



# Jaw Couplings L-Line (LC Collar Style) 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:

	<b>Warning!</b> This symbol indicates safety measures which must be observed to avoid <b>personal injury</b> .
	<b>Caution!</b> This symbol indicates safety measures which must be observed to avoid <b>damage to coupling</b> .



## 3.0 PRODUCT INSPECTION:

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

**Table 1 - Components List**

Standard Coupling Type/Size	Collar		
	Hubs	Spider(s)	w/screws
LC090 - LC225	2	1	1

## 3.0 PRODUCT INSPECTION (Continued):

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!**

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.

**4.0 REQUIRED TOOLS:**

- Calibrated Torque Wrench and Allen sockets
- Phillips head screw driver
- 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 shafts and compare this value with the 'G' dimension for Lovejoy Jaw Couplings in Table-5 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-5), 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-5.

**Note: Hubs must be mounted on the driver and driven shafts with the jaws facing each other.**

**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.

**COUPLING AND COMPONENT PREPARATION (CONT'D):**

**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. If the spline utilizes the L-LOC shaft locking feature, see section 7.0 for assistance in installing hubs with this feature.

**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 Prior to installing the hubs on the shaft**, determine which hub has the tapped holes for mounting the retaining collar. Slide the retaining collar onto the shaft where that hub will be mounted.

**6.2 Insert the key into the keyway.** The 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

**6.3 Slide the appropriate hub** on each of the shafts over the keys and align the face of the hub with the end of the shaft. Lovejoy jaw coupling hubs are machined with a clearance, or slip fit and 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.

**6.4 Using a calibrated torque wrench tighten the set screws** to the torque specified in Table-2. If one or both of the hubs contain a spline with the Lovejoy L-LOC feature, see section 7.0 regarding Splined Hub Installation for the specified set screw torque.

**6.5 Move the equipment into the proper location** to achieve the 'G' gap dimension between hub faces as specified in Table-5. The hubs could be moved back on the shafts or overhung slightly to compensate for discrepancies in shaft separation. Ideally, the amount of hub engagement on the shaft should be at least equal to the diameter of the shaft.

**6.6 Check alignment** using either "straight edge method" or a dial indicator taking measurements at four locations 90° apart to ensure alignment does not exceed the allowable misalignment as specified in Table-5.

**6.7 Wrap the Snap Wrap style spider around the hubs** insert a leg of the spider into each space between the coupling jaws. Slide the collar over the spider and rotate the collar until the screw holes line up with the tapped holes in the hub.

**6.8 Insert a screw with the star lock washer in each hole** and tighten using the Phillips head screw driver.

**6.9 Recheck set screws** for tightness and recheck the axial and angular alignment for accuracy.

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**6.0 COUPLING INSTALLATION (CONT'D):**

**6.10 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

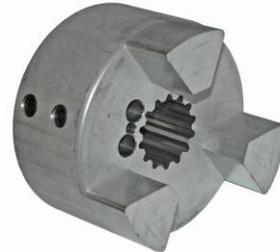
it could indicate there is an issue with alignment or other problems. These problems could point to problems related to the motor, coupling, or driven equipment and should be resolved prior to placing this coupling into operation.

**Table 2 - Set Screw Size and Tightening Torque (for LC Style Hubs)**

CPLG Size	Inch Set Screws				Metric Set Screws <sup>1</sup>					
	Set Screw - inch		Tightening Torque		Set Screw - mm		Tightening Torque			
	Size	Length	in-lbs	Nm	Size	Length	in-lbs	Nm		
LC 090	1/4-20	3/16	45-50	5.0-5.6	M4	3 & up	18	2		
		1/4 & up	78-87	9-10	M6	4-6 8 & up	44 58-62	5 6.6-7		
LC 095	5/16-18	1/4	80-90	9-10	M8	5-8	84-88	9.5-10		
LC 099			5/16 & up	150-160		17-19	10 & up	142-150	16-17	
LC 100		1/2-13		1/2 & up		540-600	61-68	M12	8-12 14 & up	372-396 504-528
LC 110			LC 150			LC 190	LC 225	LC 276		

**7.0 SPLINE HUB INSTALLATION (LC):**

**7.1 When installing a hub with a spline and L-LOC** (see holes next to the spline in the photo to the right), **ensure the spline shaft is fully engaged and extends completely under BOTH L-LOC set screws.** Some hubs may only have a single set screw and the spline **MUST** extend completely under that set screw.



**7.2 Identify if the hub is a standard powder metal hub,** or a hub manufactured from steel (1045, 1018, or equivalent) and tighten the set screws as specified in Table-3 below. If assistance is required to confirm the hub is powder metal, feel free to contact Lovejoy Customer Service.

**Warning!** If the spline shaft does not extend fully under one of the L-LOC set screws, **DO NOT** tighten that set screw.

**Table 3 - LLOC Set Screw Tightening Torque (LC Style Hubs)**

CPLG Size	Inch LLOC Set Screws <sup>1</sup>							
	PM Hubs <sup>2</sup> Set Screw Size (inch)	Tightening Torque			Steel Hubs <sup>2</sup> Set Screw Size (inch)	Tightening Torque		
		ft-lbs	in-lbs	Nm		ft-lbs	in-lbs	Nm
LC 090	3/8 - 16	23	276	31	5/16 - 18	13	156	18
LC 095	3/8 - 16	23	276	31	5/16 - 18	13	156	18
LC 099	5/16 - 18	13	156	18	3/8 - 16	23	276	31
LC 100	3/8 - 16	23	276	31	3/8 - 16	23	276	31
LC 110	3/8 - 16	23	276	31	1/2 - 13	48	576	65
LC 150	3/8 - 16	23	276	31	1/2 - 13	48	576	65
LC 190	1/2 - 13	48	576	65	1/2 - 13	48	576	65
LC 225	1/2 - 13	48	576	65	1/2 - 13	48	576	65

- Notes:**
1. Contact Lovejoy Technical Support for Metric LLOC set screws.
  2. PM = Powder Metal. Most hubs thru size L225 are PM (Powder Metal) by default

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**Table 4 - Performance Details for LC Collar Style Jaw Couplings**

Size	Maximum Bore		Maximum Speed	Torque Capacity	
	in	mm		Snap Wrap	
				in-lbs	Nm
LC 090	1.000	25	3,600	144	16.3
LC 095	1.125	28	3,600	194	21.9
LC 099	1.188	30	3,600	318	35.9
LC 100	1.375	35	3,600	417	47.1
LC 110	1.625	42	3,600	792	89.5
LC 150	1.875	48	3,600	1,240	140.0
LC 190	2.125	55	3,600	1,728	195.0
LC 225	2.625	65	3,600	2,340	264.0

**Table 5 - Allowable Misalignment for LC Style Jaw Couplings**

Size	Gap 'G' (BSE) Width In	Allowable Misalignment		
		Snap Wrap Spiders		
		Parallel in	Angular Degrees	Δ 'G' in
LC 090	0.500	0.015	1°	0.035
LC 095	0.500	0.015	1°	0.035
LC 099	0.750	0.015	1°	0.040
LC 100	0.750	0.015	1°	0.040
LC 110	0.875	0.015	1°	0.055
LC 150	1.000	0.015	1°	0.065
LC190	1.000	0.015	1°	0.075
LC 225	1.000	0.015	1°	0.085

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