Type B™ and D™ Rupture Disks
FA-7R™, Bolted, Union and Screw Type Safety Head Assemblies

DANGER: Rupture disks re intended to provide a pressure relief opening. This rupture disk is designed to
burst at a specified temperature and pressure, thereby relieving excess pressure or preventing excessive
vacuum in a system. **A RUPTURE DISK BURST COULD CAUSE SEVERE BODILY INJURY OR DEATH,
COULD RESULT IN PROPERTY DAMAGE, AND MAY RESULT IN THE RELEASE OF PRODUCT INTO
THE ATMOSPHERE OR SURROUNDING AREA. IT IS IMPERATIVE THAT THIS RUPTURE DISK BE
PROPERLY INSTALLED AND SAFELY VENTED IN ORDER TO AVOID BODILY INJURY, DAMAGE TO
PROPERTY, POLLUTION AND LOSS OF PRODUCT.** BS&B supplies disks selected by its customers
which are manufactured in reliance upon information and specifications supplied by the customer. BS&B is
not liable for any damage resulting from improper installation, improper system design, unsafe venting, or
other factors beyond BS&B’s control.

ORDER REPLACEMENT DISKS BY LOT
NUMBER (shown on disk tag).

Safety Precautions

**WARNING:** Do not locate the rupture disk where per-
sonnel will be exposed to released product and pres-
sure through the disk

**CAUTION:** Provide adequate support for piping and
connections to absorb recoil/reaction forces when the
disk ruptures. If the discharge is free vented, a baffle
plate may be mounted downstream of the outlet com-
panion pipe flange with extra length studs to minimize
recoil.

**CAUTION:** The rupture disk and Safety Head should
not be subjected to bending stresses.

**CAUTION:** Do not locate the disk where it may be
subjected to thermal shock. Moisture, rain, condensa-
tion or snow may cause a thermal shock to the disk
causing the disk to burst below its rated burst pres-
sure. A protector is recommended for temperature
above 212º(100ºC), consult BS&B.

**CAUTION:** When the disk ruptures, the resulting
shock wave may affect the operating performance of
downstream equipment.

BEFORE YOU INSTALL A RUPTURE DISK:

Inspect Safety Head
1. Inspect Safety Head’s mating surfaces for foreign
material. Pits dirt or grit can damage the rupture
disk affecting disk performance or cause leakage.
Clean if necessary. If the metal-to-metal contact
surfaces are nicked, lightly stone prior to installa-
tion.
2. The Safety Head size and rating must match the
companion flange size and rating.
3. The rupture disk and Safety Head must not be
machined or modified in any way except with the
approval of BS&B. Failure to obtain such approval
voids the warranty on this product

(continued on next page)
Inspect the Rupture Disk

1. Handle the rupture disk carefully holding the disk by the tag and the perimeter only. Examine seating and domed surfaces for nicks, dents, scratches and foreign material which can damage the disk or cause leakage or affect the burst pressure. **Do not install a damaged disk.** Installation of a damaged disk may result in a premature bursting of the disk. Vacuum supports, when specified, are permanently attached to the concave side of disk.

CAUTION: Do not reinstall a disk that had been removed from a Safety Head even if it has not ruptured. When stresses in the disk are relieved by unbolting, the impression in the seating area taken by the disk during its original installation may prevent sealing and affect disk performance if reinstalled.

Note: Corrosion and process conditions may affect disk deterioration and necessitate more frequent replacement.

Installation of Rupture Disk in FA-7R QuikSert Safety Head

1. Place inlet of Safety Head on a work surface in position shown in diagram with flow arrows up.
2. Place NEW, UNDAMAGED rupture disk on inlet flange with dome facing up. System pressure must be against concave side of disk.
3. Carefully place outlet flange in position as shown. **Flow arrows on both flanges must point in the same direction.**
4. Assemble unit with alignment lugs and capscrews. Tighten capscrews only sufficiently to hold disk snugly in place between the two flanges.

Installation of Safety Head FA-7R Assembly in Pressure System

1. Insert the Safety Head assembly into the pressure system between companion flanges. **Ensure flow arrows on the Safety Head point in the desired flow direction upon disk rupture.** System pressure must be against concave side of disk.
2. Install gaskets between FA-7R Safety Head and mating pipe flanges. BS&B recommends a hard compressed fiber gasket no greater than 1/32in. thick for all Type B’s and Type D’s of metal construction and 1/8in. thick for Type D’s with plastic seals. However, the user is cautioned to select gasket materials adequate for the service conditions and the ability of the gasket to resist “cold flows.” Gaskets that “cold flow” will allow torque relaxation which will cause low bursts. Contact BS&B if an alternative gasket type is used.
3. Install studs with nuts. Studs with nuts should be free running with lightly oiled threads. Tighten all nuts finger tight. Torque the nuts to the value shown in Table I. **Torque evenly in a diagonal pattern** by applying 1/4 of the recommended torque to each stud. Repeat pattern by torquing to 3/4 of the recommended torque value. Then using same pattern torque to full specified torque value.
4. Make sure flanges are not “cocked”. Use feeler gauge if necessary to assure even spacing all around. **DO NOT OVERTORQUE.** Angular seating surfaces help to seal disk with minimum bolt loading. Excessive tightening may damage the rupture disk.
5. The torque value on the companion flange nuts should be verified periodically at the system service temperature.

Note: All torque values are for compressed fiber gaskets. **DO NOT USE SPIRAL WOUND GASKETS.**
Bolted Type Safety Heads

1. Place inlet of Safety Head on work surface as shown, with \textit{flow arrow up}.

2. Place NEW, UNDAMAGED rupture disk on inlet flange with dome facing up. System pressure must be against concave side of disk.

3. Carefully place outlet flange in position as shown. \textit{Flow arrows on both flanges must point in the same direction.}

4. Install compressed fiber gaskets between Safety Head and mating pipe flanges. See page 2 for BS&B gasket recommendations. System pressure must be against concave side of disk. \textit{Ensure flow arrows on the Safety Head point in the desired flow direction upon disk rupture.}

   Contact BS&B if an alternative gasket type is used.

5. Install studs with nuts. Studs with nuts should be free running with lightly oiled threads. Tighten all nuts finger tight. Torque the nuts to the value shown in Table I. \textit{Torque evenly in a diagonal pattern} by applying 1/4 of the recommended torque to each stud. Repeat pattern by torquing to 3/4 of the recommended torque value. Then using same pattern torque to full specified torque value.

   Make sure flanges are not “cocked”. Use feeler gauge if necessary to assure even spacing all around. DO NOT OVERTORQUE. Angular seating surfaces help seal disk with minimum bolt loading. Excessive tightening may damage rupture disk.

   If using a Full Bolted Type Safety Head which is not placed between companion pipe flanges, select torque from Torque Table I by using the Safety Head size and flange rating.
### TORQUE TABLE I

**TYPE B OR D SERIES IN FA-7R AND BOLTED TYPE SAFETY HEAD ASSEMBLIES**

(Angular Seat, Light and Heavy Lip)**

<table>
<thead>
<tr>
<th>IN. ANSI</th>
<th>SAFETY HEAD RATING</th>
<th>METAL WITH PLASTIC SEALS TORQUE IN. ANSI (FT-LB)</th>
<th>ALL METAL CONSTRUCTION TORQUE</th>
<th>NICKEL, ALUMINUM &amp; DISKS WITH PLASTIC LINERS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TYPE D</strong></td>
<td><strong>TYPE B</strong></td>
<td><strong>INCONEL, MONEL, HASTELLOY AND 316 SS</strong></td>
<td><strong>LIGHT (L) LIP</strong></td>
<td><strong>HEAVY (H) LIP</strong></td>
</tr>
<tr>
<td><strong>NICKEL, ALUMINUM, &amp; DISKS WITH PLASTIC LINERS</strong></td>
<td><strong>INCONEL, MONEL, HASTELLOY AND 316 SS</strong></td>
<td><strong>LIGHT (L) LIP</strong></td>
<td><strong>HEAVY (H) LIP</strong></td>
<td><strong>INCONEL, MONEL, HASTELLOY AND 316 SS</strong></td>
</tr>
</tbody>
</table>

**Notes:**
1. 12 inch pounds = 1 Foot Pound.
2. Torque values are based on free running and lightly oiled threads.
3. Torque values are for use with companion flanges that have a minimum yield strength of 25,000 PSI. Consult BS&B when using other flange material such as glass lined, when suppliers recommend a maximum torque value which is lower than BS&B required torque value.
4. If using a Full Bolted Type Safety Head which is not placed between companion flanges, select torque from Torque Table I by using the Safety Head flange rating.

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*Consult BS&B for torque.*

**For Flat Seat (F) Disks consult BS&B for torque values.

***Flange diameter and stud size per MSS Specification SP-44.

Notes:
1. 12 inch pounds = 1 Foot Pound.
2. Torque values are based on free running and lightly oiled threads.
3. Torque values are for use with companion flanges that have a minimum yield strength of 25,000 PSI. Consult BS&B when using other flange material such as glass lined, when suppliers recommend a maximum torque value which is lower than BS&B required torque value.
4. If using a Full Bolted Type Safety Head which is not placed between companion flanges, select torque from Torque Table I by using the Safety Head flange rating.

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*Consult BS&B for torque.*

**For Flat Seat (F) Disks, consult BS&B for torque values.
### Union Type Installation Instructions

1. Place inlet connection in position as shown, with *flow arrow up*. (Flow arrow on Union Type Safety Head is on the assembly nut.)

2. Place NEW, UNDAMAGED rupture disk on inlet connection with dome facing up. System pressure must be against concave side of disk.

3. Carefully place outlet connection in position as shown.

4. Slip assembly nut over outlet connection as shown. Torque to the values in Table II.

5. Insert the Safety Head in the pressure system. *Ensure flow arrows on the Safety Head point in the desired flow direction upon disk rupture.*

6. Affix rupture disk tag to Safety Head Assembly after installation to identify disk in service.

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### TORQUE TABLE II

**TYPE B or D SERIES IN UNION TYPE SAFETY HEAD ASSEMBLIES**

<table>
<thead>
<tr>
<th>SIZE</th>
<th>MAXIMUM RATING</th>
<th>TORQUE FT-LBS.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LBS.</td>
<td>DISK PRESSURE PSID</td>
</tr>
<tr>
<td>0.5</td>
<td>3000</td>
<td>50 50 50 50 50</td>
</tr>
<tr>
<td></td>
<td>6000</td>
<td>50 50 50 80 120</td>
</tr>
<tr>
<td>1</td>
<td>1500</td>
<td>100 100 150 -</td>
</tr>
<tr>
<td></td>
<td>3000</td>
<td>100 100 150 -</td>
</tr>
<tr>
<td></td>
<td>6000</td>
<td>120 120 150 175 240</td>
</tr>
<tr>
<td>1.5</td>
<td>3000</td>
<td>150 250 300 350 -</td>
</tr>
<tr>
<td>2</td>
<td>1200</td>
<td>200 600 600 -</td>
</tr>
</tbody>
</table>

### METRIC UNITS

**TORQUE TABLE II**

**TYPE B or D SERIES IN UNION TYPE SAFETY HEAD ASSEMBLIES**

<table>
<thead>
<tr>
<th>SIZE</th>
<th>MAXIMUM RATING</th>
<th>TORQUE NT-M</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BARS</td>
<td>DISK PRESSURE BARG</td>
</tr>
<tr>
<td>13</td>
<td>207</td>
<td>68 68 68 68 68</td>
</tr>
<tr>
<td></td>
<td>414</td>
<td>68 68 68 108 163</td>
</tr>
<tr>
<td>25</td>
<td>103</td>
<td>136 136 203 -</td>
</tr>
<tr>
<td></td>
<td>207</td>
<td>136 136 203 -</td>
</tr>
<tr>
<td></td>
<td>414</td>
<td>163 163 203 237 325</td>
</tr>
<tr>
<td>40</td>
<td>207</td>
<td>203 339 407 475 -</td>
</tr>
<tr>
<td>50</td>
<td>83</td>
<td>271 813 813 -</td>
</tr>
</tbody>
</table>

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Screw Type Installation Instructions

1. Place inlet connection in position as shown, with flow arrow up.
2. Place NEW, UNDAMAGED rupture disk on inlet connection with dome facing up. System pressure must be against concave side of disk.
3. Insert seat ring on top of rupture disk before placing outlet connection in position.
4. Screw outlet connection to inlet connection as shown. Torque to the values in Table III.
5. Insert the Safety Head in the pressure system. Ensure flow arrows on the Safety Head point in the desired flow direction upon disk rupture.
6. Affix rupture disk tag to Safety Head Assembly after installation to identify disk in service.

TORQUE TABLE III
TYPE B or D SERIES IN SCREW TYPE SAFETY HEAD ASSEMBLIES

<table>
<thead>
<tr>
<th>SIZE</th>
<th>MAXIMUM RATING</th>
<th>DISK PRESSURE</th>
<th>TORQUE FT-LBS.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IN</td>
<td>0-1000</td>
<td>1001-3000</td>
</tr>
<tr>
<td>11/16 (F)</td>
<td>1000</td>
<td>50</td>
<td>-</td>
</tr>
<tr>
<td>1/2 (A)</td>
<td>3000</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>1/2 (F)</td>
<td>10,000</td>
<td>50</td>
<td>80</td>
</tr>
<tr>
<td>7/16 (F)</td>
<td>20,000</td>
<td>50</td>
<td>60</td>
</tr>
</tbody>
</table>

TORQUE TABLE III
TYPE B or D SERIES IN SCREW TYPE SAFETY HEAD ASSEMBLIES
METRIC UNITS

<table>
<thead>
<tr>
<th>SIZE</th>
<th>MAXIMUM RATING</th>
<th>DISK PRESSURE</th>
<th>TORQUE NT-M</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MM</td>
<td>0-69</td>
<td>70-207</td>
</tr>
<tr>
<td>17 (F)</td>
<td>69</td>
<td>68</td>
<td>-</td>
</tr>
<tr>
<td>13 (A)</td>
<td>207</td>
<td>68</td>
<td>68</td>
</tr>
<tr>
<td>13 (F)</td>
<td>689</td>
<td>68</td>
<td>108</td>
</tr>
<tr>
<td>11 (F)</td>
<td>1379</td>
<td>68</td>
<td>81</td>
</tr>
</tbody>
</table>
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ISO 9001 Quality System

Patent number 4819823 and other international patents

BS&B Safety Systems, Inc. and BS&B Safety Systems Ltd. are here to assist you in providing a safe and efficient work place. For assistance on installation, audits, training or technical advice, please contact our Customer Service Department.

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