



Curved Jaw Couplings CJSB 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:



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 (CJSB Style)

| Standard Coupling Type/Size | Standard Hub | Shaft Hub | Jaw Ring | Spider | Cap-screws |
|-----------------------------|--------------|-----------|----------|--------|------------|
| CJSB 24 - 38 | 1 | 1 | 1 | 1 | 8 |
| CJSB 42 - 48 | 1 | 1 | 1 | 1 | 12 |
| CJSB 55 | 1 | 1 | 1 | 1 | 8 |
| CJSB 65 | 1 | 1 | 1 | 1 | 12 |
| CJSB 75 - 160 | 1 | 1 | 1 | 1 | 15 |
| CJSB 180 | 1 | 1 | 1 | 1 | 18 |

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! 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 . |

| | |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | 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 CJSB Coupling in Table-6 to verify the correct 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 CJSB Spacer coupling (see Table-6), 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-6.

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.

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 curved jaw coupling 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 second set screw to allow for possible axial adjustments after the equipment has been moved.

6.4 Using a calibrated torque wrench and the flange bolts provided, connect the jaw ring to the shaft hub and tighten the flange bolts using the torque values in Table-5. 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 Insert the spider into one hub at this time. If the shaft needs to extend into the center of the spider, the hub may not align with the end of the shaft. Check Table-7 to ensure the shaft will fit in the open center of the spider.

6.6 Carefully move the equipment into the proper location to achieve the 'G' gap dimension between hub faces as specified in Table-6. 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 equal to or greater than the diameter of the shaft. When the hubs are tightened in place, the hubs 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.

6.7 Check alignment using either the "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-6.

6.8 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.

6.9 Recheck axial, parallel, and angular alignment for accuracy.

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.

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Table 2 - Set Screw Size and Tightening Torque

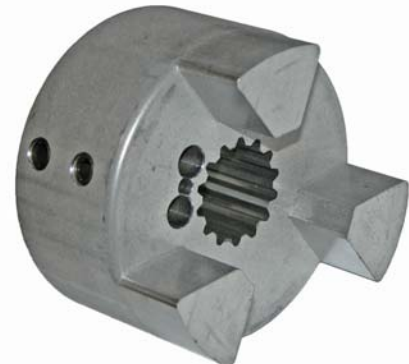
(for Standard CJSB and CJDB Hubs)

| CPLG Size | Inch Set Screws | | | | Metric Set Screws ¹ | | | |
|-------------------------------------------------------|------------------|------------------|--------------------|----------------|--------------------------------|-----------------|----------------------|------------------|
| | 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 3/8 & up | 225-250 260-290 | 25-28 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"

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 ¹ | | | |
|--------------------|------------------------------------|-------------------|--------|----|
| | 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) | 3/8 - 16 | 23 | 276 | 31 |
| 42/55 (CI) | | | | |
| 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.

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Table 5 - 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° |

Table 6 - Curved Jaw CJSB Series Dimensional Data

| Size | CJSB BSE | | Spider 'G' Gap | | CL ¹ in | Misalignment Maximum Displacement (offset) | | |
|------|----------|-------|----------------|------|-----------------------|-----------------------------------------------|-------------------|-------|
| | in | mm | in | mm | | Angular Degrees | Parallel in (+/-) | |
| | | | | | | | Axial in | |
| 24 | 1.02 | 25.9 | 0.70 | 17.8 | 0.08 | 1 | -0.0 / +0.055 | 0.009 |
| 28 | 1.18 | 30.0 | 0.79 | 20.1 | 0.10 | 1 | -0.0 / +0.060 | 0.010 |
| 38 | 1.34 | 34.0 | 0.94 | 23.9 | 0.12 | 1 | -0.0 / +0.070 | 0.011 |
| 42 | 1.50 | 38.1 | 1.02 | 25.9 | 0.12 | 1 | -0.0 / +0.079 | 0.012 |
| 48 | 1.57 | 39.9 | 1.10 | 27.9 | 0.14 | 1 | -0.0 / +0.082 | 0.014 |
| 55 | 1.81 | 46.0 | 1.18 | 30.0 | 0.16 | 1 | -0.0 / +0.087 | 0.014 |
| 65 | 2.01 | 51.1 | 1.38 | 35.1 | 0.18 | 1 | -0.0 / +0.102 | 0.016 |
| 75 | 2.32 | 58.9 | 1.57 | 39.9 | 0.20 | 1 | -0.0 / +0.120 | 0.018 |
| 90 | 2.56 | 65.0 | 1.77 | 45.0 | 0.22 | 1 | -0.0 / +0.133 | 0.019 |
| 100 | 2.95 | 74.9 | 1.97 | 50.0 | 0.24 | 1 | -0.0 / +0.150 | 0.020 |
| 110 | 3.19 | 81.0 | 2.17 | 55.1 | 0.26 | 1 | -0.0 / +0.165 | 0.021 |
| 125 | 3.54 | 89.9 | 2.36 | 59.9 | 0.28 | 1 | -0.0 / +0.180 | 0.024 |
| 140 | 3.90 | 99.1 | 2.56 | 65.0 | 0.30 | 1 | -0.0 / +0.190 | 0.024 |
| 160 | 4.45 | 113.0 | 2.95 | 74.9 | 0.35 | 1 | -0.0 / +0.220 | 0.025 |
| 180 | 4.92 | 125.0 | 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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Table 7 - Curved Jaw Spider Dimensions

| CPLG | Open Center Spiders | | | | | |
|---------|-------------------------|-----|--------------|----|-------------------------|-----|
| | Spider Outside Diameter | | Spider Width | | Center Opening Diameter | |
| | in | mm | in | mm | in | mm |
| 19/24 | 1.57 | 40 | 0.47 | 12 | 0.71 | 18 |
| 24/32 | 2.16 | 55 | 0.55 | 14 | 1.06 | 27 |
| 28/38 | 2.56 | 65 | 0.59 | 15 | 1.15 | 29 |
| 38/45 | 3.15 | 80 | 0.71 | 18 | 1.50 | 38 |
| 42/55 | 3.74 | 95 | 0.79 | 20 | 1.81 | 46 |
| 48/60 | 4.13 | 105 | 0.83 | 21 | 2.01 | 51 |
| 55/70 | 4.72 | 120 | 0.87 | 22 | 2.36 | 60 |
| 65/75 | 5.31 | 135 | 1.02 | 26 | 2.68 | 68 |
| 75/90 | 6.30 | 160 | 1.18 | 30 | 3.15 | 80 |
| 90/100 | 7.87 | 200 | 1.34 | 34 | 3.94 | 100 |
| 100/110 | 8.86 | 225 | 1.50 | 38 | 4.45 | 113 |
| 110/125 | 10.04 | 255 | 1.65 | 42 | 5.00 | 127 |
| 125/145 | 11.42 | 290 | 1.81 | 46 | 5.79 | 147 |
| 140 | 12.60 | 320 | 1.97 | 50 | 6.50 | 165 |
| 160 | 14.57 | 370 | 2.24 | 57 | 7.48 | 190 |
| 180 | 16.54 | 420 | 2.52 | 64 | 8.66 | 220 |

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