True Union Ball Valve Installation & Maintenance Service Instructions

TUBV-3M-0601

True Union 2000 Industrial Ball Valve

Regular True Union Ball Valve

This instruction covers general Installation and Maintenance Service for all Spears PVC, CPVC, and PP True Union 2000 Industrial Ball Valves and Regular Style True Union Ball Valves. All applicable instructions and procedures should be read thoroughly before starting. Suitability of the intended service application should be determined prior to installation. Plastic piping systems should be engineered, installed, operated and maintained in accordance with accepted standards and procedures for plastic piping systems.
IMPORTANT: Read *Precautions & Warnings for All Valve Installations* at the end of these instructions. It is absolutely necessary that all design, installation, operation and maintenance personnel be trained in proper handling, installation requirements and precautions for installation and use of plastic piping systems before starting.

Special Installation Information

True Union type ball valves use removable end connectors. To avoid problems, NEVER MAKE THE JOINT TO THE END CONNECTOR WHILE THEY ARE ATTACHED TO THE VALVE CARTRIDGE.

Ball valve cartridges have a removable seal carrier for internal component service or replacement. Valves are factory pre-adjusted and cartridge disassembly is not necessary for general installation.

Joining Methods

SOLVENT CEMENT WELD CONNECTIONS: Use an appropriate type of Solvent Cement and Primer for the valve material. Follow cement manufacturer's instructions for set and cure times. Joining pipe must be cut square. All joining components must be clean and dry. Remove union nuts and end connectors before priming and cementing connections. With the threads facing the valve, slide the union nut over the pipe to which the end connector socket is to be cemented. Reinstall the valve body and union nuts only after the joint has fully cured. CAUTION: TAKE EXTRA CARE THAT NO PRIMER OR SOLVENT CEMENT IS ALLOWED TO COME IN CONTACT WITH THE BALL OR OTHER INTERNAL VALVE COMPONENTS.

THREADED CONNECTIONS: Threaded connections require application of a quality grade thread sealant to seal and lubricate joint assembly. Sealant must be applied to male pipe threads. WARNING: SOME PIPE JOINT COMPOUNDS OR TEFLON PASTES MAY CONTAIN SUBSTANCES THAT COULD CAUSE STRESS CRACKING TO PLASTIC. Spears Manufacturing Company recommends the use of Spears BLUE 75™ thread sealant which has been tested for compatibility with Spears products. Please follow the sealant manufacturers' application/installation instructions. Choice of an appropriate thread sealant other than those listed above is at the discretion of the installer. 1 to 2 turns beyond FINGER TIGHT is generally all that is required to make a sound plastic threaded connection. Unnecessary OVERTIGHTENING will cause DAMAGE TO BOTH PIPE AND FITTING.

FLANGED CONNECTIONS: Use full faced, 1/8" thick gaskets having a Shore A durometer of approximately 60. Use required quantity of bolts, nuts and flat washers for each flanged connection. Lubricate bolts with an anti-seize lubricant (IMS Copper Flake or equivalent). Bolts must be tightened in a 180° opposing pattern The recommended torques are 12 ft. lbs. for ½" - 1-1/2" sizes, 25 ft. lbs. for 2" - 4" sizes, and 40 ft. lbs. for venturied 6" size.

Lubrication

WARNING: SOME LUBRICANTS, INCLUDING VEGETABLE OILS, ARE KNOWN TO CAUSE STRESS CRACKING IN THERMOPLASTIC MATERIALS. Commercially available pipe gasket lubricant suitable for PVC and CPVC should be used where lubrication is needed for installation or maintenance service (Seacord Ease-On or equivalent). These water-soluble lubricants can be mixed with water where a "mild soap and water solution" is specified to be used. Choice of lubricant is at the discretion of the installer.

Installation Instructions

Step 1: Prepare connecting pipe as required for solvent cement weld, thread, or flanged connections.

Step 2: Remove union nuts and end connectors from valve body. Slide union nuts over pipe to which each end connector socket is to be connected, being sure nut threads are facing toward valve, before making the joint. Attach each end connector to the pipe, making sure that face of each end connector is at a square, 90° angle to the pipe.

Step 3: End connector O-rings must be free from any signs of dirt or debris. Clean as necessary. If O-rings must be removed, clean all surfaces and re-install by pressing the O-ring evenly into retaining groove, being sure to avoid any wrinkles or creation of an uneven sealing surface.

(continued)

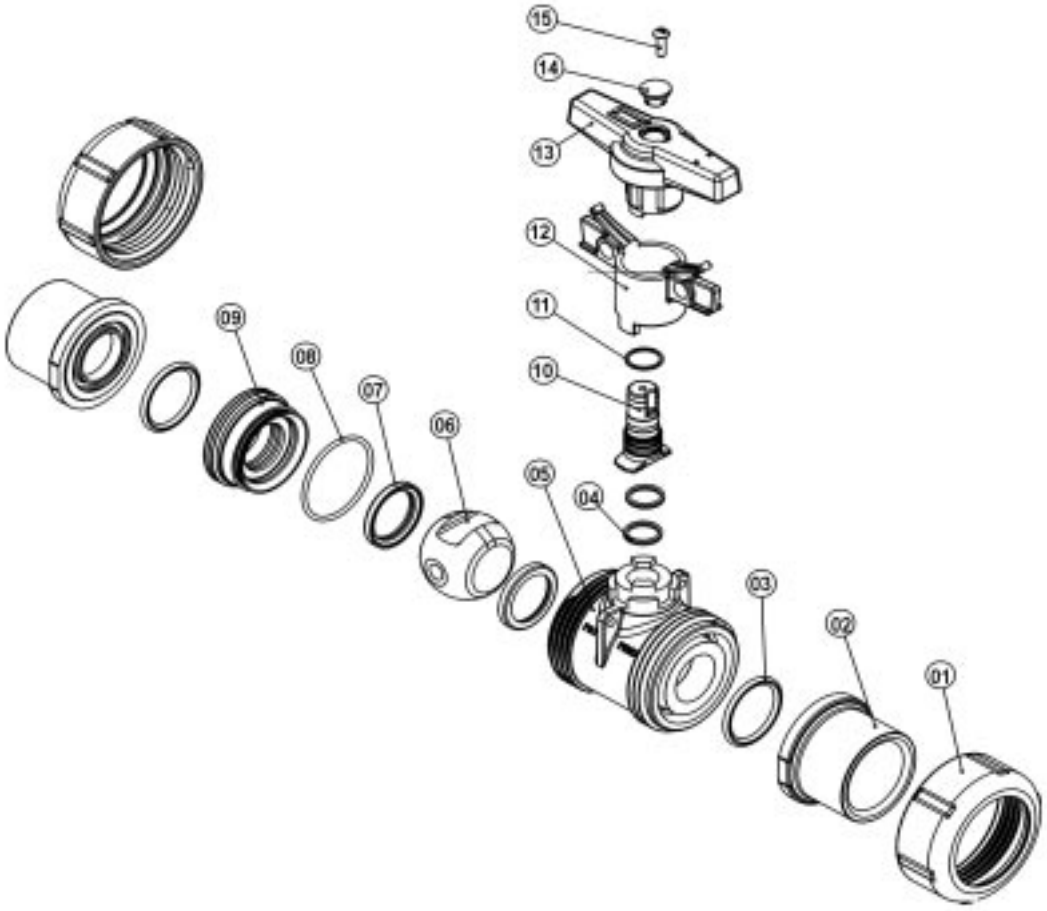
Installation Instructions (continued)

Step 4: Apply a mild soap and water solution to valve body threads for lubrication (see lubrication note). Open the valve completely and support valve body to hold its weight. Attach valve body to end connector via union nut. Tighten "hand-tight" only. (Do NOT use thread sealant.).

Step 5: Repeat Step 4 to attach opposite end of the valve. Make sure face of end connector is squarely aligned with valve body and fits flush against O-ring seal. Adjust pipe positioning if needed. DO NOT USE THE UNION NUT TO DRAW TOGETHER ANY GAPS BETWEEN END CONNECTOR AND VALVE BODY.

Step 6: Pressure test system only after all solvent cement joints have fully cured. If any leaks are found at valve End Connectors during pressure test, use a strap wrench to tighten union nut 1/4 turn to stop leak. DO NOT OVER TIGHTEN. Where threaded end connectors have been installed, a second strap-wrench must be used on end connector to prevent it from turning on pipe threads and breaking seal. Flanged connections may require additional tightening after initial pressure testing.

True Union Ball Valve Component List



No.	Component	Quantity
1.	Union Nut	2
2.	End Connector	2
3.	End Connector O-ring	2
4.	Stem O-ring - TU2000 Industrial Stem O-ring - All other models	2 1
5.	Body	1
6.	Ball	1
7.	Seat	2

No.	Component	Quantity
8.	Seal Carrier O-ring	1
9.	Seal Carrier	1
10.	Stem	1
11.	Stem Bearing	1
12.	Handle Lock (TU2000 Only)	1
13.	Handle	1
14.	Handle Cover (TU2000 Only)	1
15.	Handle Screw (TU2000 Only)	1

Maintenance Service Instructions for True Union Style Ball Valves

The True Union style valve cartridge can be easily removed from its in-line position for internal component service or replacement. Use True Union 2000 Ball Valve Repair Kit (or True Union Ball Valve Repair Kit for regular style valve) with either EPDM or genuine Viton® O-rings for valve repair or to insure extended life as a part of a preventative maintenance program.

Repair kit for valve includes 2- PTFE Seats, 2-End Connector O-rings, 2-Stem O-rings, 1-PTFE Stem Bearing and 1-Seal Carrier O-ring. Kits for 2-1/2" & larger valves include an additional 2-Seat O-rings.Specify valve size, EPDM or Viton® elastomer seal material when ordering kit. Additional valve components may be purchased separately if replacement is required.

CAUTION: Before any servicing, system should be shut down, de-pressurized, and drained.

Seat & Seal Replacement

Step 1: Back off union nuts with strap wrenches until fully disengaged and slide valve cartridge from between end connectors. Examine end connector O-rings for any damage or debris. Clean all components and replace as necessary. Note: end connector O-rings must be pressed evenly into the retaining grooves during reinstallation so as to avoid any wrinkles or creation of an uneven sealing surface.

Step 2: Place valve cartridge on a clean, solid surface.

True Union 2000 Valves come with a tool for easy removal of Seal Carrier. Insert tool in slots on the adjustment end of the valve and un thread Seal Carrier counterclockwise while holding valve body firmly in place.

For Regular Style True Union Ball Valve sizes 1/2" through 2" the seal carrier is easily removed with a wrench by inserting the appropriate standard size hex nut (see chart below) partially into splines on the valve bore, and turning nut counterclockwise while holding valve body firmly in place. A seal carrier tool is available for sizes 2-1/2", 3" & 4" valves (Spears Part Number VT-025-040).

Valve Size	1/2	3/4	1	1-1/4	1-1/2	2
Hex Nut Size	9/16	3/4	15/16	1-5/16	1-1/2	1-7/8

Step 3: With valve in the closed position, slide ball from the stem and remove from body. Examine ball for any damage, nicks or grooves around the sealing area (a slight marring of the surface is normal). Clean all components and replace as necessary. NOTE: Avoid dropping ball as surface indentations from impact may affect sealing.

Step 4: Remove Valve Handle
True Union 2000 Industrial Ball Valves have a retaining screw located under the Cap in the center of the handle. Using a small screwdriver, remove Handle Cap and unthread Retaining Screw. Pull handle and Handle Lock straight off the stem.

For Regular Style True Union Ball Valves, pull handle straight off valve stem (slightly moving handle from side to side will aid in removal).

Step 5: Press Stem down into body cavity and remove stem. Remove Stem Bearing and stem O-rings. Examine O-rings and bearing for any damage or debris (a slight distortion of the stem washer is normal). Clean all components and replace as necessary.

Notes: Only True Union 2000 Industrial Ball Valves use 2-Stem O-rings. Stem Bearings are not used on Regular Style True Union Ball Valve sizes 1" & smaller.

Step 6: Remove carrier O-ring and PTFE Seat from Seal Carrier. Remove PTFE Seat from valve Body (additionally remove seat O-rings on sizes 2-1/2" & larger. Seat O-rings are not used on smaller sizes.) Examine all O-rings and seats for damage and debris. Clean all components and replace as necessary.

Step 7: Reassemble Valve
Position body open end up and, where applicable, install new Seat O-rings in valve Body and Seal Carrier. NOTE: Seat O-rings must be pressed evenly into retaining grooves so as to avoid any wrinkles or creation of an uneven sealing surface. Install new Seats in valve Body and Seal Carrier. Install new carrier O-ring on exterior lip of Seal Carrier. Install new Stem O-rings and Stem Bearing to Stem. Lubricate (see lubrication note) Stem O-ring and insert Stem through stem hole from inside Body until fully seated (on valves with stem washers, be sure the washer is well seated in the groove on the inside of the stem hole). Slide Ball dovetail groove over stem shoe until ball is seated against PTFE Seat. Rotate Stem one-quarter turn to hold Ball in place. Lubricate (see lubrication note) carrier O-ring. Position Seal Carrier seat-side-up and thread Body onto Seal Carrier. DO NOT USE THREAD SEALANT.

For True Union 2000 Industrial Ball Valves, slide Handle Lock onto Handle and press Handle down firmly onto Stem. Secure with Retaining Screw and snap Handle Cap into center of Handle.

For Regular Style True Union Ball Valves, position Handle socket on Stem and press down firmly onto Stem. Open valve slightly and press handle again to make sure handle stops are fully engaged with body (handle skirt should meet body).

Fully close valve and tighten seal carrier just enough to feel a positive resistance to closing valve. This completes valve cartridge assembly.

Step 8: Apply a mild soap and water solution to valve Body threads and End Connector O-rings for lubrication (see lubrication note). With valve in the open position, slide the serviced valve cartridge between the End Connectors and attach Union Nuts. Tighten "hand-tight" only.

Precautions & Warnings for All Valve Installations

CAUTION: The system shall be designed and installed so as not to pull the valve in any direction. Pipe must be cut and installed in such a manner as to avoid all stress loads associated with bending, pulling, or shifting. Valve shall be supported.

CAUTION: All valve connectors and connecting pipe should be inspected for any breaking, chipping, gouging or other visible damage before proceeding. All joining components must be clean and dry. All valves and pipe shall be removed from their packaging or containers and exposed to the environment for a minimum of one hour in order to thermally balance all components. Installation temperatures should be between 40°F and 110°F.

CAUTION: BEFORE THE VALVE IS CYCLED, all dirt, sand, grit or other material shall be flushed from the system. This is to prevent scarring of internal components.

WARNING: DO NOT USE COMPRESSED AIR OR GAS TO TEST ANY PVC OR CPVC THERMOPLASTIC PIPING PRODUCT OR SYSTEM, AND DO NOT USE DEVICES PROPELLED BY COMPRESSED AIR OR GAS TO CLEAR SYSTEMS. THESE PRACTICES MAY RESULT IN EXPLOSIVE FRAGMENTATION OF SYSTEM PIPING AND COMPONENTS CAUSING SERIOUS OR FATAL BODILY INJURY. All air must be bled from the system during initial fluid fill. Pressure testing of the system should not be made until all solvent cement joints have properly cured. Initial pressure testing should be made at approximately 10% of the system hydrostatic pressure rating to identify potential problems, prior to testing at higher pressures. WARNING: Systems should not be operated or flushed out at flow velocities greater than 5 feet per second.

SPEARS® MANUFACTURING COMPANY • CORPORATE OFFICE
15853 Olden St., Sylmar, CA 91342 • PO Box 9203, Sylmar, CA 91392
(818) 364-1611 • www.spearsmfg.com

PACIFIC SOUTHWEST
15860 Olden St.
Sylmar (Los Angeles), CA 91342
(818) 364-1611 • (800) 862-1499
Fax (818) 367-3014

ROCKY MOUNTAIN
4880 Florence St.
Denver, CO 80238
(303) 371-9430 • (800) 777-4154
Fax (303) 375-9546

UTAH
1641 South 700 West
Salt Lake City, UT 84104
(801) 972-0659
Fax (801) 972-0688

SOUTHEAST
2751 Miller Rd.
Decatur (Atlanta), GA 30035
(770) 981-7122 • (800) 662-6326
Fax (770) 981-6106

MIDWEST
1 Gateway Ct . Suite A
Bolingbrook (Chicago), IL 60440
(630) 759-7529 • (800) 662-6330
Fax (630) 759-7515

NORTHWEST
3902 B St. NW
Auburn (Seattle), WA 98001
(253) 939-4433 • (800) 347-7327
Fax (253) 939-7557

SOUTH CENTRAL
4250 Patriot Drive Suite 300
Grapevine (Dallas), TX 76051-2317
(972) 691-4003 • (800) 441-1437
Fax (972) 691-4404

NORTHEAST
543 Industrial Dr.
Lewisberry (Harrisburg), PA 17339-9532
(717) 938-8844 • (800) 233-0275
Fax (717) 938-6547

FLORIDA
3445 Bartlett Blvd.
Orlando, FL 32811
(407) 843-1960 • (800) 327-6390
Fax (407) 425-3563

INTERNATIONAL SALES
15853 Olden St.
Sylmar (Los Angeles), CA 91342
(818) 364-1611 • Fax (818) 898-3774
E-mail: export@spearsmfg.com

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