

**Fermilab**

**Particle Physics Division  
Mechanical Department Calibration  
Standards/Procedures**

**Number:** MD-CALPROC-003

**Date:** 6/26/2009

**Manufacturer:** Tyco

**Model:** Anderson Greenwood Type 83 SOPRV

**Reviewer(s):** *James E. Tweed*

**This Procedure is used for:**

Calibration of Anderson Greenwood relief valves.



Flow Control

ANDERSON GREENWOOD

## Maintenance instructions for Spring Operated Safety Relief Valves Type 83 with O-ring Seat.

The intent of these instructions is to acquaint the user with the maintenance of this product. Please read these instructions carefully.

### WARNING

An attempt to repair this product by unauthorized or unqualified persons voids the product warranty and may cause damage to equipment and serious injury or death to persons.

The product is a safety related component intended for use in critical applications. The improper application, installation or maintenance of the product or the use of parts or components not manufactured by Anderson Greenwood Crosby may result in a failure of the product.

Any installation, maintenance, adjustment, test, etc. performed on the Product must be done in accordance with the requirements of all applicable Anderson Greenwood Crosby Procedures and Instructions as well as applicable National and International Codes and Standards.

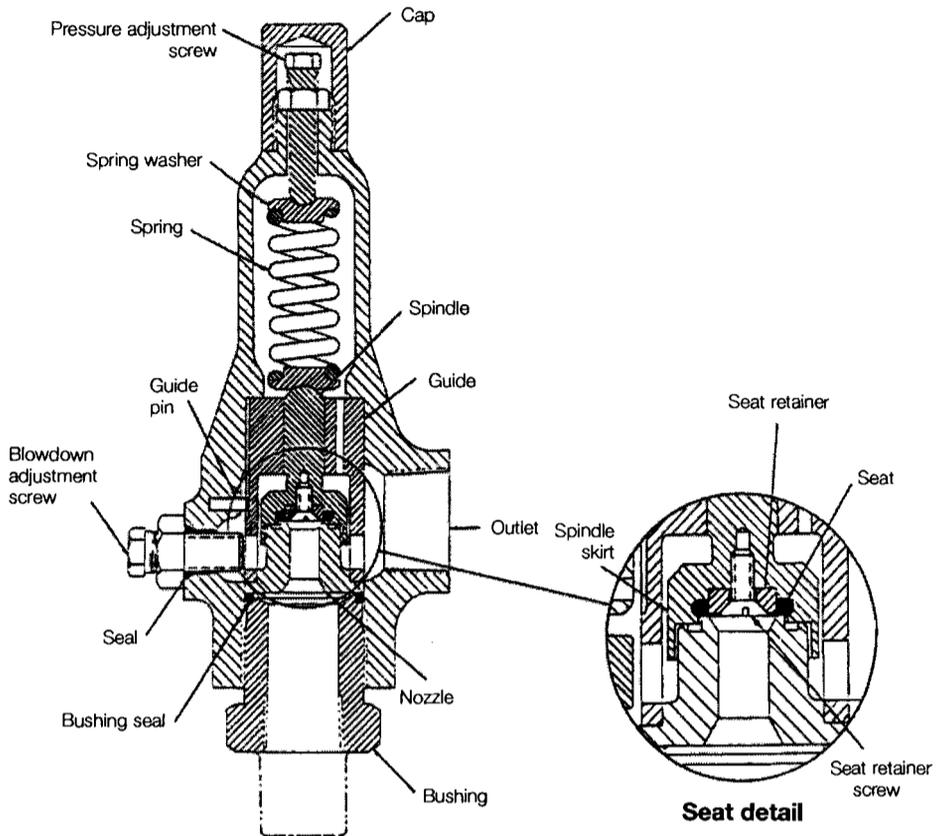


Figure 1  
Type 83 (-4, -6 & -8 orifices)

### 1. General

The Anderson Greenwood Type 83 Relief Valve is a direct acting spring loaded valve for gas service and uses O-ring seats and seals. The intent of these instructions is to acquaint the user with the maintenance of this product. Please read these instructions carefully. This product should only be used in accordance with the applicable operating instructions and within the application specifications of the original purchase order. The installation and Operational Safety Instructions (available at [www.tycovalves.com](http://www.tycovalves.com)) should be fully read and understood before returning this product to service after maintenance.

### 2. Valve repair (-4,-6,-8 Orifice) refer to figure 1

#### 2.1 Disassembly

- 2.1.1 Relieve spring tension and back blowdown adjusting screw out two turns.
- 2.1.2 Remove inlet bushing, bushing seal and valve internals.
- 2.1.3 Separate nozzle from guide by hitting top of spindle on soft surface.

#### 2.2 Repair

- 2.2.1 Hold spindle by skirt O.D. in soft jaw vise and replace seat.
- 2.2.2 Examine nozzle and polish out any scratches or nicks. Replace if necessary.

#### 2.3 Assembly

Assemble in reverse order of disassembly. Do not lubricate spindle or guide. Make sure the nozzle is fully and evenly seated in guide. This is a press fit joint. Lubricate threads and adjusting bolt tip.

#### 2.4 Soft goods repair kit

The part numbers for soft goods repair kits are listed below. Each kit contains the seat and seals for all pressure ranges.

Orifice	Material	
	Buna	Viton
-4	04.4805.015	04.4805.016
-6	04.4805.017	04.4805.018
-8	04.4805.019	04.4805.020

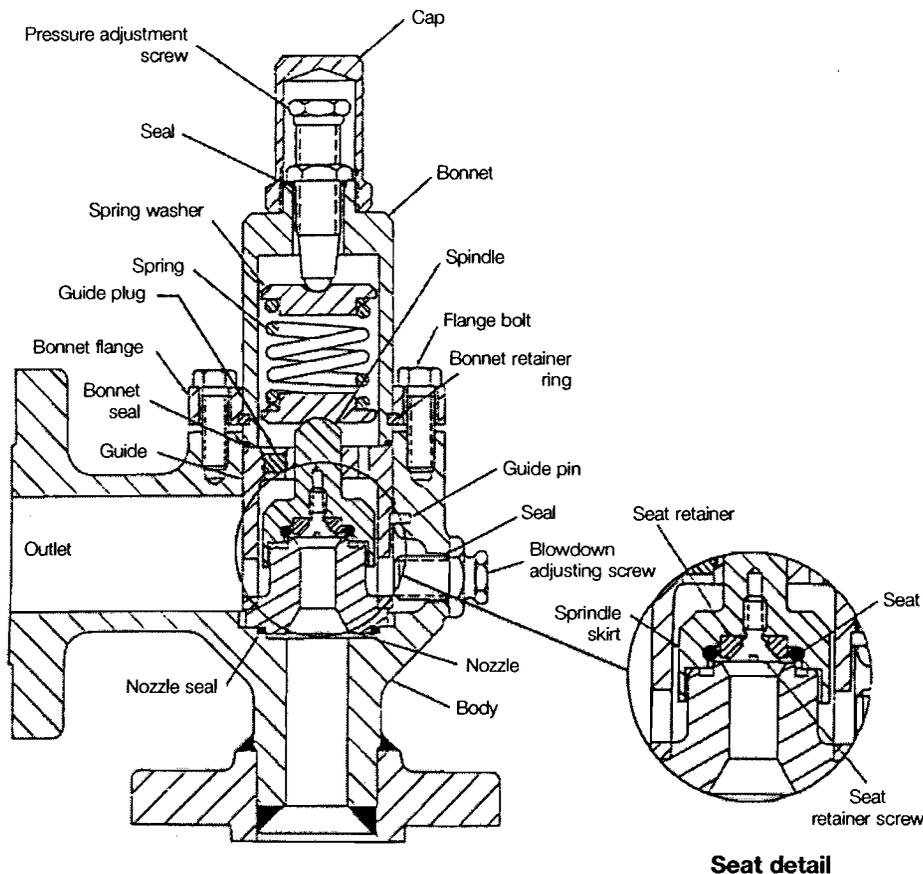


Figure 2  
Type 83 (F, G, H & J orifices)

3. Valve repair (F, G, H & J Orifice) refer to figure 2

3.1 Disassembly

3.1.1 Relieve spring tension and back blowdown screw out two turns.

3.1.2 Remove spring bonnet and valve internals.

**Note:** A pipe nipple can be attached to vent holes in top of guide to facilitate removal. (1/8 NPT/F,G, 1/4 NPT/H,J)

3.1.3 Separate nozzle from guide by hitting top of spindle on soft surface.

3.2 Repair

3.2.1 Hold spindle by skirt O.D. in soft jaw vise and replace seat.

3.2.2 Examine nozzle and polish seating surface as required. Replace if necessary.

3.3 Assembly

Assemble in reverse order of disassembly. Do not lubricate spindle or guide. Make sure the guide plugs, if used, are flush or below the top guide surface. Refer to table for plug requirements. Make sure nozzle is fully and evenly seated in guide. This is a press fit joint. Lubricate threads and adjusting bolt tip.

Orifice	Set pressure (Psig)	Set pressure (Kpag)	Quantity
F	Above 354	Above 2441	2
G	Above 223	Above 1538	2
H	Above 227	Above 1565	3
J	Above 142	Above 979	3

3.4 Soft goods repair kit

The part numbers for soft goods repair kits are listed below. Each kit contains the seat and seals for all pressure ranges.

Orifice	Material	
	Buna	Viton
F	04.4805.021	04.4805.022
G	04.4805.023	04.4805.024
H	04.4805.025	04.4805.026
J	04.4805.027	04.4805.028

**4. Valve adjustment**

**4.1 General**

Two adjustments are provided on gas service valves, one for adjusting the opening pressure and one for adjusting the closing pressure.

**4.2 Set pressure**

Turn spring adjustment screw on bonnet in most of the way. Increase pressure to desired level and back out screw until valve pops. Lock screw with jam nut and retest. Readjust as required.

**4.3 Reseat pressure**

To adjust blowdown, turn screw IN to shorten blowdown; OUT to increase blowdown.

**Note:** If volume of test set up is too small, blowdown will be set too short even though pressure gauge indicates it to be correct. Refer to Section 4.5.

**4.4 Adjustments tolerances**

Set pressure range (Psig)	Set pressure range (Kpag)	Valve operating characteristic	Tolerance*
above 70	above 483	Set Pressure	+/- 3%
70 and below	483 and below	Set Pressure	+/- 2 psi
100 and above	689 and above	Cracking Pressure	95%
50 to 99	345 to 683	Cracking Pressure	90%
below 50	below 345	Cracking Pressure	85%
100 and above	689 and above	Reseat Pressure	93%
50 to 99	345 to 683	Reseat Pressure	90%
below 50	below 345	Reseat Pressure	80%

\* Percent tolerance is of specified set pressure

**4.5 Adjusting equipment**

Where practical, valves should be set using an accumulator large enough to accurately read and set blowdown. For a -4 orifice up to 4000 psig, -6 orifice up to 1411 psig and a -8 orifice up to 600 psig, a four cubic foot accumulator is recommended. The supply pipe to the valve should be the same size as the inlet or larger and not more than 10" long.

For all other valves, or if an accumulator is not available for the sizes listed above, the blowdown may be set using the following method.

Turn the blowdown adjusting bolt all the way in until it just touches the guide, then turn it out the number of turns listed in the table.

Blowdown adjustment			
Orifice	Turns out of blowdown screw	Set pressure range (Psig)	Set pressure range (Kpag)
-4	1	20-4000	138-27579
	1 1/2	Above 4000	Above 27579
-6	3/4	20-1410	138-9722
	1 1/4	Above 1410	Above 9722
-8	1 1/2	20-600	138-4137
	2 1/2	Above 600	Above 4137
-F	1	20-700	138-4826
	1 1/2	Above 700	Above 4826
-G	1 3/4	20-700	138-4826
	2 1/4	Above 700	Above 4826
-H & -J	3/4	20-700	138-4826
	1 1/2	Above 700	Above 4826

**5. Seat leakage**

If the valve leaks after repair check the following:

1. Full and even seating of nozzle and guide.
2. Foreign particles trapped between the seat and nozzle. If any are found they may have damaged the seat, making it necessary to replace it.
3. Correct seat hardness for the valve set pressure.

**6. Set pressure change**

If the set pressure is changed more than + 5% from the nameplate set pressure, the spring, spring washers, spring bonnet, guide plugs and seat may also have to be changed. Consult the factory or refer to the soft goods repair kit, the table in section 3.3 and spring chart 03.0079.