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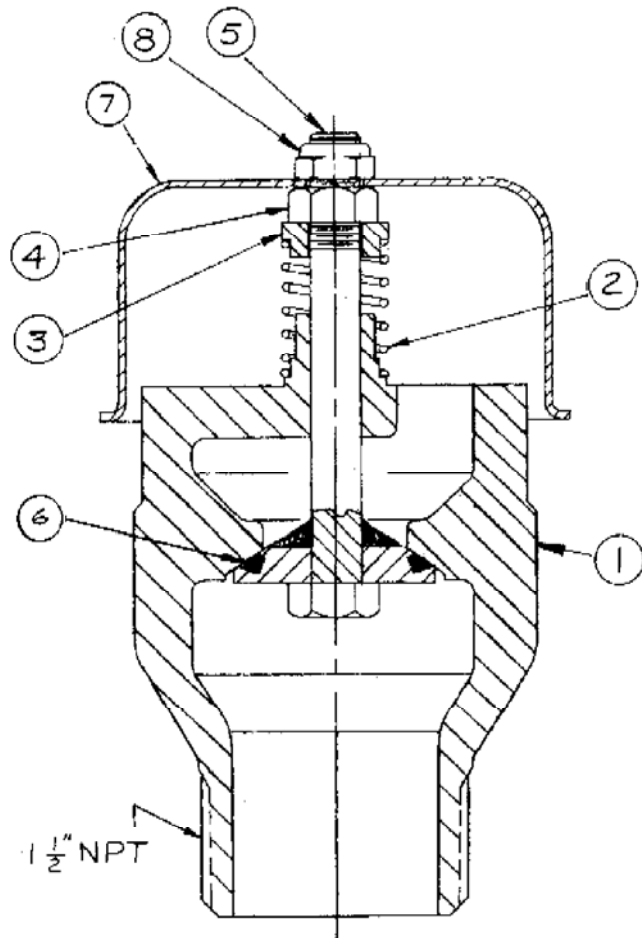
# Vacuum Relief Valves

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Operation  
and  
Maintenance



ITEM NO.	PART NAME
1	BODY
2	SPRING
3	SPRING SEAT
4	LOCK NUT
5	STEM
6	PRESSURE SEAL
7	WEATHER CAP
8	TOP NUT



### **CAUTION: IMPORTANT SAFEGUARDS**

Midland valves are used in connection with a variety of products, many of which are hazardous materials and could cause serious injury or damage.

Always use extreme caution and proper equipment when involved with hazardous materials.

This valve should only be handled by qualified personnel.

**Read all of these instructions carefully before proceeding.**

**SAVE THESE INSTRUCTIONS!**

## Operation

1. Midland makes vacuum relief valves (abbreviated VRV) in various metallic materials, with a wide variety of elastomeric seat seals. There are several sizes available, as well as pressure settings. The purchaser must exercise care to select the most desirable combination of features for the intended service conditions.
2. Since the VRVs are frequently small in size, and are set at very low pressures, these valves cannot withstand much abuse. Although the valve's sole purpose is to permit air from the atmosphere to be introduced into the tank when a negative pressure (of a prescribed amount) occurs in the tank, it has been used wrongly on occasions to ascertain if positive pressure exists in the tank. As an example, an operator may push the stem down by stepping on it to see if there is pressure in the tank before opening up the manway cover. A likely result of this is to damage the valve by bending the stem, as well as releasing product that could harm the operator.
3. We recommend that the purchaser buy a VRV with a weathercover. This part helps keep rain, cinders and other debris from accumulating in the inside of the valve body, which when the valve opens, will then potentially drop into the tank. A weathercover also serves as a deflector when there is flow out of the VRV to protect personnel near the valve.

## Installation

1. Since most VRVs are threaded, be sure the threads of the valve and on the tank are clean and serviceable.
2. Use PTFE tape, or pipe compound, to lubricate the threads to facilitate getting a good pressure-tight seal.
3. Do not use a large pipe wrench to install the valve. Care should be taken not to distort the valve body's internal seat.
4. Do not wrench on the valve stem or weathercover. They are unable to sustain much torque, and are designed to rotate freely within the valve body.

## Maintenance

1. The seal that makes the VRV bubble tight is the resilient seal. Do not try to lap the metal to metal seats between the stem and valve body.
2. The metallic seats on the stem and the valve body are carefully machined at an angle. **Do not** attempt to remachine them. However, removing rust, solidified product, and other debris by hand, or with emery paper is desirable.
3. The resilient seal of Midland valves are almost always clover-leaf-shaped pressure seals (not O-rings). Replacement pressure seals of whatever material is required should be purchased only from Midland.
4. On older Midland valves, the groove for the pressure seal was machined perpendicular to the stem's longitudinal axis. More recent versions have the groove machined at an angle. When replacing seals, use the following steps:
  - a. Clean out the groove in the poppet head of the stem, removing all foreign materials.
  - b. Stretch the pressure seal slightly to fit it into the groove. Using the rounded end of a 6" scale, carefully work the seal into place all around. Don't allow the seal to become twisted.
  - c. With one finger acting as a pivot point on the hex end of the stem, rotate the threaded (or shank) end of the stem. Sight across the edge of the pressure seal as you turn the stem.

## Maintenance (cont.)

- d. If the pressure seal is properly positioned, no waviness will be apparent as the stem is rotated. Any unevenness can be remedied by reapplying the rounded end of a 6" scale to the edge of the seal that is protruding.
5. Clamp a socket in a vise facing vertically upward. (For the 1½" VRV use a ½" hex socket on a 4" extension, and for the 2½" VRV, use a 5/8" hex socket.) Put the hex end of the stem into the socket.
6. Lower the valve body down on the stem, and rotate the body a few revolutions to make sure the stem is free to move in the guide of the body.
7. Assemble the spring, spring follower and locknut on the stem. On the 1½" VRV, there should be about 5/16" of the threaded stem protruding out above the top of the locknut when the valve is set at 0.75 psi. The stem of the 2½" VRV varies in length. However, at a 0.75 psi setting, the spring (measuring from the top to bottom of it) should be compressed to about 1¾ inches in length.
8. The VRV should be tested, in its upright position, to check the opening pressure (typically about .75 psi vacuum) and vapor tight pressure (typically about .5 psi vacuum). A test stand that pressurizes the valve from above will be necessary, as will a gage that displays relatively small increments, such as a manometer. Also, check the free travel of the stem, which should be about 5/16".
9. After testing for the negative pressure setting, it is necessary to test on positive pressure. This test fixture simulates the mounting in the tank. Fill the inside of the valve body with water and pressurize the valve from its entry end. It is also necessary to use soap suds on the exterior surface above the thread and below the valve

seat. Look for any casting leaks or leakage through the valve stem. We normally use 125 to 150 psi pressure for this test. There cannot be any evidence of leakage in this test. If there is a leak coming from the stem area, and the leak appears to be around the pressure seal, it will be necessary to repeat steps 4a through 4d. If the leak is in the welded area between the poppet head and the bolt, or a casting leak in the valve body, discard the defective part.

## **NOTICES AND WARRANTY**

Midland Vacuum Relief Valves are used in a variety of products, many of which are hazardous materials. The acceptance and transportation of the products are regulated by the DOT and AAR in the U.S.A., and in Canada by the CTC and Transport Canada, as well as other governmental bodies, particularly when used in stationary applications. All personnel should be familiar with and follow these regulations. Nothing in this pamphlet is intended to conflict with or supersede these regulations.

### **Obtaining Product Drawings**

Assembly drawings of Midland Vacuum Relief Valves are available at no charge, and will be mailed upon request. Address any questions concerning valve maintenance or usage to the Engineering Dept., Midland Manufacturing Corp.

### **Warranty**

Midland warrants the products of its own manufacture to be free of defects in material and workmanship, for a period of one (1) year from the date of invoice. Furnished materials and accessories purchased from other manufacturers are warranted only by and to the extent of those manufacturers' warranties, if any.

MIDLAND MAKES NO WARRANTY OF ANY KIND WHATSOEVER, EXPRESS OR IMPLIED, OTHER THAN AS SPECIFICALLY STATED HERE MIDLAND MAKES NO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OR USE. Midland's obligation under this warranty is strictly limited, at its option, to 1) repair or replacement at its factory of a like quantity of product: 2) refunding to purchaser money paid to Midland for its product: or 3) issuance of written authorization for the Purchaser to repair or replace, at costs comparable to Midland's normal manufacturing costs those parts proven defective, provided that

Purchaser has given to Midland immediate notice upon discovery of such defect Merchandise claimed to be defective shall not be returned without first obtaining Midland's written consent. The undertaking of repair or replacement by the Purchaser, or its agents, without Midland's written consent, shall void Midland's warranty and relieve Midland of all responsibility. Under no circumstances shall Midland 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.



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