



SXCS Disc Coupling Installation Instructions

Establish & Record the Existing 'Distance Between Shaft Ends' Before moving Equipment

1. Introduction

Although a coupling may have been correctly specified at time of order, operational conditions can sometimes change before the coupling is installed. Lovejoy, Inc. has information available to advise on the selection and limitations of their power transmission products, but the purchaser is ultimately responsible for verifying the suitability of their choice of product for the actual service conditions.

Correct installation and alignment will insure long life and trouble free operation of your coupling. Please read through these instructions carefully before you set the coupling into operation. Make sure you follow all safety guidelines during the installation. These Instructions are part of your product, and should be retained for future reference.

2. Safety

Accidents involving rotating equipment may result in loss of life, serious bodily harm or property damage. The purchaser of this equipment must assure that the equipment is properly assembled, installed, safeguarded, operated and maintained. This equipment must not be operated at conditions that exceed manufacturer's specifications.

Consult all applicable Federal, State and local laws and regulations covering the safe operation and maintenance of equipment, including, without limitation, the USDOL-OSHA "Lockout / Tagout" procedure set forth in 29 CFR 1910.147.

Because of the possible danger to persons or property from accidents which may result from the improper use or unapproved modification of the product, this product must be installed, maintained and operated in accordance with the procedures, standards and engineering specifications specified in the product literature. To assure safe operation, this product should be inspected in accordance with the instructions described in this document. Proper guards and any suitable safety equipment or procedures as may be necessary, or as may be specified in safety codes, should be installed by the user. Safety equipment and shields are not provided, nor are they the responsibility of Lovejoy, Inc.



Warning! This symbol indicates safety measures which must be observed to avoid **personal injury**.

Caution! This symbol indicates safety measures which must be observed to avoid **damage to coupling**.

3. Check Product

Before beginning installation, the coupling should be examined for any signs of damage that may have occurred during shipping and handling. Confirm that all components ordered are there.

For maximum protection, the coupling and components should be stored in the original packaging.

Measurements should be made to verify correctness of parts to meet application requirements, such as; hub bore diameter, shaft diameter, shaft separation, etc.

Note: SXCS Series Disc Couplings are shipped unassembled.

<i>Table 1</i>		<i>Components</i>				
Size	Hubs	Guard Ring	Two Piece Split Spacer	Disc Pack	Disc Pack Bolts & Nuts	Hub Bolts
090-6	2	2	1	2	12	12
110-6	2	2	1	2	12	12
132-6	2	2	1	2	12	12
158-6	2	2	1	2	12	12
185-6	2	2	1	2	12	12
202-6	2	2	1	2	12	12
228-6	2	2	1	2	12	12
255-6	2	2	1	2	12	12
278-6	2	2	1	2	12	12
302-6	2	2	1	2	12	12
325-6	2	2	1	2	12	12
345-6	2	2	1	2	12	24
380-6	2	2	1	2	12	24
410-6	2	2	1	2	12	24
440-6	2	2	1	2	12	24
475-6	2	2	1	2	12	24
505-6	2	2	1	2	12	24



Warning!
Before beginning coupling installation make sure the machinery is made safe. Discount all power.



SXCS Disc Coupling Installation Instructions

Caution!

Lovejoy manufactured the coupling interfaced based on the shaft data supplied by the purchaser. Lovejoy is not responsible for inaccurate or incomplete information supplied by the purchaser.

It is the purchaser's responsibility to assure that the interface connections (Flanges, Bolts, Keys, Hydraulic Fits, Etc.) between the coupling and the connected equipment are capable of handling the anticipated loads.

4. Tools Required

- Calipers
- Sockets
- Torque Wrench
- Open End Wrenches
- Alignment Equipment

5. SXCS Component Preparation

Clean the exposed surfaces of all components, hubs, sub-assemblies, spacers, etc., to remove any protective coating applied at the factory. All parts must be clean and free of any foreign materials before attempting installation or assembly, use a clean cloth dampened with a nonflammable solvent.

Check Hub Bores, Keyways, Mounting Rings, Split Spacer, Disc Packs and Shafts for any raised metal, nicks, burrs, dents, gouges, etc., dress if necessary.

- Prior to removing the existing gear coupling, **establish and record the Distance Between Shaft Ends (BSE)** between the driver and driven and compare that to the BSE of the Lovejoy SXCS disc coupling to verify fit.
- Once all necessary measurements are taken and all components are verified as correct, **remove existing coupling** and dress the shafts of the drive and driven equipment.
- If the **final BSE is the same as the BSE of the Lovejoy SXCS disc coupling**, then the hubs can be mounted flush with the ends of the drive and driven shafts.
- If the **final BSE is different than the BSE of the Lovejoy SXCS disc coupling**, then the hubs must be mounted on the drive and driven shafts with the correct distance from the ends of the shafts.

Note: Hubs will be mounted on the drive and driven shafts with the hub flanges facing toward the equipment.

6. Hub Installation

- Lovejoy supplies **inch** dimensioned straight disc hub bores with keyway to ANSI/AGMA 9002-B04 standard for interference fit unless otherwise specified.
- Lovejoy supplies **metric** dimensioned straight disc hub bores with keyway to ANSI/AGMA 9112-A04 standard for interference fit unless otherwise specified.

Caution!

Hubs must be supported during installation to avoid accidental damage should they slip.

- Straight Bore:** Install key(s) in the shaft. The key(s) should have a snug side-to-side fit with a small clearance over the top. To maintain dynamic balance, the key(s) should fit exactly and not be too short or long. Align hub and shaft key(s) then slide hub on the shaft.
- Straight Bore Interference Fit:** This type of installation is for straight shafts, with the exception that the hubs must be heated before they slide on to the shaft.

It is important when mounting interference hubs to make sure that clearance exists over the top of keys: otherwise, when the hub cools, it will rest on the key and produce high stresses in the hub that could cause it to fail.

Expand the hub bore with a uniform heat source, Oil, Oven or Induction.

Oil bath heating is usually limited to approximately 350°F (177°C), or less than the flash point of the oil used. Special handling devices are required such as tongs, threaded rods placed in puller holes in the hub, etc.



Warning!

If an oil bath is used, the oil must have a flash point of 350°F (177°C) or higher. Do not rest hubs on the bottom of the container.

Oven heating offers some advantages over oil. Parts can be heated to higher temperatures, usually not exceeding 600°F (315°C) and the parts can be handled with heat-resistant gloves. Do not rest hubs on oven; place them on a rack.

An Induction heater can be used as long as the temperature rise is controlled.



SXCS Disc Coupling Installation Instructions



Warning!

Do not use an open flame in a combustible atmosphere or near combustible materials.

Open Flame Heating is not recommended. If an oxy-acetylene or blow torch is used, use an excess acetylene mixture. Mark the hub body at the top, center and bottom of their length in several places with heat sensitive crayons, one 350°F (177°C) and one 450°F (232°C) melt temperature.

Elevate the hub with refractory bricks to allow the flame to flow through the hub. With a “Blue flame” or “Rose bud torch” direct the flame towards the hub bore using constant motion to avoid overheating an area. Once the heat sensitive crayons melt the hub is ready for mounting.

Caution!

Do Not Spot Heat the Hub or Distortion May Occur.

Regardless of method used, heat **MUST** be applied evenly to avoid distortion. This is especially important when using open flame heating. In any event, extreme care must be exercised when handling heated hubs to avoid injury to personnel.

Caution!

Do Not Exceed 600°F (315°C) During the Heating of the Hub. Excessive Heat may soften the Hub, Reducing the Strength of the Steel and may affect the Performance Characteristics of the Hub.

Consult all applicable Federal, State and local laws and regulations covering the safe operation and maintenance of equipment, including, without limitation, the USDOL-OSHA “Lockout / Tagout” procedure set forth in 29 CFR 1910.147.

7. SXCS Coupling Assembly

- a. For the **SXCS series coupling** with the hubs mounted and cooled the disc packs can be mounted to the hubs.
- b. On the **disc pack bushing flat, place a light coating of grease** on both sides of the bushing, this will keep the disc packs from binding when the locknuts are being torqued.

Caution!

Do NOT USE POWER TOOLS as this may create a friction weld.

- c. **Mount the disc packs** to each hub by inserting the three bolts for each disc pack and hand tightening the three locknuts. **Do not Torque** the Locknuts at this time.

- d. **Mount the mounting rings** to each disc pack by inserting the three bolts for each disc pack and hand tightening the three locknuts. **Do not Torque** the Locknuts at this time.
- e. **Torque all the disc pack bolts and locknuts (see Table 2 for torque values).** Either the hub side or the mounting ring side of the disc pack may be torqued first, **torque all three locknuts at one location before torquing locknuts at the next location.**

Note: If room permits, always tighten the locknut, not the bolt since part of the tightening torque is needed to overcome friction. As there is additional friction when turning the bolt, more of the effort goes into friction than in to stretching the bolt.

- f. Always remember to **properly seat the bolt** before tightening the locknut. Drawing the bolt through the flange and bushing by tightening the locknut could result in insufficient preloading of the bolt.

- g. **Locknuts should be tightened to the recommended torque specification in the following steps:**

- I. **Tighten the locknuts to 25%** of the recommended value in a crisscross pattern.

- II. **Continue tightening the locknuts by increasing the tightening torque by 25%** in a crisscross pattern until reaching the recommended torque value.

- III. **Check the first locknut to verify it meets the torque specification. If it does not meet the specification continue tightening the locknuts** in a crisscross pattern until reaching the recommended torque value.

- h. **The drive and driven equipment can now be repositioned.**

- I. If the **hubs were mounted flush** with the ends of the drive and driven shafts, then position the equipment so that the BSE is the same as the BSE of the SXCS disc coupling.

- II. If the **hubs were not mounted flush** with the end of the drive and driven shafts, then position the equipment with the distance between the mounting rings inside flange faces to be the same as the length of the split spacer.

- III. **For either case the distance between the mounting rings inside flange faces must be the same as the length of the split spacer.**

- i. **Mount the bottom half of the split spacer** by inserting the all bolts and hand tightening all the locknuts. **Do not Torque** the Locknuts at this time.



SXCS Disc Coupling Installation Instructions

Size	Bolt Socket Size mm	Nut Socket Size mm	Coupling Clearance Hole Diameter mm	Coupling Clearance Hole Diameter in	Torque Wrench Drive Size in	Torque Lubricated Threads Nm	Torque Lubricated Threads ft-lbs	Torque Dry Threads Nm	Torque Dry Threads ft-lbs
090-6	10	10	16	0.630	1/4	11	8	14	10
110-6	13	13	21	0.827	3/8	24	18	30	22
132-6	13	13	21	0.827	3/8	24	18	30	22
158-6	17	15	26	1.024	3/8	48	35	60	44
185-6	19	18	32	1.260	3/8	80	59	100	74
202-6	22	21	35	1.378	1/2	120	89	150	111
228-6	24	24	37	1.457	1/2	184	136	230	170
255-6	30	30	45	1.772	3/4	360	266	450	332
278-6	30	30	46	1.811	3/4	360	266	450	332
302-6	32	32	50	1.968	3/4	480	354	600	443
325-6	32	32	52	2.047	3/4	480	354	600	443
345-6	36	36	56	2.205	3/4	624	460	780	575
380-6	41	41	60	2.362	1	880	649	1100	811
410-6	46	46	68	2.677	1	1200	885	1500	1106
440-6	50	50	74	2.913	1	1600	1180	2000	1475
475-6	55	55	80	3.150	1	2080	1534	2600	1918
505-6	60	60	85	3.346	1	2640	1947	3300	2434

Please be advised that the Clearance Hole Diameter of the coupling may be smaller than the Outside Diameter of some typical sockets. The socket's OD may have to be turned down to 0.76 mm (0.030") smaller than the Coupling's Clearance Hole Diameter. For additional information contact Lovejoy's Application Engineering.

j. Mount the top half of the split spacer by inserting the all bolts and hand tightening all the locknuts. Do not Torque the Locknuts at this time.

k. Torque all the Bolts on both sides of the split spacer following the torqueing procedure in Section 8.

8. Spacer Bolt Torqueing Procedure

The spacer bolts should be tightened to the recommended torque specification in the following steps:

1. All bolts should be **tightened to one half** of the torque tightening values in a crisscross fashion as shown in Table 3.
2. Once all bolts have been tightened to half of the torque tightening value, follow the same crisscross pattern and **torque to the final torque value** as shown in Table 3.
3. Finally, **check the first bolt tightened to assure it has maintained its torque value** after all locknuts have been tightened, if it does not meet the torque value in Table 3 follow the same crisscross pattern and torque all bolts again.

Hub Size	Bolt No. & Size	Tightening Torque N-m	Tightening Torque ft-lbs
090-6	12 M6 x 12	15	11
110-6	12 M8 x 16	35	26
132-6	12 M8 x 16	35	26
158-6	12 M10 x 20	69	51
185-6	12 M12 x 25	120	89
202-6	12 M14 x 25	190	140
228-6	12 M16 x 30	295	218
255-6	12 M20 x 40	580	428
278-6	12 M20 x 40	580	428
302-6	12 M24 X 45	780	575
325-6	12	780	575
345-6	24	580	428
380-6	24	780	575
410-6	24	1,000	738
440-6	24	1,500	1,106
475-6	24	2,000	1,475
505-6	24	2,000	1,475



SXCS Disc Coupling Installation Instructions

9. Machinery Alignment

- a. **Optical methods of alignment** (such as Laser) are recommended.
- b. **The useful life of any Disc Coupling** is directly influenced by the operating misalignment; the better the alignment, the longer the coupling life. The coupling alignment should be checked periodically. Even when a coupling is well aligned at installation, subsequent settling of foundations, shifting of equipment, etc., may cause the alignment to deteriorate.
- c. **Realignment of the equipment may not be necessary** if all eight of the Disc Pack Width (PW) measurements (see Section 12-j) are within acceptable limits.
- d. If the **equipment can be realigned without much movement** of the equipment (Only adding a few adjustment shims to the corners of the equipment), then the disc coupling may remain in place during the alignment procedure.
- e. If **major equipment movement is required** (Such as removing all adjustment shims from one or more corners of the equipment), then the disc coupling should be removed prior to the alignment procedure and reinstalled after the equipment is aligned.
- f. **Soft Foot:** The equipment must sit flat on its base. Any soft foot must be corrected now.
- g. **The Axial Displacement** allowable between shafts during installation should not exceed 20% of the allowable displacement given in Table 5. This displacement is a function of the coupling size and the number of bolts utilized. The larger the size, the larger the axial displacement.
- h. The axial displacement creates large stresses in the disc pack. For a long life, it is recommended that the axial spacing of the shafts should be positioned so that **the disc pack is flat when the equipment is operating** under normal conditions. This means there is a minimal amount of waviness in the disc pack when viewed from the side. This will result in a flexing element that is centered and parallel to its mating flange faces. Move the connecting equipment or the hubs on their respective shafts to accomplish this.

- i. **Thermal expansion** of the shafts should be carefully considered. *Example: if the distance between shaft ends change by 0.015" (the shafts are coming closer to each other) from cold to hot machinery, the distance between shaft ends with cold machinery should intentionally be made larger by 0.015" when the coupling is installed.*
- j. **Measuring using a Caliper & Recording each Disc Pack Width (PW)** at four radial locations (approximately 3, 6, 9 & 12 O'clock) will be the final step in the installation. **If the PW dimension at each location on each disc pack is within the upper and lower limits of Table 4 the installation is complete.**
- k. **If the PW dimension on the disc packs are not within the limits**, calculate the average of the PW measurements for the drive and driven side of the coupling.
 - I. **Calculate the difference** between the recorded average PW value and the Table 4 value of the PW for the drive and driven side of the coupling.
 - II. This represents the **how much to adjust the hubs** on each side of the coupling. **A positive number** indicates expanded disc packs and the need to move the hubs inboard. **A negative number** indicates compressed disc packs and the need to move the hubs outboard.
 - III. If no hubs have to be moved, and there is at least **one PW measurement that is beyond the upper or lower limit**, the equipment may have to be realigned.

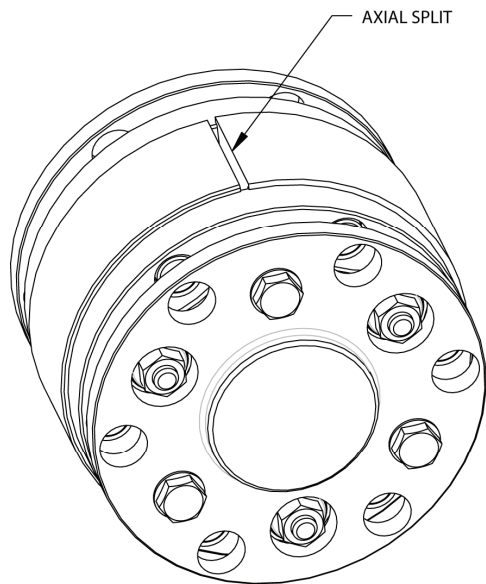
Caution!
When using the PW measurement to determine axial displacement, remember that angular misalignment will affect the PW measurement.

10. Inspection and Maintenance

For inspection or replacement of the disc packs see Lovejoy's "Disc Coupling Inspection & Maintenance Instructions" P/N 69790415374

Note: When reinstalling the coupling guard verify that the new coupling has enough clearance so as not to come in contact with the guard and that there is visibility to inspect the disc pack during operation.

Size	Axial Misalignment $\pm\Delta K_a$		Angular Misalign Max Degree	Axial Tolerance							
	in	mm		PW Disc Pack Width		+/- Tolerance		PW Low		PW High	
				in	mm	in	mm	in	mm	in	mm
090-6	0.0295	0.75	1.5°	0.295	7.5	0.003	0.08	0.292	7.43	0.298	7.58
110-6	0.0413	1.05		0.331	8.4	0.004	0.11	0.327	8.30	0.335	8.51
132-6	0.0512	1.30		0.331	8.4	0.005	0.13	0.326	8.27	0.336	8.53
158-6	0.0610	1.55		0.441	11.2	0.006	0.16	0.435	11.05	0.447	11.36
185-6	0.0728	1.85		0.551	14.0	0.007	0.19	0.544	13.82	0.558	14.19
202-6	0.0748	1.90		0.610	15.5	0.007	0.19	0.603	15.31	0.617	15.69
228-6	0.0827	2.10	1°	0.689	17.5	0.008	0.21	0.681	17.29	0.697	17.71
255-6	0.0925	2.35		0.807	20.5	0.009	0.24	0.798	20.27	0.816	20.74
278-6	0.1024	2.60		0.835	21.2	0.010	0.26	0.825	20.94	0.845	21.46
302-6	0.1122	2.85		0.961	24.4	0.011	0.29	0.950	24.12	0.972	24.69
325-6	0.1280	3.25		1.024	26.0	0.013	0.33	1.011	25.68	1.037	26.33
345-6	0.1358	3.45		1.110	28.2	0.014	0.35	1.096	27.86	1.124	28.55
380-6	0.1496	3.80		1.260	32.0	0.015	0.38	1.245	31.62	1.275	32.38
410-6	0.1614	4.10		1.307	33.2	0.016	0.41	1.291	32.79	1.323	33.61
440-6	0.1732	4.40		1.433	36.4	0.017	0.44	1.416	35.96	1.450	36.84
475-6	0.1870	4.75		1.504	38.2	0.019	0.48	1.485	37.73	1.523	38.68
505-6	0.1988	5.05		1.654	42.0	0.020	0.51	1.634	41.50	1.674	42.51



SXCS Disc Coupling

