Thomas® XTSRLS52 Coupling Installation and Maintenance

Types XTSRLS52 • Sizes 726-4588

Industrial Powertrain Solutions
Regal Rexnord
Application Engineering: 800 626 2093
PTSAppEng@regalrexnord.com
regalrexnord.com/REXNORD

FORM
CP3-008E
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⚠DANGER Indicates a hazard which, if not avoided, will result in serious injury or death.

⚠WARNING Indicates a hazard which, if not avoided, could result in serious injury or death.

⚠CAUTION Indicates a hazard which, if not avoided, could result in minor or moderate personal injury.

NOTICE Indicates information considered important, but not hazard-related (e.g. messages relating to property damage).

GENERAL SAFETY INSTRUCTIONS

⚠WARNING

- Safety should be a primary concern in all aspects of coupling installation, operation, and maintenance.
- Proper lockout/tagout procedures must be followed to safeguard against unintentional starting of the equipment.
- Make sure to disengage the electrical power and any other sources of potential energy before you perform work on the coupling.
- Do not make contact with the coupling when it is rotating and/or in operation.
- Because of the possible danger to person(s) or property from accidents which may result from improper use or installation of these products, it is extremely important to follow the proper selection, installation, maintenance and operational procedures.
- Installation should be carried out by skilled personnel only. All personnel involved in the installation, service, operation, maintenance, and repair of this coupling and the connected equipment must read, understand, and comply with these Installation and Maintenance instructions. The Installation and Maintenance instructions and assembly drawing, if provided, must be at hand at the installation site.
- Packaging material can generate electrostatic charges. It may then become an explosive hazard. It must be removed from the coupling outside any hazardous areas.
- All rotating power transmission products are potentially dangerous and can cause serious injury. They must be properly guarded in compliance with OSHA, ANSI, ATEX, European machine safety standards and other local standards. It is the responsibility of the user to provide proper guarding.
- For this coupling to meet the ATEX requirements, you must precisely follow these installation and maintenance instructions, and the supplement form 0005-08-49-01. This supplement outlines the ATEX requirements. If the operator does not follow these instructions, the coupling will immediately be considered non-conforming to ATEX.

⚠CAUTION

- The coupling should be stored in a dry corrosion protected environment, free from external loads (for example by stacking) to prevent damage which may cause a hazard when the coupling is put into service.
- For ATEX requirements the guard must have a minimum of 12.7 mm (1/2 in) radial clearance to the coupling outside diameter and allow for proper ventilation.
- All conductive parts of the equipment should be connected in such a way that hazardous electrical potential differences cannot occur. In case insulated metal parts could be charged thus becoming a potential ignition source, earth connections must be provided.
- All work on the coupling must be performed when the coupling is at rest with no load.
- Do not start or jog the motor, engine, or drive system without securing the coupling components. If the equipment is started with only a hub attached, the hub must be properly mounted and ready for operation, with the key and set screw (if included) fastened. When the full coupling assembly is started, all fasteners and hardware must be completely and properly secured. Do not run the coupling with loose fasteners.
- Use explosive environment appropriate tools only, for more information see DIN EN 1127-1:2008:02, Annex A.
- The coupling may only be used in accordance with the technical data provided in the Thomas disc coupling catalog. Customer modifications and alterations to the coupling are not permissible.

NOTICE

- All spare parts for service or replacement must originate from or be approved by Rexnord.

Figure 1 – Thomas XTSRLS52 Coupling Range 726 to 4588 sizes

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1. General Information

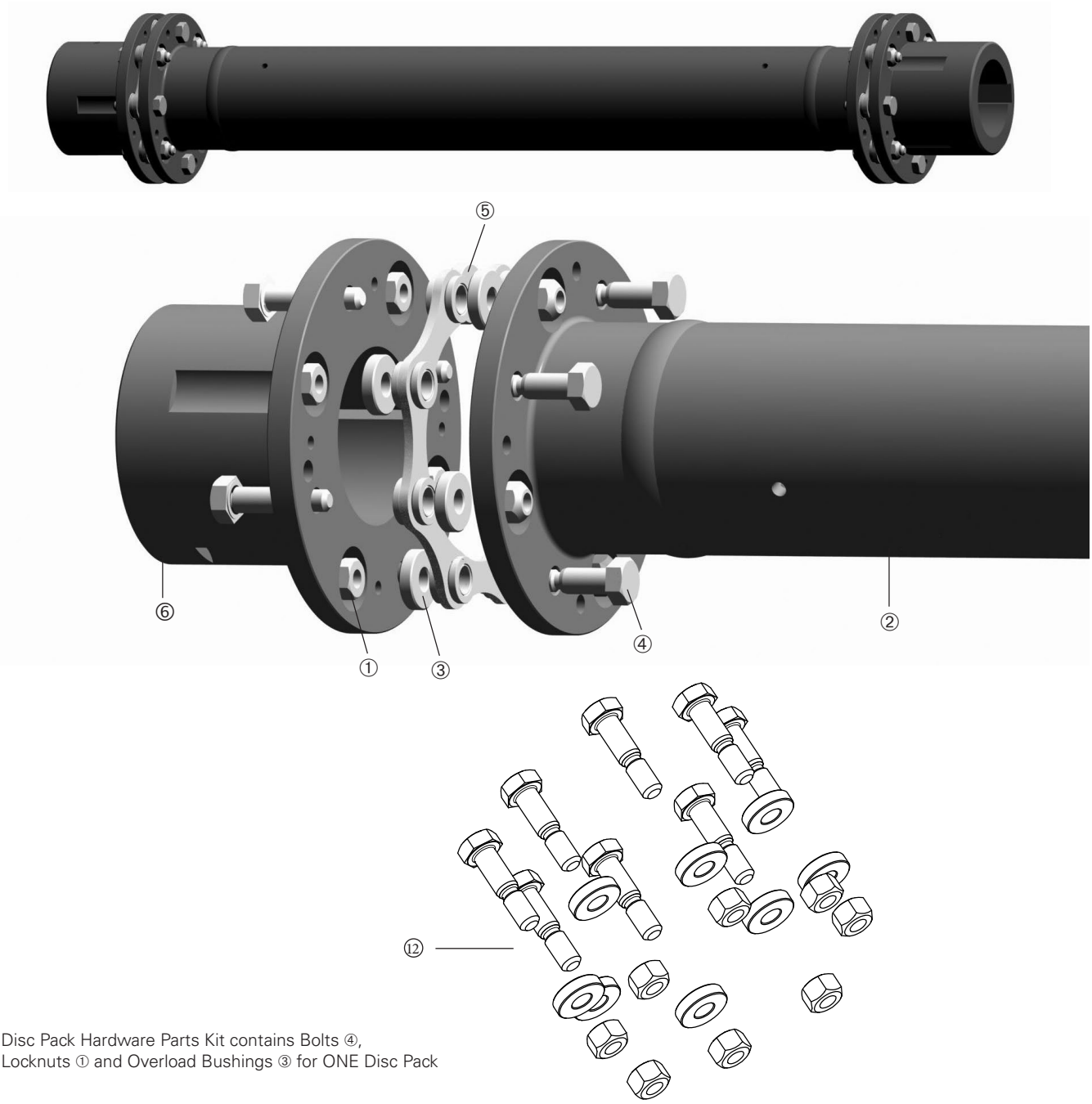
1.1 Rexnord Thomas Couplings are designed to provide a mechanical connection between the rotating shafts of mechanical equipment, using a flexible disc to accommodate inherent misalignment while transmitting the power and torque between the connected shafts.

1.2 These instructions are intended to help you to install and maintain your Rexnord Thomas coupling. Please read these instructions prior to installing the coupling, and prior to maintenance of the coupling and connected equipment. Keep these instructions near the coupling installation and available for review by maintenance personnel. For special engineered couplings, Rexnord may provide an engineering drawing containing installation instructions that take precedence over this document.

1.3 Regal Rexnord owns the copyright of this material. These Installation and Maintenance instructions may not be reproduced in whole or in part for competitive purposes.

2. Coupling Diagrams

Figure 2 – Rexnord Thomas XTSRLS52 series Coupling Components



Disc Pack Hardware Parts Kit contains Bolts ④,
Locknuts ① and Overload Bushings ③ for ONE Disc Pack

Thomas XTSRLS52 couplings with standard hubs do not utilize adapters, as such are not factory tightened to the locknut torque found in **Table 7**.

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3. Hub Mounting

DANGER! Be sure to disengage the electrical power and any other sources of potential energy before you perform work on the hub and coupling assembly.

3.1 Examine the coupling assembly to assure there is no visible damage.

3.2 Clean the hub bores and shafts using lint free cloth. Remove any nicks or burrs.

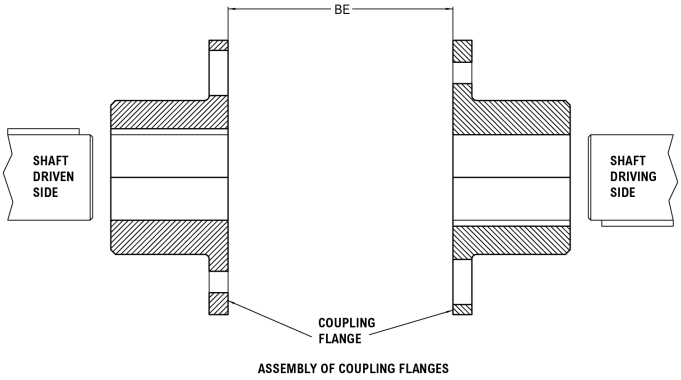
3.3 The key(s) should have a close side-to-side fit in the keyway in the hub and shaft, with a slight clearance over the top when assembled

3.4 Remove the cap screws that attach the hubs to the adapters, and remove both hubs.

CAUTION! When heating hubs is required, an oven is preferred and an open flame is not recommended. If flame heating is considered mandatory, it is important to provide uniform heating to avoid distortion and excessive temperature. A thermal stick applied to the hub surface will help determine the hub temperature.

DANGER! Touching hot hubs causes burns. Wear safety gloves to avoid contact with hot surfaces.

Figure 3 – Mounting Hubs on Shafts



4. Straight Bore with Clearance/Slip Fit

4.1 Install the key(s) in the shaft.

4.2 Check to be sure that the set screw(s) in the hub does not protrude into the keyway or the bore. Remove or back out the set screw to provide clearance during assembly.

4.3 Slide the hub up the shaft to the desired axial position.

4.4 If used; assemble and tighten the set screw(s) using a calibrated torque wrench to the values shown in **Table 1**.

Table 1 – Set Screw Tightening Torque

Set Screw Size		#6-40	#8-32	#10-32	5/16-24	1/4-28	3/8-24	1/2-20	5/8-11	3/4-10	7/8-9	1.00-8
Hex Head Key Size		1/16	5/64	3/32	5/32	1/8	3/16	1/4	5/16	3/8	1/2	9/16
Tightening torque	(Nm)	1	2	4	16	9	31	75	120	217	325	452
	(in-lb)	9	17	31	144	76	276	600	1,060	1,920	2,880	4,000

Set Screw Size		M3	M4	M5	M6	M8	M10	M12	M16	M20	M24
Hex Head Key Size		1.5	2	4	3	4	5	6	8	10	12
Tightening torque	(Nm)	0.8	2	3	6	12	25	50	100	206	379
	(in-lb)	7	17	30	55	110	220	440	880	1,827	3,358

CAUTION! Never use two set screws with one on top of the other in the same tapped hole.

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5. Straight Bore with Interference Fit

5.1 Accurately measure the bore and shaft diameters to assure proper fit.

5.2 Install the key(s) in the shaft.

5.3 Heat the hub in an oven until the bore is sufficiently larger than the shaft.

5.4 350°F (177°C) is usually sufficient for carbon steel hubs. Do not exceed 500°F (260°C).

Figure 4 – Shaft end to hub face measurement example

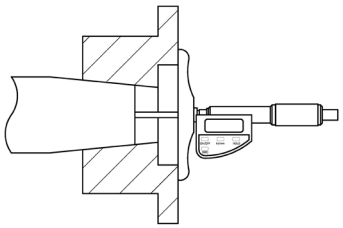
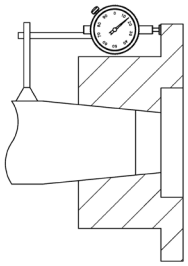


Figure 5 – Dial indicator placement for axial draw measurement example



5.5 With the hub expanded, install it quickly on the shaft to the desired axial position. A pre-set axial stop device can be helpful.

6. Taper Bore

6.1 Check for acceptable contact pattern between the hub and the shaft.

6.2 Put the hub on the shaft, keeping the keyways (if existing) aligned.

6.3 Lightly tap the face of the hub with a soft mallet. The resultant position will provide a starting point for the hub axial draw up.

6.4 Use a depth micrometer to measure the distance from the shaft end to the hub face, as shown in **Figure 4**. Record the dimension.

6.5 Mount a dial indicator to read axial hub advancement, as shown in **Figure 5**. Alternatively, the indicator can be positioned to contact the end of the hub. Set the indicator to "zero".

6.6 Remove the hub and install the key(s) in the shaft.

6.7 Heat the hub in an oven until the bore is sufficiently larger than the shaft.

6.8 350°F (177°C) is usually sufficient for carbon steel hubs. Do not exceed 500°F (260°C).

6.9 Higher temperatures may be required for higher interference fit levels where alloy steel hubs may be encountered. A general rule to consider is that for every 160°F increase in temperature, steel will expand 0.001 inch for every inch of shaft diameter (or 0.029 mm/100°C). When calculating temperatures, also consider additional expansion to provide clearance and allow for a loss of heat and subsequent shrinkage during the handling process.

6.10 With the hub expanded, install it quickly on the shaft to the "zero" set point. Continue to advance the hub up the taper to the desired axial position, as defined by Regal Rexnord's customer. Use the indicator as a guide only. A pre-set axial stop device can be helpful.

6.11 Inspect the assembly to verify that the hub is properly positioned. Consult Regal Rexnord if necessary.

6.12 Install any hub axial retention device (if any) in accordance with the equipment manufacturer's specifications.

7. Shaft Alignment

NOTICE: Soft Foot – The equipment must rest flat on its base. If one or more feet of the machine are shorter, longer, or angled in some way to prevent uniform contact (a condition commonly known as "soft foot") it must now be corrected.

NOTICE: To improve the life of the coupling, the shafts must be aligned to minimize distortion of the flexing elements. Shaft alignment is required in the axial, parallel, and angular directions, with each of these values not to exceed the recommended ratings for the coupling and the alignment values shown in **Table 2**. Shaft alignment can be measured using various established methods, including Laser Alignment, Reverse Dial Indicator, and Rim and Face.

7.1 Move the connected equipment to achieve acceptable alignment. When well aligned, the disc packs will be centered and approximately parallel to their mating flange faces and the flexing elements will have little visible waviness when viewed from the side.

Note: As a guide, the maximum and minimum values for dimension "N" shown in **Figure 8** are given in **Table 2**. These dimensions are suggested for initial installation. Additional capacity is available to compensate for thermal and structural equipment movement. Maximum axial capacity values for these couplings are also given in **Table 2.**

7.2 **Table 2** shows installation limits for Angular and Parallel alignment. The "Angular Alignment Total Indicator Reading" value is the maximum difference between the measurements (X-Y) taken at opposite ends of the hub flange, as shown in **Figure 6**. The "Parallel Alignment" value (P) is the offset between the centers of the hubs, as shown in **Figure 7**. If parallel offset is measured by rotating the hubs with a dial indicator on the outside diameter, the total indicated reading should be divided by (2) to calculate P.

7.3 The "Angular Misalignment" value is the maximum difference between the measurements X and Y taken at opposite ends of the hub flanges, as shown in **Figure 6**.

7.4 The "Parallel Misalignment" value (P) is the offset between the centers of the hubs, as shown in **Figure 7**.

Figure 6 - Angular Misalignment

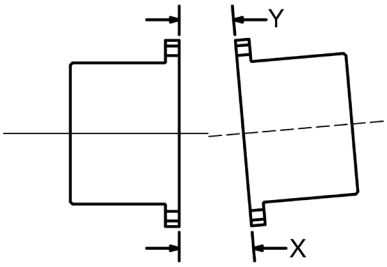


Figure 7 - Parallel Misalignment

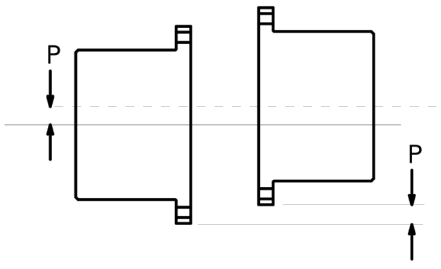


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Table 2 – Alignment Values

Size	"A" Dimension		"N" Dimension				"C" Lengths (Distance between hub flanges)	Installation Axial Limits +/-		Axial Capacity +/-		Recommended Installation Limits***					
												Parallel Misalignment				Angular Misalignment Between Hubs (X-Y)	
												Parallel Alignment Total Indicator Reading (TIR*)		Installation Limit Parallel Offset "P"**			
	Std. Hub		Min.	Max.	Min.	Max.											
	(in)	(mm)	(in)	(in)	(mm)	(mm)		(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)
726	3.74	95.0	0.33	0.35	8.3	8.8	NO STANDARD 'C' DIMENSIONS - Application Specific	0.026	0.65	0.051	1.3	0.008 inch per inch (0.008 mm per mm) of 'L' dimension		0.004 inch per inch (0.004 mm per mm) of 'L' dimension		0.005	0.13
826	4.25	108.0	0.36	0.38	9.1	9.6		0.030	0.75	0.059	1.5					0.006	0.15
996	5.08	129.0	0.37	0.39	9.3	9.9		0.035	0.90	0.070	1.8					0.007	0.18
1088	5.51	140.0	0.40	0.42	10.1	10.7		0.025	0.65	0.051	1.3	0.004 inch per inch (0.004 mm per mm) of 'L' dimension		0.002 inch per inch (0.002 mm per mm) of 'L' dimension		0.005	0.13
1298	6.54	166.0	0.50	0.52	12.6	13.3		0.031	0.80	0.061	1.6					0.006	0.15
1548	7.76	197.0	0.57	0.59	14.4	15.1		0.037	0.90	0.073	1.8					0.008	0.20
1698	8.58	218.0	0.61	0.64	15.4	16.2		0.040	1.00	0.080	2.0					0.008	0.20
1928	9.65	245.4	0.66	0.69	16.7	17.4		0.046	1.15	0.091	2.3					0.009	0.23
2068	10.39	264.0	0.71	0.74	18.0	18.8		0.049	1.25	0.097	2.5					0.010	0.25
2278	11.46	290.5	0.74	0.77	18.8	19.5		0.054	1.35	0.107	2.7					0.011	0.28
2468	12.32	313.0	0.79	0.82	20.1	20.8		0.058	1.50	0.116	3.0					0.012	0.30
2698	13.50	343.0	0.91	0.94	23.0	23.9		0.064	1.60	0.127	3.2					0.013	0.33
2888	14.61	371.0	0.97	1.01	24.7	25.6		0.068	1.75	0.136	3.5					0.014	0.36
3058	15.55	395.0	0.97	1.01	24.7	25.6		0.072	1.85	0.144	3.7					0.015	0.38
3358	16.81	427.0	1.06	1.09	27.0	27.7		0.079	2.00	0.158	4.0					0.016	0.41
3668	18.35	466.0	1.18	1.21	29.9	30.8		0.087	2.20	0.173	4.4					0.018	0.46
3908	19.29	490.0	1.18	1.21	29.9	30.8		0.093	2.35	0.185	4.7					0.019	0.48
4178	20.63	524.0	1.25	1.30	31.9	33.0		0.099	2.50	0.197	5.0					0.020	0.51
4588	23.11	587.0	1.40	1.43	35.5	36.4		0.108	2.75	0.216	5.5					0.023	0.58

* Parallel Misalignment measured by rotating the hubs with a dial indicator on the outside hub diameter will result in a maximum TIR.
All sizes use 0.001 inch per inch of "C" length (or 0.001 mm per mm of "C" length) for non-standard "C" lengths, multiply "C" x 0.001 to calculate the TIR.

** Parallel offset "P" is equivalent to one-half of the TIR measurement using dial indicators.

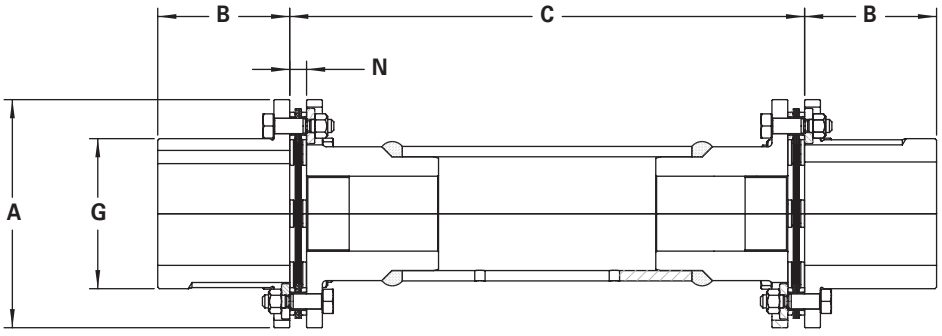
**** During installation and/or operation, do not exceed the maximum misalignment capacity of coupling.
For sizes 726-996 maximum misalignment capacity of coupling is 1/2° per disc pack.
For sizes 1088-4588 maximum misalignment capacity of coupling is 1/3° per disc pack.

Note: Refer to Rexnord Bulletin 538-214 Coupling Alignment Fundamentals for more details regarding alignment methods and procedures.

The Angular Misalignment value is the maximum difference between the measurements X and Y taken at opposite ends of the hub flanges, as shown in **Figure 6**.

The Parallel Misalignment value "P" is the offset between the centers of the hubs, as shown in **Figure 7**.

Figure 8 – Standard Hub without Adapter



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8. Final Assembly

8.1. Thomas XTSRLS52 couplings with standard hubs do not utilize adapters, as such are not factory tightened to the locknut torque found in **Table 3**. If no oversize hubs were supplied proceed to **step 8.4**.

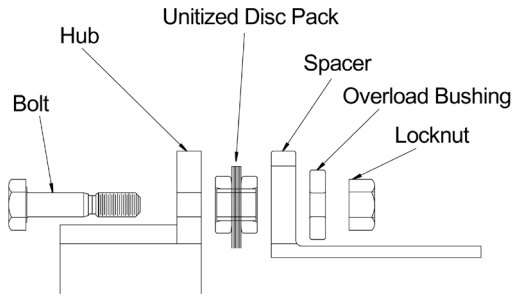
Note: Refer to the assembly drawing of coupling to obtain the appropriate 'C' length.

Any disc packs fastened with the correct torques between an adapter and a center member flange should stay fastened.

8.2 Verify that the hubs have been mounted to provide the correct "C" dimension shown in **Figure 8**. The "C" dimension is the distance measured between the faces of the two hub flanges.

8.3 If any disc packs are still fastened to the center member and a hub without an adapter, remove the locknuts, overload bushings, and bolts.

Figure 9 – Disc Pack Bolt Configuration



NOTICE: Tighten the compression cap screws equally to compress both ends only enough to allow the center member subassembly to fit between the hubs. (Do not tighten more than necessary to provide clearance for assembly.)

NOTICE: When aligning bolt holes ensure that at each bolt hole position one of the bolt holes in the flanges is the small fitted bolt hole and the other one in the opposing flange is the large clearance hole as shown in **Figure 9**.

8.4 Push bolt through small diameter bolt hole and through disc pack until body of bolt is in contact with the disc pack bushing.

8.5 Place overload bushing on threaded side of bolt through large diameter flange clearance hole.

8.6 Apply a clean motor oil to the bolt threads and screw a locknut onto each bolt until hand tight.

8.7 Repeat **steps 8.4** through **8.9** until all bolts, overload bushings, and locknuts are in place.

8.8 Proceed to the other end of the coupling. Remove the support bolts, if used, and continue to support the center member. Repeat **steps 8.4** through **9.10** to install the second disc pack.

Note: All bolts and cap screw threads must be lubricated prior to assembly. A clean motor oil is recommended. Do not use lubricants containing molybdenum disulfide or greases.

8.9 Slightly tighten all locknuts using an alternating progressive pattern on each disc pack as shown in **Figure 10** and **11** making sure the disc pack is not distorted and all the bolts are fully seated. Tighten each locknut to the appropriate torque value shown in **Table 3**, using an incremental torque in a progressive alternating pattern as shown in **Figures 10** and **11**.

Note: As a guide, measure the distance between flanges known as dimension 'N' shown in **Figure 9** and given in **Table 2**.

CAUTION! Remove any dust deposits from the coupling components and the coupling elements in an appropriate way for explosive environments.

Figure 10 – 6 Bolt Sizes 726, 826 and 996 only

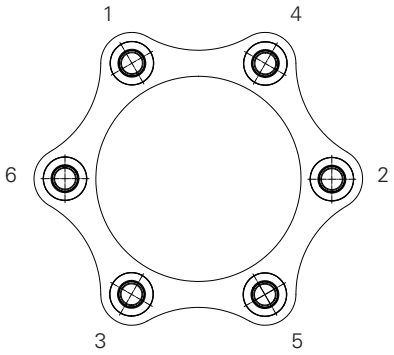
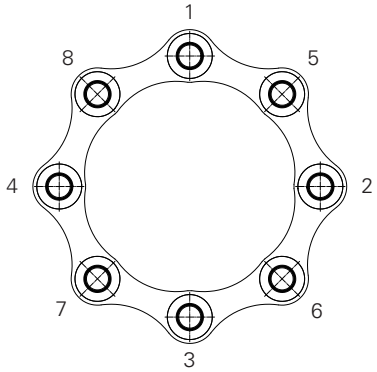


Figure 11 – 8 Bolt Sizes 1088 thru 4588



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9. Disc Pack Replacement

If it becomes necessary to replace the disc packs, it can be done as follows:

9.1 Remove all locknuts, bolts, bushings, and disc packs.

9.2 Place disc pack between the hub flanges and align the bolt holes of the disc pack to the bolt holes in the hubs.

9.3 Push bolt through small diameter bolt hole and through disc pack until the face of the disc pack is in contact with the flange face.

9.4 Place overload bushing on threaded side of bolt through large diameter flange clearance hole.

9.5 Apply a clean motor oil to the bolt threads and screw a locknut onto each bolt until hand tight

9.6 Repeat steps **9.3** through **9.5** until all bolts, overload bushings, and locknuts are in place connecting the standard hub's to the disc pack

NOTICE: All bolts and cap screw threads must be lubricated prior to assembly. A clean motor oil is recommended. Do not use lubricants containing molybdenum disulfide or greases.

9.7 Slightly tighten all locknuts using an alternating progressive pattern on each disc pack as shown in **Figures 9**, **10** and **11** making sure the disc pack is not distorted and all the bolts are fully seated. Tighten each locknut to the appropriate torque value shown in **Table 6**, using an incremental torque in a progressive alternating pattern as shown in **Figures 9**, **10** and **11**.

Note: As a guide, measure the distance between flanges known as dimension 'N' shown in **Figure 9** and given in **Table 2**.

CAUTION! Remove any dust deposits from the coupling components and the coupling elements in an appropriate way for explosive environments.

9.8 Proceed to install the center member subassembly as outlined in the Final Assembly section 7.

NOTICE: When possible, it is recommended that all locknuts have their tightening torque checked after several hours of initial operation.

For spare replacement parts, see **Tables 1** and **2**.

Table 3 – Flange Hex Head Cap Screw Tightening Torques

XTSRLS52 Coupling Size	"A" Dimension Std. Hub		Locknut			
			Thread Size (mm)	Torque		Wrench Size (in)
	(in)	(mm)		(lb-ft)	(Nm)	
726	3.74	95.0	M5	4.7	6.4	8
826	4.25	108.0	M6	8.1	11	11
996	5.08	129.0	M8	18	24	14
1088	5.51	140.0	M8	19	26	15
1298	6.54	166.0	M10	39	53	18
1548	7.76	197.0	M12	66	90	21
1698	8.58	218.0	M14	110	150	22
1928	9.66	245.4	M16	162	220	24
2068	10.39	264.0	M18	236	320	27
2278	11.46	290.5	M20	265	360	30
2468	12.32	313.0	M22	383	520	32
2698	13.50	343.0	M24	575	780	36
2888	14.61	371.0	M27	885	1200	41
3058	15.55	395.0	M27	885	1200	41
3358	16.81	427.0	M30	1180	1600	46
3668	18.35	466.0	M33	1475	2000	50
3908	19.29	490.0	M33	1475	2000	50
4178	20.63	524.0	M36	2065	2800	55
4588	23.11	587.0	M42	3245	4400	65

Note: These torque values are approximate for steel bolts with lubricated threads.
Bolts should be held from rotating while the locknuts are tightened to the values shown. Do not tighten the fastener by rotating the bolt head