

Salco Quick Inspect

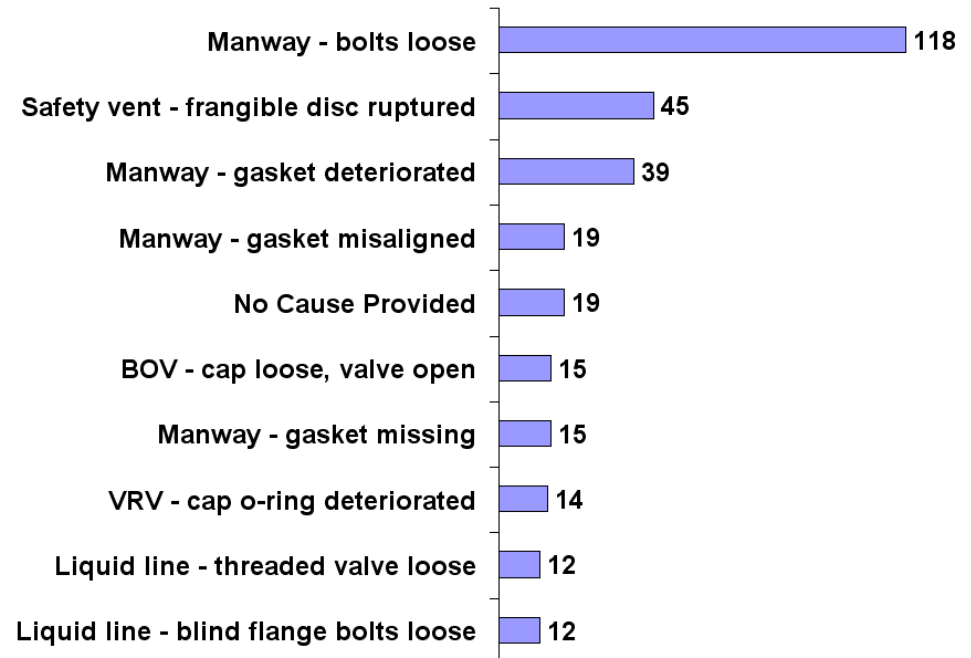
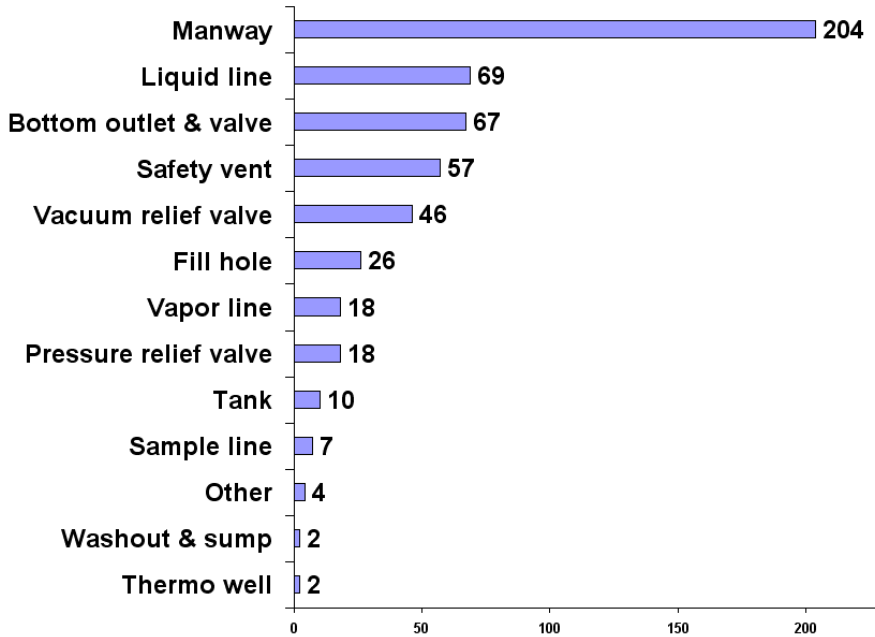
Mike Clark

Billings, MT

9-2013



NAR DATA



New Style Identification Chart

- New Chart shows the 3 configurations applicable for HCL
- Broken down into Styles 1, 2 and 3.



HYDROCHLORIC ACID CHART

TURN NO MORE THAN 1/4 TURN PAST HAND TIGHT

TURN NO MORE THAN 1/4 TURN PAST HAND TIGHT

NO SURGE PROTECTOR IN UNIT. RUPTURE DISC, SPOOL AND FLANGED SURGE PROTECTOR ARE BELOW UNIT.

NO SURGE PROTECTOR IN UNIT. FLANGED SURGE PROTECTOR BELOW UNIT.

HAZARDSOLVE SURGE PROTECTOR, FOR RUBBER LINED CARS QI261HSP##A

11	FLANGE GASKET 2 1/2" 150#	FG225150##
10	RUBBER LINED DUAL FLANGE	DF55RLB
9	SURGE PROTECTOR(SALCO PE)	HSSPRD7, HSSPRD7MT
8	RUPTURE DISC	RD165HCL, ZACRD165
7	RUPTURE DISC	RD165PL1, RD165PL2, ZMTCPRD165,
6B	QI RETAINER GASKET	QI261DG##
6A	QI RETAINER GASKET	QI261G##
5	QI RUPTURE DISK GASKET	QI261RDG##
4	QUICK INSPECT FLANGE GASKET	FG550##
3	SURGE PROTECTOR(SALCO PE)	HSSPRD33, HSSPRD33MT
2	SURGE PROTECTOR	DSP3313, DSP3313R, DSP3313SS56
1	QUICK INSPECT SAFETY VENT	QI261BSA
NO.	PART NAME	PART#

NOTES:
ALL RUPTURE DISC HOLDERS SHOULD HAVE SURGE PROTECTION. SURGE PROTECTION WILL NOT ALWAYS BE INSIDE THE QUICK INSPECT BODY. QUICK INSPECT BODY HAS A THREE HOLE 5 1/2" BOLT CIRCLE. A SPOOL ADAPTER MAY BE NECESSARY TO ADAPT TO CAR FLANGE.

REVISION: C 10/16/2009

A little History

- We have continued Testing of the device
- Look at alternative designs
- Gather NAR data
- Review/Analyze units that have been in service.
- Continue to develop training materials
- Design New RD-2 reporting form
- Laminated instruction sheets for each style
- Develop training animation/video



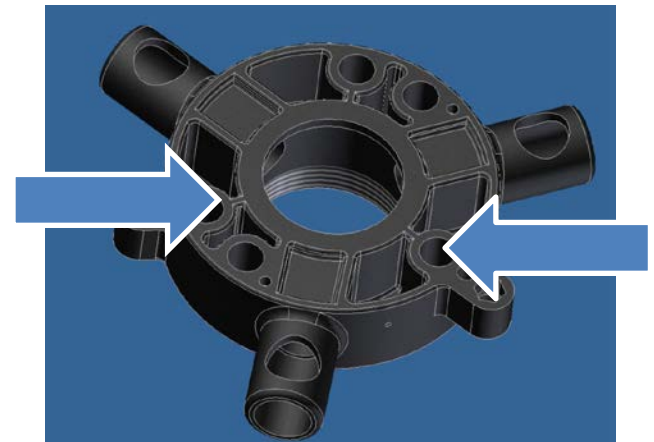
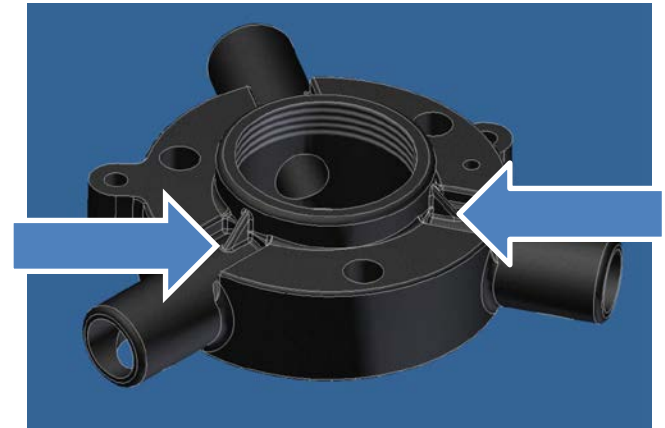
Design Considerations

- Alternative Materials
- UHMW



Design Enhancements

- Design Enhancements
- Strengthen areas that show first signs of stress
- By adding gussets
- Adding material to stress points



Review Units in Service

- **6 Assemblies**
- **Safety vent**
- **Rupture Disc**
- **Surge Protector**
- **In Working Order**
- **So as to review as just off the car**
- **Units were from 2 to +5 years old**

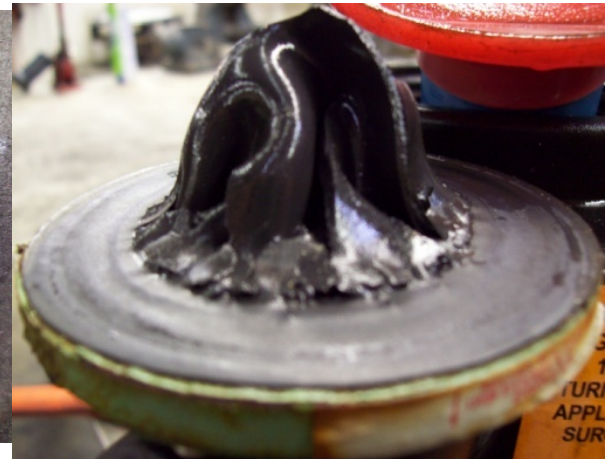
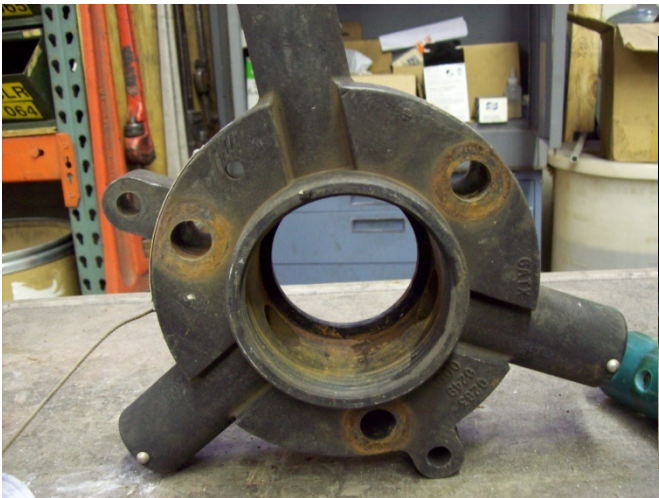


1			
QI Date	Jan-06	Mfg	Condition
QI Body		S	Good
Retainer		S	Good
SSD		HZ	Good
Disc	No date	Zook	Very bad
Gaskets		Unknown	
Notes	Disc		

Gasket on bottom side of disc badly distorted.
 Seal had failed- see photos.
 Gaskets - Very poor condition

2			
QI Date	Aug-07	Mfg	Condition
QI Body		S	Good
Retainer		S	Good
SSD		HZ	Good
Disc	Mar-08	Zook	Very Bad
Gaskets			Very Bad
Notes			

Badly corroded bolt stuck in hole
 Attached disc gasket very distorted and torn
 Exposed Teflon inner membrane distorted
 Date suggests disc has not been inspected

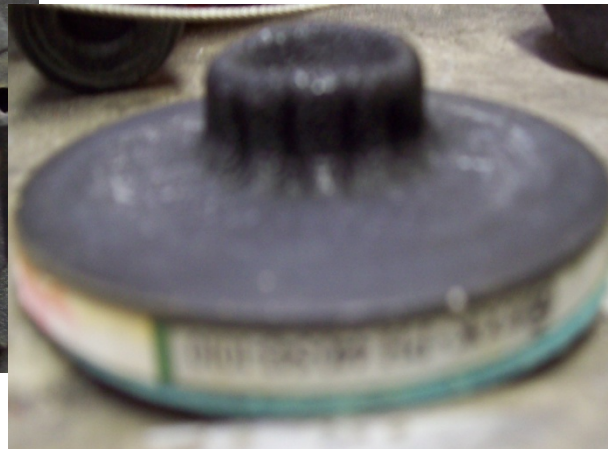


3

QI Date	Feb-08	Mfg	Condition
QI Body		S	Good
Retainer		S	Good
SSD		HZ	Good
Disc	12-09	Zook	Very Bad
Gaskets			Good
Notes			

4

QI Date	Jan-05	Mfg	Condition
QI Body		S	Good
Retainer		S	Good
SSD		HZ	Good
Disc	no date	Zook	Very Bad
Gaskets			very bad
Notes	Retainer over tightened		



	5		
QI Date	Mar-05	Mfg	Condition
QI Body		S	Good
Retainer		S	Good
SSD		HZ	Good
Disc	no date	Oseco	fair
Gaskets			none
Notes	Wrong disc no Teflon covering		

Disc gasket distorted and off disc body

	6		
QI Date	Jan-06	Mfg	Condition
QI Body		S	Good
Retainer		S	Good
SSD		HZ	Good
Disc	no date	Oseco	fair
Gaskets			none
Notes	Wrong disc no Teflon covering		



SALCO PRODUCTS, INC. Instruction Sheets and Tools

Quick Inspect

INSTALLATION INSTRUCTIONS FOR 4.75" (Large) RUPTURE DISCS USED IN CONJUNCTION WITH SALCO QUICK INSPECTS (Style 1)

Inspection of the Quick Inspect Housing
 Note: Only an AAR Class G Registered Facility (minimum) can remove or replace a safety vent (QI) housing to a tank car. This extension is not recommended for Tank use.

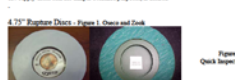
1. Inspect for possible defects. Cracks, signs of excessive wear, missing components etc. Replace if necessary.
2. Thoroughly inspect both sides of the rupture disc (Figure 1). By either of the below methods:
 - a. Remove the rupture disc inspection housing to expose the unadorned rupture disc.
 - b. Remove the top cap and inspect the rupture disc through the Quick Inspect Body.

3. Replace the top cap, the rupture disc, and rupture disc gasket in the following order:
 - a. Thoroughly inspect both sides of the rupture disc (Figure 1). By either of the below methods:
 - i. Remove the top cap and inspect the rupture disc through the Quick Inspect Body.
 - ii. Remove the rupture disc inspection housing to expose the unadorned rupture disc.
 - b. Replace the rupture disc with the rupture disc gasket.
 - c. Replace the top cap.

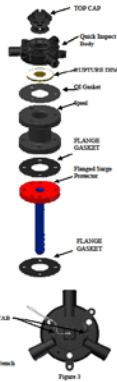
4. If you do not have a Quick Inspect Wrench, place a 3/8" flat bar across the set of slots. With a rubber mallet, gently tap the bar so it makes 1/4 inch DO NOT OVERTIGHTEN - over tightening can distort the disc and may affect performance. The ring around the cap is supposed to spin around.

5. Perform leak test. If there is a leak after the second test, please contact car shippers to schedule mobile crew for assistance.
6. If no leaks are found, remove excess leak solution by blowing on the excess until dry with the use of a clean absorbent cloth.
7. Install the top cap HAND TIGHT.
8. Apply cable seal for tamper evidence purposes, if desired.

9. If no leaks are found, remove excess leak solution by blowing on the excess until dry with the use of a clean absorbent cloth.
10. Install the top cap HAND TIGHT.
11. Apply cable seal for tamper evidence purposes, if desired.



4.75" Rupture Discs - Figure 1 (Close and Leak)



Form FD-2
 Frangible Disc and Holder Report
 AAR Tank Car Committee & AAR Hazardous Materials Committee

Please fill this form out for every non-accident hazardous materials release from a tank car safety vent or frangible disc, and for all cases of damage to either component that did not result in a release. Please send the form to the address below. Hard copies, fax and electronic files are all acceptable. Please also attach or follow up with a USDOT 5800.1 form, where applicable.

The purpose of this form is to collect data for the AAR Tank Car Committee to support its effort to reduce non-accident releases (NARs). These are data that are not confirmed on a 5800.1 release report, such as the type of frangible disc involved, or abuse and securement issues with disc holders and vents, as well as information on what happened to cause the release.

Send the forms to: Matthew R. Forister mforister@aar.org
 Association of American Railroads (202) 639-2260
 50 F Street NW (202) 639-2356 (fax)
 Washington, DC 20001

Date of incident: _____ Commodity: _____
 Railroad: _____ Station/location of incident: _____
 Tank car reporting mark, car number and specification: _____

1. FRANGIBLE DISC INFORMATION:

A) The frangible disc was made of: _____ composite material
 _____ scored stainless steel _____ other _____
 was manufactured by _____
 and was of diameter: 3-1/8" _____ 4-3/4" _____ Other: _____

B) Check one: The disc _____ burst _____ corroded to failure
 _____ failed in another way: _____
 _____ leaked without damage _____ did not leak

C) Was there anything else unusual or worthy of note about the disc or its installation? _____

v.1.12 February 17, 2010

INSTALLATION INSTRUCTIONS FOR RUPTURE DISCS IN SALCO QUICK INSPECTS WITH FLANGED SURGE PROTECTOR (Style 2)

Inspection of the Quick Inspect Housing
 Note: Only an AAR Class G Registered Facility (minimum) can remove or replace a safety vent (QI) housing to a tank car.

1. Inspect for possible defects. Cracks, signs of excessive wear, missing components etc. Replace if necessary.
2. Remove the top cap, the rupture disc, and rupture disc gasket in the following order:
 - a. Thoroughly inspect both sides of the rupture disc (Figure 1). By either of the below methods:
 - i. Remove the top cap and inspect the rupture disc through the Quick Inspect Body.
 - ii. Remove the rupture disc inspection housing to expose the unadorned rupture disc.
 - b. Replace the rupture disc with the rupture disc gasket.
 - c. Replace the top cap.

3. Remove the surge protector gasket for defects and replace if necessary. Gasket defects may include stretching, mis-shaping, flattened or missing. Replace and/or install as necessary.

4. Reinstall the components in this order:
 - a. 1/8" thick, narrow gasket - surge protector gasket
 - b. Rupture disc - DO NOT REMOVE ANY CLEAR TEFLON OR WHITE OR ANY AFFIXED GASKET FROM THIS DISC (Figure 2)
 - c. These gaskets should be on both sides of the disc.
 - d. Make sure that rupture disc is centered in housing.
 - e. Replace the rupture disc securement cap. Tighten until it is HAND tight.

5. Using the SALCO Quick Inspect Wrench (Figure 2) - lay the wrench across the slots (Figure 3) and make 1/4 turn.
6. If you do not have a Quick Inspect Wrench, place a 3/8" flat bar across the set of slots. With a rubber mallet, gently tap the bar so it makes 1/4 inch DO NOT OVERTIGHTEN - over tightening can distort the disc and may affect performance. The ring around the cap is supposed to spin around.
7. Perform leak test. If there is a leak after the second test, please contact car shippers to schedule mobile crew for assistance.
8. If no leaks are found, remove excess leak solution by blowing on the excess until dry with the use of a clean absorbent cloth.
9. Install the top cap HAND TIGHT.
10. Apply cable seal for tamper evidence purposes, if desired.

11. Perform leak test. If there is a leak after the second test, please contact car shippers to schedule mobile crew for assistance.
12. If no leaks are found, remove excess leak solution by blowing on the excess until dry with the use of a clean absorbent cloth.
13. Install the top cap HAND TIGHT.
14. Apply cable seal for tamper evidence purposes, if desired.



OSBCO or ZOOK 165 psi, 3-1/8" OD



Figure 2 Quick Inspect Wrench

HYDROCHLORIC ACID CHART

TURN NO MORE THAN 1/4 TURN, PAST HAND TIGHT

RUPTURE DISC HAS WHITE TEFLON GASKETS ATTACHED ON BOTH SIDES

NO SURGE PROTECTOR IN UNIT. RUPTURE DISC, SPOOL AND FLANGED SURGE PROTECTOR ARE BELOW UNIT.

HAZARDOUS SURGE PROTECTOR FOR RUBBER LINED CARS (QI/SR/HA)

11	FLANGE GASKET 2 1/2" 150#	FG225150#
10	RUBBER LINED DUAL FLANGE	DFSR18
9	SURGE PROTECTOR(SALCO RE)	HSPR03L, HSPR03HT
8	RUPTURE DISC	RD160PL, RD160PL2
7	RUPTURE DISC	RD160PL, RD160PL2, ZMTCPR016L
6B	QI RETAINER GASKET	QGR210G#
6A	QI RETAINER GASKET	QGR16G#
5	QI RUPTURE DISC GASKET	QGR16SR#
4	QUICK INSPECT FLANGE GASKET	FG550#
3	QUICK INSPECT(SALCO RE)	HSPR03L, HSPR03HT
2	SURGE PROTECTOR	DSR31LL, DSR313LR, DSR313556
1	QUICK INSPECT SAFETY VENT	QI180SA
NO.	PART NAME	PART#

NOTES:
 ALL RUPTURE DISC HOLDERS SHOULD HAVE SURGE PROTECTION. SURGE PROTECTION WILL NOT ALWAYS BE INSIDE THE QUICK INSPECT BODY. QUICK INSPECT BODY HAS A THREE HOLE 5 1/2" BOLT CIRCLE. A SPOCK ADAPTER MAY BE NECESSARY TO ADAPT TO CAR FLANGE.

REVISION: C 10/16/2009

INSTALLATION INSTRUCTIONS FOR RUPTURE DISCS IN SALCO QUICK INSPECTS (Style 3)

Inspection of the Quick Inspect Housing
 Note: Only an AAR Class G Registered Facility (minimum) can remove or replace a safety vent (QI) housing to a tank car. This extension is not recommended for Tank use.

1. Inspect for possible defects. Cracks, signs of excessive wear, missing components etc. Replace if necessary.
2. To inspect the rupture disc and gaskets:
 - a. Thoroughly inspect both sides of the rupture disc (Figure 1). By either of the below methods:
 - i. Remove the top cap and inspect the rupture disc through the Quick Inspect Body.
 - ii. Remove the rupture disc inspection housing to expose the unadorned rupture disc.
 - b. Replace the rupture disc with the rupture disc gasket.
 - c. Replace the top cap.

3. Remove the HazarSolve surge protector and the surge protector gasket. If the surge protector and surge protector gasket are located underneath the body, (Flanged Type) please skip this step.
 - a. Inspect the surge protector gasket for defects and replace if necessary. Gasket defects may include stretching, mis-shaping, flattened or missing. Replace and/or install as necessary.

4. Reinstall the components in this order:
 - a. 1/8" thick, narrow gasket - surge protector gasket
 - b. Rupture disc - DO NOT REMOVE ANY CLEAR TEFLON OR WHITE GASKET FROM THE DISC (Figure 1) These gaskets should be on both sides of the disc.
 - c. Make sure that rupture disc is centered in housing.
 - d. Replace the rupture disc securement cap. Tighten until it is HAND tight.

5. Using the SALCO Quick Inspect Wrench (Figure 2) - lay the wrench across the slots (Figure 3) and make 1/4 turn.
6. If you do not have a Quick Inspect Wrench, place a 3/8" flat bar across the set of slots. With a rubber mallet, gently tap the bar so it makes 1/4 inch DO NOT OVERTIGHTEN - over tightening can distort the disc and may affect performance. The ring around the cap is supposed to spin around.
7. Perform leak test. If there is a leak after the second test, please contact car shippers to schedule mobile crew for assistance.
8. If no leaks are found, remove excess leak solution by blowing on the excess until dry with the use of a clean absorbent cloth.
9. Install the top cap HAND TIGHT.
10. Apply cable seal for tamper evidence purposes, if desired.

11. Perform leak test. If there is a leak after the second test, please contact car shippers to schedule mobile crew for assistance.
12. If no leaks are found, remove excess leak solution by blowing on the excess until dry with the use of a clean absorbent cloth.
13. Install the top cap HAND TIGHT.
14. Apply cable seal for tamper evidence purposes, if desired.



OSBCO or ZOOK 165 psi, 3-1/8" OD



Figure 2 Quick Inspect Wrench





INSTALLATION INSTRUCTIONS FOR RUPTURE DISCS IN SALCO QUICK INSPECTS WITH FLANGED SURGE PROTECTOR (Style 2)

Inspection of the Quick Inspect Housing:

Note: Only an AAR Class G Registered facility (minimum) can remove or replace a safety vent (QI) housing to a tank car.

1. Inspect for possible defects including cracks, signs of excessive wear, missing components, etc. and replace if necessary.
2. To inspect the rupture disc and gaskets:
3. Remove the top cap, rupture disc securement cap, rupture disc and rupture disc gasket.
4. Thoroughly inspect both sides of the rupture disc (Figure 1).
5. Replace the disc if it is missing any OEM gaskets, shows any signs of discoloration, if the disc is blown or if there are any other suspect conditions.
6. Inspect the rupture disc gasket for defects which may include stretching, mis-shaping, flattening or missing and replace if necessary.

Reinstall the components in this order:

6. 1/8" thick, narrow gasket - "Rupture Disc Gasket"
7. Rupture disc. **DO NOT REMOVE ANY GASKET AFFIXED TO EITHER SIDE OF THE DISC** (Figure 1).
8. Ensuring the rupture disc is centered, replace the rupture disc securement cap and tighten the rupture disc securement cap until **HAND SNUG**.
 - a. **Method A (Degree Method):**
Lay the Salco Quick Inspect wrench (QI261HDL, Figure 2) across the tabs (See Figure 3) and tighten the securement cap an additional 1/4 turn (90 degrees) past hand snug.
If you do not have a quick inspect wrench, you may place a 3/8" flat bar across the tabs in the disc securement cap and use a rubber mallet to tap the bar the additional 1/4 turn (90 degrees) past hand snug.
DO NOT OVER TIGHTEN! Over tightening of the securement cap can distort the disc and may affect performance. The ring around the rupture disc securement cap should spin freely.
 - b. **Method B (Torque Wrench Method):**
Lay the SALCO Quick Inspect wrench (QI261HDL, Figure 2) across the tabs (See Figure 3) and use a torque wrench for tightening the rupture disc securement cap to the specified torque. Rytan disc and Graphite disc torque is 20 ft-lbs. If the disc does not seal, increase the torque in 5 ft-lb increments, not to exceed 90 degrees beyond the initial hand tightening.
9. Follow your companies leak test procedure.
10. Apply top cap and tighten until **HAND TIGHT**.
11. If desired, apply cable seal for tamper evidence.

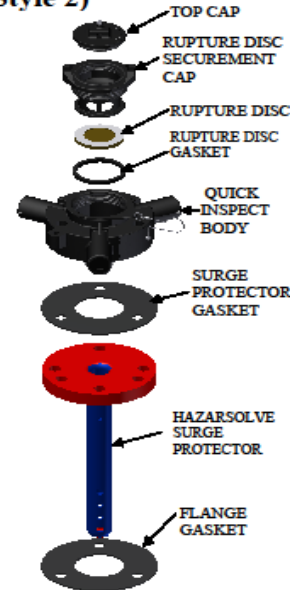


Figure 1. OSECO or ZOOK
165 psi, 3-1/8" OD



Figure 2.
Quick Inspect Wrench

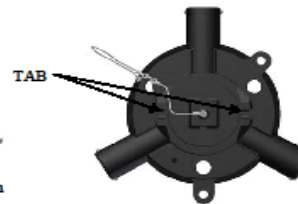


Figure 3.





INSTALLATION INSTRUCTIONS FOR RUPTURE DISCS IN SALCO QUICK INSPECTS WITH FLANGED SURGE PROTECTOR (Style 2)

Inspection of the Quick Inspect Housing:

Note: Only an AAR Class G Registered facility (minimum) can remove or replace a safety vent (QI) housing to a tank car.

1. Inspect for possible defects including cracks, signs of excessive wear, missing components, etc. and replace if necessary.

To inspect the rupture disc and gaskets:

2. Remove the top cap, rupture disc securement cap, rupture disc and rupture disc gasket.
3. Thoroughly inspect both sides of the rupture disc (Figure 1).
4. Replace the disc if it is missing any OEM gaskets, shows any signs of discoloration, if the disc is blown or if there are any other suspect conditions.
5. Inspect the rupture disc gasket for defects which may include stretching, mis-shaping, flattening or missing and replace if necessary.

Reinstall the components in this order:

6. 1/8" thick, narrow gasket - "Rupture Disc Gasket"
7. Rupture disc. **DO NOT REMOVE ANY GASKET AFFIXED TO EITHER SIDE OF THE DISC** (Figure 1).
8. Ensuring the rupture disc is centered, replace the rupture disc securement cap and tighten the rupture disc securement cap until **HAND SNUG**.

a. **Method A (Degree Method):**

Lay the Salco Quick Inspect wrench (QI261HDL, Figure 2) across the tabs (See Figure 3) and tighten the securement cap an additional 1/4 turn (90 degrees) past hand snug.

If you do not have a quick inspect wrench, you may place a 3/8" flat bar across the tabs in the disc securement cap and use a rubber mallet to tap the bar the additional 1/4 turn (90 degrees) past hand snug.

DO NOT OVER TIGHTEN! Over tightening of the securement cap can distort the disc and may affect performance. The ring around the rupture disc securement cap should spin freely.

b. **Method B (Torque Wrench Method):**

Lay the SALCO Quick Inspect wrench (QI261HDL, Figure 2) across the tabs (See Figure 3) and use a torque wrench for tightening the rupture disc securement cap to the specified torque. Ryton disc and Graphite disc torque is 20 ft-lbs. If the disc does not seal, increase the torque in 5 ft-lb increments, not to exceed 90 degrees beyond the initial hand tightening.

9. Follow your companies leak test procedure.
10. Apply top cap and tighten until **HAND TIGHT**.
11. If desired, apply cable seal for tamper evidence.



Figure 1. OSECO or ZOOK
165 psi, 3-1/8" OD



Figure 2.
Quick Inspect Wrench

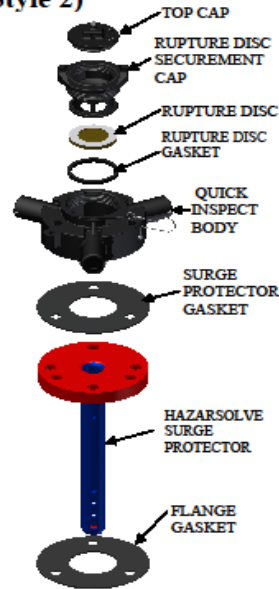


Figure 3.





INSTALLATION INSTRUCTIONS FOR RUPTURE DISCS IN SALCO QUICK INSPECTS (Style 3)

Inspection of the Quick Inspect Housing:

Note: Only an AAR Class G Registered facility (minimum) can remove or replace a safety vent (QI) housing to a tank car.

This orientation is not recommended for use with a Zook disc.

1. Inspect for possible defects including cracks, signs of excessive wear, missing components etc. Replace if necessary.

To inspect the rupture disc and gaskets:

2. Remove the top cap, the rupture disc securement cap, rupture disc and rupture disc gasket.
3. Thoroughly inspect both sides of the rupture disc (Figure 1).
4. Replace the disc if it is missing any OEM gaskets, shows any signs of discoloration, if the disc is blown or if there are any other suspect conditions.
5. Remove the Hazarsolve surge protector and the surge protector gasket.
6. Inspect the surge protector gasket for defects which may include stretching, mis-shaping, flattening or missing and replace if necessary.

NOTE: If the surge protector is located underneath the QI body, please skip this step and refer to the Flanged Style 2 instructions.

Reinstall the components in this order:

7. 1/8" thick, narrow gasket - "Surge Protector Gasket"
8. Hazarsolve Surge Protector
9. Rupture Disc Gasket
10. Rupture disc. **DO NOT REMOVE ANY GASKET AFFIXED TO EITHER SIDE OF THE DISC** (Figure 1).
11. Ensuring the rupture disc is centered, replace the rupture disc securement cap and tighten the rupture disc securement cap until **HAND SNUG**.

a. Method A (Degree Method):

Lay the SALCO Quick Inspect wrench (QI261HDL, Figure 2) across the tabs (See Figure 3) and tighten the securement cap an additional 1/4 turn (90 degrees) past hand snug.

If you do not have a quick inspect wrench, you may place a 3/8" flat bar across the tabs in the disc securement cap and use a rubber mallet to tap the bar the additional 1/4 turn (90 degrees) past hand snug.

DO NOT OVER TIGHTEN! Over tightening of the securement cap can distort the disc and may affect performance. The ring around the rupture disc securement cap should spin freely.

b. Method B (Torque Wrench Method):

Lay the SALCO Quick Inspect wrench (QI261HDL, Figure 2) across the tabs (See Figure 3) and use a torque wrench for tightening the rupture disc securement cap to the specified torque. Ryton disc = 20 ft-lbs. If the disc does not seal, increase the torque in 5 ft-lb increments not to exceed 90 degrees beyond the initial hand tightening.

12. Follow your companies leak test procedure.
13. Apply top cap and tighten until **HAND TIGHT**.
14. If desired, apply cable seal for tamper evidence.

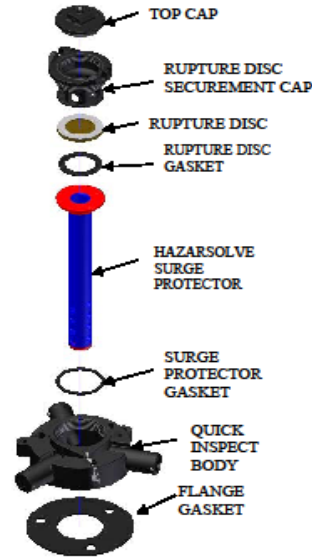


Figure 1. Salco Part # RD165PL2
Oseco 165 psi Ryton disc, 3-1/8" OD



Figure 2.
Quick Inspect Wrench

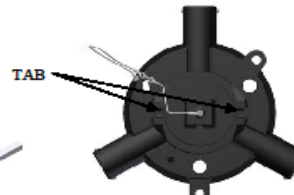


Figure 3.



QUESTIONS?



Thank You

**Mike Clark
Salco Products**

Salcoproducts.com

