

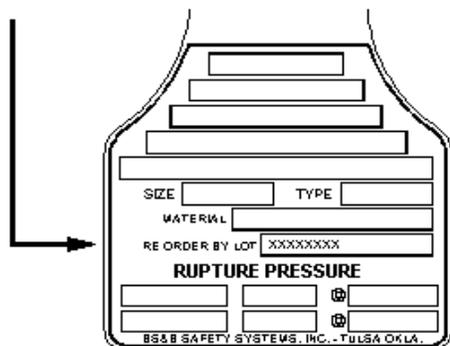


BS&B SAFETYSYSTEMS, INC.  
BS&B SAFETYSYSTEMS LTD.

# RB-90 RUPTURE DISK, RB-7R, RB-7FF AND RB-7FS SAFETY HEAD INSTALLATION INSTRUCTIONS

BULLETIN  
77-40061

- ◆ NEW INSTALLATIONS
- ◆ REPLACEMENT OF DISKS IN EXISTING INSTALLATIONS
- ◆ ORDER REPLACEMENT DISKS BY LOT NUMBER.



## Select Proper Location for the RB-90 Assembly.

1. **CAUTION - Vent to safe area.**  
Check the location. Do not locate where personnel or property could be exposed to product being discharged through the Safety Head. Any equipment or property in the vicinity of discharge could be damaged.
2. Consider recoil or "kick-back." Recoil is the force the system will experience upon rupture. Recoil is approximately twice the disk rating (psig) times the relief area (in.<sup>2</sup>). Provide adequate support for piping and connections. If the discharge is free-vented, a baffle plate mounted on the Safety Head outlet with extra length studs will minimize recoil.
3. Provide adequate support for the downstream vent piping. The rupture disk should not be subjected to excessive structural bending stresses.

## Before You Install The Rupture Disk:

1. **Inspect Flange**  
Clean seating surfaces of both Safety Head flanges before installing rupture disk. Pits, dirt, or grit can damage rupture disk or cause leakage. If surfaces are rough, polish with a fine emery cloth. **DO NOT MACHINE!** Dimensions of the Safety Head are critical **DO NOT ALTER THEM.**
2. **Inspect Knife Blades.**  
Check knife blades in outlet flange for sharpness. Dullness may affect rupture disk performance. If slightly dull or nicked, sharpen with a mill file or stone. If



RB-7R  
SAFETY HEAD ASSEMBLY

nicks cannot be filed out, the replace outlet flange. When penetration points are attached to the knife blades, they must be sharp and not bent.

3. **Inspect Rupture Disk**  
Handle rupture disk carefully - it is a precision instrument. Examine seating and prebulged surfaces before installing. **DO NOT INSTALL THE DISK IF THERE IS ANY DAMAGE IN THE DOME.** A damaged disk is any disk with visible nicks, dents, or scratches that show through. It must not be installed. Installation of a damaged disk may result in premature rupture of the disk.
4. The Safety Head size and ANSI bolting must match the companion flange size and ANSI rating.
5. Flange and disk materials should be compatible with your process.

**CAUTION** Do not reinstall a disk that has been removed from a Safety Head fitting, even though it has not been ruptured. When stresses are relieved by unbolting, the "set" taken by the disk during its original installation may prevent a tight seal and affect performance if reinstalled, RB-7FS assemblies may only be removed from service and re-installed provided the preassembly capscrews are not removed and the disk is in good condition.

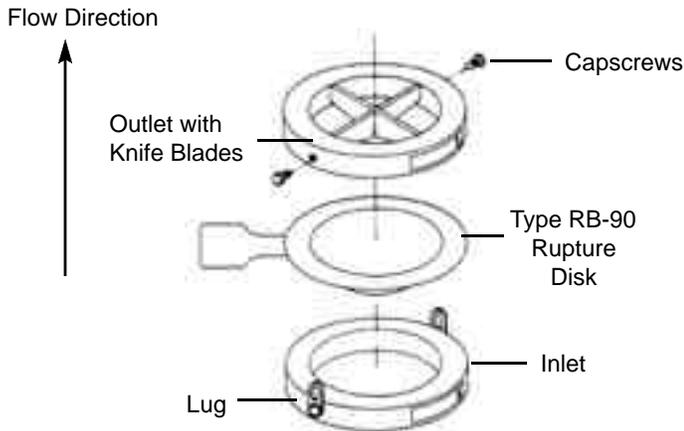
**NOTE: Install RB-90 Rupture Disks in RB-7R, RB-7FF, or RB-7FS Safety Heads only.**

See our web site at [www.bsbsystems.com](http://www.bsbsystems.com) for updates

# RB-7R Quik-Sert Installation Instructions

## PREASSEMBLE YOUR ASSEMBLY

NOTE: Undertorque can cause low reversal.  
Excessive overtorque can cause disk damage.



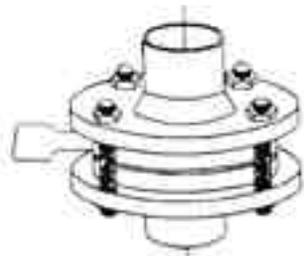
### SAFETY HEAD ASSEMBLY TYPE RB-7R

1. Place inlet flange in position as shown, with flow arrow up.
2. Place NEW, UNDAMAGED rupture disk on inlet flange with dome facing down.
3. Carefully place outlet flange with knife blades in position as shown. Flow arrows on both flanges must point in the same direction.
4. Assemble unit with alignment bars and capscrews. Tighten capscrews sufficiently to hold disk snugly in place between the two flanges.

### Install The RB-7R Preassembly

1. Insert the RB-7R Safety Head in the pressure system. MAKE SURE FLOW ARROW ON FLANGE POINTS THE DIRECTION YOU WANT FLOW TO OCCUR UPON RUPTURE. CONCAVE SIDE OF DISK MUST BE AWAY FROM PROCESS.

### RB-7R INSTALLED IN COMPANION FLANGE



The RB-7R nestles inside the bolting pattern of ANSI pipe flanges.

2. Install gaskets between RB-7R Safety Head and mating pipe flanges. BS&B recommends a compressed fiber gasket no greater than 1/32 of an inch thick for this application. However, the user is cautioned to select gasket materials adequate for the service conditions and the ability of the gasket to resist "cold flow." Gaskets that "cold flow" will allow torque relaxation which will cause low reversal.
3. Install studs with nuts. Tighten all nuts fingertight before torquing. Evenly torque the studs to the values in Table I. Even torque can be achieved by applying 1/4 of desired final torque to each stud. Repeat pattern by torquing to 3/4 of the desired final torque. Then, using same pattern, torque to full specified torque.

## TORQUE TABLE I COMPANION FLANGE TORQUE FOR RB-7R, RB-7FF and RB-7FS

SIZE	ANSI RATING	FLANGE STUD TORQUE (FT.-LB.) DISK MATERIAL		
		ALUMINUM PLAIN OR PLASTIC LINED	ALL OTHER METALS PLASTIC LINED	ALL OTHER METALS PLAIN
1	150	20	25	30
	300/600	40	50	60
	900/1500	-	155	175
1.5	150	20	30	35
	300/600	80	100	120
	900/1500	-	225	270
2	150	40	50	60
	300/600	40	50	60
	900/1500	-	155	175
3	150	60	75	90
	300/600	80	100	120
	900	-	155	175
4	150	40	50	60
	300	80	100	120
	600	120	150	180
	900	-	310	345
6	150	80	100	120
	300	80	100	120
	600	180	225	270
8	150	80	100	120
	300	120	150	180
	600	270	340	400
10	150	120	150	180
	300	180	225	270
	600	390	490	585
12	150	150	150	180
	300	300	340	400
	600	600	490	585
14	150	150	225	270
	300	300	340	400
	600	600	490	585
16	150	180	225	270
	300	390	490	585
	600	700	875	1050
18	150	270	340	400
	300	390	490	585
20	150	270	340	400
	300	390	490	585
24	150	390	490	585
	300	700	875	1050
30	150	390	490	585
	300	1150	1450	1700
36	150	700	875	1050
	300	1700	2200	2500

### 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.

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

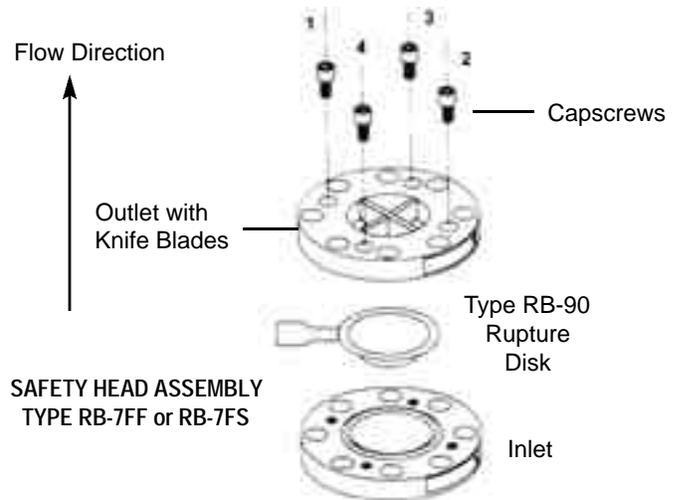
**TORQUE TABLE I-A  
COMPANION FLANGE TORQUE  
FOR RB-7R, RB-7FF AND RB-7FS  
METRIC UNITS**

SIZE	SAFETY HEAD RATING	FLANGE STUD TORQUE (NT-M) DISK MATERIAL		
		ALUMINUM PLAIN OR PLASTIC LINED	ALL OTHER METALS PLASTIC LINED	ALL OTHER METALS PLAIN
MM	DIN			
25	10/16	27	34	41
	25/40	41	52	61
40	10/16	34	52	61
	25/40	91	115	135
50	10/16	54	68	81
	25/40	108	135	163
80	10/16	41	52	61
	25/40	91	115	135
100	10/16	54	68	81
	25/40	115	142	169
150	10/16	115	142	169
	25/40	203	258	305
200	10	114	142	169
	16	75	95	115
	25	176	217	264
	40	197	251	298
250	10	149	183	217
	16	176	220	263
	25	346	434	518
	40	386	481	576
300	10	183	183	217
	16	176	220	263
	25	386	434	515
	40	427	481	569
350	10	122	183	217
	16	142	217	251
	25	536	617	712
	40	590	664	800
400	10	230	291	346
	16	251	325	386
	25	685	861	1030
	40	752	942	1125
500	10	305	386	454
	16	386	476	569
	25	658	827	990
	40	780	983	1173
600	10	447	563	678
	46	556	685	820
	25	1078	1349	1613

**NOTES:**

- Torque values are based on free running and lightly oiled threads
- 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, or when suppliers recommend a maximum torque value which is lower than BS&B required torque value.

**RB-7FF or RB-7FS Full-Bolted  
Installation Instructions  
PREASSEMBLE YOUR ASSEMBLY**



SAFETY HEAD ASSEMBLY  
TYPE RB-7FF or RB-7FS

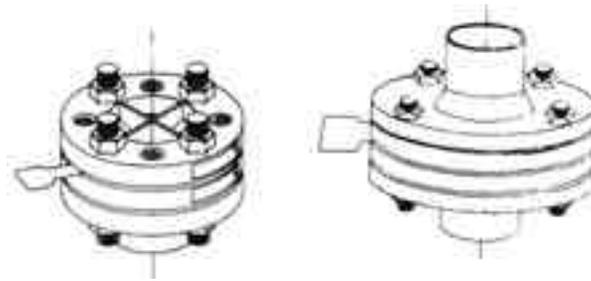
- Place inlet flange in position as shown, with flow arrow up.
- Place NEW, UNDAMAGED rupture disk on inlet flange with dome facing down.
- Carefully place outlet flange with knife blades in position as shown. Flow arrows on both flanges must point in the same direction.
- Assemble unit with recessed cap screws. 12 point high strength cap screws are supplied with the RB-7FS assembly. DO NOT SUBSTITUTE. A 12 point socket is required for preassembling the cap screws into the recess. Tighten all cap screws finger-tight before torquing.
- For the RB-7FF Assembly the cap screws should be sufficiently tight to hold the disk snugly in place between the two flanges.
- For the RB-7FS Assembly, evenly torque the cap screws to the value listed in Torque Table II. As an example on a RB-7FS 1" Head, even torque can be achieved by applying 1/4 of the desired final torque to cap screw (1) then apply 1/4 of desired final torque to cap screw (2), then apply 1/4 of desired final torque to cap screw (3) then apply 1/4 of the desired final torque to cap screw (4). Continue pattern until all cap screws have the same torque. Repeat the pattern by torquing to 3/4 of the desired final torque. Then, using same pattern, torque to final specified torque as in Table II.

**Install The RB-7FF or RB-7FS Preassembly**

- Insert the preassembled RB-7FF or RB-7FS Safety Head in the pressure system. MAKE SURE FLOW ARROW ON FLANGE POINTS THE DIRECTION YOU WANT FLOW TO OCCUR UPON RUPTURE CONCAVE SIDE OF DISK MUST BE AWAY FROM PROCESS.

The RB-7FS bolts to mating ANSI pipe flanges with the same bolting pattern. The RB-7FF bolts to mating ANSI inlet flange. Outlet is free vented.

- Install studs with nuts. Tighten all nuts finger-tight before torquing. Evenly torque the studs to the values in Table I. Even torque can be achieved by applying 1/4 of desired final torque to each stud. Repeat pattern by torquing to 3/4 of the desired final torque. Then, using same pattern, torque to full specified torque.



**RB-7FF INSTALLED IN  
COMPANION FLANGE**

**RB-7FS INSTALLED IN  
COMPANION FLANGES**

**TORQUE TABLE II  
RB-7FS PREASSEMBLY TORQUE**

SIZE		SAFETY HEAD FLANGE RATING		PREASSEMBLY CAPSCREW TORQUE				12-POINT SOCKET SIZE
				ALUMINUM		OTHER		
IN	MM	ANSI	DIN	FT-LB	NT-M	FT-LB	NT-M	IN
1	25	150	10/16	12	16	15	20	1/4
		300/600	25/40	13	18	17	23	1/4
		900/1500	~	48	65	60	81	3/8
1.5	40	150	10/16	13	18	17	23	1/4
		300/600	25/40	27	37	34	46	5/16
		900/1500	~	52	70	65	88	3/8
2	50	150	10/16	25	34	32	43	5/16
		300/600	25/40	52	70	65	88	3/8
		900/1500	~	82	111	102	138	7/16
3	80	150	10/16	44	60	55	74	3/8
		300/600	25/40	27	37	34	46	5/16
		900/1500	~	52	70	65	88	3/8
4	100	150	10/16	22	30	28	38	5/16
		300	25/40	40	54	50	68	3/8
		600	~	52	70	65	88	3/8
		900	~	120	163	150	203	1/2
6	150	150	10/16	27	37	34	46	5/16
		300	25/40	52	70	65	88	3/8
		600	~	120	163	150	203	1/2
8	200	150	10	48	65	60	81	3/8
		300	16/25/40	52	70	65	88	3/8
		600	~	120	163	150	203	1/2
10	250	150	10	52	70	65	88	3/8
		300	16/25/40	82	111	102	138	7/16
		600	~	200	271	250	339	5/8
12	300	150	10	52	70	65	88	3/8
		300	16/25/40	120	163	150	203	1/2
		600	~	110	149	140	190	1/2
14	350	150	10	80	108	100	136	7/16
		300	16/25/40	120	163	150	203	1/2
		600	~	240	325	300	407	5/8
16	400	150	10	110	149	135	183	1/2
		300	16/25/40	195	264	245	332	5/8
		600	~	350	475	440	597	3/4
18	450	150	N/A	120	163	150	203	1/2
		300	N/A	195	264	245	332	5/8
20	500	150	10	120	163	150	203	1/2
		300	16/25/40	195	264	245	332	5/8
24	600	150	10	190	258	240	325	5/8
		300	16/25	350	475	440	597	3/4
30	750	150	N/A	190	264	240	325	5/8
		300	N/A	335	454	420	569	3/4
36	900	150	N/A	240	325	300	407	5/8
		300	N/A	670	908	840	1139	7/8

## SERVICE CONDITIONS AND APPLICATIONS

### Acceptable Applications

1. Where the RB-90 is located in gas phase. Gaseous pressurized systems, or liquid systems pressurized by gas.

At 40 psig burst rating or below, operating pressures may be used up to 90% rated disk pressure less 2 psig burst tolerance.

### Unacceptable Applications

1. Where the RB-90 is located in all liquid system.

## MAINTENANCE

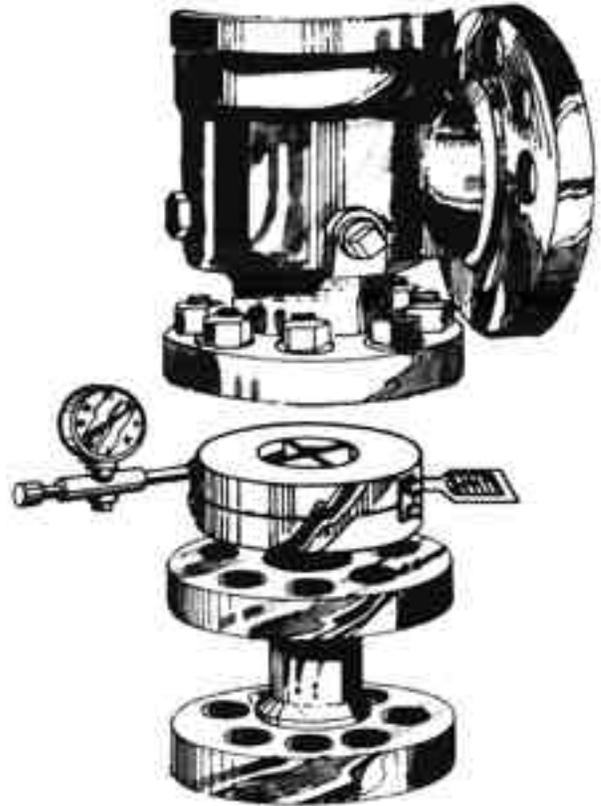
Corrosion and service conditions may affect disk life, thus requiring periodic change. Regular disk inspection is advised every 3 months to insure that corrosion, creep, etc., are not a threat to predictable performance.

For longer service life and lower maintenance, the STA-SAF® SYSTEM (type S-90, JRS and RLS Rupture Disks) is recommended

## SAFETY RELIEF VALVE ISOLATION Telltale Assemblies

ASME Code requires that the space between a rupture disk device and a Safety or Relief Valve shall be provided with a pressure gauge, a trycock, free vent, or a suitable telltale indicator.

The telltale indicator assembly detects and prohibits any pressure buildup between valve seat and rupture disk. Assembly includes tapped opening in outlet flange of Safety Head, 1/4" nipple and tee, pressure gauge and excess flow valve. Any leakage into the chamber between disk and valve plug will discharge to atmosphere or through lead-off line to a safe location.



Refer to BS&B catalog 77-1006 for more detailed application data for Relief Valve Isolation.

## LIMITATIONS OF WARRANTIES

BS&B Safety Systems, Inc. warrants its products against defective workmanship and material under normal and proper use in service for a period of twelve (12) months from the date of shipment, when owned by the original buyer and only when subject to normal operating conditions outlined by Buyer when the order is placed; except that, rupture disks are not guaranteed except to burst within specified pressure ranges at temperatures specified at the time of sale.

Where the products involved include a rupture disk inside a rupture disk holder, each must be of the proper type to be utilized with its mating part as otherwise recommended by and manufactured by BS&B. BS&B specifically disclaims any warranty and any and all liability for damages, either direct or indirect, incidental or consequential, arising from the use of rupture disk assemblies not wholly comprised of BS&B manufactured products.

Any article not manufactured by BS&B and which is sold hereunder is sold only under such warranties as the manufacturer thereof extends to BS&B and which BS&B can pass through to the Buyer and enforce with reasonable effort.

Because of the effects of corrosion or erosion caused by acids, chemicals, fumes, rust, dirt, debris and other factors of storage, use, and installation, over which BS&B has no control, BS&B makes no other warranties beyond those expressly stated in this limited warranty.

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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.

BS&B Safety Systems, Inc.  
7455 East 46th Street  
Tulsa, OK 74145  
Telephone: 918-622-5950  
Facsimile: 918-665-3904  
[www.bsbsystems.com](http://www.bsbsystems.com)

or

BS&B Safety Systems Ltd.  
Raheen Business Park  
Raheen, Limerick, Ireland  
Telephone: +353 61 227022  
Facsimile: +353 61 227987  
[www.bsb.ie](http://www.bsb.ie)