

ARI1626 Vacuum Relief Valve

INSPECTION & MAINTENANCE BULLETIN



Only facilities with AAR Activity Code C5 are certified to recondition, repair, retest and qualify tank car vacuum relief valves. Personnel performing inspection and test must be certified Level I per AAR Manual of Standards and Recommended Practices, M-1002, Appendix T, 1.4.3.

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Operation

The ARI1626 Vacuum Relief Valve is designed to be bubble tight from the specified negative set pressure to 165 psi positive pressure. This meets the requirements of AAR M-1002, Section C-III, Appendix A.

Failure to meet the operation requirements above, can require the replacement of the quad-ring on the stem and/or the valve body.

Quad-Ring Replacement

The most common reason for a leaking vacuum relief valve is a defective quad-ring on the stem.

Flanged Connection - Model F

If the valve is a model F flanged connection to the tank car instead of an NPT threaded connection, the quad-ring can be inspected without disassembling the valve. Do so by pulling the stem away from the bottom of the valve and inspecting the condition of the quad-ring. If it is deteriorated, cracked, or missing completely, then it should be replaced.

With the stem pulled away from the body, use an o-ring pick to remove the defective quad-ring from the groove in the stem. Be careful not to scratch the stem groove as it could make the stem unusable. Then stretch the quad-ring over the end of the stem to remove it.

Apply the new quad-ring by stretching it over the end of the stem and firmly inserting it into the stem groove. You can help seat it into the groove by pushing the stem against the body.

Threaded Connection

If the valve has an NPT threaded connection, the valve will need to be disassembled to inspect the condition of the quad-ring.

Valve Disassembly

1. Cut and remove the cable seal going through the three thumbscrews on the top of the valve.
2. Unscrew the three thumbscrews on the top of the valve. Applying heat may be required because there may be thread locker on the threads.
3. Remove the hood from the valve.
4. Measure the distance from the top of the stem to the top of the stem nut. The same distance should be used for reassembly.
5. While securing the bottom of the stem with a vice or other device, unthread the nut on the top of the stem. This may also need heat applied due to thread locker on the threads.
6. Remove the seat and the spring from the stem and push the stem out of the body.
7. Inspect the condition of the quad-ring on the stem. If it is deteriorated, cracked, or missing completely, then it should be replaced.
8. Use an o-ring pick to remove the defective quad-ring from the groove in the stem. Be careful not to scratch the stem groove as it could make the stem unusable.
9. Apply the new quad-ring by firmly inserting it into the stem groove.

Inspect

Body

Inspect body for general condition. If severe corrosion is evident, body should be discarded. Inspect body threads. If eroded or bent, clean with a hand tap. Check with a standard plug gage. If threads are badly pitted, or if plug gage screws in more than one turn past the gaging notch, valve body must be scrapped. If the surface where the quad-ring seals is eroded or pitted, the valve body must be scrapped. If it is dirty, clean and lightly polish, as necessary.

Valve Stem

Inspect valve stem for general condition. Inspect for straightness and corrosion. Discard any stem which is bent or severely corroded, especially corrosion in the groove that the quad-ring sits in.

Miscellaneous

Inspect the spring, seat, and other components for corrosion and defects. Discard if corroded or damaged.

Valve Reassembly

1. Insert new quad-ring into stem groove.
2. Push stem through hole in bottom of the body.
3. Insert spring and then follower onto the top of the stem.
4. Thread nut onto stem and position the same distance as it was before disassembly. Use thread lock to hold nut in position.
5. Attach hood to valve body using the three thumbscrews. Use thread lock to secure thumbscrews in the valve body.
6. Apply new cable seal through the holes in the three thumbscrews to prevent tampering.

Testing

Operating Pressure Test

Attach valve to test fixture. Pull a vacuum on the valve and verify the pressure that the valve stem moves to open the valve. If the pressure is incorrect, disassemble the valve and adjust the stem nut until you get the correct vacuum pressure.

Leakage Test

Attach valve to test fixture. Apply 3 psi positive pressure and check for leaks at the quad-ring.

The undertaking of repair or replacement by the Purchaser, or its agents, without the expressed written consent of The Greenbrier Companies (GBX) shall void the warranty and relieve GBX of all responsibility. Under no circumstances shall GBX be liable for any direct, incidental, consequential or other damages of any kind in connection with the installation, operation, maintenance, repair, inspection or other use of any product purchased from it.