



Jaw Couplings Jaw In-Shear Spacer Style (LS, CS) Installation Guide

1.0 INTRODUCTION:

The following document is intended for the explicit use of Lovejoy customers to aid in the installation of Lovejoy power transmission products. The information may be considered privileged and should only be disseminated as an active part of conducting business with Lovejoy, Inc.

Although the coupling may have been properly specified during the design and selection process before the coupling was ordered, operational conditions could possibly have changed prior to installation. Lovejoy, Inc. provides the information and technical support necessary to ensure the appropriate coupling selection was made relative to the product specifications and limitations of Lovejoy's power transmission products. The end user is ultimately responsible for verifying the suitability of the final coupling selection based on the actual service conditions at the time of the coupling installation.

Correct installation and alignment practices will ensure longer coupling life, trouble free operation, and a safer operating environment for the coupling. Please thoroughly review all of the following instructions prior to installing this coupling and placing it in operation. Proper safety guidelines and practices should always be followed during every phase of the installation.

This installation document is considered part of the purchased product and should be retained for future reference.


2.0 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. The coupling or equipment should never be operated under or subjected to conditions that exceed manufacturers' 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 / Tag-out" 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 modifications 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, coupling guards, and shields are not provided by, nor are they the responsibility of Lovejoy, Inc.

Symbols and text format used in this document may contain safety information and will appear similar to the following:

 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 .



3.0 PRODUCT INSPECTION:

Prior to installation, the coupling should be examined for signs of damage resulting from shipping or handling. Refer to the Table-1 on the following page to ensure all the ordered parts are present.

For maximum protection, the coupling and all components should be stored in the original packaging. All parts should be measured prior to installation to ensure correctness of parts to meet the application requirements; such as the hub bore diameter, shaft diameter, shaft separation, key sizes, etc. The BSE (shaft separation) dimension should be measured from the end of one shaft to the end of the other shaft, not to hub faces or pilots.

Lovejoy manufactures couplings based on the shaft details provided by the purchaser. Lovejoy will not be responsible for inaccurate or incomplete information supplied by the purchaser. Check all shaft dimensions.

It is the responsibility of the purchaser to assure the interface connections (flanges, bolts, keys, hydraulic fits, etc.) between the coupling and connected equipment are capable of handling the anticipated loads.


 Warning!	<i>Before beginning the coupling installation, make sure the machinery is made safe. Disconnect and lock out all power to the equipment. No part of the installation should be performed on moving, non secure, or unstable equipment.</i>
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Table 1 - Jaw In-Shear Spacer Coupling Components List

Size	Grid Shaft Hubs	Spacer Sub Assembly	Spacer Sub Assembly Includes:					
			Jaw-in-Shear Spider		Spacer		Retaining Ring	Hex head bolts
			Type	Qty	Adapter	Hub		
LS 090	2	1	Spider	1	2	2	1	8
LS 095	2	1	Spider	1	2	2	1	8
LS 099	2	1	Spider	1	2	2	1	8
LS 100	2	1	Spider	1	2	2	1	8
LS 110	2	1	Spider	1	2	2	1	16
LS 150	2	1	Spider	1	2	2	1	16
LS 190	2	1	Spider	1	2	2	1	16
LS 225	2	1	Spider	1	2	2	1	16
LS 276	2	1	Spider	1	2	2	1	24

4.0 REQUIRED TOOLS:

- Calibrated Torque Wrench and Allen sockets
- Sockets for Hex Head Cap Screws
- Alignment Equipment (dial indicator, laser, straight edge)
- Appropriate tooling for repositioning equipment

5.0 COUPLING AND COMPONENT PREPARATION:

5.1 All exposed surfaces of the coupling and components, including hubs, spiders, cushions, spacers, collars, and any other Lovejoy supplied subassemblies should be thoroughly cleaned prior to installation to remove any protective coatings that may have been applied by Lovejoy as corrosion protection for the coupling surfaces during shipping. All coupling parts, equipment components, shafts, and keyways must be clean and free of any foreign materials prior to attempting assembly or installation. A clean cloth dampened with a nonflammable solvent should be sufficient for this cleaning.

5.2 All sleeves, seals, hub bores, shafts, keys, and keyways must be checked for raised metal, nicks, burrs, dents, gouges, etc., and should be dressed or repaired accordingly prior to installation.

5.3 Prior to removing any existing coupling, establish and record the Distance Between Shaft Ends (BSE), or Gap (G) between the driver and driven and compare this value with the 'G' dimension for Lovejoy Jaw Couplings in Table-4 to verify fit of the coupling.

5.4 Once all necessary measurements have been taken and all components are verified as correct, remove any existing coupling and dress the shafts on the driver and driven equipment.

5.5 If the actual shaft BSE is the same as the specified gap for the Lovejoy Jaw coupling (see Table-4), then the hubs can be mounted flush with the ends of the driver and driven shafts.

5.6 If the actual shaft BSE is different than the specified gap for the Lovejoy Jaw coupling, then the hubs must be mounted on the driver and driven shafts so that the dimension between the hub faces matches the 'G' dimension, or gap as specified in Table-4.

5.0 COUPLING AND COMPONENT PREPARATION (CONT'D):

5.7 Lovejoy machines the bore in all Lovejoy Jaw style hubs with 'inch' dimensioned straight bores and keyways to meet the industry accepted **ANSI/AGMA 9002-B04** Standards' tolerance for common keyways and clearance fit bores unless otherwise specified. Tapered and spline bores may require special manufacturing and installation consideration.

5.8 Lovejoy machines the bore in all Lovejoy Jaw style hubs with 'metric' dimensioned straight bores and keyways to meet the industry accepted **ANSI/AGMA 9112-A04** Standards' tolerance for common keyways and clearance fit bores unless otherwise specified. Tapered and spline bores may require special manufacturing and installation consideration.

5.9 Lovejoy machines the bore in all Lovejoy Jaw style hubs with splines based on information provided by the customer. Standard spline meet specifications set forth in ANSI B92.1A for Class 5 fits, and DIN 5480 for metric splines.

5.10 For all Lovejoy Jaw style hubs with taper bores and taper bores with keyways, Lovejoy manufactures these hubs with bores using tolerances and specifications as supplied by the customer. Taper bores will be tested with plug gauges usually supplied by the customer or included in the cost of the coupling.

6.0 COUPLING INSTALLATION:

6.1 Before beginning the coupling installation, make sure the machinery is made safe. Disconnect and lock out all power to the equipment. No part of the installation should be performed on moving or unstable equipment.

6.2 Prior to installing the hubs, insert the key into the keyway on the shafts. Each key should fit snugly in the keyway with minimal side to side movement. Standard keys should be the same length or slightly longer than the keyway in the hub to transmit the maximum allowable torque. Woodruff keys may be shorter and may not transmit the same amount of torque. If one or both of the hubs contains a spline with the Lovejoy L-LOC feature, see section 7.0 regarding Splined Hub Installation for the specified set screw torque

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6.0 COUPLING INSTALLATION:

6.3 Slide the appropriate grid shaft hub on each of the shafts over the keys and align the pilot surface of the shaft hub with the end of the shaft. Lovejoy manufactures these shaft hubs with a clearance or slip fit and the hub should slide onto the shaft with little or no difficulty. If either shaft needs to extend into the center of the spider, the hub may not align with the end of the shaft. To achieve a shaft separation that is less than the 'G' gap dimension, ensure the opening in the center of the spider is greater than the shaft diameter. If either hub is to overhang on the shaft, ideally the amount of hub engagement on the shaft should be at least equal to the diameter of the shaft.

Note: Hubs must be mounted on the driver and driven shafts with the flange and pilot end facing each other.

6.4 Using a calibrated torque wrench, tighten the set screw on one hub to the torque specified for set screws in Table-2. Do not fully tighten the set screw on the second hub at this time to allow for this hub to be moved for minor adjustments when installing the spacer assembly.

6.5 The equipment should already be in place and the distance between the shaft ends should match the BSE dimension as ordered. This separation can be measured with a gap, or stick micrometer to ensure accuracy.

6.6 Lovejoy ships the spacer assemblies with the jaw hub already mounted on the shaft hub adapter. The adapter will have a pilot recess that will mate with the spacer hub when installed. Slide this pilot over the shaft hub male pilot and align the holes in the shaft hubs with the tapped holes in the adapters. Insert the mounting bolts and tighten with a calibrated torque wrench to the value specified in Table-2 using the industry standard procedure of tightening all the bolts in a crisscross pattern, first to 50% of the specified torque, then 75%, then the finish torque as specified.

6.7 Slide the Jaw-in-Shear retaining collar over the jaw hub prior to installing the second spacer assembly.

6.8 Repeat step 6.6 to install the second spacer assembly.

Note that the jaws on the hubs will be mounted end-to-end with the jaws on the opposite hub. If there is not enough clearance between the jaws to be oriented end-to-end, make adjustments to the shaft separation to correct this condition.

6.9 Check alignment using either "straight edge method" or a dial indicator. If using a straight edge, lay the edge across the jaw hubs and take measurements at four locations 90° apart without rotating the shafts. The alignment cannot exceed the allowable parallel, angular, or axial misalignment as specified in Table-4. If using dial indicators and the gap is not too great, mount the indicators on one shaft and take readings on the opposite hub at four locations 90° apart. If alignment exceeds the values in Table-4, realign the equipment to correct this condition.

6.10 Wrap the blue Jaw-In-Shear spider around the hubs and insert a leg of the spider into each space between the coupling jaws.

6.11 Align the pins on the side of the collar with the grooves in the spider. Slide the pins on the collar through these grooves until the collar completely covers the spider. Rotate the collar until the pins on the side of the collar rotate past the raised dots on the spider. The pins should seat between two of these raised dots.

6.12 Recheck set screws and mounting screws for tightness using a calibrated torque wrench.

6.13 Recheck the axial, parallel, and angular alignment for accuracy.

6.14 Remove any tooling and material away from the shafting and coupling. Install the appropriate coupling guard per OSHA requirements and remove the Lockout / Tagout kit from the power supply. The equipment can then be started up and tested. The coupling and equipment should run smoothly. If vibration is detected it could indicate there is an issue with alignment or other problems. These problems could point to problems related to the motor, coupling, or driven equipment and should be resolved prior to placing this coupling into operation.

Table 2 – Jaw In-Shear Spacer Hub Set Screw and Mounting Screw Torque's

Coupling Size	Spacer Shaft Hub Size	Inch Set Screws				Spacer Hub Screws (HHCS Grade 8)				
		Set Screw - inch		Tightening Torque		Screw size - inch			Tightening Torque	
		Size	Length	in-lbs	Nm	Size	Length	Qty	in-lbs	Nm
LS 090 LS 095 LS 099 LS 100	1020	8-32	3/16"	18	2	1/4-20	5/8"	8	150	17
LS 110	1030	8-32	3/16"	18	2	1/4-20	3/4"	16	150	17
LS 150	1040	10-24	1/4"	32	3.6	1/4-20	3/4"	16	150	17
LS 190	1050	10-24	1/4"	32	3.6	5/16-18	7/8"	16	330	37
LS 225	1060	10-24	1/4"	32	3.6	3/8-16	1"	16	560	64
LS 276	1070	1/4-20	5/16"	80	9.5	3/8-16	1"	24	560	64

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Table 3 - Dimensional / Performance Details for Jaw In-Shear Couplings

Size	Maximum Bore		Maximum Speed RPM	Nominal Torque Capacity	
	Standard Hubs			in-lbs	Nm
	In	mm			
LS 090	1.000	25	9,200	335	38
LS 095	1.125	29	9,200	335	38
LS 099	1.188	30	7,700	560	63
LS 100	1.375	35	7,700	560	63
LS 110	1.625	41	5,900	1,090	123
LS 150	1.875	48	5,200	1,810	205
LS 190	2.125	54	4,300	2,920	330
LS 225	2.625	67	3,900	4,200	475
LS 276	2.875	73	3,100	7,460	843

Table 4 - Allowable Misalignment for Jaw In-Shear Spacer Couplings

Size	BSE	G Dimension (Gap)		Allowable Misalignment ¹				
		In	mm	Parallel		Angular degrees	Axial	
				in	mm		in	mm
LS 090	Based on Spacer Length	1.00	25.4	0.030	0.8	2°	0.031	0.8
LS 095		1.00	25.4	0.030	0.8	2°	0.031	0.8
LS 099		1.40	35.6	0.030	0.8	2°	0.031	0.8
LS 100		1.40	35.6	0.030	0.8	2°	0.031	0.8
LS 110		1.64	41.7	0.030	0.8	2°	0.031	0.8
LS 150		1.94	49.3	0.030	0.8	2°	0.047	1.2
LS 190		1.94	49.3	0.047	1.2	2°	0.047	1.2
LS 225		1.94	49.3	0.047	1.2	2°	0.047	1.2
LS 276		3.19	81.0	0.047	1.2	2°	0.063	1.6

Notes: 1. The same misalignment values apply for both standard and spacer style couplings

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