

Installation, Operating, and Maintenance Instructions

Heavy Duty Hydraulic Overrides

Hydraulic manual overrides on Automax heavy-duty actuators provide a compact, rugged method for manually operating the actuator. The hydraulic override consists of either a hydraulic piston or ram, a hand pump, and a control valve. Double acting actuators require a piston, and spring return actuators utilize a ram. The piston or ram is an integral part of the actuator, designed to override the full rated torque of the actuator.

Installation

Automax standard hydraulic overrides are supplied as a complete integral component of the heavy duty actuator. Override units are shipped with required accessories, tubing, and fluid installed on actuator, ready to be used. No additional customer installation is required. Oil level in hydraulic override should be checked prior to installing actuator into service. See maintenance instructions for checking oil level. See Automax Nuclear Qualified Heavy Duty Actuator bulletin B00143 for instructions on installing Heavy Duty actuator into service.

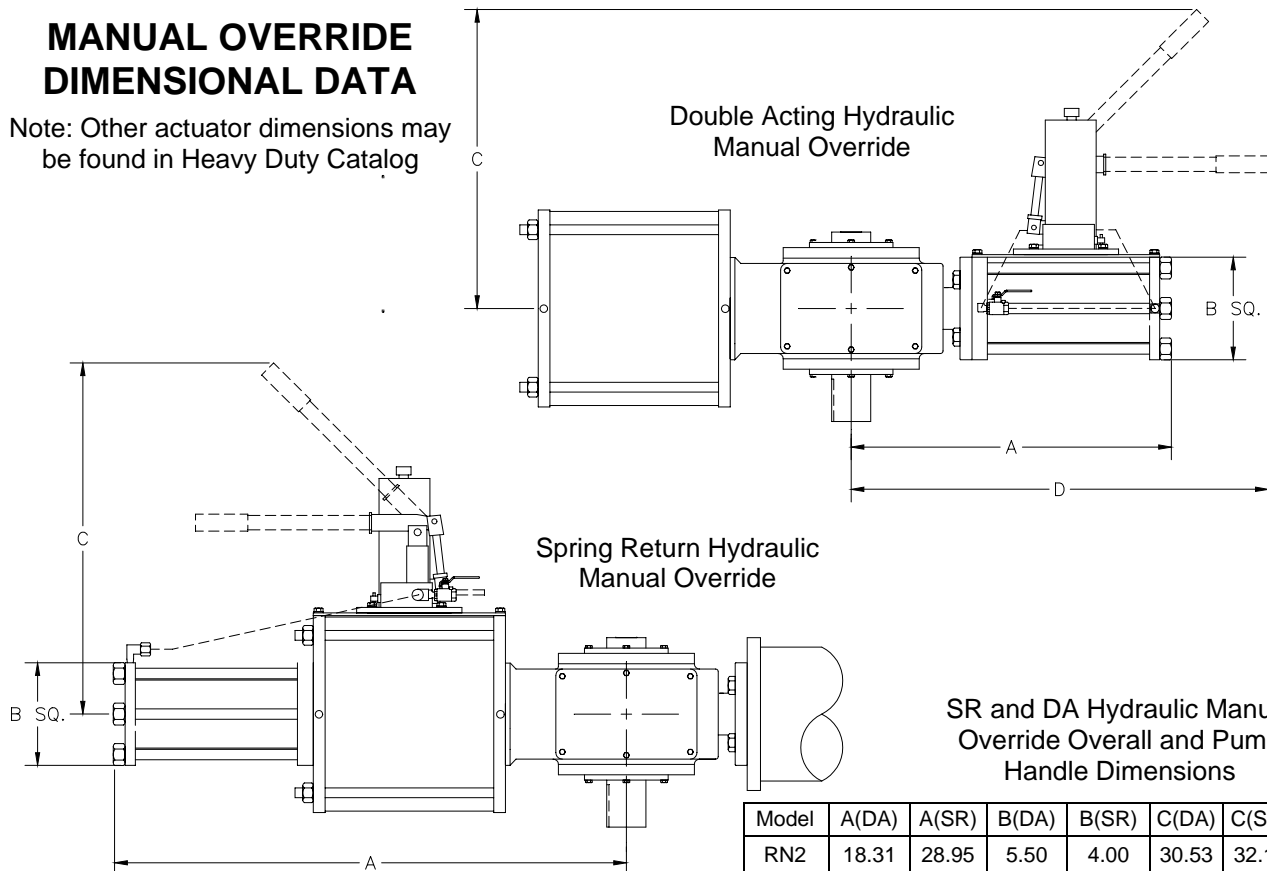
Note: Actuator orientation must be specified when ordering, to allow for proper orientation of pump and reservoir. Standard orientation is horizontal, as shown below, under 'Manual Override Dimensional Data'.

Special hydraulic override units may be supplied with remote mounted pump and controls. Installation of such units is as follows:

1. Run required hydraulic supply tubing from remote pump and controls to appropriate ports on hydraulic override, per schematic supplied with unit.
2. Fill pump reservoir with a fire-resistant, nuclear approved hydraulic fluid, such as Exxon Firexx HS68. Consult factory for seal compatibility.
3. Use hand pump to circulate fluid into hydraulic lines. Bleed air from lines by loosening cylinder bleed plug or fitting on the hydraulic override. Pump reservoir may have to be filled a few of times to completely fill the hydraulic lines.
4. See maintenance instructions to check oil level.

MANUAL OVERRIDE DIMENSIONAL DATA

Note: Other actuator dimensions may be found in Heavy Duty Catalog



SR and DA Hydraulic Manual
Override Overall and Pump
Handle Dimensions

Model	A(DA)	A(SR)	B(DA)	B(SR)	C(DA)	C(SR)	D
RN2	18.31	28.95	5.50	4.00	30.53	32.18	36.75
RN3	22.44	33.75	7.13	5.13	31.35	36.24	39.31
RN4	29.13	45.93	9.82	6.75	32.69	39.70	44.34

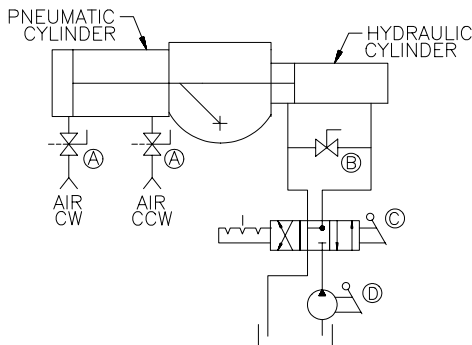
Operation

Operation of hydraulic overrides requires shifting a manual valve and operating a hand pump. Standard operation for DA or SR actuators is described below. Operation of special hydraulic override designs is per hydraulic schematics supplied with actuator.

Double Acting

Pneumatic Operation:

1. Open ball valve 'B' on hydraulic override.
2. Place directional valve 'C' in mid position.
3. Open dump valves 'A' on pneumatic cylinder.
4. Connect air supply pressure and operate.



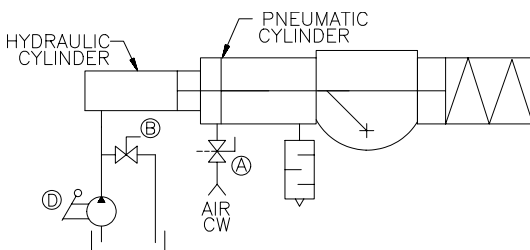
Manual Override:

1. Close both dump valves 'A' clockwise to block air pressure and vent cylinder.
2. Close ball valve 'B' clockwise.
3. Rotate directional valve 'C' handle full clockwise to manual override actuator counter-clockwise.
4. Rotate directional valve 'C' handle full counter-clockwise to manual override actuator clockwise.
5. Operate manual pump 'D' to override actuator.

Spring Return

Pneumatic Operation:

1. Open ball valve 'B' on hydraulic override.
2. Open dump valve 'A' on pneumatic cylinder.
3. Connect air supply pressure and operate.



Manual Override:

1. Close dump valve 'A' clockwise to block air pressure and vent cylinder.
2. Close valve 'B' clockwise.
3. Operate pump to open actuator against spring.
4. Open valve 'B' to allow actuator to spring return.

Maintenance

Disassembly Procedures

1. Disconnect all air and electric supplies from actuator.
2. Remove all accessories from actuator and dismount actuator from valve.

Note: See Heavy Duty Nuclear Qualified Actuator Bulletin B00143 for complete instructions on actuator disassembly.

Hydraulic Pressure Group

1. Drain hydraulic fluid from cylinder.
2. Remove Tie Rod Nuts (8), Tie Rods (7), and the Endcap (9).
3. Slide Cylinder (1) over Piston (2) or Ram (2). DA Cylinder is honed and chromed; care should be taken not to scratch inner cylinder walls.
4. DA: Remove Piston Bolt (3), and Piston Bolt Lockwasher (4). Remove Piston (2) and Piston Face Seal (5).
5. DA: Remove Adapter Nuts (12) and Lockwashers (13), and carefully slide Adapter (11) over Piston Rod. Remove High Pressure Rod Seal (14). SR: Remove Hydraulic Adapter (11), High Pressure Rod Seal (14), Rod Bearing (15), and Low Pressure Rod Seal (16).

Reassembly Procedures

1. Inspect all parts for wear and replace any worn parts as needed. Normally, all seals and gaskets should be replaced when reassembling an actuator.
2. Clean all components and lubricate seals with the hydraulic fluid.
3. Reverse the disassembly procedures to reassemble. Tie Rod Locknuts (8), Adapter Nuts (12), and Piston Bolts (3) should be tightened to torque listed on Bolt Torque chart. All threads should be lubricated with Locktite Nuclear Grade Pipe Sealant 580 prior to assembly.
4. Recommended spare parts are shown in Parts and Materials section below.
5. Test the actuator for smooth operation and absence of hydraulic leakage before re-installing.

Checking Oil Level

1. Actuator should be in full CW position for DA actuator or failed position for SR actuator.
2. Remove cap from oil reservoir and check oil level.
3. Oil level should be 2-3 inches from top of reservoir. If required, add hydraulic fluid to reservoir to reach this level.

Pump/Oil Specifications

Temperature: 0°F to 300°F

Oil Type: Fire resistant, Nuclear Approved hydraulic fluid, such as Exxon Firexx HS68. Consult factory for seal compatibility and temperature ranges of other fluids.

Oil Volume:

Actuator	SR/DA	Volume (gal)
RN2	SR	1/2
	DA	1/2
RN3	SR	1/2
	DA	3/4
RN4	SR	1
	DA	1 1/2

Pump Pressure: DA 1500 psi
SR 3500 psi

Number of strokes to override:

Actuator	SR/DA	# Pumps
RN2	SR	17
	DA	9
RN3	SR	45
	DA	25
RN4	SR	132
	DA	74

Bolt Torques**Piston Bolt (3) (SAE Grade 8 Bolt)***

<u>Actuator Size</u>	<u>Bolt Size</u>	<u>Torque Range</u>
RN2	3/4"-10 UNC	271-320 ft.lb.
RN3	1 1/4"-7 UNC	537-591 ft.lb.
RN4	1 1/4"-7 UNC	1014-1116 ft.lb.

* Not present in SR overrides

Tie Rod (7) (A311 Stressproof Rod)

<u>Actuator Size</u>	<u>Bolt Size</u>	<u>Torque Range</u>
RN2	5/8"-11 UNC	117-130 ft.lb.
RN3	3/4"-10 UNC	207-229 ft.lb.
RN4	1"-8 UNC	249-270 ft.lb.

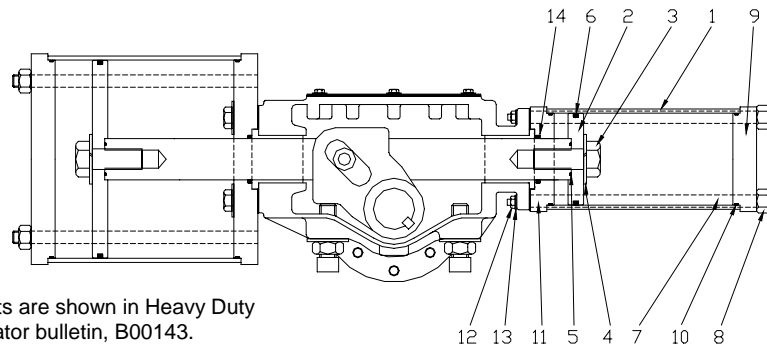
Adapter Nut (12) and Stud (ASTM A193 Gr. B7)*

<u>Actuator Size</u>	<u>Bolt Size</u>	<u>Torque Range</u>
RN2	1/2"-13 UNC	64-71 ft.lb.
RN3	3/4"-10 UNC	226-249 ft.lb.
RN4	1"-8 UNC	546-603 ft.lb.

*Not present in SR Overrides

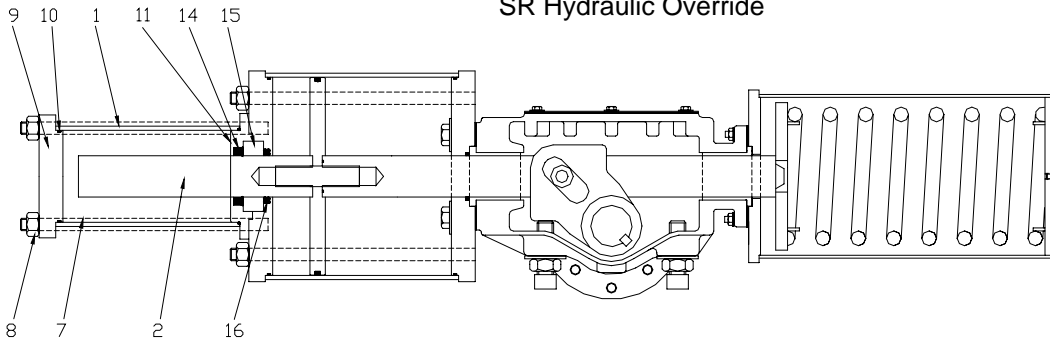
Parts and Materials

DA Hydraulic Override



Note: Other components are shown in Heavy Duty Nuclear Qualified Actuator bulletin, B00143.

SR Hydraulic Override



Item	Description	Material	Qty
1	Cylinder	Steel/Chrome Pl.	1
2	Piston(DA)/Ram(SR)	Steel	1 [†]
3	Piston Bolt	Steel	1 [†]
4	Piston Bolt Lockwasher	Steel	1 [†]
5	Piston Face Seal	Viton	1* [†]
6	Piston Seal	Viton/Nylon	1* [†]
7	Tie Rod	Steel	4
8	Tie Rod Locknut	Steel/Nylon	4
9	Endcap	Steel	1
10	Cylinder Seals	Viton	2
11	Adapter	Steel	1 [†]
12	Adapter Nuts	Steel	4 [†]
13	Adapter Stud Locknuts	Steel	4 [†]
14	High Pressure Rod Seal	Flouromyte/Viton	1*
15	Rod Bearing	Bronze	1 [‡]
16	Snap Ring	Steel	1 [‡]
17	Low Pressure Rod Seal	Viton	1* [‡]

Seal Kits

Viton/Flouromyte- RN(Actuator Base Model)-SKV
i.e.: Buna Seal kit for RN316SR80HV is:
RN316SRHSKV

Replacement hand pumps, manual directional control valves, and manual ball valves are also available. Consult factory.

*Recommended Spare Parts

[†]Not present in SR Actuator Override

[‡]Not present in DA Actuator Override