

TECHNICAL MANUAL

**OPERATION INSTRUCTIONS
MAINTENANCE INSTRUCTIONS**

**COMPRESSOR, 3000 PSI, 5 SCFM,
AIR, OIL FREE, PORTABLE,
GASOLINE ENGINE DRIVEN**

**RIX MODEL 1S3B-6
TYPE SA-6AG**

N00104-78-D-1670
N00104-79-C-3800
N00104-87-C-0039

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MOTOR SERVICE PARTS MANUAL INSERT (WISCONSIN ROBIN)

RECORD OF CHANGES

CHANGE NO.	DATE	TITLE OR BRIEF DESCRIPTION	ENTERED BY
1	2/4/87	Rollover Frame reinforced, plugs added to 2nd & 3rd stage heads, and fasteners to S/S.	

APPROVAL AND PROCUREMENT RECORD PAGE**APPROVAL DATA FOR:**

TECHNICAL MANUAL S600-A7-MM0-010/MOD 1S3B-6
OPERATION INSTRUCTIONS
MAINTENANCE INSTRUCTIONS

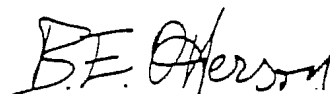
COMPRESSOR, 3000 PSI, 5 SCFM, OIL FREE
PORTABLE H.P. AIR MODEL 1S3B-6

APPROVAL AUTHORITY:

CONTRACT NUMBER	SHIP APPLICABILITY	QUANTITY OF MANUALS	QUANTITY OF EQUIPMENT	BUILDING YARD
N00104-78-D-1670		174	87	
N00104-79-C-3800		178	89	
N00104-87-C-0039		270	135	

REMARKS:**DATE: MARCH 5, 1980**

CERTIFICATION: It is hereby certified that S6220-A7-MMO-010/MOD 1S3B-6 to be provided under contract number N00104-78-D-1670, N00104-79-C-3800 and N00104-87-C-0039 has been approved by the approval data shown above.



B.E. Otterson, Contract Administrator
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Federal Code Number 28953

VALIDATION PERFORMANCE

TITLE OF PUBLICATION

Technical Manual S6220-A7-MMO-010/MOD 1S3B-6
Operation Instructions
Maintenance Instructions

Compressor, 3000 psi, 5.0 SCFM Air, Oil Free Portable Gasoline Engine Driven
Model RIX 1S3B-6

CONTRACTOR

SUB-CONTRACTOR (If performing validation)

RIX INDUSTRIES

CONTRACT NO(S) AND PURCHASE ORDERS, IF APPLICABLE

N00104-78-D-1670
N00104-79-C-3800
N00104-87-C-0039

CHAPTERS

SECTION

PARAGRAPH

DATE
VALIDATION
COMPLETEDCHECK HERE IF
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NAME & AUTHORITY OF VALIDATING
OFFICER

SIGNATURE OF VALIDATING OFFICER

CHAPTER I

GENERAL INFORMATION AND SAFETY PRECAUTIONS

1.1 SAFETY PRECAUTIONS.

1.1.1 GENERAL. To insure the safe operation of this equipment, the operator must:

- a. Follow the instructions in the manual for starting, stopping, and maintaining the compressor.
- b. Locate the compressor inlet where the air is pure, away from exhausts or other harmful gases.
- c. Never remove safety guards.
- d. Never operate if a safety valve is popping.
- e. Never operate with a safety valve removed or adjusted to a pressure other than the factory recommendation.
- f. Never pressurize any receiver, pressure vessel, or SCUBA tank above its safe working limit. Make sure the vessel being filled has been inspected, hydrostatically tested, and certified as approved for service within the last five years.
- g. Never operate the equipment if there is an indication of improper functioning, air leaks, or broken or loose parts.
- h. To prevent getting shocked, do not touch the spark plug or spark plug wire while the unit is operating.
- i. To prevent getting burned, stay clear of the exhaust muffler and all other hot areas of the engine.
- j. Never work on the equipment without first relieving all pressure. Always protect eyes and face when opening valves to bleed off pressure.

k. Handle gasoline in a safe manner. Never use it near an open fire or flame. Keep tank and fuel line away from hot exhaust.

1.2 INTRODUCTION.

1.2.1 PURPOSE AND SCOPE. The purpose of this manual is to provide all information pertinent to the operation and maintenance of the Rix Model 1S3B-6 high pressure, oil free, air compressor. This publication sets forth requirements and procedures for safe operation and servicing, and includes descriptive data and tests necessary to achieve a functional understanding of the compressor.

This publication represents the sole authority for the subject equipment.

1.2.2 APPLICABILITY. This manual is applicable to all air compressors bearing the Rix Industries Model Number 1S3B-6 and identified by serial numbers 5091 through 5177, 5251 through 5372 and 7066 through 7200, inclusive.

1.3 EQUIPMENT DESCRIPTION.

1.3.1 GENERAL. The Rix 1S3B-6 Compressor is a lightweight, portable air compressor package suitable for filling SCUBA (Self Contained Underwater Breathing Apparatus) cylinders to 3000 psi. The unit is powered by a 7.5 horsepower gasoline engine with recoil starter. The engine and compressor are coupled by a vee-belt drive and mounted in a roll-over type tubular frame.

Included are a six gallon capacity gasoline tank for remote or adjacent mounting, fuel line with quick disconnect, priming bulb, remote air suction hose with replaceable element filter, and filling hose and yoke to fit a standard SCUBA valve.

The compressor is a three stage reciprocating air pump using an axial piston drive. All bearings are sealed and the piston rings are made from self-lubricating filled PTFE plastic. No oil is used during the compression process, thereby eliminating

the possibility of introducing carbon monoxide or other harmful contaminants into the air stream. It is still critically important to locate the air inlet upwind and as far as possible from the engine exhaust or any other sources of contaminated air.

The compressor is furnished with interstage and final moisture separators to remove condensed water. Screen filters in the separators trap particulate contaminants to 25 micron in size.

Table 1-1 Reference Data

Descriptive Data	Rix Industries Model 1S3B-6 oil free, gasoline engine driven three stage, axial piston, portable air compressor package. CID Number: 061050025
Functional Characteristics and Rated Outputs	Power required: 4.0 brake horsepower (7.5 Hp engine supplied) Pressure: 3,300 psi maximum Capacity: 5.0 Standard Cubic Feet per minute Speed: 1500 RPM Compressor 3600 RPM Engine
Capabilities and Limitations	Air cooled and tubular frame mounted for portable service. Self lubricated pistons for oil free compression.
Environmental Characteristics	Designed to operate at ambient temperatures up to 125°F and relative humidities to 90 per cent. All components are anodized, plated, or painted to resist corrosive environments.

Table 1-2 Equipment, Accessories and Documents Supplied

Quantity	Item Name or Nomenclature	CID Number Unit Number	Overall Dimensions	Weight and Volume
1 ea.	Compressor, portable, high pressure, oil free, gasoline driven, Rix Model 1S3B-6 axial piston design.	061050045	33"L x 17¼"W x 17"H	140 Lbs. 5.6 Cu. Ft.
1 ea.	Gasoline tank and fuel hose.		21"L x 13"W x 9"H	6 Gallons 6 Lbs. 1.4 Cu. Ft.
1 ea.	Suction hose (for remote intake) with filter.		15 ft. long x 1" Dia.	3½ Lbs. 141 Cu. In.
1 ea.	Manual		8½" x 11" x ½"	Weight 16 oz. Volume 47 Cu. In.

Table 1-3 Specifications

Compressor	
Discharge Pressure (Max.)	3300 psi
Capacity	5.0 SCFM
Speed	1500 RPM
Brake horsepower required	4
Piston Size, 1st Stage	3.0" Dia.
Piston Size, 2nd Stage	1.25" Dia.
Piston Size, 3rd Stage	0.562" Dia.
Stroke	1.25"
Cooling	Forced air fan
Compression type	Oil Free
Gasoline Engine	
Horsepower Rating	7.5
Speed	3600 RPM*
Type	Four cycle

**Set at full throttle condition.*

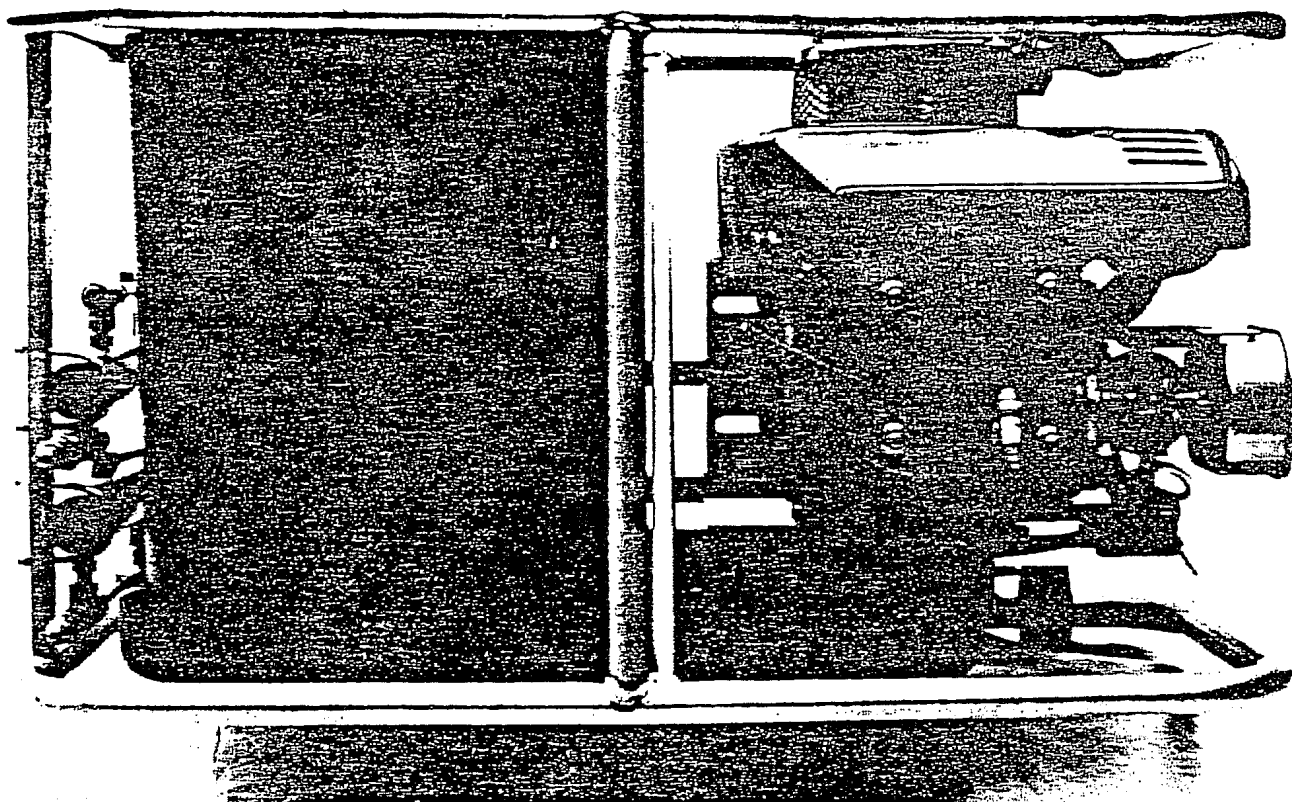


Figure 1-1 Compressor Top View

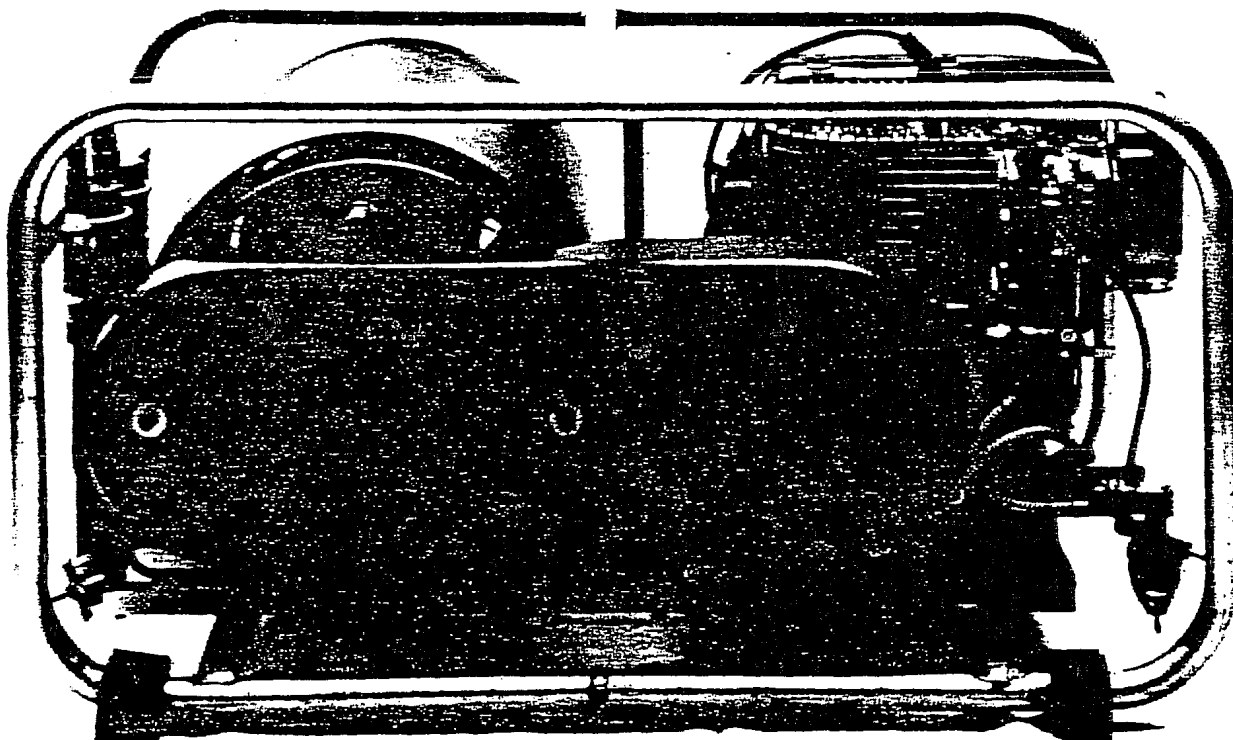


Figure 1-2 Compressor Side View

CHAPTER 2

OPERATION

2.1 INTRODUCTION.

2.1.1 GENERAL. Figure 2-1 shows the layout of the compressor, including all controls and indicators. The operator should familiarize himself with all controls and safety features prior to initial start-up.

2.2 CONTROLS AND INDICATORS

2.2.1 FUEL SYSTEMS. The fuel system consists of the six gallon gas tank, disconnectable fuel line, fuel pump and filter, carburetor, and throttle control.

2.2.1.1 GASOLINE TANK. The gas tank has a fuel level indicator incorporated in the screw-on cap. At the top of the cap is a small vent screw which should be backed off (counter-clockwise) to allow venting while the engine is running. During transportation, this vent should be closed to avoid spillage.

The base of the fuel tank has a molded divider which acts as a reserve. Momentarily tipping the tank will allow the reserve gas to flow over the divider so that it can be utilized.

This is a four cycle engine designed to use only regular grade gasoline. Do not use two cycle outboard gasoline or any oil/gas mixture.

2.2.1.2 FUEL LINE. The fuel line is an eight foot neoprene hose with end connectors and a pumping bulb for hand priming the carburetor. Make sure the gas tank and fuel line are kept clear of the hot exhaust.

2.2.1.3 FUEL PUMP AND FILTER BOWL. The fuel pump is a bellows type driven by crankcase pressure pulsation. The filter bowl is glass so that

any accumulation of dirt or water can be easily detected. The fuel line to the carburetor is clear vinyl to aid the operator visually when priming the carburetor.

A small shut off valve is located on the filter bowl. This should be left open (by backing out counter-clockwise).

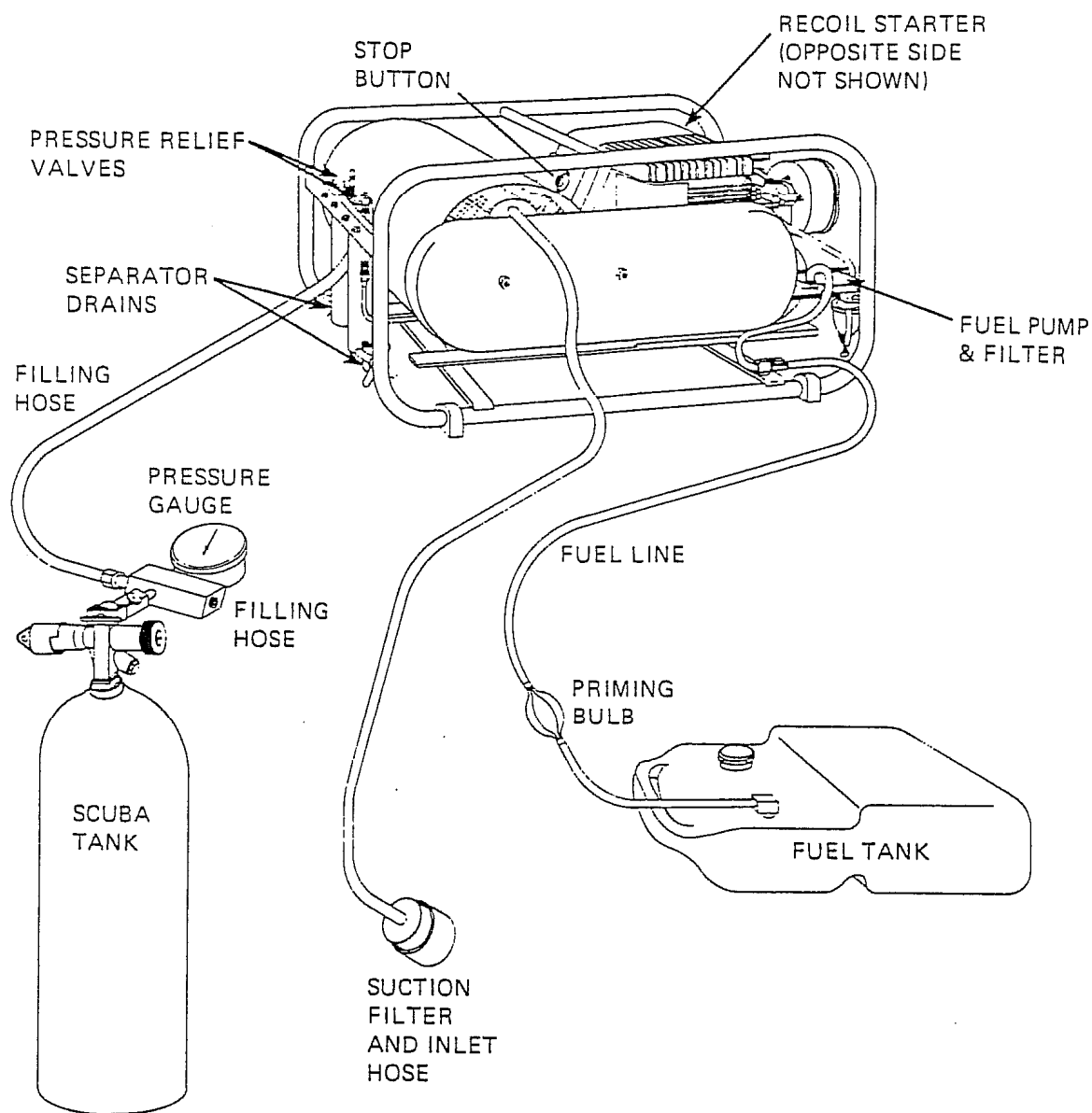
2.2.1.4 CARBURETOR. The carburetor and its controls are covered in Part II of this manual. The idle and mixture adjustments are set at the factory.

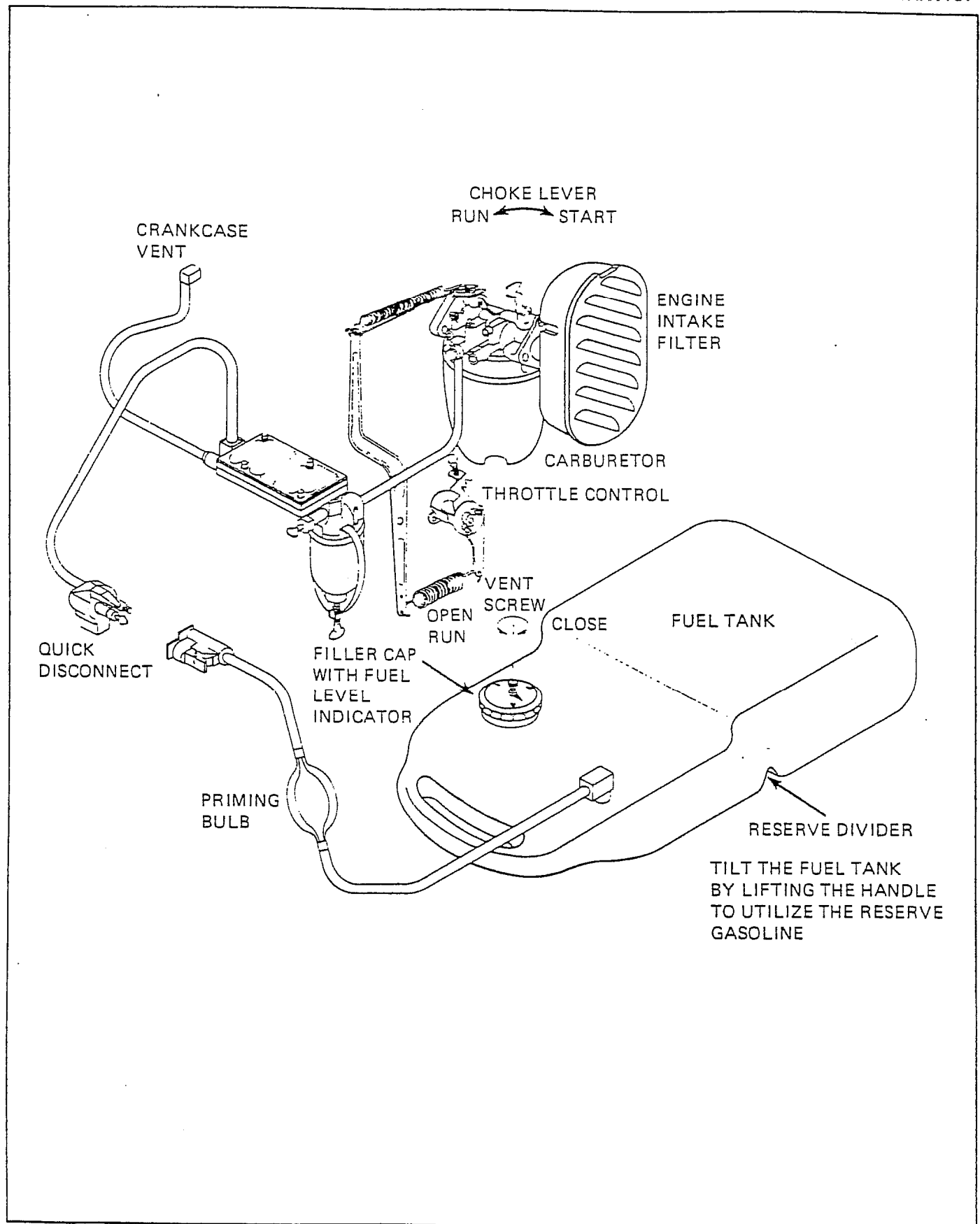
A choke lever is provided and located just behind the intake filter. When starting a cold engine, the choke should be closed down fully. After the engine has started and before the throttle is increased, the choke should be reopened. Restarting a warm engine may require the choke to be closed only half way or not at all.

2.2.1.5 THROTTLE CONTROL. A flywheel governor is linked to the throttle lever on the carburetor to regulate engine speed. A manually operated control lever mounted to the crankcase beneath the carburetor is used for speed adjustment.

The control lever should be set midway between idle and full speed for starting. After the engine has been allowed to warm up, the speed can be increased by adjusting the control lever.

2.2.2 LUBRICATION SYSTEM. The engine crankcase has an oil sump with a dipstick. Check the level before starting. Normal operation does consume oil, so frequent checks are recommended. See Part II for recommended oil viscosities. Check the oil level only when the engine is stopped. Unscrew the dipstick, wipe the stem, and insert

*Figure 2-1 Compressor Layout*

*Figure 2-2 Fuel System*

squarely back into the hole. Do not screw in. Withdraw the dipstick and check the level as indicated on the stem, topping up as necessary.

2.2.3 PULL STARTER. A recoil starter is located on the side of the engine opposite the drive end. When starting, draw the rope out until the engine compression causes resistance. Then slowly re-wind the rope back into the starter. Pull firmly and rapidly to start engine. Do not drop rope — hold onto the handle while re-winding to prevent the rope from re-winding improperly and jamming the assembly.

2.2.4 STOP BUTTON. A stop button is located on the engine shroud adjacent to the recoil starter. Pressing this button grounds the coil to the frame, thus preventing the spark plug from sparking and bringing the engine to a stop.

2.2.5 FILLING HOSE. The compressor is provided with a standard yoke for filling SCUBA cylinders. This yoke has a pressure bleed screw to relieve pressure when disconnecting. Mounted to the yoke is a back pressure regulator and pressure gauge. The back pressure regulator maintains pressure on the compressor to help seat the high pressure piston and improve the efficiency of the final moisture separator. The gauge measures pressure on the downstream or cylinder side of the regulator.

2.2.6 MOISTURE SEPARATOR DRAIN VALVES. Centrifugal type moisture separators are located between the second and third stages and at the final discharge. Each is provided with a drain valve. These are used for draining accumulated condensate and relieving all pressure when servicing.

2.2.7 PRESSURE RELIEF VALVES. The compressor is protected from over-pressurization by relief valves located after each stage. The final relief valve is set for 3600 psi. Care must be used when filling SCUBA cylinders rated for only 2250 psi. The operator must be sure that the cylinder is not filled or subjected to pressure higher than its rating. SCUBA cylinders should be fitted with valves having blow-out discs as an added safety measure.

2.3 OPERATING PROCEDURES.

2.3.1 GENERAL. The following section describes in detail the steps that must be taken to

start up and operate the equipment. A quick reference table is provided (Table 2-1), but the operator should first be acquainted with and understand each step before initial start-up.

2.3.2 SET-UP. The compressor is designed for portable use but can be installed permanently. The procedure for set-up is the same in either case.

a. Locate the compressor where there is plenty of air circulation and access space all around the equipment. Keep the equipment away from areas where sand or dust may blow.

b. Locate the fuel tank near to the compressor but away from the exhaust.

c. Connect the fuel line between the gas tank and the engine. An arrow on the primer bulb indicates fuel flow direction. Route the fuel line in a manner to avoid contact with or proximity to the engine exhaust muffler. Open the vent located in the fuel tank filler cap.

d. Locate the suction filter in an area with good air circulation upwind of the engine exhaust. The compressor should be oriented so the engine exhaust is directed downwind. Keep the suction filter close to ground level. Hot exhaust gases rise and this will reduce the chance of contamination should the wind shift.

Make sure there are no other sources of contaminated air near the intake.

e. Connect the SCUBA tank to the filler yoke. It is recommended but not necessary to submerge the tank in water to improve cooling. (Do not submerge the pressure gauge.) Do not stand the tank near the hot exhaust.

2.3.3 PRE-START CHECK. Check the following items prior to starting the engine:

a. Check level of oil in engine crankcase.

b. Check that the fuel tank is filled with regular gasoline.

c. Check that there is no pressure in the compressor by opening the separator drain valves. Close the valves before starting.

2.3.4 STARTING PROCEDURE.

a. Pump the primer bulb in the fuel line until resistance is felt.

b. Close the choke on the carburetor by turning the lever in the direction of the arrow (clockwise). If the engine is warm, close the choke only half-way or not at all.

c. Open the throttle about half-way by setting the speed control lever midway between idle and full load speed.

d. Pull the engine over against compression and then let the rope re-wind slowly into the starter. Pull firmly and rapidly to start the engine. DO NOT DROP THE ROPE — hold on to the handle while re-winding to prevent jamming the assembly.

e. After the engine starts, open the choke gradually by turning the lever counter-clockwise.

2.3.5 COMPRESSING AIR. As soon as the engine starts, the compressor will also start. The floating third stage piston may make a knocking noise for the first few strokes until sufficient pressure has built up to hold it against the push rod.

The compressor can be operated to fill the SCUBA tank by using the following procedure:

a. Increase engine speed to maximum by moving the control lever to full speed position (marked "H").

b. Make sure the bleed valve on the filler yoke is closed, the tank valve open, and the moisture separator drains closed.

c. The compressor will now deliver air to the tank until shut down by the operator.

2.3.6 SHUT DOWN.

a. Shut the engine off by pushing the stop button and holding until the engine comes to a complete stop.

b. Close the valve on the SCUBA tank and open the bleed screw and moisture separator drains. The tank can now be removed and exchanged for any empty one.

2.3.7 EXCHANGING SCUBA TANKS. The engine should be shut off and the pressure relieved before changing SCUBA tanks.

2.3.8 EQUIPMENT STORAGE. When the compressor is to be stored for more than a month, the gasoline should be run out of the carburetor to prevent the formation of "varnish" or gummy gasoline residue. This should be done by disconnecting the fuel line and operating the engine on idle until it runs out of gasoline.

Table 2-1 Simplified Start-up Check List

The operator should be familiar with all the steps covered in the text for a safe start-up. This table is provided as a quick reference and check list.

START-UP

1. Check layout of compressor, fuel tank, SCUBA tank, and suction filter.
2. Make sure all connections have been made in the correct manner.
3. Make sure the compressor is depressurized by opening the moisture separator drains. Reclose drains prior to start-up.
4. Close choke.
5. Set throttle at half speed.
6. Pull-start the engine.
7. Open choke.
8. Set throttle to full speed.

SHUT DOWN

1. Push the STOP button and hold until the engine comes to a complete stop.
 2. Close valve on SCUBA tank.
 3. Open moisture separator drains and bleed screw on the SCUBA filling yoke.
-

CHAPTER 3

FUNCTIONAL DESCRIPTION

3.1 INTRODUCTION.

3.1.1 GENERAL: This chapter contains a complete description of the functioning of the equipment. The compressor is divided into two parts: the mechanical system and the air flow system. A complete understanding of each system is useful when servicing and troubleshooting the equipment.

3.2 MECHANICAL (See Figure 3-1).

3.2.1 DRIVE SYSTEM. The compressor is powered by a 7.5 horsepower Wisconsin Robin four cycle gasoline engine. At full load and full throttle, the engine is set for a speed of 3600 rpm.

A single vee belt drives the compressor, using sheaves to reduce the speed to 1500 rpm at the compressor shaft.

In the compressor the rotation is transferred to the inner race of the wobble plate bearing mounted at an angle to the shaft. This generates the back and forth, or reciprocating, motion of the outer race.

To keep the outer race from rotating, two small thrust bearings are used to track back and forth on the thrust bar. The outer race on the wobble plate bearing is connected to each piston through rod end bearings. Each cylinder is equally spaced radially and carefully balanced, giving the assembly the necessary stability for high speed operation.

3.2.2 COOLING. The compressor is cooled by air from the fan mounted on the crankshaft. The cylinders are finned with interstage tubing wrapped around to cool the compressed air.

3.3 AIR FLOW SYSTEM (See Figure 3-2).

3.3.1 Compression of the air takes place in three steps or stages. Each cylinder volume is sized so that each stage does an equal share of the work.

Air enters the compressor through the suction filter and hose. The 15 feet of hose is provided to help keep the suction a convenient distance from the engine exhaust.

The suction stroke of the first stage piston draws air in through the inlet valve. The compression stroke builds up pressure and heat and forces the air through the discharge valve.

All valves are reed type and act as one way check valves, allowing the air to flow in one direction only. A pressure relief valve in the first stage discharge line prevents over-pressurization in the event of a second stage compression valve failure.

The air from the first stage flows through copper tubing wrapped around the outside of the cylinder housing to help remove the heat of compression. This air is compressed again by the second stage to a higher pressure, through cooling tubing and a condensate separator. The moisture laden air is directed in a swirling motion inside the separator, causing the heavier droplets of water to condense on the walls and collect in the bottom. The separator also contains a screen type filter to remove particulates that can cause valve damage.

The third stage compression is accomplished in the same manner as the second and first. The air from the third stage is cooled, flows through a moisture separator and to the filler hose. Second and third stage pressure components are protected by pressure relief valves located on the separators.

The filler yoke includes a back pressure regulator, pressure gauge, and pressure bleed screw. The back pressure regulator maintains a minimum pressure on the compressor to help seat the third stage piston and improve moisture separation when discharging at low pressures. The pressure gauge is on the SCUBA tank side of the regulator and gives a continuous indication of tank pressure.

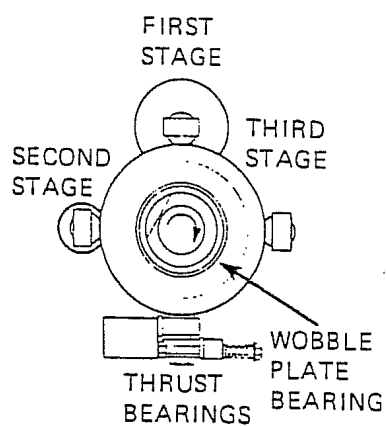
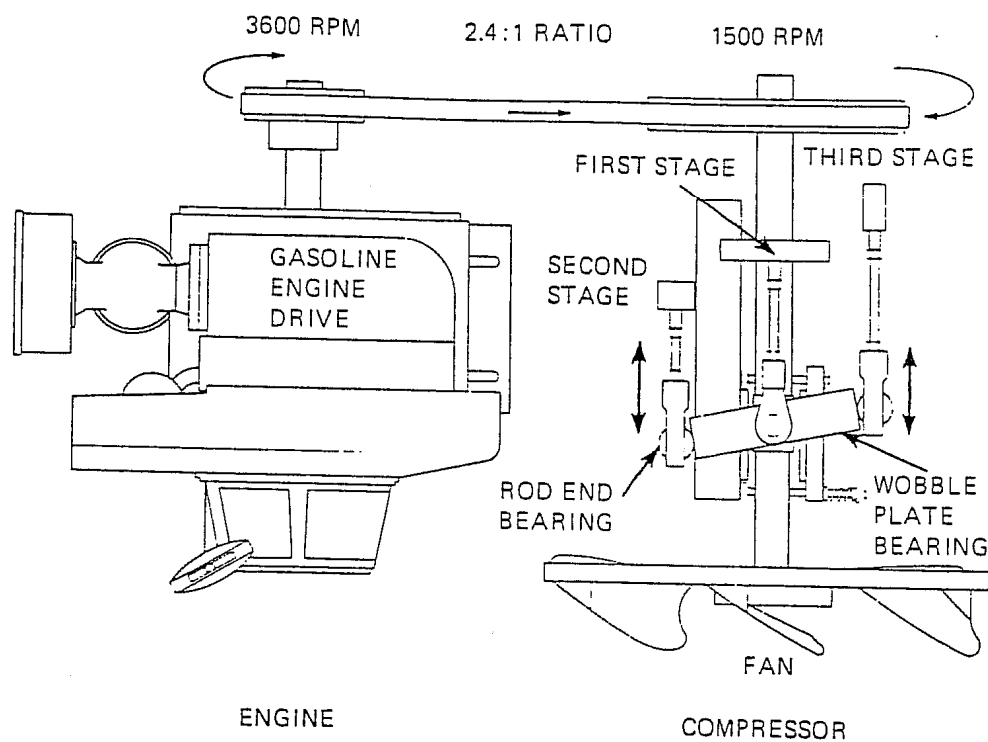
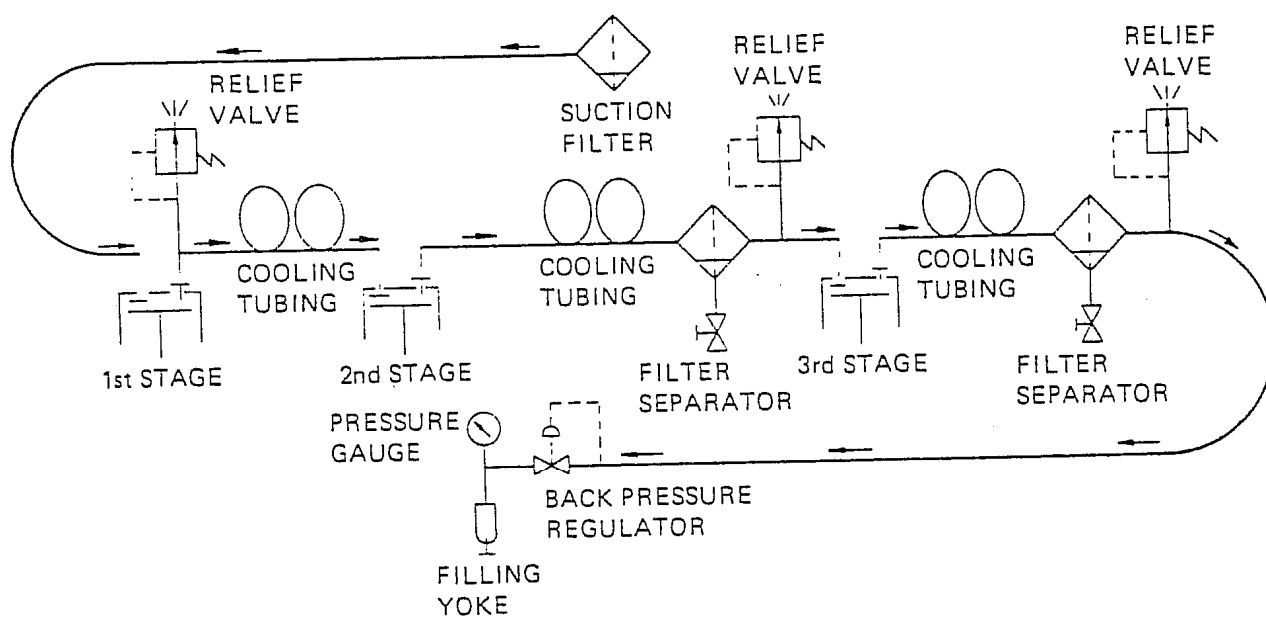


Figure 3-1 Mechanical Drive Schematic

*Figure 3-2 Air Flow Diagram*

CHAPTER 4

SCHEDULED MAINTENANCE

4.1 INTRODUCTION. The following tables and paragraphs outline the maintenance actions required to obtain the maximum service life from the equipment. The operator is encouraged to keep a written log that records operating hours and number of tanks filled.

The maintenance schedules are based on total hours operating. If the operator is unsure of the last service interval or if the equipment has stood idle for a long period of time, a complete maintenance check should be made prior to starting.

4.2 ENGINE OIL LEVEL. After every 25 hours running time the engine oil level should be checked. Check the oil level only when the engine is stopped. Unscrew the dipstick located just

beneath the carburetor, wipe and insert squarely back into the hole. Do not screw in. Withdraw the dipstick and check the level as indicated on the stem. Top-up as necessary with the approved oil. See Fig. 4-1 for the oil fill and drain locations.

4.3 ENGINE OIL CHANGE. Use only high-grade, highly refined detergent oil corresponding in body to the S.A.E. (Society of Automotive Engineers) viscosity numbers listed in Table 4-2 and meeting the requirements of the American Petroleum Institute for service class MS, SD, or SECC.

Oils conforming to MIL-L-46152 and MIL-L-2104C meet these requirements.

The crankcase capacity is 1.6 pints.

Table 4-1 Scheduled Maintenance

Service Interval	Item	Action	Para.
25 Hrs.	Engine Oil Level	Check and top-up as necessary.	4.2
50 Hrs.	Engine Oil	Change.	4.3
50 Hrs.	Engine Air Cleaner	Clean.	4.4
50 Hrs.	Rod End Bearings & Thrust Rider	Lubricate.	4.5
50 Hrs.	General Inspection	Check for leaks or loose parts and repair. Clean surfaces to improve cooling.	4.6

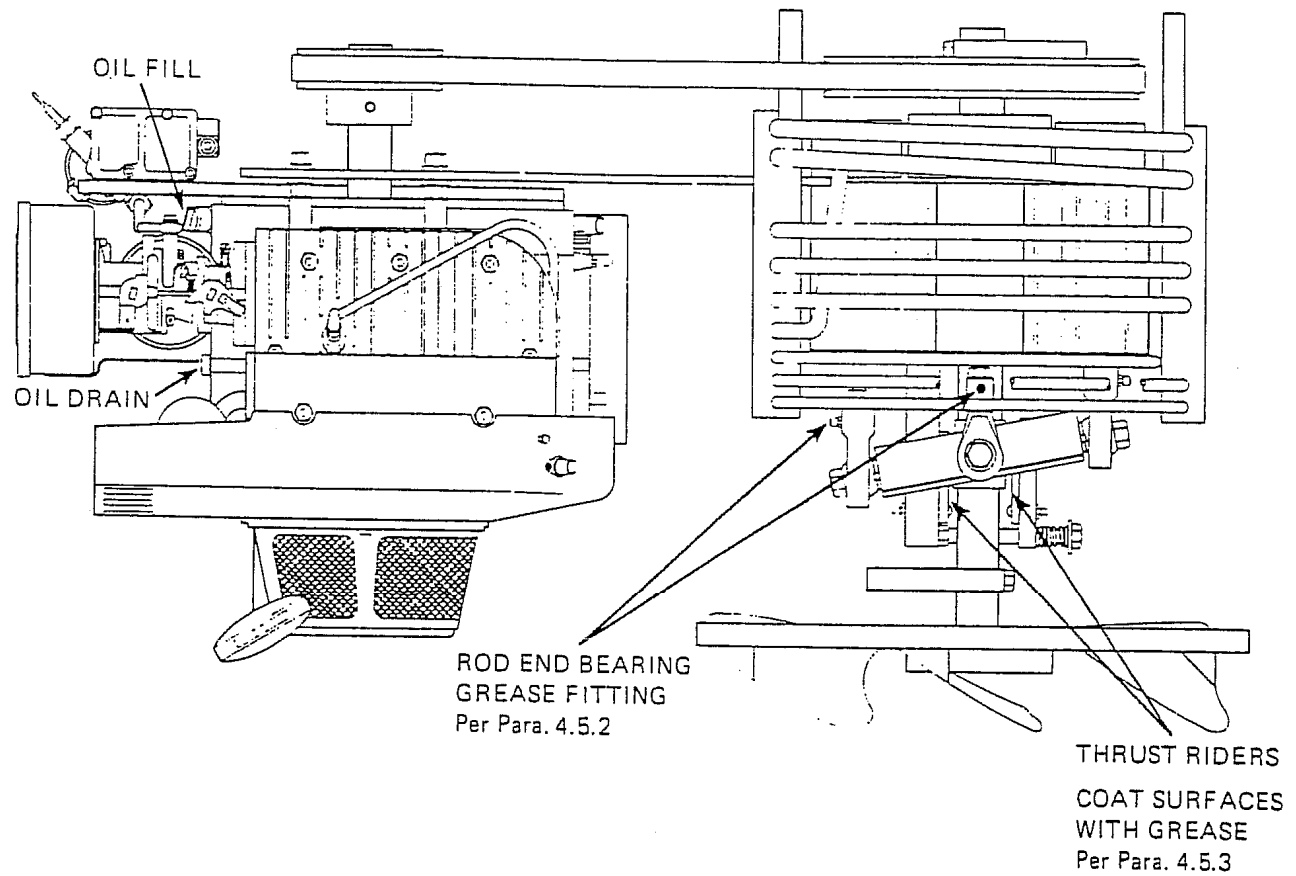


Figure 4-1 Maintenance Points

Table 4-2 Oil Grade Selection Chart

Season or Temperature	Grade of Oil
Spring, Summer, or Autumn +120°F to +40°F	SAE 30
Winter +40°F to +15°F Below +15°F	SAE 20 SAE 10W-30

4.4 ENGINE AIR CLEANER. The engine is equipped with an oiled, filter type air cleaner that should be serviced at least every 50 hours of operation.

4.4.1 DISASSEMBLY. Remove cover, element and retainer. Wipe all metal parts clean. Wash element in kerosene or liquid detergent and hot water. Wrap foam element in a cloth and squeeze dry.

CAUTION

Do not use gasoline, carbon tetrachloride, or paint thinner.

Saturate element in light engine oil and squeeze out excess oil.

4.4.2 REASSEMBLY. Mount element and retainer with arrow up, and cover with latch at bottom. See Figure 4-2.

4.5 ROD END BEARINGS AND THRUST RIDERS. All main and thrust bearings are permanently lubricated and provided with seals, therefore require no servicing. The rod end bearings, however, must be greased every 50 hours of operation.

4.5.1 ACCESS. Remove the single screw on the underside of the frame rail at the fan end of the plastic compressor shroud. Remove the shroud.

4.5.2 ROD ENDS. (See Figure 4-1). Lubricate each rod end bearing every 50 hours of operation by connecting the hand lever pump to the fitting provided. Stroke the lever until grease can be seen oozing out around the ball. Rotate the crankshaft back and forth a fraction of a turn to allow the grease to flow completely around the ball.

Use *only* Rix P/N 45-110 grease when performing this operation. Use of other greases can lead to premature rod end bearing failure.

4.5.3 THRUST RIDER. (See Figure 4-1) The track beneath the wobble plate bearing should be lubricated at the same time. The old grease may contain abrasives so this should be wiped off, using a rag. Apply a liberal coating of grease to the surfaces of the rider blocks and to the outer races of the thrust bearings.

4.5.4 REASSEMBLY. Slide the shroud into place and reinstall the single screw beneath the fan. Tighten securely.

4.6 GENERAL INSPECTION. When the compressor shroud is removed for lubrication, the compressor should be inspected for leaks, looseness, and accumulation of dirt.

4.6.1 LEAKS. Inspect all plumbing and pressurized components for evidence of leakage. Inspect tubing to make sure there is no contact with other tubing or surfaces that might wear through. If contact is observed, the tubing should be bent away to allow adequate clearance.

Use a spray bottle filled with a mixture of water and liquid detergent to spray all fittings and seal areas. Start the engine and run for 30 seconds with the shroud off. Be very careful to keep away from rotating components when doing this. Shut the engine down and inspect for leaks. Large leaks will be indicated by a loud hissing noise. Smaller leaks will form bubbles with the soap solution.

Repair all leaks.

NOTE

Some air leakage from the backs of the cylinder bores when the compressor is stopped is normal. Rings should be serviced only when the compressor capacity is reduced.

4.6.2 LOOSENESS. Inspect all parts for signs of wear, vibration damage, or loss of tightness. Correct any disorder.

Check for play on the thrust rider by turning the crankshaft over by hand and observing the

excursion of the rider bar. A .020 inch deflection maximum at the spring is permitted before servicing. See Fig. 6-3 and Chapter 6 for repair and adjustment.

4.6.3 DIRT ACCUMULATION. The presence of dust or dirt on the interstage cooling tubing or the crankcase fins reduces the cooling efficiency and can lead to overheating.

Clean all components as required, using a mild detergent and small brush. Avoid getting water inside the backside of the cylinder bores as this has a detrimental effect on the filled PTFE piston rings.

4.7 COMPRESSOR BALL BEARINGS. The ball bearings on the compressor include two main bearings, one wobble bearing and two thrust bearings. These have been permanently lubricated at the factory and sealed. It is not unusual to have grease leak from the seals of the large wobble bearing

leak from the seals of the large wobble bearing when the unit is new. This should not be cause for alarm. Excess grease should be wiped off periodically to prevent the chance of contaminating the cylinders by sling action.

When a bearing shows evidence of rough running or loss of lubrication, the bearing should be replaced. Continued running with faulty bearings can cause serious damage to other components.

4.8 FUEL LINE. Inspect the fuel line periodically for damage. Check the condition of the seal o-rings in each connector. If these are damaged it will allow air to enter the fuel line and cause a vapor lock at the fuel pump. As a temporary repair, the fuel tank can be mounted above the compressor (on a bench or step) to allow gravity flow of gasoline. The installation of new seals will correct this problem.

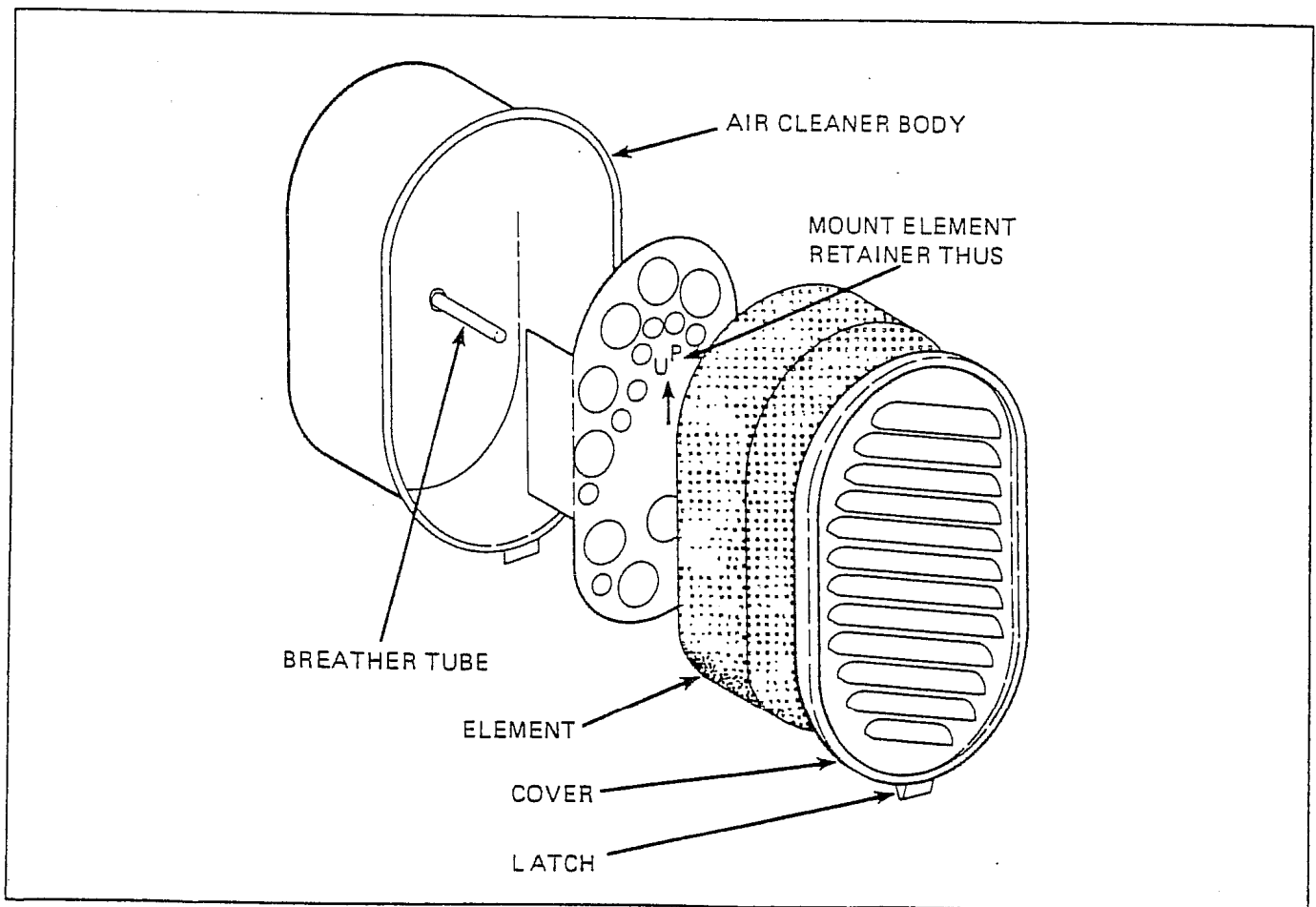


Figure 4-2 Engine Air Cleaner

CHAPTER 5

TROUBLESHOOTING

5.1 GENERAL.

Table 5-1 is a trouble-shooting chart which lists trouble indications and the probable cause and suggested remedy for each. A reference column directs the reader to the appropriate section or paragraph in the scheduled and corrective maintenance sections of this manual.

The engine manual in Section II of this manual should be used when problems can be isolated to the gasoline engine. Where a problem might arise that is a result of the engine/compressor interface, the cause and remedy are dealt with here.

Table 5-1 Compressor Troubleshooting

Trouble	Probable Cause	Remedy	Ref.
Engine fails to start.		See Engine Repair Manual in Part II.	—
Difficult to turn engine over	Pressure in compressor cylinders.	Open manual drains on moisture separators to relieve pressure.	2.3.3c
Compressor runs but pumps slowly or not at all.	Dirty inlet filter element.	Clean or replace.	
	Kink in inlet hose.	Check & straighten.	
	Leaks in lines & fittings.	Pressurize system and check for leaks with soap solution.	4.6.1
	Air blowing by piston rings.	Isolate faulty piston by pressurizing the system & by listening for leakage.	6.4.1 6.4.2
	Faulty valve in the first stage.	Inspect first stage suction & discharge valve and seats. Repair or replace as necessary.	6.5
	Excessive first stage piston clearance.	Adjust to correct setting.	6.4.3

Table 5-1 Compressor Troubleshooting (continued)

Trouble	Probable Cause	Remedy	Ref.
Compressor runs but pumps slowly or not at all. (cont.)	Drive belt slipping.	Adjust.	6.2.1
	Engine running too slowly.	Speed up to 3600 RPM.	6.2.3
1st stage relief valve leaking.	Defective relief valve.	Check, clean or replace.	6.5
	2nd stage inlet or discharge valve failure.	Remove 2nd stage head, clean or repair valves as required.	
2nd stage relief valve relieves.	Defective relief valve.	Check, clean or replace.	6.5
	3rd stage inlet or outlet valve failure.	Remove 3rd stage head, clean or repair valves as required.	
3rd stage relief valve relieves.	Defective relief valve.	Check, clean or replace.	
	Discharge gauge inaccurate and actual pressure is excessive.	Calibrate gauge.	
Excessive noise.	Loose nuts and bolts.	Tighten.	6.4.2
	Worn 3rd stage piston.	Check condition of rings and piston. Replace worn parts. Check fit on ball of piston follower, replace piston.	
	Worn rod bearing.	Replace.	6.4.3
	Loose bearing mount.	Tighten bearing nuts to 200 ft. lbs. torque.	
	Worn wobble bearing.	Check for excess play, replace.	4.7
	Loose nut on main bearing.	Check for shaft wear; tighten or repair.	
	Worn thrust riders.	Replace if worn more than approx. .02".	6.2.2
	Insufficient adjustment on thrust riders.	Make correct adjustment.	6.2.2
	Leaky piston seals.	Replace.	6.4.1
	Worn rider rings.	Check if excessive piston play on 1st & 2nd stage, replace rider rings.	6.4.1

Table 5-1 Compressor Troubleshooting (continued)

Trouble	Probable Cause	Remedy	Ref.
Excessive noise (cont.)	Loose drive belt.	Tighten.	6.2.1
	Improperly installed shroud.	Reinstall.	
	Broken fan.	Replace.	
	Loose beltguard.	Tighten.	
Excessive vibration.	Broken fan.	Replace	
	Missing counterweight.	Replace.	
	Use of other than specified reciprocating parts.	Replace with correct parts.	
	Loose nuts or bolts on compressor or motor mount.	Tighten.	
	Wrong speed.	Adjust engine speed to 3600 RPM.	
Overheating.	Loose fan.	Tighten.	4.5.2
	Dirty inlet screen on shroud.	Clean.	
	Lack of grease on rod bearings.	Relubricate.	
	Dirty fins on cylinders or dirty interstage cooling tubing.	Clean.	6.3.3
Engine running overloaded.	Lack of grease on rod bearings.	Check for freedom of movement when compressor is hot and interstage pressure is relieved. Relubricate.	4.5.2
Engine quits after short running time.	Air leaks into fuel line.	Check condition of all connections. Replace seals in connections on fuel line.	4.8
	Vent on fuel tank closed.	Open vent located on fuel tank filler cap.	2.3.2

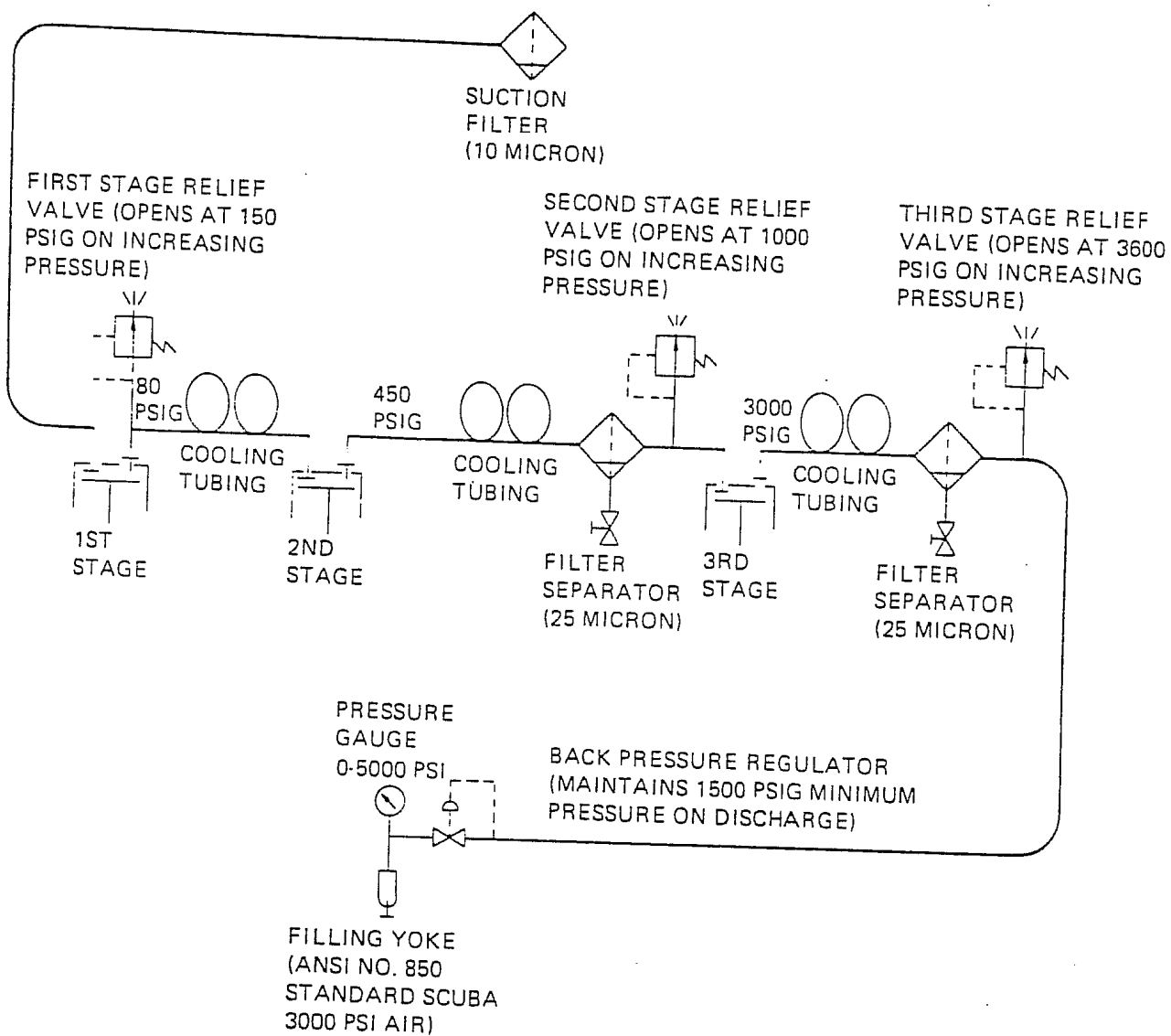


Figure 5-1 Piping Diagram

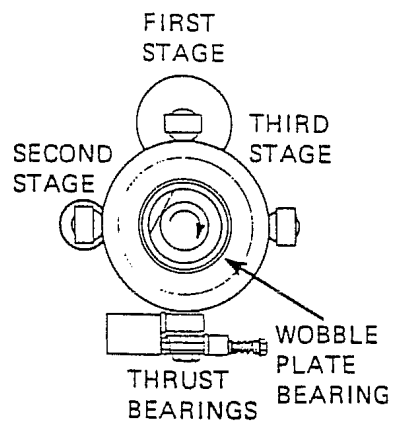
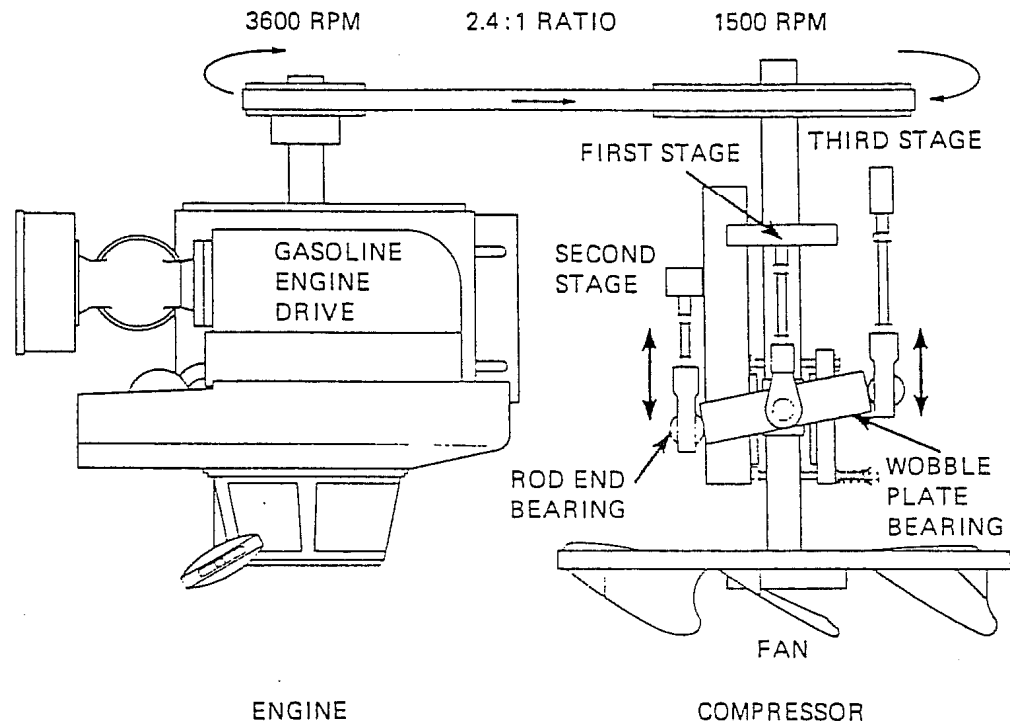


Figure 5-2 Mechanical Schematic

CHAPTER 6

CORRECTIVE MAINTENANCE

6.1 INTRODUCTION.

This chapter deals with corrective maintenance of the compressor. The servicing instructions for the gasoline engine can be found in Part II of the manual.

The procedures covered here are divided into three sections. The first deals with adjustments and alignments of the equipment. The second deals with assembly techniques and the third covers the repair of all assemblies and sub assemblies.

6.2 ADJUSTMENTS AND ALIGNMENTS.

6.2.1 DRIVE BELT ADJUSTMENTS. The proper belt tension produces a 0.22 inch deflection when a 6-8 pound weight is applied at midspan. See Fig. 6-1. A loose belt can cause excessive vibration and slippage. Too tight an adjustment can cause premature bearing failure. Replace the belt when there is evidence of fraying or lamination separation.

Adjust the belt by removing the beltguard and loosening the four engine mounting bolts. Loosen the two nuts on the engine mounting bracket and slide the engine backwards or forwards to achieve the proper tension.

Retighten the nuts and bolts, making sure that the sheave alignment is correct. This is checked by laying a straight edge along the outside edge of the sheaves. See Fig. 6-2.

6.2.2 THRUST PLATE ADJUSTMENT. The thrust plate adjustment is important for smooth operation. The thrust riders retain the thrust bearings located beneath the wobble bearing. This prevents the outer race of the wobble bearing from rotating. See Figure 6-3.

The thrust bar is rigidly mounted against the case and carries the primary load. The thrust plate acts as a retainer and is designed to float and pivot. The end closest to the compressor acts as the pivot. The opposite end is spring loaded and may float. The proper adjustment allows a minimum of travel at this end when the compressor makes a complete revolution. As the compressor wears, the travel will increase and subsequent adjustment will not eliminate all travel. When travel exceeds 0.020 inch, the thrust bearings and thrust riders should be replaced.

To make the adjustment, the thrust plate should be assembled into position with thrust riders in place and the two bolts loose. Adjust the bolt nearest the compressor until the thrust plate is, as nearly as possible, parallel to the thrust bar. Rotate the compressor one full revolution by hand and observe the displacement of the thrust rider at the spring end. Readjust the bolt nearest the case until a minimum deflection is observed at the spring end when the compressor is rotated. Lock the nut on the bolt nearest the compressor. Rotate a full revolution as a double check, and readjust if necessary.

When this is done, the outer bolt (the one with the spring) should be adjusted and locked to give a compressed spring length of 3/4 inch.

Apply a coat of approved lubricating grease to the surfaces of the thrust riders and bearings.

6.2.3 ENGINE/COMPRESSOR SPEED ADJUSTMENT.

The engine drives the compressor through a vee belt pulley drive. Adjustment of the speed of the engine to 3600 RPM yields the proper compressor speed of 1500 RPM.

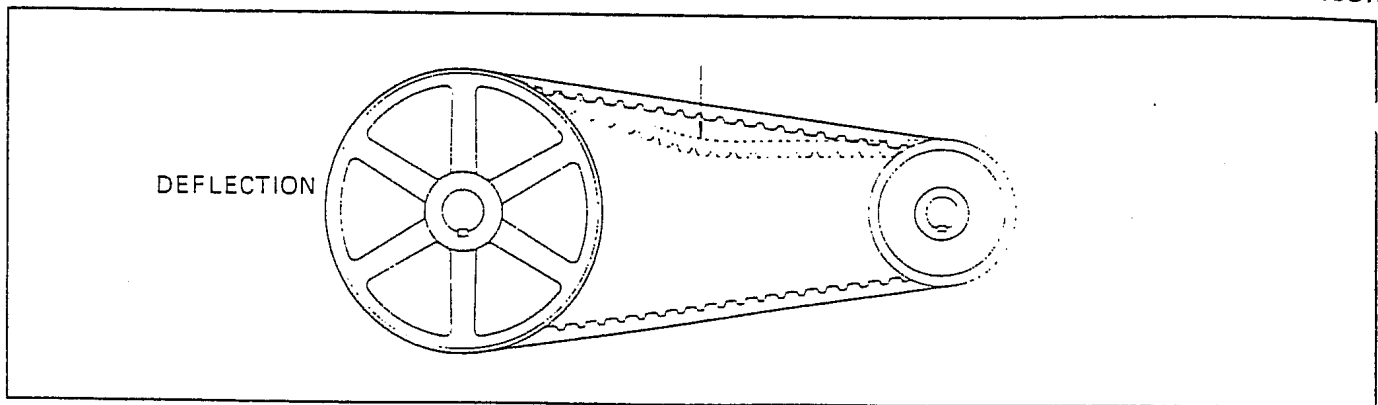


Figure 6-1 Tension Check

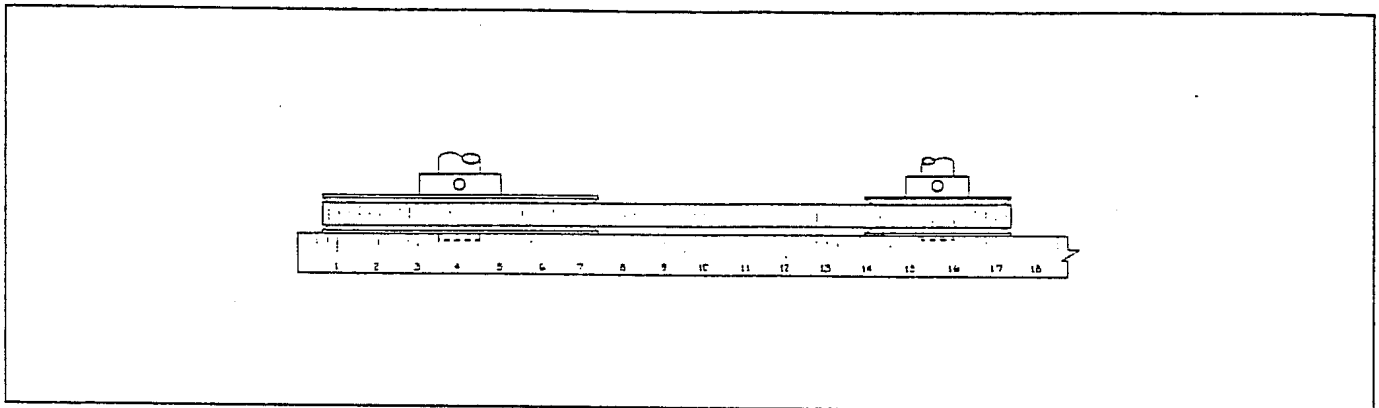


Figure 6-2 Alignment Check

Speed should be checked using a remote tachometer and it should never exceed 3600 RPM. For further information on throttle adjustment, consult the engine repair manual in Part II.

6.3 ASSEMBLY TECHNIQUES.

6.3.1 USE OF TEFLON TAPE. When using teflon tape to seal tapered pipe threads, do not apply tape to the first two threads. This will help insure that no pieces of tape are allowed to enter the air stream where they can foul the action of the valves and piston rings.

6.3.2 LUBRICATING O-RINGS. All o-rings except the expanders used on the pistons should be lubricated using Parker O-lube or a similar lubricant approved for breathing air systems. This will improve the sealing characteristics, ease of installation, and life of the ring material. No petroleum based products should be used where they could contaminate the air stream.

A light film of lubricant is all that is necessary. Excess material can cause fouling. No lubrication should be applied to the expansion rings used behind the compression piston rings.

6.3.3 CLEANING PARTS. Parts that come in contact with the air stream should be cleaned using Freon R-11* or a solution of detergent and hot water. Petroleum products could lead to contamination of the breathing air and should not be used.

All surfaces of the compressor that are used for cooling (fins on cylinders, tubing, etc.) should be kept clean for maximum heat transfer efficiency. A detergent and hot water solution applied by scrub brush works best for cleaning.

6.4 PISTONS.

6.4.1 FIRST AND SECOND STAGE PISTONS (See Figure 6-4).

- a. Disassemble by removing the rod end bolt. Withdraw the piston from the back of the cylinder.
- b. Inspect the compression ring for wear. There should be a continuous line of contact (a shiny area) all the way around the ring. Replace if there

*Freon® is a trademark of E.I. duPont de Nemours and Co., Inc. for trichlorotrifluoroethane.

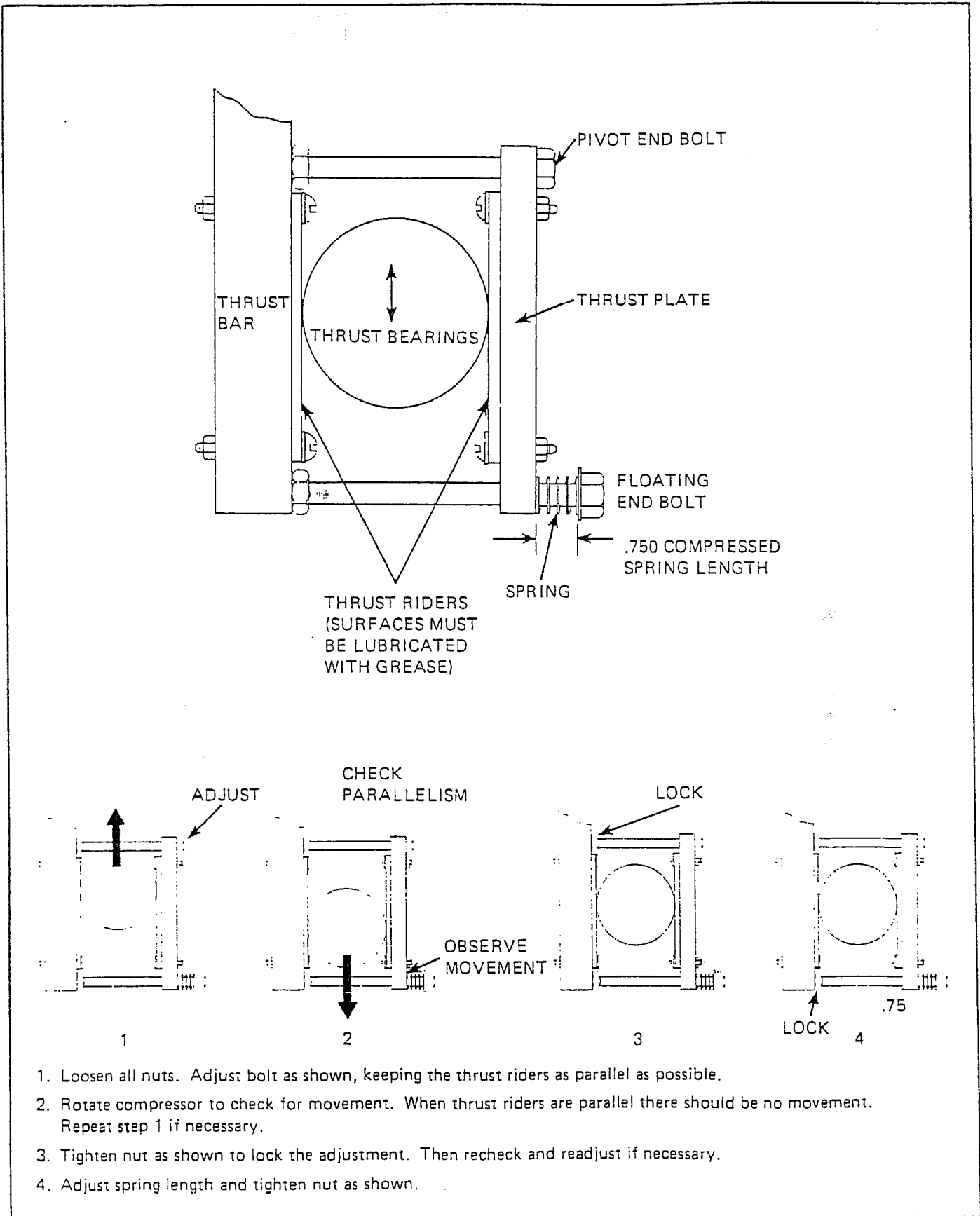
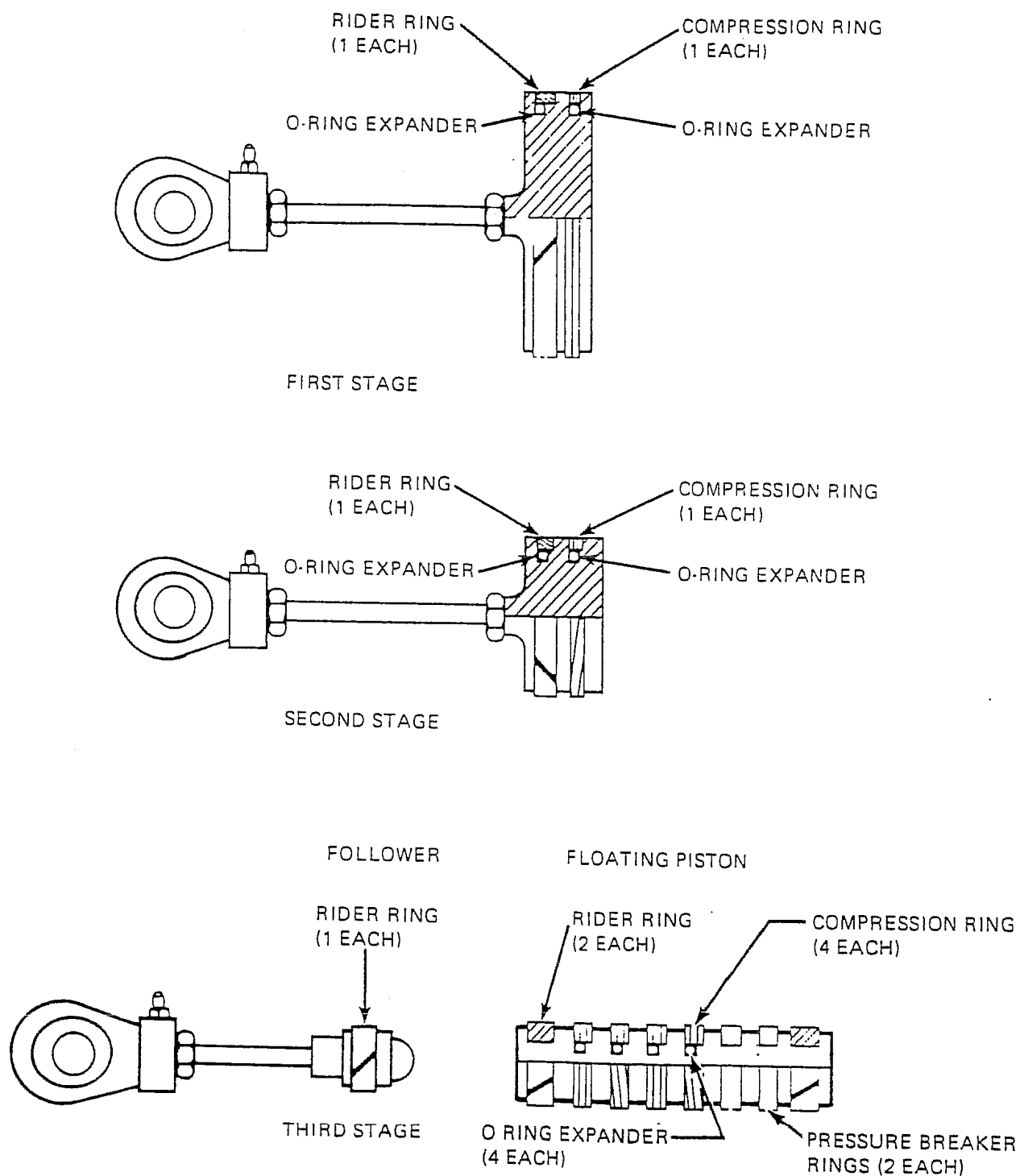


Figure 6-3 Thrust Plate Alignment

*Figure 6-4 Piston Details*

is any sign of breakage or damage to the compression ring or rubber expander ring. The rubber expander ring should expand the piston ring to a diameter larger than the cylinder bore. Replace it if it does not do this.

CAUTION

The piston ring is a spiral type and is wound into the ring groove. The ends of the spiral taper to a sharp edge. The ring should be handled carefully to avoid damaging this edge.

c. Inspect the rider ring for wear. With the compression ring removed, insert the piston in the cylinder. The rider ring alone should give a slight drag to the back and forth motion of the piston. If it is loose in the cylinder, the rider ring and rubber expander ring should be replaced.

d. Reassemble by loading the piston into the cylinder. A taper in the cylinder will aid in compressing the rings. Install the rod end bolt and apply 45-55 ft. lbs. torque. The guide pins should allow a small amount of play at the rod ends.

e. Rotate the compressor by hand to make sure there is no binding. Adjust the piston/cylinder head clearance as described in 6.4.1.3 only if necessary. Lubricate the rod end bearing.

6.4.2 THIRD STAGE PISTON. (See Figure 6-4).

a. Disassemble by removing the rod end bolt. Withdraw the rod from the back of the cylinder. The floating piston is separate from the rod and will remain in the cylinder. This can be withdrawn by removing the cylinder head and pushing out with a pencil.

b. Inspect the four compression rings and the two pressure breaker rings for wear or breakage. Typically, the top compression ring will wear out first, transferring the load to the next ring and on down the line. As long as the rings are not disturbed, the piston will seal almost perfectly until the last ring is worn out. For this reason, the floating piston should not be removed unless there is evidence of significant leakage past the rings.

Inspect the piston follower. Set the piston against the ball bearing in the follower and measure the gap between shoulders, using automotive feeler gauges. If the gap is less than .015 inches, the piston should be replaced.

c. Replace all worn or broken compression rings, pressure breaker rings and expanders. Replace rider rings on the floating piston and the piston follower. If the piston shows signs of side wear, it should be replaced.

A piston storage tube is provided in the spare parts and tools kit to aid in installing rings and expanders. The expander ring should be carefully stretched over the stepped end of the storage tube. Slide the piston through the tube from the opposite end until the empty groove lines up and the ring can be rolled in.

CAUTION

The piston ring is a spiral type and is wound into the ring groove. The ends of the spiral taper to a sharp edge. The ring should be handled carefully to avoid damaging this edge.

The pressure breaker rings come in two halves. Caution is required to prevent part or all of each ring from falling out during installation.

With the rings loaded into the grooves, the piston should be worked carefully into the storage tube from the end with the internal taper. Push the piston completely through the storage tube and inspect the rings to be sure of proper installation. Replace any damaged rings. Reload the piston in the tube (this should be much easier the second time), making sure the end with the ball socket or piston bottom is oriented opposite the end of the storage tube with the stepped-down diameter.

d. Reassemble by inserting the stepped-down diameter of the storage tube fully into the back of the third stage cylinder bore. Push the piston into the cylinder, using a pencil or other suitable rod. Insert the piston follower and assemble the rod-end bolt, making sure the washer and guide pins are in place. Torque the rod-end bolt to 45-55 ft. lbs. The guide pins should allow only a small amount of play or rocking motion at the rod end.

e. Rotate the compressor by hand to make sure there is no binding. Adjust the piston/cylinder head clearance as described in 6.4.3 only if necessary. Lubricate the rod end bearing.

6.4.3 ROD END BEARINGS. The rod end bearings require periodic lubrication per the lubrication

chart in Chapter 4. In addition, these should be lubricated whenever the pistons are serviced. Excessive wear of the rod end can be determined by rotating the crankshaft by hand back and forth and observing any looseness or play at the rod end ball. When the play exceeds .020 inch (a standard spark plug gap), the rod end should be replaced.

a. The rod may be disassembled as shown in Figure 7-1d. The connecting rod and adapter are assembled, using a thread locking sealant, by the factory and may require heating as well as unscrewing torque.

b. Reassemble, using clean parts and a thread locking sealant between connecting rod and adapter. Install the rod on the compressor, making sure the rod washer and guide pins are in place.

c. It is necessary to adjust the piston to cylinder head clearance if the factory setting is ever disturbed. A clearance of .020 inch is necessary to avoid contact between piston and head under all conditions.

With the cylinder head removed, the piston can be adjusted to top dead center by rotating the crankshaft, laying a straight edge over the cylinder, and measuring the clearance using automotive feeler gauges. Increase or decrease the piston length by screwing the threaded rod out or into the rod adapter.

Alternately, the adjustment can be made with the cylinder head in place by advancing the piston to top dead center and screwing the piston and threaded rod out until contact is made with the cylinder head. The crankshaft must be rocked back and forth by hand at the top dead center position of the piston while screwing the piston carefully back into the rod adapter until contact with the cylinder head ceases. This is a matter of feel and might take a few trials to be certain that the piston is close to, but not making contact with the head. Then screw the piston and threaded rod into the rod adapter one-half turn. This gives .020 clearance.

d. Tighten the lock nut securely and lubricate the rod bearing with the approved grease.

6.5 CYLINDER HEADS.

Servicing the cylinder heads is straightforward, using the exploded details of Figure 7-1c. Excessive interstage pressures (causing relief valves to pop) are the result of valve problems in the next higher stage. Most common is particulate matter lodged under the valve preventing it from closing completely. When this happens, the head should be removed and cleaned. Gaskets and o-rings should be replaced. Valves and valve seats should be inspected and replaced if there is evidence of wear, pitting or cracking.

When reassembling, make sure that the locating pins are in place and the valves are correctly positioned per Figure 7-1c.

Care should be exercised when reconnecting tubing and pressure fittings to avoid cross-threading or over-tightening. Nuts on fittings should be snugged down finger tight and then wrenched a quarter turn. Run the compressor briefly after reassembly to develop pressure and check for leaks, using a soapy water solution.

6.6 CYLINDERS.

All cylinders can be extracted by removing the pistons, unbolting the cylinder heads, and sliding the cylinder sleeves out. The cylinder bores should be free from pits or scoring as this will cause accelerated ring wear and blow-by. The top surface of each cylinder acts as a pressure seal area and should be handled carefully and replaced if damaged.

When reassembling, a high temperature heat conducting grease similar to Nev-R-SeeZ compound should be applied between the cylinder liner and the cylinder housing. This aids in cooling the cylinder and prevents galvanic corrosion. The cylinder bore should always be kept clean and free from any greases or oils.

Table 6-1 Tolerances on Wearing Parts

ITEM NO.	DESCRIPTION	NOMINAL DIMENSIONS (Inches)	WEAR LIMIT OR REPLACEMENT INDICATION
	PISTON RINGS		
7-1-43	1st Stage Compression	.155 Radial Thickness	Excess Blow-by
7-1-45	1st Stage Rider	.122 Radial Thickness	.015 Radial Wear
7-1-65	2nd Stage Compression	.120 Radial Thickness	Excess Blow-by
7-1-63	2nd Stage Rider	.116 Radial Thickness	.008 Radial Wear
7-1-55C	3rd Stage Compression	.057 Radial Thickness	Excess Blow-by
7-1-55B	3rd Stage Rider	.055 Radial Thickness	.003 Radial Wear
7-1-55A	THIRD STAGE PISTON	.558 Outside Diameter	.003 Diametral Wear
7-1-102	THRUST RIDER PLATE	.128 Thick	.005 Wear
7-1-20	THRUST BEARING	2.047 Diameter	.005 Wear
7-1-51A	ROD END BEARINGS	N/A	.020 Looseness of Ball in Joint
7-1-60A			
7-1-52	GUIDE PIN	.620 Long	.020 Rod End Clearance Per Side or .040 Overall

Table 6-2 Torque Chart

Torque values are based on lubricated threads. For dry threads, increase torque by ten percent.

ITEM NO.	DESCRIPTION	RECOMMENDED TORQUE VALUE
7-1-7	Bearing Nuts Fan End Sheave End	200 Ft. Lbs. 100 Ft. Lbs.
7-1-10	Fan Bolt, 3/8-24NF x 1 1/4"	35 Ft. Lbs.
7-1-18	Thrust Bearing Bolt, 5/8-18NF	50 Ft. Lbs.
7-1-53	Rod End Bolt, 5/8-18NF	50 Ft. Lbs.
7-1-116	3rd Stg. Head Bolts, 5/16-24NF x 2 1/4"	15 Ft. Lbs.
7-1-117	2nd Stg. Head Bolts, 5/16-24NF x 2 1/2"	15 Ft. Lbs.
7-1-118	1st Stg. Head Bolts, 1/4-28NF x 2"	10 Ft. Lbs.

CHAPTER 7

PARTS LIST

7.1 INTRODUCTION.

The parts listed here cover all Rix Model 1S3B-6 Compressors identified by Serial Numbers 5091 through 5177, 5251 through 5372 and 7066 through 7200 inclusive. Column 1 gives the figure and index numbers. The part number is listed in Col-

umn 2, followed by a quantity and description in Columns 3 and 4. Any special notes are given in the last column, marked "Notes". All are supplied through Rix Industries, Code 28953, Emeryville, California 94608.

Table 7-1 Compressor Assembly Breakdown

Figure & Index Number	Part Number	Qty.	Description	Notes
7-1				
-1	100-D1410	1	Block, Cylinder	
-2	64-C1096	1	Ring, Outer Bearing	
-3	64-B2111	1	Retainer Ring, Outer Bearing	
-4	64-B2112	1	Ring, Inner Bearing	
-5	91-A4423	1	Key, $\frac{5}{16}$ " Sq. x $1\frac{3}{4}$ " Lg.	
-6	181-302	2	Washer, Bearing	
-7	181-303	2	Nut, Bearing	
-8	27-C1281	1	Shaft	
-9	42-106	1	Fan	
-10	34-619	1	Bolt, Hex Hd. $\frac{3}{8}$ -24NF x $1\frac{1}{4}$ " Lg., S/S	
-11	135-A4218-1	1	Disc. Fan Mounting	
-12	20-628	1	Flat Washer, $\frac{3}{8}$ SAE, S/S	
-13	44-B2113	2	Counterweight	
-14	34-620	2	Bolt, Hex Hd. $\frac{1}{4}$ -28NF x $1\frac{1}{2}$ " Lg., S/S	
-15	34-621	4	Bolt, Hex Hd. $\frac{1}{4}$ -28NF x 2" Lg., S/S	
-16		4	Nut, $\frac{1}{4}$ -28NF, S/S	
-17	66-A3288	2	Spacer, Thrust Bearing	
-18	34-A3759-1	1	Bolt, Hex Hd.	
-19	20-A3289-1	1	Washer	
-20	181-304	2	Bearing	
-21	181-305	1	Bearing	
-22	181-A4124	2	Bearing	
-23	66-A3290	1	Spacer, Bearing	

Table 7-1 Compressor Assembly Breakdown (continued)

Figure & Index Number	Part Number	Qty.	Description	Notes
7-1				
-24	Omit			
-25	34-662	4	Bolt, Hex Hd. ½-20NF x 4½" Lg., S/S	
-26	A148-C1374	1	Shroud Assembly	
-27	106-16	2	Set Screw, Half Dog Pt. ¼-20NC x ¾" Lg.	
-28		2	Nut, ¼-20NC, S/S	
-29	34-623	2	Bolt, Hex Hd. ¼-28NF x ½" Lg., S/S	
-30	24-506	1	Spring, Wave Washer	
-31	31-B2114	1	Bearing Retainer	
-32	36-1B-068	1	Sheave	
-33	91-A4423-1	1	Key, ¼" Sq. x 1¼" Lg.	
-34	2-B2783	1	Head, 1st Stage	(See fig. 7-1c)
-35	15-A3718	1	Valve Seat, 1st Stage	
-36	15-A3719	1	Valve, 1st Stage Inlet	
-37	34-607	2	Round Head Screw, S/S	
-38	15-A3720	1	Valve, 1st Stage Outlet	
-39	16-A3717-1	1	Gasket	
-40	123-042-5	1	O-ring	
-41	15-A3946	1	Plate, Valve Backing	
-42	17-410	1	Spring Pin	
-43	18-C1084-24B	1	Ring, Compression — 1st Stage	
-44	123-230-5	2	Ring, Expansion — 1st Stage	
-45	18-B2117-1B	1	Ring, Rider — 1st Stage	
-46	Omit			
-47	8-B2118	1	Piston, 1st Stage	
-48	1-A3300-1	1	Cylinder, 1st Stage	
-49		7	Nut, Hex ¾-24NF, S/S	
-50	3-A3896-1	1	Rod, 1st Stage	(See fig. 7-1d)
-51	A7-A3302-1	2	Connecting Rod Ass'y., 1st & 2nd Stages (Incls. A-E)	
	7-A459	1	(A) Connecting Rod	
	7-A3304-1	1	(B) Rod Adapter	
	66-A3305	1	(C) Spacer	
	34-A4409	1	(D) Cap Screw	
	954-9		(E) Grease Fitting	
-52	317-A3306	6	Guide Pin	
-53	34-A3307	3	Bolt, Rod End	
-54	20-A3308	3	Washer, Rod End	
-55	A8-A3309-1	1	Piston Ass'y., 3rd Stage (Incls. A-E)	
	8-B2116	1	(A) Piston	
	18-B2117-3C	2	(B) Rider Ring	
	18-C1791-4.5C	4	(C) Compression Ring	
	123-012-5	4	(D) Expander	
	18-C1603-4.5C	2	(E) Pressure Breaker Ring	
-56	18-B2117-3-C	1	Rider Ring, Piston Follower	

Table 7-1 Compressor Assembly Breakdown (continued)

Figure & Index Number	Part Number	Qty.	Description	Notes
7-1				
-57	Omit			
-57A	30-400	1	Ball, 3/8" Dia.	
-58	1-A3312	1	Cylinder, 3rd Stage	
-59	3-B4103	1	Rod, Follower, 3rd Stage	
-60	A7-3302-2	1	Rod Assembly, 3rd Stage (Incls. A-F)	(See fig. 7-1d)
	7-A4359	1	(A) Connecting Rod	
	7-A3304-2	1	(B) Rod Adapter	
	66-A3305	1	(C) Spacer	
	34-A4409	1	(D) Cap Screw	
	954-9	1	(E) Grease Fitting	
		1	(F) Lock Washer 10-32, S/S	
-61	1-A3300-2	1	Cylinder, 2nd Stage	
-62	8-A3313	1	Piston, 2nd Stage	
-63	18-B2117-2B	1	Ring, Rider - 2nd Stage	
-64	123-210-5	1	Ring, Rider Expander - 2nd Stage	
-65	18-C1791-10B	1	Ring, Compression - 2nd Stage	
-66	123-313-5	1	Ring, Compression Expander - 2nd Stage	
-67	123-028-5	3	O-ring, 2nd Stage Head	
-68	15-B2713	2	Reed Valve, 2nd Stage Inlet & Discharge	(See fig. 7-1c)
-69	17-758	4	Pin	
-70	Omit			
-71	54M-PH-4-			
	P5ON-S	2	Plug, Hex Hd., 7/16-20NC, Stl.	
-71A	123-904-5	Ref.	O-ring	(Part of Item 71)
-72	15-A4193	1	Valve Stop, 2nd Stage Inlet	
-73	2-B4359	1	Head, 2nd Stage	
-74	15-B3569	1	Valve Seat, 2nd Stage	
-75	15-A4151	1	Valve Stop, 3rd Stage Inlet	
-76	15-B2706	2	Reed Valve, 3rd Stage Inlet	(See fig. 7-1c)
-77	Omit			
-78	15-B3570	1	Valve Seat, 3rd Stage	
-79,80	Omit			
-81	2-B4290	1	Head, 3rd Stage	
-82	Omit			
-83	Omit			
-84, 85	Omit	1	Reed Valve, 3rd Stage Outlet	
-86	123-018-5-90	3	O-ring, 3rd Stage Head - 90 Durometer	
-87	A54M-PH-8-			
	VBTX-SS	2	45° Elbow	
-88	A54M-PH-6FBU-SS	1	Male Connector	
-89	Omit			
-90	Omit			
-91	Omit	1	Flat Washer, 3/8" Wide, 1" O.D.	
-92	A54M-PH-6CBU-SS	1	90° Elbow	

Table 7-1 Compressor Assembly Breakdown (continued)

Figure & Index Number	Part Number	Qty.	Description	Notes
7-1				
-93	Omit			
-94	A54M-PH-4- FBU-SS	1	Male Connector	
-95	34-A5950	1	Hex Hd. Bolt (Special)	
-96	34-624	2	Cap Screw, Round Hd. #10-32NF x 1" Lg., S/S	
-97		4	Flat Washer, #10, S/S	
-98		4	Nut, Hex #10-32NF, S/S	
-99	34-A5950-1	1	Hex Hd. Bolt - 4 1/4" Lg. (Special)	
-99A	20-643	1	Flat Washer, 3/8", Narrow, .812 O.D., S/S	
-100	24-31	1	Spring, 1" Lg.	
-101	40-A3895	1	Plate, Thrust	
-102	40-A3322	2	Rider, Thrust	
-103	Omit			
-104	34-625	2	Cap Screw, Round Hd. #10-32NF x 1 1/2" Lg., S/S	
-105	3-A3896-2	1	Rod, 2nd Stage	(See fig. 7-1d)
-106	40-B2552-1	1	Bar, Thrust	
-107		1	Bolt, Hex Hd. 5/16-24NF x 1 3/4" Lg., S/S	
-108	A515-343	1	Relief Valves, 1st Stage set @ 150 psig	
-109	34-440	2	Shoulder Bolt, Soc. Hd.	
-110	40-B4362	1	Tubing Block	
-111		4	Cap Screw, Flat Soc. Hd. 5/16-18NC x 1 1/2" Lg., S/S	
-112	55-D2106	1	Tubing Coil - 1/2 O.D.	
-113	55-D2106-1	1	Tubing Coil - 3/8 O.D.	
-114	55-D2106-2	1	Tube, Return - 3/8 O.D.	
-115	55-D2106-3	1	Tubing Coil - 1/4 O.D.	
-116	34-627	2	Bolt, Soc. Hd. 5/16-24NF x 2 1/4" Lg., S/S	
-117	34-628	2	Bolt, Soc. Hd. 5/16-24NF x 2 1/2" Lg., S/S	
-118	34-629	2	Bolt, Soc. Hd. 1/4-28NF x 2" Lg., S/S	
-119		2	Washer, 1/4 AN, S/S	
-120	40-B4360	1	Tubing Block	
-121	40-A4343	1	Tubing Block	
-122	84-100	2	Grommet	
-123		2	Cap Screw, Flat Soc. Hd. #10-32NF x 3/4" Lg., S/S	
-124		2	Nut, Self Locking - #10-32NF, S/S	
-125	66-A3945	2	Spacer	
-126	Omit			
-127	Omit			
-128	62-400-2	1	Nameplate	
-129		4	Drive Rivet, Size 0 x 3/16	
-130		4	Flat Washer, 5/16"	
-131	316-100	4	Teflon Tape, 10" Lg.	

Table 7-1 Compressor Assembly Breakdown (continued)

Figure & Index Number	Part Number	Qty.	Description	Notes
7-1				
-132	162-421	1	Label, "CAUTION"	
-133	62-403	1	Label, "RIX"	
-134	62-432	1	Label, "SWEET AIR"	
-135		1	Washer, $\frac{5}{16}$ AN, S/S	

Table 7-2 Moisture Separators

Figure & Index Number	Part Number	Qty.	Description	Notes
7-2	A208-C1395-4	1	Separator Assembly, 3rd Stage (Incls.)	
-1	208-A4331	1	Cap	
-2	123-912-5	1	O-ring	
-3	208-B2619-1	1	Body	
-4	77-27	1	Filter Tube	
-5	342-A4216	1	Spinner	
-6	715-62	1	Hand Valve	
-7	Omit			
-8	54M-PH			
	$\frac{1}{4}$ MMS-SS	2	Tee	
-9	515-A7013	1	Relief Valve, set @ 3600 psi	
-10	54M-PH-4-4-			
	CTX-SS	1	Male Elbow	
-11	A54M-PH-4-			
	4-FBU-SS	1	Male Connector	
-12	54M-PH-			
	$\frac{1}{4}$ HHP-B	1	Hex Plug	
7-2	A208-C1395-3	1	Separator Assembly, 2nd Stage (Incls.)	
-1	208-A4331	1	Cap	
-2	123-912-5	1	O-ring	
-3	208-B2619	1	Body	
-4	77-27	1	Filter Tube	
-5	342-A4216	1	Spinner	
-6	715-62	1	Hand Valve	
-7	Omit			
-8	54M-PH-			
	$\frac{1}{4}$ MMS-SS	1	Tee	
-9	A515-269	1	Relief Valve, set @ 1000 psi	
-10	A54M-PH-			
	6CBU-SS	1	Male Elbow	
-11	A54M-PH-			
	6FBU-SS	1	Male Connector	

Table 7-3 Gasoline Driver and Accessories

Figure & Index Number	Part Number	Qty.	Description	Notes
7-3				
-1	Ref.	1	SA-6AG Compressor	(See fig. 7-1)
-2	34-630	4	Hex Hd. Bolt, ¼-28NF x 1¼", S/S	
-2A		5	Flat Washer, ¼ SAE, S/S	
-3	20-644	2	Flat Washer, ⅝ Wide, 1⅛" O.D., S/S	
-3A		2	Flat Washer, ⅝ SAE, S/S	
-4	34-631	4	Hex Hd. Bolt, ⅜-16NC x 2", S/S	
-5	A307-3	1	Fuel Pump Assembly	
-5A	77-31	1	Fuel Filter Assembly	
-5B	54M-WH-1582	2	90° Elbow	
-6	307-5	1	Gasoline Engine	
-6A	38-B2882	1	Gear Cover, Gasoline Engine	
-7	34-632	1	Hex Hd. Bolt & Locking Washer ⅜-16NC x ¾" Lg., S/S	
-8	73-423	1	Inlet Hose	
-9	A77-623	1	Inlet Filter Assembly	
-10	40-A4355	1	Linkage Bar	
-11	54M-PH- 125HBL-12-8	1	Male Barbed Insert	
-11A		2	Hose Clamp, 1" O.D. — Stl.	
-12	41-BX40-1	1	V-Belt	
-13	36-1B028-100	1	Sheave	
-14	156-C1373	1	Beltguard	
-15	40-A3985	7	Mounting Feet	
-16	54-612	1	Fill Yoke	
-17	116-432	1	Regulator	
-18	60-295	1	Gauge, 0-6000 psi	
-19		2	Socket Hd. Cap Screw, ⅝-18NC x 1¼", S/S	
-20	A73-620	1	Filler Hose Assembly (Incls. A-B)	
	73-434	6	(A) Hose	
	54-368	2	(B) Fitting	
-21	A208-C1395-4	1	Moisture Separator Assembly, 3rd Stage (See Table 7-2)	
-22	A208-C1395-3	1	Moisture Separator Assembly, 2nd Stage (See Table 7-2)	
-23		1	Key, ¼ Sq. x 1¼ Lg.	
-24	A69-515	1	Fuel Tank Assembly	
-25	A73-426	1	Hose Assembly	
-25A	A73-422	Ref.	Primer Bulb Assembly	
-26	54M-PH- 125HPL-5-4	1	Male Barbed Insert	Part of Item 25 Replacement Part Only
-27		2	Hex Hd. Bolt, ⅝-24NF x 2½" Lg.	
-28		2	Hex Nut, ⅝-24NF	
-29		4	Flat Washer, ½ SAE, S/S	
-30	34-439	2	U-Bolt	
-31		4	Nut, Self-Locking ¼-20NC, S/S	
-32		1	Tubing, Reinforced Vinyl ¼ I.D. x 16" Lg.	

Table 7.3 Gasoline Driver and Accessories (continued)

Figure & Index Number	Part Number	Qty.	Description	Notes
7-3				
-33		1	Tubing, Reinforced Vinyl ¼ I.D. x 9¼" Lg.	
-34	Omit			
-35	40-B2841	1	Fuel Pump Mounting Bracket	
-35A	553-9	3	Nut, Hex, Self-Lkg. #8-32 NC	
-36	34-444	3	Socket Hd. Cap Screw #8-32 NC x 1¼" Lg., S/S	
-37	105-A4607	4	Stud ¾-16NC x 1½" Lg., S/S	
-38		12	Hex Nut, ¾", S/S	
-39		8	Flat Washer, ¾" x 1.000 O.D., S/S	
-39A		8	Flat Washer, ¾" x .812 O.D., S/S	
-39B	66-A7125	2	Spacer, Fuel Pump Mount	
-40	307-6	1	Fuel Connector Body	
-41		1	Hex Hd. Bolt ¼-20NC x 1½" Lg., S/S	
-42		1	Lockwasher, ¼", S/S	
-43		1	Flat Socket Hd. Cap Screw ¼-28NF x 1½" Lg., S/S	
-44	54M-PH-4- 4-FTX-SS	1	Male Connector	
-45	54M-PH- ¼FF-SS	1	Hex Nipple	
-46	358-B2861	2	Mounting Foot	
-47	Omit			
-48	A75-C1384	1	Rollover Frame Assembly	
-49	62-A5972	1	Identification Plate	
-50	45-110	1	14.5 oz. Grease	

Table 7-4 Recommended Spare Parts & Tools

Part Number	Qty.	Description
A8-A3309-1	1*	Piston Assembly, 3rd Stage (Includes A-F)
8-B2116	1	(A) Piston, 3rd Stage
18-B2117-3C	2	(B) Rider Ring
18-C1791-4.5C	4	(C) Compression Ring
123-012-5	4	(D) Expander
18-C1603-4.5C	2	(E) Pressure Breaker Ring
31-A3310	1	(F) Piston Storage Tube
18-B2117-3C	1	Rider Ring, Follower
A77-623	1**	Filter
81-160	1	Grease Dispenser
45-110	1***	Rix Grease
20-A4377	1	Piston Catcher
41-BX40-1	1	V-Belt (Gas Drive)

*Per 200 hours of operation.

**Per 1000 hours of operation.

***Replace as needed: This is a specially formulated fluoroether lubricant required for sustained high temperature and pressure application. Use no substitutes.

NOTE: If your third stage piston is reusable, it can be returned to the factory to be fitted with new compression rings, expanders and rider rings. Consult the factory for prices and any additional information you may require.

All parts and spare parts are available through RIX INDUSTRIES,
6460 Hollis Street, Emeryville, California 94608.

TELEPHONE (415)658-5275, TELEX 33-7724

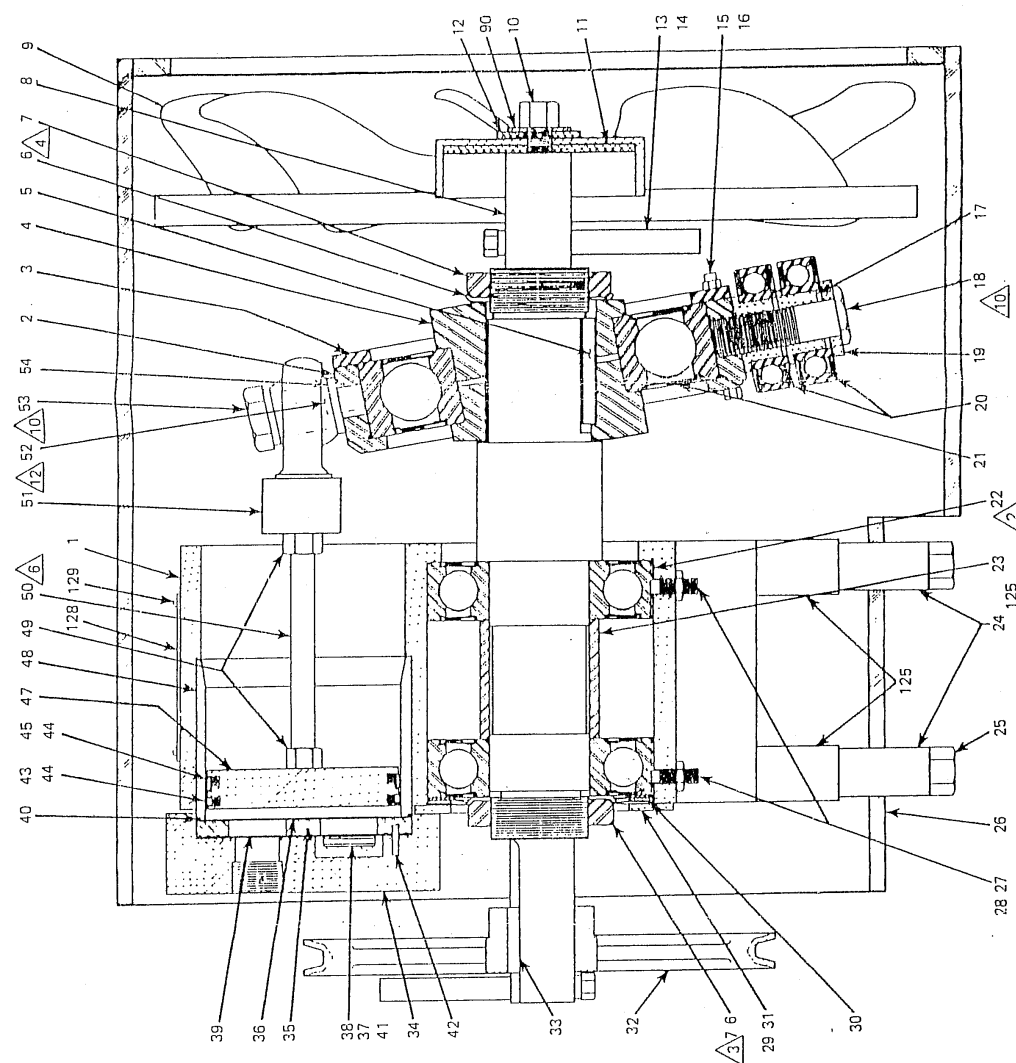


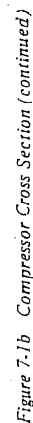
Figure 7-1a Compressor Cross Section

CHANGE 1

7-9/(7-10 Blank)

NOTES

1. To assemble:
 - A. Install 308 bearing (22) on shaft, then heat cylinder block (1) to about 150°F and install shaft in housing. Adjust outer bearing race so notch aligns with set screw (28).
 - B. Adjust set screw to just touch bottom of bearing notch.
 - C. After cylinder block has cooled, use 271 Loctite between installed 308 bearing outer races and cylinder block.
 - D. Install inner (4) and outer (2) ring on 313 bearing (21), then install on shaft.
 - E. Install and adjust thrust bearings and riders.
 - F. Install piston and head assemblies.
2. Install shaft/bearing assembly with slots in bearings aligned to receive set screw (28).
3. Torque to 100 ft. lbs. with special tools T-C1281 and T-N08.
4. Torque to 200 ft. lbs. with special tool T-N08.
5. Install end with hole toward follower piston.
6. Adjust rod length until piston touches head and back off $\frac{1}{4}$ to $\frac{3}{8}$ turn (all stages).
7. Adjust to minimize movement of spring (.010").
8. Omit.
9. Adjust to .75 spring length.
10. Torque to 50 ft. lbs.
11. Grease all bearing mounts, threads and liner O.D.'s with Chevron SR1 bearing grease except where Loctite is specified.
12. Lubricate connecting rods with Rix 45-110 grease.
13. See Chapter 7, Table 7-1 for parts list.
14. Use conducting grease between liner (58) O.D. and cylinder block (1) I.D.
15. To and from 2nd stage separator.



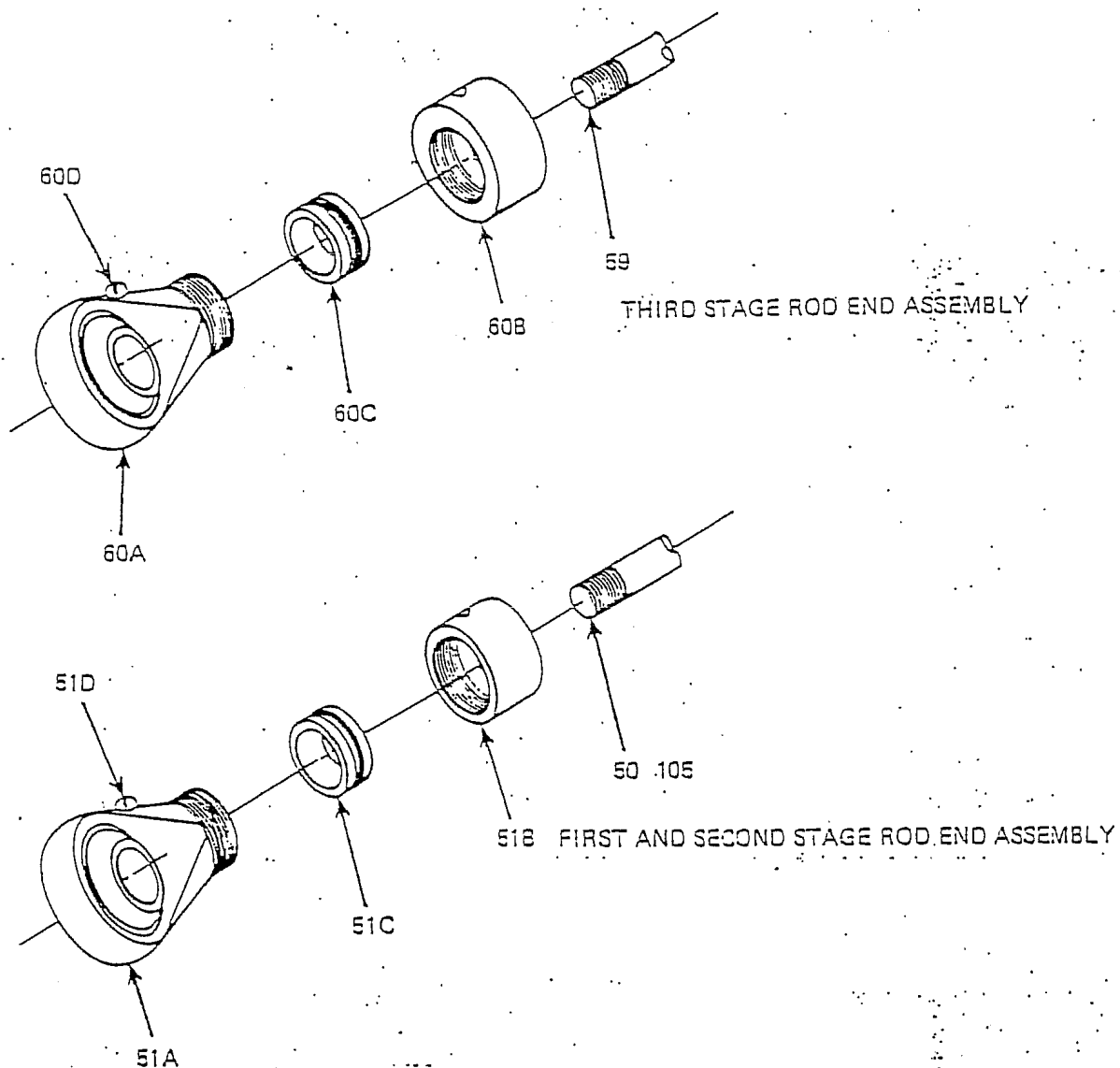


Figure 7-1d Rod End Bearing Assemblies

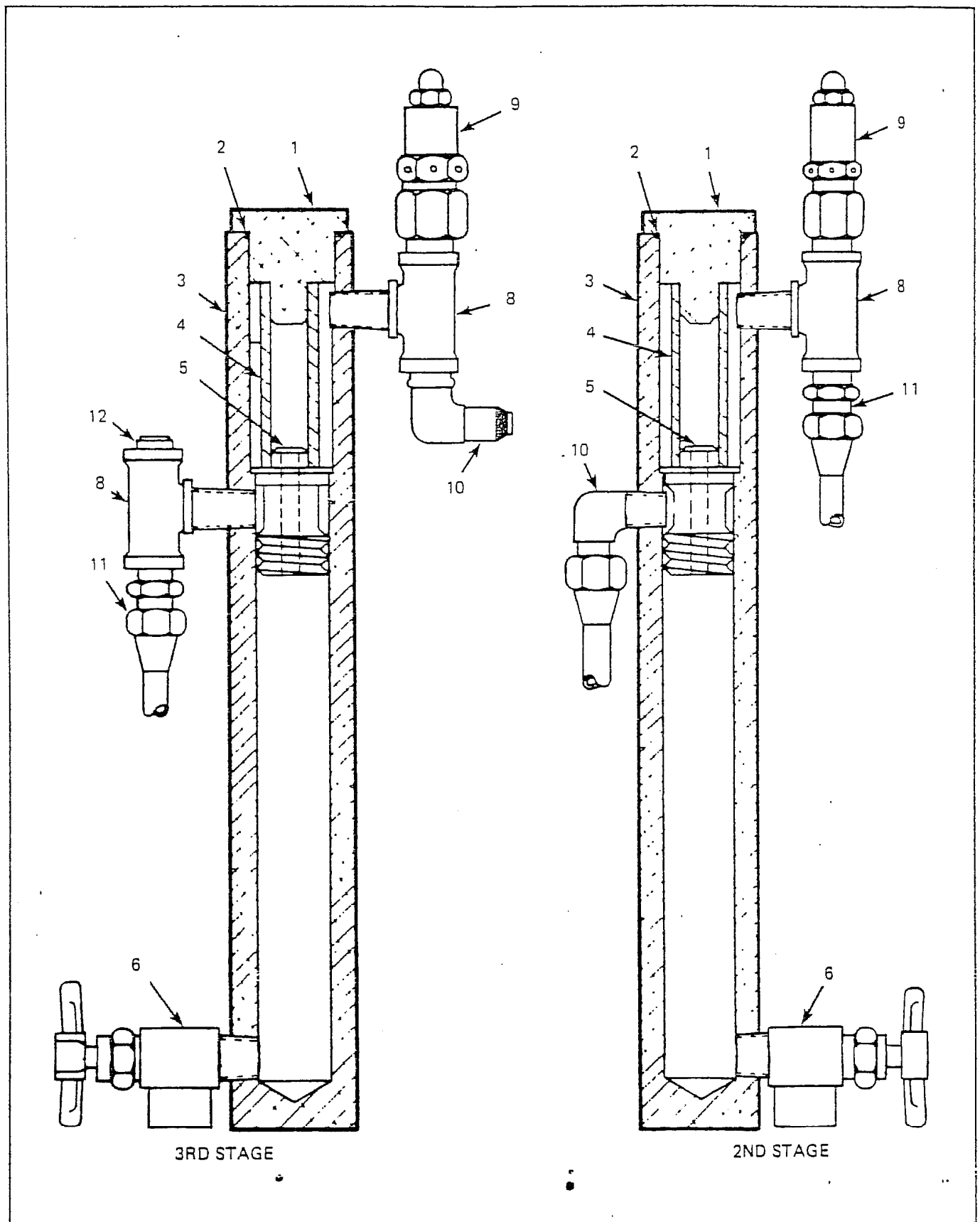


Figure 7-2 Moisture Separators

SA-6 COMPRESSOR

S6220-A7-MMC-910/MOD 1S3P-6

PARTS LIST

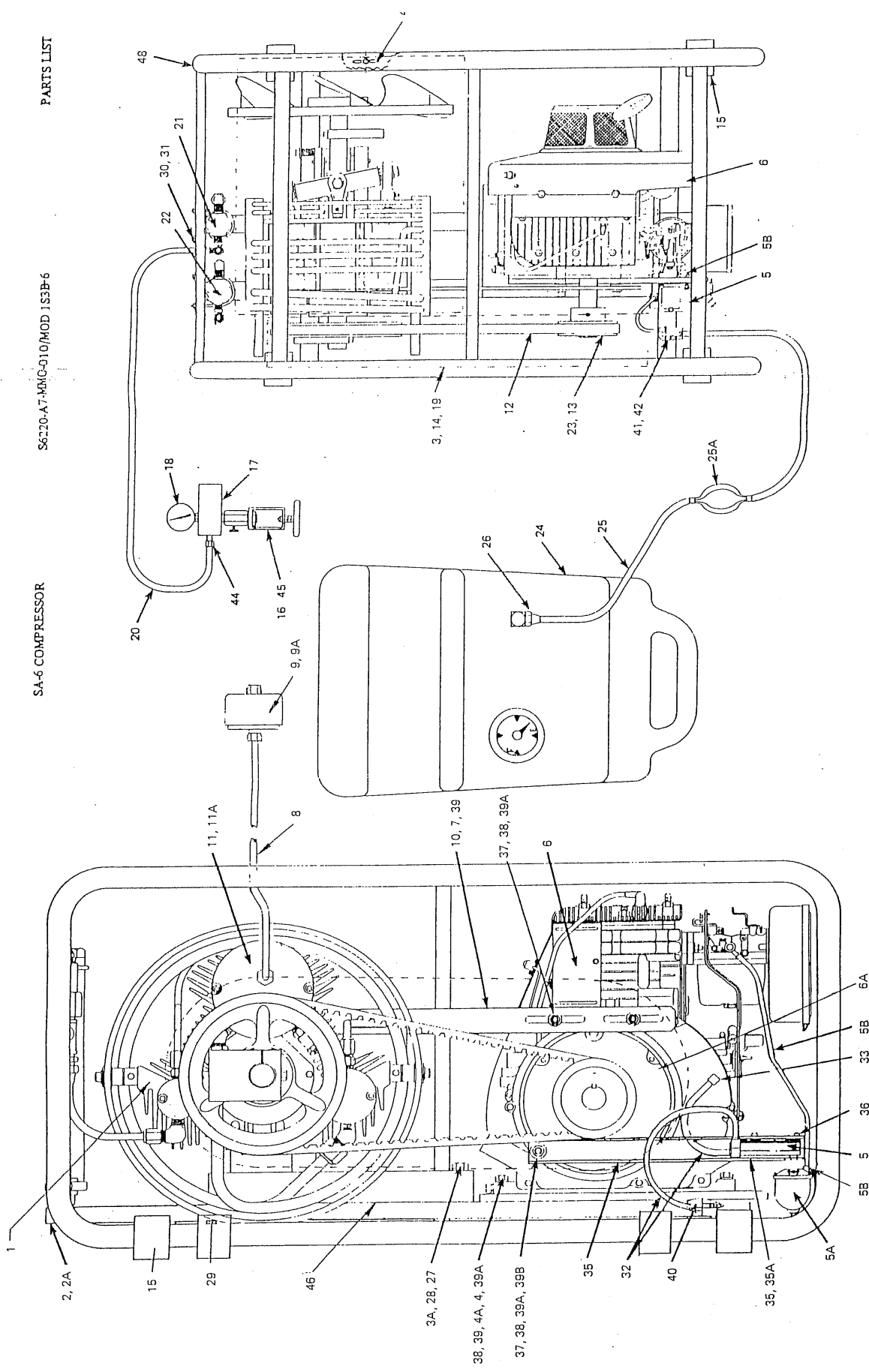


Figure 7-3a Compressor Assembly

CHANGE 1

7-17/(7-16 Blank)

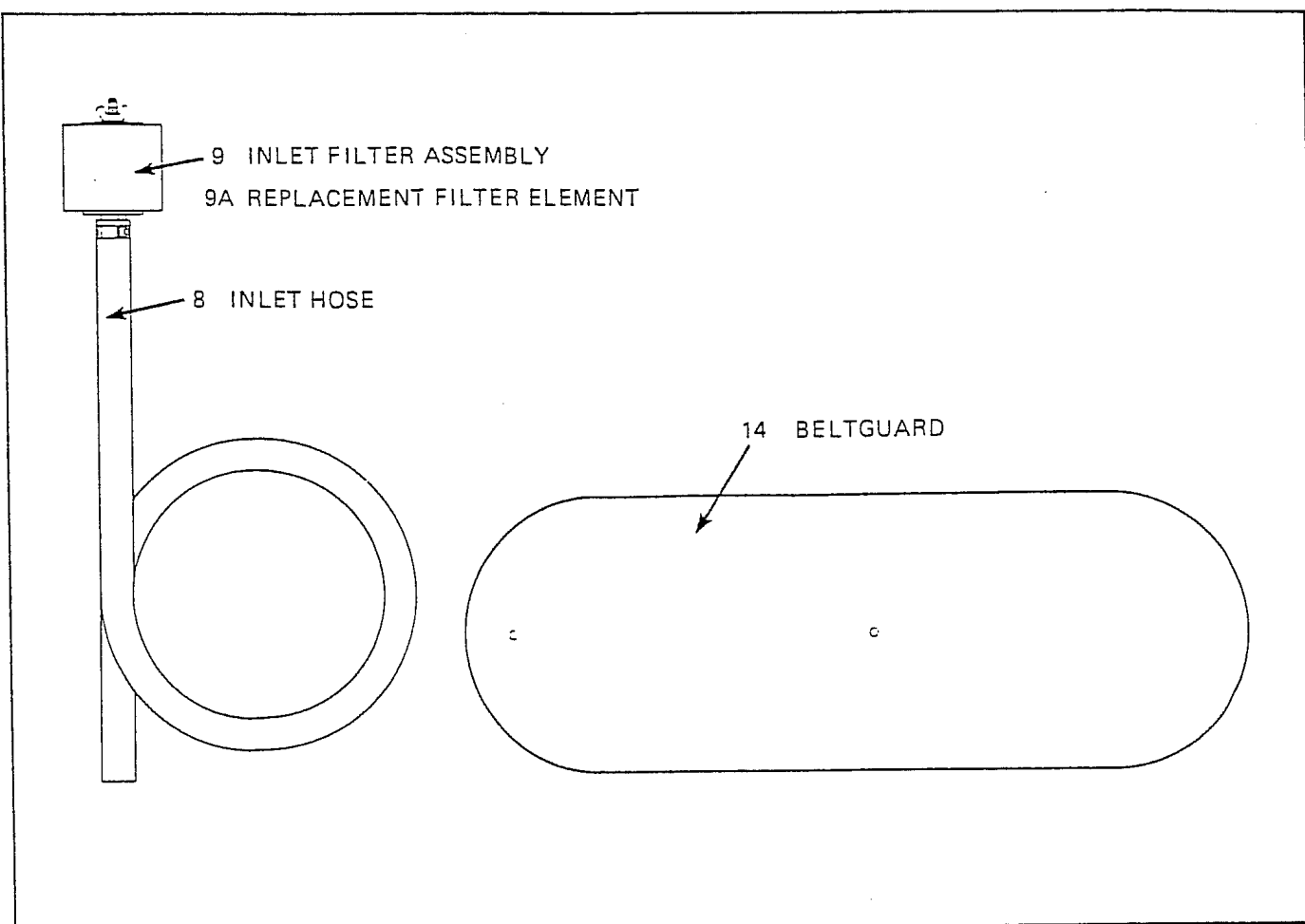


Figure 7-3b Compressor Assembly (continued)

CHAPTER 8

INSTALLATION

8.1 CRATE REMOVAL.

8.1.1 PRECAUTIONS. Care must be used when transporting and handling the crated compressor to prevent damage to its contents. Make sure each item listed in Table 1-2 is included with the shipment before disposing of packaging material. The filler hose/yoke assembly may be supplied loose. This should be connected to the flared fitting located at the high pressure moisture separator discharge.

8.1.2 INSPECTION. Visually inspect the compressor for shipping damage such as bent or broken tubing, cracks in plastic shrouds, etc. Repair as required.

8.2 COMPRESSOR SYSTEM INSTALLATION.

8.2.1 GENERAL. The compressor system is designed for portable use. See Chapter Two, Operating Procedures, Para. 2.3 for a description of the set-up. For permanent installation, the brackets shown in Figure 8-1 can be fabricated or ordered from Rix. Figure 8-2 shows the mounting dimensions utilizing this bracket.

8.3 PREPARATION FOR STORAGE/RESHIPMENT.

8.3.1 GENERAL. When a compressor system is to be stored or reshipped, special precautions should be taken to protect the interior and exterior components from rust accumulation, corrosion, or damage caused by mishandling.

It will be necessary to remove all rust or corrosion completely from exposed parts before applying a rust preventive compound. Therefore, it is recommended that the system be processed for storage

or reshipment as soon as possible after removal from service.

The compressor system should be stored in a building which is dry and can be heated during the winter months. The use of moisture absorbing chemicals is recommended when excessive dampness prevails in the storage area. The parts requiring attention and the recommended preparation for storage or reshipment are given below.

8.3.2 GASOLINE ENGINE.

a. Start the compressor with the moisture separator drains open to drain all accumulated moisture.

b. Disconnect the fuel hose at the gasoline tank and allow the engine to run.

c. When the gasoline level in the glass filter bowl is almost consumed, stop the engine and allow it to cool.

d. Remove the engine air intake filter and restart the engine.

e. After 15 to 20 seconds, spray a mist of engine lubricating oil into the carburetor air intake until the engine loses speed, runs roughly, and exhausts smoke. Shut off the engine ignition immediately.

f. Remove the float bowl and glass filter bowl and drain off any remaining fuel. Spray oil mist into the carburetor and float bowl.

g. Reinstall float bowl, filter bowl, and air intake filter.

h. Remove crankcase drain plug and drain the crankcase. Reinstall the drain plug securely.

i. Drain all gasoline from the remote fuel tank and wash out using detergent and hot water. Blow the unit dry, inside and out, using air.

8.3.3 COMPRESSOR.

a. Disconnect air inlet hose assembly and filler hose assembly from the compressor. Use cap plugs or tape to seal the inlet and discharge fittings.

b. Close the drains on the moisture separators.

c. Remove the compressor shroud and wipe away any accumulation of grease or dirt on the compressor or inside the shroud.

d. Visually inspect major components for cleanliness and indications of discrepancies or malfunctions.

e. Relubricate the rod end bearings and thrust riders per Para. 4.5.

f. Reinstall shroud and tighten the capcrew securely.

8.3.4 WRAPPING/CRATING.

a. Pack all accessories in plastic bags.

b. Verify that all parts are capped or otherwise sealed to prevent contamination and corrosion.

c. Completely enclose the compressor system in plastic (preferably vinyl) sheeting.

d. If the compressor system is to be reshipped, it should be crated to the best standard practice or better.

The stored compressor system should be inspected periodically. If rust or corrosion is present, corrective action must be taken to prevent hardware damage.

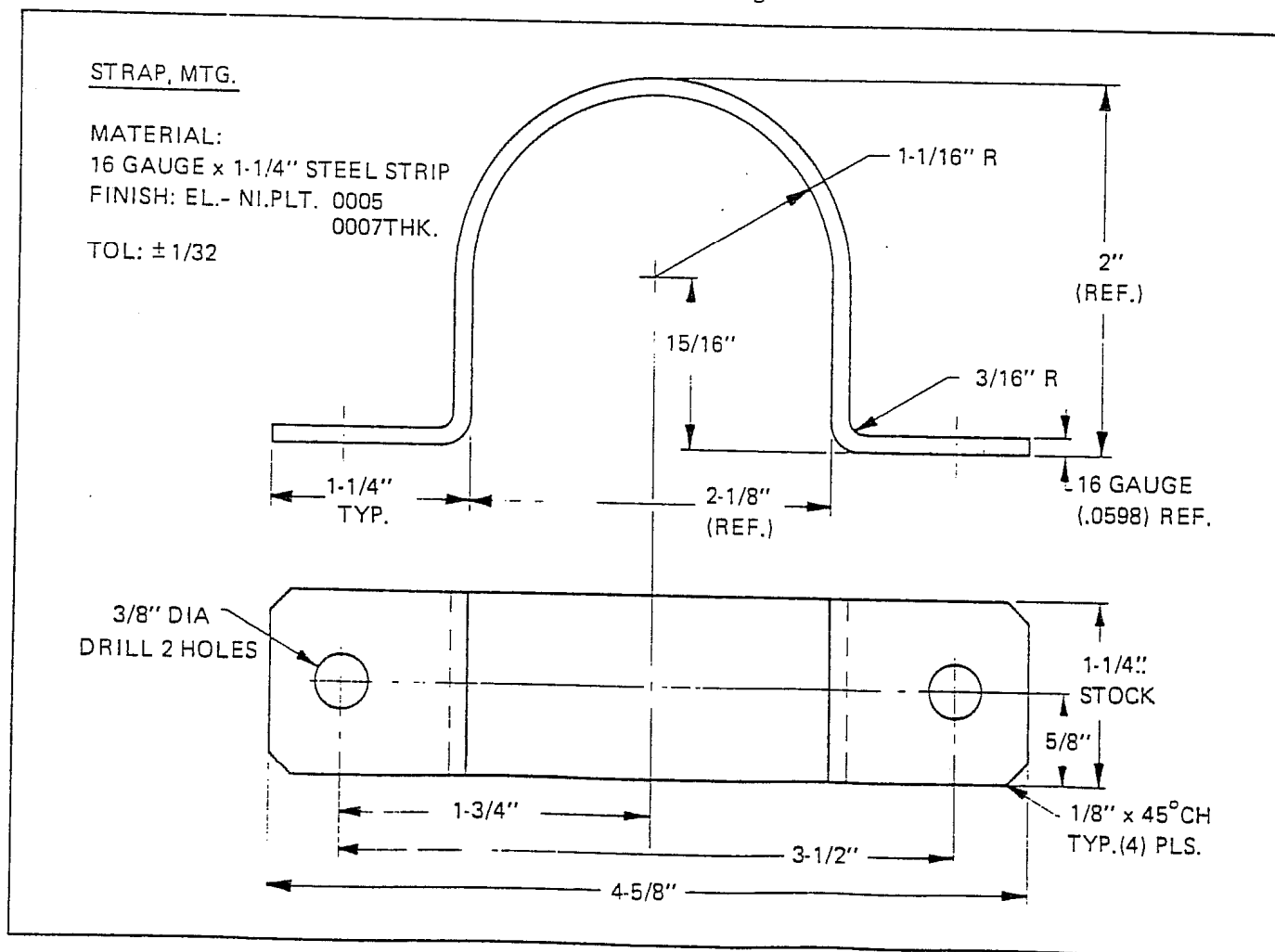


Figure 8-1 Permanent Mounting Brackets
RIX P/N 40-A4561

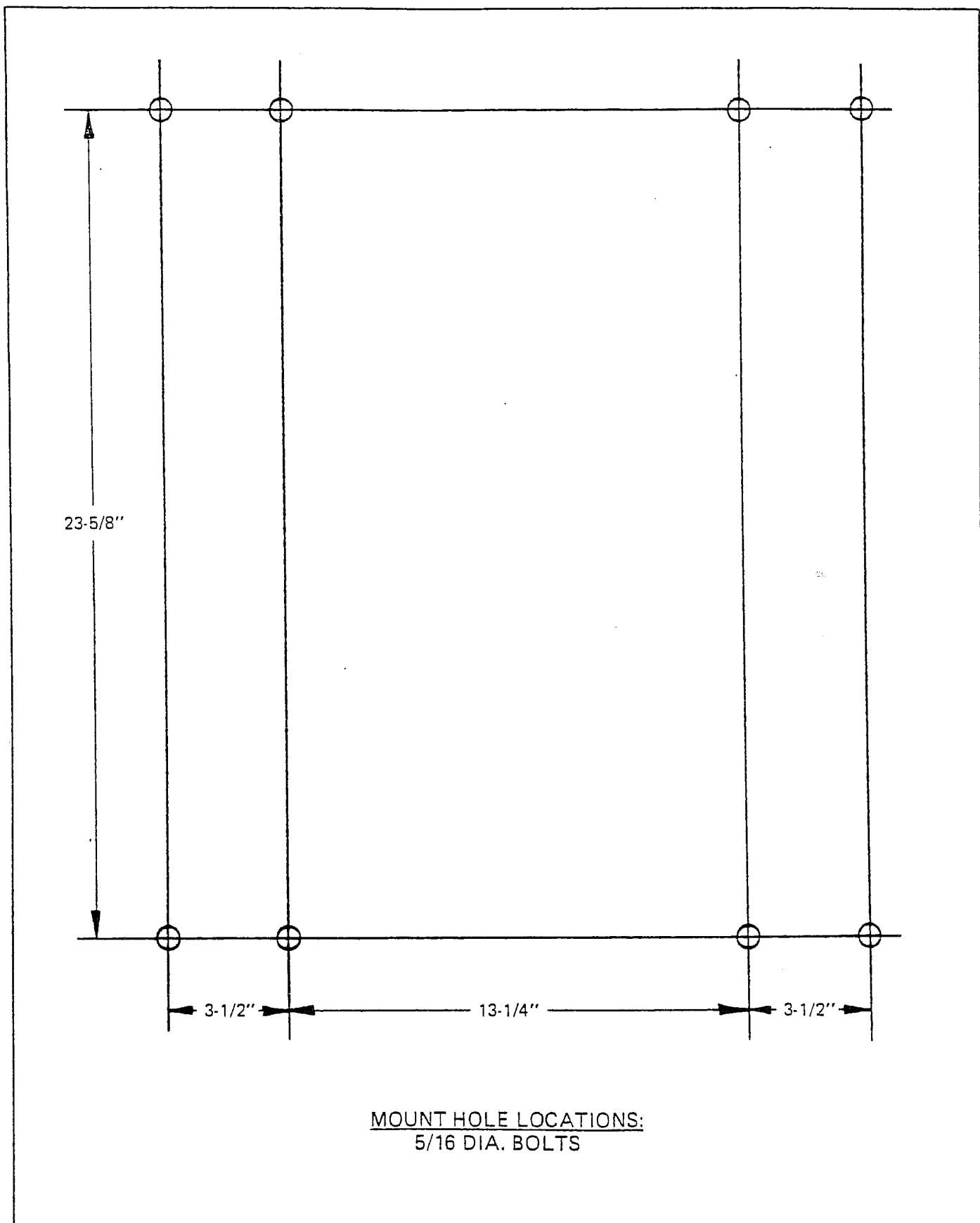


Figure 8-2 Permanent Mounting Dimensions
(Fit brackets over rubber mounting feet on compressor frame.)