

Jaw Couplings RRS and RRC 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

Spacer Coupling Type/Size	RRS / L Hubs	RRSC Hubs	Spiders	Spacer	Collars w/screws
RRS090 - RRS110 Inch Spacer	2	n/a	2	1	2
RRS090 - RRS110 Metric Spacer	2	n/a	2	1	2
RRS150 - RRS225 Inch Spacer	1	1	2	1	2
RRS150 - RRS225 Metric Spacer	1	1	2	1	2

Spacer Coupling Type/Size	Jaw Ring	Adapter Hubs	Cushions	Collar w/screws
RRC225 - RRC295	2	2	6	1
RRC2955	2	2	10	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.

3.0 PRODUCT INSPECTION (Continued):

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 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.

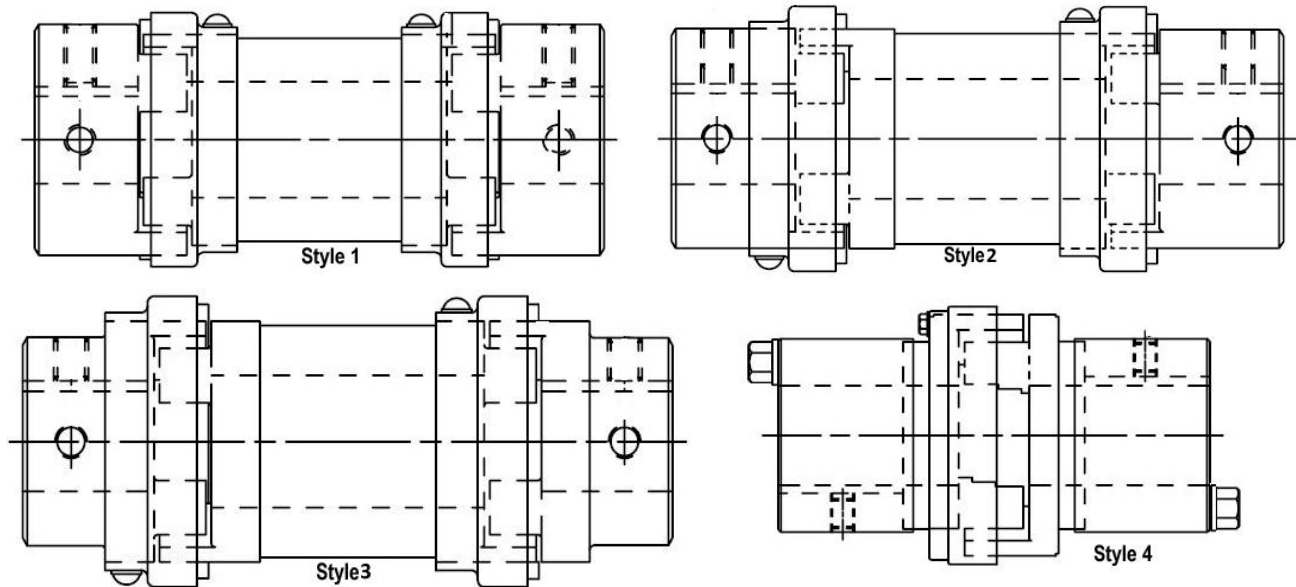
CAUTION!

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.

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.



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Version Date: 08-August-2012

5.0 COUPLING AND COMPONENT PREPARATION (Continued):

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 (RRS/RRC SPACER COUPLINGS):

6.1 Identify the style of spacer coupling being installed. The style is determined by size and hub types (see pictures on previous page).

6.2 RRS090 thru RRS110 couplings may use standard L-style or RRS jaw coupling hubs. RRS and L-style hubs are identical except that the RRS hubs are supplied with a second set screw located at 90° from the keyway. The RRSC hubs have two set screws and additional tapped holes on the outside diameter of the hub for the screws used with the retaining collar. Since RRS hubs may not be available for all bore sizes, L-Style hubs are commonly substituted. L-style hubs **cannot** be used in place of RRSC hubs.

6.3 When installing an RRS Style-2, Style-3, or Style-4 spacer coupling, one of the hubs will be an RRSC style hub with collar mounting holes located on the outside diameter. Slide the retaining collar on the appropriate shaft prior to mounting this hub.

6.4 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 as the keyway in the hub. Woodruff keys may be shorter and may not transmit the same amount of torque. If one or both hubs contain a spline with Lovejoy's L-LOC spline clamping feature, see section 7.0 for instructions on installing splined hubs.

6.5 When installing an RRC Style-4 coupling, space can be an issue and the bolts that connect the hubs to the spacer assembly should be inserted in the hubs prior to mounting the hubs.

6.6 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 supplies jaw coupling hubs with clearance, or slip fit bores and the hubs should slide onto the shaft with little or no difficulty. If the hubs are to hang off the end of the shafts, an equal amount of overhang is recommended for each hub. Note that the minimum amount of shaft engagement should be equivalent to or greater than the diameter of the shaft. If the shaft needs to extend inside the spider and spacer, see Table-5 for the size of the opening in the spacers.

6.7 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.

6.8 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-4. Angular alignment can be checked using Δ 'G', or the difference in the gap between relative locations on the faces of each hub. If misalignment exceeds the amount listed in Table-4, realign the equipment to correct this condition.

6.9 Position the spacer between the hubs and install the snap wrap spider or cushions now between the coupling jaws. Standard spiders can be used, however the equipment may need to be moved apart if attempting to use a standard spider. The Snap Wrap spider is recommended and should be wrapped around the hub and spacer with the legs inserted between the coupling jaws. Then slide the collars over the spider and secure the collar using the screws and lock washers provided. If the coupling is a C-Style or H-Style with cushions, insert the cushions between the jaws, then slide the collar in place and secure with the screws provided.

6.10 With Style-4 spacers, the axial mounting screws should be tightened using a calibrated torque wrench to 68 – 76 ft-lbs of torque.

Table 2 - Set Screw Size and Tightening Torque

(for RRS and RRC Couplings)

RRS 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
RRS 090		3/16	45-50	5.0-5.6	M4	3 & up	18	2
		1/4 & up	78-87	9-10	M6	4-6	44	5
						8 & up	58-62	6.6-7
RRS 095	5/16-18	1/4	80-90	9-10	M8	5-8	84-88	9.5-10
RRS 099								
RRS 100		5/16 & up	150-160	17-19		10 & up	142-150	16-17
RRS 110								
RRS 150								
RRS 190	1/2-13	1/2 & up	540-600	61-68	M12	8-12	372-396	42-45
RRS 225						14 & up	504-528	57-60
RRC 226	1/2-13	1/2 & up	540-600	61-68	M12	8-12	372-396	42-45
RRC 276						14 & up	504-528	57-60
RRC 280								
RRC 285	5/8-11	5/8 & up	1100-1200	124-136	M16	16	756-792	86-90
RRC 295						18 & up	1260-1320	142-150
RRC 2955								

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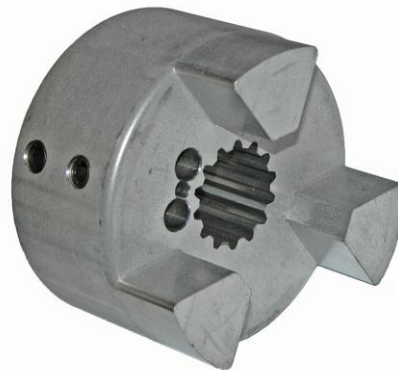
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6.0 COUPLING INSTALLATION (CONT'D)

6.11 Recheck axial, parallel, and angular alignment for accuracy

6.13 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.



7.0 SPLINE HUB INSTALLATION (L, RRS, RRC, and RRSC Hubs):

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, 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.

Table 3 – L-LOC Set Screw Tightening Torque

CPLG Size	Inch L-LOC Set Screws ¹							
	PM Hubs ² Set Screw Size (inch)	Tightening Torque			Steel Hubs ² Set Screw Size (inch)	Tightening Torque		
		ft-lbs	in-lbs	Nm		ft-lbs	in-lbs	Nm
L 090	3/8 - 16	23	276	31	5/16 - 18	13	156	18
L 095	3/8 - 16	23	276	31	5/16 - 18	13	156	18
L 099	5/16 - 18	13	156	18	3/8 - 16	23	276	31
L 100	3/8 - 16	23	276	31	3/8 - 16	23	276	31
L 110	3/8 - 16	23	276	31	1/2 - 13	48	576	65
L 150	3/8 - 16	23	276	31	1/2 - 13	48	576	65
L 190	1/2 - 13	48	576	65	1/2 - 13	48	576	65
L 225	1/2 - 13	48	576	65	1/2 - 13	48	576	65
L 276	1/2 - 13	48	576	65	1/2 - 13	48	576	65
Cast Iron Hubs					Steel Hubs			
C 226	5/8 - 11	96	1152	130	5/8 - 11	96	1152	130
C 276	1/2 - 13	48	576	65	1/2 - 13	48	576	65
C 280	5/8 - 11	96	1152	130	5/8 - 11	96	1152	130
C 285	5/8 - 11	96	1152	130	5/8 - 11	96	1152	130
C 295	5/8 - 11	96	1152	130	5/8 - 11	96	1152	130

Notes:

1. Contact Lovejoy Technical Support for Metric LLOC set screws.
2. PM = Powder Metal. Most hubs thru size L276 are PM (Powder Metal) by default

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Table 4 - Jaw Couplings Allowable Misalignment

Size	Style	Maximum RPM	Allowable Misalignment					BSE	
			Combined (par & ang.)		Parallel with Zero Angular (inch)			(Shaft Separation)	
			Parallel	Angular	3.5" Spacer	5" Spacer	7" Spacer	in	mm
RRS 090	1	3,600	0.030	1°	0.050	0.080	0.110	3.5" 5.0" or 7.0"	100mm 140mm or 180mm
RRS 095	1	3,600	0.030	1°	0.050	0.080	0.110		
RRS 099	1	3,600	0.030	1°	0.050	0.075	0.110		
RRS 100	1	3,600	0.030	1°	0.050	0.075	0.110		
RRS 110	1	3,600	0.030	1°	0.045	0.070	0.105		
RRS 150	2	3,600	0.030	1°	0.045	0.070	0.105		
RRS 190 (mm)	2	3,600	0.030	1°	0.045	0.070	0.105		
RRS 190 (in)	3	3,600	0.030	1°	0.045	0.070	0.105		
RRS 225 (mm)	2	3,600	0.015	1°	0.045	0.070	0.105		
RRS 225 (in)	4	3,600	0.015	1°	0.045	0.070	0.105		
RRC 226	4	3,600	0.015	1°	0.015	0.015	0.015	4.0", 5.0" or 7.0"	n/a
RRC 276	4	3,600	0.015	1°	0.015	0.015	0.015		
RRC 280	4	3,500	0.015	1°	0.015	0.015	0.015		
RRC 285	4	3,200	0.015	1°	0.015	0.015	0.015		
RRC 295	4	2,300	0.015	1°	0.015	0.015	0.015		
RRC 2955	4	2,300	0.015	1°	0.015	0.015	0.015		

Table 5 - Hole Size Thru Center of RRS Spacers

Size	Spacer Center Opening Diameter (INCH)						Spacer Center Opening Diameter (METRIC)					
	Spacer Length for BSE =						Spacer Length for BSE =					
	3-1/2"		5"		7"		100mm		140mm		180mm	
	Material	Opening Diameter	Material	Opening Diameter	Material	Opening Diameter	Material	Opening Diameter	Material	Opening Diameter	Material	Opening Diameter
RRS 090	Zytel	1.155	Zytel	1.155	Zytel	1.155	Aluminum	Solid	Aluminum	Solid	Aluminum	Solid
RRS 095	Zytel	1.155	Zytel	1.155	Zytel	1.155	Aluminum	Solid	Aluminum	Solid	Aluminum	Solid
RRS 099	Zytel	1.380	Zytel	1.380	Zytel	1.380	Aluminum	18mm	Aluminum	18mm	Aluminum	18mm
RRS 100	Zytel	1.380	Zytel	1.380	Zytel	1.380	Aluminum	18mm	Aluminum	18mm	Aluminum	18mm
RRS 110	Zytel	1.850	Zytel	1.850	Zytel	1.850	Aluminum	24mm	Aluminum	24mm	Aluminum	24mm
RRS 150	Cast Iron	1.880	Cast Iron	1.880	Cast Iron	1.880	Cast Iron	47mm	Cast Iron	47mm	Cast Iron	47mm
RRS 190	Cast Iron	2.120	Cast Iron	2.120	Cast Iron	2.120	Cast Iron	53mm	Cast Iron	53mm	Cast Iron	53mm
RRS 225	Cast Iron	2.380	C1018 STL	2.380	C1018 STL	2.380	C1018 STL	60mm	C1018 STL	60mm	C1018 STL	60mm

Notes: Contact Lovejoy Technical Support for information regarding RRC style couplings (RRC226 - RRC2955)

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