**DEPARTMENT OF THE ARMY TECHNICAL MANUAL**

# DS AND GS MAINTENANCE MANUAL

# COMPRESSOR, RECIPROCATING
# POWER-DRIVEN, FLAMETHROWER
# 3 ½ CFM, AN-M4/C
# STEWART-WARNER MODEL 3260101-6

**This copy .is a reprint which includes current pages from Changes 1 and 2.**

**H E A D Q U A R T E R S , D E P A R T M E N T O F T H E A R M Y**
**AUGUST 1966**

## SAFETY PRECAUTIONS

**To prevent injury to personnel and damage to property and materiel, the following safety precautions must be observed:**

**Perform all testing in an area restricted to all except test personnel.**

**Secure all pneumatic equipment under test in a vise or testing fixture.**

**Never attempt to adjust or dissemble equipment while the equipment is under pressure.**

**Protect personnel engaged in proof-pressure testing with a heavy metal shield provided with glass windows.**

**Do not attempt the removal of any component while the compressor is in operation.**

**Change in force C 2**

Change No. 2

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., 17 March 1971

**DS and GS Maintenance Manual**
**COMPRESSOR UNIT, RECIPROCATING: POWER-DRIVEN,**
**FLAMETHROWER,**
**31/2 CFM, AN-M4C**
**FSN 1040-078-5431**

TM 3-1040-244-34, 8 August 1966, is changed as follows:

The title of this manual is changed as shown above.

*Page 3,* paragraph 1-2. In line 1, "direct support" is changed to read "general support." *Page 14,* paragraph 3-3. Lines 2 through 6 are changed to read as follows: General support maintenance personnel are authorized to test and repair the moisture separator assembly (air receiver). The assembly will be tested and recorded, in accordance with TB 742-93-1, every 24 months or at any time a malfunction or erratic operation occurs. Repair consists of replacement of defective components of the moisture separator as required.

Paragraph 3-3e is rescinded.

*Page 18,* paragraph 3-11a. In lines 2 and 3, "a cover and filter assembly" is changed to read "an oil breather cap."

Paragraph 3-11b. In line 4, "cover and filter assembly" is changed to read "oil breather cap."

*Page 19,* figure 3-3. In legend; "1 Cover-and-filter assembly" is changed to read "1 Oil breather cap."

Paragraph 3-11c(l). In line 1, "cover and filter assembly" is changed to read "oil breather cap."

Paragraph 3-11d(3). In line 2, "cover and filter assembly" is changed to read "oil breather cap."

*This change supersedes C1, 19 January 1970

By Order of the Secretary of the Army:

W. C. WESTMORELAND,
*General, United States Army*
*Chief of Staff.*

Official:
KE:NNETH G. WICKHAM,
*Major General United States Army,*
*The Adjutant General.*

Distribution:

*Active Army.*

| | |
|---|---|
| CNGB(1) | USAAPSA (25) |
| USAMB (2) | Arsenals (3) except |
| USACDC (2) | Edgewood (75) |
| USACDCCBRA (2) | PG (5) |
| USADCDADA (2) | Ft Knox FLDMS (10) |
| USACDCARMA (2) | Units org under fol TOE |
| USACDCARTYA (2) | 2 cys each): |
| USACDCAVNA (2) | 3-7 |
| USACDCIA (2) | 3-42 |
| USADCDSWA (2) | 3-36 |
| USAARMC (2) | 3-500 |
| USAMC (2) | 29-1 |
| USAECFB (2) | 29-11 |
| USAPC (2) | 29-15 |
| USAMMCS (2) | 29-16 |
| USAIC(2 | 29-17 |
| CONARC (25) | 29-21 |
| ARADCOM (5) | 29-25 |
| ARADCOM Rgn (5) | 29-26 |
| USAMUCOM (5) | 29-27 |
| USAMC (5) | 29-35 |
| USACDCEC (10) | 29-37 |
| OS Maj Comd (5) | 29-51 |
| Armies (5) | 29-55 |
| Corps (3) | 29-56 |
| Div (3) | 29-57 |
| USMA (10) | 29-75 |
| Svc Colleges (10) | 27-79 |
| Br Svc Sch (10) excep | 29-99 |
| USACMLCS (50) | 29-10 |
| GENDEP (5) | 29-134 |
| Dep(5) | 29-136 |
| Army Dep(5) | 29-138 |
| POE (1) | 29-202 |
| Instl (2) | 29-206 |
| USATC(1) | 20-247 |
| EAMTMTS () | 29-208 |
| WATMITS (1) | 29-247 |
| MOTBA (1) | 29-427 |
| MOTBY (1) | 29-500 |
| MYOTKI (1) | 29-600 |
| MOTSU (1) | 29-610 |

NG: State AC (3); TOE Unite. 7-2 (1), 17-2 (1).
USAR: Same s Active Army except allowance is one (1) copy to each unit.
For explanation abbreviation used, see AR 310-50..

TECHNICAL MANUAL
No. 3-1040-244-34

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., *8 August 1966*

**DS and GS**
**Maintenance Manual**
**COMPRESSOR, RECIPROCATING, POWER-DRIVEN,**
**FLAMETHROWER, 3 1/2 CFM, AN-M4/C**
**(Stewart-Warner Model 3260101-6)**



*This manual supersedes TM 3-1040-244-34. 10 January 196, . Including C1. 27 April 1966.

# CHAPTER 1
# INTRODUCTION

## Section I. GENERAL

### 1-1. Scope

This manual is published for the information and guidance of personnel responsible for maintenance, repair, and overhaul of the AN-M4/C 3 1/2 cfm flame-thrower power-driven reciprocating compressors, model 32601016 manufactured by Stewart-Warner Corporation under Contract DA 18-035-AMC-189A and serially numbered 3260101-173 through 3260101-1398 only. It contains information on maintenance procedures beyond the scope of the operator and organizational maintenance. TM 3-1040-244-12 contains complete information on the operation and functioning of the compressor. TM 5-2805-208-14 contains maintenance procedures for the gasoline engine.

### 1-2. Special Tools

The direct support maintenance is responsible for testing and surveillance of the AN-M4/C compressors in accordance with TB 74293-1.

### 1-3. Record and Report Forms

*a.* Use the appropriate forms prescribed by TM 38-750.

*b.* The direct reporting by the individual user of errors, omissions, and recommendations for improving this manual is authorized and encouraged. DA Form 2328 (Recommended Changes to DA Publications) will be used for reporting these improvements. This form will be completed using pencil, pen, or typewriter and forwarded direct to Commanding Officer, US Army Edgewood Arsenal, ATTN: SMUEA-TSE-TPE, Edgewood Arsenal, Md., 21010.

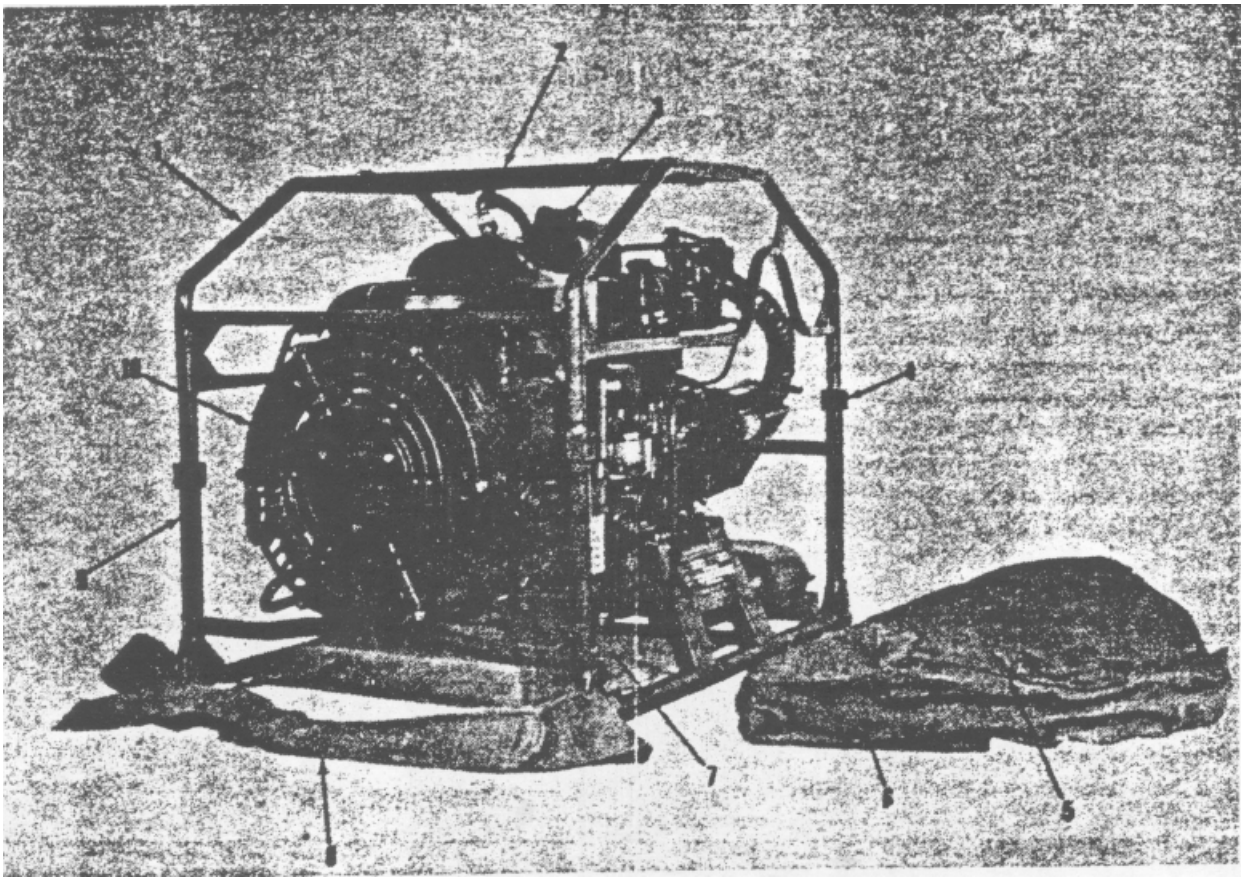
### 1-4. Allocation of Maintenance

Refer to the maintenance allocation chart (TM 3-1040-244-12) for maintenance procedures authorized to be performed by direct and general support maintenance personnel.

## Section II. DESCRIPTION AND DATA

### 1-5. Description

*a.* General. The AN-M4/C compressor (fig. 1-1) delivers 3.5 cfm of high-pressure air at 2,000 pounds per square inch to charge pressure tanks of portable flame-throwers. The unit consists of a three stage reciprocating-piston-type air compressor (10) coupled directly to a one-cylinder four-cycle air-cooled gasoline engine (3). The air compressor and engine, together with a moisture separator assembly, a pressure relief valve assembly, and a fuel tank are mounted on a lightweight tubular aluminum and steel frame (1 and 9) equipped with a web-type shoulder-and-waist strap assembly (8) and a canvas backrest harness assembly (7). A canvas cover (6) provided with the straps encloses and protects the complete unit when not in use. A starter rope (5) is issued with each compressor. An instruction plate (2) is mounted on the upper frame. A description of the compressor and its operation is contained in TM 3-1040-244-12. The gasoline engine, its operation, organizational, direct support, and general support maintenance procedures are contained in TM 5-2805-208-14.



| | | | |
|---|---|---|---|
| 1 | Upper frame | 6 | Canvas cover |
| 2 | Instruction plate | 7 | Backrest harness |
| 3 | Gasoline engine | 8 | Strap Assembly |
| 4 | Locknut | 9 | Lower frame |
| 5 | Starter rope | 10 | Compressor Assembly |

*Figure 1-1. Compressor, reciprocating, power-driven, flame-thrower 3 ½ cfm, AN-M4/C, three-quarter left front view*

**1-6. Tabulated Data**

*a. General.*

(1) *Complete unit (uncrated).*

Length, overall .....22 3/8 in. max.
Width, overall .....19 in. max.
Height, overall.....19 1/4 in. max.
Total weight (dry).....68 lb. max.

(2) Compressor.

Type .....Reciprocating piston
Number of stages .....3
Number of cylinders.....3
Operating speed (nominal) 3, 000 rpm
Cooling.....air
Lubrication:
Method..... Pressure and mist
Lubricant..... MIL-L-6085
Rated discharge Pressure 2, 000 psig
Air pumping capacity .....charge 208 ±3 cu. in.
(Sea level) .....pressure tank to 2, 000 psig in 5 1/2 min.

(3) Moisture separator'.

Operating pressure..... 2, 000 psig
Proof pressure..... 3, 750 psig
Minimum burst pressure.. 5, 000 psig (ports plugged)

(4) Pressure relief valve.

Type.....Spring loaded
Opening pressure... 2, 250 psig max.
Full flow pressure ... 2, 350 psig max.

Minimum flow.....3.5 scfm
Minimum reseal pressure 1, 950 psig
Leakage rate.....3 cc. per min.

(5) *Gasoline engine.*
Make Military Standard.....A08-3
Type.....4-cycle, gasoline, overhead valve, air-cooled
Number of cylinders.....1
Bore ..... 2.250 in.
Stroke .....2 in.
Piston displacement.....8 cu in.
Compression ratio.....6:1
Horsepower (at 3, 600 rpm).....1.5

*b. Recommended Wrench Torque for Steel Nuts and Bolts.*

| National Fine | | National Coarse | |
|---|---|---|---|
| **Thread size** | **Torque (pound-foot)** | **Thread size** | **Torque (pound-foot)** |
| 8-32 | 1 to 2 | 8-32 | 1 to 2 |
| 10-32 | 1 to 2 | 10-24 | 1 to 2 |
| 1/4-28 | 5 to 8' | 1/4-20 | 4 to 6 |
| 5/16-24 | 10 to 15 | 5/16-18 | 8 to 12 |
| 3/8-24 | 18 to 27 | 3/8-15 | 15 to 22 |
| 7/16-20 | 28 to 42 | 7/16-14 | 24 to 36 |
| 1/2-20 | 45 to 68 | 1/2-13 | 37 to 56 |
| 9/16-18 | 64 to 97 | 9/16-12 | 56 to 83 |
| 5/8-18 | 98 to 138 | 5/8-11 | 75 to 112 |
| 3/4-16 | 158 to 242 | 3/4-10 | 137 to 200 |
| 7/8-14 | 258 to 384 | 7/8-9 | 218 to 316 |
| 1-14 | 400 to 600 | 1-8 | 316 to 484 |

*c Wear Limits.*

| **Component** | **Original dimensions Min (In.)** | **Max** | **Wear limits (In.) (In.)** |
|---|---|---|---|
| FIRST STAGE CYLINDER AND PISTON ASSEMBLY | | | |
| *Cylinder bore | 2.1875 | 2.1876 | |
| Piston-to-cylinder wall clearance | 0.0003 | 0.0005 | 0.0005 |
| Wristpin hole | 0.3754 | 0.3756 | 0.0002 |
| Wristpin diameter | 0.3751 | 0.3753 | 0.0001 |
| Piston head clearances | 0.021 | 0.026 | |
| SECOND STAGE CYLINDER AND PISTON ASSEMBLY | | | |
| *Cylinder bore | 0.9687 | 0.9688 | |
| Piston-to-cylinder Wall clearances | 0.0002 | 0.0004 | 0.0003 |
| Wristpin hole | 0.4366 | 0.4368 | 0.0002 |
| Wristpin diameter | 0.4363 | 0.4365 | 0.0001 |
| Piston head clearance | 0.002 | 0.006 | |
| THIRD STAGE CYLINDER AND SLEEVE ASSEMBLY | | | |
| *Cylinder bore | 0.4050 | 0.4055 | |
| Piston-to-cylinder wall clearance | 0.00020 | 0.00025 | 0.0002 |
| Wristpin hole | 0.4366 | 0.4368 | 0.002 |
| Wristpin diameter | 0.4363 | 0.4365 | 0.0001 |
| Piston head clearance | 0.002 | 0.006 | |
| COMPRESSOR CONNECTING LINKS AND MASTER ROD | | | |
| Connecting link wristpin bearing hole | 0.5615 | 0.5620 | 0.0002 |
| Master rod connecting link holes | 0.4366 | 0.4368 | 0.0003 |
| First stage wristpin bearing hole | 0.5590 | 0.5594 | 0.0002 |
| Shaft bearing hole | 1.8750 | 1.8754 | 0.0003 |
| ENDBELL | | | |
| Shaft seal bore diameter | 1.499 | 1.500 | 0.0005 |
| Bearing bore diameter | 1.8502 | 1.8505 | 0.0001 |
| COMPRESSOR SHAFT | | | |
| Shaft seal diameter (fan end) | 0.934 | 0.940 | 0.002 |
| Bearing diameter (fan end) | 0.9842 | 0.9845 | 0.0001 |
| Master rod journal diameter | .8724 | 1.8728 | 0.0003 |
| Bearing diameter (opposite fan end) | .1809 | 1.1811 | 0.0001 |
| Shaft seal diameter (opposite fan end) | 1.059 | 1.065 | 0.002 |
| RETAINER PLATE | | | |
| Thickness | 0.092 | 0.094 | 0.002 |
| Retainer pinhole diameter | 0.253 | 0.257 | 0.002 |
| OIL PUMP PISTON | | | |
| Large diameter | 0.5595 | 0.5605 | 0.001 |
| Small diameter | 0.3790 | 0.3795 | 0.0005 |
| OIL PUMP CYLINDER | | | |
| Inner diameter | 0.3798 | 0.3801 | 0.0005 |

*Cylinder bore may be sip to 0.001 oversize for matching with piston diameter; clearance is held as stated.

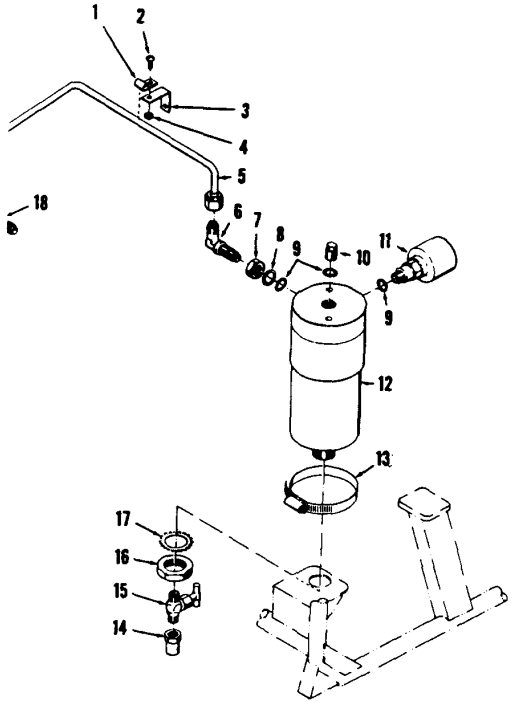
## CHAPTER 2

## DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

### Section I. MOISTURE SEPARATOR GROUP

### 2-1. Description

The moisture separator group (fig. 2-1) is located on the frame of the compressor and 3 held in place by a clamp (13). The moisture separator group consists of a tube assembly (5), elbows (6 and 18), adapter (10), pray-directing fitting (14), drain valve (15), pressure relief valve (11), and a moisture separator assembly (12).




1 Clamp, cushioned
2 Screw
3 Bracket
4 Nut
5 Tube
6 Elbow
7 Nut
8 Leather washer
9 Preformed packing
10 Adapter
11 Pressure relief valve
12 Moisture separator assembly
13 Clamp hose
14 Spray-directing fitting
15 Drain valve
16 Nut
17 Lockwasher
18 Elbow

*Figure 2-1. Moisture separator group, exploded view.*

### 2-2. Function

The moisture separator group serves to sep arate moisture and impurities from the high-pressure compressed air. These impurities are removed periodically by opening the drain valve mounted on the base of the moisture separator assembly, thus allowing high-pressure air to blow the accumulated moisture and oil condensate to atmosphere through the spray-directing fittings. The pressure relief valve mounted in the moisture separator assembly opens automatically to exhaust high-pressure to atmosphere before pressure in the shell reaches 2, 250 pounds per square inch. The relief valve reseals, or closes, preventing the further escape of air when pressure within the shell drops to 1, 950 pounds per square inch.

### 2-3. Maintenance

Direct support maintenance personnel are authorized to replace the clamp, backup washer, adapter, drain valve, pressure relief valve, moisture separator assembly, and hardware as required.

*a. Removal.*

(1) Open drain valve (15, fig. 2-1) and drain the moisture separator assembly.

(2) Remove screw (2) and nut (4) attaching clamp (1) to bracket (3). Remove tube assembly (5) from between after cooler and moisture separator. Remove bracket (3).

(3) Remove elbows (6 and 18). Remove nut (7), washer (8), and packing (9). Unscrew and remove adapter (10) and packing (9). Remove pressure relief valve assembly (11) and packing (9).

(4) Unscrew and remove fitting (14) from drain valve (15). Remove drain valve. Unscrew and remove nut (16) and lockwasher (17).

(5) Open clamp (13) and remove the moisture separator assembly (12) and clamp from frame.

*b. Installation*

(1) Position moisture separator (12, fig. 2-1) on frame and place clamp (13) on loosely.

(2) Install and tighten washer (17) and nut (16). Screw on valve (15) and fitting (14) at bottom of moisture separator.

(3) Screw pressure relief valve (11) with packing (9) into the port on the side of moisture separator (12). Note. Make sure moisture separator pressure relief valve faces toward engine and elbow faces toward fan.

(4) Screw adapter (10) with packing (9) in the port at the top center of moisture separator (12).

(5) Install elbow (6) with packing (9), backup washer (8), and nut (7) into the port on the side of moisture separator (12).

(6) Install elbow (18) and tube assembly (5). Tighten clamp (13); position clamp (1) over tube assembly on bracket (3) and secure to the bracket with screw (2) and nut (4).

## Section II. FAN, FAN GUARD, AND AFTERCOOLER GROUP

### 2-4. Description and Function

The fan, fan guard, and aftercooler group consists of the fan, fan guard, aftercooler, the second-to-third stage tube assembly, first-to second stage tube assembly, attaching clamps, and brackets. The fan consists of 10 vanes shaped in such a manner that in rotation of the fan, air is propelled over the compressor. When positioned and mounted on the basic compressor, the fan serves to move cooling air in and around the aftercooler, and the fan guard prevents external interference with the rotation of the fan providing protection to both maintenance personnel and the fan. The aftercooler is corrosive-resistant steel tubing with tin-coated, low carbon steel fins soldered to the tubing. The aftercooler is positioned around the fan and serves to cool the compressed air. The moisture in the compressed air is condensed by the cooling. The moisture is separated from the compressed air by the moisture separator.

### 2-5. Maintenance

Direct support maintenance personnel are authorized to replace the fan, fan guard, aftercooler, thrust washer, both tube assemblies, clamps, and attaching hardware.

**Warning. To prevent injury to personnel and damage to equipment, do not attempt removal of any component in this section while the unit is in operation.**

*a. Disassembly*

(1) Unscrew and remove flared tube nut connecting aftercooler (5, fig. 2-2) to third stage reducer (1, fig. 2-3).

(2) Remove three screws (1, fig. 2-2) and lockwashers (2) attaching instruction plate (3) to guard (4). Remove instruction plate.

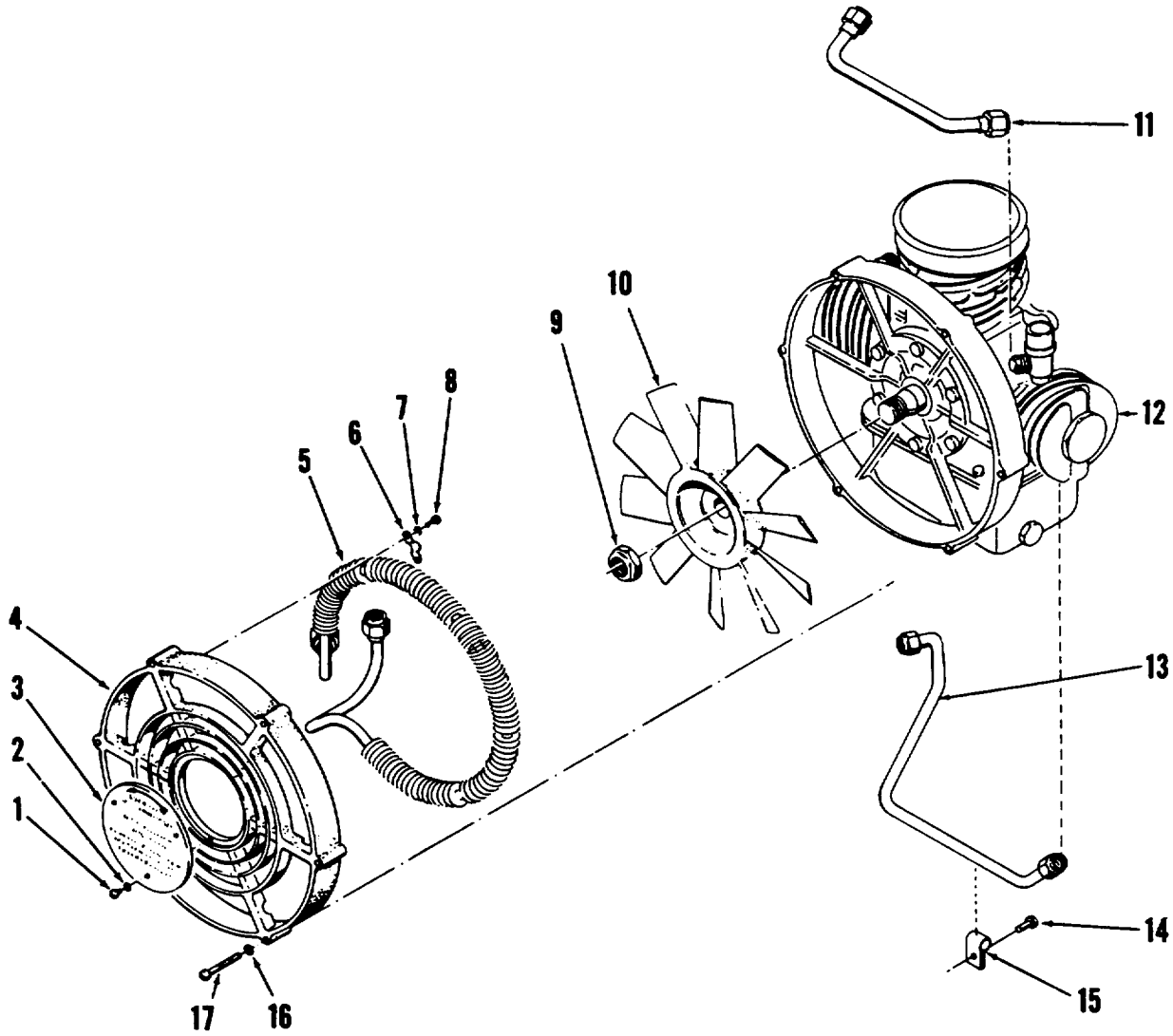
(3) If moisture separator tube assembly has not been removed, unscrew tube (5, fig. 2-1) from aftercooler and moisture separator. Remove screw (2) and nut (4) attaching clamp (1) to bracket (3) and remove tube.

(4) Remove screws (17, fig. 2-2) and lockwashers (16). Remove fan guard (4) with attached aftercooler (5) from the compressor.

(5) Remove screws (8), lockwashers (7), and clamps (6) from fan guard (4) and remove aftercooler (5) from fan guard.

(6) Remove screw (14) and attaching clamp (15) from frame. Remove clamp from over second-to-third stage tube assembly (13).

(7) Loosen flared tube nuts and remove 7




1 Machine screw
2 Lockwasher
3 Instruction plate
4 Guard
5 Aftercooler
6 Clamp
7 Lockwasher
8 Machine screw
9 Nut
10 Fan
11 Tube assembly
12 Compressor assembly
13 Tube assembly
14 Screw
15 Clamp
16 Lockwasher
17 Machine screw

*Figure 2-2. Fan, fan guard, and aftercooler, exploded view.*

the second-to-third stage tube assembly (13).

(8) Loosen flared tube nuts and remove first-to-second stage tube assembly (11).

(9) Remove nut (9) and carefully pull fan (10) from shaft of compressor assembly (12).

*b. Cleaning and Inspection.*

(1) Clean all metal parts by washing in dry-cleaning solvent (P-S-661). Dry with clean, filtered compressed air.

(2) With compressed air, blow out the aftercooler (5) and tube assemblies (11 and 13) through both orifices.

(3) Inspect components for scratches, nicks, distortion, and other damage.

*c. Assembly.*

(1) Place fan (10) over shaft of compressor (12). Secure fan to shaft with nut (9).
(2) Position first-to-second stage tube assembly (11) on compressor. Tighten tube assembly with flared-tube nuts.
(3) Position second-to-third stage tube assembly (13) on compressor. Tighten tube assembly with flared-tube nuts.
(4) Place clamp (15) over second-to-third stage tube assembly (13) and secure parts to frame with screw (14).
(5) Position aftercooler (5) on fan guard (4) and secure in position with clamps (6), screws (8), and lockwashers (7).
(6) Install fan guard (4) with attached aftercooler (5) on compressor (12) with six lockwashers (16) and screws (17).
(7) Screw tube (5, fig. 2-1) on aftercooler. Screw elbow (18) on moisture separator. Position clamp (1) over tube and secure to bracket (3) with screw (2) and nut (4).
(8) Position instruction plate (3, fig. 2-5) on fan guard (4). Secure to fan guard with three lockwashers (2) and screws (1).
(9) Position tube assembly on reducer (1, fig. 2-3). Tighten flared-tube nut.

## Section III. COMPRESSOR GROUP

### 2-6. Description and Function

A complete description of the compressor group and its function is contained in TM 3-1040-244-12.

### 2-7. Maintenance

Direct support maintenance personnel are authorized to replace the filter covers, strainer and relief valve assembly, preformed packings, sight oil level plug, drain plug, and any attaching hardware.

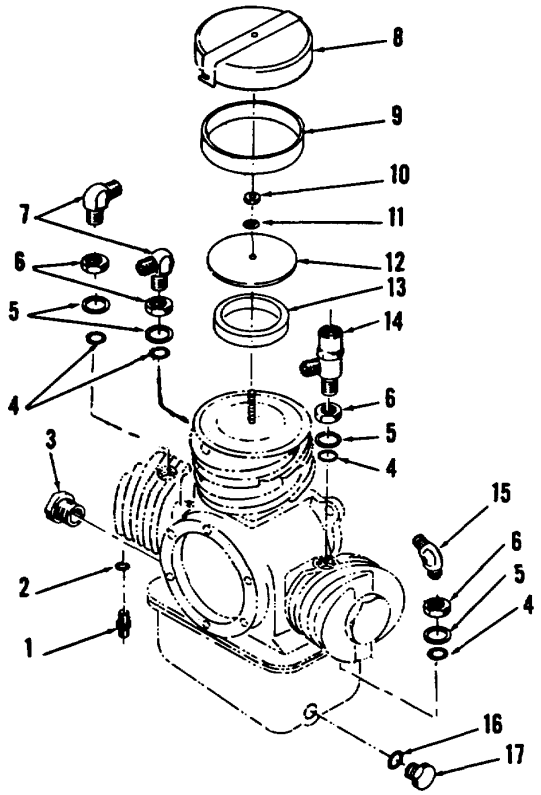
*a. Disassembly*

(1) Unscrew and remove sight oil level plug (3, fig. 2-3) from crankcase.
(2) Unscrew plug and bleeder (17). Remove packing (16).
(3) If fan, fan guard, and aftercooler assemblies have not been removed, refer to paragraph 2-4 to locate individual items for removal.
(4) Loosen locknut (6) and unscrew and remove elbow (7) on third stage. Remove backup washer (5) and preformed packing (4).
(5) Loosen second locknut (6) and unscrew and remove strainer and relief valve (14). Remove backup washer (5) and preformed packing (4).
(6) Loosen and remove reducer on third stage (1). Remove seal (2).
(7) Loosen and remove locknut (6) and elbow (15) on second stage. Remove backup washer (5) and preformed packing (4).
(8) Turn cover assembly (8), releasing it from pins in side of first stage cylinder head. Remove outer filter (9).
(9) Unscrew and remove nut (10) and lockwasher (11) attaching inner cover (12). Remove cover and inner filter (13).
(10) Loosen and remove locknut (6) and elbow (7) on first stage. Remove backup washer (5) and preformed packing (4).

**Note. Unscrew breather body (2, fig. 3-3) before removing elbow.**

b. Cleaning and Inspection.

(1) Clean all metal parts in dry-cleaning solvent (PS-661) and dry with clean, lint free cloths.
(2) Inspect all parts for distortion, cracks, defective threads, or other damage. Replace if defective.




| | | | |
|---|---|---|---|
| 1 | Reducer | 9 | Outer filter |
| 2 | Seal | 10 | Nut |
| 3 | Sight oil level plug | 11 | Washer |
| 4 | Preformed packing | 12 | Cover |
| 5 | Washer | 13 | Inner filter |
| 6 | Locknut | 14 | Strainer and relief valve |
| 7 | Elbow | 15 | Elbow |
| 8 | Cover assembly | 16 | Packing |
| | | 17 | Plug and bleeder |

*Figure 2-3. Compressor assembly, partial exploded view.*

c. *Lubrication.*

(1) Lubricate preformed packing with a light film of pneumatic system lubricating grease (MIIL-4343) during assembly.
(2) Lubricate all male threads with pneumatic system lubricating grease (MILIL-4343) during assembly.

*d. Assembly.*

(1) Install preformed packing (4), backup washer (5), locknut (6), and elbow (7) on first stage.
(2) Position inner cleaner (13) and cover (12) on first stage cylinder and secure with lockwasher (11) and nut (10).
(3) Install outer filter (9) and cover assembly (8) on end of first stage cylinder. Turn cover to lock cover slots over pins on cylinder head.
(4) Install preformed packing (4), backup washer (5), locknut (6), and elbow (15) on second stage. (5) Install seal (2) and reducer (1) on third stage.
(6) Install preformed packing (4), backup washer (5), locknut (6), and strainer and relief valve (14) on second stage.
(7) Install preformed packing (4), backup washer (5), locknut (6), and elbow (7) on third stage.
(8) Place packing (16) over plug and bleeder (17) and screw into port on the oil reservoir.
(9) Install sight oil level plug (3) in crankcase.

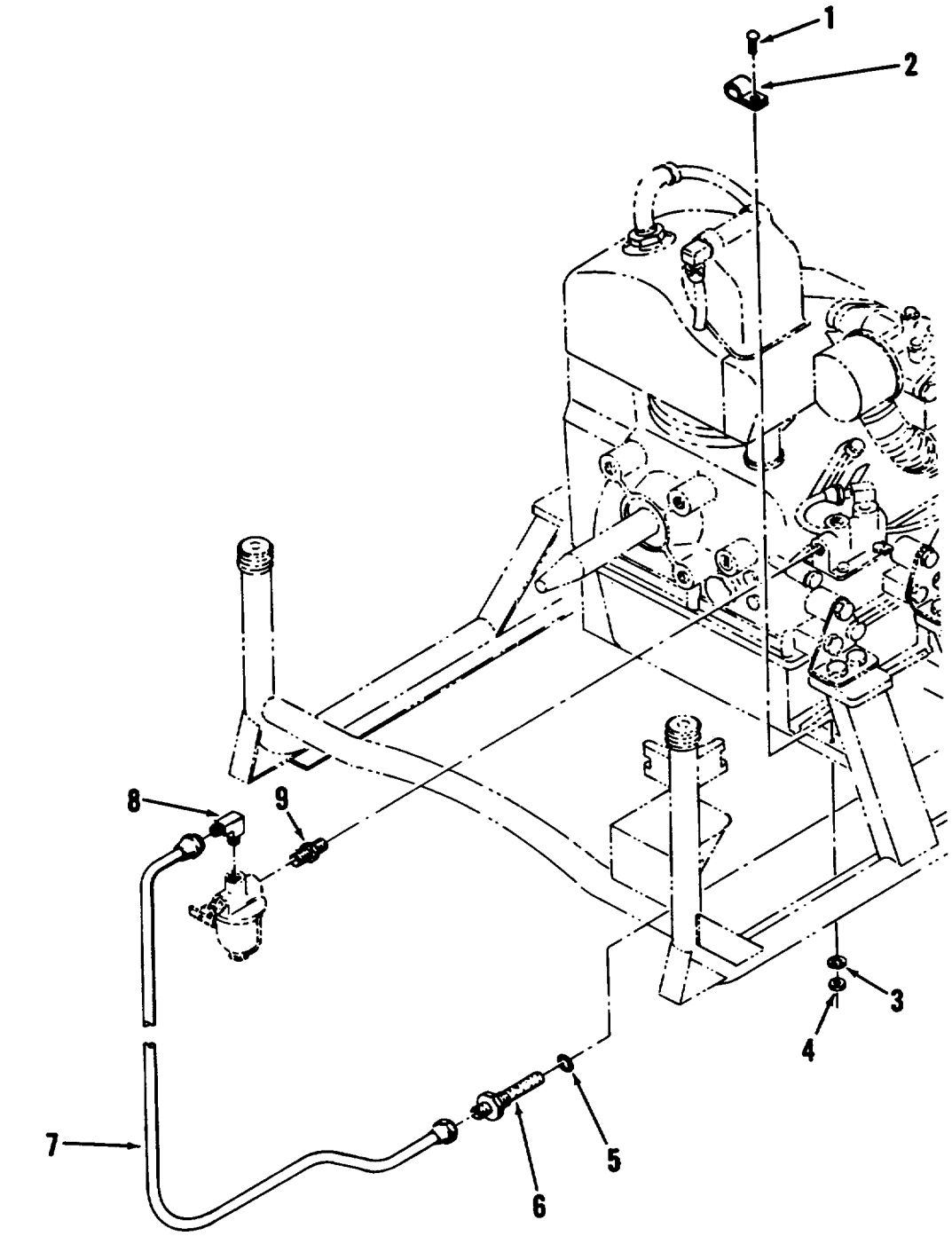
## Section IV. ENGINE GROUP

### 2-8. Description and Function

The engine is a single-cylinder four-stroke cycle internal combustion overhead valve air-cooled engine. The engine is used to drive the air compressor. Included with the gasoline engine are various accessory components required to facilitate operation of the unit. The fuel tank, which is attached to the frame assembly, stores the gasoline. The gasoline flows through the connector and filter, which filters the fuel on its way to the glass filter bowl. Gasoline then flows through the filter bowl to the fuel metering system in the gasoline engine.

### 2-9. Maintenance

Direct support maintenance personnel are authorized to replace the preformed packings, connector and filter, clamp, elbow, nipple, and attaching hardware.




1 Machine screw
2 Clamp
3 Lockwasher
4 Nut
5 Preformed packing
6 Connector and filter
7 Tube assembly
8 Elbow
9 Nipple

*Figure 2-4. Engine accessories, exploded view,*

*a. Disassembly*

(1) Unscrew and remove screw (1, fig. 2-4), nut (4), and lockwasher (3) attaching clamp (2) to the frame. Remove clamp.

(2) Disconnect and remove tube assembly (7) from between connector and filter (6) and the filter bowl.

(3) Unscrew the connector and filter (6) from the fuel tank. Remove packing (5) from the connector and filter.

(4) Unscrew elbow (8) from filter assembly. Remove glass bowl from filter assembly. Unscrew the filter assembly from nipple (9). Remove nipple from the engine.

*b. Cleaning and Inspection.*

(1) Clean all metallic parts by washing in dry-cleaning solvent (P-S-661) and dry with clean, lint free cloths.

(2) Using compressed air, blow the connector and filter (6) to clean the filter.

(3) Inspect all components for damaged threads, cracks, distortion, and other defects.

(4) Replace packing (5).

**Note. Apply antiseize compound (JAN-A-669) to all threaded fittings.**

*c. Assembly.*

(1) Screw nipple (9) into the carburetor inlet port of the gasoline engine.

(2) Assemble the filter assembly of the gasoline engine into nipple (9). Insert glass bowl into filter assembly.

(3) Screw elbow (8) into the filter assembly of the gasoline engine.

(4) Install packing (5) on connector and filter (6).

(5) Screw the connector and filter (6) into the outlet port of the fuel tank.

**Note. The filter element of the connector and filter should be inside the fuel tank.**

(6) Assemble the tube assembly (7) to the connector and filter (6) and elbow (8). Position clamp (2) on the tube assembly and secure to the frame assembly with screw (1), lockwasher (3), and nut (4).

## Section V. FRAME AND FUEL TANK GROUP

### 2-10. Description and Function

The fuel tank includes an inlet port, drain port, and fuel outlet port. Attached to the inlet port is a cap assembly used to prevent foreign matter from entering the fuel tank and to retain the contents of the fuel tank during transportation of the air compressor. The cap assembly is held to the fuel tank by a chain and two hooks in order to prevent the cap assembly from being misplaced. Located at the bottom of the fuel tank is a drain plug to drain fuel from the fuel tank.

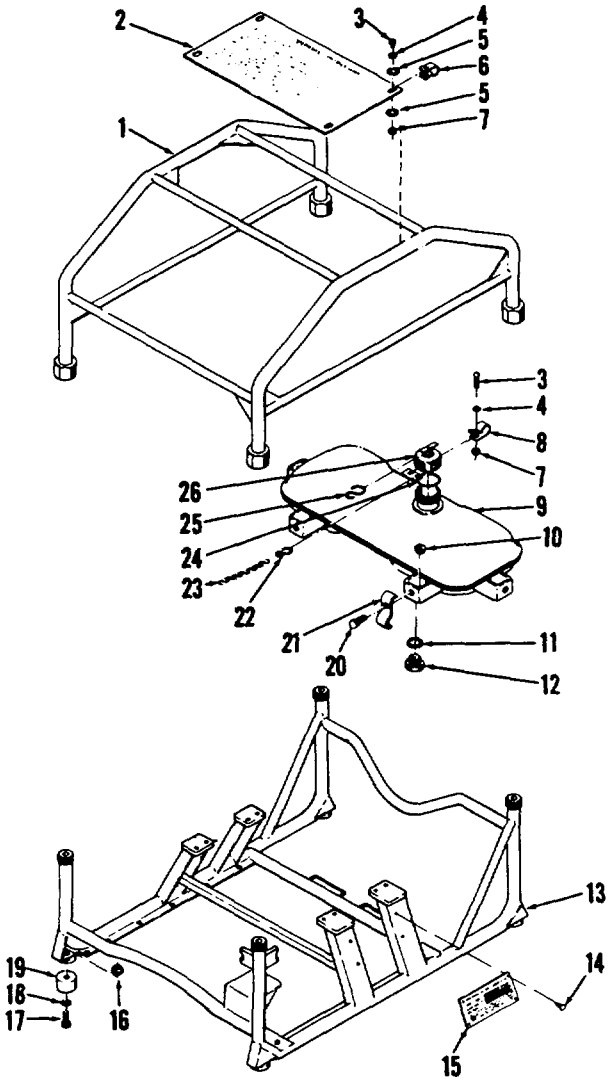
### 2-11. Maintenance

Direct support maintenance personnel are authorized to replace the drain plug, chain hooks, chain, cap assembly, packing, and the fuel tank.

*a. Removal.*

(1) If the tube assembly and filter (6, 7, fig. 2-4) have not been removed, refer to paragraph 2-9a (2) and (3).

(2) Unscrew and remove screw (3, fig.2-5), nut (7), washer (4), and clamp (8). Unscrew and remove four capscrews (20) and nuts (10) with brackets (21). Remove fuel tank (9).




| | | | |
|---|---|---|---|
| 1 | Upper frame | 14 | Rivet |
| 2 | Instruction plate | 15 | Lower identification plate |
| 3 | Machine screw | 16 | Nut |
| 4 | Flat washer | 17 | Machine screw |
| 5 | Resilient mount | 18 | Plain washer |
| 6 | Clamp | 19 | Mount |
| 7 | Nut | 20 | Capscrew |
| 8 | Clamp | 21 | Bracket |
| 9 | Fuel tank | 22 | Hook |
| 10 | Nut | 23 | Chain |
| 11 | Gasket | 24 | Packing |
| 12 | Plug | 25 | Hook |
| 13 | Lower frame | 26 | Cap assembly |

*Figure 2-5. Frame and fuel tank group, exploded view.*

*b. Disassembly.*

(1) Unscrew and remove drain plug (12) from the drain port of the tank.

(2) Remove the packing (11) from the drain plug (12).

(3) Straighten hooks (22 and 25) enough to permit removal of the hooks from the cap assembly (26), chain (23), and tank (9).

(4) Unscrew and remove cap assembly (26) from the fuel tank (9).

(5) Remove the packing (24) from the cap assembly (26).

*c. Cleaning and Inspection.*

(1) Clean metallic parts in dry-cleaning solvent (P-S-661). Dry with clean, filtered compressed air.

(2) Inspect components for damaged threads or other defects.

(3) Replace packing (24) and packing (11) during assembly.

*d. Lubrication. Apply oil (MIIL-2104, grade 30)* to packing (27) during assembly.

*e. Assembly.*

(1) Position packing (24) on cap assembly (26).

(2) Screw cap assembly (26) on the inlet port of fuel tank (9).

(3) Attach hooks (22 and 25) to chain (23). Bend hooks to prevent loss of the chain.

(4) Attach hook (22) to the fuel tank (9) and hook (25) to the cap assembly (26). Bend hooks to secure the chain (23) to both the fuel tank and cap assembly.

(5) Position packing (11) on drain plug (12). Screw drain plug with packing installed into drain port of the fuel tank (9).

*f. Installation.*

(1) Position fuel tank (9) in frame (13). Secure tank with four brackets (21), capscrews (20), and nuts (10). Install clamp (8) with screw (3), washer (4), and nut (7).

(2) To assemble filter (6) and tube assembly (7) refer to paragraph 2-9 (4) through (6).

## CHAPTER 3
## GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

### Section I. MOISTURE SEPARATOR ASSEMBLY

**3-1. Description**

The moisture separator assembly consists of a hollow aluminum shell, which contains a cylindrical baffle provided with three tilted circular vanes. High-pressure air from the compressor aftercooler enters the shell through a port in the removable cap, and is directed against the vanes. The shell cap contains ports which accommodate an outlet fitting and the pressure relief valve assembly.

**3-2. Function**

The compressed air flowing to the moisture separator has a water content in a vapor state. During the compression phase, most of the water is squeezed out of the air as a liquid. Before compressed air is made available for use, the water in liquid droplet form must be separated from the compressed air. The moisture separator performs this function by directing the incoming air-water mixture toward the vanes of the internal baffle. The combination of swirling action, decrease in velocity, and increase in ratio of surface area to volume causes the moisture and oil vapor in the air to condense and settle to the bottom of the shell. Opening the drain permits high-pressure air to blow the accumulated moisture and oil condensate to the atmosphere.

**3-3. Maintenance**

General support maintenance personnel are authorized to repair and test the moisture separator assembly. Repair consists of replacement of defective components of the moisture separator as required.

*a. Disassembly.*

(1) Unscrew shell cap (1, fig. 3-1) from top of shell (6). Unscrew baffle (5) from tank cap and remove washer (4), backup ring (2), and packing (3).

(2) Do not remove instruction plate (7) from the outside of shell (6).

*b. Cleaning and Inspection.*

(1) Wash all metal parts in dry-cleaning solvent (P-S-661) and dry with clean, lint free cloths.

(2) Inspect all parts for distortion, wear, cracks, or other damage. Replace all defective parts.

*c. Lubrication.*

(1) Lubricate all preformed packings with a light film of pneumatic system lubricating grease (MIL-L-4343) during assembly.

(2) Lubricate all male threads with pneumatic system lubricating grease (MIL-L-4343) during assembly.

*d. Assembly.*

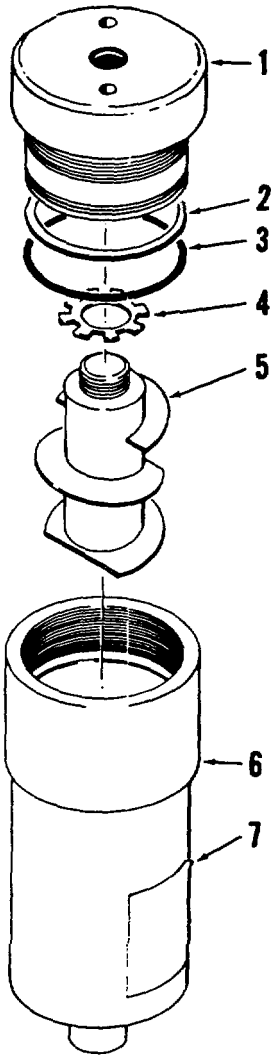
(1) Position packing (3) and backup ring (2) on tank cap (1).

(2) Place washer (4) on baffle (5). Screw both parts into tank cap (1). Position shell cap with baffle on shell (6) and screw shell cap into shell.

*e. Test.*

(1) Plug all open ports. Place unit in proof pressure chamber and pressurize unit with air to 3,750 psig for 1 minute.

(2) Lower pressure to 2,000 psig and check joint between cap and shell for leakage by brushing with a soap solution or immersing in water. There should be no visible leakage.




1 Shell cap
2 Backup ring
3 Packing
4 Lockwasher
5 Baffle
6 Shell
7 Instruction plate

*Figure 3-1. Moisture separator assembly, exploded view.*

## Section II. COMPRESSOR ASSEMBLY

### 3-4. Description

The basic compressor assembly has five different sections. These sections are the third stage section; second stage section; first stage section; endbell, master rod, and shaft section; and oil reservoir and breather section. The compressor assembly sections are joined together to form a single working unit. The first, second, and third stage cylinder sections are assembled to the endbell, master rod, and shaft section. Within the crankcase of the endbell, master rod, and shaft section is assembled the oil reservoir and

breather section. As a single working unit, the compressor assembly serves to provide high-pressure air for flamethrower applications. The three cylinder and-piston assemblies are graduated in size. The first stage has a relatively large bore, while the bores of the second and third stages are progressively smaller.

**3-5. Function**

*a. Compressor.* When the compressor is in operation, the first stage piston moves toward the crankcase and the space in the cylinder bore between the piston and valve plate is at a reduced pressure. This allows ambient air pressure to force the inlet valve away from the valve plate and air enters the cylinder. At conclusion of the intake cycle, the piston reverses direction and moves toward the cylinder head. The intake valve then closes and the air trapped in the cylinder is compressed into a smaller volume by the advancing piston. As the piston approaches the end of its compression stroke, the air pressure is sufficient to overcome the force of the spring holding the exhaust valve against the valve plate and the compressed air flows through the outlet ports through the interstage connecting tube to the inlet port of the second stage cylinder. Compressor timing is such that the second stage piston is moving toward the crankcase and is approaching the bottom of its stroke when compressed air is exhausted from the first stage cylinder. The compressed air enters the second stage cylinder through the strainer and relief valve assembly. The compressed air flows through the holes drilled in the piston, forces the poppet open, and fills the area of reduced pressure in the cylinder bore between the piston and the exhaust valve. When the piston reverses direction, the poppet valve is forced closed and the air trapped in the forward end of the cylinder is compressed by the advancing piston. As the second stage piston approaches top dead center, the pressure of the compressed air in the cylinder becomes sufficient to override the force of the spring holding the exhaust valve closed. The exhaust valv3 opens and the compressed air flows into the interstage connecting tube to the compressor third stage where the compression cycle is repeated and the air raised to its ultimate delivery pressure.

*b. Strainer and Relief Valve Assembly*. The strainer and relief valve assembly installed in the inlet port of the second stage cylinder normally serves only to strain the interstage air. However, should air pressure exceed a predetermined valve, the spring-loaded poppet is forced away from its seat and air escapes to atmosphere through the drilled hole in the spring adjusting plug. The poppet reseats automatically, preventing the further escape of air when the internal pressure drops to the normal operating level. Additional protection against inadvertent over-pressurization is provided by rupture disks installed in the second and third stage cylinder caps. The rupture disks, mounted in a port drilled through the caps, are designed to burst and exhaust air directly to atmosphere in the event of a sudden rise in pressure within either of the cylinders.

*c. Lubrication.* The air compressor assembly is lubricated by a combination of pressure and mist principles. The complete lubrication system includes an oil reservoir attached to the bottom of the crankcase, an oil pump cylinder mounted in the bottom of the reservoir, and an oil pump piston which fits into the cylinder and is driven by the master rod. The oil level in the reservoir is shown on an indicator sight glass mounted on the side of the reservoir. A drain cock located at the bottom of the reservoir enables the oil to be drained. During compressor operation, oil is drawn into the cylinder on the piston suction stroke through two holes drilled in the cylinder wall. On the piston pressure stroke, .the oil inlet holes are covered by the piston preventing the escape of oil back to the reservoir. The oil trapped in the cylinder is forced through the hollow bore of the piston, passes through a drilled hole in the master rod, and lubricates the wear surfaces of the master rod and shaft. The oil thrown from these rapidly moving parts separates into a fine mist which fills the interior of the crankcase and provides adequate lubrication of the bearings, connecting links, pistons, and other internal parts. Oil leakage from the crankcase is prevented by the use

of endbell and oil reservoir gaskets and oil seals installed at each end of the shaft.

### 3-6. Maintenance

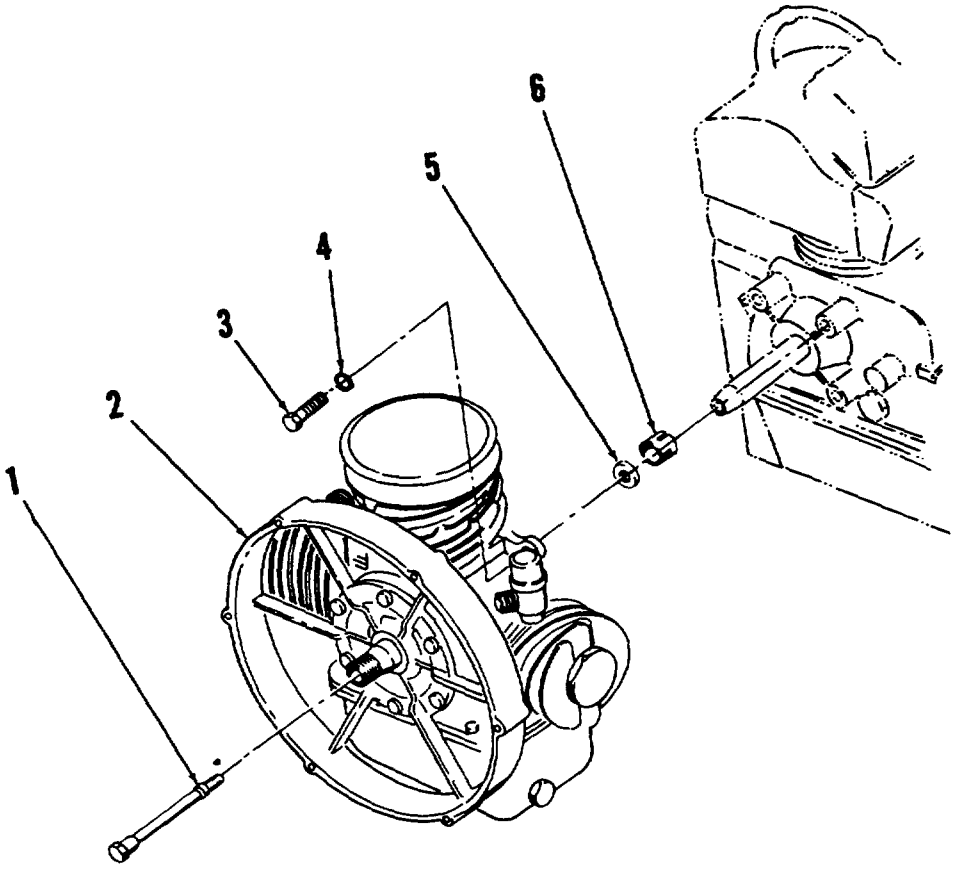
General support maintenance personnel are authorized to test and overhaul the compressor assembly. Overhaul of the compressor assembly is accomplished by replacement and overhaul of components and attaching hardware in each section.

### 3-7. Removal

***Note.*** **Prior to removal of the compressor assembly, cut and remove all lock wires and drain the oil reservoir.**

*a.* Remove the fan, fan guard, and aftercooler section (para 2-5a*).*

*b.* Remove bolt (1, fig. 3-2) and four bolts (3) and lockwashers (4). Pull the compressor assembly (2) away from the gasoline engine assembly. Be certain to recover thrust washer (5) and bushing (6).




1 Bolt
2 Compressor assembly
3 Bolt
4 Lockwasher
5 Thrust washer
6 Bushing

*Figure 3-2. Compressor assembly, removed from engine.*

### 3-8. Cleaning

*a.* All parts must be cleaned thoroughly' before they are inspected for wear and damage. Any dirt, grease, or other foreign material present on the parts after cleaning can affect the accuracy of the inspection and impair operation of the equipment following reassembly.

*b.* Wash all parts of the compressor assembly except the bearings in dry-cleaning solvent (P-S-661). Use a small brush to swab out all compressor lubricating oil passages. Thoroughly dry all parts with filtered compressed air and place in clean, covered containers.

*c.* Wash all bearings in filtered dry-cleaning solvent. Dry bearings by using the vacuum air method. Lubricate bearings immediately after cleaning (para 3-10). Avoid touching clean bearings with bare fingers; do not spin bearings while cleaning or before they are lubricated.

### 3-9. Inspection

*a.* Perform a thorough general inspection of all parts of compressor assembly. Check particularly for cracked and chipped castings, damaged threads, or finished surfaces that are scored, pitted, or scratched.

*b.* Refer to paragraph 1-6c for applicable dimensions when checking parts for excessive wear or other damage.

*c.* Carefully examine the bearing assemblies for damaged races, balls, or needle rollers. After parts have been cleaned and lubricated, test for concentricity and smoothness of operation.

d. Inspect the cylinder bores, pistons, connecting links, wristpins, and master rod for excessive wear, scoring, and other indications of damage. Refer to paragraph 1-6c for the original dimensions and permissible wear at these points.

*e.* Inspect the valves, valve seats, valve springs, and cylinder caps for nicks, scoring, burning, warping, and noticeable wear.

*f.* Examine all gaskets, packing, and shaft seals for deformation cuts, and other indications of deterioration.

*g.* Replace all defective components, preformed packings, gaskets, springs, and components of repair kits allocated to general support maintenance.

### 3-10. Lubrication

*a.* Apply a light film of pneumatic system lubricating grease (MIL-L-4343) to all preformed packings during assembly.

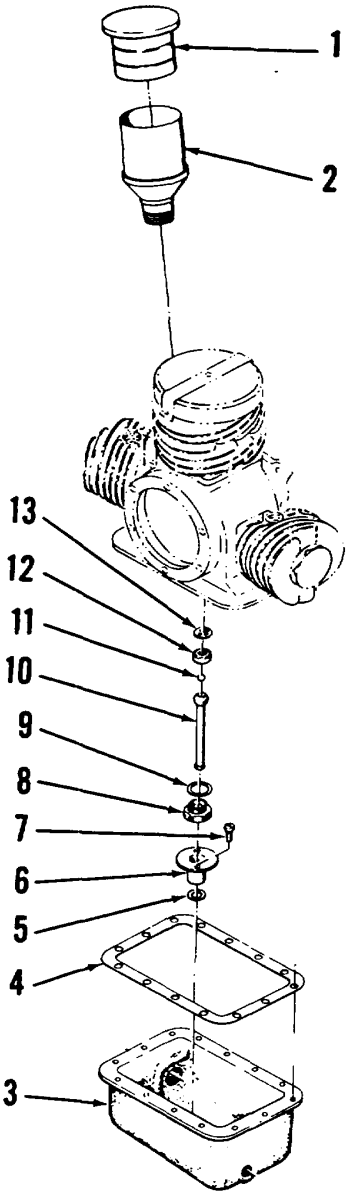
*b.* Lubricate all male threads and wear surfaces with pneumatic system lubricating grease (MILL-I343) during assembly.

*c.* Lubricate the front and rear bearings with pneumatic system lubricating grease (MIL-L-4343) during assembly.

### 3-11. Oil Reservoir-and-Breather Section

*a.* Description. The oil reservoir-and-breather section consists of a cover and filter assembly, a breather body, plug and bleeder, indicator cap, indicator, oil pump, piston assembly, cylinder, oil reservoir, and attaching hardware.

*b.* Maintenance. Overhaul of the oil reservoir-and-breather section (fig. 3-3) consists of replacement and repair of the sight glass plug, the cover and filter assembly, attaching parts, and those parts included in the oil pump piston repair kit.




1 Cover-and-filter assembly
2 Breather body
3 Reservoir
4 Gasket
5 Packing
6 Cylinder
7 Machine screw
8 Retainer
9 Shim
10 Piston assembly
11 Ball
12 Socket
13 Retainer

*Figure 3-3. Oil reservoir-and-breather section, exploded view.*

*c. Disassembly.*

(1) Pull cover and filter assembly (1) from over breather body (2).

(2) Unscrew breather body from crankcase.

(3) Remove gasket (4). Remove two screws (7) attaching cylinder (6). Remove cylinder and packing (5).

(4) Cut wire and remove retainer (8), shim (9), piston assembly (10), ball (11), socket (12), and retainer (13) from connecting rod (8, fig. 3-7).

*d. Assembly.*

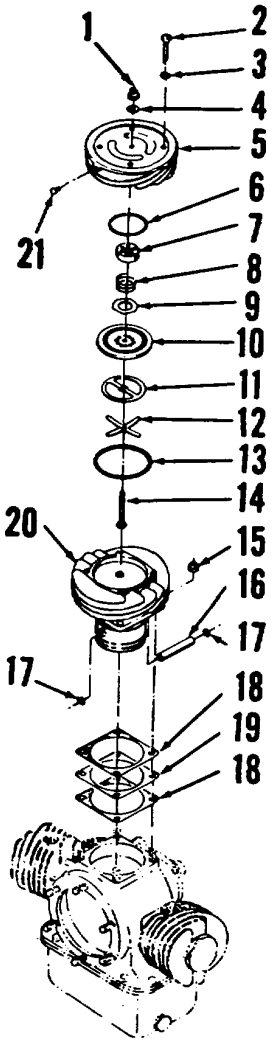
(1) Install parts of oil pump piston repair kit on connecting rod (8, fig. 3-7) and secure with wire. Carefully guide end of oil pump piston into bore of oil pump cylinder (10, fig. 3-3) positioning gasket (4) on oil reservoir (3). Secure reservoir with 14 screws and nuts.

(2) Install packing (5, fig. 3-3) in groove on end of cylinder (6) and position both parts in counterbore inside oil reservoir (3). Secure parts to reservoir with two screws (7).

(3) Screw breather (2) into crankcase. Install cover and filter assembly (1).

## 3-12. First Stage Section

*a. Description.* The first stage section consists of an elbow, gaskets, cylinder head, valve stop, valve spring, valve plate, exhaust valve, intake valve, cylinder and piston assembly, and attaching hardware. The first stage cylinder is provided with a cover and air cleaners which remove particles of foreign matter from the ambient air drawn into the compressor. Additional filtering is provided by a strainer and relief valve assembly installed in the inlet port of the second stage cylinder. Fine mesh screens installed in the body of the strainer and relief valve assembly trap solid particles in the interstage air, and spring-loaded poppets function as pressure relief valves to prevent interstage air pressures from exceeding predetermined values. The intake and exhaust valves used in the first stage of the air compressor are spring steel flapper-type valves mounted on opposite sides of a valve plate installed between the cylinder head and the cylinder. The valves are spring




| | | | |
|---|---|---|---|
| 1 | Nut | 12 | Spring |
| 2 | Machine screw | 13 | Packing |
| 3 | Lockwasher | 14 | Screw |
| 4 | Washer | 15 | Nut |
| 5 | Cylinder head | 16 | Wristpin |
| 6 | Packing | 17 | Snapring |
| 7 | Valve stop | 18 | Gasket |
| 8 | Spring | 19 | Gasket |
| 9 | Valve, exhaust | 20 | Cylinder-and-piston assembly |
| 10 | Plate, valve | | |
| 11 | Valve, intake | 21 | Pin, cover spring |

*Figure 3-4. First stage section, exploded view.*

are spring loaded to seat against concentric rings of holes which are drilled through the valve plate and coincide with the inlet and outlet ports in the cylinder head.

*b. Maintenance. Overhaul of the first stage*

section (fig. 3-4) is accomplished by replacing the intake valve spring, intake valve, exhaust valve, valve stop, cover spring pin, gaskets, wristpin, retaining ring, cylinder-and-piston assembly, and attaching parts.

**Note. The cylinder-and-piston assembly is made up of matched parts. Do not attempt replacement of individual parts.**

*c. Disassembly.*

(1) Remove breather assembly (para 3-11c).

(2) Remove four machine screws (2) and lockwashers (3) attaching cylinder head (5) to cylinder-and-piston assembly (20). Remove cylinder head.

(3) Unscrew and remove nut (1) and lockwasher (4) from cylinder head. Pull screw (14) from cylinder head (5) and remove spring (12), valve (11), valve plate (10), valve (9), valve spring (8), and valve stop (7).

(4) Remove packing (6 and 13).

(5) Remove four nuts (15) and carefully pull cylinder-and-piston assembly (20) from crankcase.

(6) Remove snapring (17) from each end of wristpin (16).

(7) Slide wristpin from piston and rod, releasing piston. Remove piston.

**Note. The cylinder-and-piston assembly consists of matched parts. Keep parts together and separate from similar assemblies of other compressors. Scribe small marks inside skirts to identify side of piston that was toward fan end of crankcase. Do not use pliers; use driftpin to remove wristpin (16).**

(8) Remove gaskets (18 and 19). Record thickness of gasket combination and discard.

**Note. The gaskets used between the cylinder-and-piston assembly and the crankcase serve as shims to obtain proper piston-head-to-valve-seal clearance. The number of gaskets used will vary with each cylinder. By measuring the thickness of removed gaskets and adding 0.005 inch for each new paper gasket to allow for crush at installation, new gaskets required to obtain proper clearance can be selected with ease during reassembly.**

*d. Assembly.*

(1) Install steel gasket (19) flanked by

two paper gaskets (18) against mounting flange of first stage cylinder.

***Note.*** **The total thickness of new gaskets used with the cylinder during reassembly should agree with the measurements taken from the original gaskets during disassembly plus allowance for new gasket crush.**

(2) Install first stage piston of cylinder-and-piston assembly (20) to master rod by pressing wrist-pin (16) through piston and master rod. Secure wrist-pin by installing rings (17).

***Note.*** **Be certain that the mark scribed inside piston skirts during disassembly faces fan end of crankcase.**

(3) Place endbell on crankcase. Refer to paragraph 3-15d(8) for alignment of the crankshaft. Slip first stage cylinder of cylinder-and-piston assembly (20) over installed piston and over four studs of crankcase mounting hole. Install four nuts (15) and tighten evenly. (Cylinder should be installed with leading edge of cooling fins slanted toward fan end of shaft.)

(4) Use a depth micrometer or dial indicator to measure piston-head-to-valve-seat clearance. Required clearance is 0.021 to 0.026 inch. Add or remove gaskets (18 and 19) as necessary to shim cylinder.

***Note.*** **Overall thickness of steel gaskets can be reduced in increments of 0.002 inch by peeling off laminations. At least one paper gasket must remain on each side of steel gasket in final installation. To measure and adjust piston-to-valve-seat clearance, install one cylinder-and-piston assembly to guide the cylinder being measured and adjusted.**

(5) Invert cylinder head (5). Insert valve stop (7) in cylinder head. Place spring (8) in valve stop. Install packing (6) in groove in cylinder head. Place valve (9) on spring (8) and depress with the fingers until valve is seated in recess in cylinder head. Hold components in position with fingers.

(6) With assembled components held in place, assemble parts (10) through (12) on screw (14) and insert screw with parts assembled through spring (8), valve (9), and hole in cylinder head.

(7) Use a 1/8-inch rod inserted through an inner hole of plate (10) to apply pressure against valve (9).

(8) With pressure applied against the valve (9) by rod, slide plate (10) into cylinder head (5) until seated.

(9) Apply finger pressure against screw (14) and remove 1/8-inch rod.

(10) With finger pressure still applied, invert cylinder head (5) and secure screw (14) with washer (4) and nut (1).

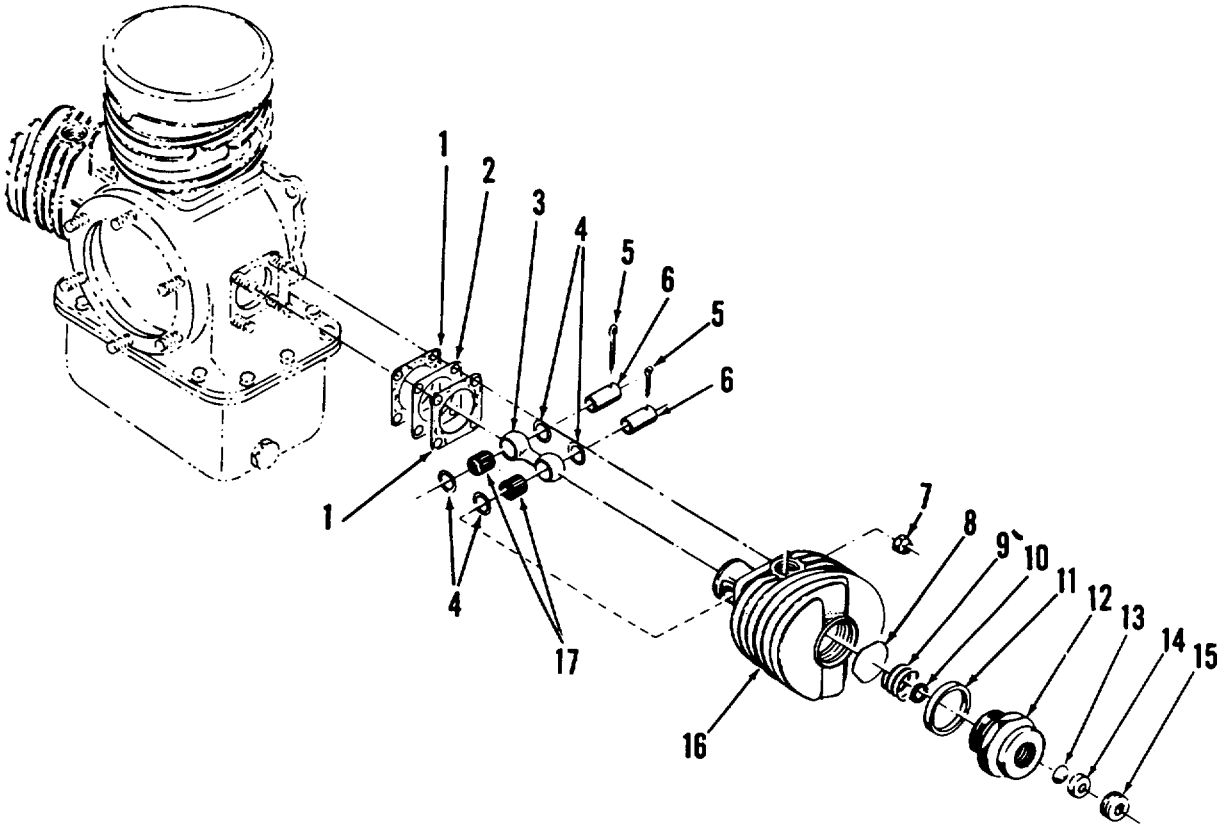
(11) Install packing (13) on outer edge of cylinder head (5). Place the cylinder head on the cylinder making certain fins on the cylinder and cylinder head are slanted in same direction. Secure the cylinder head to the cylinder with four screws (2) and washers (3).

(12) Replace breather assembly on top cylinder head (para 3-11c) (fig. 3-3).

### 3-13. Second Stage Section

*a. Description.* The second stage section consists of a strainer-and-relief valve assembly, connecting link, bearings, wrist-pins, exhaust valve spring, exhaust valve, cylinder-and-piston assembly, rupture disk assembly, and attaching hardware.

*b. Maintenance. Overhaul of the second stage section (fig. 3-5) is accomplished by replacing the second stage cylinder cap, exhaust valve spring, exhaust valve, gaskets, connecting link, the cylinder-and-piston assembly, and attaching parts.*




1 Gasket
2 Gasket
3 Link
4 Washer
5 Cotter pin
6 Wristpin
7 Nut
8 Valve, exhaust
9 Spring, exhaust valve
10 Washer
11 Packing, preformed
12 Cap
13 Disk
14 Retainer ring
15 Retainer screw
16 Cylinder-and-piston assembly
17 Needle roller bearing

*Figure 3-5. Second stage section, exploded view.*

c. Disassembly.

(1) Remove endbell (para 3-15c).

(2) Unscrew and remove retainer (15, fig. 3-5). Remove disk ring (14) and disk (13) from inside cap (12). Remove cap from -end of cylinder-and-piston assembly (16). Remove packing (11) from cap. Remove washer (10), spring (9), and valve (8).

(3) Remove four nuts (7). Carefully pull cylinder from crankcase.

(4) Pull cotter pins (5) releasing wrist-pins (6). Remove wrist-pins, washers (4), bearings (17), and link (3) attaching piston of cylinder-and-piston assembly to connecting rod inside crankcase.

**Note. The cylinder-and-piston assembly is made up of matched parts. Do not separate the cylinder and piston or mix with similar components of other compressors. Scribe small marks inside skirts to identify side of piston that was toward fan end of crankcase.**

(5) Remove gaskets (1 and 2). Record thickness of gasket combination and discard.

**Note[1]. The gaskets used between the cylinder-and-piston assembly and the**

**crankcase serve as shims to obtain proper piston-head-to-valve-seal clearance. The number of gaskets used will vary with each cylinder. By measuring the thickness of removed gaskets and adding 0.005 for each new paper gasket to allow for crush at installation, new gaskets required to obtain proper clearance can be selected with ease during reassembly.**

**Note[2]. The cylinder-and-piston assembly is made up of matched parts. Do not attempt to replace individual parts.**

*d. Assembly.*

**Note. To measure and adjust piston-head-to-valve-seat clearance, install first or third stage cylinder-and-piston assembly to guide the cylinder being measured and adjusted.**

(1) Place 25 needle rollers (17) around edge of wrist-pin hole in one end of second stage connecting link (3) Place link washers (4) at ends of needle rollers. Position connecting link inside piston of cylinder-and-piston assembly (16) and press in wrist-pin (6). Secure with cotter pins (5).

**Note. Assembly of needle rollers and link washers in connecting link is simplified by coating the parts with petrolatum (W-P-236) causing the parts to adhere to each other.**

(2) Pass free end of second stage connecting link (3) through the cylinder mounting hole in the crankcase. Marks scribed in piston skirts during disassembly should be toward fan end of crankcase.
(3) Secure connecting link to master rod with wrist-pin (6) and cotter pin (5).
(4) Place gasket (2) flanked by two paper gaskets (1) on mounting flange of second stage cylinder with cylinder fins slanted toward fan end of shaft. Slip cylinder onto piston and press firmly into crankcase. Secure cylinder with four nuts (7).

(5) Use a depth micrometer or dial indicator to measure and adjust piston-head-to-valve-seal clearance. The required clearance is 0.002 to 0.006 inch.
(6) Install valve (8), spring (9), washer (10), packing (11), and cylinder cap (12) on second stage cylinder. Tighten cylinder cap with 300-350 pound-inch torque.
(7) Install disk (13) and retainer (14) and secure parts inside cap (12) with retainer screw (15).

**3-14. Third Stage Section**

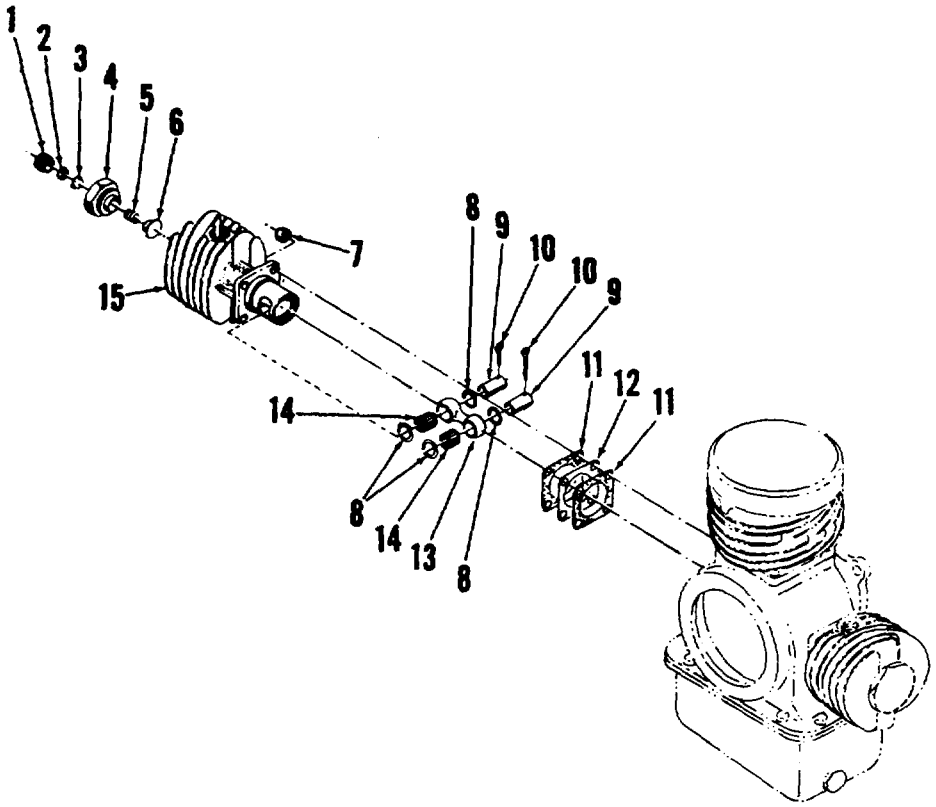
a. Description. The third stage section consists of the elbow, retainer, ring, disk, cap, exhaust valve spring, exhaust valve, reducer, gaskets, seals, cylinder-and-piston assembly, and attaching hardware.

*b. Maintenance.* Third stage section overhaul is accomplished by replacing the cylinder cap, exhaust valve spring, exhaust valve, and the cylinder-and-piston assembly.

**Note. The cylinder-and-piston assembly is made up of matched parts. Do not attempt to replace individual parts. Additional components to be replaced in the third stage section are included in the third stage connecting link repair kit.**

c. Disassembly.

(1) Unscrew and remove retainer (1, fig. 3-6). Remove disk ring (2) and disk (3) from inside cap (4).
(2) Unscrew and remove cap (4). Remove exhaust valve spring (5) and exhaust valve (6) from inside cylinder-and-piston assembly (15).
(3) Remove four nuts (7) and carefully pull cylinder from piston of cylinder-and-piston assembly (15).




| | | |
|---|---|---|
| 1 Retainer | 6 Valve | 11 Gasket |
| 2 Ring | 7 Nut | 12 Gasket |
| 3 Disk | 8 Washer | 13 Link |
| 4 Cap | 9 Wristpin | 14 Bearing |
| 5 Spring, exhaust valve | 10 Cotter pin | 15 Cylinder-and-piston assembly |

*Figure 3-6. Third stage section, exploded view.*

(4) Pull cotter pins (10) releasing wrist-pins (9). Remove wrist-pins, washers (8), bearings (14), and link (13) releasing piston from rod.

**Note. The cylinder and piston are matched parts. Do not separate the cylinder and piston or mix with similar components of other compressors. Scribe small marks inside skirts to identify side of piston that was toward fan end of crankcase.**

(5) Remove gaskets (11 and 12). Record thickness of gasket combination and discard.

**Note. By measuring the thickness of removed gaskets and adding 0.005 inch for each new proper gasket to allow for crush at installation, new gaskets required to obtain proper clearance can be selected with ease during reassembly.**

*d. Assembly.*

**Note. To measure and adjust piston-head-to-valve-seat clearance, install first or second stage cylinder-and-piston assembly to guide the cylinder being measured and adjusted.**

(1) Place 25 needle rollers (14) around edge of wrist-pin hole in one end of third stage connecting link (13). Place link washer (8) at ends of needle rollers. Position connecting link inside piston of cylinder-and-piston assembly (15) and press in wrist-pin (9). Secure with cotter pin (10). Use petrolatum (para 3-12d(1)).

(2) Assemble 25 needle rollers (14) and two link washers (8) in wrist-pin hole of connecting link (13). Pass free end of third stage connecting link (13)

through cylinder mounting hole in the crankcase. Marks scribed in piston skirts during disassembly should be toward fan end of the crankcase.

(3) Secure connecting link to master rod with wrist-pin (9) and cotter pin (10).
(4) Place gasket (12) flanked by two paper gaskets (11) on mounting flange of third stage cylinder. Slip cylinder into piston and press firmly into crankcase. Be sure cylinder fins are slanted toward fan end of shaft. Secure cylinder with four nuts (7).

**Note. The gaskets used between the cylinder-and-piston assembly and the crankcase serve as shims to obtain proper piston-head-to-valve-seat clearance. The number of gaskets used will vary with each cylinder.**

(5) Use a depth micrometer or dial indicator to measure and adjust piston-head-to-valve-seat clearance. The required clearance is 0.002 to 0.006 inch.

**Note. Make sure that piston is at top dead center before gauging. To measure for clearance, measure from top of cylinder to top of valve seat, read measurement; then measure from top of cylinder to piston head, read measurement. Difference between both readings will be the clearance indicated.**

(6) Install valve (6), spring (5), cylinder cap (4), rupture disk (3), disk ring (2), and retainer (1) into cylinder well. Tighten cylinder cap with 350 400 pound-inch torque and disk ring retainer with 350 pound-inch torque.

**Note. For removal of compressor group. refer to paragraph 2-7.**

### 3-15. Endbell, Master Rod, and Shaft Section

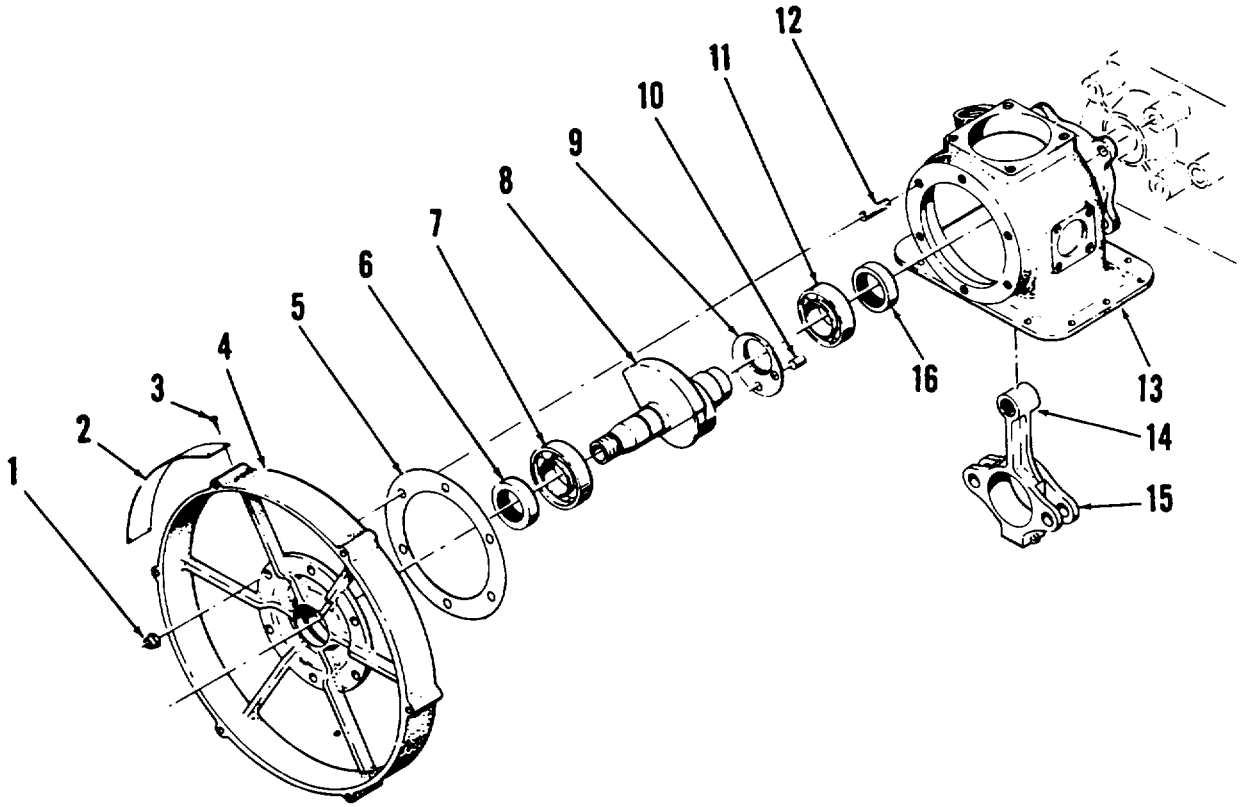
*a. Description.* The endbell, master rod, and shaft section consists of the endbell, two seals, two ball bearings, rod, bearing, crankcase, and attaching hardware.

*b. Maintenance.* Overhaul of the endbell, master rod, and shaft section consists of replacement of the endbell, oil seals, ball bearing, shaft retainer plate and pin, master rod, needle bearings, crankcase, and attaching parts.

c. Disassembly.

(1) Unscrew and remove six nuts (1, fig. 3-7) attaching endbell (4) to crankcase (13). Remove endbell. Remove gasket (5).
(2) Remove seals (6 and 16) and pull bearing (7).
(3) Carefully pull shaft (8) from connecting rod (15) and from inside crankcase.
(4) Remove connecting rod (15) and bearings (14).
(5) Remove bearing (11), plate (9), and pin (10) from crankshaft.

**Note. Pin (10) may be seated in the crankshaft so that it is extremely difficult to remove. If this occurs do not remove pin.**




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Nut | 5 | Gasket | 9 | Plate | 13 | Crankcase |
| 2 | Nameplate | 6 | Seal, front | 10 | Pin | 14 | Bearing |
| 3 | Rivet | 7 | Bearing | 11 | Ball bearing | 15 | Connecting rod |
| 4 | Endbell | 8 | Shaft | 12 | Stud | 16 | Seal, rear |

*Figure 3-7. Endbell, master rod, and shaft section, exploded view.*

*d. Assembly.*

(1) Using a suitable arbor press, seat shaft seal (17) in counterbore of crankcase (13) with lip of seal facing toward fan end of crankcase.

(2) Press ball bearing (11), smooth side of inner race up, in bearing counterbore of crankcase.

(3) Position connecting rod (15) with bearing (14) installed, with first stage throw through first stage cylinder bore in crankcase. Place pin (10) in shaft (8) if pin has been removed.

(4) Place plate (9) between connecting rod and bearing (11) with the flat side toward connecting rod. Align parts with inner diameter of bearing.

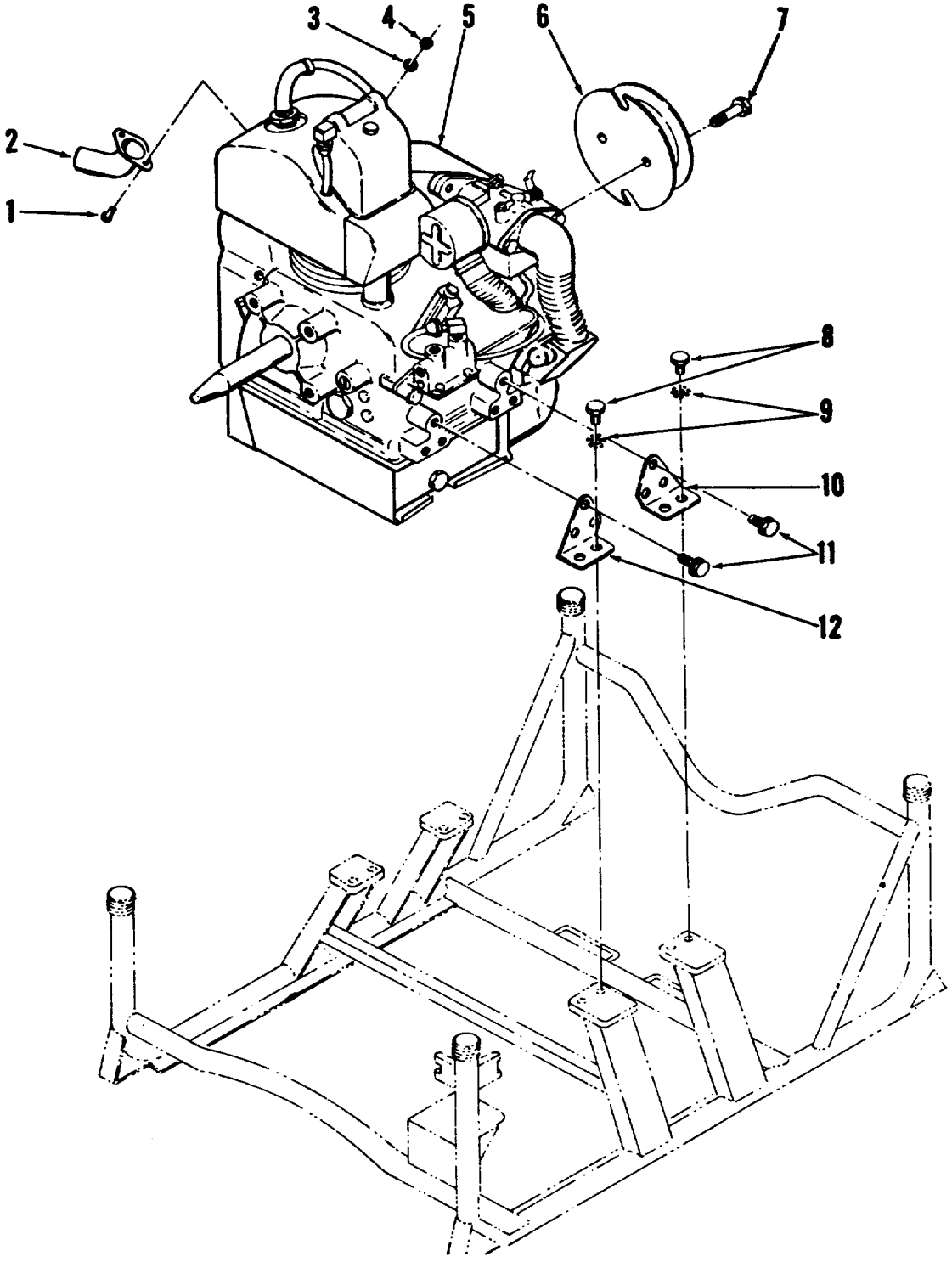
(5) Press shaft (8) through connecting rod and plate into bearing (11) until it bottoms. Be certain pin (10) passes through hole in plate (9).

(6) Press shaft front seal (6) in endbell (4) counterbore with lip of seal toward crankcase side of endbell.

(7) Press bearing (7) on shaft (8) until it bottoms.

(8) Place gasket (5) over installed studs (12) and against crankcase (13). Position endbell (4) over shaft (8) and press onto bearing (7) until endbell bottoms against gasket and crankcase. Be certain the six holes in the endbell are aligned with studs (12) before pressing into position.

(9) Install six nuts (1) and tighten evenly.




1 Screw
2 Exhaust pipe
3 Lockwasher
4 Nut
5 Engine
6 Starter flange
7 Screw
8 Capscrew
9 Lockwasher
10 Right-hand bracket
11 Screw
12 Left-hand bracket

*Figure 3-8. Gasoline engine group, exploded view.*

### 3-16. Installation

a. Position the basic compressor assembly (2, fig. 3-2) on the gasoline engine and secure with four bolts (3) and lockwashers (4). Screw bolt (1) into engine crankshaft making sure that thrust washer (5) and bushing (6) are in position.

b. Replace the fan, fan guard, and aftercooler section (para 2-5c).

## Section III. ENGINE GROUP

### 3-17. Description and Function

The engine is a single-cylinder four-stroke overhead valve air-cooled gasoline-fueled unit designed to develop 1 1/2 hp. at 3,600 rpm. Included with the gasoline engine are various accessories required to facilitate operation of the unit. A tube assembly is used to conduct fuel from the tank to the carburetor. Four brackets are used to mount the gasoline engine on the frame assembly. A starter flange is attached at the rear of the gasoline engine. The pulley is used with a starter rope to start the engine manually.

### 3-18. Maintenance

General support maintenance personnel are authorized to replace the tube assembly, brackets, exhaust pipe; connector and filter, and attaching parts. For detailed maintenance procedures on the engine, see TM 5-2805-208-14.

*a. Removal.*

(1) Perform disassembly (para 2-7a).
(2) Disconnect the aftercooler (5, fig. 2-2) from the moisture separator inlet elbow (18, fig. 2-1).
(3) Unscrew the eight screws (7, fig. 3-8) and lockwashers (8) and remove the gasoline engine and compressor assembly from the lower frame.
(4) Remove bolt (1, fig. 3-2), four screws (3), and lockwashers (4) and remove the compressor assembly from the engine. Be sure to recover thrust washer (5) and bushing (6).

*b. Disassembly.*

(1) Unscrew and remove two screws (1, fig. 3-8), lockwashers (3), and nuts (4) attaching exhaust pipe (2) to engine. Remove exhaust pipe.
(2) Remove two screws (7) and flange (6) from side of engine.
(3) Remove 12 screws (11) and 14 brackets (10 and 12) from the gasoline engine.

*c. Cleaning and Inspection*

(1) Wash all parts in drycleaning solvent (P-S-661). Dry with clean, lint free cloths.
(2) Inspect all parts for clogging, dents, scratches, or other damage. Replace defective components.

*d. Lubrication.*

(1) Apply antiseize compound to components of the fuel system (fig. 2-4).
(2) Apply pneumatic system lubricating grease (MIL-L-4343) to threads of the aftercooler (5, fig. 2-2) during assembly.

*e. Assembly.*

(1) Position two brackets (10 and 12, fig. 3-8) on gasoline engine (5). Secure to engine with 12 screws (11).
(2) Position flange (6) on gasoline engine (5) and secure with two screws.
(3) Place exhaust pipe (2) on gasoline engine (5) and install with two screws (1), lockwashers (3), and nuts (4).

*f. Installation.*

(1) Position bushing (6, fig. 3-2) on engine crankshaft. Secure thrust washer (5) on bushing and position compressor assembly against engine assembly. Secure the compressor shaft to the engine shaft with bolt (1) being certain that thrust washer and bushing are in position. Secure compressor assembly to engine assem

bly with four screws (3) and lockwashers (4).

(2) Position the gasoline engine and compressor assembly on the lower frame (13, fig. 2-5). Using eight screws (8, fig. 3-8) and lockwashers (9), secure unit to frame. Apply a torque of 60 to 80 pound-inches to the screws.

(3) Connect the aftercooler (5, fig. 2-2) to the moisture separator inlet elbow (18, fig. 2-1).

(4) Perform assembly (para 2-9c)

## Section IV. FRAME AND FUEL TANK GROUP

### 3-19. Description and Function

The frame assembly consists of a tubular protective cage and a rubber-mounted, tubular lower frame that are joined together by coupling nuts. The frame assembly is used as the mounting base for the entire unit.

### 3-20. Maintenance

General support maintenance personnel are authorized to replace the identification plate, upper frame, lower frame, rubber mounts, and the attaching hardware.

*a. Removal.*

(1) Unscrew the coupling nuts on the upper frame (1, fig. 2-5) and remove the upper frame from the lower frame (13).

(2) Remove the fuel tank and accessories (para 2-lla).

(3) Remove four rivets (14) and remove identification plate (15) from the lower frame (13).

(4) Unscrew four nuts (16) and remove screws (17), lockwashers (18), and rubber mounts (19).

*b. Cleaning and Inspection.*

(1) Clean all metallic parts with drycleaning solvent (P-S-661) and dry with clean, lint free cloths.

(2) Inspect all components for bends, breaks, scratches, damaged threads, and other defects.

(3) Replace all rubber mounts (19) if any one is unserviceable.

*c. Installation.*

(1) Replace all four rubber mounts (19) on lower frame (13) using screws (17), washers (18), and nuts (16).

(2) Replace the fuel tank accessories (para 2-11f).

(3) Position identification plate (15) on frame (13) and secure with four rivets (14).

(4) Position the upper frame (1) on lower frame (13) and secure coupling nuts on the upper frame.

## Section V. TESTING

### 3-21. General

Before installation of the compressor assembly on the gasoline engine, test runs of the compressor assembly must be performed. The type test to be performed is dependent upon the replacement performed during overhaul.

**Note. If gasoline engine group is not available, mount the compressor on a unit capable of operation at speeds ranging from 0 to 3,600 rpm.**

### 3-22. Run-In

a. Run-in is a test which is performed immediately after final assembly.

b. The compressor assembly is run for a minimum of 2 hours as follows: (Conduct all tests at ambient pressure and temperature.)

(1) Remove intake filter, first stage, and inject 1 ounce of new crankcase oil (MIL-L-6085) into cylinder head.
(2) Run for 2 hours at 3,600 rpm.

### 3-23. Pump-Up Time

a. Connect the compressor to a standard pressure tank from the M2A1-7 flamethrower or a similar volume (208 $\pm$ 3 $in.^3$). Connect pressure gauge. Observe pressure in air bottle.

b. Brush all seams and connections with a soap solution and check for leakage during pump-up.

c. The compressor is required to pump-up the system to 2,000 psig in 5 1/2 minutes when operated at 3,600 rpm maximum.

d. No leakage is permissible.

### 3-24. Blow-by Test

a. Operate the compressor at a regulated pressure of 2,000 psig under ambient air conditions until the operating temperature stabilizes.

b. Measure blowby at the crankcase oil filler pipe.

c. Blowby must not exceed 0.07 scfm at 80° F. ambient temperature.

d. Blowby may increase by 0.02 scfm per 10°F. rise in ambient temperature when oil (MIL-L-6085) is used.

## APPENDIX

## REFERENCES

| | |
|---|---|
| TB 742-93-1 | Inspection and Test of Air and Other Gas Compressors |
| TM 3-1040-244-12 | Organizational Maintenance Manual Compressor, Reciprocating, Power-Driven, Flamethrower, 31/2 CFM, AN-M4/C |
| TM 3-1040-244-35P | DS, GS, and Depot Maintenance Repair Parts and Special Tool Lists, Compressor, Reciprocating, Power-Driven, Flamethrower, 31/2 CFM, AN-M4/C |
| TM 5-2805-208-14 | Operator, Organizational, DS, and GS Maintenance Manual, Engine, Gasoline (Military Standard Model 1A083) |

By Order of the Secretary of the Army:

HAROLD K. JOHNSON,
*General, United States Army,*
*Chief of Staff.*

Official:

KENNETH G. WICKHAM,
*Major General, United States Army,*
*The Adjutant General*

Distribution:

Active Army:

| | |
|---|---|
| CNGB (1) | Army Tml (1) |
| USAMB | (2) |
| USAAPSA (5) | |
| USACDC (2) | Arsenals (3) except |
| USACDCCBRA | 2) |
| Edgewood (50) | |
| USACDCADA | (2) |
| PG (5) | |
| USACDCARMA | (2) |
| USAC (1) | |
| USACDCARTYA(2) | Ft Knox Fld Maint Shop (10) |
| USACDCAVNA (2) | Units org under fol TOE: |
| USACDCIA (2) | 3-7 (1) |
| USACDCSWA (2) | 3-32 (1) |
| USAARMC (2) | 3-36 (1) |
| USA Engr Cen (2) | 3-47 (2) |
| USAPC (2) | 3-67 (2) |
| USA GM Cen (2) | 3-117 (2) |
| USAIC (2) | 3-147 (1) |
| U.SCONARC (10) | 3-500 AA-AC (1) |
| ARADCOM (5) | 29-1 (1) |
| ARADCOM Rgn (6) | 29-I1 (1) |
| Armies (5) | 29-15 (1) |
| Corps (3) | 29-17 (1) |
| Div (3) | |
| 29-21 (1) | |
| USMA (10) | 29-25 (1) |
| Svc Colleges (10) | 2'J-27 (1) |
| Br Svc Sch (10) except | 29-35 (1) |
| USACMLS (50) | 29-37 (1) |
| GENDEP (5) | 29-45 (1) |
| Dep (5) | |
| 29-51 (1) | |
| Army Dep (5) | 29-55 (1) |
| USASMC (1) | 29-56 (1) |
| U'SAMU,COM (5) | 29-57 (1) |
| USAMC (5) | 29-75 (1) |
| USACDCEC (10) | 29-79 (1) |
| POE (1) | 29-105 (1) |
| Instl (2) except | 29-109 (1) |
| Ft Riley (9) | 29-500 (1) |
| USA Tml Comd (1) | |

NG: State AG (3); TOE 7-2 (1); 17-2 (1).
USAR: Same as active Army except allowance is one (1) copy to each unit.
For explanation of abbreviations used, see AR 320-50.

* U. S. GOVERNMENT PRINTING OFFICE : 1993 0 - 342-421 (62613)

TEAR ALONG PERFORATED LINE

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

*THEN. . JOT DOWN THE DOPE ABOUT IT ON THIS FORM, CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!*

**SOMETHING WRONG WITH THIS PUBLICATION?**

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

| PUBLICATION NUMBER | PUBLICATION DATE | PUBLICATION TITLE |
|---|---|---|
| | | |

BE EXACT. . .PIN-POINT WHERE IT IS

| PAGE NO. | PARA-GRAPH | FIGURE NO | TABLE NO. |
|---|---|---|---|
| | | | |

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

| PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER | SIGN HERE: |
|---|---|
| | |

DA FORM 1 JUL 79 2028-2

PREVIOUS EDITIONS ▸ ARE OBSOLETE.

P.S.—IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

**PIN: 024673-000**