

9/24/2004

MAINTENANCE MANUAL FOR EXTERNAL CHEMICAL HYDRAULIC VALVE

Section 1: Parts Breakdown

Section 2: Disassembly and Rebuild

**Section 3: Conversion of Single Piece Stem Valve to
2 Piece stem**

SECTION 1: PARTS BREAKDOWN

The Betts Chemical Hydraulic Valves have undergone design changes to take advantage of new seal technology and to allow replacement of the upper half of the stem without replacing the lower half. The part numbers of the new valves are as follows:

CH46949SST 4 X 4 replaces CH45586SST

CH46955SST 4 X 3 replaces CH45613SST

CH46960SST 4 X 4 w/ steam jacket replaces CH45616SST

CH46966SST 4 X 3 w/ steam jacket replaces CH45618SST

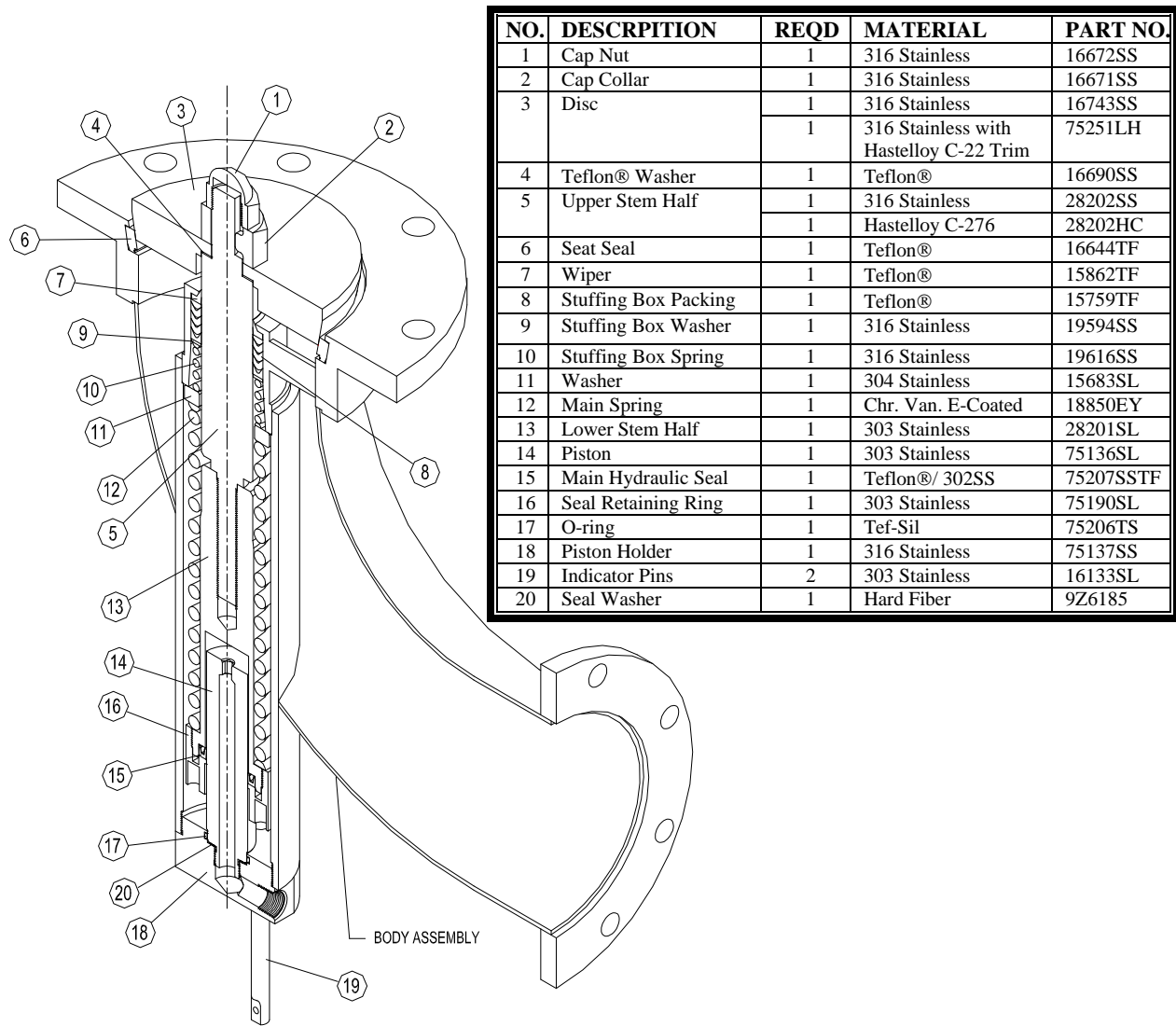


Figure 1

SECTION 2: DISASSEMBLY AND REBUILD

REBUILD KITS: A complete valve rebuild kit is available. This kit contains parts 4,5,6,7,8,9,10, and 15 (See Figure 1 for part numbers). Use kit number CH75296TF to rebuild standard valves. Use kit number CH75296TFTS to rebuild valves containing the optional double O-ring style seat.

TO REPLACE DISC AND/OR SEAT: (See Figure 2) Hold cap collar (2) and remove cap nut (1). The disc (3) can be removed. Care should be taken not to damage or lose Teflon washer (4). Seat (6) can now be removed and a new seat snapped into the groove.

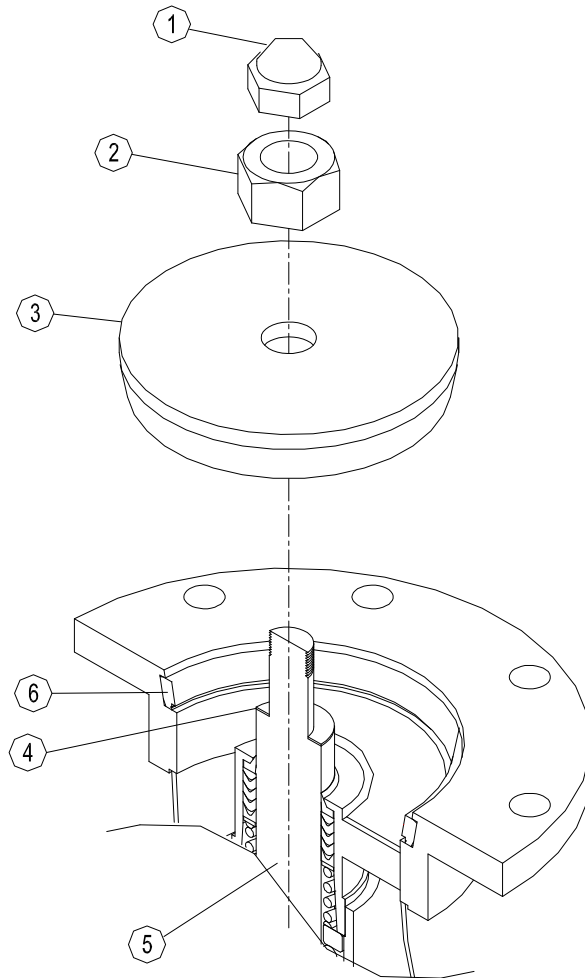


Figure 2

TO REPLACE STUFFING BOX PACKING OR PISTON HYDRAULIC SEAL: Disconnect hydraulic line. Unscrew indicator pins (19) and piston/holder assembly (14) & (18) (See FIGURE 3). Inspect piston (14). Replace piston (14) if the piston contains scratches that cannot be easily removed by polishing.

To ensure main seat (6) does not get damaged, hold cap collar (2) stationary while using a spanner wrench to unscrew seal retainer ring (16). See specific instructions below.

TO REPLACE STUFFING BOX PACKING:

If lower stem half (13) remains in valve body after seal retainer ring (16) has been unscrewed, continue to hold cap collar (2) and insert a 1/4" thick x 2" wide piece of plate into the slots on the bottom of lower stem half to unscrew it from the upper stem half (See FIGURE 4). Remove main spring (12), washers (8) & (11) and stuffing box spring (10). Remove old packing (9) and wiper (7). Clean and inspect stuffing box. If the stuffing box is pitted the valve must be replaced. Inspect upper stem half. Replace upper stem half (5) if it contains pits or scratches that cannot be easily removed by polishing. Replace old packing with a full set of new packing and a new wiper. See figure 5 for packing orientation.

TO REPLACE PISTON HYDRAULIC SEAL:

If lower stem half (13) unscrews from the upper stem half (5) it will be necessary to clamp lower stem half (13) in a vice to unscrew seal retainer ring (16). After removing seal retainer ring (16) remove old seal and install new hydraulic seal with seal lips facing inward.

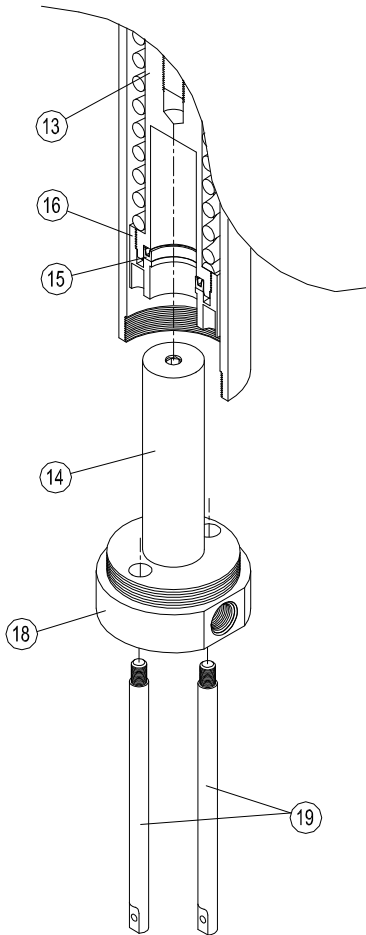


Figure 3

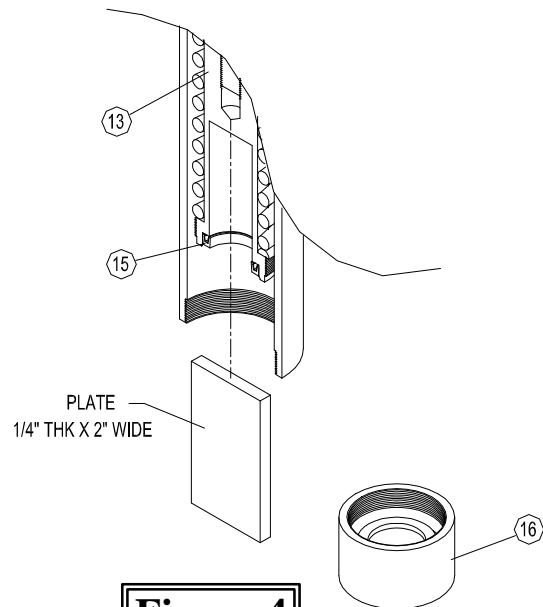


Figure 4

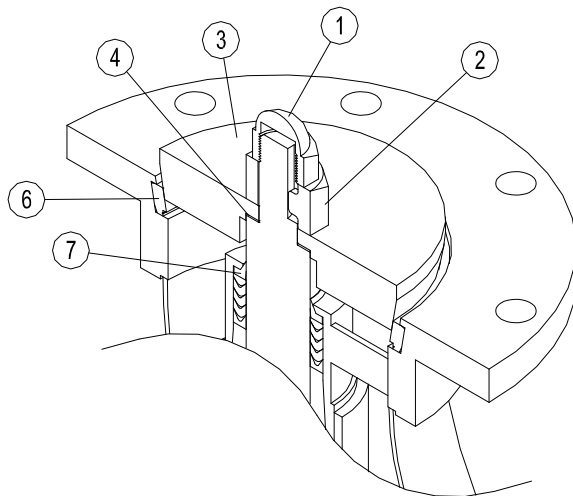


Figure 5

SECTION 3: CONVERSION AND REBUILD

CONVERSION KITS: Stem 26068SS used in valves CH45586SST, CH45613SST, CH45616SST, CH45618SST and CH45670MSB is no longer being sold. Valves with the old style single piece stem can be converted to the new style two-piece stem. Parts kits are available and include all parts required to both completely rebuild valve and convert stem to new style two-piece stem. Conversion/rebuild kits contain parts 4,5,6,7,8,9,10, 13,14,15,16,17,18 and 20. (See Figure 1 and Figure 6) Kit CH75297TF includes all parts required to rebuild and convert a standard chemical hydraulic valve. Kit CH75297TFTS includes all parts to rebuild and convert valves with the non-standard double O-ring seat.

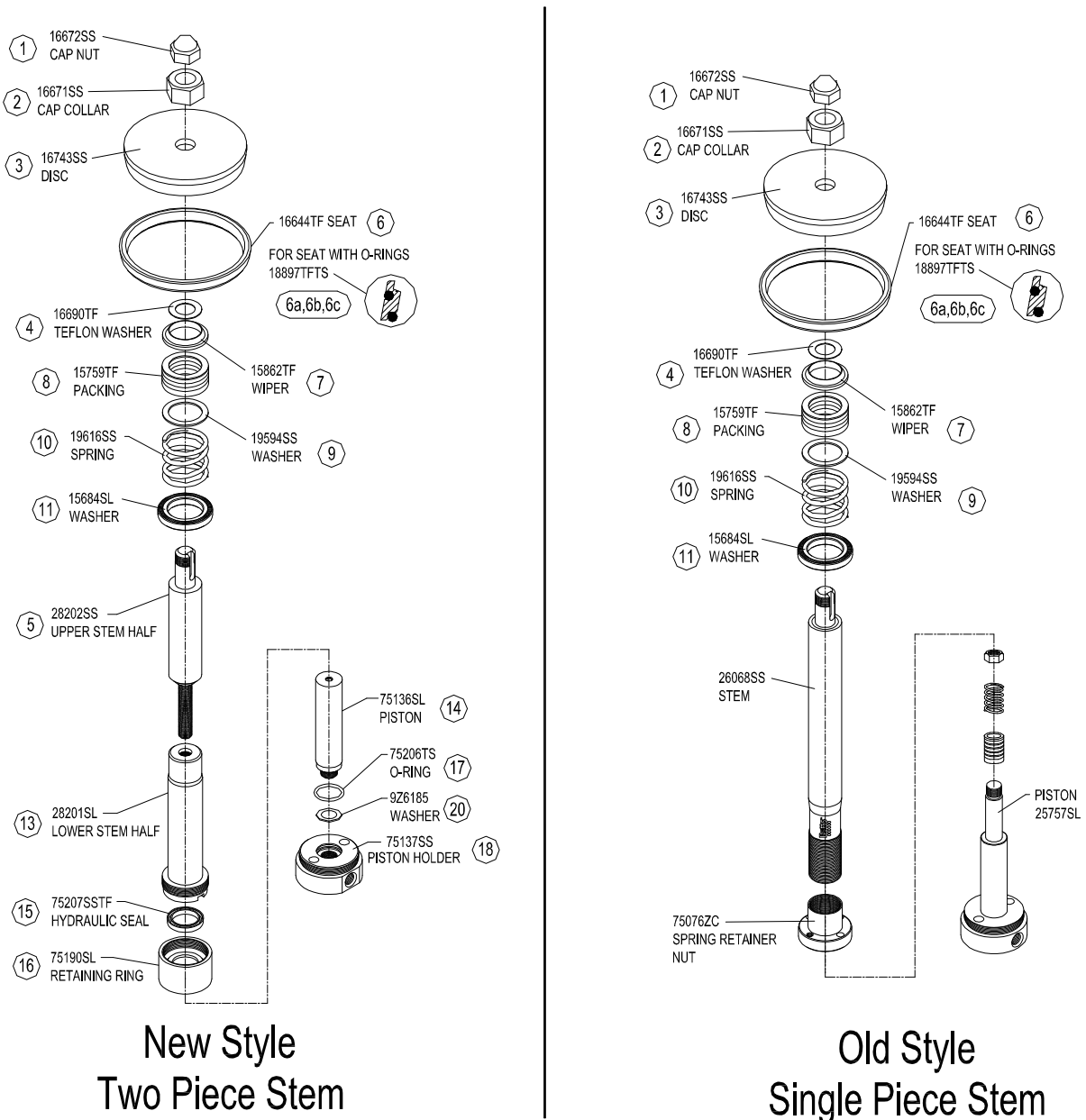


Figure 6

Conversion Procedure:

- 1. Disassembly and valve body preparation:** Disconnect hydraulic line and remove valve from tank. Remove indicator pins (19) and piston assembly 25757SL. Hold cap collar 16671SS stationary to prevent stem from rotating while removing spring compression nut 75076ZC with a spanner wrench. Remove all internal parts including main spring, stem packing, wiper and stem. Remove old Teflon® seat from valve body and replace with new seat (6).
- 2. Upper stem assembly:** Hold cap collar (2) and unscrew cap nut (1). Place new Teflon® washer (4) on top of new upper stem half (5) and assemble disc (3), cap collar (2) and cap nut (1) to upper stem half (5).
- 3. Stuffing Box:** Slide upper stem half assembly into valve body. Place new wiper (7), new packing (8), new washer (9), new stuffing box spring (10), main spring washer (11) and main spring over upper stem half.
- 4. Lower stem assembly:** Thoroughly lubricate both the internal and external threads of lower stem half (13) with anti seize compound. Assemble lower stem assembly by placing new main hydraulic seal (15) into new lower stem half (13) (insert with seal lip side in). Screw retainer ring (16) onto lower stem half.
- 5. Piston assembly:** Assemble piston assembly by first inserting O-ring (17) into piston holder (18). Use care when installing to prevent kinking and damage to O-ring. Place washer (20) into piston holder. Put a removable grade of liquid thread lock on the threads of piston (14) and screw piston into holder. Torque to 40 ft lbs.
- 6. Final assembly:** Place lower stem assembly into valve body. Hold cap collar (2) to prevent upper stem from turning. Thread lower stem assembly unto upper stem assembly. Tighten lower stem assembly against upper stem assembly with a spanner wrench. Torque to 50 ft lbs. Thread piston assembly into valve body until tight. Loosen piston assembly slightly to line up the holes in the piston holder (18) with the indicator pin threads in the retaining ring (16). Screw indicator pins into retainer ring threads. Run a piece of wire through the holes in both retainer pins to prevent pins from becoming loose.
- 7. Testing:** Attach hydraulic line to valve. Open valve and pressurize hydraulics to 3000 psi. Leave pressurized for 5 minutes. Observe valve for any sign of hydraulic leakage or hydraulic pressure bleed down. Disconnect hydraulic line. Attach a blind flange with an air fitting to the valve outlet. Pressurize valve to 5 psi and immerse valve in water. Look for any signs of air leakage. Bubbles coming out the indicator pin holes indicates a leak in the stuffing box packing. Observe for indicator pin holes for at least 2 minutes. Check seat area to be sure valve is sealing properly.