

Recommended Installation Position

Horizontal Installation with Liquids Containing Suspended Solids:

The valve plug shaft should be in the horizontal plane with the plug rotating towards the top of the valve body.

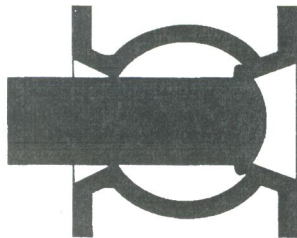
Vertical Installation with Liquids Containing Suspended Solids:

The valve should be installed with the seat end on the top side, regardless of the flow direction, with the plug rotating to the top of the valve.

ECENTRIC PLUG VALVE
Flow Designated

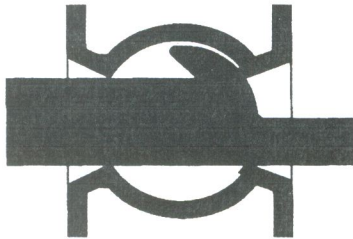
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CLOSED



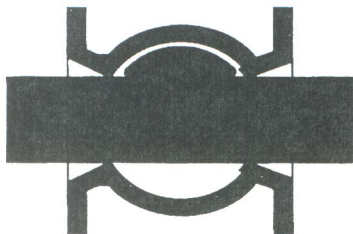
As the plug component is rotated to valve closure, the offset condition of the plug causes the seating surface to move axially downstream into the nickel. The results in a high seating force thereby crushing trapped solids and resulting in a bubble-tight seal. The upstream pressure acting on the convex side of the plug further improves the bubble-tight seal.

OPENING



Upon opening the valve, the initial rotation of the plug causes the resilient seating surface to move axially away from the nickel seat in the body. This action minimizes wear and scraping of the resilient seat, thereby improving the life of the valve. The plug can be positioned at any position between open and closed for throttling applications.

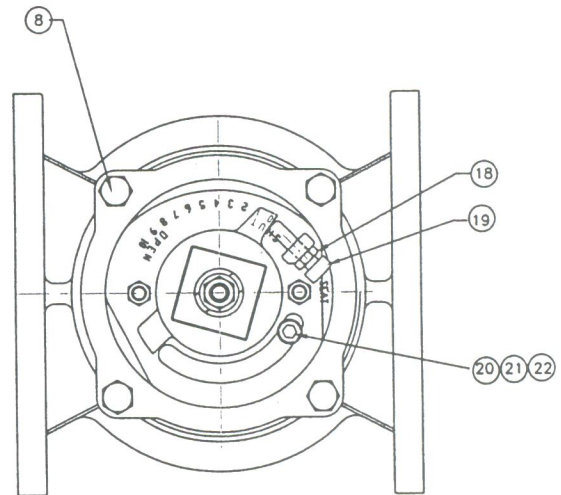
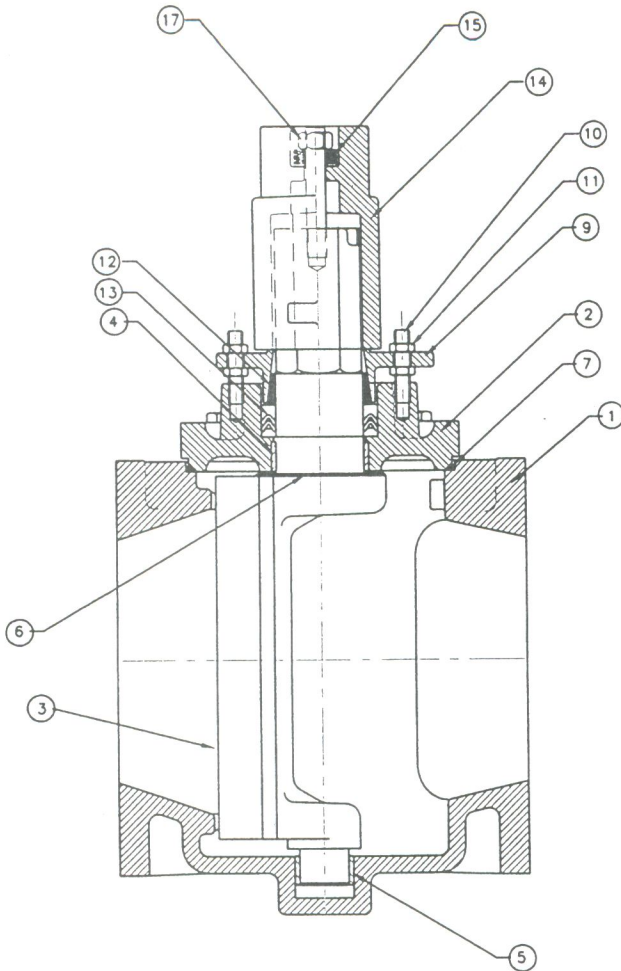
OPEN



In the full-open position, the plug is rotated out of the main fluid stream as shown. This allows for high capacity flow through the valve.

3"-12" ECCENTRIC PLUG VALVE Parts List

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DET.	QTY.	DESCRIPTION	MATERIAL
1	1	BODY	CAST IRON ASTM A-126 CLASS B
2	1	COVER	CAST IRON ASTM A-126 CLASS B
3	1	PLUG	CAST IRON & BUNA-N
4	1	TOP BEARING	316 STAINLESS STEEL
5	1	BOTTOM BEARING	316 STAINLESS STEEL
6	1	THRUST WASHER	NYLATRON
7	1	COVER O-RING	BUNA-N
8		COVER CAPSCREWS	ZINC PLATED STEEL
9	1	GLAND/BRAZE FOLLOWER	CAST IRON ASTM A-126 CLASS B
10	2	FOLLOWER STUD	ZINC PLATED STEEL
11	4	FOLLOWER NUTS	ZINC PLATED STEEL
12	1	BRAKE	GLASS REINFORCED PPS
13	1-SET	VEE PACKING	BUNA-N
14	1	OPERATING NUT	CAST IRON ASTM A-126 CLASS B
15	5	BELLVEU SPRING WASHER	ZINC PLATED STEEL
16	1	ADJUSTING STUD	ZINC PLATED STEEL
17	1	LOCK NUT	ZINC PLATED STEEL
18	1	SQUARE HEAD SET SCREW	ZINC PLATED STEEL
19	1	JAM NUT	ZINC PLATED STEEL
20	1	SOCKET HEAD CAPSCREW	ZINC PLATED STEEL
21	1	FLAT WASHER	ZINC PLATED STEEL
22	1	JAM NUT	ZINC PLATED STEEL

****RECOMMENDED SPARE PARTS**

Disassembly of 3" through 8" Eccentric Plug (1/4 turn)

Refer to 3" through 12" Parts List

Note; Line pressure must be 0 psi and the line drained if possible.

1. Put the valve in the full open position.
2. Remove #17 locknut.
3. Remove #15 bellvue spring washers.
4. Remove #14 operating nut.
5. Loosen and remove (2) follower nuts (item 11).
6. Remove gland/brake follower (item 9). This will relieve the sealing pressure on the V-Packing (item 13).
7. Loosen and remove the cover capscrews (item 8). Mark the position of the cover to body with a scribe or other markers.
8. Using (2) pry bars, one on each side of the cover (item 2) break the cover loose from the body (item 1). Remove the cover by sliding straight up over end of shaft.

* **NOTE; A suitable lubricant should be applied to the plug shaft to allow the packing to slide smoothly and prevent damage.**

9. The plug (item 3) can now be removed by turning and lifting out of the body.
10. Inspect top (item 4) and bottom bearings (item 5) for damage and replace if necessary.
11. Clean and inspect the nickel seating surface in the body (item 1). If seating surface is damaged, body should be replaced.
12. Inspect plug (item 3) sealing surface for nicks and wear. Replace if necessary.
13. Insert plug (item 3) into body (item 1) and orient in the open position.
14. Slide nylatron thrust washer (item 6) onto shaft of plug.
15. Inspect cover oring (item 7), and place in recess of body.
16. Remove old v-packing (item 13) from (item 2) recess.
17. Slide cover onto plug shaft. Align cover with scribe mark.
18. Install cover capscrews and tighten.
19. Slide packing set (item 13) over plug shaft and into packing recess in cover.
The follower gland (item 9) can be used to drive the packing into the cover.
20. Install brake #12 onto top of packing. Tapered end of brake should point up.
21. Install gland/brake follower.
22. Install follower nuts and tighten to seal packing.
23. Replace operating nut #14 with #16 adjusting stud installed in top of plug.
24. Replace bellvue spring washers #15 and lock nut#17.

* **Mystic FG-2 food grade grease or equivalent.**

DISASSEMBLY OF 4" THROUGH 12" ECCENTRIC PLUG VALVES (With Actuators)

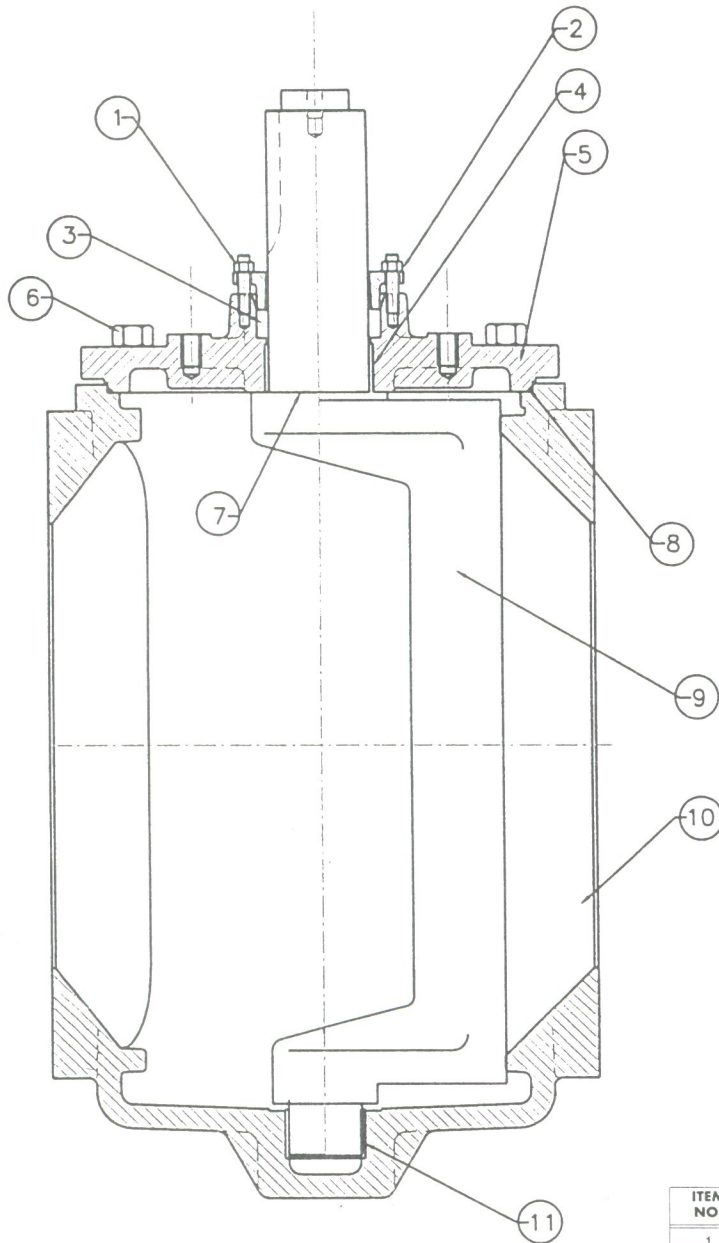
(Refer to 3"-12" Eccentric Plug Valve Parts List)

Note; Line pressure must be 0 psi and the line drained if possible.

1. Put the valve in the full open position.
2. Remove capscrews securing the actuator (worm gear, motor operator, cylinder actuator, etc.), then lift off the actuator.
Retain keys, couplings etc., for reassembly of the actuator.
3. Loosen and remove (2) follower nuts (item 11).
4. Remove gland/brake follower (item 9). This will relieve the sealing pressure on the V-Packing (item 13).
5. Loosen and remove the cover capscrews (item 8). Mark the position of the cover to body with a scribe or other markers.
6. Using (2) pry bars, one on each side of the cover (item 2) break the cover loose from the body (item 1). Remove the cover by sliding straight up over end of shaft.
**NOTE; A suitable lubricant should be applied to the plug shaft to allow the packing to slide smoothly and prevent damage.
(*Mystic FG-2 Food Grade Grease or equivalent)*
7. The plug (item 3) can now be removed by turning and lifting out of the body.
8. Inspect top (item 4) and bottom bearings (item 5) for damage and replace if necessary.
9. Clean and inspect the nickel seating surface in the body (item 1). If seating surface is damaged, body should be replaced.
10. Inspect plug (item 3) sealing surface for nicks and wear. Replace if necessary.
11. Insert plug (item 3) into body (item 1) and orient in the open position.
12. Slide nylatron thrust washer (item 6) onto shaft of plug.
13. Inspect cover oring (item 7), and place in recess of body.
14. Remove old v-packing (item 13) from cover (item 2) recess.
15. Slide cover onto plug shaft. Align cover with scribe mark.
16. Install cover capscrews and tighten.
17. Slide packing set (item 13) over plug shaft and into packing recess in cover. The follower gland (item 9) can be used to drive the packing into the cover.
18. Install follower nuts and tighten to seal packing.
19. Actuator can be reinstalled.

14"-24" ECCENTRIC PLUG VALVE Parts List

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ITEM NO.	DESCRIPTION	ASTM
1	STUD & HEX NUTS STEEL - ZINC PLATED	
2	FOLLOWER GLAND CAST IRON	ASTM A-126 CLASS B
3	"V" RING SEALS BUNA-N	
4	316 S S OIL IMPREGNATED SLEEVE BEARING	
5	COVER CAST IRON	ASTM A-126 CLASS B
6	HEX HEAD CAPSCREW STEEL - ZINC PLATED	
7	THRUST WASHER NYLATRON	
8	COVER O-RING BUNA-N	
9	PLUG CAST IRON & BUNA-N	ASTM A-126 CLASS B
10	BODY CAST IRON	ASTM A-126 CLASS B
11	316 S S OIL IMPREGNATED SLEEVE BEARING	

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★ ★ RECOMMENDED SPARE PARTS

DISASSEMBLY OF 14" THROUGH 24" ECCENTRIC PLUG VALVES (With Actuators)

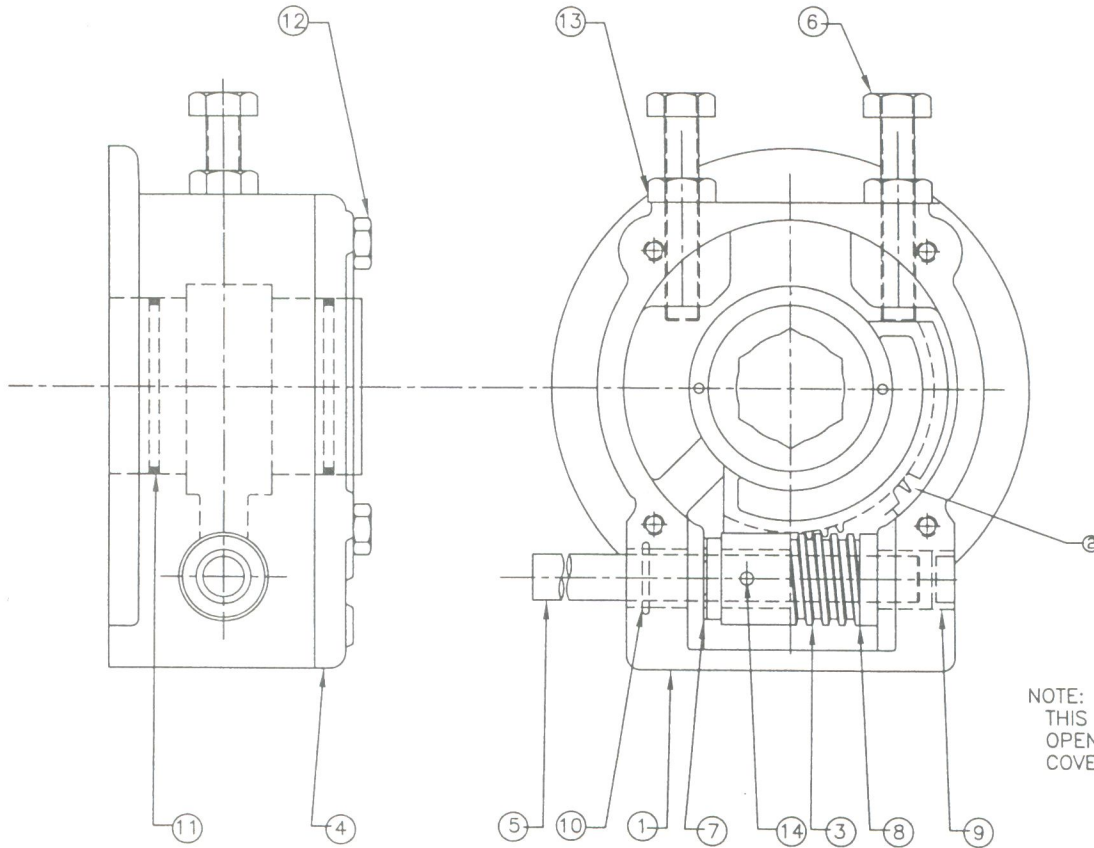
(Refer to 14"-24" Eccentric Plug Valve Parts List)

Note; Line pressure must be 0 psi and the line drained if possible.

1. Put the valve in the full open position.
 2. Remove capscrews securing the actuator (worm gear, motor operator, cylinder actuator, etc.) then lift off actuator. Retain keys, coupling etc., for reassembly of the actuator.
 3. Loosen and remove (2) follower nuts (item 1).
 4. Remove gland follower (item 2). This will relieve the sealing pressure on the v-packing (item 3).
 5. Loosen and remove the cover capscrews (item 6). Mark the position of the cover to body with a scribe or other markers.
 6. Using (2) pry bars, one on each side of the cover (item 5) break the cover loose from the body (item 10). Remove the cover by sliding straight up over end of shaft.
- Note; A suitable lubricant should be applied to the plug shaft to allow the packing to slide smoothly and prevent damage.**
7. The plug (item 9) can now be removed by turning and lifting out of the body.
 8. Inspect top (item 4) and bottom bearings (item 11) for damage and replace if necessary.
 9. Clean and inspect the nickel seating surface in the body (item 10). If seating surface is damaged, body should be replaced.
 10. Inspect plug (item) sealing surface for nicks and wear. Replace if necessary.
 11. Insert plug (item 9) into body (item 10) and orient in the open position.
 12. Slide nylatron thrust washer (item 7) onto shaft of plug.
 13. Inspect cover o-ring (item 8), and place in recess of body.
 14. Remove old v-packing (item 3) from cover (item 5) recess.
 15. Slide cover onto plug shaft. Align cover with scribe mark.
 16. Install cover capscrews and tighten.
 17. Inspect packing set (item 3) over plug shaft and into packing recess in cover. The follower gland (item 2) can be used to drive the packing into cover.
 18. Install follower nuts and tighten to seal packing.
 19. Actuator can be reinstalled.

3"-24" ECCENTRIC PLUG VALVE Worm Gear Operator – Parts List

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DET.	QTY.	DESCRIPTION	MATERIAL
1	1	HOUSING	CAST IRON ASTM A-126 CLASS B
2	1	DRIVE SLEEVE	MANGANESE BRONZE
3	1	WORM	AISI-11L41
4	1	COVER PLATE	CAST IRON ASTM A-126 CLASS B
5	1	WORM SHAFT	AISI-11L41
6	2	STOP SCREW	ASTM A108
7	2	SHIM	MILD STEEL
8	2	THRUST BEARING	OIL IMPREGNATED BRONZE
9	1	EXPANSION PLUG	ASTM A108
10	2	O-RING	BUNA-N
11	2	O-RING	BUNA-N
12	4	HEX HEAD CAP SCREW	ASTM A100
13	2	LOCK NUT	ASTM A-108
14	1	SPRING PIN	HIGH TENSILE STEEL

Instructions to Rotate Gear Box on 4" through 12"

1. Completely close the valve against the closed stop.
2. Back off operating nut (1) turn to relieve closing torque on internal of gear.
3. On worm gear with position indicators remove (2) ¼" capscrews holding indicator plate and remove plate.
On worm gear with buried service cap (on top of gear) remove (3) ¼" capscrews retaining the cap and remove the cap.
4. Loosen and remove the ½" capscrew, lockwasher, and large flat washer under the indicator plate (or cap on buried service).
5. Loosen and remove the (4) 3/8" capscrews retaining the worm gear to the flanged adapter plate which is bolted to the valve cover. (Do not remove the flanged adapter plate from the valve cover).
6. Lift worm gear off of flange adapter and remove from plug shaft.
Rotate to the desired position and slide backover plug shaft.
7. Reassemble in reverse order.
8. Operate valve and check for correct closure. Re-adjust closed stop if necessary. (Refer to stop adjustment procedures, see troubleshooting)

TROUBLESHOOTING ECCENTRIC PLUG VALVES

POSSIBLE MALFUNCTION	SYMPTOMS / CAUSES	CORRECTIVE ACTION
Joint Leak	Loose Bolts	Tighten Bolts
Shaft Leak	Loose Gland Packing Worn	Tighten Gland Tighten packing gland/ replace packing.
Seat Leak	Debris on seat.	Flush valve to clean seats.
	Damaged Seat	Inspect-replace plug
	If none of the above	*Adjust Closed position stops.
Hard to Operate (1/4 turn valve)	Gland Brake/ Follower Too tight	**Loosen follower /Plate

***Inspection for the above should be done semi annually at a minimum.*

***Instructions for adjusting stops;**

For quarter-turn op nut/lever operated valves;

1. Loosen #19 jam nut. Back off #18 (square head capscrew) appropriately.
2. Close valve. Repeat if necessary until valve seals.

For worm gear operated valves;

Note; Close stop adjustment bolt is located closest to input shaft of worm gear.

1. Loosen #13 (lock nut). Back off #6 (stop screw) ½ turn at a time. Close valve.
Repeat as need to attain seal.

ECCENTRIC PLUG VALVE Troubleshooting (continued)

****Instructions for loosening Gland/Brake Follower;
(for quarter turn op nut/lever operated valves)**

1. Loosen (#11) follower nuts. (2) on top of gland, #9. Adjust follower nuts (2) #11 on bottom of gland (#9) up to raise the gland.
2. Operate the valve several times to relax the packing (#13) and brake (#12).
Note; Addition of a penetrating oil or lubricant to the packing area may aid in freeing up the operation.
3. Repeat adjustments as necessary.
4. When valve operates freely, tighten the top (2) follower nuts, #11, down tight against the gland/brake follower, #9. Make sure gland/brake follower is level and not binding the brake/packing when operated.

For Parts and Service Contact Mfg's Rep;



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LIMITED WARRANTY

Clow warrants that the goods furnished hereunder, will be free from defects in material and workmanship, and will operate freely without failure or leakage under the service conditions they were installed under.

If within one year from date of initial operation, but not more than eighteen months from date of shipment by Clow of any item of product(s), the purchaser discovers that such item(s) was not as warranted above, notifies Clow in writing within 30 days from date purchaser discovered; or should have discovered, then Clow shall remedy such nonconformance by, at Clow's option, adjustment or repair or replacement of the item and any affected part of the product(s) within 30 days of such notice. Purchaser shall assume all responsibility and expense for removal, reinstallation and freight in connection with the foregoing remedies.

Clow shall not be liable for incidental or consequential losses, damages, or expenses, directly or indirectly arising from the sale, handling or use of the goods, or from any other cause relating thereto, and Clow's liability hereunder in any case is expressly limited to replacement (in the form originally shipped) of goods not complying with this agreement, or, at Clow's election, to the replacement of, or crediting Purchaser with, an amount equal to the purchase price of such goods whether such claims are for breach of warranty or negligence.

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