

MINI DIA-VAC® with Air Driven Motor

MAINTENANCE AND DISASSEMBLY INSTRUCTIONS

A. General Operations Characteristics

1. Normal motor temperatures may be 160 - 180 degrees F.
2. For Proper operation (1700 RPM) operator must supply approximately 40PSIG and 12 SCFM or 60 PSIG and 15SCFM to the air motor. Operator should install a pressure gauge and flow meter to ensure consistent conditions. Additionally, an oil lubricator must be installed in line and prior to the air Driven motor.
3. SAE 10 automotive engine oil is required for proper motor operation. The oil is maintained in the motor **only** and will not contaminate the pump sample in any way. ADI recommends that an automatic air line lubricator be installed in air line just ahead of air motor. Lubricator should be adjusted to feed one drop of oil for every 50-75CFM of air flow to the motor (every 3-5 minutes). **ADI does provide an oil and lubricator kit P/N 12001, please contact ADI or your local representative for pricing.**
- 4) A muffler is supplied with each air driven pump but not attached during shipping. If operator chooses not to attach the muffler to the air motor outlet, solid or liquid material exiting air motor can cause eye or skin damage. Be sure to keep away from air stream.
5. After ensuring proper motor operation you may now check pumping efficiency, employ suitably damped gauges connected so as to dead-end either pressure or vacuum.
NOTE: Check each separately, One or the other port must be open during this test.
Use 0-60 PSI pressure gauge and 0-30 inch hg. vacuum gauge, (or mercury manometer).
Maximum pressure should be 37 PSIG.
Maximum vacuum should be 21 inches Hg.
6. Pumps are intended for gaseous operation, eliminate liquids entering pump. It is also recommended that a filter be used prior to pump head to eliminate debris from entering the pump causing pump failure.

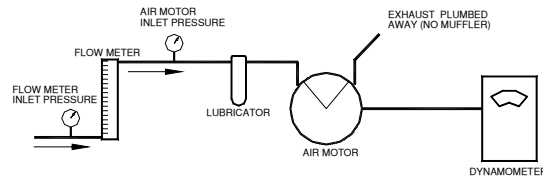
Please refer to the diagram below.



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THIS INFORMATION IS FOR THE MINI AIR MOTOR ONLY.



1. A pressure-corrected flow meter indicates the air motor's rate of consumption of free air (cfm, m³/h, and l/s are all indicated).
2. Air is fed into the motor and the resulting discharge is exhausted into the room without the restriction of a muffler.
3. A dynamometer is used to limit the speed of the motor and indicate the available torque under varying conditions.

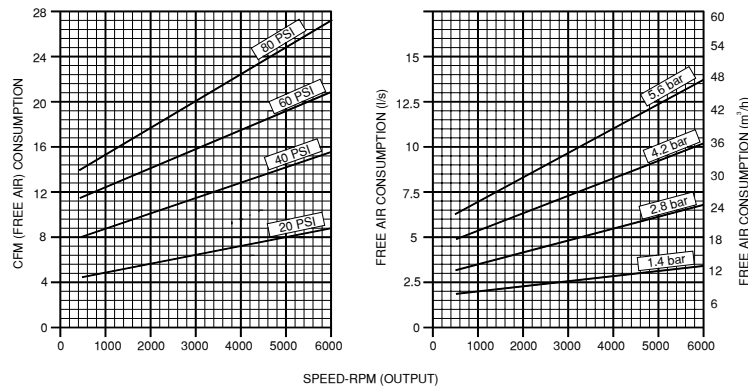
An automatic air line lubricator must be installed in the air line just ahead of the air motor. The lubricator should be adjusted to feed one drop of oil for every 50-75 CFM of air going through the motor. A detergent SAE #10 automotive engine oil should be used.

Operation of the air motor at 1500 RPM requires an inlet pressure of:

1. 40 PSIG (2.8 bar) Flow 300 LPM or 11 CFM.
2. 60 PSIG (4.2 bar) Flow 425 LPM or 15 CFM.

Mini Air Motor Air Consumption vs. Speed

.45 HP
Torque 5.25 in. lb.
Max Speed 6000 RPM
Max Air Consumption 27 CFM



AD102

B. Maintenance Procedures

1. SAE 10 automotive engine oil is required for proper motor operation. The oil is maintained in the motor **only** and will not contaminate the pump sample in any way. ADI recommends that an automatic air line lubricator be installed in air line just ahead of air motor. Lubricator should be adjusted to feed one drop of oil for every 50-75CFM of air flow to the motor (every 3-5 minutes). **ADI does provide an oil and lubricator kit P/N 12001, please contact ADI or your local representative for pricing.**

2) A muffler is supplied with each air driven pump but not attached during shipping. If not attached solid or liquid material exiting air motor can cause eye or skin damage. Be sure to keep away from air stream.

3) Always disconnect air supply prior to servicing pump or motor.

3. Diaphragm Replacement Instructions (also see Maintenance Procedure Below):

a. Standard EPDM (part 4302 or kit 11309) - Operating life can be five years or more under conditions of light pressure or vacuum loads and infrequent operation. Over 20 PSI and constant operation may

require 3 month diaphragm inspection procedure. High ambient conditions over 100 degrees F may also decrease diaphragm life.

b. Teflon coated EPDM (part 4301 or kit 11305) - Satisfactory operation can be attained for periods of 12 months or more under conditions of light pressure or vacuum loads.

c. Viton/Nomex (part 4303 or kit 11307) - same as b above.

Where critical processes may involve the pumping of corrosive or toxic gas media, it is recommended that a monthly check of the diaphragm be part of a scheduled maintenance procedure.

Air Dimensions Inc. will supply recommendations on the choice of diaphragm material and or pump head construction on request.

*Diaphragms require close precision tolerance, therefore only ADI diaphragms should be used as replacements.

C. Disassembly of Head Section and Service Diaphragm

1. Remove head section by unscrewing the four large bolts. A flat-bladed screwdriver may be needed to gently pry the head free of the service diaphragm. **If you have Teflon coating on the heads use caution not to scratch the surface.

2. The valve body can then be removed by unscrewing the two smaller screws (also accessible on the top of the head section). This part may be freed by gently tapping on these two screws after they have been loosened about three or four turns. When the valve body is removed, check all internal surfaces for any accumulation of dirt. The two valve discs can be wiped clean and replaced as long as they appear unaffected by usage. The valve gasket can be easily removed and should be inspected. As a matter of good practice, the valve discs and valve gasket should be replaced during any routine maintenance check of the head section. A once a year routine procedure is recommended.

3. The service diaphragm is secured by the single screw in its center. Remove this screw with a 5/32" Allen wrench. The diaphragm and its clamping plate should be easily lifted off. Some slight adherence to the metal may occur if the diaphragm has been in use for a long period.

4. When replacing the service diaphragm, a Teflon washer (part# 23001) should be inserted under the head of the diaphragm cap screw. This is added insurance against small gas leaks through screw heads and may be essential in vacuum applications where outside air contamination cannot be tolerated. After tightening the screw, the excess Teflon should be trimmed away.

NOTE: When replacing the service diaphragm, be sure the four projecting studs of the base casting are properly located in the four outer holes provided in the diaphragm before the part is clamped in place. Be sure the diaphragm plate is firmly replaced with its center screw.

D. Disassembly and Replacement of the Connecting Rod

1. Remove head section and service diaphragm as described in (C) above. When this is done and the front screen has been removed, the connecting rod assembly may be taken out (refer to exploded view drawing). Gently pry up and remove the connecting rod cap (part# 3301) which is held in place by the diaphragm screw.

2. Loosen but do not remove the counterweight screw. This is accessible from the top of the pump base casting and will require a 5/32" hex allen wrench. The connecting rod eccentric assembly, including

counterweight and fan, will then slide of the motor shaft.

3. When replacing the eccentric assembly, be careful to align the flat section on the motor shaft with the counterweight screw. The eccentric assembly should be aligned so the fan is on the outer side from the motor. Slide this assembly as far onto the motor shaft as it will go before tightening the counterweight screw onto the flat of the motor.

NOTE: After prolonged use, the eccentric assembly may freeze up on the motor shaft. A wheel puller may be needed to free the part. When replacing the eccentric assembly, the motor shaft should be lightly coated with a graphite or MDS based lubricant.

E. Related Torque Values

1. Head bolts - 110 inch pounds.
2. Valve body screws and Diaphragm plate screws - 70 inch pounds

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