

World Leader in Modular Torque Limiters

# Brunel Corporation

Maintenance Instructions  
Safety Element Torque Limiters  
JSE1-0244DC, & LDC Series



# Maintenance Instructions

## Safety Element Torque Limiters JSE1-0244DC, & LDC Series

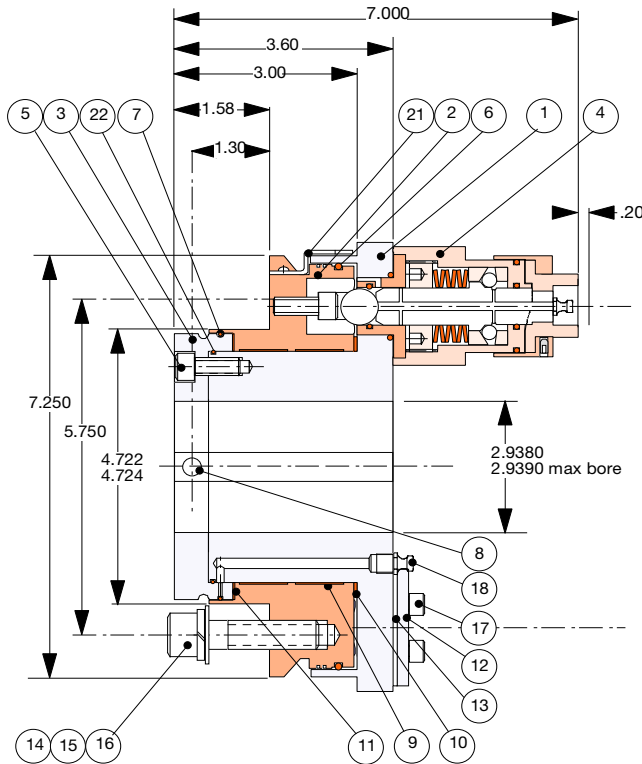


FIGURE 1  
SECTIONED VIEW  
JSE1-0244DC

Note: Part numbers referred to by (Figure No. - Part No.)

Part No.	Description	Qty.
1	Module Carrier Hub	1
2	Detent Pocket Plate	1
3	Retaining Plate	1
4	JSE1-0016 Disconnecting SE	1
5	5/16"-24 x 5/8" S.H.C.S.	7
6	"O" Ring - (Module Carrier)	1
7	"O" Ring - (Retaining Plate-Outer)	1
8	5/16"-24 x 1/2" Socket Set Screw	2
9	PTFE Bearing	2
10	PTFE Bearing Ring	1
11	PTFE Thrust Pad	1
12	Blanking Plate	1
13	Blanking Plate Seal	1
14	1/2"-13 x 2" S.H.C.S.	6
15	1/2" Lock Washer	6
16	1/2" Flat Washer	6
17	17 1/4"-28 x 5/8" SHCS	4
18	Grease Fitting	1
19	Grease Relief Valve	1
20	Detent Pocket	1
21	Alignment Pointer	1
22	"O" Ring - (Retaining Plate-Inner)	1

### 1. PRIOR TO INSTALLATION

Check shaft extension & installation area where Torque Limiter is to be mounted to make sure there is sufficient space available for resetting after disengagement.

### 2. MOUNTING TORQUE LIMITER ON SHAFT

- Make sure bore & keyway are clean and free of burrs, and keyway set screws are in place.
- Mount 11 tooth UHMW sprocket onto torque limiter using the 1/2"-13 x 2" stainless steel socket head cap screws and washers supplied. Use loctite on screws.
- Slide torque limiter onto shaft and align sprockets and chain. Lock torque limiter to shaft with set screw.

### 3. TORQUE ADJUSTMENT & INITIAL STARTUP

- These torque limiters were preset at the factory, no further adjustment is required at this time. If it is desired to adjust the torque at a later date, proceed as follows.
- To adjust torque at the job site:  
Remove Safety Element (1-4) by unscrewing qty. 4, 1/4-28 socket head cap screws. Keep all components together including shims and detent ball. Loosen Set Screw (2-17) on safety element housing and adjust the Torque Adjusting Nut (2-7) with special spanner wrench provided. The torque is increased by turning the nut clockwise (approx. 2200 lb-in / 1/4 turn) and maximum torque is reached after approx. 1 1/4 turns. (Refer to Detailed Setting Instructions) Retighten set Screw (2-17) after adjustment of torque setting to lock torque setting in place.

### 4. CHECKING RELEASE TORQUE SETTING

Clamp & lock the Detent Pocket Plate (1-2) in a vise or test stand, by clamping thru the 1/2-13 bolts. Apply torque to hub with a dummy shaft and key. Torque may be applied by a torque wrench.

### 5. DISCONNECTING

To disengage the torque limiter manually, turn the hex shroud on the safety element (2-12), 180° in the clockwise direction with a 15/16" socket or open end wrench. To re-engage follow Resetting (#6) below.

### 6. RESETTING

On overload or after manual disengagement, the Module Carrier Hub disengages from the Detent Pocket Plate, allowing the Hub (1-1) to rotate freely. With the drive at rest (the power off) and the overload cleared, first align the set screw (2-23) with the center of the flat on the safety element housing (2-11). Then align the two reset arrows on the Detent Pocket Plate and Hub by joggling the drive motor. After aligning the match marks strike the safety element plunger with a soft mallet and the plunger will move back into the safety element 1/4 inch signifying that the unit is engaged and the drive can be restarted.

## 7. TROUBLE SHOOTING

- a. Continual releasing, further adjustment making no difference.
  - 1) Detent Pocket (2-10) worn. Remove Safety Element (1-4), extract Detent Pocket (use extraction screw), & Rotate Detent 90° & reinstall. If badly worn replace with new detent pocket.
  - 2) Additional torque capacity is required. (Consult Brunel Corporation)
- b. Unable to screw Housing Nut (2-7) in any further.
  - 1) Loosen Set Screw (2-17) and make sure that the threads on the Housing Nut and Housing are not damaged, if so clean & file burrs until usable or replace defective parts.
  - 2) You have reached maximum torque capacity.
- c. Unable to reset. Reset arrows not aligned. Check reference marks on Module Carrier Hub (1-1) and Detent Pocket Plate (1-2).

## 8. SAFETY ELEMENT - METHOD OF ASSEMBLY

- a. Clean all components and coat all working surfaces with a suitable anti-seize compound.
- b. Grease & install "O" ring (2-14) into groove in Housing (2-11)
- c. Grease inside surfaces of the Housing and install Outer Thrust Race (2-2).
- d. Install the Plunger (2-1) through the end of the Housing (2-11) ensuring that the "O" Ring is not damaged by the Plunger threaded end.
- e. Grease the Outer Race (2-2) and install 11-1/4" Balls (2-3). Grease the Inner Race (2-4) and install over the balls.
- f. Install 6 Springs (2-5) oriented as shown in cross section, and fully greased.
- g. Screw in the Adjusting Nut (2-7) into the Housing until the Nut makes contact with the Springs.
- h. Insert the Locking Pellet (2-18) and Set Screw (2-17) into the side of the Housing to facilitate locking the Housing Nut. (Refer to #3 for Torque Adjustment)
- i. Grease and insert the Bushing "O" Rings (2-19), (2-21) into grooves in Bushing (2-8), also insert the Detent Ball (2-9) after thoroughly greasing the Bushing ID. Grease the Plunger (2-1) and install the Bushing with "O" Ring (2-20) installed.
- j. Install Cam Shroud "O" Ring (2-22) and thread & lockite Cam Shroud sub assembly (2-12 & 2-24) onto plunger.

## 9. GENERAL MAINTENANCE

- a. Grease 2-3 pumps from a grease gun into Grease Fitting (2-13) every 6 months. Recommended grease is Mobilith SHC PM Series.
- b. Safety elements should be stripped, inspected and re-assembled at least once every 3 years, more frequently where frequent tripping occurs. Grease for rebuilding Safety Elements: Mobilith SHC PM Series. Recommended for Grease Gun application: Mobilith SHC PM Series.

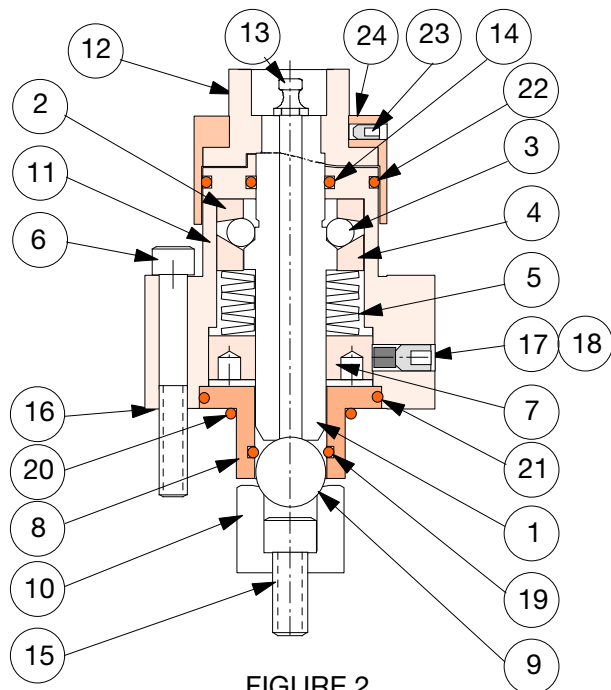


FIGURE 2  
Sectioned View of JSE1-0016 Safety Element

Item	P/N	Description	Qty.
1	JSE1 0016-1	Plunger	1
2	JSE1 0014-2	Outer Thrust Race	1
3	JSE1 0014-3	Ball - 1/4"	11
4	JSE1 0014-4	Inner Thrust Race	1
5	JSE1 0014-5	Disc Spring	6
6	JSE1 0014-6	Socket Head Cap Screw	4
7	JSE1 0014-7	Adjusting Nut	1
8	JSE1 0016-8	Bushing	1
9	JSE1 0014-9	Detent Ball	1
10	JSE1 0014-10	Detent Pocket	1
11	JSE1 0016-11	Housing	1
12	JSE1 0016-12	Shroud	1
13	JSE1 0014-13	Grease Fitting	1
14	JSE1 0016-14	"O" Ring - Housing	1
15	JSE1 0014-15	Socket Head Cap Screw	1
16	JSE1 0014-16	Shim Pack	1
17	JSE1 0014-17	Socket Set Screw	1
18	JSE1 0014-18	Locking Pellet	1
19	JSE1 0014-19	"O" Ring - Bushing Inner	1
20	JSE1 0015-20	"O" Ring	1
21	JSE1 0016-21	"O" Ring - Bushing Outer	1
22	JSE1 0016-22	"O" Ring - Cam Shroud	1
23	JSE1 0016-23	3/16" UNF Set Screw	1
24	JSE1 0016-24	Cam Shroud	1

Rotating equipment is potentially dangerous and should be properly guarded. The user should check for all applicable safety codes in his area and provide a suitable guard

# Standard and Disconnect Cam Safety Elements

## Detailed Setting Instructions



Prior to setting Safety Elements which are new or which have been disassembled, the required tangential force (Fu) must be calculated from the desired release torque of the drive.

Perform the following calculation and proceed with setting each Safety Element to the same tangential force. Note that the dimension "X" (Figure 3) as measured in step 7 will vary from element to element. However, the "depth setting from zero spring compression" from the graph must be the same and added to "X" (Figure 3) for each element.

### Formulas

$$F_u = T / ((N) \times (R)) \quad F_u = \text{Tangential Force (pounds)}$$

$$T = \text{Torque Limiter release torque (lb-in)}$$

$$F_a = F_u \times .65 \quad N = \text{Total quantity of Safety Elements}$$

$$R = \text{Mounting radius of Safety Elements (in.)}$$

$$F_a = \text{Axial Force (pounds)}$$

### Example calculation:

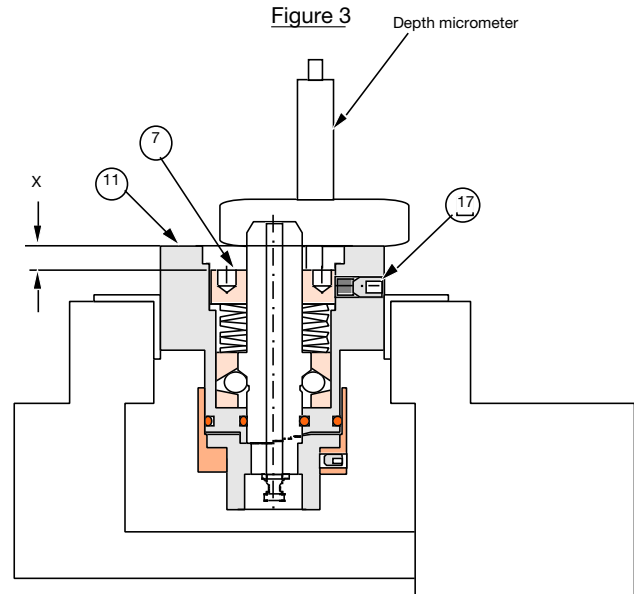
Example Torque Limiter has Qty. 1, JSE1-0016 Safety Element mounted on a 2.75" radius. Example release torque = 8,000 lb-in.

- Determine Setting for each Safety Element Setting = 8,000 lb-in / (1 element) (2.75" radius) = 2,909 lbs Tangential Force
- Read from graph for JSE1-0016, the required depth setting from zero compression. For this example: Depth from zero compression = .036" (just under 1/2 turn or 180°) Add this to the zero spring compression depth (as measured in step 7).  
Note: a depth of .080" equals one revolution of the adjusting nut.
- Set each element in accordance with instructions to follow.

### JSE1-0014, -0016, -0017 & -0018 SETTING INSTRUCTIONS

- Ensure Set Screw (3-17) is not locking the Adjusting Nut (3-7).
- Hold safety element in soft jaws in a bench vice, as shown in Figure 3.
- Tighten Adjusting Nut (3-7) by turning clockwise with adjusting tool, then loosen by turning counterclockwise until all spring load is removed.
- With adjusting tool, slowly tighten the Adjusting Nut (3-7) until it just touches the disc springs - you will note a large increase in resistance when the nut comes up against the disc springs. At this point the Adjusting Nut is bearing on the Disc Springs with no pre-load.
- Arrange a depth micrometer and measure the distance "X" from the safety element Housing (3-11) base, to the face of the Adjusting Nut (3-7). This is equivalent to the zero setting on the Torque vs. Depth setting graph. Make a scribe mark on the adjusting nut face to note the position of this measurement and make all future measurements on the scribe mark.
- Read off the graph, the depth setting for the required Torque, and add this to dimension "X".

- Using the micrometer depth gauge, slowly tighten Nut until the required depth is reached. This safety element is now set to the required Torque setting.
- Remove safety element from vice.
- Tighten Set Screw (3-17) to lock Nut (3-7).



Item	P/N	Description	Qty.
7	JSE1 0014-7	Adjusting Nut	1
11	JSE1 0014-11	Housing	1
17	JSE1 0014-17	Socket Set Screw	11

## Method of Preloading each Safety Element

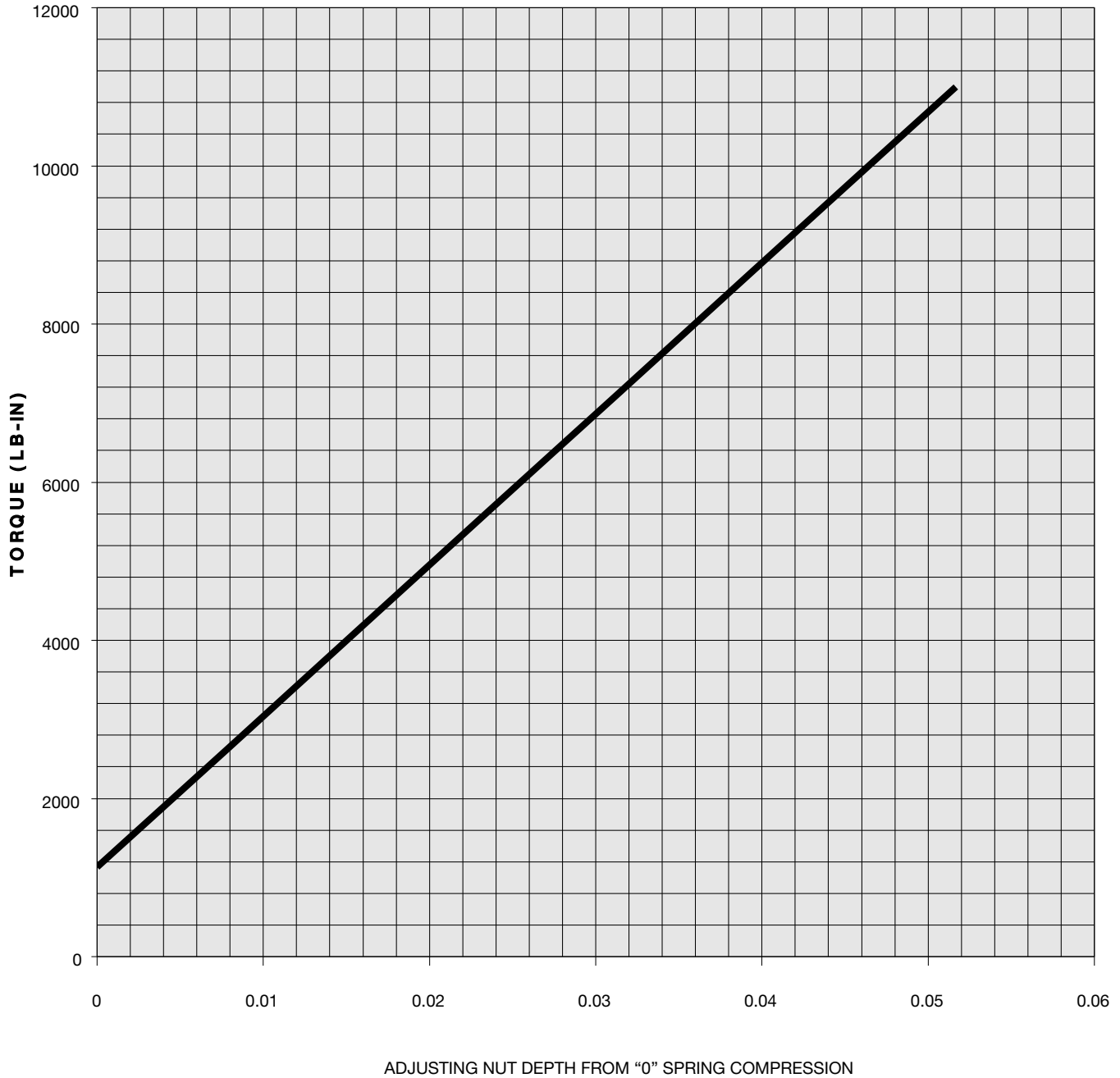
(Only required if changing Safety Elements from the original supplied)



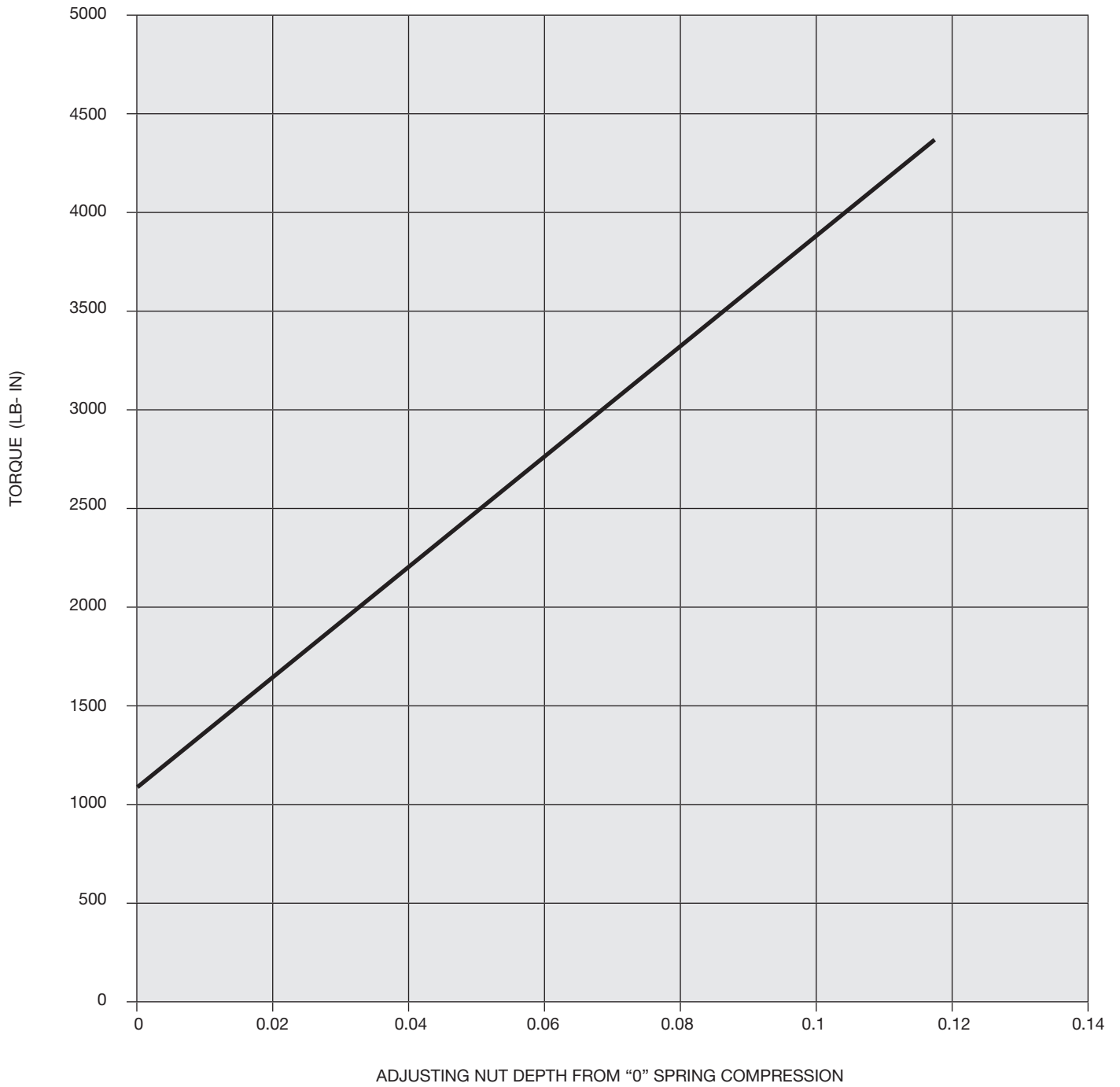
1. Grease the Detent Pocket (2-10) and lock into position with Cap Screw (2-15) treated with Loctite.
2. Place the Detent Ball (2-9) on top of the Detent Pocket then insert the assembled Safety Element including the Bushing (2-8), into the hole until the Plunger (2-1) comes in contact with the ball. Make sure:
  - a) No "O" rings (2-20), (2-21) are in place.
  - b) No Shims (2-16) are in place.
  - c) Safety Element is in the engaged position.
  - d) Adjusting Nut (2-7) has been turned clockwise to give some spring compression.
3. With a suitable height gauge or feeler gauge, measure the resultant gap between the inner face of the Housing (2-11) and the Module Carrier Hub (1-1). Deduct .003" - .008" from the measurement for required Preload. Select a suitable sized laminated Shim Pack (2-16) to accommodate this gap (may require peeling a shim to the appropriate size). Place the Shim Pack onto the Safety Element, and insert the Bushing "O" Ring (2-20) onto the Bushing. Secure the Safety Element with the 4 socket head cap screws.

Note: Shims are peel shims and may be separated by a razor or sharp knife.

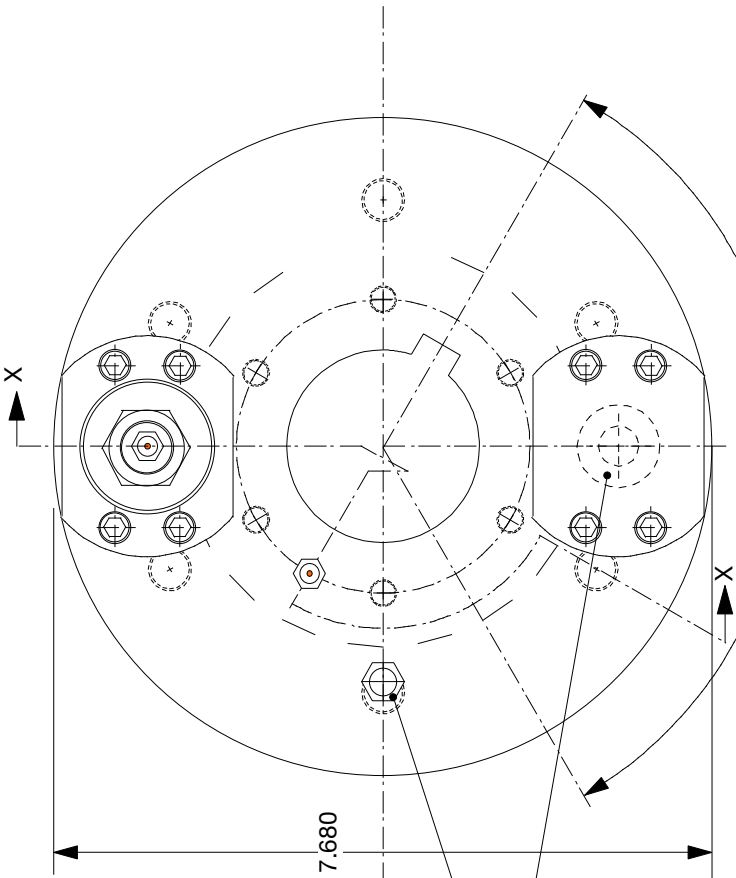
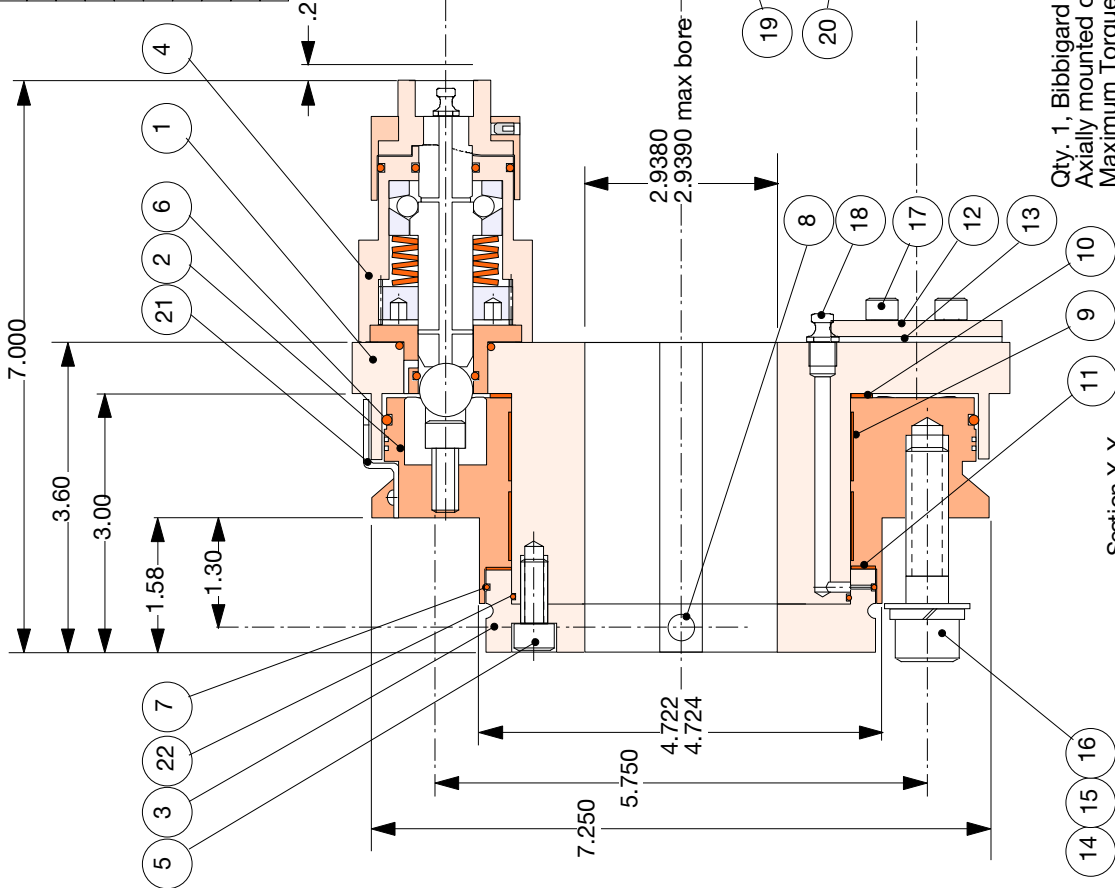
# JSE1-0244DC Torque Setting Graph



# JSE1-0244LDC Torque Setting Graph



Item	Description	Qty	Item	Description	Qty
1	Module Carrier Hub	1	12	Blanking Plate	1
2	Detent Pocket Plate	1	13	Blanking Plate Seal	1
3	Retaining Plate	1	14	1/2"-13 x 2" 316 SS SHCS	6
4	JSE1-0016 Disconnect Cam SE1	15	15	1/2" 316 SS Lock Washer	6
5	5/16-24 x 5/8" 316 SS SHCS	8	16	1/2" 316 SS Flat Washer	6
6	"O" Ring Seal	1	17	1/4"-28 x 5/8" 316 SS SHCS	4
7	"O" Ring Seal	1	18	Grease Fitting	1
8	5/16-24 x 1/2 316 SS SHSS	2	19	Grease Relief Valve (1/8 NPT)	1
9	PTFE Bearing	2	20	Detent Pocket	1
10	PTFE Bearing Ring	1	21	Pointer (Alignment)	1
11	PTFE Thrust Pad	1	22	"O" Ring Seal	1



Qty. 1, Bibbigard Safety Element, size JSE1-0016  
 Axially mounted on a 2.750 P.C. Radius  
 Maximum Torque Setting = 11,004 lb-in  
 Minimum Torque Setting = 2,448 lb-in

OEM:	Material: All wearing parts thru hardened RC62 minimum All External Components 316 Stainless Steel	Scale: 1/2	Similar to	Description
End User:	Note: This document must not be copied without our written permission and the contents thereof must not be imparted to a third party, nor be used for any unauthorized purpose. Contravention will be prosecuted. Brunel Corporation	Dimensions Inches Unless Otherwise Noted	Checked by	Safety Element Torque Limiter
		Dimensional Tolerance ± .010 Unless Otherwise Specified	Drawn by	All External Components 316 Stainless Steel
			Randy Long	Date 6/2/99
			BRUNEL CORP	Sheet
				JSE1-0244DC





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