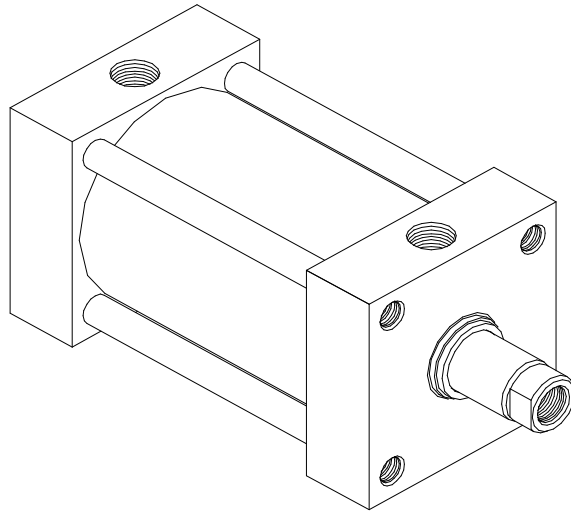




OPERATION AND MAINTENANCE
MANUAL FOR PNEUMATIC CYLINDERS



SERIES 2A
VALVE ACTUATORS

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A-STORAGE

If your Trueline pneumatic cylinder is not installed immediately, follow the procedure below for proper storage.

- 1- Store pneumatic cylinders in an indoor area which has a dry, clean and non-corrosive atmosphere. Take care to protect the cylinders from both corrosion and external damage.
- 2- Whenever possible, store cylinders in a vertical position (piston rod up) to prevent corrosion from possible condensation inside the cylinder.
- 3- Do not remove the port protector plugs until time of installation.
- 4- Apply a protective grease coating on all threads and other unpainted surfaces. After several weeks of storage, cylinders should be lubricated and cycled before being installed and submitted to any load.

B-INSTALLATION

Trueline Valve pneumatic cylinders are normally shipped with protective plastic plugs covering the ports. These plugs prevent dirt and other particles from entering the cylinder to avoid damaging the internal seals. We recommend removal of the port plugs just before connecting the air supply.

- 1- Attachment: Fix the cylinder strongly to its working attachments, making sure that the piston rod aligns perfectly with its mating component in both the extended and retracted position. Improper alignment could result in excessive rod gland and/or cylinder bore wear.
- 2- Protection: Special care should be given to the cylinder piston rod. Its surface should be free from any marks that could damage the piston rod wiper. Therefore any cylinders installed near a source of abrasive particles should be equipped with either a rod scraper or protective rod boot.
- 3- Cleanliness: Before connecting any air supply to the cylinder, all piping should be thoroughly cleaned to remove all chips or burrs, which might have resulted from cutting operation.



C- OPERATION

Each Trueline Valve pneumatic cylinder is meticulously assembled assuring perfect adjustment between all components. All sliding surfaces are factory lubricated with a lithium base grease. It is then inspected according to very high specifications to assure our customers of a premium quality product.

However, it is recommended to follow the recommendations below, in order to get the best possible performance from your cylinder.

- 1- Pressure: The maximum operating pressure of Series PA pneumatic cylinders should never exceed 150psig(1000KPa).
- 2- Filtration: The air supplied should always remain dry and free from any particles exceeding 30 microns.
- 3- Lubrication: It is recommended to use prelubricated air to maximize the life of the cylinder. A properly sized lubricator should be installed as close as possible to the cylinder.

D- MAINTENANCE

Trueline Valve cylinders are designed to give a very long life expectancy. However, packings and seals might need periodical replacement, to which the frequency will depend on the operating conditions and cycling.

- 1- Verification of piston packings
 - a) Apply air to blind end cap port of cylinder, allowing piston to travel its full stroke.
 - b) Disconnect air line from rod end cap port (head) of cylinder.
 - c) Apply pressure with your thumb to the open port. Maintain a few seconds and try to feel if air pressure is building up under your thumb. The affirmative would mean that the piston packing is leaking and therefore should be replaced.
 - d) Repeat steps a), b) and c) to verify the other piston packing. Pressure should be applied at rod end and piston rod should be retracted.



- 2- Verification of rod packings and seals
 - a) Apply air pressure to rod end port of cylinder
 - b) Spray a leak-detecting soap solution to piston rod and gland.
 - c) The formation of bubbles means that the responsible seal or packing has to be replaced.

- 3- Verification of barrel seals
 - a) Apply air pressure to the blind end cap port of the cylinder.
 - b) Spray a leak-detecting soap solution all around the barrel joint of the blind end cap.
 - c) The formation of bubbles means there is a leak... Verify if all four tie rods are torqued adequately, according to the chart included in this manual. If leakage persists, cylinder should be dismantled to correct the problem.(see dismantling and assembling instructions)
 - d) Repeat steps a), b) and c) for the rod end cap.



E- REPAIR

Repair of pneumatic cylinders should always be done in a clean area, equipped with adequate tooling.

1- Dismantling the cylinder

- a) Loosen the tie rod nuts 1/4 turn at a time alternating from corner to corner until tension is completely relieved on the tie rods.

CAUTION: SPRING-RETURN CYLINDERS

Cylinders loaded with a compressed spring are normally identified with a special nameplate. If you have any doubt, communicate with Trueline Valve to have the serial number checked.

The tie rods on a spring-return cylinder are normally longer to allow easier and safer dismantling of the cylinder. It is very important protect these extensions from damage and corrosion.

When removing the tie rod nuts on spring-return cylinders, ensure that the tie rods do not loosen from the cylinder head. Remove the nuts from the tie rods when the spring has totally decompressed.

In cases where the tie rod extensions have been cut or damaged, it is possible to dismantle the cylinder by removing two tie rods from opposite corners and replacing them with threaded rods of the same size and sufficient length. Afterward, remove the other two tie rods and relieve the spring by unscrewing the nuts from the threaded rods.

Trueline Valve will not be held responsible for any injuries to persons or property when a customer attempts to repair any spring loaded cylinder. We recommend to send all spring-return cylinders to our facility to have them repaired by our qualified technicians with proper equipment.

- b) Remove the nuts and tie rods from cylinder head.
- c) Remove cylinder head from assembly.
- d) Remove the piston and piston rod assembly from the barrel.
- e) Remove cylinder cap



- f) Inspect the barrel internal surface for any scores that could damage the packings.
- g) Remove the gland bushing from the head using a 1/4" thick flat bar.
- h) Remove packings from both piston and gland bushing, noting orientation of packing lips.
- i) Clean all parts thoroughly.
- j) Check all parts for excessive wear. Damaged parts should be replaced.
- K) In cases where the piston rod has to be removed from the piston, use a strap wrench around the piston and a "D" wrench on the rod flats. Caution: the threads have been locked with an anaerobic sealant; you may have to heat the assembly to ease the loosening.

2- Re-assembly of cylinder

- a) If the piston rod has been removed from the piston, re-insert the piston rod into the piston on the thread release side. Apply a few drops of an anaerobic sealant (Trueline Valve recommends Loctite #262). Secure the rod into the piston using a strap wrench and "D" wrench.
- b) Apply a light coating of grease on the outside diameter of piston (Trueline Valve recommends any lithium based precision grease equivalent to Dow Corning #44).
- c) Leave the piston flat on a table with the piston rod standing up.
- d) Install the first packing in the upper groove making sure to align the packing lips upward.
- e) Cylinders of bore sizes 10" and up have a third groove on their piston to insert a teflon wear strip. Roll the band around the piston; the two ends of the band should meet with an approximate space of 1/8". Maintain it in place with one hand until the insertion of the piston in the barrel.
- f) Place the barrel vertically on the table and apply a light coat of grease on the internal surface.
- g) Insert the piston and piston rod assembly into the barrel. The bottom groove should remain empty. If necessary, use a nylon tip to help the insertion of the



packing to avoid any damage. Slide the piston all the way to the other end of the barrel and let the empty groove come out of the tube.

- h) Install the second packing with its lips in the opposite direction.
- i) Push the piston back in the tube and re-apply grease on the internal surface at each end. Put aside.
- j) Apply sealing gaskets into the groove face of the head and cap.
- k) Let the barrel sit in the cap face groove.
- l) Screw the tie rods into the threaded holes on the head.
- m) Insert into the gland bushing, the seals and packings in their respective grooves. Make certain that both seals have their lips facing in opposite directions.
- n) Apply a light coat of oil to the internal surface of the bushing and screw this into the head using a 1/4" thick flat bar. Torque firmly.
- o) Install the head-tie rods-bushing assembly on the other end of the cylinder barrel being careful not to damage the rod seals.
- p) Screw the tie rod nuts and tighten 1/4 turn at a time proceeding from opposite corner to opposite corner. Consult the recommended torque chart supplied.