# Mogas SC-3PC Maintenance Manual

## An In-Line Repairable Mogas Valve

Introducing the SC-3PC, another Mogas [ENGINEERED SOLUTION] that maximizes performance and safety for valve users. The Mogas SC-3PC has a 3 piece body assembly which allows the valve body to be easily removed while the end connections remain in-line.

### Features

- The valve has a three piece body assembly which allows the user to remove the valve body while leaving the end connections in-line
- Two Inconel 718 Gold plated body gaskets ensure zero body leaks, and a long service life, even in severe thermal shocks
- The balls and seats are mate-lapped for 100% sealing area contact which ensures absolute shutoff
- Sharp leading edges of the seats wipe the ball clean each time the ball is operated, eliminating particle buildup
- Seats are protected from flow by the ball in the open or closed position, reducing wear on sealing surfaces
- Extensive stuffing box with dual anti-extrusion rings keeps packing in place
- Quarter turn non-rising stem does not deteriorate packing
- Live loading ensures zero emissions even in high cycle applications
- Precision machined “rigid” mounting bracket designed to support the actuator in any position

### Applications

- Drain and Vent Isolation
- Soot Blower Header
- Hot Reheat Spray
- Superheater Spray
- Main Turbine Drain
- Boiler Feed Pump
- Main Steam Supply

### Pipe Sizes

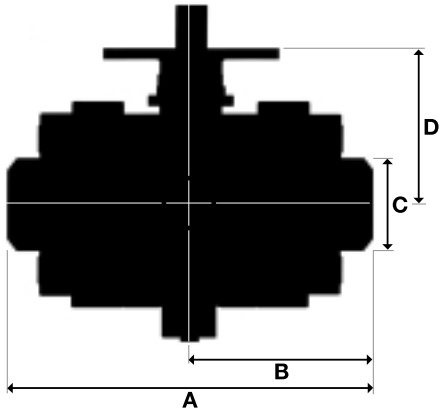
- 2 -1/2" - 6"

### Bore Sizes

- 2

### Classes

- 2500# Standard and Special Class




**Valve Dimensions for the SC-3PC**

| Pipe Size | Bore Size | Weight | A | B | C | D |
|---|---|---|---|---|---|---|
| 2 1/2" | 2" | 259# | 20.00 | 10.00 | 2.88 | 7.31 |
| 3" | 2" | 265# | 22.75 | 11.38 | 3.50 | 7.31 |
| 4" | 2" | 273# | 26.50 | 13.25 | 4.50 | 7.31 |
| 6" | 2" | 310# | 36.00 | 18.00 | 6.63 | 7.31 |

**SC-3PC CV**

| Pipe Size | | CV |
|---|---|---|
| 2 1/2" | sch XXS | 228 |
| | sch 160 | 295 |
| 3" | sch XXS | 285 |
| | sch 160 | 210 |
| 4" | sch XXS | 164 |
| | sch 160 | 152 |
| 6" | sch XXS | 126 |
| | sch 160 | 124 |

## Installation

1. Remove protective covers from valve ends.
2. Open and close valve to make sure valve is opened/closed to match handle position or actuator indicators. (If needed, use included actuator information from manufacturer to set stops.)
3. Install valve in piping. All valves have a specific direction of flow, indicated by "Pressure End" stenciled on valve body. Install valve accordingly. To install weld-in valve, make sure valve is open so slag or weld splatter can be cleaned out and ball surface is not damaged. Fail-closed actuators should be in open position. Always keep the welding ground strap adjacent to the end being welded so no current flows through the valve.
4. After valve is installed, open and close several times to ensure smooth operation.

## Operation & Maintenance

1. Valves remaining open or closed for long periods of time should be operated at least once every month.
2. Keep manual actuators on valves fully lubricated with extreme pressure and/or high temperature grease as required. Lubricate hydraulic or pneumatic actuators according to manufacturer instructions.
3. Check body and packing-gland nuts periodically; re-torque if necessary (Table 1).
4. After the first excursion to elevated temperature, re-torque gland, access plug nut, and body bolt nuts (Table 1 & 2).
5. NO LUBRICATION IS REQUIRED FOR OPERATION OF MOGAS VALVES. Improper use/injection of sealant may void your warranty.

## Disassembly

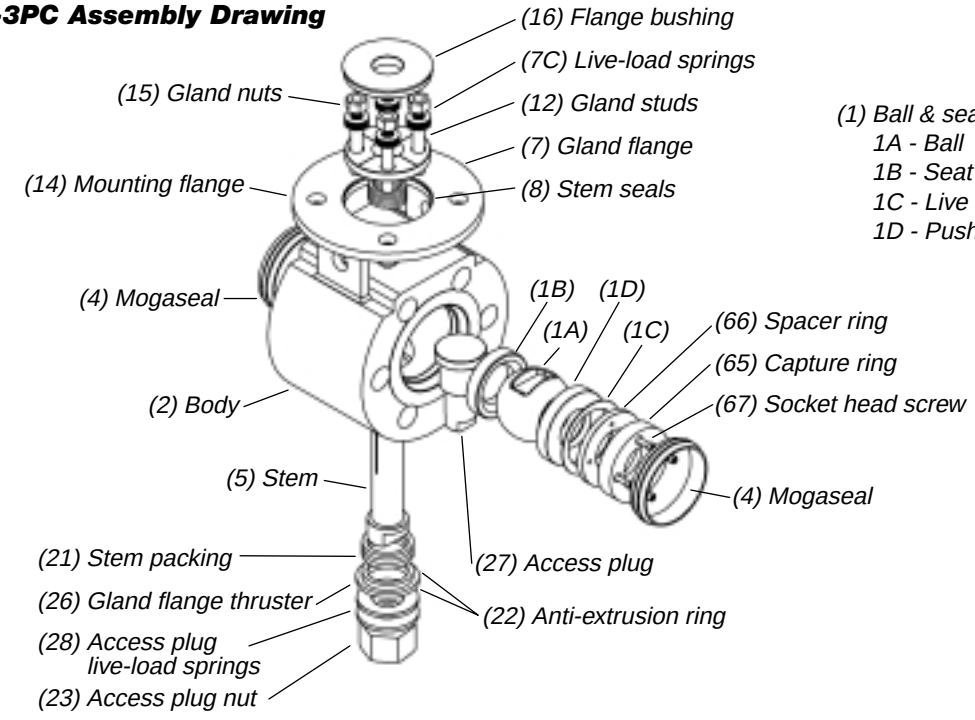
1. Remove bolts holding actuator to mounting flange or mounting flange adapter. Remove actuator.
2. Secure body section with sufficient support.
3. Remove body-to-end bolting. Be careful not to damage sealing surface inside body gasket counterbore.
4. Slowly spread end connections by use of bolting through jack-screw tabs on end connections.
5. Remove Mogaseal from body. CAUTION: Do not damage seat pocket.
6. Remove body section when clear of end connections. (All components in body section are contained inside the body section).

## Rework

Lapping compound, lapping heads, and gaskets may be purchased from Mogas. NOTE: IF VALVE IS STILL UNDER BUYER'S WARRANTY, ANY AND ALL REWORK NOT PERFORMED BY MOGAS WILL VOID WARRANTY.

1. Remove socket-head bolting (67) from capture ring (65). Remove spacer ring (66).
2. Remove retaining ring (64) (not shown).
3. All components should be easily removed.
4. Inspect seat landing surfaces after cleaning with 400 grit wet emery cloth and steel wool. If damaged, return to Mogas for repair or replacement.

### Mogas SC-3PC Assembly Drawing



5. When installing new ball and seat assembly, lightly lap back of seat (1B) to metal sealing surface on body using lapping compound. Lap for 10 minutes maximum. If surfaces do not clean up, send to Mogas for re-machining or call for technical assistance. No lapping required on Mogaseals (4).
6. Clean and inspect all parts thoroughly especially seal surfaces. Carefully replace seals, gaskets, and packing to ensure proper valve operation.
7. Ball reworking and ball-seat lapping should be done by a certified Mogas repair facility.

## Assembly

1. Clean all parts before assembly and/or replacement.
2. Place inner stem seals (8) on stem (5), and insert stem through access plug bore. Note: Inner stem seals are coated on one side; install with coated sides facing each other. The side with a chamfer is the uncoated side.
3. Install upper stem seal assembly while pushing stem into stem bore. Install the packing set as a single, integral piece over the stem. First slide the anti-extrusion ring over the stem and into the stem packing pocket of the valve body, using gland flange (7) as the packing tool. Repeat for each packing ring (9A), pressing firmly in place with gland flange, and do the same with remaining anti-extrusion rings.
4. Make sure gland studs (12) are in place, then install gland flange (7) over stem while pushing the stem through the stem bore. Align stem while holding stem top by pulling straight out from body.
5. Install live loading springs (7C) and gland nuts (15). Tighten nuts alternately until packing is uniformly compressed and nuts snug but not over tightened.
6. Install access plug (27) through valve bore, then install packing (21) and anti-extrusion rings (22).
7. Install the gland flange thruster (26) with shoulder to the outside. Place the live-loading springs (28) in parallel.
8. Tighten nut (23) alternately until packing rings uniformly compressed.
9. With body placed so the seat pocket faces up, install seat ring.
10. Roll ball (1A) – in fixed, closed position – making sure matched lapped ball and seat surfaces match. (Identifying numbers are the same). Lower ball into body cavity over properly aligned stem. (“T” or single scribe line should be facing up or to the top. Ball should “rock”.)
11. Install pusher seat ring (1D) and then live spring disk (1C) with ID against back of pusher seat. When installed properly, the pusher seat (1C) is against the live spring disk (1D).
12. Install spacer ring (66).
13. Install ring retainer (64) in the groove of body bore.
14. Install capture ring (65) with the counter-bore holes facing outside. Secure assembly with the four-socket head screws (67).
15. Ensure all bolting is torqued to respective values.
16. Seat test body section if possible.
17. Install Mogaseals (4) on end connections. Make certain the body section, when lowered to the space provided between the end-connections, does not interfere with the Mogaseals during installation.
18. Locate the stenciled “Pressure End” marking on the body section to match with the end connection with the same marking location.
19. Carefully lower body section between the end connections.
20. Install studs (10) in body tap holes to aid in aligning of body to end connections.
21. Relax the jackscrew bolting to release the end connections onto the body. Level the position of the Mogas-seals in the body gasket pocket. Let end connections rest on body and check through bore for no binding condition. Ensure a consistent gap between end connection and body around their circumference before snugging of body nuts (11).
22. Stroke valve one full cycle then tighten nuts (11) alternately to the values (Table 1).
23. Install all mounting assembly components for gear/actuator.
24. Rotate valve and check for easy operation at full open and closed positions.

## Quality Control

**Table 1**
***Recommended Packing Torque (ft-lb)***

| Item No. | Description | Value |
|---|---|---|
| 12 | 9/16 12UN A193-B8M | 45 |

**Table 2**
***Recommended Stud Torque (ft-lb)***

| Item No. | Description | Value |
|---|---|---|
| 10 | 1-3/8 8UN A193 GRB16 | 700 |
| 23 | 1-1/2 8UN A194 GR4 | 881 |

Full employee acceptance of quality is paramount to a successful Quality Assurance Program. Mogas has established a culture of quality throughout the company, from the initial customer inquiry to the final product shipment. The Mogas Industries, Inc. Quality Assurance Program encompasses a complete quality management system to ensure conformance with national reference standards including ANSI/ASME Code requirements. When used as Power Operated Relief Valves, Mogas severe service ball valves may be stamped with the ASME "V" Stamp, to ensure they have been designed, manufactured, inspected and tested to meet the requirements of ASME Code Sections I, II and IX.

## Testing

- Tested to MSS-SP-61, API 598
- Fire safe to API 607, API 6FA, BS 6755

## Customer Service

From commercial flexibility to outstanding service, our goal is your complete satisfaction. Mogas field service representatives are available 24 hours a day, 365 days a year. Mogas technical advisors will assist you with installation or training, either by phone or on-site, if requested. On-site coverage extends anywhere, bringing technical support to the harshest environments and the most remote locations. We go where you are.

**Torque Chart - Service Break Torque***

| Pressure | In - Lbs | Ft - Lbs |
|---|---|---|
| 0 | 6790 | 566 |
| 500 | 8566 | 714 |
| 750 | 9455 | 788 |
| 1000 | 10343 | 862 |
| 1250 | 11232 | 936 |
| 1500 | 12120 | 1010 |
| 1750 | 13008 | 1084 |
| 2000 | 1158 | 13897 |
| 2250 | 14785 | 1232 |
| 2500 | 15674 | 1306 |
| 2750 | 16562 | 1380 |
| 3000 | 17451 | 1454 |
| 3250 | 18339 | 1528 |
| 3500 | 19227 | 1602 |
| 3750 | 20116 | 1676 |
| 4000 | 21004 | 1750 |

* Torque stem is break torque with 1.3 service factor included.

**Standard Class Ratings**
*Temperature vs Pressure*

| Temperature (°F) | | -20 to 100 | 200 | 300 | 400 | 500 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 | 1050 | 1100* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **ANSI 2500#** *Maximum Pressure (psig)* | **F22** | 6250 | 6250 | 6070 | 5880 | 5540 | 5040 | 4905 | 4730 | 4430 | 4230 | 4060 | 3745 | 3145 | 2170 | 1455 | 915 |

*F22 not recommended for prolonged use above 1100°F ANSI B.16.34

**Special Class Ratings**
*Temperature vs Pressure*

| Temperature (°F) | | -20 to 100 | 200 | 300 | 400 | 500 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 | 1050 | 1100* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **ANSI 2500#** *Maximum Pressure (psig)* | **F22** | 6250 | 6250 | 6180 | 6035 | 6000 | 6000 | 5965 | 5930 | 5750 | 5605 | 5355 | 5000 | 3930 | 2715 | 1820 | 1145 |

*F22 not recommended for prolonged use above 1100°F ANSI B.16.34

MOGAS™
SEVERE SERVICE BALL VALVES

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