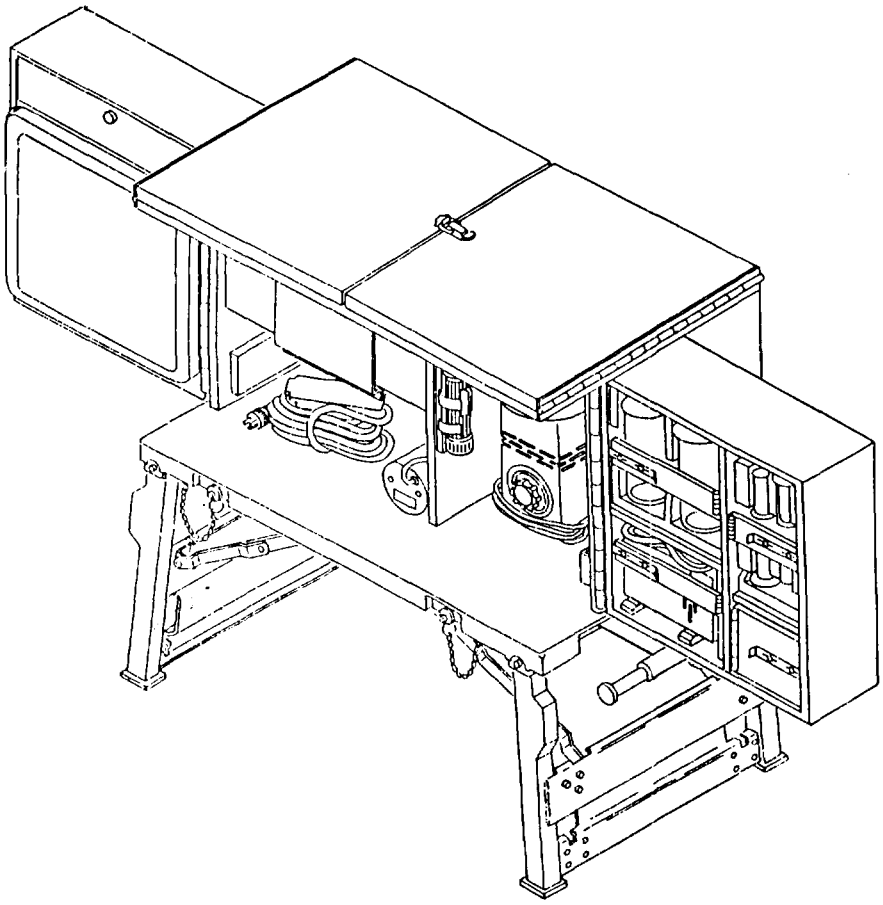
TECHNICAL MANUAL

OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE MANUAL INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST FOR GROUND FUELS PETROLEUM TEST KIT MODEL PTK-200

NSN: 6630-00-310-8564 (EIC: FHN)



QUARTERS, DEPARTMENT OF THE ARMY
18 JANUARY 1994

CHANGE

NO. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., 7 May 1997

Operator's, Unit and Direct
Support Maintenance Manual
Including Repair Parts and
Special Tools List

for

GROUND FUELS PETROLEUM TEST KIT
MODEL PTK-200
NSN: 6630-00-310-8564 (EIC: FHN)

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TM 10-6630-247-13&P, 18 January 1994, is changed as follows:

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

Remove pages	Insert pages
i and ii	i and ii
C-1 through C-6	C-1 through C-6
C-7 and C-8	(C-7 blank)/C-8
C-9 through C-13/(C-14 blank)	C-9 through C-13/(C-14 blank)
C-19/(C-20 blank)	C-1 9/(C-20 blank)
C-27 through C-29/(C-30 blank)	C-27 through C-29/(C-30 blank)
C-33 and C-34	C-33 and C-34
C-35 through C-39/(C-40 blank)	------- --------
D-1 through D-4	D-1 through D-4
F-1 and F-2	F-1 and F-2

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

By Order of the Secretary of the Army:

DENNIS J. REIMER
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03062

DISTRIBUTION:
To be distributed in accordance with DA Form 12-25-E, block no. 6133, requirements for TM 10-6630-247-13&P.

WARNINGS

HEAVY EQUIPMENT HAZARD

Lifting or moving the Test Kit incorrectly can cause serious injury. Do not try to lift or move the test kit by yourself, get three assistants. Bend legs while lifting. Don't support heavy weight with your back.

FIRE HAZARD

Do not use near open flame or excessive heat. Death or personnel injury could occur due to exploding or burning fuel.

Do not allow smoking within 100 feet of fuel drum filling area. Death or personnel injury could occur due to exploding or burning fuel.

Do not allow fuel to come in contact with eyes or skin, Wear protective goggles. Fuels are toxic and can cause illness or death. If fuel contacts skin or eyes, flush and get medical attention immediately.

Do not spill fuel on clothing. Static electricity can ignite fuel and cause personnel injury or death. Remove clothing and wash affected area thoroughly and get medical attention immediately

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

Do not allow smoking within 100 feet of the dispensing area. Post NO SMOKING signs around the area. Avoid getting fuel on the body or clothing. If clothing becomes saturated with fuel, remove the clothing immediately and wash body with hot soapy water and soak clothing in soapy water.

Avoid spillage of fuel. If spillage of fuel occurs, cover the area with dry soil to reduce the rate of vaporization,

Be certain a suitable fire extinguisher is present and that it is properly charged and positioned so as to be readily available in case of fire.

ELECTRICAL HAZARD

Use only grounded electrical power source. Do not use electrical cable if grounding lug has been removed.

To prevent serious electrical shock, do not operate electrical equipment from damp or wet soil

FIRST AID

For artificial respiration, refer to FM21-11.

TECHNICAL

NO. 10-6630-247-13&P

MANUAL HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D. C. 18 January 1994

OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE MANUAL INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL) for GROUND FUELS PETROLEUM TEST KIT MODEL PTK-200 NSN 6630-00-310-8564 (EIC: FHN)

(Current as of 3 October 1996)I

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. You may also submit your recommended changes by E-mail directly to <mpmt%/oavma28. St-Louis-emh7.army.mil>. A reply will be furnished directly to you. Instructions for sending an electronic 2028 may be found at the back1 of this manual immediately preceding the hard copy 2028.

Distribution Statement A: Approved for public release; distribution is unlimited.

TABLE OF CONTENTS

TABLE OF CONTENTS - cont

HOW TO USE THIS MANUAL

Be sure to read all Warnings before using your equipment.

This manual contains operating and maintenance instructions for operation and maintenance of the Ground Fuels Petroleum Test Kit (Test Kit)

- Chapter 1- Introduces you to the equipment and gives you information such as weight, height, length, generally used abbreviations and information on how the system works. The chapter is preceded by a full page illustration of the equipment.

- Chapter 2- Provides information necessary to identify and use the equipment's operating controls. Operating instructions in this chapter tell you how to use the equipment in both usual and unusual weather conditions. In addition, preventive maintenance instructions provide information needed to inspect and service the Test Kit.

- Chapter 3- Provides troubleshooting and maintenance procedures needed by the Operator to identify and correct equipment malfunctions. Only tasks authorized by the MAC for operator repair are contained in this chapter.

- Chapter 4- Provides unit maintenance personnel with troubleshooting procedures for identifying equipment malfunctions and maintenance instructions for repairing defective equipment

  Chapter 5- Provides direct support maintenance personnel with maintenance instructions for performing repairs on equipment as authorized by the maintenance allocation chart.

- Appendix A- Provides a list of frequently used forms and publications referenced or used in this manual.

- Appendix B - The Maintenance allocation chart identifies repairable components and the maintenance level authorized to perform the repairs.

  Appendix C - The Repair Parts and Special Tools List (RPSTL) contains illustrations and parts lists that are used to locate and identify replacement and repair parts.

- Appendix D - Lists components that are not mounted on the equipment, but are required to make the unit functional. All components in the Components of End Item (COEI) and Basic Issue Items Lists (BII) are illustrated for easy identification.

- Appendix E - Lists additional equipment authorized for your unit for use with the Test Kit, but are not supplied as part of system. This equipment list may include fire extinguishers, buckets, protective clothing etc.

- Appendix F - Provides you with information about expendable supplies such as sealants, lubricants, chemicals etc. that are used when operating or maintaining the equipment.

- Appendix G - Contains lubrication instructions that are required to keep the equipment in good working condition.

HOW TO USE THIS MANUAL - cont.

- Appendix H - Provides a list of items and instructions on how to make certain tools and devices required to perform some of the maintenance tasks contained in this manual.

  Appendix I - Provides a table of torque values for various sizes of nuts and bolts.

- Appendix J - Lists parts that must be replaced when performing maintenance on components of the Test Kit. This list includes such things as gaskets, lockwashers and seals.

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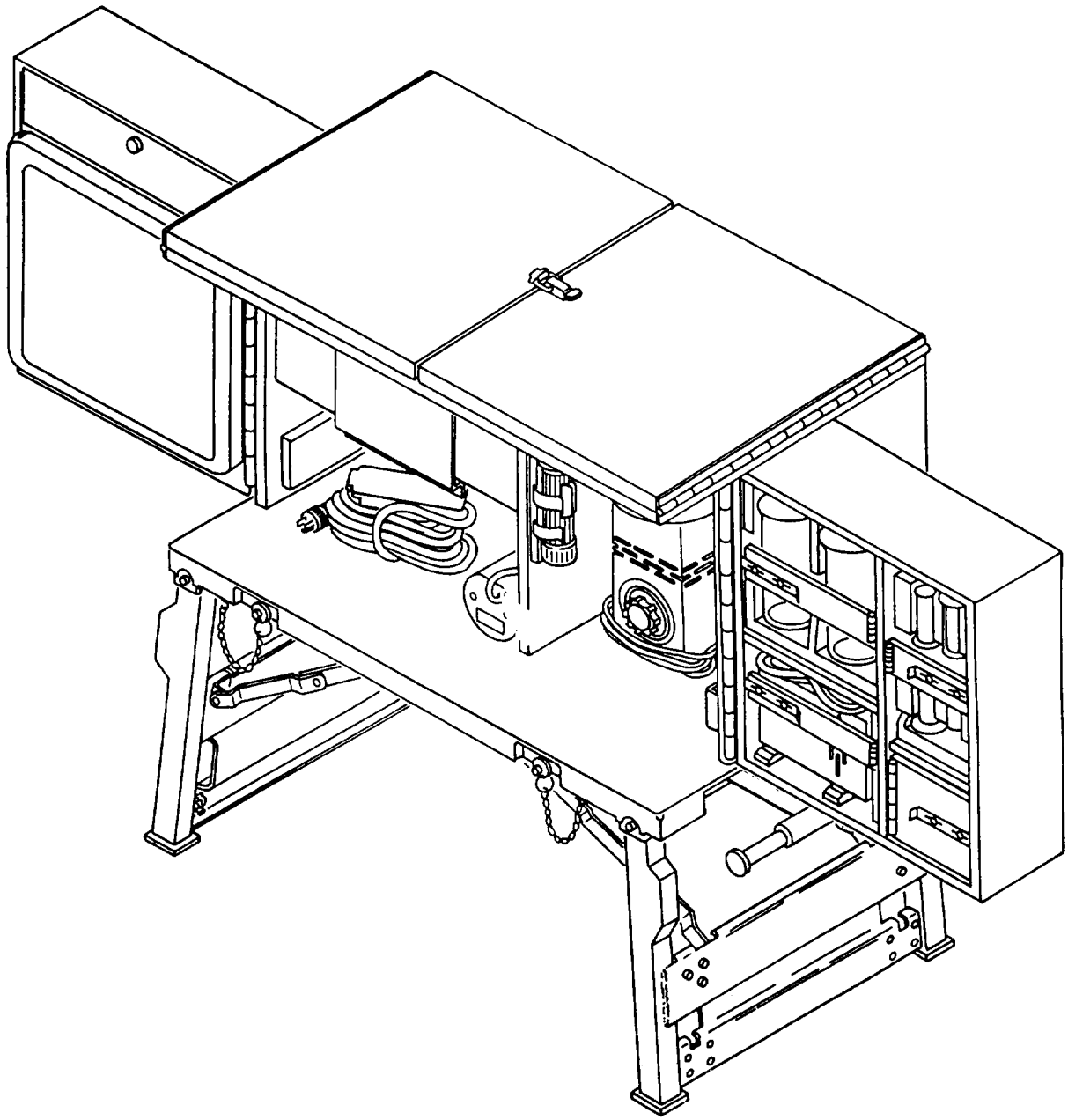


Figure 1-0. Ground Fuels Petroleum Test Kit.

CHAPTER 1

INTRODUCTION

Section I. GENERAL INFORMATION

1-1. SCOPE.

This manual contains Operating instructions, Unit and Direct Support maintenance instructions required to operate and maintain the Ground Fuels Petroleum Test Kit (Test Kit), Model PTK-200.

1-2. MAINTENANCE FORMS AND PROCEDURES.

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.

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 Test Kit 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 it to us at: Commander, U.S. Army Aviation and Troop Command, ATTN: AMSAT-I-MDO, 4300 Goodfellow Boulevard, St. Louis, MO 63120-1798. Well send you a reply.

1-6. NOMENCLATURE CROSS REFERENCE LIST.

Common Name	Official Nomenclature
Test Kit	Test Kit, Ground Fuels, Petroleum

1-7. LIST OF ABBREVIATIONS.

Abbreviation	Nomenclature
K	Kilo (Thousand)
°F	Degrees Fahrenheit
GFTK	Ground Fuels Test Kit
Gpm	Gallons Per Minute
ASTM	American Society for Testing and Materials

1-8. GLOSSARY.

Term	Description
Ambient	Outside or surrounding air

Section II. EQUIPMENT DESCRIPTION

1-9. EQUIPMENT CHARACTERISTICS, CAPABILITIES AND FEATURES.

a. Characteristics.

(1) All test equipment and accessories are stowed in one self-contained cabinet.

(2) Folding cabinet top and legs.

(3) Retractable lifting handles.

(4) Adaptable to meet varying mission and site requirements.

(5) Easily transportable. Assembled test kit can be lifted by four personnel and maybe transported by truck or airlifted.

b. Capabilities and Features.

(1) Can be setup and ready for operation in about 30 minutes.

(2) Can perform flash point testing of fuel oils, lube oils, suspensions of solids and other liquids per ASTM D-93.

(3) Can perform distillation of natural gasolines, motor gasolines, aviation gasolines, aviation turbine fuels, napthas and kerosenes in accordance with ASTM D-86.

1-10. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS.

Refer to figure 1-1.

a. Cabinet (1). The metal cabinet provides storage for all the fuel kit components. Two hinged doors open to provide access to the cabinet interior. The hinged cabinet top unfolds to provide additional work space during setup and operation of test equipment.

b. Len Supports (2). Two folding leg supports are located under the cabinet. The supports are unfolded during use and folded during storage.

c. Distillation Unit (3). The distillation unit consists of an electrical heater, heat shield, condenser and condenser stand. The unit must be assembled before use and disassembled for storage.

d. Flash Point Tester (4). The flash point tester is stored in the cabinet and consists of an electrical heater, dome, tubing and related valves and couplings.

e. Oil Drum Thief (Fuel Sampler) (5). The fuel sampler is a two piece graduated cylinder stored in the cabinet behind the distillation unit. During use, the two halves of the drum thief are assembled and lowered into a fuel storage tank or facility.

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

f. Slow Speed Stirrer (6). The slow speed stirrer consists of an electric motor, spindle, pulley and cord. An adapter clamp and spring-type belt are supplied with each motor. The stirrer is installed on the flash point tester during use.

g. Cork Borer Set (7). The cork borer set consists of 15 tube-type hole cutters of various sizes. The borers are used to cut holes in cork material. The corks are then used to connect various flasks and tubes for assembly of distillation equipment.

h. Flashlight (8). Two cell, battery operated flashlight provides lighting for night operations and is stowed in the cabinet.

i. Graduated Cylinders (9). Various sizes of cylinders are supplied in the test kit to aid in measuring, mixing and handling of fuel samples.

j. Swabs (10). Flexible metal swabs are supplied for cleaning the test instruments and equipment.

k. Propane Cylinder (11). The propane cylinder is connected to the flash point tester during use. The cylinder provides propane gas needed for conducting flash point tests. When not in use, the cylinder is stored in the cabinet.

l. Jars (12). Two jars are supplied in the test kit to aid in measuring, mixing and handling of fuel samples. When not in use, jars are stowed in the cabinet.

m. Thermometers (13). Twelve thermometers are supplied with the test kit to measure temperatures of test samples during the testing process. All thermometers are stowed inside the left door of the cabinet.

n. Brushes (14). Three brushes are supplied for cleaning the test instruments and equipment.

o. Bung Wrench (15), The bung wrench is stowed on the back wall of the cabinet and is used to remove plugs, covers and lids from fuel barrels and cans.

p. Power Cable (16). The electrical power cable is 25 feet long and contains three receptacles. The cable distributes power from the power source to the test kit.

q. Loading Plan (17). A card showing the placement of each test kit component in the cabinet. The loading plan is used to aid packing the test kit and is attached by a small chain.

r. Distillation Flasks (18). Four distillation flasks are supplied with the Test Kit and are used during distillation testing. All flasks are stowed in the left cabinet door.

s. Stop Watch (19). The stop watch is stowed in the left cabinet door and is used to time various phases of the testing process,

Refer to figure 1 –2.

t. Sampling and Gaging Kit. The sampling and gaging kit is stowed on the lower left side of the cabinet. It is used to collect fuel samples. The kit consist of an API gravity computer, a cupcase thermometer, a hydrometer cylinder, gasoline indicating paste, innage tape, a weighted beaker sampler, and standard hydrometers.

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

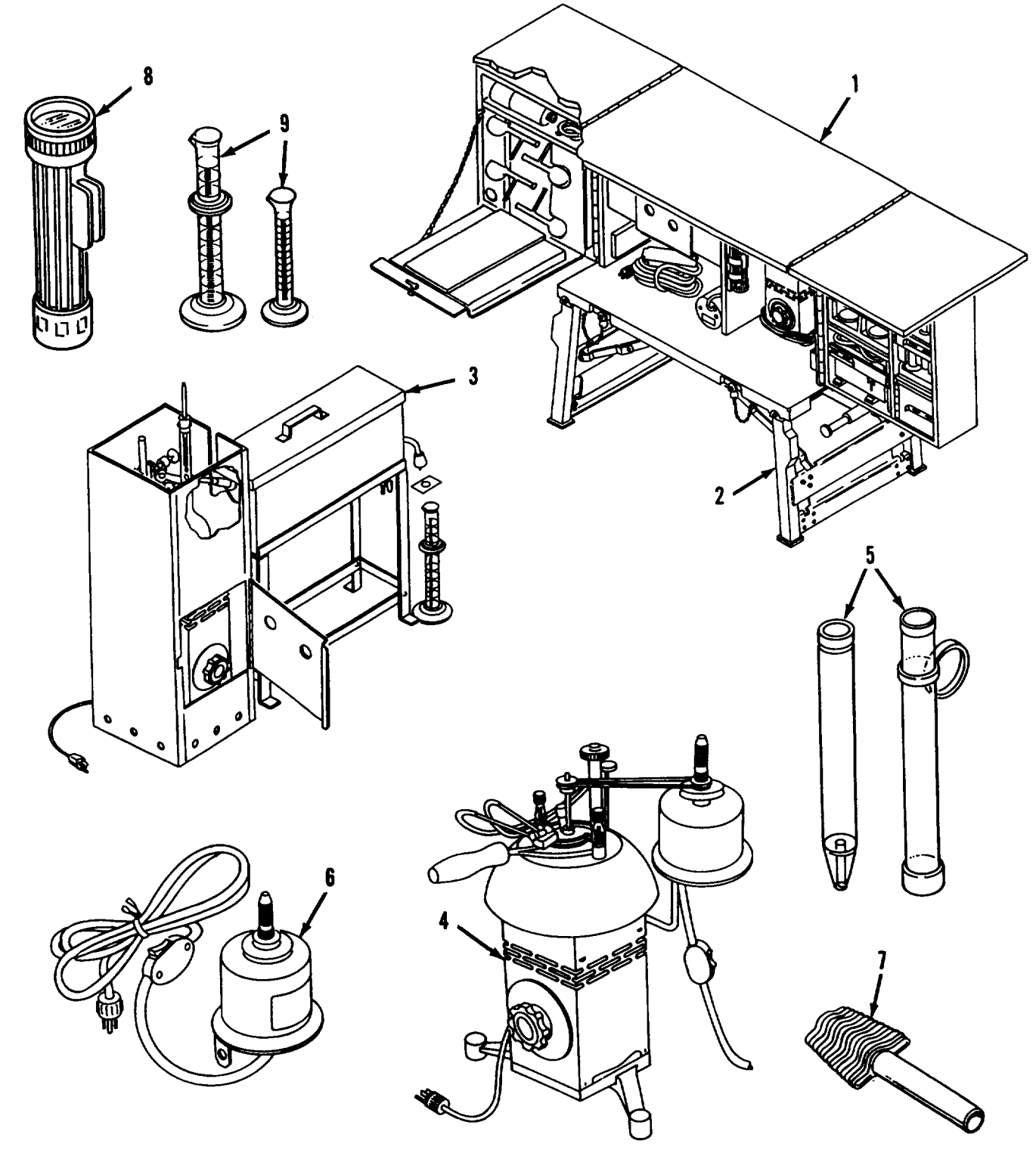


Figure 1-1. Ground Fuel Petroleum Test Kit (Sheet 1 of 2).

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

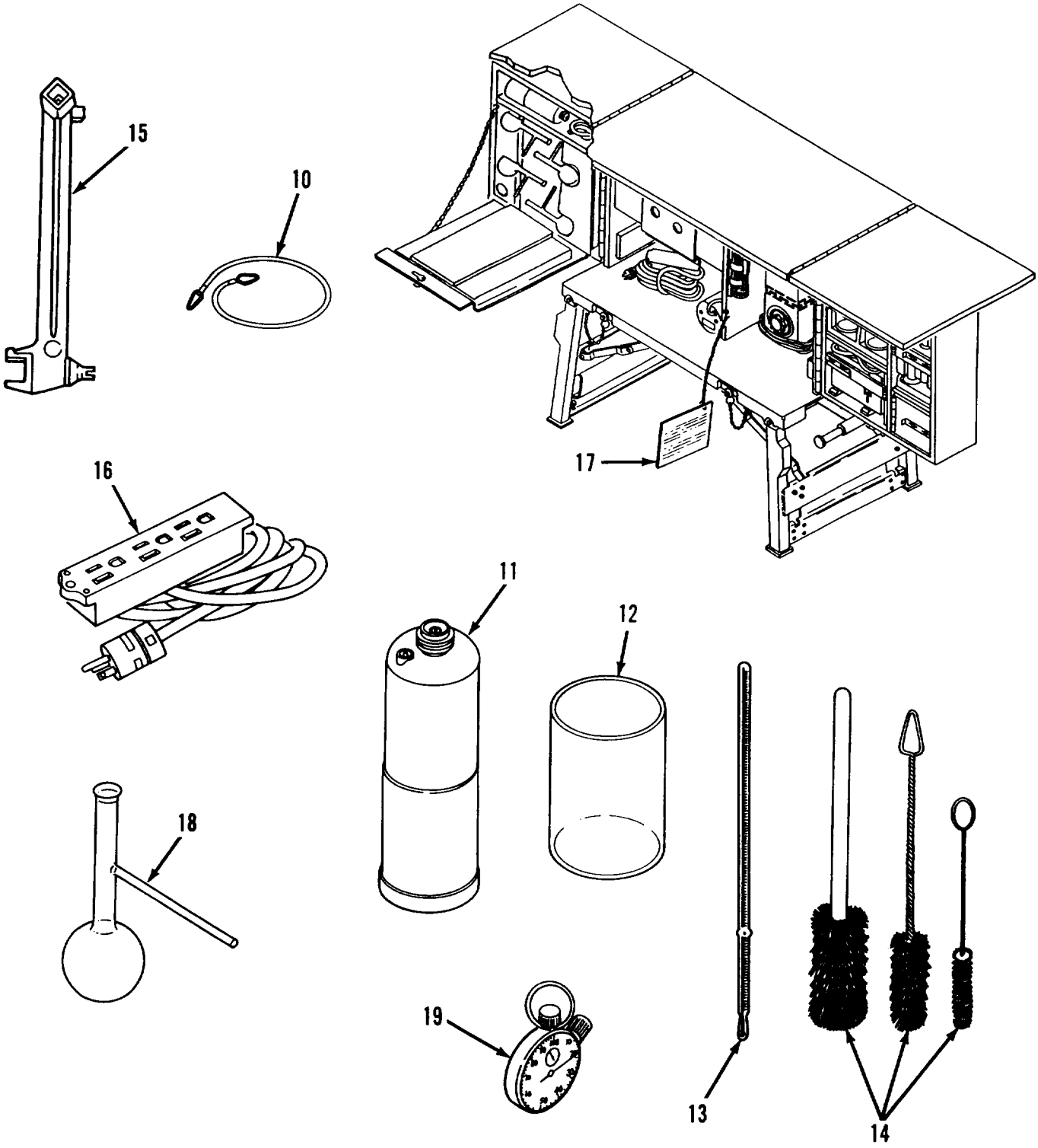


Figure 1-1. Ground Fuel Petroleum Test Kit (Sheet 2 of 2).

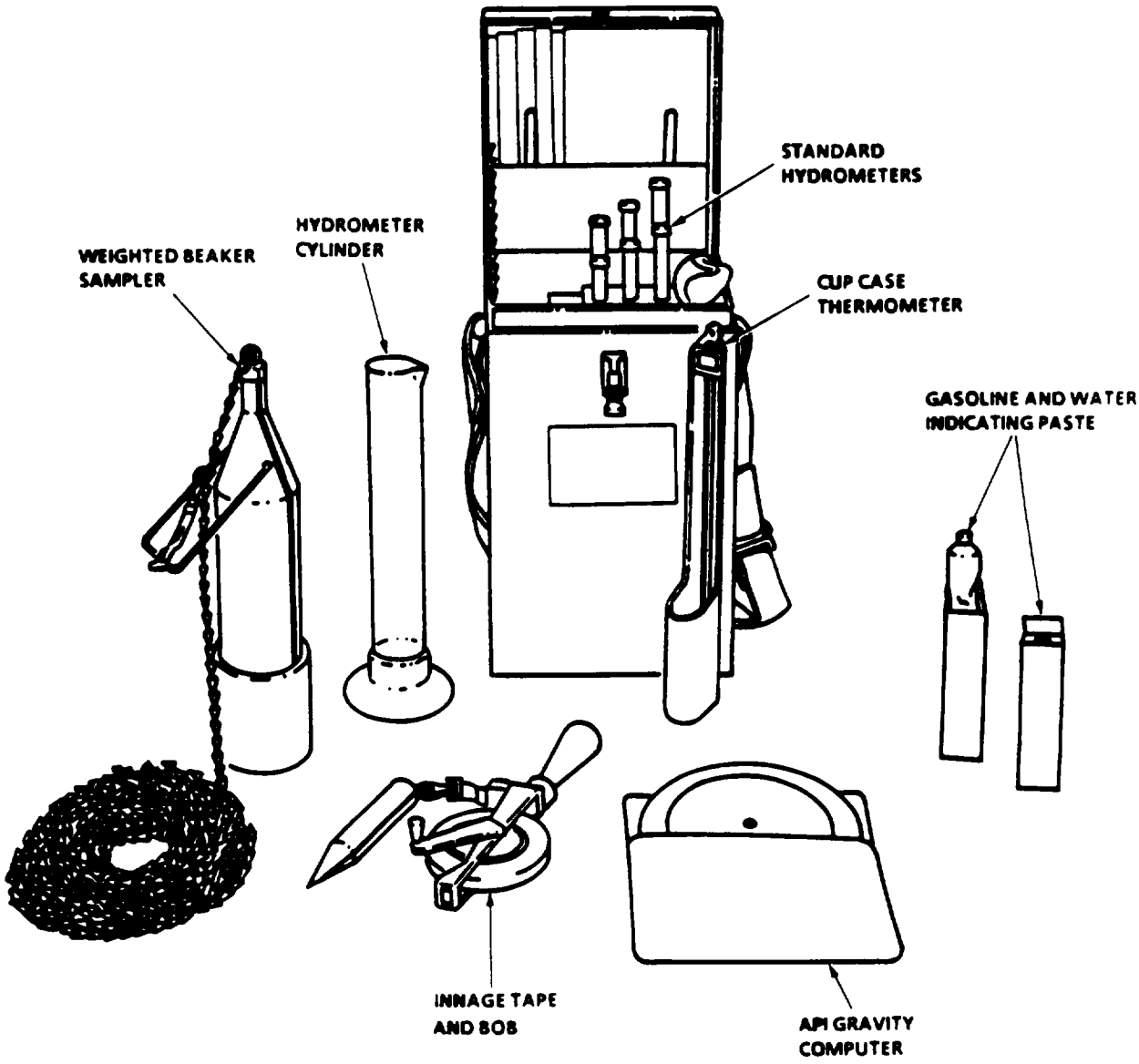


Figure 1-2 Sampling and Gaging Kit

1-11. EQUIPMENT DATA (Refer to Table 1-1).

Table 1-1. Equipment Data

CABINET	
Weight:	
Empty	175 pounds
Full	241 pounds
Length:	
Folded	37 inches
Unfolded	76 inches
Width	20.5 inches
Height	
(Legs Extended)	36.5 inches
(Legs Retracted)	24.5 inches
DISTILLATION UNIT	
Voltage	120 Vac
Hertz	50/60
Amps	6.3
Heater Range	0 to 750 Watts
Condenser Capacity	1.25 gal
FLASH POINT TESTER	
Voltage	120 Vac
Hertz	50/60
Amps	6.3
Heater Range	0 to 750 Watts

Section III. PRINCIPLES OF OPERATION

1-12. SYSTEM TECHNICAL PRINCIPLES OF OPERATION.

a. General, The Ground Fuels Petroleum Test Kit described in this manual is designed to be a self-contained petroleum testing apparatus capable of performing fuel sampling, flashpoint testing and distillation testing of various ground fuels. Your mission requirements will determine the type of tests that must be performed based on the types of fuel available. All testing must be performed in accordance with the applicable ASTMS.

b. Cabinet. When packed for shipment, the test kit cabinet provides storage and protection for all the test kit components. When opened for use, the cabinet top unfolds to provide additional workspace.

c. Distillation Unit, The distillation unit is operated by applying heat to a specific quantity of fuel and measuring the rate of evaporation and vapor condensation.

The fuel sample in the distillation flask is heated by the electrically powered variable heat source. As the fuel sample is heated and begins to boil, vapors given off by the fuel are directed from the flask into the condenser assembly,

The condenser assembly is filled with a cooling agent (ice water) that surrounds the vapor tube carrying fuel vapors from the distillation flask. The reduced surface temperature of the vapor tube causes the evaporated fuel to condense and flow down to a graduated flask positioned on the outside of the condenser.

The time required for the fuel to evaporate and condense is measured and recorded, then compared to the standards identified in the applicable ASTM fort he type of fuel being tested.

d. Flash Point Tester. The flash point tester is used to determine the lowest temperature at which a particular fuel vapor will ignite when exposed to an open flame.

A fuel sample is placed in the flash cup. The slow speed stirrer is connected to and drives the internal paddles which stirs the fuel sample.

The flash cup is heated by an electrically powered variable heat source until a vapor is formed above the fuel sample. An external flame is then introduced into the fuel vapor and the temperature at which the fuel vapor ignites is recorded. This ignition temperature is then compared to the applicable ASTM for the type of fuel being tested.

CHAPTER 2

OPERATING INSTRUCTIONS

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

This section provides the operator with information needed to locate, identify, and use the controls and indicators of the Ground Fuels Petroleum Test Kit.

2-1. CABINET CONTROLS.

Leg Supports (1)
Two folding leg supports hold the cabinet at operating height and provide a stable platform for the cabinet. Extensions on each leg allow the cabinet to be leveled when operating on an uneven surface.

Door Lock (2)
The door lock is located on the right cabinet door and is used to secure the cabinet doors in the closed position.

Quick Release Pins (3)
Two quick release pins secure the leg supports up against the cabinet base when legs are folded, Depressing button on top of pin releases internal ball locks permitting removal of pin.

Lift Handles (4)
Two stowable lift handles are located under the cabinet frame. When the cabinet is being lifted or moved by personnel, the handles are extended to provided additional lifting capability. When not in use, the handles are pushed back into the stowed position.

Brace Releases (5)
A brace release is located on each leg brace. Depressing the brace release unlocks the brace and permits folding of the leg brace and leg support.

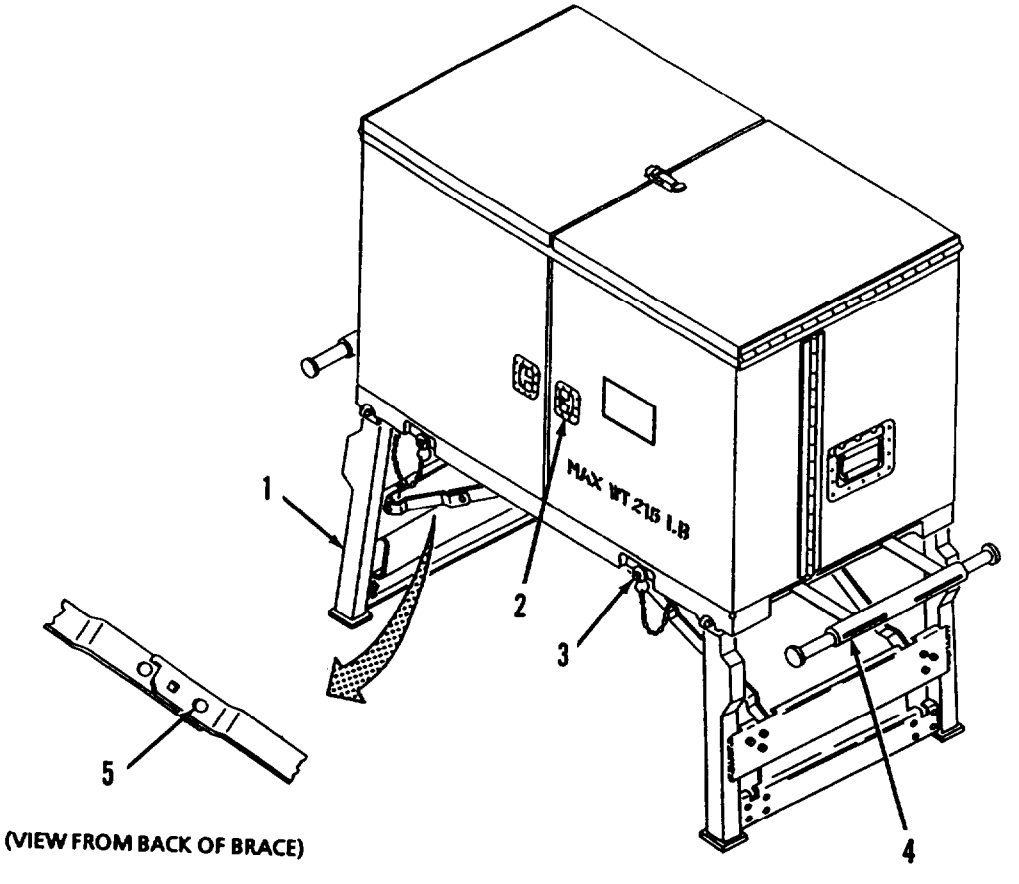


Figure 2-1. Cabinet Controls and Indicators.

2-2. DISTILLATION UNIT CONTROLS AND INDICATORS.

Thermometer (1)
Indicates temperature of test sample in the distillation flask.

Drain Valve (2)
A hand operated drain valve is located on the bottom of the condenser assembly. The purpose of the valve is to drain coolant from the condenser tank. Turning the control handle in line with the valve body opens the valve. Turning the control handle out from the valve body closes the valve.

Heater Control Knob (3)
The distillation unit heater is operated by a control knob mounted on the face of the heater. Turning the knob to the right increases heater output, turning the knob to left decreases output. Heater output ranges from 0 to 750 watts. Indicator marks on the control knob reflect the percentage of heater output. For example, turning control knob to 50 means that heater output is 50% of capacity , or 375 watts.

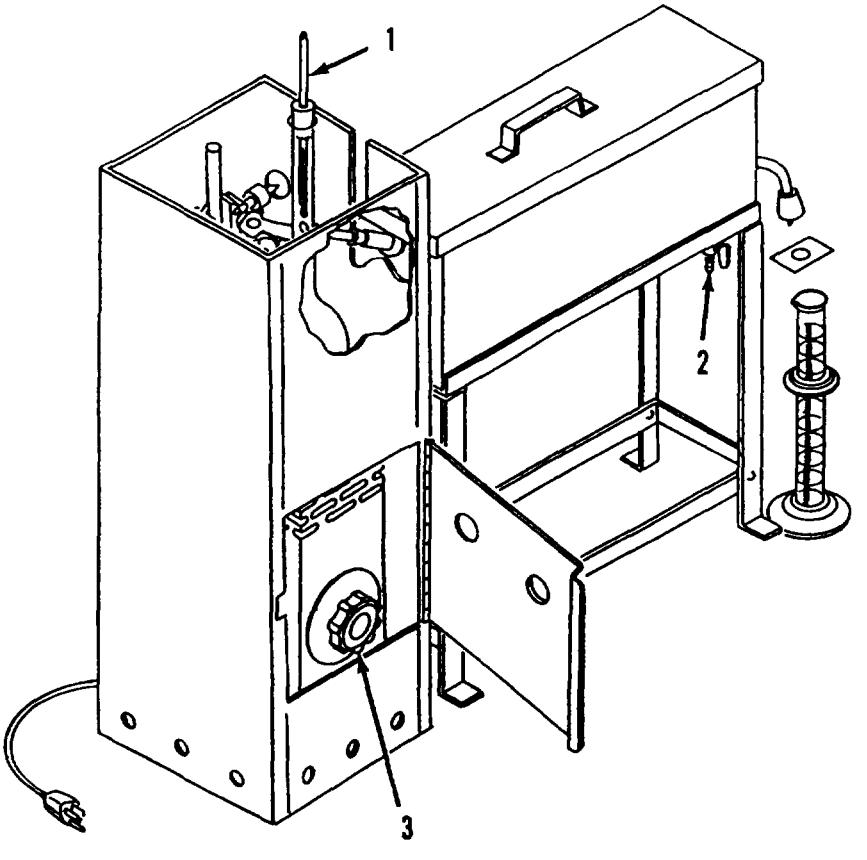


Figure 2-2. Distillation Unit Controls and Indicators.

2-3. FLASH POINT TESTER CONTROLS AND INDICATORS.

Shutter Operating Knob (1)
Spring loaded knob opens shutter and lowers test flame into test cup. Turn knob right to open shutter release knob to close.

Flame Exposure Knob (2)
Controls size of test flame. Turn knob left to enlarge flame; right to reduce flame.

Slow Speed Stirrer Power Switch (3)
The slow speed stirrer is controlled by a rocker type switch installed in the power cord. Depressing the ON side of the switch starts the slow speed stirrer; depressing the OFF side of the switch stops the stirrer,

Heater Control Knob (4)
The flash point tester heater is operated by a control knob mounted on the face of the heater. Turning the knob to the right increases heater output, turning the knob to left decreases output. Heater output ranges from O to 750 watts. Indicator marks on the control knob reflect the percentage of heater output. For example, turning control knob to 50 means that heater output is 50% of capacity, or 375 watts.

Propane Control Valve (5)
Controls flow of gas from propane cylinder to flash point tester. Turn valve to left to open valve; right to close.

Gas Line Needle Valve (6)
Controls gas flow from propane supply tank to flame exposure device. Turn needle valve right to close; left to open.

2-3. FLASH POINT TESTER CONTROLS AND INDICATORS - cont.

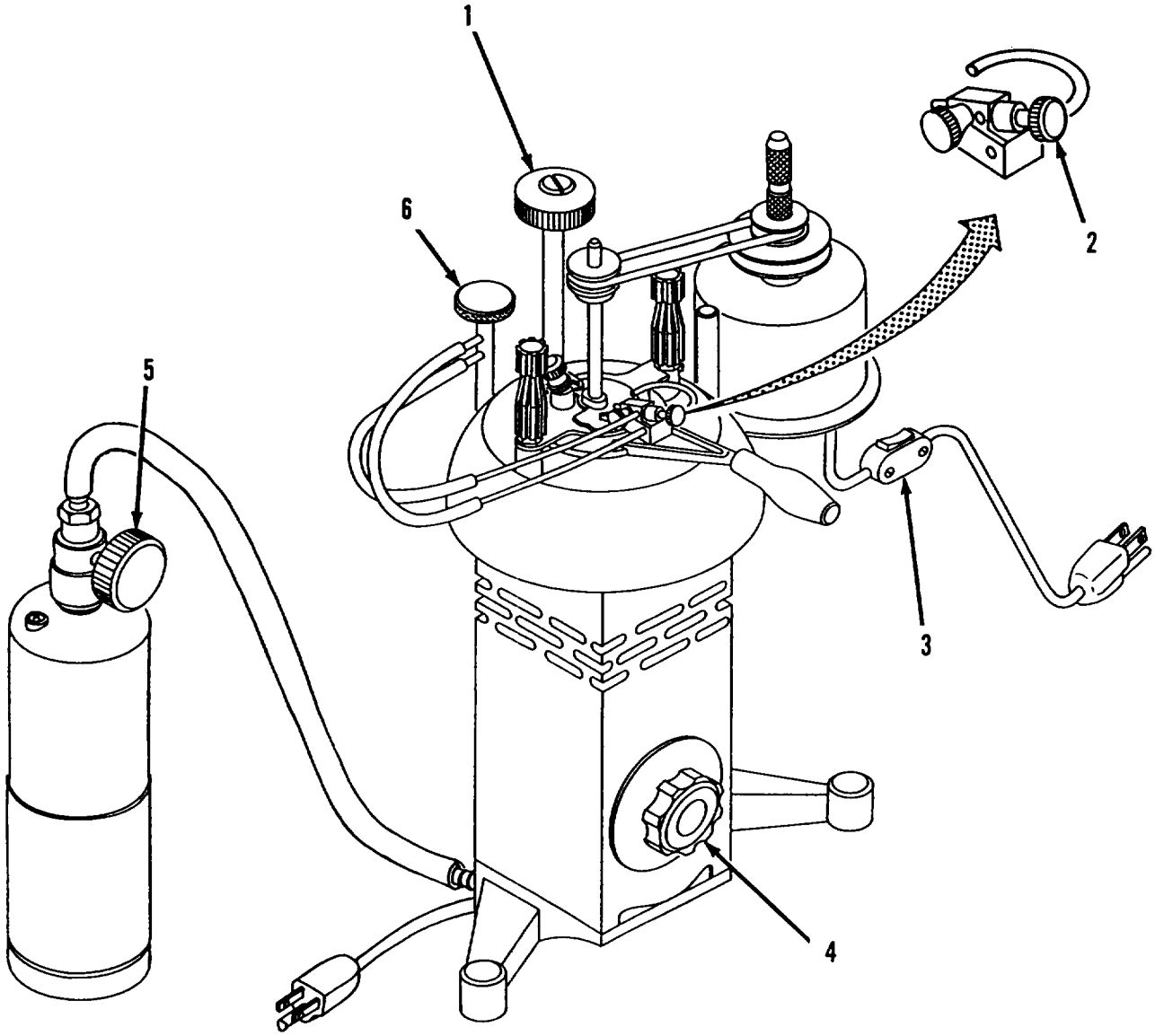


Figure 2-3. Flash Point Tester Controls and Indicators.

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

2-4. GENERAL.

Preventive Maintenance Checks and Services (PMCS) provides a means of systematically inspecting and servicing the equipment to keep it in good operating condition and to prevent breakdowns. As the operator of the Test Kit, your mission is to:

a. Be sure to perform your PMCS each time you operate the test kit. 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 operating the equipment. 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, unless you can fix them. You DO NOT need to record faults that you fix.

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.

2-5. PMCS PROCEDURES (Refer to figure 2-7).

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 do not have tools, or if the procedure requires it, notify your supervisor.

2-5. PMCS PROCEDURES - cont.

NOTE
Term "ready/available" and "mission capable" refer to the same status: Equipment is on hand and ready to perform its combat missions. (See DA Pam 738-750).

e. The "EQUIPMENT IS NOT READY/AVAILABLE 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 H, 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. Keep the equipment clean. Remove dirt, sand and debris from all Test Kit components. Use soap and water to remove dirt where possible.

i Bolts, nuts and screws. Check them for obvious looseness, missing, bent or broken condition of all hardware. If you find a bolt, nut or screw you think is loose, tighten it or report it to your supervisor.

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

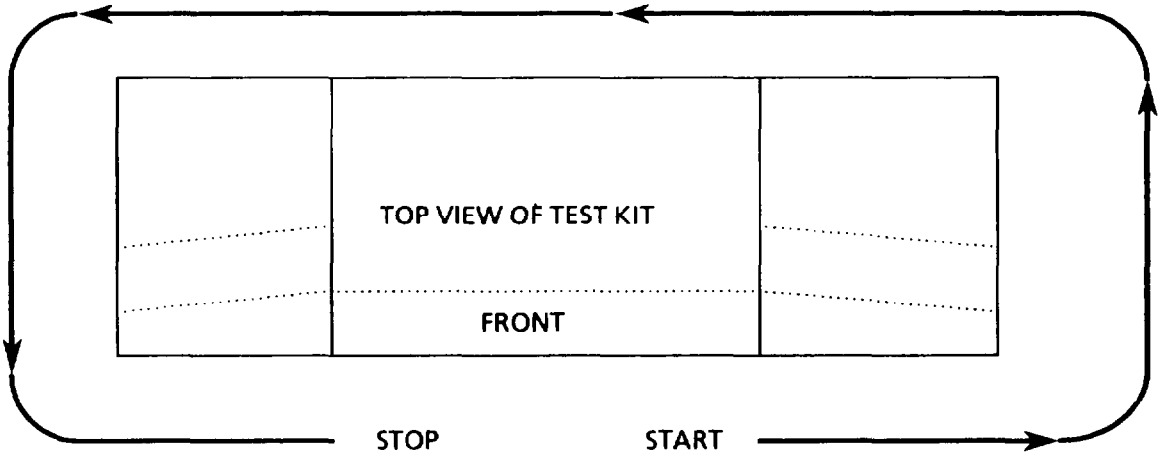


Figure 2-7. PMCS Routing Diagram.

2-6 ERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES (Refer To Table 2-1).

Table 2-1. Operator Preventive Maintenance Checks and Services for PTK-200.

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.

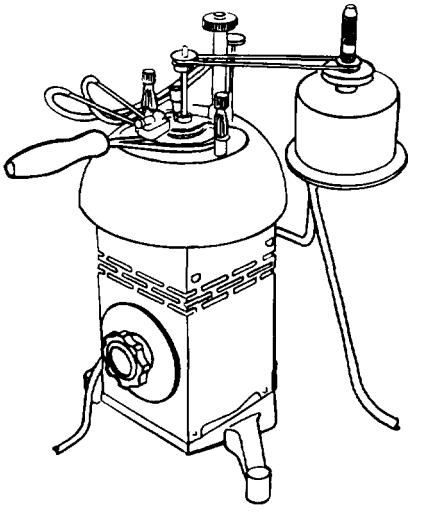
Item No.	Interval	Location / Item to Check/Service	Procedure	Not Fully Mission Capable If:
		Ground Fuels Petroleum Test Kit		
1	Before	Flash Point Tester	a. Inspect for cracked or deteriorated tubing.	Tubing broken.
			b. Inspect operating (shutter) mechanism for bent, cracked, worn or damaged components. Check operation of shutter control knob.	Shutter will not open or close.
			c. Inspect heater and slow speed stirrer for worn, cut or damaged power cable.	Power cables cut worn or frayed.
			d. Inpect heater for damaged or missing control knob and bent, dented or or cracked housing.	Heater damaged.
				

Table 2-1. Operator Preventive Maintenance Checks and Services for Model PTK-200 - cont.

Item No.	Interval	Location Item to Check/Service	Procedure	Not Fully Mission Capable If:
2	Before	Distillation Unit	a. Inspect heater for damaged or missing control knob, and bent, dented or broken housing.	Control knob broken, housing damaged.
			b. Inspect heater for worn, cut or damaged power cable.	Power cable damaged.
			c. Inspect heat shield for bent, damaged or corroded panels.	Heat shield not serviceable.
			d. Inspect condenser support for bent or broken frame components and loose or missing hardware.	Support damaged or defective.
			e. Inspect condenser assembly for cracks and dents.	Condenser cracked.
			f. Inspect condenser assembly piping for loose, damaged or missing components.	Piping loose or damaged.

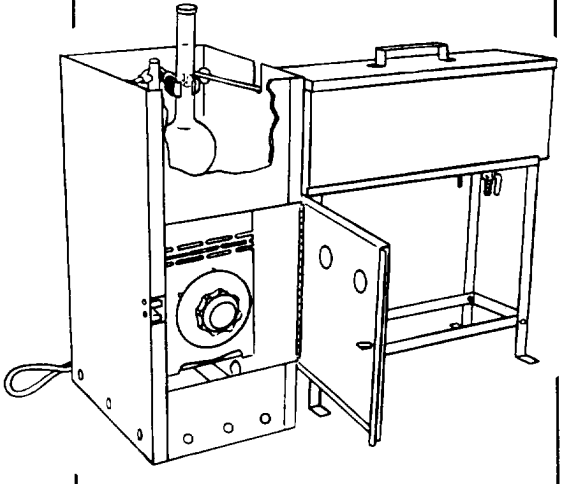


Table 2-1. Operator Preventive Maintenance Checks and Services for Model PTK-200 - cont.

Item No.	Interval	Location Item to Check/Service	Procedure	Not Fully Mission Capable If:
3	Before	Leg Supports	Inspect legs and braces for cracks, bends, broken welds, and loose or missing hardware.	Legs or braces cracked or defective.
4	Before	Cabinet	a. Inspect for dents,corrosion, stuck or damaged hinges, and loose, stuck or damaged door handles.	Cabinet or doors bent or unserviceable.
			b. Inspect cabinet interior for cracked, broken, or missing glassware and kit components.	Not enough glassware to perform mission.

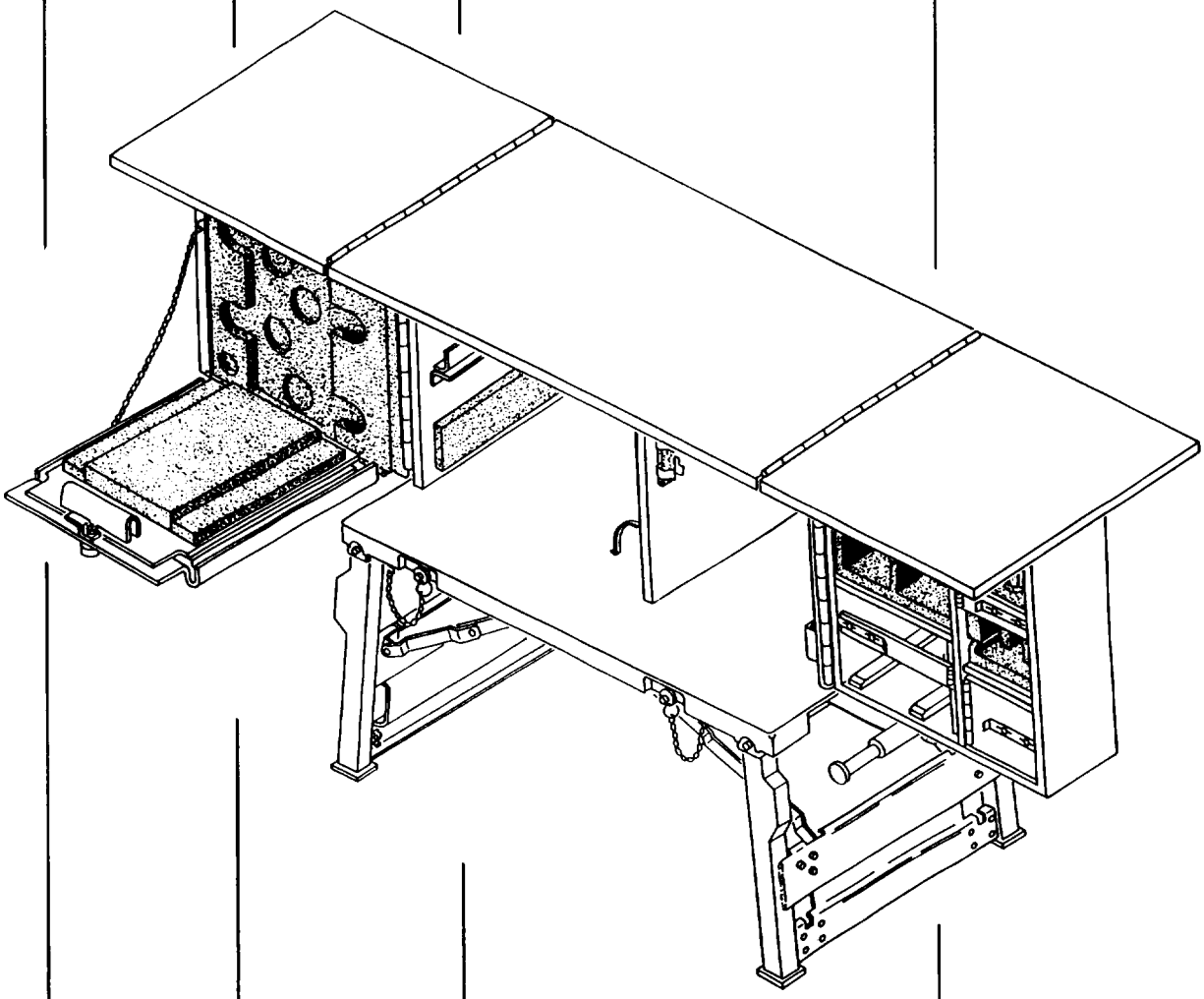


Table 2-1. Operator Preventive Maintenance Checks and Services for Model PTK-200 - cont.

Item No.	Interval	Location Item to Check/Service	Procedure	Not Fully Mission Capable If:
5	During	Flash Point Tester	Check heater and slow speed stirrer for proper operation.	Heater will not heat. Stirrer stuck or jammed.
6	During	Distillation Unit	Check heater for proper operation.	Heater will not heat.
7	During	Leg Supports	Check that braces are securely locked.	
8	During	Cabinet	Make sure workspace on top of cabinet is supported by cabinet doors.	
9	After	Flash Point Tester	Inspect heater and shutter mechanism for damage.	Heater or shutter mechanism damaged.
10	After	Distillation Unit	Inspect heater and condenser assembly for damage.	Heater or condenser damaged.
11	After	Cabinet	Inspect outside of cabinet for loose or missing hardware.	Leg support hardware missing.

Section III. OPERATION UNDER USUAL CONDITIONS

2-7. ASSEMBLY AND PREPARATION FOR USE.

a. Site Selection. Site selection must consider availability of electrical power and access to fuel storage facilities. The test kit should be setup in a tent or shelter to protect test equipment and fuel samples from wind, dust, rain, or snow. The site should be as level and dry as possible.

b. Setup Cabinet Assembly. Refer to figure 2-5.

(1) Pull out carrying handles (1) from both sides of cabinet (2).

(2) Remove detent pins (3) securing legs (4) to cabinet (2).

WARNING

The test kit is heavy and can be difficult to handle. Four personnel are required to lift and transport the test kit to prevent injury to personnel and damage to the equipment. A fifth person is required to lower the legs of the cabinet while cabinet is held up off ground.

(3) Using four personnel, lift cabinet (2) off ground.

WARNING

To prevent injury to personnel and damage to the equipment, leg braces must be locked in the down position before releasing weight of cabinet onto legs. Cabinet may fall if braces are not securely locked.

(4) Pull legs (4) down from cabinet (2) until fully extended. Make sure braces (5) are straight and securely locked.

(5) Unlock barrel bolts (6) and adjust leveling legs (7) up or down as required to level cabinet. Lock barrel bolts into leveling legs when adjustment is complete. Lower cabinet (2) to ground.

(6) Unlock right door handle (8). Fully open left and right doors (9 and 10).

(7) Unfasten table top latch (11).

(8) Unfold left table top (12) down onto left door (10).

(9) Unfold right table top (13) down onto right door (9).

2-7. ASSEMBLY AND PREPARATION FOR USE - cont.

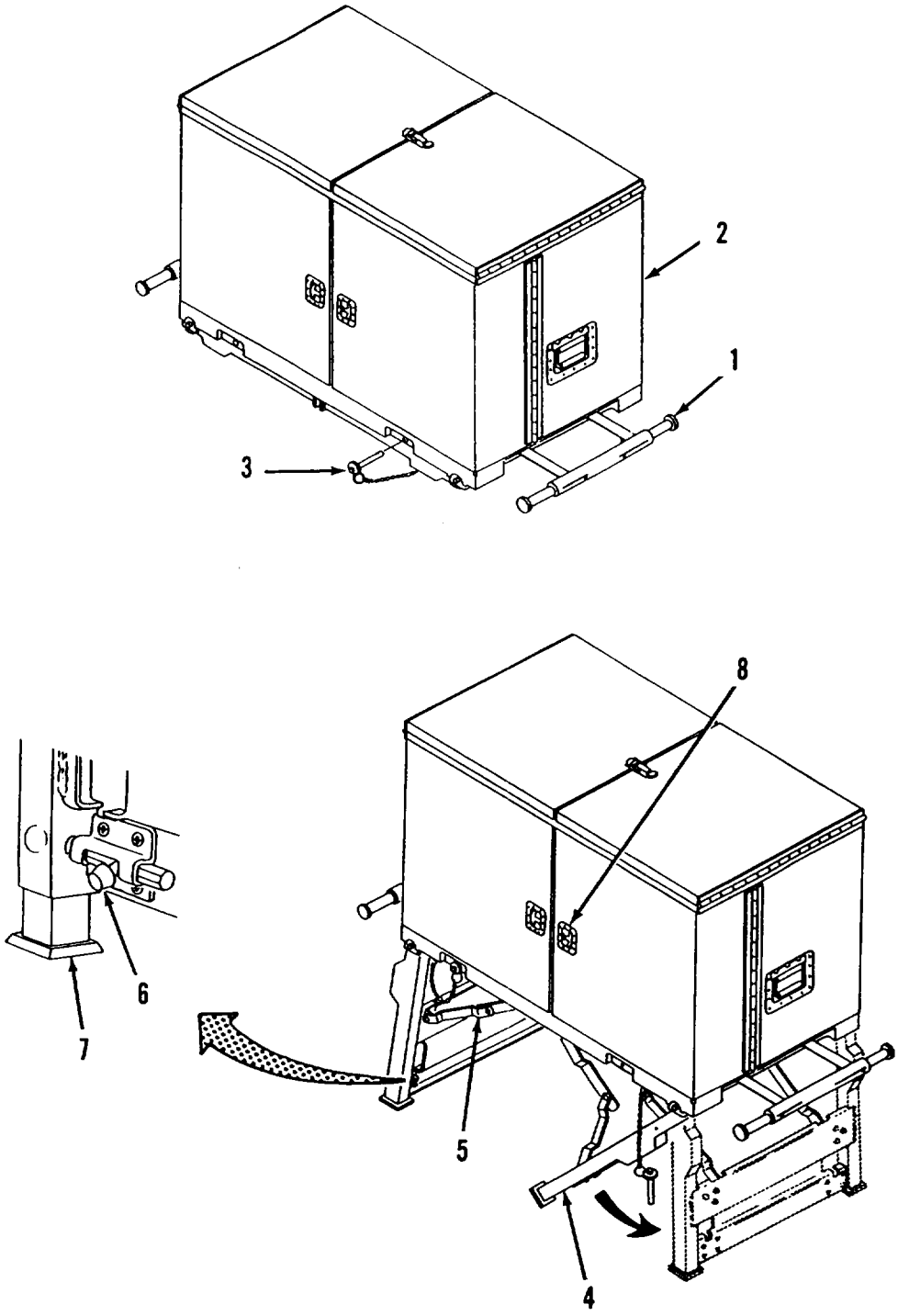


Figure 2-5. Cabinet Assembly Setup (Sheet 1 of 2).

2-7. ASSEMBLY AND PREPARATION FOR USE - cont.

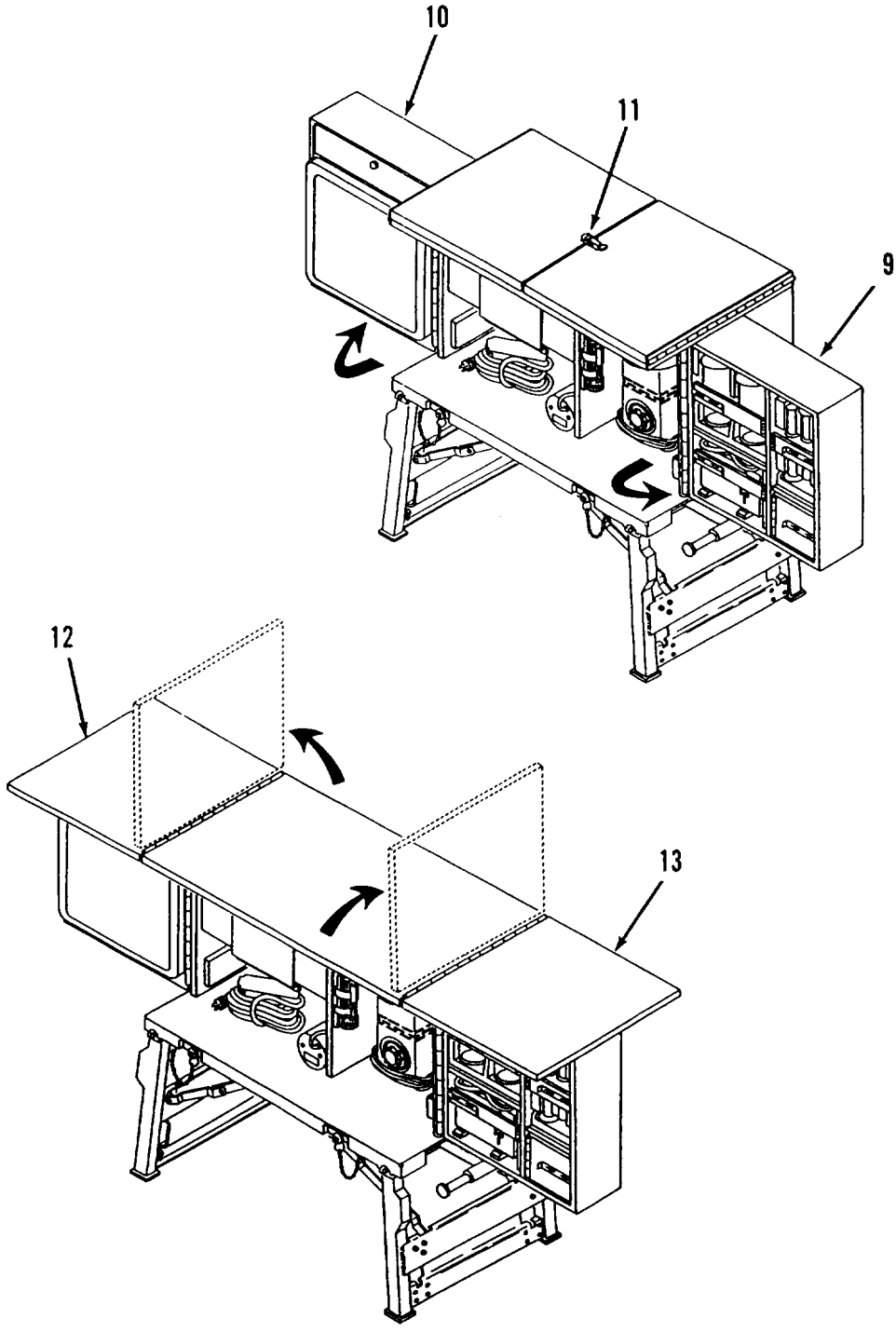


Figure 2-5. Cabinet Assembly Setup (Sheet 2 of 2).

2-7. ASSEMBLY AND PREPARATION FOR USE - cont.

c. Loading Plan. Refer to figure 2-6. The loading plan supplied with the Test Kit indicates the location of all stowed components in the cabinet. Refer to the loading plan to find the components needed to setup and assemble the equipment.

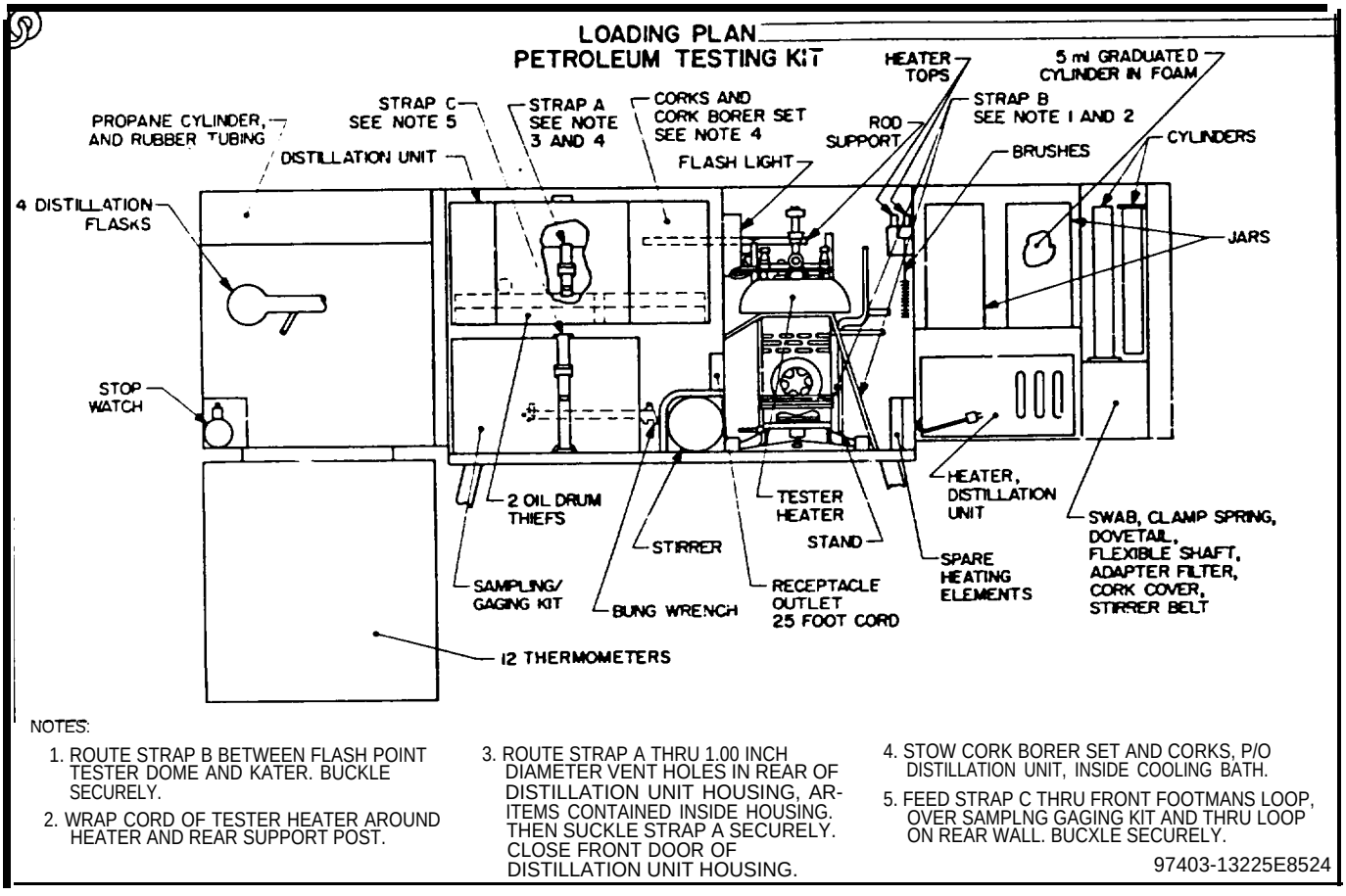


Figure 2-6. Loading Plan.

2-7. ASSEMBLY AND PREPARATION FOR USE - cont.

d. Setup Flash Point Tester. Refer to figure 2-7.

NOTE

Flash point tester refractory (heating element) is flush with top of heater housing. If refractory is not flush, distillation unit heater and flash point tester heater may have been switched.

(1) Refer to loading plan (figure 2-6) and remove flash point tester components from cabinet (1).

(2) Close gas line needle valve (2).

(3) Unfasten latch (3) and lower access panel (4).

(4) If removed, close valve (5) by turning knob fully clockwise (to the right).

(5) If removed, install valve (5) on propane cylinder (6).

(6) Push one end of rubber tubing (7) onto cylinder valve (5). Push other end of tubing onto gas line fitting (8) on flash point tester (9).

(7) Loosen screw (10) and reposition cup holder (11) out away from dome (12). Retighten screw.

(8) Connect electrical cable (13) to power source.

(9) Connect electrical cord (14) to electrical cable (13).

2-7. ASSEMBLY AND PREPARATION FOR USE - cont.

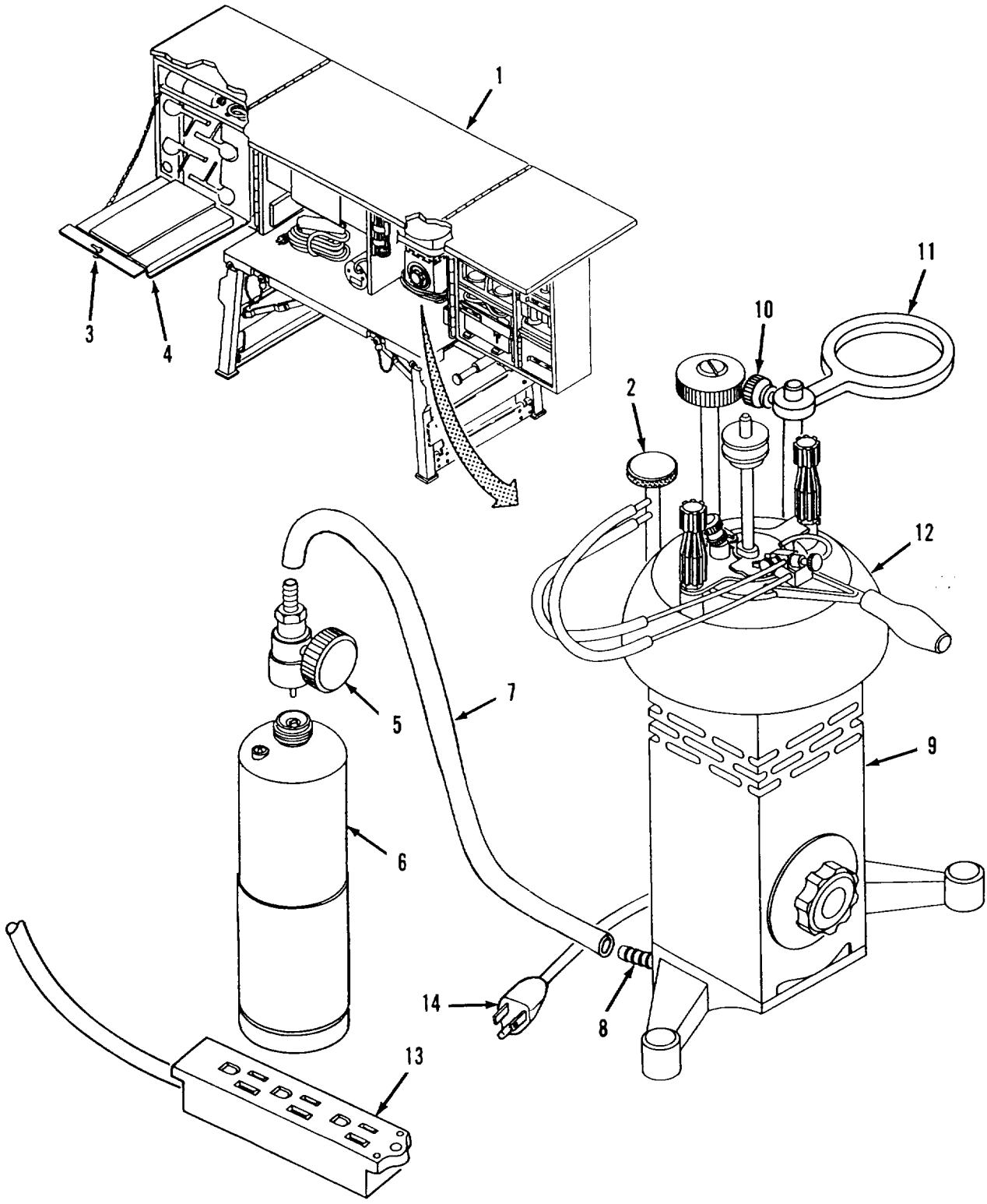


Figure 2-7. Flash Point Tester Setup

2-7. ASSEMBLY AND PREPARATION FOR USE - cont.

(10) Install slow speed stirrer as follows: Refer to figure 2-8.

(a) Place clamp (1) through mounting hole in bottom of slow speed stirrer (2).

(b) Position slow speed stirrer (2) and clamp (1) on support rod (3).

NOTE

Adjust position of slow speed stirrer as required to maintain correct alinement and fit of belt with pulleys.

(c) Align top pulley (4) on slow speed stirrer (2) with pulley (5) on cover assembly (6), then tighten clamp (1).

(d) Install belt (7) between pulleys (4 and 5)"

(e) Connect electrical cord (8) to power cable (9).

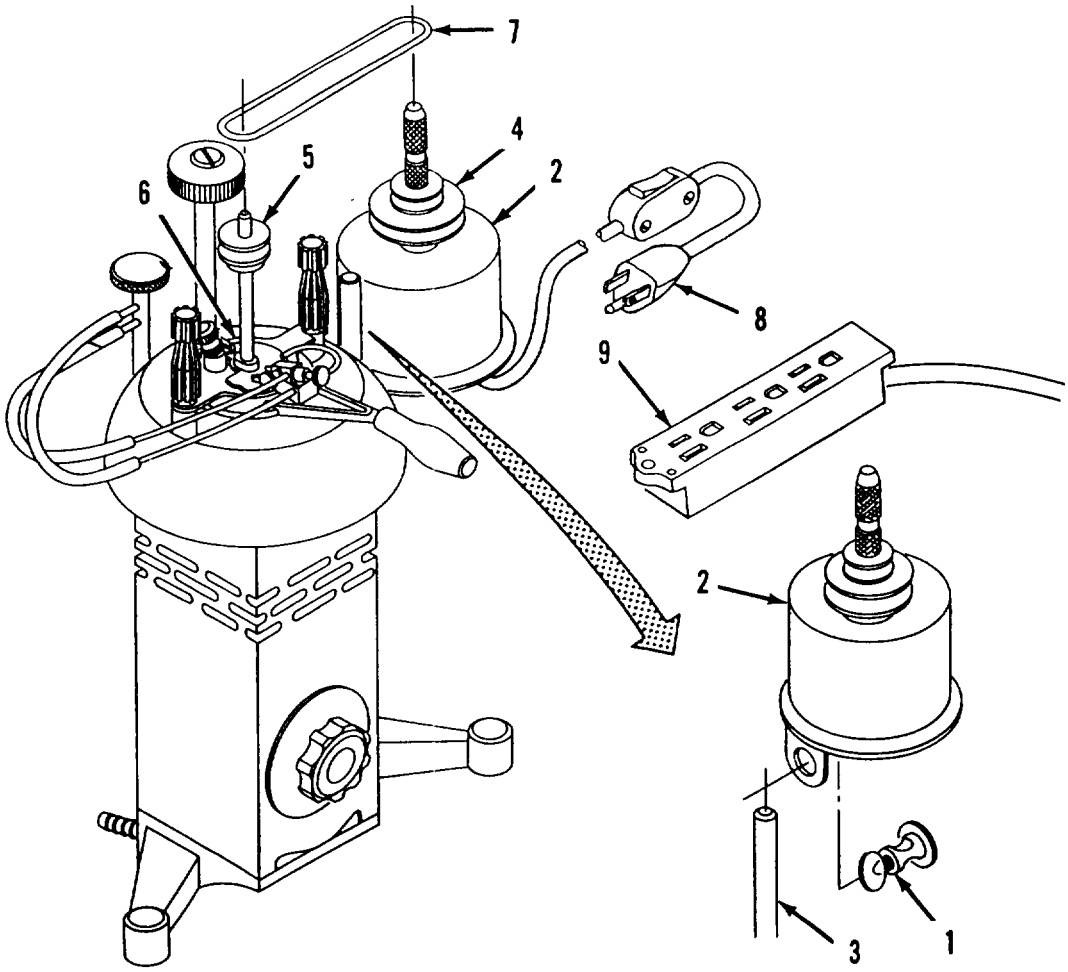


Figure 2-8. Slow Speed Stirrer.

2-7. ASSEMBLY AND PREPARATION FOR USE - cont.

e. Setup Distillation Unit.

Assemble Heater. Refer to figure 2-9.

NOTE

Distillation unit refractory is recessed into heater housing. If refractory is not recessed, flash point tester and distillation unit heaters may have been switched.

(1) Refer to loading plan (figure 2-6) and remove distillation unit components from cabinet.

(2) Separate all components to aid assembly.

(3) Install two dovetail clamps (1 and 2) on back of heater (3).

(4) Screw rod (4) into stand (5).

(5) Position heater (3) on rod (4). Tighten upper dovetail clamp (l), then lower dovetail clamp (2) to secure heater on rod.

(6) Place clay refractor (6) on top of heater (3) with concave surface facing up.

(7) Install flask clamp (7) on rod (4).

(8) Install flask holder (8) on flask clamp (7).

NOTE

Adjust flask holder and clamp as required to center flask on clay refractor.

(9) Place neck of flask (9) in flask holder (8). Position flask in holder so that bottom of flask is about 1/8-inch from concave surface of clay refractor (6), then tighten flask holder.

2-7. ASSEMBLY AND PREPARATION FOR USE - cont.

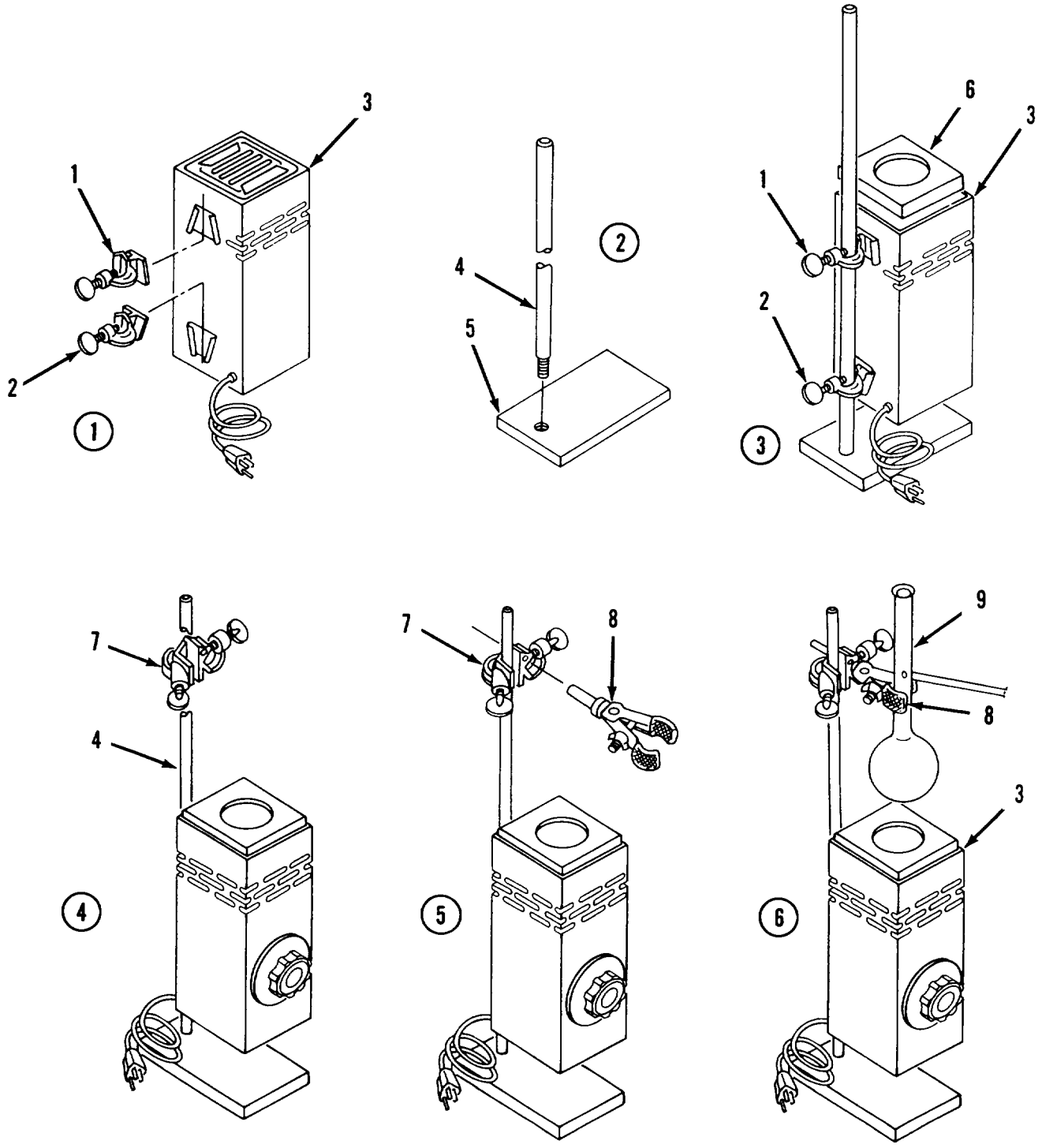


Figure 2-9. Distillation Unit Heater Setup.

2-7. ASSEMBLY AND PREPARATION FOR USE - cont.

Assemble Condenser Support. Refer to figure 2-10.

NOTE

Make sure all stowed components are removed from condenser before assembly.

(10) Unfold lower support (1).

(11) Remove two wingmuts (2) from upper support (3).

(12) Position upper support (3) on lower support (1) and secure with two wingnuts (2).

(13) Position condenser (4) on assembled support (5).

(14) Place cover (6) on top of condenser (4).

(15) Set drain valve (7) to close.

2-7. ASSEMBLY AND PREPARATION FOR USE - cont.

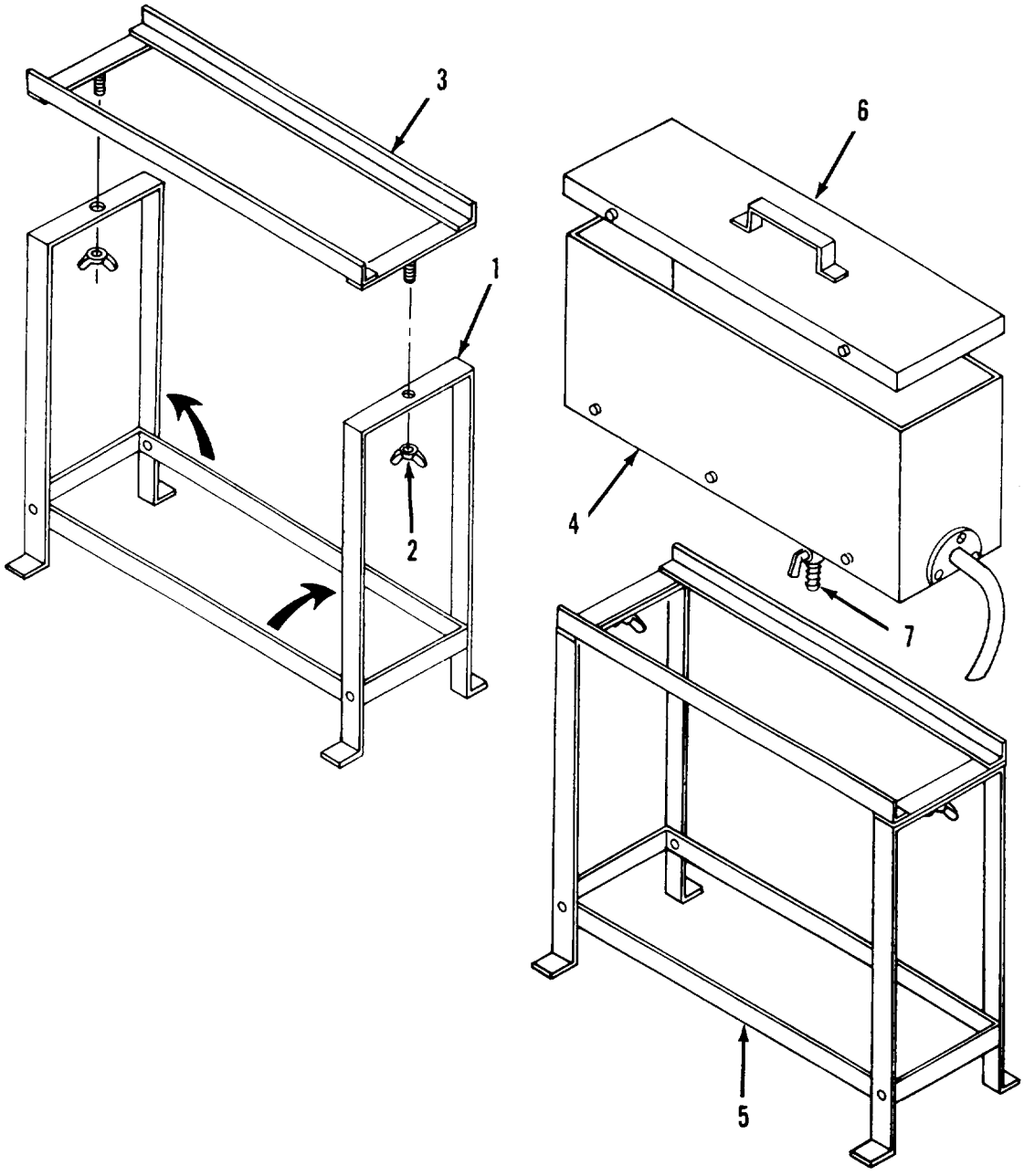


Figure 2-10. Condenser Support Setup

2-7. ASSEMBLY AND PREPARATION FOR USE - cont.

Connect Heater and Condenser. Refer to figure 2-11.

NOTE

Various sizes of corks are over packed with the test kit. Use the size cork that best fits your application.

(16) Select a cork (1) from the test kit that will fit snugly into inlet tube (2) of condenser (3).

(17) Using cork boring tool (4), cut hole through center of cork (l). Slide cork onto end of vapor tube (5).

NOTE

Heat shield must be positioned right-side-up with door at front of heater, as shown.

(18) Lower heat shield (6) over flask (7) and heater (8). Position heat shield so that door (9) will provide access to heater control knob (10).

(19) Move condenser (3) as needed to mate inlet tube (2) with vapor tube (5) on flask (7). Make sure cork (1) is properly seated and no gap is visible between mated components.

(20) Slide adapter (11) onto outlet tube (12). Small end of cone goes on first.

(21) Place cylinder cover (13) on end of outlet tube (12).

(22) Position graduated cylinder (14) under outlet tube (12).

(23) Pull down adapter (11) until cover (13) is pressed against top of graduated cylinder (14).

(24) Select a cork (15) from the test kit that will fit snugly into top of flask (7).

(25) Using cork boring tool (4), cut hole through center of cork (15) to fit thermometer (16) snugly,

NOTE

Temperature range of the thermometer and positioning of thermometer bulb in the flask will be determined by the ASTM for the type of fuel being tested.

(26) Push thermometer (16) into cork (15).

(27) Insert cork (15) and thermometer (16) into top of flask (7).

(28) Connect electrical cord (17) to power cable (18).

e. Setup Fuel Sampling Equipment. Refer to ASTM D1085.

2-7. ASSEMBLY AND PREPARATION FOR USE - cont.

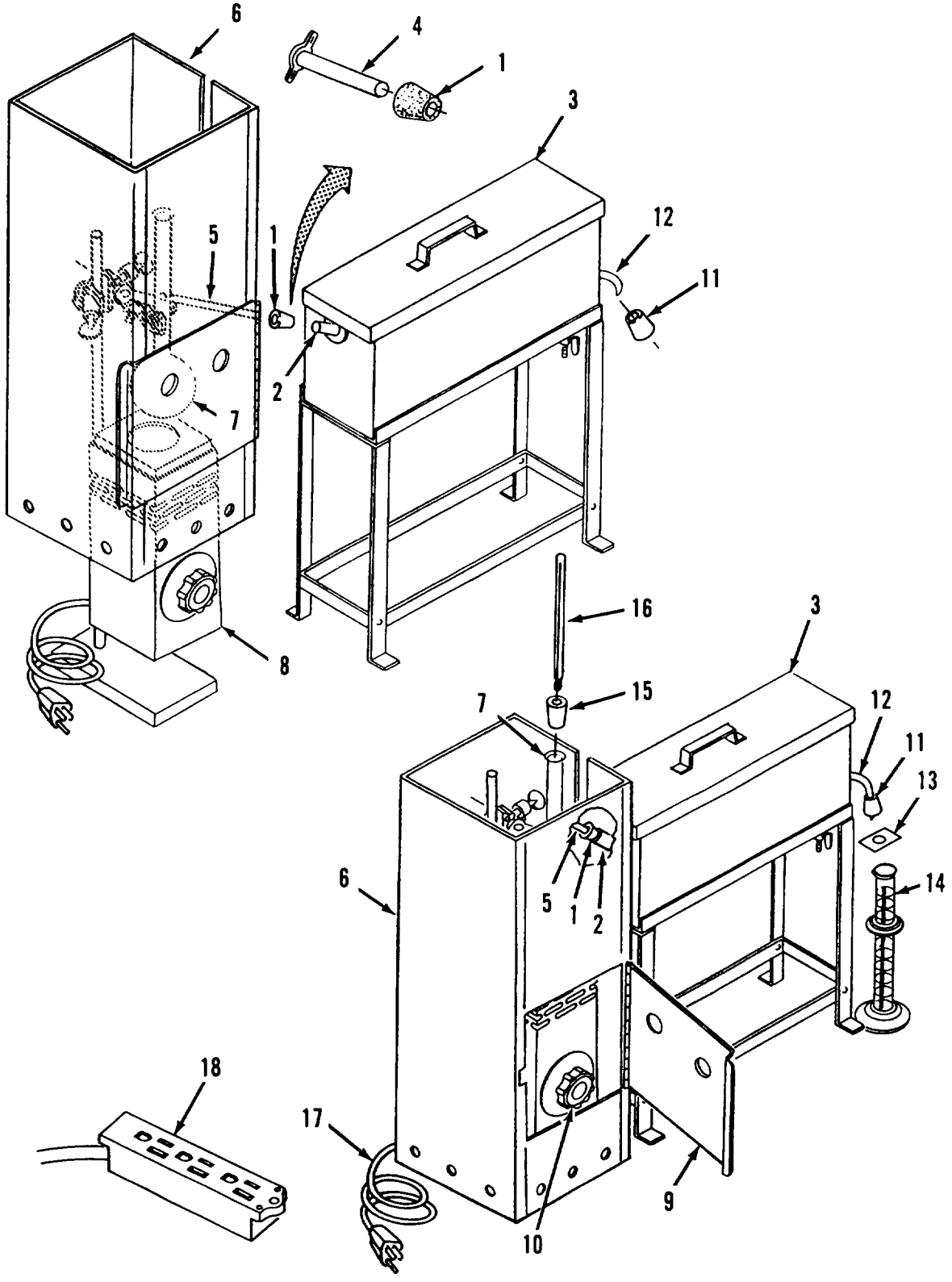


Figure 2-11. Distillation Unit Heater and Condenser Setup.

2-8 INITIAL ADJUSTMENT.

a. Distillation Unit Adjustment. Initial adjustment of the distillation unit must be performed as required by the applicable ASTM.

b. Flash Point Tester Adjustment. Initial adjustment of the flash point tester must be performed as required by the applicable ASTM.

2-9. OPERATING PROCEDURES.

Operation of the test kit and its components is determined by the type of test being performed and the petroleum product being tested. Tests to determine product flash point will required use of the flash point tester. Tests to evaluate product distillation rates will require use of the distillation unit. Taking fuel samples will require use of the gaging and sampling kit. Setup and operation instructions for each specific test are contained in the American Society for Testing and Material (ASTM) standards supplied with the test kit. Refer to the following standards as applicable.

a. For procedures and test methods to perform distillation of petroleum products, refer to ASTM D 86.

b. For procedure and test methods to perform flash point testing of fuels, refer to ASTM D 93.

c. For procedure and test methods to perform API gravity of crude petroleum and petroleum products (hydrometer method), refer to ASTM D 287.

d. For procedures and test methods to perform inspections for free water and particulate contamination in distillate fuels (visual inspection), refer to ASTM D 4176.

e. For procedures and test methods to gage petroleum products, refer to ASTM D 1085.

f. For procedures and test methods to measure the temperature of petroleum and petroleum products, refer to ASTM D 1086.

g, Setting up sampling and gaging kit for operation.

(1) Clean innage tape with cheesecloth. Ensure equipment is clean, dry, and free of dirt.

(2) Check mercury columns in hydrometer and cupcase thermometer. If mercury column is separated or glass is cracked, replace the instrument.

(3) Check thermometer readings with other thermometers in the area to ensure they read the same.

(4) Before a product is sampled or gaged, rinse the containers with the same type of product to be sampled or gaged.

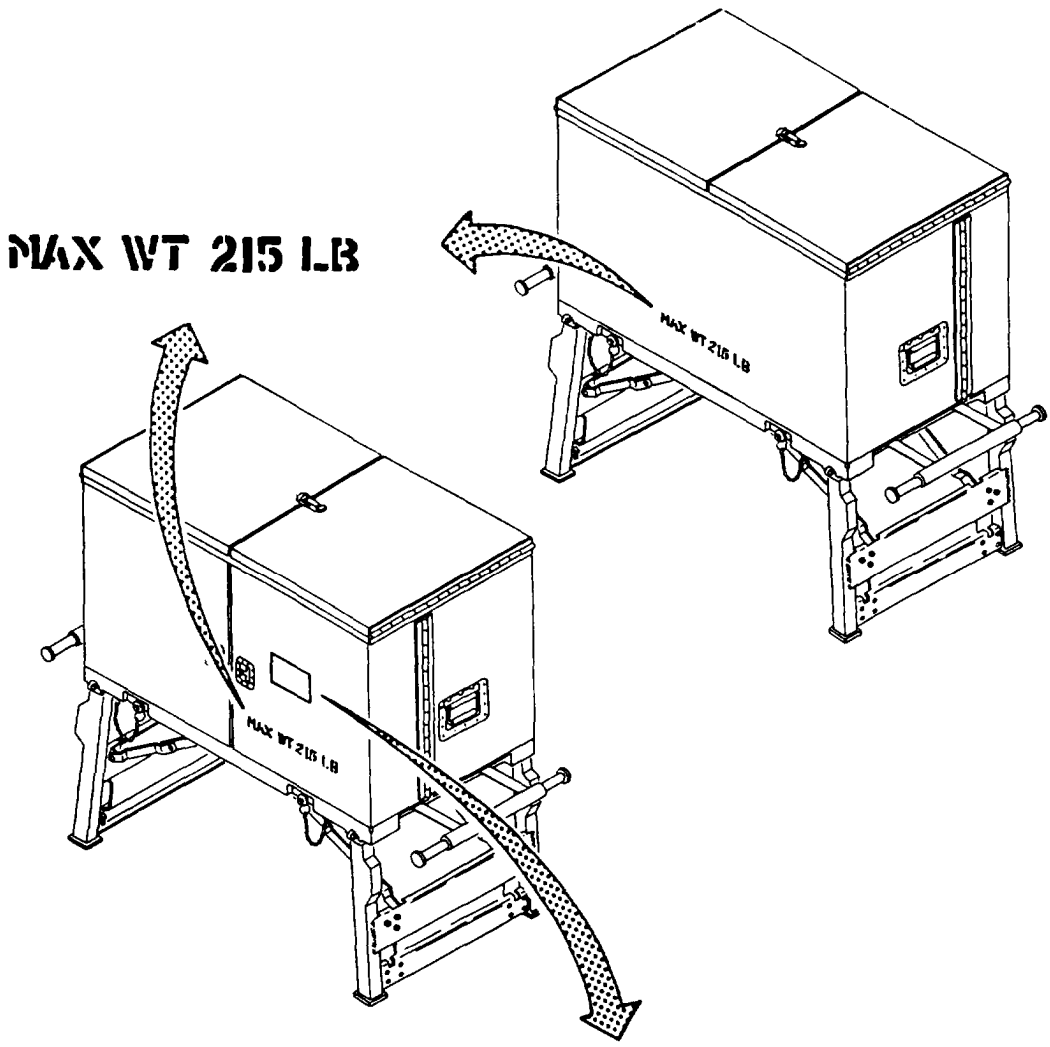
WARNING

Never gage or sample a product in a tank if there is an electrical storm or a source of sparks in the area. Failure to comply with this warning could result in serious injury or death.

(5) Conduct tests in accordance with pamphlets stored in packet of case which contain ASTM test methods.

2-10. DECALS AND DATA PLATE.

The data plate and decals on the Test Kit provide additional operating information. Figure 2-12 identifies the location and provides a description of the decals and data plate.



US ARMY
US AMERADCOM

PETROLEUM TESTING KIT
GROUND FUELS

NSN	
PART NO.	97403-13225E8500
MFD BY	
CONTRACT NO.	
DATE	
SERIAL NO.	WT LB

Figure 2-12. Decals and Instruction Plates.

2-11. OPERATING AUXILIARY EQUIPMENT.

a. Flash Point Tester. Refer to the applicable ASTM for operation of the flash point tester.

b. Distillation Unit. Refer to the applicable ASTM for operation of the distillation unit.

c. Sampling and Gaging Kit. Refer to the applicable TM for operation of the sampling kit.

2-12. PREPARATION FOR MOVEMENT.

a. Pack-Up Sampling and Gaging Kit. Refer to applicable TM.

b. Disassemble Distillation Unit.

Disconnect Heater and Condenser. Refer to figure 2-13.

(1) Disconnect electrical cord (17) from power cable (18).

(2) Remove cork (15) and thermometer (16) from top of flask (7).

(3) Remove graduated cylinder (14) and cover (13) from under outlet tube (12).

(4) Remove adapter (11) from outlet tube (12).

(5) Move condenser (3) as needed to disconnect inlet tube (2) from vapor tube (5) on flask (7). Discard cork (2).

(6) Remove flask (7) and lift heat shield (6) off of heater (8).

2-12. PREPARATION FOR MOVEMENT - cont.

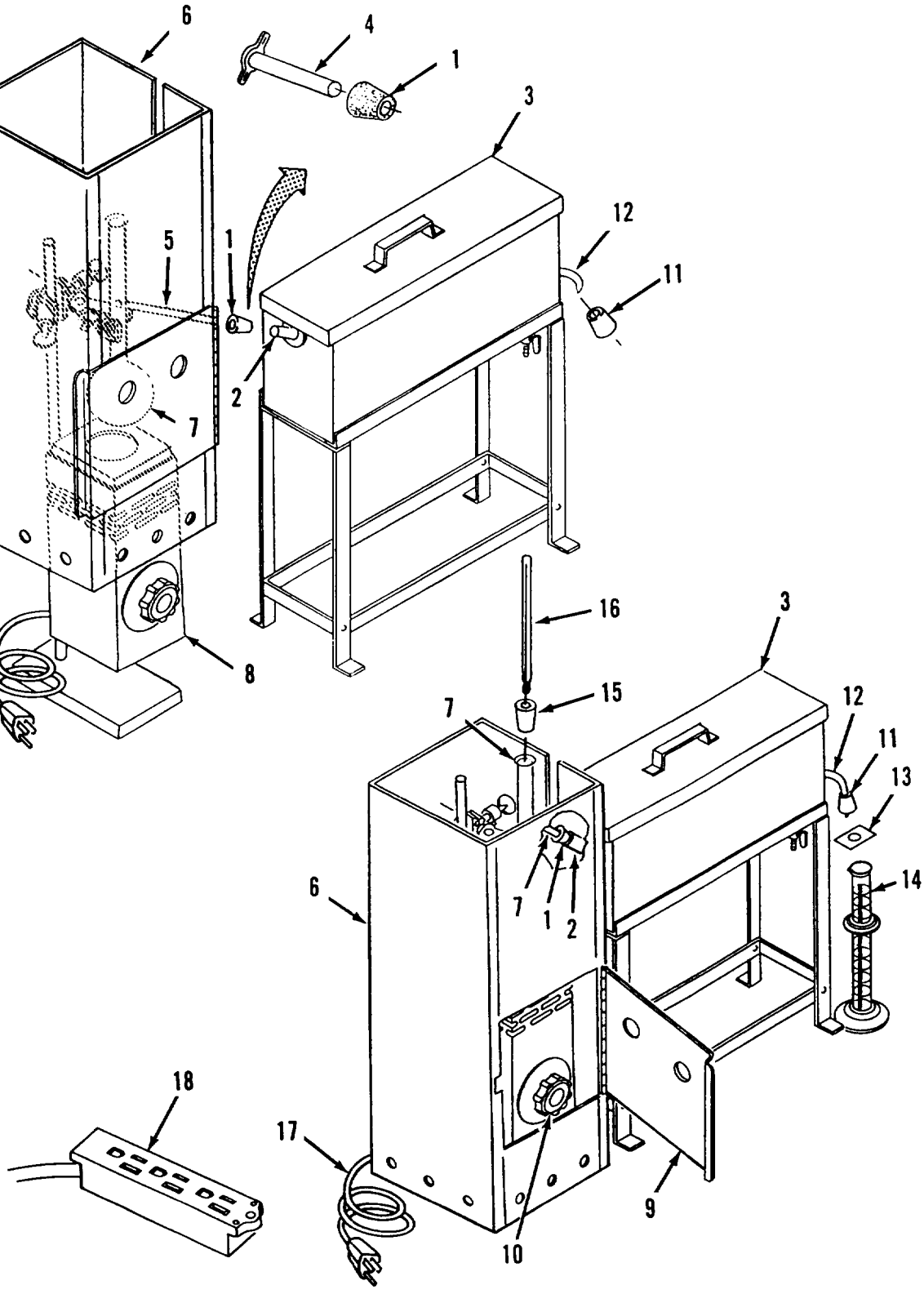


Figure 2-13. Distillation Unit Heater and Condenser Disconnection.

2-12. PREPARATION FOR MOVEMENT - cont.

Disassemble Condenser Support. Refer to figure 2-14.

(7) Remove cover (6) from top of condenser (4).

(8) Remove condenser (4) from support (5).

(9) Remove two wingnuts (2) and separate upper support (3) from lower support (l).

(10) To prevent loss, install two wingnuts (2) on upper support (3).

(11) Fold lower support (1) for storage.

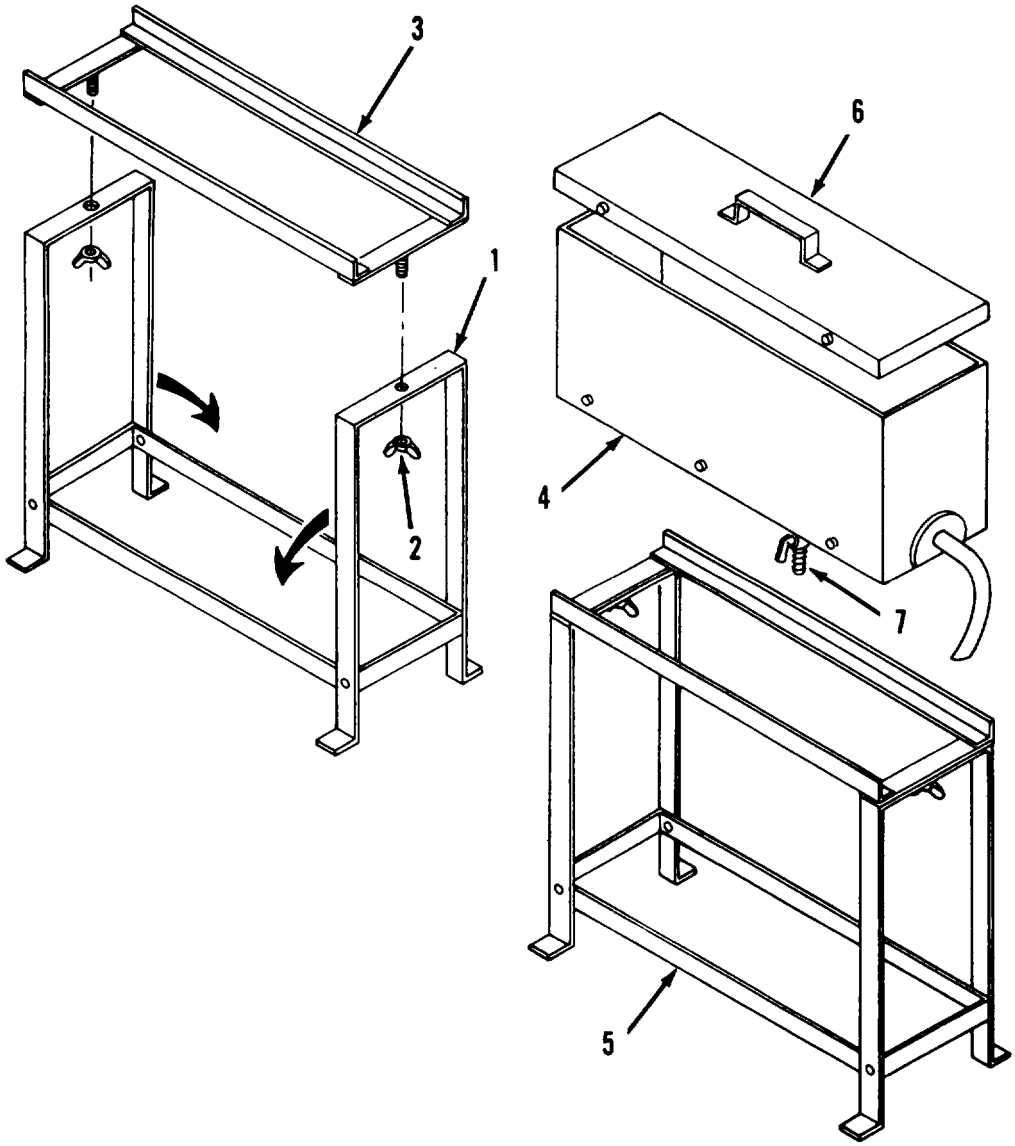


Figure 2-14. Condenser Support Disassembly.

2-12. PREPARATION FOR MOVEMENT - cont.

Disassemble Heater. Refer to figure 2-15.

(12) Remove flask holder (8) from flask clamp (7).

(13) Remove flask clamp (7) from rod (4).

(14) Remove clay refractor (6) from top of heater (3).

(15) Loosen two dovetail clamps (1 and 2) and remove heater (3) from rod (4).

(16) Remove two dovetail clamps (1 and 2) from back of heater (3).

(17) Unscrew rod (4) from base (5).

2-12. PREPARATION FOR MOVEMENT - cont.

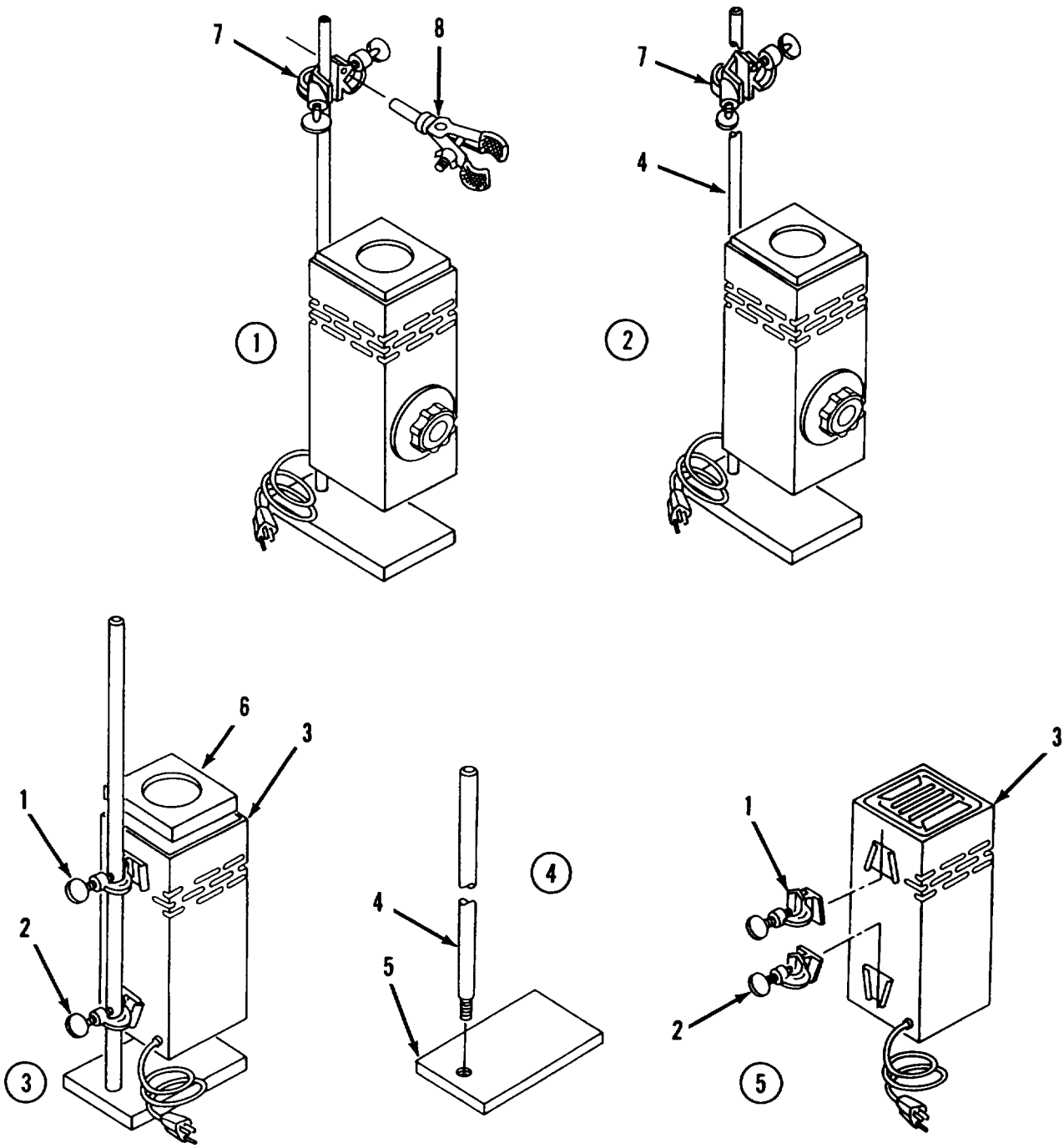


Figure 2-15. Distillation Unit Heater Disassembly.

2-12. PREPARATION FOR MOVEMENT - cont.

c. Disassemble Flash Point Tester.

Remove Slow Speed Stirrer. Refer to figure 2-16.

(1) Disconnect electrical cord (8) from power cable (9).

(2) Remove belt (7) from pulleys (4 and 5).

(3) Loosen clamp (1) and remove slow speed stirrer (2) and clamp from support rod (3).

(4) Remove clamp (1) from mounting hole in bottom of slow speed stirrer (2).

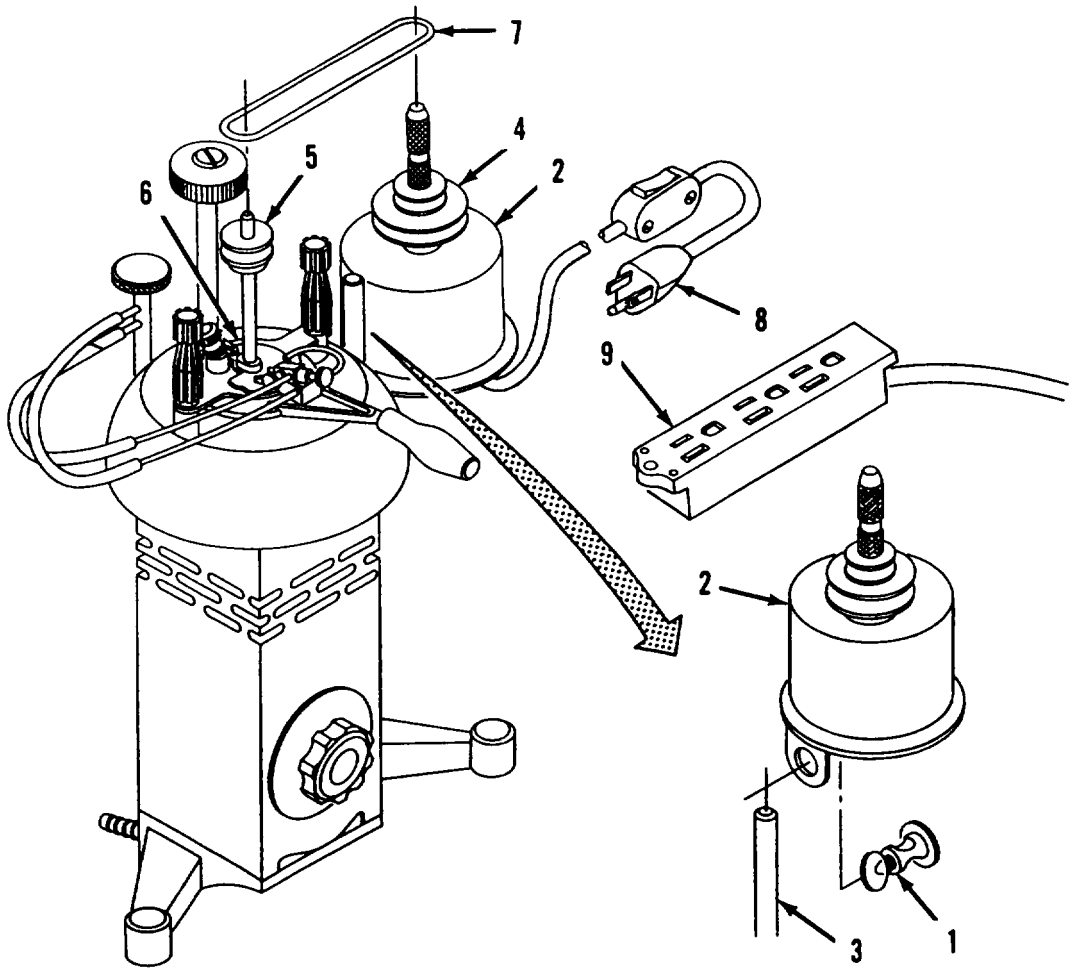


Figure 2-16. Slow Speed Stirrer Removal.

2-12. PREPARATION FOR MOVEMENT - cont.

Disassemble Flash Point Tester. Refer to figure 2-17.

(5) Disconnect electrical cord (14) from power cable (13).

(6) Disconnect power cable (13) from power source.

(7) If removed, install flash cup (15) as follows:

(a) Place flash cup (15) in top plate (16).

(b) Position cover assembly (17) over flash cup (15).

(c) Rotate cover assembly (17) so that notches in cover are positioned under knobs (18).

(d) Tighten two knobs (18).

(8) Close gas line needle valve (2) and cylinder valve (5).

(9) Disconnect rubber tubing (7) from cylinder valve (5) and gas line fitting (8).

(10) Remove cylinder valve (5) from propane cylinder (6).

d. Pack-Up Cabinet Assembly.

Pack Components. Refer to figure 2-18.

(1) Clean required components with clean, soapy water and wiping rags.

(2) Stow all test kit components in the cabinet as shown on the loading plan.

Assemble Cabinet. Refer to figure 2-19.

(3) Fold right table top (12) over onto top of cabinet (1).

(4) Fold left table top (13) over onto top of cabinet (1).

(5) Fasten table top latch (11).

(6) Close left door (10), then right door (9).

2-12. PREPARATION FOR MOVEMENT - cont.

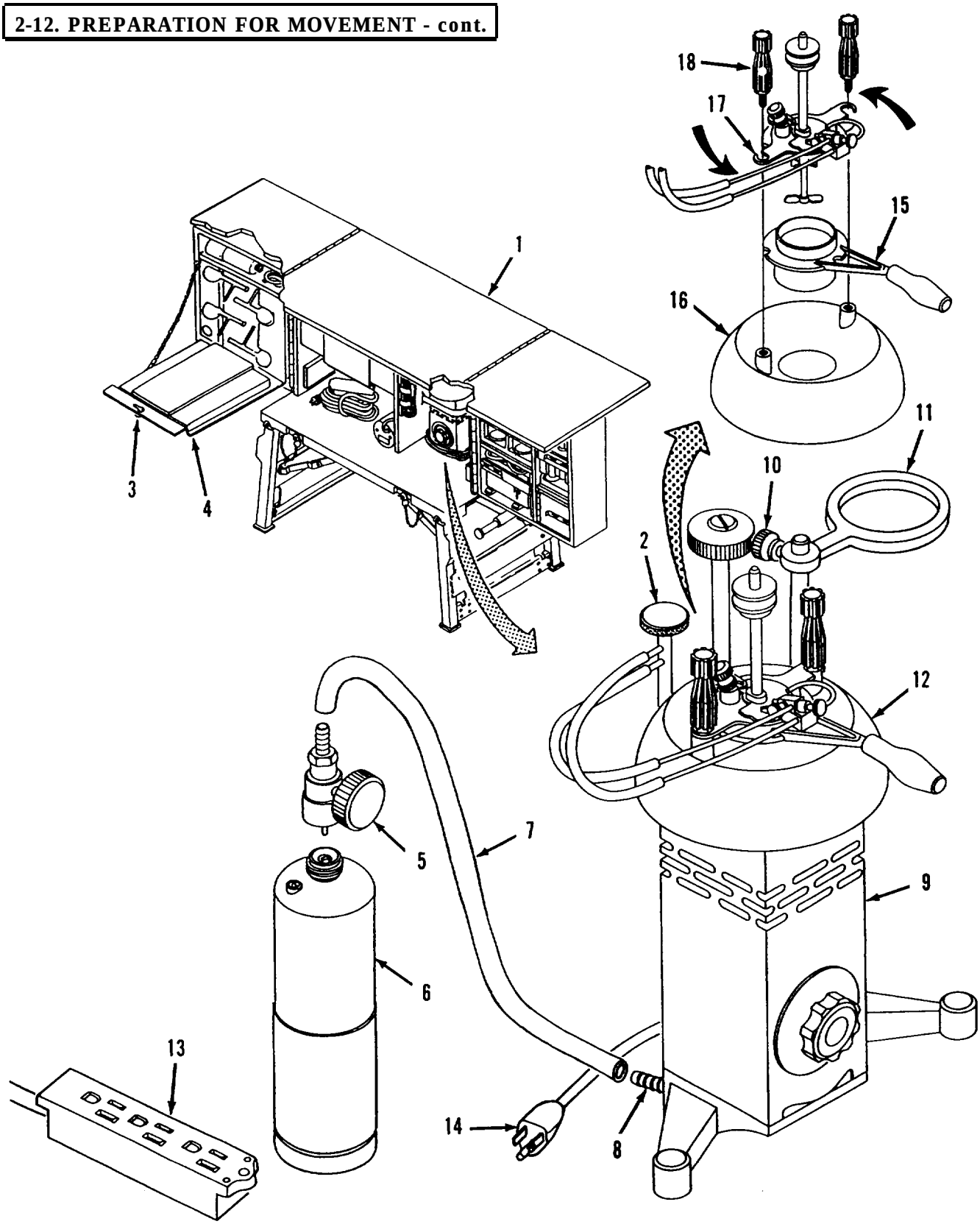
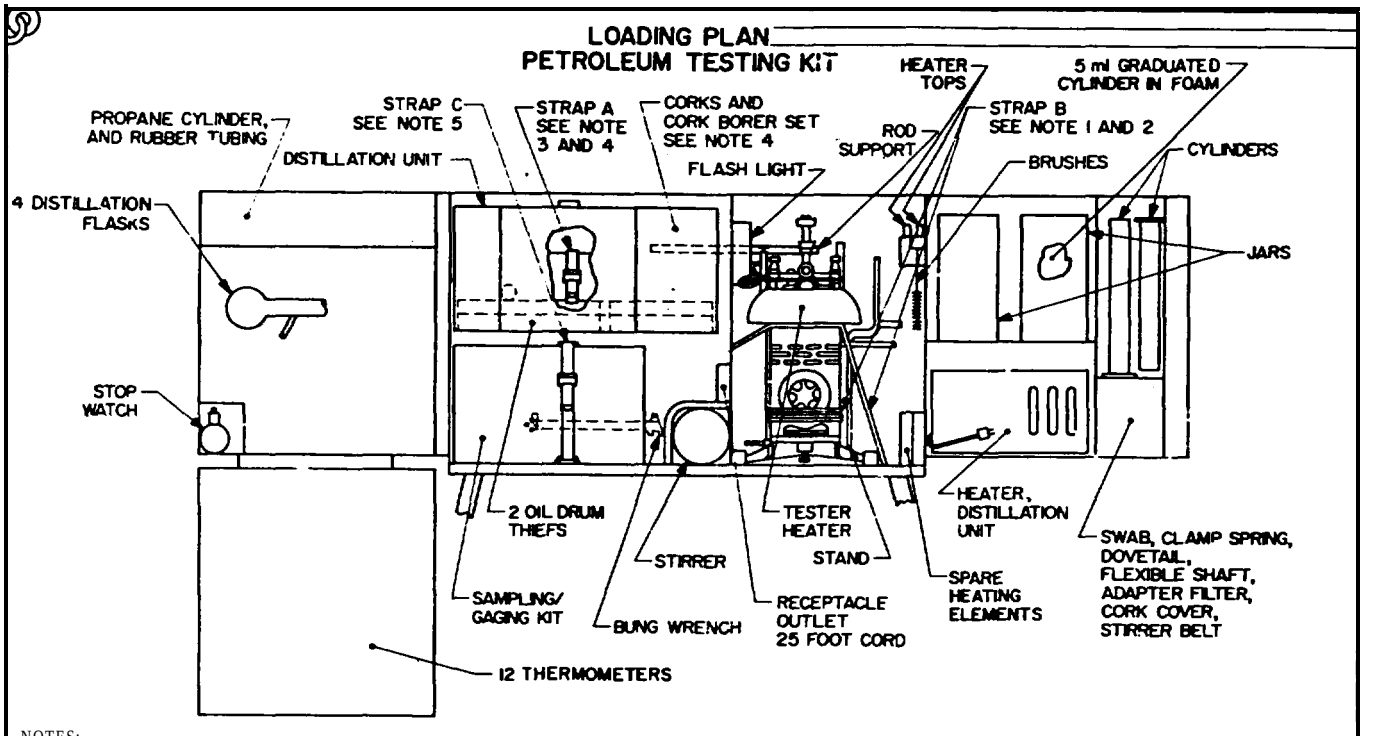


Figure 2-17. Flash Point Tester Disassembly.

2-12. PREPARATION FOR MOVEMENT - cont.



NOTES:

1 ROUTE STRAP B BETWEEN FLASH POINT TESTER DOME AND HEATER. BUCKLE SECURELY.

2. WRAP CORD OF TESTER HEATER AROUND HEATER AND REAR SUPPORT POST.

3. ROUTE STRAP A THRU LOO INCH DIAMETER VENT HOLES IN REAR OF DISTILLATION UNIT HOUSING, AROUND ITEMS CONTAINED INSIDE HOUSING, THEN BUCKLE STRAP A SECURELY. CLOSE FRONT DOOR OF DISTILLATION UNIT HOUSING.

4. STOW CORKS BORER SET AND CORKS, P/O OSCILLATION UNIT, INSIDE COOLING BATH.

5. FEED STRAP C THRU FRONT FOOTMANS LOW, OVER SAMPLING GAGING KIT AND THRU LOOP ON REAR WALL. BUCKLE SECURELY.

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Figure 2-18. Test Kit Loading Plan.

2-12. PREPARATION FOR MOVEMENT - cont.

NOTE

Cabinet doors fit snugly into face of cabinet. Foam rubber used to secure components in the cabinet must be compressed when closing cabinet doors.

(7) While pushing in on right door (9), turn door handle (4) to the left to lock doors in closed position.

(8) Pull out carrying handles (2) from both sides of cabinet (1).

WARNING

The test kit is heavy and can be difficult to handle. Four personnel are required to lift and transport the test kit. A fifth person is required to raise the legs of the cabinet while cabinet is held up off ground.

(9) Using four personnel, lift cabinet (1) off ground.

(10) Unlock four barrel bolts (7) and retract leveling legs (8). Lock barrel bolts into leveling legs when fully retracted.

(11) Unlock four leg braces (6).

(12) Fold legs (5) up under cabinet (1) and secure in place with two detent pins (3).

(13) Lower cabinet (1) to ground.

(14) Push carrying handles (2) into sides of cabinet(1).

2-12. PREPARATION FOR MOVEMENT - cont.

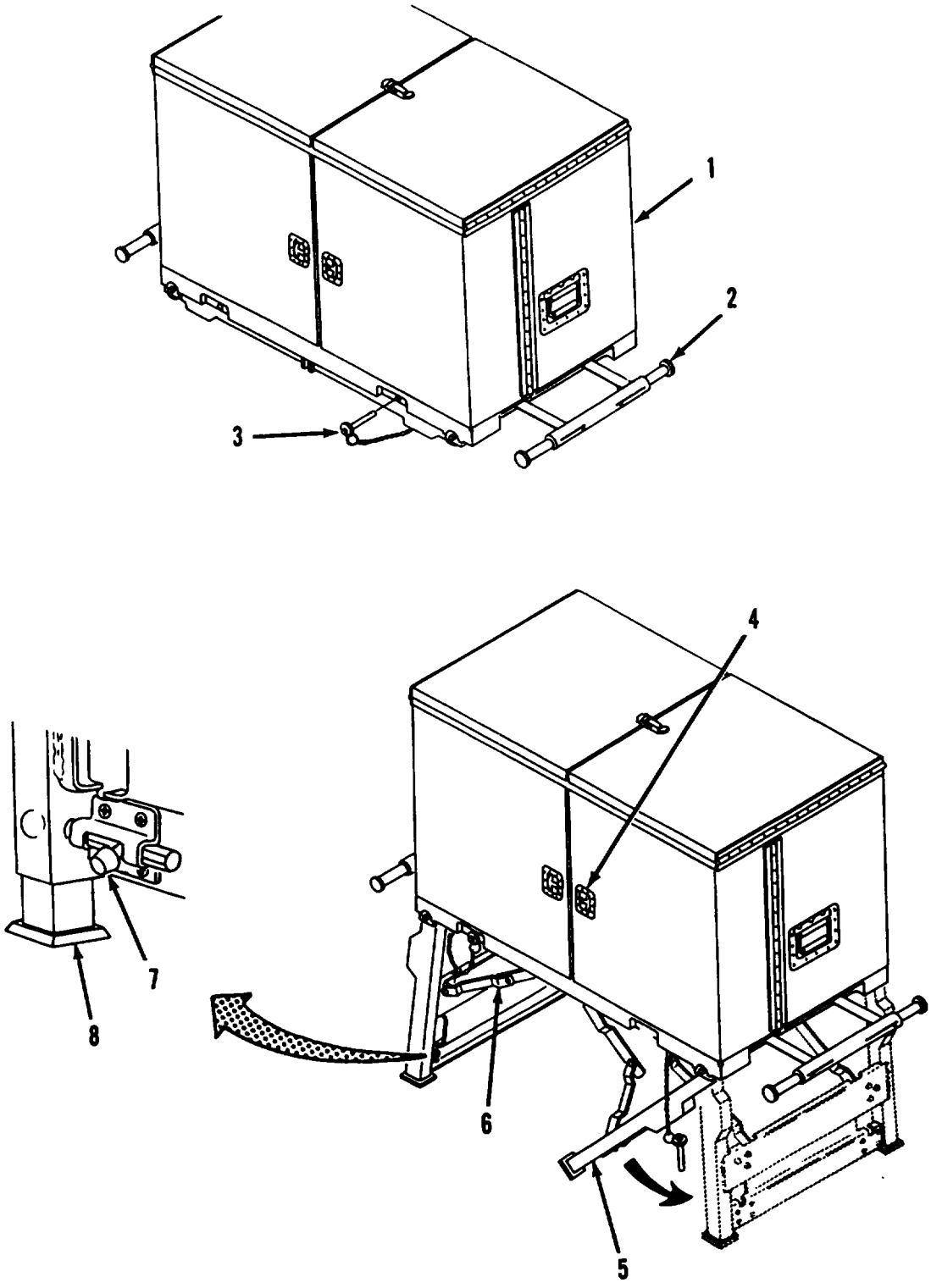


Figure 2-19. Cabinet Assembly Packing (Sheet 1 of 2),

2-12. PREPARATION FOR MOVEMENT - cont.

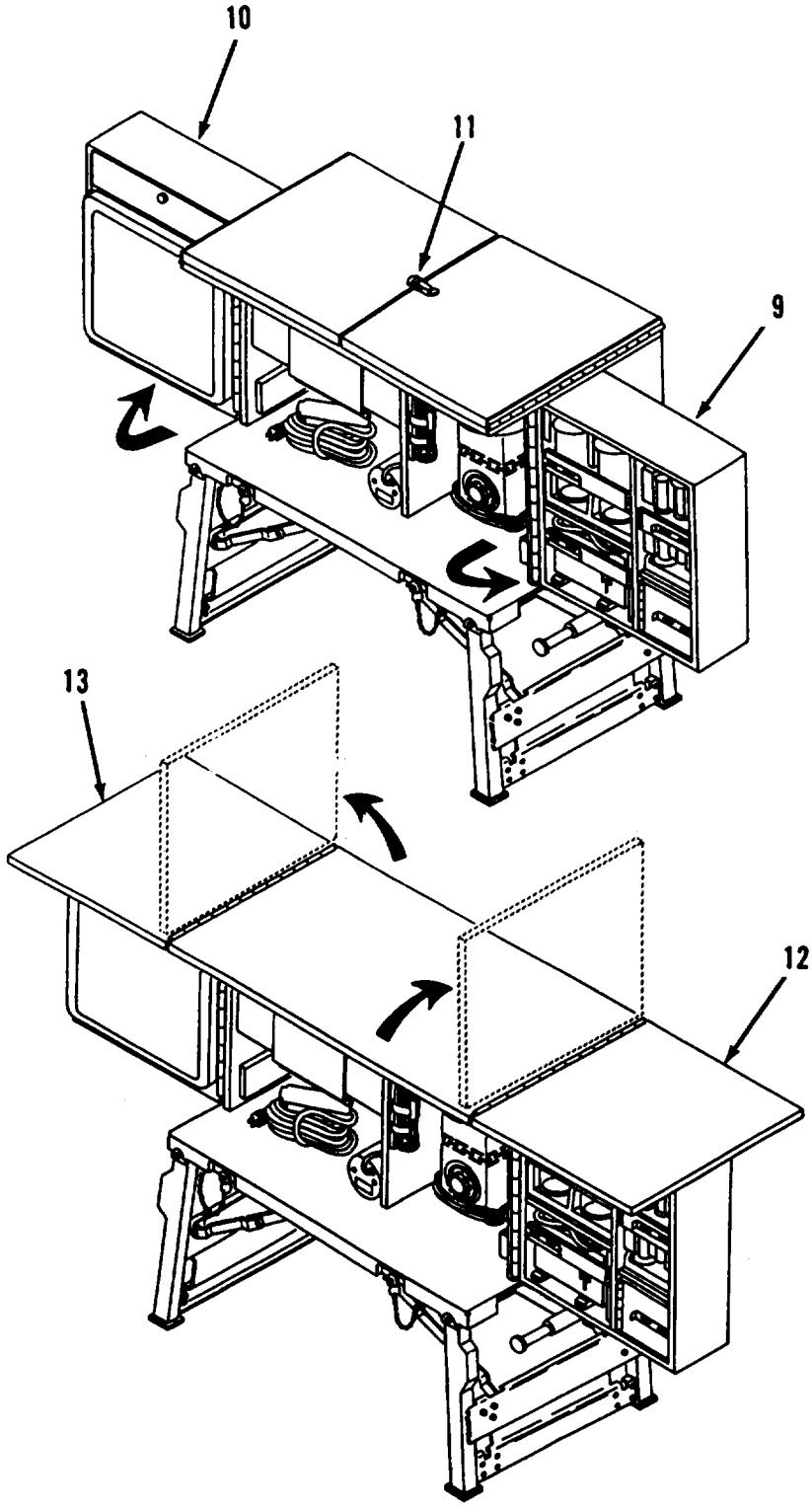


Figure 2-19. Cabinet Assembly Packing (Sheet 2 of 2).

Section IV. OPERATION UNDER UNUSUAL CONDITIONS

2-13. OPERATION IN EXTREME COLD .

Observe the following precautions when operating the Test Kit in extreme cold:

(1) Wear arctic micens and rubber gloves when handling hardware. Bare hands can freeze to metal components.

WARNING

Do not operate test kit in tents or shelter without adequate ventilation. Inhalation of petroleum fumes and vapors will result in serious illness or death.

(2) Remove snow, sleet or ice from test kit before opening cabinet.

(3) When not in use, store test kit in heated area if possible.

(4) Refer to the applicable ASTMs for conducting petroleum tests in extreme cold.

2-14. OPERATION IN EXTREME HEAT.

Observe the following precautions when operating the test kit in extreme heat:

(1) Protect test kit and components from direct sunlight. Direct sunlight may influence thermometer indications during product testing.

(2) High ambient temperatures will require use of additional coolant to perform distillation tests. Make sure enough coolant is available to complete the test.

2-15. OPERATIONS IN DUSTY OR SANDY AREAS.

Observe the following precautions when operating the test kit in dusty or sandy areas:

WARNING

Do not operate test kit in tents or shelter without adequate ventilation. Inhalation of petroleum fumes and vapors will result in serious illness or death.

(1) If dust or sand is blowing, operate the test kit only from a tent or shelter.

(2) When not in use, the kit should be covered with a tarp to prevent dust, dirt and sand from entering cabinet.

(3) Keep all test kit components in cabinet until ready for use.

(4) Carefully inspect components for accumulations of dust, dirt and sand. Remove all contamination from equipment before beginning tests.

(5) Following operation in dusty or sandy areas, rinse all flasks, graduates and jars with clean, fresh water to remove contaminants.

2-16. OPERATION IN SALT WATER AREAS.

Operation in salt water areas accelerates corrosion on bare metal surfaces. Observe the following precautions when operating the test kit in this environment.

WARNING

To prevent injury to personnel from electrical shock, do not operate test kit from wet soil, wet sand or in salt spray. Make sure electrical power source is properly grounded.

(1) Carefully inspect cabinet. If bare metal is found, notify unit maintenance to preserve or paint the metal as required.

(2) Following operation in salt water areas, remove all components and rinse empty cabinet with clean fresh water to remove salt spray and/or deposits. Do not allow electrical components to get wet.

2-17. DECONTAMINATION PROCEDURES.

(1) As required, assist the supporting NBC unit in decontaminating the test kit. Refer to FM 3-3, FM 3-4, and FM 3-5 for detailed decontamination procedures.

(2) Refer to FM 10-70 and FM 10-72 for additional operating precautions following NBC attack.

CHAPTER 3

OPERATOR MAINTENANCE INSTRUCTIONS

Section I. LUBRICATION INSTRUCTIONS

No Lubrication Required

Section II. OPERATOR TROUBLESHOOTING

3-1. INTRODUCTION.

a. The troubleshooting table lists the common malfunctions which you may find during operation of the test kit. 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, orall the corrective actions needed to correct the fault. If the equipment malfunctions not listed or actions listed do not correct the fault, notify your supervisor.

3-2. MALFUNCTION INDEX.

3-3. TROUBLESHOOTING TABLE.

Refer to table 3-1 for Operator Troubleshooting instructions.

Table 3-1. Operator Troubleshooting

NOTE
Be sure to read ALL Warnings in front of manual before troubleshooting.

MALFUNCTION 1. DISTILLATION UNIT OR FLASH POINT TESTER HEATER WILL NOT HEAT.

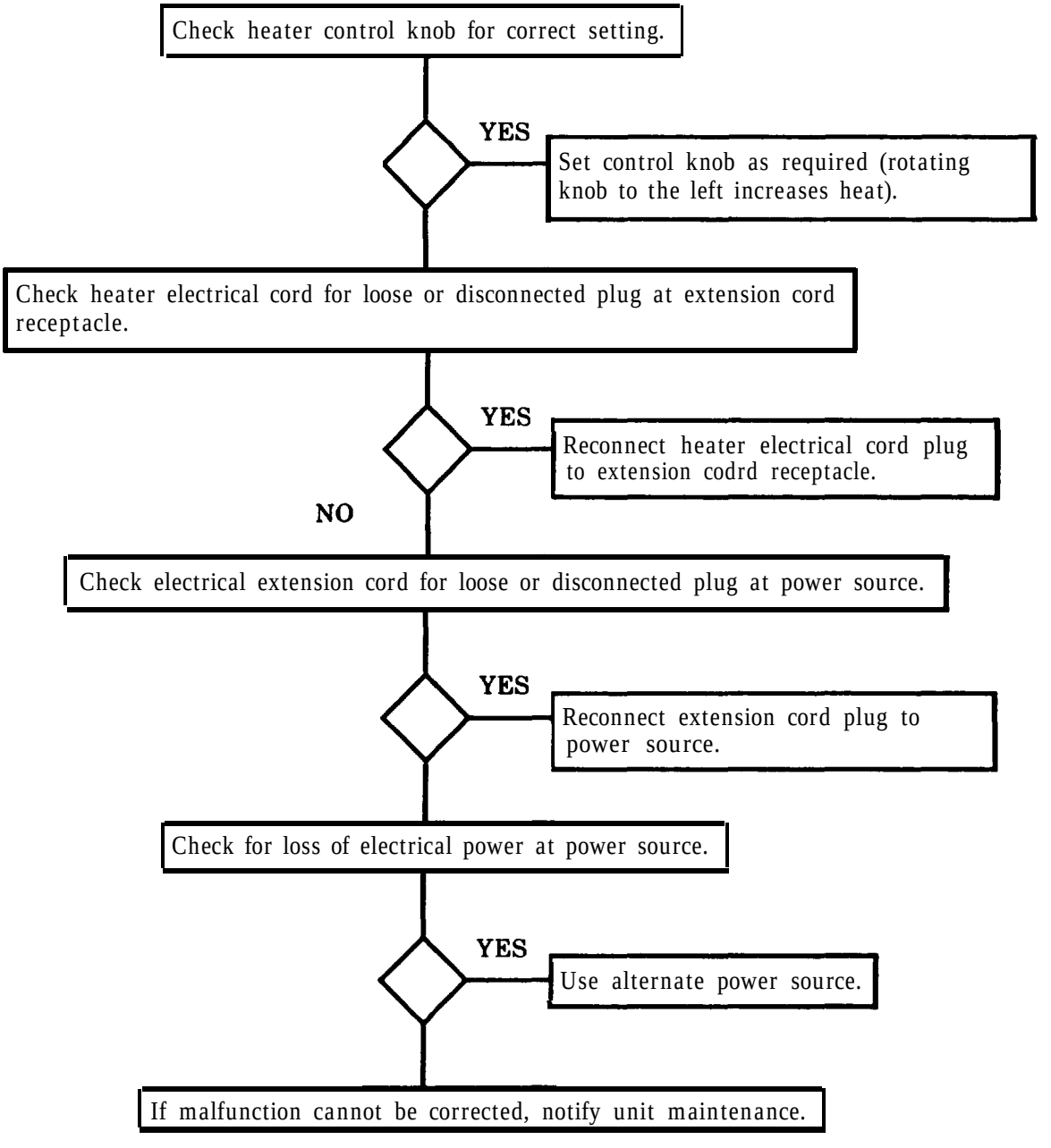
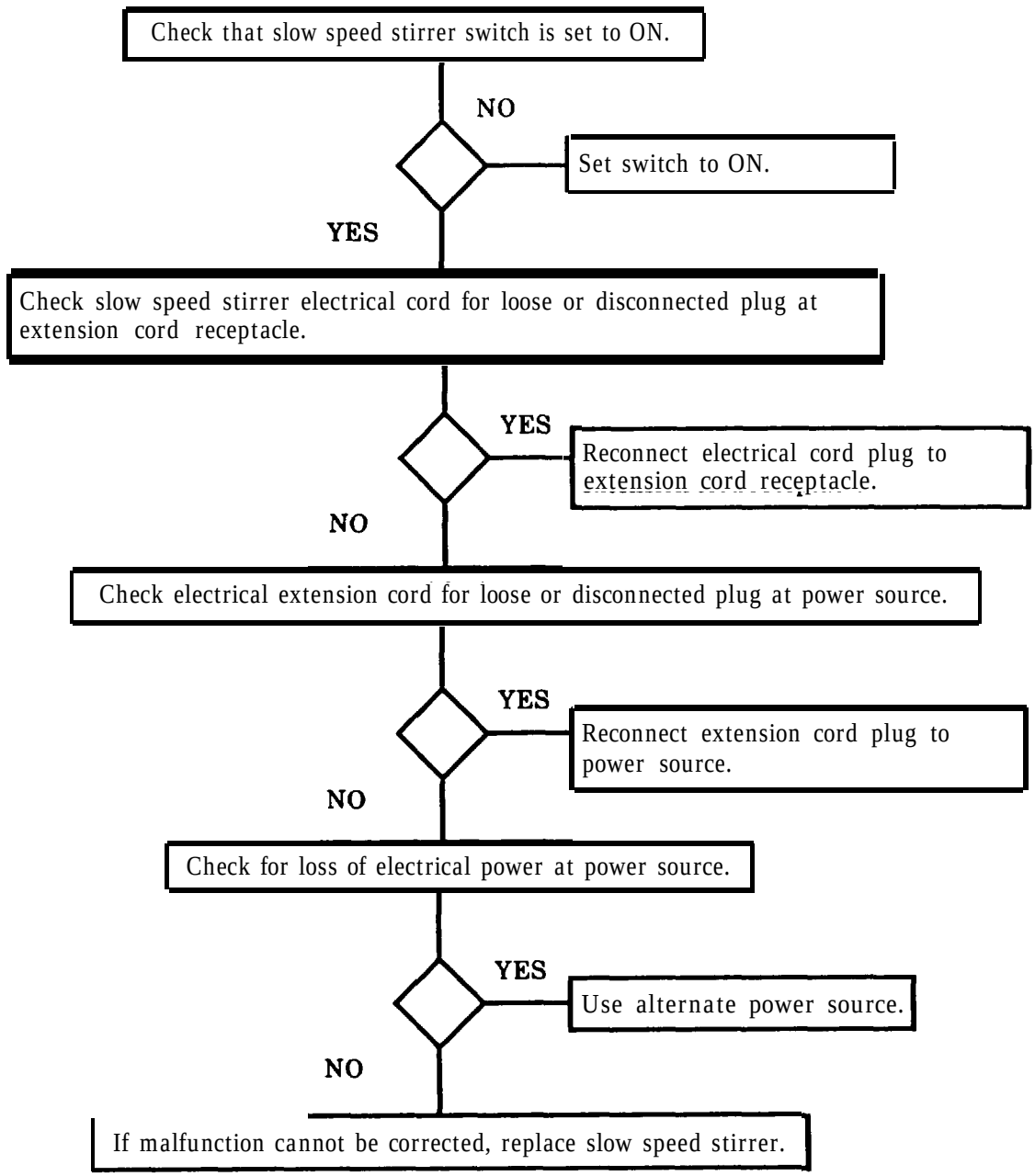


Table 3-1. Operator Troubleshooting - cont.

MALFUNCTION 2. SLOW SPEED STIRRER DOES NOT TURN.



Section III. OPERATOR MAINTENANCE PROCEDURES

3-4. COMPONENT REPLACEMENT.

WARNINGS

- To prevent electrical shock to personnel and damage to the equipment, disconnect electrical heaters and slow speed stirrer from electrical power source before removal.
- To prevent severe burns to personnel, allow electrical heaters to cool before attempting removal.

Operator replacement of test kit components is performed by removing the defective component (flask, jar, brush, straps, etc.) from the test kit and installing a serviceable replacement. The distillation unit and flash point tester must be returned to unit maintenance for repairs.

CHAPTER 4

UNIT MAINTENANCE INSTRUCTIONS

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,

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. No special tools are required to maintain the test kit..

4-3. REPAIR PARTS.

Repair parts are listed and illustrated in Appendix C, Repair Parts and Special Tools List for Unit and Direct Support maintenance.

Section II. SERVICE UPON RECEIPT

4-4. SITTING.

a. Transport. The Test Kit is designed to be transported by truck, van or similar type equipment. The test kit contains delicate glassware and precision test equipment that can be damaged by rough handling. Secure the test kit to the transport vehicle before movement. Whenever possible, avoid rough road conditions,

b. Site Selection. When selecting a site for installation of the Test Kit, consider the overall operating area. Siting must provide access to the petroleum storage facility while ensuring adequate separation for fire prevention. Electrical power to operate the test equipment must be located within 50 feet of the site. The installation site must provide good water drainage to permit continued use of the electrically operated equipment during wet weather.

4-5. SHELTER REQUIREMENTS.

The Test Kit should be installed under a tent or similar shelter to ensure adequate protection against wind and rain. The shelter must prevent sand, dirt and dust from contaminating test samples while providing adequate ventilation to prevent the buildup of fuel vapors.

4-6 CHECKING UNPACKED EQUIPMENT.

a. General. The Test Kit is packaged and shipped in a self-contained cabinet. When unpacking the equipment, keep in mind that the test kit contains glass flasks, jars, graduates and precision test equipment. Use care when unpacking to prevent damage to fragile components.

4-6. CHECKING UNPACKED EQUIPMENT - cont.

b. Processing Unpacked Equipment.

(1) Remove all tape, paper wrapping, plastic sheeting and packing materials from the test kit and components.

(2) Inspect test kit cabinet 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 or DA Pam 738-751 as applicable.

(6) Check to see if the equipment has been modified.

Section III. UNIT TROUBLESHOOTING PROCEDURES

4-7. INTRODUCTION.

This section provides the troubleshooting information for the Ground Fuels Petroleum Test Kit at the Unit maintenance level. It consists of the symptom index, listing the most common malfunction symptoms, and the troubleshooting table, Table 4-1. This table repeats the malfunctions, and provides the procedural steps and corrective actions necessary to return the system to operational readiness.

4-8. TROUBLESHOOTING.

a. The troubleshooting table lists the common malfunctions which you may find during operation of the test kit. You should perform the tests, inspections and corrective actions in the order they appear in the table.

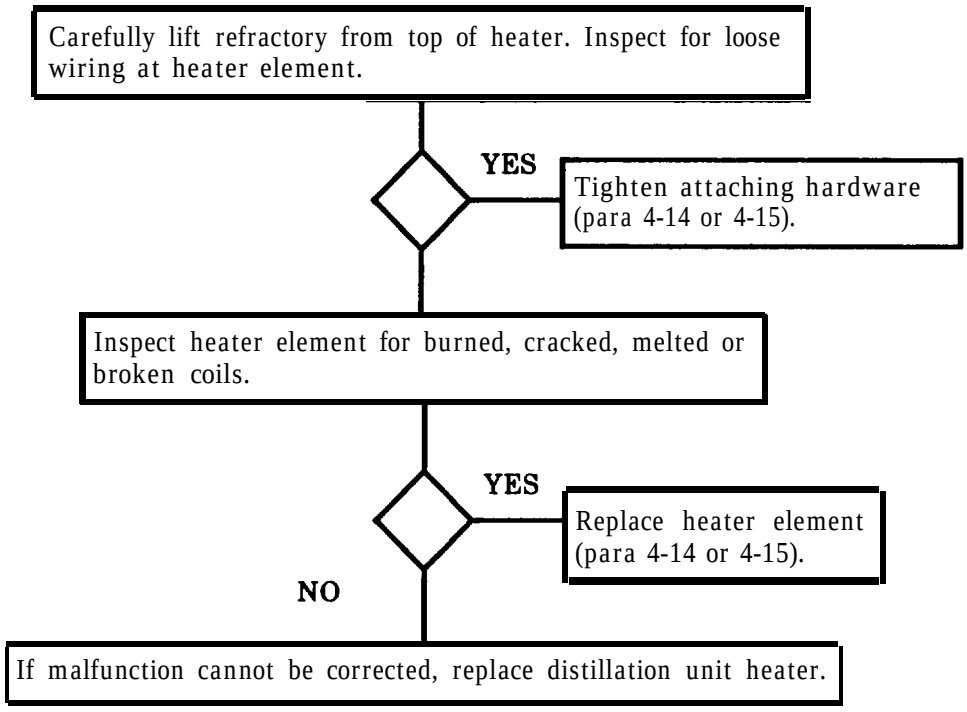
b. This table cannot list all the malfunctions that may occur, all the tests or inspections needed to find the fault, or all the corrective actions needed to correct the fault. If the equipment malfunction is not listed or actions listed do not correct the fault, notify your supervisor.

4-9. MALFUNCTION INDEX.

Table 4-1. Unit Troubleshooting.

NOTE
Be sure to read ALL Warnings in front of manual before troubleshooting.

MALFUNCTION. DISTILLATION UNIT OR FLASH POINT TESTER HEATER WILL NOT HEAT.



Section IV. UNIT MAINTENANCE PROCEDURES

4-10. GENERAL.

This section contains instructions for performing unit level maintenance on the Ground Fuels Test Kit.

4-11. PERSONAL SAFETY.

To ensure safety of personnel, proper care should be used when lifting or transporting the test kit. The Test Kit, weighs approximately 225 pounds. You will require the assistance of four personnel to lift or transport the assembled Test Kit.

Personnel must remove all items of jewelry (rings, bracelets, watches, necklaces etc) and loose clothing before working on the equipment. Jewelry and loose clothing can get caught in moving equipment and result in injury to personnel. Jewelry can cause electrical shorts or severe injury when working around electrical equipment.

When performing maintenance on the Test Kit, keep in mind that the purpose of the equipment is to test flammable liquids. Your work space must be well ventilated to prevent the build-up of vapors and fumes. Make sure a fire extinguisher is available in the event of a fire.

Operate Test Kit components after performing maintenance to ensure repairs have been performed connectly and item can be returned to service.

4-12. PROPER EQUIPMENT.

Obtain proper equipment before beginning maintenance. This includes hand tools and/or special tools, receptacles for storing small parts, expendable materials and mandatory replacement parts required by the maintenance task.

4-13. FLASH POINT TESTER MAINTENANCE.

This task consists of: a. Removal b. Cleaning c. Inspection d. Repair e. Installation

INITIAL SET-UP:	
Tools: General Mechanics Tool Kit (App B, Sect III, Item 1)	Material/Parts: Wiping Rag (Item 2, App F)
Equipment Condition: Flash point tester disconnected from power source.	

NOTES

- Ensure that all parts identified as mandatory replacement parts are discarded and replaced with new components.
- Repair of the flash point tester is limited to replacement of the heater element and refractory. A spare element and refractory are supplied in the test kit.

a. Removal. Refer to figure 4-1.

CAUTION

To prevent damage to refractory, use care when removing heater from stand.

(1) Lift and remove heater assembly (1) from stand (2).

(2) To aid removal of refractory (3), lay heater assembly (1) on its side.

CAUTION

Wires connecting refractory to the heater are short and provide very little slack. Use care when removing refractory not to damage wiring.

(3) Carefully pull refractory (3) from top of heater housing (4).

(4) Remove nut (5), starwasher (6), wire lead (7) and flat washer (8) from screw (9).

(5) Repeat step (4) for wire lead (7) on other side of refractory (3).

(6) Separate refractory (3) from heater housing (4).

4-13. FLASH POINT TESTER MAINTENANCE- cont.

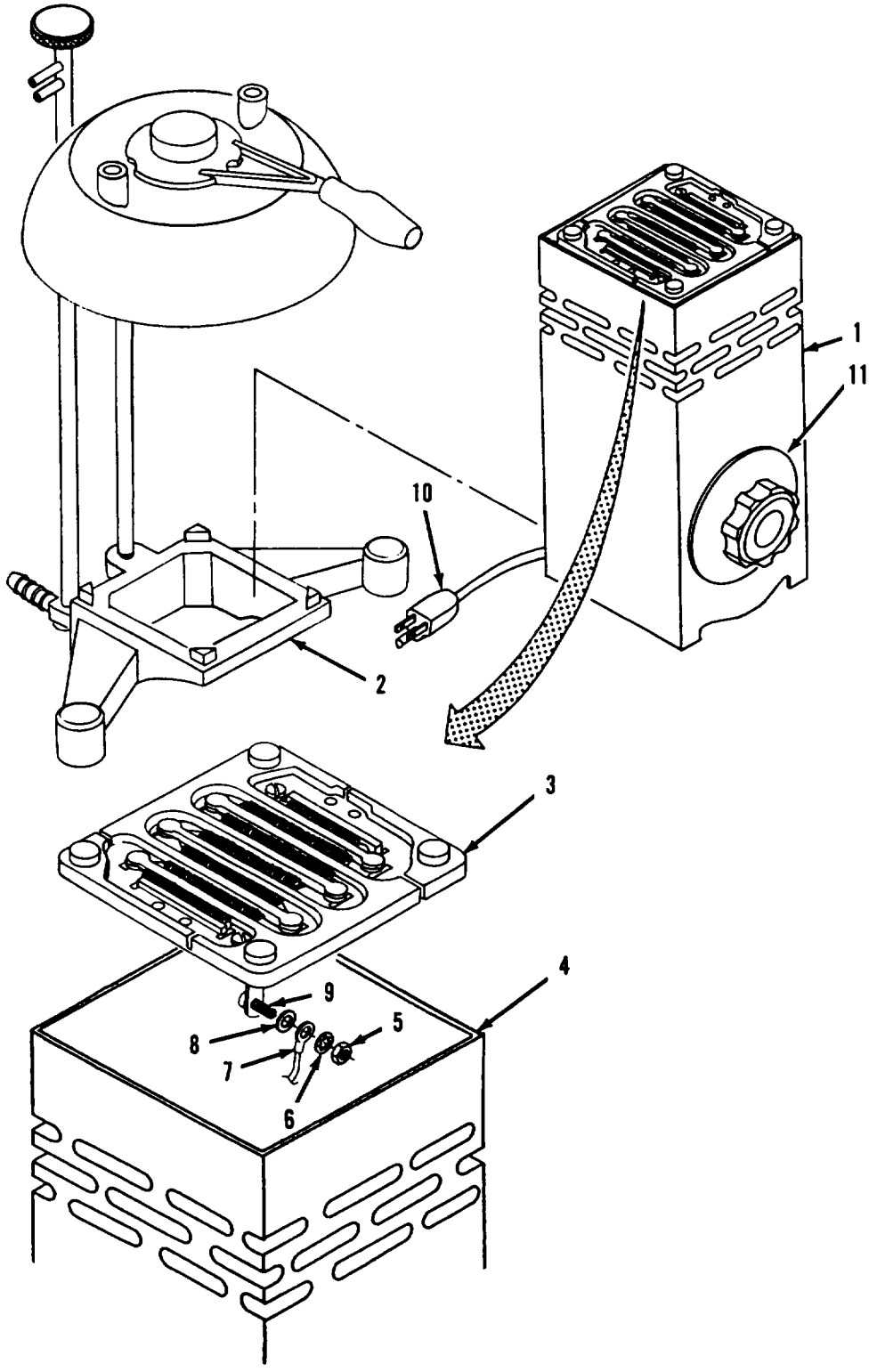


Figure 4-1. Flash Point Heater Element Removal.

4-13. FLASH POINT TESTER MAINTENANCE- cont.

b. Cleaning. Refer to figure 4-1.

(1) Using wiping rag, remove fuel deposits, oils, and crust from refractory (3).

(2) Clean sides of heater housing (4) with wiping rag.

c. Inspection. Refer to figure 4-1.

(1) Inspect heater housing (4) for cracks, dents and evidence of overheating.

(2) Check for bent or cracked control knob (11). Knob should turn smoothly in both direction.

(3) Inspect power cord (10) for cuts, tom insulation or damaged plug.

NOTE

Flash point tester has an insulating spacer installed under the refractory.

(4) Inspect heating element (4, figure 4-2) for burned, broken or shorted coils.

(5) Inspect refractory (6) for cracks, broken or missing pieces, and loose or missing terminal lugs (5).

d. Repair. Refer to figure 4-2.

(1) Remove two screws (1) and flat washers (2) securing heating element leads (3) to lugs (5).

(2) Straighten element leads (3) and pull defective element (4) from top of refractory (6).

NOTE

It will be necessary to stretch the coils of the replacement heater element to fit around refractory dividers.

(3) Place new heater element (4) on top of refractory (6) with element leads (3) positioned through refractory (6) at lugs (5).

(4) Stretch coils of heating element (4) around dividers (7) as shown.

(5) Loosely install two flat washers (2) and screws (1) in lugs (5).

(6) Wrap element leads (3) around screws (1), then tighten screws.

4-13. FLASH POINT TESTER MAINTENANCE- cont.

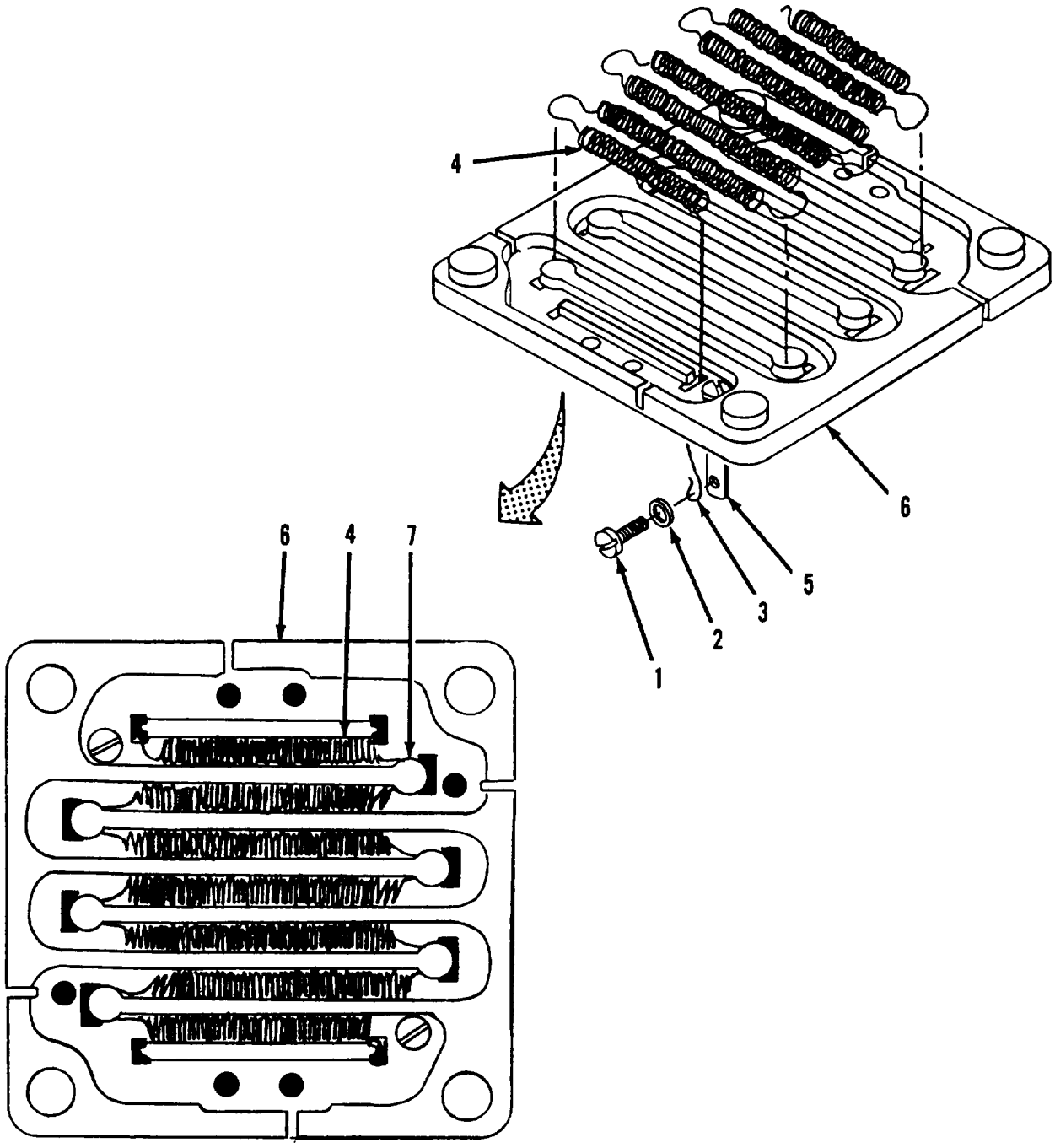


Figure 4-2. Flash Point Heater Element and Refractory Repair.

4-13. FLASH POINT TESTER MAINTENANCE- cont.

e. Installation, Refer to figure 4-3.

(1) To aid installation, lay heater housing (4) on its side.

CAUTION

Wire leads connecting heater to the refractory provide very little slack. Use care when installing the refractory to prevent damage to wire leads.

(2) Position refractory (3) on top of heater housing (4). Make sure lugs on bottom of refractory line up with wire leads (7).

(3) Install flat washer (8), wire lead (7), starwasher (6) and nut (5) on screw (9).

(4) Repeat step (3) for wire lead (7) on other side of refractory (3).

(5) Carefully push refractory (3) into top of heater housing (4) until fully seated.

(6) Set heater assembly (1) right-side-up.

(7) Install heater assembly (1) on stand (2).

(8) Connect power cord (10) to power supply and check for proper operation.

4-13. FLASH POINT TESTER MAINTENANCE- cont.

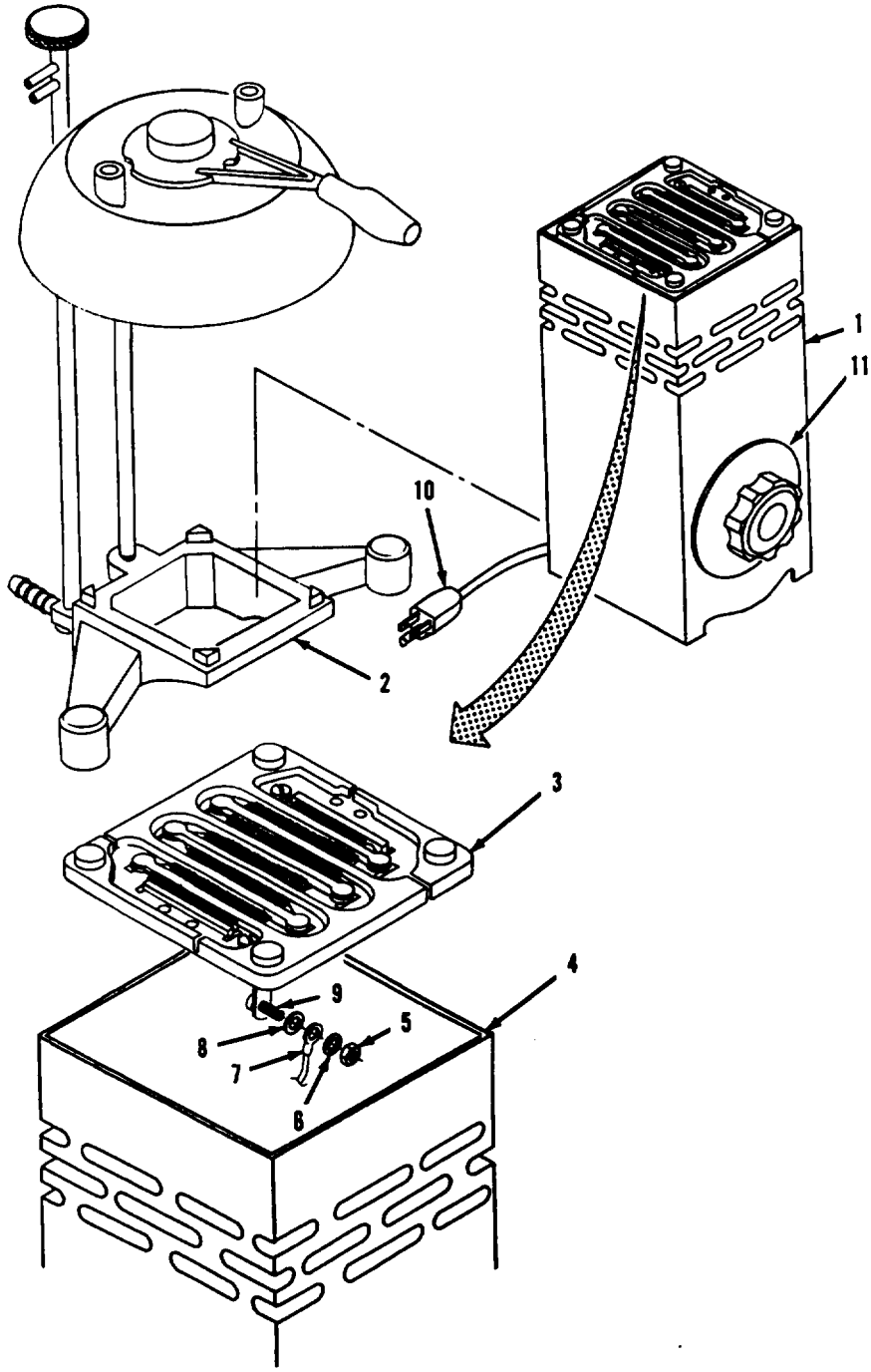


Figure 4-3. Flash Point Heater Element Installation.

4-14. DISTILLATION UNIT MAINTENANCE.

This task consists of: a. Removal b. Cleaning c. Inspection d. Repair e. Installation

INITIAL SET-UP

Tools:
General Mechanics Tool Kit (App B, Sec III, Item 1)

Material/Parts:
Wiping Rag (Item 2, App F)

Equipment Condition:
Distillation unit heater disconnected from power source.

NOTES

- Ensure that all parts identified as mandatory replacement parts are discarded and replaced with new components.
- Repair of the distillation unit is limited to replacement of the heater element and refractory. A spare element and refractory are supplied in the test kit.

a. Removal. Refer to figure 4-4.

(1) To aid removal of refractory (2), lay heater assembly (1) on its side.

CAUTION

Wire leads connecting refractory to the heater housing are short and provide very little slack. Use care to prevent damage to wiring.

(2) Carefully pull refractory (2) from top of heater housing (8).

(3) Remove nut (3), starwasher (4), wire lead (5) and flat washer (6) from screw (7).

(4) Repeat step (3) for wire lead (5) on other side of refractory (2).

(5) Separate refractory (2) from heater housing (8).

4-14. DISTILLATION UNIT MAINTENANCE- cont.

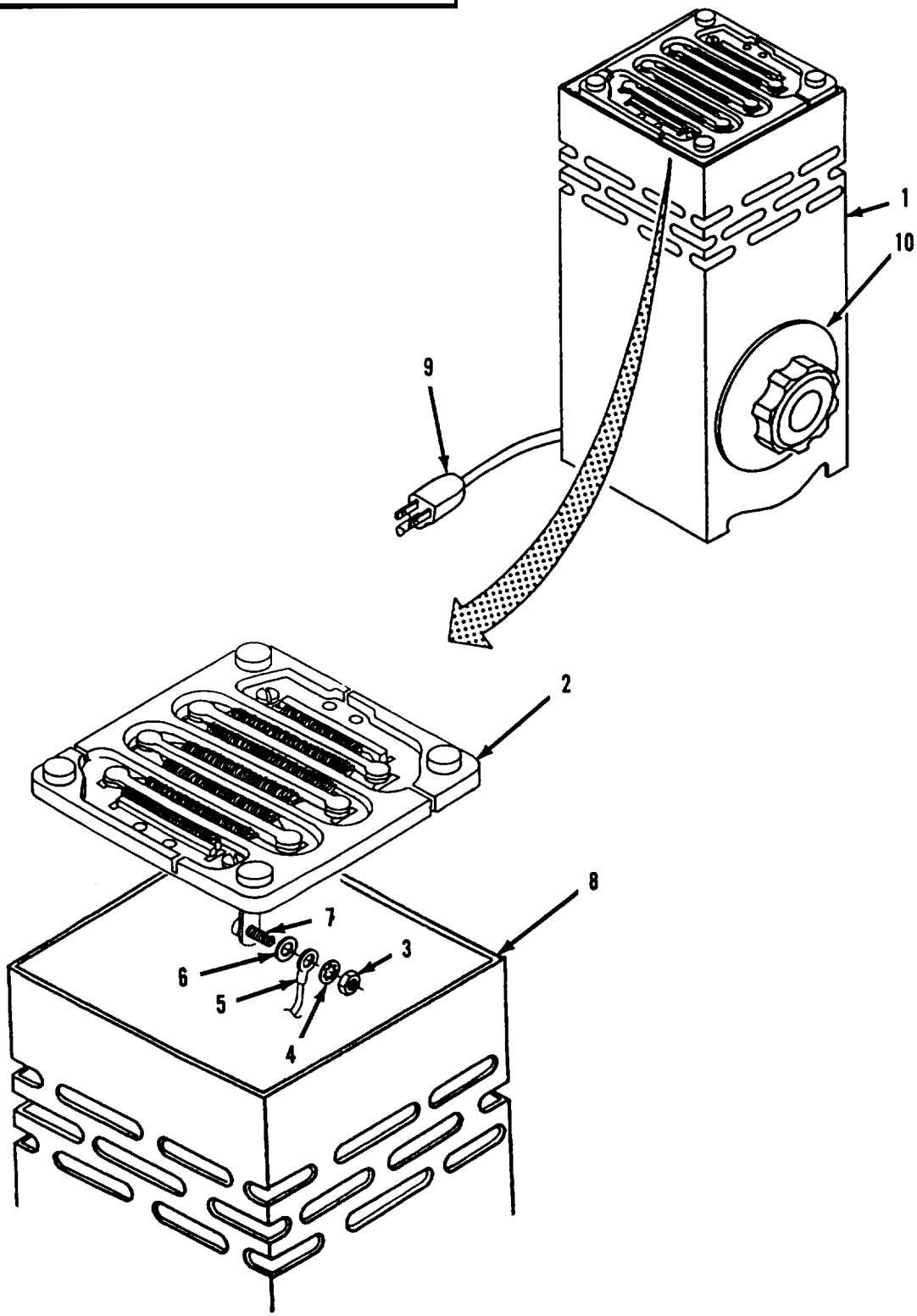


Figure 4-4. Distillation Unit Heater Element Replacement.

4-14. DISTILLATION UNIT MAINTENANCE- cont.

b. Cleaning. Refer to figure 4-4.

(1) Using wiping rag, remove fuel deposits, oils, and dust from refractory (2).

(2) Clean sides of heater housing (8) with wiping rag,

c. Inspection. Refer to figure 4-4.

(1) Inspect heater housing (8) for cracks, dents and evidence of overheating.

(2) Check for bent or cracked control knob (10), Knob should turn smoothly in both direction,

(3) Inspect power cord (9) for cuts, torn insulation or damaged plug.

NOTE

Distillation unit heater does not have an insulating spacer installed under the refractory.

(4) Inspect heating element (4, figure 4-5) for burned, broken or shorted coils.

(5) Inspect refractory (6) for cracks, broken or missing pieces, and loose or missing terminal lugs (5).

d. Repair. Refer to figure 4-5.

(1) Remove two screws (1) and flat washers (2) securing heating element leads (3) to lugs (5).

(2) Straighten element leads (3) and pull defective element (4) from top of refractory (6).

NOTE

It will be necessary to stretch the coils of the replacement heater element to fit around refractory dividers.

(3) Place new heater element (4) on top of refractory (6) with element leads (3) positioned through refractory (6) at lugs (5).

(4) Stretch coils of heating element (4) around dividers (7) as shown.

(5) Loosely install two flat washers (2) and screws (1) in lugs (5).

(6) Wrap element leads (3) around screws (1), then tighten screws,

4-14. DISTILLATION UNIT MAINTENANCE- cont.

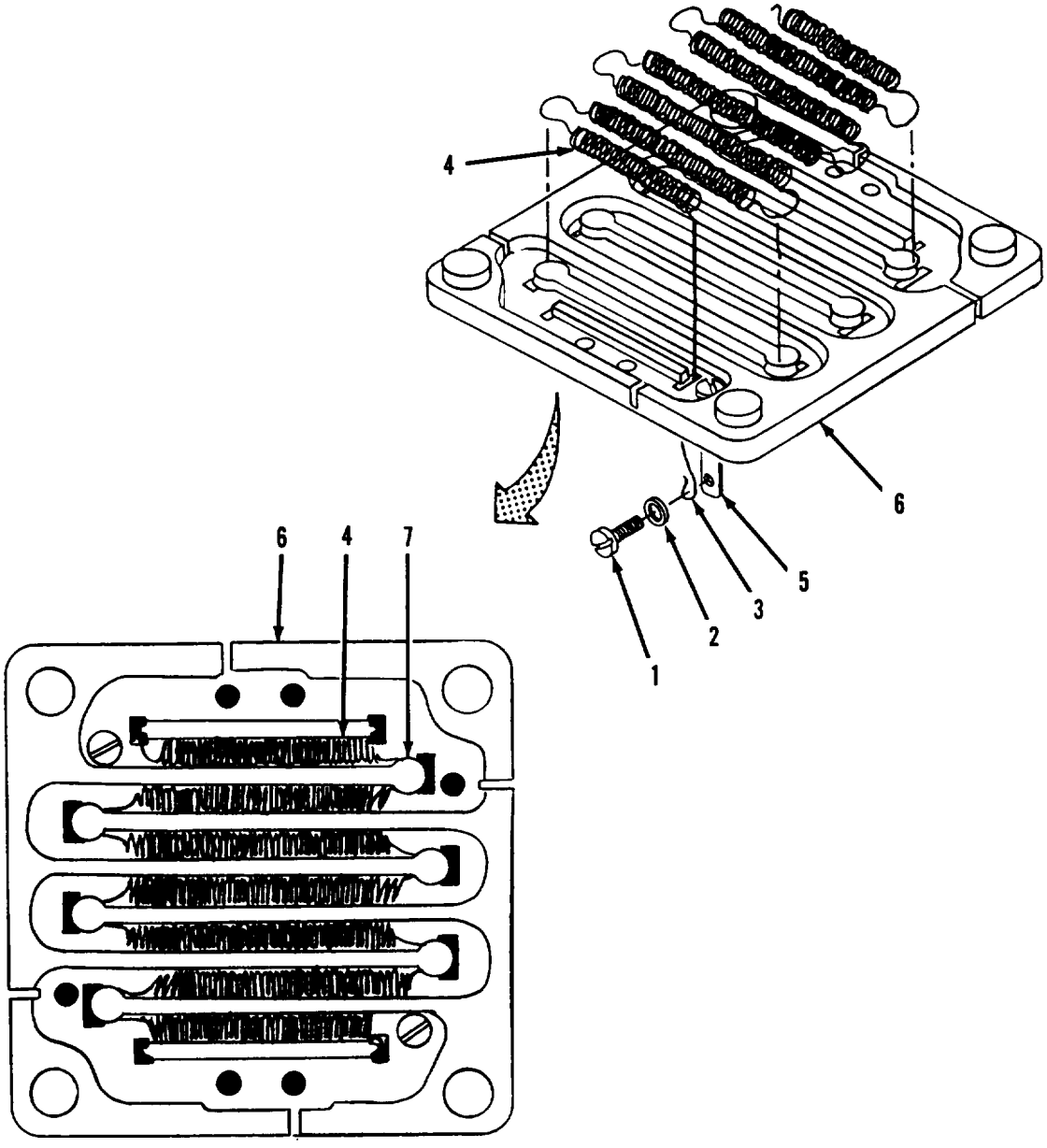


Figure 4-5. Distillation Unit Heater Element and Refractory Repair.

4-14. DISTILLATION UNIT MAINTENANCE- cont.

e. Installation. Refer to figure 4-6,

(1) To aid installation, lay heater housing (8) on its side.

CAUTION

Wire leads connecting heater to the refractory provide very little slack. Use care when installing the refractory to prevent damage to wire leads,

(2) Position refractory (2) on top of heater housing (8). Make sure lugs on bottom of refractory line up with wire leads (7).

(3) Install flat washer (6), wire lead (5), starwasher (4) and nut (3) on screw (7).

(4) Repeat step (3) for wire lead (5) on other side of refractory (2).

(5) Carefully push refractory (2) into top of heater housing (8) until fully seated.

(6) Set heater housing (8) right-side-up.

(7) Connect power cord (9) to power supply and check for proper operation.

4-14. DISTILLATION UNIT MAINTENANCE- cont.

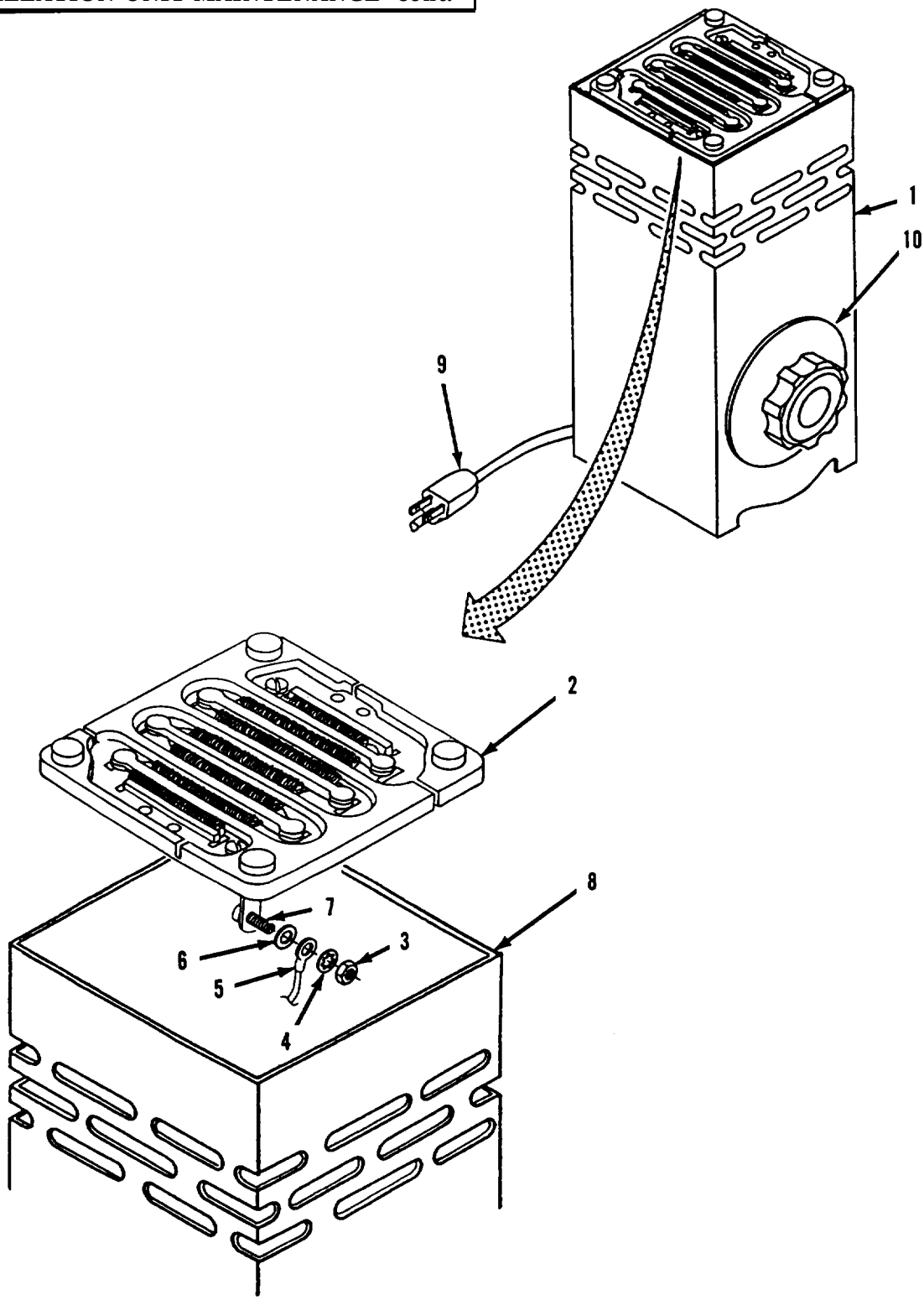


Figure 4-6. Distillation Unit Heater Element Installation.

4-15. LEG SUPPORT REPAIR.

This task consists of a. Removal b. Disassembly c. Cleaning d. Inspection e. Repair f. Assembly g. Installation

INITIAL SET-UP:	
Tools: General Mechanics Tool Kit (App B, Sec III, Item 1) Equipment Condition: All components removed from kit	Material/Parts: Lockwashers (18) (Item 1, App J) Cotter Pins (8) (Item 2, App J) Wiping Rags (Item 2, App F)

NOTE
Ensure that all parts identified as mandatory replacement parts are discarded and replaced with new components.

a. Removal. Refer to figure 4-7.

CAUTION
To prevent damage to cabinet, make sure all components are removed and both doors and work top are securely fastened before laying cabinet down.

NOTE
Removal of one leg support is shown. Removal of the other leg support is similar.

(1) Carefully lay cabinet (1) on its back.

(2) Remove cotter pin (4) and flat washer (5) from pivot pin (8).

(3) Remove cotter pin (6) and flat washer (7) from other end of pivot pin (8).

NOTE
Pivot pins can only be removed from outside of cabinet.

(4) Push out pivot pin (8) from leg (9) and bracket (10).

(5) Remove two nuts (11), lockwashers (12), flat washers (13) and screws (14) from brace (15).

(6) Separate brace (15) from angle (16).

(7) Repeat steps (2) through (6) for other side of leg support (2).

(8) Remove leg support (2) from cabinet (1).

4-15. LEG SUPPORT REPAIR - cont.

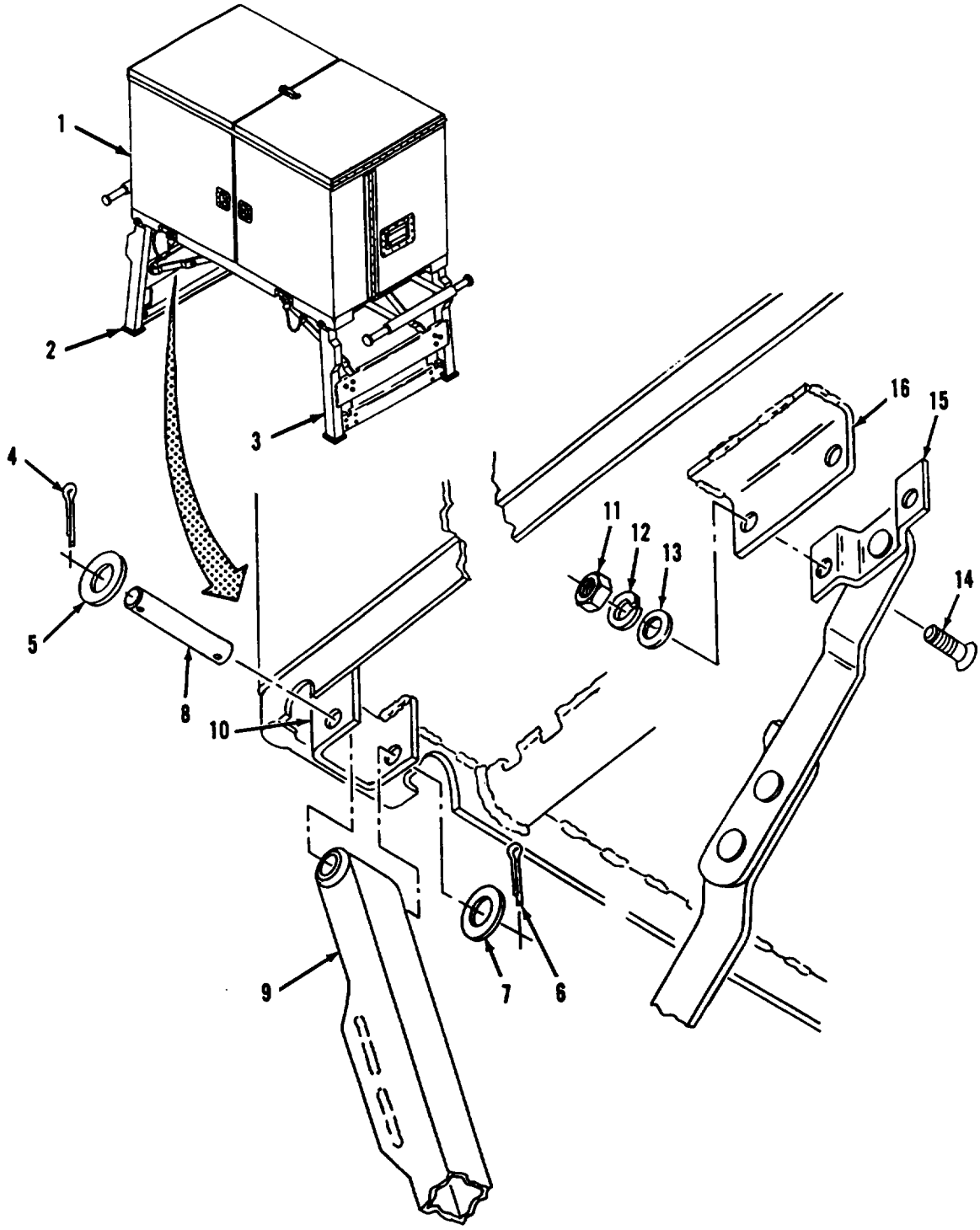


Figure 4-7. Leg Support Removal.

4-15. LEG SUPPORT REPAIR - cont.

b. Disassembly. Refer to figure 4-8.

NOTES
- Removal of one brace is shown. The other is similar.
- Ensure that all parts identified as mandatory replacement parts are discarded and replaced with new components.

(1) Remove three nuts (l), lockwashers (2), flat washers (3) and screws (4) from brace (5).

(2) Separate brace (5) from support frame (11).

NOTE
Removal of one barrel bolt is shown. The other is similar.

(3) Remove four nuts (6), lockwashers (7), flat washers (8), screws (9) and barrel bolt (10) from support frame (11).

c. Cleaning. Refer to figure 4-8,

Using wiping rag, remove dirt, grease and oil deposits from support frame (11), braces (5) and barrel bolts (10).

d. Inspection. Refer to figure 4-8.

(1) Inspect support frame (11) for cracks, broken welds and bent or twisted frame components.

(2) Inspect braces (5) for bent or twisted components.

(3) Inspect barrel bolts (10) for cracks and stuck lock bolt.

e. Repair. Red-damaged *or* defective components.

f. Assembly. Refer to figure 4-8.

NOTES
- Installation of one barrel bolt is shown. The other is similar.
- Ensure that all parts identified as mandatory replacement parts are discarded and replaced with new components.

(1) Install barrel bolt (10), four screws (9), flat washers (8), lockwashers (7) and nuts (6) on support frame (11).

NOTE
Installation of one brace is shown. The other is similar.

(2) Position brace (5) on support frame (11).

(3) Install three screws (4), flat washere (3), lockwashers (2) and nuts (1) in brace (5).

4-15. LEG SUPPORT REPAIR - cont.

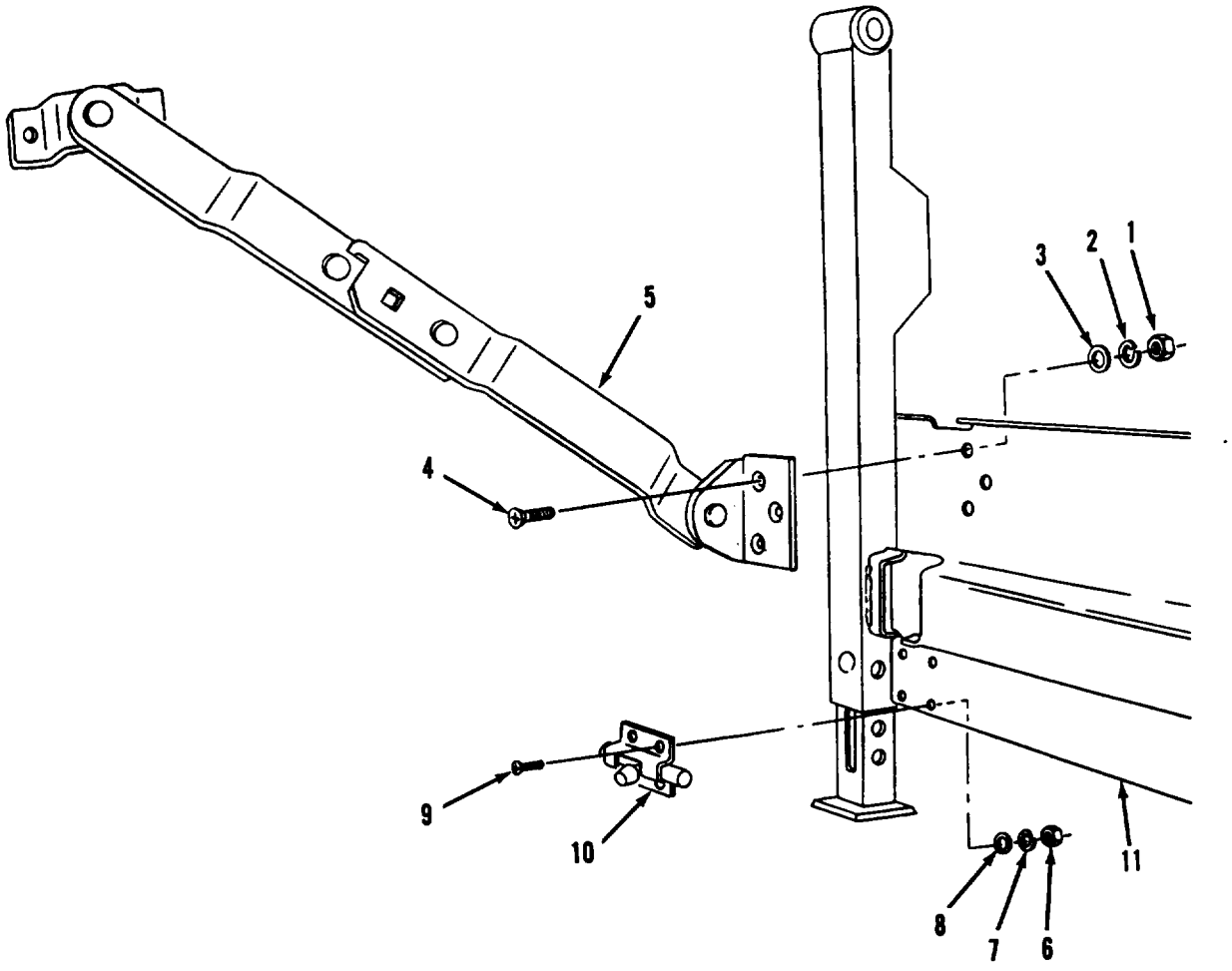


Figure 4-8. Leg Support Repair.

4-15. LEGSUPPORTREPAIR-cont.

g. Installation. Refer to figure 4-9.

NOTES
- Installation of one leg support is shown. Installation of the other leg support is similar,
- Ensure that all parts identified as mandatory replacement parts are discarded and replaced with new components.

(1) Position leg support (2) on cabinet (1) with ends of legs (9) in brackets (10).

NOTE
Pivot pins can only be installed from outside of cabinet.

(2) Push pivot pin (8) through bracket (10) and into leg (9). Make sure pivot pin extends through both ends of bracket.

(3) Install flat washer (5) and cotter pin (4) on end of pivot pin (8).

(4) Install flat washer (7) and cotter pin (6) on other end pivot pin (8).

(5) Position end of brace (15) on angle (16) and aline mounting holes.

(6) Install two screws (14), flat washers (13), lockwashers (12) and nuts (11) on brace (15).

(7) Repeat steps (2) through (6) for other side leg support (2).

(8) Extend leg supports (2) and (3) and lock braces (15).

(8) Carefully stand cabinet (1) right-side-up.

4-15. LEG SUPPORT REPAIR - cont.

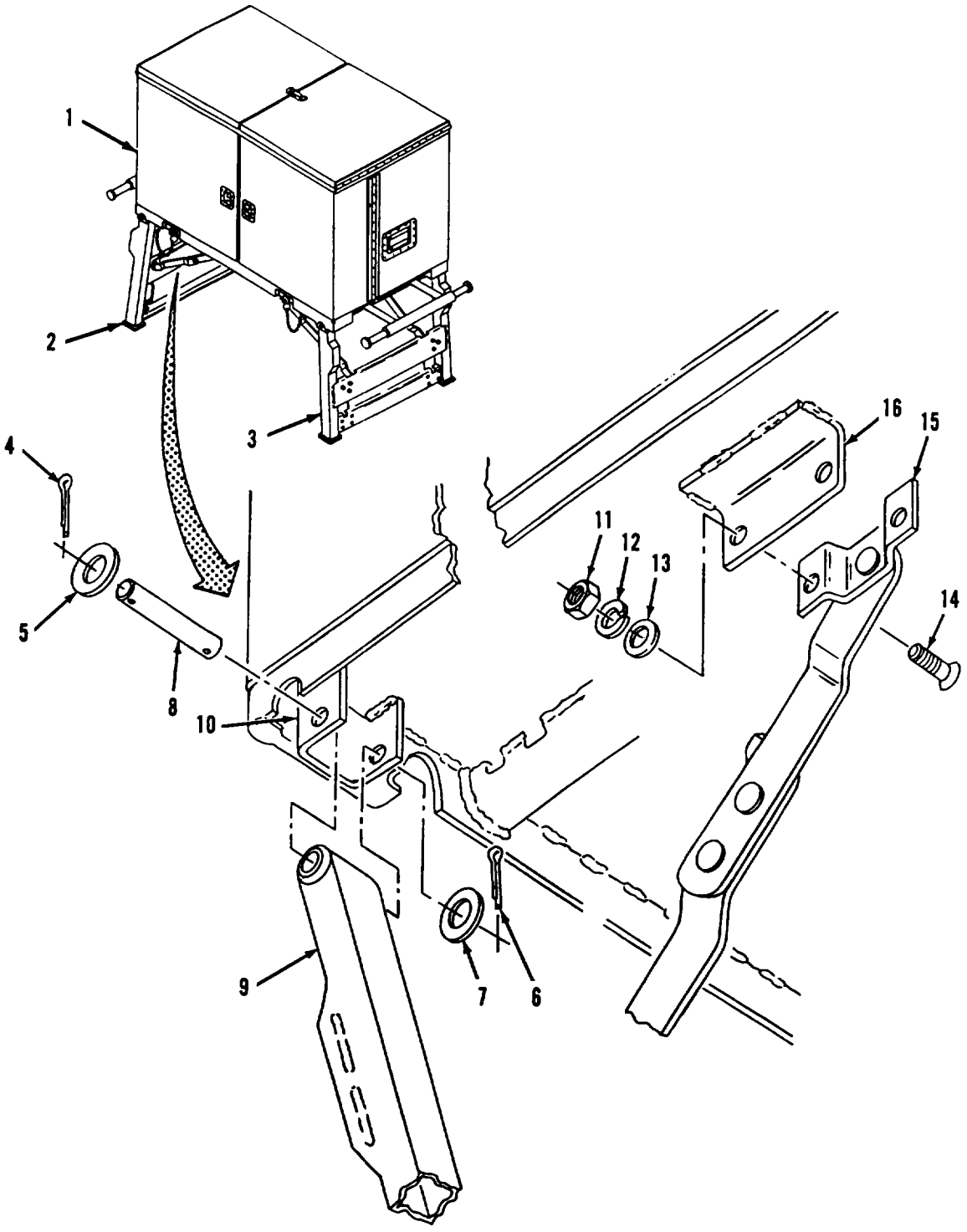


Figure 4-9. Leg Support Installation.

4-16. CABINET REPAIR.

This task consists of: a. Disassembly b. Cleaning c. Inspection d. Repair e. Assembly f. Adjustment

INITIAL SET-UP:	
Tools:	Blind Rivet (4) (Item 6, App J)
General Mechanics Tool Kit (App B, Sec III, Item 1)	Blind Rivet (28) (Item 7, App J)
Hand Riveter (App B, Sec III, Item 2)	Blind Rivet (24) (Item 8, App J)
Drill (App B, Sec III, Item 3)	Blind Rivet (2) (Item 9, App J)
Bit Set (App B, Sec III, Item 3)	Blind Rivet (12) (Item 10, App J)
Equipment Condition:	Blind Rivet (2) (Item 11, App J)
Leg supports removed (para 4-15)	Spring Pin (4) (Item 12, App J)
Material/Parts:	Spring Pin (4) (Item 13, App J)
Blind Rivet (20) (Item 3, App J)	Adhesive (Item 1, App F)
Blind Rivet (4) (Item 4, App J)	Wiping Rags (Item 2, App F)
Blind Rivet (6) (Item 5, App J)	

NOTES

- Ensure that all parts identified as mandatory replacement parts are discarded and replaced with new components.
- Cabinet repair is limited to replacement of defective components. Disassemble the cabinet only to the level required to effect repairs.

a. Disassembly.

RIGHT CABINET DOOR.

Cabinet Retainers and Foam. Refer to figure 4-10.

(1) Remove two screws (1) and separate retainer (2) from cabinet door (12).

(2) Remove two screws (3) and separate retainer (4) from cabinet door (12).

(3) Remove two screws (5) and separate retainer (6) from cabinet door (12).

(4) Remove three screws (7) and separate door (8) from cabinet door (12).

(5) Using scraper, remove foam block (9) from cabinet door (12).

(6) Using scraper, remove foam block (10) from cabinet door (12).

(7) Using scraper, remove foam block (11) from cabinet door (12).

4-16. CABINET REPAIR - cont.

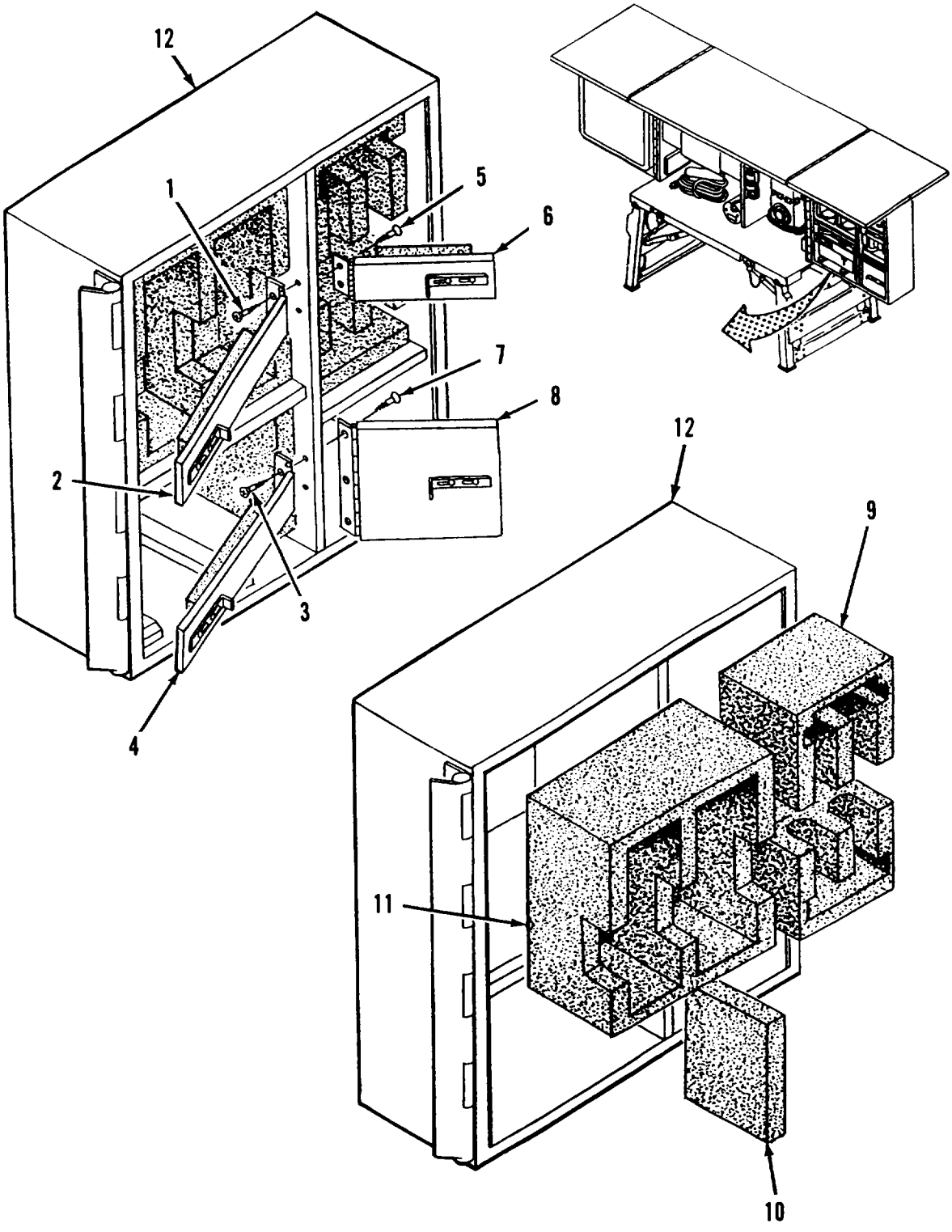


Figure 4-10. Right Cabinet Door Retainer and Foam Removal.

4-16. CABINET REPAIR - cont.

Door Dividers and Lock. Refer to figure 4-11.

NOTE

All cabinet dividers are glued in place. Destruction of the dividers may be required for removal. Remove only those dividers required to perform required repairs.

(8) Remove four screws (1) from side of cabinet door (21).

(9) Remove divider (2) and pipe support (3) from cabinet door (21).

(10) Remove divider (4) from cabinet door (21).

(11) Remove divider (5) from cabinet door (21).

(12) Remove divider (6) from cabinet door (21).

(13) Remove dividers (7 and 8) from cabinet door (21).

(14) Remove divider (9) from cabinet door (21).

(15) If required, remove wood supports (10 and 11) from divider (9).

(16) Remove ten rivets (12) from lock plate (13).

(17) Remove two rivets (14) from lower rod guide (15). Repeat for upper guide.

(18) Turn lock plate (13) about 1/4 turn to the right so that notches in retaining plate (18) aline with rods (16 and 17) as shown.

(19) Separate rods (16 and 17) from back of lock plate (13).

(20) Remove lock plate (13) from front of cabinet door (21).

(21) If required, remove four rivets (19) and nameplate (20) from cabinet door (21).

4-16. CABINET REPAIR - cont.

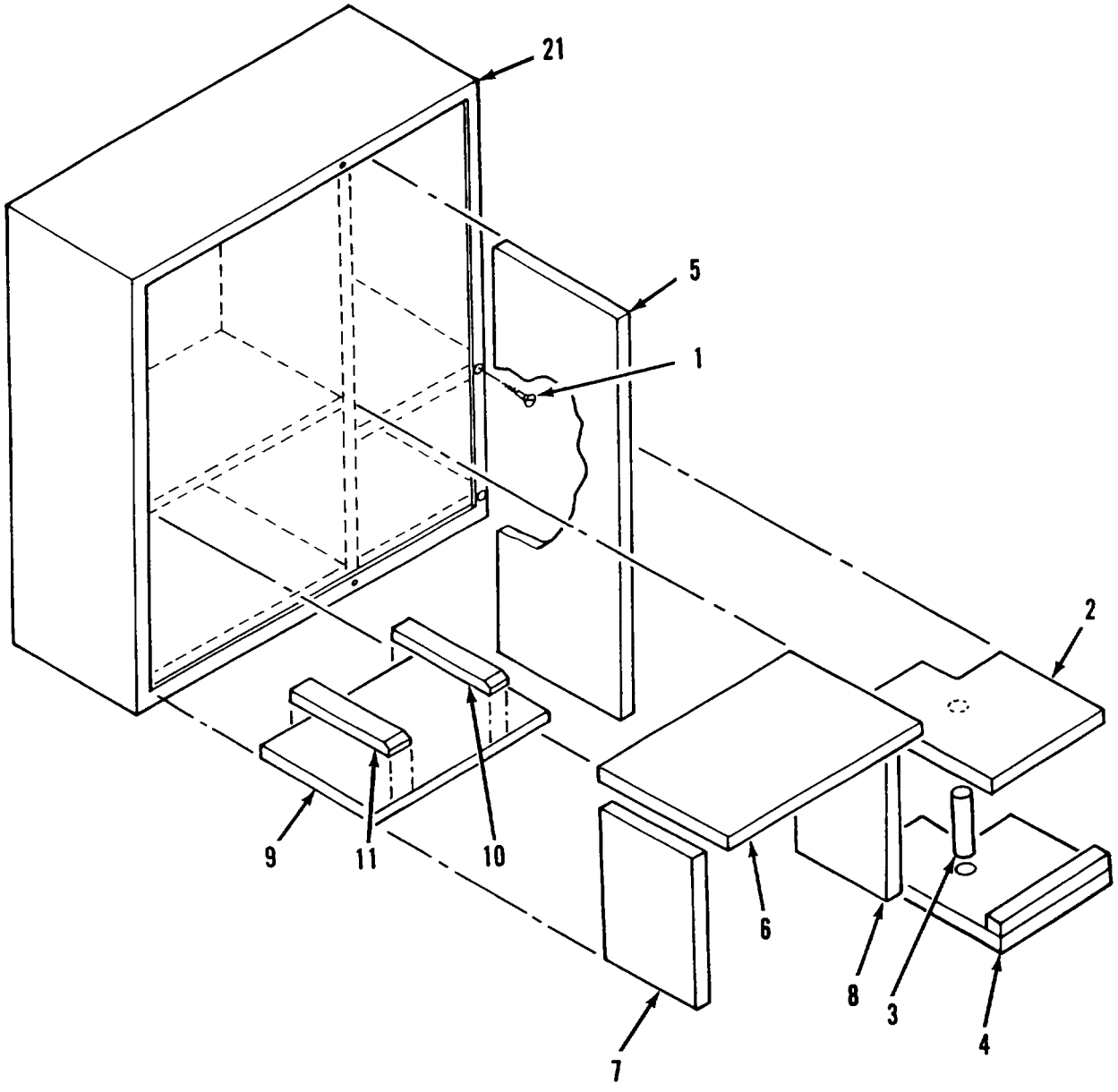


Figure 4-11. Right Cabinet Door Divider and Lock Removal (Sheet 1 of 2).

4-16. CABINET REPAIR - cont.

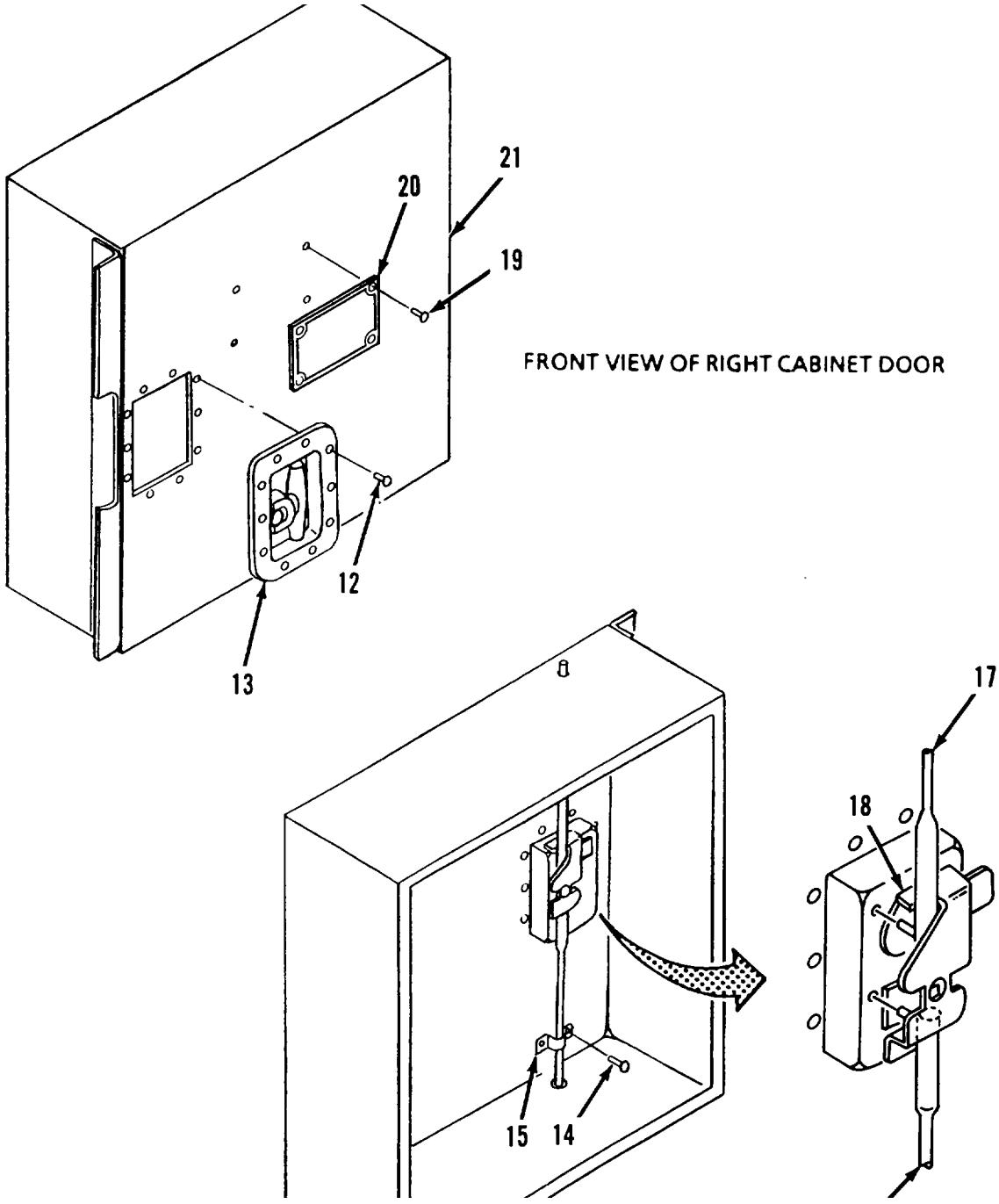


Figure 4-11. Right Cabinet Door Divider and Lock Removal (Sheet 2 of 2).

4-16. CABINET REPAIR - cont.

LEFT CABINET DOOR. Refer to figure 4-12.

(22) Remove nut (l), starwasher (2), catch (3), starwasher (4) and nut (5) from stem of latch (7).

(23) Remove nut (6) from latch (7) and separate latch from panel (12).

(24) Open chain hook (8) and remove from chain (10) and panel (12).

(25) Open chain hook (9) and remove hook from chain (10) and cabinet door (22).

(26) Using scraper, remove foam (11 and 23)) from panel (12).

(27) Using scraper, remove foam sheets (13 and 14) from divider (15).

(28) Using scraper, remove foam (16) from cabinet door (22)

(29) Remove two screws (17) from frame of cabinet door (22).

(30) Remove divider (18) from cabinet door (22).

(31) Using scraper, remove foam (19) from cabinet door (22)

(32) *Remove* ten rivets (20 from handle (21).

(33) Remove handle (21) from cabinet door (22).

14-16. CABINET REPAIR - cont.

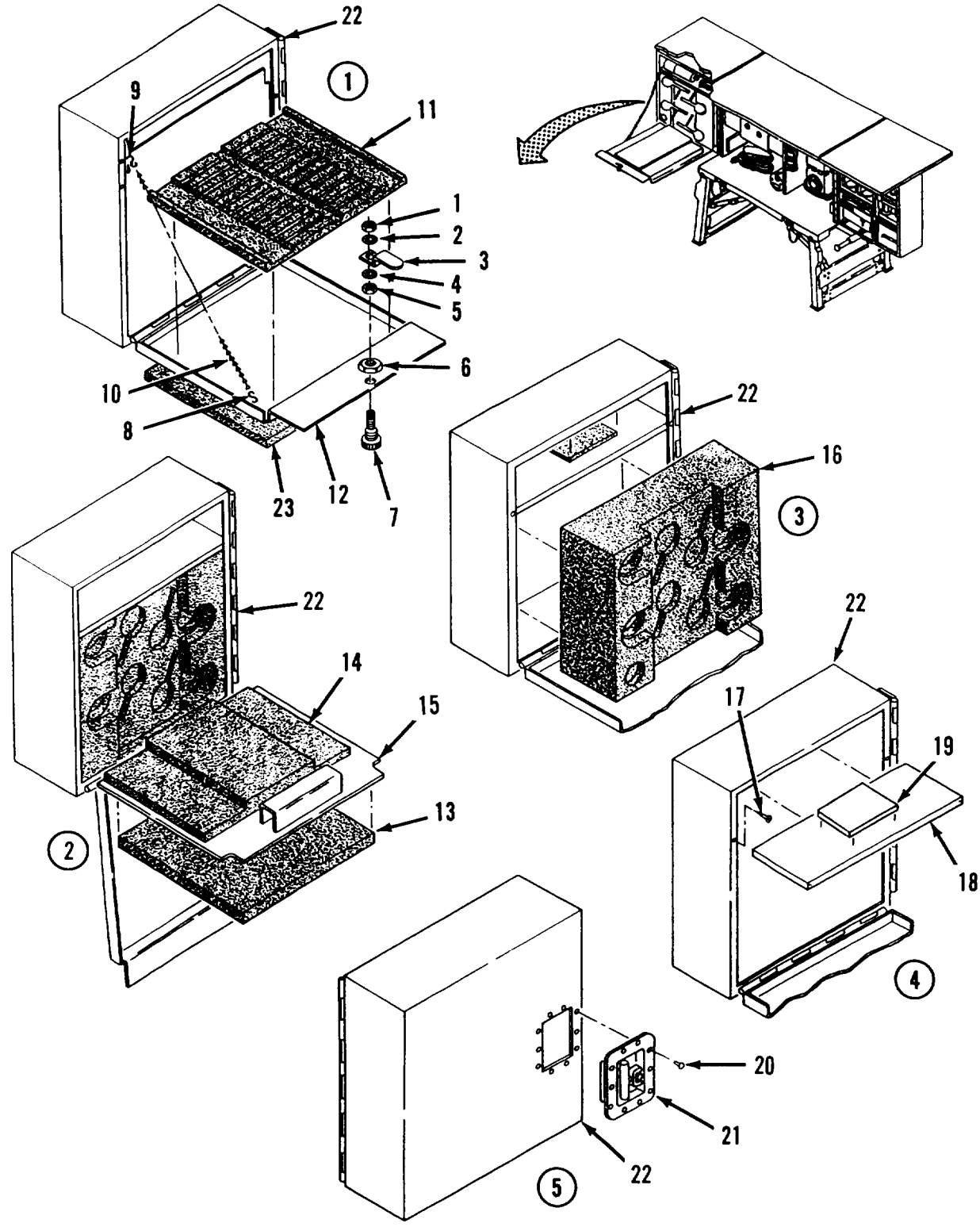


Figure 4-12. Left Cabinet Door Disassembly.

4-16. CABINET REPAIR - cont.

CABINET. Refer to figure 4-13.

(34) Remove two rivets (1) and clasp (2) from work top(5).

(35) Remove two rivets (3) and strike (4) from work top (5).

(36) Remove 22 rivets (6) and separate work top (5) from cabinet (43).

(37) Open chain hooks (7) and disconnect chains (8) from cabinet (43). Disconnect chains from quick release pins (9). Open chain hooks (44 and 46) and disconnect chain (45) from cabinet (43) and loading plan (47).

(38) Remove two rivets (10 and strap loop (11) from cabinet (43).

(39) Remove two rivets (12) and strap loop (13) from cabinet (43).

(40) Remove two rivets (14) and strap loop (15) from cabinet (43).

(41 Remove two rivets (16) and clips (17) from cabinet (43).

(42) Using wrap, remove four foam sheets (18) and from sheet (20) from pan (19).

(43) Using scraper, remove foam sheets (21 and 22) from pan (24).

(44) Using scraper, remove foam sheet (23) from under pan (24).

(45) Using scraper, remove foam sheet (25) from front of cabinet (43).

(46) Using scraper, remove foam sheet (26) from side of cabinet (43).

(47) Remove two rivets (27) and strap (28) from cabinet (43).

(48) Using scraper, remove pile strip (29) from pan (19).

(49) Remove two rivets (30) and clip (31) from cabinet (43).

NOTE

Remove only the small diameter, outer-most rivets to remove handle.

(50) Remove 14 rivets (32) and handle (33) from cabinet (43). Repeat for handle on other side of cabinet (43).

(51) Remove two rivets (34) and strap loop (35).

(52) Using scraper, remove foam sheet (36) from between two clips (38).

(53) Remove two rivets (37) and two clips (38) from cabinet (43).

14-16. CABINET REPAIR - cont.

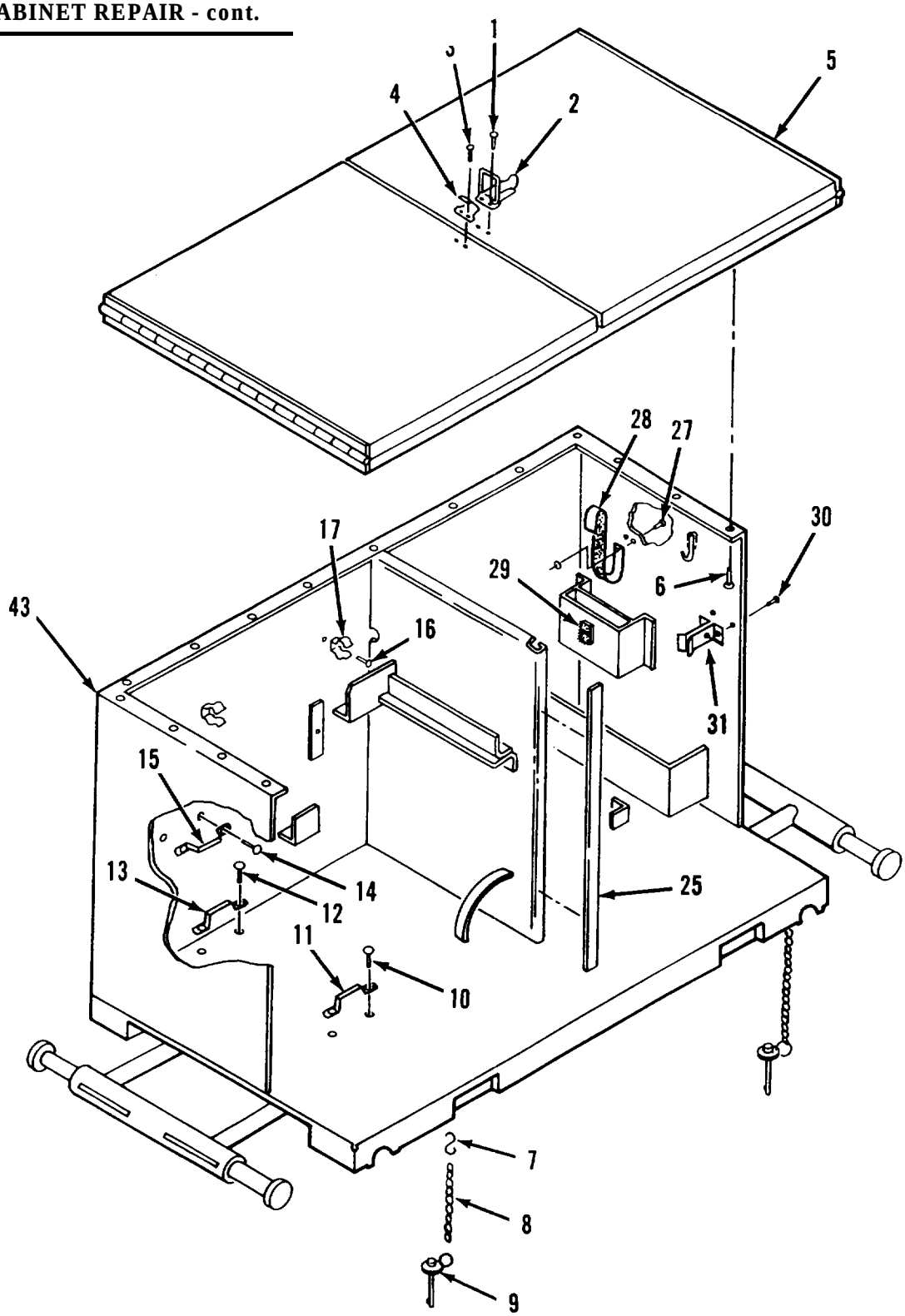


Figure 4-13. Cabinet Disassembly (Sheet 1 of 2).

4-16. CABINET REPAIR - cont.

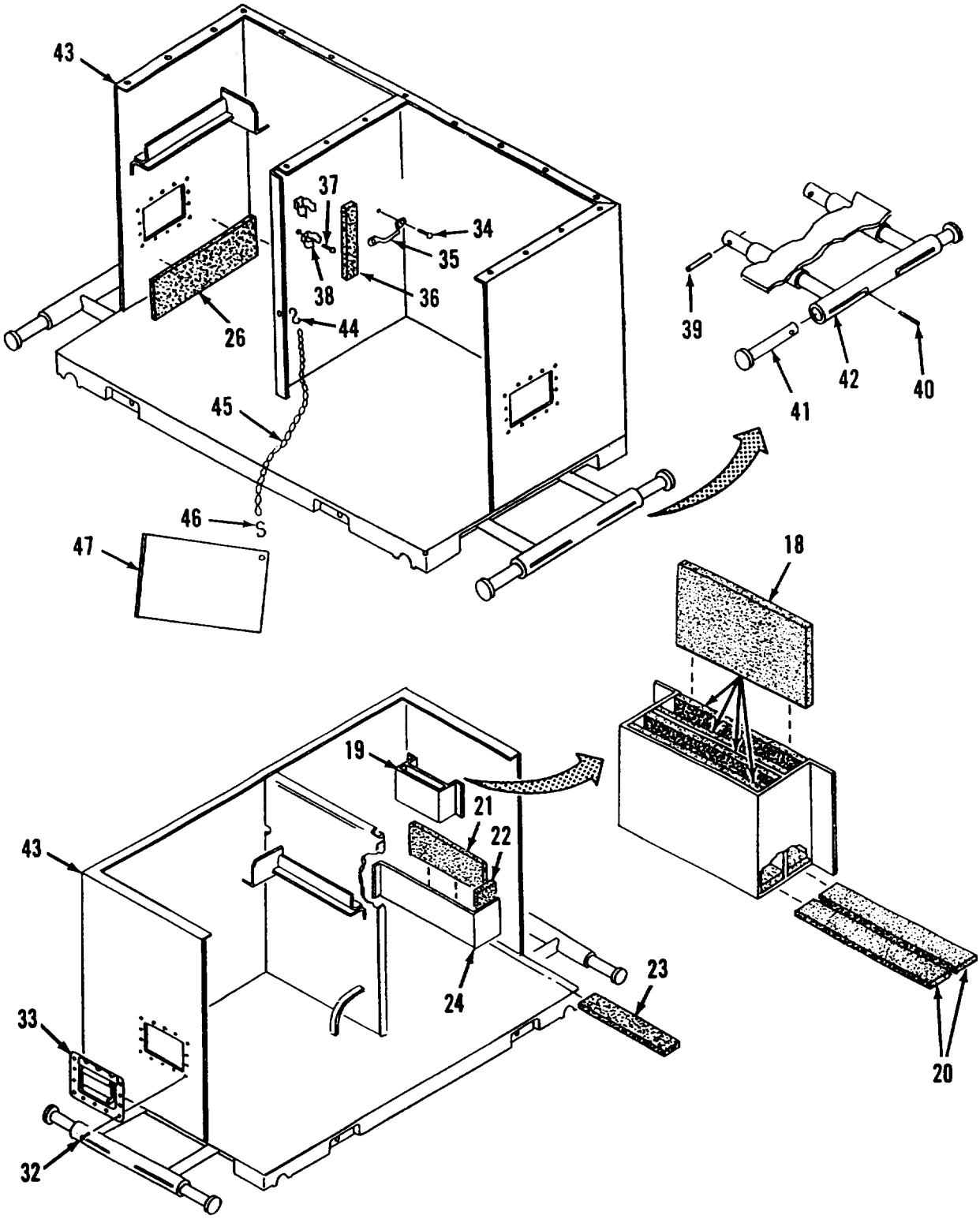


Figure 4-13. Cabinet Disassembly (Sheet 2 of 2).

4-16. CABINET REPAIR - cont.

(54) Remove two spring pins (40) from handle extensions (41).

(55) Remove two handle extensions (41) from handle (42).

(56) Remove two spring pins (39) from handle (42).

(57) Remove handle (42) from cabinet (43).

(58) Repeat steps (53) through (56) for handle on other side of cabinet (43).

b. Cleaning.

(1) Scrape off all foam and adhesive residue from cabinet.

(2) Using wiping rag, remove oil, fuel and dirt deposits from components.

c. Inspection. Refer to figure 4-13.

(1) Inspect cabinet (43) for cracks, broken welds, corrosion and badly bent or crushed components.

(2) Inspect work top (5) for cracks, broken welds, corrosion and badly bent or crushed components.

(3) Inspect handles (42) for bent, cracked or corroded tubing,

(4) Inspect handle extensions (41) for bent, cracked or corroded tubing and enlarged spring pin holes.

d. Repair. Replace all damaged or defective components. Refer cabinet to direct support maintenance for cracked or broken welds.

e. Assembly.

NOTE

Ensure that all parts identified as mandatory replacement parts are discarded and replaced with new components.

CABINET. Refer to figure 4-14.

(1) Position handle (42) in mounts on bottom of cabinet (43). Make sure slots in handle are positioned as shown.

(2) Using hammer, drive two spring pins (39) into handle (42).

(3) Position handle extensions (41) in handle (42).

(4) Using hammer, tap spring pins (40) into handle extensions (41) through slots in handle (42). Pins will extend out past handle when fully installed.

4-16. CABINET REPAIR - cont.

(5) Repeat steps (1) through (4) for handle on other side of cabinet (43).

CABINET. Refer to figure 4-14.

(6) Install two clips (38) on cabinet (43) with two rivets (37).

(7) Apply adhesive to back of foam sheet (36). Position foam sheet between two clips (38) and press in place.

(8) Install strap loop (35) on cabinet (43) with two rivets (34).

(9) Position handle (33) on cabinet (43). Make sure handle is right-side-up, as shown.

(10) Install handle (33) on cabinet (43) with 14 rivets (32).

(11) Repeat steps (9) and (10) for handle on other side of cabinet (43).

(12) Install clip (31) on cabinet (43) with two rivets (30).

(13) Apply adhesive to back of pile strip (29). Position pile strip on pan (19) and press in place.

(14) Install strap (28) on cabinet (43) with two rivets (27).

(15) Apply adhesive to back of foam sheet (26). Position foam sheet on side of cabinet (43) and press in place.

(16) Apply adhesive to back of foam sheet (25). Position foam sheet on front of cabinet (43) and press in place.

(17) Apply adhesive to foam sheet (23). Position foam sheet under pan (24) and press in place.

(18) Apply adhesive to foam sheets (21 and 22). Position foam sheets in pan (24) and press in place.

(19) Apply adhesive to four foam sheets (18) and foam sheet (20). Position foam sheets (18) on pan (19) and press in place.

(20) Install two clips (17) on cabinet (43) with two rivets (16).

(21) Install strap loop (15) on cabinet (43) with two rivets (14).

4-16. CABINET REPAIR - cont.

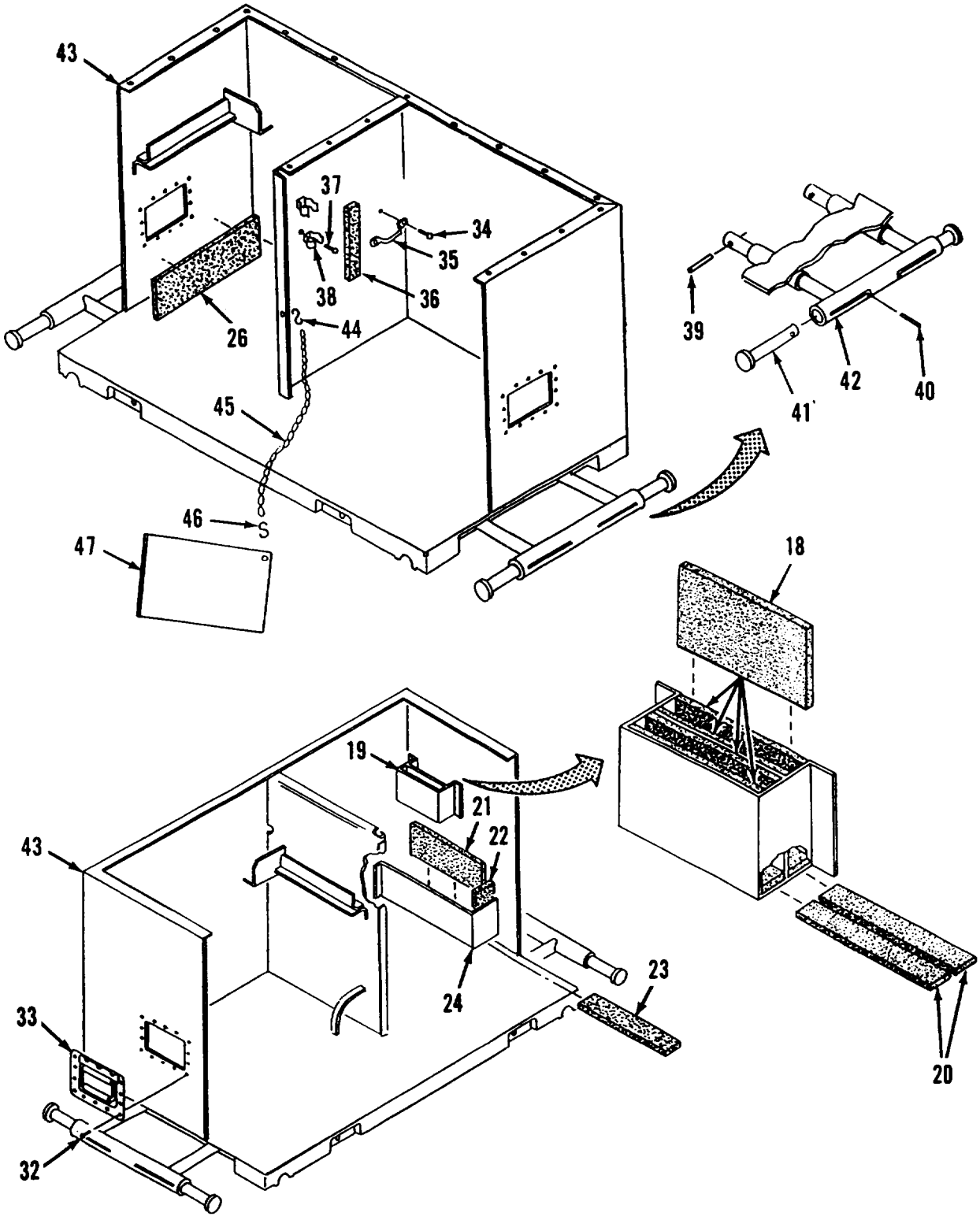


Figure 4-14. Cabinet Assembly Sheet 2 of 2).

4-16. CABINET REPAIR - cont.

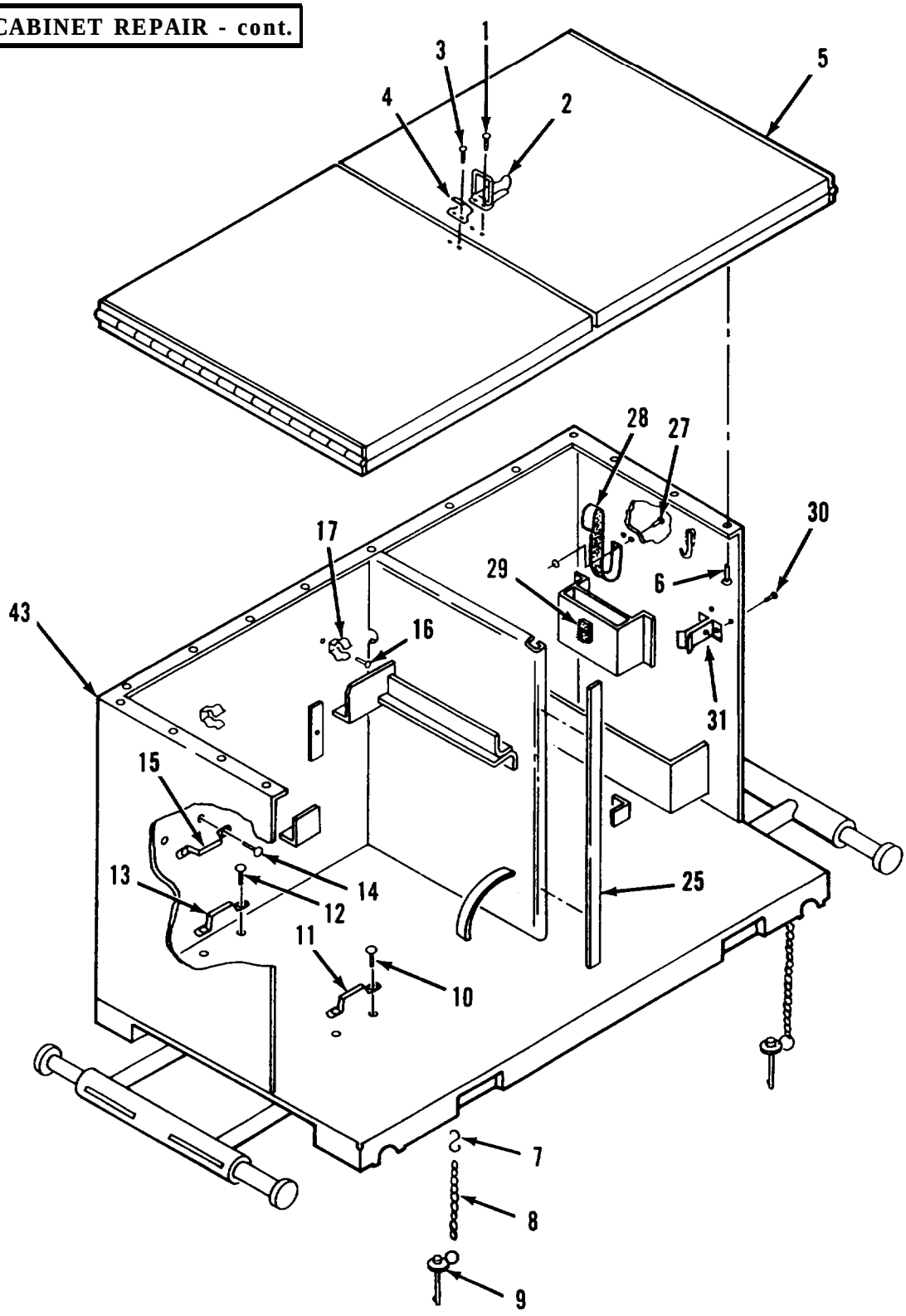


Figure 4-14. Cabinet Assembly (Sheet 2 of 2).

4-16. CABINET REPAIR - cont.

(22) Install strap loop (13) on cabinet (43) with two rivets (12).

(23) Install strap loop (11) on cabinet (43) with two rivets (10).

(24) Connect chains (8) to quick release pins (9) with chain hooks (7).

(25) Connect chains (8) to base of cabinet (43) with chain hooks (7).

(26) Position top (5) on cabinet (43) and aline rivet holes. Install 22 rivets (6) to secure top to cabinet (43).

(27) Install strike (4) on top (5) with two rivets (3).

(28) Install clasp (2) on top (5) with two rivets (1).

LEFT CABINET DOOR. Refer to figure 4-15.

(29) Position handle (21) on cabinet door (22) as shown. Aline rivet holes.

(30) Install handle (21) on cabinet (43) with ten rivets (20).

(31) Apply adhesive to back of foam (19). Position foam on cabinet door (22) and press in place.

(32) Apply adhesive to left, right and rear edges of divider (18). Position divider in cabinet door (22).

(33) Using No. 42 (3/32) drill bit, drill two pilot holes in divider (18) using holes in cabinet door as a template. Install two screws (17) through cabinet door (22) and into divider.

(34) Apply adhesive to back of foam (16), Position foam on cabinet door (22) and press in place,

(35) Apply adhesive to back of foam sheets (13 and 14). Position foam sheets on divider (15) and press in place.

(36) Apply adhesive to back of foam (11). Position foam on panel (12) and press in place.

(37) Connect chain hooks (8 and 9) to chain (10).

(38) Connect chain hook (8) to panel (12) and chain hook (9) to cabinet door (22).

(39) Position latch (7) in panel (12). Install nut (6) on latch until handtight.

(40) Rotate latch (7) until arrow on latch knob is pointing toward top of panel (12), then tighten nut (6).

(41) Install nut (5) and starwasher (4) on stem of latch (7).

4-16. CABINET REPAIR - cont.

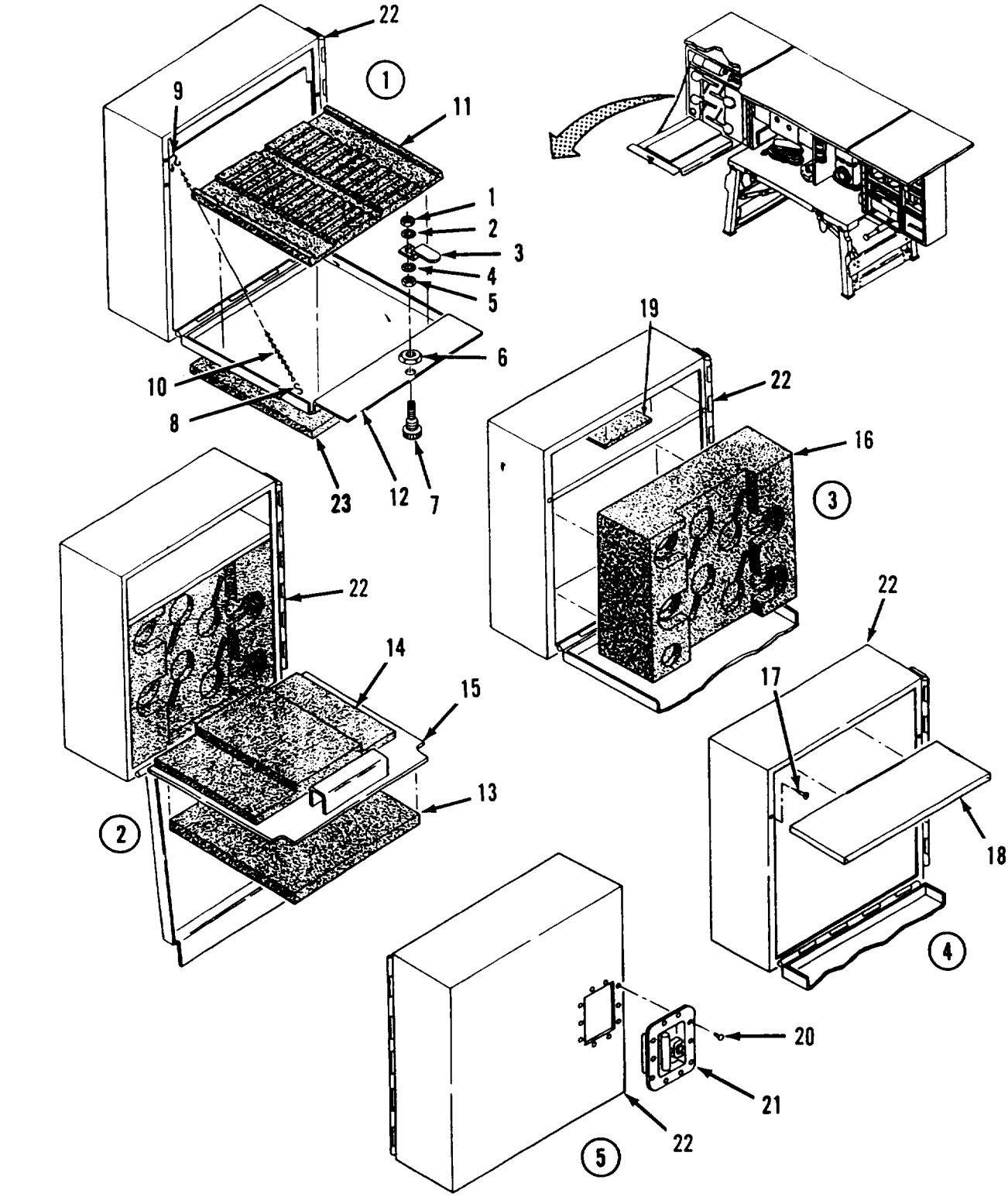


Figure 4-15. Left Cabinet Door Assembly.

4-16. CABINET REPAIR - cont.

(42) Place catch (3) on stem of latch (7). Catch must be point in the same direction as the arrow on latch (7).

(43) Install starwasher (2) and nut (1) on stem of latch (7).

(44) Close panel (12).

Right Cabinet Door Dividers and Lock. Refer to figure 4-16.

(45) Install nameplate (20) on cabinet door (21) with four rivets (19).

(46) Turn handle on lock plate (13) to the right and place lock plate on front of cabinet door (21). Make sure lock plate is positioned with handle as shown.

(47) Slide support guides (15) over ends of rods (16 and 17).

(48) Connect rods (16 and 17) to back of lock plate (13) as shown.

(49) Turn handle and lock plate (13) as required so that retaining plate (18) secures rods (16 and 17) in place and rods extend through holes in top and bottom of cabinet door (21).

(50) Aline lower support guide (15) with mounting holes in cabinet door (21). Secure guide to cabinet with two rivets (14). Repeat for upper support guide.

(51) Aline rivet holes in lock plate (13) with rivet holes in cabinet door (21). Install lock plate (13) on cabinet door (21) with ten rivets (12).

(52) If removed, apply adhesive to bottom of wooden supports (10 and 11). Position supports on divider (9) and press in place.

(53) Apply adhesive to bottom of divider (9). Position divider in cabinet door (21).

(54) Apply adhesive to to backs of dividers (7 and 8). Position divider in cabinet door (21).

(55) Apply adhesive to left, right and rear edges of divider (6). Position divider in cabinet door (21) and press in place on top of dividers (7 and 8).

(56) Apply adhesive to top, bottom and rear edges of divider (5). Position divider (5) in cabinet door (21).

4-16. CABINET REPAIR - cont.

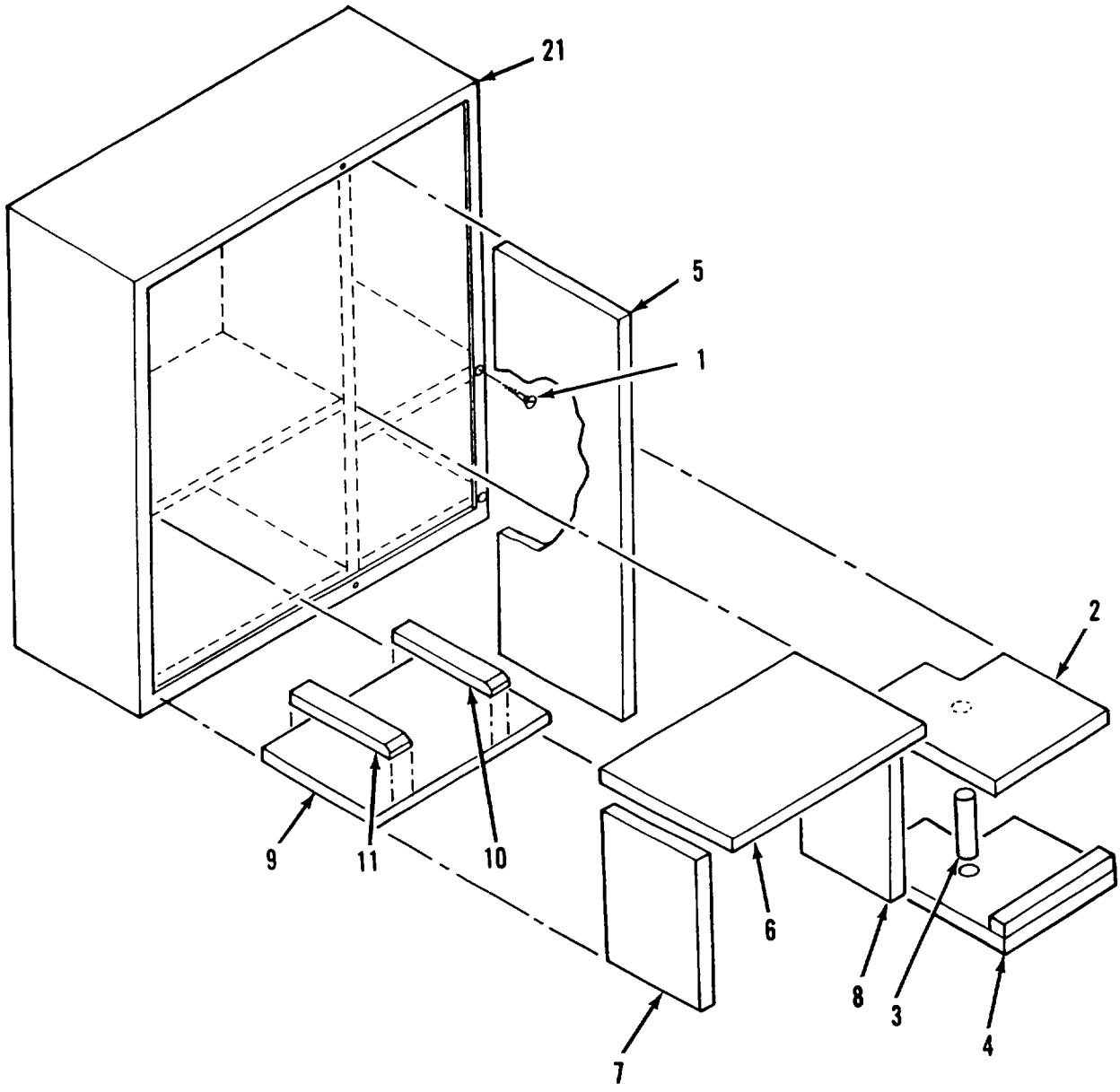


Figure 4-16. Right Cabinet Door Divider and Lock Installation (Sheet 1 of 2).

4-16. CABINET REPAIR - cont.

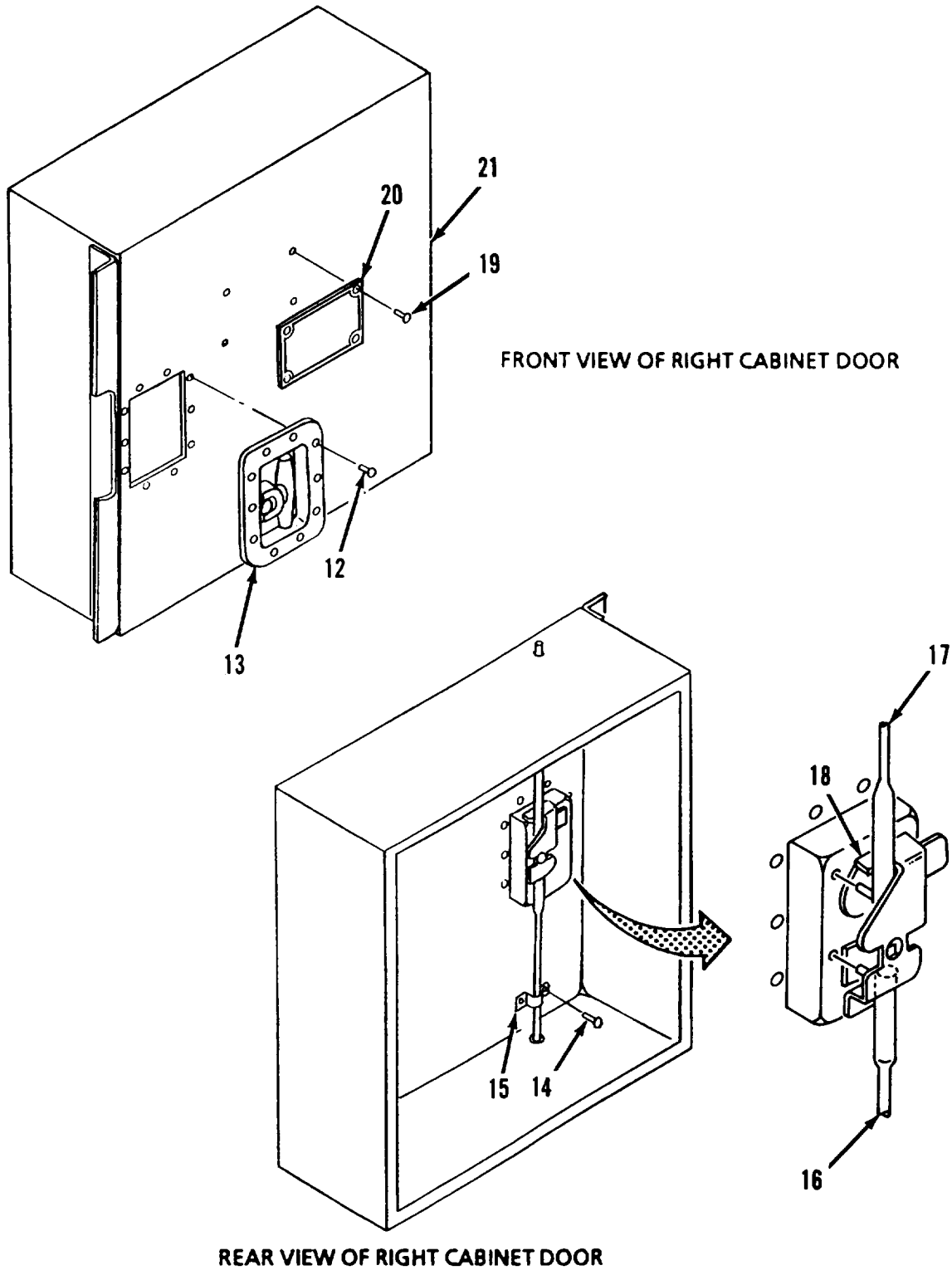


Figure 4-16. Right Cabinet Door Divider and Lock Installation (Sheet 2 of 2).

4-16. CABINET REPAIR - cont.

(57) Apply adhesive to bottom of divider (4). Position divider (4) in cabinet door (21). Make sure cut-out in divider is positioned as shown,

(58) Apply adhesive to left, right and rear edges of divider (2).

(59) Apply adhesive to both ends of pipe support (3). Position pipe support on divider (4).

(60) Position divider (2) in cabinet door (21) and press divider onto pipe support (3). Make sure cutout in divider is positioned as shown.

(61) Using No. 42 (3/32) drill bit, drill pilot holes into dividers (2 and 5) using holes in cabinet door (21) as a template.

(62) Install four screws (1) in cabinet door (21).

RIGHT CABINET DOOR.

Cabinet Retainers and Foam. Refer to figure 4-17.

(63) Apply adhesive to back of foam block (11). Position foam block in cabinet door (12) and press in place.

(64) Apply adhesive to foam sheet (10). Position foam sheet in cabinet door (12) and press in place.

(65) Apply adhesive to foam block (9). Position foam block in cabinet door (12) and press in place.

(66) Position door (8) on cabinet door (12). Using No. 42 (3/32) drill bit, drill pilot holes into cabinet door (12) using hinge on door (8) as a template. Secure door (8) in place with three screws (7).

(67) Position retainer (6) on cabinet door (12). Using No. 42 (3/32) drill bit, drill pilot holes into cabinet door using hinge on retainer as a template. Secure retainer in place with two screws (5).

(68) Position retainer (4) on cabinet door (12). Using No. 42 (3/32) drill bit, drill pilot holes into cabinet door using hinge on retainer as a template. Secure retainer in place with two screws (3).

(69) Position retainer (2) on cabinet door (12). Using No. 42 (3/32) drill bit, drill pilot holes into cabinet door using hinge on retainer as a template. Secure retainer in place with two screws (1).

f. Adjustment. Refer to figure 4-15.

(a) If panel (12) will not latch on cabinet door (21) (panel too tight), adjust two nuts (1 and 5) to move catch (3) upon stem of latch (7), then tighten two nuts.

4-16. CABINET REPAIR - cont.

(b) If panel (12) will latch, but is too loose, adjust two nuts (1 and 5) to move catch down on stem of latch (7), then tighten two nuts.

(c) Repeat steps (a) and (b) until panel (12) is held securely in place when closed.

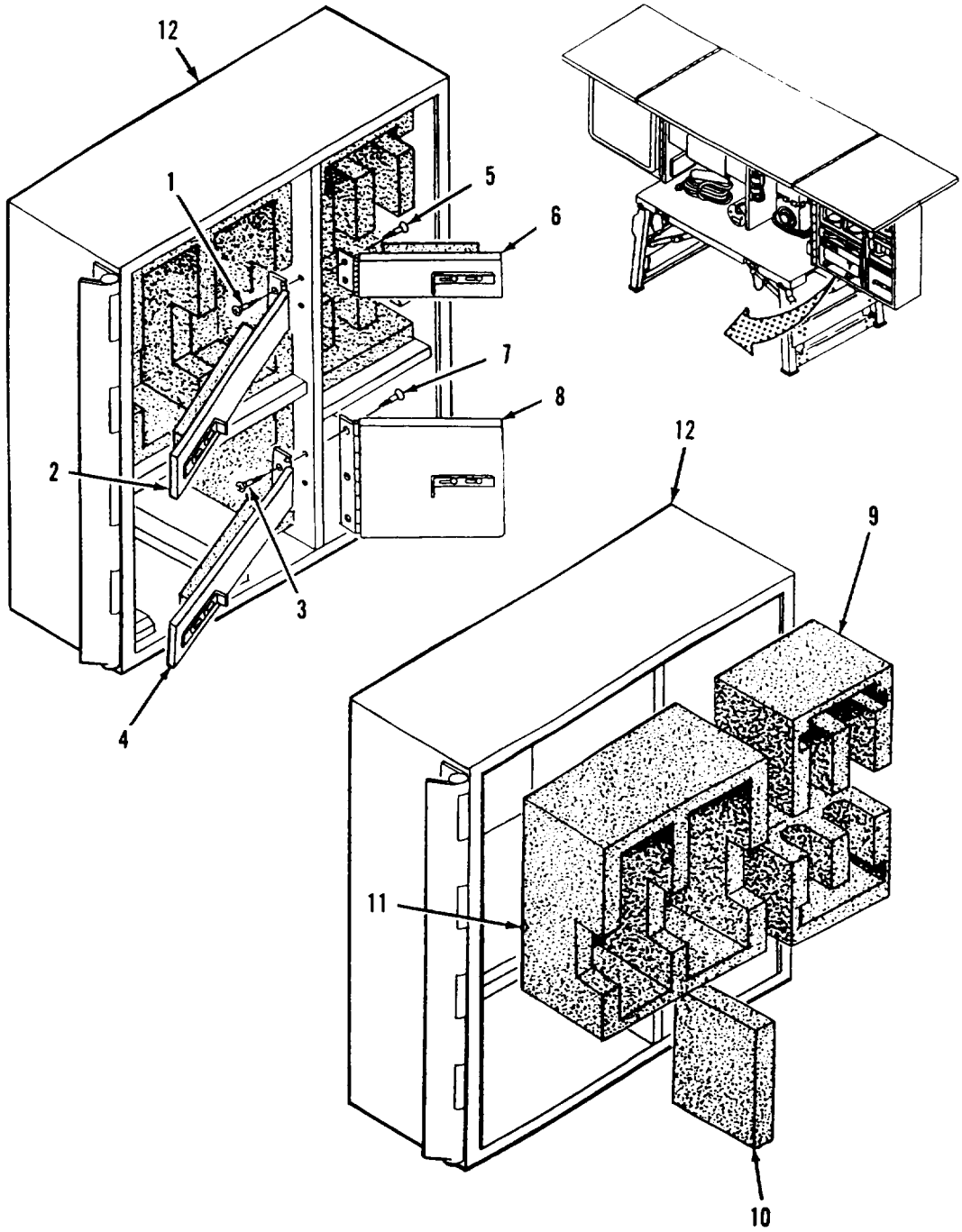


Figure Figure 4-17. Right Cabinet Door Retainer and Foam Installation

Section VI. PREPARATION FOR STORAGE OR SHIPMENT

4-17. SECURITY PROCEDURES.

Refer to AR 190-11 or AR 190-13.

4-18. 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 test kit away from corrosive materials, such as saltwater spray.

CHAPTER 5

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

DIRECT SUPPORT MAINTENANCE PROCEDURES

5-1. INTRODUCTION.

This Chapter contains instructions for performing Direct Support level maintenance on the Ground Fuels Petroleum Test Kit.

5-2. CABINET ASSEMBLY REPAIR.

This task consists of: Repair

INITIAL SET-UP:	
Tools: Welding Shop (Appendix B, Sec. III, Item 3)	References TM 9-237 Welding Theory and Application TM 43-0139 Painting Instructions for Army Materiel

Repair.

a. Straighten and weld cabinet walls, base, and sides as required in accordance with TM 9-237.

b. Paint cabinet in accordance with TM 43-0139.

APPENDIX A

REFERENCES

A-1. SCOPE.

This appendix lists all forms, field manuals, technical manuals, and miscellaneous publications referenced in this manual.

A-2. FORMS.

Equipment Control Record . . . . . DA Form 2408-9
Equipment Inspection and Maintenance Worksheet . . . . . DA Form 2404
Quality Deficiency Report . . . . . SF 368
Recommended Changes to DA Publications . . . . . DA Form 2028-2
Recommended Changes to Publications and Blank Forms . . . . . DA Form 2028
Report of Discrepancy . . . . . SF 364

A-3. FIELD MANUALS.

First Aid for Soldiers . . . . . FM 21-11
Inspecting and Testing Petroleum Products . . . . . FM 10-70
NBC Contamination Avoidance . . . . . FM 3-3
NBC Decontamination . . . . . FM 3-5
NBC Protection . . . . . FM 3-4
Petroleum Surveillance: Laboratories and Kits . . . . . FM 10-72

A-4. MISCELLANEOUS.

Consolidated Index of Army Publications and Blank Forms . . . . . DA PAM 25-30
Destructionof Army Materiel to Prevent Enemy Use . . . . . TM 750-244-3
Painting Instructions for Army Materiel . . . . . TM 43-0139
Procedures and Methods for Gaging Petroleum and Petroleum Products . . . ASTMD 1085
Procedures and Methods for Measuring Temperature of Petroleum and Petroleum Products . . . . . ASTM D 1086
Test Methods for Detecting Free Water and Particulate Contaminants in Fuel . ASTM D 4176
Test Methods for Distillation of Petroleum Products . . . . . ASTM D 86
Test Methods for Flash Point Testing Of Fuels . . . . . ASTM D 93
Test Methods for Performing API Gravity Testing Of Fuels . . . . . ASTM D 287
The Army Maintenance Management System (TAMMS) . . . . . DA PAM 738-750
Welding Theory and Application . . . . . TM 9-237

APPENDIX B
MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B-1. GENERAL.

a. This section provides a general explanation of all maintenance and repair functions 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 lean (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 a 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 (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 oft he 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 system designations for the various maintenance levels are shown on the following page.

C ..... Operator or crew
0 ..... 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 111.

a. Column 1, Reference Code. The tool and test equipment reference code correlates with a code used in the MAC, Section H, 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 H

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					(5) TOOLS & EQUIP.	(6) RE-MARKS
			UNIT		DS	GS	DEP		
			C	O	F	H	D		
00	GROUND FUELS PETROLEUM TEST KIT	INSPECT	0.5						
		REPLACE	0.2	1.0					
		REPAIR		2.5	1.5				
01	FLASH POINT TESTER	INSPECT	0.1						
		REPLACE	0.2						
		REPAIR		0.5				1	A, B
02	DISTILLATION UNIT	INSPECT	0.1						
		REPLACE	0.2						
		REPAIR		0.5				1	B, C
03	LEG SUPPORT	INSPECT	0.1						
		REPLACE		0.5					
		REPAIR		0.5				1	
04	CABINET	INSPECT	0.1						
		REPLACE		0.5					
		REPAIR		1.0	1.5			1,2,3,4	D
		ADJUST		0.2					

Section III. TOOLS AND TEST EQUIPMENT REQUIREMENTS

(1) REFERENCE CODE	(2) MAINTENANCE CATEGORY	(3) NOMENCLATURE	(4) NATIONAL STOCK NUMBER (NSN)	(5) TOOL NUMBER
1	0	Tool Kit, General Mechanics	5180-00-177-7033	SC 5180-90-CL-N26
2	0	Riveter, Blind, Hand (32048) 200-GK	5120-01-289-4310	
3	0	Shop Equipment, Automotive, Organizational Common No.1 Less Power	4910-00754-0654	SC 4910-95-CL-A74
4	F	Welding Shop, Trailer Mounted	3431-01-090-1231	SC3431-95-CL-A04

Section IV. REMARKS

REFERENCE CODE	REMARKS
A	Refer to TM10-6630-231-13&P to repair Flash Point Tester
B	Repair limited to replacement of heater element.
C	Refer to TM 10-6630-219-13&P to repair Distillation Unit
D	DS level repair limited to straightening and welding of cabinet frame.

APPENDIX C

UNIT AND DIRECT SUPPORT MAINTENANCE
REPAIR PARTS AND SPECIAL TOOLS LIST

Section I. INTRODUCTION

C-1. **SCOPE**. This RPSTL lists and authorizes spares and repair parts; special tools; special test, measurement, and diagnostic equipment (TMDE); and other special support equipment required for performance of unit, direct support and general support maintenance of the Ground Fuels Petroleum Test Kit, Model PTK-200. It authorizes the requisitioning, issue, and disposition of spares, repair parts and special tools as indicated by the source, maintenance and recoverability (SMR) codes.

C-2. **GENERAL**.. In addition to this section, Introduction, this Repair Parts and Special Tools List is divided into the following sections:

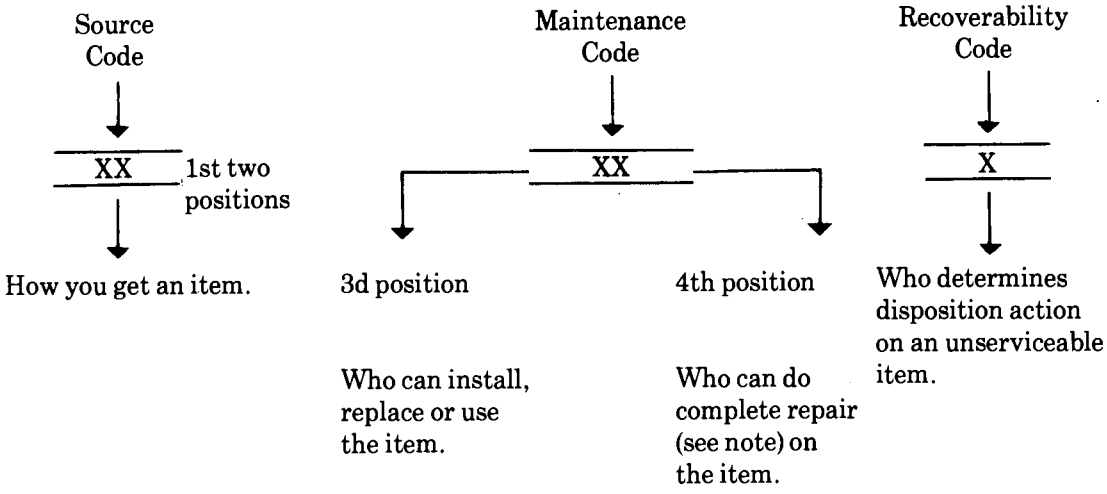
a. **Section II. Repair Parts List**. A list of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. This list also includes parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in ascending alphanumeric sequence, with the parts in each group listed in ascending figure and item number sequence. Bulk materials are listed in item name sequence. Items are shown in the associated illustration(s)/figure(s).

b. **Section III. Special Tools List**. A list of special tools, special TMDE, and other special support equipment authorized by this RPSTL (as indicated by Basis of Issue (BOI) information in DESCRIPTION AND USABLE ON CODE column) for the performance of maintenance.

c. **Section IV. Cross-Reference Index.** A list, in National Item Identification Number (NIIN) sequence, of all National stock numbered items appearing in the listing, followed by a list in alphanumeric sequence of all part numbers appearing in the listings. National stock numbers and part numbers are cross referenced to each illustration figure and item number appearance C-3. EXPLANATION OF COI UMNS (SFCTIONS II AND III).

a. **ITEM NO. (Column (1)).** Indicates the number used to identify items called out in the illustration.

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



• Complete Repair: Maintenance capacity, capability, and authority to perform all corrective maintenance tasks of the "Repair" function in a use/user environment in order to restore serviceability to a failed item.

(1) **Source Code**. The source code tells you how to get an item needed for maintenance, repair, or overhaul of an end item/equipment. Explanations of source codes follows:

Source Code	Explanation
PA PB PC PD PE PF PG	Stocked items; use the applicable NSN to request/requisition items with these source codes. hey are authorized to the category indicated by the code entered in the 3rd position of the SMR code. **NOTE: Items coded PC are subject to deterioration.
KD KF KB	Items with these codes are not to be requested/requisitioned individually. They are part of a kit which is authorized to the maintenance category indicated in the 3rd position of the SMR The complete kit must be requisitioned and applied.
MO—Made at org/AVUM category MF—Made at DS/AVUM category MH—Made at GS category ML—Made at Specialized Repair Activity (SRA) MD—Made at Depot	Items with these codes are not to be requested/requisitioned individually. They must be made from bulk material which is identified by the part number in the DESCRIPTION and USABLE ON CODE (UOC) column and listed in the Bulk Material group of the repair parts list in this RPSTL. If the item is authorized to you by the 3rd position code of the SMR code, but the source code indicates it is made at a higher level, order the item from the higher level of maintenance.
AO—Assembled by org/AVUM category AF—Assembled by DS/AVUM category AH—Assembled by GS category AL—Assembled by SRA AD—Assembled by Depot	Items with these codes are not to be requested/requisitioned individually. The parts that make up the assembled item must be requisitioned or fabricated and assembled at the level of maintenance indicated by the source code. If the3rd position code of the SMR code authorizes you to replace the item, but the source code indicates the items are assembled at a higher level, order the item from the higher level of maintenance.
XA	Do not requisition "XA"-coded item. Order its next higher assembly. (Refer to the NOTE below.)
XB	If an 'XB" item is not available from salvage, order it using the CAGEC and part number given.
XC	Installation drawing, diagram, instruction sheet, field service drawing, that is identified manufacturer's part number.
XD	Item is not stocked. Order an "XD"-coded item through normal supply channels using the CAGEC and part number given, if no NSN is available.

NOTE

Cannibalization or controlled exchange, when authorized, may be used as a source of supply for items with the above source codes, except for those source coded 'XA" or those aircraft support items restricted by requirements of AR 750-1.

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

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

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

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

NOTE

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

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

(3) Recoverability Code. Recoverability codes are assigned to items to indicate the disposition action on unserviceable items. The recoverability code is entered in the fifth position of the SMR Code as follows:

Recoverability Codes		Application/Explanation
Z	-	Nonreparable item. When unserviceable, condemn and dispose of the item at the level of maintenance shown in 3d position of SMR Code.
O	-	Reparable item. When not economically reparable, condemn and dispose of the item at unit or AVUM level.
F	-	Reparable item. When uneconomically reparable, condemn and dispose of the item at the direct support or AVIM level.
H	-	Reparable item. When uneconomically reparable, condemn and dispose of the item at the general support level.
D	-	Reparable item. When beyond lower level repair capability, return to depot. Condemnation and disposal of item not authorized below depot level.

Recoverability Codes		Application/Explanation
L	-	Reparable item. Condemnation and disposal not authorized below specialized repair activity (SRA).
A	-	Item requires special handling or condemnation procedures because of specific reasons (e.g., precious metal content, high dollar value, critical material, or hazardous material). Refer to appropriate manuals/directives for specific instructions.

c. **NSN (Column (3))**. National Stock Number.

d. **CAGEC (Column (4))**. The Commercial and Government Entity Code (CAGEC) is a 5-digit numeric code which is used to identify the manufacturer, distributor, or Government agency/activity that supplies the item.

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

NOTE

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

f. **DESCRIPTION AND USABLE ON CODE (UOC) (Column (6).** This column includes the following information:

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

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

(3) The statement "END OF FIGURE" appears just below the last item description in Column (5) for a given figure in both Section II and Section III.

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

C-4. EXPLANATION OF INDEX FORMAT AND COLUMNS (SECTION IV).

a. **NATIONAL STOCK NUMBER (NSN) INDEX**.

(1) **STOCK NUMBFR Column**. This column lists the NSN in national item identification number (NIIN) sequence. The NIIN consists of the last nine digits of the NSN, i.e.

NSN
5305-01-574-1467
NIIN

When using this column to locate an item, ignore the first four digits of the NSN. Use the complete NSN (13 digits) when requisitioning items by stock number.

(2) **FIG. Column**. This column lists the number of the figure where the item is identified/located. The figures are in numerical order in Section II and Section III.

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

b. **PART NUMBER INDEX**. Part numbers in this index are listed by part number in ascending alphanumeric sequence (i e., vertical arrangement of letter and number combination which places the first letter or digit of each group in order A through Z, followed by the numbers 0 through 9, and each following letter or digit in like order).

(1) **CAGEC Column**. The Commercial and Government Entity Code (CAGEC) is a 5-digit numeric code used to identify the manufacturer, distributor, or Government agency/activity that supplies the item.

(2) **PART NUMBER Column**. Indicates the primary number used by the manufacturer (individual, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

(3) **STOCK NUMBFR Column**. This column lists the NSN for the associated part number and manufacturer identified in the PART NUMBER and CAGEC columns to the left.

(4) **FIG. Column**. This column lists the number of the figure where the item is identified/located in Section II and Section III.

(5) **ITEM Column**. The item number is that number assigned to the item as it appears in the figure referenced in adjacent figure number column.

C-5. SPECIAL INFORMATION.

a. **USABLE ON CODE**. The usable on code appears in the lower left comer of the Description Column heading. Usable on codes are shown as "UOC:" in the Description Column (justified left) on the last line of the applicable item description/nomenclature. Uncoded items are applicable to all models. Identification of the usable on codes used in this RPSTL are:

Code	Used On
FHN	Model PTK-200

b. **FARRICATION INSTRUCTIONS**. Bulk materials required to manufacture items are listed in the Bulk Material Functional Group of this RPSTL. Part numbers for bulk materials are also referenced in the description column of the line entry for the item to be manufactured/fabricated. Detailed fabrication instructions for items source coded to be manufactured or fabricated are found in Appendix H.

c. **INDEX NUMBERS**. Items which have the word BULK in the figure column will have an index number shown in the item number column. This index number is a cross-reference between the National Stock Number/Part Number Index and the bulk material list in Section II.

d. **ASSOCIATFD PUBLICATIONS**. The publications listed below pertain to the Ground Fuels Petroleum Test Kit, Model PTK-200 and its components.

Publication	Component
TM 10-6630-231-13&P	Rash Point Tester
TM 10-6630-219-13&P	Distillation Unit
TM 5-6115-271-14	Generator Set

C-6. HOW TO LOCATE REPAIR PARTS.

a. **When National Stock Numbers or Part Numbers Are NOT Known.**

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

(2) **Second**. Find the figure covering the assembly group or subassembly group to which the item belongs.

(3) **Third**. Identify the item on the figure. The corresponding item number in the parts listing table will I have the NSN in column 3.

b. **When National Stock Number or Part Number is Known.**

(1) **First** Using the of National Stock Number and Part Number Indexes find the pertinent National Stock Number or Part Number. The NSN index is in National Item Identification Number (NIIN) sequence (see paragraph C-4.a). The part numbers in the Part Number index are listed in ascending alphanumeric sequence. Both indexes cross-reference you to the illustration/figure and item number of the item you are looking for.

(2) **Second**. Turn to the figure and item number, verify that the item is the one you are looking for, then locate the item number in the repair parts list for the figure.

C-7. **ABBREVIATIONS**. Abbreviations used in this manual are listed in MIL-STD-12.

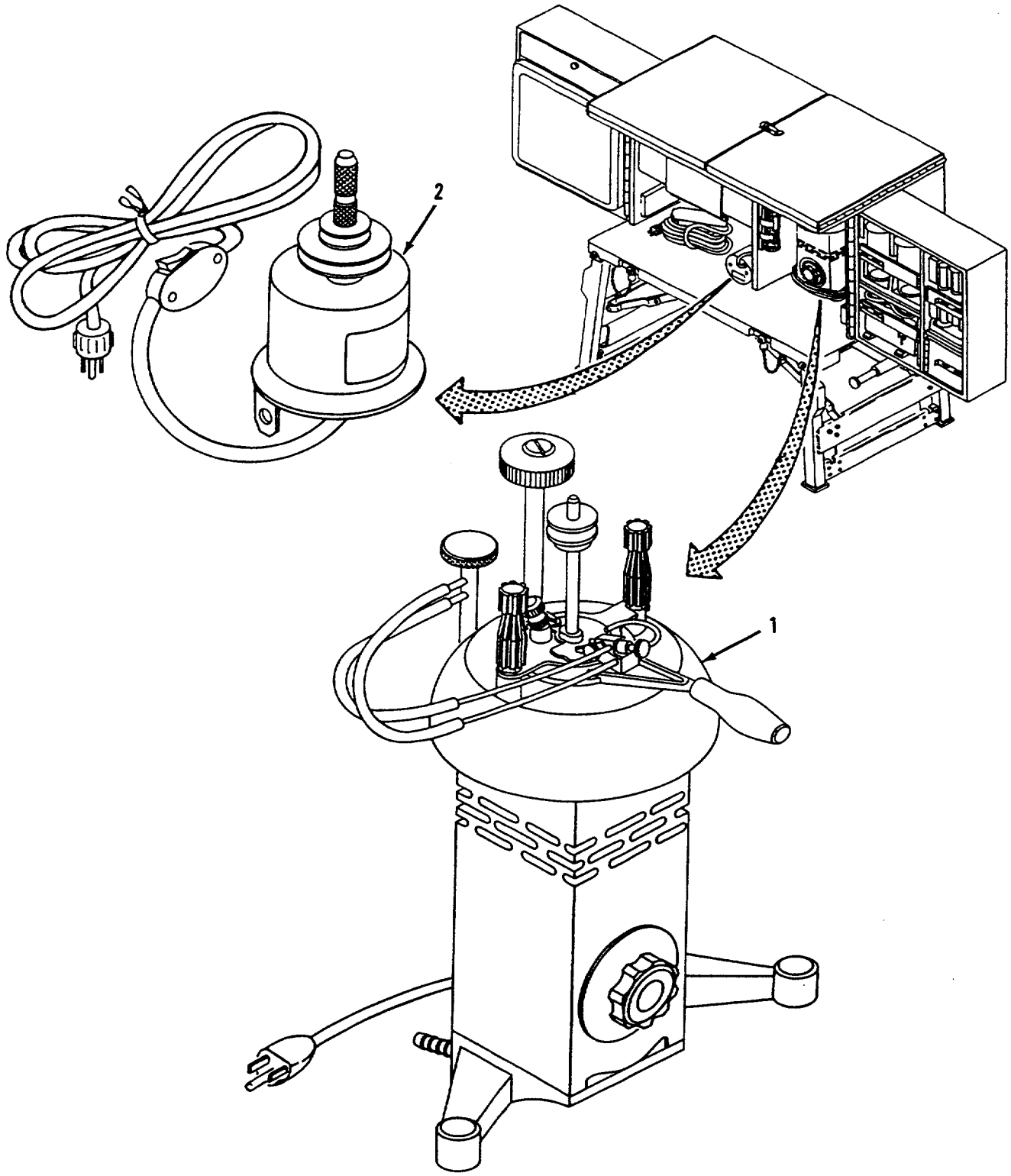


Figure 1. Flash Point Tester.

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP 01 FLASH POINT TESTER	
				FIG.	1 FLASH POINT TESTER	
1	PAOZZ	6630005300987	81348	CID A-A-54509	TESTER, FLASH POINT SEE TM 10-6630-231-13&P	1
2	PAOZZ	6640005315022	48619	75765	STIRRER, ELECTRIC, LA SEE TM 10-6640-224-13 & P	1
					END OF FIGURE	

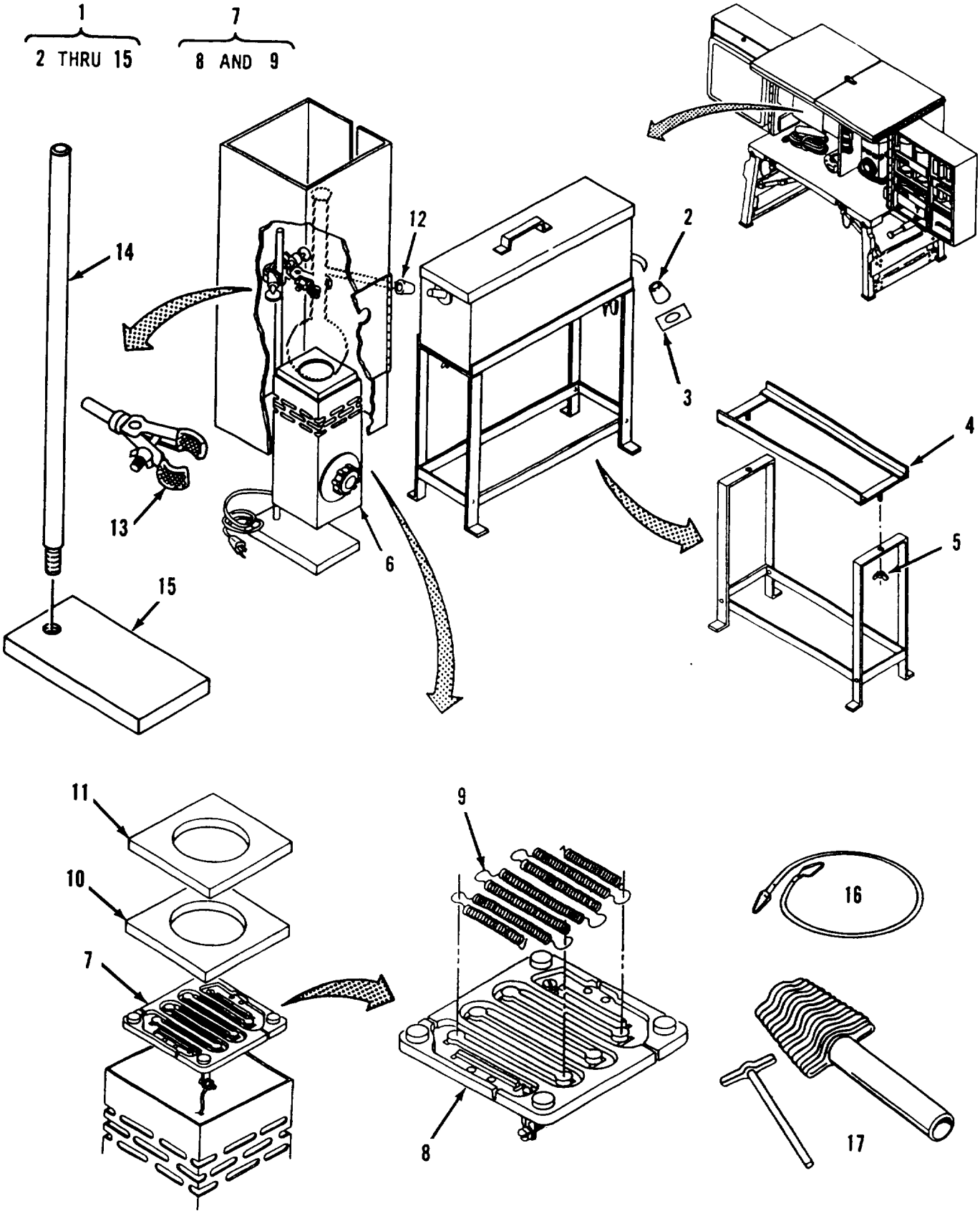


Figure 2. Distillation Unit.

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP 02 DISTILLATION UNIT	
					FIG. 2 DISTILLATION UNIT	
1	PAOOO		97403	13225E8499	DISTILLATION UNIT	1
2	PAOZZ		48619	241172	.ADAPTER, LABORATORY	1
3	PAOZZ	5330014338450	48619	509886	.COVER, GRADUATE CYL	1
4	XBOOO		48619	541143	.FRAME, TOP ASSEMBLY	1
5	PAOZZ		48619	432610	..NUT, BLANK	2
6	PAOZZ	6640009805002	48619	61600	..HEATER, ELECTRIC	1
7	PAOZZ	6640004547497	48619	61856	HEATING ELEMENT, MED 120 VOLT LOWER REFRACTORY	1
8	XDOZZ		48619	61860	...CLAY	1
9	XDOZZ		48619	61876	...ELEMENT, HEATER 120 VOLTS, 750 WATTS	1
10	PAOZZ	6640003599646	48619	61825	.SHIELD, HEAT, DISTILL 1 1/2 IN DIA HOLE	1
11	PAOZZ	6640003599642	48619	61834	.SHIELD.HEAT, DISTILL 2 IN DIA HOLE.	1
12	PCOZZ	8125004097675	11273	12402	.STOPPERS CORK, ASSOR	1
13	XDOZZ		48619	541183	.CLAMP, FLASK	1
14	XDOZZ		48619	541141	.ROD	1
15	XDOZZ		48619	541140	.BASE, STAND	1
16	PAOZZ	6640003599995	48619	76018	SWAB	1
17	PAOZZ	6640002727630	96906	MS36198-2	BORER SET, CORK CONSISTS OF 15 BORERS	1
					END OF FIGURE	

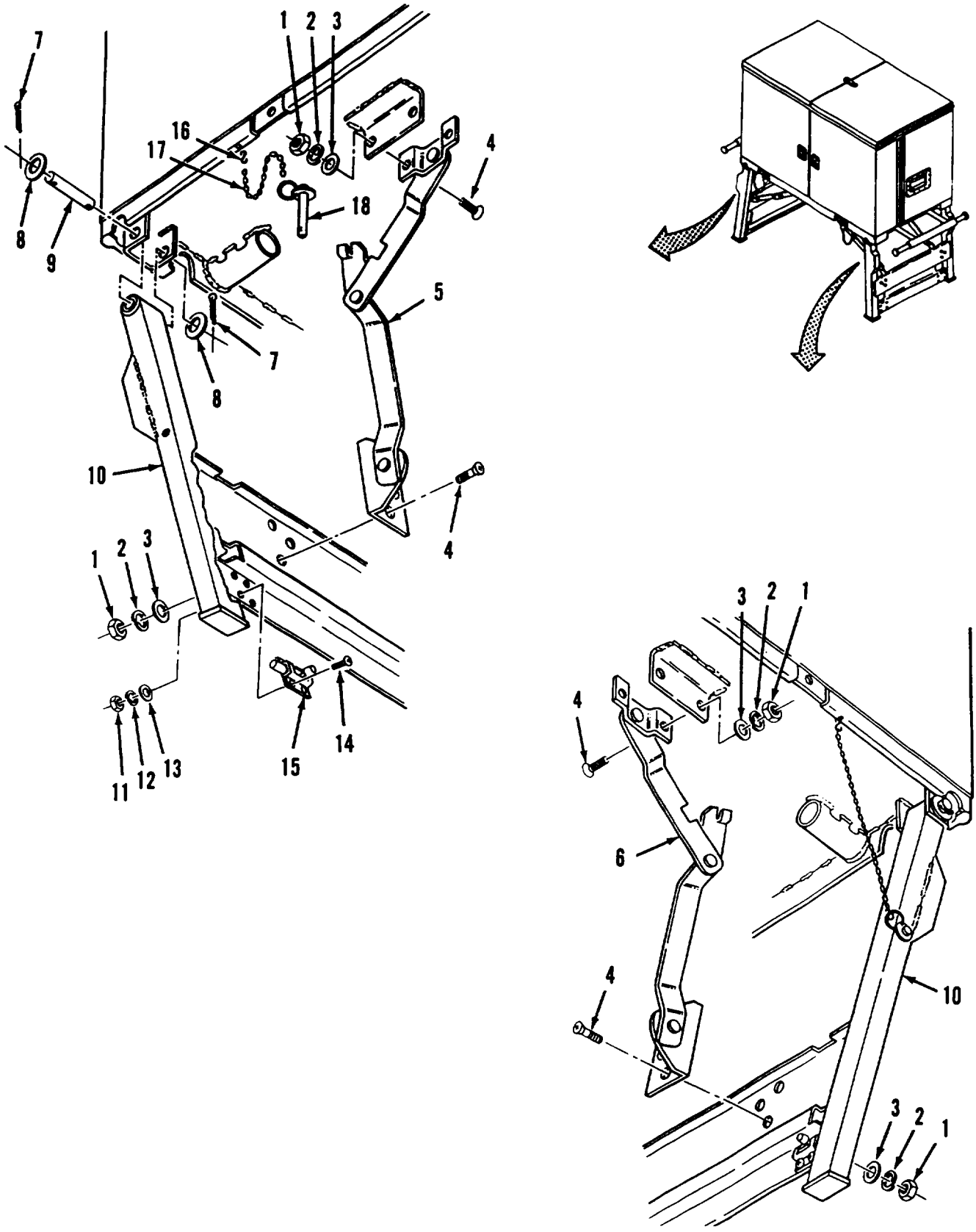


Figure 3. Leg Support.

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP 03 LEG SUPPORT	
					FIG. 03 LEG SUPPORT	
1	PAOZZ	5310009349751	96906	M535650-302	NUT, PLAIN, HEXAGON	20
2	PAOZZ	5310000453296	96906	MS35338-43	WASHER, LOCK	20
3	PAOZZ	5310000145850	96906	MS27183-42	WASHER, FLAT	20
4	PAOZZ	5305009847363	96906	MS35191-272	SCREW, MACHINE	20
5	XBOZZ		57068	446LH	BRACE, LEFT HAND	2
6	XBOZZ		57068	446RH	BRACE, RIGHT HAND	2
7	PAOZZ	5315008423044	96906	MS24665-283	PIN, COTTER	8
8	PAOZZ	5310000806004	96906	MS27183-14	WASHER, FLAT	8
9	XDOZZ		97403	13225E8516	PIN, PIVOT	4
10	XDOOO		97403	13225E8514	LEG, SUPPORT	2
11	PAOZZ	5310009349747	96906	MS35649-262	.NUT, PLAIN, HEXAGON	8
12	PAOZZ	5310000454007	96906	MS35338-41	.WASHER, LOCK	8
13	PAOZZ	5310009838483	96906	MS27183-5	.WASHER, FLAT	8
14	PAOZZ	5305009844988	96906	MS35206-228	.SCREW, MACHINE	8
15	XDOZZ		72968	CD1403-2.5-US2C	.BOLT, BARREL	2
16	PAOZZ	4030002705436	96906	MS87006-3	HOOK, CHAIN, S	2
17	MOOZZ		97403	13218E0025-43	CHAIN, WELDLESS MAKE FROM 81348 RR-C-271 TY2 CL7, CUT TO LENGTH, 6 INCHE.	2
18	PAOZZ	5315009041665	96906	MS17984C413PIN,	QUICK RELEASE	2
					END OF FIGURE	

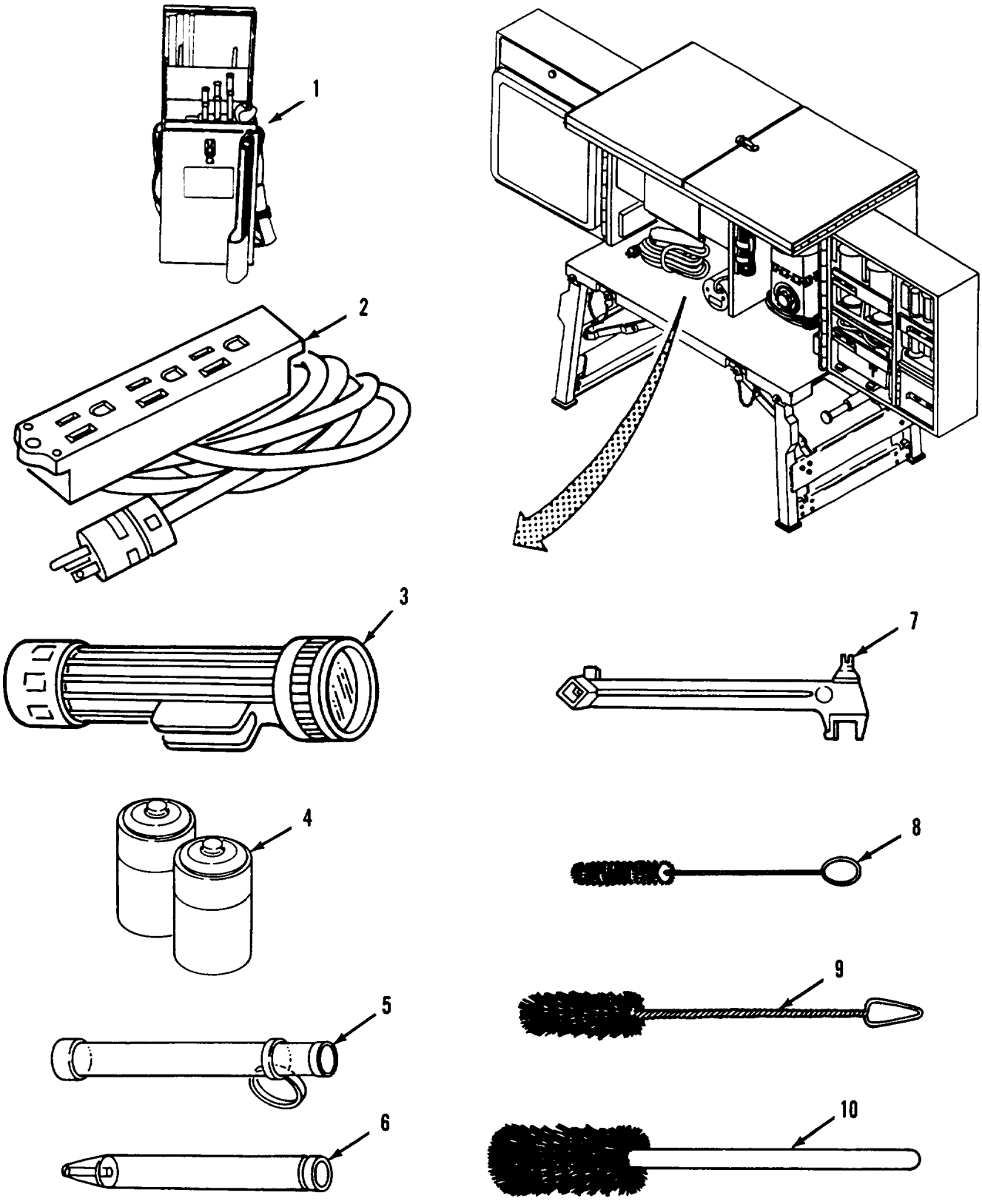


Figure 4. Cabinet (Sheet 1 of 4).

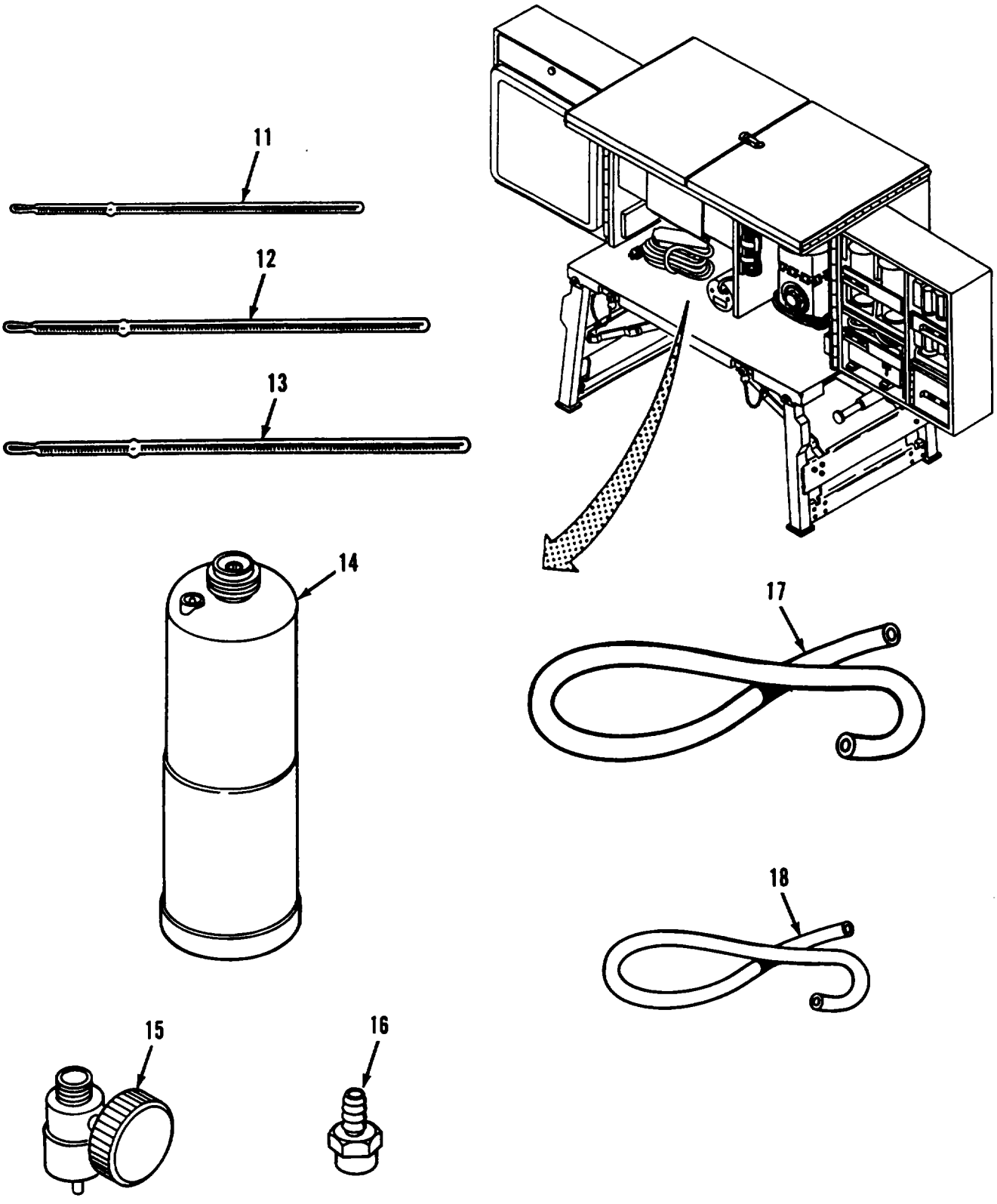


Figure 4. Cabinet (Sheet 2 of 4).

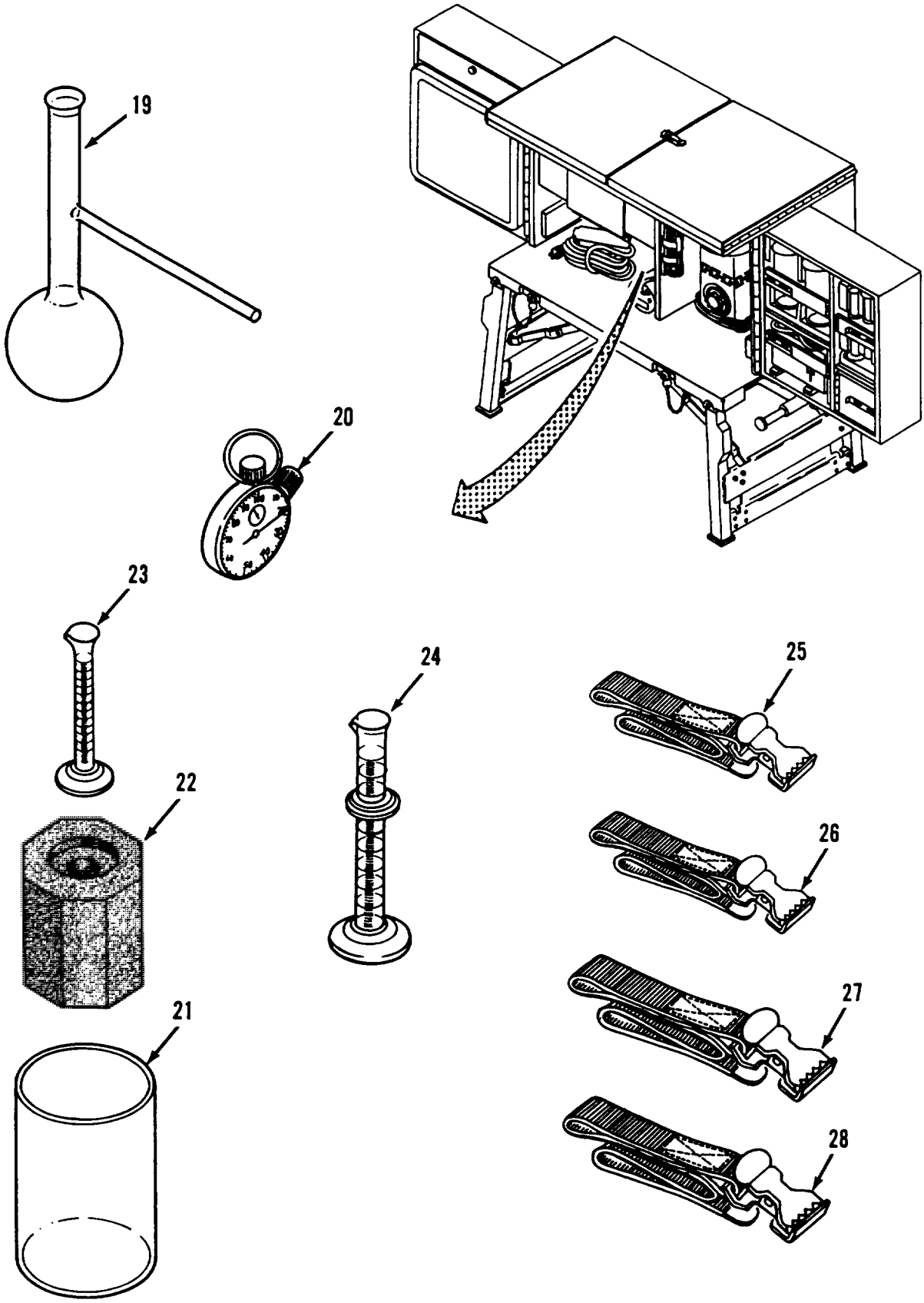


Figure 4. Cabinet (Sheet 3 of 4).

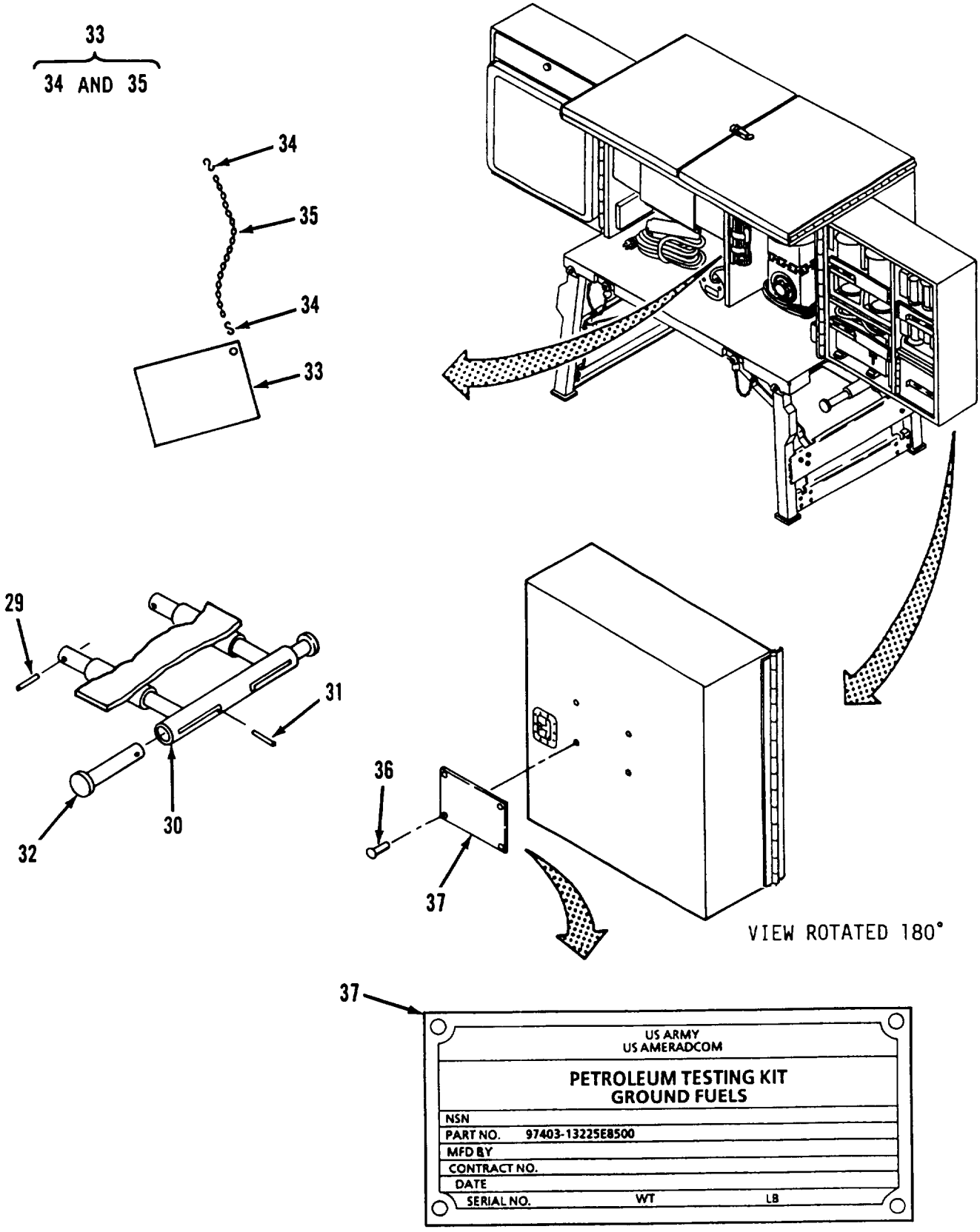


Figure 4. Cabinet (Sheet 4 of 4).

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP 04 CABINET	
					FIG. 4 CABINET	
1	XBOOO		81349	MIL-T-51028	SAMPLING AND GAGING	
2	XDOZZ		81349	M2726-69-001	RECEPTACLE, OUTLET TRIPLE, 25-FOOT1 CABLE	
3	PAOZZ	6230001631856	58536	A-A-1974	FLASHLIGHT	1
4	PAOZZ	6135008357211	77542	HD-D	BATTERY, NONRECHARGE	2
5	PAOZZ		97403	13225E8506	OIL DRUM THIEF, UPPE	1
6	PAOZZ		97403	13225E8507	SAMPLER, LIQUID	1
7	XDOZZ		81348	GGG-W-642	WRENCH, BUNG	1
8	PAOZZ	7920012663814	22527	03-576	BRUSH, TEST TUBE	1
9	PAOZZ	7920002237982	81348	H-B-1051	BRUSH, TEST TUBE	1
10	PADZZ	7920002971510	81348	H-B-1051	BRUSH, TEST TUBE	1
11	PAOZZ			22527 13-481	THERMOMETER, SELF-IN 7 CELSIUS	5
12	PAOZZ		22527	13-482	THERMOMETER, SELF-IN 8 CELSIUS	4
13	PAOZZ	6685010700716	95059	13-501	THERMOMETER, LOW RAN 9 CELSIUS	3
14	PAOZZ	8120013158703	70785	TX-9	CYLINDER, COMPRESSED	1
15	PAOZZ		97403	13225E8502	CYLINDER, COMPRESSED	1
16	PAOZZ	4730011588417	93061	125HBL-6-4	ADAPTER, STRAIGHT, PI	1
17	MOOZZ		81348	ZZ-T-831A	TUBE MAKE FROM 81348 ZZ-T-..... 831TYPiCL1 3/8IDX1/16WALL, 36IN LG.....	1
18	MOOZZ		81348	ZZ-T-831B	TUBE MAKE FROM 81348 ZZ-T-1 831TYPICL1 1/8IDX1/32WALL 24IN LG.....	
19	PAOZZ	6640004238500	81348	NNNF240	FLASK, DISTILLING	4
20	PAOZZ	6645002504680	19200	10531878	STOPWATCH	1
21	PAOZZ	6640003599870	22527	13-476	JAR, CYLINDRICAL, LAB 117 MM X 229 MM2	
22	XDOZZ		97403	13225E8527	HOLDER, GRADUATED, CY	1
23	PAOZZ	6640002906569	14674	3024-5	CYLINDER, GRADUATED, ...	1
24	PAOZZ	6640008838516	14674	3022-100	CYLINDER, GRADUATED, ...	2
25	PCOZZ	5340011624325	97403	13220E5288-2	STRAP, WEBBING 36 INCHES LONG	1
26	PCOZZ	5340011653721	97403	13220E5288-4	STRAP, WEBBING 60 INCHES LONG	1
27	XDOZZ		97403	13225E8518	STRAP ASSEMBLY 12 INCH LONG	1
28	XDOZZ		97403	13220E5288-3	STRAP ASSEMBLY 48 INCHES LONG	1
29	XBOZZ		96906	MS171657	PIN, SPRING CORROSION RESISTANT ..... STEEL, .25ODX X 1.375L.....	4
30	XBOZZ		97403	13225E8521	HANDLE.....	2
31	XBOZZ		96906	MS171652	PIN, SPRING CORROSION RESISTANT ..... STEEL, .250DX X .875L	4
32	XBOZZ		97403	13225E8520	HANDLE EXTENSION	4
33	XCOOO		97403	13225E8524	PLAN, LOADING.....	1
34	PAOZZ	4030007809350	96906	MS87006-13	.HOOK, CHAIN, S	2
35	MOOZZ		97403	13218E0025-43	.CHAIN, WELDLESS MAKE FROM 81348 RR-C-271 TY2 CL7, CUT TO LENGTH, 24 INCHES LONG	2
36	XBOZZ	5320009572515	96906	MSZ20604AD4W2	RIVET, BLIND	4
37	XBOZZ		97403	13225E8510	PLATE, IDENTIFICATIO	1
					END OF FIGURE	

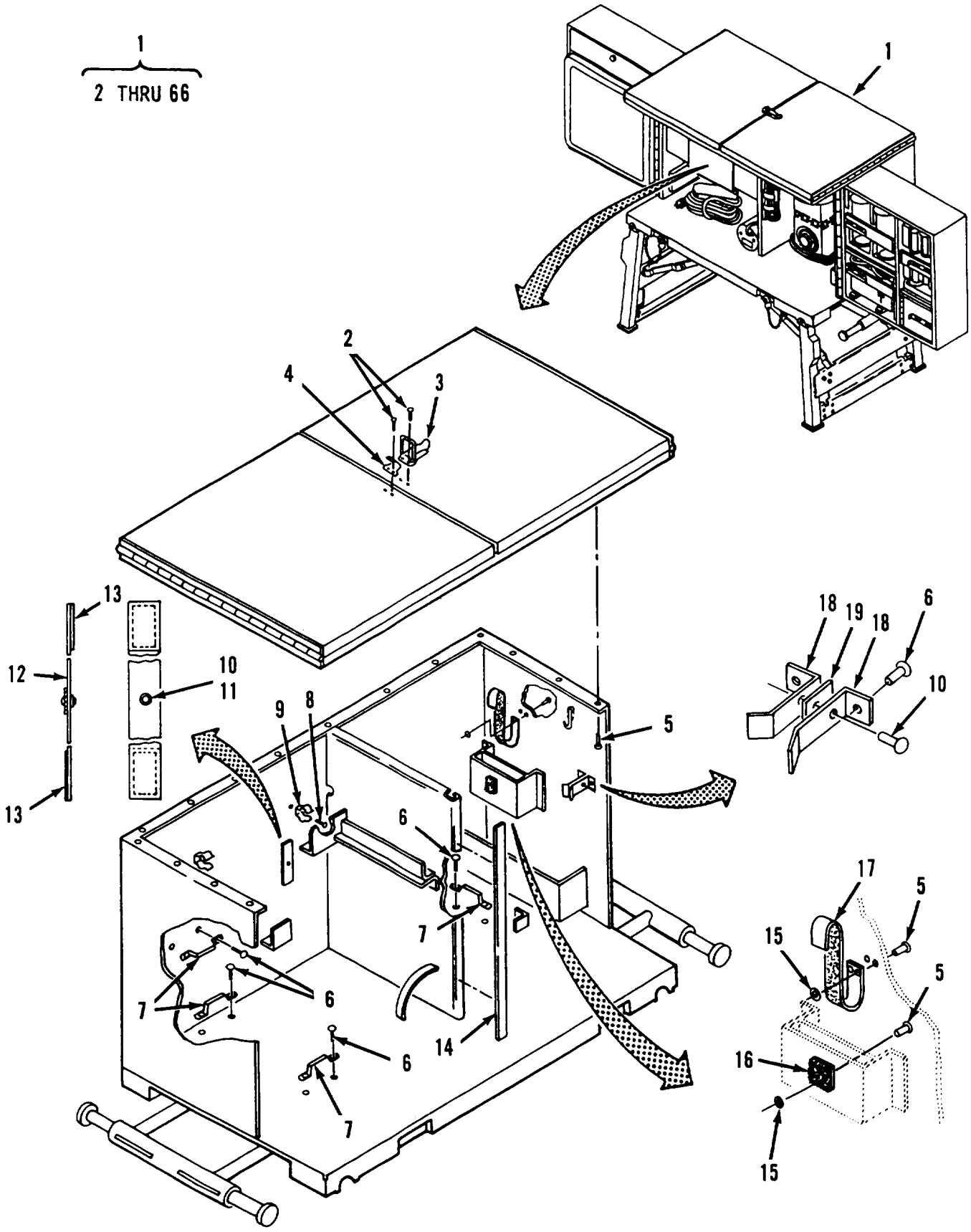


Figure 5. Cabinet Frame (Sheet 1 of 6)

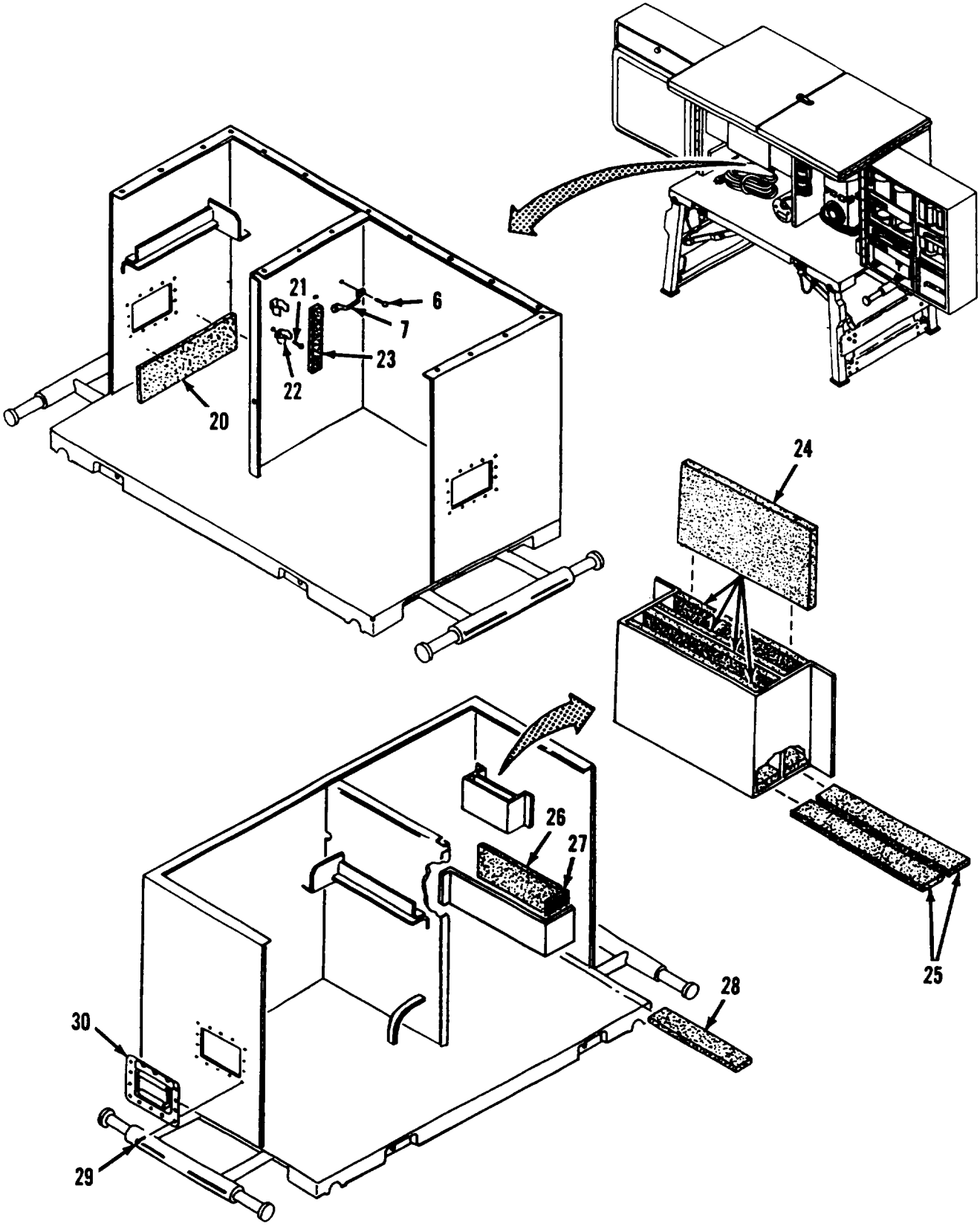


Figure 5. Cabinet Frame (Sheet 2 of 6)

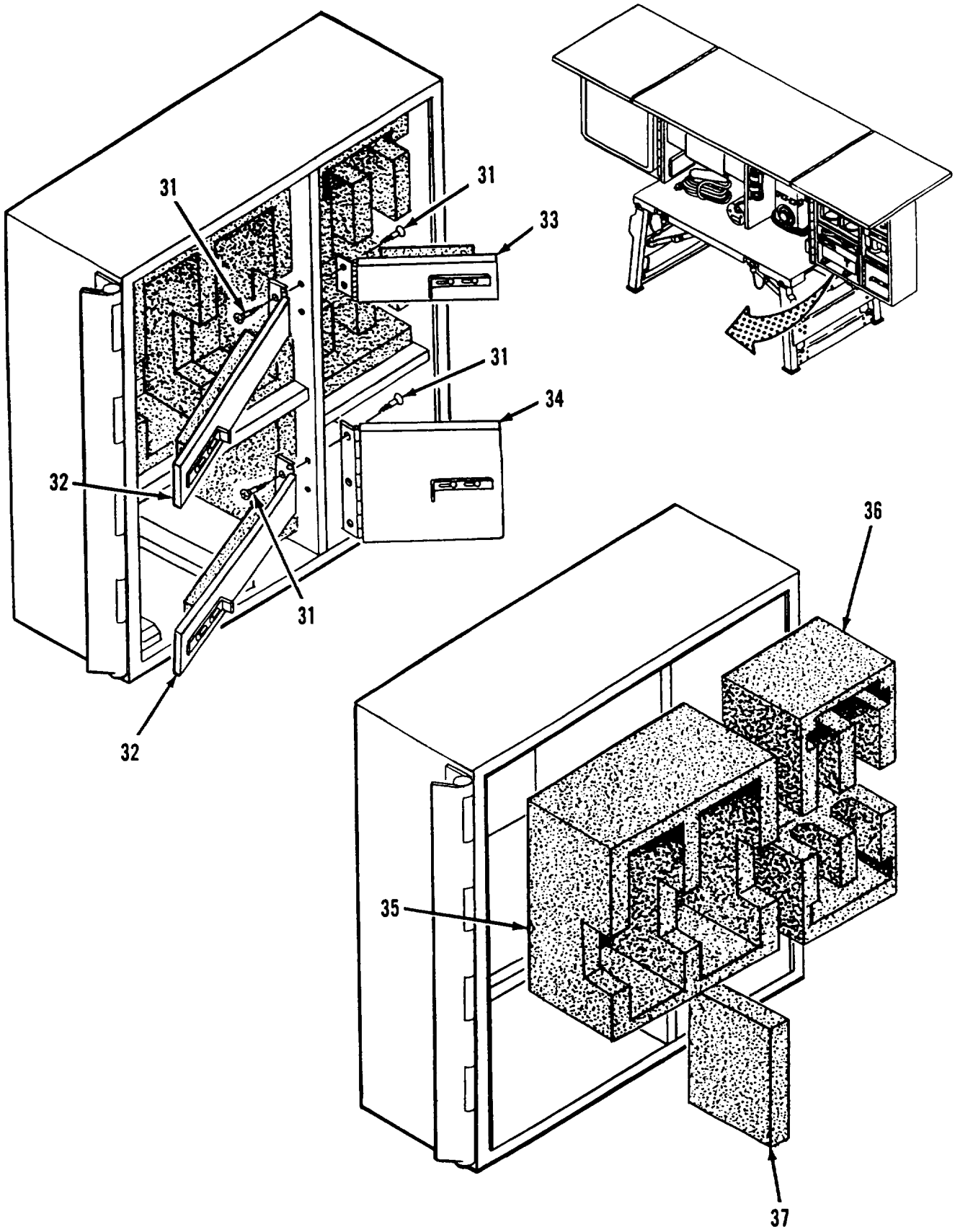


Figure 5. Cabinet Frame (Sheet 3 of 6)

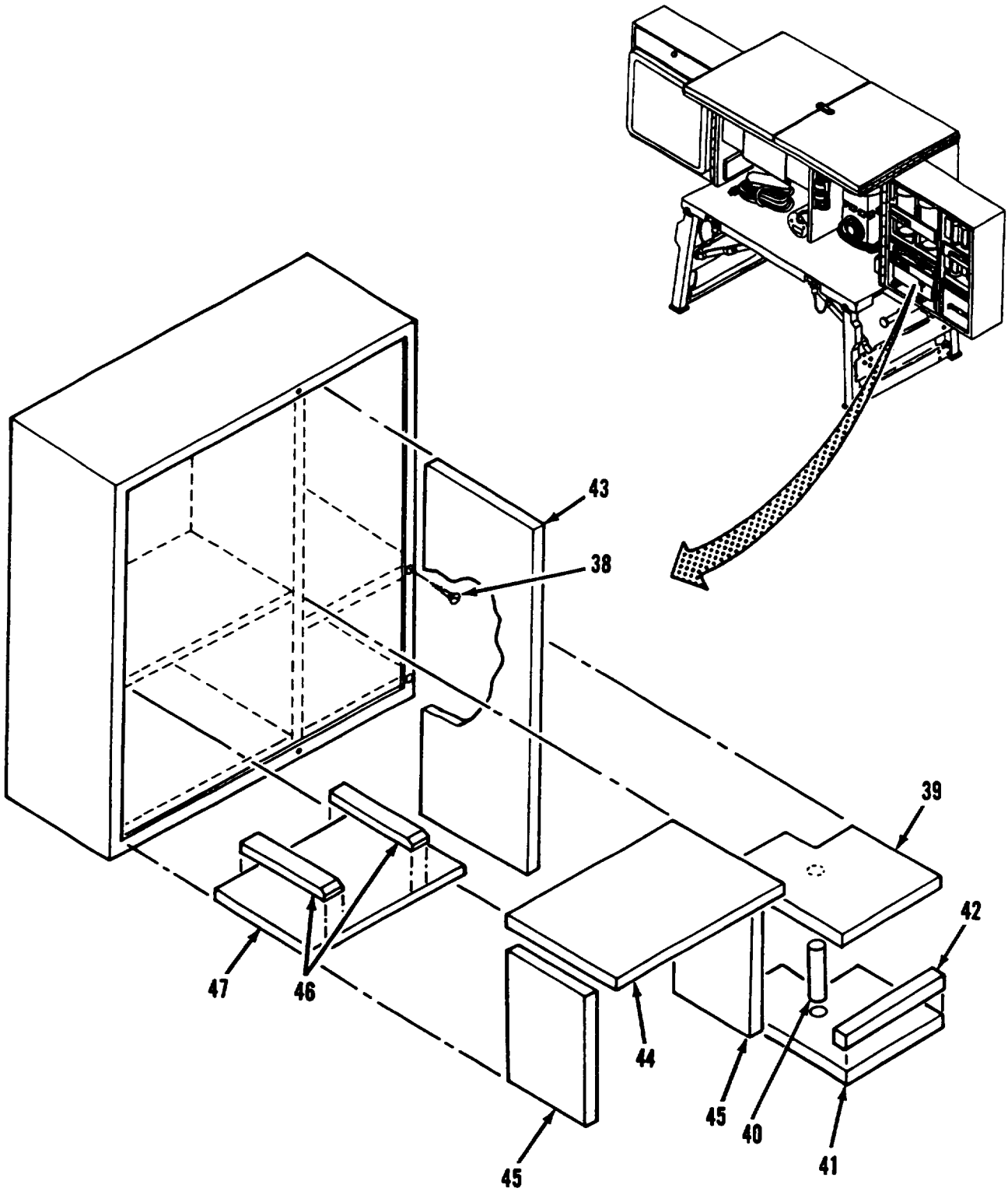


Figure 5. Cabinet Frame (Sheet 4 of 6)

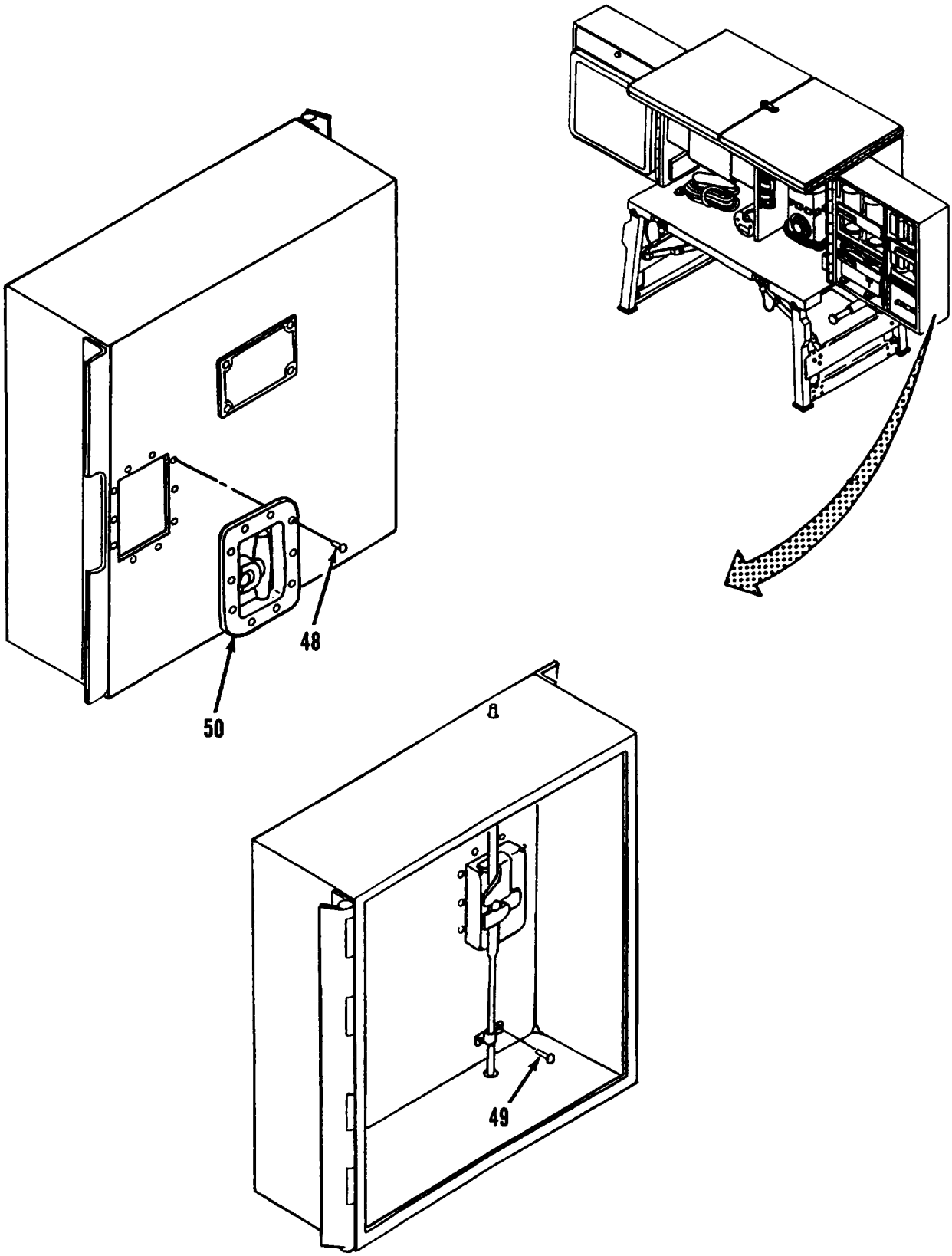


Figure 5. Cabinet Frame (Sheet 5 of 6)

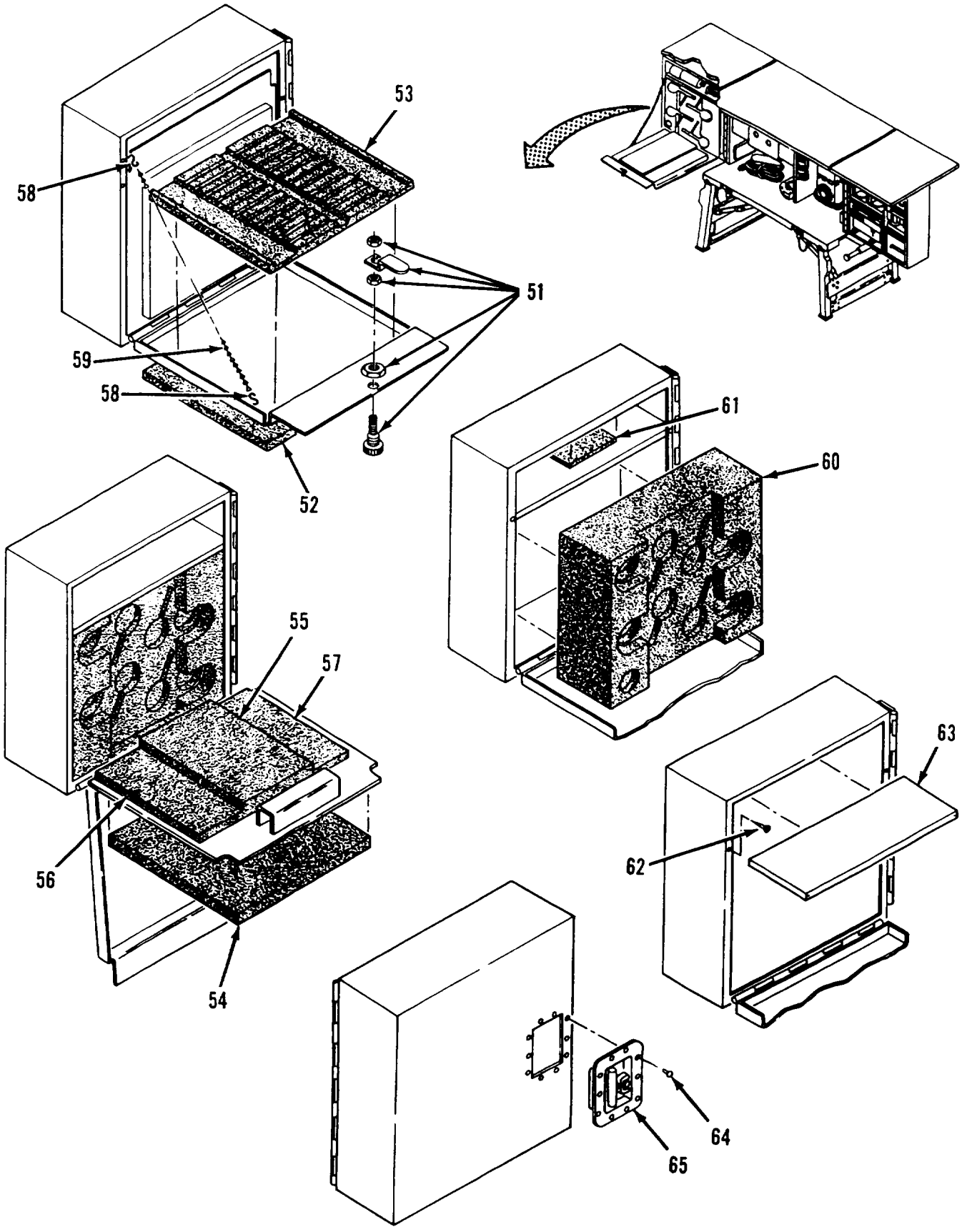


Figure 5. Cabinet Frame (Sheet 6 of 6)

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP 04 CABINET	
					FIG. 5 CABINET FRAME	
1	XBOOO97403		13225E8515		CABINET	1
2	PAOZZ	5320009446084	96906	MS20604AD4W5	.RIVET, BLIND	4
3	PAOZZ	5340001787870	96906	MS18015-2	.LATCH	1
4	PAOZZ	5340002376254	96906	MS18015-3	.STRIKE, CATCH	1
5	PAOZZ	5320009549568	96906	MS20604AD4W3	'.RIVET, BLIND	22
6	PAOZZ	5320009572507	96906	MS20604AD6W4	.RIVET, BLIND	10
7	PAOZZ	5340007642334	96906	MS51939-1	.LOOP, STRAP FASTENER	5
8	PAOZZ	5320009917484	94906	MS20604AD3W2	.RIVET, BLIND	2
9	PAOZZ	5340000515473	81349	M24066/2-310	.CLIP, SPRING TENSION	2
10	PAOZZ	5320009572514	96906	MS20604AD4W4	.RIVET, BLIND	2
11	PAOZZ	5310013034701	96906	MS51412-1	.WASHER, FLAT	1
12	MOOZZ		97403	13225E8515-25	.WEBBING, TEXTILE MAKE FROM 81349 MIL-W-5665TYXVIICL2B, CUT TO SIZE	1
13	MOOZZ		97403	13225E8515-26	.FASTENER TAPE MAKE FROM 81349 MIL-1 F-21840 TYPE II, CL 4, CUT TO LENGTH	
14	MOOZZ		97403	13225E8515-24	.RUBBER, CELLULAR MAKE FROM 813491 MIL-R-46089, GRD M, BLK, CUT TO 5/16X19	
15	XBOZZ	5310007278353	80205	NAS620-5L	.WASHER, FLAT	4
16	XBOZZ		97403	13225E8515-108	.TAPE, PILE 1 INCH X 1 INCH	1
17	XBOZZ		97403	13225E8515-105	.TAPE, HOOK 1 INCH X 6 INCH	1
18	XBOZZ		97403	13225E8515-33	STEEL SPRING	2
19	XBOZZ		97403	13225E8515-34	SPACER	1
20	MOOZZ		97403	13225E8515-93	.FOAM MAKE FROM 81349 MIL-P-26514TY1CL2GRC, CUT TO 9X4X1	1
21	PAOZZ	5320009572511	96906	MS20604AD5W2	.RIVET, BLIND	2
22	PAOZZ	6160013683117	91833	219	.RETAINER, BATTERY	2
23	MOOZZ		97403	13225E8515-87	.FOAM MAKE FROM 81349 MIL-P-26514TY1CL2GRC, CUT TO 8X11/ 2X1/2	1
24	MOOZZ		97403	13225E8515-103	.FOAM MAKE FROM 81349 MIL-P-4 26514TY1CL26RC, CUT TO 5X3X.38	
25	MOOZZ		97403	13225E8515-107	FOAM MAKE FROM 81349 MIL-P-1 26514TYICL2GRC, CUT TO 5X3X.88	
26	MOOZZ		97403	13225E8515-97	.FOAM MAKE FROM MIL-P-1 26514TY1CL2GRC, CUT TO 11.38X3X.5	
27	MOOZZ		97403	13225E8515-96	.FOAM MAKE FROM MIL-P-1 26514TYICL2GRC, CUT TO 3X3X.5	
28	MOOZZ		97403	13225E8515	-95.FOAM MAKE FROM MIL-P-1 26514TY1CL2GRC, CUT TO 11.88X2.5X.5	
29	PAOZZ	5320001176828	96906	MS20470AD4-6	.RIVET, SOLID	28
30	PAOZZ	5340008190547	01570	165CG2	.HANDLE, BAIL	2
31	PAOZZ	5305009002546	88044	AN550-5R4	.SCREW, WOOD	9
32	XDOZZ		97403	13225E8511-1	RETAINER ASSEMBLY	2
33	XDOZZ		97402	13225E8511-2	RETAINER ASSEMBLY	1
34	XDOZZ		97403	13225E8525	DOOR ASSEMBLY	1
35	XBOZZ		97403	13225E8515-70	FOAM	1
36	XBOZZ		97403	13225E8515-71	FOAM	1
37	MOOZZ		97403	13225E8515-101	.FOAM MAKE FROM 81349 MIL-P-	1

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					26514TYlCL2GRC, CUT TO 7.19X5.4X1.2	
38	PAOZZ	5305009357505	96906	MS35493-33	.SCREW, WOOD	9
39	XBOZZ		97403	13225E8515-74	.PANEL, WOOD	1
40	XBOZZ		97403	13225E8515-80	.TUBE, DRAWN 5.20X.625	1
41	XBOZZ		97403	13225E8515-79	.PANELWDOOD	1
42	XBOZZ		97403	13225E8515-85	.PANEL, WOOD	1
43	XBOZZ		97403	13225E8515-64	.PANEL, WOOD 18.25X6.38X.5	1
44	XBOZZ		97403	13225E8515-78	.PANEL, WOOD 11.12X6.38X.5	1
45	XBOZZ		97403	13225E8515-66	.PANEL, WOOD	2
46	XBOZZ		97403	13225E8515-67	.PANEL, WOOD	2
47	XBOZZ		97403	13225E8515-77	.PANEL, WOOD 11.12X6.38X.5 THK	1
48	PAOZZ	5320009572512	96906	MS20604ADSW4	.RIVET, BLIND	10
49	PAOZZ	5320009572513	96906	MS20604AD4W6	.RIVET, BLIND	4
50	XDOZZ		97403	13225E8509	.LOCK, DOOR	1
51	PAOZZ	5340011580502	94222	69-10-401-11	.LATCH SET, MORTISE	1
52	MOOZZ		97403	13225E8515-86	.FOAM MAKE FROM MIL-P-26514TYlCL2GRC, CUT TO 14.5X13.38X.5 THK	1
53	XBOZZ		97403	13225E8515-63	.FOAM	1
54	MOOZZ		97403	13225E8515-62	.FOAM MAKE FROM 81349 MIL-P-26514TY1CL2GRC, CUT TO 15X13X.5	1
55	MOOZZ		97403	13225E8515-88	.FOAM MAKE FROM 81349 MIL-P-1 26514TY1CL2GRC, CUT TO 12X3.25X.5	
56	MOOZZ		97403	13225E8515-89	.FOAM MAKE FROM 81349 MIL-P-1 26514TYlCL2GRC, CUT TO 12X2.25X.5	
57	MOOZZ		97403	13225E8515-59	.FOAM MAKE FROM 81349 MIL-P-1 26514TY1CL2GRC, CUT TO 12X9X1.25X.25 THK	
58	PAOZZ	4030002705436	96906	MS87006-3	.HOOK, CHAIN, S	2
59	MOOZZ		97403	13218E0025-43	.CHAIN, WELDLESS, SING MAKE FROM 81348 RR-C-271 TT2 CL7, CUT TO LENGTH, 19 INCHES LONG	2
60	XBOZZ		97403	13225E8515-55	.FOAM	1
61	MOOZZ		97403	13225E8515-47	.FOAM MAKE FROM 81349 MIL-P-26514TY1CL2GRC, CUT TO 6X3X.75 TH	1
62	PAOZZ	5305009357505	96906	MS35493-33	.SCREW, WOOD	4
63	XBDZZ		97403	13225E8515-49	.PANEL, WOOD 17.5X4.88X.5	1
64	PAOZZ	5320009572512	96906	MS20604ADSW4	.RIVET, BLIND	10
65	XDOZZ		19220	8002A-50	.HANDLE	1
					END OF FIGURE	

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP 05 BULK	
					FIG. BULK	
1	PAOZZ	4010009580633	81348	RR-C-271 TY2 CL7 -16	CHAIN, WELDLESS	1
2	XDOZZ		27463	T24202PP1-4	CUSHIONING MATERIAL	1
3	PAOZZ		81349	MIL-F-21840TYPEI ICL4	FASTENER TAPE, HOOK TYPE II, 1 INCH1 WIDTH, NYLON	
4	XDOZZ		81349	M46089MSC2	RUBBER SHEET, CELLUL	1
5	PAOZZ	4720002719842	81349	M6855/4-08H149	TUBING, NONMETALLIC 3/8 ID X 1/16 ..... WALL X 36 IN LENGTH	1
6	PAOZZ	4720009960362	81348	ZZT831GRADEB HEAV YWALL	TUBING, NONMETALLIC 1/8 ID X 1/321 WALL X 24 IN LENGTH	
7	PAOZZ		81349	MIL-W-5665TYXVII	WEBBING, TEXTILE TYPE XVII, CL 2B,1 CL2B1 IN WIDE, OD NO.	7
					END OF FIGURE	

Section III. SPECIAL TOOLS LIST

(Not Applicable)

CROSS- REFERENCE-INDEXES

NATIONAL STOCK NUMBER INDEX

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
5340-00-051-5473	5	9			
6230-00-163-1856	4	3			
7920-00-223-7982	4	9			
6645-00-250-4680	4	20			
4720-00-271-9842	BULK	5			
6640-00-272-7630	2	17			
6640-00-290-6569	4	23			
7920-00-297-1510	4	10			
6640-00-359-9646	2	10			
6640-00-359-9870	4	21			
8125-00-409-7675	2	12			
6640-00-423-8500	4	19			
6640-00-454-7497	2	7			
6630-00-530-0987	1	1			
5340-00-819-0547	5	30			
6135-00-835-7211	4	4			
6640-00-883-8516	4	24			
5315-00-904-1665	3	18			
5305-00-935-7505	5	38			
	5	62			
5320-00-944-6084	5	2			
5320-00-957-2511	5	21			
5320-00-957-2512	5	48			
	5	64			
5320-00-957-2513	5	49			
5320-00-957-2514	5	10			
-5320-00-991-7484	5	8			
6685-01-070-0716	4	13			
5340-01-158-0502	5	51			
7920-01-266-3814	4	8			
5310-01-303-4701	5	11			
8120-01-315-8703	4	14			
6160-01-368-3117	5	22			
5330-01-433-8450	2	3			

NATIONAL STOCK NUMBER AND PART NUMBER INDEX
PART NUMBER INDEX

CAGEC	PART NUMBER	STOCK NUMBER	FIG.	ITEM
58536	A-A-1974	6230-00-163-1856	4	3
81348	CID A-A-54509	6630-00-530-0987	1	1
81348	H-B-1051	7920-00-223-7982	4	9
		7920-00-297-1510	4	10
77542	HD-D6135-00-835-7211		4	4
81349	MIL-F-21840TYPEI ICL4		BULK	3
81349	MIL-T-51028		4	1
81349	MIL-W-5665TYXVII CL2B		BULK	7
96906	MS17984C413	5315-00-904-1665	3	18
96906	MS20604AD3W2	5320-00-991-7484	5	8
96906	MS20604AD4W4	5320-00-957-2514	5	10
96906	MS20604AD4W5	5320-00-944-6084	5	2
96906	MS20604AD4W6	5320-00-957-2513	5	49
96906	MS20604AD5W2	5320-00-957-2511	5	21
96906	MS20604AD5W4	5320-00-957-2512	5	48
			5	64
96906	MS35493-33	5305-00-935-7505	5	38
			5	62
96906	MS36198-2	6640-00-272-7630	2	17
96906	MS51412-1	5310-01-303-4701	5	11
81349	M24066/2-310	5340-00-051-5473	5	9
81349	M2726-69-001		4	2
81349	M46089MSC2		BULK	4
81349	M6855/4-08H149	4720-00-271-9842	BULK	5
81348	NNNF240	6640-00-423-8500	4	19
70785	TX-9	8120-01-315-8703	4	14
27463	T24202PP1-4		BULK	2
81348	ZZT831GRADEBHEAV YWALL		BULK	6
22527	03-576	7920-01-266-3814	4	8
19200	10531878	6645-00-250-4680	4	20
11273	12402	8125-00-409-7675	2	12
22527	13-476	6640-00-359-9870	4	21
22527	13-481		4	11
22527	13-482		4	12
95059	13-5016685-01-070-0716		4	13
97403	13225E8499		2	1
97403	13225E8502		4	15
97403	13225E8507		4	6
01570	165CG2	5340-00-819-0547	5	30
91833	219	6160-01-368-3117	5	22
48619	241172		2	2
14674	3022-100	6640-00-883-8516	4	24
14674	3024-5	6640-00-290-6569	4	23
48619	432610		2	5
48619	509886	5330-01-433-8450	2	3
48619	61825	6640-00-359-9646	2	10
48619	61856	6640-00-454-7497	2	7
94222	69-10-401-11	5340-01-158-0502	5	51

C-35 through C-39/(C-40 blank) deleted.

CROSS-REFERENCE INDEXES

PART NUMBER INDEX

CAGEC	PART NUMBER	STOCK NUMBER	FIG.	ITEM
80205	NAS620-5L		5	15
81348	RR-C-271 TY2 CL7 -16	4010-00-958-0633	BULK	1
81348	ZZ-T-831A		4	17
81348	ZZ-T-831B		4	18
81348	ZZ-T-831TY1CL11/ 8X1/32		BULK	6
81348	ZZ-T-831TY1CL13/ 8X1/16		BULK	5
22527	03-541-5		4	10
22527	03-576		4	8
22527	03-621A		4	9
93061	125HBL-6-4	4730-01-158-8417	4	16
22527	13-481		4	11
22527	13-482		4	12
95059	13-501		4	13
97403	13218E0025-43		3	17
			4	35
			5	59
97403	13220E5288-2	5340-01-162-4325	4	25
97403	13220E5288-3		4	28
97403	13220E5288-4	5340-01-165-3721	4	26
97403	13225E8499		2	1
97403	13225E8502		4	15
97403	13225E8503		4	24
97403	13225E8504		4	19
97403	13225E8506		4	5
97403	13225E8507		4	6
97403	13225E8509		5	50
97403	13225E8510		4	37
97403	13225E8511-1		5	32
97403	13225E8511-2		5	33
97403	13225E8514		3	10
97403	13225E8515		5	1
97403	13225E8515-101		5	37
97403	13225E8515-103		5	24
97403	13225E8515-105		5	17
97403	13225E8515-107		5	25
97403	13225E8515-108		5	16
97403	13225E8515-24		5	14
97403	13225E8515-25		5	12
97403	13225E8515-26		5	13
97403	13225E8515-33		5	18
97403	13225E8515-34		5	19
97403	13225E8515-47		5	61
97403	13225E8515-49		5	63
97403	13225E8515-55		5	60
97403	13225E8515-59		5	57
97403	13225E8515-62		5	54
97403	13225E8515-63		5	53
97403	13225E8515-64		5	43

CROSS-REFERENCE INDEXES

PART NUMBER INDEX

CAGEC	PART NUMBER	STOCK NUMBER	FIG.	ITEM
97403	13225E8515-66		5	45
97403	13225E8515-67		5	46
97403	13225E8515-70		5	35
97403	13225E8515-71		5	36
97403	13225E8515-74		5	39
97403	13225E8515-77		5	47
97403	13225E8515-78		5	44
97403	13225E8515-79		5	41
97403	13225E8515-80		5	40
97403	13225E8515-85		5	42
97403	13225E8515-86		5	52
97403	13225E8515-87		5	23
97403	13225E8515-88		5	55
97403	13225E8515-89		5	56
97403	13225E8515-93		5	20
97403	13225E8515-95		5	28
97403	13225E8515-96		5	27
97403	13225E8515-97		5	26
97403	13225E8516		3	9
97403	13225E8518		4	27
97403	13225E8520		4	32
97403	13225E8521		4	30
97403	13225E8524		4	33
97403	13225E8525		5	34
97403	13225E8526		4	23
97403	13225E8527		4	22
70785	19400		4	14
91833	219		5	22
48619	221167		2	12
48619	241172		2	2
59728	3276-G40		2	17
48619	432610		2	5
57068	446LH		3	5
57068	446RH		3	6
48619	509886		2	3
48619	541140		2	15
48619	541141		2	14
48619	541143		2	4
48619	541183		2	13
48619	61600	6640-00-980-5002	2	6
48619	61825		2	10
48619	61834	6640-00-359-9642	2	11
48619	61856		2	7
48619	61860		2	8
48619	61876		2	9
94222	69-10-401-11		5	51
48619	74537	6630-00-530-0987	1	1
48619	75765	6640-00-531-5022	1	2
48619	76018	6640-00-359-9995	2	16
19220	8002A-50		5	65

SECTION IV
CROSS-REFERENCE INDEXES

FIGURE AND ITEM NUMBER INDEX

FIG.	ITEM	STOCK NUMBER	CAGEC	PART NUMBER
BULK	1	4010-00-958-0633	81348	RR-C-271 TY2 CL7 -16
BULK	2		81349	MIL-F-21840TYPEI ICL4
BULK	3		81349	MIL-P-26514TY1CL 2GRC
BULK	4		81349	MIL-R-46089GRDM
BULK	5		81348	ZZ-T-831TY1CL13/ 8X1/16
BULK	6		81348	ZZ-T-831TY1CL11/ 8X1/32
BULK	7		81349	MIL-W-5665TYXV11 CL2B
1	1	6630-00-530-0987	48619	74537
1	2	6640-00-531-5022	48619	75765
2	1		97403	13225E8499
2	2		48619	241172
2	3		48619	509886
2	4		48619	541143
2	5		48619	432610
2	6	6640-00-980-5002	48619	61600
2	7		48619	61856
2	8		48619	61860
2	9		48619	61876
2	10		48619	61825
2	11	6640-00-359-9642	48619	61834
2	12		48619	221167
2	13		48619	541183
2	14		48619	541141
2	15		48619	541140
2	16	6640-00-359-9995	48619	76018
2	17		59728	3276-G40
3	1	5310-00-934-9751	96906	MS35650-302
3	2	5310-00-045-3296	96906	MS35338-43
3	3	5310-00-014-5850	96906	MS27183-42
3	4	5305-00-984-7363	96906	MS35191-272
3	5		57068	446LH
3	6		57068	446RH
3	7	5315-00-842-3044	96906	MS24665-283
3	8	5310-00-080-6004	96906	MS27183-14
3	9		97403	13225E8516
3	10		97403	13225E8514
3	11	5310-00-934-9747	96906	MS35649-262
3	12	5310-00-045-4007	96906	MS35338-41
3	13	5310-00-983-8483	96906	MS27183-5
3	14	5305-00-984-4988	96906	MS35206-228
3	15		72968	CD1403-2.5-US2C
3	16	4030-00-270-5436	96906	MS87006-3
3	17		97403	13218E0025-43
3	18		96906	MS17984C413
4	1		81348	MIL-S-51028

SECTION IV
CROSS-REFERENCE INDEXES

FIGURE AND ITEM NUMBER INDEX

FIG.	ITEM	STOCK NUMBER	CAGEC	PART NUMBER
4	2		81349	M2726/69-001
4	3		19099	GC-2B
4	4		77542	HD-D
4	5		97403	13225E8506
4	6		97403	13225E8507
4	7		81348	GGG-W-642
4	8		22527	03-576
4	9		22527	03-621A
4	10		22527	03-541-5
4	11		22527	13-481
4	12		22527	13-482
4	13		95059	13-501
4	14		70785	19400
4	15		97403	13225E8502
4	16	4730-01-158-8417	93061	125HBL-6-4
4	17		8348	ZZ-T-831A
4	18		81348	ZZ-T-831B
4	19		97403	13225E8504
4	20		81348	A-A-2580
4	21		96906	MS36296-2
4	22		97403	13225E8527
4	23		97403	13225E8526
4	24		97403	13225E8503
4	25	5340-01-162-4325	97403	13220E5288-2
4	26	5340-01-165-3721	97403	13220E5288-4
4	27		97403	13225E8518
4	28		97403	13220E5288-3
4	29		96906	MS171657
4	30		97403	13225E8521
4	31		96906	MS171652
4	32		97403	13225E8520
4	33		97403	13225E8524
4	34	4030-00-780-9350	96906	MS87006-13
4	35		97403	13218E0025-43
4	36		96906	MS20604AD4W2
4	37		97403	13225E8510
5	1		97403	13225E8515
5	2		96906	MS20604AD4W5
5	3	5340-00-178-7870	96906	MS18015-2
5	4	5340-00-237-6254	96906	MS18015-3
5	5	5320-00-954-9568	96906	MS20604AD4W3
5	6	5320-00-957-2507	96906	MS20604AD6W4
5	7	5340-00-764-2334	96906	MS51939-1
5	8		96906	MS20604AD3W2
5	9		81349	M24066/2-310
5	10		96906	MS20604AD4W4
5	11		96906	MS27183-6
5	12		97403	13225E8515-25
5	13		97403	13225E8515-26
5	14		97403	13225E8515-24
5	15		80205	NAS620-5L

CROSS-REFERENCE INDEXES

FIGURE AND ITEM NUMBER INDEX

FIG.	ITEM	STOCK NUMBER	CAGEC	PART NUMBER
5	16		97403	13225E8515-108
5	17		97403	13225E8515-105
5	18		97403	13225E8515-33
5	19		97403	13225E8515-34
5	20		97403	13225E8515-93
5	21		96906	MS20604AD5W2
5	22		91833	219
5	23		97403	13225E8515-87
5	24		97403	13225E8515-103
5	25		97403	13225E8515-107
5	26		97403	13225E8515-97
5	27		97403	13225E8515-96
5	28		97403	13225E8515-95
5	29	5320-00-117-6828	96906	MS20470AD4-6
5	30		98003	H-560-LS-2-RGZZ
5	31	5305-00-900-2546	88044	AN550-5R4
5	32		97403	13225E8511-1
5	33		97403	13225E8511-2
5	34		97403	13225E8525
5	35		97403	13225E8515-70
5	36		97403	13225E8515-71
5	37		97403	13225E8515-101
5	38		96906	MS35495-35
5	39		97403	13225E8515-74
5	40		97403	13225E8515-80
5	41		97403	13225E8515-79
5	42		97403	13225E8515-85
5	43		97403	13225E8515-64
5	44		97403	13225E8515-78
5	45		97403	13225E8515-66
5	46		97403	13225E8515-67
5	47		97403	13225E8515-77
5	48		96906	MS20604AD5W4
5	49		96906	MS20604AD4W6
5	50		97403	13225E8509
5	51		94222	69-10-401-11
5	52		97403	13225E8515-86
5	53		97403	13225E8515-63
5	54		97403	13225E8515-62
5	55		97403	13225E8515-88
5	56		97403	13225E8515-89
5	57		97403	13225E8515-59
5	58	4030-00-270-5436	96906	MS87006-3
5	59		97403	13218E0025-43
5	60		97403	13225E8515-55
5	61		97403	13225E8515-47
5	62		96906	MS35495-35
5	63		97403	13225E8515-49
5	64		96906	MS20604AD5W4
5	65		19220	8002A-50

APPENDIX D. COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BII) LISTS

Section I. INTRODUCTION

D-1. SCOPE

This appendix lists components of the end item and basic issue items for the Ground Fuels Petroleum Test Kit to help you inventory items required for safe and efficient operation.

D-2. GENERAL

The Components of End Item and Basic Issue Items (Bll) Lists are divided into the following sections:

a. **Section II.Components of End Item**. This listing is for information purposes only, and is not authority to requisition replacements. These items are part of the end item, but they are to be 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 Ground Fuels Petroleum Test Kit in operation, to operate it, and to perform emergency repairs. Although shipped separately packaged, Bll must be with the test kit during operation and whenever it is transferred between property accounts. The illustration will assist you with hard-to-identify items. This manual is your authority to request/requisition replacement Bll, based on TOE/MTOE authorization of the end item.

D-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 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 abbre viation (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 LIST

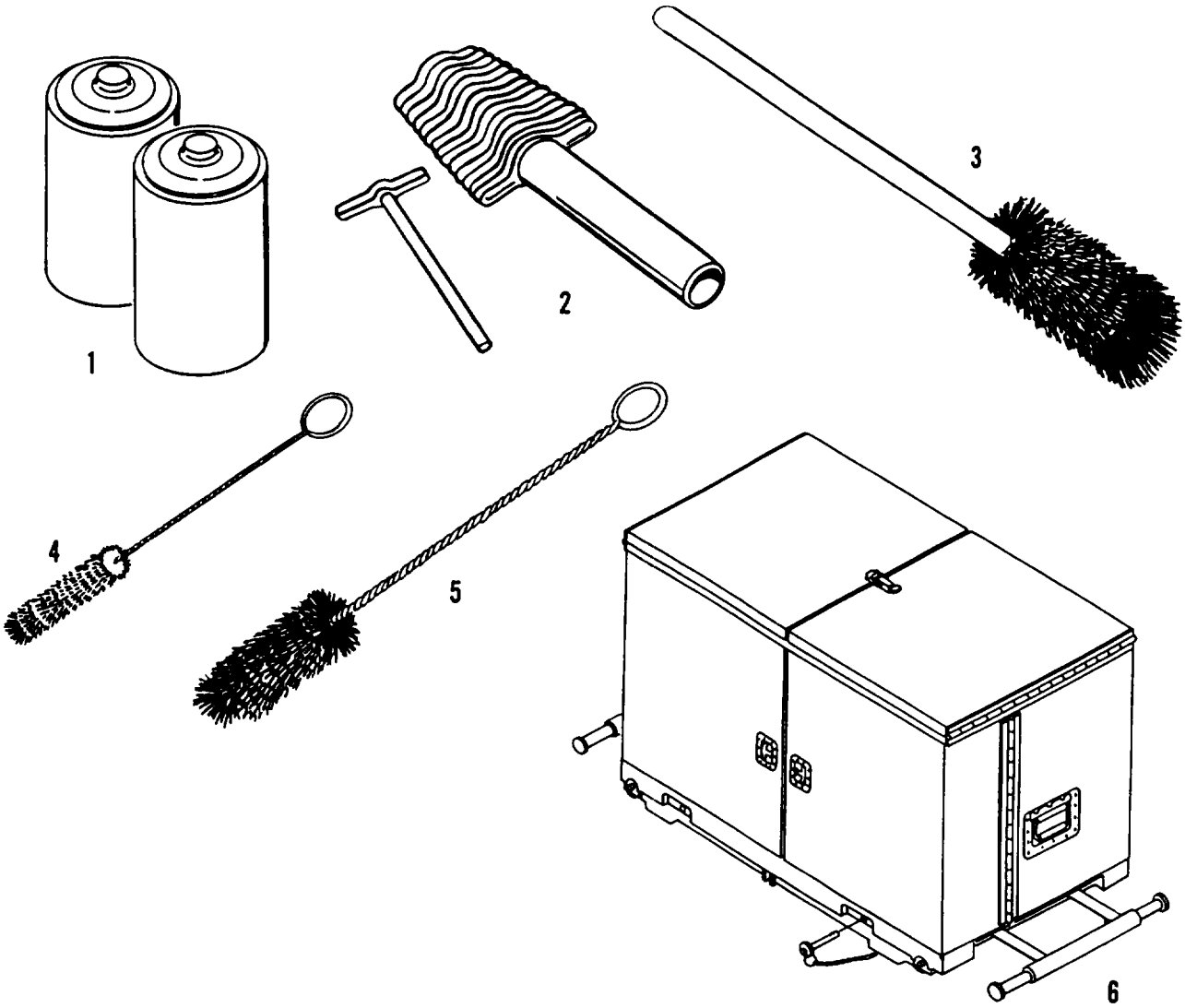
(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION, CAGEC and Part Number	Usable On Code	(4) U/M	(5) QTY Reqd
1	6135-00-835-7211	BATTERY (77542) HD-D		EA	2
2	6640-00-515-6066	BORER SET, CORK (22527) 07-845E		EA	1
3	7920-00-494-3688	BRUSH, FLASK (81348) H-B-1049		EA	1
4	7920-00-282-7783	BRUSH, TEST TUBE, TYPE STYLE A, CL1 (81348) H-B-1051		EA	1
5	7920-00-223-7982	BRUSH, TEST TUBE, TYPE 1, STYLE B, CL1, SZ1-1/2 (81348) H-B-1051		EA	1
6		CABINET (97403) 13225E8515		EA	1
7	6150-00-449-1189	CABLE ASSEMBLY, POWER, ELECTRICAL, (81349) M2726/69-001		EA	1
8	6640-00-883-8516	CYLINDER (14674)3022-100		EA	2
9	6640-00-290-6569	CYLINDER (14674) 3024-5		EA	1
10	8120-01-315-8703	CYLINDER, PROPANE (70785) TX-9		EA	1
11		DISTILLATION UNIT (97403) 13225E8499		EA	1
12	4730-01-158-8417	FITTING (93061) 125HBL-6-4		EA	1
13	6230-00-163-1856	FLASHLIGHT (58536) A-A-1 974		EA	1
14	6640-00-423-8500	FLASK, DISTILLATION (58536) A-A-51103		EA	1

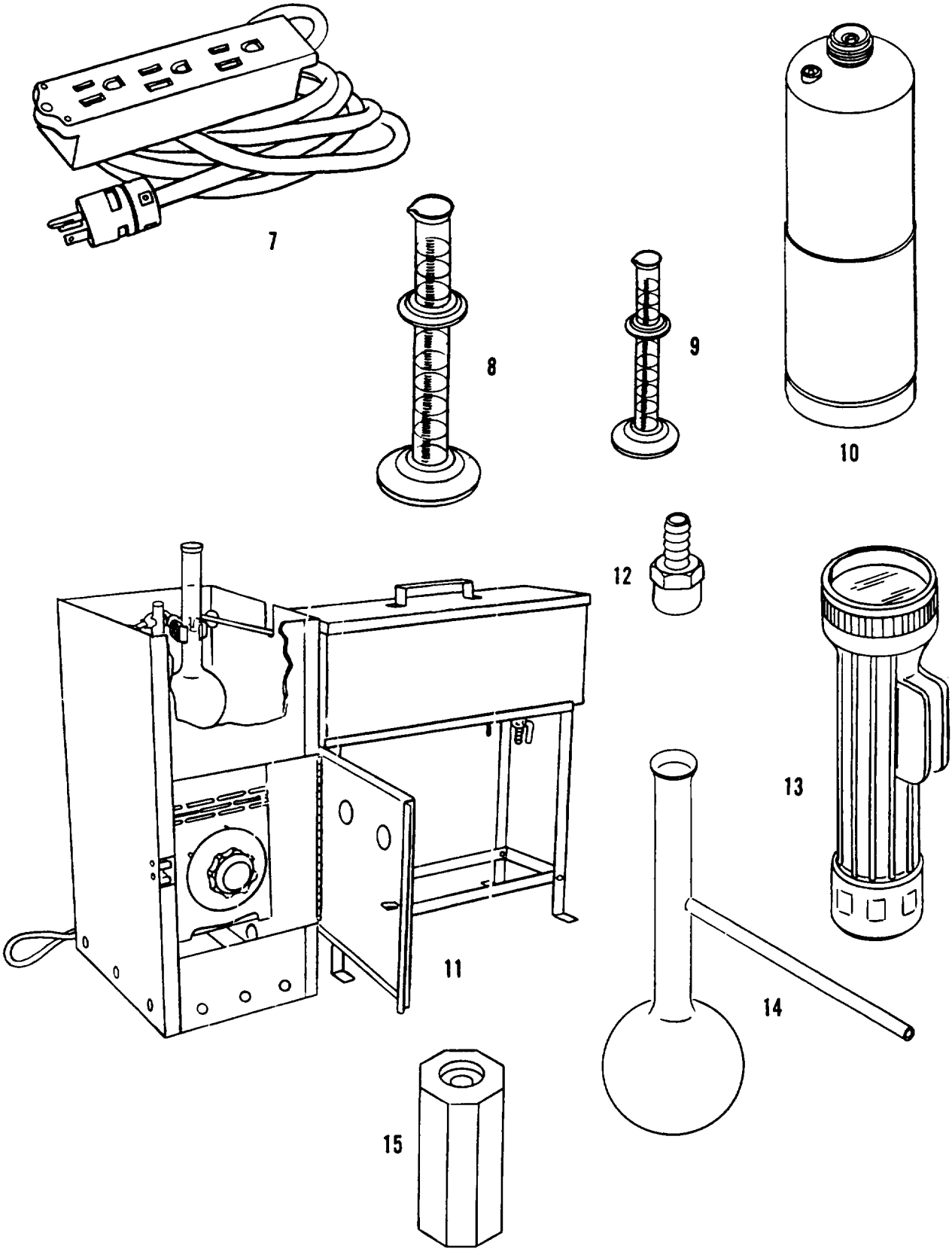
Section II. COMPONENTS OF END ITEM LIST - cont.

(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION, CAGEC and Part Number	Usable On Code	(4) U/M	(5) QTY Reqd
15		HOLDER (97403) 13225E8527		EA	1
16	6640-00-359-9870	JAR, CYLINDRICAL, LABORATORY (22527) 13-476		EA	2
17		OIL DRUM THIEF, LWR (97403) 13225E8507		EA	1
18		OIL DRUM THIEF, UPR (97403) 13225E8506		EA	1
19	6630-00-151-5310	SAMPLING/GAGING KIT (81349) MIL-T-51028		EA	1
20	6640-00-531-5022	STIRRER, SLOW SPEED (48619) 75765		EA	1
21	6645-00-250-4680	STOP WATCH (58536) A-A-2580		EA	1
22	STRAP ASSEMBLY	(97403) 13220E5288-3		EA	1
23		STRAP ASSEMBLY (97403) 13225E8518		EA	1
24	5340-01-162-4324	STRAP ASSEMBLY (97403) 13225E5288-2		EA	1
25	5340-01-165-3721	STRAP ASSEMBLY (97403) 13225E5288-4		EA	1
26	6640-00-359-9995	SWAB (48619) 76018		EA	1
27	6630-00-530-0987	TESTER, FLASH POINT CLOSED TYPE 115 V 60HZ AC (48619) 74537		EA	1
28		THERMOMETER, SPEC 7C (22527) 13-481		EA	5
29		THERMOMETER, SPEC 8C (22527) 13-482		EA	4
30	6685-01-070-0716	THERMOMETER, SPEC 9C (95059) 13-501		EA	3

Section II. COMPONENTS OF END ITEM - cont.

(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION CAGE and Part Number	Usable on Code	(4) U/M	(5) QTY. RQD
31	4720-00996-0362	TUBING, RUBBER, 1/8 ID (81348) ZZ-T-831GRADEBHEAVYWALL		EA	1
32	4720-00-954-7463	TUBING, RUBBER, 3/8 ID (81348) ZZ-T-831GRADEAEXTRAHEAVYWALL		EA	1
33		VALVE, PROPANE CYLINDER (97403) 13225E8502		EA	1
34	5120-00-2444389	WRENCH, BUNG, DOUBLE ENDED (81348) GGG-W-642		EA	1

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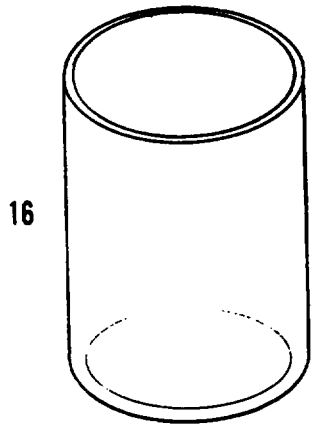
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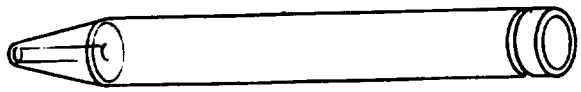
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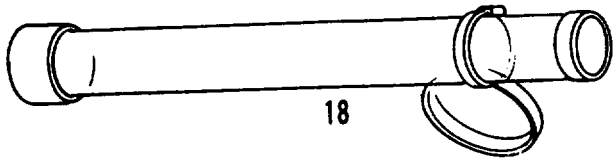
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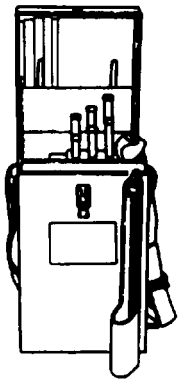
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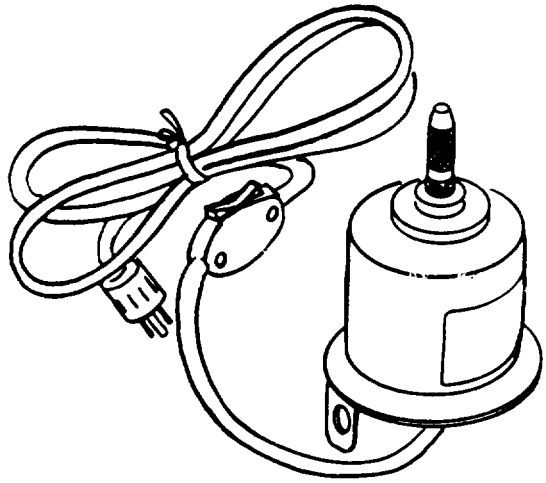
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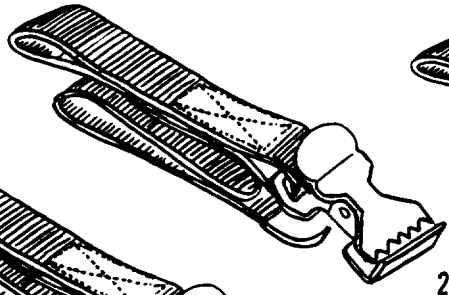
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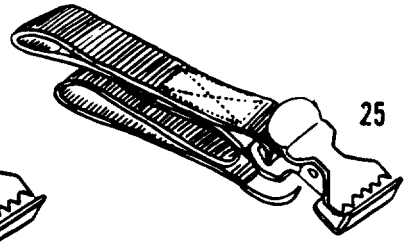
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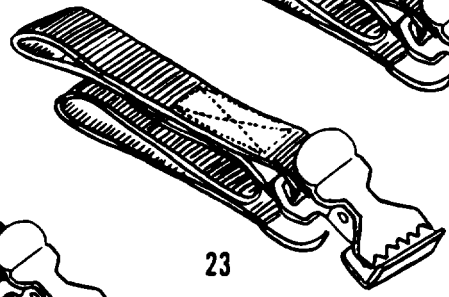
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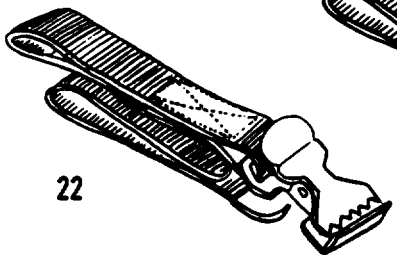
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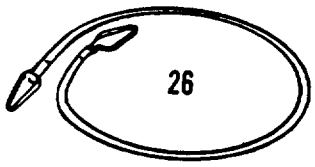

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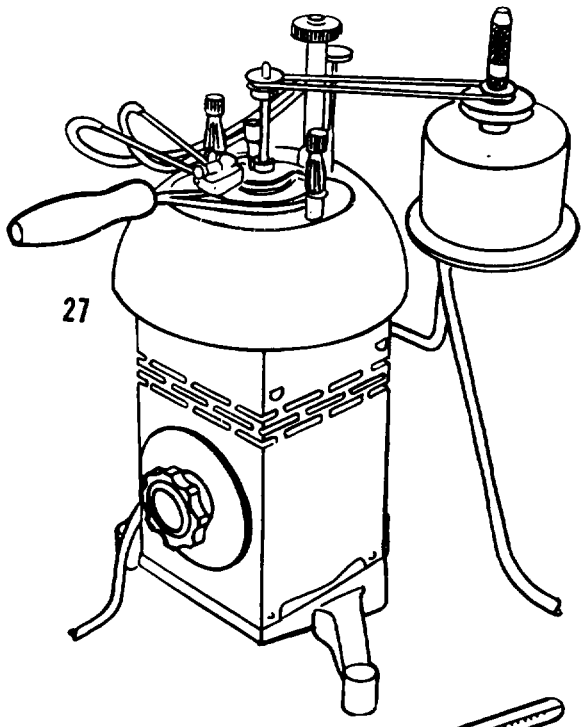

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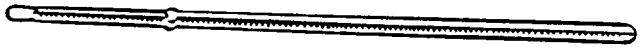

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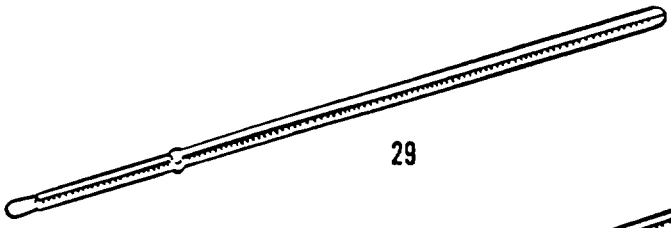

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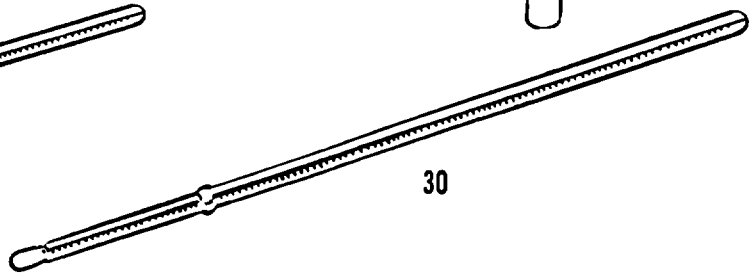

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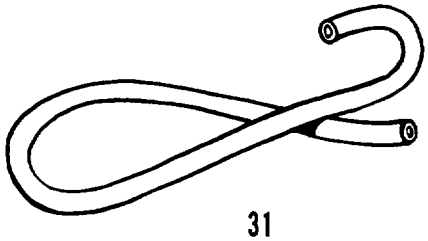

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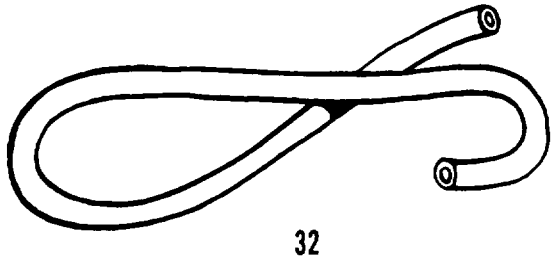

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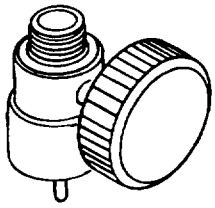

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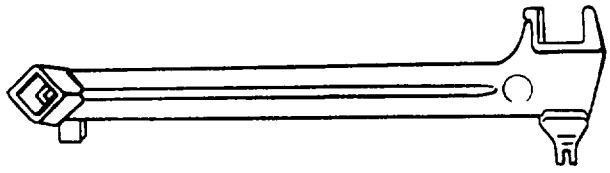

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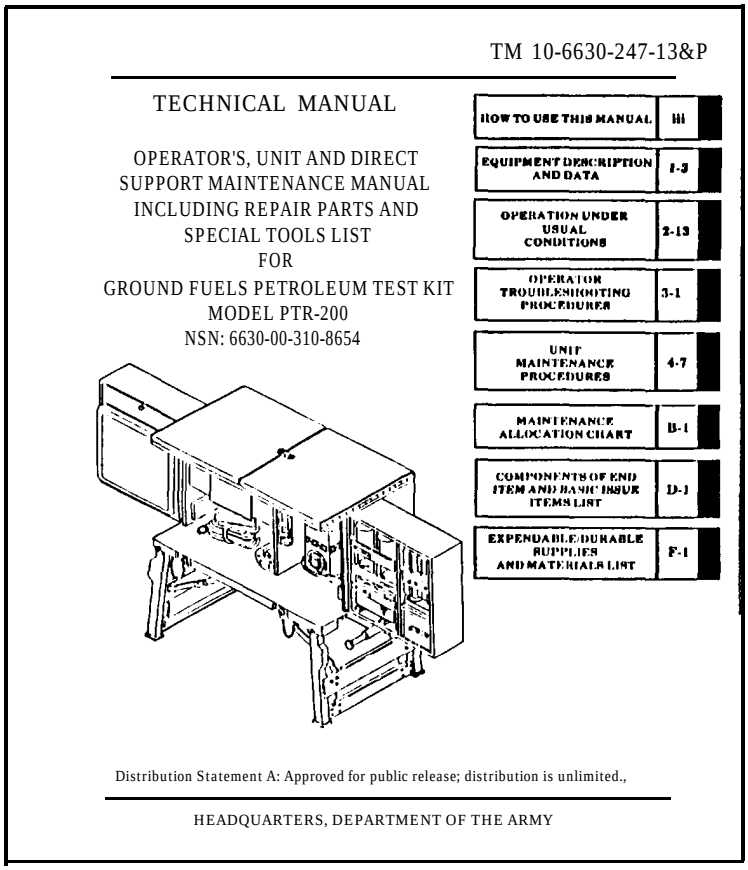
Section III. BASIC ISSUE ITEMS

(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION CAGE and Part Number Usable on Code	(4) U/M	(5) QTY. RQD
1		TECHNICAL MANUAL, OPERATORS UNIT AND DIRECT SUPPORT MAINTENANCE MANUAL FOR GROUND FUELS PETROLEUM TEST KIT, TM 10-6630-247-13&P	EA	1



TM 10-6630-247-13&P

TECHNICAL MANUAL

OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE MANUAL INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST FOR GROUND FUELS PETROLEUM TEST KIT MODEL PTR-200 NSN: 6630-00-310-8654

Distribution Statement A: Approved for public release; distribution is unlimited.,

HEADQUARTERS, DEPARTMENT OF THE ARMY

APPENDIX E

ADDITIONAL AUTHORIZATION LIST

Section I. INTRODUCTION

E-1 SCOPE.

This appendix lists additional items that you are authorized for the support of the Ground Fuels Petroleum Test Kit.

E-2. GENERAL.

This list identifies items that do not have to accompany the Ground Fuels Petroleum Test Kit and that do not have to be turned in with it. These items are all authorized to you by CFTA, MTOE, TDA, or JTA.

E-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
5120-01-289-4310	Riviter, Blind, Hand (32048) 200-GK	EA	1

APPENDIX F

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

F-1. SCOPE.

This appendix lists expendable/durable supplies and materials you will need to operate and maintain the Ground Fuels Petroleum Test Kit, 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/Durable Items (Except Medical, Class V, Repair Parts, and Heraldic Items), or CTA 8-100, Army Medical Department Expendable/Durable Items.

F-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., "Drycleaning solvent (App F)."

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
G - General 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/DURABLE SUPPLIES LIST

(1) ITEM NO.	(2) CATEGORY	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
1	0	8040-00-117-8510	Adhesive, Sealant Type II (81349) MIL-A-46146	TU
2	0	7920-00-205-1711	Rags, wiping (58536) A-A-531	LB
3	0	8125-00-409-7675	Stoppers Cork, Assorted, Size 0 to 11 (11273) 12402	EA

APPENDIX G
LUBRICATION INSTRUCTIONS

NOT APPLICABLE

APPENDIX H

ILLUSTRATED LIST OF MANUFACTURED ITEMS

H-1. INTRODUCTION.

a. This appendix includes complete instructions for making items authorized by RPSTL to be manufactured.

b. Table H-1 provides a part number index to all manufactured items identified in the RPSTL and a cross-reference to the figure that provides manufacturing instructions.

H-2. FABRICATION INSTRUCTIONS.

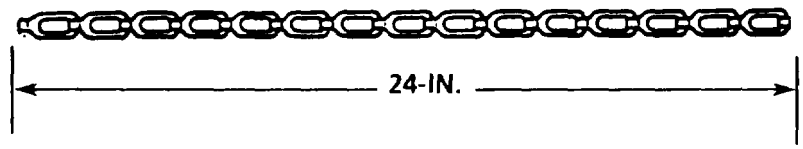
a. Fabrication instructions are contained within each figure. If only one dimension is identified, the bulk material is supplied in the correct width. Only the length of the material must be cut to the required dimension.

b. All bulk materials needed to manufacture the part are listed by part number or specification number on each figure.

Table H-1. Part Number Index to Manufactured Parts

Part Number	Description	Figure	RPSTL Fig-Item
13218E0025-43	Chain, Weldless	H-1	4-35
13218E0025-43	Chain, Weldless	H-2	5-58
13218E0025-43	Chain, Weldless	H-3	3-17
13225E8515-101	Foam	H-4	5-37
13225E8515-103	Foam	H-5	5-24
13225E8515-107	Foam	H-6	5-25
13225E8515-24	Rubber, Cellular	H-7	5-14
13225E8515-25	Webbing, Textile	H-8	5-12
13225E8515-26	Fastener, Tape	H-9	5-13
13225E8515-47	Foam	H-10	5-61
13225E8515-59	Foam	H-11	5-57
13225E8515-62	Foam	H-12	5-54
13225E8515-62	Foam	H-13	5-55
13225E8515-86	Foam	H-14	5-52
13225E8515-87	Foam	H-15	5-23
13225E8515-88	Foam	H-16	5-56
13225E8515-93	Foam	H-17	5-20
13225E8515-95	Foam	H-18	5-28
13225E8515-96	Foam	H-19	5-27
13225E8515-97	Foam	H-20	5-26
ZZ-T-831A	Tubing	H-21	4-17
ZZ-T-831B	Tubing	H-22	4-18

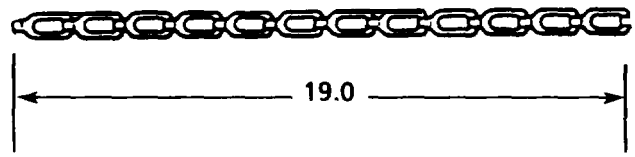
H-2. FABRICATION INSTRUCTIONS.



MAKE FROM RR-C-271, TY2, CLASS 3, SIZE 35.
CUT TO LENGTH.

NOTE: ALL DIMENSIONS IN INCHES.

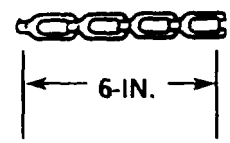
Figure H-1. Chain, Weldless, Loading Plan (13218EO025-43).



MAKE FROM RR-C-271, TY2, CLASS 7, SIZE 35.
CUT TO LENGTH.

NOTE: ALL DIMENSIONS IN INCHES.

Figure H-2. Chain, Weldless (13218EO025-43)

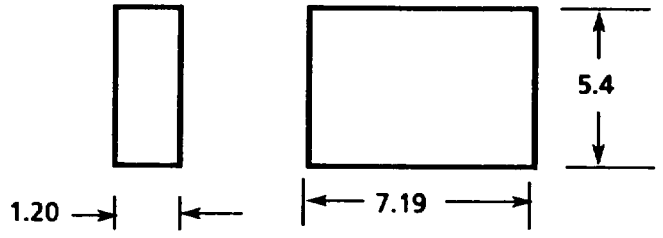


MAKE FROM RR-C-271,TY2, CLASS 3, SIZE 35.
CUT TO LENGTH.

NOTE: ALL DIMENSIONS IN INCHES.

Figure H-3. Chain, Weldless (13218EO025-43)

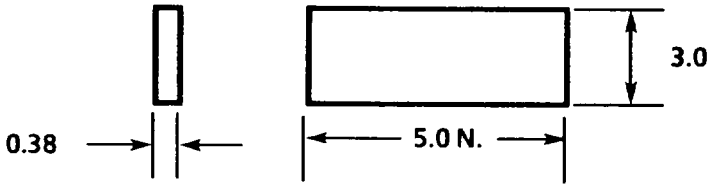
H-2. FABRICATION INSTRUCTIONS - cont.



MAKE FROM MIL-P-26514, TY1CL2 GRC.
CUT TO TO DIMENSIONS SHOWN.

NOTE: ALL DIMENSIONS IN INCHES.

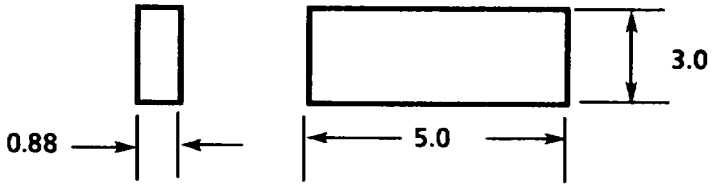
Figure H-4. Foam (13225E8515-101).



MAKE FROM MIL-P-26514, TY1CL2 GR C.
CUTTOTO DIMENSIONS SHOWN.

NOTE: ALL DIMENSIONS IN INCHES.

Figure H-5. Foam (13225E8515-103).



MAKE FROM MIL-P-26514, TY1CL2 GR C.
CUT TO TO DIMENSIONS SHOWN.

NOTE: ALL DIMENSIONS IN INCHES.

Figure H-6. Foam (13225E8515-107).

H-2. FABRICATION INSTRUCTIONS - cont.

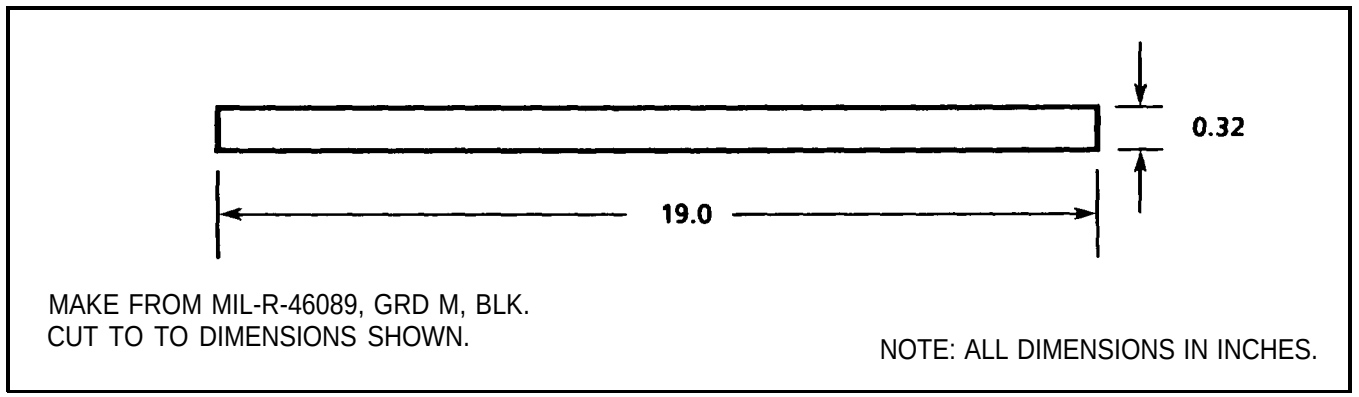


Figure H-7. Rubber, Cellular (13225E8515-24).

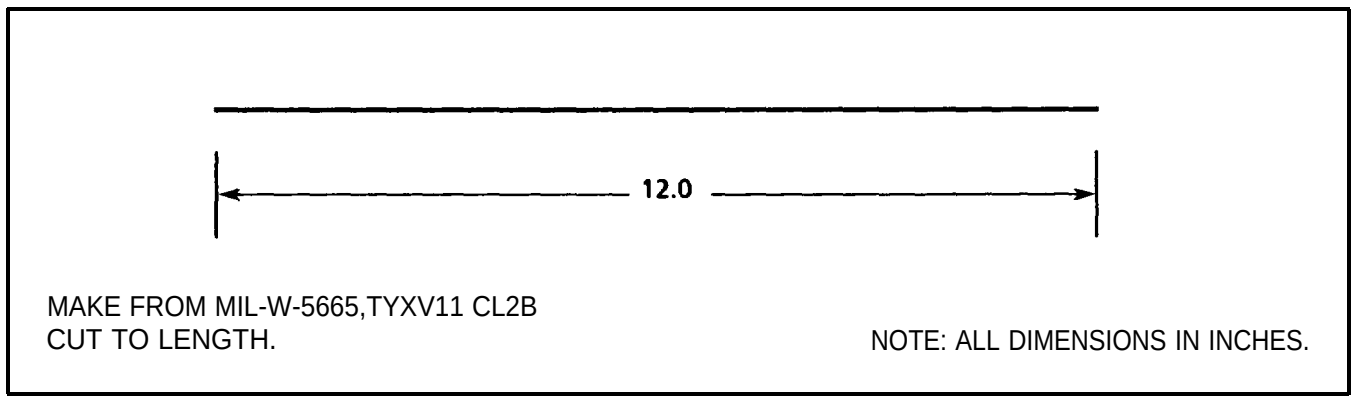


Figure H-8. Webbing, Textile (13225E8515-25).

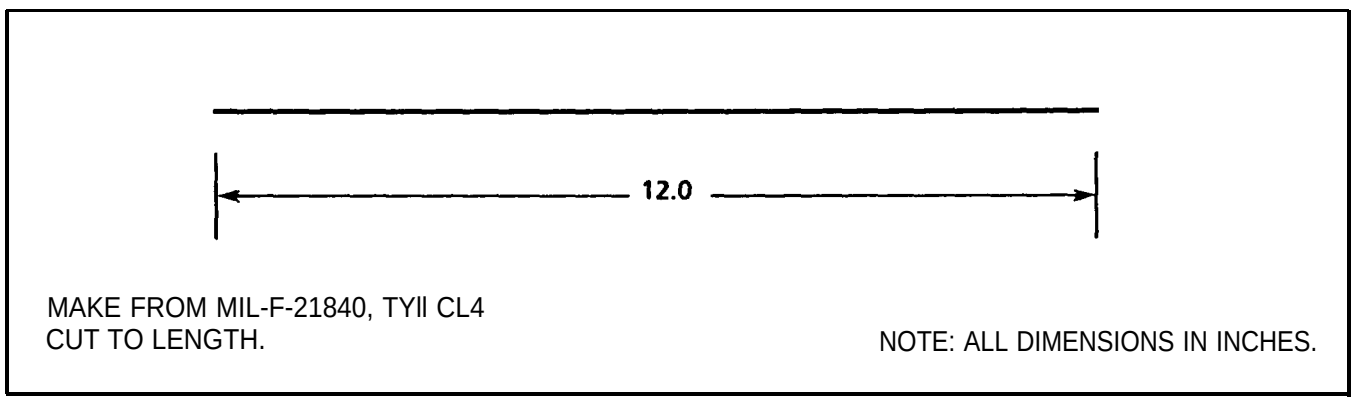
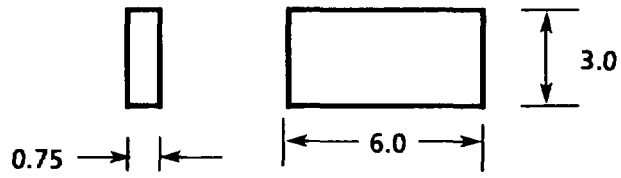


Figure H-9. Fastener, Tape (13225E8515-26).

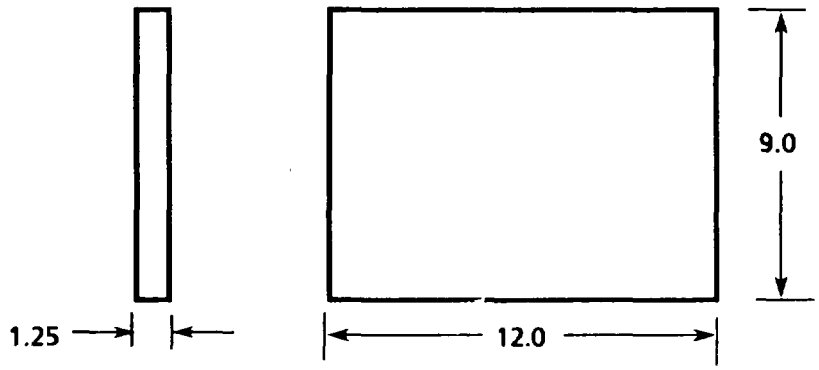
H-2. FABRICATION INSTRUCTIONS - cont.



MAKE FROM MIL-P-26514, TY1CL2 GR C.
CUT TO TO DIMENSIONS SHOWN.

NOTE: ALL DIMENSIONS IN INCHES.

Figure H-10. Foam (13225E8515-47).

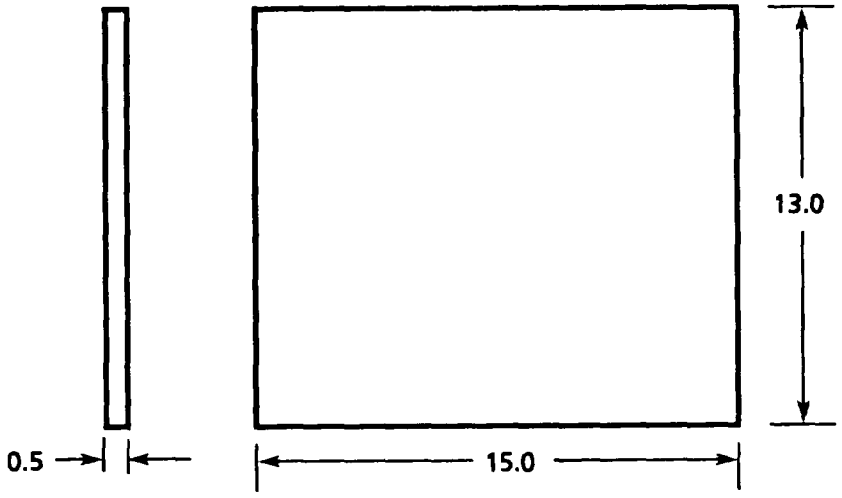


MAKE FROM MIL-P-26514, TY1CL2 GR C.
CUT TO TO DIMENSIONS SHOWN.

NOTE: ALL DIMENSIONS IN INCHES.

Figure H-n. Foam (13225E8515-59).

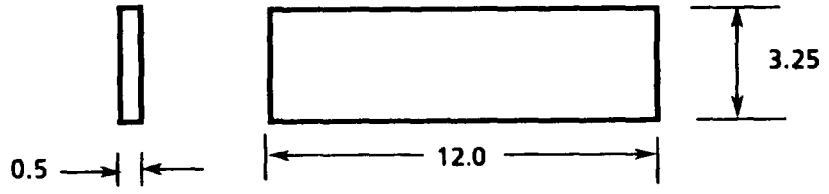
H-2. FABRICATION INSTRUCTIONS - cont.



MAKE FROM MIL-P-26514, TY1CL2 GR C.
CUT TO TO DIMENSIONS SHOWN.

NOTE: ALL DIMENSIONS IN INCHES.

Figure H-12. Foam (13225E8515-62).

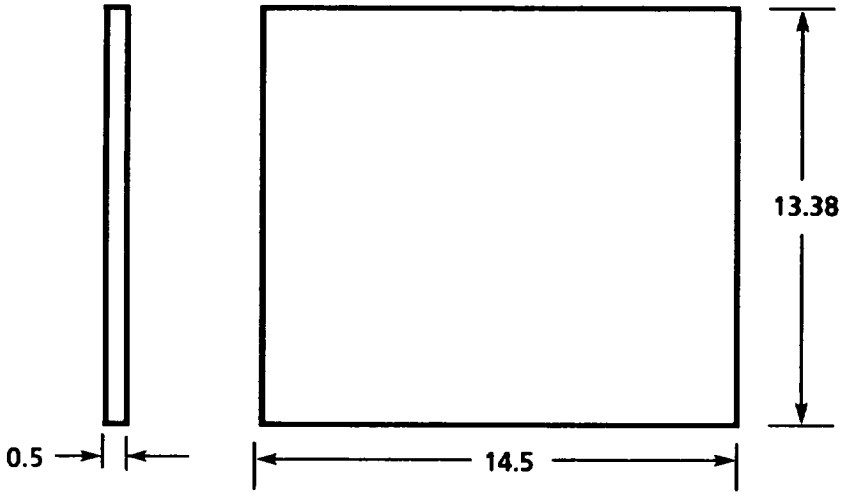


MAKE FROM MIL-P-26514, TY1CL2 GR C.
CUT TO TO DIMENSIONS SHOWN.

NOTE: ALL DIMENSIONS IN INCHES.

Figure H-13, Foam (13225E8515-88).

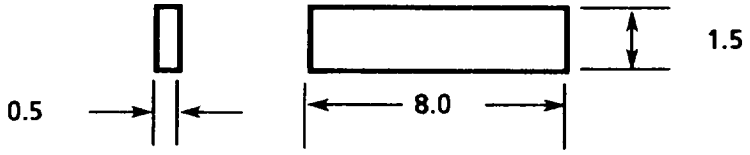
H-2. FABRICATION INSTRUCTIONS - cont.



MAKE FROM MIL-P-26514, TY1CL2 GR C.
CUT TO TO DIMENSIONS SHOWN,

NOTE: ALL DIMENSIONS IN INCHES.

Figure H-14. Foam (13225E8515-86).

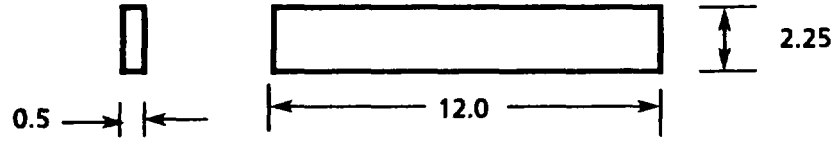


MAKE FROM MIL-P-26514, TY1CL2 GR C.
CUT TO TO DIMENSIONS SHOWN.

NOTE: ALL DIMENSIONS IN INCHES.

Figure H-15. Foam (13225E8515-87).

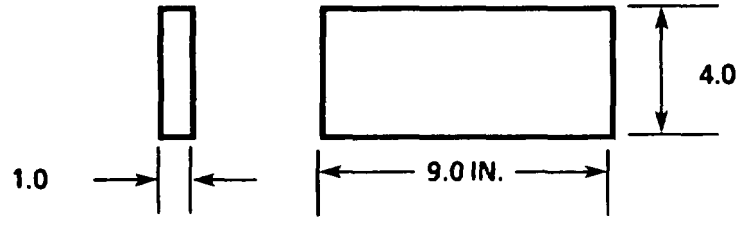
H-2. FABRICATION INSTRUCTIONS - cont.



MAKE FROM MIL-P-26514, TY1CL2 GR C.
CUT TO TO DIMENSIONS SHOWN.

NOTE: ALL DIMENSIONS IN INCHES.

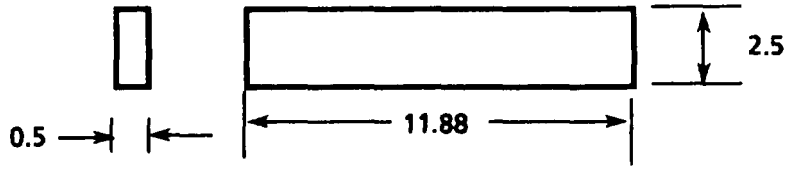
Figure H-16. Foam (13225E8515-88).



MAKE FROM MIL-P-26514, TY1 CL2 GR C.
CUT TO TO DIMENSIONS SHOWN.

NOTE: ALL DIMENSIONS IN INCHES.

Figure H-17. Foam (13225E8515-93).

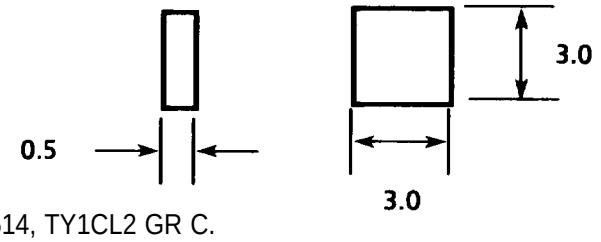


MAKE FROM MIL-P-26514, TY1CL2 GR C.
CUT TO TO DIMENSIONS SHOWN.

NOTE: ALL DIMENSIONS IN INCHES.

Figure H-18. Foam (13225E8515-95).

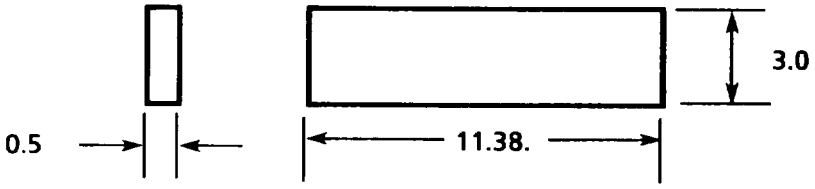
H-2. FABRICATION INSTRUCTIONS - cont.



MAKE FROM MIL-P-26514, TY1CL2 GR C.
CUT TO TO DIMENSIONS SHOWN.

NOTE: ALL DIMENSIONS IN INCHES.

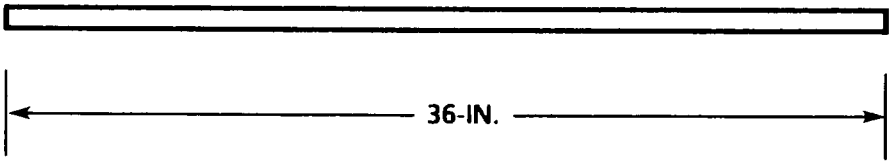
Figure H-19. Foam (13225E8515-96).



MAKE FROM MIL-P-26514, TY1CL2 GR C.
CUT TO TO DIMENSIONS SHOWN.

NOTE: ALL DIMENSIONS IN INCHES.

Figure H-20. Foam (13225E8515-97).

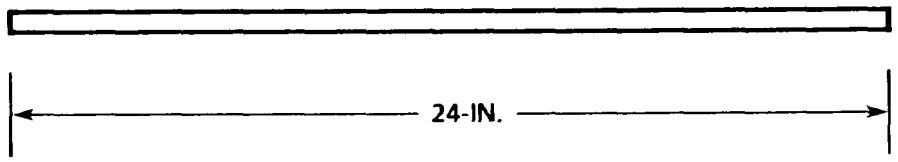


MAKE FROM ZZ-T-831A, TY1CL1, 3/8 ID X 1/16 WALL.
CUT TO LENGTH.

NOTE: ALL DIMENSIONS IN INCHES.

Figure H-21. Tube (ZZ-T-831A).

H-2. FABRICATION INSTRUCTIONS - cont.



MAKE FROM ZZ-T-831B, TY1CL1, 1/8 ID X 1/32 WALL.
CUT TO LENGTH.

NOTE: ALL DIMENSIONS IN INCHES.

Figure H-22. Tube (ZZ-T-831B).

APPENDIX I

TORQUE LIMITS

FASTENER	TYPE	MIN TENSILE STRNGN.	MATERIAL	BODY SIZE OR OUTSIDE DIAMETER OF FASTENER														
				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	74,000 PSI	LOW CARBON STEEL	206	310	480	675	900	1100	1470	1900	2360	2750	3450	4400	7350	9500	
	SAE 3	100,000 PSI	MEDIUM CARBON STEEL	372	551	872	1211	1624	1943	2660	3463	4695	5427	7226	8049	13450	17548	
	SAE 5	120,000 PSI	MEDIUM CARBON HEAT TREAT STEEL	382	587	794	1105	1500	1775	2425	3150	4200	4550	6550	7175	13000	16000	
	SAE 6	133,000 PSI	MEDIUM CARBON STEEL QUENCHED TEMPERED	550	825	1304	1815	2434	2913	3985	5189	6980	7491	10825	14983	20151	26286	
	SAE 7	133,000 PSI	MEDIUM CARBON ALLOY STEEL	570	840	1325	1825	2500	3000	4000	5300	7000	7500	11000	15500	21000	27000	
	SAE 8	150,000 PSI	MEDIUM CARBON ALLOY STEEL	600	900	1430	1975	2650	3200	4400	5650	7600	8200	12000	17000	23000	29000	
	SOCKET HEAD CAP SCREW	160,000 PSI	HIGH CARBON CASE HARDENED STEEL	640	970	1520	2130	2850	3450	4700	6100	8200	8800	13000	18000	24000	31000	
	SOCKET SET SCREW	212,000 PSI	HIGH CARBON CASE HARDENED STEEL															
	MACHINE SCREW YELLOW BRASS	60,000 PSI	COPPER (CU) 63% ZINC (ZU) 37%	160	215	325	400		595									
	SILICONE BRONZE TYPE "B"	70,000 PSI	COPPER (CU) 96% ZINC (ZNI) 2% SILICON (SI) 2%	180	250	365	450		655									

There is no difference in the above chart between the torque figures for fine or coarse threads. The torque figures for a finely-threade fastener as compared to a coarse-ly-threaded fastener of the same diameter may be slightly higher but hardly worth mentioning.

APPENDIX I

TORQUE LIMITS - cont.

FASTENER	TYPE	MIN. TENSILE STRNGN.	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	3/8	3/4
	SAE 0-1-2	74,000 PSI	LOW CARBON STEEL								6	12	20	32	47	69	98	155
	SAE 3	100,000 PSI	MEDIUM CARBON STEEL								9	17	30	47	69	103	145	234
	SAE 5	120,000 PSI	MEDIUM CARBON HEAT TREAT STEEL								10	19	33	54	78	114	154	257
	SAE 6	133,000 PSI	MEDIUM CARBON STEEL QUENCHED TEMPERED								12.5	24	43	69	108	150	209	350
	SAE 7	133,000 PSI	MEDIUM CARBON ALLOY STEEL								13	25	44	71	110	154	215	360
	SAE 8	150,000 PSI	MEDIUM CARBON ALLOY STEEL								14	29	47	78	119	169	230	380
	SOCKET HEAD CAP SCREW	160,000 PSI	HIGH CARBON CASE HARDENED STEEL	TORQUE VALUES: All figures are foot-pounds except those marked with an asterisk (*), which are inch-pounds.							16	33	54	84	125	180	250	400
	SOCKET SET SCREW	212,000 PSI	HIGH CARBON CASE HARDENED STEEL					9*	16*	30*	70*	140*	18	29	43	63	100	146
	MACHINE SCREW YELLOW BRASS	60,000 PSI	COPPER (CU) 63% ZINC (ZU) 37%	2*	3.3*	4.4*	6.4*	8*	16*	20*	65*	110*	17	27	37	49	78	104
	SILICONE BRONZE TYPE "B"	70,000 PSI	COPPER (CU) 96% ZINC (ZNI) 2% SILICON (SI) 2%	2.3*	3.7*	4.9*	7.2*	10*	19*	22*	70*	125*	20	30	41	53	88	117

There is no difference in the above chart between the torque figures for fine or coarse threads. The torque figures for a finely-threaded fastener as compared to a coarse-ly-threaded fastener of the same diameter may be slightly higher but hardly worth mentioning.

MANDATORY REPLACEMENT PARTS

ITEM NO.	NONMENCLATURE	PART NUMBER
1	LOCKWASHER	MS35338-41
2	COTTER PIN	MS24665-283
3	RIVET,BLIND	MS20604AD5W4
4	RIVET,BLIND	MS20604AD5W6
5	RIVET,BLIND	MS20604AD5W2
6	RIVET,BLIND	MS20604AD5W5
7	RIVET,SOLID	MS20470AD4-6
8	RIVET,BLIND	MS20604AD4W3
9	RIVET,BLIND	MS20604AD4W4
10	RIVET,BLIND	MS20604AD6W4
11	RIVET,BLIND	MS20604AD3W2
12	PIN,SPRING	MS171657
13	PIN,SPRING	MS171652

ALPHABETICAL INDEX

ALPHABETICAL INDEX-cont.

ALPHABETICAL INDEX-cont.

ALPHABETICAL INDEX-cont.

By Order of the Secretary of the Army:

GORDON R. SULLIVAN
General, United States Army
Chief of Staff

Official:

MILTON H. HAMILTON
Administrative Assistant to the
Secretary of the Army
06319

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RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

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Key West, FL 33040

DATE SENT
10 Jun 79

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 9-1430-550-34-1	7 Sep 72 .	Unit of Radar Set AN/MPQ-50 Tested at the HFC

BE EXACT PIN-POINT WHERE IT IS

PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO
9-19		9-5	
21-2	step 1C	21-2	

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

"B" Ready Relay K11 is shown with two #9 contacts. That contact which is wired to pin 8 of relay K16 should be changed to contact #10.

Reads: Multimeter B indicates 600 K ohms to 9000 K ohms.

Change to read: Multimeter B indicates 600 K ohms minimum.

Reason: Circuit being checked could measure infinity. Multimeter can read above 9000 K ohms and still be correct.

SAMPLE

PRINTED NAME GRADE OR TITLE AND TELEPHONE NUMBER
SP4 J.T. Brown, Jr.

SIGN HERE
SP4 James Brown, Jr.

DA FORM 2 JUL 79 2028-2

REPLACES DA FORM 2028-2 1 APR 78 WHICH WILL BE USED UNTIL EXHAUSTED
AMSAV M Overprint 3, 1 Mar 91

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TM 10-6630-247-13&P	18 JAN 94	GROUND FUELS PETROLEUM TEST KIT MODEL PTK-200

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PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO

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PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 10-6630-247-13&P	18 JAN 94	GROUND FUELS PETROLEUM TEST KIT MODEL PTK-200

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PAGE NO	PARAGRAPH	FIGURE NO	TABLE NO

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The Metric System and Equivalents

Linear Measures

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 dekagram = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quints] = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measures

1 centiliter = 10 milliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters .2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measures

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .366 sq. mile -

Cubic Measures

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feat

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square mites	square kilometers	2.580	square meters	square yards	1.496
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29,573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.356	metric tons	short tons	1.102
pound-inches	newton-meters	.11296			

Temperature (Exact)

°F Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

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