

Hydraulic Linear Actuator Instructions



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The following Instructions should be thoroughly reviewed and understood prior to installing, operating or performing maintenance on this equipment. Throughout the text, safety and/or caution notes will appear and must be strictly adhered to; otherwise, serious injury or equipment malfunction could result.

Actuator Type	
SRO	Spring that Retract Actuator Stem
SRC	Spring that Extend Actuator Stem
DA	Double Acting Actuator (no spring)

The actuator is comprised of a hydraulic cylinder with an internal spring (in case of SRO/C). Pressurizing the cylinder top cap port for SRO type or the bottom cap port for SRC type the spring is compressed and the actuator stem reach the position opposite to the spring. For actuator with manual override, the manual handwheel shall be operated with absence of hydraulic supply only. After manual operation the device shall be reset in automatic position.

Caution: Not resetting the manual override may result a damage to the cylinder parts

1. Introduction

The following instructions are designed to assist maintenance personnel in performing most of the maintenance required on Models SRO , SRC and DA cylinder actuators. Paladon has highly skilled service engineers available for start-up, maintenance and repair of our actuators and component parts. In addition, a scheduled training program can be conducted at our workshops to train customer service and instrumentation personnel in the operation, maintenance and application of our actuators and instruments. Arrangements for these services can be made through your Paladon Representative or Sales Office. When performing maintenance, use only Paladon replacement parts. Parts are obtainable through your local Paladon Representative or Sales Office. When ordering parts, always include Model and Serial Number of the unit being repaired.

2. General

The following is a step by step procedure for the removal of the Models SRO, SRC and DA cylinder actuators from the valve.

The intent of this procedure is to provide all the specialized data necessary to properly assemble, disassemble and test these actuators.

These instructions are written for use by a qualified person. Therefore, proper use of lifting and fixturing devices is assumed to be used. Various parts of this actuator are large, cumbersome and potentially dangerous if not handled properly. Proper equipment and training of personnel is the responsibility of the user.

Throughout this text item numbers relating to the appropriate parts of the assembly are noted in () parenthesis after each part reference to facilitate layout examination and assembly. At this point, it is wise to visually examine each part for defects.

Model SRO is oil to extend actuator stem, while spring retract it.
 Model SRC is oil to retract actuator stem, while spring extend it.
 Model DA is double acting (no spring is present).

The cylinder should be disassembled once every 5 years at a minimum, to relubricate the cylinder and replace all soft goods. For equipment with high cycle rates, the cylinder may require more frequent disassembly. Prior to

disassembly, check the cylinder for leakage by pressurizing one side of the cylinder. Cylinder, rod and bushing should be inspected for wear or damage and replaced as necessary.

3. Actuator Removal

Before removal from the valve and disassembly, the unit should be isolated, with the oil supply lines to the cylinder removed and the system pressure to the valve cut off. Prior to disassembly, hydraulic volume tanks should be emptied, so that no trapped oil remains in the cylinder. Also all of the electrical connections to the actuator are to be disconnected.

Maintenance of this actuator series requires removal of the actuator from the valve. The steps in removal of the actuator are different depending on whether the actuator is oil to extend (Model SRO) or oil to retract (Model SRC) or double acting (no springs - Model DA).

Note: Instructions are general in nature. Check valve instructions for additional instructions.

Note: Actuator action may be checked by referring to the valve identification tag.

3.1 Oil to Extend (Model SRO)

- A. Loosen locknuts (23).
- B. Apply required oil pressure to top cap (6) to put valve plug on seat.

Caution: Do not exceed supply pressure indicated on the working pressure tag.

- C. Remove cap screws (38) from top and bottom stem connectors (36 and 37).
- D. Shut off oil supply to top cap (6).
- E. Bleed off all oil pressure in cylinder.
- F. Disconnect oil piping from top cap (6).
- G. Remove top stem connector (36), and nut (23) from piston stem (4).
- H. Loosen and remove cap screws between valve and actuator top mounting.
- I. Connecting to lifting eyes (18) lift actuator assembly from the valve.

3.2 Oil to Retract (Model SRC)

- A. Loosen locknuts (23).
- B. Remove cap screws (38) from top and bottom stem connectors (36 and 37).
- C. Apply required oil pressure to the bottom cap (5) to retract piston stem (4) to mid stroke.

Caution: Do not exceed supply pressure indicated on the working pressure tag.

- D. Remove top stem connector (36), and nut (23) from piston stem (4).
- E. Shut off oil supply to bottom cap (5).
- F. Bleed off all oil pressure in cylinder.
- G. Disconnect oil piping from bottom cap (5).
- H. Loosen and remove cap screws between valve and actuator top mounting.
- I. Connecting to lifting eyes (18) lift actuator assembly from the valve.

3.2 Double acting (Model DA, see page 7)

- A. Bleed off all oil in the cylinder.
- B. Loosen locknuts (26).
- C. Remove cap screws (14c) from top and bottom stem connectors (13 and 12).
- D. Apply required air pressure to the bottom cap (4) to retract piston stem (3) to mid stroke.

Caution: Do not exceed supply pressure indicated on the working pressure tag.

- E. Shut off air supply to bottom cap to keep the piston in mid stroke position (4).
- F. Remove top stem connector (13), and nut (26) from piston stem (3).
- G. Bleed off all air pressure in the cylinder.
- H. Disconnect piping from bottom cap (4).
- I. Loosen and remove cap screws between valve and actuator top mounting.
- L. Connecting to lifting eyes (16c) lift actuator assembly from the valve.

4. Actuator Disassembly and Reassembly

Caution: The actuator cylinder is a spring loaded device.

Caution: It is recommended that disassembly or assembly work on these actuators be done in an upright position.

Actuator disassembly and reassembly can be carried out referring to the sectional drawing and the parts list.

5. Testing

5.1 Case pressure integrity.

- A. Pressurize the actuator cylinder with oil to 100 bar (1450 psi) and lock pressure in. Monitor any pressure change for 5 minutes.
- B. Inspect for any sign of leakage.

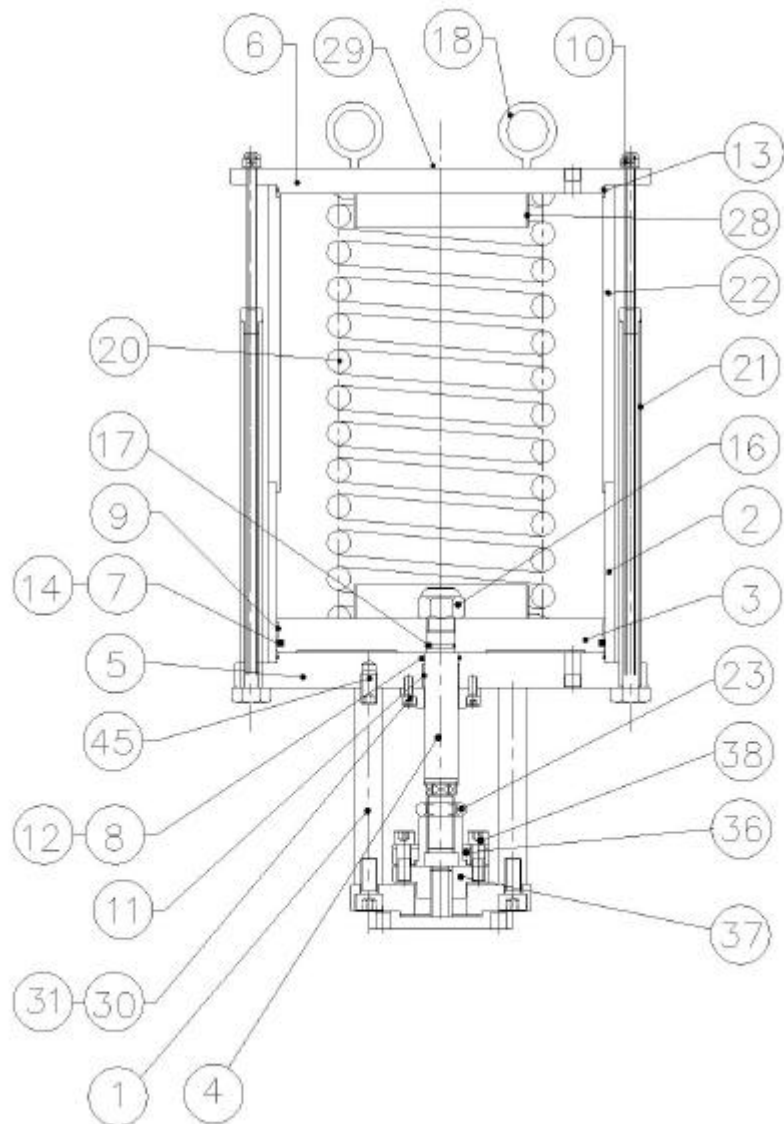
5.2 Acceptable Criteria: Any observed loss in pressure is cause for rejection.

5.3 Operate the actuator through a minimum of five full travel cycles using 1" O.D. tubing direct input and a Cv = 0.3 exhaust valve (Nupro Model JN straight body is acceptable). Inspect for the following: (1) Smoothness of operation (2) Length of travel and (3) Travel time.

5.4 To disassemble actuator, refer to instructions on page 4.

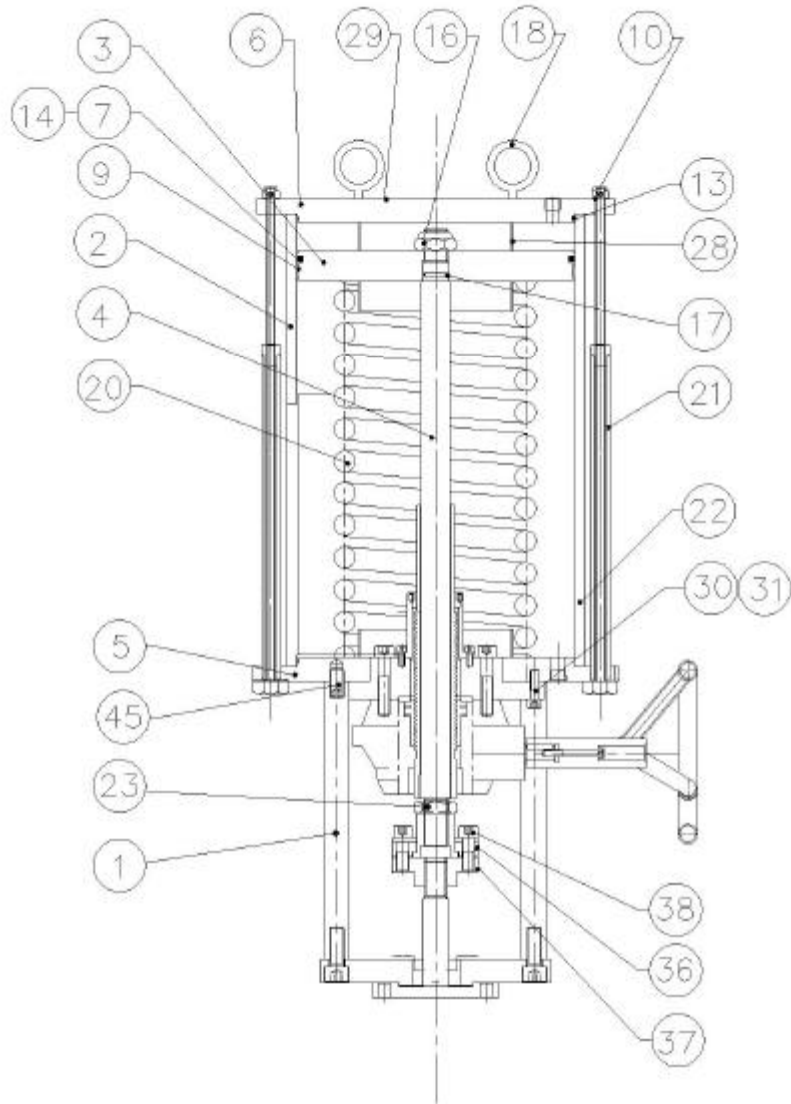
5.5 All seals and guides in the actuator should be inspected once every 5 years minimum and replaced if necessary.

Ref. No.	Description	Q.ty
1	Column	4
2	Cylinder	1
3	Piston	1
4	Piston Stem	1
5	Bottom Cap	1
6	Top Cap	1
7 •	Piston Glider	1
8 •	Stem Glider	1
9 •	Guide Slider, Piston	1
10	Tie-rod Cap Screw	6
11 •	Du Bearing, Bottom Cap	1
12 •	O-Ring, Bottom Cap	1
13 •	O-Ring, Caps	2
14 •	O-Ring, Piston	1
16	Nut, Piston	1
17 •	O-Ring, Stem	1
18	Lifting eye	2
20	Spring	1
21	Tie-rod Extended Nut	6
22	Spring Container	1
23	Nut, Stem	1
28	Travel Stop	2
29	Nameplate	1
30	Lock Plate	1
31	Cap Screw, bottom cap	4
36	Top Stem Connector	1
37	Bottom Stem Connector	1
38	Cap Screw, Socket Head	2
45	Cap Screw, column	4



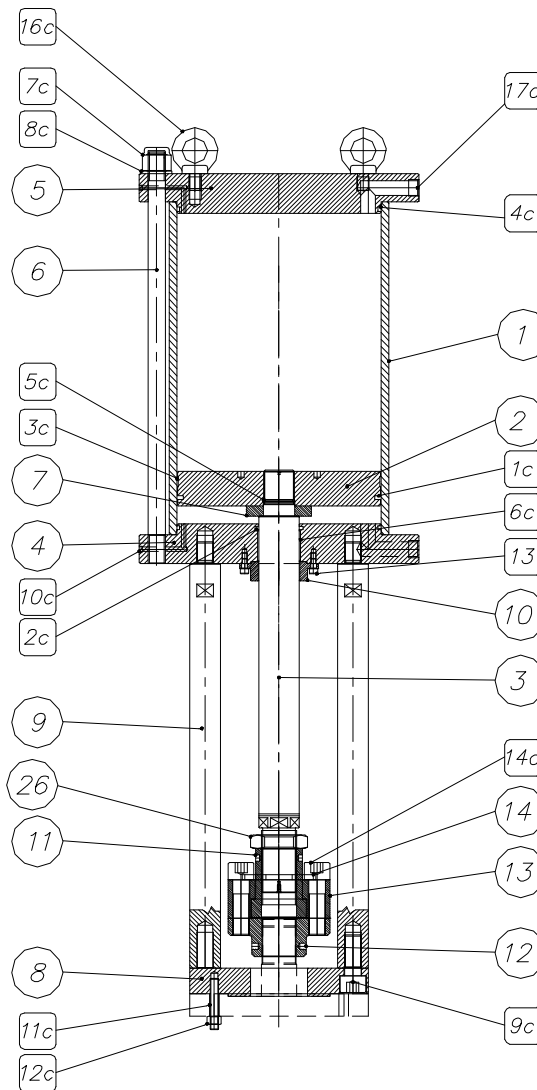
• Recommended Spare Parts

Ref. No.	Description	Q.ty
1	Column	4
2	Cylinder	1
3	Piston	1
4	Piston Stem	1
5	Bottom Cap	1
6	Top Cap	1
7 •	Piston Glider	1
9 •	Guide Slider, Piston	1
10	Tie-rod Cap Screw	6
13 •	O-Ring, Caps	2
14 •	O-Ring, Piston	1
16	Nut, Piston	1
17 •	O-Ring, Stem	1
18	Lifting eye	2
20	Spring	1
21	Tie-rod Extended Nut	6
22	Spring Container	1
23	Nut, Stem	1
28	Travel Stop	3
29	Nameplate	1
30	Lock Plate	1
31	Cap Screw, bottom cap	4
36	Top Stem Connector	1
37	Bottom Stem Connector	1
38	Cap Screw, Socket Head	2
45	Cap Screw, column	4



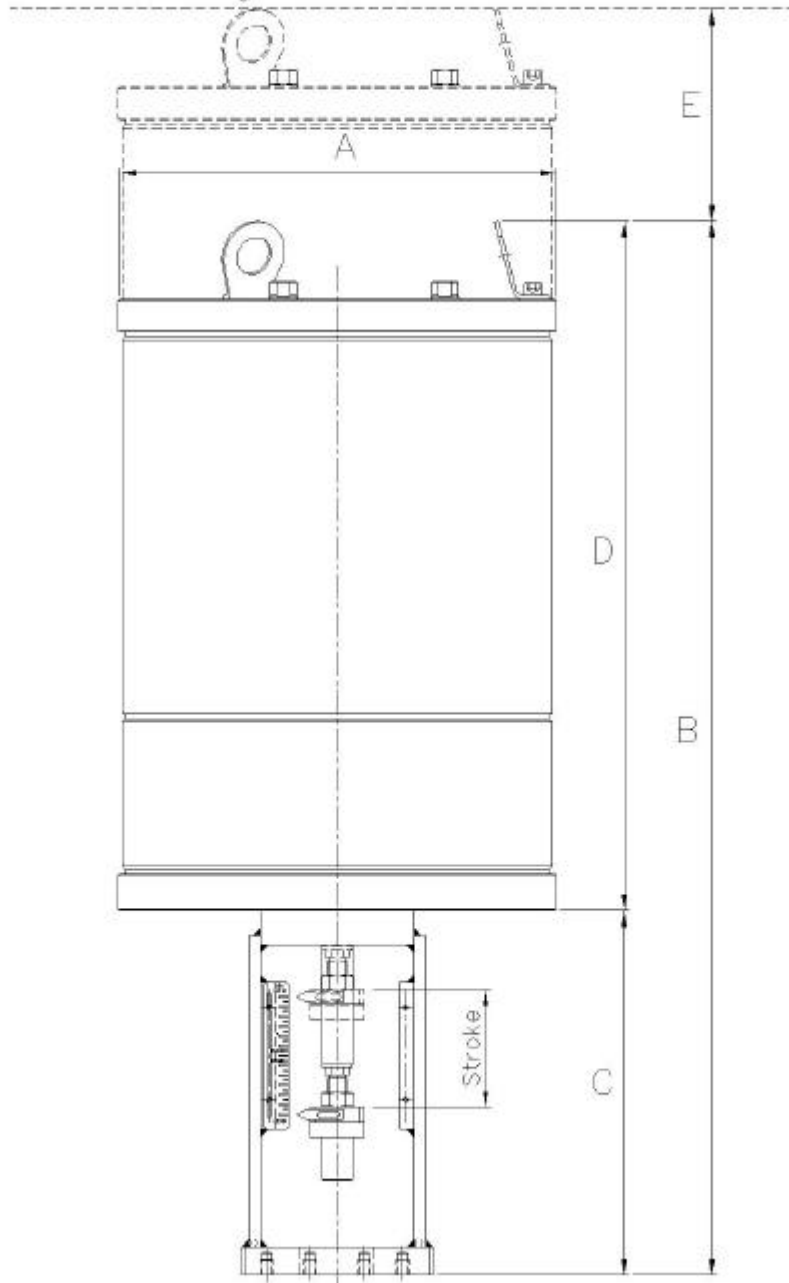
• Recommended Spare Parts

Ref. No.	Description	Q.ty
1	Cylinder	1
2	Piston	1
3	Piston Stem	1
4	Bottom Cap	1
5	Top Cap	1
6	Tie-rod	8
7	Piston washer	1
8	Actuator to valve connecting flange	1
9	Column	4
10	Lock Plate	1
11	Stem guide	1
12	Bottom Stem Connector	1
13	Top Stem Connector	1
14	Anti rotation flange	1
26	Nut, Stem	1
1c •	Piston Glider+o-ring	1
2c •	Stem Glider+o-ring	1
3c •	Guide Slider, Piston	1
4c •	O-Ring, Caps	2
5c •	O-Ring, Stem	1
6c •	Du Bearing, Bottom Cap	1
7c	Tie-rod nut	8
8c	Tie rod washer	8
9c	Cap Screw, column	4
10c	Plug 1/4"NPT	2
11c	Stud	8
12c	Nut	8
13c	Cap Screw, bottom cap	4
14c	Cap Screw, Socket Head	2
16c	Lifting eye	2
17c	Plug 1"NPT	2



• Recommended Spare Parts

Actuator Cylinder Removal Clearance



Actuator Size and Stroke	Diam.A mm	B mm	C mm	D mm	E mm	Weight Kg
HYL-50-122-SRCFK-ROD70	500	900	270	630	200	700
HYL-35-28-SRCPS50.SR-rod30	225	685	270	415	200	90
HYL-54-50-SRCPS80.SR-rod40	305	922	345	577	250	180