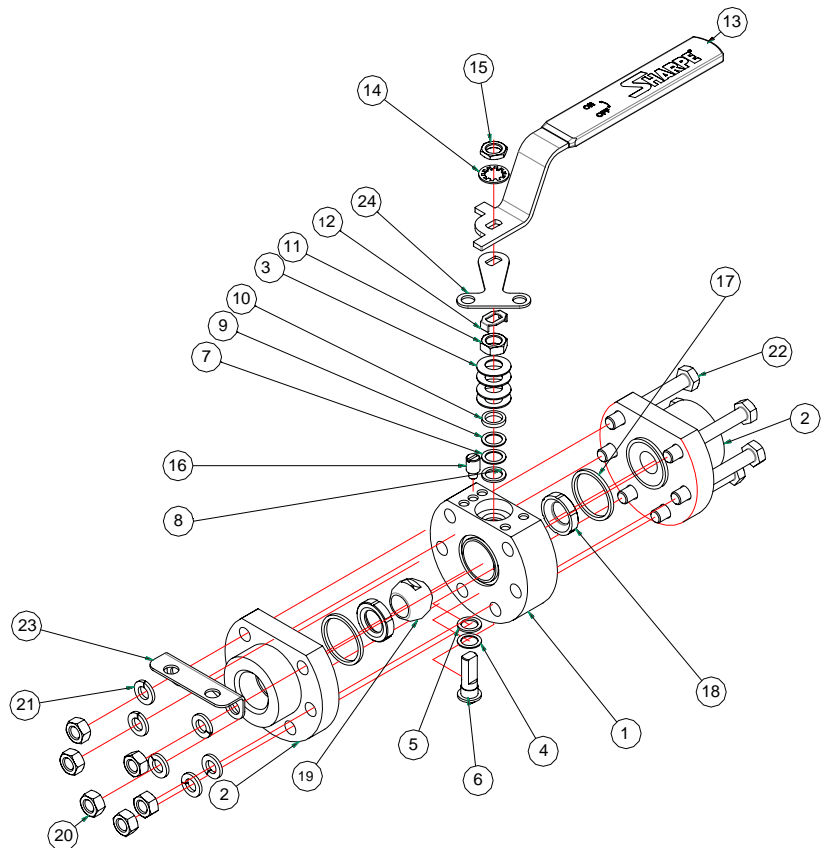


## Installation, Operation, and Maintenance Manual

### Series 60 High Pressure Ball Valves

Sizes 1/2" – 2" , Class 2500

Parts List	
Item	Parts Name
1	BODY
2	END CONNECTOR
3	BELLEVILLE WASHER
4	THRUST BEARING
5	THRUST BEARING
6	STEM
7	STEM PACKING
8	STEM PACKING
9	STEM PACKING
10	GLAND PACKING
11	PACKING NUT
12	LOCK TAB
13	HANDLE 1/2"-2"
14	LOCK WASHER
15	HANDLE NUT
16	STOP PIN
17	BODY SEAL
18	SEAT
19	BALL
20	BODY NUTS
21	BODY WASHERS
22	BODY BOLTS
23	LOWER LOCKING DEVICE
24	UPPER LOCKING DEVICE



**DESCRIPTION:**

1. Three-piece construction full port ball valve. Design allows maintenance without the need for special tools.

**INSTALLATION:**

1. Before installing the valves, the pipes must be flushed clean of dirt, burrs and welding residues, or you will damage the seats and ball surface.
2. These valves may be installed in any position using good pipe fitting practices. Flanged ends (where supplied) conform to ASME Standard B16.5, Class 2500. Threaded and socket weld ends conform to ASME B16.11; butt weld ends conform to ASME B16.25, Schedule 160.
3. In order to avoid damage to Delrin seats (when supplied), the valve must be taken apart, the end caps welded to the piping, and the valves reassembled.
4. Remove end caps following Disassembly instructions below. Align the end caps with the pipe, and tack weld in place. Check for proper alignment to the body, and complete the welds. Alternatively, the valve may be tack-welded to piping before taking the ends off to help with alignment.
5. Do not completely weld the valve in place without removing the center section; seat damage will occur.
6. When re-assembling the valve, the body seals should be replaced. A set of new seals is supplied with the valve. The old seals should be discarded.
7. Tighten body bolting. (See TABLE 2 for torque requirements.)

**MANUAL OPERATION:**

1. The valve is opened and closed by turning the handle  $\frac{1}{4}$  turn (90°). Turning the handle clockwise closes the valve (handle perpendicular to pipeline). Turning the handle counterclockwise opens the valve (handle parallel to pipeline).

**AUTOMATED OPERATION:**

1. Valves with power actuators should be checked for alignment of the actuator to the valve. Angular or parallel misalignment may result in high operational torque, and potential damage to the stem seals or stem.

### **STEM SEAL ADJUSTMENT:**

Stem seal leakage may be corrected without disassembly. If leakage is evident in stem packing area, tighten the adjusting nut 1/4 turn. If leakage persists, repeat above. Replacement of stem seals is indicated if the leak is still apparent after 1/2 turn.

### **DISASSEMBLY:**

#### **-CAUTION-**

If the Valve has been used to control hazardous media, it must be decontaminated before disassembly.

#### **---WARNING---**

Do not attempt to repair or partially disassemble a valve while it is in line and under pressure. Isolate the line, de-pressurize, and remove valve prior to performing maintenance.

1. Remove flange bolts and nuts, or disconnect attached piping and lift valve from line. Care should be taken to avoid scratching or damaging flange facings.
2. Remove handle and locking plate.
3. Remove stem nut locking tab, stem nut, belleville springs, and gland ring from stem.
4. Remove body end nuts, lockwashers, and bolts, using proper wrench size. Remove locking bracket and body end caps.
5. Remove body seal and valve seats. NOTE: Graphite body seals must be thoroughly cleaned from the body seal grooves.
6. To take out the ball, rotate stem so ball is in fully closed position. Carefully lift ball off stem tang and from body with a "rolling" motion. NOTE: Extreme caution should be taken to avoid damage to the ball.
7. Stem must be removed from inside the body. The thrust bearings should come out with the stem. Then remove the stem packing.

### **VISUAL INSPECTION:**

1. Clean and inspect all metal parts. Replace the ball and/or stem if the seating or sealing surfaces have been damaged, worn, or corroded.
2. Stem seals, seats, and body seal must be replaced whenever the valve is disassembled to avoid seal leakage and ensure proper performance.

**ASSEMBLY:**

**Note:**

The valve may be assembled and operated dry where no lubricants are allowed in the system; however, a light lubrication of mating parts will aid in assembly and reduce initial operating torque. Lubricant used must be compatible with the intended line fluid.

1. Install one seat in the body cavity with the spherical curved surface facing the ball.
2. Install thrust bearings on stem and slide the stem up through the body into the stem bore.
3. Install new stem seals, gland ring, and belleville springs. Install stem nut and tighten to the torque values given in Table 1. Install stem nut locking tab or cap. Tighten stem nut slightly if necessary to align nut with locking device surfaces.
4. Install locking plate (if supplied) and handle. Make sure handle aligns with flow bore through ball. Install hand retainer nut .
5. Turn the handle to the CLOSED position. Line up the ball slot with the stem tang and slip the ball into position on the stem tang. Turn the handle to the OPEN position to hold the ball in place.
6. Install the remaining seat into body.
7. Place new body seals into the seal grooves in valve body.
8. Place the body ends onto body and align the bolt holes.

**Note:**

Be careful not to damage body seal when putting ends on body.

9. Install locking bracket, body end lockwashers, nuts and bolts and tighten in a "star" pattern to the torque specified in Table 2.

**Note:**

For valves supplies with studs and nuts, check for even engagement of studs with nuts on both ends. There should be at least one stud thread exposed on each side.

10. Cycle the valve open and closed several times slowly to ensure that operation is smooth and free of binding or sticking.
11. Pressure test valve, if possible, before reinstalling in pipeline.

**ASSEMBLY TORQUE TABLES**

Table 1 - Stem Nut Torques

Valve Size	Torque (in-lb)
3/8" – 3/4"	65
1"	70
1-1/2" – 2"	260

Table 2 – Body Bolting Torques

Valve Size	Bolt Size	Torque (in-lb)
3/8" – 3/4"	3/8"	345
1"	1/2"	580
1-1/2" – 2"	5/8"	1450