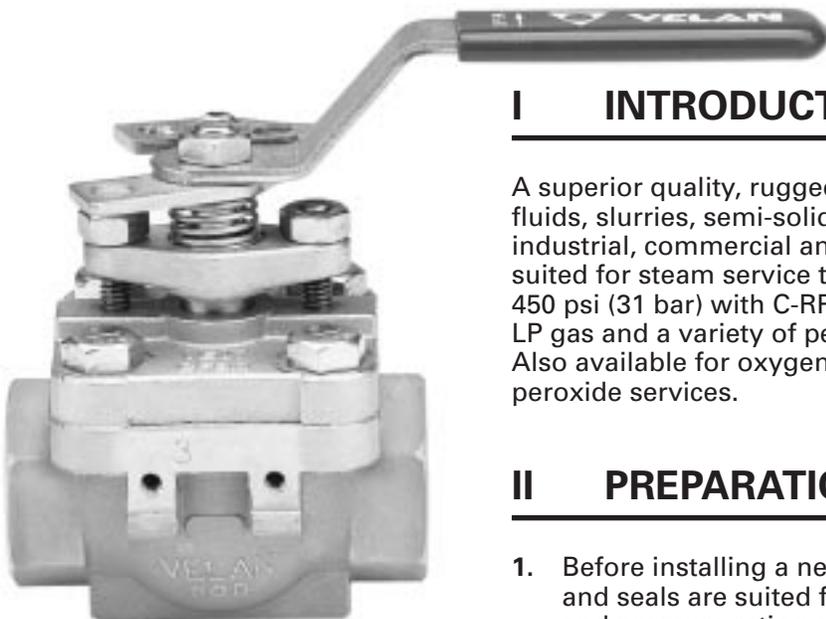


TE-150/300/600 MEMORY SEAL BALL VALVES MAINTENANCE MANUAL

Top-Entry, Full Port 3/8–3" and Regular Port 1/2–4"
Carbon or Stainless Steel

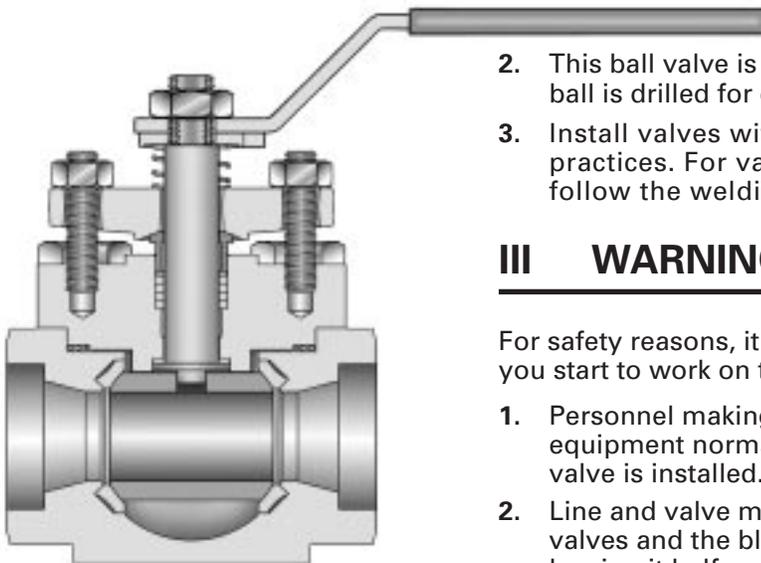


I INTRODUCTION

A superior quality, rugged and universal purpose valve for all fluids, slurries, semi-solids, and corrosive services in endless industrial, commercial and original equipment applications. Well suited for steam service to 250 psi (17 bar) with RPTFE seats and 450 psi (31 bar) with C-RPTFE seats. Fire safe, ideal for fuel lines, LP gas and a variety of petroleum and petrochemical processes. Also available for oxygen, chlorine, high vacuum and hydrogen peroxide services.

II PREPARATION AND INSTALLATION

1. Before installing a new valve in the line, make sure the seats and seals are suited for the intended service. The seat material and pressure rating are indicated on a tag fastened to the valve. If this information is missing, consult Velan for maximum ratings.
2. This ball valve is designed for bi-directional flow, unless the ball is drilled for cavity relief
3. Install valves with threaded ends using standard piping practices. For valves with socket weld or butt weld ends, follow the welding procedure on page 3.



III WARNING

For safety reasons, it is important to take these precautions before you start to work on the valve.

1. Personnel making any adjustments on the valves should wear equipment normally used to work with the process where the valve is installed.
2. Line and valve must be depressurized by shutting off the valves and the bleed line, then cycling the valve once and leaving it half open to relieve the pressure from the ball cavity.

IV GENERAL MAINTENANCE

Normal maintenance consists of tightening the gland nuts as necessary. However, they should not be tightened excessively because it will result in high torque and high packing wear or packing damage (see Table 1). It is recommended to relieve the system pressure if possible. Periodically observe the valve to be sure of proper performance. More frequent observation is recommended under extreme conditions.

V DISASSEMBLY & ASSEMBLY

DISASSEMBLY

NOTE: If complete disassembly becomes necessary, replacement of all seats and seals is recommended.

- a) Follow the instructions in the warning section.
- b) Open the valve for disassembly.
- c) Remove the four bonnet nuts or bolts and remove the bonnet (Step 1).
- d) Using special tool or a screwdriver, turn the ball 90° and remove it (Step 2). Avoid scratching the ball. A special removal tool is available from Velan.
- e) Pry out seats using a screwdriver, but do not mark body seat area. If valve is disassembled for welding only, do not damage seats (Step 3).
- f) Remove the handle and the coil spring under it.
- g) Remove the packing nuts, the packing flange and the packing gland.
- h) Remove stem by pushing it down. Then remove packing rings, thrust washer and stem bushing with a small screwdriver. Caution: Do not damage packing bore.

ASSEMBLY

- a) Clean and inspect all parts for damage and change any parts if in doubt. If possible, use lubricant compatible with the fluid in the line for smoother operation.
- b) Insert the seats in their cavities.
- c) Install ball following Steps 4 to 8 (leave ball in open position).
- d) Install new stem bushings, packing rings, packing gland and packing flange. Install the two packing nuts finger tight. Do not tighten packing nuts at this time.
- e) Install thrust washer on stem and place stem in bonnet.
- f) Tighten packing nuts following maintenance instruction (see Table 1). Reinstall coil spring and handle.
- g) Rotate handle counterclockwise until it stops
- h) Place a new body seal in the body and install the bonnet assembly with the handle aligned in the flow direction.

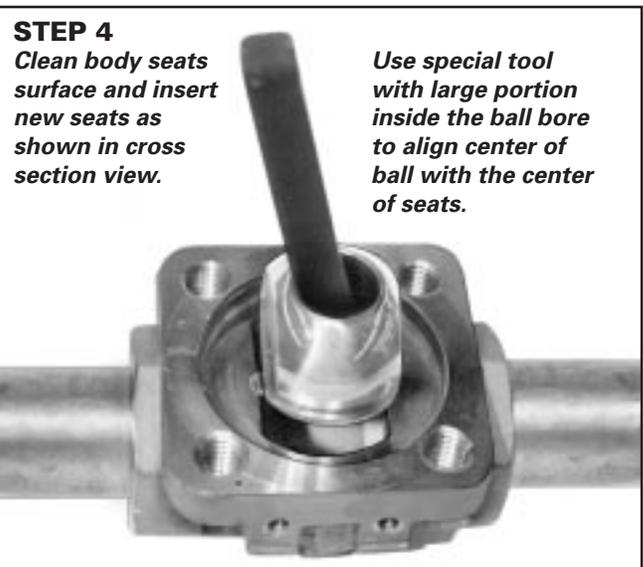
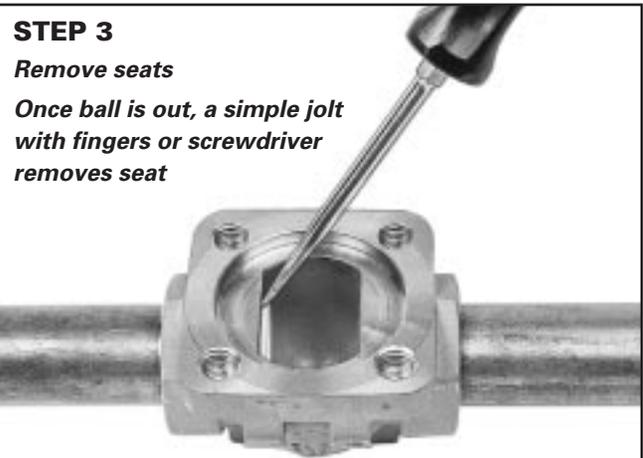
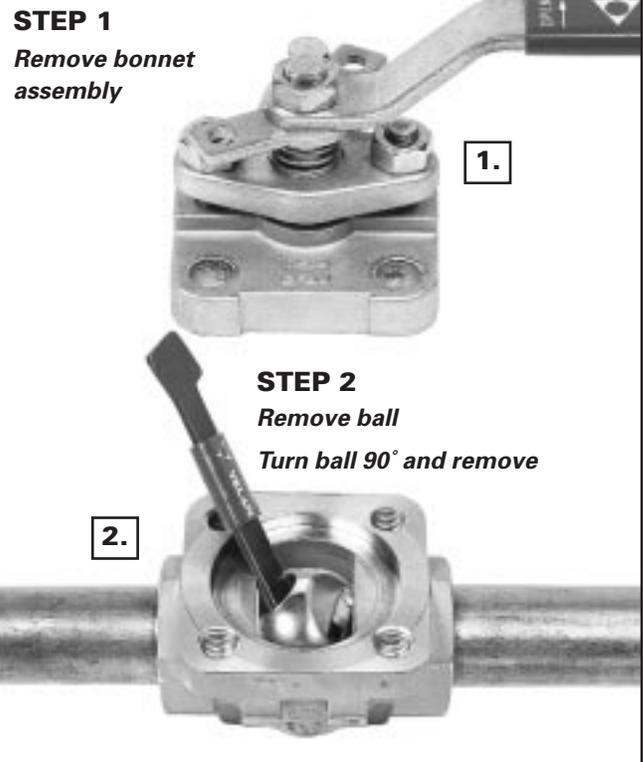


TABLE 1 Gland stud nut torques
Top-Entry Regular Port

Valve size in	Torque			
	RPTFE		Graphite	
	lbf·in	(N·m)	lbf·in	(N·m)
1/2–3/4	7	(.8)	14	(1.6)
1	21	(2.4)	42	(4.7)
1 1/4–1 1/2	23	(2.6)	45	(5.1)
2	29	(3.2)	55	(6.21)
3	63	(7.2)	125	(14.1)
4	77	(8.7)	155	(17.5)

- i) Screw the studs into the body until flush with the bottom of body flange. (If bolts are used, then perform *j* and *K*.)
- j) Push the bonnet down, making sure the stem and bonnet are properly engaged in the slot in the ball and in the body groove, respectively.
- k) Using Never-Seez or equivalent, lubricate the threads of each bonnet fastener. Tighten hand-tight and follow bolt tightening in a crosswise sequence. The recommended final torque values are shown in *Table 2*.
- l) Rotate the ball slowly back and forth a full quarter turn. This helps the seat assume its permanent position against the ball and body. A fast turning motion may damage the seat or ball.

TABLE 2 Required fastener torques

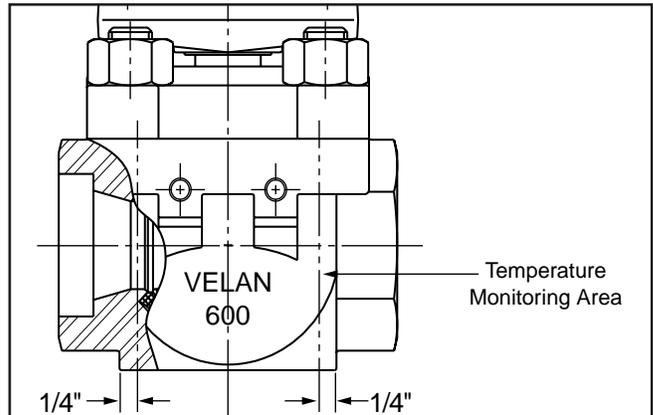
Stud size in	Stud/cap material			
	B7, 630		B8M CL. 2	
	lbf·ft	(N·m)	lbf·ft	(N·m)
5/16 – 18 UNC	12	(16)	11	(15)
3/8 – 16 UNC	19	(26)	18	(24)
1/2 – 13 UNC	48	(65)	45	(61)
5/8 – 11 UNC	95	(129)	90	(122)
3/4 – 10 UNC	170	(230)	160	(217)

WELDING WITHOUT DISASSEMBLY

For socket weld or butt weld type valves, special care must be taken when welding pipe to valve. Pipe can be welded to valve without disassembling the valve provided these precautions are taken:

- Valve must be left in open position during welding and should not be cycled until body has cooled down.
- Valve can be welded using industry standard welding procedures suitable for the valve materials. Body temperature around seats (see *Figure 1*) must be monitored with a tempil stick or T/C. Temperature should always be lower than 350°F for PTFE and RPTFE seat seals. If detailed welding procedures are required, contact Velan.

FIGURE 1 Body temperature around seats





STEP 5
Turn the ball with the tool until the tool touches the body.



STEP 6
Turn the tool 90° for removal.



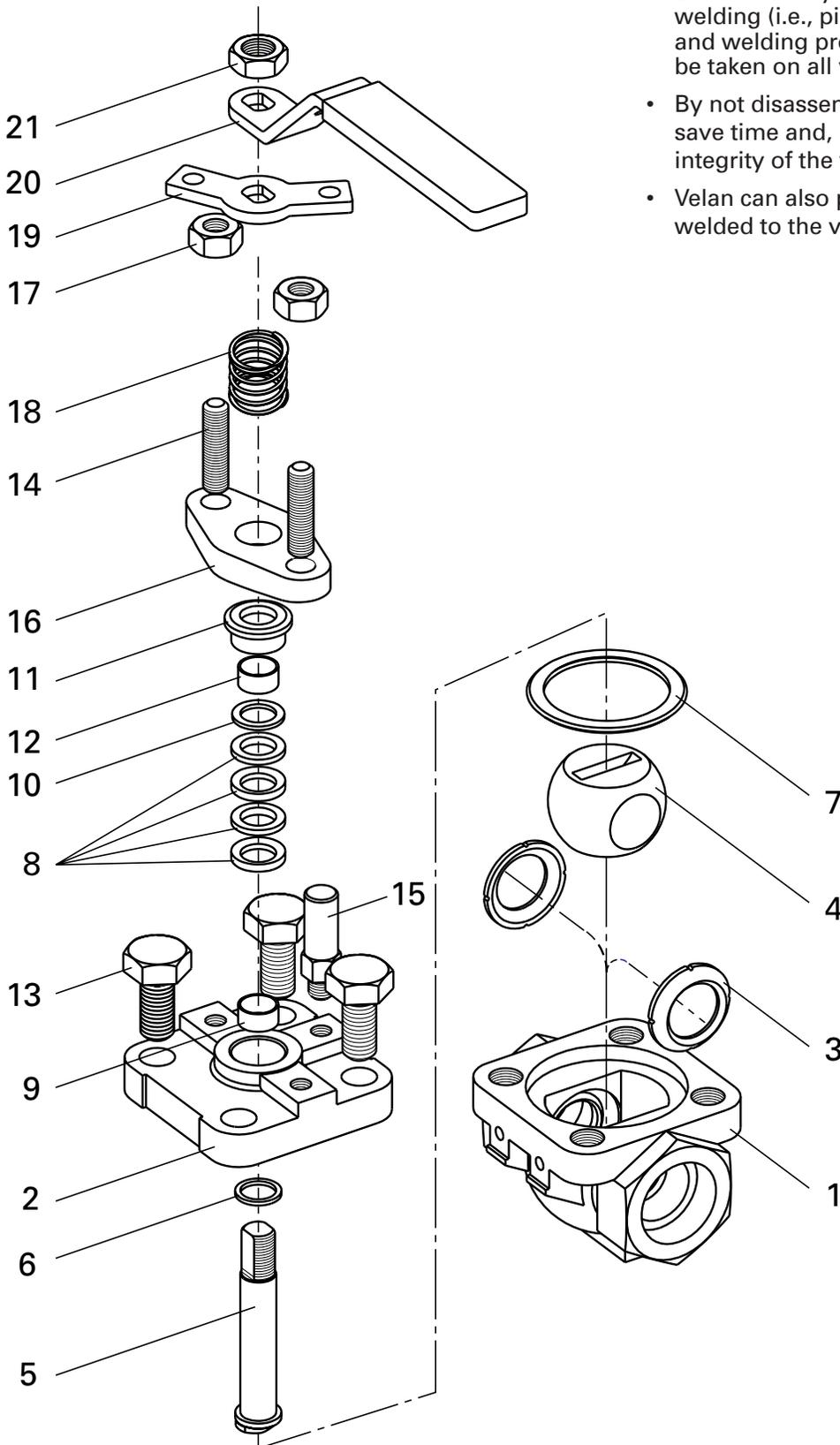
STEP 7
Insert tool small end into the ball slot and keep turning the ball in the same direction until the tool touches the body.



STEP 8
Rotate the tool small end 180° and turn the ball until the bore of the ball aligns with the bore of the body. The top of the ball should be parallel to the top of the body.

Align the stem flats with the ball slot and install the bonnet assembly.

V DISASSEMBLY & ASSEMBLY



- Because many variables can change conditions of welding (i.e., pipe schedule ambient temperature and welding procedure), these precautions must be taken on all valves installed.
- By not disassembling the valve for welding you save time and, more importantly, you maintain the integrity of the factory hydrostatic and seat test.
- Velan can also provide valves with (stub) pipes welded to the valves for customer convenience.

ITEM	QTY	PART NAME
1	1	Body
2	1	Bonnet
3	2	Seat ⁽¹⁾
4	1	Ball
5	1	Stem
6	1	Thrust washer ⁽¹⁾
7	1	Body seal ⁽¹⁾
8	4	Packing ring ⁽¹⁾
9	1	Stem bushing ⁽¹⁾
10	1	Packing washer
11	1	Gland bushing
12	1	Gland bushing sleeve ⁽¹⁾
13	4	Bonnet screw
14	2	Gland stud
15	1	Handle stop pin
16	1	Packing flange
17	2	Gland nut
18	1	Coil spring
19	1	Handle stop plate
20	1	Handle
21	1	Handle nut

⁽¹⁾ Included in seal kit

VELAN VALVE CORPORATION
 18 Avenue "C"
 Griswold Industrial Park
 Williston, Vermont
 USA 05495-9798

VELAN, INC
 2125 Ward Avenue
 Montreal, Quebec
 Canada
 H4M 1T6

Tel: (514) 748-7743
Fax: (514) 748-8635