OPERATING INSTRUCTIONS and PARTS LIST for

RIX AIR COMPRESSOR

MODEL SA-6B*

WARNING

This compressor is designed for compressing ambient air only and is not suitable for compressing oxygen, oxygen enriched air, or oxygen enriched gases.

See Serial Number Page for applicable serial numbers.

Rev. 5/16

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PART II

SERIAL NUMBER PAGE

RIX MODEL SA-6B

This manual is applicable to all RIX Industries
Model SA-6B Air Compressors bearing
one of the following Serial Numbers.

7900 – 7923, 8111 - 8135
8300 – 8333, 8415 - 8464
8664 – 8708, 8873 - 8890
8948 – 8997, 9105 - 9154
9213 – 9262, 9650 – 9700
9731 – 9779, 10079 – 10082
10133 – 10142, 10216 – 10223
10239 – 10252, 10306 – 10313
10349 – 10358, 10548 – 10557
10664 AND ABOVE

SAFETY PRECAUTIONS

WARNING

A high pressure vessel is a concentrated energy source which could release explosively.

Very special care must be exercised while filling SCUBA tanks or other high pressure containers. The pressure vessel should be placed behind a barricade which will shield personnel from injury in the event the vessel should rupture. When filling SCUBA tanks, submerging the cylinder in water also helps to reduce the temperature created in the filling process as well as reduce the chance of injury from an explosion.

The **RIX Model SA Compressor** is equipped at the factory with a final discharge safety valve set at 3600 or 4000 psig. Optional higher pressure set pointsafety valves are available at 4500 psig and 5000 psig. Trained personnel with the proper tools can adjust the safety valve to a lower pressure. Also available is RIX Pressure Switch, Part No. A76-191, which is manually adjustable and designed to operate at pressures from approximately 1500 psig up to 4500 psig.

CAUTION

The system pressure must be relieved before adjusting the pressure switch. Adjusting the pressure switch while under pressure will damage the switch. Malfunction of this switch combined with malfunction of the safety valve could have serious results.

Do not depend on the safety valve and pressure switch to control the high pressure air supply.

All self-contained breathing apparatus back-pack tanks are stamped with the design pressure and dated. These values should not be exceeded. A reliable pressure gauge which has been recently checked against another known accurate pressure gauge must be connected in the filler line. **This gauge must be continuously observed during the filling operation of the pressure vessel.**

SA COMPRESSOR RELIABILITY DO's & DON'T's

DO's

DO grease the rod end bearings and thrust rider every 25 hours of operation or every three (3) months.

DO drain moisture separators every 10 minutes or more often as needed in a high humidity climate.

WARNING

Failure to properly drain the moisture seperators could result in water carry over and possible damage to the compressor.

DO make sure dryer cartridge is pushed firmly into place before installing the top cylinder cap. Otherwise, leakage will occur through hole in bottom of the housing. Remove plastic caps from both ends of the dryer cartridge before installing.

NOTE: Installation of a spring on the top of the cap may be required to secure the cartridge on the nipple housing.

NOTE: The cartridge has a 4-year shelf life if left unopened.

DON'T's

DON'T operate without the back pressure regulator (BPR) installed. It must be located either directly at the compressor outlet and (if applicable) after the dryer cylinder as factory installed on "option packages." The compressor requires back pressure to hold the floating 3rd stage piston tightly against the piston rod (approximately 1500 psig).

DON'T drain the pressure from the dryer cylinder except when replacing the cartridge.

DON'T adjust the pressure switch (except the Murphy Switchgage on Option Package 3) unless all compressor pressure is bled off.

DON'T use **any grease** other than that designated in paragraph 4.5.2 in your manual when lubricating the rods and thrust rider. This is a special teflon resin lubricant designed for sustained high pressure operation. Substitute greases will reduce rod life.

DON'T operate the unit with main shaft counterweight(s) left off or installed out of phase. See Figure 7-1a.

DON'T operate unit in reverse rotation. See Figure 3-1.

DON'T operate without cooling shroud in place.

WARNING

This compressor is designed for compressing ambient air only and is not suitable for compressing oxygen, oxygen enriched air, or oxygen enriched gases.

RIX INDUSTRIES'

SA COMPRESSOR WARRANTY

RIX Industries warrants all SA compressors as follows:

Every RIX compressor is carefully inspected, assembled and thoroughly tested before shipment is made from the factory and each new compressor sold by RIX Industries is warranted to be free from defect in material and workmanship for a period of six (6) months from the date of shipment for the SA compressors.

The obligation under this warranty, statutory or otherwise, is limited to the replacement of repair at the Manufacturer's factory, or at a point designated by the Manufacturer, of such part as shall appear to the manufacturer, upon inspection at such point, to have been defective in material or workmanship.

This warranty shall not apply to any compressor which has been subject to misuse, neglect, or accident, nor shall it apply to any machine upon which repairs or alterations have been made unless authorized by the Manufacturer.

RIX Industries makes no warranty in respect to accessories such as electric motors and/or gasoline engines powering the compressor, or to controls such as pressure switches, solenoid valves and motor starters, such being subject to the warranties of their respective manufacturers.

The Manufacturer shall in no event be liable for consequential damages or contingent liabilities arising out of the failure of any compressor or parts to operate properly.

No express, implied or statutory warranty other than herein set forth is made, or authorized to be made, by the Manufacturer.

CHAPTER 1

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 gasses.

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 fill 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.

g. Never operate the equipment if there is an indication of improper operation, air leaks, unusual noise, or broken or loose parts.

h. Never work on the equipment without first relieving all pressure, de-energizing the unit and tagging it out. Always protect eyes and face when opening valves to bleed off pressure.

FOR ENGINE DRIVEN UNITS

i. To prevent getting shocked, do not touch the spark plug or spark plug wire while the unit is running.

j. To prevent getting burned, stay clear of the exhaust muffler and all other hot areas of the engine.

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

FOR ELECTRIC MOTOR DRIVEN UNITS

l. Make sure **ON/OFF** switch is in sight of the compressor and gauges are easily accessible. (When remotely located.)

m. Make sure electrical connections are made in the approved manner and that the unit is properly grounded.

n. Make sure the electrical service is rated and properly fused for the current rating of the motor.

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 SA-6B** 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.

The compressor is supplied as a bare pump or a package with an electric motor or gasoline engine drive. This manual covers all the available systems in the general text and gives specific details in subsections for each type of drive package.

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 SA-6B (1S3B-6) and identified by the serial numbers shown on the Serial Number page.

1.3 EQUIPMENT DESCRIPTION

1.3.1 GENERAL. The RIX SA-6B Compressor is a lightweight, portable air compressor package suitable for filling SCUBA (Self Contained Underwater Breathing Apparatus) cylinders to 3000 psi. The compressor is used for alternate applications where there is a requirement for reliable service and pure compression of air. The most common is for filling portable breathing systems (up to 4500 psi) for Fire Departments and Rescue Teams.

The main text of the manual describes the **SCUBA** filling operation but the information is applicable to filling any approved high pressure receiver.

The driver and compressor are coupled by a V-belt pulley drive and mounted on a frame.

The compressor is a three stage, reciprocating air pump using an axial piston drive. All bearings are sealed and the piston rings are a 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 contaminant to 25 micron in size.

Pressure relief valves are located after each stage to prevent over pressurization of the system. An optional high pressure shutdown switch is available to automatically shut the compressor down when the pressure reaches the high pressure shutdown preset set point of the switch.

TABLE 1-1

Reference Data

Descriptive Data	RIX Industries Model SA-6B oil free, three stage, axial piston, portable air compressor package.		
Functional	Power required:	5.0 brake horsepower (5.0) HP electric motor or 8.0 HP gas engine recommended.)	
	Pressure:	3600 psi maximum (standard relief valve setting) (4500 & 5000 psi available)	
		Normal operating pressure in relation to a final discharge pressure of the compressor is as follows (in psi):	
		1st Stage	80-90 / 90-100
		2nd Stage	450-500 / 550-620
		3rd Stage	3300 / 4500
	Capacity:	5.5 Standard Cubic Feet per minute.	
	Speed:	1500 RPM at Compressor.	
Capabilities & Limitations	Air cooled and frame mounted for portable or permanent mounting. Self lubricated pistons for oil free compression.		
Environmental Characteristic	Designed to operate at ambient temperatures up to 120˚F and relative humidities to 90 percent. All components are anodized, plated, or painted to resist corrosion.		
Compressor	Piston Size:	1st Stage:	3.0" Dia.
		2nd Stage:	1.25" Dia.
		3rd Stage:	.56" Dia.
	Stroke:		1.25"
	Cooling		Forced air fan
	Compression type		Oil free

TABLE 1-2a

GASOLINE ENGINE DRIVE PACKAGE

Equipment, Accessories and Documents Supplied (Std.)

QTY.	ITEM NAME	OVERALL DIMENSIONS	WEIGHT
1 ea.	RIX Model SA-6B with Wisconsin Engine	33"L x 19"W x 18"H	150 Lbs.
	or		
1 ea.	RIX Model SA-6B with Honda Engine	35"L x 19"W x 19"H	155 Lbs.
1 ea.	Gasoline Tank & Fuel Hose	21"L x 13"W x 9"H	6 Lbs. (Empty) 6 Gallons
1 ea.	Suction Hose (for remote intake) with Filter	15 ft. long x 1" Dia.	3 1/2 Lbs.
1 ea.	Technical Manual	8-1/2 x 11” x 1/2”	1 Lb.

TABLE 1-2b

ELECTRIC MOTOR DRIVE PACKAGE

Equipment, Accessories and Documents Supplied (Std.)

QTY.	ITEM NAME	OVERALL DIMENSIONS	WEIGHT
1 ea.	RIX Model SA-6B with 230/460/3/60 Motor	30"L x 18"W x 18"H	180 Lbs.
	or		
1 ea.	RIX Model SA-6B with 230/1/60 Motor	30"L x 18"W x 18"H	205 Lbs.
	or		
1 ea.	RIX Model SA-6B with 380/3/50 Motor	30”L x 18”W x 18”H	180 Lbs.
1 ea.	Magnetic Starter	9-3/4” x 6-1/2” x 4-1/2”	8-1/2 Lbs.
1 ea.	Technical Manual	8-1/2 x 11” x 1/2”	1 Lb.

CHAPTER 2

OPERATION

2.1 INTRODUCTION

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

The operation of each packaged system, gas and electric, is covered in separate section of this chapter. Ignore those sections that do not apply to the equipment being used.

The first section of this chapter describes controls and indicators followed by detailed operating procedures. For convenience, quick reference tables are provided on each start-up procedure.

2.2 CONTROLS AND INDICATORS COMMON TO ALL COMPRESSORS

2.2.1 FILLING HOSE. A variety of fill hoses and tank adapters are available from Rix. The yoke has a pressure bleed screw to relieve pressure when disconnecting. Mounted to the yoke is a pressure gauge. The gauge measures pressure in the cylinder.

2.2.2 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. **The moisture separator should be drained every half hour of use.**

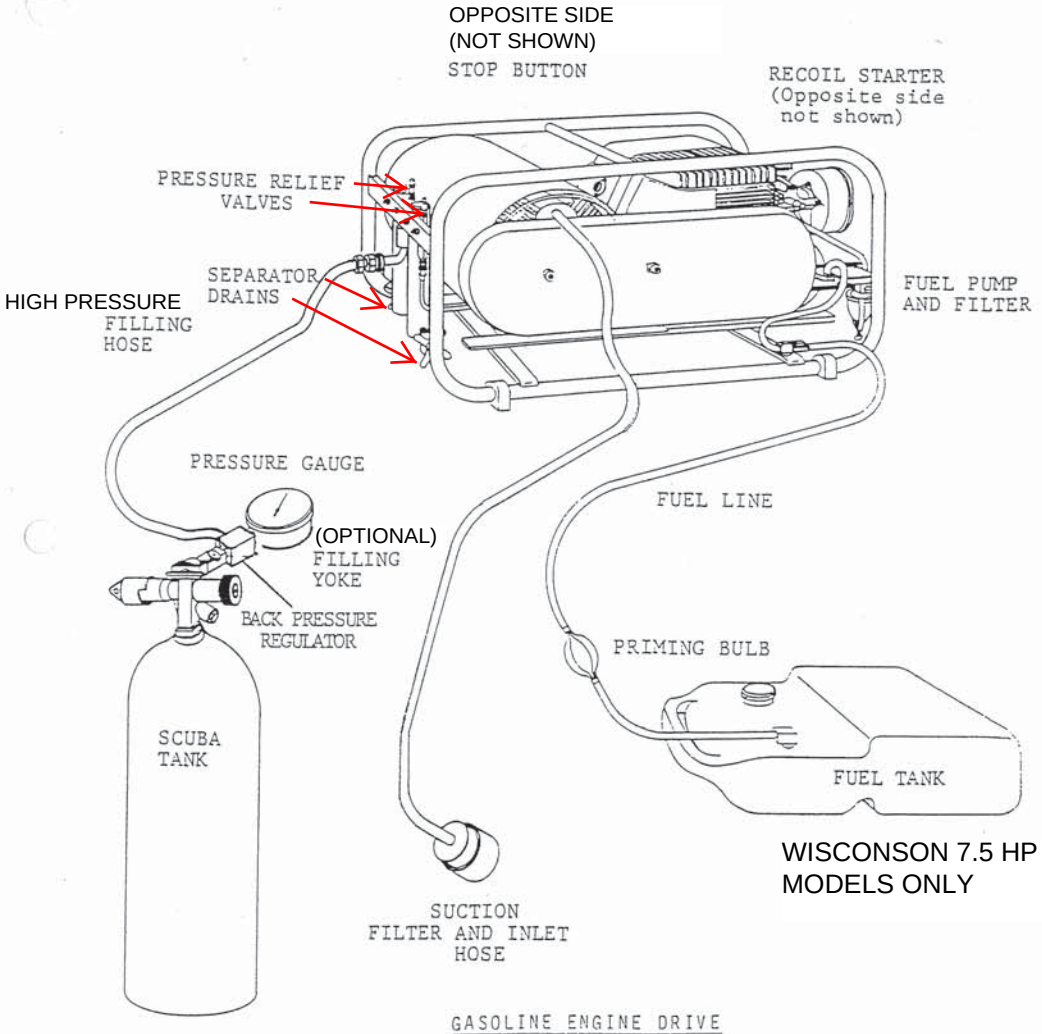
2.2.3 PRESSURE RELIEF VALVES. The compressor is protected from over pressurization by relief valves located after each stage. The standard final relief valve is set for 3600 psi. Care must be used when filling SCUBA cylinders rated for only 2250 psi.

> ## DANGER
>
> **The operator must be sure that the cylinder is not filled higher than its certified pressure rating Failure to do so could result in catastrophic failure of the cylinder.**

Make sure SCUBA cylinder being filled is fitted with a valve having a blowout disc as an added safety measure.

2.2.4 PRESSURE CONTROL SWITCH. A high pressure shutdown switch is available for mounting on electric and gasoline engine driven compressors. This can be set to shut the compressor down when the discharge pressure reaches the set point of the switch.

The high pressure shutdown switch is adjustable in the range of 1500 to 4500 psi. The switch, when provided, is set at the factory to 3000 psig or at the pressure specified by the customer and tagged with the set pressure. This pressure switch is manually adjustable to accommodate a wide range of discharge pressures.



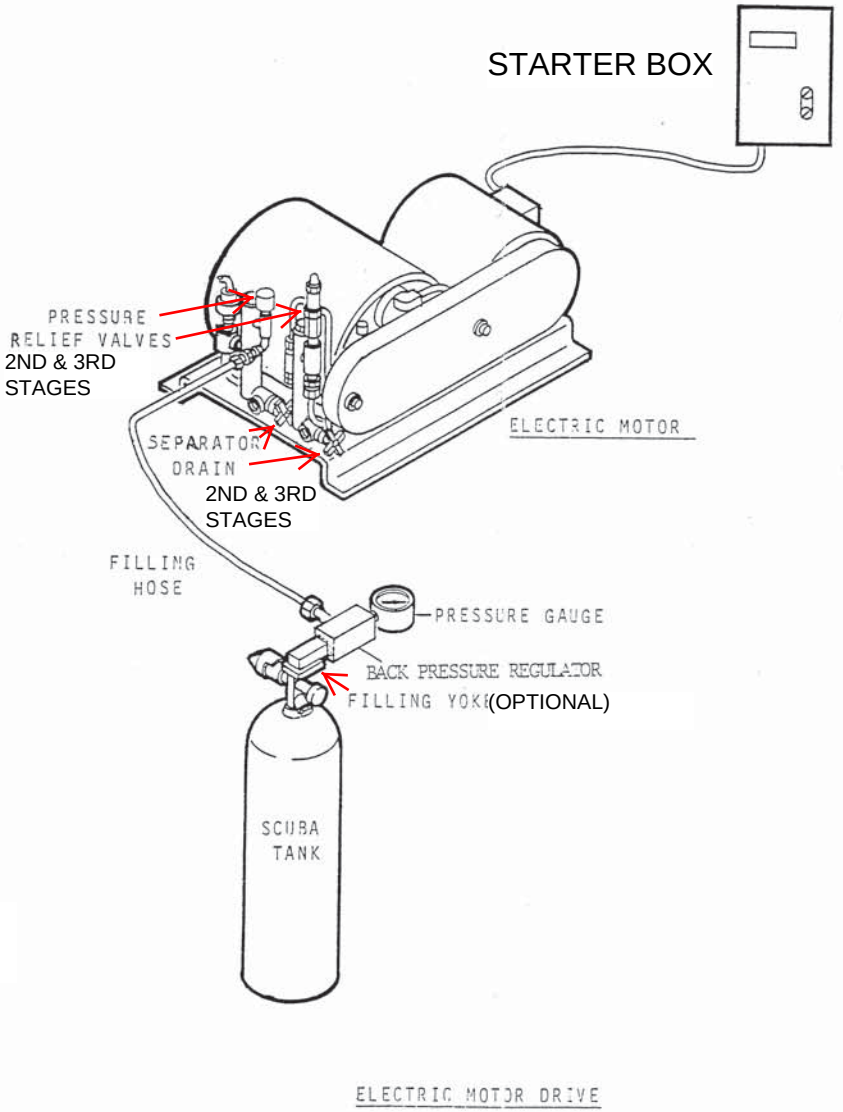
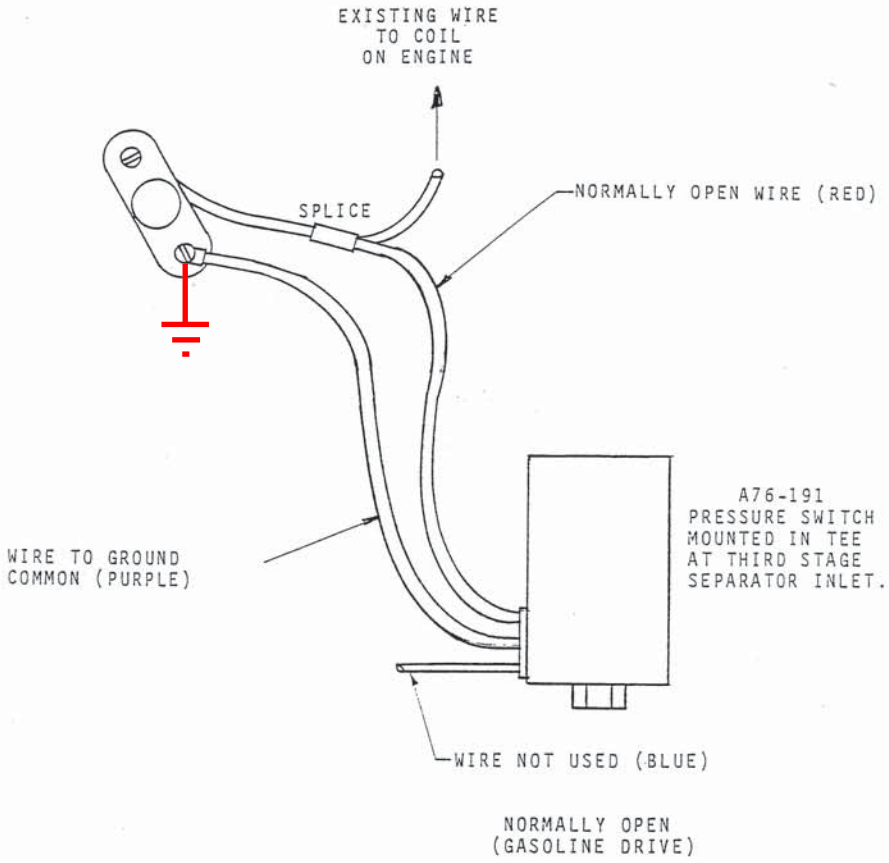


Figure 2-1 Compressor Layout



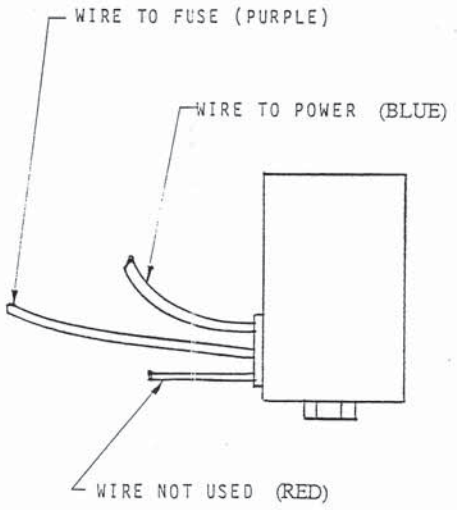


Figure 2-1a Wiring for Optional Pressure Switch

NOTE

Care must be exercised to adjust the pressure setting of the switch only when the compressor is turned off and with pressure relieved from the discharge line. Attempting to reset the switch while under pressure can damage the threads of the adjustment mechanism and may require replacement of the switch.

To set the switch at the desired shutoff pressure, rotate the adjustment screw at the top of the switch counter-clockwise to an arbitrary low pressure setting. Start the compressor and observe the discharge pressure at which the switch is actuated, stopping the compressor. Relieve the discharge pressure. Reset the switch by turning the screw clockwise and restart the compressor. Repeating this procedure will gradually increase the switch set point to the desired shutdown pressure.

It is of critical importance for the operator to be able to determine the safe working pressure of the SCUBA cylinder to be filled and not to exceed that pressure when filling. If in doubt, consult a local dive shop or call the Department of Transportation regarding SCUBA cylinder ratings.

Recommended wiring instructions for the pressure control switch are found on pages 2-6 to 2-6b for electric motor driven compressors.

NOTE: Pressure switch adjustment can only be made when pressure is relieved. DO NOT ATTEMPT TO ADJUST SWITCH WITH PLIERS!

2.3 CONTROLS AND INDICATORS ON GASOLINE ENGINE DRIVEN COMPRESSORS (See separate Wisconsin **or** Honda engine manual)

(Gasoline)

2.3.1 (Gasoline) FUEL SYSTEM. The fuel system consists of six gallon gas tank, disconnectable fuel line, fuel pump and filter, carburetor, and throttle control.

2.3.1.1 (Gasoline) 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 (counterclockwise) 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.

2.3.1.2 FUEL LINE. The fuel line is an eight foot neoprene hose with end connectors and a

(Gasoline) pumping bulb for hand priming the carburetor. Make sure the gas tank and fuel line are kept clear of the hot exhaust.

2.3.1.3 (Gasoline) 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 counterclockwise).

2.3.1.4 (Gasoline) CARBURETOR. The carburetor and its controls are covered in the engine repair 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.

2.3.1.5 (Gasoline) 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 the control lever.

2.3.2 (Gasoline) 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 Table 4-2 for recommended oil viscosities. Check the oil level only when the engine is stopped. Unscrew the dipstick, wipe the stem, and insert 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.

2.3.3 (Gasoline) 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 rewind the rope back into the starter. Pull firmly and rapidly to start engine. Do not drop rope -- hold onto the handle while rewinding to prevent the rope from re-winding improperly and jamming the assembly.

2.3.4 (Gasoline) 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.

2.4 CONTROLS AND INDICATORS ON ELECTRIC MOTOR DRIVEN COMPRESSORS

(Electric)

2.4.1 (Gasoline) ELECTRIC POWER. The standard electric drive uses a five horsepower, (three phase electric motor that can be wired for 240, 380, or 460 volts.) motor controller is provided and must be wired to a source of power according to the Electrical Schematic, Figure 2-2, 2-2a, or 2-2c. This must be done by a competent electrician in conformance with local and federal codes.

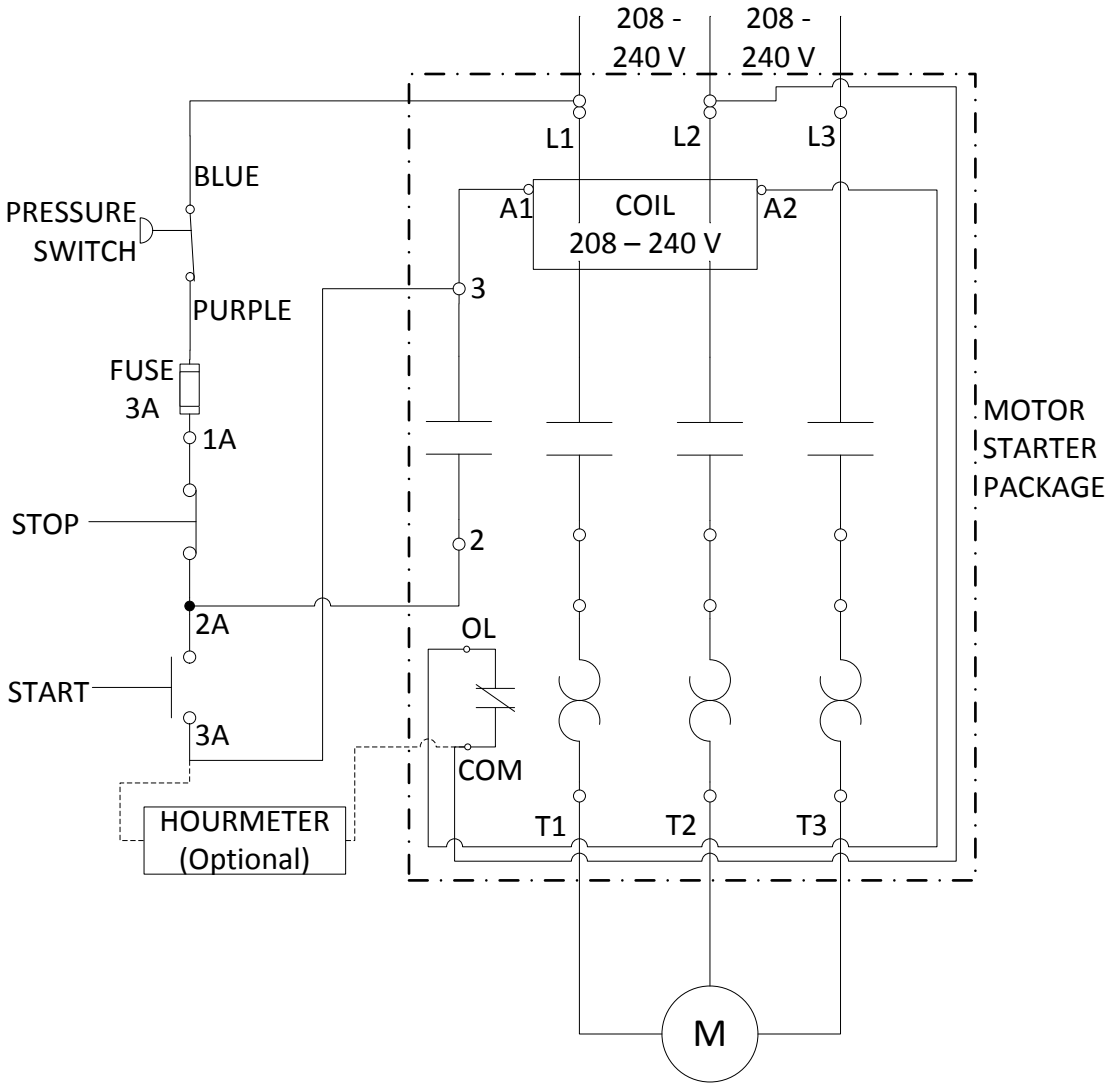


FIGURE 2-2 Electrical Schematic for Starter P/N 776-67-1
Shown Wired for 208-240 VAC/3 Ø/60 Hz

MOTOR SHALL BE WIRED FOR COUNTER-CLOCKWISE ROTATION WHEN VIEWED FROM THE SHIEVE SIDE

OPTIONS:
1) PRESSURE SWITCH – P/N A76-191
2) HOURMETER – P/N 113-10156

ONLY INSTALL WIRING AT DASHED LOCATIONS WHEN THAT OPTION IS REQUESTED. JUMPER REQ'D WHEN SOLID OPTIONS NOT REQUESTED.

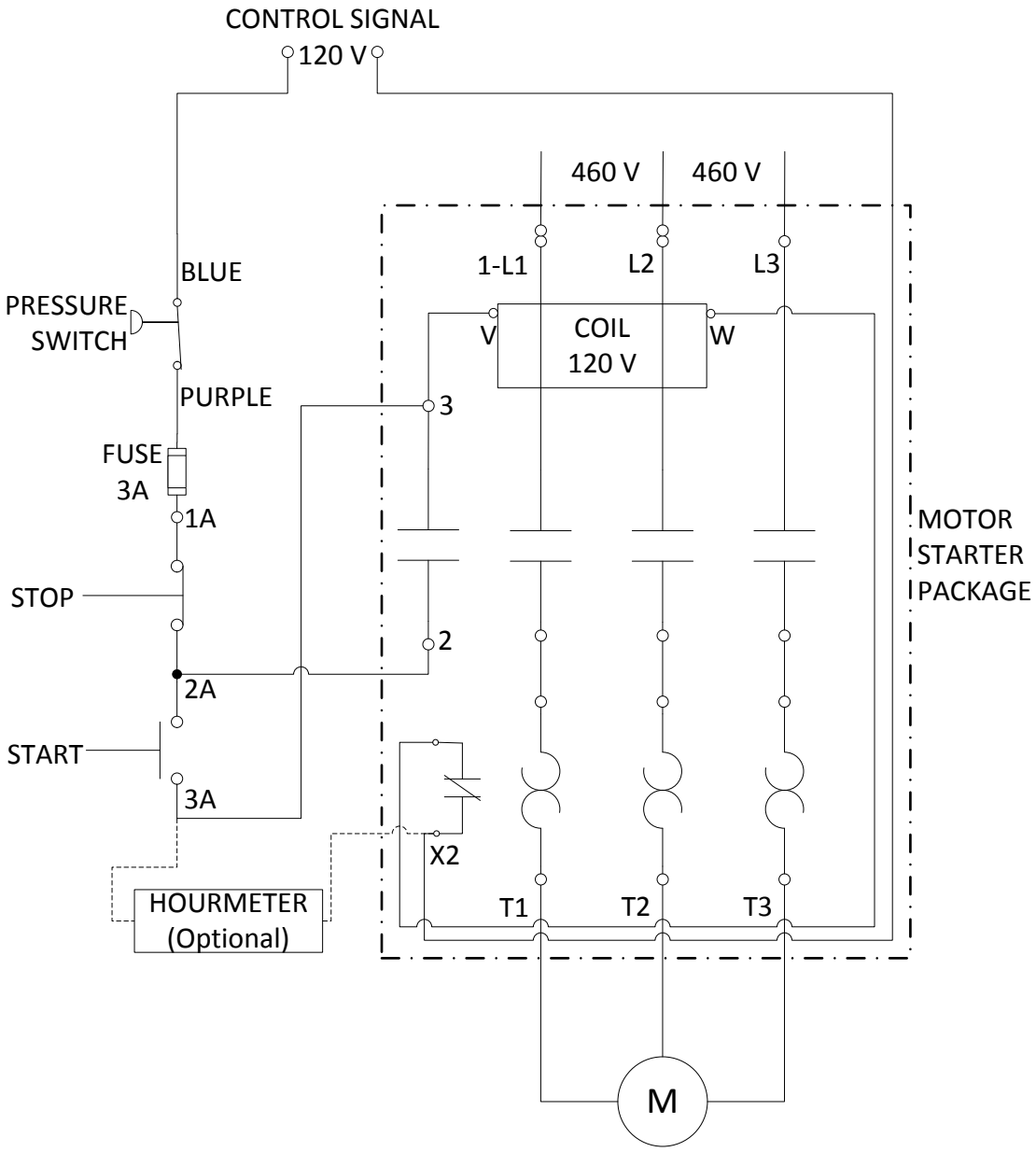


FIGURE 2-2A Electrical Schematic for Starter P/N 776-67-5
Shown Wired for 460 VAC/3 Ø/60 Hz w/ 120 VAC Control Signal

MOTOR SHALL BE WIRED FOR COUNTER-CLOCKWISE ROTATION WHEN VIEWED FROM THE SHIEVE SIDE

OPTIONS:
1) PRESSURE SWITCH – P/N A76-191
2) HOURMETER – P/N 113-10156 (MILITARY UNITS – P/N 113-703)

ONLY INSTALL WIRING AT DASHED LOCATIONS WHEN THAT OPTION IS REQUESTED. JUMPER REQ'D WHEN SOLID OPTIONS NOT REQUESTED.

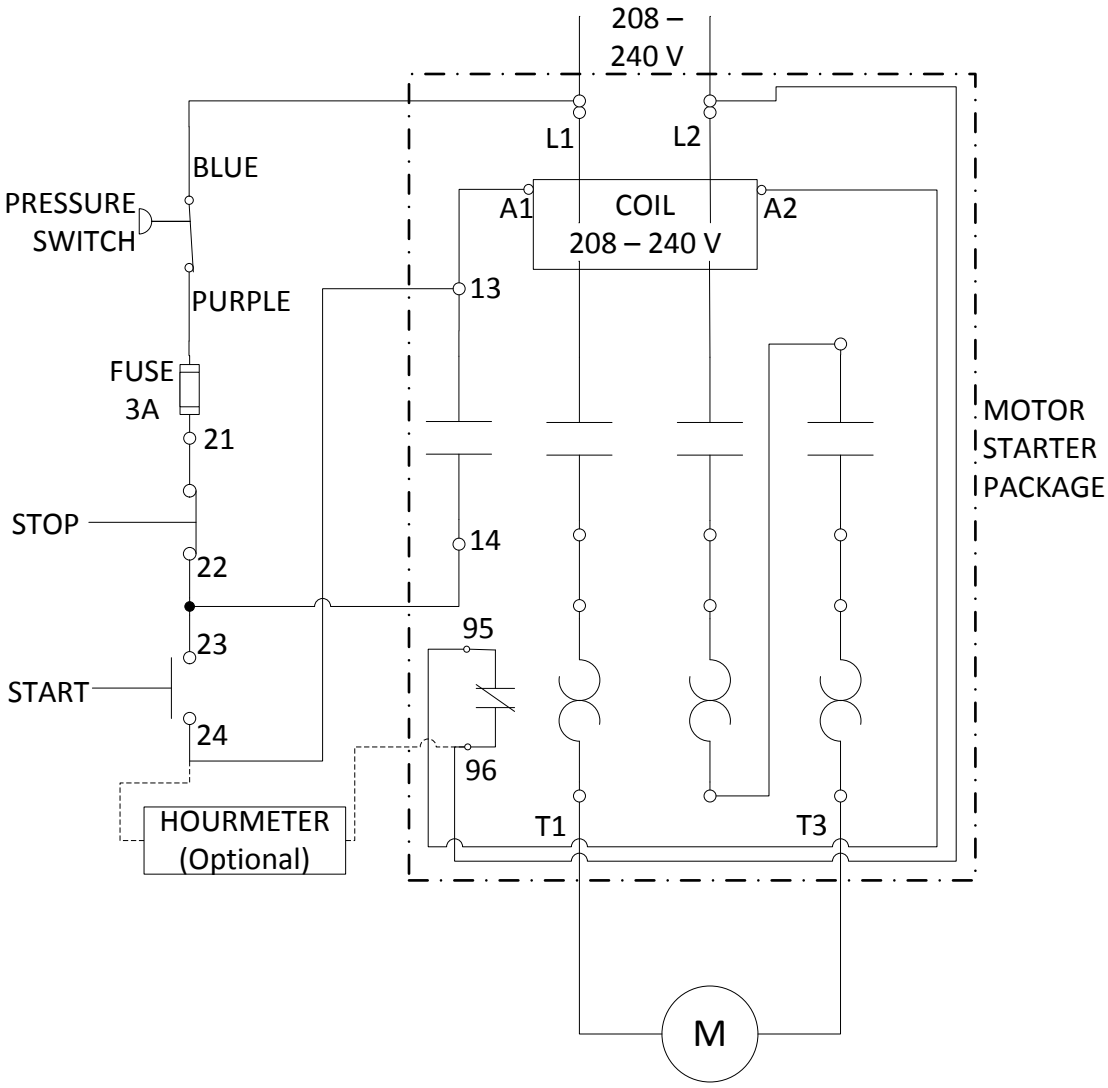


FIGURE 2-2B Electrical Schematic for Starter P/N 776-68
Shown Wired for 208-240 VAC/1 Ø/60 Hz

MOTOR SHALL BE WIRED FOR COUNTER-CLOCKWISE ROTATION WHEN VIEWED FROM THE SHIEVE SIDE

OPTIONS:
1) PRESSURE SWITCH – P/N A76-191
2) HOURMETER – P/N 113-10156

ONLY INSTALL WIRING AT DASHED LOCATIONS WHEN THAT OPTION IS REQUESTED. JUMPER REQ'D WHEN SOLID OPTIONS NOT REQUESTED.

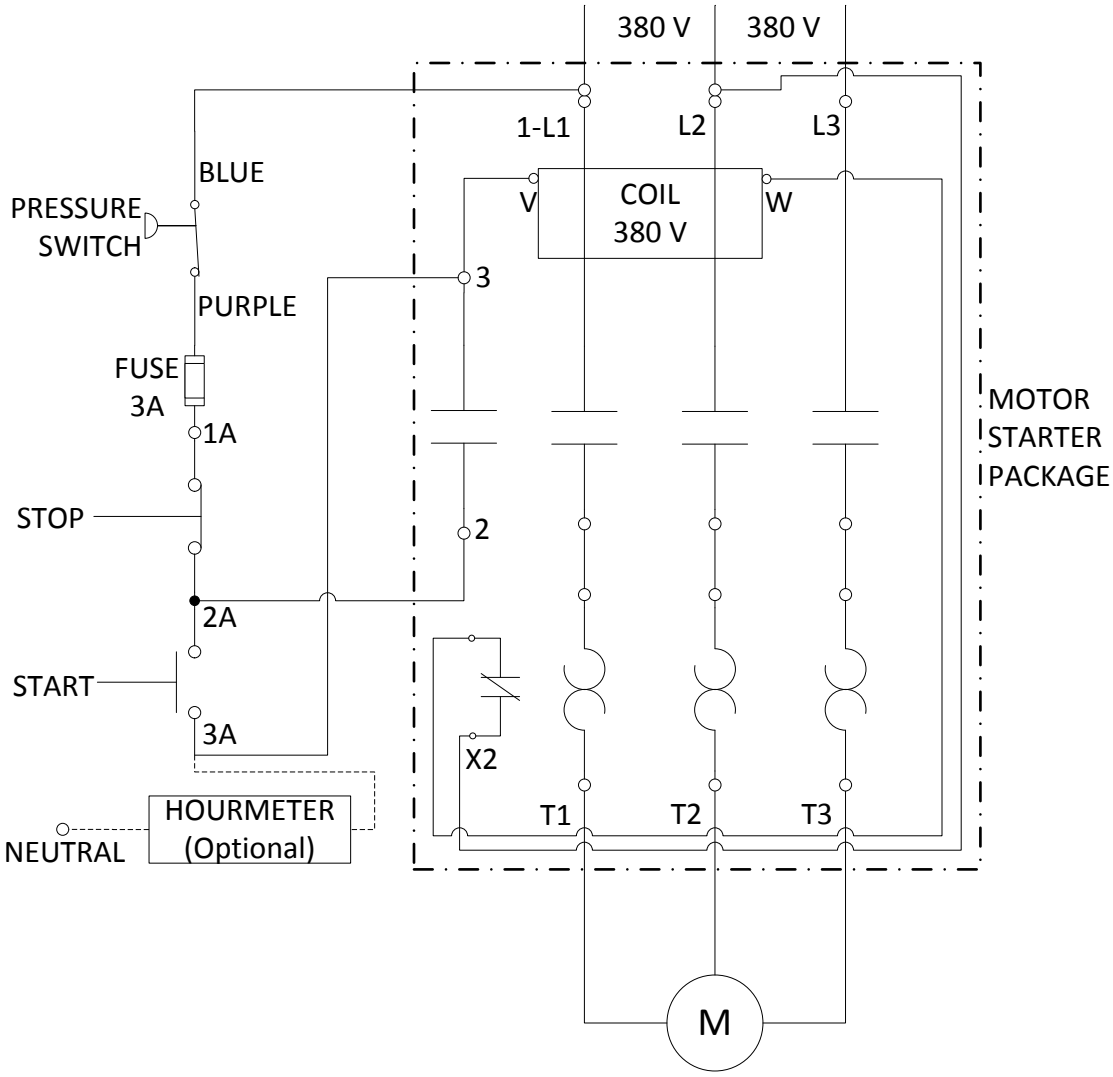


FIGURE 2-2C Electrical Schematic for Starter P/N 776-67-2
Shown Wired for 380 VAC/3 Ø/50 Hz

MOTOR SHALL BE WIRED FOR COUNTER-CLOCKWISE ROTATION WHEN VIEWED FROM THE SHIEVE SIDE

OPTIONS:
1) PRESSURE SWITCH – P/N A76-191
2) HOURMETER – P/N 113-10156

ONLY INSTALL WIRING AT DASHED LOCATIONS WHEN THAT OPTION IS REQUESTED. JUMPER REQ'D WHEN SOLID OPTIONS NOT REQUESTED.

Figure 2-2b gives the recommended wiring instructions for 208/240 volts single phase service.

The motor controller should be mounted as close to the compressor as possible, within sight of the discharge pressure gauge and wired as a permanent installation. Make sure the compressor base plate is properly grounded.

Overload heaters are supplied with the equipment and must be installed in the motor controller. Make sure the overload heaters are the proper rating for the electric power being used (see Electrical Schematic). When the pressure switch is used, it must be wired through the controller to shut the compressor down when the SCUBA tank is full.

CAUTION

Direction of rotation is counterclockwise when viewed from flywheel side of compressor. Make sure that the rotation is correct when wiring the compressor, as serious damage may occur from running the machine in reverse.

2.5 DELETED

2.6 OPERATING PROCEDURES

2.6.1 GENERAL. The following section describes in detail the steps 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.

2.6.2 GASOLINE ENGINE DRIVE OPERATION (Gasoline)

2.6.2.1 (Gasoline) 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 room for

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 close proximity to the exhaust muffler. Open the vent screw located on the 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 exhaust is directed downwind. Keep the suction close to ground level. Hot exhaust gasses rise and this will reduce the chance of contamination should the wind shift.

NOTE: 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.

2.6.2.2 (Gasoline) 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.

2.6.2.3 (Gasoline) STARTING PROCEDURE.

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

b. Close 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 them let the rope rewind slowly into the starter. Pull firmly and rapidly to start the engine. **DO NOT DROP THE ROPE**... hold onto the handle while rewinding to prevent jamming the assembly.

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

2.6.2.4 (Gasoline) COMPRESSING AIR. As soon as the engine starts, the compressor also (Gasoline) starts. 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 will fill the SCUBA tank by using the following procedure:

a. Increase engine speed to maximum by moving the control lever to the full speed condition (marked "H" on some units).

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.

Note that the pressure gauge displays tank pressure. The compressor works against either the tank pressure or the back pressure orifice setting, whichever is greater. The flow to the tank will not start for several seconds until the system reaches the back pressure orifice setting.

2.6.2.5 (Gasoline) 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 an empty

one.

2.6.2.6 (Gasoline) EXCHANGING SCUBA TANKS. The engine should be shut off and the (Gasoline) pressure relieved before changing SCUBA tanks.

2.6.2.7 (Gasoline) SECURING EQUIPMENT. When the compressor is to be stored for more (Gasoline) 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 running the engine on idle until it runs out of gasoline.

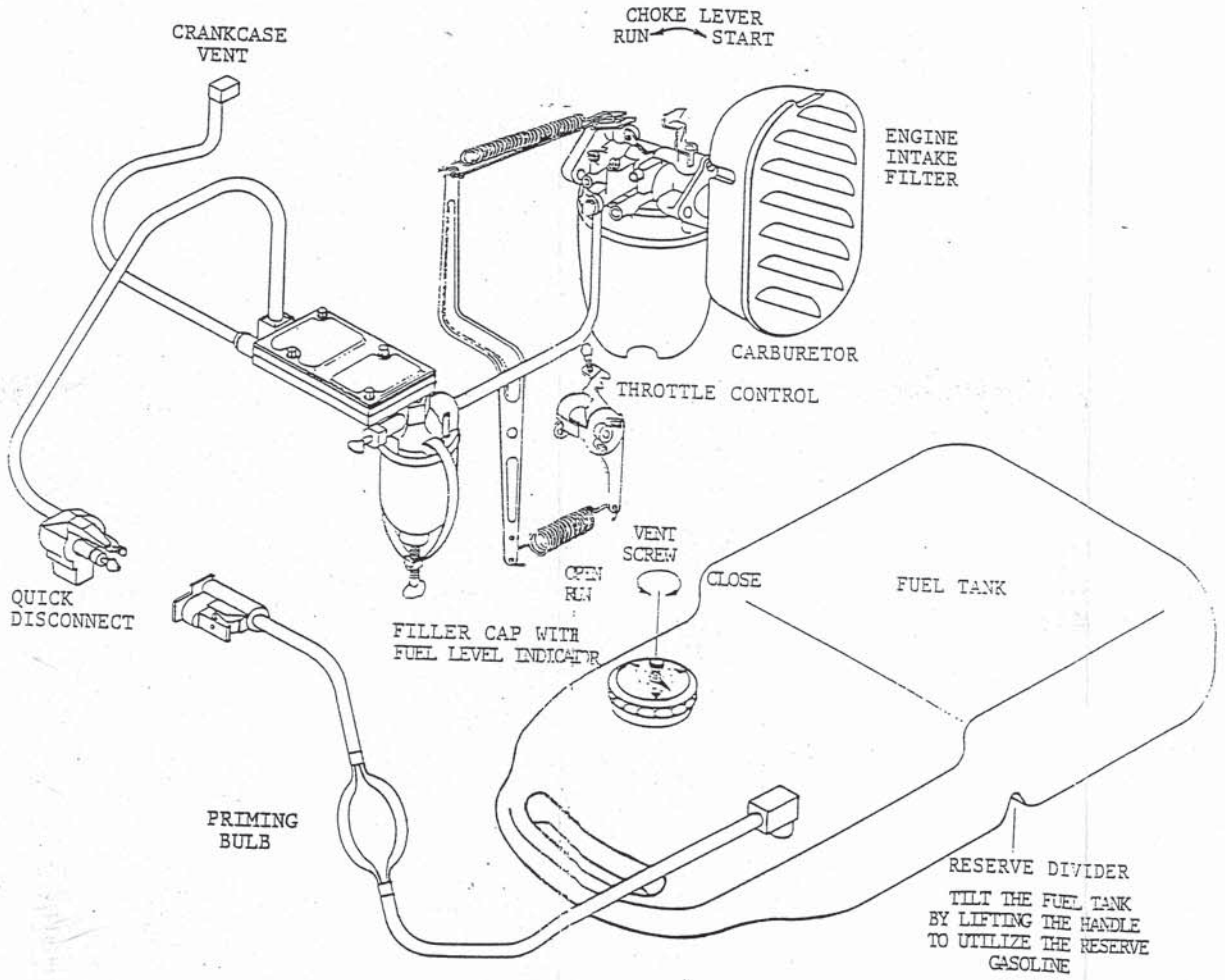
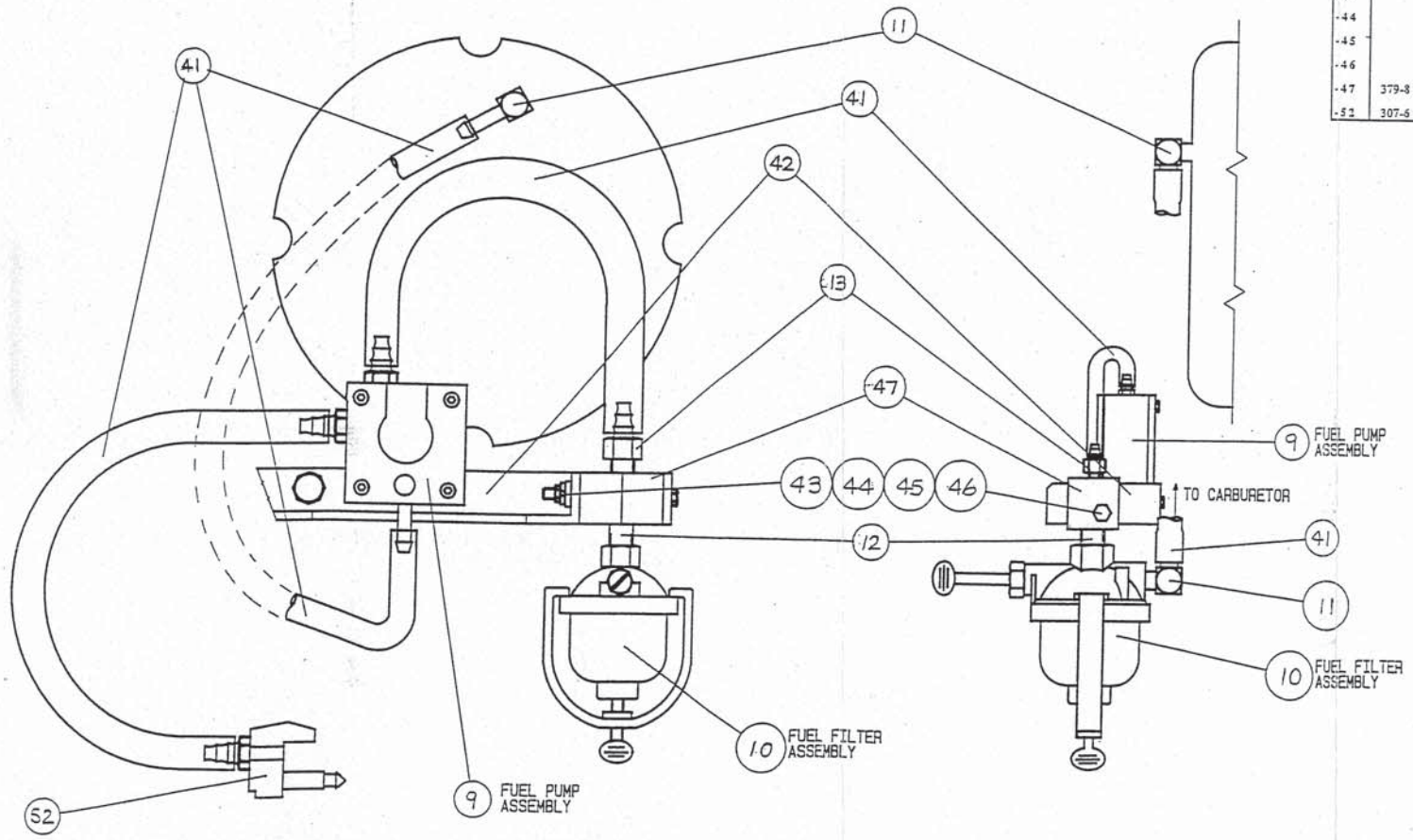


Figure 2-3 Fuel System

Fuel Pump Assembly (Ref. Table 7-3)

No.	Part No.	Qty.	Description
-9	307-14	1	Fuel Pump
-10	77-31	1	Fuel Filter, 1/4 I.D.
-11	54W-1582B	1	90° Elbow
-12	54-310	1	Long Nipple
-13	54-308	1	Hose Barb, Female
-41	73-638	1	Tubing, Reinforced 1/4 I.D. x 25-1/4 Lg. Vinyl
-42	40-B5968	1	Bracket, Fuel Pump Mounting
-43		1	Bolt, Hex.Head, 1/4-20UNC x 1-3/4 Lg, Pl.Std.
-44		1	Lockwasher, 1/4" Pl. Std.
-45		1	Nut, 1/4-20UNC, Pl.Std.
-46		1	Washer, 1/4" Pl. Std.
-47	379-8	1	Clamp
-52	307-6	1	Fuel Connector Body



Dwg. B5977A

Figure 2-3a Fuel Pump Assembly

TABLE 2-1a

GASOLINE ENGINE DRIVE PACKAGE

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.

SHUTDOWN

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.

2.6.3 (Electric) ELECTRIC MOTOR DRIVE OPERATION

2.6.3.1 (Electric) SET-UP. The compressor is designed to be installed permanently but can be used portably wherever there is a sufficient source of electric power.

a. Locate the compressor where there is plenty of air circulation and room for access all around the equipment.

b. The motor controller must be wired to a source of electric power as indicated on the motor nameplate. For dual voltage units, the starter box will be tagged at the factory for the voltage wired when shipped. Consult the motor nameplate for wiring for the alternate voltage. Check that the motor rotation is counterclockwise when viewed from the sheave end of the motor.

c. Thermal overload heaters for the voltage used must be installed in the controller. These are supplied at the time of purchase if the voltage to be used is specified.

d. Make sure the unit is properly grounded.

e. The compressor suction filter should be located in an area with good air circulation. There should be no source of contaminated air near the intake.

NOTE: The length of the suction hose has a marked effect on the flow from the compressor. The hose size should be 3/4 inch inside diameter or larger. In general, the longer the hose the more restriction there is to flow. An exception to this is the tuning effect achieved by a 36 inch length of 3/4 inch hose that will boost output by 10 percent over a compressor using no hose all.

f. 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.)

2.6.3.2 (Electric) PRE-START CHECK. Check the following items prior to starting the compressor.

a. Check that all wiring has been installed in a safe and approved manner.

b. Check the rotation of the compressor by pushing the START button, then immediately push the STOP button. The rotation should be counter-clockwise when viewed from the sheave end of the motor

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

2.6.3.3 (Electric) STARTING PROCEDURE

a. Push the START button. As the compressor starts, the third stage piston might make a knocking noise until sufficient pressure has built up to hold it against the push rod. The compressor will fill the SCUBA tank until the STOP button is pressed or the automatic pressure switch set point is reached.

Note that the pressure gauge displays tank pressure. The compressor works against either the tank pressure or the back pressure orifice setting, whichever is greater. The flow to the tank will not start for several seconds until the system reaches the orifice pressure setting.

TABLE 2-1b

ELECTRIC MOTOR DRIVE PACKAGE

Simplified Start-up Check List

The Operator should be familiar with all 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 installation of the compressor, motor starter and wiring.

2. Make sure all connections are made in the approved manner.

3. Make sure the compressor is depressurized by opening the moisture separator drains. Reclose drains prior to start-up.

4. Push START button. The compressor will now compress air into the SCUBA tank until shut off manually or by the pressure switch.

SHUT DOWN

1. Push the STOP button.

2. Close the valve on the SCUBA tank.

3. Open the 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 can be powered by:

a. 7.5 horsepower gasoline engine.
b. 5.0 horsepower electric motor

At full load and full throttle, the engine is set by the factory to run at 3600 rpm.

A double vee belt arrangement 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 swash 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 swash plate bearing is connected to each piston through rod end bearings. Each piston is specially 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 GENERAL. 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 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 stainless steel 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 filter hose. Second and third stage pressure components are protected by pressure relief valves located on the separators.

The filler yoke includes a pressure gauge and pressure bleed screw. The back pressure orifice, which is mounted on the discharge side of the third stage moisture separator, 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, or fire/rescue air pack side of the orifice and gives a continuous indication of tank pressure.

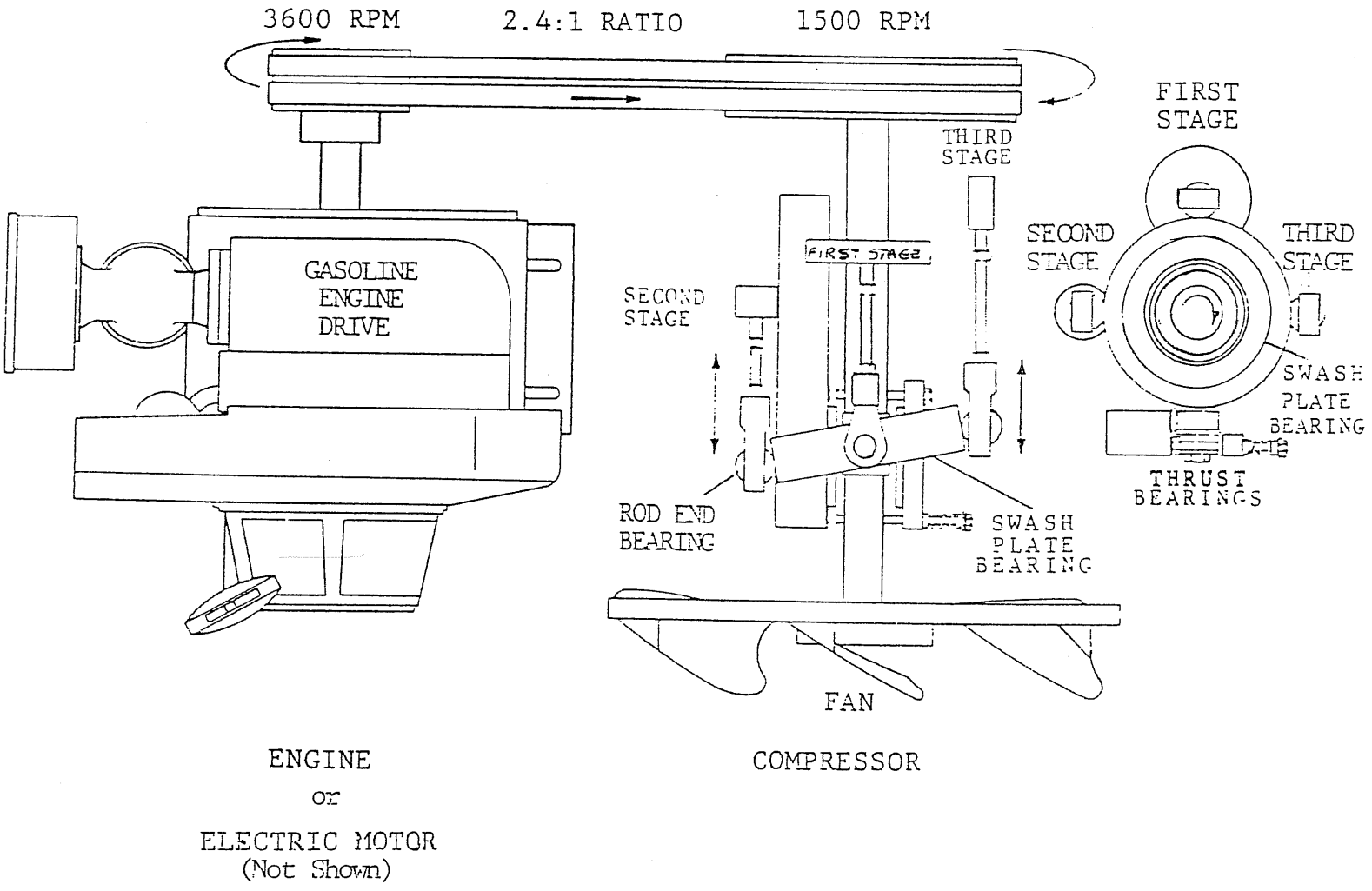


Figure 3-1 Mechanical Drive Schematic

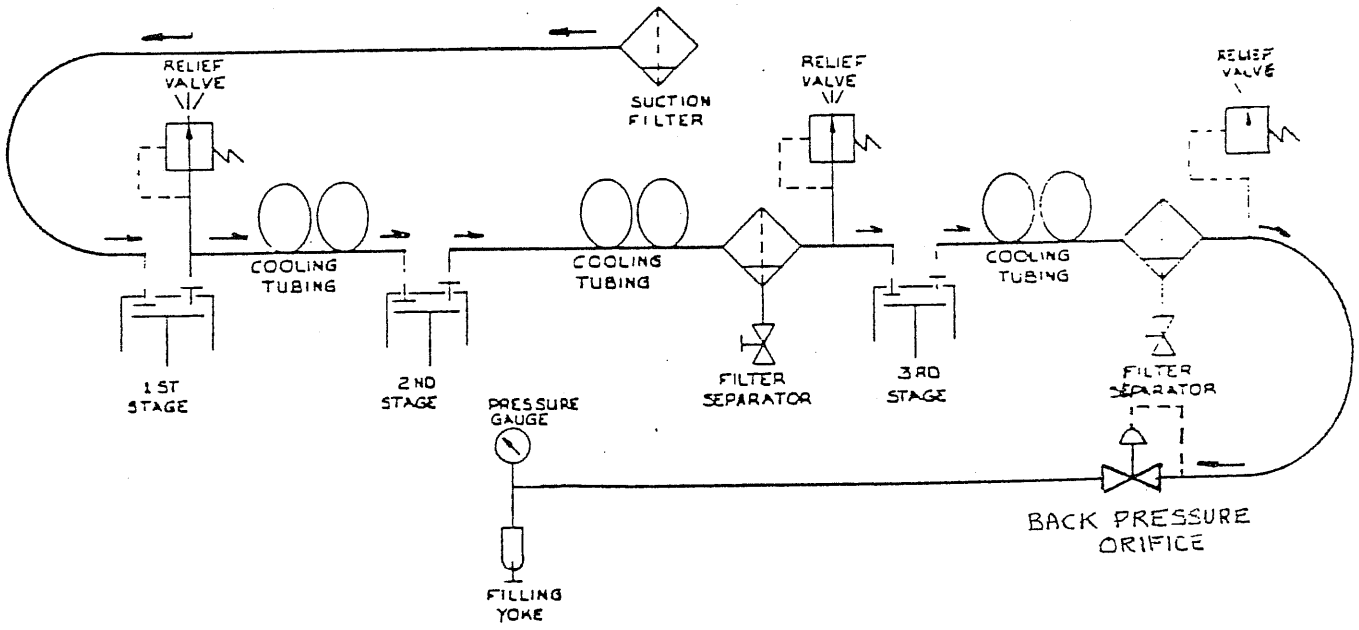


Figure 3-2 Air Flow Diagram

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 on total hours interval or if the equipment has stood idle for a long period of time, a complete maintenance check should be made prior to starting.

TABLE 4-1

Scheduled Maintenance

Service Interval	Item	Action	Para.
25 Hrs.	Engine Oil Level	Clean and top-up as necessary.	4.2
50 Hrs.	Engine Oil	Change	4.3
50 Hrs.	Engine Air Cleaner	Clean	4.4
25 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

*or every two months, whichever comes first.

4.2 (Gasoline) **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.

4.3 (Gasoline) **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.

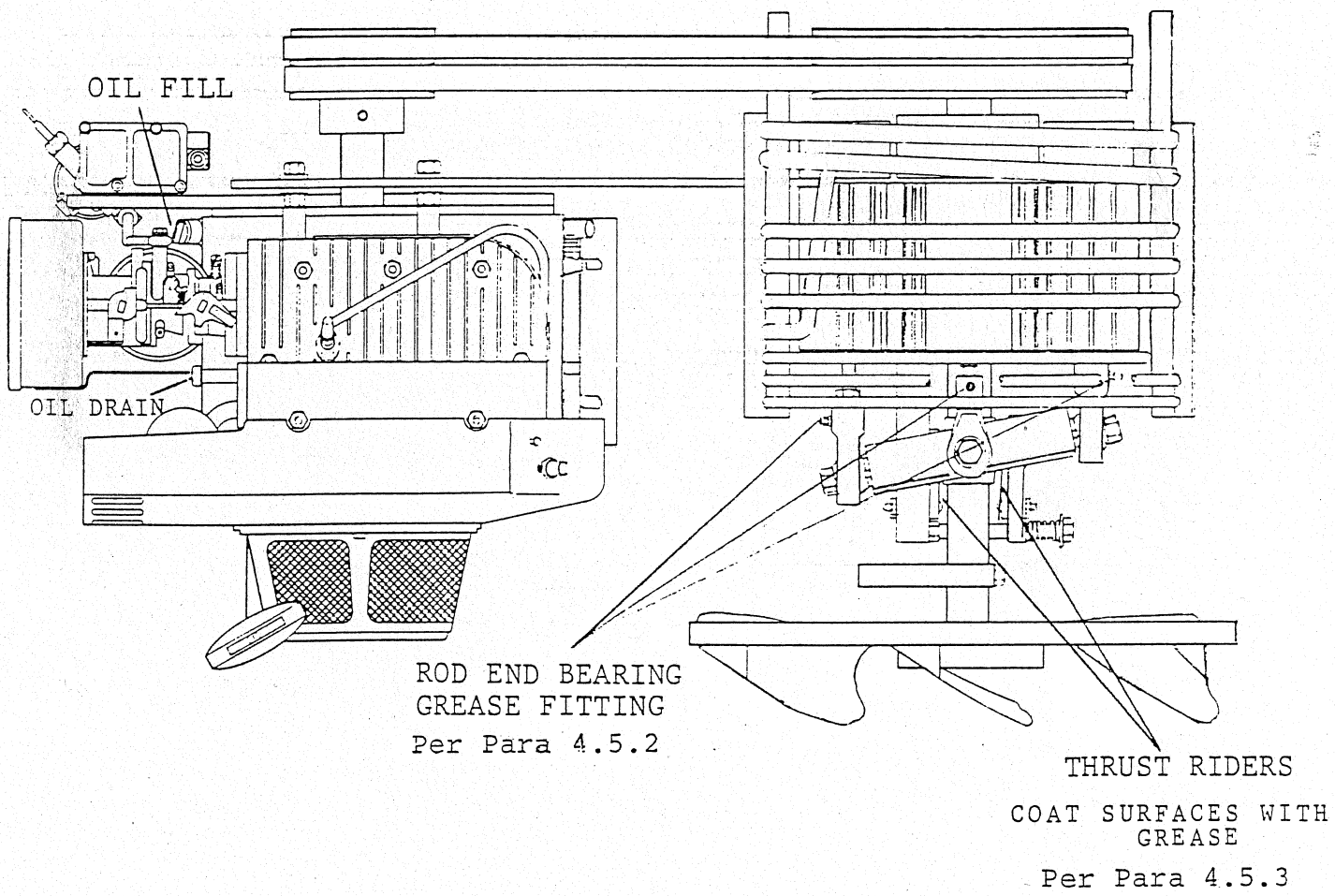


Figure 4-1 Maintenance Points

TABLE 4-2

Oil Grade Selection Chart

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

4.4 (Gasoline) **ENGINE AIR CLEANER.** The engine is equipped with an oiled, filter type air cleaner that **should be serviced at least every 50 hours of operatio**n

4.4.1 (Gasoline) 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 (Gasoline) REASSEMBLY. Mount element & retainer with arrow up, and cover with latch at bottom. See Figure 4-2.

4.5 **ROD END BEARINGS AND THRUST RIDERS.** The rod end bearings and thrust rider must be greased every 25 hours of operation or every two months (whichever comes first) according to the following procedure.

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. Lubricate each rod end bearing 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. **NOTE:** This is a special TFE resin lubricant which was chosen after extensive testing by RIX. Use of other lubricant can lead to premature rod-end bearing failure.

WARNING

This grease is not suitable when compressing oxygen, oxygen enriched air, or oxygen enriched gases.

4.5.3 THRUST RIDER. The track beneath the swash 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.

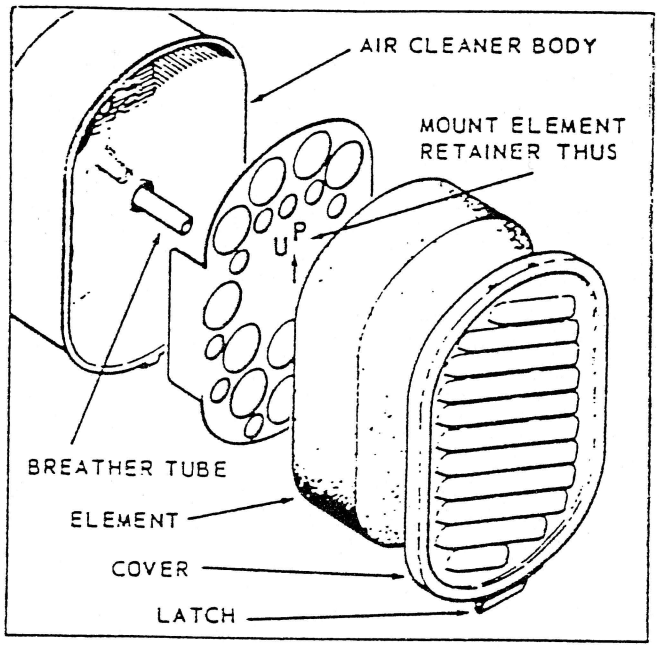


Figure 4-2 Engine Air Cleaner

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 shrouds 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 is normal when the compressor is stopped. 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" deflection maximum at the spring is permitted before servicing. See Figure 6-3 & 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 swash plate 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 swash plate 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 slinging 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 (Gasoline) **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.

CHAPTER 5

TROUBLESHOOTING

5.1 **GENERAL**. Table 5-1 is a troubleshooting 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(s) furnished with this manual should be used when problems can be isolated to the gasoline or diesel engine. Where a problem might arise which 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.
Compressor runs but pumps slowly or not at all.	Dirty inlet filter element. Kink in inlet hose.	Clean or replace. Check and straighten.	
	Leaks in lines and fittings or seals (o-rings and gaskets).	Pressurize system and check for leaks with soap solution. Repair as needed.	4.6.1
	Air blowing by piston rings.	Isolate faulty piston by pressurizing the system and by listening for leakage. Replace rings.	6.4.1 6.4.2
	Faulty valve or gasket in the first stage.	Inspect first stage suction and discharge valve, gasket and seats. Repair or replace as necessary	6.4.4
	Excessive first stage piston clearance.	Adjust.	6.4.1
	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.	6.4.4
	2nd or 3rd stage inlet or discharge valve failure.	Remove 2nd or 3rd stage head, clean or repair valves as required.	
Excessive vibration.	Broken fan.	Replace.	
	Missing or misaligned counterweight.	Replace or correct.	
	Use of other than specified reciprocating parts.	Replace with correct parts.	
	Loose nuts or bolts on compressor or motor mount.	Tighten.	
	Wrong speed (gasoline)	Adjust compressor speed to 1500 RPM.	
	Wrong direction of rotation (Electric)	Correct direction by rewiring.	

TABLE 5-1

Compressor Troubleshooting (Continued)

TROUBLE	PROBABLE CAUSE	REMEDY	REF.
Overheating.	Loose fan.	Tighten.	
	Dirty inlet screen on shroud.	Clean.	
	Lack of grease on rod bearings.	Relubricate.	4.5.2
	Dirty fins on cylinders or dirty interstage cooling tubing.	Clean.	6.3.3
	Inadequate ventilation.		
Driver 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
	Incorrect belt tension.	Correct.	6.2.1
2nd stage relief valve relieves.	Defective relief valve.	Check, clean or replace.	
	3rd stage inlet or outlet valve failure.	Remove 3rd stage head, clean or repair valves as required.	6.4.4
3rd stage relief valve relieves.	Defective relief valve.	Check, clean or replace.	
	Discharge gauge inaccurate and actual pressure is excessive.	Calibrate gauge.	
	Back pressure orifice clogged.	Remove, and reinstall opposite end and restart.	
Excessive noise.	Loose nuts and bolts.	Tighten.	
	Worn 3rd stage piston.	Check condition of rings and piston. Replace worn parts. Check fit on ball of follower, replace piston.	6.4.2
	Worn rod bearing.	Replace.	6.4.3
	Loose bearing mount.	Tighten bearing nuts to 200 ft. lbs. torque.	
	Worn swash 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

TABLE 5-1

Compressor Troubleshooting (Continued)

TROUBLE	PROBABLE CAUSE	REMEDY	REF.
Excessive Noise	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
	Loose drive belt. Improperly installed shroud.	Tighten. Reinstall.	6.2.1
	Broken fan.	Replace.	
	Loose beltguard.	Tighten.	6.2.1

CHAPTER 6

CORRECTIVE MAINTENANCE

6.1 INTRODUCTION

This chapter deals with corrective maintenance of the compressor. The servicing instructions for the gasoline engine will be found in the engine repair 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 1/4 inch deflection per each belt 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. (When replacing one belt, it is advisable to replace the other one at the same time.)

Adjust the belts 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. For electric drives, loosen the four motor mounting bolts and screw the slide base adjustment bolt to tighten or loosen the belt.

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.

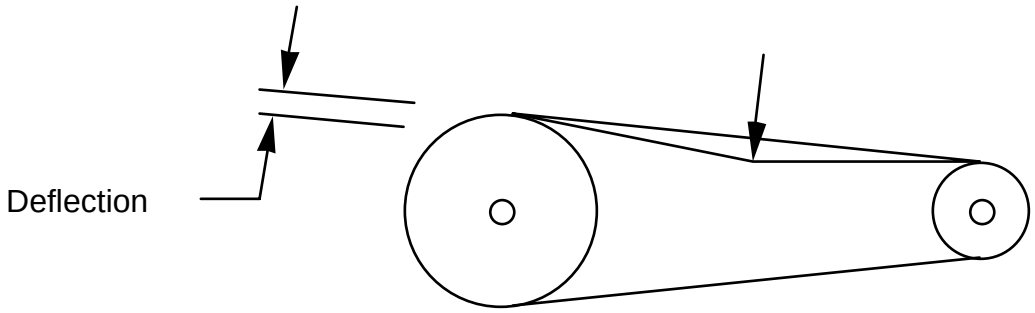


Figure 6-1 Tension Check

Figure 6-2 Alignment Check

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 swash plate bearings. This prevents the outer race of the swash 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 closet 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", 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 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 (Gasoline) 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.

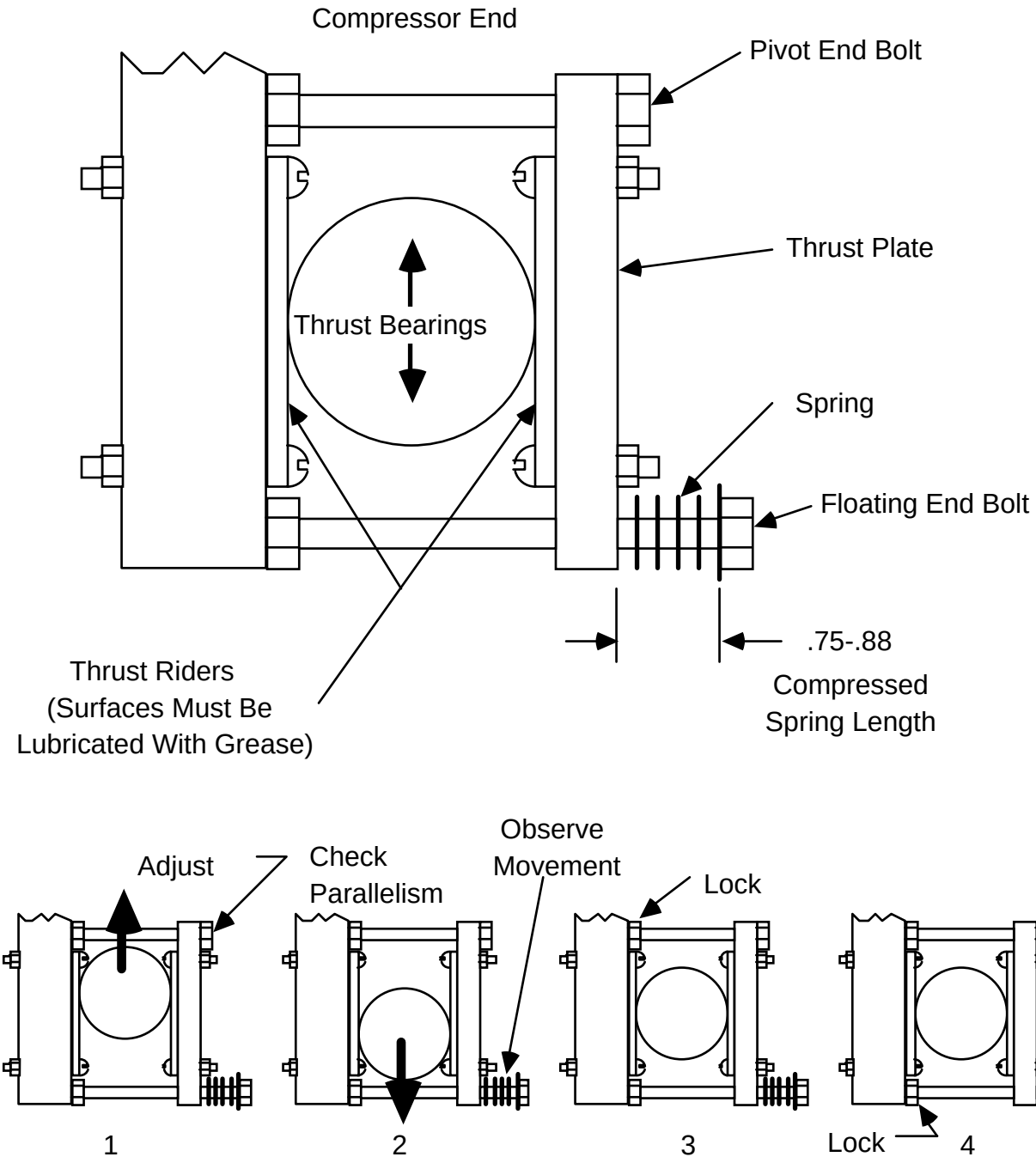
Speed should be checked using a remote tachometer and it should never exceed 3600 RPM. For further information on throttle adjustment, consult the engine repair manual.

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 Dow Corning High Vacuum Grease, RIX P/N 45-403 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.



1. Loosen all nuts. Adjust bolt as shown, keeping the thrust riders as parallel as possible.
2. Rotate compressor to check for movement. When thrust riders are parallel there should be no movement. Repeat step 1 if necessary.
3. Tighten nut as shown to lock the adjustment. Then recheck and readjust if necessary.
4. Adjust spring length and tighten nut as shown.

Figure 6-3 Thrust Plate Alignment

6.3.3 CLEANING PARTS. Parts that come in contact with the air stream should be cleaned using 111 Trichloroethane (SPRAYON Hi-Tech 00747 Safety Solvent and Degreaser (Ref.) or equal), 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 REPAIR OF ASSEMBLIES AND SUB-ASSEMBLIES

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 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 end of the spiral taper to a sharp edge. The ring should be handled carefully to avoid damaging this edge.

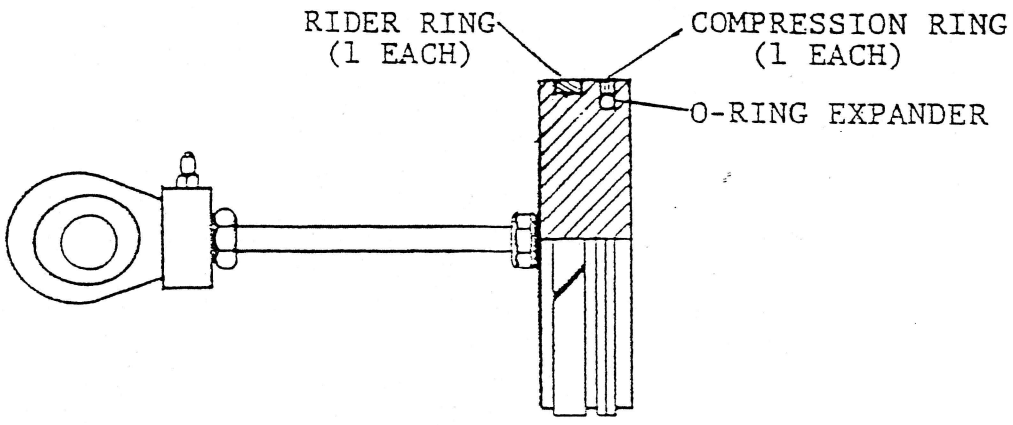
c. Inspect the rider ring for wear. With the compression ring removed, insert the piston in the cylinder. The rider ring alone should give a slight drag to the back and forth motion of the piston. If it is loose in the cylinder, the rider ring and rubber expander ring should be replaced.

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 or rocking motion at the rod ends.

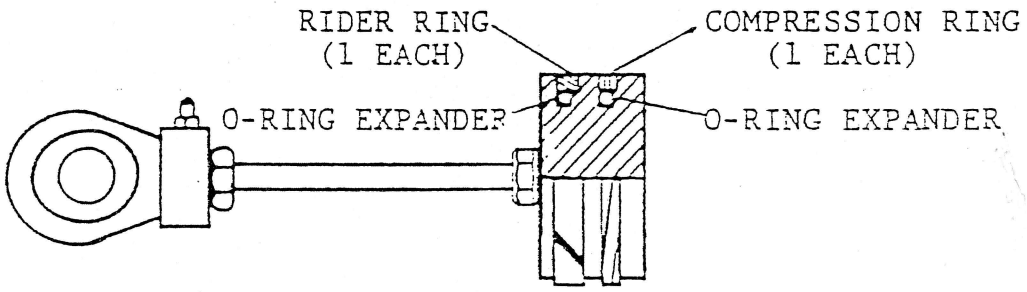
e. Rotate the compressor by hand to make sure there is no binding. Adjust the piston/cylinder head clearance as described in 6.4.3 only if necessary. Lubricate the rod end bearing.

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

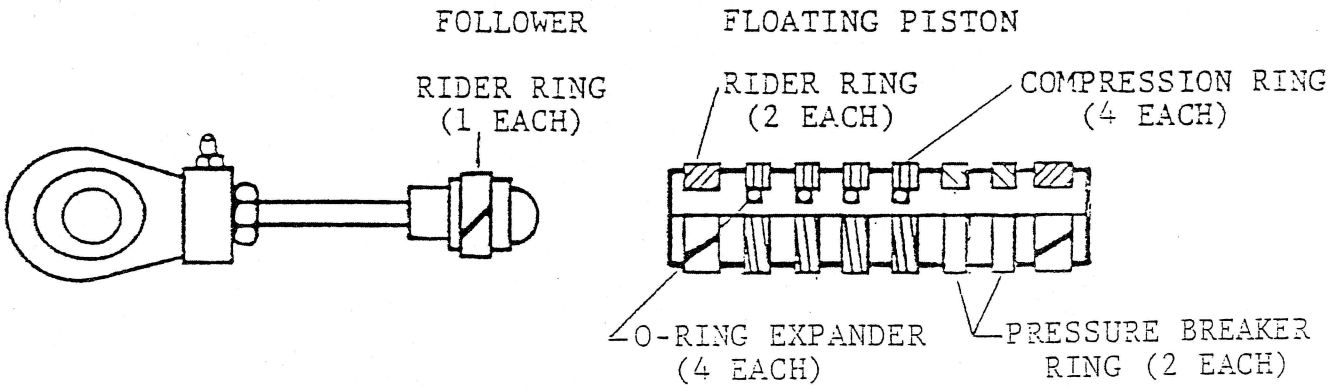
a. Disassemble by removing the rod end bolt. Withdraw the rod from the back of the cylinder. The floating piston is separate from the rod and will remain in the cylinder. This can be withdrawn by removing the cylinder head and pushing out with a pencil. If shop air is available, instead of removing cylinder head, open the second stage moisture separator drain valve and while holding a rag or glove over the third stage cylinder, lightly pressurize the moisture separator and the piston will shoot out of the cylinder into the rag.



FIRST STAGE



SECOND STAGE



THIRD STAGE

Figure 6-4 Piston Details

b. Inspect the four compression rings and 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 tapered end of the storage tube. Slide the piston through the tube form the opposite end until the empty groove lines up and the ring can be rolled in.

CAUTION

The piston ring is a tapered 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 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 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 clearance or play at the rod end ball. When the play exceeds .030 inch, the rod end should be replaced.

A rod end bearing can fail very rapidly if the spherical steel ball starts to wear. Maximum wear always occurs on the side of the ball facing the cylinder. Rod end bearing life can be increased by periodically (every 100 hours) removing the hold down bolt and rotating the ball to expose a fresh surface to face the cylinders.

If it becomes evident that a rod end bearing is about to fail (looseness of bearing or excessive noise while running), it should be replaced immediately. Severe damage to the piston rod and compressor may result if the rod end is allowed to continue to run in this condition.

a. The rod may be disassembled as shown in Figure 7-1d. The connecting rod and adapter are assembled by the factory using a thread locking sealant, 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 a .020 clearance.

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

6.4.4 CYLINDER HEADS. Servicing the cylinder heads is straightforward, using the exploded details of Figure 7-1c. First remove compressor drive belts and sheave. See Para. 6.4.6. 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.

Pick out the o-rings, valve stop, and inlet reed first.

Valve seats may be removed from the cylinder heads by removing the plug on top of the head (2nd and 3rd stages only) and installing a 7/16-20UNC bolt into the hole and driving the seat out. The first stage valve assembly drops out by slapping the head against a soft block of wood.
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.

6.4.5 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.

6.4.6 DRIVE BELTS AND SHEAVE. The compressor sheaves must be removed in order to service the heads. To remove, loosen mounting bolts for the electric motor (or gas engine) and slide motor toward compressor to relieve belt tension. Remove belts. Remove two hex screws from tapered bushing in sheave. Reinstall screws in jack screw holes and tighten. This will push the sheave in releasing the squeeze of the bushing on the shaft. The sheave and bushing will now slide off of the shaft.

Re-install in reverse order. Bushing face should be flush with end of shaft. Re-install belts and tighten per Para. 6.2.1.

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
7-1-55F	3rd Stage Pressure Breaker Rings	.125 Radial Thickness	Deterioration of Ring Gap
7-1-55B	3rd Stage Rider	.055 Radial Thickness	.003 Radial Wear
7-1-55A	3rd Stage Piston	.558 Outside Diameter	.003 Diameter Wear
7-1-102	Thrust Rider	.128 Thick	.005 Wear
7-1-20	Thrust Bearing	2.047 Diameter	.005 Wear
7-1-51A	Rod End Bearings	N/A	.030 Looseness of Ball in Joint
7-1-60A	Rod End Bearings	N/A	.030 Looseness of Ball in Joint
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	Bearings Nuts	Fan End	200 Ft. Lbs.
		Sheave End	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 Stage Socket Head Bolts, 5/16-24NF x 2-1/4"		15 Ft. Lbs.
7-1-117	2nd Stage Socket Head Bolts, 5/16-24NF x 2-1/2"		15 Ft. Lbs.
7-1-118	1st Stage Socket 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 SA-6B Compressors** identified by the serial numbers shown on the Serial Number Page of this manual. Column 1 gives the figure and index number. The part number is listed in Column 2, followed by a quantity and description in Columns 3 and 4. All are supplied through **RIX Industries, Code 28953, 4900 Industrial Way, Benicia, CA 94510; Telephone 707-747-5900, FAX 707-747-9200.**

TABLE 7-1

Figure & Index No.		Part No.	Qty.	Description
		Omitted items not included in this Assembly		
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, 5/16" Sq. x 1 3/4" Lg.
	-6	181-302	2	Washer, Bearing
	-7	181-303	2	Nut, Bearing
	-8	27-C1281	1	Shaft
	-9	42-107	1	Fan
	-10	32-4615	1	Bolt, Hex Hd., 3/8-24NF x 1 1/4" Lg.
	-11	135-A4218-1	2	Disc, Fan Mounting
	-12	20-625	1	Flat Washer 3/8 S/S SAE
	-13	44-B2113	1	Counterweight
	-14	32-4509	2	Bolt, Hex Hd., 1/4-28NF x 1 1/2" Lg.
	-15	32-4616	4	Bolt, Hex Hd., 1/4-28NF x 2" Lg.
	-16	53-4101	4	Nut, 1/4-28NF
	-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

TABLE 7-1 (Continued)

Figure & Index No.		Part No.	Qty.	Description
	-22	181-A4124	2	Bearing
	-23	66-A3290	1	Spacer, Bearing
7-1	**-25**	32-8064	4	Bolt, Hex Hd., 1/2-20NF x 4" Lg.
	-26	A148-C1374	1	Shroud Assembly
	-27	106-16	2	Set Screw, Half Dog Pt., 1/4-20NF x 3/4" Lg.
	-28	53-4098	4	Nut, 1/4-20NC
	-29	32-4619	2	Bolt, Hex Hd., 1/4-28NF x 1/2" Lg.
	-30	24-506	1	Spring, Wave Washer
	-31	31-B2114	1	Bearing Retainer
	-32	36-B5132	1	Sheave
	32.1	11-100TL1610	1	Bushing, Taperlock
	-33	91-A4423-1	1	Key, 1/4" Sq. x 1 3/4" Lg.
	-34	2-B2783	1	Head, 1st Stage
	-35	15-A3718	1	Valve Seat, 1st Stage
	-36	15-A3719	1	Valve, 1st Stage Inlet
	-37	34-607	2	Cap Screw
	-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-C1791-24B	1	Ring, Compression, 1st Stage
	-44	123-230-5	1	Ring, Expansion, 1st Stage
	-45	18-B2117-1B	1	Ring, Rider, 1st Stage
	-47	8-B2118	1	Piston, 1st Stage
	-48	1-A3300-1	1	Cylinder, 1st Stage
	-49	53-4103	7	Nut, Hex 3/8-24NF
	-50	3-A3896-1	Ref.	Rod, 1st Stage (Part of Item 48)
	-51	A7-A3302-1	2	Connecting Rod Assembly, 1st & 2nd Stages (Incls. A-E)
		7-A4359	1	(A) Connecting Rod, End Bearing
		7-A3304-1	1	(B) Rod Adapter
		66-A3305	1	(C) Spacer
		34-A4409	1	(D) Cap Screw
		954-9	1	(E) Grease Fitting

TABLE 7-1 (Continued)

Figure & Index No.		Part No.	Qty.	Description
	-52	317-A3306	6	Guide Pin
	-53	34-A3307	3	Bolt, Rod End
7-1	**-54**	20-A3308	3	Washer, Rod End
	-55	A8-A3309-1	1	Piston Assembly, 3rd Stage (Incls. A-F)
		8-B2116	1	(A) Piston
		18-B2117-3P	2	(B) Rider Ring
		18-C1791-4.5P	4	(C) Compression Ring
		123-012-5	4	(D) Expander
		31-A3310	1	(E) Piston Storage Tube
		18-C1603-4.5P	2	(F) Pressure Breaker Ring
	-56	18-B2117-3P	1	Rider Ring, Piston Follower
	-57.1	30-400	1	Ball, 3/8" Dia.
	-58	1-A3312	1	Cylinder, 3rd Stage
	-59	3-B4103	1	Rod Follower, 3rd Stage
	-60	A7-A3302-2	1	Rod Assembly, 3rd Stage (Incls. A-E)
		7-A4359	1	(A) Connecting Rod, End Bearing
		7-A3304-2	1	(B) Rod Adapter
		66-A3305	1	(C) Spacer
		34-A4409	1	(D) Cap Screw
		954-9	1	(E) Grease Fitting
	-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/Disch.
	-69	17-758	4	Pin
	-71	54P-4P50NSS	2	Hex Head Plug 7/16-20NF
	-71.1	123-904-3	2	O-ring
	-72	15-A4193	1	Valve Stop, 2nd Stage Inlet
	-73	2-B4359	1	Head, 2nd Stage

TABLE 7-1 (Continued)

Figure & Index No.	Part No.	Qty.	Description
-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/Discharge
7-1 **-78**	15-B3570	1	Valve Seat, 3rd Stage
-81	2-B4290	1	Head, 3rd Stage
-86	123-018-5-90	3	O-ring, 3rd Stage Head
-87	54-376	2	45° Elbow
-88	54P-6FBUSS	1	Male Connector
-92	54P-6CBUSS	1	Male Elbow
-93	116-432	1	Back Pressure Valve
-93.1	62-436	1	Label, B. P. Valve
-94	54P-4FBUSS	1	Male Connector
-95	34-A4214	1	Hex Hd. Bolt - 3 1/2” Lg.
-96	32-4505	2	Cap Screw, Round Hd., #10-32NF x 1" Lg.
-97	20-4526	4	Flat Washer, #10
-98	53-1003	4	Nut, Hex #10-32NF
-99	34-A4214-1	1	Hex Hd. Bolt - 4 1/2" Lg.
-99.1	20-625	1	Flat Washer, 3/8", Narrow, .812 O.D.
-100	24-31	1	Spring, 1" Lg.
-101	40-A3895	1	Plate, Thrust
-102	40-A3322	2	Rider, Thrust
-103	45-110	1	Grease (Shipped loose)
-104	32-1000	2	Cap Screw, Round Hd., #10-32NF x 1 1/2" Lg.
-105	3-A3896-2	1	Rod, 2nd Stage
-106	40-B2552-1	1	Bar, Thrust
-107	32-8065	1	Bolt, Hex Hd., 5/16-24NF x 1 3/4" Lg
-108	515-343	1	Relief Valve, 1st Stage Set @ 150 psig
-109	34-440	2	Shoulder Bolt, Soc. Hd.
-110	40-B4362	1	Tubing Block
-111	32-4515	4	Cap Screw, Flat Soc. Hd., 5/16-18NC x 1 1/2" Lg.
-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.

TABLE 7-1 (Continued)

Figure & Index No.	Part No.	Qty.	Description
-116	32-1178	2	Bolt, Soc. Hd., 5/16-24NF x 2 1/4" Lg.
-116.1	20-657	4	AN Washer, 5/16 S/S
-117	32-1177	2	Bolt, Soc. Hd., 5/16-24NF x 2 1/2" Lg.
7-1 **-118**	32-1176	2	Bolt, Soc. Hd., 1/4-28NF x 2" Lg.
-119	20-669	2	AN Washer, 1/4" S/S
-120	40-B4360	1	Tubing Block
-121	40-A4343	1	Tubing Block
-122	84-100	2	Grommet
-123	32-4714	2	Cap Screw, Flat Soc. Hd., #10-32NF x 3/4" Lg.
-124	53-4087	2	Nut, Self Locking - #10-32NF
-125	66-A3945	2	Spacer
-128	62-400-2	1	Nameplate
-129	12-4518	4	Drive Rivet, Size 0 x 3/16
-130	20-627	2	Flat Washer, 5/16" S/S
-131	316-100	4	Tape, Insulating, 10" Lg.

MOISTURE SEPARATORS

Figure & Index No.	Part No.	Qty.	Description
7-2	**A208-A7114**	**1**	**Separator Assembly**, 2nd Stage (Incls. 1-10)
-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	54P-1/4MMSB	1	Tee, Male Branch
-8	515-269	1	Relief Valve, Set @ 1000 psi
-9	54P-6CBUSS	1	Male Elbow
-10	54P-6FBUSS	1	Male Connector
7-2	**A208-A7114-4**	**1**	**Separator Assembly**, 3rd Stage (Incls. 1-13)
-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	54P-1/4MMSSS	1	Tee, Male Branch
-8	54P-44CTXSS	1	Male Elbow
-9	54P-44FBUSS	1	Male Connector
-10	54P-1/4HHPSS	1	Hex Plug
-11	54P-1/4MMOSS	1	Female Tee
-12	54P-1/4FFSS	1	Nipple
-13	62-434	1	Label, Notice

TABLE 7-2a
RELIEF VALVE, 3RD STAGE

Figure & Index No.	Part No.	Qty.	Description
7-3** **-2***	515-907-1	1	Relief Valve, Set @ 3600 psi

* For 4000 psi, Use P/N 515-907-4 Set @ 4500 psi.
* For 4500 psi, Use P/N 515-907-3 Set @ 5000 psi.
** Relief Valve is in same location on electric motor options

GASOLINE ENGINE DRIVE

Figure & Index No.	Part No.	Qty.	Description
7-3 **-1**	Ref.	1	Model SA-6 Compressor & Separators
-3	32-1015	4	Hex Head Bolt, 1/4-28NF x 1 1/4"
-4	20-1003	5	Flat Washer, 1/4 Pl. Stl.
-5	20-627	6	Washer
-6	20-1016	2	Lockwasher, 5/16 Pl. Stl.
-7	32-1126	4	Hex Head Bolt, 3/8-16NC x 3/4" Lg. Gr. 5 Pl. Stl.
-8	20-402	6	Lockwasher, 3/8 Pl. Stl.
-9	REMOVED	-	
-10	REMOVED	-	
-11	REMOVED	-	
-12	REMOVED	-	
-13	REMOVED	-	
-14	307-A7676	1	Engine, Honda, 8 HP
-15	REMOVED	-	
-16	32-1126	1	Bolt, Hex. Head, 3/8-16UNC x 3/4" Lg. Stl.
-17	73-423	15	Intake Hose
-18	A77-623	1	Inlet Filter
-19	40-A4355	1	Linkage Bar
-20	54P-125HBL128B	1	Male Barbed Insert
-21	79-4627	2	Hose Clamp, 1" O.D. Hose Stl.
-22	41-3VX425-1	2	V-Belt
-23	36-2F3V300-1.00	1	Sheave
-24	156-C1373	1	Beltguard
-25	40-A3985	7	Mounting Foot
-26	A554-541	1	Scuba Fill Yoke Assembly (Incls. A-B)
See Pg. 7-9 for Options	54-612	1	(A) Scuba Fill Yoke
	54P-1/4FFS	1	(B) Hex Nipple
-27	116-432	1	Pressure Regulator
-28	62-436	1	Label, B.P. Regulator
-29	60-295	1	Gauge, 6000 psi, 1/4 NPT
-30	32-1118	2	Soc. Head Cap Screw, 5/16-18NC x 1" Lg. Pl. Stl.

GASOLINE ENGINE DRIVE (Continued)

Figure & Index No.		Part No.	Qty.	Description
7-3	**-31**	A73-433-3	1	Fill Hose Assembly, 3'
	-32	91-A4423-1	1	Key, 1/4 Sq. x 1 3/4" Lg. Pl. Stl.
	-33	REMOVED	-	
	-34	REMOVED	-	
	-35	54P-125HBL54	1	Male Barbed Insert
	-36	32-8066	2	Hex Head Bolt, 5/16-24NF x 2 3/4" Lg. Gr. 5 Pl. Stl.
	-37	53-45	2	Hex Nut, 5/16-24NF Pl. Stl.
	-38	20-1010	4	Flat Washer, 1/2 Pl. Stl.
	-39	34-439	2	U-Bolt
	-40	553-4	4	Nut, Self Locking
	-41	73-638	1	Tubing, Reinforced 1/4 I.D. x 25-1/4 Lg. Vinyl
	-42	40-B5968	1	Bracket, Fuel Pump Mounting
	-43	32-4130	1	Bolt, Hex.Head, 1/4-20UNC x 1-3/4 Lg, Plt.Stl.
	-44	20-1017	1	Lockwasher, 1/4" Pl. Stl.
	-45	53-4361	1	Nut, 1/4-20UNC, Pl.Stl.
	-46	20-1003	1	Washer, 1/4" Pl. Stl.
	-47	379-8	1	Clamp
	-48	105-A4607	4	Stud, 3/8-16 NC x 1-3/4" Lg., Pl. Stl.
	-49	53-43	12	Hex Nut, 3/8"-16NC Pl. Stl.
	-50	20-6244	8	Flat Washer, 3/8" Pl. Stl., 1.000 O.D.
	-51	20-6245	6	Flat Washer, 3/8" Pl. St. .812 O.D.
	-52	307-6	1	Fuel Connector Body
	-53	32-1128	1	Hex Head Bolt, 1/4-20UNC x 1 1/2" Lg. Pl. Stl.
	-54	20-1017	1	Lockwasher, 1/4" Pl. Stl.
	-55	32-6302	1	Flathead Socket Head Cap Screw 1/4-28NF x 1-3/4" Lg. Pl. Stl.
	-56	54P-44FTXB	1	Male Connector Body
	-57	54P-1/4FFS	1	Pipe Nipple
	-58	358-B2861	2	Mounting Foot
	-59	A75-C1439	1	Rollover Frame Assembly
	-60	40-B3065	1	Beltguard Bracket
	-61	553-7	2	Nut Insert
	-61.1	32-8067	2	Truss Head Cap Screw, *10-32NF & 3/4 Lg., Pl, Stl.

GASOLINE ENGINE DRIVE (Continued)

Figure & Index No.		Part No.	Qty.	Description
				FILL ASSEMBLY OPTIONS
				The following items replace the corresponding items listed above when the compressor is ordered with the Low Pressure or High Pressure Scott-Pak Fill Assembly options.
7-3	**-26**	A554-539	1	L.P. Scott-Pak Assembly (Incls. A-C)
		A554-538	1	(A) L.P. Scott-Pak Adapter
		54P-1/4MROB	1	(B) Street Tee
		715-62	1	(C) Bleed Valve
				OR
7-3	**-26**	A554-540	1	H.P. Scott-Pak Adapter Assembly (Incls. A-C)
		54-614	1	(A) H.P. Scott-Pak Adapter
		54P-1/4MROSS	1	(B) Street Tee
		715-62	1	(C) Bleed Valve
	-57	54P-44FTXSS	1	Male Connector Body
				PRESSURE SWITCH OPTION
7-3	**-62**	A76-191	1	Pressure Switch
		54P-1/41/8FFSS	Ref.	Nipple (Included w/Item 62)
				OPTIONS (Electric Start)
				The following items replace the corresponding item listed above when the compressor is ordered with the electric start option package.
7-3	**-14**	307-16	1	8 H. P. Gasoline Engine, Including 12 VDC Electric Start
	-22	41-3VX450-1	1	V-Belt

ELECTRIC MOTOR DRIVE

Figure & Index No.		Part No.	Qty.	Description
		Omitted items not included in this Assembly		
7-4	**-1**		Ref.	Model SA-6 Compressor & Separators (See Table 7-2 for Separators Parts)
	-2	A70-D1462	1	Bedplate Assembly
	-5	41-3VX425-1*	2	V-Belt
	-8	36-2F3V300-1.13*	1	Motor Sheave
	-9	66-A4547	1	Spacer, Moisture Separator
	-10	142-411-1*	1	Base, Motor Mounting
	-11	358-A3947	2	Mounting Foot
	-13	32-8071	1	Hex Head Bolt, 1/4-28NF x 1" Lg. Pl. Stl.
	-14	A77-623	1	Inlet Filter
	-15	73-423	1	Inlet Hose, 3 Ft. Lg.
	-16	A554-541	1	Scuba Fill Yoke Assembly (Incls. A-B)
See Page 7-11 for Options		54-612	1	(A) Scuba Fill Yoke
		54P-1/4FFS	1	(B) Hex Nipple
	-17	54P-269HB128B	1	Street Elbow
	-18	60-295	1	Gauge, 6000 psi, 1/4 NPT
	-20	A73-433	1	Filler Hose Assembly (Incls. A-B)
		73-434-3	1	(A) Hose, 3 Ft. Lg.
		54-361	2	(B) Swivel Fitting, 37˚ Flare JIC
	-22	79-4627	2	Hose Clamp, 1" O.D. Pl. Stl.
	25	32-8068	4	Hex Head Bolt, 7/16-14NC x 1 1/4" Lg. Pl. Stl.
	-26	20-22074	8	Flat Washer, 7/16" Pl. Stl.
	-27	20-30313	4	Lock Washer, 7/16" Pl. Stl.
	-28	53-30314	4	Hex Nut, 7/16-14NC Pl. Stl.
	-29	32-8070	4	Hex Head Bolt, 1/4-28NF x 1 3/4" Lg.Pl. Stl. Gr. 5
	-30	20-1017	4	Lock Washer, 1/4" Pl. Stl.
7-4	**-31**	32-8072	2	Soc. Head Cap Screw, 5/16-18NC x 1" Lg. Pl. Stl. Gr. 5
	-32	20-627	4	Flat Washer, 5/16" (Wide 1 1/8" O.D.)
	-35	156-C1373	1	Beltguard

ELECTRIC MOTOR DRIVE (Continued)

Figure & Index No.	Part No.	Qty.	Description
-36	40-A4614	1	Bracket, Air Filter Mounting
-37	32-4136	3	Hex Head Bolt, 1/4-20NC x 3/4" Lg. Pl. Stl.
-38	20-1017	3	Lockwasher, 1/4" Pl. Stl.
-39	53-4098	3	Hex Nut, 1/4-20NC Pl. Stl.
-40	40-B3065	1	Beltguard Bracket
-41	553-7	2	Nut Insert
-42	32-8067	2	Truss Head Cap Screw, 10-32NF x 3/4" Lg. Pl. Stl.
-43	138-606	1	Conduit Nut, 1/2 NPT Pl. Stl.
-44	54P-44FTXB	1	Male Connector Body
-45	A163-400	1	Fuse Holder & Fuse Assembly (Incls. A-B)
	163-400	1	(A) Fuse, 3 Amp
	163-400-1	1	(B) Fuse Holder

* Different part numbers may be used for different motor options, see option for correct part number

FILL ASSEMBLY OPTIONS

7-4	**-16**	A554-539	1	L.P. Scott-Pak Adapter Assembly (Incls. A-C)
		A554-538	1	(A) L.P. Scott-Pak Adapter
		54P-1/4MROB	1	(B) Street Tee
		715-62	1	(C) Bleed Valve
				OR
7-4	**-16**	A544-540	1	H.P. Scott-Pak Adapter Assembly (Incls. A-C)
		54-614	1	(A) H.P. Scott-Pak Adapter
		54P-1/4MROSS	1	(B) Street Tee
		715-62	1	(C) Bleed Valve
	-44	54P-44FTXSS	1	Male Connector Body

ELECTRIC MOTOR DRIVE (Continued)

Figure & Index No.		Part No.	Qty.	Description
FIG 2-2: 208-240V, 3 PHASE, 60 Hz MOTOR / STARTER OPTION				
7-4		776-67-1	1	Magnetic Starter, 5 H.P. 220 Volt
	-6	107-415	1	Electric Motor, 5 H.P. 240/460 Volt, 3600 RPM
FIG 2-2A: 460V, 3 PHASE, 60 Hz MOTOR / STARTER OPTION (120 VAC COIL)				
7-4		776-67-5	1	Magnetic Starter, 5 H.P. 460 Volt
		776-E51	3	Starter Heaters
	-6	107-415	1	Electric Motor, 5 H.P. 240/460 Volt, 3600 RPM
FIG 2-2B: 208-240V, 1 PHASE, 60 Hz MOTOR / STARTER OPTION				
7-4		776-68	1	Magnetic Starter, 5 H.P. 220 Volt
	-6	107-418	1	Electric Motor, 5 H.P. 240 Volt, 3600 RPM
FIG 2-2C: 380V, 3 PHASE, 50 Hz MOTOR / STARTER OPTION				
7-4		776-67-2	1	Magnetic Starter, 380 Volt
		776-E51	3	Starter Heaters
	-5	41-3VX450-1	2	V-Belt
	-6	107-458	1	Electric Motor, 5 HP, 380/3/50 3000 RPM (7.5 HP, 460/3/60 derated)
	-8	36-23V365-1.13	1	Motor Sheave
FIG 2-2: 200V, 3 PHASE, 60 Hz MOTOR / STARTER OPTION				
7-4		776-67-1	1	Magnetic Starter, 5 H.P. 200 Volt, 3 ph 3600 RPM
	-6	107-453	1	Electric Motor, 5 H.P. 200 Volt, 3 ph 3600 RPM
	-10	142-410	1	Base, Motor Mounting
PRESSURE SWITCH OPTION (A76-191)				
7-4	**-33**	76-191	1	Pressure Switch
	-34	54P-1/41/8FFSS	1	Nipple
HOUR METER OPTION				
SEE FIGS 2-2		113-10156*	1	Hour Meter Universal

* Military units may have hour meter P/N 113-703

TABLE 7-5

RECOMMENDED SPARE PARTS & TOOLS

Part No.	Qty.	Description
A8-A3309-1	1*	Piston Assembly, 3rd Stage (Incls. A-F)
8-B2116	1(A)	Piston, 3rd Stage
18-B2117-3P	2(B)	Rider Ring
18-C1791-4.5P	4(C)	Compression Ring
123-012-5	4(D)	O-ring Expander
31-A3310	1(E)	Piston Storage Tube
18-C1603-4.5P	2(F)	Pressure Breaker Ring
18-B2117-3P	1*	Rider Ring, Follower
A77-623	1**	Filter Element
A45-110	****1***	RIX Grease
45-1007	1	Krytox grease (for O-ring Installation)
41-3VX425-1*****	1	V-Belt

* Per 200-700 hours of operation.

** Per 1000 hours of operation or as needed.

*** Replace as needed: This is a special TFE resin lubricant required for sustained high pressure application. Use **no** substitutes. To be applied every 25-50 hours of operation or every 2 months.

**** This special grease is included with new units.

***** The 380V/50Hz electric motor and electric start gas motor options use 41-3VX450-1

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

All parts and spare parts are available through

RIX INDUSTRIES
4900 Industrial Way
Benicia, CA 94510

TELEPHONE: **(707) 747-5900** / FAX: **(707) 747-9200**

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED

NOTES

1) TO ASSEMBLE:

   A) INSTALL 308 BEARING (22) ON SHAFT, THEN HEAT CYL.BLK. (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 CYL.BLK HAS COOLED USE 601 LOCTITE BETWEEN INSTALLED 308 BEARING OUTER RACES AND CYL.BLK.

   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 ASS'Y. WITH SLOTS IN BEARINGS ALIGNED TO RECEIVE SETSCREW (28).

△3 TORQUE TO 100 FT.-LBS WITH SPECIAL TOOLS T-C1281-1& 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 TIL PISTON TOUCHES HEAD AND BACK OFF 1/2 TO 2/3 TURN (ALL STAGES).

△7 ADJUST TO MINIMIZE MOVEMENT OF SPRING (100).

△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 SRI BEARING GREASE EXCEPT WHERE LOCTITE IS SPECIFIED.

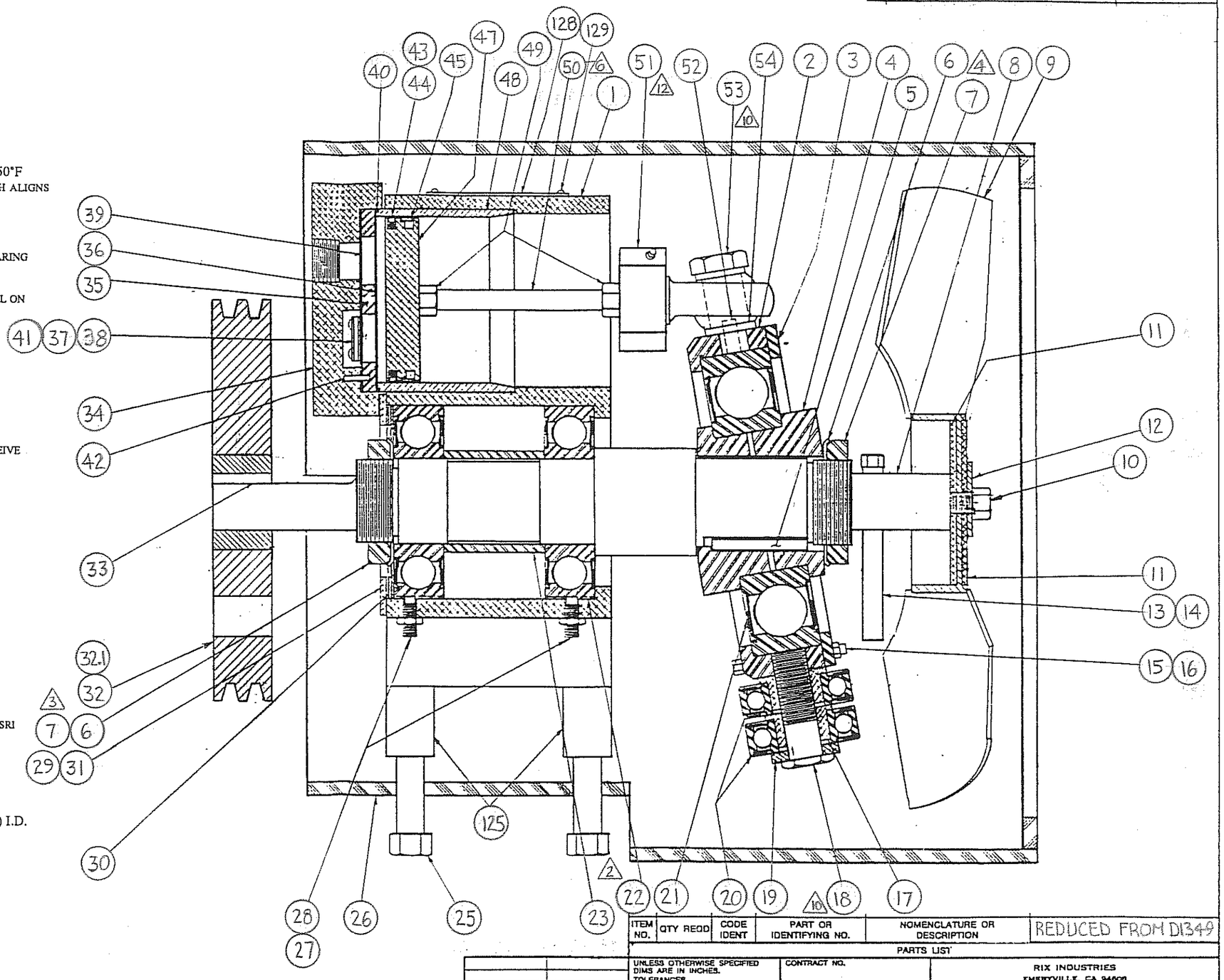
△12 LUBRICATE CONNECTING RODS WITH RIX 45-104 GREASE.

△13 SEE A4205 FOR BILL OF MATERIALS.

△14 USE HEAT CONDUCTING GREASE BETWEEN LINER (58) O.D. & CYL.BLK. (1) I.D.

△15 TO AND FROM 2ND STAGE SEPARATOR.

△F * ORIENTATION OF SWASHPLATE, ITEM 4, IS CRITICAL FOR PROPER COMPRESSOR BALANCE. ORIENTATE SWASHPLATE AS SHOWN WITH 1ST STAGE AT TOP DEAD CENTER AND SWASHPLATE KEY, ITEM 5, DOWN.



ITEM NO.	QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
				REDUCED FROM D1349

PARTS LIST

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMS ARE IN INCHES. TOLERANCES DECIMALS FRACTION ANGULAR X = — = XX = XXX = DO NOT SCALE

MATERIAL: *

FINISH:

SIMILAR TO:

CONTRACT NO.

DRAWN J. LEE DATE 9/1/14

CHECK

APPD.

DESIGN ACTIVITY APPD.

SIMILAR TO: B2969

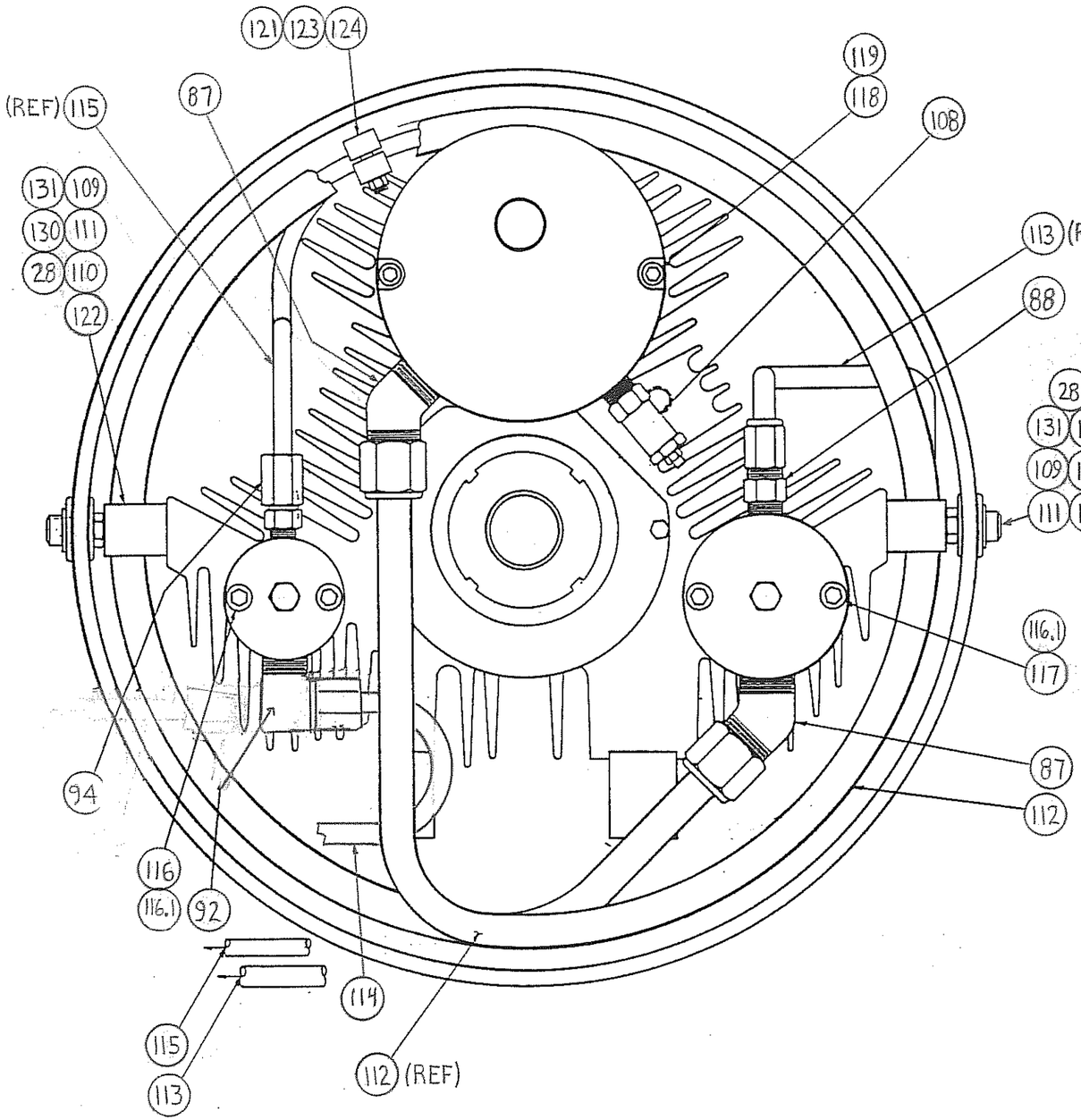
RIX INDUSTRIES
EMERYVILLE, CA 94608
ON SAN FRANCISCO BAY SINCE 1879

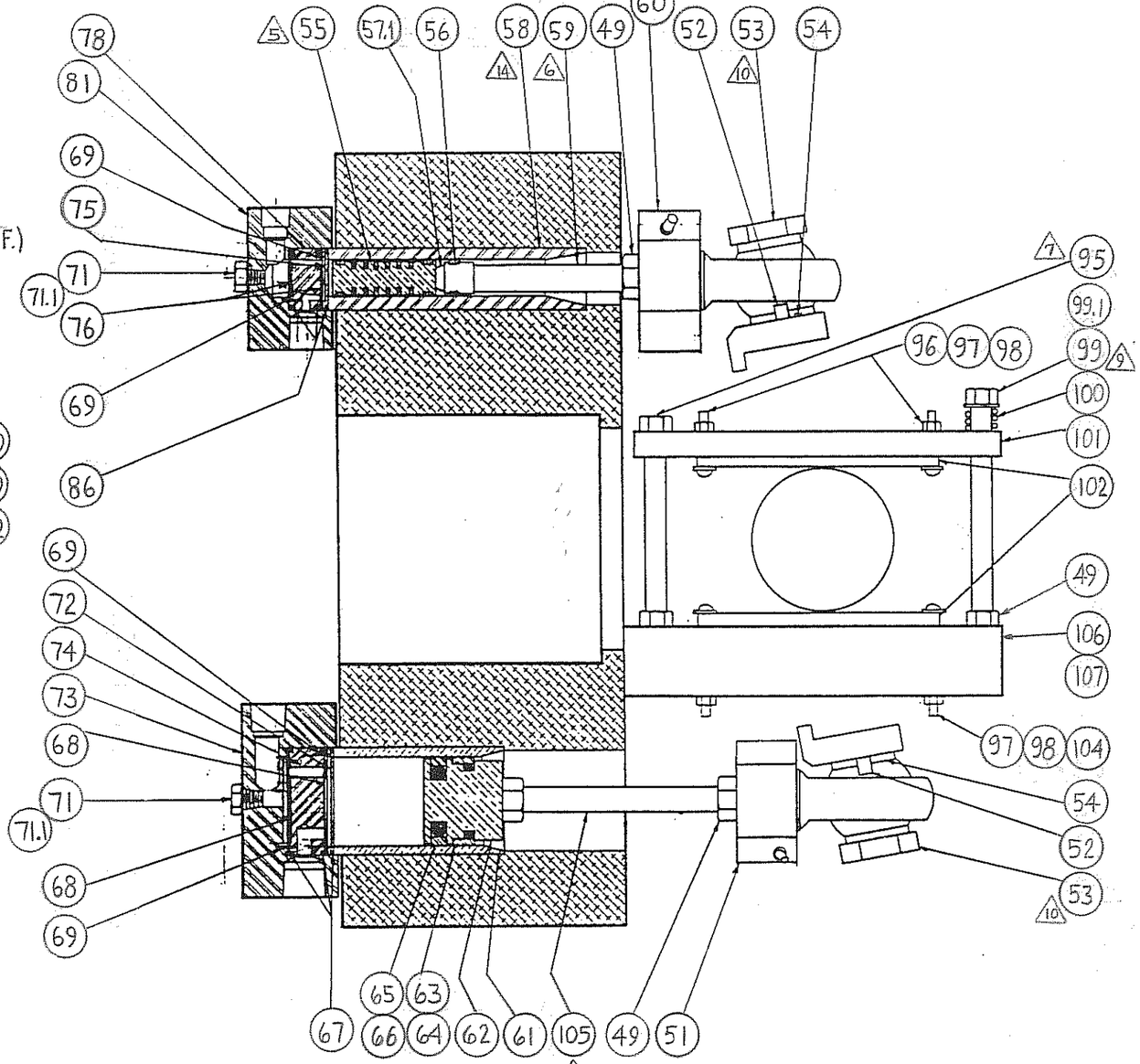
TITLE
CROSS SECTION
SA-6B

DWG SIZE	CODE IDENT NO.	DWG NO.	REV.
D	28953	B2969-1	F

SCALE 1/2 SHEET 1 OF 3

REVISIONS			
LTR	DESCRIPTION	DATE	APPRO
A	OMIT ITEM 57	8/30/84	bAM
B	CHANGE 2ND & 3RD STAGE HEAD ASS'YS	8-12-85	TMH
C	ADDED ITEM 115 and 116 A	87-5-11	TMH
D	ADDED ITEMS 51.5 & 60.5	93-1-25	TMH/AK
E	ADDED NOTE 1, PG 3, ECN 7761	08/06/06	BJ/CE
F	ADDED NOTE 5, ECN 10737	12/09/07	BJ/CE





REDUCED FROM D1349

ITEM NO.	QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION

PARTS LIST

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMS ARE IN INCHES.
TOLERANCES
DECIMALS FRACTION ANGULAR
X = — =
XX =
XXX=
DO NOT SCALE

MATERIAL:

FINISH:

SIMILAR TO:

CONTRACT NO.
N00104-78-D-1670
N00104-79-C-3800

DRAWN RJM DATE 7/21/78
CHECK J Baker
APPD. TE Cupit 7-27-78

DESIGN ACTIVITY APPD.

SIMILAR TO:

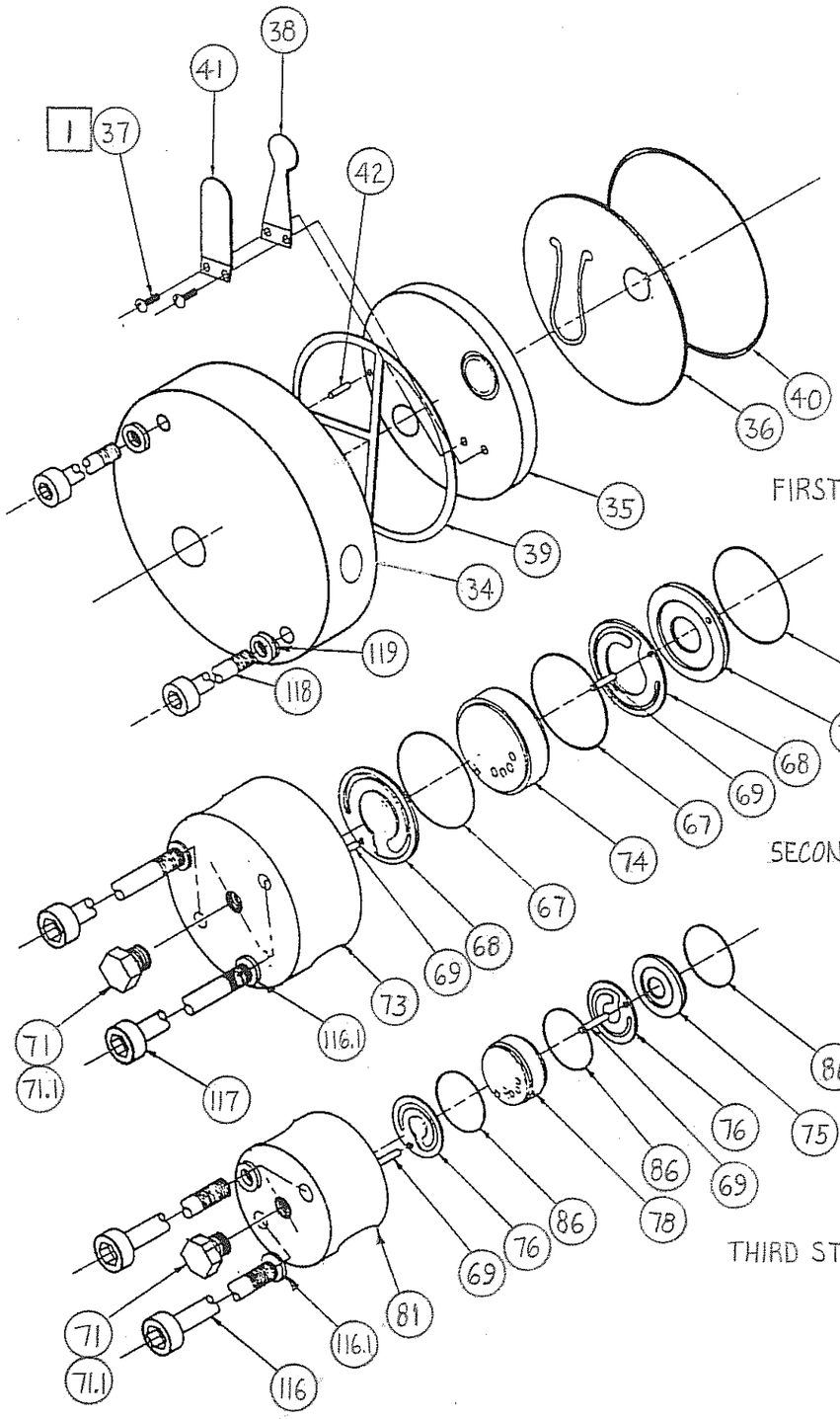
RIX INDUSTRIES
EMERYVILLE, CA 94608
ON SAN FRANCISCO BAY SINCE 1875

TITLE
CROSS SECTION
SA-6B

DWG SIZE	CODE IDENT NO.	DWG NO.	R
D	28953	B2969-1	F

SCALE 1/2 SHEET 2 OF

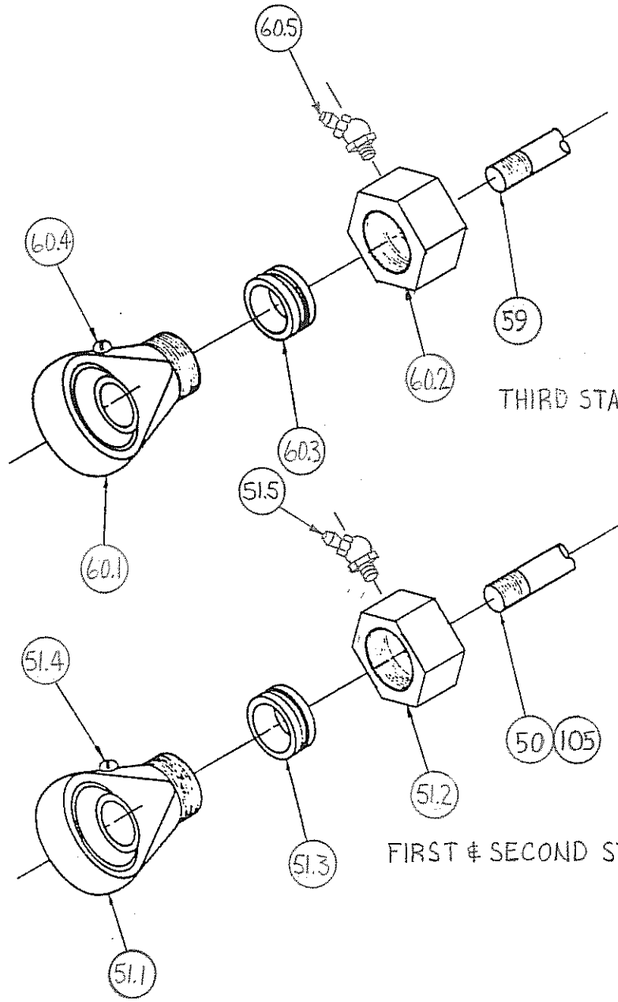
REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED



FIRST STAGE HEAD & VALVE ASSEMBLY

SECOND STAGE HEAD & VALVE ASSEMBLY

THIRD STAGE HEAD & VALVE ASSEMBLY



THIRD STAGE ROD END ASSEMBLY

FIRST & SECOND STAGE ROD END ASSEMBLY

NOTES:

1. USE LOCTITE 242 (RIX P/N 35-5857) ON THREADS.

ITEM NO.	QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	REDUCED FROM D1349

PARTS LIST

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMS ARE IN INCHES.
TOLERANCES
DECIMALS FRACTION ANGULAR
.X ± — =
.XX ±
.XXX ±
DO NOT SCALE

MATERIAL:

FINISH:

SIMILAR TO:

CONTRACT NO.

DRAWN J. LEE DATE 91-11-4

CHECK

APPD.

DESIGN ACTIVITY APPD.

SIMILAR TO: B2969

RIX INDUSTRIES
EMERYVILLE, CA 94608
ON SAN FRANCISCO BAY SINCE 1878

TITLE
ISOMETRIC SUB ASSEMBLIES
SA-6B

DWG SIZE	CODE IDENT NO.	DWG NO.	REV.
D	28953	B2969-1	F

SCALE 1/2 SHEET 3 OF 3

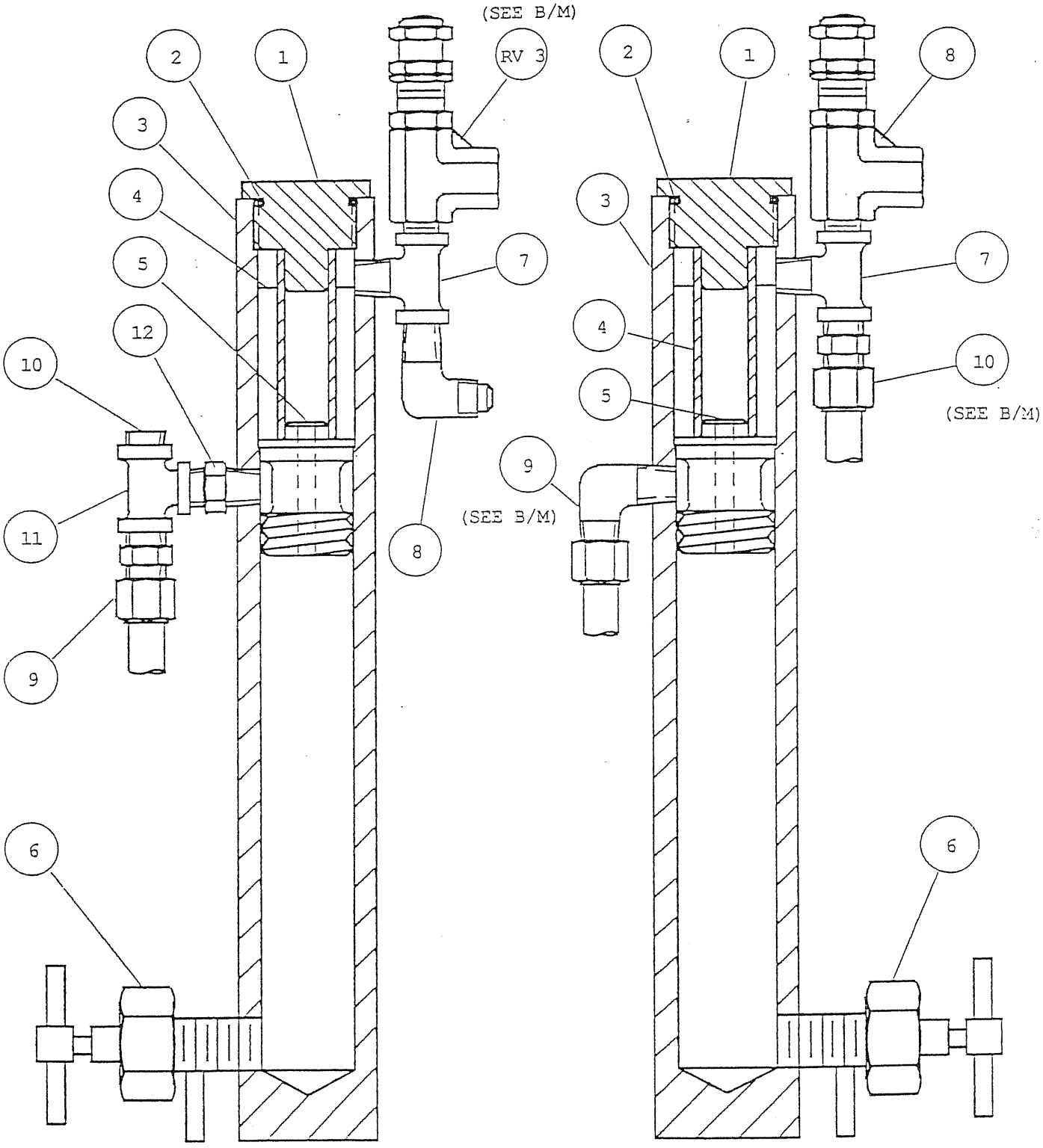


FIGURE 7-2. MOISTURE SEPARATOR ASSEMBLIES

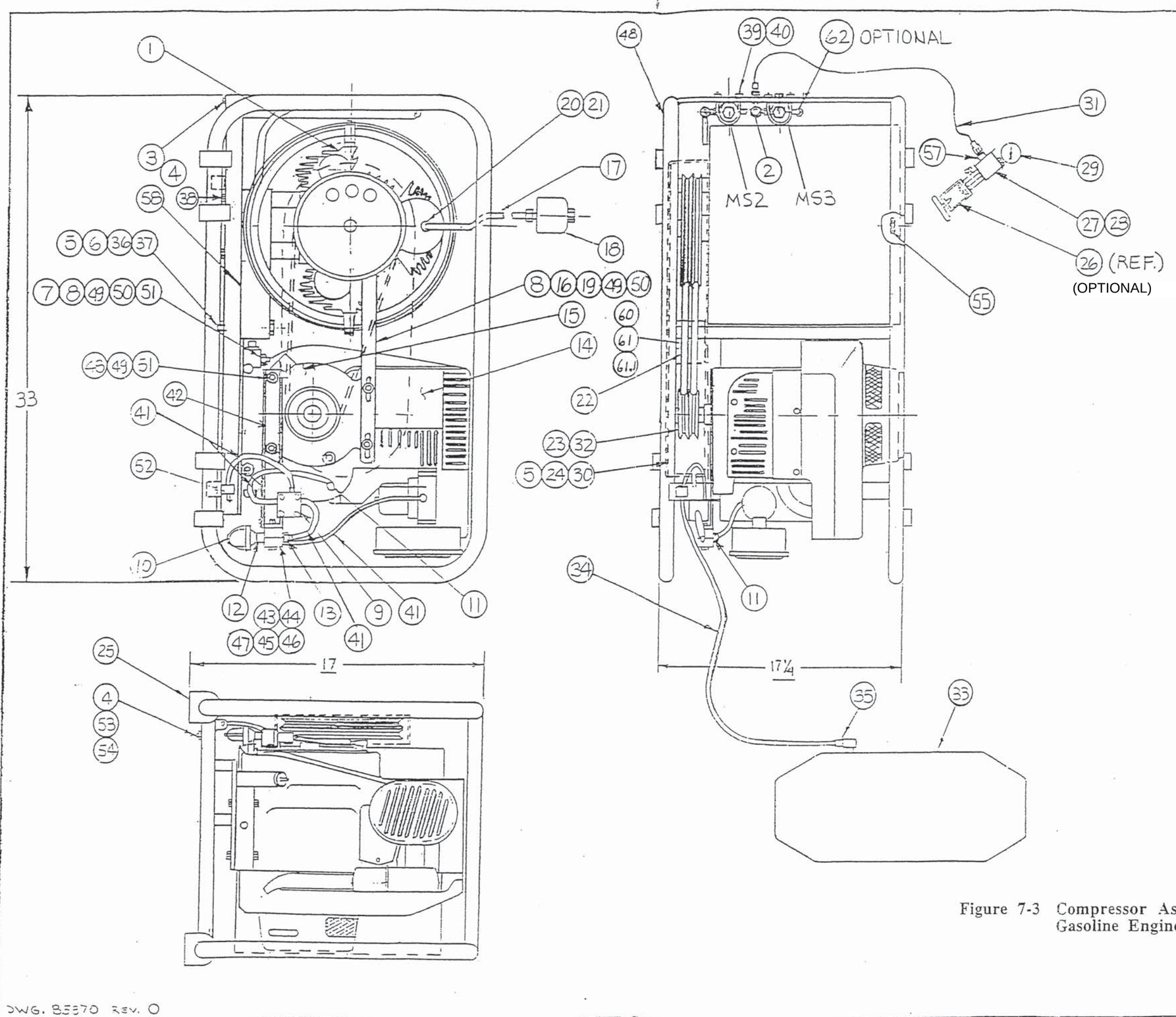


Figure 7-3 Compressor Assembly
Gasoline Engine Drive

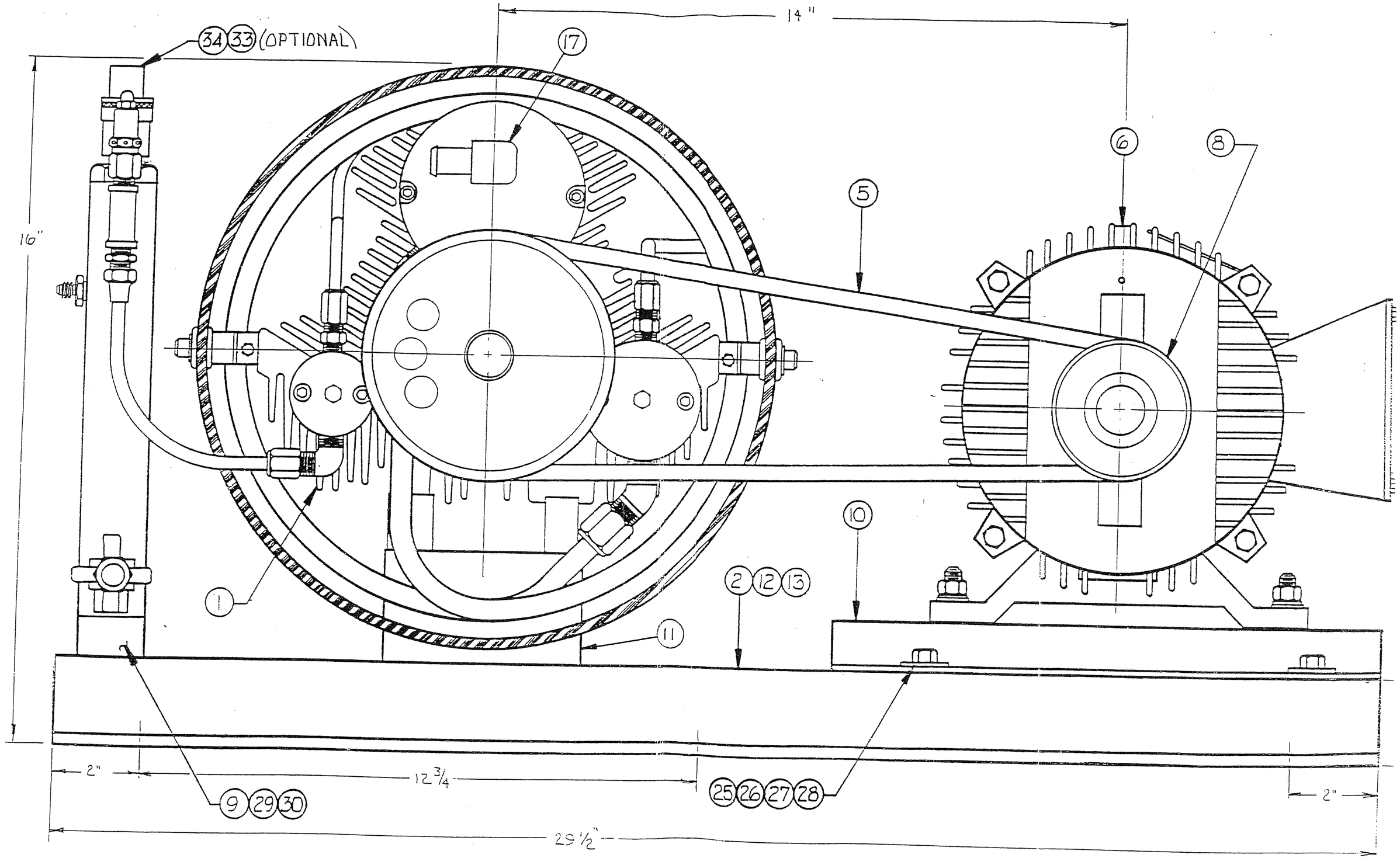


Figure 7-4a Compressor Assembly
Electric Motor Drive

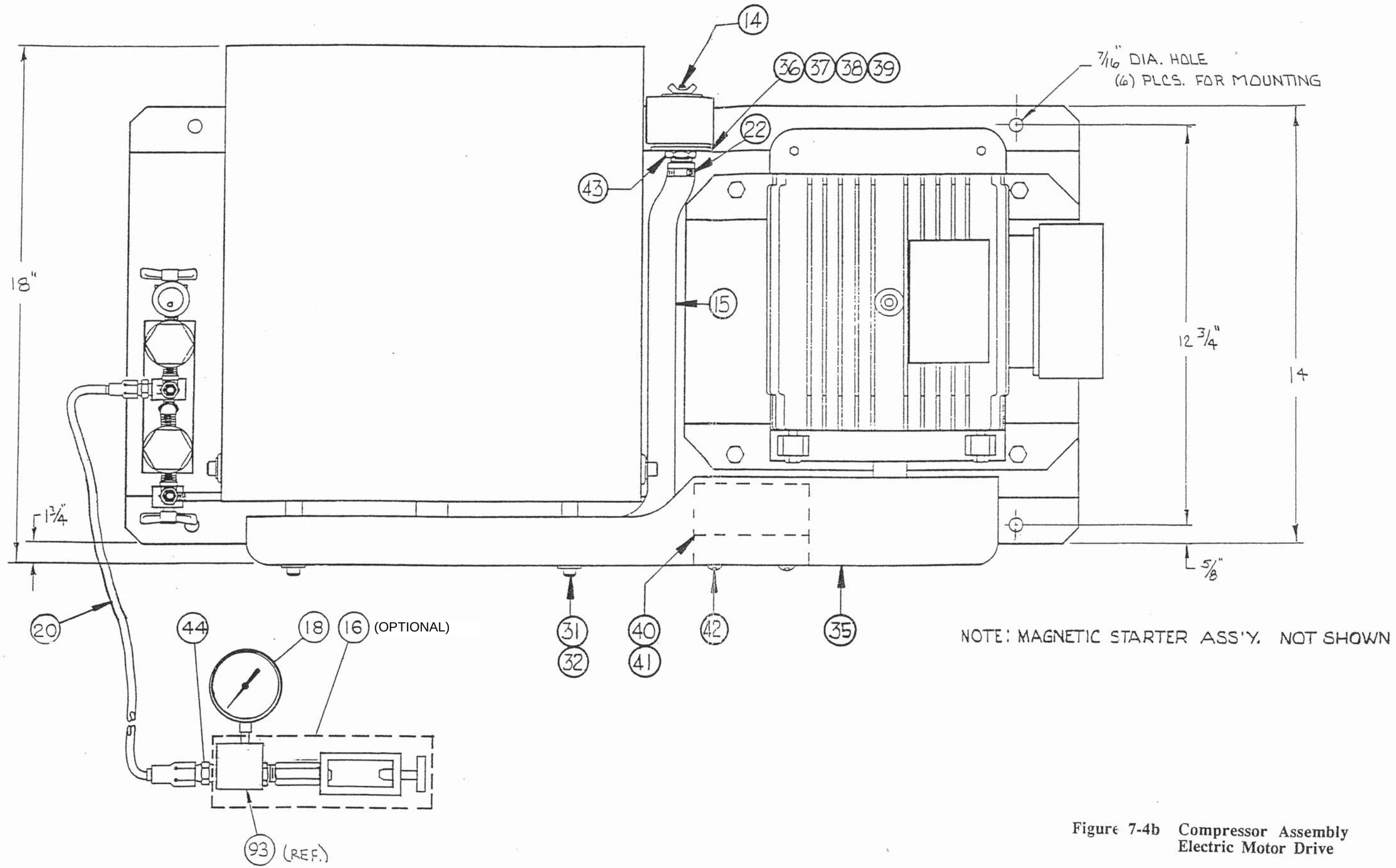


Figure 7-4b Compressor Assembly
Electric Motor Drive

PART II

BACK-PRESSURE REGULATOR
RIX P/N A116-432

Also known as a priority valve, the back-pressure regulator is a fully balanced, economical regulator. It serves a wide variety of uses, however its main use is on compressors to fill diving and fire fighting air tanks. The regulator will improve moisture separator efficiency and filter life as much as 450%. This is done by maintaining pressure in the separator and filter at 1500 PSI or more when tank pressure is lower. It has two outlet ports, permitting attachment of a filling yoke and gauge directly to the regulator. This eliminates costly fittings. If only one outlet port is required, the other can be easily plugged.

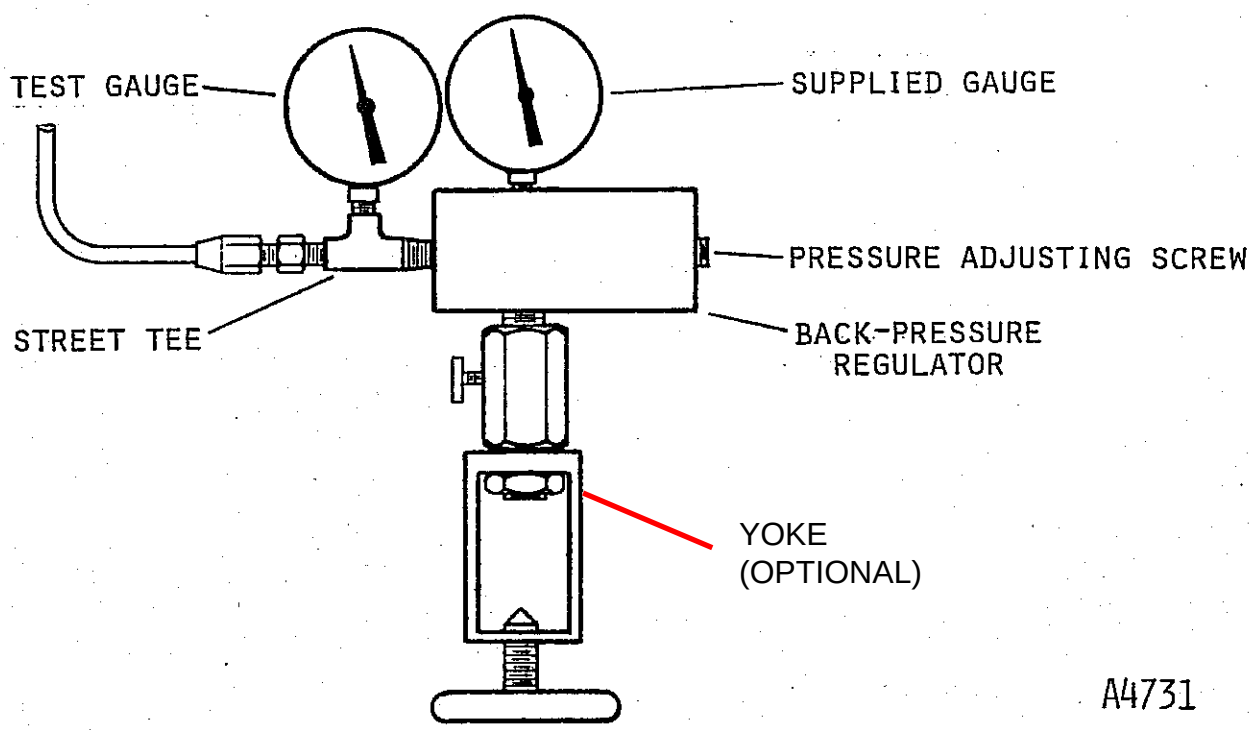
The nominal set pressure of the regulator is 1500 PSI, however it can be adjusted from 300 to 2200 PSI. Although resetting of the regulator is rarely necessary, it can be accomplished in the following manner:

a. Using a 5/16 allen wrench, back off the socket head pressure adjusting screw in the end of the regulator. The regulator will have to be held in a vise, as the screw is installed with Loctite by the manufacturer.

b. Install a street tee and pressure gauge in the inlet port of the regulator as shown. (The gauge supplied with the compressor may be used for this purpose.)

CAUTION: The street tee and pressure gauge (if other than the supplied gauge) must be properly rated for the compressor discharge pressure.

c. Start the compressor and adjust the adjusting screw until the desired pressure on the test gauge is observed. Turning the screw clockwise increases the pressure. Loctite should be applied to the screw to eliminate the necessity of further adjustment.



A4731

Maintenance Assistance Kit
for
RIX Industries Model SA-6E

Compressor condition can be evaluated more quickly and accurately with the installation of a 2nd stage pressure gauge. Variation of the interstage pressure indicates a problem condition such as worn piston rings, sticky valves, or air leaks. The following items are recommended for the installation of a pressure gauge on the 2nd stage:

RIX P/N	ITEM	MATERIAL
54-1/4FFSS	Nipple	Stainless
54P-1/4MMOB	Tee	Brass
715-140	Hand Valve (Snubber)	Sherwood, soft seat
60-401-2	Gauge, 0-1000 psig	Brass with plastic case

Remove the 2nd stage relief valve and install the nipple and tee with the center leg of the tee pointing in a horizontal direction. Install the hand valve and gauge at the top of the tee. Use the hand valve to stop the pulsations from affecting the gauge needle. Install the relief valve onto the other (horizontal) port of the tee. (**NOTE: due to compressor vibration it is a good idea to keep the gauge off unit and install only when pressure check is required.)** Normal 2nd stage pressures are as follows:

FINAL PRESSURE	2nd STAGE @ SEA LEVEL	2ND STAGE @ 5000 FT. ELEVATION
2000 psig	425-475 psig	390-440 psig
2500 psig	450-500 psig	420-470 psig
3000 psig	475-525 psig	450-500 psig
3500 psig	500-550 psig	480-530 psig

Low pressure will be caused by one or more of the following:

Worn 1st or 2nd stage rings
Leaking 1st stage valves
Leaks in piping, O-rings or 1st stage head gasket
High 1st stage piston clearance
Restricted inlet hose or filter

High pressure will be caused by one or more of the following:

Leaking 3rd stage valves
Worn 3rd stage rings

NOTE: Running compressor for long periods with a low interstage pressure may cause overheating of the 3rd stage, resulting in reduced ring life and possible O-ring failure

SEE ALSO TROUBLESHOOTING SECTION OF MANUAL

RIX INDUSTRIES
4900 Industrial Way
Benicia, CA 94510
PHONE: (707) 747-5900 FAX: (707) 747-9200