



Installation, Operation, Inspection and Maintenance Manual



PRESSURE RELIEF VALVE MODELS:

JS75 & JS75S
JS75H & JS75HS
JS165H & JS165HS

JS75XH & JS75XHS
JS75L & JS75LS
JS165L & JS165LS

JS75XL & JS75XLS
JS75LT & JS75LTS
JS165LT & JS165LTS

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1.0 Introduction

The Kelso external pressure relief valve raises the bar on **best available and safest technology** for the railroad transportation industry. With thousands of units in service, our PRV has demonstrated reliable, safe, and effective with limited maintenance and repair.

1.1 Precautions

The JS Series Pressure Relief Valves (PRVs) can be used as a safety device in the storage and transportation of a wide variety of fluids; many of which are hazardous materials and could cause serious injury or damage. Only personnel which are properly qualified should install, repair, or rebuild the JS Series PRV's. Only certified parts from Kelso or one of its authorized representatives should be used in the JS Series PRV's. The JS Series PRV's may be installed on DOT tank cars that carry hazardous chemicals and may travel under pressure.



Read these instructions prior to performing periodic maintenance or repairs.

1.2 Regulations

Kelso valves are used in contact with a variety of products; many of which are hazardous. The acceptance and transportation of products are regulated by DOT and AAR in the U.S.A and in Canada by CTC and Transport Canada. Regulations of other governmental bodies must be complied with. All personnel should be familiar with and follow these regulations. Nothing in these instructions is intended to conflict with or supersede these regulations.

NOTE: Specifications are subject to change without notice.

1.3 Technical Specifications

8 Bolt PRV:

Valve Model	Set Pressure (psig)*	Flow Rate (SCFM-Air)	Orifice Diameter (in.)	Flow Area (Sq. Inches)	Weight (lbs.)	Flange Thickness (in.)
JS75/S	75	20,571 @ 85 PSI	3.875	11.79	59	.94
JS75H/HS	75	25,635 @ 85 PSI	4.375	15.0	68	.94
JS165H/HS	165	28,213 @ 182 PSI	3.25	8.3	70	1.13
JS75XH/XHS	75	30,061 @ 85 PSI	4.835	18.31	71	1.13

*Start to Discharge Pressure

Figure 1.3.1.

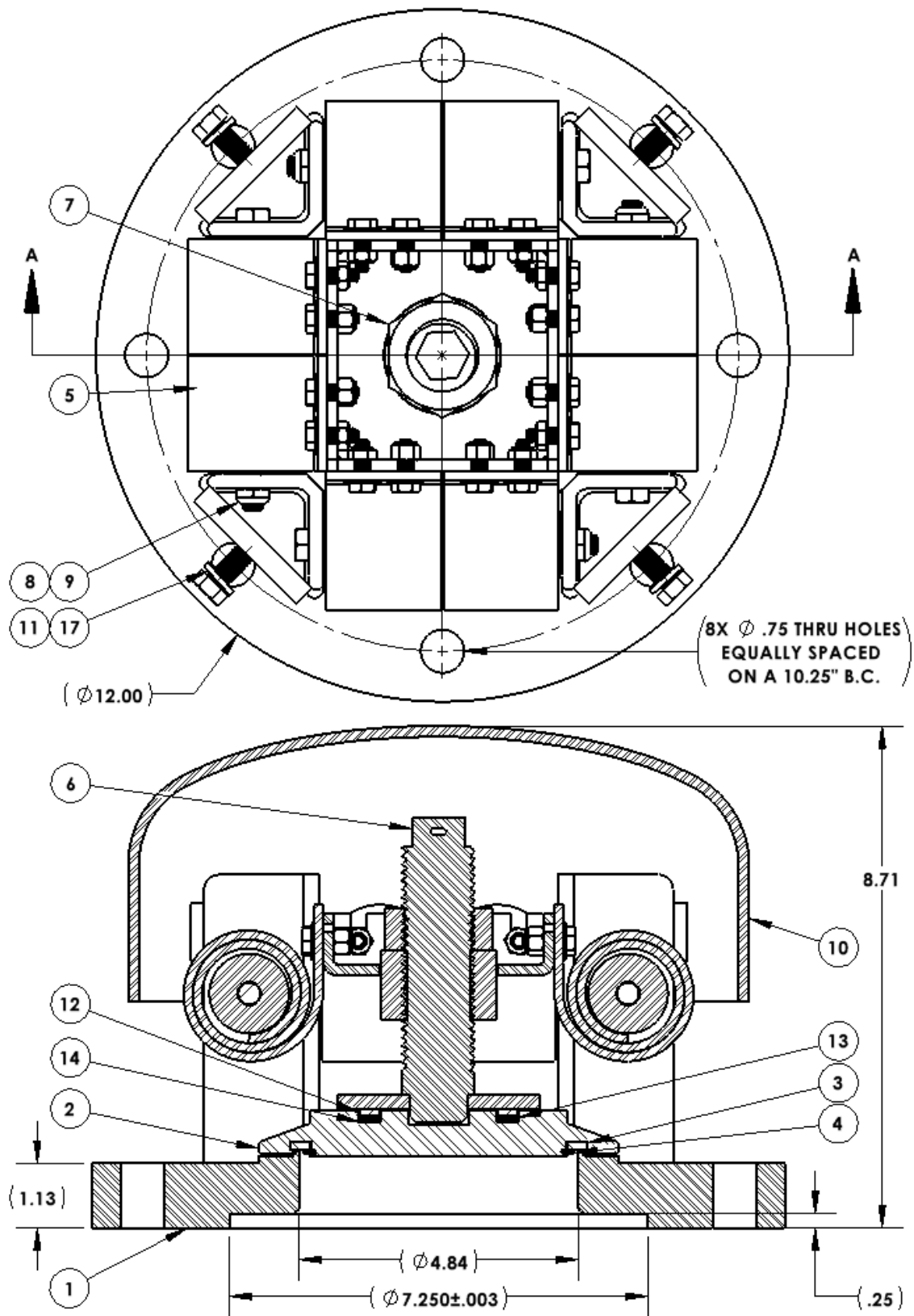


Figure 1.3.2

Item No.	Qty.	Description
1	1	Flange Assembly
2	1	Seal Disc
3	1	Seal
4	1	Seal Retainer
5	1	Spring Block Assembly with Springs*
6	1	Adjustment Screw Assembly
7	1	1-1/4 – 7 Hex Jam Nut
8	4	3/8 – 16 x 5" Hex Head Bolt
9	4	3/8 – 16 Nylon Insert Lock Nut
10	1	10" Dome Cover
11	4	3/8 – 16 x 1" Hex Head Bolt
12	1	Thrust Washer
13	1	Needle Bearing
14	1	Thrust Washer
15	1	Nameplate (Not Shown)
16	2	Nameplate Screw (Not Shown)
17	4	3/8" Split Lock Washer

Figure 1.3.3

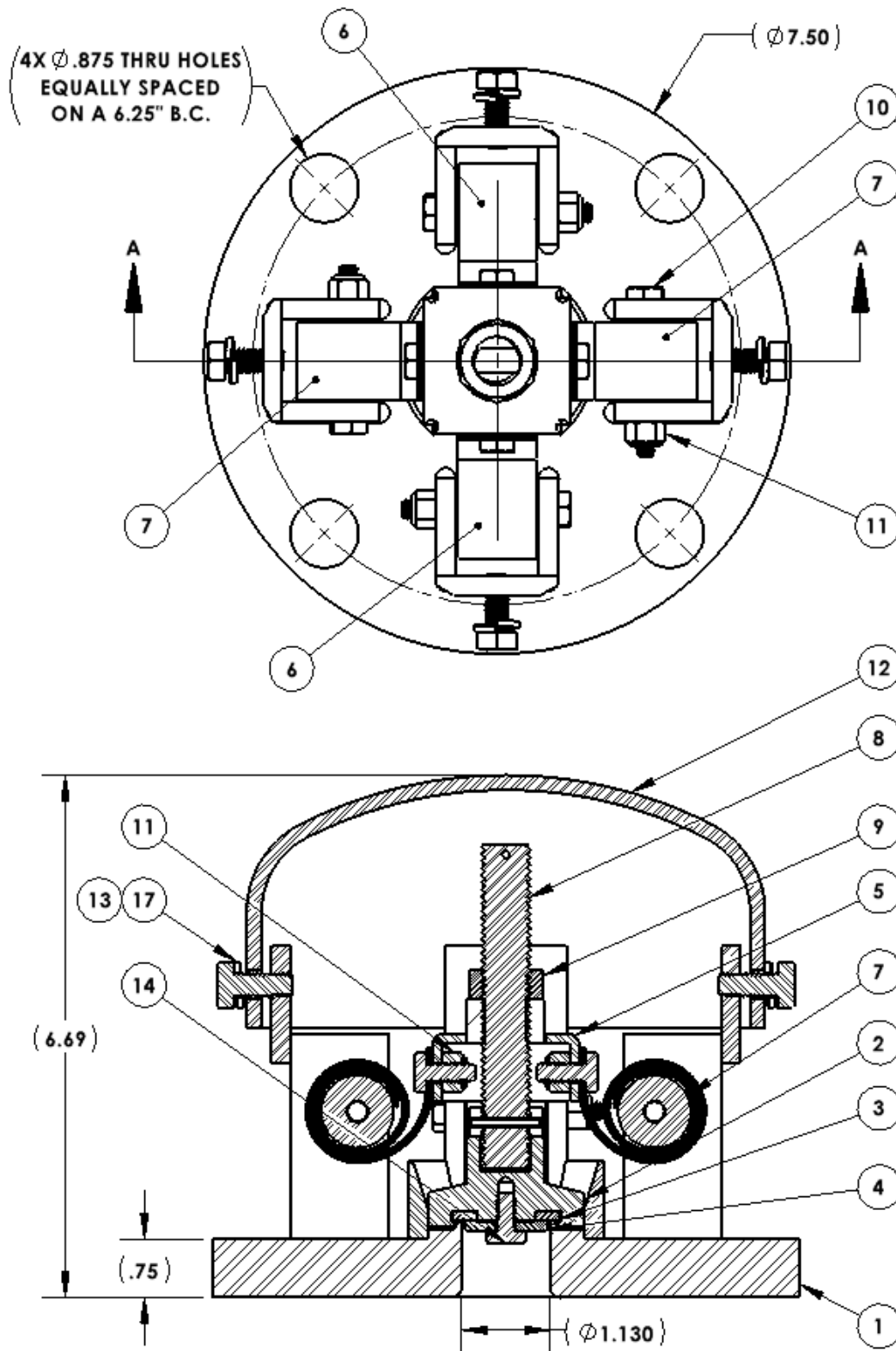
*The number of spring laminations can vary, replace with like assemblies.



The needle bearing assembly (if applicable) is rated for up to 450° F. The limiting factors of Kelso's Technologies PRV are the seal and spring drum.

4 or 3 Bolt PRV:

Valve Model	Set Pressure (psig)*	Flow Rate (SCFM-Air)	Orifice Diameter (in.)	Flow Area (Sq. Inches)	Weight (lbs.)	Flange Thickness (in.)
JS75L/LS	75	1681 @ 85 psi	1.13	1	21	.75
JS165L/LS	165	3445 @ 182 psi	1.13	1	22	.75
JS75XL/XLS	75	4089 @ 85 psi	2.05	3.32	18	.88
JS75LT/LTS	75	1681 @ 85 psi	1.13	1	18	.88
JS165LT/LTS	165	3445 @ 182 psi	1.13	1	18	.88



SECTION A-A

Figure 1.3.7

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Kelso Technologies Inc. 1526 Texas Ave, Bonham, TX. 75418, Phone: (903) 583-9200

Item No.	Qty.	Description
1	1	Flange Assembly
2	1	Sealing Disc
3	1	Seal
4	1	Seal Retainer Plate
5	1	Spring Block Assembly
6	4	Spring
7	4	Spring Drum
8	1	Adjustment Screw Assembly
9	1	5/8 – 11 Hex Jam Nut
10	4	1/4 – 20 x 2" Hex Cap Screw
11	8	1/4 – 20 Nylon Insert Lock Nut
12	1	6" Dome Cover
13	4	Hex Bolt 5/16 - 18 x 3/4" Zinc Grade 5
14	1	1/4 – 20 x 1/2" Hex Cap Screw
15	1	Nameplate (Not Shown)
16	2	Nameplate Screw (Not Shown)
17	4	5/16" Split Lock Washer

Figure 1.3.8

*The number of spring laminations can vary, replace with like assemblies.

1.4 Required Tools

Sockets/Wrenches ---	7/16, 1/2, 9/16, 13/16, 15/16, 1 5/8, 1 7/8
Cutting Pliers	Lint Free Cloth
Ratchet	400 Grit Alum. Oxide Emery Cloth
Screwdriver	Thread Locker
Torque Wrench	Anti-Seize
Wire Brush	Adjustable Wrench

2.0 Valve Installation



Only companies and their personnel which are certified by the Association of American Railroads shall perform maintenance and testing of Kelso pressure relief valves, pursuant to either M1002 or M1003.

2.1 Preliminary Considerations



New valves are tested, adjusted, and sealed at Kelso. If a new valve has been left in its original packaging, it is undamaged, and it is not more than six months old, it may be installed on a tank car without retesting or recalibration. If the valve has exceeded six months, it must be returned for retesting and recalibration. Prior to installation, ensure that the valve remains clean and that the gasket sealing surfaces are not damaged in any way, shape, or form.

2.2 Procedure

1. Prior to removing any valve or fitting from a tank, ensure that the internal pressure is atmospheric and that personnel exposure to hazardous chemicals is eliminated.
2. When the securement bolts have been removed from the mounting flange, remove the valve, and discard the old flange gasket.
3. The flange mating surface should be free from gouges, scrapes, and excessive corrosion. If the valve has a flat mating surface, clean the mating surface using a wire brush if scale, rust, adhesive, or dirt are evident. With a tongue and groove mating surface, ensure that while removing the old gasket no damage is done to the bottom of the groove. Any burrs that exist, radial gouges and debris should be removed.
4. A new pressure relief valve should be kept in its original packaging to prevent damage to the valve or its components.
5. A test certificate should be available to verify the test date of the valve, if the last known test date was within six months, the valve can be installed without retesting or requalifying.
6. Place a new gasket on the tank mounting flange. Kelso Technologies does not supply the flange gasket, refer to your company's internal documentation/procedures for the correct gasket type and material. Gasket material should be compatible with the chemical being shipped. Inspect the valve mating flange for defects as described in Paragraph 3 above. Install the valve on the mounting flange and secure using bolts. The bolts should be tightened to a prescribed torque of 100-to-180-foot pounds, depending on the gasket being used. Our suggested value is only to be used in the event your company does not have a procedure for this.
7. Once the pressure relief valve has been secured to the car, a suitable leak test should be performed to ensure the flange mating surfaces are pressure tight.

2.3 Leak Inspection

All newly installed valves must be tested under pressure to confirm that no leaks are present.



WARNING: Loose nuts, improper tongue seating in the flange, damaged and wrong size gaskets can result in leaks at the valve mating surfaces.

2.4 Valve Operation



Operation of all valves must conform to all applicable TC, AAR, DOT, and other governmental bodies.



Kelso valves are spring loaded by a constant force set of springs and there are no provisions for manual activation. Valves are activated over pressurization, even on the rail tank car.

3.0 Disassembly

Prior to any servicing of a Kelso Valve, ensure all participating personnel have adequate personal protective equipment.

3.1 Procedure

1. Remove the dome cover securement bolts. All bolts should have a locking means (a split lock washer and Loctite). Lift the cover off, invert the cover and utilize as a container for the remainder of the valve parts (*Figure 3.1*).



Figure 3.1

2. If equipped, remove the debris/bee screen. Screens are installed on the valve to prevent foreign material from entering the valve. A single pin secures the screen to the valve and can be removed by hand (*Figure 3.2*).



Figure 3.2

3. Loosen and remove the lock nut from the adjustment screw.
4. Rotate the adjustment screw counterclockwise, lowering the spring block. This will relieve the tension on the springs. Rotate the adjustment screw until the spring pressure is completely relieved (*Figure 3.3 & 3.4*).

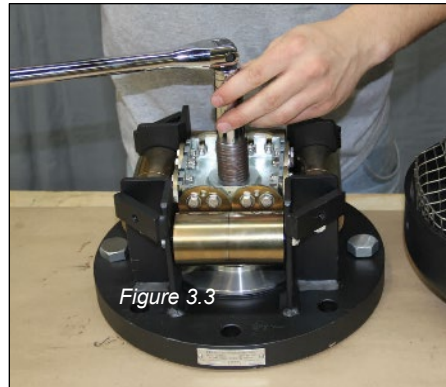


Figure 3.3

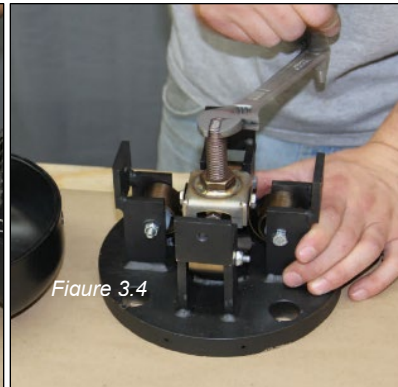


Figure 3.4

5. The spring block assembly is secured to the valve body by the drum bolts. Remove the lock nut from the drum bolt, then pull the drum bolt free from the spring assembly and valve body. If the drum bolts are not easily removed, place a slotted screwdriver between the spring coil and the spring block, then lightly pry the drum away from the spring block. This allows for easier removal of the drum bolt (*Figure 3.5 – 3.8*).

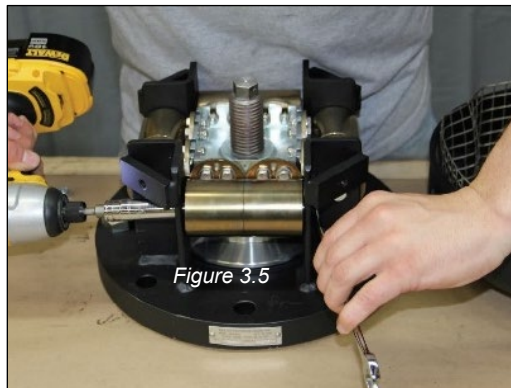


Figure 3.5

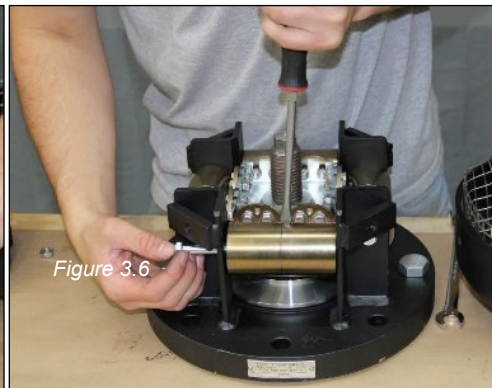


Figure 3.6

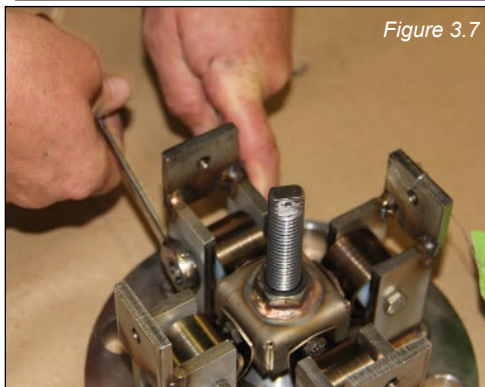


Figure 3.7

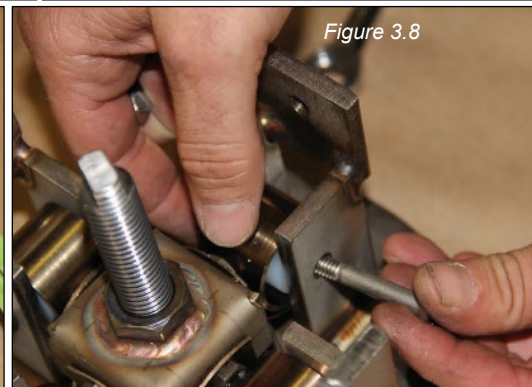


Figure 3.8

6. Lift the spring block assembly along with the adjustment screw from the valve body (*Figure 3.9 & 3.10*). If necessary, spring assemblies can be removed from the spring block by removing the securement bolts. During disassembly it is possible for the spring drum to slide free of the spring assembly. If this occurs simply tap the drum back into place.

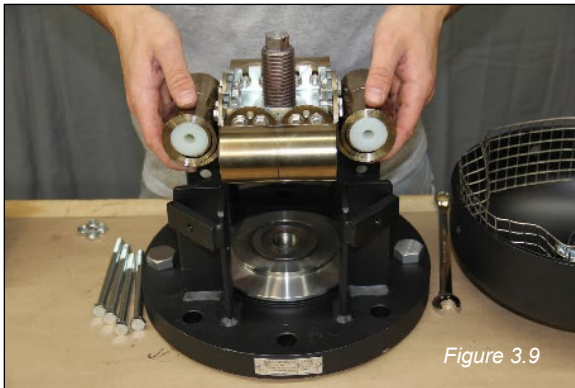


Figure 3.9

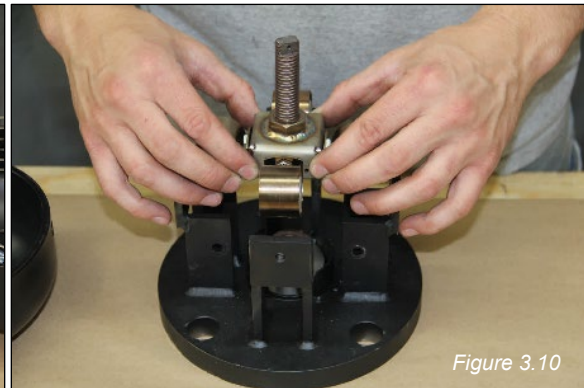


Figure 3.10

7. The sealing disc can then be lifted and removed from the valve body (*Figure 3.11 & 3.12*).

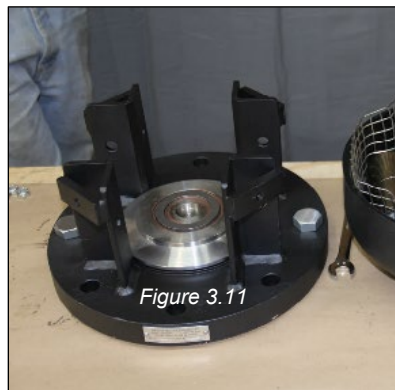


Figure 3.11

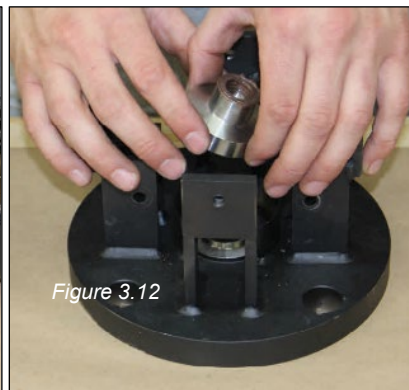


Figure 3.12

3.2 JS75/75S, JS75H/75HS, JS165H/165HS, and JS75XH/75XHS Seal Disc Disassembly

3.2.1 Needle Bearing Removal

Applies to: JS75H/HS, JS75XH/XHS, and JS165H/HS

1. Remove the top thrust washer (thicker) (*Figure 3.13*).
2. Remove the needle bearing (*Figure 3.13*).
3. Remove the bottom thrust washer (thinner) (*Figure 3.13*).

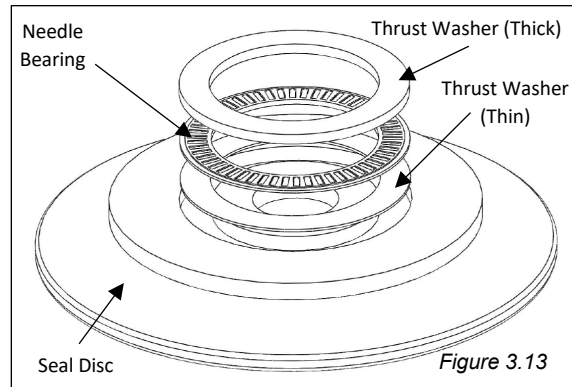


Figure 3.13

3.2.2 Seal Removal (If Necessary)

1. Turn the sealing disc over and remove the Spirolox® ring. Lift the end of the ring with a screwdriver and uncoil the ring from the sealing disc (*Figure 3.14*).
2. Remove the elastomeric seal carefully with a non-abrasive tool. Do not damage the seal mating surface.



Figure 3.14

3.3 JS75L/LS, JS165L/LS, JS75XL/XLS, JS75LT/LTS, and JS165LT/LTS Seal Disc Disassembly

1. Turn the sealing disc over and remove the seal retainer bolt. Thread locker is used on the retainer bolt and may prove difficult to loosen. Use caution not to damage sealing disc if using a vise or other means to hold seal disc while loosening bolt.
2. Lift the retainer plate from the sealing disc.
3. Remove the elastomeric seal carefully with a non-abrasive tool (*Figure 3.15*). Do not damage the seal mating surface.



Figure 3.15

4.0 Inspection

The Valve and most components can be visually inspected without removal from the tank car; however, a proper inspection should be made whenever the valve is rebuilt or when suspect operation warrants.



Kelso utilizes a compound authentication procedure whereby all seals are etched with the pedigree compound and tracing number. If the seal does not have etch, refer to the car owner for the proper pedigree compound.

4.1 Components

1. The elastomeric seal must be replaced when the valve is rebuilt. Upon inspection the seal should be secured and concentric in the sealing disc groove (*Figure 4.1 & 4.2*). The seal should be free from tears, folds, abrasions, cracking and a buildup of debris. Replace when any of these defective conditions occur.



The seal has been manufactured with a proprietary composition and should only be replaced with Kelso supplied material.



Any necessary replacement parts should be purchased through Kelso Technologies.

2. The seal disc seat face should be smooth and free from scratches, nicks, and gouges. The seat face should also be free from paint, dirt, rust, and scale prior to the application of the elastomeric seal (*Figure 4.3 & 4.4*).



- a. JS75/S, JS75H/HS, JS165H/HS, and JS75XH/XHS Seal Disc Inspection.
 - i. Visually inspect the thrust washers and needle bearing for any damage, this applies to the following: JS75H/HS, JS75XH/XHS, and JS165H/HS (*Figure 4.5*). The thrust washers should be flat, within .025" and not bent or folded. The needle bearing should not be compressed and be able to rotate freely.
 - ii. The Spirolox® retaining ring can be reused. If it is deformed or damaged it should be replaced (*Figure 4.6*).



Figure 4.5



Figure 4.6



If any component of the bearing assembly is damaged, the assembly should be replaced. Note: Not all models contain a bearing assembly.

3. The valve seat, or the crown of the seat, must be free from radial cuts, rust, and corrosion (*Figure 4.7 & 4.8*). The valve seat is most crucial for correct valve operation and any discontinuity can cause the valve to leak.



Figure 4.7



Figure 4.8



Repair work on pressure devices that involves machining, grinding, welding or other alterations/modifications can be performed only by the valve manufacturer, car owner, or a user with the valve manufacturer's permissions. (AAR M-1002 Appendix A, Paragraph 3.11)

4. The adjustment screw should be removed from the spring block in order to examine the threads. A visual exam is all that is needed for the adjustment screw, unless irregularities exist. Some dings and wear are allowed as long as the parallel wrenching surfaces, or the hex head, at the top of the screw remain square and the threads are not damaged. If the surfaces become rounded, the adjustment screw must be replaced. The threads of the screw should be clean and lightly lubricated (*Figure 4.9, 4.10, 4.11 & 4.12*). An appropriately sized thread die can be used to correct small imperfections. If cracks and/or fractures are discovered, the adjustment screw should be replaced. The nut shown in *Figure 4.11* should not be removed. This nut acts as a stop for the sealing disc and is held in place by a roll pin. Verify that the roll pin is present and securely in place (if applicable).



Figure 4.9



Figure 4.10

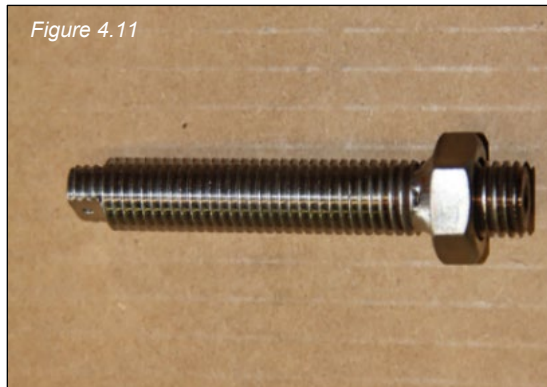


Figure 4.11

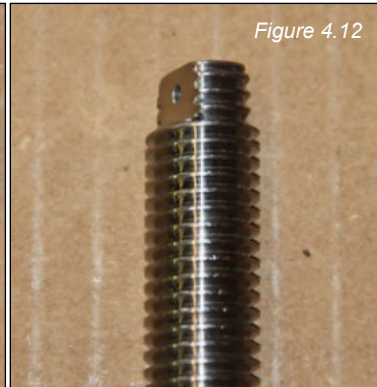


Figure 4.12

5. To perform an adequate examination of the springs, it is not necessary to remove them from the spring block. Additionally, before visual inspection, the springs should be cleaned in order to remove any foreign matter that may be covering any irregularities. The springs should show no signs of pitting or corrosion. Exposed surfaces of the spring should be examined for cracking or any defect (i.e., a nick, gouge, or irregular bend) which could be a stress concentration. If any of the springs are defective, then the complete spring assembly should be replaced. When replacing the spring assembly, the number of spring laminations may vary depending on the valve model. Thus, the replacement springs should be replaced with springs that are the same material and that have the same number of laminations. The springs may relax from around the spring drum over time, which may provide the appearance of gapping. However, it may be rectified during the rebuild and adjustment procedures. If rebuild and adjustment does not correct the gapping but the PRV passes its STDP and BBLT testing, then the springs are not considered condemnable. (Figure 4.13, 4.14, 4.15 & 4.16). Note: During disassembly it is possible for the spring drum to slide free of the spring assembly. If this occurs, simply tap the drum back into place.



Figure 4.13

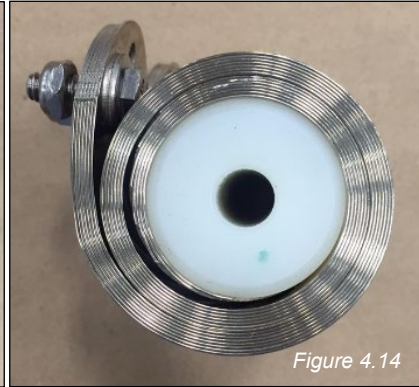


Figure 4.14

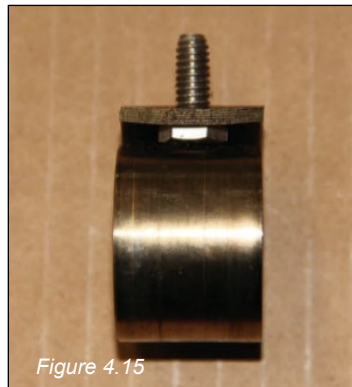


Figure 4.15



Figure 4.16

6. The spring drum should be examined for signs of distress. The drum edges should not be flared or show signs of cracking. The bore through the drums should be round and wear of 1/32" or more will require replacement of the drum (*Figure 4.17*). Excessive wear can make for uneven adjustment and affect seal disc seating. *Figure 4.18* displays the nominal I.D. dimension for each possible bolt size and the maximum allowable for each. If the measurement exceeds the maximum allowable, the drum should be replaced.

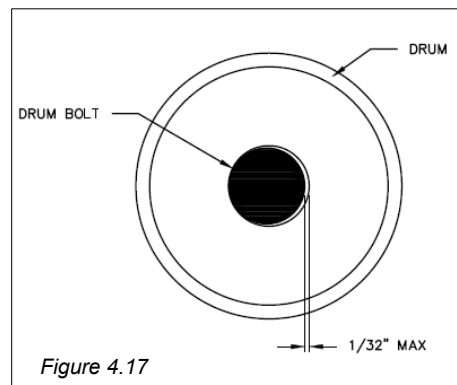


Figure 4.17

Drum Bolt Sizes, Nominal Drum I.D., and Tolerance for Each Size		
Drum Bolt Sizes	Nominal Drum I.D.	Max. Allowable Tolerance
1/4 - 20	0.280"	0.311"
5/16 - 18	0.340"	0.371"
3/8 - 16	0.410"	0.441"

Figure 4.18



Kelso Technologies does not recommend the disassembly of constant force springs by field service personnel. Any damage or deterioration that may be present on the spring assembly will be apparent with a visual inspection. DO NOT use steel abrasives or steel wire brushes to clean the springs. Doing so could cause the spring material to become contaminated and corrode unnecessarily.

4.2 Cleaning

All components, excluding the spring assembly and spring drums, of the Kelso PRV may be cleaned using the following:

1. Wire brushes and/or clean towel / cloth
2. Low pressure water, glass bead, sand or soda blasting provided the blast media is not angular in form
3. A chemical / surfactant application, in conjunction with manufactures prescribed instructions, to achieve a desired result. It is suggested the chemical / surfactant be of neutral pH to ensure the integrity of the metal composition

Regardless of cleaning method, it is suggested that the parts be double rinsed and dried (w/ sanitary towel) prior to reinstallation and immediately after any chemical / surfactant application.



Disposal should be managed in accordance with all applicable state and federal regulations.

5.0 Assembly



Prior to assembly, inspect the valve seat on the valve body and ensure that the area contacting the seal is smooth and free of any irregularities such as nicks, gouges, depressions, or porosity. Inspect the spring block assembly ensuring the spring bolts are tight and the spring drums are in place.

5.1 Procedure



Kelso utilizes a compound authentication procedure whereby all seals are etched with the pedigree compound and tracing number. If the seal does not have etch, refer to the car owner for the proper pedigree compound.

1. Insert the seal into the sealing disc and ensure the seal is seated. For seals with etching, install the etched side of the seal so that it is in contact with the sealing disc surface.
 - a. JS75/S, JS75H/HS, JS165H/HS, and JS75XH/XHS Seal Disc Assembly.
 - i. Install the Spirolox® retaining ring, be sure that the ring sits flat against the seal and is fully engaged in its groove (*Figure 5.1*).



Figure 5.1

- b. JS75L/LS, JS165L/LS, JS75XL/XLS, JS75LT/LTS, and JS165LT/LTS Seal Disc Assembly.
 - i. Place the seal into the sealing disc groove and ensure that it is properly seated (*Figure 5.2*).
 - ii. Apply a thread locking solution to the threads of the retainer bolt, then install the seal retainer and retainer bolt, torquing the bolt to 20 in.- lbs.



Figure 5.2

2. Place the sealing disc assembly onto the valve body, ensuring that the seal is uniformly contacting the valve seat. The disc should sit freely between the flange guides (*Figure 5.3 & 5.4*).

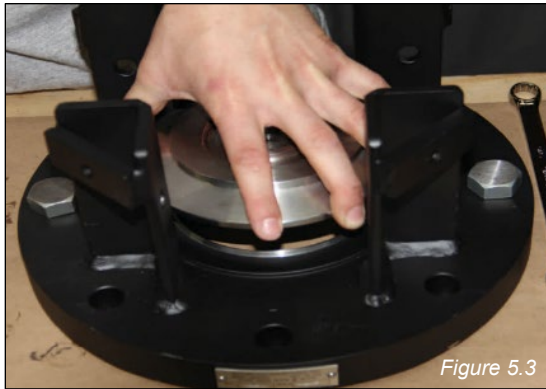


Figure 5.3



Figure 5.4

3. For JS75H/HS, JS75XH/XHS, and JS165H/HS model valves, assemble the bearing assembly according to *Figure 5.5*.
 - a. Insert the thin thrust washer onto the seal disc (*Figure 5.6*).
 - b. Insert the needle bearing ring on top of the thin thrust washer.
 - c. Coat the needle bearing ring with anti-seize (*Figure 5.7*).
 - d. Place the thick thrust washer on top of the needle bearing. It should rotate smoothly on top of the needle bearing (*Figure 5.8*).

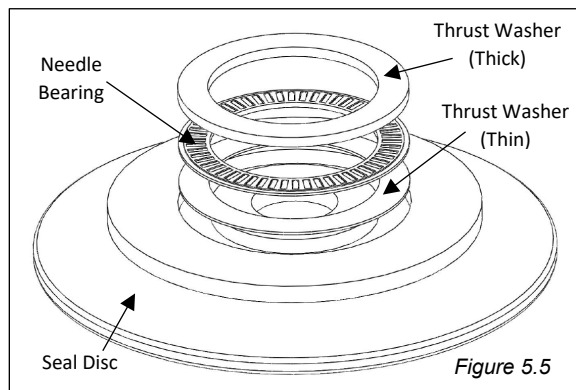


Figure 5.5

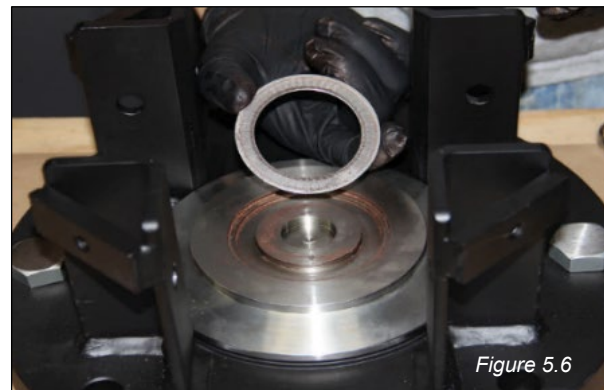


Figure 5.6

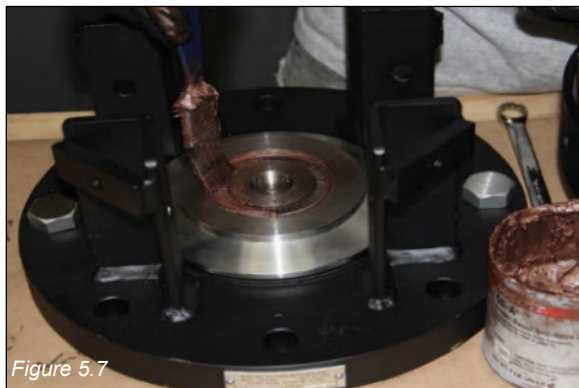


Figure 5.7

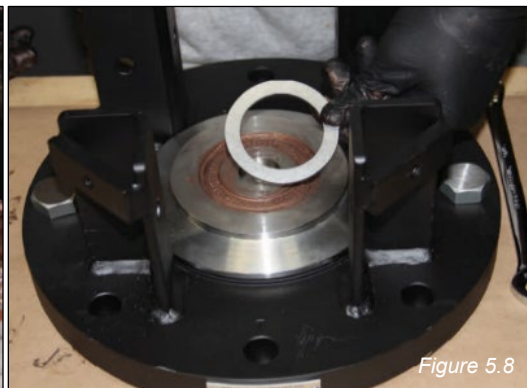


Figure 5.8

4. Apply a high-quality moly-lube or equivalent to the adjustment screw threads (*Figure 5.9 & 5.10*), then thread the adjustment screw into the spring block

assembly so that the tongue of the springs are pointing in the direction of the head of the adjustment screw.

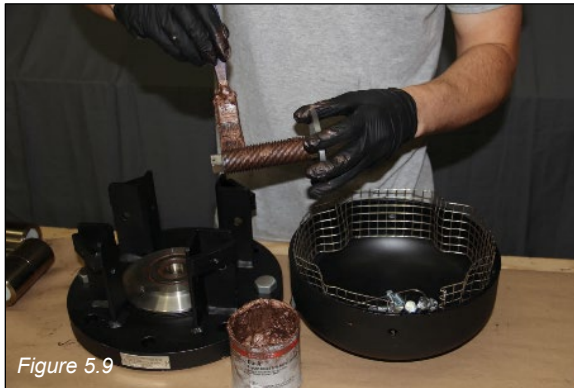


Figure 5.9



Figure 5.10

5. Place the spring block assembly onto the valve body and ensure that the mating surface of the adjustment screw is not obstructed and properly seated against the thrust washer on the sealing disc (*Figure 5.11*), or against the top surface of the sealing disc with the bottom protrusion of the screw in the counterbore of the sealing disc (*Figure 5.12*).



Figure 5.11

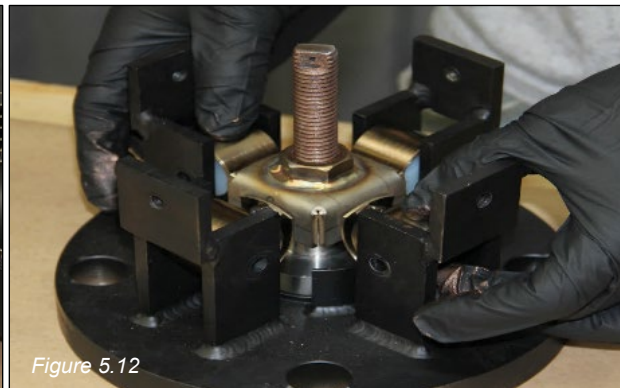


Figure 5.12

6. Insert the drum bolts through the spring brackets in the flange and the spring drums (*Figure 5.13 & 5.14*). Install nylon insert nuts to the drum bolts and ensure the bolts that the bolt threads protrude passed the nylon portion of the nut. Then, determine the thread size of the drum bolt/nut and torque the bolts/nuts according to the following values:
 - a. 1/4 – 20: 30 in. – lbs.
 - b. 5/16 – 18: 60 in. – lbs.
 - c. 3/8 – 16: 80 in. – lbs.

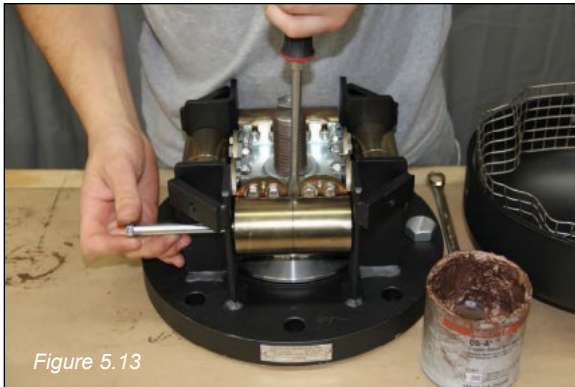


Figure 5.13

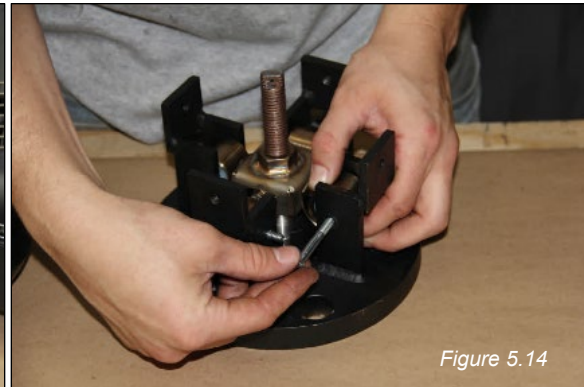


Figure 5.14

7. Place the valve on a clean flat surface, then clamp or bolt the valve down to facilitate initial positioning of the adjustment screw (*Figure 5.15 & 5.16*).

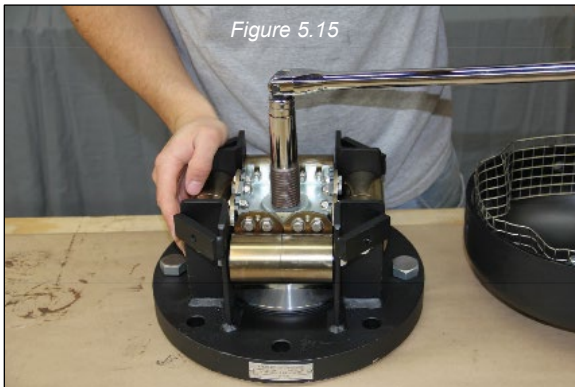


Figure 5.15

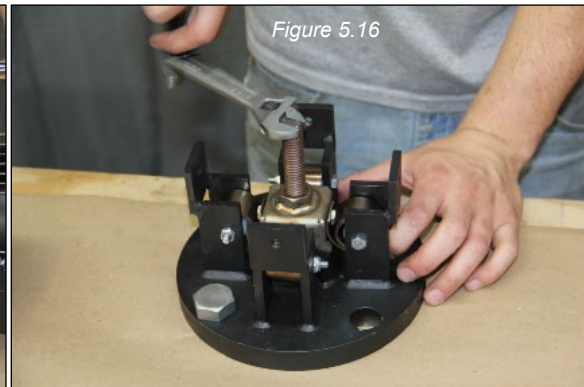


Figure 5.16

8. Rotate adjustment screw clockwise by until resistance is first encountered. This is the point of engagement for which the springs begin to apply force on the seal.
9. JS75/S, JS75H/HS, JS165H/HS, and JS75XH/XHS Spring Block Location Set.
 - a. Rotate the adjustment screw clockwise until the top of the spring block is aligned with the top of the flange body angle upright (*Figure 5.17*).

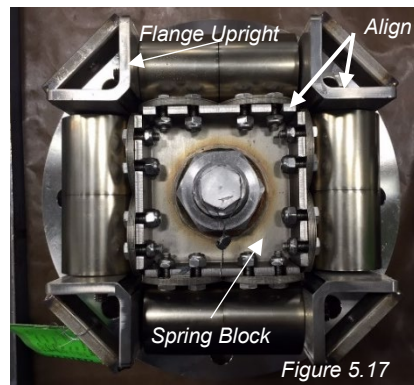
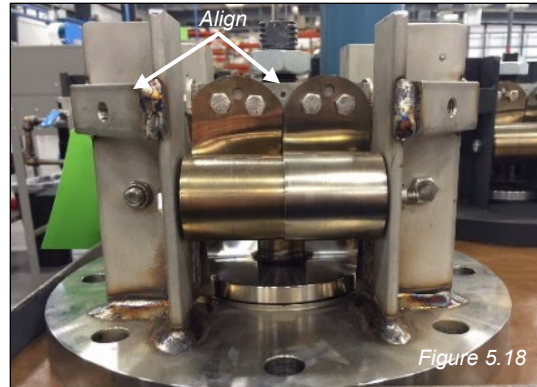


Figure 5.17

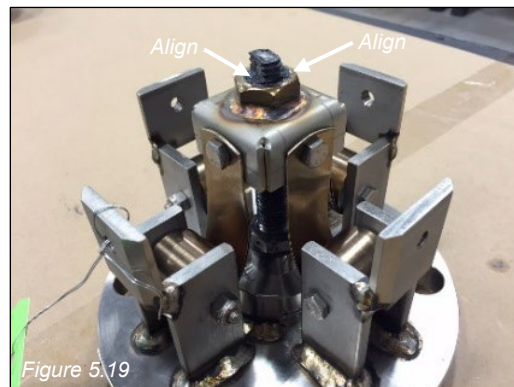


Note: On older style valves of this type, rotate the adjustment screw clockwise until the top of the spring block is aligned with the top of the dome cover attachment bracket (*Figure 5.18*). (The seal discs of these valves have a guide for the adjustment screw.)



10. JS75L/LS, JS165L/LS, JS75XL/XLS, JS75LT/LTS, and JS165LT/LTS Spring Block Location Set.

- a. Rotate the adjustment screw clockwise until the top of the spring block nut is aligned with the machined portion of the adjustment screw (*Figure 5.19*).



11. Install the jam nut on the adjustment screw by hand. Do not tighten. (This nut remains loose for valve testing).



Once the spring block location has been set at the location previously described, the valve has to undergo a dwell period before testing in order for the seal to acclimate to the seat. Valves should be kept in a climate-controlled environment for the full duration of the dwell interval, which is specified by valve type in *Figure 5.20*.

Valve Type	Dwell Times
JS75/S, JS75H/HS, JS165H/HS, and JS75XH/XHS	12 Hours
JS75L/LS, JS165L/LS, JS75XL/XLS, JS75LT/LTS, and JS165LT/LTS	24 Hours

Figure 5.20

6.0 Pressure Testing and Adjustment



Refer to AAR publication “Regulations for Tank Cars”. Appendix A applies specifically to valves. This section prescribes the start to discharge pressure (STD), the vapor tight pressure (VTP), their tolerances, and the processes associated with achieving the desired values.

6.1 Procedure

1. After the appropriate gasket style has been determined and applied to the test stand, securely clamp the valve onto the test stand (*Figure 6.1 and 6.2*). Rotate the adjustment screw counterclockwise to lower the spring block, approximately halfway between the initial spring engagement location and the dwell location. Raise the pressure in the test stand and leak test the mating surface between the valve flange and the test stand, as well as any test stand fittings to ensure the device is not losing air at any point. Release the air from the test stand. If any leaks exist, repair them, and retest the system.

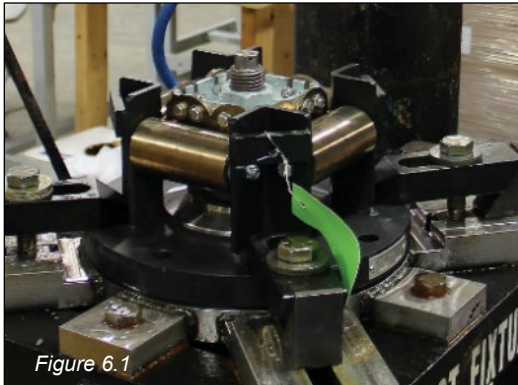


Figure 6.1

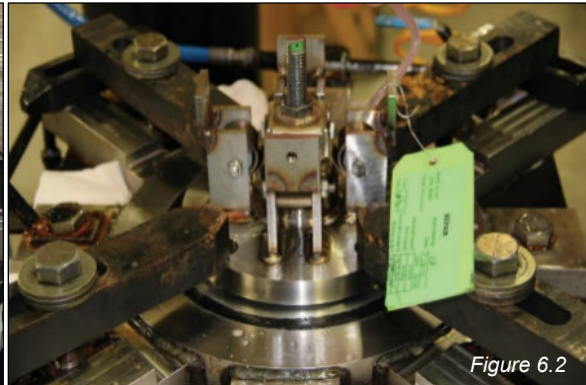


Figure 6.2

2. Spray the valve sealing disc with water or suitable leak test fluid until a continuous film of water is observed at the intersection of the sealing disc and the valve body (*Figure 6.3 & 6.4*). Maintain this film throughout the tests. Raise the pressure in the test stand until the first bubble is observed. The pressure at which this occurs is the start to discharge pressure (*Figure 6.5 & 6.6*).

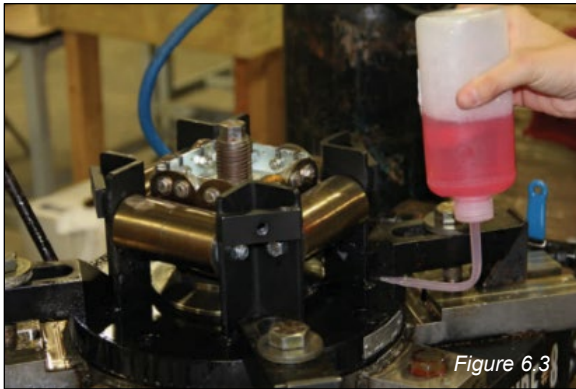


Figure 6.3

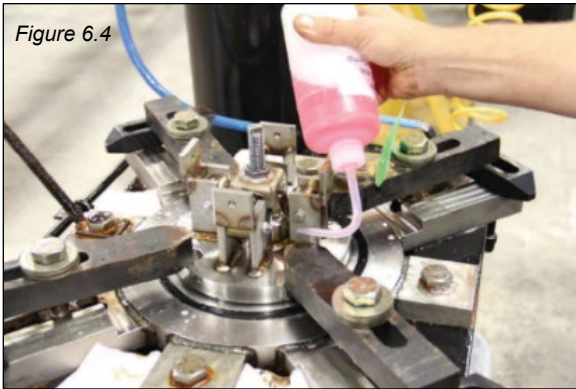


Figure 6.4

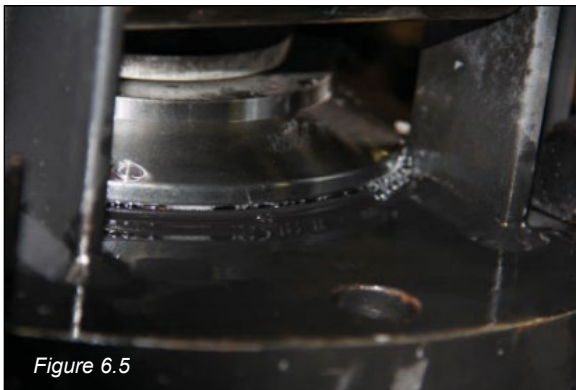


Figure 6.5

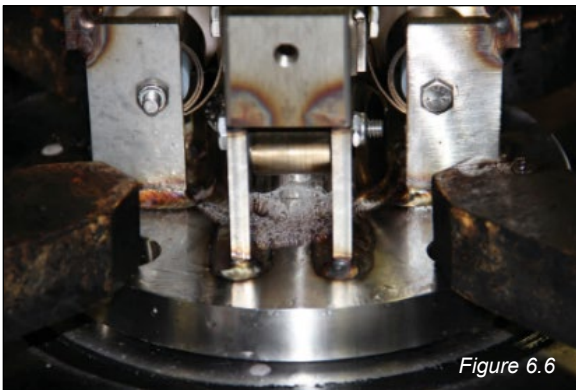


Figure 6.6

3. *Figure 6.7* specifies the AAR allowable tolerances for the STD and VTP of each valve model covered in this document. Depending on the initial STD observed, proceed with the following adjustments:

Valve Model	STD	VTP (Minimum)
JS75/75S	72-78 psi	60 psi
JS75XL/XLS	72-78 psi	60 psi
JS75L/75LS	72-78 psi	60 psi
JS165L/165LS	161-169 psi	132 psi
JS75H/HS/XH/XHS	72-78 psi	60 psi
JS165H/HS	161-169 psi	132 psi

Figure 6.7

- a. If the pressure indicated is below the acceptable AAR tolerance for valve setting, rotate the adjustment screw clockwise and test again. Repeat this process until the desired STD value has been established then record the pressure (*Figure 6.8 & 6.9*).



Figure 6.8



Figure 6.9

- b. If the pressure indicated is above the acceptable AAR tolerance for the valve setting, rotate the adjustment screw counterclockwise and test again. Repeat this process until the desired STD value has been established then record the pressure (*Figure 6.10*).

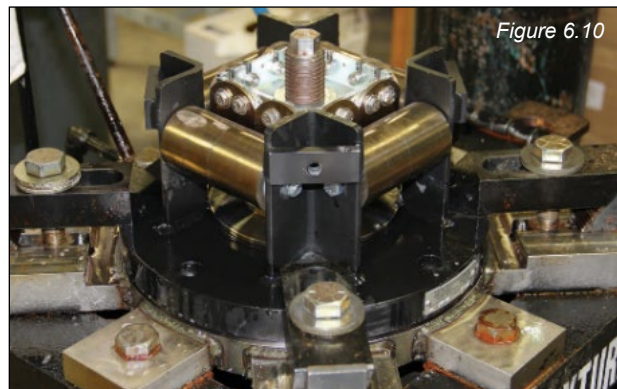


Figure 6.10

- c. Once the STD value has been achieved, and while the test stand is still pressurized, slowly start to lower the pressure until the “vapor tight pressure” has been observed. The minimum allowable pressure for this to occur for each valve model is specified in *Figure 6.7*. If the vapor tight pressure is greater than the absolute minimum, (80% of nominal set pressure) as established by AAR, continue. Otherwise investigate seal conditions and mating surfaces to resolve the problem.
- d. Perform the “start to discharge” and the “vapor tight pressure” tests again, ensuring test results are consistent with initial results. The VTP should be verified by holding the pressure for at least 2 minutes without any leaks. Verify that the measured values have been recorded for both pressures, then relieve the pressure of the system.

6.2 Valve Completion

1. Thread the adjustment screw jam nut clockwise onto the top of the adjustment screw until it comes into contact with the spring block, locking the adjustment screw in a static position (*Figure 6.12, 6.13*). Once the jam nut is in this position, it should be torqued according to the following specified values based on the valve model:
 - a. For valve models JS75/S, JS75H/HS, JS165H/HS, and JS75XH/XHS, the jam nut should be torqued to 25 ft. – lbs.
 - b. For valve models JS75L/LS, JS165L/LS, JS75XL/XLS, JS75LT/LTS, and JS165LT/LTS, the jam nut should be torqued to 100 in. – lbs.



Ensure that the adjustment screw remains static while torquing the jam nut as to prevent the adjustment screw from rotating and changing the valve's setting.

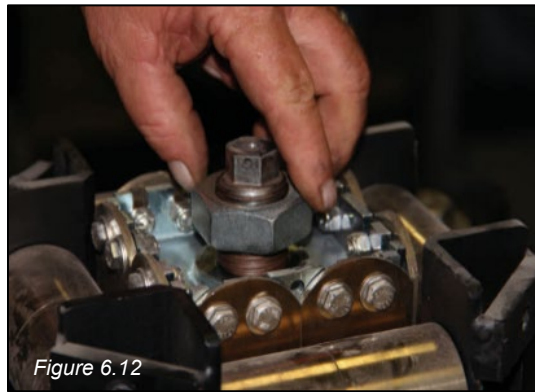


Figure 6.12

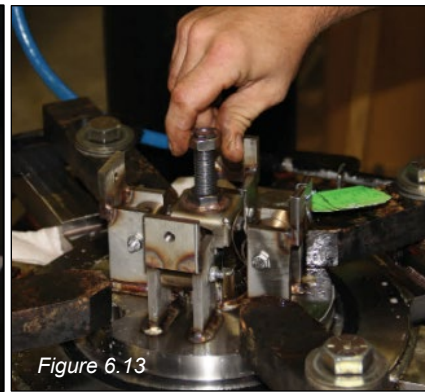


Figure 6.13



Figure 6.14

2. Install a wire and lead seal through the jam nut and the spring block and crimp the lead onto the wire, preventing unintentional adjustment of the valve (*Figure 6.15*). Install the debris screen (If applicable).



NOTE: The wire seal must be stamped with your company's facility QA Code as established by AAR.

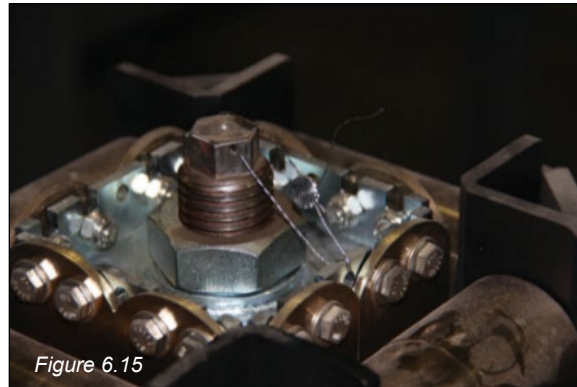


Figure 6.15

3. Fasten the valve cover onto the valve using the cover bolts with split lock washers. A thread locking solution should be applied to each of the cover bolts. Start each bolt by hand, applying the seal number tag onto one of the cover bolts. Then, tighten the bolts, in a starlike pattern, and torque them to 100 in. – lbs. (Figure 6.16).



Figure 6.16

7.0 Maintenance

Under normal operating conditions, the JS Series PRV should not require maintenance until a periodic retest is required by code or there are signs of leakage from the valve (not leakage between the tank car and valve mounting flanges). DOT and AAR have set forth a retesting interval between tests. The JS Series PVR has been designed to minimize the valves exposure to any chemicals being shipped by mounting all components external to the tank. This advantage allows for immediate visual inspection of most components as well as quick access for emergency respondents.



These instructions only describe maintenance to a valve that has been removed from the tank car and is located in a suitable environment for retest. Kelso recommends all maintenance only be performed on valves that have been removed from the tank car.



NOTE: AAR requires that new seals be installed when a valve is rebuilt. (AAR M1002 Appendix D– 3.4)

7.1 Testing Valves in Storage

Valves that are set and sealed by Kelso Technologies, have been left in their original packaging, are undamaged, and are no more than six (6) months old, may be installed without being retested. If the valve has exceeded six months since its last documented test day, it must be returned for retesting and recalibration.

7.2 Valve Repair

Repair work on pressure relief devices involving machining, grinding, welding or other alterations and modifications can only be performed by the valve manufacturer, or the car owner or user, with the valve manufacturer's permission. The flat gasket face on the valve body mounting surface or the gasket tongue, may be machined to remove nicks and burs. (AAR M1002 Appendix A, Paragraph 3.11). Unless otherwise specified standard tolerances for decimal dimensions are +/- 0.003 in.



The tolerances on the gasket tongue must not be exceeded.

8.0 Special Guidelines



Determining Applicable Pressure Values:

Refer to AAR publication "Regulations for Tank Cars". Appendix A applies specifically to valves. This section prescribes the start-to-discharge pressure (STD), the vapor-tight pressure (VTP), and their tolerances.



Test Stand and Pressure Gauge Requirements:

It is recommended that the test stand mounting must be equivalent to the AAR M1002 figures in Appendix E for the valve being tested. The pressure gauge must meet the requirements of AAR M1002 Appendix D 4.5 "Test Gauge Standards" and must be date-tagged accordingly.

9.0 Warranty

See the Warranty Terms and Conditions.

10.0 Appendix

1. The Kelso JS75/S, JS75H/HS, JS165H/HS, and JS75XH/XHS Pressure Relief Valves can be fitted with a flue. The flue can direct the flow from the valve upwards to vent through the top cover of the protection housing for the top fittings. In addition, the flue is designed to make the valve tamper resistant. The flue is attached to the valve flange with (4) bolts and a cap, attached by set screws, covers the adjustable portion of the valve. Valves that come fitted with a flue will not have a dome cover.
2. Kelso Pressure Relief Valves can be outfitted with a debris screen. The debris screen aids in preventing foreign material and nesting insects from entering the valve. Screens are secured around the valve body by a single pin.

3. Teflon® ETFE Green Coatings are available for Kelso Pressure Relief Valves. These coatings are extremely durable, abrasion resistant, and chemical resistant. Coated surfaces should be free from nicks, chips, and any other damage.

11.0 Revision Log

- Revision 1 – Section 7.2 added standard tolerance dimensions.
- Revision 2 – Section 4 (5) changed spring drum.
- Revision 3 – Section 4.0, 4.1, 5.1 and 5.1 1a and 1b seal etching.
Figure 1.3.4 and 1.3.8 Added Size, Grade Cover Bolts/Washers
- Revision 4 – Section 4.0 and 5.1 removed date (2/24/2016) for seal etching.
Updated footer to current address and phone.
- Revision 5 – Pressure Set table on page 25...minimum values changed to 80%.
Values had been taken from EI's.
- Revision 6 – Added table on page 16 defining the nominal size and allowable tolerances for drum I.D. wear; updated format and figures in accordance with current document standards.
- Revision 7 – Modified set pressure for JS75XL valves in table.