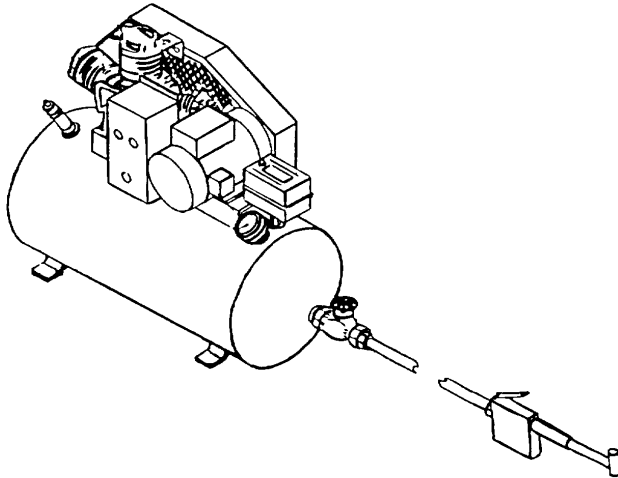


**OPERATOR'S, ORGANIZATIONAL,
DIRECT SUPPORT AND GENERAL
SUPPORT MAINTENANCE MANUAL**



**COMPRESSOR UNIT, RECIPROCATING
ELECTRIC
5 CFM, 175 PSI
(4310-01-089-4330)**

**HEADQUARTERS, DEPARTMENT OF THE ARMY
16 MAY 1981**

INTRODUCTION

**OPERATING
INSTRUCTIONS**

**OPERATION
MAINTENANCE
INSTRUCTIONS**

**ORGANIZATIONAL
MAINTENANCE**

**DIRECT AND
GENERAL
SUPPORT
MAINTENANCE**

**MAINTENANCE
PROCEDURES**

REFERENCES

INDEX

CHANGE }
 No. 1 }

HEADQUARTERS
 DEPARTMENT OF THE ARMY
 WASHINGTON, D.C., 26 March 1987

Operator, Organizational, Direct Support
 And General Support Maintenance Manual

COMPRESSOR UNIT, RECIPROCATING ELECTRIC
 5 CFM 175 PSI MODEL 50-6715
 NSN 4310-01-089-4330

TM 5-4310-370-14, 15 May 1981, is changed as follows:

1. Date on Cover is incorrect, it should read 15 May 1981.
2. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages

i and ii
 1-1 through 1-4
 2-1 and 2-2
 3-7 through 3-10
 5-25 and 5-26
 E-1 and E-2
 I-3 and I-4

Insert pages

i and ii
 1-1 through 1-4
 2-1 and 2-2
 3-7 through 3-10
 5-25 and 5-26
 E-1 and E-2
 I-3 and I-4

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

By Order of the Secretary of the Army:

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

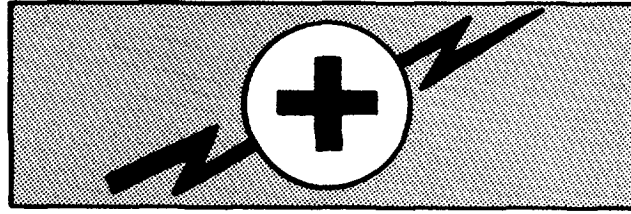
Official:

R. L. DILWORTH
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:

To be distributed in accordance with DA Form 12-25A, Operator, Organizational, Direct Support and General Support Maintenance Requirements for Compressor Unit, Reciprocating, Electric, 5 CFM, 175 PSI (50-6715) (TM 5-4310-370 Series)

WARNING



WARNING

Release pressure from air receiver and compressor pump before inspection, performing procedures, or disassembly of equipment to avoid personal injury.

WARNING

Disconnect compressor unit from main power supply before servicing, replacing or repairing parts of equipment, to avoid personal injury.

WARNING

Do not start or operate compressor unit with belt guard off, to avoid personal injury.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts, is potentially dangerous to personnel and property. Use in a well ventilated area as the fumes are dangerous if inhaled. 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).

WARNING

Close globe valve tightly to avoid personal injury.

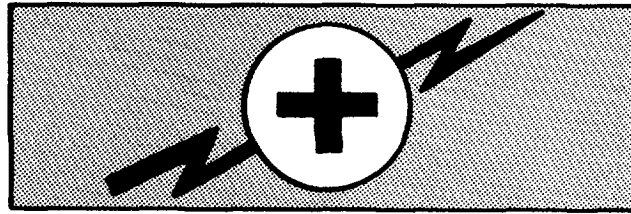
WARNING

Disconnect compressor unit from main power supply before performing check(s) or inspection, to avoid personal injury.

WARNING

Before you use this table, be sure that compressor unit has been disconnected from main power supply, to avoid personal injury.

WARNING



WARNING

Use extreme caution during the following procedures as pressure switch carries an electrical charge which will cause personal injury.

WARNING

Use extreme caution during the following procedures, as adjusting of pressure switch will cause compressor unit to start up to pressurize air receiver.

WARNING

Disconnect compressor unit from main power supply before moving compressor unit, to avoid personal injury.

OPERATOR, ORGANIZATIONAL, DIRECT SUPPORT
AND GENERAL SUPPORT MAINTENANCE MANUAL

Compressor Unit, Reciprocating Electric
5 CFM 175 PSI Model 50-6715
NSN 4310-01-089-4330

REPORTING OF ERRORS

You can help improve this manual by calling attention to errors and by recommending improvements and stating your reasons for the recommendations. Your letter or DA Form 2028, Recommended Changes to Publications, should be mailed directly to US Army Troop Support Command, Attn: AMSTR-MCTS, 4300 Goodfellow Boulevard, St. Louis, MO 63120-1798. A reply will be furnished to you.

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CHAPTER 1

INTRODUCTION

Section I. GENERAL INFORMATION

1-1. SCOPE. Type of Manual: Operator's, Organizational, Direct and General Support Maintenance for Eclipse Reciprocating Compressor Unit, Model 50-6715.

1-2. MAINTENANCE FORMS AND RECORDS. The Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-750, the Army Maintenance Management System (TAMMS).

1-3. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR's). The EIR's can and must be submitted by anyone who is aware of an unsatisfactory condition with equipment design or use. It is not necessary to show a new design or list a better way to perform a procedure, just simply tell why the design is unfavorable or why a procedure is difficult. EIR's may be submitted on SF 368 (Quality Deficiency Reports). Mail EIR's directly to: Commander, US Army Troop Support Command: AMSTR-QX, 4300 Goodfellow Boulevard, St. Louis, MO 63120-1798. A reply will be furnished to you.

1-4. DESTRUCTION OF ARMY MATERIAL TO PREVENT ENEMY USE. Refer to TM 750-244-3 for destruction requirements.

1-5. HAND RECEIPT MANUAL. Hand receipts for the End Item/Components of End Item (COEI), Basic Issue Items (BII), and Additional Authorization List (AAL) items are published in a Hand Receipt Manual. The Hand Receipt Manual numerical designation is the same as the related Technical Manual with letters HR added to the number. These manuals are published to aid in property accountability and are available through Commander, US Army Publications Center, 2800 Eastern Blvd., Baltimore, MD 21220-2896.

1-6. PREPARATION FOR STORAGE AND SHIPMENT. Administrative storage of the Air Compressor shall conform generally with the provisions of TM 740-90-1, Administrative Storage of Equipment.

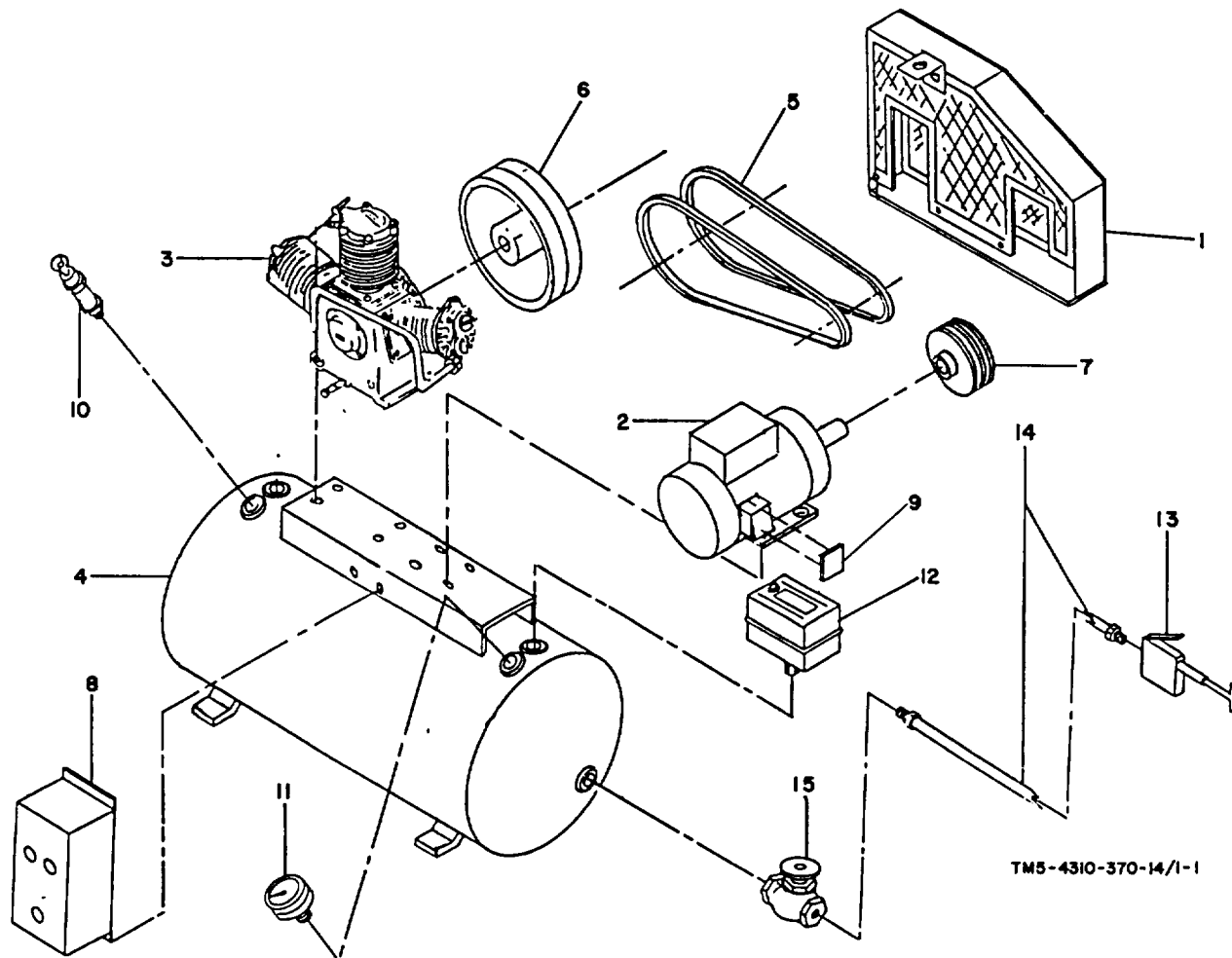
Section II. EQUIPMENT DESCRIPTION

1-7. DESCRIPTION. The Compressor Unit, Model 50-6715 is a stationary compressor unit intended for use as a source of compressed air in the normal operations conducted at filling stations and vehicle maintenance shops. The major components, indicators, safety apparatus, and essential operating items are shown in Figure 1-1.

1-8. TABULATED DATA.

a. Major Identification Plates

- (1) The manufacturer's plate(s) is located on the rear of the air receiver mounting bracket below the compressor pump and includes the serial number, contract number, type of compressor, CFM/PSI, manufacturer FSCM, model number, date of manufacture, and National Stock Number.
- (2) The motor plate located on the side of the motor body denotes make, model, frame size, h.p., rpm., ft. lbs. of torque, full load current, and serial number.



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- | | | |
|--------------------|-------------------------|------------------------|
| 1. Belt Guard | 6. Flywheel | 11. Pressure Gage |
| 2. Motor | 7. Motor Pulley | 12. Pressure Switch |
| 3. Compressor Pump | 8. Starter Switch | 13. Inflater Gage |
| 4. Air Receiver | 9. Junction Box Cover | 14. Inflater Gage Hose |
| 5. V Belts | 10. Safety Relief Valve | 15. Globe Valve |

FIGURE 1-1. COMPONENT IDENTIFICATION

(3) The Air Receiver Plate is located on the air receiver and lists manufacturer's name, National Board Number, model number, year of manufacture, and working pressure.

b. Tabulated Data, Operator Maintenance

WEIGHTS AND DIMENSIONS

| | | |
|-----------------------|----------|------------|
| Weight | 390 lbs. | (177.3 kg) |
| Length, Overall | 48 in. | (121.9 cm) |

| | |
|----------------------|------------------|
| Width, Overall | 20 in. (50.8 cm) |
| Height, Overall..... | 38 in. (96.5 cm) |

CAPACITIES, OIL/GREASE

| | |
|----------------------------|---------------------|
| Compressor Crankcase | 1/4 qts (0.236 lt.) |
| Motor Crankcase | as required |

c. Tabulated Data, Organizational Maintenance

COMPONENT WEIGHTS

| | |
|----------------------------|--------------------|
| Motor | 25 lbs. (11.3 kg) |
| Compressor Pump | 37 lbs. (16.7 kg) |
| Air Receiver..... | 170 lbs. (76.9 kg) |
| Air Receiver Capacity..... | 60 gal. (226.8 l) |

d. Tabulated Data, Direct and General Support Maintenance Compressor Nut and Bolt Torque Data

| | |
|------------------------------|-------------------------------|
| Cylinder..... | 144 in. lbs. (25,718 gr. cm) |
| Cylinder Stud Bolts | 144 in. lbs. (25,718 gr. cm) |
| Connecting Rod Bolts | 125 in. lbs. (22,325 gr. cm) |
| Bearing Housing Bolts..... | 65 in. lbs. (11,609 gr. cm) |
| Flywheel to Crankshaft | 600 in. lbs. (107,160 gr. cm) |

e. Compressor Data

| | |
|-------------------------------|-----------------------------------|
| Manufacturer..... | Champion Pneumatic Machinery Co. |
| Model..... | CAW1 |
| Type | Two Stage, Two Cycle |
| Capacity Free Air | Reciprocating |
| Speed..... | 720 rpm |
| Displacement..... | 9.0 cfm (0.255m ³ /m) |
| Number of Cylinders | 3 |
| Bore and Stroke..... | 2 5/8 in x 2 in (2) and x 1 3/4 |
| | in x 2 in (1) 66.7mm x 50.8mm (2) |
| | and 44.5mm x 50.8mm (1) |
| Maximum Working Pressure..... | 200 PSI (1380 KPa) |
| Rotation | Counter Clockwise |

Section III. TECHNICAL PRINCIPLES OF OPERATION

1-9. MAJOR COMPONENTS (Figure 1-1)

- a. Belt Guard - (Item 1) - Protects operator from flywheel and motor pulley and from belts if they should break.
- b. Motor - (Item 2) - Drives compressor pump.
- c. Compressor Pump - (Item 3) - Pumps air into air receiver at required pressure.

d. Air Receiver (Item 4) Receives and stores air at required pressure for use with shop equipment.

1-10. MINOR COMPONENTS AND ACCESSORIES (Figure 1-1).

e. V Belts (Item 5) Connects motor to compressor pump to drive same.

f. Flywheel (Item 6) Receives belts from motor to drive compressor pump.

g. Motor Pulley (Item 7) Receives belts from compressor pump to drive same.

h. Starter (Item 8) Starts and stops unit.

j. Junction Box Cover (Item 9) Covers motor electrical leads.

k. Safety Relief Valve (Item 10) Releases air from air receiver when there is too much pressure in air receiver.

l. Pressure Gage (Item 11) Indicates air pressure in air receiver.

m. Pressure Switch (Item 12) Activates motor to drive compressor pump when air pressure is required in air receiver.

n. Inflator Gage (Item 13) Indicates level of air pressure contained in air inflatable item.

o. Inflator Gage Hose (Item 14) Connects inflator gage to globe valve.

p. Globe Valve (Item 15) Closes off air supply to inflator gage.

CHAPTER 2
OPERATING INSTRUCTIONS

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

2-1. OPERATOR CONTROLS:

- a. Air Receiver Drain - Screw type valve located on the bottom of air receiver, used to drain condensation build-up from air receiver. (See figure 2-1, item 1.)
- b. Globe Valve - Screw type valve with handle located at motor end of air receiver, which turns air flow on and off to inflator gage. (See figure 2-1, item 2.)
- c. Starter Switch - Push button type mounted to the air receiver mounting bracket, used to stop and start motor. (See figure 2-1, item 5.)

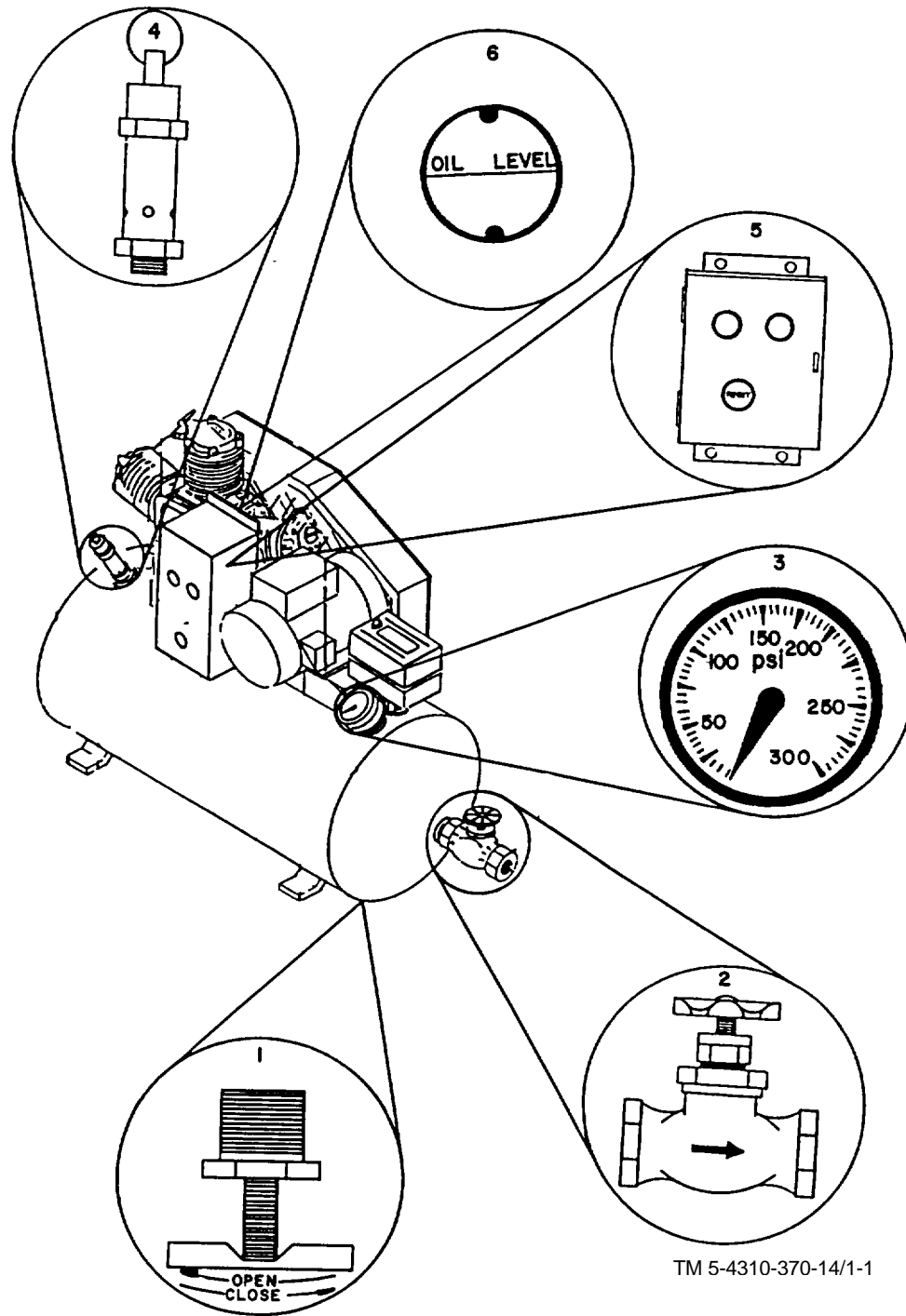
2-2. OPERATOR INDICATORS:

- a. Visible Sight Oil Level Gage - Small round clear disc with oil level line on the face. It is located on the rear of compressor pump body near the bottom and indicates oil level. (See figure 2-1, item 6.)
- b. Pressure Gage - Clear face dial on air receiver next to motor. It indicates air pressure in the air receiver. (See figure 2-1, item 3.)
- c. Safety Relief Valve - A brass pressure release valve located on the air receiver next to the compressor pump. Its function is to allow air pressure to escape from the air receiver, i.e., unit malfunctions. (See figure 2-1, item 4.)

Section II. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES.

2-3. SCOPE.

- a. This section contains preventive checks and services for the safe and efficient use of the compressor unit. Each item to be inspected is followed by a check(s) which should be performed prior to the starting and use of the compressor unit. The interval required for said check(s) is also indicated. The compressor unit will be reported not ready/available when any check has found any of the inspected items to be loose, damaged, or missing.



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- | | | |
|-----------------------|------------------------|---------------------------------|
| 1. Air Receiver Drain | 3. Pressure Gage | 5. Starter Switch |
| 2. Globe Valve | 4. Safety Relief Valve | 6. Visible Sight Oil Level Gage |

FIGURE 2-1. OPERATORS CONTROLS AND INDICATORS

- b. This manual cannot list all possible items to be checked. If any other item appears to be in a not ready condition, refer same to next higher level of maintenance (see APPENDIX B) for servicing.
- c. Table 2-1 lists the common items and checks you will need to operate compressor unit. You should perform these checks and/or services in the order listed.

WARNING

Before you use this table, be sure that unit has been disconnected from main power supply, to avoid personal injury.

TABLE 2-1. OPERATOR/CREW PREVENTIVE CHECKS AND SERVICES

B-Before D-During A-After W-Weekly M-Monthly

| Item | INTERVAL | | | | | Item to be Inspected | Procedures: Check for and have repaired or adjusted, as necessary | For readiness reporting equipment is not ready/ available if: |
|------|----------|---|---|---|---|----------------------|---|---|
| | B | D | A | W | M | | | |
| 1 | • | | | • | | V Belts | There should be no more than 1/2" of play in the belts. To tighten, loosen four (4) motor mount nuts and slide motor back until belts are taut. Tighten the (4) mounting bolts. | |
| 2 | • | | | | | Starter Switch | Check for any loose wires or nuts and bolts. Check to see if switch is loose. | Check finds any loose hardware or wires. |
| 3 | • | • | | | | Compressor Pump | Check for any loose connections or nuts and bolts. | Check finds any loose connections. |
| 4 | • | | | • | | Air Receiver | Check for any damage to Air Receiver or its components. | If any damage found creates an air leak. |
| 5 | • | | • | | | Globe Valve | Check to see that valve turns freely. | |
| 6 | | • | | | | Inflator Gage Hose | Check for air leaks in hose or its connections. | Large air leak is found. |

TABLE 2-1. OPERATOR/CREW PREVENTIVE CHECKS AND SERVICES (Cont'd)

| Item | INTERVAL | | | | | Item to be Inspected | Procedures: Check for and have repaired or adjusted, as necessary | For readiness reporting equipment is not ready/ available if: |
|------|----------|---|---|---|---|------------------------------|---|---|
| | B | D | A | W | M | | | |
| 7 | • | • | | | | Inflator Gage | Check for damage to inflator gage. | If damage is such that it interferes with the proper working or measuring of air. |
| 8 | | • | | | | Pressure Gage | Check air pressure. Pressure should not exceed 195 PSI (1350 KPa). | Pressure exceeds 195 PSI (1350 KPa). |
| 9 | • | | | | | Air Receiver Drain | Check to make sure air receiver drain is tightly closed. | Air receiver drain is missing. |
| 10 | • | | • | • | | Visible Sight Oil Level Gage | Check to see that oil has been filled to level shown on visible sight oil level gage. | Oil is below proper level. |

Section III. OPERATION UNDER USUAL CONDITIONS

2-4. INSPECTION AND SERVICING PRIOR TO OPERATION.

- a. Inspection. You should inspect the entire compressor unit for signs of damage, missing or loose hardware, or any faults that may have occurred during shipment. Report all faults to your supervisor.
- b. Servicing. Perform all the preventive maintenance services listed in Table 2-1 and fill compressor pump with oil as described in Chapter 3, Section I.
- c. Check oil level in compressor pump at visible sight oil level gage to make sure compressor pump will have proper lubrication during operation.
- d. Test all inflator gage hose connections to prevent air leaks during operation.
- e. Check all pipe connections by twisting and shaking with hands to check for any looseness which could cause air leaks.
- f. Check for any loose screws, nuts, or bolts, as they may present hazards during operation.

2-5. COMPRESSOR UNIT PREPARATION PRIOR TO OPERATION.

- a. Release all the air receiver pressure by first turning the globe valve, counter clockwise, to the open position (see figure 2-1, item 2) and then depressing the inflator gage handle.
- b. Drain the air receiver of all its water by turning the air receiver drain counter clockwise, to the open position (see figure 2-1, item 1). When all the water has drained out, close air receiver drain clockwise, until air receiver drain is in the closed position (see figure 2-1, item 1).

2-6. OPERATION OF COMPRESSOR UNIT.

- a. To start compressor unit, press the black button on the starter switch marked "START". As the air receiver pressure increases, check for air leaks. An air leak can be found by a hissing sound which is the air escaping rapidly from a malfunctioning joint or part. In case of such a leak, immediately shut compressor unit off by pressing the red button marked "STOP" on the starter switch and advise next higher level of maintenance.
- b. Note, that once compressor unit has pumped air pressure up to maximum operating pressure of 195 PSI (1350 KPa), compressor unit will shut off until operating point of falling pressure reaches 175 PSI (1210 KPa) when compressor unit will again begin pumping air.
- c. To stop compressor unit for total shutdown or repairs, press red button on starter switch marked "STOP".

Section IV. OPERATION UNDER UNUSUAL CONDITIONS

2-7. OPERATION IN EXTREME COLD (0°F - 18°F).

- a. Select the correct lubricants for the expected air temperatures as indicated on the lubrication chart.
- b. Drain condensation from air receiver prior to shutdown while unit is still warm.
- c. When possible, install the compressor unit in a properly protected shelter. Protect motor and magnetic starter from ice and snow.

2-8. OPERATION IN EXTREME HEAT.

- a. Locate the compressor unit in a well ventilated area that will allow maximum amount of air to circulate through motor and compressor.
- b. Check oil levels frequently. Fill if necessary.
- c. Keep outside of motor and compressor clean. Dirt acts as an insulator which prevents heat from escaping into the air.

2-9. OPERATION IN DUSTY OR SANDY AREAS.

- a. Protect the compressor unit from dust and sand as much as possible. Cleanliness is important to proper cooling.
- b. Check air cleaners on the compressor frequently; clean or replace as required.
- c. When adding or changing oil, remove dirt from around openings. Keep oil containers covered, dust-free and tight.

2-10. OPERATION UNDER RAINY OR MOIST CONDITIONS.

- a. High humidity and rainy weather conditions can cause deterioration of exposed metal parts.
- b. Do not operate compressor unit outside while it is raining. Make every effort to protect the motor and magnetic starter from the elements.
- c. Drain air receiver frequently of all condensation.
- d. If the compressor is not to be used for a period of time, either move it to a shelter or protect it by covering with a tarpaulin.

2-11. OPERATION IN SALT WATER AREAS.

- a. The deterioration and corrosion of exposed metal is greatly accelerated in salt water areas. All parts of the unit should be wiped dry whenever the unit is shutdown.
- b. If the compressor unit is not to be used a long period of time, apply an approved preservative to all exposed metal parts.

2-12. OPERATION AT HIGH ALTITUDES.

- a. A decrease in compressor efficiency will be observed at high altitudes. Less air is drawn into the cylinders.
- b. Service the air filters on compressor daily to assure maximum air intake.
- c. Check belt tension daily to assure maximum transfer of power from electric motor to compressor.

CHAPTER 3
OPERATION MAINTENANCE INSTRUCTIONS

Section I. LUBRICATION INSTRUCTIONS

WARNING

Disconnect compressor unit from main power supply before servicing, replacing, or repairing parts of equipment, to avoid personal injury.

NOTE

Drain compressor pump oil only when compressor unit has operated for an hour or more.

3-1. COMPRESSOR PUMP LUBRICATION.

- a. Remove oil drain cap by turning it counter clockwise. (See figure 3-1.)
- b. When oil stops running out, oil has been drained.
- c. Replace oil drain cap and tighten. (See figure 3-1.)
- d. Remove oil filler plug by turning it counter clockwise. (See figure 3-1.)
- e. Fill crankcase until oil level reaches proper level as shown on the Visible Sight Oil Level Gage in Figure 3-1. (Do not overfill.)
- f. See figure 3-1 (Lubrication Chart) for proper grade of oil.
- g. Replace oil filler plug and tighten. (Figure 3-1.)

3-2. MOTOR LUBRICATION

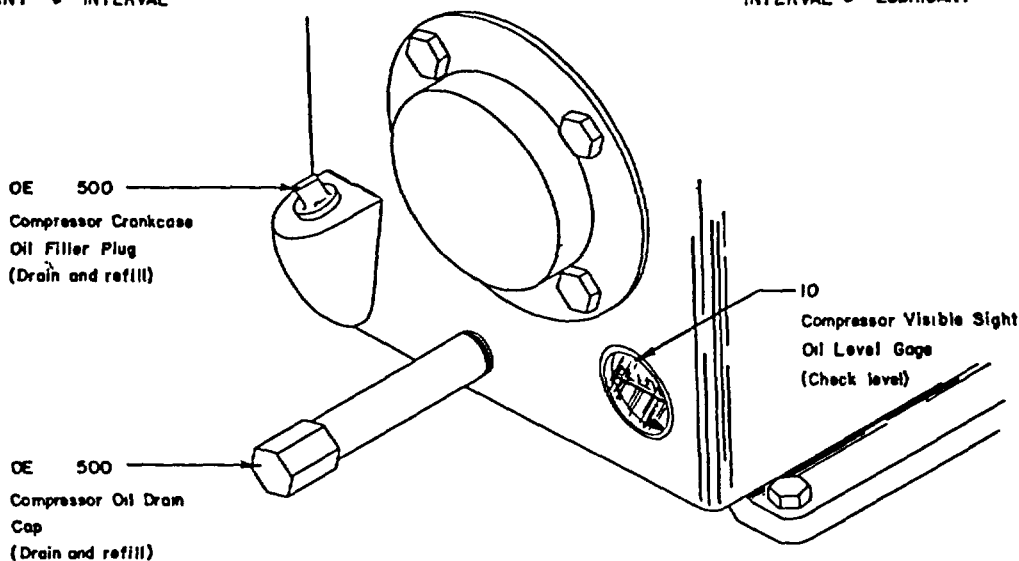
WARNING

Disconnect compressor unit from main power supply before servicing, replacing, or repairing parts of equipment, to avoid personal injury.

- a. The motor has sufficient grease to last indefinitely under usual operating conditions.

LUBRICANT • INTERVAL

INTERVAL • LUBRICANT



KEY

| LUBRICANTS | CAPACITY | EXPECTED TEMPERATURES | | | INTERVAL |
|-------------------------|----------|-----------------------|----------------|--------------|---|
| | | Above +32°F | +40°F to -10°F | 0°F to -65°F | |
| • Compressor, Crankcase | 1/4 qt. | OE 30 | OE 10 | OES | Intervals given are in hrs. of normal operation |

NOTES:

1. For Operation in Protracted Cold Temperatures Below -10°F. Remove lubricants prescribed in the key for temperatures above -10°F. Relubricate with lubricants specified in the key for temperatures below -10°F.
2. Lubricants. The following is a list of lubricants with the Military Symbols and applicable specification numbers.

OE MIL-L-2104
OES MIL-L-10295

TM 5-4310-370-14/3-1

FIGURE 3-1. LUBRICATION CHART

- b. Where motor is used constantly in very dirty, wet, or corrosive atmospheres, add one quarter ounce of grease for each of two bearings every three months.
- c. To grease motor, use standard grease gun; and grease at points shown in Figure 3-2.

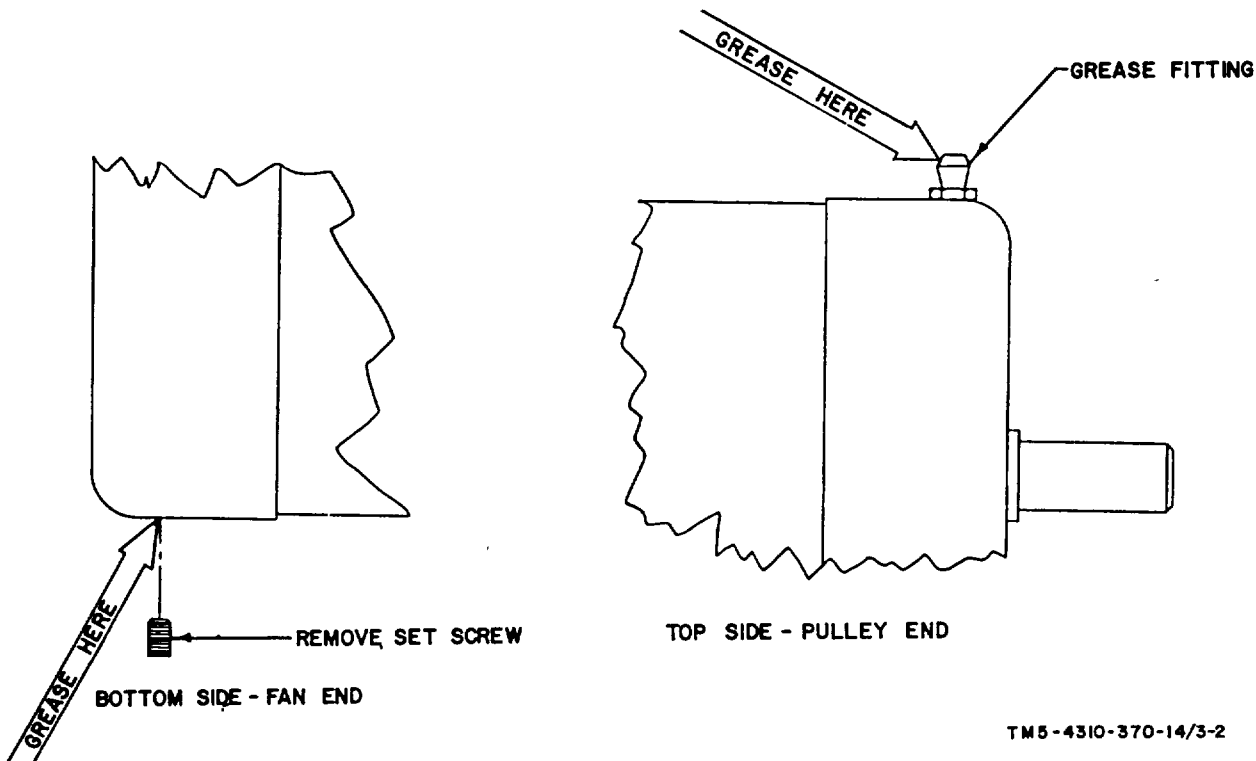


FIGURE 3-2. MOTOR LUBRICATION

Section II. OPERATOR/CREW TROUBLESHOOTING

3-3. SCOPE.

- a. This section contains troubleshooting or malfunction information and tests for locating and correcting most of the troubles which may develop in the compressor unit. Each malfunction or trouble symptom for an individual component, unit, or system is followed by a list of tests or inspections necessary for you to determine probable causes and suggested corrective actions for you to remedy the malfunction.
- b. This manual cannot list all possible malfunctions that may occur or all tests or inspections, and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, you should notify higher level maintenance.
- c. Table 3-1 lists the common malfunctions that you may find during the operation or maintenance of compressor unit or its components. You should perform the test, inspections and corrective actions in the order listed.

NOTE

Before you use this table, be sure you have performed all applicable operating checks.

TABLE 3-1. OPERATOR/CREW TROUBLESHOOTING

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

1. NO AIR COMING OUT OF INFLATOR GAGE

WARNING

Disconnect compressor unit from main power supply before servicing, replacing or repairing parts of equipment, to avoid personal injury.

Step 1. Check to be sure inflator gage hose is connected to globe valve.

Connect inflator gage hose to globe valve.

2. NO PRESSURE IN AIR RECEIVER

Step 1. Check level of air pressure in air receiver on pressure gage, it should not be less than 175 PSI (1210 KPa).

If air pressure is less than 175 PSI (1210 KPa) tighten all connections.

Step 2. Check connections and safety valve for air leaks.

Tighten any leaking connections and safety valve.

Step 3. Check air receiver drain to make sure it is closed.

Close air receiver drain tightly. If open, a loud noise from air escaping will be heard.

3. WATER IN INFLATOR GAGE HOSE OR INFLATOR GAGE.

Step 1. Check to see if there are any loose hose connections and if inflator gage hose or inflator gage are lying in water.

Drain air receiver of water as described in Chapter 3, Section III, paragraph 3-5, and remove inflator gage hose or inflator gage from water.

4. COMPRESSOR UNIT WILL NOT START

WARNING

Disconnect compressor unit from main power supply before servicing, replacing or repairing parts of equipment, to avoid personal injury.

TABLE 3-1. OPERATOR/CREW TROUBLESHOOTING (Cont'd)

| MALFUNCTION | TEST OR INSPECTION | CORRECTIVE ACTION |
|-------------|--------------------|---|
| | Step 1. | Check pressure gage for amount of pressure in air receiver as compressor unit will not come on until pressure is below 175 PSI (12.1 bars). |
| | Step 2. | If pressure is below 175 PSI (12.1 bars), check to make sure all wiring connections are tight. Tighten all electrical connections. |
| | Step 3. | Check to see that pressure switch is tight to air receiver. Tighten pressure switch, located next to motor. If unit does not start, refer further service to higher level of maintenance. (See APPENDIX B) |

5. MOTOR IS RUNNING, BUT COMPRESSOR PUMP IS NOT

WARNING

Disconnect compressor unit from main power supply before performing check(s) or inspection, to avoid personal injury.

- Step 1. Check V Belts for slippage or looseness.

Tighten belts as described in Chapter 3, Section III, paragraph 3-4.

6. MOTOR OVERHEATS

- Step 1. If compressor unit shuts down and motor is very hot to the touch of the hand.

Allow motor to cool until it is cool to the touch of the hand.

After motor has cooled, it will automatically reset itself and begin to operate again.

If cooled motor does not reset and operate, refer further service to higher level of maintenance. (See APPENDIX B)

TABLE 3-1. OPERATOR/CREW TROUBLESHOOTING (Cont'd)

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

7. V BELT BREAKAGE

WARNING

Disconnect compressor unit from main power supply before performing check(s) or inspection, to avoid personal injury.

Step 1. Check for frayed or broken V belts.

Step 2. Check both flywheel and motor pulley to make sure they are secure to shafts and in line. Any misalignment of motor pulley and flywheel will cause excessive V belt wear and breakage.

For V belt replacement, refer service to next higher level of maintenance. (See APPENDIX B)

8. OIL LEAKAGE

WARNING

Disconnect compressor unit from main power supply before performing check(s) or inspection, to avoid personal injury.

Step 1. Check to see that oil filler plug and oil drain cap are in place and secure.

Wipe oil filler plug and oil drain cap areas clean of dirt and oil.

Tighten oil filler plug and oil drain cap.

Begin normal operation and check to see if leak persists. If it does, refer malfunction to higher level of maintenance. (See APPENDIX B)

9. AIR LEAKAGE

Step 1. Check for and note location of leak.

WARNING

Disconnect compressor unit from main power supply before performing check(s) or inspection, to avoid personal injury.

TABLE 3-1. OPERATOR/CREW TROUBLESHOOTING (Cont'd)

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

Step 2. Check location of leak for loose connection.

Tighten fitting where leakage is coming from. If leak persists, refer malfunction to higher level of maintenance. (See APPENDIX B)

10. RESTRICTED AIR FLOW THROUGH AIR INLET FILTERS AND/OR PARTICLES IN INFLATOR GAGE HOSE OR INFLATOR GAGE

WARNING

Disconnect compressor unit from main power supply before performing check(s) or inspection, to avoid personal injury.

Step 1. If compressor pump is running, but air receiver is receiving air slowly, check air inlet filters for build-up of dirt.

Remove air inlet filters and clean or replace inlet filters as described in Chapter 3, Section III, paragraph 3-8.

Step 2. If there is dirt or particles in inflator gage.

Remove inflator gage and blow out inflator gage hose to remove particles.

Section III. MAINTENANCE PROCEDURES

3-4. BELT ADJUSTMENT.

WARNING

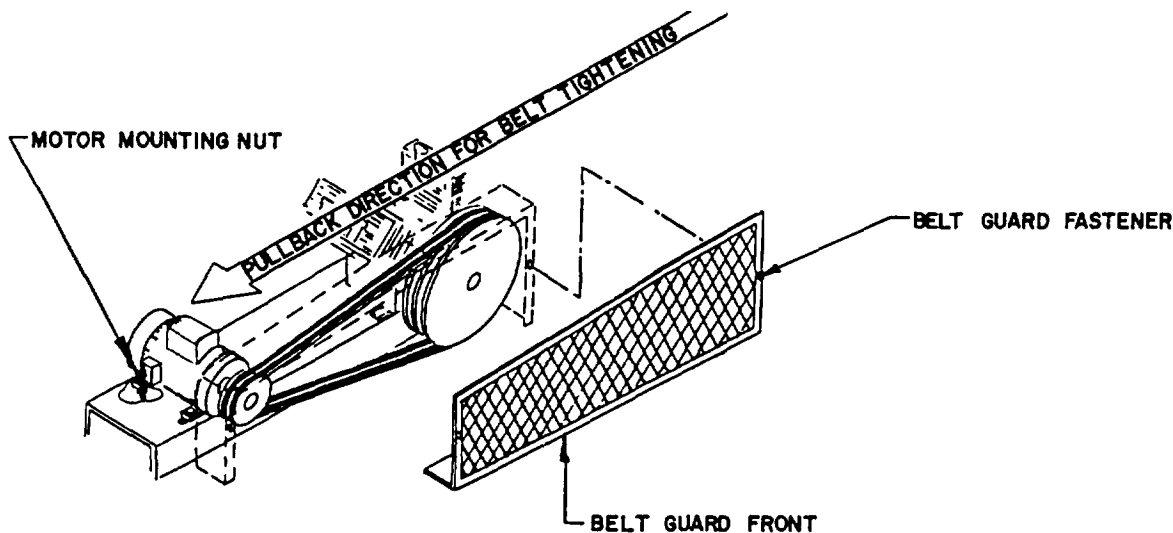
Release pressure from air receiver and compressor pump before inspection, performing procedures, or disassembly of equipment to avoid personal injury.

- a. Remove belt guard front by turning belt guard fasteners one quarter turn (figure 3-3).
- b. Loosen motor mounting nuts and pull motor back until belts become taut, as shown in figure 3-3. Proper V belt tension is when V belts can be deflected 3/8" to 1/2" midway between pulleys.

- c. With one hand holding motor in position, tighten motor mounting nuts, shown in figure 3-3.
- d. Replace belt guard front and tighten belt guard fasteners.

WARNING

Do not start or operate compressor unit with belt guard off, to avoid personal injury.



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FIGURE 3-3. V BELT ADJUSTMENT

3-5. DAILY DRAINING OF AIR RECEIVER

WARNING

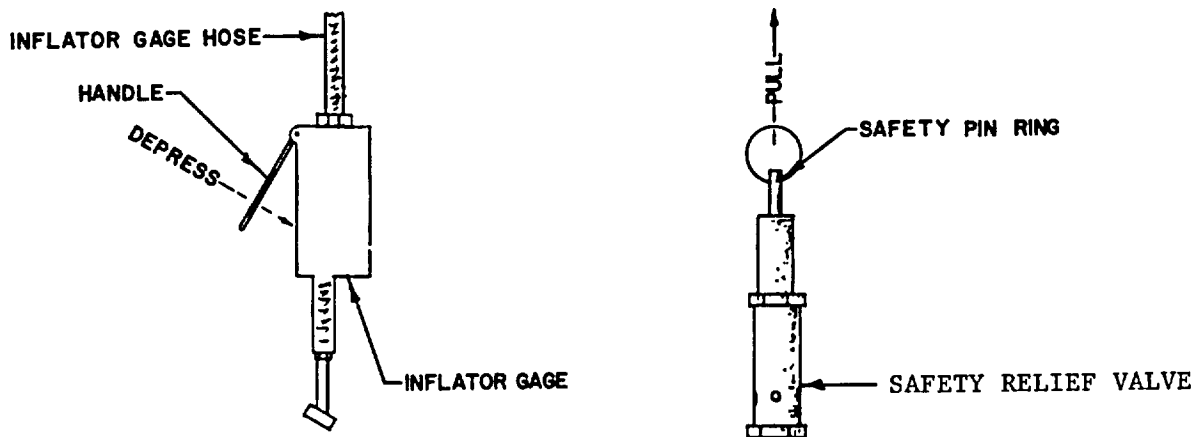
Disconnect compressor unit from main power supply before servicing, replacing, or repairing parts of equipment, to avoid personal injury.

WARNING

Release pressure from air receiver and compressor pump before inspection, performing procedures, or disassembly of equipment to avoid personal injury.

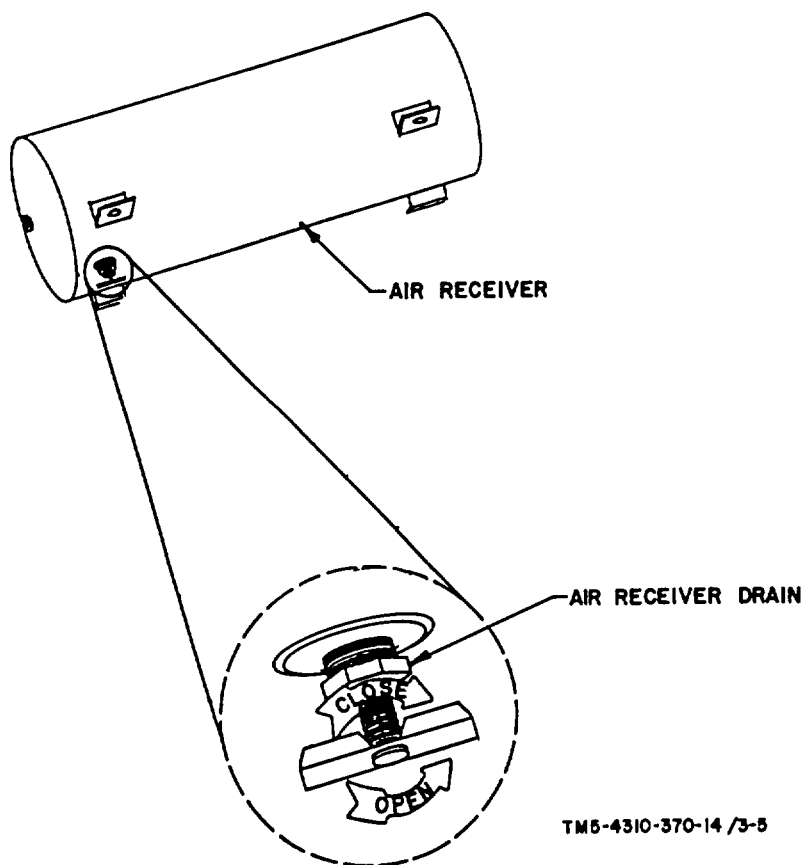
- a. To release the air receiver pressure, depress handle on inflator gage until all air is drained or pull safety pin ring on safety relief valve until all air escapes. See figure 3-4.
- b. Then turn air receiver drain counter clockwise until it stops. See figure 3-5.

- c. Water will then drain out of air receiver drain.
- d. When water is no longer running out, turn air receiver drain clockwise until it is tight.



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FIGURE 3-4. AIR RECEIVER AIR RELEASE



TM5-4310-370-14 /3-5

FIGURE 3-5. AIR RECEIVER DRAINING

3-6. GLOBE VALVE USE

- a. Turns the air supply to inflator gage and inflator gage hose on and off.
- b. To turn globe valve ON, turn valve handle counter clockwise.
- c. To turn globe valve OFF, turn valve handle clockwise.
- d. See figure 3-6.

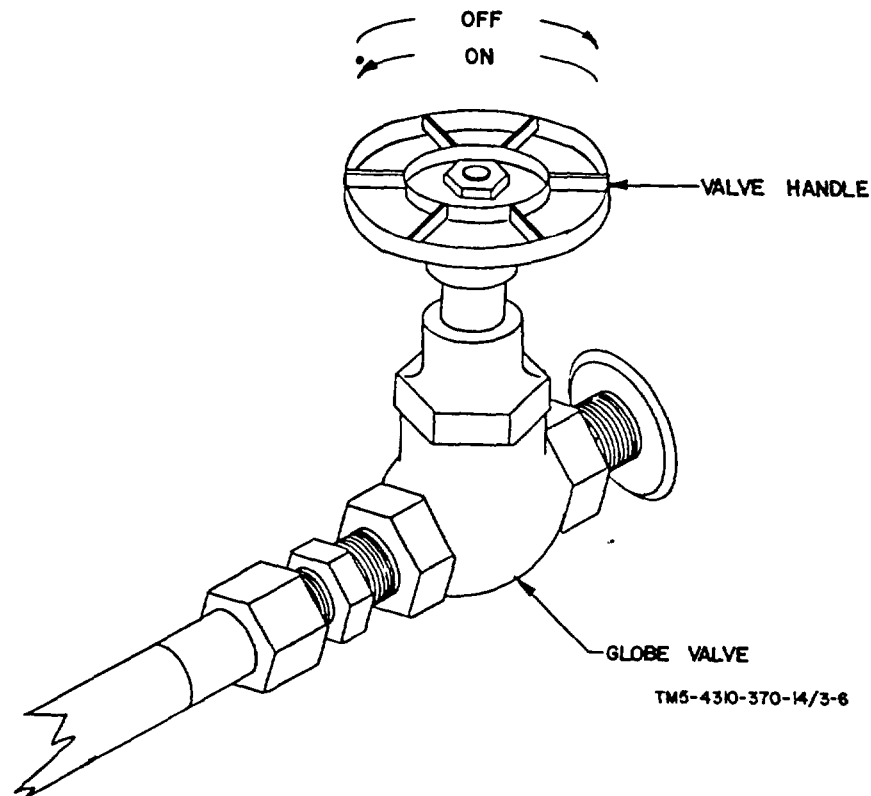


FIGURE 3-6. GLOBE VALVE USE

3-7. TIGHTENING OF INFLATOR GAGE HOSE CONNECTIONS.

- a. Turn globe valve OFF.
- b. Tighten inflator gage hose connections by turning hose connection nut clockwise.
- c. Turn globe valve ON.
- d. See figure 3-7.

3-8. CLEANING OR REPLACING OF AIR INLET FILTERS.

WARNING

Disconnect compressor unit from main power supply before servicing, replacing, or repairing parts of equipment, to avoid personal injury.

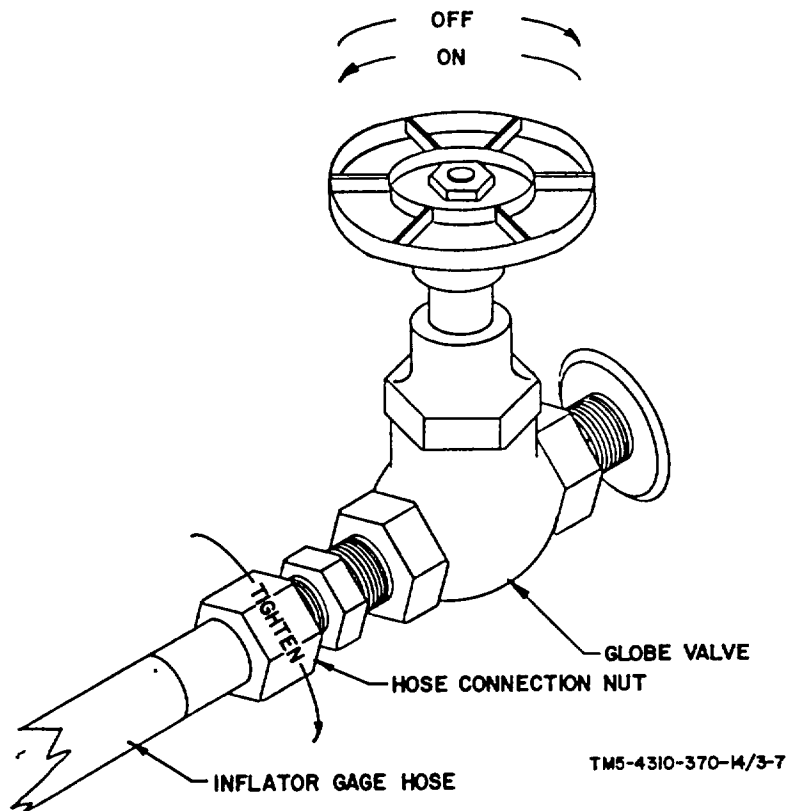


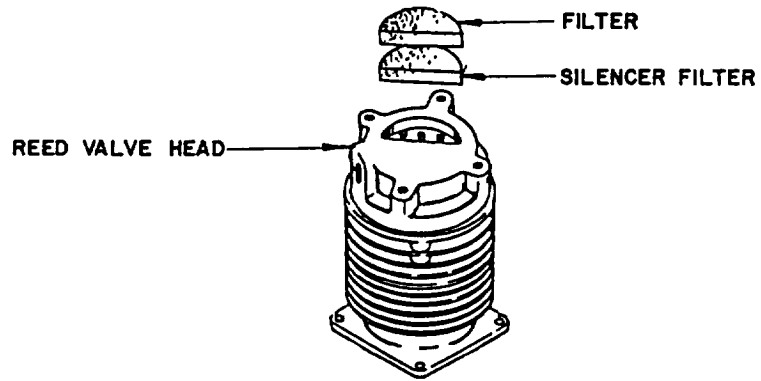
FIGURE 3-7. INFLATOR GAGE HOSE CONNECTION

- a. Remove filter and silencer filter as shown in figure 3-8.
- b. Wash foam filters in warm water with ordinary soap.

CAUTION

Do not use any caustic cleaners as they may damage the foam filters.

- c. If filters will not come clean, are brittle, or are damaged, replace them.
- d. When filters are clean, remove excess water by blowing the water out with compressed air.
- e. Replace filter and silencer filter into both reed valve heads.



TM5-4310-370-14/3-8

FIGURE 3-8. AIR INLET FILTER REPLACEMENT

CHAPTER 4

ORGANIZATIONAL MAINTENANCE

Section I. PREPARATION FOR STORAGE OR SHIPMENT

4-1. UNLOADING AND UNPACKAGING. The total weight of the compressor unit is 390 pounds (177.3 kg). You must use a fork lift of 500 pounds (227 kg) capacity to unload compressor unit. Keep compressor unit flat during the unloading operation. Before unpacking, place compressor unit in the location it is to be installed. Then remove the packaging material carefully so you do not damage the contents with the tools used for unpackaging.

4-2. INSTALLATION.

- a. Place in desired position, making sure to keep compressor unit level while doing so.
- b. For wiring instructions of starter switch and main power supply disconnect, see Figure 4-1. Wiring must be installed by a qualified electrician.
- c. Compressor flywheel must rotate counter clockwise. Observe arrow cast into flywheel.

4-3. SHIPMENT AND/OR STORAGE PROCEDURES.

- a. Shipment of Reciprocating Compressor Unit Procedures.

WARNING

Release pressure from air receiver and compressor pump before disassembly of equipment, to avoid personal injury.

WARNING

Disconnect compressor unit from main power supply before moving of unit, to avoid personal injury.

- (1) Open air receiver drain and leave open after air receiver has been drained of water.
- (2) Disconnect inflator gage and inflator gage hose. Package in same manner as received.
- (3) Loosen V belts by loosening motor mounting nuts and slide motor towards compressor pump and tighten motor mounting nuts.

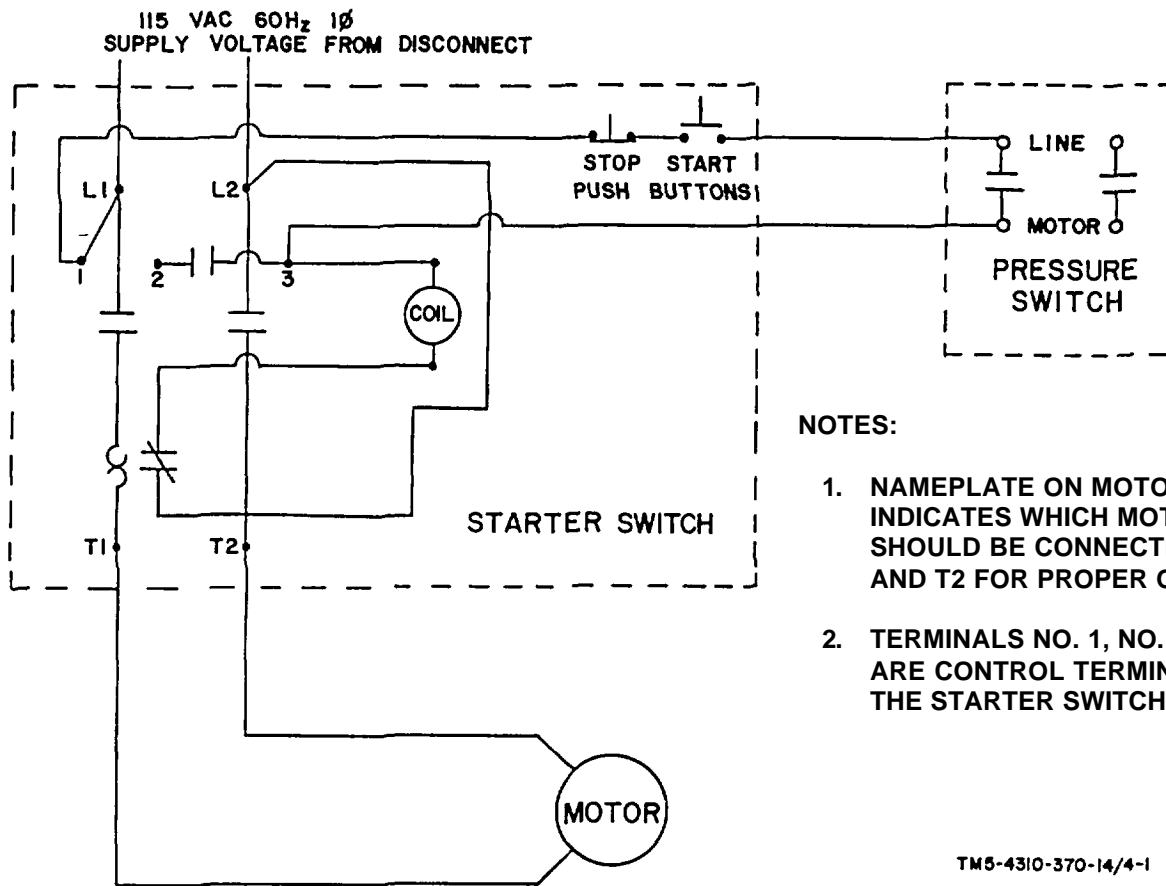


FIGURE 4-1. WIRING DIAGRAM

- (4) Pick up unit with forklift of 500 lbs. minimum capacity. Be sure to keep compressor unit level while moving it.
- (5) After compressor unit is placed on vehicle, which is to move it, tie compressor unit down securely and cover it with a tarpaulin to protect it from elements.

b. Storage of Reciprocating Compressor Unit.

- (1) Release air pressure from air receiver and compressor pump before storage of equipment.
- (2) Disconnect inflator gage and inflator gage hose and package in same manner as received.
- (3) Open air receiver drain and leave it open.
- (4) Loosen V belts by loosening motor mounting nuts and push motor towards compressor pump and tighten motor mounting nuts.

- (5) Package compressor unit in same manner as received and be sure to store compressor unit in enclosed, dry area. Compressor unit should not, under any condition, be allowed to stand in or be submerged in water.

Section II. ORGANIZATIONAL TROUBLESHOOTING

4-4. SCOPE.

- a. This section contains troubleshooting or malfunction information and tests for locating and correcting most of the troubles which may develop in the compressor unit. Each malfunction or trouble symptom for an individual component, unit, or system is followed by a list of tests or inspections necessary for you to determine probable causes and suggested correction actions for you to remedy the malfunction.
- b. This manual cannot list all possible malfunctions that may occur or all tests or inspections, and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, you should notify higher level maintenance.
- c. Table 4-1 lists the common malfunctions that you may find during the operation or maintenance of compressor unit or its components. You should perform the test, inspections and corrective actions in the order listed.

NOTE

Before you use this table, be sure you have performed all applicable operating checks.

TABLE 4-1. ORGANIZATIONAL TROUBLESHOOTING

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

1. BROKEN V BELT

WARNING

Disconnect compressor unit from main power supply before performing check(s) or inspection, to avoid personal injury.

Step 1. Check to see if one or both V belts are broken.

Install both V belts with new set of V belts even if only one V belt has broken as described in paragraph 4-5.

TABLE 4-1. ORGANIZATIONAL TROUBLESHOOTING (Cont'd)

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

2. MOTOR INOPERATIVE

WARNING

Disconnect compressor unit from main power supply before performing check(s) or inspection, to avoid personal injury.

Step 1. Check to see if motor is hot to the hand.

If motor is hot to the hand, it has over-heated. Allow motor to cool.

Step 2. If motor has cooled and will not start check motor wiring connections.

Tighten motor wiring connections.

Step 3. Make sure that motor shaft is still capable of turning.

If motor shaft is frozen, replace motor as described in paragraph 4-7.

3. COMPRESSOR UNIT RUNS ABOVE SHUT-OFF PRESSURE (195 PSI 1350 KPa)

WARNING

Release pressure from air receiver and compressor pump before inspection, performing procedures or disassembly of equipment to avoid personal injury.

WARNING

Disconnect compressor unit from main power supply before performing check(s) or inspection, to avoid personal injury.

Step 1. Remove pressure switch cover and check for loose wire connections.

Tighten any loose wire connections.

Step 2. Check setting of pressure switch.

Adjust pressure switch settings as described in paragraph 4-8.

TABLE 4-1. ORGANIZATIONAL TROUBLESHOOTING (Cont'd)

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

4. KNOCKING OR RATTLE DEVELOPS IN COMPRESSOR PUMP

WARNING

Disconnect compressor unit from main power supply before performing check(s) or inspection, to avoid personal injury.

Step 1. Check for loose motor pulley or flywheel.

Tighten motor pulley and flywheel.

Step 2. Check for loose V belts.

Tighten V belts as described in Chapter 3, Section III, paragraph 3-4.

Step 3. Listen for squeaky V belts.

If V belts squeak, then they have been glazed and should be replaced as described in Chapter 4, Section III, paragraph 4-5.

Step 4. Check for loose compressor pump mounting nuts and bolts.

Tighten any loose mountings.

Step 5. Check for lack of oil in compressor pump.

If there should be a lack of oil in compressor pump, fill to correct level as described in Chapter 3, Section I, paragraph 3-1.

Step 6. Check to make sure oil in compressor pump is correct weight.

If oil weight is incorrect, change oil in compressor pump as described in Chapter 3, Section I, paragraph 3-1.

Step 7. Check for any loose connections in tubing, compression fittings, etc.

If any loose connections are found, tighten them.

TABLE 4-1. ORGANIZATIONAL TROUBLESHOOTING (Cont'd)

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

5. EXCESSIVE OIL CONSUMPTION

WARNING

Disconnect compressor unit from main power supply before performing check(s) or inspection, to avoid personal injury.

Step 1. Check for oil leak.

If oil leak is external, tighten connection from where oil is leaking.

If oil leak is internal, such as if there is oil in the discharge air, remove compressor pump as described in Chapter 4, Section III, paragraph 4-9, and refer to next higher level of maintenance. (See APPENDIX B)

Step 2. Check for proper level of oil.

If compressor pump has improper level of oil, fill to correct level as described in Chapter 3, Section I, paragraph 3-1.

Step 3. Check for proper weight of oil.

If oil weight is incorrect, change oil in compressor pump as described in Chapter 3, Section I, paragraph 3-1.

6. COMPRESSOR PUMP OVERHEATS

WARNING

Disconnect compressor unit from main power supply before performing check(s) or inspection, to avoid personal injury.

Step 1. If compressor pump overheats (hot to touch of hand) shut compressor unit down.

Allow compressor pump to cool until it is cool to the touch of the hand.

Step 2. Check V belts to see if they are too loose or too tight.

TABLE 4-1. ORGANIZATIONAL TROUBLESHOOTING (Cont'd)

| MALFUNCTION | TEST OR INSPECTION | CORRECTIVE ACTION |
|-------------|--|--|
| | | Adjust as described in Chapter 3, Section III, paragraph 3-4. |
| | Step 3. Check level of oil to see if it is low. | If oil level is low, fill to correct level as described in Chapter 3, Section I, paragraph 3-1. |
| | Step 4. Check oil to make sure correct weight oil is being used. | If improper oil weight is found, change oil as described in Chapter 3, Section I, paragraph 3-1. |

Section III. MAINTENANCE PROCEDURES

4-5. V BELT REPLACEMENT.

WARNING

Disconnect compressor unit from main power supply before servicing, replacing or repairing parts of equipment, to avoid personal injury.

- a. Loosen belt guard fasteners. (Figure 4-2)
- b. Remove belt guard front. (Figure 4-2)
- c. Loosen motor mounting nuts and move motor towards compressor pump until V belts can be removed easily. (Figure 4-2)
- d. Remove old V belts and replace with new set (both V belts must be replaced).
- e. Move motor away from compressor pump, tightening V belts (figure 4-2). Play in fully tightened V belts should be no more than 1/2".
- f. Tighten motor mounting nuts.
- g. Install belt guard front. (Figure 4-2)
- h. Tighten belt guard fasteners. (Figure 4-2)

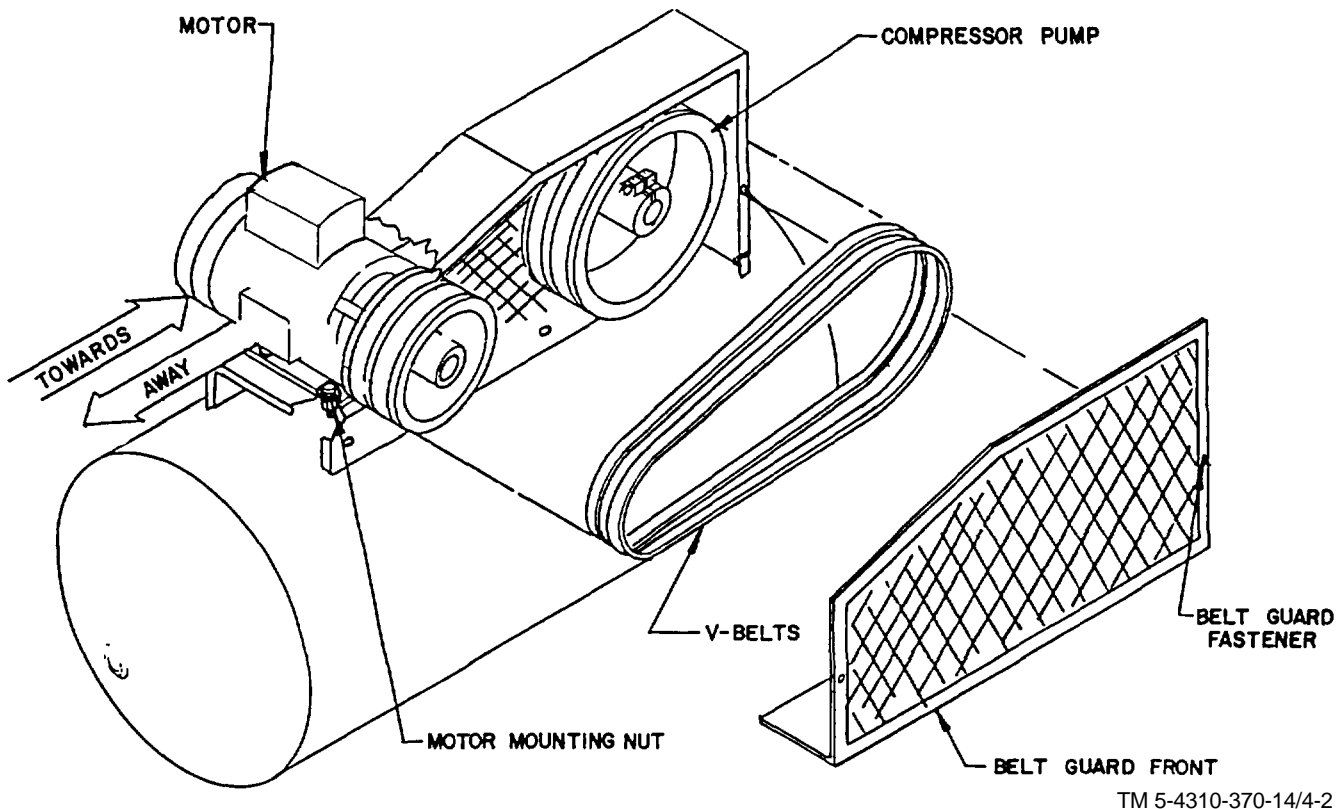


FIGURE 4-2. V BELT REPLACEMENT

4-6. STARTER SWITCH - MOTOR DISCONNECT.

WARNING

Disconnect compressor unit from main power supply before servicing, replacing or repairing parts of equipment, to avoid personal injury.

CAUTION

Depress starter switch STOP button and leave it depressed.

NOTE

The following steps must be performed by a qualified electrician.

- a. Remove junction box acorn nuts by turning them counter clockwise and remove junction box cover and junction box gasket. (Figure 4-3)
- b. Disconnect starter switch and motor leads by removing wire nuts and untwisting wires. (Figure 4-3)

- c. Disconnect motor cable from junction box by removing cable connection nut as shown in figure 4-3.
- d. Reconnect motor cable to junction box and replace cable connection nut.
- e. Reconnect starter switch and motor leads by twisting leads together and replacing wire nuts.
- f. Replace junction box gasket, junction box cover, and replace junction box screws by turning them clockwise. (Figure 4-3)

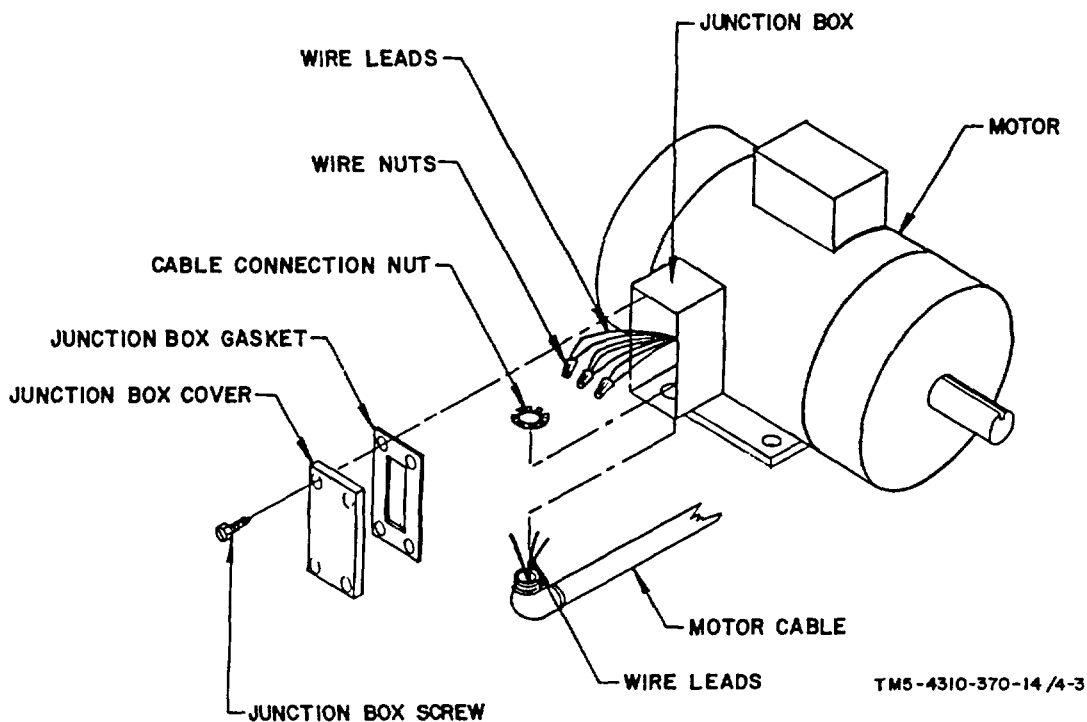


FIGURE 4-3. STARTER SWITCH-MOTOR DISCONNECT

4-7. MOTOR REPLACEMENT.

WARNING

Disconnect compressor unit from main power supply before servicing, replacing or repairing parts of equipment, to avoid personal injury.

- a. Remove belt guard front and V belts as described in paragraph 4-5.

- b. Remove motor cable by turning motor cable wire nuts counter clockwise and untwisting motor leads as shown in figure 4-3. This step must be performed by a qualified electrician.
- c. Remove motor pulley and motor pulley key from motor shaft by turning motor pulley set screw counter clockwise as shown in figure 4-4.
- d. Remove motor mounting nuts, lockwashers, and bolts as shown in figure 4-4.
- e. Lift motor from air receiver mounting bracket. (Figure 4-4)
- f. Replace motor on to air receiver mounting bracket. (Figure 4-4)
- g. Replace motor mounting bolts, lockwashers and nuts, figure 4-4, but do not tighten.
- h. Replace motor pulley and motor pulley key on to motor shaft (figure 4-4).
- j. Replace motor cable by twisting motor leads and motor cable leads together as shown in figure 4-3. This step must be performed by a qualified electrician.
- k. Install belts and belt guard as described in paragraph 4-5.

4-8. PRESSURE SWITCH ADJUSTMENT.

WARNING

Use extreme caution during the following procedures as pressure switch carries electrical charge which will cause personal injury.

Use extreme caution during the following procedures, as adjusting of pressure switch will cause unit to start up to pressurize air receiver.

- a. Remove pressure switch cover by turning pressure switch cover nut counter clockwise and lifting cover off. (Figure 4-5)
- b. Always adjust the range spring nut (A) first, until the operating point on falling pressure is 175 PSI (1210 KPa).
- c. Turning nut (A) clockwise will increase setting. Turning it counter clockwise will decrease setting. This adjustment changes both high and low operating points.
- d. To adjust operating point on rising pressure, turn differential spring nut (B) clockwise to increase the pressure difference between high and low operating points and counter clockwise to decrease pressure difference.
- e. Begin adjustments by first turning compressor unit off by pushing STOP button on starter switch.

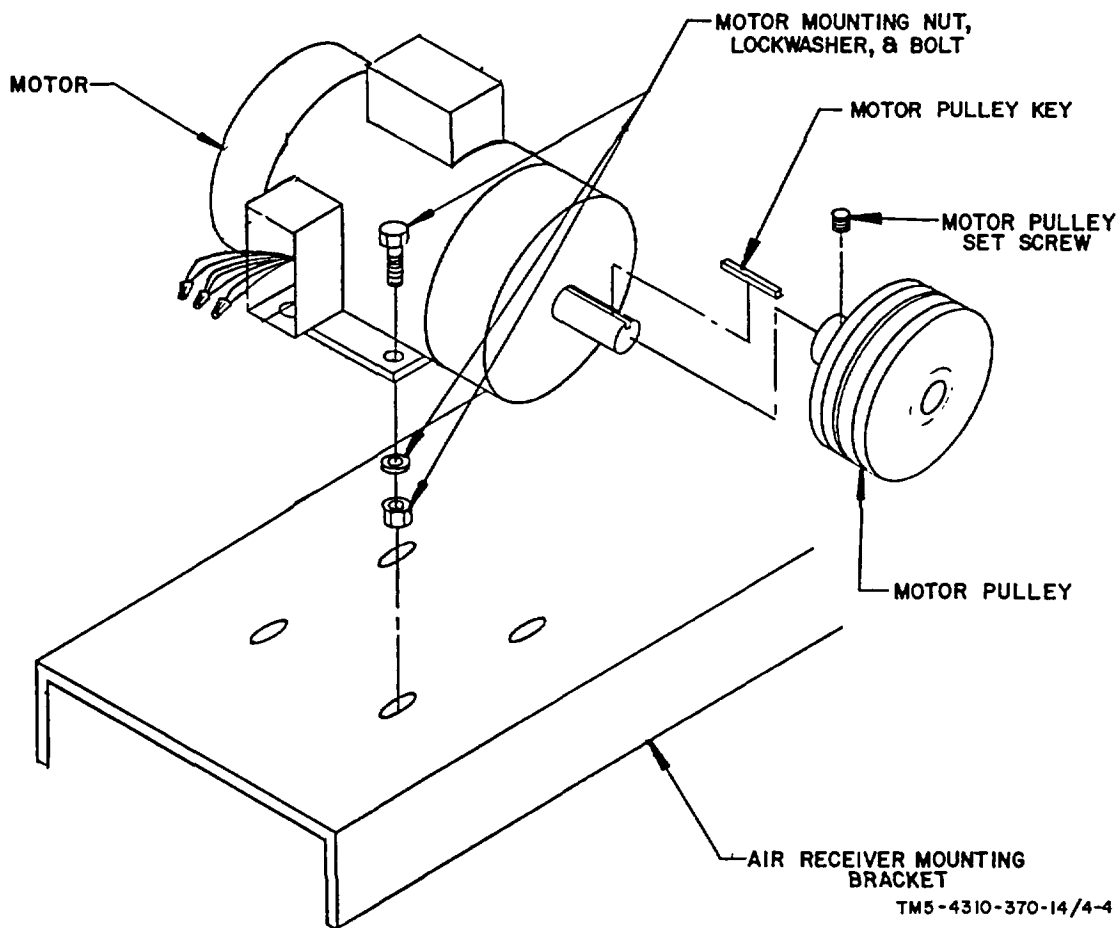


FIGURE 4-4. MOTOR REMOVAL AND REPLACEMENT

- f. Adjust nut (A) to increase or decrease low operating point as required, to set low operating point at 175 PSI (1210 KPa). This should be done by increments of a half turn at a time.
- g. After each half turn, start compressor unit and allow compressor unit to pressurize to high operating point when it will shut off. Then slowly bleed off air by depressing inflator gage handle. As air escapes and air pressure in air receiver decreases, note at what pressure the compressor unit begins operation to repressurize air receiver. If this does not occur at 175 PSI (1210 KPa), repeat step "f" until low operating point of 175 PSI (1210 KPa) is attained.
- h. After low operating point is attained, again turn compressor unit off and begin to adjust high operating point, nut (B), in half turn increments. High operating point should be 195 PSI (1350 KPa) maximum.

- j. After high operating point has been attained, replace pressure switch cover and secure it in place with pressure switch cover nut.

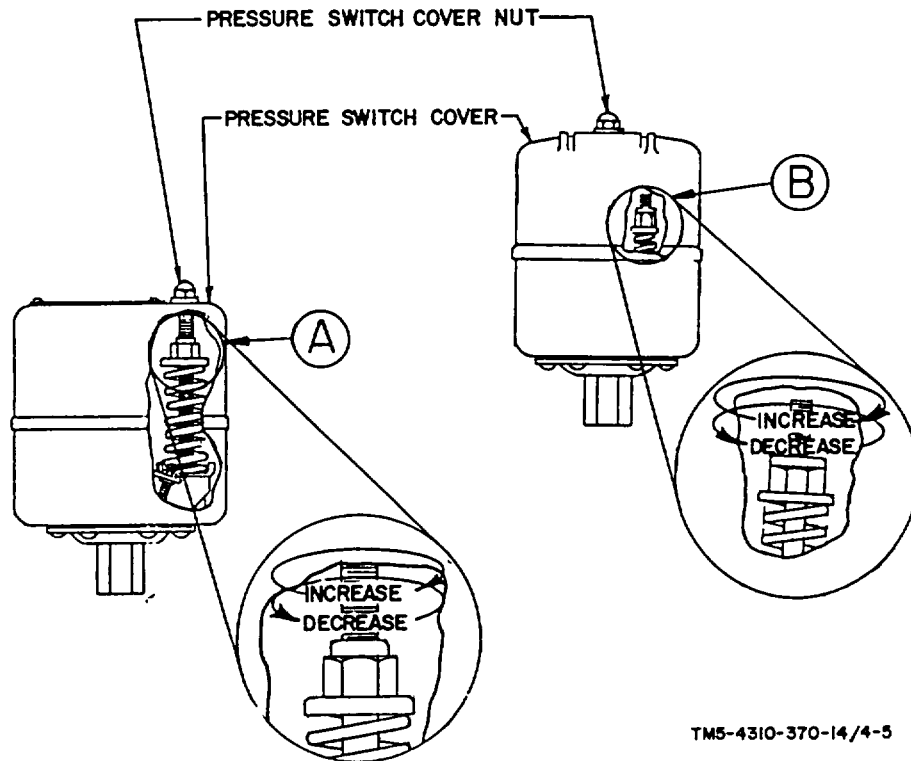


FIGURE 4-5. PRESSURE SWITCH ADJUSTMENT

4-9. COMPRESSOR PUMP REPLACEMENT.

WARNING

Disconnect compressor unit from main power supply before servicing replacing or repairing parts of equipment, to avoid personal injury.

WARNING

Release pressure from air receiver and compressor pump before inspection, performing procedures, or disassembly of equipment to avoid personal injury.

- a. Remove belt guard front and V belts as described in paragraph 4-5.
- b. Remove flywheel and flywheel key by removing flywheel set screw. Then pull off flywheel and flywheel key from compressor pump shaft (figure 4-6).
- c. Disconnect aftercooler tube from compression fitting as shown in figure 4-7.

- d. Remove compressor pump mounting nuts, lockwashers and bolts (4) as shown in figure 4-6.
- e. Lift compressor pump off air receiver mounting bracket.
- f. Replace compressor pump on to air receiver mounting bracket so that compressor pump and air receiver mounting bracket holes are aligned.
- g. Replace compressor pump mounting bolts, lockwashers and nuts (4). (Figure 4-6)
- h. Reconnect aftercooler tube to compression fitting (Figure 4-7).
- j. Replace flywheel and flywheel key by pushing them back on to compressor pump shaft and replacing flywheel set screw. Be sure that flywheel is aligned with motor pulley to prevent excessive belt wear or belt breakage.
- k. Replace V belts and then belt guard front as described in paragraph 4-5.

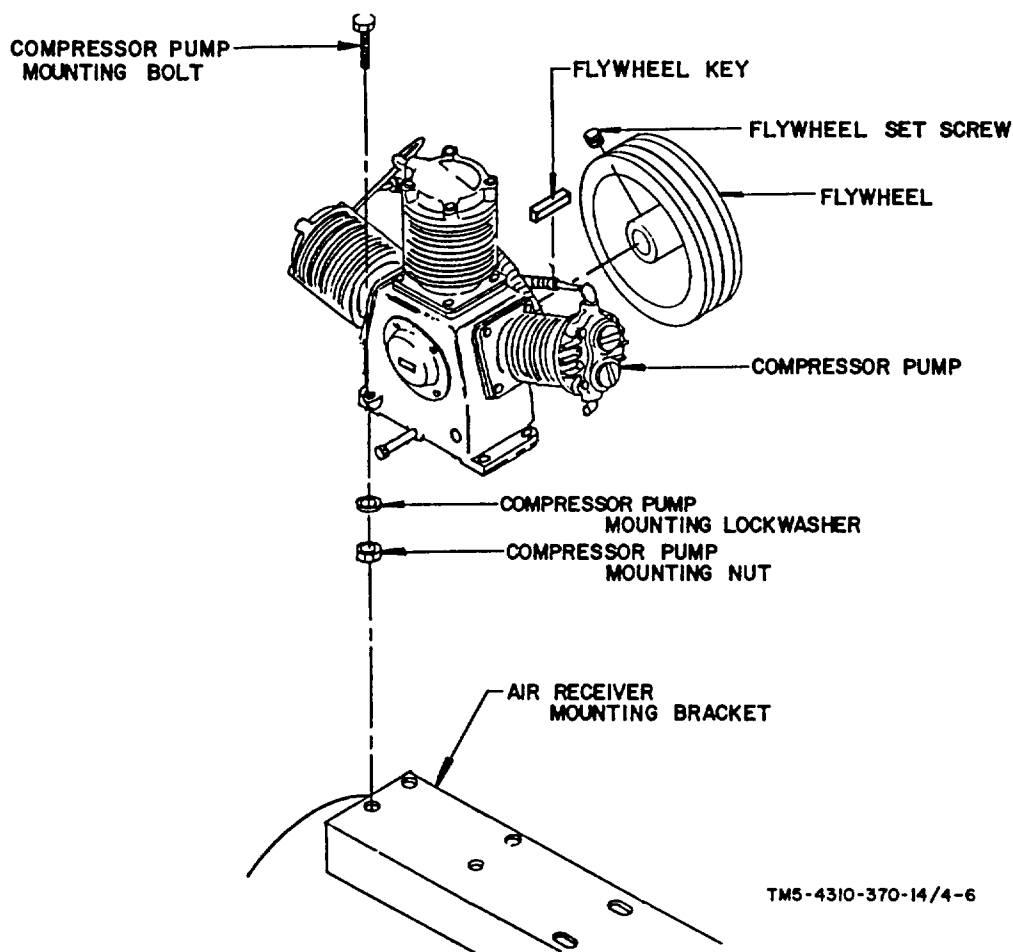
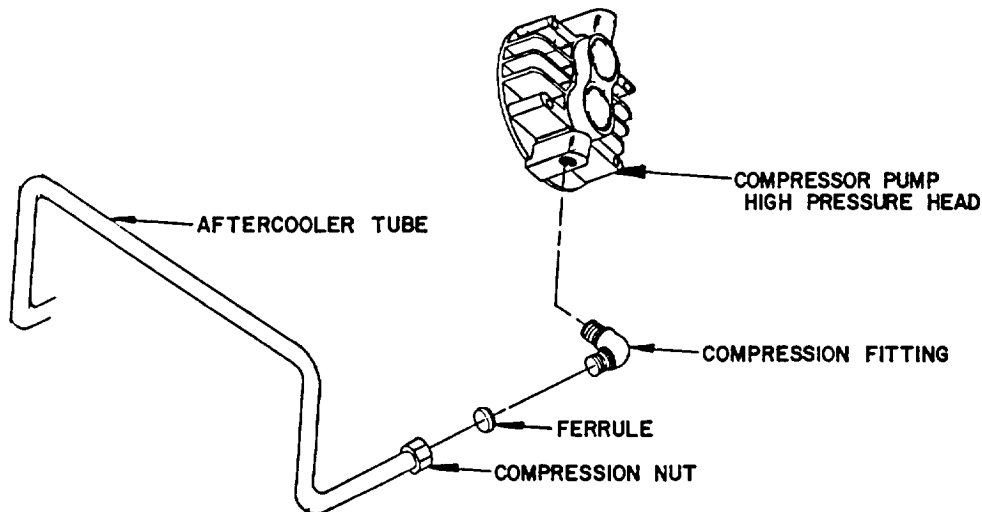


FIGURE 4-6. COMPRESSOR PUMP REMOVAL AND REPLACEMENT



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FIGURE 4-7. AFTERCOOLER TUBE DISCONNECT

4-10. REMOVAL AND REPLACEMENT OF PRESSURE GAGE.

WARNING

Disconnect compressor unit from main power supply before servicing, replacing or repairing parts of equipment, to avoid personal injury.

WARNING

Release pressure from air receiver and compressor pump before inspection, performing procedures, or disassembly of equipment to avoid personal injury.

- a. To test suspect pressure gage, remove by turning pressure gage counter clockwise as shown in figure 4-8.
- b. Perform a comparison test with known good gage.
- c. Replace pressure gage by turning clockwise into 1/4" receiver opening, next to pressure switch until tight.

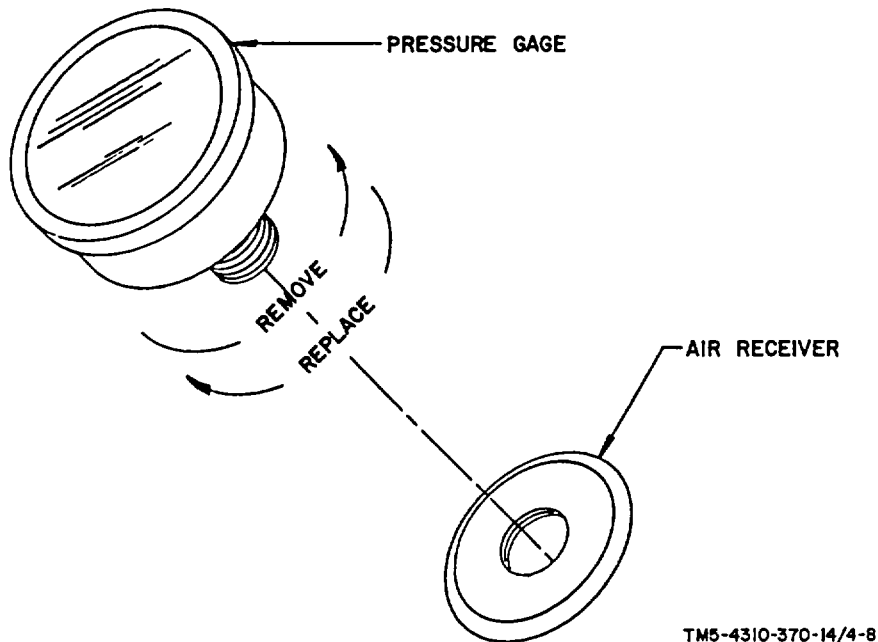


FIGURE 4-8. PRESSURE GAGE REMOVAL AND REPLACEMENT

4-11. CHECK VALVE REPLACEMENT.

WARNING

Disconnect compressor unit from main power supply before servicing, replacing or repairing parts of equipment, to avoid personal injury.

WARNING

Release pressure from air receiver and compressor pump before inspection, performing procedures, or disassembly of equipment to avoid personal injury.

- a. Turn compression nut counter clockwise until disconnected from check valve (figure 4-9).
- b. Remove check valve by turning counter clockwise until disconnected from air receiver (figure 4-9).

- c. Replace check valve on to air receiver by turning clockwise until tight (figure 4-9).
- d. Replace compression nut on to check valve and tighten (figure 4-9).

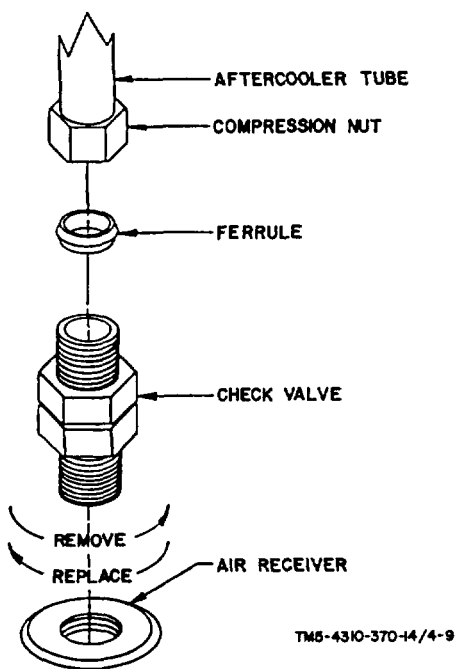


FIGURE 4-9. CHECK VALVE REMOVAL AND REPLACEMENT

4-12. GLOBE VALVE REPLACEMENT.

WARNING

Disconnect compressor unit from main power supply before servicing, replacing or repairing parts of equipment, to avoid personal injury.

WARNING

Release pressure from air receiver and compressor pump before inspection, performing procedures, or disassembly of equipment to avoid personal injury.

- a. Disconnect inflator gage hose from globe valve by turning bushing counter clockwise (figure 4-10).
- b. Remove globe valve from air receiver by turning it counter clockwise from air receiver nipple (figure 4-10).
- c. With arrow on globe valve pointing away from air receiver, turn globe valve clockwise into air receiver nipple until tight. Rotate globe valve until handle is up.

- d. Reconnect the inflator gage hose by turning the bushing clockwise into the globe valve.

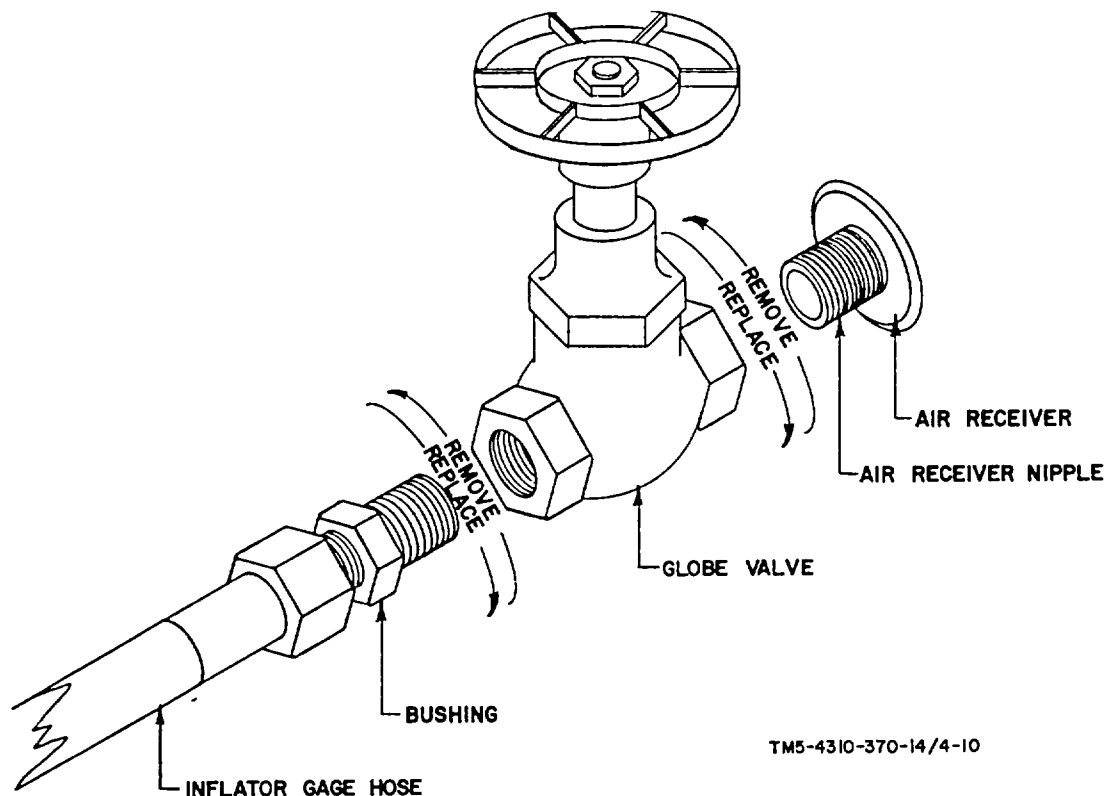


FIGURE 4-10. GLOBE VALVE REMOVAL AND REPLACEMENT

4-13. INFLATOR GAGE HOSE REPLACEMENT.

WARNING

Close globe valve tightly to avoid personal injury.

- Disconnect inflator gage hose from globe valve by turning hose connection nut counter clockwise (figure 4-11).
- Disconnect inflator gage hose from inflator gage by turning inflator gage counter clockwise until disconnected (figure 4-11).
- Leave globe valve closed.
- Replace inflator gage on to inflator gage hose by turning it clockwise until tight (figure 4-11).
- Reconnect inflator gage hose to globe valve by turning hose connection nut clockwise until tight (figure 4-11).
- Open globe valve and check connections for air leaks.

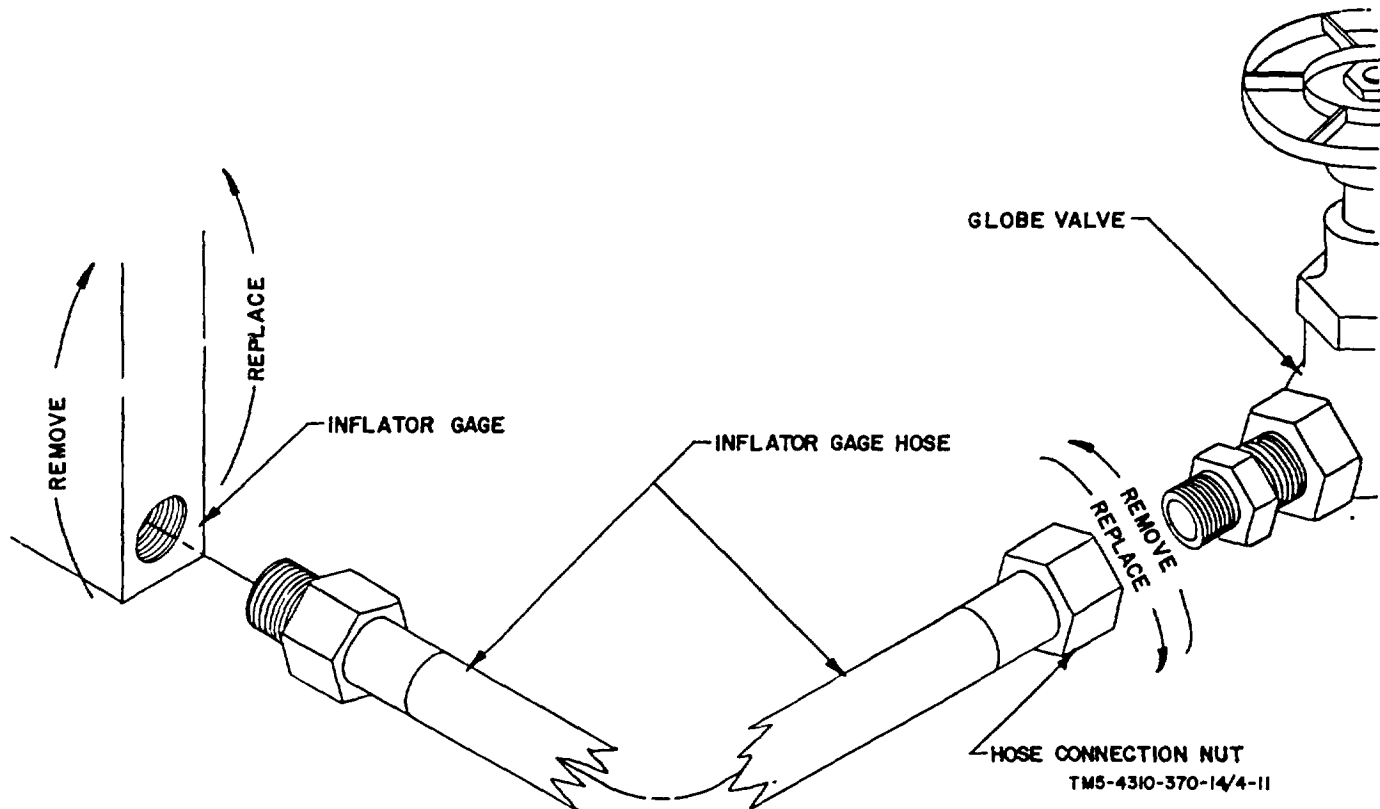


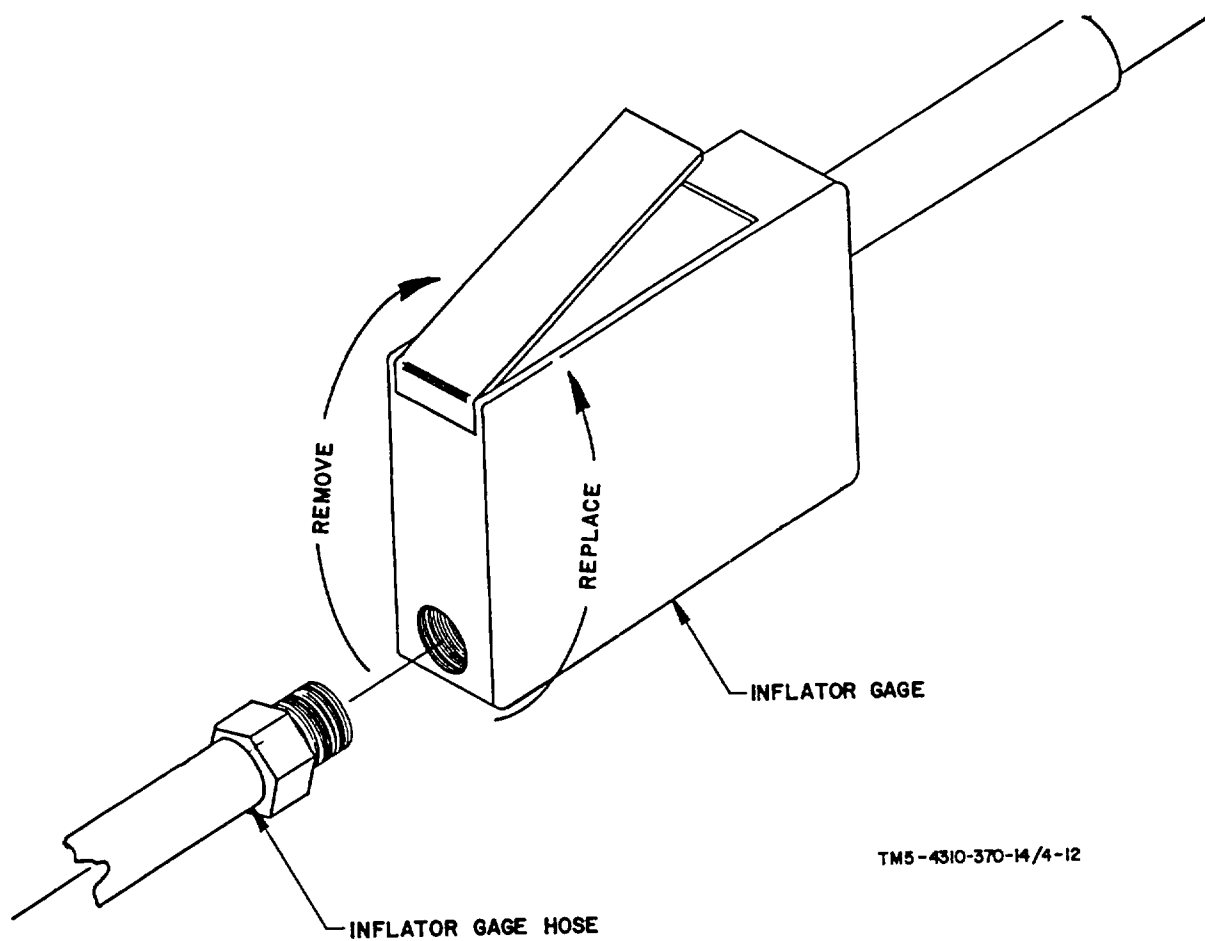
FIGURE 4-11. INFLATOR GAGE HOSE REPLACEMENT

4-14. INFLATOR GAGE REPLACEMENT.

WARNING

Close globe valve tightly to avoid personal injury.

- a. Disconnect inflator gage from inflator gage hose by turning inflator gage counter clockwise as viewed from end of inflator gage hose (figure 4-12).
- b. Leave globe valve closed.
- c. To reconnect inflator gage, turn it clockwise as viewed from end of inflator gage hose on to inflator gage hose until tight.
- d. Open globe valve and check connection for air leak.



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FIGURE 4-12. INFLATOR GAGE REPLACEMENT

CHAPTER 5

DIRECT AND GENERAL SUPPORT MAINTENANCE

Section I. DIRECT AND GENERAL SUPPORT TROUBLESHOOTING

5-1. SCOPE.

- a. This section contains troubleshooting or malfunction information and tests for locating and correcting most of the troubles which may develop in the compressor unit. Each malfunction or trouble symptom for an individual component, unit, or system is followed by a list of tests or inspections necessary for you to determine probable causes and suggested corrective actions for you to remedy the malfunction.
- b. This manual cannot list all possible malfunctions that may occur or all tests or inspections, and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, you should notify higher level maintenance.
- c. Table 5-1 lists the common malfunctions that you may find during the operation or maintenance of compressor unit or its components. You should perform the test, inspections and corrective actions in the order listed.

NOTE

Before you use this table, be sure you have performed all applicable operating checks.

TABLE 5-1. DIRECT AND GENERAL SUPPORT TROUBLESHOOTING

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

1. MOTOR RUNNING ERRATICALLY

WARNING

Disconnect compressor unit from main power supply before performing check(s) or inspection, to avoid personal injury.

TABLE 5-1. DIRECT AND GENERAL SUPPORT TROUBLESHOOTING (Cont'd)

| MALFUNCTION | TEST OR INSPECTION | CORRECTIVE ACTION |
|---|---|---|
| | <p>Step 1. Check rotor assembly rings to see if they are spotted, rough or eccentric.</p> | <p>If rotor assembly rings are spotted, rough or eccentric, remove assembly and replace. Send assembly to next higher level of maintenance. (See Appendix B)</p> |
| <p>2. LOSS OF OR NO MOTOR OUTPUT</p> | | |
| <p>WARNING</p> | | |
| <p>Disconnect compressor unit from main power supply before performing check(s) or inspection, to avoid personal injury.</p> | | |
| | <p>Step 1. Check wire connections to stator to see if they are loose or frayed.</p> | <p>If wire connections are loose or frayed, replace stator. Send stator to next higher level of maintenance. (See Appendix B)</p> <p>Step 2. Check windings to see if they have dried out and are loose.</p> <p>If windings are loose, replace stator and send suspect stator to next higher level of maintenance. (See Appendix B)</p> |
| <p>3. MOTOR WILL NOT START UP</p> | | |
| <p>WARNING</p> | | |
| <p>Disconnect compressor unit from main power supply before performing check(s) or inspection, to avoid personal injury.</p> | | |
| | <p>Step 1. Check starter switch to see if all wires are tight to terminal blocks.</p> | <p>If there are wires which are not tight to terminal blocks, tighten terminal screws.</p> <p>Step 2. Check to see that switch mechanism of starter switch assembly works smoothly without sticking.</p> <p>If starter switch mechanism sticks or jams, replace starter switch assembly.</p> |

TABLE 5-1. DIRECT AND GENERAL SUPPORT TROUBLESHOOTING (Cont'd)

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

4. MOTOR DOES NOT START AT LOW OPERATING POINT OR DOES NOT STOP AT HIGH OPERATING POINT

WARNING

Disconnect compressor unit from main power supply before performing check(s) or inspection, to avoid personal injury.

Step 1. Check pressure switch to see if any leads are loose or disconnected at terminals.

If pressure switch leads are loose or are not connected, reconnect leads and/or tighten leads.

Step 2. Check to see if pressure switch can still be adjusted.

If pressure switch adjustment mechanism can not be adjusted any further, replace pressure switch.

Step 3. Check to see if pressure switch still fails after above inspection and/or corrective actions.

If after above inspections and/or corrective actions, the pressure switch still malfunctions, replace it.

5. INTAKE OR EXHAUST VALVE TAP OR STICKING

Step 1. Listen for valve(s) tapping.

WARNING

Disconnect compressor unit from main power supply before performing check(s) or inspection, to avoid personal injury.

WARNING

Release pressure from air receiver and compressor pump before inspection, performing procedures, or disassembly of equipment to avoid personal injury.

If valve(s) is tapping, remove and replace valve(s).

Step 2. Check to see if valve(s) is sticking.

If valve(s) is sticking, remove and replace valve(s).

TABLE 5-1. DIRECT AND GENERAL SUPPORT TROUBLESHOOTING (Cont'd)

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

Step 3. Inspect valve(s) for wear including gasket(s).

If valve(s) is worn, remove and replace.

6. LOW DISCHARGE PRESSURE

WARNING

Disconnect compressor unit from main power supply before performing check(s) or inspection to avoid personal injury.

WARNING

Release pressure from air receiver and compressor pump before inspection, performing procedures, or disassembly of equipment to avoid personal injury.

Step 1. Check to see if valve(s) is leaking.

If valve(s) is leaking, remove and replace.

Step 2. Check to see if piston rings are worn or defective.

If piston rings are worn or defective, remove and replace.

7. COMPRESSOR PUMP KNOCKING

WARNING

Disconnect compressor unit from main power supply before performing check(s) or inspection, to avoid personal injury.

Step 1. Check for worn connecting rod bearings.

If connecting rod bearings are worn, remove and replace connecting rod assembly.

Step 2. Check for worn piston pin bearing.

If piston pin bearing is worn, remove and replace connecting rod assembly.

Step 3. Check for worn main bearings.

TABLE 5-1. DIRECT AND GENERAL SUPPORT TROUBLESHOOTING (Cont'd)

| MALFUNCTION | TEST OR INSPECTION | CORRECTIVE ACTION |
|-------------|---|---|
| | | If main bearings are worn, remove and replace main bearing assemblies. |
| | Step 4. Check to see if piston(s) is loose. | If piston(s) is loose, tighten down connecting rod bolts or replace piston. |
| | Step 5. Check to see if piston(s) is hitting head(s). | If piston(s) is hitting head(s), remove any foreign matter found and/or replace piston(s). |
| | Step 6. Check to see if there is excessive crankshaft end play. (See Table 5-2) | If there is excessive crankshaft end play, replace crankshaft and also any other worn mating parts. |

8. COMPRESSOR PUMP OVERHEATING

WARNING

Disconnect compressor unit from main power supply before performing check(s) or inspection, to avoid personal injury.

WARNING

Release pressure from air receiver and compressor pump before inspection, performing procedures, or disassembly of equipment to avoid personal injury.

Step 1. Check for defective or worn valve(s).

If valve(s) is defective or worn, remove and replace.

9. OIL IN DISCHARGE AIR

WARNING

Disconnect compressor unit from main power supply before performing check(s) or inspection, to avoid personal injury.

TABLE 5-1. DIRECT AND GENERAL SUPPORT TROUBLESHOOTING (Cont'd)

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

WARNING

Release pressure from air receiver and compressor pump before inspection, performing procedures, or disassembly of equipment to avoid personal injury.

Step 1. Check for worn piston rings.

If piston rings are worn, remove and replace.

10. SAFETY VALVE RELEASES AIR BELOW WORKING PRESSURE OF 195 PSI (1350 KPa)

WARNING

Disconnect compressor unit from main power supply before performing check(s) or inspection, to avoid personal injury.

WARNING

Release pressure from air receiver and compressor pump before inspection, performing procedures, or disassembly of equipment to avoid personal injury.

Step 1. Check to see that safety valve has been mounted to air receiver improperly.

If safety valve has not been mounted properly, or if connection is loose, remount and tighten.

Step 2. Check to see if safety valve is malfunctioning.

If safety valve is malfunctioning constantly, remove and replace.

11. MOTOR INCAPABLE OF TURNING COMPRESSOR PUMP

WARNING

Disconnect compressor unit from main power supply before performing check(s) or inspection, to avoid personal injury.

TABLE 5-1. DIRECT AND GENERAL SUPPORT TROUBLESHOOTING (Cont'd)

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

WARNING

Release pressure from air receiver and compressor pump before inspection, performing procedures or disassembly of equipment to avoid personal injury.

Step 1. Check to see that compressor pump can be turned by hand.

If compressor pump cannot be turned by hand, it may be due to back pressure leaking through check valve from air receiver. Remove and replace check valve.

TABLE 5-2.

| COMPRESSOR PUMP OVERHAUL REPLACEMENT STANDARDS | | | | | |
|--|--|--------|-------------------|--------|--------------------------------------|
| ITEM | Manufacturer's Dimensions and Tolerances in inches | | Desired Clearance | | Maximum allowable wear and clearance |
| | MIN. | MAX. | MIN. | MAX. | |
| Cylinders | | | | | |
| Bore, low-pressure | 2.6245 | 2.6255 | . . . | . . . | 0.002 |
| Bore, high-pressure | 1.7495 | 1.7505 | . . . | . . . | 0.002 |
| Out-of-round | .000 | .001 | . . . | . . . | 0.0001 |
| Taper | .000 | .001 | . . . | . . . | 0.0001 |
| Crankshaft | | | | | |
| Rod size | .9995 | 1.0005 | . . . | . . . | |
| Taper | .000 | .001 | . . . | . . . | 0.001 |
| Out-of-round | .0001 | .001 | . . . | . . . | 0.0001 |
| End Play | .0005 | .0030 | 0.000 | 0.002 | |
| Pistons and Pins | | | | | |
| Piston, low-pressure | 2.6190 | 2.6200 | 0.003 | 0.005 | 0.003 |
| Piston, high-pressure | 1.7465 | 1.7475 | 0.0015 | 0.0035 | 0.003 |
| Pin, low-pressure | .5628 | .5633 | 0.0001 | 0.0005 | |
| Pin, high-pressure | .5628 | .5633 | 0.0001 | 0.0005 | |
| Connecting rod bearings | | | | | |
| Bearing, I.D. | 1.0013 | 1.0023 | 0.001 | . . . | |
| Bearing, side clearance | .005 | .062 | 0.010 | . . . | |

Section II. MAINTENANCE PROCEDURES

5-2. MOTOR AND ACCESSORY REPAIR.

a. Motor Disassembly

- (1) Remove rear housing (figure 5-1, item 1) by turning housing screws (figure 5-1, item 2) counter clockwise.
- (2) Remove thru bolt nuts (figure 5-1, item 3) by turning them counter clockwise, and then lift off the PU. end plate (figure 5-1, item 4).
- (3) Remove rear fan (figure 5-1, item 5) by turning fan screw (figure 5-1, item 6) counter clockwise.
- (4) Remove thru bolts (figure 5-1, item 7) and then lift off FR. end plate (figure 5-1, item 8).
- (5) Remove PU. bearing (figure 5-1, item 9).
- (6) Remove wavy washer (figure 5-1, item 10) and then the FR. bearing (figure 5-1, item 11).
- (7) Remove balance washer (figure 5-1, item 12).
- (8) Remove front fan (figure 5-1, item 13) by turning fan screw (figure 5-1, item 14) counter clockwise.
- (9) Remove capacitor box (figure 5-1, item 15) by turning capacitor box screws (figure 5-1, item 16), and then remove capacitor box pad (figure 5-1, item 17).
- (10) Remove capacitors (figure 5-1, item 18) and the capacitor wire sleeve (figure 5-1, item 19).
- (11) Remove switches (figure 5-1, item 20) by turning switch screws (figure 5-1, item 21) counter clockwise.
- (12) Remove rotor and shaft assembly (figure 5-1, item 22) out of stator (figure 5-1, item 23).
- (13) Remove front grease fitting (figure 5-1, item 24) and rear grease plug (figure 5-1, item 25) from stator (figure 5-1, item 23). Clean fitting and grease inlets and replace fitting and plug.

b. Cleaning, Inspection, Repair or Replacement of Parts

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Use in a well ventilated area as the fumes are dangerous if inhaled. Avoid repeated and prolonged skin contact. Do not use near flame or excessive heat. Flash point of solvent is 100°F 138°F (38°C 59°C).

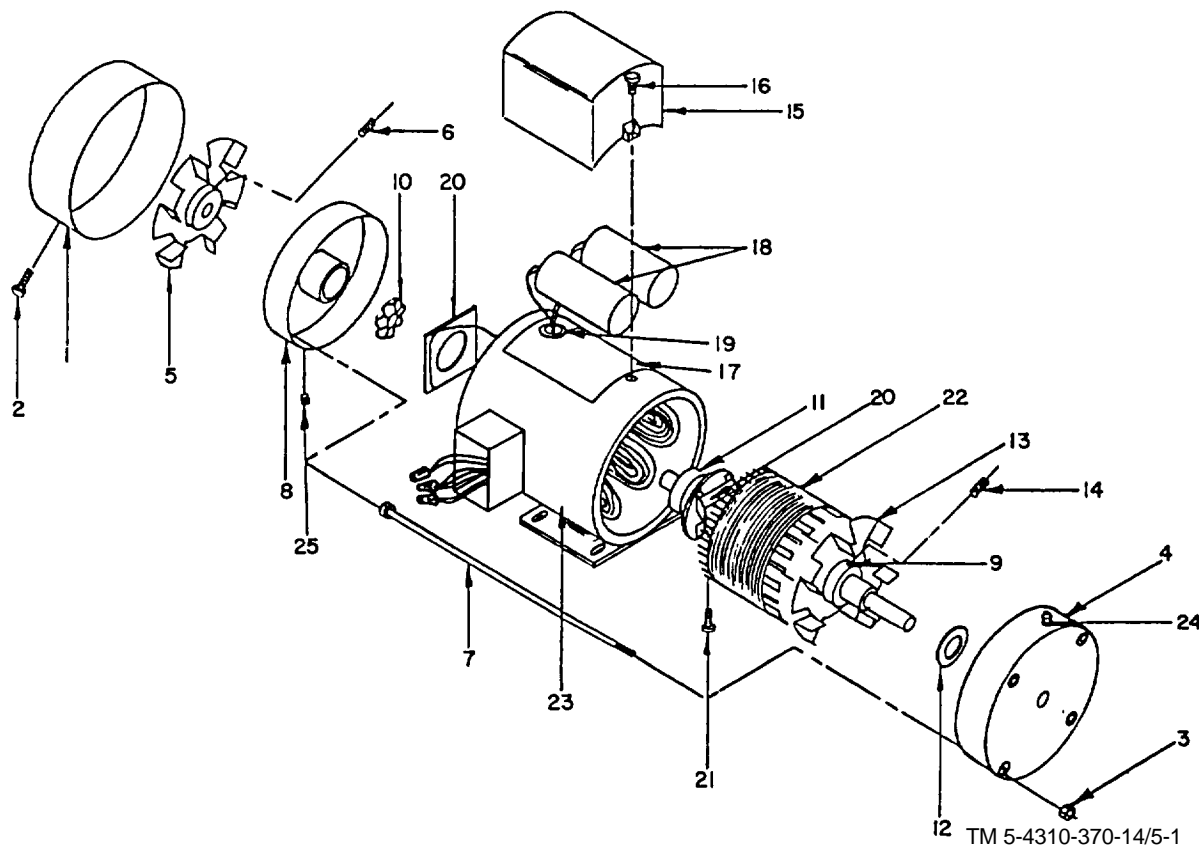


FIGURE 5-1. MOTOR ASSEMBLY

- | | |
|-----------------------|------------------------------|
| 1. Rear Housing | 14. Fan Screw |
| 2. Housing Screws (3) | 15. Capacitor Box |
| 3. Thru Bolt Nuts (4) | 16. Capacitor Box Screws (2) |
| 4. PU. End Plate | 17. Capacitor Box Pad |
| 5. Rear Fan | 18. Capacitors (2) |
| 6. Fan Screw | 19. Capacitor Wire Sleeve |
| 7. Thru Bolts (4) | 20. Switches |
| 8. FR. End Plate | 21. Switch Screws (4) |
| 9. PU. Bearing | 22. Rotor and Shaft Assembly |
| 10. Wavy Washer | 23. Stator |
| 11. FR. Bearing | 24. Front Grease Fitting |
| 12. Balance Washer | 25. Rear Grease Plug |
| 13. Front Fan | |

- (1) All parts to be thoroughly cleaned with P-D-680 solvent, and then air dried.
- (2) Inspect all parts for cracks, breaks, fissures, scores, distortions or any other applicable damage.
- (3) Inspect all parts for serviceable tolerances. (See table 5-2)

- (4) Repair or replace any unserviceable parts.

c. Motor Reassembly

- (1) Replace rotor and shaft assembly (figure 5-1, item 22) into stator (figure 5-1, item 23).
- (2) Replace switches (figure 5-1, item 20) and hold in place by tightening down switch screws (figure 5-1, item 21).
- (3) Replace capacitors (figure 5-1, item 18) and the capacitor wire sleeve (figure 5-1, item 19).
- (4) Replace capacitor box (figure 5-1, item 15) by turning capacitor box screws (figure 5-1, item 16) counter clockwise on to stator (figure 5-1, item 23) after positioning capacitor box pad (figure 5-1, item 17) in place.
- (5) Replace front fan (figure 5-1, item 13) and hold in place by tightening fan screw (figure 5-1, item 14).
- (6) Replace balance washer (figure 5-1, item 12).
- (7) Replace FR. bearing (figure 5-1, item 10) and install wavy washer (figure 5-1, item 11).
- (8) Replace PU. bearing (figure 5-1, item 9).
- (9) Replace FR. end plate (figure 5-1, item 8) on to stator (figure 5-1, item 23) and hold in position by reinsertion of thru bolts (figure 5-1, item 7).
- (10) Replace rear fan (figure 5-1, item 5) and hold in place by tightening fan screw (figure 5-1, item 6).
- (11) Replace PU. end plate (figure 5-1, item 4) and hold in place by tightening thru bolt nuts (figure 5-1, item 3).
- (12) Replace rear housing (figure 5-1, item 1) and tighten housing screws, (figure 5-1, item 2).

d. Rotor Assembly Inspection and Replacement

- (1) Inspection check to see if rotor rings (windings) are spotted, rough, eccentric, or broken. If any of these conditions exist, the rotor assembly must be replaced.
- (2) Replacement replace rotor assembly in accordance with procedures described in paragraph 5-2a.

e. Stator Assembly Inspection and Replacement

- (1) Inspection check to see if stator assembly windings are dried out and/ or cracked and if stator assembly wires are loose, frayed, split or disconnected. If any of these conditions exist, the stator assembly should be removed and sent to the next level of maintenance to be repaired. (See APPENDIX B)
- (2) Replacement replace stator assembly in accordance with procedures described in paragraph 5-2a.

f. Starter Switch Replacement

- (1) If starter switch malfunctions, check all terminals to see that switch has been wired properly (figure 4-1) and that connections are tight. Loose connections will cause starter switch to work improperly or not at all.
- (2) Starter switch wiring procedures (figure 4-1).

WARNING

Disconnect unit from main power supply before servicing, replacing or repairing parts of equipment, to avoid personal injury.

CAUTION

Push STOP button on starter switch and leave depressed.

NOTE

All following procedures must be performed by a qualified electrician.

- (a) Open front of starter switch (figure 5-2, item 1) and disconnect all electrical leads. Unscrew connection screws (figure 5-2, item 2) off wire leads (figure 5-2, item 3).
- (b) Remove ground wire nut (figure 5-2, item 4) to disconnect ground wire of motor cable from ground wire of main power supply cable.
- (c) Remove cable connection nuts (figure 5-2, item 5) from motor cable (figure 5-2, item 6), pressure switch cable (figure 5-2, item 7) and main power supply cable (figure 5-2, item 8). Pull all cables from starter switch (figure 5-2, item 1).
- (d) Remove starter switch (figure 5-2, item 1). Turn mounting bolts (figure 5-2, item 9), and mounting nuts (figure 5-2, item 10) counter clockwise. Remove them from the mounting lockwashers (figure 5-2, item 11) and from air receiver mounting bracket (figure 5-2, item 12).
- (e) For wiring schematic, see paragraph 4-2, figure 4-1.
- (f) Install starter switch (figure 5-2, item 1) on to air receiver mounting bracket. Replace mounting bolts (figure 5-2, item 9) mounting nuts (figure 5-2, item 10) turning them clockwise.

- (g) Replace cable connection nuts (figure 5-2, item 5) on to motor cable (figure 5-2, item 6). Replace cable connection nut (figure 5-2, item 5) on to pressure switch cable (figure 5-2, item 7). Replace cable connection nuts (figure 5-2, item 5) on to main power supply cable (figure 5-2, item 8).
 - (h) Reconnect ground wire with ground wire nut (figure 5-2, item 4).
 - (j) Reconnect all electrical leads from pressure switch and motor. Screw connection screws (figure 5-2, item 2) down on to wire leads (figure 5-2, item 3) by turning them clockwise.
- g. Pressure Switch Replacement (figure 5-3)

WARNING

Disconnect unit from main power supply before servicing, replacing or repairing parts of equipment, to avoid personal injury.

WARNING

Release pressure from air receiver and compressor pump before inspection, performing procedures, or disassembly of equipment to avoid personal injury.

- (1) Remove pressure switch cover by removing pressure switch cover nut. Disconnect wire leads. (Figure 5-3)
- (2) Remove pressure switch cable by removing cable connection nut. (Figure 5-3)
- (3) To remove pressure switch, turn hex fitting at bottom of switch counter clockwise until disconnected from air receiver (figure 5-3).
- (4) To replace pressure switch, install switch onto air receiver nipple and tighten hex fitting at bottom of switch clockwise (figure 5-3).
- (5) Reconnect wire leads and replace switch cover (figure 5-3).

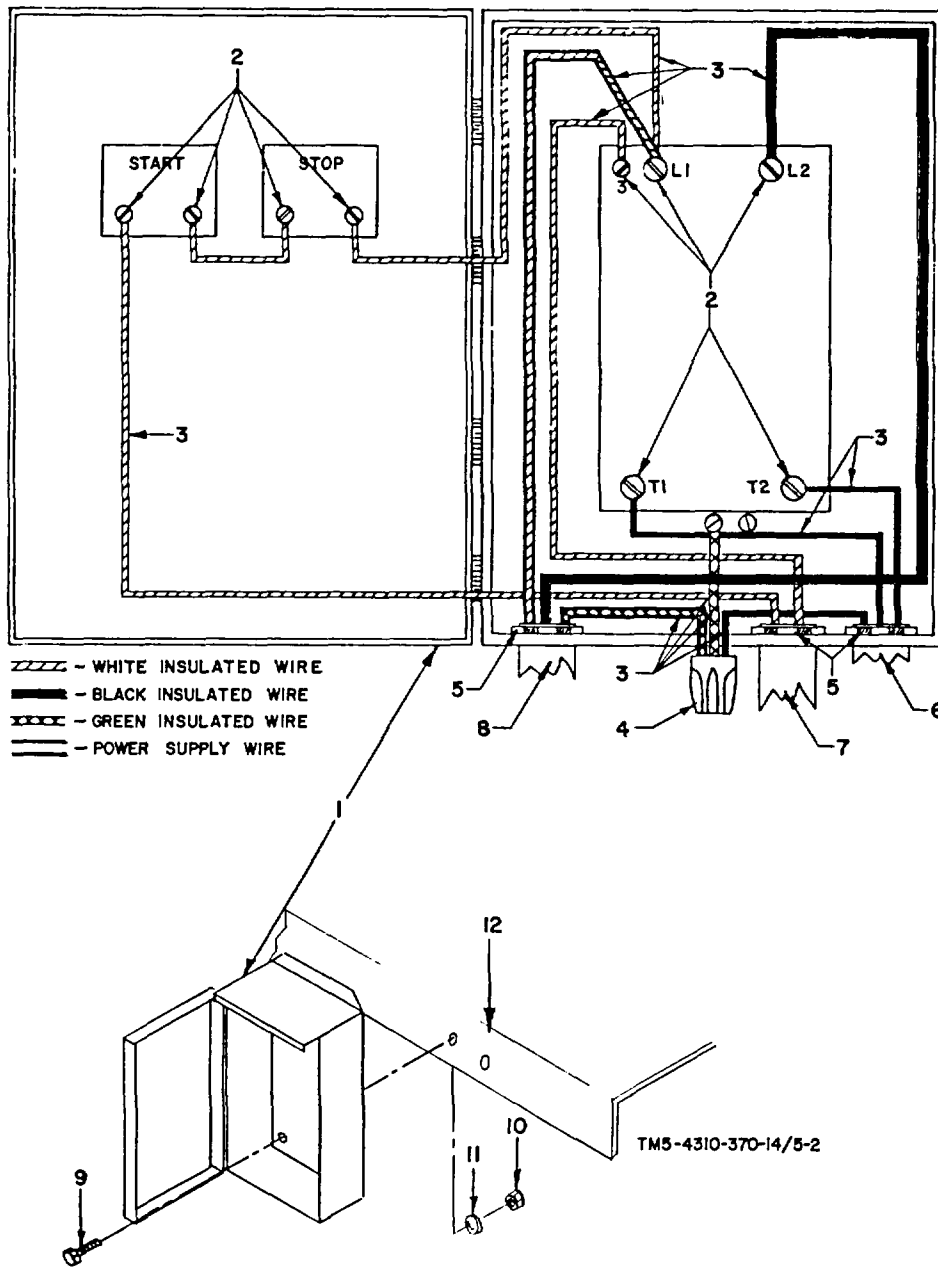
5-3. INTERCOOLER TUBE AND HEAD ASSEMBLIES DISASSEMBLY

WARNING

Disconnect unit from main power supply before servicing, replacing, or repairing parts of equipment to avoid personal injury.

WARNING

Release pressure from air receiver and compressor pump before inspection, performing procedures, or disassembly of equipment to avoid personal injury.



- | | |
|--------------------------|-----------------------------------|
| 1. Starter switch | 7. Pressure switch cable |
| 2. Connection screws | 8. Main power supply cable |
| 3. Wire leads | 9. Mounting bolts |
| 4. Ground wire nut | 10. Mounting nuts |
| 5. Cable connection nuts | 11. Mounting lockwashers |
| 6. Motor cable | 12. Air receiver mounting bracket |

FIGURE 5-2. STARTER SWITCH REPLACEMENT

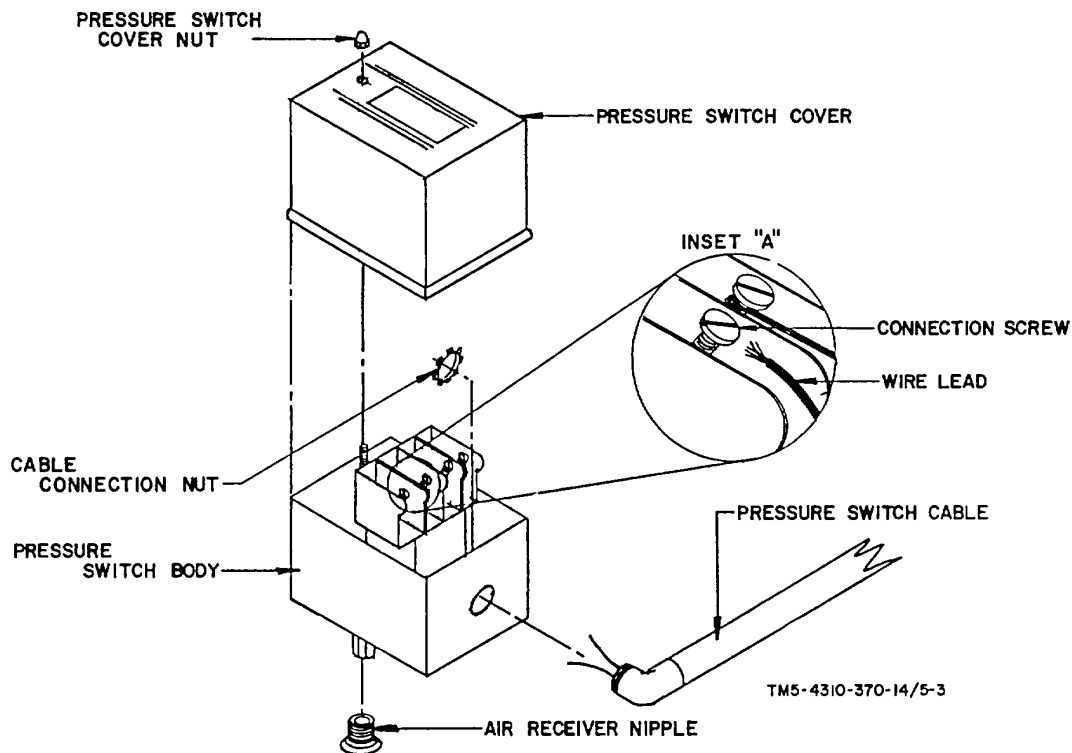


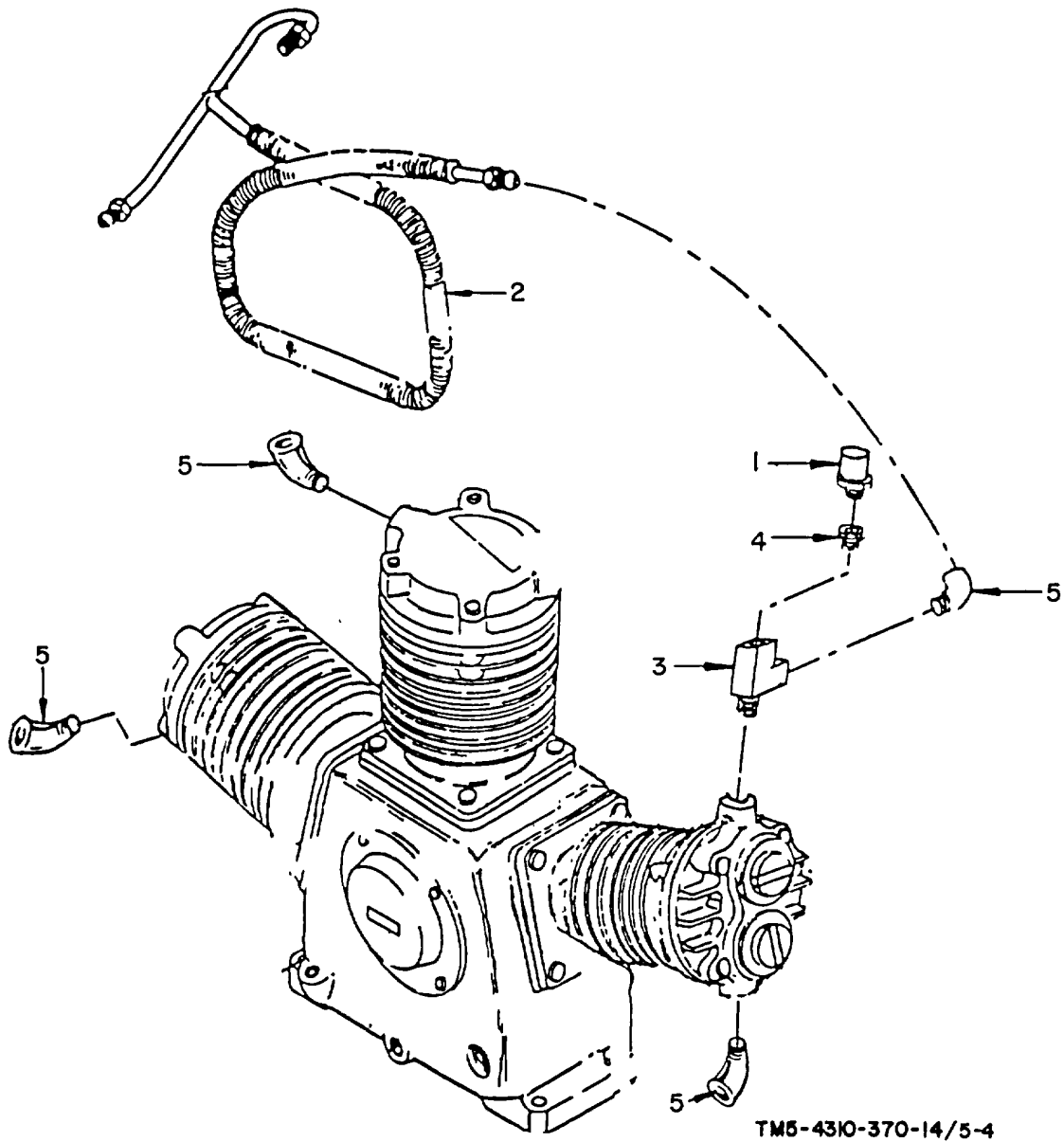
FIGURE 5-3. PRESSURE SWITCH REPLACEMENT

a. Intercooler Tube

- (1) Remove intercooler safety valve (figure 5-4, item 1) by turning it counter clockwise.
- (2) Remove intercooler tube (figure 5-4, item 2).
- (3) Remove street TEE (figure 5-4, item 3) and bushing (figure 5-4, item 4).
- (4) Remove all compression fittings (figure 5-4, item 5).

b. Head Assemblies, Removal

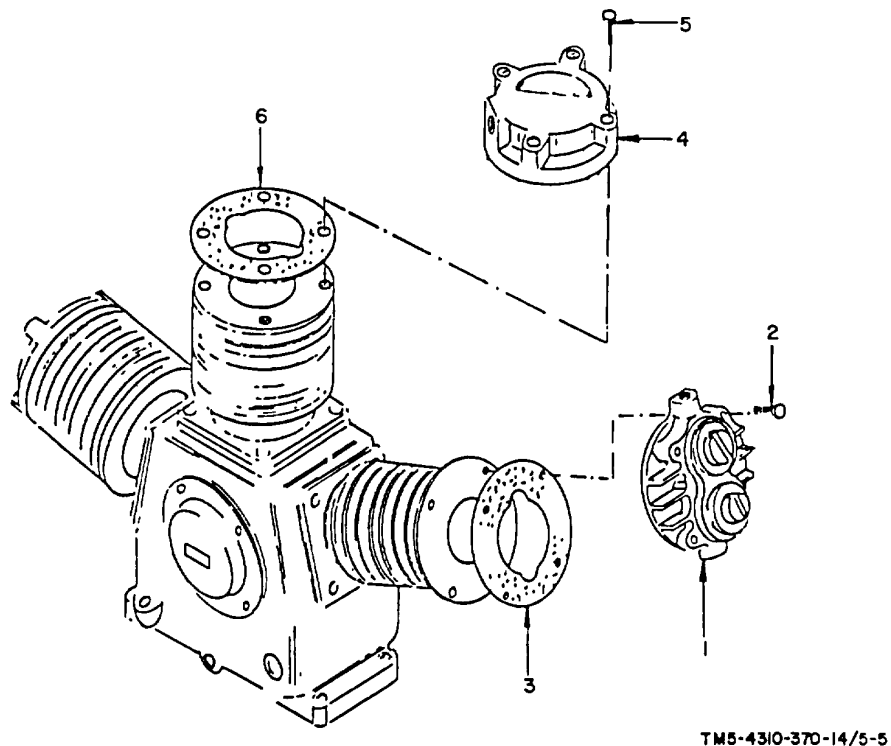
- (1) Remove high pressure head assembly (figure 5-5, item 1) by turning hex cap screws (figure 5-5, item 2) counter clockwise.
- (2) Remove high pressure head gasket (figure 5-5, item 3).
- (3) Remove low pressure head assemblies (figure 5-5, item 4) by turning hex cap screws (figure 5-5, item 5) counter clockwise.
- (4) Remove low pressure head gasket (figure 5-5, item 6).



- 1. Intercooler safety valve
- 2. Intercooler tube
- 3. Street tee

- 4. Bushing
- 5. Compression fittings

FIGURE 5-4. INTERCOOLER TUBE REMOVAL

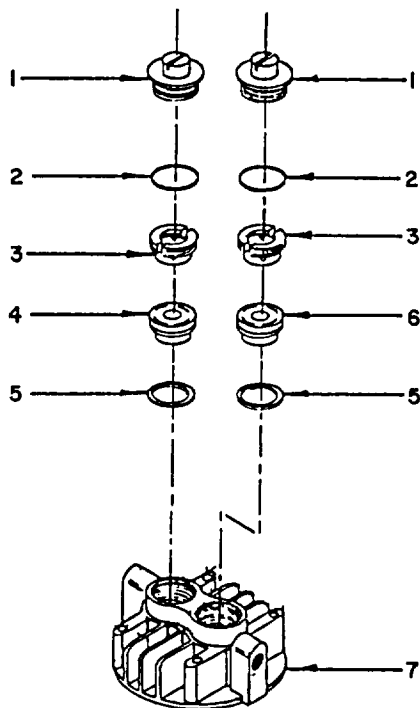


- | | |
|--------------------------------|---------------------------------|
| 1. High pressure head assembly | 4. Low pressure head assemblies |
| 2. Hex cap screws | 5. Hex cap screws |
| 3. High pressure head gasket | 6. Low pressure head gasket |

FIGURE 5-5. HEAD ASSEMBLIES REMOVAL

c. Head Assemblies, Disassembly

- (1) Place high pressure head assembly on bench and disassemble intake and exhaust valve assemblies.
 - (a) Remove both valve chamber caps (figure 5-6, item 1).
 - (b) Remove both valve chamber cap gaskets (figure 5-6, item 2).
 - (c) Remove both valve retainers (figure 5-6, item 3).
 - (d) Remove intake valve (figure 5-6, item 4) and exhaust valve (figure 5-6, item 6).
 - (e) Remove both valve gaskets (figure 5-6, item 5).

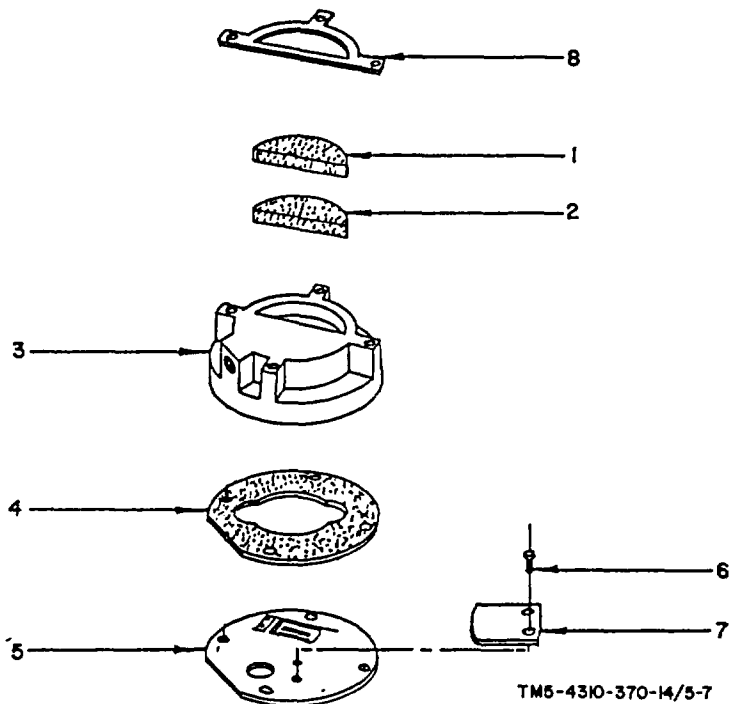


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- | | |
|----------------------------------|----------------------|
| 1. Valve Chamber Caps (2) | 5. Valve Gaskets (2) |
| 2. Valve Chamber Cap Gaskets (2) | 6. Exhaust Valve |
| 3. Valve Retainers (2) | 7. Cylinder Head |
| 4. Intake Valve | |

FIGURE 5-6. HIGH PRESSURE HEAD ASSEMBLY

- (2) Place low pressure head assemblies on bench and disassemble reed valve assemblies.
 - (a) Remove low pressure retainer (figure 5-7, item 8) from reed valve head (figure 5-7, item 3).
 - (b) Remove filter (figure 5-7, item 1) and filter silencer (figure 5-7, item 2) from reed valve head (figure 5-7, item 3).
 - (c) Remove valve plate (figure 5-7, item 5) from bottom of reed valve head (figure 5-7, item 3).
 - (d) Remove reed valve (figure 5-7, item 7) from valve plate (figure 5-7, item 5) by turning rolling screw (figure 5-7, item 6) counter clockwise.
 - (e) Remove valve plate gasket (figure 5-7, item 4).



- | | |
|-----------------------|--------------------------|
| 1. Filter | 5. Valve Plate |
| 2. Filter Silencer | 6. Rolling Screw |
| 3. Reed Valve Head | 7. Reed Valve |
| 4. Valve Plate Gasket | 8. Low Pressure Retainer |

FIGURE 5-7. LOW PRESSURE HEAD ASSEMBLY

5-4. CYLINDERS, PISTONS ASSEMBLIES, AND CONNECTING ROD ASSEMBLY DISASSEMBLY.

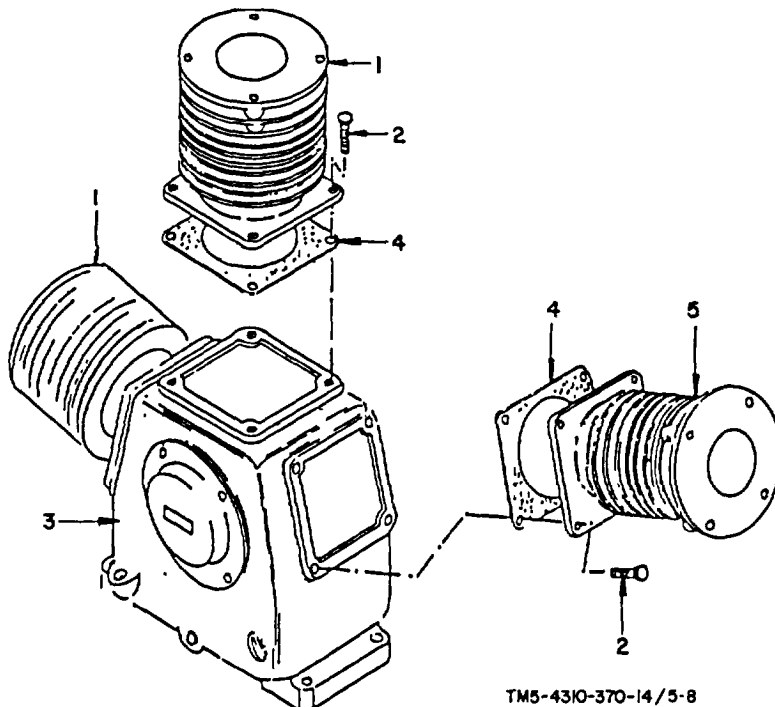
a. Cylinder

(1) High Pressure Cylinder Removal

- (a) Remove high pressure cylinder (figure 5-8, item 5) turning four hex cap screws (figure 5-8, item 2) counter clockwise and then lifting off the cylinder from crankcase (figure 5-8, item 3).
- (b) Remove cylinder flange gasket (figure 5-8, item 4).

(2) Low Pressure Cylinder Removal

- (a) Remove each low pressure cylinder (figure 5-8, item 1) by turning the four hex cap screws (figure 5-8, item 2) counter clockwise and then lifting off the cylinder from crankcase (figure 5-8, item 3).
- (b) Remove both cylinder flange gaskets (figure 5-8, item 4).



- | | |
|-------------------------------|--------------------------------|
| 1. Low pressure cylinders (2) | 4. Cylinder flange gaskets (3) |
| 2. Hex cap screws (12) | 5. High pressure cylinder |
| 3. Crankcase | |

FIGURE 5-8. CYLINDER REMOVAL AND REPLACEMENT

b. Piston and Rod Assemblies

- (1) Remove six piston pin retaining rings (figure 5-9, item 1) and three piston pins (figure 5-9, item 2).
- (2) Lift out both low pressure pistons (figure 5-9, item 3) and remove both low pressure piston ring sets (figure 5-9, item 4).
- (3) Lift out high pressure piston (figure 5-9, item 5) and remove high pressure piston rings (figure 5-9, item 6).
- (4) Drain oil by removing oil fill plug (figure 5-9, item 7) and then oil drain cap (figure 5-9, item 8).
- (5) When oil has drained, remove oil drain nipple (figure 5-9, item 9).

- (6) Remove hand hole plate (figure 5-9, item 10) and then hand hole plate gasket (figure 5-9, item 11) by turning four hex cap screws (figure 5-9, item 12) counter clockwise.
- (7) Remove three connecting rod assemblies (figure 5-9, item 13) by turning six connecting rod hex cap screws (figure 5-9, item 14) counter clockwise.
- (8) Remove oil scoop retainer (figure 5-9, item 15) and the left hand oil scoop (figure 5-9, item 16), the center dipper pin (figure 5-9, item 17).

5-5. CRANKCASE DISASSEMBLY

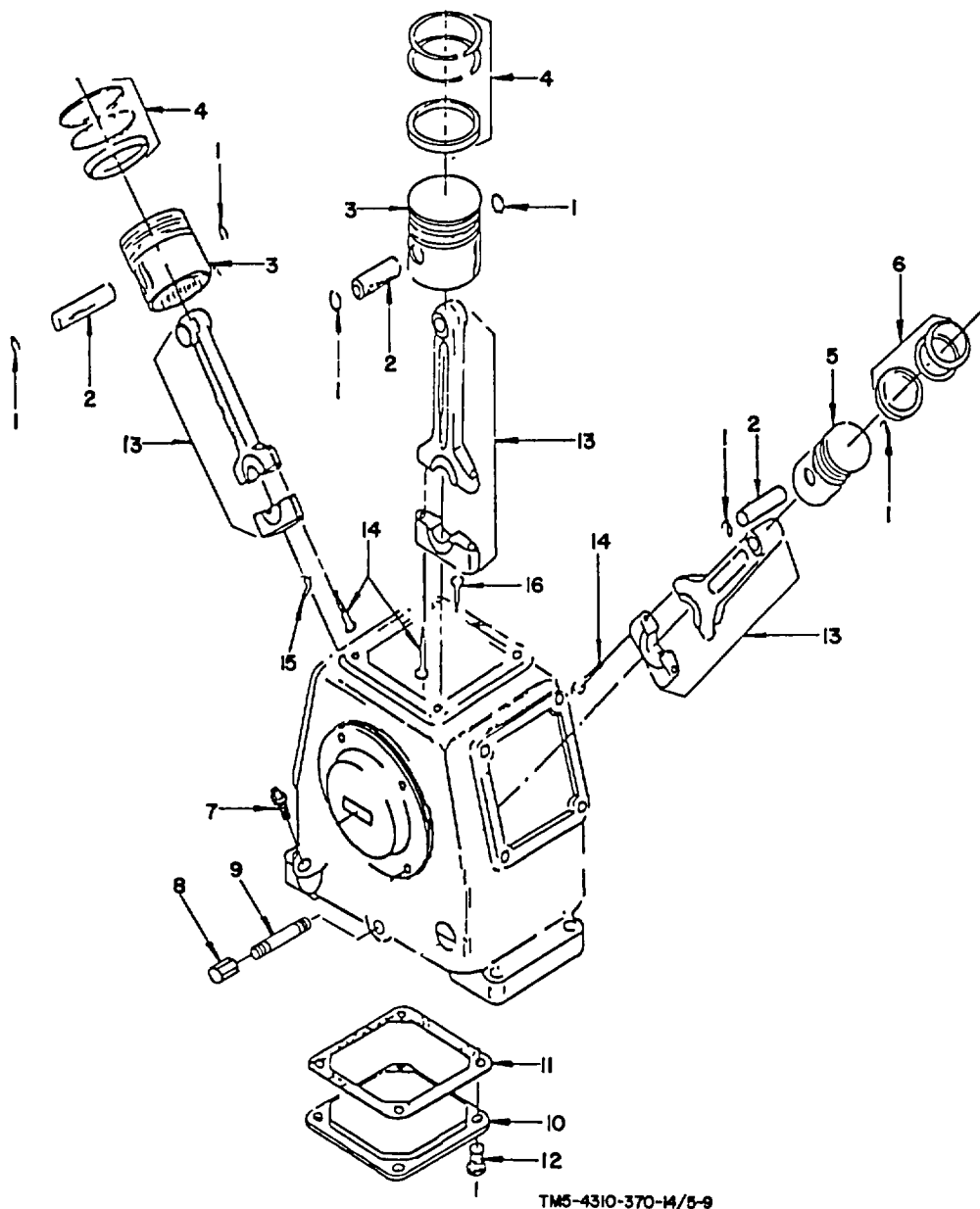
- a. Remove four hex cap screws (figure 5-10, item 1) by turning them counter clockwise.
- b. Then remove in sequence, the breather chamber, (figure 5-10, item 2) the breather element, (figure 5-10, item 3), the crankcase cover (figure 5-10, item 4). Then remove the crankcase cover gasket (figure 5-10, item 5) and any crankcase cover shims, remove oil separator (figure 5-10, item 12).
- c. Before removing crankshaft, remove any sharp edges on keyway with a fine file or stone, to avoid damaging oil seal during removal.
- d. Remove crankshaft (figure 5-10, item 8) from crankcase (figure 5-10, item 7) and disassemble by removing both main bearing cup assemblies (figure 5-10, item 9).
- e. Remove oil seal if it leaks (figure 5-10, item 10).
- f. Replace visible sight oil gage only if it leaks or is damaged (figure 5-10, item 11).

5-6. CLEANING, INSPECTION, REPAIR OR REPLACEMENT OF PARTS.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Use in a well ventilated area as the fumes are dangerous if inhaled. 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).

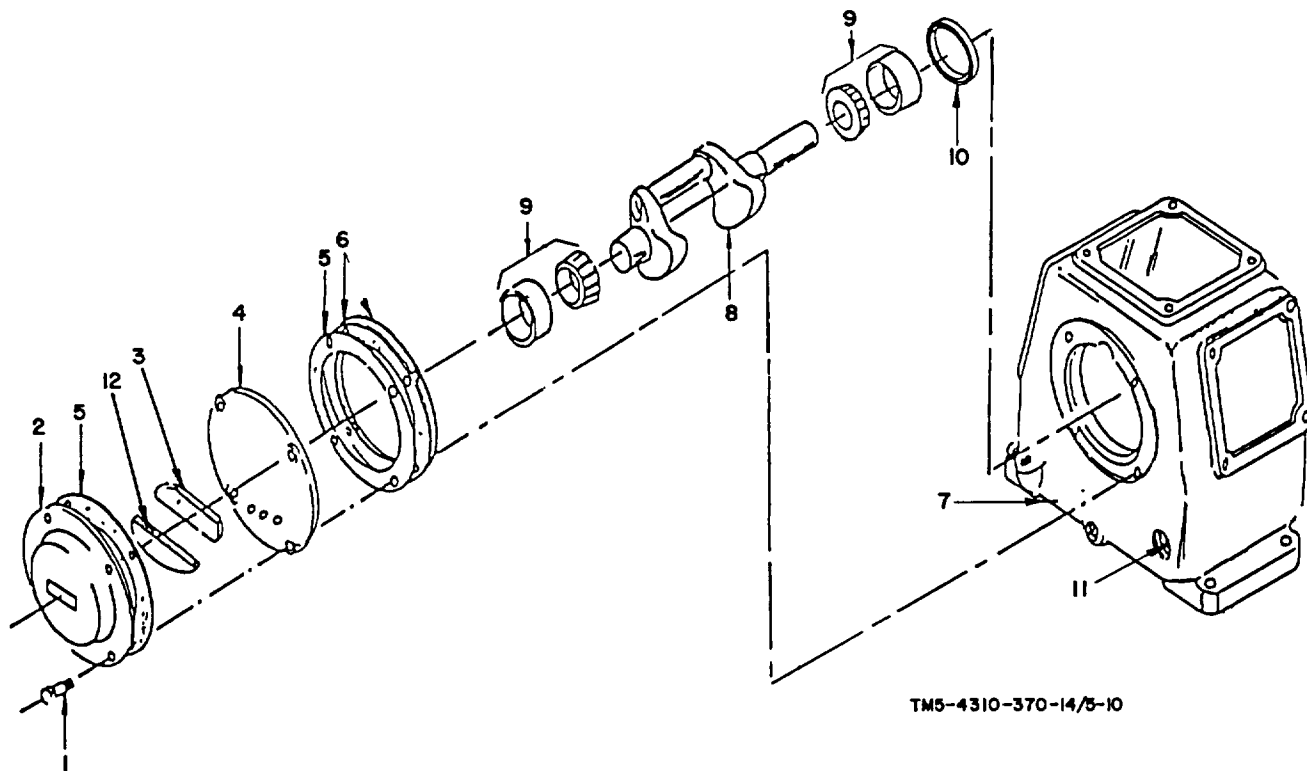
- a. All parts are to be thoroughly cleaned with P-D-680 solvent, and then air dried.
- b. Inspect all parts for cracks, breaks, fissures, scores, distortions or any other applicable damage.
- c. Inspect all parts for serviceable tolerances. (See table 5-2)
- d. Repair or replace any unserviceable parts. Also coat all internal moving parts with oil.



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- | | |
|-------------------------------------|--|
| 1. Retaining rings (6) | 10. Hand hole plate |
| 2. Piston pins (3) | 11. Hand hole plate gasket |
| 3. Low pressure piston (2) | 12. Hex cap screws (hand hole plate) (4) |
| 4. Low pressure piston ring set (2) | 13. Connecting rod assemblies (3) |
| 5. High pressure piston | 14. Hex cap screws (connecting rods) (6) |
| 6. High pressure piston ring set | 15. Oil scoop retainer |
| 7. Oil fill plug | 16. Left oil scoop |
| 8. Oil drain cap | 17. Center dipper pin |
| 9. Oil drain nipple | |

FIGURE 5-9. PISTON AND ROD ASSEMBLIES



- | | |
|---------------------------|------------------------------------|
| 1. Hex cap screws (4) | 7. Crankcase |
| 2. Breather chamber | 8. Crankshaft |
| 3. Breather element | 9. Main bearing cup assemblies (2) |
| 4. Crankcase cover | 10. Oil seal |
| 5. Crankcase cover gasket | 11. Visible sight oil gage |
| 6. Crankcase cover shims | 12. Oil separator |

FIGURE 5-10. CRANKCASE ASSEMBLY

5-7. CRANKCASE REASSEMBLY.

- a. Replace oil seal if it leaks (figure 5-10, item 11).
- b. Replace both main bearing cup assemblies (figure 5-10, item 10) on to crankshaft (figure 5-10, item 9) and place into crankcase (figure 5-10, item 8).
- c. Reassemble crankcase cover (figure 5-10, item 4), breather element (figure 5-10, item 3), and breather chamber (figure 5-10, item 2) using two hex cap screws (figure 5-10, item 1), one at the bottom and one at the top, leaving out the cover gasket and shims at this time. Be sure main bearings (figure 5-10, item 10) on the end of the crankshaft (figure 5-10, item 9) fit properly in cover. Set the two attaching hex cap screws finger tight. Using a feeler gage, measure the gap between the cover and crankcase at top and bottom of cover. Average the two dimensions and add 0.005 inch (0.0127 cm). This will determine the selection of gasket (figure 5-10, item 5) and shims (figure 5-10, items 6 & 7) to use. A combination of these should equal

the total dimension found above. Proper adherence to this procedure will minimize crankshaft end play. For maximum allowable end play, see table 5-2.

- d. Put new gasket and shim set into place, reassemble and torque four hex cap screws (figure 5-10, item 1) to 125 in. lbs. (22,325 gr. cm.).

5-8. CYLINDER, PISTON ASSEMBLIES, AND CONNECTING ROD ASSEMBLIES REASSEMBLY.

a. Piston and Rod Assemblies Reassembly

- (1) Replace oil scoop and pin (figure 5-9, items 16 and 17) into position and cover with oil scoop retainer (figure 5-9, item 15).
- (2) Reassemble connecting rod assemblies (figure 5-9, item 13) by use of six connecting rod hex cap screws (figure 5-9, item 14). Torque six hex cap screws to 125 in. lbs. (22,325 gr. cm.).
- (3) Install hand hole plate gasket (figure 5-9, item 9) and then hand hole plate (figure 5-9, item 8). Install and tighten six hex cap screws.
- (4) Replace oil drain nipple (figure 5-9, item 9), oil drain cap (figure 5-9, item 8).
- (5) Reconnect high pressure piston (figure 5-9, item 5) with new set of high pressure piston ring set (figure 5-9, item 6). Install piston pin (figure 5-9, item 2) and piston pin retaining rings (figure 5-9, item 1).
- (6) Reconnect low pressure pistons (figure 5-9, item 3) with new set of low pressure piston ring figure 5-9, item 4). Install piston pins (figure 5-9, item 2) and piston pin retaining rings (figure 5-9, item 1).
- (7) Fill compressor with oil, being sure not to over fill. Replace oil fill plug (figure 5-9, item 7).

b. Cylinder Reassembly

(1) Low Pressure Cylinder Reassembly

- (a) Reposition new cylinder flange gaskets (figure 5-8, item 4) on to crankcase (figure 5-8, item 3).
- (b) Replace low pressure cylinders (figure 5-8, items 1) on to crankcase (figure 5-8, item 3) and tighten down hex cap screws (figure 5-8, item 2) down to 144 in. lbs. (25,718 gr. cm.).

(2) High Pressure Cylinder Reassembly

- (a) Reposition new cylinder flange gasket (figure 5-8, item 4) on to crankcase (figure 5-8, item 3).
- (b) Replace high pressure cylinder (figure 5-8, item 5) on to crankcase (figure 5-8, item 3), and tighten down hex cap screws (figure 5-8, item 2) down to 144 in. lbs. (25,718 gr. cm.).

5-9. INTERCOOLER TUBE ASSEMBLY AND HEAD ASSEMBLIES REASSEMBLY.

a. Low Pressure Heads

- (1) Reassemble parts in the following sequence into both reed valve heads (figure 5-7, item 3).
- (2) Valve plate gasket (figure 5-7, item 4)
- (3) Reed valve (figure 5-7, item 7)
- (4) Rolling screw (figure 5-7, item 6)
- (5) Valve plate (figure 5-7, item 5)
- (6) Filter silencer (figure 5-7, item 2)
- (7) Filter (figure 5-7, item 1)
- (8) Low pressure retainer (figure 5-7, item 8)

b. High Pressure Head

- (1) Reassemble parts in the following sequence into cylinder head (figure 5-6, item 7).
- (2) Two valve gaskets (figure 5-6, item 5)
- (3) Exhaust valve (figure 5-7, item 6)
- (4) Intake valve (figure 5-6, item 4)
- (5) Two valve retainers (figure 5-6, item 3)
- (6) Two valve chamber cap gaskets (figure 5-6, item 2)
- (7) Two valve chamber caps (figure 5-6, item 1)

c. Head Assemblies

- (1) Replace low pressure head gasket (figure 5-5, item 6).
- (2) Install both low pressure head assemblies (figure 5-5, item 4) by turning eight hex cap screws (figure 5-5, item 5) counter clockwise.
- (3) Replace high pressure head gasket (figure 5-5, item 3).
- (4) Install high pressure head assembly (figure 5-5, item 1). Install and torque four hex cap screws (figure 5-5, item 2) to 144 in. lbs. (25,718 gr. cm.).

d. Intercooler Tube Assembly

- (1) Replace all compression fittings (figure 5-4, item 7).

- (2) Replace intercooler tube safety valve mounting TEE (figure 5-4, item 6) and bushing (figure 5-4, item 7).
- (3) Replace intercooler tube (figure 5-4, item 5).
- (4) Replace intercooler safety valve (figure 5-4, item 4) by turning it clockwise.

5-10. SAFETY RELIEF VALVE TESTING AND REPLACEMENT.

WARNING

Disconnect compressor unit from main power supply before servicing, replacing or repairing parts of equipment, to avoid personal injury.

WARNING

Release air pressure from air receiver and compressor pump before disassembly of equipment, to avoid personal injury.

- a. To remove safety relief valve, turn valve at base counter clockwise (figure 5-10, item 1) until free.
- b. To test, connect safety relief valve to a test unit. Valve must allow air to escape at 200 PSI (1380 KPa) to be working properly.
- c. To install, turn safety relief valve at base clockwise and tighten (figure 5-11).

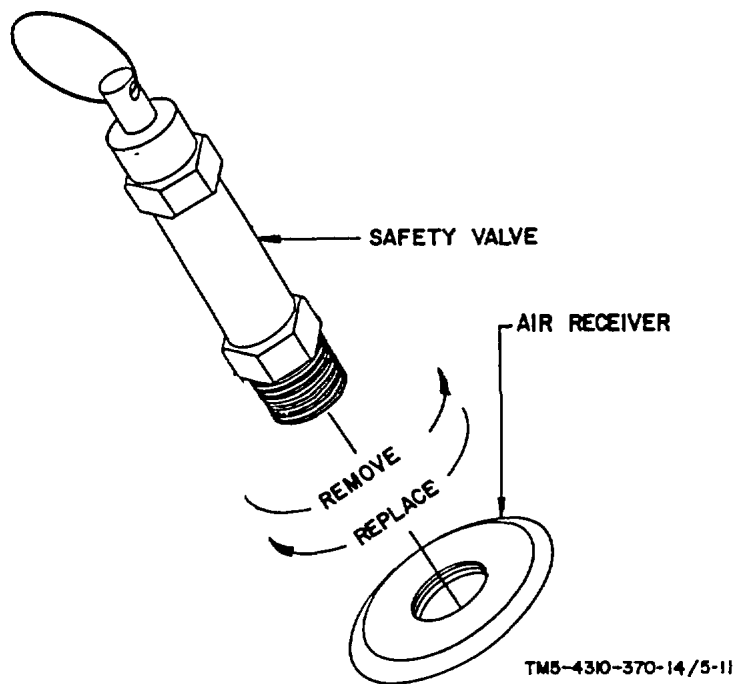


FIGURE 5-11. SAFETY RELIEF VALVE REMOVAL AND REPLACEMENT

APPENDIX A

REFERENCES

A-1. Fire Protection and Safety

TB4-4200-200-10

Hand Portable Fire Extinguishers approved for Army Users

A-2. Lubrication

L05-4310-3

Lubrication Order

C91001L

Fuel, Lubricants, Oils and Waxes

A-3. Painting

TM9-213

Painting Instructions for Field Use

A-4. Maintenance

TM-38-750

The Army Maintenance Management Systems (TAMMS)

TB-742-93-1

Inspection and Test of Air and Other Gas Compressors

TM5-4310-370-24P

Organizational, Direct Support and General Support Maintenance Repair Parts List for Compressor Unit, Reciprocating, Electric, 25 CFM, 195 PSI (Eclipse Systems, Inc. Model 50-6715) NSN 4310-01-089-4330

A-5. Shipment Storage

TM-740-90-1

Administrative Storage of Equipment

A-6. Destruction of Army Material

TM-750-244-3

The Destruction of Army Material to Prevent Enemy Use

A-7. Radio Interference Suppression

TM11-483

Radio Interference Suppression

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 levels.

b. The Maintenance Allocation Chart (MAC) in Section II designates overall responsibility for the performance of maintenance functions on the identified end item or component. The implementation of the maintenance functions upon the end item or component will be consistent with the assigned maintenance functions.

c. Section III lists the special tools and test equipment required for each maintenance function as referenced from Section II.

d. Section IV contains supplemental instructions on explanatory notes for a particular maintenance function.

B-2. MAINTENANCE FUNCTIONS.

a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical and/or electrical characteristics with established standards through examination.

b. Test. To verify serviceability and detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (decontaminate), to preserve, to drain, to paint or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

d. Adjust. To maintain, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

e. 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. Install. The act of emplacing, seating, or fixing into position an item, part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. Replace. The act of substituting a serviceable like type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

i. Repair. The application of maintenance services (inspect, test, service, adjust, align, calibrate, or replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining, or resurfacing) to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), and item, or system.

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

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

B-3. COLUMN ENTRIES USED IN THE MAC.

a. Column 1, Group Number. Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies, and modules with the next higher assembly.

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 Functions. 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.)

Section II. MAINTENANCE ALLOCATION CHART (MAC)

| (1) Group Number | (2) Component/Assembly 01 Group, Guard | (3) Mainten- ance function | (4) Maintenance level | | | | | (5) Tools and Equipment | (6) Remarks |
|--|--|--|--------------------------|------------|------------|------|---|-------------------------------|----------------|
| | | | C | O | F | H | D | | |
| 0101 | Belt Guard | Inspect Replace | 0.1 0.5 | | | | | | |
| | V Belts | Inspect Adjust Replace | 0.1 0.8 | 0.9 | | | | | |
| 02 Group, Electric Motor & Related Parts | | | | | | | | | |
| 0201 | Electric Motor | Service Replace Repair Inspect | 0.3 | 1.0 0.1 | 4.0 | | | | |
| 0202 | Rotor Assy | Inspect Replace | 0.1 | | 2.0 | | | | |
| 0203 | Stator Assy | Inspect Repair Replace | | | 0.1 2.0 | 12.0 | | | |
| 0204 | Motor Starter Assy | Inspect Repair Replace | 0.1 | | 1.0 2.0 | | | | |
| 0205 | Pressure Switch Assy | Adjust Replace Repair | | 0.5 | 0.8 1.0 | | | | |
| 03 Group, Air Compressor Assy | | | | | | | | | |
| 0301 | Air Compressor | Inspect Replace Repair Overhaul | 0.3 | 1.5 | 4.0 | 8.0 | | | |
| 0302 | Unloader Assy | Inspect Repair Replace | | 0.2 1.0 | 1.0 | | | | |
| 0303 | Inlet Filter | Service Replace | 0.2 0.3 | | | | | | |

Section II. MAINTENANCE ALLOCATION CHART (MAC) (Cont'd)

| (1) Group Number | (2) Component/Assembly 01 Group, Guard | (3) Mainten- ance function | (4) Maintenance level | | | | | (5) Tools and Equipment | (6) Remarks |
|------------------------|--|--------------------------------------|--------------------------|------------|-------------------|---|---|-------------------------------|----------------|
| | | | C | O | F | H | D | | |
| 0304 | Valve Assemblies, Intake & Exhaust | Inspect Repair Replace | | 0.5 | 1.0 1.5 | | | | |
| 0305 | Pistons & Connecting Rod Assemblies | Inspect Replace | | | 0.3 3.0 | | | | |
| 0306 | Crankshaft Assy | Inspect Replace | | | 0.3 3.0 | | | | |
| 04 Group, Air Receiver | | | | | | | | | |
| 0401 | Air Receiver Assy | Inspect Test Replace Repair | 0.2 | | 1.0 4.0 1.0 | | | | |
| 0402 | Air Pressure Gauge | Inspect Test Replace | 0.1 | 0.3 0.5 | | | | | |
| 0403 | Valve, Safety Relief | Test Replace | | | 0.1 0.3 | | | | |
| 0404 | Valve, Check Assy | Test Repair Replace | | 0.1 | 0.3 0.5 | | | | |
| 0405 | Valve, Globe | Inspect Replace | 0.1 | 0.5 | | | | | |
| 0406 | Hose, Air, Assy | Inspect Repair Replace | 0.1 | 0.5 0.3 | | | | | |
| 0407 | Inflator Gauge | Inspect Replace | 0.1 | 0.3 | | | | | |

APPENDIX C

COMPONENTS OF END ITEMS LIST

Section I. INTRODUCTION

C-1. SCOPE.

This appendix lists integral components of and Basic Issue Items (BII) for Air Compressor to help you inventory items required for safe and efficient operation.

C-2. GENERAL.

The components of end item list are divided into the following sections:

a. Section II. Integral Components of the End Item. These items, when assembled, comprise the Air Compressor and must accompany it whenever it is transferred or turned in. The illustrations will help you identify these items.

b. Section III. Basic Issue Items. These are minimum essential items required to place the Air Compressor in operation, to operate it, and to perform emergency repairs. Although shipped separately packed, they must accompany the Compressor during operation and whenever it is transferred between accountable officers. The illustration will assist you with hard-to-identify items. This manual is your authority to requisition replacement BII, based on TOE/MTOE authorization of the end item.

C-3. EXPLANATION OF COLUMNS.

a. Illustration: This column is divided as follows:

(1) Figure Number: Indicates the figure number of the illustration.

(2) Item Number: The number used to identify item called out in the illustration.

b. National Stock Number (NSN): Indicates the national stock number assigned to the end item which will be used for requisitioning.

c. Part Number (P/N): Indicates the primary number used by the manufacturer which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards and inspection requirements to identify an item or range of items.

d. Description. Indicates the federal item name and, if required, a minimum description to identify the item.

e. Location. The physical location of each item listed is given in this column. The lists are designed to inventory all items in one area of the major item before moving on to an adjacent area.

f. Usable on Code. (Not applicable)

g. Quantity Required (Qty Reqd). This column lists the quantity of each item required for a complete major item.

h. Quantity. This column is left blank for use during an inventory. Under the received column, list the quantity you actually receive on your major item. The date columns are for use when you inventory the major item at a later date, such as for shipment to another site.

Section II. INTEGRAL COMPONENTS OF END ITEM

| (1) ILLUSTRATION (a) (b) FIGURE ITEM No. No. | (2) NSN | (3) PART NO. & FSCM | (4) DESCRIPTION | (5) LOCATION | (6) USABLE ON CODE | (7) QTY RQD | (8) QUANTITY | | |
|--|------------|---------------------------|--------------------|-----------------|-----------------------------|-------------------|-----------------|------|------|
| | | | | | | | Recd | Date | Date |
| | | 61-JS-1506 94894 | INFLATOR ASSEMBLY | | | 1 | | | |
| | | 50-6741 19272 | HOSE ASSEMBLY | | | 1 | | | |

Section III. BASIC ISSUE ITEMS

| | | | | | | | | | |
|--|--|-------|-----------------|--|--|---|--|--|--|
| | | 19272 | TM5-4310-370-14 | | | 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.

D-2. GENERAL.

This list identifies items that do not have to accompany the Air Compressor and that do not have to be turned in with it. These items are authorized to you by CTA, MTOE, TDA or JTA.

D-3. EXPLANATION OF LISTING.

(Not applicable)

Section II. ADDITIONAL AUTHORIZATION LIST

| (1) NATIONAL STOCK NUMBER | (2) PART NO. & FSCM DESCRIPTION USABLE ON CODE | (3) U/M | (4) QTY AUTH |
|---------------------------------|--|----------------|------------------------|
| 4210-00-555-8837 | EXTINGUISHER, FIRE | | 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.

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, Appendix D").

b. Column 2 Level. This column identifies the lowest level of maintenance that requires the listed item.

(enter as applicable)

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 part number followed by the Federal Supply Code for Manufacturer (FSCM) in parentheses, if applicable.

e. Column 5 Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differs from the 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 |
|-----------------------|--------------|------------------------------------|-----------------------------|------------|
| | O, F, & H | 6850-00-274-5421 | Drycleaning Solvent P-D-680 | gal. |
| | O, F, & H | 9150-00-058-2301 | Oil, Vacuum Pump, Duo Seal | |

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|--------------------------------|------------|-----------|----------|---|
| PAGE NO | PARA-GRAPH | FIGURE NO | TABLE NO | |
| 6 | 2-1 a | | | In line 6 of paragraph 2-1 a the manual states the engine has <u>6</u> Cylinders. The engine on my set only has <u>4</u> Cylinders. Change the manual to show <u>4</u> Cylinders. |
| 81 | | 4-3 | | Callout 16 on figure 4-3 is pointing at a <u>bolt</u> . In key to figure 4-3, item 16 is called a <u>shim</u> - Please correct one or the other. |
| 125 | line 20 | | | I ordered a gasket, item 19 on figure B-16 by NSN 2 910-05-762-3001. 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 <u>good NSN</u> |

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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

Weight

- 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 dekaliter = 26.42 gallons
- 1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measures

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

| <i>To change</i> | <i>To</i> | <i>Multiply by</i> | <i>To change</i> | <i>To</i> | <i>Multiply by</i> |
|------------------|--------------------|--------------------|--------------------|---------------|--------------------|
| 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 | 1.365 | metric tons | short tons | 1.102 |
| pound-inches | newton-meters | .11375 | | | |

Temperature (Exact)

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

