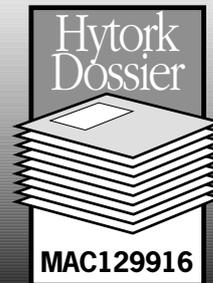


# Installation, Operating and Maintenance Instructions

# HYTORK



## Twin Port Actuators (0-90°) & QA Series

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## 1 Important Safety Procedures

Qualified maintenance personnel should read and follow these straightforward instructions.

ALWAYS disconnect the Air and Electrical supplies before carrying out any form of maintenance on an Actuator.

**Caution:** When removing any ball valve or plug valve assemblies from a pipe system, isolate the piping system on which the Actuator is installed and relieve any media pressure that may be trapped in the valve cavities before removing the Actuator for maintenance.

**Caution:** When working with Spring Return Actuators, always contain the Spring tension with HYTORK Retractor Rods as shown in Fig. 2 (*Spring Return End Cap Assembly*). Follow instructions for using the Retractor Rod carefully. Only HYTORK manufactured or approved Retractor Rods are to be used for Spring removal. As with any threaded tool that is frequently used, Retractor Rods should be checked to ensure that the threads are not worn or damaged in any way and greased regularly. Any damaged or worn rod must not be used and must be destroyed.

**Caution:** Never attempt to 'BLOW OUT' the Pistons from the Actuator Body by using air pressure when the End Caps have been removed.

**Read the relevant sections carefully before continuing.**

## 2 Repair Kits

### Recommendations.

HYTORK provide parts for their range of Actuators in kit form and it is recommended that when replacing 'O' Rings, that ALL 'O' Rings are replaced while the Actuator is disassembled.

### Spares Kits.

Each HYTORK Actuator Repair Kit includes the following items:

Infix Coils	2
Infix Coil Hole Plugs	2
Top Pinion Washer	1
Top Pinion Snap Ring	1
Top Pinion 'O' Ring	1
Bottom Pinion 'O' Ring	1
Piston 'O' Ring	2
End Cap 'O' Ring	4

### Retractor Rods.

HYTORK Retractor Rod Sets are available from HYTORK or your local Stocking Distributor of HYTORK products.

## 3 Complete Disassembly

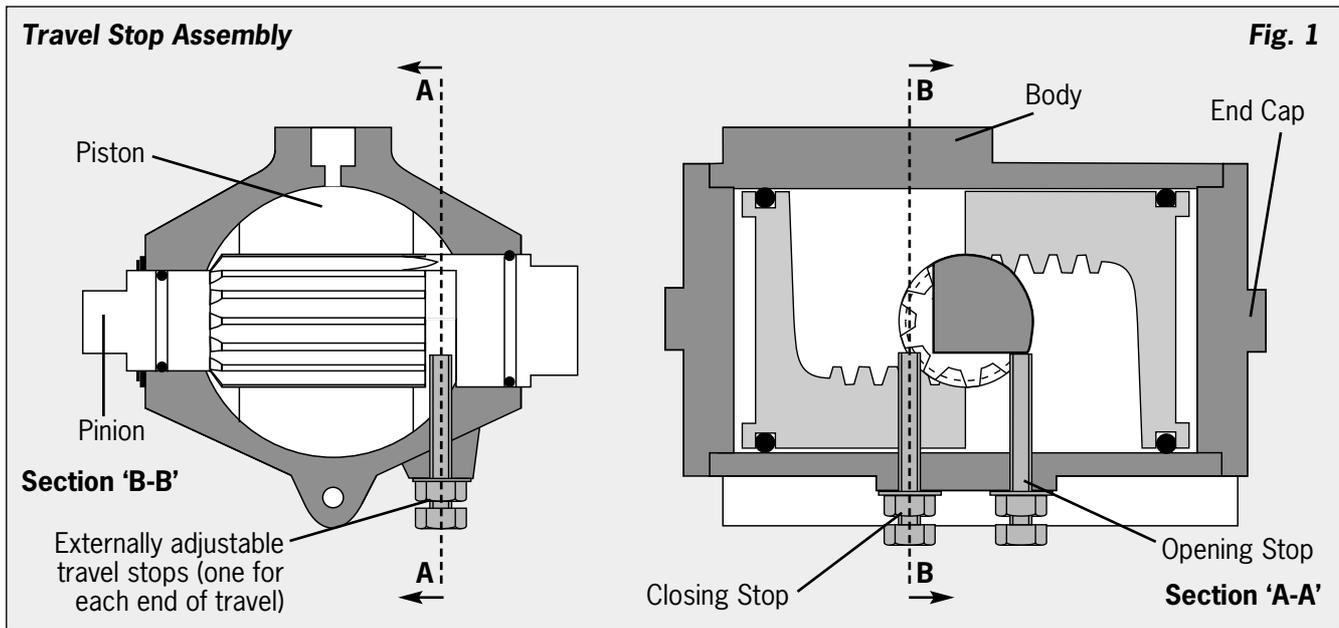
### Double Acting Models

#### Removal of Travel Stops (if supplied).

Unscrew and remove both Travel Stops, which are located at the base of the Actuator body centre section on the side opposite to the Actuator air connections (see Fig. 1).

#### Removal of End Caps.

Unscrew the two seal plugs that are located in the body next to each end cap, to permit the infix coil to exit. Rotate the end cap in the direction that causes the infix coil to come out of the hole. The rotation should continue about one full turn at which point the coil can be pulled from



the hole. Having removed the coil from one end cap, repeat the operation with the other end cap. When both coils have been removed, push out the end caps part way by rotating the pinion. Remove the end caps by pulling them free from the body, avoiding any 'cocking' of the end caps.

**Removal of Pistons.**

Rotate the pinion by means of a wrench to drive the pistons apart until the pinion rotates freely. Rotate the pistons in the cylinder bore approximately 10 degrees. Rotate the pinion carefully and the pistons will push free of the cylinder bore.

**Removal of Pinion.**

Remove the snap ring and washer from the top of the pinion and CAREFULLY push the pinion from the cylinder body. Care MUST be taken to ensure that the pinion does not damage the bores during this

operation. If necessary remove any burrs etc. before removing the pinion.

**Inspection.**

Clean and examine all parts for damage and wear.

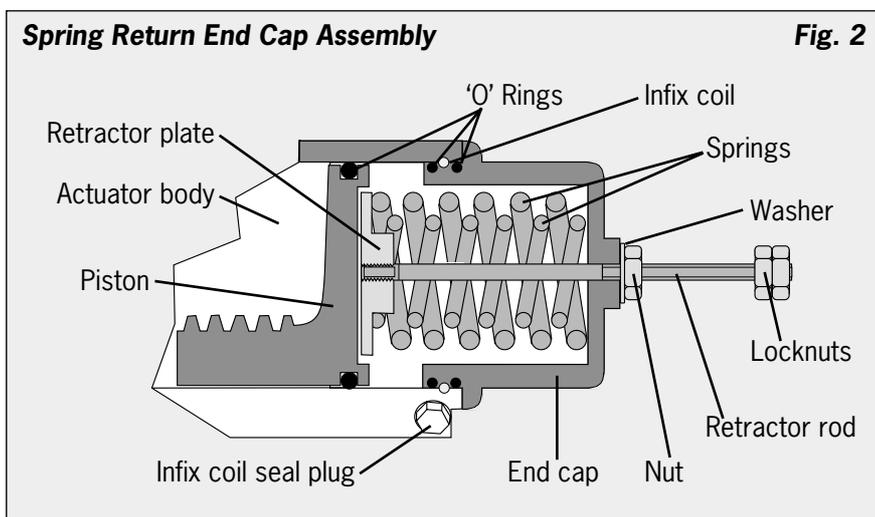
**Spring Return Models**

**Removal of End Caps.**

Place the HYTORK RETRACTOR ROD through the hole in the end caps and screw the rod into the spring retractor plate until it is fully engaged. Thread engagement should be at least 1/2" (12mm) and the rod should be tightened by using locknuts to ensure complete engagement.

Unscrew the two seal plugs that are located in the Actuator body next to each end cap, to permit the infix coil to exit. Screw the nut and washer closest to the end cap clockwise down the RETRACTOR ROD until they come up against the end cap. Using a wrench, continue to screw the nut clockwise down the rod AT LEAST two complete turns to draw the spring retractor plate away from the piston head (see Fig. 2).

Rotate the end cap in the direction which causes the infix coil to come out of the hole. The rotation should continue about one full turn at which point the coil can be pulled from the hole. Having removed the coil from one end cap, repeat this operation with the other end cap. When both coils have been removed, push out the end caps part way by rotating the pinion. Remove the end caps by pulling them free of the body, avoiding any 'cocking' of the end caps.



**Dismantling of the Body Sub-Assembly.**

These operations are as described for Double Acting Actuators, for Removal of Pistons, Removal of Pinion and Inspection.

## 4 Assembly Instructions

### Double Acting Models

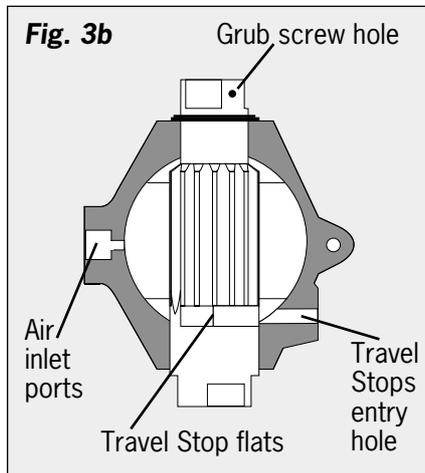
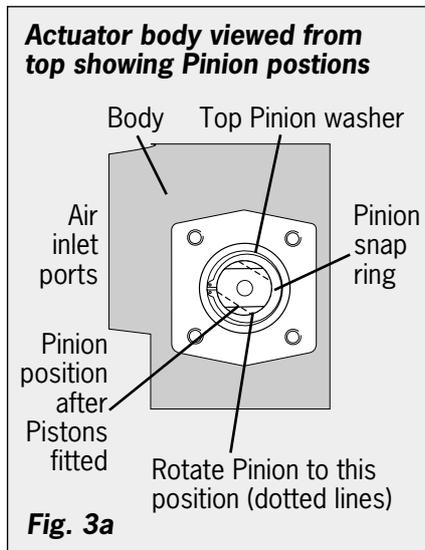
#### Inspection.

Check that all components are clean and free from damage.

#### Fitting the Pinion.

Fit 'O' Rings to the pinion and grease the pinion all over using a MOLYBDENUM based grease. Push the pinion into the cylinder body, taking CARE not to damage the bores with the pinion gear. Slight rotation of the pinion will assist when trying to enter the 'O' Rings. Fit the pinion washer and the snap ring.

Rotate the Pinion so that when viewed from the top of the body (as shown in Fig. 3a), the Pinion flat faces are at



approximately 30°. If Travel Stops are fitted, the grub screw hole on the top of the pinion must be facing away from the air inlet ports (as shown in Fig. 3b). This ensures that the machined Travel Stop Flats on the base of the pinion are in the correct position.

#### Fitting the Pistons.

Grease the pistons and Actuator cylinder bore, using a MOLYBDENUM based grease, fit the piston 'O' Rings. Insert the pistons into the cylinder bore (one piston in each end) with the gear teeth facing each other (as shown in Fig. 4). When the pinion is rotated clockwise as viewed from the top of the body, the pistons are drawn together. The top pinion drive flats should be at RIGHT ANGLES to the axis of the Actuator body.

#### Fitting the Travel Stops (where supplied).

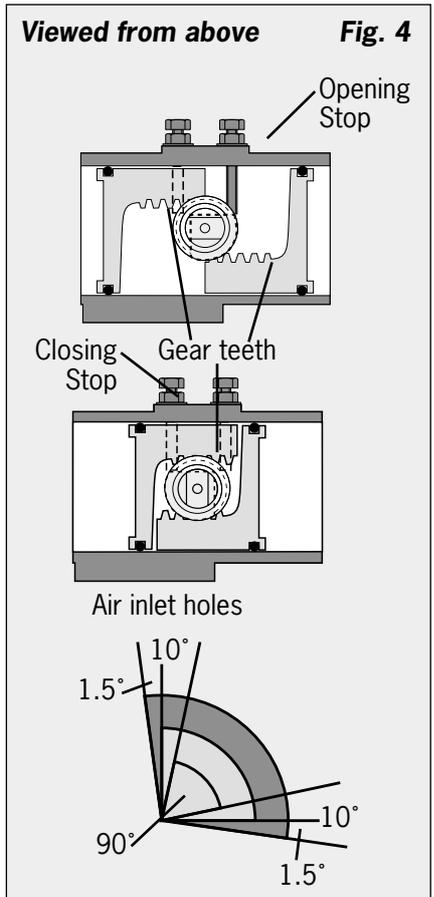
With the pistons together, screw in the travel CLOSING stop until it comes into contact with the pinion (Fig. 1). Rotate the pinion to drive the pistons apart only 90 degrees and screw in the Travel OPENING stop until it comes into contact with the pinion (Fig. 1).

Hytorch Actuators have an overtravel of 1.5 degrees at either end of the stroke, and the Travel Stops permit adjustment of 10 degrees including the overtravel (as shown in Fig. 4). Final adjustment is easily made when the Actuator has been re-fitted to its valve, damper or other device, to suit individual requirements.

#### Fitting the End Caps.

Grease the retaining coil grooves in the cylinder bore and on the end cap. Fit the two 'O' Rings in the grooves in the end cap from which the originals were removed and insert the cap into the Actuator body so that the Drive Pin located in the wire groove of the end cap is positioned approximately 0.75" (19mm) radially past the infix coil entry hole on the Actuator body.

Insert the Infix Coil into the hole and then rotate the end cap, keeping the infix coil against the drive pin. Rotate the end cap until the end of the infix coil is flush with the Actuator body. Refit the two seal plugs into the infix coil entry holes.



**IMPORTANT: ALL HYTORC ACTUATOR REPAIR KITS ARE SUPPLIED WITH INFIX COILS CUT TO AN EXACT LENGTH THAT WILL FIT THE FULL CIRCUMFERENCE OF THE END CAP. ANY SHORTENED COIL MUST NOT BE USED. IF IN DOUBT CONTACT HYTORC OR YOUR LOCAL DISTRIBUTOR.**

### Spring Return Models

#### Assembly of Pinion, Pistons and Limit Stops.

Assemble in accordance with the instructions for Double Acting models.

#### Fitting the End Caps.

Using the HYTORC RETRACTOR ROD, pull the springs into the end cap so that the spring retractor plate will not touch the piston head when the module is fully inserted into the Actuator body.

Grease the retaining coil grooves in the cylinder bore and on the end cap. Fit the two 'O' Rings to the cap in the grooves from which the originals were removed and insert the cap in the body so that the

drive pin located in the coil groove is positioned approximately 0.75" (19mm) radially past the infix coil entry hole on the body.

Insert the infix coil into the hole and then rotate the cap keeping the infix coil against the drive pin. Rotate the cap until the end of the infix coil is flush with the Actuator body. Refit the two seal plugs in the infix coil entry holes.

**IMPORTANT: ALL HYTORK ACTUATOR REPAIR KITS ARE SUPPLIED WITH INFIX COILS CUT TO AN EXACT LENGTH THAT WILL FIT THE FULL CIRCUMFERENCE OF THE END CAP. ANY SHORTENED COIL MUST NOT BE USED. IF IN DOUBT CONTACT HYTORK OR YOUR LOCAL DISTRIBUTOR.**

When the end cap is in place, remove the HYTORK Retractor Rod completely, by firstly releasing the nut and washer against the Actuator end cap and then unscrewing the rod by using the two locked nuts at the end of the Retractor Rod.

## 5 Piping Instructions

See Fig. 5 for piping instructions.

### Piping instructions

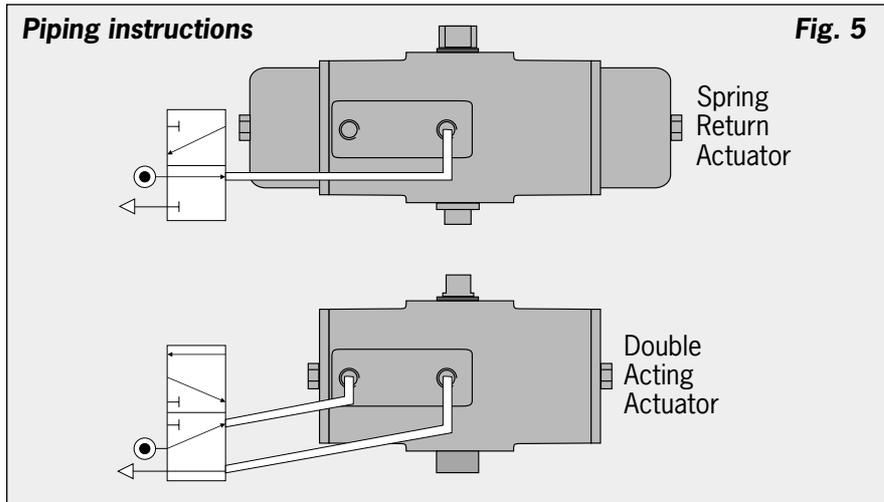


Fig. 5

## 6 Testing the HYTORK Actuator

Using compressed air at 80-100 psi (5.5 - 7 bar) check the seal areas with soapy water, ensuring there are no leaks and that the Pinion rotates smoothly over its full travel.

## 7 Testing and Cycling of Infrequently Used or Stored Actuators

Actuators not in current use (i.e. Actuators in storage or stock and/or not operated for at least a 3 month period), should be cycled a minimum of ten times and tested against the possible 'pre-set' of the seals. This is a safety precaution recommended by the Seal manufacturers.

## 8 Service

It is the policy of HYTORK to give the best possible service to our customers. We are happy to assist you in any way we can and if you have any questions about HYTORK Actuators or other HYTORK Products please do not hesitate to contact one of HYTORK'S VALVE AUTOMATION CENTERS or your local HYTORK Stocking Distributor.

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### Hytork Controls Europe

Valve Automation Center  
6 Bracken Hill  
Southwest Industrial Estate  
Peterlee  
County Durham  
SR8 2LS UK  
Tel: [+44] (0191) 5180020  
Fax: [+44] (0191) 5180032  
Email: hcesales@hytork.com  
http://www.hytork.com

### Hytork Controls Inc.

Valve Automation Center  
9009 King Palm Drive  
Tampa, Florida 33619  
USA  
Tel: [+1] (813) 630 2255  
Fax: [+1] (813) 630 9449  
Email: hcisales@hytork.com  
http://www.hytork.com

### Hytork Controls Australian Operations

25 South Street  
Rydalmere  
NSW 2116  
Australia  
Tel: [+61] (2) 9841 2414  
Fax: [+61] (2) 9684 6439  
Email: hcpsales@hytork.com  
http://www.hytork.com

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