



# Curved Jaw Couplings CJDB 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:

 **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 following chart to ensure all the ordered parts are present.


**Table 1 - Components List (CJDB Style)**

Standard Coupling Type/Size	Shaft Hub	Jaw Ring	Spider	Cap screws
CJDB 24 - 38	2	2	1	16
CJDB 42 - 48	2	2	1	24
CJDB 55	2	2	1	16
CJDB 65	2	2	1	24
CJDB 75 - 160	2	2	1	30
CJDB 180	2	2	1	36

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 or unstable equipment.

#### 4.0 REQUIRED TOOLS:

- Calibrated Torque Wrench and Allen sockets
- 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, 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 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 hub faces and compare this value with the 'BSE' or Gap (G) dimension for Lovejoy CJDB Coupling 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 BSE** for the Lovejoy CJDB Spacer 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 Curved Jaw coupling, then the hubs must be mounted on the driver and driven shafts so that the dimension between the hub faces matches the 'BSE' dimension as specified in Table-5.

**5.7 Lovejoy machines the bore in all Lovejoy Curved 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 Curved 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 Curved 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 Curved 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 CURVED JAW 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 mounting the hubs**, place the keys in the shaft keyways. 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. Woodruff keys are usually shorter and may not transmit the same amount of torque. For hubs with splines and the L-LOC spline clamping feature, see section 7.0 for instructions on installing hubs with splines.

**Note: The CJDB Style curved jaw coupling is designed with a drop out center assembly for ease of maintenance**, or for ease of disconnecting the equipment, driver from driven. Section 6.3.1 to 6.3.6 should be used for new, or first time installations. **If replacing the spider, disconnecting the equipment shafts, or reconnecting the equipment shafts, refer to Section 6.4.** Please note that when replacing the center drop out assembly, it is always recommended to replace the spider. Replacement spiders should be the same size, type, and torque capacity (determined by color) as the spider being replaced.

#### 6.3 NEW INSTALLATION:

**If this is a spider replacement only, please proceed to section 6.4 .**

**6.3.1 If this is a new installation, slide the appropriate shaft hub** on each of the shafts and align the face of the hub with the end of the shaft. Lovejoy curved jaw coupling shaft hubs are manufactured with a clearance, or slip fit and should slide onto the shaft with little or no difficulty. Using a calibrated torque wrench, tighten the set screw in one hub to the torque value specified in Table-2. Lightly tighten the set screw in the second hub to allow for possible axial adjustments after the equipment has been moved.

**6.3.2 Using a calibrated torque wrench and the cap screws provided**, connect the jaw rings to the shaft hubs and tighten the flange screws using the torque values in Table-4. The bolts should be tightened using the industry standard procedure for tightening bolts in a crisscross pattern starting at 50% or the specified torque, then 75%, then the full torque as specified.

**6.3.3 Insert the spider into** one of the hubs at this time. The jaw rings have solid centers and the shafts cannot extend past the end of the hubs. The BSE should meet the dimension specified in Table-5.

**6.3.4 Carefully 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 overhung slightly to compensate for discrepancies in shaft separation. Ideally, the amount of hub engagement on the shaft should be equal to or greater than the diameter of the shaft. When the hubs are tightened in place, the face of the jaw rings should be touching the raised dots on the side of the spider without any excess pressure. If the hubs are pressed together too tightly against the spider, the coupling could lose some of its capability to accommodate misalignment.

**6.3.5 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.

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**6.3.6 Using a calibrated torque wrench, tighten set screw in the second hub** to the torque specified in Table-2. 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.

**6.4 SPIDER REPLACEMENT OR DROP OUT CENTER MAINTENANCE**

**6.4.1 To remove the drop out center assembly**, remove all the flange screws that hold the jaw rings in place. The jaw rings are piloted to the hubs and will stay in place between the hubs unless there is damage or wear to the spider or jaw rings. The set screw holding one of the hubs in place will need to be loosened to allow the hub to be slid back on the shaft. This should disengage the pilot and allow the center assembly to drop out.

**6.4.2 Inspect the drop out center assembly** to ensure there is no excessive wear in the jaws or spiders. Ideally, the spiders should always be replaced anytime the coupling is disassembled. Replace any parts that show signs of wear or damage.

**6.4.3 Place the spider between the two jaw rings** and raise the center assembly into position between the shaft hubs. The pilots on the jaw ring should fit over the pilots on the shaft hubs.

**6.4.4 While holding the center assembly in place**, slide the hub that was loosened previously to remove the center assembly back into position against the drop out center assembly.

**6.4.5 Insert and hand tighten all the flange bolts.**

**6.4.6 Check the gap** and compare with the 'G' dimension specified in Table-5. Then tighten the set screw in the hub using a calibrated torque wrench. The jaw rings should not be pressing too tightly against the spider, or the coupling could lose some of its capability to accommodate misalignment.

**6.4.7 With a calibrated torque wrench, tighten all the flange bolts** to the torque specified in Table-4. The bolts should be tightened using the industry standard procedure for tightening bolts in a crisscross pattern starting at 50% or the specified torque, then 75%, then the full torque as specified.

**6.5 COMPLETE THE INSTALLATION:**

**6.5.1 Recheck axial, parallel, and angular alignment** for accuracy.

**6.5.2 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 Standard CJSB and CJDB 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	
24/38 (PM)	10-24	3/16 & up	32-36	3.6 - 4	M5	6 & up	35	4	
28/38 (PM) 38/45 (PM) 42/55 (CI) 48/60 (CI)	5/16-18	1/4	80-90	9-10	M6	8 & up	58-62	6.6-7	
		5/16 & up	150-160	17-19	M8	10 & up	142-150	16-17	
55/70 (CI) 65/75 (CI) 75/90 (CI) 90/100 (CI)		3/8-16	1/4	133-150	15-17	M10	6-10 12 & up	168-177 283-300	19-20 32-34
			5/16	225-250	25-28				
	3/8 & up		260-290	29-33					
100/110 (CI)	1/2-13	1/2 & up	540-600	61-68	M12	8-12 14 & up	372-396 504-528	42-45 57-60	
110/125 (CI) 125/145 (CI)	5/8-11	5/8 & up	1100-1200	124-136	M16	16 18 & up	756-792 1260-1320	86-90 142-150	

Notes 1. In some countries, set screws may be referred to as "Grub screws"

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7.0 SPLINE HUB INSTALLATION (Curved Jaw):

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.



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

7.2 Identify if the hub is a standard powder metal hub, cast iron, 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 type for the appropriate tightening torque, feel free to contact Lovejoy Customer Service.

**Table 3 - LLOC Set Screw Tightening Torque**

CJ CPLG  Size	Inch L-LOC Set Screws <sup>1</sup>			
	Screw Size (inch) in	Tightening Torque		
		ft-lbs	in-lbs	Nm
24/38 (PM)	5/16 - 18	13	156	18
28/38 (PM)				
38/45 (PM)				
42/55 (CI)	3/8 - 16	23	276	31
48/60 (CI)	1/2 - 13	48	576	65
55/70 (CI)				
65/75 (CI)				
75/90 (CI)				

Notes: 1. Contact Lovejoy Technical Support for Metric LLOC set screws.

**Table 4 - Curved Jaw - CJDB and CJSB Flange Bolt Details**

Size	Flange Bolts				Bolt Circle		
	Qty Per Hub	Size	Tightening Torque		BC diameter		Hole Pitch
			in-lbs	Nm	in	mm	
24	8	M5 x 16	89	10	1.77	45	8 x 45°
28	8	M6 x 20	150	17	2.13	54	
38	8	M8 x 22	363	41	2.60	66	
42	12	M8 x 25	363	41	3.15	80	16 x 22.5°
48	12	M8 x 25	363	41	3.54	90	
55	8	M10 x 30	725	83	4.02	102	8 x 45°
65	12	M12 x 40	735	83	4.57	116	16 x 22.5°
75	15	M16 x 40	1,062	120	5.35	136	20 x 18°
90	15	M16 x 50	2,611	295	6.77	172	
100	15	M20 x 50	2,611	295	7.68	195	
110	15	M20 x 50	5,133	580	8.58	218	
125	15	M20 x 60	5,133	580	9.92	252	
140	15	M20 x 60	5,133	580	11.10	282	
160	15	M24 x 70	8,850	1,000	12.80	325	
180	18	M24 x 80	8,850	1,000	14.76	375	24 x 15°

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**Table 5 - Curved Jaw CJDB Series Dimensional Data**

Size	CJDB BSE		Spider 'G' Gap		CL <sup>1</sup> in	Misalignment Maximum Displacement (offset)		
	in	mm	in	mm		Angular Degrees	Axial in	Parallel in (+/-)
24	1.30	33.0	0.70	17.8	0.08	1	-0.0 / +0.055	0.009
28	1.54	39.1	0.79	20.1	0.10	1	-0.0 / +0.060	0.010
38	1.69	42.9	0.94	23.9	0.12	1	-0.0 / +0.070	0.011
42	1.89	48.0	1.02	25.9	0.12	1	-0.0 / +0.079	0.012
48	1.97	50.0	1.10	27.9	0.14	1	-0.0 / +0.082	0.014
55	2.36	59.9	1.18	30.0	0.16	1	-0.0 / +0.087	0.014
65	2.56	65.0	1.38	35.1	0.18	1	-0.0 / +0.102	0.016
75	2.95	74.9	1.57	39.9	0.20	1	-0.0 / +0.120	0.018
90	3.35	85.1	1.77	45.0	0.22	1	-0.0 / +0.133	0.019
100	3.82	97.0	1.97	50.0	0.24	1	-0.0 / +0.150	0.020
110	4.06	103.1	2.17	55.1	0.26	1	-0.0 / +0.165	0.021
125	4.57	116.1	2.36	59.9	0.28	1	-0.0 / +0.180	0.024
140	5.04	128.0	2.56	65.0	0.30	1	-0.0 / +0.190	0.024
160	5.75	146.1	2.95	74.9	0.35	1	-0.0 / +0.220	0.025
180	6.26	159.0	3.35	85.1	0.41	1	-0.0 / +0.250	0.027

**Notes:** 1. CL (Clearance) is the distance between the jaws on one hub and the face of the second hub

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