



# Operating & Maintenance Instructions

## AAA Valves — 1/4" Through 2" Sizes

These instructions cover all AAA soft seal valves (O-Rings between all ports) from 1/4" through 2" size.

The information listed below is for reference only and may change at factory discretion.

### THESE SAFETY PRECAUTIONS MUST BE OBSERVED

1. *Do not operate solenoid valves above 150 psi on the pilot section! Use "externally piloted" valves for pressures above 150 psi, unless otherwise stated on the nameplate.*
2. *Mount 2-position, no-spring models with spool horizontal to avoid accidental spool drift due to vibration.*
3. *Foot-operated valves should have OSHA approved safety guard.*
4. *Although AAA valves are virtually trouble-free through millions of normal cycles, they should be disassembled and inspected for wear after 250,000 cycles.*
5. *Do not over lubricate! For further information contact factory.*

### FACTORY PRE-LUBRICATION

All valves are pre-lubricated at the factory using Magnalube®-G teflon based all purpose grease. Valves are suitable for, and perform best in a low lube service.

For long life, use an air line filter/lubricator installed no further than 8 to 10 feet from the valve. The filter should be rated 25 ppm or finer. Use a high grade of petroleum base non-detergent lubricating oil no heavier than SAE 10W. **DO NOT OVER-LUBRICATE.** This could cause the spool to stick. You should not see oil dripping or misting through the exhaust ports of the valve.

**CAUTION!** Do not use questionable fluids in air line lubricators. Do not use petroleum oil with detergent additives, volatile or aromatic fluids, vegetable oil, cup grease, or automobile chassis lubricant. The use of questionable fluids may swell rubber seals in valves and cylinders.

### RECOMMENDED LUBRICATION

When cleaning AAA valves after extended service, lubricate the valve spool with AAA high film strength grease, or use O-Ring grease, which is usually available from supply houses that sell O-Rings. Magnalube®-G is included in all valve repair kits for proper valve maintenance.

AAA Products International recommends the use of Magnalube®-G in all of its products. This teflon based lubricant is rated to operate under extreme load conditions and wide temperature ranges, mechanically and chemically stable, water resistant, and reduces the need for repetitive re-applications. We do not recommend any lubricants that include cleaners or solvents. These types of lubricants have a tendency to swell the O-Rings and reduce the performance of the valve and then the O-Rings must be replaced.

### VALVE SEALS

AAA valves are virtually trouble-free through millions of cycles if these simple lubricating instructions are followed. Some oils may swell the rubber seals in valves and cylinders of any brand and may cause binding. To determine if seals are swelled in AAA valves, remove one O-Ring from the body and slip it over the spool. If the clearance between O-Ring and spool is 0.005" or more all around, the ring is swollen from its original shape. A small amount of swelling will not usually impair valve performance, and sometimes the valve will still perform reliably with as much as 1/32" clearance all around.

AAA spool valves use standard size O-Rings available almost anywhere in the world (70 Shore durometer hardness is standard). However, due to standard O-Ring tolerances, AAA factory O-Rings are recommended. Specially built or non-standard valves may have been furnished with special O-Rings to suit special operating conditions. When inquiring from the factory, give all model numbers appearing on the valve nameplate.

1/4" and 3/8" valve bodies use 6 O-Rings, 3/4" I.D. x 15/16" O.D., Viton®.

1/2" valve bodies have 6 O-Rings, 1-1/8" I.D. x 1-3/8" O.D., Buna-N.

3/4" and 1" valves have 6 O-Rings, 1-3/8" x 1-5/8" O.D., Buna-N.

1-1/2" and 2" valve bodies have 6 O-Rings, 2-1/4" I.D. x 2-5/8" O.D., Buna-N.

### TO REPLACE O-RINGS

Use a sharp tool, such as a pick or scribe, to remove the old rings. Use an air hose, and solvent if necessary, to thoroughly clean out the grooves in the body. The new rings can be inserted with the fingers in the 1/2" and larger bodies. Install 3 rings from each end of the valve. For the 1/4" and 3/8" valve bodies, use a pair of tweezers with an angled point, starting ring in groove in one side and working around. After installing rings, lightly grease the spool and body bore before assembly, using Magnalube®-G grease or O-Ring grease. Never use oil or any other grease. If tweezers are not available, slip the spool into the bore, as a guide, to just below a groove, and work the ring into the groove with a small rod.

(Continued on Opposite Side)

## VALVE ACTUATOR INTERCHANGE

The end actuators on AAA soft seal valves can be changed from one end to the other, to put the inlet port and cylinder ports on the desired side for convenience in plumbing. Remark nameplate to indicate modification. If actuators are desired on opposite ends of the valve from standard assembly as shown in the catalog, just reverse the two letters in the valve model number when ordering. Example: ES04 represents standard assembly; EOS4 has actuators reversed end for end.

## PORT CONNECTIONS AND FLOW PATTERN

Connect inlet pressure to port marked "1" or "P"; Ports "2" or "A" and 4 or "B" go to the ports on the cylinder or air motor being controlled. Speed control valves or air mufflers are recommended to be installed in exhaust Ports "3" or "EA" and "5" or "EB". These ports may be left open, however this may allow contaminants to enter the valve and reduce the performance or life of the valve. It is not recommended to restrict the exhaust on a common exhausted solenoid controlled valve (do not connect the exhausts and then restrict the exhaust).

When using a valve for 3-way service, plug the cylinder port not used. **Do not plug either exhaust port. Plugging both a working port and the exhaust at the same time can cause valve not to operate correctly. Do not plug both Ports "2" and "3" at the same time or Ports "4" and "5" at the same time.**

Air flow is controlled by the position of an internal spool. By moving the spool between positions the flow is diverted between operating ports, and the nonoperating port is connected to an exhaust port. Optional spools are available for center spool position to either block all ports, or supply air to both operating ports or allow both operating ports to vent to exhaust ports.

## FLUID MEDIA

Soft seal models are made for air, vacuum, and gases compatible with aluminum and Buna-N or Viton® rubber, at pressure ratings given in the catalog. They should not be used on liquids.

## SOLENOID VALVES

Check voltage and frequency before connecting. **Caution!** Do not operate solenoid valves with more than 150 psi on the pilot section, **unless otherwise stated on the name plate!**

Solenoid coils are suitable for continuous duty at their rated voltage and frequency. Power consumption depends upon the coil purchased. Consult our catalog or contact the factory for specific information. Do not overtighten nuts holding coils to valves.

Standard single solenoid models and double solenoid, spring centered models operate in the pressure range of 50 to 150 psi. They may be used on vacuum or up to 250 psi pressure by re-connecting them for "external pilot" operation, then connecting a low pressure 50 to 150 psi source of compressed air to the external pilot ports provided for this purpose.

Double solenoid, 2-position, no-spring models will operate on line pressures as low as 25 psi air or inert gas, and up to 150 psi, without external piloting. Special models can be furnished for higher or lower line pressure.

**Electrical Connections:** Either non-ground wire may be connected to positive (hot) or negative (neutral), the green wire is a safety ground only. Coils are non-polarity.

## BENCH TESTING OF SOLENOID VALVES

When operating a solenoid valve on a test bench, **the spool will not shift unless back pressure is applied to the cylinder ports.** Temporarily screw a pipe plug into each cylinder port while checking spool shift.

## CONVERTING TO "EXTERNAL PILOT" OPERATION

Always stamp the name tag with a "Z" suffix to indicate external pilot operation when converting valve.

On 1/4" and 3/8" models (with solenoid assemblies mounted on the ends), remove 4 screws holding the solenoid structure to the main body and remove the entire solenoid assembly. Rotate the entire solenoid assembly 180° and re-mount on the body. Connect a source of external pilot pressure, 50 to 150 psi, to the ext. pilot port of each solenoid structure. On double solenoid valves, both solenoids must be modified in this manner, and the source of external pilot pressure must be connected to the pilot port on both structures.

On 1/4" and 3/8" models (with solenoid assemblies piggy-backed on top of valve), remove 4 screws holding the piggy back structure to the main body and remove the entire assembly. Leave gasket as orientated on the main body and rotate the piggy back assembly 180° and re-mount on the body. Connect a source of external pilot pressure, 50 to 150 psi, to the ext. pilot port of piggy back structure.

On 1/2", 3/4" and 1" models, take out 4 screws and remove end cap assembly from end of valve body. Rotate gasket with the end cap assembly 90° in either direction. This will block the internal pilot passages. Connect a source of pilot pressure, 50 to 150 psi, to the 1/8" NPT pilot port on the side of the end cap structure. On double solenoid valves, both solenoids must be modified in this manner, and the source of external pilot pressure must be connected to the pilot port on both structures.

On 1-1/2" and 2", remove entire pilot valve assembly on top and install a 1/16"-27 pipe plug in the threaded hole uncovered in the main body. Re-mount the pilot valve and connect an external source of pilot pressure, 50 to 150 psi, into the external pilot port on the main body.

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