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General Guidelines

- The owner must comply exclusively with these operating instructions and the authorized use of this piece of equipment. Should problems arise that cannot be solved using these operating instructions, please contact Dixon®. We will be happy to provide further assistance.
- If any modification work is performed on the product by the owner, Dixon shall no longer be considered the manufacturer of the device. In such cases, all components must be subjected to a new certification process for any applicable certifications that the equipment holds. Unless agreed to in writing by Dixon, liability, warranties, and guarantees shall immediately be deemed null and void as soon as the owner:
 - Performs modifications/conversion work on the product.
 - Uses the product for unauthorized purposes.
 - Removes or disable safety elements.
 - Processes products whose material, form, and size do not correspond exactly to the description provided.
 - Makes alterations to the original state of the device.
- The operating instructions are regarded as part of the product.
- The operating and maintenance personnel must always be able to access the operating instructions.
- The safety instructions provided in the operating instructions must be observed.
- The operating instructions shall be valid for the entirety of the device's lifespan.
- The operating instructions must be maintained and updated as necessary.
- The operating instructions must be passed on to any subsequent owners or operators of the device.

Safety Information

The following signs may be used in this manual. To avoid serious injury and/or possible damage to equipment, pay attention to these messages. Hazards or unsafe practices could result in severe personal injury or death.



DANGER Indicates a hazardous situation that, if not avoided, will result in death or serious injury.



WARNING Indicates a hazardous situation that, if not avoided, could result in death or serious injury.



CAUTION Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

Use only replacement parts and devices recommended by the manufacturer to maintain the integrity of the equipment. Make sure the parts are correctly matched to the series, model, serial number, and revision level of the equipment.

Safety labels are placed on equipment where appropriate. Do not remove any labeling from any piece of equipment. Replace any label that is missing.

DO NOT modify any Dixon product. Non-factory modifications could create hazardous conditions and void all warranties. DO NOT attempt to use a Dixon product in any application that exceeds the product rating.

Regulations and Safety Requirements

Regulations: Dixon® internal-style pressure relief valves are used in contact with a variety of products, many of which are hazardous materials and could cause serious injury or damage if mishandled. The acceptance and transportation of products are regulated by the DOT and AAR in the U.S., and in Canada by CTC and Transport Canada. Regulations of other governmental bodies must be complied with for stationary and mobile applications. All personnel should be familiar with and follow these regulations. Nothing in these instructions is intended to conflict with or supersede these regulations. The information in this document was gathered from knowledgeable sources. However, Dixon makes no representations or guarantees about its accuracy or completeness and assumes no liability for this information.

Specifications are subject to change without notice.

This valve should only be installed, operated, and maintained by qualified personnel. Read these instructions carefully before proceeding. Operation of the valve must conform to all applicable specifications from TC, AAR, DOT, CFR (Parts 173.31, 174.67, etc.), and other governmental bodies, along with the operating instructions of your company.

Safety Precautions

Safety Warnings and Precautions: Please carefully read each of the following warnings and cautions prior to performing any work.



WARNING: Toxic Hazard: Always use extreme caution and proper equipment when involved with hazardous materials. To avoid exposure to toxic or hazardous materials, make sure the tank car is empty and clean, and that the work area is free of hazardous chemicals before removing or installing any valve.

- Wear protective clothing and equipment suitable for withstanding the materials to which you may be exposed.
- Position yourself on the upwind side of the valve when possible.
- Work in a well-ventilated area.
- Work with a partner who can help you in the event of an emergency.
- Follow approved safety precautions for hazardous or toxic materials.
- Obtain SDS sheets for all the commodities used with the associated valve.



WARNING: Spring-Loaded Assembly: These internal-style pressure relief valves are spring-loaded assemblies with a large amount of stored potential energy in the spring. Handle with care to avoid damage to the valve stem, which could result in breakage and ejected piece parts. When assembling or disassembling the valve, DO NOT position oneself directly in front of the spring and stem. Instead, position oneself to the side away from the valve. Unexpected component failure of the valve stem or spring breakage may cause a sudden energy release that can discharge component parts a short distance in an uncontrolled manner. Personal injury may be a result.



WARNING: Valve Leakage: Improper valve-tongue seating in the flange groove, loose nuts, and damaged gaskets may result in leaks at the valve-mounting joint.



CAUTION: Groove Damage:

- Do not use a sharp tool to seat the gasket as damage may result.
- Verify that the valve tongue fits into the cover plate groove. Improper fit up could result in a leak and possible valve damage.
- To prevent tongue damage, do not install a valve having damaged sealing surfaces.

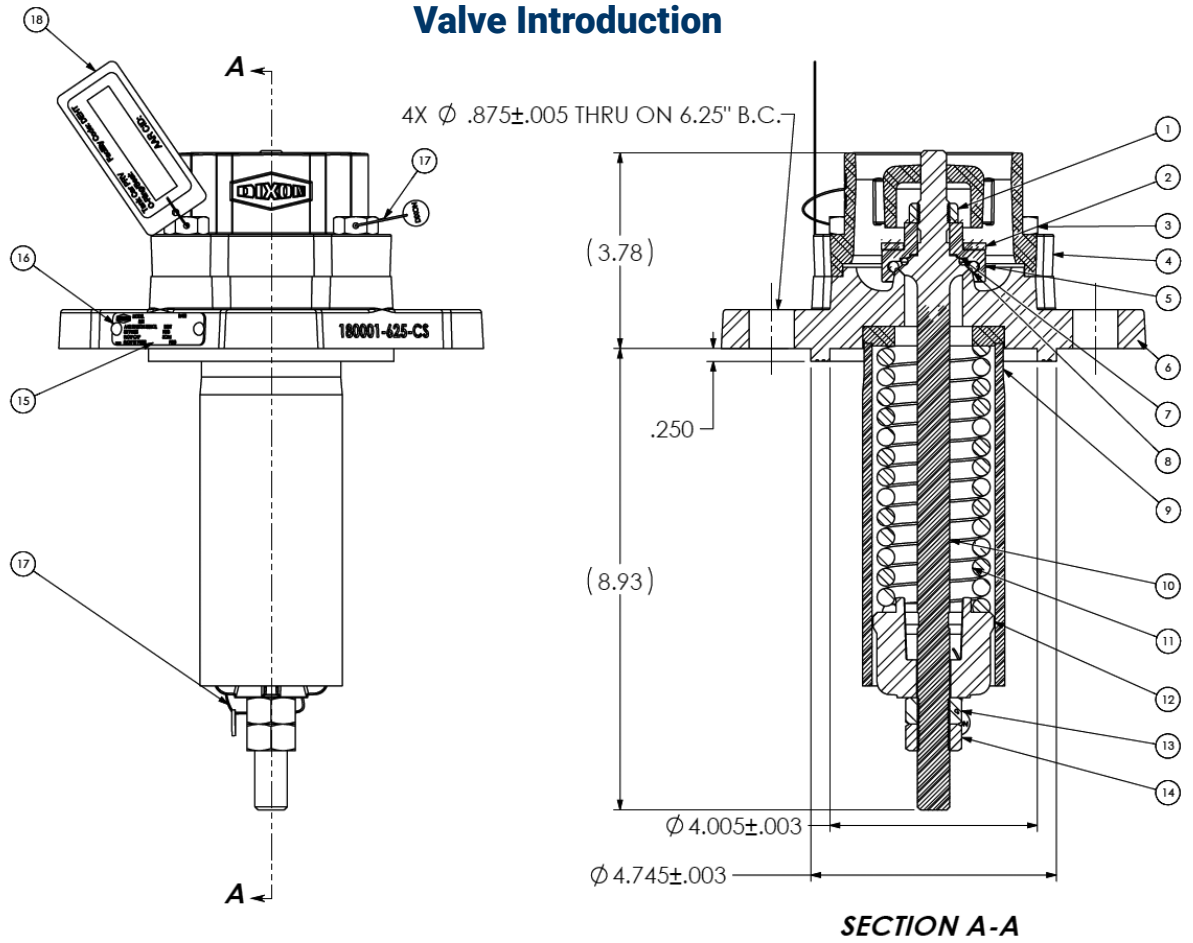


CAUTION: Incorrect Setting: Never adjust the spring compression of a valve while it is mounted on the vessel cover plate or incorrect settings may result.



CAUTION: This is a valve containing springs under load. DO NOT attempt to disassemble or otherwise adjust the valve without first reading these instructions or injuries may result. Spring pressure must be adjusted to the minimum and a bench clamp or press used for disassembly.

Valve Introduction



Item	Part #	Description	Material	Qty
1	180016-CS	top locknut	steel, plated	1
2	180015-BN	washer	NBR	1
3	180013-CS	top guide bolt	steel, plated	4
4	180003-625-S4	top guide	304 stainless steel	1
5	180009-625-S4	seal retainer	304 stainless steel	1
6	180001-625-S4	body	304 stainless steel	1
7	AS568A214NBHL	stem O-ring	NBR	1
8	AS568A324NBHL	seat O-ring	NBR	1
9	280002-625-S4	spring guide	304 stainless steel	1
10	18007-625-S4	stem	304 stainless steel	1
11	180012-625-S7	spring	17-7PH stainless steel	1
12	180005-625-S4	follower	304 stainless steel	1
13	180014-CS	spring adjustment nut	steel, plated	1
14	N2631850029G5	bottom locknut	steel, plated	1
15	180140	nameplate	304 stainless steel	1
16	180138	drive screw	304 stainless steel	2
17	180127	wire seal	lead/stainless steel	3
18	180149	CID tag	304 stainless steel	1

NOTE: Alternate materials of construction are available as well as a flat face mounting.

Valve Installation

New valves are assembled, tested, and sealed at Dixon®. If a new valve has been left in its packaging and is less than 6 months old, it may be installed without retesting. If it is older than 6 months, it will need to be retested and qualified.

Installation Procedure and Recommended Tools

Tool	Component
1-1/4" SAE wrench	mounting stud nuts
torque wrench	mounting stud nuts
lint free cloth	for cleaning sealing surfaces
wire brush	for cleaning sealing surfaces

Inspect the mounting stud threads and ensure there is no damage. Inspect the cover plate and valve mounting sealing areas (e.g., tongue-and-groove or flat-faced) and ensure there are no dents or peened surfaces.

For tongue-and-groove installations:

- Inspect the groove in the cover plate. The fitment with the tongue on the valve should be very tight. Any peening of the tongue or groove edges could interfere with the proper installation of the valve. If there is damage to the groove, make any necessary corrections to meet the tolerances specified by the AAR.
- Inspect the tongue of the valve (new or reconditioned) by running your fingernail around both the inner and outer edges checking for damages. The tolerances on the tongue are +/- .003" so any excess material due to peening could cause the valve to not seat in the groove of the cover plate. Remove any excess material to meet the tolerances specified by the AAR.
- Install the new gasket into the groove. Ensure the gasket is seated evenly. There should be 1/16" of space above the gasket to allow the valve tongue to locate properly in the groove.



CAUTION: Groove Damage:

- Do not use a sharp tool to seat the gasket as damage may result.
- Verify that the valve tongue fits into the cover plate groove. Improper fit up could result in a leak and possible valve damage.
- To prevent tongue damage do not install a valve having damaged sealing surfaces.

For flat-faced flange installations:

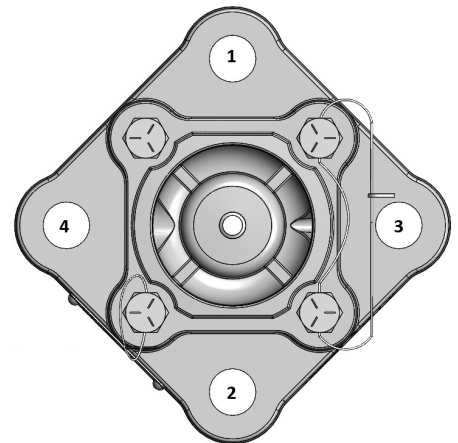
- Ensure the underside of the valve flange and the mating area on the cover plate are defect-free and clean.

Install the mounting studs into the cover plate following your company's procedure and requirements.

Mount the nuts onto the mounting studs and tighten in 1/3 torque increments using the pattern shown below. For recommended torque values contact your gasket manufacturer.

To complete this installation process, the tank car will need to be pressurized in accordance with the tank car owner's requirements. A bubble leak test must be performed per car owner's specifications. Install wire seal (item 17) through top guide bolts (item 4) once testing is complete.

Test all newly installed valves to conform with tank car owner specifications. No leaks should be present. Improper valve tongue seating in the groove, damaged gaskets, or loose mounting nuts may result in leaks at the cover plate mounting joint.



WARNING: Valve Leakage: Improper valve-tongue seating in the flange groove, loose nuts and damaged gaskets may result in leaks at the valve-mounting joint.



CAUTION: Incorrect Setting: Never adjust the spring compression of a valve while it is mounted on the vessel cover plate or incorrect settings may result.

Valve Removal

Removal Procedure and Recommended Tools

Tool	Component
1-1/4" SAE wrench	mounting stud nuts
lint free cloth	for cleaning sealing surfaces
wire brush	for cleaning sealing surfaces

1. Remove the valve by following your company's procedure for removal and securing the opening in the cover plate.
2. Using a wire brush, clean the threads of the mounting studs removing any rust or scale. The mounting nuts should move freely on the studs. Inspect the threads for any excessive wear, corrosion, or pitting. If any are found, the parts are rejectable and should be replaced.
3. Remove and dispose of any old mounting gasket material. Use care to ensure the mounting groove is not scratched or damaged.
4. Using a lint free cloth and an appropriate solvent, clean the mounting studs as well as the sealing surfaces on the valve and cover plate.

Valve Disassembly and Inspection

During disassembly of the valve, key components of the valve must be thoroughly inspected to ensure a properly operating valve after reassembly. These components include the valve body, top guide, stem, seal retainer, spring, spring follower, and spring guide tube. Inspection includes looking for cracks, excessive wear, and other potential issues as described in more detail in the steps below. All O-rings, gaskets, and wire seals must be replaced during reassembly. Dixon® suggests that nuts and bolts also be replaced during this process.

Per the requirements by the AAR, all inspection, testing, and resetting of pressure relief valves must follow the procedures developed by an ANST Level III Technician and be performed by a Non-Destructive Testing (NDT) qualified operator. See AAR M-1002 Appendix D "Retest and Qualification Requirements" and Appendix T "Nondestructive Examination". Additionally, all maintenance activity for this valve must be performed by an AAR M-1003 certified repair facility.

NOTICE: Machining is not allowed without consent from Dixon or the car owner. Machining, grinding, welding, or other alterations to the valve seat or stem is not allowed per AAR M-1002, Paragraph A3.11.1 of the tank car specifications.

NOTICE: Repair work is limited to cleaning and polishing without consent from the valve manufacturer or car owner. See AAR M-1002, Paragraph A3.11.1 of the tank car specifications.

Valve Disassembly and Recommended Tools

SAE Wrenches	Component(s)/Description	Item #
3/4"	bolts for top guide	4
15/16"	locknut for spring adjustment	14
15/16"	spring adjustment nut	13
15/16"	top locknut	1
1-1/8"	flats on O-ring retainer	5

Other Tools, Equipment, and Supplies	Component(s)/Description	Item #
spring compression press	spring	11
non-scratching tool to remove O-rings	O-rings	7, 8
wood block	for supporting valve stem	10
screwdriver/two-arm puller	O-ring retainer	5
PTFE grease (Krytox GPL204 or equivalent) *	stem	10

*Ensure compatibility of grease with the lading.

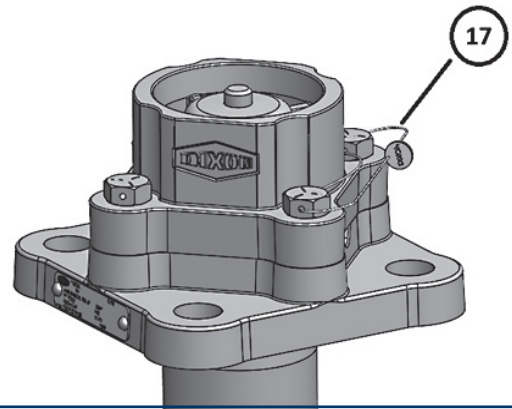
- To ensure best practices, all wire seals and elastomers should always be replaced. Nuts and bolts must be closely inspected before any possible reuse. All valve components such as the spring follower, valve body, and top guide must be thoroughly inspected.
- Valve disassembly should only be performed by trained personnel with access to proper tools, equipment, procedures, and personal protective equipment (PPE).



CAUTION: This is a valve containing springs under load. DO NOT attempt to disassemble or otherwise adjust the valve without first reading these instructions or injuries may result. Spring pressure must be adjusted to the minimum and a bench clamp or press used for disassembly.

1.

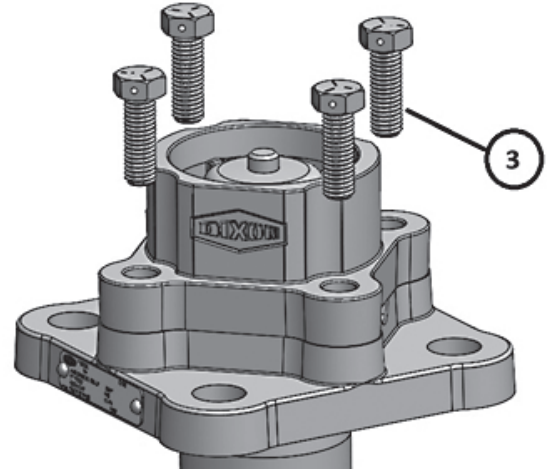
Remove the seal wire (item 17) from the top guide bolts.



2.

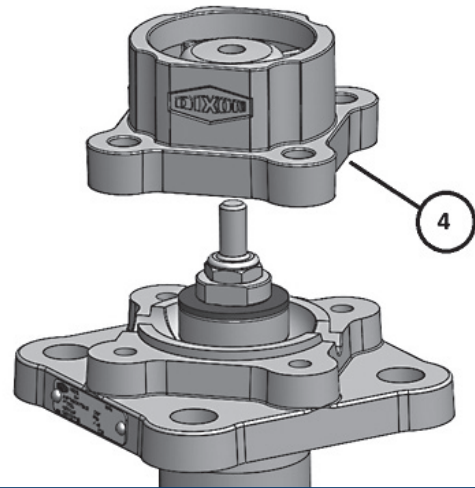
Using a 3/4" SAE wrench remove the bolts (item 3) holding on the top guide.

All threaded components, such as bolts and nuts, must be thoroughly inspected and cleaned or replaced. Inspect the threads for any sign of excessive wear, corrosion, pitting, or other defects. If any are found the part is rejected and must be replaced.



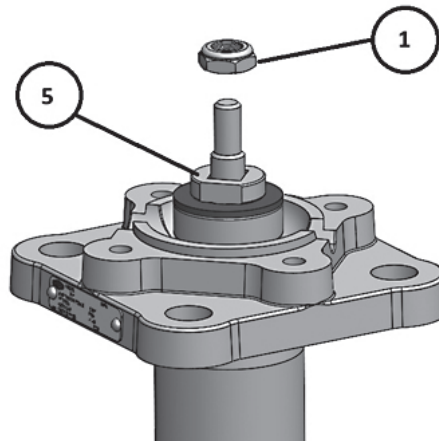
3.

Remove the top guide (item 4) from the valve body. The top guide (item 4) is a non-structural part. There should be no paint or obstructions where the stem passes through the guide bushing. There should be no paint or obstructions on the bottom surfaces that mate to the valve body.

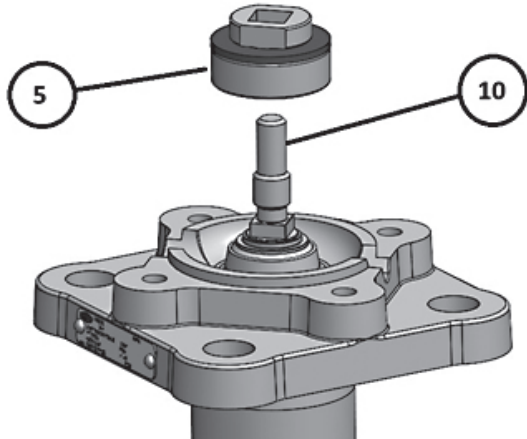


4.

Using a 1-1/8" SAE wrench hold the flats on the O-ring retainer (item 5). Place a 15/16" SAE wrench on the locknut (item 1) and remove the locknut.

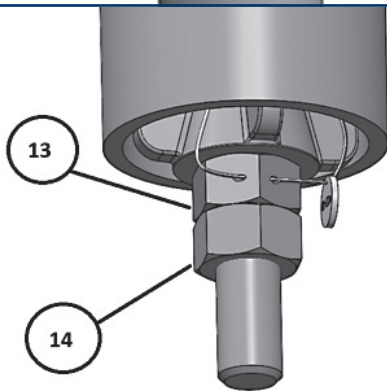


5.



Remove the O-ring retainer (item 5) from the stem (item 10). Using a two-arm puller or two flat head screwdrivers may be necessary for this step. Use caution to not scratch any metal surfaces with any removal tool.

6.

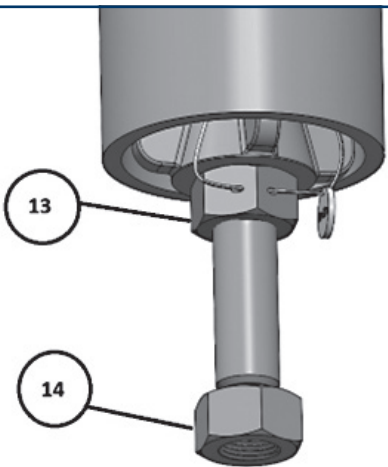


Clean and lubricate the stem thread. Inspect the threads for any excessive wear, corrosion, pitting, or other defects. If any are found the part is rejectable and should be replaced. Using two 15/16" SAE wrenches, loosen the locknut (item 14) from the spring adjustment nut (item 13).



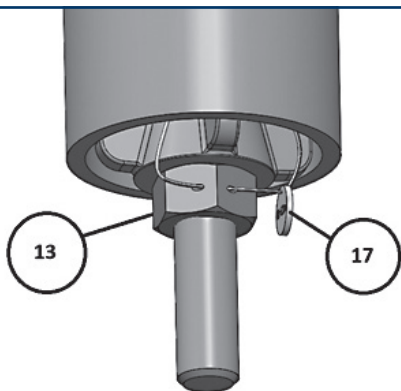
WARNING: Always point the valve away from yourself in the event of catastrophic failure of the stem; serious injury could occur.

7.



Remove the locknut (item 14) from the stem. Do not attempt to remove the spring adjustment nut (item 13) at this time.

8.



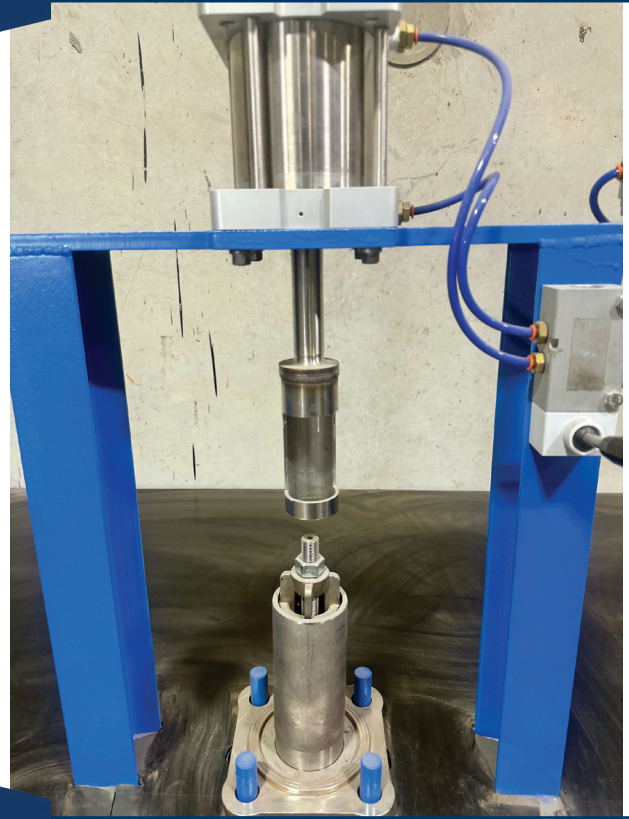
Remove wire seal (item 17) from the spring adjustment nut (item 13). Mark the location of the spring adjustment nut on the stem threads.



WARNING: To avoid personal injury or product damage, the following steps must be performed by certified and trained personnel only.

9.

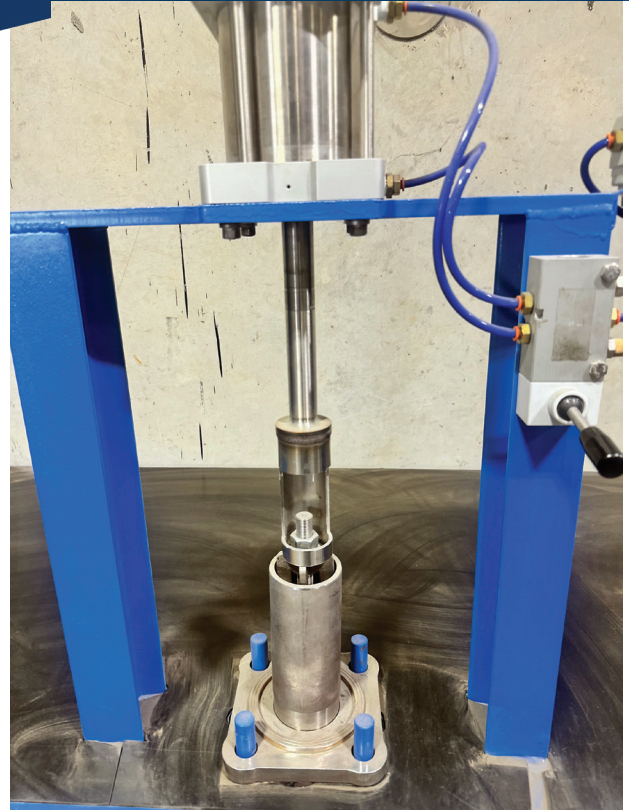
Place the assembly into a press with a support block or floorboard to allow the passthrough of the valve stem.



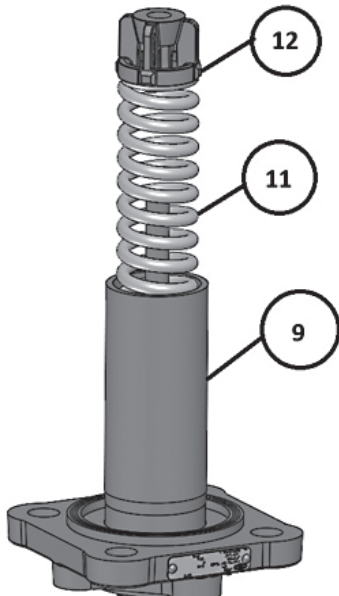
10.

Using a press yoke having a cutaway as shown, compress the valve spring to allow removal of the adjustment nut (item 13). Using a 15/16" SAE wrench remove the nut. Take care to support the valve stem during this process.

Carefully back off the press. Allow the spring to expand fully.



11.



Remove the spring (item 11) and spring follower (item 12) from the spring guide. (item 9).



CAUTION: The spring (item 11) is a highly stressed part of the assembly. The exterior surface must be free of cracks and corrosion pitting. Magnetic particle or dye-penetrant inspection (performed by certified personnel) can be used to evaluate the exterior surfaces and ensure that they are free of cracks and corrosion pits. If any excessive wear over 0.030" of the area is measured, the spring is rejectable and must be replaced.

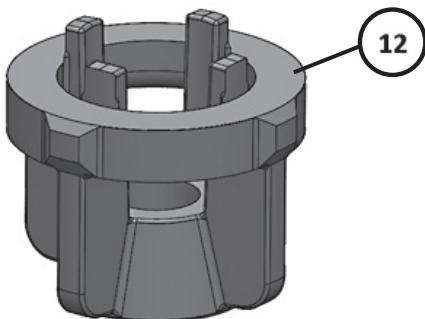


CAUTION: Valve spring failure: Defects in coil springs such as cracks and corrosion pits can act as stress concentrators. Failure to detect these cracks can result in coil-spring breakage and cause uncontrolled venting of product.



CAUTION: Insufficient valve travel: Test the springs by placing them in a press and compressing them to 80% of spring travel for two minutes. Remove from the press and then measure the free height of the spring. If free height is less than the minimum indicated in the table below the spring must be replaced. Coil springs that have taken a "set" and now have an undersized free height, may not allow the valve to open fully. Additionally, the spring should not be bowed more than 1/4" when assembled in the valve. Bowing in excess of this amount could cause the spring to rub against the inside wall of the guide tube and adversely affect the start to discharge or flowing performance. If any of the above defects are observed the spring must be replaced.

Spring Part#	Wire Size (REF)	Height at 80% of Max Deflection	Minimum Free Height
180007-625-S7	0.343"	4.85"	6.85"
180047-625-S7	0.393"	4.60"	6.86"
180053-625-S7	0.313"	4.62"	6.86"



The spring follower (item 12) is a structural part that has guide ridges on its outer diameter. Inspect the outer sliding surfaces for any nicks or burrs. Move the follower up and down the spring guide tube checking for free movement. If the part binds look for dents or gouges to the spring guide tube.

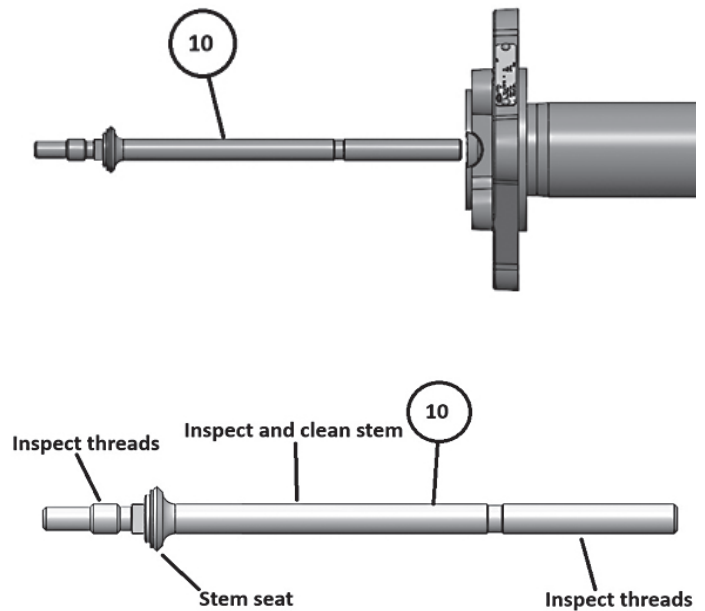


WARNING: Valve sticking: If the spring follower binds in the guide tube, the valve may stick in either the closed or open position. Always ensure free travel of the spring follower prior to reassembling the valve. Repair any damage to allow the spring follower free movement through the spring guide tube. If repairs are not possible the part must be replaced.

12.

Take the valve to a workbench being sure to support the stem (item 10). Place the valve on a workbench and carefully remove the stem. Remove residual product, scale, and other foreign material from the stem (item 10). Inspect the stem for corrosion pitting. If any is found it is cause for rejection as it may indicate more severe corrosion or the start of more difficult to detect cracking. Inspect both sets of threads for excessive wear, corrosion, pitting or other defects. If any are found the part is rejectable and should be replaced. Nickel bearing stainless steels have a likelihood of galling. Wrenching the adjustment nut without first relieving the spring pressure will frequently result in galled threads. Inspect for galled threads and if present chase the threads with a die or replace stems with significant thread damage. The seat of the stem is a sealing surface. Clean the seat with 400 grit emery cloth (minimum) and then wipe it clean using a lint free cloth and suitable solvent. Run your fingernail over the surface to detect any defects.

The valve stem must be straight and total runout should be within 0.025" (maximum). If the measurements are greater than the allowable maximum the part must be replaced.



WARNING: Valve-stem eccentricity: Excessive valve-stem eccentricity will cause binding that can result in high start-to-discharge pressure settings, reduced valve capacity and/or low vapor-tight pressures.



WARNING: Valve-stem straightening: Straightening of the stem by bending it in a press may result in the buildup of uneven stresses in the stem, which may result in valve malfunction.



CAUTION: Check for cracks: Cracks are stress concentrators and can cause catastrophic failure of the stem and uncontrolled venting.

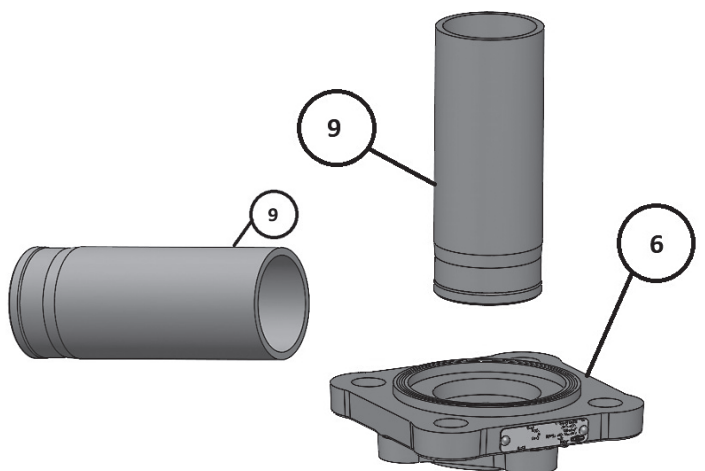


WARNING: Valve-stem failure: Cracks and corrosion of pressure relief valve stems can result in stem failure and uncontrolled venting. All threaded components such as bolts and nuts must be thoroughly inspected and cleaned, or replaced. Inspect the threads for any sign of excessive wear, corrosion, pitting or other defects. If any are found the part is rejected and must be replaced.

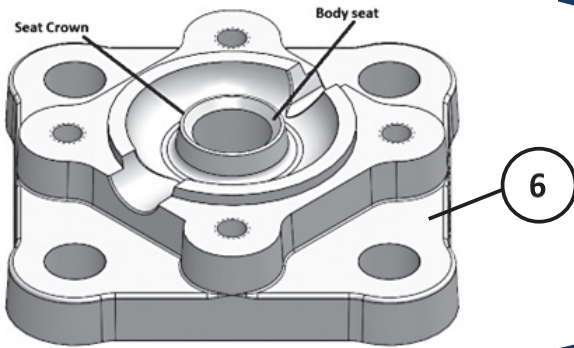
13.

Remove the spring guide (item 9) from the valve body (item 6).

Visually inspect the spring guide tube (item 9). There should be no paint or foreign material inside of the guide tube. The inner area must remain free of foreign debris that would hinder the free flow of discharging media. Inspect the spring guide tube by ensuring that the spring follower has free movement for the length of the guide tube. If the follower binds look for any gouges or dents to the inner surface of the spring guide tube. Make allowable repairs as necessary. Check the weld at the top of the guide tube. Ensure there are no cracks. If repairs are not possible the part must be replaced.

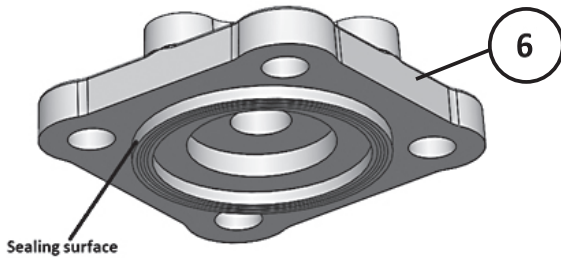


14.



Inspect the valve body (Item 6). The valve body sealing surfaces are the crown of the seat and the inside taper. Clean these surfaces using 400 grit emery cloth (minimum) and wipe using a lint free cloth and suitable solvent. Run your fingernail across the sealing surfaces inspecting for nicks or gouges. If any are found the part is rejectable and this part must be replaced.

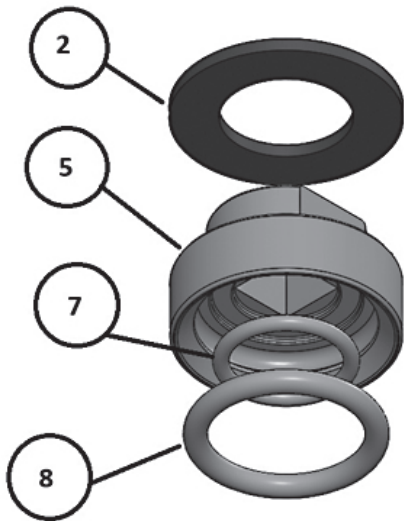
15.



Valve body sealing – tongue and groove mount: On the underside of the valve body (item 10) is the tongue surface that seals the valve to the cover plate of the tank car. Clean the tongue and bottom side of the valve body using 400 grit emery cloth (minimum) then wipe clean using a lint free cloth and a suitable solvent. Run your fingernail across the sealing surfaces to detect any flaws. If flaws are detected and are unreparable, this part must be replaced.

Valve body sealing – flat face mount: On the bottom side of the valve body is the surface that seals the valve to the cover plate of the tank car. Using a soft wire brush clean the surface then wipe with a lint free cloth and a suitable solvent. Inspect the surface for any gouges or corrosion. If a gouge is found that runs from the I.D. to the O.D. of the sealing surface the valve must be replaced.

16.

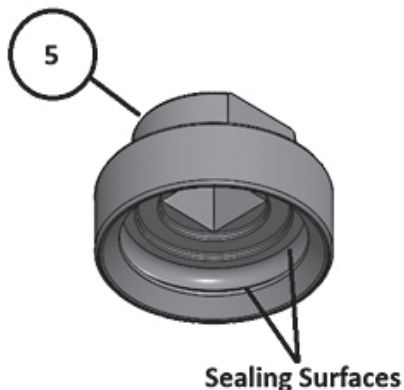


Remove the rubber washer (item 2) and O-rings (items 7 and 8) from the seal retainer (item 5). O-rings (items 7 and 8) as well as the rubber washer (item 2) must be replaced at the time of the periodic valve retest and whenever the valve is disassembled.



CAUTION: O-rings can develop micro-cracks, swell or shrink, or become harder or softer due to chemical exposure or age. Also, grooves and surfaces of sealing areas are designed for specific O-ring sizes. Only Dixon® specified and approved O-rings and gaskets must be used. Ensure that the proper O-ring material, compatible with the commodity being transported, is used. Please refer to the service equipment owner for the proper O-ring and gasket material selection.

17.



The seal retainer is a sealing surface and therefore any irregularities can create a leak path. The inside surfaces of the seal retainer (item 5) must be free of corrosion, pitting, scratching, or gouging. If any of these are present, the part must be replaced. Otherwise, clean the part using 400 grit emery cloth (minimum) and then wipe clean using a lint free cloth and suitable solvent. If you are unable to clean the part using this method, then the part must be replaced.

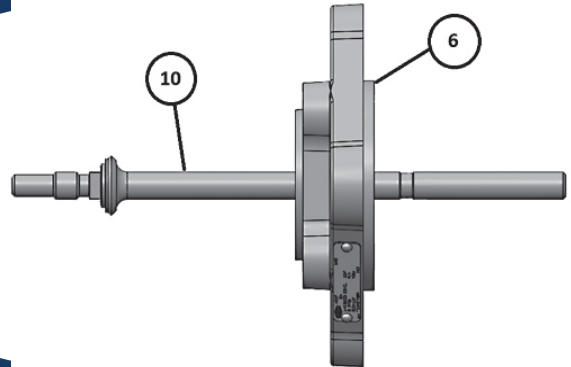
Valve Reassembly and Requalification

SAE Wrenches	Component(s)/Description	Item #	Torque (ft-lb)
3/4"	bolts for top guide	4	40
5/16"	locknut for spring adjustment	14	85 ± 5
5/16"	spring adjustment nut	13	--
5/16"	top locknut	1	65 ± 5
1-1/8"	flats on O-ring retainer	5	--

Other Tools, Equipment, and Supplies	Component(s)/Description	Item #	Torque (ft-lb)
spring compression press	spring	11	--
wood block	for supporting valve stem	10	--

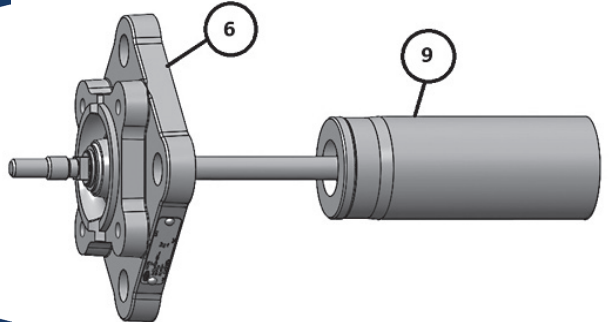
1.

Place valve body (item 6) onto a work bench and insert the stem (item 10) from the bottom as shown ensuring to support the stem.



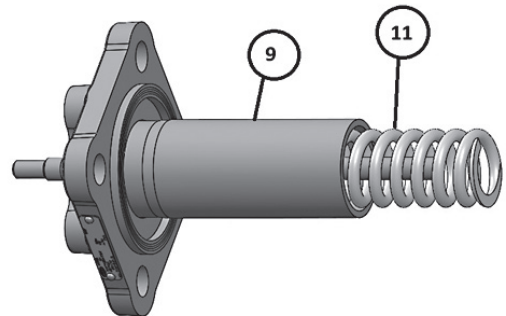
2.

Place the spring guide (item 9) into the valve body.



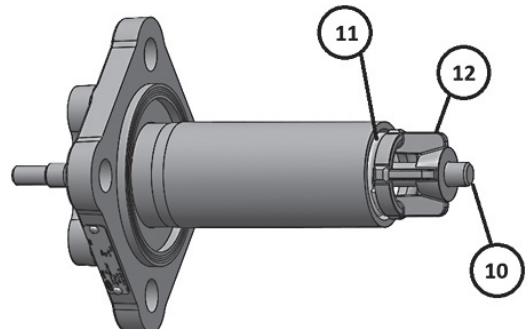
3.

Place the spring (item 11) over the stem and into the spring guide (item 9).

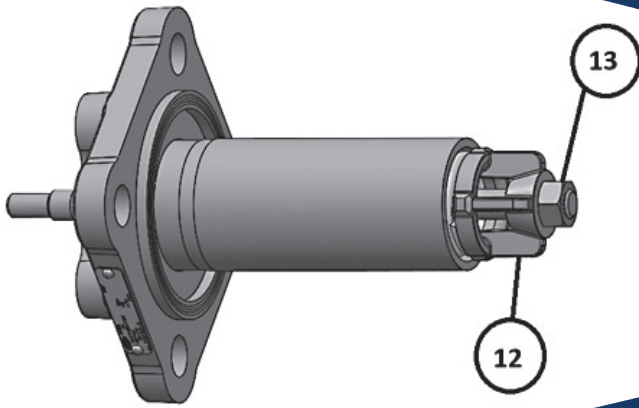


4.

Place spring follower (item 12) over stem (item 10) and onto the spring (item 11).

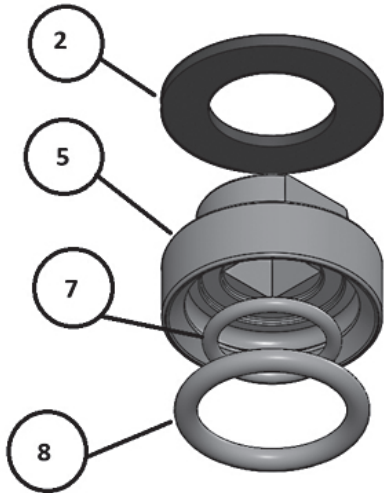


5.



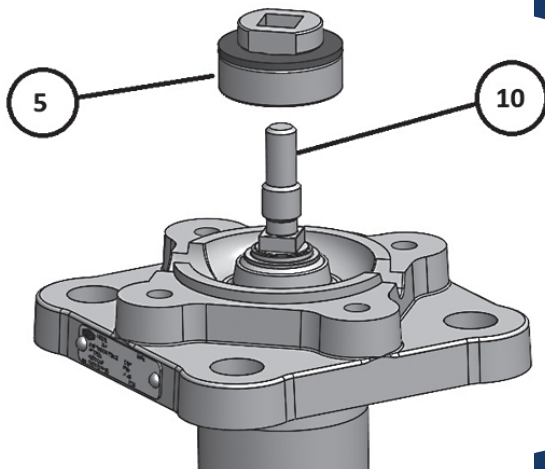
Manually install the spring adjustment nut (item 13) onto the stem to hold the spring follower (item 12) in place. The adjustment nut will hold the spring follower, spring, and guide tube in place. Place the assembly from the previous step into a press or spring compression fixture. Know the start-to-discharge pressure of the valve you are working on. Using your spring compression press, slowly compress the spring according to the required start-to-discharge for the valve. Screw on the spring adjustment nut (item 13) to the mark you made when removing it earlier, then slowly release the compression fixture, and remove the valve.

6.



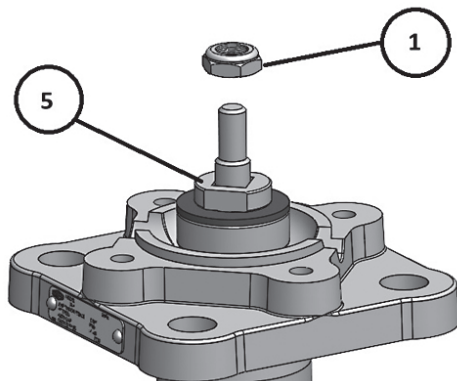
Mount the bumper washer (item 2) to the retainer (item 5). Insert the stem O-ring (item 7) and the seat O-ring (item 8) into the retainer (item 5).

7.



Place the seal retainer (item 5) and O-ring assembly onto the stem so that it rests squarely on the valve assembly.

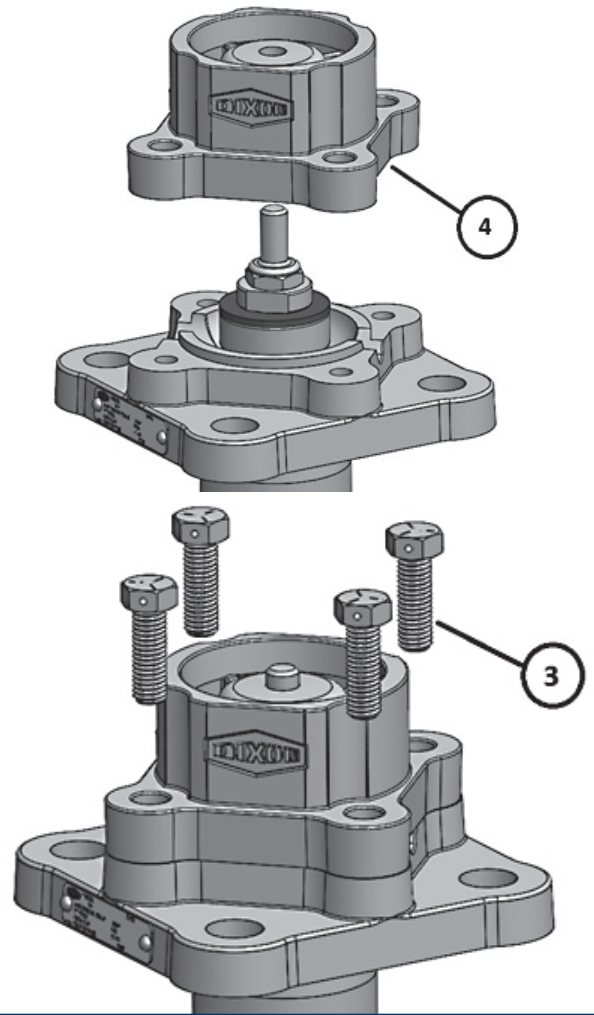
8.



Screw the top locknut (item 1) onto the stem. Hold the flats of the seal retainer (item 5) using a 1-1/8" SAE wrench. Using a torque wrench, tighten the top locknut (item 1) to 65 ± 5 ft lbs. Take care to avoid rotating the stem as rotation could damage the valve seat.

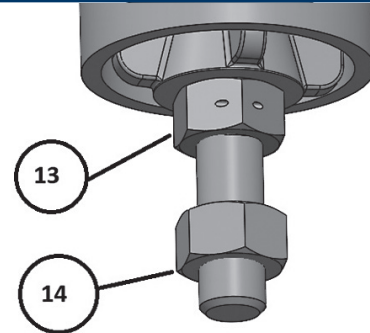
9.

Place the top guide (item 4) onto the valve body and secure using the four 1/2" bolts (item 3). Using a torque wrench tighten the bolts to 40 ft-lbs.



10.

Place the locknut (item 14) onto the bottom of the valve stem.



Start-to-Discharge and Vapor Tight Test Process



CAUTION: Safety protection: Always wear appropriate personal protective equipment (PPE) when conducting this procedure. This includes, but is not limited to, safety glasses or face shield and protective clothing. Valve testing involves high velocity air and water flow that can cause injury.

Refer to AAR publication "Regulations for Tank Cars". Appendix A applies specifically to valves. This section prescribes the start-to-discharge (STD) and vapor-tight pressures (VTP) and their tolerances. A "popping pressure" is not specified. STD is defined as a continuous leak pressure in contrast to the start-to-leak pressure which is defined as the first bubble leak.

Vapor-tight is defined as the pressure at which no bubbles are detected after the valve has opened/relieved. Dixon® recommends that no bubbles be observed for at least two minutes at vapor-tight.

Test Stand and Gauge Requirements

It is recommended that the test-stand mounting be equivalent to AAR M-1002 C-III figures E18.14 through E18.23 for the valve being tested. The pressure gauge must meet the requirements for D4.2 Test Gauge Standards and must be date-tagged.

Valve Pressure Testing Procedure

Pressure Relief Valve testing procedures must comply and meet the requirements specified in M-1002 C-III Appendix D 4.0 Pressure Relief and Hydrostatic Testing. Your company's test procedure(s) must be developed by an ANST Level III technician and be performed by a Non-Destructive Testing (NDT) qualified operator. See AAR Appendix T "Nondestructive Examination". Additionally, all maintenance activity for this valve must be performed by an AAR M-1003 certified repair facility.

Follow your company's requirements for safety and personal protection equipment (PPE).

1.



Install the valve on the test fixture and alternately tighten all the mounting nuts. Next seal the drain channels in the side of the valve body with plumbers' putty or a similar material. Fill the valve body with water to allow bubble detection at the valve seat. Take a position that allows observation of both the valve seat as well as the pressure gauge.

Slowly increase the test air pressure until the valve start-to-discharge (STD) is reached. Note, the initial opening of the valve may be slightly higher than listed in the table below and not indicative of the actual STD because the O-ring may have been partially stuck to the valve seat. Actuate the valve 2-3 times by increasing and relieving pressure to ensure there is no O-ring stiction.



CAUTION: Do not look directly into the valve as water and other debris may discharge upwards.

2.

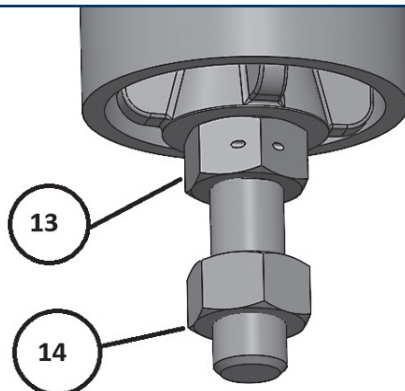
STD Settings \pm 3% (PSIG)	VTP Settings Minimum (PSIG)
165	132
280.5	224
300	240
330	264
450	360
495	396

Observe the STD pressure and then slowly bleed pressure and observe the VTP.

Repeat this procedure to ensure consistent valve performance. Both the STD and VTP should be consistent. Note that the actual STD for a valve with good condition sealing surface and new O-rings should exhibit a VTP well above the VTP settings in the table to the left. Typical VTP can be up to 95% of the STD.

If the STD and VTP results are not consistent, consult your supervisor or a Dixon technical representative. When consistent STD and VTP results are achieved, record the values.

3.



Tighten the bottom locknut (item 14) and torque to 85 ± 5 ft-lbs.

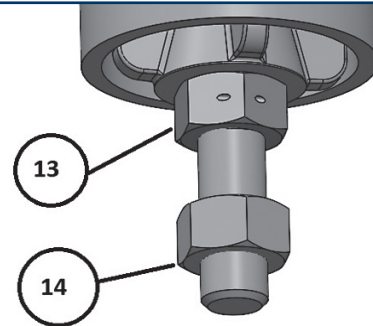
If the STD or VTP is not satisfactory, and results are consistent but out of tolerance, follow the valve setting adjustment procedure on page 6 under Valve Removal, number 4.

Valve-Setting Adjustment Procedure

If your company has an approved test procedure, follow it. If not, the following procedure provides essential guidelines regarding pressure testing.

1.

Remove the wire seal from the spring follower (item 12) and spring adjustment nut (item 13) if needed. Using a 15/16" SAE wrench loosen the bottom locknut (item 14) from the spring adjustment nut (item 13).

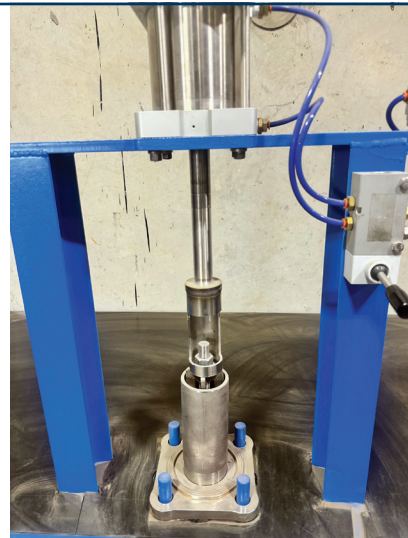


2.

Place the valve upside down in a press and compress the spring to relieve pressure from the spring adjustment nut. Use a tubular yoke with a cutaway to press down on the follower.



CAUTION: Since all nickel bearing stainless steels are susceptible to galling, wrenching the adjustment nut without first relieving the spring load will frequently result in thread damage. Inspect for threads for any excessive wear, corrosion, pitting, or other defects. If any defects are found the part is rejectable and must be replaced.



3.

Using a marker pen, mark the location of the spring adjustment nut (item 13) on the stem. Tighten or loosen the spring adjustment nut (Item 13) to set the valve to the midpoint of the STD tolerance range.

- If STD of valve is greater than that listed in the STD and VTP table on page 16, loosen the spring adjustment nut (item 13) two turns.
- If STD of valve is less than that listed in the STD and VTP table on page 16, tighten the spring adjustment nut (item 13) two turns.

Release the spring compressor.

Tighten the bottom locknut (item 14) against the spring adjustment nut (item 13) to lock in the setting.

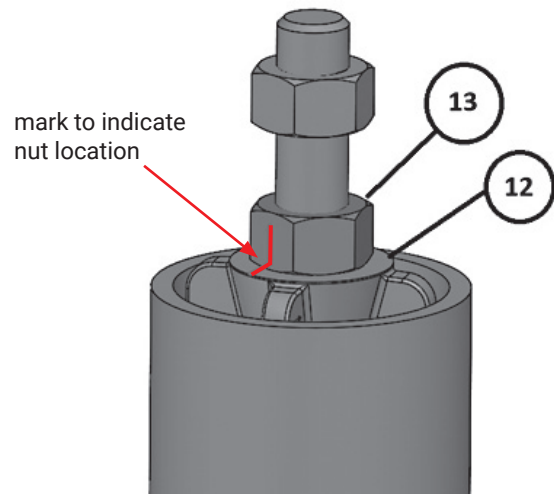
Retest the valves STD and determine how much the STD changed after loosening or tightening of the adjustment nut (item 13).

Based upon this calculation recompress the valve spring and move the valve adjustment nut to the required STD pressure.

If test results are erratic troubleshooting can be more complex. Contact your supervisor or a Dixon® technical representative.

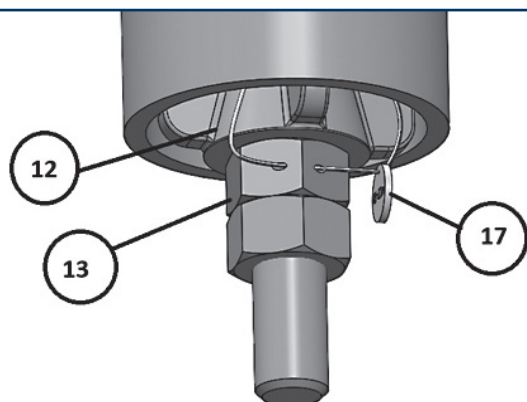
When test results are acceptable, check that the bottom locknut (item 13) is secure to 85 ± 5 ft-lbs of torque.

After testing the valve, close the pressure inlet to the test stand and vent the pressure. Remove the putty from the valve and drain the water. Then remove the valve from the test stand.



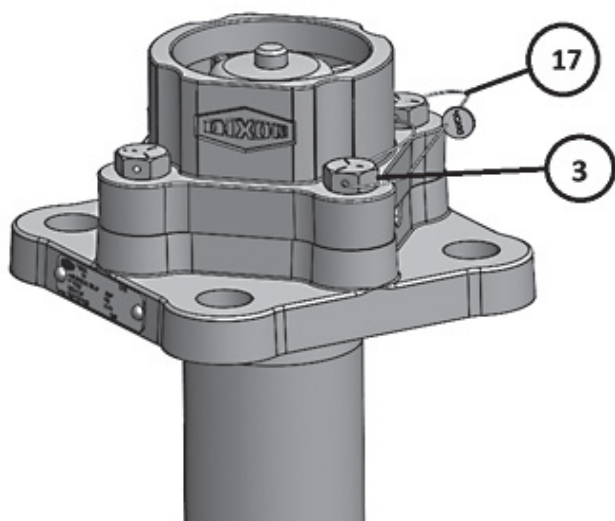
Post Test Procedure and Final Check Before Reinstallation

1.



Wipe clean or blow dry the valve ensuring to remove any residue.
Install seal wire (item 17) through the spring adjustment nut (item 13) and around the spring follower (item 12).

2.



Install seal wire around two of the top guide bolts (item 3).
For carbon steel valves, apply an appropriate corrosion inhibitor or paint to the exterior of the valve. Be sure to mask off the nameplate so that it remains readable.
Check the nameplate to make sure it is legible. If not contact your supervisor and follow your company's procedure to obtain a replacement nameplate.
Any requalification of the valve must be entered in the Umler Component Registry database. The date of qualification (maintenance), your repair company ID, material designations for O-rings and seals used, STD and VTP settings as tested, the valve's AAR approval number. The unique serial number (as contained on the affixed Component ID tag) must also be entered. Follow your company's procedure for entering valve information into the Umler Component Registry database.
Store the valve in a clean, dry place until ready for installation.

Routine Maintenance

No regular maintenance is required on this valve outside of standard interval qualification. However, Dixon® recommends that the installed valve be inspected on a regular basis to ensure that the wire seals are intact and that the valve body is free of any foreign materials that could impact the intended operation of the valve.

Emergency Response for Leaking Valve

Emergency response is the temporary remediation to a valve observed to be releasing product in an unintended manner. It is possible to replace the O-rings on an internal style pressure relief valve installed on a pressurized tank car. Leak repair is a temporary measure, once the car is unloaded and pressure is relieved, the valve should be removed for a complete inspection and repair, and qualification to the car owner's standard qualification and maintenance program. Leak repairs are unscheduled and not part of regular maintenance. This manual is not intended to provide all the information necessary to complete emergency maintenance. Personnel must be specifically trained and qualified in hazmat procedures before attempting to service a leaking valve.

Limited Warranty

DIXON VALVE AND COUPLING COMPANY, LLC (herein called "Dixon") warrants the products described herein and manufactured by Dixon to be free from defects in material and workmanship for a period of one (1) year from date of shipment by Dixon under normal use and service. Its sole obligation under this warranty being limited to repairing or replacing, as hereinafter provided, at its option any product found to Dixon's satisfaction to be defective upon examination by it, provided that such product shall be returned for inspection to Dixon's factory within three (3) months after discovery of the defect. The repair or replacement of defective products will be made without charge for parts or labor. This warranty shall not apply to: (a) parts or products not manufactured by Dixon, the warranty of such items being limited to the actual warranty extended to Dixon by its supplier; (b) any product that has been subject to abuse, negligence, accident, or misapplication; (c) any product altered or repaired by others than Dixon; and (d) to normal maintenance services and the replacement of service items (such as washers, gaskets, and lubricants) made in connection with such services. To the extent permitted by law, this limited warranty shall extend only to the buyer and any other person reasonably expected to use or consume the goods who is injured in person by any breach of the warranty. No action may be brought against Dixon for an alleged breach of warranty unless such action is instituted within one (1) year from the date the cause of action accrues. This limited warranty shall be construed and enforced to the fullest extent allowable by applicable law.

Other than the obligation of Dixon set forth herein, Dixon disclaims all warranties, express or implied, including but not limited to any implied warranties of merchantability or fitness for a particular purpose, and any other obligation or liability. The foregoing constitutes Dixon's sole obligation with respect to damages, whether direct, incidental or consequential, resulting from the use or performance of the product.

Some products and sizes may be discontinued when stock is depleted or may require a minimum quantity for ordering.

