

DynaTorque Inc.

Spring Return Manual Override (SRD Type) Installation & Operation Instructions

Installation:

The DynaTorque model SRD manual override operators offer safe and easy positioning of valves when manually overriding a spring return pneumatic actuator. Each SRD operator comes complete with a handwheel and blank drive coupling which can be easily removed for machining to match the pneumatic actuator and valve stem requirements.

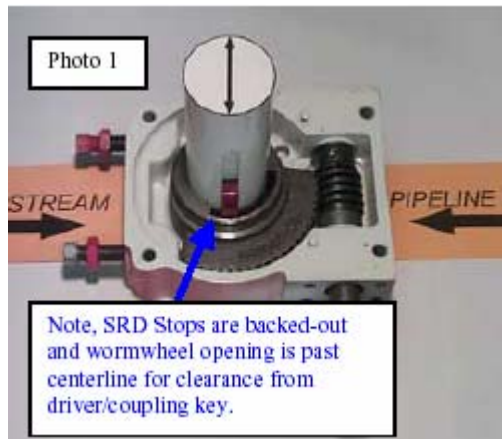
Important Note: Since the external key in the blank drive coupling mentioned above is not contained in the mating part in a traditional manner, it is necessary to bolt that key to the drive coupling to prevent possible key roll. The key has been pre-drilled and counter-bored, and hardware has been supplied. Position the key in the key slot to provide maximum engagement in the override output and using the key as a guide, drill and tap two holes for the hardware provided.

The following steps should be taken to install the DynaTorque SRD override. DynaTorque recommends operator mounting while on the test stand with the valve in the fail position.

Proper orientation and initial commissioning of the SRD manual override is a vital step as a part of the total valve and pneumatic actuator system. *[The following information is designed for the installation start-up procedure of a valve system including a DynaTorque SRD Override Operator. It is critical the installer verify the pneumatic actuator, the valve, the SRD override, and drive coupling, and any adapting bracketing are all in the same position when fully assembled.]*

The same SRD unit can be used for “Fail CCW” (left) or “Fail CW” (right) with proper key arrangement and assembly.

For Overrides which fail closed:

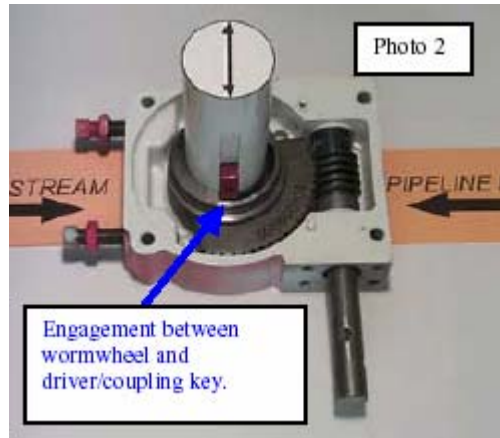


[Although the pictures show a CW (clockwise) Fail Closure; the same mirrored steps can be followed for a CCW (counter-clockwise) Fail Closure.

Step 1. Prior to installation in the valve and actuator system, loosen (back-out) both SRD travel stop bolts from the main housing approximately six to eight turns (Warning: rotating the stop bolt more than six to eight turns may allow the worm wheel and worm to disengage during the next phase of Step 1) Rotate the input shaft CW which in turn rotates the override output clockwise until the end of the key slot is just past centerline. (Ref Photo 1)

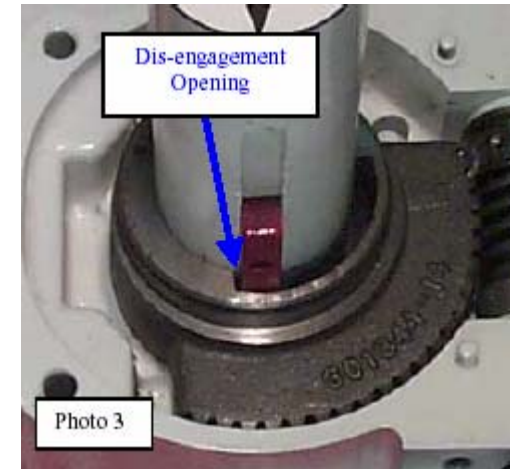
Step 2. Install the SRD override in the valve and actuator assembly making sure that the valve and actuator are in the closed position. **Note: Mounting holes on some SRD overrides break into the housing cavity creating a grease leak path. The use of Teflon tape is recommended for all valve side bolt installations.**

Step 3. Set the pneumatic actuator position stop for full closed position. The actuators position stop will always be contacted for the full closed position during normal operation not the SRD's stop.



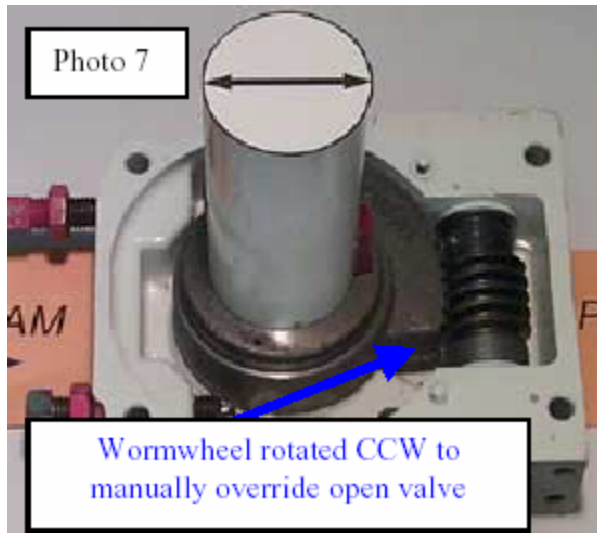
Step 4. Rotate the SRD input shaft CCW until the key in the drive coupling comes into contact with the end of the key slot and the coupling just begins to turn. (Ref Photo 2). Upon contact, reverse the SRD input shaft $\frac{1}{2}$ to $\frac{3}{4}$ of a turn to disengage the drive coupling key from the worm wheel. This will put a very small opening between the key slot and the drive coupling key. This is the SRD units **Home Position**. (Ref Photo 3)

Step 5. Set the SRD travel stop for the closed position (Home Position) by turning the bolt clockwise until the bolt comes into contact with the end of the worm wheel. Reverse the bolt $\frac{1}{2}$ turn to insure that the SRD travel stop is not used as the primary seating element for the pneumatic actuator. Tighten the lock/jam nut against the body of the override. (Note: If the SRD override has been optionally equipped with the Home Position Indicating Stop Bolt, The pins head will be pressed out to indicate the SRD override is in the "Home Position"



Step 6. Reposition the valve to the full open position using the pneumatic actuator. (Note: There should be no interruption of the 90 degree strike of the valve by the SRD or any other component. If there is an interruption, identify the problem and make the necessary corrections.) Set the pneumatic actuator position stop for the full open position. (Ref. Photo 5)

Step 7. Return the valve to the full closed position using the pneumatic actuator, to confirm the proper setting of all components. Stroke the valve and actuator assembly several times from closed to open to close to confirm proper pneumatic operation. (Note: When the assembly is in the closed position, the SRD input shaft should be able to be freely rotated $\frac{1}{2}$ to $\frac{3}{4}$ of a turn in the CCW direction if properly adjusted. (Note: It is critical to the function of the assembly that the SRD be returned to the home position after every cycle where the SRD is used. Failure to do so may render the assembly in-operable.



Step 8. Manually turn the input shaft of the SRD CCW to fully open the valve. (Note: Airlines, which may prevent back driving the actuators pneumatic piston, must be purged or otherwise vented.) As the spring in the actuator is compressed, the operating input torque of the SRD will increase. (Ref Photo 7)

Step 9. Verify the full open position of the valve by visually locating the position of the disc, ball, or plug. Set the SRD open stop bolt by turning it CCW until it comes into contact with the worm wheel. Upon contact, reverse half turn to insure the SRD stop bolt is not used as the primary seating element. (Ref. Photo 8)

Step 10. Return the SRD to the “Home Position” by rotation the input shaft CW. Complete at least one more cycle test to insure correct operation of the pneumatic actuator.



(Warning:

- The SRD must remain in the “Home Position” at all times for the pneumatic operator to function properly. Leaving the SRD in any other position will result in system failure and may cause damage to the SRD or pneumatic system components.
- Adjustment of the SRD stops from initial assembly position may prevent valve from achieving full open or full closed positions and may cause damage to SRD or pneumatic system or components.
- Remember, drive coupling exterior key should be bolted in place to prevent key roll.

Installation Tips:

1. When designing mounting kits, torque transmission devices, or specifying mounting hardware the unit rating should be considered. DynaTorque recommends using grade 5 and higher bolts with lock washers for mounting overrides to valve actuator and valve mounting flanges.
2. With the drive coupling removed from the override, place the override on the valve assembly and loosely bolt into place.
3. Before reinstalling drive coupling, liberally grease the outside of the driver and the override bore. This will prevent galling and reduce the possibility of corrosion between the two components.
4. Reinstall the driver making sure the end of the driver configured to fit the valve stem is correctly aligned.
5. Tighten the valve to SRD mounting bolts.
6. The opposite end of the drive coupling should be configured to match the pneumatic actuator output. Align the pneumatic actuator drive with the override drive coupling and lower the pneumatic actuator into place on the top flange of the override.
7. Bolt the pneumatic actuator in place.
8. Adjust override travel stops as indicated above.

Safety (Continued)

Standards. In most cases, operator and handwheel packages have been sized to produce rated torque with a maximum of 80 lbs. of handwheel rim effort. The use of larger handwheels, cheater bars, etc. will void the override warranty and may cause damage to the actuator, override, valve stem, drive couplings, or other torque transmitting devices as well as being dangerous to the user.

Trouble Shooting:**1. Override does not work at all, or very little. Read Trouble Shooting #3 prior to servicing.**

- A) Never use excessive force. If the operator will not operate correctly, follow these steps.
- B) Make certain that all compressed air has been exhausted from the pneumatic actuator. The actuator must be vented on both sides of all pistons.
- C) Make sure that all components were installed in the same beginning position. The wrong position of any one of the torque transmitting devices, couplings, drivers, can prevent the operator from stroking.
- D) Be certain that nothing is physically preventing the valve from closing/opening. That is, make sure that nothing is lodged in the valve element (ball, plug, disc. etc.)
- E) Check that no physical damage has occurred which might limit or prevent movement of the actuator. Such as a dented actuator cylinder, damaged drive coupling or hardware.

Trouble shooting:

2. Override operates, but not full travel. Read Trouble Shooting #3 prior to servicing.

- A) Never use excessive force. If the operator will not operate correctly, follow these steps.
- B) Make certain that all compressed air has been exhausted from the pneumatic actuator. The actuator must be vented on both sides of all pistons.
- C) Check to insure that the stop adjustment settings for the pneumatic actuator, valve, and override will allow the desired amount of travel.
- D) Be certain that nothing is physically preventing the valve from closing/opening. That is, make sure that nothing is lodged in the valve element (ball, plug, disc. etc.)
- E) Check that no physical damage has occurred which might limit or prevent movement of the actuator. Such as a dented actuator cylinder, damaged drive coupling or hardware.
- F) Check to insure that no drive components have been deformed. All drive components must be correctly placed and not partially sheared. Check all couplings for excessive wear/looseness and insure all bolts are snug.

Trouble shooting:

3. If the steps list above do not solve the problem, read all of the following proceeding in order as indicated.

- A) Cycle test the pneumatic actuator and override as an assembly. Assuming these components cycle fully, the problem is probably the valve. Check the valve for any obstructions. If no obstructions are visible call the valve manufacturer for further information.
- B) If the pneumatic actuator and the override assembly does not appear to function properly, make sure that the pneumatic actuator's spring is fully extended. **Never remove or separate the pneumatic actuator from the override without fully extending the spring.** Separate the pneumatic actuator from the override and cycle test separately. The problem component should be apparent at this time.
- C) If the pneumatic actuator appears to be the problem, contact the manufacturer for further instructions. If the override appears to be the problem please contact your local DynaTorque representative or the factory.

Please Note:

When assembling DynaTorque products to a valve or to an automated valve package, standard engineering practices must be utilized to assure proper mounting orientation, configuration, and distribution of weights and forces. Failure to do so could cause product damage and/or malfunction, **and void warranty consideration**. If there are any questions please contact the factory at info@dynatorque.com.