

DC Series Installation and Maintenance Guide



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Designed and manufactured in accordance to the requirements of the European Pressure Equipment Directive 2014/68/EU and carries the **CE** mark when so required and applicable.

1. Warranty

Spirax Sarco warrants, subject to the conditions described below, to repair and replace without charge, including labor costs, any components which fail within 1 year of product delivery to the customer. Such failure must have occurred because of defect in material or manufacturing and not as a result of product not being used in accordance with the instructions of this manual.

This warranty does not apply to products which require repair or replacement due to normal wear out or products that are subject to accident, misuse or improper maintenance.

Spirax Sarco Hiter only obligation with Warranty is to repair or replace any product that we consider defective. Spirax Sarco Hiter reserves the right to inspect the product in customer installations or request the return of the product with freight prepaid by the buyer.

Spirax Sarco Hiter may replace or repair any parts that are deemed defective without further responsibilities. All repairs or services executed by Spirax Sarco Hiter, which are not covered by this warranty, will be charged according to the current price list.

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— 2. *General Safety Information* —

Access

Ensure safe access and if necessary a safe working platform (suitably guarded) before attempting to work on the product. Arrange suitable lifting gear if required.

Lighting

Ensure adequate lighting, particularly where detailed or intricate work is required.

Hazardous liquids or gases in the pipeline

Consider what is in the pipeline or what may have been in the pipeline at some previous time. Consider; flammable materials, substances hazardous to health, extremes of temperature.

Hazardous environment around the product

Consider; explosion risk areas, lack of oxygen (e.g. tanks, pits), dangerous gases, extremes of temperature, hot surfaces, fire hazard (e.g. during welding), excessive noise, moving machinery.

The system

Consider the effect on the complete system of the work proposed. Will any proposed action (e.g. closing isolation valves, electrical isolation) put any other part of the system or any personnel at risk? Dangers might include isolation of vents or protective devices or the rendering ineffective of controls or alarms. Ensure isolation valves are turned on and off in a gradual way to avoid system shocks.

Pressure systems

Ensure that any pressure is isolated and safely vented to atmospheric pressure.

Consider double isolation (double block and bleed) and the locking or labeling of closed valves. Do not assume that the system has depressurized even when the pressure gauge indicates zero.

Temperature

Allow time for temperature to normalize after isolation to avoid danger of burns.

Tools and consumables

Before starting work ensure that you have suitable tools and/or consumables available. Use only genuine Spirax Sarco Hiter replacement parts.

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Before starting work ensure that you have suitable tools and/or consumables available. Use only genuine Spirax Sarco Hiter replacement parts.

Protective clothing

Consider whether any protective clothing required by yourself and / or others in the vicinity to protect against the hazards of, for example, chemicals, high / low temperature, noise, falling objects, and dangers to eyes and face.

Permits to work

All work must be carried out or be supervised by a suitably competent person. Post 'warning notices' if necessary.

Electrical works

Before starting work study the wiring diagram and wiring instructions, and check any special requirements. Consider special emphasis on primary and phase source, local isolation of the major systems, fuse requirements, grounding, special cables, cable entries and electrical voltage selection.

Commissioning

After installation or maintenance, ensure that the system is working properly. Perform tests on all alarms and protective devices.

Storage

Equipment and materials shall be stored in a proper place and securely.

Disposal

Unless otherwise stated in the Installation and Maintenance Instructions, this product is recyclable and no ecological hazard is anticipated with its disposal providing due care is taken.

3. Introduction

The **DC Series** are type diaphragm pneumatic actuators are used to operate linear displacement valves in modulating or block control systems.

It is a versatile actuator which can be changed from direct acting to reverse acting, with no need of additional parts.

For continued reliability and valve performance, only original spare parts from Spirax Sarco Hiter should be used for the maintenance of this product.

Generally actuators are supplied assembled to valves, although they can also be supplied separate.

4. Installation

4.1 The equipment is inspected in factory and shipped in proper packages. However, a careful inspection should be performed in the receiving and before installation in order to ensure no damage has been caused during transport and eventual storage.

4.2 Consult the Actuator Installation and Maintenance Manual to install and adjust the equipment. The valve installation instructions must be accomplished according to respective manual.

4.3 Control valves should be installed in an easy-maintenance place, with enough space for actuator removal and internal parts disassembly.

4.4 The air connections are ¼" NPT in all DC Series actuators. When they are supplied equipped with positioner and/or regulator filters the pressure lines are supplied with flexible nylon tubes from the factory unless otherwise specified.

4.5 Depending on specifications, rigid tubes may be used for connections between the actuator (regulator filter and positioner) and the controller instrument outlet. Connecting pipe lengths should always be kept as short as possible, with minimum number of bends or connectors that can decrease flow.

4.6 For optimum performance, the actuator should be mounted in a vertical position, or as close as possible to this. Mounting of the actuator in horizontal positions should be avoided.

4.7 Before starting actuator assembly on valve, check the following items:

- Identify correct action (normal opened or normal closed).
- Identify valve travel.
- Check if the stem fitting on actuator corresponds to the valve stem.

ATTENTION

If the actuator has a handwheel, turn it to the neutral position (upper position for direct acting, lower position for reverse acting) before mounting the actuator on the valve. In this position the handwheel does not interfere with pneumatic operation neither limits the stroke.

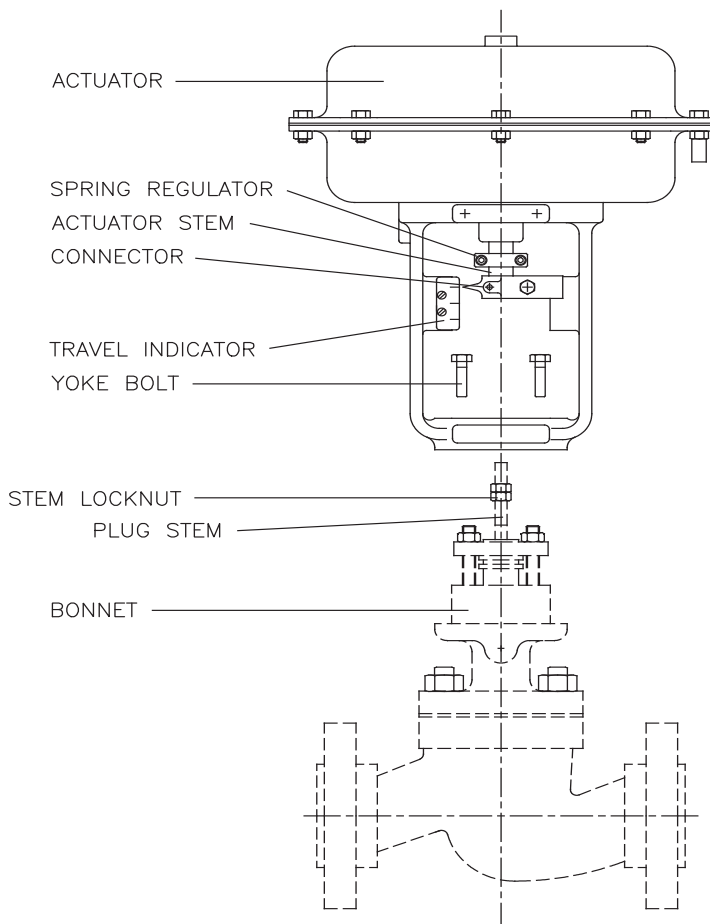


Fig. 1 - DC Series Actuator

4.8 INSTALLATION AND ADJUSTMENT

Figure 1 shows a **DC Series** actuator installation on a linear displacement valve.

WARNING:

For bellows seal valves, the plug stem should not be submitted to rotary movement, or the bellow shall be damaged. Perform the assembly and regulation of the actuator on valve in the following sequence:

4.8.1 DIRECT ACTING (Fig. 2) FOR VALVES WITHOUT BELLOW SEALS

4.8.1.1 Ensure that the valve plug is resting on its seat.

4.8.1.2 Carefully position the actuator on the valve bonnet.

4.8.1.3 Fasten the actuator onto the valve bonnet through tightening the bolt (2) until it locks.

4.8.1.4 Pressurize the actuator with the air supply indicated pressure until its stem reach the valve stem. Then, shortly lift and connect the plug stem on actuator's stem (5), using a wrench on the stem nut. Rotate the plug stem if necessary to make any final adjustments and finally ensure the set have reached the maximum travel of opening. When completing the travel, be sure the connector (4) indicates the travel begin (upper limit) on travel plate (25). If need, adjust the travel plate (25) to reach the travel plate begin (upper limit), with no pressure to the actuator.

4.8.1.5 To set the initial spring range, apply the correct pneumatic supply pressure that corresponds with actuator starting spring range. Loosen the spring regulator clamp bolts (38) and manually rotate the spring regulator (39) until the actuator movement corresponds to correct pneumatic starting pressure.

4.8.1.6 Adjust the travel plate (25) in line with the start of plug travel (upper limit).

4.8.1.7 Adjust the maximum travel (bottom limit) through clockwise or counterclockwise rotation of the valve stem.

4.8.1.8 Tighten the regulator bolt (38) and the valve stem clamp nuts against the actuator stem (5).

4.8.3.5 Relieve the pneumatic pressure from the actuator until it corresponds with the starting spring range. Adjust the valve travel by rotating the plug either clockwise (increase) or counterclockwise (decrease). ALWAYS ensure that the plug is off its seat before making adjustments.

4.8.3.6 Tighten the regulator bolt (38) and valve stem lock nuts against the actuator stem (5).

4.8.4 REVERSE ACTING FOR VALVES WITH BELLOW SEALS

4.8.4.1 Keep the plug stem in position in which the valve has been supplied.

4.8.4.2 Set the initial spring range, applying the correct pneumatic supply pressure that corresponds with actuator starting spring range. Loosen the spring regulator clamp bolts (38) and manually rotate the spring regulator (39) until the actuator movement corresponds to correct spring pressure.

4.8.4.3 With the actuator still pressurized, carefully screw the actuator onto the valve stem and fasten the actuator on to the valve bonnet with the bolts (2).

4.8.4.4 Adjust the travel plate (25) in line with the start of plug travel (bottom limit)

4.8.4.5 Adjust the maximum travel (upper limit) unscrewing the regulator bolt (38) and rotate manually the spring regulator (39).

4.8.4.6 Perform a travel check, ensuring that the travel indicator is correctly positioned and tighten the regulator bolt (38) and valve stem lock nut against the actuator stem (5).

IMPORTANT:

After the actuator assembly and adjustment, apply to the actuator a variable pressure in the whole pneumatic signal range (25-50 psig) and check the valve travel. Be sure the valve is fully opened and fully closed at the respective limits.

4.8.5 REVERSE ACTING FOR VALVES WITH BELLOW SEALS

4.8.5.1 Keep the plug stem in position in which the valve has been supplied.

4.8.5.2 Set the initial spring range, applying the correct pneumatic supply pressure that corresponds with actuator starting spring range. Loosen the spring regulator clamp bolts (38) and manually rotate the spring regulator (39) until the actuator movement corresponds to correct spring pressure.

4.8.5.3 With the actuator still pressurized, carefully screw the actuator onto the valve stem and fasten the actuator on to the valve bonnet with the bolts (2).

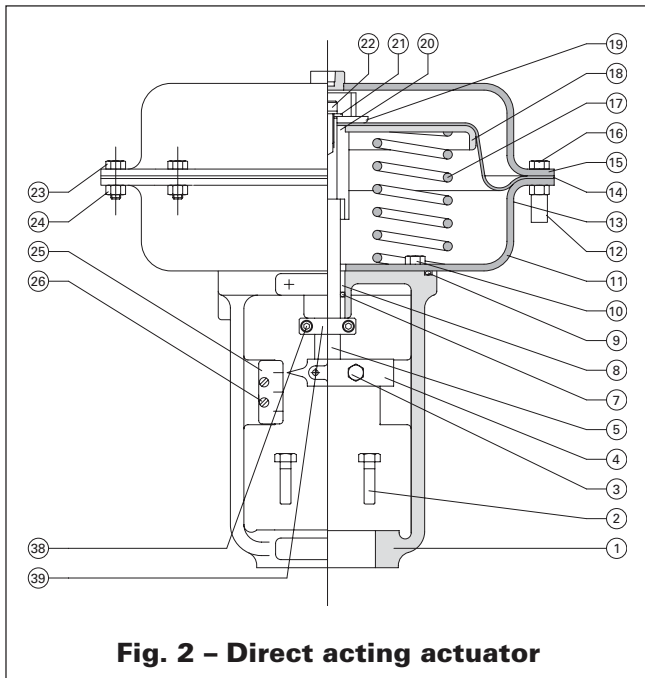
4.8.5.4 Adjust the travel plate (25) in line with the start of plug travel (bottom limit)

4.8.5.5 Adjust the maximum travel (upper limit) unscrew the regulator bolt (38) and rotate manually the spring regulator (39).

4.8.5.6 Perform a travel check, ensuring that the travel indicator is correctly positioned and tighten the regulator bolt (38) and valve stem lock nut against the actuator stem (5).

4.9 ACTUATOR ADJUSTMENT

The actuator should provide displacement correspondent the whole plug travel within spring range. Pressures inside valve body originate powers in actuator which have direct influence on pressure range applied to diaphragm. In some situations, valve travel can not be completed; this happens when pressure conditions in valve body are different from those which the valve has been factory-adjusted. In these cases, we recommend to increase the pressure on actuator diaphragm. It is important to stress that actuator spring has pressure range of defined amplitude.



5. Maintenance

5.1 Disassembly

ATTENTION

Before starting the actuator disassembly, relieve the whole pressure of the actuator, remove the air compressed lines connected to it and disconnect the valve actuator.

5.1.1 DIRECT ACTING WITHOUT HANDWHEEL

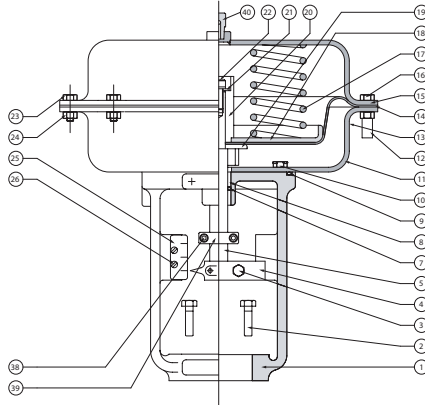


Fig. 3 – Reverse acting actuator

5.1.1.1 Unscrew the connector bolt (3).

5.1.1.2 Loosen the plug stem from the actuator stem (5), loosening the stem backing nut for valve without bellow seal or rotating the actuator if the valve has bellow seal (in this case, unscrew the bolt (2) of the actuator yoke basis so that the actuator can be rotated).

5.1.1.3 Unscrew the regulator bolt (38) and remove the spring regulator (39).

5.1.1.4 Remove the bolt and nuts of the cover (23 and 24).

5.1.1.5 Carefully remove tension bolt covers (12) and carefully loosen the tension bolts (16), one turn at a time in order to ensure a uniform pressure is applied to the covers and component parts.

5.1.1.6 Lift and remove the top cover (15).

5.1.1.7 Remove the stem bolt (22) and washer (21).

5.1.1.8 Remove the travel stop subassembly (19).

5.1.1.9 Remove the diaphragm (14).

5.1.1.10 Remove the diaphragm plate subassembly (18) and the rings (17).

5.1.1.11 Remove the travel stop (20).

5.1.1.12 Remove the connector (4) and the actuator stem (5)

5.1.1.13 Remove the valve actuator, removing the bolts (2).

5.1.1.14 For complete disassembly, unscrew the yoke bolt (10) loosening the bottom cover (11).

5.1.2 REVERSE ACTING WITHOUT HANDWHEEL

5.1.2.1 Loosen the connector bolt (3).

5.1.2.2 Loosen the plug stem from the actuator stem (5) loosening the stem lock nut for valve without bellow seal, or rotating the actuator if the valve has bellow seal (in this case, unscrew the bolts (2) from the actuator yoke basis so that the actuator can be rotated).

5.1.2.3 De-pressurize the actuator and remove all compressed air lines connected to it.

5.1.2.4 Remove the valve actuator, removing the bolt (2).

5.1.2.5 Unscrew the regulator bolt (38) and remove the spring regulator (39).

5.1.2.6 Remove the bolt and nuts of the cover (23 and 24).

5.1.3 DIRECT ACTING WITH HANDWHEEL

5.1.3.1 To disassemble the actuator proceed as the same items of the actuator direct acting without handwheel.

5.1.3.2 To remove the handwheel (32) drive out the groove pin (31). Take out the screen (30) by the inside of the bottom cover (15) check the o'rings (28) for damage.

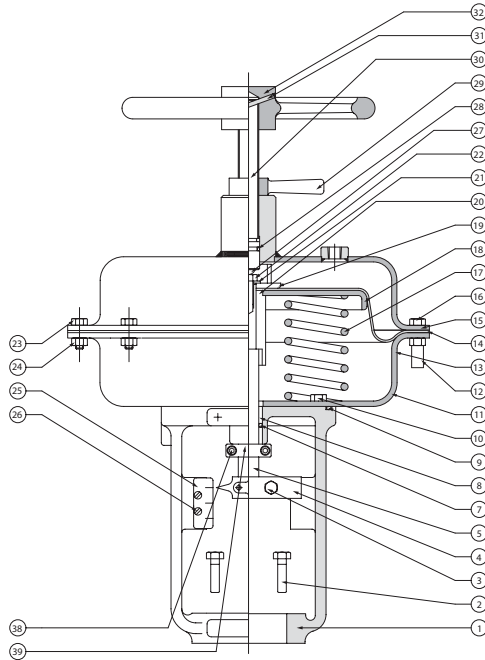


Fig. 4 – Direct acting actuator with handwheel

5.1.4 REVERSE ACTING WITH HANDWHEEL

5.1.4.1 Loosen the connector bolt (3) and remove the bolts (2) from yoke and valve bonnet.

5.1.4.2 Unscrew the valve plug stem. For valve without bellows seal, turn the stem by using a wrench on the locknuts. For valve with bellows seal turn the actuator.

5.1.4.3 Unload the pressure and remove the tubing or piping from the actuator.

5.1.4.4 Unscrew the spring regulator bolts (38) and remove the spring regulator (39).

5.1.4.5 Remove the lock pin (36), bonnet nut (35) PTFE bearing (33) and bearing washer (34).

5.1.4.6 Remove the bolts (23) and nuts (24) from the casing.

5.1.4.7 Remove the compression bolts cover (12) and carefully loosen the tension bolts (16), one turn at a time in order to ensure a uniform pressure is applied to the covers and component parts.

5.1.4.8 Lift and remove upper cover (15).

5.1.4.9 Remove the springs (17).

5.1.4.10 Remove the connector (14).

5.1.4.11 Take out the assembly of handwheel stem (22), washer (21), locking pin (37) travel stop (20), diaphragm plate (18), diaphragm (14), limiter plate (19) and actuator stem (5).

5.1.4.12 Drive out the locking pin (37) and unscrew the actuator stem (5).

5.1.4.13 Remove the washer (21), travel stop (20), diaphragm plate (18), diaphragm (14) and limiter plate (19).

5.1.4.14 If required move the cover diaphragm casing (11) from the yoke (1) by loosen the cap screws (10) that hold it place. Remove the yoke o'ring (9) and the actuator stem o'ring (7).

5.1.4.15 For complete disassembly, remove the support ring (22), retainer ring (31) handwheel (29) key (30) handwheel screw lock (28) and handwheel screw (27).

5.2 Cleaning, Inspection and Repair

All valve metallic parts must be cleaned using solvent and dried with compressed air after inspection. The approved parts should be kept clean and very well protected up to the assembly. Oil protector application on steel carbon non-painted parts is recommended. If there is any damage that can not be resolved by parts replacement and/or corrective actions, the valve should be returned properly assembled to Spirax Sarco Hiter for general revision.

5.2.1 Inspect all actuator components, especially the sealing area.

5.2.2 Replace all actuator components which are damaged after a detailed inspection. In assembly procedure description, our reference shall be figure 2, except when otherwise indicated.

5.3 Assembly

5.3.1 Assemble the actuator in inverse order described in previous section 2.1.

5.3.2 The following instructions shall help in proper assembly and smooth operation of the actuator.

- Apply grease in the stem guide bushing (8), stem o-ring (7) and in spindle (30).
- The springs must be perfectly seated in diaphragm plate subassembly.
- Tighten the bolt and nuts of cover (23 and 24) in an opposed crossed sequence in order to reach a perfect sealing between bottom and top covers as per Table 1.
- Tighten the tension bolts (16) and of the cover nuts (24) alternately to enable smooth compression of the springs as per Table 1.

TABLE 1 – ORIENTATIVE TORQUE FOR ASSEMBLY

| Thread (In) | MATERIAL - SCREWS / STUDS / NUTS | | | | | | | | | | | |
|----------------|----------------------------------|-------|-----------------|-------|-----------------|--------|-----------------|-------|-----------------|------|-----------------|-------|
| | Carbon Steel | | | | | | Stainless Steel | | | | | |
| | Torque (N.m) | | Torque (lbf.ft) | | Torque (lbf.in) | | Torque (N.m) | | Torque (lbf.ft) | | Torque (lbf.in) | |
| | Min | Máx | Min | Máx | Min | Máx | Min | Máx | Min | Máx | Min | Máx |
| 1/4" | 9 | 11 | 7 | 8 | 80 | 97 | 6 | 8 | 4 | 6 | 53 | 71 |
| 5/16" | 14 | 19 | 10 | 14 | 124 | 168 | 10 | 13 | 7 | 10 | 89 | 115 |
| 3/8" | 26 | 33 | 19 | 24 | 230 | 292 | 18 | 24 | 13 | 18 | 159 | 212 |
| 7/16" | 35 | 61 | 26 | 45 | 310 | 540 | 33 | 50 | 24 | 37 | 292 | 443 |
| 1/2" | 61 | 80 | 45 | 59 | 540 | 708 | 43 | 60 | 32 | 44 | 381 | 531 |
| 9/16" | 81 | 105 | 60 | 77 | 717 | 929 | 57 | 75 | 42 | 55 | 504 | 664 |
| 5/8" | 119 | 154 | 88 | 114 | 1053 | 1363 | 84 | 109 | 62 | 80 | 743 | 965 |
| 3/4" | 202 | 262 | 149 | 193 | 1788 | 2319 | 143 | 186 | 105 | 137 | 1266 | 1646 |
| 7/8" | 329 | 427 | 243 | 315 | 2912 | 3779 | 233 | 302 | 172 | 223 | 2062 | 2673 |
| 1" | 527 | 685 | 389 | 505 | 4664 | 6063 | 373 | 485 | 275 | 358 | 3301 | 4293 |
| 1.1/8" | 613 | 797 | 452 | 588 | 5426 | 7054 | 434 | 565 | 320 | 417 | 3841 | 5000 |
| 1.1/4" | 840 | 1092 | 620 | 805 | 7435 | 9665 | 594 | 773 | 438 | 570 | 5257 | 6842 |
| 1.3/8" | 1117 | 1452 | 824 | 1071 | 9886 | 12851 | 791 | 1028 | 583 | 758 | 7001 | 9099 |
| 1.1/2" | 1464 | 1904 | 1080 | 1404 | 12957 | 16852 | 1037 | 1348 | 765 | 994 | 9178 | 11931 |
| 1.5/8" | 1849 | 2404 | 1364 | 1773 | 16365 | 21277 | 1309 | 1702 | 965 | 1255 | 11586 | 15064 |
| 1.3/4" | 2296 | 2985 | 1693 | 2202 | 20321 | 26419 | 1626 | 2113 | 1199 | 1558 | 14391 | 18702 |
| 1.7/8"-8UN | 2822 | 3669 | 2081 | 2706 | 24977 | 32473 | 1998 | 2598 | 1474 | 1916 | 17684 | 22994 |
| 1.7/8"-12UN | 2140 | 2783 | 1578 | 2053 | 18941 | 24632 | 1515 | 1970 | 1117 | 1453 | 13409 | 17436 |
| 2"-8UN | 4574 | 5947 | 3374 | 4386 | 40483 | 52635 | 3239 | 4210 | 2389 | 3105 | 28668 | 37262 |
| 2"-12UN | 3473 | 4515 | 2562 | 3330 | 30739 | 39961 | 2459 | 3197 | 1814 | 2358 | 21764 | 28296 |
| 2.1/4"-8UN | 4887 | 6353 | 3604 | 4686 | 43254 | 56229 | 3460 | 4498 | 2552 | 3318 | 30624 | 39811 |
| 2.3/4"-8UN | 7706 | 10018 | 5684 | 7389 | 68204 | 88667 | 5393 | 7012 | 3978 | 5172 | 47732 | 62061 |
| 3"-8UN | 11126 | 14463 | 8206 | 10667 | 98473 | 128008 | 7877 | 10240 | 5810 | 7553 | 69717 | 90632 |
| 3"-12UN | 8439 | 10971 | 6224 | 8092 | 74691 | 97102 | 5975 | 7768 | 4407 | 5729 | 52883 | 68753 |

Note: The values above mentioned are considering lubricated fasteners by graphite-based grease (NEVER SEEZ PURE NICKEL SPECIAL or equivalent).

6. Action Change

ATTENTION:

Before commencing actuator action change procedure, ensure that compressed air supply is removed, the actuator completely vented, and the actuator is removed from the valve.

For valve action change, remove the actuator and perform the actuator disassembly and assembly according to sections 2.1 and 2.3.

7. Travel Change

ATTENTION:

Before commencing a travel change procedure, ensure that compressed air supply is removed, the actuator completely vented, and the actuator is removed from the valve.

7.1 The actuator should provide displacement correspondent to the plug total travel, within specified sign pressure range. The ranges can be 3-15 or 12-30 psig.

7.2 Pressures within valve body originate powers in the plug which influence directly on pressure range applied to the diaphragm. In certain situations, the valve travel may not be completed; it happens when pressure conditions in valve body are different from those ones in which the valve has been factory-adjusted. In these cases, we recommend the installation of a positioner to increase the pressure on actuator diaphragm. It is important to stress that actuator springs have pressure range of defined amplitude.

7.3 After actuator assembly for both, direct and reverse acting, for valves with or without bellow seal, apply variable pressure to the actuator in the whole used pneumatic signal range (3-15 or 12-30 psig) and check the valve travel. Be sure the valve is totally opened and totally closed.

In handwheel installation description procedure, our reference shall be figure 4 and 5 except when adversely indicated.

8. Handwheel Installation

When manual handwheel is used, generally it is installed on actuators. If an emergency drive is required, a manual handwheel supplied via kit should be installed.

For this system installation, use the following procedure:

ATTENTION:

Before commencing a hand wheel installation, ensure that compressed air supply is removed, the actuator completely vented, and the actuator is removed from the valve.

The top wheel installation in direct actuator (Figures 2 and 4) requires replacement of the top cover subassembly (15) and stem bolt (22) by other and the inclusion of items (27 to 32). The top handwheel installation in reverse actuator (figures 3 and 5) requires replacement of the top cover subassembly (15) and stem bolt (22) by other and the inclusion of items (27 to 37 and 40).

TABLE 2 – PART LIST – DIRECT ACTING ACTUATORS (FIGS. 2 AND 4)

| Item | Description | Item | Description | Item | Description |
|------|------------------|------|-------------------|------|------------------|
| 1 | YOKE | 13 | INSTRUCTION PLATE | 24 | COVER NUT |
| 2 | BOLT | 14 ● | DIAPHRAGM | 25 | TRAVEL PLATE |
| 3 | CONNECTOR | 15 | UPPER COVER | 26 | PLATE SCREW |
| 4 | CONNECTOR | 16 | SENSOR BOLT | 27 | SALT |
| 5 | ACTUATOR STEM | 17 ● | SPRING | 28 ● | "O" RING |
| 7 ● | "O" RING | 18 | DIAPHRAGM PLATE | 29 | LOCK NUT |
| 8 ● | GUIDE BUSHING | 19 | LIMITER PLATE | 30 | SPINDLE |
| 9 ● | "O" RING | 20 | TRAVEL STOP | 31 | LOCKING PIN |
| 10 | YOKE BOLT | 21 | WASHER | 32 | HANDWHEEL |
| 11 | BOTTOM COVER | 22 | STEM BOLT | 33 | REGULATOR BOLT |
| 12 | COVERTENSOR BOLT | 23 | COVER BOLT | 34 | SPRING REGULATOR |

● Recommended spare parts

TABLE 3 - PART LIST – REVERSE ACTING ACTUATOR (FIGS. 3 AND 5)

| Item | Description | Item | Description | Item | Description |
|------|-------------------|------|-----------------|------|------------------|
| 1 | YOKE | 16 | SENSOR BOLT | 29 | HANDWHEEL |
| 2 | BOLT | 17 ● | SPRING | 30 | PACKING |
| 3 | CONNECTOR | 18 | DIAPHRAGM PLATE | 31 ● | ELASTIC RING |
| 4 | CONNECTOR | 19 | LIMITER PLATER | 32 | BACKING RING |
| 5 | ACTUATOR STEM | 20 | TRAVEL SHOP | 33 ● | PTFE BEARING |
| 7 ● | "O" RING | 21 | WASHER | 34 | SUPPORT RING |
| 8 ● | GUIDE BUSHING | 22 | STEM BOLT | 35 | BONNET NUT |
| 9 ● | "O" RING | | MANUAL STEM | 36 ● | LOCK PIN |
| 10 | YOKE BOLT | 23 | COVER BOLT | 37 | LOCKING PIN |
| 11 | BOTTOM COVER | 24 | COVER NUT | 38 | BOLT REGULATOR |
| 12 | COVERTENSOR BOLT | 25 | TRAVEL PLATE | 39 | SPRING REGULATOR |
| 13 | INSTRUCTION PLATE | 26 | PLATE BOLT | 40 | BREATHER |
| 14 ● | DIAPHRAGM | 27 | SPINDLE | | |
| 15 | BOTTOM COVER | 28 | LOCK NUT | | |

● Recommended spare parts

Notes

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