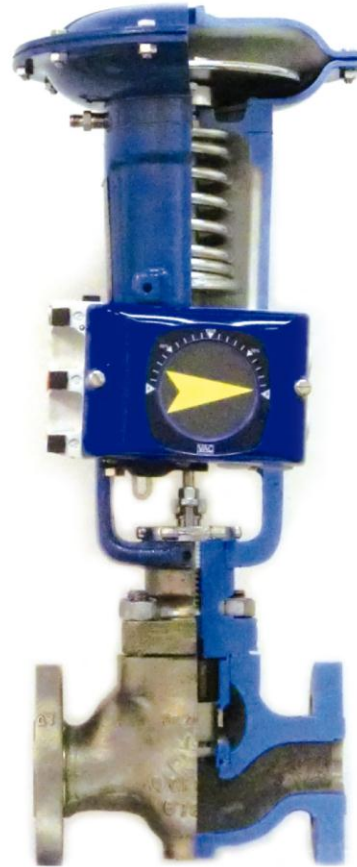


Instruction  
D-9100-1NE  
December 2010

# NOR'EAST

— CONTROLS, INC.

A DIVISION OF ALLGASH INTERNATIONAL, INC.



## Operator's Manual

### SERIES 9100 SINGLE SEATED, CAGE TYPE GLOBE VALVES

Previously manufactured by Dezurik® and Honeywell®

**Instructions** These instructions are intended for personnel who are responsible for installation, operation and maintenance of your Nor'East Controls Globe Valve.

**Safety Messages** All safety messages in the instructions are flagged with the word Caution, Warning or Danger. These messages must be followed exactly to avoid equipment damage, personal injury or death.

Safety label(s) on the product indicate hazards that can cause equipment damage, personal injury or death. If a safety label becomes difficult to see or read, or if a label has been removed, please contact Nor'East Controls for replacement label(s).



**WARNING!**

**Personnel involved in the installation or maintenance of valves should be constantly alert to potential emission of pipeline material and take appropriate safety precautions. Always wear suitable protection when dealing with hazardous pipeline materials. Handle valves, which have been removed from service with suitable protection for any potential pipeline material in the valve.**

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**Inspection** Your Nor'East Controls Globe Valve has been packaged to provide protection during shipment. Carefully inspect the unit for damage upon arrival and file a claim with the carrier if damage is apparent.

**Parts** Order parts from your local sales representative, or directly from Nor'East Controls, as listed on the back cover. Recommended spare parts are listed on the assembly drawing. These parts should be stocked to minimize downtime.

**Nor'East Controls Service** Nor'East Controls service personnel are available to install, maintain and repair all Nor'East Controls products. Nor'East Controls also offers customized training programs and consultation services.

For more information, contact your local Nor'East Controls sales representative or visit our website at [www.Nor'East Controls .com](http://www.Nor'East Controls .com).

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## Nor' East

### 1" – 12" Series 9100 Single Seated Cage Valves

#### Description

The Series 9100 valve is a heavy duty, balanced, cage-type globe valve with an available pneumatic diaphragm spring or springless actuator.



#### WARNING!

This valve is a pressure vessel. Failure to release pipeline pressure may result in personal injury and/or flow system damage. Completely release pipeline pressure before removing the actuator from the valve or removing the valve from the pipeline.

#### Valve Pressure Ratings

See Table A for valve pressure ratings.

Table A: Valve Pressure Ratings

Valve Size	Pressure Rating (ANSI)				
	Cast Iron (ANSI B16.1)		Carbon Steel & Stainless Steel (ANSI B16.34)		
	Flanged Ends	Screwed Ends	Flanged Ends	Screwed Ends	
1"	125 & 250 lbs	250 lbs	150, 300 & 600 lbs	900 lbs	600 lbs
1-1/4"					
1-1/2"					
2"					
2-1/2"					
3"					
4"					
6"					
8"					
10"					
12"					

#### Installation



#### CAUTION!

If valve is used in a water system, the water must be adequately treated to prevent the formation of rust, carbonates and other undesirable deposits on valve parts. Otherwise, deposit build-ups can damage packing, seats or other internal valve parts.

- For maximum efficiency and minimum wear, install valve in the vertical position with valve stem pointing up.
- Be sure to leave a minimum of 4 inches clearance for actuator removal.
- Before installing, be sure valve and pipeline are clean inside and free of scale, chips and welding spatter.

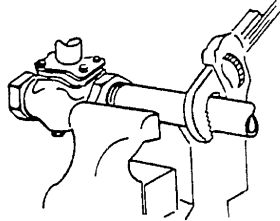
**Installation**  
*(Continued)*

- The valve must be installed with the fluid flow in the direction of the arrow on the valve body (pressure under plug). Pipes must be lined squarely with the valve at each connection. If they are forced into the valve, the body may become twisted, causing improper seating. Be sure there are no pockets in the line where condensate could accumulate and cause an undesirable water hammer.
- Be sure that the flow medium and ambient temperature and the selected location will not exceed the maximum temperature limitations for the valve or actuator.
- If the valve has screwed ends, do not apply pipe dope or seal tape to the threads of the valve body or to the first two threads of the pipe.
- If the valve has flanged ends, tighten flange bolts evenly to prevent excessive stress and possible cracking.
- If the valve has welded ends, prevent plug and cage distortion by keeping excess heat from valve body. Position plug at mid-stroke during welding and heat-treating.

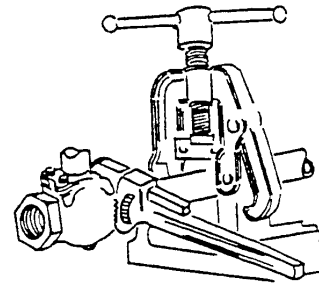
**Installation**  
(Continued)

**Piping Tips for Valves with Screwed Ends**

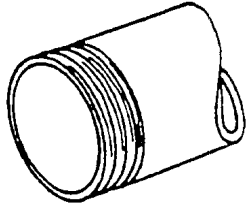
Valve held by hex next to pipe.  
(no twist, no squeeze on valve body)



Vise grips hex end next to pipe.

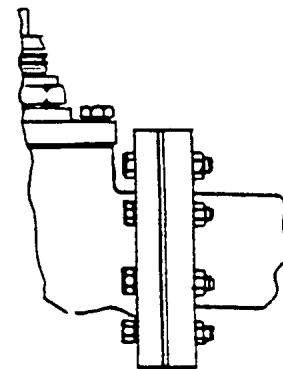
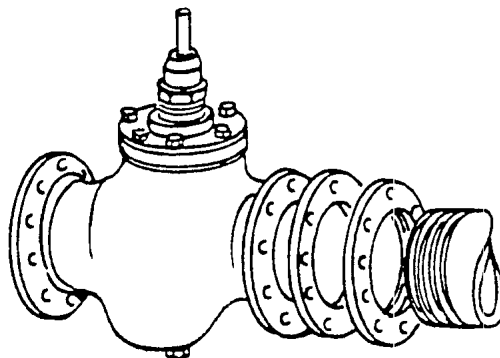


Vise holds pipe securely against turning. Parallel – jaw wrench grips hex or flats next to pipe.

Pipe reamed and cleaned.    Moderate amount of dope. (2 threads bare.)	Pipe Size	Effective Length of Threads
	1/2"	1/2"
	3/4"	9/16"
	1"	11/16"
	1-1/4"	11/16"
	1-1/2"	11/16"
	2"	3/4"
	2-1/2"	15/16"
3"	1"	

**Piping Tips for Valves with Flanged Ends**

If possible, mount companion flange on pipe before mounting flange on the valve.



Do not apply pipe dope to valve flange, companion flange or gasket. Be sure face of companion flange is flush with face of valve-body flange and lined up square before tightening mounting nuts.

**Note:** If valve has welded ends, prevent plug and cage distortion by keeping excess heat from valve body.

**Parts Identification**

**Nameplate Data**

The nameplate gives vital information on valve construction and operation. Always reference the serial number when ordering spare parts.

The spring range (on spring diaphragm actuators) is factory set to specifications on the order. Note the type of trim material, packing and lubricant number ("NONE" means packing does not require lubrication.) Remember that a change in operating conditions may mean a change in trim material, packing and lubricant type. Keep a permanent record of all nameplate information.

See Figure 1 for parts identification.

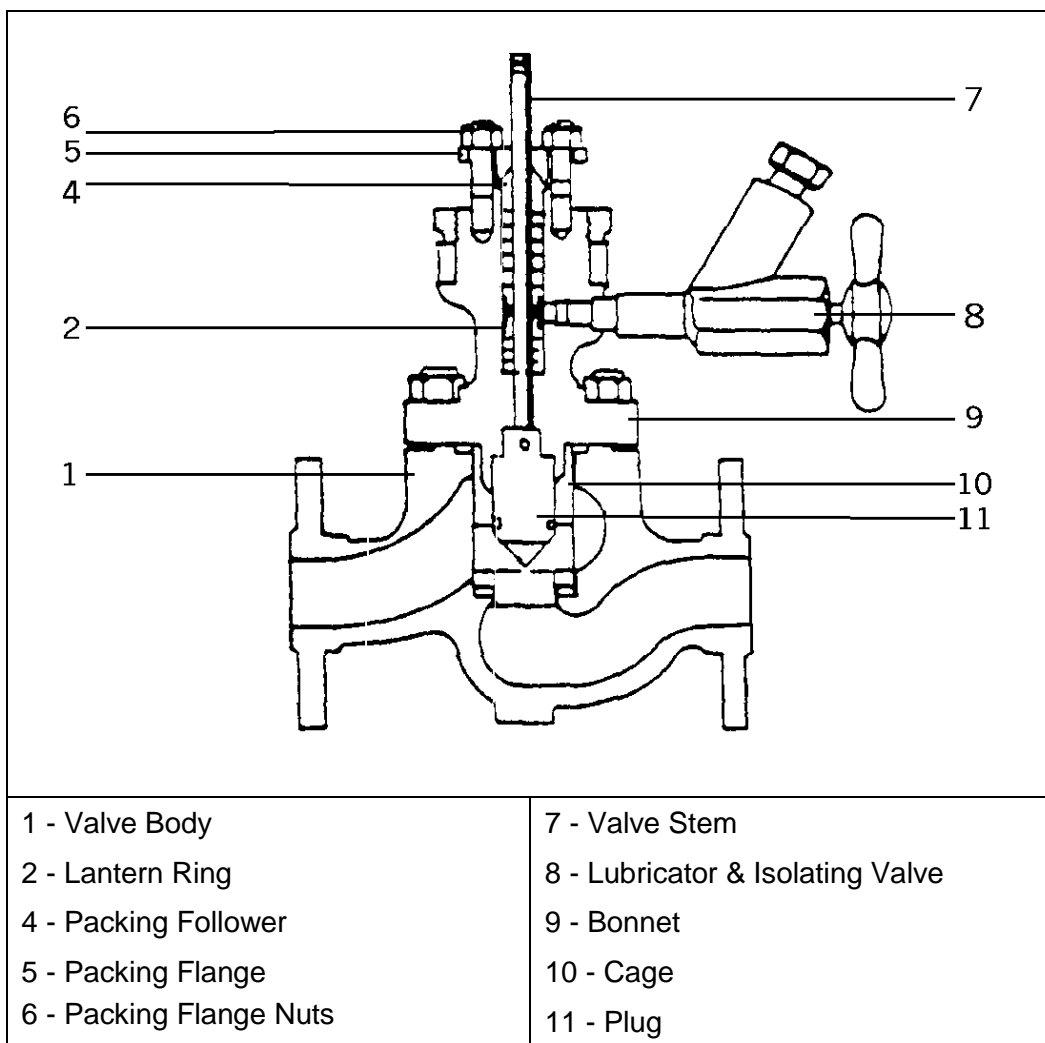


Figure 1 – Parts Identification

**Maintenance**

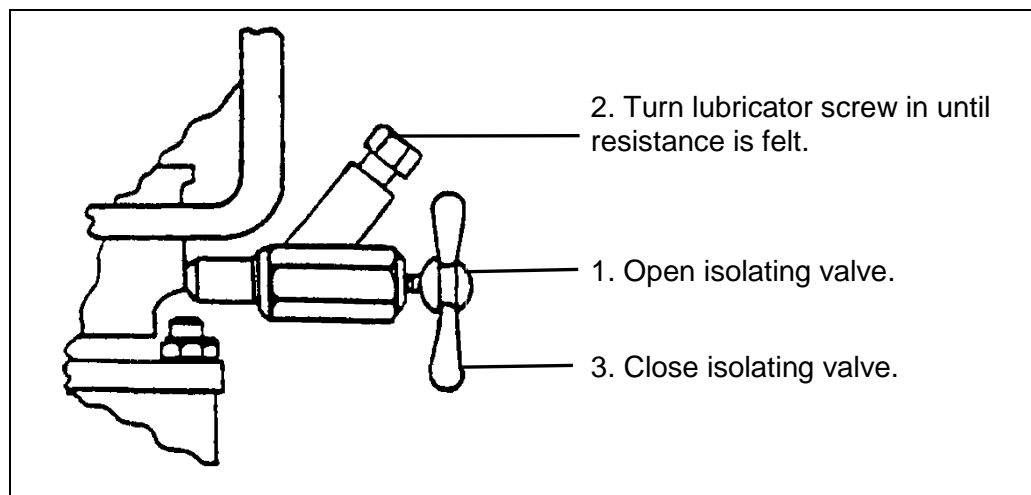
Preventive maintenance consists of making a periodic visual inspection. This will reveal packing box leaks, loosening of air connections due to vibration and visible failures of valve parts and accessories.

**Packing Box**

Checking packing box for leakage. If leakage is evident;

- With spring-loaded Teflon packing, replace packing.
- With non spring-loaded packing, do not tighten packing flange beyond point required to stop leakage. If packing is too tight, excess stem friction is created due to the pressure of the packing against the stem. This excess stem friction may cause the diaphragm top to require several additional pounds of air to stroke valve. If tightening the packing flange nuts fails to stop the leakage, the packing box requires either additional packing or removal of old packing and installation of new packing. Occasional cleaning of the valve stem will keep dirt and grit from being carried into the packing.

If lubricated packing is supplied, make regular scheduled checks on lubrication. Replace lubricant as required. See Figure 2 for lubricating packing.



**Figure 2 – Lubricating Packing**

**Connections**

Check all mechanical and air connections. In some applications, particularly where the valve is located in a line near a pump, vibrations may cause both mechanical and air connections to work loose.

If possible, stroke the valve through several cycles, noting the operation, the pressure required to for stroking and the normal action of the valve.



## Valve Overhaul

Generally, when a valve is overhauled the bonnet and actuator are removed from the valve body, the packing is removed from the packing box and all parts are cleaned. Make a thorough inspection of the plug, cage and stem to determine whether these parts should be re-used, re-worked or replaced. To minimize the possibility of leakage, always replace the bonnet and cage gaskets whenever the valve is disassembled.

### **Actuator Removal**

- Stop pipeline flow and completely release pipeline pressure.



#### **WARNING!**

**This valve is a pressure vessel. The bonnet will blow off the actuator if the bonnet bolts are removed with pressure in the valve. Completely release pressure before disassembling the valve.**

- Disconnect and lock out the pneumatic or electrical power to prevent accidental operation of the actuator.



#### **WARNING!**

**Moving parts from accidental operation of power actuator can cause personal injury or equipment damage. Disconnect and lock out power to actuator before removal.**

- Remove actuator from valve. See Figures 3 and 4 for actuator removal.

Valve Overhaul  
(Continued)

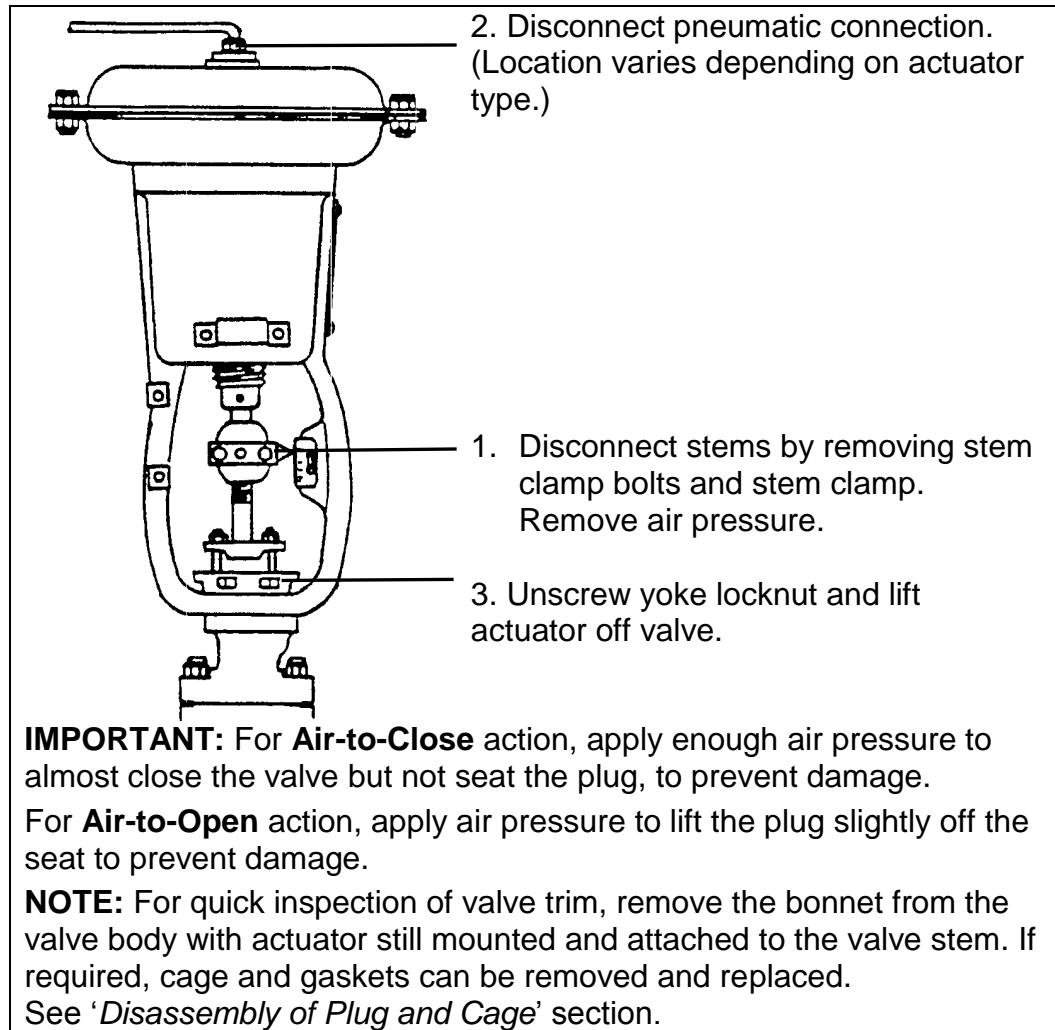
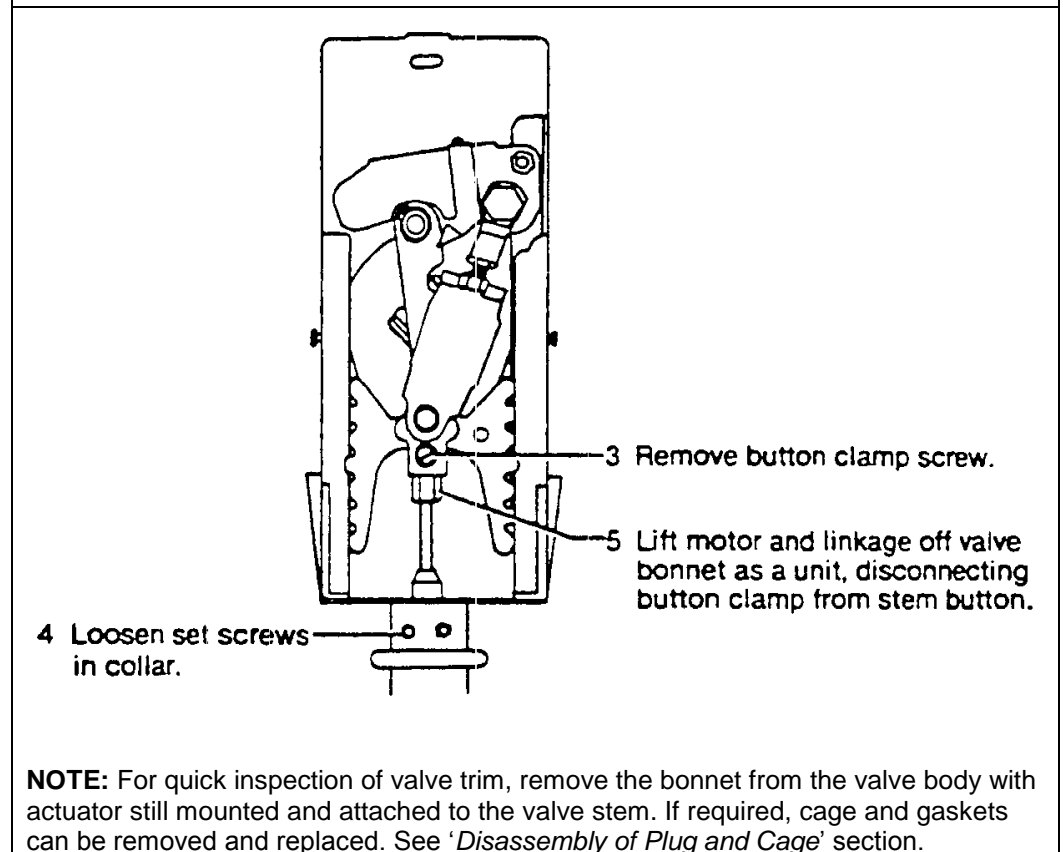
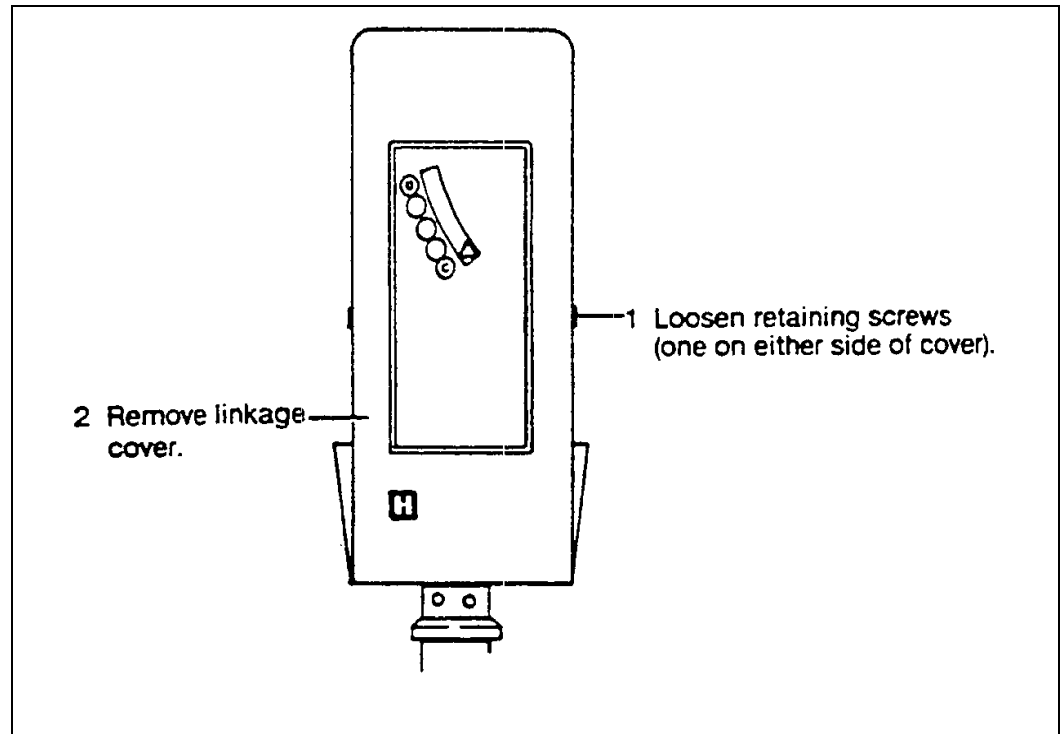


Figure 3 – Actuator Removal (Diaphragm Actuators)

Valve Overhaul  
(Continued)



**NOTE:** For quick inspection of valve trim, remove the bonnet from the valve body with actuator still mounted and attached to the valve stem. If required, cage and gaskets can be removed and replaced. See 'Disassembly of Plug and Cage' section.

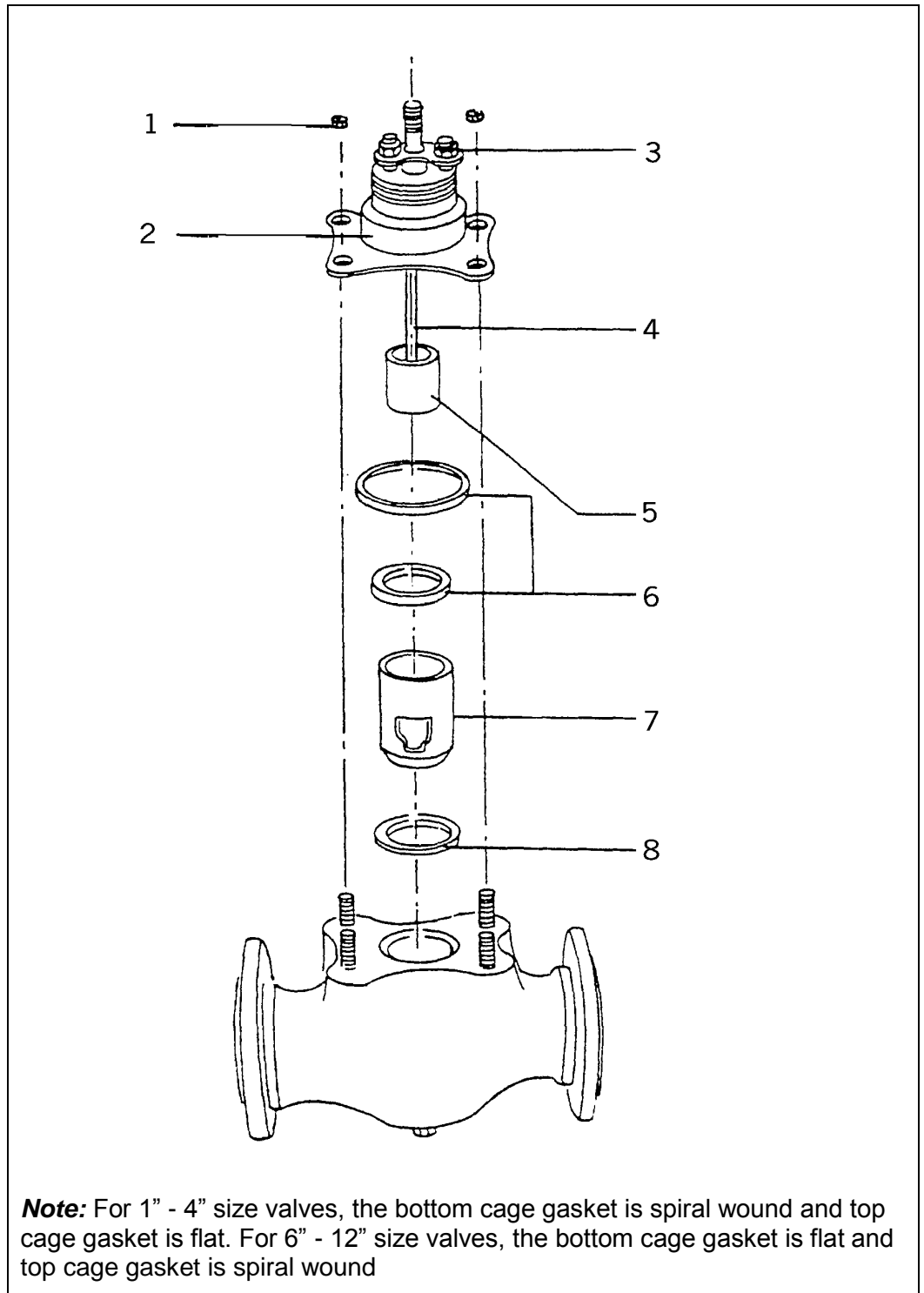
Figure 4 – Actuator Removal (Electric Motor)

**Valve Overhaul    *Valve Disassembly***

**(Continued)** To disassemble valve, follow steps 1 – 8. See Figure 5 for step identification.

1. Remove bonnet nuts or cap screws.
2. Lift bonnet, valve stem and plug assembly from body.
3. Loosen packing flange nuts.
4. Rotate plug and stem from bonnet unless valve is equipped with bellows seal bonnet. With bellows seal bonnet, knock out pin and unscrew plug from stem.
5. If plug is soft seat, see the *Soft Seat Replacement* section, page 12.
6. Remove bonnet and top cage gaskets.
7. Lift cage from valve body.
8. Remove bottom cage gaskets.

Valve Overhaul  
(Continued)



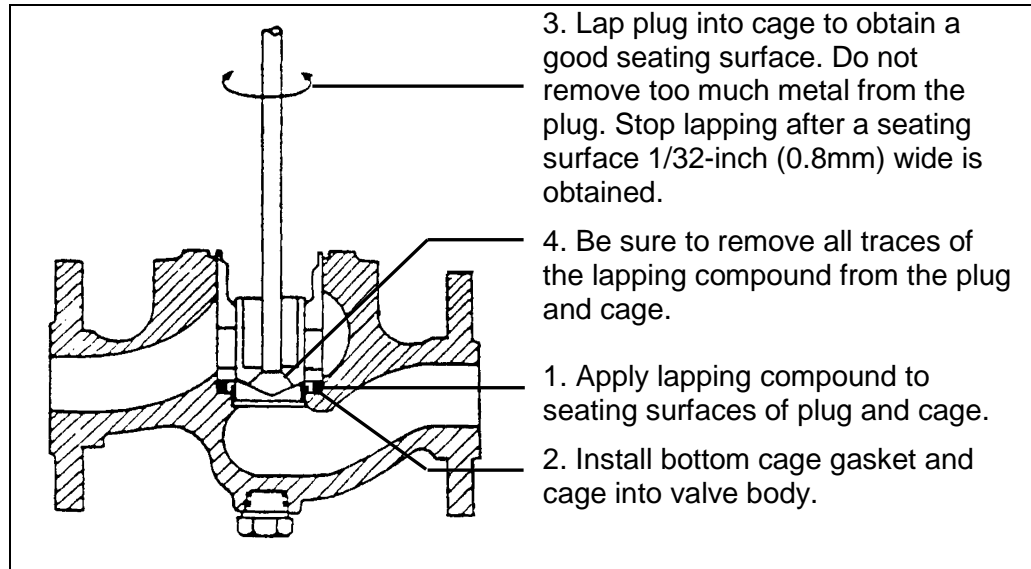
**Note:** For 1" - 4" size valves, the bottom cage gasket is spiral wound and top cage gasket is flat. For 6" - 12" size valves, the bottom cage gasket is flat and top cage gasket is spiral wound

Figure 5 – Disassembly of Valve

**Valve Overhaul** *Lapping Plug*

(Continued)

See Figure 6 for lapping plug instructions.



**Figure 6: Lapping Plug**

**Replacing Soft Seat**

See Figure 7 for the different soft seat configurations.

1. Remove nut, screw or screws and washers depending on arrangement.
2. Remove adapter plate and disc.
3. Replace disc and reinstall adapter plate and nuts, screw or screws and washers. See Table B for torque values.

**Table B: Soft Seat Torque Data**

Valve Size	Recommended Torque	
	Lbs.-ft.	N-m
1, 1-1/4 & 1-1/2	20	27
2 & 2-1/2	35	47
3 & 4	100	136
6	20	27
8	55	75
10 & 12	45	61

Valve Overhaul  
(Continued)

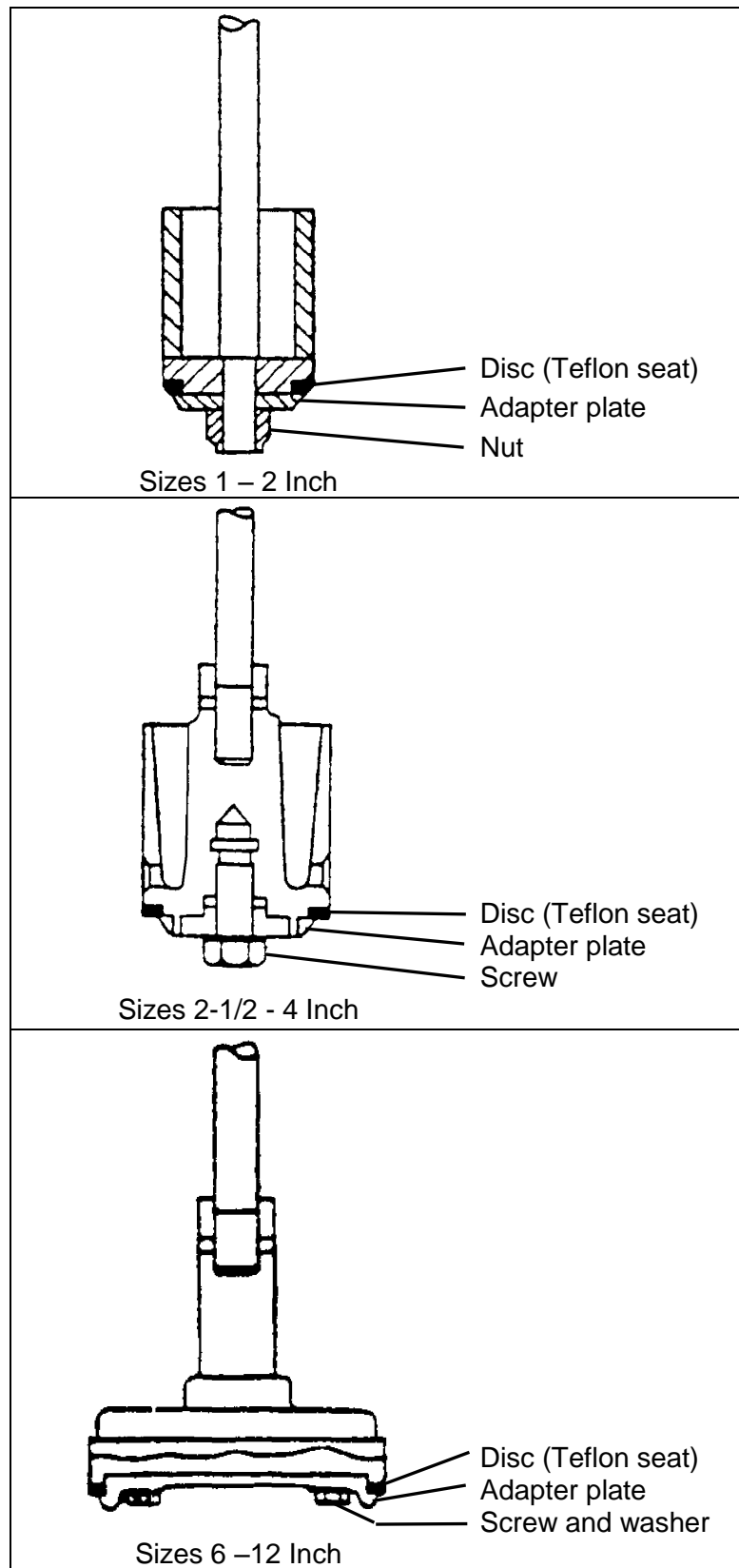


Figure 7 - Soft Seat Configurations

**1" – 12" Series 9100 Single Seated Cage Valves**

**Valve Overhaul    Valve Re-assembly**

*(Continued)*

**NOTE:** A new plug and cage should be installed at the same time to insure tight shutoff. Always replace gaskets whenever the valve is disassembled to prevent leakage.

1. Insert bottom cage gasket into valve body.
2. Insert cage into valve body. It is not necessary to orient the cage to the body.
3. If a new plug and cage is installed, lap plug. (See "Lapping Plug" section.)
4. Insert the top cage gasket on top of the cage.
5. Insert the bonnet gasket into the valve body.
6. Insert the plug and stem into the cage.
7. Slide the bonnet down the stem.
8. Finger tighten the bonnet nuts or capscrews.
9. Alternate tightening of the bonnet nuts or capscrews until the bonnet raised face contacts the body on all sides. Tighten to the appropriate torque listed in Table C and Table D.
10. Install new packing. (See "Packing Replacement" section.)
11. Return valve to service and check for leaks before installing actuator.

**Table C: Bonnet Nuts Torque – Steel and Alloy Steel Bodies**

Stud Size (Inches-UNC)	Recommended Torque	
	Lbs.-ft.	N-m
7/16-14	40-50	54-67
1/2-13	50-60	68-81
9/16-12	70-80	95-108
5/8-11	100-120	136-162
3/4-10	175-210	237-284
7/8-9	275-320	373-433
1-8	460-500	624-677
1-1/8-8	525-600	712-813

**Table D: Bonnet Capscrews Torque – Cast Iron and Bronze Bodies**

Stud Size (Inches-UNC)	Recommended Torque	
	Lbs.-ft.	N-m
7/16-14	15-25	21-33
1/2-13	30-40	41-54
9/16-12	50-70	68-94
5/8-11	70-100	95-135
3/4-10	120-170	163-230



## Valve Overhaul *Packing Replacement* (Continued)

**Teflon Graphite or Die Molded Laminated Graphite** – To replace this packing, it is not necessary to remove the actuator from valve.

- Disconnect and lock out the pneumatic or electrical power to prevent accidental operation of the actuator.

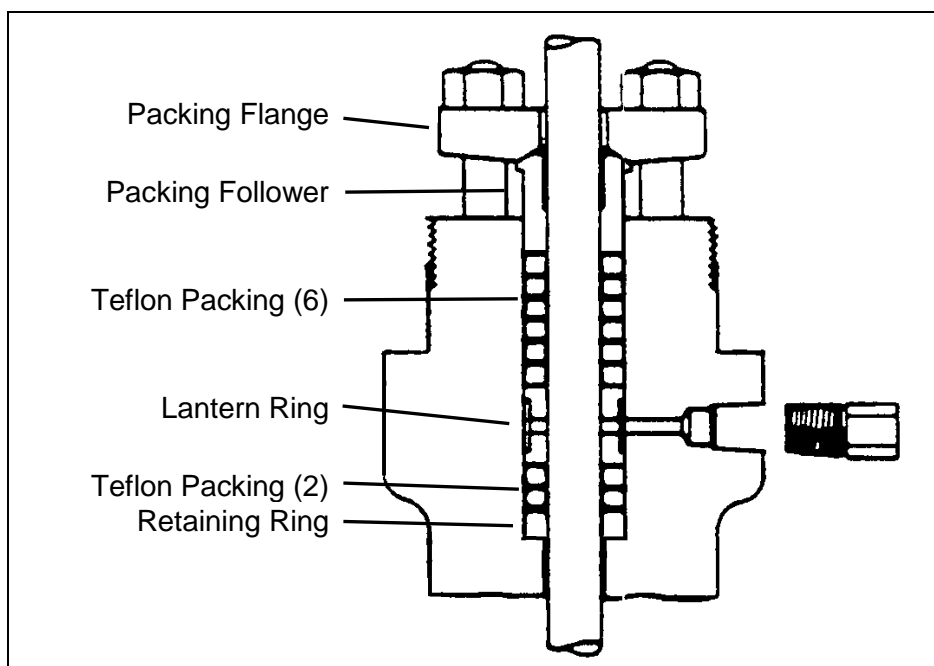


### **WARNING!**

**Moving parts from accidental operation of power actuator can cause personal injury or equipment damage. Disconnect and lock out power to actuator before servicing valve.**

See Figure 8 for Teflon Graphite or Die Molded Laminated Graphite packing identification.

1. Unscrew packing flange nuts.
2. Raise packing flange and packing follower.
3. Remove all packing with standard packing hook.
4. Replace stem if severely scored. (See Disassembly of Plug and Cage section.)
5. Insert new packing into packing chamber. Make sure retaining ring is still in place, then push in 2 Teflon rings, the lantern ring and then 6 more Teflon rings with packing follower.
6. Replace the packing follower and packing flange. Finger tighten the packing flange nuts.
7. Re-connect power to the actuator. Turn on system and check valve for leaks.



**Figure 8 - Teflon Graphite or Die Molded Laminated Graphite**

**1" – 12" Series 9100 Single Seated Cage Valves**

**Valve Overhaul**  
*(Continued)*

**Shredded Teflon** - To replace this packing, it is necessary to remove the actuator from valve and stem clamp from valve stem. See "Actuator Removal" section for instructions to remove actuator.

- Disconnect and lock out the pneumatic or electrical power to prevent accidental operation of the actuator.

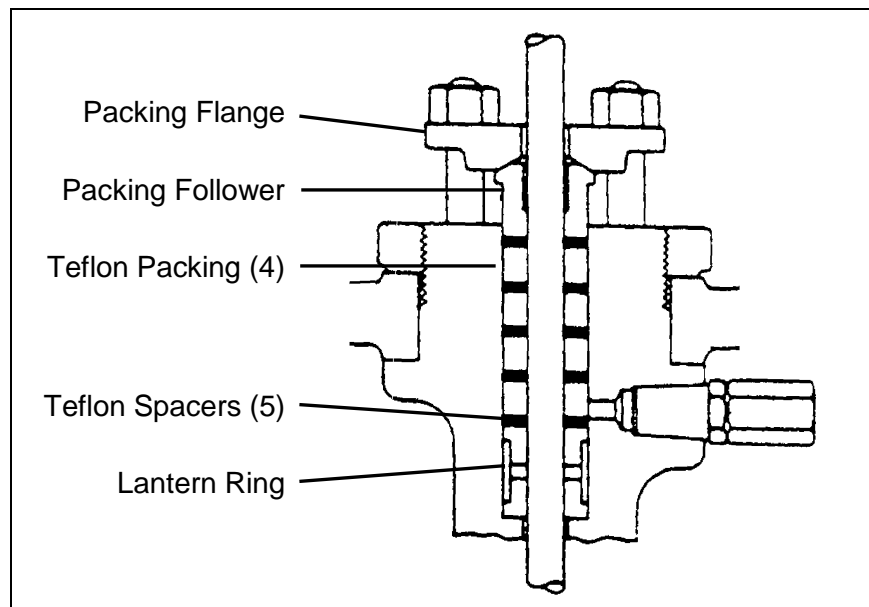


**WARNING!**

**Moving parts from accidental operation of power actuator can cause personal injury or equipment damage. Disconnect and lock out power to actuator before servicing valve.**

See Figure 9 for Shredded Teflon packing identification.

1. Unscrew packing flange nuts.
2. Lift packing flange and packing follower off valve stem.
3. Remove all packing with standard packing hook. Do not remove lantern ring.
4. Insert new packing into packing chamber. Push in 5 Teflon spacers and 4 Teflon packing rings (alternating spacer and packing rings) with packing follower.
5. Replace the packing follower and packing flange. Finger tighten the packing flange nuts.
6. Mount actuator on valve and reconnect power. Turn on system and check valve for leaks.



**Figure 9 - Shredded Teflon Packing**

**Valve Overhaul**  
*(Continued)*

**Spring-Loaded Teflon** - To replace this packing, it is necessary to remove the actuator from valve and stem clamp from valve stem. See "*Actuator Removal*" section for instructions to remove actuator.

- Disconnect and lock out the pneumatic or electrical power to prevent accidental operation of the actuator.

**WARNING!**

**Moving parts from accidental operation of power actuator can cause personal injury or equipment damage. Disconnect and lock out power to actuator before servicing valve.**

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See Figure 10 for Spring-Loaded Teflon packing identification.

1. Unscrew packing flange nuts.
2. Lift packing flange, upper stem wiper, packing follower and packing subassembly bushing off valve stem.
3. Remove all packing with standard packing hook.
4. Remove and clean upper washer, spring, lower washer and lower stem wiper.
5. Replace stem if severely scored. (See Disassembly of Plug and Cage section.)
6. Place a small amount of Plasti-Lube #2 on the Teflon rings and the upper half of the valve stem.
7. Replace lower stem wiper, lower washer, spring and upper washer.
8. Insert new packing into packing chamber. Be careful not to scratch or tear the Teflon rings while sliding over the valve stem.
9. Replace the packing subassembly bushing, packing follower and packing flange. Finger tighten the packing flange nuts.
10. Mount actuator on valve and reconnect power. Turn on system and check valve for leaks.

Valve Overhaul  
(Continued)

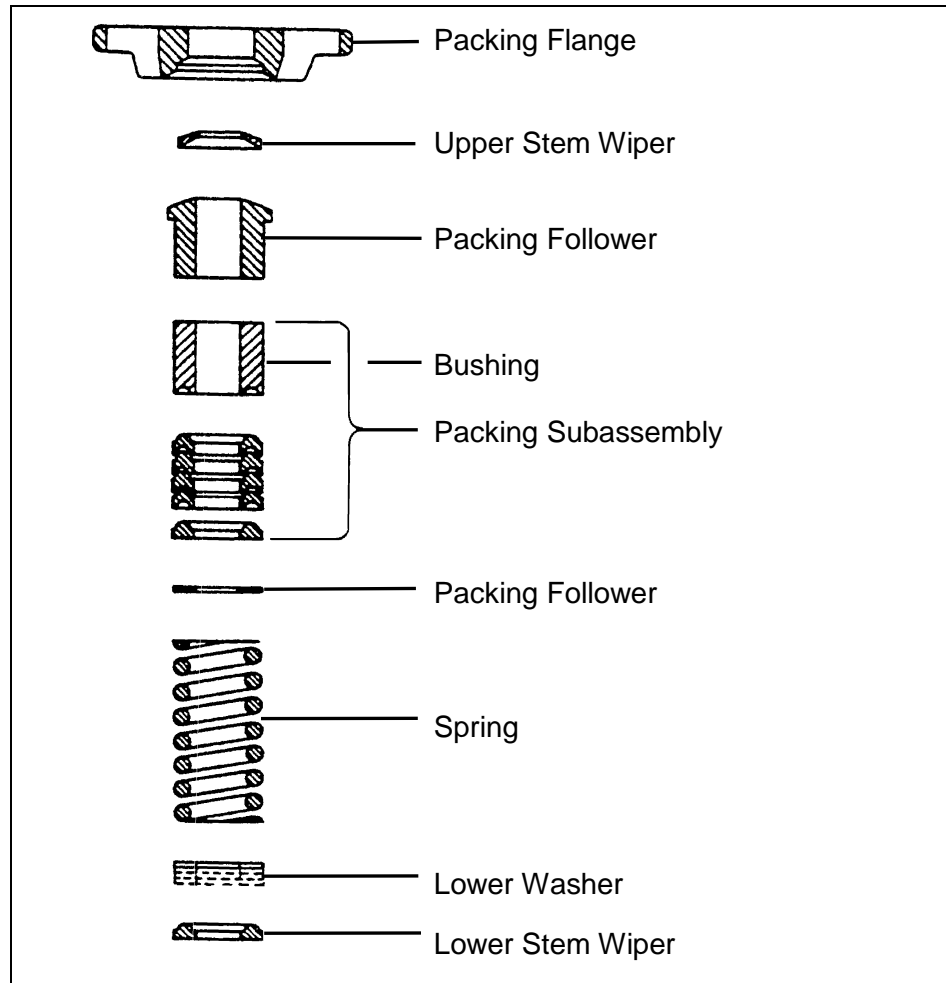


Figure 10 – Spring-Loaded Teflon Packing

**Mounting  
Actuator**

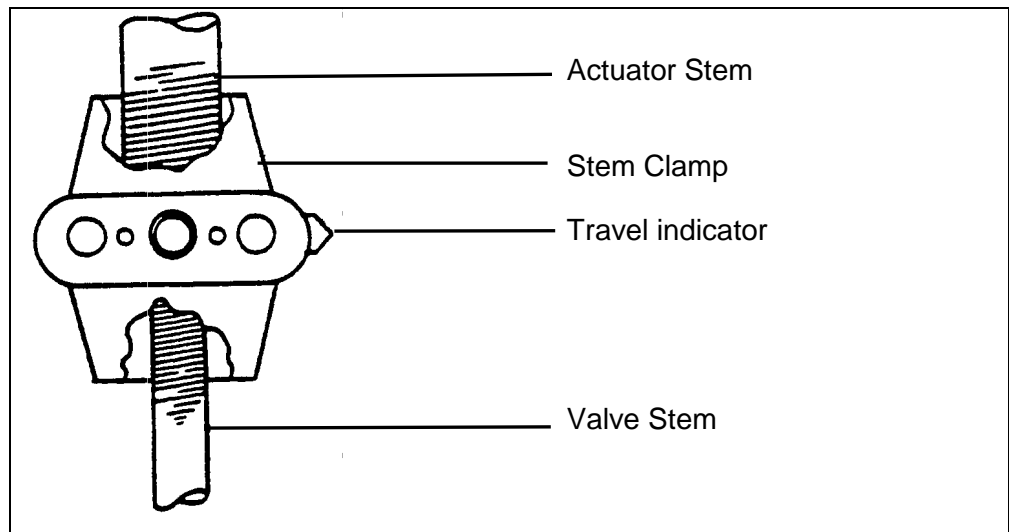
**NOTE:** Refer to nameplate to determine actuator and valve combination. See Figure 11 for stem connection.

**Air-to-Close (Direct Acting) Actuator**

1. Mount actuator onto bonnet and lock in place with hex socket head cap screws. Slip yoke lock nut over valve stem and tighten down on mounting yoke.
2. With no air pressure in actuator, seat valve plug.
3. Raise valve stem and plug a distance equal to the travel specified on nameplate.
4. Lock valve stem to actuator stem with stem clamp.

**Mounting  
Actuator  
(Continued)****Air-to-Open (Reverse Acting) Actuator**

1. Push valve stem down and seat plug.
2. Mount actuator onto bonnet and lock in place with hex socket head cap screws. Slip yoke lock nut over valve stem and tighten down on mounting yoke.
3. Apply sufficient air pressure in actuator to raise actuator stem 1/16".
4. Lock valve stem to actuator stem with stem clamp.

**Figure 11 – Stem Connection**

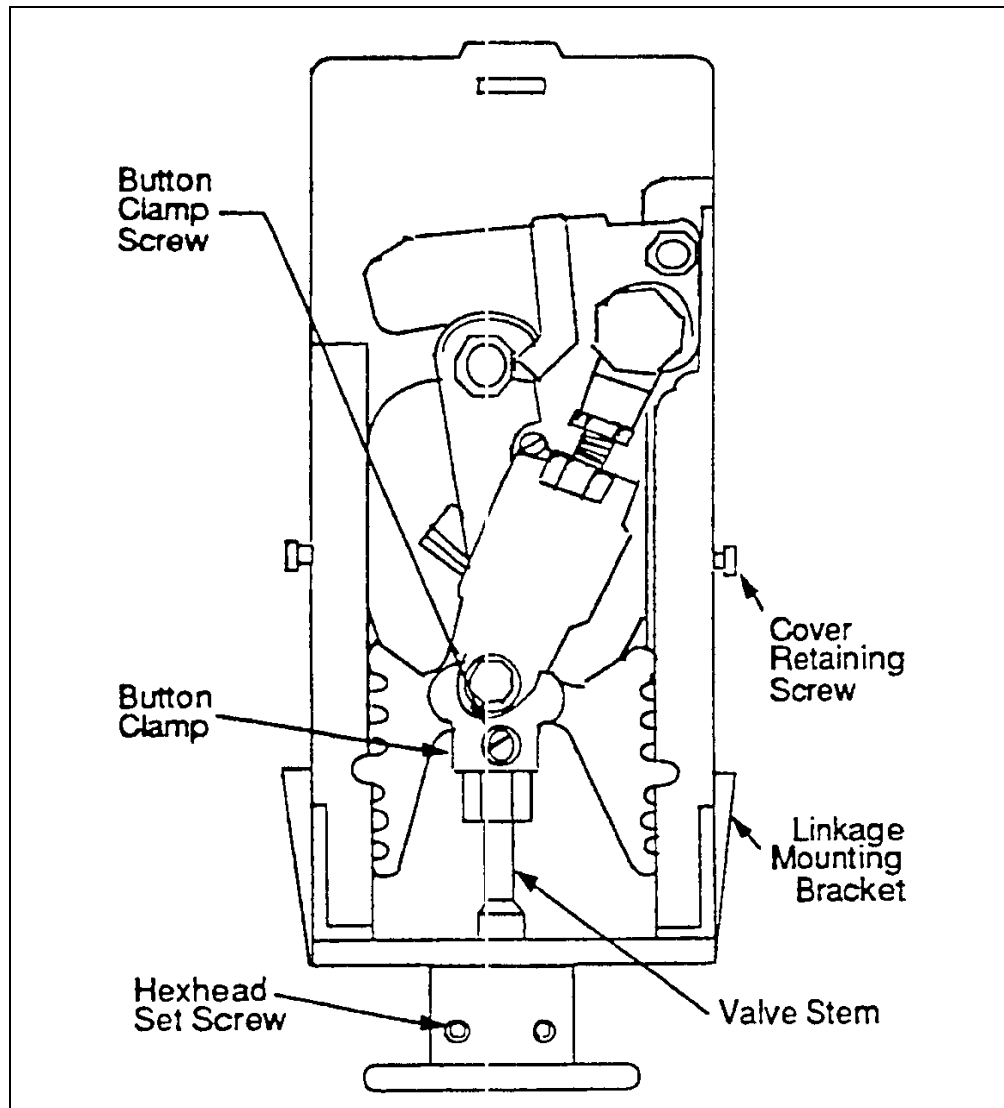
**Mounting Actuator**

*(Continued)*

**Electric Motor Actuator**

See Figure 12 for mounting electric motor.

1. Slide motor and linkage assembly onto valve bonnet and attach button clamp to valve stem.
2. Tighten hex set screws in collar.
3. Tighten button clamp screw.
4. Replace linkage cover and tighten cover retaining screws.



**Figure 12 – Mounting Electric Motor**

**Guarantee**

Products, auxiliaries and parts thereof, of Nor'East Controls' manufacture, are guaranteed for a period of one year from the date of shipment against defective workmanship and material only, when properly installed, operated and serviced in accordance with Nor'East Controls' recommendations. Replacement for items of Nor'East Controls' manufacture will be made free of charge if proved to be defective within such time. No claim for special or consequential damages, transportation, or labor shall be allowed. Purchaser shall be solely responsible for determining suitability for use and in no event shall Nor'East Controls be liable in this respect. Equipment or parts manufactured by others but furnished by Nor'East Controls will be repaired or replaced, only to the extent provided in the original manufacturer's warranty to Nor'East Controls. Nor'East Controls does not guarantee resistance to corrosion, erosion, abrasion or other sources of failure, nor does Nor'East Controls guarantee a minimum length of service. Failure of the purchaser to give prompt written notice of any alleged defect under this guarantee forthwith upon its discovery, or use and possession thereof after an attempt has been made and completed by someone other than Nor'East Controls or an authorized representative to remedy defects therein, or failure to return products or parts for replacement as herein provided, of failure to install, operate, and maintain said products or parts according to instructions provided by Nor'East Controls, of failure to pay the entire contract price when due, shall be a waiver of all rights under these representations.

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