INSTALLATION-MAINTENANCE MANUAL
FOR TV 3PC BALL VALVE

1. USE:
Long life of valves can be maintained under normal working conditions and in accordance with pressure/temperature and corrosion data chart.

2. MANUAL OPERATIONS:
The opening and closing of the valve is done by turning the handle 1/4 turn (90 degree turn).
A.VALVE IN OPEN POSITION
The handle is in line with the valve or pipeline.
B.VALVE IN CLOSED POSITION
The handle is perpendicular with the pipeline.

3. GENERAL INFORMATION FOR ON-SITE INSTALLATION:
3.1 The valve may be fitted in any position on the pipeline.
3.2 Before installing the valves, the pipes must be flushed clean of dirt, burrs and welding residues to prevent damage to the seats and ball surface.
3.3 The pipeline must be free of tension.

4. INSTALLATION OF THREADED VALVES:
4.1 Use conventional sealant, such as hemp core, Teflon, etc. on the threads.
4.2 Apply wrench on the hexagon end of the valve only. Tightening by using the valve body or handle can seriously damage the valve.
4.3 For applications where screwed end valves are back-welded on site, these valves must be dismantled according to instructions for weld end valves.

5. INSTALLATION OF WELD-END VALVES:
5.1 Tack-weld the valve on the pipe in four points on both end caps, with the ball valve in open position, Extended butt-weld end ball valve allows direct welding. *For short butt-weld or socket-weld end proceeds the next steps.
5.2 Follows 6.2 procedures and swings out the valve body. Secure seats from falling with tape.
5.3 Finish welding both end caps on the pipe.
5.4 When cooled down, clean both end caps and body surface.
5.5 Swing the body back in position and replace the bolts. Tighten all nuts slightly. This operation is very important to keep body and end caps perfectly parallel, thus, preventing distortion of the end caps.
5.6 Tighten body bolts evenly. Make sure that maximum tightening torque is observed per Bolting Torque Data.
5.7 Check proper operation of the valve.

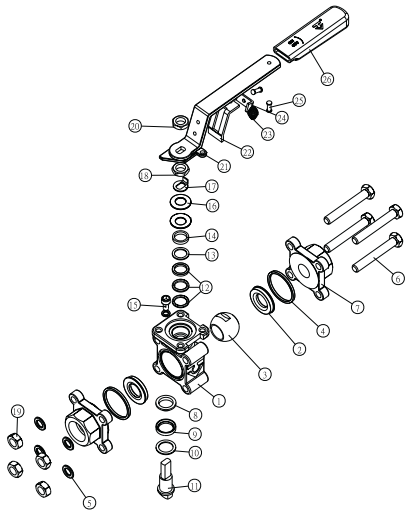
*NOTE: Due to the body gaskets on TV'S series 80 are fully encapsulated in body groove and compress by end cap, it allows direct welding (WIP) as long as the end cap heat in the body gasket area can be controlled under 400 F during the welding process.

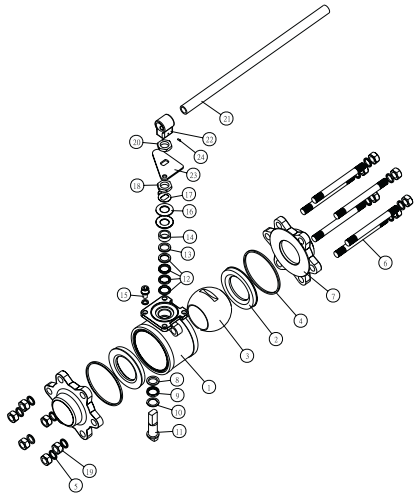
6. DISASSEMBLY AND CLEANING PROCEDURES:
Caution: Ball Valves can trap fluids in ball cavity when it is in closed position.
6.1 If the valve has been used to control hazardous media, it must be decontaminated before disassembly. It is recommended that the following steps be taken for safe removal and reassemble.
A. Relieve the line pressure.
B. Place valve in half-open position and flush the line to remove any hazardous material from valve.
C. All persons involved in the removal and disassembly of the valve should wear the proper protective clothing, such as face shield, glove, and apron, etc.
6.2 Maintenance of parts is easy, even if the valve is installed in the line:
By removing one body bolt and loosening the others, valve body can be swung out for series 50 & 70. Removed all body bolts except one and loosing the remaining one, valve body can be swung out for series 80.
6.3 Seats, gaskets, and ball can be replaced without disturbing pipe alignment:
(See procedures to change Ball and Repair Kit.)

7. PROCEDURES TO CHANGE BALL AND REPAIR KIT*:
7.1 Swing the body per 6.2 procedures and place the valve in close position.
7.2 Remove Body Gasket (#4) (No require for series 50 & 70), Seats (#2) and the Ball (#3). Inspect the Ball closely for scratches, if any, the Ball should be replaced.
7.3 Reassemble the Ball Valve by using New Seats and Body Gaskets. Swing the Body back to original position. Tighten Body Bolts per Torque Data.
7.4 Whenever Stem Seal arrangements need to be changed. Follow Step 1 & 2 and continued with following steps:
7.4.1 Removed Handle (#21), Stem Nut (#18), Lock Saddle Washer (#17), Belleville Washers (#16), Gland (#14), Bushing (#13), and Stem Packing (#12).
7.4.2 Pull out Stem (#11) and Upper Thrust Washer (#8). Compress Ring (#9) and Lower Thrust Washer (#10) from inside the Valve Body.
7.4.3 Reassemble the Stem arrangement by using new parts. Tighten Stem Nut per the Torque Data turns the Lock Saddle Washer to engage it with Stem Nut and put Handle back.
7.4.4 Check proper operation of the Valve.

* Repair Kit to contain all of soft parts.

MATERIALS CONSTRUCTION





BOLTING TORQUE DATA
FOR TV 3PC BALL VALVE

The body bolts of the valve should be tightened evenly. Tighten one-side snugly, then the one diagonally across.

Repeat for the other bolts, bringing them all down tightly in sequence to the torque shown below

FULL PORT									
VALVE SIZE		*FOR BODY NUT			•FOR STEM NUT		◊FOR STEM EXTENSION BOLT OR NUT		
INCH	DN	SIZE	IN-LB	NM	IN-LB	NM	SIZE	IN-LB	NM
¼"-3/8"	8-10	M5	70	8	55-65	6-7	M5	50	6
½"	15	M8	160	19	60-80	7-9	M5	50	6
¾"	20	M8	160	19	60-80	7-9	M5	50	6
1"	25	M8	160	19	90-110	10-12	M6	70	8
1 ¼"	32	M10	345	39	90-110	10-12	M6	70	8
1 ½"	40	M10	345	39	130-150	14-17	M8	160	19
2"	50	M10	345	39	130-150	14-17	M8	160	19
□ 2"	50	M12	580	66	190-210	21-24	M8	160	19
2 ½"	65	M12	580	66	190-210	21-24	M12	580	66
3"	80	M16	1450	120	190-210	21-24	M12	580	66
4"	100	M16	1450	120	350-400	33-35	M12	580	66
REDUCED PORT									
VALVE SIZE		*FOR BODY NUT			•FOR STEM NUT		◊FOR STEM EXTENSION BOLT OR NUT		
INCH	DN	SIZE	IN-LB	NM	IN-LB	NM	SIZE	IN-LB	NM
½"	15	M6	70	8	55-65	6-7	M5	50	6
¾"	20	M8	160	19	60-80	7-9	M5	50	6
1"	25	M8	160	19	60-80	7-9	M5	50	6
1¼"	32	M8	160	19	90-110	10-12	M6	70	8
1½"	40	M10	345	39	90-110	10-12	M6	70	8
2"	50	M10	345	39	130-150	14-17	M8	160	19
2½"	65	M10	345	39	130-150	14-17	M8	160	19
□ 2½"	65	M12	580	66	190-210	21-24	M8	160	19
3"	80	M12	580	66	190-210	21-24	M12	580	66
4"	100	M16	1450	120	190-210	21-24	M12	580	66
6"	150	M16	1450	120	290-310	33-35	M12	580	66

*ALL BODY NUTS ARE METRIC SYSTEM

•ALL STEM NUTS ARE INCH SYSTEM

□FOR SERIES 80

◊STEM EXTENSION TO INCLUDE

1. EMISSION LEAKAGE CONTROL UNIT (ELC)
2. STEM EXTENSION FOR ACTUATOR
3. STEM EXTENSION FOR PIPING INSULATION