



Read Before Use



BS&B SAFETY SYSTEMS, L.L.C.
BS&B SAFETY SYSTEMS LTD

Installation Instructions

Bulletin 77-5003I



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Type XN-85™, XN™, LCN-Plus™ Rupture Disks NX-7R™, NXV-7R™, NF-7R™, NF-7RS™ Safety Heads and Double Disk Assemblies Also for use with GFN™ and LCN™ rupture disks

Warning: Rupture Disks are 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. **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 Safety Systems, L.L.C. and BS&B Safety Systems Ltd. supply disks selected by their customers, which are manufactured in reliance upon information and specifications supplied by the customer. BS&B Safety Systems, L.L.C. and BS&B Safety Systems Ltd. are not liable for any damage resulting from improper installation, improper system design, unsafe venting, or other factors beyond BS&B Safety Systems, L.L.C. and BS&B Safety Systems Ltd. control. Do not locate the Rupture Disk device where personnel, equipment or property will be exposed to released product and pressure through the disk. Handle carefully, disk and tag may have sharp edges.

Order Replacement Disks by Lot Number (shown on disk tag).

1. Inspect Safety Head.

Inspect Safety Head's mating surfaces for foreign material. Pits, dirt or grit can damage the rupture disk affecting disk performance or cause leakage. If surfaces are rough, polish with fine emery cloth. Clean if necessary. Inspect safety head bore for product build up or corrosion.

- ◆ Do not install a damaged Safety Head (holder). Installation of a damaged Safety Head (holder) may effect pressure containment and/or disk performance.
- ◆ Do not machine Safety head holder, dimensions are critical.
- ◆ Safety Head size and pressure rating must match the companion flange size and rating at operating temperatures.


2. Inspect the Pipe Flanges.

Ensure pipe flanges are parallel to a sufficient standard that will permit proper functioning of the rupture disk.

3. Inspect the Rupture Disk.

Do not remove the rupture disk from packaging for inspection until ready to install.

Handle the rupture disk carefully as disk and tag have sharp edges. Hold 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.

For  marked disks, the disk tag identifies the Safety Head (holder) types that may be used.

- ◆ Do not install a damaged disk. Installation of a damaged disk can cause leakage and/or may result in premature bursting of the disk.
- ◆ Check the burst pressure and temperature of disk to that required by the application. An incorrect burst pressure may result in a premature disk failure or the design pressure of the vessel exceeded.




Type LCN™ Series
Composite Rupture Disks

Type XN-85™ Series
Solid Metal Rupture Disks

- ◆ The burst pressure must not exceed the Safety Head rating at operating temperatures. The rupture disk size must match the size of the Safety Head.

Rupture Disk	Use in Safety Head Type
XN™	NX-7R™
XN-85™	NF-7R, NF-7RS™
XN-85S™	NX-7R™
LCN™	NX-7R, NXV-7R™
LCN Plus™	NX-7R, NXV-7R™
GFN™	NF-7R, NF-7RS™

For  marked disks, the safety head tag identifies holder types:

NX-7R™ and NXV-7R™ - Type N
NF-7R™ and NF-7RS™ - Type NF

Safety Precautions - Caution

- Only competent trained personnel should install rupture disk safety devices in accordance with these installation instructions.
- Consider Recoil. Provide adequate support for piping and connections to absorb recoil /reaction forces when the disk ruptures. Recoil is the force the system will experience upon disk rupture. Recoil (lbs.) is approximately twice the disk's burst pressure (psig) times the relief area (in²). If the discharge is free vented a baffle plate may be mounted downstream of the outlet companion pipe flange with extra length studs to minimize recoil.
- If disks are liquid or steam cleaned and a high velocity particle spray or jet is used, take care not to damage the disk.
- Where a disk is mounted upstream of a pressure relief valve or safety valve ensure that the opening of the disk does not interfere or effect the performance of the valve.
- Where a disk is mounted upstream of a pressure relief valve or safety valve ensure that a means is provided to prevent pressure build-up in inter-space in event of disk leakage.
- When a disk ruptures, ensure that the opening of the disk does not affect the performance of downstream equipment. The bursting of the disk may result in a pressure shock wave.
- The Rupture Disk and Safety Head must not be modified in any way except with the approval of BS&B Safety Systems, L.L.C or BS&B Safety Systems Ltd. Un-approved modification may effect pressure containment and/or disk performance. Failure to obtain such approval voids the warranty on this product.
- The Rupture Disk and Safety Head material must be compatible with your process.
- Corrosion and process conditions may deteriorate disk performance and necessitate replacement.
- Do not reinstall a disk that has been removed from the piping system unless used in a pre-torqued Safety Head (NF-7RS™). Removing the rupture disk from the Safety Head relieves the stresses in the disk, the disk can never resume its original installed condition, which may prevent sealing and effect disk performance if re-installed.
- The burst pressure of a rupture disk is effected by temperature. Ensure that the disk burst pressure variation due to temperature is compatible with the system operating pressure and temperature conditions.
- A rupture disk is a differential pressure sensitive device. Where a back-pressure exists on a disk, this must be considered during the specification of the rupture disk burst pressure.
- Ensure gasket materials adequate for the service conditions including the ability of the gasket to resist "cold flow". Gaskets that cold flow will allow torque relaxation which may prevent sealing and effect disk performance. (The burst pressure of disks installed in pre-torqued Safety Heads, NF-7RS™ is un-affected.)
- Do not locate the disk where it may be subjected to thermal shock. Moisture, rain, condensation or snow may cause a thermal shock to the disk causing the disk to burst below its rated pressure.

Installation of Rupture Disk in a Quik-Sert™ Safety Head. Safety Head Types : NX-7R™, NXV-7R™ & NF-7R™

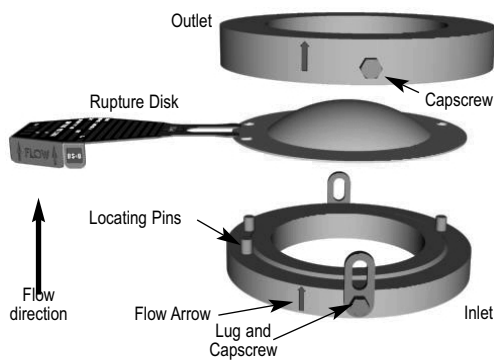


Figure 1
Type NX-7R™ Safety Head

For types XN™, LCN™, LCN Plus™, XN-85S™ disks

1. Place inlet of Safety Head on a work surface in position shown in diagram with flow arrows and location pins up.
2. Place NEW, UNDAMAGED rupture disk on inlet flange so locating pins mate with the corresponding holes in the rupture disk. Flow arrows on disk tag should indicate direction of flow.
3. Carefully align and place outlet flange in position as shown.

Ensure flow arrows on the disk tag and on the Safety Head point in the same direction.

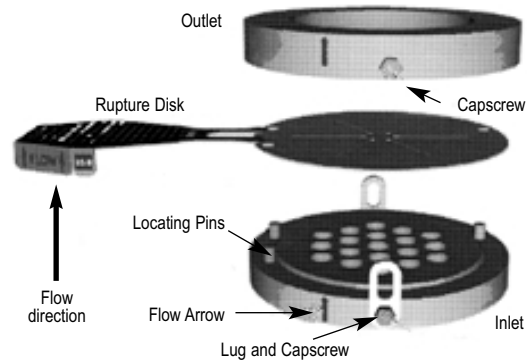


Figure 1A

Type NXV-7R™ Safety Head with integral dial vacuum support
For types LCN™, LCN Plus™ rupture disks only

4. Assemble unit with alignment lugs and capscrews. Tighten capscrews only sufficiently to hold disk snugly in place between the two flanges.

Note:

The type NXV-7R™ Safety Head (Figure 1A) has an integral dial vacuum support in the inlet flange. The NXV-7R™ Safety Head is recommended for use with type LCN™, LCN Plus™ disks ONLY. The free flow area will be reduced to Net Flow Area stamped on the Safety Head tag.

Installation of Quik-Sert™ Safety Head in Pressure System

(Please note that Quik-Sert™ Safety Heads are not pre-torqued holders)

NX-7R™ INSTALLED BETWEEN COMPANION PIPE FLANGE

The NX-7R™ nestles
inside the bolting pattern
of pipe flanges.

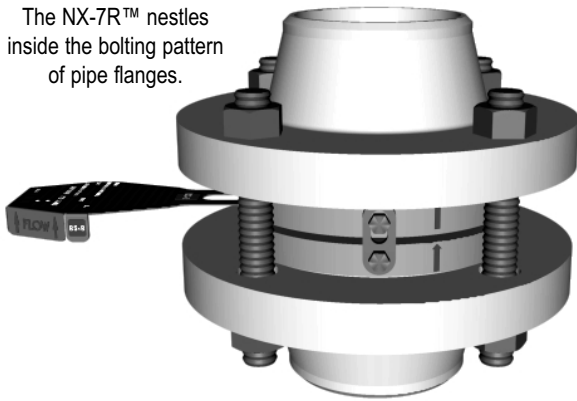


Figure 2

NF-7R™ INSTALLED BETWEEN COMPANION PIPE FLANGE

The NF-7R™ nestles
inside the bolting pattern
of pipe flanges.

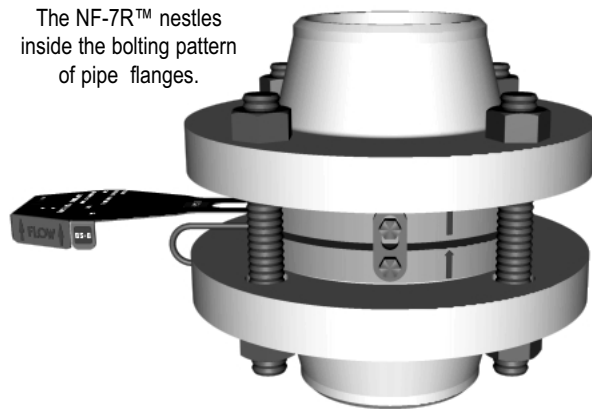


Figure 3

1. Insert Safety Head assembly into pressure system between companion pipe flanges. The Quik-Sert™ centers inside the bolting pattern of pipe flanges. (Refer to Figure 2).

Ensure flow arrows on disk tag and Safety Head point in desired flow direction upon disk rupture.

Note:

The NF-7R™ is fitted with a J-Bolt which prevents the Safety Head from being installed incorrectly with respect to flow (see Figure 3). The inlet companion flange must be radially drilled to accept the J-Bolt. Table D lists companion flange drilling dimensions. Locate the J-Bolt in the drilled hole. Do not remove or damage the J-Bolt.

2. Install gaskets between Quik-Sert™ Safety Head and companion pipe flanges. A hard compressed fibre gasket of 1/16" (1.6mm) or 1/8" (3mm) thick is recommended.

CAUTION:

Ensure gasket materials are adequate for the service conditions including the ability of the gasket to resist "cold flow". Gaskets that cold flow will allow torque relaxation which may prevent sealing and effect disk performance.

Contact BS&B Safety Systems, L.L.C or BS&B Safety Systems Ltd if an alternative gasket type is used, or for advice on the use of spiral wound gaskets.

3. Install studs with nuts which should be free-running with lightly oiled threads. Tighten all nuts finger tight.

4. Torque the nuts to value shown in Table A. Torque evenly in a diagonal pattern by applying 1/4 of recommended torque to each stud. Repeat pattern by torquing to 3/4 of recommended torque value. Then using same pattern torque to full-specified torque value. Do not exceed the specified torque value.

CAUTION:

Uneven or under-torquing can cause leakage and/or may effect burst pressure. Excessive torquing can damage the disk and Safety Head.

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 fibre gaskets.

WARNING:

Should the NXV-7R™ safety head be installed upside down, the rupture disk can not function to relieve pressure. The design pressure of the vessel may be exceeded.

Table A (continued on next page)
NX-7R™ / NXV-7R™ / NF-7R™ Safety Head and Double Disk Assemblies
Companion Flange Torques

DISK SIZE		SAFETY HEAD COMPANION FLANGE RATING				COMPANION FLANGE STUD TORQUE			
						DISK MATERIAL			
IN	MM	ANSI CL	DIN PN AND BS4504 3.1 PN	JIS PN	BS 10 TABLE	ALUMINUM		OTHER	
						FT-LBS	NM	FT-LBS	NM
1	25	150	10/16	-	D/E	20	27	20	27
1	25	-	-	10/16/20	-	25	34	25	34
1	25	-	25/40	-	-	-	-	20	27
1	25	300/600	-	-	F	-	-	40	54
1	25	-	-	30/40	-	-	-	25	34
1 1/2	40	150	-	-	D/E	20	27	25	34
1 1/2	40	-	10/16	10/16/20	-	25	34	32	43
1 1/2	40	-	25/40	-	F	-	-	46	62
1 1/2	40	300/600	-	-	-	-	-	80	108
1 1/2	40	-	-	30/40	-	-	-	90	122
2	50	150	10/16	10	D/E	40	54	40	54
2	50	-	-	16	-	25	34	46	62
2	50	-	25/40	20/30/40	F	-	-	46	62
2	50	300/600	-	-	-	-	-	40	54
3	80	150	-	-	D/E	40	54	50	68
3	80	-	10/16	10	-	20	27	25	34
3	80	-	-	16	-	60	80	90	122
3	80	-	25/40	-	F	-	-	46	62
3	80	300	-	-	-	-	-	80	108
3	80	-	-	20/30/40	-	-	-	90	122
4	100	150	10/16	10	F	40	54	45	61
4	100	-	-	-	D/E	50	68	50	68
4	100	-	-	16	-	50	68	90	122
4	100	300	25/40	20	-	-	-	90	122
4	100	-	-	30/40	-	-	-	124	168
6	150	150	10/16	10	E	80	108	95	129
6	150	-	-	16/20	-	92	125	124	168
6	150	-	-	-	D	50	68	50	68
6	150	-	25/40	30	-	-	-	155	210
6	150	300	-	-	F	-	-	95	129
6	150	-	-	40	-	-	-	230	311
8	200	150	10	-	E	80	108	95	129
8	200	-	16	10/16/20	F	-	-	64	86
8	200	-	25	30	-	-	-	140	189
8	200	-	40	40	-	-	-	157	212
8	200	-	-	-	D	50	68	50	68
8	200	300	-	-	-	-	-	122	165
10	250	150	-	-	F	100	136	125	170
10	250	300	-	-	-	-	-	188	255
10	250	-	10	-	-	-	-	92	124
10	250	-	16	-	-	-	-	149	202
10	250	-	25	-	-	-	-	235	318
10	250	-	40	40/30	-	-	-	317	429
10	250	-	-	10	-	-	-	103	140
10	250	-	-	16/20	-	-	-	158	215
10	250	-	-	-	D/E	-	-	77	105

Notes: The above torque values are suitable for use with studs of a minimum design stress of 25,000 psi as defined in ASME, Section II, Table 3. The companion flanges must be compatible for use with stud stresses up to 25,000 psi.

Consult BS&B Safety Systems, L.L.C or BS&B Safety Systems Ltd for flanges in other materials, when suppliers recommended torque values are lower than the BS&B recommended values and if gasket type differs from BS&B Safety Systems, L.L.C or BS&B Safety

Systems Ltd recommendations.

The torque values in the table above are based on the assumption of lightly oiled, clean, free running threads with a coefficient of friction of $m = 0.16 \sim 0.20$. The customer is advised that the affects of corrosion, the use of particular thread compounds or dry assembly may result in a change in the effective clamp load on the disk assembly. This may adversely affect the performance of the disk.

TABLE A (continued)
NX-7R™ / NXV-7R™ / NF-7R™ Safety Head and Double Disk Assemblies
Companion Flange Torques

DISK SIZE		SAFETY HEAD COMPANION FLANGE RATING				COMPANION FLANGE STUD TORQUE			
						DISK MATERIAL			
						ALUMINUM		OTHER	
IN	MM	ANSI CL	DIN PN AND BS4504 3.1 PN	JIS PN	BS 10 TABLE	FT-LBS	NM	FT-LBS	NM
12	300	150	-	-	E/F	110	149	125	170
12	300	300	-	-	-	-	-	266	360
12	300	-	16	16/20	-	-	-	158	215
12	300	-	25	-	-	-	-	235	318
12	300	-	40	30	-	-	-	317	429
12	300	-	-	40	-	-	-	556	753
12	300	-	-	-	D	-	-	77	105
14	350	150	-	-	F	-	-	188	255
14	350	300	-	-	-	-	-	266	360
14	350	-	10	-	-	-	-	92	124
14	350	-	16	-	-	-	-	158	215
14	350	-	25	-	-	-	-	317	429
14	350	-	40	30	-	-	-	434	589
14	350	-	-	40	-	-	-	556	753
14	350	-	-	16/20	-	-	-	308	418
14	350	-	-	-	D/E	-	-	125	170
16	400	150	-	-	F	-	-	188	255
16	400	300	-	-	-	-	-	378	512
16	400	-	10	10	-	-	-	158	215
16	400	-	16	-	-	-	-	235	318
16	400	-	25	-	-	-	-	434	589
16	400	-	40	30/40	-	-	-	556	753
16	400	-	-	16/20	-	-	-	317	429
16	400	-	-	-	D/E	-	-	125	170
18	450	150	-	-	F	-	-	266	360
18	450	300	-	-	-	-	-	378	512
18	450	-	-	10	-	-	-	158	215
18	450	150	-	16/20	-	-	-	317	429
18	450	300	-	-	D/E	-	-	125	170
20	500	150	-	-	-	-	-	266	360
20	500	300	-	-	-	-	-	378	512
20	500	-	10	-	-	-	-	158	215
20	500	-	16	16/20	-	-	-	317	429
20	500	-	25	-	-	-	-	434	589
20	500	-	40	-	-	-	-	724	981
20	500	-	-	-	D/E	-	-	156	212
20	500	-	-	-	F	-	-	332	450
24	600	150	-	-	-	-	-	378	512
24	600	300	-	-	-	-	-	660	894
24	600	-	16	-	-	-	-	434	589
24	600	-	25	16/20	-	-	-	556	753
24	600	-	-	-	D	-	-	235	318
24	600	-	-	-	E	-	-	332	450
24	600	-	-	-	F	-	-	473	641

Notes: The above torque values are suitable for use with studs of a minimum design stress of 25,000 psi as defined in ASME, Section II, Table 3. The companion flanges must be compatible for use with stud stresses up to 25,000 psi.

Consult BS&B Safety Systems, L.L.C or BS&B Safety Systems Ltd for flanges in other materials, when suppliers recommended torque values are lower than the BS&B recommended values and if gasket type differs from BS&B Safety Systems, L.L.C or BS&B Safety

Systems Ltd recommendations.

The torque values in the table above are based on the assumption of lightly oiled, clean, free running threads with a coefficient of friction of $m = 0.16 \sim 0.20$. The customer is advised that the affects of corrosion, the use of particular thread compounds or dry assembly may result in a change in the effective clamp load on the disk assembly. This may adversely affect the performance of the disk.

Installation of Rupture Disk in NF-7RS™ Safety Head

U.S. patent no. 4,751,938 and other international patents apply.

1. Place inlet of Safety head on a flat work surface in position as shown with flow arrows and locating pins up. (Please refer to the drawing in Figure 5 that corresponds to the nominal disk size and Safety Head rating to be installed).
2. Place NEW, UNDAMAGED, rupture disk on inlet so locating pins mate with the corresponding holes in the rupture disk flange.
3. Carefully align and place Safety Head outlet flange in position as shown.
Ensure flow arrows on the disk tag and on the Safety Head point in the same direction
4. Assemble unit with twelve point capscrews. Tighten the twelve point high strength capscrews with socket (See torque table as identified in these instructions for socket type) finger tight before torquing. **DO NOT SUBSTITUTE** for capscrews supplied. Do not lubricate blue fluoropolymer coated capscrews.
5. Evenly torque the capscrews to the value shown in Table B when using uncoated capscrews or Table C when using blue colour fluoropolymer coated capscrews. Torque

evenly in a diagonal pattern by applying 1/4 of the torque value to capscrew (1), and then applying torque to (2), (3) and (4) etc. Repeat the torquing pattern for 1/2 then 3/4 of the recommended torque value. Finally using same pattern, torque to full torque value.

CAUTION:

Uneven or under-torquing can cause leakage and/or may effect burst pressure. Excessive torquing can damage the disk and Safety Head.

Note: Use the correct socket and torque wrench with appropriate torque value range. The torque wrench must be calibrated.

6. The twelve point capscrew heads should be recessed into the NF-7RS™ Safety Head outlet after installation.
7. Safety Heads have a 'bite type' seal on the inlet face that engages with the rupture disk. Do not modify this feature in any way. Should the 'bite type' seal be incomplete or damaged contact BS&B Safety Systems, L.L.C, or BS&B Safety Systems Ltd for repair.

Installation of Safety Head NF-7RS™ Assembly in Pressure System

1. Insert the Safety Head assembly into the pressure system between companion flanges.
Ensure flow arrows on the Safety Head and disk tag point in the desired flow direction upon disk rupture.
The NF-7RS™ centers inside the bolting pattern of pipe flanges, see Figure 6 and a J-Bolt prevents the Safety Head from being installed incorrectly with respect to flow, see Figure 4. The inlet companion flange must be radially drilled to accept the J-Bolt. Table E list companion flange drilling dimensions. Locate the J-Bolt in the drilled hole. Do not remove or damage the J-Bolt.
2. Install gaskets between the Safety Head and the companion flanges. A hard compressed fibre gasket of 1/16" (1.6mm) or 1/8" (3mm) thick is recommended.
CAUTION:
Ensure gasket materials are adequate for the service conditions including the ability of the gasket to resist "cold flow". Gaskets that cold flow will allow torque relaxation which may prevent sealing and

effect disk performance. (The burst pressure of disks installed in pre-torqueable Safety Heads NF-7RS™ is unaffected.)

Contact BS&B Safety Systems, L.L.C or BS&B Safety Systems Ltd if an alternative gasket type is used, or for advice on the use of spiral wound gaskets.

3. Install studs with nuts. Studs with nuts should be free running with lightly oiled threads, see Table F for stud details. Tighten all nuts finger tight. Torque the nuts to the value shown in Table G. Torque evenly in a diagonal pattern by applying 1/4 of the recommended torque to each stud. Repeat pattern by torquing to 1/2 then 3/4 of the recommended torque value. Then using same pattern, torque to full torque value. Do not exceed the specified torque value.
CAUTION:
Uneven or under-torquing can cause leakage and/or may effect burst pressure. Excessive torquing can damage the disk and Safety Head.
4. The torque value on the companion flange nuts should be verified periodically.

Figure 4: Inlet Companion Flange Drilling to Accept J-Bolt

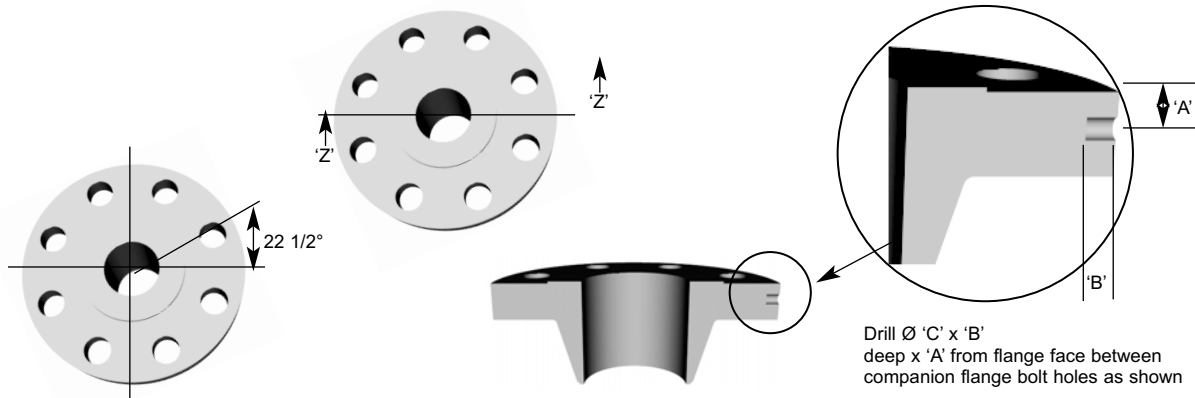


Figure 5
Type NF-7RS™ Safety Head

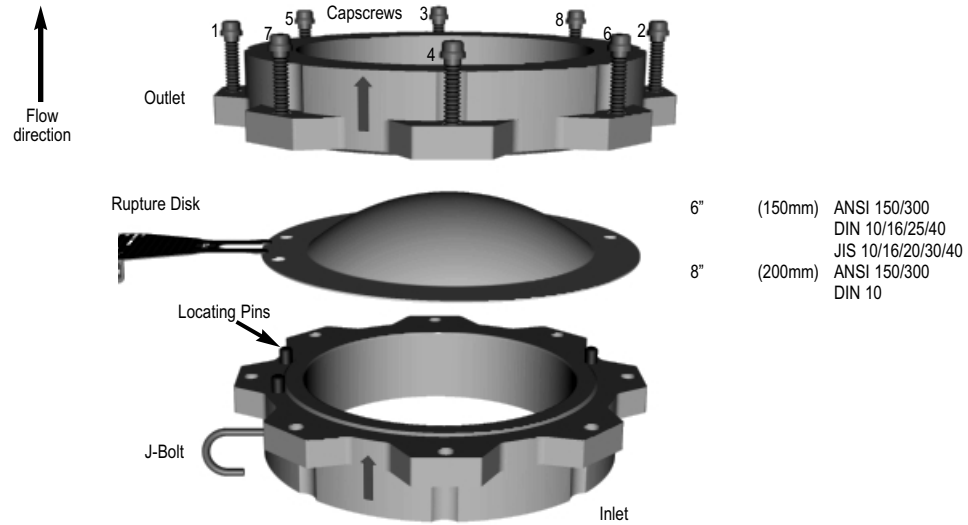
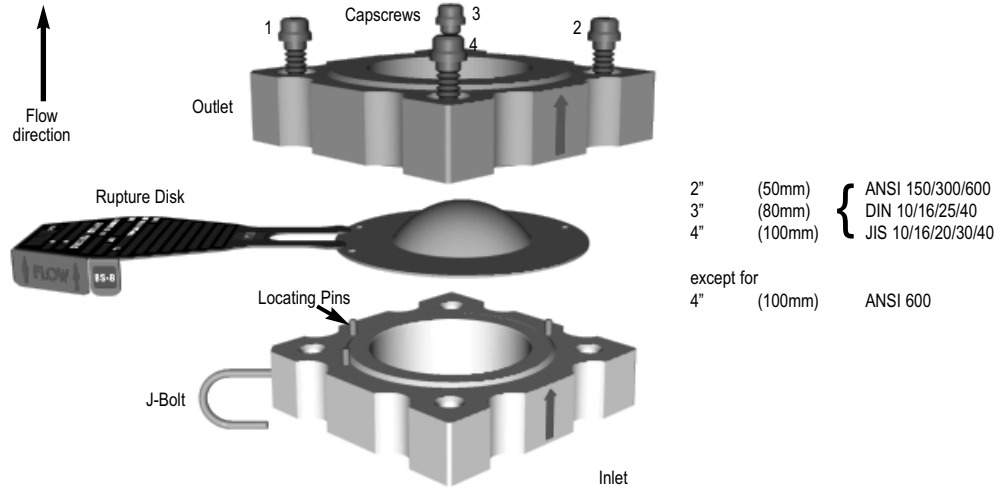
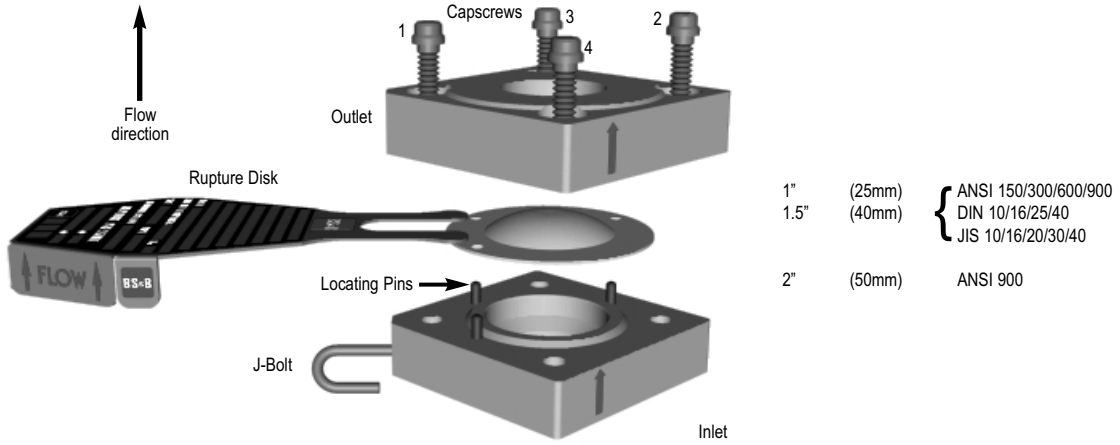


Table B - Uncoated Capscrews
NF-7RS™ Safety Head and Double Disk Assembly Preassembly Capscrew Torque

SIZE		SAFETY HEAD COMPANION FLANGE RATING			PREASSEMBLY CAPSCREW TORQUE				12 POINT SOCKET SIZE	SOCKET DRIVE *	SUGGESTED SOCKET SOURCE SNAP-ON TOOLS
					ALUMINUM		OTHER MATERIAL				
IN	MM	ANSI CL	DIN	JIS	FT-LBS.	NT-M	FT-LBS.	NT-M			
1	25	150	10/16	10/16	11	15	17	23	1/4	3/8	STMD-8
1	25	300/600	25/40	20/30/40	-	-	17	23	1/4	3/8	STMD-8
1	25	900/1500	-	-	-	-	60	81	3/8	3/8	SF-121
1.5	40	150	10/16	10/16	24	33	30	41	5/16	1/4	STMD-10
1.5	40	300/600	25/40	20/30/40	-	-	30	41	5/16	1/4	STMD-10
1.5	40	900/1500	-	-	-	-	65	88	3/8	3/8	SF-121
2	50	150	10/16	10/16	26	35	34	46	5/16	1/4	STMD-10
2	50	300/600	25/40	20/30/40	-	-	34	46	5/16	1/4	STMD-10
2	50	900/1500	-	-	-	-	100	136	1/2	3/8	SF-161
3	80	150	10/16	10/16	41	55	65	88	3/8	3/8	SF-121
3	80	300/600	25/40	20/30/40	-	-	65	88	3/8	3/8	SF-121
4	100	150	10/16	10/16	75	102	102	138	7/16	3/8	SF-141
4	100	300	25/40	20/30/40	-	-	102	138	7/16	3/8	SF-141
4	100	600	-	-	-	-	65	88	3/8	3/8	SF-121
6	150	150	10/16	10/16	47	64	60	81	3/8	3/8	SF-121
6	150	300	25/40	20/30/40	-	-	60	81	3/8	3/8	SF-121
6	150	600	-	-	-	-	102	138	7/16	3/8	SF-141
8	200	150	10	-	70	95	84	114	7/16	3/8	SF-141
8	200	300	-	-	-	-	84	114	7/16	3/8	SF-141
10	250	150	-	-	55	74	70	95	7/16	3/8	SF-141
10	250	300	-	-	-	-	70	95	7/16	3/8	SF-141
12	300	150	-	-	22	30	29	39	5/16	3/8	SF-101
12	300	300	-	-	-	-	50	68	7/16	3/8	SF-141
16	400	150	-	-	-	-	80	108	7/16	3/8	SF-141
16	400	300	-	-	-	-	195	264	5/8	1/2	SW-201
18	460	150	-	-	-	-	120	163	1/2	1/2	SW-161
18	460	300	-	-	-	-	195	264	5/8	1/2	SW-201
20	500	150	-	-	-	-	120	163	1/2	1/2	SW-161
20	500	300	-	-	-	-	195	264	5/8	1/2	SW-201
24	600	150	-	-	-	-	195	264	5/8	1/2	SW-201
24	600	300	-	-	-	-	350	475	3/4	1/2	SW-241

Notes:

* 12 point, deep length, thin wall socket

The torque values in the in the table above are based on the assumption of lightly oiled, clean, free running threads with a coefficient of friction of $m = 0.16 \sim 0.20$. The affects of corrosion, the use of thread compounds, or dry assembly may result in a change in the effective clamp load on the disk assembly. This may adversely affect the performance of the disk. Snap-on® is a registered trademark of Snap-On Technologies Incorporated.

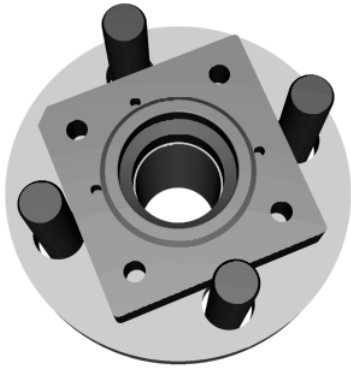
Table C - Blue Coated Capscrews
NF-7RS™ Safety Head and Double Disk Assembly Preassembly Capscrew Torque
Blue Coated Capscrews, Max Temperature 500°F (260°C)

SIZE		SAFETY HEAD COMPANION FLANGE RATING			PREASSEMBLY CAPSCREW TORQUE				12 POINT SOCKET SIZE	SOCKET DRIVE *	SUGGESTED SOCKET SOURCE SNAP-ON TOOLS
IN	MM	ANSI CL	DIN	JIS	ALUMINUM		OTHER MATERIAL				
					FT-LBS.	NT-M	FT-LBS.	NT-M			
1	25	150	10/16	10/16	6	8	9	12	1/4	3/8	STMD-8
1	25	300/600	25/40	20/30/40	-	-	9	12	1/4	3/8	STMD-8
1	25	900/1500	-	-	-	-	30	41	3/8	3/8	SF-121
1.5	40	150	10/16	10/16	12	17	15	20	5/16	1/4	STMD-10
1.5	40	300/600	25/40	20/30/40	-	-	15	20	5/16	1/4	STMD-10
1.5	40	900/1500	-	-	-	-	33	45	3/8	3/8	SF-121
2	50	150	10/16	10/16	13	18	17	23	5/16	1/4	STMD-10
2	50	300/600	25/40	20/30/40	-	-	17	23	5/16	1/4	STMD-10
2	50	900/1500	-	-	-	-	50	68	1/2	3/8	SF-161
3	80	150	10/16	10/16	21	28	33	45	3/8	3/8	SF-121
3	80	300/600	25/40	20/30/40	-	-	33	45	3/8	3/8	SF-121
4	100	150	10/16	10/16	38	52	51	69	7/16	3/8	SF-141
4	100	300	25/40	20/30/40	-	-	51	69	7/16	3/8	SF-141
4	100	600	-	-	-	-	33	45	3/8	3/8	SF-121
6	150	150	10/16	10/16	24	33	30	41	3/8	3/8	SF-121
6	150	300	25/40	20/30/40	-	-	30	40	3/8	3/8	SF-121
6	150	600	-	-	-	-	51	69	7/16	3/8	SF-141
8	200	150	10	-	35	47	42	57	7/16	3/8	SF-141
8	200	300	-	-	-	-	42	57	7/16	3/8	SF-141
10	250	150	-	-	28	37	35	48	7/16	3/8	SF-141
10	250	300	-	-	-	-	35	48	7/16	3/8	SF-141
12	300	150	-	-	11	15	15	20	5/16	3/8	SF-101
12	300	300	-	-	-	-	25	34	7/16	3/8	SF-141
16	400	150	-	-	-	-	40	54	7/16	3/8	SF-141
16	400	300	-	-	-	-	98	132	5/8	1/2	SW-201
18	460	150	-	-	-	-	60	81	1/2	1/2	SW-161
18	460	300	-	-	-	-	98	133	5/8	1/2	SW-201
20	500	150	-	-	-	-	60	81	1/2	1/2	SW-161
20	500	300	-	-	-	-	98	133	5/8	1/2	SW-201
24	600	150	-	-	-	-	98	133	5/8	1/2	SW-201
24	600	300	-	-	-	-	175	237	3/4	1/2	SW-241

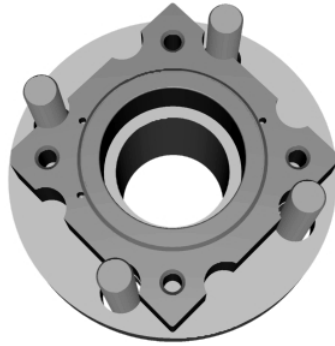
Notes:

* 12 point, deep length, thin wall socket
Do not lubricate blue fluoropolymer coated capscrews.
Snap-on® is a registered trademark of Snap-On Technologies Incorporated.

Figure 6
NF-7RS™ Safety Heads Inside the Flange Bolting Pattern



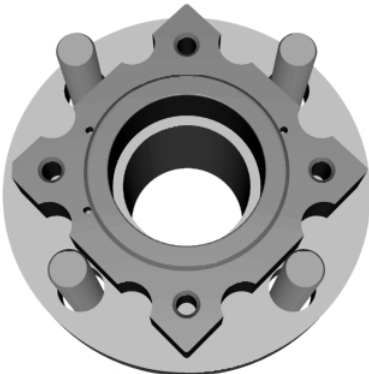
1" (25 mm) ANSI 150/300/600/
 900/1500
 DIN 10/16/25/40
 JIS 10/16/20/30/40
 1 1/2" (40mm) ANSI 150/300/600
 900/1500
 DIN 10/16/25/40
 JIS 10/16/20/30/40



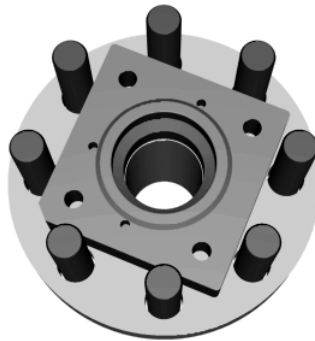
2" (50mm) ANSI 150
 JIS 10



2" (50mm) ANSI 300/600
 JIS 16/20/30/40
 3" (DN80) ANSI 300/600
 DIN 10/16/25/40
 JIS 10/16/20/30/40
 4" (DN100) ANSI 150/300
 DIN 10/16/25/40
 JIS 10/16/20/30/40



2" (50mm) DIN 10/16/25/40
 3" (80mm) ANSI 150



2" (80mm) ANSI 900/1500



6" (150mm) ANSI 150
 DIN 10/16/25/40
 JIS 10
 8" (200mm) ANSI 150
 DIN 10

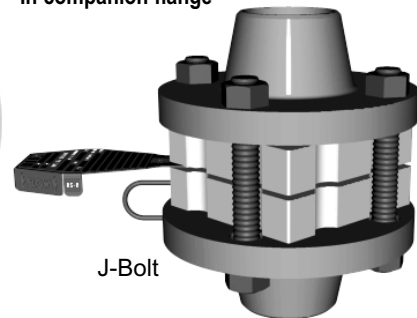


6" (150mm) ANSI 300
 JIS 16/20/30/40
 8" (200mm) ANSI 300



10" (250mm) ANSI 150
 For larger sizes, configuration is similar to
 8" and 10".

**NF-7RS™ Installed
 In companion flange**



J-Bolt

Table D
NF-7R™ Safety Head and Double Disk Assembly Companion Flange
J-Bolt Drilling Dimensions

SIZE	ANSI FLANGE RATING	NF-7R					
		A		B		C	
		IN ± 1/32	MM ± 0.8	IN + 1/16 - 0	MM + 1.6 - 0	IN	MM
1"	150	5/16	8	1/2	13	7/16	11
	300	7/16	11	7/16	11	7/16	11
	600	7/16	11	7/16	11	7/16	11
	900/1500	7/8	22	5/8	16	7/16	11
1 1/2"	150	7/16	11	1/2	13	7/16	11
	300	1/2	13	7/16	11	7/16	11
	600	1/2	13	7/16	11	7/16	11
	900/1500	7/8	22	5/8	16	7/16	11
2"	150	1/2	13	1/2	13	7/16	11
	300	1/2	13	5/8	16	7/16	11
	600	1/2	13	5/8	16	7/16	11
	900/1500	7/8	22	3/4	19	7/16	11
3"	150	5/8	16	1/2	13	7/16	11
	300	5/8	16	7/8	22	7/16	11
	600	5/8	16	5/8	16	7/16	11
	900	5/8	16	1	25	7/16	11
4"	150	11/16	17.5	1/2	13	7/16	11
	300	3/4	19	1/2	13	7/16	11
	600	3/4	19	1/2	13	7/16	11
	900	3/4	19	1	25	7/16	11
6"	150	3/4	19	1/2	13	7/16	11
	300	3/4	19	5/8	16	7/16	11
	600	3/4	19	5/8	16	7/16	11
	900	3/4	19	1	25	7/16	11
8"	150	5/8	16	1/2	13	5/8	16
	300	5/8	16	1 1/4	32	5/8	16
	600	5/8	16	1	25	5/8	16
10"	150	13/16	20	1/2	13	5/8	16
	300	13/16	20	1 1/4	32	5/8	16
	600	13/16	20	1	25	5/8	16
12"	150	13/16	20	5/8	16	5/8	16
	300	13/16	20	1 3/8	35	5/8	16
	600	13/16	20	1	25	5/8	16

Consult BS&B Safety Systems, L.L.C. or BS&B Safety Systems Ltd for other sizes and ratings.

Table E
NF-7RS™ Safety Head Companion Flange J-Bolt Drilling Dimensions

SIZE		COMPANION FLANGE RATING			DIMENSIONS					
IN	MM	ANSI	DIN	JIS	A		B		C	
					IN ± 1/32	MM ± .8	IN + 1/16 - 0	MM + 1.6 - 0	IN	MM
1	25	150	-	-	5/16	8	7/16	11	7/16	11
1	25	-	10/16	-	13/32	10	5/16	8	7/16	11
1	25	-	-	10/16	9/32	7	35/64	14	7/16	11
1	25	300	-	-	7/16	11	1/2	13	7/16	11
1	25	-	25	-	13/32	10	5/16	8	7/16	11
1	25	-	-	20	9/32	7	5/8	16	7/16	11
1	25	600	-	-	9/16	14.5	5/8	16	7/16	11
1	25	-	40	-	13/32	10	35/64	14	7/16	11
1	25	-	-	30/40	13/32	10	6/8	16	7/16	11
1.5	40	150	-	-	3/8	9.5	7/16	11	7/16	11
1.5	40	-	10/16	-	13/32	10	13/32	10	7/16	11
1.5	40	-	-	10/16/20	11/32	9	5/8	16	7/16	11
1.5	40	300	-	-	1/2	13	1/2	13	7/16	11
1.5	40	-	25/40	-	13/32	10	13/32	10	7/16	11
1.5	40	-	-	30/40	7/16	11	19/32	15	7/16	11
1.5	40	600	-	-	9/16	14.5	1/2	13	7/16	11
2	50	150	-	-	1/2	13	7/16	11	7/16	11
2	50	-	-	10/16/20	13/32	10	7/16	11	7/16	11
2	50	-	10/16/25/40	-	15/32	12	19/32	15	7/16	11
2	50	-	-	30/40	15/32	12	5/8	16	7/16	11
2	50	300/600	-	-	9/16	14.5	11/16	17.5	7/16	11
3	80	150	-	-	11/16	17.5	7/16	11	7/16	11
3	80	-	-	10	13/32	10	13/32	10	7/16	11
3	80	-	10/16/25/40	-	15/32	12	13/32	10	1/2	13
3	80	-	-	16/20	1/2	13	11/32	9	7/16	11
3	80	300/600	-	-	3/4	19	13/16	20.5	7/16	11
3	80	-	-	30/40	1/2	13	19/32	15	7/16	11
4	100	150	-	-	11/16	17.5	9/16	14.5	7/16	11
4	100	-	10/16	-	15/32	12	13/32	10	19/32	15
4	100	-	-	10	13/32	10	13/32	10	7/16	11
4	100	300	-	-	3/4	19	1-1/6	27	7/16	11
4	100	-	25/40	-	15/32	12	23/32	18	19/32	15
4	100	-	-	16/20	19/32	15	1/2	13	7/16	11
4	100	600	-	-	3/4	19	9/16	14.5	7/16	11
4	100	-	-	30	19/32	15	25/32	20	7/16	11
4	100	-	-	40	19/32	15	1-1/32	26	7/16	11
6	150	150/600	-	-	3/4	19	9/16	14.5	7/16	11
6	150	-	10/16	-	15/32	12	7/16	11	5/8	16
6	150	-	-	10	35/64	14	5/16	8	7/16	11
6	150	-	-	16/20	13/32	10	15/32	12	7/16	11
6	150	300	-	-	3/4	19	1-5/16	33.5	7/16	11
6	150	-	25/40	-	15/32	12	3/4	19	5/8	16
6	150	-	-	30	43/64	17	1-3/16	30	7/16	11
6	150	-	-	40	43/64	17	1-49/64	45	7/16	11
8	200	150	-	-	5/8	16	1/2	13	5/8	16
8	200	300	-	-	5/8	16	1-1/4	32	5/8	16
10	250	150	-	-	5/8	16	1/2	13	5/8	16
10	250	300	-	-	5/8	16	1-1/4	32	5/8	16
12	300	150/300	-	-	5/8	16	5/8	16	5/8	16
16	400	150	-	-	5/8	16	3/8	9.5	11/16	17.5
16	400	300	-	-	5/8	16	1/2	13	11/16	17.5
18	460	150	-	-	5/8	16	1/2	13	11/16	17.5
18	460	300	-	-	5/8	16	9/16	14.5	11/16	17.5
20	500	150	-	-	5/8	16	5/8	16	11/16	17.5
20	500	300	-	-	5/8	16	5/8	16	11/16	17.5
24	600	150	-	-	5/8	16	11/16	17.5	11/16	17.5
24	600	300	-	-	5/8	16	1	25.5	11/16	17.5

Table F
NF-7RS™ Safety Head Companion Flange Studs

SIZE		COMPANION FLANGE RATING			No. OF STUDS	DIAMETER OF STUD		MIN. LENGTH OF STUD	
IN	MM	ANSI	DIN	JIS		IN	MM	IN	MM
1	25	150	-	-	4	1/2	-	4 1/2	-
1	25	300	-	-	4	5/8	-	5 1/2	-
1	25	600	-	-	4	5/8	-	5 1/2	-
1	25	-	10/16/25/40	-	4	-	12	-	125
1	25	-	-	10/16/20	4	-	16	-	135
1	25	-	-	30/40	4	-	16	-	135
1.5	40	150	-	-	4	1/2	-	5	-
1.5	40	300/600	-	-	4	3/4	-	6 1/2	-
1.5	40	-	10/16/25/40	10/16/20	4	-	16	-	135
1.5	40	-	-	30/40	4	-	20	-	155
2	50	150	-	-	4	5/8	-	6 1/2	-
2	50	300	-	-	8	5/8	-	6 1/2	-
2	50	600	-	-	8	5/8	-	6 1/2	-
2	50	-	10/16/25/40	-	4	-	16	-	145
2	50	-	-	10	4	-	16	-	140
2	50	-	-	16/20	8	-	16	-	140
2	50	-	-	30/40	8	-	16	-	155
3	80	150	-	-	4	5/8	-	6 1/2	-
3	80	300	-	-	8	3/4	-	7 1/2	-
3	80	600	-	-	8	3/4	-	7 1/2	-
3	80	-	10	-	8	-	16	-	155
3	80	-	16/25/40	-	8	-	16	-	160
3	80	-	-	10	8	-	16	-	150
3	80	-	-	16/20	8	-	20	-	165
3	80	-	-	30/40	8	-	20	-	185
4	100	150	-	-	8	5/8	-	7 1/2	-
4	100	300	-	-	8	3/4	-	8 1/2	-
4	100	600	-	-	8	7/8	-	8	-
4	100	-	10/16	10	8	-	16	-	180
4	100	-	25/40	-	8	-	21	-	185
4	100	-	-	16/20	8	-	20	-	195
4	100	-	-	30/40	8	-	22	-	210
6	150	150	-	-	8	3/4	-	8 3/4	-
6	150	300	-	-	12	3/4	-	9 1/2	-
6	150	600	-	-	12	1	-	10 1/2	-
6	150	-	10/16	-	8	-	21	-	205
6	150	-	25/40	-	8	-	25	-	225
6	150	-	-	10	8	-	20	-	200
6	150	-	-	16/20	12	-	22	-	235
6	150	-	-	30	12	-	24	-	245
6	150	-	-	40	12	-	30	-	270
8	200	150	-	-	8	3/4	-	9	-
8	200	300	-	-	12	7/8	-	10	-
10	250	150	-	-	12	7/8	-	9 1/2	-
10	250	300	-	-	16	1	-	11	-
12	300	150	-	-	12	7/8	-	10 1/2	-
12	300	300	-	-	16	1-1/8	-	12 1/2	-
16	400	150	-	-	16	1	-	13	-
16	400	300	-	-	20	1-1/4	-	16	-
18	460	150	-	-	16	1-1/8	-	14 1/2	-
18	460	300	-	-	24	1-1/4	-	16-1/2	-
20	500	150	-	-	20	1-1/8	-	16	-
20	500	300	-	-	24	1-1/4	-	18	-
24	600	150	-	-	20	1-1/4	-	18	-
24	600	300	-	-	24	1-1/2	-	21	-

Table G
NF-7RS™ Safety Head and Double Disk Assembly Companion Flange Torque

Notes:

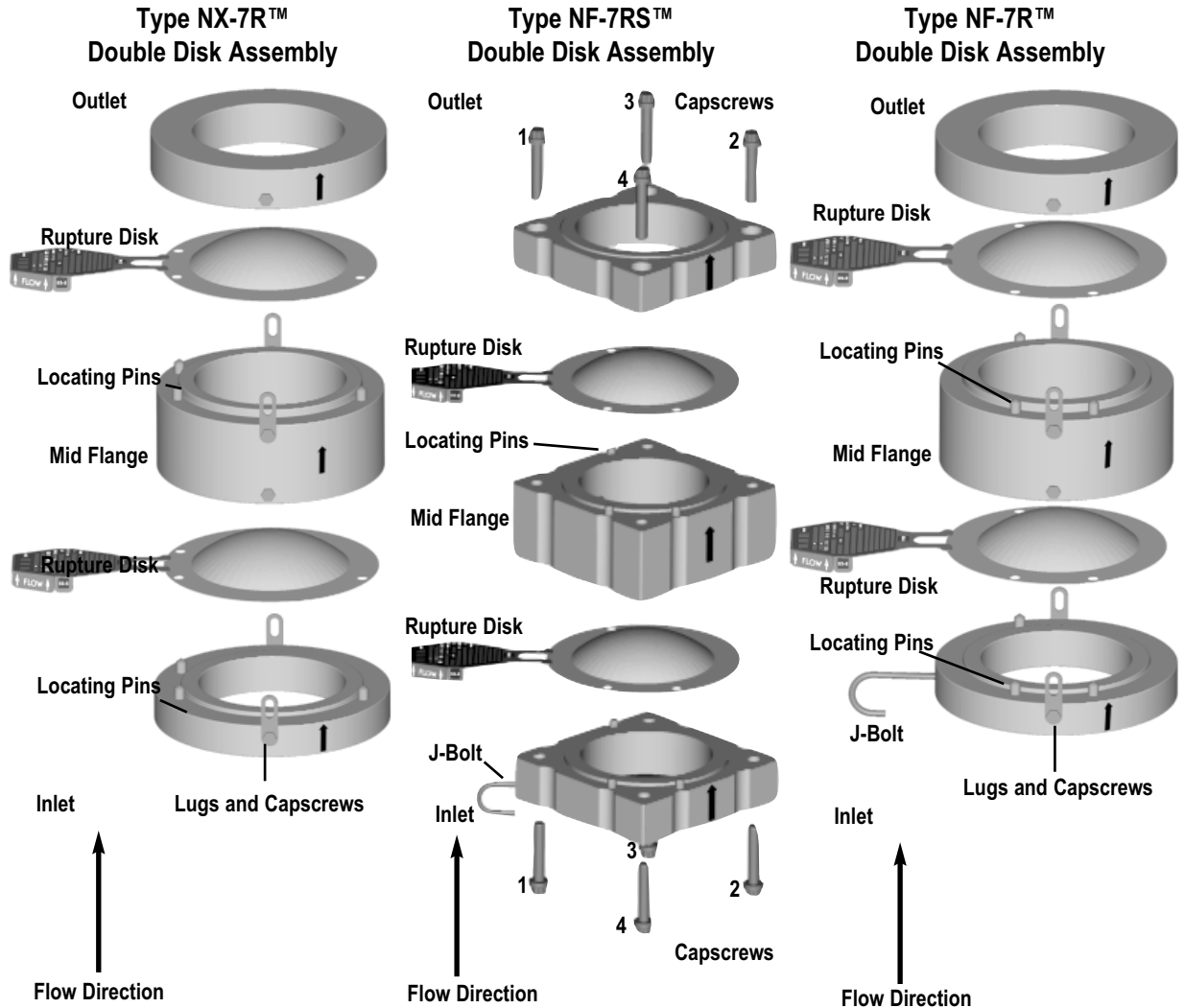
The torque values are suitable for use with studs of a minimum design stress of 25,000 psi as defined in ASME, Section II, Table 3. The companion flanges must be compatible for use with stud stresses up to 25,000 psi.

Consult BS&B Safety Systems, L.L.C or BS&B Safety Systems Ltd for flanges in other materials, when suppliers recommended torque values are lower than the BS&B recommended value and if gasket type differs from BS&B Safety Systems, L.L.C or BS&B Safety Systems Ltd recommendations.

The torque values in the table above are based on the assumption of lightly oiled, clean, free running threads with a coefficient of friction of $m = 0.16 \sim 0.20$. The customer is advised that the affects of corrosion, the use of particular thread compounds or dry assembly may result in a change in the effective clamp load on the disk assembly. This may adversely affect the performance of the disk.

SIZE		COMPANION FLANGE RATING			FLANGE STUD TORQUE			
IN	MM	ANSI	DIN	JIS	ALUMINUM		OTHER MATERIAL	
					FT-LB	NT-M	FT-LB	NT-M
1	25	150	10/16	-	20	27	20	27
1	25	-	-	10/16/20	25	34	25	34
1	25	-	25/40	-	-	-	20	27
1	25	300/600	-	-	-	-	40	54
1	25	-	-	30/40	-	-	25	34
1	25	900/1500	-	-	-	-	122	165
1 1/2	40	150	-	-	20	27	25	34
1 1/2	40	-	10/16	10/16/20	25	34	46	62
1 1/2	40	300/600	-	-	-	-	80	108
1 1/2	40	-	25/40	-	-	-	46	62
1 1/2	40	-	-	30/40	-	-	90	122
1 1/2	40	900/1500	-	-	-	-	182	247
2	50	150	-	-	40	54	40	54
2	50	-	10/16	10	40	54	46	62
2	50	-	-	16	25	34	46	62
2	50	300/600	-	-	-	-	40	54
2	50	-	25/40	20/30/40	-	-	46	62
2	50	900/1500	-	-	-	-	122	165
3	80	150	-	-	40	54	50	68
3	80	-	10/16	10	40	54	46	62
3	80	-	-	16	60	80	90	122
3	80	300/600	-	-	-	-	80	108
3	80	-	25/40	-	-	-	46	62
3	80	-	-	20/30/40	-	-	90	122
4	100	150	-	-	40	54	45	61
4	100	-	10/16	-	40	54	46	62
4	100	-	-	10	40	54	53	75
4	100	-	-	16	50	68	90	122
4	100	300	25/40	20	-	-	90	122
4	100	600	-	-	-	-	120	163
4	100	-	-	30/40	-	-	124	168
6	150	150	-	-	80	108	95	129
6	150	-	10/16	-	84	114	90	122
6	150	-	-	10	84	114	110	149
6	150	-	-	16/20	92	125	124	168
6	150	300	-	-	-	-	80	108
6	150	600	-	-	-	-	180	244
6	150	-	25/40	30	-	-	155	210
6	150	-	-	40	-	-	230	312
8	200	150	10	-	-	-	75	102
8	200	300	-	-	-	-	122	165
10	250	150	-	-	-	-	122	165
10	250	300	-	-	-	-	182	247
12	300	150	-	-	-	-	122	165
12	300	300	-	-	-	-	272	369
16	400	150	-	-	-	-	185	251
16	400	300	-	-	-	-	385	522
18	460	150	-	-	-	-	270	366
18	460	300	-	-	-	-	385	522
20	500	150	-	-	-	-	270	366
20	500	300	-	-	-	-	385	522
24	600	150	-	-	-	-	385	522
24	600	300	-	-	-	-	700	949

Double Disk Assemblies



Type NX-7R™ Double Disk Assembly

Installation of Rupture Disk in Safety Head:

Install both rupture disks following the instructions provided on page 2.

Installation of Safety Head Assembly in Pressure Systems:

Follow the installation instructions on page 3. Torque all nuts using the recommended procedure to the torque value shown in Table A.

Type NF-7RS™ Double Disk Assembly

Installation of Rupture Disk in Safety Head:

Install both rupture disks following the instructions provided on page 6. Torque the capscrews using the recommended procedure to the value shown in Table B or C.

Installation of Safety Head Assembly in Pressure Systems:

The inlet companion flange must be drilled radially to accept the J-Bolt. Table E, page 12 lists drilling dimensions. Torque all nuts using the recommended procedure to the torque value shown in Table G.

Type NF-7R™ Double Disk Assembly

Installation of Rupture Disk in Safety Head:

Install both rupture disks following the instructions provided on page 2.

Installation of Safety Head Assembly in Pressure Systems:

The inlet companion flange must be drilled radially to accept the J-Bolt. Table D, page 11 lists drilling dimensions. Torque all nuts using the recommended procedure to the torque value shown in Table A.

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