DEPARTMENT OF THE ARMY TECHNICAL MANUAL

TECHNICAL MANUAL

DIRECT SUPPORT AND GENERAL SUPPORT

MAINTENANCE MANUAL

COMPRESSOR, AIR, RECIPROCATING, POWER DRIVEN

15 CFM, 3500 PSI, 4-WHEEL MOUNTED,

WINTERIZED (STEWART-WARNER MODEL 12021A)

FSN 4310-231-5513

This copy is a reprint which includes current pages from Change 1

HEADQUARTERS, DEPARTMENT OF THE ARMY

December 1972

WARNING

GASES OR AIR UNDER PRESSURE, 3500 PSI AIR PRESSURE is used in the operation of this equipment.

DEATH

or severe injury may result if personnel fail to observe safety precautions.
Make sure the compressor is relieved of all air pressure when maintenance is to be performed on the air compressor or its components.
Do not play with compressed air. Pressurized air can cause serious injury.
Do not overcharge system.
Ensure service hose is serviceable and approved for 3500 PSI operation.

CARBON MONOXIDE FUMES prevail in the operation of this equipment.

DEATH

may result if personnel fail to observe safety precautions. Keep operating area well ventilated. Do not operate the air compressor in an enclosed area unless the exhaust gases are piped to the outside. Exhaust gases contain carbon monoxide, which is colorless, odorless and very poisonous to personnel. Be cautious of hot metal surfaces.

DANGEROUS CHEMICALS are used in the equipment.

DEATH

or severe burns may result if personnel fail to observe safety precautions. Always provide a metal-to-metal contact between container and fuel tank when filling the fuel tank. This will prevent or neutralize any static electricity being generated and prevent sparks. To minimize the fire hazard when servicing the fuel system, prevent spills, wipe spills that do occur, and ventilate area before starting engine or operating electrical components.

WARNING

Operation of this equipment presents a noise hazard. The noise level exceeds the allowable limits for unprotected personnel. Protective noise mufflers or ear plugs shall be worn when operating this equipment.

WARNING

Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Keep open flame and excessive heat away from solvent. Flash point of solvent is 100°-138°. (Fed. Spec. PD-680).

CHANGE
No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C. *5 July 1974*

Direct Support and General Support
Maintenance Manual
COMPRESSOR, AIR, RECIPROCATING, POWER DRIVEN
15 CFM, 3500 PSI, 4 WHEEL MOUNTED
WINTERIZED (STEWART-WARNER MODEL 12021A)
FSN 4310-231-5513

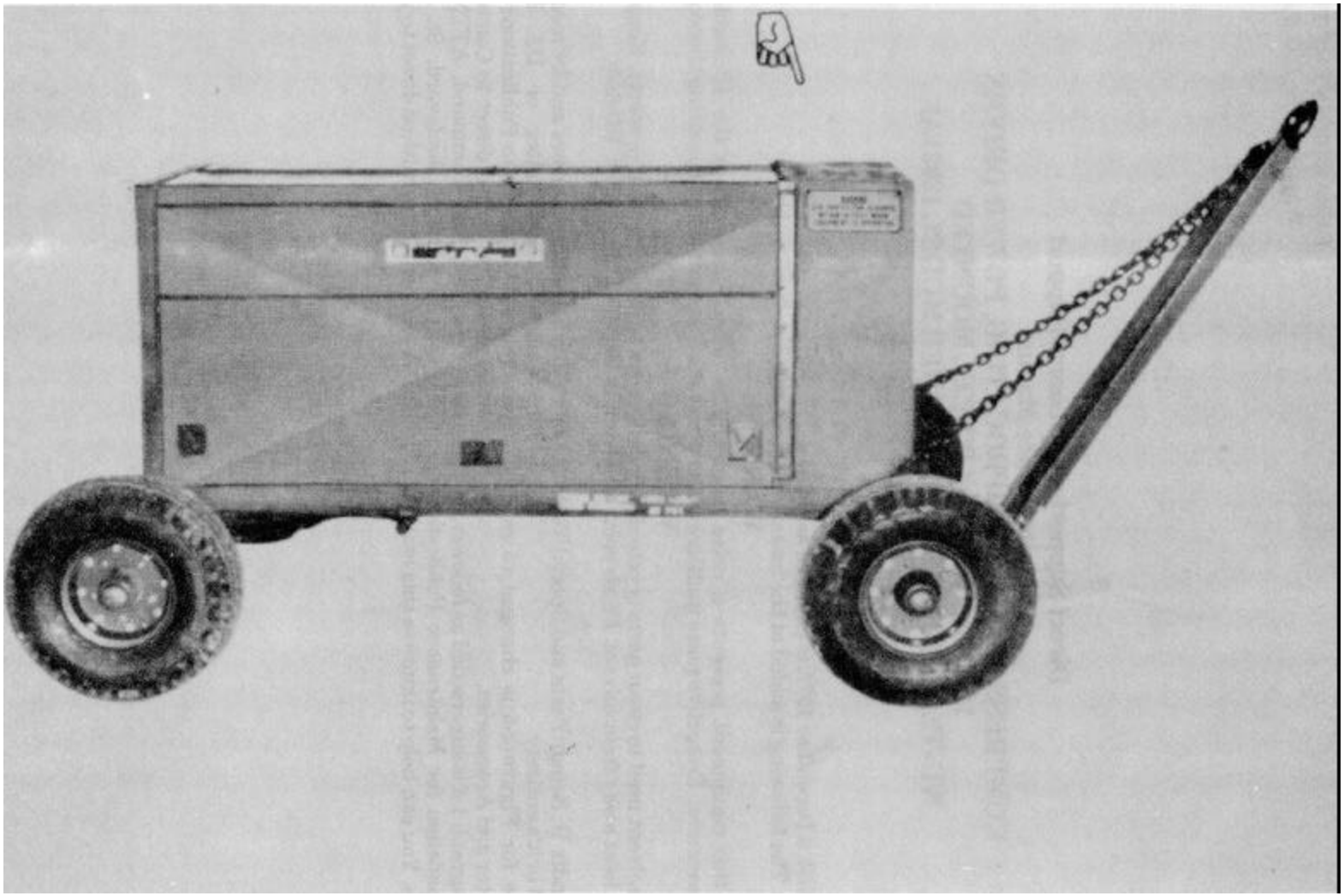
TM 5-4310-346-34, 6 December 1972, is changed as follows:
Warning page. The following is added at the bottom of the page.

WARNING
Operation of this equipment presents a noise hazard. The noise level exceeds the allowable limits for unprotected personnel. Protective noise mufflers or ear plugs shall be worn when operating this equipment.

WARNING
Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Keep open flame and excessive heat away from solvent. Flash point of solvent is 100°-138°. (Fed. Spec. PD-680).

Page ii. Appendix B, Repair Parts and Special Tools List is deleted in it's entirety.
Page iii. Title for Figure 2-5 is changed to read: Heater, Adapter and Accessories.
Page 1-1. Paragraph 1-4 is superseded as follows:
1-4. Recommendation for Maintenance Publications Improvements. You can help to improve this manual by calling attention to errors and by recommending improvements. Your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) should be mailed direct to Commander, US Army Troop Support Command, ATTN: AMSTS-MPP, 4300 Goodfellow Boulevard, St. Louis, MO 63120. A reply will be furnished direct to you.

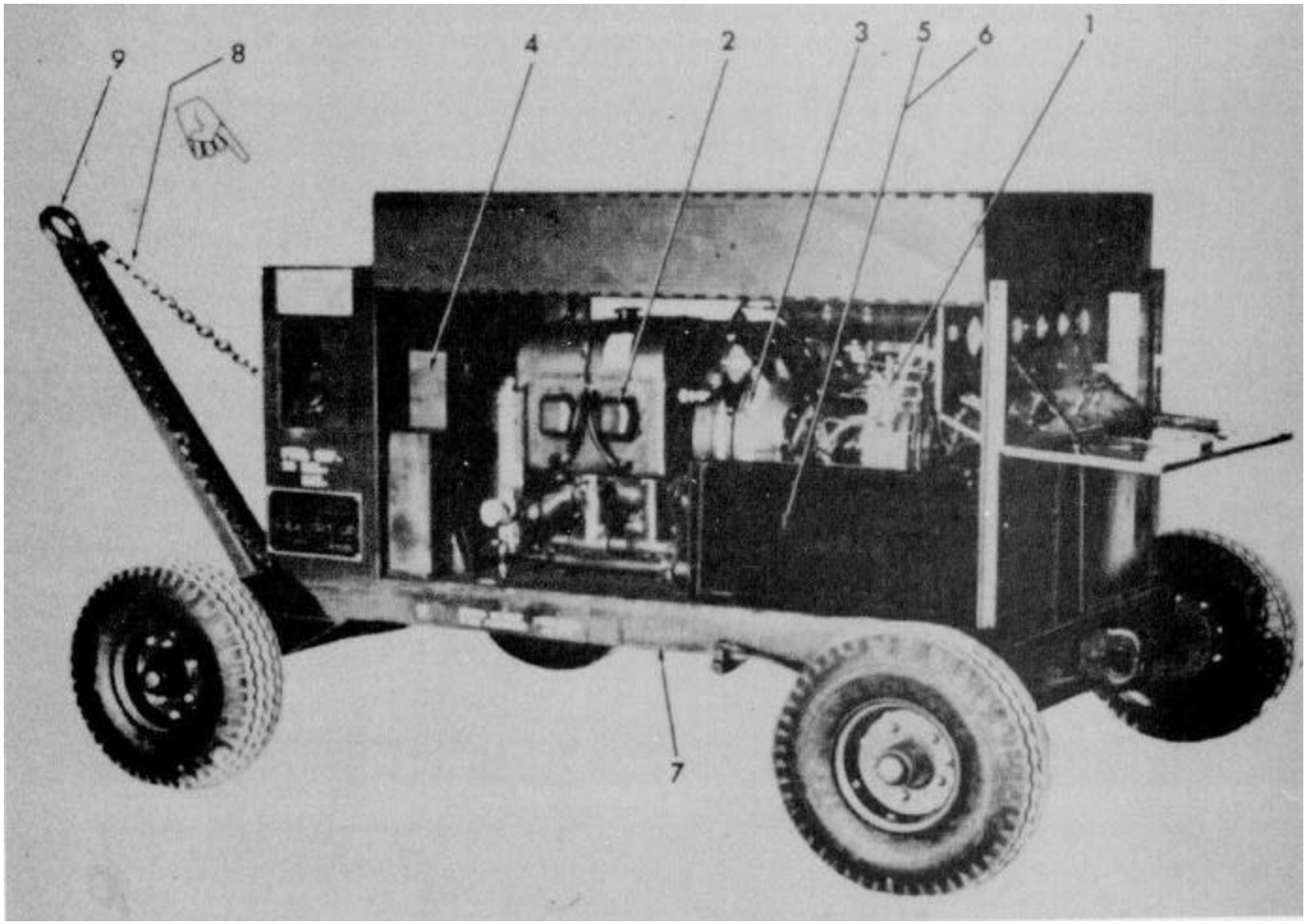
Page 1-2. Figure 1-1 is superseded as follows:



ME 4310-346-34/1-1 C1

Figure 1-1. Air Compressor

Page 1-4. Figure 1-2 is superseded as follows:



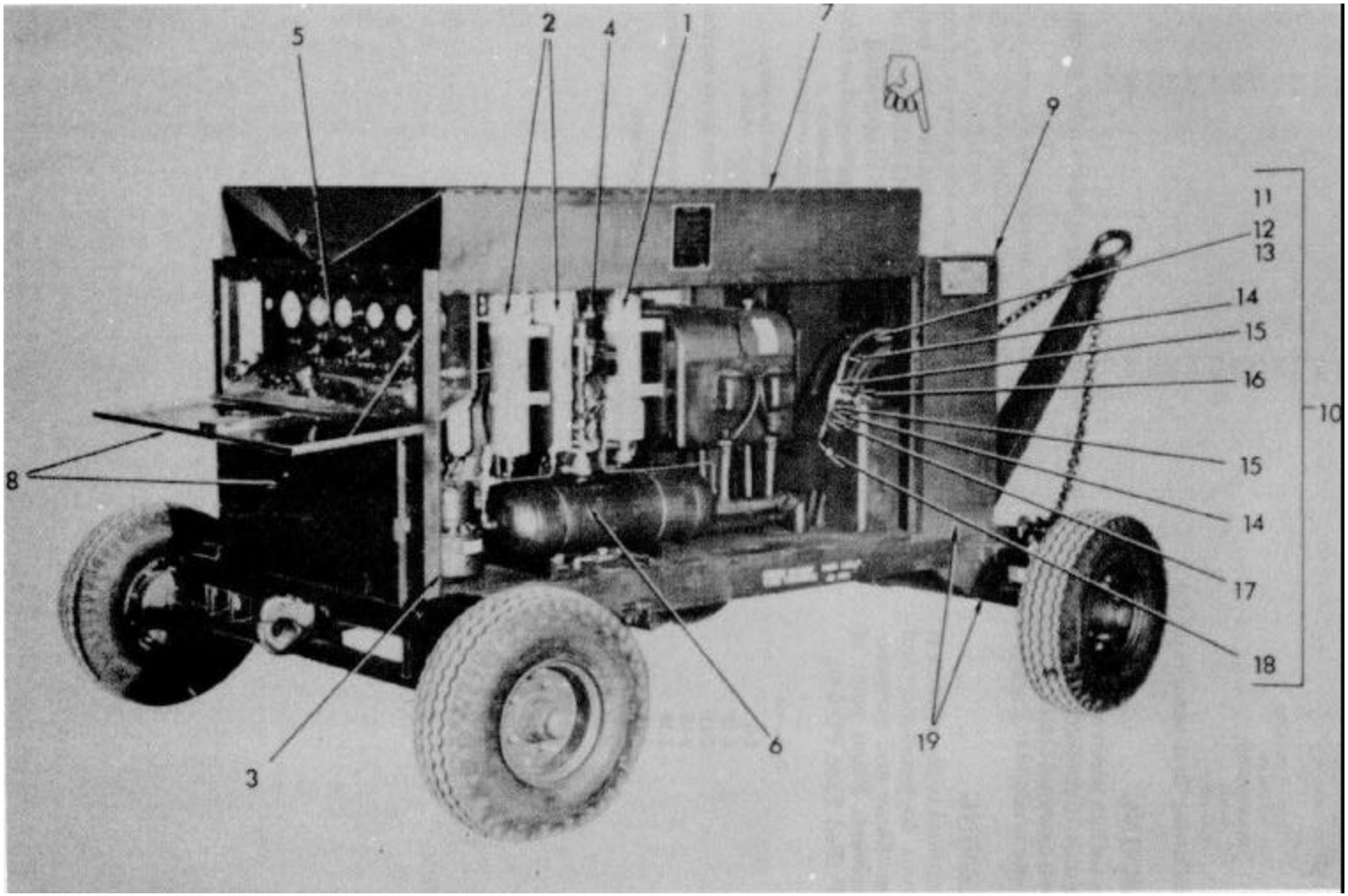
ME 4310-346-34/1-2 C1

Figure 1-2. Air Compressor, 3/4 Left Rear View

Page 1-5. Key to figure 1-2 is superseded as follows:

KEY to figure 1-2
1 Air compressor
2 Gasoline engine
3 Clutch
4 Fuel tank and tool box assembly
5 Batteries
6 Battery box
7 Chassis and wheel assembly
8 Safety chain
9 Drawbar lunette

Page 1-6. Figure 1-3 is superseded as follows:



ME 4310-346-34/1-3 C1

Figure 1-3. Air Compressor 3/4 Right Rear View

Page 1-7. Key to figure 1-3 is superseded as follows:

KEY to figure 1-3
1 Moisture separator
2 Dehydrators
3 Heater assembly
4 Cleaner assembly
5 Control panel
6 Air reservoir
7 Cover assembly
8 Doors
9 Panels
10 Auxiliary air hose assembly
11 Quick disconnect half coupling
12 Nipple
13 Hose assembly
14 Union
15 Preformed packing
16 Shutoff valve
17 Tube assembly
18 Air chuck
19 Handbrake

Page 1-8. Immediately following first paragraph 1-8 Warning Note is added.

WARNING

Always wear ear protection when within 15 feet of an operating unit, to protect against hearing damage from extreme noise.

The following warning note is added to the following pages and paragraphs:

WARNING

Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Keep open flame and excessive heat away from solvent. Flash point of solvent is 100°-138°F. (Fed. Spec. PD-680).

Page	*Paragraph*
2-3	2-6
2-7	2-10
2-7	2-11
2-7	2-12
2-9	2-13
2-11	2-14
2-13	2-15
2-19	2-17
2-23	2-19
2-24	2-20
3-1	3-2
4-1	4-2
4-3	4-4
5-1	5-2
6-1	6-2
7-1	7-2
7-3	7-4
8-2	8-2
8-9	8-4
8-17	8-6
9-6	9-6
10-3	10-2

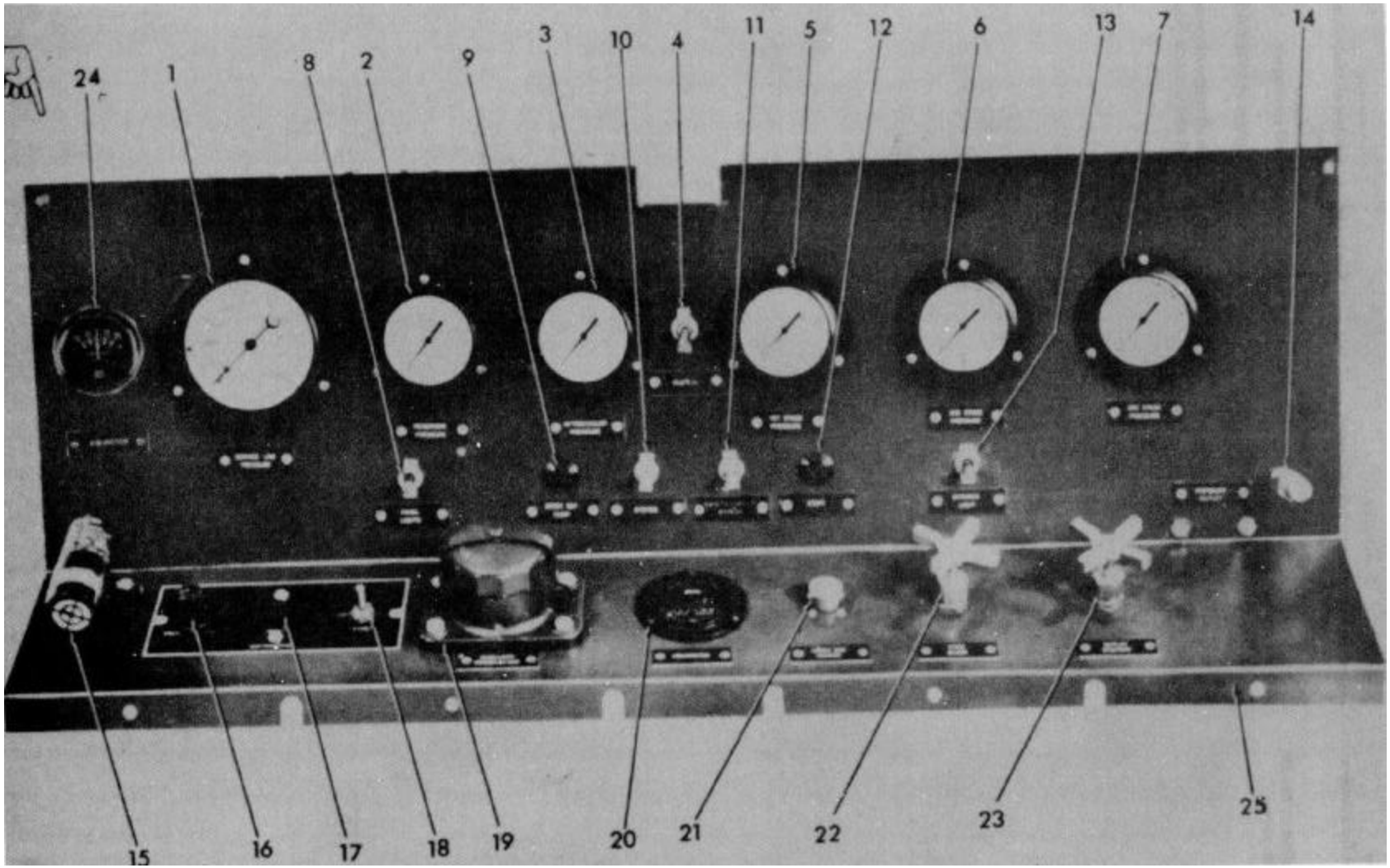
Page 1-10. Paragraph 1-8*y* is added after paragraph 1-8*x*.

y. Ammeter (24). The ammeter is a 2 pole, positive and negative type ranging from plus 20 amp. to minus 20 amp., located at the top left of the control panel. The ammeter indicates the amount of electrical current flow from the alternator to the battery, from the battery to the lights and other users of the battery current, when the unit is in operation.

Page 1-10. Key to figure 1-4 is superseded as follows:

KEY to figure 1-4
1 Pressure gauge
2 Pressure gauge
3 Pressure gauge
4 Clutch switch
5 Pressure gauge
6 Pressure gauge
7 Pressure gauge
8 Panel light switch
9 Pushbutton switch
10 System switch
11 Safety circuit switch
12 Start switch
13 Interior light switch
13 Interior light switch
14 Pressure outlet connector
15 Service indicator
16 Test light assembly switch
17 Circuit breaker switch
18 Heater switch
19 Auxiliary power source receptacle
20 Hourmeter
21 Moisture separator heater receptacle
22 Hose bleed valve
23 Outlet shutoff valve
24 Ammeter
25 Control panel

Page 1-11. Figure 1-4 is superseded as follows:



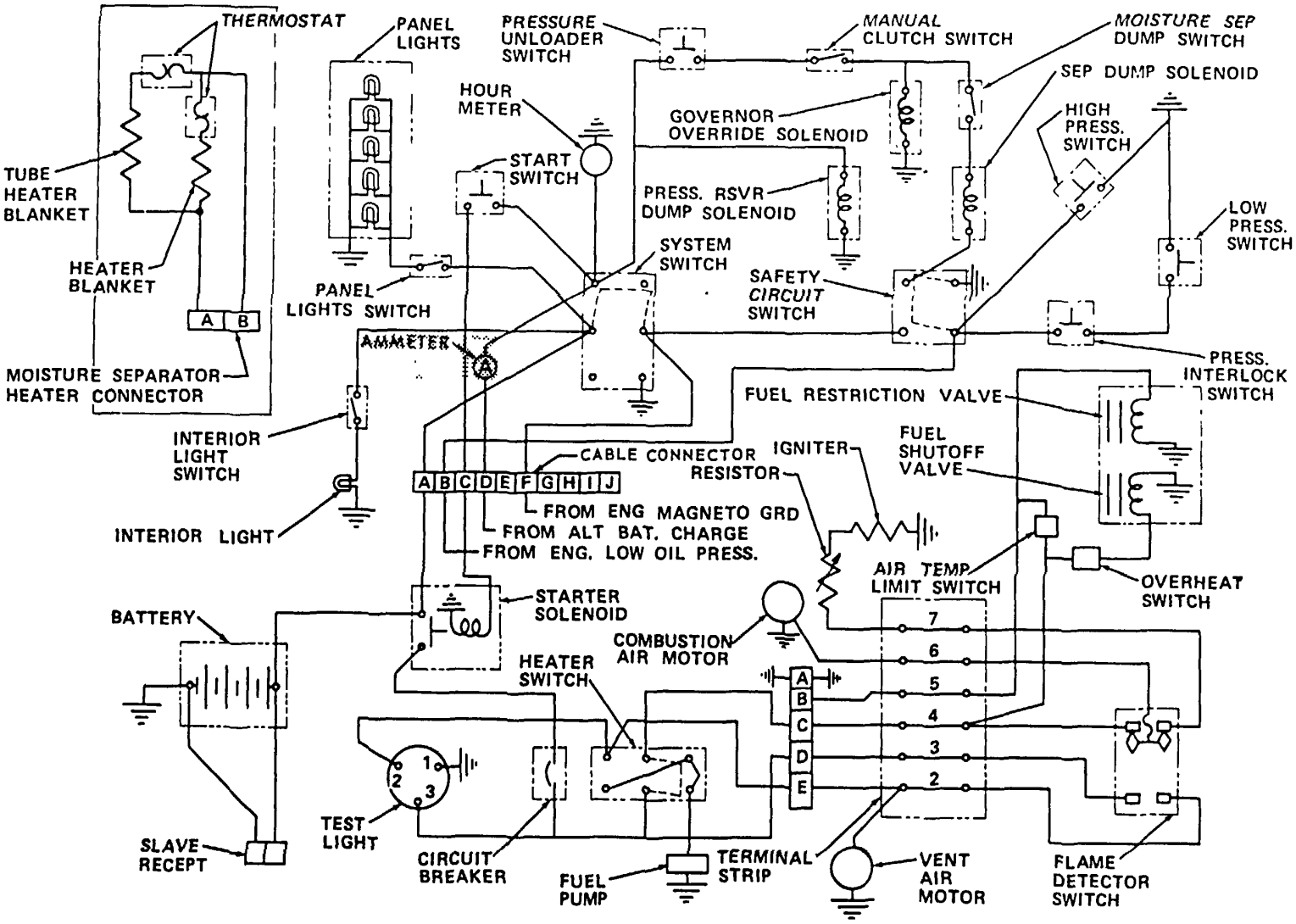
ME 4310-346-34/1-4 C1

Figure 1-4. Control panel assembly

Page 2-3. Table 2-1. Lines 21 and 22 are added after line 20.

Malfunction	*Probable cause*	*Corrective action*
21. Excessive ammeter fluctuation	*a*. High resistance infield circuit to alternator	*a*. Clean out and tighten all connections and check wiring
	b. Voltage regulator improperly set	*b*. Adjust voltage regulator
22. Ammeter Voltage drop or needle does not move from zero	*a*. Burned distributor points	*a*. Replace points and condenser
	b. Defective spark plugs	*b*. Clean and regap plugs at 0.028-0.0.33 or replace
	c. Loose or dirty connections and defective wiring	*c*. Clean and tighten all connections and to Direct and General Support Maintenance

Page 2-5. Figure 2-1 is superseded as follows:



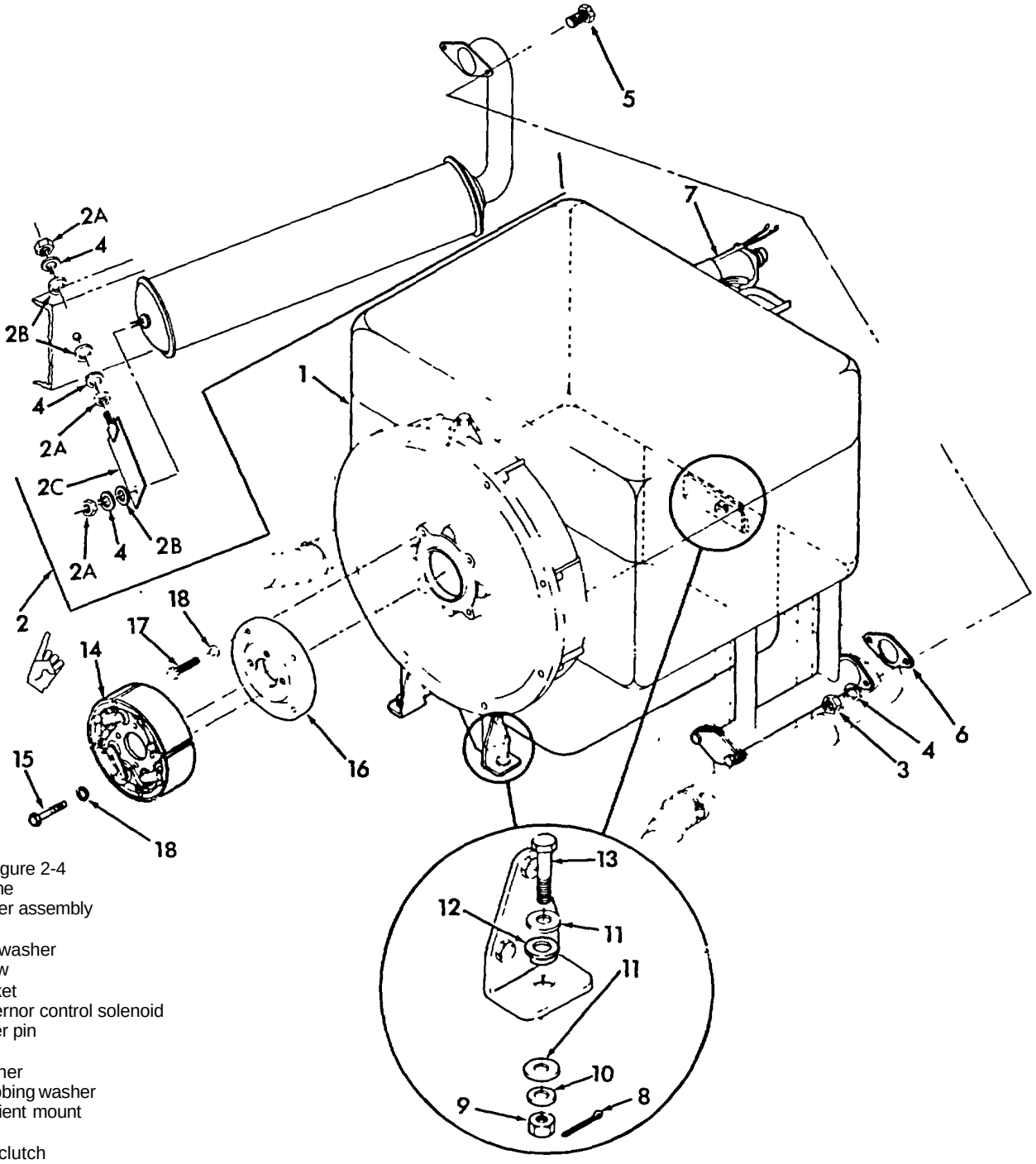
ME 4310-346-34/2-1 C1

Figure 2-1. Electrical Schematic.

Page 2-9. Paragraph 2-1*a*(1) is superseded as follows:

(1) To remove the engine (1), tag and disconnect cables (78, 66, fig. 2-6, sheet 2), wire lead (79) from starter, and disconnect cable (71) from engine manifold. Tag and disconnect wire leads of the governor control solenoid (7, fig. 2-4). To remove the muffler (2) and gasket (6) from the engine right manifold and the frame, remove two nuts (3), two lockwashers (4) and two screws (5) from the manifold. Remove two nuts (2A), two lockwashers (4) and two washers (28) retaining the strip and screw assembly (2C) to the frame. Lower the muffler elbow downward through the hole in the floor and remove muffler. To disassemble the strip and screw assembly (2C) from the muffler assembly (2), remove nut (2A), lockwasher (4) and washer (2B). Refer to fig. 4-1 and disconnect tube (17) from hose (15). Disconnect cable connector from the engine (Fig. 2-1).

Page 2-10. Key to figure 2-4 is superseded as follows:
Figure 2-4 is superseded as follows:



KEY to figure 2-4
1 Engine
2 Muffler assembly
3 Nut
4 Lockwasher
5 Screw
6 Gasket
7 Governor control solenoid
8 Cotter pin
9 Nut
10 Washer
11 Snubbing washer
12 Resilient mount
13 Bolt
14 Half clutch
15 Screw
16 Mounting plate
17 Bolt
18 Lockwasher

Figure 2-4. Engine, engine mounts and accessory removal.

Page 2-13. Paragraph 2-16*k*.1, *k*.2, *k*.3 and Warning Note is added after 2-16*k*.

WARNING

Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Keep open flame and excessive heat away from solvent. Flash point of solvent is 100°-138°F. (Fed. Spec. PD-680).

k.1. Removal of ammeter. Refer to TM 5-4310-346-12, paragraph 4-27.1 and remove the ammeter.

k.2. Cleaning and Inspection.

(1) Inspect the ammeter (7*a*), located on the control panel, for malfunction and damage.

(2) Clean the ammeter with a damp cloth or cleaning solvent Fed. Spec. PD-680 and dry thoroughly.

k.3. Installation. Refer to TM 5-4310-346-12, paragraph 4-27-1, and install the ammeter.

Page 2-14. Key to figure 2-6 (Sheet 1 of 2) is superseded as follows:

KEY to figure 2-6 (Sheet 1 of 2)

1 Panel light
2 Wire lead
3 Nut
4 Washer
5 Screw
6 Lamp
7 Hourmeter
7A Ammeter
8 Wire lead
9 Nut
10 Washer
11 Screw
12 Panel light switch
13 Jam nut
14 Washer
15 Key washer
16 Plate
17 Screw
18 Washer
19 Clutch switch
20 Interior light switch
21 System switch
22 Safety switch
23 Screw
24 Washer
25 Moist sep dump switch
26 Screw
27 Washer
28 Jam nut
29 Washer
30 Start switch
31 Heater switch
32 Connector
33 Jumper assembly
34 Circuit breaker
35 Screw
36 Washer
37 Screw
38 Press to test button switch
39 Press button
40 Bulb
41 Jam nut
42 Washer
43 Heater blanket receptacle
44 Nut
45 Screw
46 Aux pwr source receptacle
47 Nut
48 Washer
49 Screw
50 Service light
51 Wire lead
52 Screw
53 Lens
54 Gasket
55 Nut
56 Washer
57 Screw
58 Gasket
59 Lamp
60 Cover
61 Wing nut
62 Washer
63 Battery
64 Battery to ground cable
65 Battery to battery cable
66 Battery to starter cable
67 Wing nut
68 Flat washer
69 Battery retainer
70 Cap
71 Cable (Eng ground)
72 Nut
73 Lockwasher
74 Bolt
75 Cable (receptacle ground)
76 Support screen
77 Carnage bolts,
78 Cable (receptacle to starter)
79 Wire lead (circuit breaker to starter)

Page 2-15. Figure 2-6 (sheet 1 of 2) is superseded as follows:

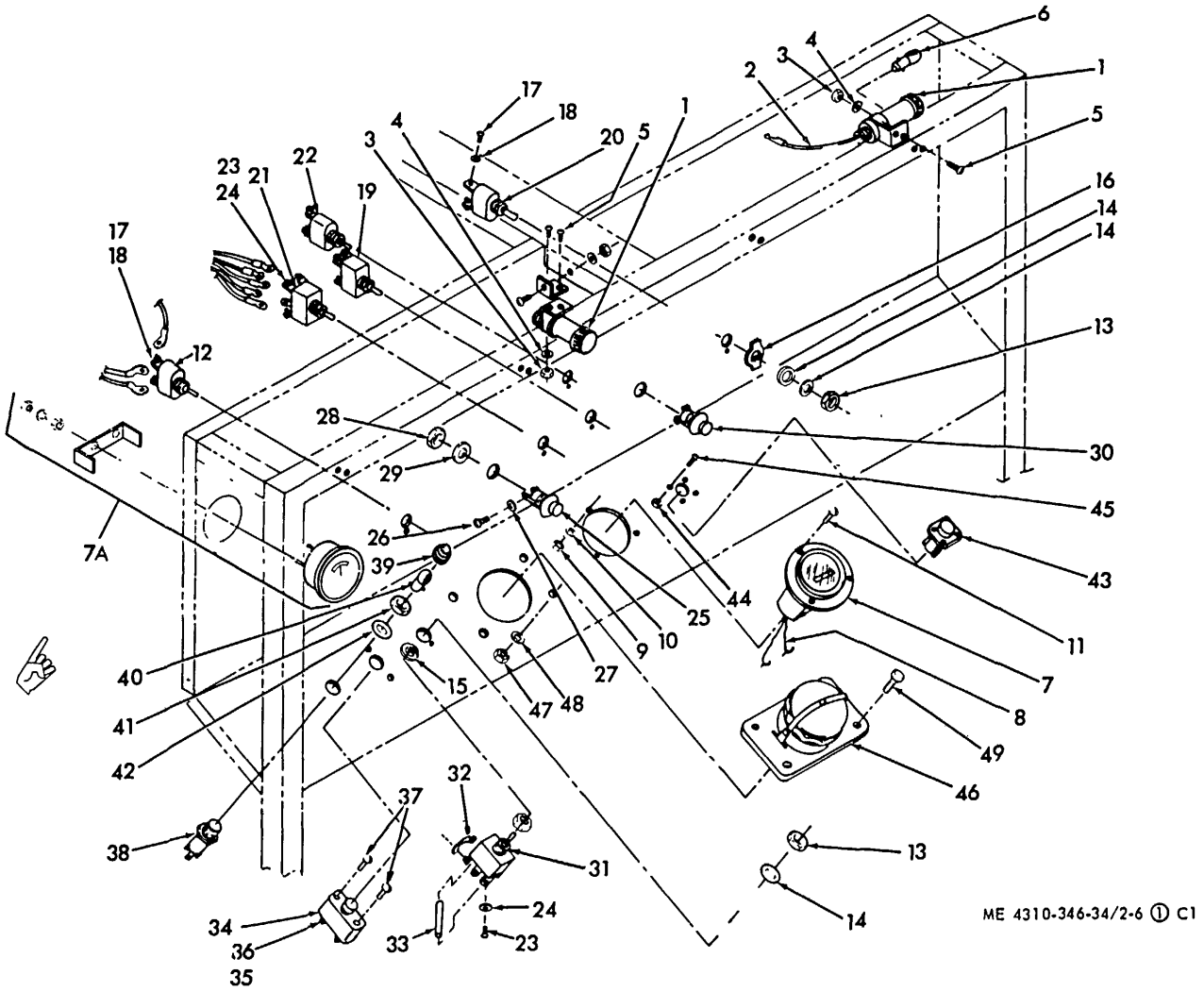


Figure 2-6. Electrical components (Sheet 1 of 2)

Page 2-17. Paragraph 2-17*a*(1)(*f*) line 3, (1 fig. 2-12, sheet 2 of 2) is changed to read "(1 fig. 2-8, sheet 1 of 2)".

Page 2-17. Paragraph 2-17*a*(1)(*h*) line 6, retaining strap is changed to read "bracket".

Page 2-17. Paragraph 2-17*a* (1)(*h*) lines 6, 7 and 8 are changed to read: "Remove the two screws (71), two nuts (69) four lockwashers (70) and four clamps (72) from the tubes."

Page 2-19. Paragraph 2-17*c*. (5) line 2 is changed to read "(44, fig. 2-8, sheet 2)".

Page 2-20. Key to figure 2-8 (Sheets 1 and 2) are superseded as follows:

KEY to figure 2-8 (Sheets 1 and 2)
1 Reducer
2 Tube
3 Union
4 Preformed packing
5 Moisture separator
6 Drain tube
7 Tube
8 Tube
9 Tee
10 Bulkhead union
11 Nut
12 Backup ring
13 Rupture disc assembly
14 Nut
15 Washer
16 Screw
17 Bracket
18 Bracket
19 Tube
20 Tube
21 Tube
22 Elbow
23 Back pressure valve
24 Screw
25 Spacer
26 Check valve
27 Tube
28 Cross
29 Pressure relief valve
30 Nut
31 Lockwasher
32 .Screw
33 Clamp
34 Air reservoir
35 Pressure interlock switch
36 Nut
37 Washer
38 Screw
39 Nipple
40 Tube
41 Pressure switch
42 Tube
43 Filter union
44 Nut
45 Washer
46 U-Bolt
47 Tube
48 Nipple
49 Elbow
50 Shut-off valve
51 Tee
52 Dump valve assem bly
53 Nipple
54 Nut
55 Lockwasher
56 Screw
57 Pressure unloader switch
58 Dehydrator No. 1
59 Tube
60 Dehydrator No. 2
61 Tube

Page 2-21. Figure 2-8 (Sheet 1 of 2) is superseded as follows:

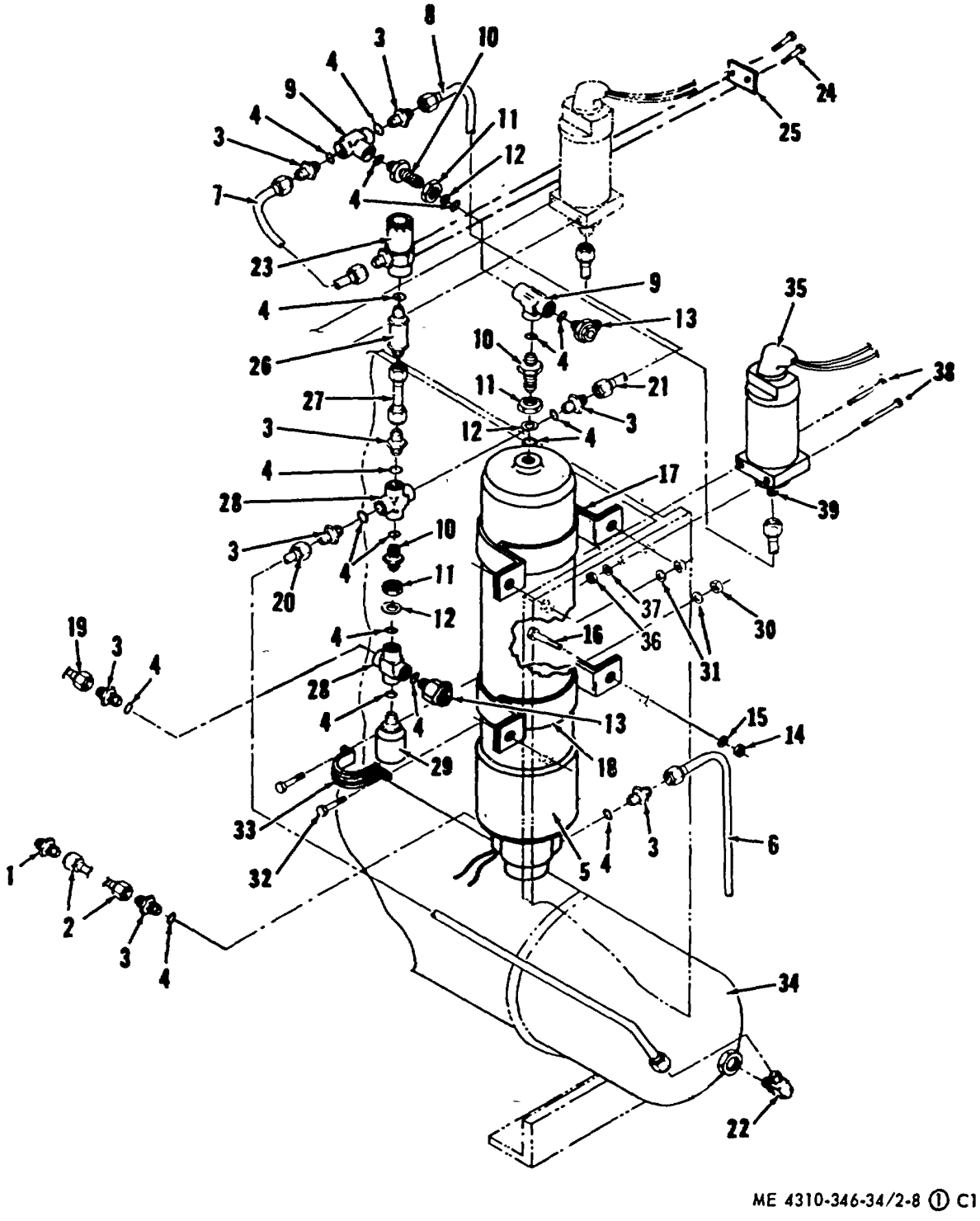


Figure 2-8. Unloading system-Dehydrator, air reservoir, moisture separator, lines and fittings (Sheet 1 of 2).

Page 2-22. Figure 2-8 (Sheet 2 of 2) is superseded as follows:

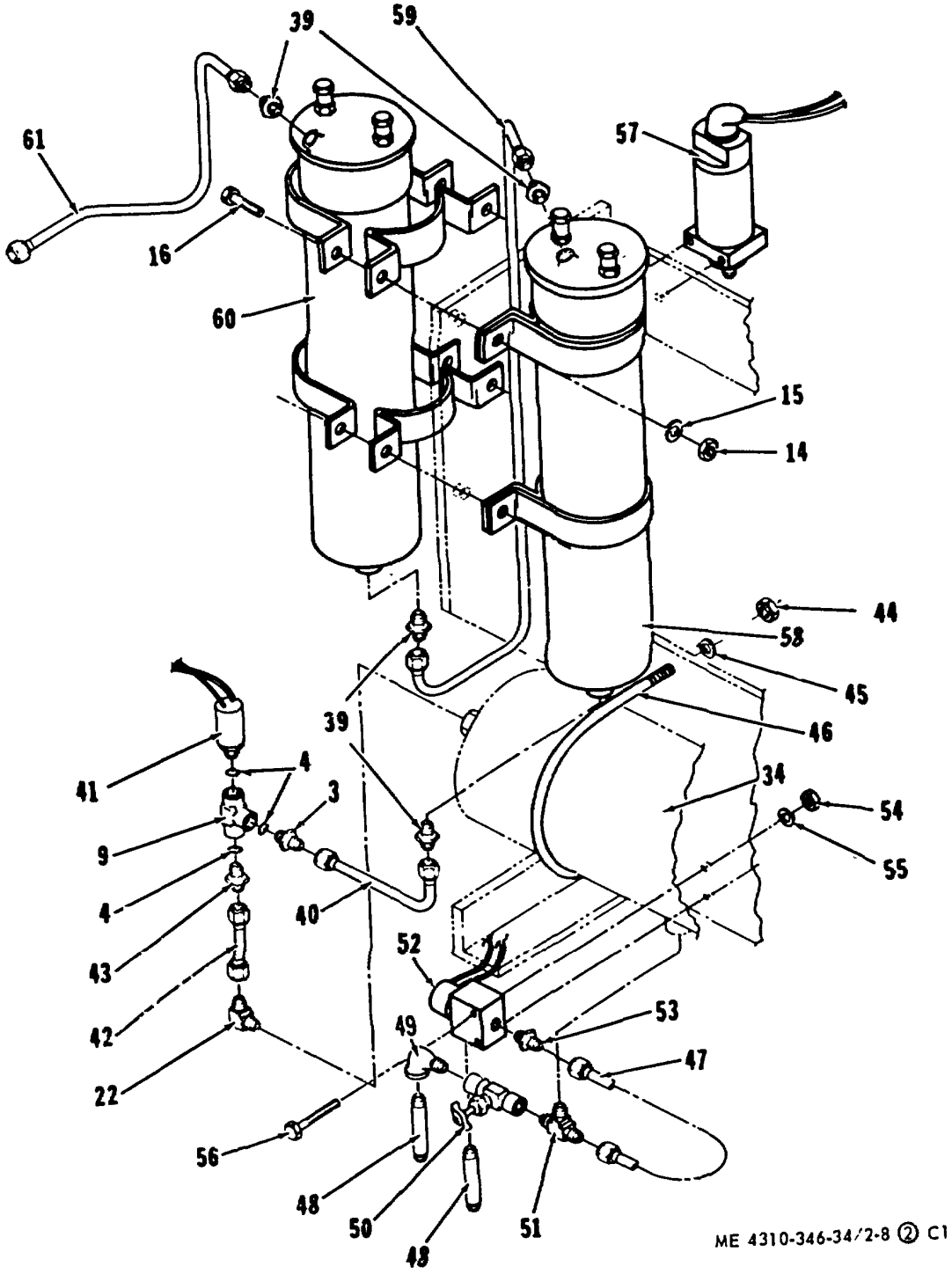


Figure 2-8. Unloading System-Dehydrator, air reservoir, moisture separator, lines and fittings (Sheet 2 of 2).

Page 3-1. Paragraph 3-2*a*, (8) line 1, Callout (34) is changed to read (24).

Page 4-1. Paragraph 4-2*a*, (4) is superseded as follows:

(4) Remove tube (19) (fuel tank to heater), two sleeves (3) and elbow (1).

Page 4-2. Figure 4-1 is superseded as follows:

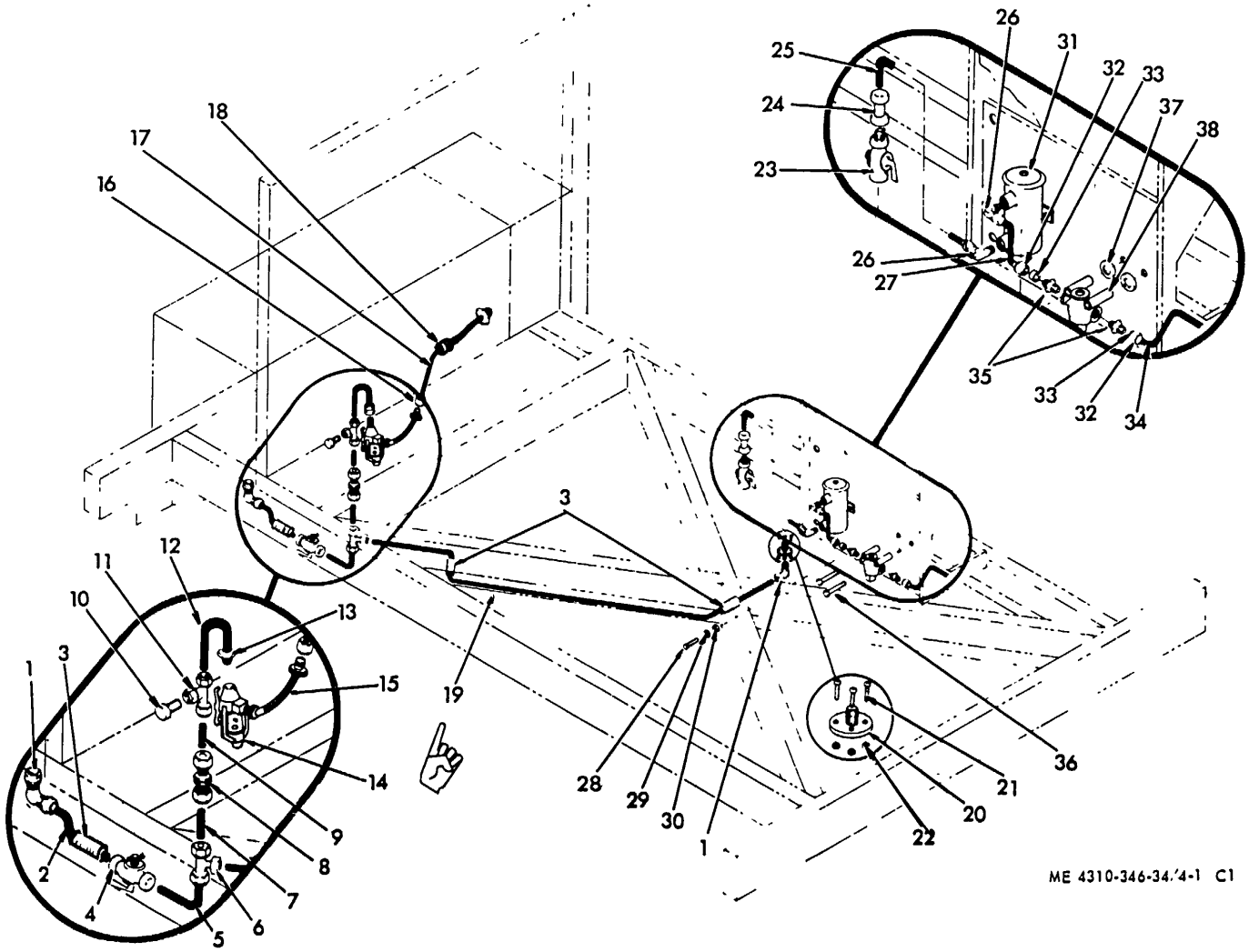


Figure 4-1. Fuel system

Page 5-1. Paragraph 5-1*b*, line 6,3500 rpm is changed to read "3600 rpm".
Page 5-1. Paragraph 5-2*d*, (1) line 3 (fig. 2-5) is changed to read "(fig. 2-4)".
Page 7-3. Paragraph 7-4*a*, Note is changed to "Warning".
Page 7-3. Paragraph 7-4c, is superseded as follows:

c. Installation. To install all parts and assemblies refer to figure 7-1 and install in reverse of removal procedures.

NOTE

Apply a commercial pipe seal teflon tape to any pneumatic pipe threads prior to installation.

Page 8-1. Paragraph 8-1 is superseded as follows:

8-1. General. The compressor, consists of a compressor assembly (fig. 8-1) containing a first, second, third and a fourth stage Piston assembly and cylinders, which build up pressure consecutively on a ratio basis until the final required pressure is reached, an oil pump housing assembly which consists of an oil metering system in itself and an oil filter element assembly and a dipstick assembly. The air compression starts at the first stage, is transmitted to the second stage, which is transmitted to the third stage, then to the fourth stage and then to the moisture separator. The pressure increases, from one stage to the other.
Page 8-7. Paragraph 8-3 is superseded as follows:

8-3. General. The oil pump housing assembly is part of the compressor, containing the dipstick assembly and oil pump. The dipstick serves as a gauge to check the amount of oil in the compressor. The oil pump lubricates the moving parts of the compressor.
Page 8-11. Paragraph 8-5 is superseded as follows:
8-5. General. The cylinder assemblies are components of the compressor. There are four stages comprising the first, second, third and fourth stage cylinders, which build up pressure consecutively on a ratio basis until the final required pressure is reached.
Page 9-1. Paragraph 9-2*a,* (2) is superseded as follows:

(2) Refer to paragraph 2-17*c*(4), figure 2-8 sheet 1 of 2 to remove the reservoir relief valve.

Page 9-5. Paragraph 9-6*a* is superseded as follows:

a. Removal. Refer to paragraph 2-17*c* (7) and fig. 2-8, sheet 2, and remove the dump valve (52). Be sure the wire leads have been tagged and disconnected.

Page 9-5. Paragraph 9-6*b*. line 2 "remove the four screws (1), is changed to read remove the four screws (1, fig. 9-5).
Page 9-6. Paragraph 9-6*f* is superseded as follows:

f. Installation. Refer to paragraph 2-17*c*(7) and figure 2-8, sheet 2, and install the valve in reverse order of removal except turn the solenoid assembly (5, fig. 9-5) clockwise fingertight and back off 1/8 turn. Tighten screw (3) against solenoid, lock the screw with nut (4) to prevent the solenoid from turning.
Page A-1. Appendix A is superseded as follows:

APPENDIX A
REFERENCES

A-1. Fire Protection

TB 5-4200-200-10	Hand Portable Fire Extinguishers Approved for Army Users
TB 5-4200-201-10	Hand Portable Fire Extinguishers for Rail, Marine, Amphibious, and Off-Road Equipment

A-2. Lubrication

C9100-IL	Identification List for Fuels, Lubricants, Oils and Waxes
LO 5-2805-259-12	Lubrication Order for Engine, Gasoline, 20HP, Military Standard Models (Model 4A084-2 and 4A084)
LO 5-4310-346-12	Lubrication Order for Compressor, Air, Reciprocating, Power Driven 15, CFM, 3500 PSI, 4 Wheel Mounted, Winterized (Steward-Warner Model 12021A)
TB 703-1	Specification List of Standard Liquid Fuels, Lubricants, Preservatives, and Related Products Authorized for Use by U.S. Army
TB 55-6650-300-15	Spectrometric Oil Analysis

A-3. Painting and Marking

TB 746-1	Color and Marking of Military Vehicles, Construction Equipment, and Materials Handling Equipment
TM 9-213	Painting Instructions for Field Use

A-4. Cleaning

C6800-IL	Chemicals and Chemical Products
SB 725-7930-1	Issue of Supplies and Equipment Engineering Practices Study of CONUS and Overseas Installation Requirements for Hard and Soft Water Cleaning Compounds.
TM 38-230-1	Preservation, Packaging, and Packing of Military Supplies and Equipment, Preservation and Packaging (Volume 1) (DSAM 4145.2/NAVSUP PUB 502/AFP 71-15/MCO 4030.31A)

A-5. Maintenance

CTA 50-970	Expendable Items (Except Medical Class V, Repair Parts and Heraldic Items.
TB ORD 1031	Purging, Cleaning, Inspecting and Coating Interior of Steel Tanks and Equipment on Tactical and Commercial Type Fuel Tank Truck and Trailers.

TB 742-93-1	Inspection and Test of Air and Other Gas Compressors
TB 750-97-43	Maintenance Expenditure Limits for FSC Group 43, FSC Classes 4310,4320 and 4330
TB 750-255	Uniform Policy for Hourmeters and Odometers on Overhaul or Repaired USATROSCOM End Items of Equipment.
TM 5-764	Electric Motor and Generator Repair
TM 9-2610-200-34	Direct Support and General Support Maintenance Manual (Including depot Rebuild) Pneumatic Ties Tires and Inner Tubes
TM 9-6140-200-14	Operator, Organizational, Direct Support Maintenance Manual: Storage Batteries Lead-Acid Type.
TM 11-483	Radio Interference Suppression
TM 38-750	The Army Maintenance Management System (TAMMS)
TM 5-4310-346-34P	Direct and General Support Maintenance Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools). For Compressor, Air Reciprocating, Power Driven 15 CFM, 3500 PSI 4-Wheel Mounted Winterized (Steward-Warner Model 12021A FSN 4310-231-2331.
TM 5-2805-259-14	Operator, Organizational Direct Support and General Support Maintenance Manual: Engine Gasoline, 20 HP; Military Standard Models (Model 4A084-2 and 4A084-3)
TM 5-2805-259-24P	Organizational, Direct and General Support Maintenance Repair Parts and Special Tools Lists: Engine, Gasoline, 20 HP; Military Standard Model (Model 4A084-2 and 4A084-3) FSN 2805-872-5972.
TM 5-4310-346-12	Operator and Organizational Maintenance Manual: For Compressor, Air, Reciprocating, Power Driven 15 CFM, 3500 PSI, 4 Wheel Mounted, Winterized (Stewart-Warner Model 12021A) FSN 4310-231-5513.

A-6. Shipment and Storage

TB 750-97-2	Preservation of TROSCOM Mechanical Equipment for Shipment and Storage
TM 740-90-1	Administrative Storage of Equipment

A-7. Destruction to Prevent Enemy Use

TB 750-244-3	Procedures for Destruction of Equipment to Prevent Enemy Use (Mobility Equipment Command)

A-8. Operation

TM 5-331C	Utilization of Engineer Construction Equipment Volume Rock Crushers, Air Compressors, and Penumatic Tools

Page B-1. Appendix B, Repair Parts and Special Tools List is deleted in it's entirety.

Pages I-1 through I-5 Index are superseded as follows:
1-1.

By Order of the Secretary of the Army:

CREIGHTON W. ABRAMS
General, United States Army
Chief of Staff

Official:

VERNE L. BOWERS
Major General, United States Army
The Adjutant General

Distribution:
To be distributed in accordance with DA Form 12-25A (qty rqr block No. 47), Direct/General Support requirements for Air-Compressor, High Pressure: 15 CFM.

TECHNICAL MANUAL
NO. 5-4310-346-34

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D. C. *6 December 1972*.

DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL COMPRESSOR, AIR RECIPROCATING, POWER DRIVEN 15 CFM, 3500 PSI, 4-WHEEL MOUNTED, WINTERIZED (STEWART-WARNER MODEL 12021A)

FSN 4310-231-5513

LIST OF ILLUSTRATIONS

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope
This manual covers information for the direct and general support personnel responsible for the removal, installation, maintenance and repair of the Compressor, Air, Reciprocating, Power Driven, 15 CFM (cubic feet per minute), 3500 PSI (pounds per square inch), 4 Wheel Mounted Winterized manufactured by Stewart-Warner Corporation. It contains a description of the major units and their functions and instructions on the repair and maintenance of the compressor as a unit.

1-2. Forms and Records
Maintenance forms, records and reports which are to be used by maintenance personnel at all maintenance levels are listed in and prescribed in TM 38-750.

1-3. Equipment Serviceability Criteria
For. serviceability criteria refer to TM 5-4300-208-ESC.

1-4. Recommendation for Maintenance Publications Improvements. You can help to improve this manual by calling attention to errors and by recommending improvements. Your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) should be mailed direct to Commander, US Army Troop Support Command, ATTN: AMSTS-MPP, 4300 Goodfellow Boulevard, St. Louis, MO 63120. A reply will be furnished direct to you.

Section II. DESCRIPTION AND DATA

1-5. Description
The Stewart-Warner Air Compressor, Model 12021A (fig. 1-1, 1-2 and 1-3) is a reciprocating 4-wheel mounted gasoline engine driven, 15 CFM, 3500-PSI unit designed for the general purpose of charging missile and flame thrower bottles. The unit is easily moved from one location to another with the use of a prime mover.

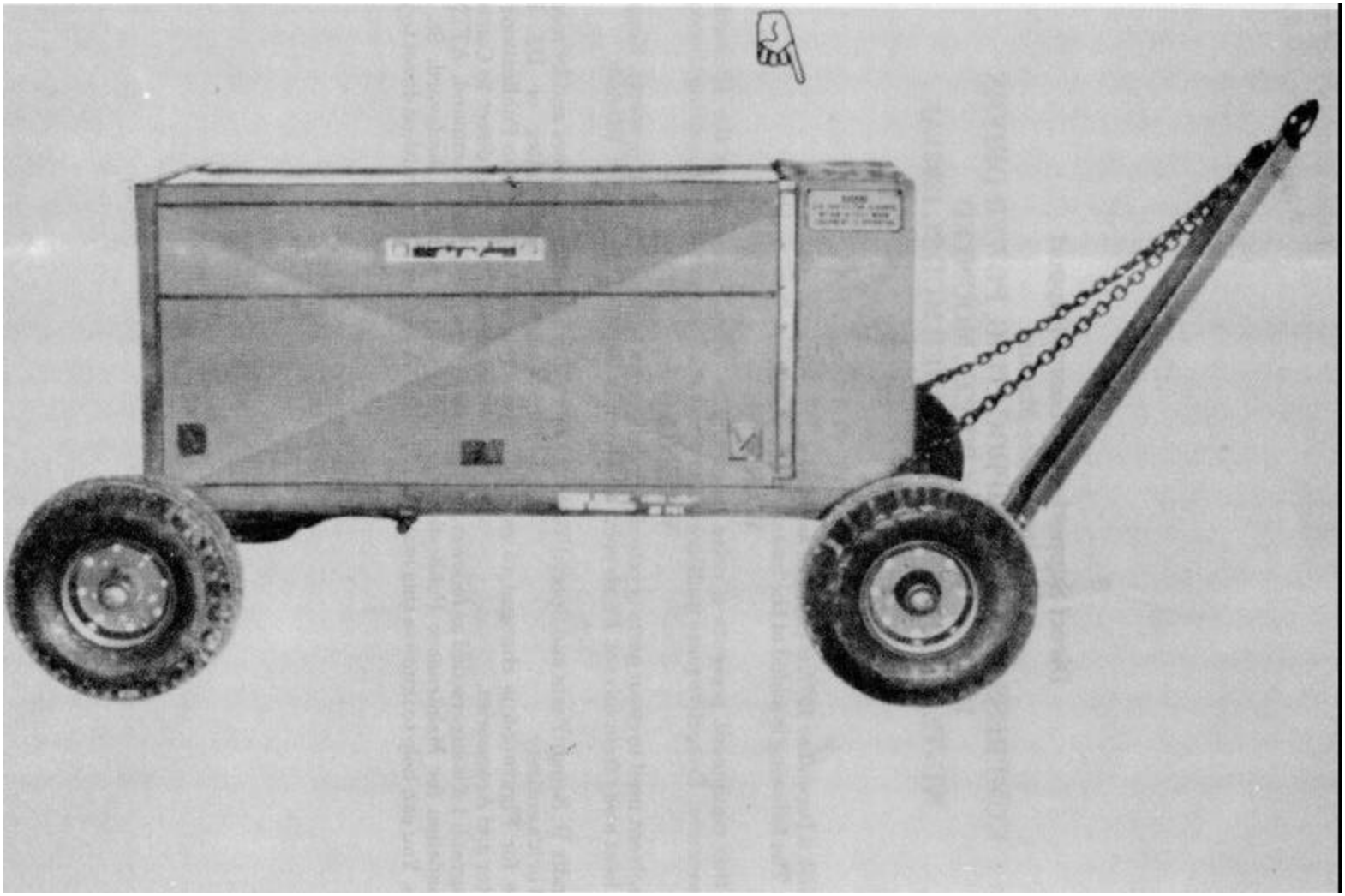


Figure 1-1. Air compressor.

ME5-4310-346-34/1-1 C1

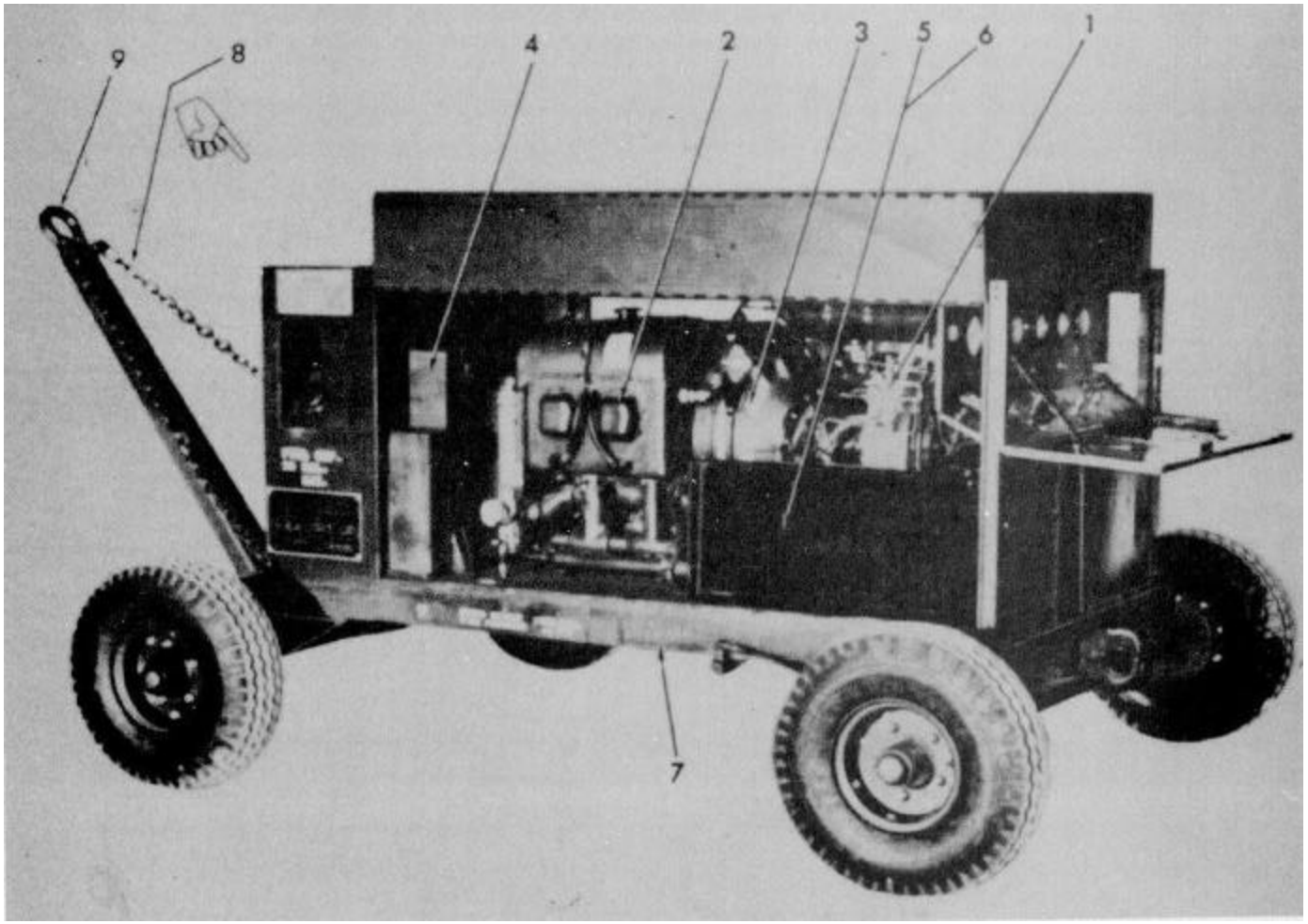
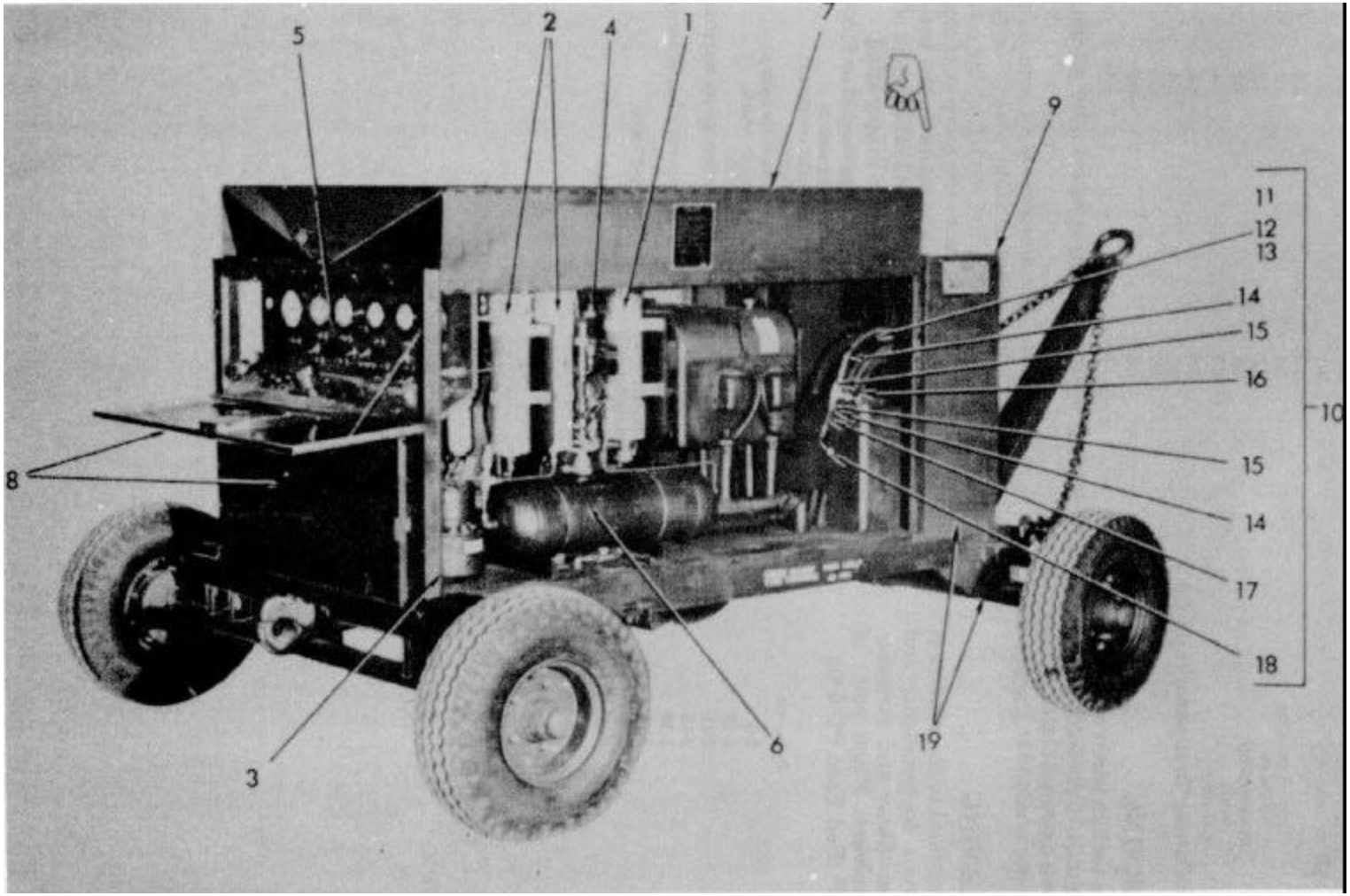


Figure 1-2. Air compressor, three-quarter left rear view.

ME5-4310-346-34/1-2 C1

KEY to figure 1-2
1 Air compressor
2 Gasoline engine
3 Clutch
4 Fuel tank and tool box assembly
5 Batteries
6 Battery box
7 Chassis and wheel assembly
8 Safety chain
9 Drawbar lunette



ME5-4310-346-34/1-3 C1

Figure 1-3. Air compressor, three-quarter right rear view.

KEY to figure 1-3

1 Moisture separator
2 Dehydrators
3 Heater assembly
4 Cleaner assembly
5 Control panel
6 Air reservoir
7 Cover assembly
8 Doors
9 Panels
10 Auxiliary air hose assembly
11 Quick disconnect half coupling
12 Nipple
13 Hose assembly
14 Union
15 Preformed packing
16 Shutoff valve
17 Tube assembly
18 Air chuck
19 Handbrake

1-6. Differences between Models

This manual covers the Stewart-Warner Model 12021A. No unit differences exist for the model covered in this manual.

1-7. Identification and Tabulated Data

a. *Identification*. Refer to TM 5-4310-346-12, Operator and Organizational Maintenance Manual for identification.

b. Tabulated Data.

(1) Refer to TM 5-4310-346-12 and the following for tabulated data.

(2) Recommended torque limits for bolts and nuts.

Location	*Item*	*Torque (In.-Lbs.)*
Oil housing to crankcase	Nut	50-60
Filter housing to crankcase	Nut	30-35
Oil pressure relief valve to crankcase	Nut	40-45
First stage cylinder to crankcase	Nut	70-80
First stage cylinder heat to cylinder	Nut	30-35
Second stage cylinder to crankcase	Nut	65-70
Second stage cylinder cap to cylinder	Screw	20-25
Third stage cylinder to crankcase	Nut	65-70
Third stage cylinder cap to cylinder	Cap	300-350
Fourth stage cylinder to crankcase	Nut	65-70
Fourth stage cylinder cap to cylinder	Cap	450-550

(3) Repair and Replacements Standards. See table 1-1.

Table 1-1. Wear limits and Tolerances

Item	Mfg dim		Design clearance		Allowable wear Maximum
	Minimum	Maximum	Minimum	Maximum	
(Compressor Shaft outside diameter	.9834	.9838	….	….	.0002
Shaft ()1) tat eccentric	….	63(3)	….	….	63(3)
Shaft finish (at eccentric)	2.060	2.062	.0020	.0044	.0002
Eccentric	2.0640	2.0644	….	….	.0010
Connecting rod bore finish	….	16(3)	…..	….	16(3)
Shaft ()0) at throttle bushing	1.1225	1.1230	.0005	0020	
Throttle bushing bore	1.1235	1.1245	….	….	0008
Throttle bushing bore finish	…	16(3)	…..	….	16(3)
Shaft finish tat throttle bushing)	…	20(3)	….	….	20(31
Oil pump retainer			….	….	….
Bore	.312	.313	.001	.003	001
Face finish		15(3)	….	….	15(3)
First Stage			….	….	….
Cylinder bore	4.249	4.251	027	033	*(2)*
Piston ()1)	4.218	4.222	….	…..	….
Cylinder bore finish	….	16(3)	….		16(3)
Piston seal rings	*(1)*	*(1)*	**NA**	**NA**	(1)
Piston pin bore	.5002	.5004	.0001	.0006	.0002
Piston pin ()1)	…..	125(3	1		125(3)
Piston ()1) finish	….	125(3)			125(3)
Piston pin finish	….	16(3)			16(3)
Inlet valve plate finish	….	8(3			8(3)
Inlet valve seat finish	….	18(3)			18(3)
Exhaust valve plate finish	….	8(3			8(3)
Exhaust valve seat finish	….	18(3)			18(3)

Table 1-1. Wear limits and Tolerances-Continued

Item	Mfg dim		Design clearance		Allowable wear
	Minimum	Maximum	Minimum	Maximum	Maximum
Second Stage					
Cylinder bore	1.7900	1.7903	.007	.0093	*(2)*
Piston ()1)	1.781	1.783	....	*(1)*	
Cylinder bore finish	.....	16(3)	....		16(3)
Piston seal rings	*(1)*	*(1)*	**NA**	**NA**	*(1)*
Piton pin bore	5.002	5.004	0001	0006	.0002
Piston pin finish()1)	.4998	5001	....	....	.0001
Piston()1)finish	....	16(3)	....	....	63(3)
Piston pin finish	....	15(3)	....	....	16(31
Inlet poppet seat finish	....	16(3)	....	....	15(3)
Inlet salve seat finish	....	4(3)	....	....	16(3)
Exhaust valve finish	....	15(3)	....	....	4(3)
Exhaust valve seat finish	....	....	....	....	15(3)
Third Stage	....	....	....	....	....
Cylinder bore	.984	986	004	008	*(2)*
Piston 4)1)	.978	980	....	....	....
Cylinder bore finish	....	12(3)	....	....	12(3)
Piston seal rings	*(1)*	*(1)*	**NA**	**NA**	*(1)*
Piston pin bore	.5002	5004	0001	0006	.0002
Piston Pin ()1)	.4998	5001	....	....	.0001
Piston ()1) finish	....	63(3)	....	....	63(3)
Piston pin finish	....	16(3)	....	....	16(3)
Inlet salve seat finish	....	16(3)	....	....	16(3)
Inlet poppet seat finish	....	16(3)	....	....	16(3)
Exhaust valve finish	....	4(3)	....	....	4(3)
Exhaust salve seat finish	....	15(3)	....	....	15(3)
Fourth Stage	....	....	....	....	....
Cylinder bore	.480	.481	001	004	*(2)*
Piston 01)	.477	.479		....	....
Cylinder bore finish	....	12(3)		....	12(3)
Piston seal rings	*(1)*	*(1)*	NA	NA	*(1)*
Piston pin bore	.5002	.5004	0001	0006	.0002
Piston pin 01)	.4998	.5001	....	....	.0001
Piston ()I) finish	....	63(3)	....	....	63(3)
Piston pin finish	....	16(3)	....	....	16(3)
Inlet valve seat finish	....	8(3)	....	....	8(3)
Inlet poppet seat finish	....	15(3)	....	....	15(3)
Exhaust valve finish	....	4(3)	....	....	4(3)
Exhaust valve seat finish	15(3)	....	....	....	15(3)

(1) Piston sealing depends on fit of rings which must be molded to perfect "No Leakage" type fit.

(2) Low friction piston guide rings and/or seals preclude any metal wear condition; therefore print dimensions are maximum.

NOTE

Surface finish of compressor sealing and running elements are extremely important. Therefore any deviation from maximum specified print finish shall be cause for replacement.

(3) Surface Roughness Height by Height Averaging method.

c. Electrical Schematic. Refer to figure 2-1.

d. Pneumatic Schematic. Refer to figure 2-2.

1-8. General Description of Controls and Instruments

This paragraph describes the various controls and instruments and their location to provide the maintenance personnel sufficient information to ensure proper operation of the air compressor as follows (fig. 1-4):

WARNING

Always wear ear protection when within 15 feet of an operating unit, to protect against hearing damage from extreme noise.

a. Safety Circuit Switch (11, fig. 1-4).

(1) Location. The safety circuit switch is an on and off toggle switch with matching nameplate located on the control panel (24).

(2) *Purpose.* The safety circuit switch de-energizes the power source to the moisture separator dump valve, high and low pressure switches.

b. System Switch (10).

(1) *Location*. The system switch is an on and off toggle switch with a matching nameplate located on the control panel (5, fig. 1-3).

(2) *Purpose.* The system switch energizes the electrical power from the battery to all the electrical components in the system of the unit and grounds the engine magneto circuit.

c. Start Switch (12).

(1) *Location*. The start switch is a push button switch with matching nameplate located on the control panel (24).

(2) *Purpose*. The start switch energizes power from the battery to the engine starter solenoid.

d. Clutch Switch (4).

(1) *Location*. The clutch switch with matching nameplate is located on the instrument panel.

(2) *Purpose.* The clutch switch manually increases the speed of the engine to 3600 rpm in order to engage the compressor and also can be used to over-ride pressure unloader switch and disengage compressor.

e. Panel Light Switch (8).

(1) *Location*. The panel light switch is an on and off toggle switch with a matching nameplate located on the control panel.

(2) *Purpose.* There are five panel lights controlled by the panel light switch to illuminate the panel.

f. Interior Light Switch (13).

(1) Location. The interior light switch is an on-off switch with matching nameplate located on the control panel.

(2) Purpose. The interior light switch when energized actuates the domelight type of fixture which illuminates the internal portion of the unit.

g. Pressure Outlet Connector (14) The pressure outlet connector with matching nameplate located on the control panel, is a quick disconnect connector used for any servicing application with the use of the auxiliary hose assembly.

h. Auxiliary Power Source Receptacle Assembly (19). For cold weather starting, the receptacle assembly with a nameplate reading "Auxiliary Power 28 VDC" (direct current volts) located on the control panel (24), is attached to an outside electrical source in order to run the unit when the battery is dead.

i. Moisture Separator Heater Receptacle (21). The moisture separator heater receptacle with a matching nameplate located on the control panel is connected to the 28 VDC power source when the unit is operated in temperatures below 320 F. This eases the load on the batteries and keeps the moisture separator operating.

j. Hose Bleed Valve (22). The hose bleed valve with a matching nameplate located on the control panel is a shutoff valve used to bleed the auxiliary air hose (10, fig. 1-3).

k. Outlet Shutoff Valve (23, fig. 1-4). The outlet shutoff valve with a matching nameplate located on the control panel is a manually operated valve used to shut off the flow of air to any outside source.

l. Heater Switch (18). The heater switch is a three-way toggle switch with information on the winterization plate reading "off", "start" and "run" positions. This switch and heater identification plate is located on the control panel and serves the purpose of starting and running the heater.

m. Test Light Assembly Switch (16). The test light assembly switch is a combination push and test light switch with the heater identification plate and is identified as the "press to test" button located on the control panel. The switch is used to energize the test light.

n. Circuit Breaker Switch (17). The circuit breaker switch is a pushbutton type shown on the heater identification plate as "reset". Both the switch and identification plate are located on the control panel. The circuit breaker is reset when the test light does not energize. If the test light still doesn't energize after the circuit breaker is reset check for trouble in the heater circuit.

p. Pressure Gauge (1). The pressure gauge is a 0-5000 psig (pounds per square inch gauge) with a nameplate indicating "Service Line Pressure" both located on the control panel.

q. Pressure Gauge (2). The pressure gauge with a nameplate indicating "Reservoir Pressure" is a 0.5000 psig located on the control panel. The gauge shows the pressure build up in the air reservoir.

r. Pressure Gauge (3). The pressure gauge is a 0-5000 psig with a nameplate "Aftercooler Pressure" located on the control panel. This gauge indicates the amount of pressure transmitted to the aftercooler.

s. Pressure Gauge (5). The pressure gauge is a 0100 psig with a nameplate "First Stage Pressure" located on the control panel and indicates the pressure build up in the first stage cylinder of the air compressor.

t. Pressure Gauge (6). The pressure gauge is a 0-300 psig with a nameplate "Second Stage Pressure" located on the control panel and indicates the amount of air pressure build up in the second stage cylinder.

u. Pressure Gauge (7). The pressure gauge is a 0-1500 psig with a nameplate "Third Stage Pressure" located on the control panel and indicates the amount of air pressure build up in the third stage cylinder of the air compressor.

v. Hour Meter (20). The hour meter is a direct current digital gauge reading in hours and tenths of an hour with a matching nameplate located on the control panel and gauge indicates the amount of hours the system has been operating.

w. Service Indicator (15). The service indicator is a military design indicator located at the lower left of the control panel and indicates any restrictions in the compressor air cleaner and whether the compressor air cleaner filter needs replacement.

x. Pushbutton Switch (9). The pushbutton switch is a military design type two-pole switch with a nameplate "Moisture Separator Dump" located on the control panel which is actuated at specified intervals to relieve the moisture separator of excess moisture.

y. Ammeter (24). The ammeter is a 2 pole, positive and negative type ranging from plus 20 amp. to minus 20 amp., located at the top left of the control panel. The ammeter indicates the amount of electrical current flow from the alternator to the battery, from the battery to the lights and other users of the battery current, when the unit is in operation.

Key to fig. 1-4

KEY to figure 1-4

1 Pressure gauge
2 Pressure gauge
3 Pressure gauge
4 Clutch switch
5 Pressure gauge
6 Pressure gauge
7 Pressure gauge
8 Panel light switch
9 Pushbutton switch
10 System switch
11 Safety circuit switch
12 Start switch
13 Interior light switch
13 Interior light switch
14 Pressure outlet connector
15 Service indicator
16 Test light assembly switch
17 Circuit breaker switch
18 Heater switch
19 Auxiliary power source receptacle
20 Hourmeter
21 Moisture separator heater receptacle
22 Hose bleed valve
23 Outlet shutoff valve
24 Ammeter
25 Control panel

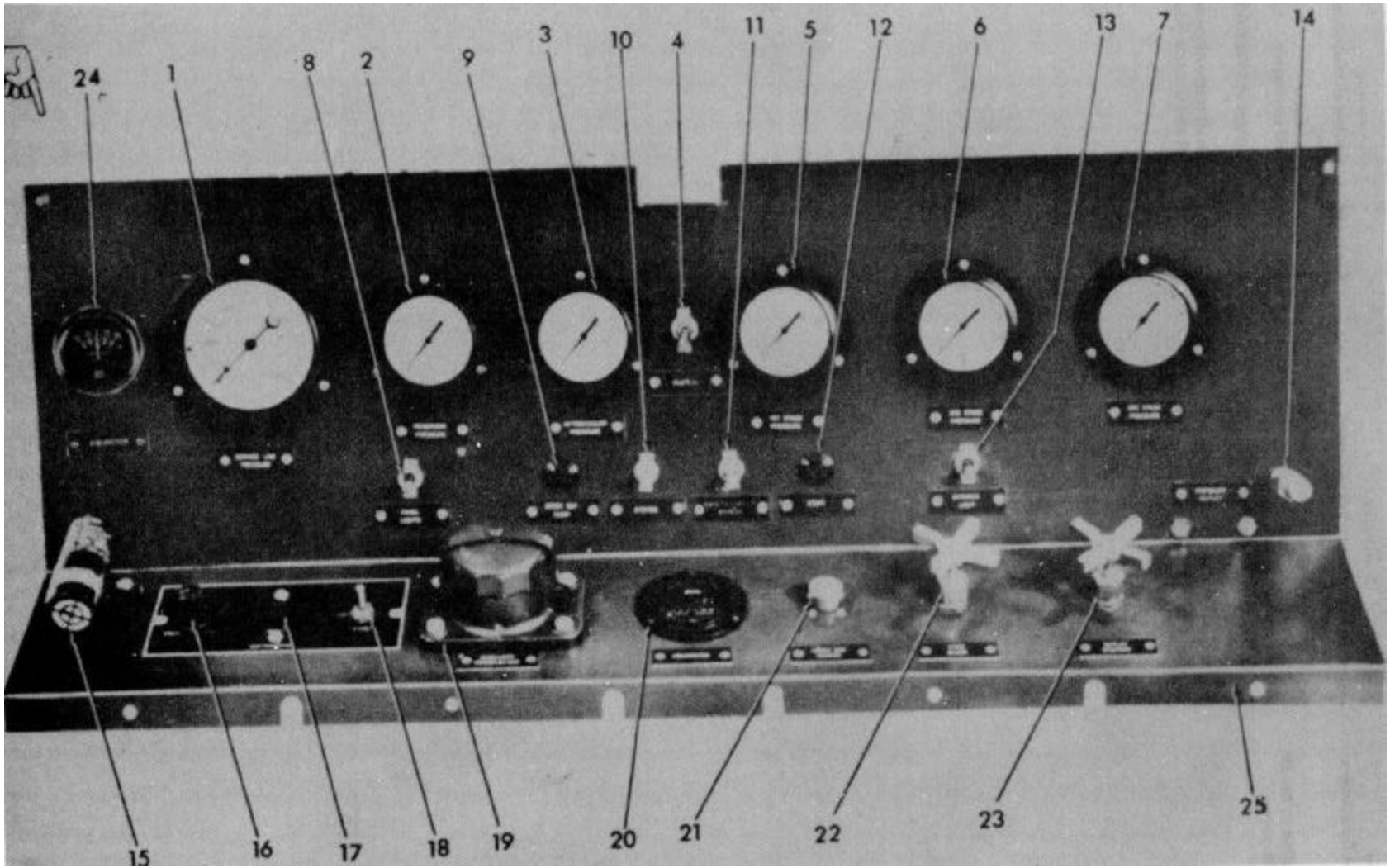


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Figure 1-4. Control panel assembly.

CHAPTER 2

DIRECT SUPPORT AND GENERAL SUPPORT

MAINTENANCE INSTRUCTIONS

Section I. REPAIR PARTS, SPECIAL TOOLS AND EQUIPMENT

2-1. Tools and Equipment

Tools, equipment and repair parts issued with or authorized for the air compressor are listed, in the Basic Issue Items List, Appendix C, of TM 5-4310346-12.

2-2. Special Tools and Equipment

No special tools or equipment are required for the air compressor.

2-3. Maintenance Repair Parts

Repair parts and equipment are listed and illustrated in the repair parts and special tools covering direct support and general support maintenance for this equipment in TM 5-4310346-34P technical manual.

Section II. TROUBLESHOOTING

2-4. General

This section provides useful information and guidance for the direct support and general support maintenance personnel to diagnose and correct any malfunctions of the air compressor using the troubleshooting table 2-1. Refer to TM 5-2805-259-14 for engine troubleshooting information not covered in table 2-1.

Table 2-1. Troubleshooting

Malfunction	Probable Cause	Corrective Action
1. Engine fails to start or hard to start.	*a.* Fuel exhausted.	*a.* Service fuel tank filters and lines. (para 4-2 & 4-4)
	b. Carburetor not choked enough.	*b.* Adjust carburetor. TM 5-2805-259-14.
	c. Water. dirt or sediment in fuel.	*c*. Clean sediment bowl strainer. Drain and refill tank. (para 4-2 & 4-4)
	d. Battery cables loose or terminals corroded.	*d.* Tighten cable connections or remove cables lean terminals, and replace cables. (para 2-16)
	e. Battery discharged or defective.	*e*. Recharge or replace defective battery. para 2-16)
2. Engine lacks power.	*a.* Water or foreign matter in fuel.	*a.* Clean sediment bowl. Drain and fill tank with clean fuel. (para 4-2& 4-4)
	b. Air cleaner clogged.	*b*. Check service indicator. If red color shows. Clean or replace cleaner element. TM 5-4310-346-12)
3. Engine develops excessive noise.	Crankcase oil too low.	Stop engine and add oil to proper level. Refer to LO 5-2805-258-12 for engine. (para 2-8) **Caution: If engine persists to be noisy after oil filling, stop engine immediately. Continued operation may seriously damage the engine. Repair**

Table 2-1. Troubleshooting

Malfunction	Probable Cause	Corrective Action
3. Engine develops excessive noise-Continued		**engine to eliminate noise. Refer to TM 5-2805-259-14.**
4. Engine stops suddenly.	*a*. Oil pressure switch stops engine.	*a*. Replace switch (para 8-1)l
	b. Water or foreign matter with fuel.	*b*. Drain and fill tank with new fuel. (para 4-2 and 4-4)
	c. Fuel exhausted.	*c*. Add fuel. (para 4-2 & 4-4)
	d. Air cleaner clogged.	*d*. Service air cleaner by cleaning or Replacing filter. (TM 5-4310-146 12}
5. Engine overheats.	*a*. Crankcase oil supply too low.	*a*. Stop engine and add oil to proper level. (para 2-8)
	b. Air shroud loose or damaged.	*b*. Tighten air shroud. Repair in accordance with TM 5-2805-25(-14.
6. Engine smoking excessively.	*a*. Crankcase oil level too high.	*a*. Drain to proper level. (para 2-8)
	b. Carburetor choked excessively.	*b*. Adjust choke. REF TM-5-2805-254-14.
	c. Engine cold causing poor combustion	*c*. Allow engine warmup before operating compressor.
7. Compressor air flow insufficient.	Air leaks caused by loose connections.	Tighten pneumatic connections. (para 2-17)
8. Excessive vibration.	Mounting bolts loose.	Tighten bolts. (para 2-12)
9. Overheating of compressor.	a. Improper air flow due to confined area or foreign objects.	*a*. Operate compressor in open area. Clean all cooling fins of obstructions dirt or dust. (para 2-12)
	b. Crankcase oil supply low.	*b*. Stop compressor (TM 5-4310-346-12) and add oil to proper level Ref. LO 5-4310-346-12).
10. Compressor knocks or excessive noise.).	*a*. Crankcase oil supply; is low Clogged filter or obstructed strainer	*a*. Add oil to proper level after stopping para 2-8 **Caution: If noise persists after crankcase is filled to proper level, stop the compressor Continued use in this condition may cause serious damage to the compressor. Repair compressor to eliminate noise. (chap. 8)**
	b. Clutch slipping.	*b*. Repair or replace chap. 6}.
11. Compressor oil pressure low.	*a*. Crankcase oil supply low.	*a*. Add oil to proper level (LO-5-4310 346-12).
	b. Oil filter dirty.	*b*. Replace element (TM 5-4310-346-121.
12. Inter- and aftercooler pressure low.	*a*. Air cleaner clogged.	*a*. Service air cleaner TM-5-4310-346-12 1.
	b. Air leaks in system.	*b* Check and service all gauge fittings. lines. filters. valves (para 2-17. 7-2, 7-2).
13. Decreased stage gauge pressure.	*a*. Leaking connections.	*a*. Cheek for leaks and repair or replace para 2 17. 7-2. 7-4).
	b. Exhaust valve leak.	*b*. Repair or replace exhaust valve (para 8-6).
	c. Upper piston seal leaks.	c. Replace piston assembly. (para 8-2)
	d. Lower Piston seal leaks.	*d*. Replace piston assembly. (para 8-2)
	e. Gauge Malfunction.	*e*. Replace gauge. (para 7-2)
14. Increased stage gauge pressure.	*a*. Succeeding stage upper piston seal leak.	*a*. Replace piston assembly. (para 8-2)
	b. Succeeding stage exhaust valve.	*b*. Replace exhaust valve. para 8-6)
	c. Succeeding stage inlet poppet valve leak	*c*. Replace inlet poppet valve. (para. 8-6)
	d. Gauge malfunction.	*d*. Replace gauge. (para 7-2)
15. Gauge Pressure continues after shut-off.	*a*. Pressure trapped interstage.	*a*. Operate cautiously. (Ref. TM 5-4310-346-121

Table 2-1. Troubleshooting-Continued

Malfunction	Probable Cause	Corrective Action
15. Gauge Pressure continues after shut-off-Continued	b. Gauge malfunction.	*b*. Replace gauge. (para 7-2)
16. Tire wear abnormal or tires worn.	a. Tires improperly inflated.	*a*. Inflate to 45 psi. (para 12-2)
	b. Wheel bearings bad.	*b*. Replace bad bearings. (para 2-20)
	c. Toe-in out of adjustment.	*c*. Adjust toe-in. (para 2-20)
	d. Wheel loose on hub.	*d*. Tighten wheel nuts. (para 2-20)
17. Winterization heater does not function.	a. Lack of fuel.	a. Check fuel lines and fittings, valves, filter, fuel pump, igniter, (para 2-15 and 4-2). Replace if necessary.
	b. Electrical system failure.	*b*. Check all wiring for correct circuitry. (para 2-6)
	c. Defective circuit switch or circuit breaker	*c*. Check wiring. If hookup is correct, defective. Remove and replace component. (para 2-6 and 2-16)
	d. Faulty flame detector switch.	*d*. Check wiring. If wiring is correct Remove and install new switch. para 11-2)
	e. Thermostat not functioning.	*e*. Replace thermostat. (para 11-2)
18. Heater goes out in low heat.	a. Vapor lock.	*a*. Check fuel line.
	b. Wick burned too low.	*b*. Adjust wick to ½-inch length. Ref. para 11-2)
	c. Fuel valve not functioning correctly.	*c*. Remove valve and check low heat Fuel flow through control valve. If defective, replace valve. (Ref. para 11-2)
19. Heater does not stop burning.	Defective fuel control valve.	Replace complete fuel control valve assembly. (para 11-2)
20. Fan stops too soon or too late.	Flame detector switch out of adjustment or defective	If switch is defective, replace. Check for broken quartz rod; if broken, replace. Check tension in spring. Ref. para 11-2)
21. Excessive ammeter fluctuation	a. High resistance infield circuit to alternator	a. Clean out and tighten all connections
	b. Voltage regulator improperly set	
22. Ammeter Voltage Drop or needle does not move from zero	a. Burned distributor points	a. Replace points and condenser
	b. Defective spark plugs	b. Clean and regap plugs at 0.028-0.0.33 or replace.
	c. Loose or dirty connections and defective wiring	c. Clean and tighten all connections and report to Direct and General Support Maintenance

Section III. GENERAL MAINTENANCE

2-5. General

This section contains information on maintenance, repair and replacement of the complete unit in general as opposed to individual components for the direct support and general support maintenance personnel tasks to be performed on the air compressor.

2-6. General Repair and Replacement

a. Electrical Components, Cable Assemblies and Wire Leads (Reference (fig. 2-1).

WARNING

Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Keep open flame and excessive heat away from solvent. Flash point of solvent is 100°-138°F. (Fed. Spec. PD-680).

(1) Visually inspect all electrical components for frayed wiring, broken terminals, loose connections, oil and dirt on connections and malfunctioning possibilities.

(12 To remove any electrical components for repair or replacement, tag and disconnect each connection to facilitate installation.

(3) Clean the components with a damp cloth or a suitable dry cleaning solvent, Fed Spec P-D680 for dirt, oil, grease, and corrosion.

(4) Repair any lead wires or cables for minor damage such as loose terminals, frayed insulation and small splicing of wires.

(5) Installation of the components may be accomplished by reversed procedure of removal, unless instructed otherwise. Be sure to match the tagged connections.

(6) Test wiring for electrical continuity with ohmmeter.

b. Lines, Fittings and Metal Parts.

(1} Visually inspect all fuel, oil and pneumatic lines, fittings and metal parts for corrosion, dents, broken connections, damaged threads, holes, dirt. oil, grease, and missing parts.

(2) To remove any lines and fittings, tag and disconnect to facilitate installation location using the pneumatic schematic (fig. 2-2).

(3) Clean all parts with a damp cloth or a suitable dry cleaning solvent, Fed. Spec. P-D-680 and dry thoroughly with compressed air. Make sure all through passages are not blocked with sediment and all port threads are not damaged. Replace pneumatic parts that have damaged threads. Apply a commercial pipe seal teflon tape to pneumatic and oil pipe threads.

(4) Install all parts removed or new parts in the reverse procedure of removal, making sure all parts are fastened securely and tagged parts are matched.

2-7. Non-Standard Requirements

Non-standard requirements such as painting, welding, riveting and soldering that may be required for minor damage will be accomplished in the most convenient manner.

2-8. General Lubrication

a. Keep all lubricants in closed, clean containers. Allow no foreign material to mix with any lubricant.

b. Clean all lubrication fittings prior to applying lubricants. Clean all fittings and lubrication points after applying lubricants for excess lubricants in order that foreign material will not accumulate at these points.

c. Lubricate the unit in accordance with LO 54310-346-12.

d. Lubricate engine in accordance with technical manual TM 5-2805-259-14, and lubrication order LO 5-2805-259-12.

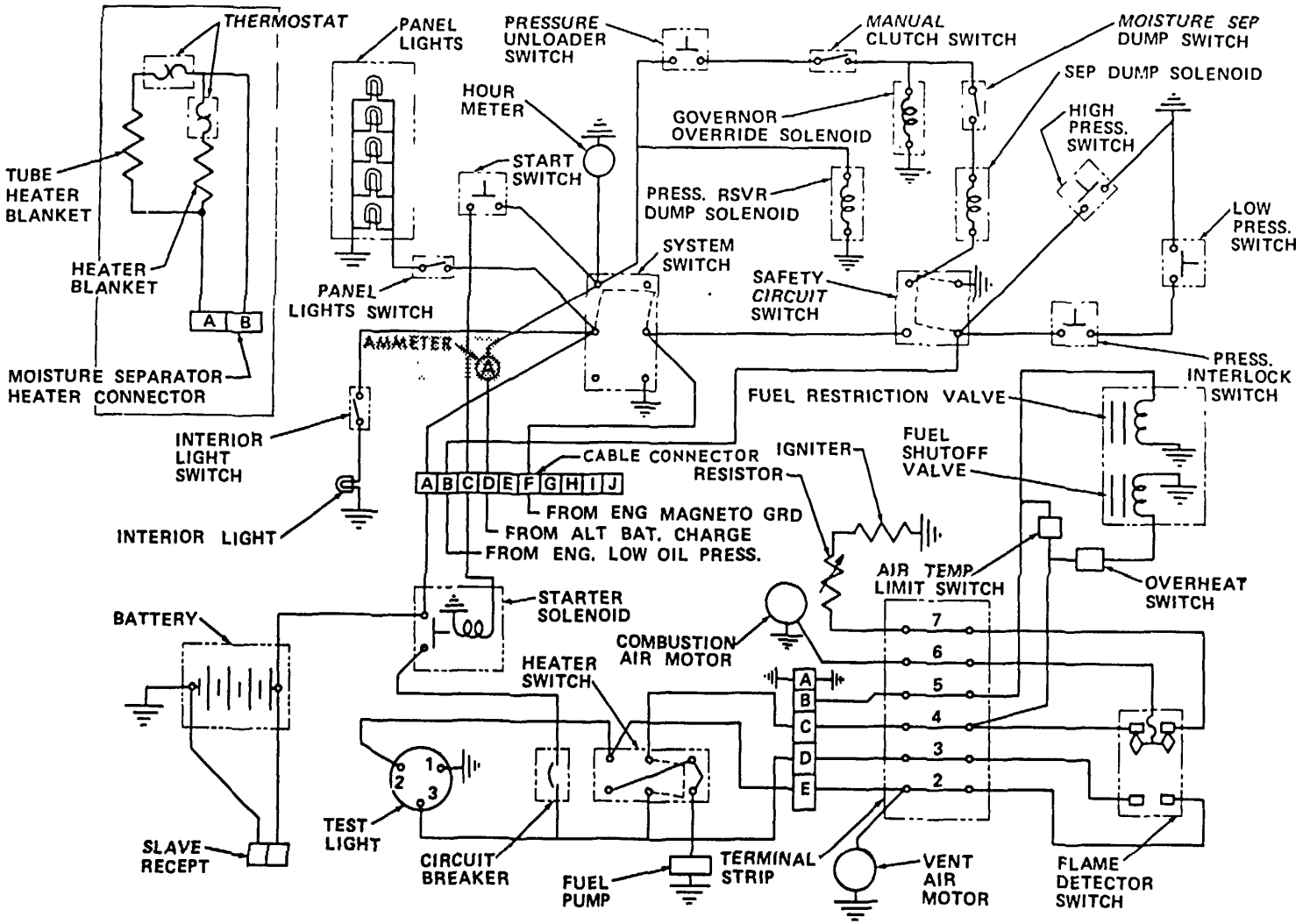

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Figure 2-1. Electrical Schematic.

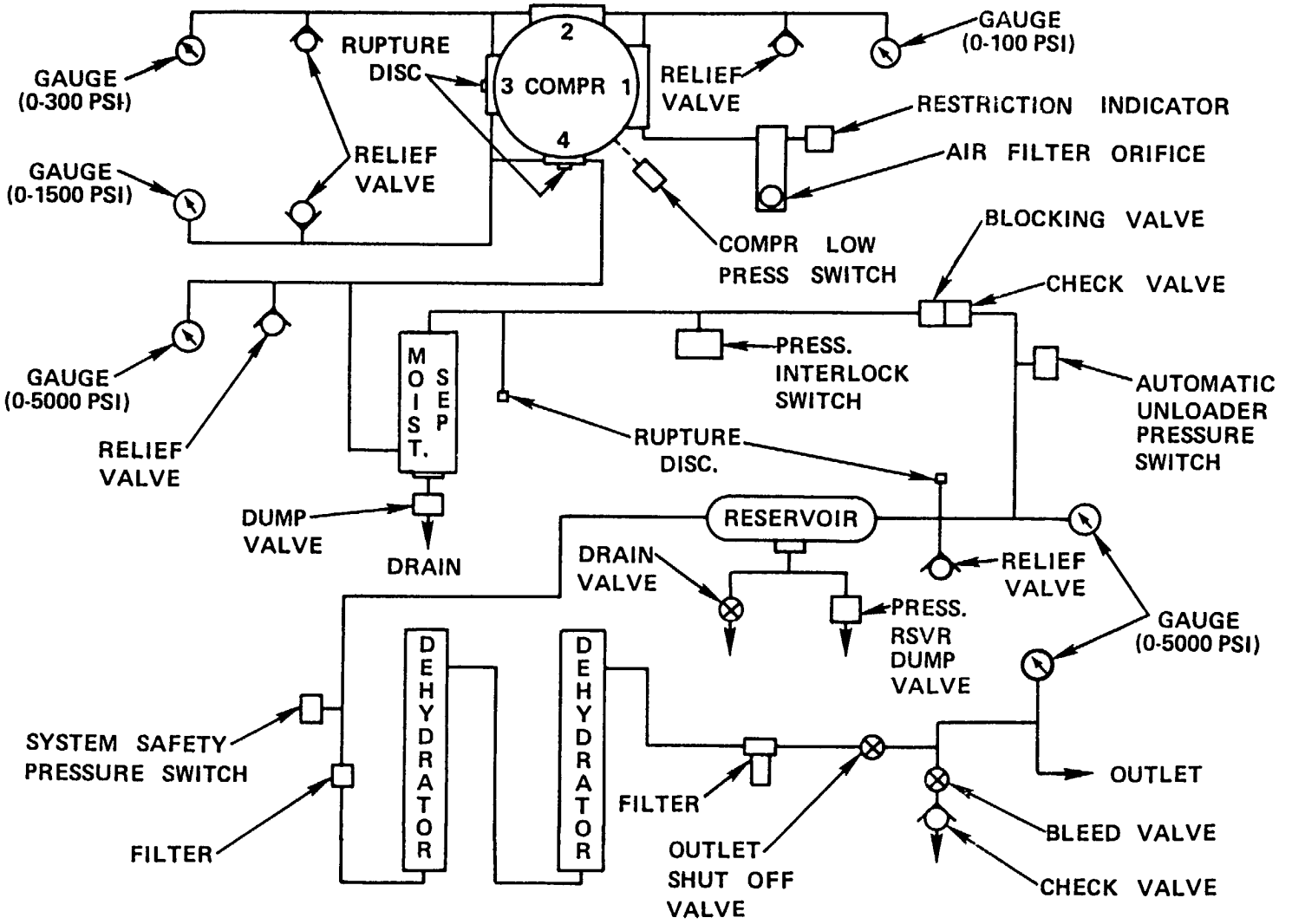

Figure 2-2. Pneumatic Schematic.

Section IV. REMOVAL AND INSTALLATION OF MAJOR COMPONENTS AND AUXILIARIES

2-9. General

This section contains information for the removal and any maintenance and adjustment during installation of major components and auxiliaries of the air compressor to be performed by the direct support and general support maintenance personnel.

2-10. Cover Assembly, Doors and Panels

WARNING

Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Keep open flame and excessive heat away from solvent. Flash point of solvent is 100°-138°F. (Fed. Spec. PD-680).

a. Removal. Refer to TM 5-4310-346-12 and remove cover assembly, doors and panels.

b. Cleaning and Inspection.

(1) Clean all parts with a suitable dry cleaning solution, Fed. Spec. P-D-680 and dry thoroughly.

(2) Inspect for cracks, dents, breaks and other dam age.

c. Installation. Refer to TM 5-4310-346-12 and install the cover assembly, doors and panels.

2-11. Compressor Air Cleaner, Clamps and Brackets

WARNING

Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Keep open flame and excessive heat away from solvent. Flash point of solvent is 100°-138°F. (Fed. Spec. PD-680).

a. Removal Refer to TM 5-4310-346-12 and remove the compressor air cleaner, clamps and brackets.

b. Cleaning and Inspection.

(1) Clean all parts with a suitable dry cleaning solution, Fed. Spec. P-D-680 and dry thoroughly.

(2) Inspect for cracks, dents, breaks and other damage.

(3) To service the compressor air cleaner refer to TM 5-4310-346-12.

c. Installation. Refer to TM 5-4310-346-12 and install the compressor air cleaner, clamps and brackets.

2-12. Compressor and Adapter (fig. 2-3)

WARNING

Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Keep open flame and excessive heat away from solvent. Flash point of solvent is 100°-138°F. (Fed. Spec. PD-680).

a. Removal

(1) Remove the clamp (1, fig. 2-3) and flexible duct (2) from the first stage cylinder.

(2) Remove the clamp and duct (17 and 18, fig. 2-5) from the warm air fitting (41) on the compressor.

(3) Remove two screws (17, fig. 2-3), two lockwashers (18) securing the service light panel (19) to the adapter (11) and remove panel. Tag and disconnect lead wires.

(4) Remove drain cap (23) and drain the crankcase oil.

(5) Refer to paragraph 2-17 b (1) and (26, fig. 2-7) and remove after-cooler from reducer (1, fig. 2-8, sheet 1 of 2). Tag and disconnect wire leads on compressor pressure switch (para 8-4 a (4)).

(6) Refer to TM 5-4310-346-12 and remove tubing from the manifold on the fan guard and the control panel.

(7) To remove the compressor (10, fig. 2-3), adapter (11) and the compressor half of the clutch (12), remove two nuts (13), two lockwashers (14) and two screws (15) securing the compressor to the stabilizing bracket (16).

(8) Remove six screws (20, fig. 2-3) and six lockwashers (18) securing the compressor adapter (11) to the engine. Lift compressor away from the engine and up using a medium strap hoist.

(9) Remove the compressor half of the clutch (12) and refer to Chapter 6 and figure 6-1 for clutch removal and repair.

(10) To remove the adapter (11, fig. 2-3) remove six nuts (21), 12 flat washers (27) and six screws (22) securing the adapter to the compressor. Remove elbow (25), elbow (26) and nipple (24).

b. Cleaning and Inspection.

(1) Clean 'all parts with damp cloth or a suitable dry cleaning solvent, Fed. Spec. P-D-680 and dry thoroughly.

(2) Inspect for broken lines, tubing, connections. check for cracks, missing parts, loose connections of parts and other damage.

(3) Replace damaged or defective part and for repair refer to Chapter 7, figure 7-1.

c. Installation.

(1) Install all parts in reverse of removal procedures.

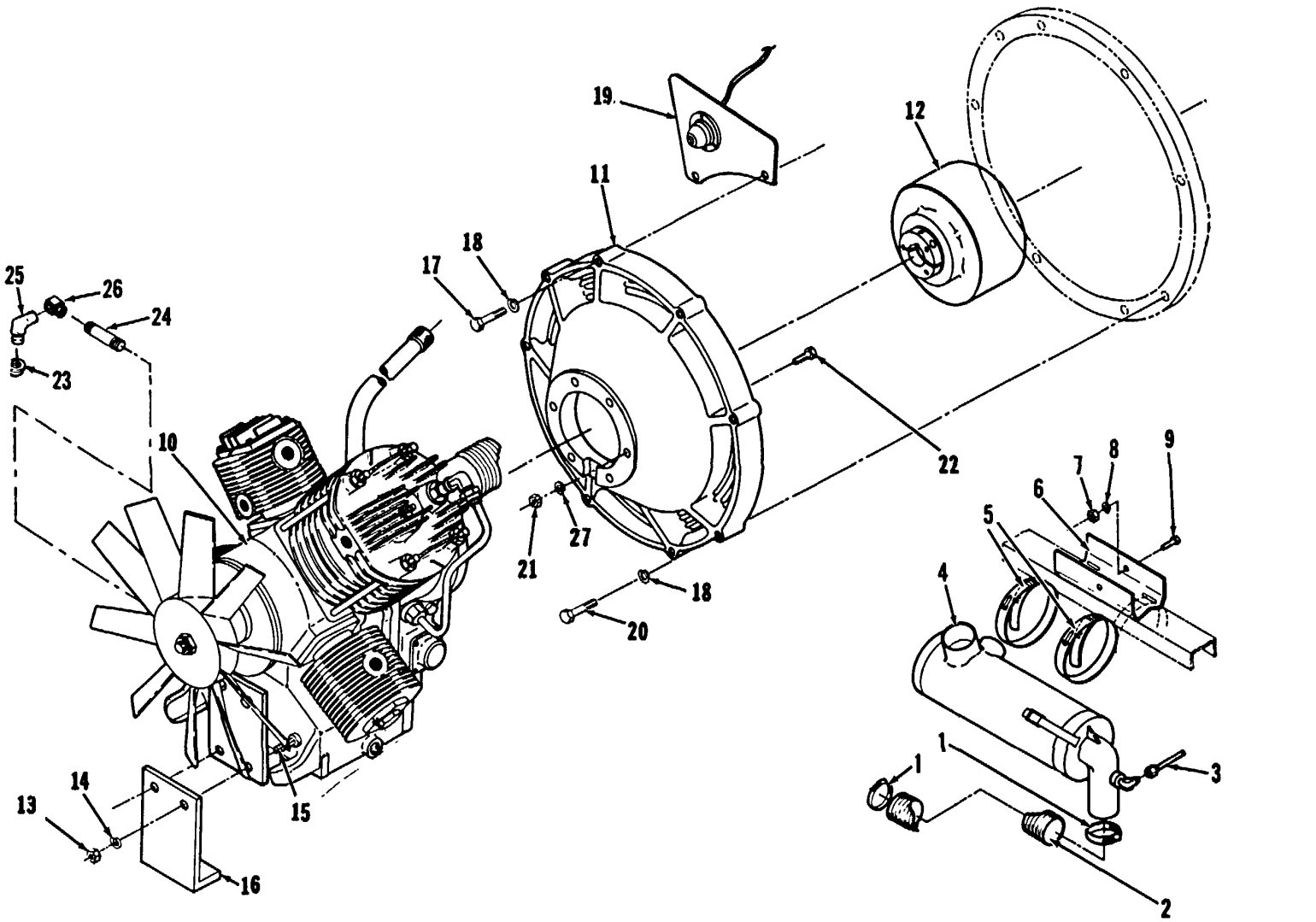

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Figure 2-3. Air cleaner, compressor, adapter and half clutch removal

Key to fig. 2-3

1. Clamp
2. Flexible duct
3. Tube
4. Air cleaner
5. Clamp
6. Bracket
7. Nut
8. Lockwasher
9. Screw
10. Compressor
11. Adapter
12. Half clutch
13. Nut
14. Lockwasher
15. Screw
16. Stabilizing bracket
17. Screw
18. Lockwasher
19. Service light panel
20. Screw
21. Nut
22. Screw
23. Cap
24. Nipple
25. Elbow
26. Elbow
27. Flatwasher

2-13. Engine, Mounts and Accessories (fig. 2-4)

WARNING

Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Keep open flame and excessive heat away from solvent. Flash point of solvent is 100°-138°F. (Fed. Spec. PD-680).

a. Removal.

(1) To remove the engine (1), tag and disconnect cables (78, 66, fig. 2-6, sheet 2), wire lead (79) from starter, and disconnect cable (71) from engine manifold. Tag and disconnect wire leads of the governor control solenoid (7, fig. 2-4). To remove the muffler (2) and gasket (6) from the engine right manifold and the frame, remove two nuts (3), two lockwashers (4) and two screws (5) from the manifold. Remove two nuts (2A), two lockwashers (4) and two washers (28) retaining the strip and screw assembly (2C) to the frame. Lower the muffler elbow downward through the hole in the floor and remove muffler. To disassemble the strip and screw assembly (2C) from the muffler assembly (2), remove nut (2A), lockwasher (4) and washer (2B). Refer to fig. 4-1 and disconnect tube (17) from hose (15). Disconnect cable connector from the engine (Fig. 2-1).

(2) To remove the heating tubes for engine removal, refer to fig. 2-5 and remove 4 clamps (1) and 2 flexible ducts (2 and 3) from the heater adapter (4) and engine heating manifold tubes (5 and 6). Remove 2 screws (7) retaining the engine oil pan tubes 18) to the right and left side manifold tubes (5 and 6). Remove the 4 nuts (9), 4 washers (10) and 4 screws (11) retaining the manifold tubes to the 4 pipe hangers (12). To remove the 4 pipe hangers (12) which retain the manifold tubes remove 4 screws (13) from beneath the floor and 4 floating nuts (14).

(3) To remove engine from 3 mounts, refer to figure 2-4 and remove 3 cotter pins (8), 3 nuts (9) 3 nuts (91, 3 washers (10), 6 snubbing washer (11), and 3 bolts (13).

(4) To remove engine half of clutch (14) remove 4 cap screws (15) and 4 lockwashers (181 securing the half clutch. To remove the clutch mounting plate (16) from the engine, remove 4 bolts (17), 4 lockwashers (18) securing the mounting plate (16) to the engine. Lift the engine up and away from the tool box and remove resilient mount (12). Refer to chapter 6, fig. 6-1 for clutch disassembly.

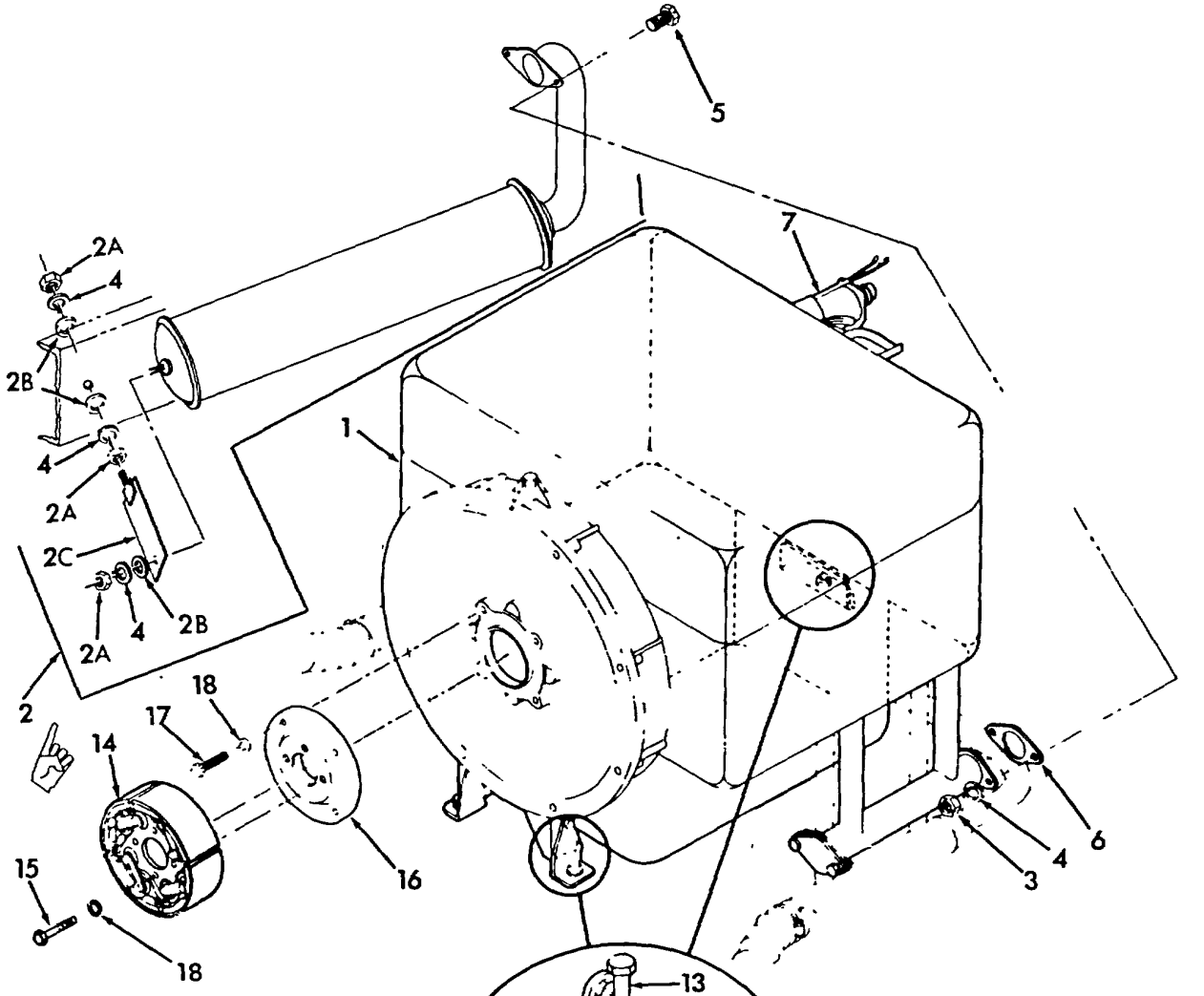
b. Cleaning and Inspection.

(1) Clean all parts with a damp cloth or a suitable dry cleaning solvent, Fed. Spec. P-D-68(and dry thoroughly.

(2) Inspect all parts for dents, breaks, loose and missing connections and other damage.

(3) For repair of the engine and accessories, refer to Chapter 5.

c. Installation. Install the parts in reverse of removal procedures.



1. Engine
2. Exhaust elbow
3. Nut
4. Lockwasher
5. Screw
6. Gasket
7. Governor control solenoid
8. Cotter pin
9. Nut
10. Washer
11. Snubbing washer
12. Resilient mount
13. Bolt
14. Half clutch
15. Cap screws
16. Mounting plate
17. Bolt
18. Lockwasher

Figure 2-4. Engine. engine mounts and accessory removal

2-14. Heater, Heater Adapter and Accessories (fig. 2-5)

WARNING

Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Keep open flame and excessive heat away from solvent. Flash point of solvent is 100°-138°F. (Fed. Spec. PD-680).

a. Removal. Refer to TM 5-4310-346-12 and remove heater, heater adapter and accessories.

b. Cleaning and Inspection.

(1) Clean all parts with a damp cloth or a suitable dry cleaning solution Fed. Spec. P-D-680 and dry thoroughly.

(2) Inspect all parts for dents, breaks, loose and missing connections, clogged openings and other damage.

c. Installation. Refer to TM 5-4310-346-12 and install the heater, heater adapter and accessories.

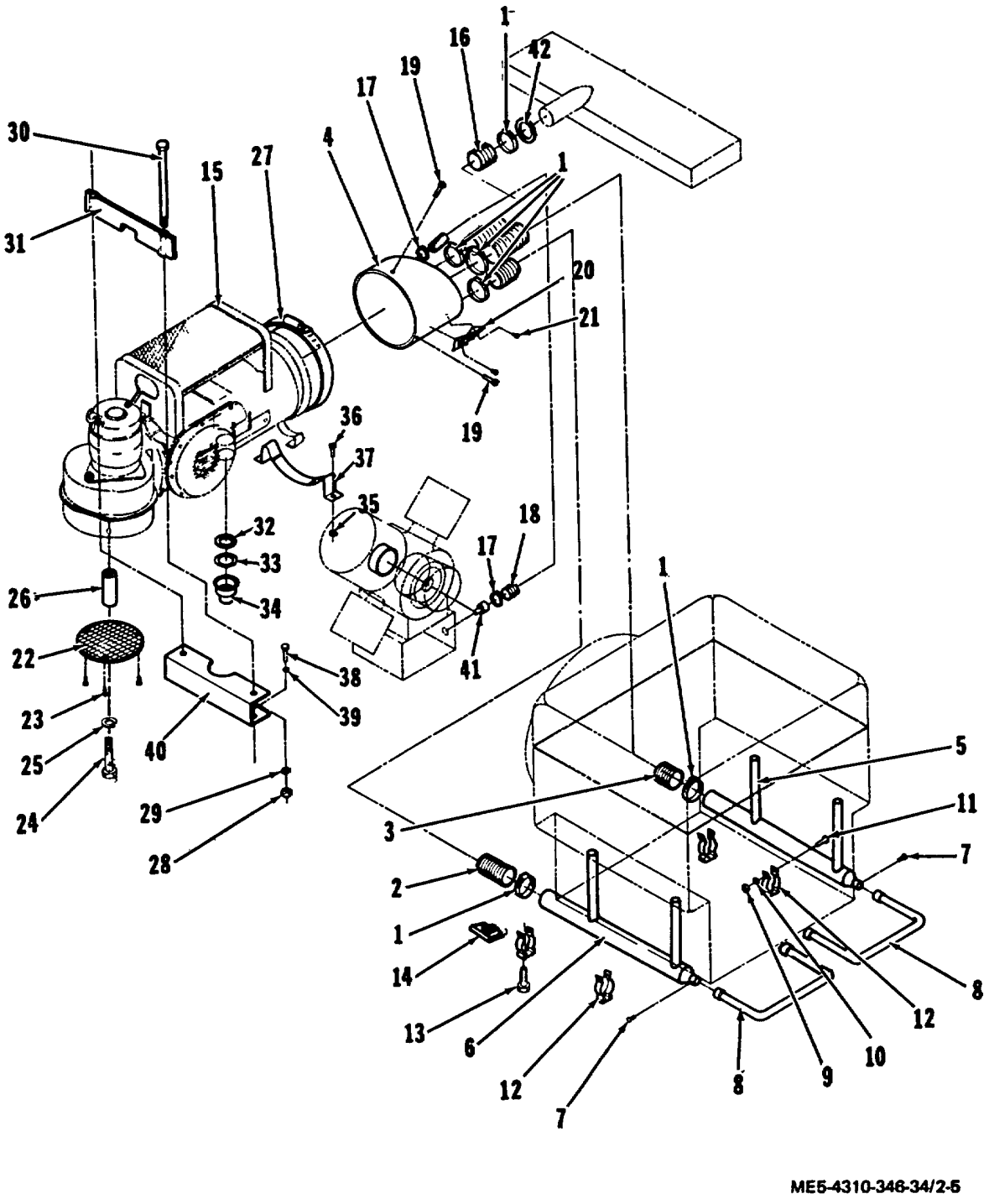


Figure 2-5. Heater, adapter and accessories (fig. 2-5).

Key to fig. 2-5

1. Clamp
2. Flexible duct
3. Flexible duct
4. Heater adapter
5. Rightside Manifold tube
6. Leftside manifold
7. Screw
8. Engine oil pan tube
9. Nut
10. Washer
11. Screw
12. Pipe hanger
13. Screw
14. Floating nut
15. Heater assembly
16. Flexible duct
17. Clamp
18. Flexible duct
19. Screw
20. Limit switch
21. Screw
22. Screen
23. Screw
24. Screw
25. Lockwasher
26. Support
27. Clamp
28. Nut
29. Washer
30. Bolt
31. Hold down clamp
32. Washer
33. Preformed packing
34. Exhaust pipe extension
35. Nut
36. Screw
37. Bracket
38. Screw
39. Lockwasher
40. Bracket
41. Warm air fitting
42. Sleeve

2-15. Fuel Tank, Fuel Filter, Lines and Fittings

WARNING

Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Keep open flame and excessive heat away from solvent. Flash point of solvent is 100°-138°F. (Fed. Spec. PD-680).

a. To remove, service and install fuel tank assembly, refer to TM 5-4310-346-12.

b. To remove, clean, repair and install fuel filter, lines and fittings, refer to TM 5-4310-346-12.

2-16. Electrical Components (fig. 2-6)

a. For description of the majority of the electrical components, refer to paragraph 1-8 and location of the components (fig. 1-4). Refer to TM 5-2805-259-14 for engine electrical components. Cut and remove sleeving from all disconnect knife points to tag and disconnect wires. Replace new sleeving at installation.

b. Removal of Panel Lights. Refer to TM 5-4310-346-12 and remove panel lights.

c. Cleaning, Inspection, Repair and Maintenance

(1) Inspect the five panel lights (1), located on the top rear cross beam of the frame, for damage or malfunction. If the bayonet type lamp (6) is expended remove lamp cover, push the lamp inward and turn counterclockwise to remove. Clean all parts and wires with a damp cloth and dry thoroughly.

(2) To install a new lamp {6), insert the bayonet type lamp into receptacle of the light 1), push inward, turn clockwise and replace lamp cover.

d. Installation. Refer to TM 5-4310-346-12 and install the panel lights.

e. 'Removal of Service Light. Refer to TM 5- 4310-346-12 and remove the service light.

f. Cleaning, Inspection, Repair and Maintenance

(1) Inspect the service light (50) located on a panel attached to the engine and compressor mounting adapter for damage and malfunction. If the lamp (59) is expended remove two screws (52) securing the lens. Remove the lens (53) gasket (54) and push the lamp (591 inward and turn counterclockwise to remove the lamp. Install a new lamp and reverse the procedures of lamp removal. Clean all parts with a damp cloth or a suitable dry cleaning solvent, Fed. Spec. P-D-680 and dry thoroughly.

g. Installation. Refer to TM 5-4310-346-12 and install the service light.

h. Removal of Hourmeter. Refer to TM 5-4310-346-12 and remove the hourmeter.

j. Cleaning and Inspection.

(1) Inspect the hourmeter (7), located on the control panel, for malfunction or damage.

(2) Clean wire leads and parts with a damp cloth or a suitable dry cleaning solvent Fed. Spec. P-D-680 and dry thoroughly.

k. Installation. Refer to TM 5-4310-346.12 and install the hourmeter.

WARNING

Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Keep open flame and excessive heat away from solvent. Flash point of solvent is 100°-138°F. (Fed. Spec. PD-680).

k.1. Removal of ammeter. Refer to TM 5-4310-346-12, paragraph 4-27.1 and remove the ammeter.

k.2. Cleaning and Inspection.

(1) Inspect the ammeter (7*a*), located on the control panel, for malfunction and damage.

(2) Clean the ammeter with a damp cloth or cleaning solvent Fed. Spec. PD-680 and dry thoroughly.

k.3. Installation. Refer to TM 5-4310-346-12, paragraph 4-27-1, and install the ammeter.

i. Removal of Switches and Circuit Breaker. Refer to TM 5-4310-346-12 and remove all switches and circuit breaker from the control panel.

m. Cleaning and Inspection

(1) Clean the switches and circuit breaker with a dry cleaning solvent Fed. Spec. P-D.680 and dry thoroughly. 12) Inspect the switches and circuit breaker for malfunction or damage,

n. Installation. Refer to TM 5-4310-346-12 and install the switches and circuit breaker.

p. Removal of Electrical Receptacles. Refer to TM 5-4310-346-12 and remove the electrical receptacles from the control panel.

q. Cleaning and Inspection. Inspect the moisture separator heater blanket receptacle and the auxiliary power source receptacle for damage and malfunction. Clean with a damp cloth and dry thoroughly.

r. Installation. Refer to TM 5-4310-346-12 and install the electrical receptacles.

s. Removal of Batteries. Refer to TM 5-4310346-12 and remove the batteries.

t. Cleaning, Testing, Servicing and Inspection. Refer to TM 5-4310-346-12 and clean, test, service and inspect the batteries.

u. *Installation*. Refer to TM 5-4310-346-12 and install batteries into the battery box.

KEY to figure 2-6 (Sheet 1 of 2)

1 Panel light
2 Wire lead
3 Nut
4 Washer
5 Screw
6 Lamp
7 Hourmeter
7A Ammeter
8 Wire lead
9 Nut
10 Washer
11 Screw
12 Panel light switch
13 Jam nut
14 Washer
15 Key washer
16 Plate
17 Screw
18 Washer
19 Clutch switch
20 Interior light switch
21 System switch
22 Safety switch
23 Screw
24 Washer
25 Moist sep dump switch
26 Screw
27 Washer
28 Jam nut
29 Washer
30 Start switch
31 Heater switch
32 Connector
33 Jumper assembly
34 Circuit breaker
35 Screw
36 Washer
37 Screw
38 Press to test button switch
39 Press button
40 Bulb
41 Jam nut
42 Washer
43 Heater blanket receptacle
44 Nut
45 Screw
46 Aux pwr source receptacle
47 Nut
48 Washer
49 Screw
50 Service light
51 Wire lead
52 Screw
53 Lens
54 Gasket
55 Nut
56 Washer
57 Screw
58 Gasket
59 Lamp
60 Cover
61 Wing nut
62 Washer
63 Battery
64 Battery to ground cable
65 Battery to battery cable
66 Battery to starter cable
67 Wing nut
68 Flat washer
69 Battery retainer
70 Cap
71 Cable (Eng ground)
72 Nut
73 Lockwasher
74 Bolt
75 Cable (receptacle ground)
76 Support screen
77 Carnage bolts,
78 Cable (receptacle to starter)
79 Wire lead (circuit breaker to starter)

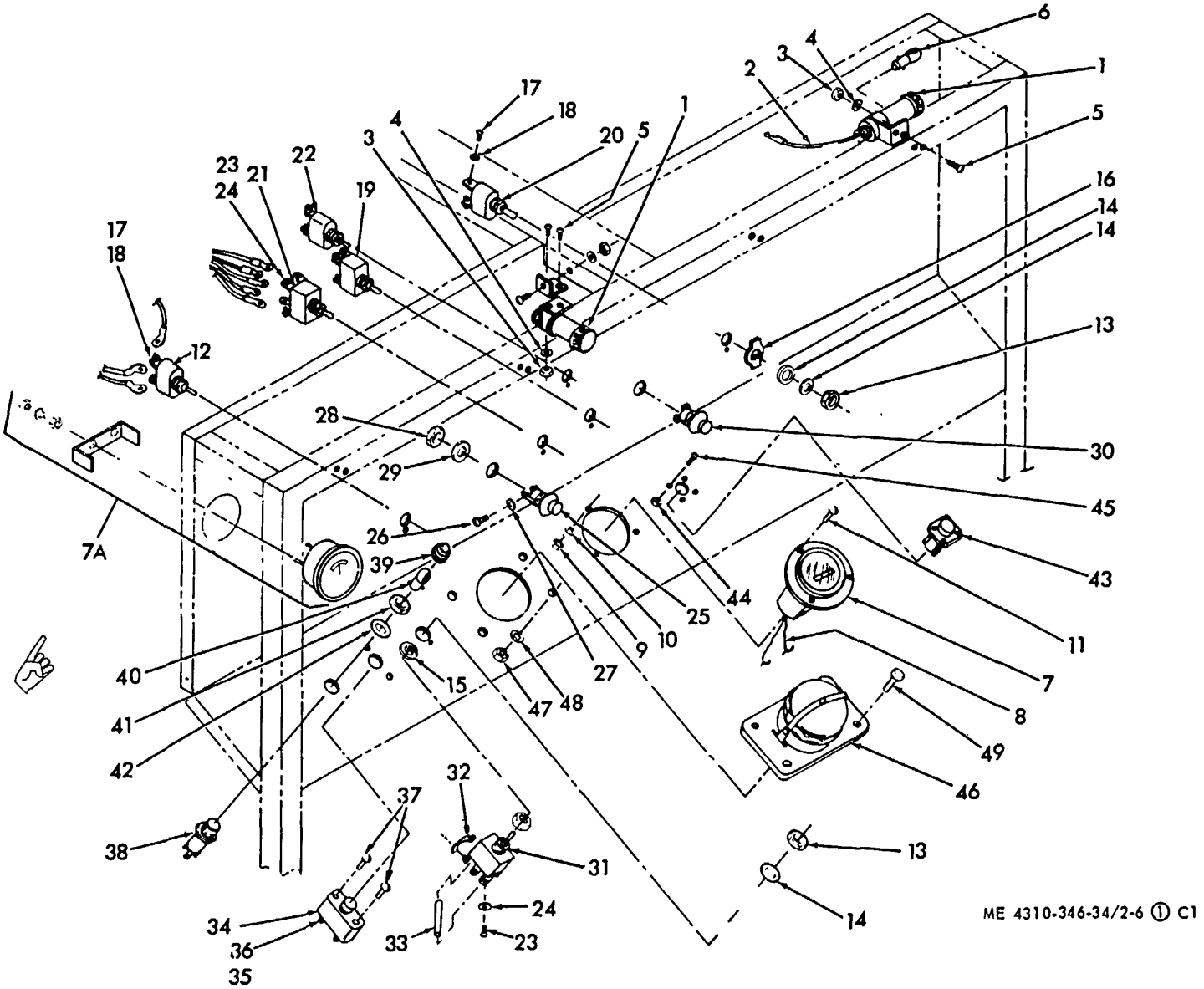


Figure 2-6. Electrical Components (Sheet 1 of 2).

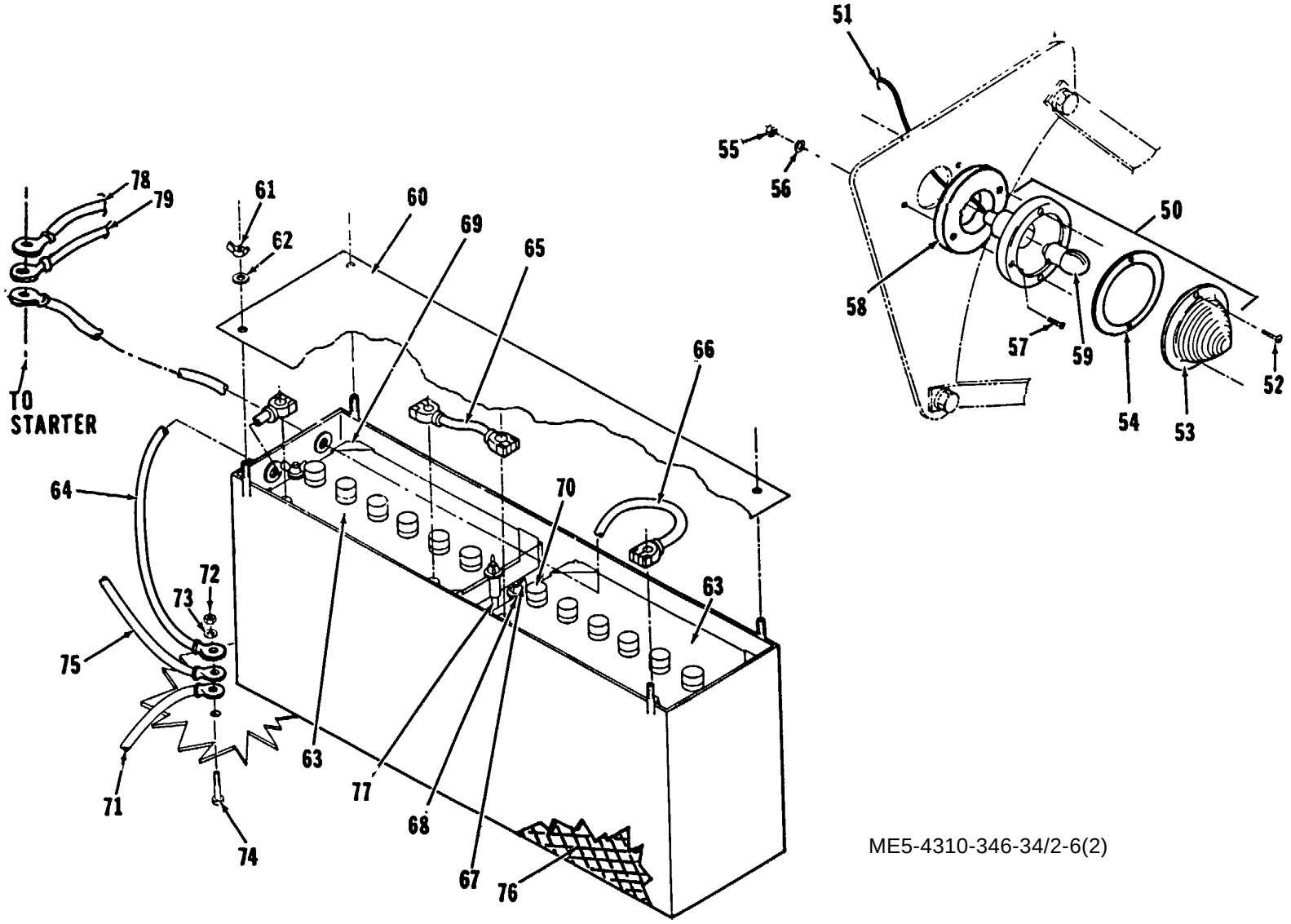


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Figure 2-6. Electrical Components (Sheet 2 of 2).

2-17. Unloading System

This paragraph contains information on the component maintenance of the unloading system, consisting of the compressor tubes and fittings, high pressure air filter, dehydrators, moisture separator, dehydrator cartridge, air reservoir, dump, check, relief and shutoff valves, pressure regulator valve, pressure switches and other lines and fittings. The procedures for inspection, checking, servicing and replacement of the components will also be explained in this paragraph. Relieve the compressor of pressure. For the removal of the unloading systems there will be a task breakdown in 4 groups:

1. Basic Compressor
2. Dehydrator
3. Moisture Separator
4. Air Receiver

WARNING

Because of the high pressure used in the air compressor, extreme caution must be used when relieving the system of air. Make sure that all pressures have been eliminated.

a. Removal-Basic Compressor Lines and Fittings (fig. 2-7)

(1) *Lines and fittings.* The removal of the lines and fittings for the unloading system will correspond to the first, second, third and fourth stages of the compressor. To remove the lines and fittings, components such as fan guard and fan must be removed and also certain tubes must be disconnected as follows:

(a) Remove tubes (11, 13, 15 and 9 fig. 71) from the control panel and the manifold (3, fig. 8-2) on the fan guard (4). Refer to paragraph 2-12, figure 2-3 for compressor removal.

(b) Remove union (1, fig. 2-7), packing (2), relief valve (3), packing (2), tube (first stage outlet to manifold) (4), elbow (5), nut (6), back-up ring (7) and preformed packing (2).

(c) Remove tube (14) (second stage outlet to manifold), elbow (5), nut (6), back-up ring (7) and preformed packing (2). Remove relief valve (15), preformed packing (2), union (1), and preformed packing (2).

(d) Remove tube (18) (third stage outlet to manifold), elbow (5), nut (6), back-up ring (7) and preformed packing (2). Remove union (1), preformed packing (2), relief valve (19), and preformed packing (2).

(e) Remove relief valve (23), preformed packing (2), tube (24) (fourth stage outlet to manifold),elbow (5), nut (6), back-up ring (7) and preformed packing (2) and remove union (22) and preformed packing (2) from manifold.

(f) Disconnect aftercooler tube (26) from the fourth stage special outlet fitting (27) and also from the reducer union (1, fig. 2-8, sheet 1 of 2).

(g) Refer to paragraph 8-2, figure 8-1 and remove the fan guard assembly and fan to facilitate removal of the aftercooler and intercooler finned tubes.

(h) Disconnect finned intercooler tubes (10, 16, and 20, fig. 2-7) from stage fittings. After removal of fan guard (30, fig. 8-1) and fan (36), remove clamp (66) and tube retainer (67) from bracket (65). Remove screw (31) and lockwasher (32) retaining bracket (68) to the crankcase. Remove the two screws (71), two nuts (69) and four lockwashers (70) and four clamps (72) from the tubes.

(2) *First stage fittings.* Remove reducer (8, fig. 2-71, seal (9), tee (11), nut (12), and seal (13), from the first stage outlet.

(3) *Second stage fittings.*

(a) Remove elbow (17), seal (13) and nut (12) from the 2nd stage inlet.

(b) Remove special fitting (28), nut (12) and seal (13) from second stage outlet.

(4) *Third stage fittings.* Remove elbow (17), nut (12) and seal (13) from the 3rd stage inlet port and remove elbow (17), nut (12), seal (13), special fitting (21), and (12) and seal (13) from 3rd stage outlet port.

(5) *Fourth stage fittings.* Remove elbow (17) nut (12) seal (13) fitting (25), nut (12) and seal (13) from the fourth stage inlet and remove special fitting (27), nut (12) and seal (13) from the fourth stage outlet.

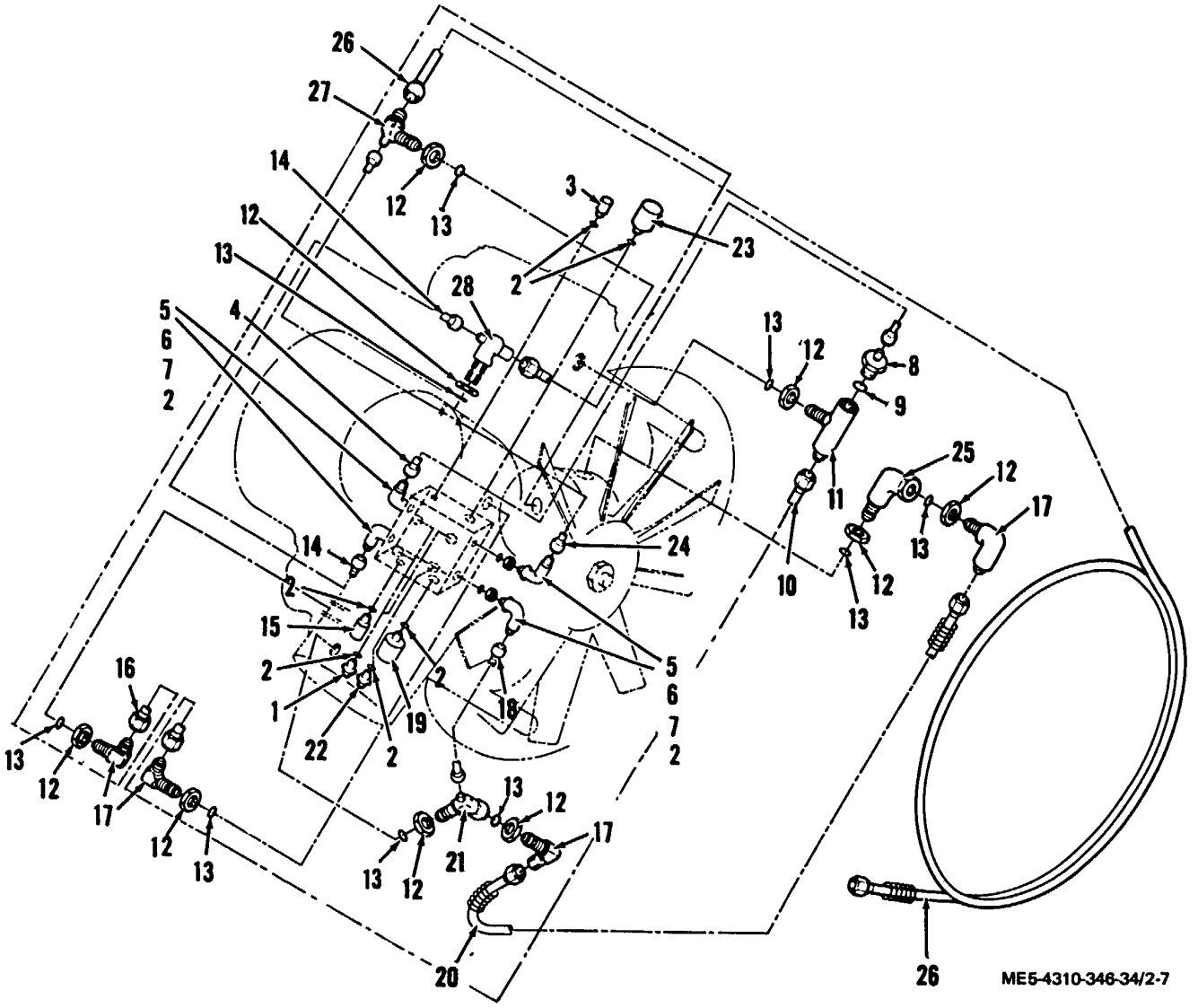


Figure 2-7. Unloading system-basic compressor fittings.

Key to Fig. 2-7

1. Union
2. Preformed packing
3. Relief valve
4. Tube
5. Elbow
6. Nut
7. Back-up ring
8. Reducer
9. Seal
10. Tube
11. Tee
12. Nut
13. Seal
14. Tube
15. Relief valve
16. Tube
17. Elbow
18. Tube
19. Relief valve
20. Tube
21. Special fitting
22. Union
23. Relief valve
24. Tube
25. Fitting
26. Aftercooler tube
27. Special fitting
28. Special fitting

WARNING

Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Keep open flame and excessive heat away from solvent. Flash point of solvent is 100°-138°F. (Fed. Spec. PD-680).

b. Removal-Moisture Separator and Fittings.

(1) Tag and disconnect lead wire and remove. Remove the reducer (1, fig. 2-8, Sheet 1), tube (2) (aftercooler to moisture separator inlet), union (3) and preformed packing (4) from the moisture separator (5).

(2) Remove moisture separator drain tube (6), union (3) and preformed packing (4) from the bottom of the moisture separator (5).

(3) Remove tube (7) (moist. sep. to back press. valve), tube (8) (moist. sep. tee to switch), 2 unions (3), 2 preformed packings (4), tee (9), packing (4), bulkhead union (10), nut (11), backup ring (12) and packing (4), rupture disc assembly (13), packing (4), tee (9), packing (4), bulkhead union (10), nut (11), backup ring (12) and packing (4) from the top of the moisture separator (5).

(4) To remove the moisture separator (5), tag and disconnect lead wires, remove 4 nuts (14), 4 lockwashers (15), 4 screws (16), 2 mounting brackets (17) and 2 mounting brackets (18) securing the moisture separator to the air reservoir bracket.

c. Removal-Air Reservoir, Lines and Fittings.

(1) Disconnect tube (19) (reservoir to pressure gauge.) Remove tube (20), (reservoir to cross), tube (21) (cross to switch) and detach tube (40, fig. 2-8, sheet 2) (switch to dehydrator).

(2) To remove the pressure switch (41) tag and disconnect wire leads, remove packing (4), union (3), packing (4), tube (42) (reservoir to switch) filter union (43), packing (4), tee (91. and 2 elbows (22, fig. 2-8, Sheet 1 & 2) from the ends of the reservoir.

(3) To remove back pressure valve (23, fig. 2-8, sheet 1), remove lockwire, 2 screws (24), spacer (25), packing (4), check valve (26), tube (27), 3 unions (3), 3 packings (4), cross (28), bulkhead union (10), nut (11), back-up ring (12), 2 packings (4), rupture disc assembly (13), packing (4), union (3), packing (4), cross (28) and packing (4).

(4) To remove pressure relief valve (29) remove 2 nuts (30), 2 lockwashers (31), 2 screws (32) and clamp (33) securing the valve to the air reservoir bracket.

(5) To remove air reservoir (34), remove 4 nuts (44, fig. 2-8, sheet 2), 4 lockwashers (45) and 2 "U" bolts (46) securing the air reservoir to the mounting bracket. Disconnect tube (47) from reservoir and lift reservoir up and out.

(6) Remove nipple (48), elbow (49), shutoff valve (50) and tee (51) from the bottom of the air reservoir.

(7) To remove the dump valve assembly (52), tag and disconnect lead wires, remove tube (47) (reservoir to dump valve), nipple (53) and remove 2 nuts (54), 2 lockwashers (55) and 2 screws (56) securing the valve assembly to the reservoir bracket. After the valve has been removed, remove the nipple (48).

(8) To remove the pressure interlock switch (35, fig. 2-8, sheet 1) and automatic pressure unloader switch (57, fig. 2-8, sheet 2), tag and disconnect wire leads on the switches and corresponding terminals. Remove 4 nuts (36, fig. 28, sheet 1), 4 lockwashers (37) and 4 screws (38) securing the switches to the air reservoir bracket and remove 2 nipples (39) from the switches.

d. Removal-Dehydrator and Fittings.

(1) Remove tube (40, fig. 2-8 Sheet 2) from the bottom of dehydrator no. 1 (58) and nipple (39). Remove tube (59), 2 nipples (39) from the top of the dehydrator no. 1 (58) to the bottom of dehydrator no. 2 (60), remove tube (61) (dehydrator to high pressure air filter) and remove nipple (39).

(2) To remove the 2 dehydrators, remove 4 nuts (14), 4 lockwashers (15) and 4 screws (16) securing the dehydrators to the air reservoir bracket.

e. Cleaning and Inspection.

(1) Inspect unloading system complete for marred threads, damaged parts and malfunction of components. Clean all parts with a suitable dry cleaning solvent, Fed Spec P-D-680 and dry thoroughly.

(2) Inspect all components for air leaks, and make sure that all components are secured properly.

f. Installation.

(1) The installation of all parts new and old is the reverse of removal procedures. Check electrical continuity of switches (41, 57, fig. 2-8, Sheet 2), (35, fig. 2-8, Sheet 1) and tube (2). Refer to (fig. 2-6). Be sure all tagged electrical leads are correctly connected. Prior to installation of pneumatic fittings with pipe threads, apply a commercial pipe seal teflon tape to the threads for sealing.

(2) Pressurize the unit and check for air leaks.

KEY to figure 2-8 (Sheets 1 and 2)

1 Reducer
2 Tube
3 Union
4 Preformed packing
5 Moisture separator
6 Drain tube
7 Tube
8 Tube
9 Tee
10 Bulkhead union
11 Nut
12 Backup ring
13 Rupture disc assembly
14 Nut
15 Washer
16 Screw
17 Bracket
18 Bracket
19 Tube
20 Tube
21 Tube
22 Elbow
23 Back pressure valve
24 Screw
25 Spacer
26 Check valve
27 Tube
28 Cross
29 Pressure relief valve
30 Nut
31 Lockwasher
32 .Screw
33 Clamp
34 Air reservoir
35 Pressure interlock switch
36 Nut
37 Washer
38 Screw
39 Nipple
40 Tube
41 Pressure switch
42 Tube
43 Filter union
44 Nut
45 Washer
46 U-Bolt
47 Tube
48 Nipple
49 Elbow
50 Shut-off valve
51 Tee
52 Dump valve assembly
53 Nipple
54 Nut
55 Lockwasher
56 Screw
57 Pressure unloader switch
58 Dehydrator No. 1
59 Tube
60 Dehydrator No. 2
61 Tube

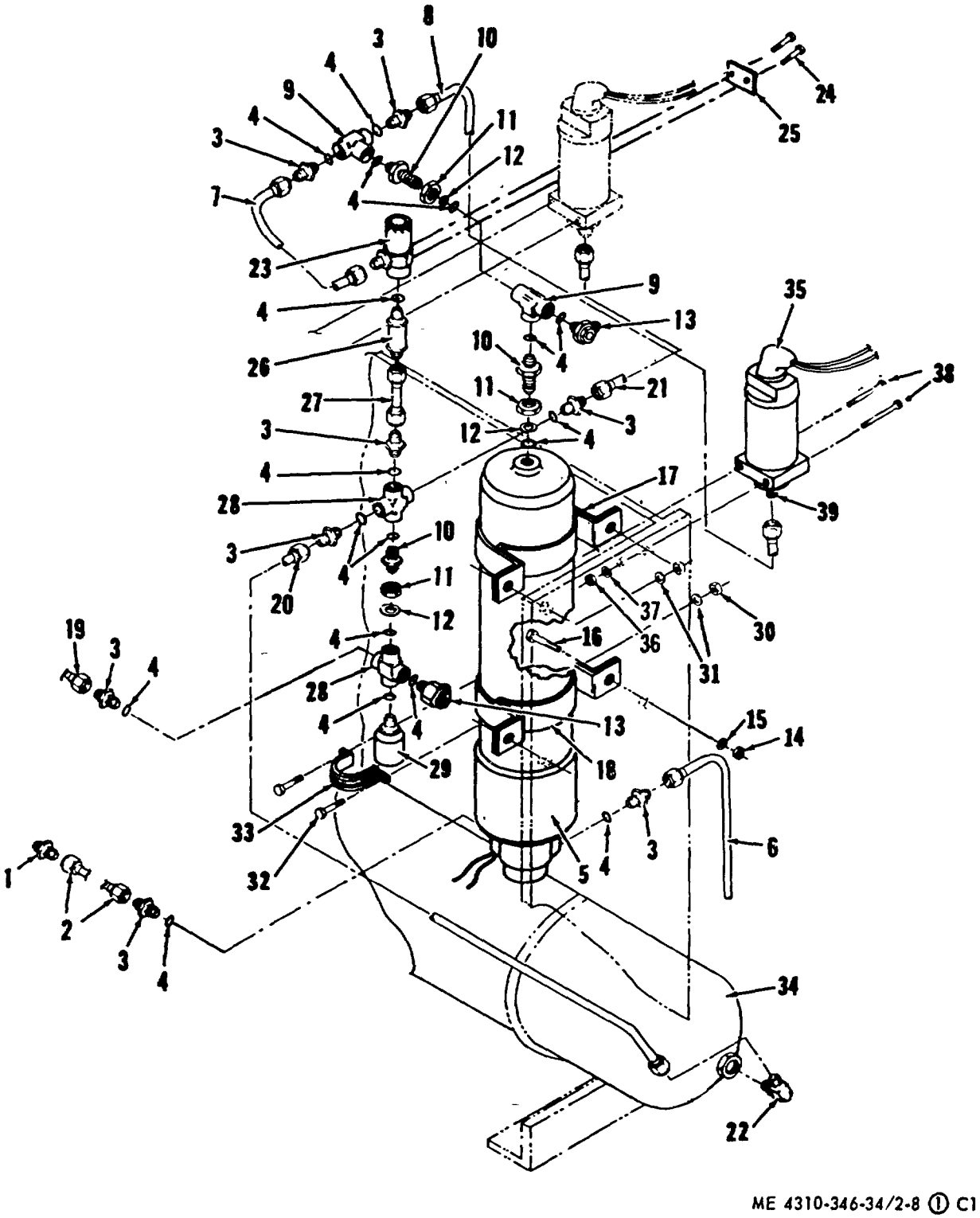


Figure 2-8. Unloading System-Dehydrator, air reservoir, moisture Separator, lines and fittings. (Sheet 1 of 2)

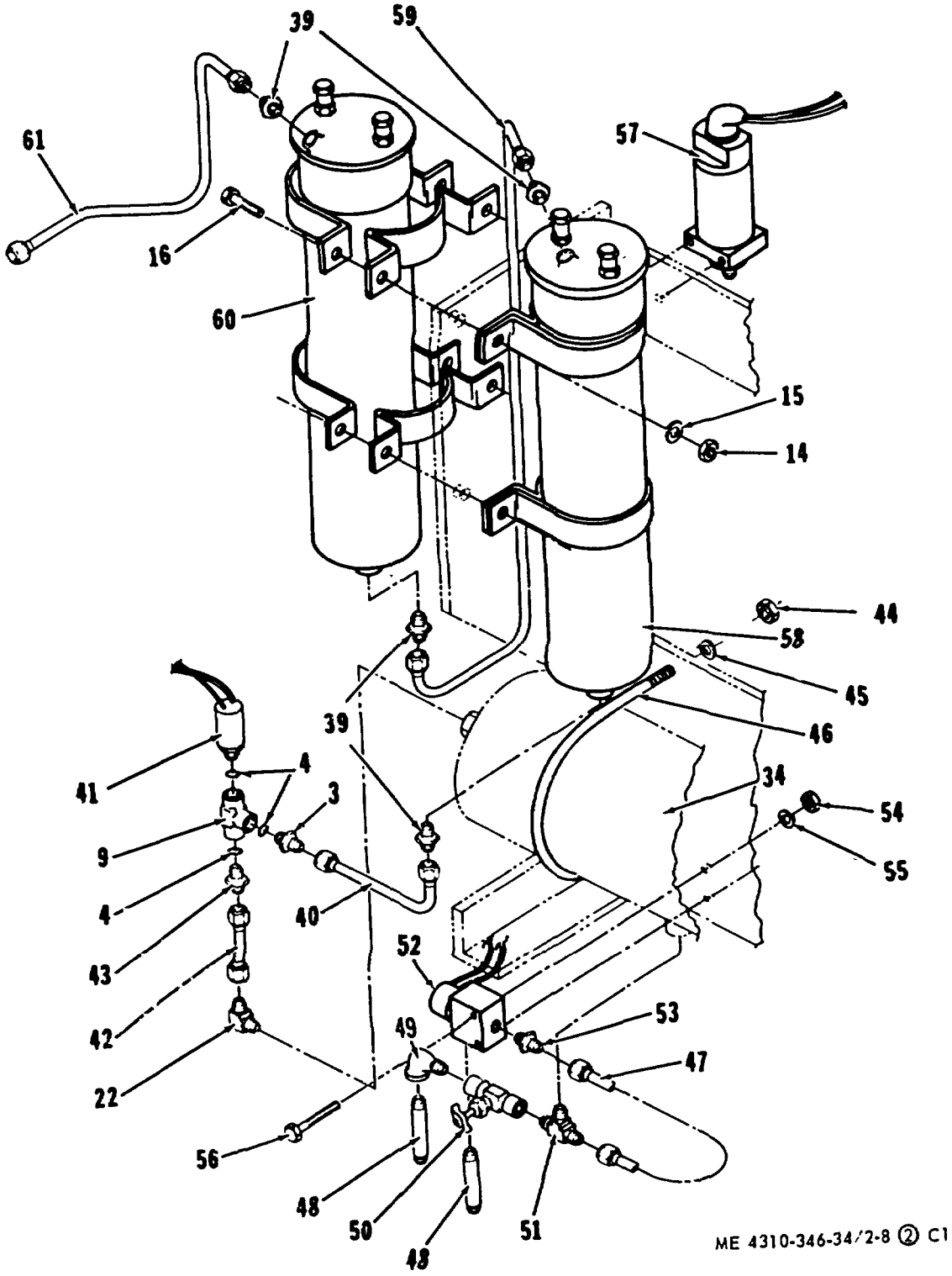


Figure 2-8. Unloading System-Dehydrator, air reservoir, moisture separator, lines and fittings. (Sheet 2 of 2)

2-18. Air Discharge Lines and Fittings

Removal, cleaning, installation and replacement. Refer to Chapter 7, fig. 7-1.

2-19. Accessory Components

WARNING

Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Keep open flame and excessive heat away from solvent. Flash point of solvent is 100°-138°F. (Fed. Spec. PD-680).

a. Removal.

(1) These components are in assembled order ready for use, located in the accessory group compartment which is part of the fuel tank and tool box assembly (4, fig. 1-2). The plunger is shipped loose with the unit.

(2) To remove the components of the accessory hose assembly (10, fig. 1-3), remove the quick disconnect half coupling, (11), nipple (12), hose assembly (13), union (14), preformed packing (15), shut-off valve (16), preformed packing (15), union (14). tube assembly (17) and air chuck (18) in this sequence.

b. Cleaning and Inspection. Inspect components for broken hose (13), malfunctioning air chuck (18) or plunger, damaged needle valve (16) and other parts that have been damaged. Clean all parts with a damp cloth or a suitable dry cleaning solvent. Fed. Spec. P-D-680 and dry thoroughly.

c. Assembly and Installation.

(1) Assemble the unit in reverse order of removal and disassembly. Apply a commercial pipe seal teflon tape to pneumatic pipe threads prior to assembly.

(2) Attach the assembly to the pressure outlet on the control panel, and purge the hose assembly to see that the components function properly and check for leaks.

(3) Install the unit in the accessory group compartment.

2-20. Chassis and Wheel Assembly (fig. 2-9. sheets 1 and 2)

a. Removal

(1) The removal of components of the chassis and wheel assembly consisting of the wheels, front hub and spindle, rear drum and hub, brakes, drawbar, front axle components, rear axle and pintle is broken down as one major assembly.

(2) To remove each of the wheel assemblies (1, fig. 2-9, sheets 1 and 2), remove five nuts (2), five lockwashers (3) securing each front wheel to the hub assembly and each rear wheel to the hub and drum assembly. To disassemble the wheel assembly (1), divide the two rims (4) by removing eight nuts (5), eight washers (6) and eight bolts (7). This facilitates removal of valve core (15), tube (8) from within the tire (9) for repair. For repair of tires and tubes, refer to Chapter 12, Section II.

(3) To remove each front hub assembly (10), and each hub and drum assembly (48, fig. 2-13 sheet 2), remove the dust caps (11, fig. 2-9, sheet 1 and 2), cotter pin (12), nut (13) and lockwasher (14) from the spindles. To disassemble each hub assembly (10, fig. 2-9 sheet 1) and each hub and drum assembly (48, fig. 2-9, sheet 2), remove outer bearing cone (16, fig. 2-9, sheet 1 & 2), outer bearing cup (18), inner bearing cone (18), inner bearing cup (19), grease seal (20), hub (21, fig. 2-9, sheet 1), and hub and drum (19, fig. 2-9, sheet 2).

(4) To remove the drawbar (22, fig. 2-9, sheet 1), remove 2 chains (23) with the bracket secured to the drawbar with nut (24), lockwasher (25) and bolt (26). Remove the cotter pin (27), king pin (28) securing the drawbar (22) to the steering arm.

(5) To remove and disassemble the front axle assembly (29), remove the 2 lubrication fittings (30), 8 lubrication fittings (31), 2 roll pins (32) and remove king pins (33) and spindle (34). Remove 4 cotter pins (35), 4 pins (36), securing the 2 tie rods (37). Remove jam nuts (38) and 2 yokes (39) from each tie rod (37). Remove cotter pin (27) 1, pin (40), washer (41) securing the steering arm (42) to the front axle (43). To remove the front axle (43), remove 4 nuts (44), 4 lockwashers (45) and 4 bolts (46) securing the axle to the frame. Remove axle (43).

(6) To remove and disassemble the hand brake and components, remove 2 cotter pins (27, fig. 2-9, sheet 2) from 2 yoke pins (50) securing the tie rod (51) to the hand brake (47, fig. 2-9, sheet 1) and cross shaft (52, fig. 2-9, sheet 2). Remove 2 nuts (47A, fig. 2-9, sheet 1), lockwashers (47B) and bolts (47C) securing hand brake (47) to the frame. Remove 4 cotter pins (27, fig. 2-9, sheet 2), 4 yoke pins (50) securing the tie rods (53) to the cross shaft (52) and brake cam lever (54). Remove 3 pins (55) securing 3 levers (56) to the cross shaft (52). Remove 2 end levers (56), 4 nuts (57), four lockwashers (58), 4 bolts (59), 2 hangers (60) and the center lever (56) from the cross shaft and remove cross shaft (52). Remove 2 jam nuts (61) and 2 yokes (62) from each tie rod (53 and 51).

(7) Remove nut (63), lockwasher (64) and bolt (65) securing cam lever (54) to the brake assembly (66), remove 4 nuts (67), 4 lockwashers (68) and 4 bolts (69) securing the brake assembly (66) and dust shield (70) to rear axle (71). Remove the brake assembly (66) and dust shield (70).

(8) Remove 4 nuts (44), 4 lockwashers (45) and 4 bolts (46) securing the rear axle (71) to the frame. Remove the rear axle. Remove 4 nuts (72), 4 lockwashers (73) and 4 bolts (74) securing the pintle (75) to the frame. Remove 4 nuts (76), lockwashers (77), and bolts (78), securing the cover assembly support channel (79) to the frame (80). To remove reservoir bracket (81), remove four nuts (82), four washers (83) and four screws (84). To remove battery box assembly (85), remove four nuts (86), four washers (87), battery box assembly (85), four grommets (88) and 2 grommets (89).

b. Cleaning, Inspection, Servicing and Adjustment.

(1) Inspect all components for damage that may cause malfunction of the air compressor maneuverability.

(2) Clean all parts from any foreign matter, excess grease, oil, dust and dirt with an approved dry cleaning solvent, Fed Spec. P-D-680.

(3) Service the front and rear axle assembly and components in accordance with LO 5-4310-346-12 lubrication order for the compressor.

(4) Make sure the tires serviced have 45 pounds of air and also that the bearings have been lubricated with the proper grease.

(5) Make sure that all components are free from foreign matter. If the components are damaged beyond repair replace them.

(6) Adjustment of the hand brake is accomplished by tightening or loosening the linkage to the brake. Turn the knurled end of the lever on the hand brake (44, fig. 2-9, sheet 1) either clockwise for tightening the linkage or counterclockwise to loosen the linkage. This operation adjusts the camshaft in the brake assembly (61).

c. Assembly and Installation.

(1) Assemble all parts sub-assemblies and assemblies, and install in the reverse of removal and disassembly.

WARNING

Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Keep open flame and excessive heat away from solvent. Flash point of solvent is 100°-138°F. (Fed. Spec. PD-680).

Key to Fig. 2-9

1. Wheel assembly
2. Nut
3. Lockwasher
4. Rim
5. Nut
6. Lockwasher
7. Bolt
8. Tube
9. Tire
10. Front hub assembly
11. Dust cap
12. Cotter pin
13. Nut
14. Lockwasher
15. Valve core
16. Outer bearing cone
17. Outer bearing cup
18. Inner bearing cone
19. Inner bearing cup
20. Grease seal
21. Hub
22. Drawbar
23. Chain
24. Nut
25. Lockwasher
26. Bolt
27. Cotter pin
28. King pin
29. Front axle assembly
30. Lubrication fitting
31. Lubrication fitting
32. Roll pin
33. King pin
34. Spindle
35. Cotter pin
36. Pin
37. Tie rod
38. Jam nut
39. Yoke
40. Pin
41. Washer
42. Steering arm
43. Front axle
44. Nut
45. Lockwasher
46. Bolt
47. Handbrake
47A. Nut
47B. Washer
47C. Bolt
48. Hub & drum assembly
49. Hub & drum
50. Yoke pin
51. Tie rod
52. Cross shaft
53. Tie rod
54. Cam lever
55. Pin
56. Lever
57. Nut
58. Lock washer
59. Bolt
60. Hanger
61. Jam nut
62. Yoke
63. Nut
64. Washer
65. Bolt
66. Brake assembly
67. Nut
68. Lockwasher
69. Bolt
70. Dust shield
71. Rear axle
72. Nut
73. Lockwasher
74. Bolt
75. Pintle
76. Nut
77. Lockwasher
78. Bolt
79. Support channel
80. Frame
81. Reservoir bracket
82. Nut
83. Washer
84. Screw
85. Battery box assembly
86. Nut
87. Washer
88. Grommet
89. Grommet

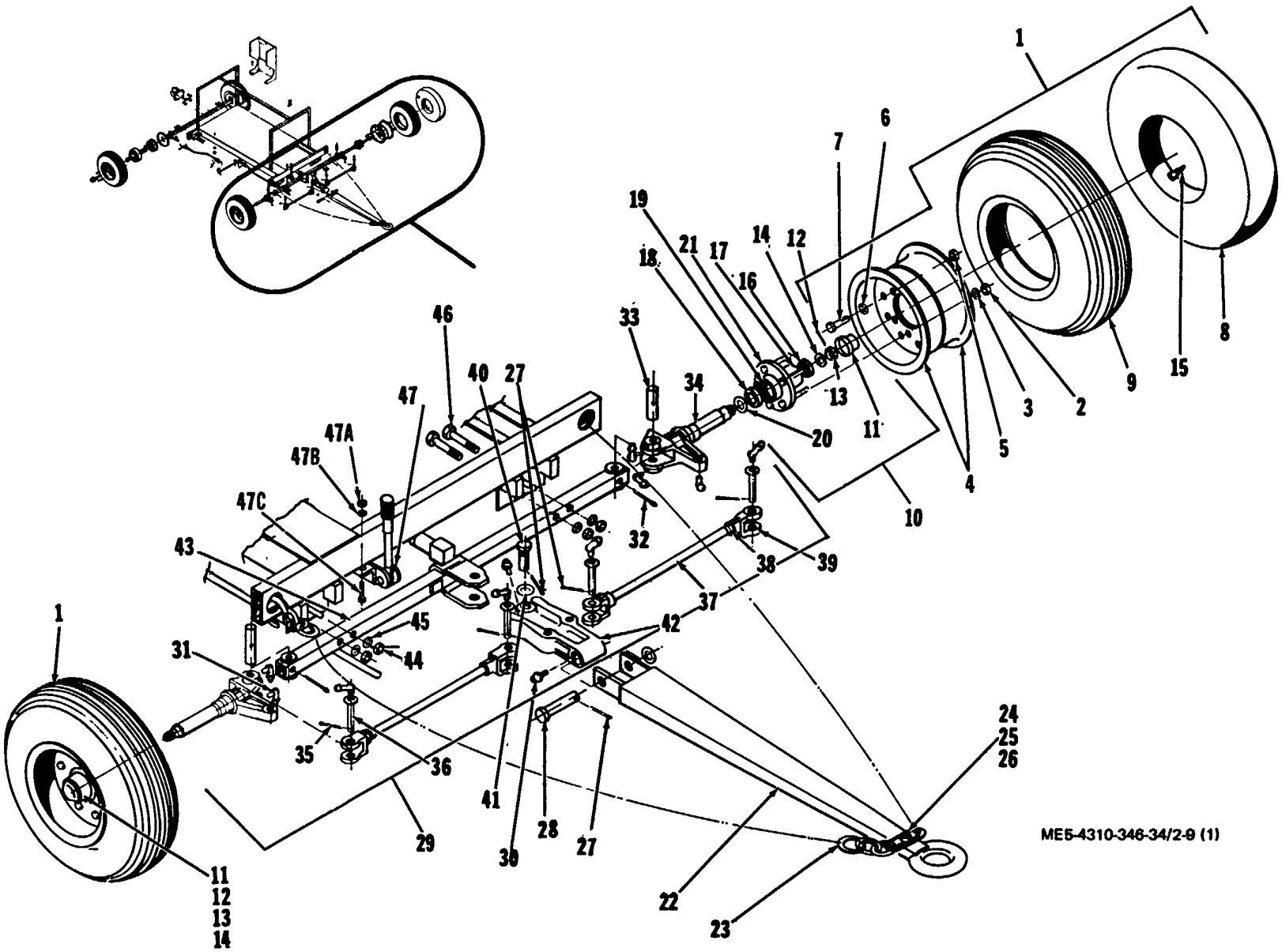


Figure 2-9. Chassis and Wheel Assy. (Sheet 1 of 2)

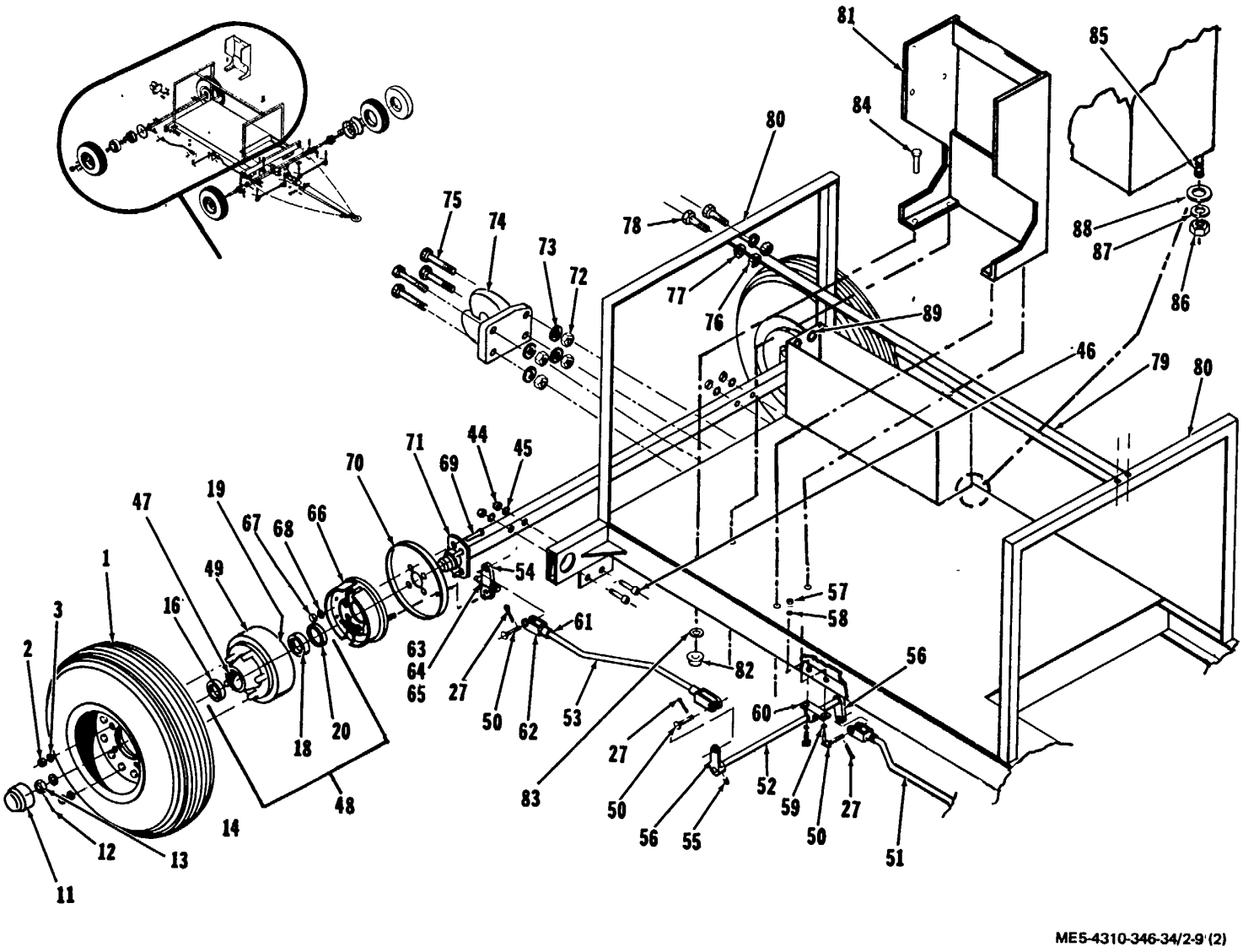


Figure 2-9. Chassis and Wheel Assy. (Sheet 2 of 2)

CHAPTER 3

REPAIR OF COVER ASSEMBLY, DOORS, PANELS AND LATCHES

Section I. COVER ASSEMBLY, REAR DOOR, PANELS AND LATCHES

3-1. General

a. Cover Assembly.

The cover assembly is of sheet metal construction consisting of six hinged panels that can be folded up for access to components.

The lower panel on each side of the cover has three locks and catches to secure the cover. The top hinge is secured to the frame with holddown clamps which facilitates removal of the cover.

b. Rain Shields (rear).

The rain shields are of sheet metal construction which prevent rain from entering at the cover assembly and panel jams.

c. Rear Doors and Panels.

(1) The control panel door is a hinged dropdown panel made of sheet metal retained by two chains in the open position, in order to be used for a counter area. It has a handle and catch for securing the door in the closed position to protect the controls on the control panel.

(2) The lower back panel door is a sheet metal constructed unit to weather-protect the heater assembly and to give air passage to the compressor for cooling when in the open position. It has a clamp type latch.

(3) The rear panels are weather protectors and also used for retaining the lower panel door of sheet metal construction.

3-2. Cover Assembly, Rear Doors, Panels and Latches (fig. 3-1)

WARNING

Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Keep open flame and excessive heat away from solvent. Flash point of solvent is 100°-138°F. (Fed. Spec. PD-680).

a. Removal.

(1) Remove four screws (1), four lockwashers (2), and two holddowns (3). Remove the cover assembly (4) from the chassis.

(2) Remove rain shields (7,8, and 9) from the rear frame by removing 24 screws (10) and 24 lockwashers (11) and also remove four nuts (5), four washers (12), and two bolts (13) from the top of the cover assembly.

(3) Remove the back panel (14) by removing 25 screws (10) and 25 lockwashers (11).

(4) Remove the back panel door (15) by compressing the latch and sliding the door sideways and out. Remove the latch (16) and latch guide (17) by removing two screws (18), two nuts (19) and two lockwashers (11) from the door (15).

(5) Remove the control panel door (20) by removing two screws (10) which retain the chains to the frame and eight screws (21), eight nuts (5) and eight lockwashers (6). This will also free gasket (22) and the bottom portion of the control panel (23).

(6) Remove the handle (24) and catch (51) by removing nut (5) and lockwasher (6) from the control panel door (20).

(7) Remove three screws (10) and three lockwashers (11) in order to remove two gaskets (26), gasket (27) and control panel (23).

(8) Remove the handles (28, 29, 24, 30) and catches (31, 32, and 25) by removing six nuts (5) and six lockwashers (6) from the left-hand lower panel and right-hand lower panel of the cover assembly (4).

(9) When removal of the control panel (23) with controls attached is required, tag and disconnect cable and wire leads to facilitate replacement. Refer to figure 2-1 electrical schematic and figure 2-6 for electrical components removal. Disconnect all tubing from the components on the control panel and refer to figure 2-2 pneumatic schematic and figure 7-1 for removal.

b. Cleaning, Inspection and Repair.

(1) Clean all parts with a damp cloth or suitable dry cleaning solvent, Fed. Spec. P-D-680 and dry thoroughly.

(2) Inspect all parts for dents, breaks, corrosion, loose or missing parts.

(3) If corrosion is present, sand paper the surface that is marred and retouch with primer and matching paint.

(4) Repair any damaged assemblies by replacing damaged parts, or if repair is possible use the most convenient method.

c. Assembly and Installation.

(1) Assembly and installation is the reverse procedure of removal and disassembly procedures.

(2) Refer to figure 3-1 and install assemblies and parts.

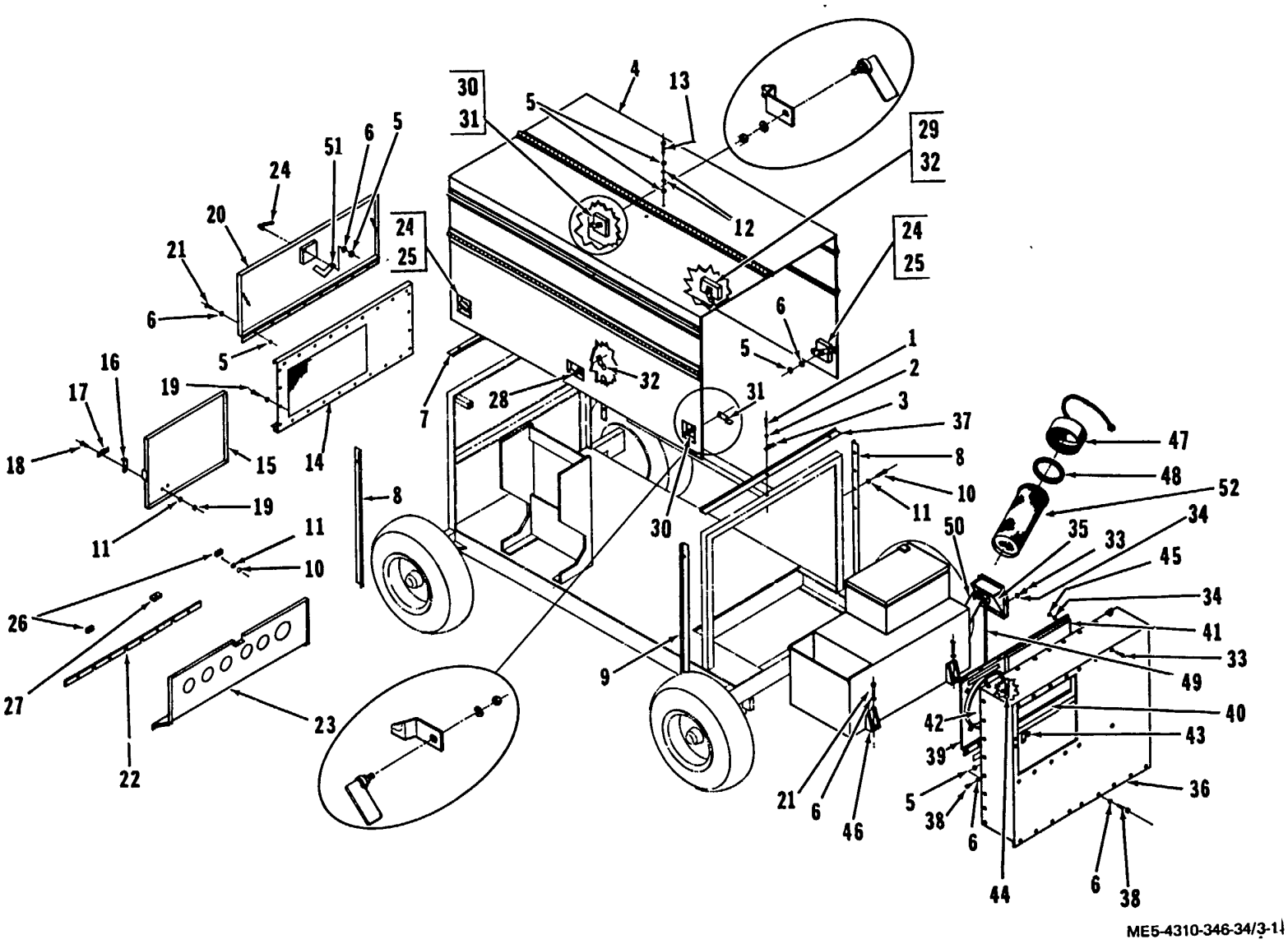


Figure 3-1. Body, cover, panels and frame (exploded view).

Key to Fig. 3-1

1. Screw
2. Lockwasher
3. Holddown
4. Cover assembly
5. Nut
6. Screw
7. Rain shield
8. Rain shield
9. Rain shield
10. Screw
11. Lockwasher
12. Washer
13. Bolt
14. Back panel
15. Back panel door
16. Latch
17. Latch guide
18. Screw
19. Nut
20. Control panel door
21. Lockwasher
22. Gasket
23. Control panel
24. Handle
25. Catch
26. Gasket
27. Gasket
28. Handle
29. Handle
30. Handle
31. Catch
32. Catch
33. Screw
34. Lockwasher
35. Adapter
36. Front panel
37. Rain shield
38. Bolt
39. Air panel
40. Spacer
41. Air panel door
42. Air panel coupling
43. Latch
44. Lock
45. Nut
46. Fuel tank and tool box assembly
47. Gas cap
48. Grommet
49. Tube
50. Elbow
51. Catch
52. Strainer

Section II. FRONT DOOR, PANELS AND LATCHES

3-3. General

a. The front rain shields serve the same purpose as the rear. Refer to paragraph 3-1 *b*.

b. The door, air panel and front panel are of sheet metal construction and serve the purpose of weather protection. However, the door is a sliding door, left to right, with a pocket. The door is opened for air acceptance and also, if added heat is desired an outside duct heat source may be adapted to the air panel.

3-4. Front Door, Panels and Latches (fig. 3-1)

a. Removal and Disassembly.

(1) Remove six screws (33) and six lockwashers (34) to release adapter (35) from the front panel (36). Slide bracket down on gas tank filler tube.

(2) Remove front panel (36), rain shields (37, 8, and 9) by removing 22 nuts (5), 33 lockwashers (6) and 33 bolts (38). This will release gas cap chain.

(3) Remove air panel (39), two spacers (40), air panel door (41), air panel coupling (42), latch (43) and lock (44) by removing 24 screws (33), 24 lockwashers (34) and 24 nuts (45).

b. Cleaning, Inspection and Repair. Refer to paragraph 3-2 *b* for cleaning, inspection and repair.

c. Assembly and Installation.

(1) Assembly and installation is the reverse of removal and disassembly procedures.

(2) Refer to figure 3-1 and install assemblies and parts.

CHAPTER 4

REPAIR OF FUEL SYSTEM

Section I. LINES AND FITTINGS

4-1. General

The lines and fittings for the fuel system begin at the bottom of the fuel tank beneath the floor and are routed in two directions above the floor, one route to the engine and the other through the heater fuel components to the heater assembly. Lines and fittings are of metal, rubber and copper utilizing compression tube fittings. Make sure all components and fuel tank are free of gasoline before removal.

WARNING

When handling gasoline always provide a metal to metal contact between container and fuel tank. This will prevent or neutralize any static electricity being generated and prevent sparks. To minimize the fire hazard when servicing the fuel system; prevent spills, wipe spills that do occur and ventilate area before starting engine or operating electrical components.

4-2. Fuel Lines and Fittings (fig. 4-1)

WARNING

Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Keep open flame and excessive heat away from solvent. Flash point of solvent is 100°-138°F. (Fed. Spec. PD-680).

a. Removal.

(1) For removal of the fuel system (fig. 4-1), the first portion to be removed will be those components beneath the floor of the chassis assembly, followed by those parts above the floor.

(2) Remove the elbow (1), tube (2), sleeve (3), shutoff valve (4), tube (5) and tee (6) by loosening the compression tube nuts.

(3) Remove the tube (7), bulkhead union (8), tube (9), leading to the auxiliary tee (11). Remove auxiliary fuel filter (14) by removing pipe plug (10), tee (11), filter tube (12), connector (13), hose (15), connector (16), tube (17) (connector to engine carburetor) and remove grommet (18).

(4) Remove tube (19) (fuel tank to heater), two sleeves (3) and elbow (1).

(5) Remove three screws (21) and three nuts (22) which retain the plate and adapter assembly (20) to the chassis floor.

(6) Remove shutoff valve (23), connector (24), tube (25) shutoff valve to pump), two elbows (26), tube (27), pump to filter.

(7) Remove fuel pump and cable (31) from bracket by removing two screws (28) and two lockwashers (29) and one lockwasher (30) beneath the cable clamp. Tag and disconnect wire leads to facilitate installation.

(8) Remove tube (34) (filter to heater) and also remove two connectors (35) from the heater fuel filter.

(9) Remove fuel filter (38) from bracket by removing two bolts (36) and two spacers (37) which facilitates the removal of the ground wire attached to the heater cable.

b. Cleaning, Inspection and Repair.

(1) Clean the parts and components with a damp cloth or a suitable dry cleaning solvent Fed Spec P-D-680 and dry thoroughly.

(2) Inspect all components, lines and fittings for breaks, damaged threads, loose connections and missing parts.

(3) Repair and service the auxiliary fuel filter (14). Refer to TM 5-2805-259-14 engine technical manual. This filter is furnished with the government-furnished engine. The heater fuel filter (38) and fuel pump (31) are military standard design components and would be more economical to replace than repair. To clean and service the fuel filter and fuel pump unscrew the metal bowls and remove bowls. The filter element may be cleaned by washing in gasoline. When reassembling, be sure the gasket is in place between the bowl and filter body.

(4) Check all lines and fittings for proper passage of fuel and check for leaks.

(5) Repair lines and fittings in the most convenient manner possible, such as, chasing threads with die cutter and straightening tubes.

c. Installation

(1) Installation is the reverse of removal procedures except if new tubes are required new compression nuts (32) and sleeves (33) must be replaced.

(2) Refer to figure 4-1 and reassemble and install all parts and components.

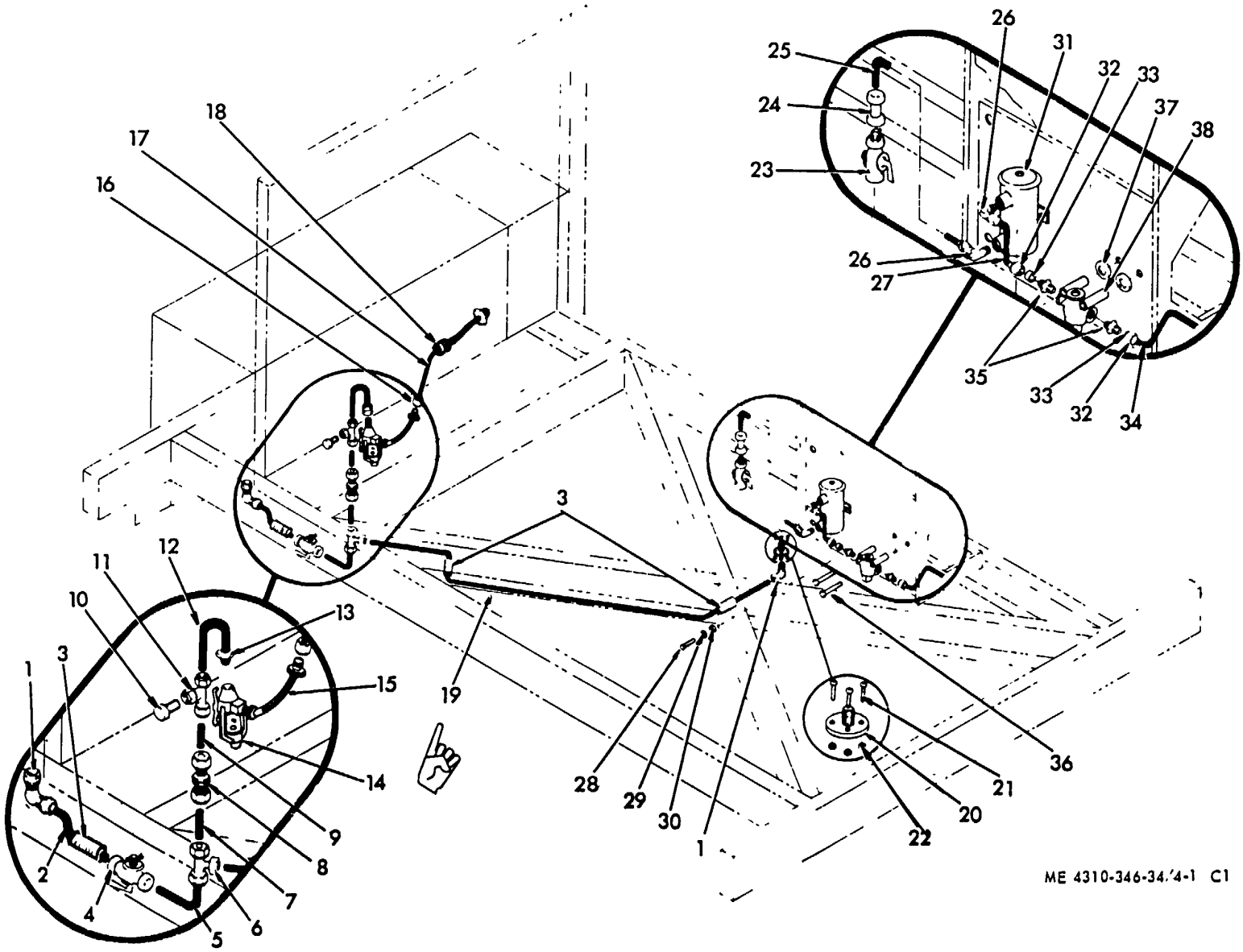


Figure 4-1. Fuel system.

Key to Fig. 4-1

1. Elbow
2. Tube
3. Sleeve
4. Shutoff valve
5. Tube
6. Tee
7. Tube
8. Bulkhead union
9. Tube
10. Pipe plug
11. Auxiliary tee
12. Filter tube
13. Connector
14. Auxiliary fuel filter
15. Hose
16. Connector
17. Tube
18. Grommet
19. Tube
20. Plate and adapter assembly
21. Screw
22. Nut
23. Shutoff valve
24. Connector
25. Tube
26. Elbow
27. Tube
28. Screw
29. Lockwasher
30. Lockwasher
31. Fuel pump
32. Nut
33. Sleeve
34. Tube
35. Connector
36. Bolt
37. Spacer
38. Filter

Section II. FUEL TANK AND TOOL BOX ASSEMBLY

4-3. General

The fuel tank and tool box assembly is of a one-piece sheet metal construction with a 20-gallon fuel capacity. It consists of a fuel tank with gas cap and chain, strainer, overflow tube and outlet port at the bottom of the tank. The top portion is the tool box with a hinged cover and lock, while the right side of the construction is an open accessory retaining container housing the accessory components. Make sure the fuel tank is free of gasoline prior to removal.

4-4. Fuel Tank and Tool Box Assembly (fig. 3-1)

WARNING

Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Keep open flame and excessive heat away from solvent. Flash point of solvent is 100°-138°F. (Fed. Spec. PD-680).

a. Removal. To remove the fuel tank and tool box assembly refer to (46, fig. 3-1) and make sure the front panel (36) has been removed. See paragraph 3-4*a* (12) for adapter removal from panel. Remove four screws (6) and four lockwashers (21) securing the gas tank to the floor. Remove gas cap (47), strainer (52), grommet (48), adapter (35), overflow tube (49), and elbow (50). Refer to figure 4-1 and disconnect tube (2) before removing tank.

b. Cleaning, Inspection and Repair.

(1) Inspect the fuel tank and tool box assembly for holes, breaks, damaged threads, missing and loose parts.

(2) Clean the internal portion of the gas tank with water and flush and drain at least two times to remove any sediment. Clean the rest of the fuel tank and tool box with a damp cloth or suitable dry cleaning solvent, Fed Spec P-D-680. Sand paper, prime and paint any blemished surface.

(3) Repair the fuel tank and tool box in the most convenient manner. If small holes are present, they can be repaired by welding but the tank should be filled with water prior to any heat being applied. Replacement of parts and fuel tank and tool box assembly should be accomplished if damage is beyond repair.

c. Installation.

(1) Installation is the reverse of removal.

(2) Refer to figure 3-1 and 4-1 and install parts and assemblies.

(3) Fill the fuel tank with gasoline after complete assembly of the fuel system and check for leaks. (Ref. Warning, para 4-1).

CHAPTER 5

REPAIR OF ENGINE

Section I. ENGINE ACCESSORIES

5-1. General

a. The engine accessories and mounts are items consisting of the mounting fasteners, the engine heating components and revisions of the engine governor controls by adding a governor control solenoid and linkage. Heat for cold weather starting is transferred through the heating tubes to the engine crankcase and cylinders. The clutch mounting plate and half of the clutch are accessories to mount the clutch in order to drive the compressor.

b. The governor control solenoid is actuated by the clutch switch located on the control panel and unloading pressure switch. The solenoid controls the engine idle speed at 2000 rpm with compressor idle and switch "off". With switch "on", the engine governed speed is 3600 rpm of the centrifugal force engages the clutch.

5-2. Engine Accessories

WARNING

Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Keep open flame and excessive heat away from solvent. Flash point of solvent is 100°-138°F. (Fed. Spec. PD-680).

a. Removal. Cleaning, Inspection and Installation. For removal, cleaning, inspection and installation of the accessories refer to paragraph 2-13 and figure 2-4.

b. Disassembly of Governor Control Solenoid (fig. 5-1). To disassemble the governor control solenoid (7) tag and disconnect lead wires and remove roll pin (11), washer (2), spring (3), nut (4) and lockwasher (5) securing the solenoid (7) to the bracket (6). To remove the solenoid plunger (8) hold the solenoid control rod (12) from turning and turn the plunger counterclockwise. Remove the two nuts (9), spring (10), solenoid control rod (12) and let the reworked governor control rod (11) hang loose until the components are replaced. Remove the two screws (13) and two lockwashers (14) securing the bracket (6) to the engine.

c. Cleaning, Inspection and Repair.

(1) Inspect the parts of the solenoid for malfunction, damaged threads, broken parts and other damage.

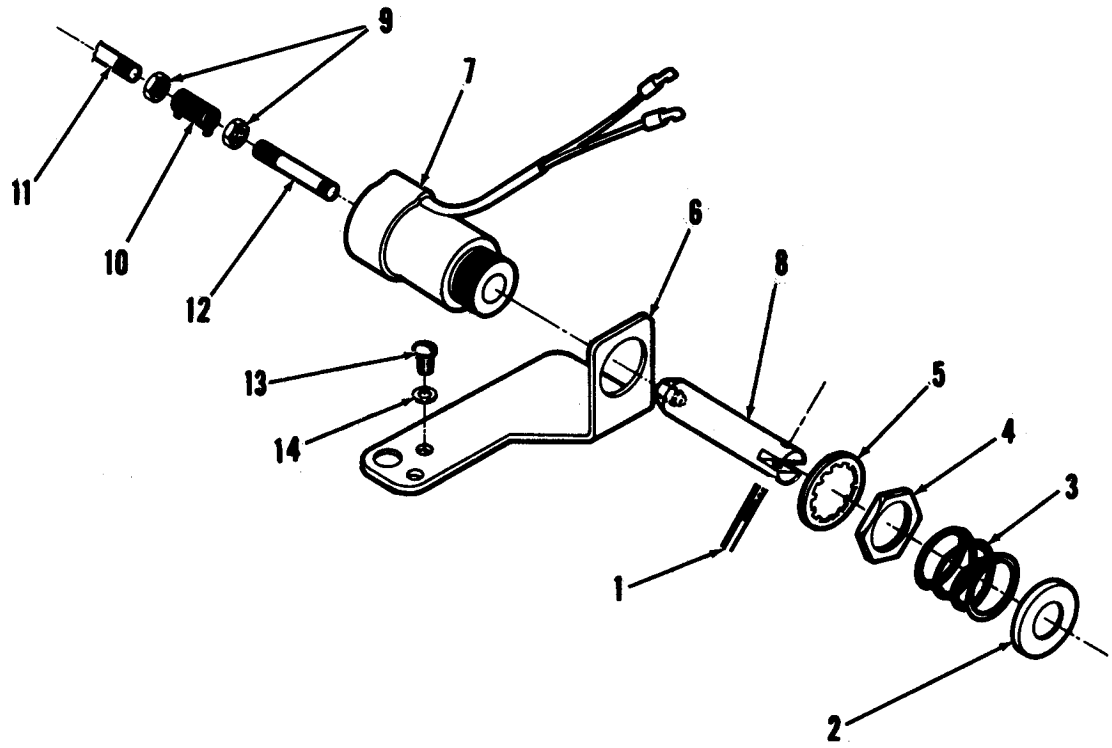
(2) Clean all parts with a damp cloth or a suitable dry cleaning solvent, Fed. Spec. P-D-680 and dry thoroughly.

(3) Repair or replace the parts as necessary. Chase any threads with a standard tap or die.

d. Installation and Adjustment.

(1) Refer to figure 5-1 and assemble the governor control solenoid, then install in reverse order of removal (fig. 2-4).

(2) If the rated speed with the compressor loaded is too high or too low adjust the governor in order to reach the desired speed. This can be accomplished by adjusting the governor in accordance with TM 5-2805-259-14.



1. Roll pin
2. Washer
3. Spring
4. Nut
5. Lockwasher
6. Bracket
7. Solenoid
8. Plunger
9. Nut
10. Torsion spring
11. Governor control rod
12. Solenoid control rod.
13. Screw
14. Lockwasher

Figure 5-1. Engine governor controls (exploded).

Section II. ENGINE

5-3. General

The engine is a government-furnished engine with accessories used to drive the compressor. The idle speed of the engine is 2000 rpm but the governor control solenoid changes the speed to 3500 rpm to engage the compressor.

5-4 Engine Removal, Cleaning, Inspection, Repair and Installation

a. removal of the engine refer to paragraph 2-13 and figure 2-4.

b. Refer to TM 5-2805-259-14 technical manual for engine repair and servicing.

CHAPTER 6

REPAIR OF CLUTCH

Section I. CLUTCH

6-1. General

The clutch is a centrifugal type unit which serves as a connecting drive for the compressor to operate at a speed of 3500 rpm.
The clutch is a steel constructed unit and for the purpose of this compressor is divided into two halves; one adapted to the compressor, the other adapted to the engine. When the compressor is fastened to the engine by means of an adapter and clutch plate the clutch works as a unit.

6-2. Clutch (fig. 6-1)

WARNING

Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Keep open flame and excessive heat away from solvent. Flash point of solvent is 100°-138°F. (Fed. Spec. PD-680).

a. Removal.

(1) To remove the compressor half of the clutch (1), remove three screws (4) and three lockwashers (5) securing the clutch housing (6) to the hub (7) to facilitate removal of the adapter from the compressor, (2-12*a* (5), fig. 2-3). Remove the set screw (2), clamp screw (3) securing the hub (7) to the compressor shaft.

(2) To remove the engine half of the clutch (17) from the clutch mounting plate, refer to paragraph 2-13*a* (4) and remove clutch. To disassemble engine half of clutch (17), remove eight nuts 48), eight bolts (9), eight links (10), eight spacers (11), eight bushings (12), 16 spring studs (13), eight springs (14) securing the four shoe subassemblies (15) to the hub (16).

b. Cleaning, Inspection and Repair.

(1) Inspect the parts for wear, damaged threads, pitted housing, worn shoes and any other damage.

(2) Clean all parts with a damp cloth or suitable dry cleaning solvent, Fed Spec P-D-680 and dry thoroughly.

(3) To repair the clutch, replace any worn parts with new parts. To overhaul, replace all screws, nuts, bushings and shoe subassemblies and any other parts which are damaged. The housing may be repaired by turning the inside of the housing on a lathe to remove a rough surface. The maximum amount of material to be removed is .125 inches. Replace housing if repair cannot be accomplished.

c. Assembly and Installation.

(1) Refer to figure 6-1 and assemble.

(2) Assembly and installation is the reverse of removal and disassembly.

(3) For installation of the clutch refer to para. 2-12 and 2-13, figure 2-3 and 2-4.

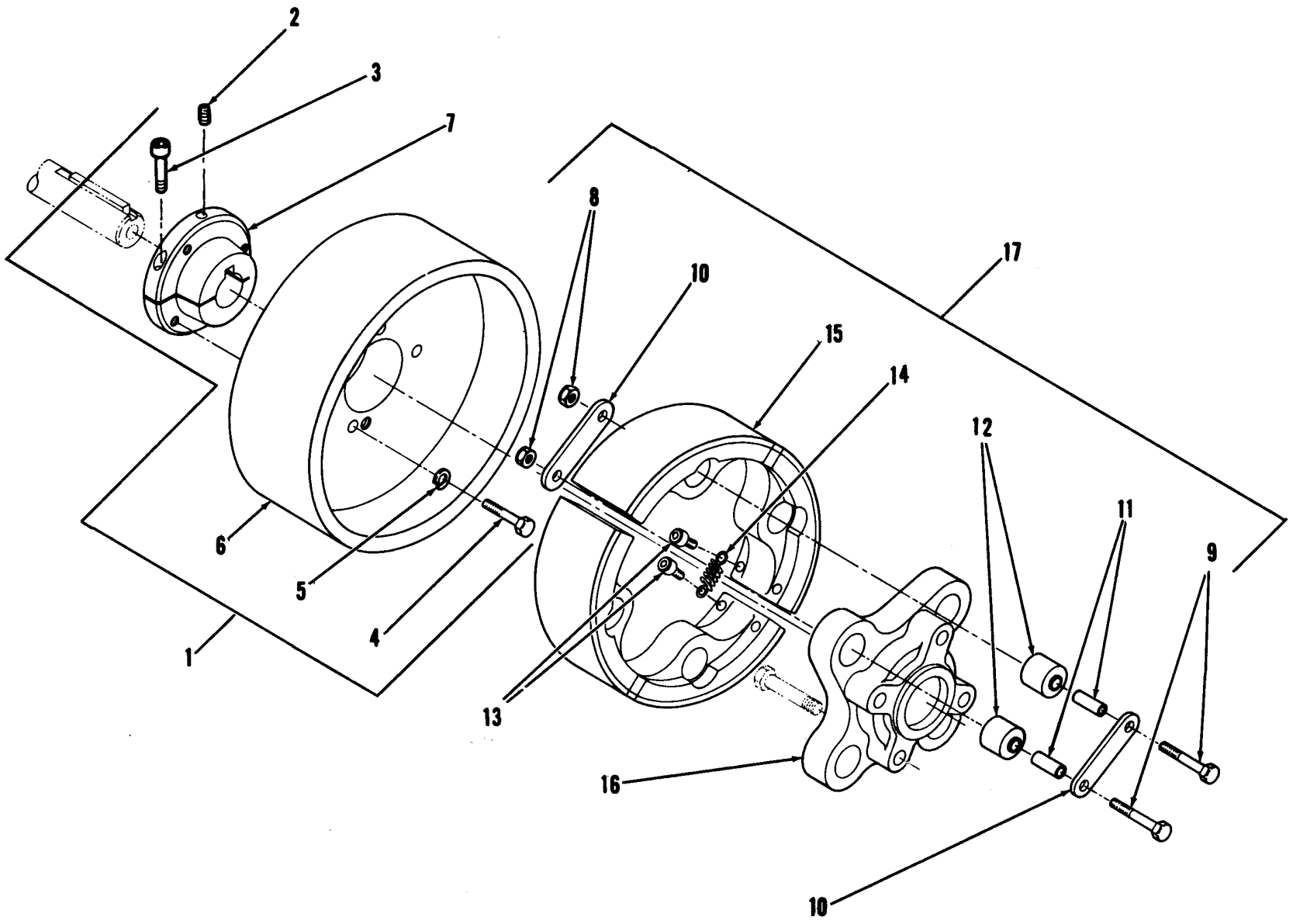


Figure 6-1. Clutch assembly.

ME 5-4310-346-34/6-1

Key to Fig. 6-1

1. Compressor half clutch
2. Set screw
3. Clamp screw
4. Screw
5. Lockwasher
6. Housing
7. Hub (Q.D.)
8. Nut
9. Bolt
10. Link
11. Spacer
12. Bushing
13. Spring stud
14. Spring
15. Shoe subassembly
16. Hub
17. Engine half clutch

CHAPTER 7

REPAIR OF GAUGE AND AIR DISCHARGE LINES AND FITTINGS

Section I. GAUGES, LINES, AND FITTINGS

7-1. General

The gauge lines and fittings are of metal construction connecting the gauges to components within the system. These lines work in conjunction with the air discharge lines and fittings explained in Section II of this chapter. Both the gauge and air discharge lines are located on the control panel either outside or inside and the removal of gauges will be explained in Section II of this chapter.

7-2. Gauges, Lines and Fittings (fig. 7-1)

WARNING

Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Keep open flame and excessive heat away from solvent. Flash point of solvent is 100°-138°F. (Fed. Spec. PD-680).

a. Removal. Refer to TM 5-4310-346-12 and remove the gauges, lines and fittings.

b. Cleaning, Inspection and Repair.

(1) Maintain the air pressure gauges in a readable condition. Clean the glasses with a cloth dampened with dry cleaning solvent, Fed. Spec PD-680. If pressure readings are incorrect, check the pneumatic lines for leakage. If this does not correct the reading, check the gauge that is known to be good. Replace damaged gauges.

(2) Inspect all parts for damaged threads, broken or badly bent tubes, broken glass on gauges and damaged gauges.

(3) Do not attempt to reclaim damaged connecting tubes or other high pressure pneumatic fittings by repairing or replacing component parts. Replace damaged or defective tube assemblies and fittings.

c. Installation. Install all parts and components in reverse order of removal except when tube (17) is replaced the compressor nut (47) and sleeve (39) must be replaced. Refer to figure 7-1.

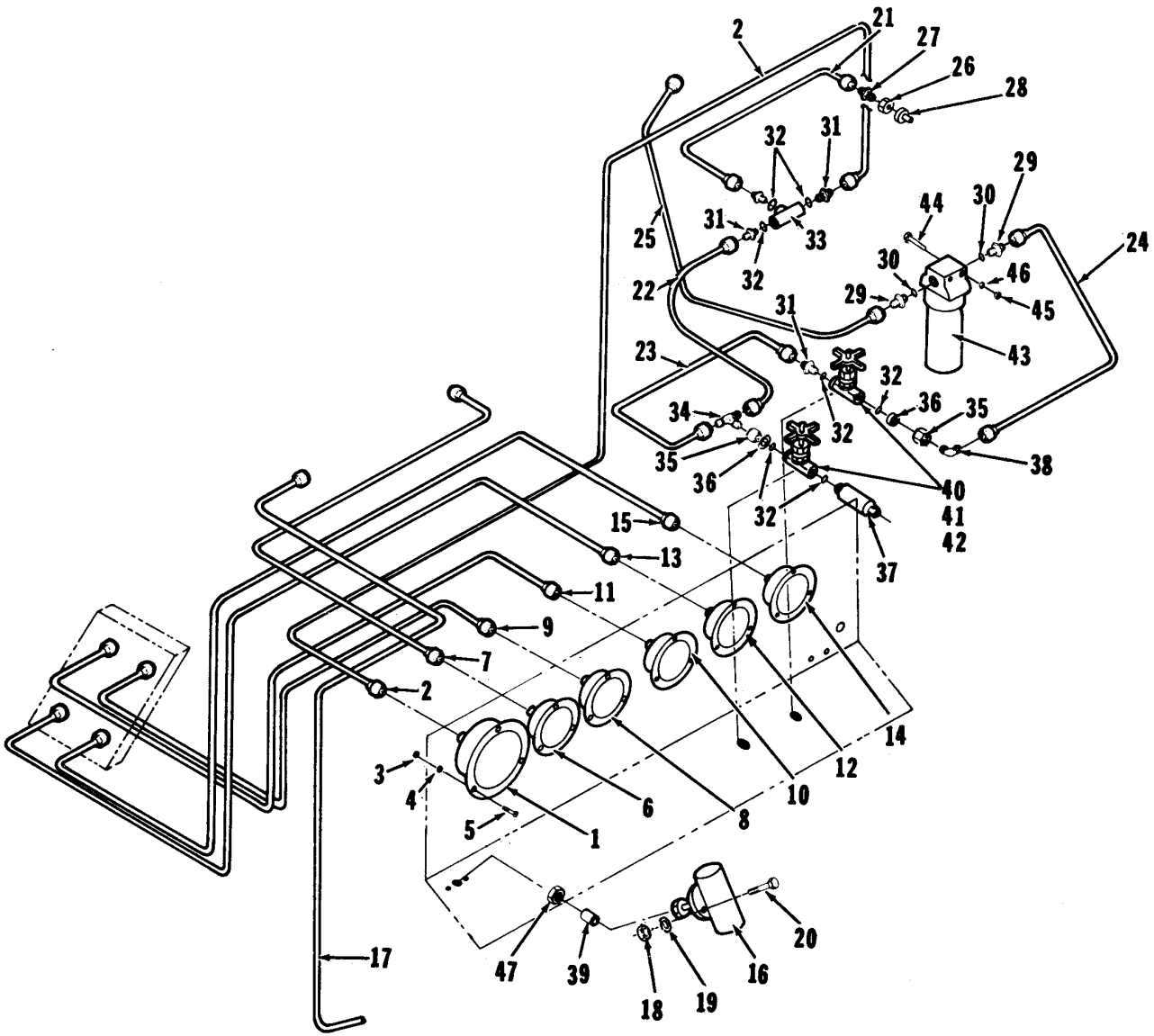


Figure 7-1. Pressure gauges, high pressure air filter, regulating valve, lines and fittings.

Key to Fig. 7-1

1. System air pressure gauge
2. Tube
3. Nut
4. Lockwasher
5. Screw
6. Reservoir pressure gauge
7. Tube
8. Aftercooler pressure gauge
9. Tube
10. First stage pressure gauge
11. Tube
12. Second stage pressure gauge
13. Tube
14. Third stage pressure gauge
15. Tube
16. Air filter indicator
17. Tube
18. Nut
19. Lockwasher
20. Screw
21. Tube
22. Tube
23. Tube
24. Tube
25. Tube
26. Nut
27. Union
28. Quick disconnect half coupling
29. Reducer
30. Preformed packing
31. Union
32. Packing
33. Tee
34. Tee
35. Nut
36. Back-up ring
37. Check valve
38. Elbow
39. Sleeve
40. Regulating valve
41. Nut
42. Washer
43. Air filter
44. Screw
45. Nut
46. Lockwasher
47. Nut

Section II. AIR DISCHARGE COMPONENTS LINES AND FITTINGS

7-3. General

The air discharge components lines and fitting located on the control panel and the back of the control panel are of metal construction and is the termination of the air to be discharged. The air discharge is controlled by two regulating valves on the control panel.

7-4. Air Discharge Components, Lines and Fittings (fig. 7-1)

WARNING

Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Keep open flame and excessive heat away from solvent. Flash point of solvent is 100°-138°F. (Fed. Spec. PD-680).

a. Removal

Warning

Be sure the system has been relieved of all pressures prior to the removal of the discharge system.

(1) To remove the components of the air discharge system, detach tube (2) (manifold to discharge tee), tube (25) (dehydrator to filter), and remove tubes (21, 22, 23 and 24). Remove union (27), nut (26) securing the quick disconnect half coupling (28) to the control panel.

(2) Remove 3 unions (31) and packing (32) from the tee (33) and remove the tee (33). Remove reducers (29) and 2 preformed packings (30) from the air filter (43).

(3) Remove the tee (34), nut (35), back-up ring (36) 2 packings (32) and check valve (37) from the one regulating valve (40).

(4) Remove union (31), elbow (38), nut (35), back-up ring (36) and 2 packings (32), from the other regulating valve (40).

(5) To remove the 2 regulating valves (40), remove the handle nut, handle and stem nut from the valve, remove the nut (41), lockwasher (42) securing the valve to the control panel. Remove the valve (40) and washer (42) from the rear of the panel.

(6) To remove high pressure air filter (43), remove the 2 nuts (45), 2 lockwashers (46) and 2 screws (44) securing the air filter to the rear of the panel.

b. Cleaning Inspection and Repair.

(1) Inspect all parts for damaged threads, broken or badly bent tubes, damaged shutoff valves and check valve.

(2) Clean all parts with a damp cloth or a suitable dry cleaning solvent, Fed Spec P-D-680 and dry thoroughly.

(3) Refer to paragraph TM 5-4310-346-12 for servicing of the high pressure filter.

c. Installation. To install all parts and assemblies refer to figure 7-1 and install in reverse of removal procedures.

NOTE

Apply a commercial pipe seal teflon tape to any pneumatic pipe threads prior to installation.

CHAPTER 8

REPAIR OF COMPRESSOR, COMPONENTS AND ACCESSORIES

Section I. BASIC COMPRESSOR

8-1. General. The compressor, consists of a compressor assembly (fig. 8-1) containing a first, second, third and a fourth stage Piston assembly and cylinders, which build up pressure consecutively on a ratio basis until the final required pressure is reached, an oil pump housing assembly which consists of an oil metering system in itself and an oil filter element assembly and a dipstick assembly. The air compression starts at the first stage, is transmitted to the second stage, which is transmitted to the third stage, then to the fourth stage and then to the moisture separator. The pressure increases, from one stage to the other.

8-2. Basic Compressor (fig. 8-1)

a. Removal and Disassembly.

(1) For removal of the compressor from the other components and assemblies refer to paragraph 2-12 and figure 2-3.

(2) To disassemble the compressor, the fan guard assembly (30) must be removed.

(3) To remove the fan guard assembly (30), refer to paragraph 2-19 for tubing and fitting removal from the manifold.

(4) Remove three screws (31, fig. 8-1) and three lockwashers (32) securing the fan guard assembly to the crankcase (5) and the fan guard bracket (35). Remove the fan nut (33), and washer (34). Disconnect the aftercooler tube (36, fig. 2-7) from the fourth stage outlet fitting (27, fig. 2-7) and the reducer on the moisture separator inlet tube (ref. fig. 2-8).

(5) Pull the fan guard (30, fig. 8-1), the fan (36) and the aftercooler away from the compressor.

(6) Refer to paragraph 2-17, figure 2-7 for removal of interstage tubing, however, the interstage tubings are fastened together and must be removed as a bundle.

(7) To remove the tube bundle remove screw (31, fig. 8-1), lockwasher (32) securing the bracket (68) to the crankcase, and remove clamp (66) from mounting plate (65) on the crankcase.

(8) Remove two nuts (69), four washers (70), two screws (71) four clamps (72) and cushion (67) from the tubes.

(9) Refer to paragraph 2-17 figure 2-7 and remove stage fittings.

(10) To continue the compressor disassembly (fig. 8-1) for repair or overhaul, the following steps apply:

(a) To remove the first stage head (1) cylinder (2) and piston assembly (3), remove tube (14, fig. 8-4), elbow (73, fig. 8-1), nut (74), backup ring (75), packing (47), four nuts (4) from the long studs in the crankcase (5). Turn the crankshaft until the first stage piston assembly (3) is at its outermost position in older to remove two retaining rings (6) and wrist pin (7) from connecting rod assembly. Remove the gaskets (8 and 9).

(b) To remove the second stage cylinder (10) and piston assembly (11), remove four flexloc nuts (12) from the studs in the crankcase (5). Turn the crankshaft until the second stage piston assembly reaches the outermost position in order to remove two retaining rings (13) and wrist pin (14) from connecting rod, and also remove a shim (15) and gasket (16) between the cylinder and crankcase.

(c) For the removal of the third stage cylinder (17) and piston assembly (18) from the crankcase (5), turn the crankshaft until the piston assembly reaches the outermost position. Remove four flexloc nuts (12) from the studs of the crankcase. Then remove the cotter pin (19) and the wrist pin (20). Remove gaskets (21) and shim (22).

(d) To remove the fourth stage cylinder (23) and piston assembly (24), rotate the crankshaft until the piston reaches the outermost position. Remove four flexloc nuts (121 from the crankcase studs. Then remove cotter pin (25) from the wrist pin (26) which retains the piston assembly (24) to the connecting rod. Remove three gaskets (21) and a shim (22) from between the cylinder (23) and crankcase (5).

(e) Refer to paragraph 8-4*a* (1) and (2) figure 8-3 and remove items 1 through 17 to facilitate removal of oil pump housing.

(f) Remove the oil pump housing (27, fig. 8-1) and gasket (28) by removing 12 flexloc nuts (12) from the studs on the crankcase (5). Refer to

paragraph 8-4 *a* (5) figure 8-4 and remove bolt (15) and washer (16). The oil metering pump assembly and oil element are all in the housing. To remove all the components in the oil pump housing assembly, refer to paragraph 8-4, figure 8-3 and 8-4.

(g) To remove the remaining parts of the basic compressor (fig. 8-1), remove woodruff key (49) and remove eight flexloc nuts (37) securing the oil seal housing (38), shaft seal (39), gasket (40), bearing lock nut (41), set screw (42), ball (43), bearing (44), end bell (45), and gasket (40).

(h) Remove shaft and plug assembly (46) with bearing (48), oil slinger (55) and key (56) front the rear of the crankcase. Remove counter balance (58). eccentric (59), four connecting rods (52) and two needle bearings (53) from first stage connecting rod (54) and one each needle bearing (51) from the three connecting rods (52) and counter balance (50). Remove keys (56 and 57), slinger (55), and bearing (48) from the shaft (46). Remove two unions (62) and finned tube (60), if damaged, by cutting the tube from within the crankcase (5). Remove two screws (63) and two lockwashers (64) securing the mounting plate (65) to the crankcase (5).

(i) To remove the manifold (3), (fig. 8-2), remove two screws (1) and two lockwashers (2) securing the manifold to the fan guard (4). Remove three screws (5) and three nuts (6) securing the three tube clamps (7) to the fan guard. Remove nut (8), screw (9) securing clamp (10) and block (11) to the fan guard. Remove aftercooler (12) from the fan guard and remove clamp (10) and three tube clamps (7) from the aftercooler tube. Remove roll pin (13) from block (11).

b. Cleaning. Inspection, Repair and Overhaul

(1) Clean all metallic parts in a soap solution or suitable dry cleaning solvent, Fed Spec P-D-680. Do not put piston assemblies in solvents. Air-dry all parts after cleaning.

(2) Inspect all threads for burrs and damage. Make sure all bearings and bearing surfaces are free of nicks and burrs. Inspect for broken, loose and missing parts. Inspect closely for any other visible damage.

(3) Repair any finned tubing by soldering any minor damage of fins. Straighten any bent fins if possible otherwise replace the part. If it is not possible to repair any part replace the item.

(4) Overhaul the basic compressor to a completely serviceable condition. Replace worn, damaged and missing parts. Refer to figure 8-1 and 8-2 for reassembly and to paragraph 8-6 and figure 8-5 through 8-8 for disassembly and reassembly of cylinder assemblies.

c. Assembly and Installation

(1) Assemble all parts in reverse order of disassembly, except when installing new tube (60, fig. 8-1), add new unions (62) and sleeves (61). When installing nut (41) to crankshaft, torque the nut to 350 in/lbs. Replace damaged and worn parts with new parts. Reference overhaul paragraph 8-2 *b* and paragraph 8-6 figure 8-5 through 8-8 for reassembly of cylinder assemblies. Apply a commercial pipe seal teflon tape to all oil and pneumatic pipe threads for sealing.

In order to install the piston assemblies and cylinders, the clearance from the top of the piston to the exhaust valve seats of the 2nd, 3rd and 4th stage cylinder assemblies must be held by the addition of, or removal of the necessary layers of laminated gaskets to accomplish the clearance. The first stage measurement is taken from the top of the piston to the valve assembly seat of the cylinder. The measurements are as follows:

Stage	*Clearance*	*Gasket per fig. 8-1*
1st	-.010 to-.018 in.	(8) and (9)
2nd	-.005 to-.010	(15) and (16)
3rd	-.005 to-.010	(21) and (22)
4th	-.005 to-.010	(21) and (22)

These measurements are made with a depth micrometer. To accomplish the above clearance, the piston must be in its uppermost position within a cylinder which is bolted in place. If a new cylinder, piston or both are replaced, a run-in for thirty minutes at unloaded conditions followed by 30 minutes of cooling should be accomplished prior to actual operation.

(2) Refer to paragraph 2-17 and figure 2-7 and install tubing and fittings in reverse order of removal.

(3) Refer to Chapter 8, Section II, figures 8-3 and 8-4 for installing oil metering housing assembly.

NOTE

Make sure all fastenings are secure so no leaks can occur and lockwire all previously lockwired parts.

WARNING

Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Keep open flame and excessive heat away from solvent. Flash point of solvent is 100°-138°F. (Fed. Spec. PD-680).

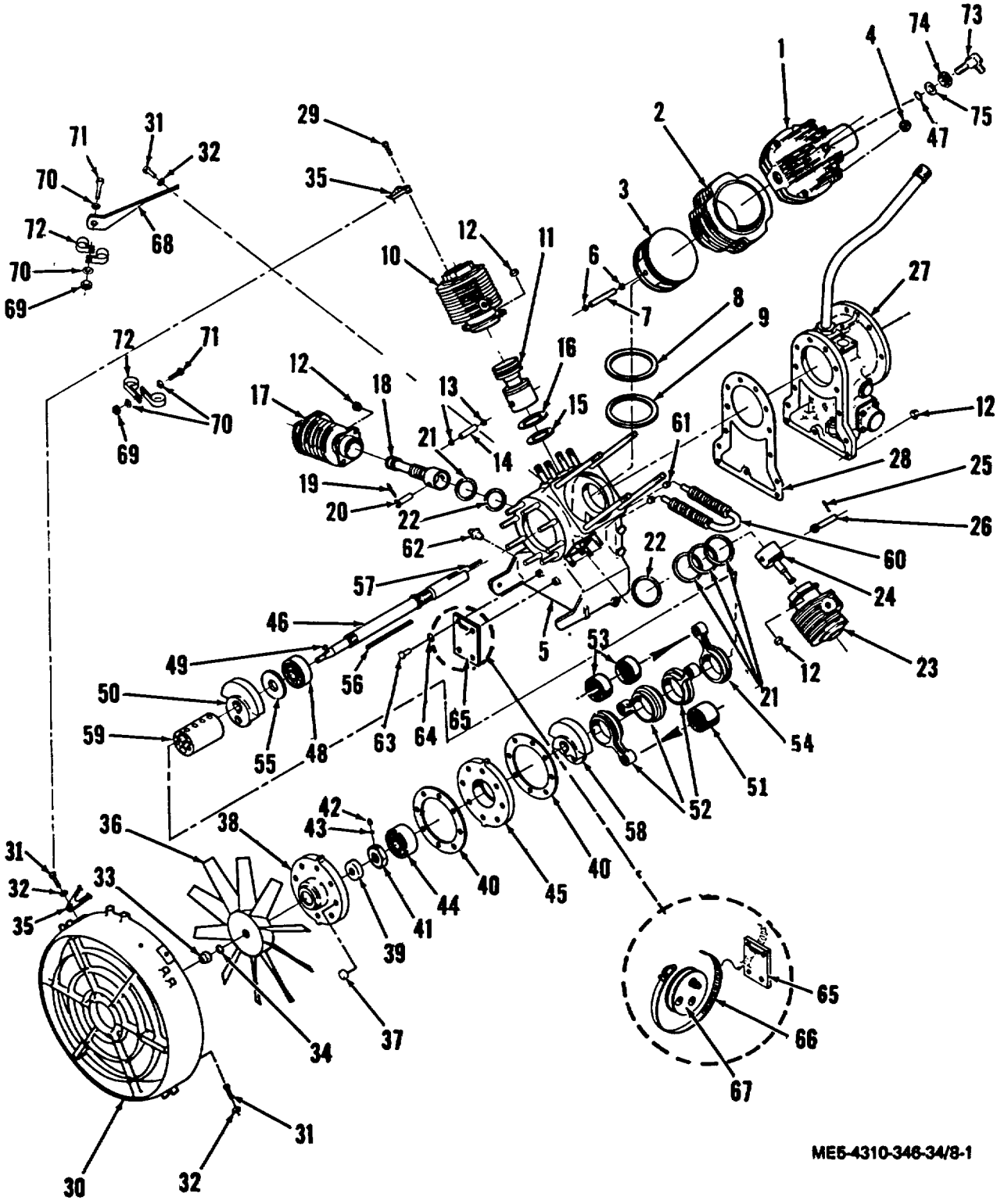
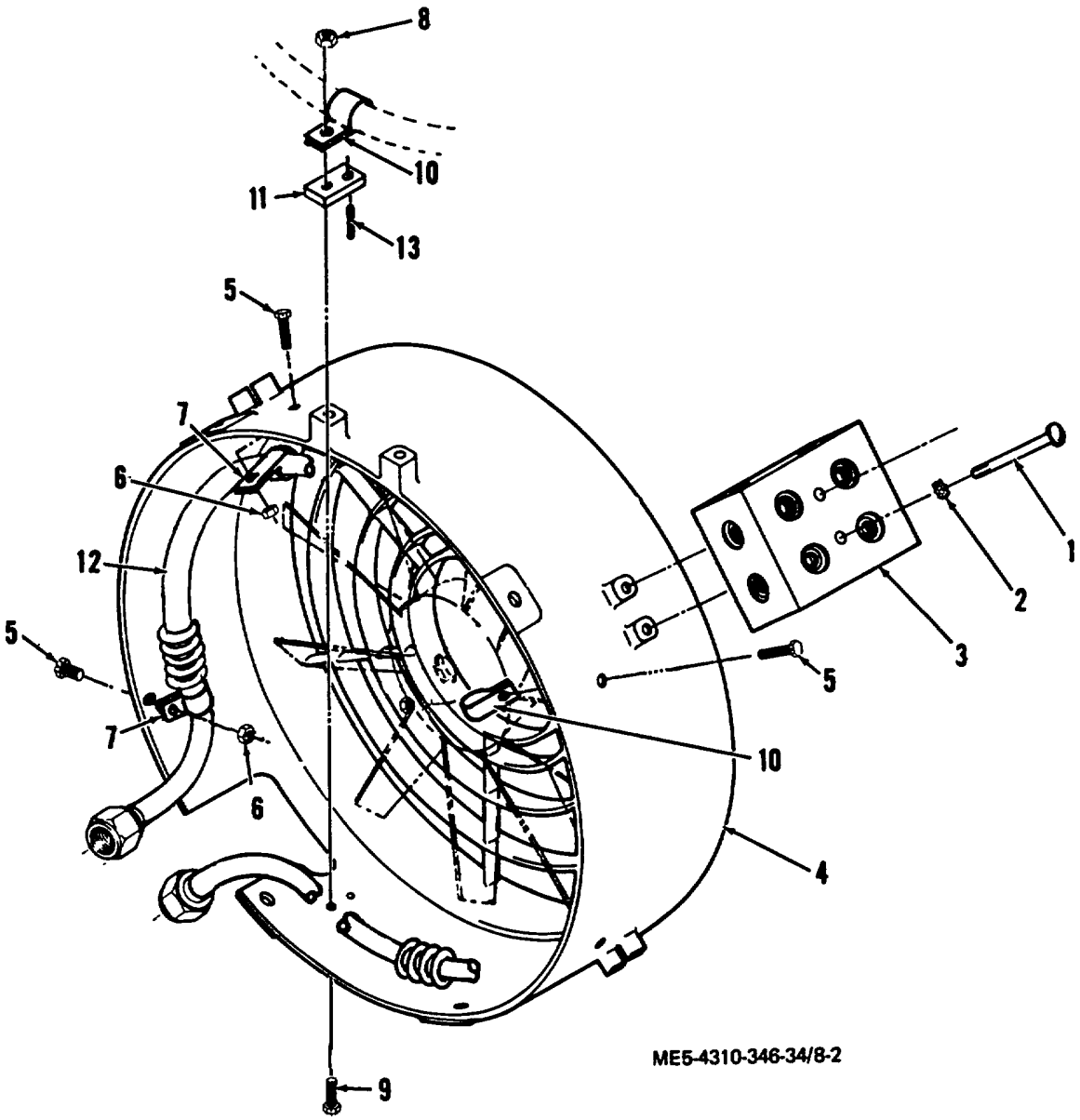


Figure 8-1. Compressor assembly (basic).

Key to Fig. 8-1.

1. First stage cylinder head
2. First stage cylinder
3. First stage piston assembly
4. Lock nut
5. Crankcase
6. Retaining ring
7. Wrist pin
8. Gasket
9. Gasket
10. 2nd Stage cylinder assembly
11. 2nd stage piston assembly
12. Lock nut
13. Retaining ring
14. Wrist pin
15. Shim
16. Gasket
17. 3rd stage cylinder assembly
18. 3rd stage piston assembly
19. Cotter pin
20. Wrist pin
21. Gasket
22. Shim
23. 4th stage cylinder assembly
24. 4th stage piston assembly
25. Cotter pin
26. Wrist pin
27. Oil pump housing assembly
28. Gasket
29. Screw
30. Fan guard assy.
31. Screw
32. Lockwasher
33. Nut
34. Washer
35. Fan guard bracket
36. Fan
37. Nut
38. Oil seal housing
39. Seal
40. Gasket
41. Bearing lock nut
42. Set screw
43. Ball
44. Bearing
45. Endbell
46. Shaft and plug assembly
47. Preformed packing
48. Bearing
49. Key
50. Counterbalance
51. Needle bearing
52. Connecting rod
53. Needle bearing
54. Connecting rod
55. Oil slinger
56. Key
57. Key
58. Counterbalance
59. Eccentric
60. Finned tube
61. Sleeve
62. Union
63. Screw
64. Lockwasher
65. Mounting plate
66. Clamp
67. Cushion
68. Bracket
69. Nut
70. Washer
71. Screw
72. Clamp
73. Elbow
74. Nut
75. Back-up Ring



1. Screw
2. Lockwasher
3. Manifold
4. Fan guard
5. Screw
6. Nut
7. Tube clamp
8. Nut
9. Screw
10. Clamp
11. Block
12. Aftercooler
13. Roll pin

Figure 8-2. Fan guard, manifold and bracket.

Section II. OIL PUMP HOUSING ASSEMBLY

8-3. General. The oil pump housing assembly is part of the compressor, containing the dipstick assembly and oil pump. The dipstick serves as a gauge to check the amount of oil in the compressor. The oil pump lubricates the moving parts of the compressor.

8-4. Oil pump housing assembly (fig. 8-3 and 8-4)

a. Removal and Disassembly

(1) Refer to paragraph 8-2, fig. 8-1 and remove the oil pump housing assembly.

(2) To disassemble the oil dipstick portion of the oil pump housing assembly, remove the dipstick assembly (1, fig. 8-3) from the dipstick housing (2), remove two preformed packings (31 from the dipstick assembly (1). Loosen nut (4) and remove from dipstick housing (2). Remove two lockwires (5 and 6), four screws 17), and two screws 18). Remove filter housing (9), gasket (10), two perforated plates (11), filter element 412), housing cover 113), preformed packing (14) and gasket (15). Remove nut (16) and gear (17) from the end of the metering shaft (51, fig. 8-4).

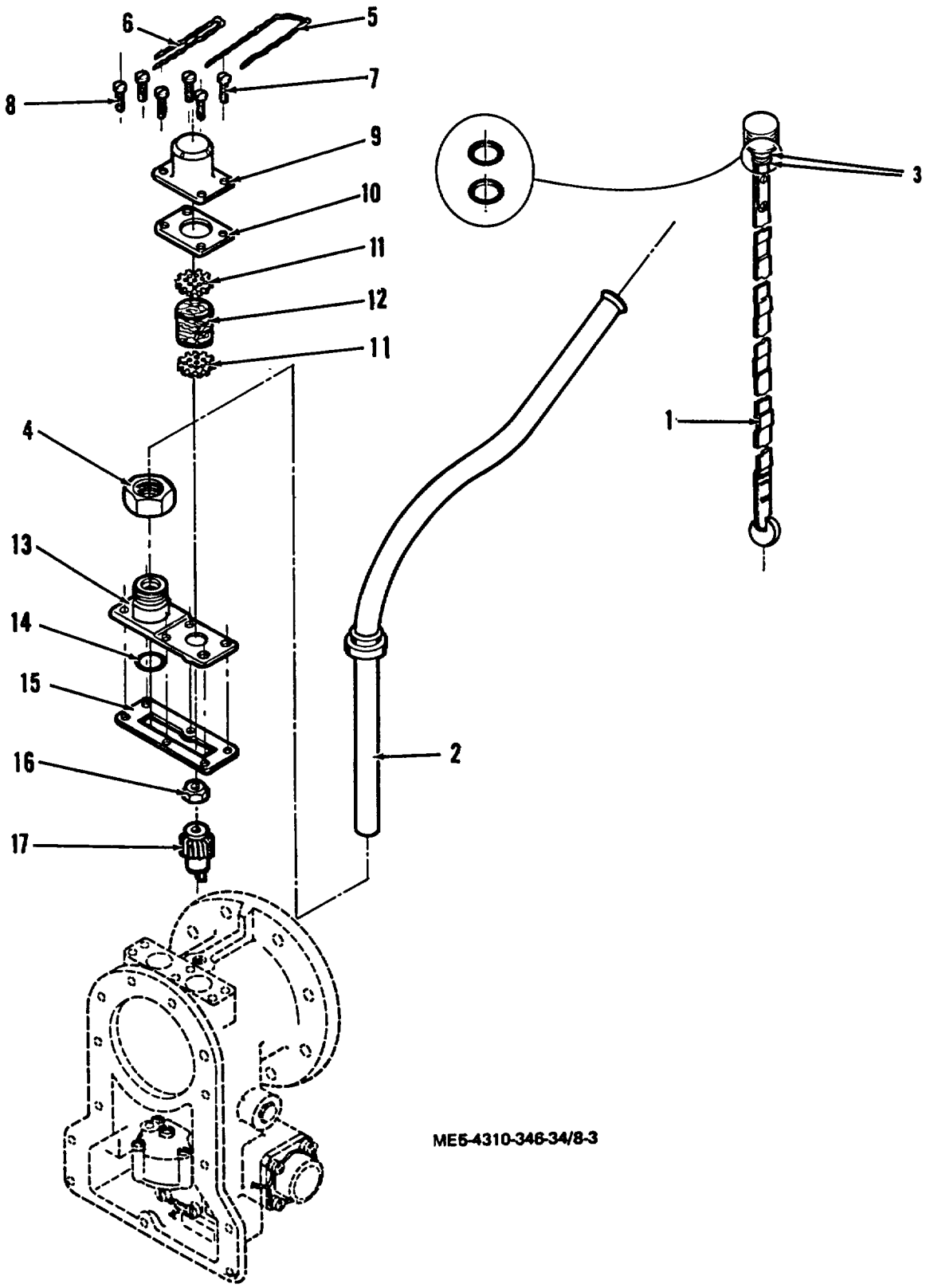


Figure 8-3. Crankcase vent filter element and dipstick (exploded).

Key to fig. 8-3

1. Dipstick assembly
2. Dipstick housing
3. Preformed packing
4. Nut
5. Lockwire
6. Lockwire
7. Screw
8. Screw
9. Filter housing
10. Gasket
11. Perforated plate
12. Filter element
13. Housing cover
14. Preformed packing
15. Gasket
16. Nut
17. Gear

WARNING

Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Keep open flame and excessive heat away from solvent. Flash point of solvent is 100°-138°F. (Fed. Spec. PD-680).

(3) To remove the remaining parts from the oil pump housing assembly, refer to figure 8-4 and the following procedures.

(4) To remove switch assembly (1) from the housing (57). turn switch counterclockwise and remove. Remove lockwire (2), four screws (3), four lockwashers (4), cap and spring assembly consisting of cap (5) and spring (6). Remove packing (71) and remove filter element (8). The element (8), when replaced, should have the packing (91 located on the inside of the filter also removed and replaced. Remove four flexloc nuts (10), bypass valve housing (11) and packings (12 and 13).

(5) Remove aircraft machine bolt (151 and washer (16) from the bottom center of the oil housing to facilitate removal of the oil pump housing (57) from the crankcase. Remove tube assembly (14 and 17) by removing nut (18), elbow (19). fiber washer (20), and elbow (21). Cut lockwire and move two screws (26) holding the metering valve assembly (27) to the oil housing (57) and remove tube assembly (22), packing (23), sleeve (24), fitting (25). Cut lockwire, remove screw and brass washer (28 and 29) and three screws (30). This releases upper housing (31) and lower housing (32) which relieves spring (33) packing (34), plate and bushing assembly (35) lower drive gear (36), upper drive gear (37), gear shaft (38) and pin (39). Remove lockwire (40) four bolts (41), oil pump cap (42), packing (43) intake screen 144), oil pump element retainer (45) pump elements (46), three woodruff keys (47 and 48), retaining ring (49), bearing (50) and shaft (51). Remove oil pressure control valve cap (52) packing (53), spring (54) and oil pressure control valve piston (55). Remove two seals (56) front within the housing (57).

b. Cleaning, Inspection and Repair.

(1) Inspect all tubing for holes, bent section that may cause clogging, damaged threads, worn parts, broken gear teeth, worn packings, clogged filters and any other visible damage.

(2) Clean all parts in a suitable dry cleaning solvent, Fed Spec P-D-680 thoroughly with an ail gun. Remove any grease or accumulated oil on parts with a wire brush and cleaning solvent. Dc not damage any bearing surfaces.

(3) Repair the parts requiring repair by chasing threads with a tap or die. Weld or braze any minor holes or breaks excluding components designed for 3500 psi. Replace all preformed packings, springs, worn bearings, gears with broken teeth, filters and the switch, if there is doubt of it functioning properly. Be sure the gasket surfaces are smooth.

c. Assembly and Installation.

(1) Refer to figure 8-3 and 8-4 to assemble all parts in-reverse order of disassembly. Apply a commercial pipe seal teflon tape to any oil or pneumatic pipe threads for sealing.

(2) Refer to figure 8-1 and 8-2 paragraph 8-2 and install in reverse order of removal.

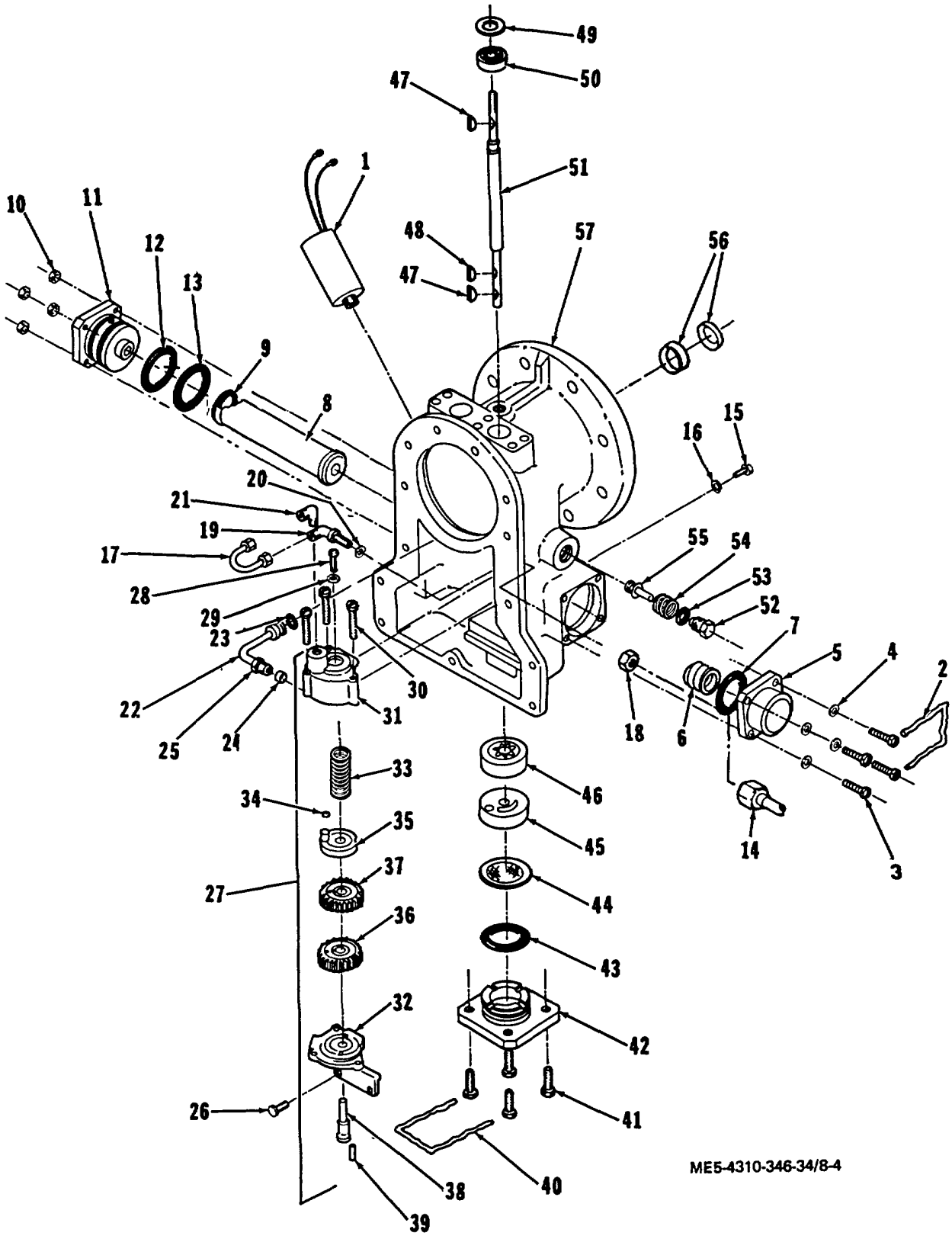


Figure 8-4. Oil pump housing assembly (exploded).

Key to fig. 8-4

1. Switch
2. Lockwire
3. Screw
4. Washer
5. Cap
6. Spring
7. Packing
8. Filter element
9. Packing
10. Flexloc nuts
11. Bypass valve housing
12. Preformed packing
13. Preformed packing
14. Tube
15. Aircraft machine bolt
16. Washer
17. Tube assembly
18. Nut
19. Elbow
20. Fiber washer
21. Elbow
22. Tube assembly
23. Preformed packing
24. Sleeve
25. Fitting
26. Screw
27. Metering valve assembly
28. Screw
29. Brass washer
30. Screw
31. Upper housing
32. Lower housing
33. Spring
34. Packing
35. Plate and bushing assembly
36. Lower drive gear
37. Upper drive gear
38. Gear shaft
39. Pin
40. Lockwire
41. Bolt
42. Oil pump cap
43. Preformed packing
44. Intake screen
45. Oil pump element retainer
46. Pump elements
47. Woodruff key
48. Woodruff key
49. Retaining ring
50. Bearing
51. Shaft
52. Cap
53. Packing
54. Spring
55. Piston
56. Seal
57. Oil pump housing

Section III. CYLINDER ASSEMBLIES

8-5. General.

The cylinder assemblies are components of the compressor. There are four stages comprising the first, second, third and fourth stage cylinders, which build up pressure consecutively on a ratio basis until the final required pressure is reached.

8-6. Cylinder Assemblies

a. Removal and Disassembly-First Stage.

(1) Refer to paragraph 8-2, fig. 8-1 and remove first stage cylinder assembly.

(2) Disassemble first stage head and cylinder (fig. 8-5) for repair by removing the valve assembly. The valve assembly is disassembled by removing nut (1), retainer (2), packing (3), cylinder head (4), six springs (5), six spring washers (6), roll pin (7), packings (8 and 9), exhaust valve (10), valve plate (11), intake valve (12), retainer plate assembly (13), screw (14) and cylinder (15).

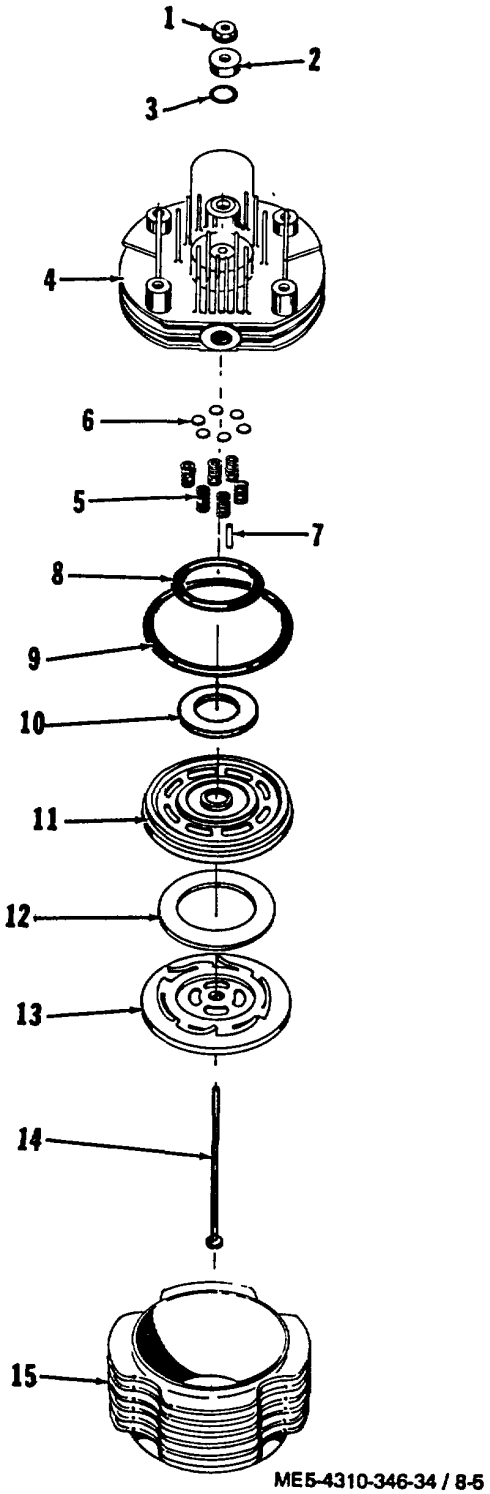


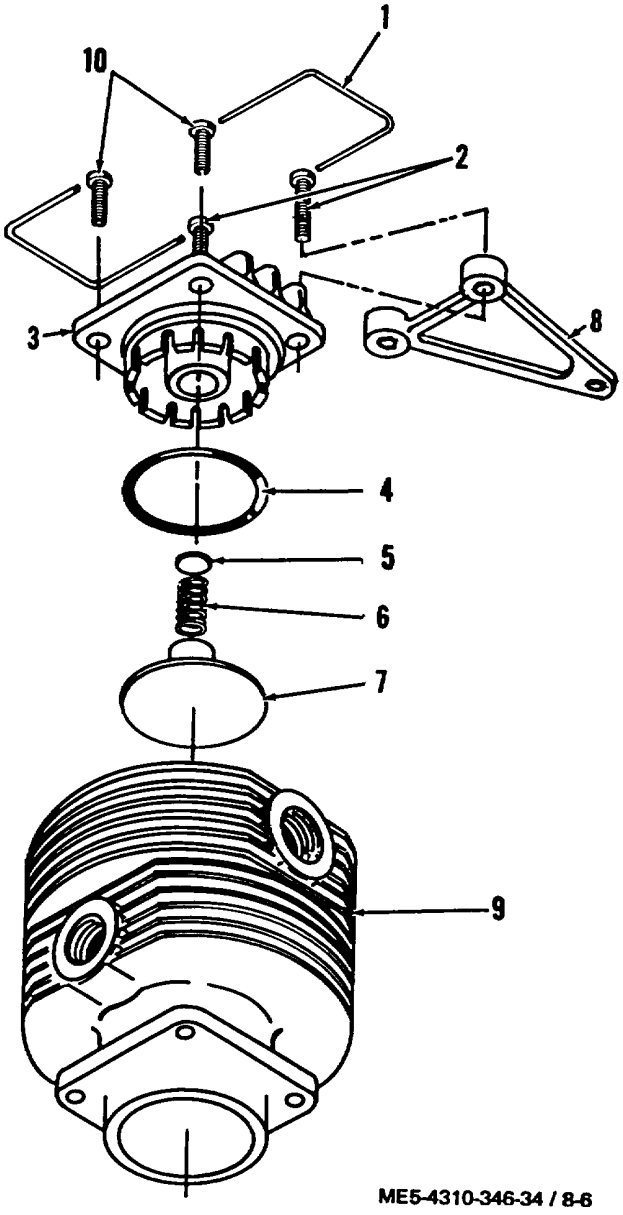
Figure 8-5. First stage cylinder head and cylinder assembly.

Key to fig. 8-5
1. Nut
2. Packing retainer
3. Packing
4. Cylinder head
5. Spring
6. Spring washer
7. Roll pin
8. Packing
9. Packing
10. Exhaust valve
11. Valve plate
12. Intake valve
13. Retaining plate and spring assembly
14. Screw
15. Cylinder

b. Removal and Disassembly-Second Stage

(1) Refer to paragraph 8-2, figure 8-1 and remove the second stage cylinder assembly.

(2) The second stage cylinder assembly (fig 8-6) is disassembled by removing the lockwires (1) from the four screws (2 and 10). Remove screws (1) and 10), fan guard bracket (8), cap (3), packing (4), spring washer (5), the spring (6) and exhaust valve (7), leaving the cylinder (9).



1. Lockwire
2. Screw
3. Cap
4. Packing
5. Spring washer
6. Spring
7. Exhaust valve
8. Bracket
9. Cylinder
10. Screw

Figure 8-6. Second stage cylinder assembly.

c. Removal and Disassembly-Third Stage.

(1) Refer to paragraph 8-2, fig. 8-1 and remove the third stage cylinder assembly.

(2) To disassemble the third stage cylinder assembly (fig. 8-7) remove the cap and rupture disc assembly consisting of the lockwire (1), rupture disc retainer (2), rupture disc (3) and the cap (4) These items should be removed and replaced as an assembly. Remove packing (5), spring washer (6), spring (7) and exhaust valve (8) leaving cylinder (9).

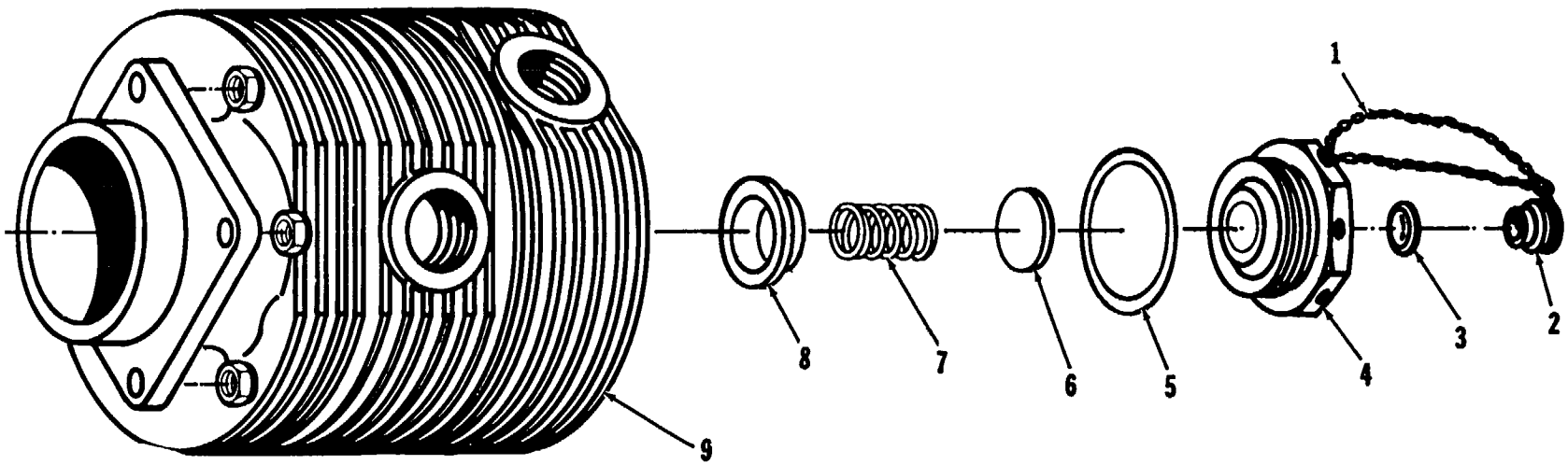


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Figure 8-7. Third stage cylinder assembly.

Key to fig. 8-7
1. Lockwire
2. Rupture disc retainer
3. Rupture disc
4. Cap
5. Packing
6. Washer
7. Spring
8. Exhaust valve
9. Cylinder

d. Removal and Disassembly-Fourth Stage.

(1) Refer to paragraph 8-2, figure 8-1 and remove fourth stage cylinder assembly.

(2) To disassemble the fourth stage cylinder assembly (fig. 8-8), remove the cap and rupture disc assembly consisting of lockwire (1), rupture disc retainer (2), rupture disc (3) and cap (4). These four items should be removed and replaced as an assembly. Remove spring washer (5), spring (6), and exhaust valve (7) from the cylinder (8).

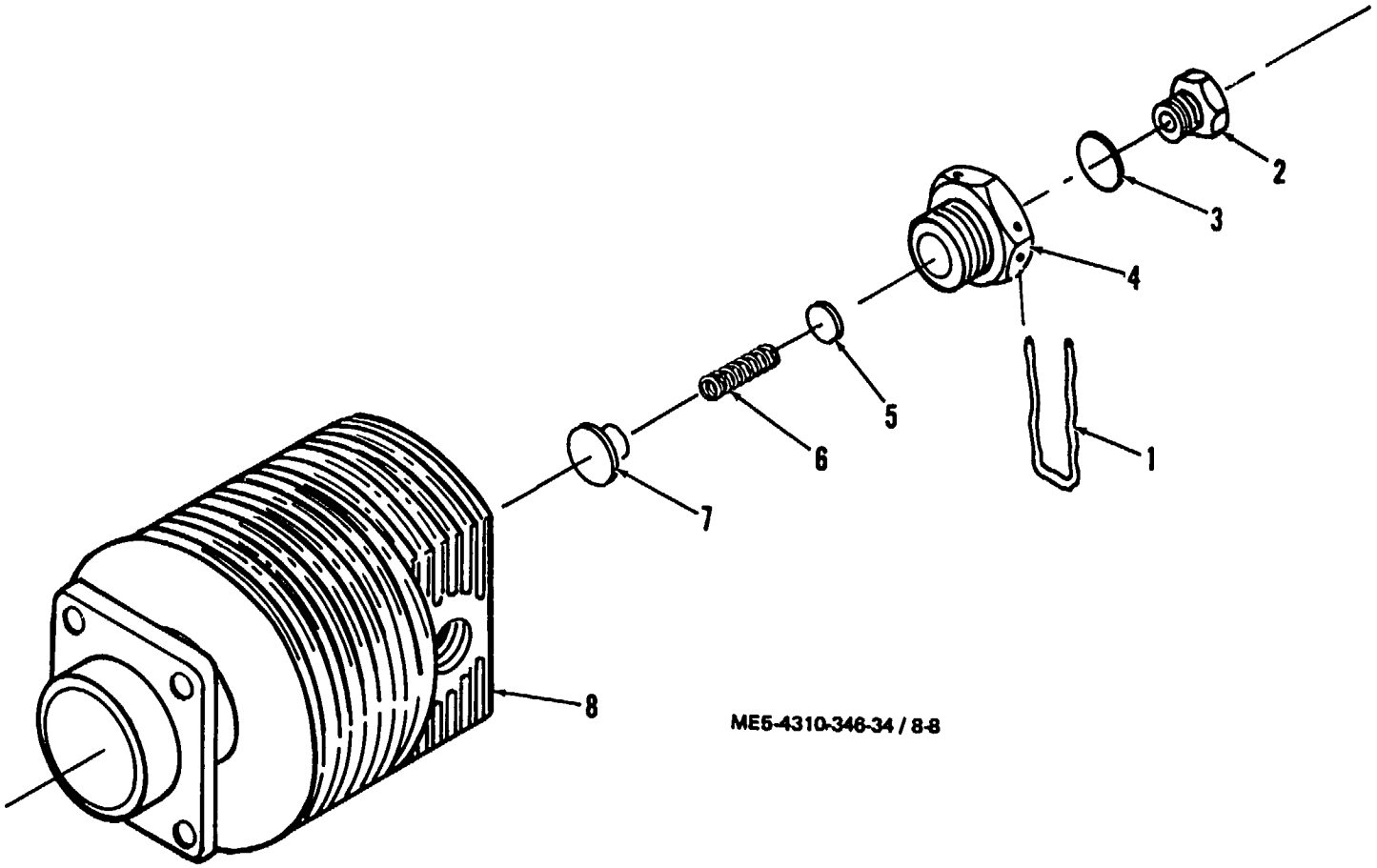


Figure 8-8. Fourth stage cylinder assembly.

Key to fig. 8-8
1. Lockwire
2. Rupture disc retainer
3. Rupture disc
4. Cap
5. Spring washer
6. Spring
7. Exhaust valve
8. Cylinder

e. Cleaning, Inspection and Repair.

WARNING

Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Keep open flame and excessive heat away from solvent. Flash point of solvent is 100°-138°F. (Fed. Spec. PD-680).

(1) Clean all parts with a suitable dry cleaning solvent, Fed Spec P-D-680 and dry thoroughly. Be sure that no passages are clogged with foreign material.

NOTE

Do not use cleaning solvent on non-metallic surfaces.

(2) Inspect for thread damage, broken fins on cylinders, worn parts, nicks, burrs and other damage.

(3) Repair any damaged part that is economical to repair in the most convenient manner. Threaded parts may be chased with a standard tap or die. Valve seats and cylinder bores shall be free of any nicks or burrs.

f. Assembly and Installation

(1) Refer to figures 8-5, 8-6, 8-7, and 8-8 to assemble the cylinders. When assembling the rupture disc retainer, they must be torqued 300 to 350 in / lbs. The cap assemblies must be torqued as follows: 3rd stage to 300 in/lbs and 4th stage to 550 in / lbs.

(2) Refer to figure 8-5, and install the assembly of the cylinders as one part.

(3) Assembly and installation is the reverse procedure of removal and disassembly.

CHAPTER 9

REPAIR OF VALVES

Section I. PRESSURE RELIEF VALVES

9-1. General

a. There are five pressure relief valves manufactured by Stewart-Warner Corporation used in this unit. The construction of these valves is very similar but the settings and a few parts differ.

b. The five valves are:

(1) The first stage relief valve located on the manifold of the basic compressor has a nominal opening pressure of 200 psig to protect the first stage of the compressor.

(2) The second stage relief valve located on the manifold of the basic compressor has a nominal opening pressure of 800 psig to protect the second stage of the compressor.

(3) The third stage relief valve located on the manifold of the basic compressor has a nominal opening pressure of 1675 psig to protect the third stage of the compressor.

(4) The fourth stage relief valve located on the manifold of the compressor has a nominal opening pressure of 3860 psig to protect the fourth stage of the compressor.

(5) The reservoir relief valve located in the lines and fittings to the inlet side of the reservoir has a nominal opening pressure of 4000 psig.

9-2. First, Second, Third, Fourth Stage and Reservoir Valves

a. Removal.

(1) Refer to paragraph 2-17 figure 2-7 to remove first, second, third and fourth stage valves.

(2) Refer to paragraph 2-17*c*(4), figure 2-8 sheet 1 of 2 to remove the reservoir relief valve.

b. Cleaning and Inspection.

(1) Inspect the valves for any thread damage or pitted surfaces.

(2) Clean only the external surface with a suitable dry cleaning solvent, Fed. Spec. P-D-680 and dry thoroughly.

c. Performance Tests.

(1) *General*. Conduct the following tests in the sequence shown. The performance requirement are shown in table 9-1 and refer to figure 9-1 for test set-up.

(2) *Opening Pressure.*

(a) Connect the leakage tube to the collector cup.

(b) Starting from zero, slowly increase inlet pressure until the unit opens. Opening is indicated by leakage through the unit in excess of the maximum allowable rate as shown in Column 6, Table 9-1. The unit must open within the limit shown in Column 2.

(3) *Full Flow.*

(a) Connect the flowmeter to the collector cup. Following valve opening, increase inlet pressure to that shown in Column 4 Table 9-1 and observe the flowmeter indication.

(b) The flow, when corrected to standard conditions, must be as shown in Column 3.

(4) *Reseal Pressure.*

(a) Connect the leakage tube to the collector cup.

(b) With inlet pressure above the opening pressure, slowly reduce inlet pressure until the until reseals. Wait approximately two (2) minutes before starting the following test to allow the valve and the air inside the collector cup to return to room, temperature. Resealing is indicated by leakage through the unit decreasing to less than the maximum allowable rate shown in Column 6.

(c) The unit must reseal within the limits shown in Column 5.

(5) *Leakage.*

(a) Connect the leakage tube to the collector cup.

(b) Cycle pressure from zero to opening pressure and back to zero. Observe the leakage tube for evidence of unit leakage.

(c) Leakage through the unit must not exceed that shown in Column 6 at any pressure below resealing.

Table 9-1. Performance Requirements

Valve	Opening Pressure psig	Minimum flow scfm (square cubic feet per minute)	Full flow pressure psig	Minimum reseal pressure psig	Maximum leakage rate
(1)	(2)	(3)	(4)	(5)	(6)
1st Stage	200	15	.....	175	
2nd Stage	800	15	.....	750	
3rd Stage	2025	15.0	.....	1700	
4th Stage	3920	15.0	.....	3600	
Reservoir	4000 ± 100	15.0	4400 Max.	3500	3 cc /min

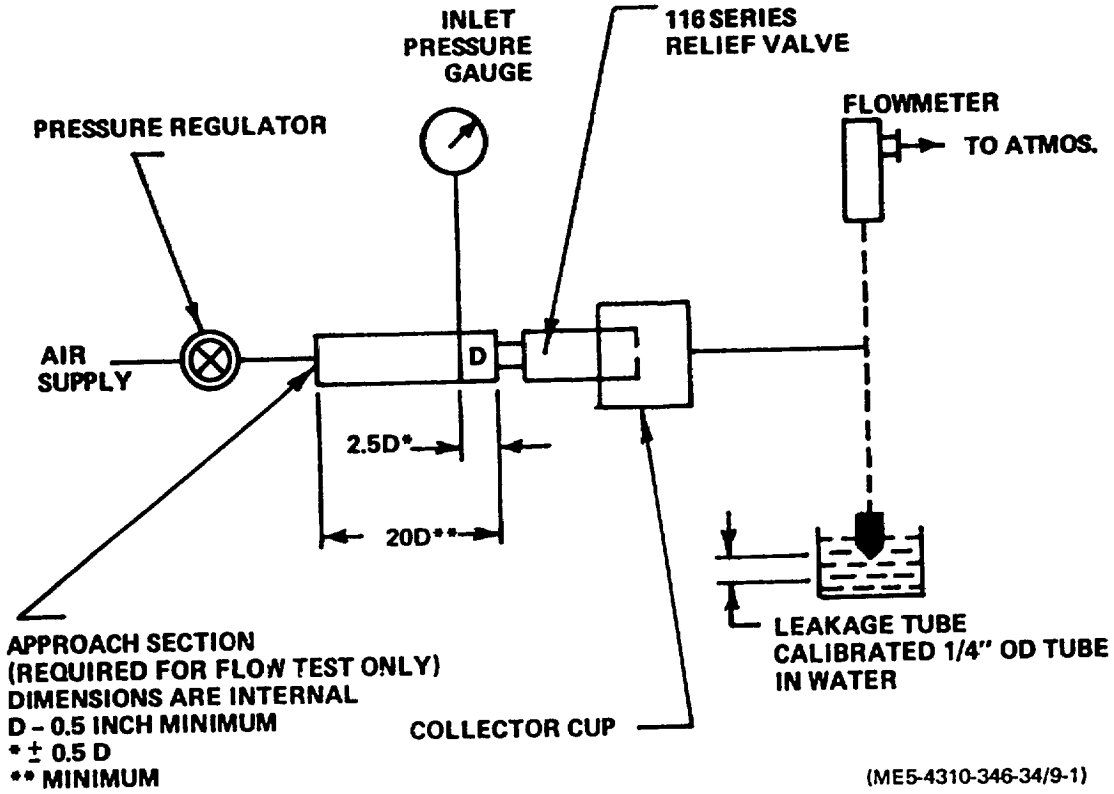


Figure 9-1. Test set-up for 1st, 2nd, 3rd, 4th stage and reservoir pressure relief valves.

d. Installation. Refer to paragraph 2-17 fig. 2-7 and 2-8 and install the relief valves in reverse order of removal.

Section II. BACK PRESSURE AND CHECK VALVE ASSEMBLIES

9-3. General

a. The back pressure valve assembly located in the lines on the outlet side of the moisture separator has a nominal outlet pressure of 2650 psig. The check valve has the inlet side screwed into the outlet side of the back pressure valve with a nominal opening pressure of 5 psi. Both valves protect the moisture separator of any back pressure from the air reservoir.

b. Refer to TM 5-4310-346-12 for more tabulated information on the valve settings.

9-4. Back Pressure and Check Valve Assemblies

a. Removal. Refer to paragraph 2-17 c(5) fig. 2-8 for removal of the valves.

b. Cleaning. Inspection and Repair. Refer to paragraph 9-2 c and clean and inspect the back pressure and check valve assemblies.

c. Performance Tests For Back Pressure Valve

(1) *General.* Connect the unit as shown in figure 9-2. The performance requirements are given in table 9-2.

(2) *Full Flow-Pressure Test.*

(a) Fully open the shut-off valve. Open the pressure regulator to gradually increase inlet pressure until the flow meter registers a flow slightly above that shown in Column 3.

(b) With flow as specified, the inlet pressure, Gauge 1. must be as shown in Column 4. Gauge 2 must indicate zero pressure.

(3) *Full flow with Back Pressure.*

(a) Partially open the shut-off valve. Adjust the pressure regulator and the shutoff valve until outlet pressure, Gauge 2 is as shown in Column 5 and flowmeter registers a flow slightly greater than that shown in Column 3.

(b) With outlet pressure and flow as specified, inlet pressure, Gauge 1, must not exceed that shown in Column 6.

(4) *Leakage Tests Increasing Pressure Leakage.*

(a) Fully open the shutoff valve. Starting with zero inlet pressure, open the pressure regulator to gradually increase inlet pressure, Gauge 1, to that shown in Column 7.

(b) With inlet pressure as specified in Column 7, leakage through the unit, as indicated by the flowmeter, must not exceed 5 cc/min.

(5) *Leakage Tests Decreasing Pressure Lea kage.*

(a) Fully open the shutoff valve. Open the pressure regulator to increase inlet pressure to that shown in Column 8. Close the pressure regulator to gradually decrease inlet pressure to that shown in Column 7.

(b) With inlet pressure as specified in Column 7. leakage through the unit, as indicated by the flowmeter, must not exceed 0.15 scfm.

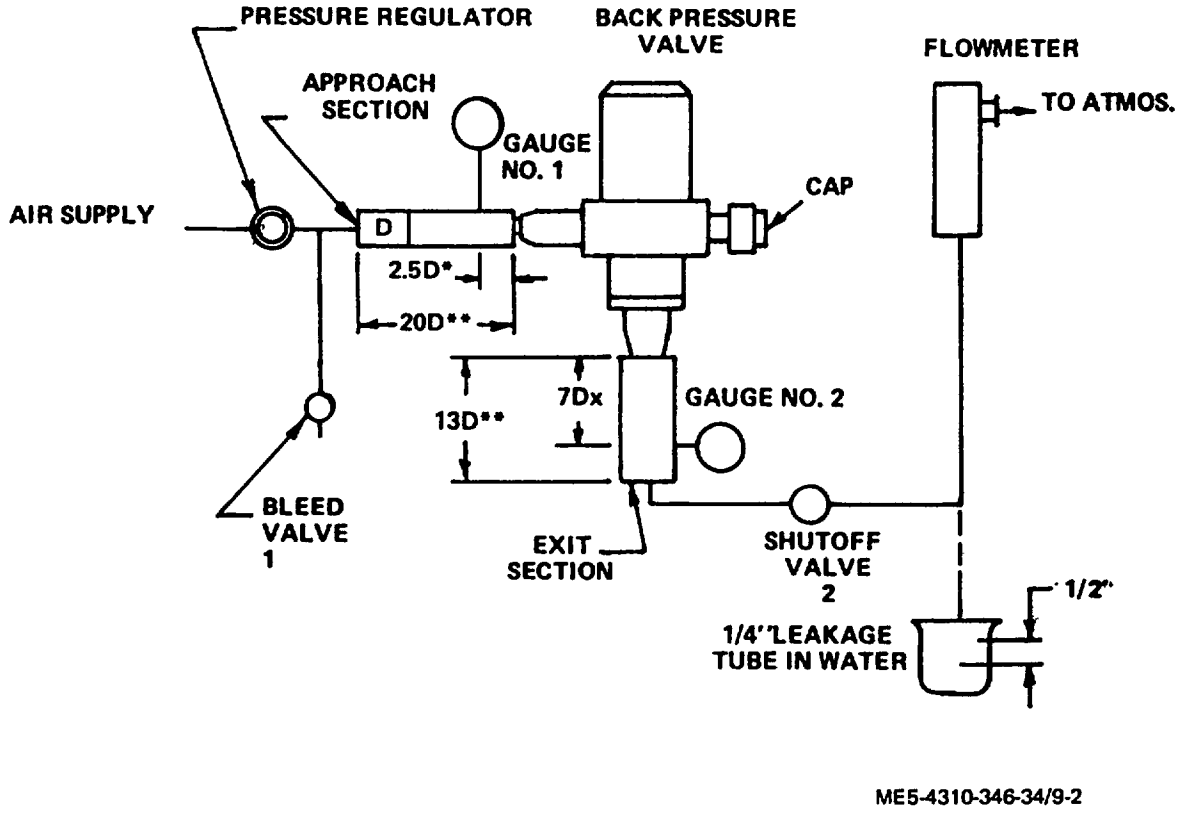
(6) *External Leakage.*

(a) With the shutoff valve closed, open the pressure regulator to increase inlet and outlet pressure to that shown in Column 2. Brush the surface of the unit with a soap/water solution to detect external leakage.

(b) There must be no apparent external leakage.

Table 9-2. Performance Requirements for Back Pressure Valve

Proof pressure	Minimum flow	Full flow pressure-zero back pressure	Flow with back pressure		Leakage tests	
			Outlet press.	Inlet press.	Test inlet press	Initial press. decr. press. test
psig	scfm	psig	psig	psig	psig	psig
(21	(3)	(4)	(5)	(6)	(7)	(8)
5250	2	2650+50	2400	2450	2000	2750
		-100				



D - 0.5 INCH MINIMUM
*** - PLUS OR MINUS ONE-HALF D**
**** - MINIMUM**
X - PLUS OR MINUS ONE D
DIMENSIONS GIVEN ARE INTERNAL.
SHUTOFF VALVE MUST BE 1/2 INCH NPT MINIMUM.
DOWNSTREAM TUBING MUST BE 3/8 INCH MINIMUM.

Figure 9-2. Test Set-up for back pressure valve.

d. Performance Test For Check Valve.

(1) *General.* Connect the unit as shown in Figure 9-3. The Performance Requirements are given in table 9-3.

(2) *Proof Pressure.*

(a) Install the unit in a test set-up as shown in Figure 9-3. With the outlet port plugged and the unit submerged in water or the body seam and joints brushed with a soap solution, open the pressure regulator to apply a proof pressure, as listed in Column 4. Table 9-3 to the inlet port for two minutes.

(b) Reverse the unit in the set-up so that proof pressure is applied to the outlet port for two minutes. There shall be no external leakage, permanent set or resultant malfunction of the unit.

(3) *Leakage.* Install the unit in a test set-up as shown in Figure 9-3, but with the direction of flow reversed and a calibrated leakage tube, submerged in a beaker of water, connected to the inlet port. Apply the pressures given in Column 2, Table 9-2 to the outlet port for 5 minutes each. The leakage rates, as indicated by bubbles escaping from the leakage tube, shall be within the corresponding limits given in Column 3.

(4) *Opening Pressure.* With the unit installed in a test set-up as in Figure 9-3, open the pressure regulator until the flow exceeds the maximum allowable leak rate. This indicates valve opening. The pressure gauge reading at this point shall be within the limits shown in Column 3, Table 9-3.

Table 9-3. Performance Requirements for Check Valve

Direction of pressure	Pressure differential	Max. allowable leakage	Max rated pressure	Opening press. press.	Prod press	Burst
Reverse Flow	3000 PSI	3 cc / Hr	3000 PSI	2 to 8 PSI	4500 PSI	7500 PSI
Reverse Flow	5 PSI	3 cc/ Min.				

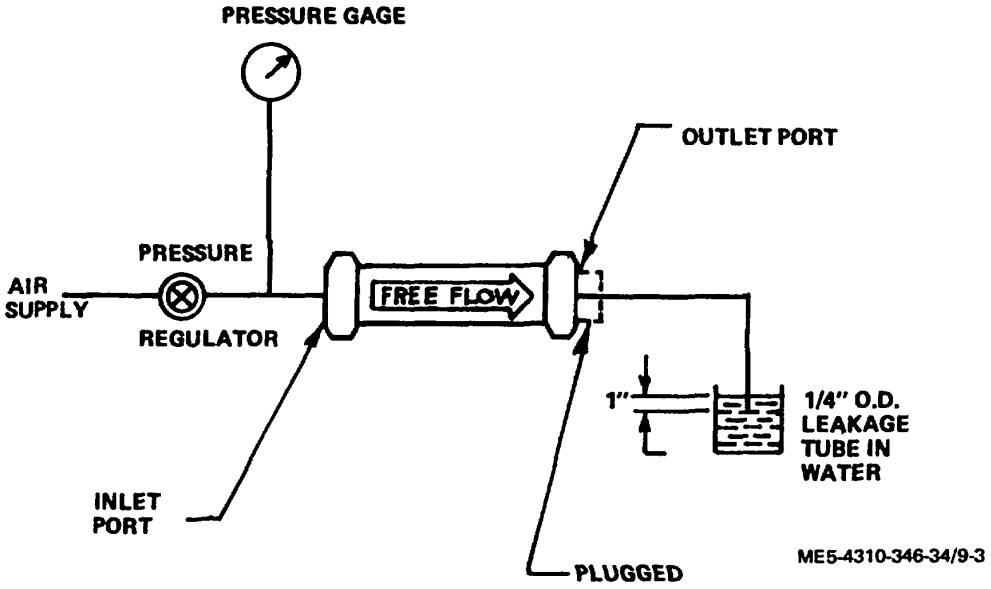


Figure 9-3. Test set-up for check valve.

e. Installation. Refer to figure 2-8 Sheet 1 and install the back pressure and check valves in reverse order of removal (para 2-17c (5).

Section III. DUMP VALVE ASSEMBLY

9-5. General

The dump valve is an automatic solenoid operated unloading valve. The solenoid actuates electrically closing the valve when the electrical system' is energized to operate the unit. When the unit is operating the valve remains closed until the unit electrical system is de-energized to stop the operation of the unit. At this time the solenoid de-energizes releasing the poppet in the valve allowing the air pressure to be unloaded. The valve is located at the bottom of the air reservoir with the manual shutoff valve.

9-6. Dump Valve (fig. 9-5)

a. Removal. Refer to paragraph 2-17*c* (7) and fig. 2-8, sheet 2, and remove the dump valve (52). Be sure the wire leads have been tagged and disconnected.

b. Disassembly. To disassemble the dump valve remove the four screws (1, fig 9-5) securing the bracket (2) to the body (14). Remove screw (3) and nut (4) from the bracket (2). Turn the solenoid assembly (5) counterclockwise and remove the solenoid assembly. Remove poppet (6), lockwire (7) securing adapter (8). Remove adapter (8), retainer (9). preformed packings (10 and 11) from the body (14). Remove guide (12, seat (13) and packing.

c. Cleaning, Inspection and Repair.

(1) Inspect all parts for damaged threads

nicks, cracks, loose or missing parts. Inspect solenoid leads and terminals for damage.

WARNING

Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Keep open flame and excessive heat away from solvent. Flash point of solvent is 100°-138°F. (Fed. Spec. PD-680).

(2) Clean the solenoid and leads with a damp cloth and dry thoroughly. Clean all metal parts with a suitable dry cleaning solvent, Fed Spec P-D680. and dry thoroughly.

(3) Repair the terminals if bent and repair wire if possible by splicing. Replace all worn parts. Chase the threads with a tap or die if required. Replace all packings with new packings.

d. Assembly. Refer to fig, 9.5 and assemble the valve in reverse order of disassembly.

e. Testing.

(1) To test for leakage refer to Figure 9-4 and remove the plug from drain port and connect air source to inlet. Connect 24 volt power supply to solenoid leads with switch in positive line. Apply 24 volts and close switch. Connect leakage tube to dump port and insert end into glass of water. Apply 3600 psig air pressure. There should he no leakage in excess of 3 cc/hr.

(2) For solenoid function test, remove leakage apparatus from last test. Open and close switch ii power line a couple of times. Proper dump valve operation is detectable by air discharge from dump port when switch is in open position. Open switch. Bleed system.

(3) To adjust the solenoid adjusting screw it leakage occurs, loosen the nut (15), adjust the screw (16) for desired setting.

f. Installation. Refer to paragraph 2-17*c*(7) and figure 2-8, sheet 2, and install the valve in reverse order of removal except turn the solenoid assembly (5, fig. 9-5) clockwise fingertight and back off 1/8 turn. Tighten screw (3) against solenoid, lock the screw with nut (4) to prevent the solenoid from turning.

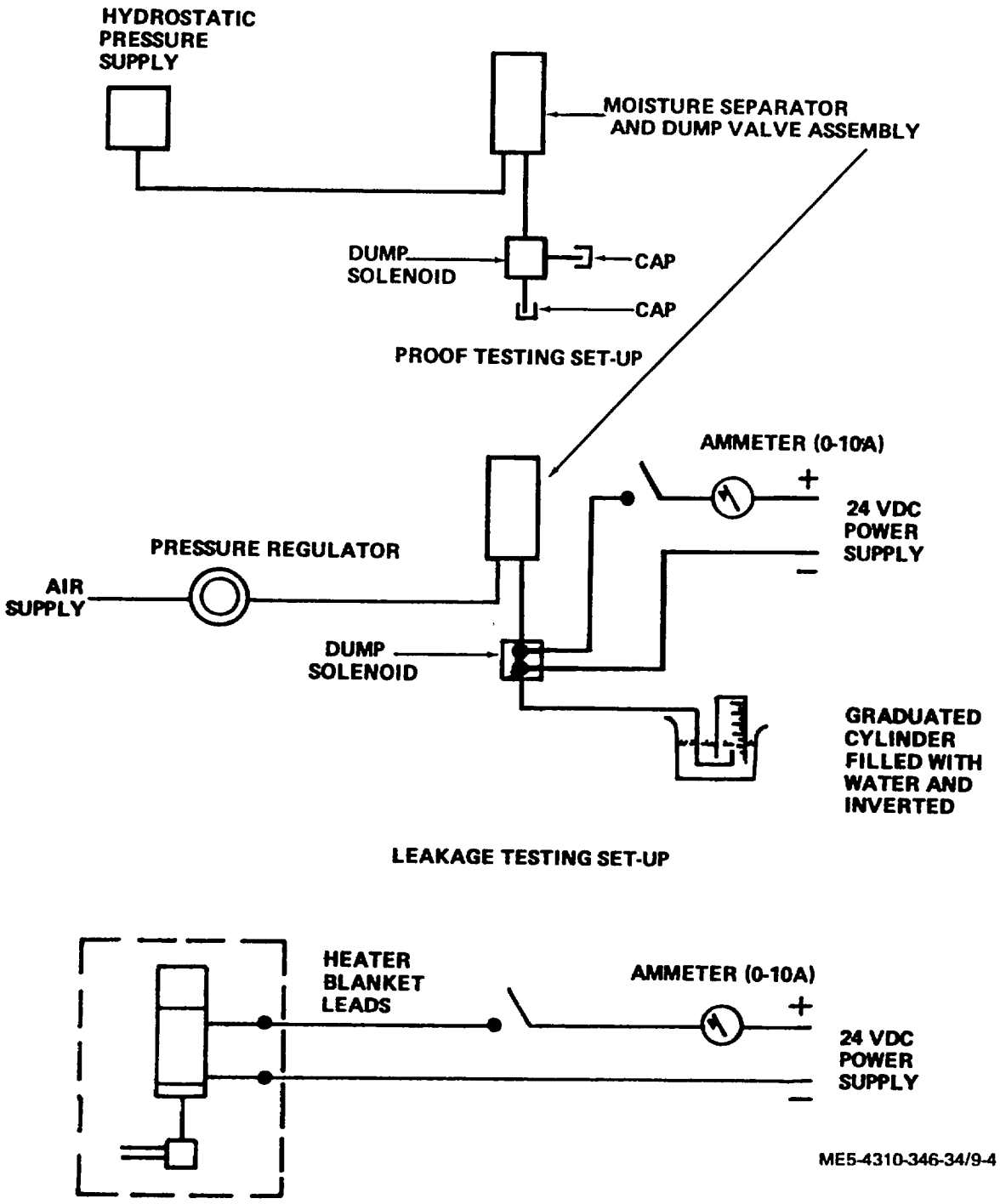


Figure 9-4. Test set-up for dump valve and moisture separator.

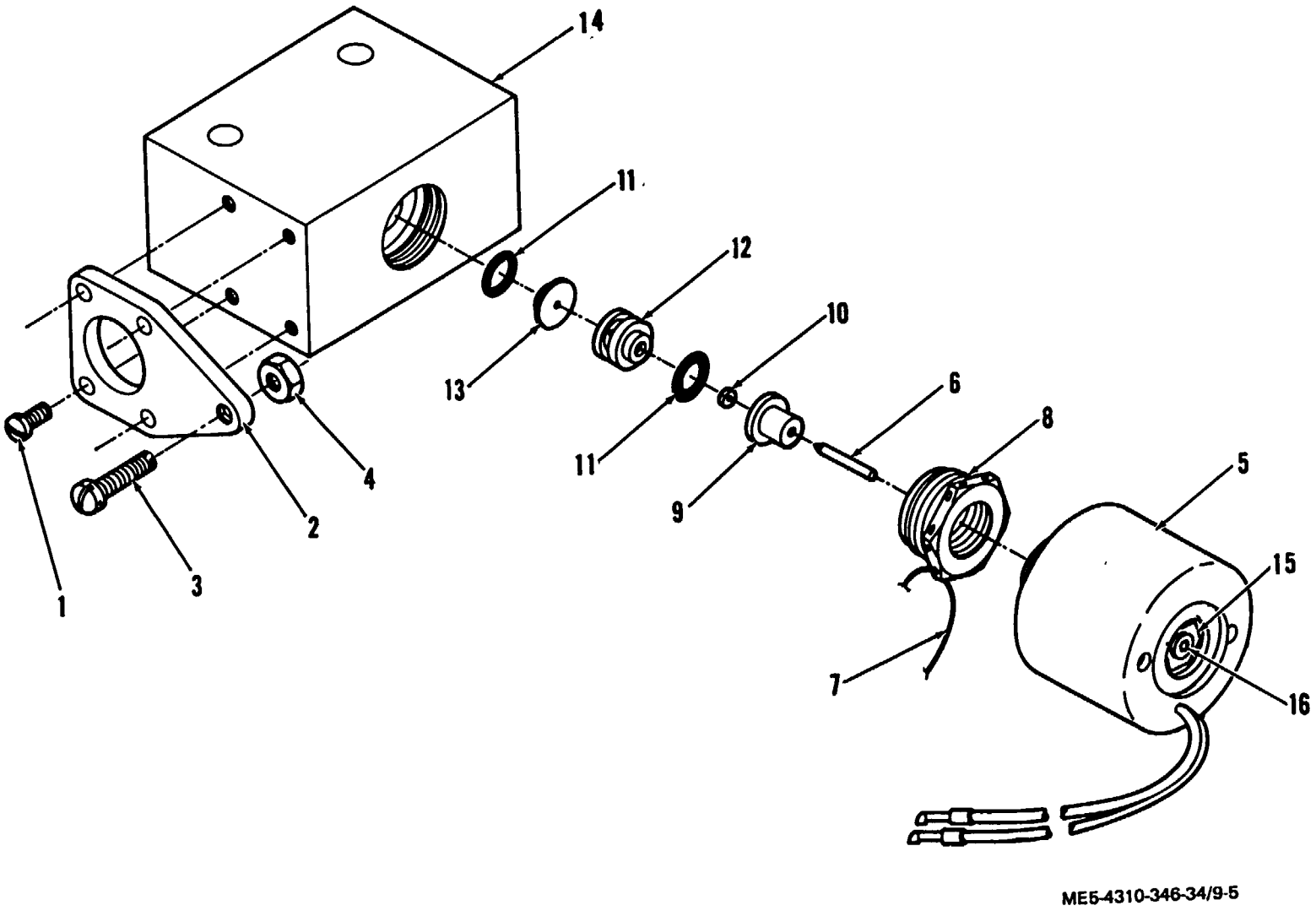


Figure 9-5. Dump valve assembly (reservoir).

Key to fig. 9-5

1. Screw
2. Bracket
3. Screw
4. Nut
5. Solenoid assembly
6. Poppet
7. Lockwire
8. Adapter
9. Retainer
10. Preformed packing
11. Preformed packing
12. Guide
13. Seat
14. Body
15. Nut
16. Screw

CHAPTER 10

REPAIR OF MOISTURE SEPARATOR

AND DEHYDRATOR

Section I. MOISTURE SEPARATOR

10-1. General

The moisture separator is a cylindrically constructed component with an electrical solenoid operated dump valve in the bottom of the cylinder. An electrical heating blanket surrounds the lower portion of the cylinder with a thermostat attached to eliminate freezing of the moisture collected in the separator. The moisture separator collects moisture from the compressor and lines to the separator and unloads the moisture automatically by actuation of the solenoid valve and manually by a push button switch on the control panel at specified intervals. The separator is located on the reservoir bracket.

10-2. Moisture Separator Assembly (fig. 10-1)

a. Removal and Disassembly.

(1) Refer to paragraph 2-17 *b* (6) fig. 2-8 and remove the moisture separator.

(2) To disassemble the moisture separator (fig. 10-1), remove identification plate (1), heater blanket (6) by removing insulator tape and unlacing the heater blanket. Tag and disconnect lead (3) attached at disconnect knife (5) to the blanket. Tag and disconnect lead (2) from thermostat switch (7) by removing the solder at solder joint (4).

(3) Remove three set screws (8) and three locking plugs (9), securing cap assembly (10). Remove retainer (11), packing (12), cap spacer (13) by unscrewing cap assembly (10) from body (34).

(4) Disassemble the cap assembly (10) by removing three screws (14) from tube plate assembly consisting of plate (15) and tube (16). Tag and disconnect lead (17) on the thermostat and remove thermostat (7) and bracket (18) by removing lockwire and four screws (19). Then remove positioning screw (20) and nut (21) from bracket (18).

(5) Tag and disconnect two leads (22) and remove solenoid (23), disconnect knives (24) and sleeving (25). Turn adapter (26), counterclockwise to remove, relieving poppet (27), retainer (28), two packings (29), packing (30), poppet guide (31) and seat (32) from cap (33).

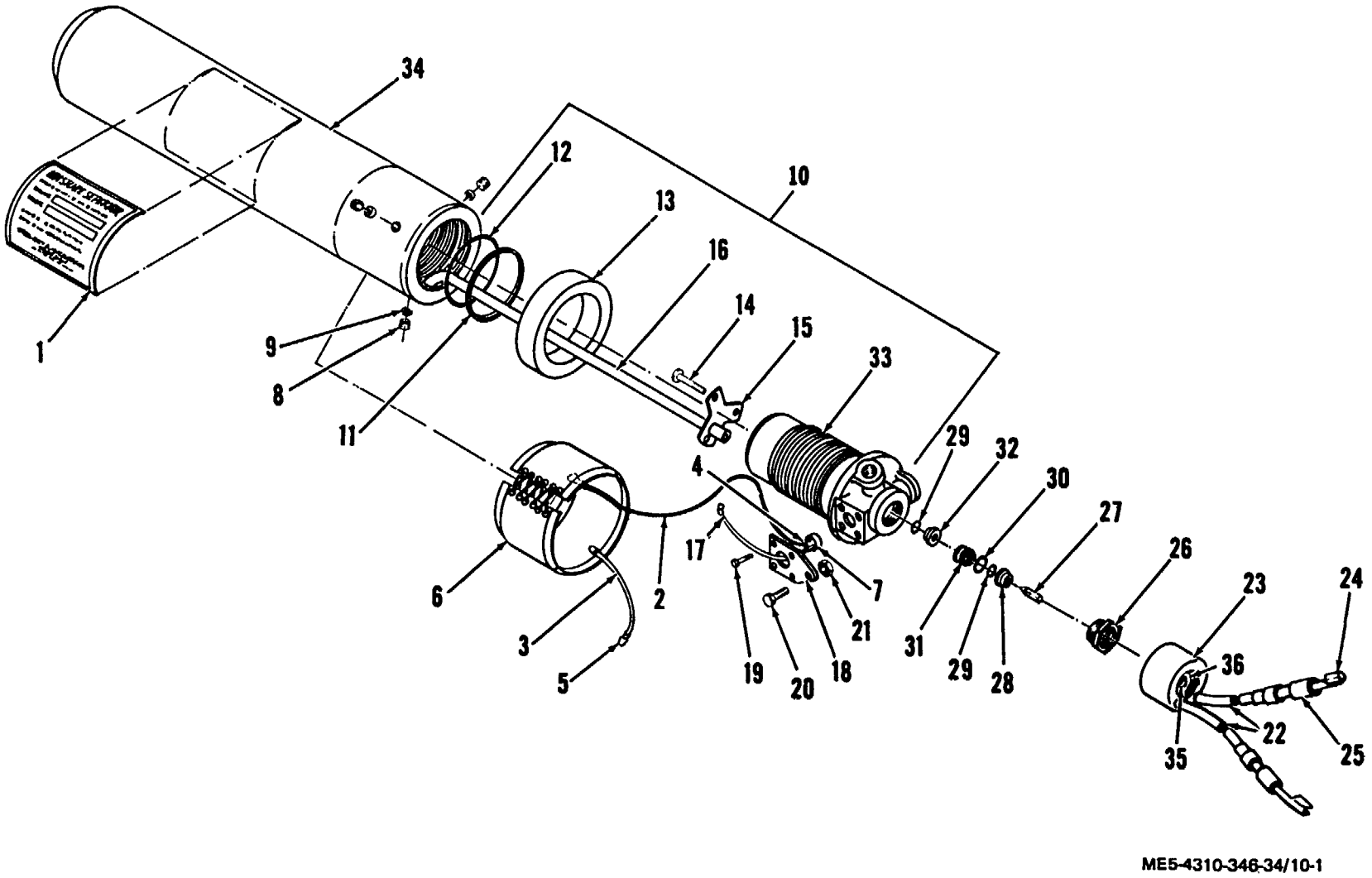


Figure 10-1. Moisture separator assembly (exploded).

Key to Fig. 10-1
1. Identification plate
2. Lead
3. Lead
4. Solder joint
5. Disconnect knife
6. Heater blanket
7. Heater blanket thermostat
8. Set screw
9. Plug
10. Cap assembly
11. Retainer
12. Packing
13. Cap spacer
14. Screw
15. Plate
16. Tube
17. Lead
18. Bracket
19. Screw
20. Screw
21. Nut
22. Lead
23. Solenoid
24. Disconnect knife
25. Sleeve
26. Adapter
27. Poppet
28. Retainer
29. Packing
30. Packing
31. Poppet guide
32. Seat
33. Cap
34. Body
35. Nut
36. Screw

b. Cleaning, Inspection and Repair.

WARNING

Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Keep open flame and excessive heat away from solvent. Flash point of solvent is 100°-138°F. (Fed. Spec. PD-680).

(1) Inspect all wire leads and terminals for breaks, bent or missing terminals. Inspect all mechanical and metal parts for damaged threads, nicks and chips, missing or loose parts. Check for clogged ports.

(2) Clean the electrical parts with a damp cloth and dry thoroughly. Clean all metal parts in a suitable dry cleaning solvent, Fed Spec P-D-680, and dry thoroughly. Make sure all holes are not restricted.

(3) For minor repairs, straighten any bent terminals, splice broken wires and repair damaged threads with a standard tap or die. Replace any preformed packing and any parts which are beyond rep air.

c. Assembly.

(1) Refer to figure 10-1 and assemble in reverse order of disassembly except turn the solenoid (23) clockwise fingertight and back off 1/8 turn. Tighten screw (20) against solenoid, lock with nut (21) to secure the solenoid from turning.

d. Testing. (fig. 9-4)

(1) *Proof Test.* Plug outlet and drain port from moisture separator. Apply 5250 psig hydrostatic pressure to inlet. Any visible signs of deformation or leakage shall be cause for immediate rejection. Drain complete system.

(2) *Leak Test.* Remove plug from drain port and connect air source to inlet. Connect 24 volt power supply to solenoid leads with switch in positive line. Apply 24 volts and close switch. Connect leakage tube to separator dump port and insert end into glass of water. Apply 3600 psig air pressure. There should be no leakage in excess of 3 cc / hour.

(3) *Solenoid Function.* Remove leakage apparatus from last test. Open and close switch in power line a couple of times. Proper dump valve operation is detectable by air discharge from dump port when switch is in open position. Open switch. Bleed system.

(4) *Thermostat Operation.* Connect 24 volt power supply to leads with an ammeter in series in the positive line. Refrigerate to below 40° F. Thermostat actuation should be evident by current flow showing on ammeter. Remove from refrigeration. Re-actuation of thermostat should be evidenced after a short time by ammeter going to zero.

(5) *Adjustment.* To adjust the solenoid adjusting screw, if leakage occurs, loosen the nut (35) and adjust screw (36) for desired setting.

e. Installation. Refer to paragraph 2-17 fig. 2-8 and install the moisture separator in reverse order of removal.

Section II. DEHYDRATOR

10-3. General

The air compressor uses two dehydrators located on the air receiver bracket in the outlet lines of the air receiver before the air passes into the unit being serviced. They serve the purpose of cleaning the air dehydrating the air by filtering before the air is discharged.

10-4. Dehydrator (Fig. 10-2)

a. Removal and Disassembly

(1) Refer to paragraph 2-17 figure 2-8 and remove the dehydrator and dehydrator brackets.

(2) To disassemble the dehydrators, the brackets (20 and 21) and head assembly (1) must be

removed. To remove the head assembly (1) using the two studs (2) as leverage points, turn the head assembly and cover counterclockwise and remove. Remove two studs (2) securing the cover (3) to the head assembly (1). Remove the preformed packing (4 and 5) from the lower head (11). Remove the retaining ring (6) securing the lower head to the tipper head (7) and remove the upper head (7). Remove the screw (8) securing the perforator (9) and spring (10) to the lower head (11). Remove the cartridge (12).

(3) To remove the tail piece assembly (13), install the two studs (2), turn the tail piece assembly counterclockwise and remove it from the cylinder (19). Remove the preformed packing (5) from the tail piece (18). Remove the screw (14) securing the perforator (15), plate (16) and spring (17) to the tail piece (18), leaving the cylinder (19).

Key to fig. 10-2

1. Head assembly
2. Stud
3. Cover
4. Preformed packing
5. Preformed packing
6. Retaining ring
7. Upper head
8. Screw
9. Perforator
10. Spring
11. Lower head
12. Cartridge
13. Tail piece assembly
14. Screw
15. Perforator
16. Plate
17. Spring
18. Tail piece
19. Cylinder
20. Bracket
21. Bracket

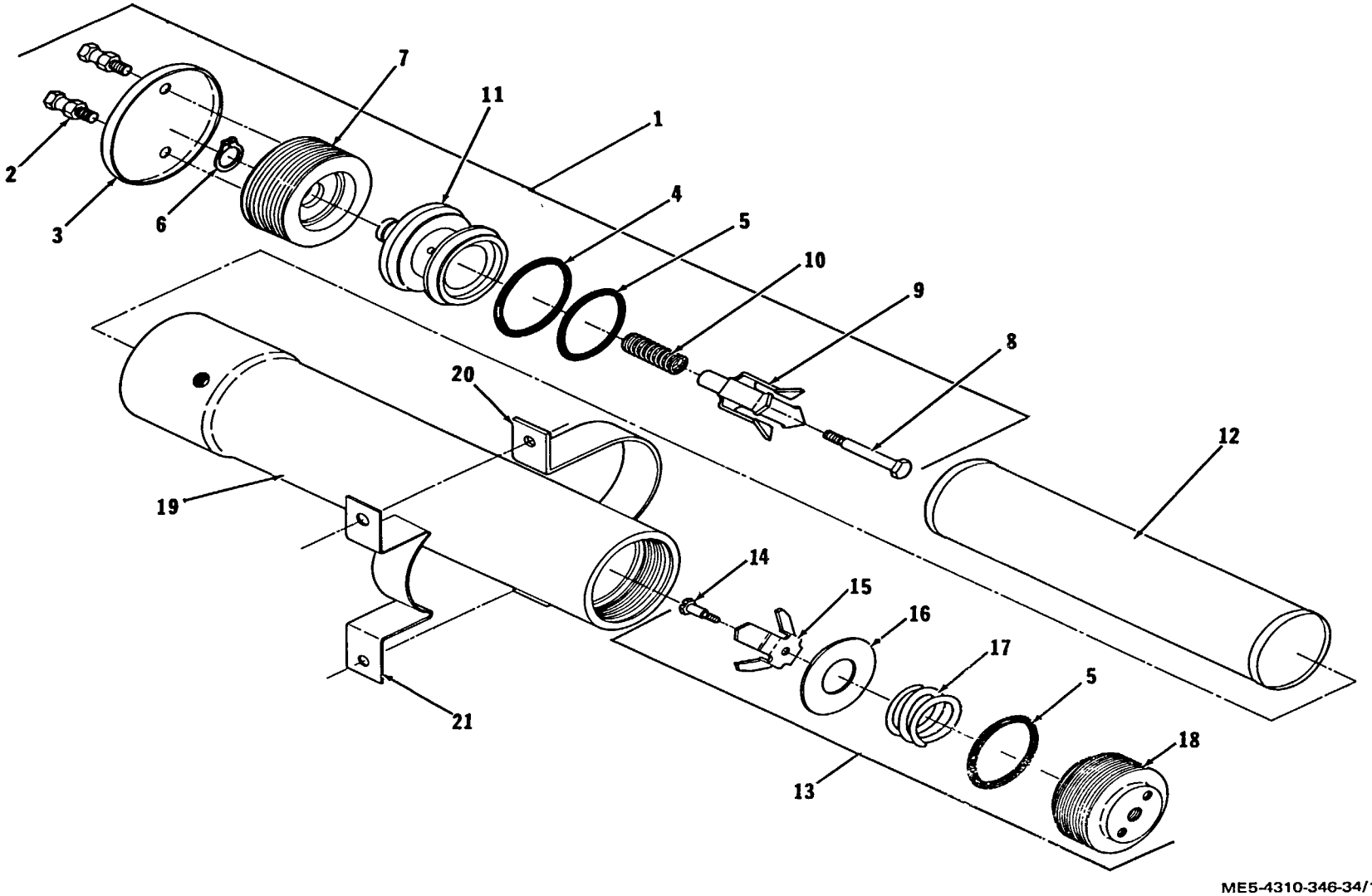


Figure 10-2. Dehydrator (assembly).

b. Cleaning, Inspection and Repair.

(1) Inspect the pans for damaged threads, loose or missing parts, nicks, burrs or any other dam age.

(2) Clean all metal parts in a suitable dry cleaning solvent, Fed Spec P-D-680, and dry thoroughly.

(3) Repair any damaged threads if possible by chasing threads with a standard tap or die. Sharpen perforator cutting edges with a file or grinder. Remove and discard preformed packings and cartridge and install new parts, To disconnect ground lead 141) from the heater housing (42), remove nut (7) and washer (8). Replace any parts damaged beyond repair.

c. Assembly and Installation.

(1) Refer to figure 10-2 and assemble the dehydrator components in reverse order of disassembly. Refer to TM 5-4310-346-12 for installing the cartridge and head assembly.

(2} Refer to paragraph 2-17 and figure 2-8 and install the dehydrators in reverse order of removal.

CHAPTER 11
REPAIR OF HEATER ASSEMBLY AND COMPONENTS

Section I. HEATER

11-1. General

The heater assembly and components has an adapter with flexible ducting attached which transfers heat to the battery box, the compressor oil pan and engine oil pan. It is electrically energized and operates with the use of any at. native gasoline as supplied from the fuel system. The integral components fastened to the heater are the fuel control valve, igniter, overheat limit switch, ventilating air blower, combustion air blower, flame detector switch, terminal strip, heater housing. heat exchanger and guard assembly.

11-2. Heater Assembly (Fig. 11-1)

a. Removal and Disassembly.

(1) To remove the heater assembly, refer to paragraph 2-15, figure 2-5 and remove heater, adapter and accessories.

(2) To disassemble the heater assembly and components (Fig. 11-1), remove the guard assembly (1) from the heater by turning the two Dzus fasteners (2) ¼ turn counterclockwise. If the identification plate (4) is damaged and needs replacing, remove the four rivets (5) securing the identification plate to the guard assembly (1).

(3) Tag and disconnect the ventilating air motor lead on the blower (6) from the terminal No.2 of the terminal strip (36). Loosen three nuts (7) and remove one nut (7) with wire clip (3) securing the blower housing to the case. To remove the blower (6), turn the blower counterclockwise on the heater housing (42) until slots of the blower line up with the studs on the case.

(4) Remove the flexible duct (9) and two clamps (101 securing the duct to the blower (11). To remove nameplates (12) and (13), if damaged, remove six rivets (5) from the heater housing (42).

(5) Tag and disconnect the motor lead on the blower (11) from the No. 6 terminal on the terminal strip (36). Loosen three nuts (14) securing the blower to the heater housing (42). To remove the blower (11), turn counterclockwise and pull the blower away from the heater housing.

(6) To remove the flame detector switch assembly (15), tag and disconnect the five switch leads from the terminal strip screws (16) nos. 2, 3, 4, 6 and 7. Loosen the jam nut (17) on the expansion tube (18) and remove the switch assembly (15) by lifting straight up and away from the heater (43) until the expansion tube clears the heater part

CAUTION

Use care in removing this switch since the quartz rod (19) encased in the expansion tube may be easily broken by twisting or excessive lateral pressure. When installing the switch, be sure that expansion tube does not "bottom" inside the heat exchanger (43). If expansion tube touches bottom, it should be raised approximately 1/8 inch before tightening jam nut.

(7) To remove overheat switch (20), tag and disconnect switch lead wire from terminal strip screw no. 4 and remove two screws (21).

(8) Tag and disconnect shut-off solenoid lead attached to control valve (22) from the switch (20) secured by nut (44) and washer (45). Tag and disconnect shut-off solenoid lead from terminal strip (36) screw No. 5. Loosen compression nut (23) on standpipe until control valve (22) is free, and lift valve off. Remove elbow (24) and union (25) from the control valve (22).

(9) To remove the knit cable (26), standpipe (27) and resistor (28), remove the two screws (21) tapping plate (29) and flange (30) from the heater housing (42). Tag and disconnect resistor lead from the igniter (31) by removing two nuts (32) and disconnect resistor lead from terminal strip (36) screw no. 7. Unscrew the standpipe (27) to remove both the standpipe and resistor (28).

(10) Tag and disconnect igniter ground wire be removing screw (33). To remove the igniter 131) from the igniter pocket, turn the igniter counterclockwise and remove gasket (40).

(11) To remove the receptacle (34), remove four screws (35) and tag and disconnect all lead tires.

(12) To remove the terminal strip (36), remove four screws (37), strip (39), and grommet (38).

(13) A spare igniter (31) is shipped loose with the heater assembly.

(14) Remove the heater housing (42) by removing three screws (21) from the exhaust on the heat exchanger (43) and lift the housing out and over the end of the heat exchanger.

b. Cleaning, Inspection and Repair.

(1) Inspect the heat exchanger for possible damage or leaks. Clean combustion residue from inside walls of igniter housing every 250 hours with a scraping tool. Remove the combustion residue from inside of heat exchanger by soaking heat exchanger in a 20% solution of ammonium acetate at a temperature of 180° F. for a period of 5 to 10 minutes. This is the best method of cleaning the exchanger and will noticeably increase efficiency if the heater has been in use over an extended period of time. Alternate method of cleaning is to pour small shot into heat exchanger and shake vigorously: and, at the same time, tap exchanger lightly with a rawhide mallet. This will loosen most of residue and allow it to be blown out with compressed air.

CAUTION

Remove all shot after performing this operation.

(2) Replace the igniter at each repair period.

(3) Remove the three screws from the back of the fuel control valve and clean orifice plate by blowing on it. If valve malfunctions, replace with new unit.

(4) Blower wheels and housing may be washed in gasoline. if dirty. inspect fan blades for possible damage. Both motors are of ball bearing type and will require no lubrication since they are factory packed with special low temperature grease.

(5) Inspect condition of rubber grommet on heater and clean inside of housing with wire brush or kerosene.

(6) Remove detector switch and inspect quartz rod. Replace if necessary. If the quartz rod is not broken. loosen two switch mounting screws. Back off adjusting screw until the switch "clicks." Turn adjusting screw in until the switch "clicks" again and then turn in an additional ¾ turn from the click point. Switch is now correctly adjusted.

NOTE

Click is very faint and close attention must be paid while attempting this adjustment.

Tighten two switch mounting screws to hold switch in proper position.

(7) Visually inspect the overheat switch for damage and clean by sliding piece of plain paper between the contacts. Do not attempt to bend blade or contact arm.

(8) Inspect hose and ducts for damage, air leaks, frayed ends, etc. Clean inside of hose by blowing out with compressed air.

(9) Inspect wires for cracks and worn insulation. Inspect terminal strip for possible damage. Inspect receptacle for possible damage. If any components are damaged beyond repair, replace with new components.

(10) Repair any damaged threads with a standard tap or die, splice damaged wires, straighten bent terminals and tubing, patch heater flexible duct and replace those components dam aged beyond repair with new parts. Replace all preformed packing.

(11) Test continuity of electrical components with ohmmeter.

c. Assembly and Installation

(1) Refer to figure 11-1 and assemble the heater assembly in reverse order of disassembly.

(2) Refer to paragraph 2-15 figure 2-5 and install heater assembly, adapter and accessories in reverse order of removal.

Key to Fig. 11-1

1. Guard assembly
2. Dzus fasteners
3. Wire clip
4. Identification plate
5. Rivet
6. Ventilating air blower
7. Nut
8. Washer
9. Flexible duct
10. Clamp
11. Blower
12. Nameplate
13. Nameplate
14. Nut
15. Flame detector switch
16. Screw
17. Nut
18. Expansion tube
19. Quartz rod
20. Overheat switch
21. Screw
22. Fuel control valve
23. Compression nut
24. Elbow
25. Union
26. Knit cable
27. Standpipe
28. Resistor
29. Tapping plate
30. Flange
31. Igniter
32. Nut
33. Screw
34. Receptacle
35. Screw
36. Terminal strip
37. Screw
38. Grommet
39. Strip
40. Gasket
41. Ground lead
42. Heater housing
43. Heat exchanger
44. Nut
45. Washer

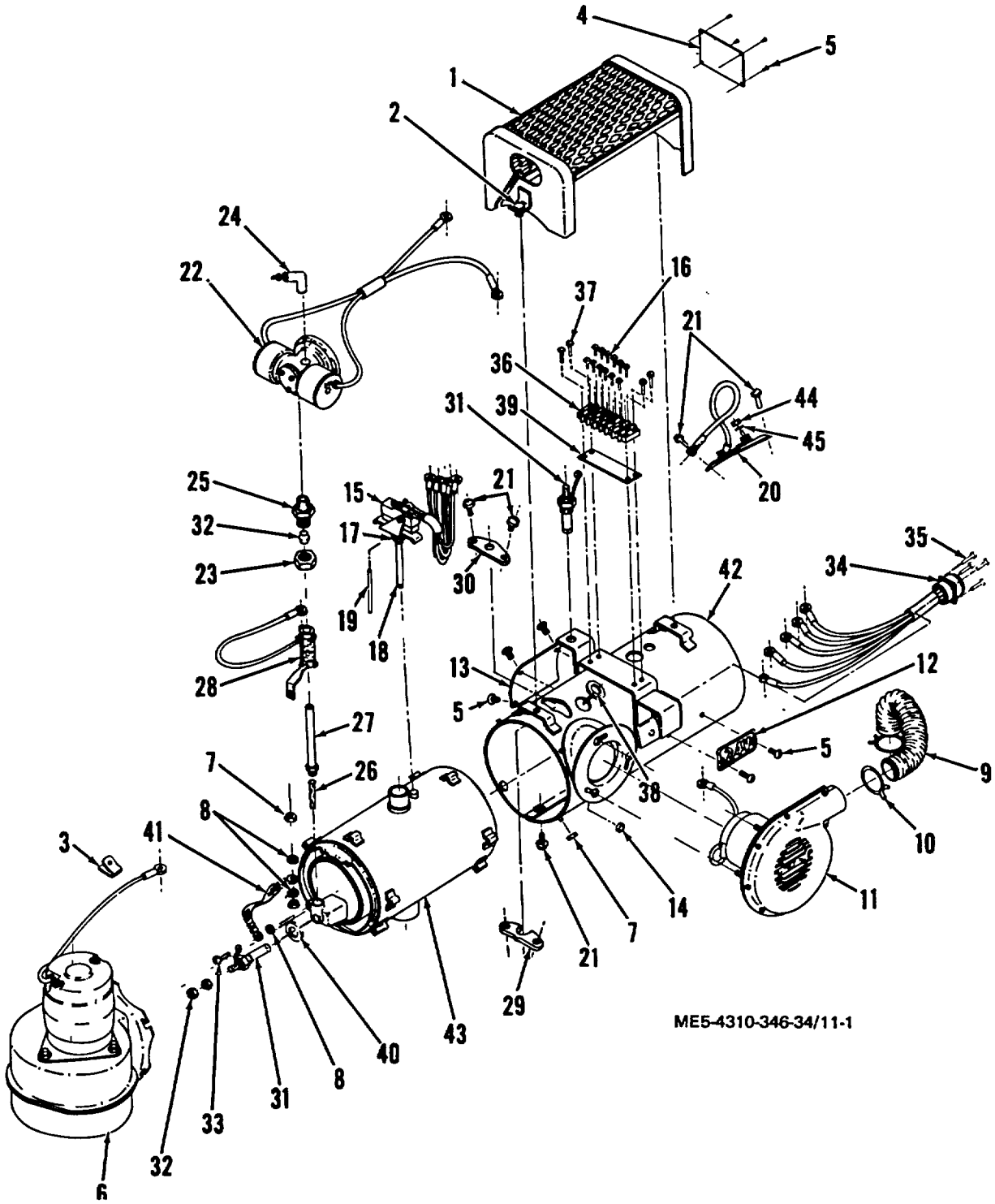


Figure 11-1. Heater assembly and components.

CHAPTER 12

REPAIR OF CHASSIS AND WHEEL

ASSEMBLY COMPONENTS

Section I. FRONT AXLE ASSEMBLY, DRAWBAR AND PINTLE

12-1. Genera

The front axle assembly located at the front of the air compressor unit consists of the axle, tie rods, spindle and knuckle and steering arm is of steel construction. The drawbar is fastened to the steering arm of the front axle assembly and is hooked to a prime mover for traveling. The pintle is fastened to the rear of the chassis and is used to hook any caisson or cart to the air compressor traveling.

12-2. Drawbar,Front Axle Assembly and Pintle

a. Removal and Disassembly

(1) Refer to paragraph 2-20a (4) figure 2-9 and remove and disassemble the drawbar.

(2) Refer to paragraph 2-20 a (5) figure 2-9 to remove and disassemble the front axle assembly.

(3) Refer to paragraph 2-20a (8) figure 2-9 to remove the pintle.

b. Cleaning, Inspection and Repair

(1) Refer to paragraph 2-20 c (1), (2) and (3) to clean and inspect the components.

(2) To repair the drawbar, if bent, try to straighten. If damage is beyond repair, replace the drawbar with a new drawbar. Repair the drawbar in the most convenient manner by welding. Sandpaper, prime coat and paint any damaged surfaces.

(3) Repair the front axle assembly as conveniently as possible by straightening tie bars and axle. If damage is beyond repair, replace the necessary parts with new parts.

(4) Repair any minor damage of the pintle by brazing. Sandpaper, prime coat and paint any blemished surface. The pintle is a military standard design item and would be more advantageous to replace than repair.

c. Assembly and Installation.

(1) Refer to figure 2-9 to assemble and install the front axle assembly, drawbar and pintle in reverse order of removal and disassembly.

(2) Lubricate in accordance with lubrication order LO 5-4310-346-12.

Section II. TIRES AND TUBES

12-3. General

Pneumatic tires and tubes, mounted on the wheel assemblies, provide necessary shock absorption for the compressor assembly. The tires and tubes are inflated to 45 lbs. of air.

12-4. Tires and Tubes

a. Removal. Refer to TM 5-4310-346-12 for removal of tires and tubes.

b. Cleaning, Inspection and Repair. Inspect tire and tube visually for damage. Repair a defective tire or tube as directed by TM 9-2610-200-34 or replace an unrepairable tire or tube.

c. Installation. Refer to TM 5-4310-346-12 and install tire and tube.

APPENDIX A
REFERENCES

A-1. Fire Protection

TB 5-4200-200-10	Hand Portable Fire Extinguishers Approved for Army Users
TB 5-4200-201-10	Hand Portable Fire Extinguishers for Rail, Marine, Amphibious, and Off-Road Equipment

A-2. Lubrication

C9100-IL	Identification List for Fuels, Lubricants, Oils and Waxes
LO 5-2805-259-12	Lubrication Order for Engine, Gasoline, 20HP, Military Standard Models (Model 4A084-2 and 4A084)
LO 5-4310-346-12	Lubrication Order for Compressor, Air, Reciprocating, Power Driven 15, CFM, 3500 PSI, 4 Wheel Mounted, Winterized (Steward-Warner Model 12021A)
TB 703-1	Specification List of Standard Liquid Fuels, Lubricants, Preservatives, and Related Products Authorized for Use by U.S. Army
TB 55-6650-300-15	Spectrometric Oil Analysis

A-3. Painting and Marking

TB 746-1	Color and Marking of Military Vehicles, Construction Equipment, and Materials Handling Equipment
TM 9-213	Painting Instructions for Field Use

A-4. Cleaning

C6800-IL	Chemicals and Chemical Products
SB 725-7930-1	Issue of Supplies and Equipment Engineering Practices Study of CONUS and Overseas Installation Requirements for Hard and Soft Water Cleaning Compounds.
TM 38-230-1	Preservation, Packaging, and Packing of Military Supplies and Equipment, Preservation and Packaging (Volume 1) (DSAM 4145.2/NAVSUP PUB 502/AFP 71-15/MCO 4030.31A)

A-5. Maintenance

CTA 50-970	Expendable Items (Except Medical Class V, Repair Parts and Heraldic Items.
TB ORD 1031	Purging, Cleaning, Inspecting and Coating Interior of Steel Tanks and Equipment on Tactical and Commercial Type Fuel Tank Truck and Trailers.
TB 742-93-1	Inspection and Test of Air and Other Gas Compressors
TB 750-97-43	Maintenance Expenditure Limits for FSC Group 43, FSC Classes 4310,4320 and 4330
TB 750-255	Uniform Policy for Hourmeters and Odometers on Overhaul or Repaired USATROSCOM End Items of Equipment.
TM 5-764	Electric Motor and Generator Repair
TM 9-2610-200-34	Direct Support and General Support Maintenance Manual (Including depot Rebuild) Pneumatic Ties Tires and Inner Tubes
TM 9-6140-200-14	Operator, Organizational, Direct Support Maintenance Manual: Storage Batteries Lead-Acid Type.
TM 11-483	Radio Interference Suppression
TM 38-750	The Army Maintenance Management System (TAMMS)
TM 5-4310-346-34P	Direct and General Support Maintenance Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools). For Compressor, Air Reciprocating, Power Driven 15 CFM, 3500 PSI 4-Wheel Mounted Winterized (Steward-Warner Model 12021A FSN 4310-231-2331.
TM 5-2805-259-14	Operator, Organizational Direct Support and General Support Maintenance Manual: Engine Gasoline, 20 HP; Military Standard Models (Model 4A084-2 and 4A084-3)
TM 5-2805-259-24P	Organizational, Direct and General Support Maintenance Repair Parts and Special Tools Lists: Engine, Gasoline, 20 HP; Military Standard Model (Model 4A084-2 and 4A084-3) FSN 2805-872-5972.
TM 5-4310-346-12	Operator and Organizational Maintenance Manual: For Compressor, Air, Reciprocating, Power Driven 15 CFM, 3500 PSI, 4 Wheel Mounted, Winterized (Stewart-Warner Model 12021A) FSN 4310-231-5513.

A-6. Shipment and Storage

TB 750-97-2	Preservation of TROSCOM Mechanical Equipment for Shipment and Storage
TM 740-90-1	Administrative Storage of Equipment

A-7. Destruction to Prevent Enemy Use

TB 750-244-3	Procedures for Destruction of Equipment to Prevent Enemy Use (Mobility Equipment Command)

A-8. Operation

TM 5-331C	Utilization of Engineer Construction Equipment Volume Rock Crushers, Air Compressors, and Penumatic Tools

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