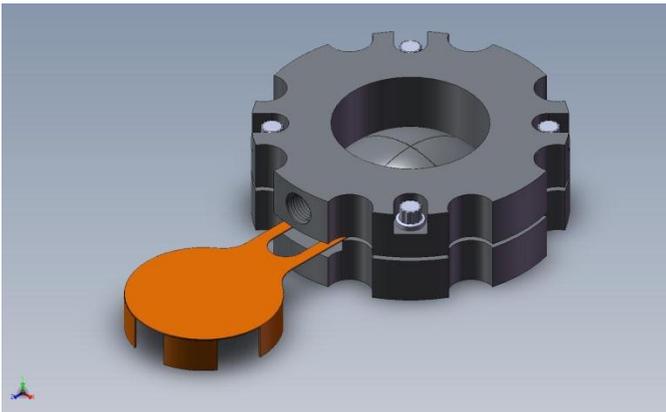


Installation Instructions for FRDI, FRDI-P and FRDH Flat Seat Rupture Disc Holders

TYPICAL FRDI-P INSTALLATION SHOWN



1.0 SAFETY



WARNING!

- 1) All rupture disc installations should be located to allow full unrestricted discharge of a ruptured disc when over-pressure of the system occurs.
- 2) Never locate a rupture disc installation where the discharge from a ruptured disc could directly impact personnel or equipment.
- 3) Venting of a rupture disc discharge must always be routed to a safe disposal area.
- 4) Handle ruptured discs carefully! Avoid rupture discs' sharp, jagged edges when removing them from holder by wearing appropriate gloves.

IMPORTANT

A rupture disc is a precision piece of equipment. Handle it with extreme care.

- Avoid scratching,
- bending,
- denting, or otherwise damaging the dome and/or flat seat areas of the disc.

- Handle the disc alone by grasping both the name tag and the flat outer sealing surfaces and avoid the domed area as much as possible. Never carry a disc/holder assembly by the rupture disc name tag alone as damage to the disc could occur.
- Always wear appropriate gloves when installing rupture discs.

2.0 RUPTURE DISC HOLDER PREPARATION

IMPORTANT

- 1) All disc holders with a nubbin seal are carefully machined and designed to be installed with a disc in place.
- 2) Always install a disc or approved seal protector in the disc holder prior to disc holder installation! Replace the holder if there is scaling, rust, or other evidence of damage.

2.1 All Assemblies:

- 1) Loosen and remove flange bolting only after verifying that the system is depressurized.
- 2) Always purge toxic and/or dangerous materials from any system that is to be opened to a safe disposal area.
- 3) If preassembly side bars and/or pretorque capscrews are utilized, loosen and remove them from the holder, be careful not to allow any part of the disc holder to slip or fall. If damage to the disc or holder occurs, please consult the factory.

2.2 FRDI-P Assemblies Only:

- 1) Slip the disc holder insert from between the companion piping flanges and verify that all holder restraints have been removed.
- 2) Separate the holder inlet from the outlet and remove existing rupture disc taking care to avoid the sharp edges.
- 3) Thoroughly inspect and clean all seating surfaces of the disc holder. Do not scrape or scratch any seating surface including the

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raised nubbin area!

- 4) If wiping these surfaces with a "shop rag" moistened with a suitable solvent does not remove surface residues, fine emery cloth or steel wool may be utilized. Be careful not to press too firmly on the emery cloth or steel wool as this may "cut or groove" these sealing surfaces.

3.0 RUPTURE DISC INSTALLATION



WARNING!

If disc or holder is installed incorrectly, it can significantly alter the burst pressure of the disc, endangering personnel and/or causing damage to equipment.

3.1 FRDH Assemblies Only:

- 1) Place the rupture disc on the inlet flange of the rupture disc holder in a position that will allow system pressure to be exerted on the concave side of the rupture disc. This will allow the convex side (dome) of the rupture disc to extend away from the inlet flange and into the outlet flange of the rupture disc holder.
- 2)
 - a. Carefully position the outlet flange of the rupture disc holder over the dome of the rupture disc and lower it until seated on the flat surface of the rupture disc.
 - b. During this step, do not allow the rupture disc to slip from its position on the inlet flange. Damage will occur to the rupture disc if the outlet holder flange is seated on anything other than the flat surfaces (seating area) of the rupture disc.

3)

- a. Reinstall studs and nuts. Tighten nuts uniformly, see figure 2, using a calibrated torque wrench to maintain flange surfaces parallel to one another.
- b. Always keep studs and nuts lightly lubricated to maintain a "free running" condition.
- c. The torque values listed in the table are a suitable starting point for many of the gasket and flange bolting materials currently in use.
- d. Increase torque values by 20% until seal is achieved.
- e. Please consult the factory when a leak free rupture disc holder installation cannot be achieved or maintained.

3.2 FRDI Assemblies Only:

- 1) Place the rupture disc on the inlet half of the rupture disc holder in a position that will allow system pressure to be exerted on the concave side of the rupture disc. This allows the convex side (dome) of the rupture disc to extend away from the inlet half of the rupture disc holder and into the outlet half.
- 2) Carefully position the outlet half of the rupture disc holder over the dome of the rupture disc and lower same until seated on the flat surface of the rupture disc.
- 3) Install side bars' however, screws should only be "finger-tight", not wrench tight.
- 4)
 - a. Position the FRDI/disc assembly within the bolt circle of companion piping flanges with proper studs, nuts and gasketing.
 - b. Tighten nuts uniformly to maintain companion flange surfaces parallel to one another.
 - c. Always keep studs and nuts lightly lubricated to maintain a "free running"

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condition.

- d. The torque values listed in the table are suitable for many of the gasket and flange bolting materials currently in use.
- e. Please consult the factory when leak free rupture disc holder installation cannot be achieved or maintained.

3.3 FRDI-P Assemblies Only:

- 1) Place the rupture disc on the inlet half of the rupture disc holder in a position that will allow system pressure to be exerted on the concave side of the rupture disc. This allows the convex side (dome) of the rupture disc to extend away from the inlet half of the rupture disc holder and into the outlet half.
- 2) Carefully position the outlet half of the rupture disc holder over the dome of the rupture disc and lower same until seated on the flat surface of the rupture disc.
- 3) Install capscrews in a star pattern per figure 2, tighten to given torque values in table 2.
- 4) Position the FRDI/disc assembly within the bolt circle of companion piping flanges then reinstall studs, nuts and gasketing.
 - a. Tighten nuts uniformly to maintain companion flange surfaces parallel to one another.
 - b. Always keep studs and nuts lightly lubricated to maintain a "free running" condition.
 - c. The torque values listed in the table are suitable for many of the gasket and flange bolting materials currently in use.
 - d. Please consult the factory when gasket sealing or leak free rupture disc holder installation cannot be achieved or maintained.

4.0 OSECO RECOMMENDED TORQUE INSTRUCTIONS:

Tighten nuts uniformly, see figure 2, using a calibrated torque wrench to maintain flange surfaces parallel to one another.

- Always use disc specific installation instructions and torque values.
- Always keep studs and nuts lightly lubricated to maintain a "free running" condition.
- Beginning at 20% of the value in Table 1, tighten nuts in a star pattern (see figure 2), increasing the torque value by 20% until the recommended torque value is reached.
- The torque values listed in Table 1 are suitable for many of the gasket and flange bolting materials currently in use. If necessary, increase torque values by 20% until seal is achieved.
- Please consult the factory when gasket sealing or a leak free rupture disc holder installation cannot be achieved or maintained.
- Do not use excessive torque on flange bolting as this may cause damage to the "bite" type seal in the holder as well as the rupture disc itself.
- Re-check torque values after running your process once, check again after 24 hours to ensure proper torque values.

OSECO recommends adhering to API guidelines when installing discs.

- API RP 520 recommends using compressed fiber gaskets (not high energy spiral wound gaskets) when a rupture disc is used. It is important to ensure the inside diameter of spiral wound gaskets is not smaller than the inside diameter of the rupture disc holder.

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5.0 GENERAL GUIDELINES

When installing a rupture disc and rupture disc holder please keep in mind these general guidelines to get the most out of your pressure intelligent device:

- Always maintain the pipe flanges parallel to one another during installation.
- For fixed piping, ensure the space between flange faces is appropriate for the holder overall height and gaskets to be used.
- When installing a disc into a FRDI holder, be sure to follow the diagram in figure 1, ensuring that the disc type is appropriate for your holder type.
- When available, use disc specific installation instructions.

OSECO strives to be a leader in customer service. As part of OSECO's customer service efforts, we offer rupture disc training and 24 hour assistance. OSECO recommends all personnel responsible for disc installations attend an installation training seminar.

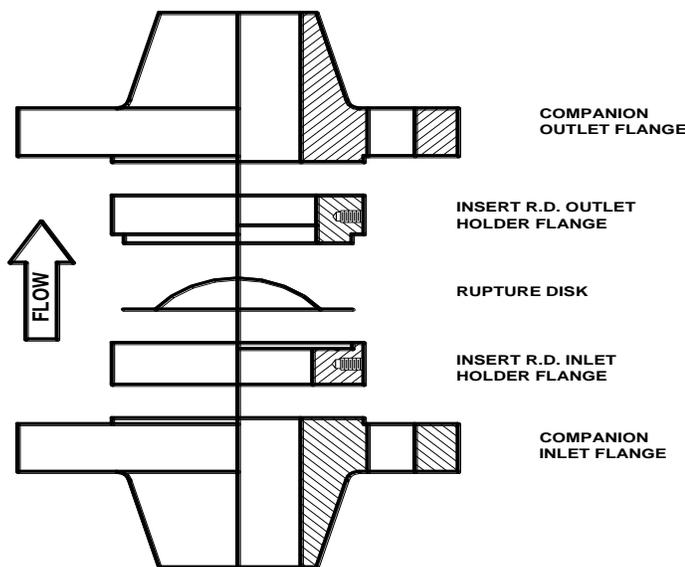


Figure 1

6.0 COMPANION FLANGE TORQUE REQUIREMENTS FOR RFAS FAMILY RUPTURE DISCS

Table 1
Semi-Metallic gaskets
For FRDI, FRDI-P and FRDH Pre-torque holders
Companion Flange Torque (ft-lbs)

Size (inches)	Pressure Rating (ANSI)			
	150	300	600	900
1	35	52	52	68
1.5	40	88	88	105
2	68	52	52	68
3	77	95	95	92
4	68	88	150	150
6	118	95	140	145
8	132	140	175	240
10	185	170	235	265
12	210	250	250	280

Table 2
Compressed Fiber gaskets
For FRDI, FRDI-P and FRDH Pre-torque holders
Companion Flange Torque (ft-lbs)

Size (inches)	Pressure Rating (ANSI)			
	150	300	600	900
1	25	31	31	44
1.5	40	59	59	89
2	61	31	31	53
3	96	58	58	76
4	65	78	101	130
6	123	81	121	136
8	164	128	181	208
10	155	133	194	190
12	165	194	-	-
14	165	225	-	-
16	213	250	-	-
18	250	-	-	-
24	-	-	-	-

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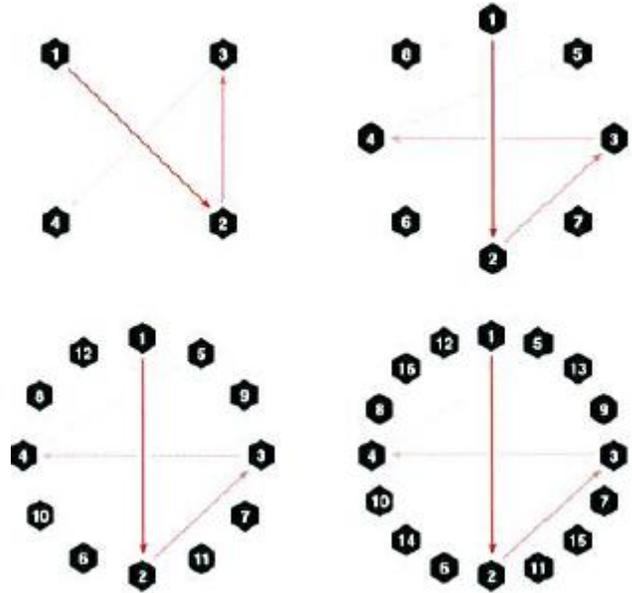
Table 3
Capscrews
For FRDI-P pre-torque holders
Pre-torque Capscrew Torque (ft-lbs)

Size (inches)	Pressure Rating (ANSI)			
	150	300	600	900
1	32	32	32	32
1.5	32	32	32	32
2	32	32	32	32
3	32	32	32	32
4	32	32 </td <td>32</td> <td>32</td>	32	32
6	61	61	61	61
8	61	61	61	61
10	61	61	61	61
12	61	61	61	61
14	61	61	61	61
16	61	61	61	61
18	61	61	61	61
24	61	61	61	61

7.0 BOLT PATTERN

Use the following pattern when tightening companion flange bolts or pre-torque bolts.

Figure 2



Installation Instructions for FRDI, FRDI-P and FRDH Flat Seat Rupture Disc Holders
