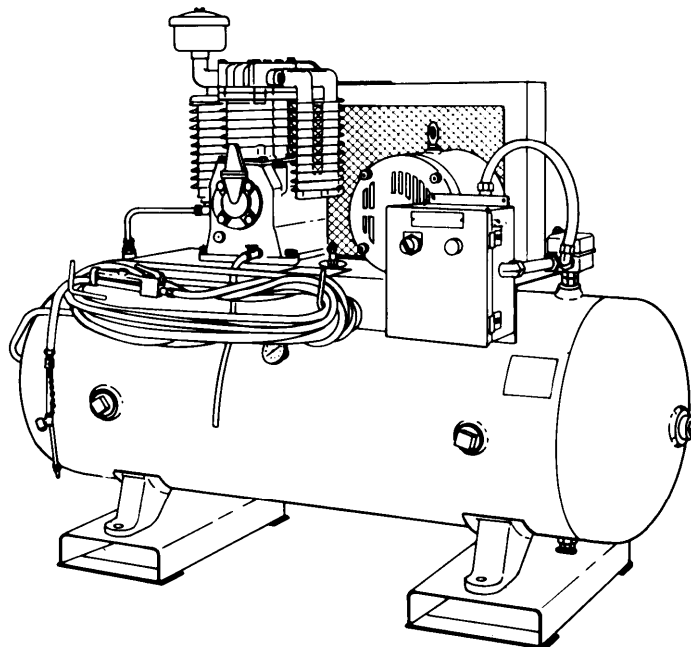


**OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT, AND  
GENERAL SUPPORT  
MAINTENANCE MANUAL**

**COMPRESSOR UNIT, RECIPROCATING,  
15 CFM, 175 PSI, ELECTRIC  
MOTOR DRIVEN  
MODEL RI22RAAB, PART NO. 84950  
(NSN 4310-01-139-4815)**



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**WARNING**

Dry cleaning solvent, Federal Specification P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near an open flame or excessive heat. Flash point of the solvent is 100°F - 138°F (38°C - 59°C),

Electricity is dangerous. Before performing any maintenance or adjustments, be sure the electrical power is turned off. Never depend on the ON-OFF switch. Turn power off at the source.

When cleaning electrical parts with trichloroethane, provide adequate ventilation. Avoid prolonged breathing of vapors and minimize contact with skin.

When cleaning with compressed air, nozzle pressure shall not exceed 30 psi (2.11 kg/cm<sup>2</sup>). Eye protection is required.

A forklift, or other lifting device, used for unloading or movement must be capable of lifting a minimum of 1000 pounds (454 kgs).

Drain air system before performing any maintenance by opening air receiver drain cock.



## TECHNICAL MANUAL

TM 5-4310-375-14

**HEADQUARTERS**  
**DEPARTMENT OF THE ARMY**  
**WASHINGTON, D. C., 9 November 1983**

**OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT, AND  
 GENERAL SUPPORT  
 MAINTENANCE MANUAL  
 FOR  
 COMPRESSOR UNIT, RECIPROCATING,  
 15 CFM, 175 PSI, ELECTRIC  
 MOTOR DRIVEN  
 MODEL RI22RAAB, PART NO. 84950  
 (NSN 4310-01-139-4815)**

**REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS**

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, US Army Troop Support and Aviation Materiel Readiness Command, ATTN: DRSTS-MPSD, 4300 Goodfellow Blvd., St. Louis, MO 63120. A reply will be furnished directly to you.

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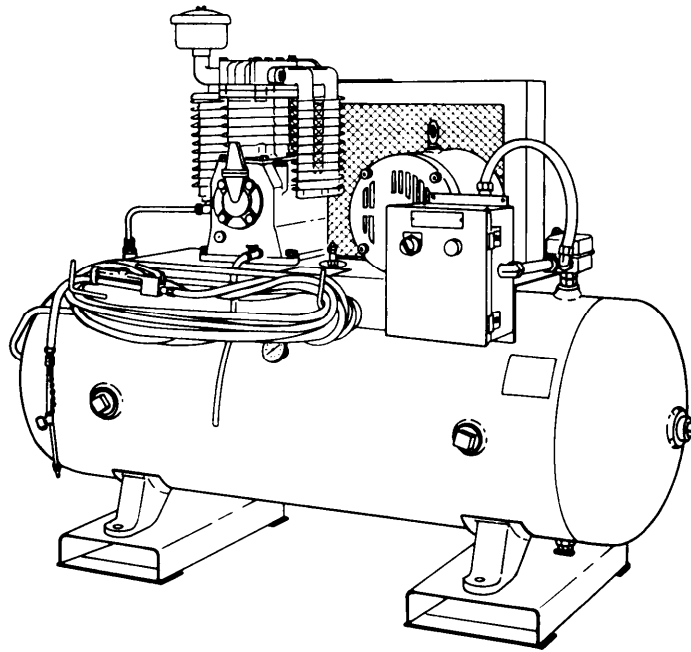
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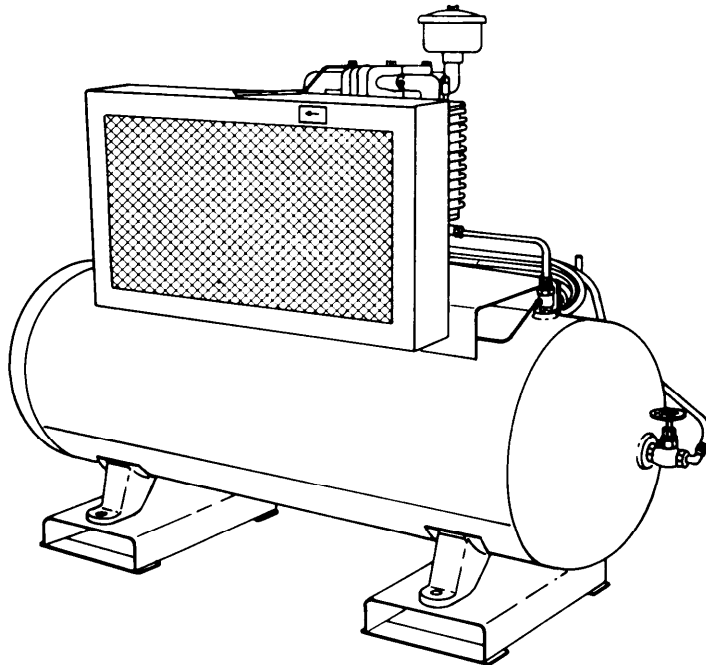
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THREE-QUARTER FRONT VIEW



THREE-QUARTER REAR VIEW

*Figure 1-1. Air compressor unit*



CHAPTER 1  
INTRODUCTION

Section I. GENERAL INFORMATION

**1-1. Scope.** This manual contains operator, organizational, direct support, and general support maintenance for the Air Compressor Unit, Model RI22RAAB. This unit is manufactured by Davey Compressor Company, Cincinnati, Ohio 45242 (FSCM 16004) under Part Number 84950. The air compressor is of reciprocating design, electric motor driven, tank mounted. Refer to figure 1-1 for identifying views. Output capacity of the unit is 15 cubic feet per minute (cfm) at 175 pounds per square inch (psi) [0.425 cubic meters per minute (m<sup>3</sup>/min) at 12.3 kilograms per square centimeter (kgs/cm<sup>2</sup>)]. The compressors are intended for use as a source of compressed air in normal operations conducted at filling stations and vehicle maintenance shops.

**1-2. Maintenance forms and records.** Department of the Army forms and procedures used for equipment maintenance will be those prescribed by TM 38-750, The Army Maintenance Management System (TAMMS).

**1-3. Hand receipt (-HR) manuals.** This manual has a companion document with a TM number followed by “-HR” (which stands for Hand Receipt). The TM 5-4310-375-14-HR consists of preprinted hand receipts (DA Form 2062) that list end item related equipment (i.e., COEI, BII, and AAL) you must account for. As an aid to property accountability, additional -HR manuals may be requisitioned from the following source in accordance with procedures in Chapter 3, AR310-2:

US Army Publications Center  
2800 Eastern Blvd.  
Baltimore, MD 21220

**1-4. Reporting equipment improvement recommendations (EIR's).** If your air compressor unit needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on an SF 368 (Quality Deficiency Report). Mail it to us at: Commander, US Army Troop Support and Aviation Materiel Readiness Command, ATTN: DRSTS-MPSD, 4300 Goodfellow Blvd., St. Louis, MO 63120. We'll send you a reply.

**1-5. Warranty information.** The air compressor unit, Models RI22RAAB, is warranted by Davey Compressor Company for 12 months or 1000 hours, whichever comes first. Report all defects in material or workmanship to your supervisor, who will take appropriate action through your organizational maintenance shop.

**1-6. Nomenclature cross-reference list.** The listing below includes nomenclature cross-reference used throughout this manual.

Common Name	Official Nomenclature
Air compressor	Compressor Unit, Reciprocating, 15 CFM (0.425 m <sup>3</sup> /min), 175 PSI (12.3 kgs/cm <sup>2</sup> ), Electric Motor Driven, Tank Mounted.
Motor	Motor Assembly, Electric, 7-1/2 HP, 1725 RPM, 213T Frame, 230/460 Volts, 3 Phase, 60 Hertz.

**1-7. List of abbreviations.** Abbreviations used in this manual are in accordance with Military Standard, MIL-STD-12, and are defined at their first appearance in the manual.

1-8. **Glossary.** The glossary of terms used in this manual are listed below.

- Cut-in . . . . . Motor starts, compressor starts compressing air.
- Cut-out . . . . . Motor stops, compressor stops compressing air.
- Equipment . . . . . Compressor Unit, Reciprocating, Electric Motor Driven, Tank Mounted.
- Front . . . . . Side of the unit facing the motor control box.
- Left end . . . . . Left-hand end of the unit facing the front.
- Load . . . . . See “Cut-in” above.
- Manufacturer . . . . . Davey Compressor Company, Cincinnati, OH 45242 (FSCM 16004).
- Rear . . . . . Side of unit facing the belt guard.
- Right end . . . . . Right-hand end of the unit facing the motor control box.
- Unit . . . . . See “Equipment” above.
- Unload . . . . . See “Cut-out” above.

Section II. EQUIPMENT DESCRIPTION

1-9. **Equipment characteristics, capabilities, and features.**

a. **Equipment purpose.** The purpose of the unit is to provide a source of compressed air for normal operations conducted at filling stations and vehicle maintenance shops.

b. **Characteristics.**

- (1) Electric motor, belt drive
- (2) Reciprocating air compressor, two-stage
- (3) Air receiver (tank) mounted

c. **Capabilities and features.**

- (1) 15 CFM (0.425 m<sup>3</sup>/min) of compressed air
- (2) 175 PSI (12.3 kgs/cm<sup>2</sup>) rated; 200 PSI (14.1 kgs/cm<sup>2</sup>) maximum
- (3) 80 Gallon (302.8 liters) receiver tank capacity
- (4) Two (2) forklift tine openings for lifting
- (5) Adjustable pressure switch
- (6) Magnetically operated starter
- (7) Manual reset of overload protective device

1-10. **Location and description of major components.** Refer to figure 2-1 for location and description of major components.

1-11. **Differences between models.** This manual covers only the Davey Compressor Company Model RI22RAAB, Part Number 84950, compressor unit. No known differences exist for model covered herein.

**1-12. Equipment data.** Numerical and other specifications applicable to this air compressor unit needed by the operator for operation and maintenance are listed below.

#### *Dimensions*

Length . . . . .	70 inches (177.8 cm)
Width . . . . .	27 inches (68.6 cm)
Height . . . . .	51 inches (129.5 cm)
Shipping cube . . . . .	77 ft <sup>3</sup> (2.18 m <sup>3</sup> )

#### *Compressor unit*

Manufacturer (FSCM 16004) . . . . .	Davey Compressor Company
Model . . . . .	RI22RAAB
Part number . . . . .	84950
Output . . . . .	15 cfm at 175 psi (0.425 m <sup>3</sup> /min at 12.3 kgs/cm <sup>2</sup> )

#### *Electric motor*

Manufacturer (FSCM 05472) . . . . .	Baldor Electric Co.
Catalog number . . . . .	M3311T
Spec number . . . . .	37B01X54
Insulation class . . . . .	B
Code . . . . .	J
Design . . . . .	B
Hertz . . . . .	60
Phase . . . . .	3
Horsepower . . . . .	7.5
Volts . . . . .	230
Duty . . . . .	Continuous
Rated speed . . . . .	1725 rpm
Frame size . . . . .	213T
Temperature rise . . . . .	40°C (104°F)
Amperes at 230 volts . . . . .	22
Service factor . . . . .	1.15

#### *Compressor*

Manufacturer (FSCM 62106) . . . . .	American Imported Machinery Co., Inc.
Model . . . . .	T35
Type . . . . .	Two-stage, reciprocating

#### *Compressor inlet air filter*

Manufacturer (FSCM 62106) . . . . .	American Imported Machinery Co., Inc.
Type . . . . .	Dry
Element . . . . .	Cleanable

#### *Magnetic starter switch assembly*

Manufacturer (FSCM 15605) . . . . .	Cutler-Hammer
Part Number . . . . .	A11CNOB

Operating coil . . . . . 9-1887-2  
 Heater coils (3) . . . . . H-1043

**Pressure switch**

Manufacturer (FSCM 23826) . . . . . Furnas Electric Company  
 Type . . . . . 69HAU1  
 Maximum pressure . . . . . 250 psi (17.58 kgs/cm<sup>2</sup>)  
 Minimum differential . . . . . 30 psi (2.11 kgs/cm<sup>2</sup>)

**Capacities**

Compressor crankcase . . . . . 1-1/2 quarts (1.4 liters)  
 Air receiver tank . . . . . 80 gallons (302.8 liters)/10.7 ft<sup>3</sup> (0.30 m<sup>3</sup>)  
 Working pressure of receiver tank . . . . . 200 psi (14.1 kgs/cm<sup>2</sup>)

**Air hose**

Size . . . . . 5/16 in. ID x 50 ft lg (7.9 mm ID x 15.2 m lg)

**Weight**

Net weight . . . . . 520 pounds (235.8 kgs)  
 Shipping weight . . . . . 595 pounds (269.9 kgs)

### Section III. TECHNICAL PRINCIPLES OF OPERATION

**1-13. Technical principles of operation.** The unit has few operating controls and indicators and is simple cooperate. Refer to figure 2-1 for the description and use of operator's controls and indicators.

**1-14. Wiring diagram.** Refer to figure 1-2 for schematic unit wiring diagram.

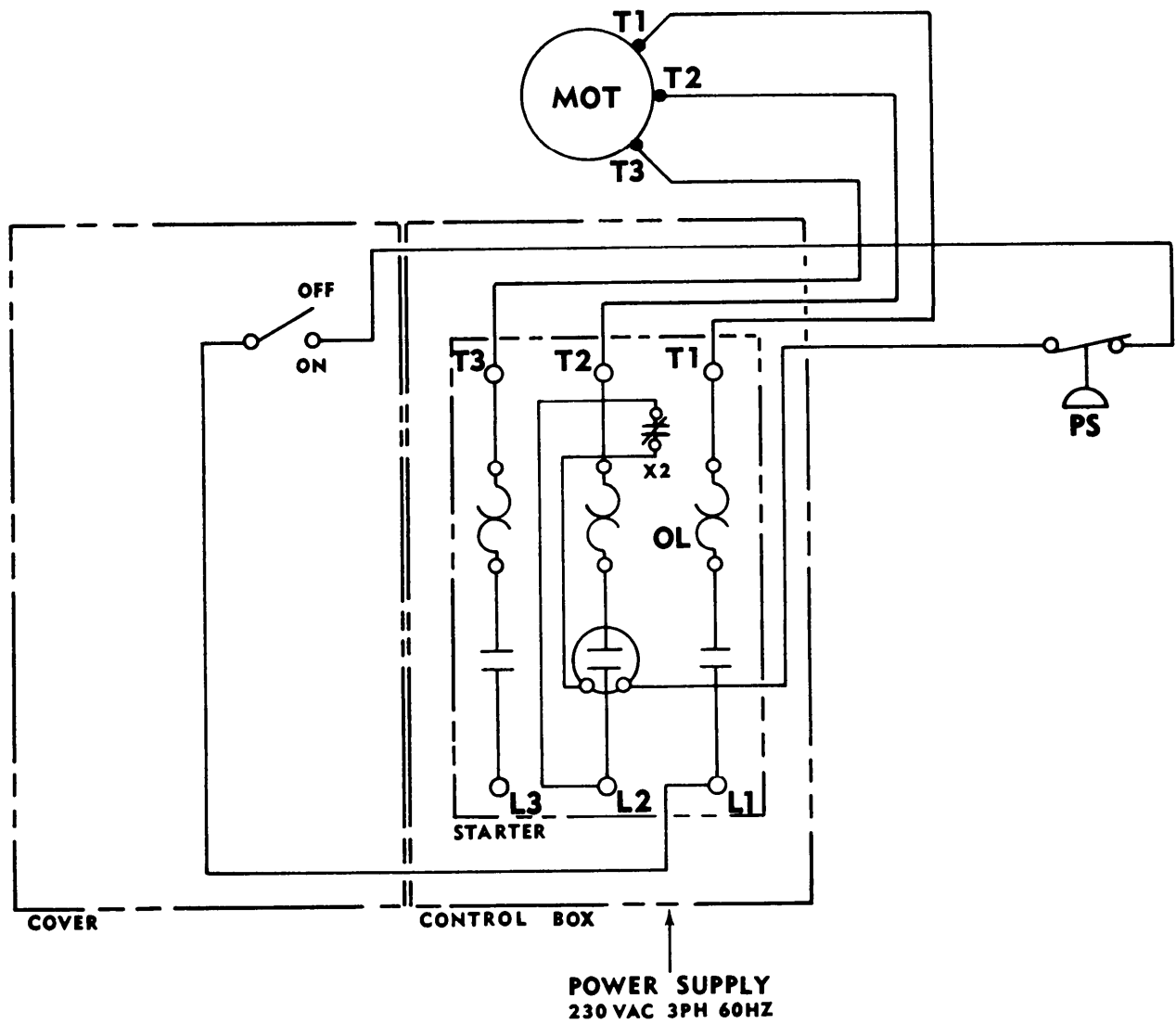


Figure 1-2. Schematic unit wiring diagram



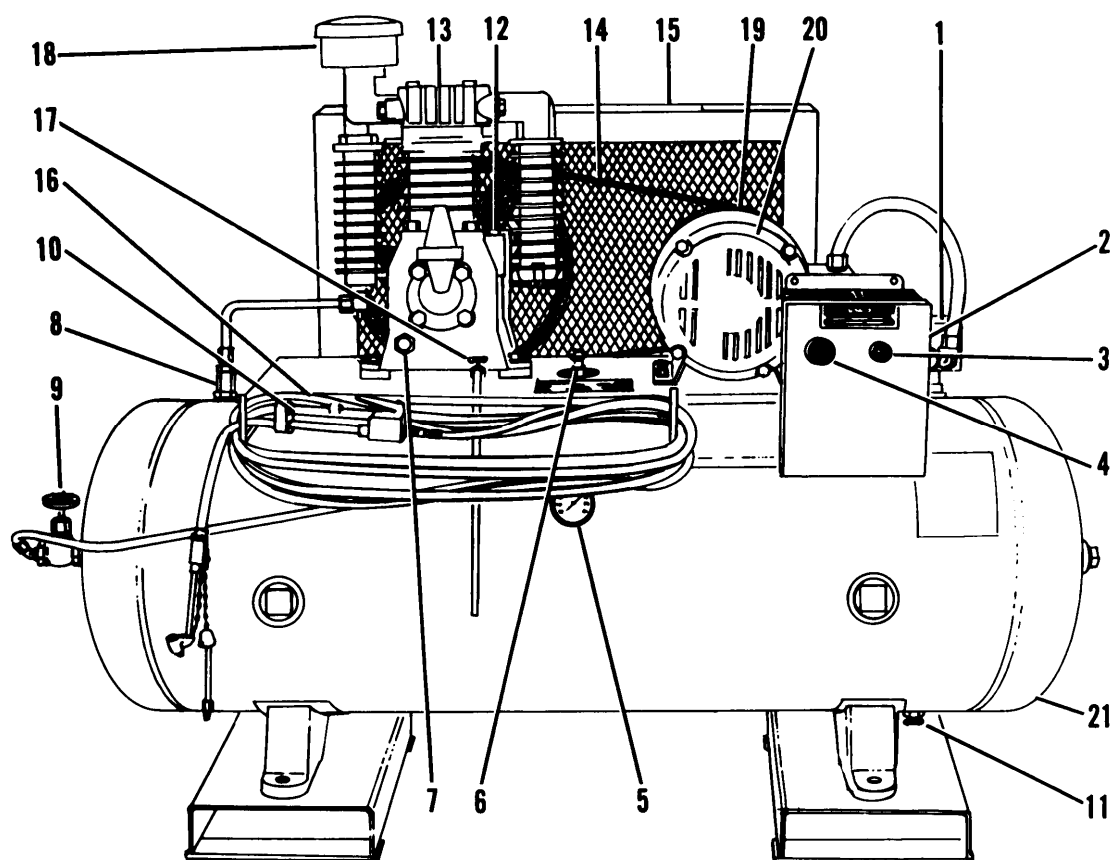
## CHAPTER 2

### OPERATING INSTRUCTIONS

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

2-1. **Operator's controls.** Refer to figure 2-1 for description and use of operator's controls.

2-2. **Operating indicators.** Refer to figure 2-1 for description and use of operator's indicators.



Legend for fig 2-1:

- |                          |                         |                       |
|--------------------------|-------------------------|-----------------------|
| 1. Pressure switch       | 8. Check valve          | 15. Belt guard        |
| 2. Motor control box     | 9. Globe valve          | 16. Air service hose  |
| 3. Reset button          | 10. Inflator gauge      | 17. Oil drain cock    |
| 4. ON-OFF Switch         | 11. Receiver drain cock | 18. Inlet air filter  |
| 5. Air pressure gauge    | 12. Oil filler cap      | 19. Drive pulley      |
| 6. Safety valve          | 13. Air compressor      | 20. Motor             |
| 7. Oil level sight gauge | 14. Drive belts         | 21. Air receiver tank |

*Figure 2-1. Description and use of operator's controls and indicators*

Legend for fig 2-1:

KEY	CONTROL OR INDICATOR	FUNCTION
1	Pressure switch	Regulates motor starting and stopping in relation to air pressure in receiver tank. Has an unloader feature which relieves pressure in compressor outlet line.
2	Motor control box	Houses the motor control magnetic contactor, reset button, and ON-OFF switch.
3	Reset button	Used to manually reset contactor when low voltage has caused open circuit.
4	ON-OFF switch	Used to turn unit ON or OFF.
5	Air Pressure gauge	Indicates pressure of air in receiver tank.
6	Safety valve	Used to protect unit from over-pressure.
7	Oil level sight gauge	Indicates level of oil in air compressor.
8	Check valve	Allows air to flow into receiver tank and prevents back flow from tank.
9	Globe valve	Used to manually control flow of air from receiver tank to service hose.
10	Inflator gauge	Used to attach to tires or other systems. Lever controls flow of air and gauge indicates pressure in serviced item.
11	Receiver drain cock	Used to drain off condensate and relieve receiver tank pressure after shutdown.



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

### 2-3. General PMCS introduction.

- a. Before you operate.* Always keep in mind the CAUTIONS and WARNINGS. Perform your before (B) PMCS.
- b. While you operate.* Always keep in mind the CAUTIONS and WARNINGS. Perform your during (D) PMCS.
- c. After you operate.* Be sure to perform your after (A) PMCS.
- d. If your equipment fails to operate.* Troubleshoot with proper equipment. Report any deficiencies using the proper forms. See TM 38-750.

**2-4. PMCS procedures.** PMCS procedures shown in table 2-1 lists the operator/crew preventive maintenance checks and services in a sequence requiring minimum time and motion to perform. The table column heads and PMCS intervals are explained below.

*a. Item number column.* Checks and services are numbered in chronological order regardless of interval. This column shall be used as a source of item numbers for the "TM Number" column of DA Form 2404, Equipment Inspection and Maintenance Worksheet, in recording results of PMCS.

*b. Interval columns.* The columns headed "B", "D", "A", "W" and "M" contain a dot (•) opposite the appropriate interval check. If a given check is to be performed before operation, a dot appears opposite the check in the "B" column; if the check is to be accomplished during operation the dot appears in the column headed "D". If the same check is made in two or more periods, a dot will appear in each applicable column.

*c. Item to be inspected column.* Items listed in this column are divided into groups indicating the portion of the equipment of which they are a part. Under these groups, the common name of the item to be checked is identified.

*d. Procedures column.* This column contains a brief description of the procedure by which the check is to be performed.

*e. Equipment is not ready/available if: column.* This column contains the criteria that will cause the equipment to be classified as "not ready/available" because of inability to perform its primary task.

*Table 2-1. Operator/Crew Preventive Maintenance Checks and Services***NOTE**

If the equipment must be kept in continuous operation, check and service only those items that can be checked and serviced without disturbing operation. Make the complete checks and services when the equipment can be shut down.

Perform weekly as well as before operations PMCS if:

- (1) You are the assigned operator and have not operated the item since the last weekly.  
 (2) You are operating the item for the first time.

B - Before Operation  
 D - During Operation

A - After Operation  
 W - Weekly

M - Monthly

ITEM NO.	INTERVAL					ITEM TO BE INSPECTED	PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF:
	B	D	A	W	M			
1	●			●		Air compressor (13, figure 2-1)	Check level of oil. Level shall be at center mark on sight gauge (7, figure 2-1). Remove filler cap (12, figure 2-1) and add oil as necessary; use SAE 30 weight oil. Install filler cap (8). Refer to paragraph 3-2 for other lubrication instructions.	Oil level is below center mark on sight gauge.
2	●	●		●		Air compressor (13, figure 2-1)	Visually inspect for oil leakage. Refer to footnotes for leakage class.	Class III leaks are detected.
3					●	Pressure switch and motor control (1, 2, figure 2-1)	Visually inspect for loose, frayed, or burned wires at pressure switch (1, figure 2-1) and motor control (2). Notify Organizational Maintenance if any are found.	Loose, frayed, or burned wires are found.
4	●					Drive belts (14, figure 2-1) and belt guard (15, figure 2-1)	Visually inspect for broken, frayed, or loose drive belts (14, figure 2-1) and loose or damaged belt guard. Notify Organizational Maintenance for adjustment or replacement.	Belts are loose, frayed, or broken.
5		●				Air pressure gauge (5, figure 2-1)	Visually check pressure gauge (5, figure 2-1) while unit is running. The motor should stop when pressure gauge reads 200 psi (14.1 kgs/cm <sup>2</sup> ) +0 - 10 psi (0.70 kgs/cm <sup>2</sup> ) and start again when gauge reads 175 psi (12.3 kgs/cm <sup>2</sup> ) ± 10 psi (0.70 kgs/cm <sup>2</sup> ). If gauge is broken or correct pressures are not indicated, notify Organizational Maintenance	Gauge face is broken or load and unload pressures are not as specified.

Table 2-1. Operator/Crew Preventive Maintenance Checks and Services - Continued

ITEM NO.	INTERVAL					ITEM TO BE INSPECTED	PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF:
	B	D	A	W	M			
							for gauge replacement or pressure switch adjustment.	
6		●		●		Air hose (16, figure 2-1), Inflator gauge (10, figure 2-1), Globe valve (9, figure 2-1)	Check operation of globe valve (9, figure 2-1) and inflator gauge (10). Check air hose (16) for cuts and breaks. Examine all fittings for visual damage. Report all defects to Organizational Maintenance for repair or replacement.	Globe valve sticking, cuts or breaks in air hose, or inflator gauge does not operate.
7			●	●		Receiver drain (11, figure 2-1)	After operation and at least once each week open receiver drain (11, figure 2-1) to drain off accumulated condensate. Check to make certain drain cock closes and seats properly. If drain cock leaks or is damaged, notify Organizational Maintenance for replacement.	
8		●		●		Safety valve (6, figure 2-1)	Check operation of safety valve (6, figure 2-1) by pulling upon ring located on end of valve until air escapes from receiver tank. Release ring; valve should reseal stopping escaping air. If valve does not relieve air pressure in tank, or does not reseal, notify Organizational Maintenance for replacement.	Any malfunction of safety valve.
9				●		Air compressor (13, figure 2-1)	Change oil in air compressor (13, figure 2-1) after the first 100 hours of operation (every 500 hours thereafter). Drain while oil is warm. Place a container below compressor drain, open oil drain cock (17) and remove filler cap (12). When oil flow stops, close oil drain cock (17), Fill compressor with SAE 30 weight oil to level of center mark on sight gauge (7). Capacity of compressor frame is 1-1/2 quarts (1.4 liters). Refer to paragraph 3-2 for lubrication instructions.	

Table 2-1. Operator/Crew Preventive Maintenance Checks and Services - Continued

ITEM NO.	INTERVAL					ITEM TO BE INSPECTED	PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF:
	B	D	A	W	M			
10					●	Inlet air filter (18, figure 2-1)	Remove wing nut from top of inlet air filter (18, figure 2-1), lift off cap and remove element. Clean element in warm water and low-sudsing household type detergent. Rinse thoroughly in clean water and air dry. Inspect element for breaks or rupture; replace if any are found. Install element, cap, and wing nut. If unit is operated in an environment of dust or dirt, clean more often than monthly.	Inlet air filter element is damaged and no replacement is available. Do not operate compressor without element.
11	●				●	Belt guard (15, figure 2-1), pulley (19, figure 2-1), and drive belts (14, figure 2-1)	Inspect belt guard (15, figure 2-1) for loose or missing mounting hardware and for breaks in guard screen. Inspect drive pulley (19) for tightness on motor shaft and for any damage to grooves that would damage drive belts. Check drive belts for proper tension (fig 2-3). Notify Organizational Maintenance for repair or replacement.	Belt guard or drive pulley are damaged in any way.
12					●	Air compressor (13, figure 2-1)	<p>Examine the air compressor (13, figure 2-1) for accumulated oil and dirt on cooling fins of intercooler and aftercooler and fins of cylinder head. Buildup of dirt will reduce cooling effect of flywheel fan blades. Clean the unit as needed.</p> <p><b>WARNING</b></p> <p>Dry cleaning solvent, Fed Spec P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near an open flame or excessive heat. Flash point of solvent is 100° F - 138°F (38°C - 59°C).</p>	

Table 2-1. Operator/Crew Preventive Maintenance Checks and Services - Continued

ITEM NO.	INTERVAL					ITEM TO BE INSPECTED	PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF:
	B	D	A	W	M			
							Clean unit using solvent, Fed Spec P-D-680, or equivalent, to remove oil and dirt from the compressor and dry thoroughly.	

Note: Leakage definitions for operator/crew PMCS are as follows:

- Class I - Seepage of fluid (as indicated by wetness or discoloration) not great enough to form drops.  
Class II - Leakage of fluid great enough to form drops but not enough to cause drops to drip from item being checked/inspected.  
Class III- Leakage of fluid great enough to form drops that fall from the item being checked/inspected.

### CAUTION

Equipment operation is allowable with minor leakages (Class I or II). Of course, you must consider the fluid capacity in the item/system being checked/inspected. When in doubt, notify your supervisor. When operating with Class I or Class II leaks, continue to check fluid levels as required in your PMCS. Class III leaks should be reported to your supervisor or Organizational Maintenance.

## Section III. OPERATION UNDER USUAL CONDITIONS

**2-5. Assembly and preparation for use.** The air compressor is shipped as a completely assembled unit. Openings for forklift tines are provided for lifting unit from transporting equipment.

### WARNING

The forklift, or other lifting device, used for unloading or movement must be capable of lifting a minimum of 1000 pounds (454 kgs).

**a. Unloading.** The unit can be unloaded from transporting carrier by using a lifting device or picked up with a forklift. If lifting device is used, attach lifting cables under receiver tank and use spreader bars as necessary to prevent unit from turning when lifted.

### CAUTION

Do not lift unit by attaching cables to air compressor, motor, or belt guard to prevent component damage.

(1) Remove all blocking and tie downs securing unit to carrier.

(2) Lift unit from carrier and transport to installation sight.

**b. Unpacking and deprocessing.** Remove all crating, blocking, and protective material. Refer to DA Form 2258 (Depreservation Guide for Vehicles and Equipment) furnished with the unit and complete reprocessing as necessary before doing any servicing.

- (1) Refer to Components of End Items List (Appendix C) and check to see if you have received all required items.
- (2) Refer to Additional Authorization List (Appendix D) and check to see if you have received additional items authorized for support of the air compressor.
- (3) Check for and tighten any loose mounting screws and nuts. Visually check for missing parts and for damage that may have occurred during shipment.
- (4) Position unit where there is adequate ventilation and air circulation for cooling. Installation must be at least 2 feet (0.6 meters) from wall to belt guard.
- (5) Secure unit to floor, when required. Refer to figure 2-2 for mounting diagram.

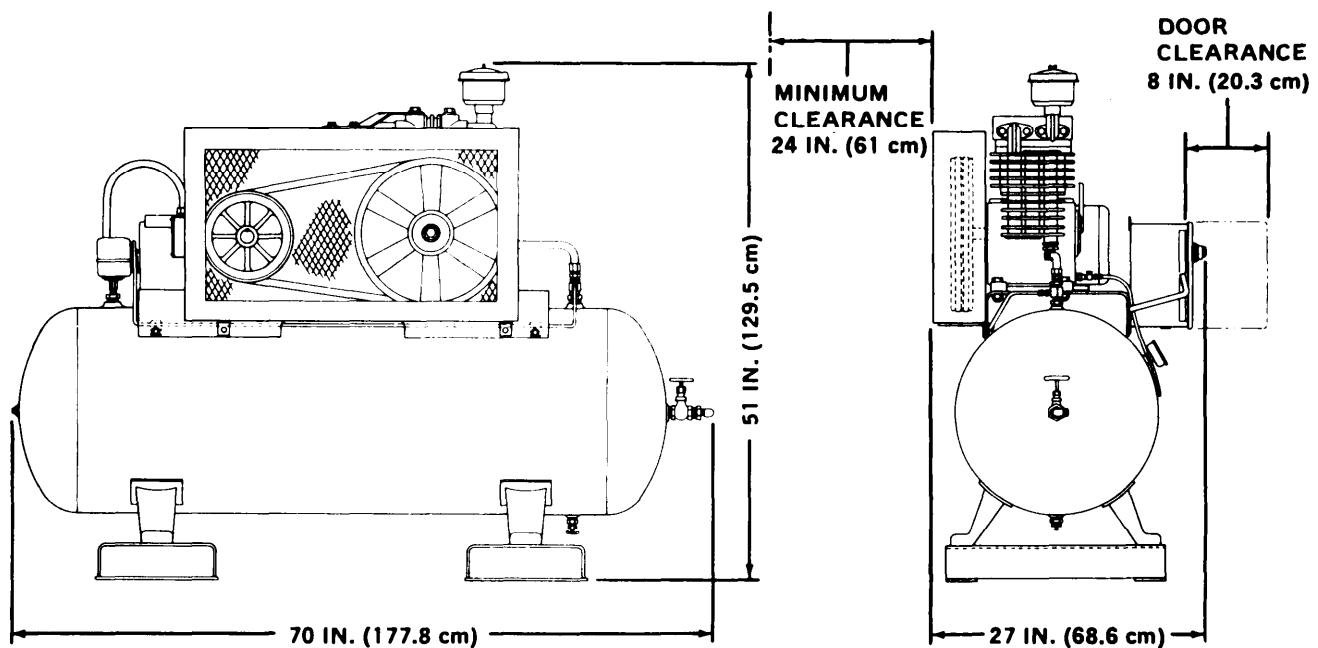


Figure 2-2. Unit floor mounting diagram.

**2-6. Initial adjustments, daily checks, and self test.** Perform all before operation preventive maintenance checks and services (PMCS) shown in table 2-1 and the following:

### WARNING

Electricity is dangerous. Before performing any adjustments or maintenance, be sure the electrical power is turned off. Never depend on the ON-OFF switch, Turn power off at the source.

### NOTE

Refer to paragraph 3-2 for lubrication instructions.

- a.* Turn electrical power source OFF at the source to prevent electrical shock while making initial main power connections. Make certain ON-OFF switch (4, figure 2-1) is in OFF position.
- b.* Open cover of motor control box (2, figure 2-1) and connect main power source leads to motor starter terminals as shown on wiring diagram, figure 1-2. Close cover of motor control box (2, figure 2-1). Press reset button (3) to make certain relay is not tripped.
- c.* The unit was tested by the manufacturer prior to shipment; therefore, no adjustment of pressure switch (1, figure 2-1) is necessary.
- d.* Refer to figure 2-3 and adjust compressor drive belt tension.
- e.* Turn main power source ON.

- STEP 1. UNSCREW AND REMOVE CYLINDER HEAD BOLT AND WASHER ATTACHING GUARD TOP BRACE.
- STEP 2. UNSCREW AND REMOVE FOUR SCREWS ATTACHING BELT GUARD TO BASE. LIFT OFF BELT GUARD.
- STEP 3. LOOSEN FOUR LOCKNUTS AND SCREWS ATTACHING MOTOR TO AIR RECEIVER SADDLE. MOVE MOTOR AWAY FROM COMPRESSOR TO TIGHTEN BELT TENSION. TIGHTEN FOUR LOCKNUTS AND SCREWS SECURING MOTOR TO SADDLE.
- NOTE: TENSION IS CORRECT WHEN DEFLECTION OF BELTS IS APPROXIMATELY 1/2 INCH (12.7 MM) WHEN PRESSED MID WAY BETWEEN PULLEYS.
- STEP 4. USE A SUITABLE STRAIGHT EDGE PLACED AGAINST FACES OF PULLEYS, WITH 3/16 INCH (4.8 MM) THICK SPACER BLOCK ACROSS MOTOR PULLEY, TO ALIGN PULLEYS.
- STEP 5. LOOSEN MOTOR ATTACHING LOCKNUTS AND ADJUST PULLEY ALIGNMENT AS NECESSARY. TIGHTEN LOCKNUTS SECURING MOTOR TO RECEIVER SADDLE.
- STEP 6. PLACE BELT GUARD IN POSITION ON BASE AND SECURE WITH FOUR SCREWS.
- STEP 7. ATTACH GUARD TOP BRACE TO CYLINDER HEAD WITH WASHER AND BOLT REMOVED IN STEP 1. TORQUE CYLINDER HEAD BOLT TO 30-33 FT-LBS (4.1 - 4.6 KGS-M).



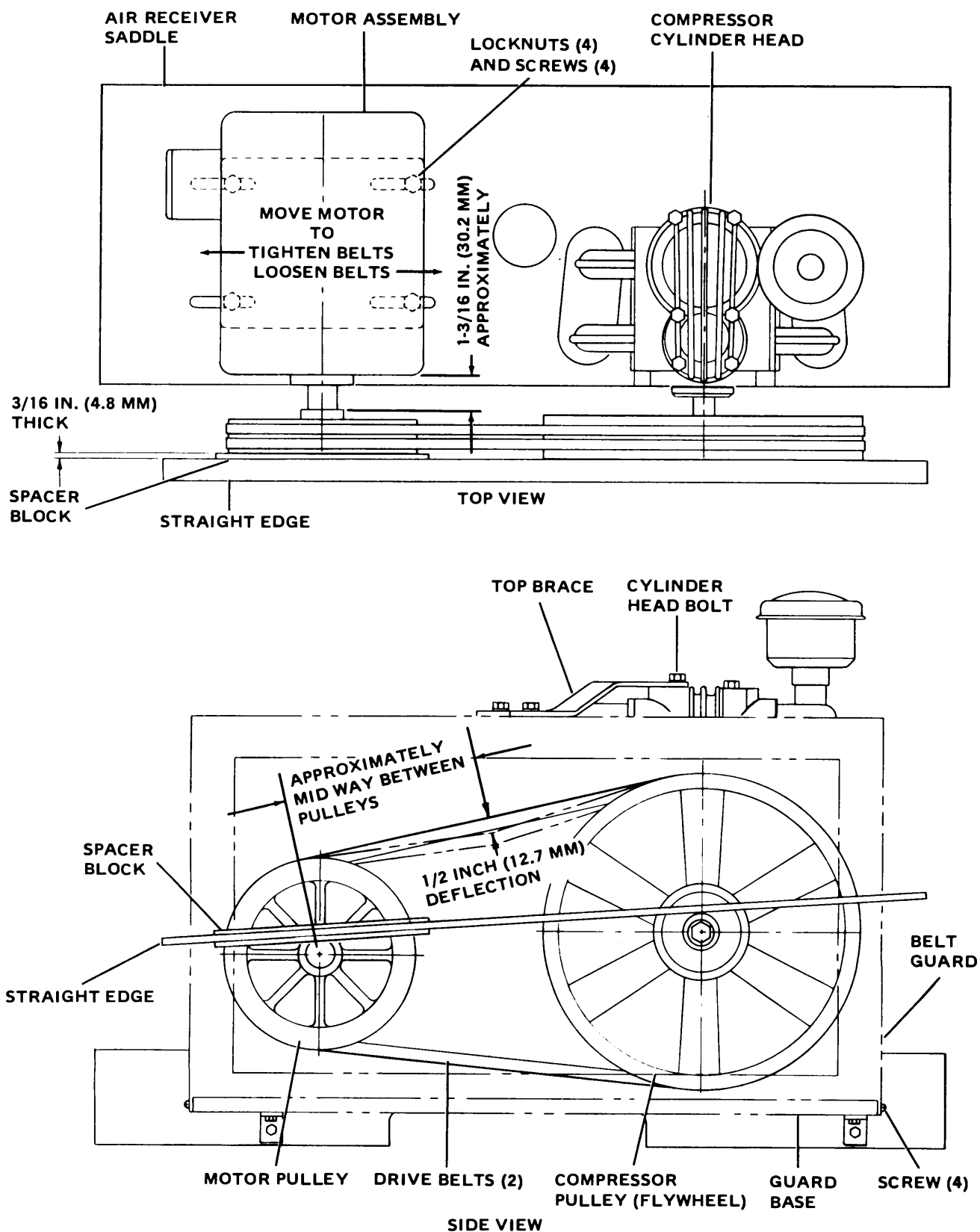


Figure 2-3. Compressor drive belt tension adjustment.

**2-7. Operating procedure.** The following steps are to be followed in sequence for proper operation under normal conditions.

***a. Starting***

(1) Inspect the electric motor to make sure it is properly wired for incoming power source and that the main power source is ON.

(2) Close the globe valve (9, figure 2-1) by turning handle clockwise.

(3) If not connected, attach air service hose (16, figure 2-1) to globe valve (9) and attach inflator gauge (10) to hose (16).

(4) Turn the ON-OFF switch (4, figure 2-1) to "ON" position.

**CAUTION**

Check rotation of motor pulley. Proper rotation is clockwise when viewed from control box side. If rotation is not correct, reverse any two power source lead connections in control box.

**NOTE**

If motor does not start, press the reset button (3, figure 2-1). If motor still does not start, refer to table 3-1 and troubleshoot.

***b. Operating.***

(1) The unit is automatic and will run until air pressure in air receiver tank (21, figure 2-1) reaches 200 psi, +0, -10 psi (14.1, +0, -0.70 kgs/cm<sup>2</sup>), then, the motor will stop until tank pressure drops to 175 psi, ±10 psi (12.3, \* 0,70 kgs/cm<sup>2</sup>). When the low pressure is reached, the motor will start and run until the cut-out pressure is again reached.

(2) When operating pressure is attained, read air receiver tank pressure on air pressure gauge (5, figure 2-1), open globe valve (9) by turning handle counterclockwise. Attach inflator gauge (10) to tire or system requiring compressed air.

***c. Stopping.***

(1) When servicing is complete, close globe valve (9, figure 2-1) by turning handle clockwise. Open inflator gauge (10) to relieve pressure in service hose (16). Coil hose on hanger provided.

(2) Turn ON-OFF switch (4) to OFF position.

(3) Open drain cock (11) in bottom of air receiver tank (21) to relieve pressure from tank and drain off condensate.

(4) Perform your after operation PMCS.

**2-8. Operation of auxiliary equipment.** There is no auxiliary equipment used with this unit.

**2-9. Preparation for movement.** This equipment is not designed for routine movement by the operator.

**2-10. Operating instructions on decals and instruction plates.**

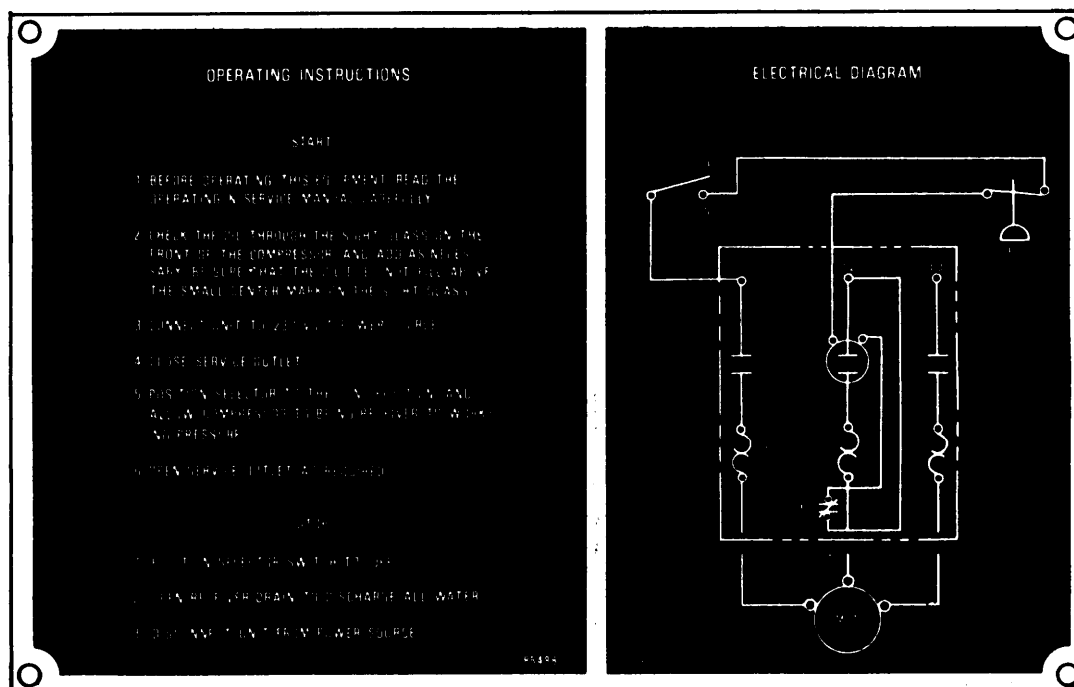


Figure 2-4. Decals and instruction plates

#### Section IV. OPERATION UNDER UNUSUAL CONDITIONS

**2-11. Operation in extreme heat.** Make certain the operating area is well ventilated and that there are no obstructions to prevent cooling air circulation. Provide intake and exhaust fans to ventilate enclosed operating areas.

- a. Lubricate the compressor in accordance with paragraph 3-2.
- b. Check drive belt tension frequently. Loose drive belts can result in slippage causing overheating.
- c. Keep the motor, compressor, belt guard, and air receiver tank clean.

**2-12. Operation in extreme cold [below 0°F (-18°C)].** The air compressor unit should be located in a shed, building, or protected area whenever possible. If unit must be operated outdoors, protect it from prevailing winds with suitable barrier and cover with tarpaulin when not in use.

- a. Lubricate the compressor in accordance with paragraph 3-2.
- b. Avoid sharp bending, kinking, and excessive handling of the air service hose, which will become brittle at low temperatures.
- c. Keep all wiring connections clean and tight. Make sure there are no short circuits. Avoid unnecessary handling and sharp bending of wires. Wiring insulation tends to become brittle at low temperatures. Protect motor and control box from snow and ice.
- d. Make certain that air receiver tank and air service hose are drained and free of condensate after shutdown to prevent freezing.

**2-13. Operation in salt air, sea spray, or high humidity.** Protect the unit with a shelter keeping enough open area for good ventilation.

- a.* Wipe unit dry at frequent intervals. Pay particular attention to motor and motor control box. If unit becomes covered with salt from salt spray, wash unit with fresh water. Take care not to damage electrical system with water.
- b.* Lubricate the compressor in accordance with paragraph 3-2. Make certain surfaces around lubrication points are clean and dry.
- c.* If exposed metal surfaces become rusty, remove rust and coat the area with suitable rustproof material or grease until unit can be thoroughly cleaned and painted.
- d.* Open air receiver drain cock frequently to blow out accumulated condensate.

**2-14. Operation in dusty or sandy areas.** Protect the unit with a suitable shelter but provide adequate ventilation to prevent overheating.

- a.* Clean the compressor air intake filter element more frequently than indicated in PMCS.
- b.* Lubricate compressor in accordance with paragraph 3-2. Make certain areas around lubrication points are clean before lubricating. Wipe areas clean of any spilled lubricants after lubricating.
- c.* Keep the motor, motor control box, air compressor cooling fins, and air receiver tank free of accumulated dirt or sand.
- d.* Keep the unit covered with a tarpaulin when not in use.

## CHAPTER 3

### OPERATOR'S MAINTENANCE INSTRUCTIONS

#### Section I. LUBRICATION

**3-1. General instructions.** No separate Lubrication Order (LO) is available for this unit; therefore, lubrication instructions contained in this section are mandatory.

**3-2. Lubrication instructions.**

*a. General.* Keep all lubricants in closed containers and store in a clean dry place away from external heat. Allow no dust, dirt, or other foreign material to mix with the lubricants. Keep all lubrication equipment clean.

*b. Cleaning.* Wipe lubrication points and surrounding areas free of dirt. Clean lubrication points and surrounding areas after lubrication of all spilled lubricants to prevent accumulation of dirt and foreign matter.

*c. Lubrication.* Lubricate the unit at intervals indicated with the recommended lubricants, or their equivalents, as shown in table 3-1.

*Table 3-1. Operator's Lubrication Table*

LUBRICATION TASK	INTERVAL <sup>1</sup>	LUBRICANT	CAPACITY
1. AIR COMPRESSOR: Check level of compressor oil through sight gauge (7, fig 2-1). Add oil as necessary to fill to full mark. See figure 3-2 for air compressor service.	10 hours	MIL-L-2104	1-1/2 quarts (1.4 liters)
While oil is still warm, remove compressor oil filler cap, place container under oil drain hose, open drain cock and drain compressor oil. Close drain cock, discard oil and fill compressor with clean compressor oil to full mark on oil level sight gauge. Install oil filler cap. Refer to figure 3-4.	After first 100 hours	MIL-L-2104	
While oil is still warm, remove compressor oil filler cap, place container under oil drain hose, open drain cock and drain compressor oil. Close drain cock, discard oil and fill compressor with clean compressor oil to full mark on oil level sight gauge. Install oil filler cap. Refer to figure 3-4.	500 hours	MIL-L-2104	

*Table 3-1. Operator's Lubrication Table - Continued*

LUBRICATION TASK	INTERVAL <sup>1</sup>	LUBRICANT	CAPACITY
2. ELECTRIC MOTOR: Two end plate lubrication fittings: Continuous duty, high ambient temperatures, dirty or moist locations, high vibration.	6 months	Shell Alvania, or equivalent	1 to 2 full strokes with grease gun.
Seasonal service, motor idle 6 months or more.	1 year (at beginning of season.	Shell Alvania, or equivalent	1 to 2 full strokes with grease gun.
Continuous duty, normal use.	2 years	Shell Alvania, or	1 to 2 full strokes with grease gun.
Service of 5,000 hours per year.	5 years	Shell Alvania, or equivalent	1 to 2 full strokes with grease gun.

1. Intends of lubrication tasks are based on normal hours of operation under usual conditions or as indicated for the electric motor. Reduce interval if lubricants become contaminated or if equipment is operating under unusual conditions (Reference paragraphs 2-11 through 2-14.)

## Section II. TROUBLESHOOTING

### 3-3. Introductory information.

*a.* The troubleshooting table lists the common malfunctions which you may find during the operation or maintenance of the air compressor unit or its components. You should perform the tests/inspections and corrective actions in the order listed.

*b.* This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

**3-4. Troubleshooting table.** Refer to table 3-2 for common malfunctions, test or inspection, and corrective actions within the scope of the operator.

Table 3-2. Troubleshooting

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

## 1. COMPRESSOR PUMPING OIL

Step 1. Check for a clogged air intake filter element.

Service the air intake filter as follows:

- a. Remove wing nut (1, fig 3-1).
- b. Remove cover (2).
- c. Lift element (3) out of base (4).
- d. Clean element (3) by washing in warm water and low-sudsing household type detergent. Rinse thoroughly in clean water and air dry. Wipe out inside of filter base (4) and inside of cover (2) with a clean lint-free cloth.
- e. Install clean element (3) in base (4).
- f. Install cover (2) and secure with wing nut (1).

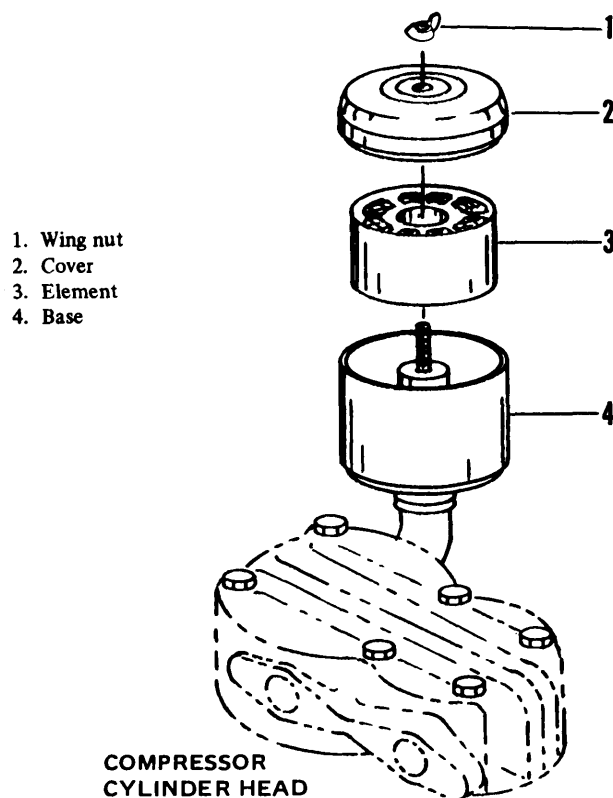


Figure 3-1. Compressor air intake filter service.

Table 3-2. Troubleshooting - Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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## 1. COMPRESSOR PUMPING OIL - Continued

Step 2. Check oil level. View level of oil through sight gauge on air compressor frame.

If oil level is above center mark full indicator, open oil drain cock and drain oil to center mark level. Close drain cock. If oil level is below center mark level, remove oil filler cap and fill to proper level in accordance with lubrication table, table 3-1.

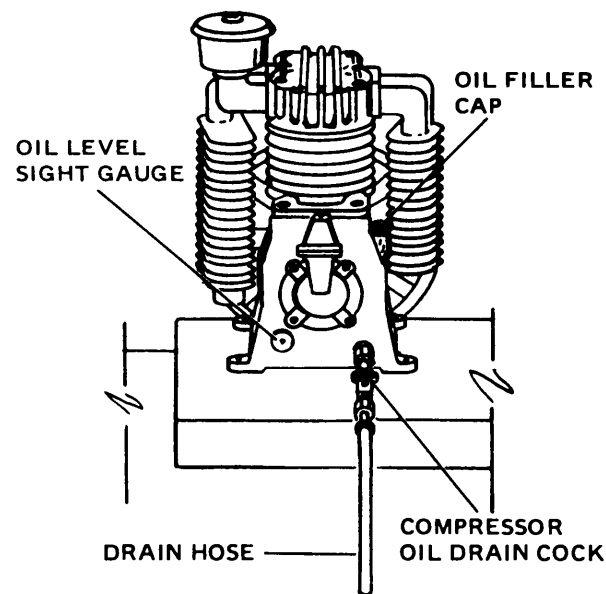


Figure 3-2. Air compressor service

## 2. MOTOR STARTING AND STOPPING FREQUENTLY

Step 1. Check air receiver tank for excessive condensate.

Drain the air receiver as follows:

- Turn ON-OFF switch to OFF.
- Open drain cock on bottom of air receiver tank to allow air and condensate to drain off. Close drain cock.
- Turn ON-OFF switch to ON.

Step 2. Check for air leaks in piping.

- Make a solution of soapy water.
- Apply solution to all fittings and connections with a brush. A leak is indicated by bubbling of the solution.
- If a leak is found, notify Organizational Maintenance.



*Table 3-2. Troubleshooting - Continued***MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION****2. MOTOR STARTING AND STOPPING FREQUENTLY - Continued**

Step 3. Pressure switch is not set properly. Observe the cut-in and cut-out air pressure readings on receiver tank pressure gauge. The motor should start when pressure reads 175 psi (12.3 kgs/cm<sup>2</sup>), plus or minus 10 psi (0.70 kg/cm<sup>2</sup>), and stop when pressure reads 200 psi (14.1 kgs/cm<sup>2</sup>), plus zero minus 10 psi (0.70 kg/cm<sup>2</sup>).

**If pressure switch is not operating properly, notify Organizational Maintenance.**

**3. AIR DELIVERY DROPPING**

Check for clogged air intake filter element.

**Service the air intake filter as instructed in malfunction number 1.**

**4. UNIT KNOCKS OR RATTLES**

Step 1. Check for loose or damaged belts or pulleys.

**Notify Organizational Maintenance.**

Step 2. Intake or exhaust valves leaking or air passages restricted.

**Notify Organizational Maintenance.**

Step 3. Check oil level as instructed in malfunction 1, step 2.

**Service the air compressor in accordance with Corrective Action under malfunction 1, step 2.**

**5. COMPRESSOR RUNNING TOO HOT**

Step 1. Check oil level.

**Refer to Corrective Action under malfunction 1, step 2.**

Step 2. Check for clogged air intake filter.

**Refer to malfunction 1, step 1, and service the air intake filter.**

Step 3. Check for obstructions that would block circulating air flow.

**Remove any obstructions. Unit must be at least 2 feet (0.6 meters) from wall or any obstruction on belt guard side.**

Step 4. Check for accumulation of dirt or foreign material on compressor cooling fins.

Table 3-2. Troubleshooting - Continued

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

## 5. COMPRESSOR RUNNING TOO HOT - Continued

**WARNING**

When cleaning with compressed air, nozzle pressure shall not exceed 30 psi (2.11 kgs/cm<sup>2</sup>). Eye protection is required.

Use compressed air to blow off any accumulation of dust or dirt.

## 6. COMPRESSOR RUNNING TOO SLOW

**WARNING**

Electricity is dangerous. Before performing any maintenance or adjustments, be sure the electrical power is turned off. Never depend on the ON-OFF switch. Turn power off at the source.

Turn power off at the source and check for loose wiring connection. Also, check that main power source is 230 volts, 3 phase, 60 hertz.

**Notify Organizational Maintenance.**

## Section III. MAINTENANCE PROCEDURES

**3-5. Introduction.** This section contains those maintenance tasks authorized by the Maintenance Allocation Chart (Appendix B) for operator/crew level. Maintenance for higher levels will be found in later Chapters.

**3-6. Belt guard assembly.**

**a. Inspection.** Inspect belt guard assembly (fig 3-3) for damage to the screen or panels. Inspect for accumulation of grease, dirt, or foreign matter.

**WARNING**

Dry cleaning solvent, Fed Spec P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100°F - 138°F (38°C - 59°C).

**b. Cleaning.** Clean the belt guard with a rag dipped in solvent, P-D-680, or equivalent, and dry thoroughly.

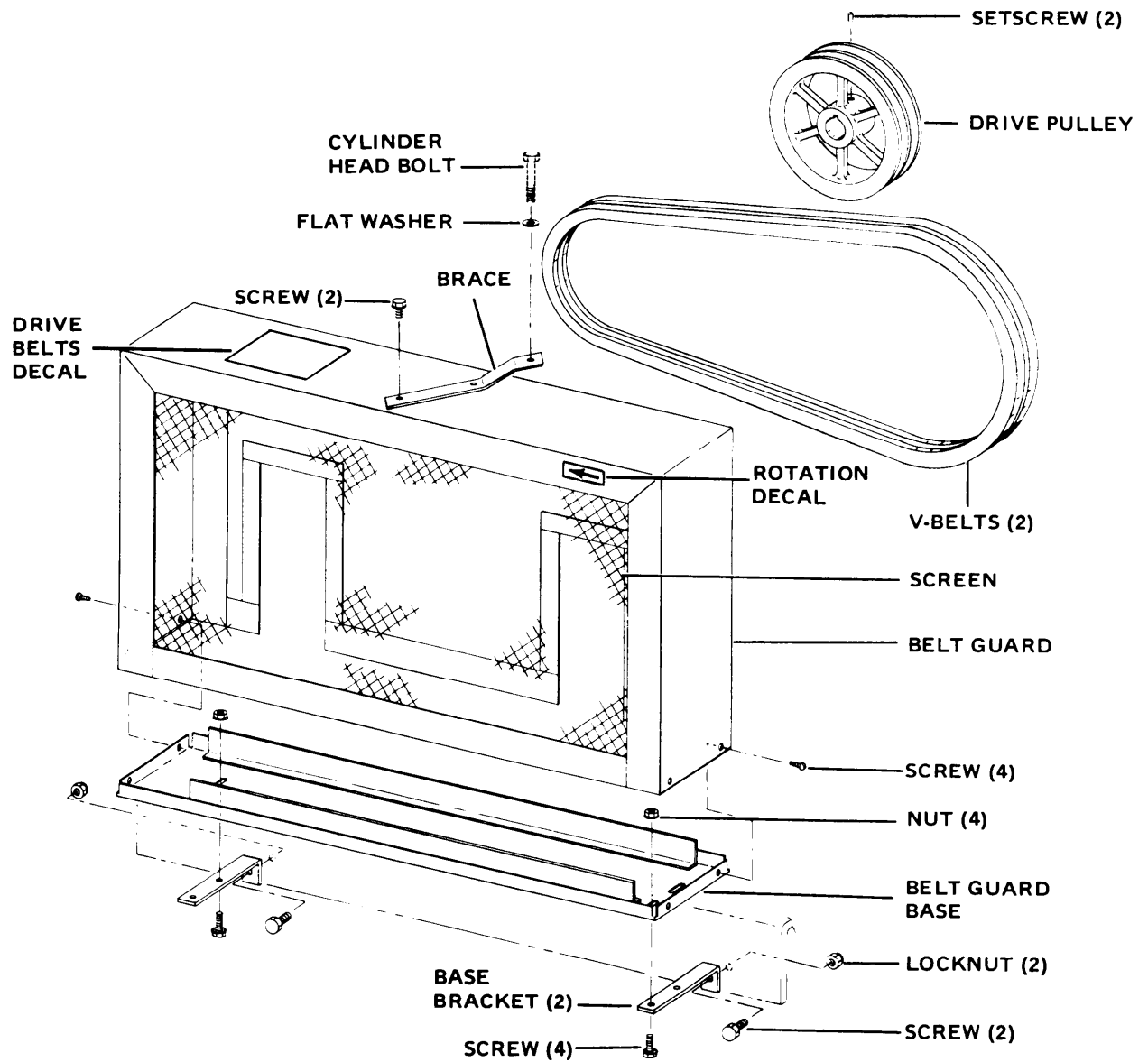


Figure 3-3. Belt guard, V-belts, and drive pulley

### 3-7. V-Belts and drive pulley.

#### *a. Cleaning.*

#### **WARNING**

Dry cleaning solvent, Fed Spec P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100°F - 138°F (38°C - 59°C).

- (1) Use a cloth dampened in cleaning solvent, P-D-680, to wipe oil and dirt off V-belts (fig 3-3).
- (2) Clean drive pulley with solvent, P-D-680, and dry thoroughly.

#### *b. Inspection.*

(1) Inspect V-belts for cuts, breaks, fraying, and for saturation with oil or grease that could cause slippage. Notify Organizational Maintenance of any defects.

(2) Inspect drive pulley grooves for chipping and cracks. Inspect bore keyway for damage from motor shaft key, indicating pulley was loose on shaft. Notify Organizational Maintenance of any damage.

### 3-8. Motor starter assembly.

#### **WARNING**

Electricity is dangerous. Before performing any maintenance or adjustments, be sure that electrical power is turned off. Never depend on the ON-OFF switch. Turn power off at the source.

#### *a. Inspection.*

(1) Turn motor control box ON-OFF switch to OFF position. Also, turn main power OFF at source.

(2) Open motor control box cover and inspect wiring connections to motor starter assembly and to ON-OFF switch for tightness and any evidence of shorts, grounds, or burned insulation. Check operation of ON-OFF switch and reset button. Notify Organizational Maintenance if any defects are found.

***b. Maintenance.*** No maintenance of motor starter assembly is authorized at operator/crew level. Close motor control box cover and do not operate until Organizational Maintenance has performed repair and/or replacement.

### 3-9. Motor assembly.

#### *a. Cleaning.*

#### **WARNING**

Dry cleaning solvent, Federal Specification P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100°F - 138°F (38°C - 59°C).

- (1) Wipe off motor with a cloth dampened with solvent, P-D-680, or equivalent, and dry thoroughly.

### **WARNING**

When cleaning with compressed air, nozzle pressure shall not exceed 30 psi (2.11 kgs/cm<sup>2</sup>). Eye protection is required.

- (2) Remove accumulated dust or dirt from inside of motor by blowing out with compressed air.

#### ***b. Inspection***

- (1) Inspect motor shaft for excessive end play.
- (2) Inspect wiring to motor for any damage to insulation.
- (3) Notify Organizational Maintenance of any motor damage or defect.

#### ***c. Lubrication.*** Refer to table 3-1.

### **3-10. Air compressor.**

#### ***a. Cleaning.***

### **WARNING**

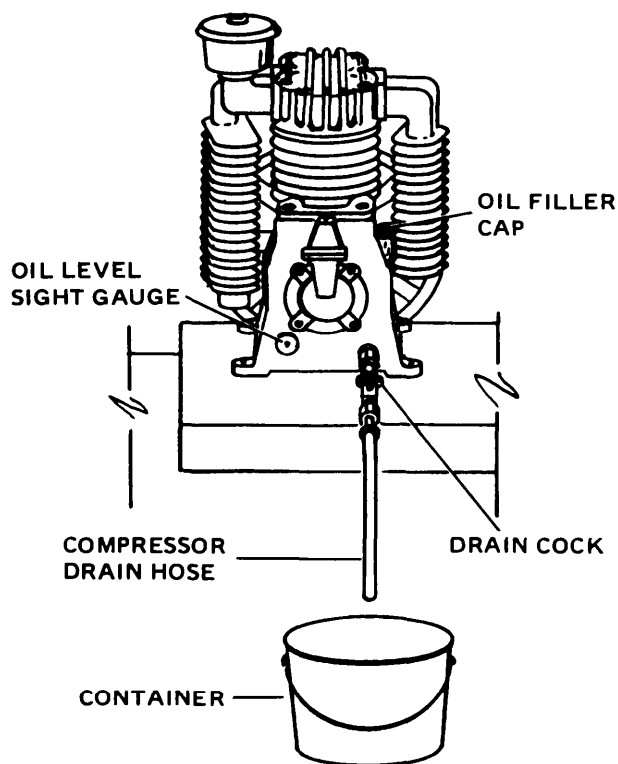
Dry cleaning solvent, Federal Specification P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near an open flame or excessive heat. Flash point of the solvent is 100°F - 138°F (38°C - 59°C).

- (1) Clean the air compressor by wiping off accumulated dirt and other foreign matter with a cloth dampened with solvent, P-D-680, or equivalent, and dry thoroughly.
- (2) Pay particular attention to cooling fins on intercooler, aftercooler, cylinder head, and cylinder. Accumulated foreign matter in these areas prevents proper cooling.

#### ***b. Inspection.***

- (1) Visually inspect air compressor for any broken or cracked cooling fins and damage to other parts.
- (2) While unit is operating, listen for knocks or rattle that could indicate internal damage.
- (3) Listen for short start-stop cycling which would indicate leakage or faulty adjustment of pressure switch.
- (4) While air compressor is running, use a soapy water solution applied with a brush to check air compressor aftercooler safety valve for leakage. Leakage will be indicated by bubbling of the solution. Pull up on ring located on end of safety valve to relieve pressure. Release ring; safety valve should reseat immediately. Again check for leakage with solution. Notify Organizational Maintenance for replacement of leaking or defective safety valve.
- (5) Notify Organizational Maintenance if any air compressor damage is detected.

#### ***c. Servicing.*** Service the air compressor as shown in figure 3-4.



**STEP 1.** WHILE COMPRESSOR IS STILL WARM, REMOVE OIL FILLER CAP; PLACE A CONTAINER UNDER COMPRESSOR DRAIN; OPEN DRAIN COCK AND DRAIN OIL FROM COMPRESSOR.

**NOTE:** OIL CAPACITY OF COMPRESSOR IS 1-1/2 QUARTS (1.4 LITERS).  
CONTAINER MUST HAVE A CAPACITY OF AT LEAST THIS AMOUNT.

**STEP 2.** WHEN OIL FLOW STOPS, CLOSE OIL DRAIN COCK. FILL COMPRESSOR TO CENTER MARK FULL INDICATOR ON OIL LEVEL SIGHT GAUGE. REFER TO LUBRICATION TABLE 3-1. INSTALL OIL FILLER CAP.

*Figure 3-4. Air compressor service*

**3-11. Air intake filter.** Inspect, service, or replace the air intake filter as shown in figure 3-5.

Legend for fig 3-5: —————→

**INSPECTION:**

**STEP 1.** UNSCREW AND REMOVE WING NUT, COVER AND ELEMENT.

**STEP 2.** EXAMINE ALL PARTS FOR BREAKS, CRACKS, AND DEFORMATION.

**STEP 3.** ANY DEFECTIVE PART SHALL BE REPLACED.

**STEP 4.** SERVICE THE ELEMENT AS INSTRUCTED BELOW; THEN, ASSEMBLE ELEMENT, COVER, AND SECURE WITH WING NUT.

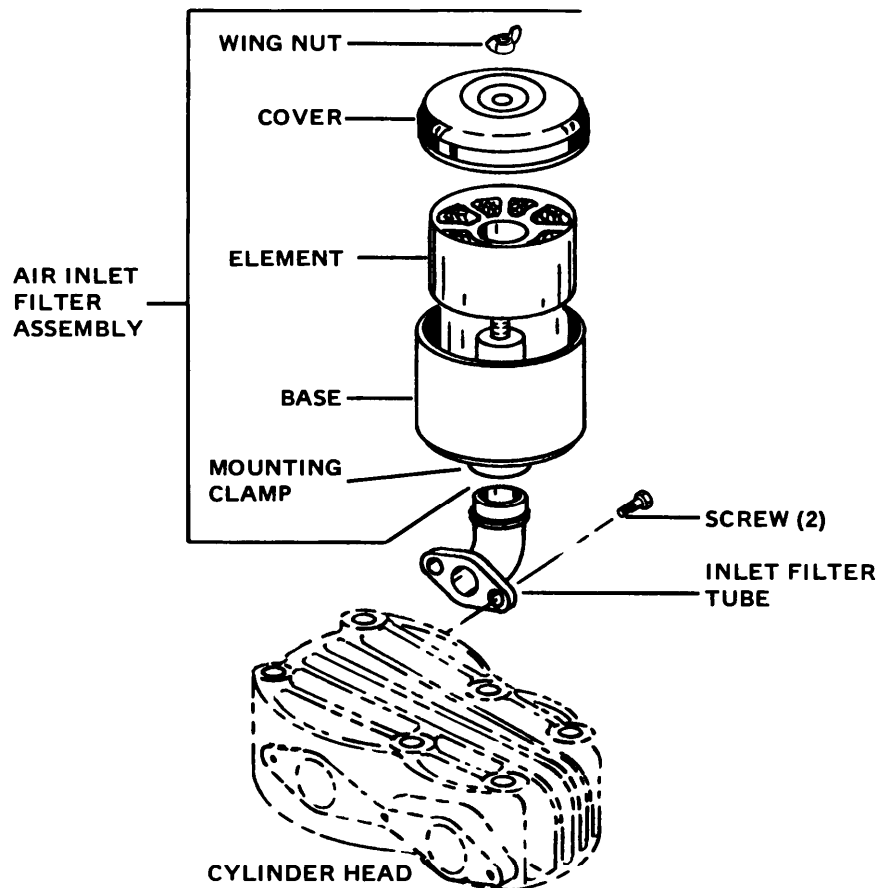


Figure 3-5. Air intake filter inspection, service, or replacement.

Legend for fig 3-5: Continued

**SERVICE:**

- STEP 1.** REFER TO INSPECTION STEP 1 ABOVE. WIPE COVER AND BASE CLEAN WITH A CLEAN, LINT-FREE, CLOTH DAMPENED WITH A SOLUTION OF HOUSEHOLD TYPE, LOW-SUDSING, DETERGENT AND WARM WATER. RINSE AND DRY.
- STEP 2.** CLEAN ELEMENT BY IMMERSING IN THIS SOLUTION OF DETERGENT AND WATER. AGITATE AND SOAK TO REMOVE ACCUMULATED DUST AND DIRT. SHAKE OFF EXCESS SOLUTION.
- STEP 3.** RINSE ELEMENT IN CLEAN WATER TO REMOVE ALL DETERGENT SOLUTION AND AIR DRY.
- STEP 4.** ASSEMBLE CLEAN ELEMENT, COVER, AND SECURE WITH WING NUT.

**REPLACEMENT:**

**(REMOVAL)**

- STEP 1.** LOOSEN SCREW SECURING FILTER ASSEMBLY MOUNTING CLAMP TO INLET FILTER TUBE AND LIFT FILTER ASSEMBLY OFF TUBE.
- STEP 2.** WHEN REPLACEMENT OF INLET FILTER TUBE IS NECESSARY, REMOVE TWO SCREWS AND INLET FILTER TUBE.

**(INSTALLATION)**

- STEP 3.** INSTALL INLET FILTER TUBE IN POSITION ON CYLINDER HEAD AND SECURE WITH TWO SCREWS.
- STEP 4.** ASSEMBLE AIR INLET FILTER ASSEMBLY ONTO INLET FILTER TUBE. TIGHTEN MOUNTING CLAMP SCREW.

### 3-12. Air receiver system.

**a. Safety Valve.** Check safety valve for leaking by using a soapy water solution applied with a brush. Leakage will be indicated by bubbling of the solution. Check operation of safety valve with pressure in air receiver tank. Full up on ring located on end of safety valve to relieve tank pressure. Release ring; safety valve should reseal. Check again for leakage with soapy water solution. Notify Organizational Maintenance of a leaking or defective safety valve.

**b. Receiver Drain Cock.** With air pressure in receiver tank, use a soapy water solution applied with a brush to check for leakage at drain cock. Leakage will be indicated by bubbling of the solution. Open and close the drain cock and check for proper seating by again applying soapy water solution. Notify Organizational Maintenance of a leaking or defective air receiver drain cock.

### 3-13. Air discharge system.

**a. Inflator Gauge.** Inspect threads for damage, slip-sleeve for proper operation and gripping of air chucks, hose for cuts and fraying, cartridge lever for operation, and gauge for overall function. Notify Organizational Maintenance for replacement of defective inflator gauge.

**b. Air Service Hose.** Inspect air service hose for any cuts, fraying, or damaged end fittings. Notify Organizational Maintenance for replacement of damaged hose assembly.

**c. Globe Valve.** With globe valve closed and air pressure in receiver tank, use soapy water solution applied with a brush to check globe valve for leaks. Open and close the valve several times to determine if operating properly. Close valve and again check for leaks with soapy water solution. Notify Organizational Maintenance for replacement of a defective globe valve.



## CHAPTER 4

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

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## Section I. REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

- 4-1. Common tools and equipment.** For authorized common tools and equipment refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.
- 4-2. Special tools, TMDE, and support equipment.** Refer to TM 5-4310-375-24P, Organizational, Direct Support and General Support Maintenance Repair Parts and Special Tools List. Refer to Maintenance Allocation Chart (Appendix B) for maintenance tasks allocated to organization level. There are no special tools or equipment required for maintenance of this air compressor unit.
- 4-3. Repair parts.** Repair parts are listed and illustrated in the repair parts and special tools list, TM 5-4310-375-24P, covering organizational maintenance for this equipment.

## Section II. SERVICE UPON RECEIPT OF EQUIPMENT

**4-4. Site and shelter requirements.**

**a. Siting.** Locate the air compressor unit as close as possible to a 230 volt, 3 phase, 60 hertz power source. Avoid muddy, sandy, or dusty locations if possible. If necessary to locate unit on soft ground, provide a suitable level foundation of planking. Unit should never be operated when out-of-level is 15 degrees in either direction (front to rear or side to side). Unit should be as level as possible.

**b. Shelter requirements.** Floor space required for the unit is 4-1/2 feet wide by 6 feet long (1.37 m by 1.83 m) as shown in figure 2-2. When unit is to be permanently installed it must be located at least 2 feet (0.6 meters) from any wall or obstruction on the belt guard side. Refer to figure 2-2 for floor mounting diagram. Unit weight is 520 pounds (236 kgs). Make sure floor capacity in shelter site is capable of supporting this weight for extended period of time. The shelter area must allow for adequate ventilation and air circulation completely around unit to provide proper cooling and intake air supply to compressor. If shelter area does not have a cover to adequately protect the unit against bad weather, cover with tarpaulin when not in use.

**4-5. Service upon receipt of materiel.** Refer to paragraph 2-5.a. and 2-5.b. for unloading, unpacking and reprocessing. Refer to table 4-1 for service upon receipt.

*Table 4-1. Service Upon Receipt*

LOCATION	ITEM	ACTION	REMARKS
1. Compressor drive	Belt guard assembly	<i>a.</i> Examine screen and panels for dents, breaks and rust. Repair or replace as necessary. (Para 4-14)	
	V-Belts	<i>b.</i> Check belt tension and adjust if needed (Fig 2-3). Replace cut, frayed or stretched belts. Replace belts in sets. (Para 4-14)	
	Drive pulley	<i>c.</i> Examine drive pulley for tightness on motor shaft, damaged keyway, chipping or cracks in grooves. Replace a damaged drive pulley. (Para 4-14)	
2. Electric motor and controls	Motor control starter assembly	<i>a.</i> Open motor control box door and examine starter assembly. When notified by operator/crew of defective wiring or malfunction, repair or replace as necessary. (Para 4-15)	
	Motor assembly	<i>b.</i> When notified by operator/crew of motor malfunction, test motor and replace when necessary (para 4-16). Notify Direct Support when you determine repair is required.	
	Pressure switch and unloader	<i>c.</i> Inspect pressure switch and unloader for any wiring damage, dents, and proper cut-in, cut-out operation. Notify Direct Support for adjustment, repair, or replacement.	
3. Compressor assembly	Cylinder head, first stage and second stage valves.	<i>a.</i> When notified by operator/crew of cylinder head damage, inspect and replace as necessary. (Para 4-19)  <i>b.</i> When cylinder head is removed, inspect first and second stage valves for wear or damage. Replace the valves as necessary. (Para 4-19)	
	Intercooler and aftercooler	<i>c.</i> Clean and examine the intercooler and aftercooler for cracks and breaks (para 4-20). Notify Direct Support for replacement when necessary.	
	Flywheel	<i>d.</i> Inspect flywheel for chipping and cracks in drive belt grooves and air circulating blades. Replace a damaged flywheel. (Para 4-21)	

*Table 4-1. Service Upon Receipt - Continued*

LOCATION	ITEM	ACTION	REMARKS
	Compressor assembly	<i>e.</i> When damage to air compressor is determined to be beyond Organizational level, replace the compressor assembly (para 4-18). Notify Direct Support for repair and/or General Support for over-haul.	
4. Air receiver system	Safety valve	<i>a.</i> When notified by operator/crew of leaking or malfunctioning safety valve, replace the valve assembly. (Para 4-22)	
	Check valve	<i>b.</i> Inspect check valve threads for damage and air flow operation. Replace a damaged check valve. (Para 4-23)	
	Pressure gauge	<i>c.</i> Inspect pressure gauge for broken face and operation, replace if damaged. (Para 4-24)	
	Air receiver drain cock	<i>d.</i> When notified by operator/crew of leaking or damaged drain cock, replace. (Para 4-25)	
	Air receiver tank	<i>e.</i> Inspect air receiver tank for dents and rust. The tank is a pressure vessel and no maintenance beyond removing rust and painting is permitted (para 4-26). Notify Direct Support for replacement of damaged tank.	
5. Air discharge system	Inflator gauge	<i>a.</i> When notified by operator/crew of inflator gauge malfunction, replace the gauge. (Para 4-27)	
	Air service hose	<i>b.</i> When notified by operator/crew of air service hose damage, replace the hose assembly. (Para 4-28)	
	Globe valve	<i>c.</i> When notified by operator/crew of a damaged or leaking globe valve, replace the valve. (Para 4-29)	

#### 4-6. Checking unpacked equipment

*a.* Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on DD Form 6, Packaging Improvement Report.

*b.* Check the equipment against the packing slip to see if the shipment is complete. Report all discrepancies in accordance with the instructions of TM 38-750.

*c.* Check to see whether the equipment has been modified.

#### 4-7. Installation instructions. After locating equipment in site and shelter (para 4-4), install as follows:

*a. Adjustment.* Adjust compressor drive belt tension as shown in figure 2-3.

*b. Service.* Service the air compressor as shown in figure 3-4. Inspect air intake filter and service if necessary as shown in figure 3-5.

*c. Power source connection.*

#### WARNING

Electricity is dangerous. Before performing any maintenance or adjustments, be sure the electrical power is turned off. Never depend on the ON-OFF switch. Turn power off at the source.

(1) Make certain main power source is OFF before making connections to motor control starter. Also, place motor control box switch in OFF position.

(2) Refer to figure 4-1 and connect main power source to motor control starter.

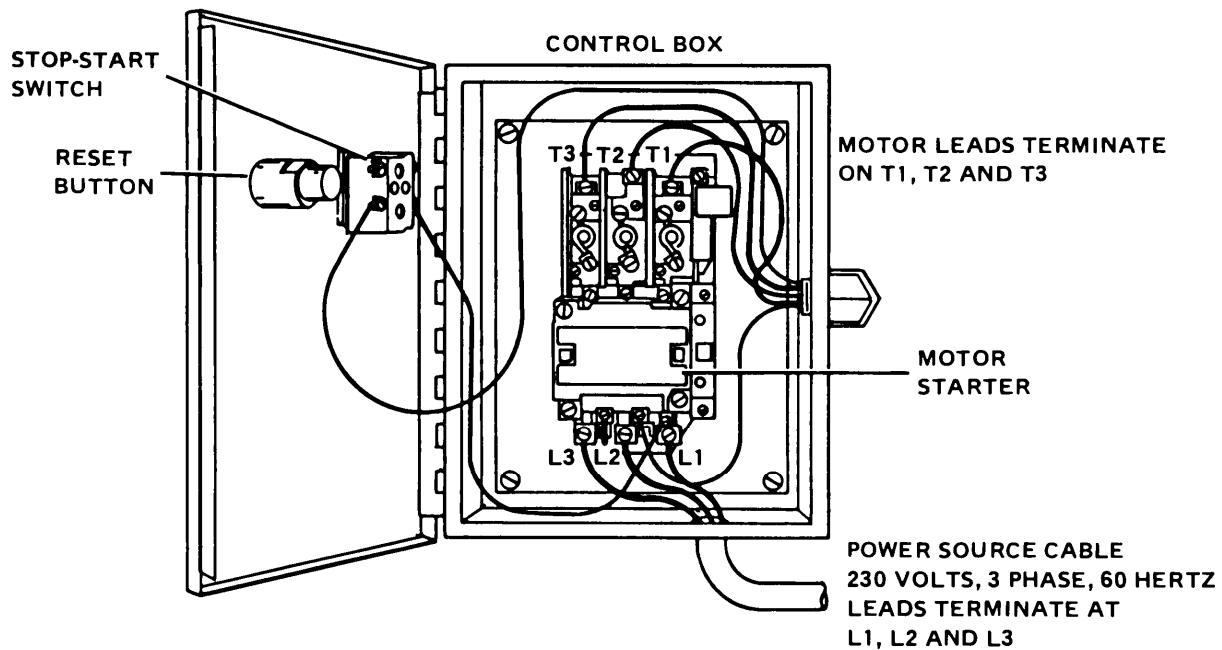


Figure 4-1. Main power source connection.

(3) Check to be certain air pressure switch leads and electric motor leads are connected properly. Refer to figure 4-1 and figure 1-2.

(4) When connection is complete, close motor control box door and press reset button.

**d. Air service hose connection.** If air service hose is not connected, install as follows:

- (1) Attach service hose end to air receiver globe valve fitting.
- (2) Attach inflator gauge to other end fitting and service hose.
- (3) Wrap service hose on hangers provided until ready for use.

### Section III. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

**4-0. Introduction.** Refer to table 4-2 for organizational preventive maintenance checks and services (PMCS). The PMCS in table 4-2 are those authorized for this maintenance level by the MAC, Appendix B.

**4-9. Explanation of columns.** An explanation of table 4-2 column heads and codes follows.

**a. Item number column.** Checks and services are numbered in a logical order of performance regardless of interval. The column shall be used as a source of item number for the TM Number Column on DA Form 2404, Equipment Inspection and Maintenance Worksheet, in recording results of PMCS.

**b. Interval column.** The columns headed "M", "Q", "S", "A", and "H" contain a dot (•) opposite the appropriate check or service. If a check is to be performed monthly the dot appears opposite that check or service in the "M" column; if the check or service is to be performed at two or more intervals, a dot appears in each applicable column.

**c. Item to be inspected column.** Items listed in this column are divided into groups indicating the portion of the equipment of which they are a part. Under these groupings, the item to be inspected is identified by its common name.

**d. Procedure column.** This column contains a brief description of the procedure by which the check or service is to be performed. Where procedure is extensive, a reference to detailed paragraphs found in maintenance section is made.

Table 4-2. Organizational Preventive Maintenance Checks and Services

M - Monthly  
Q - Quarterly

S - Semiannually  
A - Annually

H - Hours

ITEM NO.	INTERVAL					ITEM TO BE INSPECTED	PROCEDURE
	M	Q	S	A	H		
1.	●					V-Belts	Adjust drive belt tension as shown in figure 2-3.
2.		●				Pressure switch	Inspect the pressure switch for physical damage, tightness of wiring lead connections and function while operating. Cut-in pressure is 175 psi $\pm$ 10 psi (12.3 kgs/cm <sup>2</sup> $\pm$ 0.70 kgs/cm <sup>2</sup> ) and cut-out is 200 psi $\pm$ 0 -10 psi (14.1 kgs/cm <sup>2</sup> $\pm$ 0, -0.70 kgs/cm <sup>2</sup> ). Refer to para 4-17.
3.					●	Compressor first and second stage valves.	Every 1500 hours check the air compressor first and second stage valves for wear and damage. Refer to para 4-19.
4.					●	Intercooler and aftercooler	Every 1500 hours, when item 3 above is performed, clean the intercooler and aftercooler and inspect for any damage. Refer to para 4-20.
5.	●					Flywheel	When adjusting drive belt tension (Item 1. above), inspect flywheel for chipping or cracks on drive belt grooves and air circulating ribs. Inspect for tightness on compressor crankshaft. Replace a damaged flywheel. Refer to para 4-21.
6.			●			Check valve	Inspect check valve for any physical damage and air flow direction operation. Replace a defective check valve. Refer to para 4-23.
7.	●					Pressure gauge	Inspect pressure gauge for broken face and proper operation while pressure is in air receiver tank. Replace a defective pressure gauge. Refer to para 4-24.
8.				●		Air receiver tank	Inspect air receiver tank for any dents, rusting, or other physical damage. Refer to para 4-26. If replacement is necessary, notify Direct Support.
9.			●			Inflator gauge and globe valve	When notified by operator/crew of defective inflator gauge or globe valve, replace. Also, at interval indicated, check for leaks and operation as directed in para 4-27 and 4-29.
10.		●				Air service hose	At interval indicated, check air service hose for cuts, fraying of hose cover, and damaged hose end fittings. Replace a damaged service hose. Refer to para 4-28.

## Section IV. TROUBLESHOOTING

**4-10. Introduction.** This section contains those checks and corrective actions which will isolate defects which can be corrected by performance of maintenance allocated to organizational maintenance technicians by the MAC, Appendix B.

**4-11. Troubleshooting table.** Table 4-3 lists Malfunctions, Test or Inspection, and Corrective Actions. The table is based on symptoms which you may observe during PMCS. Only checks and corrective actions authorized for organization are listed. (Operator/Crew Troubleshooting is found in table 3-2.)

*Table 4-3. Organizational Troubleshooting*

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION
<b>1. COMPRESSOR PUMPING OIL</b>
Step 1. Check for oil mixed with condensate when air receiver is drained.
Possible piston ring damage, notify Direct Support Maintenance.
Step 2. Check cylinder and cylinder head for overheating. Could indicate damaged piston rings.
Notify Direct Support Maintenance.
<b>2. MOTOR STARTING AND STOPPING FREQUENTLY</b>
Step 1. Use soapy water solution applied with brush to check for air leaks in piping. Leakage will be indicated by bubbling of solution.
Refer to para 4-30 and replace defective fittings.
Step 2. Inspect pressure switch for loose connections and faulty operation.
Refer to para 4-17 and inspect pressure switch. If defective, notify Direct Support Maintenance for adjustment, repair, or replacement.
<b>3. AIR DELIVERY DROPPING</b>
Step 1. Check for air leaks in piping.
Refer to para 4-30.
Step 2. Check for restricted air passages, worn or broken first or second stage valves.
Refer to para 4-19. If valves are not defective or passages restricted, notify Direct Support Maintenance for repair or overhaul of compressor.
<b>4. UNIT KNOCKS OR RATTLES</b>
Step 1. Check for loose or damaged drive belts and pulley.
Refer to para 4-14 for adjustment or replacement.

*Table 4-3. Organizational Troubleshooting - Continued*

<b>MALFUNCTION</b>	
<b>TEST OR INSPECTION</b>	<b>CORRECTIVE ACTION</b>
Step 2. Check first and second stage valves.	
	<b>Refer to para 4-19.</b>
Step 3. Any other cause.	
	<b>Notify Direct Support Maintenance for compressor repair or overhaul.</b>
<b>5. COMPRESSOR RUNNING TOO HOT</b>	
Step 1. Check for any obstruction blocking circulating air through belt guard screen.	
	<b>Remove any object that would cause blocking of air circulation.</b>
Step 2. Possible piston ring damage.	
	<b>Notify Direct Support Maintenance.</b>
<b>6. COMPRESSOR RUNNING TOO SLOW</b>	
Step 1. Check for defect or malfunction in motor starter.	
	<b>Refer to para 4-15.</b>
Step 2. Check motor for proper operation or defect.	
	<b>Refer to para 4-16 and test motor or replace. Notify Direct Support Maintenance for motor repair.</b>
<b>7. MOTOR OVERLOAD RELAY TRIPS</b>	
Step 1. Check line voltage or motor terminals for loose connections.	
	<b>Tighten any loose connections. If power source is incorrect voltage, make necessary main power source change. Refer to para 4-7.c for power source connection.</b>
Step 2. Check for defective coil in motor starter.	
	<b>Refer to para 4-15 and replace coil.</b>

## Section V. MAINTENANCE PROCEDURES

**4-12. Introduction.** This section explains maintenance procedures which are the responsibility of the organizational maintenance technician as authorized by the MAC (Appendix B) and Source, Maintenance, and Recoverability (SMR) coded items.



**4-13. Maintenance procedures.** Maintenance procedures are presented in the order listed below, as applicable. Complete instructions for maintenance operations within the scope of organizational maintenance for each Functional Group is provided in step-by-step procedures in following paragraphs.

**Maintenance Operations (as applicable):**

Servicing	Alignment
Ground handling	Painting
Operational check	Lubrication
Inspection-installed items	Reassembly
Removal	Test procedures
Disassembly	Installation
Cleaning	Adjustment
Inspection-acceptance/ rejection criteria	Radio interference suppression
Repair or replacement	Placing in service
	Testing

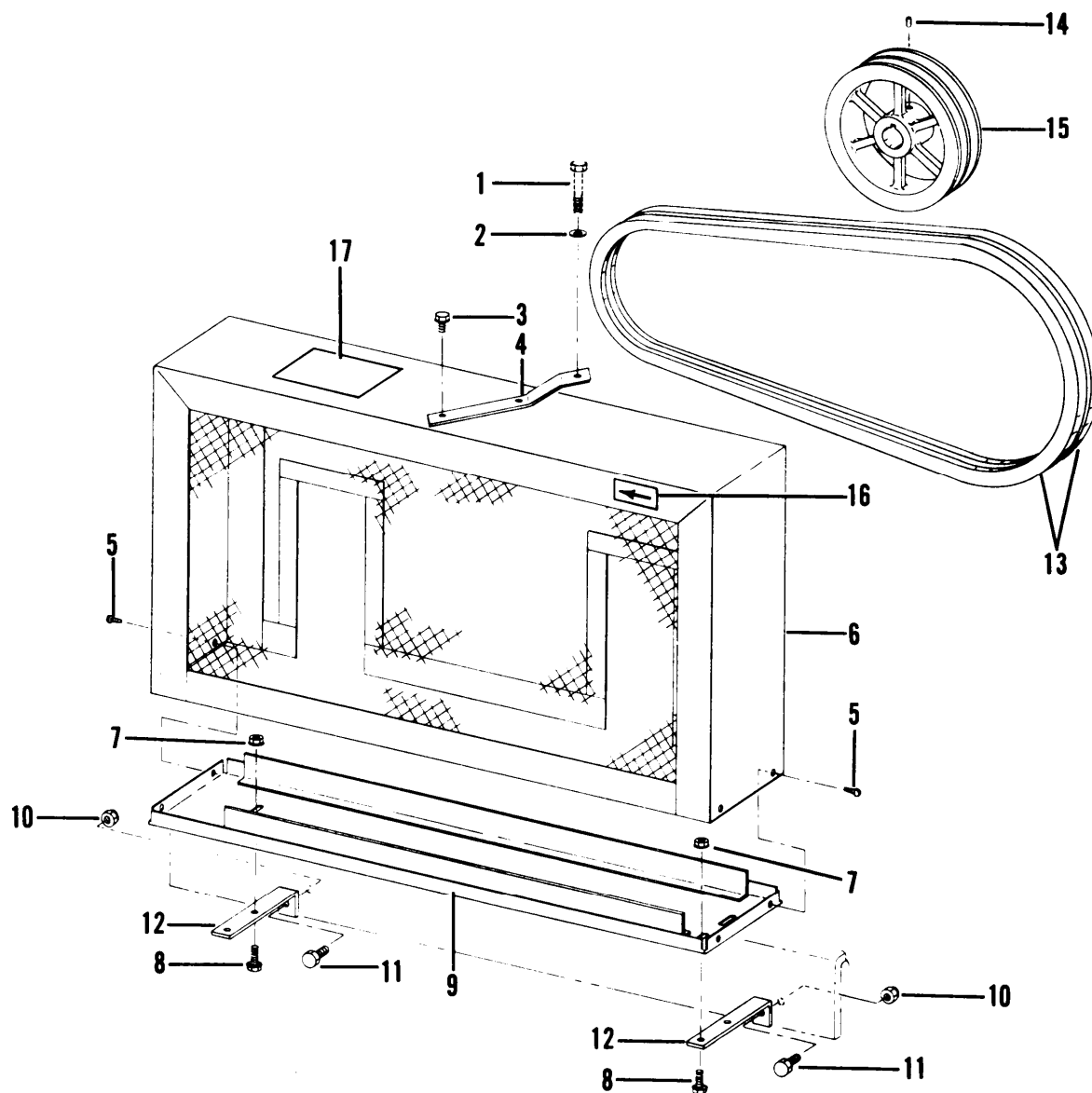
**4-14. Belt guard, drive belts, and drive pulley.** Maintenance of belt guard, drive belts, and drive pulley is as follows:

**a. Removal/Disassembly.** Turn main power off at the source. Remove and disassemble belt guard, drive belts, and drive pulley in following sequence.

- (1) Unscrew and remove cylinder head bolt (1, fig 4-2) and washer (2) attaching brace (4) to compressor cylinder head. As necessary, remove two screws (3) and remove the brace (4).
- (2) Remove four screws (5) and lift off belt guard (6).
- (3) Only when necessary for repair or replacement, remove four nuts (7) and screws (8) and lift off belt guard base (9). Remove two locknuts (10), screws (11) and brackets (12).
- (4) Loosen attaching hardware securing motor assembly to air receiver saddle and move the motor toward compressor enough to loosen drive belts (13). Remove the two drive belts (13).
- (5) When removal of drive pulley is necessary, loosen two setscrews (14) in hub of pulley (15), use a suitable puller and pull drive pulley (15) off of motor shaft.

**b. Reassembly/Installation.** Reassemble and install drive pulley, drive belts, and belt guard in following sequence.

- (1) Make certain the two setscrews (14, fig 4-2) are unscrewed far enough to allow pulley (15) to be installed on motor shaft. Install drive pulley on motor shaft with pulley hub toward motor to a point where hub is approximately 1-3/16 inches (30.163 mm) from motor end frame. Secure the pulley (15) to motor shaft by tightening the two setscrews (14), one onto shaft; the other onto shaft key.
- (2) Install two drive belts (13) onto drive pulley (15) and compressor flywheel pulley grooves. Move motor assembly away from air compressor aligning pulleys and adjusting belt tension as shown in fig 2-3.
- (3) If removed from air receiver saddle, install the two brackets (12) and secure with two each screws (11) and locknuts (10).
- (4) Install belt guard base (9) on brackets (12) and secure with four screws (8) and nuts (7).
- (5) Place belt guard (6) over pulleys into position on base (9) and install four screws (S).
- (6) If removed, install brace (4) and attach to belt guard with two screws (3). Attach brace (4) to compressor cylinder head with washer (2) and bolt (1). Torque bolt (1) to 30-33 ft-lbs (4.1 - 4.6 kgs-m). Turn main power on at source.



Legend for fig 4-2:

- |                             |                      |
|-----------------------------|----------------------|
| 1. Cylinder head bolt (ref) | 10. Locknut (2)      |
| 2. Flat washer              | 11. Screw (2)        |
| 3. Screw (2)                | 12. Bracket (2)      |
| 4. Brace                    | 13. Drive belt (2)   |
| 5. Screw (4)                | 14. Setscrew (2)     |
| 6. Belt guard               | 15. Drive pulley     |
| 7. Nuts (4)                 | 16. Rotation decal   |
| 8. Screw (4)                | 17. Drive belt decal |
| 9. Belt guard base          |                      |

Figure 4-2. Belt guard, drive belts, and drive pulley

**4-15. Motor control box and starter assembly.** Maintenance of the control box and starter assembly is as follows:

*a. Removal/Disassembly.* Remove and disassemble to the extent necessary to perform repair or replacement in following sequence.

### WARNING

Electricity is dangerous. Before performing any maintenance or adjustments, be sure the electrical power is turned off. Never depend on the ON-OFF switch. Turn power off at the source.

- (1) Turn main power OFF at the source. Turn ON-OFF switch (2, figure 4-3) to OFF position. Loosen control box cover clamp screws, move clamps from door lip and open control box door.
- (2) Disconnect and tag all wires for reassembly reference.
- (3) Unscrew and remove mounting nut of reset button and remove the reset button (1).
- (4) Unscrew and remove mounting nut of ON-OFF switch; remove the switch (2) and legend plate (3).
- (5) Remove four screws (4) and lift starter assembly (9) and mounting panel (8) out of control box. Remove three nuts (5), lockwashers (6) and screws (7). Separate starter assembly (9) from mounting panel (8).
- (6) To gain access to coil (13), unscrew the two captive cover screws (A) and remove cover (10). Tilt the top of the armature (11) away from the coil and slide armature (11) up and out. Remove spring plate (12) and pull coil (13) straight out.
- (7) To remove the three heater coils (14), remove terminal screws securing the coil ends and lift coils (14) off overload relay. Install terminal screws to prevent their loss until ready for reassembly.
- (8) To gain access to movable and stationary contacts (16, 20) it is not necessary to remove parts (10 through 14). Simply, unscrew the captive hex head slotted screws (B) and pull out the power unit (15).

### NOTE

The power unit (15) consists of a factory assembly of all the magnetic parts, movable contacts, and their carrier assembly. This unit usually permits immediate restoration to service of a device which may have become inoperative. A set of stationary contacts is included with a new power unit assembly. It is advisable to install these stationary contacts at the same time, particularly if visual inspection indicates contacts need replacement. Also, a set of contacts (21) is available for parts replacement, see TM 5-4310-375-24P.

### CAUTION

The power contacts should not be filed or dressed, they should be replaced.

- (9) To remove movable contacts (16), depress one end of the contact and push the contact out as shown in Sketch "A". Remove the springs (18) and retainers (17).

Legend for fig 4-3:

1. Reset button	12. Spring plate	22. Conduit elbow
2. Off-On switch	13. Coil	23. Conduit
3. Legend plate	14. Heater coil (3)	24. Conduit connector
4. Screw (4)	15. Power unit	25. Nuts (4)
5. Nut (3)	16. Movable contact (3)	26. Screws (4)
6. Lockwasher (3)	17. Retainer (3)	27. Spacing washers (2)
7. Screw (3)	18. Spring (3)	28. Screw (6)
8. Mounting panel	19. Screw (6)	29. Wiring plate
9. Motor starter assembly	20. Stationary contact (6)	30. Operating instruction plate
10. Cover	21. Contact set	31. Control box
11. Armature		

(10) Remove stationary contact mounting screws (19). Slide stationary contacts (20) out of the groove in the molding. A hole in the contact plate is provided for removal with a screwdriver.

(11) Only when necessary, remove conduit elbow (22) from control box (31) and withdraw wires from box. Remove conduit elbow (22), conduit (23), and disconnect conduit connector (24) from pressure switch.

(12) To remove control box (31) from air receiver saddle, remove the four nuts (25) and screws (26), and two spacing washers (27) securing the box (28). Remove screws (28), wiring plate (29) and operating instruction plate (30) only when necessary.

**b. Repair/Replacement.** Replace defective heater coils (14, fig 4-3), any wires that show evidence of insulation damage, malfunctioning reset button (1) or ON-OFF switch (2). Replace any other damaged or malfunctioning part. Replace movable and stationary contacts (16, 20) as a set (21). Refer to following paragraph for assembly of these parts.

**c. Reassembly/Installation.** Reassemble the motor control box and starter assembly in following sequence.

- (1) If removed, install operating instruction plate (30, fig 4-3) and wiring plate (29) with screws (28). Attach control box (31) to air receiver saddle with four screws (26), two spacing washers (27) and four nuts (25).
- (2) If removed, install conduit connector (24) on pressure switch, connect conduit (23) and conduit elbow (22) running control wires through the conduit into control box (31).

### CAUTION

The stationary contacts (20) must be installed so they seat on top of the terminal plates.

- (3) Slide stationary contacts (20) into grooves in the molding, seating on top of terminal plates. Secure with screws (19).
- (4) Install retainers (17) as shown in Sketch "C." The retainer must be installed so the springs (18) will seat over the extruded hole, with the retainer ends extending away from the moveable contact (16). Install springs (18) as shown in Sketch "D." Install moveable contacts (16) as shown in Sketch "B." Insert contact (16), raise end slightly and push into seat.
- (5) If power unit (15) was removed as an assembly, push in power unit (15) and tighten the slotted hex head screws (B). If disassembled, install coil (13) with coil terminal blades engaging the coil terminal clips. Install and seat the spring plate (12). Slide the armature (11) into its seated operating position. Install cover (10) and tighten the two screws (A).

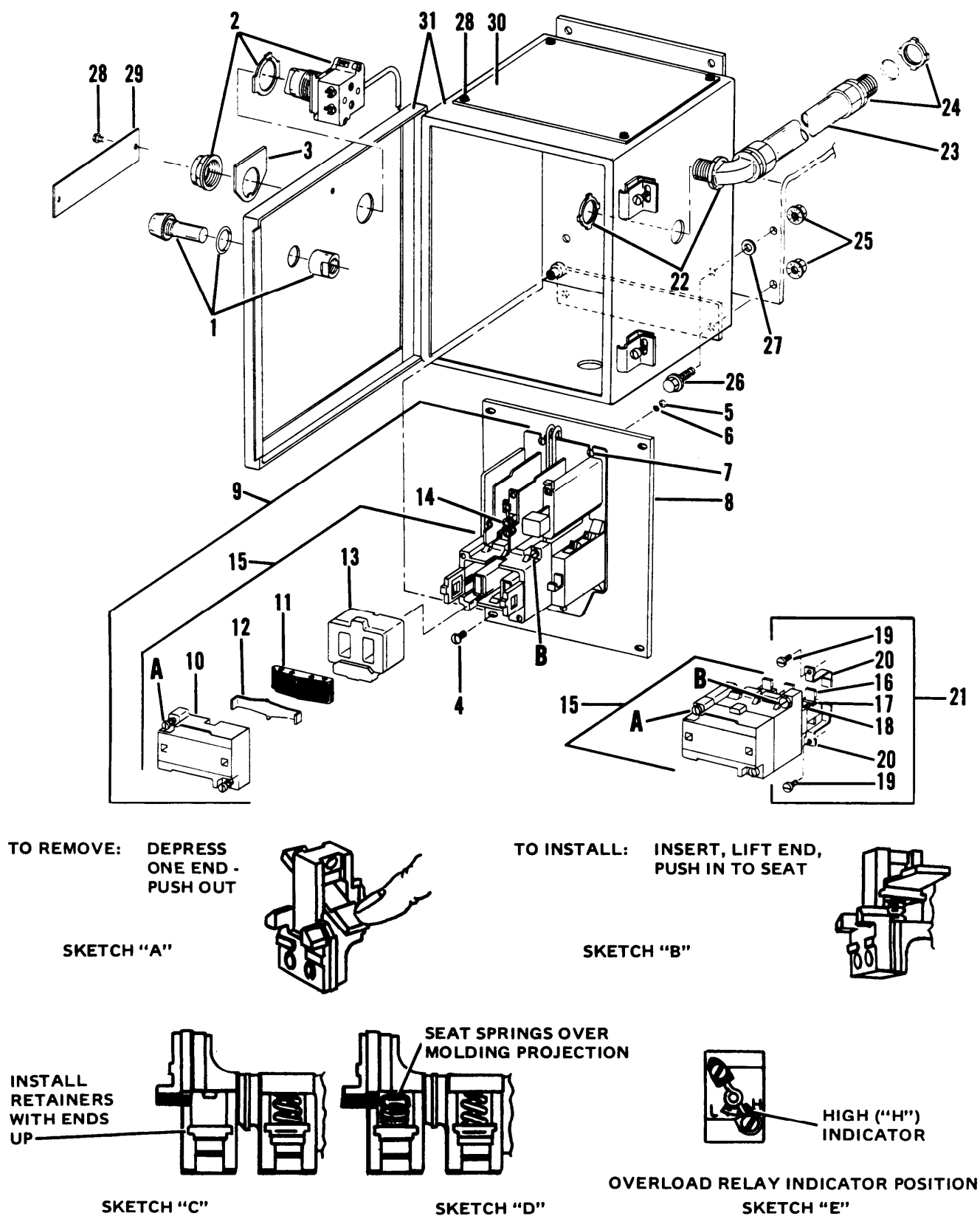


Figure 4-3. Motor control box and starter assembly

### CAUTION

When installing the heater coils (14) make certain all three overload relay indicators are set in the "H" position as shown in Sketch "E."

- (6) Install the three heater coils (14) as shown in Sketch "E."
- (7) Assemble the motor starter assembly (9) to mounting panel (8) and secure with three screws (7), lockwashers (6) and nuts (5). Install starter and panel assembly in control box (31); secure with four screws (4).
- (8) Install ON-OFF switch (2) and legend plate (3). Install the reset button (1).
- (9) Make all wiring connections as tagged at disassembly. Refer to figure 1-2 for wiring diagram.

**4-16. Motor assembly.** Maintenance of motor assembly is as follows:

### WARNING

Electricity is dangerous. Before performing any maintenance or adjustments, be sure the electrical power is turned off. Never depend on the ON-OFF switch. Turn power off at the source.

**a. Inspection/Test.** Turn ON-OFF switch on motor control box to OFF position. Turn main power source off. Remove four screws (1, fig 4-4) securing the motor conduit box lid (2) to the conduit box (7). Remove the lid (2) and gasket (3). Inspect the motor lead connections with nameplate (11) on side of motor. These connections shall be for 230 volts, three phase, 60 hertz. Examine leads for evidence of shorts or grounds and for burned lead insulation. Open motor control box door and check for proper connection of motor leads to starter terminals. Refer to figures 4-1 and 1-2. Remove cover of pressure switch and examine for loose connections and for defective switch. If all wiring connections are secure and correct, wires or switch are not damaged, and motor still does not operate, the motor assembly shall be replaced.

**b. Removal.** Remove motor assembly as follows:

- (1) Disconnect motor leads T1, T2, and T3 inside motor conduit box (7, fig 44). Remove conduit connector (4) and two conduit reducing washers (5) from motor conduit box (7), pulling wires out of conduit box.
- (2) Refer to para 4-14 and remove belt guard, drive belts and drive pulley.
- (3) Unscrew and remove four locknuts (8), flat washers (9) and screws (10). Attach a lifting device to lifting eye on top of motor assembly (12) and remove motor assembly.

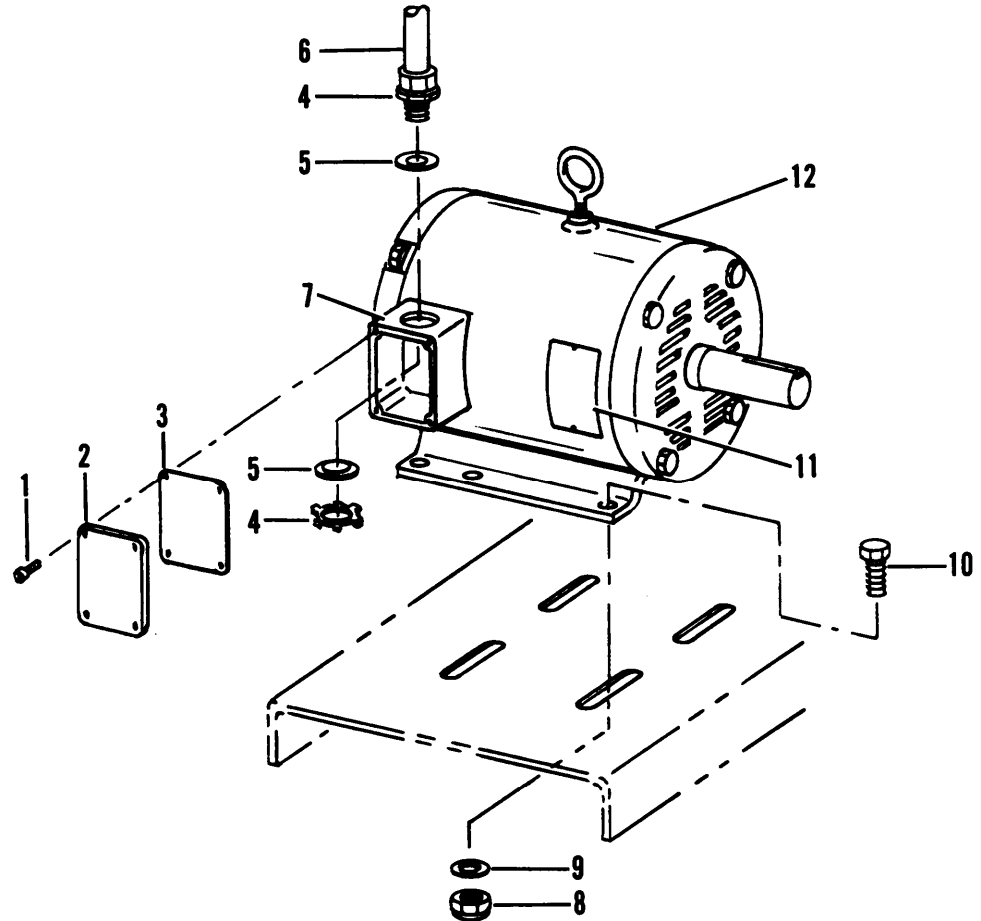
**c. Repair or Replacement.** Notify Direct Support for repair requirement of motor assembly.

**d. Reassembly.** Reassemble a new or repaired motor assembly onto unit in following sequence.

- (1) Install motor assembly (12, fig 4-4) on air receiver and reassemble the four mounting screws (10), flat washers (9), and locknuts (8) but do not tighten hardware until drive belts are installed and pulleys are aligned.
- (2) Refer to para 4-14 and reassemble drive pulley, install drive belts, align and adjust belts as instructed in figure 2-3; then, reassemble belt guard.
- (3) Reconnect conduit (6, fig 4-4) to conduit box (7) with two conduit reducing washers (5) and connector (4).

Legend for fig 4-4:

1. Screw (4)
2. Lid
3. Lid gasket
4. Conduit connector
5. Reducing washer (2)
6. Conduit
7. Conduit box
8. Locknut (4)
9. Flat washer (4)
10. Screw (4)
11. Nameplate
12. Motor assembly



**Figure 4-4. Motor assembly**

Connect wire terminals T1, T2, T3 as disconnected at removal. Check all motor lead connections against wiring instructions on nameplate (11). Reassemble lid gasket (3), lid (2) and secure with four screws (1).

(4) Turn main power source on and turn ON-OFF switch to ON position. Unit should start to run.

### CAUTION

Check rotation of motor pulley. Proper rotation is clockwise when viewed from control box side. If rotation is not correct, reverse any two power source lead connections in control box.

**4-17. Pressure switch.** Maintenance of pressure switch is limited to inspection at organizational level as follows:

**a. Inspection - Installed item.** While unit is running, observe the air pressure gauge and note the cut-in and cut-out pressures. Cut-in pressure should be  $175 \text{ psi} \pm 10 \text{ psi}$  ( $12.3 \pm 0.70 \text{ kgs/cm}^2$ ) and cut-out pressure  $200 \text{ psi} + 0, -10 \text{ psi}$  ( $14.1 + 0 - 0.70 \text{ kgs/cm}^2$ ). If either pressure is incorrect, notify direct support for adjustment.

### WARNING

Electricity is dangerous. Before performing any maintenance or adjustments, be sure the electrical power is turned off. Never depend on the ON-OFF switch. Turn power off at the source.

**b. Maintenance.** Turn main power off at the source. Unscrew the captive-type screw attaching pressure switch cover and remove the cover. Inspect wire connections for tightness. Examine for evidence of shorts or burning of wire insulation. Install pressure switch cover and notify direct support of any defect noted for repair or replacement.

**4-18. Compressor assembly.** Maintenance of compressor assembly at organizational level is restricted to removal and installation and instructions contained in para 4-19, 4-20, and 4-21. Removal and installation is as follows:

### WARNING

Drain air system before performing any maintenance. Open air receiver drain cock.

**a. Removal.** Refer to para 4-14 and remove belt guard and drive belts. Refer to para 4-30 and remove air discharge piping from aftercooler air outlet. Remove the air compressor assembly from the unit in following sequence.

(1) Unscrew and remove the four locknuts (1, fig 4-5) and screws (2) attaching air compressor assembly (3) to the air receiver saddle (4).

(2) Use a suitable sling and lifting device to remove air compressor assembly (3) from unit and place on a work bench.

### NOTE

Place wooden blocks under air compressor frame so the flywheel does not rest on the bench.

**b. Installation.** Install air compressor assembly on air receiver saddle as follows:

(1) Use suitable sling and lifting device to set air compressor assembly (3, fig 4-5) on air receiver saddle (4).

(2) Secure the assembly (3) to saddle (4) with four screws (2) and locknuts (1).

(3) Refer to para 4-30 and install air discharge piping to aftercooler air outlet. Refer to para 4-14 and install drive belts. Adjust drive belts as shown in figure 2-3; then install belt guard.



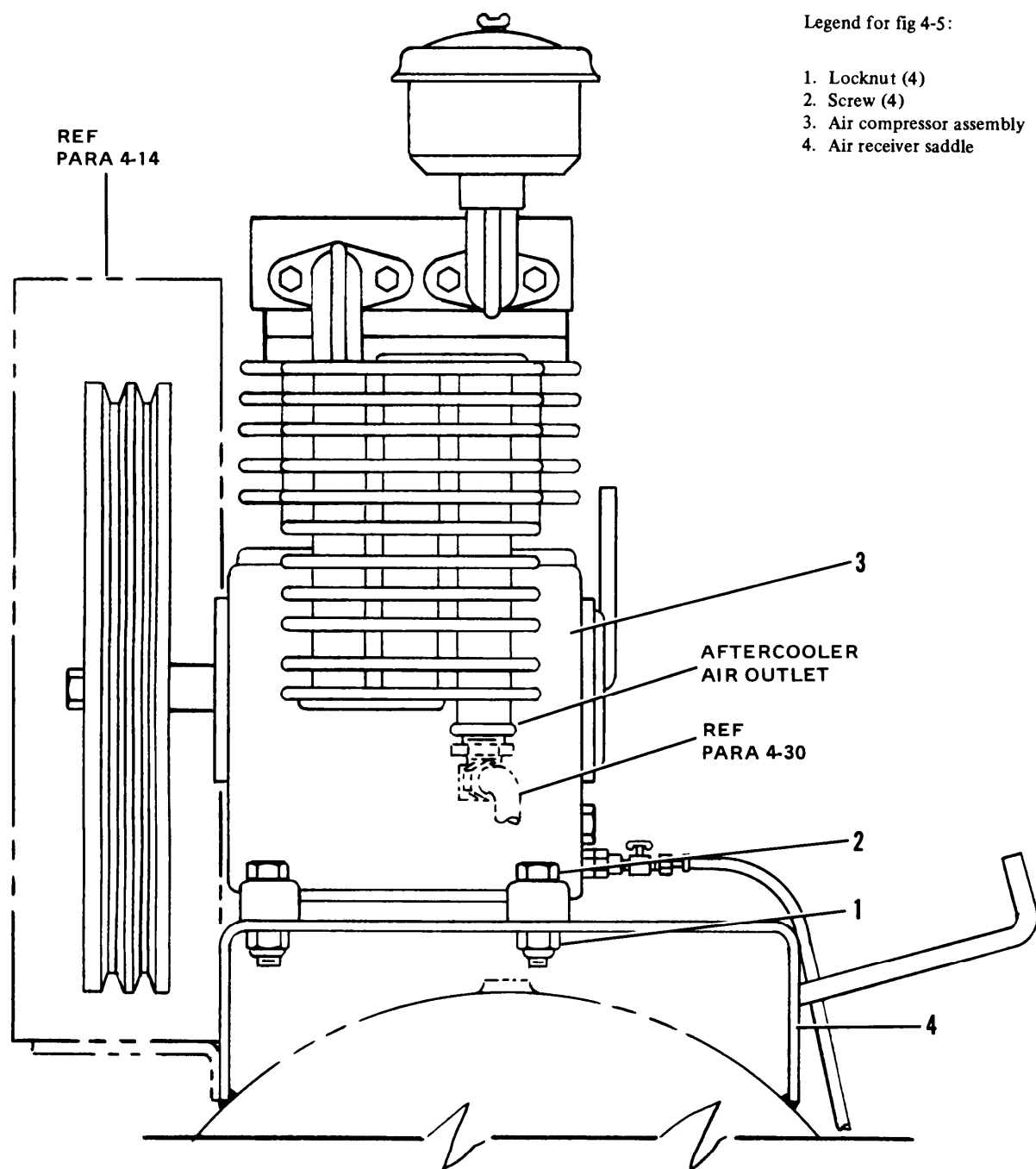


Figure 4-5. Air compressor assembly, removal and installation

**4-19. Cylinder head, first and second stage valves.** Maintenance of cylinder head, first and second stage valves at organizational level is as follows:

**a. Removal/Disassembly.** Remove and disassemble in the following sequence.

**WARNING**

Drain air system before performing any maintenance. Open air receiver drain cock.

- (1) Unscrew and remove the six cylinder head bolts (1, fig 4-6). Tap the cylinder head lightly with a plastic head hammer, or equivalent, to break the seal of cylinder head and valve plates to compressor cylinder.
- (2) Separate cylinder head (2) and cylinder head gasket (3) from upper valve plate (4).

**CAUTION**

As an aid at assembly, mark the upper valve plate (4) and lower valve plate (8) in a suitable manner on the edge of each so they are assembled in the same sequence as removed.

- (3) Separate the upper valve plate (4) from lower valve plate (8). Remove the two second stage valves (5), two first stage valves (6), valve plate gasket (7), and cylinder gasket (9).

**WARNING**

Dry cleaning solvent, Federal Specification P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100°F - 138°F (38°C - 59°C).

**b. Cleaning.** If gasket material has stuck to cylinder head (2, fig 4-6) or valve plates (4, 8), carefully scrape off material. Clean all parts, except gaskets (3, 7, 9) with solvent, P-D-680, or equivalent, and dry thoroughly. Make certain air passage holes in valve plates (4, 8) are free of any foreign matter.

**c. Inspection.** Visually inspect all parts for cracks, breaks, chipping, distortion, and evidence of wear. Any part suspected of defect from this inspection shall be replaced.

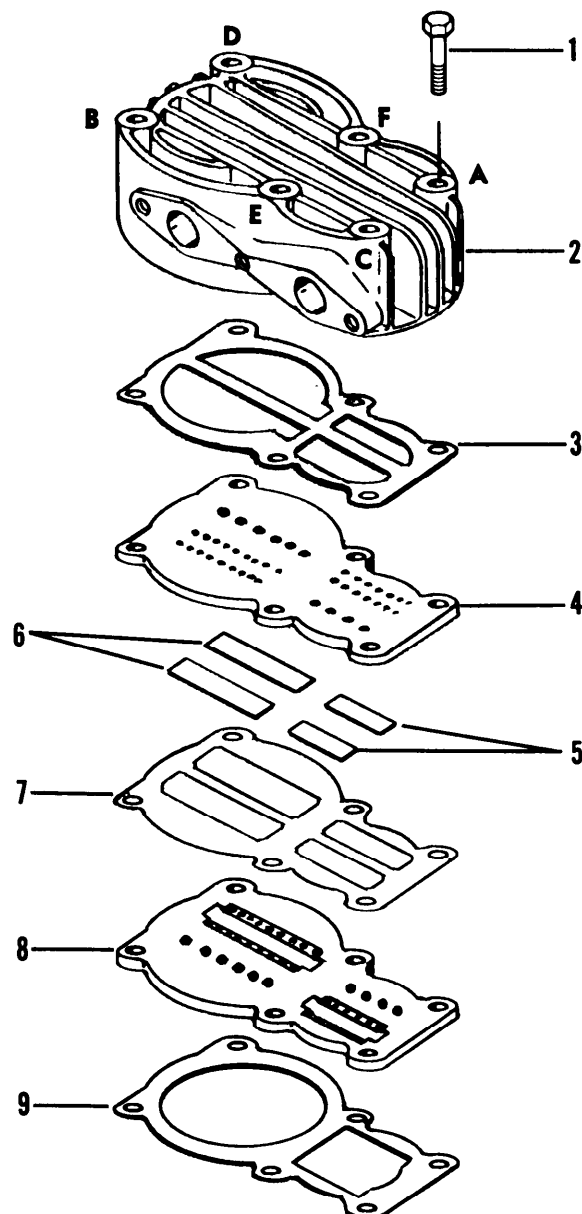
**d. Repair or replacement.** No repair of these parts is authorized. Replace gaskets (3, 7, 9, fig 4-6) each time cylinder head (2) is removed to ensure proper sealing at assembly. If second stage valves (5) or first stage valves (6) are worn or damaged, replace all of the valves.

**e. Reassembly/Installation.** Reassemble/install in the following sequence.

- (1) Place a new cylinder gasket (9, fig 4-6) in position on compressor cylinder. Position lower valve plate (8) on gasket (9) with valve recesses facing up.
- (2) Position valve plate gasket (7) on lower valve plate (8). Apply just enough grease (MIL-G-10924) or petroleum jelly on ends of first stage and second stage valves (6, 5) to hold them in place. Assemble the two first stage valves (6) and two second stage valves (5) in position on valve plates.

Legend for fig 4-6:

1. Cylinder head bolt (6)
2. Cylinder head
3. Cylinder head gasket
4. Upper valve plate
5. Second stage valve (2)
6. First stage valve (2)
7. Valve plate gasket
8. Lower valve plate
9. Cylinder gasket



*Figure 4-6. Cylinder head, first and second stage valves*

- (3) Place upper valve plate (4) on lower valve plate (8) in position as marked at disassembly.
- (4) Place cylinder head gasket (3) and cylinder head (2) onto stacked valve plates. Install six cylinder head bolts (1). Tighten bolts until snug; then, torque the bolts to 30-33 ft-lbs (4.1 - 4.6 kgs-m) in the letter sequence, A through F, as shown in figure 4-6.

**4-20. Intercooler and aftercooler.** Maintenance of intercooler and aftercooler is limited to the following:

- a. Removal/Disassembly.* Remove and disassemble intercooler and aftercooler in following sequence.

**WARNING**

Drain air system before performing any maintenance. Open air receiver drain cock.

- (1) Unscrew and remove three screws (1, fig 4-7), attaching intercooler (2) to cylinder head. Remove two o-ring gaskets (3).
- (2) Unscrew and remove six screws (4), separate intercooler cap (5) from intercooler (2) and remove cap gasket (6).
- (3) Disconnect air discharge piping (see para 4-30) from aftercooler air outlet. Unscrew and remove two screws (7, fig 4-7) attaching aftercooler (8) to cylinder head. Remove the o-ring gasket (9).
- (4) Unscrew and remove four screws (10), separate lower aftercooler cap (11) from aftercooler (8) and remove cap gasket (12).
- (5) Unscrew and remove four screws (13), separate upper aftercooler cap (14) from aftercooler (8) and remove cap gasket (15).

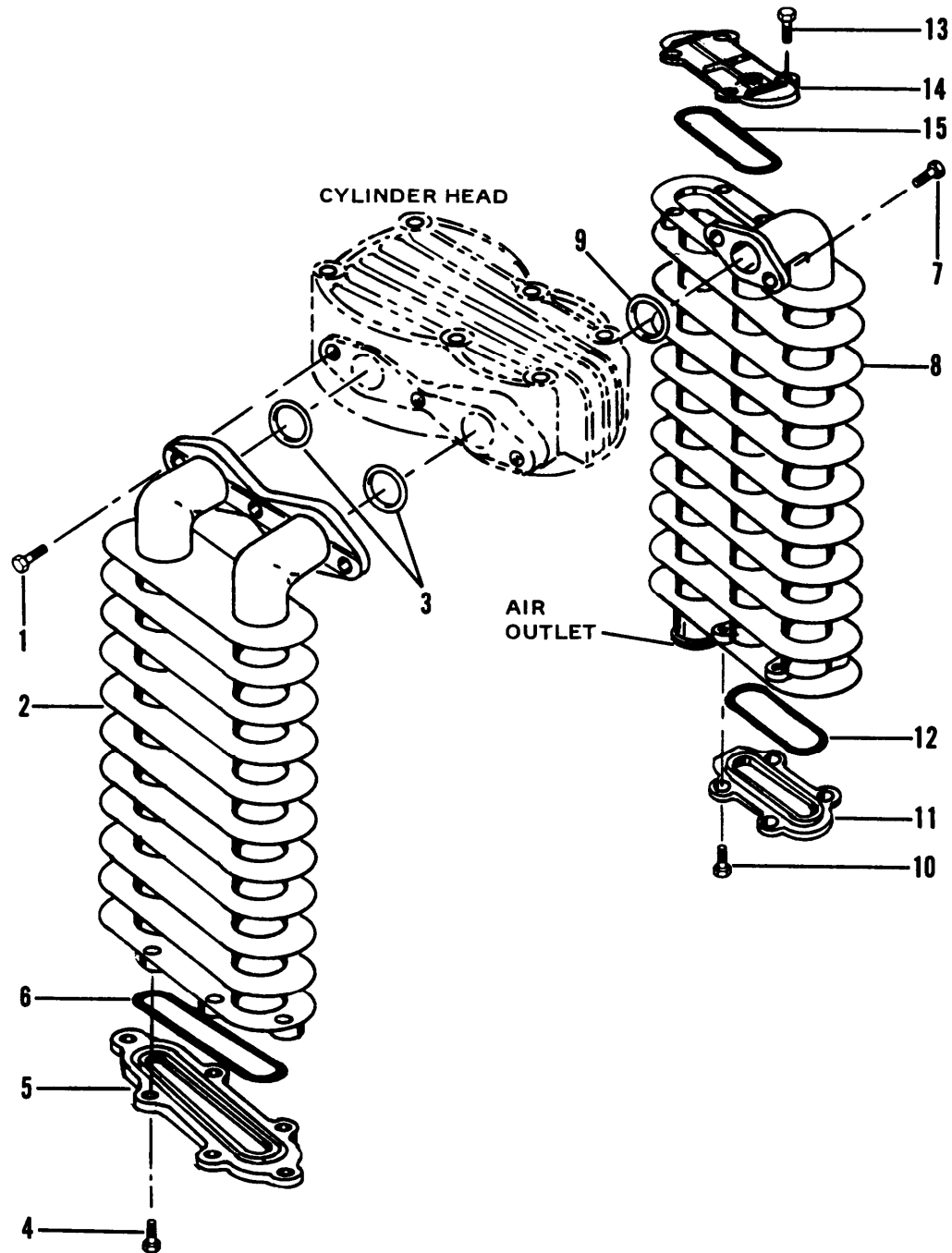
**WARNING**

Dry cleaning solvent, Federal Specification P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near an open flame or excessive heat. Flash point of the solvent is 100°F - 138°F (38°C - 59°C).

*b. Cleaning/Inspection.* Wipe o-ring gaskets (3, 9, fig 4-7) and cap gaskets (6, 12, 15) with a clean, lint-free cloth moistened slightly with solvent, P-D-680, or equivalent. Clean intercooler (2), aftercooler (8) and caps (5, 11, 14) with solvent, P-D-680, or equivalent, and air dry. Examine o-ring gaskets (3, 9) and cap gaskets (6, 12, 15) for breaks, cuts and evidence of pinching. Inspect other parts for breaks and cracks. Notify organizational maintenance of any defects for replacement.

- c. Reassembly/Installation.* Reassemble and install the intercooler and aftercooler in following sequence.

- (1) Place cap gasket (15, fig 4-7) in groove provided, install upper aftercooler cap (14); secure with four screws (13).
- (2) Place cap gasket (12) in groove provided, install lower aftercooler cap (11); secure with four screws (10).
- (3) Place o-ring gasket (9) in groove provided, install aftercooler (8) onto cylinder head and secure with two screws (7). Connect air discharge piping to aftercooler air outlet (see para 4-30).
- (4) Place cap gasket (6) in groove provided, install intercooler cap (5) and secure with six screws (4).
- (5) Place the two o-ring gaskets (3) in grooves provided, install intercooler (2) onto cylinder head and secure with three screws (1).



Legend for fig 4-7:

- |                      |                  |                           |
|----------------------|------------------|---------------------------|
| 1. Screw (3)         | 6. Cap gasket    | 11. Lower aftercooler cap |
| 2. Intercooler       | 7. Screw (2)     | 12. Cap gasket            |
| 3. O-ring gasket (2) | 8. Aftercooler   | 13. Screw (4)             |
| 4. Screw (6)         | 9. O-ring gasket | 14. Upper aftercooler cap |
| 5. Intercooler cap   | 10. Screw (4)    | 15. Cap gasket            |

Figure 4-7. Intercooler and aftercooler

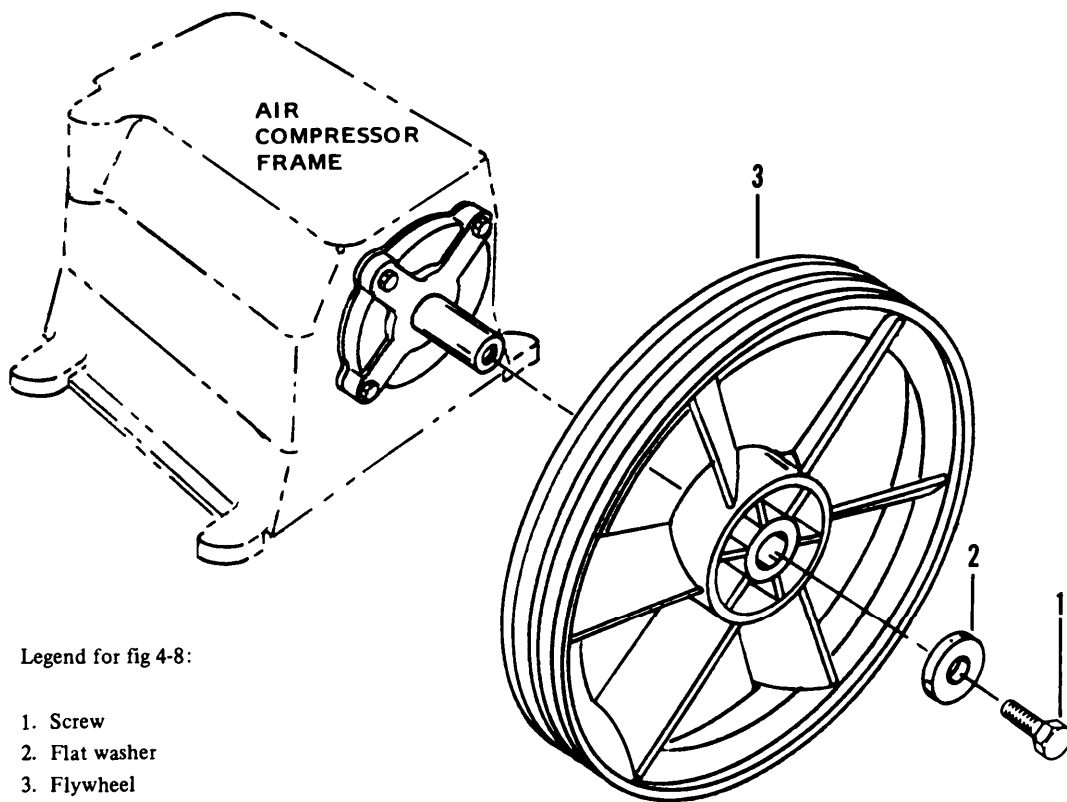
**4-21. Flywheel.** Maintenance of flywheel is limited to the following.

*a. Inspection.* Inspect flywheel (3, fig 4-8) for breaks, chips, and cracks in belt grooves and fan ribs. Any damage is cause for replacement.

**NOTE**

Flywheel screw (1, fig 4-8) is left-hand thread. Turn clockwise to remove and counterclockwise to install.

*b. Replacement.* Unscrew and remove screw (1, fig 4-8) and flat washer (2). Tap hub of flywheel (1) lightly with a soft-type hammer to free from crankshaft or use a suitable puller. Install new flywheel (1) on crankshaft, install flat washer (2) and secure with screw (1). Torque screw (1) to 33-37 ft-lbs (4.6 - 5.1 kgs-m).



*Figure 4-8. Flywheel*

**WARNING**

Drain air system before performing any maintenance. Open air receiver drain cock.

**4-22. Safety valve.** When notified by operator/crew of either air compressor aftercooler or air receiver safety valve leakage or that safety valve does not seat properly when inspected, unscrew the safety valve and replace. No repair is authorized. (Ref 13, fig 4-10.)

**4-23. Check valve.** Maintenance of check valve is as follows:

**a. Inspection-Installed item.** With air pressure in air receiver tank, apply a soapy water solution with a brush to the check valve and connections. Observe for evidence of leakage indicated by bubbling of the solution. Check connections for tightness; if secure and leakage is at check valve, replace the valve. Stop the unit and relieve air pressure from tank.

**b. Removal/Replacement.** Remove and replace check valve as follows:

- (1) Disconnect air discharge tube (1, fig 4-10) from air compressor aftercooler outlet to check valve (refer to para 4-30). Disconnect unloader tubing (9) from check valve and remove tubing connectors (2, 10) and reducing bushing (3) from check valve (11).
- (2) Unscrew and remove check valve (11) from air receiver tank.
- (3) Install new check valve (11), install reducing bushing (3) and tube connectors (10, 2). Connect unloader tubing (9) to connector (10) and air discharge tube (1) to connector (2).
- (4) After replacement and installation, again check for leakage as instructed in para 4-23.a above.

**4-24. Pressure gauge.** Inspect, remove and replace the air pressure gauge as follows:

**a. Inspection - Installed item.** While unit is operating, observe air pressure gauge (14, fig 4-10) for proper operation. Inspect for broken face. Apply soapy water solution with a brush around connection to tank and check for leakage indicated by bubbling of solution. If face of gauge is broken, gauge does not operate properly, or leakage is detected, the pressure gauge shall be replaced. Stop the unit and relieve pressure from air receiver tank.

**b. Removal/Replacement.** Unscrew and remove the air pressure gauge (14, fig 4-10) from air receiver tank. Install a new gauge and position so gauge is in reading position when faced by operator. Then, again inspect as instructed in para 4-24.a above.

**4-25. Air receiver drain cock.** Maintenance of the drain cock (15, fig 4-10) is limited to replacement. When notified by operator/crew of leakage or improper seating stop unit and drain receiver. Unscrew and discard the drain cock (15, fig 4-10) from bottom of air receiver tank. Install new drain cock (15) and check for leakage as instructed in para 3-12.b.

**4-26. Air receiver.** Maintenance of air receiver is as follows:

**a. Inspection.** Inspect air receiver for any dents and rusting. The air receiver is an ASME Pressure Vessel and shall not be repaired. If inspection reveals dents that could cause rupture, notify direct support for replacement of air receiver.

**b. Painting.** If inspection reveals rusting, clean, treat, and paint in accordance with Military Standard, MIL-T-704, type A, lusterless, color Forest Green.

**4-27. Inflator gauge.** When advised of malfunction of inflator gauge (1, fig 4-9) by operator/crew, close globe valve (6, fig 4-9), relieve pressure in hose; then, unscrew the gauge (1) from end of air service hose nipple (2) and replace with new gauge. Screw the new gauge (1) onto air service hose nipple (2) and again inspect in accordance with para 3-13.a.

**4-28. Air service hose.** When advised of any air service hose damage by operator/crew, replace air service hose assembly as follows:

**a. Removal.** Close globe valve (6, fig 4-9), relieve pressure in hose; then, unscrew and remove inflator gauge (1, fig 4-9) and nipple (2) from end of air service hose (3). Disconnect hose assembly from elbow (4). Discard a damaged hose assembly (3) to avoid possible injury from the use of a defective hose.

**b. Replacement.** Replace damaged hose assembly (3, fig 4-9) with a new assembly. Attach hose to elbow (4) and install nipple (2) and inflator gauge (1) on other end. Coil hose assembly on hanger provided on air receiver saddle until ready for use.

**4-29. Gobe valve.** When notified of defective globe valve by operator/crew, replace as follows:

**a. Removal.** Stop the unit and drain air receiver. Disconnect air service hose (3, fig 4-9) at elbow (4). Unscrew and remove elbow (4) and reducing bushing (5) from globe valve (6), unscrew and remove globe valve (6) from close nipple in end of receiver tank (7). Discard defective globe valve.

**b. Replacement.** Screw new globe valve (6, fig 4-9) onto close nipple in tank (7). Position globe valve handle in up position for easy access. Install reducing bushing (5) in globe valve (6), install elbow (4) and attach air service hose (3) to elbow (4).

Legend for fig 4-9:

1. Inflator gauge
2. Nipple
3. Service hose assembly
4. Elbow
5. Reducing bushing
6. Globe valve
7. Air receiver tank

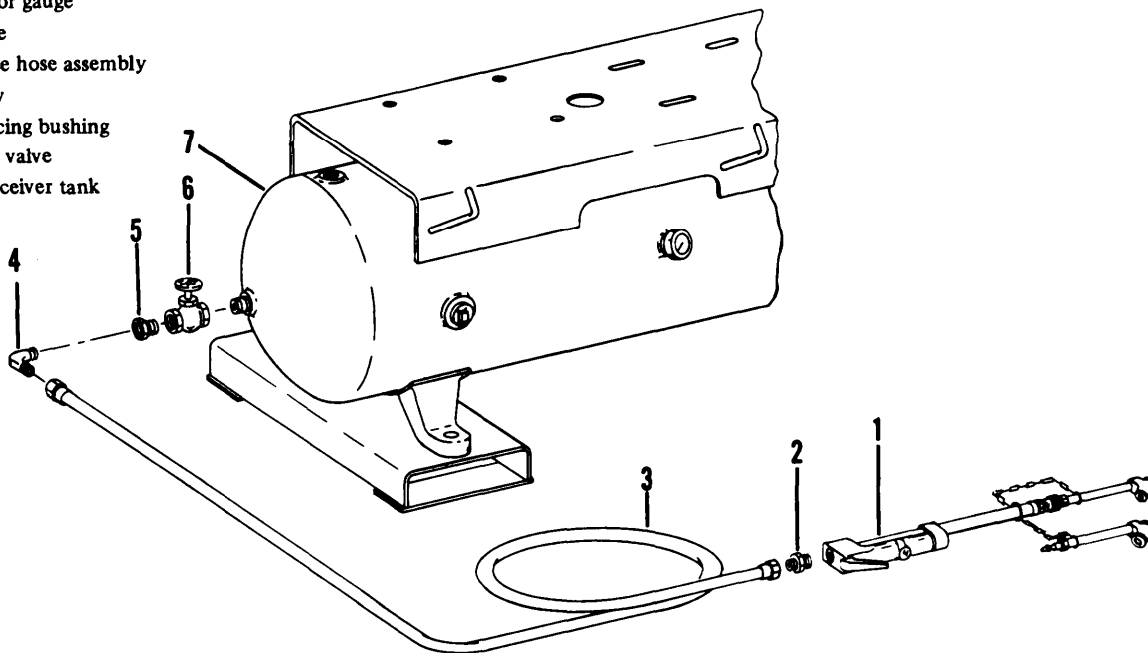


Figure 4-9. Air discharge system



**4-30. Air discharge piping.** Maintenance of air discharge piping is as follows:

**a. Inspection - installed items.** While unit is running, use a soapy water solution applied with a brush to discharge piping connections, see figure 4-10, to check for leaks. Leakage will be indicated by bubbling of the solution. Tighten connections where leakage is found. If tightening does not stop leakage, stop the unit and replace defective parts.

#### NOTE

Checking for leaks must be done while compressor is running. When motor and compressor stops, the unloader on the pressure switch bleeds the air from compressor discharge piping.

**b. Removal/Disassembly.** As necessary for replacement of damaged parts, remove or disassemble to extent necessary as follows:

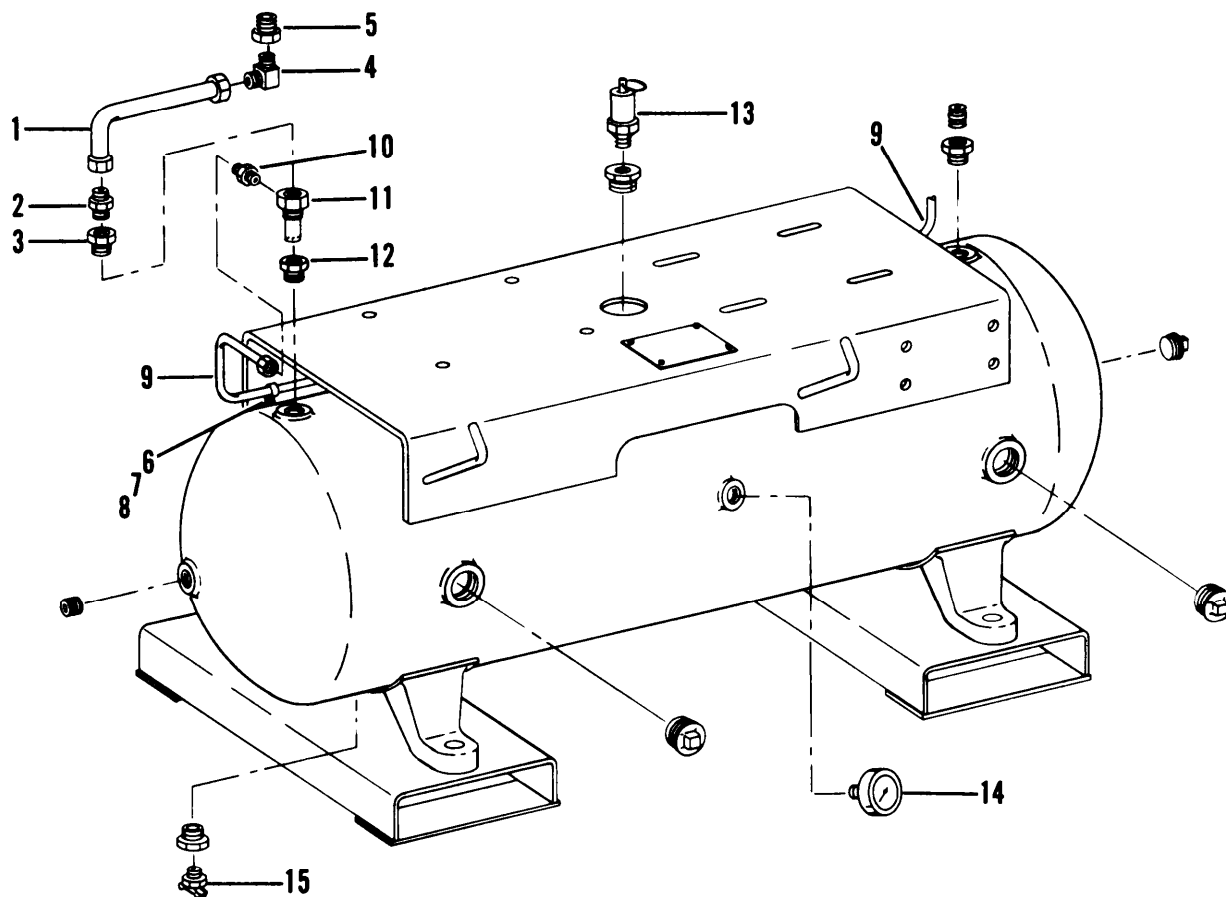
#### WARNING

Drain air system before performing any maintenance. Open air receiver drain cock.

- (1) Disconnect and remove air outlet tube assembly (1, fig 4-10), remove tube connector (2) and reducing bushing (3) from top of check valve (11).
- (2) Unscrew and remove tubing elbow (4) and reducing bushing (5) from air compressor aftercooler air outlet port.
- (3) Remove two nuts (6), screws (7), and tubing clips (8) securing unloader tube assembly (9) to air receiver saddle. Disconnect tube assembly (9) from pressure switch unloader and tubing connector (10). Remove the tube assembly (9).
- (4) Unscrew and remove tubing connector (10), check valve (11) and reducing bushing (12).

**c. Reassembly /Installation.** Replace all defective parts and reassemble or install as follows:

- (1) Install reducing bushing (12, fig 4-10) and check valve (11) with port for tube connector (10) facing as shown so that tube assembly (9) will connect when assembled. Install connector (10).
- (2) Install tube assembly (9) connecting to tube connector (10) and unloader on pressure switch. Secure tube assembly (9) to air receiver saddle with two each tubing clips (8), screws (7) and nuts (6).
- (3) Install reducing bushing (5) into air outlet of compressor aftercooler. Assemble elbow (4), install reducing bushing (3), tubing connector (2), and install air outlet tube assembly (1).
- (4) When unit is started, check all connections for leaks with a soapy water solution applied with a brush.



Legend for fig 4-10:

- |                         |                         |
|-------------------------|-------------------------|
| 1. Air outlet tube assy | 9. Unloader tube assy   |
| 2. Tube connector       | 10. Tubing connector    |
| 3. Reducing bushing     | 11. Check valve         |
| 4. Tubing elbow         | 12. Reducing bushing    |
| 5. Reducing bushing     | 13. Safety valve        |
| 6. Nut (2)              | 14. Air pressure gauge  |
| 7. Screw (2)            | 15. Receiver drain cock |
| 8. Tubing clip (2)      |                         |

Figure 4-10. Air discharge piping

## Section VI. PREPARATION FOR STORAGE OR SHIPMENT

### 4-31. Types of storage.

***a Short term (Administrative storage).*** Short term (administrative storage) is 1 to 45 days. This covers storage of equipment which can be readied for mission performance within 24 hours. Before placing an item in administrative storage, the next scheduled preventive maintenance checks and services (PMCS) should be performed, all known deficiencies corrected, and all current modification work orders applied. Storage site should provide required protection from the elements and allow access for visual inspection.

***b. Intermediate storage*** = 46 to 180 days.

***c. Long term storage*** = No time limit.

**4-32. Preparation for storage or shipment.** Refer to TB 740-94-2, Preservation of USAMECOM Mechanical Equipment for Shipment and Storage.



**CHAPTER 5**  
**DIRECT SUPPORT AND GENERAL SUPPORT**  
**MAINTENANCE INSTRUCTIONS**

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**Section I. TROUBLESHOOTING**

**5-1. Introduction.** This section contains those checks and corrective actions which will isolate defects which can be corrected by performance of maintenance allocated to direct support and general support maintenance technicians by the MAC, Appendix B.

**5-2. Troubleshooting table.** Table 5-1 lists Malfunction, Test or Inspection, and Corrective Actions. The table is based on symptoms which may have been observed during PMCS. Only checks and corrective actions authorized for direct support and general support maintenance are listed. (Operator/Crew troubleshooting is found in table 3-2 and Organizational troubleshooting is found in table 4-3.)

*Table 5-1. Direct Support and General Support Troubleshooting*

---

**MALFUNCTION**

**TEST OR INSPECTION**

**CORRECTIVE ACTION**

---

**1. ELECTRIC MOTOR FAILS TO START OR FAILS TO RUN.**

Step 1. Check motor leads for proper connection in control box assembly. If leads are connected properly, proceed to Step 2. If leads are not connected properly, repair as follows:

**WARNING**

Electricity is dangerous. Before performing any maintenance or adjustments, be sure the electrical power is turned off. Never depend on the ON-OFF switch. Turn power off at the source.

- a. Turn OFF main power source.
- b. Loosen the two control box cover screws and open control box cover.
- c. Check name plate on motor to determine correct lead connections to starter. Also, refer to figure 1-2 for wiring diagram.
- d. Refer to figure 1-2 and connect motor leads to correct starter terminals.
- e. Close control box cover and secure by tightening the two cover clamp screws.
- f. Turn ON main power source.

Step 2. Check for a defective pressure switch.

Refer to para 5-6 for adjustment, repair, or replacement, as required.

Step 3. Check magnetic starter switch and on-off switch for defects.

*Table 5-1. Direct Support and General Support Troubleshooting- Continued*

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

Refer to para 4-15 and remove, disassemble, repair or replace, assemble and install the magnetic starter or on-off switch.

Step 4. Check for a defective motor.

Refer to para 4-16.a and test motor. If motor is defective, remove motor in accordance with para 4-16.b and repair in accordance with para 5-5. Install repaired motor as instructed in para 4-16.c.

## 2. ELECTRIC MOTOR REVERSES.

Step 1. Check motor leads for proper connection to magnetic starter in control box.

Refer to **MALFUNCTION 1, Step 1, and connect leads properly.**

## 3. ELECTRIC MOTOR OVERHEATS.

Step 1. Use a volt meter and check for low line voltage from power source.

**If voltage is low, connect to another power source.**

Step 2. Check alignment of motor pulley and compressor pulley.

**Refer to figure 2-3 and align the pulleys and adjust the drive belts.**

Step 3. Check electric motor for any accumulation of dirt, foreign matter, and belt guard obstructions that would cause poor cooling air circulation.

### WARNING

When cleaning with compressed air, nozzle pressure shall not exceed 30 psi (2.11 kg/cm<sup>2</sup>). Eye protection is required.

**Remove dirt and foreign matter with air hose.**

## 4. ELECTRIC MOTOR NOISY.

Step 1. Check motor mounting hardware for tightness.

**Tighten mounting hardware. Check alignment of pulleys and belt tension. Refer to figure 2-3.**

Step 2. Motor bearings may be defective. If noise is coming from inside of motor, the motor should be repaired.

**Refer to para 5-5 and repair the motor.**

## 5. ELECTRIC MOTOR DOES NOT CUT-IN OR CUT-OUT AT PROPER AIR PRESSURE.

Step 1. Check pressure switch for proper setting.

*Table 5-1. Direct Support and General Support Troubleshooting- Continued*

<b>MALFUNCTION</b>	<b>TEST OR INSPECTION</b>	<b>CORRECTIVE ACTION</b>
		Refer to para 5-6.a and adjust pressure switch.
	Step 2. Check for incorrect lead connections in pressure switch.	
		Refer to para 5-6 and fig 1-2 for correct lead connections. Correct as necessary.
	Step 3. Check for a defective pressure switch.	
		Refer to para 5-6.b and repair or replace defective pressure switch.
<b>6. COMPRESSOR NOT PRODUCING ENOUGH COMPRESSED AIR OR PRODUCING TOO SLOWLY.</b>		
	When advised by organizational maintenance of malfunction of air compressor beyond repair capability of their level, the air compressor shall be repaired/overhauled.	
		Refer to para 5-7 for air compressor repair/overhaul.
<b>7. INTERCOOLER AND AFTERCOOLER.</b>		
	When advised by organizational maintenance of malfunction of intercooler and aftercooler beyond repair capability of their level, the intercooler or aftercooler shall be replaced.	
		Refer to para 5-8.
<b>8. AIR RECEIVER TANK.</b>		
	When advised by organizational maintenance of malfunction of air receiver tank beyond repair capability at their level, the air receiver tank shall be replaced.	
		Refer to para 5-11.

## Section II. MAINTENANCE PROCEDURES

**5-3. Introduction.** This section explains maintenance procedures which are the responsibility of the direct support and general support maintenance technicians as authorized by the MAC (Appendix B) and the Source, Maintenance, and Recoverability (SMR) coded items.

**5-4. Maintenance procedures.** Maintenance procedures are presented in the same order, as applicable, listed in para graph 4-13. Complete instructions for maintenance operations within the scope of this maintenance level for each Functional Group is provided in step-by-step procedures in following paragraphs.

**5-5. Electric motor assembly.** Maintenance of the electric motor assembly is as follows:

**WARNING**

Electricity is dangerous. Before performing any maintenance or adjustments, be sure the electrical power is turned off. Never depend on the ON-OFF switch. Turn power off at the source.

**a. Removal/Disassembly.** Remove the four screws (5, fig 5-1), conduit box cover and gasket (6, 7), disconnect and tag, as necessary, all motor leads within the motor conduit box (9). Unscrew retaining nut of conduit connector (27) and pull out conduit (29), conduit connector (27), and remove conduit washers (28) from conduit box (9). Reassemble gasket (7), cover (6), and screws (5) to prevent loss until ready for motor disassembly. Refer to para 4-14 and remove belt guard, drive belts and drive pulley shown in figure 4-2. Remove four locknuts (1, fig 5-1) flat washers (2), and screws (3). Attach a lifting device to eye bolt (23) and lift motor assembly (4) off air receiver saddle and place motor assembly on a clean work bench. Disassemble motor assembly (4) as follows:

- (1) Remove four screws (5), conduit box cover (6), and cover gasket (7). If removal of conduit box (9) is required, remove two screws (8), conduit box (9), and box gasket (10).
- (2) Remove four nuts (11) and through bolts (12). Tap endplate (13) with a soft hammer, or equivalent, to break seal against stator (26) and pull away from stator assembly (26). Remove thrust washer (14) and, as necessary, two lubrication fittings (15).
- (3) Remove key (16) from shaft keyway if not removed when drive pulley was disassembled from shaft. Tap endplate (17) with a soft hammer, or equivalent, to break seal against stator assembly (26). Pull endplate (17) away from stator assembly. The rotor and shaft assembly (22) and bearings (19, 20) will come out of stator assembly along with endplate (17).
- (4) Pull endplate (17) off of shaft bearing (19) and remove two bearing guards (18). Use a bearing puller and remove pulley end bearing (19) and closed end bearing (20) from rotor and shaft assembly (22).
- (5) Only when replacement is necessary, pull internal fan (21) off rotor and shaft assembly (22). It is not necessary to remove eye bolt (23) or nameplate screws and nameplate (24, 25) from stator assembly (26), except for replacement.

**b. Repair/Replacement.** Repair of the electric motor assembly is limited to replacement of defective parts, such as the bearings (19, 20, fig 5-1). Press new bearings onto rotor and shaft assembly (22) until they seat against shoulders on shaft extensions. Defects in windings of rotor and shaft assembly (22) or stator assembly (26) is cause for replacement of motor assembly (4).

**c. Reassembly/Installation.** Reassembly and installation of electric motor assembly is in the following sequence:

- (1) If removed, install eye bolt (23, fig 5-1), nameplate (25) and screws (24) on stator assembly (26). Assemble internal fan (21) onto rotor and shaft assembly (22).

**CAUTION**

When pressing bearings (19, 20) into place, press on inner races only to prevent bearing damage.

- (2) Assemble closed end bearing (20) and pulley end bearing (19) onto rotor and shaft assembly (22) bearing journals, pressing on inner races only, until bearings seat against shaft shoulders.
- (3) Assemble two bearing guards (18) and endplate (17) over shaft extension and bearing (19). Carefully





insert rotor and shaft assembly (22) through stator assembly (26). Assemble thrust washer (14) and endplate (13); install four through bolts (12) and nuts (11). Tighten nuts alternately and evenly to draw assembly together.

- (4) Install two lubrication fittings (15), place key (16) in keyway of shaft and tape in position until ready to assemble drive pulley onto shaft.
- (5) If removed, assemble conduit box gasket (10) and conduit box (9); secure with two screws (8). Assemble conduit cover gasket (7), conduit box cover (6) and secure with four screws (5) until ready to connect conduit (29) and make wire connections.
- (6) Use lifting device attached to eye bolt (23) and move motor assembly (4) to unit. Place motor assembly on air receiver saddle and attach with four screws (3), flat washers (2) and locknuts (1).
- (7) Remove four screws (5), conduit box cover (6), and gasket (7). Install conduit washers (28) and conduit connector (27) attaching conduit (29) from pressure switch. Make wiring connections as tagged at disassembly; also, refer to connection diagram plate (25) on side of motor and figure 1-2.
- (8) Install cover gasket (7), conduit box cover (6) and secure cover with four screws (5). Refer to para 4-14 and install drive pulley and drive belts. Adjust belt tension and install belt guard, refer to figure 2-3.

**5-6. Pressure switch.** When notified by organizational maintenance of malfunction of pressure switch during their inspection, direct support maintenance is as follows:

**a. Adjustment.** The pressure switch (7, fig 5-2) is installed so that air receiver tank pressure is applied directly to the diaphragm (11) of the switch. The electrical contact (10) operation results when the pressure changes within the tank are transmitted by the diaphragm (11) to the switch mechanism. Design cut-in pressure is  $175 \text{ psi} \pm 10 \text{ psi}$  ( $12.3 \pm 0.70 \text{ kgs/cm}^2$ ) and cut-out pressure is  $200 \text{ psi} + 0 - 10 \text{ psi}$  ( $14.1 + 0 - 0.70 \text{ kgs/cm}^2$ ). The cut-in to cut-out range is termed the differential pressure. To adjust the pressure switch, refer to figure 5-2, and proceed as follows:

- (1) Start the unit (para 2-7.a) and observe the air pressure gauge on the receiver tank to determine the cut-in and cut-out pressures. If adjustment is necessary, stop the unit (para 2-7.c) and turn OFF main power source.
- (2) Remove the cover (8) from pressure switch (7).
- (3) To raise the cut-in and cut-out pressures, turn the pressure adjusting screw (12) clockwise, or to decrease, turn counterclockwise.

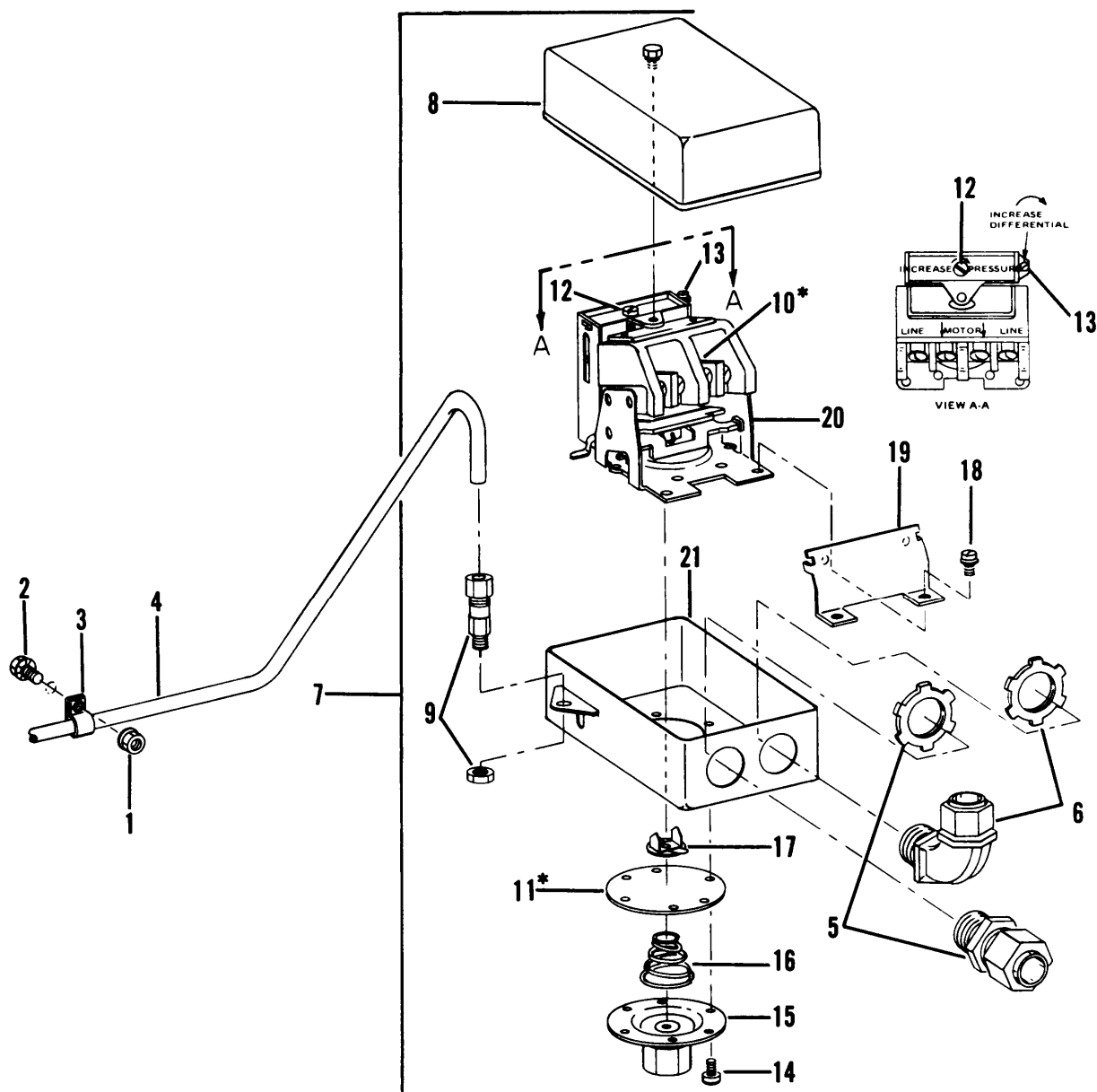
### CAUTION

When adjusting the differential screw (13), do not turn farther than it will turn easily.

- (4) To increase differential pressure, turn differential adjusting screw (13) clockwise, or to decrease, turn counterclockwise.
- (5) To increase the differential and maintain the same cut-out pressure, turn the differential adjusting screw (13) clockwise and, at the same time, turn pressure adjusting screw (12) counterclockwise.

### NOTE

If the differential is increased only by turning the differential adjusting screw (13) clockwise, the cut-in pressure changes only slightly, and the cut-out pressure rises.



Legend for fig 5-2:

- |                         |  |                                |
|-------------------------|--|--------------------------------|
| 1. Nut                  | 9. Unloader                              | 16. Spring                     |
| 2. Screw                | 10. Board assy and contacts              | 17. Contact actuator           |
| 3. Tubing clip          | 11. Diaphragm                            | 18. Screw (2)                  |
| 4. Unloader tube assy   | 12. Pressure adjusting screw             | 19. Plate                      |
| 5. Conduit connector    | 13. Differential adjusting screw         | 20. Frame assembly             |
| 6. Conduit elbow        | 14. Screw (6)                            | 21. Body                       |
| 7. Pressure switch assy | 15. Inlet fitting and diaphragm retainer | *Component of repair parts kit |
| 8. Cover                |  |                                |

Figure 5-2. Pressure switch assembly

- (6) Turn main power source on, start the unit (para 2-7.a) and check the adjustment. To check cut-in pressure, open the drain cock on bottom of receiver tank and allow air pressure to fall below 175 psi (12.3 kgs/cm<sup>2</sup>). Close drain cock and motor should start immediately.
- (7) Repeat above adjustments as necessary to obtain proper operating pressures.
- (8) Install switch cover (8) and secure with captive cover screw.

**b. Removal.** To remove pressure switch for repair or replacement, proceed as follows:

#### **WARNING**

Electricity is dangerous. Before performing any maintenance or adjustments, be sure the electrical power is turned off. Never depend on the ON-OFF switch. Turn power off at the source.

- (1) Turn main power OFF at the source.
- (2) Disconnect compressor unloader line (4, fig 5-2) from pressure switch unloader (9).
- (3) Unscrew pressure switch captive cover screw and remove pressure switch cover (8).
- (4) Disconnect and tag wiring leads from switch terminals.
- (5) Remove the conduit connector (5) and elbow (6) with conduit and wires.
- (6) Unscrew and remove pressure switch assembly (7) from receiver tank fitting.

**c. Cleaning, Inspection and Repair.**

#### **WARNING**

When cleaning with compressed air, nozzle pressure shall not exceed 30 psi (2.11 kgs/cm<sup>2</sup>). Eye protection is required.

#### **WARNING**

When cleaning electrical parts with trichloroethane, provide adequate ventilation. Avoid prolonged breathing of vapors and minimize contact with skin.

- (1) Use compressed air to remove dust and dirt from pressure switch. Wipe components with a clean, lint-free cloth dampened with trichloroethane, or an approved electrical component cleaning solvent.

#### **NOTE**

A pressure switch spare parts kit is available. The kit consists of the board and contacts (10) and diaphragm (11). Disassembly beyond that listed below is not recommended. (Refer to TM 5-4310-375-24P.)

- (2) Unscrew and remove nut securing unloader (9) to body (21). Examine for plugging and free action of unloading pin. Replace a defective unloader (9).

- (3) Remove six screws (14), inlet fitting and diaphragm retainer (15), spring (16), diaphragm (11), and actuator (17). Examine diaphragm (11) for rupture and deterioration. Replace a damaged diaphragm (11). (Component of repair kit.)
- (4) Only when necessary, remove two screws (18), plate (19) and frame assembly (20) from body (21). Examine board and contacts (10) for any damage. Replace defective board and contacts (10). (Component of repair kit.)

***e. Reassembly/Installation.***

- (1) When disassembled, install frame assembly (20) in body (21), install plate (19) and secure with two screws (18).
- (2) Reassemble actuator (17), diaphragm (11), spring (16), inlet fitting and diaphragm retainer (15) and secure with six screws (14).
- (3) Install unloader (9) securing with mounting nut.
- (4) Install pressure switch assembly (7) onto air receiver fitting. Connect unloader tube assembly (4) to unloader (9). If removed, secure tube assembly (4) to receiver tank saddle with tube clip (3), screw (2) and nut (1).
- (5) Connect conduit elbow (6), with conduit and wires, to switch body (21). Connect conduit connector (5), with conduit and wires, to switch body (21).
- (6) Connect wires to switch terminals as tagged at disassembly.
- (7) Refer to para 5-6.a and adjust as necessary; then, install cover (8).

**5-7. Air compressor assembly.** Repair and/or overhaul the air compressor assembly as follows:

***a. Removal/Disassembly.***

- (1) Refer to para 4-14 and remove belt guard and drive belts.
- (2) Refer to para 3-11 and remove air intake filter.
- (3) Refer to para 4-30 and remove air discharge piping from aftercooler discharge opening.
- (4) Refer to para 4-18 and remove air compressor assembly from unit.
- (5) Maintenance of air compressor by functional groups is detailed in paragraphs 5-8 through 5-10 following.

***b. Cleaning, Inspection, Repair or Replacement.*** The cleaning, inspection, repair or replacement instructions for the air compressor functional groups is detailed, as applicable, in paragraphs 5-8 through 5-10. Refer to table 5-2 for repair and replacement standards.

**NOTE**

Repair parts kits are available for this air compressor assembly. Refer to TM 5-4310-375-24P for applicable kit numbers and components.

***c. Reassembly/Installation.***

- (1) When repair and/or overhaul of functional groups, paragraphs 5-8 through 5-10 is complete, refer to para 4-18 and install air compressor assembly on air receiver saddle.

- (2) Refer to para 4-30 and install air discharge piping to aftercooler discharge opening.
- (3) Refer to para 3-11 and install air intake filter.
- (4) Refer to para 4-14 and install drive belts. Adjust belts in accordance with figure 2-3; then, install belt guard.

*Table 5-2. Compressor Repair and Replacement Standards*

COMPONENT	MANUFACTURER'S DIM AND TOL IN INCHES AND (MILLIMETERS)		DESIRED CLEARANCE		MAXIMUM WEAR OR CLEARANCE
	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM	
First stage cylinder bore	4.1334 (105.000)	4.1350 (105.029)			0.0016 (0.041)
Second stage cylinder bore	2.0472 (52.000)	2.0488 (52.040)			0.0016 (0.041)
Crankshaft connecting rod insert journal	1.7699 (44.955)	1.7717 (45.000)			0.0018 (0.046)
Connecting rod insert			0.0015 (0.038)	0.0020 (0.051)	0.0030 (0.076)

**5-8. Intercooler and aftercooler.** When notified by organizational maintenance of defective parts detected during their inspection, replace as follows:

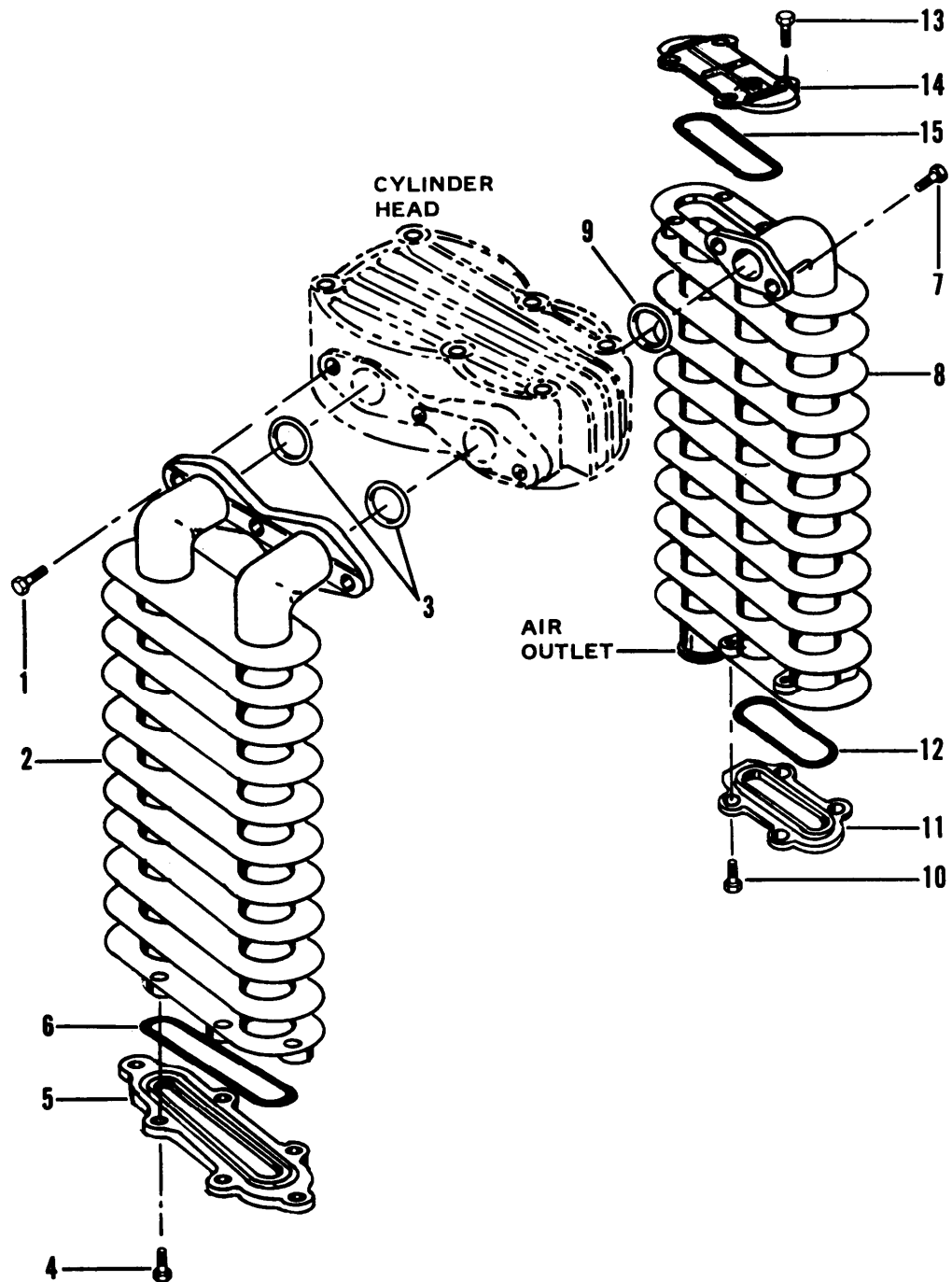
**a. Removal/Disassembly.** Remove and disassemble the intercooler and aftercooler in sequence below.

- (1) Open receiver drain cock to drain receiver pressure; then, close drain cock. Turn main power off at source. Unscrew and remove three screws (1, fig 5-3), separate intercooler (1) from cylinder head and remove the two o-ring gaskets (3).
- (2) Unscrew and remove six screws (4), separate intercooler cap (5) from intercooler (2) and remove cap gasket (6).
- (3) Disconnect air discharge piping from aftercooler (8) air outlet (see para 4-30). Unscrew and remove two screws (7), separate aftercooler (8) from cylinder head and remove o-ring gasket (9).
- (4) Unscrew and remove four screws (10), separate lower aftercooler cap (11) from aftercooler (8) and remove cap gasket (12).
- (5) Unscrew and remove four screws (13), separate upper aftercooler cap (14) from aftercooler (8) and remove cap gasket (15).

**b. Replacement.** Replace all damaged gaskets (3, 6, 9, 12, 15, fig 5-3) that are found defective. Replace all parts that are cracked or broken.

**c. Reassembly/Installation.** Reassemble and install intercooler and aftercooler in sequence below.

- (1) Assemble cap gasket (15, fig 5-3), upper aftercooler cap (14) and four screws (13) onto aftercooler (8).



Legend for fig 5-3:

- |                      |                           |
|----------------------|---------------------------|
| 1. Screw (3)         | 9. O-ring gasket          |
| 2. Intercooler       | 10. Screw (4)             |
| 3. O-ring gasket (2) | 11. Lower aftercooler cap |
| 4. Screw (6)         | 12. Cap gasket            |
| 5. Intercooler cap   | 13. Screw (4)             |
| 6. Cap gasket        | 14. Upper aftercooler cap |
| 7. Screw (2)         | 15. Cap gasket            |
| 8. Aftercooler       |                           |

Figure 5-3. Intercooler and aftercooler

- (2) Assemble cap gasket (12), lower aftercooler cap (11) and four screws (10) onto aftercooler (8).
- (3) Place o-ring gasket (9) in groove provided and install aftercooler (8) onto cylinder head with two screws (7). Connect air discharge piping to aftercooler (8) air outlet (see para 4-30).
- (4) Assemble cap gasket (6), intercooler cap (5) and six screws (4) onto intercooler (2).
- (5) Place two o-ring gaskets (3) in grooves provided and install intercooler (2) onto cylinder head attaching with three screws (1). Turn main power on at source.

**5-9. Cylinder, pistons, and connecting rods.** Refer to para 3-11 and remove air intake filter. Refer to para 4-14 and remove belt guard. Refer to para 4-18 and remove air compressor from unit. Place air compressor on a work bench. Refer to para 4-19, 4-20, and 4-21 and remove cylinder head and valves, intercooler and aftercooler, and flywheel respectively. Maintenance of cylinder, pistons, and connecting rods is as follows:

**a. Removal/Disassembly.** Remove and disassemble to extent necessary in following sequence.

- (1) Unscrew and remove six cylinder bolts (1, fig 5-4) and washers (2). Tap cylinder (3) lightly on mounting flange to break seal with compressor frame and carefully lift off cylinder (3). Remove gasket (4).
- (2) Use a piston ring expander and remove the three-ring first stage ring set (5). Remove the two piston pin retaining clips (6), slide out piston pin (7) and remove the first stage piston (8).
- (3) To remove first stage connecting rod assembly (9), rotate crankshaft to position where connecting rod cap nuts (10) can be reached. Remove the two nuts (10), lockwashers (11) and bolts (12). Carefully separate rod cap (13) from rod (14).

#### CAUTION

Mark connecting rod cap (13) and rod (14) in a manner to indicate cap position on rod so that at reassembly the cap is assembled in same relationship as when removed.

- (4) Only when necessary, remove oil splash rod (15) from cap (13) and press bushing (16) from rod (14). Remove the connecting rod bearing halves (17).
- (5) Use a piston ring expander and remove the four-ring second stage ring set (18). Remove the two piston pin retaining clips (19), slide out piston pin (20) and remove second stage piston (21).
- (6) To remove second stage connecting rod assembly (22), rotate crankshaft to position where connecting rod cap nuts (23) can be reached. Remove the two nuts (23), lockwashers (24) and bolts (25). Carefully separate rod cap (26) from rod (27).

#### CAUTION

Mark connecting rod cap (26) and rod (27) in a manner to indicate cap position on rod so that at reassembly the cap is assembled in same relationship as when removed.

- (7) Only when necessary, remove oil splash rod (28) from cap (26) and press bushing (29) from rod (27). Remove the connecting rod bearing halves (30).



Legend for fig 5-4:

1. Bolt (6)
2. Washer (6)
3. Cylinder
4. Cylinder gasket
5. First stage ring set
6. Piston pin retaining clip (2)
7. First stage piston pin
8. First stage piston
9. Connecting rod assembly
10. Nut (2)
11. Lockwasher (2)
12. Connecting rod bolt (2)
13. Connecting rod cap
14. Connecting rod
15. Oil splash rod
16. Connecting rod bushing
17. Connecting rod bearing
18. Second stage ring set
19. Piston pin retaining clip (2)
20. Second stage piston pin
21. Second stage piston
22. Connecting rod assembly
23. Nut (2)
24. Lockwasher (2)
25. Connecting rod bolt (2)
26. Connecting rod cap
27. Connecting rod
28. Oil splash rod
29. Connecting rod bushing
30. Connecting rod bearing

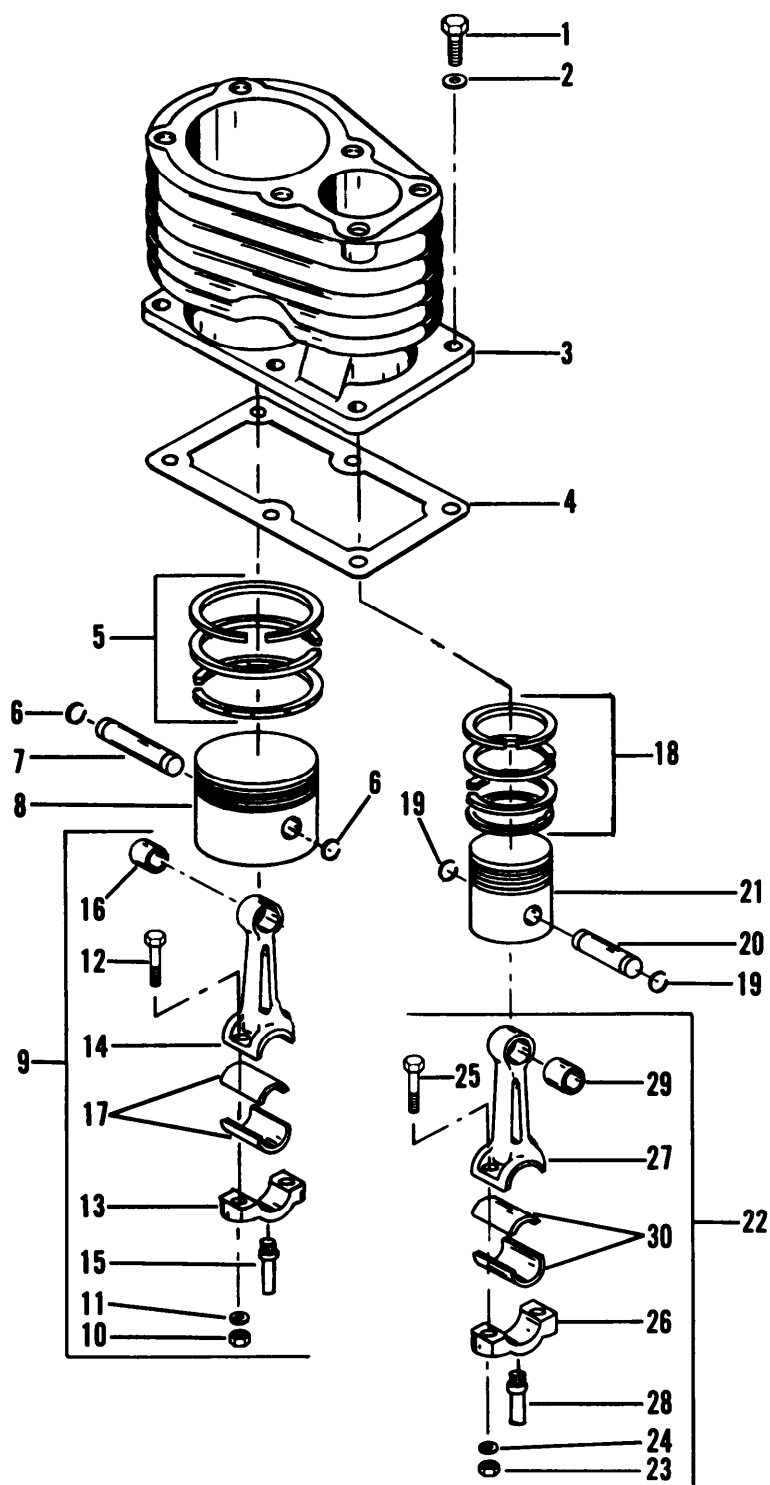


Figure 5-4. Cylinder, pistons, and connecting rods

## WARNING

Dry cleaning solvent, Federal Specification P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near an open flame or excessive heat. Flash point of the solvent is 100°F - 138°F (38°C - 59°C).

**b. Cleaning.** Clean all parts in solvent, P-D-680, or equivalent. Dry thoroughly. Clean any gasket material that may have stuck to cylinder (3, fig 5-4) flange or compressor frame by carefully scraping off the material.

**c. Inspection.** Inspect component parts of this functional group in following manner.

(1) Inspect cylinder (3, figure 54) bores for scratches and scoring. Inspect cooling fins and mounting flange for cracks and breaks. Examine for cross-threading in cylinder head bolt holes. Check cylinder bores for excessive wear. Acceptable diameter of first stage cylinder bore is 4.13 in. (105 mm) and second stage cylinder bore is 2.05 in. (75 mm).

(2) Inspect piston ring sets (5, 18) for cracked or broken rings. Replace rings in sets only. Inspect pistons (8, 21) for broken or cracked ring lands, cracked heads or skirts.

## NOTE

Piston ring sets (5, 18) and pistons (8, 21) are available in oversize spare parts.  
Refer to TM 5-4310-375-24P.

(3) Inspect piston pins (7, 20) for scoring and evidence of binding in bushings (16, 29). Inspect the bushings (16, 29) for scoring and free fit of pins.

(4) Inspect connecting rod bearings (17, 30) for scoring and excessive wear.

## NOTE

Connecting rod bearings (17, 30) are available in undersize spare parts.  
Refer to TM 5-4310-375-24P.

(5) Examine all parts for nicks, crack, breaks, damage to threads, and distortion.

**d. Repair/Replacement.** Replace damaged piston rings (5, 18, fig 5-4) in sets only. Cylinder (3) bores may be honed to remove scratches within limits shown in table 5-2. Replace all damaged parts. Replace cylinder gasket (4) each time cylinder (3) is removed. Replace connecting rod bearings (17, 30) when worn beyond limits shown in table 5-2.

## NOTE

Piston ring sets (5, 18) and pistons (8, 21) are available in oversize spare parts. Connecting rod bearings (17, 30) are available in undersize spare parts. Refer to TM 5-4310-375-24P.

**e. Reassembly/Installation.** Reassemble and install as follows:

(1) If removed, press bushing (29, fig 54) into piston pin end of connecting rod (27). If removed, install oil splash rod (28) in connecting rod cap (26).

(2) Coat bearing (30) liberally with clean compressor oil. Install connecting rod bearing (30) halves in cap (26) and connecting rod (27). Attach connecting rod assembly (22) to crankshaft, matching rod cap (26) to

rod (27) as marked at disassembly. Install two each bolts (25), lockwashers (24) and nuts (23). Torque nuts (23) to 20-22 ft-lbs (2.8 -3.0 kgs-m).

- (3) Slide piston pin (20) through piston (21) and piston pin bushing (29) attaching second stage piston (21) to connecting rod assembly (22). Install two retaining clips (19).
- (4) Use a piston ring expander and install the four-ring piston ring set (18) in grooves on piston (21). Stagger ring gaps approximately 90 degrees.
- (5) If removed, press bushing (16) into piston pin end of connecting rod (14). If removed, install oil splash rod (15) in connecting rod cap (13).
- (6) Coat bearing (17) liberally with clean compressor oil. Install connecting rod bearing (17) halves in cap (13) and connecting rod (14). Attach connecting rod assembly (9) to crankshaft, matching rod cap (13) to rod (14) as marked at disassembly. Install two each bolts (12), lockwashers (11) and nuts (10). Torque nuts (10) to 20-22 ft-lbs (2.8 - 3.0 kgs-m).
- (7) Slide piston pin (7) through piston (8) and piston pin bushing (16) attaching first stage piston (8) to connecting rod assembly (9). Install two retaining clips (6).
- (8) Use a piston ring expander and install the three-ring piston ring set (5) in grooves on piston (8). Stagger ring gaps approximately 120 degrees.
- (9) Coat rings (5, 18) and cylinder (3) bores liberally with clean compressor oil.
- (10) Place a new cylinder gasket (4) in position on compressor frame. Use piston ring compressors on first stage and second stage piston rings (5, 18) and install cylinder (3). Install six each washers (2) and cylinder bolts (1). Torque bolts (1) to 30-33 ft-lbs (4.1 - 4.6 kgs-m).
- (11) Install flywheel (para 4-21). Assemble and install cylinder head and valves (para 4-19) and intercooler and aftercooler (para 4-20). Install air compressor assembly on unit (para 4-18). Install and adjust drive belts fig 2-3). Install belt guard (para 4-14). Refer to para 3-11 and install air intake filter.

**5-10. Crankshaft, bearings, seal, compressor frame.** Refer to para 3-11 and remove air intake filter. Refer to para 4-14 and remove belt guard. Refer to para 4-18 and remove air compressor from unit. Place air compressor on a work bench. Refer to para 4-19 and 4-20 and remove cylinder head and valves and the intercooler and aftercooler respectively. Refer to para 5-9 and remove cylinder, pistons, and connecting rods. Maintenance of crankshaft, bearings, seal, and compressor frame is as follows:

**a. Removal/Disassembly.** Remove and disassemble these functional group parts in sequence below to extent necessary.

- (1) Remove oil drain hose (23, fig 5-5), drain cock (24), drain assembly (25) and gasket (26) from frame (27).
- (2) Remove flywheel bolt (1, fig 5-5), washer (2) and flywheel (3) as instructed in para 4-21.
- (3) Unscrew and remove four screws (4), the front plate (5) and gasket (6). Use a suitable puller and remove oil seal (7).
- (4) Pull crankshaft (9), with bearings (8, 10) out of compressor frame (27). As necessary, use a puller to free bearing (10) from bore in rear plate (17).

### CAUTION

When using bearing puller to remove bearings (8, 10) from crankshaft (9), use type of puller that will pull on inner race of bearing.

- (5) Use a bearing puller and remove front main bearing (8) and rear main bearing (10) from crankshaft (9).
- (6) Unscrew and remove two socket head screws (11), frame vent (12), vent gasket (13), unscrew and remove screw (14), and pull baffle (15) out of frame vent (12).
- (7) Unscrew and remove four screws (16), remove rear plate (17) and gasket (18).
- (8) Unscrew and remove oil filler cap (19) and gasket (20). Unscrew and remove oil level sight gauge (21) and gasket (22) from compressor frame (27).

### WARNING

Dry cleaning solvent, Federal Specification P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near an open flame or excessive heat. Flash point of the solvent is 100°F - 138°F (38°C - 59°C).

**b. Cleaning.** Wipe gasket (13, fig 5-5), baffle (15), oil filler cap (19), gasket (20), oil level sight gauge (21) and gasket (22) clean with a cloth moistened with solvent, P-D-680, or equivalent. If gasket material has stuck to mounting surfaces of end plates (5, 17) or compressor frame (27), carefully scrape off material. Clean other parts with solvent, P-D-680, or equivalent, and dry thoroughly.

**c. Inspection.** Inspect all parts for cracks, breaks, distortion, and for damaged threads. Inspect bearings (8, 10, fig 5-5) for free movement without gritty action. Inspect crankshaft (9) connecting rod bearing journals for scoring and excessive wear. Minimum allowable diameter is 1.7699 inches (44.955 mm).

**d. Replacement.** Replace gaskets (6, 18, fig 5-5) each time end plates (5, 17) are removed. Replace oil seal (7) each time removed. Replace all damaged parts. If crankshaft (9) bearing journals are worn beyond allowable limits and beyond use of undersize connecting rod bearings (see TM 5-4310-375-24P), replace the crankshaft (9).

**e. Reassembly/Installation.** Reassembly and installation of this functional group is in the following sequence.

- (1) Install sight gauge gasket (22, fig 5-5) and oil level sight gauge (21) into compressor frame (27). Install filler cap gasket (20) and oil filler cap (19).

### CAUTION

When pressing bearing (10) into end plate (17), press on outer race of bearing only to prevent bearing damage.

- (2) Dip rear main bearing (10) in clean compressor oil and press into rear end plate (17) until bearing (10) bottoms on shoulder in end plate.
- (3) Assemble a new gasket (18) and the rear end plate (17). Position end plate (17) on compressor frame (27) with mounting surface for frame vent (12) facing up; secure end plate (17) with four screws (16).

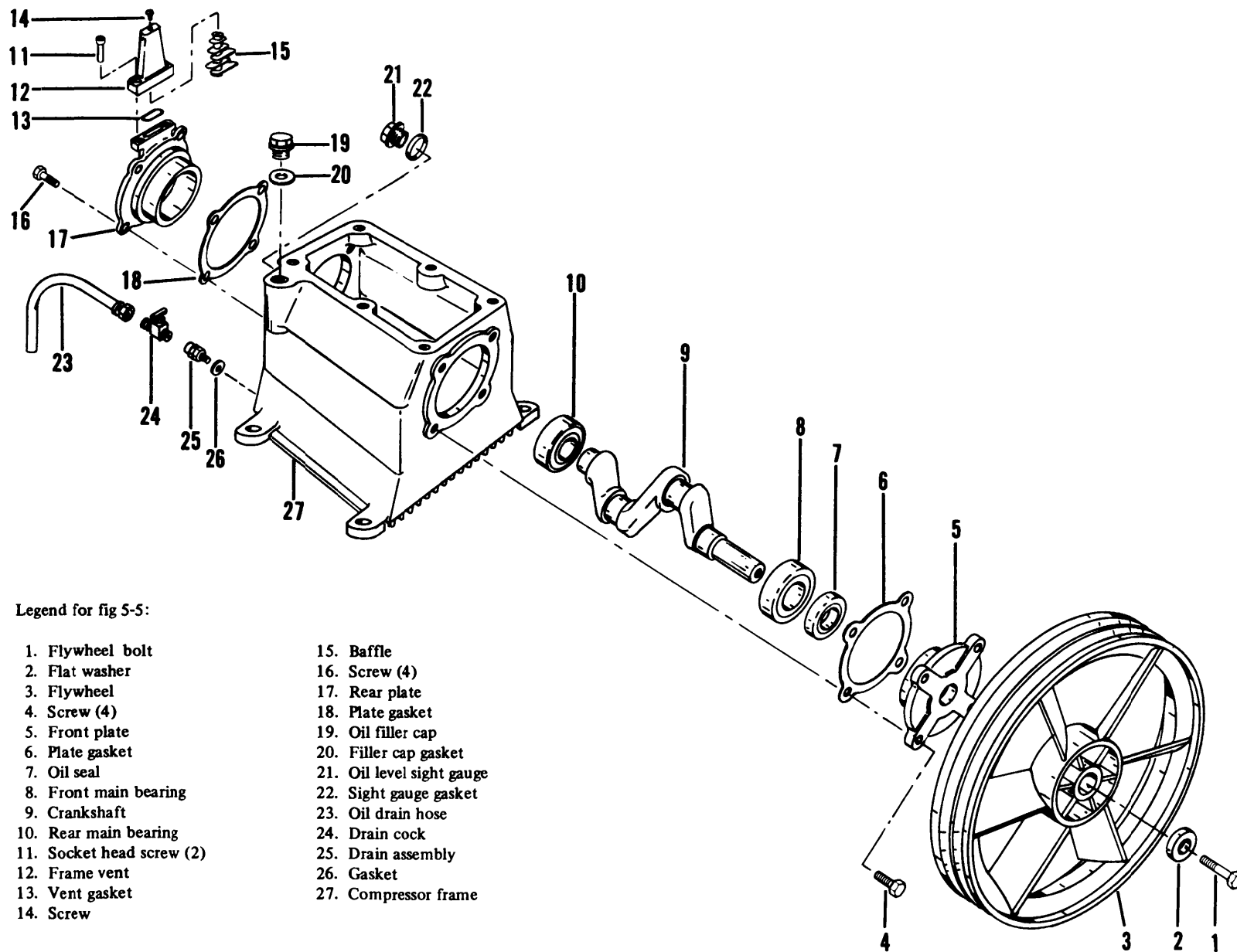


Figure 5-5. Crankshaft, bearings, seal, and compressor frame

- (4) Assemble baffle (15) into frame vent (12) and attach with screw (14). Install gasket (13), frame vent (12), and two socket head screws (11).

### CAUTION

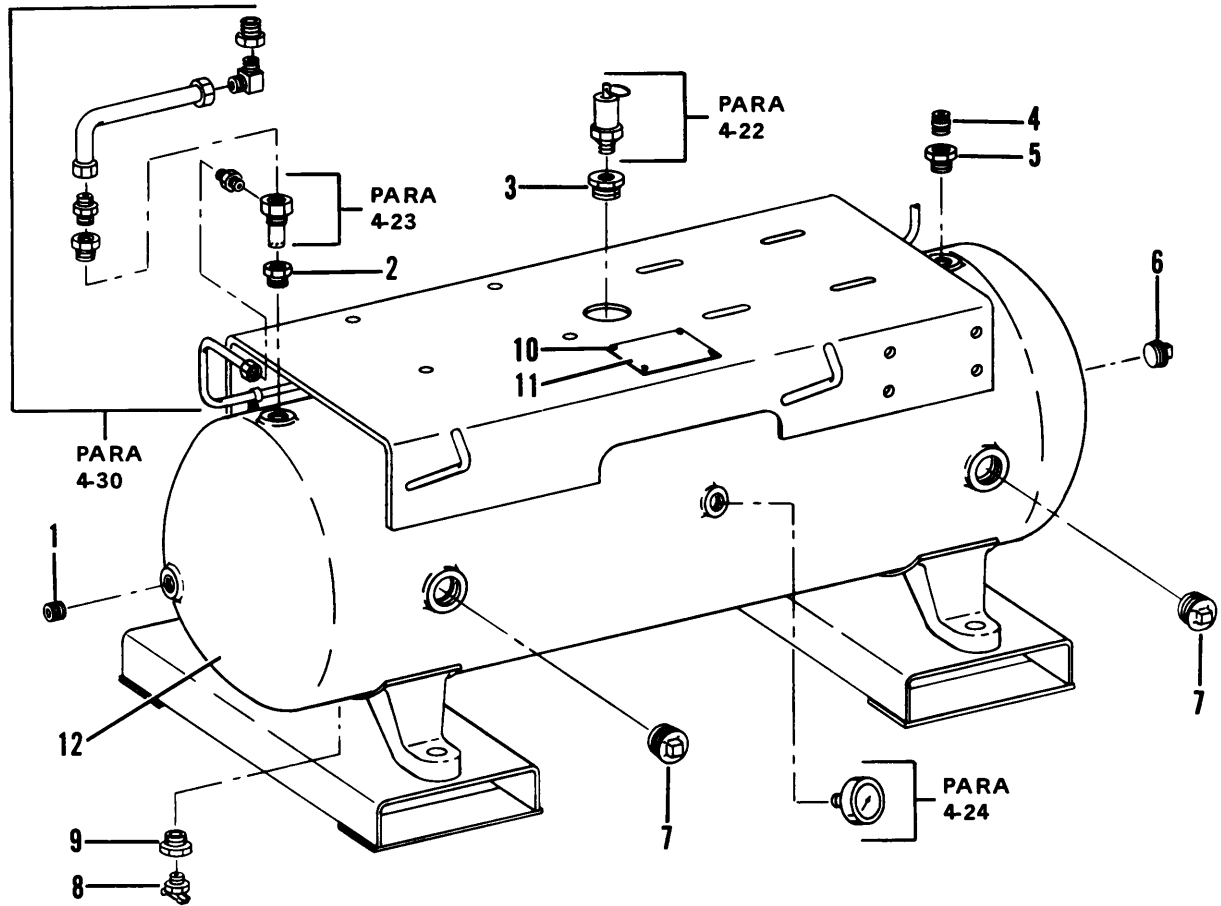
When oil seal (7) is pressed into front end plate (5), the sealing lip of seal must face the bearing (8). When pressing bearing (8) into end plate (5), press on outer race of bearing only to prevent bearing damage.

- (5) Carefully and evenly, press oil seal (7) into front end plate (5) until it bottoms on bore shoulder. Dip front main bearing (8) in clean compressor oil and press into end plate (5) until bearing (8) bottoms on shoulder in end plate.
- (6) Assemble crankshaft (9) through front end plate opening, guiding carefully so that bearing journals are not damaged. Insert short stub main bearing journal into bore of rear main bearing (10).
- (7) Assemble a new gasket (6) and the front end plate (5). Guide the end plate (5) carefully over the crankshaft, using a turning motion so that oil seal (7) is not damaged and so front main bearing (8) aligns on crankshaft bearing journal.
- (8) Secure front end plate (5) to compressor frame (27) with four screws (4). Tighten the screws (4) alternately and evenly to seat bearing (8) on crankshaft (9) journal.
- (9) Install flywheel (3), flat washer (2) and flywheel bolt (1) as instructed in para 4-21.
- (10) Install gasket (26), drain assembly (25), drain cock (24) and drain hose (23).
- (11) Refer to para 5-9 and assemble cylinder, pistons, and connecting rods. Refer to para 4-19 and 4-20 and assemble cylinder head and valves and the intercooler and aftercooler. Refer to para 4-18 and install air compressor assembly on unit. Refer to para 4-14 and install belt guard. Refer to para 3-11 and install air inlet filter. Fill compressor with proper grade of oil, refer to table 3-1.

#### 5-11. Air receiver tank. Replacement of air receiver tank is as follows:

##### a. *Disassembly.*

- (1) Refer to para 4-14 and remove belt guard and drive belts. It is not necessary to remove drive pulley from motor assembly.
- (2) Refer to para 4-15 and remove motor control box assembly from air receiver tank saddle.
- (3) Refer to para 4-16 and remove the motor assembly from air receiver tank saddle.
- (4) Refer to para 5-6 and remove pressure switch.
- (5) Refer to para 4-30 and remove air discharge piping from air compressor and receiver tank.
- (6) Refer to para 4-18 and remove air compressor assembly from receiver tank saddle.
- (7) Refer to para 4-22 and remove safety valve; para 4-23 and remove check valve and para 4-24 and remove pressure gauge.
- (8) Refer to para 4-29 and remove globe valve and fittings from air receiver tank.



Legend for fig 5-6:

- |                     |                          |
|---------------------|--------------------------|
| 1. Close nipple     | 7. Pipe plug (2)         |
| 2. Reducing bushing | 8. Drain cock            |
| 3. Reducing bushing | 9. Reducing bushing      |
| 4. Close nipple     | 10. Screw (4)            |
| 5. Reducing bushing | 11. Identification plate |
| 6. Pipe plug        | 12. Air receiver tank    |

*Figure 5-6. Air receiver tank*

- (9) Refer to figure 5-6 and remove close nipple (1), reducing bushing (2) and reducing bushing (3). Remove close nipple (4) and reducing bushing (5). The square head pipe plugs (6, 7) need not be removed. Remove drain cock (8) and reducing bushing (9) from air receiver tank (12). As necessary, remove four screws (10) and identification plate (11).

**b. Repair/Replacement.** The air receiver tank (12, figure 5-6) is an ASME Pressure Vessel and shall not be repaired. Replace a damaged air receiver tank (12). Paint the tank as instructed in para 4-26. Replace all damaged fittings of air receiver tank group, figure 5-6.

**c. Reassembly.**

- (1) Refer to figure 5-6 and install reducing bushing (9) and drain cock (8). If removed, install pipe plugs (7, 6). Install reducing bushing (5) and close nipple (4). Install reducing bushing (3), reducing bushing (2) and close nipple (1). Attach identification plate (11) with four screws (10).
- (2) Refer to para 4-29 and install fittings and globe valve on air receiver tank.
- (3) Refer to para 4-24 and install pressure gauge; para 4-23 and install check valve; para 4-22 and install safety valve.
- (4) Refer to para 4-18 and install air compressor assembly on air receiver saddle.
- (5) Refer to para 4-30 and reassemble the air discharge piping from air compressor to receiver tank.
- (6) Refer to para 5-6 and install air pressure switch.
- (7) Refer to para 4-16 and install motor assembly. Refer to fig 2-3 and align motor drive pulley and compressor pulley (flywheel).
- (8) Refer to para 4-15 and install motor control box assembly.
- (9) Refer to para 4-14 and fig 2-3 and install drive belts and adjust belt tension; then, install the belt guard.
- (10) Refer to fig 1-2 and check all unit wiring connections.



## APPENDIX A

REFERENCES

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**A-1. Fire protection:**

TB 5-4200-200-10 Hand Portable Fire Extinguisher Approved for Army Users.

**A-2. Lubrication:**

C9100-1L Petroleum, Petroleum-Base Products and Related Materials.

**A-3. Painting:**

TM 43-0139 Painting Instructions for Field Use.

**A-4. Maintenance:**

TM 38-750 The Army Maintenance Management Systems (TAMMS).

TM 5-4310-375-24P Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts and Special Tools) for Compressor Unit, Reciprocating, 15 CFM (0.425 m<sup>3</sup>/min), 175 PSI (12.3 kgs/cm<sup>2</sup>), Electric Motor Driven (NSN 4310-01-139-4815).

**A-5. Radio interference suppression:**

TM 11-483 Radio Interference Suppression.

**A-6. Shipment and limited storage:**

TB 740-94-2 Preservation of USAMECOM Mechanical Equipment for Shipment and Storage.



## APPENDIX B

## MAINTENANCE ALLOCATION CHART

## Section I. INTRODUCTION

## B-1. General.

- a.* This section provides a general explanation of all maintenance and repair functions authorized at various maintenance categories.
- b.* The Maintenance Allocation Chart (MAC) in section II designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component will be consistent with the capacities and capabilities of the designated maintenance categories.
- c.* Section III lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from section II.
- d.* Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

## B-2. Maintenance functions. Maintenance functions will be limited to and defined as follows:

- a. Inspect.* To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e g., by sight, sound, or feel).
- b. Test.* To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards.
- c. Service.* Operations required periodically to keep an item in proper operating condition, i.e., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases.
- d. Adjust.* To maintain or regulate, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.
- e. Align.* To adjust specified variable elements of an item to bring about optimum or desired performance.
- f. Calibrate.* To determine and cause corrections to be made or to be adjusted on instruments or test, measuring, and diagnostic equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.
- g. Remove/Install.* To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.
- h. Replace.* To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and is shown as the 3d position code of the SMR code.
- i. Repair.* The application of maintenance services<sup>1</sup>, including fault location/troubleshooting<sup>2</sup>, removal/installation,

<sup>1</sup>Services - inspect, test, service, adjust, align, calibrate, and/or replace.

<sup>2</sup>Fault locate/troubleshoot - The process of investigating and detecting the cause of equipment malfunctioning; the act of isolating a fault within a system or unit under test (UUT).

and disassembly/assembly<sup>3</sup> procedures, and maintenance actions<sup>4</sup> to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

*j. Overhaul.* That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications (i.e., DMWR). Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

*k. Rebuild.* Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles, etc.) considered in classifying Army equipment/components.

### B-3. Explanation of Columns in the MAC, Section II.

*a. Column 1, Group Number.* Column 1 lists functional group code numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the next higher assembly. End item group number shall be "00."

*b. Column 2, Component/Assembly.* Column 2 contains the names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

*c. Column 3, Maintenance Function.* Column 3 lists the functions to be performed on the item listed in Column 2. (For detailed explanation of these functions, see paragraph B-2.)

*d. Column 4, Maintenance Category.* Column 4 specifies, by the listing of a work time figure in the appropriate sub-column(s), the category of maintenance authorized to perform the function listed in Column 3. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance categories, appropriate work time figures will be shown for each category. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. The symbol designations for the various maintenance categories are as follows:

C . . . . .	Operator or crew
O . . . . .	Organizational maintenance
F . . . . .	Direct Support Maintenance
H . . . . .	General Support Maintenance
D . . . . .	Depot maintenance

*e. Column 5, Tools and Equipment.* Column 5 specifies, by code, those common tool sets (not individual tools) and special tools, TM DE, and support equipment required to perform the designated function.

<sup>3</sup>Disassemble/assemble - encompasses the step-by-step taking apart (or breakdown) of a spare/functional group coded item to the level of its least componency identified as maintenance significant (i.e., assigned an SMR code) for the category of maintenance under consideration.

<sup>4</sup>Actions - welding, grinding, riveting, straightening, facing, remachinery, and/or resurfacing.

*f. Column 6, Remarks.* This column shall, when applicable, contain a letter code, in alphabetic order, which shall be keyed to the remarks contained in Section IV.

**B-4. Explanation of Columns in Tool and Test Equipment Requirements, Section III.**

*a. Column 1, Reference Code.* The tool and test equipment reference code correlates with a code used in the MAC, Section II, Column 5.

*b. Column 2, Maintenance Category.* The lowest category of maintenance authorized to use the tool or test equipment.

*c. Column 3, Nomenclature.* Name or identification of the tool or test equipment.

*d. Column 4, National Stock Number.* The National stock number of the tool or test equipment.

*e. Column 5, Tool Number.* The manufacturer's part number.

**B-5. Explanation of Columns in Remarks, Section IV.**

*a. Column 1, Reference Code.* The code recorded in column 6, Section II.

*b. Column 2, Remarks.* This column lists information pertinent to the maintenance function being performed as indicated in the MAC, Section II.

Section II. MAINTENANCE ALLOCATION CHART  
FOR  
COMPRESSOR UNIT, RECIPROCATING, 15 CFM, 175 PSI, EMD, TANK MOUNTED

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQPT.	(6) REMARKS
			C	O	F	H	D		
01	Compressor Drive: Belt Guard	Inspect	0.1						
		Replace		0.2				T1,T4,T5	
		Repair		0.5				T1,T4,T5	
	V-Belts	Inspect	0.1						
		Adjust		0.2				T1,T4,T5	
		Replace		0.5				T1,T4,T5	
	Pulley, Drive	Inspect	0.1						
		Replace		0.5				T1,T4,T5	
02	Electric Motor and Controls:								
	Starter Assembly	Inspect	0.1					T1	
		Replace		0.2				T1,T4	
		Repair		0.5				T1,T4	
	Motor	Inspect	0.1					T1	
		Service	0.1					T1,T4	
		Test		0.2				T1,T4,T5	
	Pressure Switch and Unloader	Replace		0.5				T2	
		Repair			1.0				
	Pressure Switch and Unloader	Inspect		0.1				T1,T4	
		Adjust			0.1			T2	
		Replace			0.2			T2	
	Compressor Assembly	Repair			0.5			T2	
03	Compressor Assembly	Inspect	0.1						
		Service	0.1					T1,T5	
		Replace		0.5				T1,T4,T5	
	Air Intake Filter	Repair			2.0			T2,T5	
		Overhaul				4.0		T3,T5	
	Air Intake Filter	Inspect	0.1						
		Service	0.1						
		Replace	0.1					T1	
	Cylinder Head, First and Second Stage Valves	Inspect		0.5				T1,T4,T5	
		Replace		1.0				T1,T4,T5	

## MAINTENANCE ALLOCATION CHART - Continued

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQPT.	(6) REMARKS
			C	O	F	H	D		
04	Intercooler and Aftercooler	Inspect Service Replace	0.1	0.2	0.2			T1,T5 T1,T4,T5 T2,T5	
	Cylinder, Pistons and Rods	Inspect Replace			1.0 1.5			T2,T5 T2,T5	
	Flywheel	Inspect Replace		0.1 0.2				T1,T4,T5	
	Crankshaft, Bearings, Seal, Frame	Inspect Replace			2.0 4.0			T2,T5 T2,T5	
	Air Receiver System:								
	Safety Valve	Inspect Replace	0.1	0.1				T1 T1,T4	
	Check Valve	Inspect Replace		0.1 0.2				T1,T4 T1,T4	
	Pressure Gauge	Inspect Replace		0.1 0.1				T1,T4 T1,T4	
	Drain Cock	Inspect Replace	0.1	0.1				T1 T1,T4	
	Air Receiver (Tank)	Inspect Replace		0.1	2.0			T1,T4 T2,T5	
05	Air Discharge System:								
	Inflator Gauge	Inspect Replace	0.1	0.1				T1 T1,T4	
	Hose	Inspect Replace	0.1	0.1				T1 T1,T4	
	Globe Valve	Inspect Replace	0.1	0.1				T1 T1,T4	

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS  
FOR  
COMPRESSOR UNIT, RECIPROCATING, 15 CFM, 175 PSI, EMD, TANK MOUNTED

(1) TOOL OR TEST EQUIPMENT REF CODE	(2) MAINTENANCE CATEGORY	(3) NOMENCLATURE	(4) NATIONAL/ NATO STOCK NUMBER	(5) TOOL NUMBER
T1	C, O, F, H	Tool Kit, General Mechanic, Automotive	5180-00-177-7033	
T2	F	Shop Set, Automotive Repair Field Maintenance, Basic	4910-00-754-0705	
T3	H	Shop Set, Machine: Field Maintenance, Heavy	3470-00-754-0738	
T4	O	Shop Equipment Automotive Maintenance and Repair: Organization, Common No. 1	4910-00-754-0654	
T5	C, O, F, H	Tool Set, General Mechanic, Metric, Consisting of:		
		Wrench, hex socket (Allen Wrench), 'L' Shape, 3mm	5120-01-045-4888	
		Wrench, combination box end and open end, 10mm	5120-01-113-7134	
		Wrench, combination box end and open end, 17mm	5120-00-077-2106	
		Socket, hex, 17mm, 1/2 in. square female drive	5120-00-263-4143	



Section IV. REMARKS

(1) Reference Code	(2) Remarks
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## APPENDIX C

## COMPONENTS OF END ITEM LIST

## Section I. INTRODUCTION

**C-1. Scope.** This appendix lists components of end item and basic issue items for the air compressor unit to help you inventory items required for safe and efficient operation.

**C-2. General.** The Components of End Item and Basic Issue Items List are divided into the following sections:

**a. Section II. Components of End Item.** This listing is for informational purposes only, and is not authority to requisition replacements. These items are part of the end item, but are removed and separately packaged for transportation or shipment. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Illustrations are furnished to assist you in identifying the items.

**b. Section III. Basic Issue Items.** These are the minimum essential items required to place the air compressor unit in operation, to operate it, and to perform emergency repairs. Although shipped separately packaged, BII must be with the air compressor unit during operation and whenever it is transferred between property accounts. The illustrations will assist you with hard-to-identify items. This manual is your authority to request/requisition replacement BII, based on TOE/MTOE authorization of the end item.

**C-3. Explanation of columns.** The following provides an explanation of columns found in the tabular listings:

**a. Column (1) - Illustration Number (Illus Number).** This column indicates the number of the illustration in which the item is shown.

**b. Column (2) - National Stock Number.** Indicates the National Stock Number assigned to the item and will be used for requisitioning purposes.

**c. Column (3) - Description.** Indicates the Federal item name and, if required, a minimum description to identify and locate the item. The last line for each item indicates the FSCM (in parentheses) followed by the part number. If item needed differs for different models of this equipment, the applicable model will be shown under the "Usable on" heading in this column. When no code letters appear under this heading, the listed item is applicable to all models. At this printing, only one model is covered by this publication. The code assigned is

Code

Used On

DQB . . . . . Model RI22RAAB. Part No. 84950

**d. Column (4) - Unit of Measure (U/M).** Indicates the measure used in performing the actual operational/maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr).

**e. Column (5) - Quantity Required (Qty rqr).** Indicates the quantity of the item authorized to be used with/on the equipment.

## Section II. COMPONENTS OF END ITEM

(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	Usable On Code	(4) U/M	(5) Qty rqr
Fig. 4-9	4910-00-030-2365	Hose Assembly, Air (16004) 85403		EA	1
Fig. 4-9		Gauge, Inflator (94894) 61J2-1506		EA	1

## Section III. BASIC ISSUE ITEMS

(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	Usable On Code	(4) U/M	(5) Qty rqr
		TM 5-4310-375-14		EA	1
		TM 5-4310-375-24P		EA	1



APPENDIX D  
ADDITIONAL AUTHORIZATION LIST

---

Section I. INTRODUCTION

**D-1. Scope.** This appendix lists additional items you are authorized for the support of the air compressor unit.

**D-2. General.** This list identifies items that do not have to accompany the air compressor unit and that do not have to be turned in with it. These items are all authorized to you by CTA, MTOE, TDA, or JTA.

**D-3. Explanation of listing.** National stock numbers, descriptions, and quantities are provided to help you identify and request the additional items you require to support this equipment. The items are listed in alphabetical sequence by item name under the type document (i.e., CTA, MTOE, TDA, or JTA) which authorizes the item(s) to you. When the item you require differs between serial numbers of the same model, effective serial numbers will be shown in the last line of the description. When item required differs for different models of this equipment, the model will be shown under the “Usable ON” heading in the description column. When no code appears, the item(s) is applicable to all models. At this printing only one model is covered in this publication. The code assigned to this model is:

Code	Used On
DQB . . . . .	Model RI22RAAB, Part No. 84950

## Section II. ADDITIONAL AUTHORIZATION LIST

(1) National Stock Number	(2) Description FSCM and Part Number Usable On Code	(3) U/M	(4) Qty Auth
7520-00-559-9618	Cotton Duck Case	EA	1
7510-00-889-3494	Log Book Binder	EA	1
4240-00-622-2946	Protector, Aural	PR	1



## APPENDIX E

EXPENDABLE SUPPLIES AND MATERIALS LIST

---

## Section I. INTRODUCTION

**E-1. Scope.** This appendix lists expendable supplies and materials you will need to operate and maintain the air compressor unit. These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

**E-2. Explanation of columns.**

**a. Column (1) - Item Number.** This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use cleaning compound, item 5, App. E").

**b. Column (2) - Level.** This column identifies the lowest level of maintenance that requires the listed item. These levels are:

- C - Operator/Crew
- O - Organizational Maintenance
- F - Direct Support Maintenance
- H - General Support Maintenance

**c. Column (3) - National Stock Number.** This is the National stock number assigned to the item; use it to request or requisition the item.

**d. Column (4) - Description.** Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the Federal Supply Code for Manufacturer (FSCM) in parentheses followed by the part number.

**e. Column (5) - Unit of Measure (U/M).** Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

## Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
1	O,F	6850-00-274-5421	Drycleaning Solvent, P-D-680	GAL.



Section II. MANUFACTURED ITEMS ILLUSTRATIONS

NOT APPLICABLE





## GLOSSARY

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**GLOSSARY 1. Abbreviations.** Refer to paragraph 1-7 for explanation of abbreviations used throughout this manual.

**GLOSSARY 2. Glossary of terms.** The glossary of terms used in this manual are listed below.

Cut-in . . . . .	Motor starts, compressor starts compressing air.
Cut-out . . . . .	Motor stops, compressor stops compressing air.
Equipment . . . . .	Compressor Unit, Reciprocating, Electric Motor Driven, Tank Mounted.
Front . . . . .	Side of the unit facing the motor control box.
Left end . . . . .	Left-hand end of the unit facing the front.
Load . . . . .	See "Cut-in" above.
Manufacturer . . . . .	Davey Compressor Company, Cincinnati, OH 45242 (FSCM 16004).
Rear . . . . .	Side of unit facing the belt guard.
Right end . . . . .	Right-hand end of the unit facing the motor control box.
Unit . . . . .	See "Equipment" above.
Unload . . . . .	See "Cut-out" above.





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**By Order of the Secretary of the Army:**

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

**Official:**

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

**DISTRIBUTION:**

To be distributed in accordance with DA Form 12-25A, Operator Maintenance Requirements for Air Compressor, 15 CFM.





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COA, 3d ENGINEER BN  
FT. LEONARDWOOD, MD 63108

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TM 5-4310-375-14

PUBLICATION DATE

9 Nov 83

PUBLICATION TITLE Compressor Unit,  
Reciprocating, 15 CFM, 175 PSI

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6

PARA-  
GRAPH2-1  
aFIGURE  
NO

4-3

TABLE  
NO

125

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

In line 6 of paragraph 2-1a the  
manual states the engine has  
6 Cylinders. The engine on my  
set only has 4 Cylinders.  
Change the manual to show 4  
Cylinders.

Callout 16 on figure 4-3 is  
pointing at a bolt. In key  
to figure 4-3, item 16 is called  
a shim - Please correct  
one or the other.

I ordered a gasket, item  
19 on figure B-16 by NSN  
2 910-00-762-3001. I got a  
gasket but it doesn't fit.  
Supply says I got what  
I ordered, so the NSN is  
wrong. Please give me a  
good NSN

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

JOHN DOE, PFC (268) 317-7111

SIGN HERE

JOHN DOE

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# The Metric System and Equivalents

## Linear Measure

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

## Weights

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

## Liquid Measure

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

## Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch  
 1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches  
 1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet  
 1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet  
 1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres  
 1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

## Cubic Measure

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

## Approximate Conversion Factors

To change	To	Multiply by	To change	To	Multiply by
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29.573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.356	metric tons	short tons	1.102
pound-inches	newton-meters	.11296			

## Temperature (Exact)

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



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