Jaw Couplings
L-Line (L, AL, SS, C, H)
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 that may have occurred as a result of shipping or handling. Refer to the following chart to ensure all the ordered parts are present.

Table 1 - Components List

Standard Coupling Type / Size	Hubs	Spider or Cushions	Collar w/screws
L/AL/SS 035 - L/AL/SS 276	**2**	**1**	**--**
C 226 – C 295	2	6	1
C 2955	2	10	1
H 3067 – H 4567	2	14	1

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 data 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.

3.0 PRODUCT INSPECTION (Continued):

> ***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 (C and H)
- 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-4 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-4), 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-4.

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.

5.0 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 (L, AL, SS, C, and H):

6.1 Identify if the spider is a standard L-style spider, C or H style cushions, or a Snap Wrap style wrap around spider. All three types are shown in the photo to the right.

6.2 Couplings with Snap Wrap style spiders are provided with either retaining rings or collars. Please review the specific installation guide for either Snap Wrap (SW Style) or Collar Style (LC Style) couplings found at http://www.lovejoy-inc.com .

6.3 For C-Style and H-Style couplings, identify which of the hubs has threaded holes for the screws that will hold the cushion retaining collar in place. Slide the cushion retaining collar onto the shaft where this hub will be mounted.

6.4 Prior to mounting the hubs, place the keys in the shaft keyways. The key should fit snuggly 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.

6.5 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. 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.

6.6 If using a spider, insert the spider into one of the hubs at this time. If either shaft needs to extend into **the center of an open center spider**, the hub may not align with the end of the shaft. If using cushions, they will be installed after the equipment has been moved into position. If the shaft will extend into the spider, check Table-6 to ensure the shaft will fit in the open center in the spider.

6.7 Move the equipment into the proper location to achieve the 'G' gap dimension between hub faces as specified in Table-4. 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 the diameter of the shaft. When the hubs are tightened in place, the hubs should be touching the side of the spider or cushions without any excess pressure. If the hubs are pressed too together tightly against the spider, the coupling could lose some of its capability to accommodate misalignment.

6.8 Check alignment using either “straight edge method” or a dial indicator taking measurements at four locations 90º apart to ensure alignment does not exceed the allowable misalignment as specified in Table-4.

6.9 If installing a C-Style or H-Style coupling, the cushions can be inserted between the jaws in each hub. Any tightness in the inserts should be between the jaws, not between the faces of the hubs. If the hubs are pressed too together tightly against the spider or cushions, the coupling could lose some of its capability to accommodate misalignment. Again, check the gap between the faces of the hubs to ensure that dimension matches the “G’ or Gap dimension in Table-4.

6.10 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.

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

6.12 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. This 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 L, AL, SS, C, and H Hubs)***

CPLG Size [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
L 035	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
L/AL 050	1/4-20	3/16 1/4 & up	45-50 78-87	5.0-5.6 9-10	M4	3 & up	18	2
L/AL 070 L/AL 075 L/AL 090					M6	4-6 8 & up	44 58-62	5 6.6-7
L/AL 095 L/AL 099 L/AL 100 L/AL 110 L 150 AL 150	5/16-18	1/4 5/16 & up	80-90 150-160	9-10 17-19	M8	5-8 10 & up	84-88 142-150	9.5-10 16-17
L 190 L 225 L 276	1/2-13	1/2 & up	540-600	61-68	M12	8-12 14 & up	372-396 504-528	42-45 57-60
C 226 C 276 C 280	1/2-13	1/2 & up	540-600	61-68	M12	8-12 14 & up	372-396 504-528	42-45 57-60
C 285 C 295 C 2955	5/8-11	5/8 & up	1100-1200	124-136	M16	16 18 & up	756-792 1260-1320	86-90 142-150
H 3067 H 3567	5/8-11	5/8 & up	1100-1200	124-136	M16	16 18 & up	756-792 1260-1320	86-90 142-150
H 3667 H 4067 H 4567	3/4-10	3/4 & up	1800-2000	203-226	M20	20 25 & up	1200-1240 2520-2650	133-140 285-300

Notes
1. Coupling types include aluminum and stainless steel hubs
2. In some countries, set screws may be referred to as "Grub screws"

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7.0 SPLINE HUB INSTALLATION (L and C):

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.

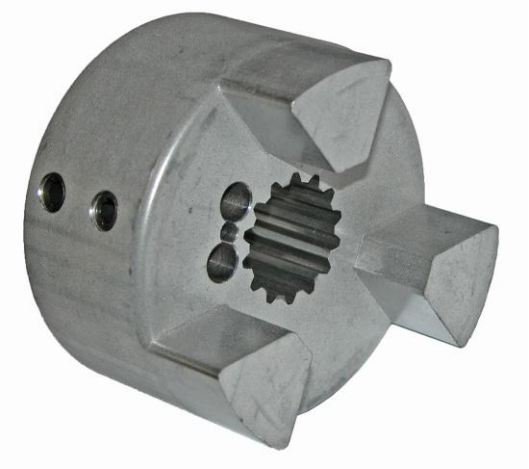
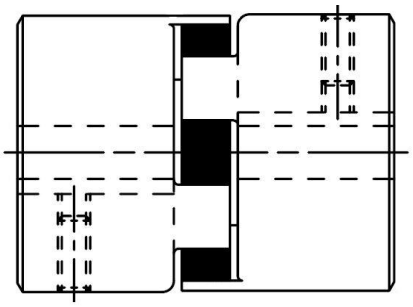


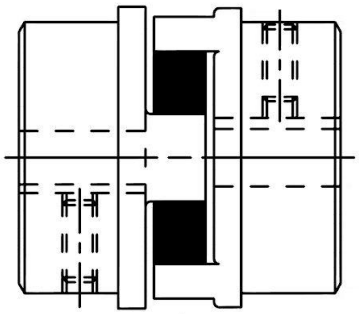
Table 3 - LLOC Set Screw Tightening Torque

CPLG Size	Inch L-LOC Set Screws [1]							
	PM Hubs [2] Set Screw Size (inch)	Tightening Torque ft-lbs	Tightening Torque in-lbs	Tightening Torque Nm	Steel Hubs [2] Set Screw Size (inch)	Tightening Torque ft-lbs	Tightening Torque in-lbs	Tightening Torque 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

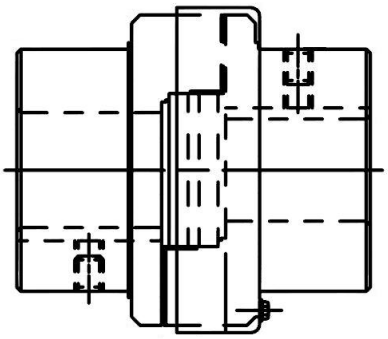
Notes:
1. Contact Lovejoy Technical Support for Metric LLOC set screws.
2. PM = Powder Metal. Most hubs thru size L276 are PM (Powder Metal) by default



Style 1



Style 2



Style 3

Table 4 - Jaw Couplings Allowable Misalignment

Size	Style	Gap 'G' (BSE) Width In	Allowable Misalignment at 3,600 RPM or Slower [1]								
			NBR or Urethane up to L225			Hytrel			Bronze [2]		
			Parallel	Angular		Parallel	Angular		Parallel	Angular	
			in	Degrees	Δ 'G' in	in	Degrees	Δ 'G' in	in	Degrees	Δ 'G' in
L 035	1	0.281	0.015	1°	0.010	--	--	--	--	--	--
L/AL 050	1	0.469	0.015	1°	0.018	0.015	1/2°	0.012	0.010	1/2°	0.012
L/AL 070	1	0.500	0.015	1°	0.022	0.015	1/2°	0.012	0.010	1/2°	0.012
L/AL 075	1	0.500	0.015	1°	0.030	0.015	1/2°	0.015	0.010	1/2°	0.015
L/AL 090	1	0.500	0.015	1°	0.035	0.015	1/2°	0.018	0.010	1/2°	0.018
L/AL 095	1	0.500	0.015	1°	0.035	0.015	1/2°	0.018	0.010	1/2°	0.018
L/AL 099	1	0.750	0.015	1°	0.040	0.015	1/2°	0.022	0.010	1/2°	0.022
L/AL 100	1	0.750	0.015	1°	0.040	0.015	1/2°	0.022	0.010	1/2°	0.022
L/AL 110	1	0.875	0.015	1°	0.055	0.015	1/2°	0.030	0.010	1/2°	0.030
L 150	1	1.000	0.015	1°	0.065	0.015	1/2°	0.033	0.010	1/2°	0.033
AL 150 [3]	1	1.000	0.015	1°	0.070	--	--	--	--	--	--
L 190	2	1.000	0.015	1°	0.075	0.015	1/2°	0.040	0.010	1/2°	0.040
L 225	2	1.000	0.015	1°	0.085	0.015	1/2°	0.044	0.010	1/2°	0.044
L 276	2	1.625	0.015	1°	0.100	--	--	--	--	1/2°	--
C 226	3	1.500	0.015	1°	0.090	0.015	1/2°	0.046	0.010	1/2°	0.046
C 276	3	1.625	0.015	1°	0.100	0.015	1/2°	0.054	--	--	--
C 280	3	1.625	0.015	1°	0.130	0.015	1/2°	0.065	--	--	--
C 285	3	1.625	0.015	1°	0.145	0.015	1/2°	0.075	--	--	--
C 295	3	1.875	0.015	1°	0.160	0.015	1/2°	0.080	0.010	1/2°	0.080
C 2955	3	1.875	0.015	1°	0.160	0.015	1/2°	0.080	0.010	1/2°	0.080
H 3067	3	2.125	0.015	1°	0.180	0.015	1/2°	0.090	0.010	1/2°	0.090
H 3567	3	2.375	0.015	1°	0.195	0.015	1/2°	0.100	0.010	1/2°	0.100
H 3667	3	2.625	0.015	1°	0.210	0.015	1/2°	0.105	0.010	1/2°	0.105
H 4067	3	2.875	0.015	1°	0.235	0.015	1/2°	0.120	0.010	1/2°	0.120
H 4567	3	3.125	0.015	1°	0.265	0.015	1/2°	0.135	0.010	1/2°	0.135

Notes

1. Maximum speed for all L-Line Hytrel L050 through L276 is 3,600 RPM. See catalog for larger sizes.
2. Maximum speed for all Bronze spiders or cushions is 250 RPM regardless of size
3. AL150 couplings are dimensionally larger in size than the standard L150. AL150 spiders have more legs than L150

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Table 5 - Performance Details for Jaw Couplings

Size L / AL / SS RRS / RRC	Maximum Bore in	Maximum Bore mm	Maximum RPM [1] NBR only	Torque Capacity by Spider Material: SOX (NBR) in-lbs	SOX (NBR) Nm	Hytrel in-lbs	Hytrel Nm	Urethane in-lbs	Urethane Nm	Bronze in-lbs	Bronze Nm
L 035	0.375	10	31,000	3.5	0.4	--	--	--	--	--	--
L/AL 050	0.625 [3]	16	18,000	26.3	3.0	50	5.6	39	4.5	50	5.6
L/AL 070	0.750	19	14,000	43.2	4.9	114	12.9	65	7.3	114	12.9
L/AL 075	0.875	22	11,000	90	10.2	227	25.6	135	15.3	227	25.6
L/AL 090	1.000	25	9,000	144	16.3	401	45.3	216	24.4	401	45.3
L/AL 095	1.125	28	9,000	194	21.9	561	63.4	291	32.9	561	63.4
L/AL 099	1.188	30	7,000	318	35.9	792	89.5	477	53.9	792	89.5
L/AL 100	1.375	35	7,000	417	47.1	1,134	128	626	70.7	1,134	128
L/AL 110	1.625	42	5,000	792	89.5	2,268	256	1,188	134.0	2,268	256
L 150	1.875	48	5,000	1,240	140.0	3,708	419	1,860	210.0	3,708	419
AL 150 [2]	1.875	48	5,000	1,450	163.8	--	--	--	--	--	--
L 190	2.125	55	5,000	1,728	195.0	4,680	529	2,592	293.0	4,680	529
L 225	2.625	65	4,200	2,340	264.0	6,228	704	3,510	397.0	6,228	704
L 276	2.875	73	1,800	4,716	533.0	--	--	--	--	12,500	1,412
C 226	2.500	64	4,800	2,988	338	5,940	671	--	--	5,940	671
C 276	2.875	73	4,200	4,716	533	9,432	1,066	--	--	--	--
C 280	3.000	76	3,500	7,560	854	13,866	1,567	--	--	--	--
C 285	4.000	102	3,200	9,182	1,038	16,680	1,882	--	--	--	--
C 295	3.500	89	2,300	11,340	1,281	22,680	2,563	--	--	22,680	2,563
C 2955	4.000	102	2,300	18,900	2,136	37,800	4,271	--	--	37,800	4,271
H 3067 NBR	4.500	114	2,300	33,395	3,774	--	--	--	--	--	--
H 3067 Hytrel	4.000	102	2,300	--	--	47,196	5,333	--	--	47,196	5,333
H 3567 NBR	5.000	127	2,100	46,632	5,269	--	--	--	--	--	--
H 3567 Hytrel	4.500	114	2,100	--	--	63,000	7,119	--	--	63,000	7,119
H 3667 NBR	5.625	143	1,900	64,812	7,323	--	--	--	--	--	--
H 3667 Hytrel	5.000	127	1,900	--	--	88,200	9,966	--	--	88,200	9,966
H 4067 NBR	6.250	159	1,800	88,224	9,969	--	--	--	--	--	--
H 4067 Hytrel	5.500	140	1,800	--	--	126,000	14,237	--	--	126,000	14,237
H 4567 NBR	7.000	178	1,500	119,700	13,525	--	--	--	--	--	--
H 4567 Hytrel	6.000	152	1,500	--	--	170,000	19,209	--	--	170,000	19,209

Notes:

1. Maximum speed is for closed center spiders - NBR (SOX) Spiders Only
   Maximum speed for all open center spiders is 1,800 RPM
   Maximum speed for all Hytrel spiders, size L050 - L276 is 3,600 RPM
   Maximum speed for all Bronze spiders is 250 RPM with no exceptions
2. The AL 150 coupling has a unique SOX (NBR) spider that is not interchangable with standard L150 couplings
3. Maximum bore is without a keyway (L/AL 050 hubs)

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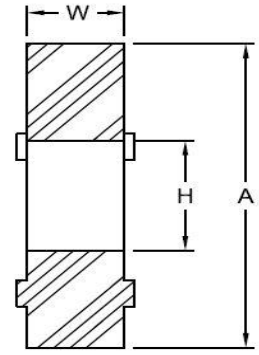
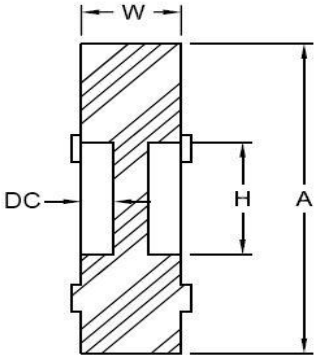
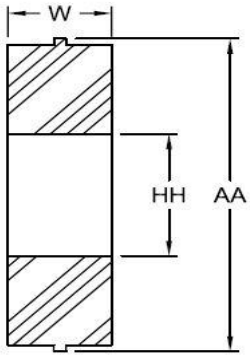


Open Center



Solid Center



Snap Wrap

Table 6 - Standard Spider Dimensions

Size	A - Diameter				W - Width		H & HH - Center Hole Diameter				DC - NBR Solid Center	
	Std (A)		SW (AA)		width		Std Spiders (H)		SW Spiders (HH)		Recess Depth	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
L 035	0.62	16	--	--	0.28	7.1	--	--	--	--	--	--
L/AL 050	1.07	27	--	--	0.42	10.7	0.31	7.9	--	--	--	--
L/AL 070	1.38	35	--	--	0.42	10.7	0.50	12.7	--	--	--	--
L/AL 075	1.75	44	--	--	0.44	11.2	0.75	19.1	--	--	--	--
L/AL 090	2.12	54	2.56	65	0.44	11.2	0.88	22.4	1.06	26.9	0.18	4.5
L/AL 095	2.12	54	2.56	65	0.44	11.2	0.88	22.4	1.06	26.9	0.18	4.5
L/AL 099	2.54	65	3.08	78	0.61	15.5	1.03	26.2	1.37	34.8	0.25	6.4
L/AL 100	2.54	65	3.08	78	0.61	15.5	1.03	26.2	1.37	34.8	0.25	6..4
L/AL 110	3.31	84	3.87	98	0.75	19.1	1.18	30.0	1.50	38.1	0.25	6.4
L 150	3.75	95	4.56	116	0.88	22.4	1.25	31.8	1.75	44.5	0.31	7.9
AL 150 [3]	4.25	108	--	--	0.88	22.4	1.25	31.8	--	--	0.31	7.9
L 190	4.50	114	5.18	132	0.88	22.4	1.38	35.1	2.25	57.2	0.31	7.9
L 225	4.98	126	5.44	138	0.88	22.4	1.75	44.5	2.75	69.9	0.38	9.5
L 276	6.19	157	--	--	1.45	36.8	1.75	44.5	--	--	--	--

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