0500F

OPERATING INSTRUCTIONS

PM COMPRESSOR 02/2002

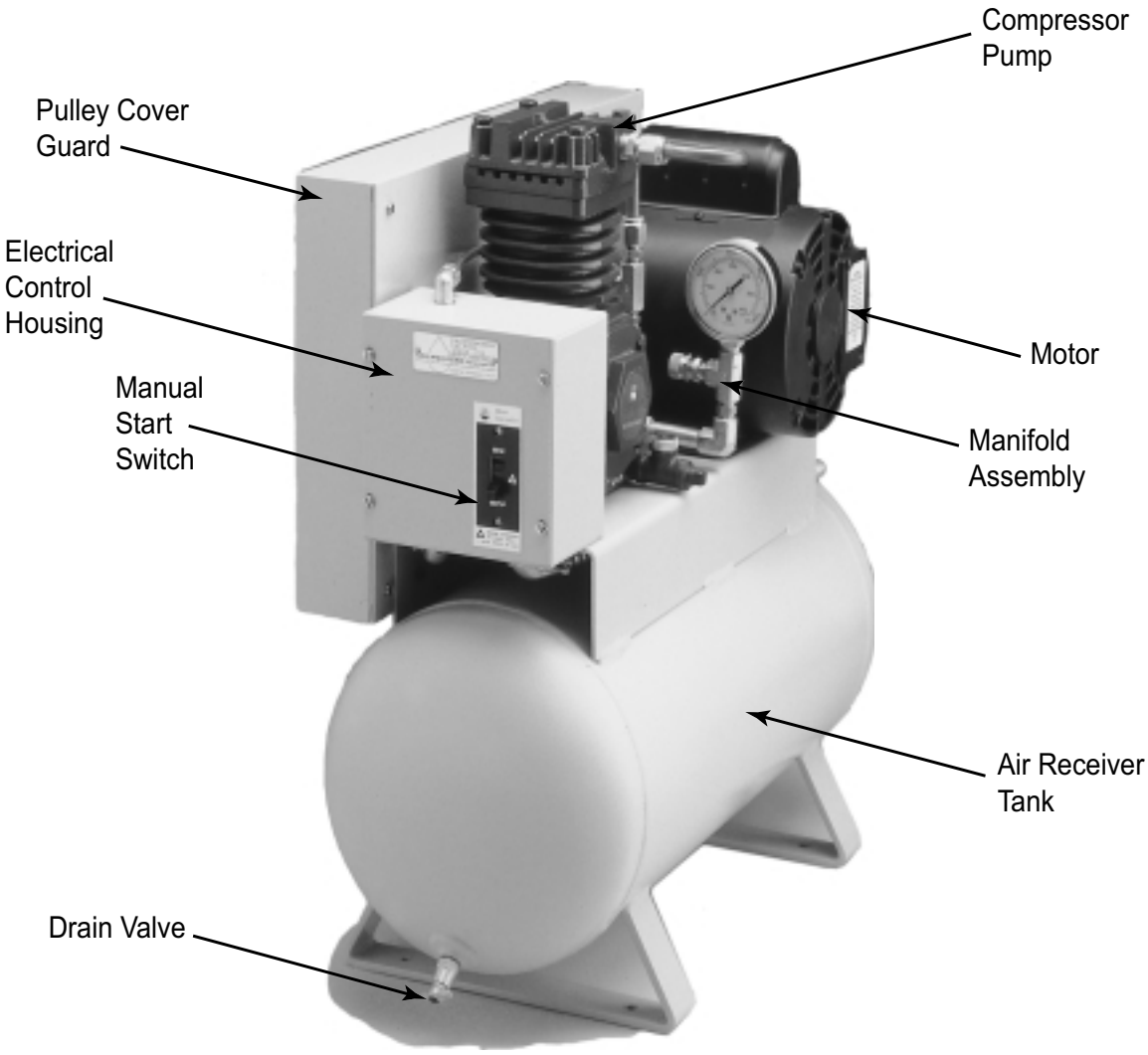

Fig. 1 - 0500F PM Compressor

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Website: http://www.soilmoisture.com

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Unpacking

When unpacking your Compressor, carefully remove all packing material and tape, and check for any damage that may have occurred during shipment.

If the Extractor is damaged, call the carrier immediately to report it. Keep the shipping container and all evidence to support your claim.

Any damage found upon receipt should be reported immediately to the transport carrier for claim. It is important that you save the shipping container and all evidence to support your claim.

Assembly

Be sure to read all operating instructions thoroughly before operating the unit.

The 0500F Series Air Compressor comes completely assembled and ready to be wired to a wall plug to connect to your electrical supply.

Warranty

Soilmoisture Equipment Corp. (SEC) warrants all products manufactured by SEC to be free from defects in materials and workmanship under normal use and service for twelve (12) months from the date of invoice subject to the following conditions:

SEC's obligation under this warranty is limited to repairing or replacing (at SEC's option) products which have been returned prepaid to SEC or SEC's agent in the user's country. SEC will return warranted equipment prepaid.

This warranty shall not apply to any SEC products which have been modified, misused, neglected, involved in accidents of nature, or sustained shipping damage. Under no circumstances will SEC reimburse the claimant for costs incurred in removing and/or reinstalling equipment. This warranty, and SEC's obligation thereunder, is in lieu of all other warranties, expressed or implied, including warranties of suitability and fitness for a particular purpose.

Products may NOT be returned without prior authorization from SEC. A Return Merchandise Authorization (RMA) must be obtained from the factory prior to shipping products to SEC.

Not Liable for Improper Use

Soilmoisture Equipment Corp. is not responsible for any damage, actual or inferred, for misuse or improper handling of this equipment. The 0500 Series compressors are to be used solely as directed by a prudent individual under normal conditions in the applications intended for this equipment.

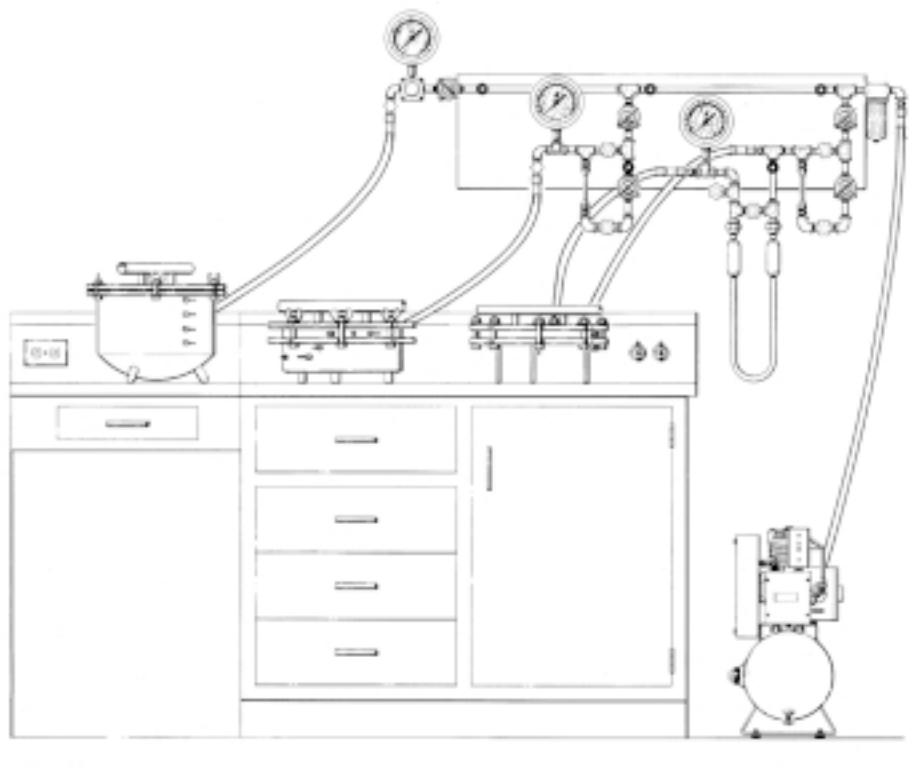

Fig. 2 - Laboratory Setup of Pressure Extractors using the 0500F Air Compressor as a source of pressure

The 0500F Series Air Compressors are designed specifically as a pressure source for all gas pressure extractors. The Compressor combines a heavy duty roller bearing pump together with a heavy-duty 1/2-HP motor. The Compressor is completely guarded. Recommended placement is next to your laboratory bench. (Fig. 2).

Safety features such as a controlled, five-minute runtime out of every 20 minutes, are built into the Compressor to protect it from damage in the event of an accidental rupture of a membrane or diaphragm in a pressure extractor.

You will find four rubber shock mounts packed with each Compressor. It is recommended that these be mounted in the holes in the legs (Fig. 3) to isolate the compressor vibration from the floor and reduce noise level to a minimum. Assemble to leg holes as shown in Fig. 4.

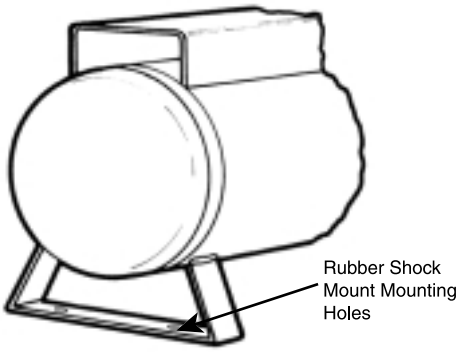

Fig. 3

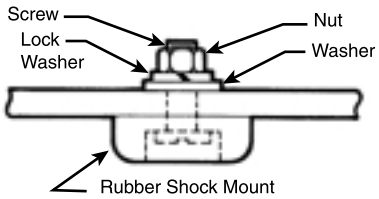

Fig. 4

Electrical Control Housing

The Compressor Motor is controlled by the Manual Start Switch, the Timer Circuit and the Pressure Switch. These are contained in the Electrical Control Housing at the front of the Compressor (see Fig. 1 and Fig. 5).

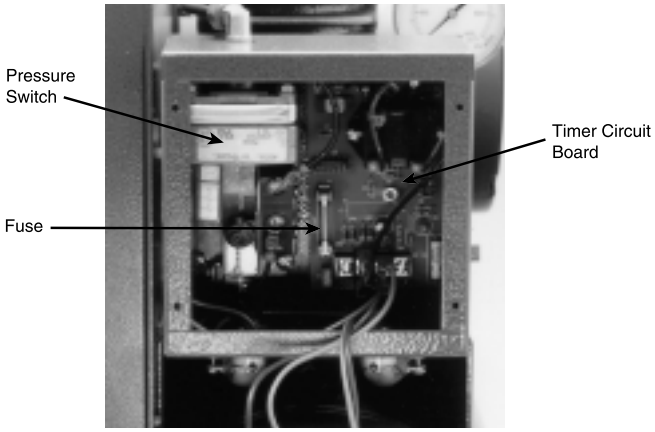

Fig. 5

Fuse

The 3AG 1/4 Amp Fuse is an added safety feature to protect the timer circuit board against overload.

Manual Start Switch

The Manual Start Switch (on the front cover of the Electrical Control Housing - Fig. 1) is a double pole switch which controls both incoming electrical leads. It contains a resetable heater element for full overload protection to the motor. If the motor is being overloaded and drawing too much current at any time, this Switch will snap off and the Switch Lever will go to a midpoint position, noted by the symbol "Δ", and stay there. To start again, push lever to the “OFF” position and then to the “ON” position. (Fig. 6).

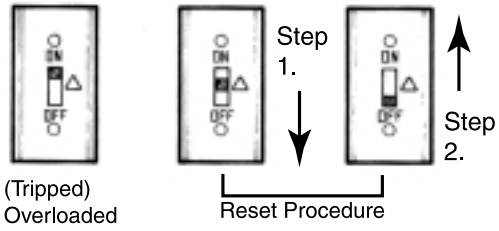

Fig. 6

After initial start, the Manual Starting Switch should always be left in the "ON" position. The Timer and Pressure Switch will then control the motor in order to maintain proper tank pressure.

Timer

The Timer is an electronic circuit that allows the pump motor to run approximately 5 minutes out of every 20 minutes. This 5-minute pump cycle is sufficient for normal use and prevents damage to the Compressor from running continuously in the event of a rupture of a pressure membrane or diaphragm. If the tank pressure has not dropped sufficiently in 20 minutes to close the Pressure Switch, the Pump Motor will not turn on. If several pump cycles are required one after the other, the Timer may be overridden by turning off, and then turning on, the Manual Start Switch. Special care must be exercised when overriding the Timer to assure that the Compressor Pump does not overheat. To start again, push Manual Start Switch to "OFF" position and then to "ON" position.

Pressure Switch

The Pressure Switch (Fig. 7) senses air pressure in the Air Receiver Tank and "CLOSES" when the air pressure drops below the set value. The Pressure Switch is set to "OPEN" at 305 psi and to "CLOSE" at 280 psi. Since the Pressure Switch is connected in series with the Timer Circuit, the Compressor will not necessarily turn "ON" as soon as the Pressure Switch closes. Instead, it will turn "ON" during the next 5-minute Timer Circuit pumping cycle. The Pressure switch has been set and tested at the factory. There should be no need to reset the unit.

If Compressor is pumping to pressure greater than 305 psi, turn set point adjusting screw counterclockwise to reset Pressure Switch to a maximum of 305 psi.

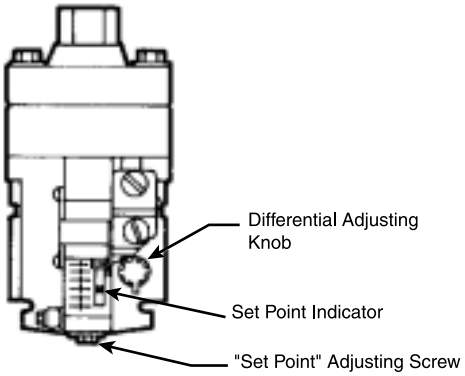

Fig. 7

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Manifold Assembly

The Manifold Assembly incorporates a Pressure Gauge, Safety Relief Valve, Unloader Valve and a Check Valve, (Fig. 8).

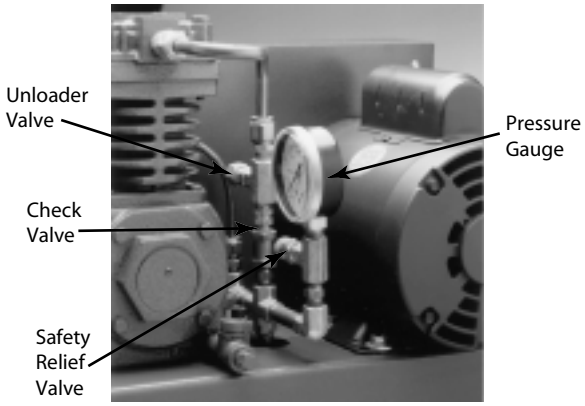

Fig. 8

Pressure Gauge

The Pressure Gauge is a Bourdon Tube-type gauge and registers the air pressure in the Air Receiver Tank. The pressure indicated by the gauge should not exceed 325 psi at any time.

Unloader Valve

The Unloader Valve is a specialized valve that unloads pressure developed between the Check Valve and the Compressor Pump after completion of a pumping cycle. This unloading of air pressure between the Pump and Check Valve assures full sealing of the Check Valve during non-pumping periods, and minimizes the load on the motor at the beginning of the next pumping cycle. The small ceramic disc used in the valve bleeds air slowly from its pores. This is to be expected during, and for a short time after, a pumping cycle.

Check Valve

The Check Valve provides a one-way input from the Pump to the Air Receiver Tank.

Safety Relief Valve

The Safety Relief Valve protects your Compressor from accidental excess pressurization. The Safety Relief Valve is set at 325 psi, and any pressure in excess of this set relief pressure will be exhausted through the valve.

Drain Valve

The Drain Valve, located at the front bottom of the Compressor, (Fig. 1), is used to drain excess water from the Air Receiver Tank. The pump delivers hot, compressed air to the Air Receiver Tank. When this air cools, excess moisture condenses and accumulates in the bottom of the Air Receiver Tank. The Drain Valve must be opened periodically to drain the accumulated water. See “General Care and Maintenance” in these Operating Instructions.

Pulley Cover Guard

IMPORTANT: COMPRESSOR MUST BE UNPLUGGED OR POWER TURNED OFF AT SOURCE PRIOR TO REMOVAL OF PULLEY COVERGUARD.

The Pulley Cover Guard, located on the side of the Compressor, (Fig. 1), protects the operator from the motor and compressor pulleys and the "V" belt drive. Removal of the 4 screws, located at each corner, will allow access to the pulleys and drive belt.

COMPRESSOR SPECIFICATIONS CHART

Tank Specifications

Capacity: 0.94 cu.ft. (26.6 liters)
Normal Working Pressure: 300 psi * (2.07 MPa)
Design Safety Factor: 4
Tested @ 450 psi* (3.1 MPa)
* pounds per square inch

Compressor Pump Rates

0500FG3 (110V, 50 or 60 Hz) Approx. 3.0 cfm (cu.ft./min) or 85 liters/min.
0500FG4 (230V, 50 or 60 Hz) Approx. 3.0 cfm (cu.ft./min) or 85 liters/min.

Equipment Pressure Settings

Safety relief valve: 325 psi (2.24 MPa)
Pressure Switch:
"OPEN" at 295 to 305 psi
(2.04 to 2.10 MPa)
"CLOSE" at 280 to 290 psi
(1.93 to 2.00 MPa)

Electrical Wire

14 A.W.G., Stranded, 600 volt maximum

REQUIREMENTS PRIOR TO USE

Location of Compressor

The Compressor should be located in a clean, accessible area, free of excessive dust and where electrical power is available. Since the noise level is not excessive, and the unit is completely guarded, the Compressor may be located adjacent to the laboratory bench.

Electrical Connection

CHECK COMPRESSOR NAMEPLATE ON FRONT OF ELECTRICAL CONTROL HOUSING (FIG. 1) FOR THE PROPER VOLTAGE AND CYCLE TO BE USED.

CAUTION: NEVER attempt to change voltage or cycles from those stamped on the nameplate. This could result in damage to the Compressor or Timer Motor. The flexible conduit extending to the rear of the Compressor is 3/8 inches outside diameter and contains the three wires for electrical connection. The green wire is a ground wire and should be connected to a ground line or grounded pipeline. The red and black wires are for connection to an outlet box with standard fittings, or a pronged plug may be attached for use in a wall outlet (Fig. 9).

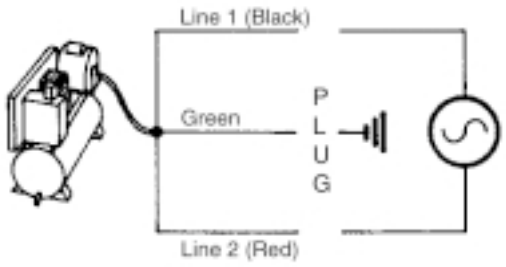

Fig. 9

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Connecting the Air Compressor

The 1/4 inch standard pipe outlet at the rear of the Compressor Tank is used for connection to the air line. A simple and effective way of making connection to the Compressor is with the Model 0779G1 Connecting Hose, Combination. The Model 0779G1 consists of a 60-inch long air hose with 1/4-inch NPT street elbow and shutoff valve on one end, (Fig. 10) and a 9/16 in-18 hose fitting on the other end.

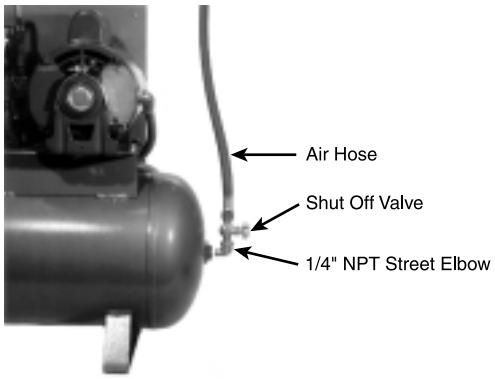


Fig. 10

Our 0772G01 Adapter may be useful in various hookups. The Adapter screws into standard 1/4 inch NPT pipe fittings and couples directly to our 0775L60 Connecting Hose. A hose is the preferable method of connection between the Compressor and a rigid air line. The hose should be rated for a minimum of 350 psi continuous use. The flexible hose isolates any compressor vibration and facilitates service requirements.

Fill Compressor With Oil

CAUTION: The crankcase must be filled with oil before starting the Compressor for the first time. The crankcase should be checked periodically for proper oil level.

The Compressor is shipped lubricated, but with its Compressor Pump Crankcase drained. To fill, turn knurled filler plug counterclockwise to unscrew it from the base casting (Fig. 11).

Fig. 11

Use approximately 1/3 pint of heavy duty (HD) SAE 90 weight detergent oil. A small funnel or short length of tubing will be helpful in adding the oil. After filling, screw the filler plug back into the base.

OPERATING THE 0500F AIR COMPRESSOR

After electrical connection has been made, the air line installed, and the Compressor Pump Crankcase filled with oil, the Compressor may be turned on. Before turning Manual Start Switch to "ON", be sure that the Drain Valve (Fig. 1) at the front of the tank near the base is closed tightly and that other air line valves are closed (Fig. 10).

The Timer will permit the Compressor to run for 5 minutes. During this time the tank pressure will build up to approximately 140 psi. After 15 minutes, the Timer will turn the Compressor on again and the tank pressure will rise to approximately 220 psi. After the third cycle, the tank pressure will be up to approximately 270 psi. A fourth cycle will probably be required for the tank pressure to reach the maximum value required for the Pressure Switch to “OPEN”. Thereafter, the Compressor will run only when required to maintain tank pressure within the operating limits as demanded by the Pressure Switch and Timer.

After air pressure has built up in the system, check air line joints for leaks with a soapy water solution and take corrective action where necessary to stop leaks.
If Air Receiver Tank is to be drained of air for any reason, be sure to first switch the Manual Starting Switch to the “OFF” position.

GENERAL CARE & MAINTENANCE

Monthly

Check air filter, located on the side of the cylinder head, and clean if necessary (Fig. 12).

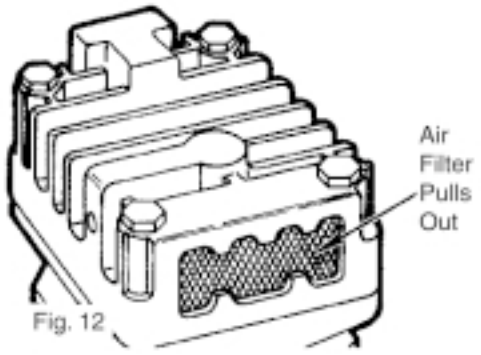


Fig. 12

Check oil level; fill as needed. Drain water from Air Receiver Tank by opening Air Drain Valve at the front of the Air Receiver Tank. The Manual Starting Switch should be shut "OFF" prior to the opening of the valve.

Semi-Annually

IMPORTANT: COMPRESSOR MUST BE UNPLUGGED OR POWER TURNED OFF AT source prior to removal of the pulley guard cover.

Check the belt for tightness by removing Pulley Cover Guard and observing the amount of play in the belt. Adjust as required. Drain oil and refill Compressor Pump with new SAE HD 90 weight detergent oil.

MINOR ADJUSTMENTS

Adjusting the Belt

To check tension on the belt, remove the four bolts on the Pulley Cover Guard and observe the amount of play in the belt. If the belt is slack, loosen four motor mounting bolts located beneath the motor and pull motor away from Compressor Pump and retighten motor mounting bolts. Deflection should be about .15 inches (4 mm) as shown in Fig. 13.

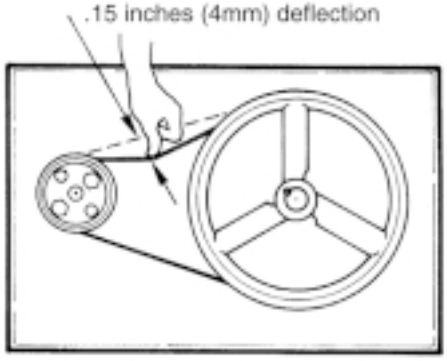


Fig. 13

Adjusting the Safety Relief Valve

If Safety Relief Valve is not exhausting at the 325 psi factory-set value, you will need to check the pressure adjustment. For this you will need a 5/32 inch hex key.

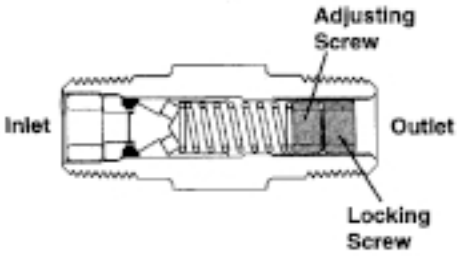


Fig. 14

Insert wrench into locking screw. Loosen screw by turning counterclockwise (Fig. 15a). Slide wrench down into adjusting screw (Fig. 15b).

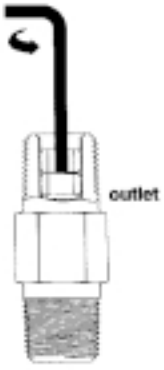


Fig. 15 a

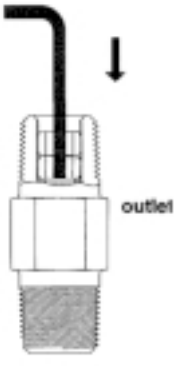


Fig. 15b

Next, turn both screws to reach desired cracking pressure. (Turn clockwise to increase cracking pressure, counter clockwise to decrease cracking pressure).

Slide wrench back up into locking screw and turn clockwise to lock (Fig. 16).

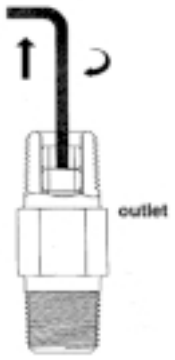


Fig. 16

DO NOT EXCEED 325 PSI PRESSURE! After adjustment, tighten locknut against cap.

TROUBLESHOOTING

Motor Will Not Start

1. Check to see that Compressor Plug is wired properly, plugged in, and the correct voltage is available to electrical outlet.

Safety Relief Valve Leaks Air

1. Check the Pressure Gauge. If the pressure is 325 psi or above, the Pressure Switch must be adjusted.
2. If the Pressure Gauge is below 320 psi, reset Safety Relief Valve.

Unit Unable to Reach Maximum Pressure

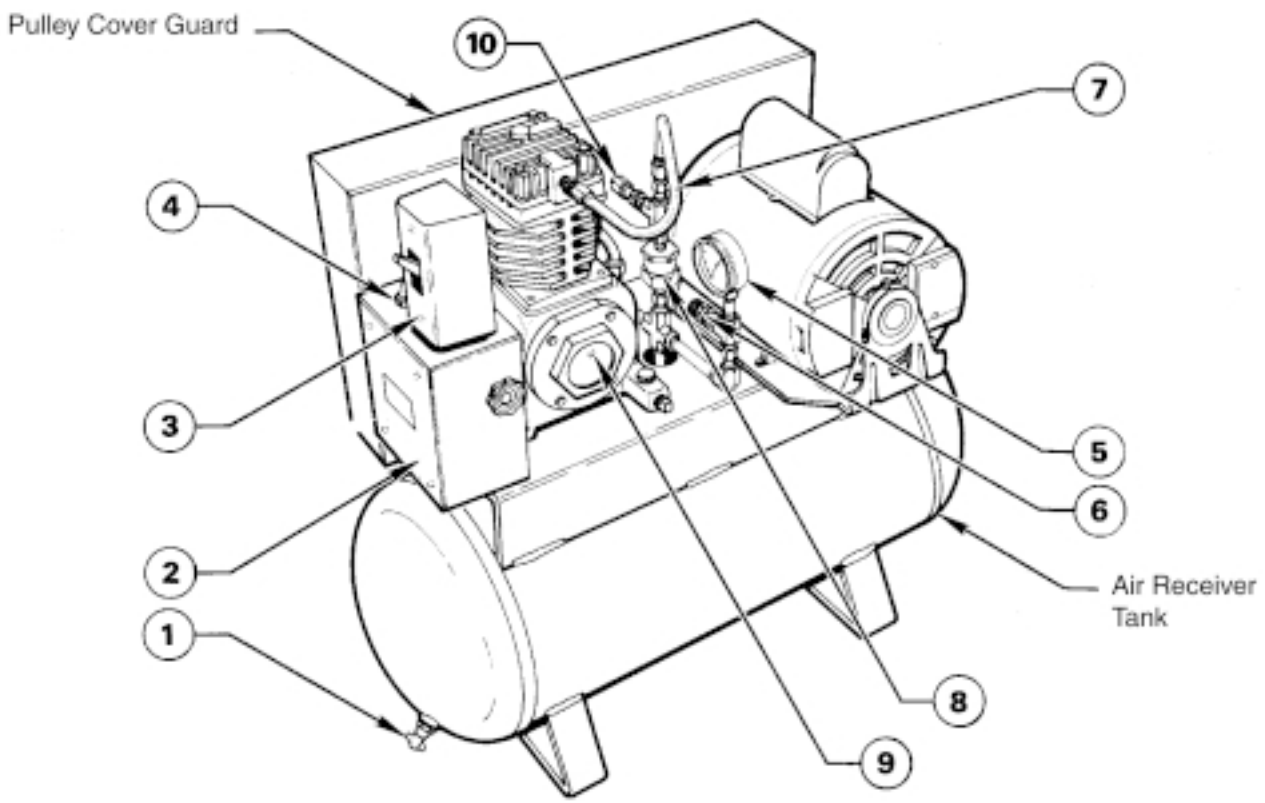
1. Check Compressor Pump Air Filter for clogging.
2. With a soapy water solution, check for air leaks at connections, fittings, or other possible leakage sources on Compressor.
3. Check air distribution manifolds for leaks, faulty Air Regulators, or other leaking pressurized equipment.
4. If Check Valve is not functioning properly as indicated by continuous, high volume leakage through the Unloader Valve, long after pumping cycle is complete, clean and repair or replace Check Valve.
5. Check Compressor Pump Valves, located in the head of the Compressor Pump, to see if they are sealing properly on compression cycle.

Unusual Noise, Knock, or Vibration

1. Check area around Compressor to assure that it is free from contact with rigid surfaces or extraneous materials that will transmit vibrations during the operation.
2. Remove Pulley Cover Guard and inspect Drive Belt for looseness.
3. Check Pulleys and Hubs on the Motor and Compressor Pump for looseness, misalignment, or damage.
4. If noise comes from Compressor Pump interior, loose or worn connecting rod, piston ring, or support bearings may be the cause; repair or replace.

0500F PARTS LIST

0500F AIR COMPRESSOR PARTS MANUFACTURED AFTER 3-21-83



Item No.	Part No.	Description
1	0763G2	DRAIN VALVE
2	0500F-800	TIMER CIRCUIT BOARD (Located in Electrical Control Housing)
3	MES008K1	STARTER SWITCH KIT, 115 VOLT
	MES008K2	STARTER SWITCH KIT, 230 VOLT
4	0764G2	PRESSURE SWITCH (Located in Electrical Control Housing)
5	0781P0600	0-600 PSI PRESSURE GAUGE
6	0763G1	SAFETY RELIEF VALVE
7	0500F-005	COOLING TUBE ASSEMBLY
8	0762G2	COMPRESSOR CHECK VALVE
9	0501F	COMPRESSOR PUMP FOR "F" STYLE COMPRESSOR
10	0500F-200	UNLOADER VALVE

SPARE PARTS

0500F-800CR	UPGRADE KIT
MEG001	FUSE YSW, 1/8 watt
MEL002	MOTOR 50/60 HZ, 110/220 VOLTS
MML033-001	AIR FILTER
MRL007	PULLEY BELT

When ordering compressor replacement parts, please provide the voltage and cycle rating, and the serial number of your compressor. The voltage and cycle rating can be found on the nameplate located on the electrical control housing cover. The serial number can be found on the tank plate on the pulley side of the compressor tank.

P------

Located on pulley side of tank

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