

Mogas MVP Installation, Operation And Maintenance Manual



Congratulations on your purchase of a

“Mogas Valve For Power”

This pamphlet is intended to provide complete information on installation, operation, maintenance, disassembly, and assembly of the Mogas MVP metal seated ball valve series. If you have any further questions concerning your MVP valve(s) please call (713) 449-0291 and ask for the Service Manager.

Installation

Mogas valves are shipped with corrosion resistant paint for storage up to six months. For long term storage, the internal parts of carbon and alloy steel valves should be sprayed with a rust preventative.

Remove the valve and/or actuator carefully from the shipping box, or crate. Use nylon straps around the valve body and sturdy section of the actuator. Review this maintenance manual, assembly drawing with the bill of materials and actuator manual shipped with the valve. Inspect the general condition of the valve and actuator for shipping damage.

Remove protective covers from the valve ends and inspect for shipping damage or debris. Remove any debris from valve interior. Consult the Mogas factory if damage is present.

Open and close the valve to ensure the valve position is identified correctly and matches the handle position or actuator indication. **(Photo 11)** The actuator stops are set at our factory, but if the actuator is removed or reoriented, the stops can be reset per the actuator manual, if required, to achieve full open and/or full closed. Note that the actuator must not be reoriented without removal from the valve to prevent 180° rotation of the ball. This is to assure the mated ball & seat surfaces match. (See **Assembly** section, step 7.)

Identify the preferred direction of the seal indicated by "PRESSURE END" stamped on the valve body. The normal direction of flow is from the higher to lower pressure end. However, if normal and/or critical high pressure sealing is required opposite the flow direction, install with the pressure end stamp in the high pressure direction.

--Flanged Connections--

Install the valve in line with mating flanges. Support or lift as required.

Install the flange gaskets, studs, and nuts and tighten per **ANSI** or **API** torque requirements. Mogas flanges are supplied in the customary straddle centerline hole orientation unless otherwise specified.

--Welded Connections--

Verify that the valve is in the open position to prevent damage to the internals from weld splatter. The "spring return to close" actuators must be energized or manually opened as required to keep the valve open during welding.

Use the welding ground strap on the same end that is being welded to prevent current flow through the valve. **(Figure 1)** **CAUTION:** Current flow through valve can damage the ball or seat coating and cause valve leakage!!

Install the valve inline and support valve and actuator as necessary with nylon straps.

Weld the circumference evenly to minimize distortion, and allow cooling between passes, if allowed by the weld procedure. Preheat and postweld stress relief should be carried out per ASME VIII, or ANSI B31.1, & ANSI B31.3 per **Table 2**. Note that F-22 materials over 1/2" thick require 350° to 400°F preheat and 1300° to 1400° postweld heat treat. Heat input to the valve during stress relief is to be minimized and monitored to keep the body below 1100°F and the actuator below 200°F. Place the heating coils as close to the weld as possible and keep the valve surfaces clear to allow maximum heat dissipation from the valve.

Inspect the condition of the valve and actuator for proper orientation and alignment. Operate the valve several times to ensure smooth operation, noting any differences between before and after installation. Retorque packing glands nuts.

Operation and Maintenance

After first exposure to elevated temperature, re-torque gland and body nuts per **(Table 1)**.

No lubrication is required for operation of MOGAS valves. Improper use/injection of sealant may void your warranty.

Valves remaining, open or closed for long periods should be operated at least once every month. Keep manual actuators fully lubricated with extreme pressure and/or high temperature type grease as required. Lubricate hydraulic or pneumatic actuators according to manufacturers instruction. (see actuator manual)

Check body studs/nuts periodically; re-torque when necessary. **(Table 1)**

Stem Packing Maintenance (Table 1)

Stem packing torque should be checked periodically or at least on 6 month intervals. Optional live loading is available to assure proper stem packing loads for extended service with little or no adjustment.

1. At initial installation retighten torque to the installation value given in Table 1.

2. For routine maintenance, packing life can be conserved by adjusting the nuts to the lower maintenance torque value.

3. For maintenance to stop stem leakage: Tighten packing nuts to maintenance value given in Table 1. If leakage persists, continue tightening until leakage stops, & then tighten one additional turn of each nut.

Table 1	Recommended Body Stud Torque	Recommended Packing Gland Stud Torque	
Valve type	Stud - A193 GR.B16	Stud - A193 GR.B8M	
		Installation	Maintenance
MVP-bc MVP-uc	43 ft.lbs.	15 ft.lbs.	8 ft.lbs.
MVP-bd MVP-ud	245 ft.lbs.	15 ft.lbs.	8 ft.lbs.
MVP-bh MVP-uh	365 ft.lbs.	36 ft.lbs.	20 ft.lbs.

Disassembly

1. Remove bolts holding actuator to mounting flange or mounting flange adapter; remove adapter.

2. Remove valve from piping. If welded in, **make sure valve is open** to allow slag to be cleaned out of the bore and to prevent damage to the ball.

3. Grind or chisel off ground strap welded across end connection joint. Remove body-to-end connect bolting and remove end connect **(03)**. **(Photo 1)** Be careful not to damage sealing surface inside body gasket counterbore. If ball and seat appear in good condition, skip to paragraph 2 of the **REWORK** section.

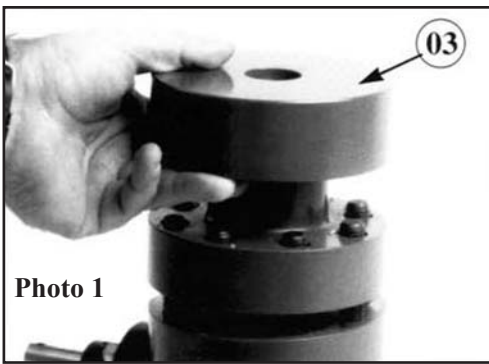


Photo 1

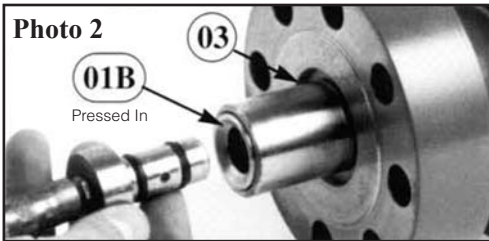


Photo 2

4. Remove pressed-in seat ring (01B), if scratched or damaged, from end connect by inserting the removal tool (Photo 2) until it bottoms out on the seat ring. Then pump in grease with a high pressure gun. The special seat removal tool is available from Mogas. Small scratches can be lapped out per Rework section.

5. Rotate ball (01A) to fully closed; remove by lifting at end opposite stem and gently “rolling out” until ball is clear of body.

6a. For unidirectional valves (model MVP-U) with an upstream push ring (01D), remove the push ring and live spring disc (01C) from the body. (Photo 3A)

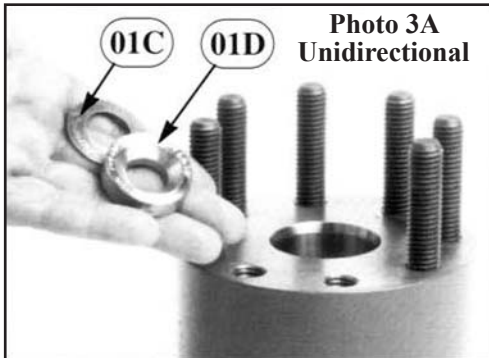


Photo 3A
Unidirectional

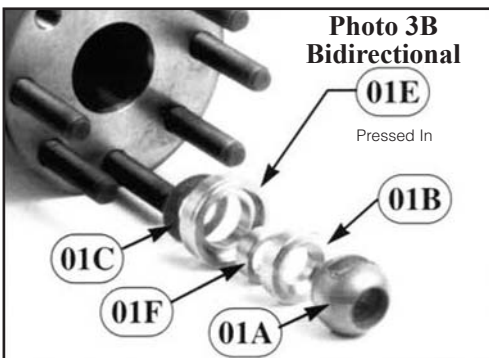


Photo 3B
Bidirectional

6b. For bidirectional valves (model MVP-B) remove only the seat (01B) and the spacer ring (01F). (Photo 3B) The upstream seat pocket (01E) is press-fit into the body and retains the spring (01C). The

seat pocket (01E) and spring pocket in the body (02) should be cleaned and inspected. Small scratches can be lapped out per the rework instructions, but larger scratches or damage requires replacement or remachining at the factory. Special tooling for seat pocket removal, is available from Mogas.

7. Remove body gasket (04) from body.

Note: If the stem packing is in good condition, skip to Rework. For replacement of stem packing only follow step 8, remove packing with corkscrew removal tool and install packing per Assembly - Item 3

8. To disassemble the stem; remove the mounting flange adapter (51) if used, then remove the shear pin (06A) from the stem adapter (13) or lever (50), and remove. (Photo 4) Then disassemble the mounting flange bolts (18), mounting flange (14A), and mounting flange leg (14B), or mounting flange casting (14). Remove the gland nuts (15), gland flange (07), and upper stem packing assembly (09A) & (09B).

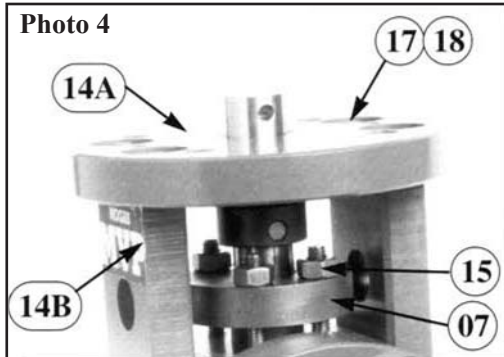


Photo 4

9. With a brass hammer or wood block, tap the stem (05) into the body cavity, remove the lower retainer pin (08B) and pull the stem up through the body. (Photo 5) The thrust bearing (08A) can be removed from the body.

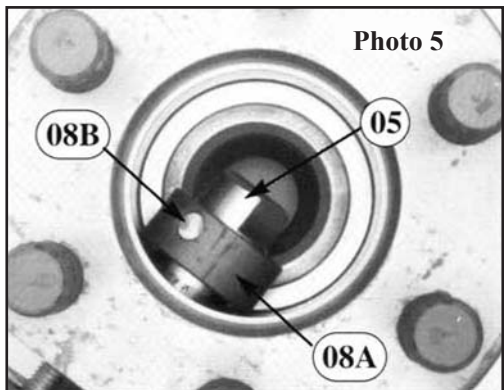


Photo 5

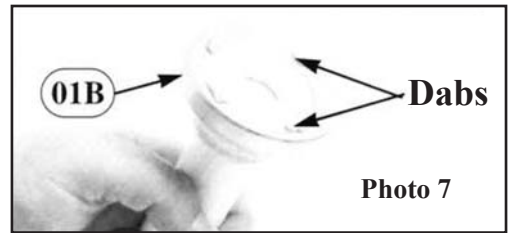


Photo 7

1. Visually inspect all parts for damage taking note of all sealing surfaces. If the seal landing surfaces are damaged, return the valve for repair or replacement. (Photo 3B)

2. The ball (HA) may be “kiss lapped” to the downstream seat ring (01B) while still in end connection (03) using a small amount of fine diamond lapping compound. (Photo 6A). If the surfaces do not clean up, showing full contact with machinist bluing, contact Mogas & see Assembly section 4 as special tooling is required for seat ring removal (Photo 2). If the pressed-in seat ring is removed, a new oversize seat ring should be installed with the seat press-in tool (Figure 2). Relap & check for full seat contact after seat installation. The body side seat (01B) may be lightly lapped to the upstream side of the ball (01A) and to the seat pocket (01E) (Photo 7 & 6B), using diamond lapping compound and a circular motion. Lap for ten to fifteen minutes maximum. If the surfaces do not clean up, return the valve to Mogas or call for assistance.

3. Clean all parts thoroughly and inspect (especially sealing surfaces). Replace the body gasket and stem packing to ensure proper valve operation.

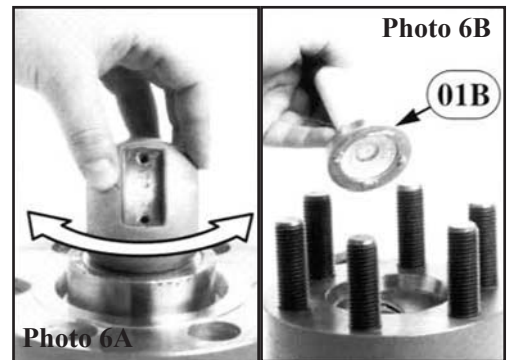


Photo 6A

Photo 6B

Assembly

1. Clean all parts before assembly and/or replacement of parts. Install thrust bearing (08A) into stem bore from inside body. Make sure saddle in thrust washer is biased to the body bore and not to the gland flange side.

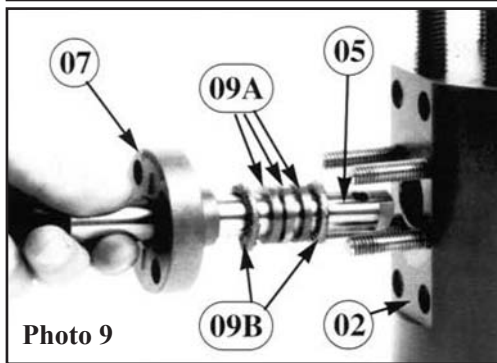
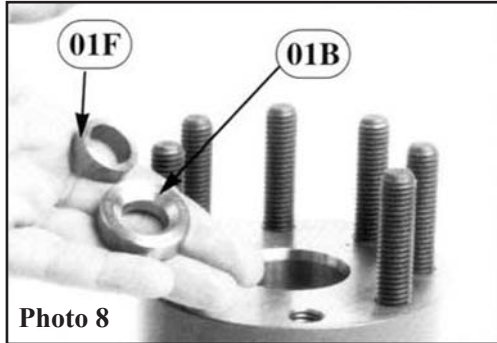
2. Hold the body (02) vertically. For unidirectional valves, model MVP-U, Install the spring (01C) and push ring (01D) in the body cavity (Photo 3A). For bidirectional valves model MVP-B, install the spacer ring (01F) and the seat ring (01B) into the seat pocket (01E). (Photo 8) & (Photo 3B)

Rework

NOTE: If valve is still under buyer's warranty, any and all rework not performed by Mogas will void warranty.

Lapping compound, and gaskets may be purchased from Mogas.

3. Install anti-extrusion rings (09B) and stem packing (09A) by sliding the first anti-extrusion ring in the stem packing pocket of valve body (with stem in place) using the gland flange (07) as a packing tool. Repeat for each of the three packing rings, pressing firmly in place with gland flange, and do the same with remaining anti-extrusion ring. (Photo 9)



4. Make sure gland studs (12) are in place, then install gland flange over stem. Push down on stem from top of valve so the shear pin hole can be seen from the valve body bore. Insert shear pin (08B) into bottom of stem and thrust bearing (08A).

5. Tighten the nuts alternately to uniformly compress the packing set per Table 1. Slide the upper thrust bearing (08A) on the stem and pin with the retainer pin (08B). Make sure that the thrust bearing's drilled hole is biased toward the valve body and not the mounting flange. With a center punch and hammer, peen around the hole on the thrust bearing (both sides) so that the shear pin is trapped within the thrust bearing.

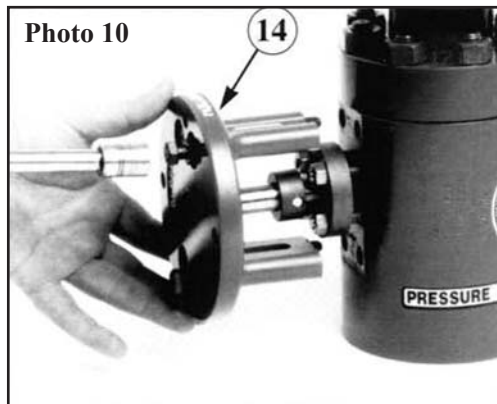
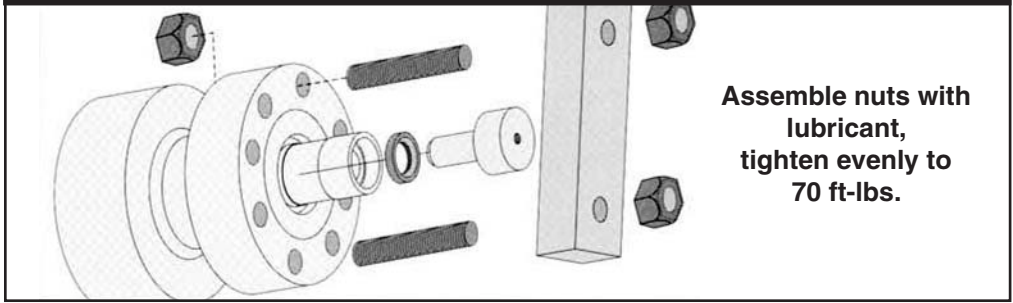


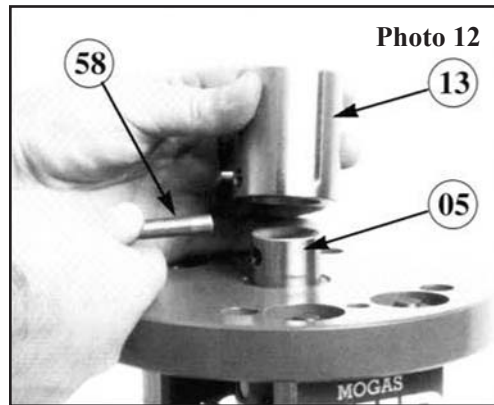
Figure 2

Using the Seat Press-In Tool



Assemble nuts with lubricant, tighten evenly to 70 ft-lbs.

6. Position the mounting flange legs (14B) in the proper holes in the body. Place the mounting flange (14A) over the stem (05) and position on the legs. Install the bolts (30) and lockwashers (17) through the mounting flange and tighten. (Photo 10) The upper thrust bearing (08A) should be contacting the gland packing flange (07). If not, pull up on the stem. The stem must not be pushed into the ball, as this could cause misalignment and leakage. Re-check that the upper thrust bearing contacts the stem bushing after installing the stem adapter (13) and actuator (50).



7. Roll ball (01A) to fixed, closed position making sure matching-lapped ball and seat surfaces match. (Identifying numbers are the same.) Place ball into body cavity over properly aligned stem. "T" or single scribe line should be facing up or to the end connect. (Photo 11)

8. Install body gasket (04) into groove located at body face where end connect mates to body.

9. Make sure all studs (10) are in place.

10. Install end connection assembly onto body by positioning it (seat facing down) over body bore. Align bolt holes with studs. Lower end connection to body face. Screw on nuts (11). Stroke valve freely before alternately snugging all nuts. Stroke valve one full cycle then alternately torque to recommended tightness (Table 1). If valve does not stroke easily, disassemble and take necessary corrective action.

11. Place the stem adapter (13), if used, on stem (05) and install shear pin (06A). (Photo 12)

12. If mounting flange adapter (51) is used, bolt to mounting flange.

13. Rotate valve and check for easy operation in hill open and closed positions.

14. Install actuator or hand lever on mounting flange (or adapter) as originally supplied by Mogas. When installing actuator verify by measurement or observation that valve stem is not pushed into valve body. Make sure stem is not rotated 180° causing unmatched ball & seat surfaces.

15. Tests For leakage are outlined on back of this manual.

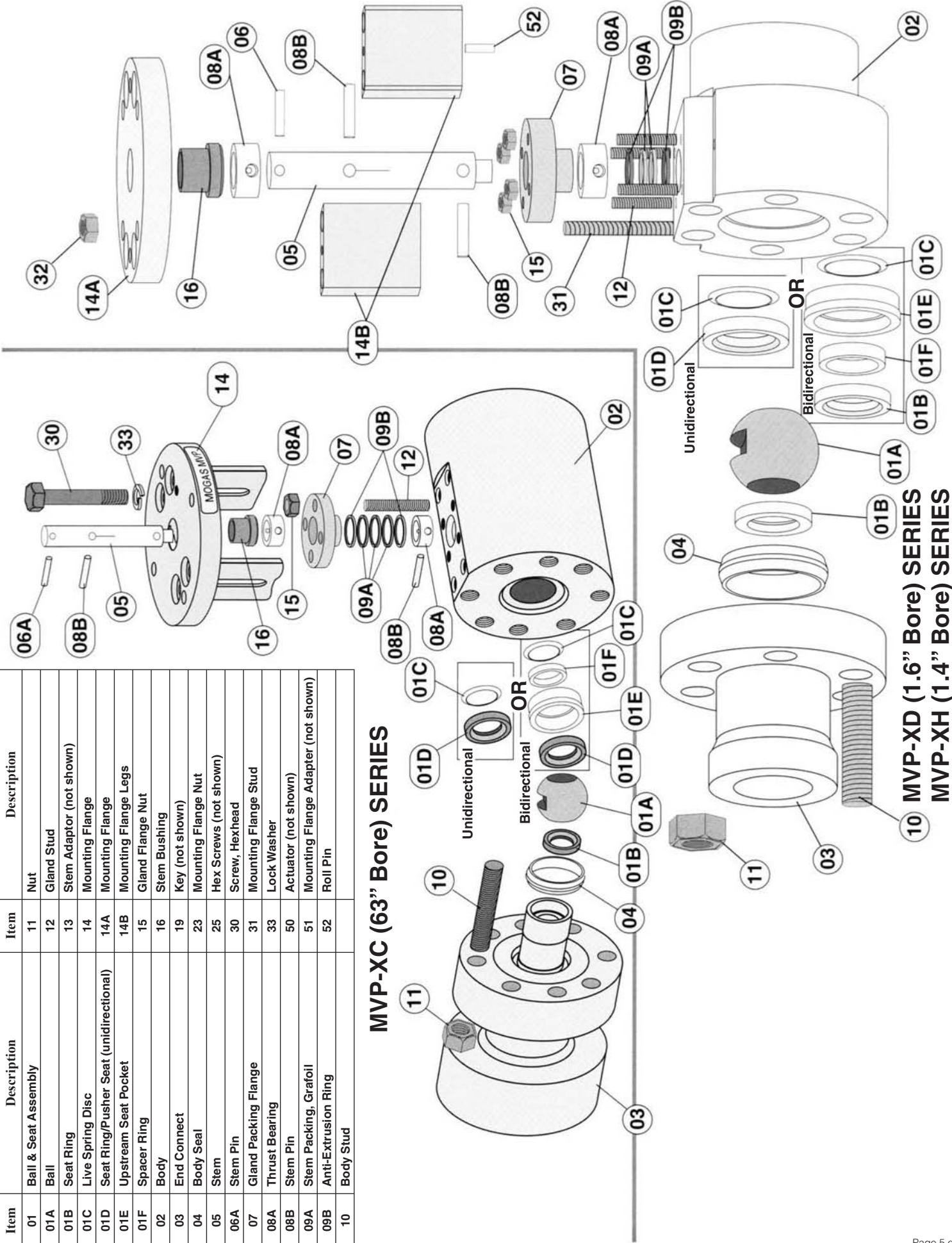
16. Install valve in piping as outlined under "Installation".



MVP SHOWN IN "CLOSED" POSITION

Item	Description	Item	Description
01	Ball & Seat Assembly	11	Nut
01A	Ball	12	Gland Stud
01B	Seat Ring	13	Stem Adaptor (not shown)
01C	Live Spring Disc	14	Mounting Flange
01D	Seat Ring/Pusher Seat (unidirectional)	14A	Mounting Flange
01E	Upstream Seat Pocket	14B	Mounting Flange Legs
01F	Spacer Ring	15	Gland Flange Nut
02	Body	16	Stem Bushing
03	End Connect	19	Key (not shown)
04	Body Seal	23	Mounting Flange Nut
05	Stem	25	Hex Screws (not shown)
06A	Stem Pin	30	Screw, Hexhead
07	Gland Packing Flange	31	Mounting Flange Stud
08A	Thrust Bearing	33	Lock Washer
08B	Stem Pin	50	Actuator (not shown)
09A	Stem Packing, Grafoil	51	Mounting Flange Adapter (not shown)
09B	Anti-Extrusion Ring	52	Roll Pin
10	Body Stud		

MVP-XC (63" Bore) SERIES



MVP-XD (1.6" Bore) SERIES
MVP-XH (1.4" Bore) SERIES

Table 2
Weld Requirements Per ANSI 31.1 & 31.3

Material	P No.	Group No.	Preheat (F°)	Postweld Heat Treatment (F°)
A105	1	2	50 - Nom. Thickness < 1" 175 - Nom. Thickness 1"	1100 - 1200 ① Nom. Thickness > 3/4"
F5, F9, & F22	5	1, 2	350 - 400	1300 - 1400 ② Nom. Thickness > 1/2"
304,316,347	8	1	50 - 70	None

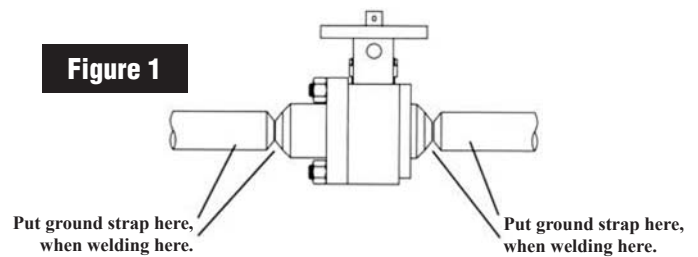
Notes:

The term Nominal Thickness is the lesser thickness of the weld, or the materials being joined.

① Not required if nominal thickness is under 3/4" and 200°F minimum preheat is applied if the base material exceeds 1".

② Not required for nominal thickness under 112', 300°F minimum preheat is applied and a maximum chrome content of 3%.

Figure 1



Field Hydrostatic Test

1. Install blind flanges on both ends of valve. Connect hydrostatic pump with block and bleed valves (See Figure 3).
2. With test valve bore vertical and valve half open, pump body cavity with water containing suitable corrosive inhibitor (such as watersoluble oil) through block valve "D" while bleeding through block valve "A".

NOTE: Valves "A" and "D" are open, valve "B" closed. If pneumatic actuator is present, the valve can be put into half-open position by using a valve in the air pressure line to restrict air flow.

3. Mount test setup so discharge side of bleed valve "A" is at the highest elevation of test system to insure all air is purged. With all air purged, close bleed valve "A".
4. Shell test: Increase pressure to 1.1 times Maximum Cold Working Pressure. Leakage of body gasket & stem packing should be zero. Hold test pressure for length of time outlined in MSS-SP-61 standards. Then bleed pressure off using bleed valve "B" and re-close immediately.
5. Seat test: Close test valve. Open bleed valve "A". Build test pressure again to 1.1 times C.W. P. Check leakage rate at bleed valve "A" (refer to Table 3 for acceptable value).
6. If valve passes, skip to step 7., If valve has more leakage than specified by Table 3, bleed pressure by opening bleed valve "B" and re-close immediately. Build pressure to 25% of seat test pressure and close block valve "D". Then stroke valve one full cycle (back to closed position).

CAUTION: When valve is stroked, pressure will be released through bleed valve "A". Now return to step 5, and repeat the seat test.

7. Bleed pressure completely by opening bleed valve "B".
8. Valve is "preferred direction" type and if seat test is also desired from opposite direction, turn valve around in test circuit and repeat test from step 1. through 7., but omit shell test in step 4.

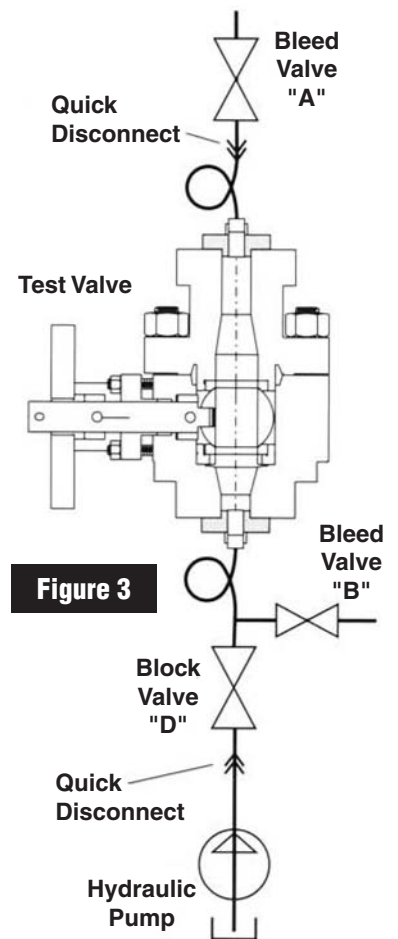


Figure 3

Note: 16 drops = 1 ml		Maximum Seat Leakage							
		In accordance with MSS-SP-61 for ANSI class 150# - 4500#							
Nominal Bore Size		1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"
LIQUID	ml/min	.08	.12	.17	.21	.25	.33	.42	.50
	drops/min	1.5	2	2.5	3.5	4	5	7	8
GAS	SCFH	.05	.75	.10	.13	.15	.20	.25	.30

Table 3

Gas Test: Because of safety risks involved in a high pressure gas test, PLEASE consult with Mogas. If gas tests are required Mogas recommends a 300-400 psi test pressure.