Torsional Products
LK Flywheel Mount Couplings
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.

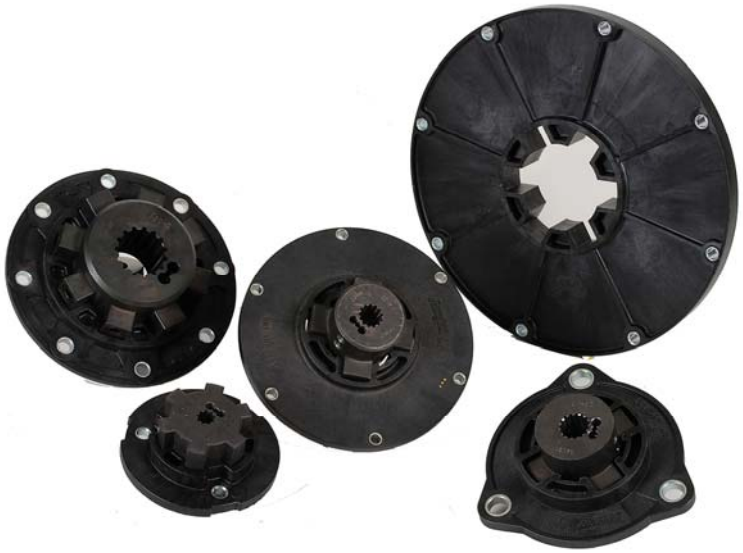
Consult all applicable Federal, State, and local laws and regulations covering the safe operation and maintenance of equipment, including, without limitation, the USDOL-OSHA "Lockout / Tag-out" procedure set forth in 29 CFR 1910.147.

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

Coupling Size	Element (Zytel)	Adapter [1] Plate (Steel)	Hub
LK80	1	Cust Supplied	1
LK100	1	--	1
LK125	1	--	1
LK150	1	0 or 1 [2]	1
LK150D	2	1	1

Notes:
1. Two piece elements consist of Zytel element(s) and a steel adapter plate.
2. SAE 14 Element uses a universal element and adapter plate.

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, flywheel pilot and bolt circle dimensions, flywheel to shaft separation, key sizes, spline details, etc.

Lovejoy manufactures couplings based on the equipment details provided by the purchaser. Lovejoy cannot be responsible for inaccurate or incomplete information supplied by the purchaser.

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.

3.0 PRODUCT INSPECTION (Continued):

> ***Warning!*** *Before beginning the coupling installation, make sure the engine and pump are 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
- Appropriate tooling for repositioning equipment
- Bolts and hardware for installing element and pump

5.0 COUPLING AND COMPONENT PREPARATION:

5.1 All exposed surfaces of the coupling components, including the Zytel element, adapter plates, and hubs, 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, keyways, and splines must be clean and free of any foreign materials prior to attempting assembly or installation.

5.2 All components, the hub bore, shaft, key, and keyway must be checked for raised metal, nicks, burrs, dents, gouges, etc., and should be dressed or repaired accordingly prior to installation.

5.3 It is the responsibility of the customer to ensure the proper pump mounting plate is being used necessary to establish the distance from the face of the flywheel to the end of the pump shaft. This is important when verifying the proper fit of the coupling.

5.4 Once all necessary measurements have been taken and all components are verified as correct, remove any existing coupling, clean the face and pilot surfaces of the flywheel, and dress the shafts on the driven equipment if necessary.

5.5 Lovejoy machines the bore in all Lovejoy torsional coupling 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.

5.6 Lovejoy machines the bore in all Lovejoy torsional coupling 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.

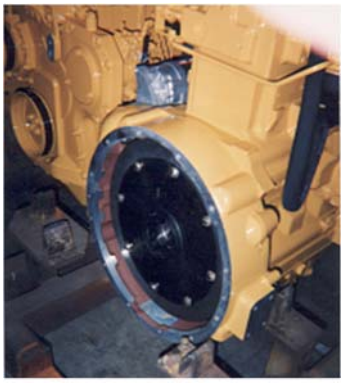
5.7 Lovejoy machines the bore in all Lovejoy torsional coupling hubs with splines based on information provided by the customer. Standard spline meet specifications set forth in ANSI B92.1A for Class 5 fits, and DIN 5480 for metric splines. If the spline utilizes the L-LOC shaft locking feature, see section 7.4 and 7.5 for assistance in installing hubs with this feature.

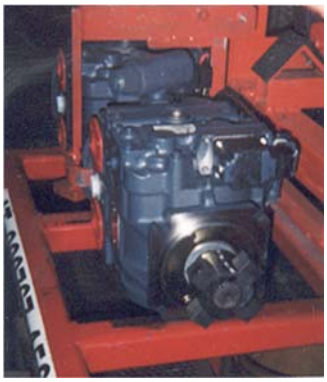
5.8 For all Lovejoy torsional coupling hubs with **taper bores** and **taper bores with keyways**, Lovejoy manufactures these hubs with bores using tolerances and specifications as supplied by the customer. Taper bores will be tested with plug gauges usually supplied by the customer or included in the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

6.0 COUPLING ELEMENT INSTALLATION:

6.1 Coupling elements for most standard SAE J620 flywheel sizes are single piece elements. Some designs for nonstandard flywheel sizes, or for very large flywheel or coupling sizes (LK150D) use a universal element bolted to a steel flywheel adapter plate. This element, whether a single piece or multiple pieces should fit snuggly into the pilot in the flywheel with little or no side-to-side movement. The alignment tolerance of the coupling is dependent on how well the equipment flywheel housing and pump mounting plate lines up and is not the responsibility of Lovejoy. For flywheel dimensions see Table-6.

6.2 Bolt the element to the flywheel using the correct size bolts and torque values specified by SAE requirements. The bolts used to mount the element to the flywheel are supplied by the customer.





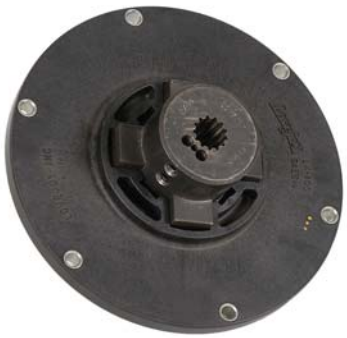
7.0 COUPLING HUB INSTALLATION:

7.1 If the pump is being mounted using a pump mounting plate, mount the plate on the pump at this time.

7.2 Slide the hub on the pump shaft, locating the hub on the shaft to allow the most possible engagement between 'dogs' on the hub and the pockets in the element.

7.3 If the pump shaft has a straight bore and keyway, locate the appropriate set screw size as specified in Table-2 and tighten the set screw to the specified torque value.

7.4 For hubs with splines using the Lovejoy LLOC feature, when tightening the LLOC screws, ensure the spline shaft is fully engaged and extends completely under both L-LOC set screws. Some cylindrical hubs may only have a single L-LOC set screw. The spline shaft must extend fully beneath the set screw(s) before tightening. Spline shafts meant use in a piggy back configuration are shorter that standard lengths, but are often used as the primary pump. If this shaft is not long enough to extend completely under one of the set screws, **DO NOT** tighten that set screw. Always use a calibrated torque wrench when tightening the screws. Tighten the LLOC set screw to the torque specified in Table-3.



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7.5 For hubs with splines using the Lovejoy LLOC feature, if the hub slides on the shaft after the set screws are tightened to the specified torque, loosen the screws a full turn then re tighten to the specified torque. If this does not resolve the issue, the spline in the hub and the spline on the shaft may not match, or may be of different spline fit classes. Lovejoy machines splines to meet a class 5 fit and some pumps may have shafts that conform to a looser class 7 fit. If unable to make the LLOC feature clamp properly on the spline, please contact Lovejoy Technical Support for further assistance.

8.0 Move the pump and pump mounting plate into position, lining up the hub with the element. Use care to ensure the 'dogs' on the hub line up with the slots in the element already mounted on the flywheel. While supporting the pump and plate, line up the bolt holes on the outer edge of the pump mounting plate with the threaded holes in the flywheel housing and move the assembly together. Insert the cap screws thru the plate into the housing and tighten per SAE specifications. These screws are not provided by Lovejoy and acquisition of the specifications for tightening these bolts are the responsibility of the customer or person performing the installation.

Table 2 - Set Screw Size and Tightening Torque [1]

Inch Set Screws				Metric Set Screws [2]			
Set Screw - inch		Tightening Torque		Set Screw - mm		Tightening Torque	
Size	Length	in-lbs	Nm	Size	Length	in-lbs	Nm
6-32	3/32 1/8 3/16 & up	3-4 7-8 9-10	0.34-0.45 0.8-0.9 1.0-1.1	M3	3 4 & up	4.4 5.3	0.5 0.6
1/4-20	3/16 1/4 & up	45-50 78-87	5.0-5.6 9-10	M4 M6	3 & up 4-6 8 & up	18 44 58-62	2 5 6.6-7
5/16-18	1/4 5/16 & up	80-90 150-160	9-10 17-19		5-8 10 & up	84-88 142-150	9.5-10 16-17
3/8-16	1/4 5/16 3/8 & up	135-150 225-250 260-290	15-17 25-38 29-33	M10	6-10 12& up	168-177 283-300	19-20 32-34
1/2-13	1/2 & up	540-600	61-68	M12	8-12 14 & up	372-396 504-528	42-45 57-60
1/2-13	1/2 & up	540-600	61-68	M12	8-12 14 & up	372-396 504-528	42-45 57-60
5/8-11	5/8 & up	1100-1200	124-136	M16	16 18 & up	756-792 1260-1320	86-90 142-150
5/8-11	5/8 & up	1100-1200	124-136	M16	16 18 & up	756-792 1260-1320	86-90 142-150
3/4-10	3/4 & up	1800-2000	203-226	M20	20 25 & up	1200-1240 2520-2650	133-140 285-300

1. Torque settings are based on powder metal constructed hubs.
2. In some countries, set screws may be referred to as "Grub screws"

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Table 3: LLOC Screw Tightening Torque (based on screw size)

L-LOC Feature Inch	5/16-18 UNC	3/8-16 UNC	1/2-13 UNC	5/8-11 UNC
Set Screw Torque	13 ft-lbs	23 ft-lbs	48 ft-lbs	96 ft-lbs
L-LOC Feature Metric	M10	M12	M16	M20
Set Screw Torque	20 ft-lbs	35 ft-lbs	90 ft-lbs	150 ft-lbs

Table 4. Performance Details

Coupling Size	**Nominal Torque T_{KN}**		**Maximum Torque T_{KMAX}**		**Maximum Speed (RPM)**
	in-lb	**Nm**	**in-lb**	**Nm**	
LK80	1,080	125	2,880	330	6,000
LK100	3,540	400	7,080	800	5,000
LK125	7,080	800	14,160	1,600	4,500
LK150	10,620	1,200	26,400	3,000	4,000
LK150D	21,240	2,400	58,200	6,000	4,000

Table 5: Dimensional Details

Coupling Size	**Available Flywheel Sizes**	**Number of Dogs**	**Maximum Bore**		**HD**		**LTB Standard Hub Lengths**	
			in	**mm**	**in**	**mm**		
LK80	Universal	6 (4 opt)	1.563	40	2.340	59	32, 36, 48, 50	mm
LK100	6.5, 7.5, 8, 10	4	1.563	40	2.559	65	32, 42, 48, 56	mm
LK125	10, 11.5	6	2.125	55	3.346	85	42, 48	mm
LK150	11.5, 14	8	2.750	70	4.331	110	44, 54, 60	mm
LK150-D	11.5, 14	8	2.750	70	4.331	110	54, 60	mm

Table 6: SAE J620 Flywheel Dimensions (Pilot and Bolt Circle)

Flywheel Size	**Pilot Diameter**		**Bolt Circle Diameter**	
	in	**mm**	**in**	**mm**
6.5	8.500	215.90	7.875	200.03
7.5	9.500	241.30	8.750	222.25
8	10.375	263.53	9.625	244.48
10	12.375	314.33	11.625	295.28
11.5	13.875	352.43	13.125	333.38
14	18.375	466.73	17.250	438.15

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