fuel flow through the nozzle. Pulling back (releasing) the handle stops fuel flow. The gravity fill adapter nozzle must be used with the Closed Circuit Refueling (CCR) nozzle.

Refer to TM 10-4930-243-13&P for additional information, description and use of the operator's controls and indicators on the gravity fill adapter nozzle.

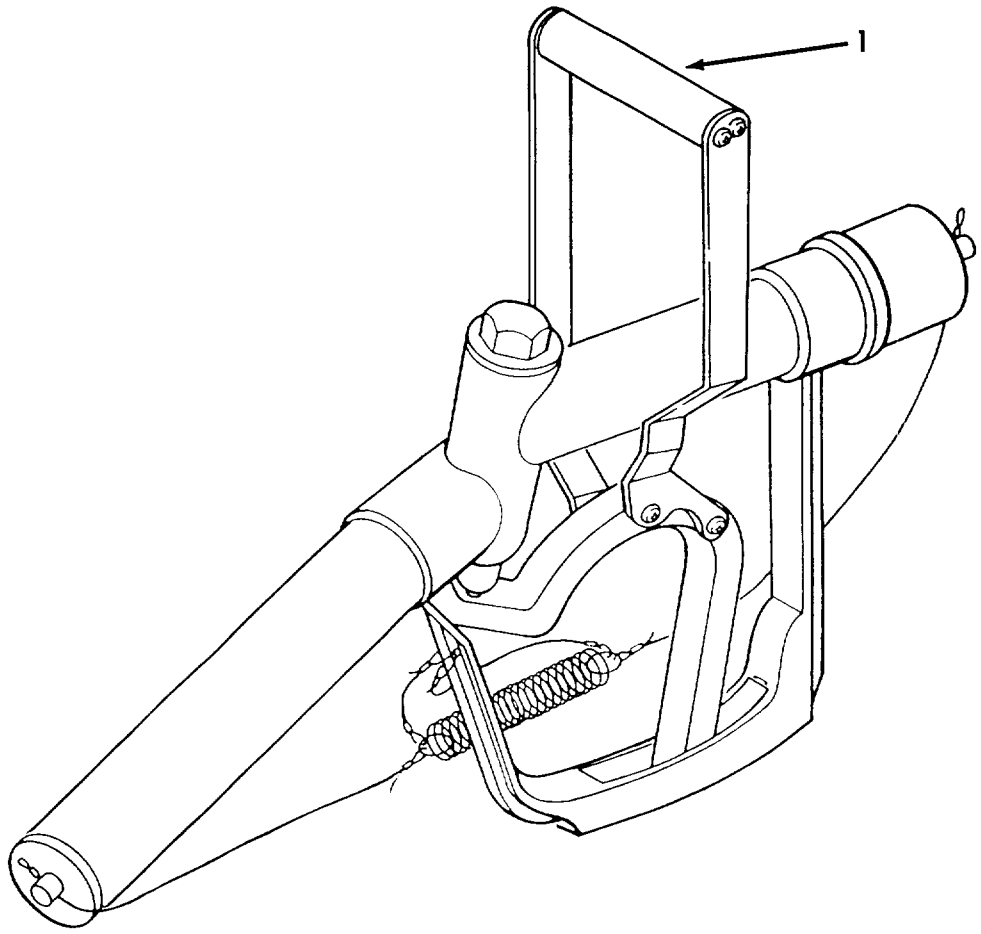


Figure 2-2 . Gravity Fill Adapter Nozzle Controls .

2-3. CLOSED CIRCUIT REFUELING (CCR) NOZZLE CONTROLS. |

Refer to figure 2-3.

The Closed Circuit Refueling Nozzle (CCR) is supplied as an accessory item.

Quick-Disconnect Automatic Shutoff Coupler Collar (1).
Connects nozzle to equipment refueling adapter. Pull back spring loaded collar to disconnect nozzle. Collar automatically moves forward to lock nozzle nozzle in place.

Flow Indicator (2).
Red indicator extends from back of nozzle body when fuel flow through the nozzle has stopped or handle has been moved to CLOSE position.

Handle (3).
Starts and stops fuel flow through the nozzle. The handle is held in the CLOSE position by a spring loaded latch (4). Depress latch and raise handle to OPEN position to allow fuel flow. Pull handle down to CLOSE position to stop fuel flow.

Latch (4).
Holds handle (3) in the CLOSE Position. Depress latch to release handle (3).

Refer to TM 10-4930-243-13&P for additional information, description and use of the operator's controls and indicators on the CCR nozzle.

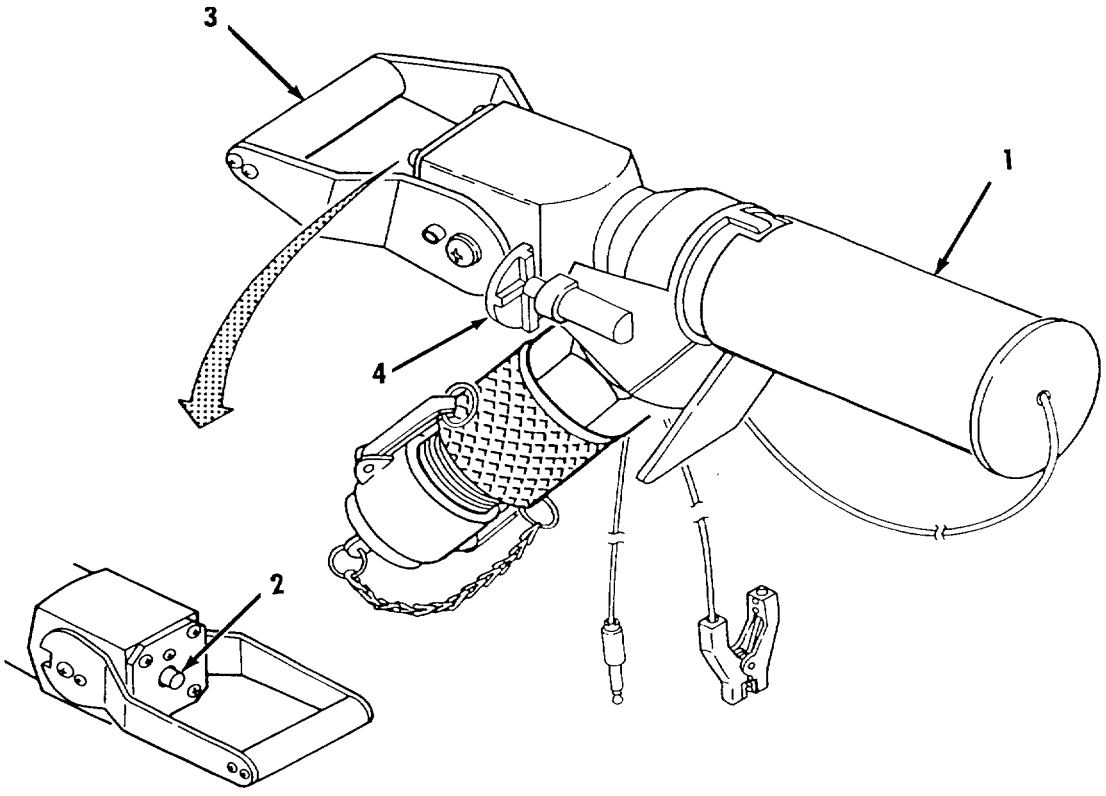


Figure 2-3 . CCR Nozzle Controls and Indicators .

2-4. FILTER SEPARATOR CONTROLS AND INDICATORS.

Refer to figure 2-4.

Air Vent Valve (1).

Manually operated valve purges air from tank while filter separator is being filled.

Differential Pressure (DP) Gage (2).
Indicates pressure differential across filters during operation.

Defrost Door (3).
Defrost door controls heat through defrost shroud. The wider the door is opened, less heat is applied to the defrost shroud.

Water Detection Kit Adapter Assembly (4).
The adapter is connected to the filter separator outlet coupling. The adapter contains a sampling probe which extends into the fuel flow. A water detector kit may be connected to the probe for fuel sampling.

Water Drain Valve (5).
Manually operated ball valve is used to drain separated water from the tank water sump.

Refer to TM 10-4930-243-13 for additional information, description and use of the operator's controls and indicators on the filter separator.

2-4. FILTER SEPARATOR CONTROLS AND INDICATORS - cont.

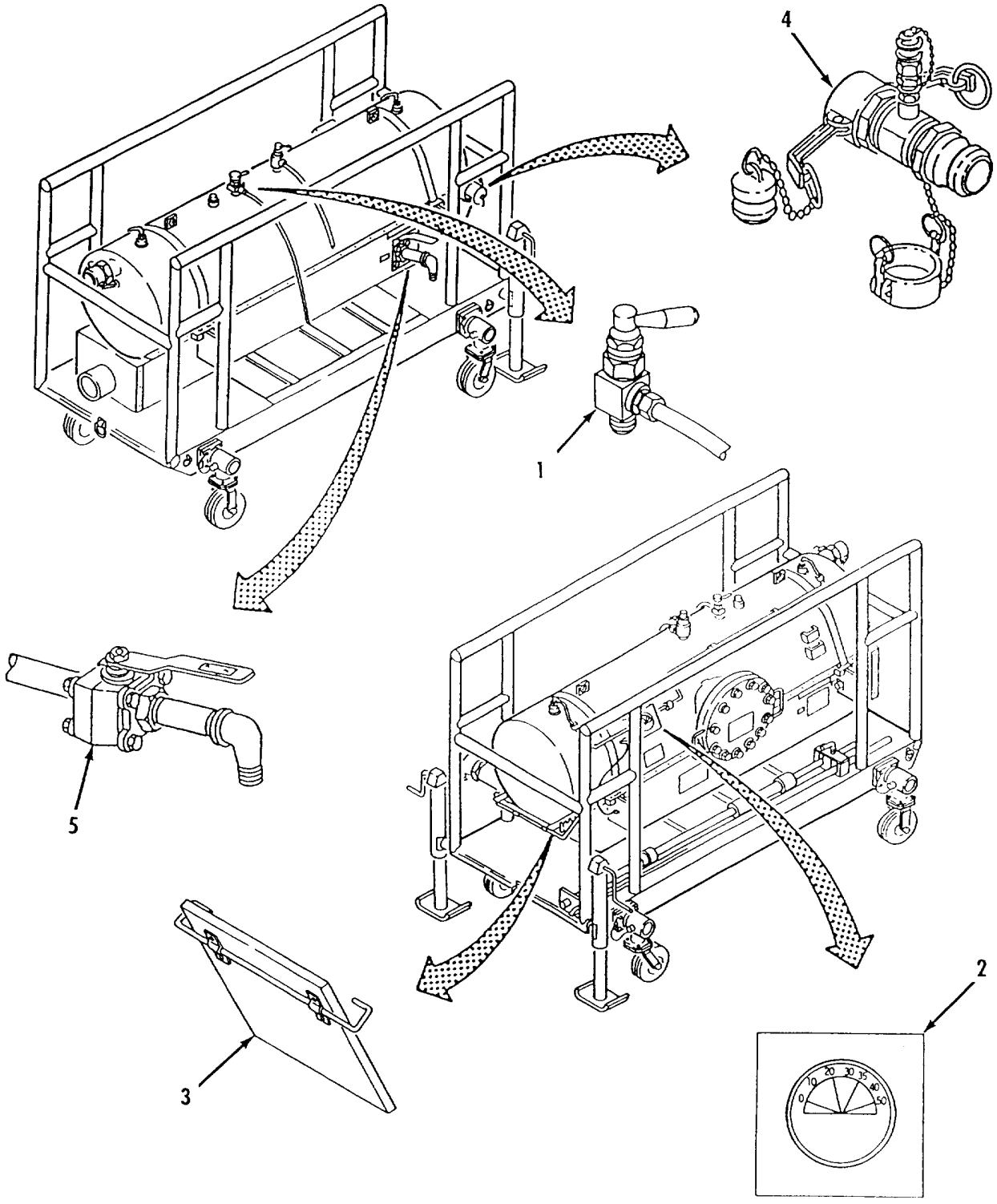


Figure 2-4 . Filter Separator Controls and Indicators .

2-5. 600 GPM PUMP ASSEMBLY CONTROLS AND INDICATORS.

Refer to figure 2-5.

MASTER Switch (1).
Applies 24 vdc to electrical system. PULL switch to turn power ON. PUSH switch to turn power OFF.

FUEL HEAT Switch (2).
Fuel heat switch turns fuel heater on and off. Heating of engine fuel is required at temperatures below 100F.

ENGINE PUMPS Switch (3).
Switch is used to turn gear reducer oil pumps (2 each) and engine fuel pump on and off. Pumps must be on before engine can be started.

START Switch (4).
Switch is used to start and run engine. To start and run engine, switch is set to START/RUN position, then released to RUN for operation. Engine will stop when switch is set to STOP position.

PUMP CLUTCH Switch (5)
Switch is used to engage or disengage clutch in fuel pump. Engine must be running before clutch can be engaged.

Panel Lights Switch (6).
Panel lights illuminate panel to facilitate operation and monitoring of pump.

LIGHTS Switch (7)
Turning switch to the right turns panel lights on and increases brightness of lamps. Turning switch to the left decreases brightness of lamps and turns lights off.

BATTERY Gage (Ammeter) (8).
Ammeter indicates rate of current at which battery is being charged or discharged.

SUCTION Pressure Gage (9)
Indicates vacuum/pressure in psi at the fuel pump inlet port.

DISCHARGE Pressure Gage (10)
Indicates fuel pump outlet pressure in psi.

ENGINE OIL TEMP Light (11).
Engine Oil temperature light illuminates if engine oil temperature is high. With power on, PRESS TO TEST-light illuminates.

ENGINE Light (12)
Engine light illuminates when engine malfunction occurs. With power on, PRESS TO TEST light illuminates.

Circuit Breakers (13).
The circuit breakers provide overcurrent protection to the electrical system.

CLUTCH DISENGAGED Light (14).
Light illuminates if the pump clutch is disengaged while the pump clutch switch is engaged.

2-5. 600 GPM PUMP ASSEMBLY CONTROLS AND INDICATORS - cont.

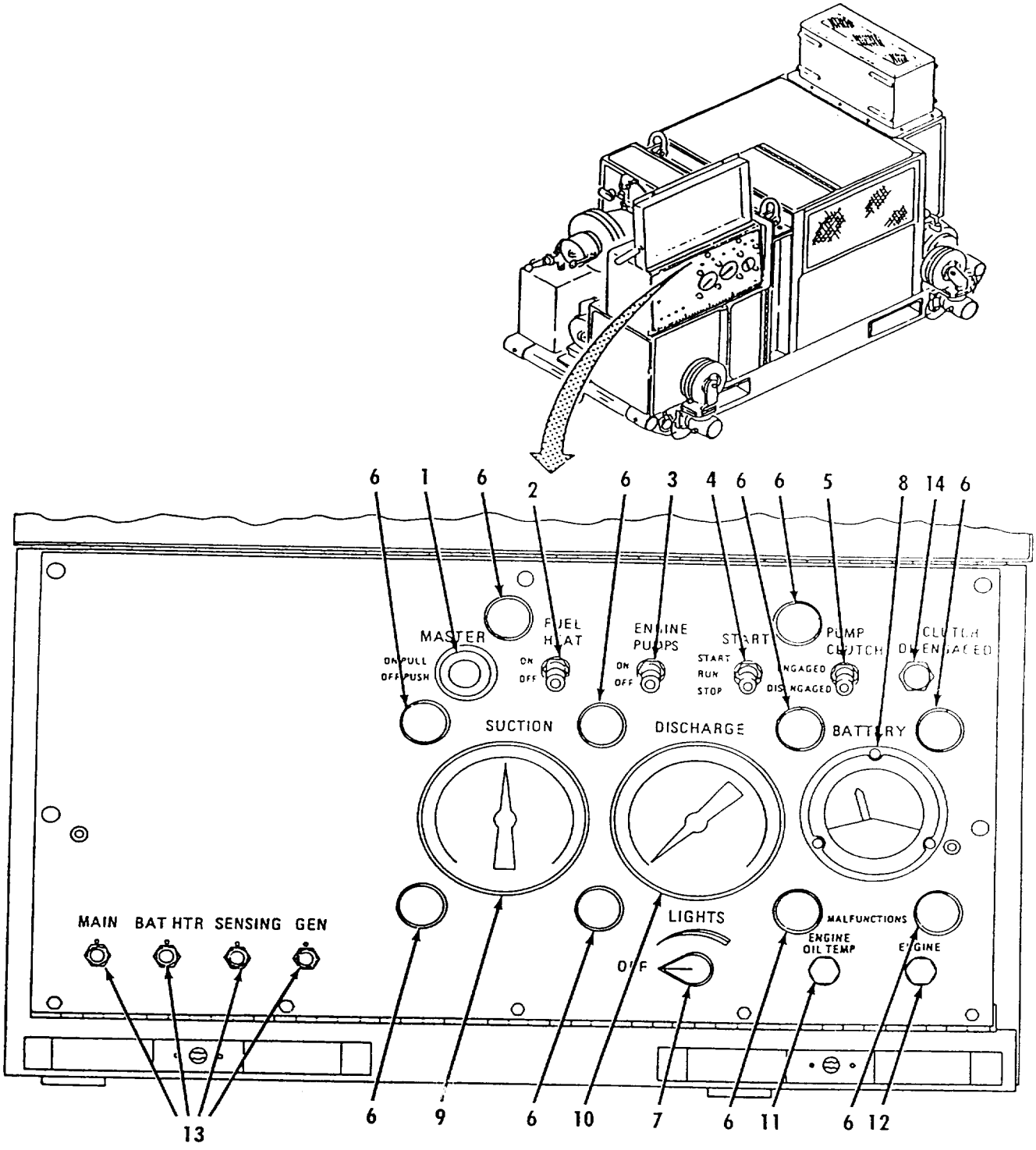


Figure 2-5 . 600 GPM Pump Controls and Indicators (sheet 1 of 2)

2-5. 600 GPM PUMP ASSEMBLY CONTROLS AND INDICATORS - cont.

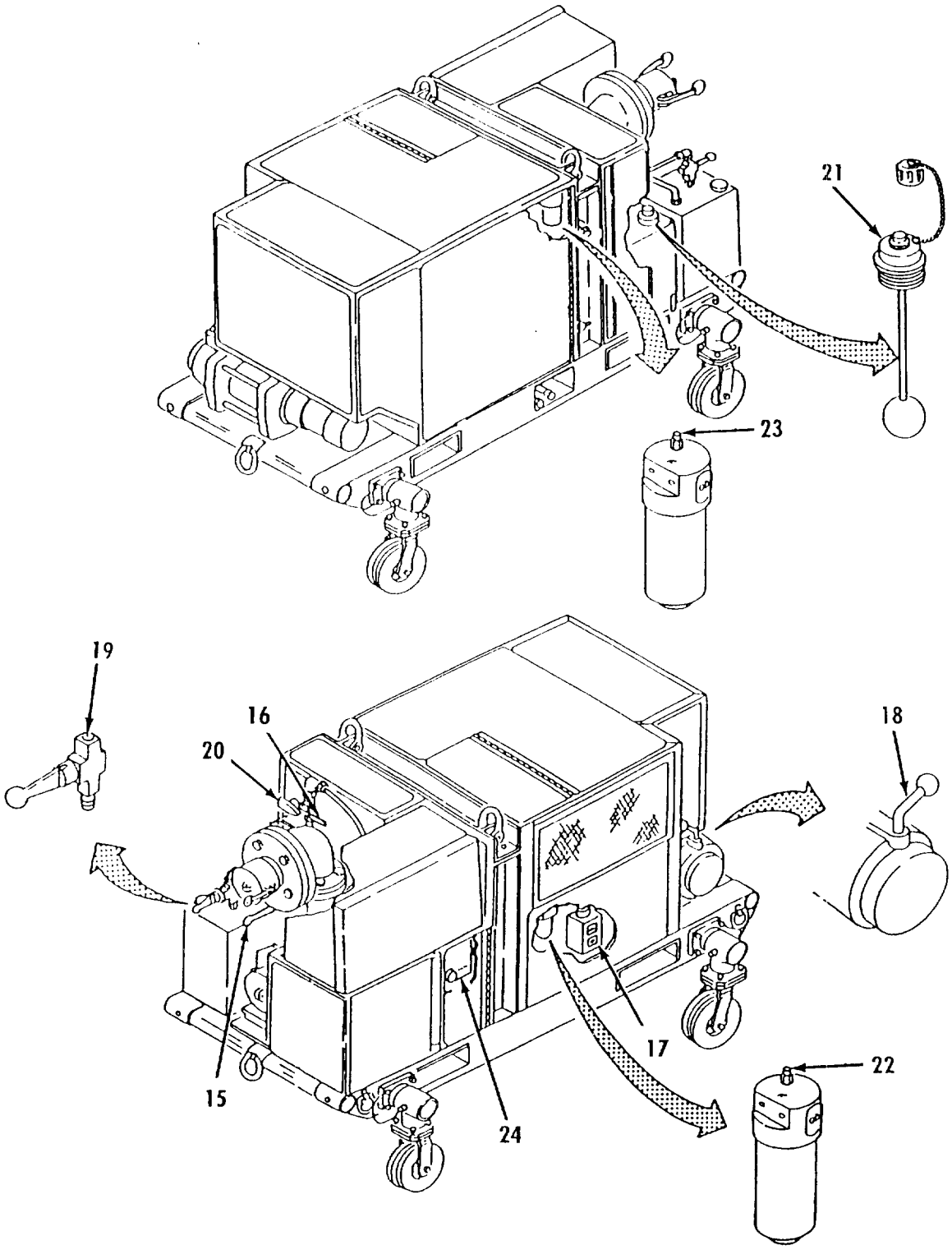


Figure 2-5 . 600 GPM Pump Controls and Indicators (Sheet 2 of 2) .

2-5. 600 GPM PUMP ASSEMBLY CONTROLS AND INDICATORS - cont.

Flow Control Valve Handle (15).
Hand operated valve used to control fuel flow and to prevent backflow when pump is shut down. Valve must be open to pump fuel.

PRIMING SHUT OFF VALVE (16).
ON/OFF two-way ball valve used to prime fuel pump. Fuel valve must be open for priming. After priming, valve is shut off manually to prevent backflow of fuel into priming vent drain tank.

Winch Control (17).
Winch box control with two directional control switches used to extend and retract winch cable.

Winch Control Handle (18).
Handle is used to engage or disengage winch mechanically. Winch is disengaged (freewheeling) when handle is in forward position and engaged when handle knob points toward the control panel.

Priming Vent Drain Tank Valve (19).
Valve is used to return fuel, accumulated in tank during priming process, back to the system.

FUEL SELECTOR VALVE (20).
Ball valve for using external fuel or internal fuel (fuel in transfer lines) for engine.

Oil Indicator (21).
Indicates level of oil in speed reducer oil reservoir.

Oil Filter Clogged Indicator (22).
Red indicates when filter elements are dirty. Gold indicates filter is operating properly.

Fuel Filter Clogged Indicator (23).
Red indicates when filter elements are dirty. Gold indicates filter is operating properly.

Electronic Sensing Unit (ESU) (24).
Controls electronics of engine for operating and Built in Test (BIT). There are four indicators that define malfunctions.

Refer to TM 10-4320-342-10 for additional information, description and use of the operator's controls and indicators on the filter 600 GPM pump assembly.

2-6. 4-INCH AND 6-INCH VALVE SECTION CONTROLS.

Refer to figure 2-6.

Handwheel (1).
Valve sections are used to control the flow of fuel into the AFSSP. A manually operated gate valve mounted in the valve section is opened to allow fuel to flow or closed to stop the flow of fuel.

TYPICAL VALVE SECTION

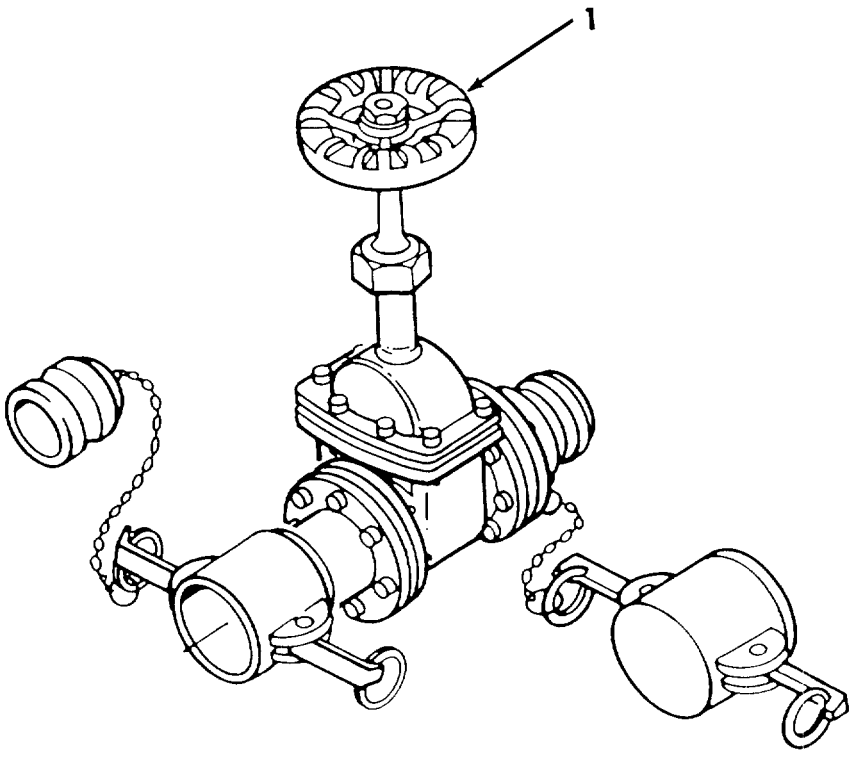


Figure 2-6 . Valve Section Controls .

2-7. 4-INCH AND 6-INCH FUELING MANIFOLD CONTROLS.

Refer to figure 2-7.

Handwheel (1).
The fueling manifolds are used to connect hoses and control the flow of fuel through the AFSSP. A manually operated gate valve, mounted on the manifolds, is opened to allow fuel to flow freely through the manifolds, or closed to stop the flow of fuel through one leg.

TYPICAL FUEL MANIFOLD

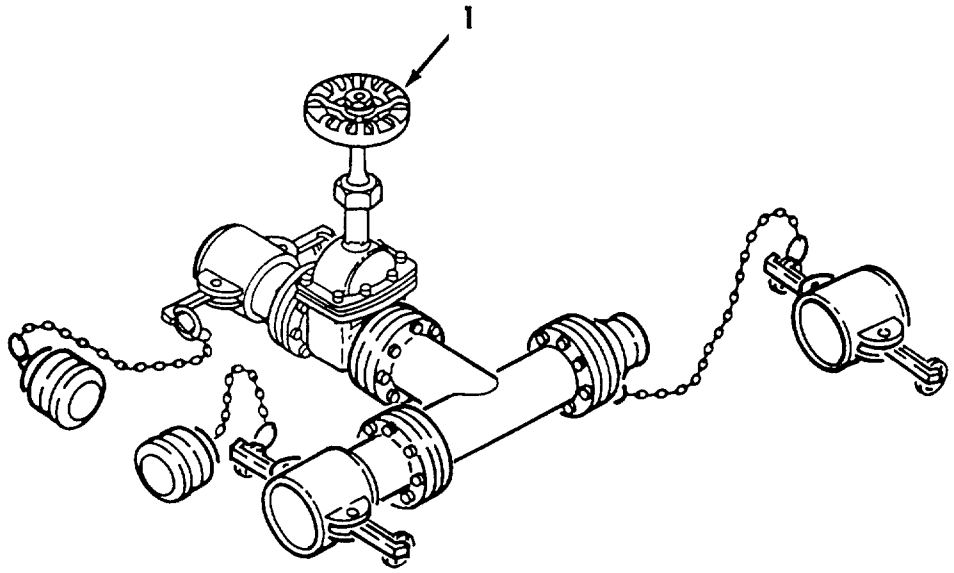


Figure 2-7 . 4-Inch and 6-Inch Fueling Manifold Controls .

2-8. COLLAPSIBLE TANKS CONTROLS.

Refer to figure 2-8.

Tank Drain Gate Valves (1).
Start and stop flow from tank drains.

Berm Liner Gate Valves (2).
Start and stop flow from berm liner drains.

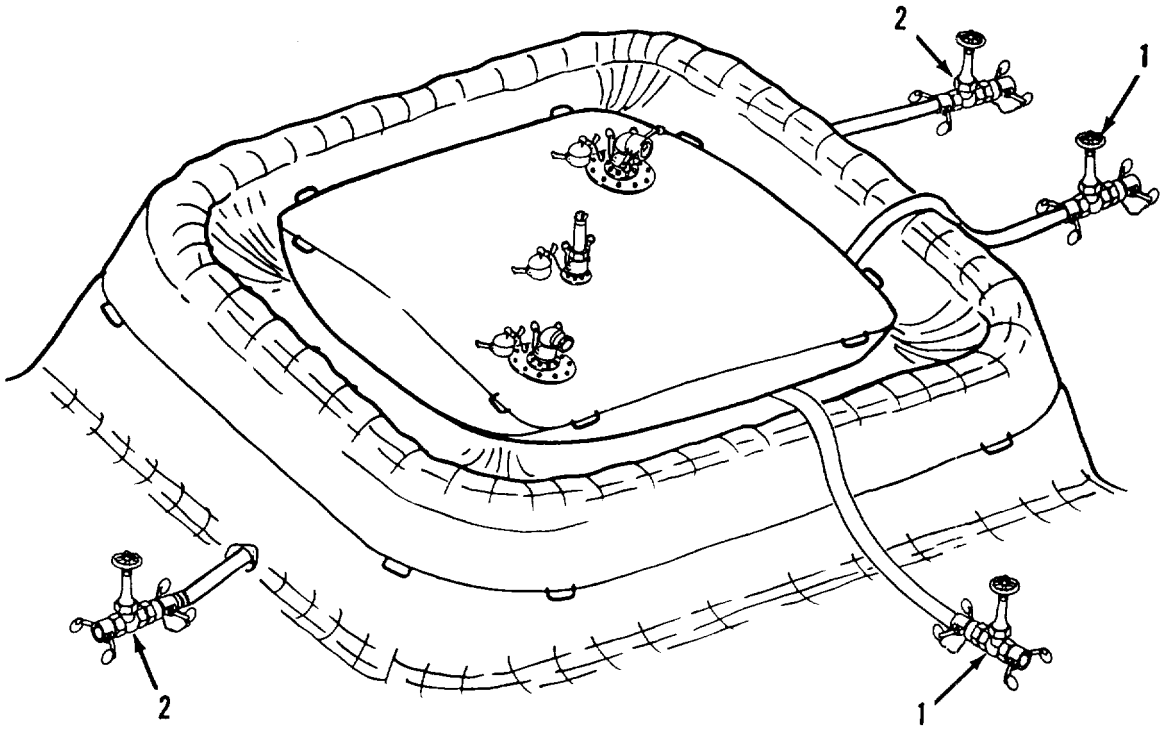


Figure 2-8 . Collapsible Tank Controls .

2-9. 3-INCH COUPLER CONTROLS.

Refer to figure 2-9.

Lever Handle (1).
The 3-inch couplers are used to control the flow of fuel to the AFSSP. Turning the lever handle to the open position causes a poppet inside the coupler to extend and unseat a check valve, allowing fuel to flow. Turning the handle to the closed position allows the check valve to seat, stopping fuel flow.

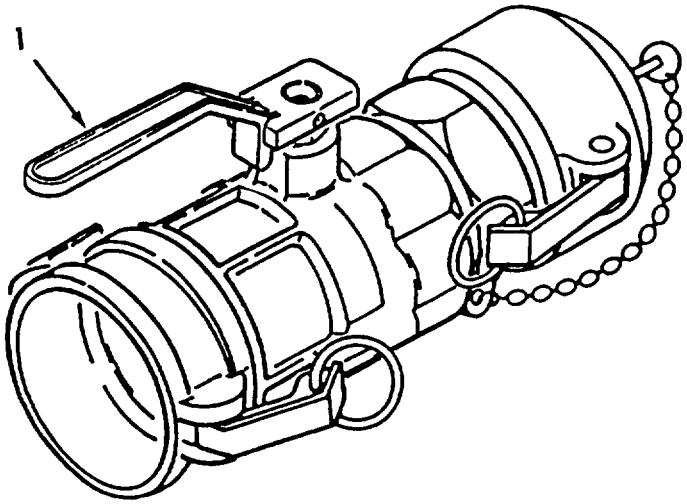


Figure 2-9 . 3-Inch Coupler Controls .

2-10. 4-INCH BALL VALVE CONTROLS.

Refer to figure 2-10.

Extension Wench (1).
The 4-inch ball valves are used to control the flow of fuel from the AFSSP. Turning the handle to the open position allows fuel to flow. Turning the handle to the closed position stops the fuel flow.

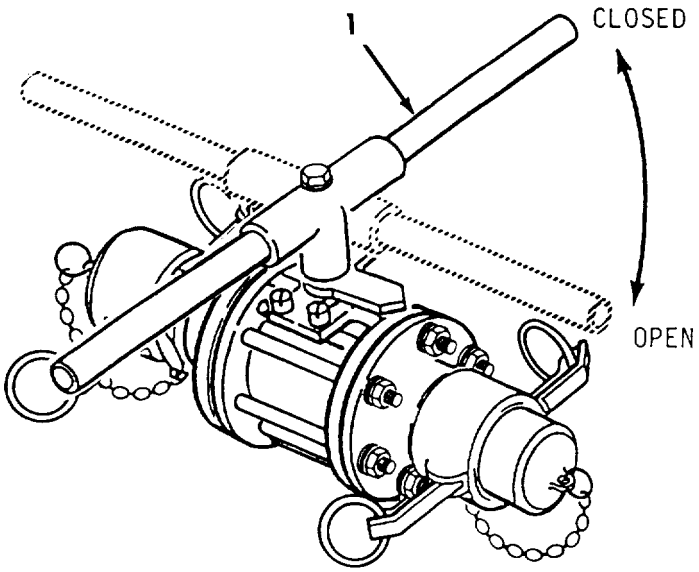


Figure 2-10 . 4-Inch Ball Valve Controls .

2-11. ARCTIC NOZZLE FUEL AND OIL SERVICING CONTROLS. I

Refer to figure 2-11.

Handle (1).
The handle on the arctic nozzle is sized to permit control of the nozzle by an operator wearing arctic mittens. Pushing forward on the handle opens a valve and allows fuel flow through the nozzle. Pulling back (releasing) the handle stops fuel flow.

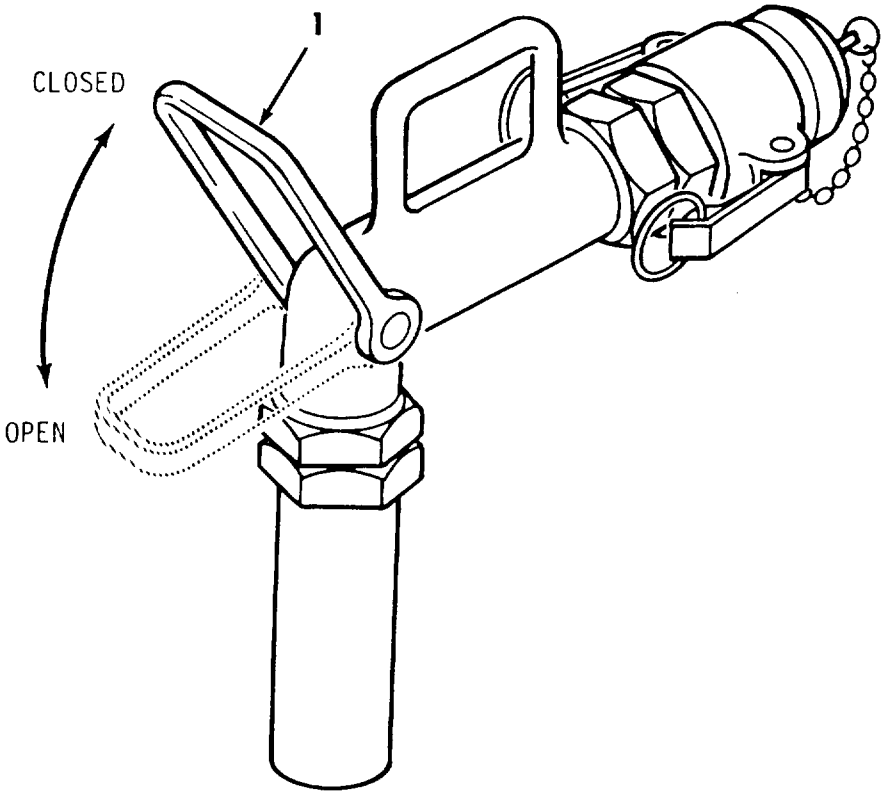


Figure 2-11 . Arctic Nozzle Fuel and Oil Servicing Controls .

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

2-12. GENERAL.

Preventive Maintenance Checks and Services (PMCS) means systematic inspecting and servicing of equipment to keep it in good condition and to prevent breakdowns. As the operator of the Arctic Fuel System Supply Point (AFSSP), your mission is to:

a. Be sure to perform your PMCS each time you operate the AFSSP. Always do your PMCS in the same order, so it gets to be a habit. Once you've had some practice, you'll quickly spot anything wrong.

b. Do your BEFORE (B) PMCS just before you operate the equipment. Pay attention to WARNINGs, CAUTIONs and NOTEs.

c. Do your DURING (D) PMCS while you operate the equipment. During operation means to monitor the equipment and its related components while it is actually being operated. Pay attention to WARNINGs, CAUTIONs and NOTEs.

d. Do your AFTER (A) PMCS right after final operation has been completed. Pay attention to WARNINGs, CAUTIONs and NOTEs.

e. Use DA Form 2404 (Equipment Inspection and Maintenance Worksheet) to record any faults that you discover before, during, or after operation that cannot be fixed by the operator.

f. Be prepared to assist unit maintenance when required.

g. When a check and service procedure is required for both WEEKLY and BEFORE intervals, it is not necessary to do the procedure twice if the equipment is operated during the weekly period.

2-13. PMCS PROCEDURES.

a. Your Preventive Maintenance Checks and Services, Table 2-1, lists inspections and care required to keep your equipment in good operating condition. It is setup so you can make BEFORE (B) OPERATION checks as you walk around the equipment.

b. The 'INTERVAL" column of Table 2-1 tells you when to do a certain check or service.

c. The "LOCATION, ITEM TO CHECK/SERVICE" column of Table 2-1 tells you the name of the item to be checked or serviced and where the item is located.

d. The "PROCEDURE" column of Table 2-1 tells you how to do required checks and services. Carefully follow these instructions. If you cannot perform the procedure, notify your supervisor.

2-13. PMCS PROCEDURES - cont.

e. The "NOT FULLY MISSION CAPABLE IF:" column in Table 2-1 tells you when your equipment is not mission capable and why the system cannot be used.

f. If the equipment does not perform as required, refer to Chapter 3, Section II, Troubleshooting.

g. If anything looks wrong and you can't fix it, write it on your DA Form 2404. IMMEDIATELY, report it to your supervisor.

h. The following are checks that are common to the entire fuel system:

(1) Keep the equipment clean. Remove dirt, snow, ice and debris from quick-disconnect couplings, hose ends, gate valves and distribution nozzles to prevent excessive wear and contamination of the fuel system.

(2) Bolts, nuts and screws. Check them for obvious looseness, missing, bent or broken condition on gate valves. If you find a bolt, nut or screw you think is loose, report it to your supervisor.

(3) Hoses. Look for wear, damage and leaks. Make sure clamps and quick disconnect couplings are tight. Wet spots show leaks, but a stain around a fitting or connector can also mean a leak. If a leak comes from a loose fitting or coupling, tighten it. If something is broken or worn out, report it to your supervisor.

i. When you check for "operating condition", look at the component to see if it's serviceable.

2-14. LEAKAGE CRITERIA.

WARNING

- To prevent injury to personnel and damage to equipment, be certain all system components are securely connected before operation to avoid fuel spills.

- Fuel vapors are extremely flammable. Do not allow smoking within 100 feet of the AFFSP. Be certain a suitable and properly charged fire extinguisher is available at all times.

No fuel leaks are permissible when operating the AFSSP. Stop operation immediately, report all leaks to your supervisor.

2-15. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES.

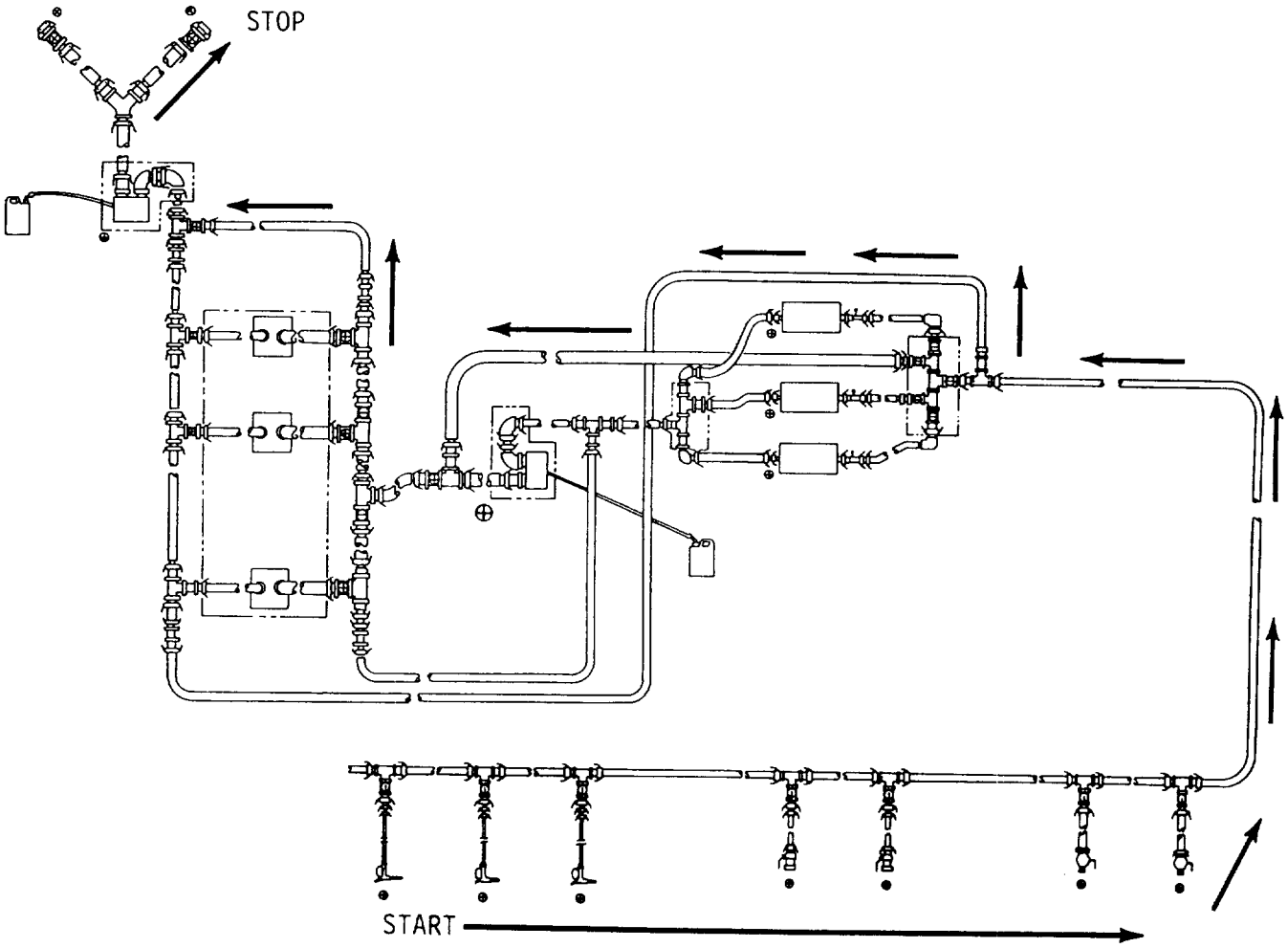


Figure 2-11. PMCS Routing Diagram.

2-15. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - cont.

NOTE

If the equipment must be kept in continuous operation, do only the procedures that can be done without disturbing operation. Make complete checks and services when the equipment is shut down.

Table 2-1. Operator Preventive Maintenance Checks and Services for Model AFSSP100.

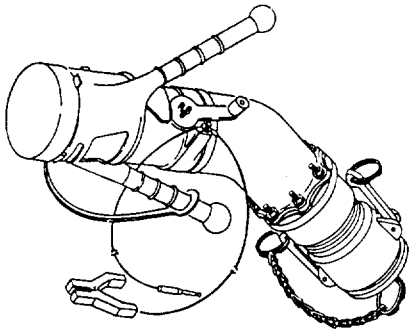
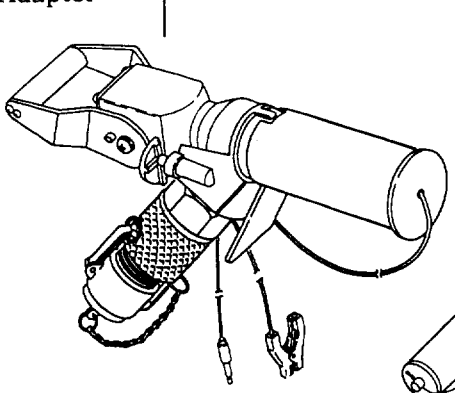
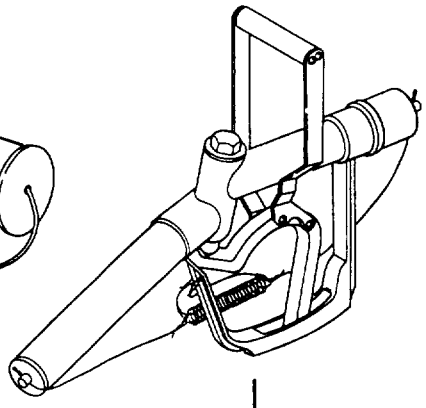
Item No.	Interval	Location / Item to Check/Service	Procedure	Not Fully Mission Capable If:
		AFSSP		
1	Before	Single Point Refueling Nozzle (D1)	Perform "BEFORE" PMCS in accordance with **TM 10-4930-242-13&P** 	
2	Before	CCR Nozzle and Gravity Fill Adapter	Perform "BEFORE" PMCS in accordance with **TM 10-4930-243-13&P**  	

Table 2-1. Operator Preventive Maintenance Checks and Services for Model AFSSP100 - cont.

Item No.	Interval	Location --- Item to Check/Service	Procedure	Not Fully Mission Capable If:
3	Before	Hose Assembly, 1½ in x 25 ft	a. Inspect for cuts, tears and deep abrasions in hose material. b. Check for and straighten kinked hoses. c. Inspect quick disconnect couplings for cracks, broken lock arms and damaged or missing gaskets. d. Inspect for damaged or missing dust caps and plugs.	Hoses cut or torn. Coupling cracked; lock arms damaged; gaskets damaged or missing.

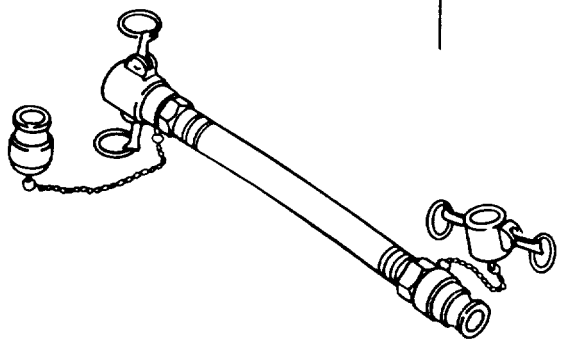


Table 2-1. Operator Preventive Maintenance Checks and Services for Model AFSSP100 - cont.

Item No.	Interval	Location Item to Check/Service	Procedure	Not Fully Mission Capable If:
4	Before	4-Inch Fueling Manifold	a. Inspect piping components for cracks, damage and corrosion.	Body cracked or damaged.
			b. Inspect for missing, loose or damaged handwheel.	Handwheel missing.
			c. Check operation of valve. Valve should turn freely without sticking or binding.	Valve sticks or binds.
			d. Inspect quick disconnect couplings for cracks, broken lock arms and damaged or missing gaskets.	Coupling cracked; lock arms damaged; gaskets damaged or missing.
			e. Inspect for damaged or missing dust caps and plugs	
			f. Inspect for loose, damaged or missing mounting hardware.	Hardware missing or damaged.

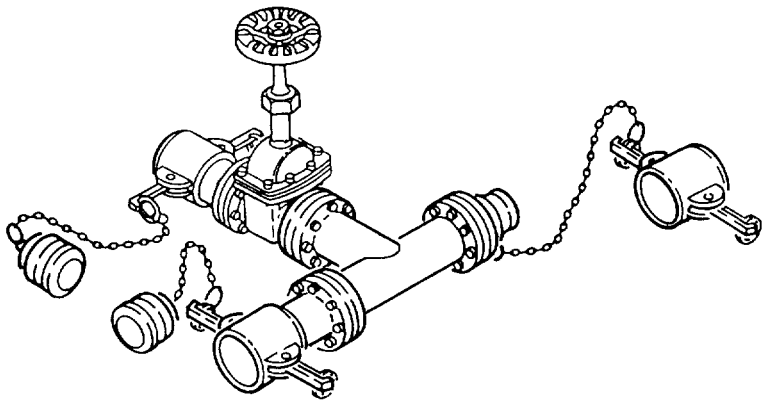


Table 2-1. Operator Preventive Maintenance Checks and Services for Model AFSSP100 - cont.

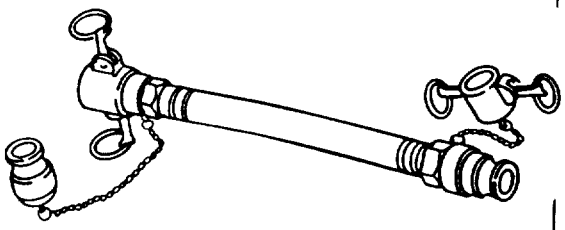
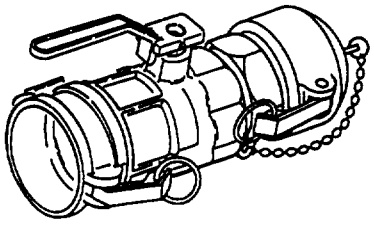
Item No.	Interval	Location / Item to Check/Service	Procedure	Not Fully Mission Capable If:
5	Before	Hose Assembly, 4 in x 25 ft or 4 in x 50 ft	a. Inspect hose for cuts, tears and deep abrasions in hose material.	Hose cut or torn.
			b. Check for and straighten kinked hose.	
			c. Inspect quick disconnect couplings for cracks, broken lock arms and damaged or missing gaskets.	Coupling cracked; lock arms damaged; gaskets damaged or missing.
			d. Inspect for damaged or missing dust caps and plugs.	
				
6	Before	3-Inch Coupler	a. Inspect valve body for cracks.	Coupler body cracked.
			b. Inspect for missing, loose or damaged handle.	Handle missing.
			c. Check operation of coupler. Handle should turn freely without sticking or binding.	Handle sticks or binds.
			d. Inspect for cracks, broken lock arms and damaged or missing gaskets.	Lock arms damaged; gaskets damaged or missing.
			e. Inspect for damaged or missing dust caps and plugs.	
				

Table 2-1. Operator Preventive Maintenance Checks and Services for Model AFSSP100 - cont.

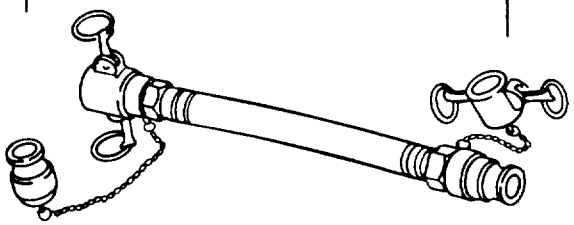
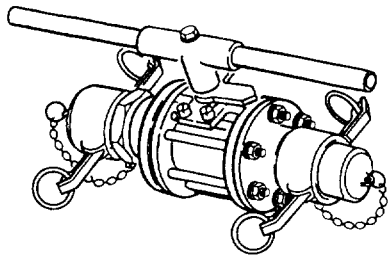
Item No.	Interval	Location / Item to Check/Service	Procedure	Not Fully Mission Capable If:
7	Before	Hose Assembly, 3 in x 25 ft	a. Inspect for cuts, tears and deep abrasions in hose material.	Hose cut or torn.
			b. Check for and straighten kinked hose.	
			c. Inspect quick disconnect couplings for cracks, broken lock arms and damaged or missing gaskets.	Coupling cracked; lock arms damaged; gaskets damaged or missing.
			d. Inspect for damaged or missing dust caps and plugs	
				
8	Before	4-Inch Valve Ball	a. Inspect valve body for cracks.	Valve body cracked.
			b. Inspect for missing, loose or damaged extension wench.	Extension wench missing.
			c. Check operation of valve. Valve should turn freely without sticking or binding.	Valve sticks or binds.
			d. Inspect quick disconnect couplings for cracks, broken lock arms and damaged or missing gaskets.	Coupling cracked; lock arms damaged; gaskets damaged or missing.
			e Inspect for damaged or missing dust caps and plugs.	
				

Table 2-1. Operator Preventive Maintenance Checks and Services for Model AFSSP100 - cont.

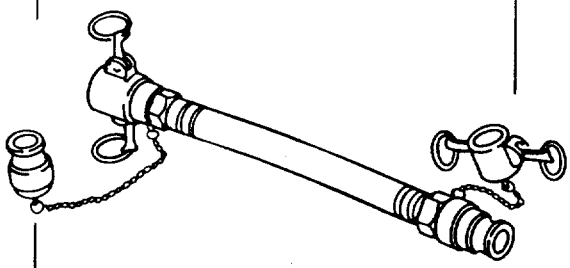
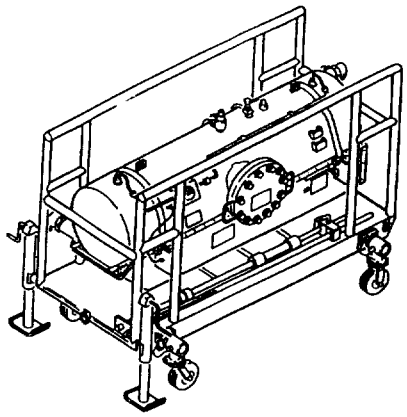
Item No.	Interval	Location --- Item to Check/Service	Procedure	Not Fully Mission Capable If:
9	Before	Hose Assembly, 4 in x 50 ft	a. Inspect hose for cuts, tears and deep abrasions in hose material. b. Check for and straighten kinked hose. c. Inspect quick disconnect couplings for cracks, broken lock arms and damaged or missing gaskets. d. Inspect for damaged or missing dust caps and plugs. 	Hose cut or torn. Coupling cracked; lock arms damaged; gaskets damaged or missing.
10	Before	Filter Separator	Perform "BEFORE" PMCS in accordance with **TM 10-4330-236-13.** 	

Table 2-1. Operator Preventive Maintenance Checks and Services for Model AFSSP100 - cont.

Item No.	Interval	Location --- Item to Check/Service	Procedure	Not Fully Mission Capable If:
11	Before	Hose Assembly, 6 in x 10 ft.	a. Inspect for cuts, tears and deep abrasions in hose material. b. Check for and straighten kinked hoses. c. Inspect quick disconnect couplings for cracks, broken lock arms and damaged or missing gaskets. d. Inspect for damaged or missing dust caps and plugs	Hoses cut or torn. Coupling cracked; lock arms damaged; gaskets damaged or missing.

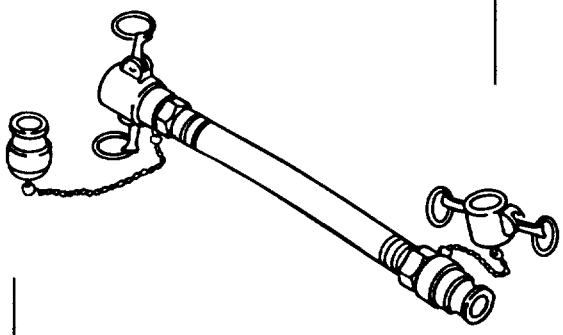


Table 2-1. Operator Preventive Maintenance Checks and Services for Model AFSSP100 - cont.

Item No.	Interval	Location / Item to Check/Service	Procedure	Not Fully Mission Capable If:
12	Before	6-Inch Fueling Manifold	a. Inspect piping components for cracks damage and corrosion.	Body cracked or damaged.
			b. Inspect for missing, loose or damaged handwheel.	Handwheel missing.
			c. Check operation of valve. Valve should turn freely without sticking or binding.	Valve sticks or binds.
			d. Inspect quick disconnect couplings for cracks, broken lock arms and damaged or missing gaskets.	Coupling cracked; lock arms damaged; gaskets damaged or missing.
			e. Inspect for damaged or missing dust caps and plugs.	
			f. Inspect for loose, damaged or missing mounting hardware.	Hardware missing or damaged.

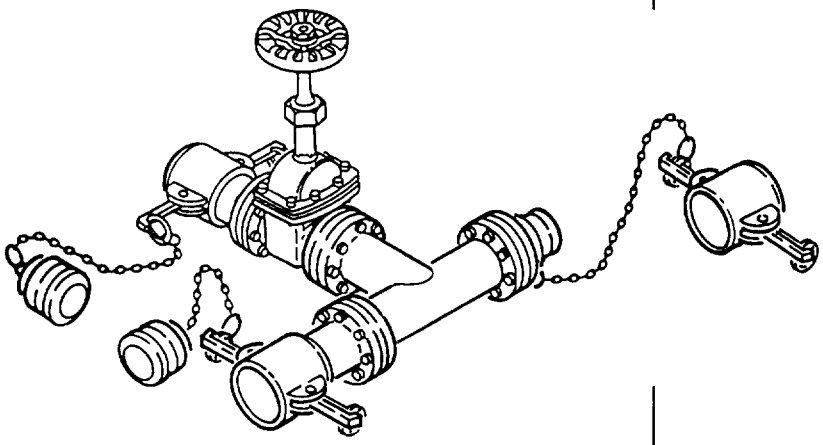
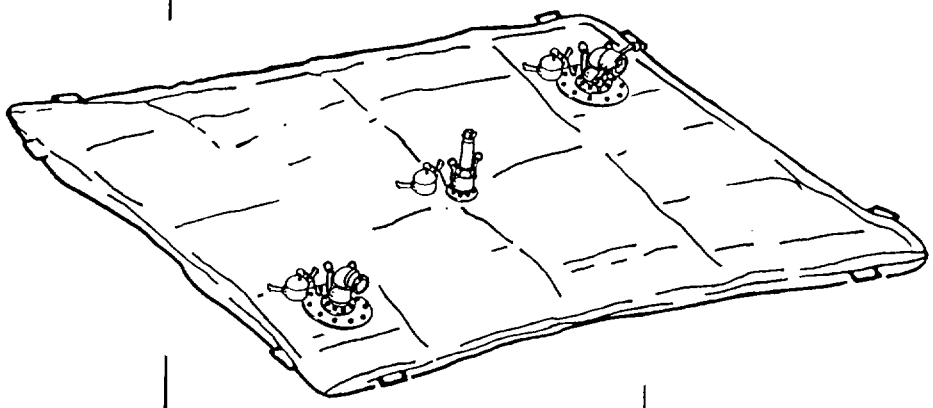


Table 2-1. Operator Preventive Maintenance Checks and Services for Model AFSSP100 - cont.

Item No.	Interval	Location Item to Check/Service	Procedure	Not Fully Mission Capable If:
13	Before	3,000, 10,000 and 20,000 gallon collapsible tanks	Perform "BEFORE" PMCS in accordance with **TM 10-5430-231-12.**	
14	Before	600 GPM Pump	Perform "BEFORE" PMCS in accordance with **TM 10-4320-342-10.** a. Check that pump is properly grounded. b. Inspect fuel lines for damaged threads, cuts, tears or damage. c. Check external fuel source.	Pump not grounded. Fuel line is cut, torn or damaged.



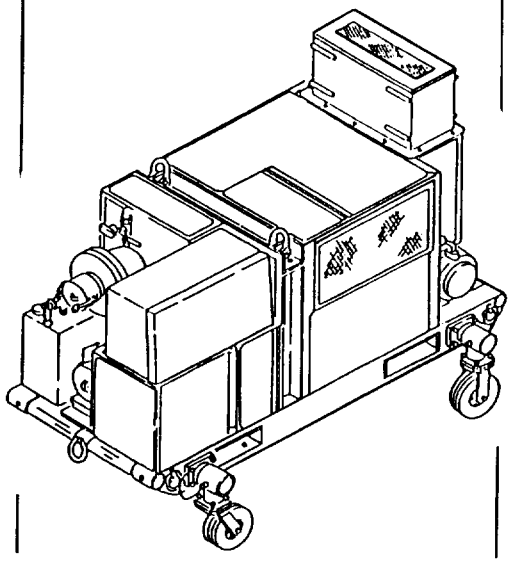


Table 2-1. Operator Preventive Maintenance Checks and Services for Model AFSSP100 - cont.

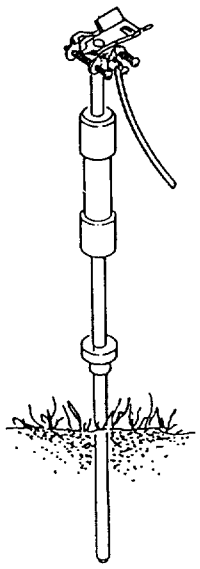
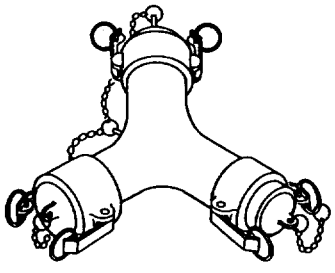
Item No.	Interval	Location --- Item to Check/Service	Procedure	Not Fully Mission Capable If:
15	Before	Grounding Rods	a. Inspect grounding rods for severe bends, cracks and corrosion. b. Verify that grounding clamp is securely connected. Reconnect if required. 	Grounding rod missing or broken.
16	Before	Wyes/Reducers	a. Inspect body for cracks and corrosion. b. Inspect quick disconnect couplings for cracks, broken lock arms and damaged or missing gaskets. c. Inspect for damaged or missing dust caps and dust plugs. 	Body cracked. Coupling cracked; lock arms damaged; gaskets damaged or missing.

Table 2-1. Operator Preventive Maintenance Checks and Services for Model AFSSP100 - cont.

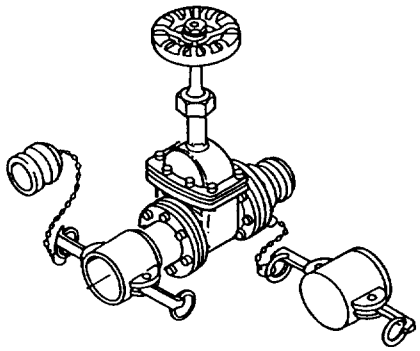
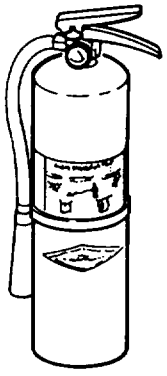
Item No.	Interval	Location --- Item to Check/Service	Procedure	Not Fully Mission Capable If:
17	Before	Valve Section	a. Inspect valve body for cracks.	Valve body cracked.
			b. Inspect for missing, loose or damaged handwheel.	Handwheel missing.
			c. Check operation of valve. Valve should turn freely without sticking or binding.	Valve sticks or binds.
			d. Inspect quick disconnect couplings for cracks, broken lock arms and damaged or missing gaskets.	Coupling cracked; lock arms damaged; gaskets damaged or missing.
			e Inspect for damaged or missing dust caps and plugs. 	
18	Before	Fire Extinguishers	a. Check that fire extinguishers are fully charged.	Extinguishers discharged
			b. Inspect fire extinguishers for damage. 	Fire Extinguishers damaged.

Table 2-1. Operator Preventive Maintenance Checks and Services for Model AFSSP100- cont.

Item No.	Interval	Location Item to Check/Service	Procedure	Not Fully Mission Capable If:
19	During	Single Point Refueling Nozzle (D1)	Perform "DURING" PMCS in accordance with **TM 10-4930-242-13&P.**	
20	During	CCR Nozzle and Gravity Fill Adapter	Perform "DURING" PMCS in accordance with **TM 10-4930-243-13&P.**	
21	During	Hose Assemblies	Inspect hose material and quick disconnect couplings for leaks.	Any fuel leak
22	During	Fueling Manifolds	Inspect manifold piping, gate valve and quick disconnect couplings for leaks.	Any fuel leak
23	During	3-Inch Couplers	Inspect coupler body and quick disconnect coupling for leaks.	Any fuel leak.
24	During	4-Inch Valve Ball	Inspect valve and quick disconnect couplings for leaks.	Any fuel leak.
25	During	Filter Separator	Perform "DURING" PMCS in accordance with **TM 10-4330-236-13.**	
26	During	3,000, 10,000 and 20,000 Gallon Tanks	Perform "DURING" PMCS in accordance with **TM 10-5430-231-12.**	
27	During	600 GPM Pump	Perform "DURING" PMCS in accordance with **TM 10-4320-342-10.**	
28	During	Grounding Rods	Check connection of grounding clamps. Clamps must be securely fastened. Reconnect if required.	Grounding clamp (s) disconnected.
29	During	Wyes /Reducers	Inspect body and quick disconnect couplings for leaks.	Any fuel leak.
30	During	Valve Section	Inspect valve and quick disconnect couplings for leaks.	Any fuel leak.
31	During	Fire Extinguishers	a. Check that fire extinguishers are fully charged.	Fire extinguishers not charged.
			b. Inspect fire extinguishers for damage.	Fire extinguishers damaged.

Table 2-1. Operator Preventive Maintenance Checks and Services for Model AFSSP100- cont.

Item No.	Interval	Location --- Item to Check/Service	Procedure	Not Fully Mission Capable If:
32	After	Single Point Refueling Nozzle (D1)	Perform "AFTER" PMCS in accordance with **TM 10-4930-242-13&P.**	
33	After	CCR Nozzle and Gravity Fill Adapter	Perform "AFTER" PMCS in accordance with **TM 10-4930-243-13&P.**	
34	After	Hose Assemblies	a. Inspect for cuts, tears and deep abrasions in hose material.	Hose cut or torn.
			b. Inspect quick disconnect couplings for damaged or missing gaskets.	Gaskets damaged or missing.
			c. Inspect for missing dust caps or plugs.	
			d. Inspect for leaks.	Any fuel leak.
35	After	Fueling Manifolds	a. Inspect manifold gate valves for bent or damaged stems.	Manifold gate valves damaged.
			b. Inspect quick disconnect couplings for damaged or missing gaskets.	Gaskets damaged or missing.
			c. Inspect for missing dust caps or plugs.	
			d. Inspect for leaks.	Any fuel leak.
36	After	3-Inch Coupler	a. Inspect coupler for cracks, damage, corrosion and bent lever handle.	Coupler cracked or damaged; lever handle bent.
			b. Inspect quick disconnect couplings for damaged or missing gaskets.	Gaskets damaged or missing.
			c. Inspect for missing dust caps or plugs.	
			d. Inspect for leaks.	Any fuel leak.
37	After	4-Inch Valve Ball	a. Inspect valve for bent stem.	Valve damaged.
			b. Inspect quick disconnect couplings for damaged or missing gaskets.	Gaskets damaged or missing.
			c. Inspect for missing dust caps or plugs.	

Table 2-1. Operator Preventive Maintenance Checks and Services for Model AFSSP100 - cont.

Item No.	Interval	Location Item to Check/Service	Procedure	Not Fully Mission Capable If:
37 (cont)	After	4-Inch Valve Ball	d. Inspect for leaks.	Any fuel leak.
38	After	Filter Separator	Perform "AFTER" PMCS in accordance with **TM 10-4330-236-13.**	
39	After	3,000, 10,000 and 20,000 Gallon Tanks	Perform "AFTER" PMCS in accordance with **TM 10-5430-231-12.**	
40	After	600 GPM Pump	Perform "AFTER" PMCS in accordance with **TM 10-4320-342-10.**	
41	After	Wyes/Reducers	a. Inspect body for cracks and corrosion.	Body cracked.
			b. Inspect quick disconnect couplings for damaged or missing gaskets.	Gaskets damaged or missing.
			c. Inspect for missing dust caps or plugs.	
			d. Inspect for leaks.	Any fuel leak.
42	After	Valve Section	a. Inspect gate valve for bent stem.	Valve damaged.
			b. Inspect quick disconnect couplings for damaged or missing gaskets.	Gaskets damaged or missing.
			c. Inspect for missing dust caps or plugs.	
			d. Inspect for leaks.	Any fuel leak.
43	After	Fire Extinguishers	a. Check that fire extinguishers are fully charged.	Fire extinguishers not fully charged.
			b. Inspect fire extinguishers for damage.	Fire extinguishers damaged.

Section III. OPERATION UNDER USUAL CONDITIONS

2-16. ASSEMBLY AND PREPARATION FOR USE.

NOTE

Eight personnel are required to safely assemble the AFSSP.

a. Site Selection. Select a firm, level installation area large enough to contain all system components. Melting and refreezing soil, ice, and blowing snow present special hazards that must be anticipated before setting up the Arctic Fuel System Supply Point (AFSSP). The site must provide access to the fuel system for resupply by trucks, train and aircraft and provide adequate clearance for approaching equipment at the refueling points.

For additional information on selecting a site for the AFSSP, refer to FM 10-69.

After selecting the installation area, position all AFSSP components near the site.

b. Unpacking.

(1) Remove AFSSP components from the transport vehicle.

(2) To aid assembly, separate components into groups of similar parts during removal. For example, group all the collapsible hose, noncollapsible hoses, reducers, adapters, elbows, nozzles, fueling manifolds, valve sections, grounding rods, and ball valves.

(3) Unpack fuel tanks. Refer to TM 10-5430-231-12.

NOTE

Each Arctic Fuel System Supply Point (AFSSP) module can accommodate three tank (3,000, 10,000, or 20,000) assemblies in any combination. The quantity of each size of the tank assemblies is dependent upon the amount of fuel authorized the user.

(4) Unpack 600 GPM pumps. Refer to TM 10-4320-342-10.

(5) Unpack the filter separators. Refer to TM 10-433-23613.

(6) Unpack the accessory items.

c. Position Components.

(1) Using rough terrain forklift or suitable lifting device, position fuel tanks, filter separator, fueling manifolds, 600 GPM pumps and accessory items within the installation site.

(2) Position bundled noncollapsible and collapsible fuel hoses next to the fuel tanks.

(3) Position fueling manifolds and valve sections next to fuel tanks.

(4) Assemble and prepare fuel tanks for use. Refer to TM 10-5430-231-12.

(5) Assemble and prepare 600 GPM pumps for use. Refer to TM 104320-342-10.

2-16. ASSEMBLY AND PREPARATION FOR USE - CONT.

(6) Assemble and prepare filter-separators for use. Refer to TM 10-33- 23613.

d. Install 600 GPM Pump External Fuel Can, Adapter and Fuel Hose. Refer to figure 2- 12.

(1) Remove cap (1) from fuel can (2).

(2) Lower handle (3) on adapter (4) to release position.

(3) Place adapter (4) in fuel can (2).

(4) Press adapter (4) into neck of fuel can (2) and raise handle(3) to lock position. Adapter seal will expand and secure adapter in place.

(5) Remove cap (5) from external fuel connector (6) on 600 GPM pump (7).

(6) Connect one end of fuel hose (8) to external fuel connector (6) on 600 GPM pump (7).

(7) Connect other end of fuel hose (8) to coupling (9) on adapter (4).

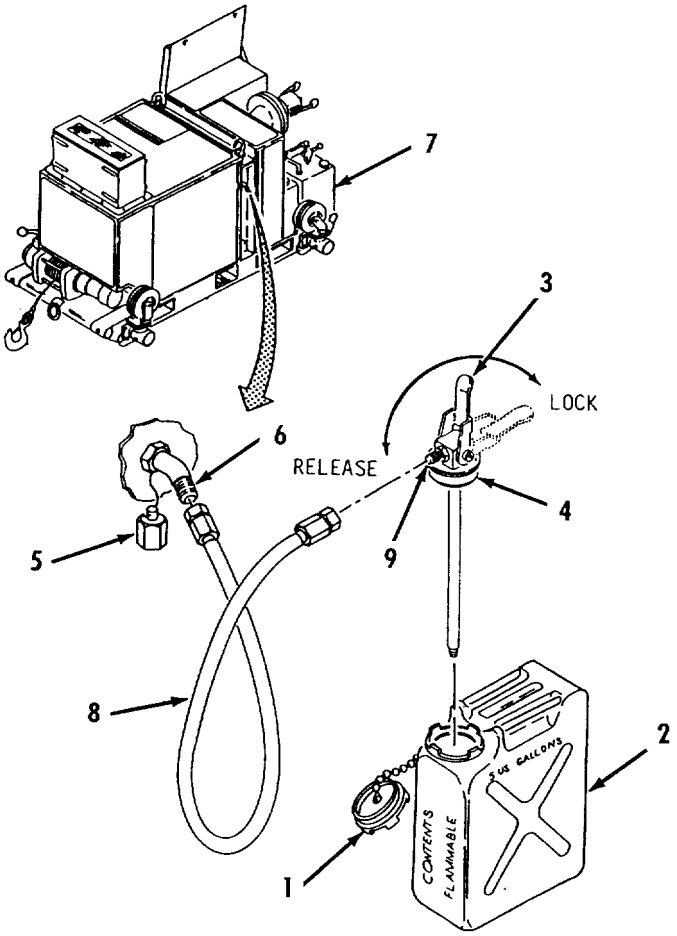


Figure 2-12. External Fuel Tank Installation.

2-16. ASSEMBLY AND PREPARATION FOR USE - CONT.

e. Quick disconnect couplings. Refer to figure 2-13.

All components of the AFSSP module are equipped with quick disconnect couplings to permit rapid assembly and disassembly of components. The following instructions apply to all operator installation and removal tasks.

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.

CAUTIONS

- Use care when connecting couplings to avoid getting metal, ice, snow, dirt, sand and debris on coupling mating surfaces or in hoses.

- To prevent leaks and ensure tight connections, make sure arctic gaskets (blue) are installed in all female quick disconnect couplings before connecting components.

CONNECTION

(1) Pull locking arms (1) out from female coupling (2).

(2) Remove plug (3) from female coupling (2).

(3) Pull locking arms (4) out from cap (5).

(4) Remove cap (5) from male coupling (6).

(5) Position male coupling (6) in female coupling (2) and hold in place.

(6) Pull locking arms (1) back at the same time until arms are down against body of female coupling (2).

(7) Verify that male coupling (6) and female coupling (2) are connected by pulling on couplings. Couplings should remain securely connected and locking arms (1) must remain snug against coupling body.

DISCONNECTION

WARNINGS

- Do not disconnect hose couplings while fuel system is pressurized. Hose ends may whip, causing severe injury to personnel and damage to equipment.

- When hoses are disconnected, spills may occur and the potential for fire exists.

(8) Pull locking arms (1) from female coupling (2).

2-16. ASSEMBLY AND PREPARATION FOR USE - CONT.

(9) Pull female coupling (2) from male couplings (6).

(10) Insert plug (3) in female coupling (2) and pull locking arms (1) back against coupling body.

(11) Place cap (5) over male coupling (6) and pull locking arms (4) back against cap body.

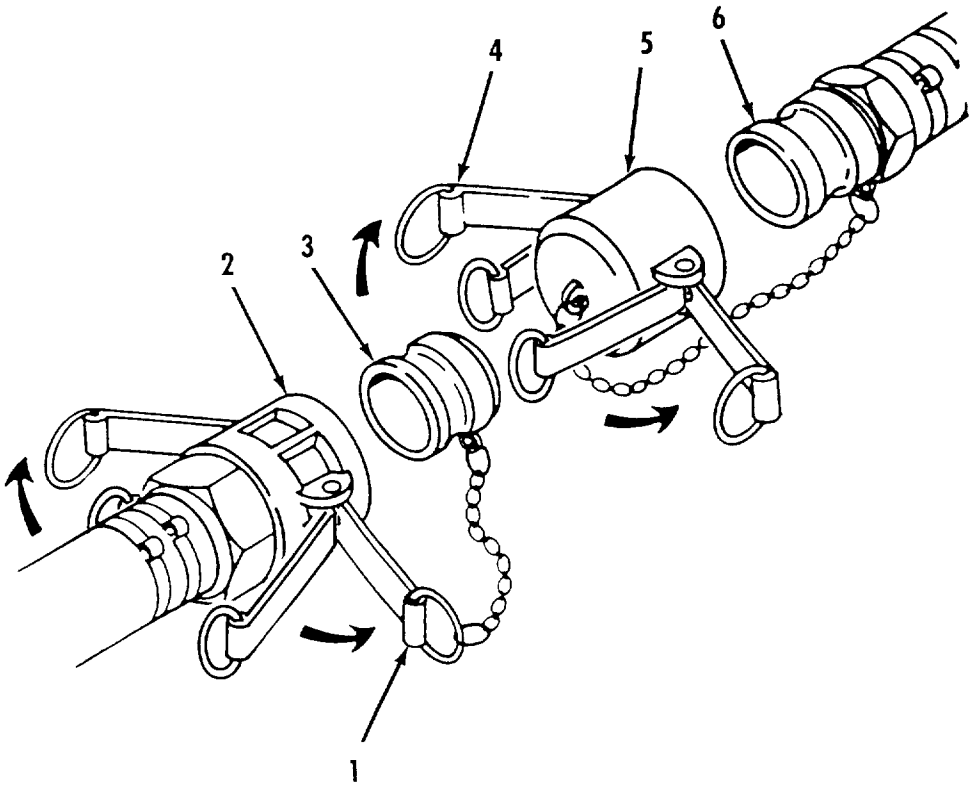


Figure 2-13. Quick Disconnect Couplings.

12-16. ASSEMBLY AND PREPARATION FOR USE - CONT.

f. Fuel System Primary 600 GPM Pump Input. Refer to figure 2-14.

CAUTION

To prevent contamination of fuel system components, keep dirt, ice and snow from entering open couplings during assembly.

NOTES

- This manual covers installation of a typical AFSSP system. You may need to adjust the number of components used, and their position in the system, to meet your mission requirements. Additional hoses, couplings, adapters and elbows are supplied with the AFSSP as accessories.

- If required two 6-inch elbows may be used at the input of primary pump.

- Refer to para 2-16e for connection of quick disconnect couplings.

    (1) Connect together seven 10 foot 6-inch noncollapsible hoses (1).

    (2) Connect 6-inch valve section (2) to one end of noncollapsible hoses (1).

    (3) Connect wye assembly (6 in. M x 6 in. F x 6 in. F) (3) to other end of noncollapsible hoses (1).

    (4) Connect together three 10 foot 6-inch noncollapsible hoses (4).

    (5) Connect one end of 6-inch noncollapsible hoses (4) to wye assembly (3).

    (6) Connect 6-inch valve section (5) to other end of noncollapsible hoses (4).

    (7) Connect together four 10 foot 6-inch noncollapsible hoses (6).

    (8) Connect one end of 6-inch noncollapsible hoses (6) to wye assembly (3).

    (9) Connect other end of noncollapsible hoses (6) to input of primary 600 GPM pump (7).

2-16. ASSEMBLY AND PREPARATION FOR USE - CONT.

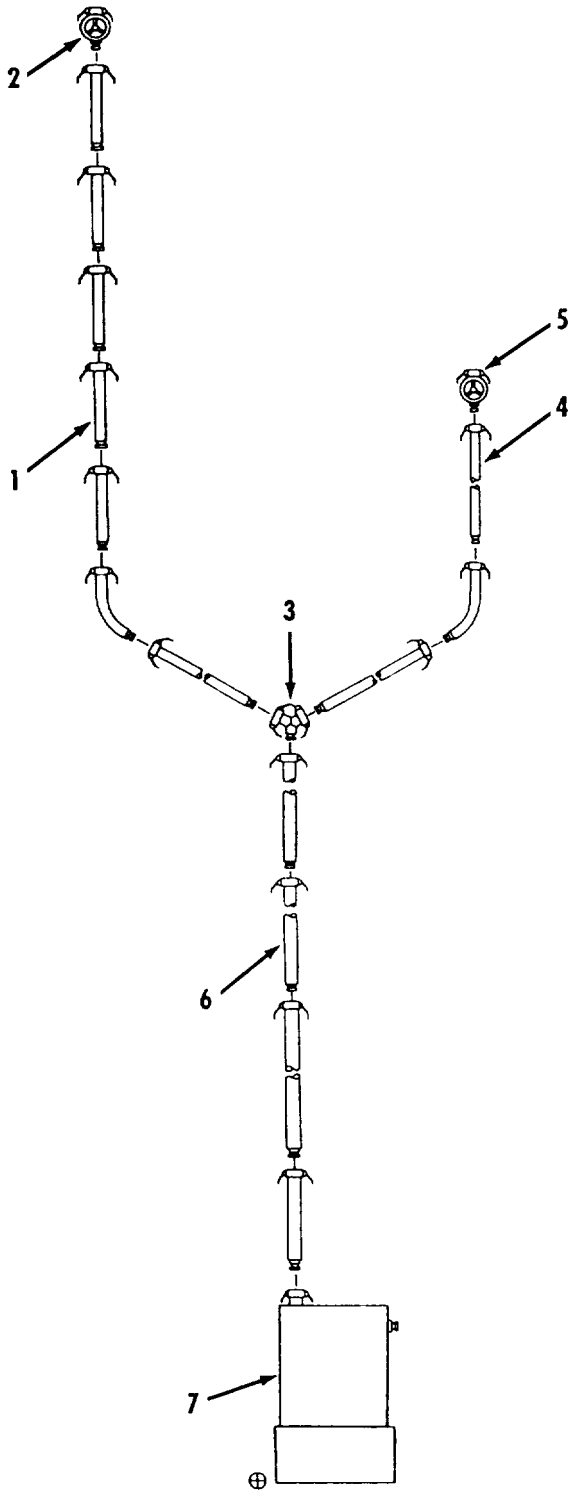


Figure 2-14. Fuel System - Primary 600 GPM Pump Input.

2-16. ASSEMBLY AND PREPARATION FOR USE CONT.

g. Fuel System Primary 600 GPM Pump Output to Filler Hose of Fuel Tanks. Refer to figure 2-15.

CAUTION

To prevent contamination of fuel system components, keep dirt, ice and snow from entering open couplings or hoses during assembly.

NOTES

- This manual covers installation of a typical AFSSP system. You may need to adjust the number of components used, and their position in the system, to meet your mission requirements. Additional hoses, couplings, adapters and elbows are supplied with the AFSSP as accessories.

- If required two 4-inch elbows may be used at the output of primary pump.

- Refer to para 2-16e for connection of quick disconnect couplings.

(1) Connect a 50 foot 4-inch collapsible hose (1) output of pump (2).

(2) Connect 4-inch fueling manifold (13) to collapsible hose (I).

(3) Connect 4-inch valve section (4) to fueling manifold (3).

(4) Connect together four 25 foot 4-inch collapsible hoses (5) and connect one end of hoses to valve section (4).

(5) Connect 4-inch fueling manifold (6) to other end of collapsible hoses (5).

(6) Connect filler hose (7) to valve side of fueling manifold (6) and fuel tank (8).

(7) Connect together two 20 foot 4-inch collapsible hoses (9) and connect one end of hoses to fueling manifold (6).

(8) Connect 25 foot 4-inch noncollapsible hose (10) to other end of collapsible hoses (9).

(9) Connect 4-inch fueling manifold (11) to other end of collapsible hoses (10).

(10) Connect filler hose (12) to valve side of fueling manifold (11) and fuel tank (13).

(11) Connect together two 20 foot 4-inch collapsible hoses (14) and connect one end of hoses to fueling manifold (11).

(12) Connect 20 foot 4-inch collapsible hose (15) to other end of collapsible hoses (14).

(13) Connect 4-inch fueling manifold (16) to end of collapsible hose (15).

(14) Connect filler hose (17) to valve side of fueling manifold (16) and fuel tank (18).

(15) Connect 4-inch female adapter (19) to fueling manifold (16).

(16) Connect 4-inch valve section (20) to adapter (19).

12-16. ASSEMBLY AND PREPARATION FOR USE - CONT.

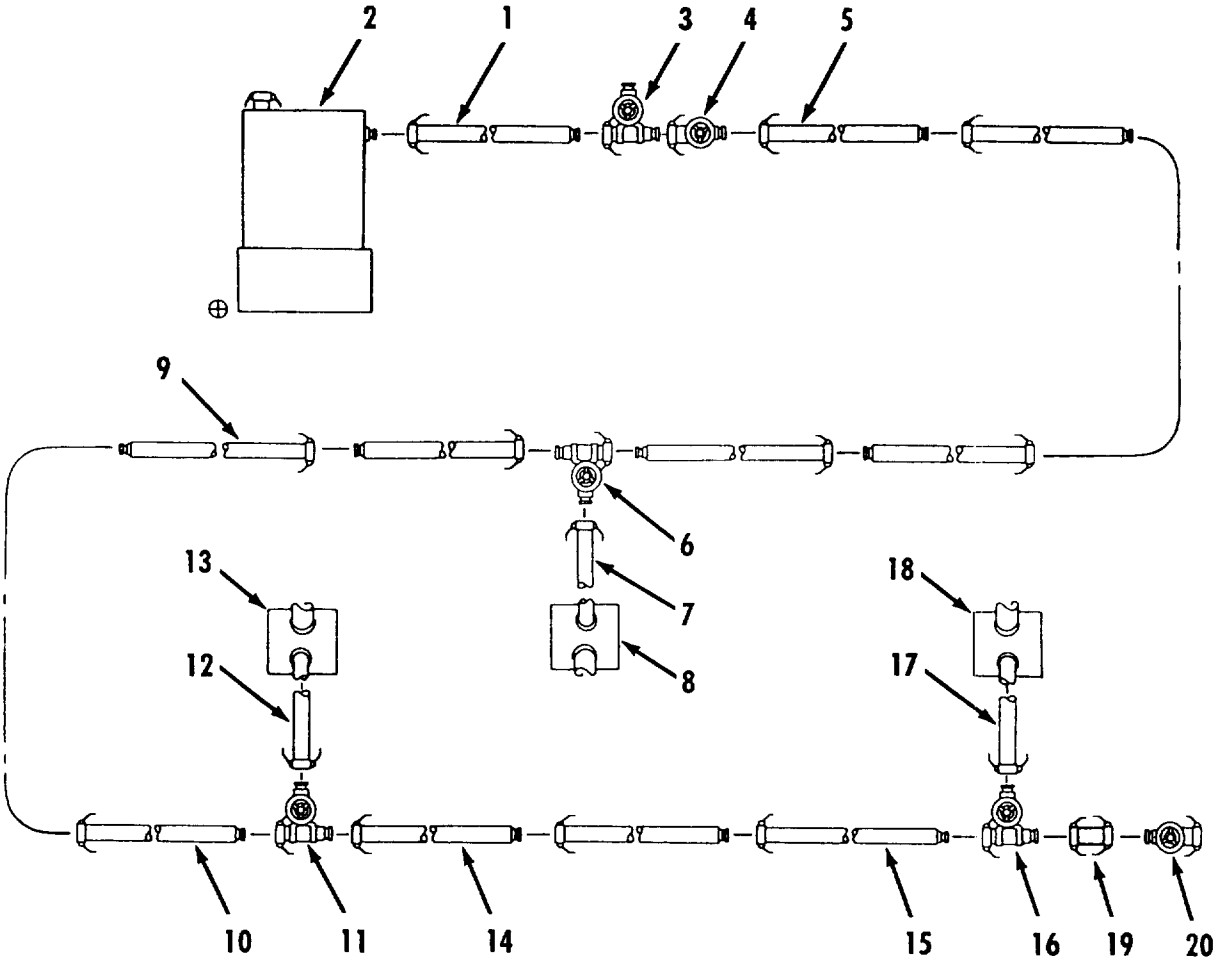


Figure 2-15. Fuel System - Primary 600 GPM Pump Output to Filler Hose of Fuel Tanks.

2-16. ASSEMBLY AND PREPARATION FOR USE - CONT.

h. Fuel System Fuel Tank Discharge to Secondary 600 GPM Pump Input. Refer to figure 2-16.

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.

CAUTIONS

- To prevent contamination of fuel system components use care when connecting couplings to avoid getting metal, ice, snow, dirt, sand and debris on coupling mating surfaces or in hoses.

- To prevent leaks and ensure tight connections, make sure arctic gaskets (blue) are installed in all female quick disconnect couplings before connecting components.

NOTES

- This covers installation of a typical AFSSP system. You may need to adjust the number of components used, and their position in the system, to meet your mission requirements. * Refer to para 2-16e for connection of quick disconnect couplings.

(1) Connect 4-inch valve section (1) to 6-inch male x 4-inch female reducer (2).

(2) Connect 6-inch fueling manifold (3) to reducer (2).

(3) Connect discharge hose (4) to valve side of fueling manifold (3) and fuel tank (5).

(4) Connect together seven 10 foot 6-inch noncollapsible hoses (6) and connect one end of hoses to fueling manifold (3).

(5) Connect valve end of fueling manifold (7) to other end of hoses (6).

(6) Connect discharge hose (8) to other valve side of fueling manifold (7) and fuel tank (9).

(7) Connect together three 10 foot 6-inch noncollapsible hoses (10) and connect one end of hoses to fueling manifold (7).

(8) Connect 6-inch fueling manifold (11) to other end of noncollapsible hoses (10).

(9) Connect together three 10 foot 6-inch noncollapsible hoses (12) and connect one end to valve side of fueling manifold (11).

(10) Connect 6-inch fueling manifold (13) to other end of noncollapsible hoses (12).

(11) Connect discharge hose (14) to valve side of fueling manifold (13) and tank (15)..

(12) Connect 6-inch male x 4-inch female reducer (16) to fueling manifold (13).

(13) Connect 4-inch valve section (17) to reducer (16).

2-16. ASSEMBLY AND PREPARATION FOR USE - CONT.

(14) Connect together two 10 foot 6-inch noncollapsible hoses (18).

(15) Connect one end of noncollapsible hoses (18) to fueling manifold (11).

(16) Connect valve side of 6-inch fueling manifold (19) with two valves to other end of noncollapsible hoses (18).

(17) Connect 10 foot 6-inch noncollapsible hose (120) to non-valve side of fueling manifold (19).

(18) Connect other end of noncollapsible hose (20) to input of secondary 600 GPM pump (21).

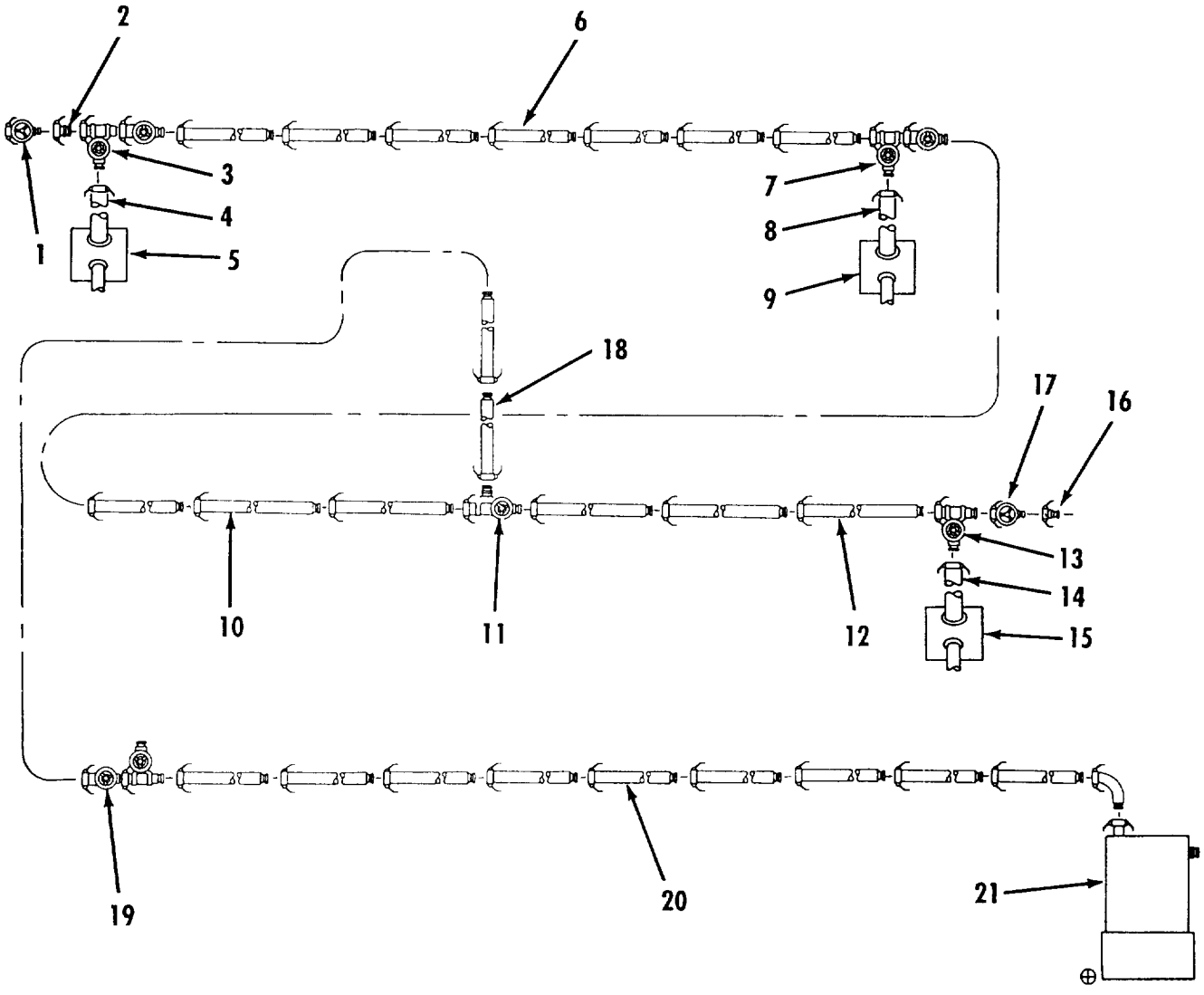


Figure 2-16. Fuel System - Fuel Tank Discharge to Secondary 600 GPM Pump Input.

2-16. ASSEMBLY AND PREPARATION FOR USE - CONT.

i. Fuel System Secondary 600 GPM Pump Output to Filter-Separators. Refer to figure 2-17.

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.

CAUTION

To prevent contamination of fuel system components use care when connecting couplings to avoid getting metal, ice, snow, dirt, sand and debris on coupling mating surfaces or in hoses during assembly.

NOTES

- This covers installation of a typical AFSSP system. You may need to adjust the number of components used, and their position in the system, to meet your mission requirements.

- Refer to para 2-16e for connection of quick disconnect couplings.

- There are three 200 GPM filter-separators used in AFSSP.

(1) Connect together two 25 foot 4-inch collapsible hoses (1).

(2) Connect one end of the collapsible hoses (1) to secondary 600 GPM pump (2).

(3) Connect other end of hoses (1) to 4-inch fueling manifold (3) with two valves.

(4) Connect together two 4-inch collapsible hoses (4).

(5) Connect one end of collapsible hoses (4) to 4-inch fueling manifold (5) with three valves.

(6) Connect elbows (6 and 7) to end of fueling manifold (5).

(7) Connect 4-inch collapsible hoses (8 and 9) to elbows (6 and 7).

(8) Connect 4-inch collapsible hose (10) to fueling manifold (5).

(9) Connect 3-inch male x 4-inch female reducers (11, 12 and 13) to end of collapsible hoses (8, 9 and 10).

(10) Connect other end of reducers (ii, 12 and 13) to filter separators (14, 15 and 16).

2-16. ASSEMBLY AND PREPARATION FOR USE - CONT.

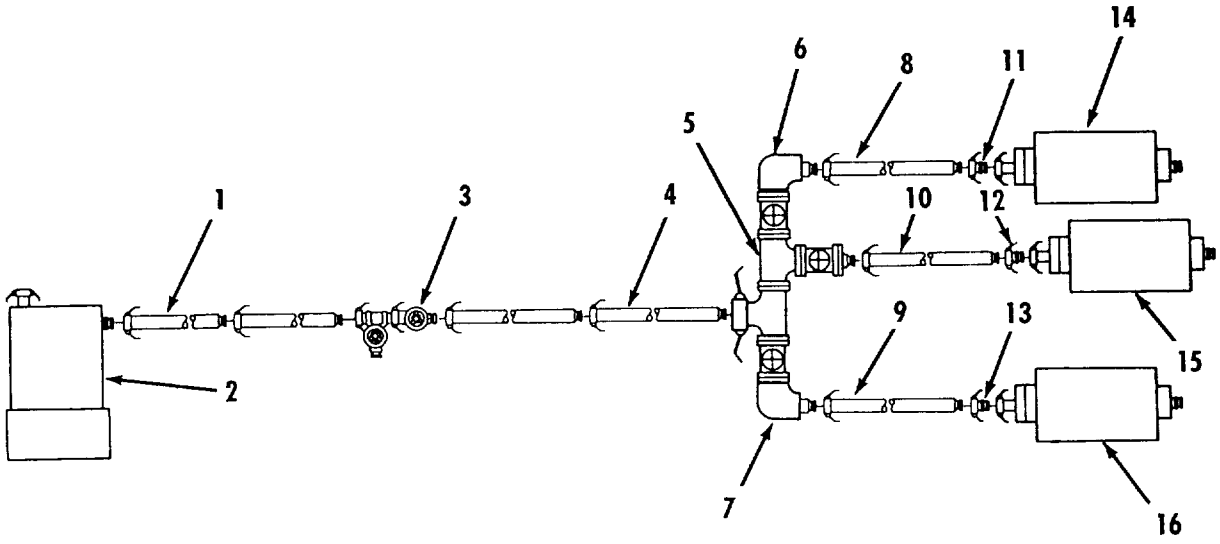


Figure 2-17. Fuel System - Secondary 600 GPM Pump Output to 200 GPM Filter-Separators.

2-16. ASSEMBLY AND PREPARATION FOR USE - CONT.

j. Fuel System 200 GPM Filter-Separators to Fueling Manifold with Five Valves. Refer to figure 2-18.

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.

CAUTION

To prevent contamination of fuel system components use care when connecting couplings to avoid getting metal, ice, snow, dirt, sand and debris on coupling mating surfaces or in hoses during assembly.

NOTES

- This covers installation of a typical AFSSP system. You may need to adjust the number of components used, and their position in the system, to meet your mission requirements.

- If required, connect 3-inch male x 3-inch female elbow to water detection assembly.

- Refer to para 2-16e for connection of quick disconnect couplings.

(1) Connect water detection assemblies (1, 2 and 3) to output of filter-separator (4,5 and 6).

(2) Connect 4-inch male x 3-inch female reducers (7,8 and 9) to water detection assemblies (1,2, and 3).

(3) Connect 25 foot 4-inch collapsible hoses (10,11 and 12) to reducers (7,8 and 9).

(4) Connect 4-inch male x 4-inch female elbows (13 and 14) to collapsible hoses (10 and 12).

(5) Connect elbows (13 and 14) to 4-inch fueling manifold (15) with five valves.

(6) Connect 4-inch collapsible hose (1 l) to 4-inch fueling manifold (15) with five valves.

2-16. ASSEMBLY AND PREPARATION FOR USE - CONT.

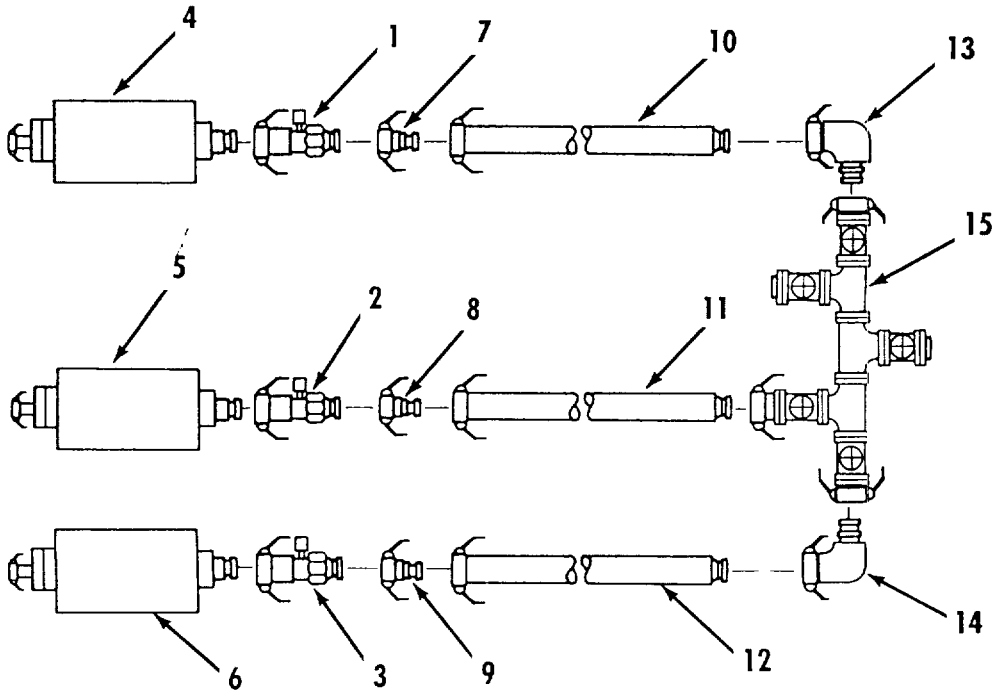


Figure 2-18. Fuel System - 200 GPM Filter-Separators to Fueling Manifold with Five Valves.

2-16. ASSEMBLY AND PREPARATION FOR USE - CONT.

k. Fuel System Fueling Manifold with Five Valves to Bottom Loading Points. Refer to figure 2-19.

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components,

CAUTION

To prevent contamination of fuel system components use care when connecting couplings to avoid getting metal, ice, snow, dirt, sand and debris on coupling mating surfaces or in hoses during assembly.

NOTES

- This covers installation of a typical AFSSP system. You may need to adjust the number of components used, and their position in the system, to meet your mission requirements.

- Refer to para 2-16e for connection of quick disconnect couplings.

- Off loading points can be accomplished at the refueling, drum filling or bottom loading points.

(1) Connect 4-inch fueling manifold (1) to fueling manifold (2) with five valves.

(2) Connect a 50 foot 4-inch collapsible hose (3) to fueling manifold (1).

(3) Connect 4-inch fueling manifold (4) to collapsible hose (3).

(4) Connect a 25 foot 4-inch collapsible hoses (5) to valve side of fueling manifold (4).

(5) Connect 4-inch ball valve (6) to collapsible hose (5).

(6) Connect a 50 foot 4-inch collapsible hose (7) to fueling manifold (4).

(7) Connect a 25 foot 4-inch collapsible hose (8) to collapsible hose (7).

(8) Connect 4-inch fueling manifold (9) to collapsible hose (8).

(9) Connect a 25 foot 4-inch collapsible hose (10) to fueling manifold (9).

(10) Connect 4-inch ball valve (11) to collapsible hose (10).

2-16. ASSEMBLY AND PREPARATION FOR USE - CONT.

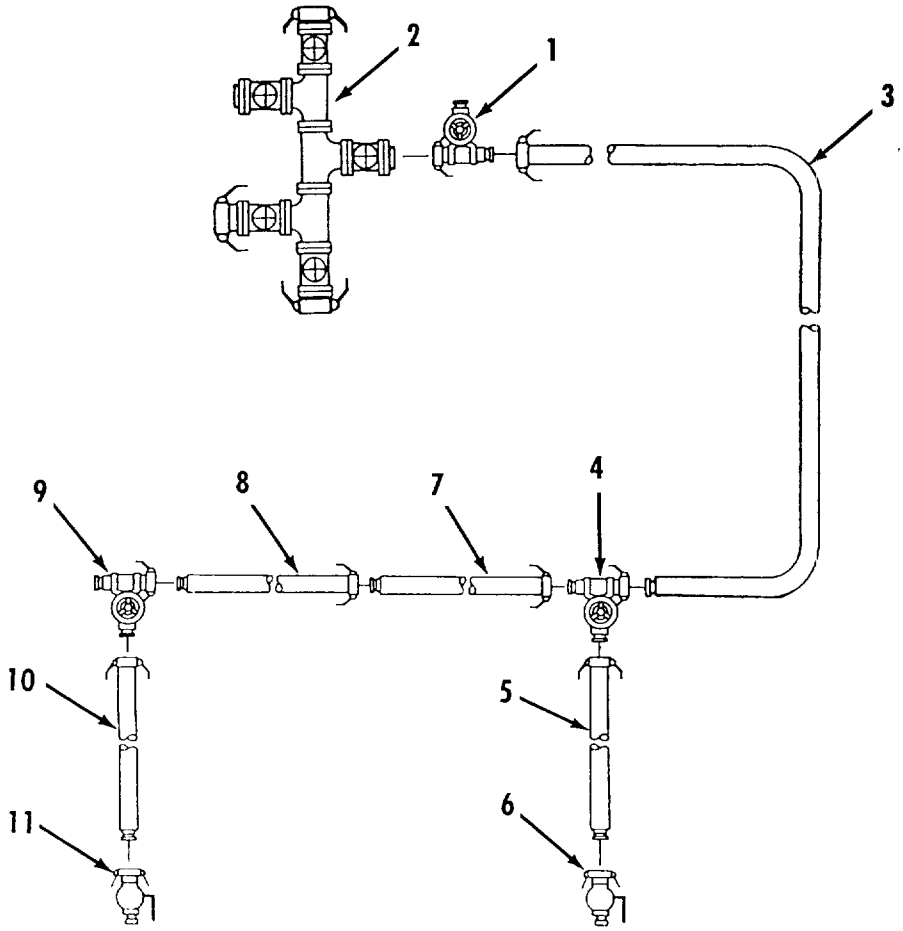


Figure 2-19. Fuel System - Fueling Manifold with Five Valves to Bottom Loading Points.

2-16. ASSEMBLY AND PREPARATION FOR USE - CONT.

1. Fuel System Bottom Loading Point to Drum Filling Points. Refer to figure 2-20.

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.

CAUTION

To prevent contamination of fuel system components use care when connecting couplings to avoid getting metal, ice, snow, dirt, sand and debris on coupling mating surfaces or in hoses during assembly.

NOTES

- This covers installation of a typical AFSSP system. You may need to adjust the number of components used, and their position in the system, to meet your mission requirements.

- Refer to para 2-16e for connection of quick disconnect couplings.

- Off loading points can be accomplished at the refueling, drum filling or bottom loading points.

  (1) Connect a 50 foot 4-inch collapsible hose (i) to 4-inch fueling manifold (2) of bottom loading.

  (2) Connect a 25 foot 4-inch collapsible hose (3) to collapsible hose (1).

  (3) Connect 4-inch fueling manifold (4) to collapsible hose (3).

  (4) Connect a 3-inch male x 4 inch female reducer (5) to fueling manifold (4).

  (5) Connect a 25 foot 3-inch collapsible hose (6) to reducer (5).

  (6) Connect a 3-inch tank coupler (17) to collapsible hose (61.

  (7) Connect a 50 foot 4-inch collapsible hose (8) to 4-inch fueling manifold (4).

  (8) Connect 4-inch fueling manifold (9) to collapsible hose (8).

  (9) Connect a 3-inch male x 4 inch female reducer (10) to fueling manifold (9).

  (10) Connect a 25 foot 3-inch collapsible hose (11) to reducer (10).

  (11) Connect a 3-inch tank coupler (12) to collapsible hose (11).

2-16. ASSEMBLY AND PREPARATION FOR USE - CONT.

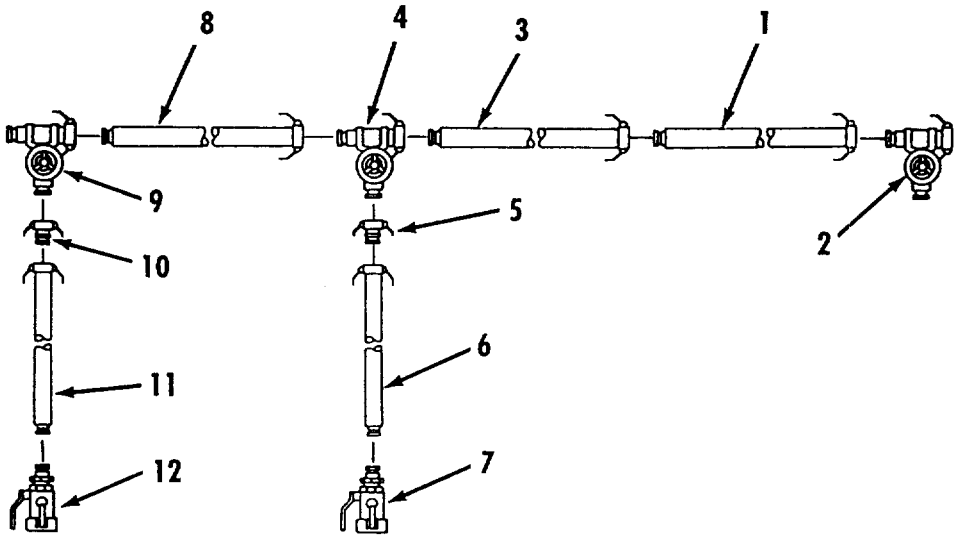


Figure 2-20. Fuel System - Bottom Loading Point to Drum Filling Points.

2-16. ASSEMBLY AND PREPARATION FOR USE - CONT.

m. Fuel System Drum Filling Points to Refueling Points. Refer to figure 2-21.

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.

CAUTION

To prevent contamination of fuel system components use care when connecting couplings to avoid getting metal, ice, snow, dirt, sand and debris on coupling mating surfaces or in hoses during assembly.

NOTES

- This covers installation of a typical AFSSP system. You may need to adjust the number of components used, and their position in the system, to meet your mission requirements.

- Refer to para 2-16e for connection of quick disconnect couplings.

- Off loading points can be accomplished at the refueling, drum filling or bottom loading points.

(1) Connect a 50 foot 4-inch collapsible hose (1) to 4-inch fueling manifold (2).

(2) Connect a 25 foot 4-inch collapsible hose (3) to collapsible hose (1).

(3) Connect 4-inch fueling manifold (4) to collapsible hose (3).

(4) Connect a 4-inch female x 2-inch female reducer (5! to fueling manifold (4).

(5) Connect a 1.5-inch male x 2-inch female reducer (61 to reducer (5).

(6) Connect a 25 foot 1 1/2-inch collapsible hose (7) to reducer (6).

(7) Connect arctic fuel and oil servicing nozzle (8) to collapsible hose (7).

(8) Connect a 25 foot 4-inch collapsible hose (9) to fueling manifold (4).

(9) Connect 4-inch fueling manifold (10) to collapsible hose (9).

(10) Connect a 4-inch female reducer (11) to fueling manifold (10).

(11) Connect a 1.5 inch male x 2-inch female reducer (12) to reducer (11).

(12) Connect 2 25 foot 1 1/2-Inch collapsible hose (13) to reducer (12).

(13) Connect arctic fuel and oil servicing nozzle (14) to collapsible hose.

(14) Connect a 25 foot 4-inch collapsible hose (15) to 4-inch fueling manifold (10).

(15) Connect 4-inch fueling manifold (16) to other end of 4-inch collapsible hose (15).

(16) Connect a 4-inch female x 2 inch female reducer (17) to 4-inch fueling manifold (16).

2-16. ASSEMBLY AND PREPARATION FOR USE - CONT. I

(17) Ensure dust cap (18) is installed in fueling manifold (16).

(18) Connect a 1.5 inch male x 2.-inch female reducer (19) to reducer (17).

(19) Connect a 25 foot a 1/2-inch collapsible hose (20) to reducer (19).

(20) Connect arctic fuel and oil servicing nozzle (21) to collapsible hose (20).

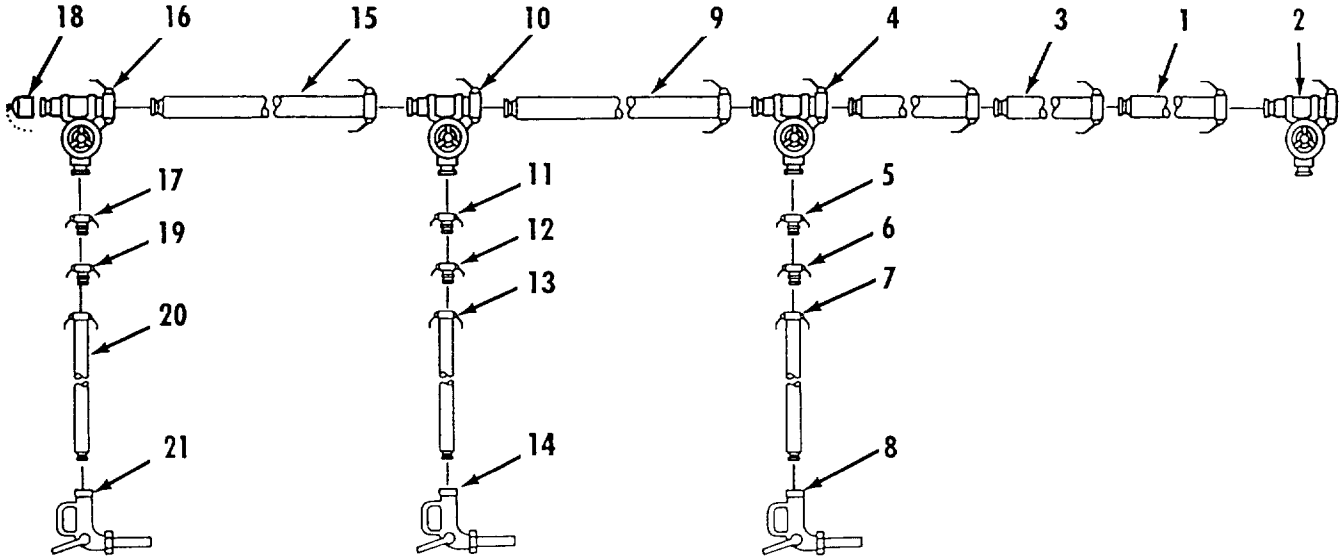


Figure 2-21. Fuel System - Refueling Points.

2-16. ASSEMBLY AND PREPARATION FOR USE - CONT.

n. Fuel System Fuel Tank Bypass Hose. Refer to figure 2-22.

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.

CAUTIONS

- To prevent contamination of fuel system components use care when connecting couplings to avoid getting metal, ice, snow, dirt, sand and debris on coupling mating surfaces or in hoses during assembly.

- To prevent leaks and ensure tight connections, make sure arctic gaskets are installed in all female quick disconnect couplings before connecting components.

NOTES

- This covers installation of a typical AFSSP system. You may need to adjust the number of components used, and their position in the system, to meet your mission requirements.

- Refer to para 2-16e for connection of quick disconnect couplings.

  (1) Connect together seven 25 foot 4-inch collapsible hoses (1).

  (2) Connect 4-inch fueling manifold (2) to output of primary 600 GPM pump (3).

  (3) Connect one end of the collapsible hoses (1) to 4-inch fueling manifold (2).

  (4) Connect the other end of the 4-inch collapsible hose (1) to 4-inch valve section (4).

  (5) Connect 4-inch valve section (4) to discharge side of fuel tank (5).

2-16. ASSEMBLY AND PREPARATION FOR USE - CONT.

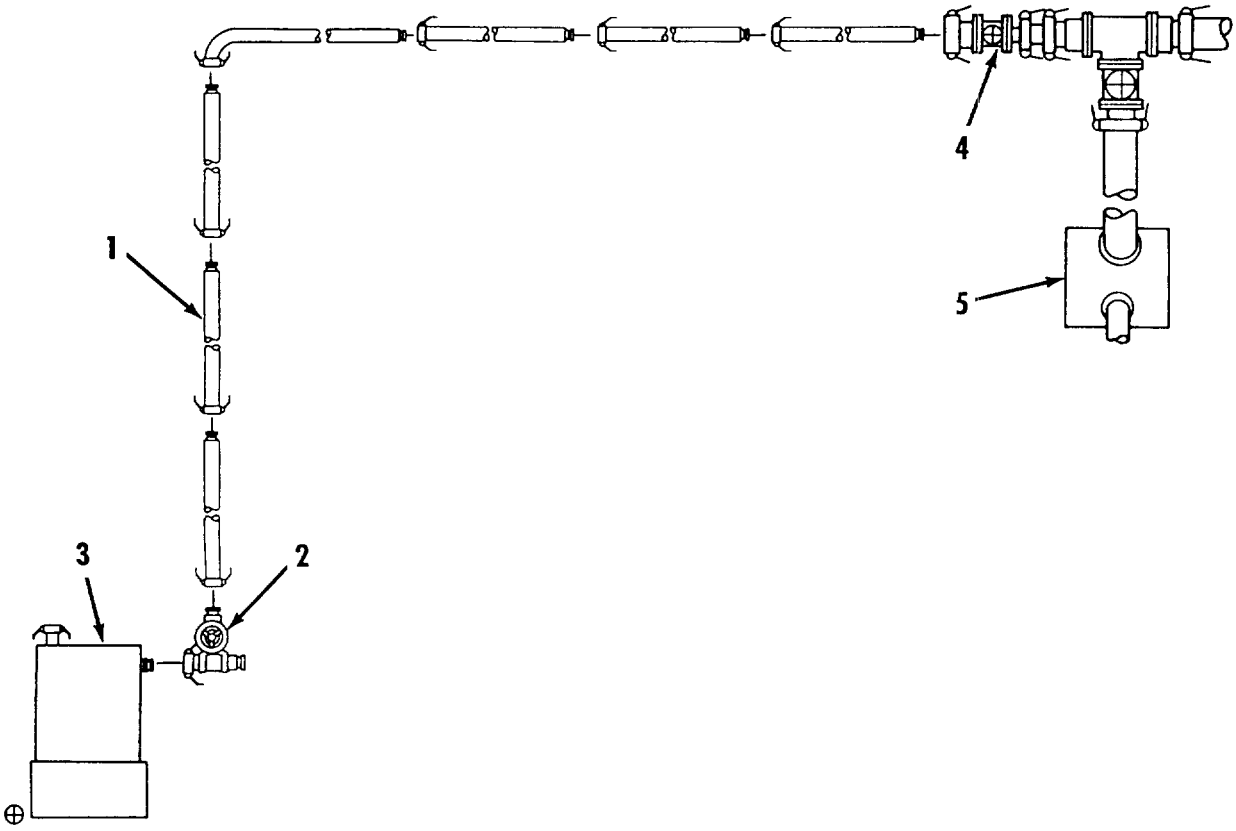


Figure 2-22. Fuel System - Fuel Tank Bypass Hose.

2-16. ASSEMBLY AND PREPARATION FOR USE - CONT.

o. Fuel System Secondary 600 GPM Pump Fuel Bypass Hose. Refer to figure 2-23.

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.

CAUTIONS

- To prevent contamination of fuel system components use care when connecting couplings to avoid getting ice, snow, dirt, sand and debris on coupling mating surfaces or in hoses during assembly.

- To prevent leaks and ensure tight connections, make sure arctic gaskets are installed in all female quick disconnect couplings before connecting components.

NOTES

- This covers installation of a typical AFSSP system. You may need to adjust the number of components used, and their position in the system, to meet your mission requirements.

- Refer to para 2-16e for connection of quick disconnect couplings.

  (1) Connect a 50 foot 4-inch collapsible hose (1) to 4-inch valve section (2) on discharge side of fuel tank (3).

  (2) Connect a 25 foot 4-inch collapsible hose (4) to 50 foot 4-inch collapsible hose (1).

  (3) Connect other end of 25 foot 4-inch collapsible hose (4) to 4-inch fueling manifold (5) on output of 600 GPM secondary pump (6).

2-16. ASSEMBLY AND PREPARATION FOR USE - CONT.

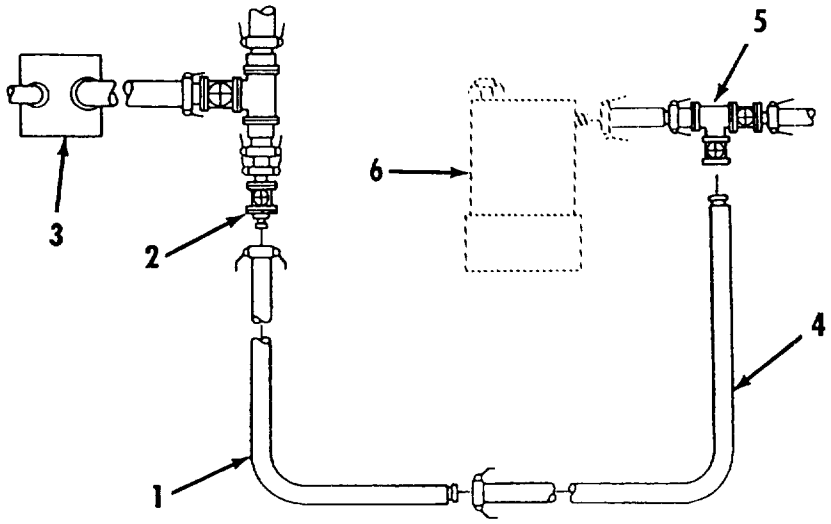


Figure 2-23. Fuel System - Secondary 600 GPM Pump Fuel Bypass Hose.

2-16. ASSEMBLY AND PREPARATION FOR USE - CONT.

p. Fuel System - Fuel Tank, Secondary 600 GPM Pump and Filter-Separator Bypass Hoses. Refer to figure 2-24.

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.

CAUTIONS

- To prevent contamination of fuel system components use care when connecting couplings to avoid getting metal, ice, snow, dirt, sand and debris on coupling mating surfaces or in hoses during assembly.

- To prevent leaks and ensure tight connections, make sure arctic gaskets are installed in all female quick disconnect couplings before connecting components.

NOTES

- This covers installation of a typical AFSSP system. You may need to adjust the number of components used, and their position in the system, to meet your mission requirements.

- Refer to para 2-16e for connection of quick disconnect couplings.

(1) Connect together four 50 foot 4-inch collapsible hoses (1).

(2) Connect one end of collapsible hoses (1) to 4-inch valve section (2) on fill side of fuel tank (3).

(3) Connect other end of collapsible hoses (1) to 4-inch fueling manifold (4).

2-16. ASSEMBLY AND PREPARATION FOR USE - CONT.

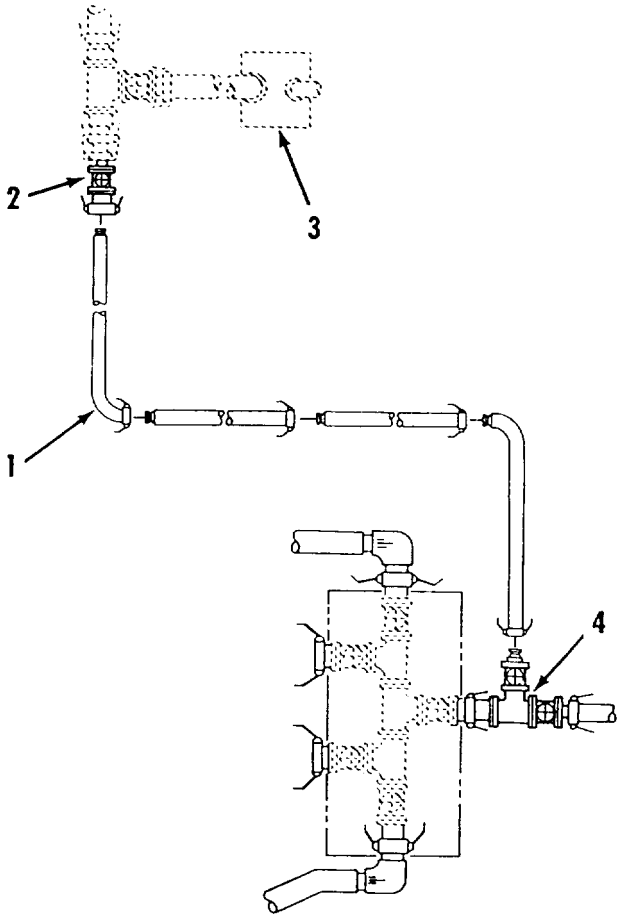


Figure 2-24. Fuel System - Fuel Tank, Secondary 600 GPM Pump and 200 GPM Filter-Separator Bypass Hoses.

2-16. ASSEMBLY AND PREPARATION FOR USE - CONT.

q. Fuel System - Fuel Return Hoses Installation. Refer to figure 2-25.

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.

CAUTIONS

- To prevent contamination of fuel system components use care when connecting couplings to avoid getting metal, ice, snow, dirt, sand and debris on coupling mating surfaces or in hoses during assembly.

- To prevent leaks and ensure tight connections, make sure arctic gaskets are installed in all female quick disconnect couplings before connecting components.

NOTES

- This covers installation of a typical AFSSP system. You may need to adjust the number of components used, and their position in the system, to meet your mission requirements.

- Refer to para 2-16e for connection of quick disconnect couplings.

(1) Connect together twelve 10 foot 6-inch non- collapsible hoses (1).

(2) Connect one end of non- collapsible hoses (1) to 6-inch fueling manifold (2) on input side of secondary 600 GPM pump (3).

(3) Connect 6-inch male x 4- inch female reducer (4) to other end of noncollapsible hoses (1).

(4) Connect other end of reducer (4) to 4-inch fueling manifold (5) with five valves.

2-16. ASSEMBLY AND PREPARATION FOR USE - CONT. I

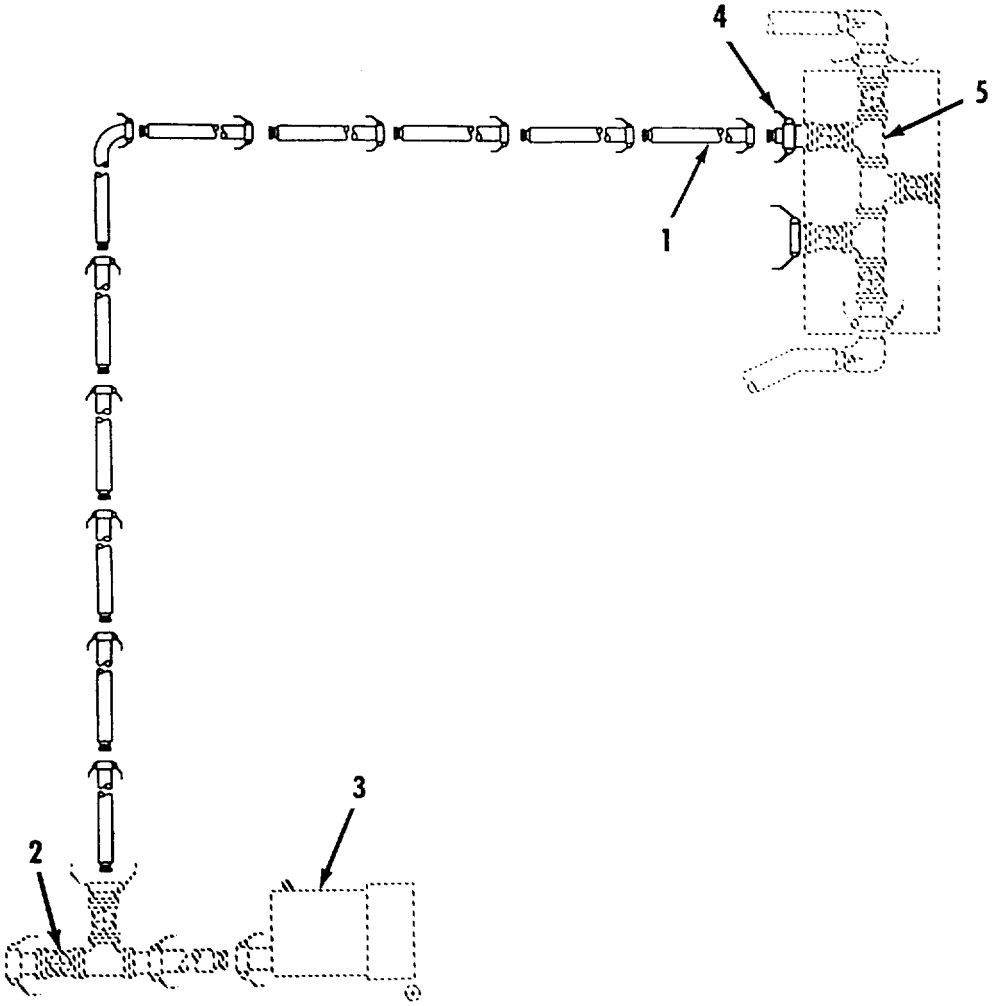


Figure 2-25. Fuel System - Fuel Return Hoses Installation.

2-16. ASSEMBLY AND PREPARATION FOR USE - CONT.

r. Fueling Point Ground Rod Installation. Refer to figure 2-26.

WARNINGS

- Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.
- Use care to prevent injury when driving ground rod into the soil. Wear gloves to protect your hands. Do not hold ground rod above the stop collar.
- Do NOT operate the fuel system until it has been properly grounded. Fuel flow can generate static charges which could ignite the fuel or cause an explosion of fuel vapor.

NOTES

- Before the AFSSP can be placed in operation, it must be properly grounded. Install ground rods at three refueling points, two drum filling points, two bottom loading points, three 200 GPM filter-separators, two 600 GPM pumps and two receiving points.
- If ground cannot be sufficiently penetrated, bury the ground rod in a trench not less than four feet long and at least eight inches beneath the surface.
- Nozzle ground clamps maybe used to supplement aircraft grounding rod.

(1) Place ground rod (1) in vertical position.

(2) Raise, the lower slide (2) forcefully against stop collar (3). Repeat until collar is flush with surface of soil (rod will be at least three feet deep).

(3) Connect connector (4) to either fuel nozzle (5), 3-inch tank coupler (6), 4-inch ball valve (7) or 6-inch valve section (9).

(4) Connect connector (9) to ground rod (1).

(5) Repeat steps (1) through (4) for other fueling points.

2-16. ASSEMBLY AND PREPARATION FOR USE - CONT.

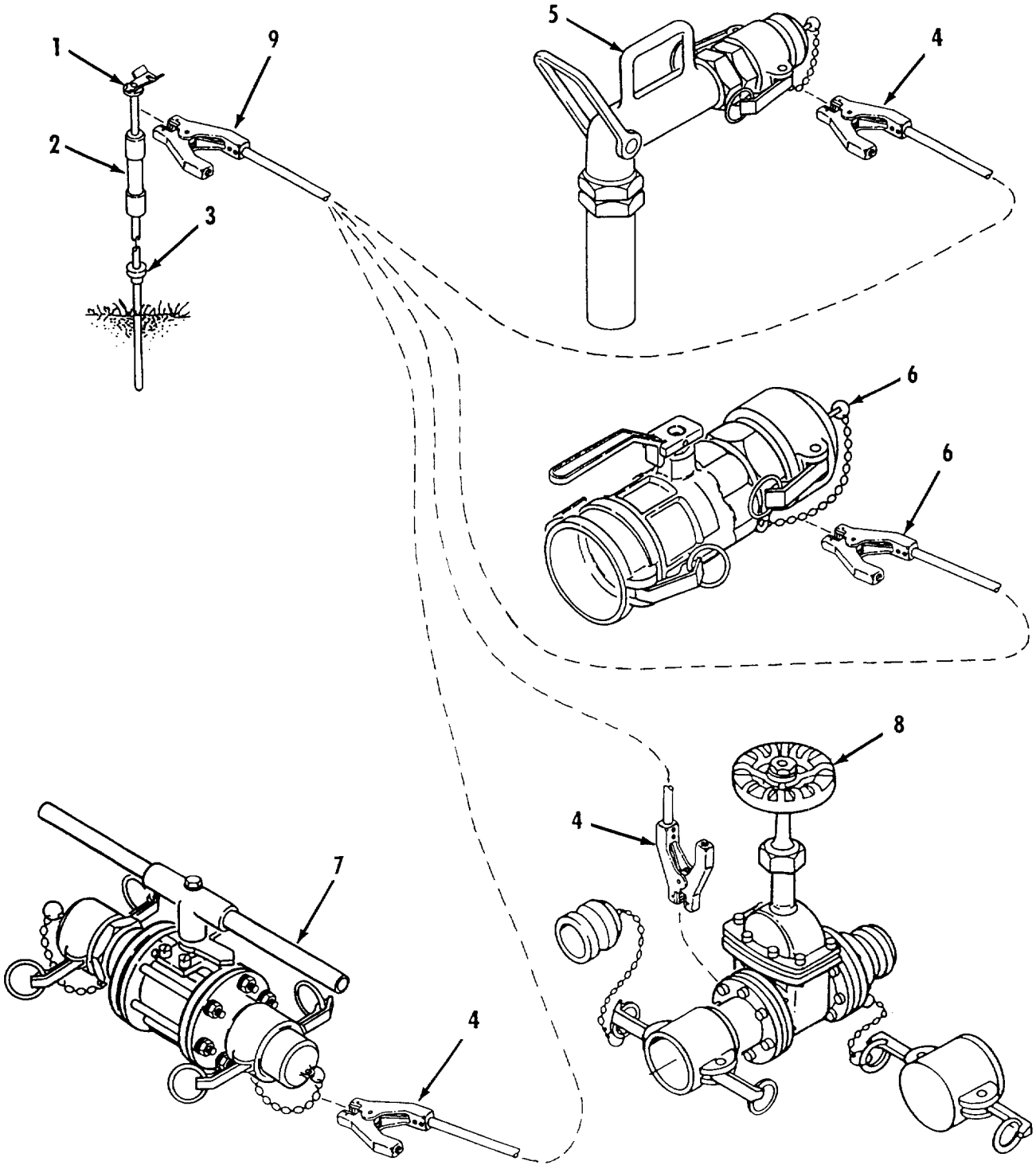


Figure 2-26. Refueling Point Ground Rod Installation.

2-16. ASSEMBLY AND PREPARATION FOR USE - CONT.

s. 600 GPM Pump Ground Rod Installation. Refer to figure 2-27.

WARNINGS

- Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.
- Use care to prevent injury when driving ground rod into the soil. Wear gloves to protect your hands. Do not hold ground rod above the stop collar.
- Do NOT operate the fuel system until it has been properly grounded. Fuel flow can generate static charges which could ignite the fuel or cause an explosion of fuel vapor.

NOTE

If ground cannot be sufficiently penetrated, bury the ground rod in a trench not less than four feet long and at least eight inches beneath the surface.

(1) Place ground rod (1) in vertical position.

(2) Raise the lower slide (2) forcefully against stop collar (3). Repeat until collar is flush with surface of soil (rod will be at least three feet deep).

(3) Loosen two screws (4) and rotate front plate (5) to open clamp.

NOTE

Position of back plate may be reversed to fit smaller diameter ground rods.

(4) Position front plate (5) and back plate (6) around ground rod (1). Secure plates to ground rod with two screws (4).

(5) Place end of ground wire (7) in front plate (5) and tighten screw (8).

(6) Locate ground lug 110) on 600 GPM pump (11) and loosen nut (9).

(7) Place free end of ground wire (7) through slot in ground lug (10).

(8) Tighten nut (9) until ground wire (7) is held securely.

(9) Repeat step (1) through (8) for other 600 GPM pump.

2-16. ASSEMBLY AND PREPARATION FOR USE - CONT.

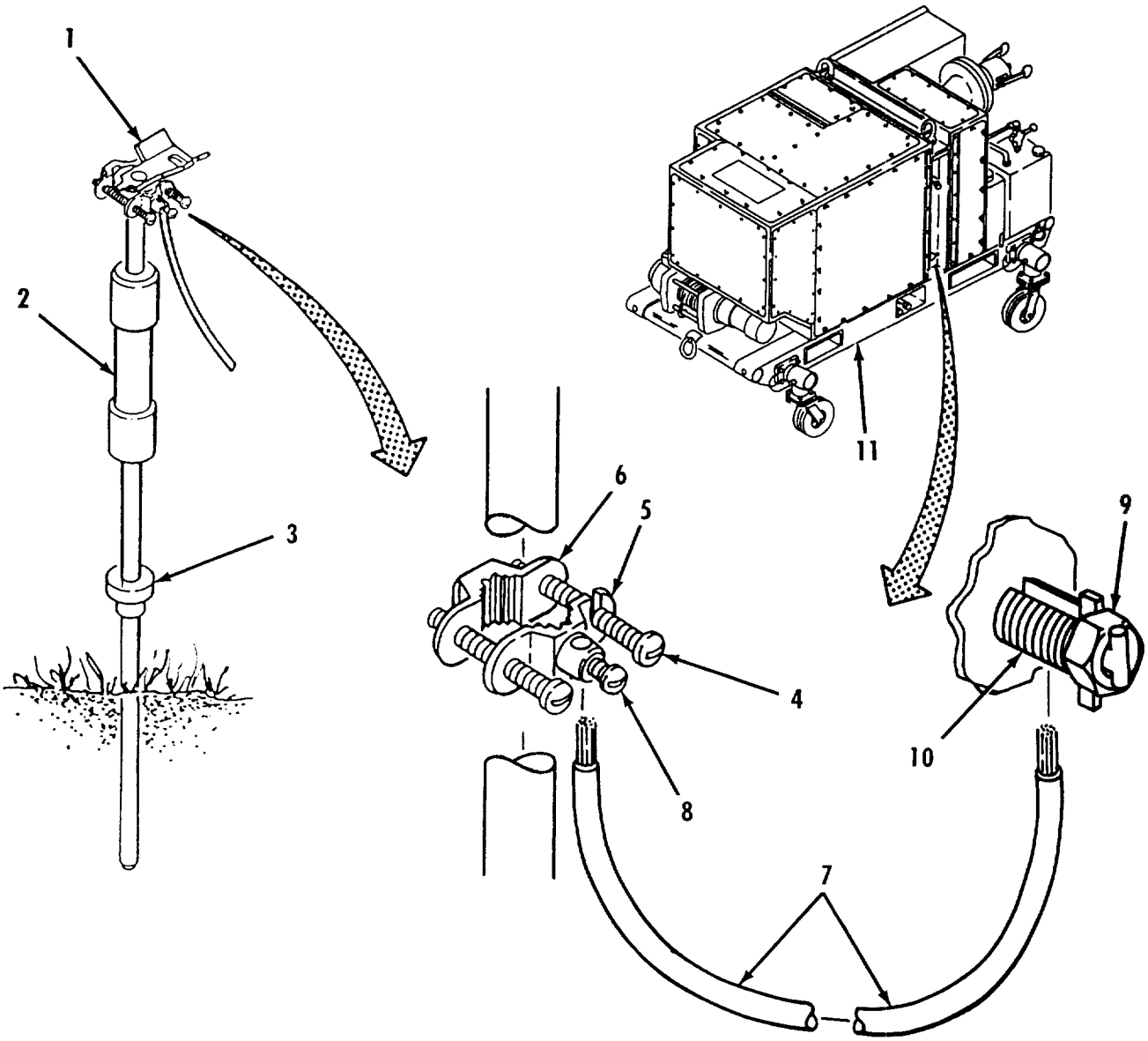


Figure 2-27. Primary and Secondary 600 GPM Pump Ground Rod Installation.

2-16. ASSEMBLY AND PREPARATION FOR USE - CONT.

t. 200 GPM Filter-Separator Ground Rod Installation. Refer to figure 2-28.

WARNINGS

- Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.
- Exercise care to prevent injury when driving ground rod into the soil. Wear gloves to protect your hands. Do not hold ground rod above the stop collar.
- Do NOT operate the fuel system until it has been properly grounded. Flowing fuel can generate static charges which could ignite the fuel or cause an explosion of fuel vapor.

NOTE

If ground cannot be sufficiently penetrated, bury the ground rod in a trench not less than four feet long and at least eight inches beneath the surface.

(1) Loosen the threaded bar (1) and remove ground rod (2) from 200 GPM filter-separator (3).

(2) Place ground rod (2) in vertical position.

(3) Drive ground rod (2) into the ground three feet by sliding the hammer (4) up and down on rod.

(4) Attach connectors (5) of ground cable (6) to ground rod (2) and grounding stud (7) on 200 GPM filter-separator (3),

(5) Repeat steps (1) through (4) for remaining 200 GPM filter-separators.

2-16. ASSEMBLY AND PREPARATION FOR USE - CONT.

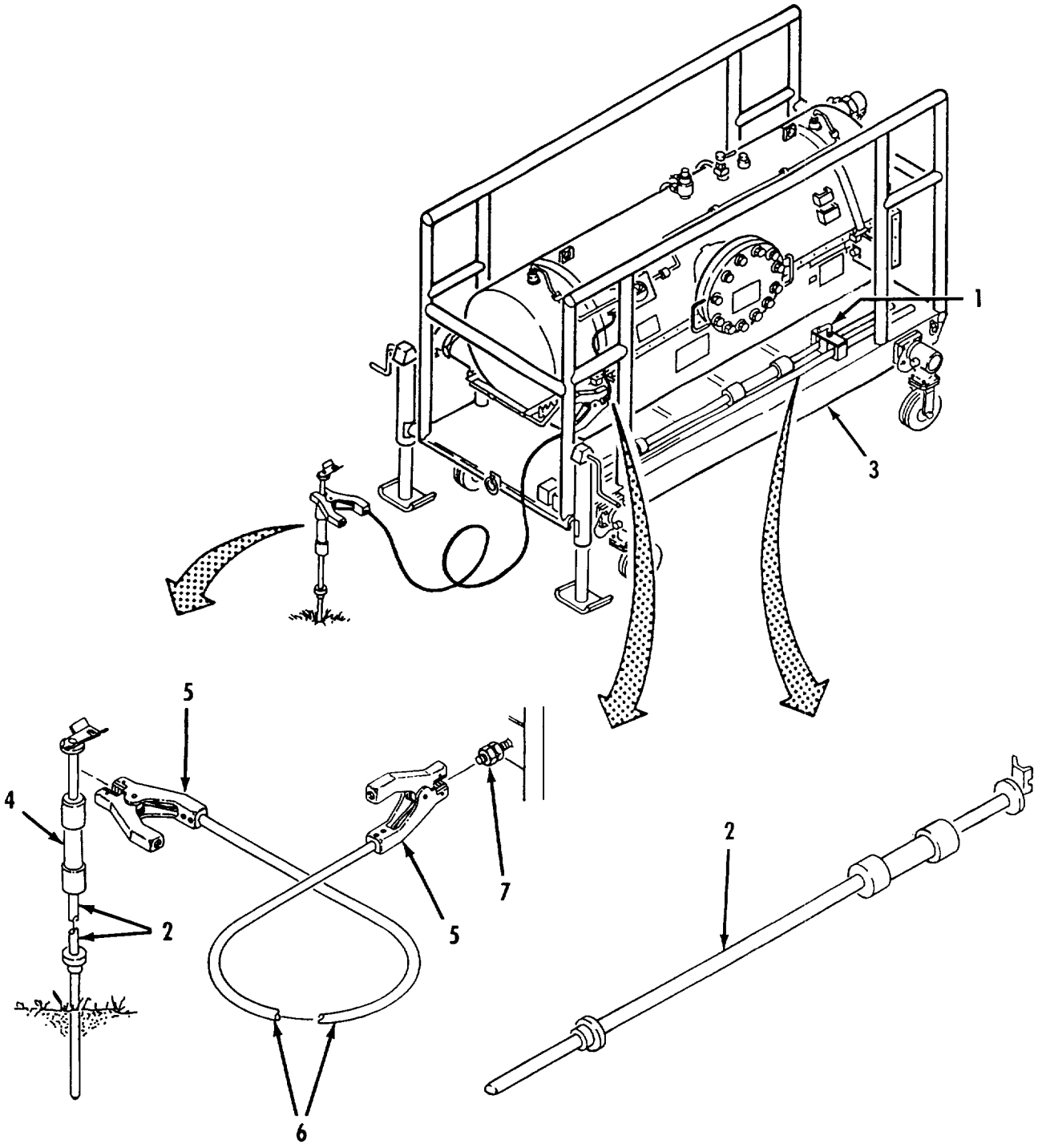


Figure 2-28. 200 GPM Filter-Separator Ground Rod Installation.

2-16. ASSEMBLY AND PREPARATION FOR USE - CONT.

u. 600 GPM Pump Ground Rod Installation. Refer to figure 2-29.

WARNINGS

- Use care to prevent injury when driving ground rod into the soil. Wear gloves to protect your hands. Do not hold ground rod above the stop collar.
- Do NOT operate the fuel system until it has been properly grounded. Flowing fuel can generate static charges within the fuel hoses. A static discharge could ignite the fuel or cause an explosion of fuel vapor.

(1) Place ground rod (1) in vertical position.

(2) Raise, then lower slide (2) forcefully against stop collar (3). Repeat until collar is flush with surface of soil (rod will be at least three feet deep).

NOTE

If ground cannot be sufficiently penetrated, bury the ground rod in a trench not less than four feet long and at least eight inches beneath the surface.

(3) Loosen two screws (4) and rotate front plate (5) to open clamp.

NOTE

Position of back plate may be reversed to fit smaller diameter ground rods.

(4) Position front plate (5) and back plate (6) around ground rod (1). Secure plates to ground rod with two screws (4).

(5) Place end of ground wire (7) in front plate (5) and tighten screw (8).

(6) Locate ground lug (10) on 600 GPM pump (11), then loosen nut (9).

(7) Place free end of ground wire (7) through slot in ground lug (10).

(8) Tighten nut (9) until ground wire (7) is held securely.

2-16. ASSEMBLY AND PREPARATION FOR USE - CONT.

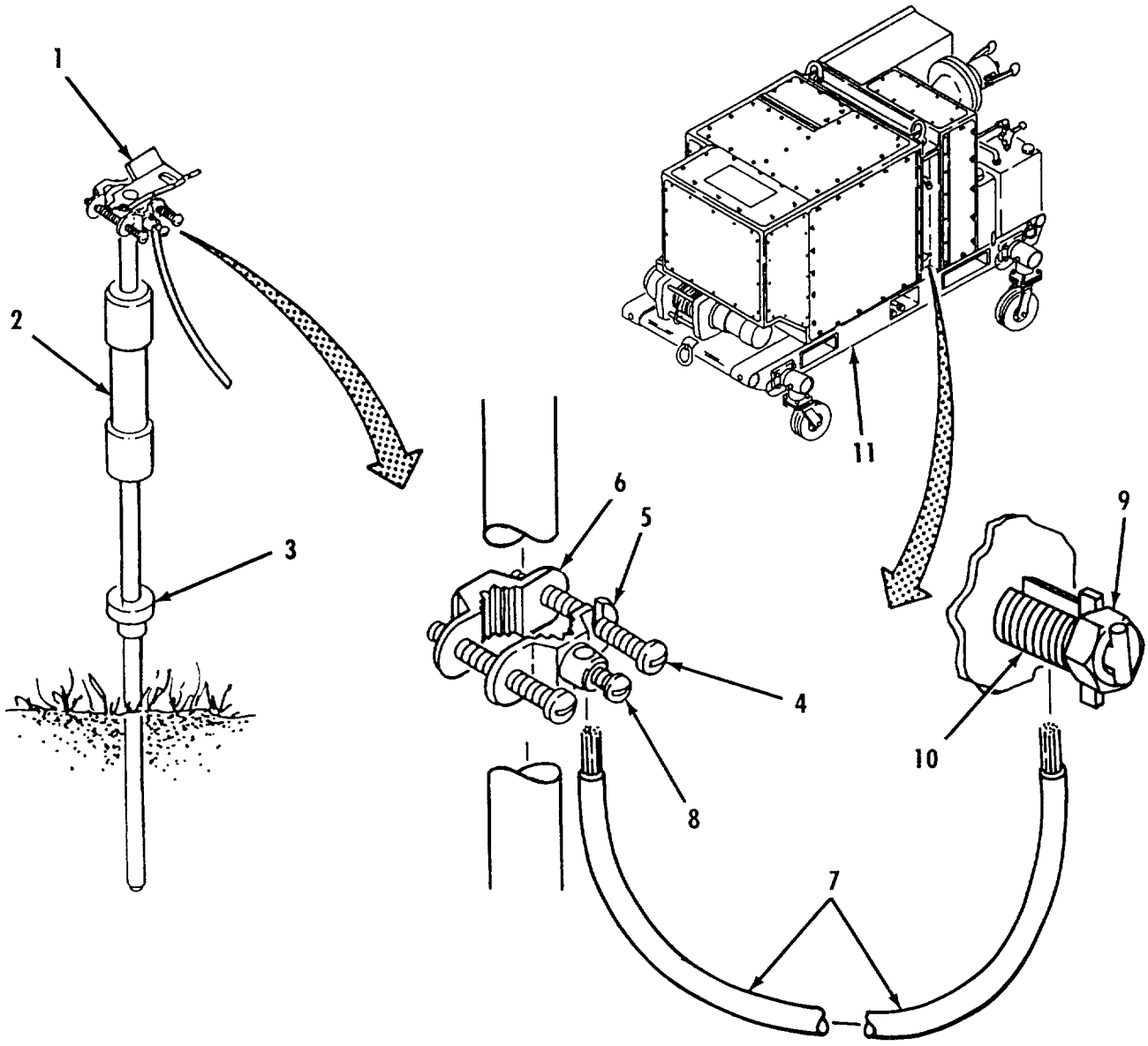


Figure 2-29. 600 Gpm Pump Ground Rod Installation.

2-16. ASSEMBLY AND PREPARATION FOR USE - CONT.

v. Fire Extinguisher Installation. Refer to figure 2-30.

Before operating the AFSSP, fire extinguishers must be positioned in the fuel system in event of a fire. Refer to local standard operating procedures for placement of fire extinguishers within the AFSSP system.

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.

(1) Lift handle (1) and unlatch hook (2) from fire extinguisher (3).

(2) Remove fire extinguisher (3) from frame (4).

(3) Repeat steps (1) and (2) for remaining fire extinguishers.

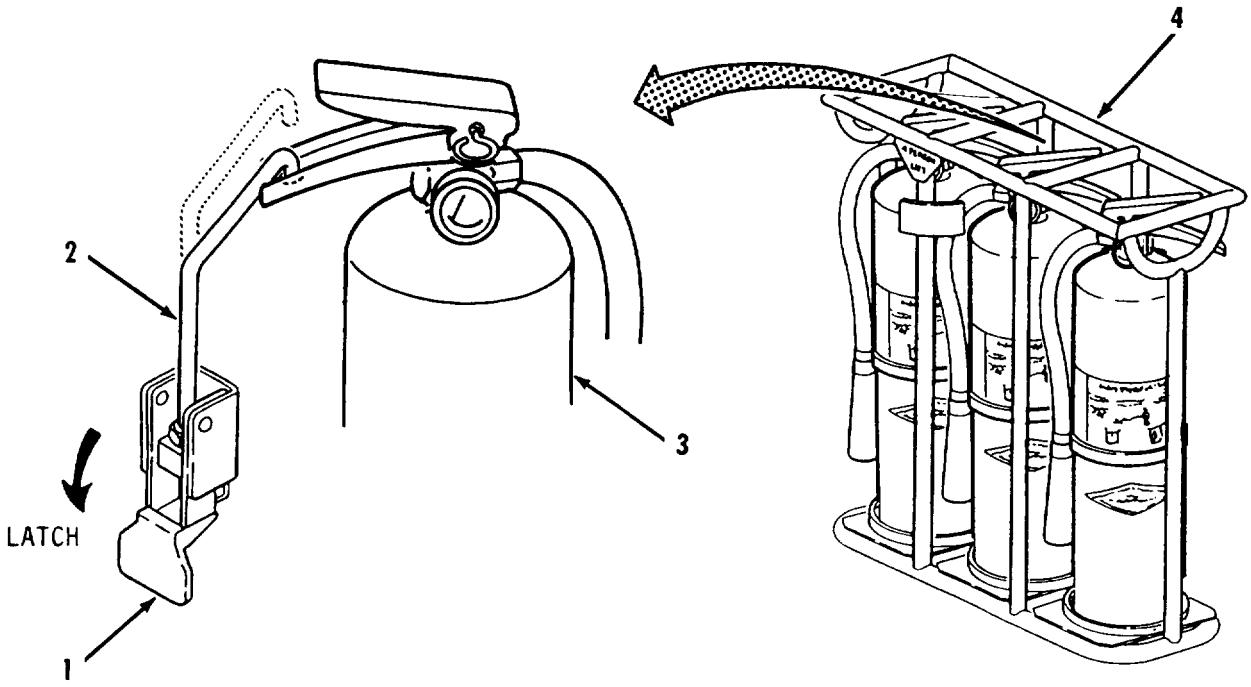


Figure 2-30. Fire Extinguisher Installation.

2-17. INITIAL ADJUSTMENT.

a. Hoses, Couplings, Fueling Manifolds, Tank Couplers, Ball Valves, and Valve Sections.

(1) Verify that all quick disconnect coupling connections are secure.

(2) Verify that all valves are positioned with handwheels facing up **and closed**.

(3) Verify that caps and plugs are installed on all open components.

(4) Inspect fuel hoses for kinks, twists and tight bends. Straighten hoses as required.

b. 3,000, 10,000 or 20,000 gallon tanks. Perform initial adjustments in accordance with **TM 10-5430-231-12**.

c. 200 GPM Filter-Separators. Perform initial adjustments in accordance with **TM 10-4330-2313**.

d. 600 GPM Pumps. Perform initial adjustments in accordance with **TM 10-4320-342-10**.

e. CCR Nozzle and Gravity Fill Adapters. Perform initial adjustments in accordance with **TM 10 4930-243-13&P**

f. Fire Extinguishers. Position fire extinguishers.

2-18. OPERATING PROCEDURES.

a. General. The AFSSP has primary two modes of operation, refueling and defueling. In the refueling mode, fuel is drawn from the 3,000, 10,000 or 20,000 gallon fuel tanks and distributed to the refueling points (bottom loading, drum filling and refueling). In the defuel mode, fuel is removed from the supply tanker and stored in the 3,000, 10,000 or 20,000 gallon fuel tanks.

b. 3,000, 10,000,or 20,000 Gallon Fuel Tanks. For procedures required to operate the fuel tanks, refer to **TM 10-5430-231-12.**

c. 600 GPM Pump Operation. For procedures to operate the 600 GPM pumps (Primary and Secondary), refer to **TM 10-4320-342-10**.

d. **200 GPM Filter-Separator Operation. For procedures required to operate the 200 GPM filter-separator, refer to TM 10-4330-236-13**.

e. Single Point Refueling Nozzle (D1) Operation. For procedures required to operate the single point refueling nozzle and gravity fill adapter, refer to **TM 10-4930-242-13&P**

2-18. OPERATING PROCEDURES - Cont.

f. CCR Nozzle and Gravity Fill Adapter. For procedures required to operate the CCR nozzle and gravity fill adapter, refer to TM 104930-243-13&P

g. Fuel System Operation.

WARNINGS

Fueling operations are potentially dangerous. Make sure you identify and eliminate all safety hazards before operating the fuel system. If a fuel spill occurs during refueling, immediately shutdown the system, isolate the defective components(s) and clean up spilled fuel in accordance with local regulations. Observe the following safety precautions and warnings to prevent injury to personnel and damage to equipment.

- Do not allow smoking within 100 feet of the AFSSP. Fuel vapors are extremely flammable. Post NO SMOKING signs around refueling area. Do not operate system or components near open flame or excessive heat. Death or injury could result from exploding or burning fuel. Suitable and properly charged fire extinguishers must be available at all times.
- Wear protective goggle and gloves. Use fuel resistant gloves when handling system components due to toxic effects of some fuel additives. Avoid contact with skin, eyes, and clothes. If fuel contacts eyes, immediately flush eyes with clean fresh water and get medical attention.
- Avoid getting fuel on your body or clothing. Fuel can cause chemical burns on unprotected skin. If clothing becomes saturated with fuel, remove clothing immediately and wash you body with hot soapy water.
- Do not breathe fuel vapors. Refuel only in well-ventilated area. Vapors are toxic and can cause serious illness or death. If dizziness occurs, leave area and get fresh air. Get medical attention.
- Static discharge could ignite the fuel or cause an explosion of the fuel vapor. Do not operate the system until properly grounded or bonded.
- Be certain that nozzles are properly bonded to the aircraft or vehicle being refueled. Make sure the 600 GPM pumps and 200 GPM filter-separators ground rods are installed and connected.
- Radio transmitters can cause an arc at antennas. Do Not ground equipment to a radio antenna. Do not transmit during refueling operations.
- Before operation, be certain all system components are securely connected to avoid fuel spills. If fuel spills occurs, cover the area with dry soil to reduce rate of vaporization. During operation avoid fuel spills as much as possible. Make sure fire extinguishers are charged and readily available in case of a fire.

2-18. OPERATING PROCEDURES - Cont.

(1) Defuel Mode - Valve Section to Fill Side of Fuel Tanks. Refer to figure 2-31.

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components

NOTES

- Handwheel on valve sections may be opened to allow fuel from one or two supply tankers at the same time. Open handwheels as needed to support your mission.
- Handwheels on fueling manifolds may be opened to allow fuel flow to fill one, two or three fuel tanks at the same time. Open valves as needed to support your mission requirements.
- The following procedures describes filling three fuel tanks at the same time from a supply tanker.

(a) Connect valve section (1) to supply tanker.

(b) Ensure valve section (3) is closed.

(c) Turn handwheel (2) to open position on valve section.

(d) Ensure gate valve (4) on fueling manifold is closed.

(e) Turn handwheel (5) to open position on valve section.

(f) Ensure valve section (6) is closed.

(g) Turn handwheels (7, 8 and 9) to open position on fueling manifolds.

(h) Ensure gate valves (10, 11 and 12) are closed.

(i) Start and operate primary 600 GPM primary pump (13) until operation is complete.

(j) Shutdown 600 GPM primary pump (13).

(k) Close all valves.

(l) Disconnect valve section (1) from supply tanker.

2-18. OPERATING PROCEDURES - Cont.

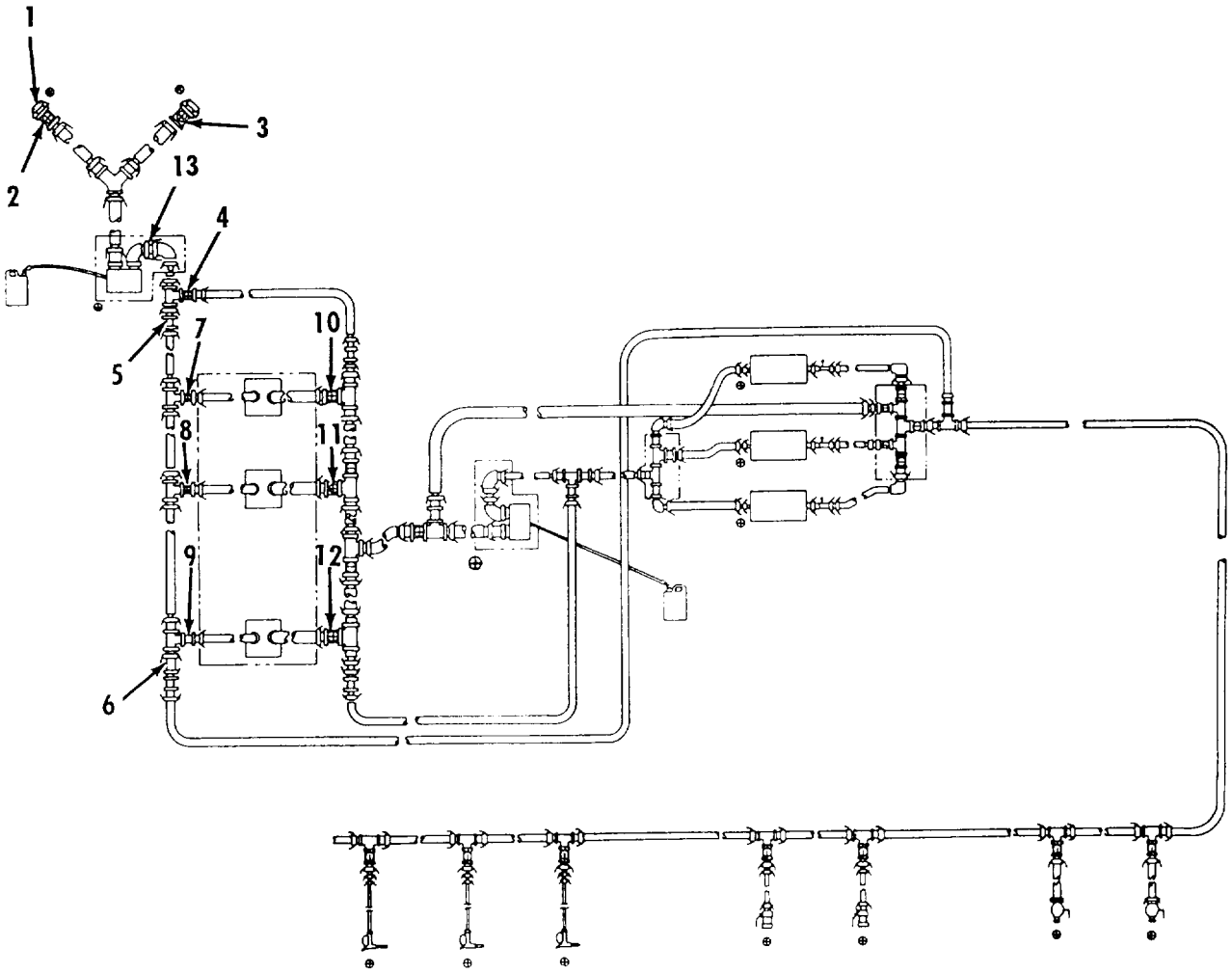


Figure 2-31. Defuel Mode - Valve Section to Fill Side of Fuel Tanks.

2-18. OPERATING PROCEDURES - Cont.

(2) Defuel Mode - Tank Coupler on Drum Filling Points. Refer to figure 2-32.

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.

NOTES

- Handle on tank couplers may be opened to allow fuel from one or two supply tankers at the same time. Open handles as needed to support your mission.
- Handwheels on fueling manifolds may be opened to allow fuel flow to fill one, two or three fuel tanks at the same time. Open valves as needed to support your mission requirements.
- The following procedures describes filling three fuel tanks at the same time from one supply tanker.

(a) Connect 3-inch female tank coupler (1) to supply tanker.

(b) Turn handle (2) to open position on tank coupler.

(c) Turn handwheel 13) to open position on fueling manifold.

(d) Ensure gate valves (4 thru 10) are closed.

(e) Turn handwheel (11) to open position on fueling manifold.

(f) Ensure gate valves (12 and 13) are closed.

(g) Turn handwheels (14 and 15) to open position on fueling manifold.

(h) Ensure gate valve (16) is closed.

(i) Turn handwheel i: 17) to open position on fueling manifold.

(j) Ensure gate valve (18) is closed.

(k) Turn handwheel (:19) to open position on fueling manifold.

(l) Ensure gate valve (20) is closed.

(m) Turn handwheels (21 thru 26) to open positions on valve section.

(n) Ensure gate valve (27) is closed.

(o) Start and operate secondary 600 GPM pump (28) until operation is complete.

2-18. OPERATING PROCEDURES - CONT.

(p) Shut down secondary 600 GPM pump (28).

(q) Close all valves.

(r) Disconnect tank coupler (1) from supply tanker.

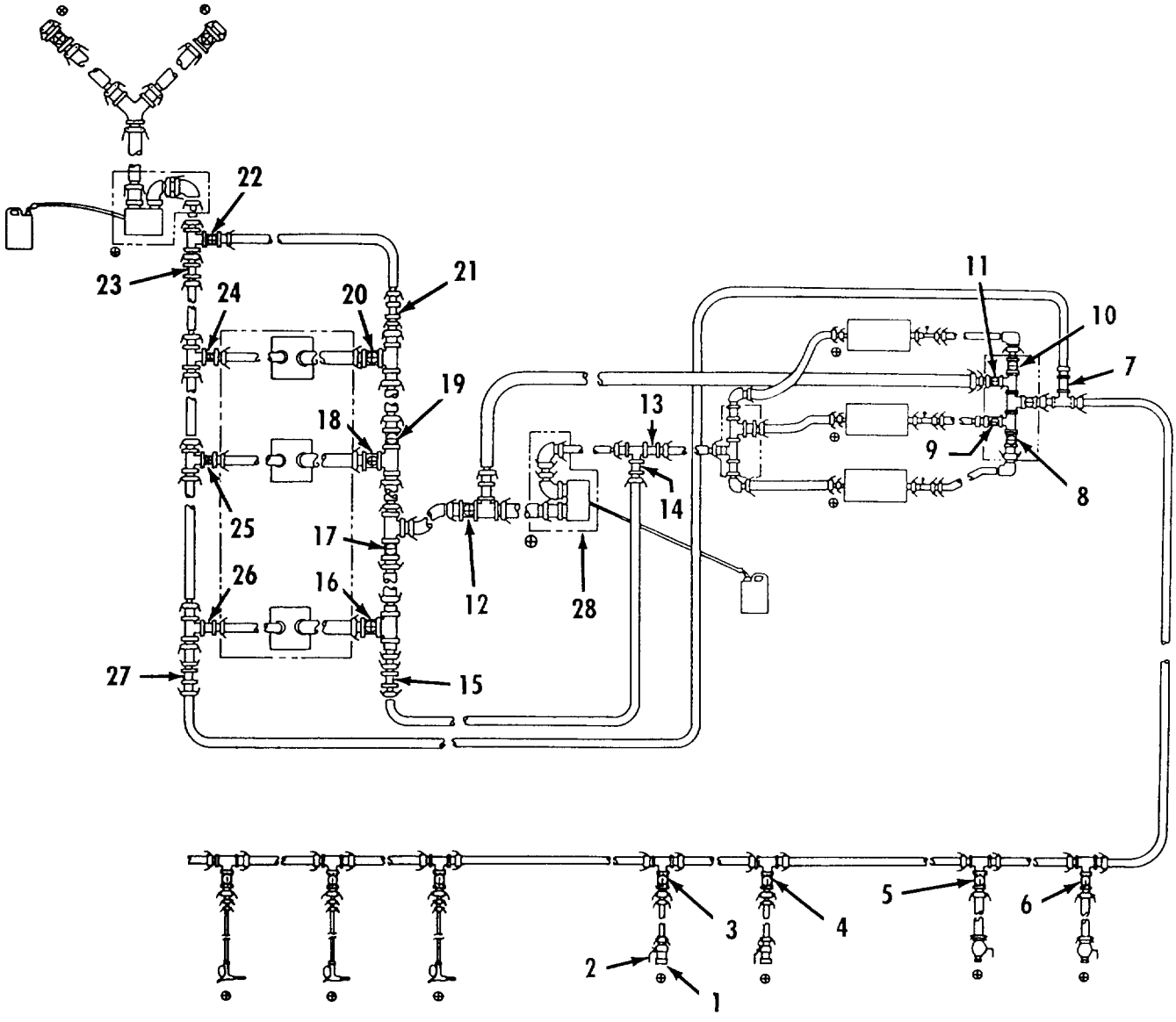


Figure 2-32. Defuel Mode - Tank Coupler on Drum Filling Points.

2-18. OPERATING PROCEDURES - CONT.

(3) Defuel Mode - 4-Inch Ball Valve on Bottom Loading Points. Refer to figure 2-33.

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.

NOTES

- Handle on tank 4-inch ball valves may be opened to allow fuel from one or two supply tankers at the same time. Open handles as needed to support your mission.
- Handwheels on fueling manifolds may be opened to allow fuel flow to fill one, two or three fuel tanks at the same time. Open valves as needed to support your mission requirements.
- This procedures describes filling three tanks at the same time from one supply tanker.

(a) Connect 4-inch ball valve (1) to supply source.

(b) Turn handle (2) to open position on ball valve.

(c) Turn handwheel (3) to open position on fueling manifold.

(d) Ensure gate valves (4 thru 10) are closed.

(e) Turn handwheel (11) to open position on fueling manifold.

(f) Ensure gate valves (12 and 13) are closed.

(g) Turn handwheels (14 and 15) to open position on fueling manifold.

(h) Ensure gate valve (16) is closed.

(i) Turn handwheel (17) to open position on fueling manifold.

(j) Ensure gate valve (18) is closed.

(k) Turn handwheel (19) to open position on fueling manifold.

(l) Ensure gate valve (20) is closed.

(m) Turn handwheels (21 thru 26) to open position on valve section.

(n) Ensure gate valve (27) is closed.

(o) Start and operate secondary 600 GPM pump (28) until operation is complete.

(p) Shut down secondary 600 GPM pump (28).

2-18. OPERATING PROCEDURES - CONT.

(q) Close all valves.

(r) Disconnect 4-inch ball valve (1) from supply source.

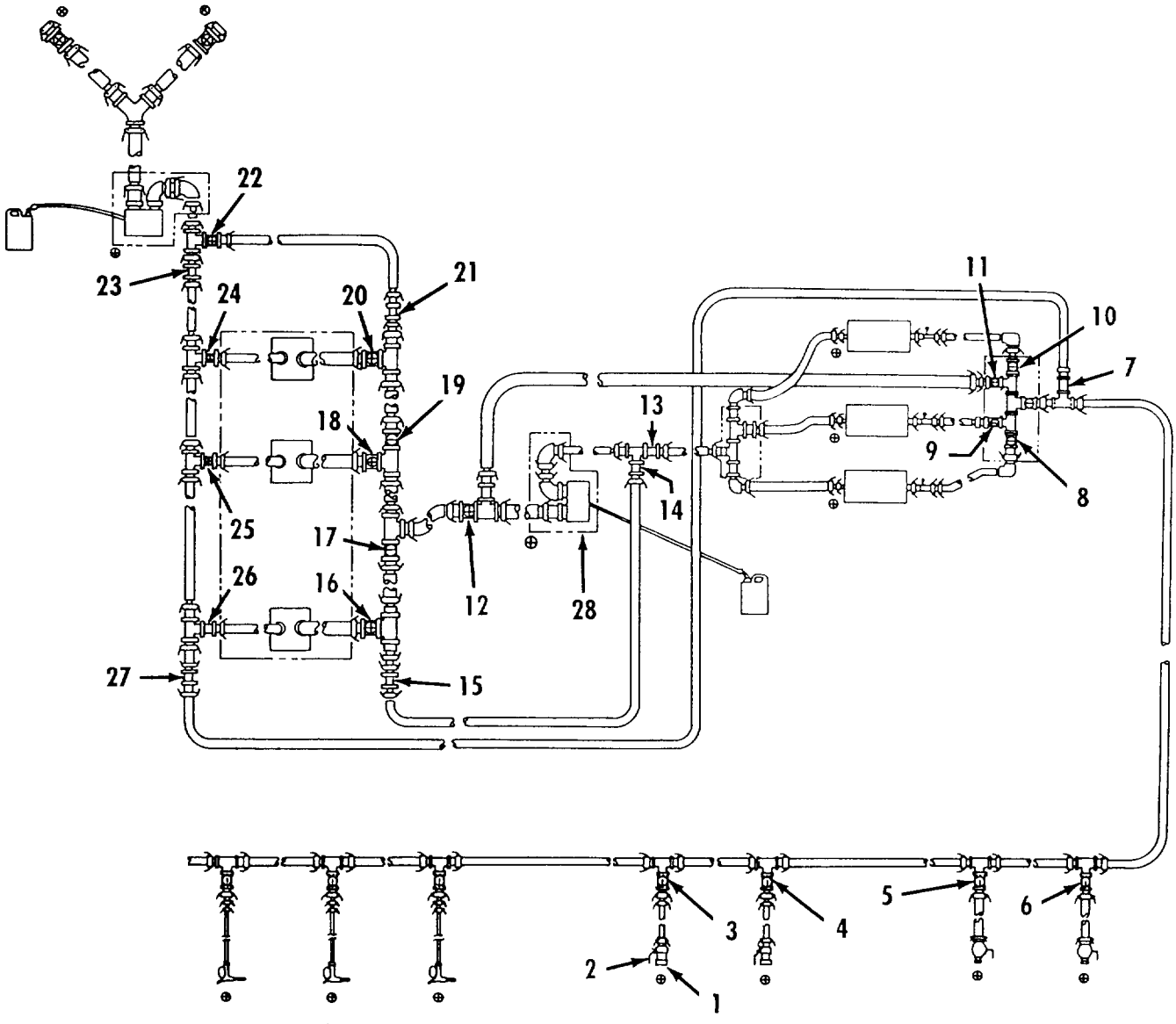


Figure 2-33. Defuel Mode - 4-Inch Ball Valve on Bottom Loading Points.

2-18. OPERATING PROCEDURES - CONT.

(4) Refuel Mode - Fuel Distribution from Fuel Tanks to Off Loading Points. Refer to figure 2-34.

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.

NOTE

Handwheels on fueling manifolds may be opened to allow fuel flow to fill one, two or three fuel tanks at the same time. Open valves as needed to support your mission requirements.

- The following procedures describes fuel distribution from the three fuel tanks at the same time to off loading points (refilling, drum filling and bottom loading).

  (a) Ensure gate valves (1 and 2) are closed.

  (b) Turn handwheels (3 thru 8) to open position on fueling manifolds.

  (c) Ensure gate valves (9 and 10) are closed.

  (d) Turn handwheels (11 thru 14) to close positions on fueling manifolds.

  (e) Ensure gate valve (15) is closed.

  (f) Turn handwheels (16 thru 19) to open position.

  (g) Ensure gate valve (20) is closed.

NOTE

Fuel is now available at the off loading points (refilling, drum and bottom loading).

(h) Start and operate secondary 600 GPM pump (22). Refer to TM 10-4320-342-10.

(i) Fill and purge 200 GPM filter separators(21). Refer to TM 10-4330-23613.

(j) When fueling operations are completed, shut down secondary 600 GPM pump (22).

(k) Close all valves.

2-18. OPERATING PROCEDURES - CONT.

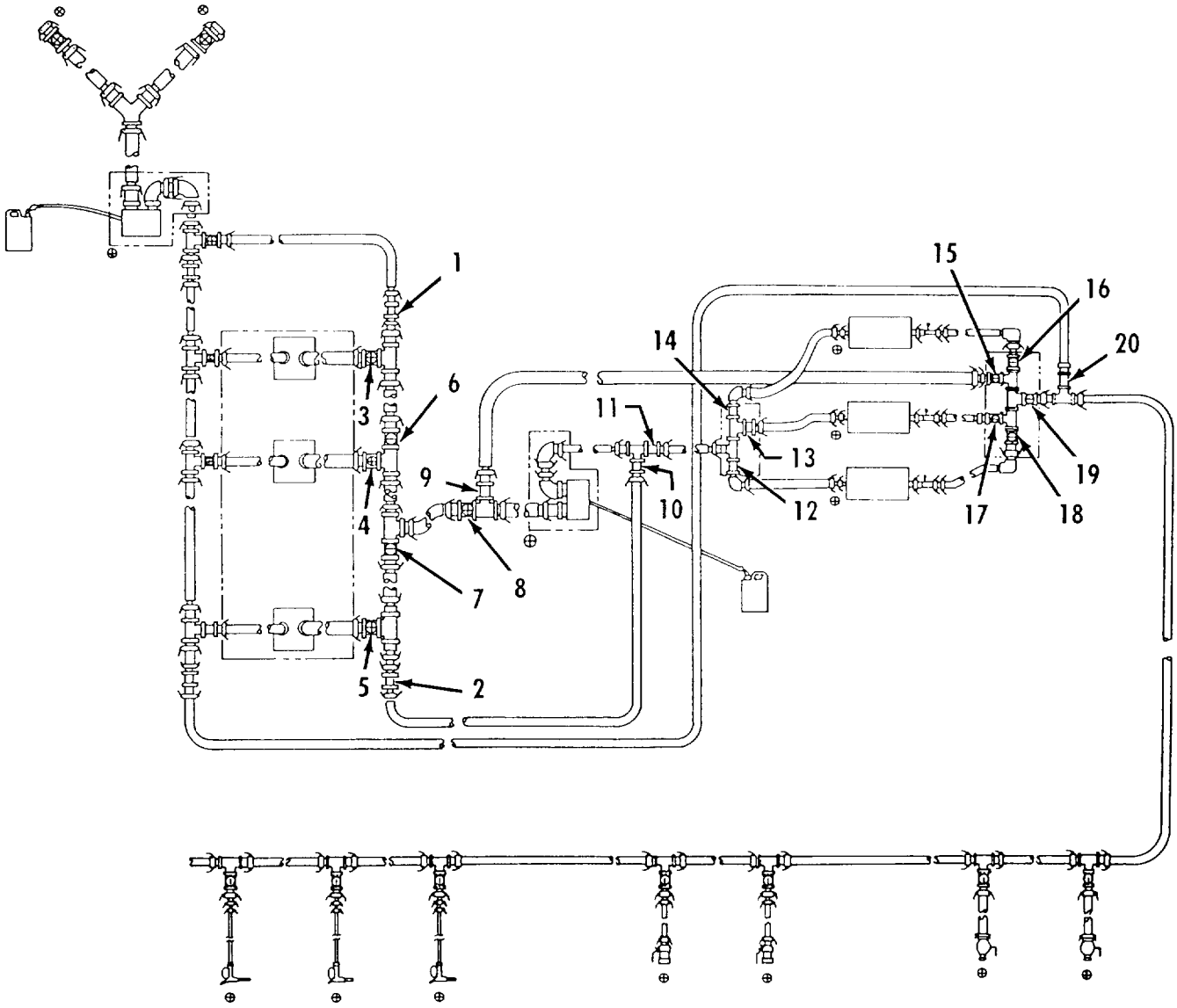


Figure 2-34. Fuel Distribution from Fuel Tanks to Off Loading Points.

2-18. OPERATING PROCEDURES - CONT.

(5) Refuel Mode - Bottom Loading Points Distribution. Refer to figure 2-35.

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.

NOTES

- Handle on 4-inch ball valves may be opened to allow fuel to one or two tankers at the same time. Open handles as needed to support your mission.
- Refer to para 2-18g (4) for operating procedures for refuel mode.
- Ensure vehicle/equipment is properly grounded.

(a) Connect 4-inch ball valve (1) to tanker/equipment being refueled.

(b) Open valves (2 and 3).

(c) When tank equipment is full, close valves (2 and 3) and disconnect 4-inch ball valve (1).

(d) When fueling operation is completed, shutdown 600 GPM pump.

(e) Close all valves.

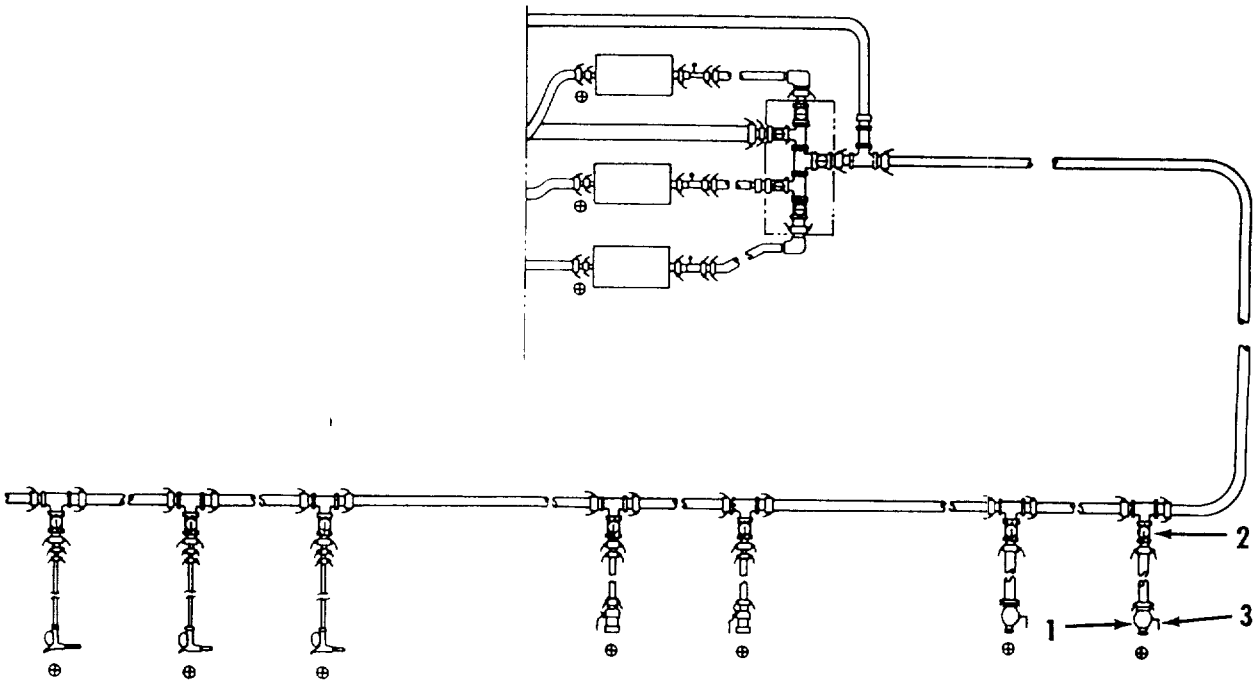


Figure 2-35. Refuel Mode - Bottom Loading Points Distribution.

2-18. OPERATING PROCEDURES - CONT.

(6) Refuel Mode - Drum Filling Points. Refer to figure 2-36.

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.

NOTES

- Handles on tank couplers may be opened to allow fuel to one or two tankers at the same time. Open handles as needed to support your mission.
- Ensure vehicle/equipment is properly grounded.

(a) Connect tank coupler (1) to tanker/equipment being refueled.

(b) Open valves (2 and 3).

(c) When tanker/equipment is full, close valves (2 and 3) and disconnect tank coupler (1).

(d) Turn handwheel (2) to closed position on fueling manifold.

(e) When fueling operation is completed, shutdown 600 GPM pump.

(f) Close all valves.

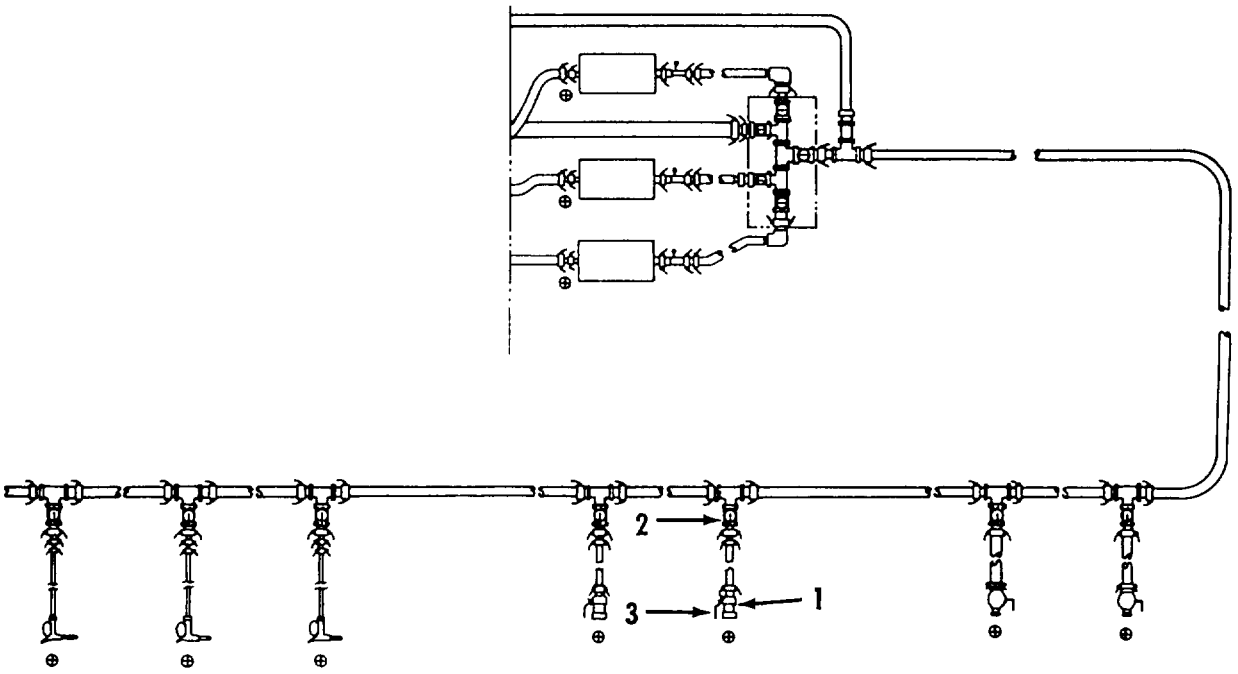


Figure 2-36. Refuel Mode - Drum Filling Points.

2-18. OPERATING PROCEDURES - CONT.

(7) Refuel Mode - Refueling Points. Refer to figure 2-37.

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.

NOTES

- Handles on arctic nozzles may be opened to allow fuel flow to service one or two vehicle/equipment at the same time. Open handles as needed to support your mission.
- Handwheels on fueling manifolds may be opened to allow fuel flow from one or two bottom loading points. Open handles as needed to support your mission requirements.
- Ensure vehicle/equipment is properly grounded.

(a) Turn handwheel (1) to open position fueling manifold.

(b) Install arctic fuel and oil servicing nozzle (2) in servicing port on vehicle/'equipment.

(c) Push handle (,3) on arctic nozzle (2) forward to service vehicle/equipment.

(d) When vehicle/'equipment is full, pull handle (3) to closed position and remove from servicing port and disconnect ground.

(e) Turn handwheel (1) to closed position on fueling manifold.

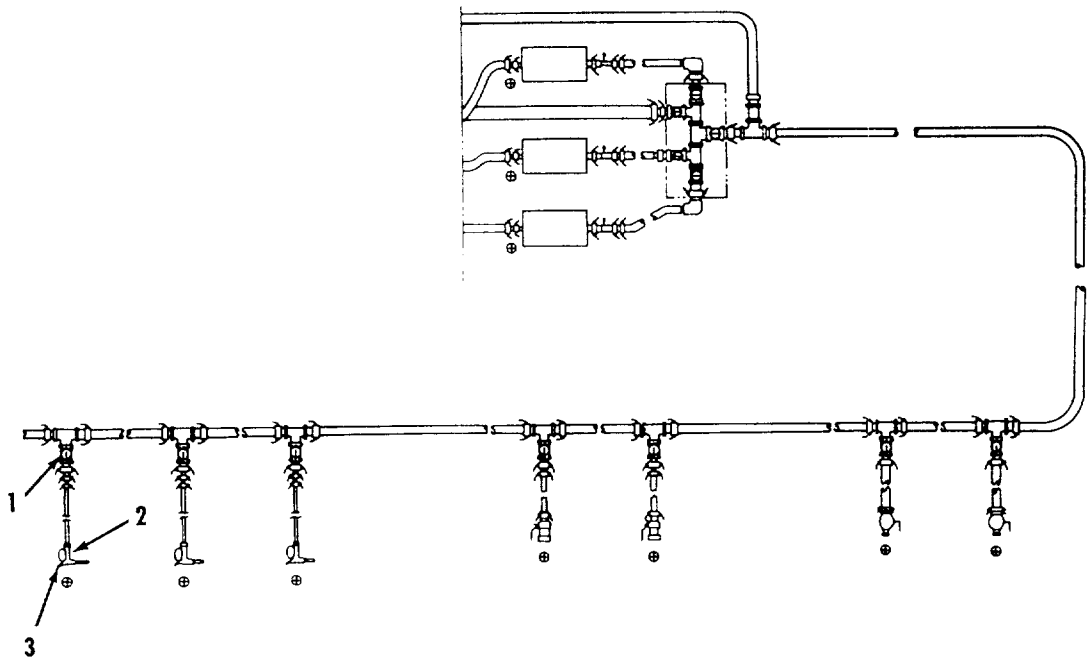


Figure 2-37. Refuel Mode - Refueling Points.

2-18. OPERATING PROCEDURES - CONT.

(f) When fueling operation is completed, shutdown 600 GPM pump.

(g) Close all valves.

(8) Refuel Mode - Fuel Tank Bypass. Refer to figure 2-38.

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.

(a) Connect valve section (1) to supply tanker and open valve.

(b) Ensure valves (2 and 3) are closed.

(c) Ensure valves (4 and 5) are open.

(d) Ensure valves (6 thru 9) are closed.

(e) Open valves (10 thru 14).

(f) Ensure valve (15) is closed.

(g) Start and operate primary and secondary 600 GPM pumps (16 and 17).

(h) When operation is complete, shut down 600 GPM pumps (16 and 17).

(i) Close all valves.

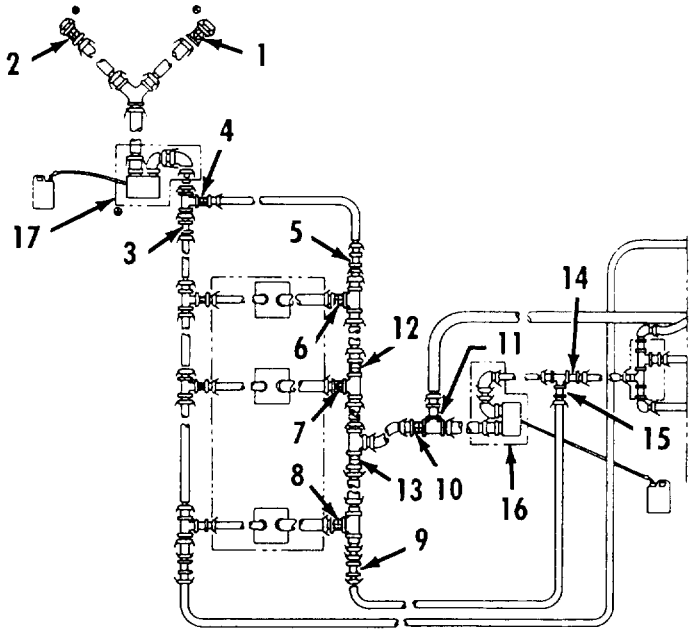


Figure 2-38. Refuel Mode - Fuel Tank Bypass.

2-18. OPERATING PROCEDURES - CONT.

(9) Refuel Mode - Fuel Tank and Secondary Pump Bypass. Refer to figure 2-39.

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.

(a) Connect valve section (1) to supply tanker and open valve.

(b) Ensure valves (2 and 3) are closed.

(c) Open valves (4 and 5).

(d) Ensure valves (6 thru 8) are closed.

(e) Open valves (9 thru 11).

(f) Ensure valve (12) is closed.

(g) Open valves (13 and 14).

(h) Start and operate primary 600 GPM pump (15).

(i) When operation is complete shut down 600 GPM pump (15)

(j) Close all valves.

2-18. OPERATING PROCEDURES - CONT.

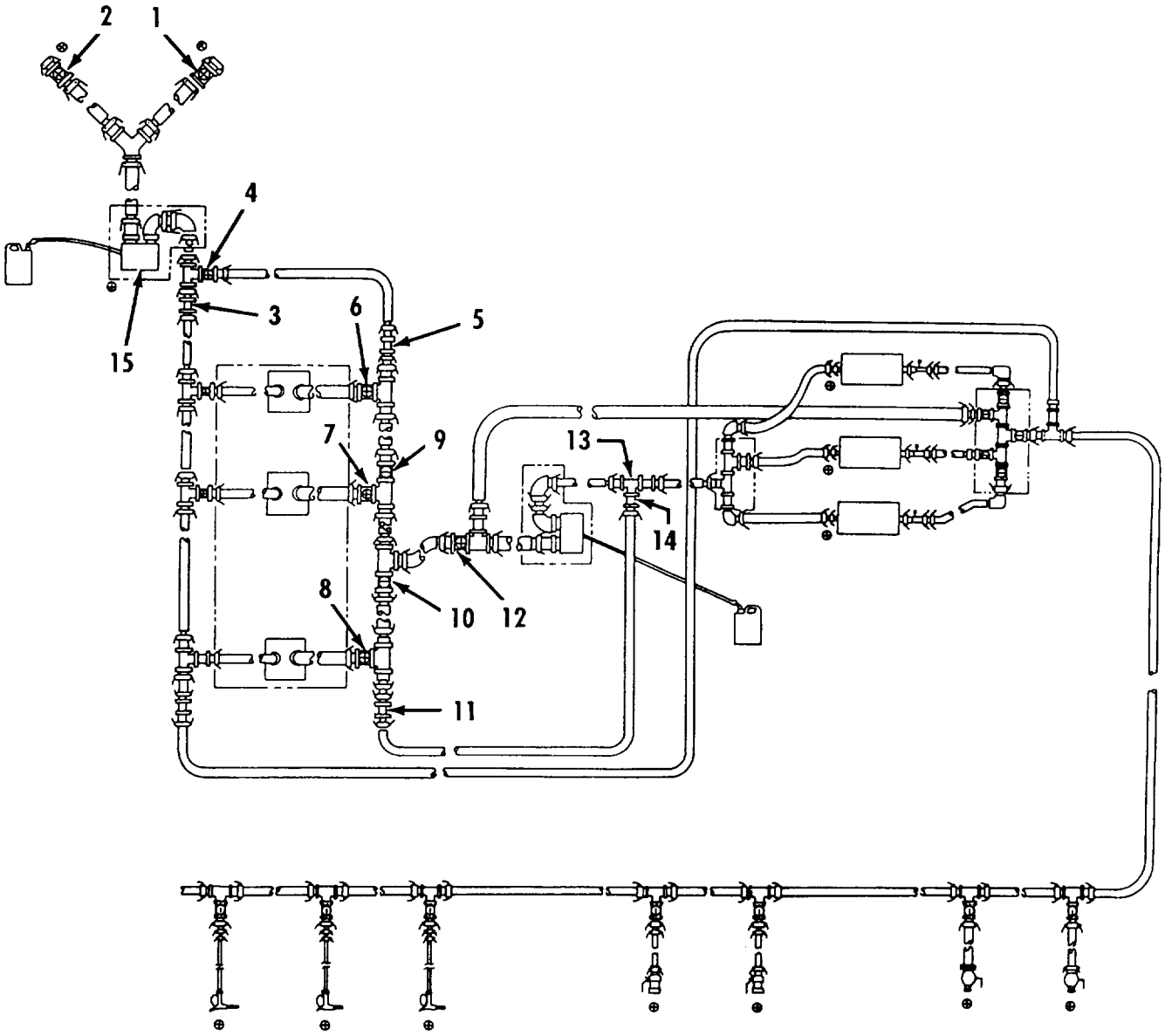


Figure 2-39. Refuel Mode - Fuel Tank and Secondary Pump Bypass.

2-18. OPERATING PROCEDURES - CONT.

(10) **Refuel Mode - Fuel Tank. Secondary 600 GPM Pump and 200 GPM Filter-Separator Bypass**. Refer to figure 2-40.

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.

(a) Connect valve section (1) to supply tanker and open valve.

(b) Ensure valves (2 and 3) are closed.

(c) Open valve (4).

(d) Ensure valves 5, 6, and 7) are closed.

(e) Open valves (8 and 9).

(f) Ensure valve (10) is closed.

(g) Start and operate secondary 600 GPM pump (11).

(h) When operation is complete, shut down 600 GPM pump (11)

(j) Close all valves.

2-18. OPERATING PROCEDURES - CONT.

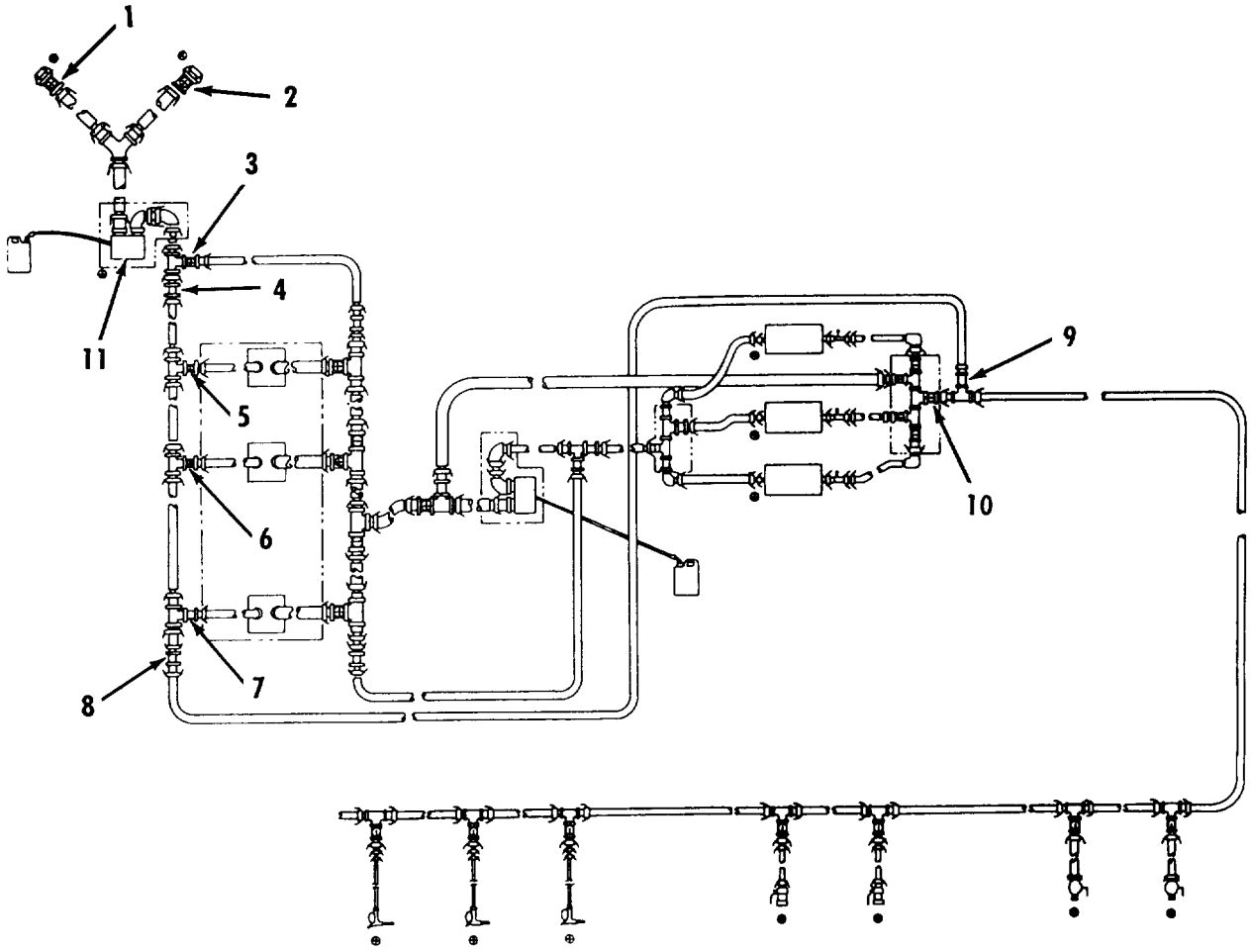


Figure 2-40. Refuel Mode - Fuel Tank, Secondary 600 GPM Pump and 200 GPM Filter Separators Bypass.

2-18. OPERATING PROCEDURES -CONT.

h. Fuel System Shutdown. Refer to figure 2-41.

(1) Shut down filter separators (1, 2 and 3). Refer to **TM 10-4330-236-13**.

(2) Shut down primary 600 GPM pump (4) and secondary 600 GPM pump (5). Refer to **TM 10-4320-342-10**.

(3) Close all valves.

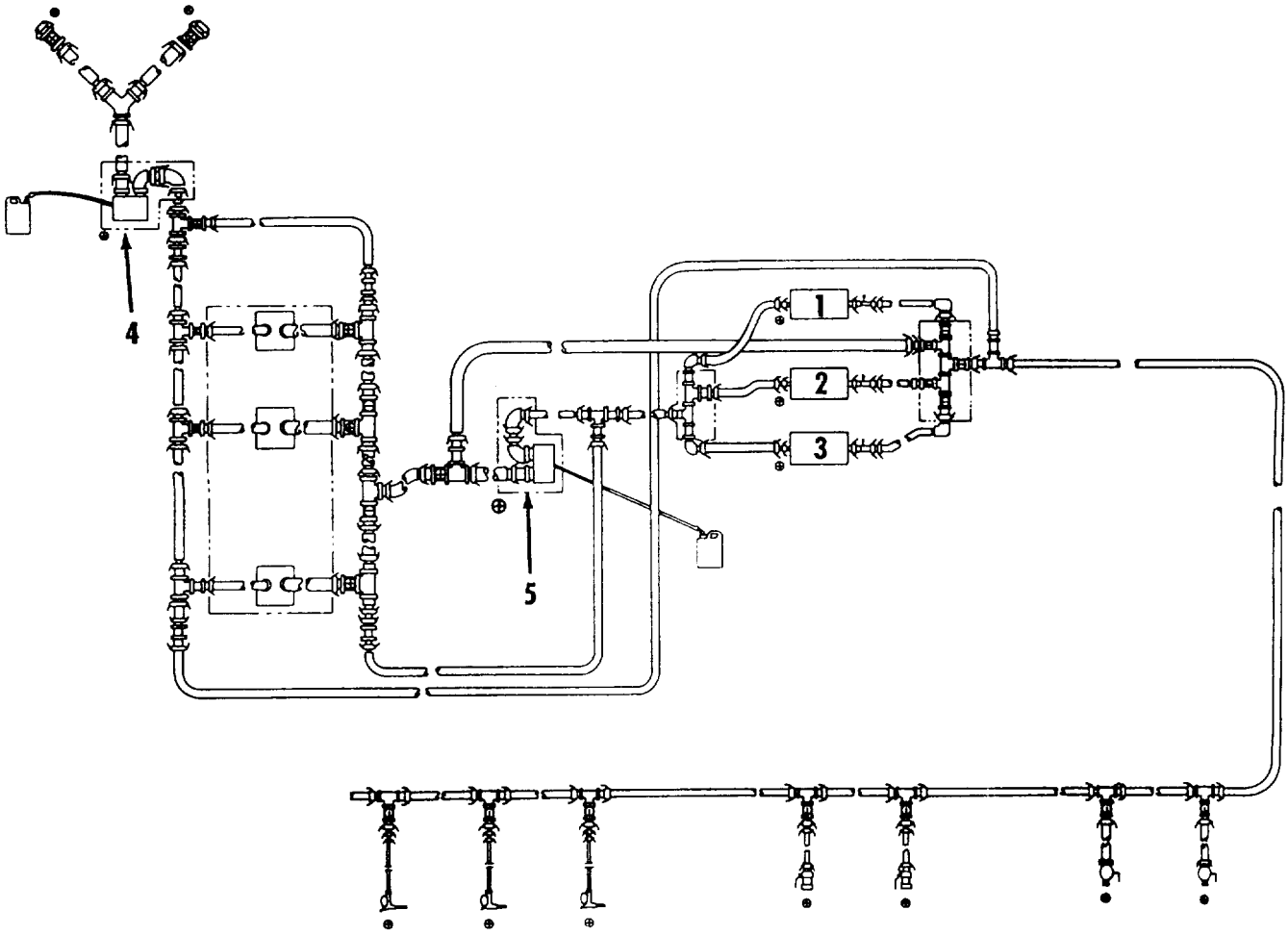


Figure 2-41. Fuel System Shutdown.

2-19. DECALS AND INSTRUCTION PLATES.

For location and description of data plates used on the AFSSP system, refer to the applicable technical manual on the following equipment.

600 GPM Pump Assembly .....TM 10-4320-342-10
Closed Circuit Refueling (CCR) Nozzle and Gravity Fill Adapter.....TM 10-4930-243-13&P
Single Point Refueling Nozzle (D-) .....TM 10-4930-242-13&P
Collapsible Fabric Tank, Low Temperature .....TM 10-5430-231-12
200 Gpm Filter-Separator .....TM 10-4330-236-13

2-20. OPERATING AUXILIARY EQUIPMENT.

Refer to the applicable technical manual for operating the following equipment:

600 GPM Pump Assembly .....TM 10-4320-342-10
Closed Circuit Refueling (CCR) Nozzle and Gravity Fill Adapter .....TM 10-4930-243-13&P
Single Point Refueling Nozzle (D- 1) .....TM 10-4930-242-13&P
Collapsible Fabric Tank, Low Temperature .....TM 10-5430-231-12
200 Gpm Filter-Separator .....TM 10-4330-236-13

2-21. PREPARATION FOR MOVEMENT.

a. Fueling Point Ground Rod Removal (Typical). Refer to figure 2-42.

WARNINGS

- Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.
- Exercise care to prevent injury when removing ground rod from the soil. Wear gloves to protect your hands.

(1) Disconnect connector (9) from ground rod (1).

(2) Disconnect connector (4) from either fuel nozzle (5), 3-inch tank coupler (6), 4-inch ball valve (7) or 6-inch valve section (8).

(3) Lift slide (2) forcefully against upper collar (3). Repeat until ground rod (1) is pulled from soil.

2-21. PREPARATION FOR MOVEMENT - CONT.

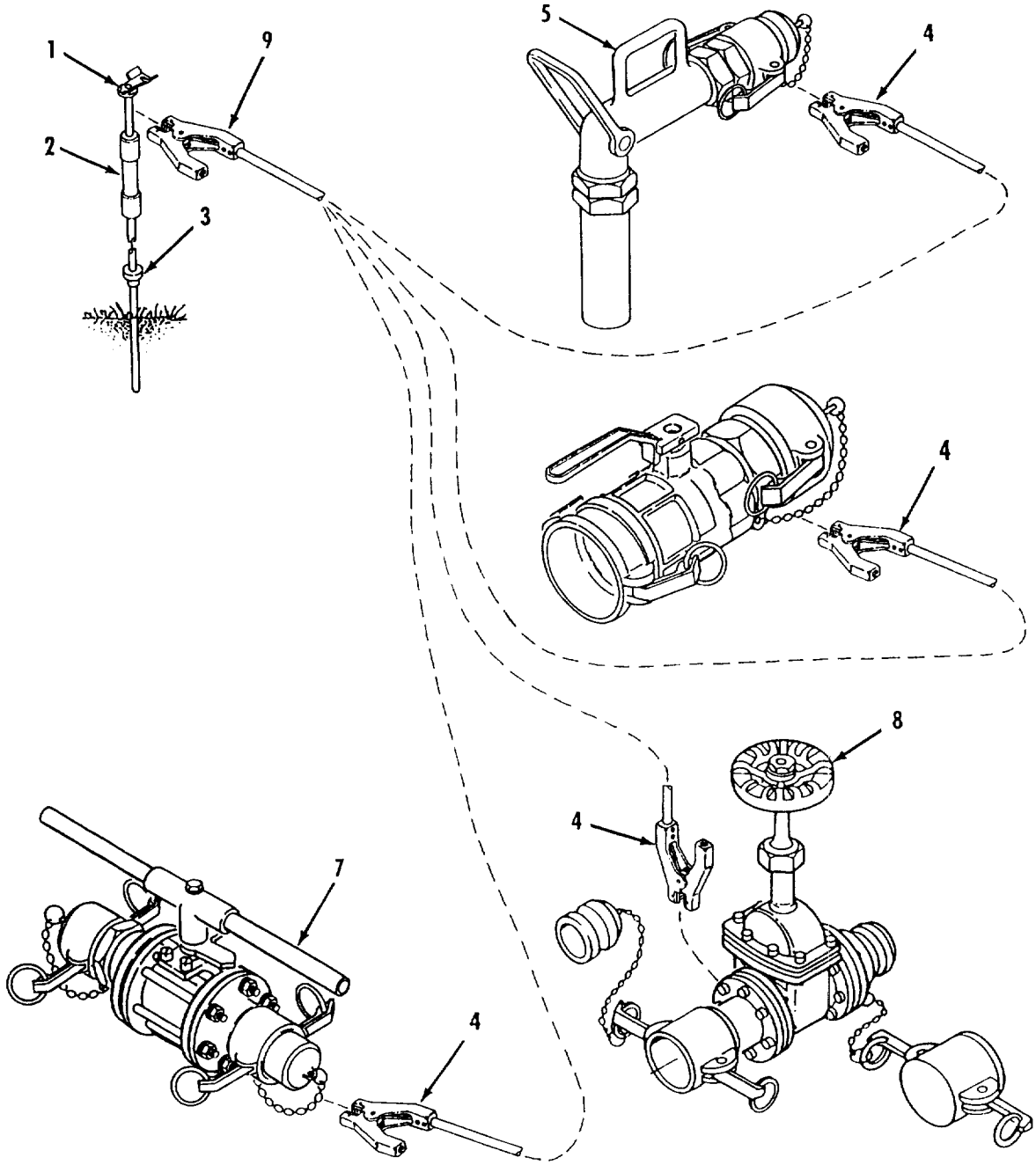


Figure 2-42. Fueling Point Ground Rod Removal (Typical).

2-21. PREPARATION FOR MOVEMENT - CONT.

b. 200 GPM Filter-Separator Ground Rod Removal. Refer to figure 2-43.

WARNING

- Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.
- Exercise care to prevent injury when removing ground rod from the soil. Wear gloves to protect your hands.

(1) Disconnect connectors (5) of ground cable (6) from ground rod (:2) and grounding stud (7).

(2) Remove ground rod (2) from the ground by sliding hammer (4) up and down on rod.

(3) Install ground rod (2) on filter separator (3) and tighten threaded bar (1).

(4) Repeat steps (1) through (31 for remaining filter separators.

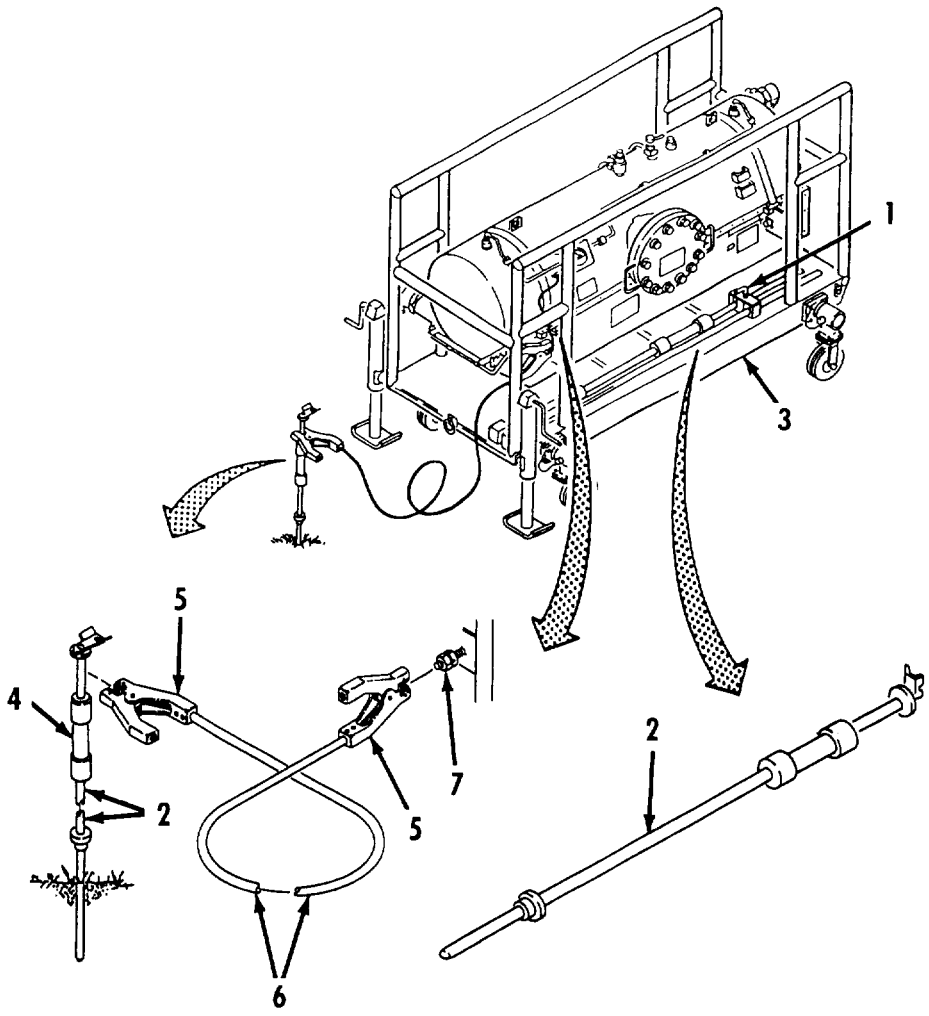


Figure 2-43. 200 GPM Filter-Separator Ground Rod Removal.

2-21. PREPARATION FOR MOVEMENT - CONT.

c. 600 GPM Pump Ground Rod Removal. Refer to figure 2-44.

WARNINGS

- Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.
- Exercise care to prevent injury when removing ground rod from the soil. Wear gloves to protect your hands.

(1) Loosen nut (9) and remove ground wire (7) from slot in ground lug (10) on pump (11).

(2) Loosen screw (8) and disconnect ground wire (7) from front plate (5).

(3) Loosen screws (4),rotate plate (5) from back plate (6) and remove clamp

(4) Lift slide (2) forcefully against upper stop collar (3). Repeat until ground rod (1) is pulled from ground.

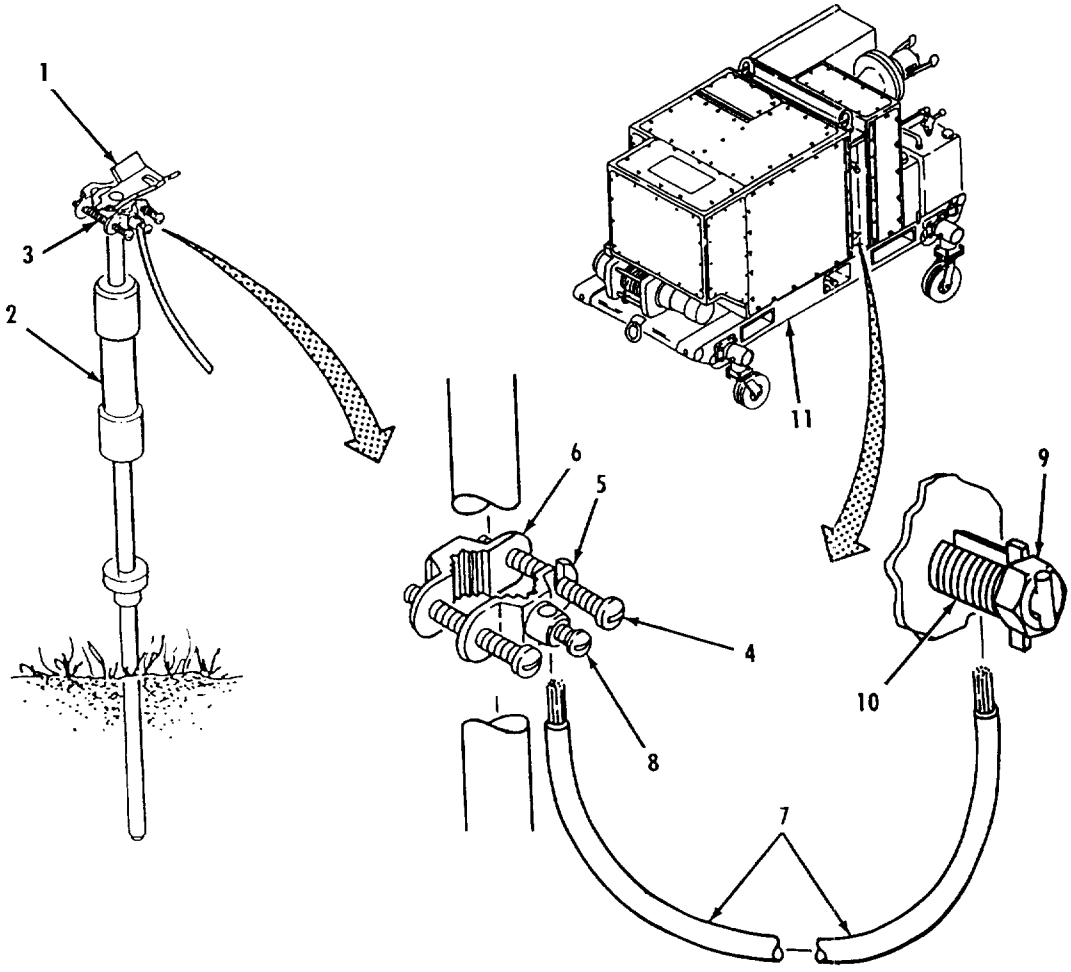


Figure 2-44. 600 GPM Pump Ground Rod Removal.

2-21. PREPARATION FOR MOVEMENT - CONT.

d. Fuel System - Fuel Return Hoses Removal. Refer to figure 2-45.

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.

CAUTION

To prevent contamination of fuel system components use care when disconnecting coupling to avoid getting ice, snow, dirt, sand and debris on coupling mating surfaces or in hoses.

NOTE

Refer to para 2-16e for disconnect of quick disconnect couplings.

(1) Disconnect one end of reducer (4) from 4-inch fueling manifold (5)

(2) Disconnect other end of reducer (4) from end of noncollapsible hoses (1).

(3) Disconnect noncollapsible hoses (1) from 6-inch fueling manifold (2) on input side of secondary 600 GPM pump (3).

(4) Disconnect 6-inch fueling manifold (2) from input side of secondary 600 GPM pump (3).

(5) Disconnect the twelve 10 foot 6-inch noncollapsible hoses (1).

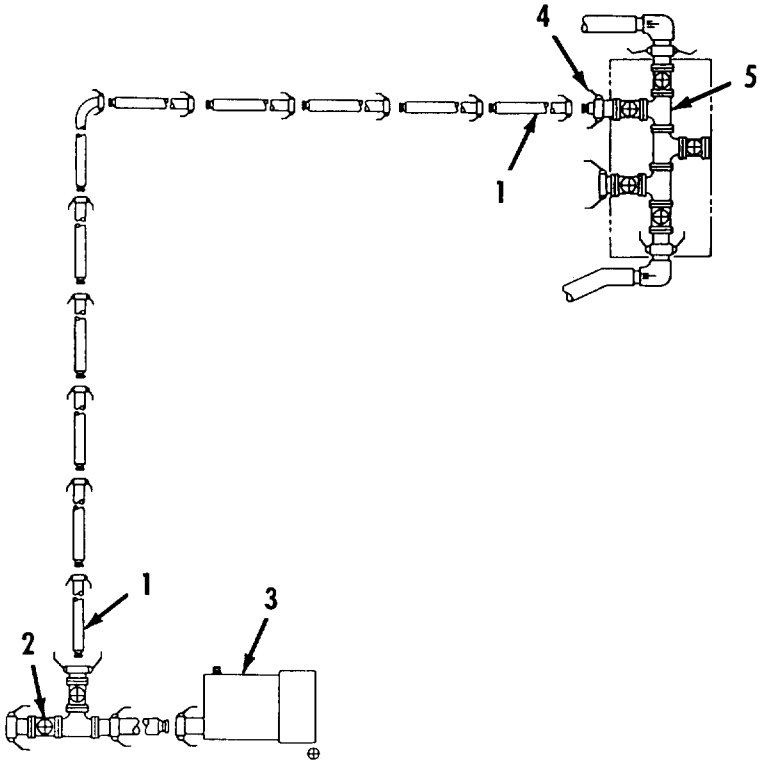


Figure 2-45. Fuel System - Fuel Return Hoses Removal.

2-21. PREPARATION FOR MOVEMENT - CONT.

e. Fuel System - Fuel Tank, Secondary 600 GPM Pump and 200 GPM Filter-Separators Bypass Hoses Removal. Refer to figure 2-46.

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.

CAUTION

To prevent contamination of fuel system components use care when disconnecting coupling to avoid getting ice, snow, dirt, sand and debris on coupling mating surfaces or in hoses.

NOTE

Refer to para 2-16e for disconnect of quick disconnect couplings.

(1) Disconnect one end of collapsible hoses (1) from 4-inch fueling manifold (4).

(2) Disconnect other end of collapsible hoses (1) from 4-inch valve section (21

(3) Disconnect 4-inch valve section (2) from fill side of fuel tank (3).

(4) Disconnect the four 50 foot 4-inch collapsible hoses (1).

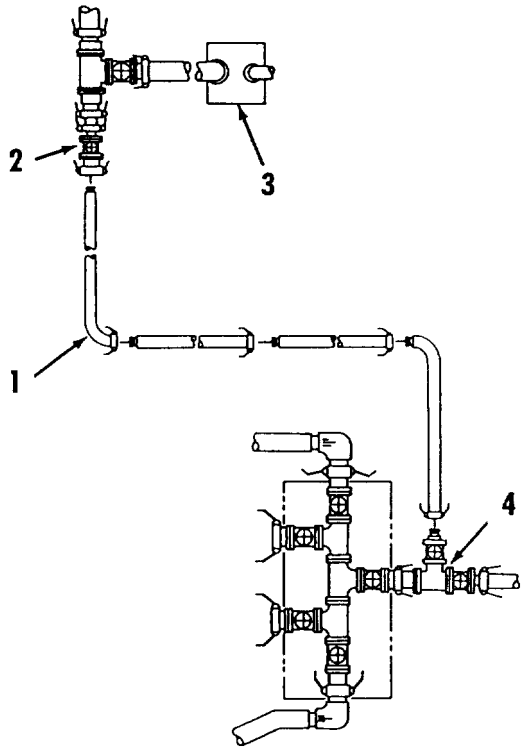


Figure 2-46. Fuel System - Fuel Tank, Secondary 600 GPM Pump and 200 GPM Filter-Separators Bypass Hoses Removal.

2-21. PREPARATION FOR MOVEMENT - CONT.

f. Fuel System - Secondary 600 GPM Pump Bypass Hose Removal. Refer to figure 2-47.

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.

CAUTION

To prevent contamination of fuel system components use care when disconnecting coupling to avoid getting ice, snow, dirt, sand and debris on coupling mating surfaces or in hoses.

NOTE

Refer to para 2-16e for disconnect of quick disconnect couplings.

(1) Disconnect one end of collapsible hose (4) from 4-inch fueling manifold (5) on output of secondary 600 GPM pump (6).

(2) Disconnect 4-inch fueling manifold (5) from output of secondary 600 GPM pump (6).

(3) Disconnect the 25 foot 4-inch collapsible hose (4) from 50 foot 4-inch collapsible hose (1).

(4) Disconnect other end of 50 foot 4-inch collapsible hose (1) from 4-inch valve section (2) on discharge side of fuel tank (3).

(5) Disconnect 4-inch valve section (2) from discharge side of fuel tank (3).

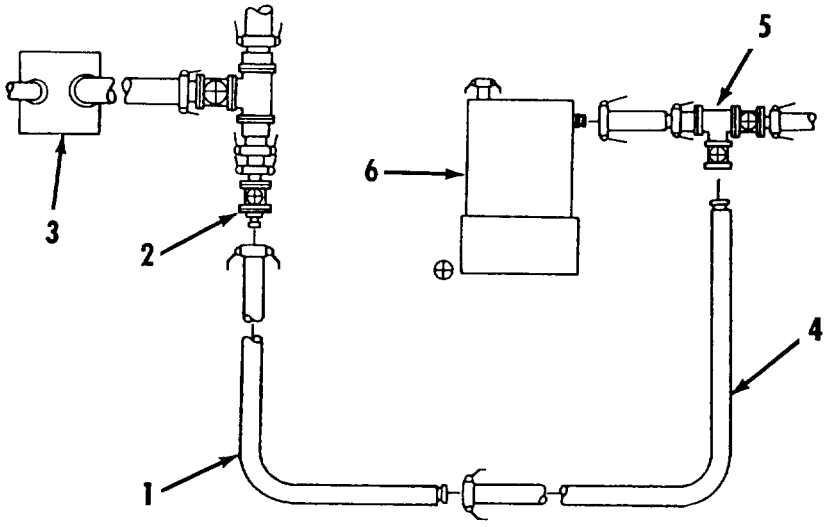


Figure 2-47. Fuel System - Secondary 600 GPM Pump Bypass Hose Removal.

2-21. PREPARATION FOR MOVEMENT - CONT.

g. Fuel System - Fuel Tank Bypass Hose Removal. Refer to figure 2-48.

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.

CAUTION

To prevent contamination of fuel system components use care when disconnecting coupling to avoid getting ice, snow, dirt, sand and debris on coupling mating surfaces or in hoses.

NOTE

Refer to para 2-16e for disconnect of quick disconnect couplings.

(1) Disconnect one end of 4-inch hoses (1) from 4-inch valve section (4) on discharge side of fuel tank (5).

(2) Disconnect 4-inch valve section (4) from discharge side of fuel tank (5)

(3) Disconnect other end of 6-inch hoses (1) from 4-inch manifold (2).

(4) Disconnect 4-inch manifold (2) from out put of primary 600 GPM pump (3).

(5) Disconnect seven 25 foot 4-inch collapsible hoses (1).

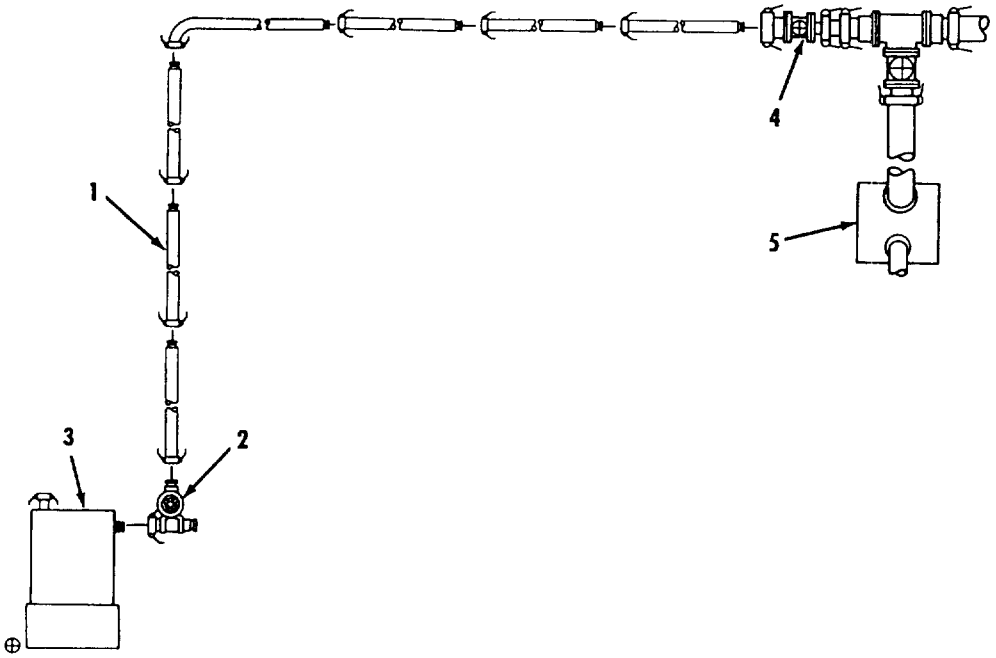


Figure 2-48. Fuel System - Fuel Tank Bypass Hose Removal.

12-21. PREPARATION FOR MOVEMENT -CONT.

h. Fuel System - Drum Filling Points to Refueling Points Removal. **Refer to figure 2-49.**

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.

CAUTION

To prevent contamination of fuel system components use care when disconnecting coupling to avoid getting ice, snow, dirt, sand and debris on coupling mating surfaces or in hoses.

NOTE

Refer to para 2-16e for disconnect of quick disconnect couplings.

(1) Disconnect arctic fuel and oil servicing nozzle (20) from collapsible hose (19)

(2) Disconnect a 25 foot 1 1/2 inch collapsible hose (19) from reducer (18).

(3) Disconnect reducer (18) from reducer (17).

(4) Ensure coupling cap is installed in fueling manifold (16).

(5) Disconnect female reducer (17) from fueling manifold (16).

(6) Disconnect fueling manifold (16) from collapsible hose (15).

(7) Disconnect a 25 foot collapsible hose (15 from fueling manifold (10).

(8) Disconnect arctic fuel and oil servicing nozzle (14) from collapsible hose (13).

(9) Disconnect a 25 foot 1 1/2-inch collapsible hose (13) from reducer (12).

(10) Disconnect female reducer (12) from reducer (11).

(11) Disconnect female reducer (11) from fueling manifold (10).

(12) Disconnect fueling manifold (10) from collapsible hose (9).

(13) Disconnect a 25 foot collapsible hose (9) from fueling manifold (4).

(14) Disconnect arctic fuel and oil servicing nozzle (8) from collapsible hose (7).

(15) Disconnect a 25 foot 1 1/2-inch collapsible hose (7) from reducer (6).

(16) Disconnect female reducer (6) from reducer (5).

(17) Disconnect female reducer (5) from fueling manifold (4)

2-21. PREPARATION FOR MOVEMENT - CONT.

(18) Disconnect fueling manifold (4) from collapsible hose (3).

(19) Disconnect a 25 foot collapsible hose (3) from collapsible hose (1).

(20) Disconnect a 50 foot collapsible hose (1) from fueling manifold (2) of drum filling point.

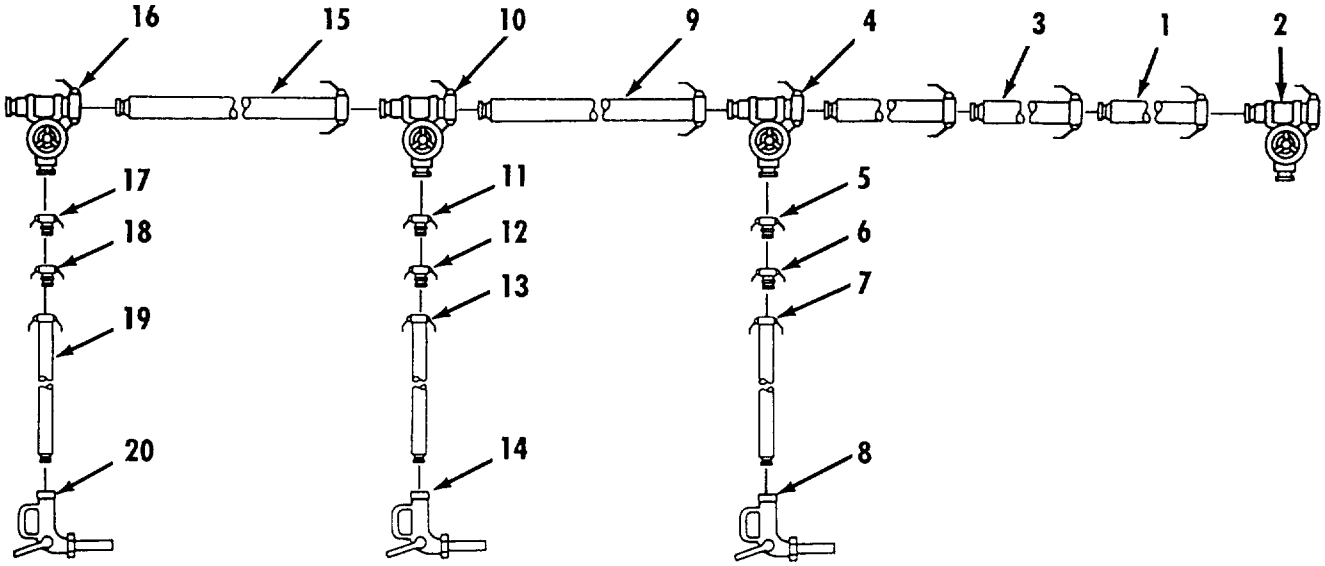


Figure 2-49. Fuel System - Drum Filling Points to Refueling Points Removal..

2-21. PREPARATION FOR MOVEMENT - CONT.

i. Fuel System - Bottom Loading Point to Drum Filling Points Removal. **Refer to figure 2-50.**

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.

CAUTION

To prevent contamination of fuel system components use care when disconnecting coupling to avoid getting ice, snow, dirt, sand and debris on coupling mating surfaces or in hoses.

NOTE

Refer to para 2-16e for disconnect of quick disconnect couplings.

(1) Disconnect a 3-inch tank coupler (12) to collapsible hose (11).

(2) Disconnect a 25 foot collapsible hose (11) from reducer (10).

(3) Disconnect female reducer (10) from fueling manifold (9).

(4) Disconnect fueling manifold (9) from collapsible hose (8).

(5) Disconnect a 50 foot collapsible hose (8) from fueling manifold (4).

(6) Disconnect tank coupler (7) from collapsible hose (6).

(7) Disconnect a 25 foot collapsible hose (6) from reducer (5).

(8) Disconnect female reducer (5) from fueling manifold (4).

(9) Disconnect fueling manifold (4) from collapsible hose (3).

(10) Disconnect a 25 foot collapsible hose (3) from collapsible hose (1).

(11) Disconnect a 50 foot collapsible hose (1) from fueling manifold (2).

2-21. PREPARATION FOR MOVEMENT - CONT.

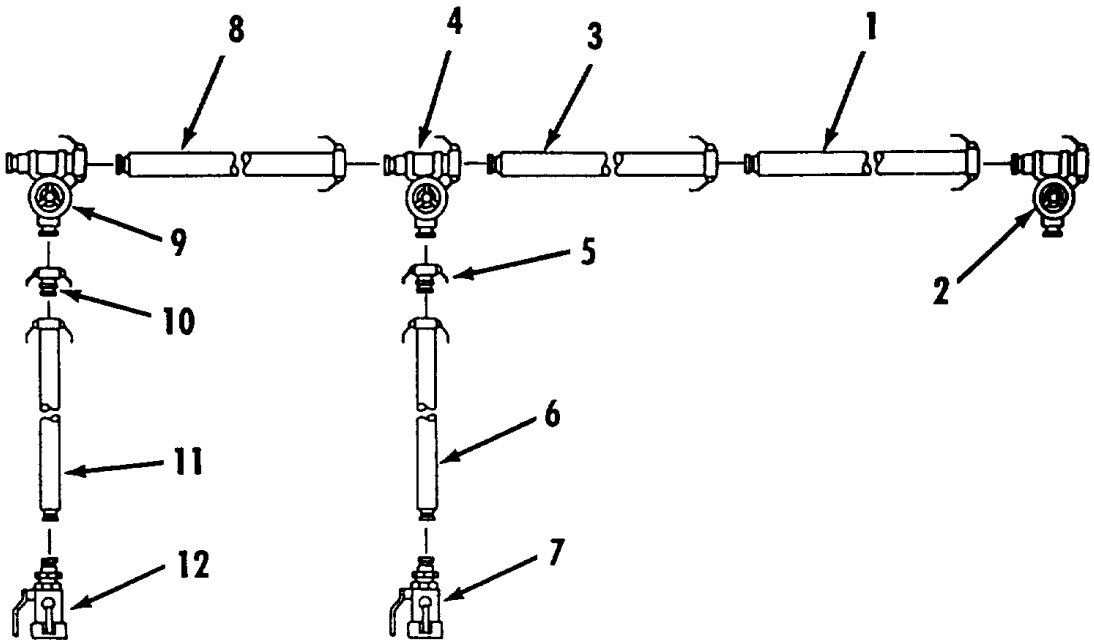


Figure 2-50. Fuel System - Bottom Loading Point to Drum Filling Points Removal.

2-21. PREPARATION FOR MOVEMENT - CONT.

j. Fuel System - Fueling Manifold with Five Valves to Bottom loading Points Removal. **Refer to figure 2-51.**

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.

CAUTION

To prevent contamination of fuel system components use care when disconnecting coupling to avoid getting ice, snow, dirt, sand and debris on coupling mating surfaces or in hoses.

NOTE

Refer to para 2-16e for disconnect of quick disconnect couplings.

(1) Disconnect 4-inch ball valve (11) from collapsible hose (10).

(2) Disconnect a 25 foot collapsible hose (10) from fueling manifold (9).

(3) Disconnect fueling manifold (9) from collapsible hose (8).

(4) Disconnect a 25 foot collapsible hose (8) from collapsible hose (7).

(5) Disconnect a 50 foot collapsible hose (7) from fueling manifold (4).

(6) Disconnect 4-inch ball valve (6) from collapsible hose (5).

(7) Disconnect a 25 foot collapsible hose (5) from valve side of fueling manifold (4).

(8) Disconnect fueling manifold (4) from collapsible hose (3).

(9) Disconnect a 50 foot collapsible hose (3) from fueling manifold (1).

(10) Disconnect fueling manifold (1) from fueling manifold (2) with five valves.

2-21. PREPARATION FOR MOVEMENT - CONT.

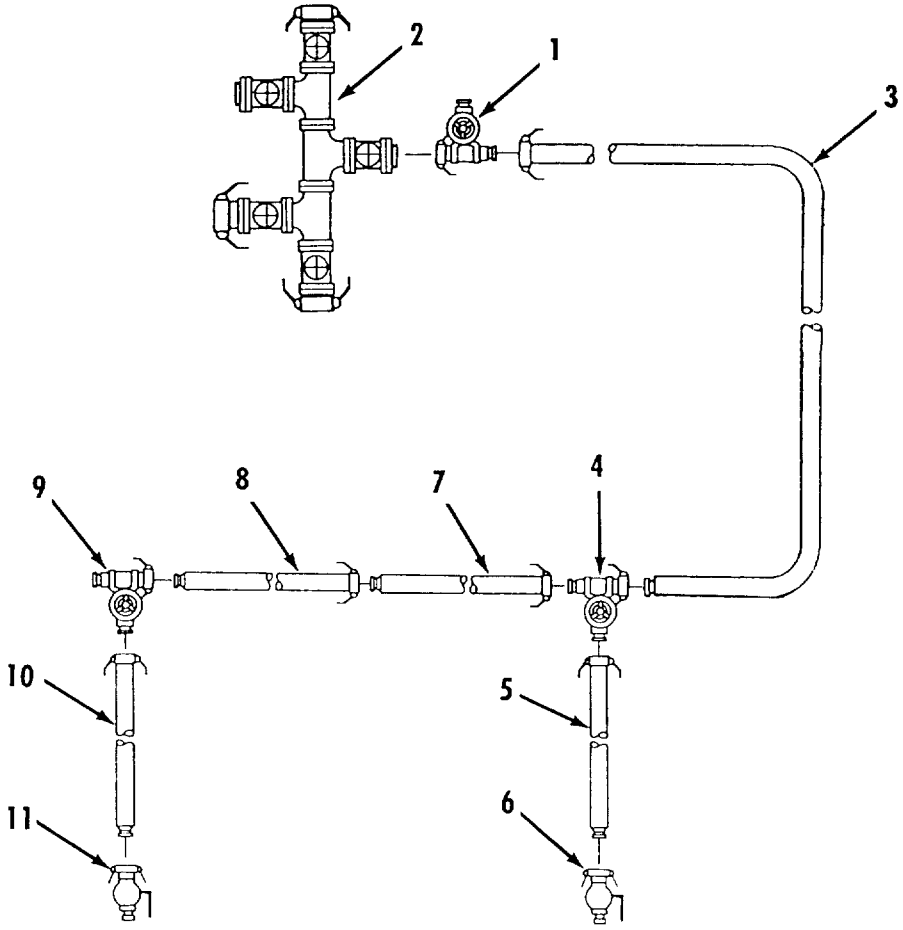


Figure 2-51. Fuel System - Fueling Manifold with Five Valves to Bottom Loading Points Removal.

2-21. PREPARATION FOR MOVEMENT - CONT.

k. Fuel System - 200 GPM Filter Separators to Fueling Manifold with Five Valves Removal. Refer to figure 2-52.

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.

CAUTION

To prevent contamination of fuel system components use care when disconnecting coupling to avoid getting ice, snow, dirt, sand and debris on coupling mating surfaces or in hoses.

NOTE

Refer to para 2-16e for disconnect of quick disconnect couplings.

(1) Disconnect elbows (13 and 14) from fueling manifold (15) with five valves.

(2) Disconnect elbows(13 and 14) from collapsible hoses (10, 11 and 12).

(3) Disconnect collapsible hose (11) from fueling manifold (15) with five valves.

(4) Disconnect a 25 foot collapsible hoses (10, 11 and 12) from reducers (7, 8 and 9).

(5) Disconnect female reducers (7, 8 and 9) from water detection assemblies (1, 2 and 3).

(6) Disconnect water detection assemblies (1, 2 and 3) from output of 200 GPM filter- separators (4, 5 and 6)

2-21. PREPARATION FOR MOVEMENT - CONT.

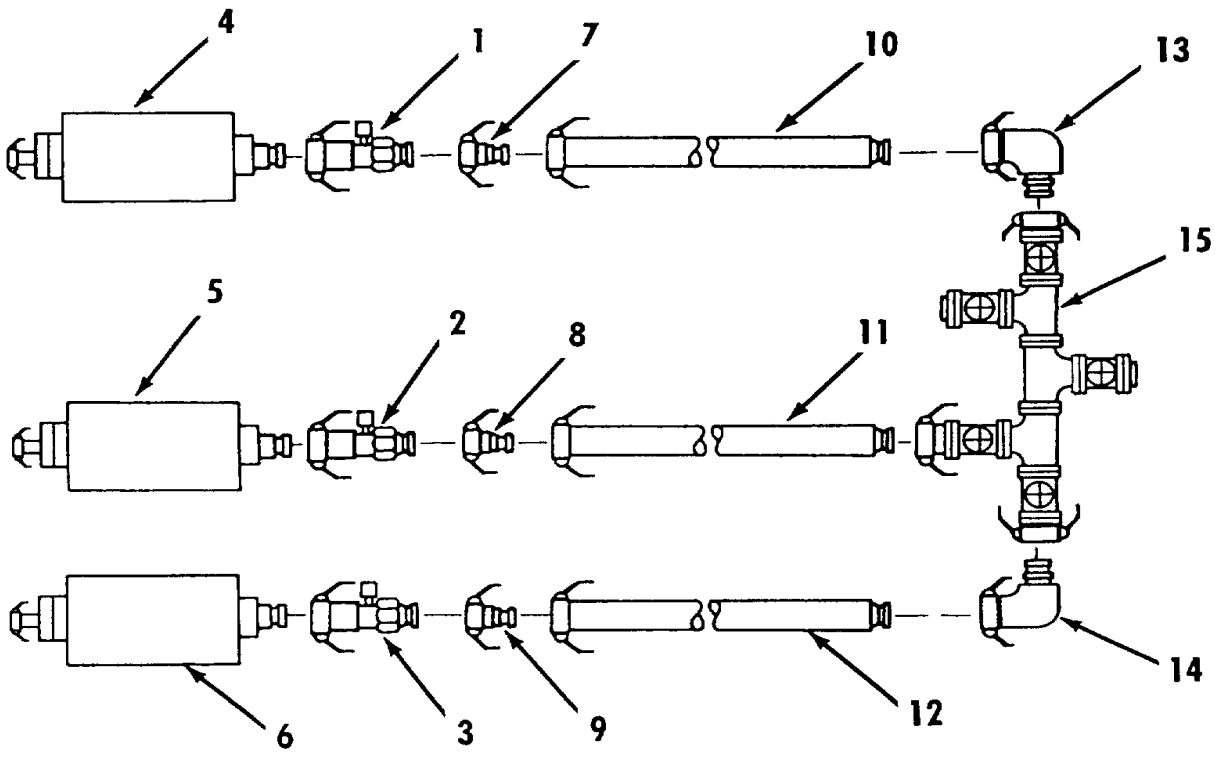


Figure 2-52. Fuel System - 200 GPM Filter Separator to Fueling Manifold With Five Valves Removal.

2-21. PREPARATION FOR MOVEMENT - CONT.

l. Fuel System - Secondary 600 GPM Pump Output to 200 (PM Filter-Separator Removal). **Refer to figure 2-53**.

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.

CAUTION

To prevent contamination of fuel system components use care when disconnecting coupling to avoid getting ice, snow, dirt, sand and debris on coupling mating surfaces or in hoses.

NOTES

There are three 200 GPM filter-separators used in AFSSP.

Refer to para 2-16e for disconnect of quick disconnect couplings.

(1) Disconnect one end of female reducers (11, 12 and 13) from 200 GPM filter-separators (14, 15 and 16).

(2) Disconnect other end of female reducers (11, 12, and 13) from end of collapsible hoses (8, 9 and 10).

(3) Disconnect collapsible hose (10) from fueling manifold (5).

(4) Disconnect collapsible hoses (8 and 9) from elbows (6 and 7).

(5) Disconnect elbows (6 and 7) from fueling manifold (5).

(6) Disconnect one end of collapsible hoses (4) from fueling manifold (5) with three valves.

(7) Disconnect other end of collapsible hose (4) from fueling manifold (3) with two valves.

(8) Disconnect two collapsible hoses (4).

(9) Disconnect one end of hoses (1) from fueling manifold (3) with two valves.

(10) Disconnect other end of collapsible hoses (1) from secondary 600 GPM pump (2).

(11) Disconnect two 25 foot collapsible hoses (1).

2-21. PREPARATION FOR MOVEMENT - CONT.

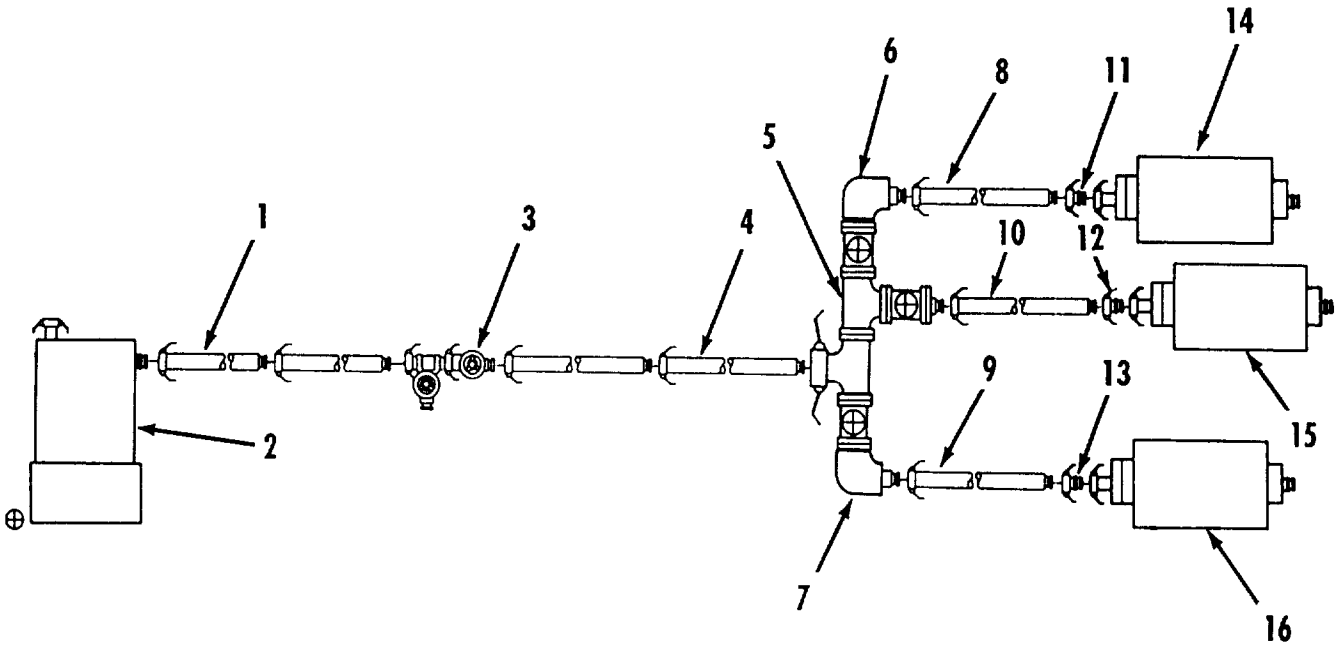


Figure 2-53. Fuel System - Secondary 600 GPM Pump Output to 200 GPM Filter-Separator Removal.

2-21. PREPARATION FOR MOVEMENT - CONT.

m. Fuel System - Fuel Tank Discharge to Secondary 600 GPM Pump Input Removal. **Refer to figure 2-54.**

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.

CAUTION

To prevent contamination of fuel system components use care when disconnecting coupling to avoid getting ice, snow, dirt, sand and debris on coupling mating surfaces or in hoses.

NOTE

Refer to para 2-16e for disconnect of quick disconnect couplings.

(1) Disconnect end of noncollapsible hose (20) from input of secondary 600 GPM pump (21)

(2) Disconnect 10 foot noncollapsible hose (20) from valve side of fueling manifold (19).

(3) Disconnect fueling manifold (19) from other end of noncollapsible hoses (18).

(4) Disconnect one end of noncollapsible hoses (18) from fueling manifold (11).

(5) Disconnect two 10 foot noncollapsible hoses (18).

(6) Disconnect valve section (17) from reducer (16).

(7) Disconnect female reducer (16) from fueling manifold (13).

(8) Disconnect fueling manifold (13) from discharge hose i 14) on tank (15).

(9) Disconnect fueling manifold (13) from noncollapsible hoses (12).

(10) Disconnect three 10 noncollapsible hoses (12) and disconnect from fueling manifold (11).

(11) Disconnect fueling manifold (ii) from one end of noncollapsible hoses (10).

(12) Disconnect one end of noncollapsible hoses (10) from fueling manifold (7) with two valves and disconnect three noncollapsible hoses (10).

(13) Disconnect fueling manifold 17) with two valves from discharge hose (8) on fuel tank (9).

(14) Disconnect fueling manifold (7) with two valves from end of noncollapsible hoses (6).

(15) Disconnect noncollapsible hoses (6) from fueling manifold (3) with two valves and disconnect seven noncollapsible hoses (6).

(16) Disconnect fueling manifold (3) with two valves from discharge hose (4) on fuel tank (5).

2-21. PREPARATION FOR MOVEMENT - CONT.

(17) Disconnect fueling manifold (3) with two valves from reducer (2).

(18) Disconnect valve section (1) from female reducer (2).

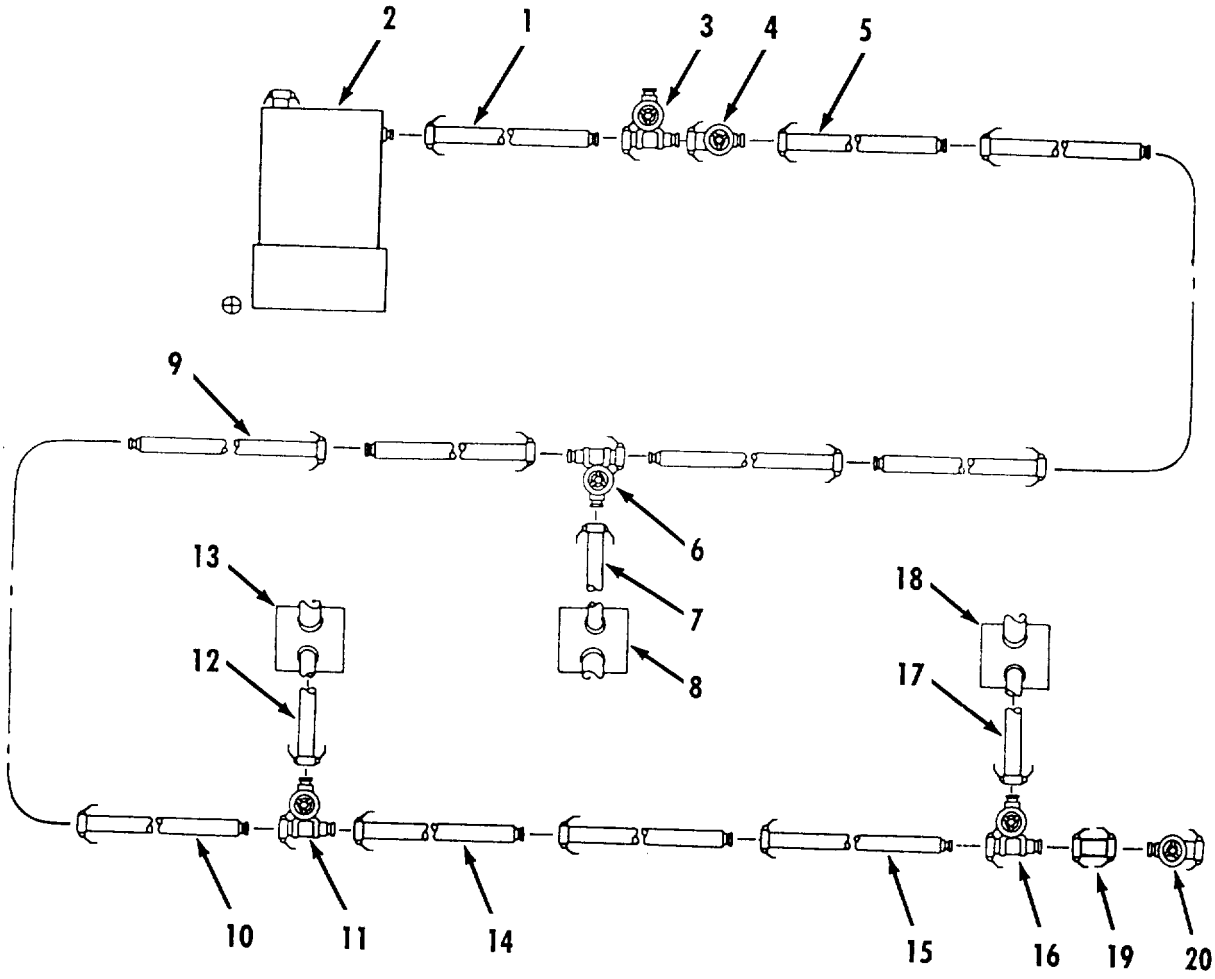


Figure 2-54. Fuel System - Fuel Tank Discharge to Secondary 600 GPM Pump Input Removal.

2-21. PREPARATION FOR MOVEMENT - CONT.

n. Fuel System - Primary 600 GPM Pump Output to Filler Hose of Fuel Tanks Removal. **Refer to figure 2-55**.

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.

CAUTION

To prevent contamination of fuel system components use care when disconnecting coupling to avoid getting ice, snow, dirt, sand and debris on coupling mating surfaces or in hoses.

NOTE

Refer to para 2-16e for disconnect of quick disconnect couplings.

(1) Disconnect valve section (20) from adapter (19).

(2) Disconnect adapter (19) from fueling manifold (16).

(3) Disconnect fueling manifold (16) from filler hose (17) on fuel tank (18).

(4) Disconnect fueling manifold (16) from one of collapsible hose (15).

(5) Disconnect collapsible hose (15) from end of collapsible hoses (14).

(6) Disconnect end of hoses (14) from fueling manifold (11) and disconnect the two collapsible hoses (14).

(7) Disconnect fueling manifold (11) from filler hose (12) on fuel tank (13).

(8) Disconnect fueling manifold (11) from end of hoses (10).

(9) Disconnect collapsible hose (10) from end of hoses (9).

(10) Disconnect end of hose (9) from fueling manifold (6) and disconnect collapsible hoses (9).

(11) Disconnect fueling manifold (6) from filler hose (7) on fuel tank (8).

(12) Disconnect fueling manifold (6) from end of collapsible hoses (5).

(13) Disconnect end of hoses (5) from valve section (4) and disconnect four collapsible hoses (5).

(14) Disconnect valve section (4) from fueling manifold (3).

(15) Disconnect fueling manifold (3) from end of collapsible hose (1).

(16) Disconnect collapsible hose (1) from output of primary pump (2).

2-21. PREPARATION FOR MOVEMENT - CONT.

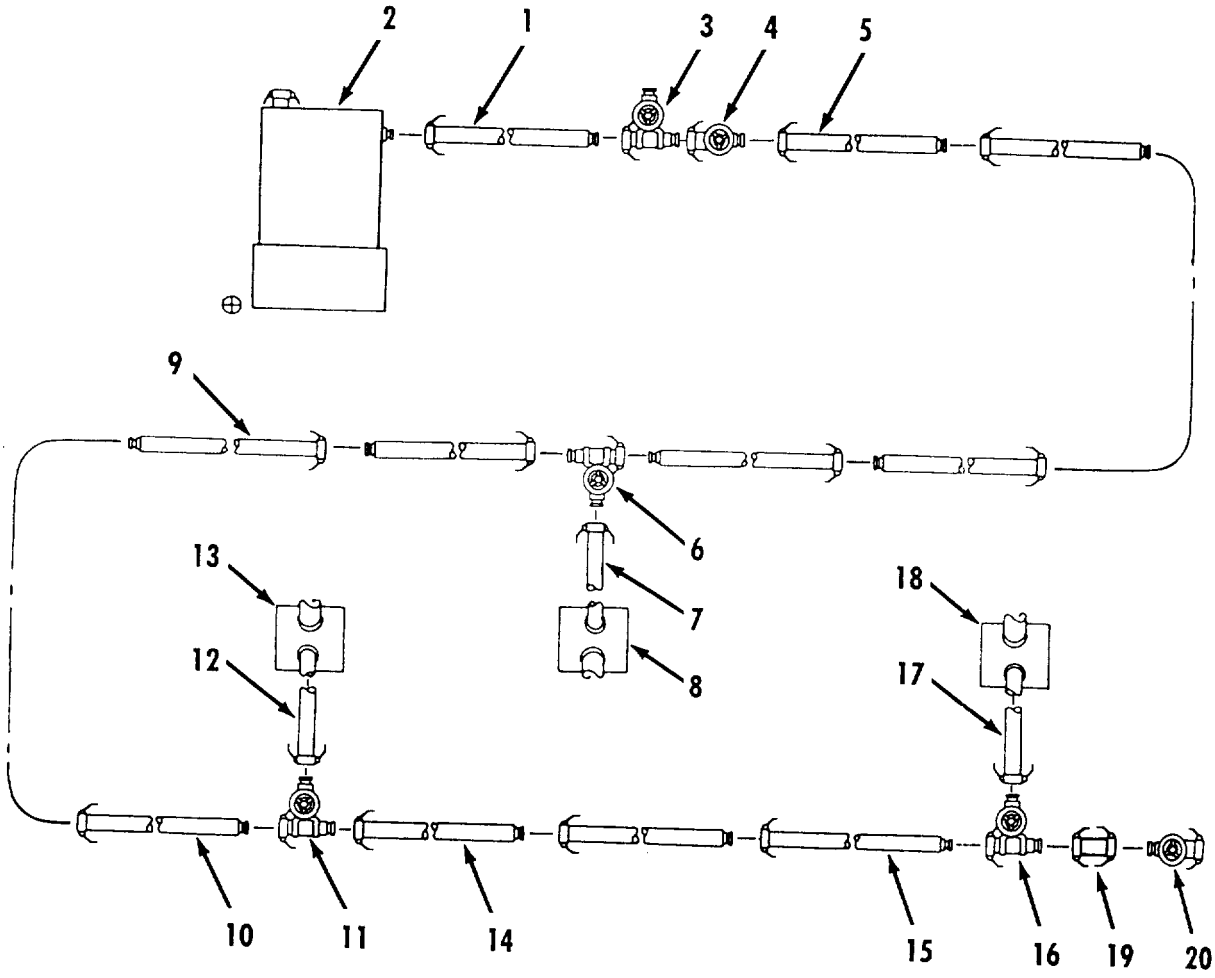


Figure 2-55. Fuel System - Primary 600 GPM Pump Output to Filler Hose of Fuel Tanks Removal.

2-21. PREPARATION FOR MOVEMENT - CONT.

o. Fuel System - Primary 600 GPM Pump Input Removal. **Refer to figure 2-56**.

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.

CAUTION

To prevent contamination of fuel system components use care when disconnecting coupling to avoid getting ice, snow, dirt, sand and debris on coupling mating surfaces or in hoses.

NOTES

- Refer to para 2-16e for disconnect of quick disconnect couplings.
- If required two 6-inch elbows might have been used at the input of the 600 GPM primary pump.

(1) Disconnect end of noncollapsible hoses (6) from input of primary 600 GPM pump 17).

(2) Disconnect other end of noncollapsible hoses (6) from wye assembly (3).

(3) Disconnect four noncollapsible hoses (6).

(4) Disconnect valve section (5) from end of noncollapsible hoses (4).

(5) Disconnect end of noncollapsible (4) from wye assembly (31.

(6) Disconnect three noncollapsible hoses (4).

(7) Disconnect wye assembly (3) from one end of noncollapsible hoses (1).

(8) Disconnect valve section (2) from one end of noncollapsible hoses (1).

(9) Disconnect seven noncollapsible hoses (1).

2-21. PREPARATION FOR MOVEMENT - CONT.

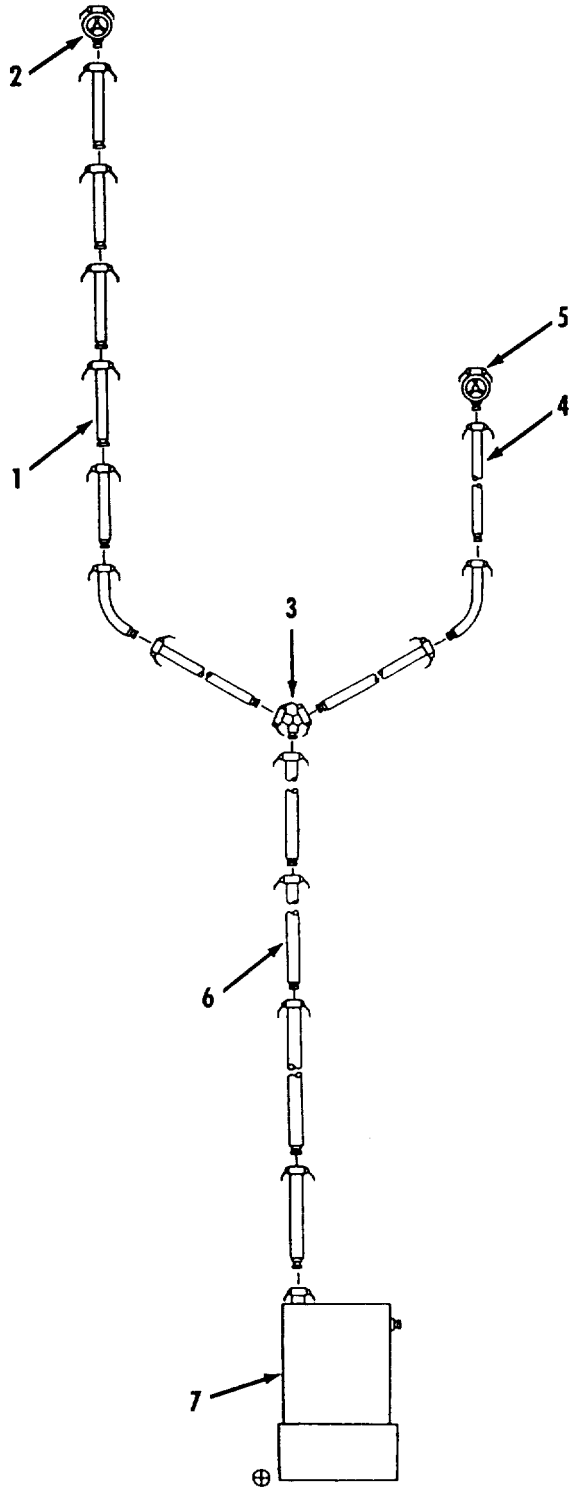


Figure 2-56. Fuel System - Primary 600 GPM Pump Input Removal.

2-21. PREPARATION FOR MOVEMENT -CONT.

p. Fuel System - 600 GPM Pump External Fuel Can, Adapter and Fuel Hose Removal. **Refer to figure 2-57**.

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.

NOTE

Procedures covers removal of fuel can, adapter, and fuel hose from primary and secondary 600 GPM pumps.

(1) Disconnect end of fuel hose (8) from coupling (9) on adapter (4).

(2) Disconnect other end of fuel hose (8) from external fuel connector (6) on 600 GPM pump (7).

(3) Install cap (5) on external fuel connector (6) on 600 GPM pump (7).

(4) Push handle (3) down to release tension on adapter (4).

(5) Remove adapter (4) from fuel can (2) and install cap on fuel can (2).

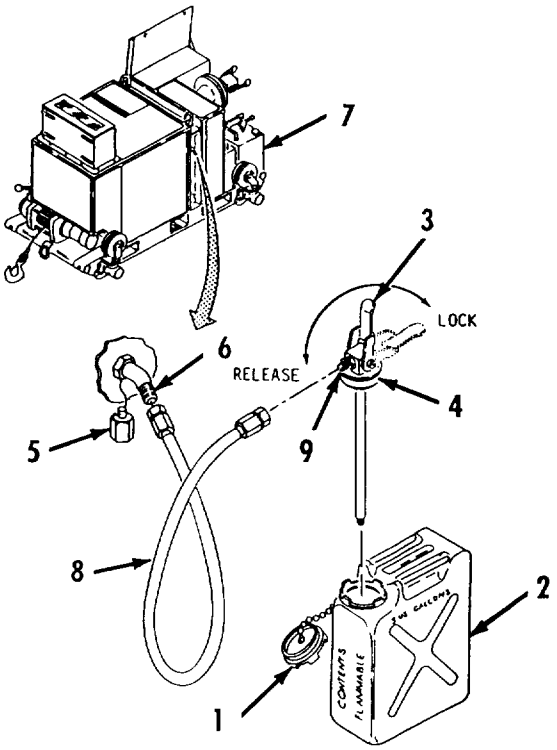


Figure 2-57. Fuel System - 600 GPM Pump External Fuel Can, Adapter and Fuel Hose Removal.

2-21. PREPARATION FOR MOVEMENT - CONT.

q. Fire Extinguisher Removal. **Refer to figure 2-58**.

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.

(1) Position fire extinguisher (3) in frame (4).

(2) Push down on handle (1) and latch hook (2) onto handle of fire extinguisher (3).

(3) Repeat steps (1) and (2) for remaining fire extinguishers.

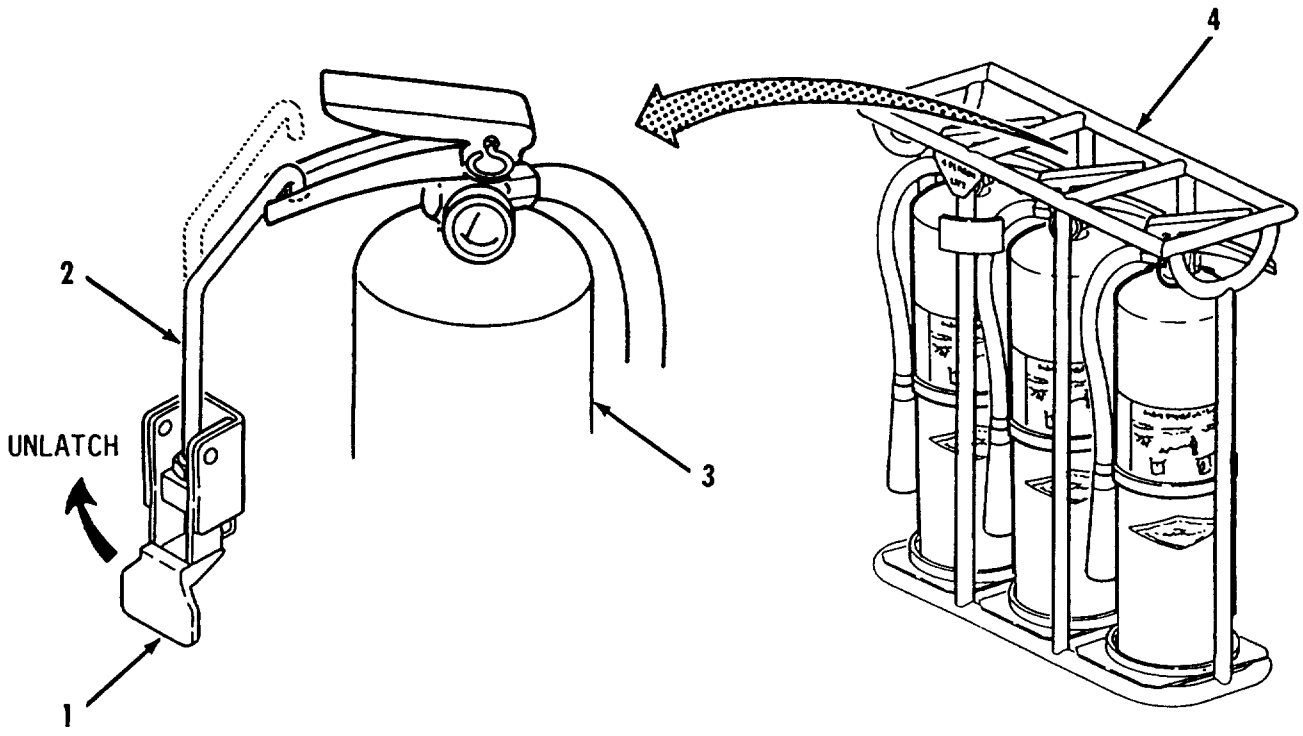


Figure 2-58. Fire Extinguisher Removal.

2-21. PREPARATION FOR MOVEMENT - CONT.

r. Packing.

WARNING

Do not touch surfaces with bare skin. Bare skin will freeze to metal surfaces in subzero temperatures. Always wear arctic mittens when handling components.

NOTE

Prepare and store like items in the same shipping container.

(1) Prepare 200 GPM filter-separators for movement. Refer to TM 10-4330-236-13.

(2) Prepare 600 GPM pumps for movement. Refer to TM 10-432042-10.

(3) Prepare fuel tanks for movement. Refer to TM 10-5430-231-12.

(4) Drain fuel from all hoses, wyes, valve section, fueling manifolds, fuel cans and reducers.

(5) Prepare and pack nozzles, wyes, reducers, ball valves, tank couplers, and couplings in shipping container.

(6) Prepare and pack fueling manifolds and valve sections in shipping container.

(7) Prepare and pack noncollapsible hoses in shipping containers.

(8) Prepare and pack collapsible hoses in shipping containers.

(9) Pack grounding rods and grounding cables in shipping container.

(10) Pack fire extinguishers in shipping container.

(11) Pack fuel hose and fuel can in shipping container.

Section IV. OPERATION UNDER UNUSUAL CONDITIONS

2-22. OPERATIONS IN EXTREME HEAT.

Observe the following precautions when operating the AFSSP in extreme heat:

WARNINGS

Do not operate fuel system in area of tents or shelters. Inhalation of petroleum fumes and vapors will result in serious illness or death. To prevent injury to personnel and damage to the equipment, do not operate the AFSSP in ambient temperatures over 95°F (35°C).

a. Shade fuel system components from direct sunlight. Direct sunlight on fuel hoses and tanks may increase system fuel pressure resulting in fuel leaks or fuel hose ruptures.

b. Refer to TM 104320-342-10 for additional precautions to follow when operating the 600 GPM pumps in extreme heat.

c. Refer to TM 104330-236-13for additional precautions to follow when operating the 200 GPM filter-separator in extreme heat.

d. Refer to TM 10-543231-12 for additional precautions to follow when operating the 3,000, 10,000 or 20,000 gallon fuel tanks in extreme heat.

2-23. OPERATIONS IN DUSTY OR SANDY AREAS.

Observe the following precautions when operating the AFSSP in dusty or sandy areas:

WARNING

Do not operate fuel system in area of tents or shelters. Inhalation of petroleum fumes and vapors will result in serious illness or death.

a. Make sure dust caps or plugs are installed on all open couplings and nozzles.

b. Do not lay fuel nozzles in dust or sand. Fuel nozzles may pick up dirt and contaminate the fuel system being serviced.

c. Carefully inspect fuel nozzles for accumulations of dust, dirt and sand before connecting to refueling adapters. Remove contaminants before refueling.

WARNING

Dry cleaning solvent, P-D-680, Type III, is potentially dangerous to personnel and equipment. Eye and skin protection is required. Avoid repeated and prolonged skin contact. Wash hands immediately after exposure. Do not use near open flame or excessive heat. Use only in areas with good ventilation.

d. Following operation in dusty or sandy areas, rinse all system components with solvent to remove dust, dirt and grit from nozzles and quick disconnect couplings.

2-23. OPERATIONS IN DUSTY OR SANDY AREAS - cont.

e. Do not operate the 600 GPM pump during dust storms or in blowing sand.

f. Refer to TM 10-4320-342-10for additional precautions to follow when operating the 600 GPM pumps in extreme dust or sandy areas..

g. Refer to TM 10-4330-23613for additional precautions to follow when operating the 200 GPM filter-separator in extreme dusty or sandy areas.

h. Refer to TM 10-5430-231-12 for additional precautions to follow when operating the 3,000, 10,000, or 20,000 gallon fuel tanks in extremely dusty or sandy areas.

2-24. OPERATIONS IN SALTWATER AREAS.

Observe the following precautions when operating the AFSSP in saltwater areas.

WARNINGS

- Do not operate fuel system in area of tents or shelters. Inhalation of petroleum fumes and vapors will result in serious illness or death.
- Dry cleaning solvent, P-D-680, Type III, is potentially dangerous to personnel and equipment. Eye and skin protection is required. Avoid repeated and prolonged skin contact. Wash hands immediately after exposure. Do not use near open flame or excessive heat. Use only in areas with good ventilation.

a. Operation in saltwater areas accelerates corrosion on bare metal surfaces. Following operation in saltwater areas, rinse components with solvent to remove salt spray and/or deposits. Do not allow saltwater to remain on aluminum components.

b. Refer to **TM 10-4320-34210** for additional precautions to follow when operating the 600 GPM pumps in saltwater areas.

c Refer to **TM 10-4330-23613** for additional precautions to follow when operating the 200 GPM filter-separator in saltwater areas.

d. Refer to **TM 10-5430-231-12** for additional precautions to follow when operating the 3,000, 10,000 or 20,000 gallon fuel tanks in saltwater areas.

2-25. EMERGENCY PROCEDURES.

WARNING

If a fuel spill occurs during refueling, immediately shut down the system, isolate the defective component(s) and clean up spilled fuel in accordance with local regulations. Observe the following safety precautions and warnings to prevent injury to personnel and damage to the equipment:

- Do not allow smoking with 500 feet of fuel spill.
- Wear protective goggles and gloves. Use fuel resistant gloves when handling system components due to toxic effects of some fuel additives. Avoid contact with skin, eyes and clothes. If fuel contacts eyes, immediately flush eyes with fresh clean water and get medical attention.
- Avoid getting fuel on your body or clothing. Fuel can cause chemical burns on unprotected skin. If clothing becomes saturated with fuel, remove clothing immediately and wash your body with hot soapy water.
- Do not breathe fuel vapors. Refuel only in well-ventilated area. Vapors are toxic and can cause serious illness or death. If dizziness occurs, leave area and get fresh air. Get medical attention.
- Static discharge could ignite the fuel or cause an explosion of the fuel vapor. Cover fuel spill with dry soil to reduce rate of vaporization. Make sure a suitable fire extinguisher is charged and readily available in case of fire.

a. In the event of a fuel hose rupture or component failure, immediately shut down the AFSSP system. Para 2-18h.

b. Isolate defective component by closing the nearest upline or downline valves.

c. Absorb or disperse spilled fuel. Refer to AR200-1 and local standard operating procedures.

d. Refer to TM 10-4320-342-14 for additional emergency when operating the 600 gpm pump.

e. Refer to TM 10-4330-236-14 for additional emergency when operating the filter-separators

f. Refer to TM 10-5430-231-12 for additional precautions to follow when operating the 3,000, 10,000 or 20,000 gallon fuel tanks.

g. Do not operate the AFSSP until defective components or fuel leak has been corrected.

2-26. DECONTAMINATION PROCEDURES.

As required, assist the supporting NBC unit in decontaminating the AFSSP. Refer to FM 3-3, FM3-4, and FM 3-5 for detailed decontamination procedures.

CHAPTER 3
OPERATOR MAINTENANCE INSTRUCTIONS

Paragraph	Title	Page
Section I	Lubrication Instructions	3-1
Section II	Operator Troubleshooting Procedures	3-1
3-1	Introduction	3-1
3-2	Malfunction Index	3-2
3-3	Troubleshooting Procedures	3-2
Section III	Operator Maintenance Procedures	3-17

Section I. LUBRICATION INSTRUCTIONS

Lubrication of the AFSSP is limited to the 600 GPM pump. Lubricate the pump in accordance with LO10-4320-342-12.

Section II. OPERATOR TROUBLESHOOTING PROCEDURES

3-1. INTRODUCTION.

a. The troubleshooting table lists the common malfunctions which you may find during operation of the AFSSP. You should perform the tests, inspections and corrective actions in the order they appear in the table.

b. This table cannot list all the malfunctions that may occur, all the tests or inspections needed to find the fault, or all the corrective actions needed to correct the fault. If the equipment malfunction is not listed or actions listed do not correct the fault, notify your supervisor.

c. Refer to the referenced technical manuals for operator troubleshooting procedures on the following equipment:

600 GPM Pump Assembly ..... TM 10-4320-342-10
Closed Circuit Refueling (CCR) Nozzle and Gravity Fill Adapter ..... TM 10-4930-243-13&P
Single Point Refueling Nozzle (D- 1) ..... TM 10-4930-242-13&P
Collapsible Fabric Tank, Low Temperature ..... TM 10-5430-231-12
200 Gpm Filter-Separator ..... TM 10-4330-236-13

3-2. MALFUNCTION INDEX.

Malfunction		Page
1.	No Fuel Flow To Offloading Point (Refuel Mode)	3-3
2.	Low Fuel Pressure at Offloading Point	3-4
3.	Fuel Hose Assembly Leaks	3-5
4.	Wye Assemblies Leaks	3-6
5.	Reducer Assembly Leaks	3-7
6.	Valve Section Leaks	3-8
7.	Valve Section Stuck or Jammed	3-9
8.	Manifold Leaks	3-10
9.	Manifold Stuck or Jammed	3-11
10.	Coupler Assembly Leaks	3-12
11.	Coupler Assembly Stuck or Jammed	3-13
12.	4-Inch Ball Valve Leaks	3-14
13.	4-Inch Ball Valve Stuck or Jammed	3-15
14.	Arctic Fuel and Oil Servicing Nozzle Leaks	3-16
15.	Arctic Fuel and Oil Servicing Nozzle Stuck or Jammed	3-17

3-3. TROUBLESHOOTING PROCEDURES.

Refer to table 3-1 for Operator Troubleshooting instructions.

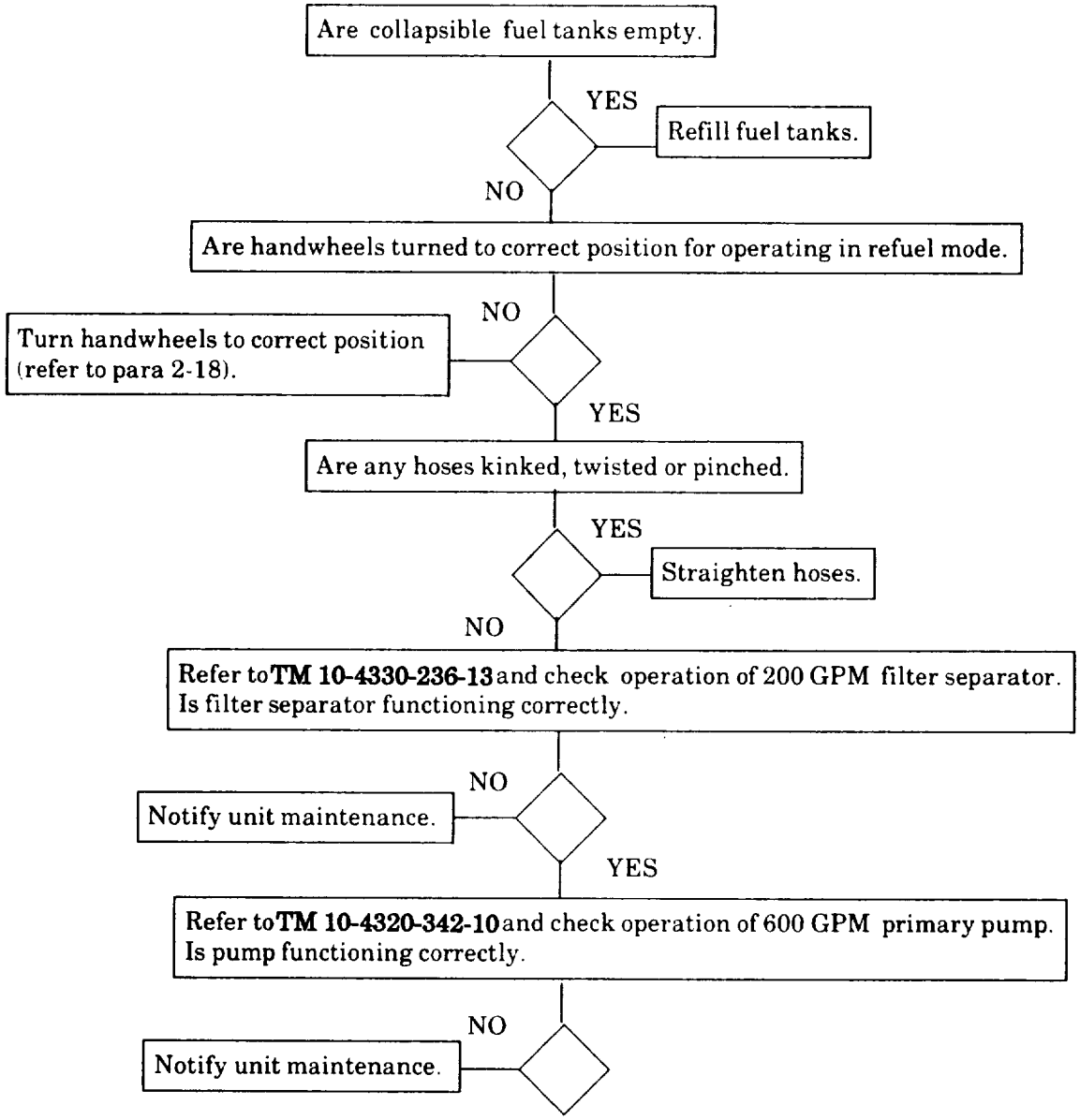
3-3. TROUBLESHOOTING PROCEDURES - cont.

Table 3-1. Operator Troubleshooting.

WARNING

Be sure to read ALL Warnings in front of this manual before troubleshooting.

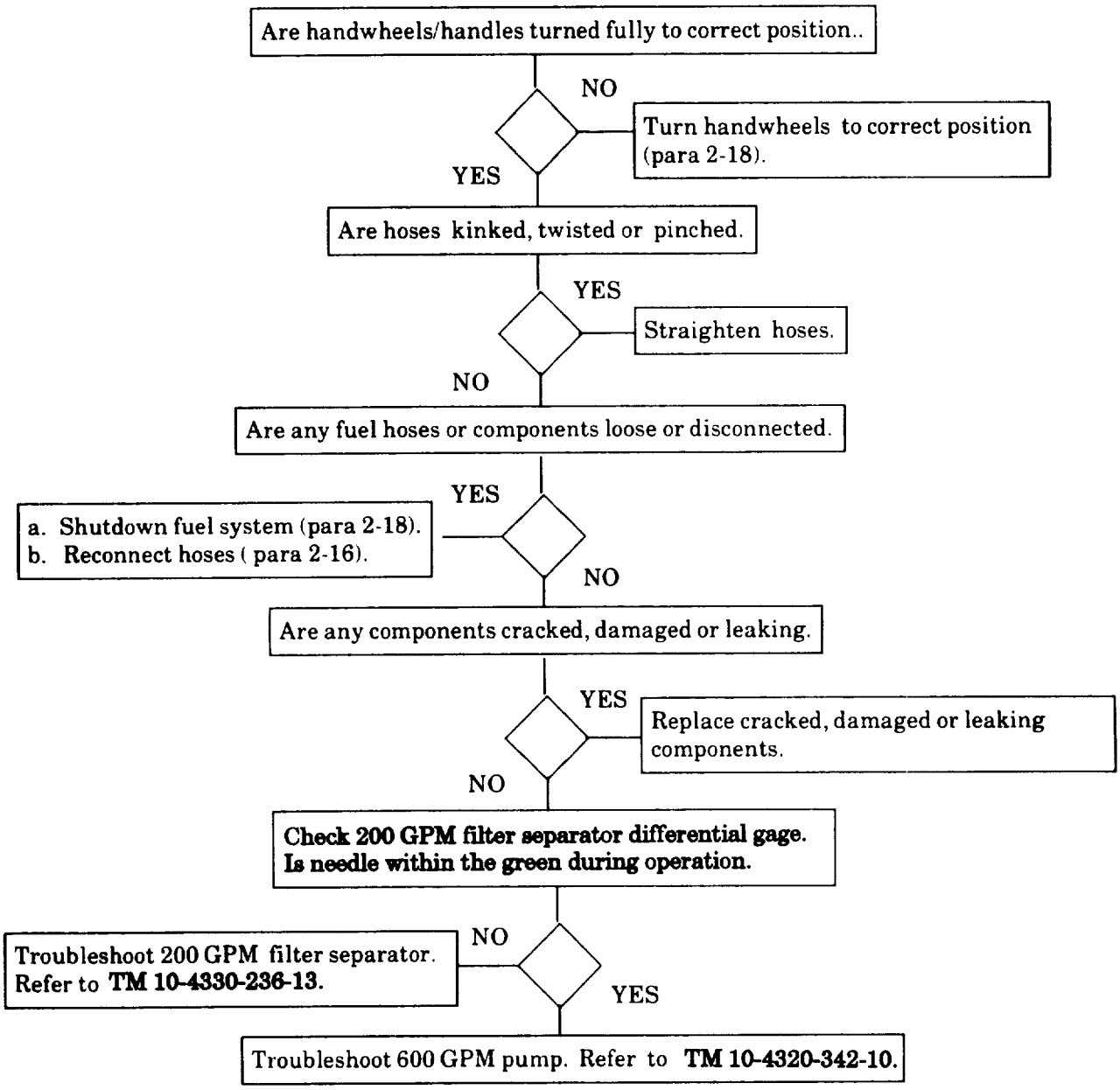
MALFUNCTION 1. NO FUEL FLOW TO OFFLOADING POINT (REFUEL MODE).



3-3. TROUBLESHOOTING PROCEDURES - cont.

Table 3-1. Operator Troubleshooting - cont.

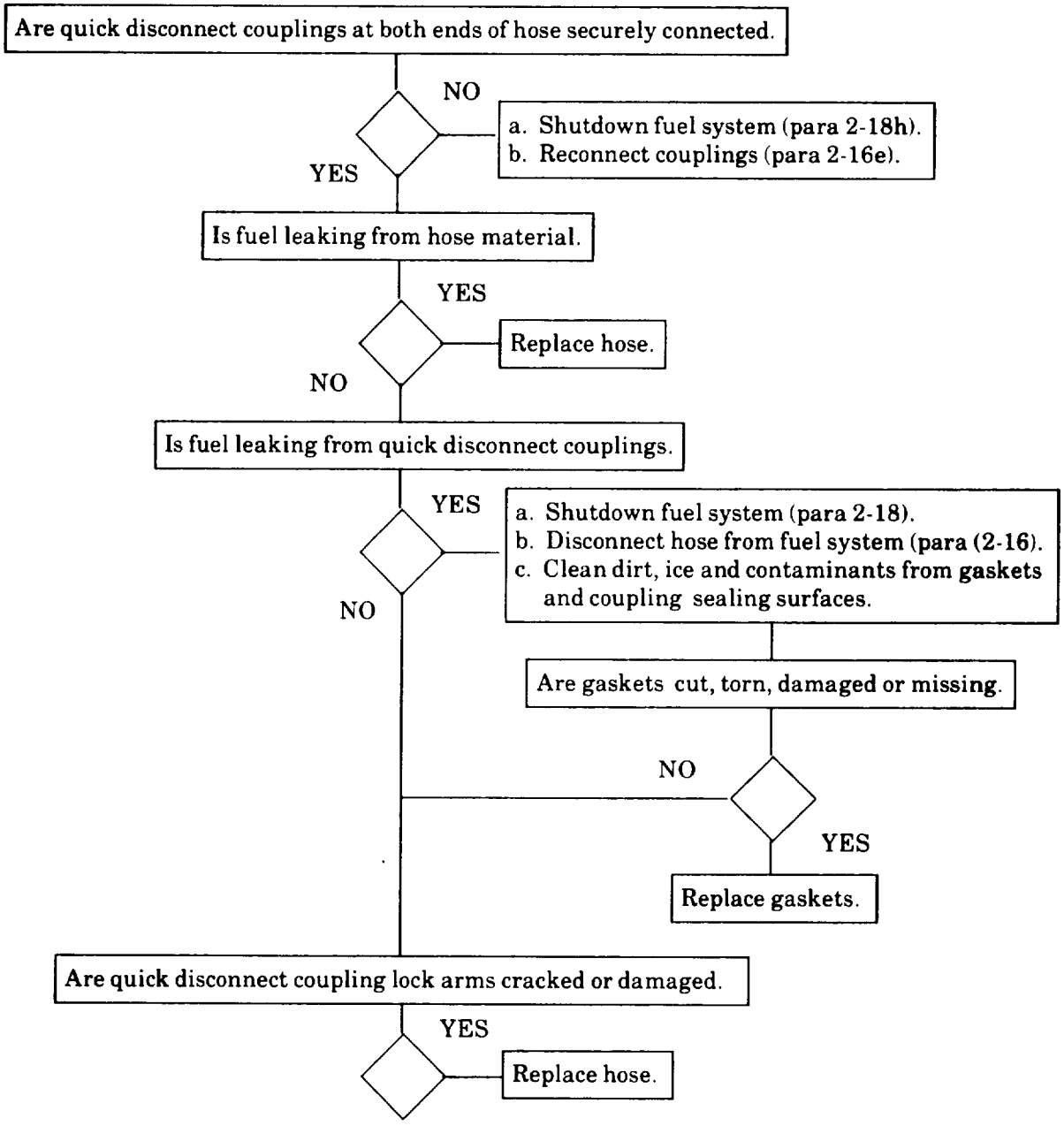
MALFUNCTION 2. LOW FUEL PRESSURE AT OFFLOADING POINT.



3-3. TROUBLESHOOTING PROCEDURES - cont.

Table 3-1. Operator Troubleshooting - cont.

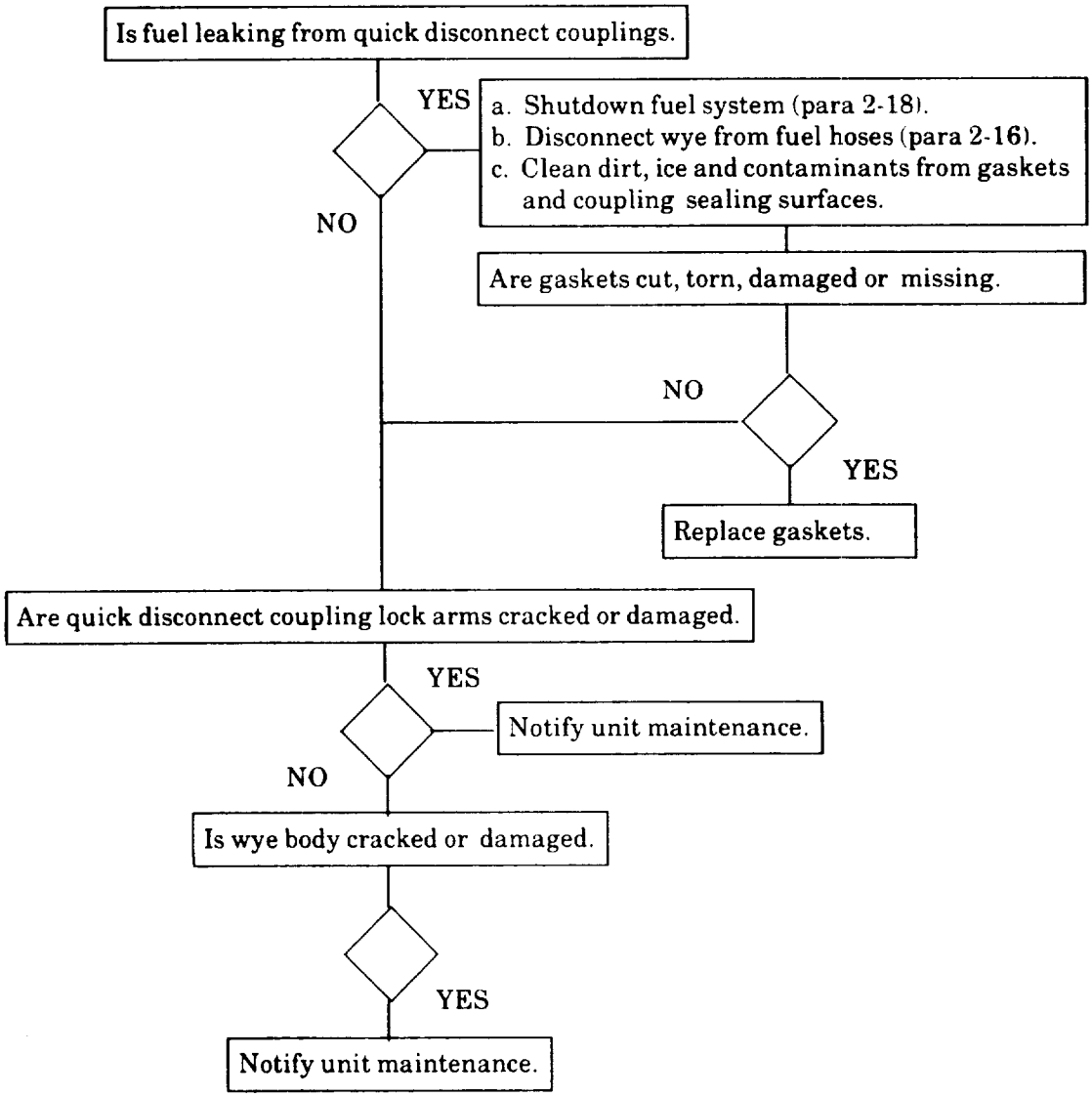
MALFUNCTION 3. FUEL HOSE ASSEMBLY LEAKS.



3-3. TROUBLESHOOTING PROCEDURES - cont.

Table 3-1. Operator Troubleshooting - cont.

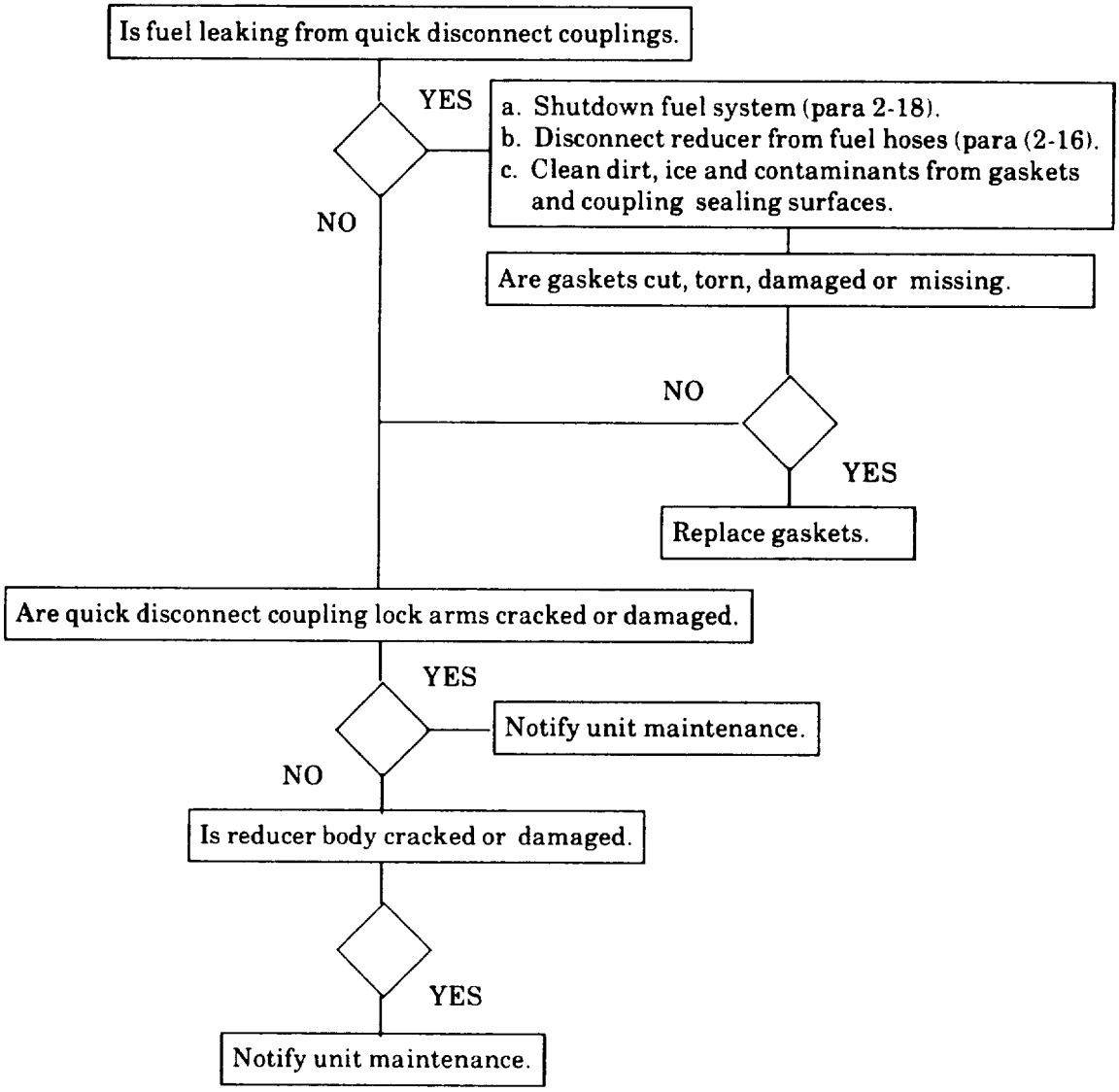
MALFUNCTION 4. WYE ASSEMBLY LEAKS.



3-3. TROUBLESHOOTING PROCEDURES - cont.

Table 3-1. Operator Troubleshooting - cont.

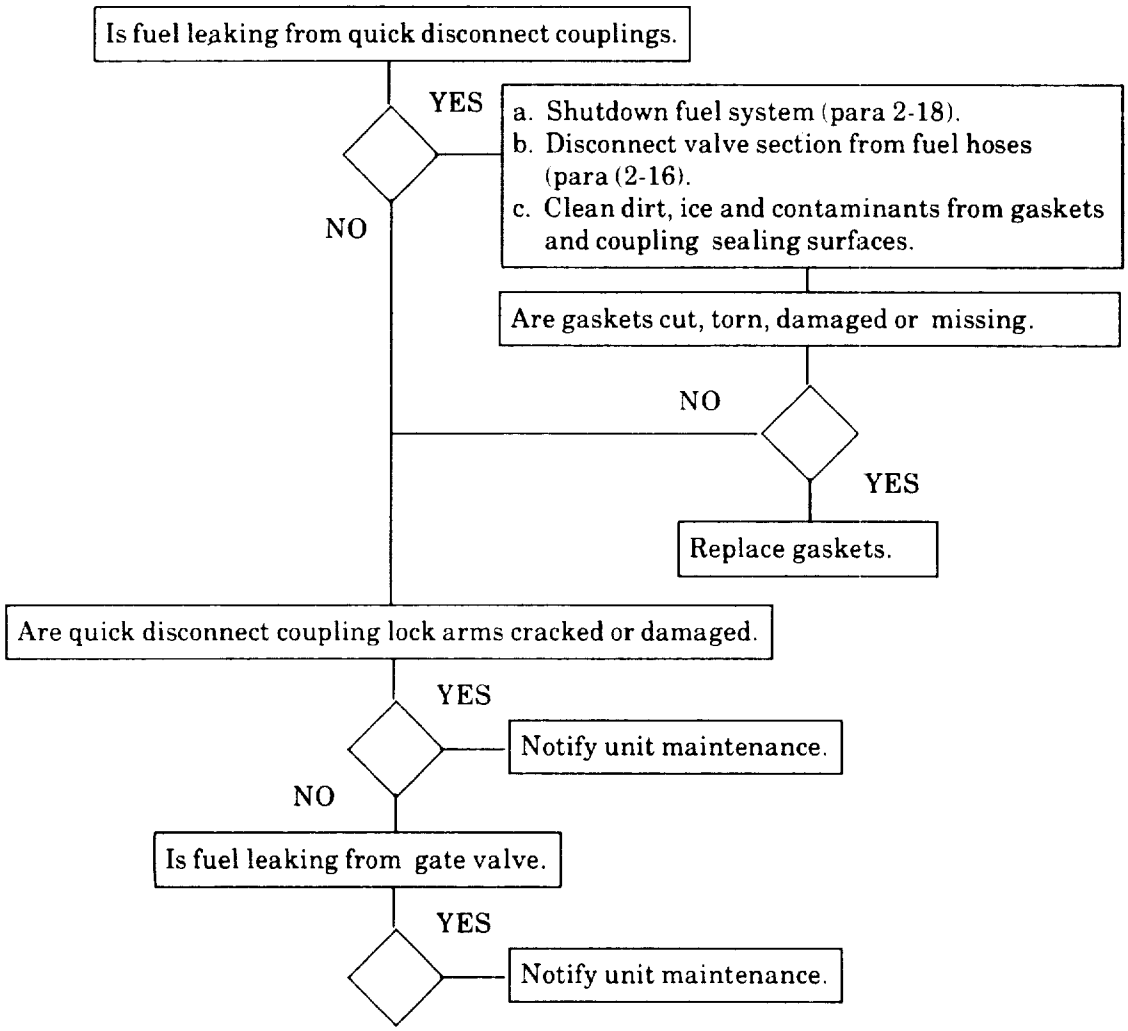
MALFUNCTION 5. REDUCER ASSEMBLY LEAKS.



3-3. TROUBLESHOOTING PROCEDURES - cont.

Table 3-1. Operator Troubleshooting - cont.

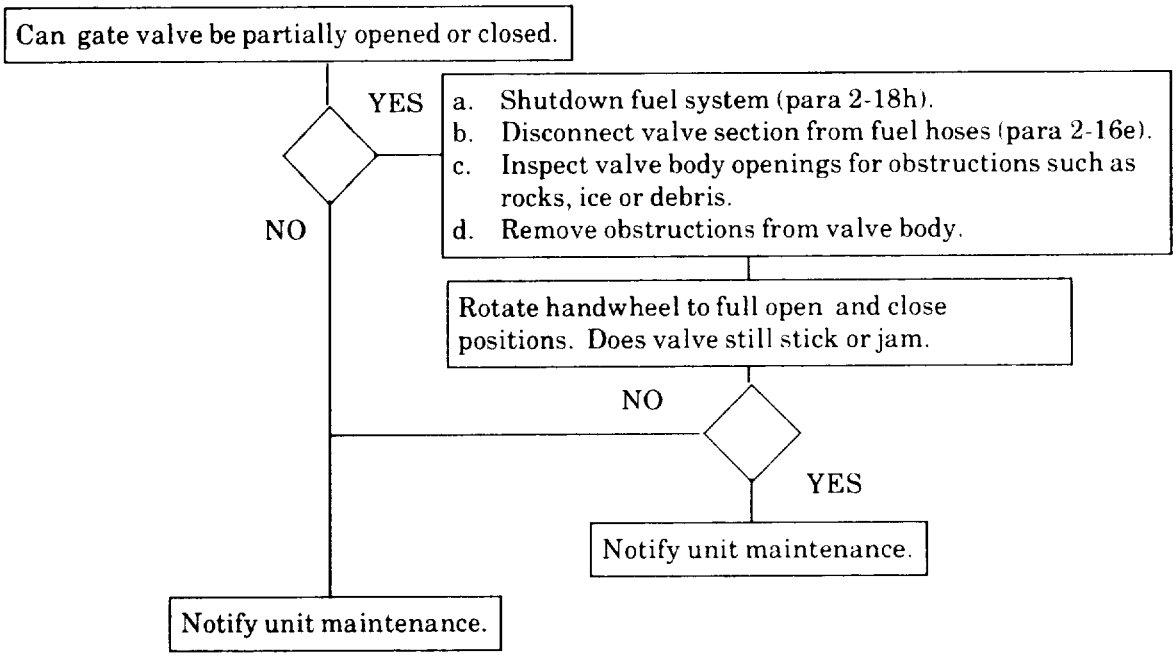
MALFUNCTION 6. VALVE SECTION LEAKS.



3-3. TROUBLESHOOTING PROCEDURES - cont.

Table 3-1. Operator Troubleshooting - cont.

MALFUNCTION 7. VALVE SECTION STUCK OR JAMMED.



3-3. TROUBLESHOOTING PROCEDURES - cont.

Table 3-1. Operator Troubleshooting - cont.

MALFUNCTION 8. MANIFOLD LEAKS.

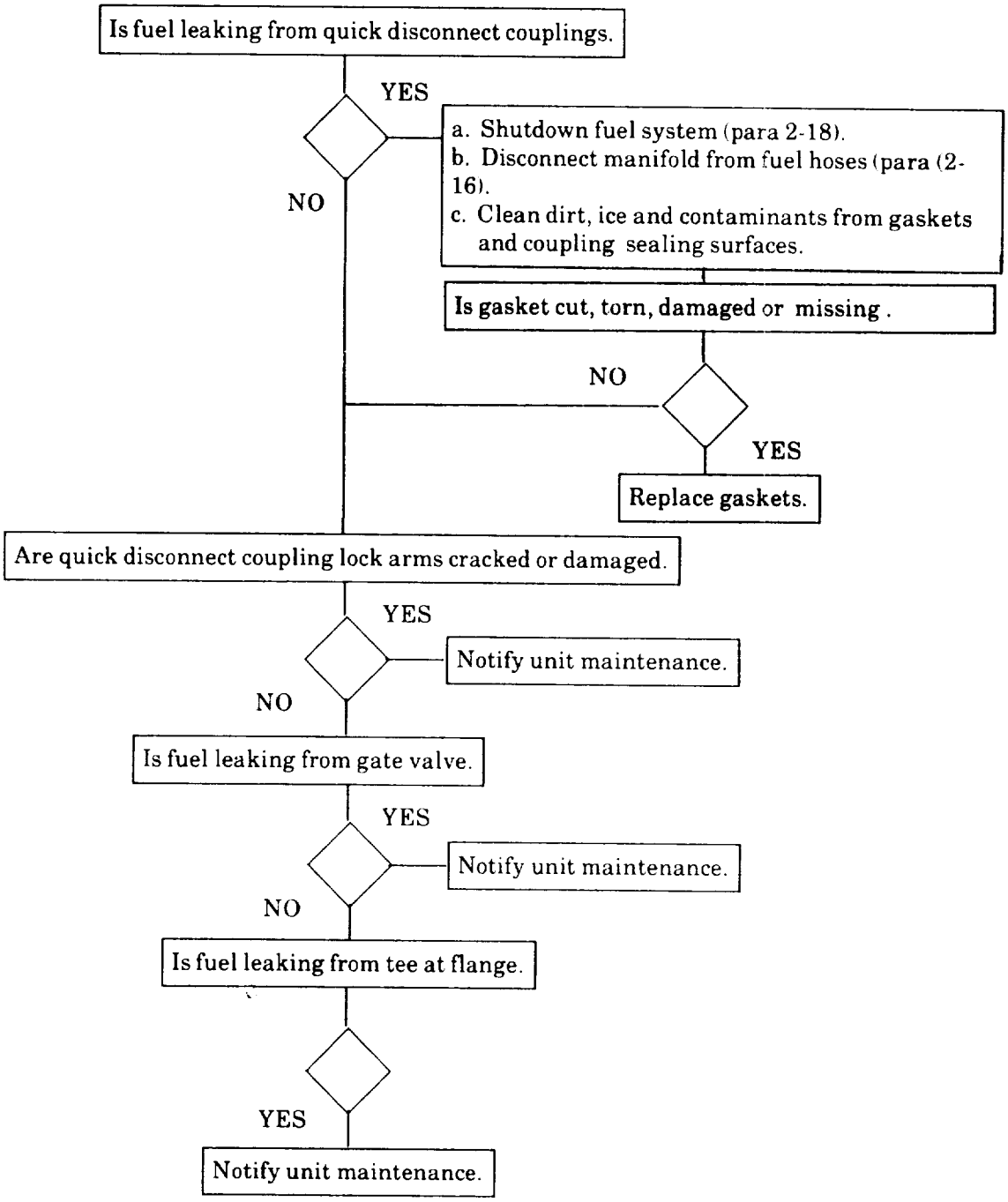
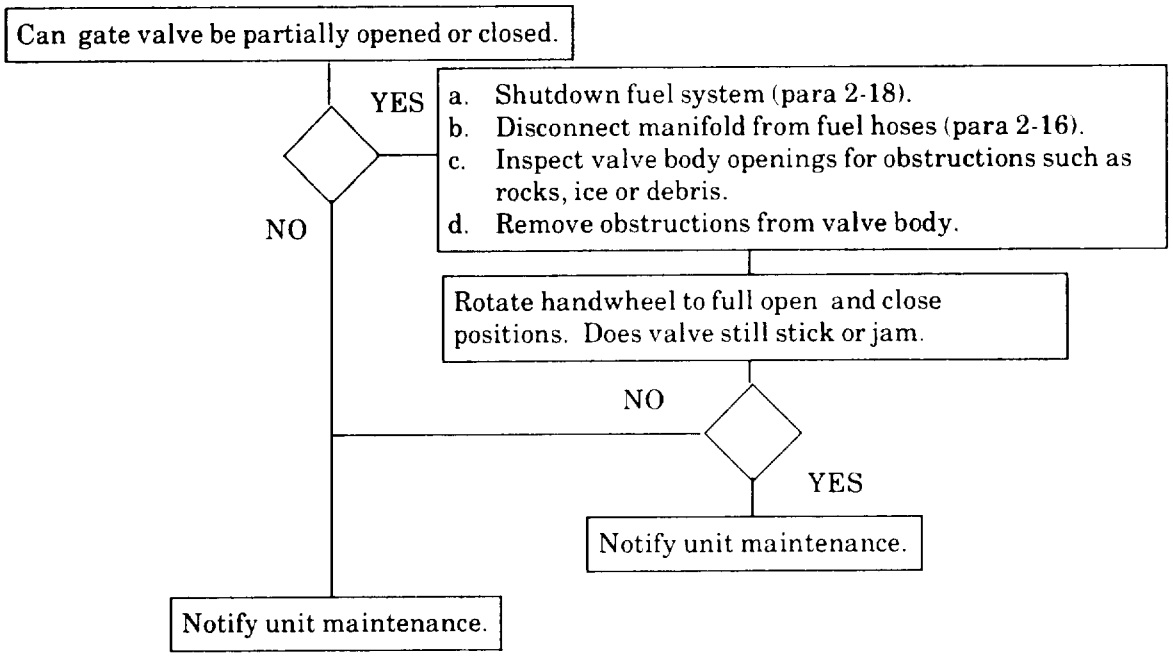


Table 3-1. Operator Troubleshooting - cont.

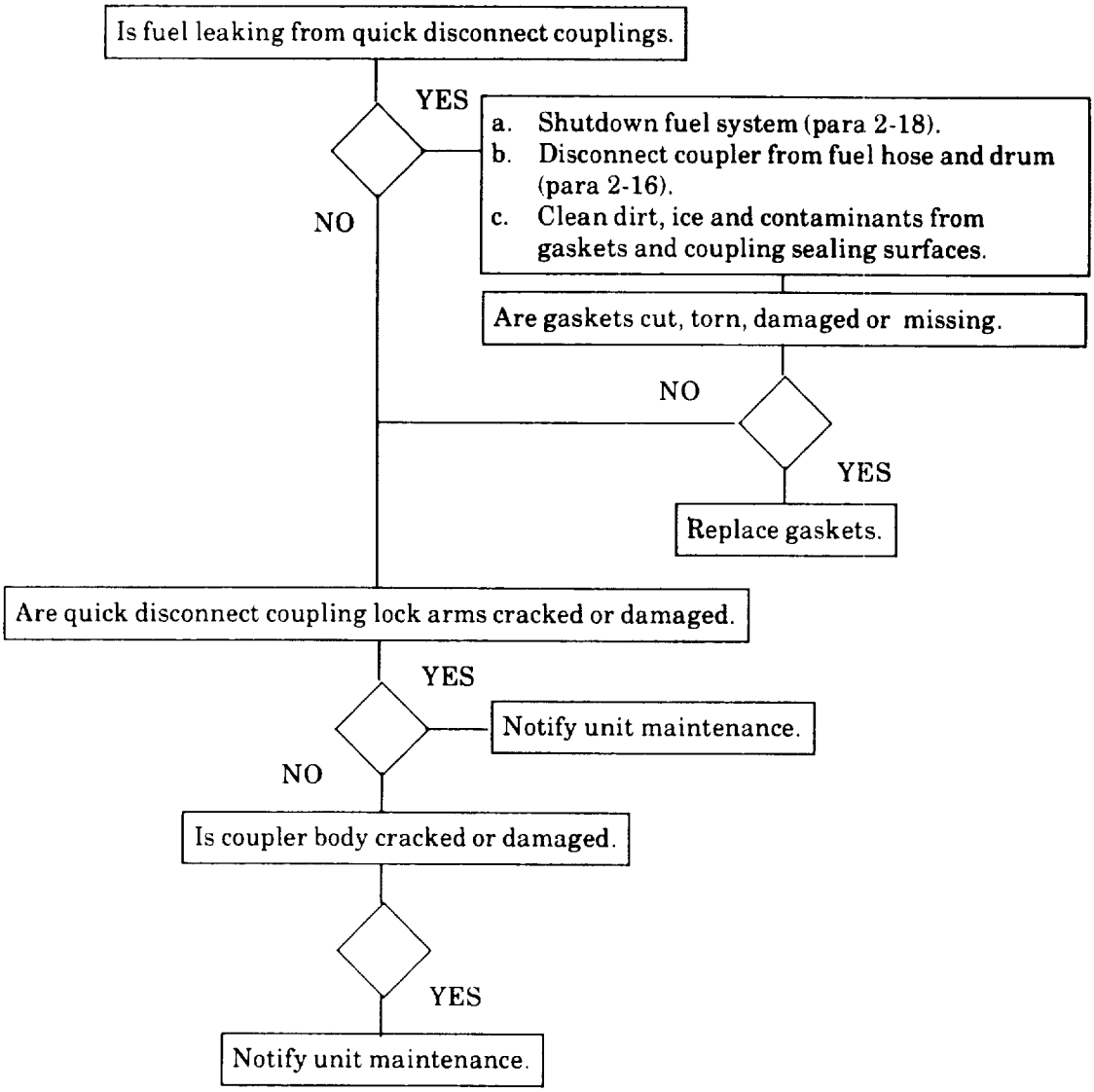
MALFUNCTION 9. FUELING MANIFOLD STUCK OR JAMMED.



3-3. TROUBLESHOOTING PROCEDURES - cont.

Table 3-1. Operator Troubleshooting - cont.

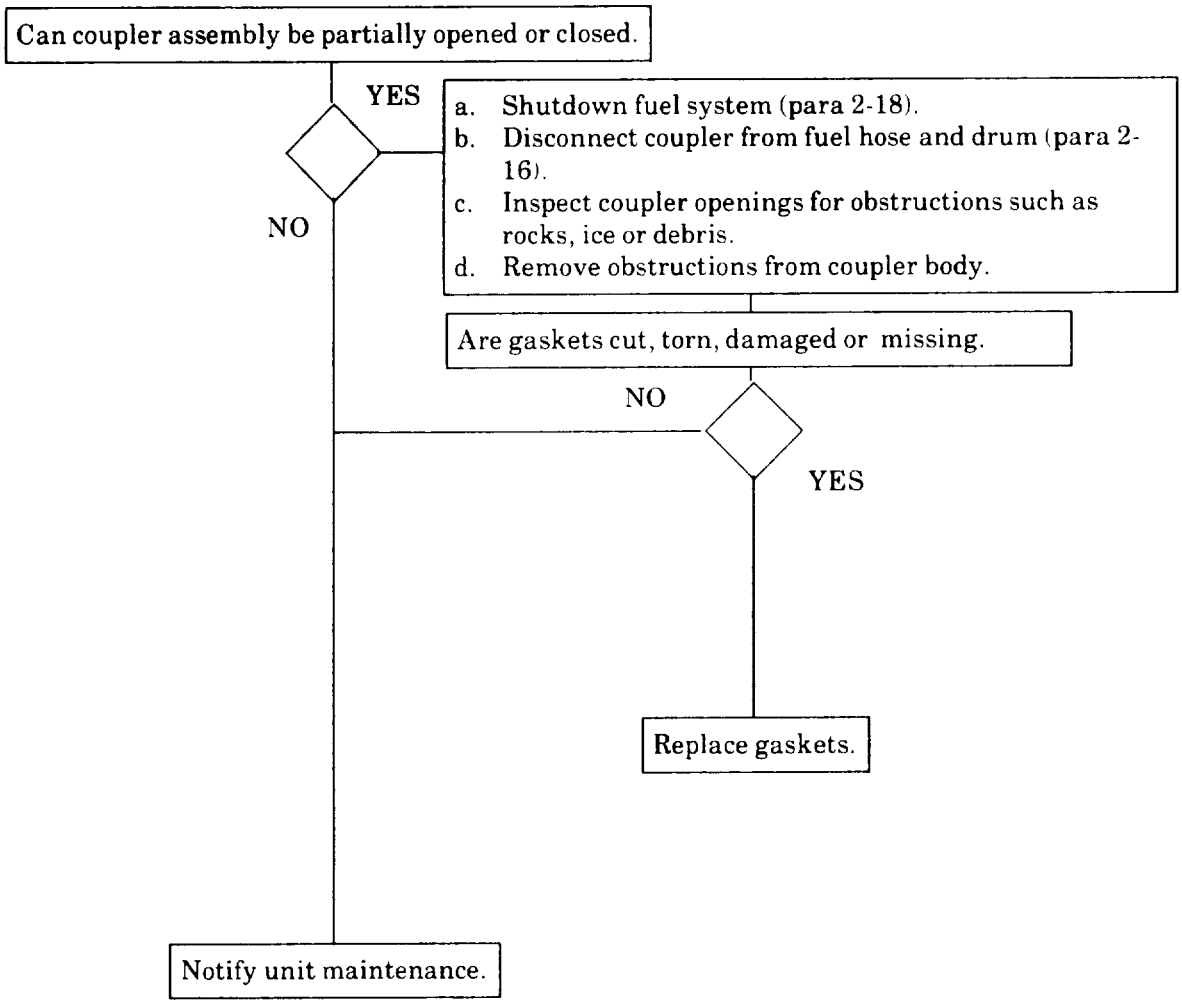
MALFUNCTION 10. COUPLER ASSEMBLY LEAKS.



3-3. TROUBLESHOOTING PROCEDURES - cont.

Table 3-1. Operator Troubleshooting - cont.

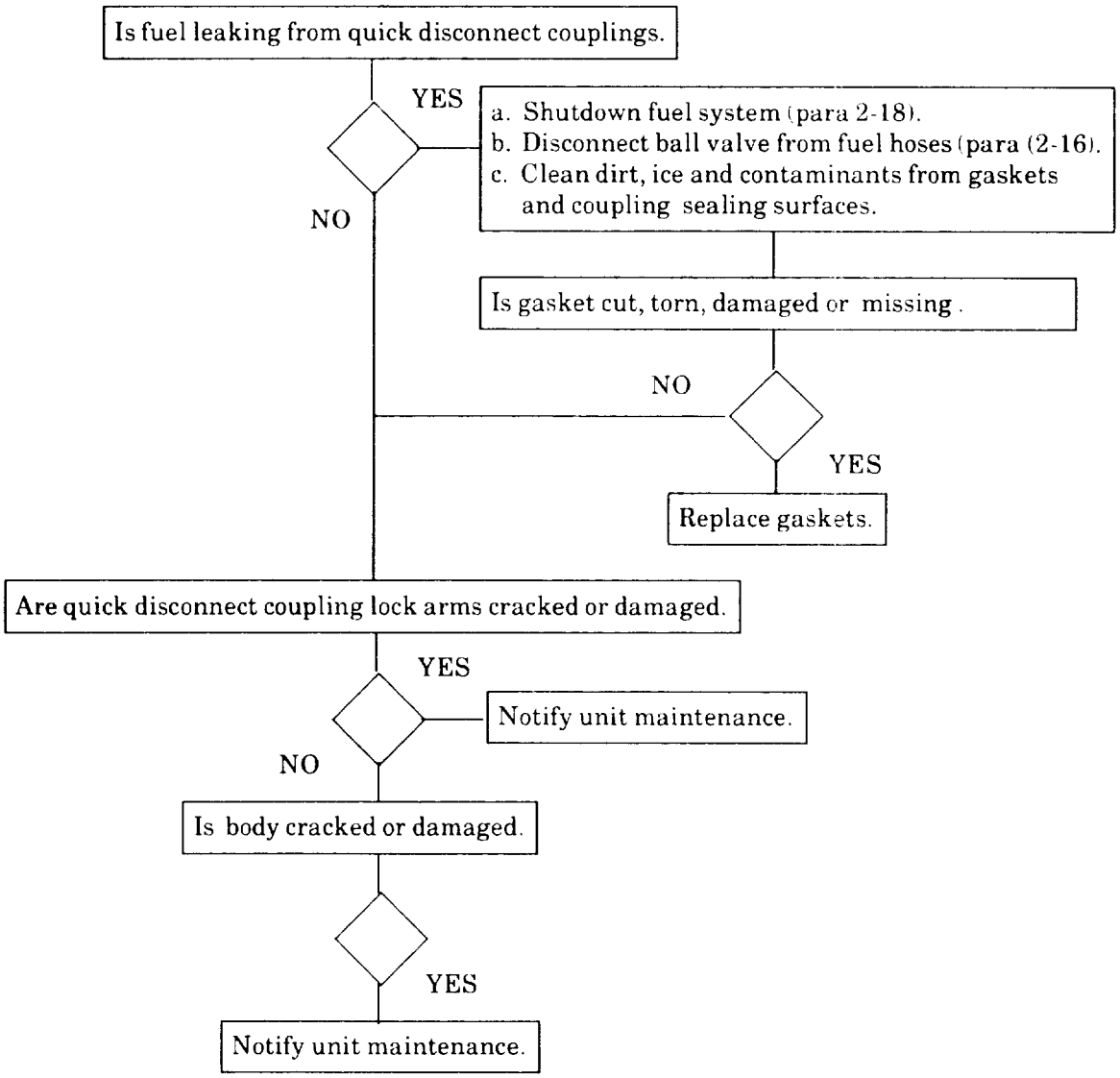
MALFUNCTION 11. COUPLER ASSEMBLY STUCK OR JAMMED.



3-3. TROUBLESHOOTING PROCEDURES - cont.

Table 3-1. Operator Troubleshooting - cont.

MALFUNCTION 12. 4-INCH BALL VALVE LEAKS.



3-3. TROUBLESHOOTING PROCEDURES - cont.

Table 3-1. Operator Troubleshooting - cont.

MALFUNCTION 13. 4-INCH BALL VALVE STUCK OR JAMMED.

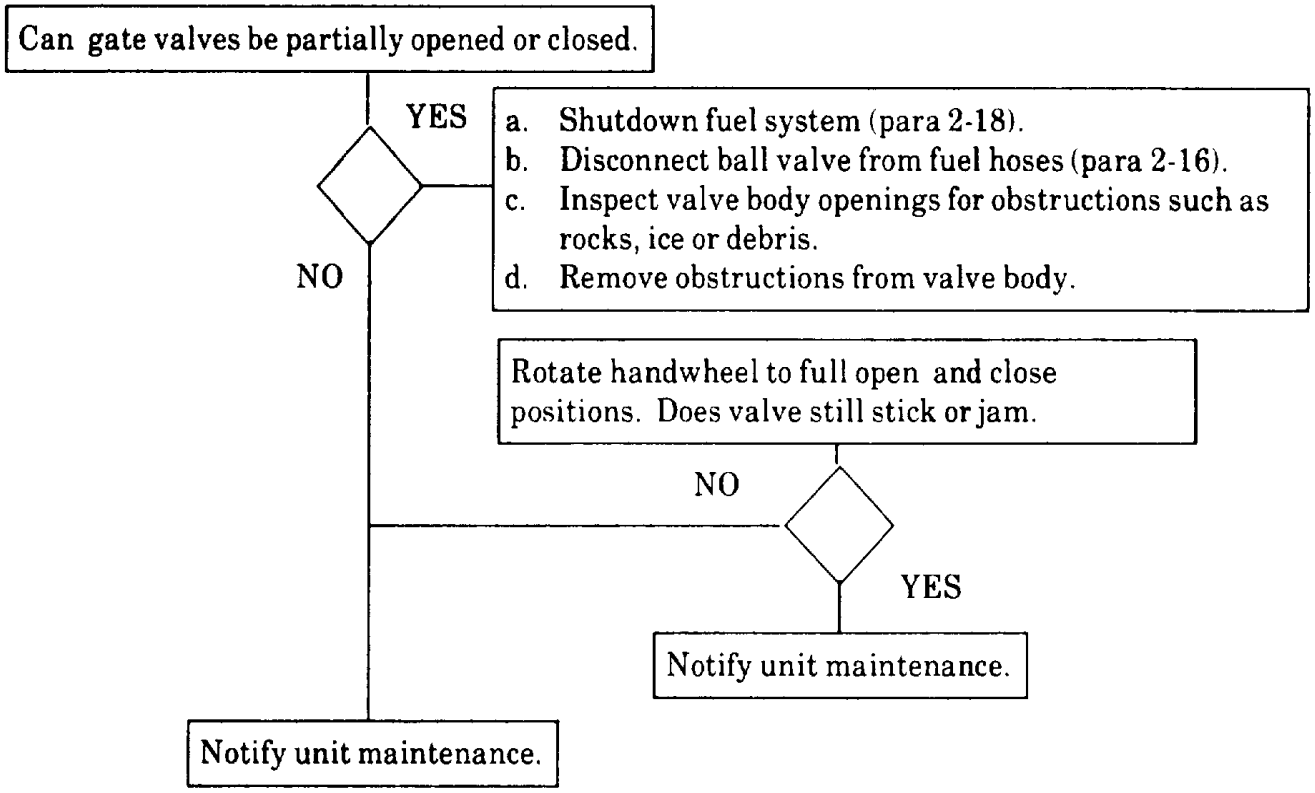


Table 3-1. Operator Troubleshooting - cont.

MALFUNCTION 14. ARCTIC FUEL AND OIL SERVICING NOZZLE LEAKS.

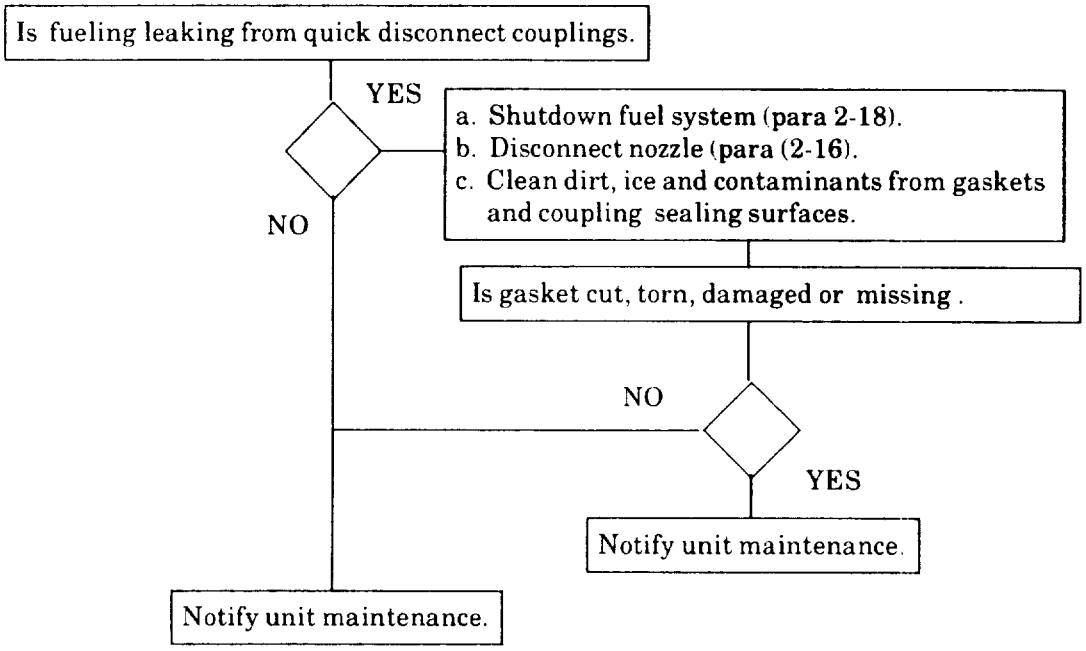
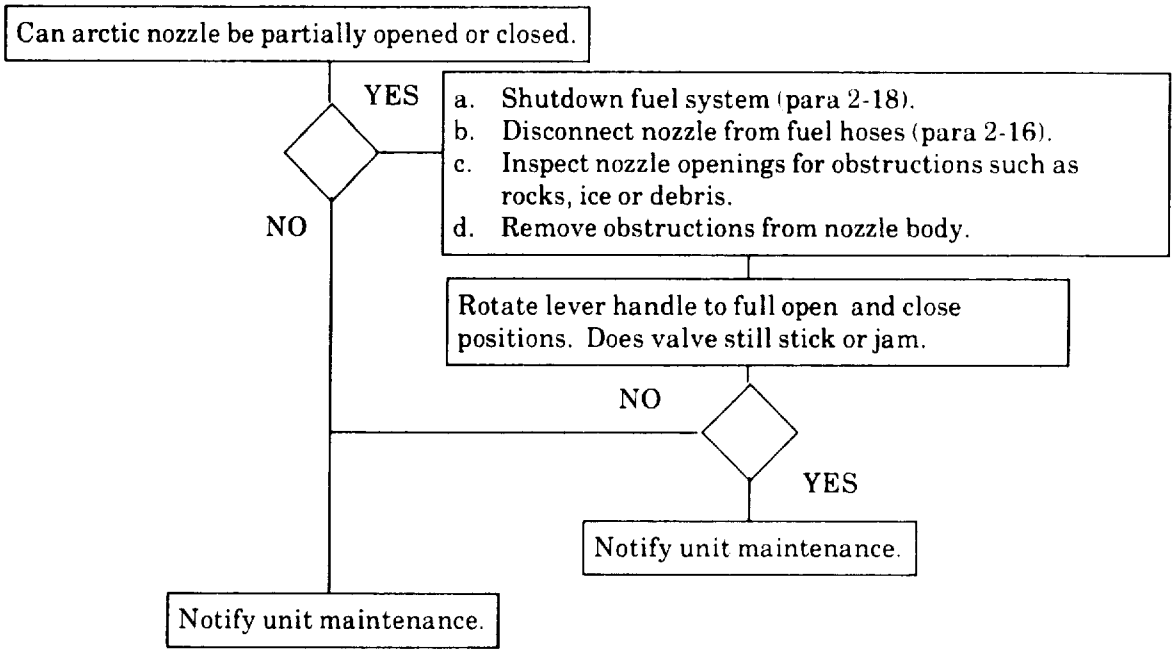


Table 3-1. Operator Troubleshooting - cont.

MALFUNCTION 15. ARCTIC FUEL AND OIL SERVICING NOZZLES STUCK OR JAMMED.



Section III. OPERATOR MAINTENANCE PROCEDURES

Operator maintenance on the AFSSP consists of only those tasks and procedures identified in the Operator's Preventive Maintenance Checks and Services (PMCS) chart. Refer to the operator's PMCS chart and perform all tasks at the intervals specified.

CHAPTER 4

UNIT MAINTENANCE INSTRUCTIONS

Paragraph	Title	Page
Section I	**Repair Parts, Special Tools, Test, Measurement, and Diagnostic Equipment (TMDE), and Support Equipment**	4-2
4-1	Common Tools and Equipment	4-2
4-2	Special Tools, TMDE and Support Equipment	4-2
4-3	Repair Parts	4-2
Section II	**Service Upon Receipt**	4-3
4-4	Siting	4-3
4-5	Shelter Requirements	4-3
4-6	Checking Unpacked Equipment	4-3
Section III	**Unit Preventive Maintenance Checks and Services (PMCS)**	4-4
4-7	General	4-4
4-8	PMCS Procedures	4-4
4-9	PMCS Table	4-5
Section IV	**Unit Troubleshooting Procedures**	4-5
4-10	Introduction	4-5
Section V	**Unit Maintenance Procedures**	4-6
4-11	General	4-7
4-12	Arctic Fuel and Oil Servicing Nozzle Repair	4-6
4-13	Discharge and Suction Hose Repair (Typical)	4-9
4-14	Reducer Assembly (1.5-in M x 2-in F) Repair	4-14
4-15	Reducer Assembly (2-in M x 4-in F) Repair	4-16
4-16	Manifold (4-Inch/One Valve) Repair	4-17
4-17	Gate Valve (4-Inch) Repair (Typical)	4-21
4-18	Coupler Assembly Repair	4-24
4-19	Discharge Hose Assembly (4-in x 50-ft) Repair	4-30
4-20	Discharge Hose Assembly (3-in x 25-ft) Repair	4-30
4-21	Reducer (3-in M x 4-in F) Repair	4-30
4-22	Ball Valve Assembly (4-Inch) Repair	4-30
4-23	Manifold (4-Inch /Five Valves) Repair	4-35
4-24	Elbow (4-in M x 4-in F) Repair	4-35
4-25	Reducer (4-in M x 3-in F) Repair	4-37
4-26	Reducer (6-in M x 4-in F) Repair	4-38
4-27	Suction Hose Assembly (6-in x 10-ft) Repair	4-38
4-28	Manifold (4-Inch) (Three Valves) Repair	4-38
4-29	Gate Valve (4-Inch) Repair	4-38
4-30	Manifold (4-Inch) (Two Valves) Repair	4-38
4-31	Gate Valve (4-Inch) Repair	4-38
4-32	Manifold (6-Inch) (Two Valves) Repair	4-38
4-33	Gate Valve (6-inch) Repair	4-38

Paragraph	Title - cont.	Page
4-34	4-inch Valve Section Repair	4-38
4-35	Gate Valve (4-Inch) Repair	4-38
4-36	Manifold (6-Inch) (One Valve) Repair	4-38
4-37	Adapter (4-in F x 4-in F)	4-39
4-38	Discharge Hose Assembly (4-in x 20-ft) Repair	4-42
4-39	6-inch Valve Section Repair	4-42
4-40	Wye Assembly Repair	4-42
4-41	Extinguisher Frame	4-45
Section V	**Preparation for Storage or Shipment**	4-47
4-42	Security Procedures	4-47
4-43	Administrative Storage	4-47

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

4-1. COMMON TOOLS AND EQUIPMENT.

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE), CTA 50-970 or CTA 8-100, applicable to your unit. The General Mechanics Tools Kit, SC5180-90CL-N26, is authorized for your use.

4-2. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT.

Refer to the Maintenance Allocation Chart contained in Appendix B for maintenance tasks authorized at unit level maintenance and the TMDE and support equipment required to perform these tasks. Special tools required to maintain the AFARE components are listed in Appendix B, Section III.

4-3. REPAIR PARTS.

Repair parts are listed and illustrated in TM10-4930-241-23P Repair Parts and Special Tools List for Unit, Direct Support and General Support maintenance.

Section II. SERVICE UPON RECEIPT

4-4. SITING.

a. Transport. The AFSSP is designed to be packaged and transported by truck or aircraft. Secure AFSSP components to the transport vehicle before movement.

b. Site Selection. When selecting a site for installation of the fuel system, consider the overall operating area. Siting must include access to the aircraft, tanker and rail staging areas and provide adequate space to set up the system, and space for movement of support vehicles. Site should be level, free of overhead obstructions and provide good drainage to prevent water damage. Avoid low areas where fuel vapors can collect. To prevent a hazard to personnel and equipment, site must be located downhill or downstream from other installations. For additional siting information, refer to FM 10-68 and FM10-69.

4-5. SHELTER REQUIREMENTS.

The fuel system does not require special sheltering during normal operation. Store unused fuel system components in a storage van or shelter to prevent damage and minimize routine maintenance.

4-6. CHECKING UNPACKED EQUIPMENT.

a. Unpacking Fuel System Equipment. Components of the AFSSP are packaged and shipped in cardboard boxes or crates. Where possible, save packaging materials for reuse. Use ca e when unpacking to prevent damage to fragile components. This manual addresses installation and use of all components, but you may not need to unpack all of them to perform your mission.

Refer to the applicable technical manuals for unpacking instructions for the following equipment:

600 GPM Pump Assembly ..... TM 10-4320-342-24
Closed Circuit Refueling (CCR) Nozzle and Gravity Fill Adapter ..... TM 10-4930-243-13&P
Single Point Refueling Nozzle (D1) ..... TM 10-4930-242-13&P
Collapsible Fabric Tank, Low Temperature ..... TM 10-543231-12
200 Gpm Filter-Separator ..... TM 10-4330-236-13

4-6. CHECKING UNPACKED EQUIPMENT - cont.

b. Processing Unpacked Equipment.

(1) Remove all tape, paper wrapping, plastic sheeting and packing materials from the AFSSP components.

(2) Inspect stencils, markings and information plates. All items should be clear and readable.

(3) Inspect all components to make sure they are in serviceable condition.

(4) Inspect the equipment for any damage incurred during shipment. If the equipment has been damaged, report the damage on SF 364, Report of Discrepancy.

(5) Check equipment against the packing slip to see if the shipment is complete. Report all discrepancies in accordance with the instructions of DA Pam 738-750.

(6) Check to see if the equipment has been modified.

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

4-7. GENERAL.

To ensure that the AFSSP is ready for use at all times, it must be inspected systematically so that defects may be discovered and corrected before they result in serious damage or equipment failure.

4-8. PMCS PROCEDURES.

a. Your Preventive Maintenance Checks and Services, Table 4-1, lists inspections and care required to keep your equipment in good operating condition.

b. The "INTERVAL" column of Table 4-1 tells you when to do a certain check or service.

c. The "LOCATION, ITEM TO CHECK/SERVICE" column of Table 4-1 tells you the name of the item to be checked or serviced and where the item is located.

d. The "PROCEDURE" column of Table 4-1 tells you how perform the required checks and services. Follow these instructions carefully.

4-9. PMCS TABLE.

The necessary preventive maintenance services to be performed are listed and described in Table 4-1. Defects discovered during operation of the system should be corrected as soon as possible. All deficiencies and shortcomings will be recorded, together with the corrective action taken, on DA Form 2404 (Equipment Inspection and Maintenance Worksheet) as soon as possible.

Table 4-1. Unit Preventive Maintenance Checks and Services for Model AFSSP100.

Item No.	Interval	Location Item to Check/Service	Procedure
1	Monthly	CCR Nozzle	Perform unit PMCS procedures at the intervals specified in **TM 10-4930-243-13&P**
2	Monthly	Filter Separator	Perform unit PMCS procedures at the intervals specified in **TM 10-4330-236-13**
3	Monthly	600 Gpm Pump	Perform unit PMCS procedures at the intervals specified in **TM 10-4320-342-24**.
4.	Monthly	3K, 10K and 20K Collapsible Tanks	Perform unit PMCS procedures at the intervals specified in **TM 10-5430-231-12**.
5	Monthly	Single Point Refueling Nozzle (D1)	Perform unit PMCS procedures at the intervals specified in **TM 10-4930-242-13&P**

Section IV. UNIT TROUBLESHOOTING PROCEDURES

4-10. INTRODUCTION.

a. The troubleshooting table lists the common malfunctions which you may find during operation of the AFSSP. You should perform the tests, inspections and corrective actions in the order they appear in the table.

b. This table cannot list all the malfunctions that may occur, all the tests or inspections needed to find the fault, or all the corrective actions needed to correct the fault. If the equipment malfunction is not listed or actions listed do not correct the fault, notify your supervisor.

c. Refer to the technical manuals for operator troubleshooting procedures on the following equipment:

600 GPM Pump Assembly ..... TM 10-4320-342-24
Closed Circuit Refueling (CCR) Nozzle and Gravity Fill Adapter ..... TM 10-4930-243-13&P
Single Point Refueling Nozzle (D-1) ..... TM 10-4930-242-13&P
Collapsible Fabric Tank, Low Temperature ..... TM 10-430-231-12
200 Gpm Filter-Separator ..... TM 14330-23613

Section V. UNIT MAINTENANCE PROCEDURES

4-11. GENERAL.

This section contains instructions for performing unit level maintenance on the AFSSP.

4-12. ARCTIC FUEL AND OIL SERVICING NOZZLE REPAIR.

This task covers:

a. Disassembly **b. Cleaning** **c. Repair**
d. Assembly

INITIAL SETUP:

Tools:
General Mech. Tool Kit (App B, Sect III, Item 1)
Pipe Wrench (App B, Sect III, Item 4)

Equipment Condition:
Nozzle removed (para 2-21)

Material/Parts:

Cleaning Solvent	(Item 1, App E)
Wiping Rag	(Item 2, App E)
Thread Sealant	(Item 3, App E)
Coupling Gasket	(Item 1, App I)

NOTE

Ensure that all parts identified as mandatory replacement parts are discarded and replaced with new components.

a. Disassembly. Refer to figure 4-1.

(1) Disconnect split rings (1 and 2) and remove chain (3).

(2) Remove dust plug (4) from female coupling half (6).

(3) Remove gasket (5) from female coupling half (6).

(4) Remove female coupling half(6) from nozzle (7).

b. Cleaning.

WARNING

Dry cleaning solvent, P-D-680, Type III, is potentially dangerous to personnel and equipment. Eye and skin protection is required. Avoid repeated and prolonged skin contact. Wash hands immediately after exposure. Do not use near open flame or excessive heat. Use only in areas with good ventilation.

Using wiping rags and cleaning solvent, remove dirt and contaminants from all components.

c. Repair. Replace damaged or defective components.

4-12. ARCTIC FUEL AND OIL SERVICING NOZZLE REPAIR - cont.

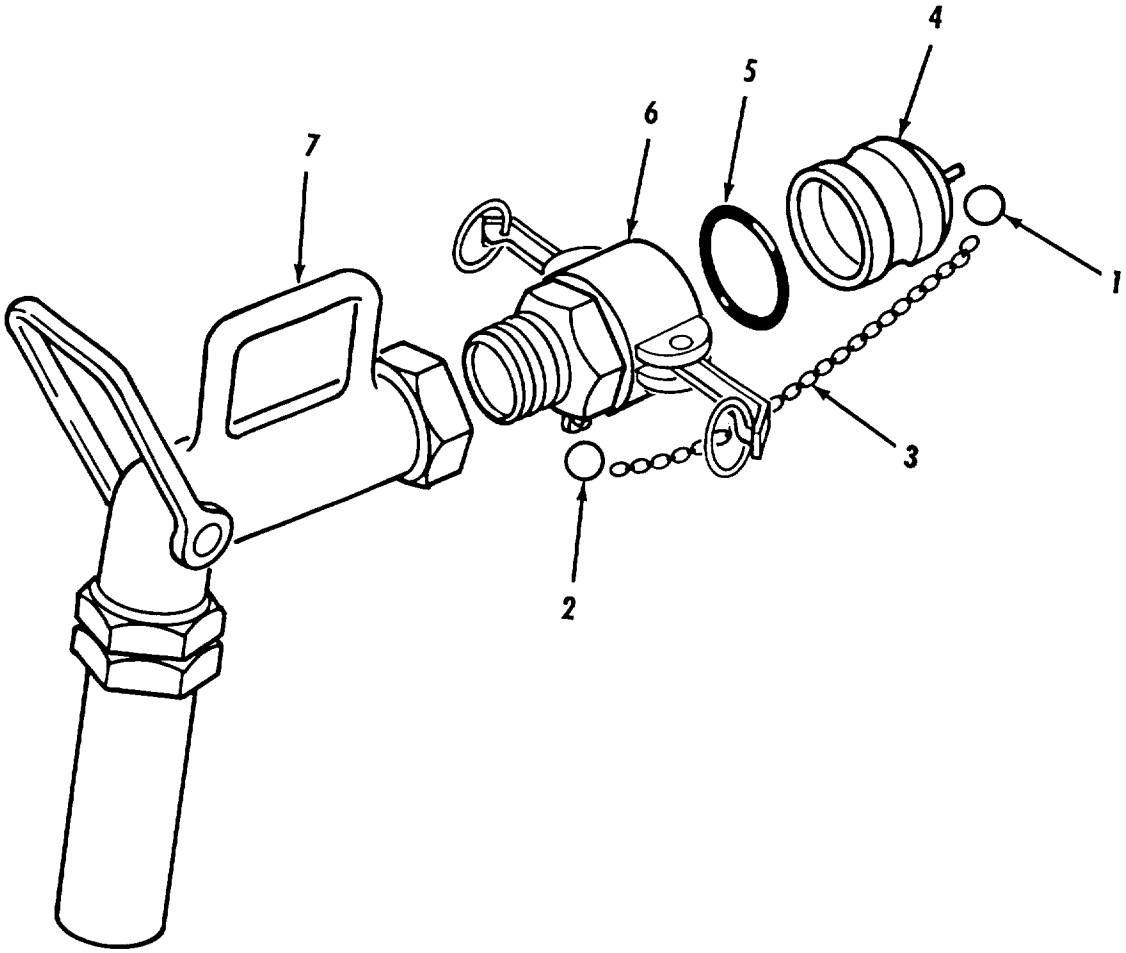


Figure 4-1. Arctic Fuel and Oil Servicing Nozzle Disassembly.

4-12. ARCTIC FUEL AND OIL SERVICING NOZZLE REPAIR - cont.

d. Assembly. Refer to figure 4-1.

(1) Apply thread sealant to male threads on female coupling half (6).

(2) Install female coupling half (6) on nozzle (7).

CAUTIONS

* To prevent premature failure of nozzle, gaskets certified for arctic service must be installed. If a new female coupling half has been installed, remove and discard black gaskets supplied with the new component and replace it with an arctic service gasket.
* Ensure gasket is fully seated in gasket seat of coupling/dust cap to prevent leaks in assembled components.

(3) Install gasket (5) in female coupling half(6).

(4) Install dust plug (4) in female coupling half (6).

(5) Connect chain (3) and split rings (1 and 2).

4-13. DISCHARGE AND SUCTION HOSE REPAIR (TYPICAL).

NOTE

The following procedure applies to all sizes and lengths of discharge and suction hoses used in the fuel system.

This task covers:

a. Disassembly **b. Cleaning**
c. Repair **d. Assembly**

INITIAL SETUP:

Tools:
General Mech. Tool Kit (App B, Sect III, Item 1)
Clamping Tool (App B, Sect III, Item 3)
Vice (App B, Sect III, Item 2)
Equipment Condition:
Hose assembly removed (para 2-21)
Material/Parts:
Cleaning Solvent (Item 1, App E)
Wiping Rag (Item 2, App E)
Gasket (2) (Item 1, App I)
Seal (4) (Item 2, App I)
Strapping (A/R) (Item 3, App I)
Gasket (2) (Item 4, App I)
Seal (4) (Item 5, App I)
Strapping (A/R) (Item 6, App I)
Gasket (2) (Item 7, App I)
Seal (4) (Item 8, App I)
Strapping (A/R) (Item 9, App I)
Gasket (2) (Item 10, App I)
Seal (4) (Item 11, App I)
Strapping (A/R) (Item 12, App I)
Gasket (2) (Item 13, App I)
Seal (6) (Item 14, App I)
Strapping (A/R) (Item 15, App I)

NOTE

* Ensure that all parts identified as mandatory replacement parts are discarded and replaced with new components. Disassemble hoses only to the level required to make repairs.
* Six inch diameter hoses require three strapping clamps and seals at each end of hose.

a. Disassembly. Refer to figure 4-2.

(1) Disconnect split ring (1), chain (2) and split ring (3) from dust plug (4).

(2) Remove dust plug (4) from female coupling (6).

(3) Remove gasket (5) from female coupling (6).

(4) Disconnect split ring (7), chain (8) and split ring (9) from dust cap (10).

(5) Remove dust cap (10) from male coupling (12).

(6) Remove gasket (11) from dust cap (10).

(7) Cut strapping (13 and 14) from hose (17). Pull female coupling (6) from hose.

(8) Cut strapping (15 and 16) from hose (17). Pull male coupling (12) from hose.

4-13. DISCHARGE AND SUCTION HOSE REPAIR (TYPICAL) - cont

b. Cleaning.

WARNING

Dry cleaning solvent, P-D-680, Type III, is potentially dangerous to personnel and equipment. Eye and skin protection is required. Avoid repeated and prolonged skin contact. Wash hands immediately after exposure. Do not use near open flame or excessive heat. Use only in areas with good ventilation.

Using wiping rags and cleaning solvent, remove dirt and contaminants from all components.

c. Repair. Replace damaged components. Do not reuse coupling gaskets (5 and 11).

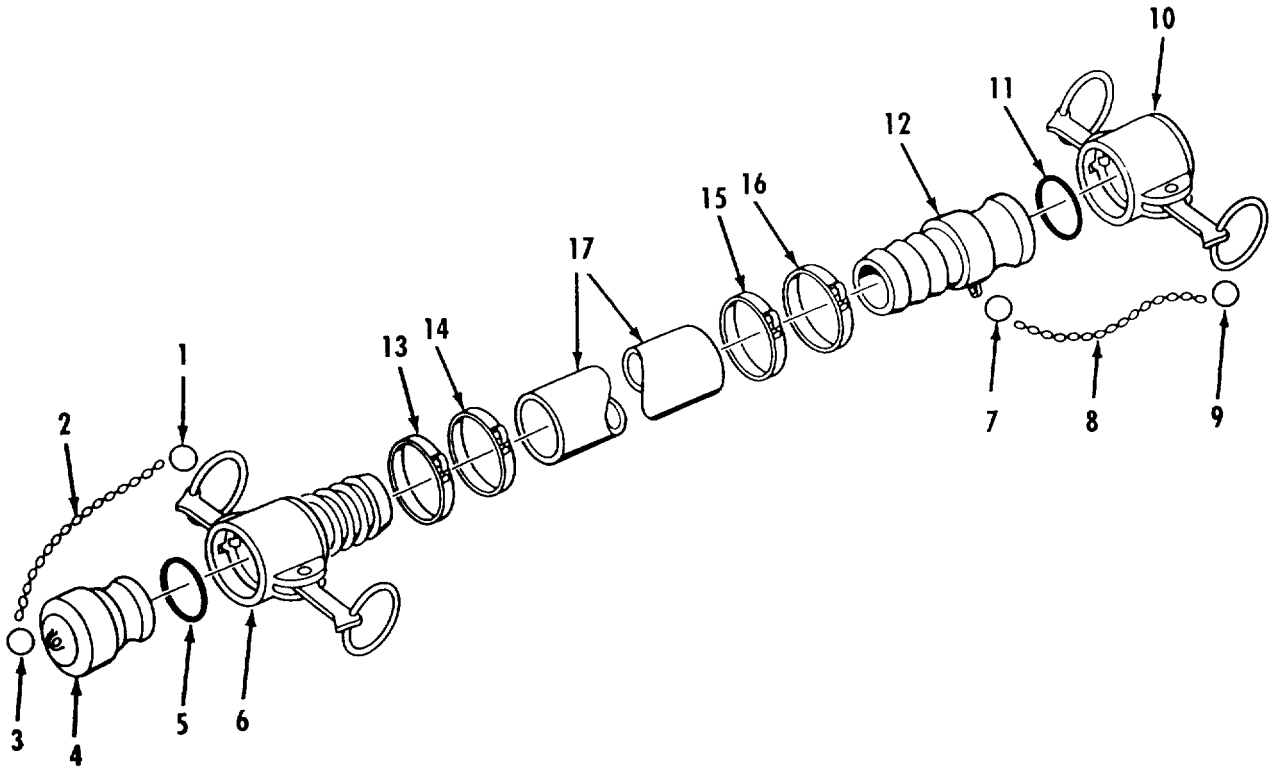


Figure 4-2. Discharge and Suction Hose Disassembly.

4-13. DISCHARGE AND SUCTION HOSE REPAIR (TYPICAL) - cont

NOTE

The following procedure applies to all sizes and lengths of discharge and suction hoses used in the fuel system.

d. Assembly.

(1) Push male coupling (12, figure 4-2) and female coupling (6) into hose (17).

NOTE

Strapping and seals are supplied in the accessory kit.

(2) Cut a piece of strapping (1, figure 4-3) 36 inches long.

(3) Slide seal (2) onto strapping (1) as shown. Bend end of strapping under seal.

(4) Wrap other end of strapping (1) around hose (3) and through seal (2). Position strapping on hose about 1 inch from end of coupling.

(5) Wrap another loop of strapping (1) around hose (3) and through seal (2).

(6) Position strapping (1) in slots of clamping tool (4). Tool nose (5) should fit snug against seal (2).

(7) Apply pressure to gripper lever (6) and turn handle (7) until strapping (1) is snug. Tool will lock in place when correct tension is applied. Reposition tool as required.

CAUTION

Strapping can damage hose if over tightened.

(8) Turn handle (7) clockwise to tighten strapping (1). Continue turning handle until strapping stops moving through seal (2).

CAUTION

Strapping may break if operator does not release tension on handle when bending over seal.

(9) While reversing handle (7) 3/4 turn, roll tool (4) to opposite side of seal (2). (This will bend strapping and prevent it from slipping through seal when tool is removed.)

(10) Pull cutting handle (8) on tool to cut strapping (1).

(11) Remove tool (4) while holding tag end of strapping down on seal (2) with thumb.

(12) Clinch tag end of strapping (1) by hammering down tabs of seal (2) over strapping.

(13) Repeat steps (2) through (12) for three remaining straps. Straps should be spaced 1-inch from end of coupling and 1-inch apart.

4-13. DISCHARGE AND SUCTION HOSE REPAIR (TYPICAL) - cont.

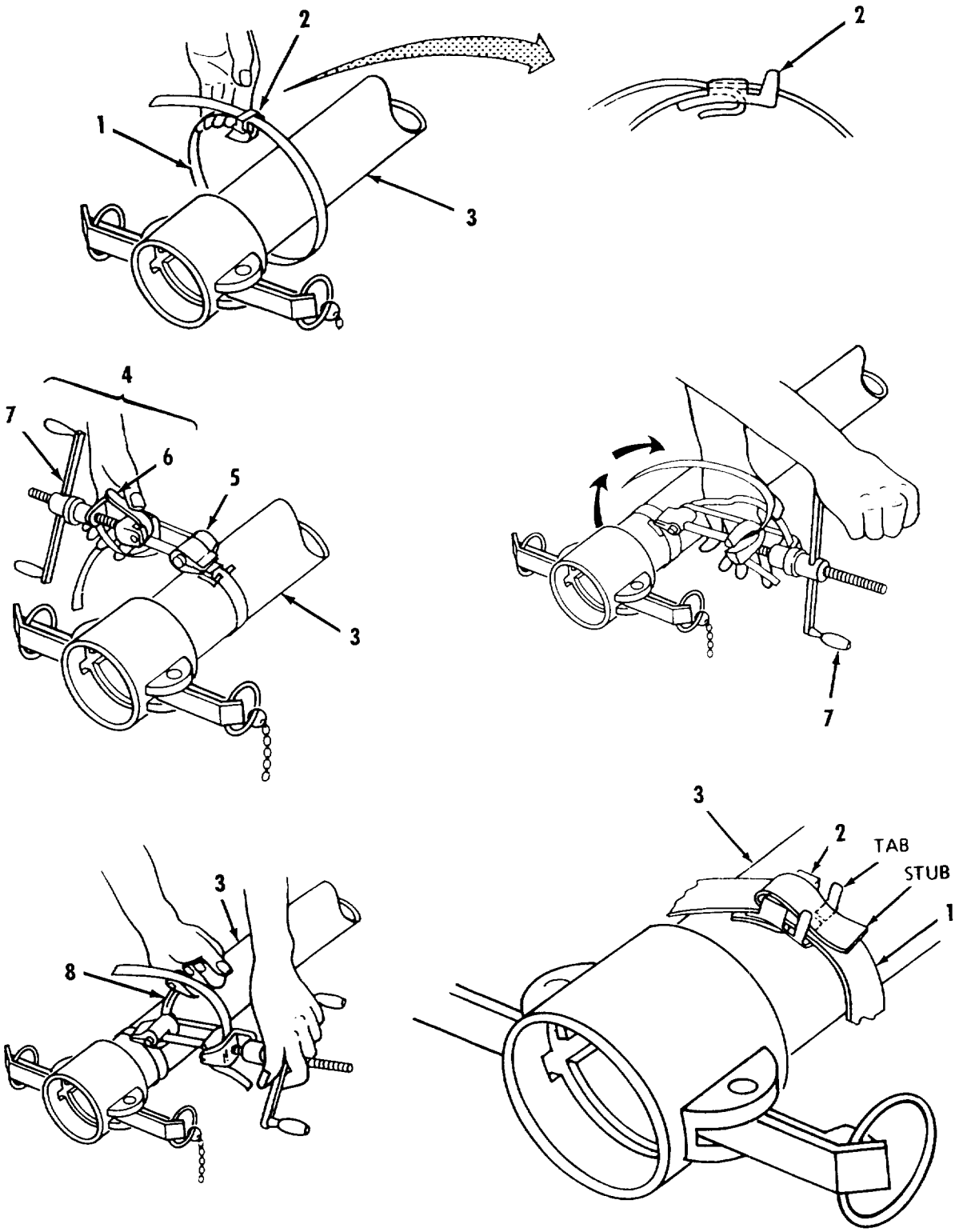


Figure 4-3. Strapping and Seal Installation.

4-13. DISCHARGE AND SUCTION HOSE REPAIR (TYPICAL) - cont

CAUTIONS

* To prevent premature failure of hose assembly, gaskets certified for arctic service must be installed. If a new dust cap or female coupling has been installed, remove and discard black gaskets supplied with the new components and replace them with arctic service gaskets.

* Ensure gasket is fully seated in gasket seat of coupling/dust cap to prevent leaks in assembled components.

(14) Install gasket (5, figure 4-2) in female coupling (6).

(15) Install gasket (11) in dust cap (10).

(16) Connect split ring (9), chain (8) and split ring (7) to dust cap (10) and male coupling (12).

(17) Connect split ring (1), chain (2) and split ring (3) to dust plug (4) and install in female coupling (6).

(18) Install dust plug (4) in female coupling (6).

4-14. REDUCER ASSEMBLY (1.5 IN. M X 2 IN. F) REPAIR.

NOTE

This procedure applies to all reducers in the AFFSP.

This task covers:

a. Disassembly **b. Cleaning**
c. Repair **d. Assembly**

INITIAL SETUP:

Tools:
General Mech. Tool Kit (App B, Sect III, Item 1)
Equipment Condition:
Reducer assembly removed (para 2-21)
Material/Parts:
Cleaning Solvent (Item 1, App E)
Wiping Rag (Item 2, App E)
Gasket (Item 1, App I)
Gasket (Item 4, App I)
Gasket (Item 7, App I)
Gasket (Item 10, App I)
Gasket (Item 13, App I)

NOTES

* Ensure that all parts identified as mandatory replacement parts are discarded and replaced with new components.
* The following instructions are typical for all reducers supplied with the AFSSP. A 1 1/2-in. Male X 2-in. Female reducer assembly is shown. Repair of other reducers is similar.

a. Disassembly. Refer to figure 4-4.

(1) Disconnect split rings (1, 2 and 3) and remove chains (4 and 5).

(2) Remove dust plug (6) from female end of reducer (10).

(3) Remove gasket (7) from female end of reducer (10).

(4) Remove dust cap (9) from male end of reducer (10).

(5) Remove gasket (8) from dust cap (9).

b. Cleaning.

WARNING

Dry cleaning solvent, P-D-680, Type III, is potentially dangerous to personnel and equipment. Eye and skin protection is required. Avoid repeated and prolonged skin contact. Wash hands immediately after exposure. Do not use near open flame or excessive heat. Use only in areas with good ventilation.

Using wiping rags and cleaning solvent, remove dirt and contaminants from all components.

4-14. REDUCER ASSEMBLY (1.5 IN. M X 2 IN. FEM) REPAIR - cont.

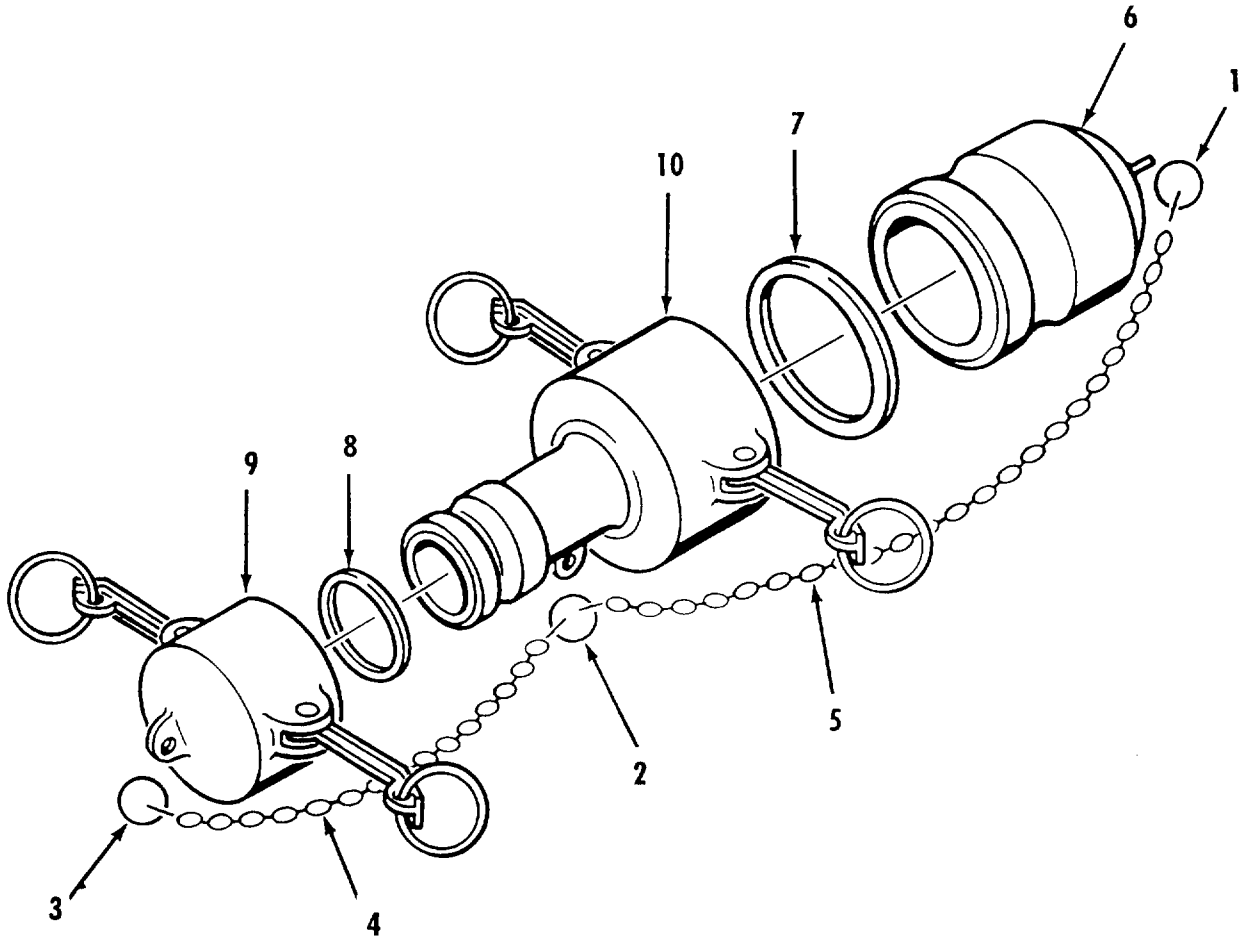


Figure 4-4. Reducer Repair.

4-14. REDUCER ASSEMBLY (2 IN. M X 3 IN. FEM) REPAIR - cont.

c. Repair. Replace damaged or defective components.

d. Assembly. Refer to figure 4-4.

CAUTIONS

* To prevent premature failure of reducer assembly, gaskets certified for arctic service must be installed. If a new dust cap or reducer has been installed, remove and discard black gaskets supplied with the new components and replace them with arctic service gaskets.
* Ensure gasket is fully seated in gasket seat of reducer/dust cap to prevent leaks in assembled components.

(1) Install gasket (8) in dust cap (9).

(2) Install dust cap (9) on male end of reducer (10).

(3) Install gasket (7) in female end of reducer (10).

(4) Install dust plug (6) in female end of reducer (10).

(5) Install chains (4 and 5) with split rings (1, 2 and 3).

4-15. REDUCER ASSEMBLY (2 IN. M X 4 IN. FEM) REPAIR.

Refer to para 4-14 to repair the 2-in. M X 4-in. F reducer assembly

4-16. MANIFOLD (4-INCH/ONE VALVE) REPAIR.

NOTE

The following procedure applies to all sizes of manifolds and gate valve sections in the AFFSP.

This task covers:

a. Disassembly **b. Cleaning**
c. Repair **d. Assembly**

INITIAL SETUP:

Tools:
General Mech. Tool Kit (App B, Sect III, Item I)
Equipment Condition:
4-Inch Manifold removed (para 2-21)

Material/Parts:

Cleaning Solvent	(Item 1, App E)
Wiping Rag	(Item 2, App E)
Coupling Gasket (3)	(Item 10, App I)
Flange Gasket (4)	(Item 16, App I)
Lockwasher (32)	(Item 17, App I)

NOTE

Ensure that all parts identified as mandatory replacement parts are discarded and replaced with new components.

a. Disassembly. Refer to figure 4-5.

(1) Disconnect split ring (1), chain (2) and split ring (3) from dust plug (4).

(2) Remove dust plug (4) from female coupling half (5).

(3) Remove gasket (6) from female coupling half (5).

(4) Remove nuts (7), lockwashers (8), flat washers (9) and cap screws (10.

(5) Separate female coupling half (5) and flange gasket (11) from tee (12).

(6) Disconnect split ring (13), chain (14) and split ring (15) from dust cap (16).

(7) Remove dust cap (16) and remove gasket (17).

(8) Remove nuts (18), lockwashers (19), flat washers (20) and cap screws (21).

(9) Separate male coupling half(22) and flange gasket (23) from gate valve (24).

(10) Remove nuts (25), lockwashers (26), flat washers (27) and cap screws (28).

(11) Separate gate valve (24) and flange gasket (29) from tee (12).

(12) Disconnect split ring (30), chain (31) and split ring (32) from dust cap (33).

14-16. MANIFOLD (4-INCH/ONE VALVE) REPAIR- cont.

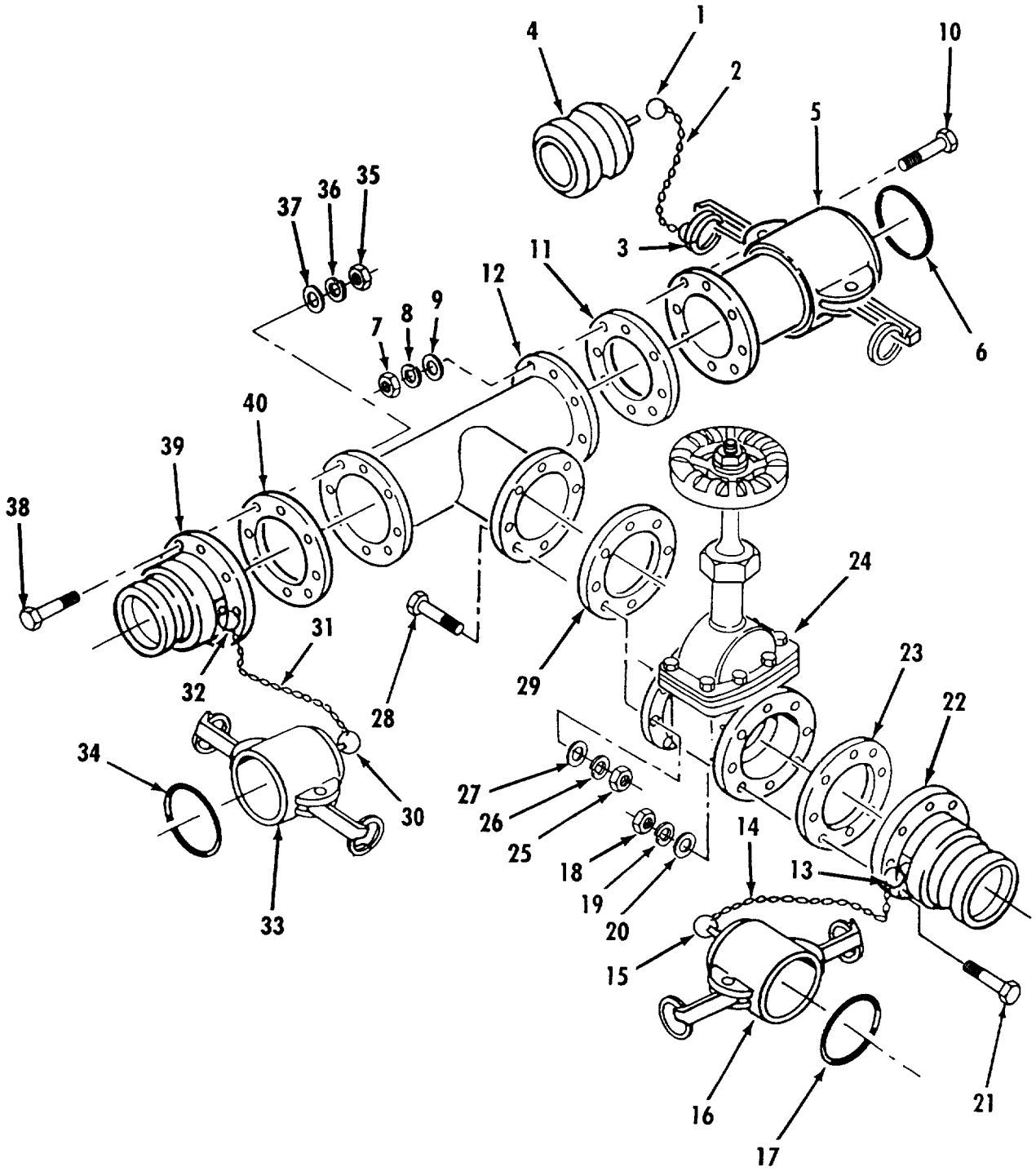


Figure 4-5. Manifold (4-Inch/One Valve) Repair.

4-16. MANIFOLD (4-INCH/ONE VALVE) REPAIR - cont.

(13) Remove dust cap (33) and remove gasket (34).

(14) Remove nuts (35), lockwashers (36), flat washers (37) and cap screws (38).

(15) Separate male coupling half(39) and flange gasket (40) from tee (12).

b. Cleaning.

WARNING

Dry cleaning solvent, P-D-680, Type III, is potentially dangerous to personnel and equipment. Eye and skin protection is required. Avoid repeated and prolonged skin contact. Wash hands immediately after exposure. Do not use near open flame or excessive heat. Use only in areas with good ventilation. Using wiping rags and cleaning solvent, remove dirt and contaminants from all components.

c. Repair.

(1) Refer to para. 4-17 to repair gate valve.

(2) Replace defective components. Do not reuse sealing components.

d. Assembly. Refer to figure 4-5.

CAUTIONS

* To prevent premature failure of manifold, coupling gaskets and flange gaskets certified for arctic service must be installed. If a new dust cap or female coupling half has been installed, remove and discard black gaskets supplied with the new components and replace them with arctic service gaskets.
* Ensure gasket is fully seated in gasket seat of coupling/dust cap to prevent leaks in assembled components.

(1) Position flange gasket (40) and male coupling half (39) on tee (12).

(2) Install cap screws (38), flat washers (37), lockwashers (36) and nuts (35). **Tighten nuts** evenly in a cross pattern.

(3) Install gasket (34) in dust cap (33) and connect to male coupling half (39).

4-16. MANIFOLD (4-INCH/ONE VALVE) REPAIR - cont.

(4) Connect chain (31) and split rings (30 and 32).

(5) Position flange gasket (29) and gate valve (24) on tee (12).

(6) Install cap screws (28), flat washers (27), lockwashers (26) and nuts (25). Tighten nuts evenly in a cross pattern.

(7) Position flange gasket (23) and male coupling half 122) on gate valve (24).

(8) Install cap screws (21), flat washers (20), lockwashers (19) and nuts (18). Tighten nuts evenly in a cross pattern.

(9) Install gasket (17) in dust cap (16). Connect dust cap to male coupling half (22).

(10) Connect chain (14) and split rings (13 and 15).

(11) **Position flange gasket (11) and female coupling half (5) on tee (12).**

(12) Install cap screws (10), flat washers (9), lockwashers (8) and nuts (7). Tighten nut evenly in a cross pattern.

(13) Install gasket (6) in female coupling half (5).

(14) Connect dust plug (4) to female coupling half (5).

(15) Connect chain (2) and split rings (1 and 3) to dust plug (4).

4-17. GATE VALVE (4-INCH) REPAIR(TYPICAL).

NOTE

The following procedure applies to all gate valves in the AFSSP.

This task covers:

a. Disassembly **b. Cleaning** **c. Inspection**
d. Repair **e. Assembly**

INITIAL SETUP:

Tools:
General Mech. Tool Kit (Item 1, App B)
Equipment Condition:
4-inch gate valve removed (para 2-21)
Material/Parts:
Cleaning Solvent (Item 1, App E)
Wiping Rag (Item 2, App E)
Packing Ring (Item 18, App I)
Gasket (Item 19, App I)
Lockwasher (Item 20, App I)

NOTE

Ensure that all parts identified as mandatory replacement parts are discarded and replaced with new components.

a. Disassembly. Refer to figure 4-6.

(1) Remove nut (1) and handwheel (2) from stem (12).

(2) Remove packing nut (3), gland spring (4), packing gland (5) and packing (6) from top of bonnet (10).

(3) Remove nuts (7), lockwashers (8), and cap screws (9) from valve body (17) and bonnet (10).

NOTE

If needed, tap bonnet with mallet to loosen sealing surfaces.

(4) Remove bonnet (10), gasket (11), and attached parts from valve body (17).

(5) Remove two allen screws (13) and separate discs (14 and 15) from disc riser (16).

(6) Remove disc riser (16) from stem (12).

(7) Unscrew stem (12) from bottom of bonnet (10).

b. Cleaning.

WARNING

Dry cleaning solvent, P-D-680, Type III, is potentially dangerous to personnel and equipment. Eye and skin protection is required. Avoid repeated and prolonged skin contact. Wash hands immediately after exposure. Do not use near open flame or excessive heat. Use only in areas with good ventilation.

Using wiping rags and cleaning solvent, remove dirt and contaminants from all components.

4-17. GATE VALVE ASSEMBLY (4-INCH) REPAIR - cont.

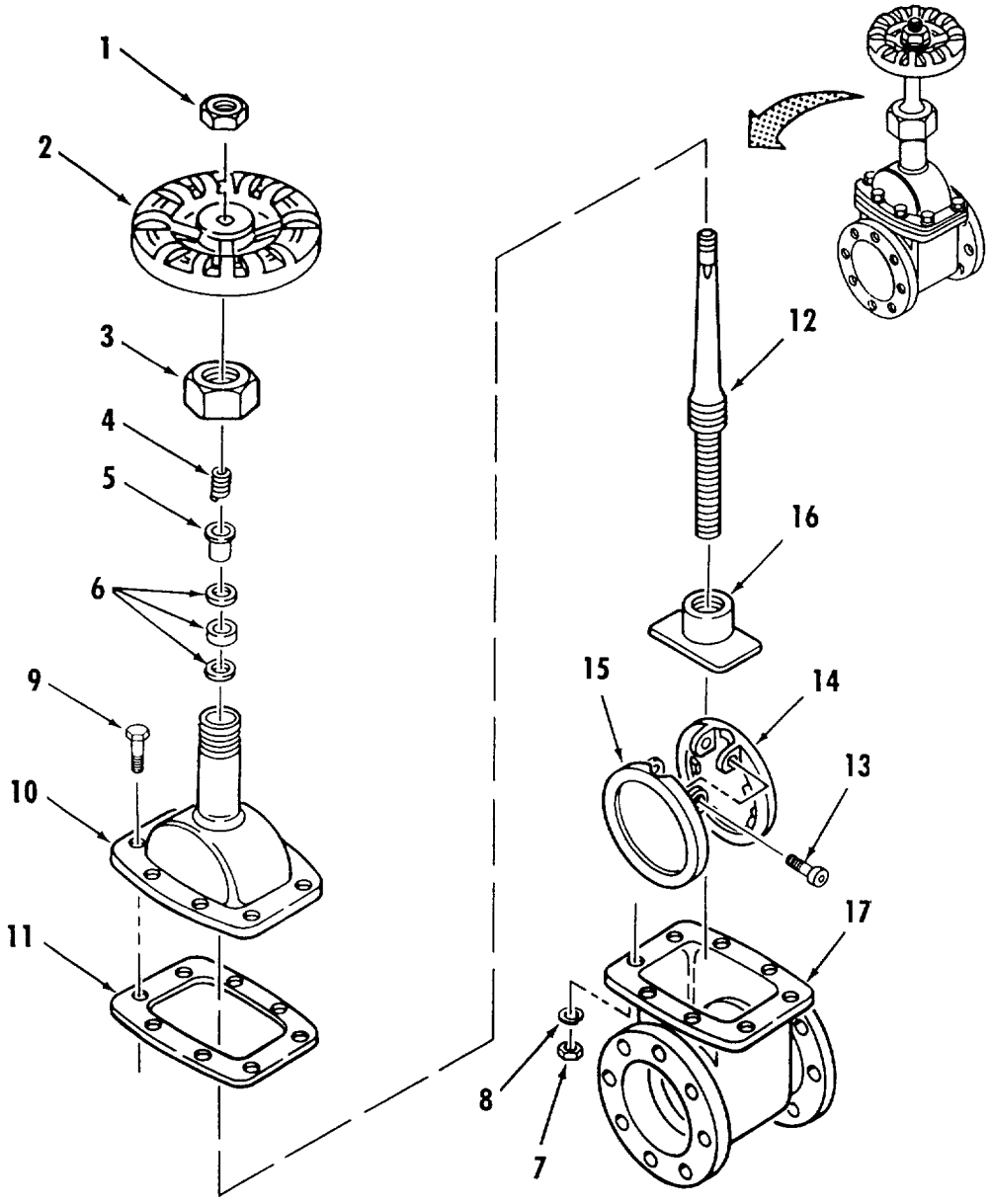


Figure 4-6. 4-Inch Gate Valve Repair.

4-17. GATE VALVE ASSEMBLY (4-INCH) REPAIR - cont.

c. Inspection. Refer to figure 4-6.

(1) Inspect bonnet (10) and valve body (17) for cracks, scored mating surfaces, stripped threads and corrosion.

(2) Inspect for bent stem (12) and galled or stripped threads.

(3) Inspect sealing surfaces of discs (14 and 15) and valve body (17) for deep scratches and cracks.

d. Repair. Replace damaged or defective parts. Replace all sealing components.

e. Assembly. Refer to figure 4-6.

(1) Screw stem (12) all the way into bottom of bonnet (10), then back out stem three full turns. Do not allow stem to move from this position.

(2) While holding stem (12) in place, screw disc riser (16) onto stem until bottom of riser is flush with end of stem.

(3) Position discs (14 and 15) on disc riser (16) and install two alien screws (13).

(4) While preventing stem (12) from turning in bonnet (10), turn discs (14 and 15) and riser (16) counterclockwise onto stem until top of discs contact bottom of bonnet.

(5) Position gasket (11) on valve body (17).

(6) While holding stem (12) in position, lower bonnet (10) and discs (14 and 15) into valve body (17). Do not rotate discs more than 1/4 turn to aline discs with body.

(7) Install cap screws (9), lockwashers (8) and nuts (7) in valve body (17) and bonnet (10). Tighten nuts evenly in a cross pattern.

(8) Slide packing (6) over stem (12) and down into bonnet (10).

(9) Slide packing gland (5) and gland spring (4) over stem (12).

(10) Slide packing nut (3) over stem (12) and tighten onto top of bonnet (10).

(11) Position handwheel (2) on stem (12) and secure with nut (1).

4-18. COUPLER ASSEMBLY REPAIR

This task covers:

a. Disassembly **b. Cleaning**
c. Repair **d. Assembly**

INITIAL SETUP:

Tools:		Thread Sealant	(Item 3, App E)
General Mech. Tool Kit	(App B, Sect III, Item 1)	Silicone Lubricant	(Item 6, App E)
Vise	(App B, Sect III, Item 2)	Coupling Gasket (2)	(Item 10, App I)
Pipe Wrench (2 ea)	(App B, Sect III, Item 5)	Seal	(Item 25, App I)
Adjustable Wrench	(App B, Sect III, Item 2)	Cotter Pin	(Item 26, App I)
Equipment Condition:		Cotter Pin	(Item 27, App I)
Coupler removed	(para 2-20)	Seal	(Item 28, App I)
Material/Parts:		Cylinder	(Item 29, App I)
Cleaning Solvent	(Item 1, App E)		
Wiping Rag	(Item 2, App E)		

NOTE

Ensure that all parts identified as mandatory replacement parts are discarded and replaced with new components.

a. Disassembly.

Remove Couplings. Refer to figure 4-7.

(1) Place coupler in vise.

(2) Remove split rings (1 and 2) and chain (3).

(3) Remove dust cap (4), then remove gasket (5) from dust cap (4).

(4) Remove male coupling half (6) from coupler body (7).

(5) Remove gasket (8) from coupler body (7).

Disassemble Coupler. Refer to figure 4-8.

(6) Turn handle (1) to open position.

(7) Remove cotter pin (2) from end of shaft (3).

(8) Drive out groove pin (4) from handle (1). Pin must be driven out in the opposite direction of the flow arrow on handle (1).

4-18. COUPLER ASSEMBLY REPAIR - cont.

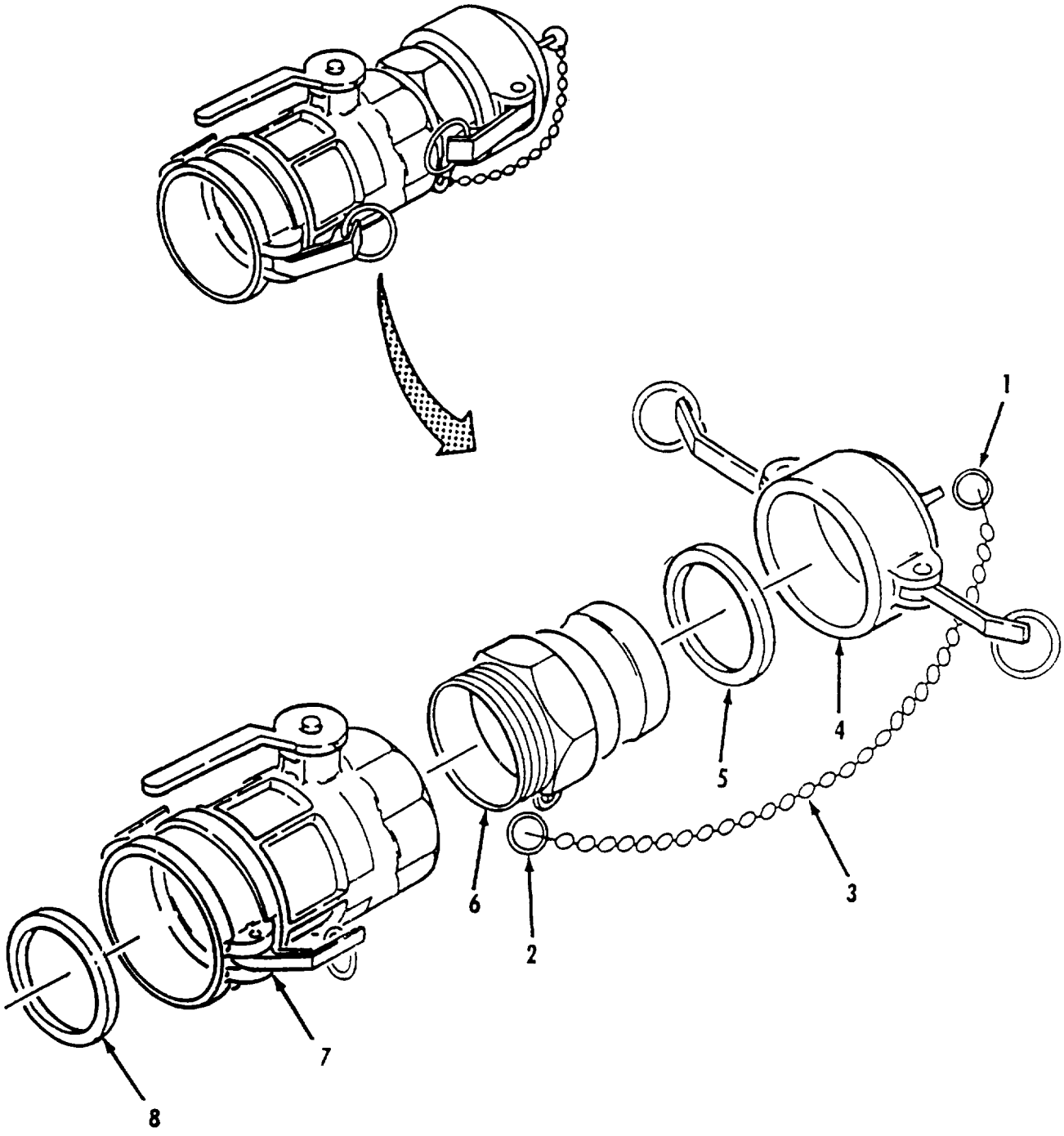


Figure 4-7. Coupling Replacement.

4-18. COUPLER ASSEMBLY REPAIR - cont.

(9) Remove handle (1) from top of shaft (3).

(10) Remove stuffing box (5) **and seal (6).**

(11) Note position of drive pin hole before **removing shaft (3).**

(12) Pull shaft (3), bushing (7), seal (8) and retainer (9) from body (10).

(13) Note position of yoke (11) in body (10).

WARNING

Assembled components are under spring tension. Use care when removing components to prevent injury from flying parts. Slowly release spring tension as components are removed.

(14) While pushing poppet (12) against spring (13), turn and aline yoke (11) with cutouts in washer (14). Slowly release spring tension and remove poppet and yoke components as an assembly.

(15) Slide spring (13) off over yoke (11).

(16) Remove screw (15) and seal (16) from end of poppet (12).

NOTE

To aid in assembly, count and record the number of turns required to remove setscrew from poppet.

(17) Remove setscrew (17) from poppet (12).

(18) Unscrew poppet (12) and remove poppet (12), poppet guide (18) and cylinder (19) from stem (20).

(19) Remove cotter pins (21 and 22) from pin (23).

(20) Remove pin (23) and stem (20) from link (24).

(21) Note position of yoke (11) and link (24) before separating.

(22) **Remove cotter pins (25 and 26) from pin (27).**

(23) Remove pin (27) from yoke (11).

(24) Remove packing (28), washer (14) and bushing (29) from body (10).

4-18. COUPLER ASSEMBLY REPAIR REPAIR - cont.

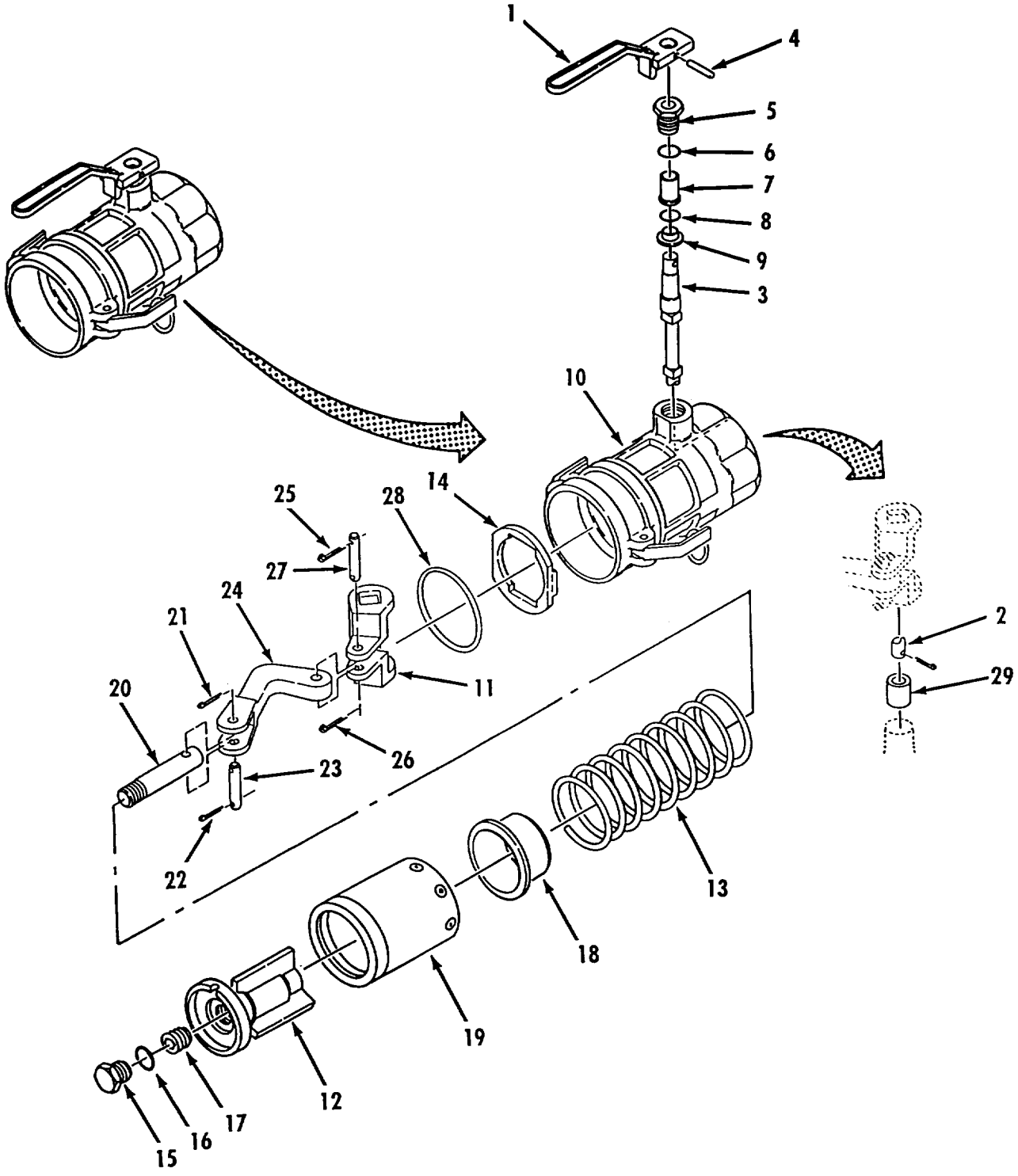


Figure 4-8. Coupler Repair.

4-18. COUPLER ASSEMBLY REPAIR - cont.

b. Cleaning.

WARNING

Dry cleaning solvent, P-D-680, Type III, is potentially dangerous to personnel and equipment. Eye and skin protection is required. Avoid repeated and prolonged skin contact. Wash hands immediately after exposure. Do not use near open flame or excessive heat. Use only in areas with good ventilation.

Using wiping rags and cleaning solvent, remove dirt and contaminants from all components.

c. Repair. Replace damaged or defective parts and all sealing components.

d. Assembly. Refer to figure 4-8

(1) Install bushing (29) in body (10)

(2) Install washer (14) with tabs facing inward in body (10).

(3) Apply lubricant to packing and install in body (10).

(4) Aline link (24) with yoke (11) as noted during disassembly and install pin (27).

(5) Install cotter pins (25 and 26) in pin (27).

(6) Aline stem (20) in link (24) and install pin (23).

(7) Install cotter pins (21 and 22) in pin (23).

(8) Install setscrew (17) in poppet (12). Setscrew must be turned in the same amount as recorded during disassembly.

(9) Position poppet guide (18) and cylinder (19) over stem (20).

(10) Insert poppet (12) into cylinder (19) and screw poppet (12) onto stern (20) until it stops, then tighten.

(11) Install seal (16) on screw (15), then install screw (15) into poppet (12)

WARNING

Assembled components are under spring tension. Use care when installing body to prevent injury from flying parts. Slowly compress spring when installing.

(12) Slide spring (13) on over yoke (11).

4-18. COUPLER ASSEMBLY REPAIR - cont.

(13) Apply lubricant to cylinder (19) and push assembly yoke and poppet components into body (10).

NOTE

Ensure yoke is locked in the same position as noted during disassembly.

(14) Aline and push yoke (11) through cutouts in washer (14). When yoke (11) is through washer (14), turn poppet (12) and lock yoke (11) against washer (14).

(15) Install retainer (9), seal (8) and bushing (7) on shaft (3).

NOTE

Shaft must be installed in the same position as noted during disassembly.

(16) Install shaft (3) in body (10) and push through yoke (11) and bushing (29) until fully seated.

(17) Install stuffing box (5) and seal (6) in body (10).

(18) Position handle (1) on top of shaft (3). Aline handle with the drive pin hole on shaft (3).

(19) With smooth end of drive pin (4) pointing with flow of arrow, drive pin (4) through handle (1) and shaft (3).

(20) Turn handle (1) and install cotter pin (2) in bottom hole on shaft (3).

Refer to figure 4-7.

(21) Install gasket (8) in coupler body (7).

(22) Apply sealant to male threads of male coupling half (6).

(23) Install male coupling half half (6) on coupling body (7).

(24) Install gasket (5) in dust cap (4) and install dust cap (4) on coupling half (6).

(25) Connect split rings (1 and 2) to chain (3).

(26) Connect split rings (1 and 2) to coupling half (6) and dust cap (4).

4-19. DISCHAIRGE HOSE ASSEMBLY (4-IN X 50-FT) REPAIR.

To repair the 4-inch X 50 foot discharge hose assembly, refer to para 4-13.

4-20. DISCHARGE HOSE ASSEMBLY (3-IN X 25-FT) REPAIR.

To repair the 3-inch X 25 foot discharge hose assembly, refer to para 4-13.

4-21. REDUCER (3-IN M X 4-IN F) REPAIR.

To repair the 3-inch Male X 4-inch Female reducer, refer to para 4-15.

4-22. BALL VALVE ASSEMBLY (4-INCH) REPAIR

This task covers:

a. Disassembly **b. Cleaning** **c. Inspection**
d. Repair **e. Assembly**

INITIAL SETUP:

Tools:
General Mech. Tool Kit (App B, Sect III, Item 1)
Pipe Wrench (App B, Sect III, Item 4)
Vise (App B, Sect III, Item 4)

Equipment Condition:
Ball valve assembly removed (para 2-21)

Material; Parts:
Cleaning Solvent (Item 1, App E)
Wiping Rag (Item 2, App E)
Thread Sealant (Item 3, App E)
Gasket (Item 10, App I)
Stem Seal (Item 21, App I)
Thrust Bearing (Item 22, App I) -
Body Seal (Item 23, App I)
Seat (Item 24, App I)

NOTE

Ensure that all parts identified as mandatory replacement parts are discarded and replaced with new components.

a. Disassembly. Refer to figure 4-9.

NOTE

Disassemble ball valve assembly only the extent required to replace defective component.

(1) Disconnect split ring (1), chain (2), and **split ring (3) from dust plug (4).**

(2) Remove dust plug (4) from female coupling half (5).

(3) Remove gasket (6) from female coupling (5).

(4) Remove female coupling half (5) from ball valve (7).

(5) Disconnect split ring (8), chain (9) and split ring (10) from dust cap (11).

4-22. BALL VALVE ASSEMBLY (4-INCH) REPAIR - cont.

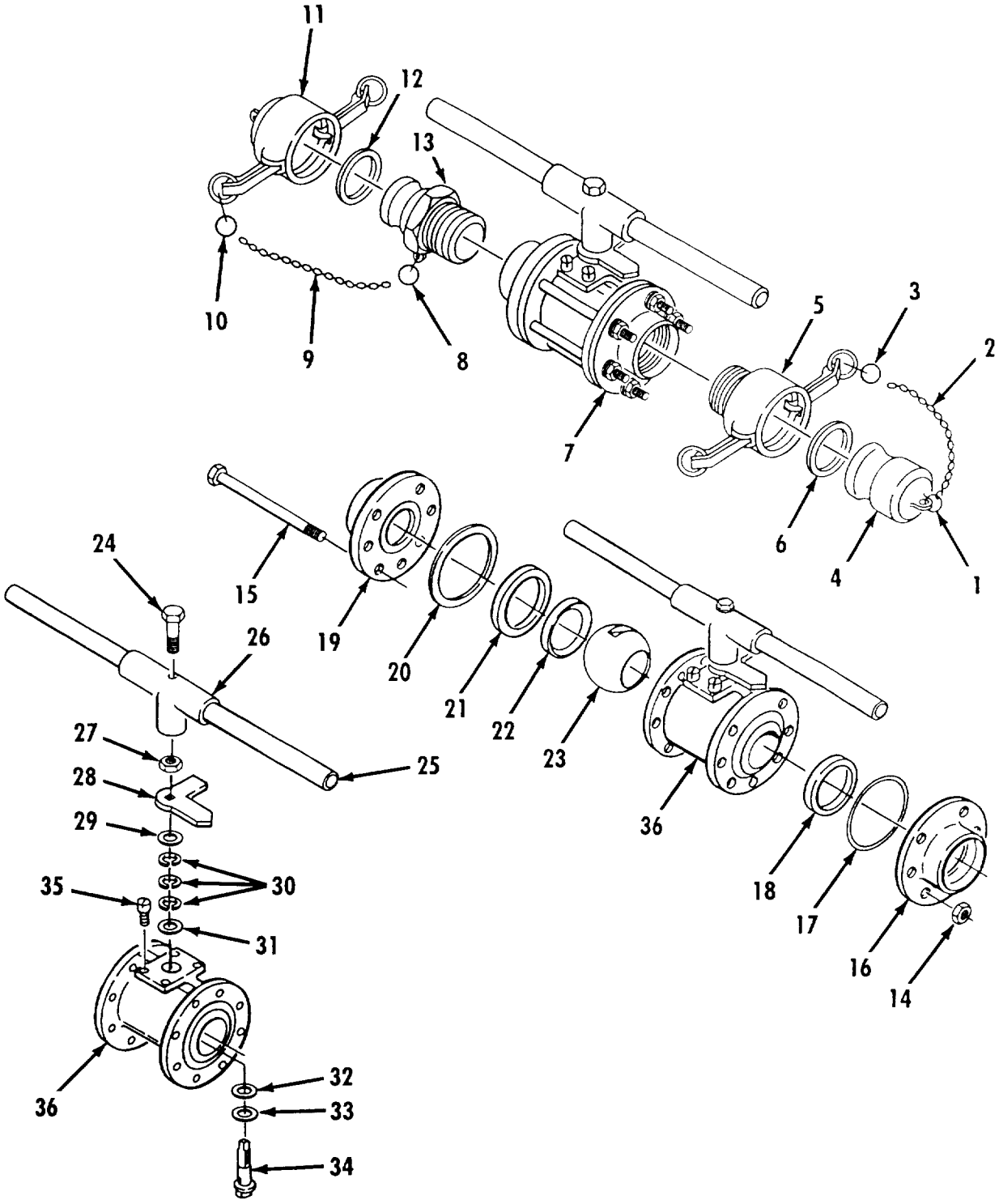


Figure 4-9. Ball Valve Coupling Repair.

4-22. BALL VALVE ASSEMBLY (4-INCH) REPAIR - cont.

(6) Disconnect dust cap (11) and remove gasket (12).

(7) Remove male coupling half (13) from valve (7).

(8) Using extension (25), set valve to closed position.

(9) Remove nuts (14) and bolts (15).

(10) Separate pipe end (16) from body (36).

(11) Remove body seal (17) and seat (18) from body (36).

(12) Separate pipe end (19) from body (36).

(13) Remove body seal (20), seal retainer (21) and seat (22) from body (36).

(14) Pull ball (23) from body (36).

(15) To aid assembly, mark and record location of stop (28) on body (36).

(16) Remove bolt (24), wrench block (26) and extension (25) from top of stem (34). Slide extension from wrench block.

(17) Remove retaining nut (27) and stop (28).

(18) Push stem (34) down into body (36), then remove from body.

(19) Remove follower (29), stem seals (30) and centering washer (31).

(20) Remove centering washer (32) and thrust bearing (33).

(21) To aid assembly, mark location of stop screws (35) on body (36). Remove two stop screws.

b. Cleaning.

WARNING

Dry cleaning solvent, P-D-680, Type III, is potentially dangerous to personnel and equipment. Eye and skin protection is required. Avoid repeated and prolonged skin contact. Wash hands immediately after exposure. Do not use near open flame or excessive heat. Use only in areas with good ventilation.

Using wiping rags and cleaning solvent, remove dirt and contaminants from all components.

4-22. BALL VALVE ASSEMBLY (4-INCH) REPAIR - cont.

c. Inspection. Refer to figure 4-9.

(1) Inspect ball (23) for deep scratches, dents, corrosion and signs of excessive wear.

(2) Inspect bolts (15) and pipe ends (16 and 19) for stretched, stripped or damaged threads.

d. Repair. Replace damaged or defective components.

e. Assembly. Refer to figure 4-9.

(1) Install two stop screws (35) on body (36) as marked during disassembly.

(2) Install thrust bearing (33) and centering washer (32) on stein (34).

(3) Install stem (34) and attached parts in body (36).

(4) While holding stem (34) in place, slide centering washer (31), stem seals (30) and follower (29) over stem and into body (36).

(5) Position stop (28) on top of stem (34) as marked during disassembly. Install retaining nut (27).

(6) Slide extension (25) into wrench block (26), then position wrench block on end of stem (34),

(7) Aline bolt hole in extension (25) with hole in wrench block (26) and install bolt (24).

(8) Turn extension (25) so that it is in closed position.

(9) Install ball (23) in body (36). Slot in top of ball must mesh with flats on bottom of stem (34).

(10) **Install seal retainer (21), seat (22), and body seal (20) in body (36).**

(11) Position pipe end (19) on body (36).

(12) Install seat (18) and body seal (17) on body (36).

(13) Position pipe end (16) on body (36).

(14) Install bolts (15) and nuts (14). Tighten nuts evenly in a cross pattern.

(15) Apply thread sealant to male threads of female coupling half (5) and male coupling half (13).

4-22. BALL VALVE ASSEMBLY (4-INCH) REPAIR - cont.

(16) Install male coupling half (13) on ball valve (7).

CAUTIONS

* To prevent premature failure of ball valve assembly, gaskets certified for arctic service must be installed. If a new dust cap or female coupling half has been installed, remove and discard black gaskets supplied with the new components and replace them with arctic service gaskets.
* Ensure gasket is fully seated in gasket seat of coupling/dust cap to prevent leaks in assembled components.

(17) Install gasket (12) in dust cap (11), then install dust cap on male coupling (13).

(18) Connect chain (9) and split rings (8 and 10) to dust cap (11) and male coupling (13).

(19) Install female coupling half (5) on ball valve (7).

(20) Install gasket (6) in female coupling (5).

(21) Install dust plug (4) on female coupling half (5).

(22) Connect chain (2) and split rings (1 and 3) to dust plug (4) and female coupling (5).

4-23. MANIFOLD (4-INCH/FIVE VALVES) REPAIR.

To repair the 4-inch/five valves manifold. Refer to para 4-16.

4-24. ELBOW REPAIR

This task covers:

a. Disassembly **b. Cleaning**
c. Repair **d. Assembly**

INITIAL SETUP:

Tools:
General Mech. Tool Kit (App B, Sect III, Item 1)

Equipment Condition:
Elbow removed (para 2-21)

Material/Parts:

Cleaning Solvent	(Item 1, App E)
Wiping Rag	(Item 2, App E)
Coupling Gasket	(Item 7, App D
Coupling Gasket	(Item 10, App I)
Coupling Gasket	(Item 13, App I)

NOTES

* Ensure that all parts identified as mandatory replacement parts are discarded and replaced with new components.
* The following instructions are typical for all elbows supplied with the AFSSP.

a. Disassembly. Refer to figure 4-10.

(1) Remove three split rings (1, 2, and 3) and chains (4 and 5).

(2) Remove dust cap (6) from male end of elbow (7).

(3) Remove gasket (8) from dust cap (6).

(4) Remove dust plug (9) from female end of elbow (7).

(5) Remove gasket (10) from female end of elbow (7).

4-24. ELBOW REPAIR-cont.

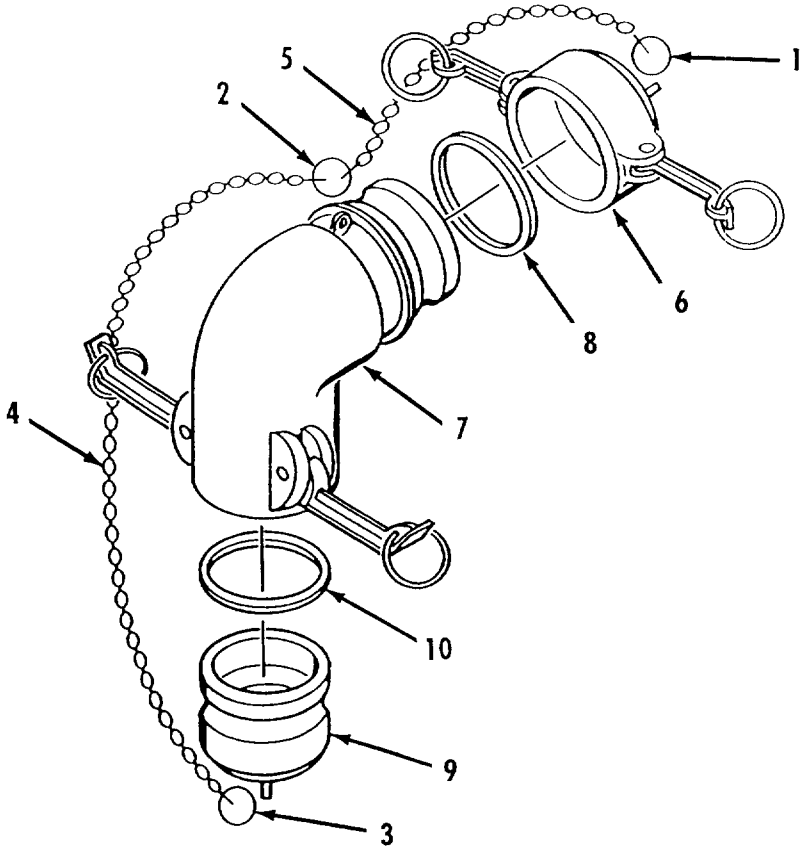


Figure 4-10. Elbow Repair.

4-24. ELBOW REPAIR - cont.

b. Cleaning.

WARNING

Dry cleaning solvent, P-D-680, Type III, is potentially dangerous to personnel and equipment. Eye and skin protection is required. Avoid repeated and prolonged skin contact. Wash hands immediately after exposure. Do not use near open flame or excessive heat. Use only in areas with good ventilation.

Using wiping rags and cleaning solvent, remove dirt and contaminants from all components.

c. Repair. Replace damaged or defective parts and all sealing components.

d. Assembly. Refer to figure 4-10.

CAUTIONS

* To prevent premature failure of elbow assembly, gaskets certified for arctic service must be installed. If a new elbow or dust cap has been installed, remove and discard black gaskets supplied with the new components and replace them with arctic service gaskets.
* Ensure gasket is fully seated in gasket seat of coupling/dust cap to prevent leaks in assembled components.

(1) Install gasket (10) in female end of elbow (7).

(2) Install dust plug (9) in female end of elbow (7).

(3) Install gasket (8) in dust cap (6).

(4) Install dust cap (6) on male end of elbow (7).

(5) Install chains (4 and 5) and three split rings (1, 2, and 3) on elbow (7), dust cap (6) and dust plug (9)..

4-25. REDUCER (4-IN M X 3-IN F)REPAIR.

To repair the 4-inch Male X 3-inch Female reducer, refer to para **4-14.**

4-26. REDUCER (6-IN M X 4-IN F) REPAIR.

To repair the 6-inch Male X 4-inch Female reducer, refer to para 4-14.

4-27. SUCTION HOSE ASSEMBLY (6-IN X 10-FT) REPAIR.

To repair the 6-inch X 10 foot suction hose assembly, refer to para 4-13.

4-28. MANIFOLD (4-INCH/THREE VALVES) REPAIR.

To repair the 4-Inch/Three valves manifold, refer to para 4-16.

4-29. GATE VALVE (4-INCH) REPAIR

To repair the 4-inch gate valve, refer to para 4-17.

4-30. MANIFOLD (4-INCH/TWO VALVES) REPAIR.

To repair the 4-Inch/Two Valves manifold, refer to para 4-16

4-31. GATE VALVE (4-INCH) REPAIR

To repair the 4-inch gate valve, refer to para 4-17.

4-32. MANIFOLD (6-INCH/TWO VALVES) REPAIR.

To repair the 6-Inch/Two valves manifold, refer to para 4-16.

4-33. GATE VALVE (6-INCH) REPAIR.

To repair the 6-inch gate valve, refer to para 4-17.

4-34. 4-INCH VALVE SECTION REPAIR.

To repair the 4-inch valve section, refer to para 4-16 for flanges and para 4-17 for gate valve.

4-35. GATE VALVE (4-INCH) REPAIR.

To repair the 4-inch gate valve, refer to para 4-17.

4-36. MANIFOLD (6-INCH/ONE VALVE) REPAIR.

To repair the 6-Inch/One valve manifold, refer to para 4-16.

4-37. ADAPTER ASSEMBLY (4 IN. F X 4 IN. F) REPAIR.

This task covers:

a. Disassembly **b. Cleaning** **c. Repair**
d. Assembly

INITIAL SETUP:

Tools:		**Material/Parts**:	
General Mech. Tool Kit	(App B, Sect III, Item 1)	Cleaning Solvent	(Item 1, App E)
Vise	(App B, Sect III, Item 2)	Wiping Rag	(Item 2, App E)
Pipe Wrench	(App B, Sect III, Item 4)	Thread Sealant	(Item 3, App E)
Equipment Condition:		Gasket	(Item 4, App I)
Adapter removed	(para 2-21)	Gasket	(Item 10, App I)

NOTES

* Ensure that all parts identified as mandatory replacement parts are discarded and replaced with new components.
* The following instructions are typical for all adapters supplied with the AFSSP.

a. Disassembly. Refer to figure 4-11.

(1) Place assembled adapter in vise.

(2) Disconnect split rings (1, 2 and 3) and remove chains (4 and 5).

(3) Remove dust plug (6) from female coupling half (7).

(4) Remove gasket (8) from female coupling half (7).

(5) Remove dust plug (9) from female coupling half (10).

(6) Remove gasket (11) from female coupling half (10).

(7) Remove female coupling half (7) from female coupling half (10).

4-37. ADAPTER ASSEMBLY (4 IN. F X 4 IN. F) REPAIR - cont.

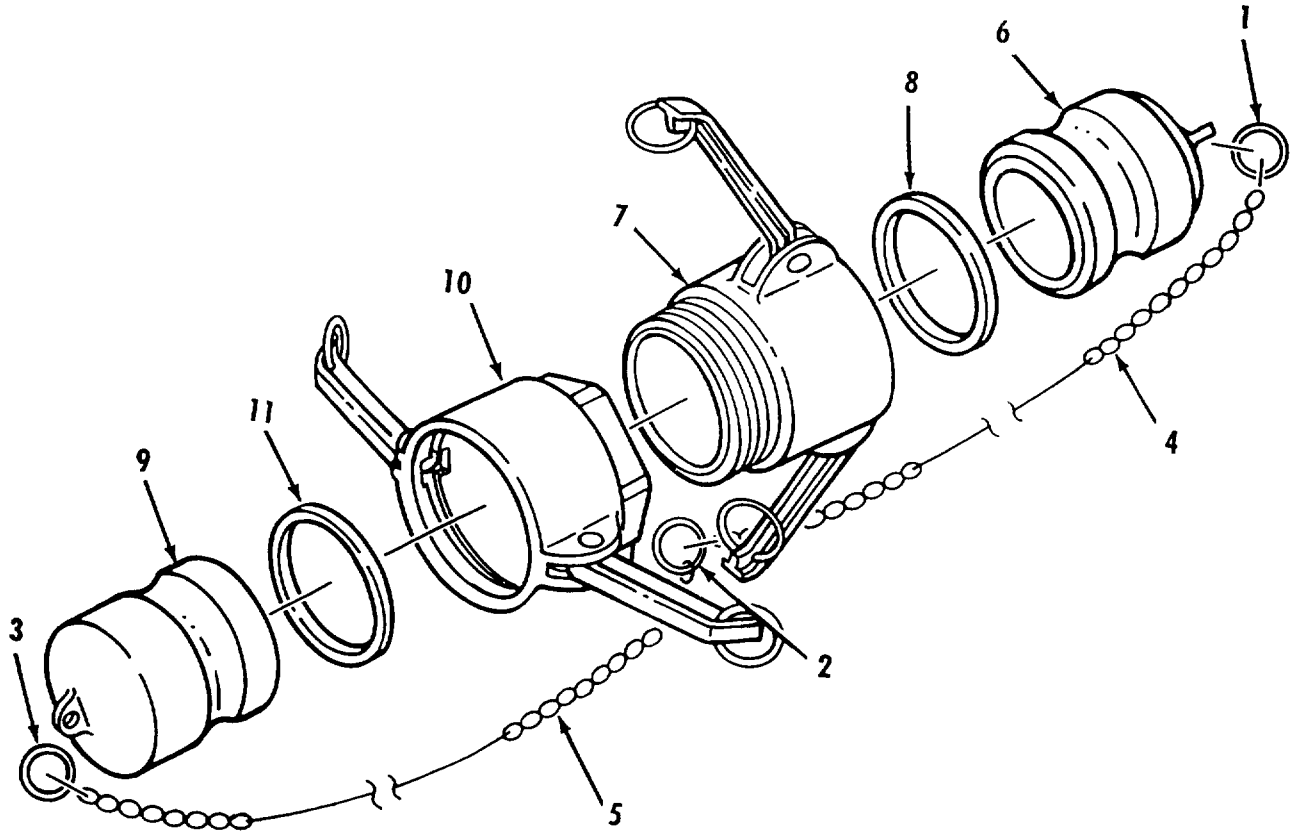


Figure 4-11. Adapter Repair.

4-37. ADAPTER ASSEMBLY (4 IN. F X 4 IN. F) REPAIR - cont.

b. Cleaning.

WARNING

Dry cleaning solvent, P-D-680, Type III, is potentially dangerous to personnel and equipment. Eye and skin protection is required. Avoid repeated and prolonged skin contact. Wash hands immediately after exposure. Do not use near open flame or excessive heat. Use only in areas with good ventilation.

Using wiping rags and cleaning solvent, remove dirt and contaminants from all components.

c. Repair. Replace damaged or defective parts. Do not reuse sealing components.

d. Assembly. Refer to figure 4-11.

CAUTIONS

- To prevent premature failure of reducer assembly, gaskets certified for arctic service must be installed. If a new female coupling half has been installed, remove and discard black gaskets supplied with the new components and replace them with arctic service gaskets.
- Ensure gasket is fully seated in gasket seat of female coupling half to prevent leaks in assembled components.

(1) Apply thread sealant to male threads of female coupling half(7).

(2) Install female coupling half (10) on female coupling half(7).

(3) Install gasket (11) in female coupling half(10).

(4) Install dust plug (9) to female coupling half(10).

(5) Install gasket (8) in female coupling half(7).

(6) Install dust plug (6) in female coupling half(7).

(7) Connect chains (4 and 5) and split rings (1, 2 and 3) to female coupling half (10) and dust plugs (6 and 9).

4-38. DISCHARGE HOSE ASSEMBLY (4 IN. F X 20 FT. F) REPAIR.

To repair the 4-inch X 20-foot discharge hose, refer to para. 4-13.

4-39. 6-INCH VALVE SECTION REPAIR.

To repair the 6-inch valve section, refer to para. 4-16 for flanges and para. 4-17 for gate valve.

4-40. WYE ASSEMBLY REPAIR.

This task consists of:

a. Disassembly
b. Cleaning
c. Repair
d. Assembly

INITIAL SET-UP:

Tools:
General Mech. Tool Kit (App B, Sect III, Item 1)
Equipment Condition:
Wye assembly removed (para. 2-21)

Material/Parts:

Cleaning Solvent	(Item 1, App E)
Wiping Rag	(Item 2, App E)
Coupling Gasket	(Item 13, App I)
Flange Gasket	(Item 30, App I)

NOTE

Ensure that all parts identified as mandatory replacement parts are discarded and replaced with new components.

a. Disassembly. Refer to figure 4-12.

(1) Disconnect split ring (1), chain (2), and split ring (3) from dust plug (4) and female coupling (5).

(2) Remove dust plug (4) from female coupling half (5).

(3) Remove gasket (6) from female coupling half (5).

(4) Remove twelve nuts (7), lockwashers (8), flat washers (9) and cap screws (10).

(5) Separate female coupling half (5) and flange gasket (11) from wye (12).

(6) Disconnect split ring (13), chain (14), and split ring (15) from dust cap (:16) and male coupling half (17).

(7) Remove dust cap (16) from male coupling half (17).

(8) Remove gasket (18) from dust cap (16).

(9) Remove twelve nuts (19), lockwashers (20), flat washers (21) and cap screws (22).

(10) Separate male coupling half(17), flange gasket (23) from wye (12).

4-40. WYE ASSEMBLY REPAIR - cont.

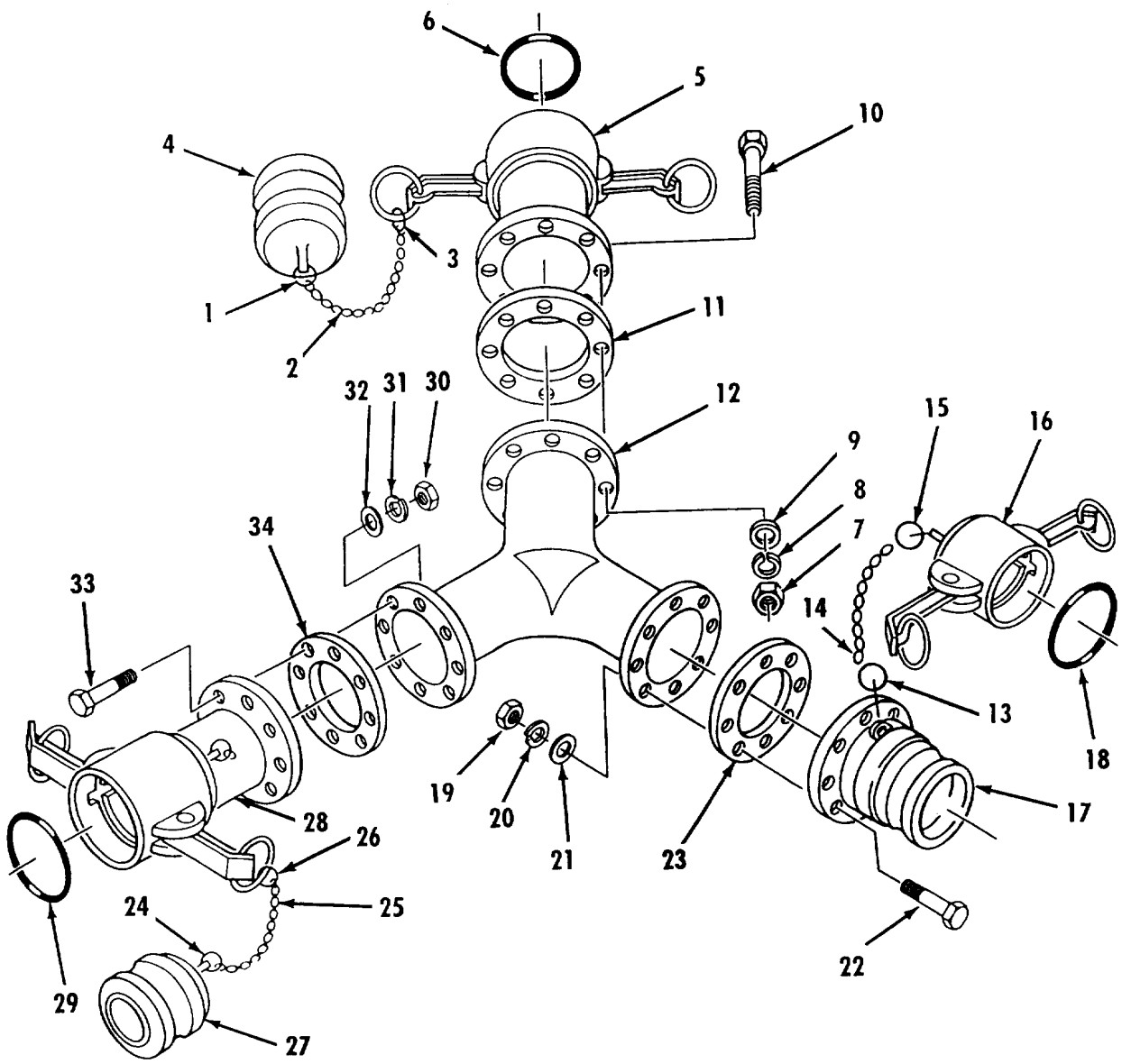


Figure 4-12. Wye Assembly Repair.

4-40. WYE ASSEMBLY REPAIR - cont.

(11) Disconnect split ring (24), chain (23) and split ring (26) from dust plug (27) and female coupling half (28).

(12) Remove dust plug (27) from female coupling half (28).

(13) Remove gasket (29) from female coupling half(28).

(14) Remove twelve nuts (30), lockwashers (31), flat washers (32) and cap screws (33).

(15) Separate female coupling half (28) and flange gasket (34) from wye (12).

b. Cleaning.

WARNING

Dry cleaning solvent, P-D-680, Type III, is potentially dangerous to personnel and equipment. Eye and skin protection is required. Avoid repeated and prolonged skin contact. Wash hands immediately after exposure. Do not use near open flame or excessive heat. Use only in areas with good ventilation.

Using wiping rags and cleaning solvent, remove dirt and contaminants from all components.

c. Repair. Replace damaged or defective parts. Replace all sealing components.

d. Assembly. Refer to figure 4-12.

(1) Position flange gasket (34) and female coupling half (28) on wye (1].2).

(2) Install twelve cap screws (33), flat washers (32), lockwashers (31) and nuts (30). Tighten nuts evenly in a cross pattern.

(3) Install gasket (29) in female coupling half (28).

(4) Install dust plug (27) in female coupling half(28).

(5) Connect split ring (24), chain (25) and split ring (26) to dust plug (27) and female coupling half(28).

(6) Position flange gasket (23) and male coupling half (17) on wye (12).

(7) Install twelve cap screws (22), flat washers (21), lockwashers (20) and nuts (19). Tighten nuts evenly in a cross pattern.

(8) Install gasket (18) in dust cap (16).

(9) Install dust cap (16) on male coupling half (17).

(10) Connect split ring (13), chain (14) and split ring (15) to dust cap (16) and male coupling half(17).

4-40. WYE ASSEMBLY REPAIR - cont.

(11) Position flange gasket (11) and female coupling half (5) on wye (12).

(12) Install twelve cap screws (10), flat washers (9), lockwashers (8) and nuts (7). Tighten nuts evenly in a cross pattern.

(13) Install gasket (6) in female coupling half (5).

(14) Install dust plug (4) in female coupling half (5).

(15) Connect split ring (3), chain (2) and split ring (1) to dust plug (4) and female coupling half (5).

4-41. FIRE EXTINGUISHER FRAME REPAIR.

This task consists of:

a. Disassembly b. Cleaning
c. Repair d. Assembly

INITIAL SET-UP:

Tools:
General Mech. Tool Kit (App B, Sect III, Item 1)
Equipment Condition:
Fire extinguishers removed (para. 2-16x)

Material/Parts:

Cleaning Solvent	(Item 1, App E)
Wiping Rag	(Item 2, App E)
Lockwasher	(Item 34, App I)

NOTE

Ensure that all parts identified as mandatory replacement parts are discarded and replaced with new components.

a. Disassembly. Refer to figure 4-13.

(1) Remove two screws (1), lockwashers (2), flat washers (3), latch (4) and nut plate (5) from frame (6).

(2) Repeat step (1) for two remaining latches (4).

b. Cleaning.

WARNING

Dry cleaning solvent, P-D-680, Type III, is potentially dangerous to personnel and equipment. Eye and skin protection is required. Avoid repeated and prolonged skin contact. Wash hands immediately after exposure. Do not use near open flame or excessive heat. Use only in areas with good ventilation.

Using wiping rags and cleaning solvent, remove dirt and contaminants from all components.

4-41. FIRE EXTINGUISHER FRAME REPAIR - cont.

c. Repair. Replace damaged or defective components.

d. Assembly. Refer to figure 4-13.

(1) Position nut plate (5) and latch (4) on frame (6).

(2) Install two flat washers (3), lockwashers (2) and screws (1) and attach latch (4) and nut plates (5).

(3) Repeat steps (1) and (2) for two remaining latches (4).

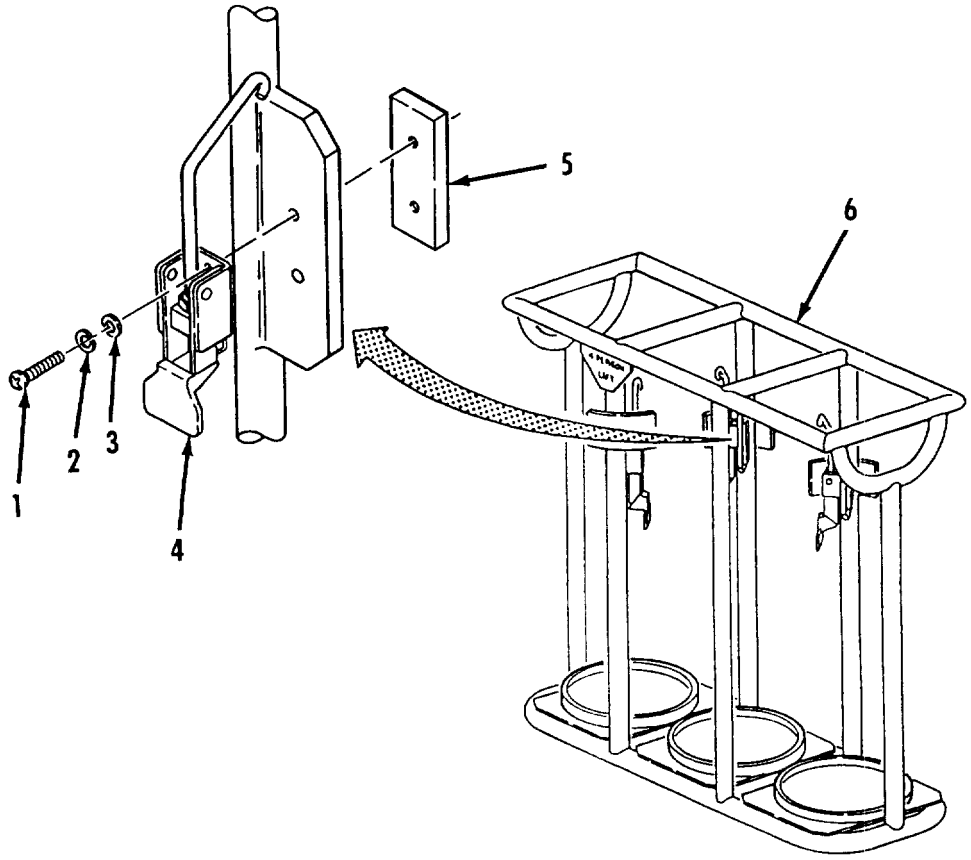


Figure 4-13. Fire Extinguisher Frame Repair.

SECTION VI. PREPARATION FOR STORAGE OR SHIPMENT

4-42. SECURITY PROCEDURES.

Refer to AR 190-11 or AR 190-13.

4-43. ADMINISTRATIVE STORAGE.

WARNING

To prevent injury to personnel and damage to equipment, all fuel system components must be cleaned and purged before administrative storage.

a. Placement of equipment in administrative storage should be for short periods of time when a shortage of maintenance effort exists. Items should be mission ready within 24 hours or within the time factors as determined by the directing authority. During the shortage period, appropriate maintenance records will be kept.

b. Before placing equipment in administrative storage, Preventive Maintenance Checks and Services should be completed, shortcomings and deficiencies should be corrected, and all modification work orders (MWOs) should be applied.

c. Storage Site Selection. Inside storage is preferred for items selected for administrative storage. If inside storage is not available, keep fuel system components away from corrosive materials, such as saltwater spray.

CHAPTER 5

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

Paragraph	Title	Page
	Direct Support Maintenance Procedures	5-1
5-1	Introduction .	5-1
5-2	Fire Extinguisher Frame Repair	5-1

DIRECT SUPPORT MAINTENANCE PROCEDURES

5-1. INTRODUCTION.

This chapter contains instructions for performing Direct Support level maintenance on components of the Arctic Fuel System Supply Point (AFSSP).

5-2. FIRE EXTINGUISHER FRAME REPAIR.

This task consists of:
Repair

INITIAL SET-UP:

Tools:
Shop Equip., Welding (App B, Sect III, Item 6)

Equipment Condition:
Fire extinguishers removed (para. 2-21)

References:
TM 9-237 Welding Theory and Application
TM 43-0139 Painting Instructions for Army Materiel.

Repair.

a. Straighten and weld frame as required. Refer to TM 9-237 for welding procedures.

b. Paint frame in accordance with TM 43-0139.

c. If frame is damaged beyond repair, replace frame.

APPENDIX A

REFERENCES

A-1. SCOPE.

This appendix lists all forms, field manuals, technical manuals, and miscellaneous publications referenced in this manual. Also listed are publications that should be consulted for additional information.

A-2. FORMS.

Recommended Changes to Publications and Blank Forms.....DA Form 2028
Recommended Changes to Equipment Technical Publications .....DA Form 2028-2
Equipment Inspection and Maintenance Worksheet .....DA Form 2404
Maintenance Request.....DA Form 5504
Equipment Control Records .....DA Form 2408-9
Quality Deficiency Report.....SF 368
Report of Discrepancy.....SF 364

A-3. FIELD MANUALS.

NBC Contamination Avoidance .....FM 3-3
NBC Protection .....FM 3-4
NBC Decontamination.....FM 3-5
Organizational Maintenance of Military Petroleum
Pipelines, Tanks and Related Equipment .....FM 10-20
Aircraft Refueling .....FM 10-68
Petroleum Supply Point Equipment and Operations .....FM 10-69
First Aid for Soldiers.....FM 21-11
Basic Cold Weather Manual .....FM 31-70
Northern Operations.....FM 31-71
Inspecting and Testing Petroleum Products.....FM 10-70

A-4. TECHNICAL MANUALS.

Destruction of Army Materiel to Prevent Enemy Use.....TM 750-244-3

Operator's Maintenance Manual for 200/600 GPM Pump Assembly .....TM 10-4320-342-10

Unit, Direct Support and General Support Maintenance Manual
for 200/600 GPM Pump Assembly .....TM 10-4320-342-24

Unit, Direct Support and General Support Maintenance Repair Parts
and Special Tools List for 200/600 GPM Pump Assembly .....TM 10-4320-342-24P

Operator's Unit, and Direct Support Maintenance Manual Including Repair
Parts and Special Tools List for Closed-Circuit Refueling Nozzle Assembly .....TM 10-4930-243-13&P

Operator's, Unit and Direct Support Maintenance Manual for
200 GPM Filter-Separator .....TM 10-4330-23613

Unit and Direct Support Maintenance Repair Parts and Special Tools List for
200 GPM Filter-Separator .....TM 10-4330-2323P

A-4. TECHNICAL MANUALS - cont.

Operator's, Unit, and Direct Support Maintenance Manual for Single Point Refueling Nozzle (D1) Including Repair Parts and Special Tools List..... TM 10-4930-242-13&P

Operator's and Unit Maintenance Manual for Collapsible Fabric Petroleum Tanks, Low Temperature: 3,000 10,000 and 20,000 Gallon Capacity ..... TM 10 -5430-231-12

Unit Maintenance Repair Parts and Special Tools List for Collapsible Fabric Petroleum Tanks, Low Temperature: 3,000, 10,000 and 20,000 Gallon Capacity .... TM 10-5430-231-20P

Operator's, Unit, Direct Support and General Support Maintenance Manual for 200 GPM Filter-Separator ..... TM 10-4330-23613

Unit, Direct Support and General Support Maintenance Repair Parts and Special Tools List for 200 GPM Filter-Separator ..... TM 10-4330-23623P

A-5. MISCELLANEOUS.

The Army Maintenance Management System ..... DA PAM 738-750
Security Procedures..... AR 190-11, AR 190-13
Packing of Army Material for Shipment and Storage ..... AR 746-1
Environmental Protection and Enhancement..... AR 200-1

APPENDIX B

MAINTENANCE ALLOCATION CHART

SECTION I. INTRODUCTION

B-1. GENERAL.

a. This section provides a general explanation of all maintenance and repair function authorized at various maintenance categories.

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

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

d. Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

B-2. MAINTENANCE FUNCTIONS.

Maintenance functions will be limited to and are defined as follows:

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

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

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

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

e. Aline. To adjust specified variable elements of an item to bring about optimum performance.

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

B-2. MAINTENANCE FUNCTIONS - cont

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

h. Replace. To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and is shown as the 3rd position code of the SMR code.

i. Repair. The application of maintenance services, including fault location/troubleshooting, removal/installation, and disassembly/assembly procedures, and maintenance actions to identify troubles, and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly) end item, or system.

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

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

B-3. EXPLANATION OF COLUMNS IN THE MAC - SECTION II.

a. Column 1, Group Number. Column 1 lists functional group code numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the next higher assembly. End item group numbers are "00".

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

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

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

identified for the maintenance functions authorized in the maintenance allocation chart. The symbol designations for the various maintenance levels are shown on the following page.

C..... Operator or crew
O..... Unit Maintenance
F ..... Direct Support Maintenance
H..... General Support Maintenance
D..... Depot Maintenance

e. Column 5, Tools and Equipment. Column 5 specifies, by code, those common tool sets (not individual tools) common TMDE, and special tools, special TMDE, and support equipment required to perform the designated function.

f. Column 6, Remarks. This column, when applicable, contains a letter code, in alphabetic order, which is keyed to the remarks contained in Section IV.

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

a. Column 1, Reference Code. The tool and test equipment reference code correlates with a code used in the MAC, Section II, Column 5.

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

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

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

e. Column 5, Tool Number. The manufacturer's part number.

B-5. EXPLANATION OF COLUMNS IN REMARKS, SECTION IV.

a. Column 1, Reference Code. The code recorded in column 6, Section II.

b. Column 2, Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC, Section II.

Section II MAINTENANCE ALLOCATION CHART

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL UNIT C	UNIT O	INTERMEDIATE F	INTERMEDIATE H	DEPOT D	(5) TOOLS AND EQUIPMENT	(6) REMARKS
00	ARCTIC FUEL SYSTEM SUPPLY POINT (AFSSP)								
01	MODULE, ARCTIC FUEL SYSTEM SUPPLY POINT (AFSSP)								
0101	ARCTIC NOZZLE, FUEL AND OIL SERVICING	INSPECT REPLACE REPAIR	0.3	 0.5 1.0				 1,2	
0102	HOSE ASSY, DISCHARGE (1-1/2 IN X 25 FT)	INSPECT REPLACE REPAIR	0.2	 0.2 1.0				 1, 2, 3	
0103	REDUCER (1.5IN X2 INF)	INSPECT REPLACE REPAIR	0.2	 0.2 0.5				 1	
0104	REDUCER (4-IN M X 4-IN F)	INSPECT REPLACE REPAIR	0.2	 0.2 0.5				 1	
0105	4 INCH MANIFOLD (ONE VALVE)	INSPECT REPLACE REPAIR	0.2	 0.2 1.0				 1, 2	
010501	GATE VALVE, 4-IN.	INSPECT REPLACE REPAIR	0.2	 0.2 1.0				 1, 2,	
0106	HOSE ASSY, DISCHARGE (4-IN X 25-FT)	INSPECT REPLACE REPAIR	0.2	 0.2 1.0				 1,2,3,	
0107	COUPLER, TANK TO HOSE, 3 INCH	INSPECT REPLACE REPAIR	0.2	 0.5 2.0				 1, 2, 4	
0108	HOSE ASSY, DISCHARGE (4-IN X 50-FT)	INSPECT REPLACE REPAIR	0.2	 0.2 1.0				 1, 2, 3	

Section II MAINTENANCE ALLOCATION CHART

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL UNIT C	UNIT O	INTERMEDIATE F	INTERMEDIATE H	DEPOT D	(5) TOOLS AND EQUIPMENT	(6) REMARKS
0109	HOSE ASSY, DISCHARGE 3-IN X 25 FT	INSPECT	0.2						
		REPLACE		0.2					
		REPAIR		1.0				1, 2, 3	
0110	REDUCER 3-IN M X 4-IN F	INSPECT	0.2						
		REPLACE		0.2					
		REPAIR		0.5				1	
0111	BALL VALVE ASSEMBLY, 4-IN.	INSPECT	0.2						
		REPLACE		0.2					
		REPAIR		2.0				1, 2, 4	
0112	MANIFOLD, 4-IN. (FIVE VALVES)	INSPECT	0.2						
		REPLACE		0.5					
		REPAIR		2.0				1, 2	
011201	GATE VALVE, 4-IN.	INSPECT	0.2						
		REPLACE		0.2					
		REPAIR		1.0				1, 2	
0113	ELBOW, 4-LN 4 IN M X 4-IN F	INSPECT	0.2						
		REPLACE		0.2					
		REPAIR		0.5				1	
0114	REDUCER 4-IN M X 3-IN F	INSPECT	0.2						
		REPLACE		0.2					
		REPAIR		0.5				1	
0116	200 GPM FILTER SEPARATOR	INSPECT							
		REPLACE							
		REPAIR							B
0117	REDUCER 6-IN M X 4 IN F	INSPECT	0.2						
		REPLACE		0.2					
		REPAIR		0.5				1	
0118	HOSE ASSY, SUCTION 6-IN X 10 FT	INSPECT	0.2						
		REPLACE		0.2					
		REPAIR		1.0				1, 2 3	

Section II MAINTENANCE ALLOCATION CHART

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		INTERMEDIATE		DEPOT		
GROUP NUMBER	COMPONENT/ ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D	TOOLS AND EQUIPMENT	REMARKS
0119	4 INCH MANIFOLD (THREE VALVES)	INSPECT REPLACE REPAIR	0.2	 0.5 1.5				 1	
011901	GATE VALVE, 4-IN	INSPECT REPLACE REPAIR	0.2	 0.2 1.0				 1,2	
0120	MANIFOLD, 4-IN (TWO VALVES)	INSPECT REPLACE REPAIR	0.2	 0.3 1.0				 1, 2	
012001	GATE VALVE, 4-IN	INSPECT REPLACE REPAIR	0.2	 0.2 1.0				 1,2	
0121	600 GPM PUMP ASSEMBLY	INSPECT REPLACE REPAIR							B
0122	MANIFOLD, 6-IN (TWO VALVES)	INSPECT REPLACE REPAIR	0.2	 0.3 1.0				 1, 2	
012201	GATE VALVE, 6-IN	INSPECT REPLACE REPAIR	0.2	 0.2 1.0				 1,2	
0123	VALVE SECTION, 1-IN	INSPECT REPLACE REPAIR	0.2	 0.3 1.0				 1, 2	
012301	GATE VALVE, 4-IN	INSPECT REPLACE REPAIR	0.2	 0.2 1.0				 1,2	
0124	MANIFOLD, 6-IN (ONE VALVE)	INSPECT REPLACE REPAIR	0.2	 0.2 1.0				 1,2	
012401	GATE VALVE, 6-IN	INSPECT REPLACE REPAIR	0.2	 0.2 1.0				 1, 2	

Section II MAINTENANCE ALLOCATION CHART

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL UNIT C	UNIT O	INTERMEDIATE F	INTERMEDIATE H	DEPOT D	(5) TOOLS AND EQUIPMENT	(6) REMARKS
0125	MANIFOLD, 6-IN (ONE VALVE)	INSPECT	0.2						
		REPLACE		0.2					
		REPAIR		1.0				1,2	
012501	GATE VALVE, 6-IN	INSPECT	0.2						
		REPLACE		0.2					
		REPAIR		1.0				1, 2	
0126	MANIFOLD, 6-IN (TWO VALVES)	INSPECT	0.2						
		REPLACE		0.3					
		REPAIR		1.0				1, 2	
012601	GATE VALVE, 6-IN	INSPECT	0.2						
		REPLACE		0.2					
		REPAIR		1.0				1, 2	
0127	MANIFOLD, 6-IN (ONE VALVE)	INSPECT	0.2						
		REPLACE		0.2					
		REPAIR		1.0				1, 2	
012701	GATE VALVE, 6-IN	INSPECT	0.2						
		REPLACE		0.2					
		REPAIR		1.0				1, 2	
0128	ADAPTER 4-IN F X 4-IN F	INSPECT	0.2						
		REPLACE		0.3					
		REPAIR		0.5				1,2, 4	
0129	HOSE ASSY, DISCHARGE 4-IN X 20 FT	INSPECT	0.2						
		REPI.ACE		0.2					
		REPAIR		1.0				1,2, 3	
0130	VALVE SECTION, 6-IN PIPELINE	INSPECT	0.2						
		REPLACE		0.3					
		REPAIR		1.0				1, 2	
013001	GATE VALVE, 6-IN	INSPECT	0.2						
		REPLACE		0.2					
		REPAIR		1.0				1, 2	
0131	WYE ASSEMBLY	INSPECT	0.2						
	REPLACE			0.3					
	REPAIR			1.0				1, 2	

Section II MAINTENANCE ALLOCATION CHART

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL UNIT C	UNIT O	INTERMEDIATE F	INTERMEDIATE H	DEPOT D	(5) TOOLS AND EQUIPMENT	(6) REMARKS
0132	COLLAPSIBLE FUEL TANK ASSEMBLY								B
0133	ACCESSORY ITEMS								
013301	REDUCERS	INSPECT	0.2						
		REPLACE		0.2					
		REPAIR		0.5				1,2, 4	
013302	ADAPTER, 2-IN M X 2-IN M	INSPECT	0.2						
		REPLACE		0.3					
		REPAIR		0.5				1,2, 4	
013303	ELBOWS 3-IN M X 3:-IN F 1-IN M X 4-IN F	INSPECT	0.2						
		REPLACE		0.2					
		REPAIR		0.5				1	
013304	FRAME. EXTINGUISHER	INSPECT	0.2						
		REPLACE		0.3					
		REPAIR		0.5				1.01,2,5	A,
013305	CLOSED CIRCUIT REFUELING NOZZLE	INSPECT							
		REPLACE							
		REPAIR							B
013106	D-1 NOZZLE	INSPECT							
		REPLACE							
		REPAIR							B
013307	HOSE ASSY, DISCHARGE 4-IN X 20 FT 1.5-IN X 25 FT 3-IN X 25 FT 2-IN X 50 FT	INSPECT	0.2						
		REPLACE		0.2					
		REPAIR		1.0				1,2, 3	
013108	HOSE ASSY, SUCTION 6-IN X 10 FT	INSPECT	0.2						
		REPLACE		0.2					
		REPAIR		1.0				1, 2, 3	

SECTION III. TOOLS AND TEST EQUIPMENT REQUIREMENTS

(1) REFERENCE CODE	(2) MAINTENANCE CATEGORY	(3) NOMENCLATURE	(4) NATIONAL STOCK NUMBER (NSN)	(5) TOOL NUMBER
1	O	Tool Kit, General Mechanics	5180-00-177-7033	SC 5180-90-CL-N26
2	O	Shop Equipment, Automotive Maintenance and Repair: Organizational Maintenance, Common No.1, Less Power	4910-00-754-0654	SC-4910-95-CL-A74
3	O	Clamping Tool	5120-00-278-9925	GGG-C-00413
4	O	Wrench, Pipe, 36-inches	5120-01-335-1035	PW36C
5	F	Shop Equipment, Automotive Maintenance and Repair: Field Maintenance, Basic, Less Power	4910-00-754-0705	SC-4910-95-A31
6	F	Shop Equipment, Welding Field Maintenance	4940-00-357-7268	SC-4910-95 CL-B19-HR

SECTION IV. REMARKS

REFERENCE CODE	REMARKS
A	Weld and straighten at Direct Support
B	Refer to applicable technical manual.

APPENDIX C

COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LIST

SECTION I. INTRODUCTION

C-1. SCOPE.

This appendix lists components of end item and basic issue items for the Arctic Fuel System Supply Point (AFSSP) to help you inventory items required for safe and efficient operation.

C-2. GENERAL.

The Components of End Item and Basic Issue Items List are divided into the following sections:

a. Section II. Components of End Item. This listing is for informational purposes only, and is not authority to requisition replacements. These items are part of the end item, but are removed and separately packaged for transportation or shipment. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Illustrations are furnished to assist you in identifying the items.

b. Section III. Basic Issue Items. These are the minimum essential items required to place the Arctic Fuel System Supply Point (AFSSP) in operation, to operate it, and to perform emergency repairs. Although shipped separately packaged, BII must be with the system during operation and whenever it is transferred between property accounts. The illustrations will assist you with hard to-identify items. This manual is your authority to request/requisition replacement BII, based on TOE/MTOE authorization of the end item.

C-3. EXPLANATION OF COLUMNS.

The following provides an explanation of columns found in the tabular listing:

a. Column (1) - Illustration Number (Illus Number). This column indicates the number of the illustration in which the item is shown.

b. Column (2) - National Stock Number. Indicates the national stock number assigned to the item and will be used for requisitioning purposes.

c. Column (3) - Description. Indicates the Federal item and name and, if required, a minimum description to identify and locate the item. The last line for each item indicates the Commercial and Government Entity Code (CAGE) (in parentheses) followed by the part number.

d. Column (4) - Unit of Measure (U/M). Indicates the measure used in performing the actual operational/maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr).

e. Column (5) - Quantity required (Qty rqd). Indicates the quantity of the item authorized to be used with/on the equipment.

Section II. COMPONENTS OF END ITEM

(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION CAGEC AND PART NUMBER USABLE ON CODE	(4) U/M	(5) QTY RQD
1		ADAPTER (96906) MS39352-21	EA	4
2		ADAPTER (97403) 13228E1803	EA	4
3	5340-00-066-1235	ADAPTER ASSEMBLY, FUEL DRUM (97403) 13211E7541	EA	4
4		ADAPTER, 4 INCH FEMALE (97403) 13228E1839	EA	2
5		BALL VALVE ASSEMBLY, 4 INCH (97403) 13228E1814	EA	4
6	6150-00-483-3918	CABLE ASSEMBLY, 6 FOOT, GROUND (97403) 13219E3930	EA	4
7		CABLE, GROUND (97403) 13220E1127-1	EA	4
8		CABLE, GROUND (97403) 13220E1127-2	EA	12
9		CABLE, GROUND (97403) 13220E1127-3	EA	4
10		CAN, PLASTIC, 5 GALLON FUEL (81349) M53L09-2	EA	32
11		CLAMPING TOOL, STRAP BAND, 3/8 TO 3/4 WIDTH (70847)C001 GGG-C-413	EA	2
12	5120-00-359-6587	CLAMPING TOOL, STRAP BAND, HOSE, 3/8 TO 5/8 WIDTH (70847)S38	EA	2
13		COUPLER, TANK TO HOSE 3 INCH FEMALE (97403) 13228E1834	EA	4
14	5120-00-357-8431	COUPLING WRENCH, TANK CAR 1 3/4 WIDTH (09310) E0160-001	EA	2
15		COUPLING, RAIL TANKER, NATO (97403) 13222E8219	EA	4

Section II. COMPONENTS OF END ITEM

(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION CAGEC AND PART NUMBER USABLE ON CODE	(4) U/M	(5) QTY RQD
16		ELBOW, 3 INCH MALE BY 3 INCH FEMALE (97403) 13228E185 8	EA	12
17		ELBOW, 4 INCH (97403) 13228E18410	EA	12
18		ELBOW, QUICK DISCONNECT (97403) 13228E1828-2	EA	4
19	1330-01-262-9496	FILTER/SEPARATOR, FUEL, 200 GPM ARTIC SERVICE (97403) 13228E1770	EA	6
20	4210-01-237-2887	FIRE EXTINGUISHER, DRY CHEMICAL AND PORTABLE) (97403) A-A-393	EA	24
21		FRAME, EXTINGUISHER (97403) 13229E2400	EA	8
22		HOSE ASSEMBLY (81349) M53095 03G250	EA	62
23		HOSE ASSEMBLY (81349) M53095-03G500	EA	22
24		HOSE ASSEMBLY (81349) M53096- 10B2A100	EA	96
25		HOSE ASSEMBLY (96906) M53095-03F250	EA	8
26		HOSE ASSEMBLY, 20 FOOT (97403) M53095-03G200	EA	12
27		HOSE ASSEMBLY, 25 FOOT (97403) M53095 03G250	EA	10
28		HOSE ASSEMBLY, 50 FOOT (81349) M5.3095 0.3D500	EA	6
29	4720-01-192-0423	HOSE ASSEMBLY, NUMBER 6, FUEL CAN (96906) MS28741-6-1200	EA	4
30		MANIFOLD, 4 INCH FUELING (97403) 13228E1830	EA	2
31		MANIFOLD, 4 INCH FUELING (97403) 13228E1831	EA	2

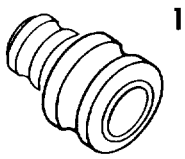
Section II. COMPONENTS OF END ITEM

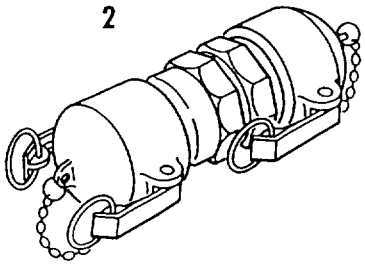
(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION CAGEC AND PART NUMBER USABLE ON CODE	(4) U/M	(5) QTY RQD
32		MANIFOLD, 4 INCH FUELING (97403) 13228E1832	EA	24
33		MANIFOLD, 4 INCH FUELING (97403) 13228E1845	EA	2
34		MANIFOLD, 6 INCH FUELING (97403) 131228E1843	EA	2
35		MANIFOLD, 6 INCH FUELING (97403) 13228E1844	EA	2
36		MANIFOLD, 6 INCH FUELING (97403) 13228E 1854	EA	2
37		MANIFOLD, 6 INCH FUELING (97403) 13228E1859	EA	2
38		MANIFOLD, 6 INCH FUELING (97403) 13228EL861	EA	2
39	4930-01-376-7725	NOZZLE ADAPTER, CLOSED-CIRCUIT TO GRAVITY FILL (81349) MIL-N-53093	EA	2
40	4930-01-370-3061	NOZZLE ASSEMBLY, CLOSED-CIRCUIT REFUELING ARCTIC SERVICING, (81349) MIL-N-53094	EA	2
41	4930-01-396-6230	NOZZLE ASSEMBI.Y, D-1 FUEL (97403) 13228E1821	EA	2
42		NOZZLE FUEL, AND OIL SERVICING, ARCTIC (97403) 13228E1838	EA	6
43	4320-01-327-4579	PUMP ASSEMBLY, 600 GPM (97403) 13229E1000	EA	4
44		REDUCER 3 INCH MALE BY 4 INCH FEMALE (97403) 13228E1833	EA	14
45		REDUCER, 1.5 INCH MALE BY 2 INCH FEMALE (97403) 13228E1836	EA	6
46		REDUCER, 2 INCH MALE BY 3 INCH FEMALE (97403) 13228E1809	EA	4
47		REDUCER, 3 INCH MALE BY 2 INCH FEMALE (97403) 13228E1807	EA	4

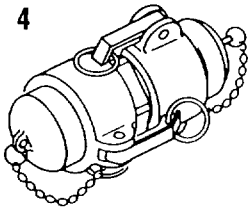
Section II. COMPONENTS OF END ITEM

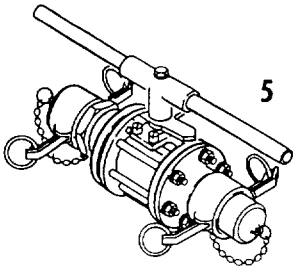
(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION CAGEC AND PART NUMBER	USABLE ON CODE	(4) U/M	(5) QTY RQD
48		REDUCER, 3 INCH MALE BY 6 INCH FEMALE (97403) 13228E1810		EA	4
49		REDUCER, 4 INCH BY 3 INCH FEMALE (97403) 13228E1842		EA	10
50		REDUCER, 4 INCH FEMALE BY 2 INCH FEMALE (97403) 13228E1835		EA	6
51		REDUCER, 4 INCH MALE BY 2 INCH FEMALE (97403) 13228E1808		EA	4
52		REDUCER, 6 INCH MALE BY 2 INCHI FEMALE (97403) 13228E1811		EA	4
53		REDUCER, 6 INCH MALE BY 4 INCH FEMALE (97403) 13228E1841		EA	10
54	5975-01-050-5707	ROD, GROUND (97403) 13219E0462		EA	28
55		SEAL,STRAPPING TYPE 201, 1/2 WIDTH (96906) WW-C-440,TYPE 201		BX	2
56		SEAL,STRAPPING TYPE 201, 3/4 WIDTH (96906) WW-C-440,TYPE 201		BX	2
57		STRAPPING, TYPE 201,1/2 WIDTH (96906) QQ-S-766, TYPE 201, 12 WIDTH		RL	2
58		STRAPPING, TYPE 201,3/4 WIDTH (96906) QQ-S-766, TYPE 201,3/4 I WIDTH		RL	2
59		VALVE SECTION, 4 INCH (97403) 13228E1829		EA	8
60		VALVE SECTION, 6 INCH (97403) 13228E1815		EA	4
61		WYE ASSEMBLY (97403) 13228E1847		EA	2

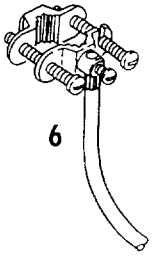
SECTION II. COMPONENTS OF END ITEM - cont.

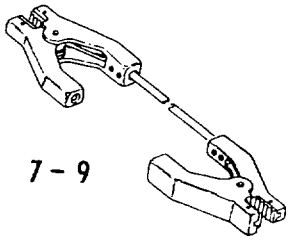


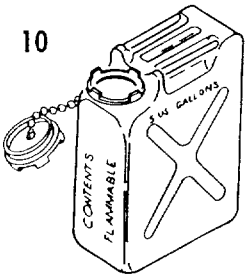


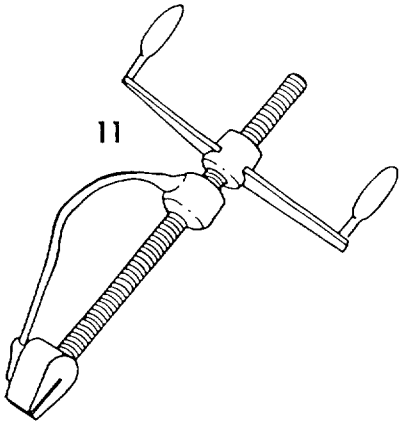


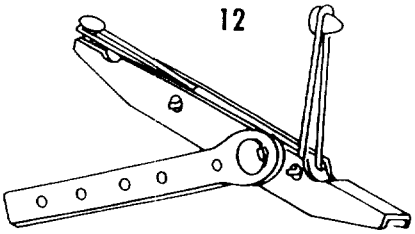


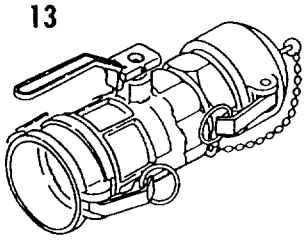


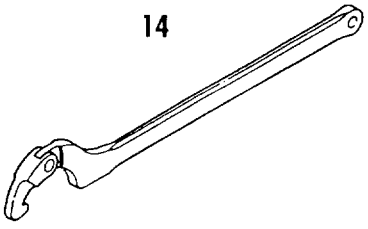


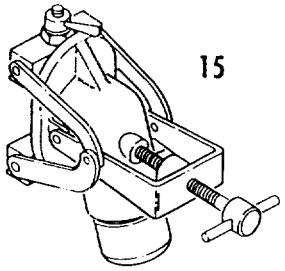












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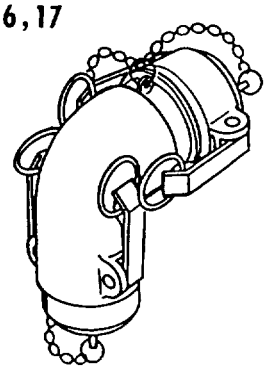

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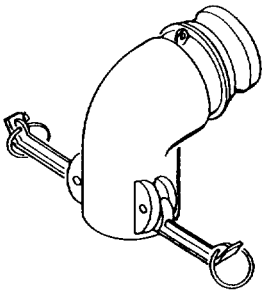

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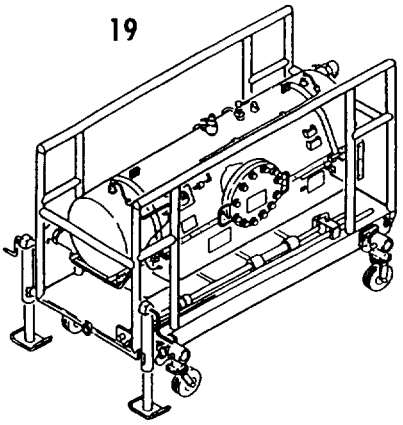

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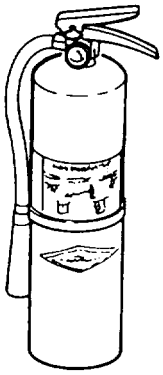

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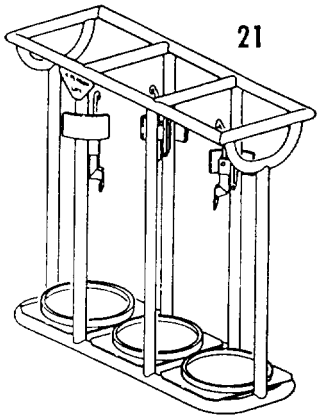
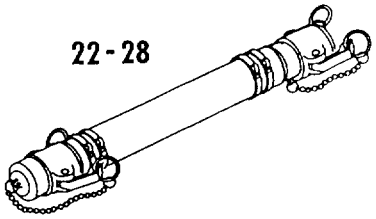


22 - 28



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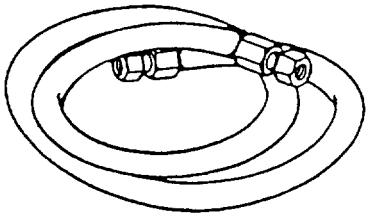

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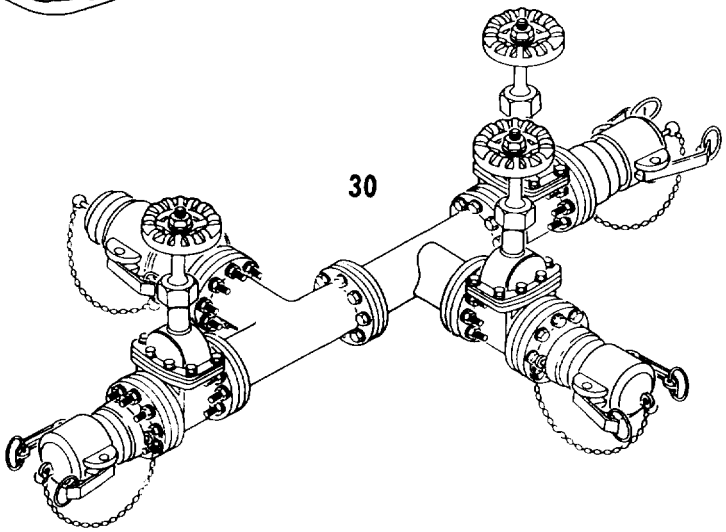

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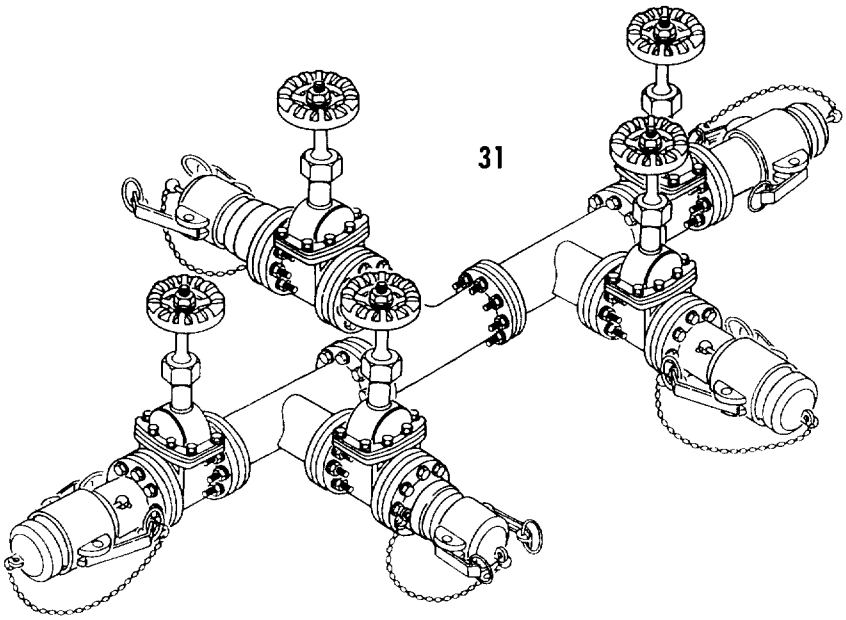
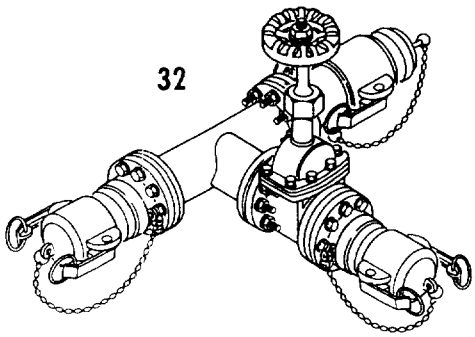
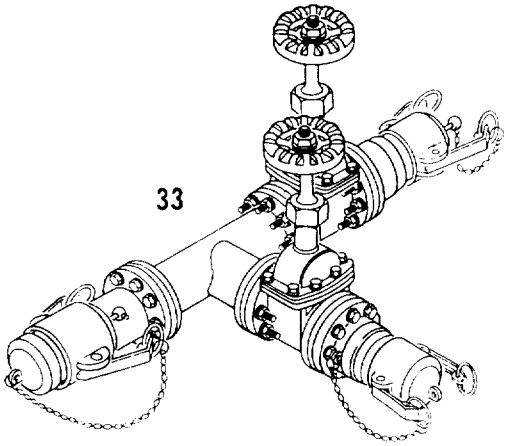
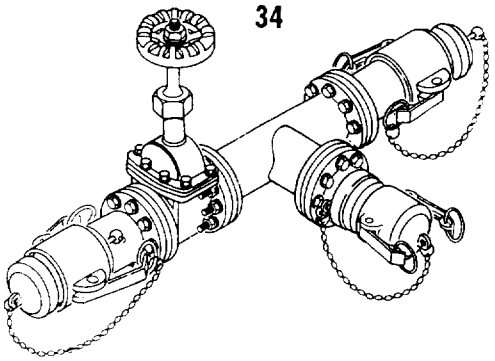
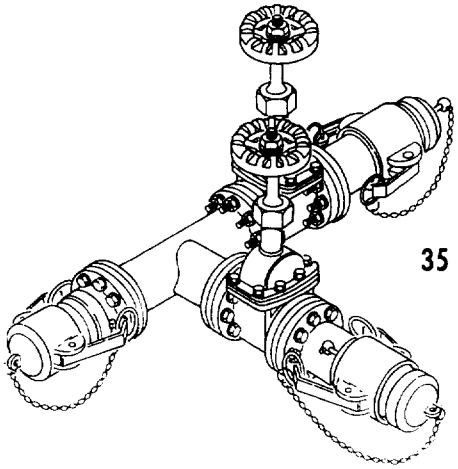
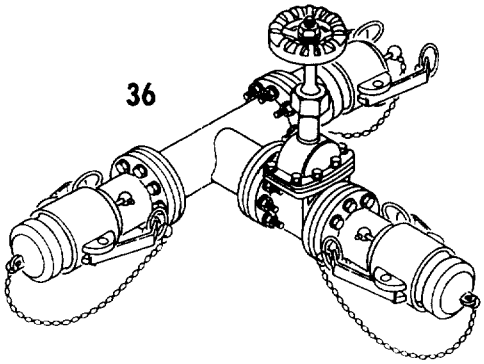






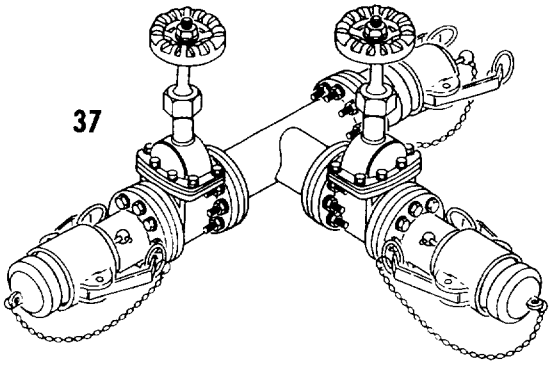






SECTION II. COMPONENTS OF END ITEM - cont.

37



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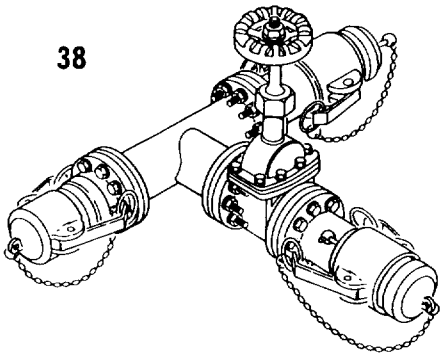

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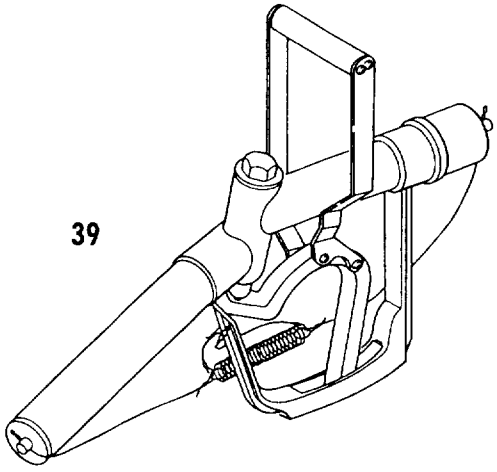

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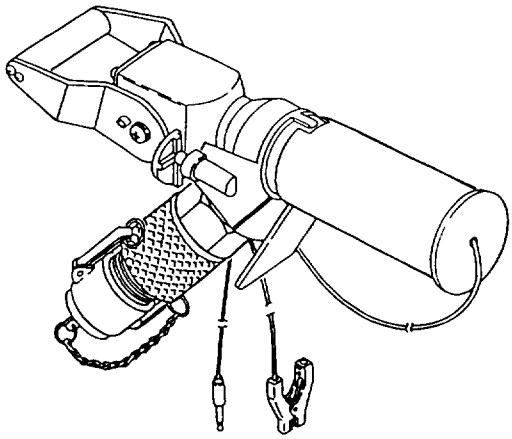

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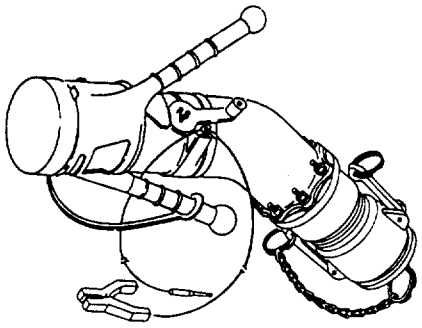

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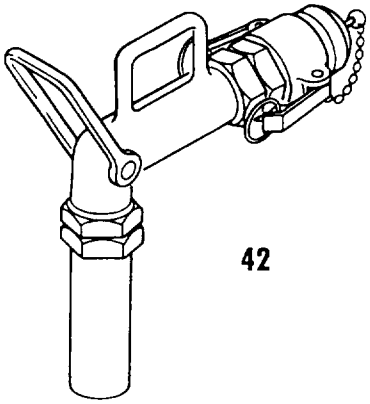
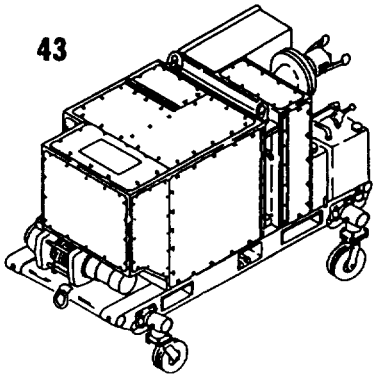


SECTION II. COMPONENTS OF END ITEM - cont.

43



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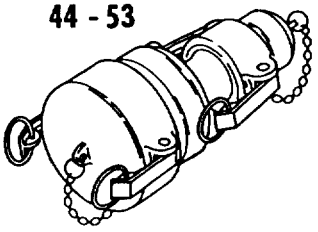

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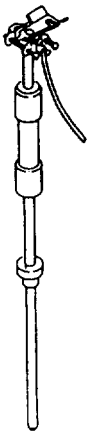

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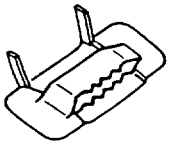

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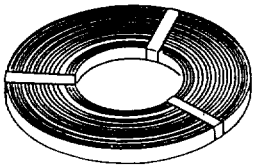

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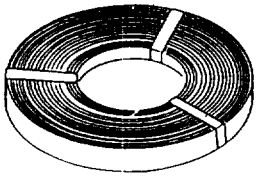

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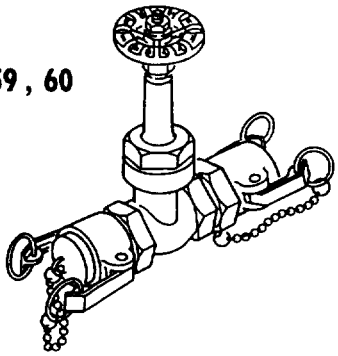

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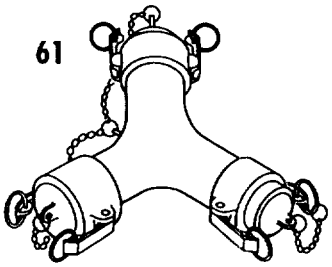
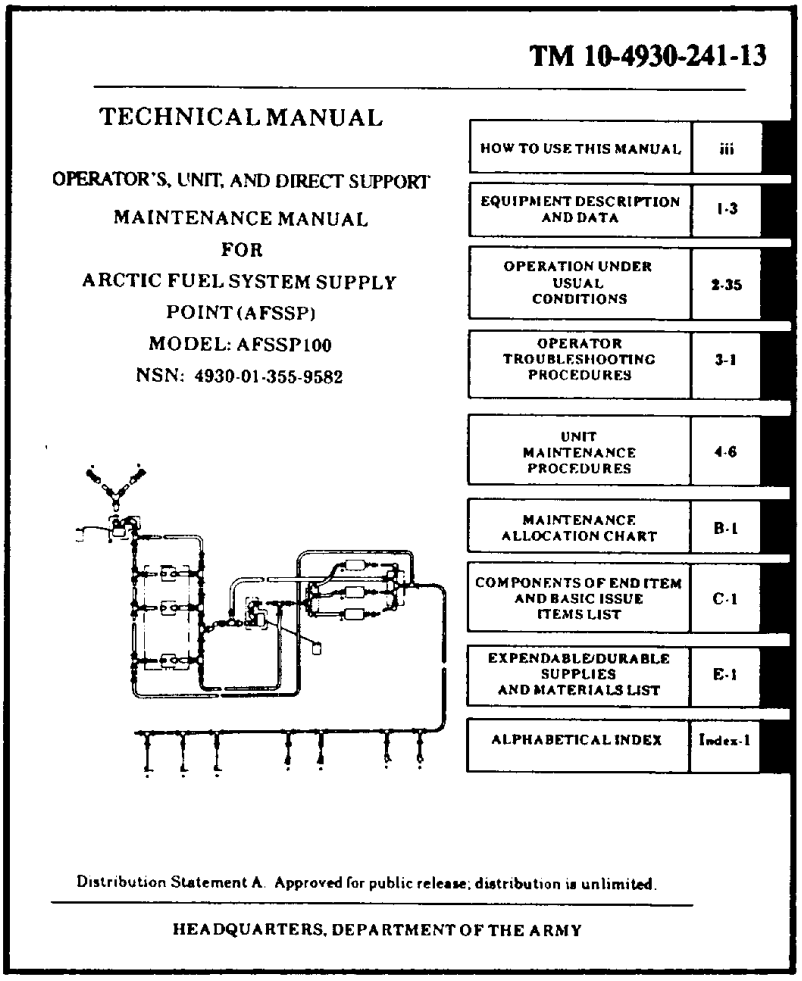


SECTION III. BASIC ISSUE ITEMS

(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION Usable on CAGE and Part Number Code	(4) U/M	(5) QTY. REQ
		TECHNICAL MANUAL, OPERATOR'S, UNIT, AND DIRECT SUPPORT MAINTENANCE MANUAL FOR ARCTIC FUEL SYSTEM SUPPLY POINT (AFSSP), TM 10-4930-241-13	EA	1



TM 10-4930-241-13

TECHNICAL MANUAL

OPERATOR'S, UNIT, AND DIRECT SUPPORT MAINTENANCE MANUAL FOR ARCTIC FUEL SYSTEM SUPPLY POINT (AFSSP) MODEL: AFSSP100 NSN: 4930-01-355-9582

HOW TO USE THIS MANUAL	iii
EQUIPMENT DESCRIPTION AND DATA	1-3
OPERATION UNDER USUAL CONDITIONS	2-35
OPERATOR TROUBLESHOOTING PROCEDURES	3-1
UNIT MAINTENANCE PROCEDURES	4-6
MAINTENANCE ALLOCATION CHART	B-1
COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LIST	C-1
EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST	E-1
ALPHABETICAL INDEX	Index-1

Distribution Statement A. Approved for public release; distribution is unlimited.

HEADQUARTERS, DEPARTMENT OF THE ARMY

APPENDIX D

ADDITIONAL AUTHORIZATION LIST

SECTION I. INTRODUCTION

D-1. SCOPE.

This appendix lists additional items that you are authorized for the support of the AFSSP.

D-2. GENERAL.

This list identifies items that do not have to accompany the AFSSP and that do not have to be turned in with it. These items are all authorized to you by CFTA, MTOE, TDA, or JTA.

D-3. EXPLANATION OF LISTING.

National stock numbers, descriptions, and quantities are provided to help you identify and request the additional items you require to support this equipment. The items are listed in alphabetical sequence by item name. If the item you require differs between serial numbers of the same model, effective serial numbers are shown in the last line of the description If the item required differs for different models of the equipment, the model is shown under the "Usable On" heading in the description column.

SECTION II. ADDITIONAL AUTHORIZED ITEMS LIST

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION CAGEC AND PART NUMBER USABLE ON CODE	(3) U/I	(4) QTY RECM
5120-00-237-6985	Screwdriver, Flat Tip (81348) GGG-S-121	EA	1
5430-01-327-7788	Tank, Collapsible Fabric, Petroleum, Low Temp., 20K Gals (66618) M53101-20	EA	VAR*
5430-01-327-2717	Tank, Collapsible Fabric, Petroleum, Low Temp., 3K Gals (66618) M53101-03	EA	VAR*
5430-01-327-7787	Tank, Collapsible Fabric, Petroleum, Low Temp., 10KGals (66618) M53101-10	EA	VAR*
5120-00-449-8083	Wrench, Adjustable, 10-Inch (58536) A-A-2344	EA	1

*Quantity is variable, depending on user's authorization.

APPENDIX E

EXPENDABLE AND DURABLE ITEMS LIST

SECTION I. INTRODUCTION

E-1. SCOPE.

This appendix lists expendable/durable supplies and materials you will need to operate and maintain the AFFSP. This listing is for informational purpose only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable and Durable Items (Except Medical, Class V, Repair Parts, and Heraldic Items), or CTA 8-100, Army Medical Department Expendable/Durable Items.

E-2. EXPLANATION OF COLUMNS.

a. Column 1 - Item Number. This number is assigned to the entry in the listing and is referenced in the task Initial Setup instructions to identify the material; e.g., "Cleaning solvent (App E)."

b. Column 2 - Category. This column identified the lowest category of maintenance that requires the listed item:

C - Operator/Crew
O - Unit Maintenance
F - Direct Support Maintenance

c. Column 3 - National Stock Number. This is the national stock number assigned to the item; use it to request or requisition the items.

d. Column 4 - Description. Indicates the federal item name and, if required, a description to identify the item. The last line for each item indicates the part number followed by the Commercial And Government Entity (CAGE) Code for Manufacturer in parentheses, if applicable.

e. Column 5 - Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differs from the rest of the issue, requisition the lowest unit of issue that will satisfy your requirements.

SECTION II. EXPENDABLE AND DURABLE ITEMS LIST

Item Number	Category	National Stock Number	Description	U/M
1	O	6850-00-331-3349	Cleaning Solvent, Federal Specification P-D-680, Type III	GL
2	O	7920-00-295-1711	Rags, Wiping (58536) A-A-531	LB
3	O		Sealant, Thread, with Teflon (97403) 13228E1791	TU
4	O	8040-01-142-9823	Adhesive, Sealant (81349) MIL-A-46106	TU
5	O	8030-00-889-3535	Tape, Anti-seize (80244) MIL-T-27730 SZ2	RL
6	O	6850-00-177-5094	Silicone Compound (81349) MIL-S-8660	OZ

APPENDIX F

LUBRICATION INSTRUCTIONS

Lubrication of the AFSSP is limited to the 600 GPM pump. Lubricate the pump in accordance with TM 10-4320-342-12.

APPENDIX G

ILLUSTRATED LIST OF MANUFACTURED ITEMS

NOT APPLICABLE

APPENDIX H

TORQUE LIMITS

H-1. SCOPE.

This appendix provides torque limits for general use type fasteners. The torque values given in this appendix shall be used when specific torque values are not identified in the maintenance instructions.

H-2. TORQUE LIMITS.

Torque limits for fine threaded fasteners as compared to coarse threaded fasteners of the same diameter are slightly higher, but are not significant to general use. The following table identifies the torque limits for various sizes and types of fasteners.

APPENDIX H

TORQUE LIMITS - cont.

TYPE	MINIMUM TENSILE STRENGTH	MATERIAL	BODY SIZE OR OUTSIDE DIAMETER OF FASTENER												
			#2	#3	#4	#5	#6	#8	#10	1/4	5/16	3/8	7/16	1/2	9/16
SAE 0-1-2	74,000 PSI	LOW CARBON STEEL								6 (8)	12 (16)	20 (27)	32 (44)	47 (64)	69 (94)
SAE 3	100,000 PSI	MEDIUM CARBON STEEL								9 (12)	17 (23)	30 (41)	47 (64)	69 (94)	103 (140)
SAE 5	120,000 PSI	MEDIUM CARBON HEAT TREAT STEEL								10 (14)	19 (26)	33 (45)	54 (73)	78 (106)	114 (155)
SAE 6	133,000 PSI	MEDIUM CARBON STEEL QUENCHED TEMPERED								12 (16)	24 (33)	43 (58)	69 (94)	106 (144)	150 (203)
SAE 7	133,000 PSI	MEDIUM CARBON ALLOY STEEL								13 (18)	25 (34)	44 (60)	71 (96)	110 (141)	154 (209)
SAE 8	150,000 PSI	MEDIUM CARBON ALLOY STEEL								14 (19)	29 (39)	47 (64)	78 (106)	119 (161)	169 (229)
SOCKET HEAD CAP SCREW	160,000 PSI	HIGH CARBON CASE HARDENED STEEL								16 (22)	33 (45)	54 (73)	84 (114)	125 (170)	180 (244)
SOCKET SET SCREW	212,000 PSI	HIGH CARBON CASE HARDENED STEEL					9 (1.0)	16 (1.8)	30 (3.4)	70 (7.9)	140 (15.8)	18 (2.0)	29 (3.3)	43 (4.9)	63 (7.1)

APPENDIX H

TORQUE LIMITS - cont.

TYPE	BODY SIZE OR OUTSIDE DIAMETER OF FASTENER															
	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/4	2 1/2	2 3/4	3
SAE 0-1-2	96 (130)	155 (210)	206 (279)	310 (420)	480 (651)	675 (915)	900 (1220)	1100 (1492)	1470 (1993)	1900 (2576)	2360 (3200)	2750 (3729)	3450 (4678)	4400 (5966)	7350 (9967)	9500 (12882)
SAE 3	145 (197)	234 (317)	372 (504)	551 (747)	872 (1182)	1211 (1642)	1624 (2202)	1943 (2635)	2660 (3607)	3463 (4696)	4695 (6366)	5427 (7359)	7226 (9798)	8049 (10914)	13450 (18238)	17548 (23795)
SAE 5	154 (209)	257 (349)	382 (518)	587 (796)	794 (1077	1105 (1498)	1500 (2034)	1775 (2407)	2425 (3288)	3150 (4271)	4200 (5695)	4550 (6170)	6550 (8882)	7175 (9729)	13000 (17628)	16000 (21696)
SAE 6	209 (283)	350 (475)	550 (746)	825 (1119)	1304 (1768)	1815 (2461)	2434 (3301)	2913 (3950)	3985 (5404)	5189 (7036)	6980 (9465)	7491 (10158)	10825 (14679)	14983 (20317)	20151 (27325)	26286 (35644)
SAE 7	215 (292)	360 (488)	570 (773)	840 (1139)	1325 (1797)	1825 (2475)	2500 (3390)	3000 (4068)	4000 (5424)	5300 (7187)	7000 (9492)	7500 (10170)	11000 (14916)	15500 (21018)	21000 (28476)	27000 (36612)
SAE 8	230 (312)	380 (515)	600 (814)	900 (1220)	1430 (1940)	1975 (2678)	2650 (3593)	3200 (4339)	4400 (5966)	5650 (7661)	7600 (10306)	8200 (11119)	12000 (16272)	17000 (23052)	23000 (31188)	29000 (39324)
SOCKET HEAD CAP SCREW	250 (339)	400 (542)	640 (868)	970 (1315)	1520 (2061)	2130 (2888)	2850 (3865)	3450 (4678)	4700 (6373)	6100 (8272)	8200 (11119)	8800 (11933)	13000 (17628)	18000 (24408)	24000 (32544)	31000 (42036)
SOCKET SET SCREW	100 (136)	146 (198)														

APPENDIX H

TORQUE LIMITS - cont.

TYPE	MINIMUM TENSILE STRENGTH	MATERIAL	BODY SIZE OR OUTSIDE DIAMETER OF FASTENER													
			#2	#3	#4	#5	#6	#8	#10	1/4	1/10	1/8	1/16	1/2	5/16	
MACHINE SCREW YELLOW BRASS	60,000 PSI	COPPER (CU) 63% ZINC (ZN) 37%	2 (.2)	3.3 (.3)	4.4 (.5)	6.4 (.7)	8 (.9)	16 (1.8)	20 (2.3)	65 (7.3)	110 (12.4)	17 (23)	27 (37)	37 (50)	49 (66)	
SILOCONE BRONZE TYPE "B"	70,000 PSI	COPPER (CU) 96% ZINC (ZN) 2% SILICON (SI) 2%	2.3 (.2)	3.7 (.3)	4.9 (5)	7.2 (.8)	10 (1.1)	19 (2.1)	22 (2.5)	70 (7.9)	125 (14.1)	20 (27)	30 (41)	41 (56)	53 (72)	

TYPE	BODY SIZE OR OUTSIDE DIAMETER OF FASTENER															
	3/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/4	2 1/2	2 3/4	3
MACHINE SCREW YELLOW BRASS	78 (106)	104 (141)	160 (217)	215 (292)	325 (441)	400 (542)		595 (807)								
SILOCONE BRONZE TYPE "B"	88 (119)	117 (159)	180 (244)	250 (339)	365 (495)	450 (610)		655 (888)								

LEGEND

1. TORQUE VALUES: All numbers are in foot-pounds except those that are underlined, which are inch-pounds.
2. Numbers in parentheses are Newton-Meters.

APPENDIX I

MANDATORY REPLACEMENT PARTS

ITEM NO.	NOMENCLATURE	PART NUMBER
1	Coupling Gasket, 1 1/2-in.	13228E1768-5
2	Strapping Seal	C255
3	Strapping	C20503C
4	Coupling Gasket, 2-in.	13228E1768-6
5	Strapping Seal	C456
6	Strapping	C40603D
7	Coupling Gasket, 3-in.	13228E1768-8
8	Strapping Seal	C456
9	Strapping	C40603G
10	Coupling Gasket, 4-in.	13228E1768-9
11	Strapping Seal	C456
12	Strapping	C40603G
13	Coupling Gasket, 6-inch	13228E1768-10
14	Strapping Seal	C456
15	Strapping	C40610B
16	Flange Gasket, 4-in.	13228E1827-4
17	Lockwasher	MS35338-46
18	Packing Ring	RF-0206 21
19	Gasket	RF-0109 2G
20	Lockwasher	RF-0221-2W
21	Stem Seal	445667SER2 ITEM7
22	Thrust Bearing	445667SER2 ITEM9
23	Body Seal	445667SER2 ITEM12
24	Seat	445667SER2 ITEM15
25	Stuffing Box Seal	H-10459M
26	Cotter Pin	H-4881-N
27	Cotter Pin	1711D-3-29
28	Seal	1711D-3-3
29	Cylinder	1711D-3-9

APPENDIX I

MANDATORY REPLACEMENT PARTS - cont.

ITEM NO.	NOMENCLATURE	PART NUMBER
30	Flange Gasket, 6-in.	13228E1827-5
31	Gasket	235RF-0309 2G
32	Packing Ring	35RF-0308 2P
33	Lockwasher	235RF-0221 2W
34	Lockwasher	MS35338-139

ALPHABETICAL INDEX

Paragraph		Page
	-A-	
Adapter (4-in F x 4-in F) Repair		4-39
Administrative Storage		4-47
Arctic Fuel and Oil Servicing Nozzle Repair		4-6
Arctic Nozzle Fuel and Oil Servicing Controls		2-17
Assembly and Preparation for Use		2-35
	-B-	
Ball Valve Assembly (4-Inch) Repair		4-30
Ball Valve Controls, 4-Inch		2-16
	-C-	
Checking Unpacked Equipment		4-3
Closed Circuit Refueling (CCR) Nozzle Controls		2-5
Collapsible Tank Controls		2-14
Common Tools and Equipment		4-2
Corrosion Prevention and Control (CPC)		1-2
Coupler Assembly Repair		4-24
Coupler Controls, 3-Inch		2-15
	-D-	
Decals and Instruction Plates		2-91
Decontamination Procedures		2-120
Description and Use of Operator's Controls and Indicators		2-2
Destruction of Army Materiel to Prevent Enemy Use		1-2
Direct Support Maintenance Procedures		5-1
Discharge and Suction Hose Repair (Typical)		4-9
	-E-	
Elbow (4-in M x 4-in F) Repair		4-35
Emergency Procedures		2-120
Equipment Characteristics and Features		1-3
Equipment Data		1-8
Equipment Description and Data		1-3
Extinguisher Frame		4-45

ALPHABETICAL INDEX - cont.

Paragraph	Page
-F-	
Filter Separator Controls and Indicators	2-6
Fire Extinguisher Frame Repair	5-1
Fueling Manifold Controls, 4-Inch and 6-Inch	2-13
-G-	
Gate Valve (4-Inch) Repair (Typical)	4-21
Gate Valve (6-inch) Repair	4-38
General Information	1-1
Glossary	1-2
Gravity Fill Adapter Nozzle Controls	2-4
-H-	
-I-	
Initial Adjustment	2-72
Introduction	3-1, 4-5, 5-1
-J-	
-K-	
-L-	
Leakage Criteria	2-19
List of Abbreviations	1-2
Location and Description of Major Components	1-4
Lubrication Instructions	3-1
-M-	
Maintenance Forms Records and Reports	1-1
Malfunction Index	3-2
Manifold (4-Inch /Five Valves) Repair	4-35
Manifold (4-Inch) (Three Valves) Repair	4-38
Manifold (4-Inch) (Two Valves) Repair	4-38
Manifold (4-Inch/One Valve) Repair	4-17
Manifold (6-Inch) (One Valve) Repair	4-38
Manifold (6-Inch) (Two Valves) Repair	4-38

ALPHABETICAL INDEX - cont.

Paragraph	Page
-N-	
Nomenclature Cross Reference List	1-2
-O-	
Operating Auxiliary Equipment	2-91
Operating Procedures	2-72
Operation in Dusty or Sandy Areas	2-118
Operation in Saltwater Area	2-119
Operation Under Unusual Conditions	2-118
Operation Under Usual Conditions	2-35
Operator Maintenance Procedures	3-17
Operator Preventive Maintenance Checks and Services	2-20
Operator Troubleshooting Procedures	3-1
Operator's Preventive Maintenance Checks and Services IPMCS)	2-18
-P-	
PMCS Procedures	4-4
PMCS Procedures	2-18
PMCS Table	4-5
Preparation for Movement	2-91
Preparation for Storage or Shipment	4-47
Principles of Operation	1-10
Pump Assembly Controls and Indicators, 600 GPM	2-8
-Q-	
-R-	
Reducer (3-in M x 4-in F) Repair	4-30
Reducer (4-in M x 3-in F) Repair	4-37
Reducer (6-in M x 4-in Fl Repair	4-38
Reducer Assembly (1.5-in M x 2-in F) Repair	4-14
Reducer Assembly (2-in M x 4-in F) Repair	4-16
Repair Parts	4-2
Repair Parts, Special Tools, Test, Measurement, and Diagnostic Equipment (TMDE), and Support Equipment	4-2
Reporting of Equipment Improvement Recommendations (EIR).	1-2

ALPHABETICAL INDEX - cont.

Paragraph		Page
	-S-	
Scope		1-1
Security Procedures		4-47
Service Upon Receipt		4-3
Shelter Requirements		4-3
Single Point Refueling Nozzle (DI) Controls		2-3
Siting		4-3
Special Tools, TMDE and Support Equipment		4-2
Suction Hose Assembly (6-in x 10-ft) Repair		4-38
System Technical Principles of Operation		1-10
	-T-	
Troubleshooting Procedures, Unit		3-2
	-U-	
Unit Maintenance Procedures		4-6
Unit Preventive Maintenance Checks and Services ! PMCS)		4-4
Unit Troubleshooting Procedures		4-5
	-V-	
Valve Section Controls, 6-Inch		2-12
Valve Section Repair, 4-Inch		4-38
Valve Section Repair, 6-Inch		4-42
	-W-	
Wye Assembly Repair		4-42
	-X-	
	-Y-	
	-Z-	

By Order the Secretary of the Army:

DENNIS J. REIMER
General, United States Army
Chief of Staff

Official

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00622

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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 = 3.2808.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 dekagram = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 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

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu in.
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Square measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. in.
1 sq. decimeter = 100 sq. centimeters = 15.5 inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 feet
1 sq. dekameter (are) = 100 sq. meters = 1.076.4 sq. ft.
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 hectometers = .386 sq. miles

Liquid Measure

1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons
1 liter = 10 deciliters = 33.81 fl. ounces
1 centiliter = 10 milliliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3 38 fl. ounces
1 metric ton = 10 quintals = 1.1 short tons

Approximate Conversion Factors

To change	To	Multiply by
inches	centimeters	2.540
feet	meters	.305
yards	meters	.914
miles	kilometers	1.609
sq. inches	sq. centimeters	6.451
sq. feet	sq. meters	.093
sq. yards	sq. meters	.836
sq. miles	sq. kilometers	2.590
acres	sq. hectometers	.405
cubic feet	cubic meters	.028
cubic yards	cubic meters	.765
fluid ounces	milliliters	29.573
pints	liters	.472
quarts	liters	.946
gallons	liters	3.785
ounces	grams	28.349
pounds	kilograms	.454
short tons	metric tons	.907
pound inches	newton-meters	.11296

To change	To	Multiply by
ounce inches	newton-meters	.0070062
centimeters	inches	.394
meters	feet	3.280
meters	yards	1.094
kilometers	miles	.621
sq. centimeters	sq. inches	.155
sq. meters	sq. yards	10.764
sq. kilometers	sq. miles	1.196
sq. hectometers	acres	2.471
cubic meters	cubic feet	35.315
milliliters	fluid ounces	.034
liters	pints	2.113
liters	quarts	1.057
grams	ounces	.035
kilograms	pounds	2.205
metric tons	short tons	1.102
pound-feet	newton-meters	1.356

Temperature (Exact)

°F Fahrenheit temperature — 5/9 (after subtracting 32) — Celsius Temperature °C

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