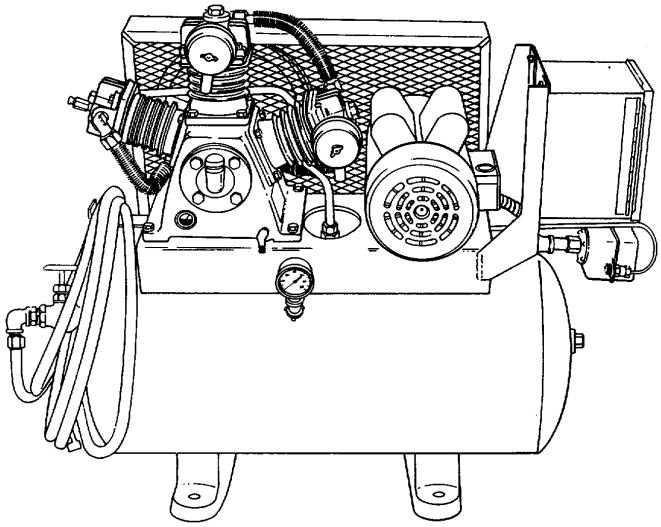
TECHNICAL MANUAL

OPERATOR'S UNIT, FORWARD INTERMEDIATE, AND REAR INTERMEDIATE MAINTENANCE MANUAL



COMPRESSOR UNIT, RECIPROCATING, 5 CFM, 175 PSI, ELECTRIC MOTOR DRIVEN

MODEL: E23CV7A
NSN 4310-01-165-6676

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HEADQUARTERS, DEPARTMENT OF THE ARMY

28 JUNE 1984

WARNING

Cleaning solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well-ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

WARNING

Always disconnect electric power from the air compressor before starting any work on it. The air compressor could start up accidentally and cause serious injury to maintenance personnel.

WARNING

Never attempt to service any of the air compressor components until the unit is relieved of all air pressure.

WARNING

Do not operate the air compressor with the belt guard removed.

WARNING

Make certain any lifting device used has a minimum lifting capacity of 400 pounds (181.6 kgs). Failure to observe this precaution could result in injury or death to personnel and damage to the equipment.

WARNING

Never wear loose, hanging clothing while inspecting, operating, or working on the equipment.

TECHNICAL MANUAL

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C. 28 June 1984

OPERATOR'S UNIT, FORWARD INTERMEDIATE, AND REAR INTERMEDIATE MAINTENANCE MANUAL FOR COMPRESSOR UNIT, RECIPROCATING, 5 CFM, 175 PSI, ELECTRIC MOTOR DRIVEN

MODEL: E23CV7A
NSN: 4310-01-165-6676

REPORTING OF ERRORS AND RECOMMENDING IMPROVEMENTS

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

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CHAPTER 1

INTRODUCTION

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Section I. GENERAL INFORMATION

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1-1. SCOPE.

a. Type of Manual.

Operator's, Unit, Forward Intermediate, and Rear Intermediate Maintenance Instructions.

b. Equipment Name.

Compressor Unit, Reciprocating, 5 CFM, 175 PSI, Electric Motor Driven.

c. Purpose of Equipment.

Provides 175 psig (12.3 kgs/cm2) compressed air at a discharge rate of 5.0 cubic feet (0.141 m3) per minute.

1-2. MAINTENANCE FORMS AND RECORDS.

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. HAND RECEIPT (HR) MANUALS.

This manual has a companion document with a TM number followed by "-HR" (which stands for Hand Receipt). The TM 5-4310-377-13-HR consists of preprinted hand receipts (DA Form 2062) and list end item related equipment

1-3. HAND RECEIPT (HR) MANUALS - Continued.

(i.e., COEI, BIL, and AAL) you must account for. As a aid to property accountability, additional -HR manuals may be requisitioned from the following source in accordance with procedures in Chapter 3, AR 310-2:

The US Army Adjutant General Publications Center
ATTN: AGLD-OD
2800 Eastern Blvd.
Baltimore, MD 21220

1-4. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE.

Refer to TM 750-244-3 for methods and procedures to destroy Army materiel to prevent enemy use.

1-5. PREPARATION FOR STORAGE OR SHIPMENT.

To prepare the equipment for storage or shipment, refer to Chapter 3, Section XI.

1-6. REPORTING OF EQUIPMENT IMPROVEMENT RECOMMEN- DATIONS (EIR's).

If your air compressor needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on an SF 368 (Quality Deficiency Report). Mail it to us at DRSTR-QX, 4300 Goodfellow Boulevard, St. Louis, MO 63120. We'll send you a reply.

1-7. LIST OF ABBREVIATIONS.

Abbreviation	Definition
cfm	cubic-feet-per-minute
cm	centimeter
EIR	Equipment Improvement Recommendation
hp	horsepower
Hz	Hertz
kg	kilogram
lb-ft	pound-foot
lbs	pounds
mm	millimeters
nm	newton meters
psi	pounds-per-square-inch
psig	pounds-per-square-inch-gage
rpm	revolutions-per-minute
vac	Volts-alternating-current

1-8. WARRANTY INFORMATION.

The air compressor is warranted by Curtis-Toledo for 12 months. It starts on the date, found in block 23, DA Form 2408-9, in the logbook. Report all defects in materiel or workmanship to your supervisor, who will take appropriate action through your organizational maintenance shop.

Section II. EQUIPMENT DESCRIPTION

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Characteristics	1-9	Location and Description of Major Components	1-11

1-9. CHARACTERISTICS.

a. Electric motor driven.

b. Belt driven.

c. Stationary tank mounted.

d. Air cooled.

e. Two-stage compressor.

1-10. CAPABILITIES AND FEATURES.

a. Supplies 175 psig (12.3 kgs/cm^2) air to the receiver tank.

b. Can supply 5.0 cubic feet (0.141 m^3) of free air per minute.

c. Operates at a normal motor speed of 1,740 rpm and a compressor speed of 680 rpm.

d. Has a receiver tank with a 20 gallon (74.7 liters) capacity.

e. Has a 50 foot (15.24 meters) flexible hose.

f. Receiver tank has air pressure gage reading from 0 to 300 psi (21.2 kgs/cm^2) capacity.

g. Starter overload in the starter box is set at 30 amps.

1-11. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS.

(Refer to Figure 1-1).

a. Air Intake Filters. The air intake filters (1) remove the dust and debris from the incoming air to prevent damage to the compressor.

b. Intercooler. The intercooler (2) cools the compressed air between the first and second stages.

c. Belt Guard. The belt guard (3) prevents personnel and debris from getting caught in the belts.

d. Fan Pulley. The fan pulley (4) directs cooling air to the finned intercooler and to the finned cylinders.

e. Air Compressor. The air compressor (5) is of three cylinder design and compresses the air.

f. Motor. The motor (6) is a 2 hp, brushless type that provides the motive force to drive the compressor.

g. Pressure Switch. The pressure switch (7) automatically turns on the motor at 175 psi ±10 (12.3 ±0.70 kgs/cm^2) and turns off the motor at 200 +0, -10 psi (14.1 +0, -0.70 kgs/cm^3) to regulate the pressure in the tank.

h. Air Receiver Tank. The air receiver tank (8) holds the compressed air until ready for use.

i. Air Pressure Gage. The air pressure gage (9) reads the air pressure in the air receiver tank.

j. Starter. The starter (10) starts and stops the motor upon command from the pressure switch.

k. Flexible Hose. The flexible hose (11) transfers the compressed air from the air receiver tank to where the air will be used.

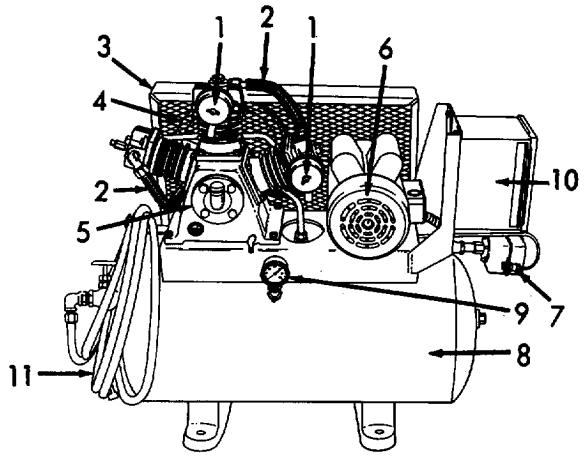

Figure 1-1. Compressor Unit, Reciprocating, 5 CFM, 175 PSI, Electric Motor Driven.

1-12. EQUIPMENT DATA.

Table 1-1. Equipment Data

AIR COMPRESSOR

Model (Compressor Unit)	E23CV7A
Model (Compressor)	HTA-65
Bore and Stroke	
First Stage	2.56 inches X 1.89 inches (65 mm X 48 mm)
Second Stage	2.0 inches X 1.89 inches (51 mm X 48 mm)
Weight (Tank, Motor, Compressor)	204.6 lbs. (93 kg)
Operating Speed	680 rpm
Output Pressure	175 psi (12.3 kgs/cm^2)
Output Air Flow	5 cfm (0.141 m^3 per minute)
Length (Overall)	37 inches (93.98 cm)
Width (Overall)	17 inches (43.18 cm)
Height (Overall)	32 inches (81.28 cm)
Length (Compressor)	18.35 inches (46.61 cm)
Width (Compressor)	12.60 inches (32.0 cm)
Height (Compressor)	14.05 inches (35.69 cm)
Manufacturer	Curtis-Toledo St. Louis, Missouri

ELECTRIC MOTOR

Model	606331A
Horsepower	2
Operating Speed	1740 rpm
Power Requirements	115 vac, 1 phase, 60 Hz
Type	Brushless
Manufacturer	Doerr Electric Corporation Cedarburg, Wisconsin

AIR RECEIVER TANK

Capacity	20 gallons (75.7liters)
Length	33 inches 83.82 cm)
Width	16 inches (40.64 cm)
Height	18 inches (45.72cm)

MOTOR STARTER

Model	CA3-23A
Type	Magnetic
Power Requirements	115 vac, 1 phase, 60 Hz
Manufacturer	Sprecher & Schuh Port Chester, New York

Section III. PRINCIPLES OF OPERATION

1-13. PRINCIPLES OF OPERATION.

a. Compressor. (Refer to Figure 1-2).

(1) Filtered air is drawn into the first stage (low-pressure) cylinders at atmospheric pressure as the pistons move down.

(2) The air is compressed when the pistons are moved upwards. When the air pressure inside the cylinders reaches a pre-determined value, the valve spring pressure is overcome and the air is forced out the discharge valve to the intercooler.

(3) As the air flows through the intercooler, much of the heat of compression is dissipated.

(4) The second stage (high-pressure) is similar except that the air enters from the intercooler and is recompressed to a higher pressure.

(5) The air then flows to the air receiver tank.

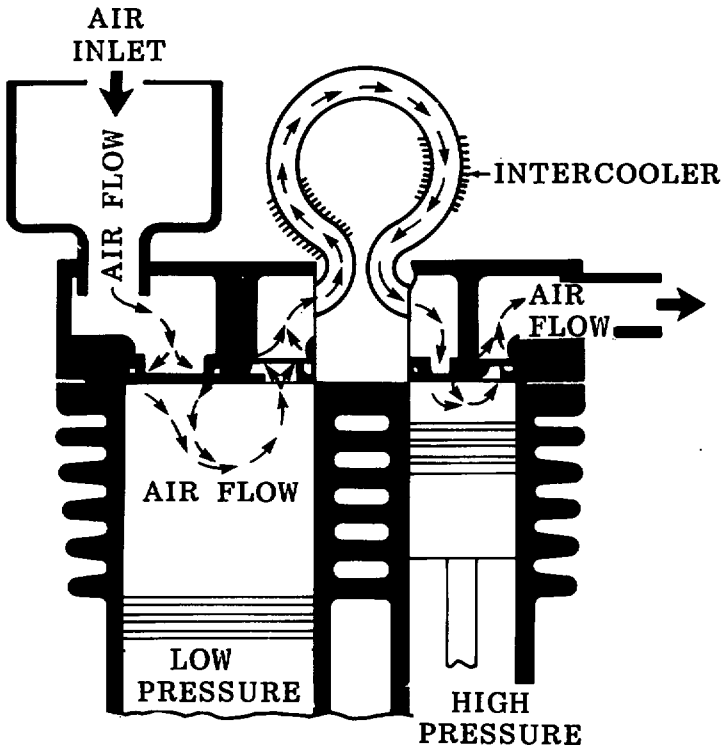

Figure 1-2. Air Compressor, Operation.

1-13. PRINCIPLES OF OPERATION - Continued.

b. Pressure Switch. The pressure switch is connected directly to the air pressure in the tank. When the air pressure in the tank drops to 175 ±10 psi (12.3 ±0.70 kgs/cm^2) the switch is actuated and causes the motor starter to start the motor. When the air pressure in the tank is raised to 200 +0, -10 psi (14.1 +0, -0.70 kgs/cm^2) the switch opens and causes the motor starter to shutoff the motor.

c. Unloader. The unloader is a valve that opens the compressor pump output pressure line to free air and allow the motor to start running. Once the motor has started, the valve is closed and compressed air is directed into the tank. The unloader is part of the pressure switch.

d. Motor Starter. The motor starter receives the signal to start and shutoff the motor from the pressure switch. The voltage from the pressure switch is applied to the starter coil and close the starter contacts. The motor current will then pass to the motor and start the motor running. When the pressure switch reaches the shutoff (cut-out) pressure, the voltage is removed from the starter coil and causes the contacts to open. The motor current is thus removed and the motor will stop.

1-14. WIRING DIAGRAM. (Refer to Figure 1-3).

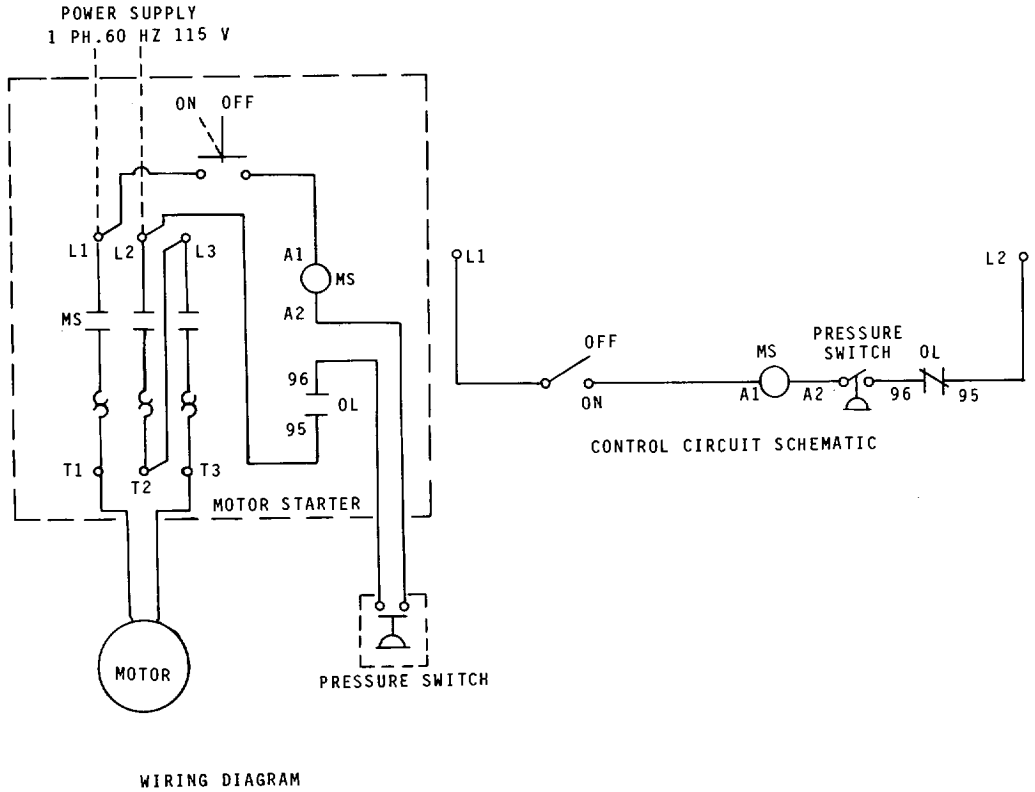

Figure 1-3. Compressor Unit Wiring Diagram.

CHAPTER 2

OPERATING INSTRUCTIONS

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Section	II.	Operation Under Usual Conditions	2-4
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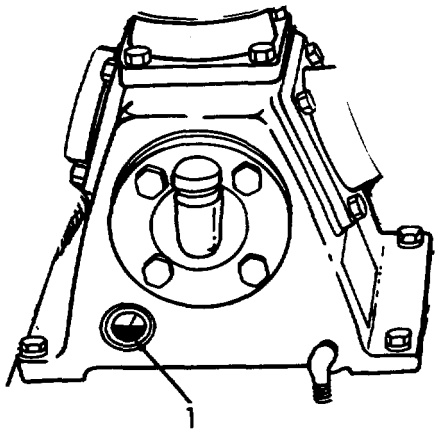
Section I. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS

2-1. OPERATOR'S CONTROLS AND INDICATORS.

a. Air Compressor Controls and Indicators. (Refer to Figure 2-1).

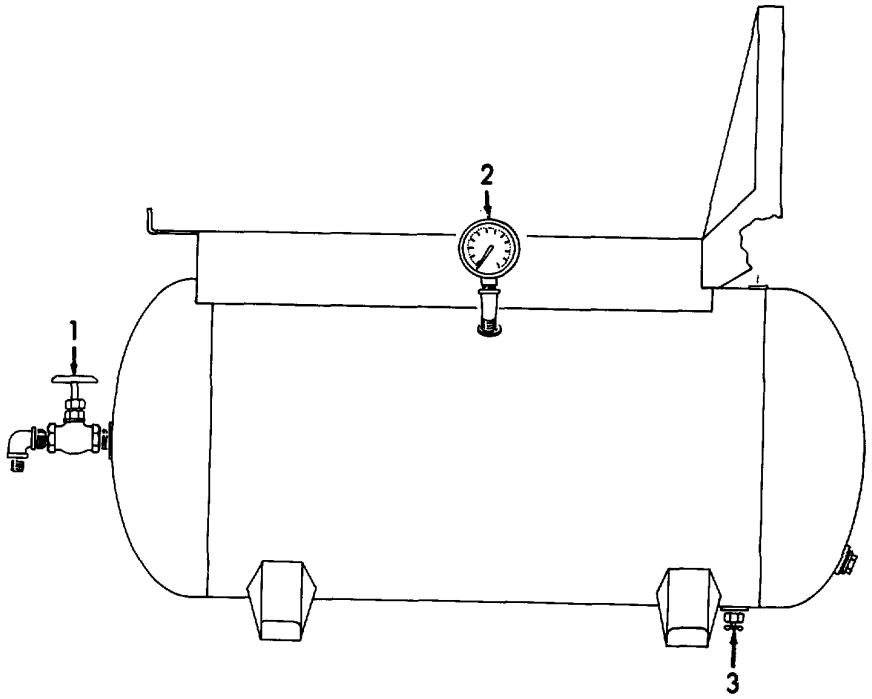


KEY	CONTROL OR INDICATOR	FUNCTION
1	Oil Level Sight Gage	Shows the oil level in the crankcase. Maintain oil level at centerline of sight glass and add oil as necessary.

Figure 2-1. Air Compressor, Controls and Indicators.

2-1. OPERATOR'S CONTROLS AND INDICATORS - Continued.

b. Air Receiver Tank Controls and Indicators. (Refer to Figure 2-2).

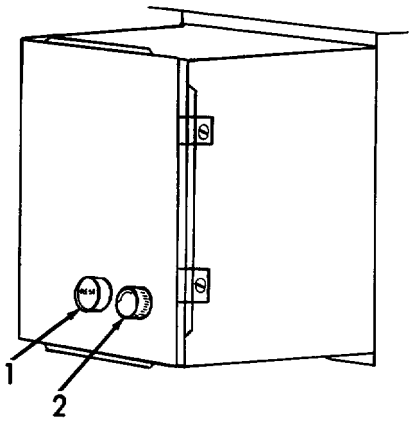


KEY	CONTROL OR INDICATOR	FUNCTION
1	Air Shut-off Valve	Allows the operator to shut-off the air from the tank to the flexible hose.
2	Air Pressure Gage	Provides an indication of air pressure in the tank. The gage reads 0 to 300 psig.
3	Drain Cock	Provides a means of draining off any moisture that may have condensed in the tank.

Figure 2-2. Air Receiver Tank, Controls and Indicators.

2-1. OPERATOR'S CONTROLS AND INDICATORS - Continued.

c. Motor Starter Box Controls and Indicators. (Refer to Figure 2-3).



KEY	CONTROL OR INDICATOR	FUNCTI.ON
1	RESET Switch	Resets the motor starter box circuit breaker.
2	On/Off Switch	Turns the air compressor on and off.

Figure 2-3. Motor Starter Box, Controls and Indicators.

Section II. OPERATION UNDER USUAL CONDITIONS

2-2. AIR COMPRESSOR START-UP.

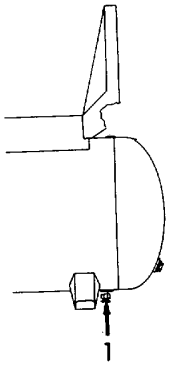


Figure 2-4. Air Tank Draining.

WARNING

Wear goggles while draining the tank. Keep all parts of your body away from drain cock.

a. Refer to Figure 2-4. Open the drain cock (1) and allow all moisture to drain from air receiver tank.

b. Close the drain cock (1).

c. Refer to Figure 2-5. Turn the motor starter box on/off switch (1) to start the motor.

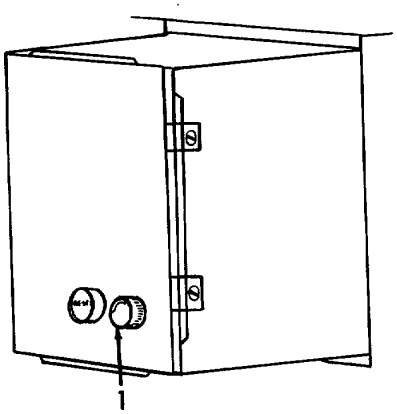


Figure 2-5. Motor Start-Up.

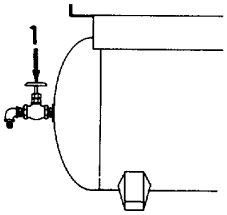


Figure 2-6. Air Shut-Off Valve Opening.

d. Refer to Figure 2-6. Open the air receiver tank air shut-off valve (1) and allow the air to enter the flexible hose.

2-3. AIR COMPRESSOR SHUT-DOWN.

a. Refer to Figure 2-7. Turn the motor starter box on/off switch (1) to stop the motor.

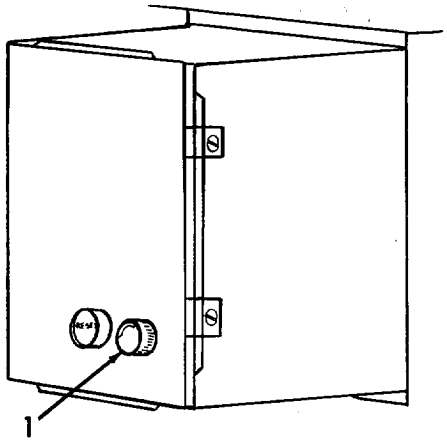


Figure 2-7. Motor Shut-Down.

b. Refer to Figure 2-8. Close the air receiver tank air shut-off valve (1) by turning clockwise.

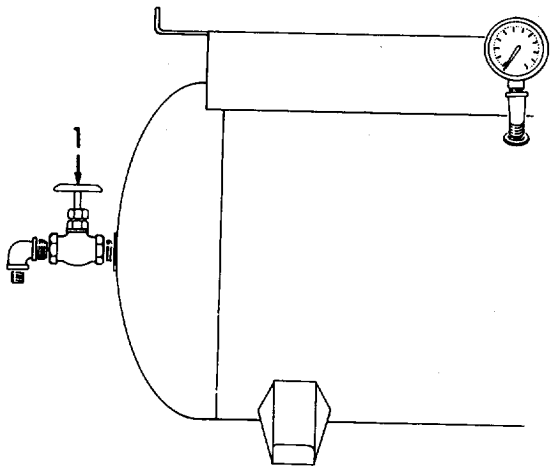


Figure 2-8. Air Shut-Off Valve Closing.

c. Refer to Figure 2-4. Open the draincock (1) and allow all moisture to drain from tank.

d. Close the draincock (1).

Section III. OPERATION UNDER UNUSUAL CONDITIONS

2-4. OPERATION IN EXTREME HEAT.

a. Make certain that the operating area is well ventilated and that there are no obstructions to prevent the circulation of cooling air.

b. Provide fans to ventilate an enclosed operating area.

c. Perform the lubrication instructions contained in paragraph 3-1 more frequently using OE/HDO-20 (Lubricating Oil, Appendix E, item 1).

d. Check drive belt tension frequently.

e. Be sure to keep all parts of the air compressor clean.

2-5. OPERATION IN EXTREME COLD (Below 0° F or -18°C),

a. Locate the air compressor in a shed, building, or protected area. If the unit must be placed outdoors, protect it from wind, ice, and snow. Cover with a tarpaulin when not in use.

b. Perform the lubrication instructions contained in paragraph 3-1 using OE/HDO-10 (Lubricating Oil, Appendix E, item 1).

c. Avoid bending, kinking, and excessive handling of the air service hose as it becomes brittle at low temperatures.

d. Keep all wiring connections clean and tight. Be sure there are no short circuits. Protect motor from snow and ice.

e. Be sure that the tank and air service hose are drained and free of moisture after shutting down the compressor to prevent freezing.

2-6. OPERATION IN SALT AIR, SEA SPRAY, OR HIGH HUMIDITY.

a. Protect the unit with shelter being sure to keep enough area open for good ventilation.

b. Wipe the unit dry af frequent intervals. Pay particular attention to the motor and starter box. If unit becomes covered with salt from salt spray or salt air, wash the unit with fresh water.

c. Perform the lubrication instructions contained in paragraph 3-1.

d. If exposed metal surfaces become rusty, remove rust and coat the area with suitable rustproof material or grease until the unit can be cleaned and painted.

e. Open the tank draincock frequently to drain accumulated moisture.

2-7. OPERATION IN DUSTY OR SANDY AREAS.

a. Protect the unit with a suitable shelter but provide adequate ventilation.

b. Clean the air filters frequently.

c. Perform the lubrication instruction contained in paragraph 3-1. Be sure to clean all areas around the lubrication points.

d. Keep the motor, starter box, all cooling fins, and the tank free of accumulated dirt and sand.

e. Keep the unit covered with a tarpaulin when not in use.

CHAPTER 3
UNIT MAINTENANCE INSTRUCTIONS

			Page
Section	I	Lubrication Instructions	3-1
Section	II	Repair Parts, Special Tools, TMDE, and Support Equipment	3-3
Section	III	Service Upon Receipt of Equipment	3-3
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Section I. LUBRICATION INSTRUCTIONS

	Para.		Para.
Lubrication Procedure	3-2	Lubrication Methods	3-1

3-1. LUBRICATION METHODS.

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

b Cleaning. Keep all external parts not requiring lubrication free of lubricants. Before lubricating the equipment, wipe all lubrication points free of dirt and grease. Clean all lubrication points after servicing to prevent the accumulation of foreign matter.

c. *Lubrication Points.* Service the lubrication points at the proper intervals as specified in the lubrication procedure (para. 3-2). The interval specified is based on normal operation. Modifications of the recommended interval may be required when operating under unusual conditions.

3-2. LUBRICATION PROCEDURE.

Perform the following procedure every three (3) months to lubricate the air compressor.

NOTE

These instructions are mandatory.

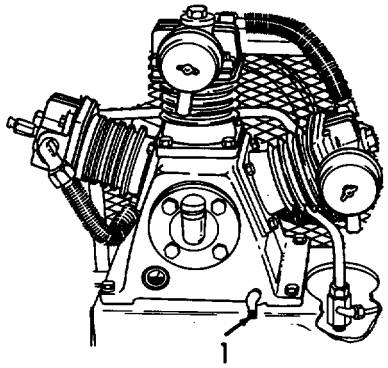


Figure 3-1. Oil Draining.

a. Refer to Figure 3-1. Place a suitable container under the air compressor oil drain plug (1).

b. Remove the drain plug (1) and allow the oil to completely drain from the crankcase.

c. Reinstall the drain plug (1). Discard the used oil.

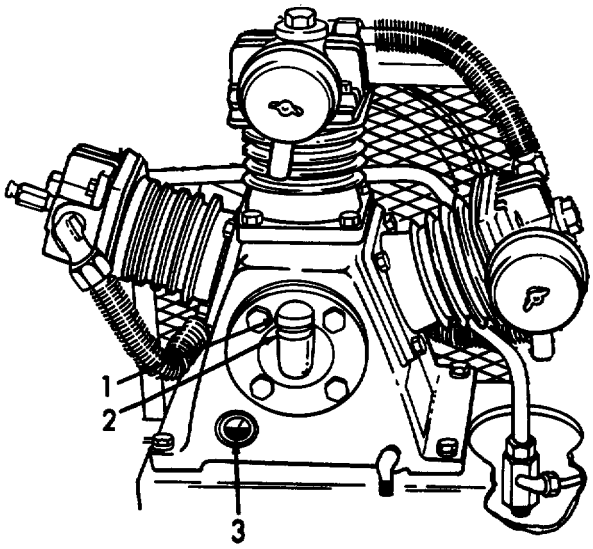


Figure 3-2. Refilling the Crankcase.

d. Refer to Figure 3-2. Remove the oil breather cap (1).

e. Fill the crankcase through the oil breather cap opening (2) with 1 3/4 pints of oil (Appendix E, item 1).

f. Check oil sight gage (3) to ensure that crankcase is properly filled with oil.

g. Reinstall the oil breather cap (1).

Section II. REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

	Para.		Para.
Common Tools and Equipment	3-3	Special Tools, TMDE, and Support Equipment	3-4
Repair Parts	3-5		

3-3. COMMON TOOLS AND EQUIPMENT.

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

3-4. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT.

No special tools and equipment are required to maintain the air compressor at the unit maintenance level.

3-5. REPAIR PARTS.

Repair parts are listed and illustrated in the repair parts and special tools list (TM 5-4310-377-23P) covering unit and intermediate maintenance for the equipment.

Section III. SERVICE UPON RECEIPT OF EQUIPMENT

	Para.		Para.
Checking Unpacked Equipment	3-6	Installation	3-7
		Preliminary Servicing	3-8

3-6. CHECKING UNPACKED EQUIPMENT.

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

b. Check the equipment against the packing slip to see if the shipment is complete. Report all discrepancies in accordance with the instructions of DA Pam 738-750.

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

3-7. INSTALLATION.

a. Install the compressor at least 24 inches from any wall.

b. Install the four screws and four washers to secure the compressor unit to the floor.

c. Connect the electrical wiring to the motor starter box per the wiring diagram contained in paragraph 1-14.

3-8. PRELIMINARY SERVICING.

a. Fill the crankcase with lubricating oil per the instructions contained in paragraph 3-2.

b. Check the oil sight gage for proper oil level.

c. Start the compressor per the procedure contained in paragraph 2-2.

Section IV. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

3-9. GENERAL.

a. The best way to maintain the air compressor is to inspect on a regular basis so minor faults can be discovered and corrected before they result in serious damage, failure, or injury. This section contains systematic instructions for inspection, adjustment, and correction of the compressor components to avoid costly repairs or major breakdowns. This is Preventive Maintenance Checks and Services.

b. All shortcomings will be reported on DA Form 2404, Equipment Inspection and Maintenance worksheet, immediately after the PMCS and before taking corrective action. They will also be reported in the equipment log.

c. Do your Before (B) PREVENTIVE MAINTENANCE before operation.

d. Do your During (D) PREVENTIVE MAINTENANCE during operation.

e. Do your After (A) PREVENTIVE MAINTENANCE after operation.

f. Do your Weekly (W) PREVENTIVE MAINTENANCE once each week.

g. Do your Monthly (M) PREVENTIVE MAINTENANCE once each month.

h. Do your Quarterly (Q) PREVENTIVE MAINTENANCE once each quarter.

i. If something doesn't work, troubleshoot it with the instructions in your manual or notify your supervisor.

3-9. GENERAL - Continued.

j. Always do your PREVENTIVE MAINTENANCE in the same order so it gets to be a habit. Once you've had some practice, you'll spot anything wrong in a hurry.

k. If anything looks wrong and you can't fix it, write in on your DA Form 2404. If you find something seriously wrong, report it to Forward Intermediate Maintenance RIGHT NOW.

l. When you do your PREVENTIVE MAINTENANCE take along the tools you will need to make all the checks. Take along a rag, you'll always need at least one.

WARNING

Cleaning solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well-ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

(1) Keep it clean: Dirt, grease, oil, and debris only get in the way and may cover up a serious problem. Clean as you work and as needed. Use cleaning solvent (Appendix E, item 2) on all metal surfaces. Use soap and water when you clean rubber or plastic material.

(2) Bolts, nuts, and screws: Check them all for obvious looseness, missing, bent, or broken condition. You can't try them all with a tool of course, but look for chipped paint, bare metal, or rust around bolt heads. If you find one you think is loose, tighten it or report it to Forward Intermediate Maintenance if you can not tighten it.

(3) Welds: Look for loose or chipped paint, rust, or gaps where parts are welded together. If you find a bad weld, report it to Forward Intermediate Maintenance.

(4) Electric wires and connectors: Look for cracked or broken insulation, bare wires, and loose or broken connections. Make sure wires are in good shape.

Table 3-1. Preventive Maintenance Checks and Services.

B-Before *D-During* *A-After* *W-Weekly* *M-Monthly* *Q-Quarterly*

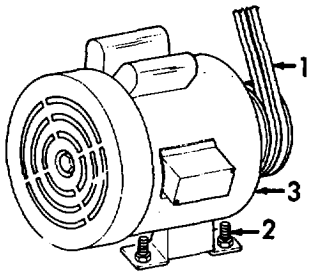
ITEM NO.	INTERVAL B	D	A	W	M	Q	ITEM TO BE INSPECTED PROCEDURE:	EQUIPMENT IS NOT READY/AVAILABLE IF:
1	•						*Motor Starter Box.* Inspect for completeness and secure mounting. Inspect for signs of burning and/or overheating.	Any signs of damage.
2	•						*Pressure Switch.* Inspect for completeness and secure mounting. Inspect for any signs of damage.	Any signs of damage.
3	•						*Belt Guard Assembly.* Inspect for damage and secure mounting.	Any signs of damage or loose mounting.
4	•				•		*Drive Belts.* Inspect for damaged or broken belts. Check belt (1) tension for 3/8 to 1/2 inch deflection at mid-point between pulleys. To adjust belt tension, loosen the four motor hold-down bolts (2) and move motor (3) until belt tension is 3/8 to 1/2 inch. Tighten the four holddown bolts (2). 	Damaged or broken.

Table 3-1. Preventive Maintenance Checks and Services. (Continued)

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

ITEM NO.	INTERVAL B	D	A	W	M	Q	ITEM TO BE INSPECTED PROCEDURE:	EQUIPMENT IS NOT READY/AVAILABLE IF:
5	•		•				*Drive Motor.* Inspect for secure mounting. Inspect for overheating.	Loose mounting or overheating.
6	•	•	•				*Flexible Hoses and Rigid Piping.* Inspect for damage, loose connections, and air leakage.	
7	•						*Oil Sight Gage.* Check that oil level is in center of sight gage (1). If oil is low, remove oil breather cap (2) and add oil (Appendix E, Item 1) to breather cap opening (3) until oil level is at center of sight gage (1).	

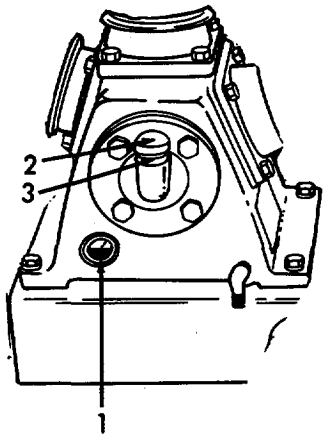


Table 3-1. Preventive Maintenance Checks and Services. (Continued)

B-Before *D-During* *A-After* *W-Weekly* *M-Monthly* *Q-Quarterly*

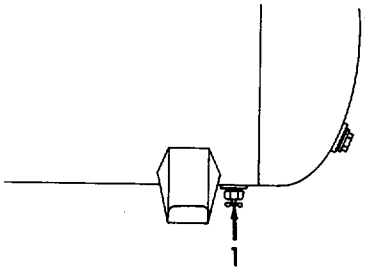
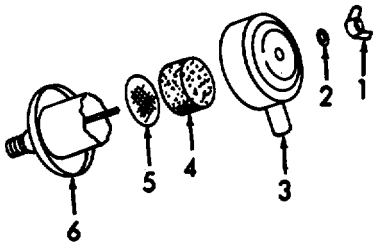
ITEM NO.	INTERVAL B	D	A	W	M	Q	ITEM TO BE INSPECTED PROCEDURE:	EQUIPMENT IS NOT READY/AVAILABLE IF:
8	•						*Drain Cock*. Open the drain cock (1) and allow all condensed moisture to drain off. Close the drain cock.  	
9				•			*Air Filters*. Clean the air filters as follows: Remove wing nut (1), washer (2), and cover (3). Remove filter (4) and screen (5). Clean filter (4) and screen (5) in a solution of mild soap and water. Rinse thoroughly and allow to dry. Wipe the cover (3) and body (6) clean with a clean cloth. Install screen (5), filter (4), cover (3), washer (2), and wing nut (1).  	

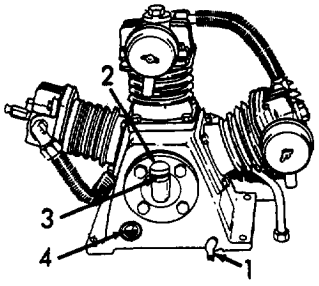
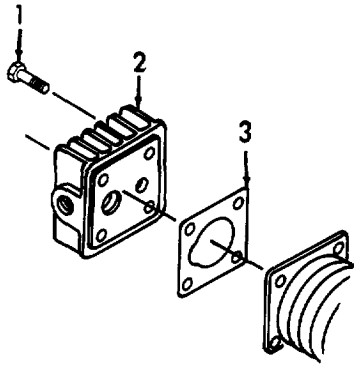
Table 3-1. Preventive Maintenance Checks and Services. (Continued)

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

ITEM NO.	INTERVAL B	D	A	W	M	Q	ITEM TO BE INSPECTED PROCEDURE:	EQUIPMENT IS NOT READY/AVAILABLE IF:
10				•			*Air Compressor.* Clean the complete air compressor (external) with a solution of mild soap and water. Rinse thoroughly and allow to dry.	
11				•			*Pressure Relief Valve.* Pull the ring on the pressure relief valve with the compressor running. The valve should allow air to escape.	Pressure valve does not allow air to escape.
12						•	*Mounting Hardware*. Check all hardware for secure mounting and damage. Tighten all loose hardware. Replace all damaged hardware.	
13						•	*Oil.* Change the oil as follows: Remove the drain plug (1) and allow the oil to completely drain into a suitable container. Reinstall drain plug (1). Remove oil breather cap (2). Fill the crankcase through the breather cap opening (3) with 1 3/4 pints of oil (Appendix E, item 1). Check sight gage (4) for proper oil level. Reinstall oil breather cap (2).	

Table 3-1. Preventive Maintenance Checks and Services. (Continued)

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

ITEM NO.	INTERVAL B	D	A	W	M	Q	ITEM TO BE INSPECTED PROCEDURE:	EQUIPMENT IS NOT READY/AVAILABLE IF:
								
14						•	*Head and Valves*. Disconnect all piping from heads. Remove four bolts (1), head (2), and gasket (3). Discard gasket (3). Remove any carbon buildup from head and valves. Inspect head and valves for damage. Install a new gasket (3). Install head (2) and four bolts (3). Tighten bolts securely. Reconnect piping. 	

Section V. TROUBLESHOOTING

3-10. GENERAL.

a. The table in this section lists the common malfunctions which you may find during the operation or maintenance of the air compressor or it components. You should perform the test/inspection and corrective maintenance in the order listed.

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

Troubleshooting Symptom Index

MALFUNCTION	PAGE
Flywheel revolves in wrong direction	3-12
Bearings overheat	3-12
Motor/Compressor speed slows down	3-12
Severe vibration	3-12
Abnormal noise	3-13
Little or no air pressure buildup	3-13
Pressure gage inaccurate	3-15
Excessive oil consumption	3-15
Belts slip	3-15
Motor overheats	3-15
Motor will not start	3-16

Table 3-2. Unit Maintenance Troubleshooting.

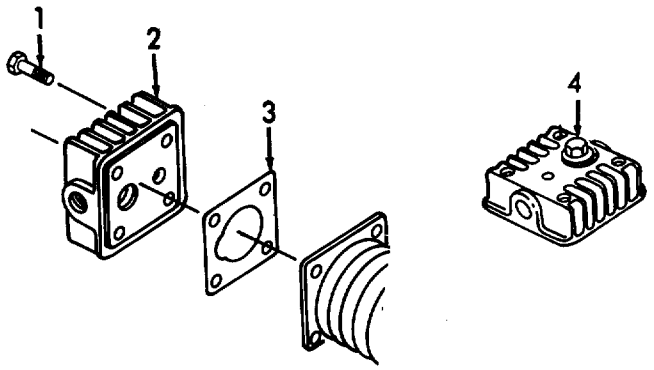
MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
1. FLYWHEEL REVOLVES IN WRONG DIRECTION.
Check motor for proper wiring connections (para 1-14).
Reconnect motor wiring properly (para 1-14).
2. BEARINGS OVERHEAT.
Check that proper oil level is visible through sight gage (para 3-2).
If oil level is low, add oil to crankcase (para 3-2).
If oil level is normal, notify Forward Intermediate Maintenance.
3. MOTOR/COMPRESSOR SPEED SLOWS DOWN.
Check line voltage for 115 vac.
If line voltage is abnormal, notify your supervisor.
If line voltage is normal, replace the motor (para 3-22).
4. SEVERE VIBRATION.
Step 1. Check for damaged motor pulley and damaged compressor flywheel.
If motor pulley is damaged, replace damaged motor pulley (para 3-15)
If compressor flywheel is damaged, replace damaged compressor flywheel (para 3-17).
If motor pulley and compressor flywheel are undamaged, proceed to step 2.
Step 2. Observe motor and compressor pulleys while air compressor is running.
If motor pulley is wobbling, replace motor (para 3-22).
If compressor flywheel is wobbling, replace compressor (para 3-16).

Table 3-2. Unit Maintenance Troubleshooting (Continued).

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

5. ABNORMAL NOISE.

Disconnect all electrical power to the compressor. Disconnect piping. Remove four bolts (1), head (2), and gasket (3). Inspect for loose valve assembly and for signs of piston striking head. Repeat for other two cylinders.



If valve is loose, tighten valve push cover (4). Install new head gasket (3), head (2), and four bolts (1). Tighten all four bolts (1) securely. Reconnect piping.

If piston was striking head, install two new gaskets (3), head (2), and four bolts (1). Tighten all four bolts (1) securely. Reconnect piping.

If the above corrective actions do not correct the malfunction, notify Forward Intermediate Maintenance of possible defective crankshaft or piston bearing.

6. LITTLE OR NO AIR PRESSURE BUILDUP.

Step 1. Inspect for leaking drain cock.

If drain cock is leaking, replace the drain cock (para 3-26).

If drain cock is not leaking, proceed to step 2.

Step 2. Inspect for leaks by applying a soapy solution to valve body.

Pull out ring and release, valve should seat.

If safety valve is leaking or defective, replace safety valve (para 3-23).

If safety valve is not leaking or defective, proceed to step 3.

Table 3-2. Unit Maintenance Troubleshooting (Continued).

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

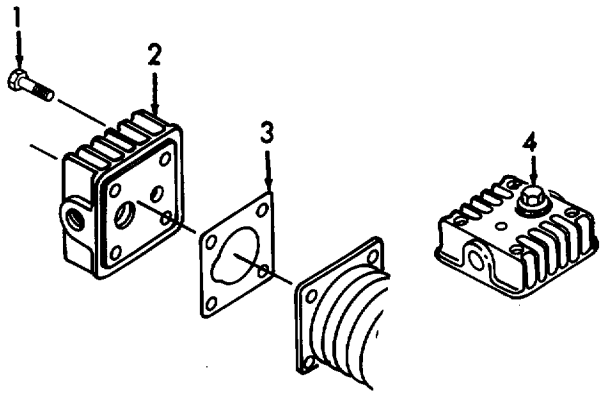
6. LITTLE OR NO AIR PRESSURE BUILDUP (Continued).

Step 3. Check for leaking or broken tubing.

If tubing is defective, replace defective tubing (para 3-20).

If tubing is not defective, proceed to step 4.

Step 4. Disconnect all electrical power to the compressor. Disconnect piping. Remove four bolts (1), head (2), and gasket (3). Inspect for loose, damaged or dirty valve assemblies. Inspect for cracks, torn or defective head gasket. Repeat for other two cylinders.



If valve is loose, tighten valve push cover (4). Install new head gasket (3), head (2), and four bolts (1). Tighten all four bolts (1) securely. Reconnect piping.

If valve assembly is damaged replace valve assembly. Install new head gasket (3), head (2), and four bolts (1). Tighten all four bolts (1) securely. Reconnect piping.

If valve assembly is dirty, clean valve assembly. Install new head gasket (3), head (2), and four bolts (1). Tighten all four bolts (1) securely. Reconnect piping.

If head gasket is defective, replace head gasket. Install new head gasket (3), head (2), and four bolts (1). Tighten all four bolts (1) securely. Reconnect piping.

If the above steps do not correct the malfunction, notify Forward Intermediate Maintenance.

Table 3-2. Unit Maintenance Troubleshooting (Continued).

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

7. PRESSURE GAGE INACCURATE.

Check for damaged/defective pressure gage.

Replace damaged/defective pressure gage (para 3-25).

8. EXCESSIVE OIL CONSUMPTION.

Notify Forward Intermediate Maintenance.

9. BELTS SLIP.

Step 1. Inspect for worn belts.

If belts are worn, replace with new belts (para 3-14).

If belts are not worn, proceed to step 2.

Step 2. Inspect for proper belt tension (para 3-14).

If belt tension is improper, adjust belt tension (para 3-14).

10. MOTOR OVERHEATS.

Check for line voltage of 115 vac.

If line voltage is not 115 vac, notify your supervisor.

If line voltage is proper, notify Forward Intermediate Maintenance.

Table 3-2. Unit Maintenance Troubleshooting (Continued).

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
11. MOTOR WILL NOT START.
Step 1. Check air pressure gage.
If air pressure gage indicates above 200 psi (14.1 kgs/cm^2) motor is not supposed to start.
Pull safety valve ring to reduce pressure to 160 psi.
If air pressure gage indicates below 175 psi (12.3 kgs/cm^2), proceed to step 2.
Step 2. Check for proper operation of pressure switch.
If pressure switch is defective, replace pressure switch (para 3-12).
Design cut in pressure is 175 psi ±10 psi (12.5 ± 0.70 kgs/cm^2) and cut out pressure 200 psi to -10 psi.
If pressure switch is not defective, proceed to step 3.
Step 3. Push RESET switch.
If RESET switch does not reset circuit breaker, replace RESET switch (para 3-11).
If motor does not start, proceed to step 4.
Step 4. Loosen belt and try to turn the compressor by hand.
If compressor does not turn, replace the compressor (para 3-16).
If compressor turns, proceed to step 5.
Step 5. Check for 115 vac at motor.
If 115 vac is present, replace the motor (para 3-22).
If 115 vac is not present, proceed to step 6.
Step 6. Check for proper operation of On/Off switch.
If On/Off switch is defective, replace On/Off switch (para 3-11).
If On/Off switch is not defective, notify Forward Intermediate Maintenance.

Section VI. MAINTENANCE OF MOTOR CONTROLS

	Para.		Para.
Motor Starter Box		Pressure Switch	
Assembly	3-11f	Adjustment	3-12f
Cleaning	3-11c	Cleaning	3-12b
Disassembly	3-11b	Inspection	3-12c
Inspection	3-11d	Installation	3-12e
Installation 3	3-11g	Removal	3-12a
Removal	3-11a	Repair	3-12d
Repair	3-11e		

3-11. MOTOR STARTER BOX.

This task covers:

a. Removal b. Disassembly c. Cleaning d. Inspection
e. Repair f. Assembly g. Installation

SET-UP:

Tools: Common screwdriver
Phillips screwdriver
Pliers, water pump
1/4 inch wrench (2 each)

Materials: Brush, Medium Bristle (Appendix E, item 4)
Cloth, Lint-Free (Appendix E, item 3)
Solvent, Dry Cleaning (Appendix E, item 2)

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

Personnel: 1 Person

Equipment Conditions: Electrical power removed at master control panel.
Tank drain cock open and air bleed off (para. 2-2a &b).

GO TO NEXT PAGE

3-11. MOTOR STARTER BOX - Continued.

a. Removal. (Refer to Figure 3-3).

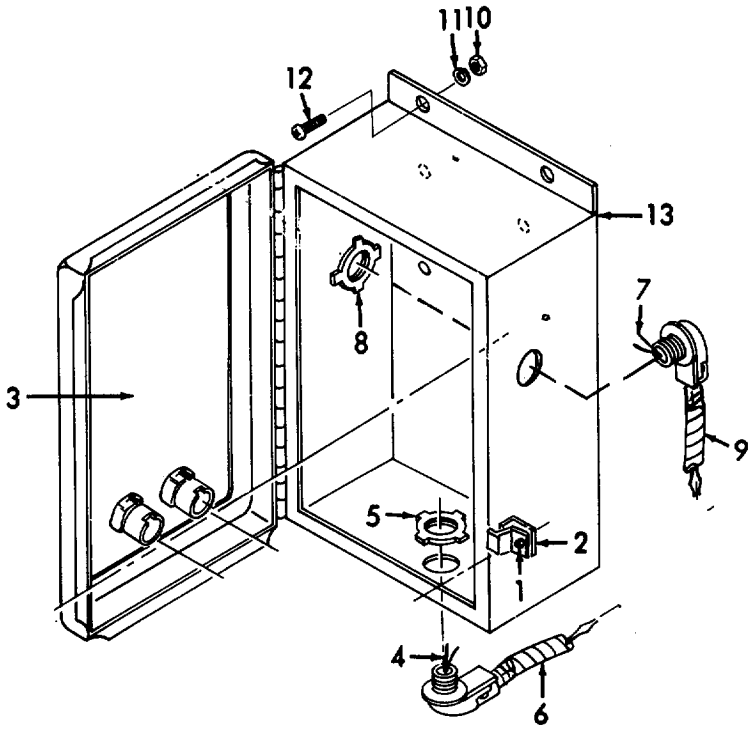


Figure 3-3. Motor Starter Box, Removal.

(1) Loosen both screws (1) and slip clamps (2) off lip of door (3) and open door (3).

(2) Tag and disconnect power source wiring.

(3) Tag and disconnect motor wiring (4).

(4) Remove nut (5) and then remove conduit (6).

(5) Tag and disconnect pressure switch wiring (7).

(6) Remove nut (8) and then remove conduit (9).

(7) Remove four nuts (10), four lockwashers (11), four bolts (12), and motor starter box (13).

GO TO NEXT PAGE

3-11. MOTOR STARTER BOX - Continued.

b. Disassembly. (Refer to Figure 3-4).

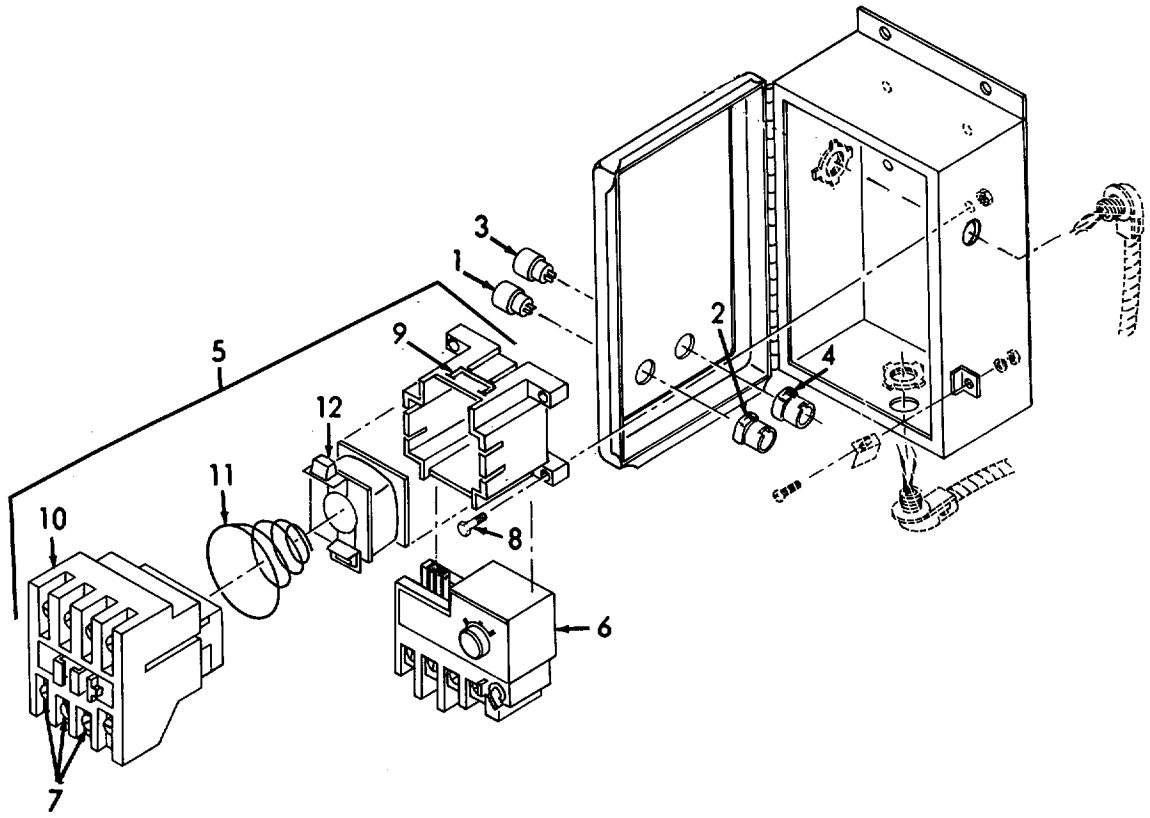


Figure 3-4. Starter Box, Disassembly.

(1) Tag and disconnect wiring from on/off switch (1).

(2) Loosen two screws (2) and turn rear of switch one-quarter turn counterclockwise. Remove switch (1).

(3) Loosen two screws (4) and turn rear of RESET switch one- quarter turn counterclockwise. Remove switch (3).

(4) Tag and disconnect wiring from the contactor (5) and the overload (6).

(5) Loosen screws connecting T1, T2, and T3 (7) on contactor (5).

(6) Remove overload assembly (6) by pulling straight down.

(8) Remove two screws (8) and contactor (5).

(9) Unhook two spring clips (9) and remove cover (10), spring (11), and coil (12).

GO TO NEXT PAGE

3-11. MOTOR STARTER BOX - Continued.

c. Cleaning.

(1) Remove all buildup of dirt, grease, etc. by wiping with a soft cloth (Appendix E, item 3).

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well-ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

(2) Clean using a--clean, soft cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 4) and cleaning solvent (Appendix E, item 2).

d. Inspection.

(1) Inspect for missing or damaged hardware.

2) Inspect box for damage.

(3) Inspect switches for damage.

(4) Inspect wiring for damage.

(5) Inspect contactor for damage.

(6) Inspect overload for damage.

e. Repair. Repair of the motor starter box is limited to the replacement of defective components at the Unit Maintenance Level.

NOTE

When installing new overload, set overload at 30 amps.

GO TO NEXT PAGE

3-11. MOTOR STARTER BOX - Continued.

f. Assembly. (Refer to Figure 3-5).

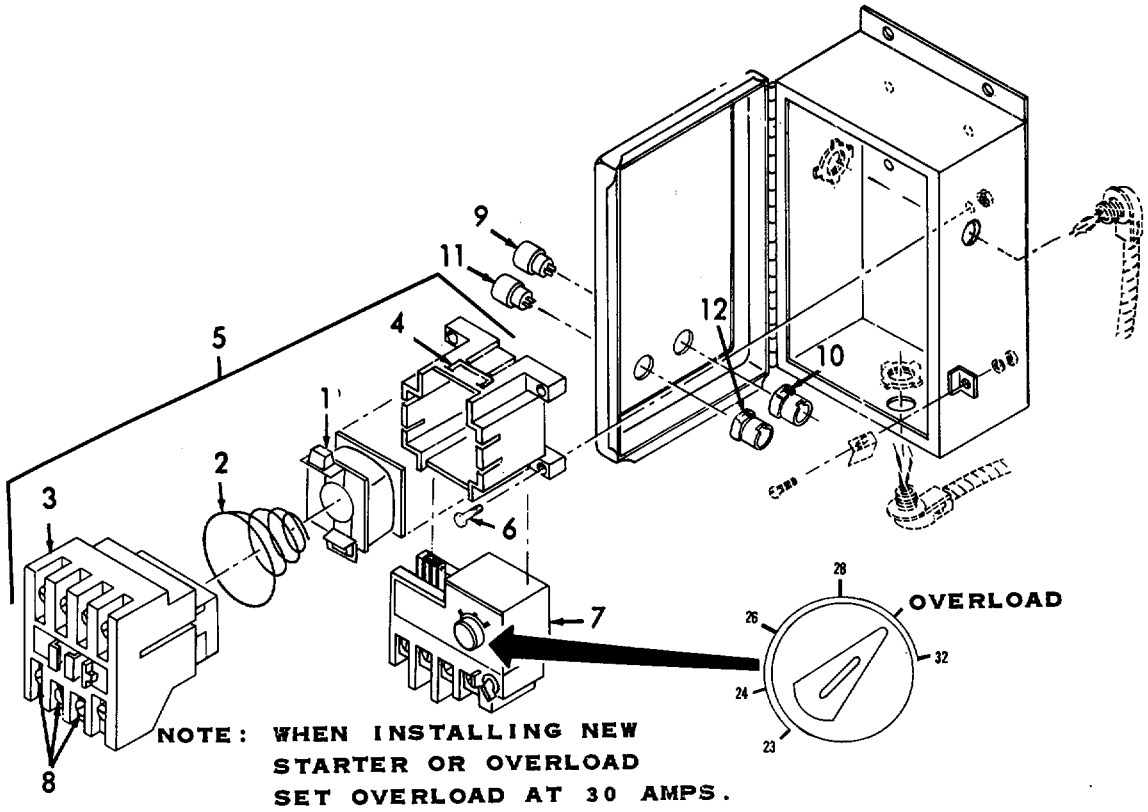


Figure 3-5. Starter Box, Assembly.

(1) Install coil (1), spring (2), and cover (3). Secure with two spring clips (4).

(2) Install contactor (5) and secure with two screws (6).

(3) Install overload (7) by pushing straight up and secure by tightening screws T1, T2, and T3 (8).

(4) Connect the wiring to the overload (7) and to the contactor (5) per the tagged identification.

(5) Install the rear of the switch and the RESET switch (9) and then turn the switch one-quarter turn clockwise. Secure by tightening two screws (10).

(6) Install the rear of the switch and the on/off switch (11) and then turn the switch one-quarter turn clockwise. Secure by tightening the two screws (12).

(7) Connect the wiring to the switch (11) per the tagged identification.

GO TO NEXT PAGE

3-11. MOTOR STARTER BOX - Continued.

g. Installation. (Refer to Figure 3-6).

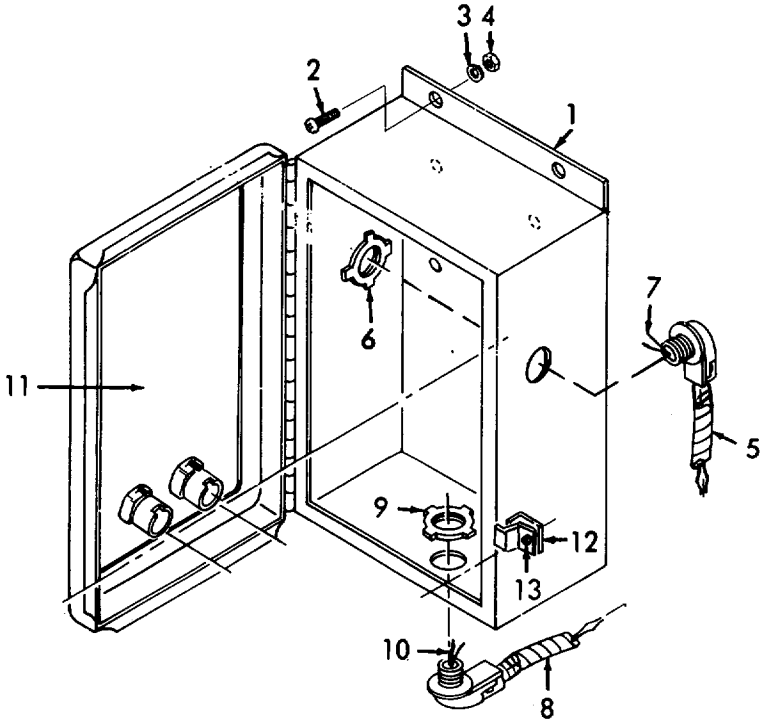


Figure 3-6. Motor Starter Box, Installation.

(1) Install motor starter box (1) into position and secure with four bolts (2), four lockwashers (3), and four nuts (4).

(2) Install conduit (5) into position and secure with nut (6).

(3) Connect pressure switch wiring (7) per the tagged identification.

(4) Install conduit (8) into position and secure with nut (9).

(5) Connect motor wiring (10) per the tagged identification.

(6) Connect the power source wiring per the tagged identification.

(7) Close door (11) and slip clamps (12) over lip of door. Tighten both screws (13).

END OF TASK

3-12. PRESSURE SWITCH.

This task covers:

a. Removal b. Cleaning c. Inspection d. Repair
e. Installation f. Adjustment

SET-UP:

Tools: Pliers, water pump
1/2 inch wrench
1/4 inch wrench
Common screwdriver

Materials: Brush, Medium Bristle (Appendix E, item 4)
Cloth, Lint-Free (Appendix E, item 3)
Solvent, Dry Cleaning (Appendix E, item 2)

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

Personnel: 1 Person

Equipment Conditions: Electrical power removed at master control panel. Tank drain cock open and air bleed off (para. 2-2a &b). Motor starter box removed (para. 3-11a).

GO TO NEXT PAGE

3-12. PRESSURE SWITCH - Continued.

a. Removal. (Refer to Figure 3-7).

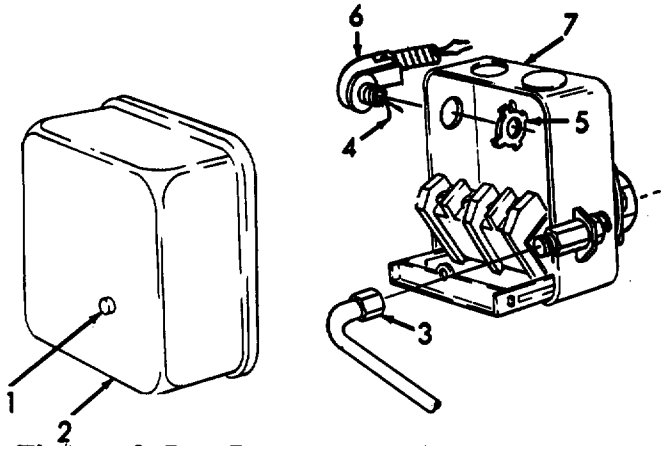


Figure 3-7. Pressure Switch, Removal.

(1) Loosen bolt (1) and remove cover (2).

(2) Disconnect unloader tube at check valve then back off nut (3) and remove unloader tube.

(3) Tag and disconnect wiring (4).

(4) Remove nut (5) and separate conduit (6) from pressure switch (7).

(5) Remove pressure switch from piping by turning counter-clockwise.

b. Cleaning.

(1) Remove all buildup of dirt, grease, etc. by wiping with a soft cloth (Appendix E, item 3).

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well-ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

(2) Clean using a clean, soft cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 4) and cleaning solvent (Appendix E, item 2).

GO TO NEXT PAGE

3-12. PRESSURE SWITCH - Continued.

b. Cleaning-Continued.

(3) Allow to dry.

c. Inspection.

(1) Inspect for missing or damaged hardware.

(2) Inspect pressure switch for damage.

d. Repair. Repair of the pressure switch is limited to the replacement of the component parts contained in the pressure switch repair kit (refer to TM 5-4310-377-23P) . Refer to Figure 3-8 and proceed as follows to repair the pressure switch.

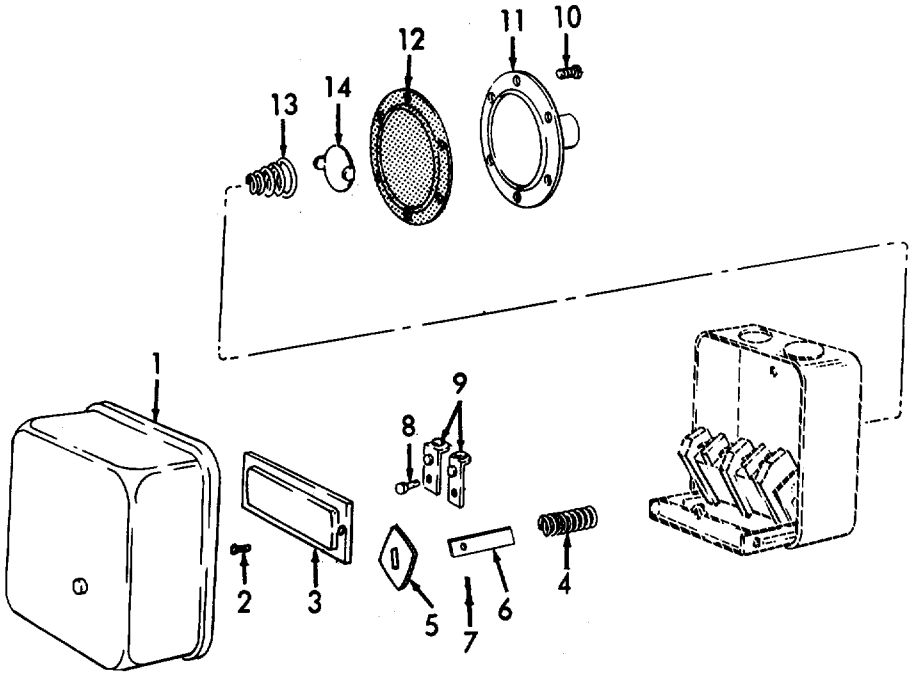


Figure 3-8. Pressure Switch Repair.

(1) Open the housing cover (1).

(2) Remove two screws (2) and carefully remove cover (3) while taking care that the springs (4) do not fly off the contacts (5).

GO TO NEXT PAGE

3-12. PRESSURE SWITCH - Continued.

d. Repair-Continued.

(3) Remove and discard two springs (4), two movable contacts (5), two pushrods (6), and two pins (7).

(4) Remove two screws (8) and four stationary contacts (9). Discard the stationary contacts (9).

(5) Remove six screws (10), diaphragm housing (11), and diaphragm (12), spring (13), and plate (14). Discard diaphragm (12).

(6) Discard the long pushrods and open wound springs from the repair kit.

(7) Install the plate (14), spring (13), new diaphragm (12) and diaphragm housing (11) into position and secure with six screws (10).

(8) Install four new stationary contacts (9) and secure with two screws (8).

(9) Install two new movable contacts (5) and two new pins (7) to the two new pushrods (6).

(10) Install pushrods (6), and two new springs (4).

(11) Install cover (3) and secure with two screws (2).

(12) Close housing cover (1).

e. Installation. (Refer to Figure 3-9).

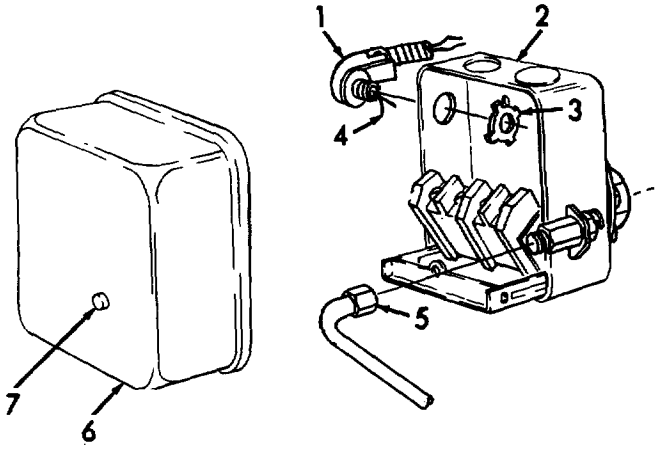


Figure 3-9. Pressure Switch, Installation.

GO TO NEXT PAGE

3-12. PRESSURE SWITCH - Continued.

e. Installation-Continued.

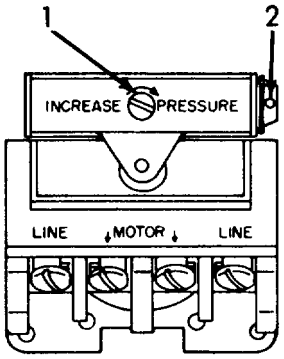
(1) Install conduit (1) to pressure switch (2) and secure with nut (3).

(2) Connect motor starter box wiring (4) per tagged identification.

(3) Connect unloader tube to pressure switch (2) and tighten nut (5) securely.

(4) Install cover (6) and secure with bolt (7).

f. Adjustment. (Refer to Figure 3-10).



NOTE

Run compressor and observe pressure gage to monitor cut-in/out pressure.

Figure 3-10. Pressure Switch, Adjustment.

NOTE

The design cut in pressure is 175 psi ± 10 psi (12.5 ± 0.70 kgs/cm2) and cut out pressure is 200 psi to -10 psi.

(1) To increase the cut-in/out pressure, turn screw (1) clockwise.

(2) To decrease the cut-in/out pressure, turn screw (1) counterclockwise.

(3) To increase the difference between the cut-in and cut-out pressure, turn screw (2) clockwise.

(4) To decrease the difference between the cut-in and cut-out pressure, turn screw (2) counterclockwise.

END OF TASK

Section VII. MAINTENANCE OF COMPRESSOR DRIVE

	Para.
Drive Belts	
Cleaning	3-14b
Inspection	3-14c
Installation	3-14e
Removal	3-14a
Repair	3-14d
Drive Pulley	
Cleaning	3-15b
Inspection	3-15c
Installation	3-15e
Drive Pulley (Cont.)	
Removal	3-15a
Repair	3-15d
Guard Assembly	
Cleaning	3-13b
Inspection	3-13c
Installation	3-13e
Removal	3-13a
Repair	3-13d

3-13. GUARD ASSEMBLY.

This task covers:

a. Removal b. Cleaning c. Inspection d. Repair
e. Installation

SET-UP:

Tools: 7/16 inch wrench (2 each)
1/2 inch wrench (2 each)
13 mm wrench
Common screwdriver

Materials: Brush, Medium Bristle (Appendix E, item 4)
Cloth, Lint-Free (Appendix E, item 3)
Solvent, Dry Cleaning (Appendix E, item 2)

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

Personnel: 1 Person

Equipment Conditions: Electrical power removed at master control panel.
Tank drain cock open and air bleed off (para. 2-2a &b).

GO TO NEXT PAGE

3-13. GUARD ASSEMBLY - Continued.

a. Removal. (Refer to Figure 3-11).

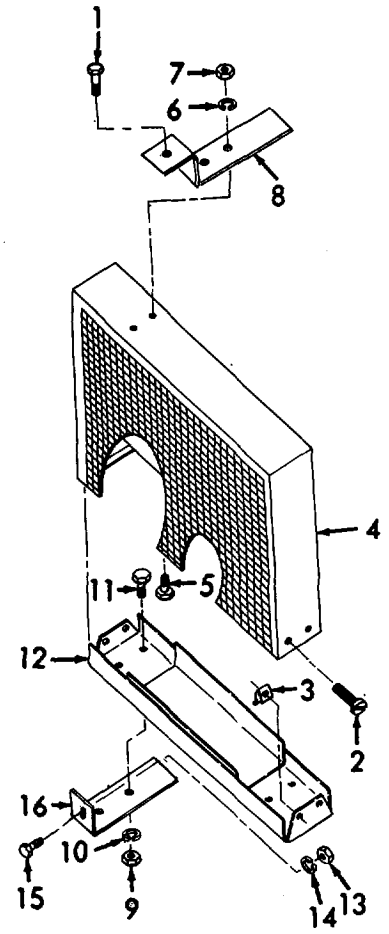


Figure 3-11. Guard Assembly, Removal.

(1) Remove headbolt (1).

(2) Remove four screws (2), four nuts (3), and upper belt guard (4). Remove two bolts (5), two lockwashers (6), two nuts (7), and bracket (8).

(3) Remove four nuts (9), four lockwashers (10), four bolts (11), and lower belt guard (12).

(4) Remove nut (13), lockwasher (14), bolt (15), and bracket (16).

Repeat for other bracket.

GO TO NEXT PAGE

3-13. GUARD ASSEMBLY - Continued.

b. Cleaning.

(1) Remove all buildup of dirt, grease, etc. by wiping with a soft cloth (Appendix E, item 3).

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well-ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

(2) Clean using a clean, soft cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 4) and cleaning solvent (Appendix E, item 2).

c. Inspection.

(1) Inspect for missing or damaged hardware.

(2) Inspect upper belt guard for damage.

(3) Inspect lower belt guard for damage.

(3) Inspect brackets for damage.

d. Repair. Repair of the guard assembly is limited to the replacement of defective components at the Unit Maintenance Level.

GO TO NEXT PAGE

3-13. GUARD ASSEMBLY - Continued.

e. Installation. (Refer to Figure 3-12).

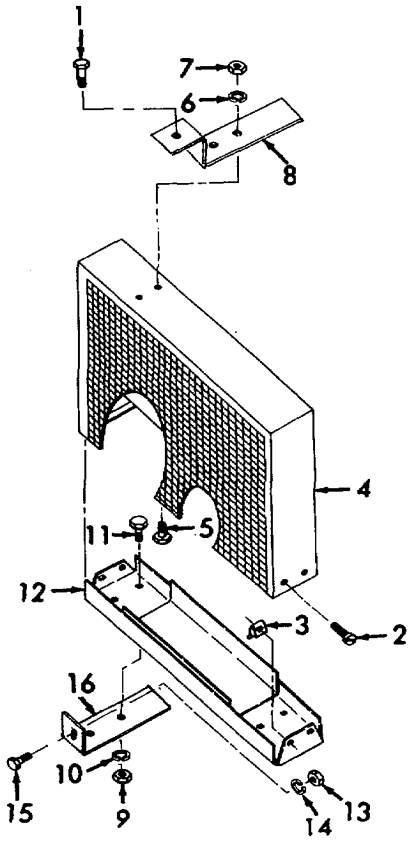


Figure 3-12. Guard Assembly, Installation.

(1) Install bracket (16) and secure with bolt (15), lockwasher (14), and nut (13). Repeat for other bracket.

(2) Install lower belt guard (12) into position and secure with four bolts (11), four lockwashers (10) and four nuts (9).

(3) Install bracket (8) and secure with two nuts (7), two lockwashers (6), and two bolts (5).

(4) Install upper belt guard (4), nut (3), and secure with four screws (2).

(5) Install headbolt (1).

END OF TASK

3-14. DRIVE BELTS.

This task covers:

a. Removal b. Cleaning c. Inspection d. Replace
e. Installation

SET-UP:

Tools: 1/2 inch wrench

Materials: Brush, Medium Bristle (Appendix E, item 4)
Cloth, Lint-Free (Appendix E, item 3)
Solvent, Dry Cleaning (Appendix E, item 2)

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

Personnel: 1 Person

Equipment Conditions: Electrical power removed at master control panel.
Tank drain cock open and air bleed off (para. 2-2).
Guard assembly removed (para. 3-13a).

a. Removal. (Refer to Figure 3-13).

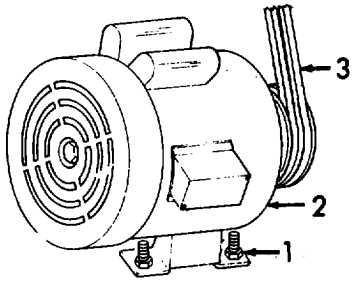


Figure 3-13. Drive Belts, Removal.

(1) Loosen four nuts (1) on motor holddown bolts.

(2) Slide motor (2) until belts (3) are loose.

(3) Remove belts (3).

GO TO NEXT PAGE

3-14. DRIVE BELTS - Continued.

b. Cleaning.

(1) Wash the belts in a mild solution of soap (Appendix E, item 5).

2) Rinse thoroughly with clean water.

(3) Allow to dry.

c. Inspection. Inspect the belts for damage.

d. Replace. Replace defective drive belts.

e. Installation. (Refer to Figure 3-14).

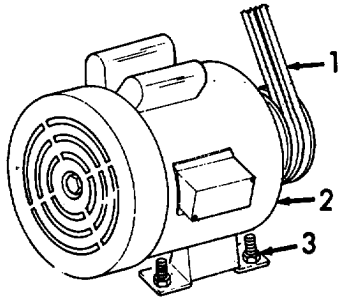


Figure 3-14. Drive Belts, Installation.

(1) Install belts (1) into position.

(2) Move motor (2) until the belt deflection at the mid-point between the pulleys is 3/8 to 1/2 inch.

(3) Tighten the four nuts (3) on the motor holddown bolts.

END OF TASK

3-15. DRIVE PULLEY.

This task covers:

a. Removal b. Cleaning c. Inspection d. Repair
e. Installation

SET-UP:

Tools: 5/16 inch wrench
Gear Puller

Materials: Brush, Medium Bristle (Appendix E, item 4)
Cloth, Lint-Free (Appendix E, item 3)
Solvent, Dry Cleaning (Appendix E, item 2)

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

Personnel: 1 Person

Equipment Conditions: Electrical power removed at master control panel.
Tank drain cock open and air bleed off (para. 2-2).
Guard assembly removed (para. 3-13a).
Drive belts removed (para. 3-14a).

GO TO NEXT PAGE

3-15. DRIVE PULLEY - Continued.

a. Removal. (Refer to Figure 3-15).

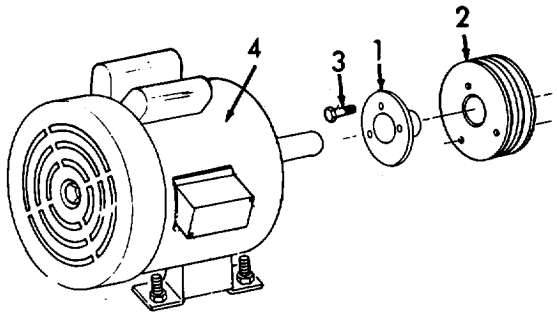


Figure 3-15. Drive Pulley, Removal.

(1) Use a gear puller and remove the pulley (1) from the motor (2).

2) Remove three bolts (3) and then remove bushing (4) from pulley (1).

b. Cleaning.

(1) Remove all buildup of dirt, grease, etc. by wiping with a soft cloth (Appendix E, item 3).

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well-ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

(2) Clean using a clean, soft cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 4) and cleaning solvent (Appendix E, item 2).

(3) Allow to dry.

GO TO NEXT PAGE

3-15. DRIVE PULLEY - Continued.

c. Inspection.

(1) Inspect for missing or damaged hardware.

(2) Inspect bushing for damage.

(3) Inspect pulley for damage.

d. Repair. Repair of the drive pulley is limited to the replacement of defective components at the Unit Maintenance level.

e. Installation. (Refer to Figure 3-16).

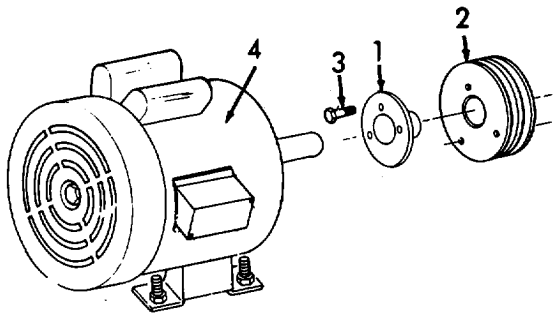


Figure 3-16. Drive Pulley, Installation.

(1) Attach bushing (1), to pulley (2) with three bolts (3).

(2) Install pulley (2) on motor (4).

END OF TASK

Section VIII. MAINTENANCE OF COMPRESSOR ASSEMBLY

Para.

Air Cleaner
- Cleaning 3-18b
- Inspection 3-18c
- Installation 3-18e
- Removal 3-18a
- Repair 3-18d

Air Compressor
- Cleaning 3-16b
- Inspection 3-16c
- Installation 3-16e
- Removal 3-16a
- Repair 3-16d

Compressor Flywheel
- Cleaning 3-17b
- Inspection 3-17c
- Installation 3-17e
- Removal..... 3-17a
- Repair..... 3-17d

Para.

Oil Filler Cap, Plug, and Sight Gage
- Cleaning 3-19b
- Inspection 3-19c
- Installation 3-19e
- Removal 3-19a
- Repair 3-19d

Tube Assemblies
- Cleaning 3-20b
- Inspection 3-20c
- Installation 3-20e
- Removal..... 3-20a
- Repair 3-20d

Valve Assemblies
- Assembly 3-22f
- Cleaning 3-22c
- Disassembly 3-22b
- Inspection 3-22d
- Installation 3-22g
- Removal 3-22a
- Repair 3-21e

3-16. AIR COMPRESSOR.

This task covers:

a. Removal b. Cleaning c. Inspection d. Repair
e. Installation

SET-UP:

Tools: 13mm Wrench

Materials: Brush, Medium Bristle (Appendix E, item 4)
Cloth, Lint-Free (Appendix E, item 3)
Solvent, Dry Cleaning (Appendix E, item 2)

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well-ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

Personnel: 1 Person

Equipment Conditions: Electrical power removed at master control panel.
Tank drain cock open and air bleed off (para. 2-2).
Guard assembly removed (para. 3-13a).
Drive belts removed (para. 3-14a).
Tube assemblies removed (para 3-20a).

GO TO NEXT PAGE

3-16. AIR COMPRESSOR - Continued.

a. Removal. (Refer to Figure 3-17).

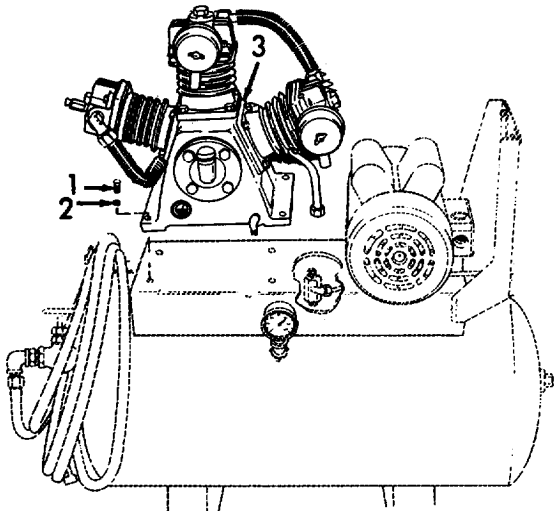


Figure 3-17. Air Compressor, Removal.

(1) Remove four bolts (1) and four lockwashers (2).

(2) Remove the air compressor (3).

b. Cleaning.

(1) Remove all buildup of dirt, grease, etc. by wiping with a soft cloth (Appendix E, item 3).

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well-ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

(2) Clean using a clean, soft cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 4) and cleaning solvent (Appendix E, item 2).

(3) Allow to dry.

GO TO NEXT PAGE

3-16. AIR COMPRESSOR - Continued.

c. Inspection.

(1) Inspect for missing or damaged hardware.

(2) Inspect air compressor for damage.

d Repair. Repair is limited to the replacement defective components at the Unit Maintenance level as defined by the MAC (Appendix B).

e. Installation. (Refer to Figure 3-18).

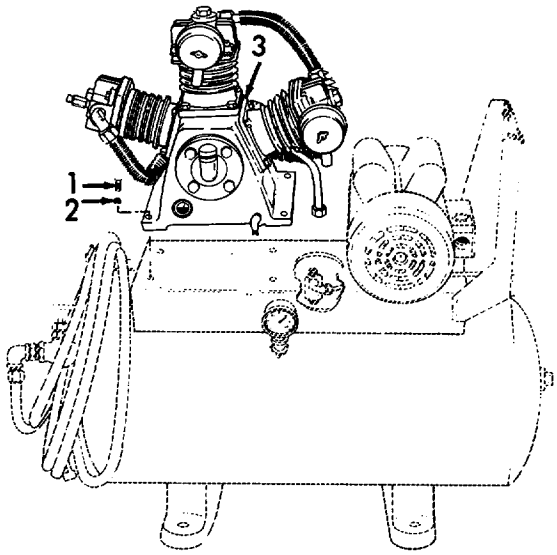


Figure 3-18. Air Compressor, Installation.

(1) Install air compressor (3) into position.

(2) Install four lockwashers (2) and four bolts (1).

END OF TASK

3-17. COMPRESSOR FLYWHEEL.

This task covers:

a. Removal b. Cleaning c. Inspection d. Replace
e. Installation

SET-UP:

Tools: 13mm Wrench
Gear Puller

Materials: Brush, Medium Bristle (Appendix E, item 4)
Cloth, Lint-Free (Appendix E, item 3)
Solvent, Dry Cleaning (Appendix E, item 2)

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

Personnel: 1 Person

Equipment Conditions: Electrical power removed at master control panel.
Tank drain cock open and air bleed off (para. 2-2).
Guard assembly removed (para. 3-13a).
Drive belts removed (para. 3-14a).

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3-17. COMPRESSOR FLYWHEEL - Continued.

a. Removal. (Refer to Figure 3-19).

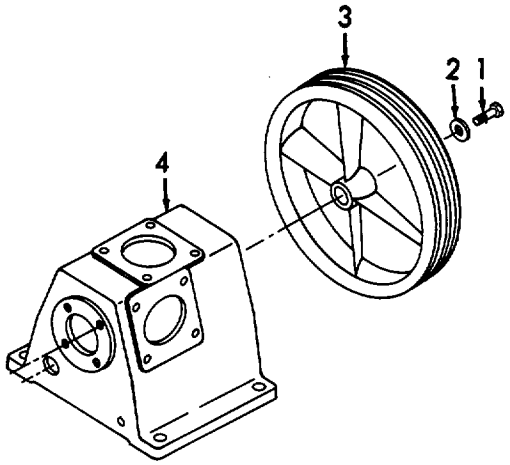


Figure 3-19. Compressor Flywheel, Removal.

(1) Remove bolt (1) and washer (2).
(2) Use a gear puller and remove the compressor flywheel (3) from the motor (4).

b. Cleaning.

(1) Remove all buildup of dirt, grease, etc. by wiping with a soft cloth (Appendix E, item 3).

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well-ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

(2) Clean using a clean, soft cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 4) and cleaning solvent (Appendix E, item 2).

(3) Allow to dry.

GO TO NEXT PAGE

3-17. COMPRESSOR FLYWHEEL - Continued.

c. Inspection.

(1) Inspect for missing or damaged hardware.

(2) Inspect compressor flywheel for damage.

d. Replace. Replace defective compressor flywheel.

e. Installation. (Refer to Figure 3-20).

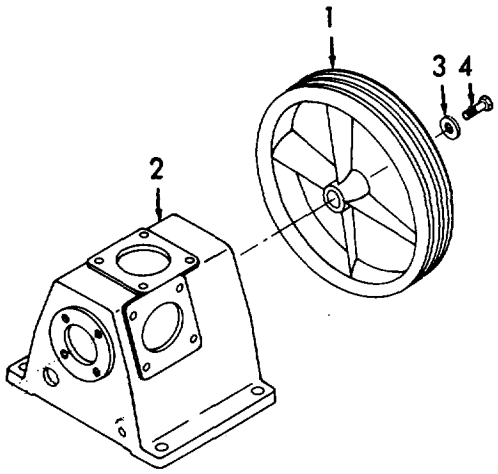


Figure 3-20. Compressor Flywheel, Installation.

(1) Install compressor flywheel (1) to compressor (2).

(2) Install washer (3) and bolt (4).

END OF TASK

3-18. AIR CLEANER.

This task covers:

a. Removal b. Cleaning c. Inspection d. Repair
e. Installation

SET-UP:

Tools: None

Materials: Brush, Medium Bristle (Appendix E, item 4)
Cloth, Lint-Free (Appendix E, item 3)
Solvent, Dry Cleaning (Appendix E, item 2)

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

Personnel: 1 Person

Equipment Conditions: Electrical power removed at master control panel.
Tank drain cock open and air bleed off (para. 2-2).

GO TO NEXT PAGE

3-18. AIR CLEANER - Continued.

a. Removal. (Refer to Figure 3-21).

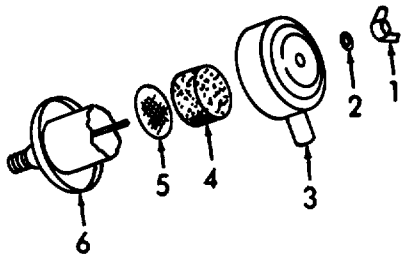


Figure 3-21. Air Cleaner, Removal.

(1) Remove wing nut (1), washer (2), and cover (3).

(2) Remove filter (4) and screen (5).

(3) Remove air cleaner body (6).

b. Cleaning.

(1) Remove all buildup of dirt, grease, etc. by wiping with a soft cloth (Appendix E, item 3).

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well-ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

(2) Clean using a clean, soft cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 4) and cleaning solvent (Appendix E, item 2).

(3) Allow to dry.

GO TO NEXT PAGE

3-18. AIR CLEANER - Continued.

c. Inspection.

(1) Inspect for missing or damaged hardware.

(2) Inspect cover for damage.

(3) Inspect filter for damage.

(4) Inspect screen for damage.

(5) Inspect body for damage.

d. Repair. Repair of the air cleaner is limited to the replacement of defective components at the Unit Maintenance level.

e. Installation. (Refer to Figure 3-22).

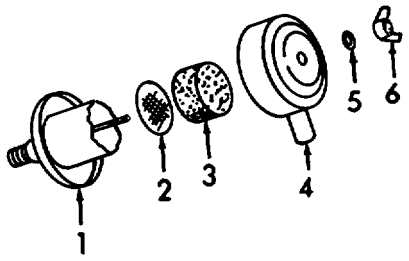


Figure 3-22. Air Cleaner, Installation.

(1) Install body (1) by hand tightening.

(2) Install screen (2) and filter (3).

(3) Install cover (4) with tube facing down, washer (5), and wing nut (6).

END OF TASK

3-19. OIL FILLER CAP, PLUG, AND SIGHT GAGE.

This task covers:

a. Removal b. Cleaning c. Inspection d. Replace
e. Installation

SET-UP:

Tools: 3/8 inch wrench
Pliers, common

Materials: Sight Gage Seal (1 each)
Lubricating Oil (Appendix E, item 1)
Brush, Medium Bristle (Appendix E, item 4)
Cloth, Lint-Free (Appendix E, item 3)
Solvent, Dry Cleaning (Appendix E, item 2)

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well- ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

Personnel: 1 Person

Equipment Conditions: Electrical power removed at master control panel.
Tank drain cock open and air bleed off (para. 2-2).
Crankcase drained (para. 3-2).

GO TO NEXT PAGE

3-1.9. OIL FILLER CAP, PLUG, AND SIGHT GAGE -Continued.

a. Removal. (Refer to Figure 3-23).

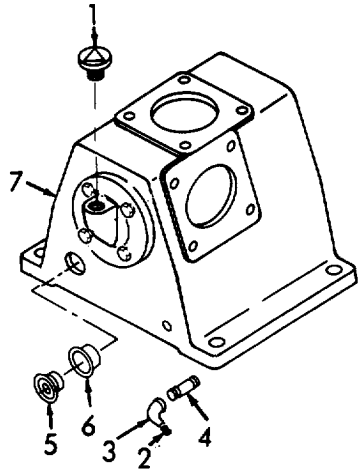


Figure 3-23. Oil Filler Cap, Plug, and Sight Gage, Removal.

(1) Remove oil filler cap (1).

(2) Remove oil plug (2), elbow (3), and nipple (4).

(3) Remove oil sight gage (5) and gage seal (6) from the crankcase

(7) Discard seal (6).

b. Cleaning.

(1) Remove all buildup of dirt, grease, etc. by wiping with a soft cloth (Appendix E, item 3).

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well-ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

(2) Clean using a clean, soft cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 4) and cleaning solvent (Appendix E, item 2).

(3) Allow to dry.

GO TO NEXT PAGE

3-19. OIL FILLER CAP, PLUG, AND SIGHT GAGE -Continued.

c. Inspection.

(1) Inspect oil filler cap for damage.

(2) Inspect oil sight gage for damage.

(3) Inspect oil drain plug for damage.

d. Replace. Replace damaged oil filler cap, plug, and sight gage.

e. Installation. (Refer to Figure 3-24).

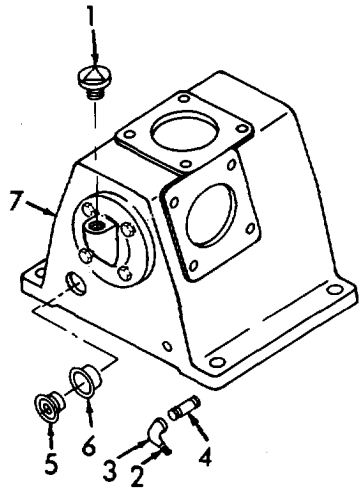


Figure 3-24. Oil Filler Cap, Plug, and Sight Gage, Installation.

(1) Install new gage seal (6) and oil sight gage (5).

(2) Install nipple (4), elbow (3) and oil plug (2).

(3) Install oil filler cap (1) to crankcase (7).

(4) Fill the crankcase with oil in accordance with the instructions contained in paragraph 3-2.

END OF TASK

3-20. TUBE ASSEMBLIES.

This task covers:

a. Removal b. Cleaning c. Inspection d. Replace
e. Installation

SET-UP:

Tools: 9 mm wrench
24 mm wrench

Materials: Brush, Medium Bristle (Appendix E, item 4)
Cloth, Lint-Free (Appendix E, item 3)
Solvent, Dry Cleaning (Appendix E, item 2)

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well-ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

Personnel: 1 Person

Equipment Conditions: Electrical power removed at master control panel.
Tank drain cock open and air bleed off (para. 2-2).

GO TO NEXT PAGE

3-20. TUBE ASSEMBLIES - Continued.

a. Removal. (Refer to Figure 3-25).

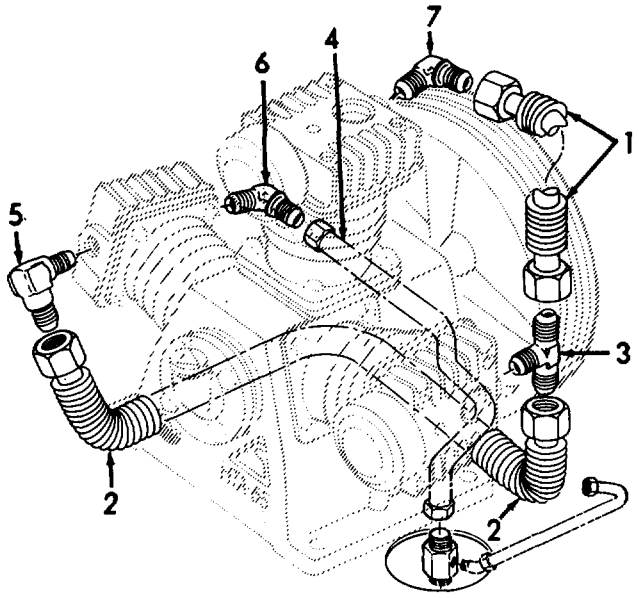


Figure 3-25. Tube Assemblies, Removal.

(1) Loosen nuts and remove intercooler tube (1) that connects the two first stage cylinders.

(2) Loosen nuts and remove intercooler tube (2) that connects the first stage and second stage.

(3) Remove tee fitting (3) from first stage cylinder.

(4) Loosen nuts and remove tube (4) that connects second stage and check valve.

(5) Remove three elbows (5, 6, and 7).

GO TO NEXT PAGE

3-20. TUBE ASSEMBLIES - Continued.

b. Cleaning.

(1) Remove all buildup of dirt, grease, etc. by wiping with a soft cloth (Appendix E, item 3).

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well-ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

(2) Clean using a clean, soft cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 4) and cleaning solvent (Appendix E, item 2).

(3) Allow to dry.

c. Inspection.

(1) Inspect intercooler tubing for damage.

(2) Inspect second stage output tube for damage.

(3) Inspect tee fitting and elbows for damage.

d. Replace. Replace defective tube assemblies, tee fitting, and elbows.

GO TO NEXT PAGE

3-20. TUBE ASSEMBLIES - Continued.

e. Installation. (Refer to Figure 3-26).

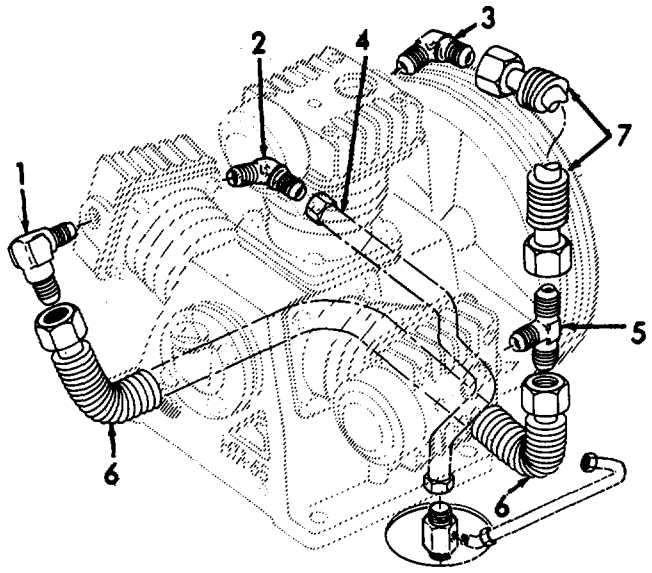


Figure 3-26. Tube Assemblies, Installation.

(1) Install three elbows (1, 2, and 3).

(2) Install tube assembly (4) to connect second stage cylinder to check valve.

(2) Install tee fitting (5) to first stage cylinder.

(3) Install intercooler tube (6) that connects first stage cylinder to second stage cylinder.

(4) Install intercooler tube (7) that connects the two first two stage cylinders.

END OF TASK

3-21. VALVE ASSEMBLIES.

This task covers:

a. Removal
b. Disassembly
c. Cleaning
d. Inspection
e. Repair
f. Assembly
g. Installation

SET-UP:

Tools: 13 mm Wrench
21 mm Wrench
Pliers, snap ring

Materials: Head Gasket (3 each)
First Stage Outlet Valve Packing (2 each)
Second Stage Outlet Valve Packing (1 each)
Brush, Medium Bristle (Appendix E, item 4)
Cloth, Lint-Free (Appendix E, item 3)
Solvent, Dry Cleaning (Appendix E, item 2)

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well-ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

Personnel: 1 Person

Equipment Conditions: Electrical power removed at master control panel.
Tank drain cock open and air bleed off (para. 2-2).
Air cleaners removed (para. 3-17).
Tubing assemblies removed (para. 3-19)

GO TO NEXT PAGE

3-21. VALVE ASSEMBLIES - Continued.

a. Removal. (Refer to Figure 3-27).

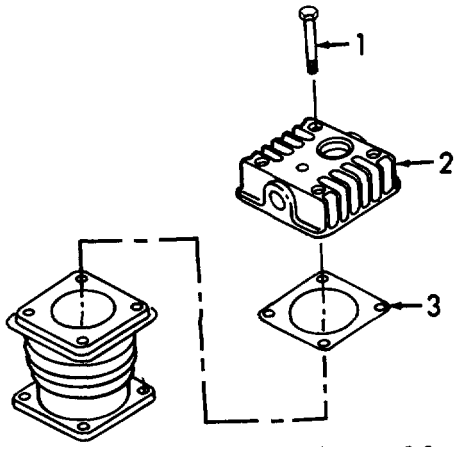


Figure 3-27. Head and Valve Assembly, Removal.

(1) Remove four bolts (1).

(2) Remove head (2) and gasket (3). Discard gasket.

b. Disassembly. (Refer to Figure 3-28).

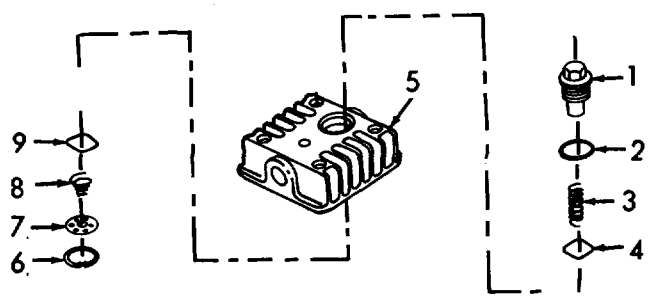


Figure 3-28. Valve Assemblies, Disassembly.

(1) Remove outlet valve push cover (1), packing (2), spring (3), and valve plate (4) from head (5). Discard packing (2).

(2) Remove snap ring (6), inlet valve receiver (7), spring (8), and valve plate (9).

GO TO NEXT PAGE

3-21. VALVE ASSEMBLIES - Continued.

c. Cleaning.

(1) Remove all buildup of dirt, grease, etc. by wiping with a soft cloth (Appendix E, item 3).

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well-ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

(2) Clean using a clean, soft cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 4) and cleaning solvent (Appendix E, item 2).

(3) Allow to dry.

d. Inspection.

(1) Inspect for missing or damaged hardware.

(2) Inspect head for damage.

(3) Inspect valve plates for damage.

(4) Inspect springs for damage.

(5) Inspect push cover for damage.

(6) Inspect valve receiver for damage.

e. Repair. Repair is limited to the replacement of defective components at the Unit Maintenance level.

GO TO NEXT PAGE

3-21. VALVE ASSEMBLIES - Continued.

f. Assembly. (Refer to Figure 3-29).

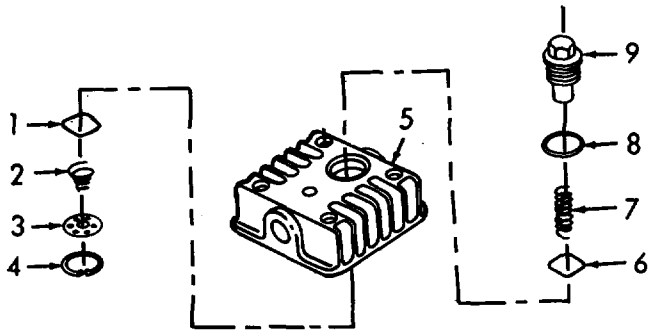


Figure 3-29. Valve Assemblies, Assembly.

(1) Install valve plate (1), spring (2), valve receiver (3), and snap ring (4) to head (5).

(2) Install valve plate (6), spring (7), new packing (8), and push cover (9).

g. Installation. (Refer to Figure 3-30).

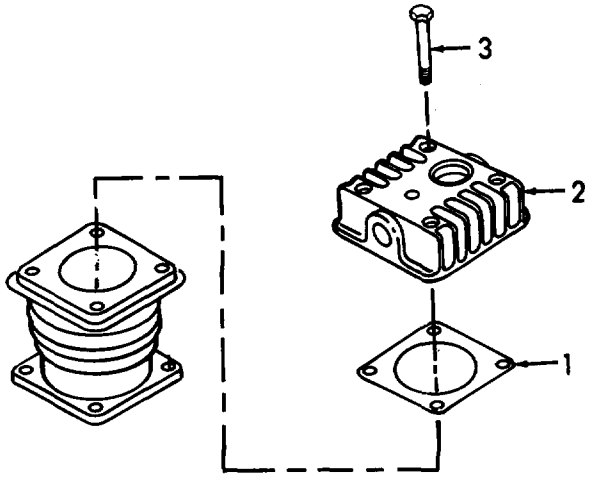


Figure 3-30. Head and Valve Assemblies, Installation.

(1) Install new head gasket (1) and head (2).

(2) Install four bolts (3).

END OF TASK

Section IX. MAINTENANCE OF ELECTRIC MOTOR

3-22.. ELECTRIC MOTOR.

This task covers:

a. Removal b. Cleaning c. Inspection d. Test
e. Replace f. Installation

SET-UP:

Tools: Common screwdriver
Pliers, water pump
1/4 inch wrench
1/2 inch wrench

Materials: Brush, Medium Bristle (Appendix E, item 4)
Cloth, Lint-Free (Appendix E, item 3)
Solvent, Dry Cleaning (Appendix E, item 2)

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well-ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

Personnel: 1 Person

Equipment Conditions: Electrical power removed at master control panel.
Tank drain cock open and air bleed off (para. 2-2).
Guard assembly removed (para. 3-13a).
Drive belts removed (para. 3-14a).
Drive pulley removed (para. 3-15a).

GO TO NEXT PAGE

3-22. ELECTRIC MOTOR - Continued.

a. Removal. (Refer to Figure 3-31).

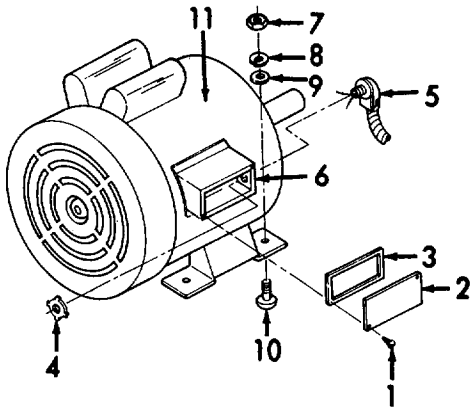


Figure 3-31. Electric Motor, Removal.

(1) Remove screw (1), cover (2), and gasket (3).

(2) Tag and disconnect motor wiring.

(3) Remove nut (4) and conduit (5) from conduit box (6).

(4) Remove four nuts (7), four lockwashers (8), four flatwashers

(9) and four screws (10).

(5) Remove motor (11).

GO TO NEXT PAGE

3-22. ELECTRIC MOTOR - Continued.

b. Cleaning.

(1) Remove all buildup of dirt, grease, etc. by wiping with a soft cloth (Appendix E, item 3).

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well-ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

(2) Clean using a clean, soft cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 4) and cleaning solvent (Appendix E, item 2).

(3) Allow to dry.

c. Inspection.

(1) Inspect for missing or damaged hardware.

(2) Inspect motor for damage.

d. Test.

(1) Check motor rotation by turning shaft. If there is any stiffness or binding, contact forward intermediate maintenance.

(2) Check motor bearing for shaft end play. If there is excessive end play, contact forward intermediate maintenance.

e. Replace. Replace a defective motor.

GO TO NEXT PAGE

3-22. ELECTRIC MOTOR - Continued.

f. Installation. (Refer to Figure 3-32).

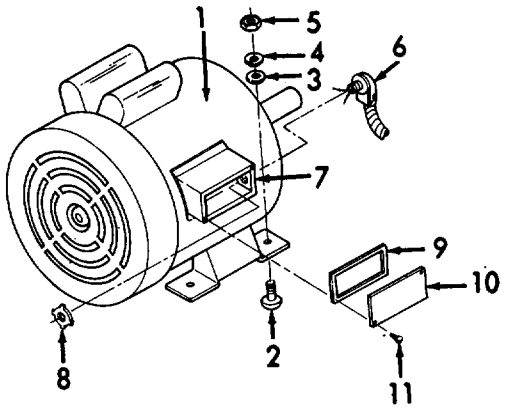


Figure 3-32. Electric Motor, Installation.

(1) Place motor (1) into position.

(2) Install four screws (2), four flat washers (3), four lockwashers

(4) and four nuts (5).

(3) Install conduit (6) to conduit box (7) and secure with nut (8).

(4) Connect motor wiring per the tagged identification.

(5) Install gasket (9), cover (10), and secure with screw (11).

END OF TASK

Section X. MAINTENANCE OF AIR RECEIVER SYSTEM

	Para.
Check Valve	
Cleaning	3-24b
Inspection	3-24c
Installation	3-24e
Removal	3-24a
Repair	3-24d
Drain Cock	
Cleaning	3-26b
Inspection	3-26c
Installation	3-26e
Removal	3-26a
Repair	3-26d
Flexible Hose	
Cleaning	3-29b
Inspection	3-29c
Installation	3-29e
Removal	3-29a
Repair	3-29d
Globe Valve	
Cleaning	3-27b
Inspection	3-27c
Installation	3-27e
Removal	3-27a
Repair	3-27d
Inflator Gage	
Cleaning	3-30b
Inspection	3-30c
Installation	3-30e
Removal	3-30a
Repair	3-30d
Pressure Gage	
Cleaning	3-25b
Inspection	3-25c
Installation	3-25e
Removal	3-25a
Repair	3-25d
Safety Valve	
Cleaning	3-23b
Inspection	3-23c
Installation	3-23e
Removal	3-23a
Repair	3-23d
Tank	
Cleaning	3-28b
Inspection	3-28c
Installation	3-28e
Removal	3-28a
Repair	3-28d

3-23. SAFETY VALVE.

This task covers:

a. Removal b. Cleaning c. Inspection d. Replace
e. Installation

SET-UP:

Tools: 3/4 inch Wrench

Materials: Brush, Medium Bristle (Appendix E, item 4)
Cloth, Lint-Free (Appendix E, item 3)
Solvent, Dry Cleaning (Appendix E, item 2)

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well-ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

Personnel: 1 Person

Equipment Conditions: Electrical power removed at master control panel.
Tank drain cock open and air bleed off (para. 2-2).

a. Removal. Unscrew and remove the safety valve (1, Figure 3-33).

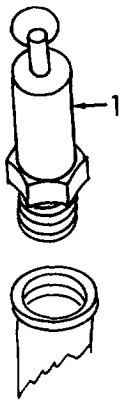


Figure 3-33. Safety Valve, Removal.

GO TO NEXT PAGE

3-23. SAFETY VALVE - Continued.

b. Cleaning.

(1) Remove all buildup of dirt, grease, etc. by wiping with a soft cloth (Appendix E, item 3).

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well-ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

(2) Clean using a clean, soft cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 4) and cleaning solvent (Appendix E, item 2).

(3) Allow to dry.

c. Inspection.

(1) Inspect for stripped threads.

(2) Inspect for signs of obvious damage.

d. Replace. Replace a defective safety valve.

GO TO NEXT PAGE

3-23. SAFETY VALVE - Continued.

e. Installation. Install the safety valve (1, Figure 3-34).

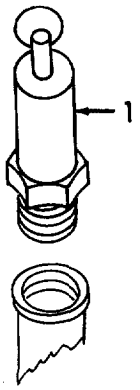


Figure 3-34. Safety Valve, Installation.

END OF TASK

3-24. CHECK VALVE.

This task covers:

a. Removal
b. Cleaning
c. Inspection
d. Replace
e. Installation

SET-UP:

Tools: 3/4 inch Wrench
24 mm Wrench
3/8 inch Wrench

Materials: Brush, Medium Bristle (Appendix E, item 4)
Cloth, Lint-Free (Appendix E, item 3)
Solvent, Dry Cleaning (Appendix E, item 2)

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well-ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

Personnel: 1 Person

Equipment Conditions: Electrical power removed at master control panel.
Tank drain cock open and air bleed off (para. 2-2).

GO TO NEXT PAGE

3-24. CHECK VALVE - Continued.

a. Removal. (Refer to Figure 3-35).

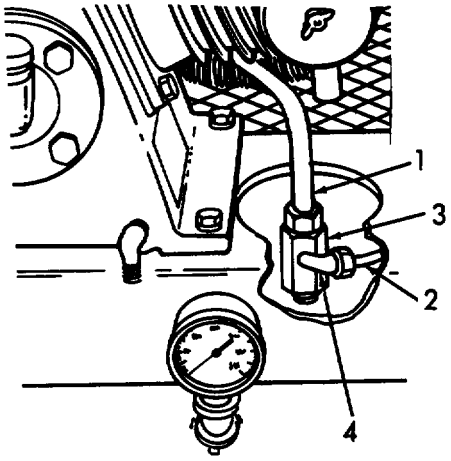


Figure 3-35. Check Valve, Removal.

(1) Disconnect input tube from compressor (1).

(2) Disconnect pressure switch unloader tube (2).

(3) Remove check valve (3).

(4) Remove elbow (4).

b. Cleaning.

(1) Remove all buildup of dirt, grease, etc. by wiping with a soft cloth (Appendix E, item 3).

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well-ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

(2) Clean using a clean, soft cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 4) and cleaning solvent (Appendix E, item 2).

(3) Allow to dry.

GO TO NEXT PAGE

3-24. CHECK VALVE - Continued.

c. Inspection.

(1) Inspect for stripped threads.

(2) Inspect for signs of obvious damage.

d. Replace. Replace a defective check valve.

e. Installation. (Refer to Figure 3-36).

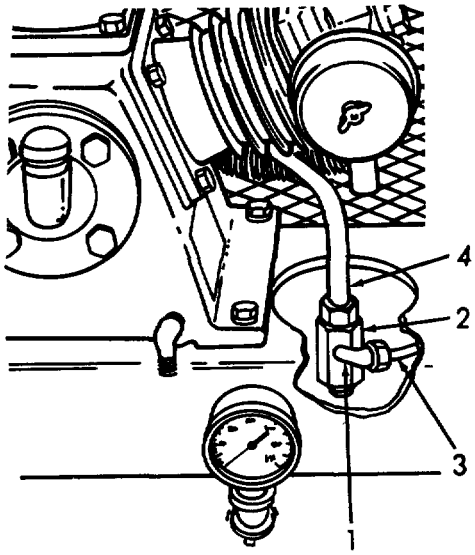


Figure 3-36. Check Valve, Installation.

(1) Install elbow (1).

(2) Install check valve (2).

(3) Connect pressure switch unloader tube (3).

(4) Connect input tube (4) from compressor.

END OF TASK

3-25. PRESSURE GAGE.

This task covers:

a. Removal b. Cleaning c. Inspection d. Replace
e. Installation

SET-UP:

Tools: 1/2 inch Wrench

Materials: Brush, Medium Bristle (Appendix E, item 4)
Cloth, Lint-Free (Appendix E, item 3)
Solvent, Dry Cleaning (Appendix E, item 2)

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well-ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

Personnel: 1 Person

Equipment Conditions: Electrical power removed at master control panel.
Tank drain cock open and air bleed off (para. 2-2).

a. Removal. Unscrew and remove pressure gage (1, Figure 3-37).

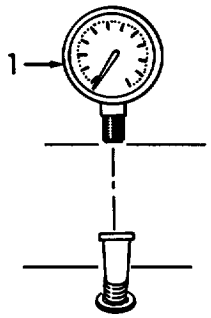


Figure 3-37. Pressure Gage, Removal.

GO TO NEXT PAGE

3-25. PRESSURE GAGE - Continued.

b. Cleaning.

(1) Remove all buildup of dirt, grease, etc. by wiping with a soft cloth (Appendix E, item 3).

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well-ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

(2) Clean using a clean, soft cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 4) and cleaning solvent (Appendix E, item 2).

(3) Allow to dry.

c. Inspection.

(1) Inspect for stripped threads.

(2) Inspect for signs of obvious damage.

d. Replace. Replace a defective pressure gage.

e. Installation. Install the pressure gage (1, Figure 3-38).

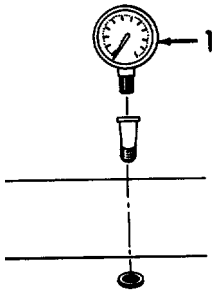


Figure 3-38. Pressure Gage, Installation.

END OF TASK

3-26. DRAIN COCK.

This task covers:

a. Removal b. Cleaning c. Inspection d. Replace
e. Installation

SET-UP:

Tools: 9/16 inch Wrench

Materials: Brush, Medium Bristle (Appendix E, item 4)
Cloth, Lint-Free (Appendix E, item 3)
Solvent, Dry Cleaning (Appendix E, item 2)

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well-ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

Personnel: 1 Person

Equipment Conditions: Electrical power removed at master control panel.
Tank drain cock open and air bleed off (para. 2-2).

a. Removal. Unscrew and remove drain cock (1, Figure 3-39).

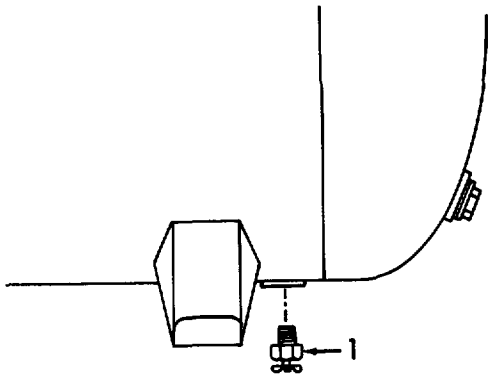


Figure 3-39. Drain Cock, Removal.

GO TO NEXT PAGE

3-26. DRAIN COCK - Continued.

b. Cleaning.

(1) Remove all buildup of dirt, grease, etc. by wiping with a soft cloth (Appendix E, item 3).

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well-ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

(2) Clean using a clean, soft cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 4) and cleaning solvent (Appendix E, item 2).

(3) Allow to dry.

c. Inspection.

(1) Inspect for stripped threads.

(2) Inspect for signs of obvious damage.

d. Replace. Replace a defective drain cock.

e. Installation. Install the drain cock (1, Figure 3-40).

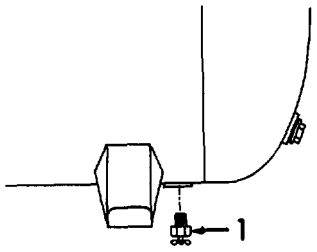


Figure 3-40. Drain Cock, Installation.

END OF TASK

3-27. GLOBE VALVE.

This task covers:

a. Removal b. Cleaning c. Inspection d. Replace
e. Installation

SET-UP:

Tools: Pipe Wrench

Materials: Brush, Medium Bristle (Appendix E, item 4)
Cloth, Lint-Free (Appendix E, item 3)
Solvent, Dry Cleaning (Appendix E, item 2)

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well-ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

Personnel: 1 Person

Equipment Conditions: Electrical power removed at master control panel.
Tank drain cock open and air bleed off (para. 2-2).

GO TO NEXT PAGE

3-27. GLOBE VALVE - Continued.

a. Removal. (Refer to Figure 3-41).

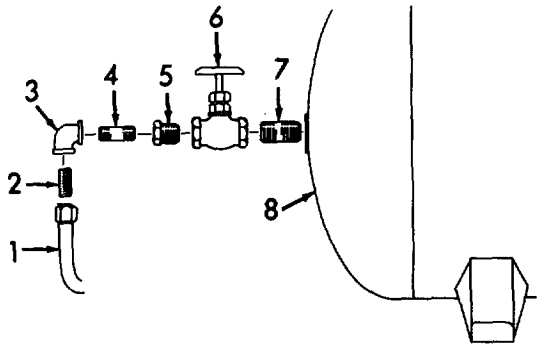


Figure 3-41. Globe Valve, Removal.

(1) Remove the flexible hose (1).

(2) Remove the nipple (2), elbow (3), nipple (4), and pipe bushing (5).

(3) Remove the globe valve (6).

(4) Remove the nipple (7) from the tank (8).

b. Cleaning.

(1) Remove all buildup of dirt, grease, etc. by wiping with a soft cloth (Appendix E, item 3).

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well-ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

(2) Clean using a clean, soft cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 4) and cleaning solvent (Appendix E, item 2).

(3) Allow to dry.

GO TO NEXT PAGE

3-27. GLOBE VALVE - Continued.

c. Inspection.

(1) Inspect for stripped threads.

(2) Inspect for signs of obvious damage.

d. Replace. Replace a defective globe valve.

e. Installation. (Refer to Figure 3-42).

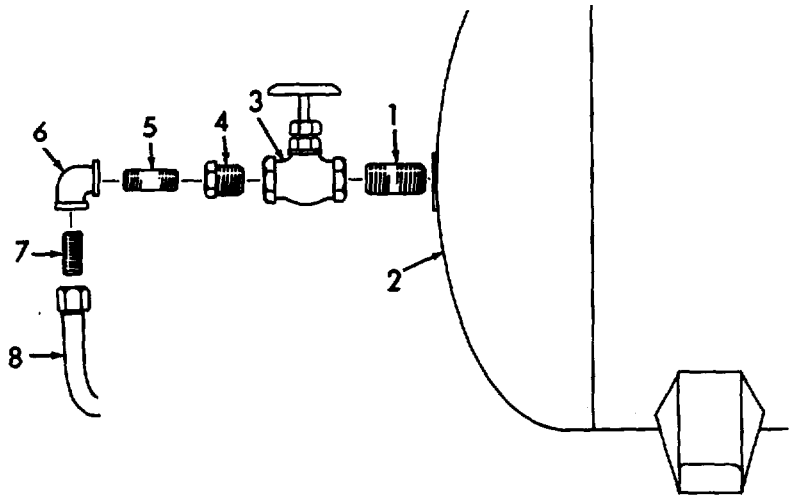


Figure 3-42. Globe Valve, Installation.

(1) Install nipple (1) to tank (2).

(2) Install globe valve (3).

(3) Install pipe bushing (4), nipple (5), and elbow (6).

(4) Install nipple (7).

(5) Install flexible hose (8).

END OF TASK

3-28. TANK.

This task covers:

a. Removal b. Cleaning c. Inspection d. Replace
e. Installation

SET-UP:

Tools: None

Materials: Mild Soap (Appendix E, Item 5)

Personnel: 1 Person

Equipment Conditions:
Electrical power removed at master control panel.
Tank drain cock open and air bleed off (para. 2-2).
Motor starter box removed (para. 3-11).
Pressure switch removed (para. 3-12).
Guard assembly removed (para. 3-13).
Drive belts removed (para. 3-14).
Electric motor removed (para. 3-22).
Check valve removed (para. 3-24).
Drain cock removed (para. 3-26).
Globe valve removed (para. 3-27).
Safety valve removed (para. 3-23).
Pressure gage removed (para. 3-25).

a. Removal. Remove tank (1, Figure 3-43).

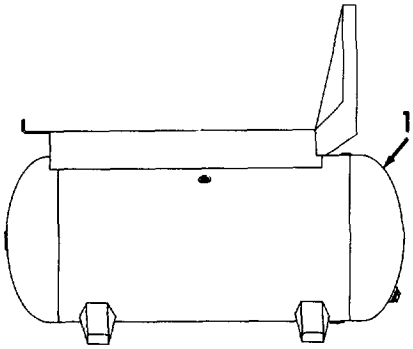


Figure 3-43. Tank, Removal.

GO TO NEXT PAGE

3-28. TANK - Continued.

b. Cleaning.

(1) Clean the tank using a solution of mild soap and water.

(2) Rinse thoroughly with clean water.

(3) Allow to dry.

c. Inspection.

(1) Inspect all threads for damage.

(2) Inspect tank for damage.

d. Replace. Replace a defective tank.

e. Installation. Install the tank (1, Figure 3-44).

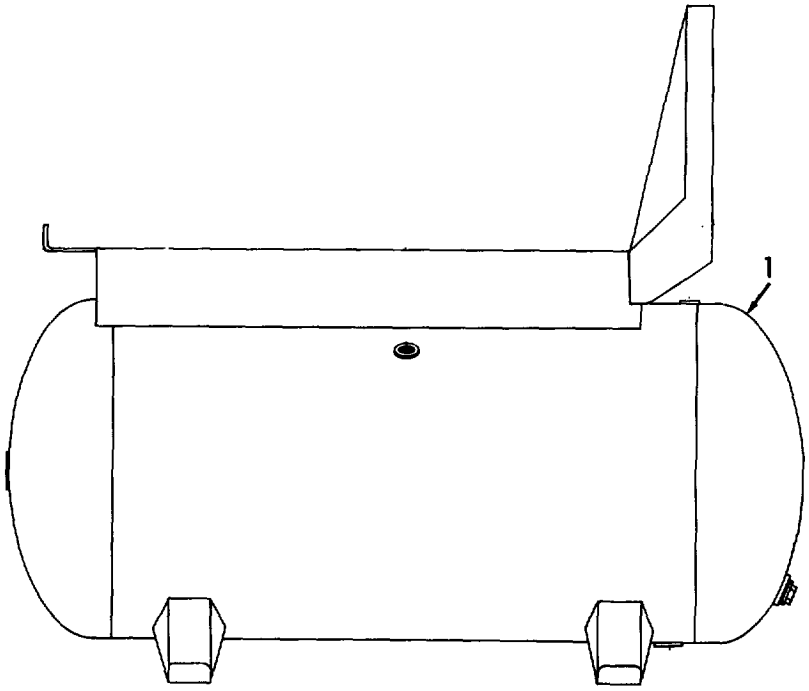


Figure 3-44. Tank, Installation.

END OF TASK

3-29. FLEXIBLE HOSE.

This task covers:

a. Removal b. Cleaning c. Inspection d. Replace
e. Installation

SET-UP:

Tools: Pipe Wrench

Materials: Mild Soap (Appendix E, Item 5)

Personnel: 1 Person

Equipment Conditions: Electrical power removed at master control panel.
Tank drain cock open and air bleed off (para. 2-2).

a. Removal. Disconnect flexible hose (1, Figure 3-45).

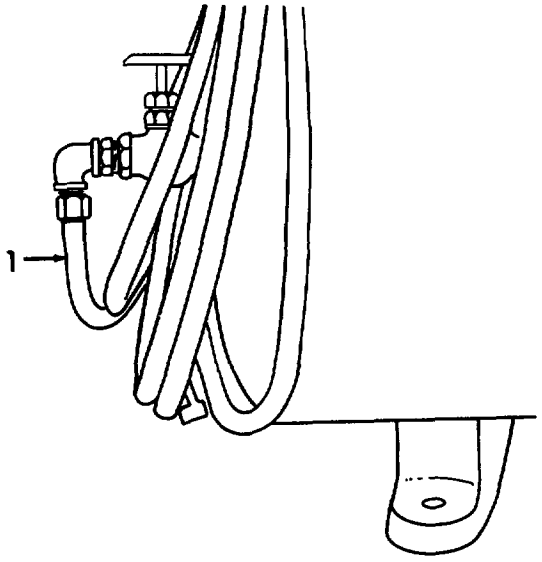


Figure 3-45. Flexible Hose, Removal.

GO TO NEXT PAGE

3-29. FLEXIBLE HOSE - Continued.

b. Cleaning.

(1) Clean the hose using a solution of mild soap and water.

(2) Rinse thoroughly with clean water.

(3) Allow to dry.

c. Inspection.

(1) Inspect fittings for damage.

(2) Inspect hose for damage.

d. Replace. Replace a defective hose.

e. installation. Connect the flexible hose (1, Figure 3-46) to the tank.

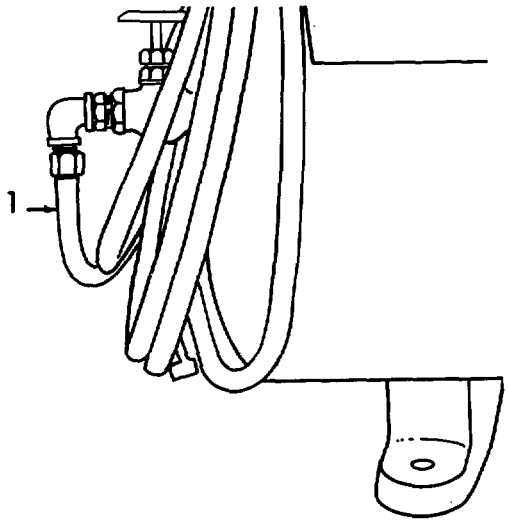


Figure 3-46. Flexible Hose, Installation.

END OF TASK

3-30. INFLATOR GAGE.

This task covers:

a. Removal b. Cleaning c. Inspection d. Replace
e. Installation

SET-UP:

Tools: Pipe Wrench

Materials: Mild Soap (Appendix E, Item 5)

Personnel: 1 Person

Equipment Conditions: Electrical power removed at master control panel.
Tank drain cock open and air bleed off (para. 2-2).

a. Removal. Disconnect inflator gage (1, Figure 3-47).

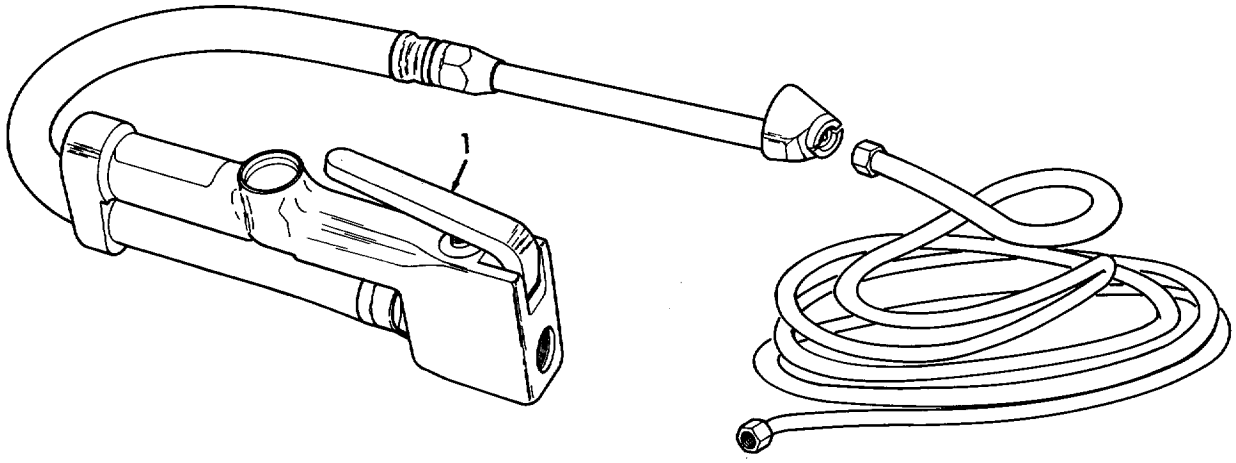


Figure 3-47. Inflator Gage, Removal.

GO TO NEXT PAGE

3-30. INFLATOR GAGE - Continued.

b. Cleaning.

(1) Clean the inflator gage using a solution of mild soap and water.

(2) Rinse thoroughly with clean water.

(3) Allow to dry.

c. Inspection.

(1) Inspect fitting for damage.

(2) Inspect inflator gage for damage.

d. Replace. Replace a defective inflator gage.

e. Installation. Connect the inflator gage (1, Figure 3-48).

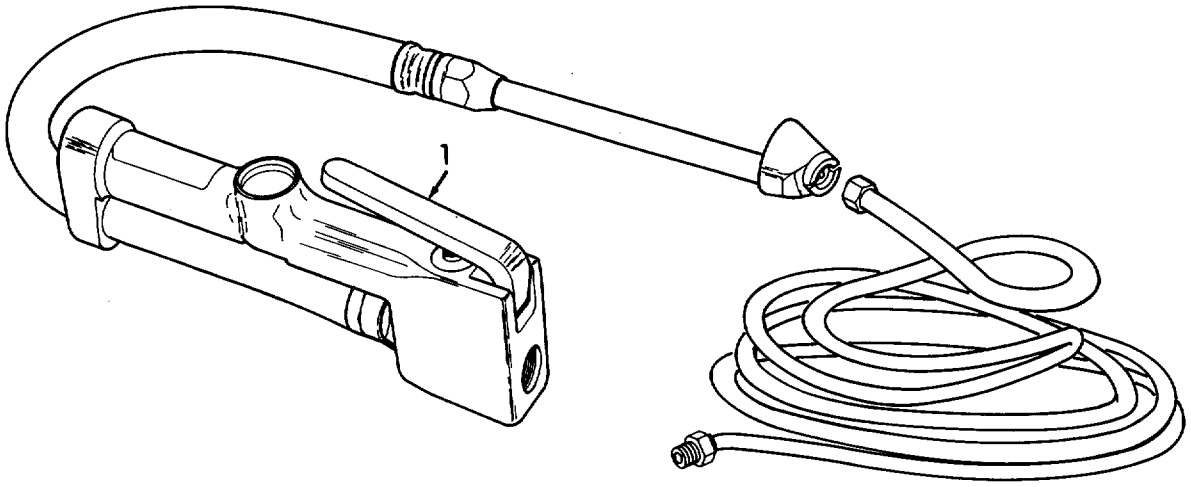


Figure 3-48. Inflator Gage, Installation.

END OF TASK

Section XI. PREPARATION FOR STORAGE OR SHIPMENT

3-31. GENERAL.

To prepare the air compressor for storage or shipment, proceed as follows:

a. Turn off electrical power and disconnect the power lines to the air compressor.

b. Remove the oil drain plug and drain the oil into a suitable container. Reinstall the drain plug.

c. Open the drain cock and allow the air and accumulated moisture to drain off. Close the drain cock.

d. Remove the flexible hose.

e. Set the air compressor on a skid and bolt the air compressor to the skid.

CHAPTER 4

FORWARD INTERMEDIATE MAINTENANCE INSTRUCTIONS

		Page
Section I.	Troubleshooting	4-1
Section II.	Maintenance of Air Compressor	4-6
Section III.	Maintenance of Electric Motor	4-12

Section I. TROUBLESHOOTING

4-1. GENERAL.

a. The table in this section lists the common malfunctions which you may find during the operation or maintenance of the air compressor or it components. You should perform the test/inspection and corrective maintenance in the order listed.

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

Troubleshooting Symptom Index

MALFUNCTION	PAGE
Severe vibration	4-2
Abnormal noise	4-2
Little or no air pressure buildup	4-3
Excessive oil consumption	4-4
Motor runs slow	4-5

Table 4-1. Forward Intermediate Maintenance Troubleshooting.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION	K

1. SEVERE VIBRATION.

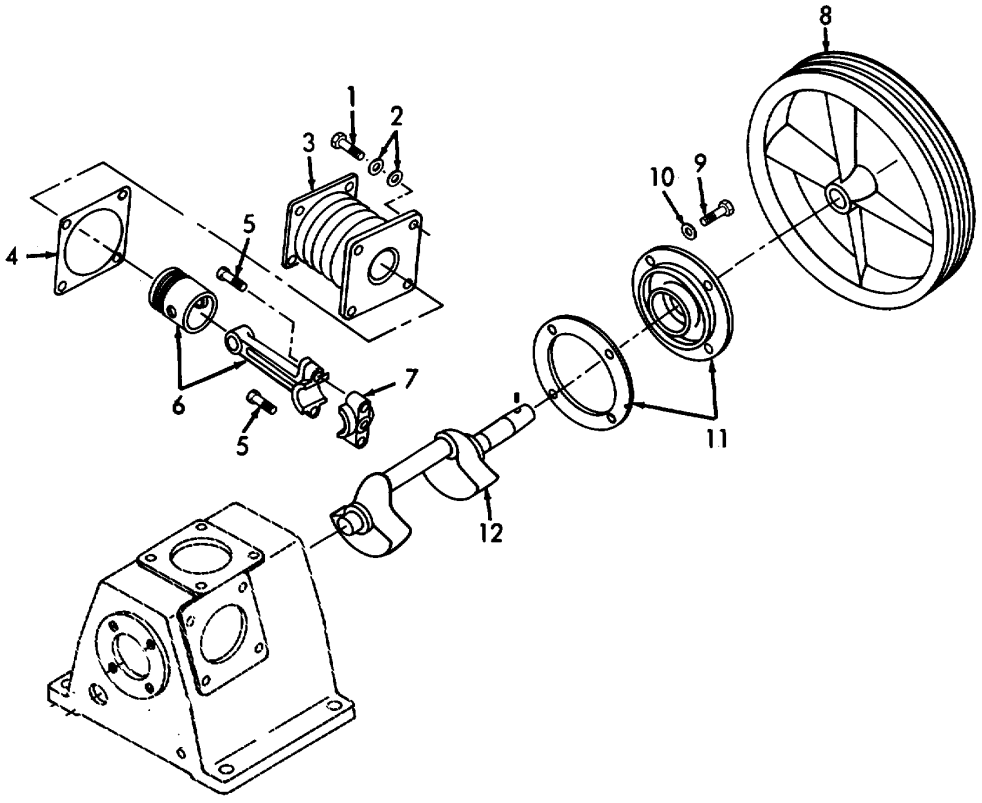
   Disassemble and inspect crankshaft and bearings (para. 4-2).

   Replace defective crankshaft or bearings.

2. ABNORMAL NOISE.

   Disconnect piping from cylinder heads and remove cylinder heads. Remove four bolts (1), eight washers (2), cylinder (3), and cylinder gasket (4). Remove two bolts (5), piston and connecting rod (6), and rod cap (7). Repeat for two other pistons. Remove pulley (8). Remove four bolts (9), four washers (10), bearing cover (11). Remove crankshaft (12).

   Inspect connecting rods for signs of wear and burning. Inspect crankshaft for damage. Inspect bearings for damage. Inspect pistons and cylinders for damage.



Replace any defective parts and reassemble air compressor.

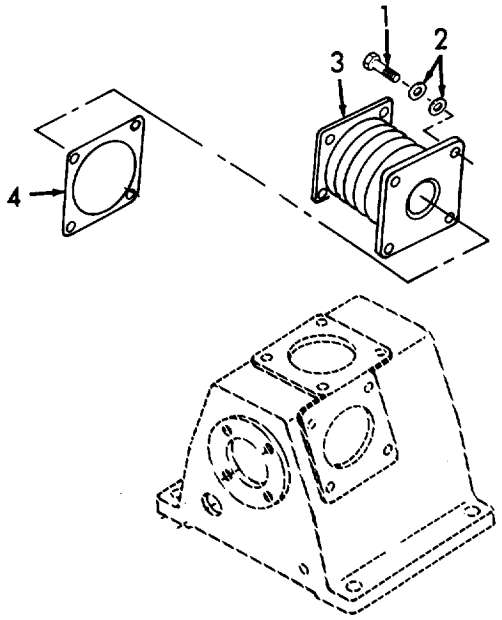
Table 4-1. Forward Intermediate Maintenance Troubleshooting (Continued).

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION	K

3. LITTLE OR NO AIR PRESSURE BUILDUP.

Disconnect piping from cylinder heads and remove cylinder heads. Remove four bolts (1), eight washers (2), cylinder (3), and cylinder gasket (4).

Inspect cylinders and pistons (including rings) for damage.



Replace any defective parts and reassemble air compressor.

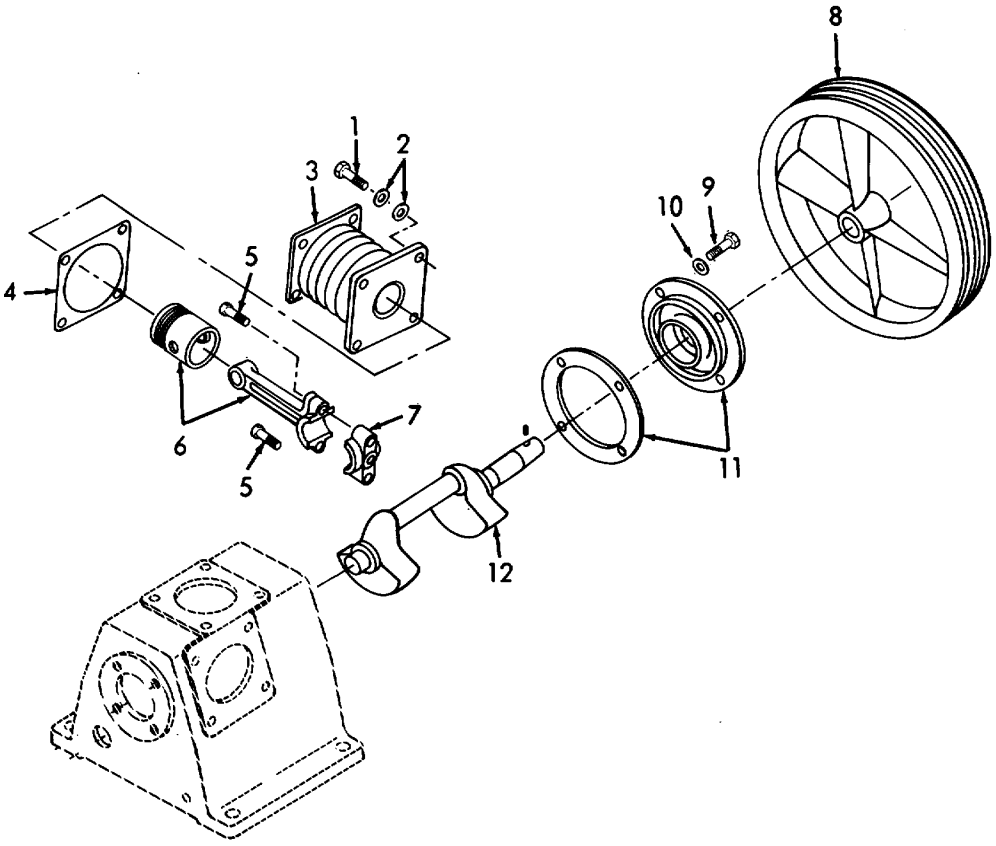
Table 4-1. Forward Intermediate Maintenance Troubleshooting (Continued).

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION	K

4. EXCESSIVE OIL CONSUMPTION.

Disconnect piping from cylinder heads and remove cylinder heads. Remove four bolts (1), eight washers (2), cylinder (3), and cylinder gasket (4). Remove two bolts (5), piston and connecting rod (6), and rod cap (7). Repeat for two other pistons. Remove pulley (8). Remove four bolts (9), four washers (10), bearing cover (11). Remove crankshaft (12).

Inspect connecting rods for signs of wear and burning. Inspect crankshaft for damage. Inspect bearings for damage. Inspect cylinders and pistons (including rings) for damage.



Replace any defective parts and reassemble air compressor.

Table 4-1. Forward Intermediate Maintenance Troubleshooting (Continued).

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION	K
5. MOTOR RUNS SLOW.	
Step 1. Run capacitor must be able to withstand a minimum continuous voltage of 240 VAC plus 10%. MFD range is 16 MFD ± 10%.	
Replace defective run capacitor (para 4-3).	
Step 2. Start capacitor rated voltage is 110 VAC. MFD range is 1070 MFD ± 10%.	
Replace defective start capacitor (para 4-3).	
Step 3. Inspect points on stationary switch.	
Replace a defective switch (para 4-3).	
Step 4. Inspect bearings.	
Replace defective bearings (para 4-3).	

Section II. MAINTENANCE OF AIR COMPRESSOR

4-2. AIR COMPRESSOR.

This task covers:

a. Disassembly b. Cleaning c. Inspection d. Repair
e. Assembly

SET-UP:

Tools: Arbor Press
3/8 inch wrench
12 mm wrench
13 mm wrench

Materials/Parts:

Cylinder Gasket (3 each)
First Stage Compression Ring Set (2 each)
First Stage Oil Ring (2 each)
Second Stage Compression Ring Set (1 each)
Second Stage Oil Ring (1 each)
Rear Bearing Cover Packing (1 each)
Front Bearing Cover Packing (1 each)
Front Oil Seal (1 each)
Oil Sight Gage Seal (1 each)
Brush, Medium Bristle (Appendix E, item 4)
Cloth, Lint-Free (Appendix E, item 3)
Solvent, Dry Cleaning (Appendix E, item 2)

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well-ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

Personnel: 1 Person

Equipment Conditions: Air compressor removed from tank (para. 3-16a).
Cylinder heads removed (para. 3-22a).
Flywheel removed (para. 3-17a).

GO TO NEXT PAGE

4-2. AIR COMPRESSOR - Continued.

a. Disassembly. (Refer to Figure 4-1).

(1) Remove four bolts (1), eight copper washers (2), first stage cylinder (3), and gasket (4). Discard gasket. Repeat for other first stage cylinder.

(2) Remove four bolts (5), eight copper washers (6), second stage cylinder (7), and gasket (8). Discard gasket.

(3) Remove two bolts (9), first stage connecting rod and piston assembly (10), and connecting rod cap (11). Repeat for other first stage piston.

(4) Remove two bolts (12), second stage connecting rod and piston assembly (13), and connecting rod cap (14).

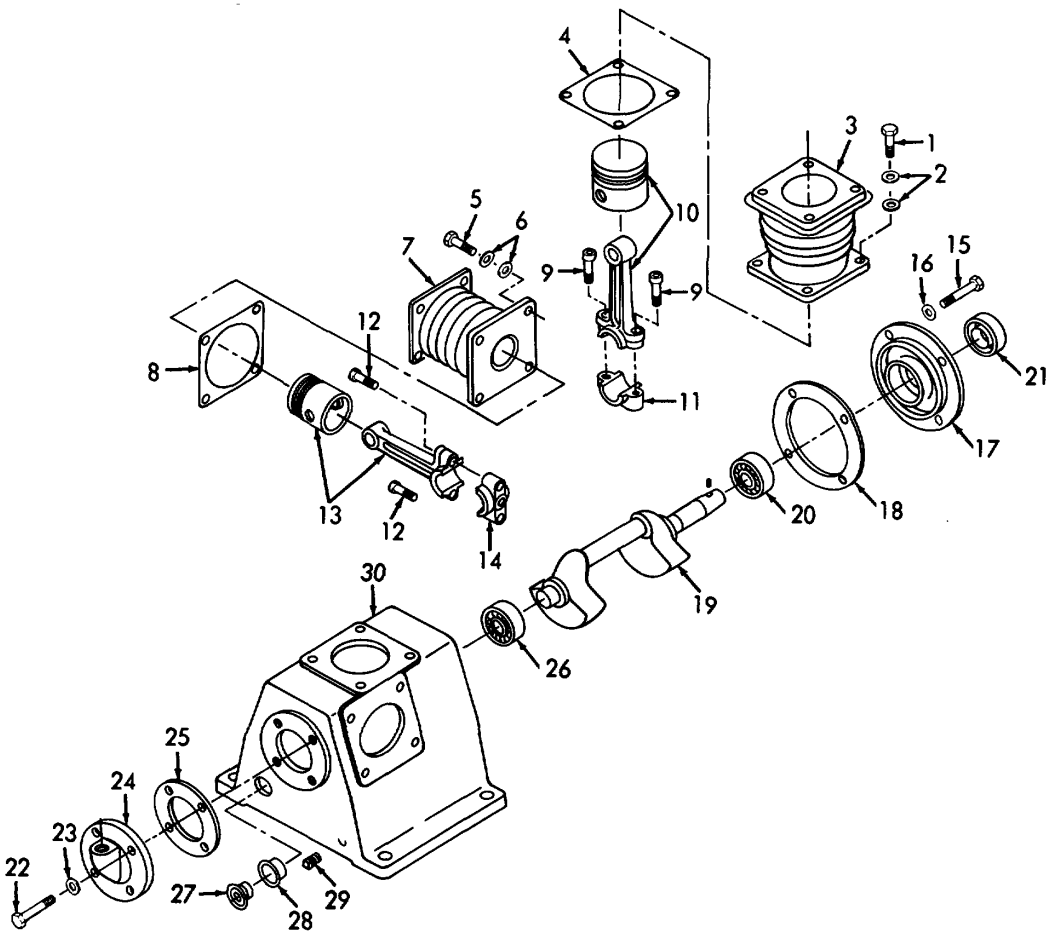


Figure 4-1. Air Compressor, Disassembly.

GO TO NEXT PAGE

4-2. AIR COMPRESSOR - Continued.

a. Disassembly-Continued.

(5) Remove four bolts (15), four washers (16), front bearing cover (17), and front bearing gasket (18). Discard gasket.

(6) Remove crankshaft (19).

(7) Remove bearing (20) and bearing seal (21).

(8) Remove four bolts (22), four washers (23), rear bearing cover (24), and gasket (25). Discard gasket.

(9) Remove bearing (26).

(10) Remove oil sight gage (27) and oil sight gage seal (28).

(11) Remove oil drain plug (29) from crankcase (30).

b. Cleaning.

(1) Remove all buildup of dirt, grease, etc. by wiping with a soft cloth (Appendix E, item 3).

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well-ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

(2) Clean using a clean, soft cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 4) and cleaning solvent (Appendix E, item 2).

GO TO NEXT PAGE

4-2. AIR COMPRESSOR - Continued.

c. Inspection.

(1) Inspect for missing or damaged hardware.

(2) Inspect cylinders for damage and wear.

(3) Inspect piston and connecting rod assembly for damage and wear.

(4) Inspect crankshaft for damage and wear.

(5) Inspect crankcase for damage.

(6) Inspect front bearing cover for damage.

(7) Inspect rear bearing cover for damage.

(8) Inspect both bearings for damage and wear.

d. Repair.

(1) Repair of the air compressor (except for the piston and connecting rod assemblies) is limited to the replacement of defective parts.

(2) Repair the piston and connecting rod assemblies is as follows (Refer to Figure 4-2):

(a) Carefully remove both compression rings (1) and the oil ring (2). Discard the rings.

(b) Remove both snap rings (3) and using an arbor press, press out the piston pin (4).

(c) Separate the piston (5) from the connecting rod (6).

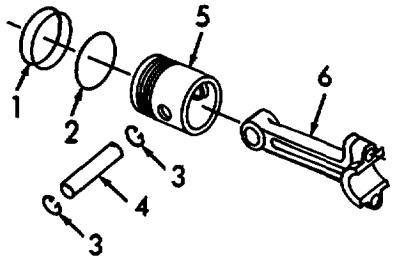


Figure 4-2. Piston and Connecting Rod, Repair.

GO TO NEXT PAGE

4-2. AIR COMPRESSOR - Continued.

d. Repair-Continued.

(d) Exchange defective parts for known good parts.

(e) Place piston (5) into position on connecting rod (6) and install piston pin (4) into position using an arbor press.

(f) Install two snap rings (3).

(g) Carefully install a new oil ring (2).

(h) Carefully install two new compression rings (3).

e. Assembly. (Refer to Figure 4-3).

(1) Install oil drain plug (1) to crankcase (2).

(2) Install oil sight gage seal (3) and oil sight gage (4).

(3) Install bearing (5).

(4) Install new gasket (6), rear bearing cover (7), eight copper washers (8), and four bolts (9).

(5) Install new bearing seal (10) and bearing (11).

(6) Install crankshaft (12).

(7) Install new gasket (13), front bearing cover (14), four washers (15), and four bolts (16).

(8) Install second stage connecting rod and piston assembly (17), connecting rod cap (18), and secure with two bolts (19). Be sure that cap is installed in the original position.

(9) Install first stage connecting rod and piston assembly (20), connecting rod cap (21), and secure with two bolts (22). Be sure that cap is installed in the original position. Repeat for other first stage connecting rod and piston assembly.

(10) Install new gasket (23) into position.

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4-2. AIR COMPRESSOR - Continued.

e. Assembly-Continued.

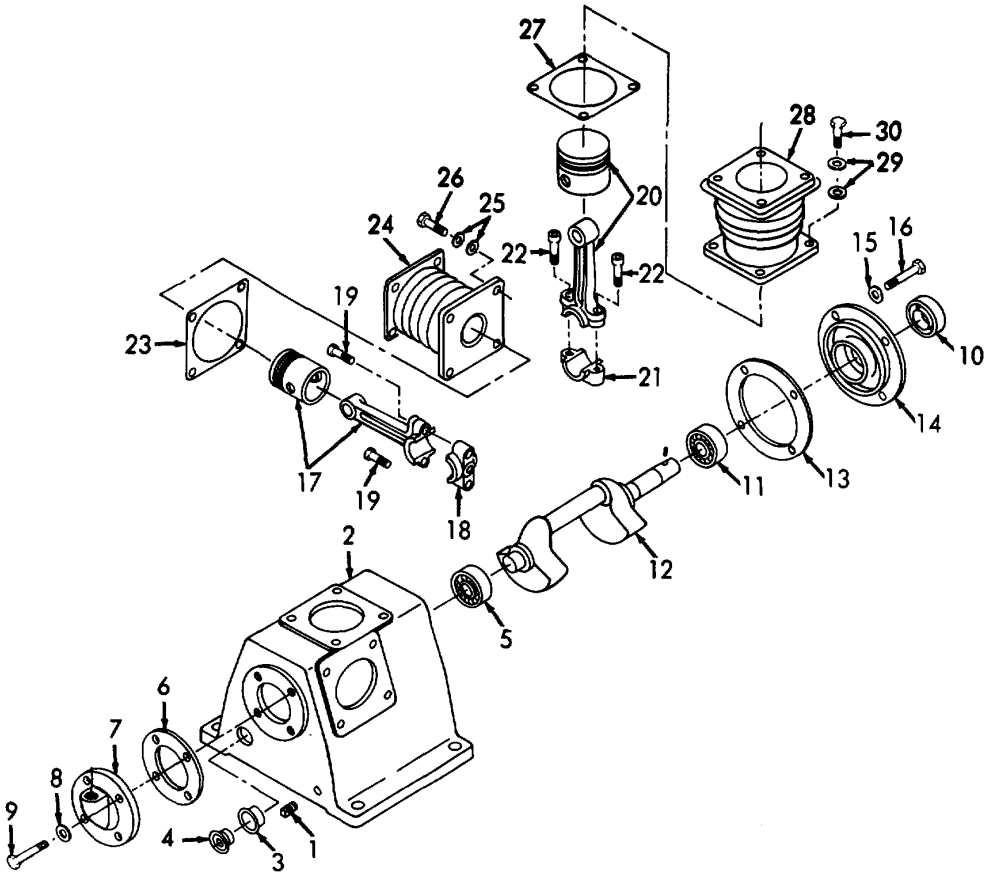

Figure 4-3. Air Compressor, Assembly.

(11) Carefully install cylinder (24) over connecting rod and piston assembly. Secure with eight copper washers (25) and four bolts (26). Repeat steps (10) and (11) for the other first stage cylinder.

(12) Install gasket (27) into position.

(13) Carefully install cylinder (28) over connecting rod and piston assembly. Secure with eight copper washers (29) and four bolts (30).

GO TO NEXT PAGE

4-2. AIR COMPRESSOR - Continued.

e. Assembly-Continued.

(14) Install flywheel per paragraph 3-16e.

(15) Install cylinder heads per paragraph 3-22g.

END OF TASK

Section III. MAINTENANCE OF ELECTRIC MOTOR

4-3. ELECTRIC MOTOR.

This task covers:

a. Disassembly b. Cleaning c. Inspection d. Repair
e. Assembly

SET-UP:

Tools: Screwdriver, Common
7/16 inch wrench
Lock Ring Pliers

Materials/Parts:
Brush, Medium Bristle (Appendix E, item 4)
Cloth, Lint-Free (Appendix E, item 3)
Solvent, Dry Cleaning (Appendix E, item 2)

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well-ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

Personnel: 1 Person

Equipment Conditions: Motor removed from tank (para. 3-22a).
Pulley removed (para. 3-15a).

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4-3. ELECTRIC MOTOR - Continued.

a. Disassembly. (Refer to Figure 4-4).

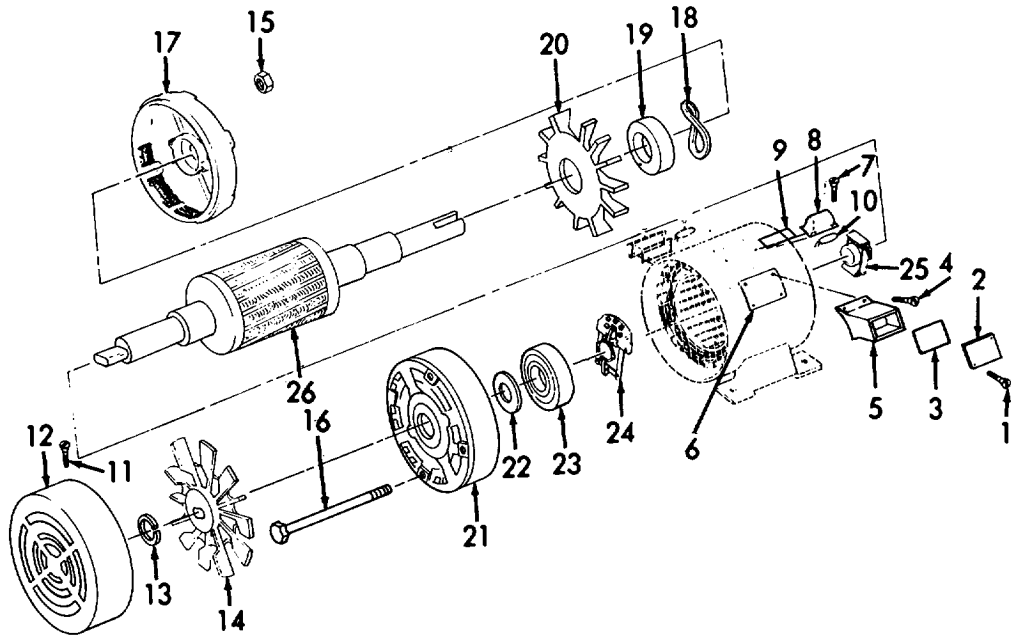

Figure 4-4. Electric Motor, Disassembly.

(1) Remove screw (1), cover (2), and gasket (3).

(2) Remove four screws (4), conduit box (5), gasket (6).

(3) Remove two screws (7), cover (8), gasket (9), and capacitor (10). Remove other capacitor in the same manner.

(4) Remove three screws (11), cover (12), lockring (13), and fan (14).

(5) Remove nut (15), bolt (16), and endshield (17).

(6) Remove washer (18), bearing (19), and fan (20).

(7) Remove endshield (21), spacer (22), and bearing (23).

(8) Remove stationary switch (24) and switch (25) from rotor (26).

GO TO NEXT PAGE

4-3. ELECTRIC MOTOR - Continued.

b. Cleaning.

(1) Remove all buildup of dirt, grease, etc. by wiping with a soft cloth (Appendix E, item 3).

WARNING

Cleaning Solvent, Federal Specification P-D-680, is toxic and flammable. Use solvent only in a well-ventilated area. Avoid prolonged breathing of fumes. Keep solvent away from flames. Do not use in excessive amounts. Avoid skin contact.

(2) Clean using a clean, soft cloth (Appendix E, item 3) or a medium bristle brush (Appendix D, item 4) and cleaning solvent (Appendix E, item 2).

(3) Allow to dry.

c. Inspection.

(1) Inspect for missing or damaged hardware.

(2) Inspect bearings for wear.

(3) Inspect spacer for damage.

(4) Inspect spring for damage.

(5) Inspect switches for damage.

(6) Inspect capacitors for damage.

d. Repair. Repair of the electric motor is limited to the replacement of defective hardware, bearings, spacer, switches, capacitors and spring at the forward intermediate support level.

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4-3. ELECTRIC MOTOR - Continued.

e. Assembly. (Refer to Figure 4-5).

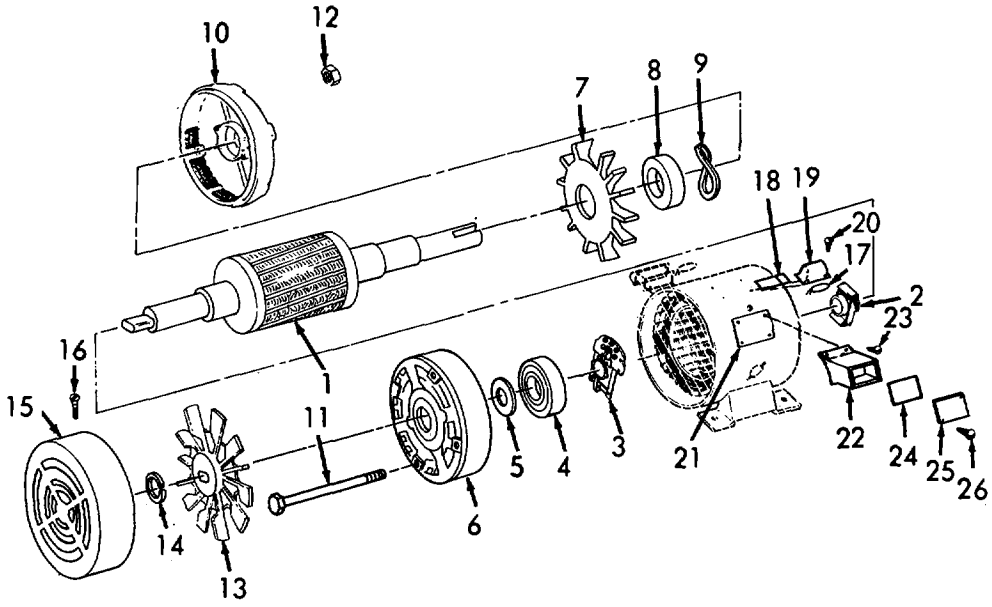

Figure 4-5. Electric Motor, Assembly.

(1) Install switch (2) and stationary switch (3) on rotor (1).

(2) Install bearing (4), spacer (5), and endshield (6).

(3) Install fan (7), bearing (8), spring (9), and endshield (10).

(4) Install bolt (11), nut (12), fan (13), and lockring (14).

(5) Install cover (15) and secure with three screws (16).

(6) Install capacitor (17), gasket (18), cover (19), and two screws (20).

(7) Install other capacitor in same manner.

(8) Install gasket (21), box (22), and screw (23).

(9) Install gasket (24), cover (25), and screw (26).

END OF TASK

CHAPTER 5

REAR INTERMEDIATE MAINTENANCE INSTRUCTIONS

5-1. GENERAL.

Rear Intermediate Maintenance consists of the overhaul of the air compressor. Use the instructions contained in Chapters 3 and 4 for the disassembly and assembly of air compressor. Use the table contained in this chapter (Table 5-1) to determine if a part is worn past the maximum limits. If the part is not worn past the maximum limits, dress the part with emory cloth or a hone as required. If the part is worn past the maximum wear limits, replace the part with new part.

Table 5-1. Maximum Wear Tolerances.

ITEM NOMENCLATURE	NORMAL DIMENSION	MAXIMUM ALLOWABLE WEAR
Piston Pin	16.000 mm (0.6304 in) dia.	15.995 mm (0.6302 in) dia.
Connecting Rod (Piston Pin Bushing End)	16.001 mm (0.6305 in) dia.	16.020 mm (0.6312 in) dia.
Connecting Rod (Crankshaft Bushing End)	25.502 mm (1.0048 in) dia.	25.507 mm (1.0049 in) dia.
First Stage Cylinder Bore	65.002 mm (2.5611 in) dia.	65.010 mm (2.5614 in) dia.
Second Stage Cylinder Bore	51.002 mm (2.0095 in) dia.	51.010 mm (2.0098 in) dia.
Crankshaft Connecting Rod Throw	25.479 mm (1.0039 in) dia.	25.469 mm (1.0034 in) dia.

APPENDIX A

REFERENCES

A-1. PUBLICATION INDEXES AND GENERAL REFERENCES.

Indexes should be consulted frequently for latest changes or revisions of references given in this appendix and for new publications relating to material covered in this publication.

a. Military Publication Indexes.

Consolidated Index of Army Publications and Blank Forms .....DA PAM 310-1

b. General References.

How to Prepare and Conduct Military Training .....FM 21-6
Military Symbols .....FM 21-30

A-2. FORMS.

Refer to DA Pam 738-750, The Army Maintenance Management System (TAMMS), for instructions on the use of Maintenance forms pertaining to the material.

A-3. OTHER PUBLICATIONS.

The following publications contain information pertinent to the major item materiel and associated equipment.

a. Administrative Storage.

Administrative Storage of Equipment .....TM 740-90-1

b. Decontamination.

Chemical, Biological, and Radiological (CBR) Decontamination .....TM 3-220
Nuclear, Biological, and Chemical Defense .....FM 21-40

c. General.

Basic Cold Weather Manual .....FM 31-70
Northern Operations.....FM 31-71
Operation and Maintenance of Ordinance Materiel in Cold Weather (0 to -65°F) .....FM 9-207

A-3. OTHER PUBLICATIONS - Continued.

d. Maintenance and Repair.

Description, Use, Bonding Techniques, and Properties of Adhesives .....TB ORD 1032
Electric Motor and Generator Repair .....TM 5-764
Inspection, Care, and Maintenance of Antifriction Bearings .....TM 9-214
Materials Used for Cleaning, Preserving, Abrading, and Cementing .....TM 9-247
Welding Theory and Application .....TM 9-237

APPENDIX B

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B-1. GENERAL.

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance categories.

b. The Maintenance Allocation Chart (MAC) in Section II designates overall responsibility for the performance of maintenance functions on the identified end item or components. 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 and explanatory notes for a particular maintenance function.

B-2. MAINTENANCE FUNCTIONS.

Maintenance functions will be limited to and defined as follows (Except for ammunition MAC) :

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 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 (including decontamination, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases.

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

e. Aline. To adjust specified variable elements of an item to bring about optimum or desired performance.

B-2. MAINTENANCE FUNCTIONS - Continued.

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 or 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, aline, calibrate, or replace) or other maintenance actions (welding, grinding, riveting, by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

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

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

B-3. EXPLANATION OF COLUMNS in THE MAC, SECTION II.

a. Column 1, Group Number. Column 1 lists functional group code numbers, the purpose of which is to identify 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 Function. Column 3 lists the functions to be performed on the item listed in Column 2.

B-3. EXPLANATION OF COLUMNS IN THE MAC, SECTION II - Continued.

d. Column 4, Maintenance Category. Column 4 specifies, by the listing of a work time figure in the appropriate subcolumn(s), the category of maintenance authorized to perform the function listed in column 3. This figure represents the active time required to perform that maintenance function at the indicated category or maintenance. If the number or complexity of the tasks with the listed maintenance function vary at different maintenance categories, appropriate work times will be shown for each category. The work time figure represents the average time required to restore an item, (assembly, subassembly, component, module, end item, or system) to a serviceable time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance allocation chart. The symbol designations for the various maintenance categories are as follows:

C.....Operator or Crew
O.....Unit Maintenance
F.....Forward Intermediate Maintenance
H.....Rear Intermediate Maintenance
D.....Depot

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

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

B-4. EXPLANATION OF COLUMNS IN TOOL AND TEST EQUIPMENT REQUIREMENTS, SECTION III.

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

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

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

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

B-4. EXPLANATION OF COLUMNS IN TOOL AND TEST EQUIPMENT REQUIREMENTS, SECTION III - Continued.

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

B-5. EXPLANATION OF COLUMNS IN REMARKS, SECTION IV.

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

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

Section II. MAINTENANCE ALLOCATION CHART FOR COMPRESSOR UNIT, RECIPROCATING, 5CFM, 175 PSI, ELECTRIC MOTOR DRIVEN

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT	(6) REMARKS
			C	O	F	H	D		
01	MOTOR CONTROLS								
0101	Starter, Electric Motor and Wiring	Inspect		0.1					A
		Replace		0.5					
		Repair		0.5				T1	
0102	Pressure Switch	Inspect		0.1					
		Adjust		0.2					
		Replace		0.5					
		Repair		0.5				T1	F
02	COMPRESSOR DRIVE								
0201	Guard Assembly, Belt	Inspect		0.1					B
		Replace		0.2				T1	
0202	Belts, V, Matched Set	Inspect		0.1					
		Replace		0.2				T1	
0203	Pulley, Drive	Inspect		0.1					
		Replace		0.2				T1, T4	
03	COMPRESSOR ASSEMBLY	Inspect		0.2				T1	A, C
		Replace		0.8				T1	
		Repair			1.0			T1, T2	
		Overhaul				4.0		T1, T3	
0301	Air Cleaner	Inspect		0.1					
		Replace		0.2				T1	
		Service		0.2					D
0302	Oil Filler Cap, and Plugs	Inspect		0.1					
		Replace		0.2				T1	
0303	Flywheel	Inspect		0.2				T1	
		Replace		0.3				T1, T4	
0304	Tube Assemblies	Inspect		0.2				T1	
		Replace		0.3				T1	

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT	(6) REMARKS
			C	O	F	H	D		
0305	Intake, Exhaust and Head	Inspect Replace Repair		0.2 0.3 0.6				T1, T4 T1, T4 T1, T4	A
0306	Pistons, Connecting Rods, and Cylinder Block	Inspect Replace Repair			0.3 0.5 2.0			T1, T2 T1, T2 T1, T2	A
0307	Crankshaft, Bearings, and Oil Seals	Inspect Replace Repair			0.4 0.6 2.5			T1, T2 T1, T2 T1, T2	A
04	MOTOR, ELECTRIC	Inspect Test Replace Repair		0.1 0.3 0.3	 1.0			T1 T1, T4 T1 T1, T2	 E
05	AIR RECEIVER SYSTEM								
0501	Safety Valve	Inspect Replace		0.1 0.2				T1 T1	
0502	Check Valve	Inspect Replace		0.1 0.2				T1 T1	
0503	Pressure Gage	Inspect Replace		0.1 0.2				T1 T1	
0504	Drain Cock	Inspect Replace		0.1 0.1				T1 T1	
0505	Globe Valve	Inspect Replace		0.1 0.2				T1 T1	
0506	Air Tank	Inspect Replace		0.1 0.2				T1 T1	
06	AIR DISCHARGE SYSTEM								

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT	(6) REMARKS
			C	O	F	H	D		
0601	Hoses	Inspect Replace		0.1 0.2				 T1	
0602	Inflator Gage	Inspect Replace		0.1 0.2				 T1	
07	DATA PLATES	Inspect Replace		0.1 0.2					

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS

(1) REFERENCE CODE	(2) MAINTENANCE LEVEL	(3) NOMENCLATURE STOCK NUMBER	(4) NATIONAL/NATO NUMBER	(5) TOOL
T1	O,F,H	Tool Kit, General Mechanic, Automotive	5180-00-177-7033	
T2	F	Shop Set, Automotive Repair, Field Maintenance, Basic	4910-00-754-0705	
T3	H	Shop Set, Machine: Field Maintenance, Heavy	3470-00-754-0738	
T4	O	Shop Equipment, Automotive Maintenance and Repair: Organization, Common, No. 1	4910-00-754-0654	
T5	O,F,H	The following metric size tools are required		
		Wrench, Box and Open End, Combination, 12.0 mm	5120-01-113-6285	
		Wrench, Box and Open End, Combination, 13.0 mm	5120-01-113-6286	
		Wrench, Box and Open End, Combination, 19.0 mm	5120-01-113-6291	
		Wrench, Box and Open End, Combination, 21.0 mm	5120-01-113-6292	
		Wrench, Box and Open End, Combination, 24.0 mm	5120-01-113-8068	

Section IV. REMARKS

REFERENCE CODE	REMARKS
A	Repair by replacing components.
B	Repair by replacing riv-nuts, welding, and/or hammering out dents as needed.
C	Overhaul consists of any or all of the repair tasks required to put the compressor in a like new condition.
D	Service consists of cleaning the air filter element.
E	Repair consists of replacing the bearings, capacitors, switches, and spacers as needed.
F	See paragraph 3-12d.

APPENDIX C

COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LIST

Section I. INTRODUCTION

C-1. SCOPE.

This appendix lists components of end item and basic items for the air compressor to help you inventory items required for safe and efficient operation.

C-2. GENERAL.

The Components of End Item and Basic Issue List are divided into the following sections:

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

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

C-3. EXPLANATION OF COLUMNS.

The following provides an explanation for the columns found in the tabular listings:

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

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

C-3. EXPLANATION OF COLUMNS - Continued.

c. Column (3) Description. Indicates the National Item Name and, if required, a minimum description to identify and locate the item. The last line for each item indicates the FSCM (in parentheses) followed by the part number. If the item needed differs for different models of this equipment, the model is shown under the "Usable On" heading in this column. These codes are identified as:

CODE	USED ON
N/A	N/A

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

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

Section II. COMPONENTS OF END ITEM

(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	USABLE ON CODE	(4) U/M	(5) QTY RQR
Fig. 3-45		Hose Assembly, Air (16004) 85403		EA	1
Fig. 3-47	4910-00-030-2365	Gage, Inflator (94894) 61J2-1506		EA	1

Section III. BASIC ISSUE ITEMS

(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	USABLE ON CODE	(4) U/M	(5) QTY RQR
		TM 5-4310-377-13		EA	1

APPENDIX D

ADDITIONAL AUTHORIZATION LIST

Section I. INTRODUCTION

D-1. SCOPE.

This appendix lists additional items you are authorized for 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 all authorized to you by CTA, MTOE, TDA, or JTA.

D-3. EXPLANATION OF LISTING.

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

CODE	USED ON
DQB	Model R122RAAB, Part No. 84950

Section II. ADDITIONAL AUTHORIZATION LIST

(1) National Stock Number	(2) Description FSCM and Part Number / Usable On Code	(3) U/M	(4) Qty Auth
7520-00-559-9618	Cotton Duck Case	EA	1
7510-00-889-3494	Log Book Binder	EA	1
4240-00-622-2946	Protector, Aural	EA	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 (i.e., "Use cleaning compound, Appendix E, item 5").

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

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

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

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

Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
1	O		Oil, Lubricating (MIL-2104)	
2	O	6850-00-274-5421	Solvent, Dry Cleaning (P-D-680)	GAL
3	O		Cloth, Lint-Free	
4	O		Brush, Medium, Oval	
5	O		Soap, Mild	

APPENDIX F

TORQUE TABLE

Section I. INTRODUCTION

F-1. SCOPE.

This appendix lists standard torque values in both foot-pounds (ft-lbs) and equal metric values in kilogram-meters (kg-m) for the standard and metric thread sizes used on the air compressor unit.

F-2. SPECIAL TORQUE LIMITS.

Special torque limits are found in the narrative portion of the maintenance procedures for applicable components.

Section II. TORQUE LIMITS

THREAD SIZE	FT-LBS	KG-M
4-40NC	0.4	0.06
8-32NC	1.5	0.21
10-24NC	1.9	0.27
10-32NF	2.7	0.37
1/4-20NC	6.7	0.92
M6	8.0	1.11
3/8-16NC	20.8	2.88
M10	39.0	5.39
1/2-13NC	45.8	6.34

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COA, 3d ENGINEER BN
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PAGE NO.	PARAGRAPH	FIGURE NO.	TABLE NO.	IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
6	2-1 a			In line 6 of paragraph 2-1a the manual states the engine has 6 Cylenders. The engine on my set only has 4 Cylenders. Change the manual to show 4 Cylenders.
81		4-3		Callout 16 on figure 4-3 is pointing at a bolt. In key to figure 4-3, item 16 is called a shim - Please Correct one or the Other.
125	line 20			I ordered a gasket, item 19 on figure B-16 by NSN 2910-00-762-3001. I got a gasket but it doesn't fit. Supply says I got what I ordered, so the NSN is Wrong. Please give me a good NSN

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The Metric System and Equivalents

Linear Measure

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

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = 0.35 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 fluid ounce
1 deciliter = 10 centiliters = 3.38 fluid ounces
1 liter = 10 deciliters = 33.81 fluid ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 27.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq millimeters = .155 sq. inch
1 sq. decimeter= 100 sq centimeters = 125.5 sq. inches
1 sq. meter (centare) = 100 sq decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 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. decimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

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

Temperature (Exact)

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

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