TECHNICAL MANUAL

OPERATOR'S AND ORGANIZATIONAL

MAINTENANCE MANUAL

SHELTER SYSTEM, COLLECTIVE PROTECTION,

CHEMICAL-BIOLOGICAL: INFLATABLE,

TRAILER-TRANSPORTED, M51

NSN 4240-00-854-4144

This copy is a reprint which includes current pages from Changes 1 through 4.

HEADQUARTERS, DEPARTMENT OF THE ARMY

AUGUST 1975

WARNING

Do not unload trailer before lowering rear support leg. Failure to comply may result in overturning trailer and subsequent injury to personnel and damage to equipment.

Shelter in carrying case weighs approximately 314 pounds. When lifting, be careful to avoid injury to personnel, and damage to the shelter and carrying case.

Entrance weighs approximately 250 pounds. When lifting, be careful to avoid injury to personnel and damage to the entrance.

When handling the support rack, keep handles extended out to prevent injury to fingers.

Be careful when handling entrance. Protect against tears and abrasions. Failure to comply may result in DEATH or serious illness to occupants.

Be sure that trailer grounding wire is attached to anchor prior to starting gasoline engine.

DO NOT WALK ON THE FABRIC. Be extremely careful when handling the shelter. Protect against tears and abrasions. Failure to comply may result in DEATH or serious illness to occupants.

The gas and particulate filters used in the M51 shelter system do not provide protection against carbon monoxide.

Do not apply contents of M11 decontaminating apparatus on hot surfaces. Container holds combustible DS2 solution.

Use extreme caution when applying heat to engine with open flame. Death or serious burns may result if flame is concentrated on or near fuel tank.

Avoid vapors and prolonged skin contact with hydraulic lubrication oil. Failure to comply may result in lung, skin, and eye irritation.

When using the adhesive and cleaning solvent, keep open flame away from working area. Have working area well ventilated. DEATH or severe burns may result if personnel fail to observe safety precautions.

The unit commander or senior officer in charge of personnel assigned to remove and dispose of contaminated gas and particulate filters must prescribe the necessary protective clothing to be worn during this operation. He must also prescribe the necessary safety measures to be followed, including the decontamination operations that must be performed before new filters are installed in the filter unit (TM 3-220).

HIGHLY INFLAMMABLE MATERIAL. When draining gasoline from the fuel tank, keep open flame away from working area. DEATH or severe burns may result if personnel fail to observe safety precautions.

When draining gasoline from the fuel tank, use an approved receptacle to catch the gasoline.

Observe the applicable Surface Danger Zones contained in AR 385-63 for hazards or ricochet from gunfire.

TM 3-4240-264-12
C5

CHANGE

NO. 5

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, 28 May 1990

TECHNICAL MANUAL
OPERATOR'S ORGANIZATIONAL MAINTENANCE MANUAL
FOR
SHELTER SYSTEM COLLECTIVE PROTECTION,
CHEMICAL-BIOLOGICAL: INFLATABLE TRAILER-TRANSPORTED, M51

TM 3-4240-264-12, 5 August 1975, and changes 1 thru 4 are changed as follows:

1. The purpose of this change is to update guidance for disposal, handling, and storage of filters.

2. New or changed material is indicated by a vertical bar in the margin of the page.

3. Delete entire warning page on inside cover with pen and ink.

4. Remove old pages and insert new pages as follows:

Remove Pages	Insert Pages
None	a and b
4-37 and 4-38	4-37 and 4-38
4-77 and 4-78	4-77 and 4-78
A-1 and A-2	A-1 and A-2

4. File this change sheet in front of the publication for reference purposes.

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

WILLIAM J. MEEHAN II
Brigadier General, United States Army
The Adjutant General

Distribution:

To be distributed in accordance with DA Form 12-28 (block 137), maintenance requirements for TM 3-4240-264-12.

CHANGE
No. 4

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON DC, *23 September 1981*

Operator's and Organizational Maintenance Manual
SHELTER SYSTEM, COLLECTIVE PROTECTION, CHEMICAL-BIOLOGICAL: INFLATABLE, TRAILER-TRANSPORTED, M51
(NSN 4240-00-854-4144)

TM 3-4240-264-12, 29 August 1975, is changed as follows:
1. This change is prepared for replacement of the aluminum fuel tank with a steel fuel tank, and deletion of the fuel tank drain procedure.
2. Remove old pages and insert new pages as indicated below.

Remove Pages	*Insert Pages*
3-25 through 3-28	3-25 through 3-28
4-61 and 4-62	4-61 and 4-62
C-3 through C-6	C-3 through C-6
Index 1 and Index 2	Index l and Index 2

3. New or changed material is indicated by a vertical bar in the left margin of the page.
4. File this change sheet in front of the publication for reference purposes.

By Order of the Secretary of the Army:

E. C. MEYER
General, United States Army
Chief of Staff

Official:

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

Distribution:
To redistributed in accordance with DA Form 12-28, Operator maintenance requirements for Collective Protection Equipment, Field and Shelters.

WARNING

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Avoid vapors and prolonged skin contact with hydraulic lubrication oil. Failure to comply may result in lung, skin, and eye irritation.

When using the adhesive and cleaning solvent, keep open flame away from working area. Have working area well ventilated. DEATH or severe burns may result if personnel fail to observe safety precautions.

The unit commander or senior officer in charge of maintenance personnel assigned to remove the contaminated gas and particulate filters must prescribe the necessary protective clothing (TM 10-277) to be worn during this operation He must also prescribe the necessary safety measures to be followed including the NBC decontamination (FM 3-5). This must be performed before the new filters are installed. Failure to wear protective clothing or follow safety measures may result in injury or death.

HIGHLY INFLAMMABLE MATERIAL. When draining gasoline from the fuel tank, keep open flame away from working area. DEATH or severe bums may result if personnel fail to observe safety precautions.

When draining gasoline from the fuel tank, use an approved receptacle to catch the gasoline.

Observe the applicable Surface Danger Zones contained in AR 385-63 for hazards or ricochet from gunfire.

WARNING

HEALTH/ENVIRONMENTAL HAZARD

Filters use ASC Whetlerite Carbon which contains Chromium VI. Chromium VI is a known carcinogen if inhaled or swallowed. Damaged or unusable filters are classified as hazardous waste:

DO NOT throw away damaged or unusable filters as ordinary trash.

DO turn in damaged or unusable filters to your hazardous waste management office or Defense Reutilization and Marketing Office (DRMO).

Filters are completely safe to handle and use if they are not damaged in such a way that carbon leaks from them. In unlikely event that carbon should leak, use protection such as a dust respirator to cover nose and mouth and put carbon in container such as self-sealing plastic bag; turn in to hazardous waste management office or DRMO.

Disposal of hazardous waste is restricted by the Resource Conservation and Recovery Act as amended (42 U.S.C.A sec 6901 et seq). Violation of these laws is subject to severe criminal penalties.

TECHNICAL MANUAL

No. 3-4240-264-12

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., *29 August 1976*

OPERATORS AND ORGANIZATIONAL MAINTENANCE MANUAL

SHELTER SYSTEM, COLLECTIVE PROTECTION CHEMICAL-BIOLOGICAL: INFLATABLE, TRAILER-TRANSPORTED, M51

(NSN 4240-00-854-4144)

LIST OF ILLUSTRATIONS

LIST OF TABLES

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1–1. Scope

These instructions are for use by the crew, operator, and organizational maintenance personnel. They apply to the M51 trailer-transported inflatable chemical-biological collective protection shelter system, hereinafter, referred teas the shelter system. The instructions contain information on the erection, operation, and maintenance of the equipment, as well as a description of the major systems and components and their functions in relation to other systems and components of the equipment.

1-2. Record and Report Forms

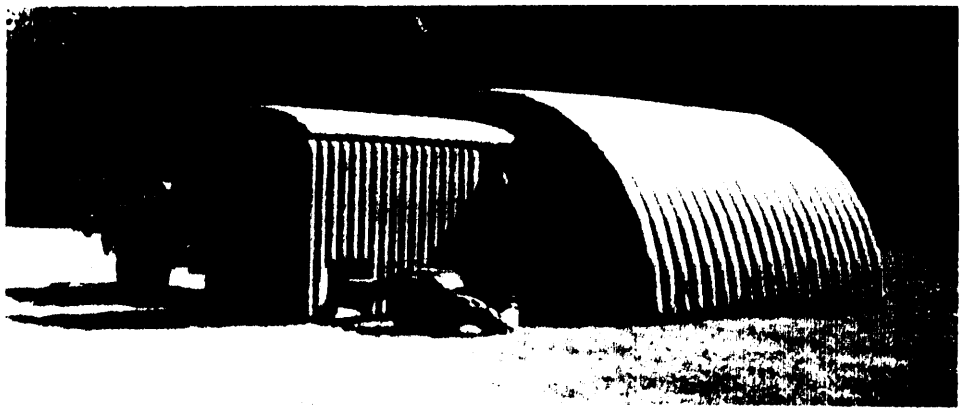
a. Equipment maintenance forms and procedures for their use are prescribed in TM 38-750.

b. You can improve this manual by recommending changes using DA Form 2028 (Recommended Changes to Publications and Blank Forms) or DA Form 2028-2 (Test) (Recommended Changes to Equipment Technical Manuals), located in the back of this manual. Mail the form direct to Commander, US Army Armament Materiel Readiness Command, ATTN: DRSAR–MAS–C, Aberdeen Proving Ground, MD 21010. A reply will be furnished to you.

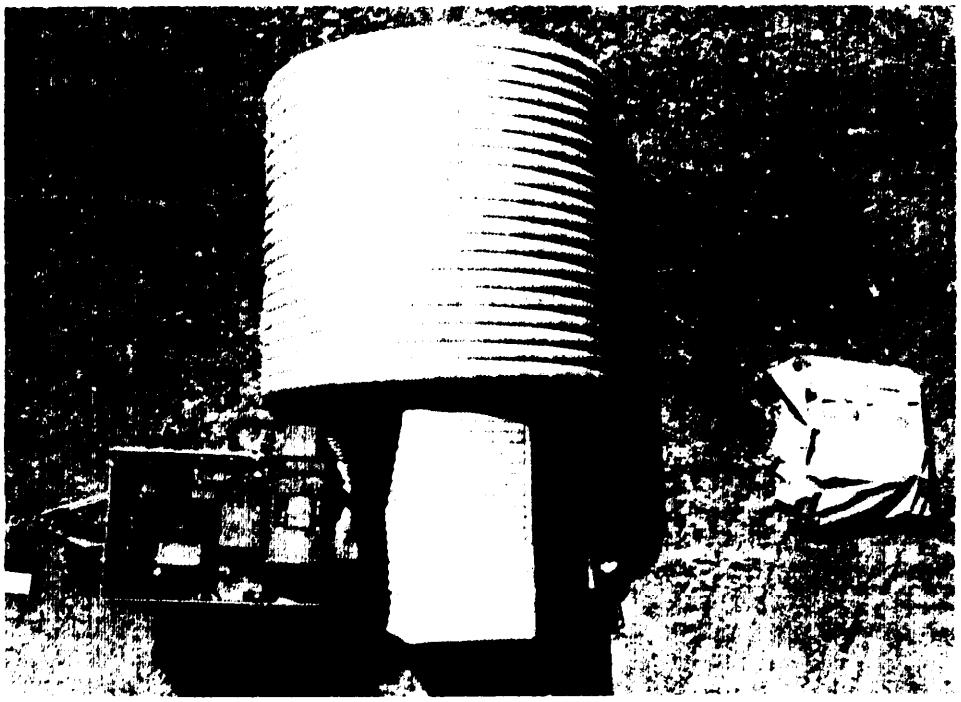
Section II. DESCRIPTION DATA

1–3. General

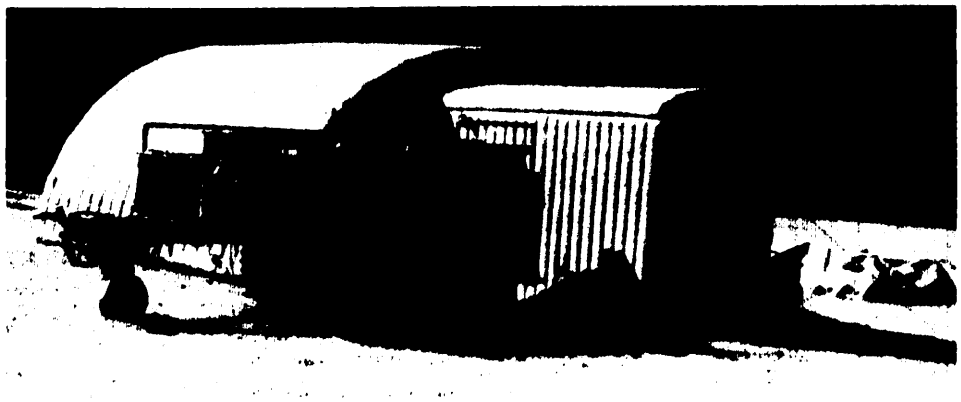
The shelter system (fig. 1-1) is a self-contained unit, designed to provide collective protection for 10 occupants against all known chemical-biological (CB) agents. It normally is deployed whenever a CB attack is anticipated or imminent. Using alternate erection procedures, it can be deployed during or immediately after a CB attack (contaminated environment). The shelter system can be stored or used in most climates and erected on most terrains. In normal weather, four men and a crew chief can remove the shelter system from the trailer and erect it in approximately 30 minutes. Disassembly and return to the transit configuration can also be accomplished in approximately 30 minutes. Basically the shelter system consists of an inflatable entrance, an inflatable shelter, a military standard gasoline engine, a gas-particulate filter assembly, an air conditioning system, heating system, centrifugal blower, generator, an entrance gas-particulate filter unit, an air-evacuation fan, emergency shelter supports, and the necessary cables, controls, and flexible ducts. A modified 2-wheel military standard model M105A2, 1½-ton trailer transports the system. The entire system can be air-dropped.



RIGHT FRONT THREE-QUARTER VIEW



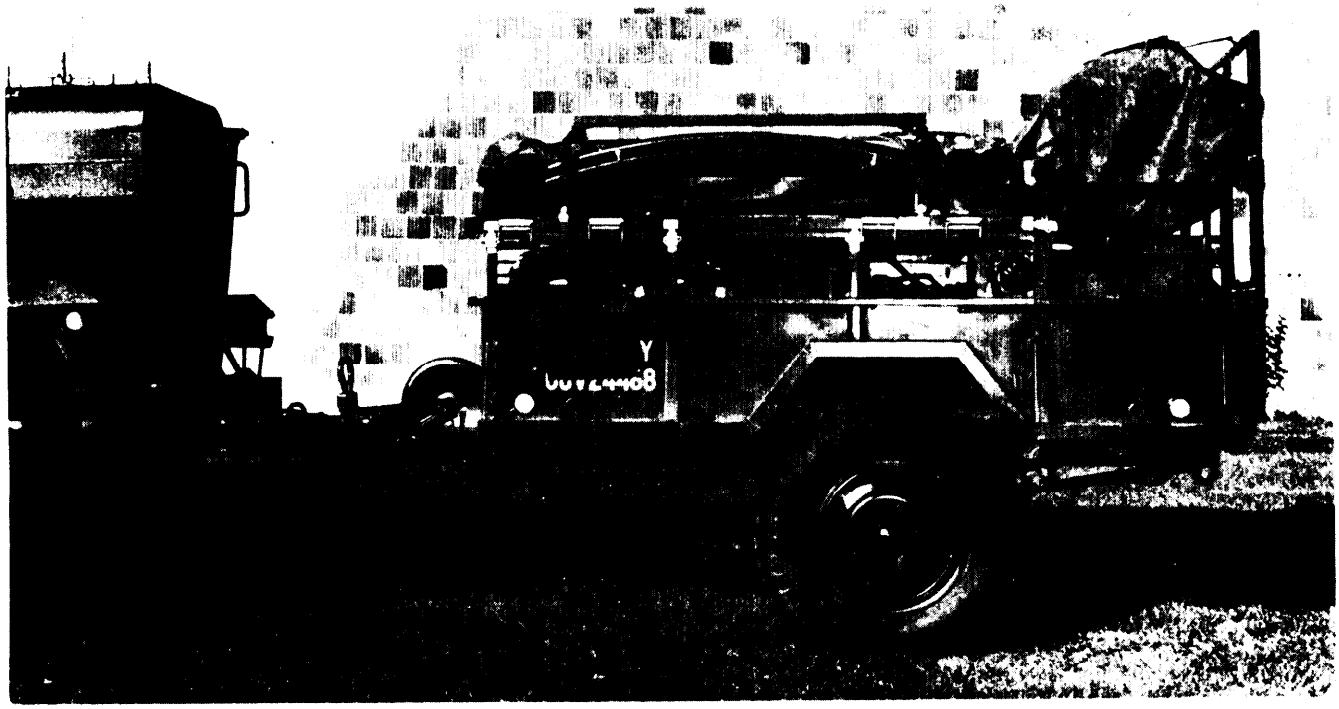
TOP VIEW



LEFT FRONT THREE-QUARTER VIEW

Figure 1-1 (1). M51 inflatable chemical-biological collective protection shelter system (sheet 1 of 2).

WITH COVER



WITHOUT COVER

AR600154

Figure 1-1② . M51 inflatable chemical-biological collective protection shelter system (sheet 2 of 2).

1-4. Inflatable Entrance

The entrance (fig. 1-2) is a double-walled, air-inflatable, self-supporting structure. The integral walls and floor are made of material impermeable to CB agents. Each end of the entrance has a metal door frame in which are mounted double-hung doors. One door at each end of the entrance has a window; the other door has an airflow control butterfly valve to maintain a predetermined air pressure within the entrance and shelter. The entrance incorporates a distribution box, a switch box, an inflation fitting, interconnecting fittings, air-recirculation outlet and inlet connections, and tiedown ropes. The purpose of the entrance is to reduce to a minimum contaminants entering the shelter interior during entry and exit of personnel. In transit, the entrance is mounted on the entrance support rack.

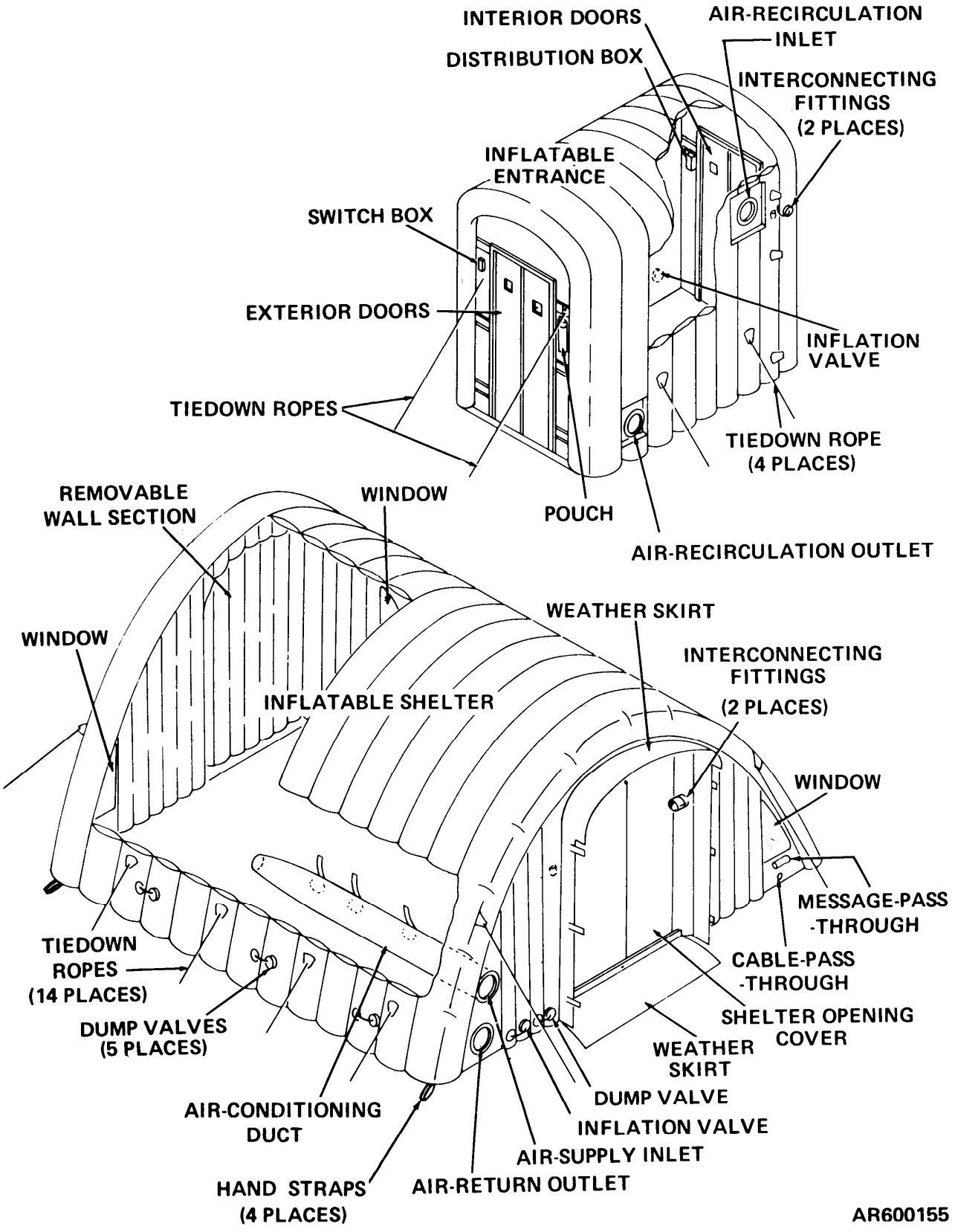


Figure 1-2. Inflatable entrance and shelter.

a. Distribution Box. The distribution box, attached to the door frame, routes electrical power to operate the shelter and entrance lighting, the entrance gas-particulate filter unit, and monitoring shelter entry and exit.

b. Switch Box. The switch box provides a means for actuating the warning light system controlling entry from the outside.

c. Inflation Valve. The inflation valve provides a connection for the flexible air duct hose.

d. Interconnecting Fittings. The interconnecting fittings provide a shelter-to-entrance connection to maintain pressure throughout the double walls of both the entrance and shelter.

e. Air-Recirculation Outlet and Inlet Connections. The air-recirculation outlet and inlet connections provide the means to attach the entrance gas-particulate filter unit and air duct for the recirculation and filtration of air. An electrical receptacle is provided near the air-recirculation outlet for electrical power to the entrance gas-particulate filter unit.

f. Tiedown Ropes. Two tiedown ropes on each side, and two in front of the entrance provide stability.

1-5. Inflatable Shelter

The shelter (fig. 1-2) is a double-walled, air-inflatable, self-supporting structure. The integral walls and floor are made of a material impermeable to CB agents. The shelter is semi-circular in cross-section, with a maximum inside height of 7-feet 6-inches and an inside floor area of 210 square feet. During system operation, the shelter provides a CB hazard-free environment (no protective mask and clothing required) in which personnel may perform their necessary functions. The shelter incorporates two weather skirts, a fabric gas seal, three translucent windows, an inflation valve, dump valves, interconnecting fittings, a shelter opening cover, a message pass-through, a cable pass-through, an air-conditioning duct, tiedown ropes, and a removable wall section.

a. Gas-Seal and Weather Skirts. An integral gas-seal is provided to maintain CB protection integrity when the shelter is joined to the entrance. Two weather skirts provide protection against the weather, and additional CB integrity.

b. Inflation Valve. The inflation valve provides a connection for the flexible air duct hose.

c. Dump Valves. Five dump valves are provided for rapid deflation of the shelter.

d. Interconnecting Fittings. The interconnecting fittings provide a shelter-to-entrance connection to maintain pressure throughout the double walls of both the entrance and shelter.

e. Shelter Opening Cover. The integral shelter opening cover is made of material impermeable to CB agents, and is fastened in place to seal the shelter entrance during erection of the shelter in a CB environment.

f. Message-Pass-Through. Allows for the transfer of messages and packages without personnel entering or leaving the shelter.

g. Cable-Pass-Through. The cable-pass-through allows for the passage of auxiliary cables into the shelter interior.

h. Tiedown Ropes. Fourteen tiedown ropes provide shelter stability, and prevent ballooning of the floor when the shelter is pressurized.

i. Removable-Wall-Section. The removable-wall-section is located in the rear wall of the shelter. When removed, it allows two shelter systems to be joined back-to-back or front-to-back (entrance-to-shelter).

1-6. Entrance Gas-Particulate Filter Unit

The filter unit (fig. 1-3), in normal operation, continuously recirculates and filters the interior air of the entrance. The unit consists of a gas filter, a particulate filter, inlet and outlet plenums, a fan and motor unit, and a flexible duct.

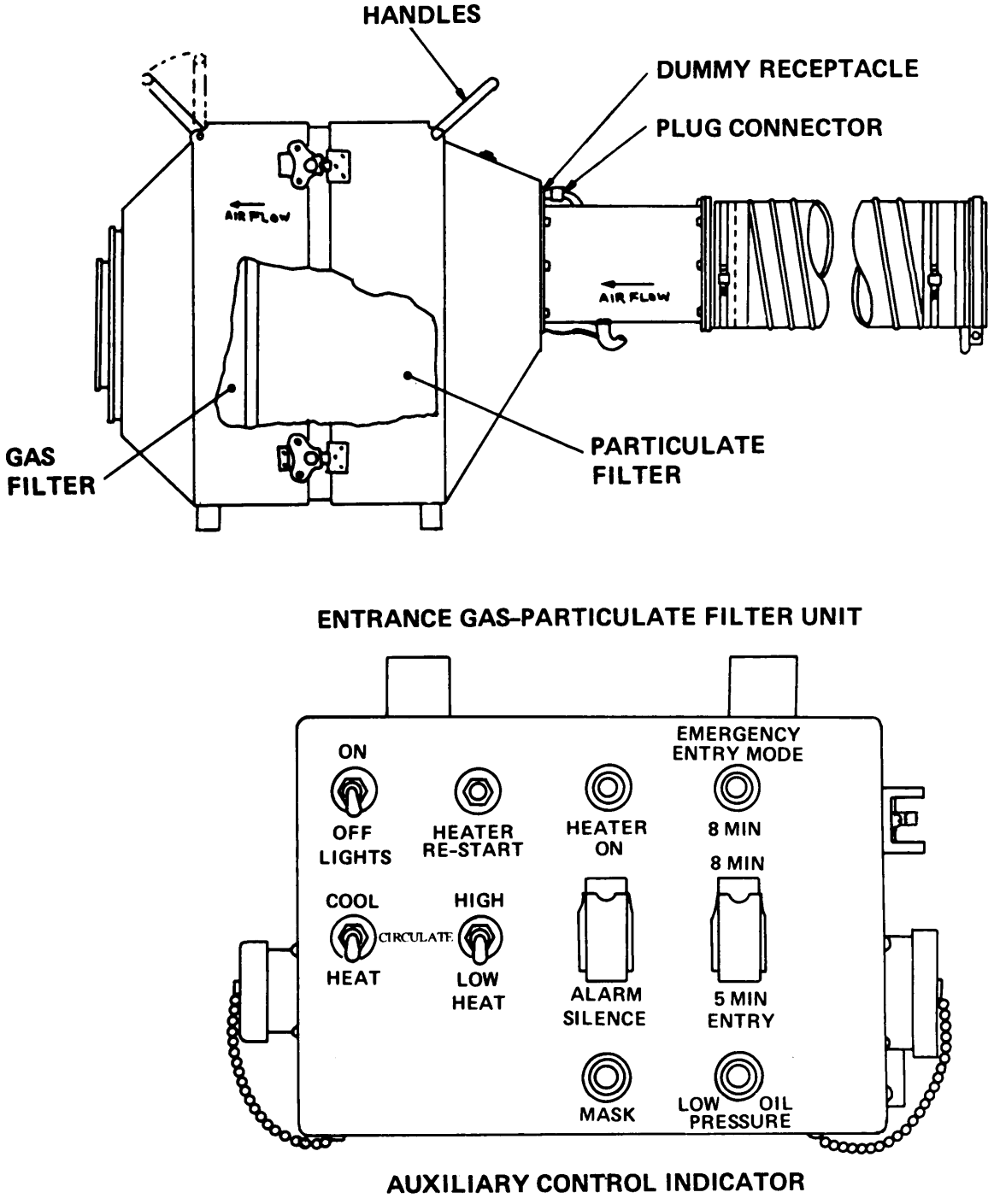


Figure 1-3. Entrance gas-particulate filter unit and auxiliary control indicator.

1-7. Auxiliary Control Indicator

The auxiliary control indicator (fig. 1-3) contains the controls and indicating lights required for operation and monitoring of the shelter system. In operation, it is installed on the front interior wall of the shelter.

1-8. Air Duct Hose and Air Ducts

a. Air Duct Hose. The air duct hose (fig. 1-4) is used to inflate both the entrance and shelter. Each end incorporates a special fitting for quick installation.

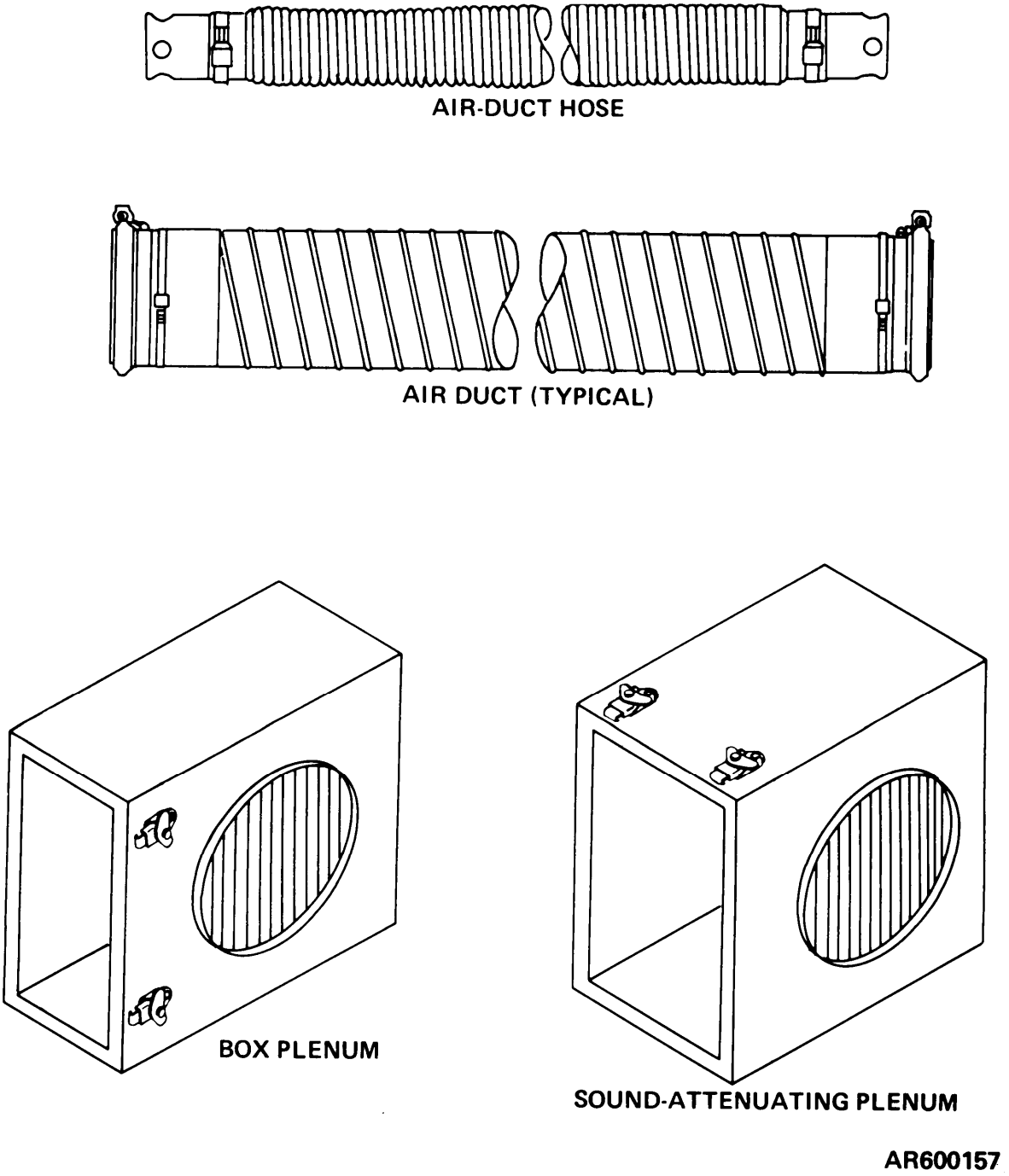


Figure 1-4. Air ducts, air duct hose, and plenums.

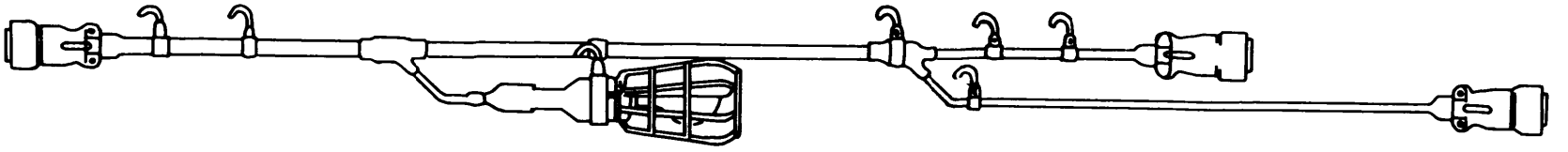
b. Air Ducts. These air ducts are made of a combination of neoprene and fiberglass material, helically reinforced with corrosion-resistant-spring-steel wire. The ends of the ducts incorporate a quick-release coupling for ease in installation. When installed, the 12-inch inside diameter supply and return air ducts furnish the means of supplying the interior of the shelter with filtered pressurized air from the filtration and pressurization system. The 8-inch inside diameter recirculating air duct furnishes the means of connecting the air-outlet plenum of the entrance gas-particulate filter unit to the entrance for the purpose of supplying filtered pressurized air to the entrance interior.

1-9. Box and Sound-Attenuating Plenums

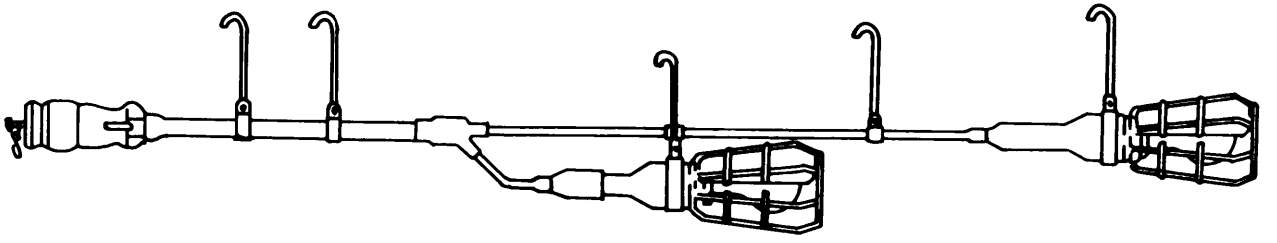
The plenums (fig 1-4) provide the means of attaching the supply and return air ducts to the trailer mounted equipment.

1-10. Electrical Cables

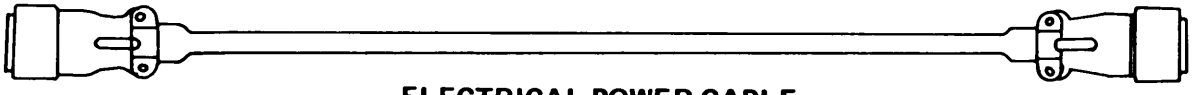
The electrical cables (fig. 1-5) provide the electrical power distribution from the auxiliary control indicator to the entrance gas-particulate filter unit, switch and distribution boxes, and for interior lighting.



CABLE AND LIGHT ASSEMBLY (ENTRANCE)



CABLE AND LIGHT ASSEMBLY (SHELTER)



ELECTRICAL POWER CABLE

(AUXILIARY CONTROL INDICATOR TO ENTRANCE DISTRIBUTION BOX)

AR600158

Figure 1-5. Electrical cables.

1-11. Support Rack

The support rack (fig. 1-6) provides space to stow the entrance, and the shelter supports during transit and storage. Securing straps and clamps maintain the stowed items in position.

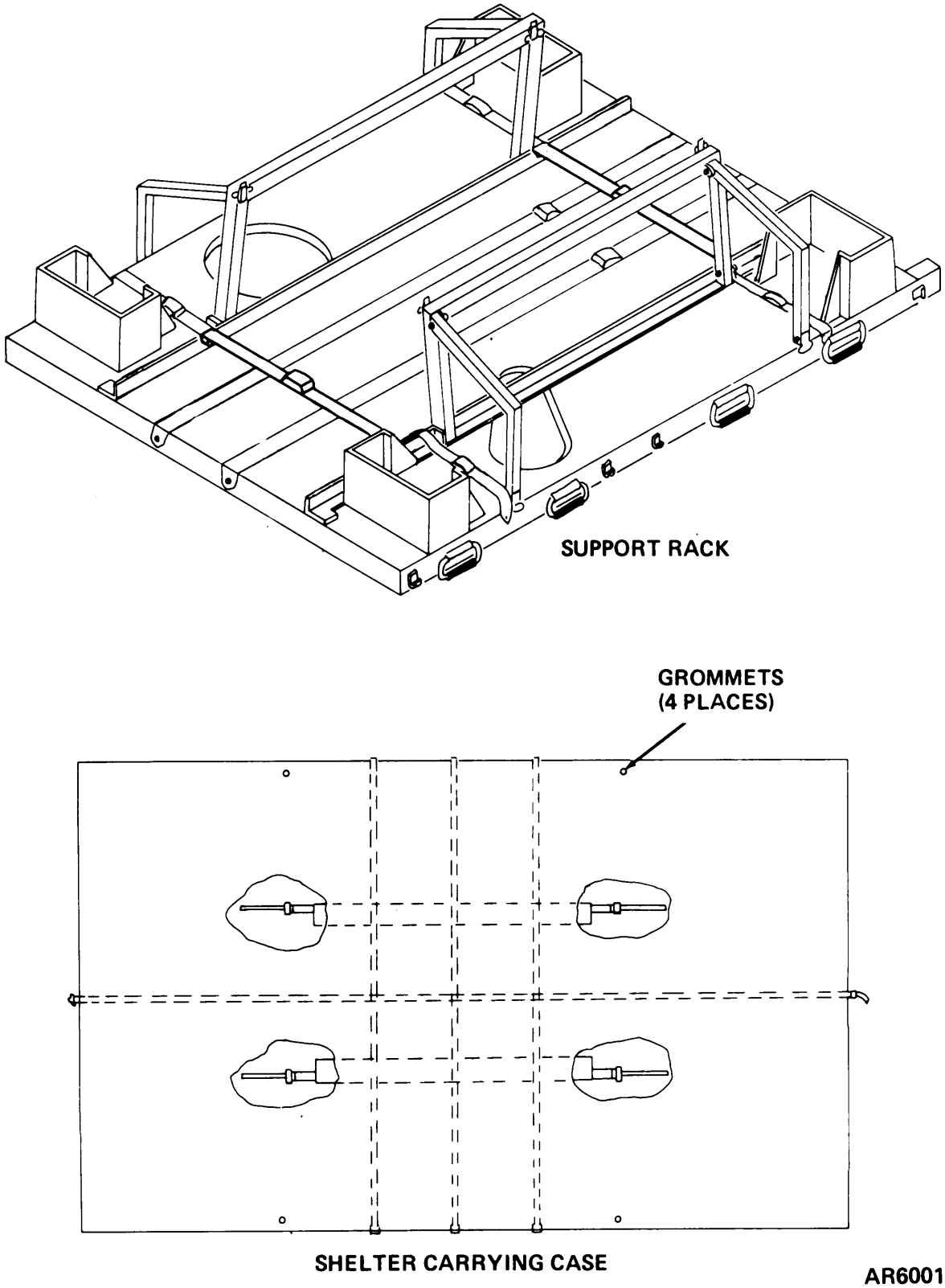


Figure 1-6. Shelter carrying case and support rack.

1-12. Carrying Case

The shelter carrying case (fig. 1-6) is used for unloading and loading the shelter from and onto the trailer. During transit, the shelter is stowed in the carrying case on the trailer.

1-13. Trailer

The trailer (fig. l-l) is a model M105A2, 1½-ton, 2-wheel cargo-type, modified to accommodate the shelter system components.

1-14. Trailer -Mounted Equipment

(fig. 1-7)

a. Gasoline Engine. A military Standard Model 4A084-3 20-hp engine supplies the power for operation of the shelter system.

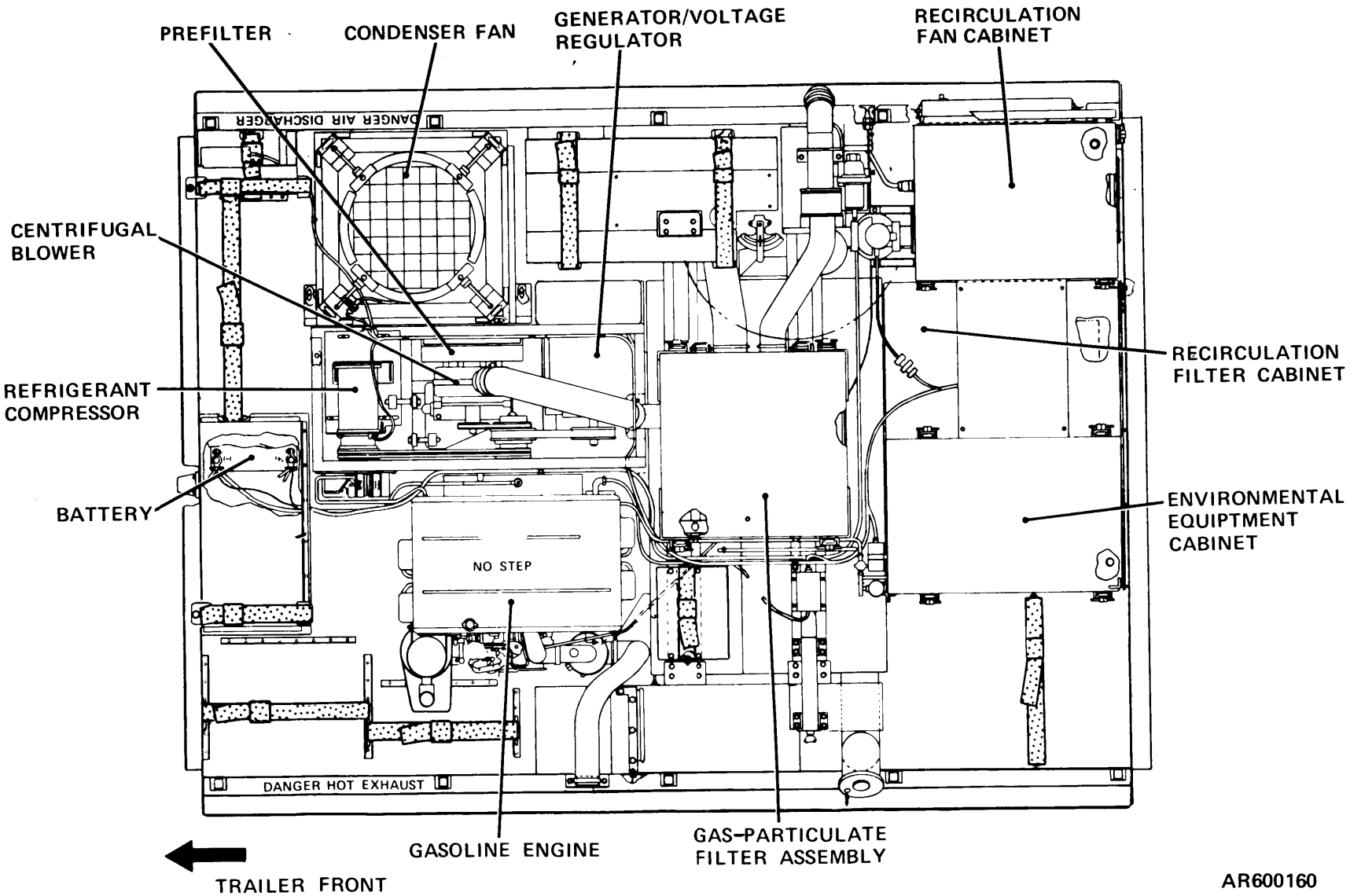


Figure 1-7. Major trailer-mounted equipment.

b. Battery. The military standard battery furnishes the power for starting the gasoline engine. It is a 24-volt waterproof lead-acid storage battery.

c. Centrifugal Blower. The engine-driven centrifugal blower provides the air for inflation of the shelter and entrance ribs. In addition, the blower provides filtered make-up air to maintain a positive pressure in the shelter and entrance.

d. Generator. The engine-driven generator provides electrical power for operation of the shelter system. It has an output of 208V, 3-phase, 60-Hertz (Hz).

e. Voltage Regulator. A saturable core-type variation voltage regulator maintains generator output within ten percent from no load to full load condition.

f. Gas-Particulate Filter Assembly. The gas-particulate filter assembly consists of an M23 gas filter and an M24 particulate filter enclosed in a common housing. The particulate filter removes CB aerosols and particles from the air entering the system. The gas filter absorbs gaseous toxic warfare agents.

g. Refrigerant Compressor. The refrigerant compressor is an automotive-type-compressor, belt-driven from the gasoline engine. Its function is to compress the refrigerant used in the shelter air-conditioning system.

h. Condenser Fan. Air for the condenser coil is provided by the motor-driven condenser fan. The fan motor operates on 208V, 3-phase, 60-Hz electrical power from the generator.

i. Recirculation Fan Cabinet. Contained within the recirculation fan cabinet are the main control indicator, temperature thermostat, electrical power supply, and the evaporator fan.

(1) *Main control indicator.* The main control indicator contains the controls and instruments for operating the shelter system.

(2) *Power supply.* The shelter system utilizes a 3-phase transformer-rectifier power supply. The power supply distributes the 208vac to the power requirements. A 12vdc output is available but not used.

(3) *Evaporator fan.* Recirculating air is provided by the motor-driven evaporator fan to the shelter interior at the rate of 1,050 cfm. The fan motor operates on 208v, 3-phase, 60-Hz electrical power.

(4) *Thermostat.* Controls the shelter interior temperature when the environmental control switch, located on the auxiliary control indicator, is in the COOL or HEAT position. The thermostat is normally preset and locked at 700 F (21°C).

j. Recirculation Filter Cabinet. This cabinet houses the recirculation filters which consist of a particulate filter and gas filter. The filters filter the recirculating interior air of the shelter.

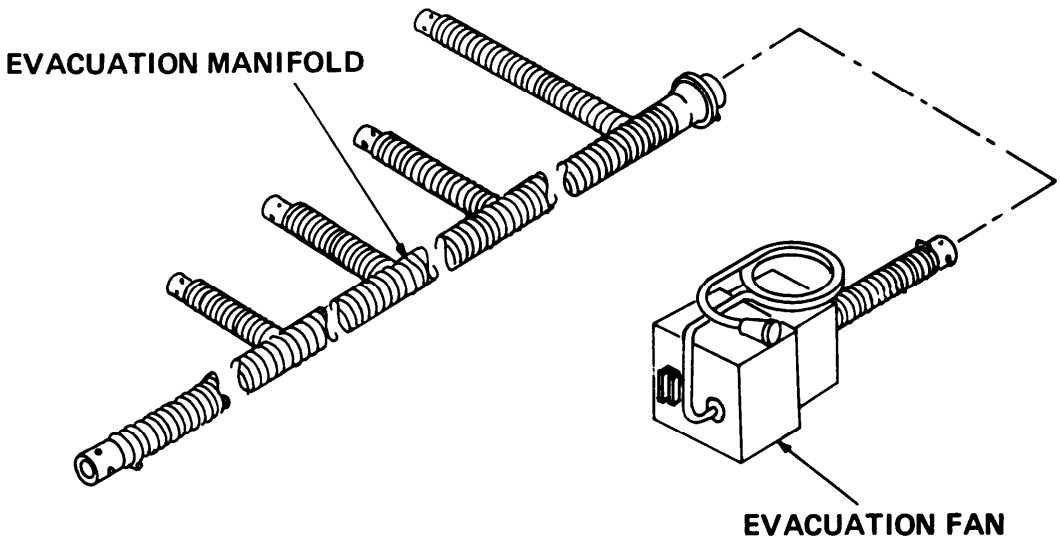
k. Environmental Equipment Cabinet. This cabinet houses the air-conditioning evaporator coil and combustion heater.

(1) *Evaporator coil.* The evaporator coil cools the recirculating interior air of the shelter.

(2) *Combustion heater.* The combustion heater heats the recirculating interior air of the shelter.

1-15. Accessories

a. Evacuation Fan and Manifold. When striking the shelter and entrance, the evacuation fan and manifold (fig. 1-8) provide fast and complete deflation. In addition, should the centrifugal blower fail, the air exhaust from the fan can be used as an emergency source of make-up air to the entrance and shelter ribs.



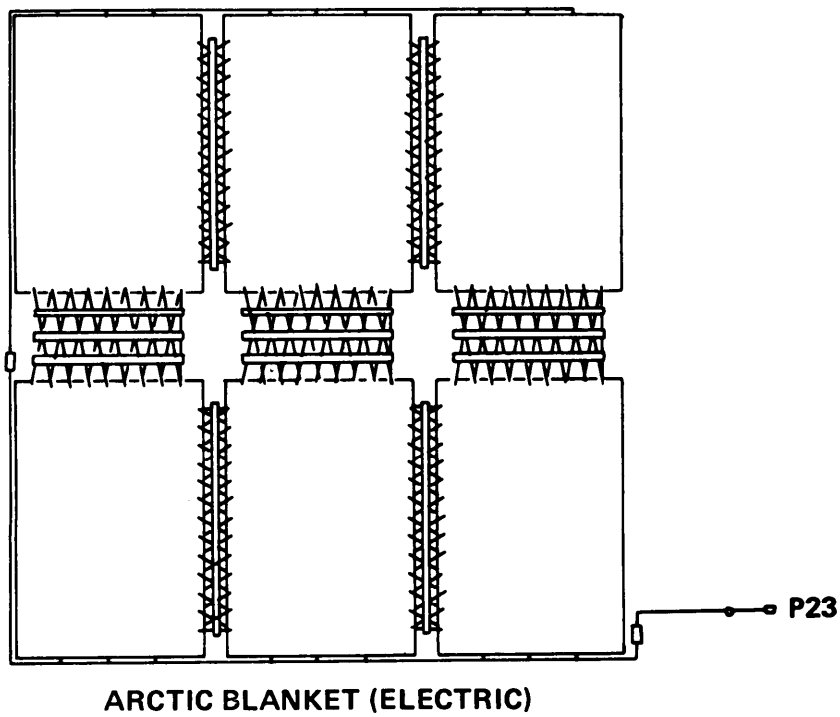
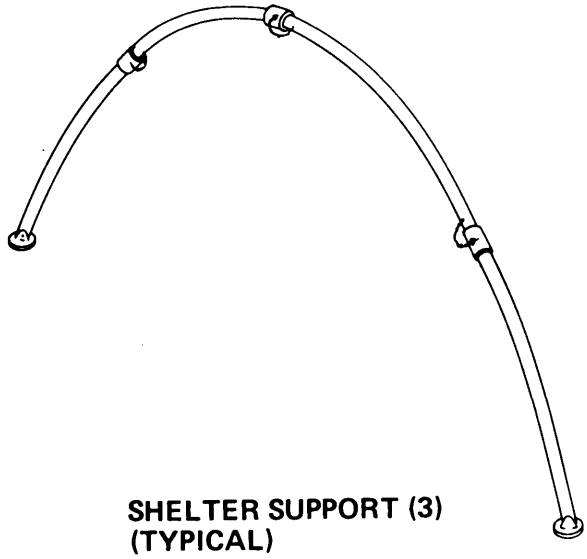


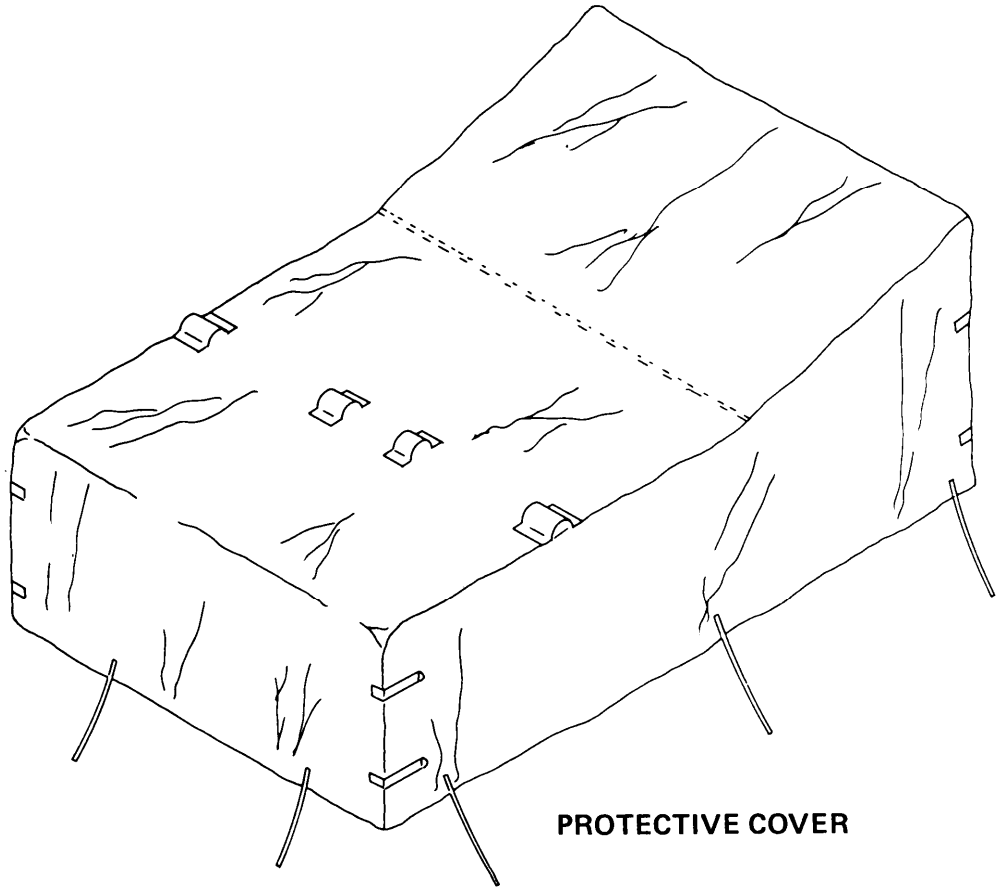
Figure 1-8. Accessories.

b. Arctie Blanket. The electric arctic blanket is comprised of six separate panels laced together to form a 174-inch by 165-inch rectangle. In temperatures below – 25° F, the blanket is used to heat the shelter material prior to erecting and during striking operations. The blanket is spread on the shelter floor during striking operations. The shelter is then collapsed, folded, and rolled with the blanket in place.

c. Shelter Supports. These supports (fig. 1-9) are provided to support the shelter when a malfunction occurs in the air-make-up-system. Three supports are furnished with each shelter system. Each support has four segments and fits the radius of the shelter interior. The supports can also be used to erect an entrance ante-room. During normal operation, and in transit, the supports are stowed on the entrance support rack.



SHELTER SUPPORT (3)
(TYPICAL)



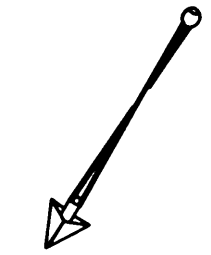
PROTECTIVE COVER

AR600162

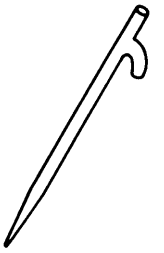
Figure 1-9. Accessories.

d. Protective Cover. The form-fitting protective cover is made of the same material as the shelter and entrance. It is designed to cover and protect the shelter system during transit and storage.

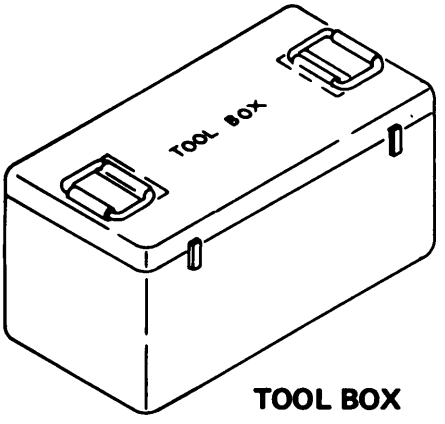
e. Anchors and Tent-Pins. The arrowhead anchors and tent-pins (fig. 1-10) secure the inflated shelter and entrance to the ground.



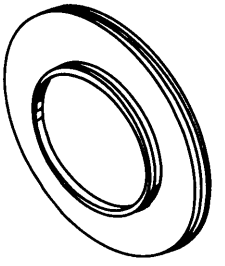
ANCHORS



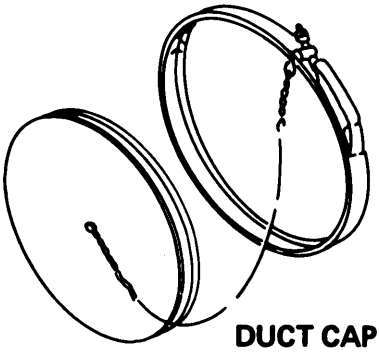
TENT PINS



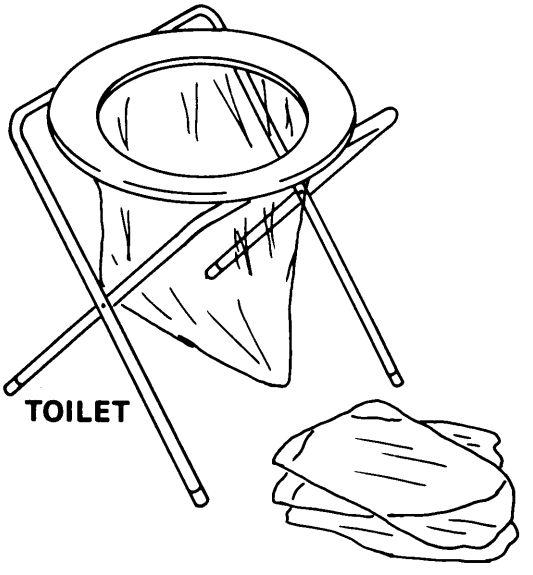
TOOL BOX



DUCT ADAPTER



DUCT CAP



TOILET

PLASTIC BAGS

Figure 1-10. Accessories.

f. Tool Box. The portable tool box provides storage for the items listed in table l-l.

Table 1–1. Tool Box Contents

Nomenclature	Quantity
Air-flow gage	1
Auxiliary control indicator	1
Belt tension bar	1
Cable and light assemblies	2
Cord (4-foot lengths)	4
Electric power cable	1
Electric hand lantern (w/o battery)	1
Footwear covers (roll)	1
Funnel	1
Hydraulic lubrication oil (quart can)	1
Plastic bags (for portable toilet) (12 each package)	1
Plastic tubing (4-inches long)	1
Pouch	1
Rope (10-foot lengths)	4
Starter rope (gasoline engine)	1
V-belt tensiometer	1

g. Duct Adapter. The duct adapter has a 12-inch diameter flange on one side and an 8-inch diameter flange on the other side. It adapts the 8-inch inside diameter (id) air-recirculation duct to the 12-inch id air-return duct. The duct adapter is used when the entrance gas-particulate filter unit is needed to provide clean air to the interior of the shelter during its erection in a contaminated area.

h. Duct Cap. The 12-inch duct cap is used to seal the shelter air-return outlet when the entrance gas-particulate filter unit is used during erection of the shelter in a contaminated area.

i. Portable Toilet. The portable toilet has a tubular frame and a plastic seat. The toilet is designed to use disposable plastic bags. The unit folds for storage.

j. Plastic Bags. The plastic bags are used with the portable toilet. Extra bags are stored in the tool box.

k. Footwear Covers. The plastic film footwear covers (fig. 1-11) are supplied on a roll of 24 footwear covers. They are connected in a continuous length by perforated interfaces which can be torn to separate the individual footwear cover. Each footwear cover contains a string to tighten it around the wearer's ankle. The footwear covers are placed over regular footwear to avoid tracking contaminants into the shelter.

l. Air Duct Storage Retainers. Three air duct storage retainers hold the flexible air ducts in a compressed position for ease in handling when in transit or when in storage.

m. Lantern. The lantern is a 6-volt portable battery-operated type. It has a flashing dome light on top and a concentrated spotlight beam on the side.

n. Pouch. The pouch is installed on the exterior door frame of the entrance (fig. 1-2). It is used to stow one roll of plastic footwear covers. When not in use the pouch is stowed in the tool box.

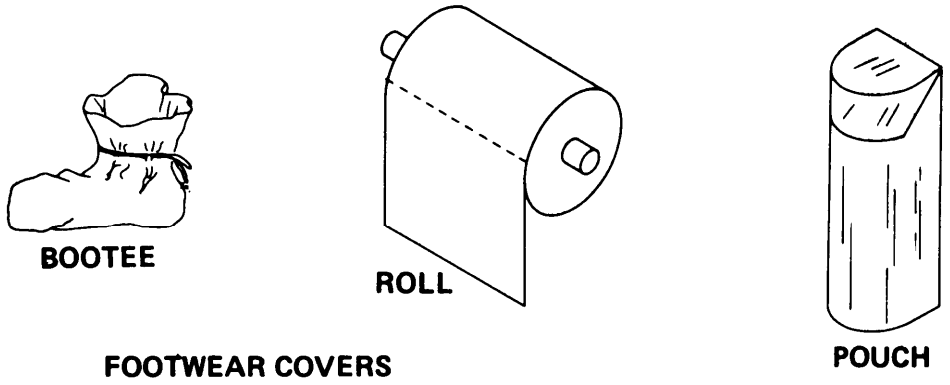
o. Tradition. The transition (fig. 1-11) is used when two shelter systems are erected in tandem (back-to-back). It is fastened in place with zippers. The transition is made of the same material as the entrance and shelter.

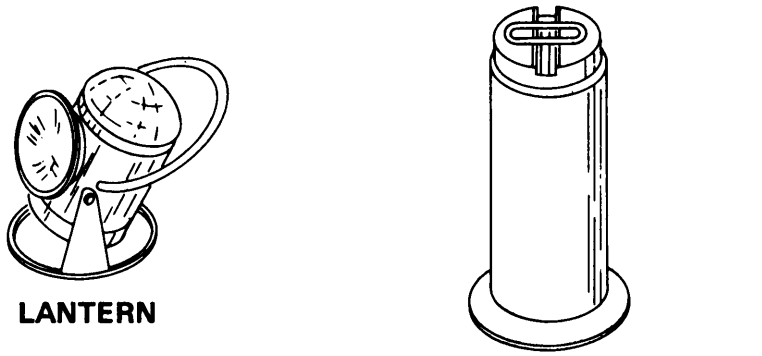
p. Repair Kit. The shelter system repair kit has the necessary tools and material to perform minor repairs and maintenance to the fabric material (table 1-2). The container is a drawstring type cloth bag.

1–16. Functional Description

a. Electrical and Control System. Figures FO–1 and FO–2 illustrate the complete electrical and control system of the shelter system.

b. Makeup Air and Inflation System. Figures 1-12 and 1-13 illustrate the normal airflow of the make-up and inflation system. If a rapid inflation is necessary, a press-to-inflate switch, located on the main control indicator, is depressed causing the solenoid valve to close. The closing of the solenoid valve directs all of the airflow to the shelter ribs. Upon complete inflation of the shelter, the press-to-inflate switch is released allowing the solenoid valve to reopen. The solenoid valve will remain open until the pressure on the inlet to the evaporator fan reaches 0.3 inch water gage (wg). At that time, a low-air-pressure switch will close the solenoid valve. The solenoid valve will remain closed provided the shelter internal pressure stays above approximately 0.15 inch wg. A check valve prevents back flow loss of inflation air in case of centrifugal blower shut down. A relief valve prevents over-inflation of the ribs of the entrance and shelter.





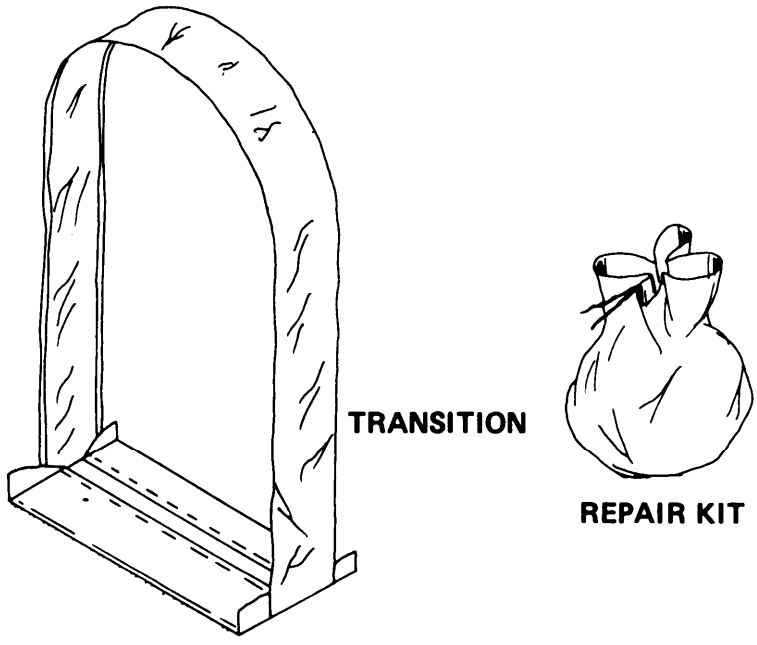


Figure 1-11. Accessories.

Table 1–2. Repair Kit Contents

Quantity	Size	Container	Nomenclature
1	5-ounce	tube	Adhesive sealant
*1	Quart	can	Cement (fabric)
1	Pint	can	Solvent
1	50-feet	spool	Thread
1	—	stick	Zipper lubricant
1	3-inches x 60 yards	roll	Pressure sensitive tape
1	—	package	Needles
20		—	Brushes 3/8-inch wide
1	—		Stiff bristle brush
1	10 each	package	Shop towels
1	8-inch	—	Shears
6	5-inch diameter	—	Patch (olive drab)
6	6-inch diameter	—	Patch (olive drab)
6	8-inch diameter	—	Patch (olive drab)
3	10-by-36-inch	—	Patch (olive drab)
6	5-inch diameter	—	Patch (white)
6	6-inch diameter	—	Patch (white)
6	8-inch diameter	—	Patch (white)
3	10-by-36-inch	—	Patch (white)
6	5-inch diameter	—	Patch (floor material)
6	6-inch diameter	—	Patch (floor material)
6	8-inch diameter	—	Patch (floor material)
1	6-inches-by-30-inches	—	Window material (clear)
1	—	—	Drawing B5-19-5245

* Not in repair kit. Requisition from stock (NSN 8040–00–165–8614).

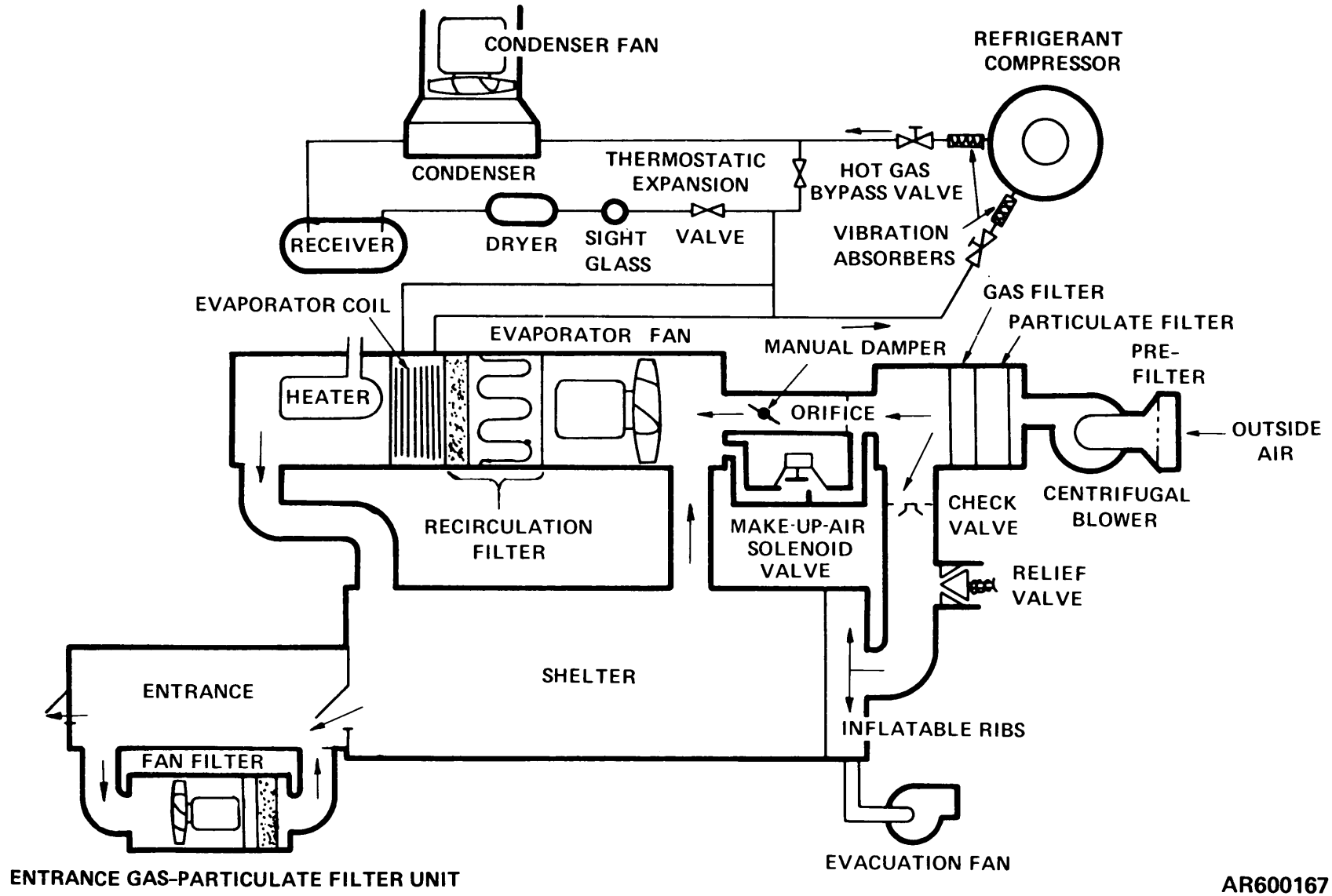


Figure 1-12. Shelter system air and refrigerant flow diagram.

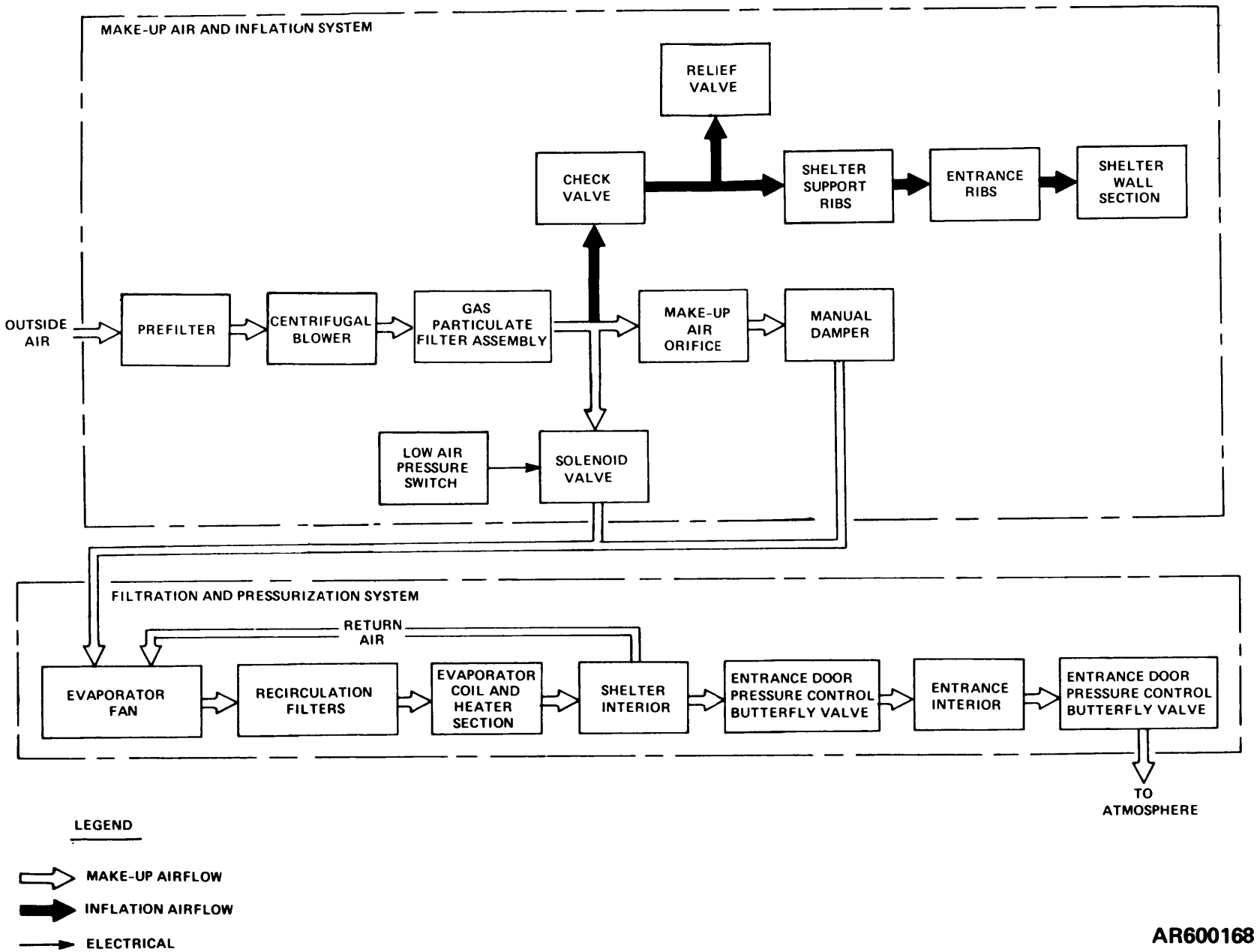


Figure 1-13. Make-up air, inflation, filtration, and pressurization system, block diagram.

c. Filtration and Pressurization System. During operation, the evaporator fan recirculates approximately 1,050 cfm of return air from the shelter and make-up air received from the centrifugal blower. The make-up air is cleaned of CB agents by the gas-particulate filter assembly. If CB agents are carried into the shelter, on personnel or equipment, the gas and particulate filters located in the recirculation filter cabinet will reduce the level of concentration. A butterfly valve in the entrance interior door is manually set to maintain a positive shelter pressure of 0.5 (+0.1 or – 0.2) inch wg between the shelter and entrance. The butterfly valve in the entrance exterior door is similarly adjusted to maintain a positive entrance pressure of 0.5 (+0.1 or – 0.2) inch wg between the entrance interior and the outside.

d. Entrance Recirculation System. The entrance gas-particulate filter unit (fig. 1-14) continually circulates the entrance interior air through its particulate and gas filters. This continuous recirculation of the interior air removes any particles and chemical-biological agents that may have entered during personnel entries and exits.

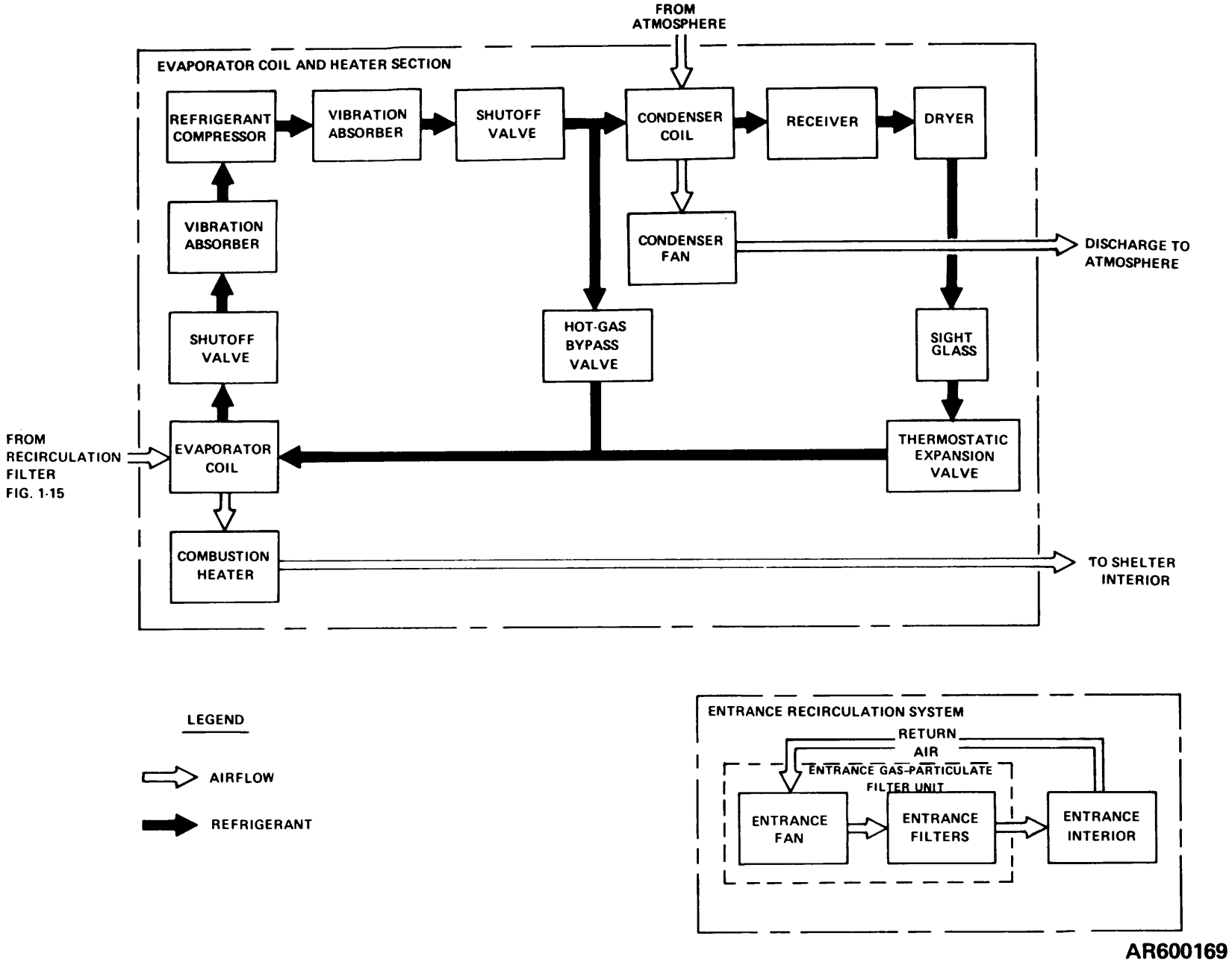


Figure 1-14. Environment control system and entrance recirculation system, block diagram.

e. Environmental Control System. This system, figures 1-12 and 1-14, is comprised of an air-conditioning system and a combustion heater for cooling and heating the shelter interior. The air-conditioning evaporator coil and combustion heater are located downstream of the recirculation filters (fig. 1-13) so that all the air entering the shelter can be cooled or heated as required. The switches for controlling the heating and cooling of the shelter interior air are located on the auxiliary control indicator.

(1) *Cooled air*. Placing the environmental control switch (fig. 1-3) in the COOL position starts the refrigerant compressor (fig. 1-14). Hot refrigerant gas passes to the condenser coil where it is condensed by airflow from the condenser fan. The condensed refrigerant then passes through the receiver, dehydrator, and sight glass to the thermostatic expansion valve where it is metered to the evaporator coil to provide cooling.

(2) *Heated air.* Placing the environmental control switch (fig. 1-3) in the HEAT position starts the electrical cycle for ignition to the combustion heater (fig. 1-14). After approximately a 2-minute delay, a HEATER ON light (fig. 1-3) will illuminate to indicate that the heater is operating. If for any reason the combustion heater fails to ignite, a HEATER RESTART switch can be depressed to restart the electrical cycle.

(3) *Circulation.* Placing the environmental control switch (fig. 1-3) in the CIRCULATE position shuts down the operation of the environmental control system (fig. 1-14). Circulation and filtration of air is continuous regardless of mode selected.

1-17. Identification and Instruction Plates and Markings

a. Refer to figure 1-15 for location and data given.

b. Refer to TM 5–2805-259–14 and TM 9–2330-213–14 for information on the identification and instruction plates for the gasoline engine and trailer, respectively.

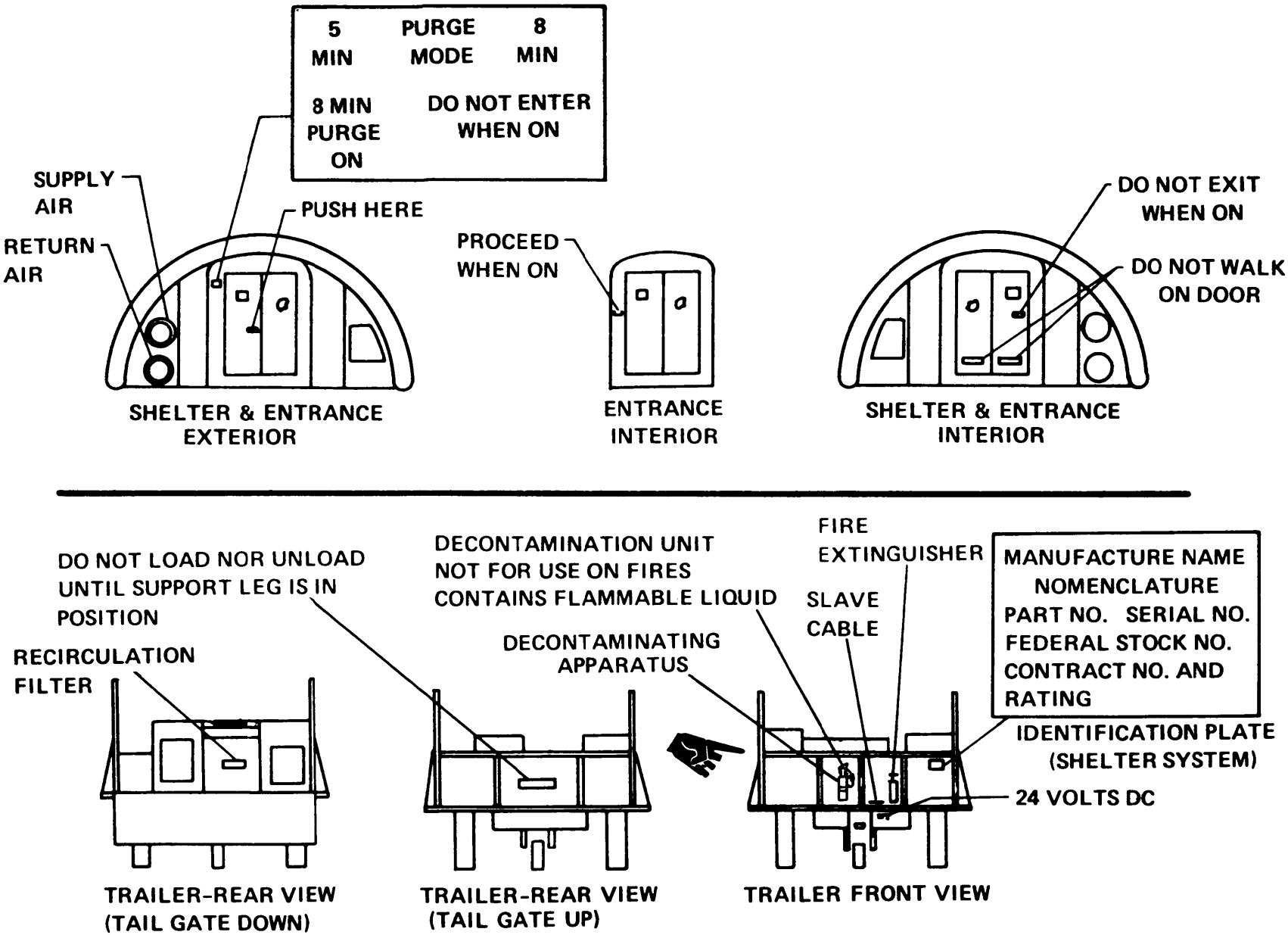


Figure 1–15①. Identification and instruction plates, and markings (sheet 1 of 2).

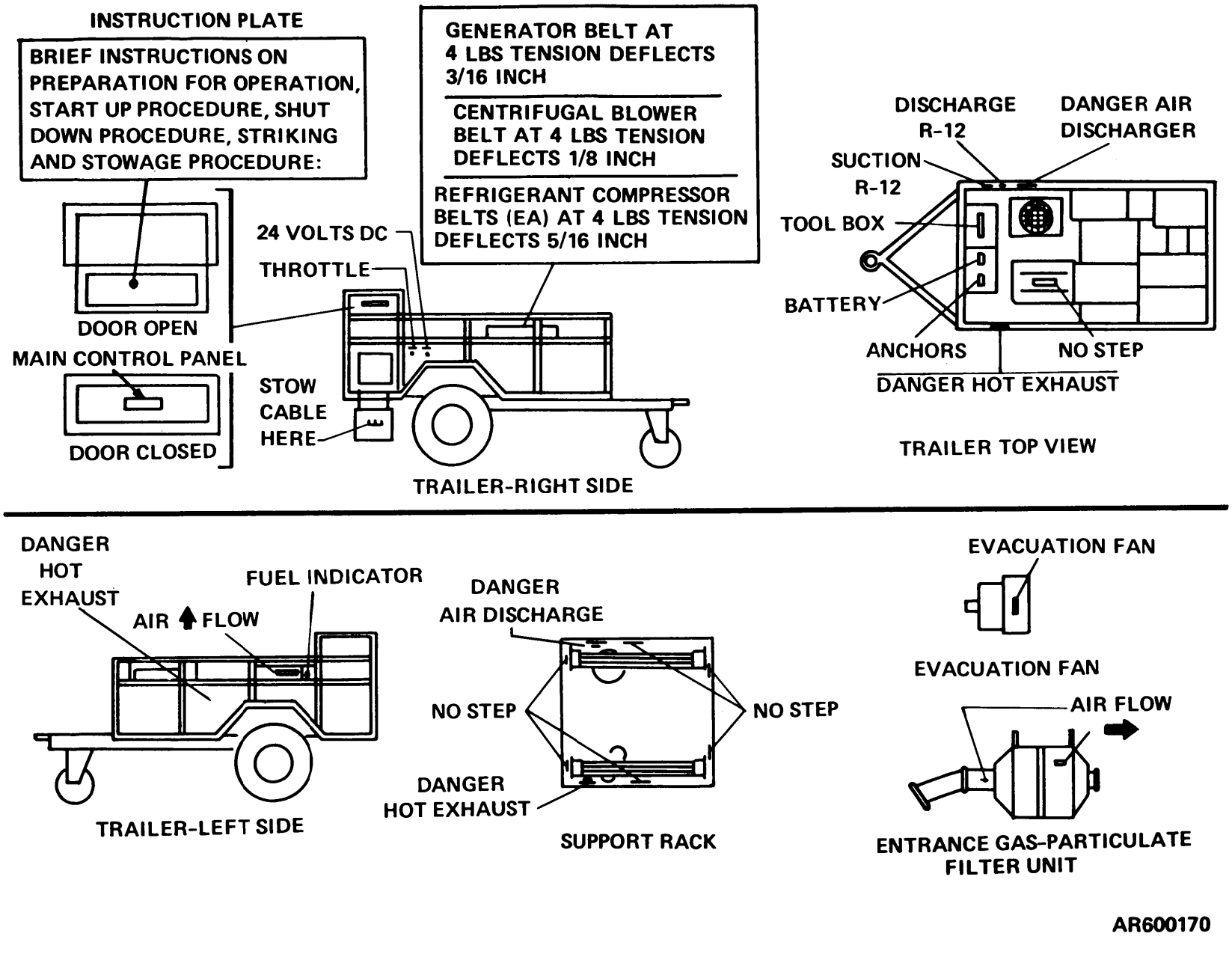


Figure 1-15 ②. Identification and instruction plates, and markings (sheet 2 of 2).

1-18. Tabulated Data

a. General.

(1) Dimensions and Weight (approx).

(a) Transit con figuration.

(without plywood cap)
Height . . . . . .8 feet
Length . . . . . .14 feet
Width. . . . . .7 feet
Weight . . . . . .5405 pounds
(with plywood cap;
Height . . . . . .8.13 feet
Length. . . . . .14 feet
Width . . . . . .7 feet
Weight . . . . . .5,705 pounds

(b) *Entrance and shelter assembled.*
Height . . . . . .9 feet
Length . . . . . .26 feet
Width . . . . . .18 feet

(2) *Capacity (personnel).* 10

(3) *Performance.*
Cooling . . . . . 42,000 Btu per hour dry coil at 150° F ambient and 90° F return air

Heating:
High heat . . . . . 60,000 Btu per hour
Low heat . . . . . 30,000 Btu per hour

Air circulation (approx)
Air circulation . . . . 1,050 standard cubic feet per minute (scfm)

(4) *Fuel.*
Type . . . . . gasoline
Capacity . . . . . 50 gallons (approx)

(5) *Refrigerant.*
Type R12
Capacity . . . . . 9 pounds (approx)

b. Entrance.

Rib inflation pressure . . . 30-to-45 inches (wg)
Internal pressure . . . . . 0.5 (+0.1 or –0.2) inch wg over ambient pressure
Recirculation airflow . . . 550 scfm (approx)
Dimensions (approx)

	Interior	*Exterior*
Height	7 feet	8 feet
Length	11 feet	11 feet
Width	4 feet	6 feet

Folded for transit:
Length . . . . . 82 inches
Width . . . . . 52 inches
Thickness . . . . . 14 inches
Weight . . . . . 250 pounds

c. Shelter.

Rib inflation pressure 30-to-45-inches wg
Internal pressure 0.5 (+0.1 or –0.2) inch wg over entrance pressure

Dimensions (approx):

	Interior	*Exterior*
Height	8 feet	9 feet
Length	14 feet	16 feet
Width	15 feet	18 feet

Folded for transit:
Length . . . . . .72 inches
Diameter (Rolled) . . .30 inches
Weight (including shelter carrying case) . . . . . .314 pounds

d. Entrance Gas-Particulate Filter Unit.

(1) *Fan motor.*
Power, requirement 208-Vat, 3-phase, 60-Hz
Rated horsepower (hp) . . 1/3-hp
Speed 3,450-rpm

(2) *Fan.*
Type . . . . . Vaneaxial
Output . . . . . .550-scfm at 3,450-rpm
Pressure. . . . . 1.75-inches wg

(3) *Filter.*
(a) *Particulate.*
Quantity 1
Type . . . . . Recirculating
Dimensions:
Height . . . . . .23.50 inches
Length . . . . . 17.38 inches
Width . . . . . 11.00 inches

(b) *Gas.*
Quantity 1
Type . . . . . .Recirculating
Dimensions:
Height . . . . . .23.50 inches
Length . . . . . .17.38 inches
Width . . . . . .3.12 inches

(c) *Airflow capacity* . . . 550 scfm

e. Evacuation Fan.

Type . . . . . Two-stage bypass with separate motor ventilation
Power requirement . . . . . 24 Vdc
Output . . . . . 40.cfm at 33-inches vacuum

f. Trailer.

Type . . . . . Military Standard
Model . . . . . M105A2, Modified
Capacity 1½-ton

g. Engine.

Type . . . . . Military Standard
Model 4A084-3
Electrical requirement 24-Vdc
Power rating . . . . . .20-hp at 3,600-rpm (normal operating range for shelter system is 18.3-hp at 3,000-rpm)
Oil capacity . . . . . 492 quarts

h. Centrifugal Blower.

Type . . . . . .Centrifugal, Belt-driven
Output 200-scfm
Pressure . . . . . .1.5 psi
Speed 4,500-rpm
Lubricant capacity 21-ounces

i. Generator.

Type . . . . . .Alternating current, brush type
Output voltage . . . . . .208-volt, 3-phase, 110-volt single phase, 60-Hz
Output power . . . . . .7.25-kilovolt-amphere (kv.-a)

j. Evaporator Fan and Motor.

(1) *Motor.*
Type . . . . . Totally enclosed, air over
Power requirement 208-vac, 3-phase, 60-hz
Rated horsepower . . . . . l-hp
Speed 3,450-rpm
(2) *Fan.*
Type . . . . . Vaneaxial
Output . . . . . 1,200-scfm at 3,460-rpm
Pressure . . . . . 3.1-inches wg

k. Power Supply.

Type . . . . . 3-phase transformer-rectifier
Input voltage 208-Vac, 3-phase, 60-Hz
Output voltage . . . . . 110-Vac, 24-Vdc, and 12-Vdc

l. Shelter Recirculation Filters.

(1) *Particulate:*
Quantity 1
Dimensions:
Height . . . . . .16 inches
Length . . . . . .26 inches
Width . . . . . .11 inches
(2) *Gas.*
Quantity 1
Dimensions:
Height . . . . . .16 inches
Length . . . . . .26 inches
Width . . . . . .3.12 inches
(3) Airflow capacity . . . . .1,200 scfm

m. Condenser Fan and Motor.

(1) *Motor.*
Type . . . . . Totally enclosed, air over
Power requirement . . . 208-volt, 3-phase, 60-Hz
Rated hp 1½-hp
Speed 3,600-rpm
(2) *Fan.*
Type . . . . . Tubeaxial
Output . . . . . .2,990-scfm at 3,450-rpm
Pressure . . . . . .1.6-inches wg

n. Refrigerant Compressor.

Type . . . . . .6-cylinder. axial
Speed 3,000-rpm
Capacity . . . . . .42,000 Btu per hour

o. Battery.

Type . . . . . .Military Standard
Voltage 24-vdc
Rated capacity . . . . . 21 ampere-hours

p. Combustion Heater.

Type . . . . . Gasoline burning
Output . . . . . .30,000/60,000 Btu per hour
Fuel consumption 0.75-gph

1-19. Expendable Items

a. Table 1-3 lists the expendable items required to properly maintain and operate the shelter system.

b. The items listed are authorized in accordance with provisions of common tools of allowance CTA 50-970, on expendable items or can be purchased locally.

Table 1-3. Expendable Items

Item No.	Nomenclature	NSN
1	Gasoline–grade 91A	9130-00-160-1817
2	Gasoline–grade 91C (temperatures consistently below 32°F)	9130-00-160-8131
3	Engine starting fluid	6850-00-823-7861
4	Denatured alcohol	6810-00-201-0906
5	Electrolyte sulfuric acid	6810-00-249-9354
6	Hydraulic lubrication oil	9150-00-009-0217
7	Aircraft grease	9150-00-269-8255
8	Pressure sensitive adhesive tape	8135-00-815-3415
9	Pressure sensitive adhesive tape (black)	8135-00-282-7803
10	Decreasing solvent cleaning compound	6850-00-224-6665
11	Adhesive sealant	8040-00-078-9774
12	Adhesive sealant	8040-00-867-4358
13	Enamel paint (yellow)	8010-00-286-7758
14	Graphite	9620-00-204-2643
15	Antiseize compound	8030-00-209-8005
16	Antiseize tape	8030-00-889-3535
17	Adhesive (fabric)	8040-00-165-8614
18	Wiping rags	7920-00-205-1711
19	Adhesive sealant	8040-00-841-9773
20	Antifouling paint: vinyl-zinc chromate primer	8010-00-290-4247
21	Enamel paint (olive drab)	8010-00-290-6648
22	Dry battery (6 Volts)	6135-00-050-3280

CHAPTER 2

OPERATING INSTRUCTIONS

Section I. CONTROLS

2-1. General

This section describes, locates, illustrates, and furnishes the operating and maintenance personnel sufficient information about the various controls used to operate the shelter system.

2-2. Gasoline Engine

The basic controls for the gasoline engine Model No. 4A084-3 are described in TM 5-2805-259-14.

2-3. Trailer Controls

The controls for the trailer model No. M105A2 are described in TM 9-2330-213-14.

2-4. Throttle

(9, fig. 2-1)

The throttle is used to adjust the speed of the gasoline engine. The throttle is pulled out to obtain idle speed, and can be locked in this position by turning clockwise. Unlock throttle by turning counterclockwise, and push in fully to obtain normal operating speed.

1 Air-duct coupling
2 Cover
3 Clamp
4 Receptacle connector
5 Cover
6 Circuit breaker
7 Cover
8 Receptacle connector
9 Throttle

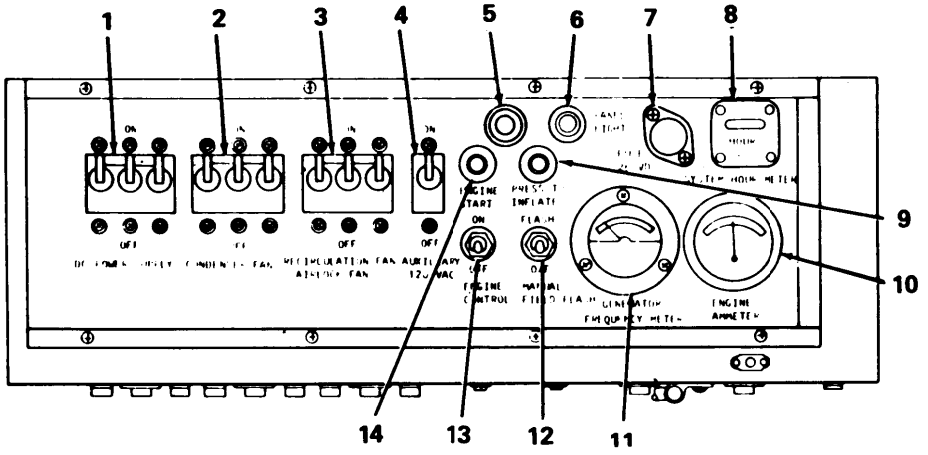
Figure 2-1. Controls and instruments.

2-5 Arctic Blanket Circuit Breaker (6, fig. 2-1)

Set to ON to provide electrical current to the ARCTIC BLANKET receptacle connector (8).

2-6. DC POWER SUPPLY Circuit Breaker (1, fig. 2-2)

Set to ON for operation of the 24 vdc circuit.



1 DC POWER SUPPLY circuit breaker
2 CONDENSER FAN circuit breaker
3 RECIRCULATION AND ENTRANCE FAN circuit breaker
4 AUXILIARY 120 VAC circuit breaker
5 Panel light
6 PANEL LIGHT switch
7 FUSE 26 vdc holder
8 SYSTEM HOUR METER
9 PRESS-TO-INFLATE switch
10 AMMETER
11 GENERATOR FREQUENCY METER
12 MANUAL FIELD FLASH switch
13 ENGINE CONTROL switch
14 ENGINE START switch

Figure 2-2. Main control indicator.

2-7. CONDENSEER FAN Circuit Break
(2, fig. 2-2)

Set to ON for operation of the condenser fan.

2-8. RECIRCULATION and ENTRANCE FAN Circuit Breaker
(3, fig. 2-2)

Set to ON for operation of the evaporator fan, and entrance gas-particulate filter unit fan.

2-9. AUXILIARY 120 VAC Circuit Breaker
(4, fig. 2-2)

Set to ON to operate the entrance and shelter overhead lighting. It also controls the electrical current to the GENERATOR FREQUENCY METER (11).

2-10. PANEL LIGHT Switch
(6, fig. 2-2)

Controls the illumination of the panel light (5). Depress switch to turn panel light ON. Release switch to turn light OFF.

2-11. PRESS-TO-INFLATE Switch
(9, fig. 2-2)

Provides the means for manual control of the make-up-air solenoid valve. When depressed, the switch causes the make-up-air solenoid valve to close, allowing maximum airflow to the shelter and entrance ribs.

2-12. MANUAL FIELD FLASH Switch
(12, fig. 2-2)

When held in the FLASH position, electrical current is drawn directly from the battery and applied to the generator field. It should be used only in the event of a generator malfunction.

2-13. ENGINE CONTROL Switch
(13, fig. 2-2)

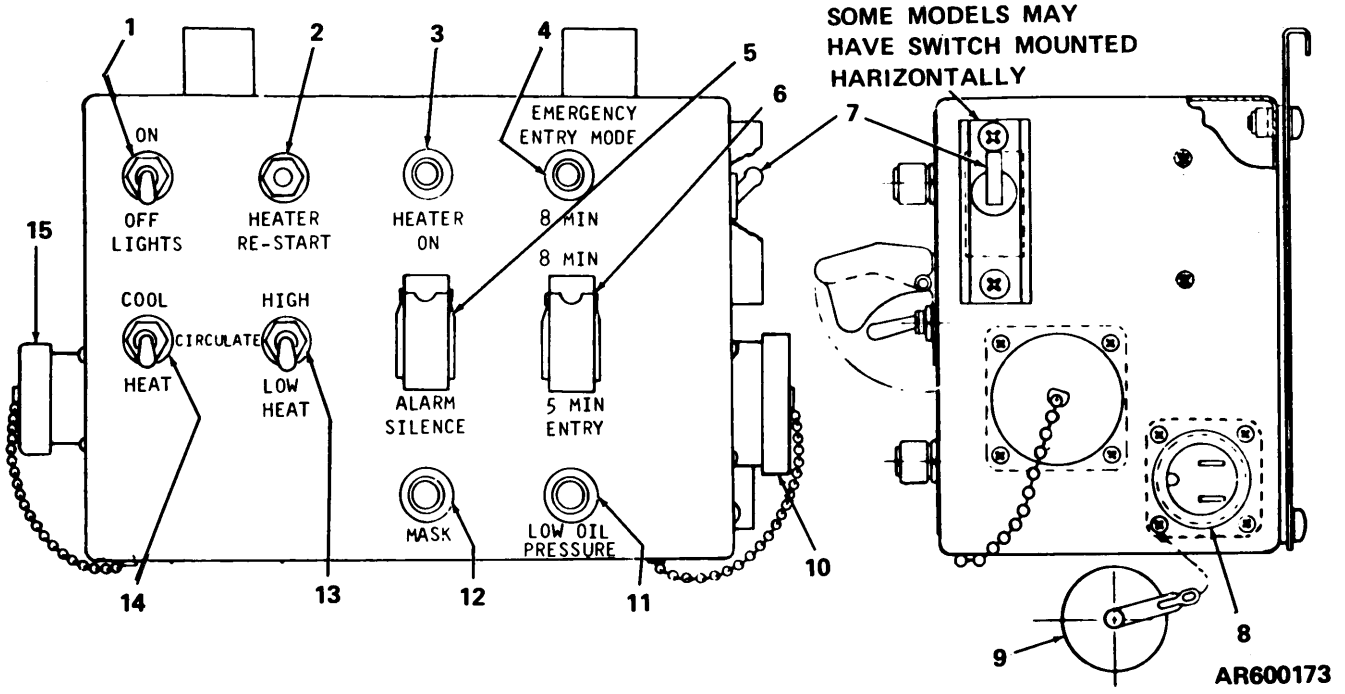
Controls the gasoline engine ignition circuit. When set to ON, it applies electrical current to the gasoline engine magneto-relay and the LOW-OIL-PRESSURE light.

2-14. ENGINE START Switch
(14, fig. 2-2)

When depressed, it energizes the gasoline engine starter.

2-15. LIGHTS Switch
(1, fig. 2-3)

Controls the entrance and shelter overhead lights.



1 LIGHTS switch
2 HEATER RE-START switch
3 HEATER ON light
4 Mode lights
5 ALARM SILENCE switch
6 Mode switch
7 Auxiliary circuit breaker
8 Receptacle connector
9 Cover
10 Cover
11 LOW-OIL-PRESSURE switch
12 MASK light
13 HIGH-LOW HEAT switch
14 Environmental control switch
15 Cover

Figure 2-3. Auxiliary control indicator.

2-16. HEATER RE-START Switch
(2, fig. 2-3)

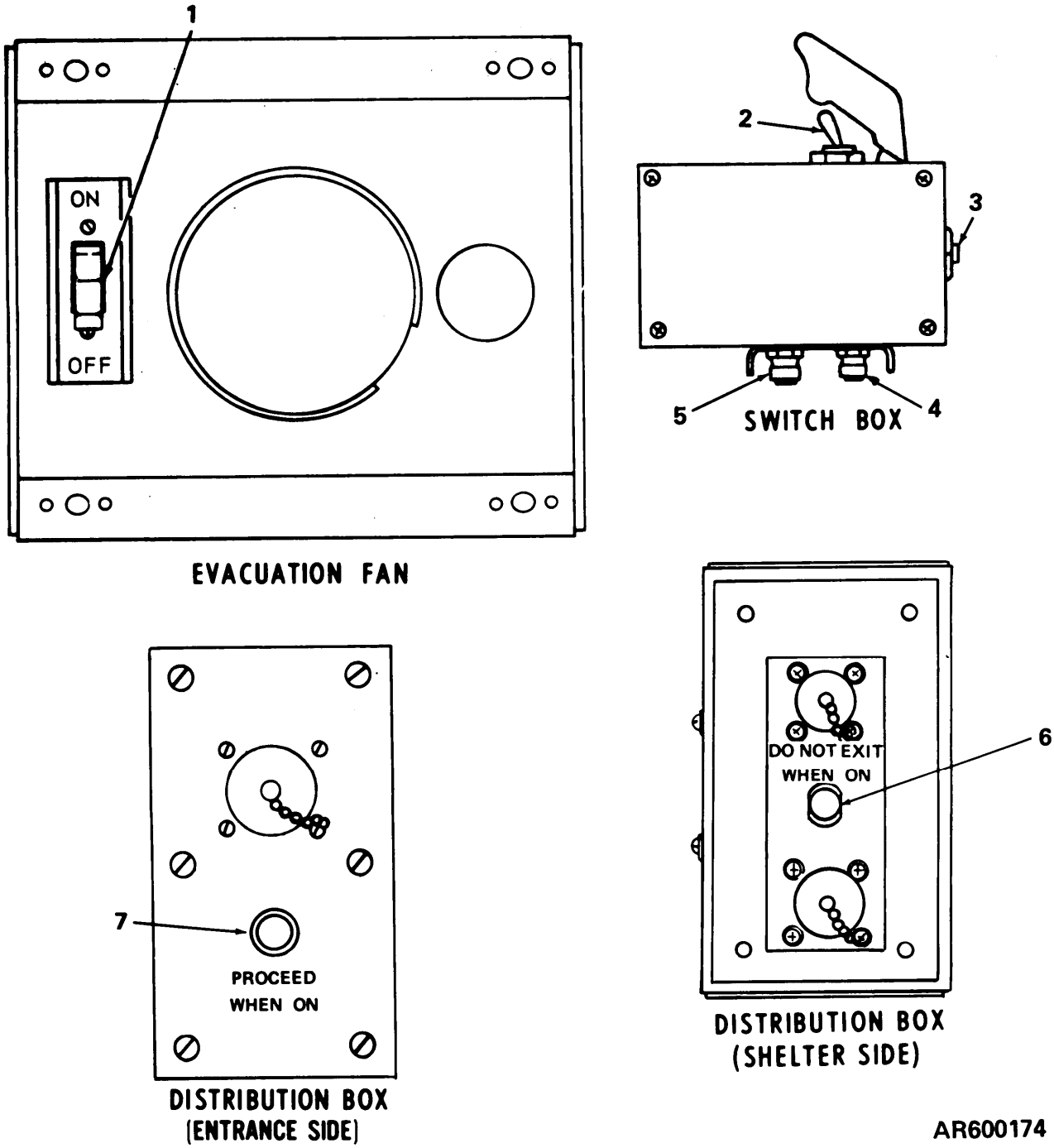
Resets the combustion heater electrical circuit when the ignition is lost or when the heater fails to ignite. When depressed, the switch breaks the previous circuit and allows for an automatic re-start.

2-17. ALARM SILENCE Switch
(5, fig. 2-3)

Set to OFF to silence low-air-pressure buzzer.

2-18. Entry Mode Switches

Two switches (6, fig. 2-3, and 2, fig. 2-4) select the time cycle for the indicator lights (4, 5, 6, and 7). These switches can be set on a 5-minute entrance purge cycle or an emergency 8-minute purge cycle. If one of the switches is in an 8-minute purge position, it will over-ride the 5-minute purge cycle. Both switches must be in the 5-minute purge position to obtain a 5-minute purge cycle.



1 Evacuation fan circuit breaker
2 Mode switch
3 Limit switch
4 DO NOT ENTER WHEN ON light
5 Mode light
6 DO NOT EXIT WHEN ON light
7 PROCEED WHEN ON light

Figure 2-4. Controls and instruments.

2-19. HIGH-LOW HEAT Switch
(13, fig. 2-3)

Controls the heat output of the combustion heater. When set to the high heat position, the combustion heater produces an output of approximately 60,000 BTU per hour. When set to the low heat position, the heater produces an output of approximately 30,000 BTU per hour.

2-20. ENVIRONMENTAL CONTROL Switch
(14, fig. 2-3)

Provides a means to select the operating mode of the environmental control system. When set to COOL, the switch starts the operation of the condenser fan and refrigerant compressor. When set to HEAT, it starts the operation of the combustion heater. In the CIRCULATE (center) position, the heating and cooling systems will not operate.

2-21. Auxiliary Circuit Breaker
(7, fig. 2-3)

Set to ON, it applies electrical current to receptacle connector (8). Receptacle connector (8) can be used for any appliance or equipment with a standard two or three prong plug requiring 120 Vac.

2-22. EVACUATION FAN Circuit Breaker
(1, fig. 2-4)

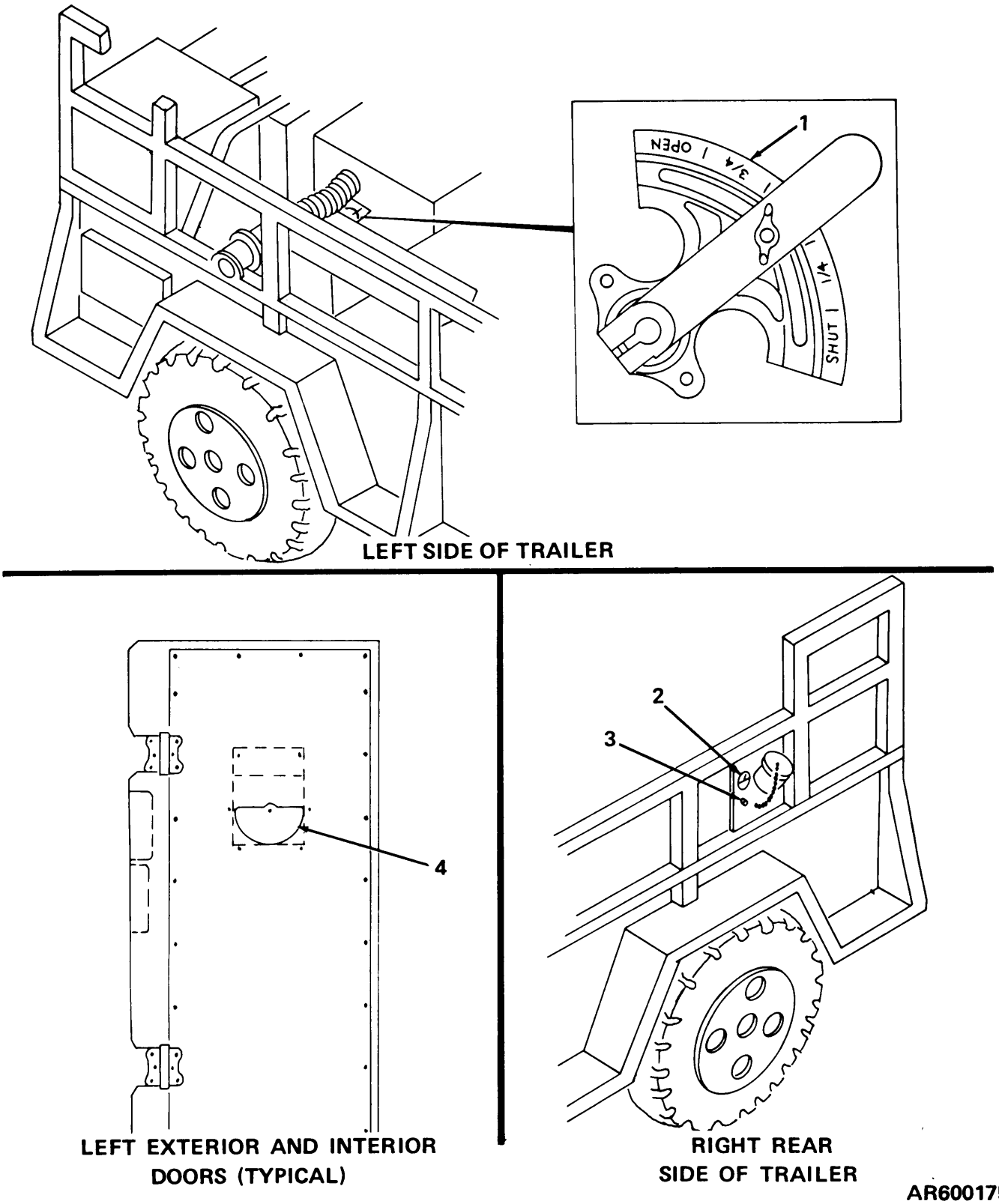
Set to ON for operation of the evacuation fan. Set to OFF to discontinue operation.

2-23. Entrance Door Limit Switch
(3, fig. 2-4)

This switch is actuated when the right hand exterior door of the entrance is opened. It turns on lights (4 or 5, and 6) and turns off light (7).

2-24. Make -Up Air Damper
(1, fig. 2-5)

Provides a means of adjusting the amount of pressurized air entering the shelter. It is adjusted by loosening a wing nut and moving a lever. Damper position can be determined by a scale showing SHUT, ¼ , ½ , ¾, and OPEN.



1 Make-up air damper
2 Fuel quantity gage
3 Fuel indicator switch
4 Butterfly valves

Figure 2-5. Controls and instruments.

2-25. Fuel Indicator Switch
(3, fig. 2-5)

The fuel indicator switch is pressed and held in to energize the fuel quantity gage.

2-26. Butterfly Valves
(4, fig. 2-5)

Two butterfly valves, one located on each left-hand door of the entrance, provides a means of adjusting the shelter and entrance interior air pressure. The valves are adjusted by loosening a thumbscrew and swinging the valve left or right, and exposing an aperture through the door for the escape of interior pressurized air.

Section II. INSTRUMENTS AND INDICATOR LIGHTS

2-27. General

This section describes, locates, illustrates, and furnishes the operating and maintenance personnel sufficient information about the various instruments and indicator lights used to operate the shelter system.

2-28. SYSTEM HOUR METER
(8, fig. 2-2)

Records and provides a visual indication of total running time for the complete system for maintenance purposes. The meter consists of five continuous digital wheels, the last one of which represents tenths of an hour. The hour digital wheels have white numbers on black background. The meter has a maximum readout of 9999.9 hours. The system hour meter will only operate when circuit breakers (1 and 3, fig. 2-2) are in the ON position.

2-29. AMMETER
(10, fig. 2-2)

Provides a visual indication of the electrical output of the gasoline engine generator. It has a range of -20 to +20 amps dc. The dial is graduated, and has numbers at 10- and 20-amps increments for both the negative and plus side. During operation, the ammeter should indicate a slightly positive charge.

2-30. GENERATOR FREQUENCY METER
(11, fig. 2-2)

Provides a visual indication of generator output frequency. The meter dial is graduated from 55 to 65 cycles per second in increments of one cycle. Every second cycle is numbered, with a vertical red line at 60. Under full load operating conditions, the meter should indicate between 58 to 62 cycles per second.

2-31. HEATER ON Light
(3, fig. 2-3)

This green light will go ON whenever the heater is operating. The light can be tested by depressing the lens.

2-32. Entry Mode Lights

These two yellow lights (4, fig. 2-3, and 5, fig. 2-4) provide a visual indication when the entry mode switches (6, fig. 2-3, and 2, fig. 2-4) are in the 8-minute purge cycle position (para 2-18). The lights can be tested by depressing the lens.

2-33. LOW-OIL-PRESSURE Light
(11, fig. 2-3)

This red light will go ON when the gasoline engine oil pressure drops below 15 psig. Stop operations immediately if light illuminates. The light can be tested by depressing the lens.

2-34. MASK Light
(12, fig. 2-3)

This red light provides a visual indication that the interior air pressure has dropped to an unsafe level of +0.15 inch wg. The light is an indication to personnel to don masks immediately. The light can be tested by depressing the lens.

2-35. DO NOT ENTER WHEN ON Light
(4, fig. 2-4)

This red light provides a visual indication to personnel outside the entrance that the entrance purge cycle is in process and not to enter. When light is extinguished, personnel may enter entrance. The light can be tested by depressing the lens.

2-36. DO NOT EXIT WHEN ON Light
(6, fig. 2-4)

Provides the same visual indication as the DO NOT ENTER WHEN ON light to personnel inside shelter. The light can be tested by depressing the lens.

2-37. PROCEED WHEN ON Light
(7, fig. 2-4)

This green light provides a visual indication to personnel within the entrance that the purge cycle is completed, and the shelter may be entered. When the light is OFF, entrance doors, should be kept closed. The light can be tested by depressing the lens.

2-38. Fuel Quantity Gage

(2, fig. 2-5)

The fuel quantity gage registers the amount of fuel in the tank. The gage dial is graduated and marked in quarters from empty to full. The fuel indicator switch (3, fig. 2–5) must be depressed for each reading.

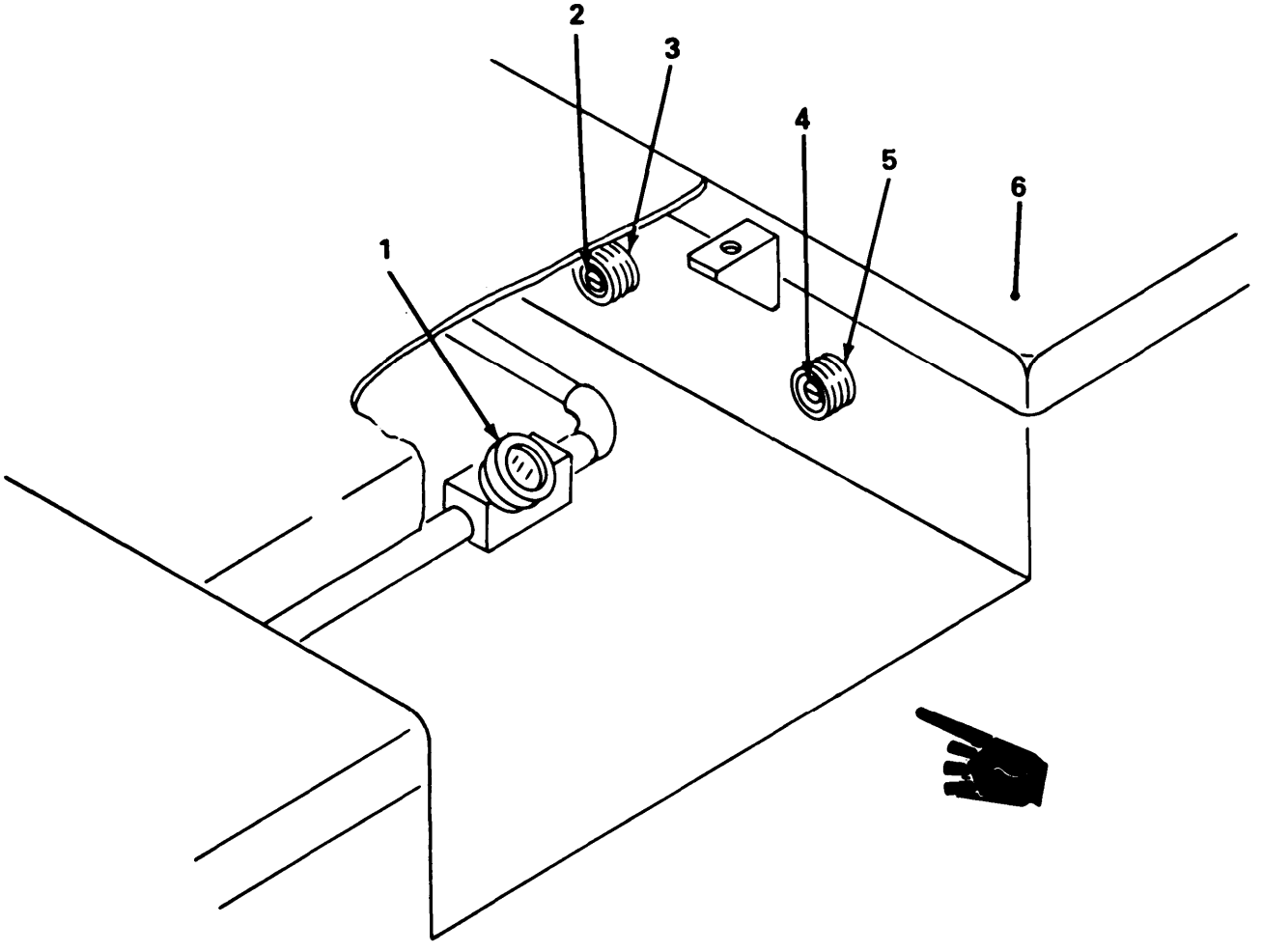
2-39. Low-Air-Pressure Buzzer

The low air pressure buzzer is located inside the auxiliary control indicator. It sounds an audible warning when internal shelter pressure drops to an unsafe level (below +0.15 in. wg). This buzzer is an indication to personnel to don masks immediately.

2-40. Refrigerant Sight Glass

(1, fig. 2-6)

The refrigerant sight glass is located at the rear of the trailer. The sight glass provides a visual indication of refrigerant flow and moisture content. Low refrigerant can be determined by watching for bubbles in the refrigerant fluid. Moisture content in the refrigerant fluid can be determined by checking for color change of the chemically treated sight glass. A normal "blue" color means no moisture content. A change to "pink" means moisture content.



1 Refrigerant sight glass
2 Adjustment screw
3 Pressure switch
4 Adjustment screw
5 Pressure switch
6 Recirculation fan cabinet
7 Deleted

Figure 2–6. Controls and instruments

2-41. Pressure Switches
(3, and 5, fig. 2-6)

The pressure switches sense air pressure within the recirculation fan cabinet (6). Pressure switch (3) activates at 0.15 inches wg. When the internal air pressure drops to 0.15 inches wg, the pressure switch turns ON the MASK light (para 2-34) and the low air pressure buzzer (para 2-39). Pressure switch (5) regulates the airflow into the shelter interior and shelter ribs. Switch (5) is preset at 0.3 inches wg of internal pressure. When the internal air pressure increases above 0.3 inches wg, the switch closes a solenoid valve to direct pressurized air into the ribs. When the internal air pressure decreases, below 0.3 inches wg, the switch opens the solenoid valve to direct pressurized air into the shelter interior.

Section III. OPERATION UNDER USUAL CONDITIONS

NOTE
Operation under usual conditions equals normal weather conditions with no active CB operations.

2-42. Erection Site

a. Acquire site that is at least 30 feet square and if possible, level, well-drained, and can provide concealment.

b. Be sure that there is sufficient overhead clearance before inflating.

c. Drainage ditches may be required if site area has poor water drainage.

CAUTION
Be sure that the area to be covered by the entrance and shelter is clear of any object that may puncture the material.

d. Level area to be covered by entrance and shelter and remove all debris.

2-43. Positioning and Preparing Trailer

a. Position trailer on cleared erection site so that deflated entrance and shelter can be positioned as shown in figure 2-7.

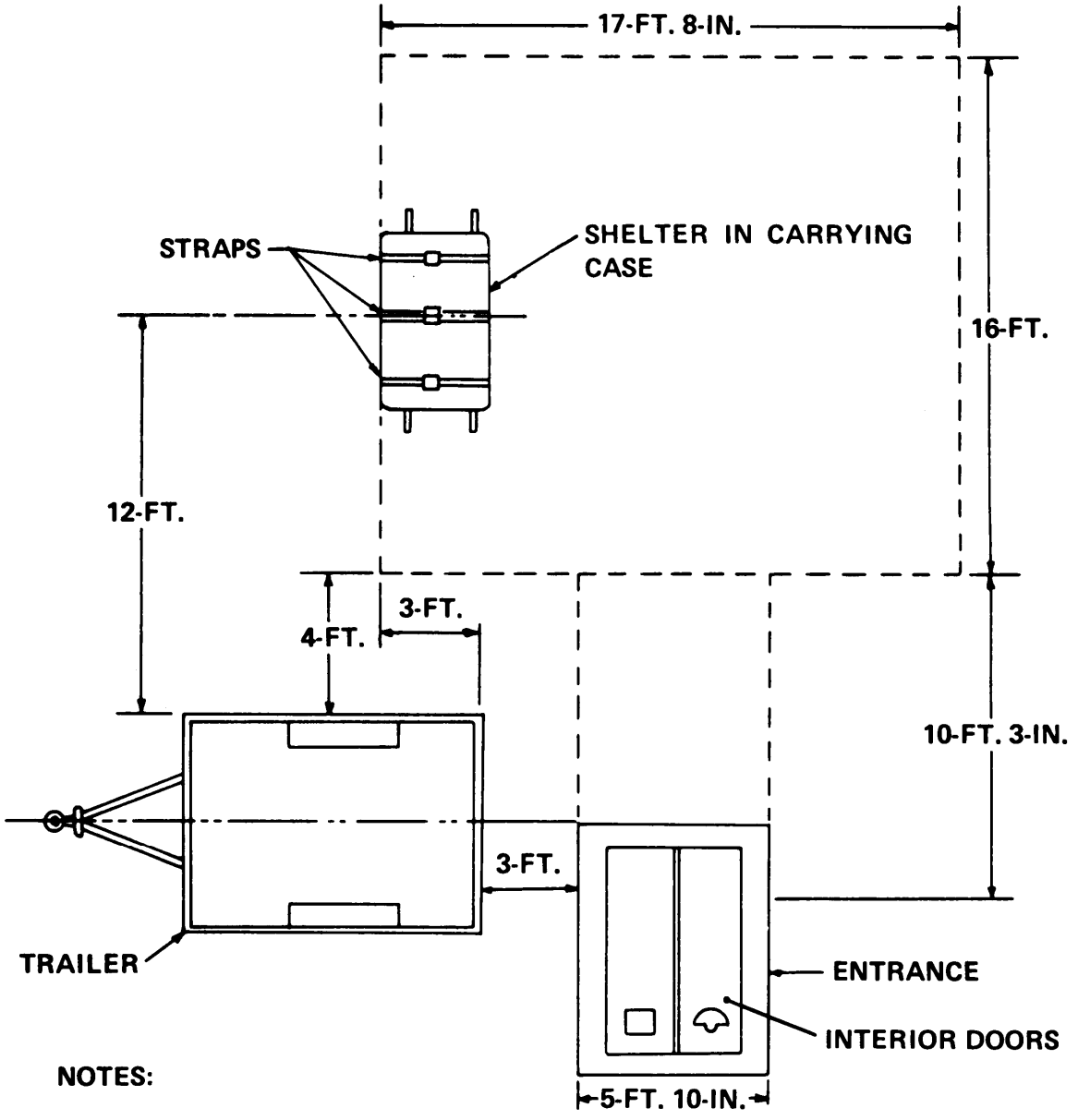


Figure 2-7. Position of equipment prior to inflution.

b. Disconnect trailer from tow vehicle (TM 9-2330-213-14).

2-44. Unloading and Positioning Equipment

WARNING

Do not unload trailer before lowering rear support leg. Failure to comply may result in overturning trailer and subsequent injury to personnel or damage to equipment.

a. Lower and adjust rear support leg of trailer (TM 9-2330-213-14).

b. Remove protective cover.

b.1. Remove evacuation manifold from top of entrance.

c. Release and remove two pins (3, fig. 2-8), and open brackets (4).

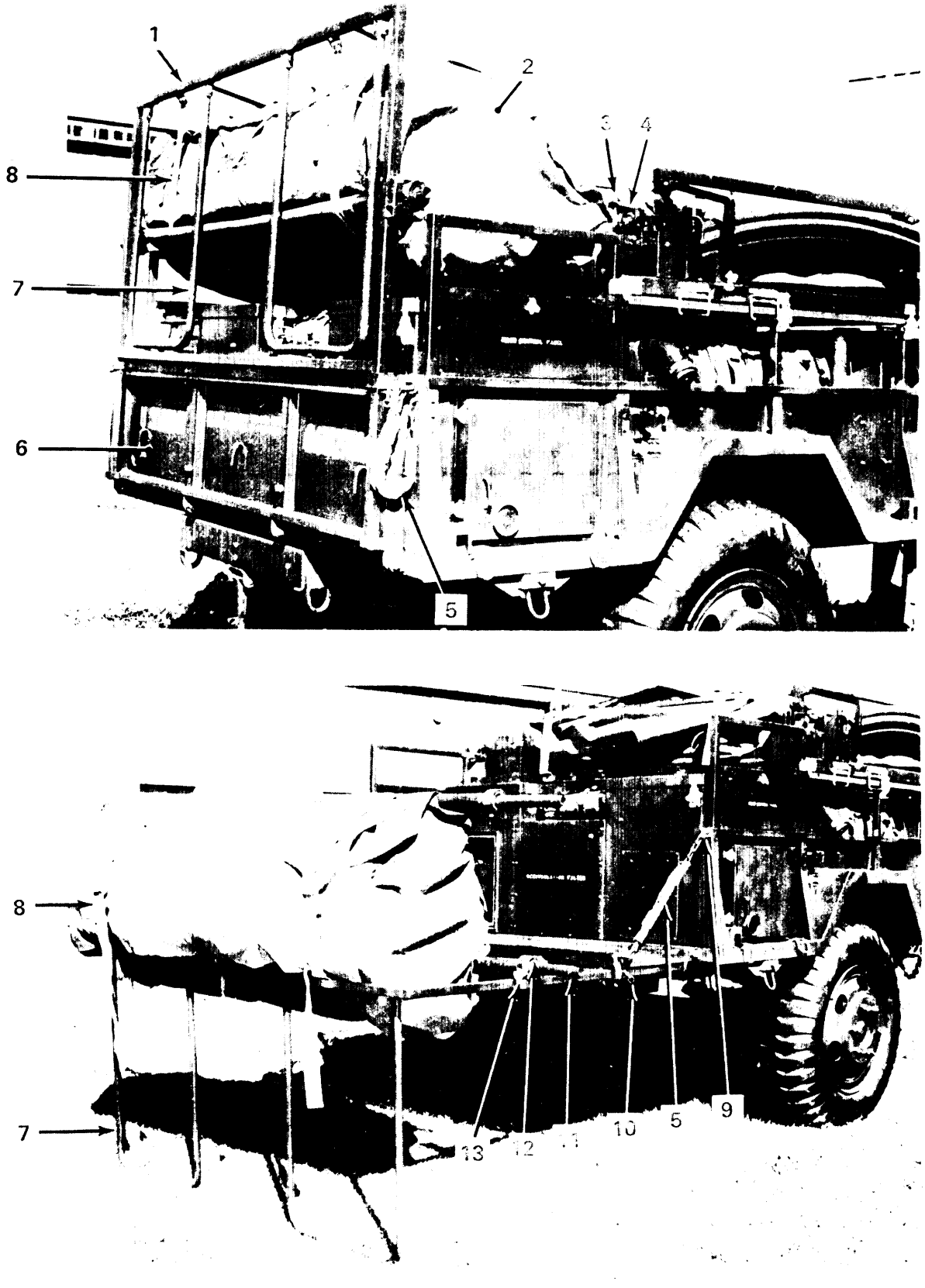


Figure 2-8. Shelter unloading.

Legend for fig. 2-8:
1 Tailgate extension
2 Shelter in carrying case
3 Pins
4 Brackets
5 Chains
6 Tailgate
7 Handles
8 Straps
9 Hasps
10 Pins
11 Handles
12 Brackets
13 Pins

CAUTION

Do not stand or walk on the entrance doors. You could damage the doors.

d. Tighten two straps (8) until shelter in carrying case (2) is lifted clear of brackets.

e. Pull out two handles (7).

f. Unhook two tailgate chains (5).

g. With four persons, disengage tailgate from trailer hasps (9). Fasten chains (5) to tailgate.

h. Lower tailgate extension (1) with shelter in carrying case (2) to rest on handles (7).

i. Unfasten two straps (8) and roll shelter in carrying case forward.

j. Release and remove two pins (13), and open brackets (12).

WARNING

Shelter in carrying case weighs approximately 314 pounds. When lifting, be careful to avoid injury to personnel, and damage to the shelter and carrying case.

CAUTION

Do not throw or drop any removable equipment from trailer.

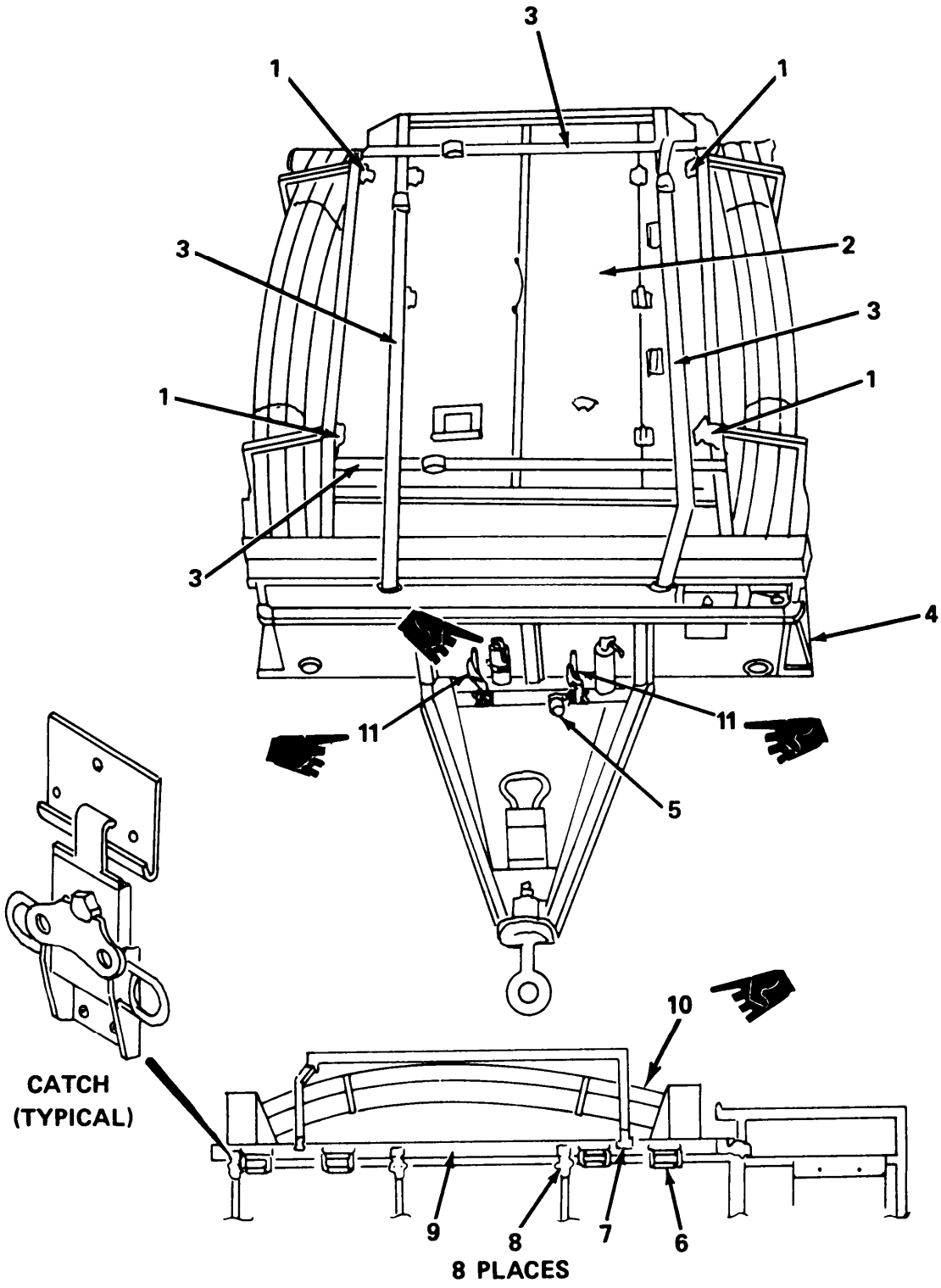
k. Pull out four handles (11). With four persons, lift shelter in carrying case (2) and position as shown in figure 2-7.

l. Remove two pins (10, fig. 2-8).

m. Remove tailgate extension (1) from tailgate (6). Lay tailgate extension in safe area until stored.

n. Unhook two tailgate chains (5) and lower tailgate (6).

o. Unfasten four straps (3, fig. 2-9).



1 Catches
2 Entrance
3 Straps
4 Trailer
5 Receptacle connector
6 Handles
7 Catches
8 Catches
9 Support rack
10 Arch supports
11 Hand brakes

Figure 2-9. Inflatable entrance and support rack unloading.

p. Release four catches (1 and 7).

CAUTION

Do not stand or walk on entrance doors. You could damage the doors.

q. Tilt support frames (10) away from entrance (2).

WARNING

Entrance weighs approximately 250 pounds. When lifting be careful to avoid injury to personnel and damage to the entrance.

r. With four persons, carefully slide entrance (2) forward and off of support rack (9). Position entrance as shown in figure 2-7.

CAUTION

Do not stand or walk on entrance doors. You could dameg the doors.

s. Reposition support frames (10, fig. 2–9) and refasten four catches (7). Refasten four straps (3).

t. Release eight catches (8). Swing catches flush against rails.

WARNING

When handling the support rack, keep handles extended out to prevent injury to fingers.

u. With four men using handles (6), slide support rack (9) forward and off of trailer (4). Place support rack away from working area.

CAUTION

Do not lift the entrance gas-particulate filter unit by the flexible duct.

v. Unfasten strap (4, fig. 2-10), catch (6), and coupling (10).

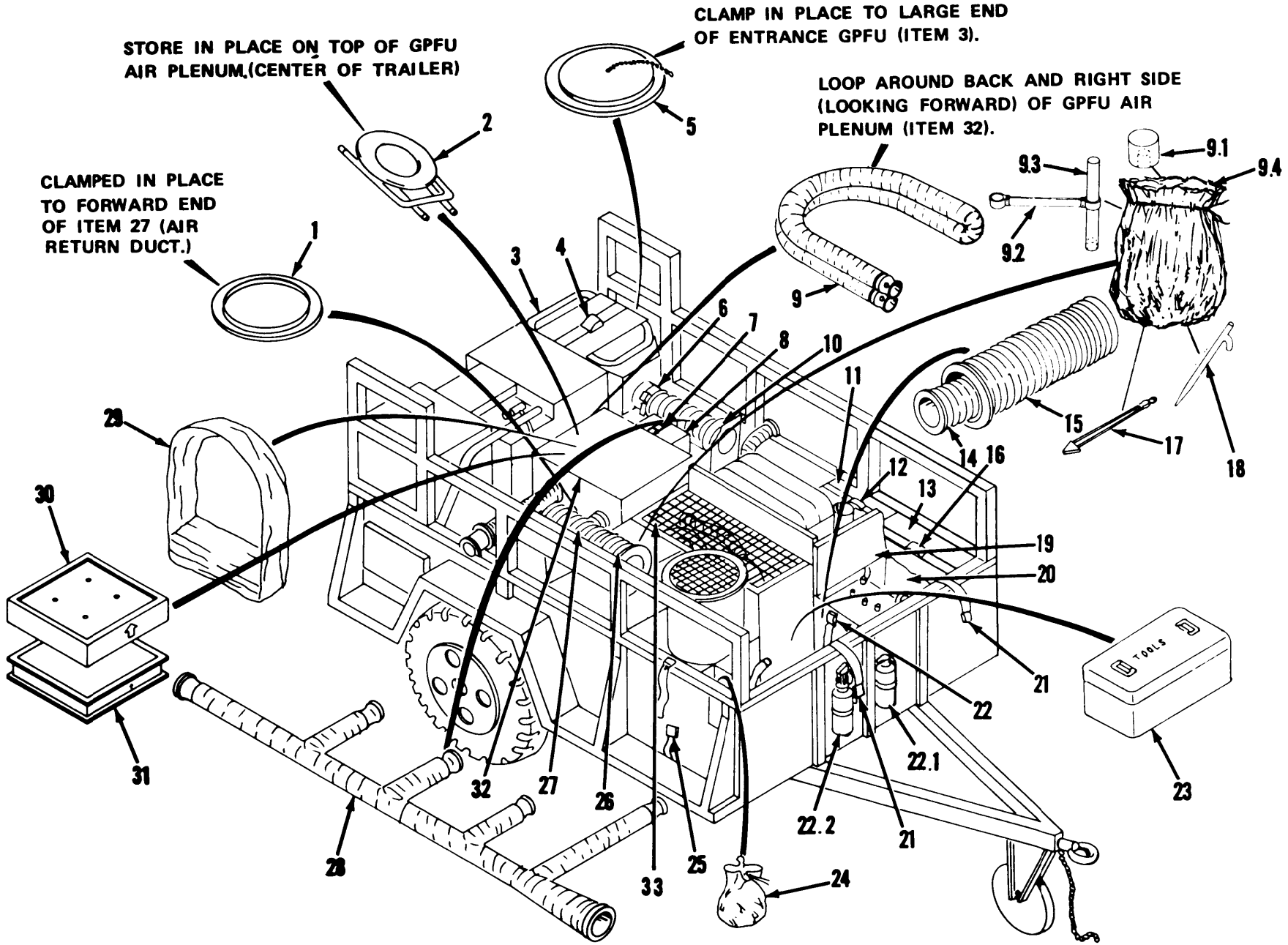


Figure 2–10. Removable items.

Legend for fig. 2-10:
1 Adapter
2 Portable toilet
3 Entrance gas-particulate filter unit (GPFU)
4 Strap
5 Duct cap
6 Catch
7 Strap
8 Evacuation fan
9 Air-duct hose
9.1 Driving head
9.2 Holding rod handle
9.3 Driving rod
9.4 Barracks bag
10 Coupling
11 Box plenum
12 Strap
13 Sound-attenuating plenum
14 Air-recirculation duct
15 Air-supply duct
16 Strap
17 Anchors
18 Tent pins
19 Battery box lid
20 Storage box
21 Straps
22 Strap
22.1 Fire extinguisher
22.2 Decontaminating apparatus M11
23 Tool box
24 Repair kit
25 Strap
26 Straps
27 Air-return duct
28 Evacuation manifold
29 Transition
30 Gas filter M23
31 Particulate filter M24
32 GPFU air plenum
33 Safety shield

w. With three men, unload entrance GPFU (3). Place aside until needed.

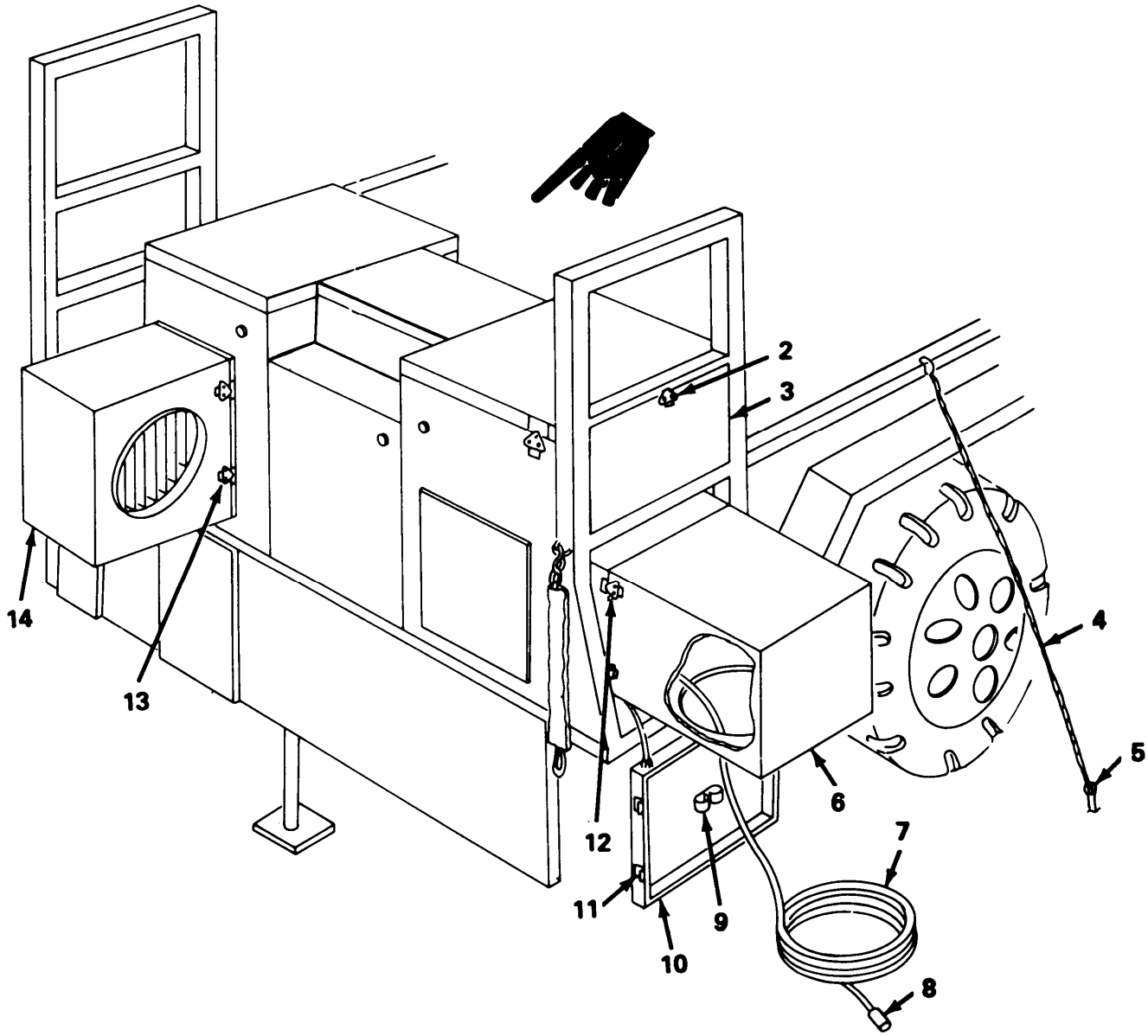
x. Unfasten two straps (21). Unload air-supply duct (15) and air-recirculation duct (14). Place ducts aside until needed.

y. Unfasten two straps (26), and unload air. return duct (27). Place duct aside until needed.

z. Unfasten strap (22), and unload tool box. Place tool box aside until needed.

au. Unfasten strap (12 and 16). Unload sound-attenuating plenum (13) and box plenum (11). Place plenums aside until needed.

ab. Release four catches (11, fig, 2-11) and remove cover (10).



1 Not used
2 Catch
3 Door
4 Ground wire
5 Anchor
6 Sound-attenuating plenum
7 Cable
8 Connector
9 Clip
10 Cover
11 Catches
12 Catches
13 Catches
14 Box plenum

Figure 2–11. Box and sound-attenuating plenums installation.

ac. Remove adapter (1, fig. 2-10) and duct cap (5) assembled from recirculation fan cabinet. Place items on support rack.

ac.1 Remove air-duct hose (9) located around GPFU air plenum. Place hose aside until needed.

ac.2 Remove transition (29) from top of GPFU air plenum (32). Place transition on support rack.

ad. Unload portable toilet (2). Place toilet aside until assembled.

ae. Unfasten four straps (fig. 2-7) and unfold carrying case.

af. Unroll and unfold shelter. Remove carrying case from under shelter and store on support rack.

ag. Place tailgate extension on support rack.

2-45. Preparing for Startup and Inflation

a. Pull connector (8, fig. 2-11) from clip (9), and remove cable (7) from cover (10).

b. Feed cable (7) through sound-attenuating plenum (6).

c. Install plenum and secure with four catches (12).

d. Install box plenum (14) and secure with four catches (13).

e. Open storage box lid (19, fig. 2-10) to form a baffle.

NOTE

Baffle prevents engine exhaust fumes from entering the airstream of the centrifugal blower.

f. Using a heavy hammer and tools (para 2-77), drive one anchor (5, fig. 2-11) approximately 2 inches below ground level. Moisten ground around anchor to obtain a good electrical ground.

g. Attach trailer grounding wire (4) to anchor (5).

CAUTION

Be sure that the top shroud of the gasoline engine is in place for adequate circulation of cooling air (TM 5-2805-259-14).

Ih. Adjust gasoline engine air-cleaner-intake shutter and oil pan baffle (TM 5-2805-259-14).

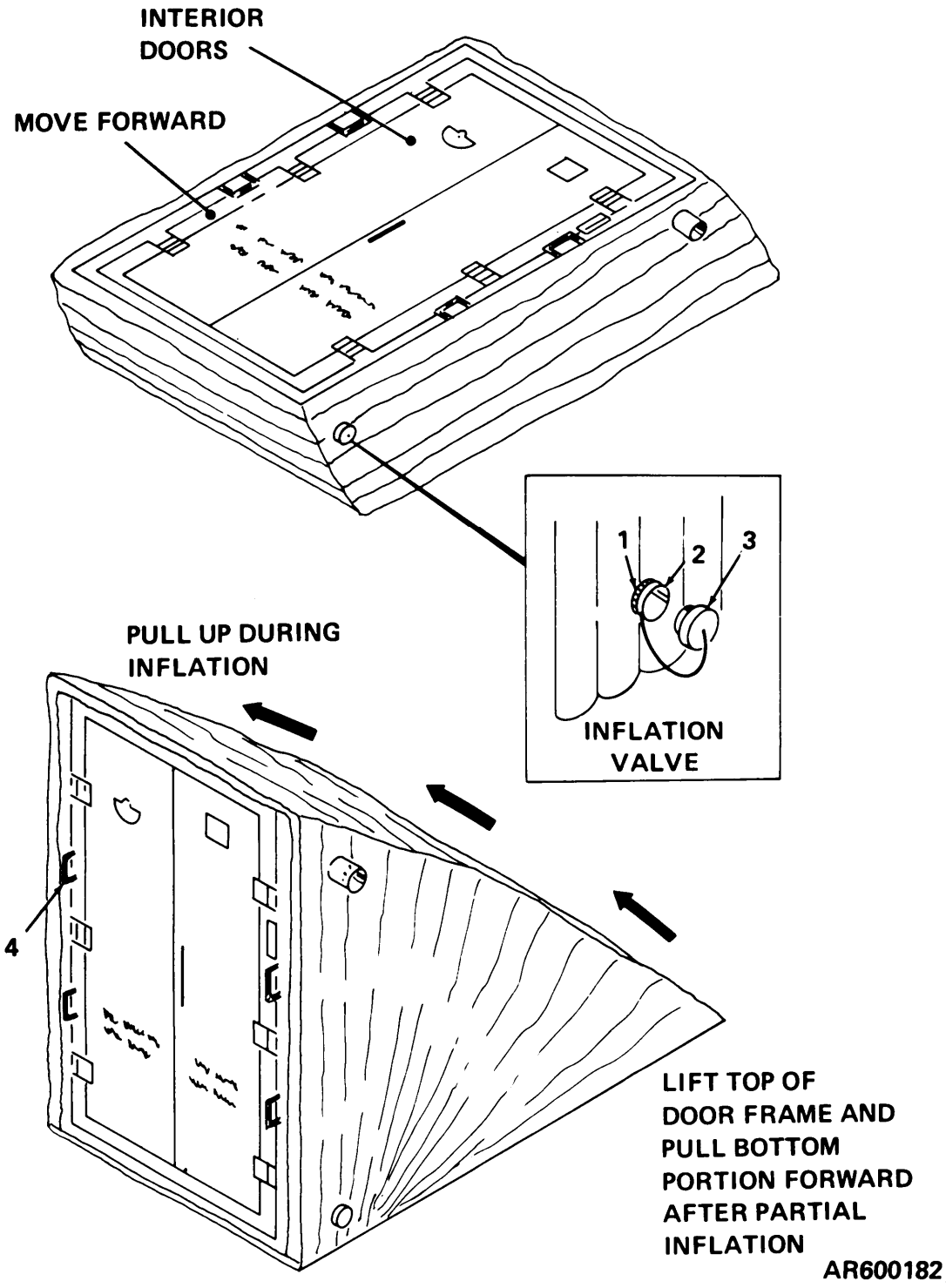
i. Release clamp (3, fig. 2-1) and remove cover (2).

j. Connect one end of air duct hose (9, fig. 2-10) to air duct coupling (1, fig. 2-1) and secure with clamp (3).

WARNING

Be careful when handling entrance. Protect against tears and abrasions. Failure to comply may result in DEATH or serious illness to occupants.

k. Lift top door frame of entrance to gain access to inflation valve (fig. 2-12).



1 Clamp
2 Inflation valve
3 Cover

Figure 2-12. Positioning entrance for inflation.

l. Release the inflation valve clamp (1) and remove cover (3).

m. Insert open end of air duct hose into inflation valve (2) and close clamp (1).

2-46. Startup and Entrance Inflation

WARNING

Be sure that trailer grounding wire is attached to anchor prior to starting gasoline engine.

CAUTION

Insure that the blower and generator drive belts are not obstructed and can operate freely (fig. 1-7).

CAUTION

Be sure that the immediate area around the gasoline engine is clear. Especially, the area near the flywheel, manifold, and muffler.

a. Depress the fuel indicator switch (3, fig. 2-5) and check fuel quantity gage (2). Add fuel if necessary.

b. Remove engine crankcase oil-gage-rod (fig. 32). Check oil level; maintain level at full mark. Add oil as required in LO 5-2805-259-12.

b.1 Remove safety shield (33, fig. 2-10).

c. Remove centrifugal blower dipstick (fig. 32). Check oil level; maintain oil level at full mark. If necessary, add hydraulic lubrication oil (item 6, table 1-3).

c.1 Install safety shield (33, fig. 2-10).

d. Unfasten catch (2, fig. 2-11) and open door (3).

e. Be sure that circuit breakers (1, 2, 3, and 4, fig. 2-2) are in OFF position.

f. Position engine control switch (13) to ON.

NOTE

Be sure that throttle is fully in before starting engine.

CAUTION

Do not depress ENGINE START switch for more than 15 seconds. If engine fails to start after two 15-second attempts, allow starter to cool off for 5 minutes before next attempt. Failure to comply may result in damage to starter or loss of battery charge.

NOTE

If engine fails to start after two attempts, use engine choke, TM 5-2805-259-14.

g. Depress ENGINE START switch (14).

h. After engine starts, pull out throttle (9, fig. 2-1) until idle speed is obtained. Turn throttle clockwise (CW) to lock in idle position.

NOTE

Prior to applying the applicable load requirements, allow cold engine to warm up at idle speed for 5 minutes. Allow a warm engine to operate at idle speed for 1 minute before applying load.

i. Turn throttle (9) counterclockwise (CCW) and push full in. Lock throttle in by turning clockwise (CW).

j. Set AUXILIARY 120-VAC circuit breaker (4, fig. 2-2) to ON.

k. Check GENERATOR FREQUENCY METER (11, fig. 2-2) for a reading of 62 Hz. If no reading is observed, momentarily snap MANUAL FIELD FLASH switch (12). Repeat three times if required. Adjust and set engine speed to produce 60 a 2.0 Hz. Refer to figure 2-19.1 for adjustment procedure.

l. Set DC POWER SUPPLY circuit breaker (1, fig. 2-2) to ON.

m. Depress PRESS TO INFLATE switch (9) and hold during inflation.

n. Maintain entrance position (fig. 2-12) while inflating.

o. After entrance has inflated, release PRESS TO INFLATE switch.

p. Release clamp (1) and remove air-duct hose. Install cover (3) and secure with clamp (1).

q. Position inflated entrance as shown in figure 2-13.

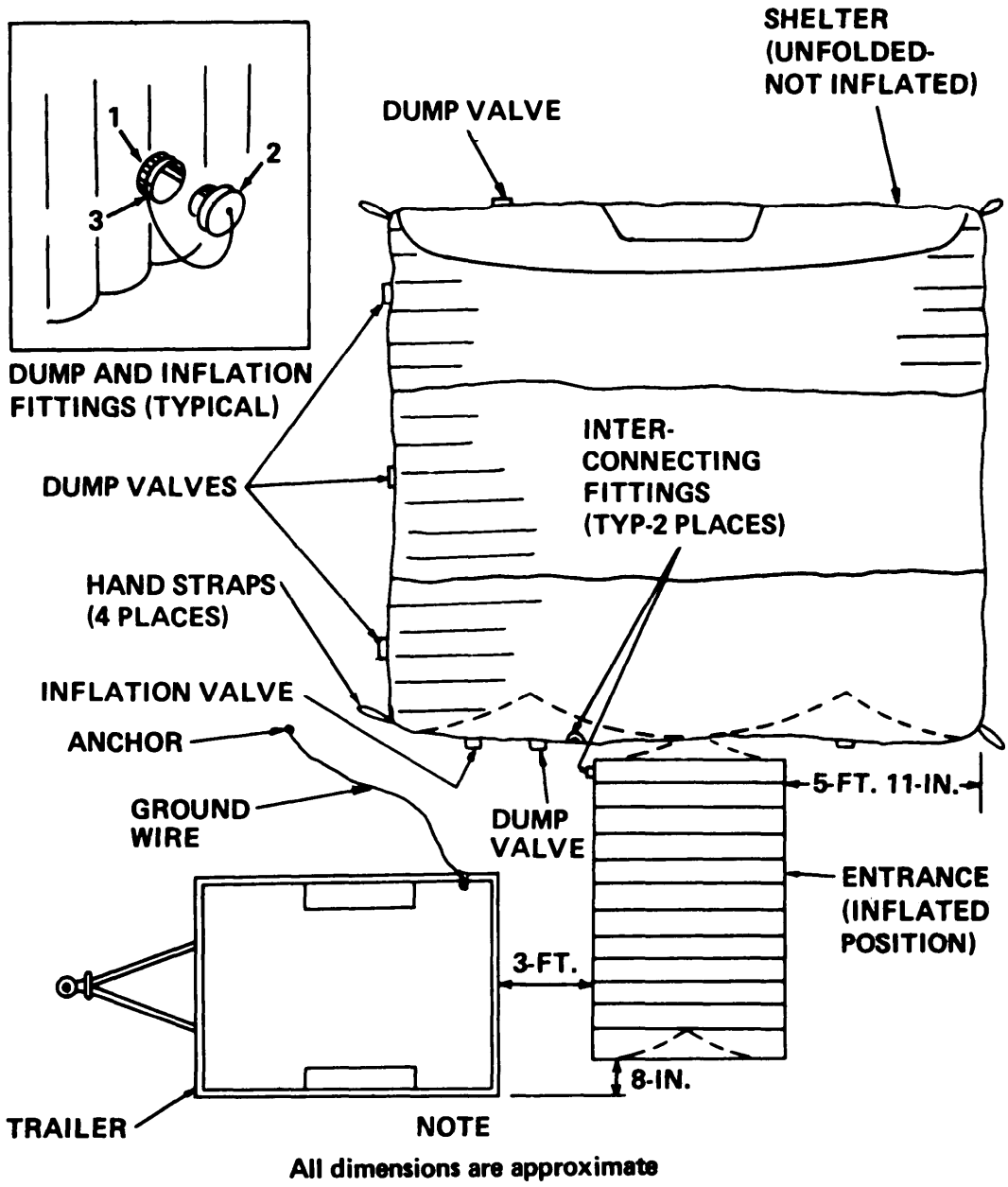


Figure 2-13. Positioning shelter for inflation.

2-47. Shelter Inflation

WARNING

DO NOT WALK ON THE FABRIC. Be extremely careful when handling the shelter. Protect against tears and abrasions. Failure to comply may result in DEATH or serious illness to occupants.

a. Release inflation fitting clamp (1, fig. 2-13) and remove cover (2). Insert open end of air duct hose into inflation fitting (9) and close clamp (1).

b. Be sure that the five dump valves. have covers installed and are clamped in position.

c. Depress PRESS-TO-INFLATE switch (9, fig. 2-2) and hold during inflation.

CAUTION

Do not use tiedown ropes to move shelter into position.

d. After inflation, push shelter into position as shown in figure 2–7.

NOTE

Be sure that air-supply duct can be connetted between box plenum and shelter.

2-48. Entrance to Shelter Connection

a. Unfasten 10 straps (19, fig. 2-14) from dee-rings (18).

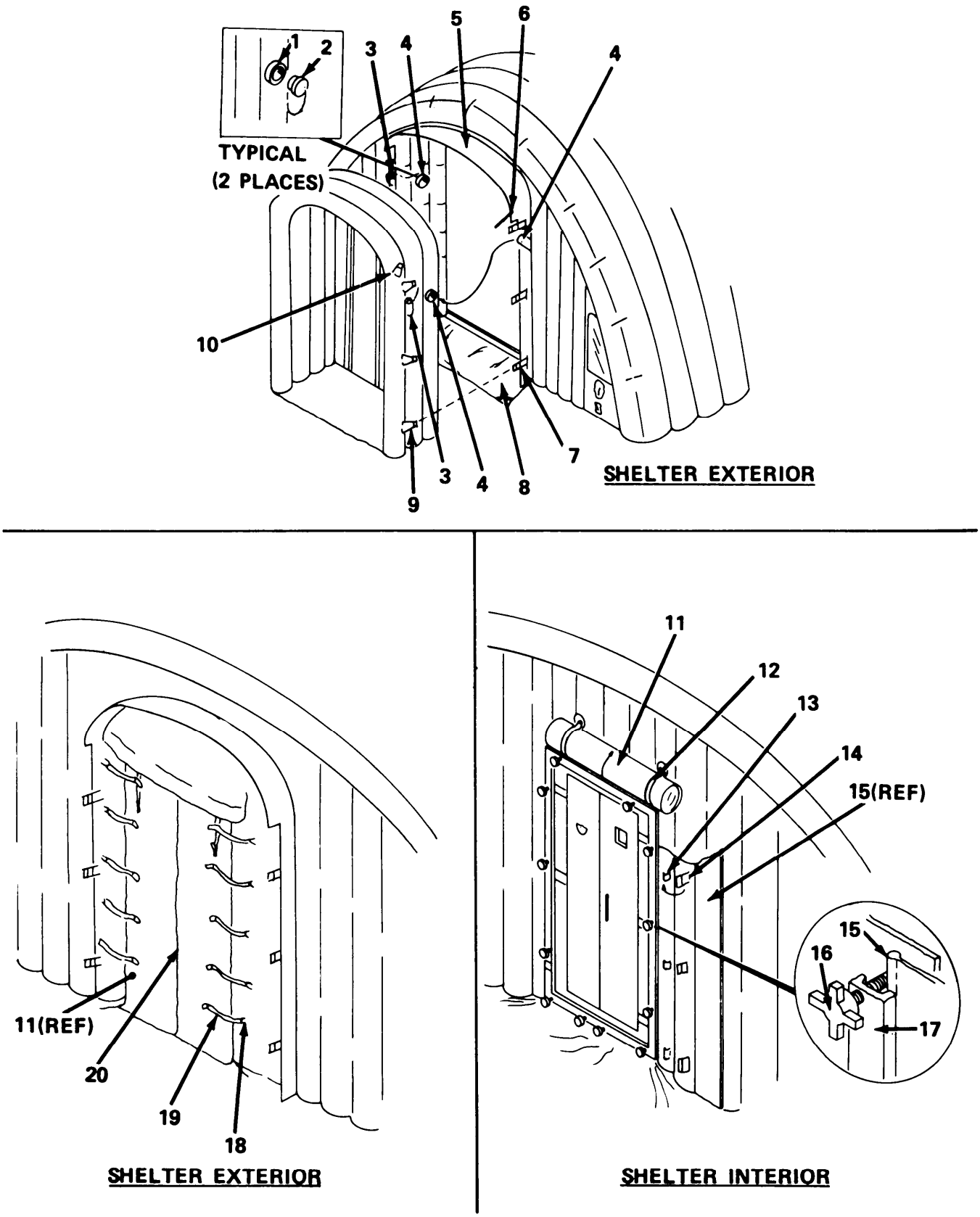


Figure 2-14. Entrance and shelter connection.

Legend for fig. 2-14:

1 Clamps
2 Covers
3 Pockets
4 Interconnecting fittings
5 Weatherskirt
6 Ropes
7 Dee-rings
8 Weatherskirt
9 Hooks
10 Dee-rings
11 Cover
12 Straps
13 Hooks
14 Dee-rings
15 Gas seal
16 Hand knobs
17 Door frame seal
18 Dee-rings
19 Straps
20 Zipper

b. Push shelter opening cover (11) inward to free it from the securing hook and pile fastener.

c. Enter shelter and roll up shelter opening cover. Secure cover with two straps (12).

d. If present, fold arctic blanket (fig. 2-15).

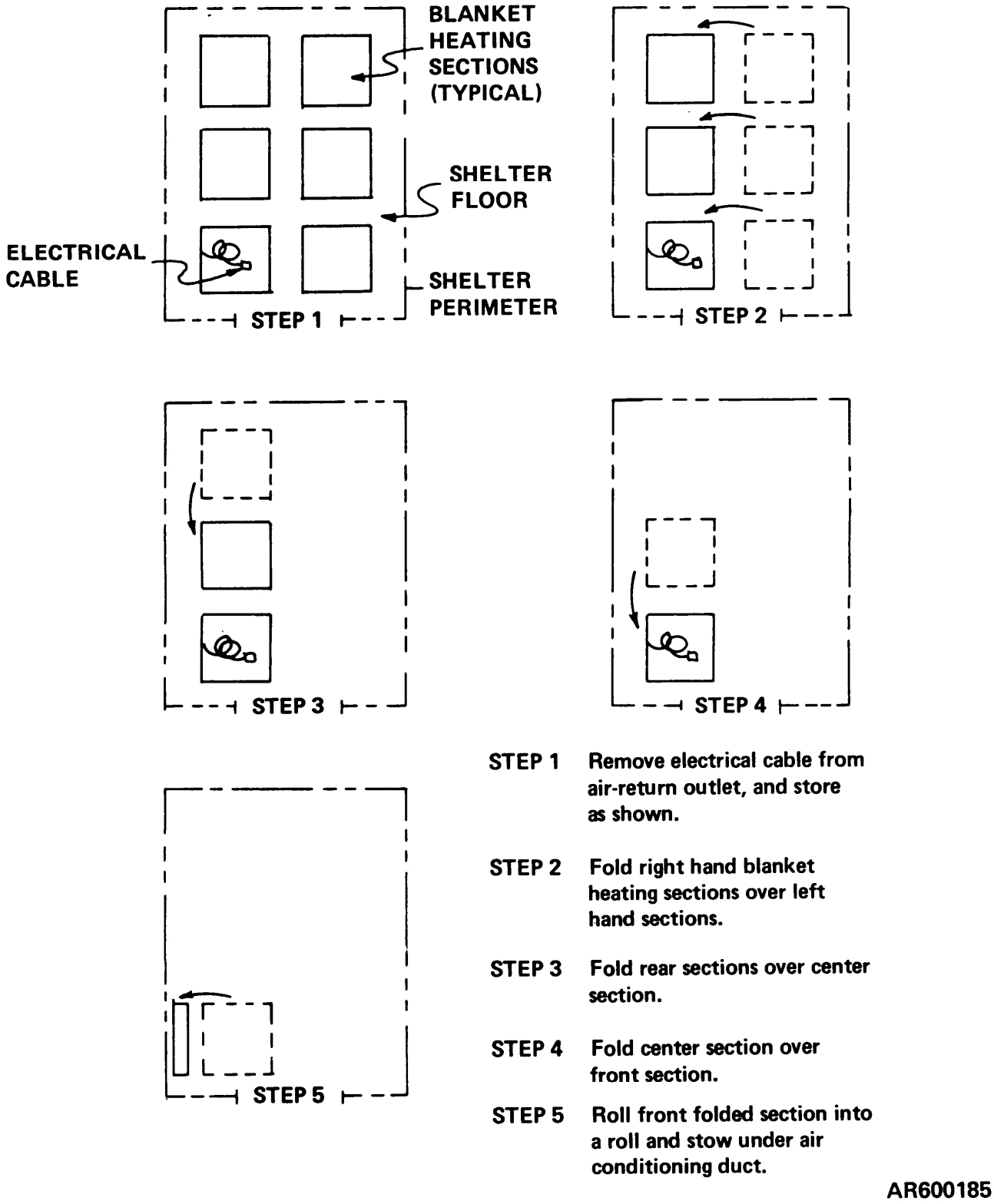


Figure 2-15. A retie blanket folding sequence.

e. Place tool box and portable toilet inside shelter.

f. Lay bottom weatherskirt (8, fig. 2-14) flat on ground.

g. Apply thin coat of aircraft grease (item 7, table 1-3) to inner and outer surfaces of interconnecting fittings (4).

h. Partially deflate entrance by inserting fingers into inflation valve (2, fig. 2-12), and unseating internal flapper valve.

NOTE

Entrance will reinflate once it is properly connected to the shelter.

i. Position entrance in shelter opening. Connect 12 hooks (13, fig. 2-14) and dee-rings (14). Two connections are located on top of door frame and five on each side.

j. Position weatherskirt (5) to lay flat on entrance.

k. Connect six dee-rings (7) and hooks (9). Three connections on each side of entrance.

l. Unfasten two clamps (1) and remove two covers (2). Place covers in pockets (3).

m. Connect interconnecting fittings (4) and close clamps (1).

n. Starting in upper right-hand corner of door frame, insert gas seal (15) under door frame seal (17).

o. Hand-tighten 12 knobs (16).

p. Tie ropes (6) to dee-rings (10) on both sides of entrance.

2-49. Staking and Tiedown

a. Using a heavy hammer, drive 19 tent pins at locations shown (No. 1, fig. 2-16).

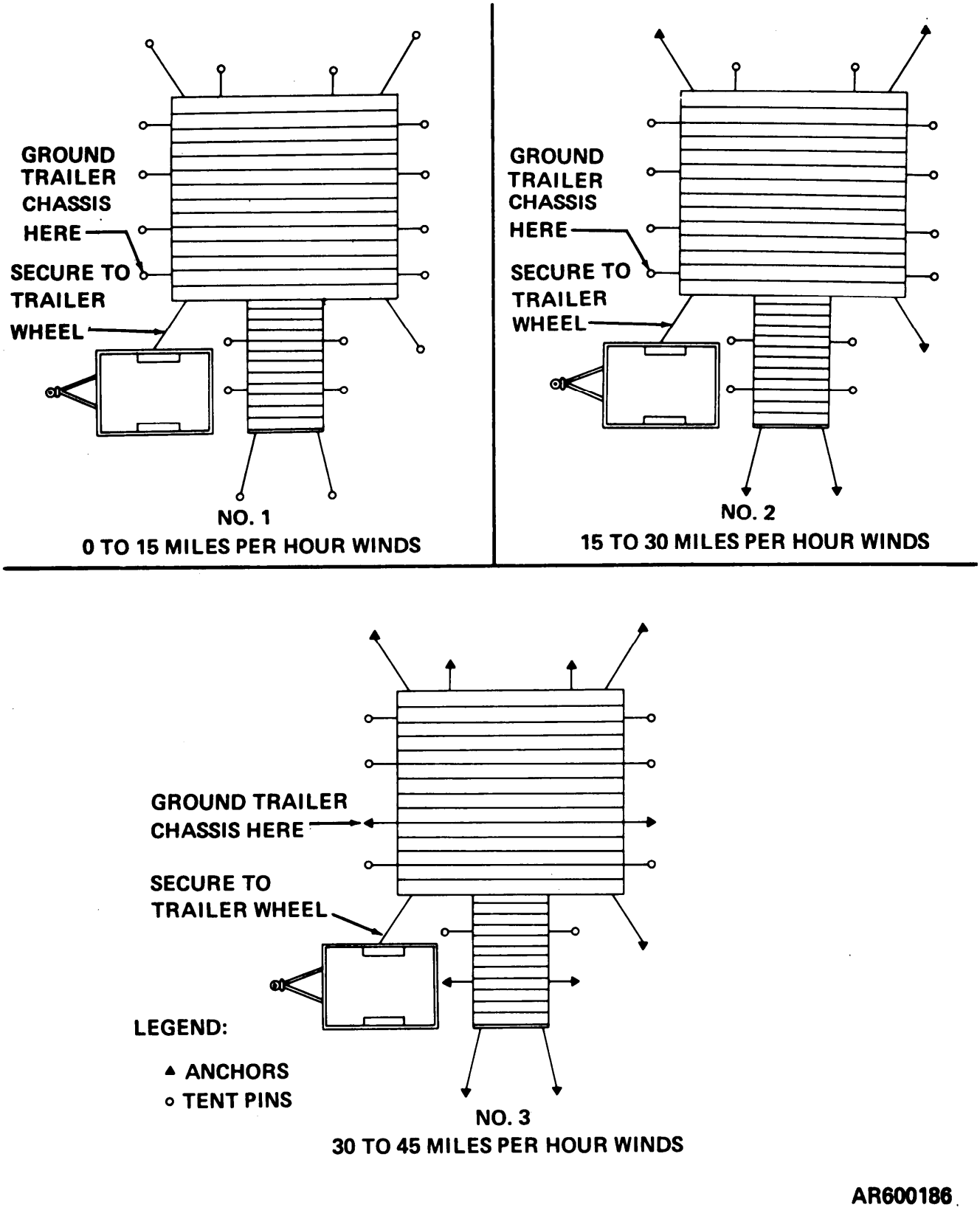


Figure 2-16 ①. Anchors and tent pins installation (sheet 1 of 2).

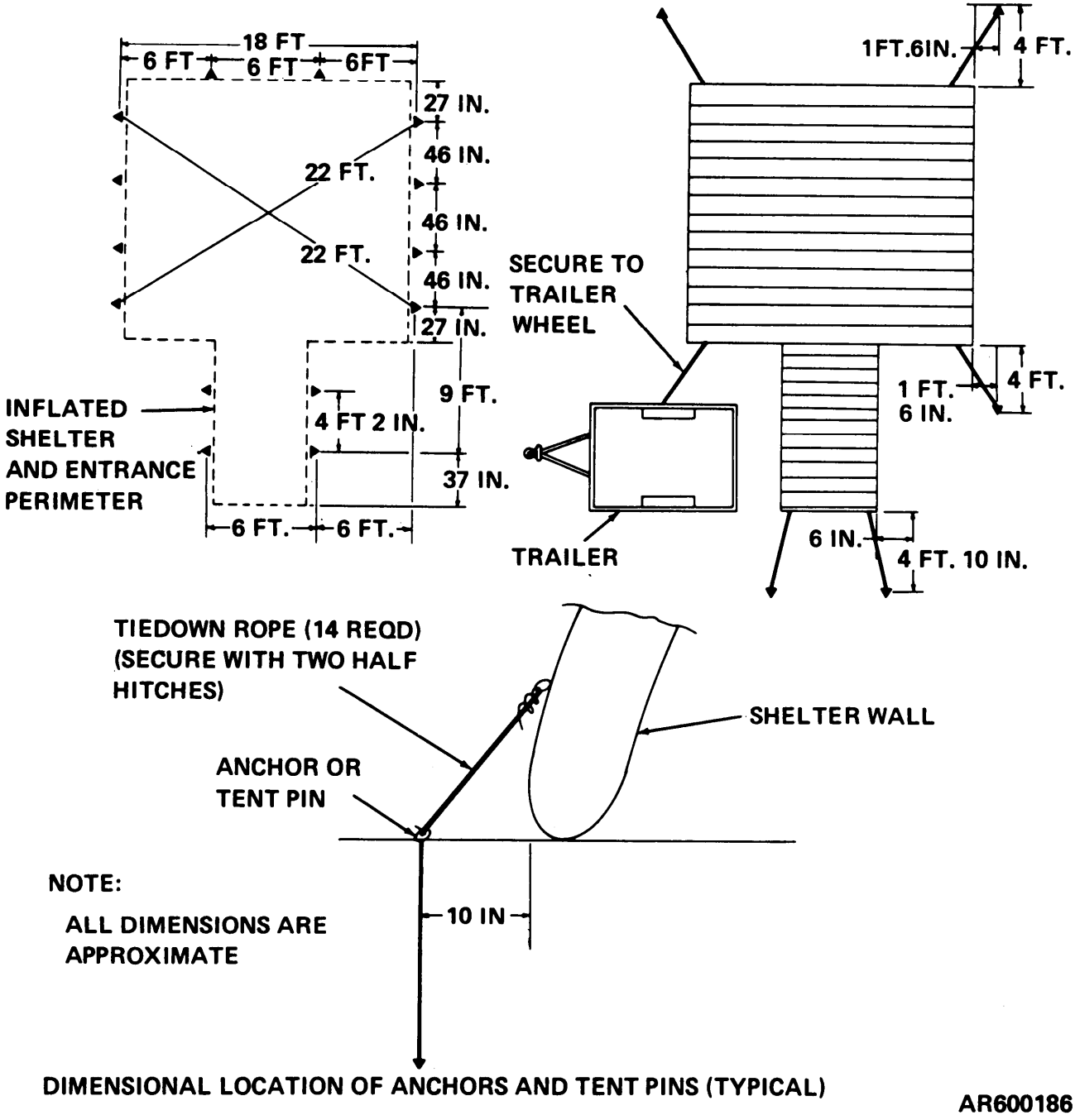


Figure 2-16 ②. Anchors and tent pins installation (sheet 2 of 2).

CAUTION

Shelter and entrance must be firmly secured to ground. If edges of shelter and entrance rise from ground (ballooning) replace tent pins with ground anchors.

b. Tie 19 tiedown ropes to tent pins and one to trailer wheel.

2-50. Air-Return and Air-Supply Duct Installation

a. Remove air-return and air-supply ducts from their storage retainers (fig. 2-17). Place storage retainers on support rack.

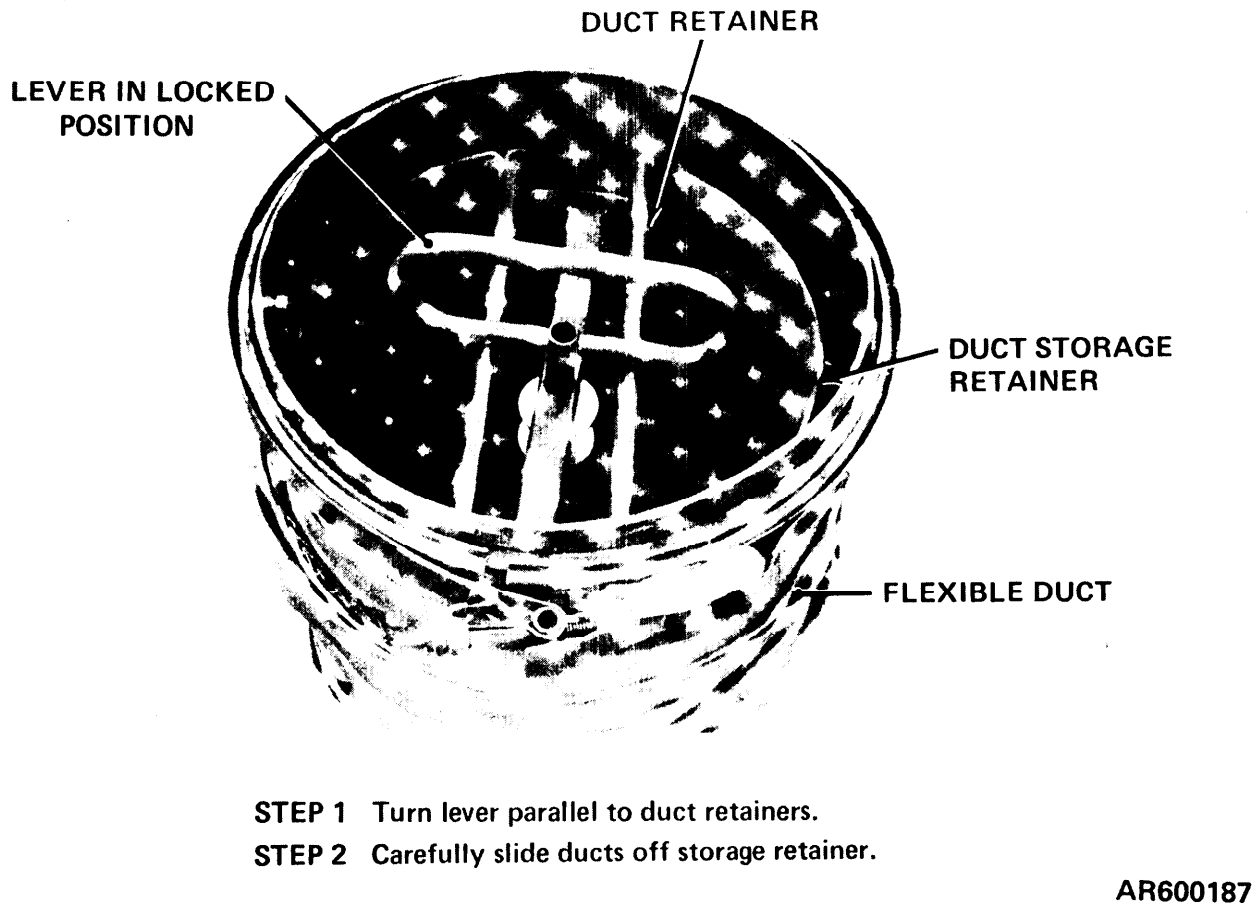


Figure 2-17. Air-supply, air-return, and air-recirculation duct storage.

b. Feed cable (7, fig. 2-11) through air-return duct (fig. 2-18). Lay cable through shelter air-return outlet.

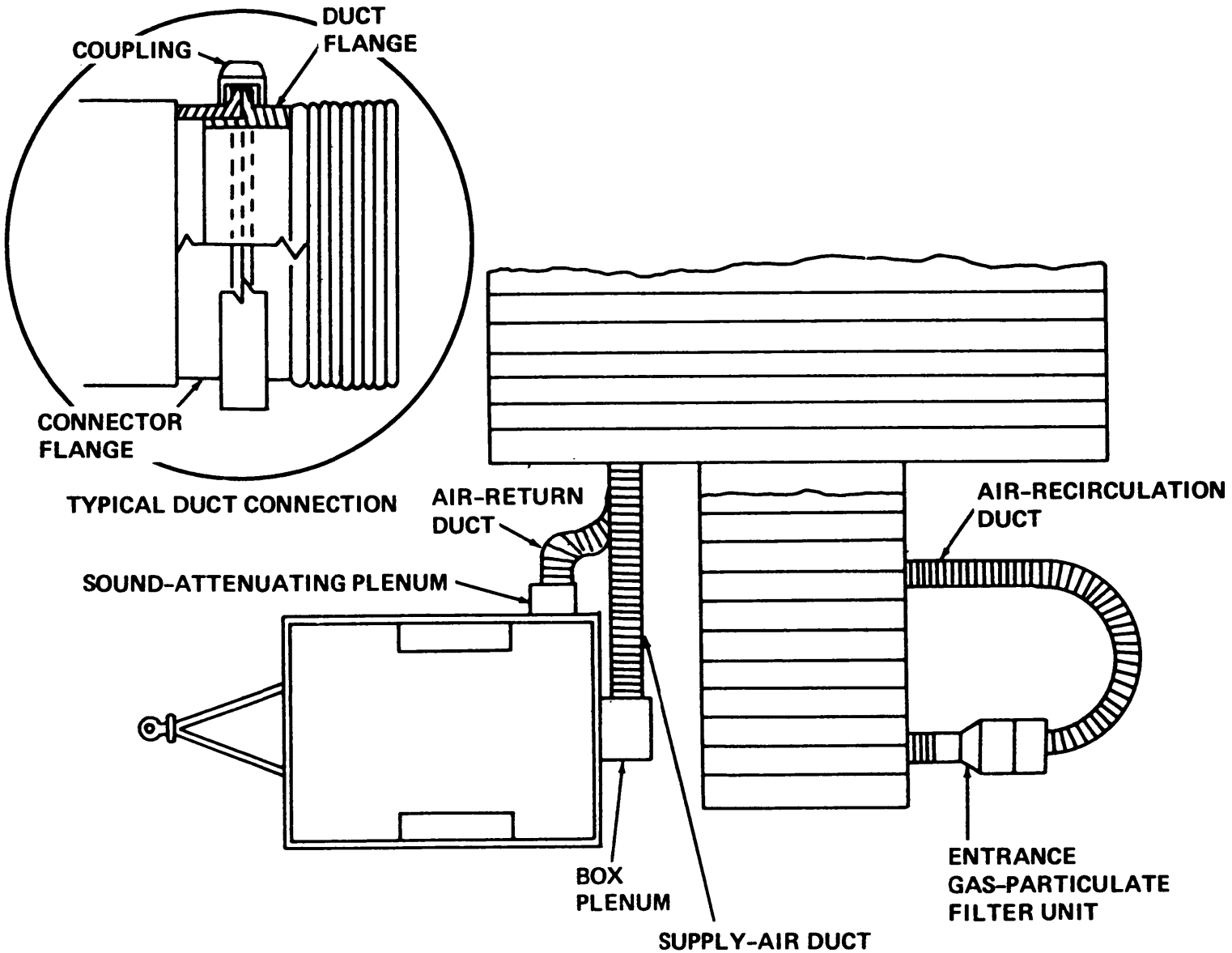


Figure 2–18. Air-return and air-supply duct installation.

c. Connect air-return duct to shelter air-return outlet and to sound-attenuating plenum. Secure with attached couplings.

d. Connect air-supply duct to shelter air-supply inlet and box plenum. Secure with attached couplings.

e. Adjust coupling clamps if required. They might be too loose or too tight. Coupling clamp handle should close easily.

2-51. Entrance Gas-Particulate Filter Unit Installation

a. Position entrance gas-particulate filter unit as shown in figure 2-18.

b. Remove air-recirculation duct from its storage retainer (fig. 2-17). Place storage retainer on support rack.

c. Connect the filter unit flexible duct to the air-recirculation outlet and secure with attached coupling.

d. Connect the air-recirculation duct to the filter unit and the entrance-air-recirculation inlet. Secure both ends with the attached couplings.

e. Remove plug connector (fig. 1-3) from dummy receptacle. Remove cover from receptacle (5, fig. 2-19) and connect plug connector.

Legend for fig. 2-19:
1 Switch box
2 Hanger straps
3 Cable and light assembly
4 Distribution box
5 Receptacle connector
6 Auxiliary control indicator
7 Power supply cable
8 Cable and light assembly
9 Electric power cable

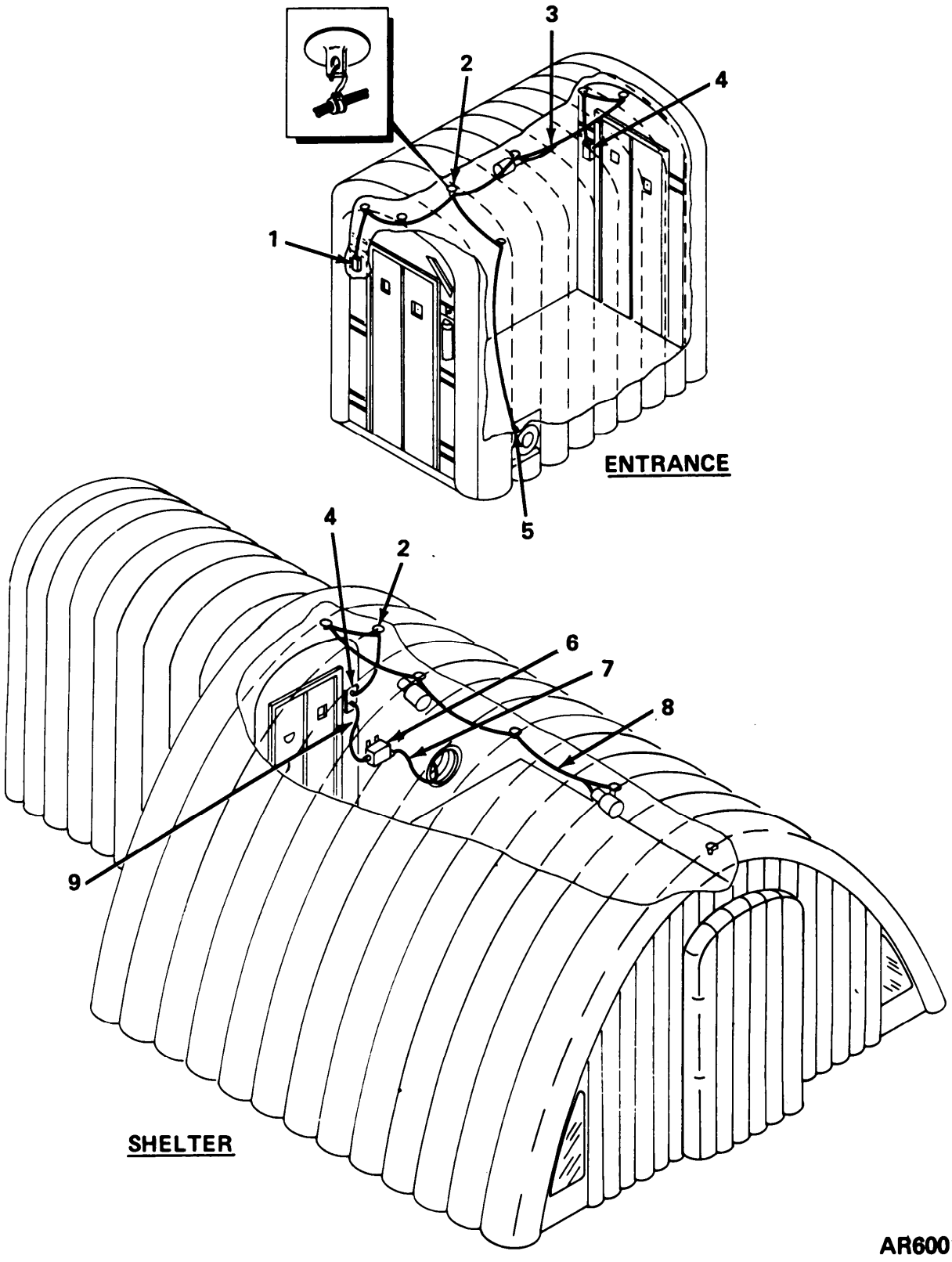


Figure 2-19. Electrical cables installation.

2-52. Electrical Installation

a. Remove auxiliary control indicator (fig. 2-3) from tool box. Install auxiliary control indicator on two dee-rings near location shown (fig. 2-19).

b. Remove cover from plug connector P-8 on power supply cable (7).

c. Remove cover (10, fig. 2-3). Connect plug connector P-8 to receptacle connector.

d. Remove cables (3, 8, and 9, fig. 2-19) from tool box.

e. Remove cover (15, fig. 2-3). Connect plug connector P-9 on electric power cable (9, fig. 2-19) to receptacle connector.

f. Remove two covers from distribution box (4).

g. Connect plug connector P-10 on electric power cable (9) to bottom receptacle connector.

h. Connect plug connector P-11 on cable and light assembly (8) to top receptacle connector. Attach hangers on cable to hanger straps (2).

i. On the entrance side, remove cover on distribution box (4). Connect plug connector P-14 on cable and light assembly (3) to receptacle connector. Attach hangers on cable to hanger straps (2).

j. Remove cover from switch box (1). Connect plug connector P-17 on cable (3) to receptacle connector.

k. Remove cover from receptacle connector (5). Connect plug connector P-16A on cable and light assembly (3) to receptacle connector.

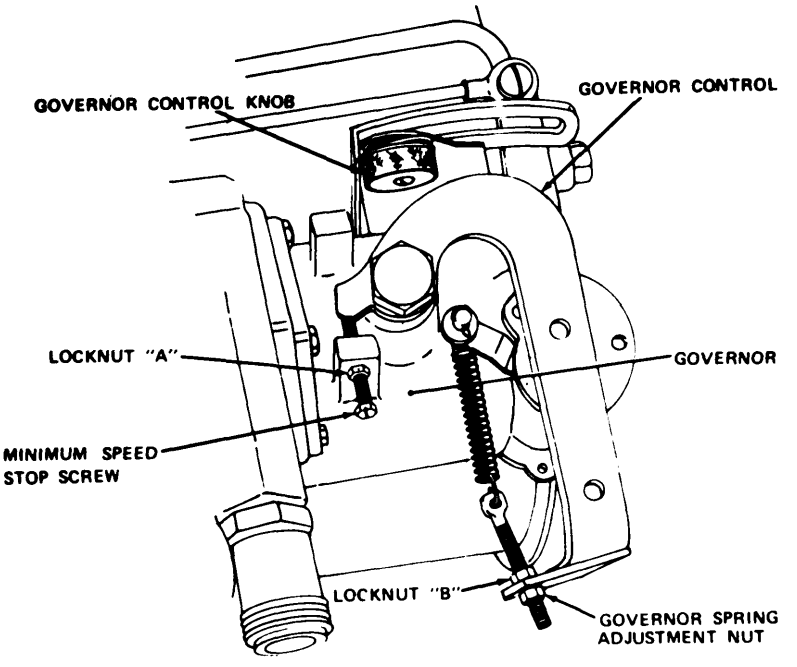
NOTE

Be sure throttle is in full-in position.

l. Set circuit breakers (2 and 3, fig. 2-2) to ON.

m. Set LIGHT switch (1, fig. 2-3) to ON.

n. Check GENERATOR FREQUENCE METER (11, fig. 202) for a no-load reading of 62 Hz. If a reading of 62 Hz cannot be obtained with the throttle in a full-in position, adjust engine governor (fig. 2-19.1).



STEP 1. Loosen locknut A and turn minimum speed stop screw counter-clockwise 4 turns to prevent engine overspeed.

STEP 2. If provided, loosen governor control knob and place governor control knob in govern position, tighten knob.

STEP 3. Turn minimum speed stop screw clockwise to obtain 62 Hz on the generator frequency meter.

STEP 4. Insure circuit breakers (1, 2, and 3, fig. 2-2) are in the ON position

NOTE
If ambient temperature is below 70° F (21° C) omit step 5.

STEP 5. Set environmental control switch (14, fig. 2-3) to COOL.

STEP 6. Turn minimum speed stop screw clockwise to obtain a minimum of 58 Hz on the generator frequency mater.

STEP 7. Set circuit breakers (1, 2, and 3, fig. 2-2) to OFF. Observe generator frequency meter for a reading not to exceed 62 Hz. If reading exceeds 62 Hz, perform steps 8 and 9.

STEP 8. Loosen locknut B and turn governor spring adjustment nut 2 turns clockwise to reduce no-load speed.

STEP 9. Perform steps 4 and 6 through 8 until the no-load and load reading on the generator frequency meter remains between 58 and 62 Hz.

NOTE

If no-load speed is adjusted too close to load-speed, instability or hunting will occur. If instability or hunting occurs, adjust governor spring adjustment nut to obtain no-load reading of 62 Hz. Then perform steps 4 and 6 through 8 to obtain stability

STEP 10. Tighten locknuts A and B. Set circuit breakers 1, 2, and 3 to ON.

Figure 2–19.1. Governor adjustment.

2-63. Air-Flow Gage Adjustment

a. Remove air-flow gage (para 2-78) from tool box.

b. Connect one hose to each tap of top gage. Hold gage vertically.

c. If pointer is not directly on zero, turn adjustment screw (fig. 2-33) CW or CCW to position pointer on zero.

d. Perform steps band c above on bottom gage.

2-54. Air-Pressure Checks and Adjustments

WARNING

The gas and particulate filters used in the M151 shelter system do not provide protection against carbon monoxide.

a. Shelter Rib Pressure.

(1) On bottom gage, insert one hose into tap marked HI. Insert other hose into tap marked LOW.

(2) Insert free end of hose from the HI tap into air-pressure tap (10, fig. 2-20). Leave remaining hose to atmosphere.

Legend for fig 2-20:
1 Relief valve
2 Nut
3 Bolt
4 Gas-particulate filter assembly
5 Pressure tap
6 Pressure tap
7 Lever
8 Wing nut
9 Pressure tap
10 Pressure tap
11 Pressure tap
12 Environmental equipment cabinet
13 Not used
14 Recirculation fan cabinet
15 Pressure tap
16 Pressure tap
17 Butterfly valves
18 Thumbscrew
19 Pressure tap
20 Pressure tap
21 Pressure tap
22 Pressure tap

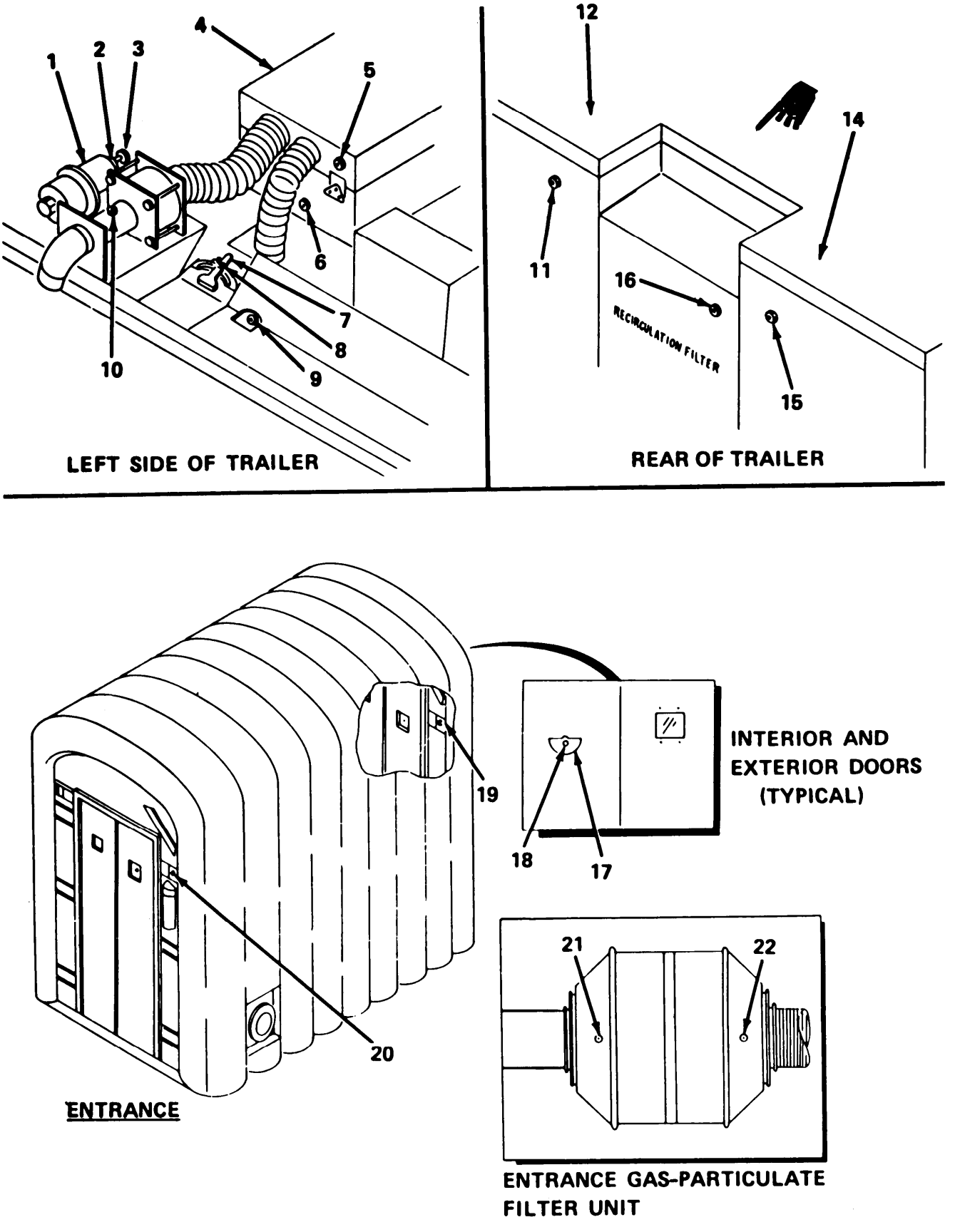


Figure 2-20. Air pressure taps.

NOTE

To avoid incorrect reading, hold air-flow gage vertically when taking reading.

(3) Depress PRESS-TO-INFLATE switch (9, fig. 2-2). Gage should read 30- to 45-inches wg.

(4) If reading is incorrect, loosen nut (2, fig. 2-20) and turn bolt (3) in-or-out until correct reading is obtained. Tighten nut (2).

(5) Remove gage hose from air-pressure tap (10).

b. Orifice Pressure Differential.

(1) Insert free end of hose from the HI tap into air-pressure tap (5).

(2) Insert free end of remaining hose into air-pressure tap (9).

NOTE

Pressure settings vary with altitude.

(3) Obtain correct pressure reading at altitude of erection site (fig. 2-21).

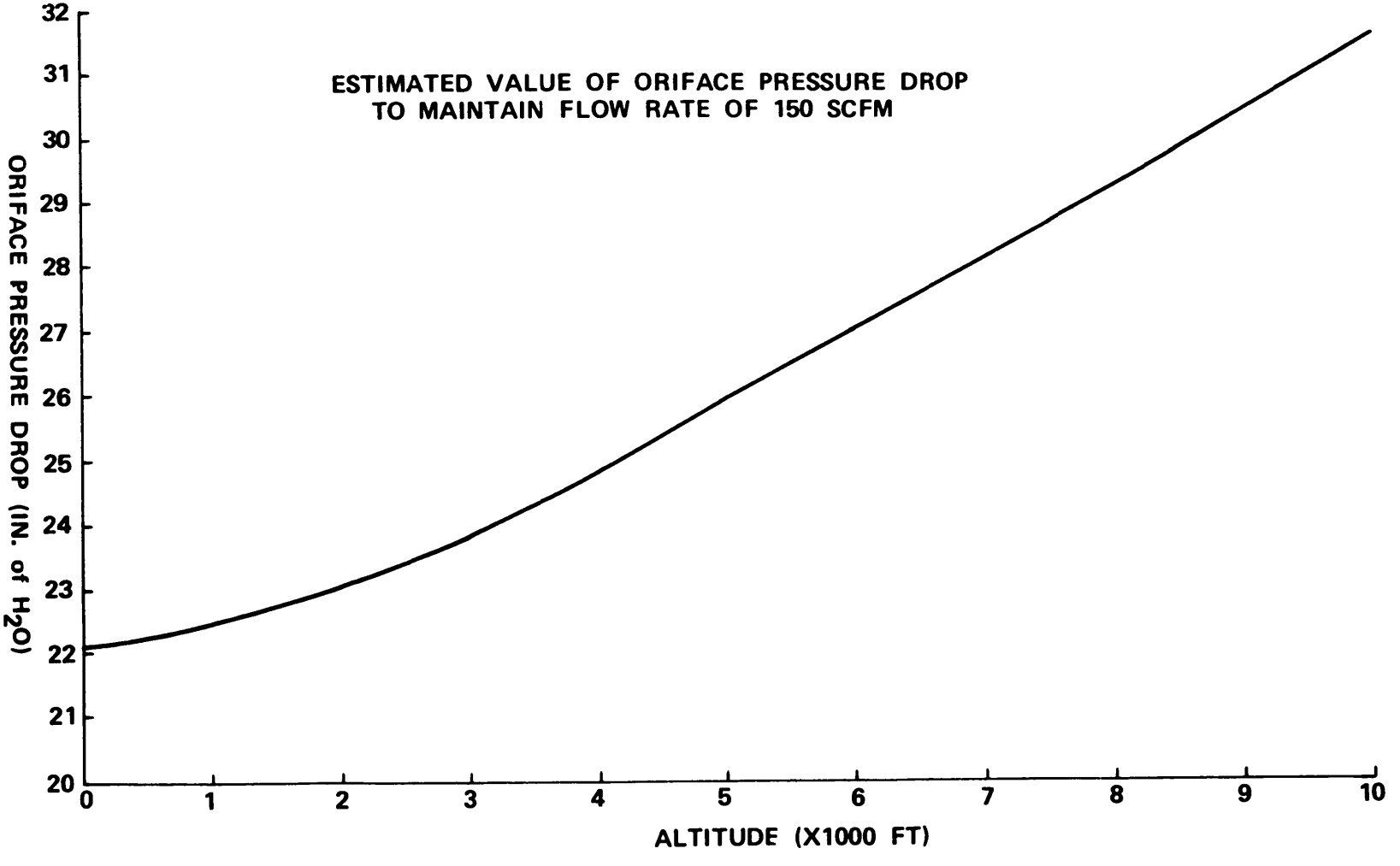


Figure 2-21. Altitude correction chart.

NOTE

To avoid incorrect readings, hold air-flow gage vertically when taking reading.

(4) Depress PRESS-TO-INFLATE switch (9, fig. 2-2).

(5) If reading is incorrect, loosen wing nut (8, fig. 2-20) and adjust lever (7) until reading is obtained. Tighten wing nut (8).

(6) Remove hoses from taps (5) and (9).

(7) Remove both hoses from gage assembly.

c. Shelter and entrance overpressure.

(1) On upper gage, insert one hose into tap marked HI. Insert other hose into tap marked LOW .

NOTE

Entrance doors must be completely closed for this check.

(2) Close entrance doors.

NOTE

To avoid incorrect readings, hold air-flow gage vertically when taking readings.

(3) Insert free end of hose from the HI tap into air-pressure tap (20, fig. 2-20). Leave remaining hose to atmosphere. Gage should read 0.5 (–0.1) inch wg.

(4) If reading is incorrect, loosen thumbscrew (18) on exterior door, and adjust butterfly valve (17) until a reading of 0.5 (–0.1) inch wg is obtained. Tighten thumbscrew (18).

(5) Disconnect hose from air pressure tap (20).

NOTE

To avoid incorrect readings, hold air-flow gage vertically when taking readings.

(6) Insert free end of hose from the HI tap into air-pressure tap (19). Leave remaining hose open to entrance air pressure. Gage should read 0.5 (+0.1 or –0.2) inch wg.

(7) If reading is incorrect, loosen thumbscrew (18) on interior door and adjust butterfly valve (17) until a reading of 0.5 (+0.1 or –0.2) inch wg is obtained. Tighten thumbscrew (18).

(8) Remove hose from air pressure tap (19).

NOTE

To avoid incorrect readings, hold air-flow gage vertically when taking readings.

(9) Insert free end of hose from the HI tap into air pressure tap (20). Leave remaining hose to atmosphere. Gage should read 0.5 (±0.1) inch wg.

(10) If reading is incorrect, repeat step (7).

(11) Remove hose from air pressure tap (20).

d. Entrance gas-particulate filters pressure drop.

(1) Insert free end of hose from the HI tap into air-pressure tap (21). Insert remaining hose into air-pressure tap (22).

NOTE

To avoid incorrect readings, hold air-flow gage vertically when taking readings.

(2) If pressure reading is above 1.55 inches wg have particulate filter replaced.

(3) Remove hoses from air-pressure taps (21 and 22).

e. Shelter Recirculation Filters Pressure Drop.

(1) Insert free end of hose from the HI tap into air-pressure tap (16). Insert free end of remaining hose into air-pressure tap (11).

NOTE

To avoid incorrect readings, hold air-flow gage vertically when taking readings.

(2) If pressure reading is above 2.0 inches wg, have recirculation particulate filter replaced.

(3) Remove hoses from air-pressure taps (11 and 16).

f. Mask Alarm Buzzer and Make-up Air Pressure Checks.

(1) Insert free end of hose from the HI tap into air-pressure tap (15). Leave remaining hose to atmosphere.

(2) Set circuit breakers (1, 2, 3, and 4, fig. 2-2) to OFF.

(3) Pull out throttle (9, fig. 2-1) until idle speed is obtained.

(4) Set ENGINE CONTROL switch (13, fig. 2-2) to OFF.

NOTE

To avoid incorrect readings, hold air-flow gage vertically when taking readings.

(5) While air pressure is decreasing, listen for audible buzzer (located in auxiliary control indicator) to go ON at 0.15-inch wg. If reading is correct, omit steps (6), (7), and (8).

(6) If reading is incorrect, adjust pressure switch (3, fig. 2-6) by turning adjustment screw (2). Turn adjustment screw counterclockwise (CCW) to decrease pressure, and clockwise (CW) to increase pressure.

(7) Push throttle (9, fig. 2-1) to full in position.

(8) Set ENGINE CONTROL switch (13, fig. 2-2) to ON. Start engine by depressing ENGINE START switch (14). Allow shelter internal pressure to exceed 0.3-inch wg, and repeat steps (3) through (5).

(9) Set ENGINE CONTROL switch (13, fig. 2-2) to ON. Start engine by depressing ENGINE START switch (14).

(10) Push throttle (9, fig. 2-1) to full in position.

(11) Set circuit breakers (1, 2, 3, and 4, fig. 2–2) to ON.

(12) While pressure is increasing, listen for audible click of solenoid valve when air pressure reaches approximately 0.30 inch wg. If reading is correct, omit steps (13) through (17).

(13) If reading is incorrect, adjust pressure switch (5, fig. 2-6) by turning adjustment screw (4). Turn adjustment screw CCW to decrease pressure, and CW to increase pressure.

(14) Set circuit breakers (1, 2, 3, and 4, fig. 2–2) to OFF.

(15) Set ENGINE CONTROL switch (13) to OFF. Wait for pressure to drop below 0.20 inch wg.

(16) Push throttle (9, fig. 2-1) to full in position.

(17) Set ENGINE CONTROL switch (13, fig. 2-2) to ON. Start engine by depressing ENGINE START switch (14). Repeat steps (10) through (12).

(18) Remove hose from air pressure tap (15, fig. 2-20) .

(19) Remove hoses from air-flow gage.

g. *Shelter Filter Pressure Drop.*

(1) On bottom gage, insert one hose into tap marked HI. Insert other hose into tap marked LOW.

(2) Insert free end of hose from the HI tap into air-pressure tap (6). Insert end of remaining hose into air-pressure tap (5).

NOTE

To avoid incorrect readings, hold air-flow gage vertically when taking reading.

(3) If pressure reading is above 4.8 inches wg, have particulate filter replaced.

(4) Remove hoses from air pressure taps (5 and 6).

(5) Remove hoses from air-flow gage taps.

2-55. Shelter System Operation

a. Set environmental control switch (14, fig. 2-3) to COOL.

b. Unless cooling air is required in shelter, set environmental control switch (14) to CIRCULATE (center position).

c. If heat is required in shelter, perform the following:

(1) Set environmental control switch (14) to HEAT.

NOTE

HEATER ON light (3) will go on in approximately 2 minutes, indicating combustion of fuel in the heater.

NOTE

If HEATER ON light fails to go ON wait an additional 5 minutes before pushing HEATER RE-START switch.

(2) If heater on light (3) fails to go ON, depress HEATER RE-START switch (2) to start heater.

(3) Set HIGH-LOW-HEAT switch (13) to HI or LOW as required.

d. If heating or cooling is not required, set environmental control switch (14) to CIRCULATE (center position).

e. Attach pouch, stored in tool box, to entrance door frame (fig. 1-2).

f. Place one roll of footwear covers, stored in tool box, in pouch and close cover.

g. Assemble toilet and attach plastic bag per instructions on package.

h. Place protective cover over stowed items on support rack for protection against the weather. Secure cover by tucking under support rack.

i. Periodically during operation, depress fuel indicator switch (3, fig. 2–5) to obtain a reading on the fuel quantity gage (2).

2-56. Striking and Storage

a. Remove all equipment not associated with the shelter system from inside the shelter and entrance.

b. Remove debris from shelter and entrance.

c. Remove plastic bag from toilet. Place toilet outside of shelter until stowed.

d. Set environmental control switch (14, fig. 2-3) to CIRCULATE (center position).

e. Set circuit breaker (7) to OFF.

f. Set LIGHTS switch (1) to OFF.

NOTE

If system has been operating in heating mode, do not proceed until heater blower shuts down.

Set four circuit breakers (1, 2, 3, and 4, fig. 2-2) to OFF.

h. Pull out throttle (9, fig. 2-1) until idle speed is obtained. Turn CW to lock in idle position. Idle

engine 3 minutes, then set ENGINE CONTROL SWITCH (13, fig. 2-2) to OFF. After engine stops turn throttle CCW push in and turn CW to lock.

i. If engine fails to stop, pull out choke control to stop engine (TM 5-2805-259-14).

j. Close door (3, fig. 2-11) and lock with catch (2).

k. Disconnect plug connectors on cable and light assembly (3, fig. 2-19) frorm distribution box (4), switch box (1), and receptacle connector (5). Replace all covers.

l. Unhook cable and light assembly (3) from hanger straps (2). Place cable in tool box.

m. Disconnect electric power cable (9) from distribution box (4) and auxiliary control indicator (6). Replace all covers. Place electric power cable in tool box.

n. Disconnect cable and light assembly (8) from distribution box (4). Replace cover on distribution box.

o. Unhook cable from hanger straps. Place cable in tool box.

p. Disconnect power supply cable (7) from auxiliary control indicator (6), replace covers on auxiliary control indicator and cable (7).

q. If used, remove plug connector from receptacle connector (8, fig. 2-3) and replace cover (9).

r. Remove auxiliary control indicator from shelter wall and place in tool box.

s. Remove plastic footwear covers from pouch (fig. 1-2) and place in tool box.

t. Remove pouch from entrance and place in tool box.

NOTE

Be careful not to damage electrical cable in air-return duct.

u. Disconnect and remove air-supply and return ducts from shelter and plenums (fig. 2-18).

v. Disconnect air recirculation duct from entrance, and entrance gas-particulate filter unit.

w. Place ducts on retainers and compress for stowage (fig. 2-17).

z. Unfasten four catches (13, fig. 2-11) and remove box plenum (14) from trailer.

CAUTION

Be careful not to damage the plenum or electrical cable when removing plenum from trailer.

y. Unfasten four catches (12) and remove sound-attenuating plenum (6) from trailer.

z. Stow box plenum (11, fig. 2-10) in trailer with flanged opening facing side of trailer. Secure plenum with strap (12).

aa. Stow sound-attenuating plenum (13) in trailer with flanged opening facing side of trailer. Secure plenum with strap (16).

aa.1. Store adapter (1, fig. 2-10) by clamping in place to forward end of air-return duct (27). Store duct cap (5) by clamping in place to large end of entrance GPFU (4).

ab. Roll cable (7, fig. 2-11) in cover (10) and place plug connector (8) in clip (9).

ac. Place cover (10) over opening and secure with four catches (11).

ad. Disconnect entrance gas-particulate filter unit plug connector from receptacle (5, fig. 2-19). Install cover on receptacle.

ae. Screw entrance gas-particulate filter unit plug connector on dummy receptacle (fig. 1-3).

CAUTION

Do not lift the entrance gas-particulate filter unit by the flexible duct.

af. Disconnect entrance gas-particulate filter unit from entrance. With three men, place unit on trailer (fig. 2-10) and secure with catch (6), coupling (10), and strap (4).

ag. Loosen 12 hand knobs (16, fig. 2-14) and disconnect gas seal (15).

ah. Release two weatherskirt ropes (6) and all tiedown ropes. Pull and stow all tent pins in barracks bag (9.4, fig. 2-10). Thread entrance front tiedown ropes through front handles and tie-Off.

ai. Close storage box lid (19).

aj. Release clamp (1, fig. 2-12) and remove cover (3). Partially deflate ribs by inserting fingers into valve (2) and unseating internal flapper valve.

ak. Pull entrance towards shelter and unhook 12 hooks (13, fig. 2-14) from dee-rings (14). Two connections are located on top of door frame and five on each side.

al. Unhook six hooks (9) and dee-rings (7). Three on each side of entrance.

am. Release clamps (1) and disengage interconnecting fittings (4). Place covers (2) into interconnecting fittings and close clamps.

CAUTION

To avoid damaging the entrance and shelter software, make sure that steps ah, ak, al, and am have been completed before performing step an.

an. Pull entrance approximately 3 feet from shelter.

CAUTION

Do not stand or walk on the entrance doors. You could damage the doors.

ao. As pressure bleeds from entrance, push bottom in direction of arrow 1 (fig. 2-22). This will allow entrance to collapse in the position indicated by arrows 2 and 3.

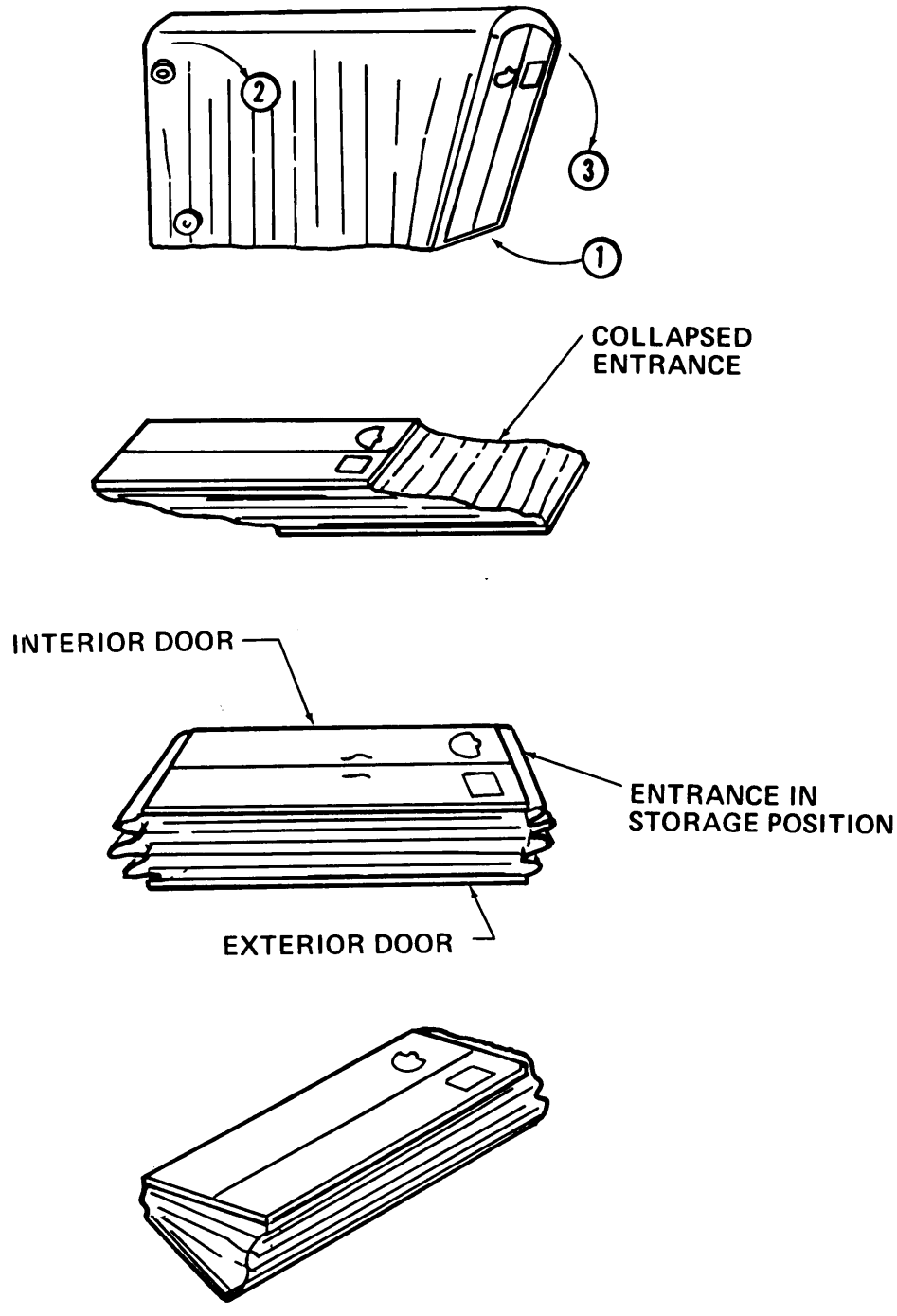


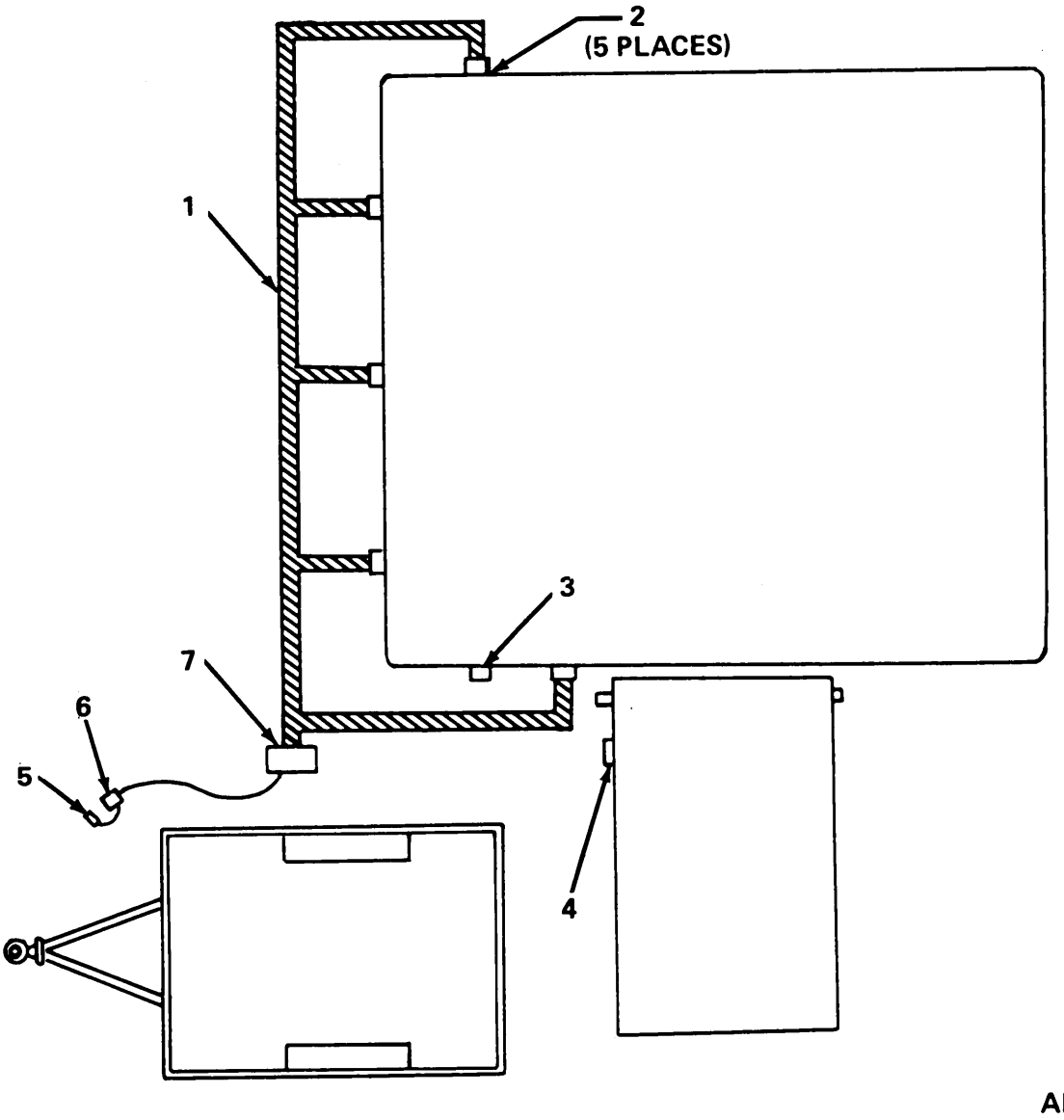
Figure 2-22. Entrance preparation for storage.

up. Unfasten strap (7, fig. 2-10) and remove evacuation fan (8).

aq. Connect evacuation fan hose into inflation valve (2, fig. 2-12) and close clamp (1).

ar. Make sure that circuit breaker (1, figu. 2-4) in an OFF position.

as. Remove cover (5, fig. 2-23) from plug connector (6).



1 Evacuation manifold
2 Dump valve
3 lnflation valve
4 Inflation valve
5 Cover
6 Plug connector
7 Evacuation fan

Figure 2-23. Shelter and entrance evacuation hookup.

at. Remove cover (5, fig. 2-1) and connect plug connector to receptacle (4).

au. Set evacuation fan circuit breaker to ON.

au. After entrance has completely collapsed, set circuit breaker to OFF.

aw. Release clamp (1, fig. 2-12) and remove air duct hose from inflation valve. Place cover (3) into valve and close clamp (1).

ax. Position entrance interior doors (fig. 2-22) over exterior doors.

ay. Lift one side of entrance door frame and position fabric as shown.

az. Position fabric on opposite side of entrance in the same manner.

ba. Tuck side tie down ropes in folds of fabric.

bb. Remove tool box from shelter and place on trailer. Secure tool box with strap (22, fig. 2-10).

bc. If present, unroll and unfold arctic blanket onto floor of shelter. Be sure the arctic blanket cable is extending through shelter air-return opening.

bd. Unfasten two straps (12, fig. 2-14) and unroll shelter opening cover (11). Press cover

against shelter and fasten the hook and pile fastener tape.

be. Unzip cover and step out of shelter. Rezip cover. Fasten 10 straps (19) to dee-rings (18).

bf. Release inflation fitting clamp (1, fig. 2-13) and remove air duct hose. Place cover (2) into inflation fitting and close clamp.

bg. Release clamp (3, fig. 2-1) and remove air duct hose. Release cover (2) into air duct coupling (1) and close clamp (3).

bh. Remove ground wire (fig. 2-11) from anchor. Stow ground wire on trailer.

bi. Position evacuation manifold (1, fig. 2-23). Release clamp and remove cover from rear wall dump valve (2). Insert evacuation manifold into dump valve (2) and close clamp.

NOTE

Do not connect manifold into inflation fitting.

bj. Progress toward front of shelter, connecting manifold to four remaining dump valves.

bk. Connect evacuation manifold to evacuation fan hose.

bl. Set circuit breaker (1, fig. 2-4) to ON.

bm. After shelter has completely collapsed, set circuit breaker (1) to OFF.

bn. Disconnect evacuation manifold and evacuation fan hose.

bo. Disconnect evacuation manifold from dump valves. Replace dump valve covers.

bp. Disconnect plug connector from receptacle (4, fig. 2-1). Replace cover (5) on receptacle.

bq. Replace cover (5, fig. 2-23) on plug connector (6).

br. Place evacuation fan on trailer and secure with strap (7, fig. 2-10).

bs. Place air-recirculation duct (14) inside air-supply duct (15). Fold transition (29) and place inside air-recirculation duct (14). Place ducts on trailer and secure with two straps (21).

bt. Store air duct hose (9) by looping around back and right side, looking forward, of GPFU air plenum (32).

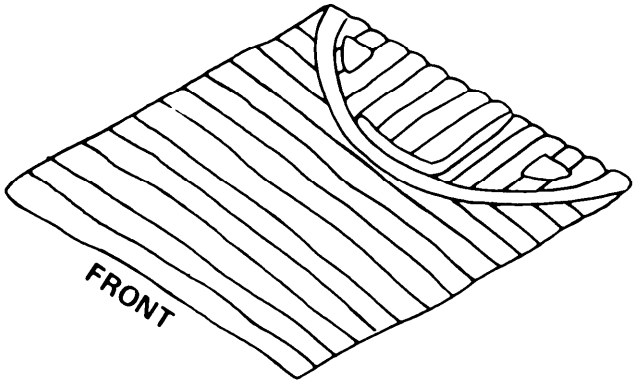
bu. Place air-return duct (27) on trailer and secure with two straps (26).

bv. Store portable toilet (2) on top of GPFU air plenum (32).

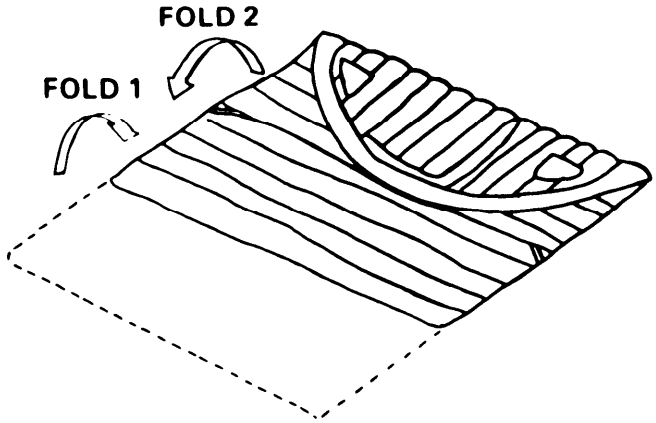
bw. Fold, roll, and secure shelter in carrying case (fig. 2-24).

WARNING

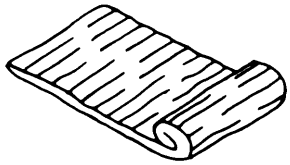
BE EXTREMELY CAREFUL WHEN HANDLING THE SHELTER. PROTECT AGAINST TEARS AND ABRASIONS. DO NOT WALK ON FABRIC. FAILURE TO COMPLY MAY RESULT IN DEATH OR ILLNESS TO OCCUPANTS.



STEP 1 Position rear of shelter as shown.



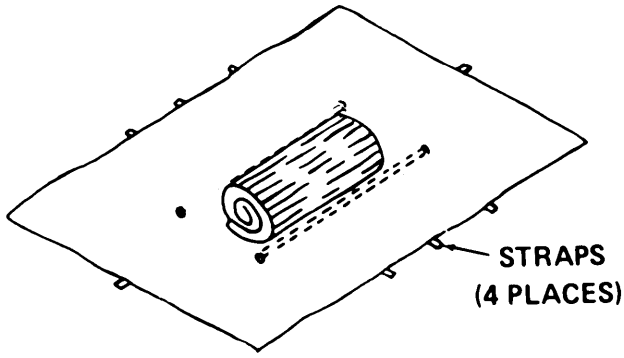
STEP 2 Using furnished hand straps, fold f rent of shelter back approximately 1/3 distance (Fold-1). If Arctic Blanket is present, be sure full length of blanket cable is accessible outside of folded shelter. Fold back of shelter over front portion (Fold-2).



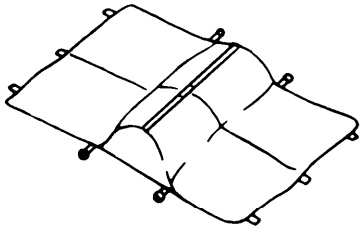
STEP 3 Remove two or more dump valve covers to release trapped air. Roll shelter tightly. Unroll until dump valves are accessible, and install dump valve covers. Reroll shelter.

NOTE

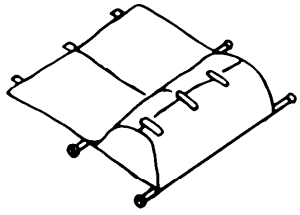
To adequately fit in carrying case and on trailer, rolled shelter should be approximately 30-inches in diameter.



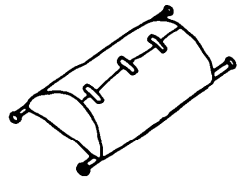
STEP 4 Place carrier on ground. Roll shelter onto carrier as shown.



STEP 5 Fold both sides and secure with strap.



STEP 6 Fold both ends and secure with straps. Pull straps tight.



STEP 7 Pull out four handles to carry.

Figure 2-24. Shelter folding and storage.

WARNING

When handling the support rack, keep handles extended out to prevent injury to fingers.

bx. With four men, slide support rack (9, fig. 2-9) on trailer, and secure with eight catches (8).

by. Release four catches (7) and tilt support hoop frames (10) back. Remove straps (3) from surface of support rack (9).

WARNING

Entrance weighs approximately 250 pounds. When lifting, be careful to avoid injury to personnel and damage to the entrance.

CAUTION

Be sure entrance fabric is not snagged and ripped when sliding entrance on support rack.

bz. With four men, carefully slide entrance (2) on support rack (9).

CAUTION

After the folded entrance doors are loaded on the rack, check to see that the rubber seals attached to the four sides of the door are flat. This will prevent distortion and damage to the rubber seals.

CAUTION

Check to see that the damper flap is flat against the door. This will prevent distortion and damage to the flap.

cu. Fasten four catches (1).

cb. Reposition support frame (10) and refasten four catches (7).

cb.1. Place evacuation manifold (28, fig. 2-10) on top of entrance.

cc. Fasten four securing straps (3, fig. 2-9).

cd. Raise tailgate to horizontal position and hold in position with two tailgate chains (5, fig. 2-8).

ce. Install tailgate extension (1) on tailgate (6) handles (7) towards ground. Secure with two pin (10).

Pull down two handles (7).

cg. Be sure two brackets (4) and (12) are open.

WARNING

Shelter in carrying case weighs approximately 314 pounds. When lifting, be careful to avoid injury to personnel and damage to the shelter and carrying case.

ch. With four men, place shelter in carrying case on trailer so rear handle engages in brackets (12). Lower forward carrying case handle and let weight of shelter rest on tailgate hains.

ci. Secure brackets (12) with pins (13).

cj. Roll shelter in carrying case to rear of tailgate extension (1), and secure with two straps (8). Pull straps as tight as possible.

ck. With four men, lift tailgate extension (1) and release two tailgate chains (5) from tailgate (6). Raise tailgate extension to a vertical position. Secure tailgate in vertical position with chains (5).

cl. Release two straps (8), and allow carrying case handle to rest in brackets (4). Close brackets (4) and secure with pins (3). Refasten two straps (8).

cm. Push the two handles (7) against tailgate extension and press into securing clips. Push the four carrying case handles (11) into stowed position.

cn. Place protective cover over equipment and secure in place.

co. Raise and lock trailer rear support leg (TM 9-2330-213-14).

cp. Connect trailer to tow vehicle (TM 9-2330-213-14).

Section IV. ERECTION AND OPERATION OF SHELTER AND ANTEROOM IN CHEMICAL-BIOLOGICAL ENVIRONMENT

2.57. General

This section contains supplemental instructions for the erection of the Shelter System and anteroom in a chemical-biological environment.

2-58. Shelter System

a. Perform procedures in paragraphs 2-42 through 2-44.

b. Open storage box lid (19, fig. 2-10) to form a baffle.

NOTE

Baffle prevents engine exhaust fumes from entering the airstream of the centrifugal blower.

c. Using a heavy hammer and tools (para 2-77), drive one anchor (5, fig. 2-11) approximately 2 inches below ground level. Moisten ground around anchor to obtain a good electrical ground.

d. Attach trailer grounding wire (4) to anchor (5).

e. Adjust gasoline engine air cleaner intake shutter and oil pan baffle (TM 5-2805-259-14).

f. Release clamp (3, fig. 2-1) and remove cover (2).

g. Connect one end of air duct hose (9, fig. 2-10),

to air duct coupling (1, fig 2-l), and secure with clamp (3).

h. Lift top doorframe of entrance to gain access to inflation valve (fig. 2-12).

i. Release clamp (1) and remove cover (3).

j. Insert open end of air duct hose into inflation valve (2) and close clamp (1).

k. Perform procedures in paragraph 2-46, steps *a* through *o.*

l. Pull out throttle (9, fig. 2-1) until idle speed is obtained.

m. Set ENGINE CONTROL switch (13, fig. 2-2 to OFF.

n. Push throttle to full in position.

o. Install duct cap (9, fig. 2-25) on shelter air-return outlet. If present, place arctic blanket electrical cable inside shelter.

Legend for fig. 2-25:

1 Main control indicator
2 Receptacle connector
3 Cover
4 Catches
5 Air duct hose
6 Electrical cable
7 Entrance GPFU
8 Air-return duct
9 Duct cap
10 Duct adapter
11 Air-supply duct
12 Box plenum

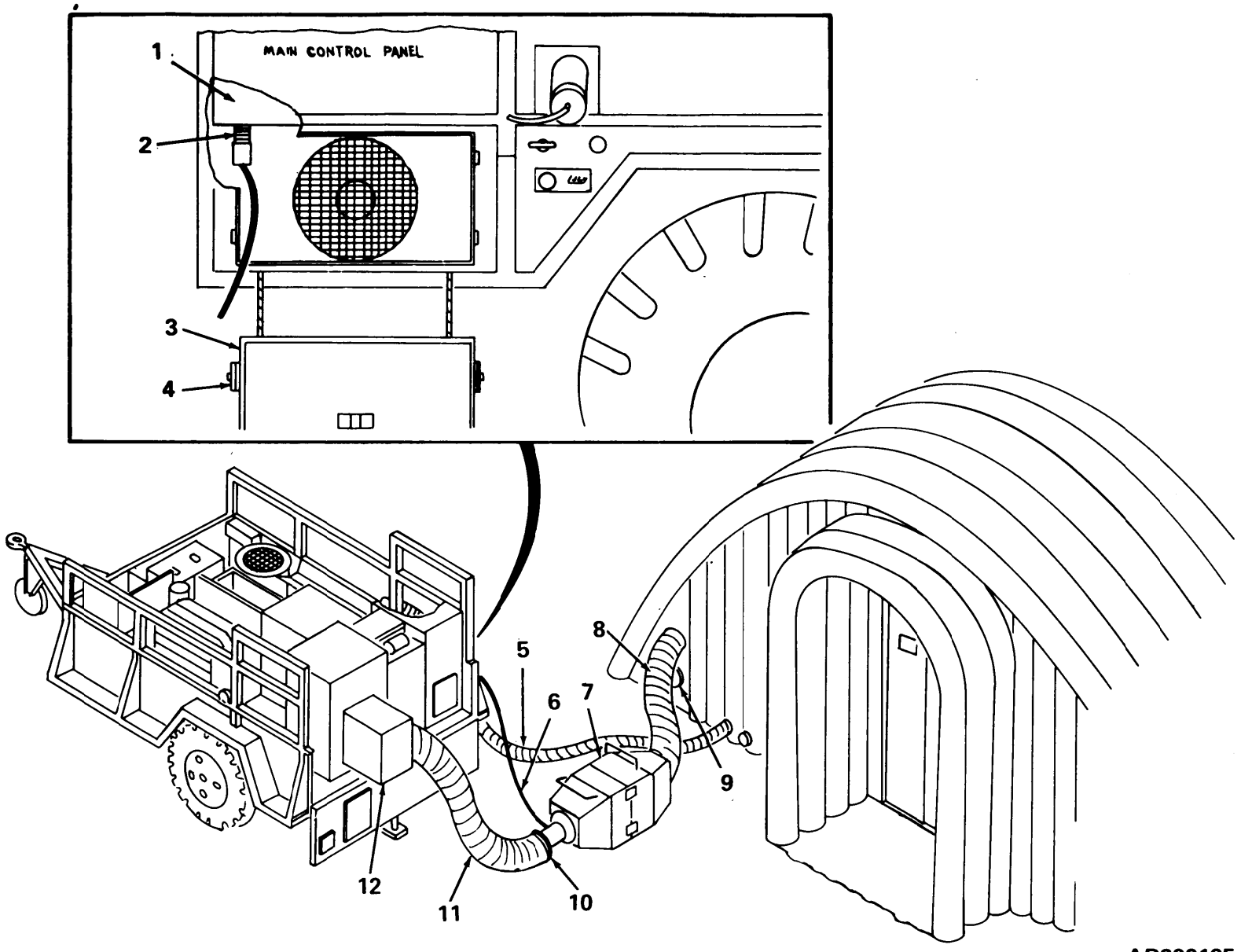


Figure 2-25. Shelter system erection in chemical-biological environment.

p. Remove air-return duct (8) from stowage retainer.

q. Remove stored air-recirculation duct from inside of air-supply duct retainer.

r. Remove air-supply duct (11) from stowage retainer.

s. Connect air-return duct (8) to shelter air-supply inlet.

t. Connect free end of air-return duct to 12-inch flange of entrance GPFU (7).

u. Connect 8-inch flange of duct adapter (10) to entrance GPFU duct.

U. Connect air-supply duct (11) to duct adapter (10).

w. Install box plenum (12).

x. Connect free end of air-supply duct (11) to box plenum (12).

y. Release four catches (4) and remove cover (3).

z. Remove entrance GPFU plug connector from dummy receptacle.

aa. Connect entrance GPFU plug connector to receptacle (2).

ab. Release clamp (1, fig. 2-12) and remove airduct hose from entrance. Install cover (3) and secure with clamp (1).

ac. Release shelter inflation fitting clamp (1, fig. 2-13) and remove cover (2). Insert open end of airduct hose into inflation valve (3) and close clamp (1).

ad. Make sure that five dump valves have covers installed and are clamped in position.

CAUTION

Do not depress ENGINE START switch for more than 15 seconds. If engine fails to start after two 15-second attempts, allow starter to cool off for 5 minutes before next attempt. Failure to comply may result in damage to starter or loss of battery charge.

ae. Set ENGINE CONTROL switch (13, fig. 2-2) to ON. Depress ENGINE START switch (14) to start engine.

af. Set AUXILIARY 120-VAC circuit breaker (4) to ON.

ag. Check GENERATOR FREQUENCY METER (11) for a reading of 62 Hz. If no reading is observed, momentarily snap field flash switch (12). Repeat three times, if necessary. Adjust gasoline engine speed by moving throttle in-or-out to obtain the 62 Hz. Lock throttle in correct position by turning CW.

ah. Set recirculation and entrance fan circuit breaker (3) to ON.

NOTE

The shelter cavity will purge while ribs are inflating, eliminating possibility of contaminating shelter interior.

ai. Depress PRESS-TO-INFLATE switch (9) and hold during inflation.

CAUTION

Do not use tiedown rope to move shelter into position.

aj. After inflation, use four floor hand straps (fig. 2-13) to position shelter to trailer at distance shown (fig. 2-7).

ak. Unhook 10 straps (19, fig. 2-14) from dee-rings (18).

al. Push shelter opening cover (11) inward to free it from the securing hook and pile fastener.

am. Enter shelter and roll up shelter opening cover. Secure cover with two straps (12).

an. If present, fold arctic blanket (fig. 2-15).

ao. Remove duct cap (9, fig. 2-25) and stow on support rack.

ap. Connect entrance to shelter (para 2-48, steps *e* through *p).*

aq. Set circuit breakers (1, 3, and 4, fig. 2-2) to OFF.

ar. Pull out throttle (9, fig. 2-1) until idle speed is obtained.

as. Set ENGINE CONTROL switch (13, fig. 2-2) to OFF.

at. Push throttle (9, fig. 2-1) to full in position.

au. Disconnect entrance GPFU plug connector from receptacle connector (2, fig. 2-25).

au. Disconnect air-return duct (8) from shelter air-supply inlet.

aw. Disconnect air-supply duct (11) from adapter (10).

ax. Connect air-supply duct (11) to shelter air-supply inlet.

ay. Disconnect air-return duct (8) from entrance GPFU (7).

az. Feed cable (7, fig. 2-11) through sound-attenuating plenum (6). Install plenum and secure with four catches (12).

ba. Feed cable (7) through air-return duct. Lay cable through shelter air-return outlet.

bb. Connect air-return duct (8, fig. 2-25) to shelter air-return outlet and to sound-attenuating plenum. Secure with attached couplings.

bc. Disconnect duct adapter (10) from entrance GPFU (7). Stow adapter on support rack.

bd. Perform staking and tiedown (para 2-49).

be. Set ENGINE CONTROL switch (13, fig. 2-2) to ON. Depress ENGINE START switch (14) to start engine.

bf. Set AUXILIARY 120-VAC circuit breaker (4) to ON.

bg. Perform usual operations (para 2-51 through 2-55).

2-59. Ante-Room

a. General. The ante-room allows personnel to disrobe and perform their normal decontamination before entering the entrance. This procedure reduces the percentage of chemical. biological agent entering the entrance and shelter.

b. Erection.

NOTE

If shelter supports have been installed in shelter, remove center support for erection of ante-room.

(1) Rap on shelter wall, and instruct occupants to pass four 10-foot lengths of rope (stored in tool box) through message-pass through.

(2) Unfasten two straps (1, fig. 2-26) and remove shelter support segments (3) from support rack (4).

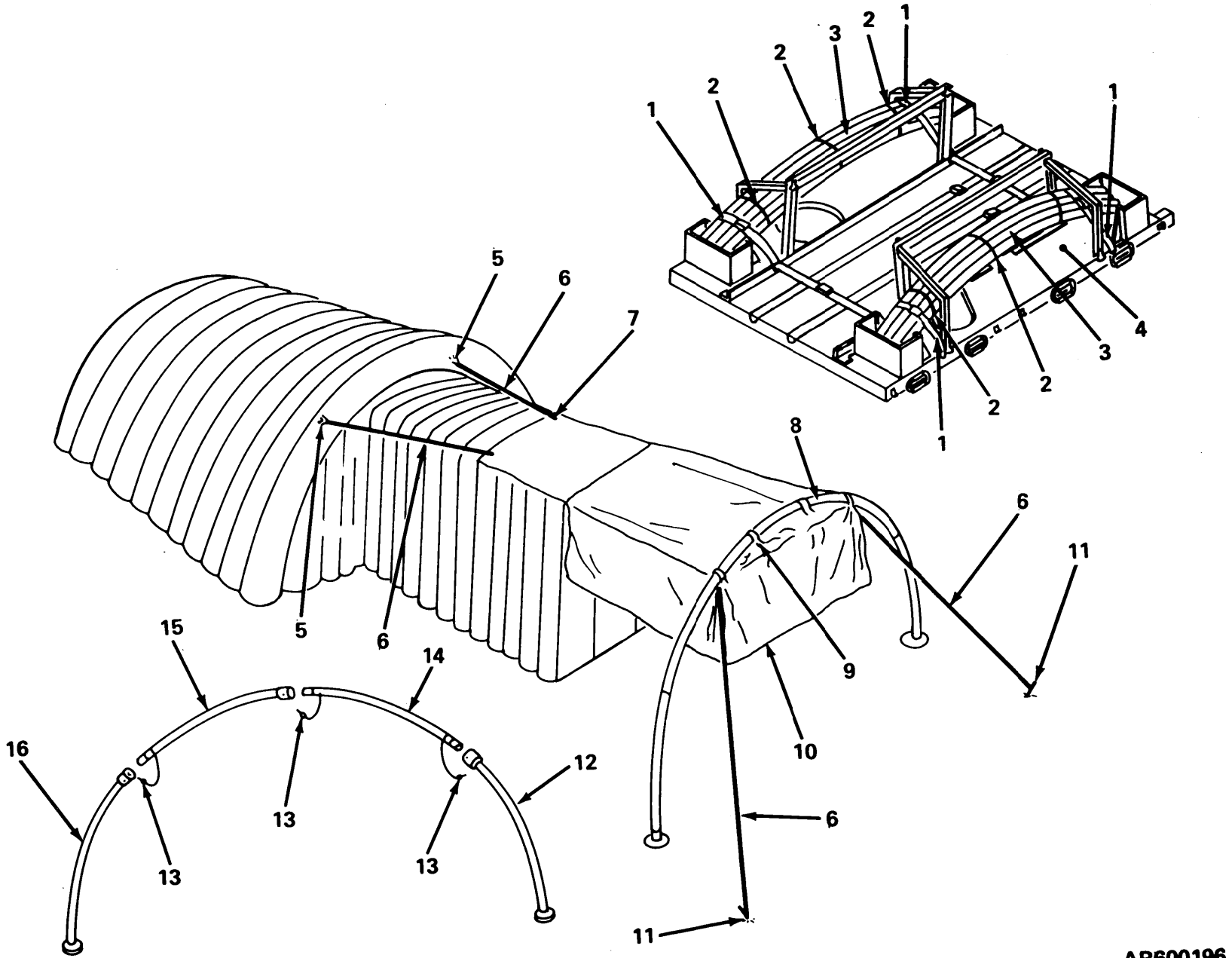


Figure 2-26. Ante-room erection.

Legend for fig. 2-26:

1 Straps	9 Loops
2 Clamps	10 Protective cover
3 Segments	11 Anchors
4 Support rack	12 Arch support
5 Dee-rings	13 Pins
6 Ropes	14 Arch support
7 Grommets	15 Arch support
8 Shelter support	16 Arch support

(3) Unfasten three clamps (2).

(4) With loops (9) facing away from entrance, lay protective cover (10) on ground.

(5) Tie one length of rope to two grommets (7) as shown.

(6) Slide flap of protective cover (10) onto top of entrance as shown.

NOTE

Make sure that side flaps of protective cover hang flush with entrance walls.

(7) Tie two ropes (6) to dee-rings (5).

(8) Slide arch supports (14) and (15) through loops (9). Join the two supports together and secure with pin (13).

(9) Attach arch supports (12) and (16). Secure with pins (13).

(10) Behind each outer loop (9), tie one length of rope (6).

(11) Raise the shelter support in an upright position.

(12) Using a heavy hammer and anchor driving tools (para 2-77), drive. two anchors (11) into ground.

(13) Pull ropes (65) tight and tie to anchors.

(14) If area has been sprayed with chemical agent, decontaminate under anteroom by turning over soil, removing snow, or by using the M11 decontaminating apparatus (13, fig. 2-20). Decontaminate entrance doors and surrounding area with M11 decontaminating apparatus.

2-60. Entry and Exit Shelter Procedures in a Chemical-Biological Environment

NOTE

Refer to Chapter 6 for personnel entry and exit procedures.

2-61. Delivery of Messages and Maps

NOTE

Refer to Chapter 6 describing delivery of messages and maps.

Section V. OPERATION OF MATERIAL USED IN CONJUNCTION WITH MAJOR ITEMS

2-62. ABC-M 11 Portable Decontaminating Apparatus

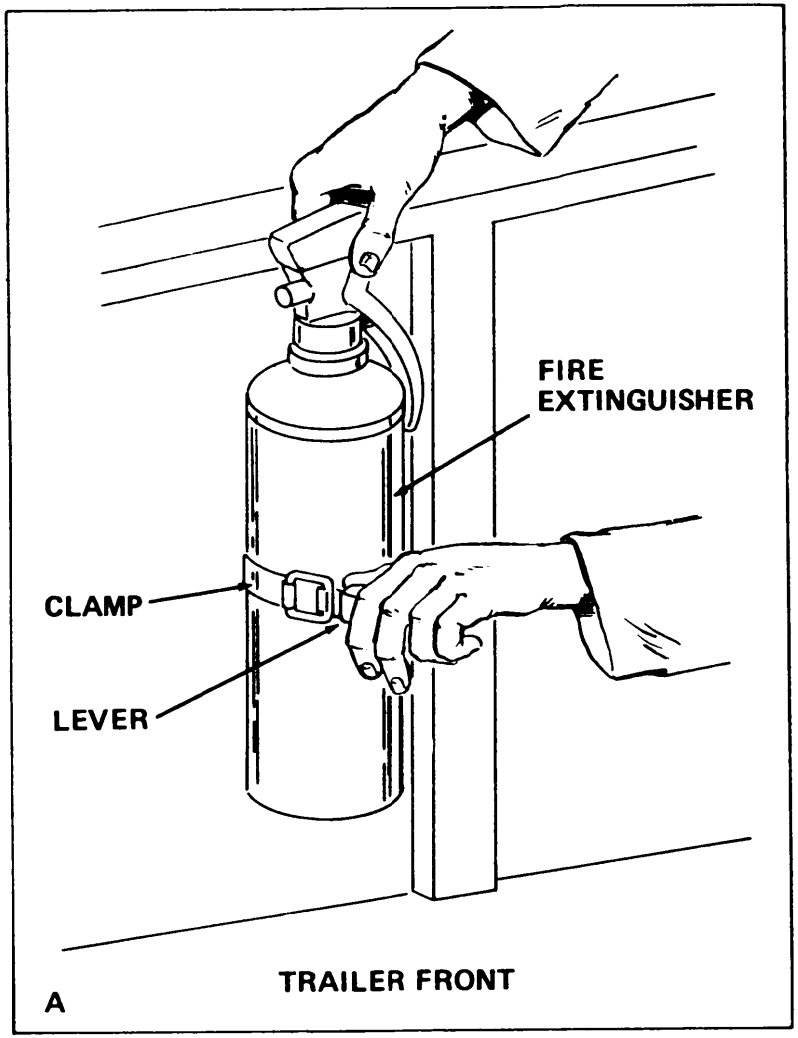
WARNING

Do not apply contents of M11 decontaminating apparatus on hot surfaces. Container holds combustible DS2 solution.

The M11 decontaminating apparatus is used for decontaminating equipment to the minimum extent necessary for continued operation. Instructions for use are on the decontaminating apparatus and in TM 3A230-204–12&P. It is stored on the front of the trailer, next to the fire extinguisher.

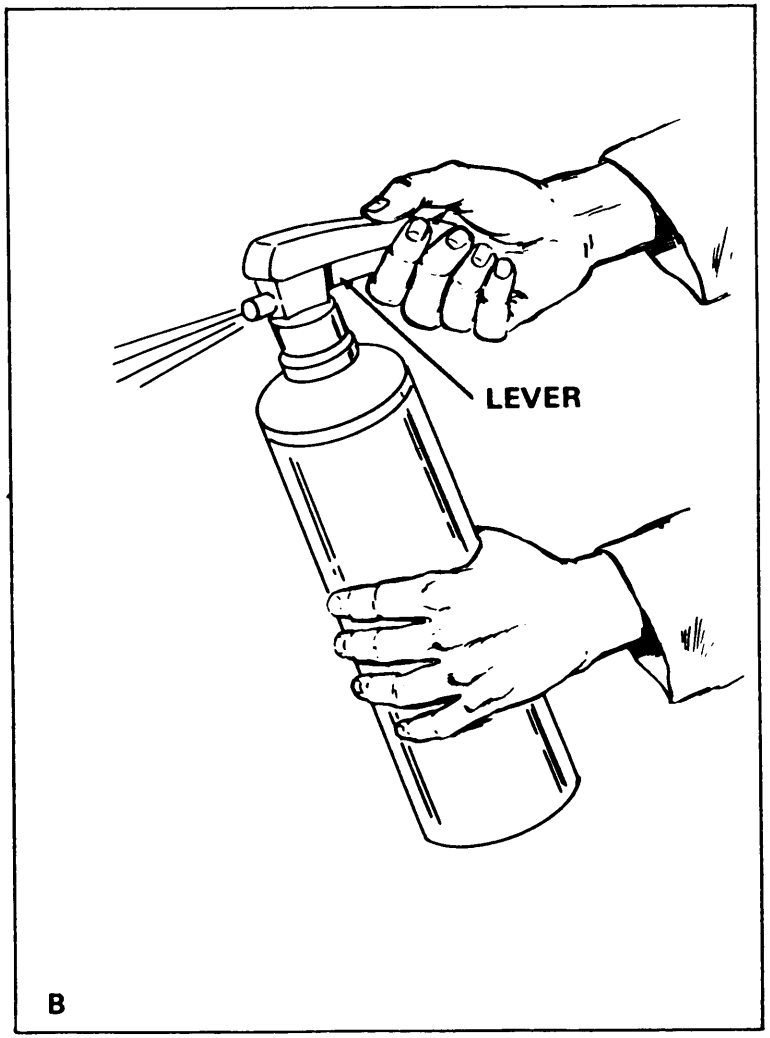
2-63. Fire Extinguisher

The fire extinguisher (fig. 2-27) is a dry-chemical type and is used to extinguish small fires. It has a maximum range of 10-to-12 feet and an approximate discharge time of 10 seconds. A pressure gage on the bottom of the cylinder indicates amount of charge. Instructions on reading the pressure gage are on the cylinder.



Step 1. Unfasten clamp.

2. Remove fire extinguisher.



Step 3. Direct extinguisher towards fire and squeeze lever.

Figure 2–27. Fire extinguisher and usage.

Section VI. OPERATION UNDER UNUSUAL CONDITION

2-64. General

This section contains supplemental instructions for the operation of the Shelter System under unusual conditions. Operation under unusual conditions equals adverse conditions with no active CB operations.

2-65. Cold Weather

a. Gasoline Engine.

(1) *Cold (0° F).*

(a) Make sure that engine oil pan is filled with correct grade of lubricant (LO 5-2805-259-12).

(b) Position oil pan baffle air control handle toward front of engine. Refer to TM 5-2805-259-14 for location.

(c) Allow engine to warm up approximately 15 minutes prior to applying load.

(2) *Extreme Cold (–25° F and Below).*

(a) Place engine air cleaner intake shutter in winter position. Refer to TM 5-2805-259-14 for location.

NOTE

If engine fails to start, use one or all of the following procedures until it starts.

NOTE

The lubricant in the centrifugal blower may thicken and congeal keeping engine from turning over.

(b) Use engine starter fluid (item 3, table 1-3).

(c) Connect electrical special purpose cable assembly, NSN 4940-00-474-9135, to receptacle (5, fig. 2-9), and to an alternate 24 vdc source of power.

b. Fuel System.

NOTE

Maintain fuel tank as full as possible to prevent condensation.

(1) If icing occurs in fuel system, add approximately one pint of denatured alcohol (item 4, table 1-3).

(2) Remove snow and ice from fuel filler cap, and fuel dispensing equipment before filling fuel tank.

(3) In temperatures above 0° F, fill fuel tank with automotive gasoline (item 1, table 1-3).

(4) In temperatures consistently below 32° F, use automotive gasoline (item 2, table 1-3).

c. Shelter.

(1) *Erection,*

NOTE

Under emergency conditions, during a chemical agent attack or when an attack is imminent, the shelter can be erected without preheating.

NOTE

Preheating of the shelter before unrolling normally will be performed in temperature of 0° F and below.

(a) Before unrolling shelter, remove cover (7, fig. 2-1) and cover from arctic blanket plug connector. Connect arctic blanket plug connector to receptacle connector (8).

(b) Set circuit breaker (6) to ON.

CAUTION

Be sure shelter material is not preheated longer than necessary; damage to material may occur.

(c) Preheat shelter material for 15 minutes.

(d) Set circuit breaker (6) to OFF.

(e) Disconnect arctic blanket cable from receptacle connector. Replace protective covers on receptacle connector and plug connector.

(f) Quickly unroll shelter and inflate using normal procedures (para 2-47).

(g) Fold and stow arctic blanket (fig. 2-15).

(h) Stow evacuation manifold (28, fig. 2-10) in shelter.

NOTE

Evacuation manifold becomes very stiff and hard to handle in extreme cold temperatures.

NOTE

In extreme cold temperatures, dump valve covers, inflation valve covers and interconnecting fittings may become difficult to insert.

(i) If necessary, apply aircraft grease (item 7, table 1-3) to dump valve covers, inflation valve covers, and interconnecting fittings for easier insertion.

(2) *Striking.*

(a) After all equipment and debris has been removed from shelter, unfold arctic blanket by reversing steps in figure 2-15. Feed arctic blanket cable through shelter's air-return outlet.

(b) After shelter has been deflated and rolled into a large roll, remove cover (7, fig. 2-1) and cover from arctic blanket plug connector. Connect blanket plug connector to receptacle connector (8).

(c) Set circuit breaker (6) to ON.

CAUTION

Be sure shelter material is not heated longer than necessary; damage to material may occur.

(d) Heat shelter roll for 20 minutes.

(e) Unroll and reroll shelter as fast as possible to obtain a smaller normal roll.

(f) Set circuit breaker (6) to OFF.

(g) Disconnect blanket cable from receptacle connector. Replace protective covers on receptacle connector and blanket plug connector.

d. Support Rack. Install entrance support rack (fig. 1-6) on trailer in the transit position to help prevent the accumulation of snow and ice on trailer components.

e. *Trailer.* Refer to TM 9-2330-213-14 for operation of trailer under cold weather conditions.

2-66. Snow and Ice

a. Remove accumulated snow from shelter and entrance by pulling a rope over top of structures or partially deflating structures and flexing the ribs.

b. Check centrifugal blower prefilter periodically to make certain it is free of snow and ice.

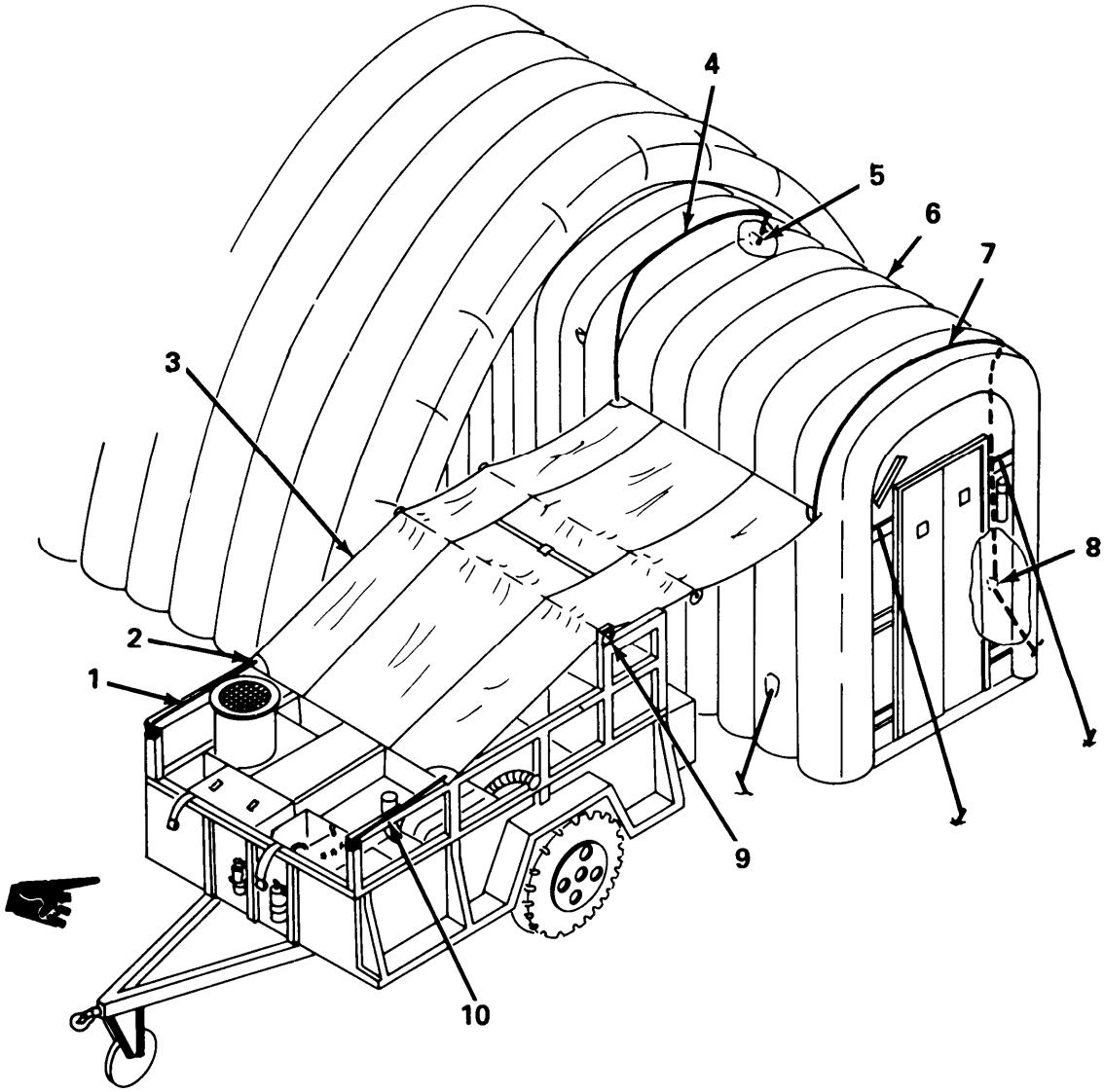
2-67. Hot Weather

a. Make sure that engine oil pan is filled with correct grade of lubricant LO 5-2805-259-12.

b. Place engine air cleaner intake shutter in summer position. Refer to TM 5-2805-259-14 for location.

c. Place oil pan baffle air control handle away from front of engine. Refer to TM 5-2805-259-14 for location.

d. In temperatures 100° F and above, use shelter carrying case (3, fig. 2-28) as a sun canopy to shield the environmental cabinets.



1 Rope
2 Grommets
3 Carrying case
4 Rope
5 Dee-ring
6 Entrance
7 Rope
8 Dee-ring
9 Handle
10 Rope

Figure 2-28. Erection of sun canopy.

e. Erect sun canopy as follows:

(1) Remove four 10-foot lengths of rope from tool box.

(2) Tie one end of each rope to four grommets (2, fig. 2-28).

(3) Place carrying case on trailer as shown. Secure one carrying handle (9) into brackets (4, fig. 2-8).

(4) Pull ropes (1 and 10, fig. 2-28) taut and secure to trailer as shown.

(5) Pull rope (4) taut and secure to dee-ring (5).

(6) pull rope (7) over top of entrance (6) and secure to dee-ring (8).

(7) Fold sides of carrying case (3) back to allow for air circulation.

2-68. Dusty and Sandy Areas

a. Take precautions to prevent dust or sand from entering fuel tank while filling.

b. Change engine oil and filter (TM 5-2805-259-14), and centrifugal blower oil after every 24-hours of operation.

c. Service engine air cleaner at more frequent intervals.

d. Remove accumulation of sand and dirt from trailer at frequent intervals.

2-69. Salt Water and High Humidity Areas

a. Wipe all accessible, exposed areas frequently.

b. Remove fungus growth.

c. Keep electrical connections dry.

d. Coat unprotected metal surfaces with engine oil .

2-70. High Wind Conditions

a. In winds 15 to 30 miles per hour, replace tent pins with anchors (No. 2, fig. 2-16).

b. In winds 30 to 45 miles per hour replace tent pins with anchors (No. 3, fig. 2-16).

c. Make sure that all tiedown lines and guylines are securely fastened.

d. Check to see that inflation pressure is at proper level.

e. Shelter must be manned at all times.

2-71. Inflation System Inoperative

a. General. Three shelter supports are provided to support the shelter during operation when the inflation system is inoperative. In addition, the evacuation fan can be used to supply air to the ribs, provided current is still available in the battery.

b. Shelter Supports.

(1) Unfasten four straps (1, fig. 2-26) and remove shelter support segments (3).

(2) Place segments inside shelter.

(3) Remove six clamps (2). Place clamps in tool box.

(4) Assemble and arrange supports (fig. 2-29). Secure each support to shelter ribs with four tiedown straps.

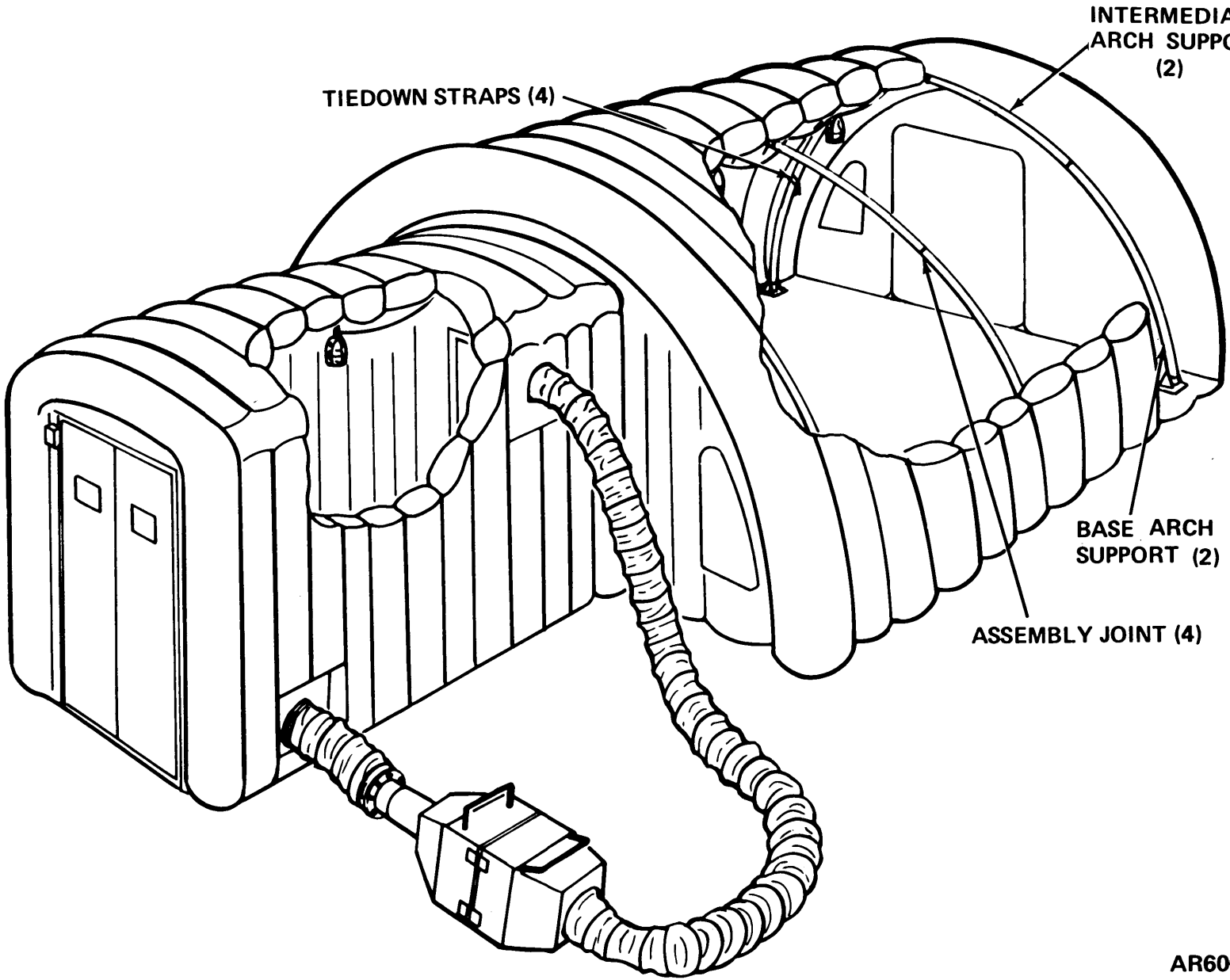


Figure 2-29. Installation of shelter supports.

c. Evacuation Fan.

(1) Remove evacuation fan from trailer.

(2) Loosen clamp and remove hose from vacuum port (fig. 2-30).

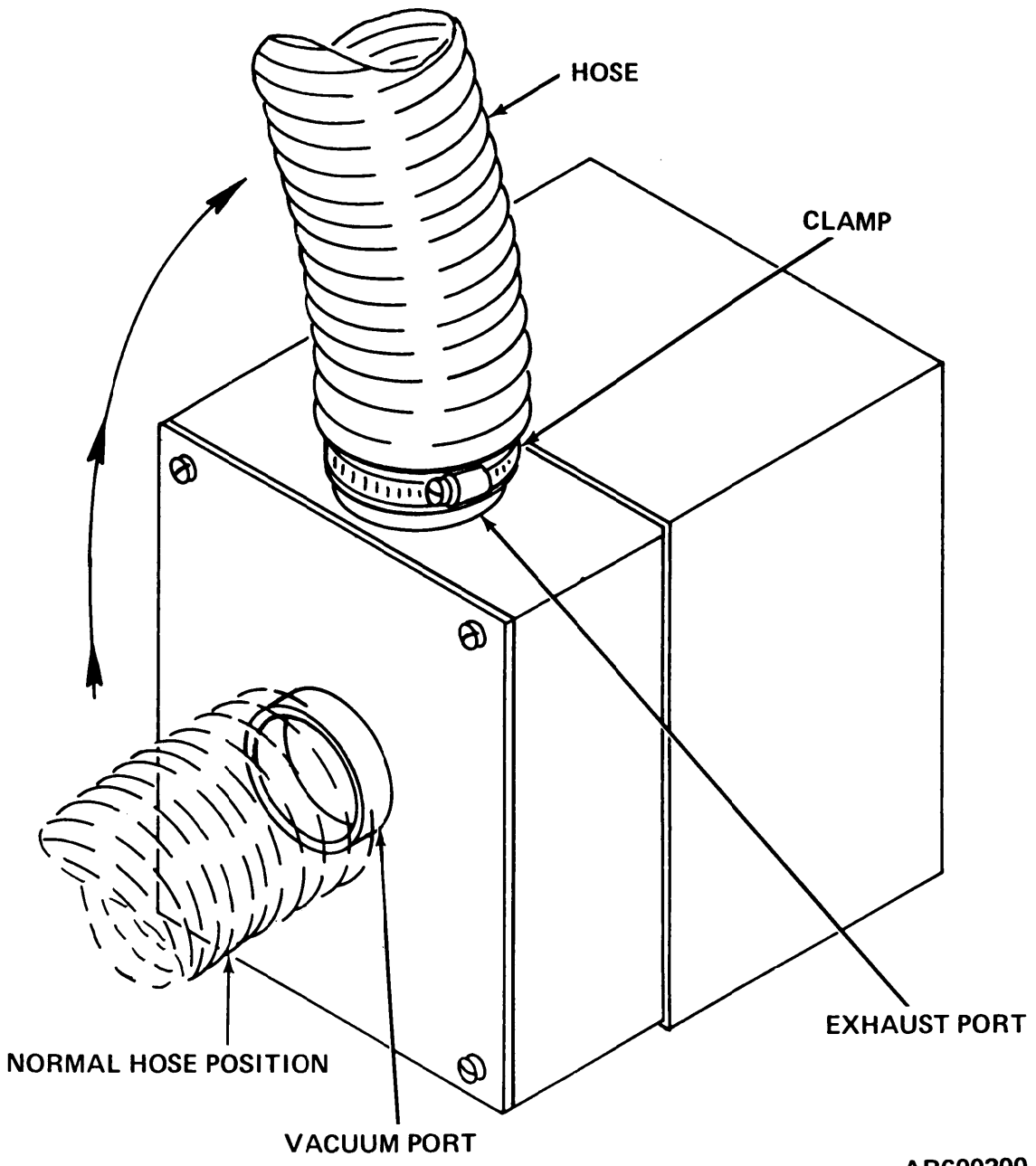


Figure 2-30. Evacuation fan.

(3) Install hose on exhaust port and tighten clamp.

(4) Remove cover (5, fig. 2-1). Remove cover from evacuation fan plug connector.

(5) Connect evacuation fan plug connector to receptacle connector (4).

CAUTION

Be sure fan vacuum port is positioned so not to pull-in debris, and that motor air intake is open for cooling.

(6) Release clamp (1, fig. 2-13) and remove air duct hose from shelter inflation fitting.

(7) Insert evacuation fan hose into shelter inflation fitting and secure with clamp (1).

(8) Set evacuation fan circuit breaker to ON.

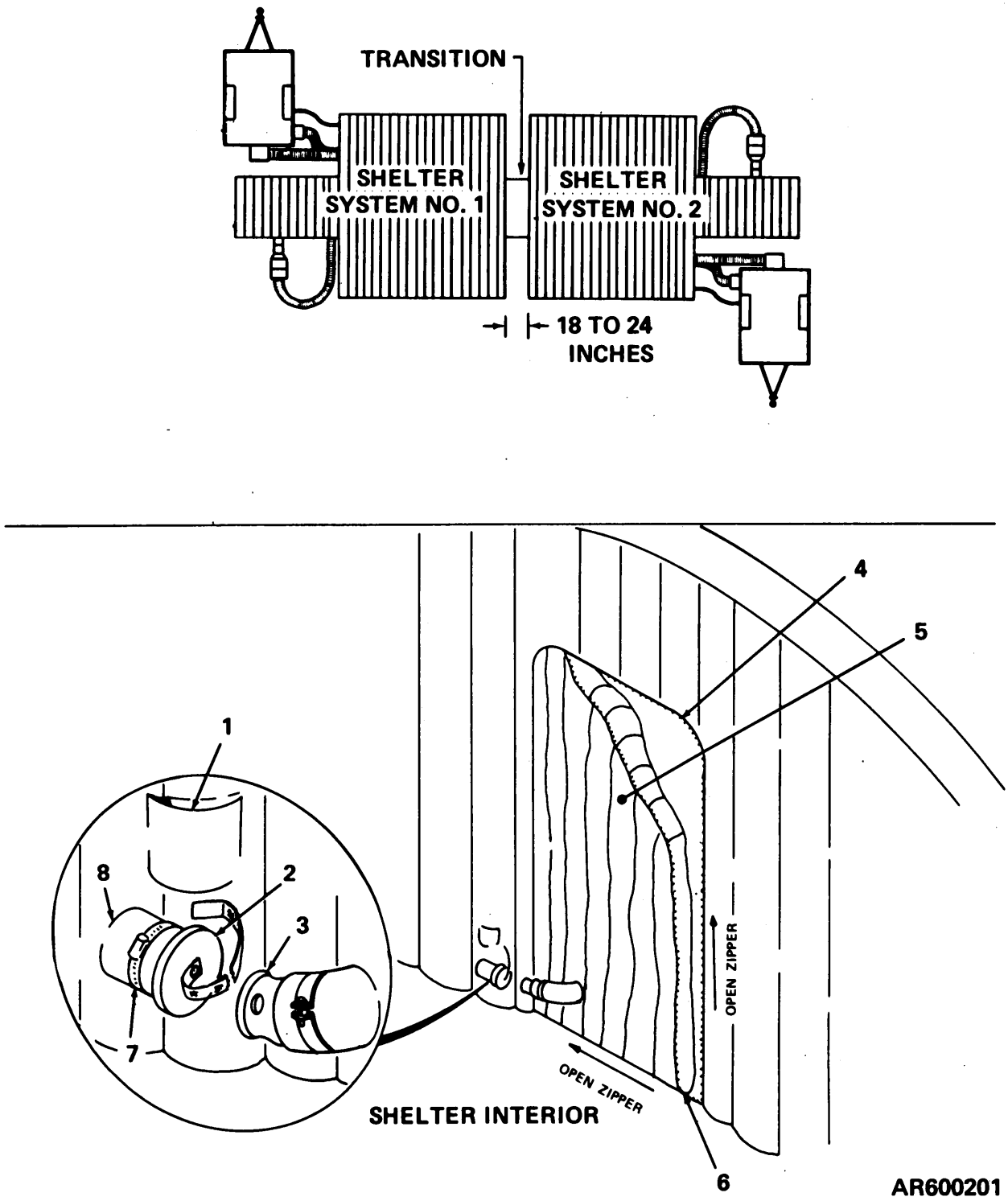
Section VII. TANDEM INSTALLATION

2-72. General

The shelter system is designed to enable connetting two shelters back-to-back or an entrance of one shelter system to a shelter of another system (front-to-back).

2-73. Shelter-To-Shelter Installation

a. Erect shelter system no. 1 (fig. 2-31) using usual erection procedures.



1 Pocket
2 Cover
3 Fitting
4 Zipper
5 Removable wall section
6 Zipper
7 Clamp
8 Fitting

Figure 2-31. Shelter to shelter installation.

b. Erect shelter system No. 2 (para 2-43 through 2-47).

c. Unfasten 10 straps (19, fig. 2-14) from dee-rings (18).

d. Push shelter opening cover (11) inward to free it from the securing hook and pile fastener.

e. Enter shelter and roll up shelter opening cover. Secure cover with two straps (12).

f. If present, remove arctic blanket cable from air-return outlet. Fold arctic blanket (fig. 2-15).

g. Position shelter as shown in figure 2-31. Make sure that shelters are aligned, and at distance shown.

h. Perform the following steps on both shelters:

(1) Release clamp (7) and pull fitting (3) from fitting (8).

(2) Remove cover (2) from pocket (1). Place cover on fitting (8) and close clamp (7).

(3) Unfasten zippers (4) and (6), and remove deflated removable wall section (5). Stow removable wall section on support rack.

(4) Connect the transition to each shelter with zippers (4 and 6). Start the transition connection with zipper (6).

NOTE

Move shelter of shelter system No. 2 as required to connect transition.

i. Roll up removable wall sections and stow on respective support rack.

j. Connect entrance to shelter system No. 2 (para 2-48, steps e through p).

k. Perform remaining erection procedures (para 2-49 through 2-54).

2-74. Striking Shelter-To-Shelter Installation

a. Starting with zipper (4, fig. 2-31) remove transition.

b. Starting with zipper (6) install removable wall section (5).

c. Release clamp (7) and remove cover (2) from fitting (8). Insert fitting (3) into fitting (8) and tighten clamp (7).

d. Place cover (2) in pocket (1).

e. Perform usual striking and storage procedures (para 2-56).

2-75. Entrance-To-Shelter Installation

a. Position trailer of shelter system No. 2 on cleared erection site (fig. 2-32).

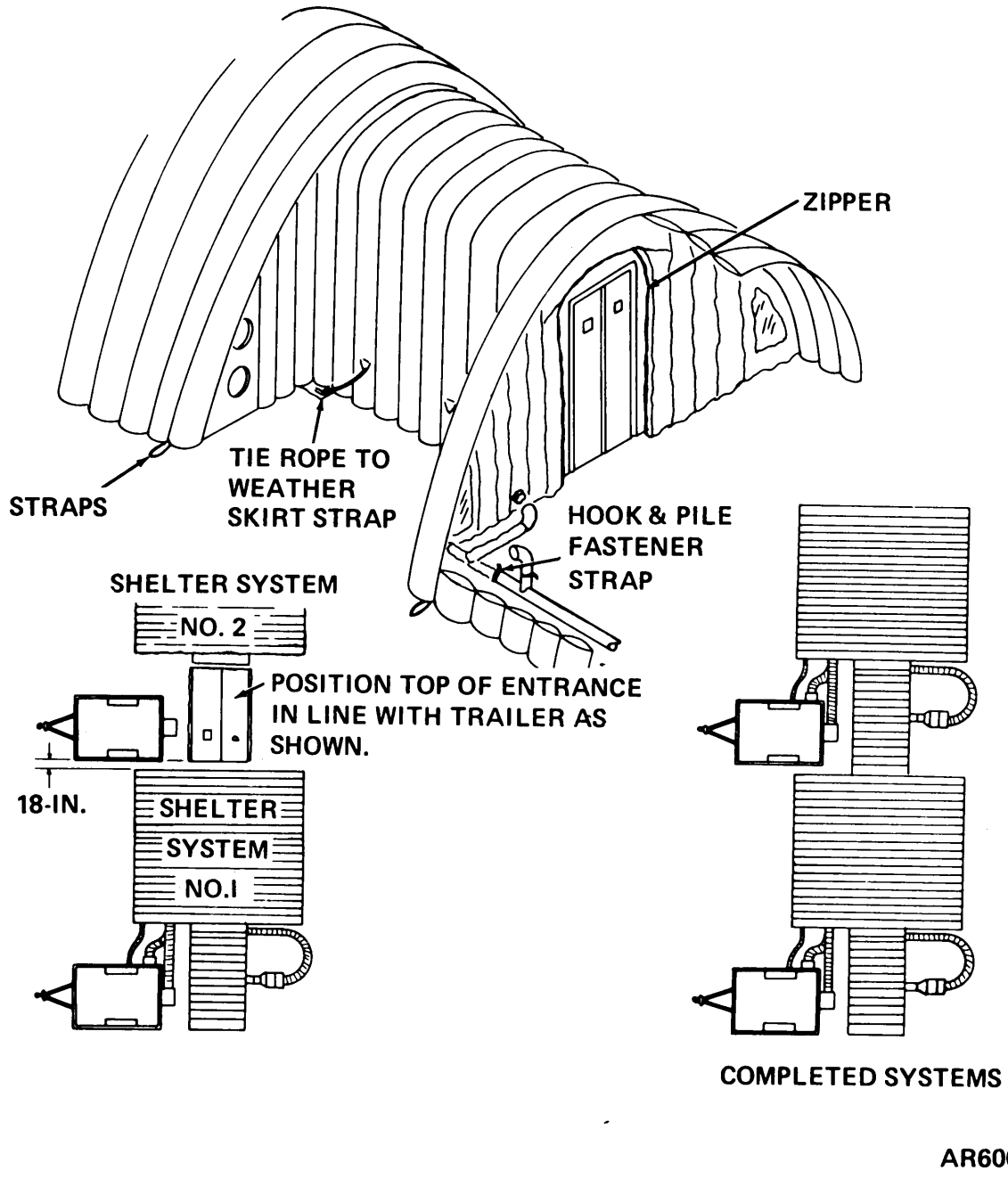


Figure 2-32. Entrance-to-shelter installation.

b. Disconnect trailer from tow vehicle (TM 9-2330-213-14).

c. Prepare erection site (para 2-42).

d. Unload and position equipment (para 2-44, steps *a* through *q)*.

e. With four men, carefully slide entrance (2, fig. 2-9) forward and off of support rack. Position top of deflated entrance even with side of trailer that is facing shelter (fig. 2-32),

f. Perform remaining unloading and positioning of equipment (para 2-44, steps *s* through *ag)*.

g. Perform usual erection procedures (para 2-45 through 2-48).

h. Perform the following steps on shelter system No. 1:

(1) Release clamp (7, fig. 2-31) and pull fitting (3) from fitting (8).

(2) Remove cover (2) from pocket (1). Place cover on fitting (8) and close clamp (7).

(3) Unfasten zippers (4) and (6), and remove deflated removable wall section (5). Stow removable wall section on support rack.

i. Perform the following steps on shelter system No. 2:

(1) Pull entrance zipper from hook and pile fastener.

(2) Tie the two rear entrance tiedown ropes to the two bottom weather skirt straps.

NOTE

Five men are required to perform the following step. Two men on the outside rear wall; one man on each forward shelter floor strap; one man on the entrance handles.

(3) Move shelter and entrance toward rear wall opening of shelter system No. 1 so as to mate entrance and shelter zippers.

j. Perform the following procedures on shelter system No. 1:

(1) Release clamp (7, fig. 2-31) and remove cover (2).

(2) Close off air supply to rear wall with the hook and pile fastener strap (fig. 2-32).

(3) Fasten zippers (5 and 6, fig. 2-31) to entrance zippers.

(4) Replace cover (2) and secure with clamp (7).

(5) Release hook and pile fastener (fig. 2-32).

k. Perform the following procedures on shelter system No. 2:

(1) Perform staking and tiedown (para 2-49).

NOTE

Do not use the two front entrance tiedown ropes.

(2) Install air-return and air-supply ducts (para 2-50).

(3) Install entrance GPFU (para 2-51).

(4) Perform electrical installation (para 2-52).

(5) Obtain ropes from tool box, and tie open doors of shelter system No. 2.

l. Adjust air-flow gage, and perform air-pressure checks and adjustments (para 2-53 and 2-54).

m. On shelter system No. 2, perform shelter system operation (para 2-55, steps *a* through *d*, and *g* through *i)*.

2-76. Striking Entrance-To-Shelter Installation

a. Perform operations (para 2-56, steps *a* through *j)*.

b. Remove ropes holding entrance doors open. Place ropes in tool box.

c. Perform operations (para 2-56, steps *k* through *r,* and *u* through *af)*.

d. Release two weatherskirt ropes (6, fig. 2-14) and all tiedown ropes (fig. 2-16).

e. Pull and stow tent pins in storage box (20, fig. 2-10). Close storage box lid (19).

f. Unfasten zippers (4 and 6, fig. 2-31) securing entrance to shelter.

g. Using the shelter floor straps, pull shelter and entrance away (approximately 6 feet) from shelter system No. 1.

h. Press entrance zipper against door frame and engage hook and pile fastener.

i. Install removable wall section in shelter system No. 1 and secure with zippers (4 and 6).

j. Release clamp (7) and remove cover (2) from fitting (8). Insert fitting (3) into fitting (8). Place cover (2) into pocket (l).

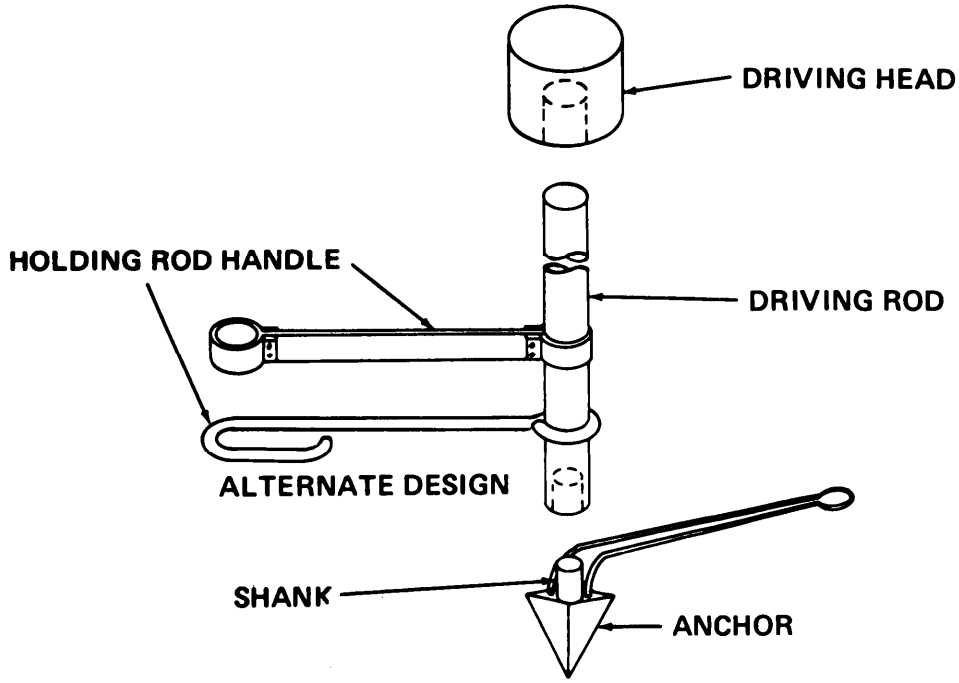
k. Loosen 12 hand knobs (16, fig. 2-14) and disconnect gas seal (15).

l. Perform operations (para 2-56, steps *aj* through *cp)*.

Section VIII. TOOLS AND EQUIPMENT

2-77. Tools

a. Driving Rod. The steel driving rod (fig. 2-33) is used to drive the arrow shaped anchors into the ground. The rod has a hole in one end to hold the shank of the anchor.



TOOLS

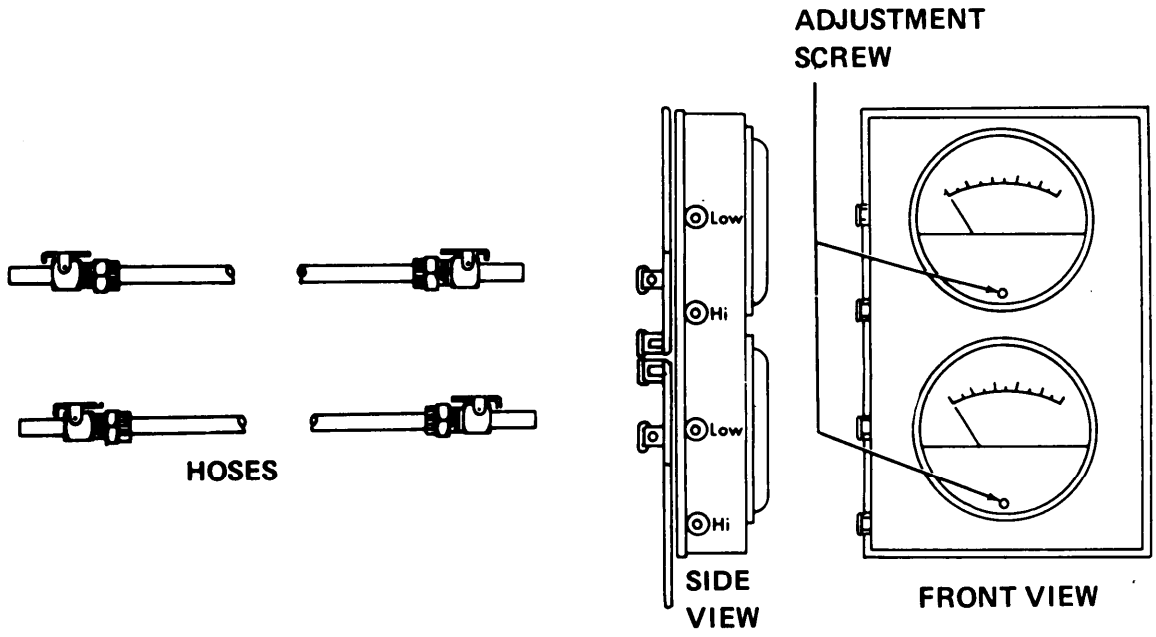


Figure 2-33. Tools and equipment.

b. Driving Head. The cylindrical shaped steel driving head has a hole in one end which fits over the driving rod. The driving head is placed on top of the driving rod to allow for a larger impact surface, and to protect the top of the driving rod from mushrooming.

c. Holding Rod Handle. The holding rod handle may be made from a shaped steel rod, or a steel of wood bar with a leather or fabric loop riveted on each end. The handle allows a person to hold the driving rod steady and straight while the anchors are being driven into the ground.

2-78. Equipment

The air-flow gage (fig. 2-33) consists of two dial indicating pressure gages mounted in a case. Two hoses with quick-connect fittings connect to various pressure taps. The dial on the top gage is graduated from 0 through 2.0 inches wg. Every fifth increment is numbered. The dial on the bottom gage is graduated from 0 through 50 inches wg. Every tenth increment is numbered. The air-flow gage is used to verify air pressure differential at specific check points (fig. 2-20).

CHAPTER 3

OPERATOR'S MAINTENANCE INSTRUCTIONS

Section I. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

3-1. Purpose

The preventive maintenance checks and services (table 3-1), provide the operator with a list of maintenance services which must be performed at the intervals prescribed. Use the list to make sure that all required maintenance is accomplished. If corrective action is not authorized at operator level, report equipment failures to your NCO or Officer.

3-2. Explanation of Columns

A number under before, during, after, daily, weekly, and quarterly operation in the "Interval and sequence No." column indicated that the service opposite the number must be performed in the numerical sequence and at the prescribed interval. The time required to perform all the checks and services for each interval is shown in the worktime column. These times are stated in man-hours (M/H) and carried to one decimal place (tenths of hours).

Table 3-1. Operator/Crew Preventive Maintenance Checks and Services

B – Before Operation
Time required: 1.5

D – During Operation
Time required: 1. 9

A – After Operation
Time required: 1.1

DA – Daily
Time required: 0.5

W – Weekly
Time required: 0. 9

Q – Quarterly
Time required: 0. 9

Interval Sequence No.						ITEM TO BE INSPECTED PROCEDURE	Work time (M/H)
B	D	A	DA	W	Q		
						INFLATABLE SHELTER AND ENTRANCE	
1		21				Visually inspect fabric for extensive cuts and tears (para 3-12 and 3-20). Replace unserviceable shelter. Check for broken and missing tiedown ropes. Check for missing and damaged valve clamps, replace missing and damaged valve clamps.	0.1
	10					Visually inspect interior and exterior of walls and floor for dirt, dust, mud, grease, and fungus. Keep all surfaces clean. Clean with water, and if available, use soap. Clean all zippers, as required, using a stiffy dry brush. Lubricate zipper seals (para 3-7). Visually inspect doors for freedom of movement and condition of rubber seals.	0.2
						FLEXIBLE DUCTS AND AIR DUCT HOSE	
2		22				Visually inspect for cuts and abrasions. Inspect clamps and metal fittings for dents and deterioration. Make minor repairs to small tears (para 3-28).	0.1
						ENTRANCE GAS-PARTICULATE FILTER UNIT	
3		23				Visually inspect for loose or missing fasteners (fig. 1-3). Visually inspect electrical cable for damaged plug connector, and deterioration of wires. Visually inspect clamps, and adapters for dents, distortion and missing hardware. Visually inspect flexible duct for cuts and holes.	0.1
						DRIVEBELTS	
4			1			Check tension of drivebelts (para 3-26). Visually inspect centrifugal blower, generator. and refrigerant compressor drivebelts *for damage*.	0.1
						CONDENSER AND RECIRCULATION FANS	
5						Visually inspect for loose and missing mounting hardware, and other damage that may affect equipment operation. Check condenser coil, located under condenser fan (fig. 1-7), for accumulation of leaves, paper, or other debris that affect cooling operation.	0.1
	11					Listen for unusual noises and vibrations.	0.1
						COMBUSTION HEATER	
6						Before heater is used visually inspect the combustion heater, located in the environmental equipment cabinet (fig. 1-7) for loose and missing hardware, corrosion, and physical damage.	0.1

Table 3-1. Operator/Crew Preventive Maintenance Checks and Services–Continued

Interval Sequence No.						ITEM TO BE INSPECI'ED PROCEDURE	Work time (M/H)
B	D	A	D A	W	Q		
						REFRIGERANT SIGHT GLASS	
	12					When air conditioning is to be used, set environmental switch (14, fig. 2-3) to COOL. After 2 minutes, check sight glass for presence of air bubbles and moisture (para 2-40).	0.1
						FIRE EXTINGUISHER	
7						Check for availability and that extinguisher (para 2-63) is fully charged. Replace if necessary.	0.1
						SWITCH AND DISTRIBUTION BOX	
	13					Visually inspect for loose mounting and loose electrical connectors (fig. 1-2). Visually check for damage and broken lens (3, fig. 3-5). Test incandescent lamp by depressing the lens; lamp should go ON. If necessary replace defective lamp (para 3-23).	0.1
						CABLE AND LIGHT ASSEMBLIES	
	14					Visually inspect for frayed electrical wires, distorted plug connectors, damaged and missing insulation, missing and damaged hardware. Replace cable and light assemblies if found to be unserviceable. Check for defective incandescent lamps. Replace defective lamp by placing fingers through end of extension light and remove lamp. Install new incandescent lamp (fig. 1-5).	0.2
						AUXILIARY CONTROL INDICATOR	
	15					Inspect switches, lights, and electrical connectors for secure mounting. Inspect for damaged and missing parts. If unserviceable, replace the auxiliary control indicator (6, fig. 2-19). Test incandescent lamps for the above lights by depressing the lens; lamp should go ON. If necessary replace defective lamps (para 3-19). Clean exterior surfaces with a soft clean cloth.	0.1
						MAIN CONTROL INDICATOR	
	16					Visually inspect SYSTEM HOURMETER, ENGINE AMMETER, AND GENERATOR FREQUENCY METER for damage and broken glass. Insure all circuit breakers and switches are securely mounted. Test incandescent lamp by depressing switch (6, fig. 2-2), lamp should go ON. If necessary, replace defective lamp (para 3-24 *b*). Clean exterior surface of panel with a soft cloth.	0.1
						BATTERY	
8			*2*			Inspect for loose connections, corrosion of terminals, loose or missing hardware, and electrolyte level. If electrolyte is low, add distilled or clean water. Never allow the electrolyte to drop below the top of the plates. Clean corrosion from terminals and apply petroleum jelly or a few drops of engine lubricating oil to prevent further corrosion (TM 9-6140-200- 14).	0.3
						INFLATABLE SHELTER CARRYING CASE	
	17					Visually inspect for rips, cuts, missing or broken straps, missing grommets, bent or damaged transport bars, broken or damaged handles. Insure carrying case is clean, free of dirt, dust, grease, and fungus. Clean with water and, if available, use soap. Repair damaged carrying case fabric (para 3-32). If necessary, replace unserviceable carrying case.	0.1
						TAILGATE EXTENSION AND SUPPORT RACK	
	18					Visually inspect tailgate extension (1, fig. 2-8), and entrance support rack (fig. 1-6) for loose and missing hardware, broken, damaged or missing straps, and structural failure. Replace unserviceable tailgate extension and entrance support rack.	0.1
						EVACUATION FAN AND EVACUATION MANIFOLD	
	19					Visually inspect evacuation fan (fig. 1-8) for loose and missing hardware, frayed and damaged electrical wires and insulation, distorted or broken plug connector. Visually inspect hose and evacuation manifold for cuts, abrasions, and loose connections. Clean dirt, mud, and foreign matter from equipment. Replace unserviceable evacuation fan and manifold.	0.1
						TOOL BOX AND CONTENTS	
	20					Visually inspect tool box (fig. 1-10) for distortion, damaged and missing handles, damaged catch and hinge. Insure all items stowed in tool box are available and serviceable (table 1-1). Replace missing and unserviceable items.	0.2
						BOX AND SOUND-ATTENUATING PLENUMS	
		24				Visually inspect for broken, loose and missing fastener, and dented and distorted flexible duct connections. Clean all dust, mud, dirt and foreign matter from plenums. Replace unserviceable plenums.	0.1

Table 3-1. Operator/Crew Preventive Maintenance Checks and Services–Continued

Interval and Sequence No.						ITEM TO BE INSPECTED PROCEDURE	Work time (M/H)
B	D	A	DA	W#	Q #		
		25				PREFILTER Visually inspect prefilter for damage, deterioration and clogging (para 3-25).	0.1
9			3			GENERATOR, CENTRIFUGAL BLOWER, REFRIGERANT COMPRESSOR Visually inspect for loose and missing hardware and damage that may affect system operation. Visually check oil level of centrifugal blower. Visually inspect oil for dirt, discoloration, and metal particles (para 3-6).	0.1
	26				1	GAS-PARTICULATE FILTER ASSEMBLY Visually inspect for loose and missing mounting hardware, and catches. Check to see that the flexible ducts are fastened securely (fig. 1-7). (Perform operations in para 2-54 *g.*	0.1
		27				ARTIC BLANKET (ELECTRIC) Visually inspect for damage, deterioration or signs of overheating. Check wiring for frayed insulation, sings of overheating and damage.	0.1
		28				AIR-FLOW GAGE Visuall inspect hoses for deterioration and damaged couplings. Visually check for damaged and missing plastic lenses (fig. 2-33). Replace gage if found to be unserviceable. Clean mud, dirt, and dust from exterior surfaces.	0.1
				2		RECIRCULATION FILTERS Check for physical damage and for water immersion. If physical damage or water immersion is visible, have filters replaced. Perform operations in paragraph 2-54 *e.*	0.3
				3		ENTRANCE GAS-PARTICULATE FILTER UNIT Check for physical damage and for water immersion. If physical damage or water immersion is visible, have filters replaced. Perform operations in paragraph 2-54 *d.*	0.2
					1	GASOLINE ENGINE MUFFLER, AND THROTTLE Visually inspect gasoline engine (TM 5-2805-259-14). Visually inspect muffler for holes, evidence of rusting through, and tightness of mounting hardware. Visually inspect throttle (9, fig. 2-1) for missing or loose mounting. Move throttle in and out, check for full movemnt of handle and throttle bracket, and for ease of movement. Inspect throttle casing for damage, kinks, and tightness. Apply dry graphite lubrication (item 14, table 1-3) as required.	0.1
					2	REPAIR KIT Inventory contents of repair kit (table 1-2). If inventory shows that contents are depleted to such an extent that the repair kit is useless, replace repair kit,	0.2
					3	GAS FILTER CHANGE CRITERIA Determine protective life of gas filters. Refer to paragraphs 3-33 and 3-34. Visually inspect for evidence of lubricant and fuel leaks during daily operation.	0.1
*	*	*		*	*	*GASOLINE ENGINE* *#Perform checks and services-on engine as prescribed in TM 5-2805-259-14.*	0.4

#Perform weekly and quarterly checks and services only when the equipment is in use.

Section II. TROUBLESHOOTING

3-3. Scope

a. This section contains troubleshooting or malfunction information and tests for locating and correcting most of the troubles which may develop in the shelter system. Each malfunction or trouble symptom for an individual component, unit, or system is followed by a list of tests or inspections necessary for you to determine probable causes and suggested corrective actions for you to remedy the malfunction.

b. This manual cannot list all possible malfunctions that may occur or all tests or inspections, and corrective actions. If a malfunction is not listed (except when malfunction and cause are obvious), or is not corrected by listed corrective actions, you should notify higher level maintenance. Refer to TM 5-2805-259-14 for troubleshooting the gasoline engine and to TM 9-2330-213-14 for troubleshooting the trailer.

3-4. Explanation of Table 3-2

Table 3-2 lists the common malfunctions you may find during the operation or maintenance of the shelter system or its components. You should perform the tests/inspections and corrective actions in the order listed.

Table 3-2. Operator/Crew Troubleshooting

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
GASOLINE ENGINE
1. ENGINE FAILS TO START
Step 1. Check ENGINE CONTROL switch (13, fig. 2-2) for "OFF" position. Set switch to "ON" position.
Step 2. Engine requires manual choking. Choke engine as required. For location of choke refer to engine manual TM 5-2805-259-14.
Step 3. Depress fuel indicator switch (3, fig. 2-5) and check fuel quantity gage (2) for fuel supply exhaustion. If fuel supply is exhausted, add gasoline (item 1 or 2, table 1-3).
Step 4. Connect auxiliary 24 vdc power supply to receptacle connector (5, fig. 2-9) to start engine. If engine fails to start have new battery installed.
Step 5. Use starting rope to start engine. If engine fails to start notify your NCO or Officer.
NOTE
Starting rope is stored in tool box.
ELECTRICAL SYSTEM
2. GENERATOR FREQUENCY METER FAILS TO REGISTER
Step 1. Check AUXILIARY 120 VAC circuit breaker for "OFF" position Set circuit breaker to "ON" position.
Step 2. Momentarily set MANUAL FIELD FLASH switch (12, fig. 2-2) to FLASH. Repeat three times.
3. SHELTER AND ENTRANCE LIGHTS FAIL TO GO ON
Step 1. Check AUXILIARY 120 VAC circuit breaker (4, fig. 2-2) for "OFF" position. Set circuit breaker to "ON" position.
Step 2. Check for defective incandescent lamps. Replace defective lamps.
Step 3. Check for disconnected and loose cable connections. Insure all cable connections have been properly connected and are secure.
4. NO ELECTRICAI, POWER AT 24 VDC RECEPTACLE
Step 1. Check DC POWER SUPPLY circuit breaker (1, fig. 2-2) for "OFF" position. Set circuit breaker to "ON" position.
Step 2. Check for blown fuse. Replace blown fuse as follows: *a.* Set four circuit breakers (1, 2, 3, and 4, fig. 2-2) of OFF. *b.* Unscrew cap (17, fig. 3-8) with preformed packing (16) attached. *c.* Remove fuse (15) from fuse holder (14), and insert new fuse.
Step 3. Loose wire at battery terminal adapter. Tighten wing nuts (fig. 3-l).

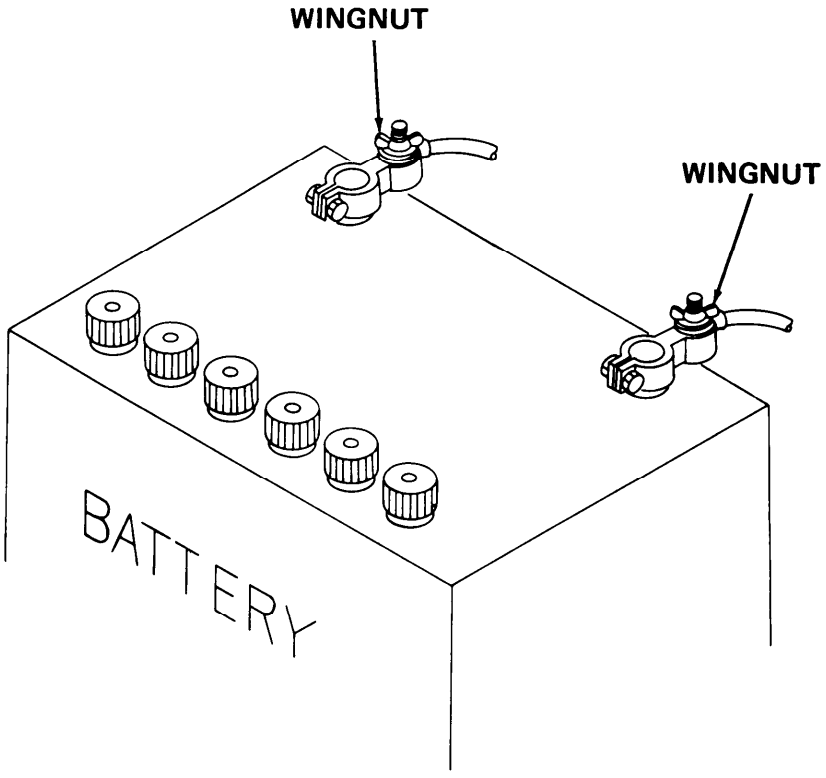


Figure 3-1. Battery terminals.

Table 3-2. Operator/Crew Troubleshooting– Continued

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
5. NO ELECTRICAL POWER
Step 1. Check DC POWER supply circuit breaker (1, fig. 2-2) for "OFF" position. Set circuit breakers to "ON" position.
Step 2. Momentarily set MANUAL FIELD FLASH switch (12, fig. 2-2) to FLASH. Repeat three times.
Step 3. Check for slipping generator drive belt. If belt is slipping, adjust belt tension (para 3-26).
Step 4. Check for blown fuse. See MALFUNCTION 4, step 2.
INFLATABLE ENTRANCE AND SHELTER
6. NO RIB INFLATION PRESSURE
Step 2. Check for improper setting of relief valve and manual damper. Make air-pressure checks and adjustments (para 2-54 *a* and *b*).
Step 2. Check for slipping centrifugal fan belt. It belt is slipping, adjust belt tension (para 3-26).
Step 3. Check for uninstalled dump valve covers. Install dump valve covers.
Step 4. Check for unfastened gas-particulate filter assemhy enclosure. Secure catches of gas-particulate filter assembly inclosure.
7. LOW INTERNAL SHELTER PRESSURE. MASK AND AND BUZZER AUDIBLE.
Step 1. (Check for improperly adjusted makeup-air damper (1, fig. 2-5) and butterfly valves (4). Adjust makeup-air damper and butterfly valves (para 2-54 *b* and *c*).
Step 2. Air supply and return duct connections leaking. Loosen couplings and properly join connections. Refasten couplings.
Step 3. Check for clogged prefilter. Clean prefilter (para 3-25).

Table 3-2. Operator/Crew Troubleshooting– Continued

MALPUNCTION TEST OR INSPECTION CORRECTVE ACTION

Step 4. Check for slipping centrifugal fan drive belt.
Adjust belt tension (para 3-26).
Step 5. Check for improper seating of the recirculation fan cabinet and environmental equipment cabinet access covers.
Properly seat access covers and tighten catches.
Step 6. Check for improper seating of the box and sound-attenuating plenums.
Properly seat plenums and tighten catches.
Step 7. Check for leaking gas seal and loose handknobs.
Properly insert gas seal and tighten handknobs.
Step 8. Check for unfastened gas-particulate filter assembly inclosure.
Secure catches of gas-particulate filter assembly inclosure.
Step 9. Check for an unsecured message-pass-through and cable-pass-through opening.
Close and secure openings.

8. NO HEAT OR INSUFFICIENT HEAT
Step 1. Check for the RECIRCULATION AND ENTRANCE FAN circuit breaker in "OFF" position.
Set circuit breaker to "ON" position.
Step 2. Check for the DC POWER SUPPLY circuit breaker (1, fig. 2-2) in "OFF" position.
Set circuit breaker to "ON" position.
Step 3. Momentarily set MANUAL FIELD FLASH switch (12, fig. 2-2) to FLASH. Repeat three times.
Step 4. Check for blown fuse.
See MALFUNCTION 4, *Step 2.*
Step 5. Check HEATER ON light for failure of fuel ignition.
Press HEATER RE-START switch (2, fig. 2-3) (para 2-16).
Step 6. Check for the HIGH-LOW HEAT switch to be in the LOW heat position.
Set switch to the HIGH heat position.

9. NO COOLING OR INSUFFICIENT COOLING
Step 1. Check for slipping refrigerant compressor belts.
Adjust tension of belts (para 3-26 *a* and *d).*
Step 2. Check CONDENSER FAN circuit breaker (2, fig. 2-2) for "OFF" position.
Set circuit breaker to "ON" position.
Step 3. Momentarily set MANUAL FIELD FLASH switch (12, fig. 2-2) to FLASH, repeat three times.
Step 4. Check DC POWER SUPPLY circuit breaker (1, fig. 2-2) for "OFF" position.
Set circuit breaker to "ON" position.
Step 5. Check the RECIRCULATION AND ENTRANCE FAN circuit breaker (3, fig. 2-2) for "OFF" position.
Set circuit breaker to "ON" position.
Step 6. Check for blown fuse.
See MALFUNCTION 4, *Step 2.*
Step 7. Check for leaks in refrigerant system.
Observe the refrigerant sight glass (para 2-40) for bubbles in the refrigerant, and for a change in color. If a defective refrigerant system is found, replace the defective trailer system.

OPERATING AND WARNING LIGHTS

10. SWITCH BOX LIGHT(S) FAIL TO ILLUMINATE
Step 1. Test for defective incandescent lamp by depressing lens, light should illuminate.
If no illumination, replace incandescent lamp(s).
Step 2. Check for disconnected or loose plug connector.
Connect and tighten plug connector.

11. DISTRIBUTION BOX LIGHT(S) FAIL TO ILLUMINATE
See MALFUNCTION 10, steps 1 and 2.

12. AUXILIARY CONTROL INDICATOR LIGHT(S) FAIL TO ILLUMINATE
See MALFUNCTION 10, steps 1 and 2.

13. MAIN CONTROL INDICATOR PANEL LIGHT FAILS TO ILLUMINATE WITH PANEL LIGHT SWITCH DEPRESSED.
Step 1. Be sure cap (11, fig. 3-8) has pulled out to allow light to shine through aperture.
Step 2. Replace defective incandescent lamp by unscrewing cap (11) and installing new incandescent lamp. Test new lamp by depressing panel light switch.

LOW OIL PRESSURE WARNING SYSTEM

14. LOW OIL PRESSURE LIGHT ON AND FAILS TO GO OFF
Perform shutdown procedures and check oil level in gasoline engine.
If necessary, add engine lubricant (para 3-8).

15. LOW OIL PRESSURE LIGHT FAILS TO ILLUMINATE WITH INSUFFICIENT OIL IN ENGINE CRANKCASE
Test incandescent lamp by depressing lens, light should illuminate. If no illumination, replace incandescent lamp. Test new lamp by depressing lens.

Table 3-2. Operator/Crew Troubleshooting-Continued

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
INTERNAL AIR-PRESSURE WARNING SYSTEM
16. PROPER INTERNAL AIR PRESSURE WITH MASK INDIATOR LIGHT ON AND BUZZER AUDIBLE Check For improper adjustment of low air-pressure switch (3, fig. 2-6) By performing procedures in paragraphs 2-54 *f* steps 1 through 5. Properly adjust low air-pressure switch (para 2-54 *f*, steps 1 through 5). CAUTION If system is operating in heat mode, set switch (14, fig. 2-3) to *circulate*, and wait until heater blower shuts down before adjusting air-pressure switch.
17. MASK INDICATOR LIGHT "OFF" WITH LOW AIR-PRESSURE BUZZER AUDIBLE Test for defective incandescent lamp by depressing lens, light should illuminate. If no illumination, replace incandescent lamp. Test new lamp by depressing lens, if new lamp does not illuminate replace defective auxiliary control indicator.
ENTRANCE GAS-PARTICULATE FILTER UNIT
18. ENTRANCE GAS-PARTICULATE FILTER UNIT FAILS TO OPERATE *Step 1.* Check RECIRCULATION AND ENTRANCE FAN circuit breaker (3, fig. 2-2) for "OFF" position. Set circuit breaker to "ON" position. *Step 2.* Check for loose or disconnected plug connector at receptacle (5, fig. 2-19). Connect and tighten plug connector.

Section III. LUBRICATION

3-5. General

This section contains instructions for the lubrication of the Shelter System. There instructions must be followed to maintain the equipment in an operational condition.

3-6. Centrifugal Blower

a. Refer to Figure 3-2 for dipstick and drain plug location.

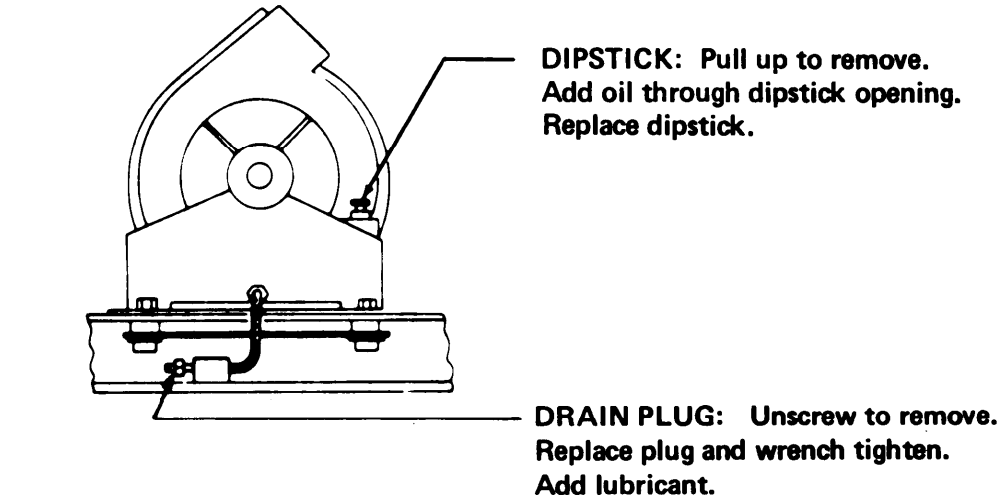


Figure 3-2. Centrifugal blower and gasoline engine lubrication

b. Check oil level every 5 hours for first 25-hours of operation.

c. Maintain oil at FULL level mark on dipstick.

d. Use only all temperature hydraulic lubrication oil (item 6, table 1-3).

WARNING

Avoid vapors and prolonged skin contact with hydraulic lubrication oil. Failure to comply may result in lung, skin and eye irritation.

e. Drain oil from blower while oil is warm.

f. Change oil after every 2,000-hours of operation. Fill oil reservoir with hydraulic lubricant, to full mark on dip stick.

NOTE

The 2,000-hour interval is based on normal hours of operation. Reduce to compensate for abnormal operations and severe conditions.

g. Clean area around dipstick before adding lubricant.

h. Use the funnel and plastic tubing, located in the tool box, for ease in filling the centrifugal blower oil reservoir.

3-7. Zipper Seals

a. All zipper rubber seals require lubrication in temperatures –25° F and below.

b. Lubricate zipper seals with aircraft grease (item 7, table 1-3).

3-8. Gasoline Engine

a. Refer to figure 3–2 for oil-gage-rod and drain plug location.

b. Refer to LO 5–2805–259–12 for engine lubrication.

3–9. Trailer

Refer to TM 9–2330–213–14 for trailer lubrication.

Section IV. SPECIAL TOOLS AND EQUIPMENT

3-10. Tools

The special tools required to perform operator/crew maintenance on the Shelter System are listed in table 3–3. The references indicating the use of these tools are listed in the table.

3-11. Equipment

There is no specal equipment required by the operator/crew to perform maintenance on the shelter system.

Table 3-3. Special Tools and Equipment

Item	NSN	Reference		Use
		Fig. No.	Para No.	
BAR, BELT TENSION	4240-00-489-5134	3-9	3-26	Positioned across drive belts surfaces for measuring belt deflection with the aid of a belt tensiometer

Section V. INFLATABLE SHELTER AND AUXILIARY CONTROL INDICATOR

3-12. Fabric Repair

The operator/crew are authorized to repair the shelter fabric.

a. *Temperatures Above 32° F.*

(1) *Shelter Walls.*

(a) Unfasten strap (25, fig. 2-10) and remove repair kit (24) from trailer.

NOTE

A judgment must be made as to whether the damaged section is to be inflated or not. It will depend upon location of repair.

(b) Using the hook and pile straps (Fig. 2–32), tie closed the duct feeding air to the damaged section.

(c) Remove cover (2, fig. 2-13) from dump valve in section to be repaired.

(d) If tear is long or irregular sew fabric together with needle and thread (fig. 3-3).

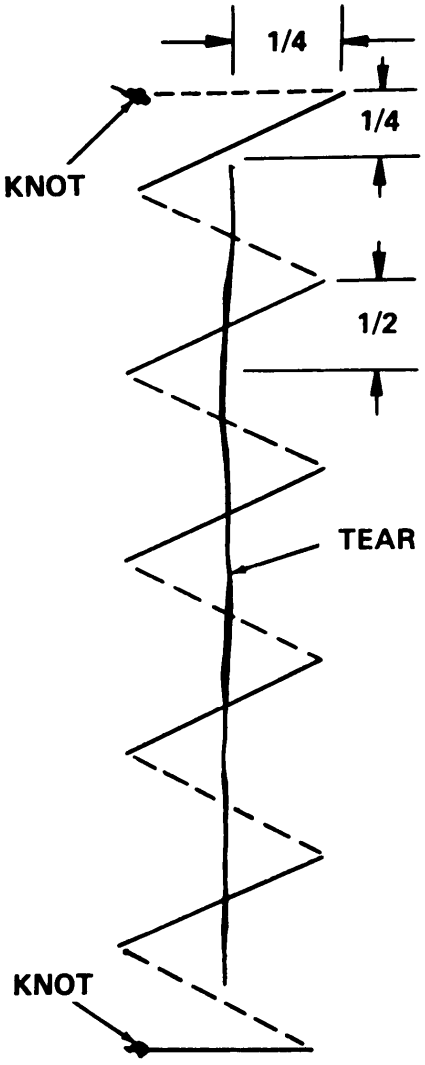


Figure 3-3. Stitching pattern.

NOTE

Patching cement will not adhere to painted surfaces.

(e) Remove all dirt and paint from patching area with a rough rag (item 18, table 1-3), dampened with solvent. Use a clean area of rag with each wipe.

(f) Select or cut a patch extending 2½-inches beyond edges of tear.

NOTE

Insure selected patch corresponds in color to surface being repaired.

(g) Clean contact surface of patch as stated in procedure (d) above.

WARNING

When using the adhesive and cleaning solvent, keep open flame away from working area. Have working area well ventilated.

DEATH

or severe bums may result if personnel fail to observe safety precautions.

NOTE

Adhesive must be applied uniformly to avoid puddles and dry spots to obtain a necessary uniform drying.

NOTE

Humid weather and damp areas may cause moisture to condense on cemented surfaces because of rapid evaporation of the solvents. If possible, keep cemented area warm.

(h) Apply an even coat of adhesive (item 17, table 1-3) to damaged area slightly larger than the patch. Work the adhesive well into the fabric.

(i) Apply an even coat of adhesive to the contact surfaces of the patch. Work the adhesive well into the fabric.

(j) Allow first coat to dry to touch before applying second coat.

(k) Apply second coat of adhesive to surface. Allow adhesive to become tacky. Check tackiness by pressing knuckles on adhesive to insure a good agressive tack.

NOTE

Take care to properly position patch to damaged area.

(l) Aline weave of patch material with that of the area to be patched.

(m) Knot a rag to use as a scrubbing tool.

(n) Apply patch with a rolling action to eliminate trapping air. Scrub patch surface firmly as it is rolled onto the shelter wall surface.

(o) Cure repaired area for approximately 1 hour to develop full strength before applying normal pressure.

(2) *Shelter Floor, Windows, and Air-Conditioning Duct.* Repair the shelter floor, windows, and air-conditioning duct in the same manner as the shelter walls, except for the following procedures:

(a) Rough damaged area with a stiff bristle brush. Avoid exposing base material of-the fabric.

(b) Always repair the window material on interior side.

b. Temperatures Below 32° F. Except for the following procedures, follow instructions in paragraph 4-15 *a.*

(1) Allow repair kit to warm inside shelter.

(2) Do not attempt spreading adhesive when adhesive temperature is below 32° F.

(3) If necessary to expedite warming, pla-

adhesive in air-conditioning duct with heat ON. Do not use engine exhaust to warm adhesive.

(4) Warm surfaces to be cemented. Rags warmed by engine exhaust or muffler shroud can be used to warm surfaces to be cemented.

(5) Do not use stiff bristle brush on window material.

3-13. Shelter Replacement

The operator/crew are authorized to replace the shelter.

a. Removal.

(1) Remove all equipment not associated with the shelter system from inside of shelter and entrance.

(2) Remove debris from shelter and entrance.

(3) Remove plastic bag from toilet and discard. Place toilet on trailer.

(4) Set environmental control switch (24, fig. 2-3) to CIRCULATE (center position).

(5) Set switch (7) to OFF.

(6) Set LIGHTS switch (1) to OFF.

NOTE

If system has been operating in heating mode, do not proceed until heater blower shuts down.

(7) Set four circuit breakers (1, 2, 3, and 4, fig. 2-2) to OFF.

(8) Pull out throttle (9, fig. 2-1) until idle speed is obtained. Turn clockwise to lock in idle position. Idle engine 3-minutes, then set ENGINE CONTROL switch (13, fig. 2-2) of OFF. After engine stops, push throttle in and lock.

(9) If engine fails to stop, pull out choke control to stop engine (TM 5-2805-259-14).

(10) Disconnect electrical power cable (9, fig. 2-19) from distribution box (4) and auxiliary control indicator (6). Replace all receptacle covers. Place cable (9) in tool box.

(11) Disconnect cable and light assembly (8) from distribution box (4). Replace receptacle cover on distribution box.

(12) Unhook cable and light assembly (8) from hanger straps (2). Place cable in tool box.

(13) Disconnect cable (7) from auxiliary control indicator (6). Replace receptacle covers on auxiliary control indicator and cable (7).

(14) If used, remove plug from receptacle connector (8, fig. 2-3). Replace cover (9).

(15) Remove auxiliary control indicator from shelter wall and place in tool box.

NOTE

Be careful not to damage electrical cable in air-return duct.

(16) Disconnect and remove air-supply and return ducts from shelter (fig. 2-18).

(17) Disconnect air recirculation duct from entrance.

(18) Disconnect entrance gas-particulate filter unit plug connector from receptacle (5, fig. 2-19). Install cover on receptacle.

(19) Screw entrance gas-particulate filter unit plug connector on dummy receptacle.

(20) Disconnect entrance gas-particulate filter unit from entrance. Remove gas-particulate filter unit and attached duct from working area.

(21) Release two weatherskirt ropes (6, fig. 2-14) and all tiedown ropes (fig. 2-16). Pull and stow all tent pins in storage box (20, fig. 2-10).

(22) Loosen 12 hand knobs (16, fig. 2-14) and disconnect gas seal (15).

(23) Release clamp (1, fig. 2-12) and remove cover (3). Partially deflate ribs by inserting fingers into dump valve (2) and unseat internal flapper valve.

(24) Pull entrance towards shelter and unhook 12 hooks (13, fig. 2-14) and dee-rings (14). Two connections are located on top of door frame and five on each side.

(25) Unhook six hooks (9) and dee-rings (7) (three on each side of entrance).

(26) Release clamps (1) and disengage interconnecting fittings (4). Place covers (2) into interconnecting fittings and close clamps.

(27) Pull entrance approximately 3 feet away from shelter.

(28) Remove tool box from shelter.

(29) If present, fold and remove electric blanket from shelter (fig. 2-15).

(30) Release inflation fitting clamp (1, fig. 2-13) and remove air-duct hose. Place cover (2) into inflation fitting and close clamp.

(31) Position evacuation manifold (1, fig. 2-23). Release clamp and remove cover from rear wall dump valve (2). Insert evacuation manifold into dump valve (2) and close clamp.

NOTE

Do not connect manifold to inflation fitting.

(32) Progress toward front of shelter, connecting manifold to four remaining dump valves.

(33) Unfasten strap (7, fig. 2-10) and remove evacuation fan (8).

(34) Connect evacuation manifold to evacuation fan hose.

(35) Insure circuit breaker (1, fig. 2-4) is in OFF position.

(36) Remove cover (5, fig. 2-23) from plug connector (6).

(37) Remove cover (5, fig. 2-1) and connect plug connector to receptacle connector (4).

(38) Set circuit breaker (1, fig. 2-4) to ON.

(39) After shelter ahs completely collapsed, set circuit breaker (1) to OFF.

(40) Disconnect evacuation manifold and evacuation fan hose.

(41) Disconnect evacuation manifold from shelter. Replace dump valve covers and secure with clamps.

(42) Disconnect plug connector from receptacle (4, fig. 2-1). Replace cover (5) on receptacle.

(43) Replace cover (5, fig. 2-23) on plug connector (6).

(44) Place evacuation fan on trailer and secure with strap (7, fig. 2-10).

(45) Stow evacuation manifold on support rack.

(46) Fold shelter (fig. 2-24), steps 1 and 2. Roll shelter to ease handling.

b. Installation.

WARNING

DO NOT WALK ON THE FABRIC. Be extremely careful when handling the shelter. Protect against tears and abrasions. Failure to comply may result in DEATH or serious illness to occupants.

(1) Remove new shelter from shipping container.

(2) Position shelter (fig. 2-7).

(3) Unroll and unfold shelter (fig. 2-13).

(4) Start engine (para 2-46 *e* through *j*).

(5) Inflate shelter (para 2-47).

(6) Unfasten 10 straps (19, fig. 2-14) from dee-rings (18).

(7) Push shelter opening cover (11) inward to free it from the hook and pile fastener.

(8) Enter shelter and roll up shelter opening cover. Secure cover with two straps (12).

(9) If present, fold arctic blanket (fig. 2-15).

(10) Place tool box inside shelter.

(11) Lay bottom weatherskirt (8, fig. 2-14) flat on ground.

(12) Apply thin coat of aircraft grease (item 7, table 1-3) to inner and outer surfaces of interconnecting fittings (4).

(13) Position entrance in shelter opening. Connect 12 hooks (13) and dee-rings (14). Two connections are located on top of door frame and five on each side.

(14) Position weatherskirt (5) so as to lay flat on entrance.

(15) Connect six dee-rings (7) and hooks (9). Three connections on each side of entrance.

(16) Unfasten two clamps (1) and remove two covers (2). Place covers in pockets (3).

(17) Connect interconnecting fittings (4) and close clamps (1).

(18) Starting in upper right-hand corner of door frame, insert gas seal (15) under door frame seal (17).

(19) Hand-tighten 12 hand knobs (16).

(20) Tie two ropes (6) to dee-rings (10) on both sides of entrance.

(21) Using a heavy hammer, drive tent pins at locations shown (No. 1, fig. 2-16).

CAUTION

Shelter and entrance must be firmly secured to ground. If edges of shelter and entrance rise from ground (ballooning) replace tent pins with ground anchors.

(22) Tie 19 tiedown ropes to anchors and tent pins and one to trailer wheel.

(23) Connect air-return duct to shelter air-return opening (fig. 2-18). Secure with attached coupling.

(24) Connect air-supply duct to shelter air-supply opening. Secure with attached coupling.

(25) position the entrance gas-particulate filter unit as shown in figure 2-18.

(26) Connect the filter units flexible duct to the air recirculation outlet and secure with attached coupling.

(27) Connect the air-recirculation duct to the entrance air-recirculation inlet. Secure with attached coupling.

(28) Remove plug connector from dummy receptacle. Remove cover from receptacle (5, fig. 2-19) and connect plug connector.

(29) Remove auxiliary control indicator from tool box. Install auxiliary control indicator on two dee-rings near location shown (fig. 2-19).

(30) Remove cover from plug connector P-8 on cable (7).

(31) Remove cover (10, fig. 2-3). Connect plug connector P-8 to receptacle connector.

(32) Remove cables (8 and 9, fig. 2-19) from tool box.

(33) Remove cover (15, fig. 2-3). Connect plug connector P-9 on cable (9, fig. 2-19) to receptacle connector.

(34) Remove two covers from distribution box (4).

(35) Connect plug connector P-10 on electrical power cable (9) to bottom receptacle connector.

(36) Connect plug connector P-11 on cable and light assembly (8) to top receptacle con-

nector. Attach hangers on cable to hanger straps (2).

(37) Set circuit breakers (2 and 3, fig. 2-2) to ON.

(38) Check GENERATOR FREQUENCY METER (11) for a reading of 62-Hz. If necessary, adjust gasoline engine speed by moving throttle in-or-out and locking throttle in the correct position to obtain the 62-Hz reading.

(39) Turn DC POWER SUPPLY circuit breaker (1) to OFF. Repeat procedure (38) above.

(40) Set DC POWER SUPPLY circuit breaker (1) to ON.

(41) Set LIGHT switch (1, fig. 2-3) to ON.

(42) Assemble toilet and attach plastic bag per instructions on package. Place toilet in shelter.

(43) Adjust air-flow gage (para 2-53).

(44) Check and adjust air pressure (para 2-54, steps *o* through *w)*.

3-14. Air-Supply Duct Mounting Plate

The operator/crew are authorizied to replace air-supply duct mounting plate and attaching hardware.

a. Removal.

NOTE

One person will be required to hold the ring and air-conditioning duct in position when removing the air duct mounting plate.

(1) Remove eight binder posts (1, fig. 3-4), washers (2), and washers (9).

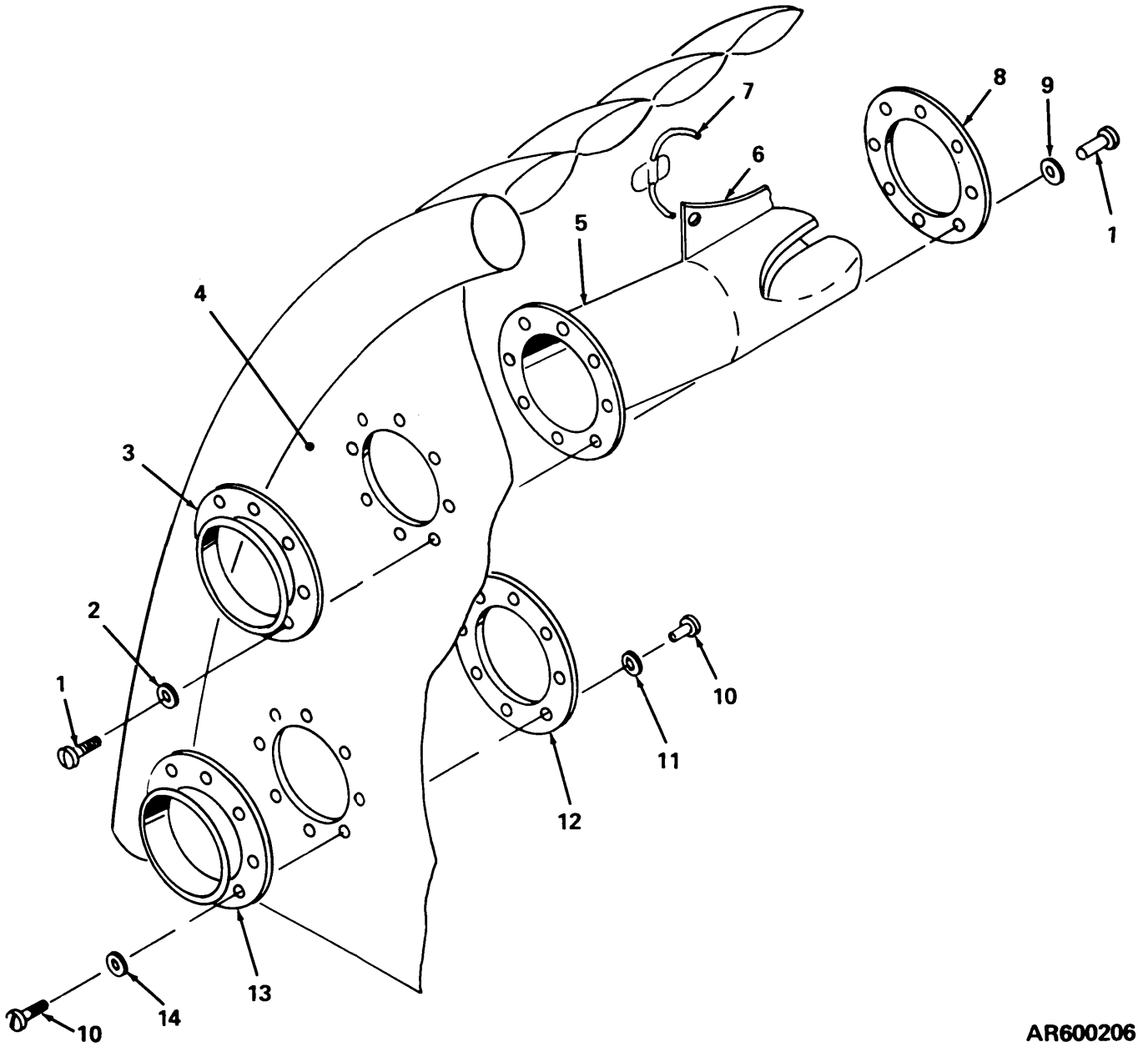


Figure 3-4. Mounting plates air-conditioning duct, and rings, exploded view.

Legend for fig. 3-4:

1 Binder posts	8 Ring
2 Washers	9 Washers
3 Air-duct mounting plate	10 Binder posts
4 Shelter wall	11 Washers
5 Air-conditioning duct	12 Ring
6 Grommets	13 Air-duct mounting plate
7 Ropes	14 Washers

(2) Remove air duct mounting plate (3) from shelter wall (4).

b. Installation. Installation is the reverse of removal (*a* above), except replace an unserviceable binder post with a screw, washer, and nut.

3-15. Air-Conditioning Duct and Ring

The operator/crew are authorized to replace the air conditioning duct, ring, and mounting hardware.

a. Removal.

(1) Untie five ropes (7, fig. 3-4) and remove from grommets (6).

(2) Remove inlet air duct mounting plate (para 3-14 *a).*

(3) Remove ring (8) amd air-conditioning duct (5) from shelter wall (4). Remove ring from air-conditioning duct.

b. Installation. Installation is the reverse of removal (*a* above), except replace an unserviceable binder post with a screw, washer and nut.

3-16. Air-Return Duct Mounting Plate and Ring

The operator/crew are authorized to replace the air-return duct mounting plate, ring, and mounting hardware.

a. Removal.

(1) Remove eight binder posts (10, fig. 3-4), washers (14), and washers (11).

(2) Remove air duct mounting plate (13) and ring (12) from shelter wall (4).

b. Installation. Installation is the reverse of removal (a above), except replace an unserviceable binder post with a screw, washer, and nut.

3-17. Removable Wall Section

The operator/crew are authorized to replace the removable wall section.

a. Removal.

(1) Release clamp (5, fig. 3-5) and pull out fitting (4).

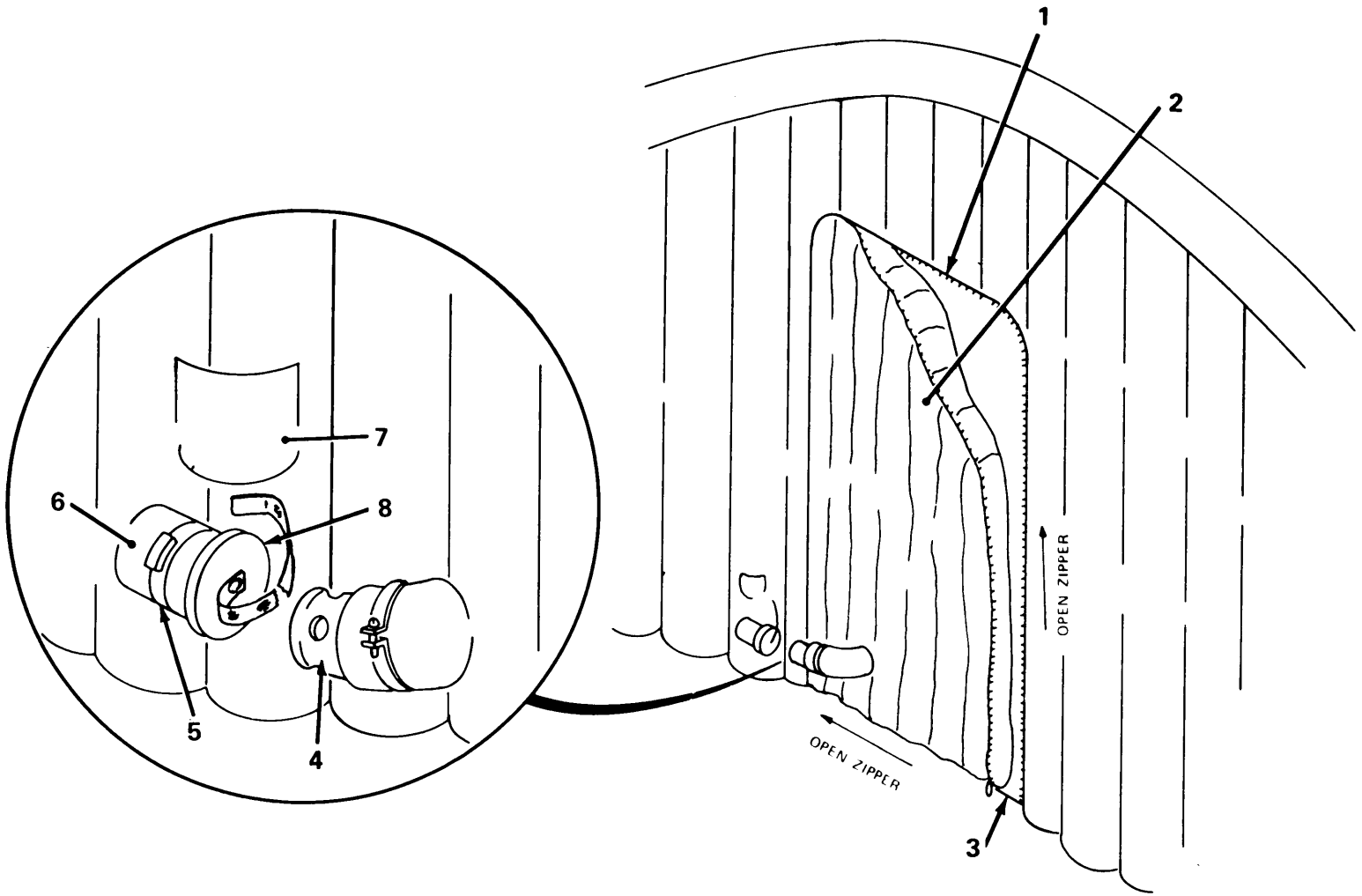


Figure 3-5. Removable wall section, exploded view.

Legend for fig. 3-5:
1 Zipper
2 Removable wall section
3 Zipper
4 Fitting
5 Clamp
6 Fitting
7 Pocket
8 Cover

(2) Remove cover (8) from pocket (7). Place cover on fitting (6) and close clamp (5).

(3) Unzip zipper (1) and (3).

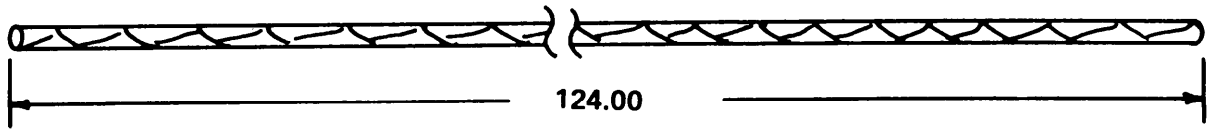
(4) Remove deflated removable wall section (2).

b. Installation. Installation is the reverse of removal (*a* above).

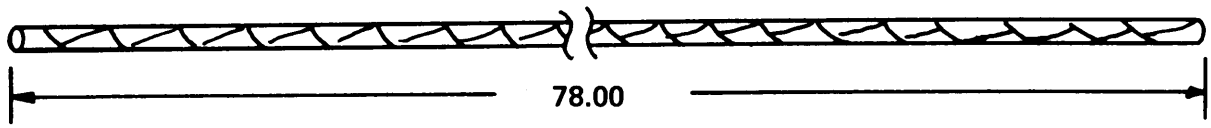
3-18. Tiedown Ropes

The operator/crew are authorized to manufacture and replace the tiedown ropes.

a. Manufacture. Fabricate tiedown ropes (fig. 3-6).



ENTRANCE AND SHELTER CORNER TIEDOWN ROPES



ENTRANCE AND SHELTER SIDE TIEDOWN ROPES

NOTES:

1. **Material: Nylon rope, MIL SPEC, MIL-C-43307.**
2. **Melt ends of cut rope to prevent fraying.**
3. **Dimensions in inches.**

Figure 3-6. Entrance and shelter tiedoun ropes fabrication.

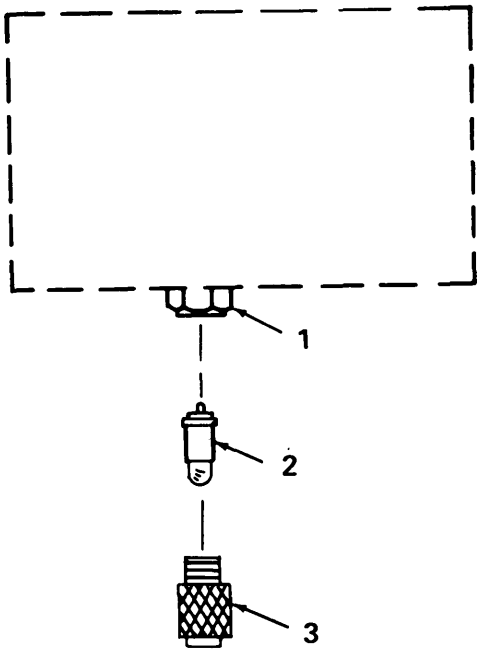
b. Removal and Installation. Cut off broken or frayed ropes. Using two half-hitch knots tie new ropes to dee-rings on shelter.

3-19. Auxiliary Control Indicator

a. Incandescent Lamps. The operator/crew are authorized to replace a defective incandescent lamp. The replacement of the HEATER ON, EMERGENCY ENTRY MODE, MASK, and LOW OIL PRESSURE incandescent lamps are identical.

(1) *Removal.*

(a) Unscrew lens (3, fig. 3-7).



1 lndicator light
2 Incandescent lamp
3 Lens

Figure 3-7. Incandescent lamp, exploded view.

(b) Remove incandescent lamp (2) from lens (3).

(2) *Installation.* Installation is the reverse of removal ((1) above). Test incandescent lamp by depressing lens.

Section VI. INFLATABLE ENTRANCE, SWITCH BOX, AND DISTRIBUTION BOX

3-20. Fabric Repair

Organizational maintenance personnel are authorized to repair the entrance fabric. Refer to paragraph 3-12 for instructions on repair of the inflatable entrance fabric.

3-21. Inflatable Entrance Replacement

The operator/crew are authorized to replace the inflatable entrance.

a. Removal.

(1) Remove all equipment not associated with shelter system.

(2) Remove all debris.

(3) Remove pouch and place in tool box.

(4) Untie all tiedown ropes. Pull and stow tent pins in storage box (20, fig. 2-10).

(5) Untie two ropes (6, fig. 2-14).

(6) Set LIGHT switch (1, fig. 2-3) to OFF.

(7) Disconnect cable and light assembly (8, fig. 2-19) and electrical power cable from distribution box (4). Replace receptacle covers.

(8) Disconnect plug connectors on cable and light assembly (3, fig. 2-19) from distribution box (4), switch box (1), and receptacle connector (5).

(9) Unhook cable and light assembly (3) from hanger straps (2). Place cable in shelter.

(10) Disconnect entrance gas-particulate filter unit plug connector from receptacle (5). Replace cover on receptacle.

(11) Remove air recirculation duct and entrance gas -particulate filter unit from entrance (fig. 2-18).

(12) Loosen 12 hand knobs (16, fig. 2-14) and disconnect gas seal (15).

(13) Pull entrance towards shelter, and unhook 12 hooks (13) and dee-rings (14). Two connections are located on top of door frame and five on each side.

(14) Unhook six hooks (9) and dee-rings (7). Three on each side of entrance.

(15) Release clamp (1, fig. 2-12) and remove cover (3). Deflate entrance ribs by inserting fingers into inflation valve (2) and unseating internal flapper valve.

(16) Release clamps (1, fig. 2-14) and disengage interconnecting fittings (4). Place covers (2) on interconnecting fittings and close clamps.

(17) Pull entrance away from shelter approximately 3 feet. Thread front tiedown ropes through handles and tieoff.

(18) Unfasten strap (7, fig. 2-10) and remove evacuation fan (8) from trailer.

(19) Release clamp (1, fig. 2-12) and remove cover (3). Connect evacuation fan duct into inflation valve (2) and close clamp (1).

(20) Insure circuit breaker (1, fig. 2-4) is in OFF position.

(21) Remove cover (5, fig. 2-23) from plug connector (6).

(22) Remove cover (5, fig. 2-1) and connect plug connector to receptacle connector (4).

(23) Set circuit breaker (1, fig. 2-4) to ON.

(24) As pressure bleeds from entrance, push bottom in direction of arrow 1 (fig. 2-22). This will allow entrance to collapse in the position indicated by arrows 2 and 3.

(25) After entrance has completely collapsed, set circuit breaker (1, fig. 2-4) to OFF.

(26) Release clamp (1, fig. 2-12) and remove evacuation fan from inflation valve. Place cover (3) into valve and close clamp (1).

(27) Position entrance interior doors over exterior doors. Remove damaged entrance from installed area.

(28) Disconnect plug connector from receptacle connector (4, fig. 2-1). Replace covers on receptacle and plug connectors.

(29) Place evacuation fan (8, fig. 2-10) on trailer and secure with strap (7).

b. Installation.

(1) Remove entrance from shipping container, and position entrance (fig. 2-7).

(2) Release clamp (1, fig. 2-13) and remove air duct hose from shelter inflation fitting. Place cover (2) into shelter inflation fitting and secure with clamp (1).

(3) Release clamp (1, fig. 2-12) and remove cover (3).

(4) Insert air duct hose into inflation valve (2).

(5) Depress PRESS-TO-INFLATE switch (9, fig. 2-2) and hold during inflation.

(6) Maintain entrance position (fig. 2-12) while inflating.

(7) After entrance is partially inflated, release PRESS-TO-INFLATE switch.

(8) Release clamp (1) and remove air duct hose. Install cover (3) and secure with clamp.

(9) Release clamp (1, fig. 2-13) and remove cover (2) from shelter inflation fitting. Insert air duct hose into shelter inflation fitting, and secure with clamp (1).

(10) Connect entrance and shelter (para 2-48 *f* through *p)*.

(11) Using a heavy hammer, drive six tent pins at locations shown (no. 1, fig. 2-16).

(12) Tie tiedown ropes to tent pins.

(13) Connect the filter unit flexible duct to the air-recirculation outlet and secure with attached coupling.

(14) Connect the air-recirculation duct to the entrance air-recirculation inlet. Secure with attached coupling.

(15) Remove cover from receptacle connector (5, fig. 2-19). Connect plug connector (fig. 1-3) to receptacle connector.

(16) Remove cover on distribution box (4, fig. 2-19). Connect plug connector P-14 on cable and light assembly (3) to receptacle connector. Using hangers on cable, attach cable to hanger straps (2).

(17) Remove cover from switch box (1). Connect plug connector P-17 on cable and light assembly (3) to receptacle connector.

(18) Remove cover from receptacle connector (5). Connect plug connector P-16A on cable and light assembly (3) to receptacle connector.

(19) Remove covers from distribution box (4) and connect cable and light assembly (9) to bottom receptacle connector.

(20) Connect cable and light assembly (8) to top receptacle connector of distribution box (4).

(21) Set LIGHT switch (1, fig. 2-3) to ON.

(22) Attach pouch to entrance door frame (fig. 1-2).

(23) Using the air-flow gage, adjust the entrance door butterfly valves (para 2-54 *o* through *w*).

3-22. Tiedown Ropes

The operator/crew are authorized to manufacture and replace the tiedown ropes (para 3-18).

3-23. Switch and Distribution Box

a. Incandescent Lamps. The operator/crew are authorized to replace the incandescent lamps. The switch box and distribution box incandescent lamps are replaced by the same procedures as the auxiliary control indicator lamps (para 3-19).

Section VII. TRAILER MOUNTED AND MISCELLANEOUS EQUIPMENT

3-24. Main Control Indicator

a. Fuse. The operator/crew are authorized to replace a defective fuse.

(1) *Removal.*

(a) Set four circuit breakers (1, 2, 3, and 4, fig. 2-2) to OFF.

(b) Unscrew cap (17, fig. 3-8) with preformed packing (15) attached.

Legend for fig. 3-8:

1 Access cover
2 Main control indicator
3 Receptacle connector (J6)
4 Receptacle connector (J7)
5 Receptacle connector (J21)
6 Screws
7 Washers
8 Plug connector (P2)
9 Plug connector (P26)
10 Screw
11 Cap
12 Incandescent lamp
13 Light assembly
14 Fuse holder
15 Fuse
16 Packing preformed
17 Cap
18 Clamp
19 Washer
20 Locknut
21 Receptacle connector (J2)
22 Shelter recirculation fan cabinet
23 Receptacle connector (J26)
24 Plug connector (P21)
25 Plug connector (P7)
26 Plug connector (P6)
27 Washers
28 Screws
29 Rivets
30 Catches
31 Rivets
32 Washers
33 Screws
34 Screws
35 Washers
36 Screw
37 Clamp
38 Washer
39 Locknut

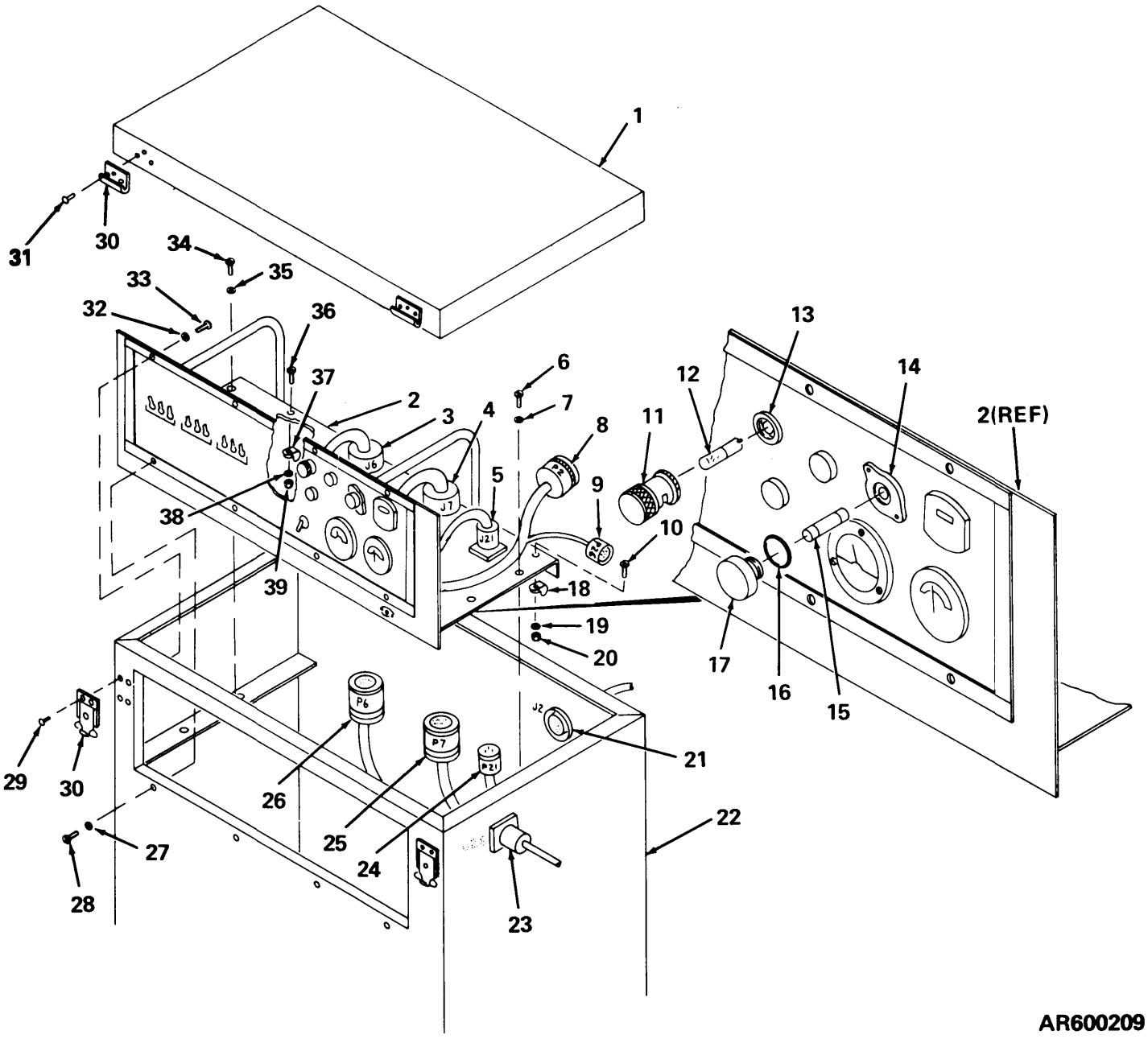


Figure 3-8. Main control indicator, exploded view.

(c) Remove fuse (15) from fuse holder (14).

(2) *Installation.* Installation is the reverse of removal (a above).

b. Incandescent Lamp. The operator/crew are authorized to replace a defective incandescent lamp.

(1) *Removal.*

(a) Unscrew cap (11).

(b) Remove incandescent lamp (12) from light assembly (13).

(2) *Installation.* Installation is the reverse of removal ((1) above), except test incandescent lamp by depressing PANEL LIGHT switch (6, fig. 2-2).

3-25. Prefilter

The operator/crew are authorized to remove and clean the prefilter.

a. Shutdown Procedures.

(1) Set environmental control switch (14, fig. 2-3) to CIRCULATE (center position).

NOTE

If system has been operating in heating mode, do not proceed until heater blower shuts down.

(2) Set circuit breakers (1, 2, 3, and 4, fig. 2-2) to OFF.

(3) Pull out throttle (4, fig. 2-1) until idle speed is obtained. Turn clockwise to lock in idle position. Idle engine 3 minutes, then set ENGINE CONTROL switch (13, fig. 2-2) to OFF. After engine stops, push throttle in and lock.

(4) If engine fails to stop, full out choke control to stop engine (TM 5-2805-259-14).

b. Removal, Cleaning, and Installation.

(1) Slide prefilter (fig. 1-7) up and out of' plenum.

(2) Visually inspect prefilter and mesh holder for damage and deterioration. Replace if unserviceable.

(3) Visually check for amount of dirt and foreign matter collecting on metal mesh.

(4) If necessary, wash prefilter in water to remove dirt and foreign matter, and shake dry.

(5) Slide prefilter back into plenum.

3-26. Drivebelts

The operator/crew are authorized to check and adjust the tension of the centrifugal blower, generator, and refrigerant compressor drivebelts.

a. Belt Tension Check.

(1) Remove belt tension bar (fig. 3-9) and tensiometer from tool box.

BELT TENSION BAR

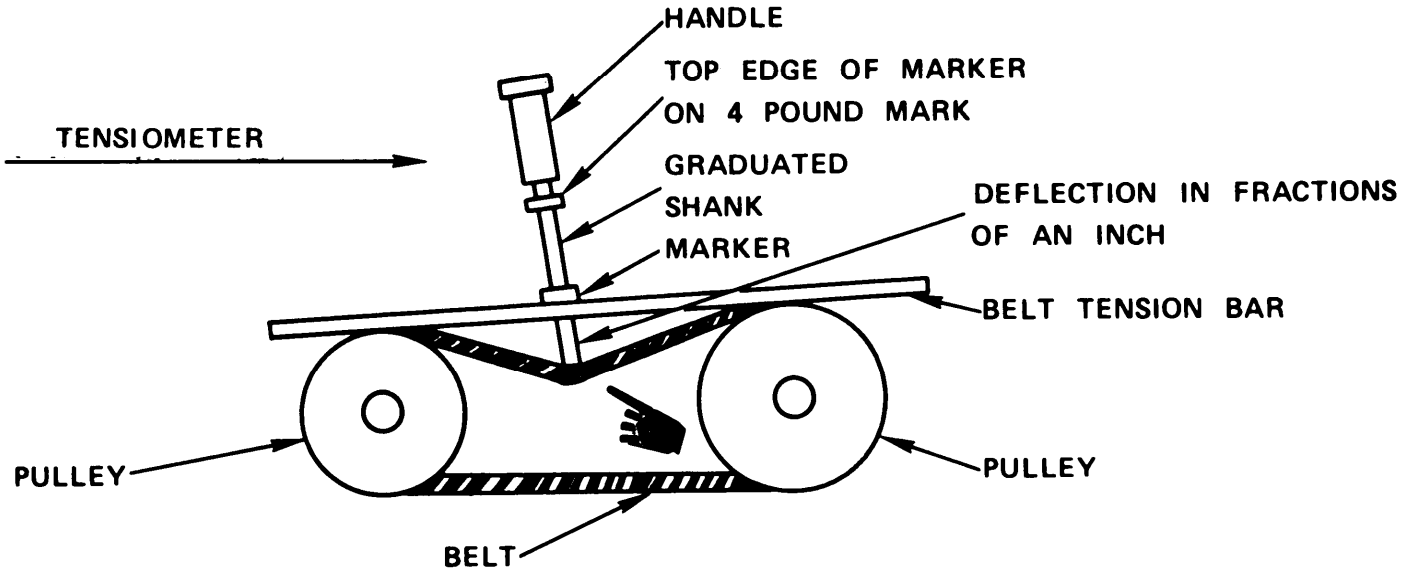


Figure 3-9. Special tools.

(2) Perform shutdown procedures (para 3-25(a).

(2.1) Remove safety shield (33, fig. 2-10).

(3) On the tensiometer, set top of upper marker at the 4 pound graduation. Set lower mark at the ¼-inch graduation.

(4) Place belt tension bar across applicable pulleys with one of the two holes centered between the drive and driven pulleys.

(5) Place the tensiometer shank through the centered hole of the belt tension bar.

(6) Press down on tensiometer handle until bottom of handle touches the upper marker.

(7) Withdraw the tensiometer, and read the scale graduation at the bottom of the lower marker (which moved along the shank (scale) by the amount of pressure applied). Refer to table 3-4 for correct belt deflection.

Table 3-4. Drive belt Tension

Drivebelt	Belt Quantity	Deflection in INCHES*	Pounds Pressure Applied
Generator	2	3/16	4
Centrifugal blower	1	1/8	4
Refrigerant Compressor	2	6/16	4

* Use dimension shown plus thickness of belt tension bar.

NOTE

If belt tension bar is not available, use dimension shown plus thickness of straight edge used.

(8) If the belt tension is unsatisfactory, proceed to applicable paragraph below for adjustment procedures.

b. Generator Belt Adjustment.

(1) Loosen nut (13, Fig. 3-10). Rotate adjusting bolt (12) CCW to loosen or CW to tighten belts (14).

NOTE

If rotation of adjusting bolt (12) does not change tension of belts (14) it may be necessary to loosen two screws (13.1).

(2) Check drivebelt tension (table 3-4). If necessary readjust.

(3) Hold adjusting bolt (12) to prevent turning and tighten nut (13).

Legend for fig. 3-10:

1 Gasoline engine	9 Centrifugal blower
2 V-belt	10 Adjusting bolt
3 V-belt	11 Generator
4 Refrigerant compressor	12 Adjusting bolt
5 Screw	13 Nut
6 Nut	13.1 Screws
7 Adjusting bolt	14 V-belts
8 Screws	15 V-belt

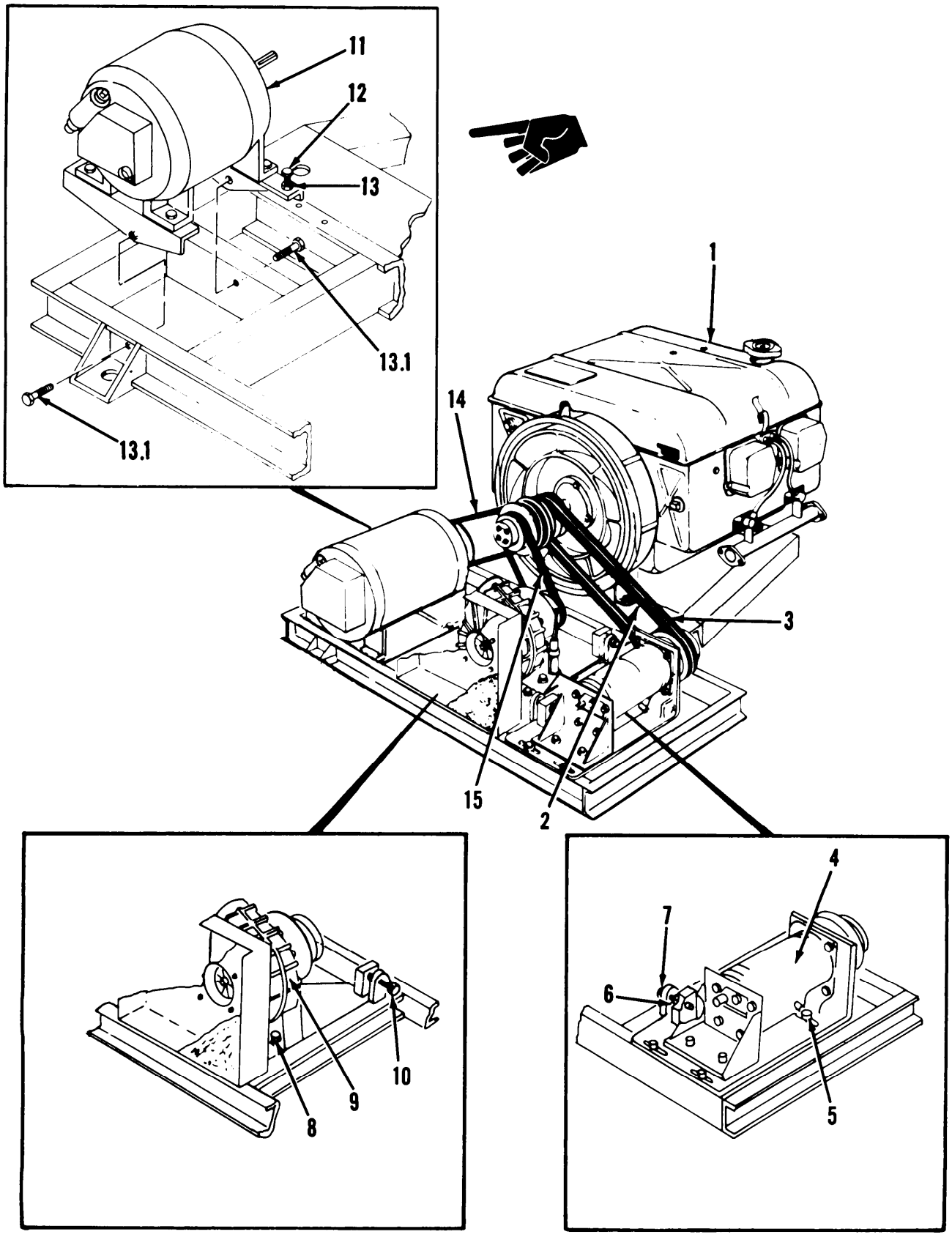


Figure 3-10. Drivebelt adjustment.

c. Centrifugal Blower V-Belt Adjustment.

(1) Loosen four screws (8).

(2) Rotate adjustment bolt (10) to loosen or tighten V-belt (15).

(3) Check belt tension (table 3-4). If necessary readjust.

(4) Tighten four screws (n). Recheck V-belt tension.

d. Refrigerant Compressor V-Belts Adjustment.

(1) Loosen three screws (5) and nut (6).

(2) Rotate adjustment bolt (7) and nut (6) to loosen or tighten V-belts (2) and (3).

(3) Check V-belt tension (table 3-4). If necessary readjust.

(4) Tighten three screws (5) and nut (6). Recheck V-belt tension.

(5) Replace safety shield (33, fig. 2-10).

3-27. Fuel Tank Strainer

The operator/crew are authorized to clean and replace the fuel tank strainer.

a. Removal.

(1) Remove fuel tank cap (5, fig. 3-11) from fill neck (1).

Legend for fig. 3-11:

1 Fill neck
2 Pad
3 Screws
4 Strainer
5 Fuel tank cap
6 Washer
7 Screw
8 Chain
9 Fuel gage
10 Switch
11 Screws
12 Shield
13 Lockwasher
14 Nut
15 Receptacle connector
16 Plug connector
17 Nuts
18 Washers
19 Screws
20 Enclosure
21 Locknuts
22 Nuts
23 Washers
24 Clamp
25 Deleted
26 Fuel tank
27 Vent tube shield
28 Screws
29 Cover
30 Gasket
31 Magnet
32 Filter element
33 Fuel pump
34 Bowl
35 Gasket
36 Thumbscrew
37 Fuel filter
38 Elbow
39 Elbow

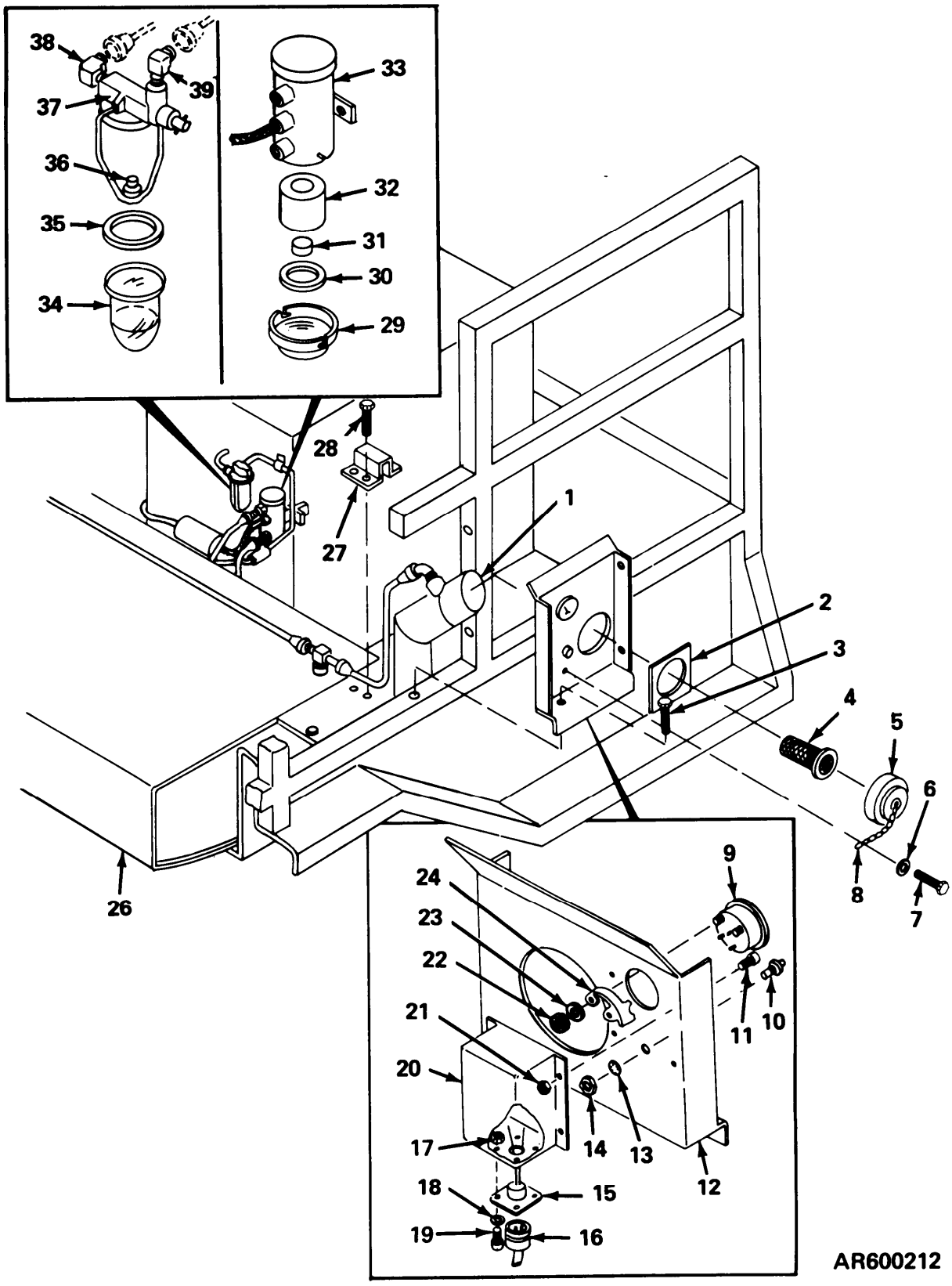


Figure 3-11. Fuel tank strainer, gage, switch, pump, and filter, exploded view.

(2) Remove strainer (4) from fill neck.

b. Cleaning. Clean strainer in decreasing solvent (item 10, table 1-3).

c. Installation. Installation is the reverse of removal *(a* above).

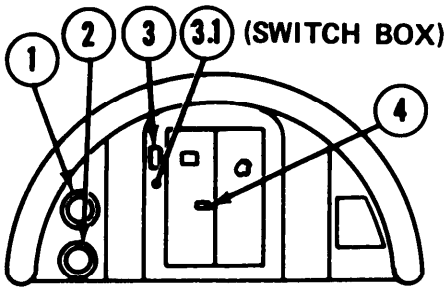
3-28. Flexible Ducts and Air Duct Hose

The operator/crew are authorized to make minor repairs to the flexible ducts and air duct hose. Minor repairs are those repairs that require less than 30 minutes down time. Repair consists of cleaning the damaged area and using the pressure sensitive tape in the repair kit (24, fig. 2-10) to temporarily seal a tear or puncture until the duct or hose can be replaced. On long or extremely irregular tears in the flexible ducts the tear should be sewn together before applying the pressure sensitive tape.

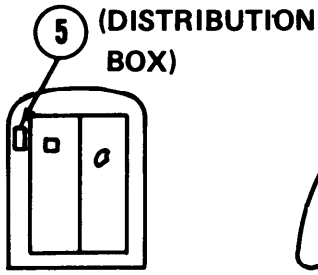
Section VIII. STENCILING

3-29. General

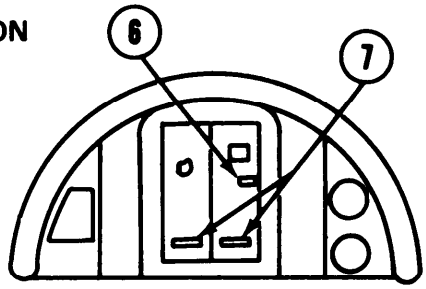
The operator/crew are authorized to restencil identification and instruction nomenclature. Figure 3-12 identifies location and size of lettering.



SHELTER & ENTRANCE EXTERIOR



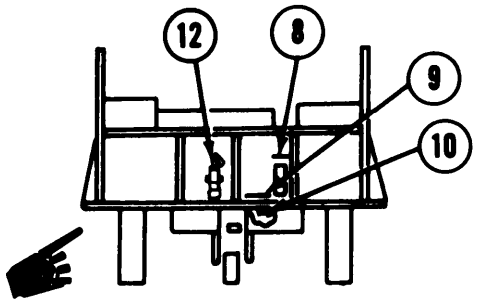
ENTRANCE INTERIOR



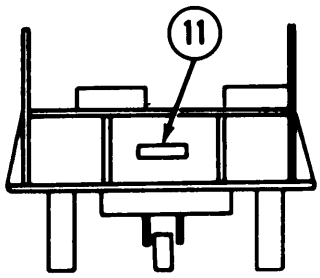
SHELTER & ENTRANCE INTERIOR

STENCIL NO.	STENCIL REQUIREMENTS	LETTER HEIGHT IN INCHES
1	SUPPLY AIR	1/4
2	RETURN AIR	1/4
3	5 PURGE 8 MIN MODE MIN	1/4
3.1	8 MIN PURGE ON DO NOT ENTER WHEN ON	1/4
4	PUSH HERE	3/4
5	PROCEED WHEN ON	1/4
6	DO NOT EXIT WHEN ON	1/4
7	DO NOT WALK ON DOOR	1-1/2

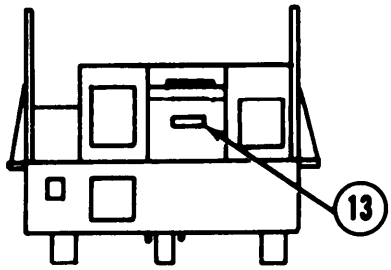
Figure 3-12.①. Stencil requirements anad location (sheet 1 of 6).



TRAILER-FRONT VIEW



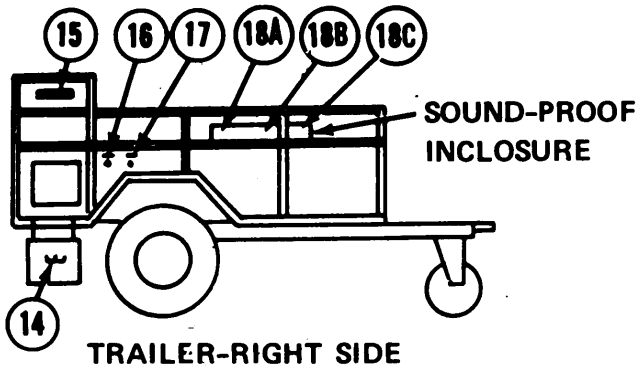
TRAILER-REAR VIEW
(TAIL GATE UP)



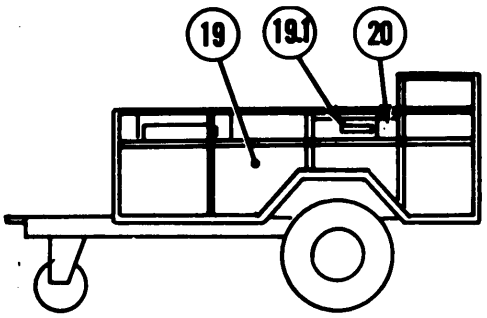
TRAILER-REAR VIEW
(TAIL GATE DOWN)

STENCIL NO.	STENCIL REQUIREMENTS	LETTER HEIGHT IN INCHES
8	FIRE EXTINGUISHER	1/4
9	SLAVE CABLE	1/2
10	24 VOLTS DC	1/4
11	DO NOT LOAD NOR UNLOAD UNTIL SUPPORT LEG IS IN POSITION	3/4
12	DECONTAMINATION UNIT	1/4
	NOT FOR USE ON FIRES	1/2
	CONTAINS FLAMMABLE LIQUID	1/4
13	RECIRCULATION FILTER	5/8

Figure 8-12②. Stencil requirements and location (sheet 2 of 5).



TRAILER-RIGHT SIDE



TRAILER-LEFT SIDE

STENCIL NO.		STENCIL REQUIREMENTS	LETTER HEIGHT IN INCHES
14		STOW CABLE HERE	3/4
15		MAIN CONTROL PANEL	1/2
16		THROTTLE	1/4
17		24 VOLTS DC	1/4
18	A	GENERATOR BELT AT 4 LBS TENSION DEFLECTS 3/16 INCH	1/4
	B	CENTRIFUGAL BLOWER BELT AT 4 LBS TENSION DEFLECTS 1/8 INCH	1/4
	C	REFRIGERANT COMPRESSOR BELTS (EA) AT 4LBS TENSION DEFLECTS 5/16 INCH	1/4
19		DANGER HOT EXHAUST	1–1/2
19.1		AIR ↑ FLOW	1/2
20		FUEL INDICATOR	3/16

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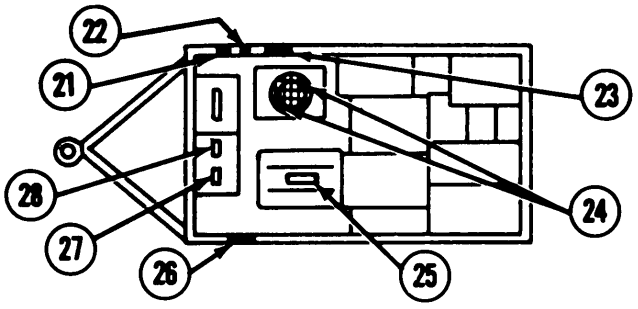
Figure 3-12③. Stencil requirements and location (sheet 3 of 5).



TRAILER-TOP VIEW

STENCIL NO.	STENCIL REQUIREMENTS	LETTER HEIGHT IN INCHES
21	SUCTION	1/4
	R-12	1/8
22	DISCHARGE	1/4
	R-12	1/8
23	DANGER AIR DISCHARGE	1/2
24	CAUTION NO STEP	5/8
25	NO STEP	1-1/2
26	DANGER HOT EXHAUST	1/2
27	ANCHORS	5/8
28	BATTERY	5/8

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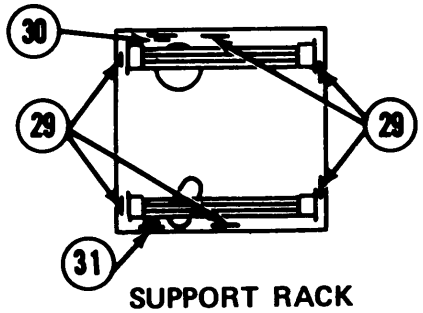
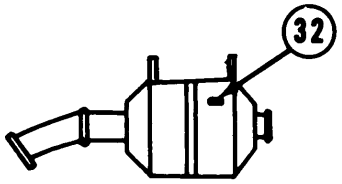
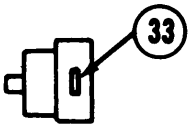
Figure 3-12 ④. Stencil requirements and location (sheet 4 of 5).



SUPPORT RACK



ENTRANCE GAS-PARTICULATE FILTER UNIT



EVACUATION FAN

STENCIL NO.	STENCIL REQUIREMENTS	LETTER HEIGHT IN INCHES
29	NO STEP	1-1/2
30	DANGER AIR DISCHARGE	1/4
31	DANGER HOT EXHAUST	1/4
32	➡ AIR FLOW	1/2
33	EVACUATION FAN	1/4

Figure 3-12⑤. Stencil requirement and location (sheet 5 of 6).

3-30. Cleaning

Before attempting to stencil nomenclature, clean area to be painted with a clean rag dampened with decreasing solvent (item no. 10, table 1-3).

3-31. Paint to be Used

All stenciling will be in full-gloss-yellow-enamel paint (item 13, table 1-3).

3–32. Trailer Cover and Shelter Carrying Case

The operator/crew are authorized to repair and replace the trailer cover and the shelter carrying case.

a. Fabric Repair

(1) *Temperatures above 32° F.*

(a) Repair cover and carrying case using paragraph 3–12, steps (d) through (n).

(b) Cure repaired area for approximately 30 minutes before using.

(2) *Temperatures below 32° F.*

Except for the following procedures, follow in. structions in (a) above.

(a) Repair cover and carrying case in heated shelter or in area above 32° F.

(b) Allow repair kit to warm-up before using. Do not attempt spreading adhesive when adhesive temperature is below 32° F.

(c) If necessary to expedite warming, place adhesive in air conditioning duct with heat ON. Do not use engine exhaust to warrn adhesive.

b. Replacement. Replacement consists of inspecting the trailer cover and carrying case for extensive damage. If the trailer cover and carrying case are beyond repair, replace the trailer cover and carrying

Section IX. FILTER CHANGE CRITERIA

3-33. Filter Change

Refer to table 3-5 for filter change criteria.

3-34. Notification of Filter Replacement

Notify organizational maintenance personnel to replace the gas filter and/or particulate filter when one or more of the conditions in Table 3-5 are met.

Table 3-5. Filter Change Criteria

	Gas	*Particulate*
1 10,000 hours of operation (no chemical agent used)	X	X
2 1,500 hours (approx 5 months) of operation (chemical agent used—wartime operation)	X	X
3 After each CK attack-change as soon as possible	X	X
4 At beginning of combat conditions and when use of CK is expected	X	X
5 Physical damage	X	X
6 Water immersion	X	X
7 Excessive pressure drop:		
Entrance gas-particulate filters pressure drop. para 2-54d		X
Shelter recirculation filters pressure drop. para 2-54e		x
Shelter filter pressure drop. para 2–54g		x

Section X. TRAILER REPLACEMENT, M68 (Maintenance Float Filter and Utilities Unit)

3-35. General

The operator/crew are authorized to remove and replace a defective M68 trailer with a serviceable M68 trailer.

3-36. Removal of the defective trailer

a. Set the following circuit breakers to OFF (fig. 2-2):

DC POWER SUPPLY

CONDENSER FAN

RECIRCULATION AND ENTRANCE FAN

AUXILIARY 120 VAC

b. Set engine control switch (13) to OFF.

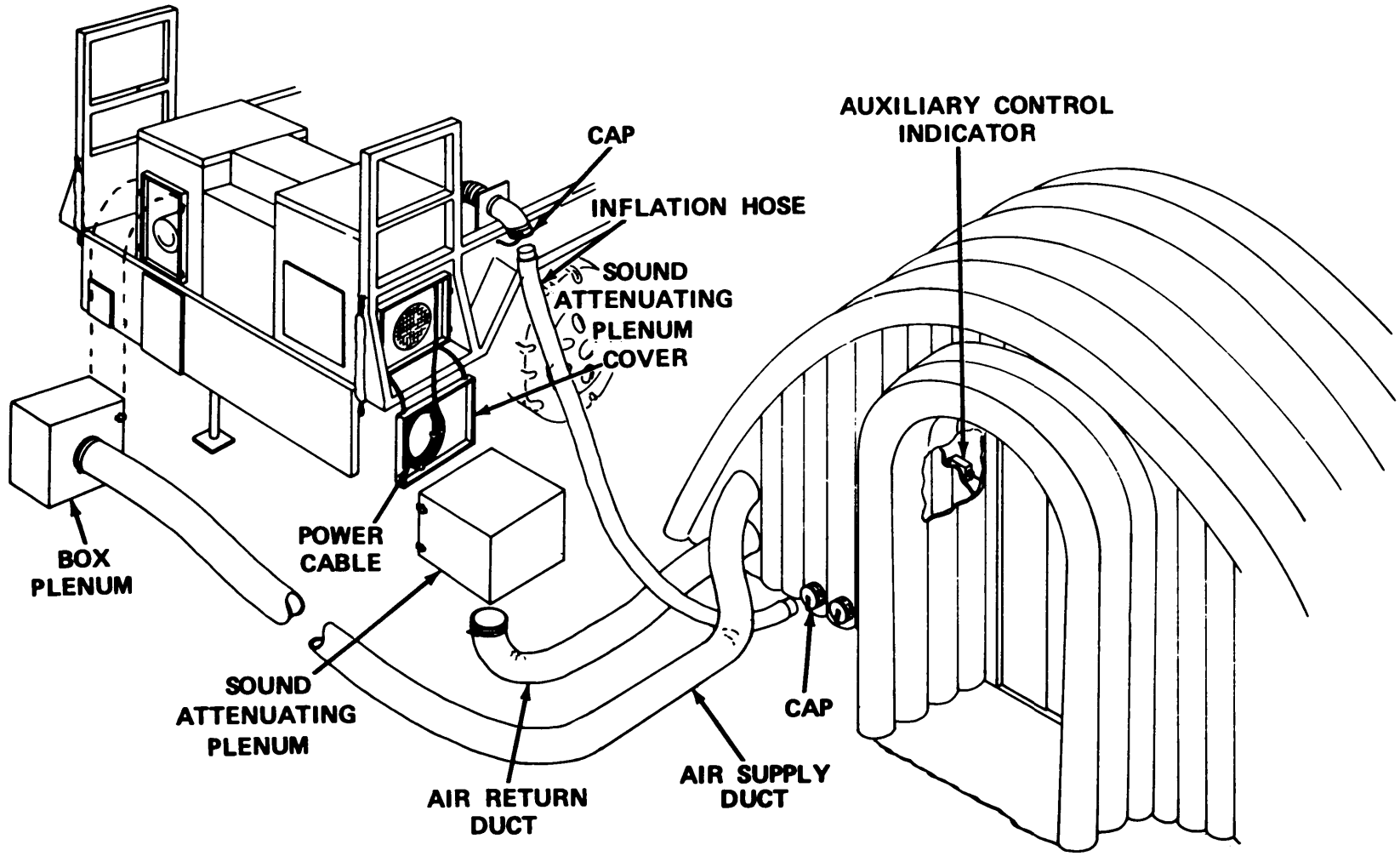


Figure 3-13. Trailer replacement, M68 (maintenance float filter and utilities unit).

NOTE

If engine fails to stop, pull out choke control to stop engine (TM 5-2805-259-14).

c. Close and latch main control panel cover.

d. Disconnect inflation hose (fig. 3-13) at the shelter and immediately cap the shelter opening.

e. Disconnect inflation hose at the trailer and cap the trailer opening (fig. 3-13).

f. Disconnect the power cable from the auxiliary control indicator (fig. 3-13) in the shelter. Cap the cable and the auxiliary control indicator.

g. Disconnect the air return duct from the sound-attenuating plenum (fig. 3-13).

h. Remove the sound-attenuating plenum (fig. 3-13) from the trailer.

i. Pull the power cable out through the air return duct and sound-attenuating plenum.

j. Stow the power cable in the sound-attenuating plenum cover (fig. 3-13) and close the cover.

k. Disconnect the box plenum (fig. 3-13) from the trailer.

l. Disconnect the ground wire (4, fig. 2-11).

m. Raise the tail gate and latch.

n. Raise support leg and lock in position.

NOTE

Clear all disconnected parts away from trailer.

o. Release both hand brakes (11, fig. 2-9).

p. Move the defective trailer away from the shelter.

3-37. Installation of Maintenance Float Trailer

a. Position the maintenance float trailer where the defective trailer had been during operation. Lock brakes (11, fig. 2-9).

b. Lower and adjust the support leg.

c. Unlatch and lower the tail gate.

d. Connect the ground wire (4, fig. 2-11).

e. Connect the box plenum to the trailer (fig-3-13).

f. Open the sound-attenuating plenum cover. Remove the power cable from the cover.

g. Feed the power cable through the sound-attenuating plenum and attach the plenum to the trailer.

h. Feed the power cable through the air return duct. Attach duct to the sound-attenuating plenum.

i. Remove caps and connect the power cable to the auxiliary control indicator in the shelter (fig. 3-13).

j. Remove caps and connect the inflation hose to the trailer air supply outlet and to the shelter.

k. Open battery box lid (19, fig. 2-10) to form a baffle.

NOTE

Baffle prevents engine exhaust fumes from entering the airstream of the centrifugal blower.

l. Start engine according to Chapter 2 para 2-46 a. through k.

m. Set the following circuit breakers to ON (fig. 2-2):

DC POWER SUPPLY
CONDENSER FAN
RECIRCULATION AND ENTRANCE FAN

NOTE

Final setup and operation of the replacement trailer, M68, should be identical to the original trailer (Chapter 2). Refer to Section II, Chapter 3, and Section III, Chapter 4, for any troubleshooting.

CHAPTER 4

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF MATERIEL

4-1. General

a. This section contains instructions and procedures pertaining to services performed at organizational level on receipt of an M51 Shelter System.

b. The shelter system is shipped as a complete unit, protected by a polyethylene cover under a plywood cover. The required particulate and gas filters are shipped with the equipment but are packaged separately.

4-2. Unpacking

a. Prepare erection site (para 2-42).

WARNING

Do not unload the trailer before lowering the rear support leg. Failure to comply may result in overturning trailer and subsequent injury to personnel and damage to equipment.

b. Lower and adjust rear support leg of trailer (TM 9-2330-213-14).

CAUTION

Be careful during unpacking to prevent damage to equipment.

c. Remove shipping straps and protective wood cap and discard (fig. 4-1).

d. Remove polyethylene cover and discard.

e. Remove shipping box and trailer cover from top of equipment.

f. Release two pins (3, fig. 2-8) and open brackets (4).

g. Tighten two straps (8), until shelter in carrying case (2) is lifted clear of brackets.

h. Pull out two handles (7).

i. Unhook two tailgate chains (5).

j. With four men, lower tailgate extension (1) with shelter in carrying case (2).

k. Unfasten two straps (8) and roll shelter in carrying case forward.

l. Release two pins (13) and open brackets (12).

WARNING

Shelter in carrying case weighs approximately 314 pounds. When lifting, be careful to avoid injury to personnel and damage to the shelter and carrying case.

CAUTION

Do not throw or drop any removable equipment from trailer.

m. Pull out four carrying handles (11). With four men, lift shelter in carrying case (2), and position as shown (fig. 2-7)

m.1 Close brackets (4, fig. 2-8) and secure with pins (3).

n. Remove two retaining pins (10) and fasten chains to tailgate.

o. Remove tailgate extension (1) from tailgate and set aside for future use.

o.1 Disconnect chains from tailgate and lower the tailgate.

p. Unfasten four securing straps (3, fig. 2-9).

q. Release four catches (1) and four catches (7); move arch supports (10) away from entrance (2).

WARNING

Entrance weighs approximately 250 pounds. When lifting, be careful to avoid injury to personnel and damage to the entrance.

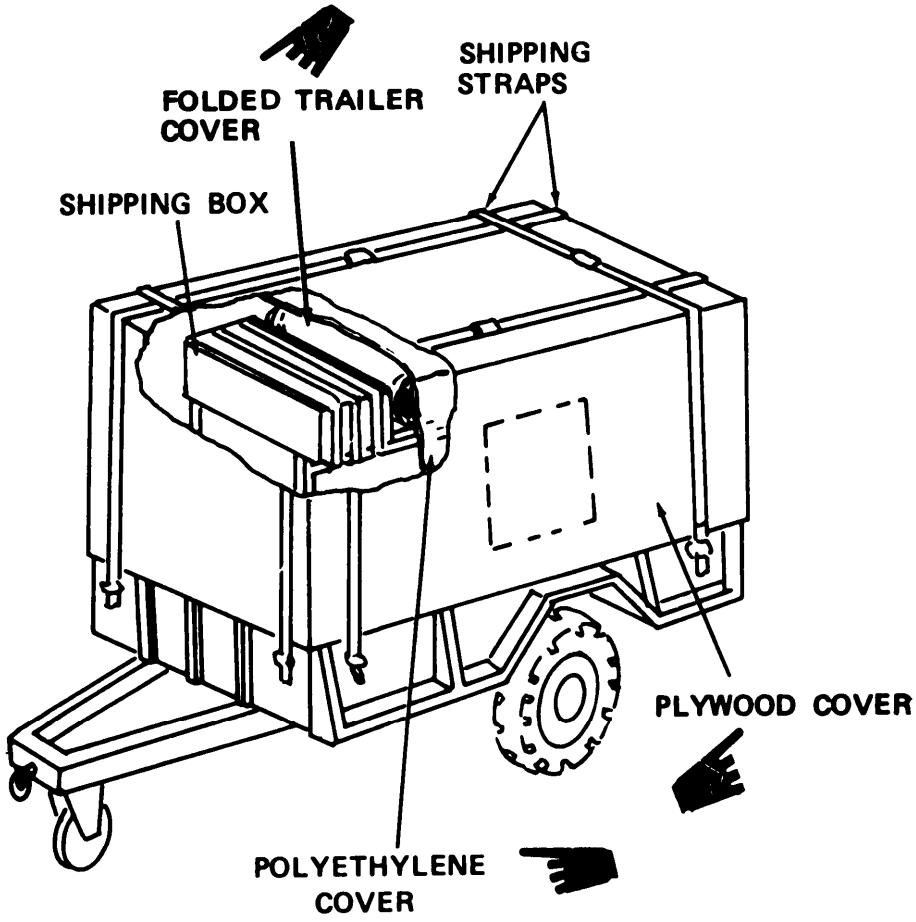


Figure 4-1. Shelter system, packaged for transit.

r. With four persons, carefully slide entrance (2, fig. 2-9) forward, and off of support (9), position entrance (fig. 2-7).

s. Reposition arch supports (10, fig. 2-9) and fasten four catches (7). Place loose straps (3) on top of support rack (9).

WARNING

When handling the support rack, keep handles extended out to prevent injury to fingers.

t. Release eight catches (8). Swing catches flush against rails.

t.1 With four persons, and using handles (6), slide support rack (9) forward and off of trailer (4).

CAUTION

Do not lift the entrance gas-particulate filter unit by the flexible duct.

u. Unfasten strap (4, fig. 2-10), catch (6), and coupling (10). With three men, unload entrance gas-particulate filter unit (3).

v. Unfasten two straps (21). Unload air-supply duct (15) and air-recirculation duct (14).

w. Unfasten straps (12 and 16). Unload sound-attenuating plenum (13) and box plenum (11).

w.1 Remove barracks bag containing 12 ground anchors (17) from inside air return duct (27).

z. Unfasten two straps (26) and unload air-return duct (27).

y. Unload air duct hose (9) and duct cap (5) from trailer.

z. Unfasten strap (22) and remove tool box (23). Inventory toolbox contents (table 1-l).

NOTE

If the tool box contains a Detector Kit M256 and the discard date has passed, return the expired detector kit to: Commander, Chemical Systems Laboratory, ATTN: DRDAR–CLC–E, Aberdeen Proving Ground, MD21010

aa. Unfasten strap (25) and remove repair kit (24). Inventory repair kit contents (table 1-2). Place repair kit back on trailer and secure with strap.

ab. Unfasten strap (7) and unload evacuation fan (8).

4-3. Removing Preservation Material

WARNING

When using the adhesive and clean solvent, keep open flame away from working area. Have working area well ventilated. DEATH or severe burns may result if personnel fail to observe safety precautions.

Remove all preservation tape from battery cable terminals, heater intake, heater exhaust, engine air intake, engine exhaust, sensing ports for pressure switches, taps for pressure readings and any other visible masking tape. Clean preservative material from equipment and components with decreasing solvent (item 10, table 1-3).

4-4. Inspection

a. Open shipping box (top of equipment) and inventory contents (table 4-1).

b. Open shipping box 2 of 2 and inventory Gas and Particulate Filters (table 4-1).

c. Visually inspect exposed fabric and rubber material for tears, rips, and punctures.

d. Visually inspect all metal components for rust, distortion, cracks, and broken welds.

e. Visually inspect trailer mounted equipment for hose and missing securing hardware, and damaged and missing components.

4-5. Servicing Equipment

a. Remove battery (fig. 1-7) from battery compartment.

b. Read instruction card attached to battery.

c. Add battery acid (item 5, table 1-3) according to TM 9–6140–200–12.

d. Install battery in battery compartment.

e. Connect battery cables to battery (+ to + and — to — connections).

Table 4-1. Miscellaneous Tools and Item Not Installed

	Nomenclature	*Figure No.*	*Qty*
#	Ground anchors	2-10	12
#	Barracks bag	2-10	1
*	Evacuation manifold	2-10	1
*	Tent pins	2-10	19
*	Portable toilet	2-10	1
*	Duct cap	2-10	1
*	Adapter cap	2-10	1
*	Transition	2-10	1
*	Fire extinguisher	2-10	1
*	Decontaminating apparatus M11	2-10	1
*	Holding rod handle	2-10	1
*	Holding rod hanlle	2-10	1
*	Driving rod	2-10	1
*	Logbook (including maintenance forms)		1
*	TM 3-4240-264-12		1
*	TM 5-2805-259-14		1
*	LO 5-2805-259-12		1
*	TM 9-2330-213-12		1
**	Gas filter (entrance, 4240-00–152-1550)	4–4	1
**	Particulate filter (entrance, 4240-00–152-1544)	4-4	1
**	Gas filter (air circulation, 4240-00-152-1545)	4-3	1
**	Particulate filter (air circulation, 4240-00–152-1543)	4 4	1
**	M23 Gas filter (4240-00-802-5170)	4-2	1
**	M24 Particulate filter (4240-00-802-5169)	4-2	1

\# Shipped in air return duct
* Packed in shipping box (top of equipment)
** Packed in shipping box 2 of 2

f. Drain preservative oil from engine crankcase, and fill with proper grade oil (para 3-8).

g. Check level of fluid in centrifugal blower. Refer to figure 3–1 for dipstick location. If fluid is below full mark on dipstick, add hydraulic lubrication oil (item 6, table 1-3). Use the funnel and plastic tubing, located in the tool box, to fill the centrifugal blower reservoir.

h. Check tension of drive belts (para 3-26).

i. Install M23 gas filter and M24 particulate filter in the gas-particulate filter assembly (fig. 1–7) as follows:

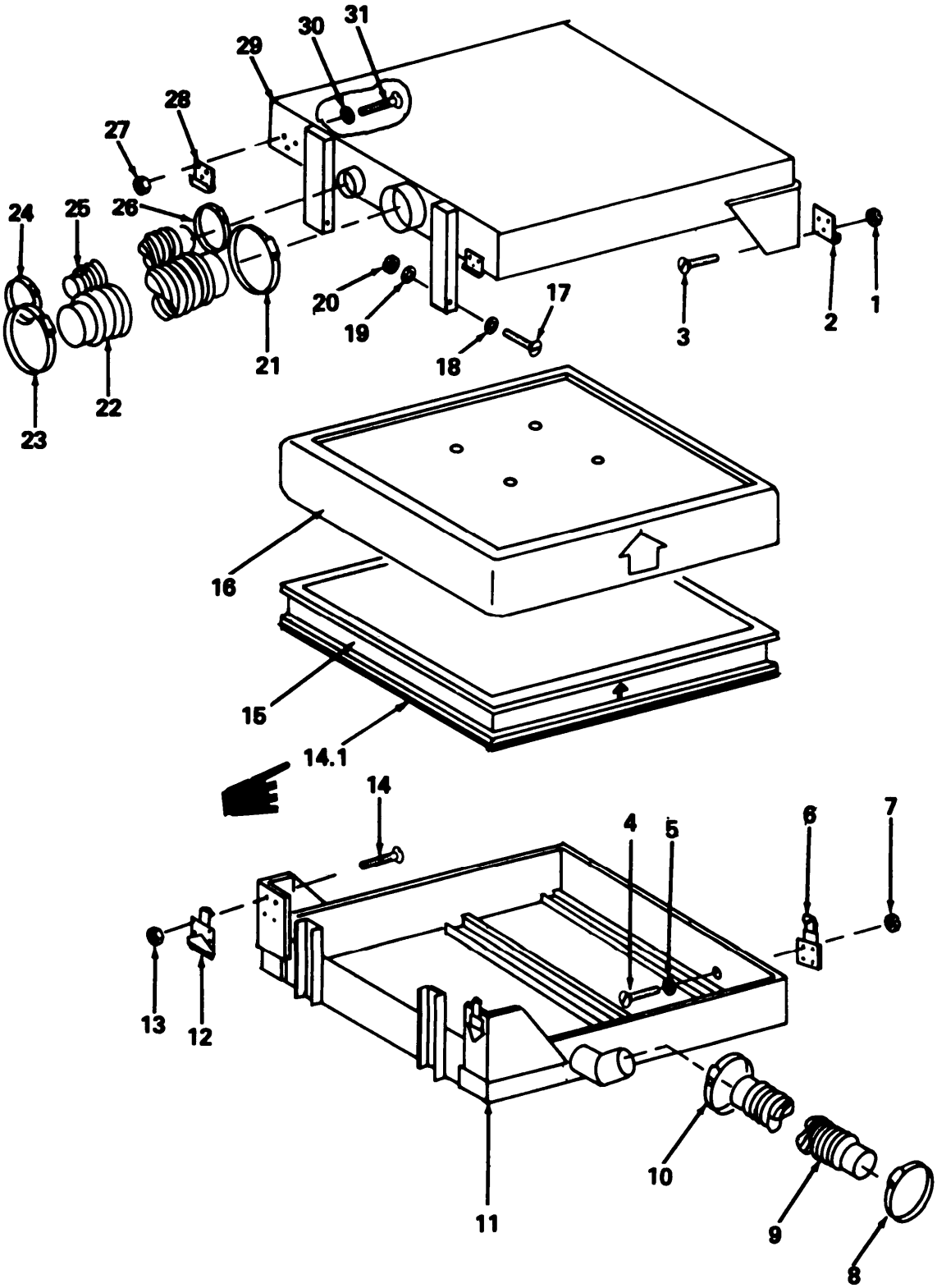


Figure 4-2. Gas-Particule filter assembly, exploded view.

Legend for fig. 4-2:

1 Nuts	16 Gas filter
2 Strikes	17 Screws
3 Screws	18 Washers
4 Screws	19 Washers
5 Washers	20 Nuts
6 Latches	21 Clamp
7 Nuts	22 Hose
8 Clamp	23 Clamp
9 Hose	24 Clamp
10 Clamp	25 Hose
11 Lower inclosure	26 Clamp
12 Latches	27 Nuts
13 Nuts	28 Strikes
14 Screws	29 Upper inclosure
14.1 Gasket	30 Washer
15 Particulate filter	31 Screws

(1) Unfasten two latches (6, fig. 4-2), and two latches (12).

(2) Swing upper inclosure (29) upward.

(3) Remove dummy spacer from gas-particulate filter assembly.

(4) Unpack the M23 gas filter and the M24 particulate filter. Inspect filters for damage. Replace if necessary.

(5) Install particulate filter (15) on bottom with gasket (14.1) on bottom.

NOTE

Be sure arrow on M23 gas filter points upward in direction of airflow.

(6) Install M23 gas filter (16) on top of particulate filter with arrow pointing up and bolt heads on bottom side.

(7) Lower upper inclosure (29) and secure with two latches (6) and two latches (12).

f. Install gas and particulate filters in recirculation filter cabinent as follows:

(1) Remove 12 screws (13, fig. 4-3) and remove access cover (12).

(2) (Using a ¼-inch socket-head-screw-key, rotate adjusting screw (7) counterclockwise until retaining tube (6) is well back.

(3) Deleted.

(4) Unpack the gas and particulate filters. Inspect filters for damage. Replace if necessary.

NOTE

Be sure arrow on each filter points to the left, in direction of airflow.

(5) Slide gas filter (10) into cabinet on channel (9). Press gas filter firmly against cabinet side.

CAUTION

When installing particulate filter, be careful not to tear or mutilate fins. Be sure sufficient space exists between gas filter and retaining tube for installation of particulate filter.

(6) Slide particulate filter (16) into cabinet on channel (8).

(7) Rotate adjusting screw (7) clockwise until retaining tube (6) presses filters firmly into position.

(8) Install access cover (12) and secure with screws (13).

g. Install gas and particulate filters in entrance gas-particulate filter unit as follows:

(1) Unfasten four latches (21, fig. 4-4), and separate inlet plenum (15) and outlet plenum (22).

(2) Remove dummy spacer.

(3) Unpack the gas and particulate filters. Inspect filters for damage. Replace if necessary.

NOTE

Be sure arrow on each filter points toward the outlet plenum (22) in direction of airflow.

(4) Install particulate filter (18) in inlet plenum (15).

(5) Install gas filter (19) in outlet plenum (22).

(6) Position plenums together and secure with four latches (21).

h. Install fire extinguisher in clamp (fig. 2-27).

h.1 Stow the logbook and manuals in the canvas pouches located on the side of the trailer.

h.2 Stow the decontaminating apparatus M11 (24, fig. 4-47) in mounting bracket (27).

i. Service trailer (TM 9-2330-213-14).

j. Service engine (TM 5-2805-259-14).

k. Fill fuel tank with approximately 50 gallons of gasoline (item 1 or 2, table 1-3).

l. Requisition dry battery, item 22 Table 1-3, and install in hand lantern.

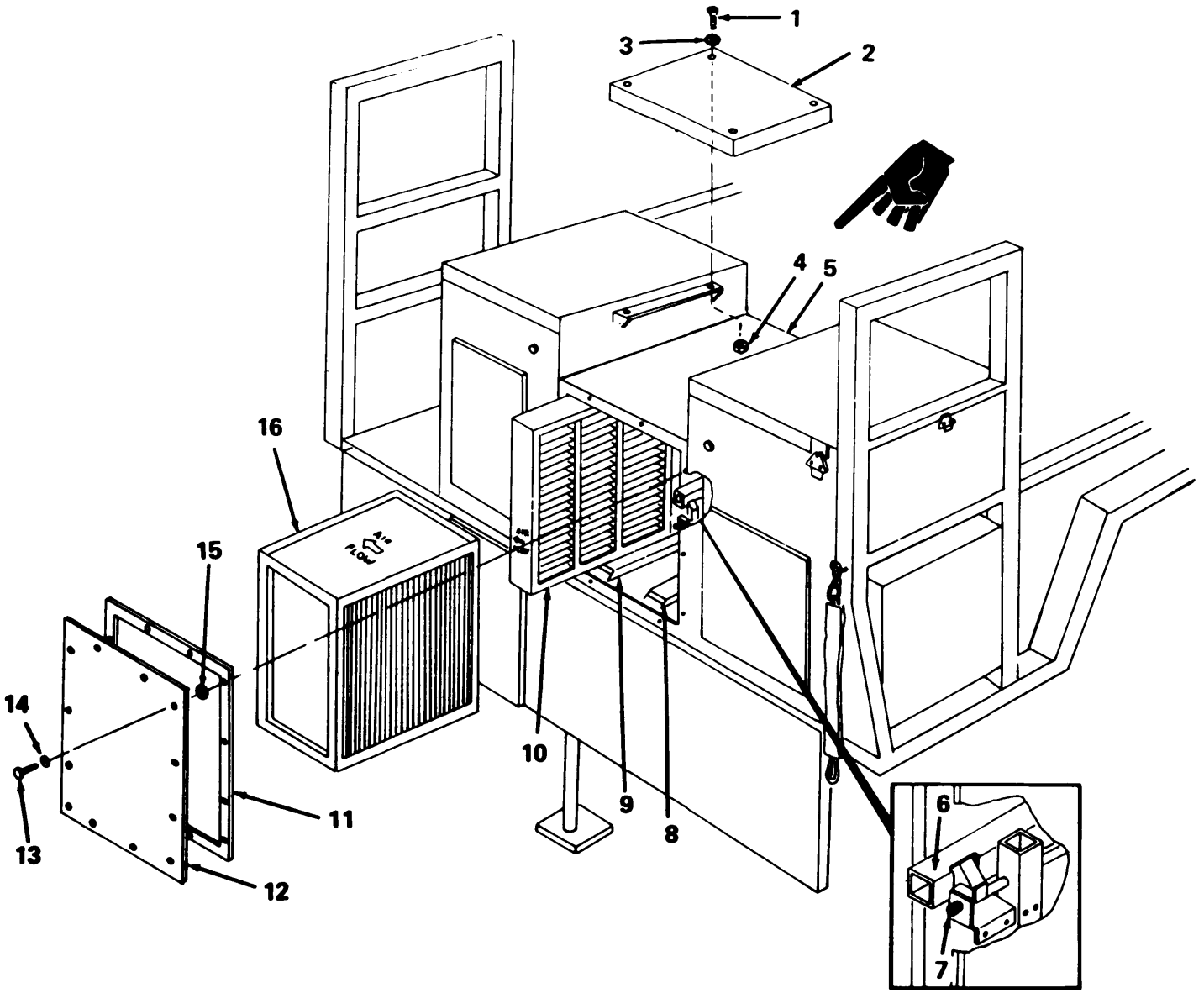


Figure 4-3. Gas and particulate filters installation, and shelter side support, exploded view.

Legend for fig. 4-8:

1 Screws
2 Shelter side support
3 Washers
4 Locknuts
5 Recirculation filter cabinet
6 Retaining tube
7 Adjusting screw
8 Channel
9 Channel
10 Gas filter
11 Gasket
12 Access cover
13 Screws
14 Washers
15 Nonmetallic washers
16 Particulate filter

4-6. Twenty-Five Hour Operation Checkout

Organizational maintenance personnel are required to perform a 25-hour operation checkout before equipment is issued to the field. Deficiencies beyond the scope of organizational maintenance personnel will be corrected by direct or general support maintenance personnel as authorized.

a. Place support rack (9, fig. 2–9) away from working area.

b. Place the following items on the support rack.

(1) Evacuation manifold and fan (fig. 1-8).

(2) Duct adapter, duct cap, and toilet (fig. l-10).

(3) Transition (fig. 1-11) and tailgate extension (l, fig. 2-8).

(4) Place protective cover (fig. 1-9) over stowed items on support rack for protection against the weather. Secure cover by tucking under support rack.

c. Unload air duct hose (9, fig. 2-10) from trailer. Place aside until needed.

d. Unfasten four straps (fig. 2-7) and unfold carrying case.

e. Unroll and unfold shelter (fig. 2-13). Remove carrying case from under shelter and store on support rack.

f. Erect entrance and shelter para 2-45 through 2-54 and para 2-55, steps *a* through *g).*

g. Perform the "During" preventive maintenance checks and services (table 3-l).

h. Check for air leaks between enclosures of gas-particulate filter assembly (fig. 1-7). Insure filters are properly seated.

i. Check for air leaks between enclosures of entrance gas-particulate filter unit (fig. 1-3). Insure filters are properly seated.

j. Check trailer mounted flexible duct connections for air leaks.

k. After 5 hours of operation, and every 5 hours thereafter stop operation and perform the procedures below:

(1) Remove engine crankcase oil-gage-rod (fig. 3-2). Check oil level; maintain level at full mark. Add oil as required LO 5–2805-259–12. If oil consumption is excessive, check for leaks.

(2) Remove centrifugal blower dipstick and check oil level; maintain oil level at full mark. If necessary, add hydraulic lubrication oil (item 6, table 1-3). If fluid consumption is excessive, check for leaks.

(3) Check tension of all drivebelts (para 3-26).

l. Periodically during operation, depress fuel indicator switch (3, fig. 2-5) to obtain a reading on the fuel quantity gage (2).

m. At completion of 25 hour check-out, change engine oil, and oil filter element (TM 5-2805-259-14). Refer to figure 3-1 for drain plug location.

n. Perform striking and storage procedures (para 2-56).

NOTE

Omit steps 2-56 *c, s,* and *t.*

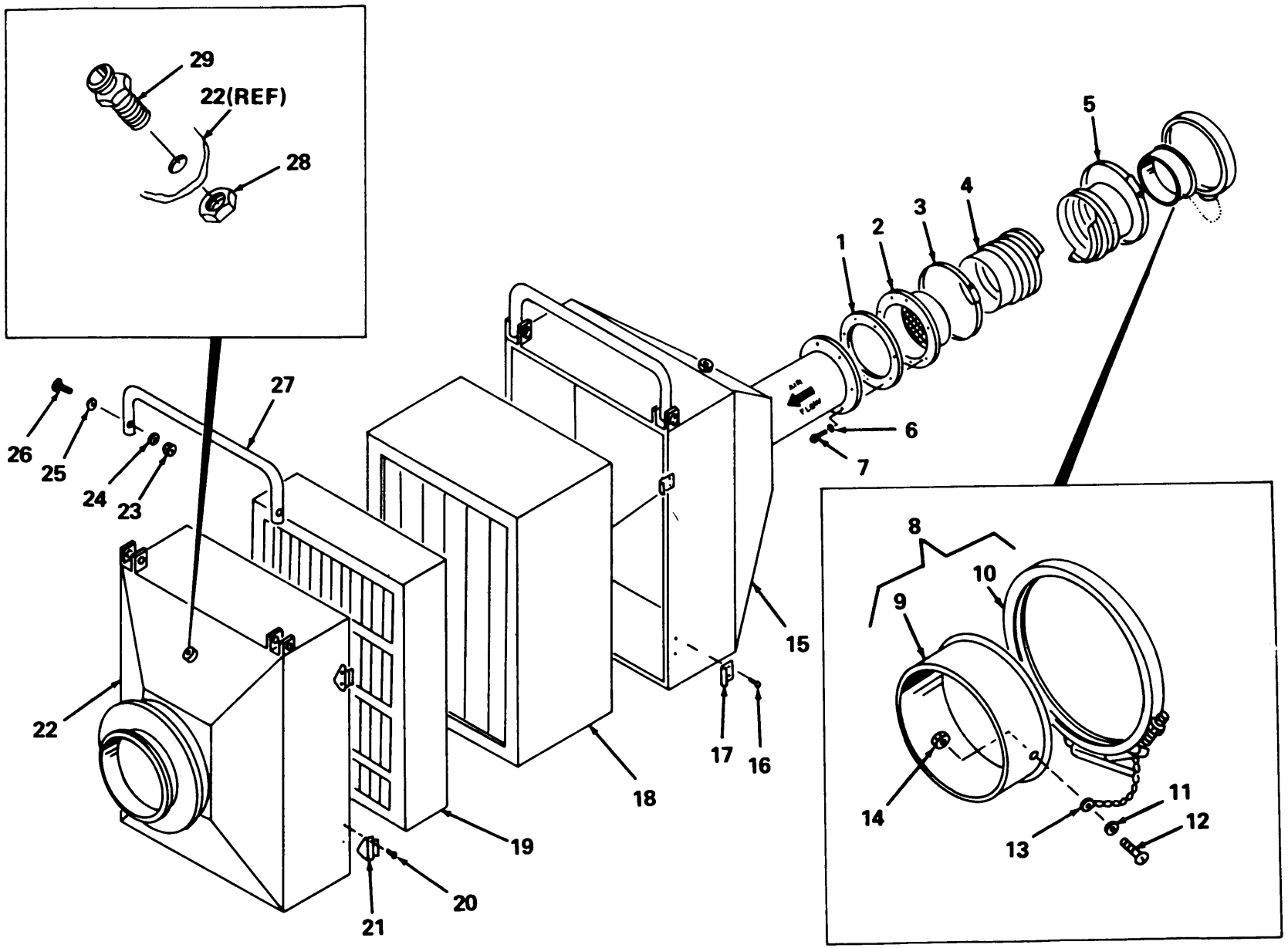


Figure 4–4. Entrance gas-particulate filter unit, exploded view.

Legend for fig. 4-4:

1 Gasket
2 Adapter
3 Clamp
4 Hose
5 Clamp
6 Washers
7 Screws
8 Adapter
9 Tube
10 Coupling
11 Washer
12 Screw
13 Chain
14 Locknut
15 Inlet plenum
16 Rivet
17 Strikes
18 Particulate filter
19 Gas filter
20 Rivet
21 Latches
22 Outlet plenum
23 Locknuts
24 Washers
25 Washers
26 Screws
27 Handles
28 Nut
29 Quick-disconnect coupling

Section II. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES

4-7. Purpose

The preventive maintenance checks and services (table 4-2) provide organizational maintenance personnel with a list of maintenance services which

must be performed at the interval prescribed. Use the list to make sure that all required maintenance is accomplished. If corrective action is not authorized at organizational level, report equipment failures to direct support maintenance personnel.

4-8. Explanation of Columns

The number in the "Sequence Number" column indicates that the service opposite the number must be performed in the numerical sequence shown. The time required to perform all the checks and services for each is shown in the work time column. These times are stated in man-hours (M/H) and carried to one decimal place (tenths of hours).

Table 4-2. Organizational Preventive Maintenance Checks and Services

Total Man-hours required :1.8

Sequence Number			ITEM TO BE INSPECTED PROCEDURE	Work time (M/H)
1000 hrs	2000 hrs	6 mo		
			Section I. GENERATOR *Man-hours required: 0.6*	
1			BEARINGS During operation of equipment, listen for unusual noise that may indicate damaged or worn bearings.	0.1
			BRUSHES AND BRUSH HOLDERS Remove brushes (para 4-109) and visually inspect for wear and damage. Visually inspect holders for cracks, wear, and other damage that may render holders unserviceable. If necessary, replace holders.	0.5
			Section II. INFLATABLE ENTRANCE *Man-hours required: 0.5*	
		1	DOORS Visually inspect for loose and missing panel screws and washers. Tighten loose screws, and replace missing screws, and washers. Visually inspect for missing and worn door gaskets and hinge gaskets. Replace if necessary (para 4-29 and 4-30, respectively). Visually inspect periphery gaskets for wear, distortion, tears and mutilation. If gaskets are unserviceable, replace doors (para 4-28).	0.5
			Section III. MISCELLANEOUS EQUIPMENT *Man-hours required:* 0.2	
		2	ARTIC BLANKET (Electric) If present, visually inspect arctic blanket (fig. 1-8) for damage, signs of overheating, burned areas, frayed wire insulation, and damaged electrical components. Replace an unserviceable blanket.	0.1
		3	AIR FLOW GAGE Visually inspect air-flow gage hoses (fig. 2-33) for cracks, deterioration, mutilated end fittings. Replace unserviceable hoses.	
			Section IV. ELECTRICAL SYSTEM (Trailer Mounted) *Man-hours required: 0.2*	
		4	ELECTRICAL CABLES Visually inspect electrical cables for loose connections, frayed insulation, and exposed conductors (fig. 1-13).	0.1
			Section V. GASOLINE ENGINE *Man-hours required: 0.3*	
2			SPARK PLUGS, AIR BREATHER, GOVERNOR AND MAGNETO Perform checks and services as prescribed in TM 5-2805-259-14.	0.2

Section III. TROUBLESHOOTING

4-9. Scope

a. This section contains troubleshooting or malfunction information and tests for locating and correcting most of the troubles which may develop in the shelter system. Each malfunction or trouble symptom for an individual component, unit, or system is followed by a list of tests or inspections necessary for you to determine probable causes and suggested corrective actions for you to remedy the malfunction.

b. This manual cannot list all possible malfunctions that may occur or all tests or inspections, and corrective actions. If a malfunction is not listed (except when malfunction and cause are obvious), or is not corrected by listed corrective actions, you should notify higher level maintenance. Refer to TM 5-2805-259-14 for troubleshooting the gasoline engine, and to TM 9-2330-213-14 for troubleshooting the trailer.

4-10. Explanation of Table 4-3

Table 4-3 lists the common malfunctions you may find during the operation or maintenance of the shelter system or its components. You should perform the tests/inspections and corrective actions in the order listed.

Table 4-3. Organizational Troubleshooting

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
1. ENGINE FAILS TO START
Step 1. Check for loose or corroded battery terminals.
Clean and tighten battery terminals.
Step 2. Make continuity check of ENGINE CONTROL switch (13, fig. 2-2), and ENGINE START switch (14).
Be sure the switches are in the "ON" position when testing.
If defective, replace switch (para 4-76)
ELECTRICAL SYSTEM
2. GENERATOR FREQUENCY METER FAILS TO REGISTER
Check for broken generator timing belt.
If broken, replace timing belt (para 4-74).
3. 62Hz CANNOT BE OBTAINED ON GENERATOR FREQUENCY METER
Step 1. Check for improperly adjusted engine governor (para 2-52 *n).*
Properly adjust engine governor.
Step 2. Visually inspect for worn generator brushes (pars 4-109).
Replace worn generator brushes.
Step 3. Perform shutdown procedures (para 4-73 *a).*
Remove screws (2, 5, fig. 4-39), washer (2.6) and cover (2.4).
Remove screws (2.8, washers (2.9), and cover (2.4).
Unplug rectifier (2.3).
Use fine steel wool or crocus cloth to clean contacts of rectifier to assure good electrical contact.
Reinstall cleaned rectifier.
WARNING
Keep hands and limbs away from voltage regulator when restarting system. Death or severe burns can occur from high voltage.
Restart engine and check generator frequency meter for 62 HZ.
a. If 62 Hz cannot be obtained: notify higher maintenance.
b. 62 Hz is obtained: stop system, replace all covers and attaching hardware. Restart system for operation.
4. EVAPORATOR FAN FAILS TO OPERATE
Step 1. Make continuity check of circuit breaker CB2, fig. FO-2. If defective notify higher maintenance.
Step 2. Check for loose plug connectors P6 and P12, fig. FO-2.
If loose, tighten plug connectors.
Step 3. Visually inspect for operation of evaporator fan.
If fan is not operating, replace evaporator fan (para 4-103).
5. NO ELECTRICAL POWER REGISTERING ON AMMETER
Check for loose cable connection at plug connector (P2) fig. FO-2.
If loose, tighten plug connector.
6. INTERIOR LIGHTS FAIL TO OPERATE
Step 1. Visually inspect for loose plug connectors on the auxiliary control indicator and distribution box.
Tighten all loose plug connectors.
Step 2. Check for defective LIGHTS switch (para 4-50).
If defective, replace switch.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

OPERATING AND WARNING LIGHTS

7. SWITCH BOX INCANDESCENT LAMPS FAIL TO ILLUMINATE
Step 1. Check for improper switch box adjustment.
Properly adjust switch box (para 4-32 *a).*
Step 2. Make continuity test of toggle switch (7, fig. 4-14). If switch is defective replace switch (para 4-36 *a).*
Step 3. Remove armature relay (para 4-58). and make continuity test using electrical diagram on relay cover as a guide.
If relay is defective, replace relay.

8. DISTRIBUTION BOX INCANDESCENT LAMPS FAIL TO ILLUMINATE.
Step 1. Remove armature relay (para 4-58), and make continuity test using electrical diagram on relay cover as a guide.
If relay is defective, replace relay.
Step 2. Examine distribution box for defective wiring (burnt insulation, broken wire).
If wires are defective, replace distribution box (para 4-37)

ENVIRONMENTAL SYSTEM

9. CONDENSER FAN FAILS TO OPERATE
Step 1. Make continuity test of circuit breaker (2. fig. 2-2).
If defective, notify higher maintenance.
Step 2. Check for loose plug connectors P2 and P15, fig. FO-2.
If loose, tighten plug connectors.
Step 3. Inspect and test environmental control switch (para 4-52 *a).*
If defective, replace switch.
Step 4. Remove relay (K3, fig. FO-2) and make continuity test using electrical diagram on relay cover as a guide.
Step 5. Remove relay (K10, fig. FO-2) and make continuity test using electrical diagram on relay cover as a guide.
Step 6. Make continuity test on plug connector (7, fig. 4-43) using fig. FO-2.
If condenser fan fails continuity test, replace fan (para 4-118).

10. REFRIGERANT COMPRESSOR FAILS TO OPERATE
Step 1. Visually inspect for broken V-belts.
If V-belts are broken, replace V-belts (para 4-75).
Step 2. Check to see if condenser fan is operating.
If condenser fan is not operating refer to MALFUNCTION 9.

11. NO COOL AIR OR INSUFFICIENT COOLING
Step 1. Check for operating of refrigerant compressor.
If not operating, refer to MALFUNCTION 10.
Step 2. Check for defective environmental control switch (para 4-52 *a).*
If defective, replace switch.
Step 3. Visually inspect for clogged condenser coil fins.
Remove leaves or other debris clogging fins.
Step 4. Visually inspect for broken compressor belts.
If V-belts are broken, replace V-belts (para 4-75).
Step 5. Visually inspect for operation of evaporator fan.
If fan is not operating, refer to MALFUNCTION 4.
Step 6. Remove access cover (1, fig. 4-36), and set thermostat (23) to a temperature higher than the ambient temperature

12. NO HEAT OR INSUFFICIENT HEAT
Step 1. Check for defective environmental control switch (para 4-52 *a).*
If defective, replace switch.
Step 2. Check for loose connections or damaged electrical power cable (3, fig. 4-34).
If loose, tighten connections.
If damaged, replace cable (para 4-98).
Step 3. Check for defective HI-LOW HEAT switch (para 4-53).
If defective, replace switch.
Step 4. Remove access cover (2, fig. 4-35), and set thermostat (23) to a temperature lower than the ambient temperature.
Step 5. Visually inspect for operation of evaporator fan.
If fan is not operating refer to MALFUNCTION 4.
Step 6. Remove filter elements (para 4-88).
Replace filter element.

MAKE-UP AIR AND INFLATION SYSTEM

13. LOW INFLATION PRESSURE
Step 1. Visually inspect for broken centrifugal blower V-belt.
If broken, replace belt (para 4-73).
Step 2. Check contrifugal blower by listening for a high whinning noise, and for exceptional loss of hydraulic lubrication oil.
Replace centrifugal blower (para 4-115).

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
SPACE HEATER
14. HEATER WILL NOT START, BLOWER DOES NOT RUN
Step 1. Test and inspect flame detector switch (fig. 4-51), (para 4-151), Replace switch (para 4-151), if defective.
15. BLOWER RUNS WHEN SWITCH IS IN HI OR LOW POSITION BUT HEATER WILL NOT IGNITE
Step 1. Inspect igniter (fig. 4-51), (para 4-152). Replace igniter (para 4-152), if defective.
16. BLOWER RUNS WHEN SWITCH IS IN HI OR LOW-POSITION AND HEATER IGNITES BUT GOES OUT AFTER SHORT INTERVAL.
Step 1. Inspect for defective flame detector switch (fig. 4-51) (para 4-151). Replace switch (para 4-151), if defective.

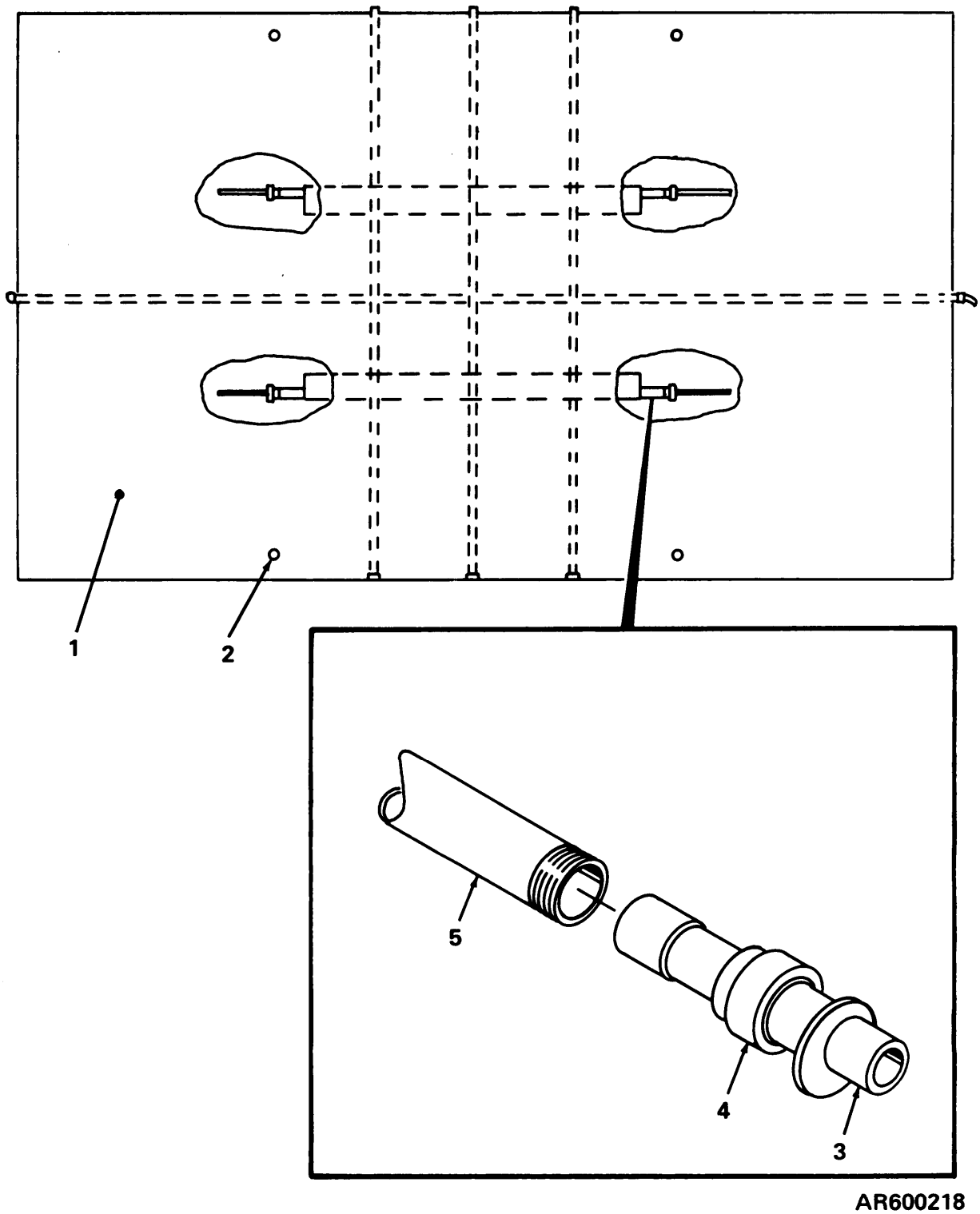
Section IV. CARRYING CASE

4-11. Carrying Case

Organizational maintenance personnel are authorized to replace the carrying case.

a. Removal.

(1) Unscrew collar (4, fig. 4-5) from tube (5) and remove handle (3). Repeat on second bar assembly.



1 Carrying case
2 Grommets
3 Handles
4 Collars
5 Tubes

Figure 4-5. Shelter carrying case, exploded view.

(2) From opposite side, pull tube (5) from carrying case (1).

b. Installation. Installation is the reverse of removal *(a* above).

4-12. Bar Assemblies

Organizational maintenance personnel are authorized to replace the bar assemblies.

a. Removal.

(1) Unscrew collar (4, fig. 4-5) from tube (5) and remove handle (3).

(2) From opposite side, tube (5) from. carrier (1).

b. Installation. Installation is the reverse of removal *(a* above).

4-13. Grommets

Organizational maintenance personnel are authorized to replace the carrying case grommets *(2,* fig. 4-5). Replacement consists of inspecting for missing or damaged grommets, and installing a new grommet. If replacement is necessary, make a 1/2-inch diameter hole two inches to the right of the previous mounting position and install new grommet.

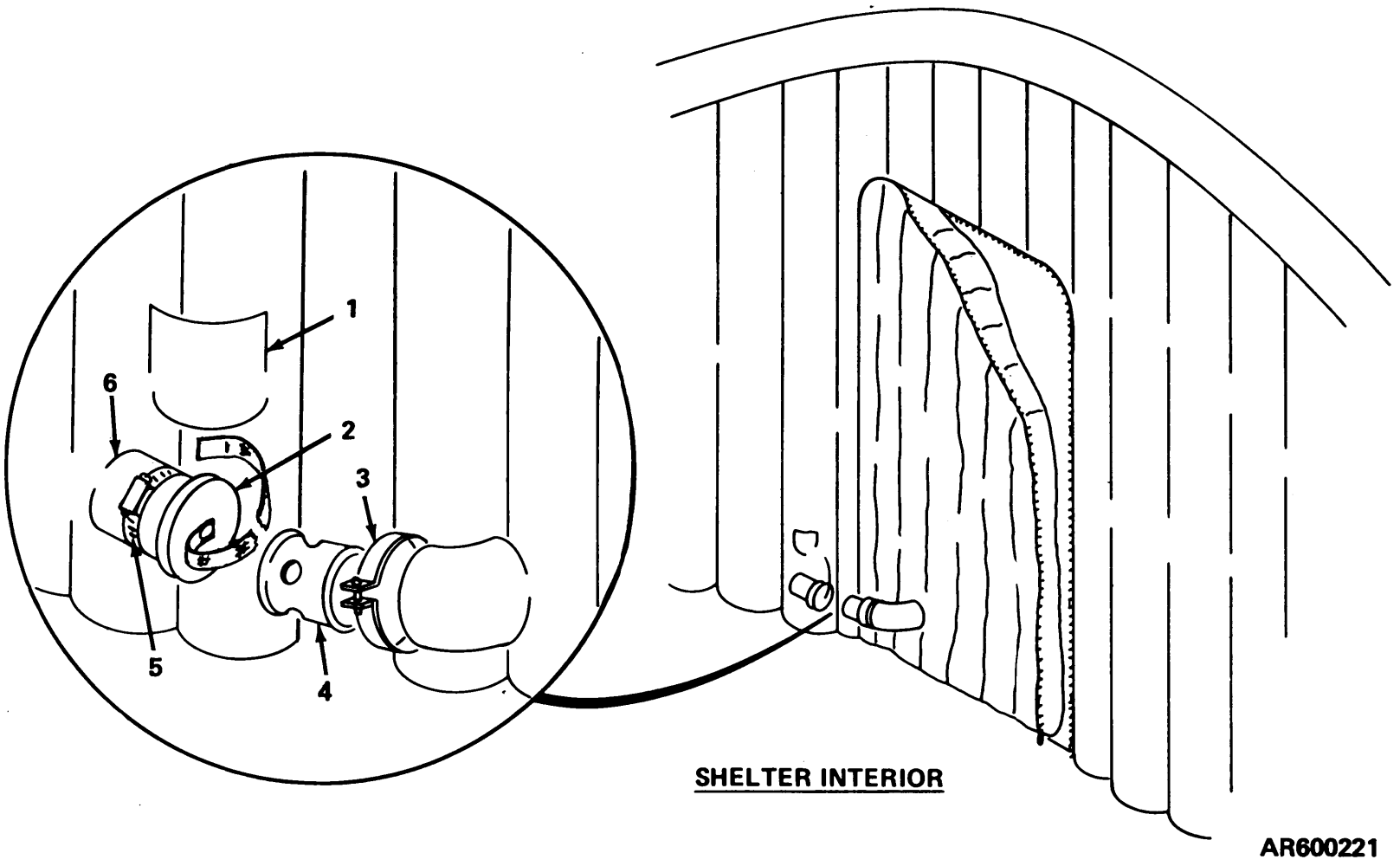
Section V. INFLATABLE SHELTER

4-14. Connector

Organizational maintenance personnel are authorized to replace the connector and attaching hardware.

4-15. Connector Removal

a. Loosen clamp (5, fig. 4-6) and disconnect connector (4) from fitting (6).



1 Pocket
2 Cover
3 Clamp
4 Connector
5 Clamp
6 Fitting

Figure 4-6. Connector, exploded view.

b. Remove cover (2) from pocket (1). Place cover in fitting (6) and tighten clamp (5).

c. Loosen clamp (3) and remove connector (4).

4-16. Connector installation

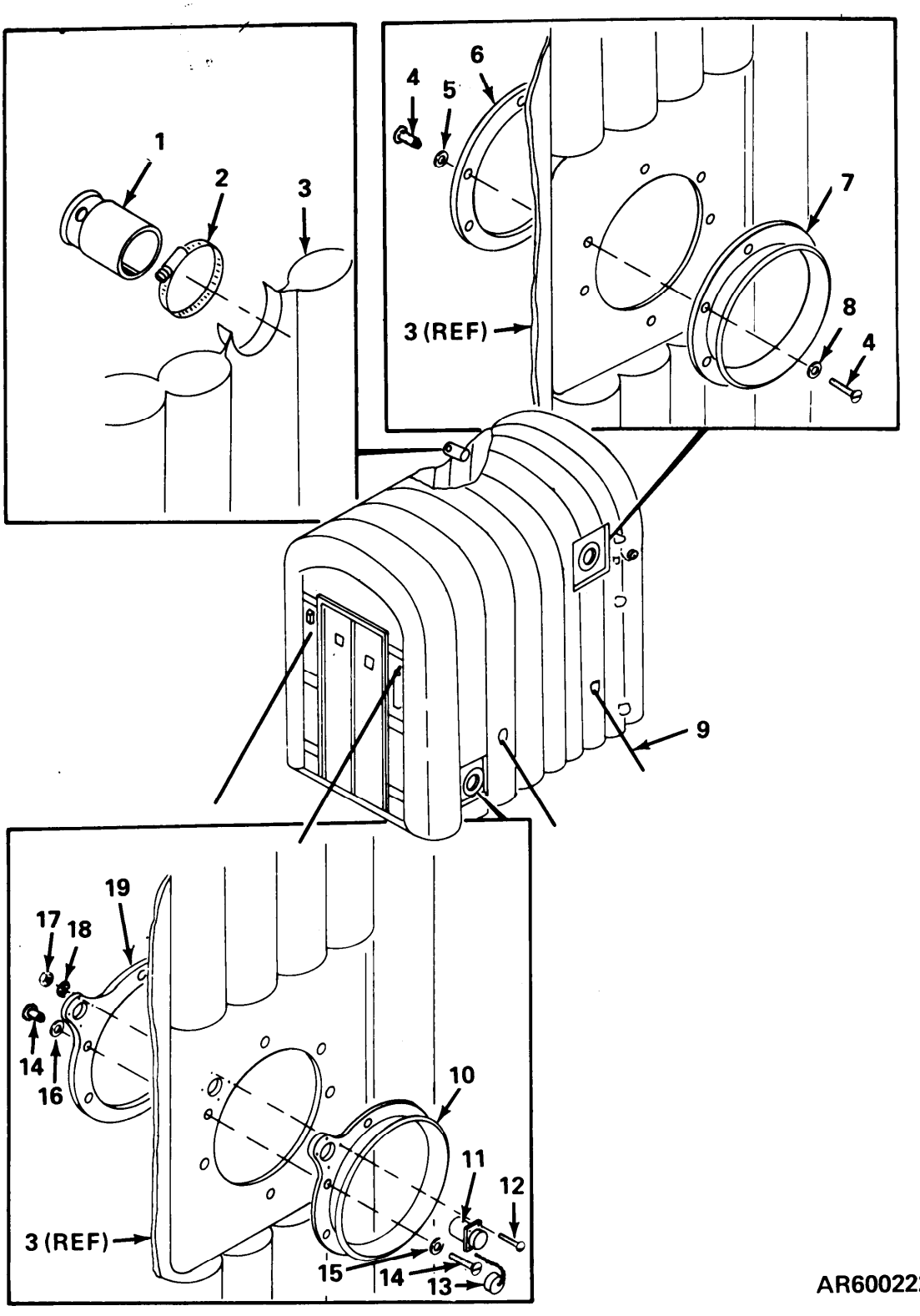
Installation is the reverse of removal (para 4-15 above).

Section VI. INFLATABLE ENTRANCE

4-17. Electrical Receptacle Cover

Organizational maintenance personnel are authorized to replace the electrical receptacle cover and attaching hardware.

a. *Removal*. Remove locknut (17, fig. 4-7), washer (18), screw (12), and receptacle cover (13).



1 Exhaust fitting	6 Ring	11 Bulkhead receptacle	16 Lockwashers
2 Clamp	7 Mounting plate	12 Screws	17 Locknuts
3 Entrance wall	8 Lockwashers	13 Receptacle cover	18 Washers
4 Binder posts	9 Tiedown ropes	14 Binder posts	19 Ring
5 Lockwashers	10 Mounting plate	15 Lockwashers	

Figure 4-7. Inflatable entrance, exploded view.

b. Installation. Installation is the reverse of removal (a above).

4-18. Bulkhead Receptacle

Organizational maintenance personnel are authorized to replace the bulkhead receptacle and attaching hardware.

a. Removal.

(1) Remove four locknuts (17, fig. 4-7), washers (18), screws (12), and receptacle cover (13).

(2) Remove bulkhead receptacle (11).

b. Installation. Installation if the reverse of removal *(a* above).

4-19. Return Air Duct Mounting Plate

Organizational maintenance personnel are authorized to replace the return air duct mounting plate and attaching hardware.

a. Removal.

(1) Remove bulkhead receptacle (para 4-18).

(2) Remove six binder posts (14) and lock-washers (15) and (16).

(3) Remove air duct mounting plate (10) and ring (19).

b. Installation. Installation is the reverse of removal *(a* above), except replace an unserviceable binder post with a screw, two washers, and locknut.

4-20. Supply Air Duct Mounting

Organizational maintenance personnel are authorized to replace the supply airduct mounting plate and attaching hardware.

a. Removal.

(1) Remove six binder posts (4, fig. 4-7), and lockwashers (5) and (8).

(2) Remove mounting plate (7) and ring (6).

b. Installation. Installation is the reverse of removal (a above), except replace an unserviceable binder post with a screw, two washers, and locknut.

4-21. Exhaust Fitting

Organizational maintenance personnel are authorized to replace the male exhaust fitting attaching hardware.

a. Removal. Loosen clamp (2, fig. 4-7) and remove exhaust fitting (1).

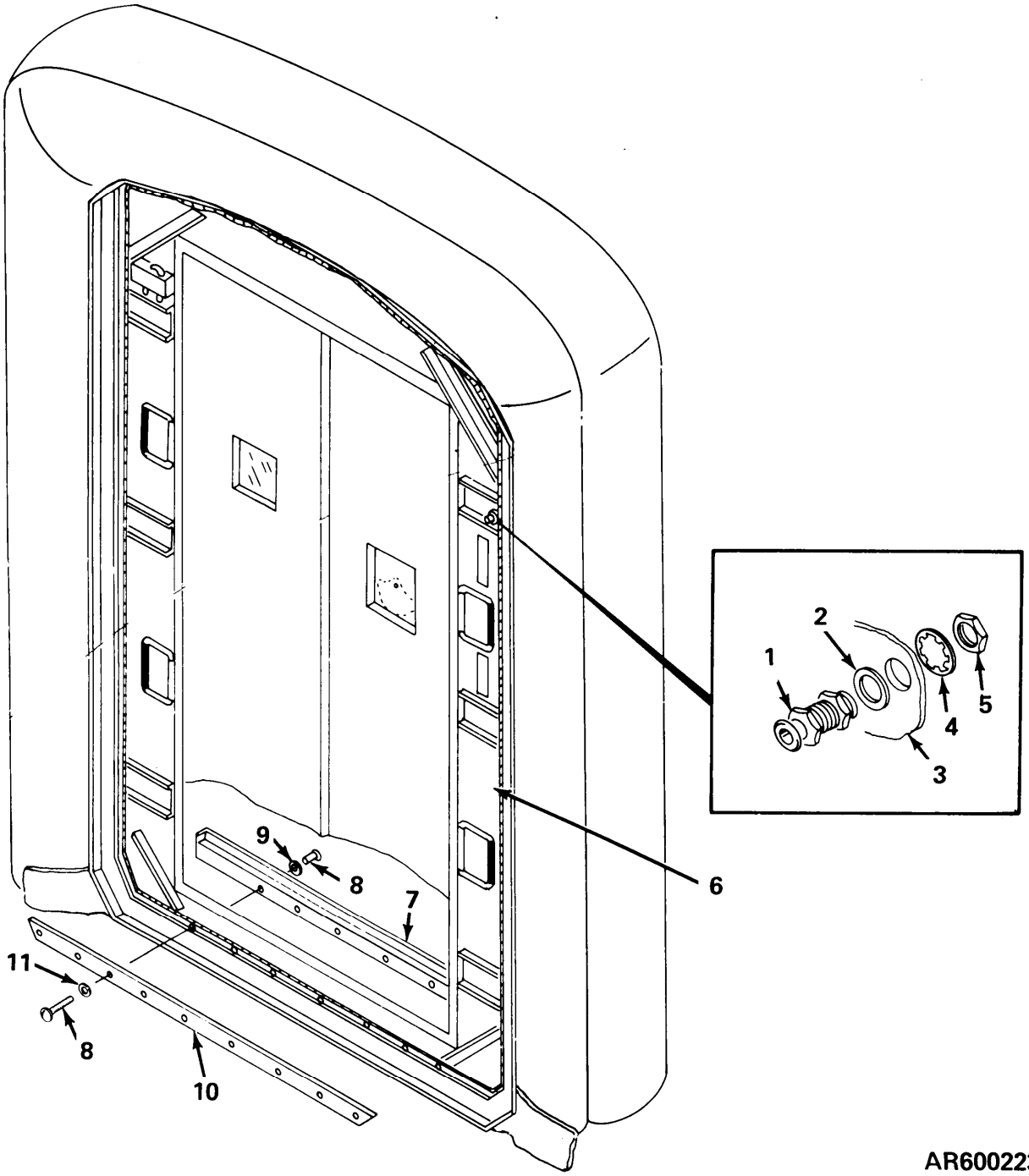
b. Installation. Installation is the reverse of removal *(a* above).

4-22. Eave Trough and Zipper Retainer

Organizational maintenance personnel are authorized to replace the cave trough, zipper retainer, and attaching hardware.

a. Removal.

(1) Remove 13 bind posts (8, fig. 4-8), lock-washers (9) and washers (11).



1 Quick-disconnect coupling
2 Washer
3 Frame wall
4 Lockwasher
5 Nut
6 Exterior doors
7 Eave trough
8 Binder posts
9 Lockwashers
10 Zipper retainer
11 Washers

Figure 4-8. Eave trough and zipper retainer, exploded view.

(2) Remove cave trough (7) and zipper retainer (10).

b. Installation. Installation is the reverse of removal *(a* above) except for the following procedures:

(1) Be sure mounting holes of items (7), and

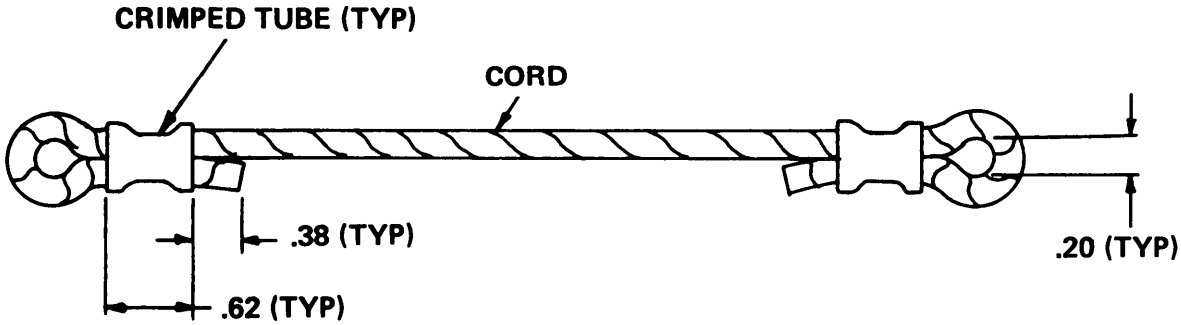
(10) are alined with zipper material mounting holes before installing securing hardware.

(2) Replace an unserviceable binder post with a screw, two washers, and locknut.

4-23. Retaining Cords

Organizational maintenance personnel are authorized to manufacture and replace the retaining cords. Instructions for replacing one retaining cord are typical for both.

a. Manufacture. Fabricate retaining cords (fig. 4-9).



NOTES:

1. **Material:**
   - A. **Cord - Nylon, MIL SPEC, MIL-C-7515, type I.**
   - B. **Tube - Copper, 0.500 outside dia, 0.032 wall thickness, FED SPEC WW-T-775.**
2. **Cut length of cord is 14-1/4 inches long.**
3. **Dimensions in inches.**

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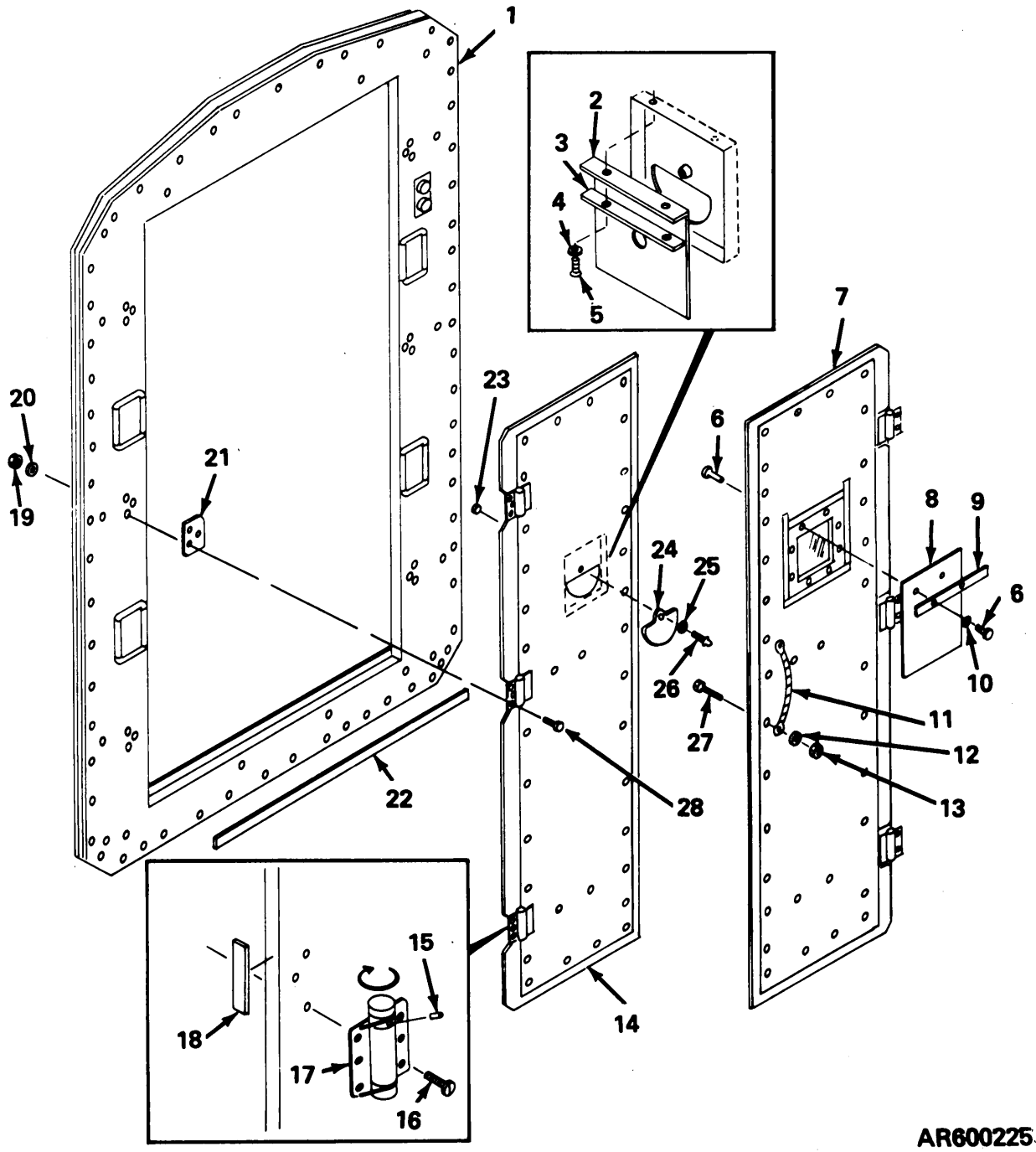
Figure 4-9. Retaining cord fabrication.

b. Removal.

(1) Remove two locknuts (13, fig. 4-10), washers (12), and screws (27).



1 Frame
2 Damper flaps
3 Support strips
4 Lockwashers
5 Screws
6 Binder posts
7 Left door
8 Curtains
9 Support strips
10 Washers
11 Retaining cords
12 Washers
13 Locknuts
14 Right door
15 Pin
16 Screws
17 Hinges
18 Gaskets
19 Locknuts
20 Washers
21 Spacer plates
22 Gaskets
23 Locknuts
24 Butterfly valves
25 Lockwashers
26 Thumbscrew
27 Screws
28 Screws

Figure 4-10. Doors, exploded view.

(2) Remove retaining cord (11).

c. Installation. Installation is the reverse of removal *(b* above).

4-24. Butterfly Valves

Organizational maintenance personnel are

authorized to replace the butterfly valves and attaching hardware. Instructions for replacing one butterfly valve are typical for both.

a. Removal. Remove locknut (23, fig. 4-10), thumbscrew (26), lockwasher (25), and butterfly valve (24).

b. Installation. Installation is the reverse of removal (a above), except adjust butterfly valve to maintain proper internal pressure (para 2-54 *c*).

4-25. Damper Flaps

Organizational maintenance personnel are authorized to manufacture and replace the damper flaps and attaching hardware. Instructions for manufacturing one damper flap are typical for both.

a. Manufacture. Fabricate damper flap (fig. 4-11).

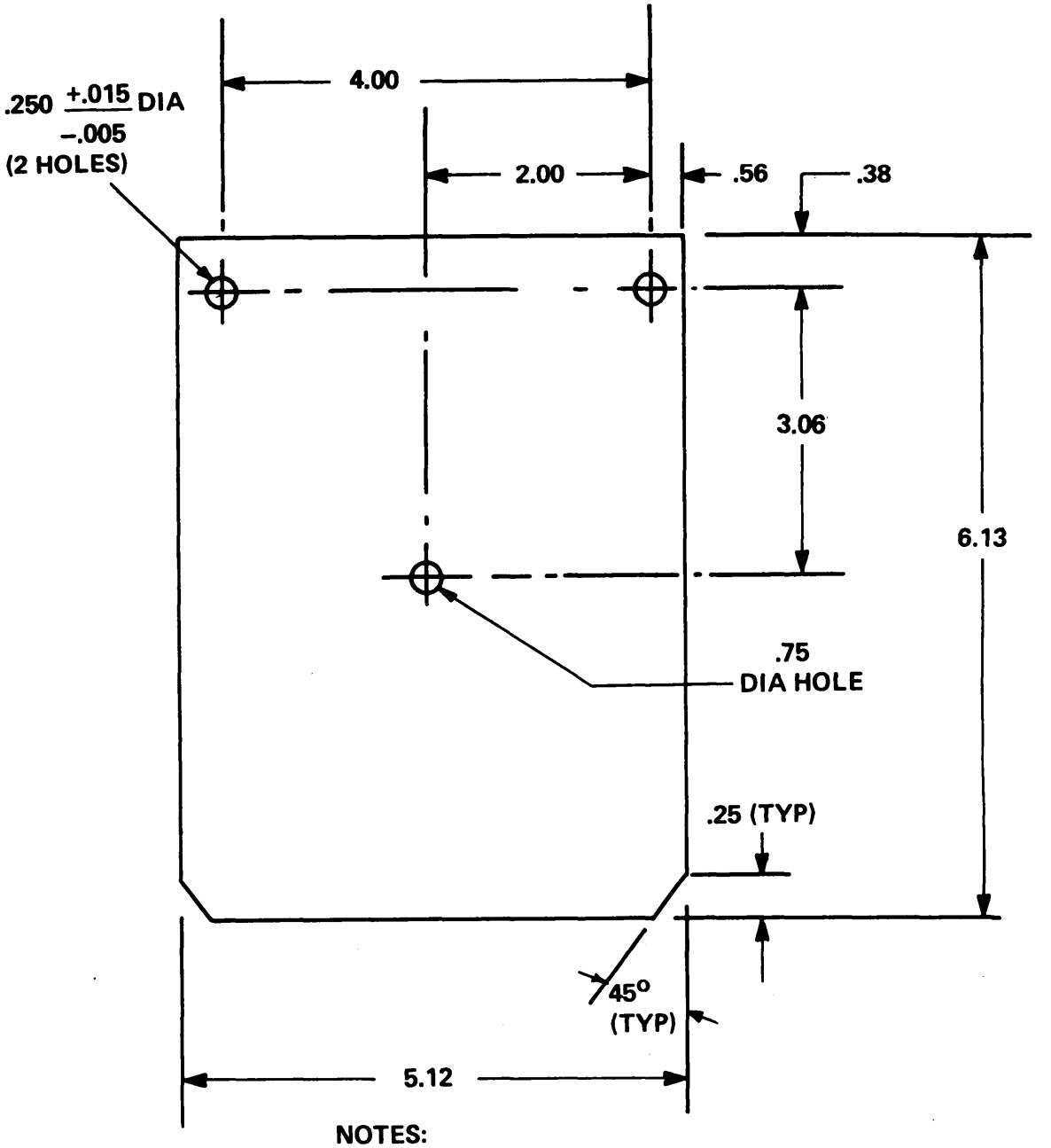


Figure 4-11. Damper flap fabrication.

b. Removal. Remove two screws (5, fig. 4-10), lockwashers (4), support strip (3), and damper flap (2).

c. Installation. Installation is the reverse of removal *(b* above).

4-26. Window Curtain

Organizational maintenance personnel are authorized to replace the window curtains and

attaching hardware. Instructions for replacing one window curtain are typical for both.

a. Removal. Remove two binder posts (6, fig. 4-10), washers (10), support strip (9), and window curtain (8).

b. Installation. Installation is the reverse of removal *(a* above).

4-27. Quick-Disconnect Coupling

Organizational maintenance personnel are authorized to replace the quick-disconnect coupling and attaching hardware. Instructions for replacing one quick-disconnect coupling are typical for both.

a. Removal.

(1) Remove nut (5, fig. 4-8) and lockwasher (4).

(2) Remove quick-disconnect coupling (1) and washer (2).

b. Installation. Installation is the reverse of removal *(a* above).

4-28. Entrance Doors

Organizational maintenance personnel are authorized to replace the entrance doors and attaching hardware. Instructions for replacing one door are typical for all four doors.

a. Removal.

(1) Remove nine locknuts (19, fig. 4-10), washers (20), and screws (28) securing door to frame (1).

(2) Remove door (14) and three spacer plates (21).

b. Installation. Installation is the reverse of removal *(a* above), except for the following procedures:

(1) Check hinge tension to insure door stays in full closed position (para *c* below).

(2) If right door (14) is replaced, adjust butterfly valve to maintain proper internal pressure (para 2-54 *c*).

(3) If left exterior door (7) is replaced, check for proper alignment of switch box. If necessary, adjust switch box (para 4-32 *a).*

(4) If one or both interior doors are replaced, stencil the appropriate safety directions (stencil No. 7, fig. 3-12).

c. *Hinge Tension Adjustment.*

(1) Insert pointed tool into hole next to pin (15, fig. 4-10) and rotate collar to increase tension.

(2) Remove pin (15) and insert in next hole.

(3) Repeat steps (1) and (2) until door is firmly seated against frame (1).

4-29. Door Gaskets

Organizational maintenance personnel are authorized to manufacture and replace the door gaskets. Instructions for manufacturing and replacing one door gasket are typical for all four gaskets.

NOTE

The door gaskets are located at the top and bottom of the door jam.

a. Manufacture. Fabricate door gasket (fig. 4-12).

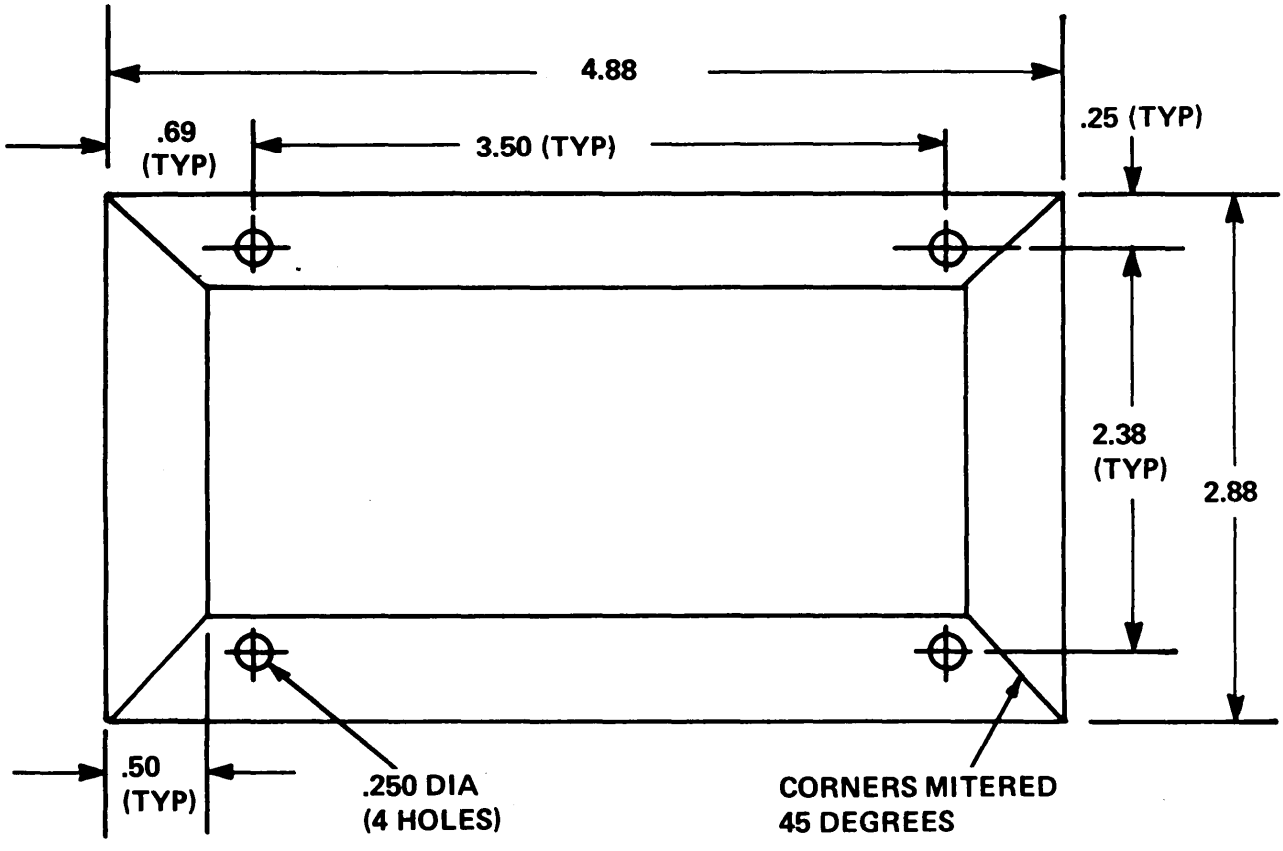
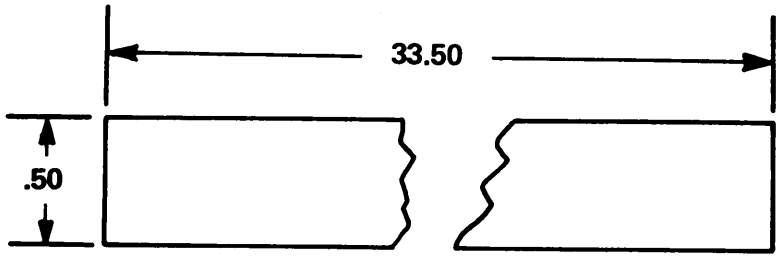


Figure 4-12①. Gasket fabrication (sheet 1 of 2).



DOOR GASKET

NOTES:

1. **Material: Silicone sponge rubber, 0.188 inch thickness.**
2. **Dimensions in inches.**

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Figure 4-12.(2) . Gasket fabrication (sheet 2 of 2).

b. Removal.

(1) Remove gasket (22, fig. 4-10) from frame (l).

(2) Clean adhesive and gasket residue from door jam with decreasing solvent (item 10, table 1-3).

c. Installation. Installation is the reverse of removal *(b* above), except use adhesive (item 11, table 1-3) to secure gasket to frame.

4-30. Hinge Gaskets

Organizational maintenance personnel are authorized to manufacture and replace the hinge gaskets. Instructions for manufacturing and replacing one hinge gasket are typical for all 12 gaskets.

a. Manufacture. Fabricate hinge gasket (fig. 4-12).

b. Removal.

(1) Remove gasket (18, fig. 4-10) from door (14).

(2) Clean adhesive and gasket residue from door edge with decreasing solvent (item 10, table 1-3).

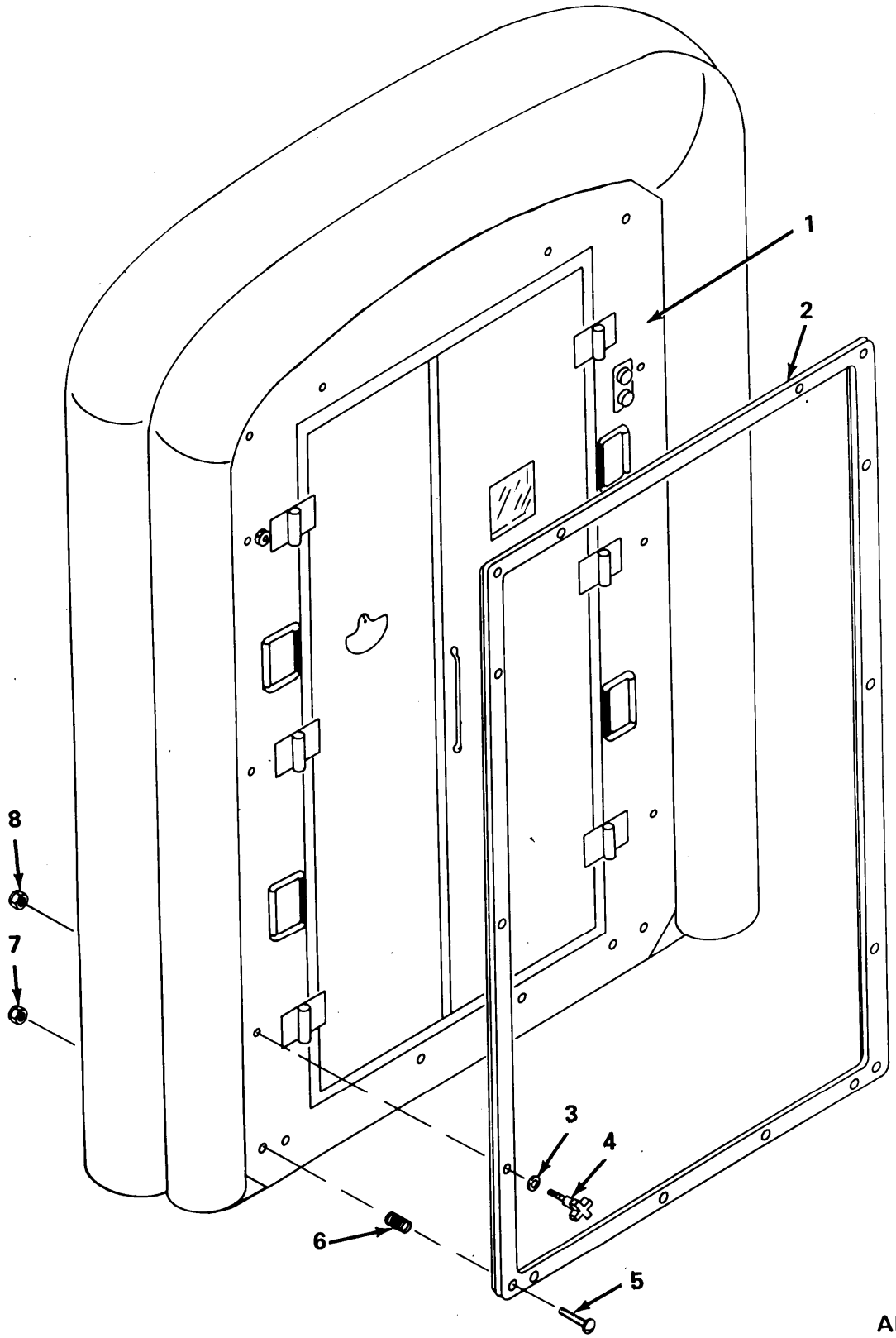
c. Installation. Installation is the reverse of removal *(b* above), except use adhesive (item 11, table 1-3) to secure gasket to door edge.

4-31. Seal Retaining Frame

Organizational maintenance personnel are authorized to replace the seal retaining frame and attaching hardware.

a. Removal.

(1) Remove 12 locknuts (8, fig. 4-13), hand-knobs (4), and washers (3).



1 Frame and door assembly
2 Seal retaining frame
3 Washers
4 Handknobs
5 Screws
6 Springs
7 Locknuts
8 Locknuts

Figure 4-13. Seal retaining frame, exploded view.

(2) Remove four locknuts (7), screws (5), and springs (6).

(3) If entrance is connected to shelter, perform steps below:

(a) Set LIGHT switch (1, fig. 2-3) to OFF.

(b) Disconnect electrical power cable (9, fig. 2-19) from distribution box (4).

(c) Disconnect cable and light assembly (8) from distribution box (4).

(4) Remove seal retaining frame (2, fig. 4-13).

b. Installation. Installation is the reverse of removal *(a* above).

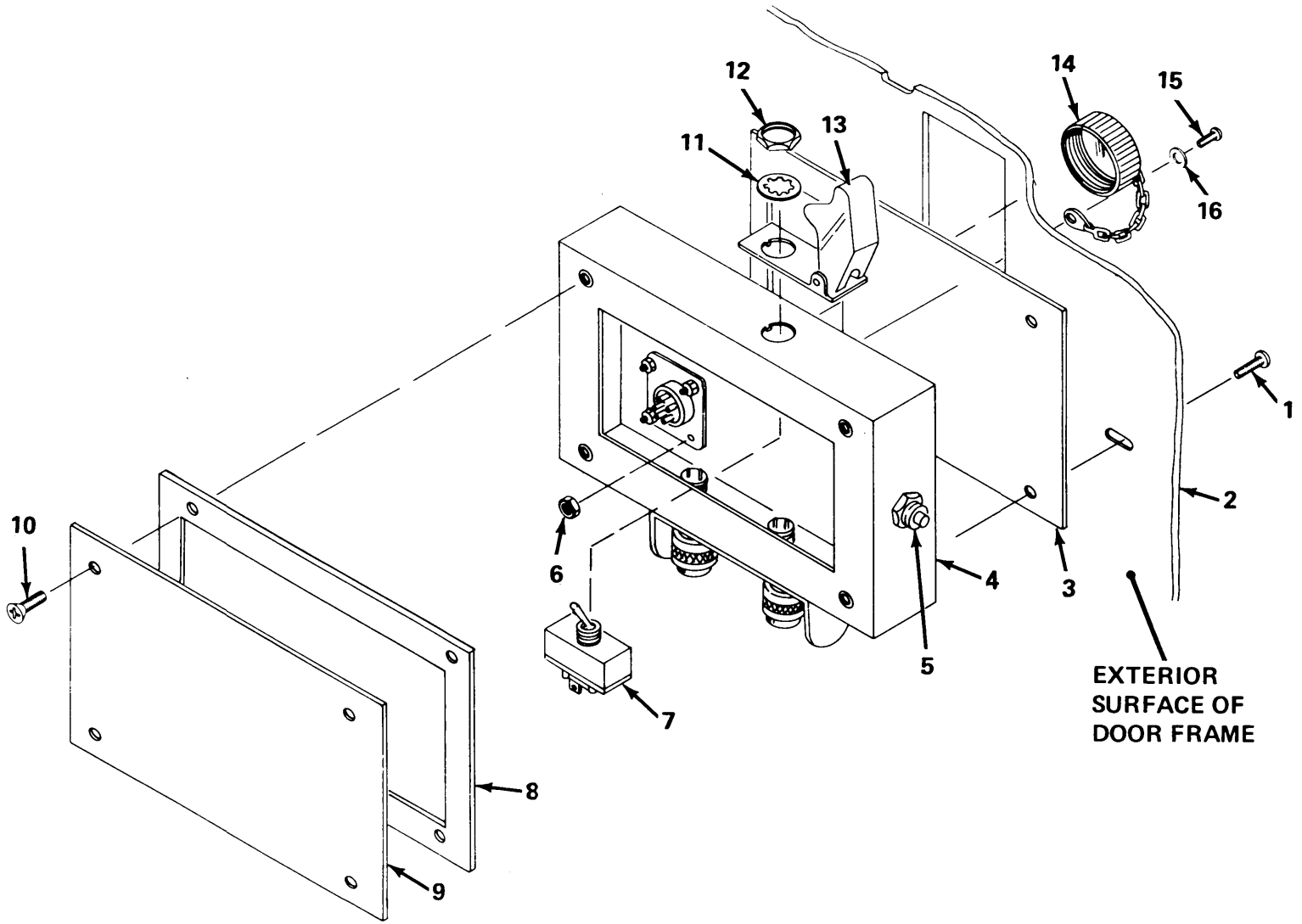
Section VII. SWITCH BOX

4-32. Switch Box

Organizational maintenance personnel are authorized to adjust and replace the switch box.

a. Adjustment.

(1) Loosen, but do not remove, four screws (1, fig. 4-14).



1 Screws	5 Switch	9 Access cover	13 Guard
2 Door frame	6 Locknuts	10 Screws	14 Cover
3 Gasket	7 Switch	11 Lockwasher	15 Screws
4 Switch box	8 Gasket	12 Nut	16 Washers

Figure 4-14. Switch box, exploded view.

CAUTION

Do not force switch box against door edge. Protruding actuator may be damaged when door is opened and then closed.

(2) Slide switch box (4) toward door edge until pushbutton switch (5) just clicks (actuates).

(3) Tighten four mounting screws (1).

(4) Open and close entrance door, and listen for click as switch actuates.

(5) If switch does not actuate, repeat steps(l) through (4).

b. Removal.

(1) Disconnect cable and light assembly (3, fig. 2-19) from switch box (l).

(2) Remove four screws (1, fig, 4-14) securing switch box to entrance door frame (2).

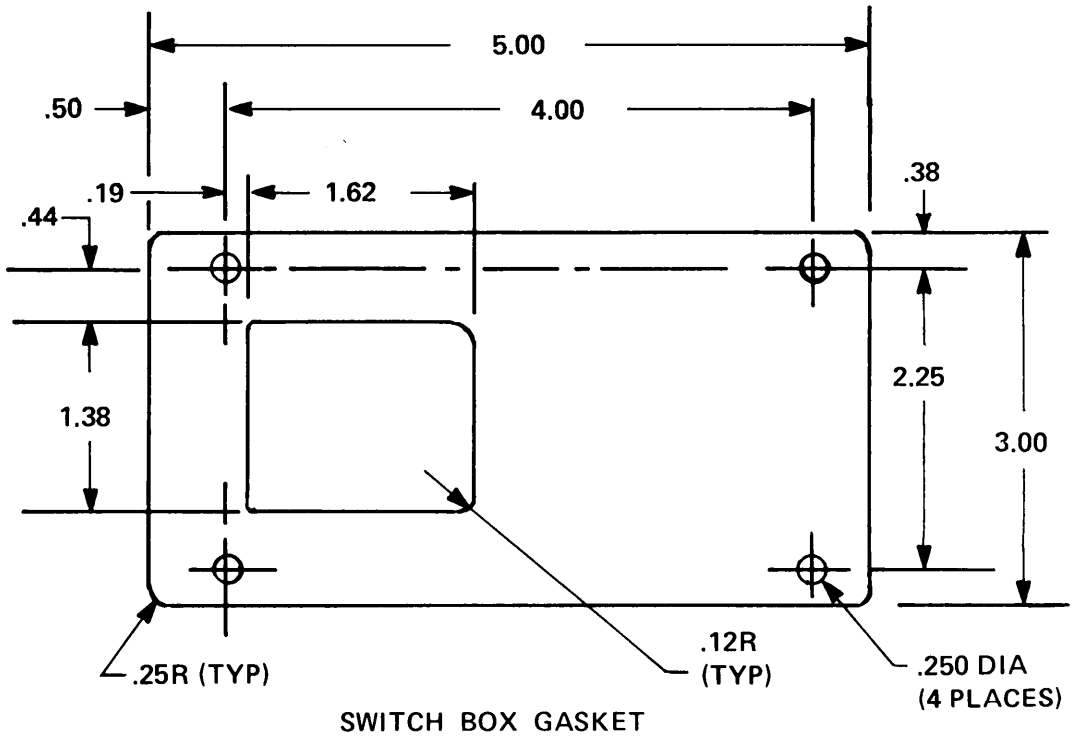
(3) Remove switch box (4) and mounting gasket (3).

c. Installation. Installation is the reverse of removal (b above), except adjust switch box *(a* above).

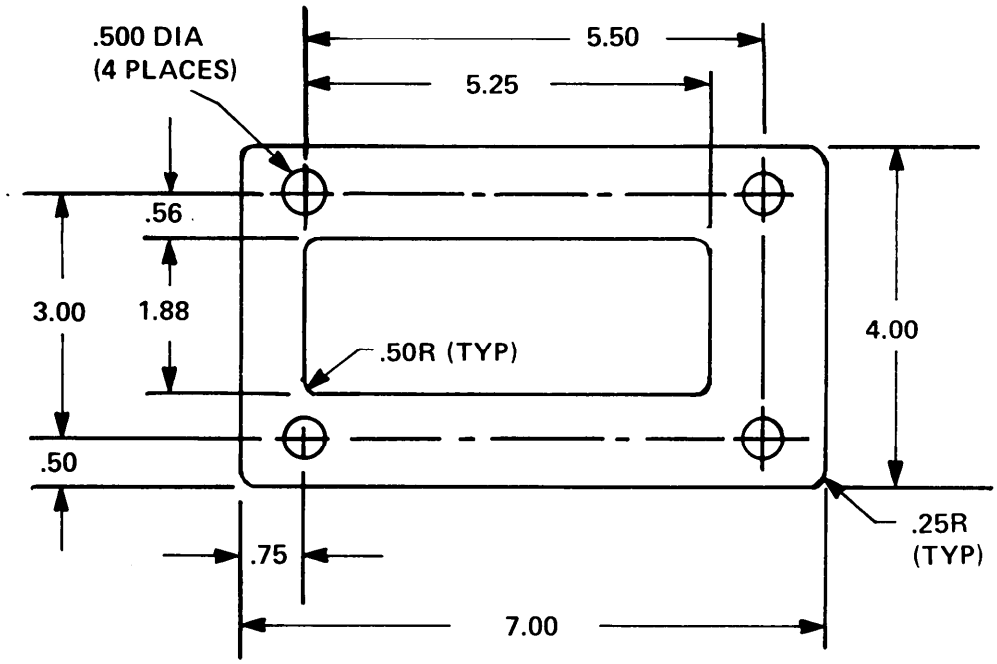
4-33. Gasket

Organizational maintenance personnel are authorized to manufacture and replace the switch box gasket.

a. Manufacture. Fabricate switch box gasket (fig. 4-15).



SWITCH BOX GASKET



DISTRIBUTION BOX GASKET

NOTES:

1. Material: Neoprene rubber, black, 60 durometer, MIL SPEC, MIL-R-3065.
2. Dimensions in inches.

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Figure 4-15. Switch and distribution box gasket fabrication.

b. Removal.

(1) Disconnect cable and light assembly (3, fig. 2-19) from switch box (l).

(2) Remove four screws (1, fig. 4-14) securing switch box to entrance door frame (2).

(3) Remove switch box (4) and mounting gasket (3).

c. Installation. Installation is the reverse of removal (*b* above), except adjust switch box (para 4-32 *a).*

4-34. Access Cover and Gasket

a. Access Cover. Organizational maintenance personnel are authorized to replace the access cover and attaching hardware.

(1) *Removal.* Remove four screws (10, fig. 4-14) and access cover (9).

(2) *Installation.* Installation is the reverse of removal ((1) above).

b. Gasket. Organizational maintenance personnel are authorized to manufacture and replace the access cover gasket.

(1) *Manufacture.* Fabricate access cover gasket (fig. 4-12).

(2) *Removal.*

(a) Remove four screws (10, fig. 4-14) and access cover (9).

(b) Remove gasket (8) from access cover (9).

(c) Clean gasket and adhesive residue from access cover with decreasing solvent (item 10, table 1-3).

(3) *Installation.*

(a) Install gasket (8) on access cover (9) with adhesive (item 11, table 1-3).

(b) Install access cover on switch box (4) with four screws (10).

4-35. Electrical Connection Cover

Organizational maintenance personnel are authorized to replace the electrical connection cover and attaching hardware.

a. Removal.

(1) Remove four screws (10, fig. 4-14) and access cover (9).

(2) Remove locknut (6), screw (15), and washer (16) securing chain of electrical connection cover (14). Remove cover.

b. Installation. Installation is the reverse of removal *(a* above).

4-36. Toggle Switch and Guard

Organizational maintenance personnel are authorized to replace the toggle switch, guard, and attaching hardware.

a. Removal.

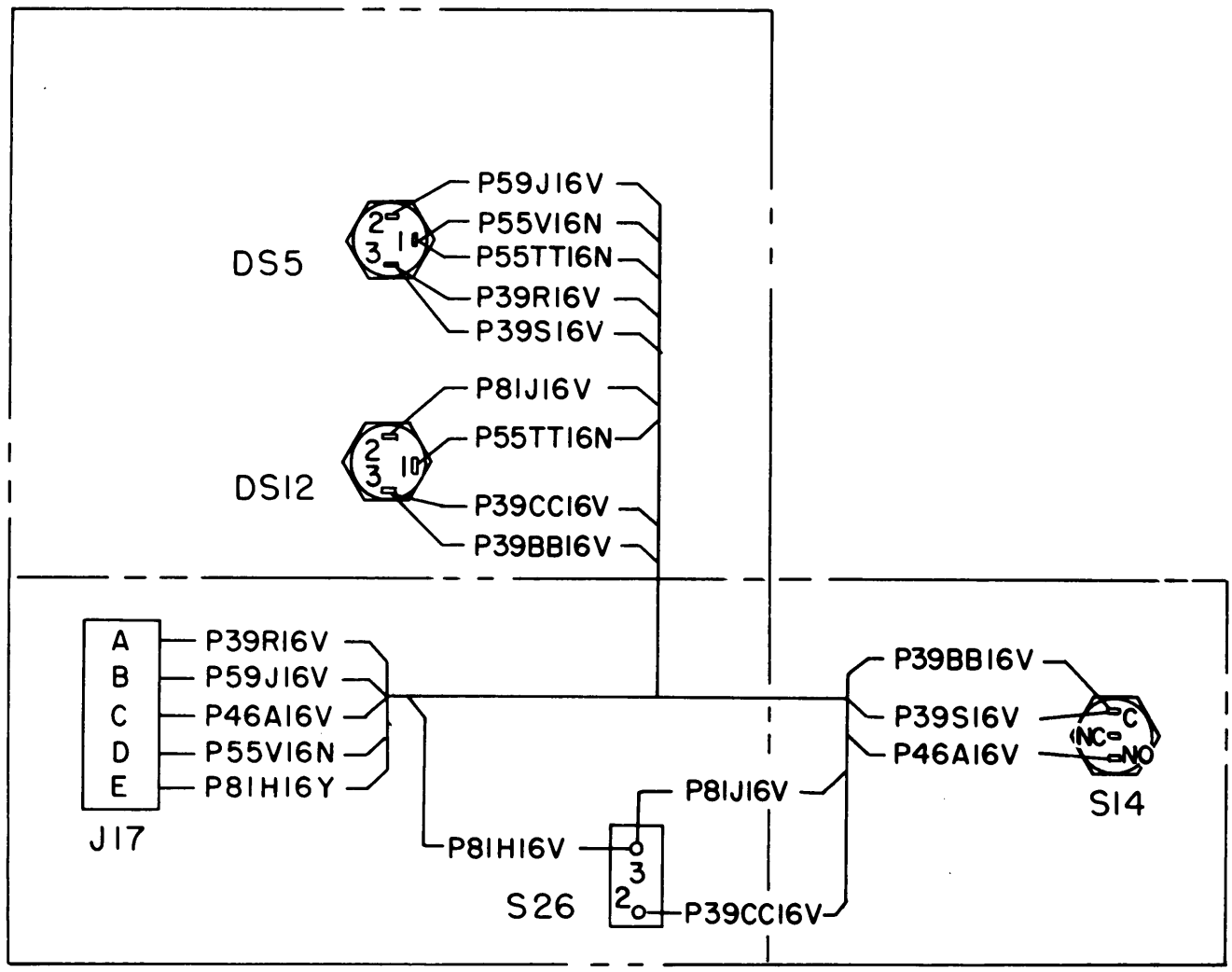
(1) Disconnect cable and light assembly (3, fig. 2-19) from switch box (l).

(2) Remove four screws (10, fig. 4-14) and access cover (9).

(3) Remove nut (12), lockwasher (11), and guard (13).

(4) Remove toggle switch (7) with electrical leads attached.

(5) Identify and tag electrical leads (fig. 4-16).



LEGEND

DS5 - INDICATOR LIGHT

DS12 - INDICATOR LIGHT

J17 - RECEPTACLE CONNECTOR

S14 - PUSH BUTTON SWITCH

S26 - TOGGLE SWITCH

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Figure 4-16. Switch box wiring diagram.

(6) Remove electri al leads from toggle switch.

b. Installation. Installation is the reverse of removal *(a* above).

Section VIII. DISTRIBUTION BOX

4-37. Distribution Box

Organizational maintenance personnel are authorized to replace the distribution box and attaching hardware.

a. Removal.

(1) Set LIGHT switch (1, fig. 2-3) to OFF.

(2) Disconnect electric power cable (9, fig. 2-19) from distribution box (4).

(3) Disconnect cable and light assemblies (8) and (3) from distribution box (4).

(4) Remove four screws (1, fig. 4-17) and lockwashers (2).

Legend for fig. 4-17:

1 Screws
2 Lockwasher
3 Door frame
4 Gasket
5 Distribution box
6 Access cover
7 Screws
8 Cover
9 Screws
10 Washers
11 Washers
12 Nuts

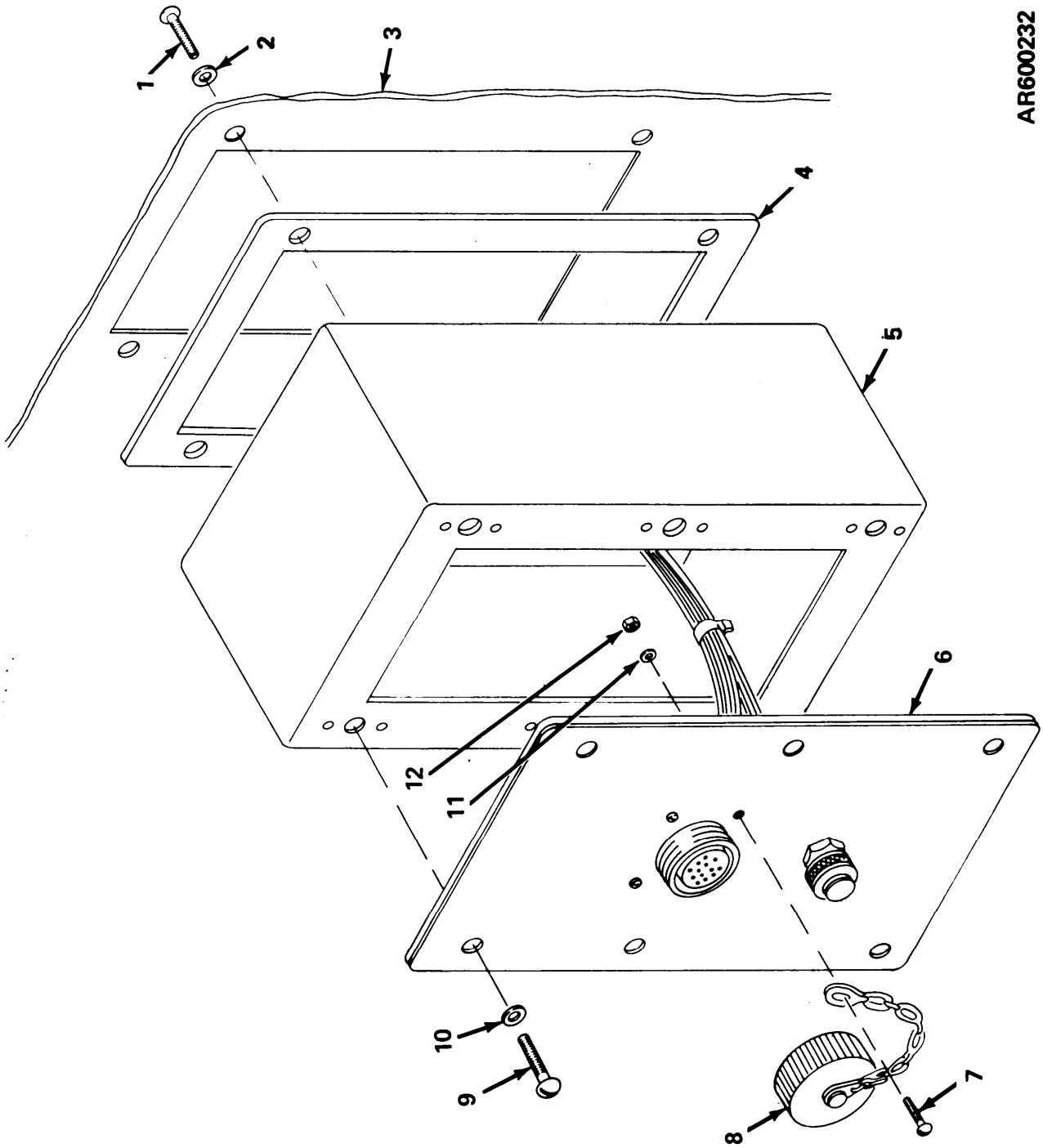


Figure 4-17. Distribution box, exploded view.

(5) Remove distribution box (5) and gasket (4).

b. Installation. Installation is the reverse of removal *(a* above), except remove electrical receptacle covers before connecting cables.

4-38. Gasket

Organizational maintenance personnel are authorized to manufacture and replace the distribution box gasket.

a. Manufacture. Fabricate distribution box gasket (fig. 4-15).

b. Removal. Remove distribution box (para 4-37 *a).*

c. Installation. Installation is the reverse of removal (*b* above).

4-39. Electrical Receptacle Covers

Organizational maintenance personnel are authorized to replace the electrical receptacle covers. Instructions for replacing one receptacle cover are typical for all three.

a. Removal.

(1) Remove distribution box (para 4-37 *a).*

(2) Remove six screws (9, fig. 4-17) and washers (10).

(3) Pull access cover (6) away from distribution box (5).

(4) Remove nut (12), washer (11), screw (7), and receptacle cover (8).

b. Installation. Installation is the reverse of removal *(a* above).

Section IX. ENTRANCE GAS-PARTICULATE FILTER UNIT

4-40. Entrance Gas-Particulate Filter Unit (GPFU)

Organizational maintenance personnel are authorized to replace the GPFU.

a. Removal.

(1) Remove plug connector from receptacle (5, fig. 2-19) and install on dummy receptacle (fig. 1-3).

(2) Remove air-recirculation duct (fig. 2-18) from GPFU.

(3) Remove GPFU from entrance.

b. Installation. Installation is the reverse of removal *(a* above), except install new gas and particulate filters in unit (para 4-5 *g*).

4-41. Coupling

Organizational maintenance personnel are authorized to replace the coupling and attaching hardware.

a. Removal.

(1) Remove plug connector from receptacle (5, fig. 2-19) and install on dummy receptacle (fig. 1-3).

(2) Disconnect GPFU from entrance.

(3) Move GPFU away from entrance.

(4) Remove locknut (14, fig. 4-4), screw (12), and washer (11) securing chain (13) to tube (9).

(5) Remove coupling (10) from tube.

b. Installation. Installation is the reverse of removal *(a* above).

4-42. Air Duct Adapter

Organizational maintenance personnel are authorized to replace the air duct adapter and attaching hardware.

a. Removal.

(1) Remove plug connector from receptacle (5, fig. 2-19) and install on dummy receptacle (fig. 1-3).

(2) Disconnect GPFU from entrance.

(3) Move GPFU away from entrance.

(4) Loosen clamp (5, fig. 4-4).

(5) Remove air duct adapter (8) from air duct hose (4).

b. Installation. Installation is the reverse of removal *(a* above), except insure air duct adapter is inserted approximately 2-3/4 inches into air duct hose before tightening clamp.

4-43. Air Duct Hose

Organizational maintenance personnel are authorized to replace the air duct hose and attaching hardware.

a. Removal.

(1) Remove air duct adapter (para 4-42 *a).*

(2) Loosen clamp (3, fig. 4-4). Pull air duct hose from fan adapter (2).

(3) Remove clamps (3) and (5) from air duct hose.

b. Installation. Installation is the reverse of removal *(a* above).

4-44. Fan Adapter

Organizational maintenance personnel are authorized to replace the fan adapter and attaching hardware.

a. Removal.

(1) Remove plug connector from receptacle (5, fig. 2-19) and install on dummy receptacle (fig. 1-3).

(2) Disconnect GPFU from entrance.

(3) Move GPFU away from entrance.

(4) Loosen clamp (3, fig. 4-4). Pull air duct hose from fan adapter (2).

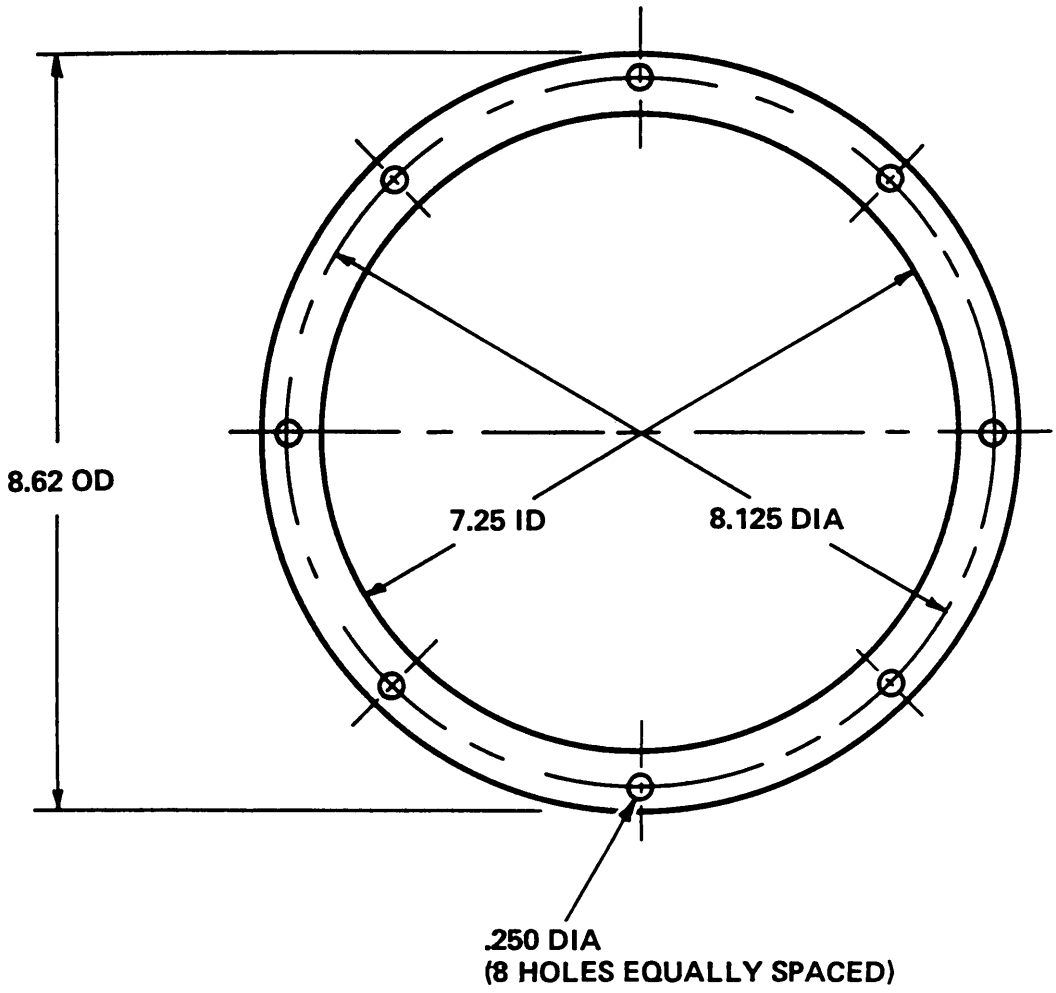
(5) Remove eight screws (7) and washers (6).
(6) Remove fan adapter (2) and gasket (1).

b. Installation. Installation is the reverse of removal *(a* above).

4-45. Gasket

Organizational maintenance personnel are authorized to manufacture and replace the fan adapter gasket.

a. Manufacture. Fabricate gasket (fig. 4-18).



NOTES:

1. **Material: Silicone sponge rubber, 3/16 thickness, grade medium.**
2. **Dimensions in inches.**

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Figure 4-18. Fan gasket fabrication.

b. Removal.

(1) Remove eight screws (7, fig. 4-4) and washers (6).
(2) Remove fan adapter (2) and gasket (1).

c. Installation. Installation is the reverse of

removal *(b* above), except remove gasket residue from mounting surface of fan adapter (2) and fan with degreasing solvent (item 10, table 1-3).

4-46. Bail Handles

Organizational maintenance personnel are authorized to replace the bail handles and attaching hardware. Instructions for replacing one bail handle are typical for both.

a. Removal.

(1) Remove two locknuts (23, fig. 4-4) and washers (24).

(2) Remove two screws (26) and washers (25).

(3) Remove bail handle (27).

b. Installation. Insolation is the reverse of removal *(a* above).

4-47. Gas and Particulate Filters

Organizational maintenance personnel are authorized to replace the gas and particulate filters.

WARNING

The unit commander or senior officer in charge of maintenance personnel assigned to remove the contaminated gas and particulate filters must prescribe the necessary protective clothing (TM 10-277) to be worn during this operation. He must also prescribe the necessary safety measures to be followed including the NBC decontamination (FM 3-5) . This must be performed before the new filters are installed. Failure to wear protective clothing or follow safety measures may result in injury or death.

CAUTION

Handle filters with care to prevent damage.

NOTE

Ordinarily, the particulate filter will be replaced when the gas filter is replaced. However, if inspection of the particulate filter shows serviceable, it may be retained for further use. A chemical of officer will determine if the filter is servicaable.

a. Removal.

WARNING

DO NOT throw away damaged or unusable filters as ordinary trash.

DO turn in damaged or unusable filters to your hazardous waste management office or Defense Reutilization and Marketing Office (DRMO).

(1) Remove the GPFU from the entrance (para 4-40 *a*) .

(2) Unfasten four latches (21, fig. 4-4).

(3) Separate inlet plenum (15) and outlet plenum (22).

(4) Remove gas filter (19) and particulate filter (18).

b. Installation. Installion is the reverse of removal *(a* above).

NOTE

Be sure arrow on each filter points toward the outlet plenum in direction of air-flow.

4-46. Quick-Disconnect Coupings

Organizational maintenance personnel are authorized to replace the quick-disconnect couplings and attaching hardware. Instructions for replacing one coupling are typical for both.

a *Removal.*

(1) Remove gas and partculate filters (para 4-47 *a).*

(2) Remove nut (28, fig. 4-4) and quick-disconnect coupling (29) from plenum.

b. Installation. Installation is the reverse of removal *(a* above).

4-49. Fasteners

Organizational maintenance personnel are authorized to replace the fasteners and attaching hardware. Instructions for replacing one fastener are typical for all four fasteners.

a. Removal

(1) Remove gas and particulate filters (pare 4-47 *a).*

(2) Remove three rivets (16, fig. 4-4) securing strike (17).

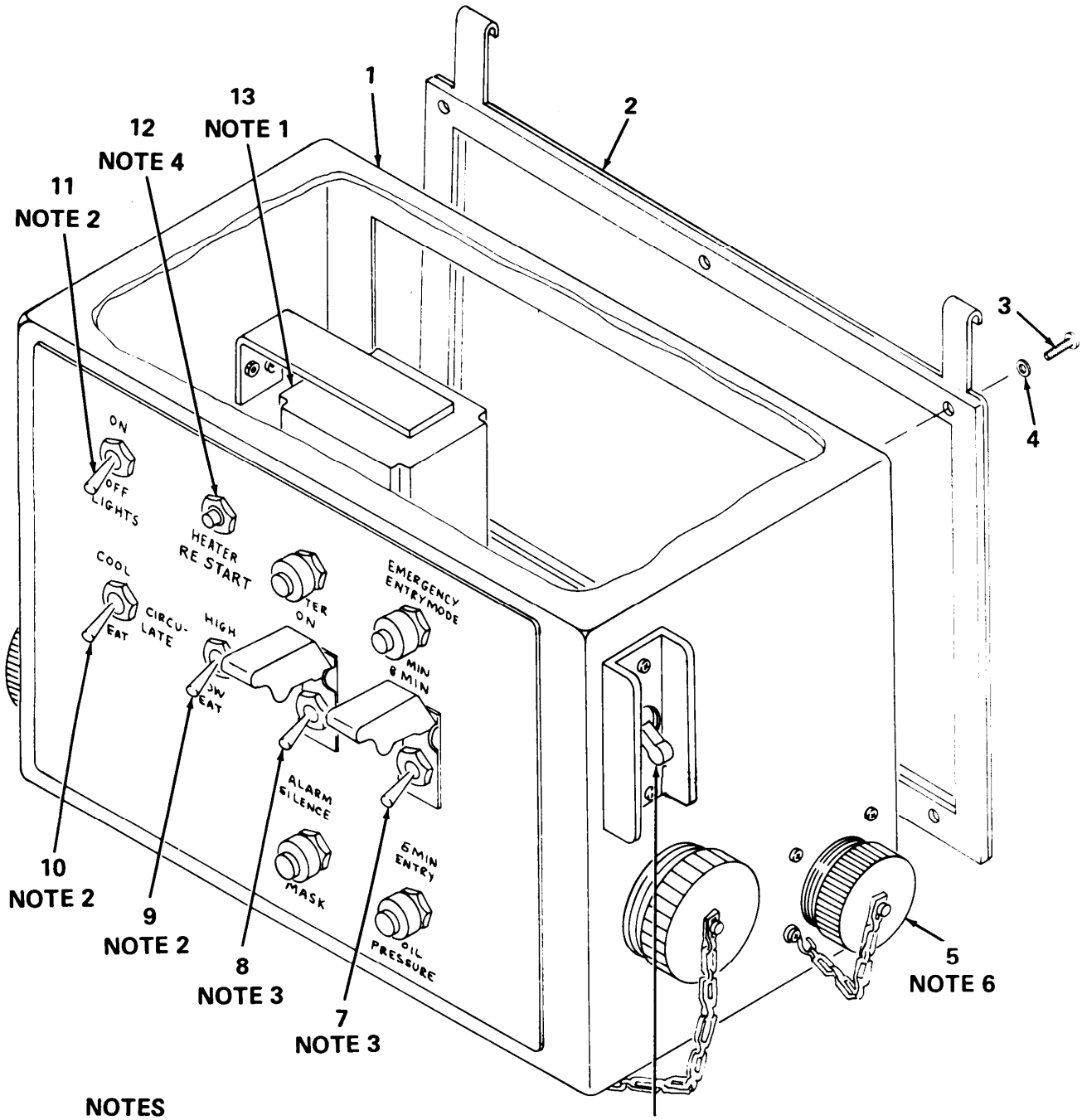
(3) Remove four rivets (20) securing latch (21).

b. Installation. Installation is the reverse of removal *(a* above).

Section X. AUXILIARY CONTROL INDICATOR

4-50. LIGHTS Switch

Organizational maintenance personnel are authorized to inspect, test, and replace the LIGHTS switch (11, fig. 4-19) and attaching hardware.



NOTES

1. **SEE DETAIL A, FIG. 4–21**
2. **SEE DETAIL B, FIG. 4–21**
3. **SEE DETAIL C, FIG. 4–21**
4. **SEE DETAIL D, FIG. 4–21**
5. **SEE DETAIL E, FIG. 4–21**
6. **SEE DETAIL F, FIG. 4–21**

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1 Auxiliary control indicator
2 Access cover
3 Screws
4 Washers
5 Receptacle connector
6 Auxiliary circuit breaker
7 Mode switch
8 ALARM SILENCE switch
9 HIGH-LOW HEAT switch
10 Environmental control switch
11 LIGHTS switch
12 HEATER RE-START switch
13 Armature relay

Figure 4-19. Auxiliary control indicator, exploded view.

a. Inspection and Testing.

(1) Remove six screws (3), washers (4), and access cover (2).

(2) Visually inspect for loose, disconnected and damaged terminal lugs and electrical leads.

(3) Remove armature relay (para 4-58).

(4) Test switch for continuity as follows:

(a) Position switch to OFF. Check for open circuit between switch terminals (no continuity).

(b) Position switch to ON. There should be continuity between terminals.

(c) If switch is faulty, remove switch *(b* below).

(d) If necessary, remove and install new terminal lugs.

(e) If switch is functioning, install access cover and secure with six screws (3) and washers (4).

b. Removal.

(1) Identify and tag electrical leads (fig. 4-20).

Legend for fig. 4-20:

CB7	Circuiit breaker
DS4	HEATER ON indicator light
DS8	Buzzer
DS9	MASK indicator light
DD10	LOW OIL PRESSURE indicator light
DS13	Purge mode indicator light
J9	Receptacle connector
J22	Receptacle connector
K5	Arntature relay
K11	Relay
R11	Time delay resistor
R12	Time delay resistor
S2	LIGHT switch
S4	Environmental control switch
S9	HIGH-LOW HEAT switch
S21	HEATER RE-START switch
S23	ALARM SILENCE switch
S25	Time delay mode switch
TB2	Terminal block

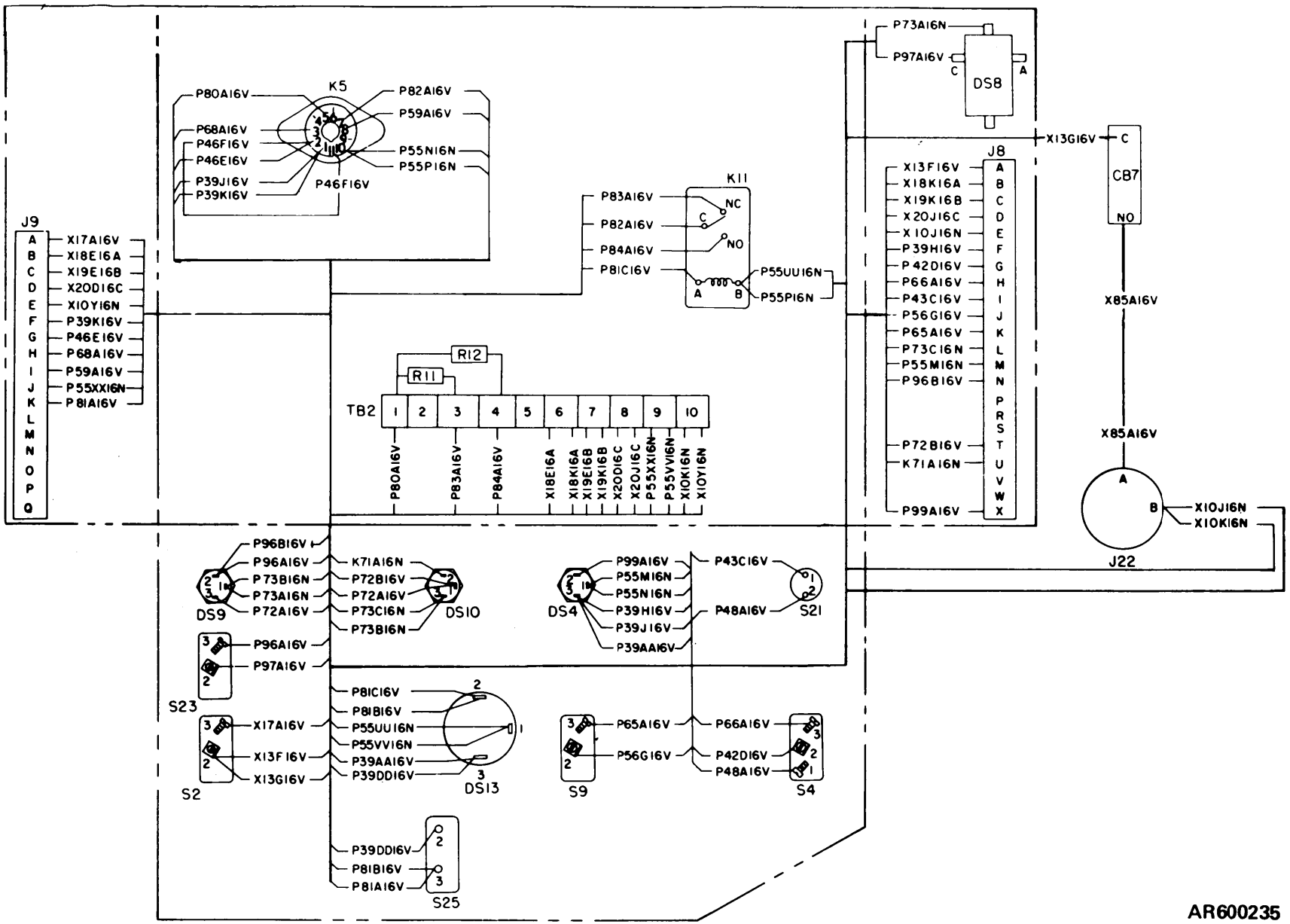

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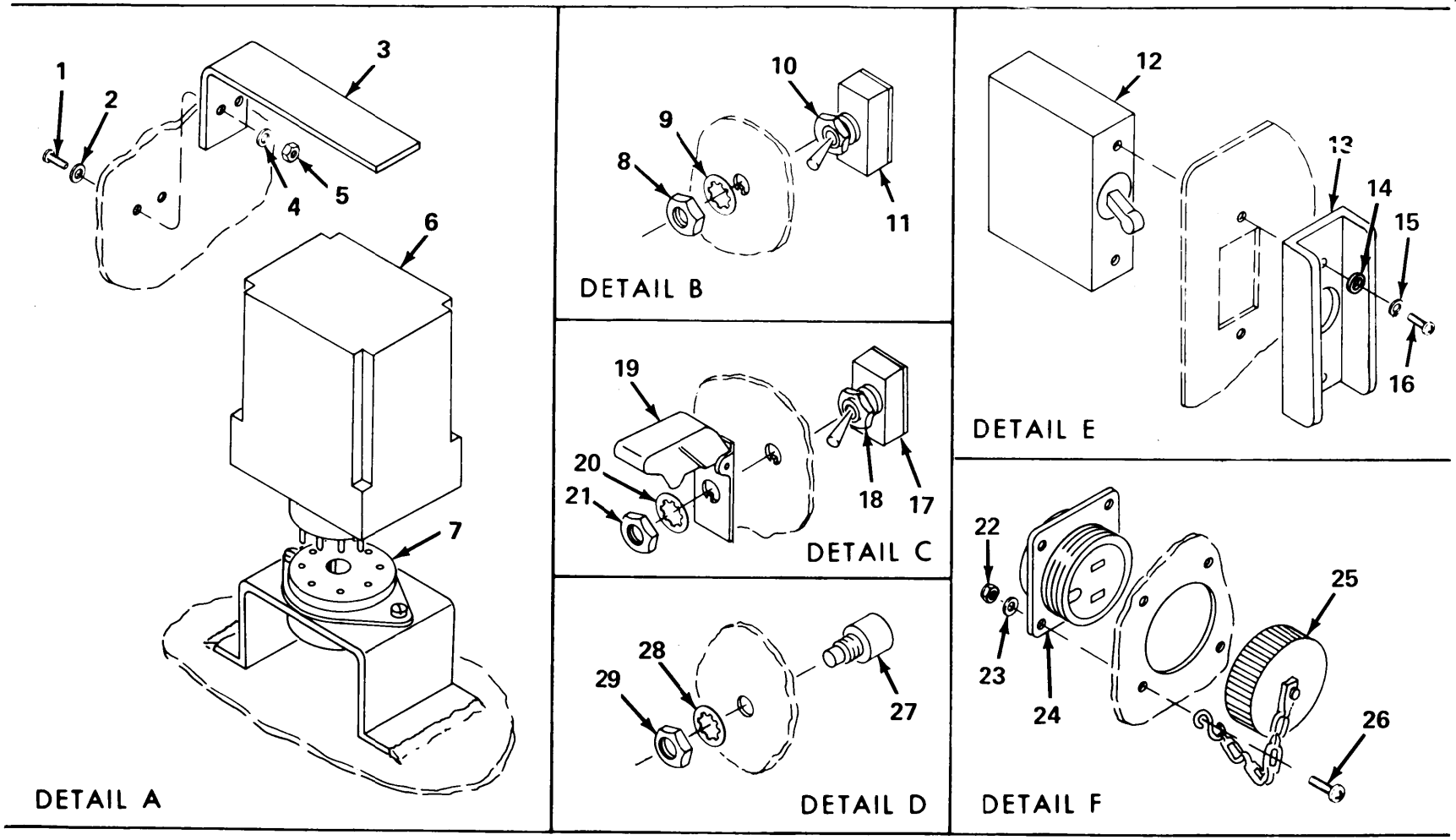
Figure 4-20. Auxiliary control indicator wiring diagram legend.

(2) Remove nut (8, fig. 4-21), lockwashers (9), and switch (11).



1 Screws	9 Lockwasher	16 Screws	23 Washers
2 Washer	10 Nut	17 Switch	24 Receptacle connector
3 Clip	11 Switch	18 Nut	25 Cover
4 Washers	12 Circuit breaker	19 Guard	26 Screws
5 Locknuts	13 Shield	20 Lockwasher	27 Switch
6 Armature relay	14 Washers	21 Nut	28 Lockwasher
7 Socket	15 Lockwashers	22 Locknuts	29 Nut
8 Nut			

Figure 4-21. Auxiliary control indicator details, exploded view.

(3) Disconnect electrical leads from switch.

c. Installation.

Connect electrical leads to switch terminals.

(2) Adjust nut (10) so threaded portion of switch (11) will be flush with nut (8) when installed.

(3) Install new switch and secure with lockwasher (9) and nut (8).

(4) Install armature relay (para 4-58).

(5) Install access cover. Secure cover with screws (3, fig. 4-19) and washers (4).

4-51. HEATER RE-START Switch

Organizational maintenance personnel are authorized to inspect, test, and replace the HEATER RE-START switch (12, fig. 4-19).

a. Inspection and Testing.

(1) Remove six screws (3), washers (4) and access cover (2).

(2) Visually inspect for loose, disconnected, and damaged terminal lugs and electrical leads.

(3) Test switch for continuity as follows:

(a) Check continuity between switch terminals. There should be continuity.

(b) Depress switch and check for open circuit (no continuity).

(c) If switch is faulty, remove switch *(b* below).

(d) If necessary, remove and install new terminal lugs.

(e) If switch is functioning, install access cover and secure with six screws (3) and washers (4).

b. Removal.

(1) Remove armature relay (para 4-58).

(2) Remove nut (29, fig. 4-21), lockwasher (28), and switch (27).

(3) Identify and tag electrical leads (fig. 4-20).

(4) Disconnect electrical leads from switch.

c. Installation.

(1) Connect electrical leads to switch terminals.

(2) nstall switch (27) and secure with lockwasher (28) and nut (29).

(3) Install armature relay (para 4-58).

(4) Install access cover. Secure cover with six screws (3, fig. 4-19) and washers (4).

4-52. Environmental Control Switch

Organizational maintenance personnel are authorized to inspect, test, and replace the environmental control switch (10, fig. 4-19) and attaching hardware.

a. Inspection and Testing.

(1) Remove six screws (3), washers (4), and access cover (2).

(2) Visually inspect for loose, disconnected, damaged terminal lugs and electrical leads.

(3) Test switch for continuity as follows:

(a) Remove armature relay (para 4-58).

(b) Position switch to HEAT. Check continuity between terminals. Continuity should exist between center terminal and top terminal. An open circuit should exist between center terminal and bottom terminal.

(c) Position switch to CIRCULATE. There should be no continuity between any terminals.

(d) Position switch to COOL. An open circuit should exist between the center terminal and the top terminal. Continuity should exist between the center terminal and the bottom terminal.

(e) If switch is faulty, remove switch *(b* below).

(f) If necessary, remove and install new terminal lugs.

(g) If switch is functioning, install access cover and secure with screws (3) and washers (4).

b. Removal.

(1) Remove nut (8, fig. 4-21), lockwasher (9), and switch (11).

(2) Identify and tag electrical leads (fig. 4-20).

(3) Disconnect electrical leads from switch.

c. Installation.

(1) Connect electrical leads to switch terminals.

(2) Adjust nut (10, fig. 4-2 1) so threaded portion of switch (11) will be flush with nut (8) when installed.

(3) Install new switch and secure with lockwasher (9) and nut (8).

(4) Install relay armature (para 4-58).

(5) Install access cover. Secure cover with six screws (3, fig. 4-19) and washers (4).

4-53. HIGH-LOW HEAT Switch

Organizational maintenance personnel are authorized to inspect, test, and replace the HIGH-LOW HEAT switch (9, fig. 4-19) and attaching hardware.

a. Inspection and Testing.

(1) Remove six screws (3), washers (4), and access cover (2).

(2) Visually inspect for loose, disconnected and damaged terminal lugs and electrical leads.

(3) Test switch for continuity as follows:

(a) Position switch to LOW. Check for open circuit (no continuity).

(b) Position switch to HIGH. There should be continuity between terminals.

(c) If switch is faulty, remove switch *(b* below).

(d) If necessary, remove and install new terminal lugs.

(e) If switch is functioning, install access cover. Secure with six screws (3) and washers (4).

b. Removal and Installation. The HIGH-LOW HEAT switch is removed and installed by the same procedures as the LIGHTS switch (para 4-50 *b* and c).

4-54. ALARM SILENCE Switch

Organizational maintenance personnel are authorized to inspect, test, and replace the ALARM SILENCE switch (9, fig. 4-19) and attaching hardware.

a. Inspection and Testing.

(1) Remove six screws (3), washers (4), and access cover (2).

(2) Visually inspect for loose, disconnected and damaged terminal lugs and electrical leads.

(3) Test switch for continuity as follows:

(a) Position switch to OFF. Check for open circuit (no continuity).

(b) Position switch to ON. There should be continuity between terminals.

(c) If switch is faulty, remove switch *(b* below).

(d) If necessary, remove and install new terminal lugs.

(e) If switch is functioning, install access cover and secure with six screws (3) and washers (4).

b. Removal.

(1) Remove nut (21, fig. 4-21), lockwasher (20), guard (19), and switch (17).

(2) Identify and tag electrical leads (fig. 4-20).

(3) Disconnect electrical leads from switch.

c. Installation.

(1) Connect electrical leads to switch terminals.

(2) Adjust nut (18, fig. 4-21), so threaded portion of switch (17) will be flush with nut (21) when installed.

(3) Install switch (17), guard (19), and lockwasher (20), and secure with nut (21).

(4) Install access cover. Secure cover with six screws (3, fig. 4-19) and washers (4).

4-55. Mode Switch

Organizational maintenance personnel are authorized to inspect, test, and replace the mode switch (7, fig. 4-19) and attaching hardware.

a. Inspection and Testing.

(1) Remove six screws (3), washers (4), and access cover (2).

(2) Visually inspect for loose, disconnected, and damaged terminal lugs and electrical leads.

(3) Test switch for continuity as follows:

(a) Postion switch to the 5-minute mode. Check for open circuit (no continuity).

(b) Position switch to the 8-minute mode. There should be continuity between terminals.

(c) If switch is faulty, remove switch *(b* below).

(d) If necessary, remove and install new terminal lugs.

(e) If switch is functioning, install access cover and secure with six screws (3) and washers (4).

b. Removal and Installation. The mode switch is removed and installed by the same procedures as the ALARM SILENCE switch (para 4-54 *b* and *c).*

4-56. Auxiliary Circuit Breaker

Organizational maintenance personnel are authorized to inspect, test, and replace the auxiliary circuit breaker (6, fig. 4-19) and attaching hardware.

a. Inspection and Testing.

(1) Remove six screws (3), washers (4), and access cover (2).

(2) Visually inspect for loose, disconnected, and damaged terminal lugs and electrical leads.

(3) Test circuit breaker for continuity as follows:

(a) Position circuit breaker to OFF. Check for open circuit (no continuity).

(b) Position circuit breaker to ON. There should be continuity between terminals.

(c) If circuit breaker is faulty, remove circuit breaker (*b* below).

(d) If necessary, remove and install new terminal lugs.

(e) If circuit breaker is functioning, install access cover and secure with six screws (3) and washers (4).

b. Removal.

(1) Remove two screws (16, fig. 4-21), lockwashers (15), and washers (14).

(2) Remove shield (13) and circuit breaker (12).

(3) Identify and tag electrical leads (fig. 4-20).

(4) Disconnect electrical leads from circuit breaker.

(5) If necessary, replace damaged shield (13, fig. 4-21).

c. Installation.

(1) Connect electrical lead to circuit breaker terminals.

(2) Install circuit breaker (12) and shield (13), and secure with two screws (16), lockwashers (15), and washers (14).

(3) Install access cover, and secure with six screws (3, fig. 4-19) and washers (4).

4-57. Electrical Receptacle Connector

Organizational maintenance personnel are authorized to replace the auxiliary electrical

receptacle connector (5, fig. 4-19) and attaching hardware.

a. Removal.

(1) Remove six screws (3), washers (4), and access cover (2).

(2) Identify and tag electrical leads (fig. 4-20).

(3) Remove four locknuts (22, fig. 4-21), washers (23), screws (26), and cover (25).

(4) Remove receptacle connector (24) from auxiliary control indicator.

(5) Disconnect electrical leads from receptacle connector.

b. Installation. Installation is the reverse of removal *(a* above), except for the following procedures:

(1) If cover (25) is unserviceable, replace with new cover.

(2) If terminal lugs on electrical leads are damaged or loose, remove and install new terminal lugs.

4-58. Armature Relay

Organizational maintenance personnel are authorized to replace the armature relay (13, fig. 4-19) and attaching hardware.

a. Removal.

(1) Remove six screws (3), washers (4), and access cover (2).

(2) Remove two locknuts (5, fig. 4-21), washers (4), screws (1), washers (2), and clip (3).

(3) Unplug armature relay (6) from socket (7).

b. Installation. Installation is the reverse of removal *(a* above).

Section XI. TAILGATE EXTENSION, SUPPORT RACK, AND SHELTER SUPPORT PIN ASSEMBLIES

4-59. Tailgate Extension

Organizational maintenance personnel are authorized to replace the webbing strap assemblies, lock pins, clamping brackets, handles, clip springs, and attaching hardware.

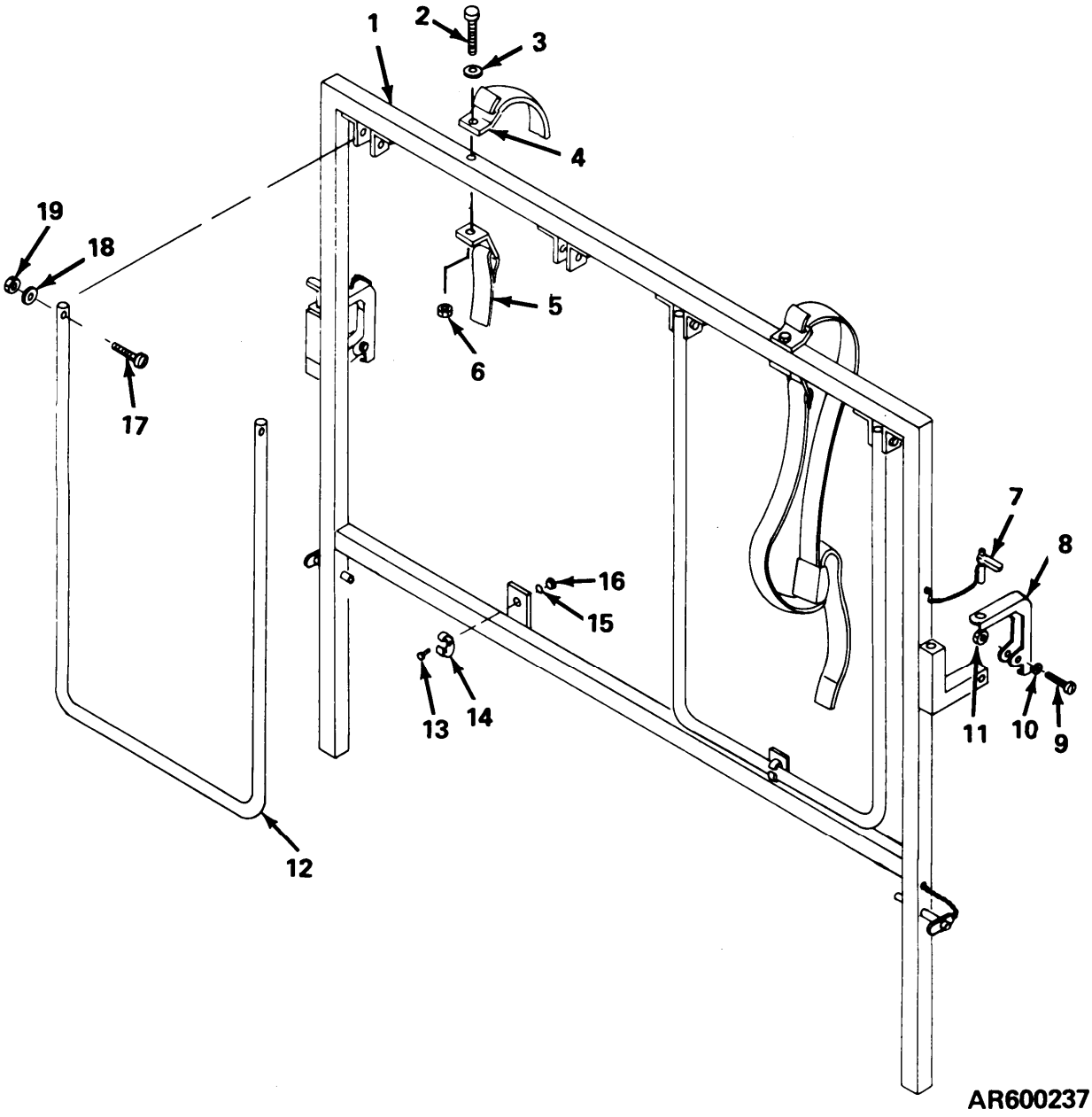
a. Strap Assemblies. Instructions for replacing one strap assembly are typical for both.

(1) *Removal.*

NOTE

Straps must be replaced as an assembly.

(a) Remove locknut (6, fig. 4-22) and strap (5).



1 Tailgate extension
2 Screws
3 Washers
4 Strap
5 Strap
6 Locknuts
7 Lock pins
8 Brackets
9 Screws
10 Washers
11 Locknuts
12 Handles
13 Screws
14 Spring clip
15 Washers
16 Locknuts
17 Screws
18 Washers
19 Locknuts

Figure 4-22. Tailgate extension, exploded view.

(b) Remove screw (2), washer (3), and strap (4).

(2) *Installation.* Installation is the reverse of removal ((1) above).

b. Clamping Brackets. Instructions for replacing one clamping bracket are typical for both.

(1) *Removal.*

(a) Depress button and pull lock pin (7) from clamping bracket (8).

(b) Remove locknut (11), screw (9), washer (10), and clamping bracket (8).

(2) *Installation*. Installation is the reverse of removal ((1) above).

c. Handles. Instructions for replacing one handle are typical for both.

(1) *Removal*.

(a) Pull handle (12), from spring clip (14).

(b) Remove two locknuts (19), washers (18), and screws (17).

(c) Remove handle (12).

(2) *Installation*. Installation is the reverse of removal ((1) above).

d. Clip Springs. Instructions for replacing one clip spring are typical for both.

(1) *Removal*.

(a) Remove locknut (16), and washer (15).

(b) Remove screw (13) and spring clip (14).

(2) *Installation*. Installation is the reverse of removal ((1) above).

4-60. Support Rack

Organizational maintenance personnel are authorized to replace the shields, strap assemblies, support tubes, support frames, frame supports, latches, catches, and attaching hardware.

a. Shields. Instructions for replacing one shield are typical for all four.

(1) *Removal*. Remove four screws (2, fig. 4-23), washers (4), lockwashers (3), and shield (11).

Legend for fig. 4-23:
1 Shields
2 Screws
3 Lockwashers
4 Washers
5 Support rack
6 Screws
7 Lockwashers
8 Washers
9 Frame supports
10 Rivets
11 Latches
12 Support frames
13 Locknuts
14 Support tubes
15 Washers
16 Screws
17 Screws
18 Washers
19 Washers
20 Locknuts
21 Strikes
22 Latches
23 Rivets
24 Rivets
25 Strikes
26 Rivets
27 Rail section
28 Latches
29 Screws
30 Washers
31 Locknuts
32 Screws
33 Strap assemblies
34 Washers
35 Locknuts
36 Strap assemblies
37 Washers
38 Lockwashers
39 Screws

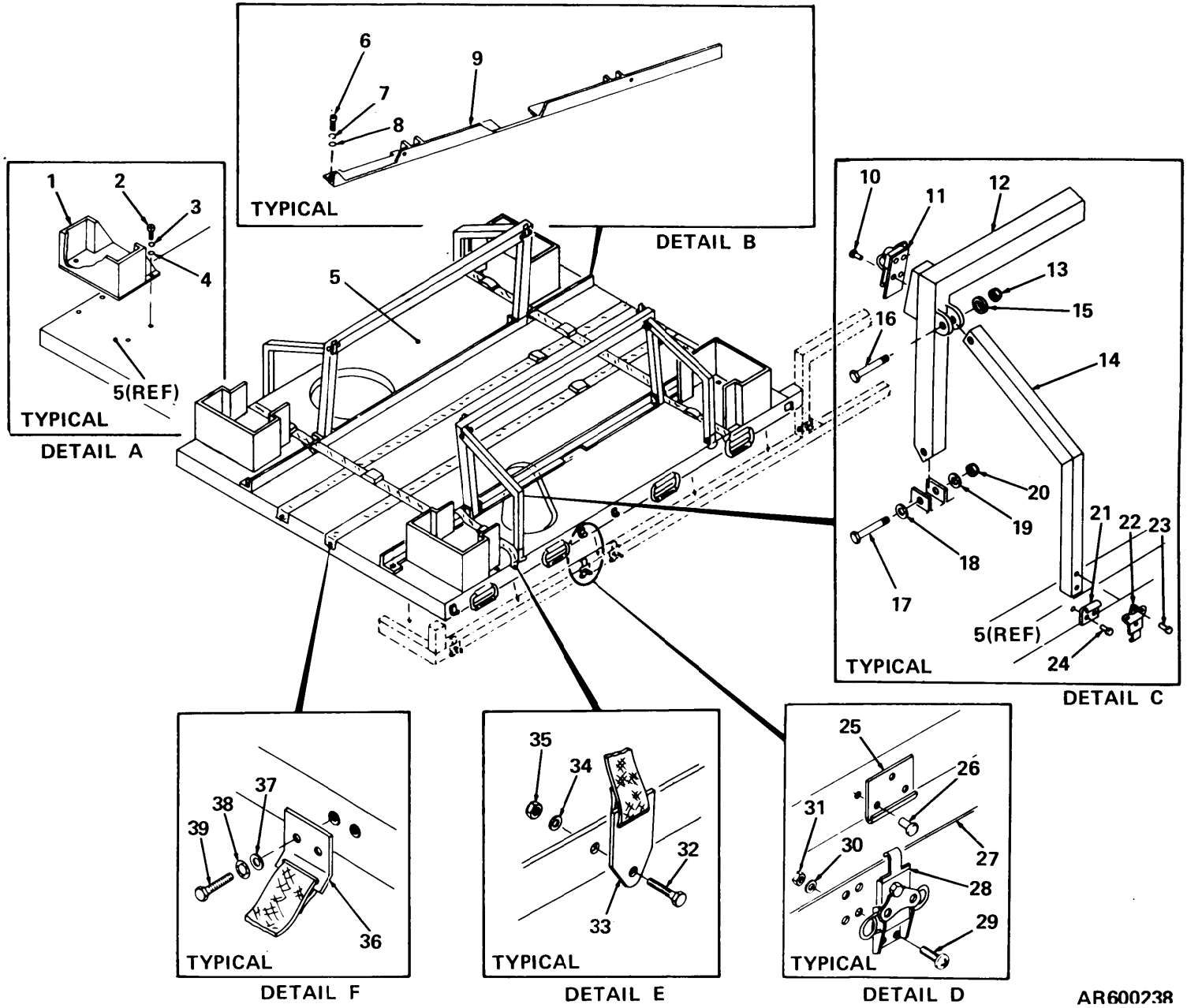


Figure 4-23. Support rack, exploded view.

(2) *Installation.* Installation is the reverse of removal ((1) above).

b. Strap Assemblies. Remove and install strap assemblies as shown in detail E and detail F, figure 4-23.

c. Support Tubes. Instructions for replacing one support tube are typical for all four.

(1) *Removal.*

(a) Unfasten latch (22, fig. 4-23).

(b) Remove locknut (13), washers (15), screw (16), and support tube (14).

(2) *Installation.* Installation is the reverse of removal ((1) above).

d. Support Frames. Instructions for replacing the support frames are typical for both.

(l) *Removal and disassembly.*

(a) Unfasten two latches (22, fig. 4-23).

(b) Remove two locknuts (20), washers (19), screws (17), and washers (18).

(c) Remove support frame (12).

(d) Remove two locknuts (13), washers (15), and screws (16). Remove support tubes (14).

(e) Remove eight rivets (10) and two latches (11).

(2) *Installation.* Installation is the reverse of removal ((1) above).

e. Left and Right Frame Supports. Instructions for replacing one frame support are typical for both.

(1) *Removal.*

(a) Remove strap assemblies attached to frame support (b above).

(b) Remove support frame *(d* above, steps (a) through (c)).

(c) Remove eight screws (6, fig. 4-23), lockwashers (7), washers (8), and frame support (9).

(2) *Installation.* Installation is the reverse of removal ((1) above).

f. Latches. Instructions for replacing one latch are typical for all four.

(1) *Removal.* Remove four rivets (10, fig. 4-23) and latch (11).

(2) *Installation.* Installation is the reverse of removal ((1) above).

g. Support Tube Catches. Instructions for replacing one catch are typical for all four.

(1) *Removal.*

(a) Remove two rivets (24, fig. 4-23) and strike (21).

(b) Remove two rivets (23) and latch (22).

(2) *Installation.* Installation is the reverse of removal ((1) above).

h. Support Rack Catches. Instructions for replacing one catch are typical for all ten catches.

(1) *Removal.*

(a) Remove three rivets (26, fig. 4-23) and strike (25).

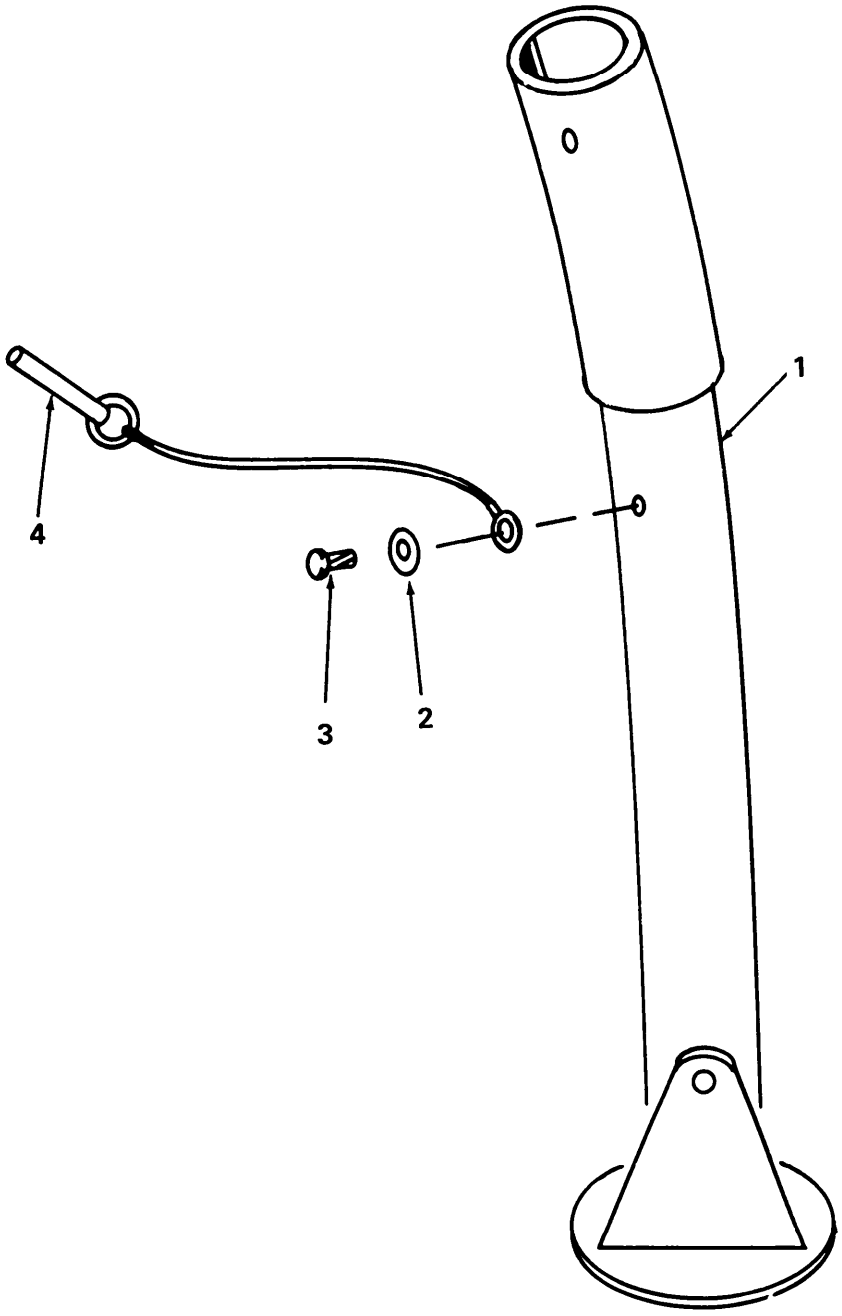
(b) Remove four screws (29) and latch (28).

(2) *Installation.* Installation is the reverse of removal ((1) above).

4-61. Shelter Support Pin Assemblies

Organizational maintenance personnel are authorized to replace the shelter support pin assemblies and attaching hardware. Instructions for replacing one pin assembly are typical for all nine pin assemblies.

a. Removal. Remove drive screw (3, fig. 4-24), washer (2), and pin assembly (4).



1 Shelter support
2 Washer
3 Drive screw
4 Pin assembly

Figure 4-24. Shelter support pin, exploded view.

b. Installation. Installation is the reverse of removal (*a* above).

Section XII. EVACUATION FAN

4-62. Connector Cover and Plug Connector

Organizational maintenance personnel are authorized to replace the connector cover and plug connector.

a. Connector Cover.

(1) *Removal.* Remove screw (10, fig. 4-25), securing chain (11) to plug connector (9). Remove connector cover (12).

Legend for fig. 4-25:

1 Male fitting
2 Clamp
3 Hose
4 Screws
5 Washers
6 Fan cover
7 Motor cover
8 Outlet plenum
9 Plug connector
10 Screw
11 Chain
12 Connector cover
13 Screws
14 Lockwashers
15 Washers
16 Switch shield
17 Circuit breaker
18 Terminal lug
19 Terminal lug
20 Clamp

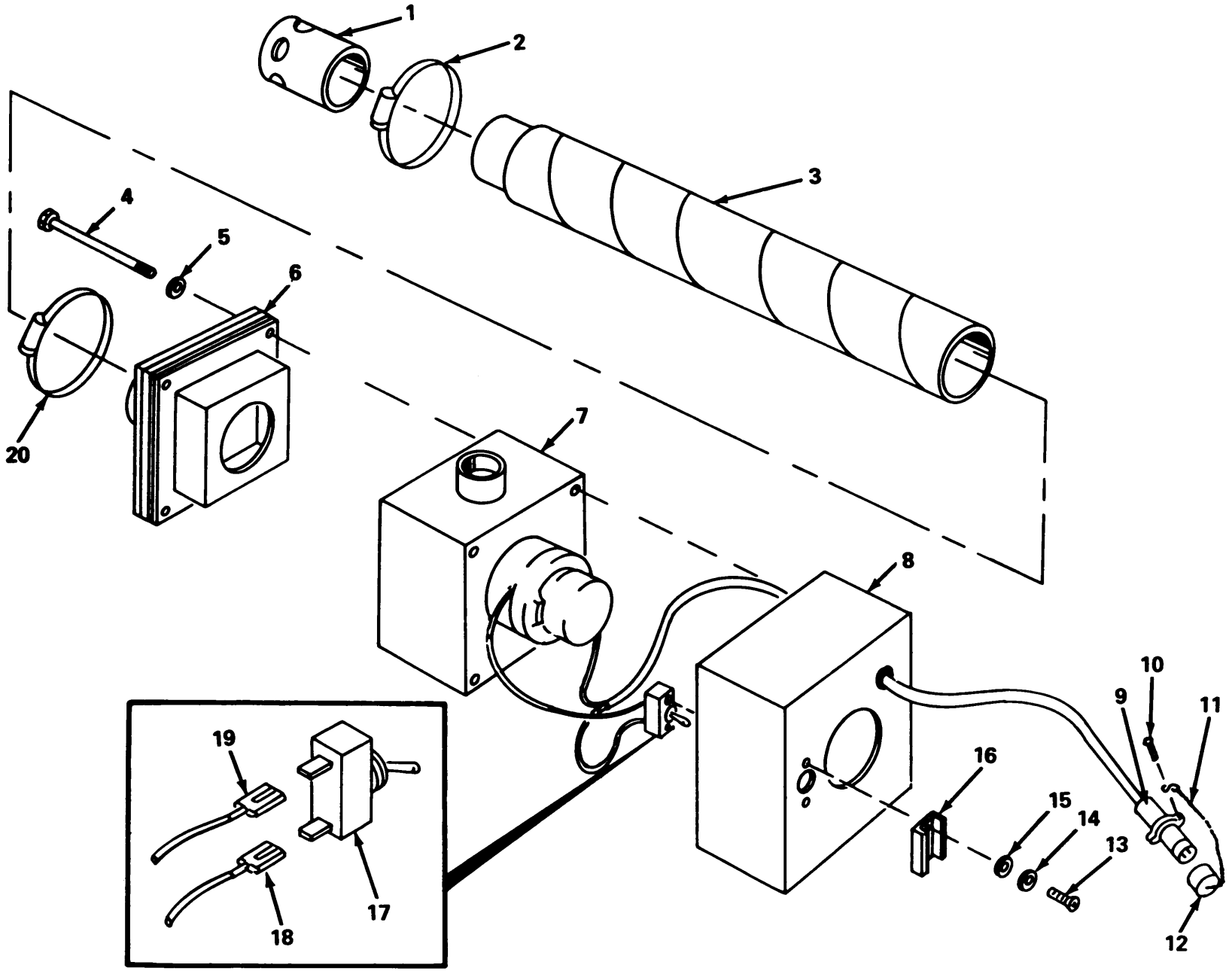


Figure 4–25. Evacuation fan, exploded view.

(2) *Installation*. Installation is the reverse of removal ((1) above).

b. *Plug Connector.*

(1) *Removal*

(a) Remove connector cover (a(l) above).

(b) Disassemble and remove plug connector (9).

(2) *Installation.* Installation is there verse of removal ((1) above), except connect black lead to pin "A" and white lead to pin "B" of plug connector (9).

4-63. Evacuation Fan

Organizational maintenance personnel are authorized to test the evacuation fan for continuity.

a. Disassembly and Continuity Test.

(1) Remove four screws (4, fig. 4-25) and washers (5).

(2) Remove fan cover (6) with evacuation hose (3) attached.

(3) Separate the outlet plenum (8) and motor cover (7).

(4) Check for continuity of motor between pin "B" of plug connector (9) and terminal (18) (black wire). There should be continuity between these two points.

b. Reasembly. Reassembly is the reverse of disassembly (a(1) through (3) above).

4-64. Shield and Circuit Breaker

Organizational maintenance personnel are authorized to replace the shield, circuit breaker, and attaching hardware.

a. *Shield.*

(1) *Removal.*

(a) Remove evacuation fan (para 4-63a (1) through (3)).

(b) Remove two screws (13, fig. 4-25), lockwashers (14), washers (15), and switch shield (16).

(2) *Installation.* Installation is the reverse of removal ((1) above).

b. Circuit Breaker.

(1) *Removal.*

(a) Remove shield *(a* (1) above).

(b) Remove circuit breaker (17, fig. 4-25) from outlet plenum (8).

(c) Remove electrical leads from circuit breaker (17).

(2) *Installation.* Installation is the reverse of removal ((1) above), except install electrical connector adapter kit furnished with new circuit breaker.

4-65. Male Fitting

Organizational maintenance personnel are authorized to replace the male fitting and attaching hardware.

a. Removal.

(1) Loosen clamp (2, fig. 4-25).

(2) Remove male fitting (1) from hose (3).

b. Installation. Installation is the reverse of removal *(a* above).

4-66. Evacuation Hose

Organizational maintenance personnel are authorized to replace the evacuation hose and attaching hardware.

a. Removal.

(1) Loosen clamp (20, fig. 4-25).

(2) Remove hose (3) with male fitting (1) and clamp (2) assembled.

(3) Remove clamp (20).

(4) Remove clamp (2) and male fitting (1) from hose (3).

b. Installation. Installation is the reverse of removal *(a* above).

Section XIII. SHELTER AIR DUCTS, EVACUATION MANIFOLD, AIRDUCT HOSE, AND STORAGE RETAINERS

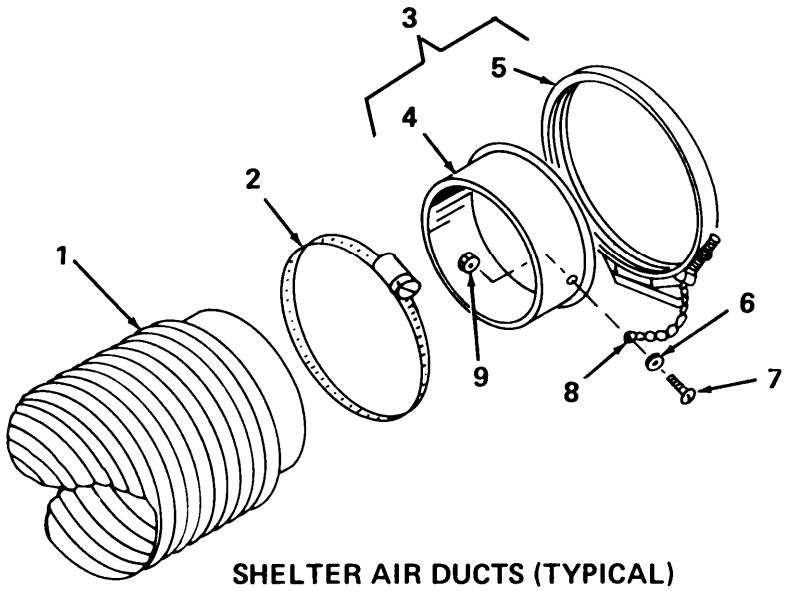
4-67. Shelter Air Ducts

Organizational maintenance personnel are authorized to replace the coulpings, adapters, hose and attaching hardware.

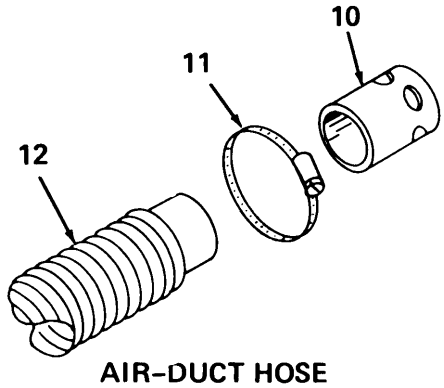
a. Coupling. Instructions for replacing one coupling are typical for all couplings.

(1) *Removal.*

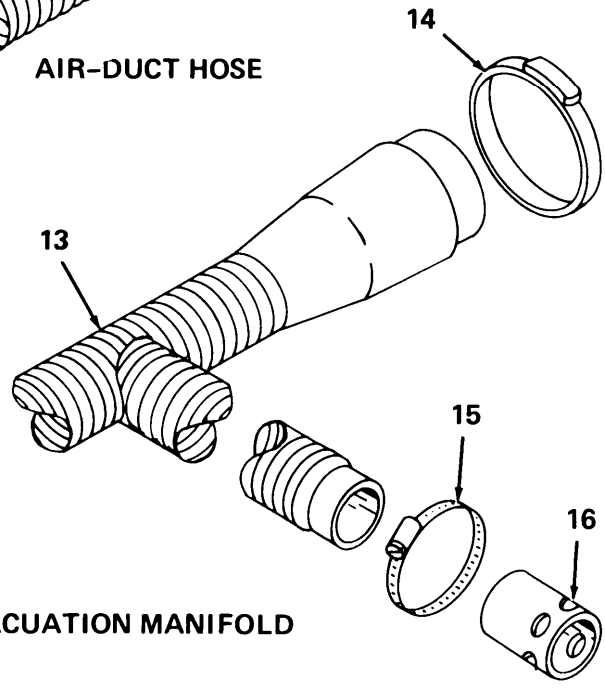
(a) Remove locknut (9, fig. 4–26), screw (7), and washer (6) securing chain (8) to tube (4).



SHELTER AIR DUCTS (TYPICAL)



AIR-DUCT HOSE



EVACUATION MANIFOLD

AR600241

1 Hose
2 Clamp
3 Air duct adapter
4 Tube
5 Coupling
6 Washer
7 Screw
8 Chain
9 Locknut
10 Exhaust fitting
11 Clamp
12 Hose
13 Evacuation manifold
14 Clamp
15 Clamp
16 Exhaust fittings

Figure 4-26. Shelter air ducts, air duct hose, and evacuation manifold, exploded view.

(b) Remove coupling (5) from tube (4).

(2) *Installation.* Installation is the reverse of removal ((1) above).

b. Air Duct Adapter, and Air Duct Adapter and Retainer. Instructions for replacing one air duct adapter or air duct adapter and retainer are typical for all air duct adapters and air duct adapter retainers. The difference between the air adapter and the air duct adapter retainer is that the retainer has two bars through its opening (fig. 2-17).

(1) *Removal.*

(a) Loosen clamp (2, fig. 4-26).

(b) Remove air duct adapter (3) or air duct adapter retainer from hose (1).

(c) If necessary, remove clamp (2) from hose (l).

(2) *Installation.* Installation is the reverse of removal ((1) above).

c. Hose. Instructions for replacing one hose are typical for all hoses.

(1) *Removal.*

(a) Loosen clamp (2, fig. 4-26).

(b) Remove air-duct adapter (3) from hose (l).

(c) Remove clamp (2).

(d) Repeat above procedures on opposite end of hose.

(2) *Installation.* Installation is the reverse of removal ((1) above).

4-68. Air Duct Hose

Organizational maintenance personnel are authorized to replace the male exhaust fittings, hose, and attaching hardware.

a. Exhaust Fittings. Instructions for replacing one exhaust fitting are typical for both.

(1) *Removal.*

(a) Loosen clamp (11, fig. 4-26).

(b) Remove exhaust fitting (10) from hose (12).

(c) If necessary, remove clamp (11).

(2) *Installation.* Installation is the reverse of removal ((1) above).

b. Hose.

(1) *Removal.*

(a) Loosen clamp (11) and remove exhaust fitting (10).

(b) Remove clamp (11).

(c) Repeat above procedures on opposite end of hose.

(2) *Installation.* Installation is the reverse of removal ((1) above).

4-69. Evacuation Manifold

Organizational maintenance personnel are authorized to replace the exhaust fittings and attaching hardware. The exhaust fittings (16, fig. 4-26) are removed and installed by the same procedures as the air duct hose exhaust fittings (para 4-68 *a).*

4-70. Air Duct Storage Retainers

Organizational maintenance personnel are authorized to replace the air duct storage retainers. Replacement consists of inspecting the storage retainers (fig. 1-11) for damage. If the storage retainer is not serviceable, replace the storage retainer.

Section XIV. CABLE AND LIGHT ASSEMBLIES

4-71. Entrance Cable and Light Assembly

Organizational maintenance personnel are authorized to replace the extension light, hangers, loop clamps and attaching hardware.

a. Extension Light.

(1) *Removal.*

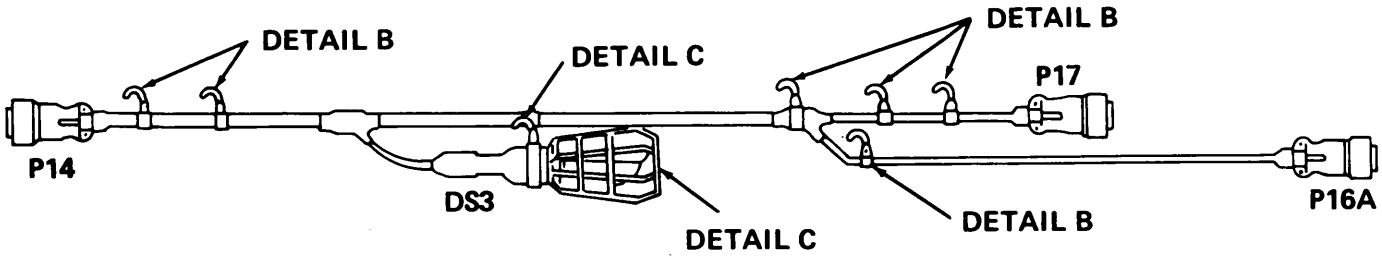
(a) Set LIGHTS switch (1, fig. 2-3) to OFF.)

(b) If necessary, remove cable from strap hangers.

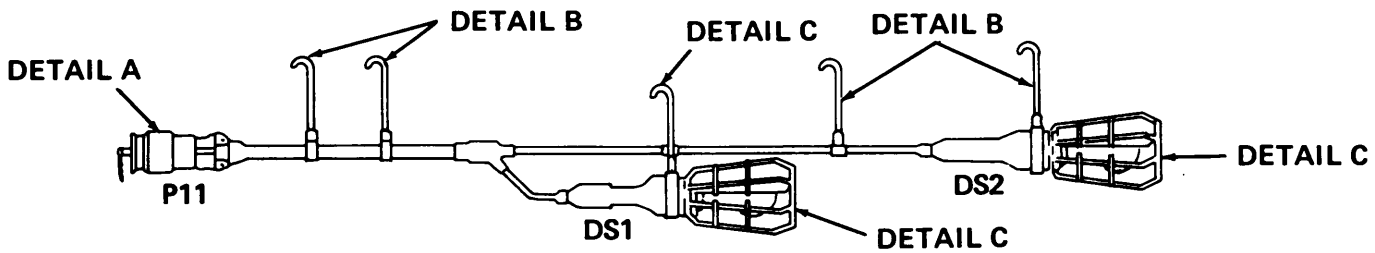
(c) Remove two screws (15, fig. 4-27) and light (16).

Legend for fig. 4-27:

1 Screw
2 Chain
3 Cover
4 Plug connector
5 Cable
6 Locknut
7 Washer
8 Clamp
9 Hanger
10 Screw
11 Holder
12 Hanger
13 Locknut
14 Washer
15 Screw
16 Extension light
17 Incandescent lamp
18 Clamp
19 Screw
20 Clamp



ENTRANCE CABLE AND LIGHT ASSEMBLY



SHELTER CABLE AND LIGHT ASSEMBLY

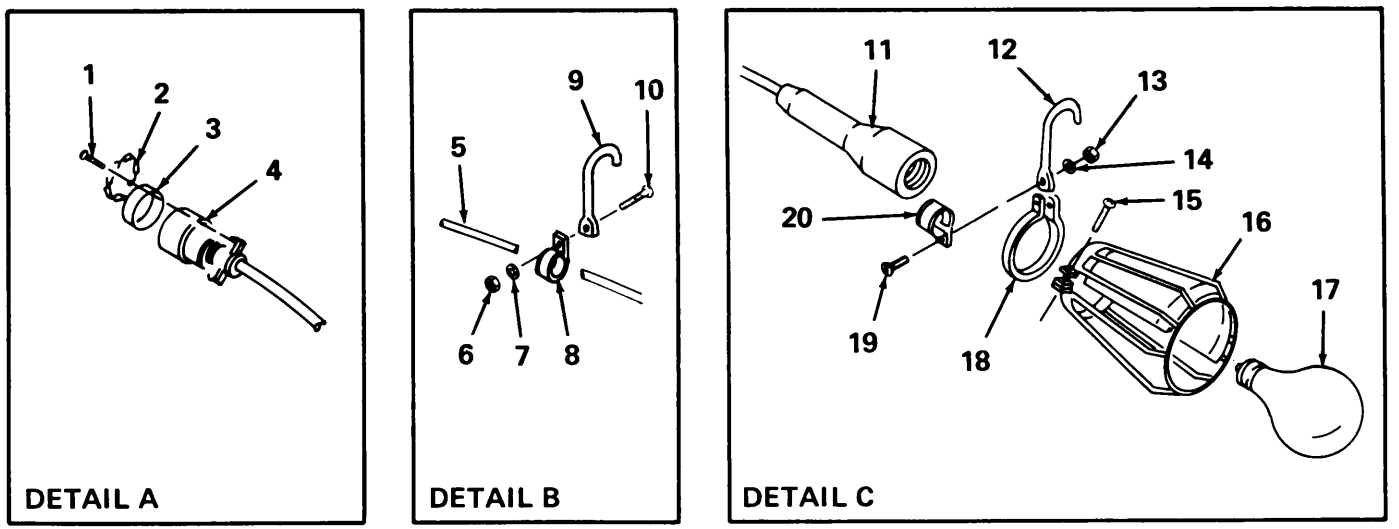


Figure 4-27. Cable and light assemblies, exploded view.

(2) *Installation.* Installation is the reverse of removal ((1) above).

b. Cable Hangers and Loop Clamps. Instructions for replacing one hanger and loop clamp are typical for all hangers and loop clamps.

(1) *Removal.*

(a) Set LIGHTS switch (1, fig. 2-3) to OFF.

(b) If necessary, remove cable from strap hangers.

(c) Remove locknut (6, fig. 4-27), washer (7), screw (10), and hanger (9).

(d) If necessary, remove loop clamp (8) from cable (5).

(2) *Installation.* Installation is the reverse of removal ((1) above).

c. Extension Light Hangers and Loop Clamps. Instructions for replacing one extension light hanger and loop clamp are typical for all extension light hangers and loop clamps.

(1) *Removal.*

(a) Set LIGHTS switch (1, fig. 2-3) to OFF.

(b) If necessary, remove cable from strap hangers.

(c) Remove locknut (13, fig. 4-27), washer (14), screw (19), loop clamp (20), and hanger (12).

(d) If necessary, remove loop clamp (18).

(2) *Installation.* Installation is the reverse of removal ((1) above).

4-72. Shelter Cable and Light Assembly

Organizational maintenance personnel are authorized to replace the extension lights, hangers, loop clamps, connector cover, and attaching hardware.

a. Extension Lights. The extension lights are removed and installed by the same procedures as the entrance cable and light assembly extension light (para 4-71 *a*).

b. Cable Hangers and Loop Clamps. The cable hangers and loop clamps are remove and installed by the same procedures as the entrance cable hangers and loop clamps (para 4-71 *b).*

c. Extension Hanger and Loop Clamps. The extension hanger and loop clamps are removed and installed by the same procedures as the entrance extension hanger and loop clamps (para 4-71 *c*).

d. Connector Cover.

(1) *Removal.* Remove screw (1, fig. 4-27), securing chain (2) to plug connector (4). Remove cover (3).

(2) *Installation.* Installation is the reverse of removal ((1) above).

Section XV. DRIVE BELTS

4-73. Centrifugal Blower V-belt

Organizational maintenance personnel are authorized to replace the centrifugal blower V-belt.

a. Shutdown Procedures.

(1) Set environmental control switch (14, fig. 2-3) to CIRCULATE (center position).

NOTE

If system has been operating in heating mode, do not proceed until heater blower shuts down.

(2) Set circuit breakers (1, 2, 3, and 4, fig. 2-2) to OFF.

(3) Pull on throttle (9, fig. 2-1) until idle speed is obtained. Turn throttle clockwise to lock in idle position. Idle engine 3 minutes, then set ENGINE CONTROL switch (13, fig. 2-2) to OFF. After engine stops, push throttle fully in and lock.

(4) If engine fails to stop, pull out choke control to stop engine (TM 5-2805-259-14).

b. Removal.

(1) Loosen four screws (8, fig. 3-8).

(2) Rotate adjusting bolt (10) to loosen V-belt (15).

(3) Remove V-belt (15).

c. Installation.

(1) Position V-belt on engine and centrifugal blower pulleys.

(2) Rotate adjustment bolt (10) to tighten V-belt.

(3) Check for proper belt tension (table 3-4) and adjust belt accordingly.

(4) Tighten four screws (8). Recheck V-belt tension.

4-74. Generator Timing Belt

Organizational maintenance personnel are authorized to replace the generator timing belt.

a. Removal.

(1) Remove centrifugal blower V-belt (para 4-73 *a* and *b).*

(2) Loosen nut (13, fig. 3-8). Rotate adjusting bolt (12) to loosen timing belt (14).

(3) Remove timing belt (14).

b. Installation.

CAUTION

New generator timing belts will stretch and disengage with teeth of pulleys. To avoid damage to a new timing belt, adjust belt every 4 hours for the first 12 hours of operation.

(1) Position timing belt on engine and generator pulleys. Insure timing belt teeth mesh with pulley teeth,

(2) Rotate adjusting bolt (12) to tighten timing belt (14).

(3) Check for proper belt tension (table 3-4) and adjust belt accordingly.

(4) Tighten nut (13).

(5) Install centrifugal blower V-belt (para 4-73 *c*).

(6) Recheck timing and V-belt tension.

4-75. Refrigerant Compressor V-belts

Organizational maintenance personnel are authorized to replace the refrigerant compressor V-belts.

a. Removal.

(1) Remove generator timing belt (para 4-74 *a).*

(2) Loosen four screws (5, fig. 3-8) and nut (6).

(3) Rotate adjusting bolt (7) to loosen V-belts (2) and (3).

(4) Remove V-belts (2) and (3).

b. Installation.

(1) Position V-belts on engine and refrigerant compressor pulleys.

(2) Rotate adjusting bolt (7) to tighten V-belts (2) and (3).

(3) Check for proper belt tension (table 3-4) and adjust belt accordingly.

(4) Tighten nut (6).

(5) Tighten four screws (5).

(6) Install generator timing belt (para 4-74 *b).*

(7) Recheck tension of belts.

Section XVI. MAIN CONTROL INDICATOR

4-76. Main Control Indicator

Organizational maintenance personnel are authorized to replace the main control indicator and attaching hardware.

4-77. Shutdown Procedures

a. Set environmental control switch (14, fig. 2-3) to CIRCULATE (center position).

NOTE

If system has been operating in heating mode, do not proceed until heater blower shuts down.

b. Set circuit breakers (1, 2, 3, and 4, fig. 2-2) to OFF.

c. Pull out throttle (9, fig. 2-1) until idle speed is obtained. Turn throttle clockwise to lock in idle position. Idle engine 3 minutes, then set ENGINE CONTROL switch (13, fig. 2-2) to OFF. After engine stops, push throttle fully in and lock.

d. If engine fails to stop, pull out choke control to stop engine (TM 5-2805-259-14).

4-78. Removal

a. Release four catches (30, fig. 3-8) and remove access cover (1).

b. Remove four screws (28) and washers (27).

c. Disconnect plug connector (9) from receptacle connector (23).

d. Remove four screws (33) and washers (32).

e. Remove two screws (6) and washers (7).

f. Remove two screws (34) and washers (35).

g. Disconnect plug connector (8) from receptacle connector (21).

h. Disconnect plug connectors (24, 25, and 26) from receptacle connectors (5, 4, and 3) respectively.

i. Remove locknut (20), washer (19), screw (10), and clamp (18).

j. Remove locknut (39), washer (38), screw (36), and clamp (37).

k. Lift main control indicator (2) from shelter recirculation fan cabinet (22).

4-79. Installation

Installation is the reverse of removal (para 4-78).

Section XVII. FUEL SYSTEM

4-80. Fuel Tank Cap

Organizational maintenance personnel are authorized to replace the fuel tank cap and attaching hardware.

a. Removal.

(1) Remove screw (7, fig. 3-11) and washer (6) securing chain (8) to shield (12).

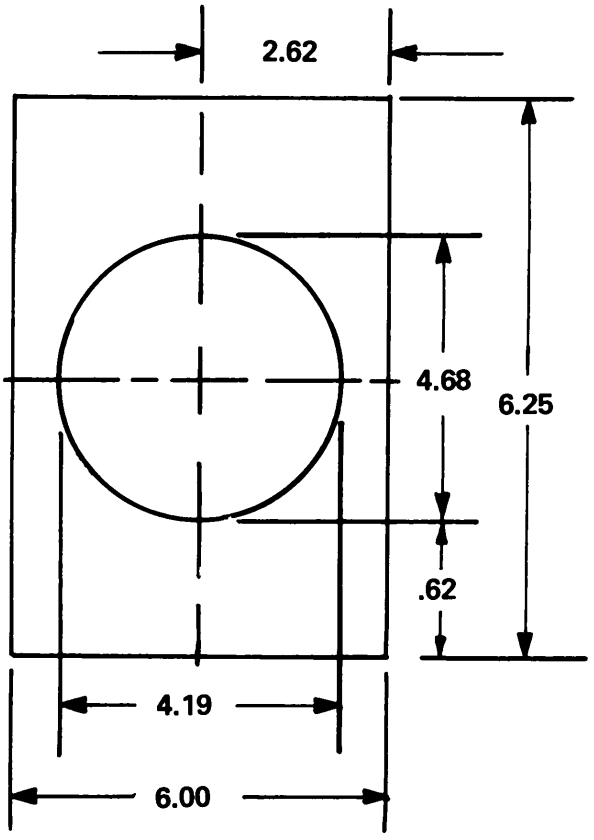
(2) Remove fuel tank cap (5) from fill neck (1).

b. Installation. Installation is the reverse of removal *(a* above).

4-81. Pad

Organizational maintenance personnel are authorized to manufacture and replace the pad.

a. Manufacture. Fabricate pad (fig. 4-28).



NOTES:

1. **Material: Rubber gasket material, 50 durometer hardness, class 1, MIL SPEC, MIL-R-15624.**
2. **Dimensions in inches.**

AR600243

Figure 4-28. Pad fabrication.

b. Removal.

(1) Remove fuel tank cap (5, fig. 3-11) from fill neck (1).

(2) Remove pad (2) from shield (12).

(3) Remove adhesive sealant residue from shield with decreasing solvent (item 10, table 1-3).

c. Installation.

(1) Install pad (2) on shield (12) with adhesive sealant (item 12, table 1-3).

(2) Install fuel tank cap (5) on fill neck (1).

4-82. Fuel Gage

Organizational maintenance personnel are authorized to replace the fuel gage.

a. Removal.

(1) Remove four locknuts (21, fig. 3-11) and screws (11).

(2) Move enclosure (20) away from shield (12) to allow for sufficient working space.

(3) Identify and tag electrical leads (fig. 4-29).

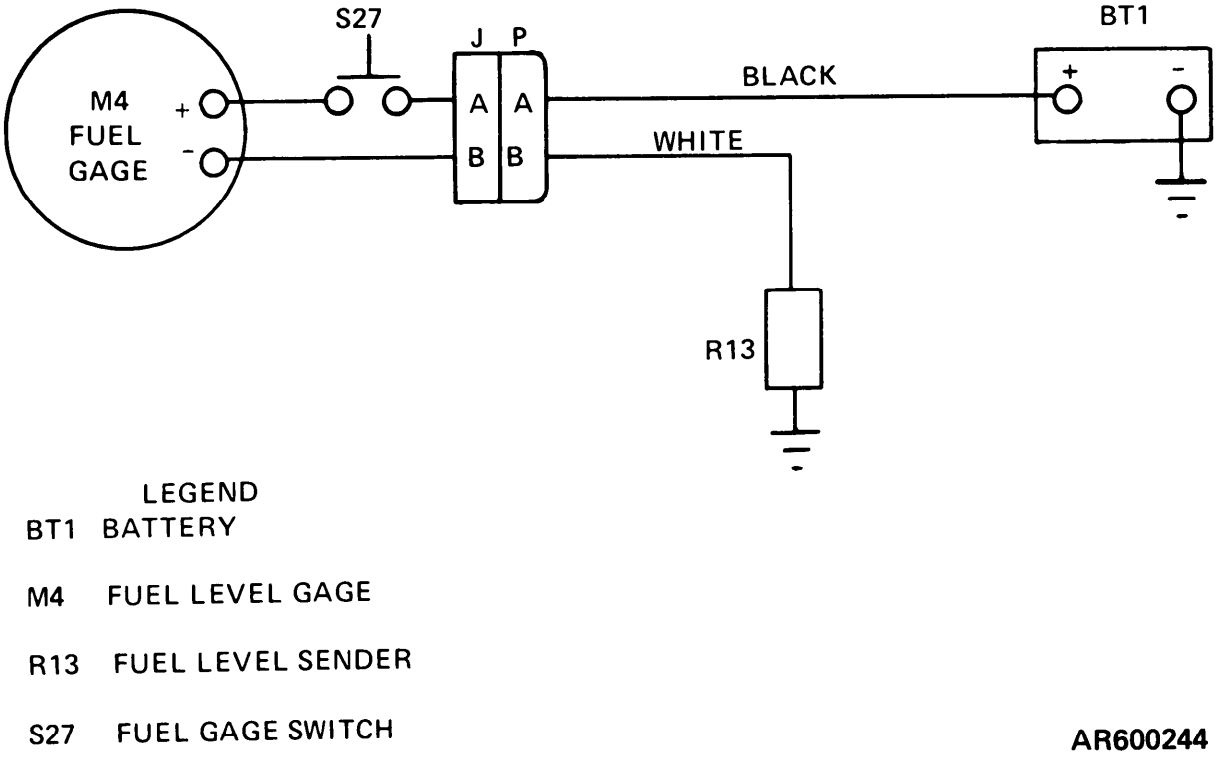


Figure 4-29. Fuel gage wiring diagram.

(4) Disconnect electrical leads from fuel gage (9, fig. 3-11).

(5) Remove two nuts (22), lockwashers (23), clamp (24), and fuel gage (9).

b. Installation. Installation is the reverse of removal *(a* above), except remove and discard warning tag and clamp retainer from new fuel gage.

4-83. Switch

Organizational maintenance personnel are authorized to replace the switch.

a. Removal.

(1) Disconnect plug connector (16, fig. 3-11) from receptacle connector (15).

(2) Remove four locknuts (21) and screws (11).

(3) Move enclosure (20) away from shield (12) to allow for sufficient working space.

(4) Identify and tag electrical leads (fig. 4-29).

(5) Disconnect electrical leads from switch (10, fig. 3-11).

(6) Remove nut (14) and lockwasher (13).

(7) Remove switch (10).

b. Installation. Installation is the reverse of removal *(a* above).

4-84. Enclosure and Receptacle Connector

Organizational maintenance personnel are authorized to replace the enclosure, receptacle connector, and attaching hardware.

a. Removal.

(1) Disconnect plug connector (16, fig. 3-11) from receptacle connector (15).

(2) Remove four locknuts (21) and screws (11).

(3) Move enclosure (20) away from shield (12) to allow for sufficient working space.

(4) Identify and tag electrical leads (fig. 4-29).

(5) Disconnect black lead from switch (10, fig. 3-11) and white lead from fuel gage (9).

(6) Remove four nuts (17), washers (18), and screws (19).

(7) Remove receptacle connector (15) from enclosure (20).

(8) Remove electrical leads from receptacle connector.

b. Installation. Installation is the reverse of removal *(a* above).

4-85. Fuel Gage and Switch Shield

Organizational maintenance personnel are authorized to replace the gage, switch shield, and attaching hardware.

a. Removal.

(1) Remove screw (7, fig. 3-11) and washer (6) securing chain (8) to shield (12).

(2) Remove fuel tank cap (5) from fill neck (l).

(3) Disconnect plug connector (16) from receptacle connector (15).

(4) Remove three screws (3) and shield (12) with attached components from trailer.

(5) Remove fuel gage (para 4-82 *a).*

(6) Disconnect electrical leads from switch (10).

(7) Remove nut (14), lockwasher (13), and switch (lo).

b. Installation. Installation is the reverse of removal *(a* above), except manufacture and install a new pad (2) (para 4-81 *a* and *b,* steps (2) and (3)).

4-86. Vent Tube Shield

Organizational maintenance personnel are authorized to replace the vent tube shield and attaching hardware.

a. Removal. Remove four screws (28, fig. 3-11) and vent tube shield (27).

b. Installation. Installation is the reverse of removal *(a* above).

4-87 Paragraph 4-87 deleted

4-88. Heater Fuel Pump

Organizational maintenance personnel are authorized to replace the fuel pump filter and ancillary items.

a. Removal.

(1) If heater is ON, set ENVIRONMENTAL CONTROL switch (14, fig. 2-3) to CIRCULATE (center position). Wait approximately 10 minutes before performing the following steps.

(2) Loosen cover (29, fig. 3-11) by twisting with a downward motion.

(3) Remove cover (29), gasket (30), magnet (31), and filter element (32).

b. Installation. Installation is the reverse of removal *(a* above).

4-89. Fuel Filter

Organizational maintenance personnel are authorized to replace the fuel filter, Requisitioning information is in TM 5-2805-259-24P.

a. Removal.

(1) If heater is ON, set ENVIRONMENTAL CONTROL switch (14, fig. 2-3) to CIRCULATE (center position). Wait approximately 10 minutes before performing the following steps.

(2) Disconnect tubing from elbows (38 and 39, fig. 3-11).

(3) Remove elbows (38) and (39) from fuel filter (37).

b. Installation. Installation is the reverse of removal *(a* above), except apply a film of antiseize compound (item 15, table 1-3) or use antiseize tape (item 16) on pipe threads of elbows.

4-90. Fuel Filter Bowl

Organizational maintenance personnel are authorized to replace the fuel filter bowl and gasket. Requisitioning information is in TM 5-2805-259-24P.

a. Removal.

(1) If heater is ON, set ENVIRONMENTAL CONTROL switch (14, fig. 2-3) to CIRCULATE (center position). Wait approximately 10 minutes before performing the following steps.

(2) Hold the bowl (34, fig. 3-11) and loosen thumbscrew (36) sufficiently to allow the bail to swing to one side.

(3) Remove bowl (34) by gently twisting with a downward motion.

(4) Remove gasket (35) from fuel filter head.

b. Installation. Installation is the reverse of removal *(a* above).

a. Removal.

(1) If heater is ON, set ENVIRONMENTAL CONTROL switch (14, fig. 2-3) to CIRCULATE (center position). Wait approximately 10 minutes before performing the following steps.

(2) Disconnect tubing from elbows (38 and 39, fig. 3–11).

(3) Remove elbows (38) and (39) from fuel filter (37).

b. Installation. Installation is the reverse of removal *(a* above), except apply a film of antiseize compound (item 15, table 1–3) or use antiseize tape (item 16) on pipe threads of elbows.

4-90. Fuel Filter Bowl

Organizational maintenance personnel are authorized to replace the fuel filter bowl and gasket. Requisitioning information is in TM 5-2805-259-24P.

a. Removal.

(1) If heater is ON, set ENVIRONMENTAL CONTROL switch (14, fig. 2-3) to CIRCULATE (center position). Wait approximately 10 minutes before performing the following steps.

(2) Hold the bowl (34, fig. 3-11) and loosen thumbscrew (36) sufficiently to allow the bail to swing to one side.

(3) Remove bowl (34) by gently twisting with a downward motion.

(4) Remove gasket (35) from fuel filter head.

b. Installation. Installation is the reverse of removal *(a* above).

Section XVIII. GASOLINE ENGINE

4-91. Throttle Adjustment

Organizational maintenance personnel are authorized to adjust the throttle.

a. Shutdown Procedures.

(1) Set environmental control switch (14, fig. 2-3) to CIRCULATE (center position).

NOTE

If system has been operating in heating mode, do not proceed until heater blower shuts down.

(2) Set circut breaker (1, 2, 3, and 4, fig. 2–2) to OFF.

(3) Pull out throttle (9, fig. 2-1) until idle speed is obtained. Turn throttle clockwise to lock in idle position. Idle engine 3 minutes, then set ENGINE CONTROL switch (13, fig. 2–2) to OFF. After engine stops, push throttle fully in and lock.

(4) If engine fails to stop, pull out choke control to stop engine (TM 5–2805–259–14).

b. Adjustment. Loosen screw (4, fig. 4–30) and move clamping collar (5) against throttle bracket (3), and tighten screw (4).

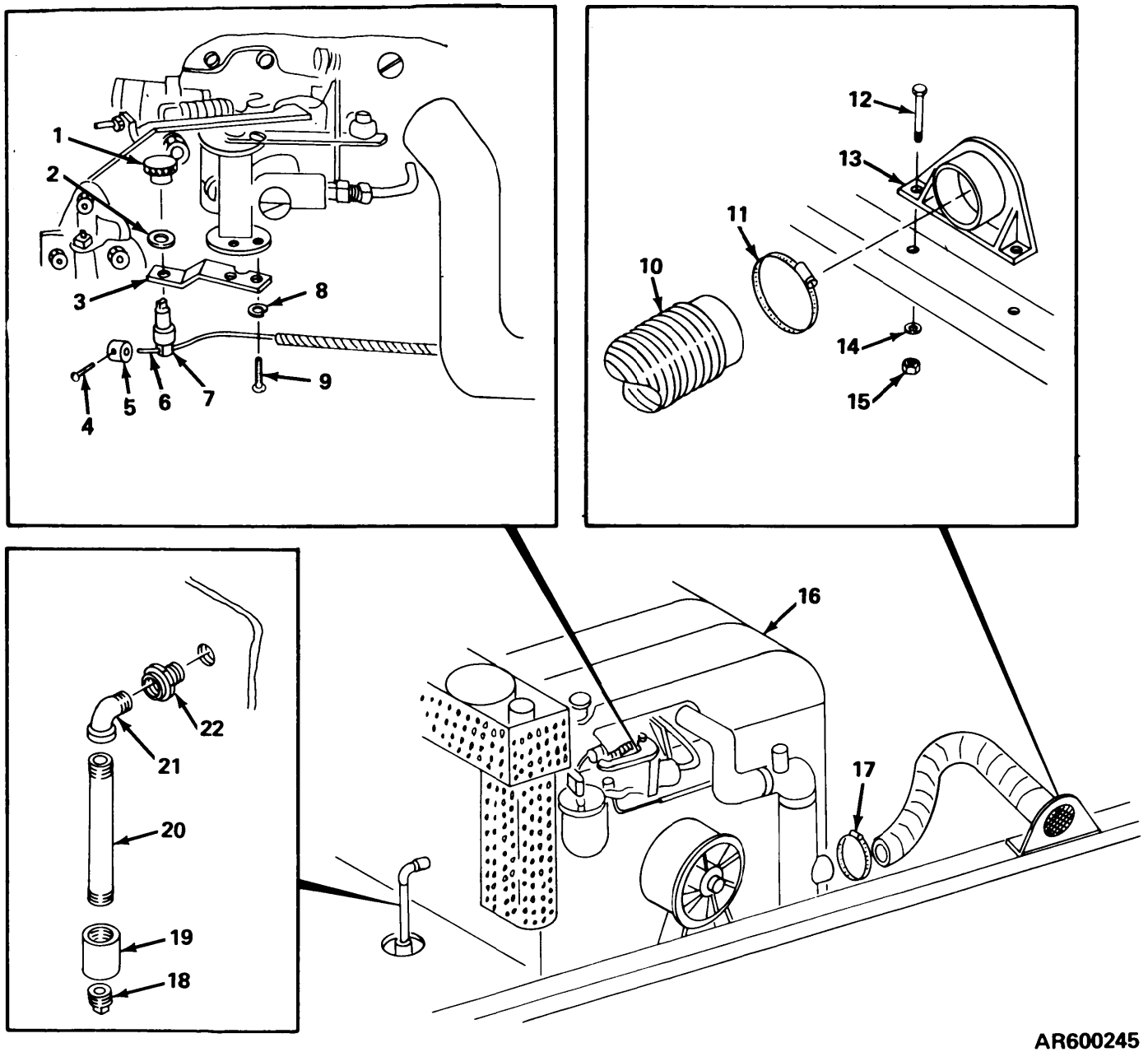


Figure 4-30. Throttle, air duct hose, and oil drain, exploded view.

Legend for fig. 4-30:

1 Nut
2 Washer
3 Throttle bracket
4 Screw
5 Clamping collar
6 Cable
7 Stud
8 Lockwashers
9 Screws
10 Air duct hose
11 Clamp
12 Screws
13 Mounting bracket
14 Washers
15 Locknuts
16 Gasoline engine
17 Clamp
18 Plug
19 Coupling
20 Nipple
21 Elbow
22 Adapter

4-92. Clamping Collar

Organizational maintenance personnel are authorized to replace the cable clamping collar and attaching hardware.

a. Removal.

(1) Perform shutdown procedures (para 4-91 *a*).

(2) Loosen screw (4, fig. 4-30).

(3) Slide clamping collar (5) off of cable (6).

(4) Remove screw (4) from clamping collar (5).

b. Installation. Installation is the reverse of removal *(a* above), except adjust throttle (para 4-91 *b*).

4-93. Air Duct Hose

Organizational maintenance personnel are authorized to replace the air duct hose and attaching hardware.

a. Removal.

(1) Loosen clamps (11 and 17, fig. 4-30) and remove air duct hose (10).

(2) Remove clamps from air duct hose. If damaged, replace clamps.

b. Installation.
removal *(a* above).

4-94. Mounting Bracket

Organizational maintenance personnel are authorized to replace the hose mounting bracket and attaching hardware.

a. Removal.

(1) Loosen clamp (11, fig. 4-30) and remove air duct hose (10) from mounting bracket (13).

(2) Remove two locknuts (15), washers (14), screws (12), and mounting bracket (13).

b. Installation. Installation is the reverse of removal *(a* above).

4-95. Oil Drain

Organizational maintenance personnel are authorized to replace the gasoline engine oil drain components.

a. Removal.

(1) Perform shutdown procedures (para 4-91 *a*).

(2) Remove plug (18, fig. 4-30) and drain oil from engine.

(3) Remove coupling (19), nipple (20), elbow (21), and adapter (22).

b. Installation. Installation is the reverse of removal *(a* above), except refer to LO 5-2805-259-12 for engine lubrication.

Section XIX. ENVIRONMENTAL EQUIPMENT CABINET

4-96. Heater Access Panel and Gasket

a. Heater Access Panel. Organizational maintenance personnel are authorized to replace the heater access panel and attaching hardware.

(1) *Shutdown procedures.*

(a) Set environmental control switch (14, fig. 2-3) to CIRCULATE (center position).

NOTE

If system has been operating in heating mode, do not proceed until heater blower shuts down.

(b) Set circuit breakers (1, 2, 3, and 4, fig. 2-2) to OFF.

(c) Pu1l out throttle (9, fig. 2-1) until idle speed is obtained. Turn throttle clockwise to lock in idle position. Idle engine 3 minutes, then set ENGINE CONTROL switch (13, fig. 2-2) to OFF, After engine stops, push throttle fully in and lock.

(d) If engine fails to stop, pull out choke control to stop engine (TM 5-2805-259-14).

(2) *Removal,*

(a) Loosen 12 screws (31, fig. 4-31) and remove heater access panel (30).

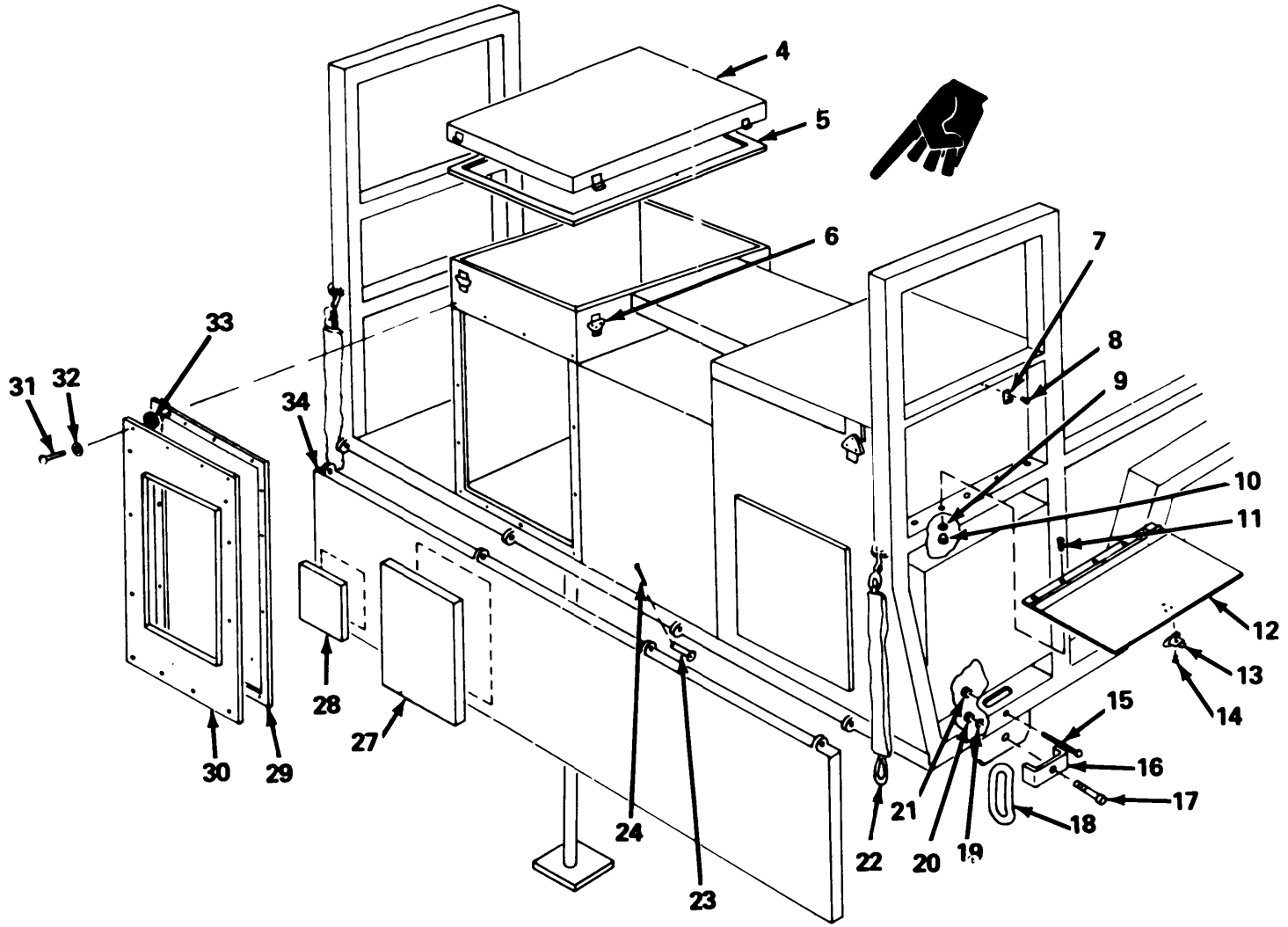


Figure 4-31. Environmental and miscellaneous equipment, exploded view.

Legend for fig. 4-31:

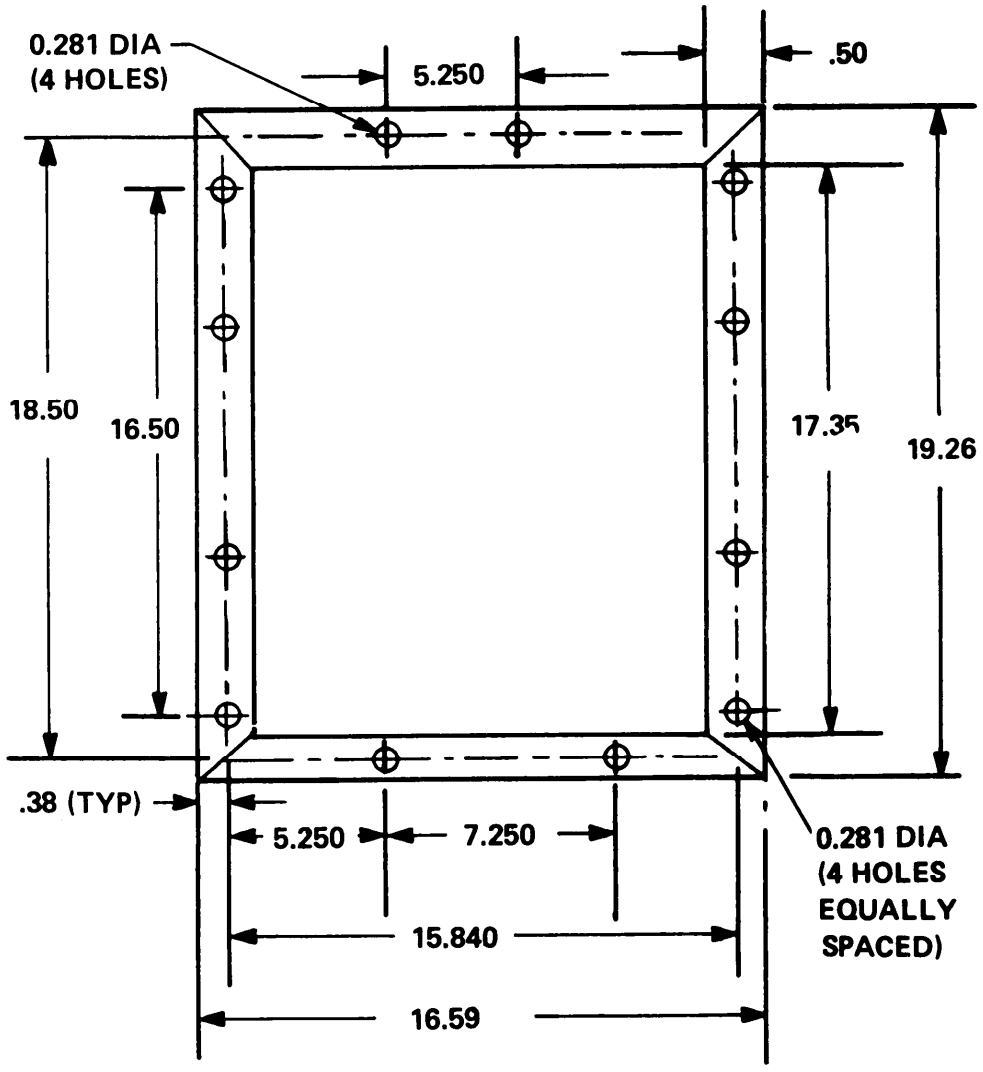
1 Not used
2 Not used
3 Not used
4 Cover
5 Gasket
6 Latches
7 Strike
8 Rivets
9 Washers
10 Locknuts
11 Screws
12 Door
13 Latches
14 Rivets
15 Screw
16 Clamp
17 Screw
18 Ring
19 Washer
20 Locknut
21 Locknut
22 Chains
23 Pins
24 Cotter pins
25 Not used
26 Not used
27 Insulation sheet
28 Insulation sheet
29 Gasket
30 Access panel
31 Screws
32 Washers
33 Nonmetallic washer
34 Tailgate

(b) Remove twelve nonmetallic washers (33), screws (31), and washers (32).

(3) *Installation.* Installation is reverse of removal ((2) above).

b. Gasket. Organizational maintenance personnel are authorized to manufacture and replace the heater access panel gasket.

(1) *Manufacture.* Fabricate gasket (fig. 4-32).



NOTES:

1. Material: Silicone sponge rubber, 0.188 thickness.
2. Corners to be cut 45 degrees after final finish.
3. Dimensions in inches.

Figure 4-32. Heater access pond gasket fabrication.

(2) *Removal.*

(a) Remove heater access panel (para 4-96 *a* (1) and (2)).

(b) Remove gasket (29). Clean gasket and adhesive residue from panel with decreasing solvent (item 10, table 1-3).

(3) *Installation.* Installation is the reverse of removed ((2) above), except use adhesive (item 11, table 1-3) to secure gasket to heater access panel.

4-97. Refrigerant Access Cover and Gasket

a. Refrigerant Access Cover. Organizational maintenance personnel are authorized to replace the refrigerant access cover.

(1) *Removal.*

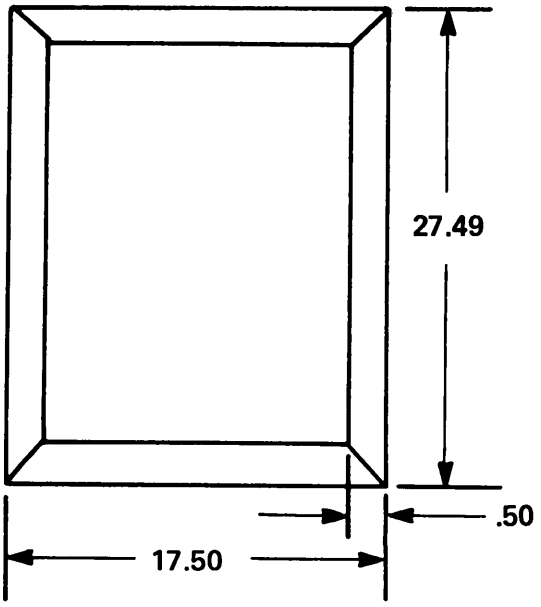
(a) Perform shutdown procedures (para 4-96 *a* (1)).

(b) Release four latches (6, fig. 4-31) and remove cover (4).

(2) *Installation.* Installation is reverse of removal ((1) above).

b. Gasket. Organizational maintenance personnel are authorized to manufacture and replace the refrigerant access cover gasket.

(1) *Manufacture.* Fabricate gasket fig. 4-33).



NOTES:

1. Material: Silicone sponge rubber, 0.188 thickness.

2. Gasket to be cut 45 degrees at corners.

3. Dimensions in inches.

AR600248

Figure 4-33. Refrigerant t access cover gasket fabrication.

(2) *Removal.*

(a) Release four latches (6, fig. 4-31) and remove cover (4).

(b) Remove gasket (5). Clean gasket and adhesive residue from cover with degreasing solvent (item 10, table 1-3).

(3) *Installation.* Installation is reverse of removal ((2) above), except use adhesive (item 11, table 1-3) to secure gasket to access cover.

4-98. Electrical Power Cable

Organizational maintenance personnel are authorized to replace the heater electrical power cable.

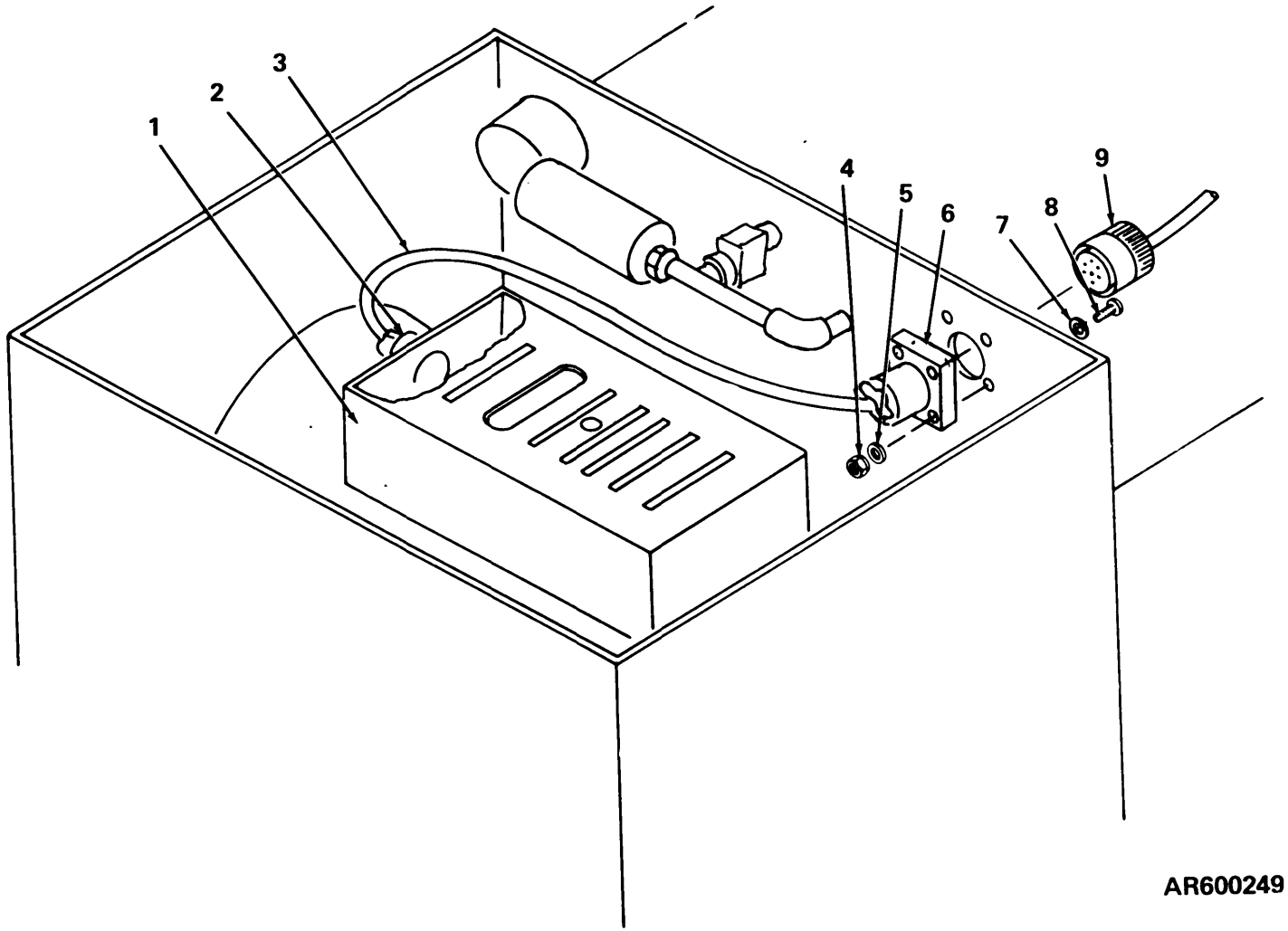
a. Removal.

(1) Perform shutdown procedures (para 4-96 *a.* (l)).

(2) Remove decontaminating apparatus (1, fig. 4-31).

(3) Release four latches (6) and remove cover (4).

(4) Disconnect plug connector (2, fig. 4-34) from heater control box (1).



1 Control box
2 Plug connector
3 Electrical power cable
4 Locknuts
5 Washers
6 Receptacle connector
7 Washers
8 Screws
9 Plug connector

Figure 4-34. Heater electrical power cable.

(5) Disconnect plug connector (9) from receptacle connector (6).

(6) Remove four locknuts (4), washers (5), screws (8), and washers (7).

(7) Remove electrical power cable (3).

b. Installation. Installation is the reverse of removal *(a* above).

Section XX. RECIRCULATION FILTER CABINET

4-99. Shelter Side Support

Organizational maintenance personnel are authorized to replace the shelter side support.

a. Removal.

(1) *Remove* four locknuts (4, fig. 4-3), washers (3), and screws (1).

(2) Remove shelter side support (2).

b. Installation. Installation is the reverse of removal *(a* above).

4-100. Filter Access Cover and Gasket

a. Access Cover. Organizational maintenance personnel are authorized to replace the filter access cover and attaching hardware.

(1) *Shutdown Procedures.*

(a) Set environmental control switch (14, fig. 2-3) to CIRCULATE (center position).

NOTE

If system has been operating in heating mode, do no proceed until heater blower shuts down.

(b) Set circuit breakers (1, 2, 3, and 4, fig. 2-2) to OFF.

(c) Pull out throttle (9, fig. 2-1) until idle speed is obtained. Turn throttle clockwise to lock in idle position. Idle engine 3 minutes, then set ENGINE CONTROL switch (13, fig. 2-2) to OFF. After engine stops, push throttle fully in and lock.

(d) If engine fails to stop, pull out choke control to stop engine (TM 5-2805-259-14).

(2) *Removal.*

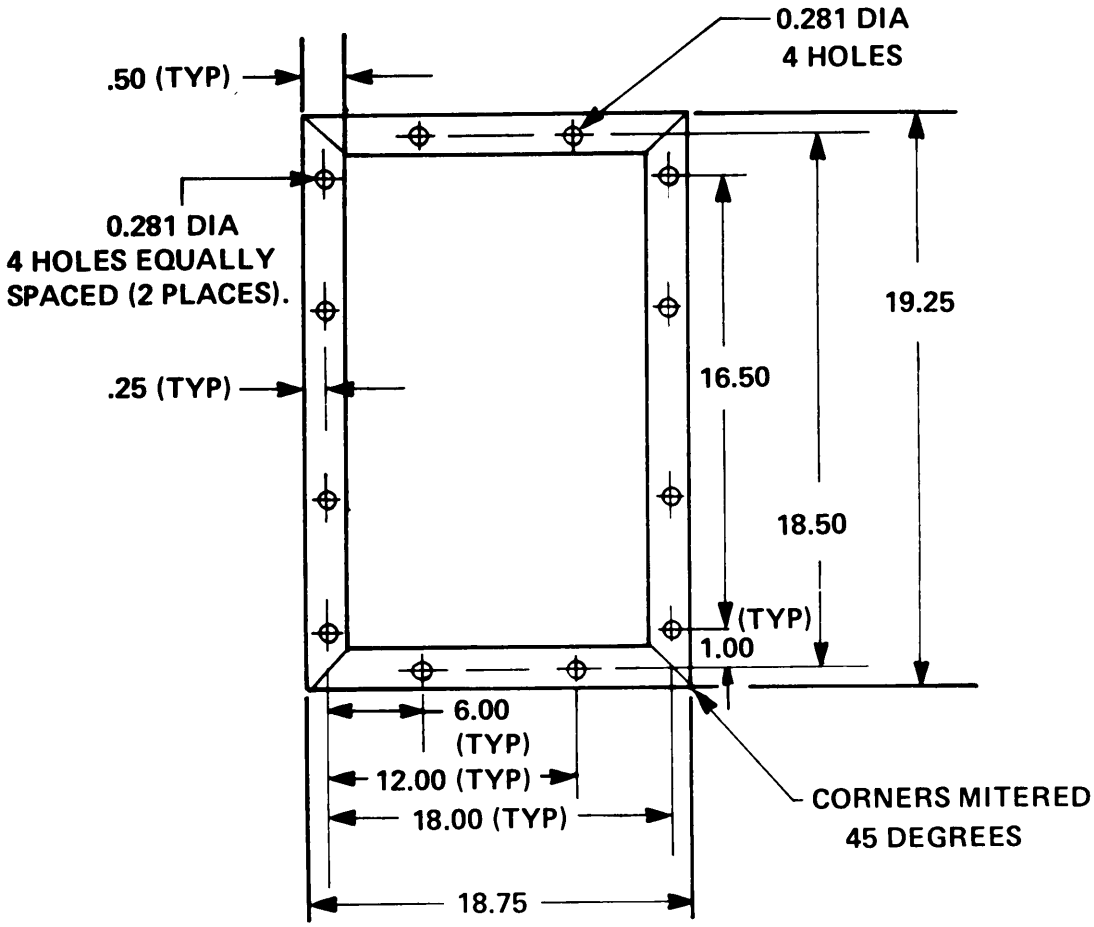
(a) Loosen 12 screws (13, fig. 4-3) and remove access cover (12).

(b) Remove nonmetallic washers (15), screws (13), and washers (14).

(3) *Installation.* Installation is the reverse of removal ((2) above).

b. Gasket. Organizational maintenance personnel are authorized to manufacture and replace the access cover gasket.

(1) *Manufacture.* Fabricate gasket (fig. 4-35).



NOTES:

1. **Material: Silicone sponge rubber, 0.188 thickness.**
2. **Dimensions in inches.**

AR600250

Figure 4-35. Access cover gasket fabrication.

(2) *Removal.*

(a) Remove access cover (para 4-100 *a*).

(b) Remove damaged gasket (11, fig. 4-3). Clean gasket and adhesive residue from cover with degreasing solvent (item 10, table 1-3).

(3) *Installation.*

(a) Secure new gasket (11) to access cover (12) with adhesive sealant (item 11, table 1-3).

(b) Install access cover (para 4- l00 *a* (3)).

4-101. Gas and Particulate Filters

Organizational maintenance personnel are authorized to replace the gas and particulate filters.

a. Removal.

WARNING

The unit commander or senior officer in charge of personnel assigned to remove and dispose of contaminated gas and particulate filters must prescribe the necessary protective clothing to be worn during this operation. He must also prescribe the necessary safety measures to be followed, including the decontamination operations that must be performed before new filters are installed (TM 3-220).

NOTE

Ordinarily, the particulate filter will be replaced when the gas filter is replaced. However, if inspection of the particulate filter shows serviceable, it may be retained for further use. A chemical officer will determine if the filter is serviceable.

(1) Set RECIRCULATION AND ENTRANCE FAN circuit breaker (3, fig. 2-2) to OFF.

(2) Disconnect air-supply duct from box plenum.

(3) Loosen 12 screws (13, fig. 4-3), washers (14), and remove access cover (12).

(4) Using a ¼-inch socket head screw key, rotate adjusting screw (7) counterclockwise until retaining tube (6) is well back from particulate filter (16).

(5) Remove particulate filter (16) and gas filter (10).

b. Installation.

CAUTION

Handle filters with care to prevent damage.

NOTE

Be sure arrow on each filter points to the left, in direction of air-flow.

(1) Slide gas filter (10) into cabinet on channel (9). Press gas filter firmly against cabinet side.

CAUTION

When installing particulate filter, be careful not to tear or multilate fins. Be sure sufficient space exists between gas filter and retaining tube.

(2) Slide particulate filter (16) into cabinet on channel (8).

(3) Rotate adjusting screw (7) clockwise until retaining tube (6) presses filters firmly into position.

(4) Install access cover (12) and secure with screws (13).

(5) Install air-supply duct to box plenum.

(6) Set RECIRCULATION AND ENTRANCE FAN circuit breaker (3, fig. 2-2) to ON.

Section XXI. SHELTER RECIRCULATION FAN CABINET AND EVAPORATOR FAN

4-102. Shelter Recirculation Fan Cabinet

Organizational maintenance personnel are authorized to replace the access cover and to manufacture and replace the access cover gasket.

a. Shutdown Procedures.

(1) Set environmental control switch (14, fig. 2-3) to CIRCULATE (center position).

NOTE

If system has been operating in heating mode, do not proceed until heater blower shuts down.

(2) Set circuit breakers (1, 2, 3, and 4, fig. 2-2) to OFF.

(3) Pull out throttle (9, fig. 2-1) until idle speed is obtained. Turn throttle clockwise to lock in idle position. Idle engine 3 minutes, then set ENGINE CONTROL switch (13, fig. 2-2) to OFF. After engine stops, push throttle fully in and lock.

(4) If engine fails to stop, pull out choke control to stop engine (TM 5-2805-259-14).

b. Access Cover.

(1) *Removal.* Release four latches (21, fig. 4-36) and remove access cover (1).

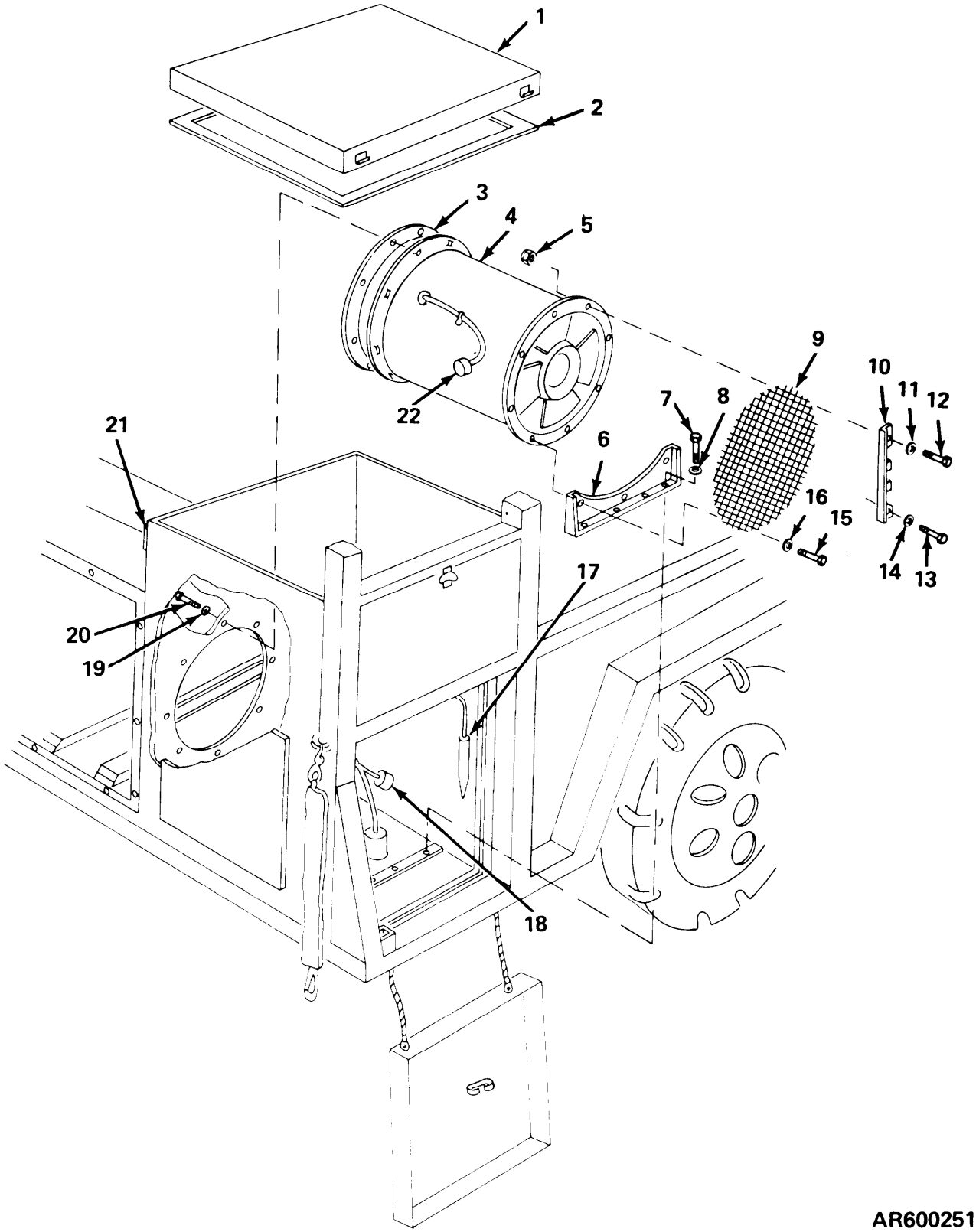


Figure 4-36. Shelter recirculation fan cabinet and evaporator fan, exploded view.

Legend for fig. 4-36:

1 Access cover
2 Gasket
3 Gasket
4 Evaporator tan
5 Locknuts
6 Bracket
7 Screws
8 Washers
9 Screen
10 Bracket
11 Washers
12 Screws
13 Screws
14 Washers
15 Screws
16 Washers
17 Temperature control
18 Plug connector
19 Washers
20 Screws
21 Latches
22 Plug connector

(2) *Installation.* Installation is the reverse of removal ((1) above).

c. Access Cover Gasket.

(1) *Manufacture.* Fabricate gasket (fig. 4-37).

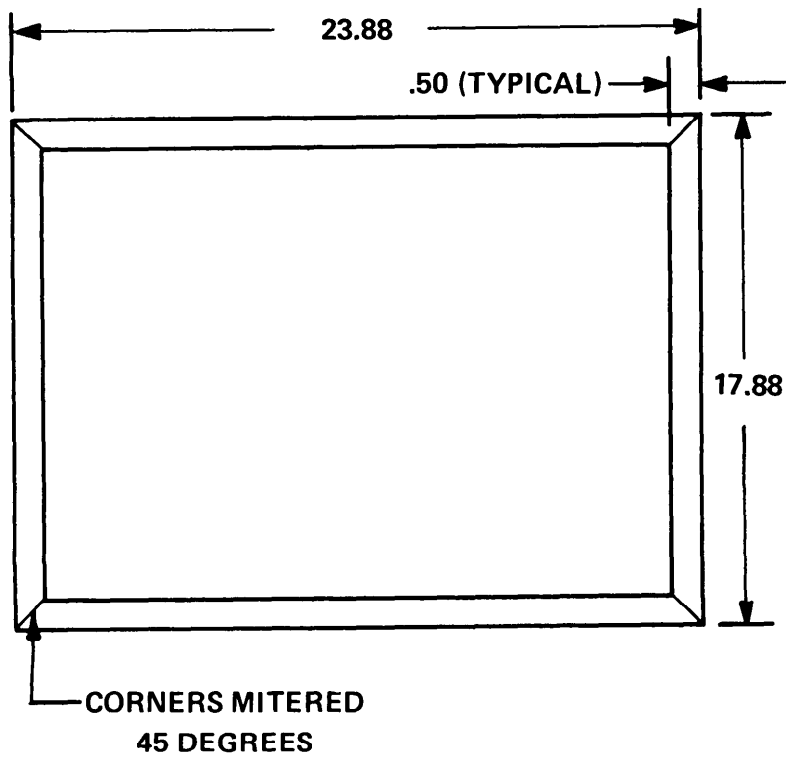


Figure 4-37. Access cover gasket fabrication

(2) *Removal.*

(a) Release four latches (21, fig. 4-36) and remove access cover (1).

(b) Remove gasket (2) from access cover. Clean gasket and adhesive residue from cover with degreasing solvent (item 10, table 1-3).

(3) *Installation.*

(a) Secure gasket (2) to access cover (1) with adhesive sealant (item 11, table 1-3).

(b) Place access cover in position and secure with four latches (21).

4-103. Evaporator Fan and Gasket

Organizational maintenance personnel are authorized to replace the evaporator fan and to manufacture and replace the gasket.

a. Evaporator Fan.

(l) Removal and Disassembly.

(a) Remove main control indicator (para 4-77 and 4-78).

(b) Release four catches (12, fig. 2-11) and remove sound-attenuating plenum (6) with air-return duct attached.

(c) Remove temperature control (17, fig. 4-36) from bracket (10).

(d) Remove gas-particulate filters (para 4-10l *a*, steps (3) through (5)).

(e) Remove four screws (7) and washers (8).

(f) Remove eight screws (20) and washers (19).

(g) Remove evaporator fan (4) from cabinet with mounting bracket (6), bracket (10), and screen (9) attached.

(h) Remove gasket (3).

(i) Remove locknut (5), screw (12), washer (11), screw (13), washer (14), and bracket (10).

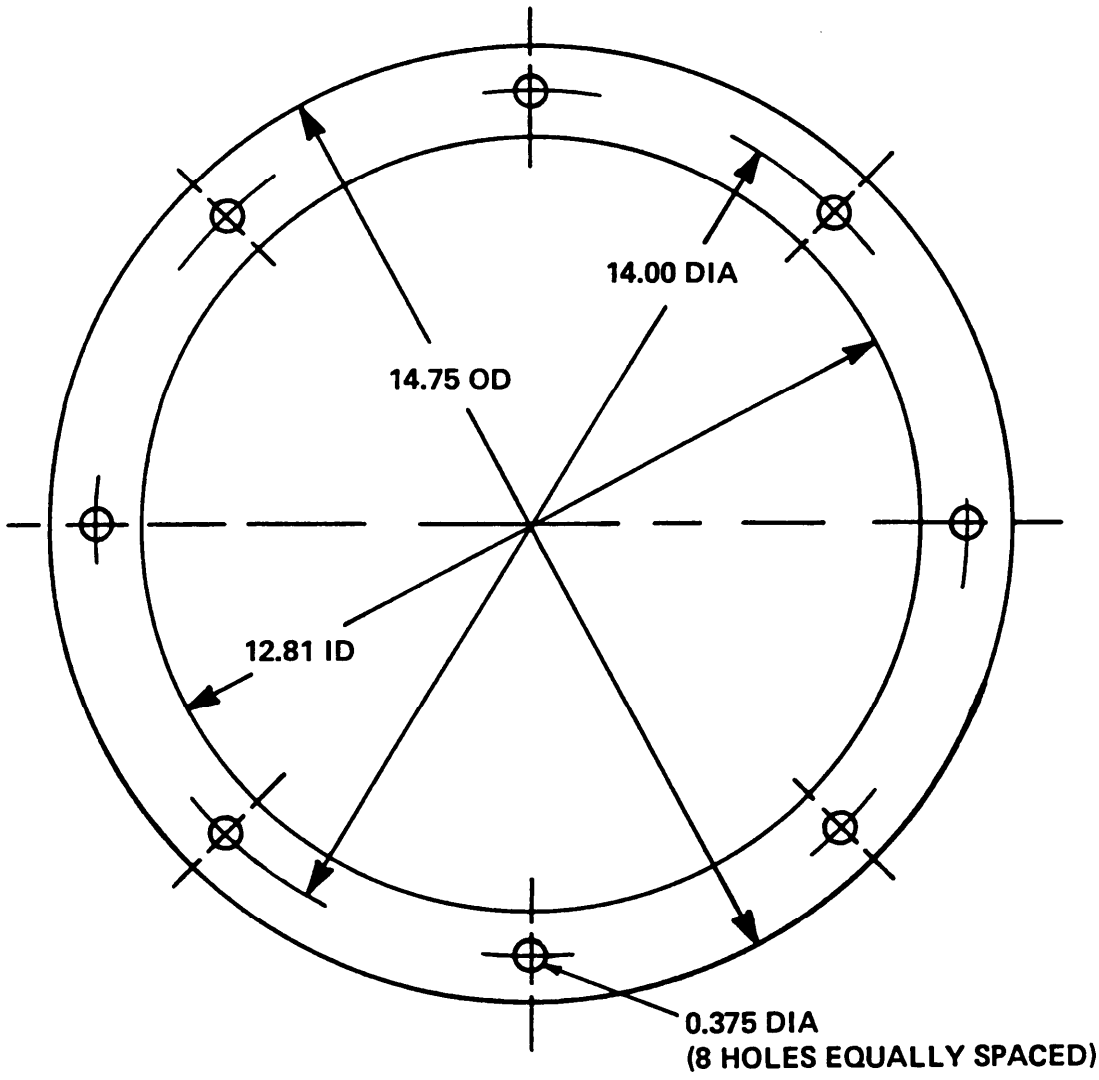
(j) Remove remaining locknuts (5), screws (12), and washers (11).

(k). Remove two screws (15), washers (16), mounting bracket (6), and screen (9).

(2) *Installation.* Installation and reassembly is the reverse of removal and disassembly *(a* (1) above).

b. Gasket.

(1) Manufacture. Fabricate gasket (fig. 4-38).



NOTES:

1. **Material: Silicone sponge rubber, 0.188 thickness**
2. **Dimensions in inches.**

AR600253

Figure 4-38. Evaporator fan gasket fabrication.

(2) *Removal.* Remove evaporator fan *(a* (1) above, steps *(a)* through (h)).

(3) *Installation.* Installation is the reverse of removal ((2) above).

Section XXII. GAS-PARTICULATE FILTER ASSEMBLY

4-104. Air Duct Hoses

Organizational maintenance personnel are authorized to replace the air duct hoses and attaching hardware. Instructions for replacing one hose' are typical for all three hoses.

a. Shutdown Procedures.

(1) Set environmental control switch (14, fig. 2-3) to CIRCULATE (center position).

NOTE

If system has been operating in heating mode, do not proceed until heater blower shuts down.

(2) Set circuit breakers (1, 2, 3, and 4, fig. 2-2) to OFF.

(3) Pull out throttle (9, fig. 2-1) until idle speed is obtained. Turn throttle clockwise to lock in idle position. Idle engine 3 minutes, then set ENGINE CONTROL switch (13, fig. 2-2) to OFF. After engine stops, push throttle fully in and lock.

(4) If engine fads to stop, pull out choke control to stop engine (TM 5-2805-259-14).

b. Removal

(1) Loose clamps (8 and 10, fig. 4-2). Slide clamps back on hose (9).

(2) Remove hose from fittings. Remove clamps from hose.

c. Installation. Installation is the reverse of removal *(b* above).

4-105. Gas and Particulate Filters

Organizational maintenance personnel are authorized to replace the gas and particulate filters.

WARNING

The unit commander or senior officer in charge of maintenance personnel assigned to remove the contaminated gas and particulate filters must prescribe the necessary protective clothing (TM 10-277) to be worn during this operation. He must also prescribe the necessary safety measures to be followed including the NBC decontamination (FM 3-5). This must be performed before the new filters are installed. Failure to wear protective clothing or follow safety measures may result in injury or death.

CAUTION

Handle filters with care to prevent damage.

NOTE

Ordinarily, the particulate filter will be replaced when the gas filter is replaced. However, if inspection of the particulate filter shows serviceable, it may be retained for further use. A chemical officer will determine if the falter is serviceable.

a. Removal.

WARNING

DO NOT throw away damaged or unusable filters as ordinary trash.

DO turn in damaged or unusable filters to your hazardous waste management office or Defense Reutilization and Marketing office (DRMO).

(1) Perfom shutdown procedures (para 4-104 *a*).

(2) Release two latches (12, fig. 4-2) and two latches (6).

(3) Swing upper enclosure (29) upward.

(4) Remove filters (16) and (15).

b. Installation.

(1) Unpackage the new M24 gas filter and the M23 particulate falter. Inspect filters for damage. Replace if necessary.

NOTE

Be sure arrow on each filter points upward in direction of airflow.

(2) Install particulate filter (15) on bottom with gasket side down.

(3) Install gas filter (16) on top of particulate falter.

(4) Lower upper enclosure (29) and secure with latches (6) and (12).

4-106. Fasteners

Organizational maintenance personnel are. authorized to replace the gas-particulate filter assembly fasteners and attaching hardware.

a. Removal (Upper Inclosure).

(1) Remove gas and particulate filters (pare 4-105 *a* steps (1) through (4).

(2) *Front sties.*

(a) Remove three nuts (1, fig. 4-2) and screws (3) .

(b) Remove strike (2).

(3) *Rear strikes.*

(a) Remove three nuts (27), screws (31), and washers (30).

(b) Remove strike (28).

b. Installation. Installation is the reverse of removal *(a* above).

c. Removal (Lower Inclosure).

(1) Remove gas and particulate filters (para 4-105 *a* steps (1) through (4)).

(2) *Front latches.*

(a) Remove four nuts (7), screws (4), and washers (5).

(b) Remove latch (6).

(3) *Rear latches.*

(a) Remove four nuts (13) and screws (14).

(b) Remove latch (12).

d. Installation. Installation is the reverse of removal *(c* above).

4-107. Upper Inclosure

Organizational maintenance personnel are authorized to replace the upper inclosure.

a *Removal.*

(1) Perform shutdown procedured (para 4-104 *a*).

(2) Loosen two clamps (21 and 26, fig. 4-2).

(3) Remove two air duct hoses (22) and (25) from upper inclosure (29).

(4) Release two latches (12) and two latches (6).

(5) Remove two nuts (20), washers (19), screws (17), and washers (18).

(6) Remove upper inclosure (29).

b. Installation. Installation is the reverse of removal *(a* above).

Section XXIII. GENERATOR

4-108. Brush Box Cover

Organizational maintenance personnel are authorized to replace the brush box cover, gasket and attaching hardware.

a. Shutdown Procedures.

(1) Set environmental control switch (14, fig. 2-3) to circulate (center position).

NOTE

If system has been operating in heating mode, do not proceed until heater blower shuts down.

(2) Set circuit breakers (1, 2, 3, and 4, fig. 2. 2) to OFF.

(3) Pull out throttle (9, fig. 2-1) until idle speed is obtained. Turn throttle clockwise to lock in idle position. Idle engine 3 minutes, then set ENGINE CONTROL switch (13, fig. 2-2) to OFF. After engine stops, push throttle fully in and lock.

(4) If engine fails to stop, pull out choke control to stop engine (TM 5-2805-259-14).

b. Removal.

(1) Remove four locknuts (11, fig. 4-39), washers (12), screws (2), and duct support (1).

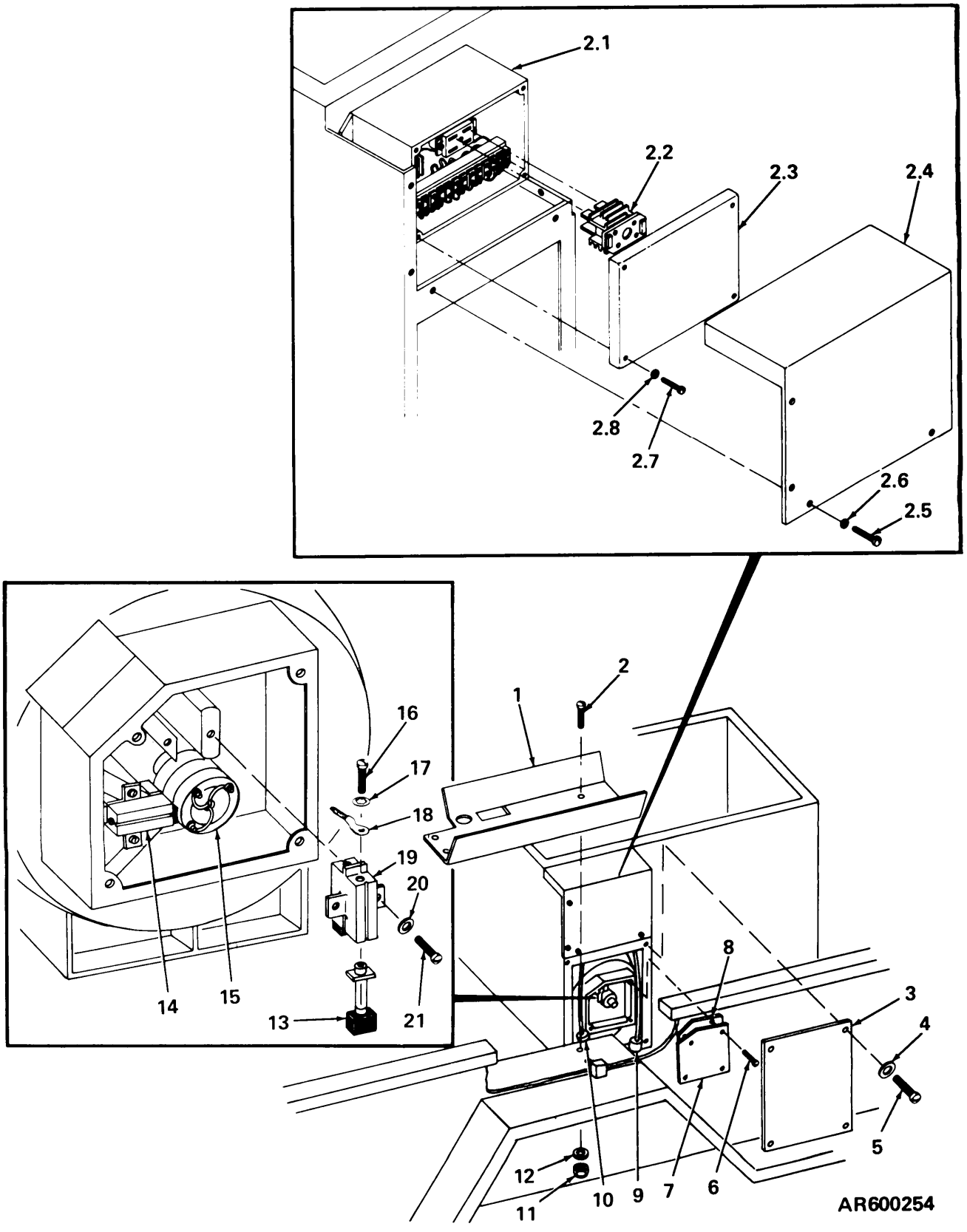


Figure 4-39. Generator and voltugc regulator, exploded view.

Legend for fig. 4-39:
1 Duct support
2 Screws
2.1 Voltage regulator
2.2 Rectifier
2.3 Cover
2.4 Access cover
2.5 Screws
2.6 Washers
2.7 Screws
2.8 Washers
3 Access panel
4 Washers
5 Screws
6 Screws
7 Cover
8 Gasket
9 Plug receptacle
10 Receptacle connector
11 Locknuts
12 Washers
13 Brushes
14 Brush holder
15 Commentator
16 Screws
17 Lockwashers
18 Electrical leads
19 Brush holder
20 Washers
21 Screws

(2) Remove four screws (5), washers (4), and access panel (3).

(3) Disconnect plug receptacle (9) from receptacle connector (10).

(4) Remove four screws (6) and cover (7).

(5) If necessary, remove gasket (8).

c. Installation. Installation is the reverse of removal *(b* above).

4-109. Electrical Brushes and Brush Holders

Organizational maintenance personnel are authorized to replace the electrical brushes, brush holders and attaching hardware.

a. Removal.

(1) Remove brush box cover (para 4-108).

(2) Remove four screws (21, fig. 4-39), and washers (20), securing brush holders (14) and (19).

(3) Carefully pull brush holders away from commentator (15).

NOTE

Two electrical brushes are located in brush holder (19) and one electrical brush in brush holder (14).

(4) Identify and tag electrical leads (18) connected to brushes (13).

(5) Remove three screws (16) and lockwashers (17) securing electrical leads (18) and brushes (13) to brush holders (14) and (19).

(6) Remove brushes (13) from brush holders.

b. Installation. Installation is the reverse of removal *(a* above).

4-110. Generator Adjustment Screw

Organizational maintenance personnel are authorized to replace the generator adjustment screw and attaching hardware.

a. Removal.

(1) Perform shutdown procedures (para 4-108 *a*).

(2) Loosen nut (13, fig. 3-10).

(3) Remove adjusting bolt (12) and nut (13).

(4) Remove nut (13) from adjusting bolt (12).

b. Installation. Installation is the reverse of removal (a above), except adjust timing belt tension (table 3-4).

Section XXIV. CENTRIFUGAL BLOWER

4-111. Dipstick

Organizational maintenance personnel are authorized to replace the lubricant dipstick. Replacement consists of inspecting the dipstick (fig. 3-2) for damage and replacing it if found unserviceable.

4-112. Lubricant Drain Components

Organizational maintenance personnel are authorized to replace the lubricant drain components.

a. Shutdown Procedures.

(1) Set environmental control switch (14, fig. 2-3) to CIRCULATE (center position).

NOTE

If system has been operating in heating mode, do not proceed until heater blower shuts down.

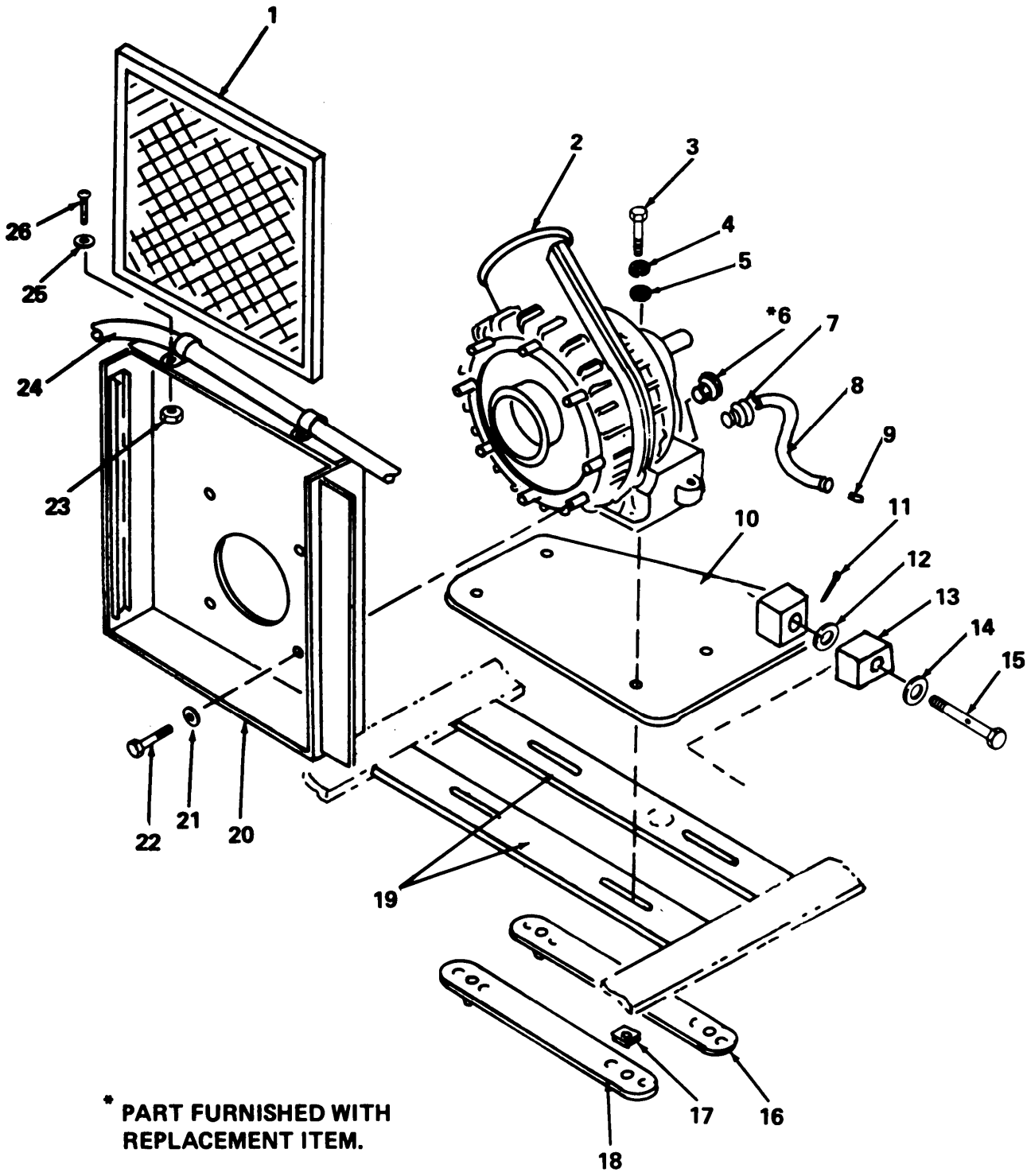
(2) Set circuit breakers (1, 2, 3, and 4, fig. 2-2) to OFF.

(3) Pu1l out throttle (9, fig. 2-1) until idle speed is obtained. Turn throttle clockwise to lock in idle position. Idle engine 3 minutes, then set ENGINE CONTROL switch (13, fig. 2-2) to OFF. After engine stops, push throttle fully in and lock.

(4) If engine fails to stop, pull out choke control to stop engine (TM 5-2805-259-14).

b. Removal.

(1) Remove plug (9, fig. 4-40) and drain lubricant from centrifugal blower.



AR600255

1 Prefilter
2 Centrifugal blower
3 Screws
4 Lockwashers
5 Washers
6 Plug
7 Adapter
8 Hose
9 Plug
10 Mounting plate
11 Cotter pin
12 Washer
13 Block
14 Washer
15 Adjusting screw
16 Locking plate
17 Bevel washer
18 Locking plate
19 Supports
20 Plenum
21 Washers
22 Screws
23 Locknuts
24 Cable
25 Washers
26 Screw

Figure 4-40. Centrifugal blower, plenum, and mounting plate, exploded view.

(2) Remove hose (8) and adapter (7).

c. Installation. Installation is the reverse of removal *(b* above).

4-113. Adjusting Screw

Organizational maintenance personnel are authorized to replace the mounting plate adjusting screw and ancillary items.

a. Removal.

(1) Perform shutdown procedures (para 4-l12 *a*).

(2) Remove cotter pin (11, fig. 4-40), washer (12), adjusting screw (15), and washer (14).

b. Installation. Installation is the reverse of removal *(a* above), except adjust V-belt tension (table 3-4).

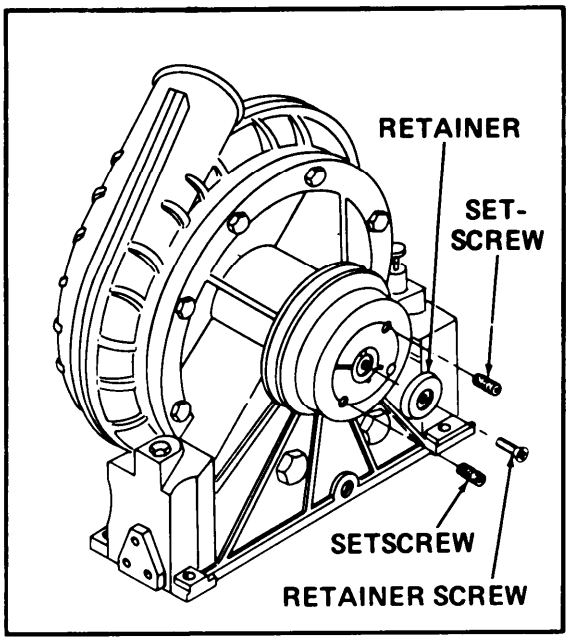
4-114. Pulley

Organizational maintenance personnel are authorized to replace the centrifugal blower pulley, bushing and attaching hardware.

a. Removal.

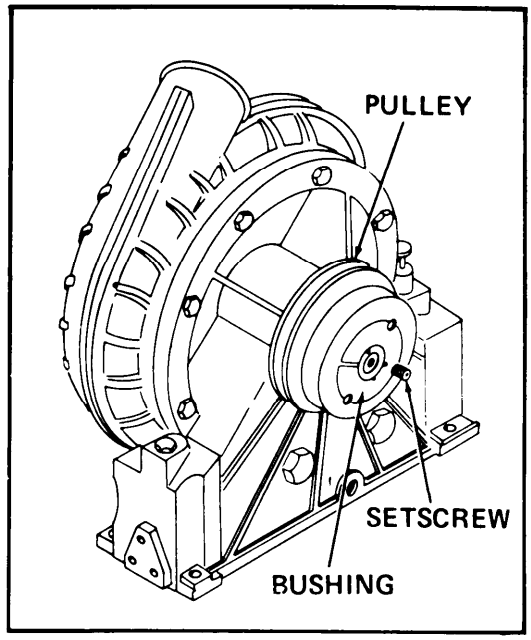
(1) Remove V-belt (para 4-73 *a* and *b).*

(2) Remove pulley from blower (fig. 4-41).

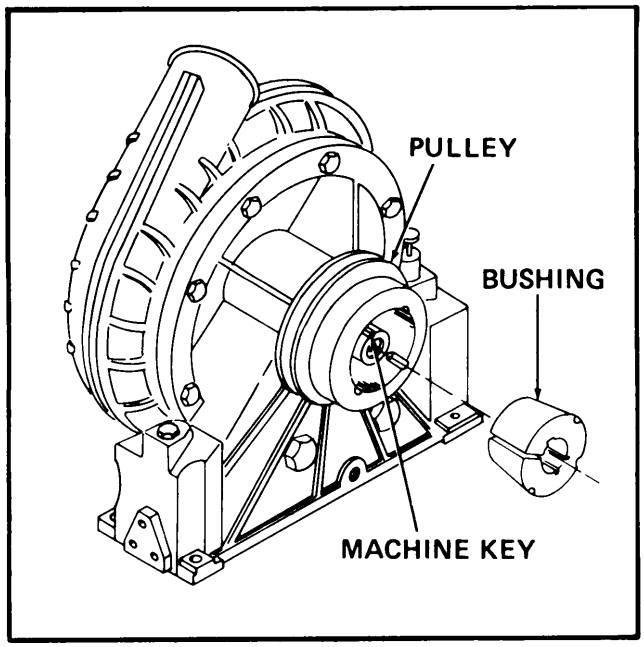


STEP 1. Remove retainer screw and retainer

STEP 2. Remove two setscrews.



STEP 3. Screw one setscrew into hole that is threaded on the bushing side only. Tighten setscrew until pulley is forced off of bushing.

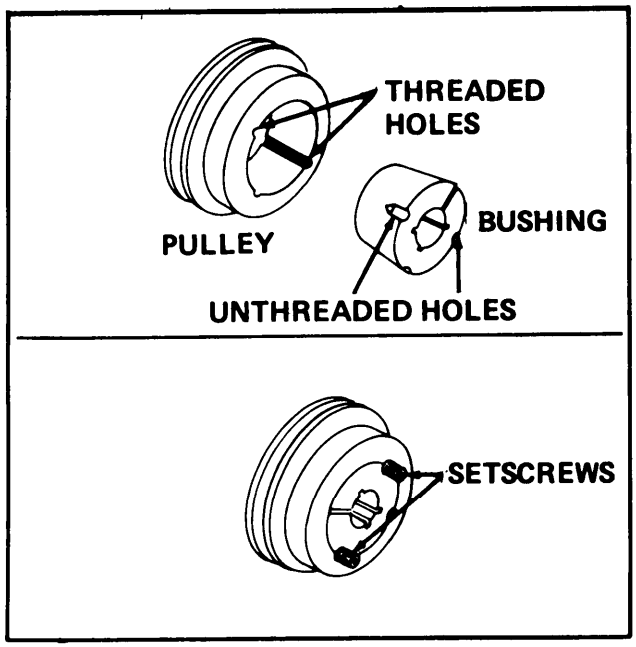


STEP 4. Remove bushing and pulley from shaft. If necessary remove machine key.

AR600256

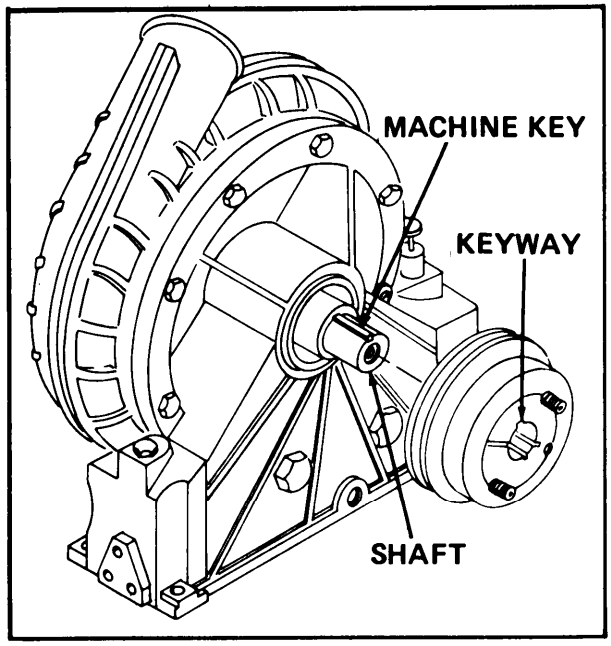
Figure 4-41. Pulley removal.

b. Installation. Install pulley on blower (fig. 4-42).

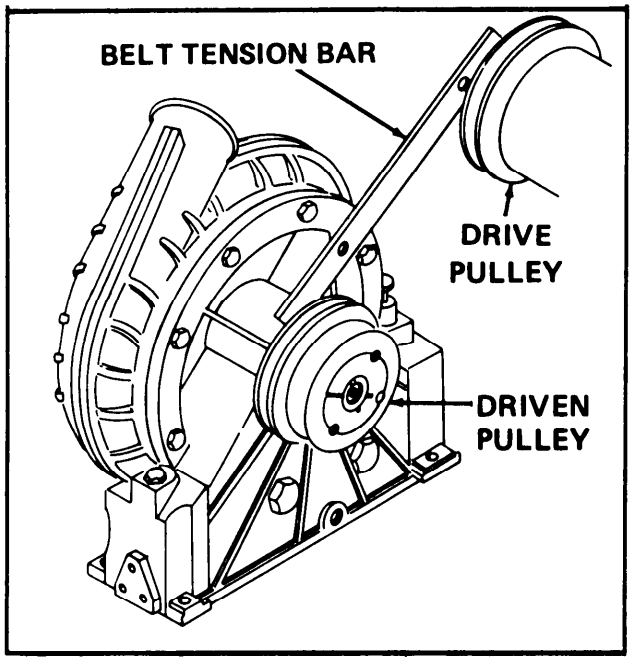


STEP 1 Aline unthreaded bushing holes with threaded holes in pulley. Place bushing into pulley.

STEP 2 Install two setscrews in the pulley threaded holes and hand tighten.



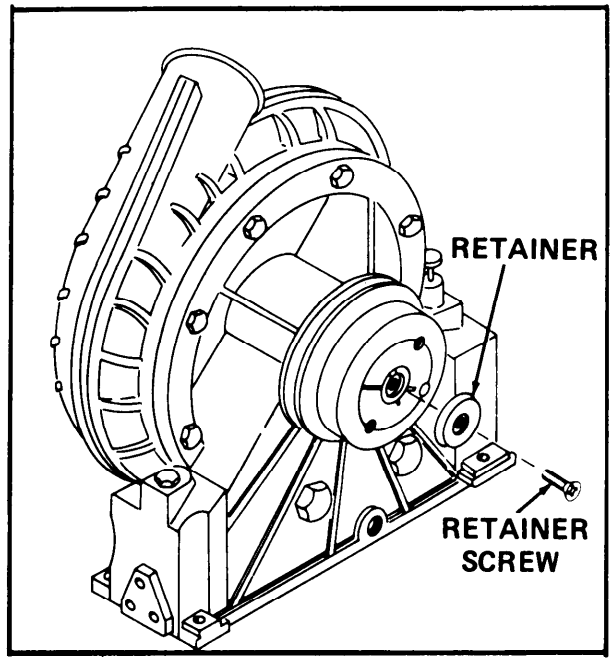
STEP 3 If removed, place machine key in shaft keyway. Aline the small bushing keyway with the machine key. Slide assembled pulley and bushing on shaft.



STEP 4 Using the belt tension bar as a straight edge, aline the driven pulley with the drive pulley. Tighten setscrews to secure pulley in position:

CAUTION

TO AVOID DAMAGING THE PULLEY DO NOT USE PLIERS OR PIPE WRENCH TO HOLD PULLEY.



STEP 5 Install retainer and retainer screw. install V belt (para. 4-73c).

Figure 4-42. Pulley installation.

4–115. Centrifugal Blower

Organizational maintenance personnel are authorized to replace the centrifugal blower, mounting plate and attaching hardware.

a. Removal and Disassembly.

(1) Remove V-belt (para 4-73 *a* and *b).*

(2) Loosen clamp (8, fig. 4-2) and remove hose (9).

(3) Remove prefilter (1, fig. 4-40).

(4) Remove two locknuts (23), screws (26), and washers (25).

(5) Remove four screws (3), lockwashers (4), washers (5), two locking plates (16) and (18), and four bevel washers (17).

NOTE

Keep cable (24) clear of plenum (20) when removing centrifugal blower.

(6) Remove centrifugal blower (2).

(7) If necessary, remove cotter pin (11), washer (12), adjusting screws (15), washer (14), and mounting plate (10).

(8) Remove four screws (22), washers (21), and plenum (20).

(9) Remove pulley (fig. 4-41).

(10) Remove lubricant drain components (para 4-l12 *b).*

b. Assembly and Installation.

(1) Install pulley (steps 1, 2, and 3, fig. 4-42). Tighten one setscrew to hold pulley on shaft.

(2) Install plenum (20, fig. 4–40) with four screws (22) and washers (21).

(3) Apply a film of antiseize compound (item 15, table 1-3) or an antiseize tape (item 16) on male threads of items (7), (8), and (9).

(4) Remove plug (6). Install adapter (7), hose (8), and plug (9).

(5) Remove dipstick (fig. 3-1) and fill blower oil reservoir with hydraulic lubrication oil (item 6, table 1-3). Check lubricant level with dipstick. Insure lubricant registers to the FULL mark on dipstick.

(6) If removed, place mounting plate (10, fig. 4-40) on supports (19).

(7) Place washer (14) on adjusting screw (15). Push screw (15) through block (13). Place washer (12) on adjusting screw (15) and secure with cotter pin (11).

(8) Thread adjusting screw (15) into block of mounting plate (10).

(9) Hang blower V-belt behind engine pulley.

(10) Place centrifugal blower (2) on mounting plate (10). Aline mounting holes and slots.

(11) Secure centrifugal blower with four screws (3), lockwashers (4), washers (5), bevel washers (17), and two locking plates (16) and (17). Do not wrench tighten securing hardware.

(12) Aline pulley and install V-belt (steps 4 and 5, fig. 4-42).

(13) Place cable (24, fig. 4-40) on top of plenum (20). Aline mounting holes of clamps with monting holes in plenum. Secure clamps to plenum with screws (26), washers (25), and locknuts (23).

(14) Install prefilter (1).

(15) Install hose (9, fig. 4-2) to centrifugal blower and secure with clamp (8).

Section XXV. CONDENSER FAN

4-116. Screen

Organizational maintenance personnel are authorized to replace the condenser fan screen.

a. *Removal.*

(1) Set CONDENSER FAN circuit breaker (2, fig. 2-2) to OFF.

(2) Remove four locknuts (13, fig. 4-43), washers (14), screws (17), and screen (18).

Legend for fig. 4-43:

2 Screws
3 Clamps
4 Adjusting supports
5 Locknuts
6 Nuts
7 Lockwashers
8 Bracket
9 Lockwashers
10 Nuts
11 Plug connector
12 Receptacle connector
13 Locknuts
14 Washers
15 Washers
16 Screws
17 Screws
18 Screen brackets
19 Screen
20 Condenser fan
21 Cable

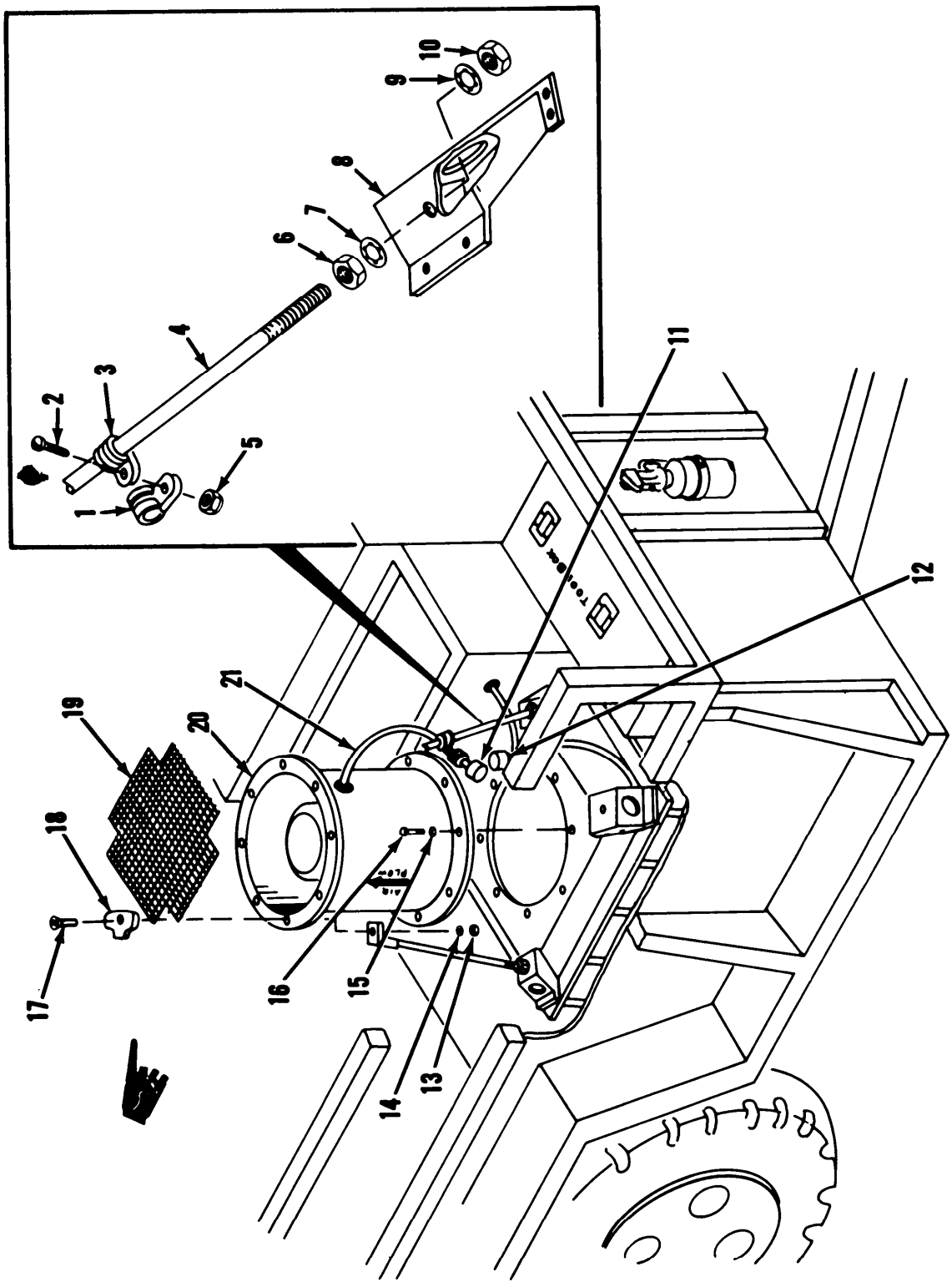


Figure 4-43. Condenser fan, exploded view.

b. Installation. Installation is the reverse of removal *(a* above).

4-117. Adjusting Support

Organizational maintenance personnel are authorized to replace the adjusting support and attaching hardware. Instructions for replacing one adjusting support are typical for all four adjusting supports.

a. Removal.

(1) Set CONDENSER FAN circuit breaker (2, fig. 2-2) to OFF.

(2) If necessary, remove locknut (5, fig. 4-43), screw (2), and clamp (3).

(3) Loosen nut (6).

(4) Remove nut (10) and lockwasher (9).

(5) Remove locknut (13), washer (14), and screw (17).

(6) Remove adjusting support (4).

(7) Remove lockwasher (7) and nut (6) from adjusting support (4).

b. Installation. Installation is the reverse of removal *(a* above).

4-118. Condenser Fan

Organizational maintenance personnel are authorized to replace the condenser fan and attaching hardware.

a. Removal.

(1) Set CONDENSER FAN circuit breaker (2, fig. 2-2) to OFF.

(2) Disconnect plug connector (11, fig. 4-43) from receptacle connector (12).

(3) Remove four locknuts (13), washers (14), screws (7), four brackets (18) and screen (19).

(4) Remove eight screws (16) and washers (15).

(5) Remove condenser fan (20).

NOTE

The plug assembly on the condenser fan must be removed and retained when the condenser fan is to be removed and replaced.

(6) Identify the wires on the condenser fan plug assembly.

(7) Unsolder the wires attached to the plug assembly.

b. Assembly and Installation.

(1) Solder the wires on the condenser fan to the plug (fig. 4-43.1).

(2) Install the condenser fan in the reverse of removal *(a* above) including the following procedures:

(a) Mount the condenser fan with the impeller in the down position.

(b) Aline the mounting holes so that the plug connector and receptive connector can be easily connected.

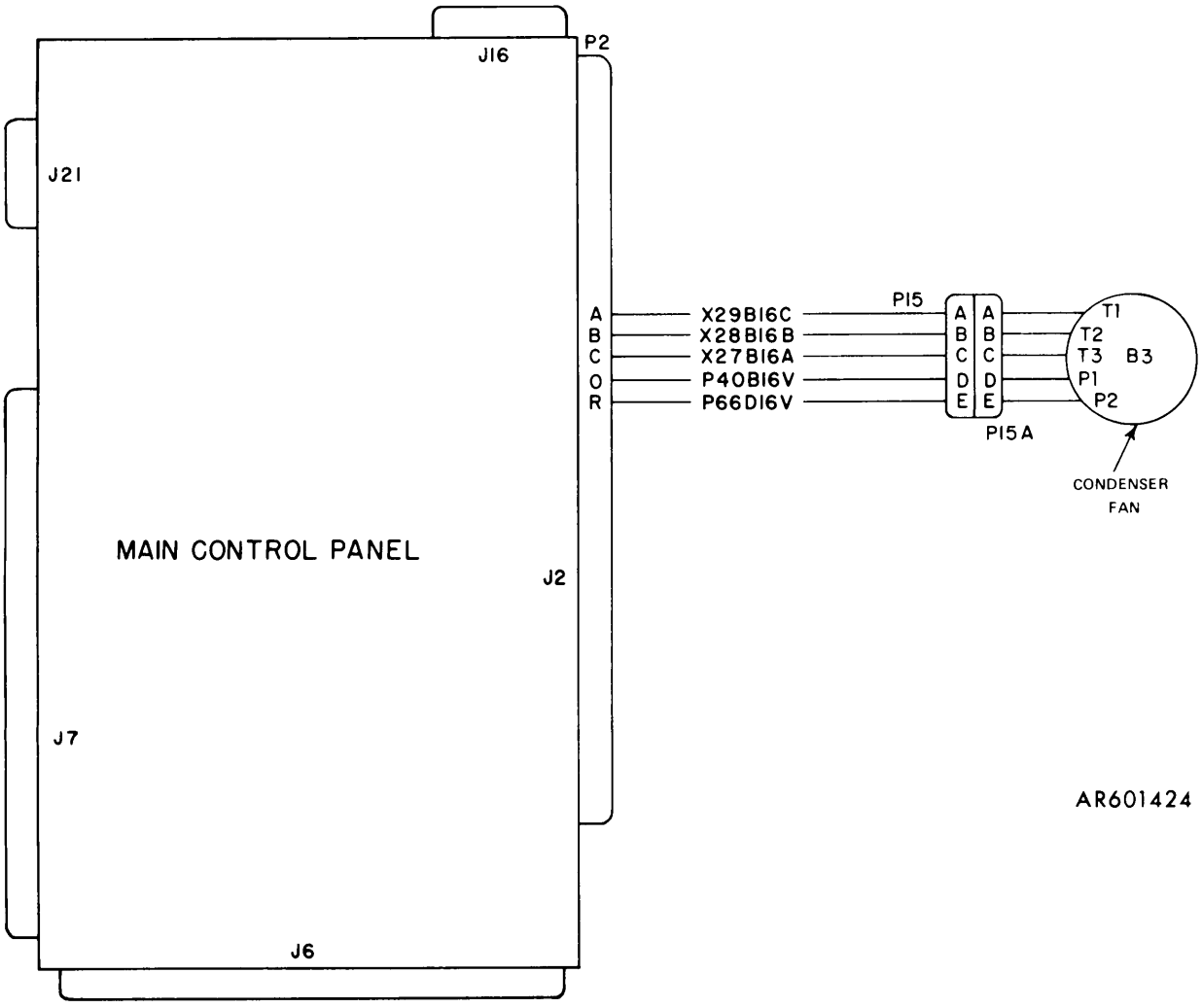


Figure 4-43.1. Condenser Fan-Wiring Diagram

Section XXIX. SPACE HEATER

4-119. Box and Sound-Attenuating Plenums

Organizational maintenance personnel are authorized to replace the box plenum and sound-attenuating plenum latches. Replacement consist of inspecting the latches for damage and replacing unserviceable latches (fig. 4-44).

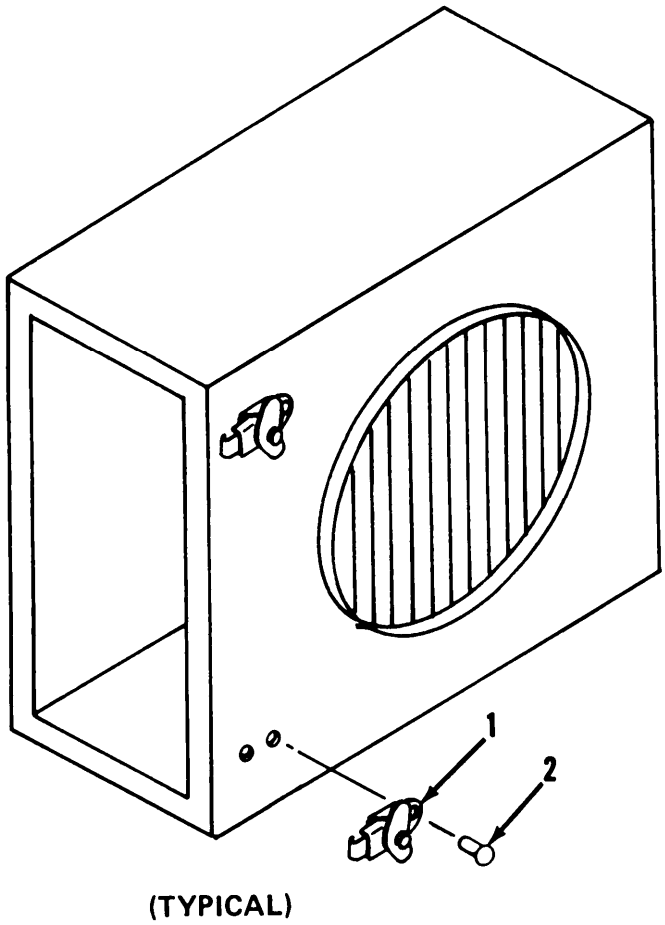


Figure 4-44. Latches (box and sound-attenuating plenum), exploded view.

4-120. Brackets

Organizational maintenance personnel are authorized to replace the left and right rail brackets and attaching hardware. Instructions for replacing one bracket are typical for both.

a. Removal.

(1) Remove ball pin (1, fig. 4-45) from bracket (2).

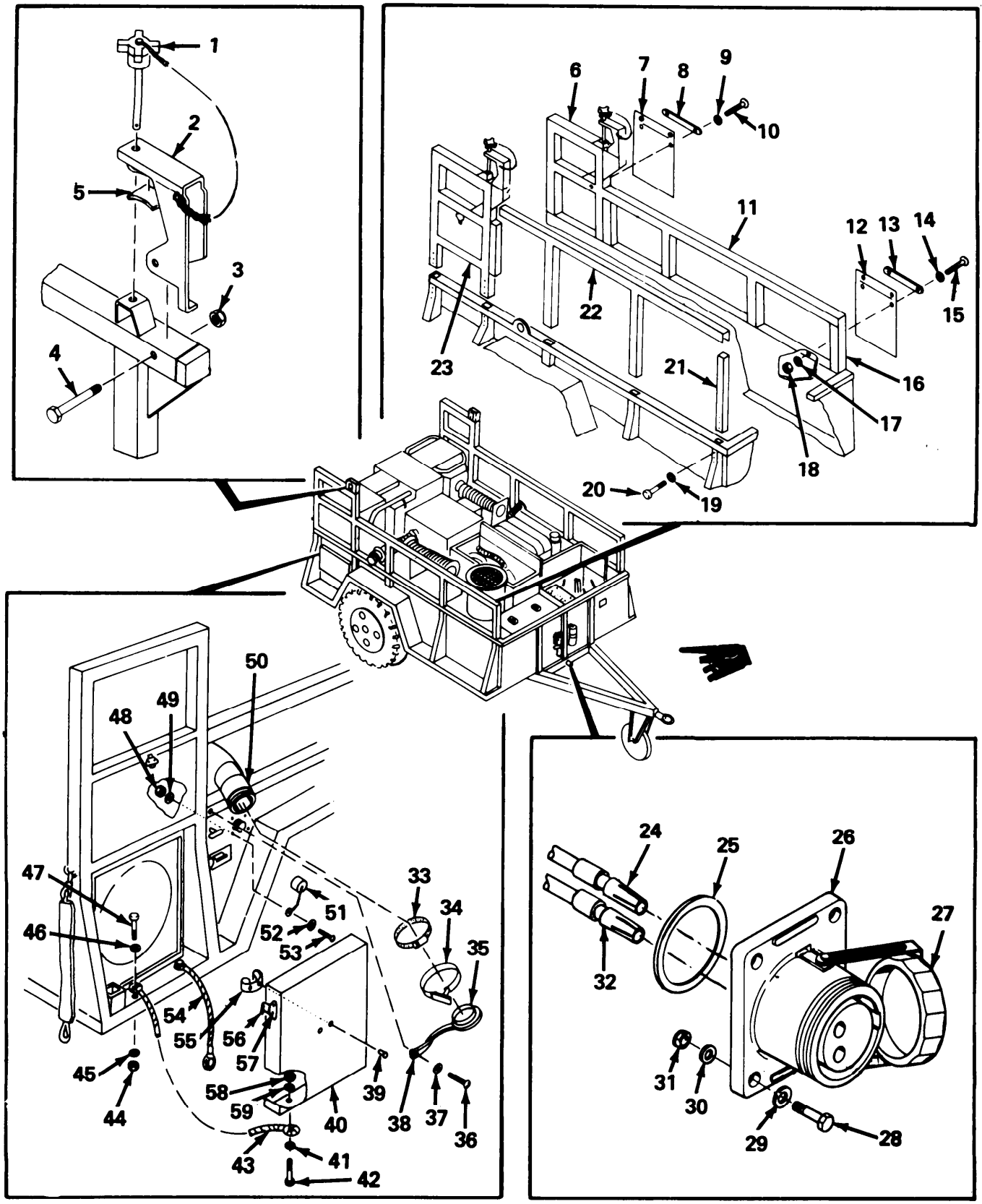


Figure 4-45. Miscellaneous trailer-mounted equipment, exploded view.

Legend for fig. 4-45:
1 Ball pin
2 Braket
3 Nuts
4 Screws
5 Pad
6 Left support rail
7 Pouch
8 Retainer
9 Washers
10 Screws
11 Rail section
12 Pouch
13 Retainer
14 Washers
15 Screws
16 Rigid post
17 Washers
18 Locknuts
19 Washers
20 Screws
21 Rigid post
22 Rail section
23 Right support rail
24 Electrical lead
25 Gasket
26 Receptacle connector
27 Cover
28 Screws
29 Washers
30 Washers
31 Locknuts
32 Electrical lead
33 Clamp
34 Clamp
35 Cover
36 Screw
37 Washer
38 Strap
39 Rivets
40 Dust cover
41 Washers
42 Screws
43 Retaining cord
44 Locknut
45 Washer
46 Washer
47 Screw
48 Locknut
49 Washer
50 Air duct coupling
51 Cover
52 Washer
53 Screw
54 Reatining cord
55 Clip spring
56 Strike
57 Rivets
58 Locknuts
59 Washers

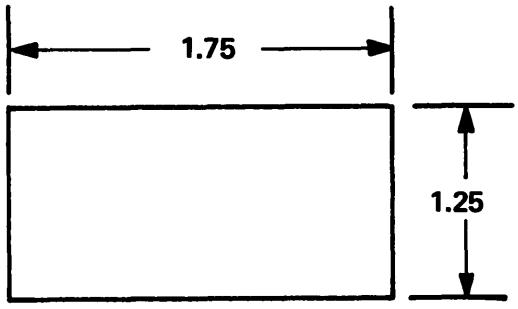
(2) Remove nut (3), screw (4), and bracket 12).

b. Installation. Installation is the reverse of removal *(a* above).

4-121. Pad

Organizational maintenance personnel are authorized to manufacture and replace the bracket pad. Instructions for replacing one pad are typical for both.

a. Manufacture. Fabricate bracket pad (fig. 4-46).



NOTES:

1. **Material: Rubber, grade SC615ABF2, durometer hardness 60,0.062 thickness, MIL SPEC, MIL-R-3065.**
2. **Dimensions in inches.**

AR600262

Figure 4-46. Bracket pad fabrication.

b. Removal and Installation.

(1) Remove pad (5, fig. 4-45) from bracket (2).

(2) Clean pad and adhesive residue from bracket with decreasing solvent (item 10, table 1-3).

(3) Install pad (5) on bracket (2) with adhesive sealant (item 11, table 1-3).

4-122. Manual Pouches

Organizational maintenance personnel are authorized to replace the manual pouches.

a. Front Manual Pouch.

(1) *Removal.*

(a) Remove two locknuts (18, fig. 4-45) and washers (17).

(b) Remove two screws (15), washers (14), retainer (13), and pouch (12).

(2) *Installation.* Installation is the reverse of removal ((1) above).

b. Rear Manual Pouch.

(1) *Removal.* Remove two screws (10, fig. 4-45), washers (9), retainer (8), and pouch (7).

(2) *Installation.* Installation is the reverse of removal ((1) above).

4-123. Left Support Rail

Organizational maintenance personnel are authorized to replace the left support rail and attaching hardware.

a. Removal.

(1) Remove two screws (10, fig. 4-45), washers (9), retainer (8), and pouch (7).

(2) Remove two screws (3, fig. 3-11) securing gage and switch shield (12) to left support rail (6, fig. 4-45).

(3) Remove six screws (20) and washers (19) securing left support rail (6).

(4) Lift left support rail (6) and rail section (11) up and out of trailer body posts.

b. Installation. Installation is the reverse of removal *(a* above).

4-124. Right Support Rail

Organizational maintenance personnel are authorized to replace the right support rail and attaching hardware.

a. Removal.

(1) Remove six screws (20, fig. 4-45) and washers (19) securing right support rail (23).

(2) Lift right support rail (23) and rail section (22) up and out of trailer body posts.

b. Installation. Installation is the reverse of removal *(a* above).

4-125. Dust Cover and Component Parts

Organizational maintenance personnel are authorized to replace the dust cover and component parts.

a. Dust Cover.

(1) *Removal.* Remove two locknuts (58, fig. 4-45), washers (59), screws (42), washers (41), and dust cover (40).

(2) *Installation.* Installation is the reverse of removal ((1) above).

b. Retaining Cords.

(1) *Manufacture.* Fabricate retaining cord (fig. 4-9).

(2) *Removal.*

(a) Remove locknut (58, fig. 4-45), washer (59), screw (42), and washer (41).

(b) Remove locknut (44), washer (45), screw (47), washer (46), and retaining cord (43) or (54).

(3) *Installation,* Installation is the reverse of removal ((2) above).

c. Spring Clip.

(1) *Removal.* Remove two rivets (39, fig. 4-45) and clip spring (55).

(2) *Installation.* Installation is the reverse of removal ((1) above).

d. Strikes.

(1) *Removal.* Remove three rivets (57, fig. 4-45) and strike (56).

(2) *Installation.* Installation is the reverse of removal ((1) above).

4-126. Cover and Clamps

Organizational maintenance personnel are authorized to replace the cover and clamps.

a. Removal.

(1) Release clamp (34, fig. 4-45) and remove cover (35) from air duct coupling (50).

(2) Remove screw (36) and washer (37) securing strap (38) to trailer body.

(3) If damaged, remove clamp (34).

(4) If damaged, remove clamp (33).

b. Installation. Installation is the reverse of removal *(a* above), except make a 0.173 inch diameter hole in end of strap (38) to accommodate screw (36).

4-127. Connector Cover

Organizational maintenance personnel are authorized to replace the electrical connector cover and attaching hardware.

a. Removal. Remove locknut (48, fig. 4-45), washer (49), screw (53), washer (52), and cover (51).

b. Installation. Installation is the reverse of removal *(a* above).

4-128. Rail Sections and Rigid Posts

Organizational maintenance personnel are authorized to replace the rail sections, rigid posts, and attaching hardware.

a. Removal.

(1) As applicable, lift the left or right rail section (11 or 22, fig. 4-45) up and out of trailer body posts.

(2) Remove three screws (20) and washers (19).

(3) Lift rigid post (16) or (21) up and out of trailer body post.

b. Installation. Installation is the reverse of removal *(a* above).

4-129. Electrical Receptacle Connector

Organizational maintenance personnel are authorized to replace the electrical receptacle connector and attaching hardware.

a. Shutdown Procedures.

(1) Set environmental control switch (14, fig. 2-3) to CIRCULATE (center position).

NOTE

If system has been operating in heating mode, do not proceed until heater blower shuts down.

(2) Set circuit breakers (1, 2, 3, and 4, fig. 2-2) to OFF.

(3) Pull out throttle (9, fig. 2-1) until idle speed is obtained. Turn throttle clockwise to lock in idle position. Idle engine 3 minutes, then set ENGINE CONTROL switch (13, fig. 2-2) to OFF. After engine stops, push throttle fully in and lock.

(4) If engine fails to stop, pull out choke control to stop engine (TM 5-2805-259-14).

b. Removal.

(1) Unfasten two latches (17, fig. 4-47) and remove battery cover (12).

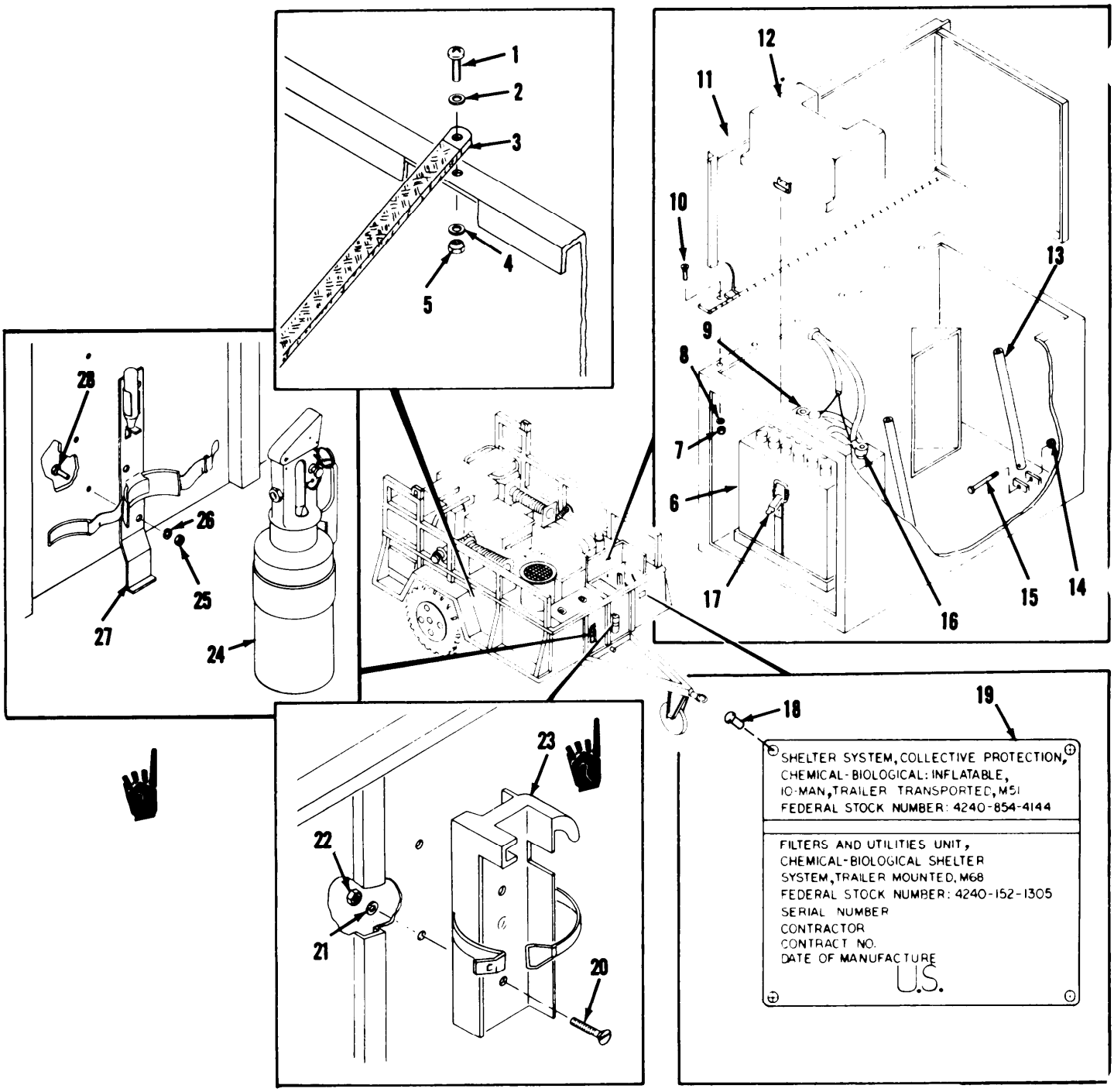


Figure 4-47. Ground wire, battery, baffle, identification plate, and fire extinguisher bracket, exploded view.

Legend for fig. 4-47:

2 Washer
3 Ground wire
4 Washer
5 Locknut
6 Battery
7 Locknuts
8 Washers
9 Cable (negative lead)
10 Screws
11 Baffle
12 Battery cover
13 Retainer
14 Nut
15 Screw
16 Cable (positive lead)
17 Latches
18 Rivets
19 Identification plate
20 Screws
21 Washers
22 Locknuts
23 Bracket
24 Decontaminating Apparatus ABC–M11
25 Nut
26 Washer
27 Mounting bracket
28 Screw

(2) Identify and tag positive and negative battery cables.

(3) Remove negative battery cable (16) from battery.

(4) Unscrew cover (27, fig. 4-45).

(5) Identify and tag electrical leads (24) and (32).

(6) Using an appropriate tool, knock terminal contacts out through rear of receptacle connector (26).

(7) Remove four locknuts (31), washers (30), screws (28), and washers (29).

(8) Remove receptacle connector (26) and gasket (25).

c. Installation. Installation is the reverse of removal *(b* above).

CAUTION

To avoid damage to equipment, be sure the electrical lead that attaches to the positive post of the battery is installed in the positive opening of the connector receptacle.

4-130. Ground Wire

Organizational maintenance personnel are authorized to replace the ground wire and attaching hardware.

a. Removal. Remove locknut (5, fig. 4-47), washer (4), screw (1), washer (2), and ground wire (3).

b. Installation. Installation is the reverse of removal *(a* above).

4-131. Battery Cover

Organizational maintenance personnel are authorized to replace the battery cover.

a. Removal. Release two latches (17, fig. 4-47) and remove battery cover (12).

b. Installation. Installation is the reverse of removal ((a) above).

4-132. Battery

Organizational maintenance personnel are authorized to replace the battery and attaching hardware.

a. Removal.

(1) Perform shutdown procedures (para 4-129 *a).*

(2) Unfasten two latches (17, fig. 4-47) and remove battery cover (12).

(3) Identify and tag battery cables.

(4) Disconnect negative battery cable (9) and positive battery cable (16) from battery posts.

(5) Remove battery (6) from trailer.

b. Installation. Installation is the reverse of removal *(a* above).

NOTE

Be sure that the post side of the battery is placed nearest to the battery cables.

4-133. Baffle

Organizational maintenance personnel are authorized to replace the baffle and attaching hardware.

a. Removal. Remove six locknuts (7, fig. 4-47), washers (8), screws (10) and baffle (11).

b. Installation. Installation is the reverse of removal *(a* above).

4-134. Ground Anchor Retainers

Organizational maintenance personnel are authorized to replace the ground anchor retainers and attaching hardware. Instructions for replacing one ground anchor retainer are typical for both.

a. Removal. Remove nut (14, fig. 4-47), screw (15), and ground anchor retainer (13).

b. Installation. Installation is the reverse of removal *(a* above).

4-135. Identification Plate

Organizational maintenance personnel are authorized to replace the identification plate and attaching hardware.

a. Removal. Remove four rivets (18, fig. 4-47) and identification plate (19).

b. Installation. Installation is the reverse of removal *(a* above).

4-136. Fire Extinguisher

Organizational maintenance personnel are authorized to replace the fire extinguisher and attaching hardware.

a. Removal.

(1) Remove fire extinguisher from bracket (steps 1 and 2, fig. 2-27).

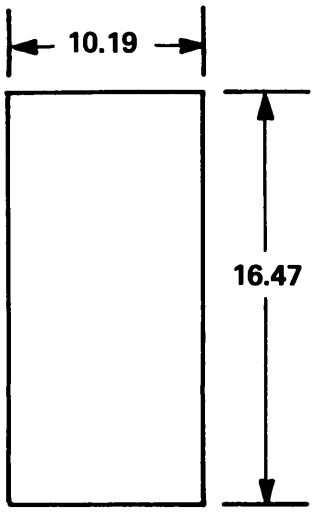
(2) Remove two locknuts (22, fig. 4-47), washers (21), two screws (20), and bracket (23).

b. Installation. Installation is the reverse of removal *(a* above), except replacement item may necessitate drilling new mounting holes in the trailer. If possible, use one of the existing mounting holes.

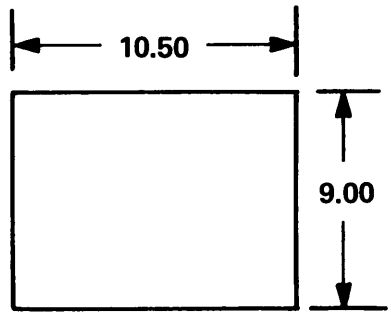
4-137. Insulation Sheets

Organizational maintenance personnel are authorized to manufacture and replace the heater and entrance gas-particulate filter unit insulation sheets.

a. Manufacture. Fabricate the applicable insulation sheet (fig. 4-48).



HEATER INSULATION SHEET



ENTRANCE GAS-PARTICULATE FILTER UNIT INSULATION SHEET

NOTES:

1. **Material: Plastic foam, unicellular, sheet, type II, form 2, MIL SPEC, MIL-P-15280, 5-10 lb density, 1 inch thick.**
2. **Dimensions in inches.**

Figure 4-48. Insulation sheet fabrication.

b. Removal.

(1) Remove applicable insulation sheet (27 or 28, fig. 4-31) from tailgate (34).

(2) Remove insulation sheet and adhesive sealant residue from mounting area with decreasing solvent (item 10, table 1-3).

c. *Installation.* Adhere insulation sheet on tailgate with adhesive sealant (item 19, table 1-3).

4-138. Tailgate

Organizational maintenance personnel are authorized to replace the tailgate and attaching hardware.

a. Removal.

(1) Engage two tailgate chains (22, fig. 4-31) to hold tailgate in horizontal position.

(2) Remove four cotter pins (24) and hinge pins (23).

(3) Disengage the two tailgate chains (22) and remove tailgate (34).

b. Installation.

(1) Place tailgate (34) in horizontal position and engage the two tailgate chains (22). Aline mounting holes.

(2) Insert four hinge pins (23) and secure with four cotter pins (24).

4-139. Control Panel Fastener

Organizational maintenance personnel are authorized to replace the control panel access door fastener and attaching hardware.

a. Removal.

(1) Remove two rivets (8, fig. 4-31) and strike (7).

(2) Remove two rivets (14) and latch (13).

b. Installation. Installation is the reverse of removal *(a* above).

4-140. Control Panel Access Door

Organizational maintenance personnel are authorized to replace the control panel acceas door and attaching hardware.

a. Removal.

(1) Remove four locknuts (10, fig. 4-31), washers (9), and screws (11).

(2) Remove control panel access door (12).

b. Installation. Installation is the reverse of removal *(a* above).

4-141. Lifting Ring

Organizational maintenance personnel are authorized to replace the lifting ring and attaching hardware.

a. Removal.

(1) Remove locknut (20, fig. 4-31), washer (19), screw (17), and clamp (16).

(2) Remove locknut (21), screw (15), and lifting ring (18).

b. Installation. Installation is the reverse of removal *(a* above).

4-142. Tie-Down Strap

NOTE

Tie down straps must be replaced as an assembly.

Organizational maintenance personnel are authorized to replace the trailer mounted straps and attaching hardware. Replacement consists of removing the unserviceable strap (fig. 4-49) and replacing it with a new strap. The details in figure 4-49 show the various strap mounting positions and securing hardware.

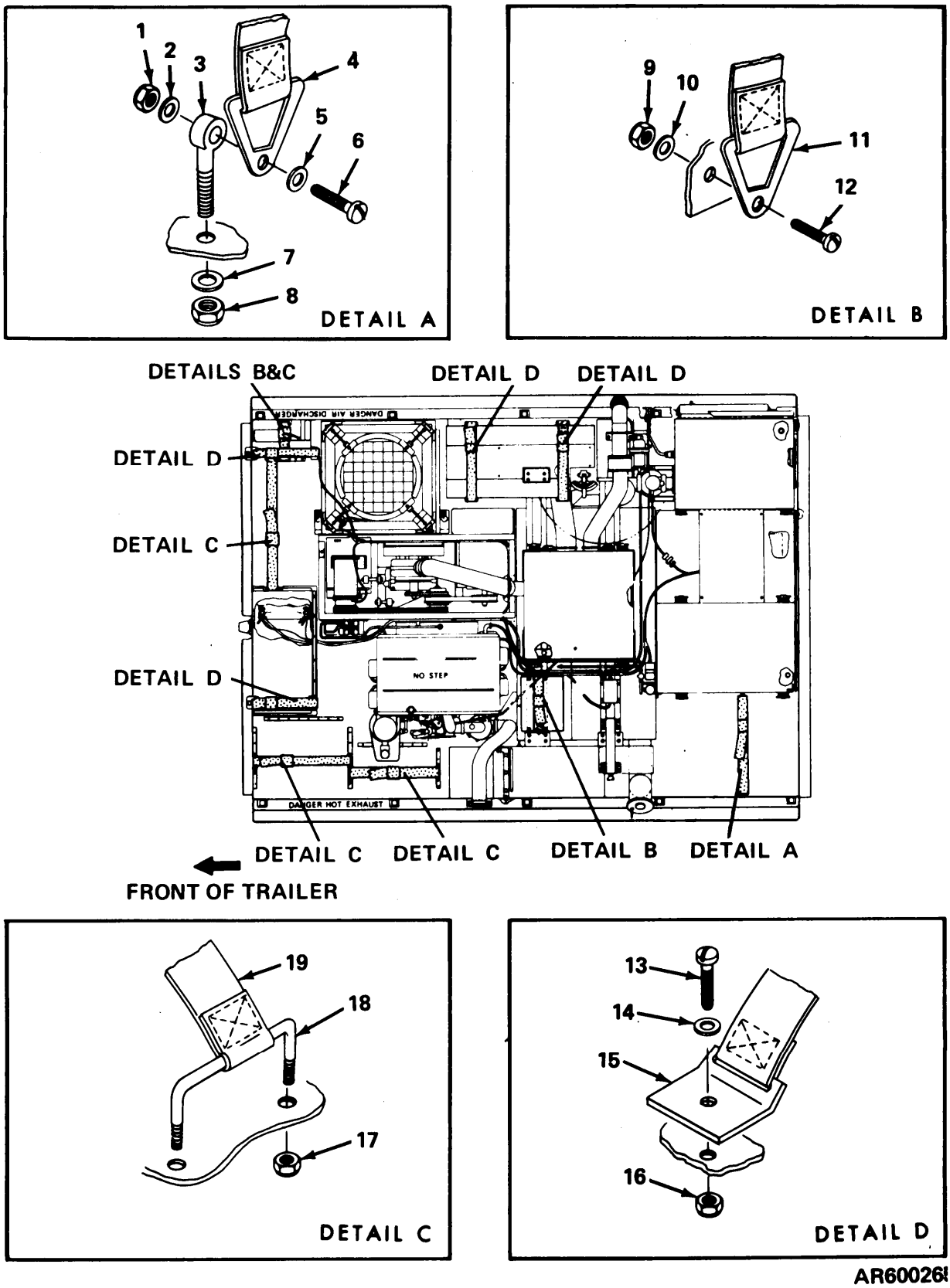


Figure 4-49. Trailer-mounted tiedown straps, exploded view.

Legend fort fig. 4-49:

2 Washers
3 Swing bolt
4 Strap assembly
5 Washers
6 Screws
7 Washers
8 Locknuts
9 Locknut
10 Washers
11 Strap assembly
12 Screws
13 Screws
14 Washers
15 Strap assembly
16 Locknuts
17 Locknuts
18 U bolts
19 Strap assembly

4-143. ABC-M11 Portable Decontaminating Apparatus

Organizational maintenance personnel are authorized to replace the ABC-Ml1 portable decontaminating apparatus and attaching hardware.

a. Removal.

(1) Remove portable tool box (23, fig. 2-10) to gain access to mounting bracket hardware.

(2) Remove decontaminating apparatus ABC-M11 (24, fig. 447) from mounting bracket (27).

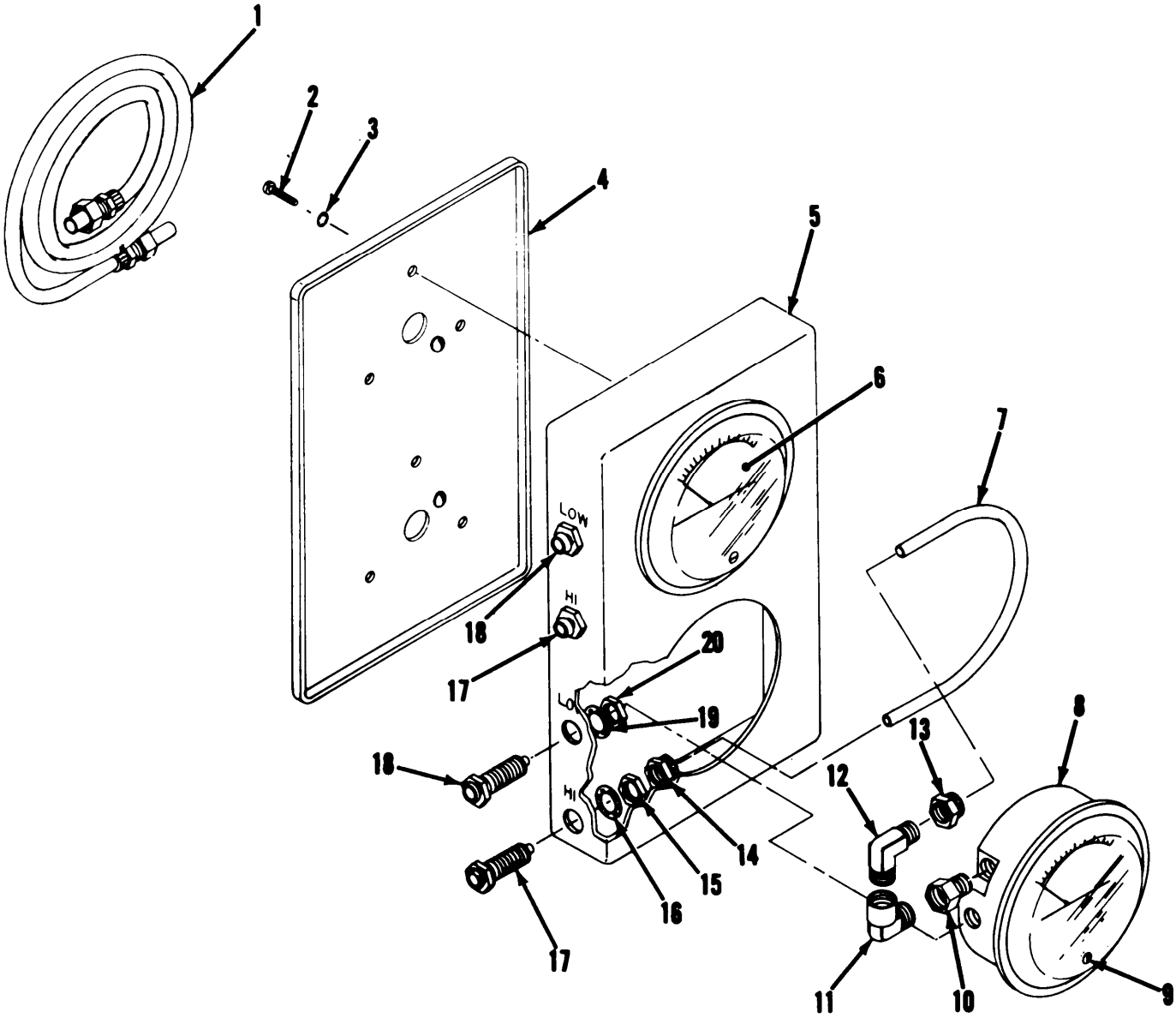
(3) Remove three locknuts (25), washers (26), screws (28), and bracket (27).

b. Installation. Installation is reverse of removal.

Section XXVII. AIR-FLOW GAGE

4-144. Tubing Assemblies

Organizational maintenance personnel are authorized to replace the tubing assemblies (1, fig. 4-50). Replacement consists of inspecting each tubing assembly for deterioration and damage. If the tubing assembly is unserviceable, replace the tubing assembly.



1 Tubing assembly
2 Screws
3 Lockwashers
4 Cover
5 Housing
6 Gage (pressure)
7 Tubing
8 Gage (differential)
9 Adjustment screw
10 Coupling
11 Elbow
12 Elbow
13 Nut assembly
14 Nut assembly
15 Nut
16 Lockwasher
17 Coupling
18 Coupling
19 Lockwasher
20 Nut

Figure 4-50. Air-Flow gage, exploded view.

4-145. Tubing

Organizational maintenance personnel are authorized to manufacture and replace the plastic tubing. Instructions for replacing one tube are typical for both.

a. Removal.

(1) Remove two screws (2, fig. 4-50), lockwashers (3), and access cover (4).

(2) Hand-loosen nut assemblies (13) and (14).

(3) Pull defective tubing (7) from elbow (12) and quick connect coupling (17).

b. Fabrication and Installation.

(1) Using the defective tubing as a pattern, cut a new length of tubing from bulk material.

(2) Install the new tubing by pushing the tubing ends into the elbow and coupling.

(3) Hand-tighten nut assembly (13) and (14).

(4) Install cover (4) and secure with screws (2) and lockwashers (3).

4-146. Quick Connect Couplings (LOW)

Organizational maintenance personnel are authorized to replace the quick connect couplings and attaching hardware. Instructions for replacing one quick connect coupling are typical for both.

a. Removal.

(1) Remove two screws (2, fig. 4-50), lockwashers (3), and access cover (4).

(2) Loosen nut (20), unthread nut to end of threads on quick connect coupling (18).

(3) Unscrew quick connect coupling (18) from gage (6) or (8).

(4) Remove nut (20) and lockwasher (19) from quick connect coupling (18). Remove quick connect coupling (18) from housing (5).

b. Installation. Installation is the reverse of removal *(a* above), except remove nut assembly (14) from quick connect coupling and discard.

4-147. Quick Connect Couplings (HI)

Organizational maintenance personnel are authorized to replace the quick connect couplings and attaching hardware. Instructions for replacing one quick connect couplings are typical for both.

a. Removal.

(1) Remove two screws (2, fig. 4-50), lockwashers (3), and access cover (4).

(2) Hand-loosen nut assembly (14), and pull tube (7) from fitting.

(3) Remove nut assembly (14), nut (15), and lockwashers (16) from quick connect coupling (17). Remove quick connect coupling from housing (5).

b. Installation. Installation is the reverse of removal *(a* above).

4-148. Differential and Pressure Gages

Organizational maintenance personnel are authorized to replace the differential and pressure gages. Instructions for replacing one gage are typical for both.

a. Removal.

(1) Remove two screws (2, fig. 4-50), lockwashers (3), and access cover (4).

(2) Hand-loosen nut assembly (13) and (14). Remove tubing (7) from elbow (12) and quick connect coupling (17).

(3) Remove quick connect coupling (para 4-146 *a* steps (2) through (4)).

(4) Remove gage (6) or (8) from housing (5) with adapter (10) and elbow (11) and (12) assembled.

(5) Remove elbow (12), elbow (11) and adapter (10) from gage (6) and (8).

b. Installation. Installation is the reverse of removal *(a* above), except insure elbows (11) and (12) are tightened and alined in direction shown on illustration.

Section XXVIII. PAINTING

4-149. General

Organizational maintenance personnel are authorized to repaint and touch-up all painted exterior metal surfaces of the shelter system. Never paint fabric surfaces or identification and instruction plates. If stenciled nomenclature is made illegible during repainting or touch-up, restencil nomenclature as necessary (para 3-31) (fig. 3-12).

4-150. Painting Instructions

a. Prepare area to be painted in accordance with standard shop practices.

b. Prime all worn, scratched, bare metal surfaces with two coats of zinc-chromate primer (item 20, table 1-3).

c. Repaint or touch-up all painted exterior metal surfaces with rust inhibiting, olive drab enamel (item 21, table 1-3).

SECTION XXIX. SPACE HEATER

4-151. Flame Detector Switch

Oganizational maintenance personnel are authorized to inspect, clean, replace and adjust the Flame detector switch.

a. Shutdown Procedures.

(1) Before attempting any maintenance operations on the space heater, observe the following warnings.

WARNINGS

To prevent injury to personnel, if system has been operating in heating mode, do not proceed with maintenance operations until heater blower shuts down and heater is cool enough to handle.

To prevent explosion or flashfire, be sure system is inoperative and heater has not been operating for approximately 10 minutes before attempting to remove component from the heater.

(2) Perform the shutdown procedures as prescribed in para 3-25 *a.*

b. Removal.

(1) Loosen the latches on the heater compartment cover and remove the cover. (fig. 4-51).

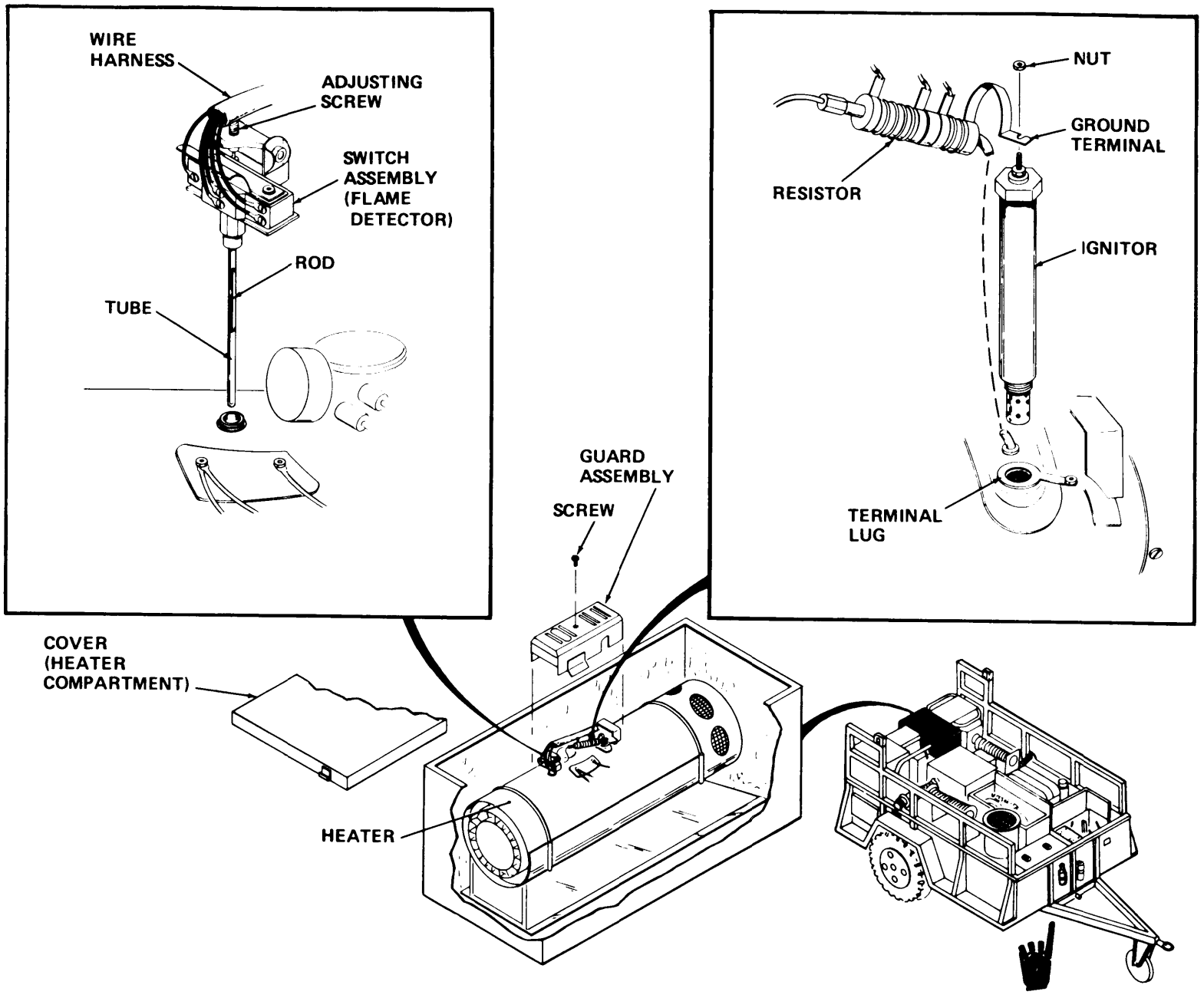


Figure 4–51. Heater-flame detector switch and ignitor.

(2) Loosen the screw on the guard assembly and remove the guard assembly.

(3) Tag and disconnect the five harness wire leads from the flame detector switch.

(4) Loosen the hex fitting until it is completely loose.

NOTE

Attached to the switch assembly is a fragile ceramic rod in the tube, that can be damaged.

(5) Carefully pull the switch assembly and tube out of the heat exchanger.

(6) If the rod in the tube is damaged perform the following steps.

(7) Remove and retain the switch and attaching parts from the housing.

(8) Remove the damaged rod.

c. Cleaning. Cleaning of the switch is limited to removal of deposits that may accumulate in the tube and removal of dirt from the micro switch. Clean unit as follows:

(1) With switch removed (5) above, gently tap tube and bracket against the palm of the hand or other soft object to dislodge deposits from the tube.

(2) Inspect the tube for straightness and corrosion. Replace entire switch if tube is bent or corroded .

(3) Using low pressure compressed air or a soft brush, carefully clean the switch.

(4) After cleaning, make certain that the pivot arm on the switch rotates freely and that switch contacts are opening and closing.

d. Assembly. Assembly is the reverse of removal.

e. Adjusting.

(1) Turn adjusting screw until the switch clicks.

(2) Turn the screw an additional ¾ turn.

4-152. Igniter

Organizational maintenance personnel are authorized to replace the igniter.

a. Removal.

(1) Loosen nut on igniter, and disconnect ground terminal and bend out of way.

(2) Using a 13/16-inch socket, loosen igniter until threads are clear and draw it out of the heater.

b. Installation. Installation is the reverse of removal.

CHAPTER 5

SHIPMENT, ADMINISTRATIVE STORAGE, AND DESTRUCTION TO PREVENT ENEMY USE

Section I. SHIPMENT AND ADMINISTRATIVE STORAGE

5-1. Shipment

There are no special preparations or procedures to be followed for shipment of the M51 shelter system.

5-2. Administrative Storage

Refer to TM 740-90-1 for administrative storage instructions on this equipment.

Section II. DESTRUCTION TO PREVENT ENEMY USE

5-3. General

This section contains the preferred methods for the destruction of the M51 shelter system. The methods may be used singly or, if time permits, in combination.

5-4. Preferred Methods of Destruction

The preferred methods of destruction in order are burning, mechanical means, improper operation, and gunfire.

a. Burning.

(1) *Incendiary grenades.*

(a) Fasten and ignite an incendiary grenade on the engine.

(b) Fasten and ignite an incendiary grenade between the main control indicator and its door.

(c) Fasten and ignite incendiary grenades on the interior doors.

(2) *Fire by combustible material.* Use combustible material, such as scrap lumber, boxes, cartons, or brush, to start a fire. Place the equipment or parts to be destroyed in a pile. Pack the combustible material under, around, and over the pile (not over 2,000 pounds of equipment or parts to a pile). Use enough material to assure an extremely hot fire. Pour used motor oil, thickened flame fuel or diesel fuel over the entire pile. Ignite the pile by means of a combustible train (such as excelsior, or slow-burning propellant) of suitable length, and take cover immediately. If incendiary grenades are used, fasten them in an upright position over essential parts. Trail the lanyard along the ground for a safe distance from the grenade. Attach the lanyard to the pull ring of each grenade. Straighten the safety pin on each grenade. Take cover at the end of the lanyard at a safe distance and pull the lanyard to function the grenades.

b. Mechanical The mechanical method can be accomplished by using a sledge hammer, crowbar, pick, ax, heavy tool, or crane. The priorities of destruction are as follows:

(1) Main control indicator

(2) Centrifugal blower

(3) Gasoline engine

(4) Gas-particulate filter assembly (trailer mounted)

(5) Fuel tank

c. Improper Operations. Drain oil from centrifugal blowerand gasoline engine. Start gasoline engine and runit "wide open."

d. Gunfire.

WARNING

Observe the applicable Surface Danger Zones contained in AR 385-63 for hazards of ricochet from gunfire.

When explosive and demolition material are not available or time prohibits their use, use hand grenades, rifle grenades, rifle fire, machinegun fire, or antitank rockets. Several hits usually are required for complete destruction of essential parts of equipment and supplies.

CHAPTER 6

A GUIDE FOR PERSONNEL ENTRY / EXIT AND MESSAGE DELIVERY PROCEDURES

6-1. General

The guidelines and specific procedures described below provide for optimum use of equipment while protecting personnel against CB agents during entry/exit.

NOTE

Recommend that an abbreviated SOP (outline) be prepared by user.

NOTE

Refer to FM 21-40 for information on symptoms to personnel from a CB agent attack.

6-2. Equipment and Supplies

a. Detector Kit, Chemical Agent, VGH: AN-M15A2A (TM 3-6665-253-12, NSN 6665-00-903-4765) or Dectector Kit, Chemical Agent: ABC-M18A2 (TM 3-6665-254-12, NSN 6665-00-903-4767) should be made available for use in the M51 shelter. These kits may be procured through normal supply channels.

b. Operators of the M51 shelter system must have available the following expendable items:

(1) Decontaminating material, such as supertropical bleach (STB) (NSN 6850-00-297-6653, 50 lb metal container) and DS2 (NSN 6850-00-753-4870, 5 gallon can).

(2) Decontaminating and Reimpregnating Kit, Individual: ABC M13 (TM 3-4230-211-10, NSN 4230-00-90-4828).

(3) Decontaminating Kit, Skin, M258 (TM 3-4230-213-10, NSN 4230-00-123-3180).

(4) Protective outergarments and gloves, as issued.

(5) Footwear Covers, Disposable (4 rolls of 12 each per package, NSN 8430-00-172-3762) (initially supplied with the shelter system).

c. The quantity of these items for availability will be determined by the unit commander based upon the number of personnel involved and the frequency of entires. Space in the shelter should be assigned for storing a limited quantity of spare outergarments, gloves, M13 kits and M258 kits. A spare detector kit should also be stored in the shelter.

6-3. Anteroom and Clean Area Around the Entrance

a. The anteroom should be erected adjscent to the entrance to provide protection for removed individual clothing and field gear against liquid agent fallout. Instructions for erecting the anteroom are included in para 2-59.

b. If the area surrounding the shelter has been subjected to liquid chemical agent attack, the immediate area around the entrance should be decontaminated. Decontamination can be accomplished by turning over about four inches of soil; by removing the top layer of soil containing any liquid chemical agent; by removing any snow; by adding several inches of clean soil or sand; or by using supertropical bleach (STB). The STB should be spaded into the soil in front of the entrance to make a dry mix shuffle pit. (See TM 3-220 for additional details useful in decontamination of terrain, shelters, equipment, etc., and for preparation of a dry mix shuffle pit.)

NOTE

The entrance of the M51 shelter can accommodate six persons or a litter patient and two attendants at one time.

NOTE

A guard should be assigned to assist personnel utilizing this shelter. The guard will monitor the purge mode switch which is normally set at five minutes. When there is contamination around the shelter, the purge mode switch is set at eight minutes.

6-4. Entry Procedure for Ambulatory Personnel

a. If there has been no previous exposure to chemical or biological agents, and there is no immediate risk of a CB attack, stow in the anteroom, but not in the path to the entrance door, individual field gear (including outergarments, as appropriate) except the mask-hood assembly and other gear required by local SOP to be carried into the shelter. Proceed to the shelter directly without the waiting period in the entrance.

b. If, during CB operations, there is chemical agent in the atmosphere around the shelter, every

effort should be made to hold entries to a minimum in order to reduce the risk of contaminating the interior of the shelter. No entries should be made during a known agent attack except when absolutely necessary.

c. When there has been known, or suspected, exposure by the individual to CB agents, perform the following steps:

(1) Check for the presence of liquid chemical agent on impermeable surfaces of individual gear, such as mask-hood assembly, weapon, etc., and that portion of the entrance door coming in contact with the hands, by the use of M8 detector paper from the detector kit. If liquid agent is detected, wipe it off with a rag, one of the large bags from the M13 kit, or any other suitable material that is available. Decontaminate the mask-hood assembly by using the large bag from the M13 kit. Discard all items used for decontamination to a designated area.

(2) Crush the dye capsule in a fresh large bag from the M13 kit and knead it into the contents of the bag. Pat and rub the bag on all permeable surfaces, such as mask carrier, boots (decontamination of boots is also accomplished by means of a shuffle pit or by washing with soap and water), protective gloves, outergarments except for the Chemical Protective Suit (outergarment), etc. The rubbing action with the bag will mechanically remove loosely held aersol agent contamination. Individual may be assisted by a guard or "buddy." If the dye indicates the present of liquid agent on the outergarments or gloves, they should be discarded when removed. Since the large bag will not be used on it, a Chemical Protective Suit (overgarment) should be discarded when removed only if the mask-hood assembly or other field gear indicated the presence of liquid contamination when checked with M8 detector paper. Discard large bag after use to designated area.

(3) Stow the mask carrier and other field gear, not required by local SOP to be carried into the shelter, in the anteroom but not in the path to the entrance door.

(4) Obtain two footwear covers, with string, from the designated storage space. Place the footwear covers over the boots and secure snugly around the ankles with the string.

NOTE

If airborne contamination is present around the shelter, the time of exposure after removing the outergarments and before entering the protective entrance should be held to a minimum.

(5) Remove first the lower and then the upper protective outergarment. If the use of the large bag indicated liquid contamination on the protective outergarments, discard them into a designated container. If the Chemical Protective Suit (overgarment) is worn, it should be discarded into a designated container if there are indications that it was exposed to liquid contamination. If the outergarments are free from liquid contamination, fold them so as not to leave the interior exposed and stow them near the mask carrier and other gear in the anteroom for reuse.

(6) Remove the M1 waterproofing bag from the mask carrier. Unfold the M1 bag and place the M258 skin decon kit in the bag.

(7) While holding the M1 waterproofing bag between the knees, remove the protective gloves. If the gloves are contaminated, discard them into the designated container. If they are free from contamination, place them with the outergarments or other gear in the anteroom.

NOTE

To hold penetration of contamination to a minimum and to maintain proper pressures in the system, doors should be open only long enough to permit passage of personnel and should not be held open while waiting for other personnel to complete their decontamination procedures.

(8) Insure that red "DO NOT ENTER WHEN ON" light is out and that the entrance is empty by looking through the window. Open the door and enter the entrance carrying the M1 waterproofing bag and any other gear prescribed by local SOP.

(9) At the end of the purge period as indicated by the green "PROCEED WHEN ON" light going on, remove the mask-hood assembly. Gather the inside-out hood to one side of the facepiece. Remove the M258 skin decon kit from the M1 bag. Gather the inside-out hood to one side of the facepiece and place the mask/hood assembly in the bag.

(10) Decontaminate the hands, as required, using the M258 skin decon kit. Discard used gauze and scrapers into a designated area.

(11) Proceed into the shelter carrying the M1 bag and any other gear prescribed by the local SOP.

(12) If the individual has entered the shelter area from the entrance where airborne chemical agent was present, or suspected, check him immediately, by the use of a detector kit, for agent desorbing from his clothing. If contamination is detected, all occupants shall don masks. The individual bringing in the contamination shall don a set of clean outergarments from the designated storage space in the shelter area to prevent further resorption of the agent. Masks should be worn until test of the air beneath the face of the individual bringing in the contamination indicates a safe condition.

6-5. Exit Procedure for Ambulatory Personnel

a. If protective outergarments (and gloves) are required outside, and the ones previously removed were discarded due to contamination, obtain clean ones from the designated storage space and don them in the shelter, unless a set is being worn to prevent resorption of agent.

b. Secure a new M13 kit and a new M258 kit, as required, from the designated storage space and place them in the M1 bag.

c. Insure that the "DO NOT EXIT WHEN ON" light is out and that the entrance is empty by looking through the window. Proceed into the entrance carrying the M1 waterproofing bag and any other gear taken into the shelter.

d. If the outergarments were worn in the shelter to prevent resorption and are not needed outside, remove them and pass them back into the shelter to be stored for future use. Don mask-assembly if required.

WARNING

If more than one individual are exiting at the same time, the outer entrance door should not be opened until all those in the entrance have donned their masks.

e. Proceed immediately to the outside carrying the M1 bag and any other gear taken into the shelter.

NOTE

In exiting, no waiting period in the entrance is required except for donning mask-hood assembly and possible removal of outergarments. However, if contamination is present around the shelter, exits should be spaced at least five minutes apart. This will permit purging the entrance of contaminants that may penetrate inside it while the door is open. Doors should be open only long enough to permit passage.

f. If reusable outergarments and gloves were left outside in the anteroom and are required to be worn, don the. Remove footwear covers and discard them to a designated area. Stow M13 kit in mask carrier and attach M258 kit to outside of carrier. Fold up and return the M1 waterproofing bag to the mask carrier. Don other gear left outside.

6-6. Emergency Entry Procedure for Ambulatory Personnel

a. In an extreme tactical emergency when entry must be made immediately and time does not permit decontamination, the removal of the outergarments, or waiting the recommended period prior to entering the shelter, the following steps should be performed.

(1) Stow in the anteroom the mask carrier and other field gear except that required by local SOP to be carried inside the shelter. Remove the M13 kit from the mask carrier.

(2) Enter the entrance carrying the M13 kit, M258 kit and any other gear required by local SOP. Notify the shelter occupants to don masks.

(3) Proceed into the shelter.

(4) When the tactical situation permits, check for vapor hazard within the shelter by use of a detector kit. If a vapor hazard is present, use M8 detector paper and/or large bag (containing the dye capsule) from the M13 kit to check for contamination on the floor of the shelter brought in on the boots. Also check the floor of the entrance. Decontaminate by using the large bag or wipe with a rag. Discard the used bag or rag to the designated area.

(5) After emergency treatment, if the individual must remain within the shelter for an appreciable period of time, he should exit to the outside and follow the normal procedure for entry as set forth in paragraph 6-4 except that the mask-hood assembly should not be removed prior to indication of a safe condition in the shelter.

(6) When a test of the atmosphere in the shelter indicates a safe condition, occupants remove the masks.

6-7. Entry Procedure for Litter Patients

a. Guard notifies the shelter occupants of the arrival of a litter patient.

b. Patient on the litter, along with his gear, is placed in the anteroom by the litter bearers. Field gear of the litter bearers and of the patient, not prescribed by local SOP to be carried into the shelter, is stowed in the anteroom.

c. Shelter occupant places clean litter and blankets against the wall in the entrance and returns to the shelter.

d. Litter bearers remove the M13 kit and the Ml waterproofing bag from the patient's mask carrier.

e. If the litter bearers have been exposed to known, or suspected, liquid agent that would contaminate their boots, they should obtain foot-wear covers, with string, from the designated storage space and place them over their boots, securing them with the string.

f. Litter bearers check the patient's mask-hood assembly for liquid contamination by the use of M8 detector paper. Decontamination is performed by using large bag from the M13 kit. Discard used bag to a designated area. Remove the blanket(s) and outergarments from the patient and discard them into a designated container.

NOTE

If airborne contamination is present around the shelter, the time of exposure after removing the outergarments and before

entering the entrance should be held to a minimum.

g. Guard insures that the red "DO NOT ENTER WHEN ON" light is out and there is no one in the entrance by looking through the window.

h. Guard notifies the litter bearers to proceed with the litter into the entrance while he assists by holding open the doors. Patient's M13 kit, M258 kit and M1 waterproofing bag, along with any other gear prescribed by local SOP, are also taken in.

i. Litter bearers transfer patient to the clean litter and notify the shelter occupants and the guard of their readiness to exit.

j. Guard assits by holding the door open, while the litter bearers exit with the empty litter.

k. Litter bearers remove footwear covers, if worn, and discard to designated area. Redon field gear left in the anteroom.

l. When the red "DO NOT ENTER WHEN ON" light is out, occupants from the shelter enter the entrance and remove the patient's mask, placing it into the M1 waterproofing bag. They decontaminate their hands by using the M258 kit.

m. Occupants carry the patient on the litter, with the Ml bag, the M258 kit, and the M13 kit, into the shelter.

n. If the patient was exposed to airborne chemical agent, or suspected chemical agent, check him immediately by use of a detector kit, for agent desorbing from his clothing. If contamination is detected, all occupants must don masks and wear them until subsequent test of the air near the patient indicates a safe condition.

6-8. Exit Procedure for Litter Patients

a. Occupants of the shelter notify the guard that patient is ready to leave.

b. Guard advises the occupants of the shelter when litter bearers (with litter) are available to remove the patient.

c. If required, mask-hood assembly, clean outergarments, and blanket(s) are placed on the patient.

d. Insure that the "DO NOT EXIT WHEN ON" light is out and the entrance is empty, then carry patient on litter into the entrance.

e. Transfer patient to litter brought in by litter bearers.

f. Notify guard that patient is ready to be taken out of the entrance.

g. Occupants of shelter retriever litter from entrance.

h. Occupants return to the shelter from the entrance.

i. Litter bearers place their field gear in the anteroom.

j. If the litter bearers have been exposed to liquid agent that would contaminate their boots, they should obtain footwear covers, with string, and place them over their boots, securing them with the string.

k. Guard assures that the red "DO NOT ENTER WHEN ON" light is out and that the shelter occupants have left the entrance by looking through the window.

l. Guard notifies the litter bearers who proceed into the entrance.

m. Litter bearers exit carrying the litter patient while being assisted by the guard.

n. Litter bearers pick up the patient's mask carrier along with any other gear. Footwear covers, if worn, should be removed and discarded to designated area. Litter bearers should then redon their own gear from the anteroom.

6-9. Delivery of Messages, Maps, Etc., to the Shelter in a CB Environment

NOTE

The shelter has designed into it a message-pass-through for transfer of messages, maps, etc.

a. While enroute to the shelter, keep messages, etc., under cover, such as in pocket of uniform, protective mask carrier, M1 waterproofing bag, or other field expedient.

WARNING

A message, etc., contaminated with liquid agent should not be transferred to the shelter.

b. Upon arrival, remove the message, etc., from the protective cover. Open message-pass-through. Place message, etc., into message-pass-through.

c. Close message-pass-through.

d. Notify occupants that the message, etc., has been placed in the message-pass-through by rapping on the shelter wall or by voice communication.

e. Occupants in shelter will open message-pass-through, remove contents and reseal message-pass-through.

APPENDIX A

REFERENCES

A-1. CBR Defense and Protection

FM 21-40	Chemical, Biological, Radiological, and Nuclear Defense
FM 3-4	NBC Protection
FM 3-5	NBC Decontamination
TM 10-277	Chemical, Toxicological and Missile Fuel Handlers Protective Clothing

A-2. Expendable Items

CTA 50-970	Expendable Items (Except: Medical, Class V, Repair Parts and Heraldic Items)

A-3. Lubrication

LO 5-2805-259-12	Engine, Gasoline, 20hp, Military Standard Models (Model 4A084-2 and 4A084-3)

A-4. Maintenance

TM 3-4230-204-12&P	Operator's and Organizational Maintenance Manual (Including Repair Parts and Special Tools List): Decontaminating Apparatus, Portable, DS 2, 1½ Quart, ABC-M11, NSN 4230-00-720-1618
TM 3-4230-211-10	Operator's Manual Decontaminating and Reimpregnating Kit: Individual, ABC-M13 (NSN 4230-00-907-4828)
TM 3-4230-213-10	Operator's Manual Decontaminating Kit, Skin: M258 (NSN 4230-00-123-3180)
TM 3-4240-264-20P	Organizational Maintenance Repair Parts and Special Tools Lists, Shelter System, Collective Protection, Chemical-Biological: Inflatable, Trailer-Transported, M51, NSN 4240-00-854-4144
TM 3-6665-307-10	Operator's Manual Detector Kit, Chemical Agent: M256
TM 5-2805-259-14	Operator, Organizational, Direct Support and General Support Maintenance Manual: Engine, Gasoline, 20hp, Military Standard Models (Model 4A084-2) NSN 2805-00-952-3926, (Model 4A084-3) NSN 2805-00-872-5972
TM 5-2805-259-24P	Operator, Organizational, Direct Support and General Support Maintenance Repair Parts and Special Tools Lists for Engine, Gasoline, 20 hp, Mil Std Models (Model 4A084-2) NSN 2805-00-952-926 and (Model 4A084-3) (NSN 2805-00-872-5972)
TM 9-2330-213-14	Operator's, Organizational, Direct Support, and General Support Maintenance Manual (Including Repair Parts and Special Tools Lists): Chassis, Trailer: 1½-ton, 2-wheel, M103A1 (2330-835-8629), M103A2 (2330-049-8050), M103A3 (2330-141-8052), M103A3C (2330-542-2181), M103A4 (2330-141-8051), M103A4C (2330-542-2182); Trailer, Cargo: 1½-ton, 2-wheel, M104 (2330-754-0509), M104A1 (2330-835-8630), M105A1 (2330-835-8631), M105A2 (2330-141-8050), M105A2C (2330-542-5689); Trailer, Tank, Water: 1½-ton, 2-wheel, 400-gallon, M107A1 (2330-835-8633), M107A2 (2330-141-8049), M107A2C (233W542-5688); Trailer, Van, Shop: Folding Sides, 1½-ton, 2-wheel, M448 (2330-631-5692)

TM 9-6140-200-14	Operator's, Organizational, Direct Support and General Support Maintenance Manual for Lead-Acid Storage Batteries 4HN, 24V (NSN 6140-00–059-3528) MS75047-1; 2HN, 12V (NSN 6140-00-057-2553) MS 35000; 6TN, 12V (NSN 6140-00-57-2554) MS35000-3
TM 38-750	The Army Maintenance Management System (TAMMS)

A-5. Safety

AR 385-63	Regulations for Firing Ammunition for Training, Target Practice, and Combat

A-6. Storage

TM 740-90-1	Administrative Storage of Equipment

APPENDIX B

BASIC ISSUE ITEMS LIST AND ITEMS TROOP INSTALLED OR AUTHORIZED LIST

Section I. INTRODUCTION

B-1. Scope

This appendix lists basic issue items and items troop installed or authorized required by the operator/crew for the operation and maintenance of the Shelter System.

B-2. General

This Basic Issue Items and Items Troop Installed or Authorized List is divided into the following sections:

a. Section II—Basic Issue Items List. Not applicable.

b. Section III–Items Troop Installed or Authorized List. A list of items, in alphabetical sequence, which may accompany the end item at the discretion of the unit commander. These items should not be turned in with the equipment.

B-3. Explanation of Columns

The following provides an explanation of columns found in the tabular listings.

a. National Stock Number. Indicates the National stock number assigned to the item and will be used for requisitioning purposes.

b. Description. Indicates the Federal item name and a minimum description required to identify the item. The last line indicates the reference number followed by the applicable Federal Supply Code for Manufacturer (FSCM) in parentheses.

c. Unit of Measure (U/M). Indicates the standard of the basic quantity of the listed item as used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation, (e. g., ea, in., pr, etc). When the unit of measure differs from the unit of issue, the lowest unit of issue that will satisfy the required units of measure will be requisitioned.

d. Quantity Authorized. Indicates the quantity of the item authorized to be used with the equipment.

B-4. Abbreviations

Abbreviation	*Explanation*
CL	Class
LG	Long/Length
SQ	Square
STY	Style
TY	Type
W /	With

Section III. ITEMS TROOP INSTALLED OR AUTHORIZED LIST

(1) National stock number (NSN)	(2) Description Part Number & FSCM Usable on Code	(3) U / M	(4) QTY AUTH
4240-00-106-7292	BLANKET ASSEMBLY, ELECTRICALLY, HEATED: E5-19-6564 (81361) **NOTE** The above listed for identification purposes only. This item is issued only to units deployed in arctic areas.	EA	1
6665-01-016-8399	DETECTOR KIT, CHEMICAL AGENT: M256 C5-77-2001 (81361)	EA	1
5120-00-243-1691	EXTENSION, SOCKET WRENCH: 3/8 IN. DRIVE, 12 IN. LG GGG-W-641 (81348)	EA	1
5120-00-251-4489	HAMMER, HAND: 8 LB GGG-H-86, TY SA, CL 2 (81348)	EA	1
5120-00-240-5364	HANDLE, SOCKET WRENCH: 3/8 IN. SQ DRIVE, 6 IN. LG. REVERSIBLE RATCHET GGG-W-641, TY 3, CL 2 (81348)	EA	1
5120-00-240-8716	SCREWDRIVER, CROSS TIP: 3 IN. SHANK, PLASTIC HANDLE, GGG43-121, TY 6, CL 1, STY 1 (81348)	EA	1
5120-00-234-8912	SCREWDRIVER, CROSS TIP: 6 IN. SHANK, PLASTIC HANDLE GGG-S-121, TY 6, CL 1, STY 1 (81348)	EA	1
5120-00-764-8058	SCREWDRIVER, FLAT TIP: ¼ IN. TIP W, 4 IN. SHANK, PLASTIC HANDLE, W/3/8 IN. SQ FEMALE INSERT IN HANDLE GGG-S-121, DESIGN A, SHAPE A (81348)	EA	1
5120-00-278-1279	SCREWDRIVER, FLAT TIP: 3/8 IN. TIP W, 8 IN. SHANK, PLASTIC HANDLE, W/3/8 IN. SQ FEMALE INSERT IN HANDLE GGG-S-121, Design A, SHAPE B (81348)	EA	1
5120-00-935-7413	SOCKET, SOCKET WRENCH: 9/16 IN. SIZE, 3/8 IN. SQ DRIVE, REGULAR LG, THIN WALL, 12-POINT GGG-W-1437, TY 2, CL 1 (81348)	EA	1
5120-00-224-9215	UNIVERSAL JOINT, SOCKET WRENCH: 3/8 IN. SQ DRIVE GGG-W-641 (81348)	EA	1
5120-00-277-3102	WRENCH, OPEN END, FIXED: 5/8 IN. AND 3 IN. OPENINGS, GGG-W-636, TY 4 (81348)	EA	1
5120-00-277-2307	WRENCH, OPEN END, FIXED: 5/16 IN. AND 3/8 IN. OPENINGS GGG-W-636, TY 4 (81348)	EA	1

APPENDIX C

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

C-1. General

This maintenance allocation chart lists the authorized maintenance functions assigned the maintenance categories for maintenance of the shelter system.

C-2. Use

The maintenance allocation chart will be used by all categories of maintenance to insure complete support of the equipment.

Section II. COLUMN EXPLANATION AND MAINTENANCE ALLOCATION CHART

C-3. Column 1, Group Number

The group numbers identify components, assemblies, subassemblies, and modules with the next higher assembly.

C-4. Column 2, Component/ Assembly

This column contains the noun names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

C-5. Column 3, Maintenance Functions

Lists the functions to be performed on the item(s) listed in Column 2. Maintenance functions will be limited to and defined as follows:

a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical and/or electrical characteristics with established standards through examination.

b. Test. To verify serviceability and detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

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

e. Install. The act of emplacing, seating, or fixing into position an item, part, or module (component or assembly) in a manner to allow the proper functioning of an equipment system.

f. Replace. The act of substituting a serviceable liketype part, subassembly, or module (component or assembly) for an unserviceable counterpart.

g. Repair. The application of maintenance services or other maintenance actions to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component/assembly), end item or system.

h. 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 materiel 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.

C-6. Column 4, Maintenance Category

Specifies by the listing of a "worktime" (WT) figure in the appropriate subcolumns, the lowest 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 category of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance categories, appropriate WT figures will be shown for each category. The number of man-hours specified by the WT figure represents the average time required to restore an item to serviceable condition under typical field operating conditions. This time includes preparation time,

troubleshooting time, and quality assurante/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. This time will be expressed in man-hours and carried to one decimal place (tenths of hours).

C-7. Column 5, Tools and Equipment

Specifies by code, those common tool sets and special tools, test, and support equipment required to perform the designated function. Refer to paragraph C-8 and table C-1 for identification of the tools, tool sets, and equipment.

MAINTENANCE ALLOCATION CHART
for
M51 Shelter System

(1)	(2)	(3)	(4)					(5)
Group Number	Component / assembly	Maintenance Function	Maintenance Calegory*					Tools and Equipment
			C	O	F	H	D	
0100	TRAILER COVER AND SHELTER CASE	Inspect	0.1					
		Install	0.1					
		Replace	0.1					
		Repair	0.2	0.2				21
0200	INFLATABLE SHELTER AND ENTRANCE							
0201	INFLATABLE SHELTER	Inspect	0.1					
		Test	0.2					1
		Service	0.3					
		Adjust	0.1					1
		Install	0.5					
		Replace	0.5					
		Repair	0.4	0.2	0.7			21
0202	INFLATABLE ENTRANCE	Inspect	0.1					
		Test	0.3					1
		Service	0.2					
		Adjust	0.2					1
		Install	0.3					
		Replace	0.5					
		Repair	0.4	0.2	0.7			21
0203	EXTERIOR FRAME AND DOOR ASSEMBLY	Inspect	0.1					
		Test	0.2					1
		Service	0.4					
		Adjust	0.2					1
		Replace		0.5	1.5			
		Repair		0.3				
0204	CONTROL (SWITCH) BOX	Inspect	0.1					
		Test	0,18		0.2			
		Service	0.2					
		Adjust	0.3					
		Replace		0.2				
		Repair	0.1	0.4	0.5			5
0205	INTERIOR FRAME AND DOOR ASSEMBLY	Inspect	0.1					
		Test	0.2					1
		Service	0.4					
		Adjust	0.2					1
		Replace		0.5	0.5			
		Repair		0.3				
0206	DISTRIBUTION BOX	Inspect	0.1					
		Test	0.3					
		Service	0.2					
		Replace		0.2				
		Repair	0.1	0.3	0.5			5
0300	REMOVABLE TRAILER COMPONENTS							
0301	TAILGATE EXTENSION	Inspect	0.1					
		Install	0.1					
		Replace	0.1					
		Repair		0.5				

* See footnote at the end of the chart

MAINTENANCE ALLOCATION CHART
for
M51 Shelter System

(1)	(2)	(3)	(4)					(5)
Group Number	Component/assembly	Maintenance Function	Maintenance Category *					Tools and Equipment
			C	O	F	H	D	
0302	SUPPORT RACK	Inspect	0.1					
		Install	0.1					
		Replace	0.1					
		Repair		0.4	0.4			
0303	AIR DUCT ASSEMBLIES AND RETAINERS	Inspect	0.1					
		Install	0.1					
		Replace		0.2				
		Repair	0.2	0.2				21
0304	ENTRANCE GAS-PARTICULATE FILTER UNIT (GPFU)	Inspect	0.1					
		Test	0.1					1
		Install	0.1					
		Replace		0.1				
		Repair		0.2	1.0			21
0305	ENTRANCE VANEAXIAL FAN (MODIFIED)	Inspect			0.2			
		Replace			1.0			
		Repair			1.0			5
0306	EVACUATION FAN ASSEMBLY	Inspect	0.1					
		Install	0.1					
		Replace	0.2					
		Repair		0.3				6
0307	BOX AND SOUND-ATTENUATING PLENUMS	Inspect	0.1					
		Install	0.2					
		Replace	0.1					
		Repair		0.1				
0308	EVACUATION MANIFOLD	Inspect	0.1					
		Install	0.2					
		Replace	0.1					
		Repair	0.1	0.3				21
0309	TOOL BOX AND CONTENTS	Inspect	0.1					
		Replace	0.1					
		Repair			0.3			
0310	CABLE AND LIGHT ASSEMBLIES	Inspect	0.1					
		Install	0.1					
		Replace	0.2					
		Repair	0.1	0.5				
0311	AIR-FLOW GAGE	Inspect	0.1					
		Adjust	0.1					
		Replace	0.1					
		Repair		0.3				
0312	AUXILIARY CONTROL INDICATOR	Inspect	0.2					
		Test	0.1	0.5	0.5			s
		Install	0.1					
		Replace	0.2					
		Repair	0.1	1.0	1.0			
0313	ARCTIC BLANKET (ELECTRIC)	Inspect	0.1					
		Test			0.2			6
		Install	0.1					
		Replace		0.1				
		Repair			1.0			
0400	FILTER AND UTILITIES UNIT (M68) (Maintenance Float)	Inspect	0.5					
		Install	.20					
		Replace	.40					
		Repair			3.00			

*** See footnote at the end of the chart**

MAINTENANCE ALLOCATION CHART for M51 Shelter System—Continued

(1)	(2)	(3)	(4)					(5)
Group Number	Component/assembly	Maintenane Function	Maintenance Category l					Tools and Equipment
			C	O	F	H	D	
0401	TRAILER RACKS, COVERS, AND TOOL POUCHES	Replace		0.1				
		Repair		0.5				
0402	ARCTIC (ELECTRIC) BLANKET DISTRIBUTION BOX	Replace			.02			
		Repair			0.6			6
0403	ACCESS COVERS AND POWER SUPPLY	Inspect	0.1					
		Replace		0.2	0.2			
		Repair			0.5			6
0404	BATTERY, COVER AND FIRE EXTINGUISHER	Inspect	0.1					
		Service	0.1					4
		Replace	0.2	0.3				
0405	STRAP ASSEMBLIES	Inspect	0.1					
		Replace		.02				
0406	MAIN CONTROL INDICATOR	Inspect	0.1					
		Test	0.1		1.0			6
		Service	0.2					
		Replace		0.6				
		Repair	0.1		1.0			
0407	FUEL LINES AND PUMP	Inspect	0.1					
		Replace			0.6			
		Repair		0.8	0.5			
0408	REFRIGERATION TUBING AND ANCILLARY ITEMS	Inspect	0.1					
		Test			0.2			6,7
		Service			1.0			
		Replace			0.5			6,7
		Repair			0.5			6,7
0409	ELECTRICAL WIRING	Inspect	0.1					
		Test			0.5			6
		Replace			1.0			
		Repair		0.1	1.0			6
0410	GAS-PARTICULATE FILTER ASSEMBLY	Inspect	0.1					
		Test	0.2					1
		Replace		0.2				
		Repair		0.4	1.0			
0411	AIR DUCTS, VALVING AND RELATED COMPONENTS	Inspect	0.1					
		Adjust	0.2					1
		Repair		0.2	1.0			
0412	FUEL SYSTEM AND RELATED PARTS	Inspect	0.1		0.1			
		Service	0.1					
		Replace	0.1					
		Repair		0.5	2.0			5,22,23,24,25
0413	COMBUSTION HEATER	Inspect	0.1					
		Replace		0.4	0.5			
		Repair			1.0			
		Service		0.1				
		Rebuild			2.0			6
0414	EVAPORATOR COIL	Inspect	0.1					
		Service	0.1					
		Replace			1.0			6, 7
		Repair			1.0			6, 7
0415	AIR RECIRCULATION GAS AND PARTICULATE FILTERS	Test	0.2					1
		Replace		0.2				
		Repair			1.0			
0416	EVAPORATOR VANEAXIAL FAN	Inspect	0.2					
		Replace		0.5				
		Repair			1.0			1, 6
0417	TEMPERATURE AND PRESSURE SWITCHES	Adjust	0.2					
		Replace			0.6			6

*See footnote at the end of this chart

MAINTENANCE ALLOCATION CHART for M51 Shelter System—Continued

(1)	(2)	(3)	(4)					(5)
Group Number	Component/assembly	Maintenance Function	Maintenance Category*					Tools and Equipment
			C	O	F	H	D	
0418	EVACUATION CONTROL UNIT (ECU) COMPARTMENTS	Repair		0.2				
0419	ENGINE COMPONENTS, ENGINE AND PALLET	Inspect	0.1					
		Service	0.2					
		Adjust	0.1					
		Replace		0.5	0.8			2,3
		Repair			2.0			
0420	REFRIGERANT COMPRESSOR	Inspect	0.1					
		Adjust	0.1					2,3
		Replace			0.6			2,3, 6,7
		Repair			1.0			8,9,
0421	CENTRIFUGAL BLOWER							10
		Inspect	0.1					
		Service	0.1					
		Adjust	0.1					2,3
		Replace		0.5				2,3
		Repair		0.3				
		Rebuild				9.0		11 thr- ough 20
0422	GENERATOR	Inspect	0.1					
		Adjust	0.3					2,3
		Replace			0.5			2,3,5
		Repair		0.4				6
		Rebuild			2.0			
0423	SOUNDPROOF ENCLOSURE	Inspect			0.1			
		Repair			0.5			
0424	VOLTAGE REGULATOR	Service		0.3				
		Replace			0.5			6
		Repair		0.2	1.0			6
		Rebuild			2.0			6
0425	FAN AND CONDENSER ASSEMBLY	Inspect	0.1					
		Service	0.3					
		Replace		0.4				
		Repair			2.0			6
		Rebuild			2.0			6
0426	CARGO TRAILER	Inspect	0.1					
		Service	0.4					
		Repair		0.5				

* The subcolumns are as follows:
C—Operator/crew
O—Organizational
F—direct support
H—general support
D—depot

C-8. Tool and Test Equipment Requirements (Table C-1)

Table C-1 identifies all tools and test equipment required for maintenance and repair of the Shelter System as specified in the maintenance allocation chart (MAC). The list gives tool or test equipment reference codes; user maintenance category code; a short description of items required; and national stock numbers. The tool or test equipment code corresponds to the code in column 5 of the MAC. The maintenance category code indicates the level of availability and authorized use. All remaining columns are self-explanatory.

Table C-1. Tool and Test Equipment Requirements

Tool or Test Equipment Reference Code	Maintenance Category	Nomenclature	National NATO Stock Number	Tool Number
		TEST EQUIPMENT		
1	C	GAGE ASSEMBLY, DIFFERENTIAL, DIAL INDICATING (AIR-FLOW GAGE)	4240-00-477-6733	
2	C, O, F	TENSIOMETER, V-BELT	6635-00-921-6255	
3	C, O, F	BAR, BELT TENSION	4240-00-489-5134	
4	C, O	HYDROMETER	6630-00-171-5157	
5	D, F	MULTI METER	6625-00-643-1668	
6	F	LEAK DETECTOR, REFRIGERANT GAS (ELECTRONIC)		
7	F	LEAK DETECTOR, REFRIGERANT GAS	4940-00-756-1207	
		REFRIGERANT COMPRESSOR TOOLS		
8	F	HOLDING TOOL, CLUTCH HUB	5120-00-174-2383	
9	F	REMOVER, HUB AND DRIVE PLATE ASSEMBLY	5120-00-174-2386	
10	F	HUB AND DRIVE PLATE INSTALLER	5120-00-279-2218	
		CENTRIFUGAL BLOWER FAN TOOLS		
11	H	BENCH BLOCK	4140-00-560-7093	
12	H	PULLER, IMPELLER	4140-00-560-7100	
13	H	PULLER, OUTER RACE	4140-00-560-7101	
14	H	BEARING SUPPORT TOOL	4140-00-560-7103	
15	H	INSTALLING TOOL, BEARING	4140-00-560-7104	
16	H	SEATING TOOL, BEARING	4140-00-560-7105	
17	H	IN PUT SHAFT TOOLS	4140-00-560-7106	
18	H	REMOVAL TOOL, SEAL	4140-00-560-7107	
19	H	BEARING SUPPORT PLATE	4140-00-560-7119	
20	H	HOLDER, BALL DRIVER	4140-00-342-9729	
		SOFTWARE TOOLS		
21	C	REPAIR KIT, INFLATABLE SHELTER	4240-00-008-1674	
		FUEL TANK REPLACEMENT TOOLS		
22	F	STRAPPING AND SEALING KIT	3540-00-565-6243	
23	F	ADAPTER SOCKET WRENCH	5120-00-240-8702	
24	F	CROWFOOT ATTACHMENT, SOCKET WRENCH	5120-00-541-4071	
25	F	TAPE, MEASURING	5210-00-293-3500	

BT1 BATTERY, 24-VOLT
B1 EVAPORATOR FAN/MOTOR
B2 ENTRANCE FAN/MOTOR
B3 CONDENSER FAN/MOTOR
B4 HEATER FAN/MOTOR
B5 EVACUATION FAN/MOTOR
B6 ENGINE STARTER/MOTOR
CB1 CIRCUIT BREAKER, AUXILIARY 120 VAC
CB2 CIRCUIT BREAKER, EVAPORATOR FAN AND ENTRANCE FAN
CB3 CIRCUIT BREAKER, CONDENSER FAN
CB4 CIRCUIT BREAKER, DC POWER SUPPLY
CB5 CIRCUIT BREAKER, EVACUATION FAN
CB6 CIRCUIT BREAKER, ARCTIC BLANKET CONNECTOR
CB7 CIRCUIT BREAKER, 110 VAC OUTLET
CR3 DIODE, HEATER
CR7 DIODE, POWER SUPPLY IN1202
CR8 DIODE, POWER SUPPLY IN1202
CR9 DIODE, POWER SUPPLY IN1202
CR10 DIODE, POWER SUPPLY IN1202
CR11 DIODE, POWER SUPPLY IN1202
CR12 DIODE, POWER SUPPLY IN1202
C1 CAPACITOR
DS1 LIGHT, SHELTER ILLUMINATION
DS2 LIGHT, SHELTER ILLUMINATION
DS3 LIGHT, ENTRANCE ILLUMINATION
DS4 INDICATOR LIGHT, HEATER ON—GREEN
DS5 INDICATOR LIGHT, DO NOT ENTER WHEN ON—RED
DS6 INDICATOR LIGHT, DO NOT EXIT WHEN ON—RED
DS7 INDICATOR LIGHT, PRECEDE WHEN ON—GREEN
DS8 BUZZER—LOW SHELTER PRESSURE
DS9 INDICATOR LIGHT, MASK—RED
DS10 INDICATOR LIGHT, LOW OIL PRESSURE—ENGINE
DS11 PANEL LIGHT
DS12 INDICATOR LIGHT, PURGE MODE—SWITCH BOX
DS13 INDICATOR LIGHT, PURGE MODE—AUXILIARY CONTROL INDICATOR
FC1 FREQUENCY CONVERTOR
FL1 RFI FILTER
F2 FUSE
G1 GENERATOR—SYSTEM
G2 GENERATOR—ENGINE
J1 CONNECTOR, RECEPTACLE, ELECTRICAL
J22 CONNECTOR, RECEPTACLE, ELECTRICAL
J23 CONNECTOR, RECEPTACLE, ELECTRICAL
J25 CONNECTOR, RECEPTACLE, ELECTRICAL
J27 CONNECTOR, RECEPTACLE, ELECTRICAL
K1 RELAY, TIME DELAY
K3 RELAY, CONDENSER FAN
K4 RELAY, HEATER
K5 RELAY, TIME DELAY—ENTRANCE
K6 RELAY, ENGINE START
K7 RELAY, TIME DELAY—HEATER
K8 RELAY, RECIRCULATION FAN
K9 ENGINE MAGNETO RELAY AND RFI FILTER
K10 RELAY, TIME DELAY—CLUTCH
K11 RELAY, SWITCHING
L1 CLUTCH, COMPRESSOR
L2 FUEL PUMP, HEATER
L3 REGULATOR VALVE, HEATER
L4 SOLENOID VALVE, MAKE-UP AIR
L5 CHOKE, ENGINE
L6 MAGNETO, ENGINE
L7 VALVE, HEATER SHUTOFF
M1 GENERATOR FREQUENCY METER
M2 ENGINE AMMETER
M3 SYSTEM HOURMETER
M4 FUEL LEVEL GAGE

PS1 POWER SUPPLY
R2 RESISTOR, HEATER FAN
R5 RESISTOR, TIME DELAY RELAY
R8 RESISTOR, 1000 OHM
R9 RESISTOR, 10 OHM, 1 WATT
R10 RESISTOR, 2000 OHM
R11 RESISTOR, TIME DELAY
R12 RESISTOR, TIME DELAY
R13 FUEL QUANTITY TRANSMITTER
SCR1 RECTIFIER, 2N3528
SCR2 RECTIFIER, 2N3528
S1 SWITCH, MANUAL FIELD FLASH
S2 SWITCH, SHELTER LIGHTS
S3 SWITCH, PRESS-TO-INFLATE
S4 SWITCH, AIR-CONDITIONING, HEAT-COOL-CIRCULATE
S5 SWITCH, THERMOSTAT
S7 SWITCH, HIGH PRESSURE CUTOUT
S8 SWITCH, LOW PRESSURE CUTOUT
S9 SWITCH, HEATER OUTPUT, HI-LOW
S10 SWITCH, FLAME—HEATER
S11 SWITCH, LIMIT—HEATER
S12 SWITCH, MAKE-UP AIR PRESSURE
S13 SWITCH, LOW AIR PRESSURE
S14 SWITCH, LIMIT—ENTRANCE TIME DELAY
S15 SWITCH, ENGINE CONTROL
S16 SWITCH, LOW OIL PRESSURE—ENGINE
S17 SWITCH, ENGINE START
S18 OVERLOAD SWITCH, EVAPORATOR FAN MOTOR
S19 THERMOSTAT, EXHAUST MANIFOLD
S20 OVERLOAD SWITCH, CONDENSER FAN MOTOR
S21 SWITCH, HEATER RE-START
S22 OVERLOAD SWITCH, ENTRANCE FAN MOTOR
S23 SWITCH, BUZZER SILENCER
S24 SWITCH, PANEL LIGHT
S25 SWITCH, TIME DELAY MODE—AUXILIARY CONTROL INDICATOR
S26 SWITCH, TIME DELAY MODE—SWITCH BOX
S27 SWITCH, FUEL GAGE
VR1 VOLTAGE REGULATOR—SYSTEM
VR2 VOLTAGE REGULATOR—ENGINE

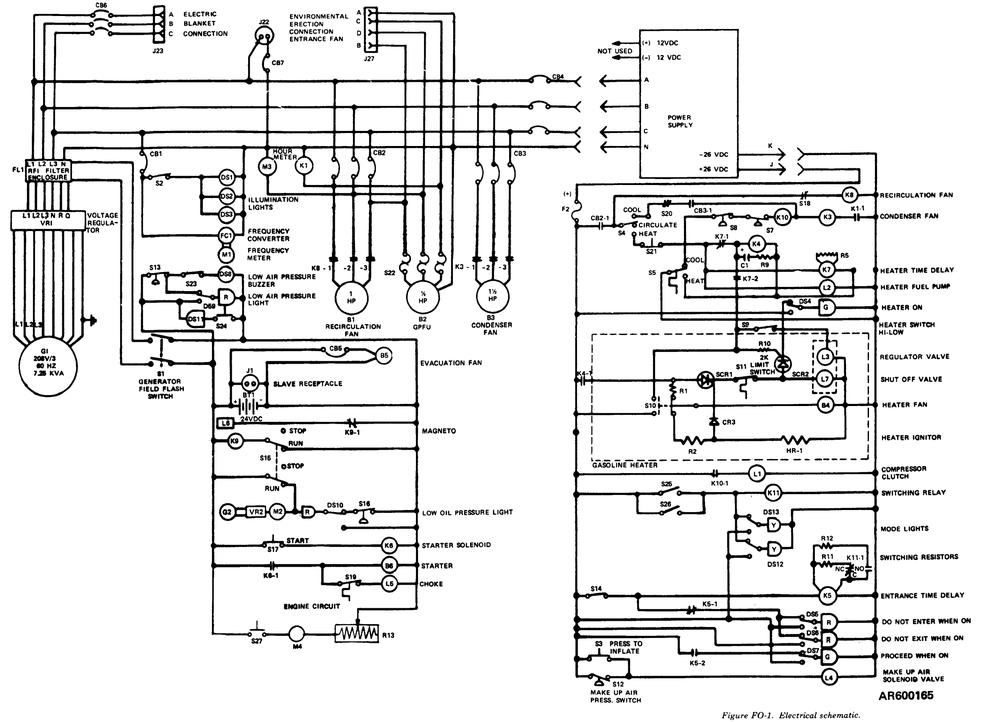


Figure FO-1. Electrical schematic.

BT1 BATTERY, 24-VOLT
B1 EVAPORATOR FAN/MOTOR
B2 ENTRANCE FAN/MOTOR
B3 CONDENSER FAN/MOTOR
B4 HEATER FAN/MOTOR
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P12 CONNECTOR, PLUG, ELECTRICAL
P13 CONNECTOR, PLUG, ELECTRICAL
P14 CONNECTOR, PLUG, ELECTRICAL
P15 CONNECTOR, PLUG, ELECTRICAL
P16 CONNECTOR, PLUG, ELECTRICAL
P17 CONNECTOR, PLUG, ELECTRICAL
P18 CONNECTOR, PLUG, ELECTRICAL
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VR1 VOLTAGE REGULATOR—SYSTEM
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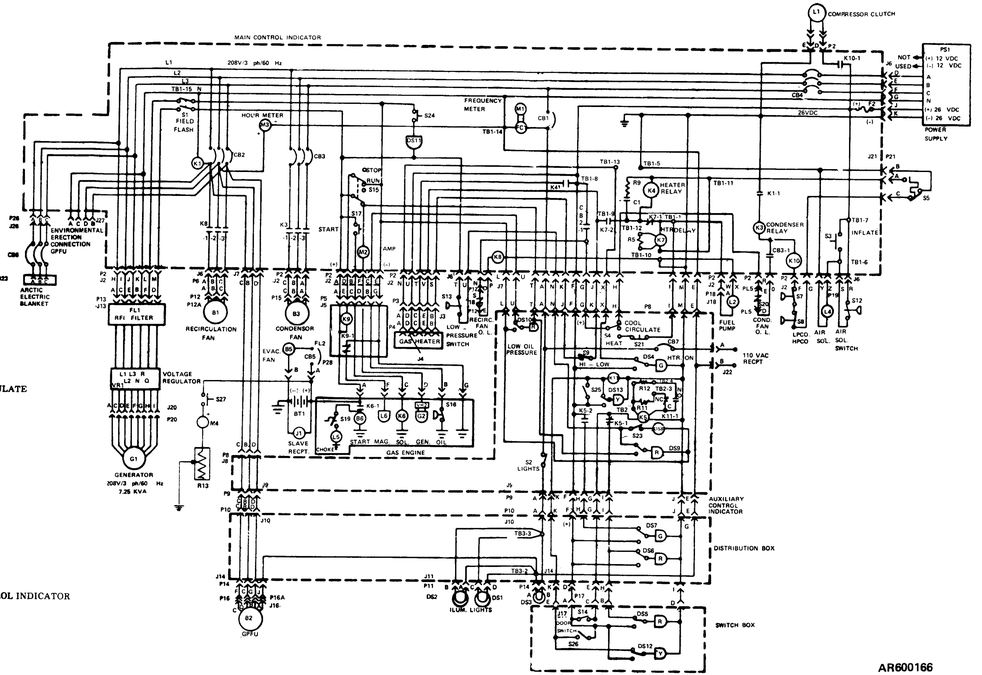

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RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL MANUALS

SOMETHING WRONG WITH THIS MANUAL?

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APO New York 09827

DATE 22 Jan 1976

PUBLICATION NUMBER	DATE	TITLE
TM 3-4240-264-12	15 Aug 1975	Operator's and Organizational Maint Manual M51 Shelter System

BE EXACT. . .PIN-POINT WHERE IT IS

PAGE NO.	PARAGRAPH	FIGURE NO.	TABLE NO.	IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
1-28		1-6		Revise drawing of support rack to show correct position of horizontal entrance securing straps. Reason: The horizontal entrance securing straps should be in line with the shelter supports securing straps.
1-66			1-3	Add: Wiping rags (NSN 7920-00-205-1711) to table of expendable items. Reason: Wiping rags are required during repair of the entrance and shelter fabric.
2-5	2-54a			Add the word momentarily in the second sentence after the word only. Reason: Generator can be permanently damaged by improper use of the field flash switch.

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S/4 KENNETH OLDS (Autovon 584-3837)	S/4 Kenneth Olds

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