

# Midland Manufacturing

## Applicability of Assembly & Test Procedures

Safety relief, CO2 regulator valves – All A-1800 Series

### Documents:

WI-09, 1800asy1.doc

WI-09, 1800asy2.doc

WI-09, 1800asy3.doc

WI-09, 1800asy4.doc

WI-09, 1800asy5.doc

### Notes:

1. Refer to engineering documentation for part numbers
2. Non-conformance identified visually, through assembly or through testing, is handled as described in procedures for handling non-conforming material.

Revision Date	Reason for Revision	Approved by	Approval Date	Effective Date
11/4/98	Original			
3/15/02	Removed specific Model #s. Renamed.	H.B.	4/5/02	4/5/02

# Disassembly, Inspection and Assembly Procedures



#	Parts List	#	Parts List
1	Body	10	Follower
2	Adjustment Screw	11	Guide
3	Top Guide	12	O-Ring
4	Cap	13	Screen
5	Small Spring	14	Diaphragm
6	Large Spring	15	Retaining Ring
7	Stem	16	Aluminum Gaskets
8	Bolts & Lock washers	17	Top Nut
9	Brass Seat		

## Disassembly



Mount assembly into a vice as shown



Remove the cap with a medium crescent wrench



Loosen nuts under the cap. Careful, contents under load, only slightly loosen nuts



Loosen the (4) nuts holding the top guide to the body. Careful, contents under load, only slightly loosen the nuts





Place assembly in locking press adjusting the top locking arbo so that the arbor is firmly pressing down on the nuts loosened in step two and fully locks out. Careful, contents under load, be sure the arbor properly locks out before proceeding



Remove the (4) nuts holding the top guide to the body and slowly release the locking arbor guiding the arbor arm all of the way up in a slow, controlled motion. Remove the top guide.



Remove the contents of the top guide with your hands



Using a pair of long nose pliers, gently remove the brass seat if required



Use the special tipped pliers or a dental pick to remove the retaining ring and screen. Discard retaining ring and spring

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## Assembly & Test Procedures

See document “**Applicability of assembly & test procedures**”

Safety relief, CO2 regulator valves (1800aply.doc)

For applicability of these procedures

### Body subassembly



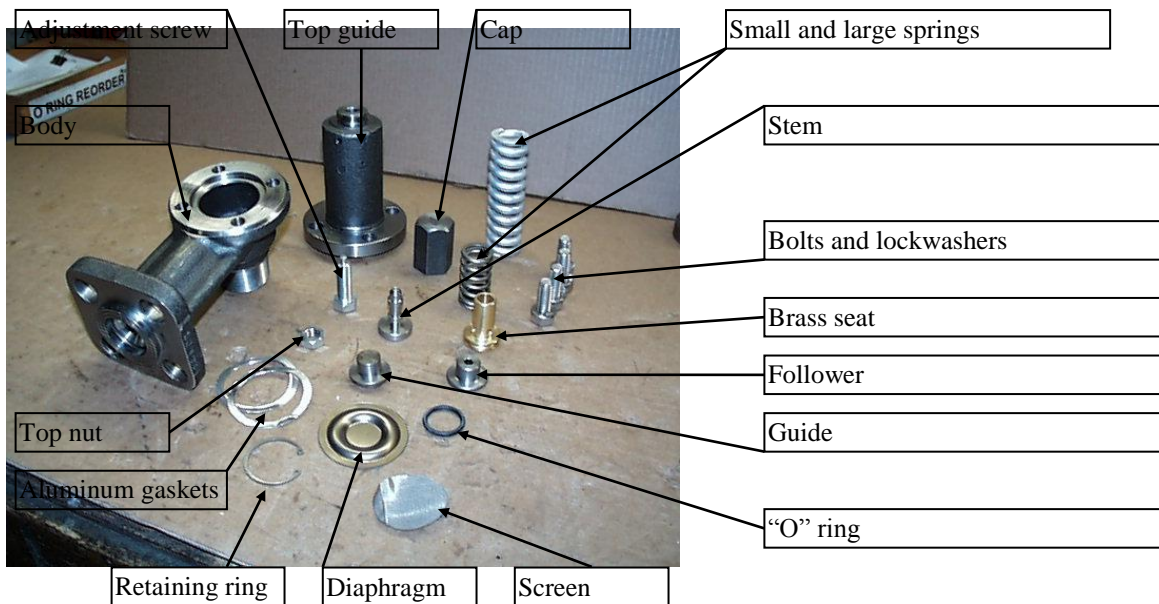
reg100

#### Notes:

1. Refer to engineering documentation for part numbers
2. Non-conformance identified visually, through assembly or through testing, are handled as described in procedures for handling non-conforming material.

Revision Date	Reason for Revision	Approved by	Date
2/12/98	Original		
	Original after production review		
11/4/98	Added copyright notice, + Word 97, created separate applicability document		
3/15/02	Renamed	H.B.	4/5/02





Check for cracks on tongue and groove (reg110), and inside the body (reg120).



Clean the brass seat with shop air, as shown.



Make sure the brass seat fits in the body without a problem, as shown.





Grease up the seat of the body.



Insert the "O" ring in the groove of the brass seat.



Insert the brass seat into the body.



To make sure it fits properly, rotate it to the left and to the right, pushing down at the same time.



Wipe off the seat of the stem.



Make sure the stem fits, by inserting it in the brass seat (as shown).





Grease up the seat of the stem slightly.



Put the small spring in the body, as shown.



Put the stem inside the small spring as shown.



Put two aluminum gaskets on as shown (it does not matter which side is up).



Wipe off the diaphragm (attention: the side shown will go up)



Grease this side of the stem so diaphragm when in place will not move.



Place diaphragm as shown, with convex side up, and press to keep it in place.

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Safety relief, CO2 regulator valves (1800aply.doc)

For applicability of these procedures

Top guide assembly



### Notes:

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Revision Date	Reason for Revision	Approved by	Date
2/12/98	original		
11/4/98	Added copyright notice; Word 97; created separate applicability document		
3/18/02	Renamed	H.B.	4/5/02





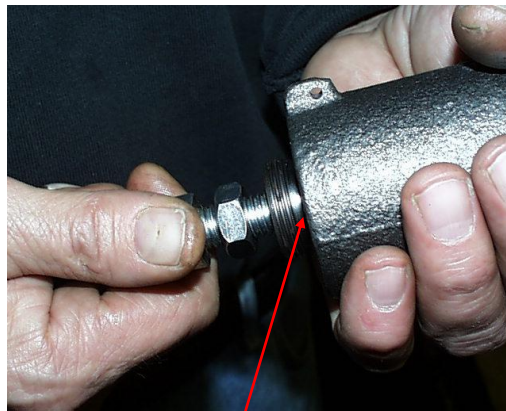
Check if tip of adjustment screw fits in the hole of the follower, as shown.



Screw the top nut on the adjustment screw.



Grease up the tip of the adjustment screw, as shown.



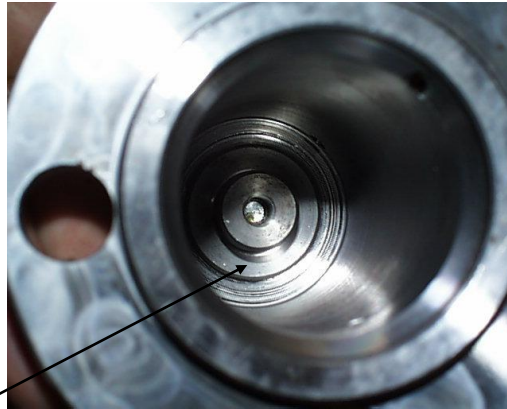
Screw the adjustment screw in the top guide hole and turn it four times, as shown.



Insert the follower in one end (either) of the large spring, as shown.



Insert the guide on the other end of the large spring, as shown.



Put the large spring inside of the top guide with the end that has the follower first. Make sure that the tip of the adjustment screw fits in the hole of the follower, as shown.



Top guide assembly complete.

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For applicability of these procedures

### Pressing



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Revision Date	Reason for Revision	Approved by	Date
2/12/98	Original		
11/4/98	Added copyright notice to footer; +Word 97; created separate applicability document		
3/27/02	Safer press fixture and new method of pressing was implemented. Renamed.	H.B.	4/5/02





Press fixture



Studs that will help guide the top guide subassembly when pressed.



Screw in the studs that will help you guide the top guide assembly.



Place the top guide assembly as shown.



To help you, hold with one hand the guide and the large spring, as shown.



Also, make sure the tip shown in the picture is facing opposite the square flange of body assembly. Indicated here with arrows.

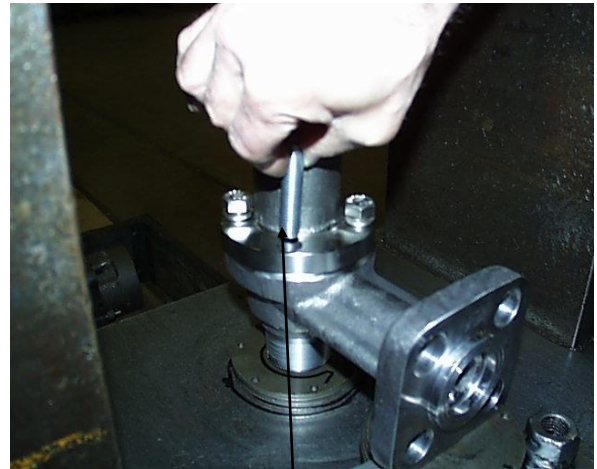




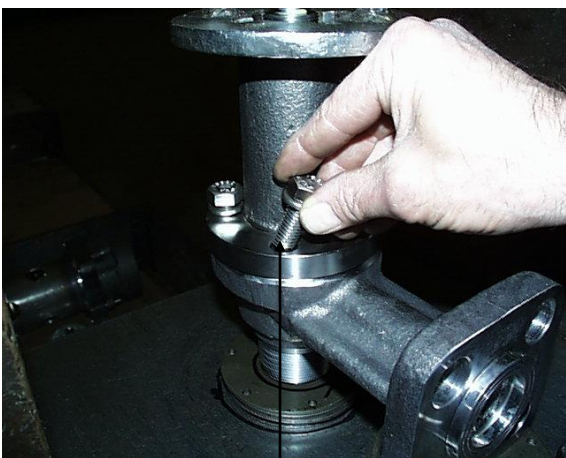
Top guide assembly is ready to be pressed.



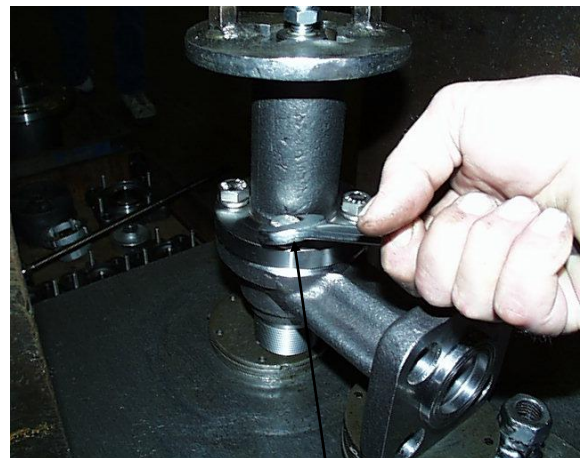
Press top guide assembly all the way down and while holding it down, screw in two bolts and lock washers hand tight.



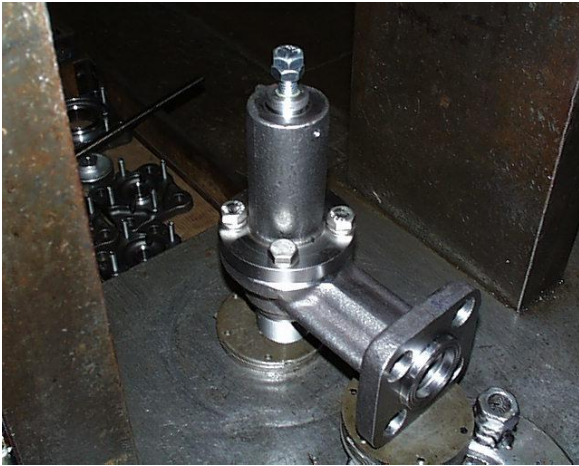
Remove both studs that helped you guide the top guide assembly.



Place the other two bolts with the lock washers and hand tight them.



Tight the bolts with a  $\frac{3}{4}$ " wrench, using the cross "+" technique.



Valve set to be tested.



Turn the adjustment screw to the approximate adjustment point.



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### Testing



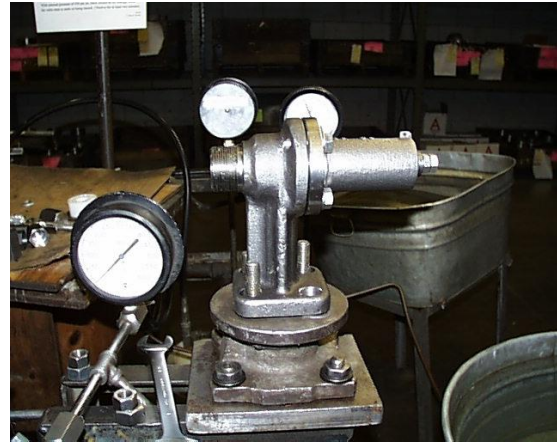
#### Notes:

1. Refer to engineering documentation for part numbers
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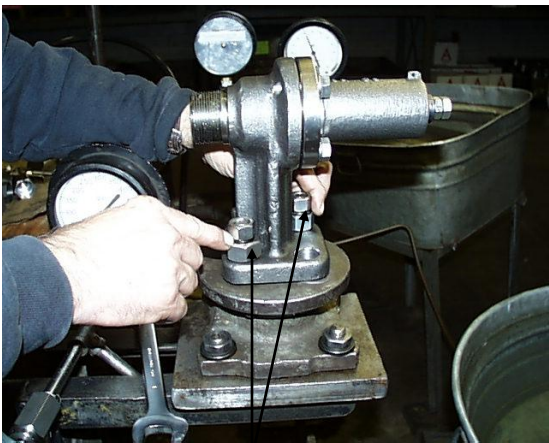
Revision Date	Reason for Revision	Approved by	Date
2/12/98	Original		
11/4/98	Added notes 1&2, added copyright notice to footer, created separate applicability document		
04/04/02	Sequence of operations, notes to them and pictures from reg630 to reg720 were rearranged and revised.	H.B.	4/5/02
11/9/07	Updated testing method and relevant pictures	J.S.	11/14/07



Testing fixture



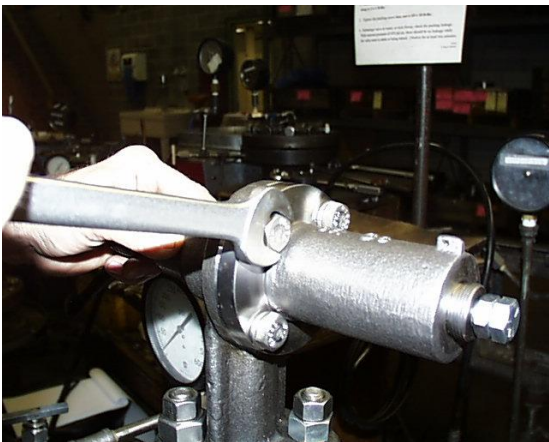
Place the valve in testing fixture as shown.



Tighten the valve in place with two nuts, one across the other one, as shown



You may use two larger nuts as spacers, as shown.



Tighten nuts. Make sure the four bolts are really tight.



Testing fixture gage.





Attach flow meter to the 1 ½” NPT outlet of the regulator as shown with the flow meter control display facing up. Connect the brown wire to the “+” connection on the testpak and the blue wire to the “-” of the test pak

Wait until the flow meter calibrates itself and also make sure that “SCFM” units is selected.



Slowly raise the pressure going into the regulator until 10 +/- 1 SCFM of air going through the flow meter is achieved for a given regulator model being set.

Pressure into the regulator @ 10 +/- 1 SCFM of air is the pressure 10 psig higher than the regulator nominal pressure setting.

*Example:*

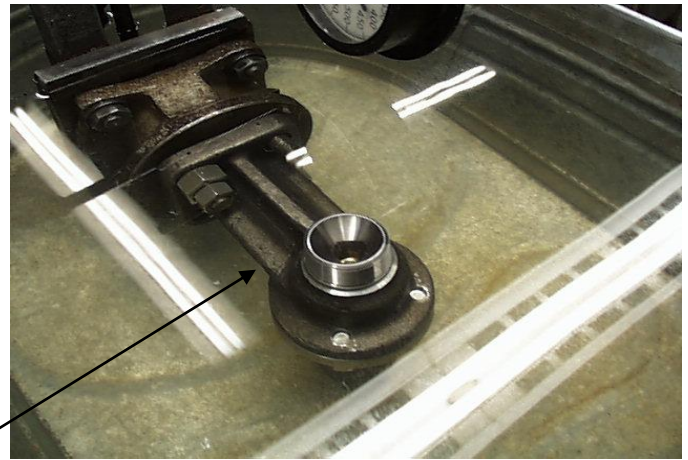
*How to set a regulator to be marked @ 340 psig nominal setting?*

*Bring the pressure going through the regulator up to 350 psig of air and check to ensure the flow through the flow meter is 10 +/- 1 SCFM of air.*





Use a  $\frac{3}{4}$ " wrench to loosen the top lock nut. Then using the same wrench, turn the adjustment screw counter-clock wise to increase flow or clockwise to reduce flow. Tap the regulator top guide a few times with the wrench to release any wind-up in the spring. Repeat procedure until acceptable air flow through the flow meter at a pressure for your desired regulator setting is achieved.



Slightly release pressure until flow through the flow meter has completely stopped. Once flow has completely stopped, remove flow meter from regulator.

Submerge the regulator assembly under water to check for leaks in the casting as well as the joints and check for the vapor tight pressure. The vapor tight pressure must be equal to 80% of the nominal pressure setting of the regulator.



If erratic single bubbles appear after the STD is reached, place the aluminum rod on top of the seat inside the hole, as shown in the picture. Then gently, hammer the rod. This will help coin the seat.

#### COMMENTS:

If the air flow is not the desired value per the regulator pressure setting at 10 +/- 1 SCFM of air through the flow meter, the regulator must be adjusted.  
Prior to any adjustments, release the pressure in the test stand.  
Do not adjust while pressure is applied through the regulator.

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Safety relief, CO2 regulator valves (1800aply.doc)

For applicability of these procedures

Testing and screen assembly

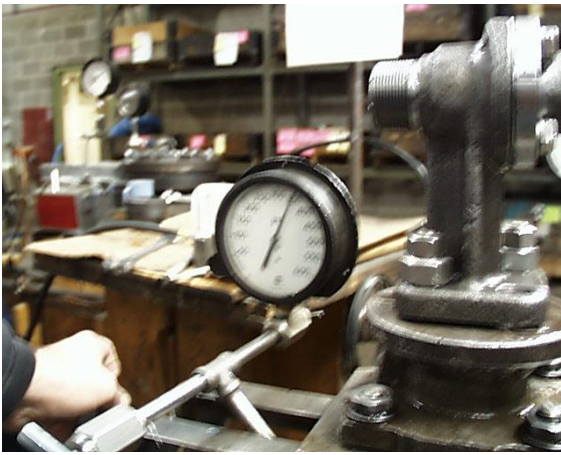


### Notes:

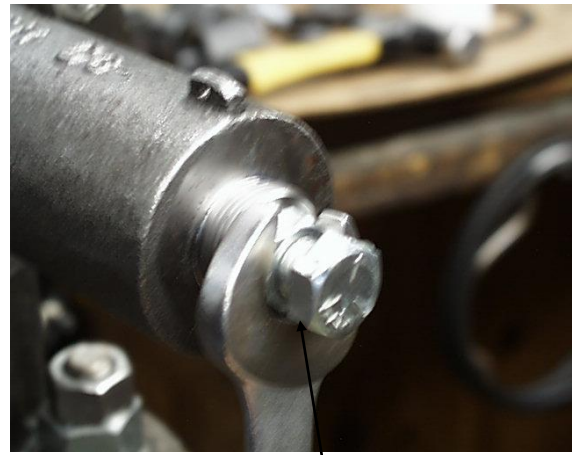
1. Refer to engineering documentation for part numbers
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Revision Date	Reason for Revision	Approved by	Date
2/12/98	Original		
11/4/98	Added footer with copyright notice;+ Word 97, created separate applicability document		
4/04/02	Pictures reg915, reg920 and notes added, reg730 with notes removed.	H.B.	4/5/02

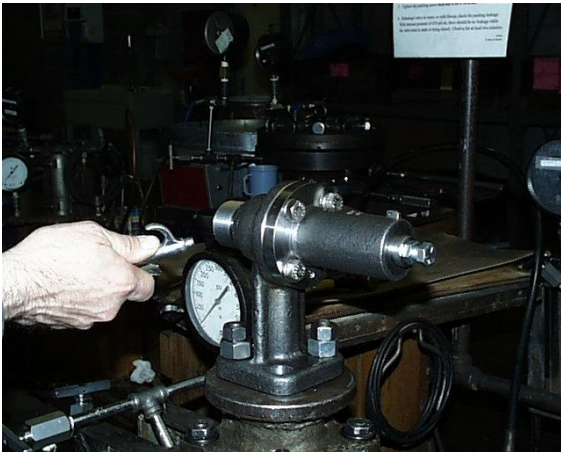




Get the valve out of the water and check the opening one more time (this will also help dry off the seat).



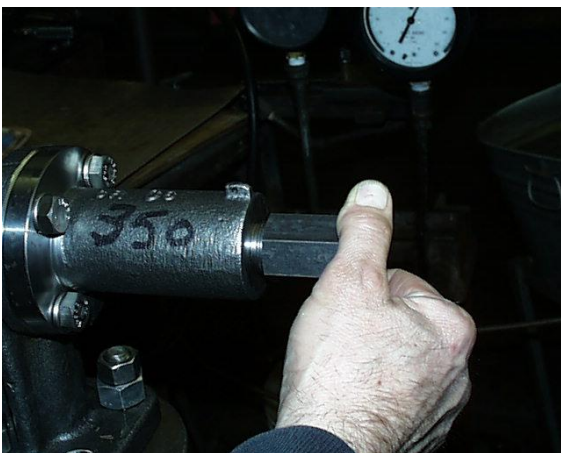
When the testing and setting is done, tighten the counter nut.



Wipe or blow the valve off.



Write the setting pressure, as shown.

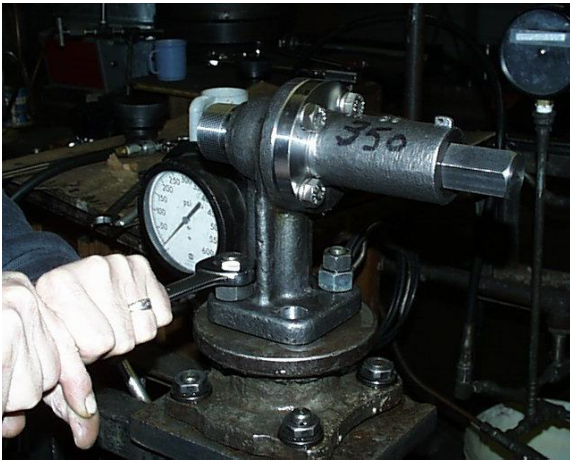


Put the cap on.



Tighten the cap





Loosen the nuts and remove the valve from the fixture.



Wipe off the tongue and groove of the body.



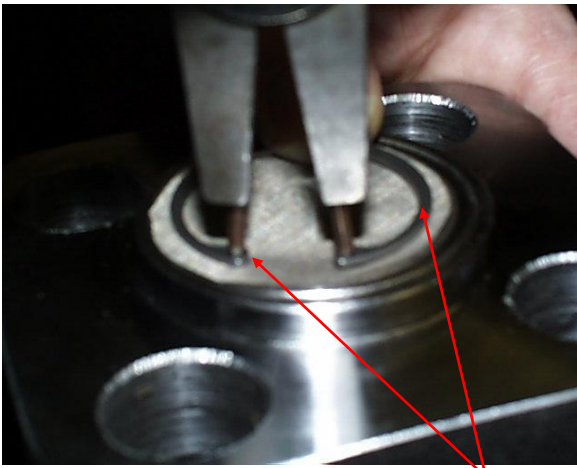
Place the valve in the vice as shown.



Place the screen on top of the tongue and groove, as shown.



The rounded side of snap ring should go down, against the screen.



With snap ring pliers, close the ring a little bit so it fits in the hole and push with the pliers and a finger, as shown.



Push down the borders of the screen down the tip of a finger, as shown.



Valve completed, tested and assembled.



Put protective caps as shown  
Install nameplate.



Put wire seal as shown.



# Notices and Warranty

## Regulations

The Midland valves are used in contact with a variety of commodities, many of which are hazardous materials. The acceptance and transportation of products are regulated by the 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 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, but, Midland Manufacturing Corporation makes no representations or guarantees about its accuracy or completeness and assumes no liability for this information. Specifications are subject to change without notice.

## Obtaining Product Drawings

Assembly drawings of Midland pressure 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.

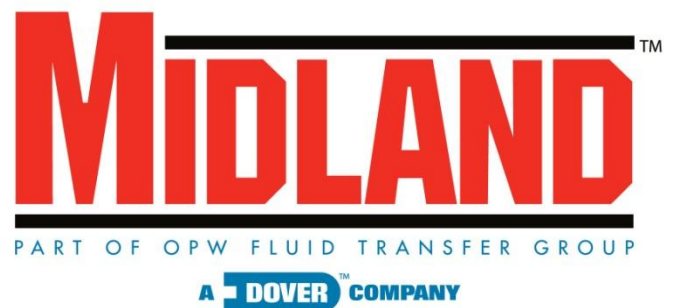
## Warranty

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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