



**FL Flywheel
Coupling/
Guardex™
Type FLD
Pulley
Coupling**



FL FLYWHEEL COUPLING FEATURES AND ADVANTAGES

MINIMUM SPACE

The entire coupling length is normally mounted inside the flywheel housing face requiring only a flat pump mounting plate, saving valuable space inside the equipment frame.

HEAT STABLE

The glass reinforced nylon flywheel flange is designed to operate in diesel engine ambients without air circulation. It is dimensionally stable to 250° F.

CROWNED GEAR TEETH

The steel hub gear tooth design provides for angular misalignment, preventing angular forces on the pump shaft bearings and seals.

FREE AXIAL TRAVEL

The crowned steel hub teeth slide freely in the nylon flywheel gear teeth. Any shaft float is absorbed by the coupling and is not transmitted to the pump.

BLIND ASSEMBLY

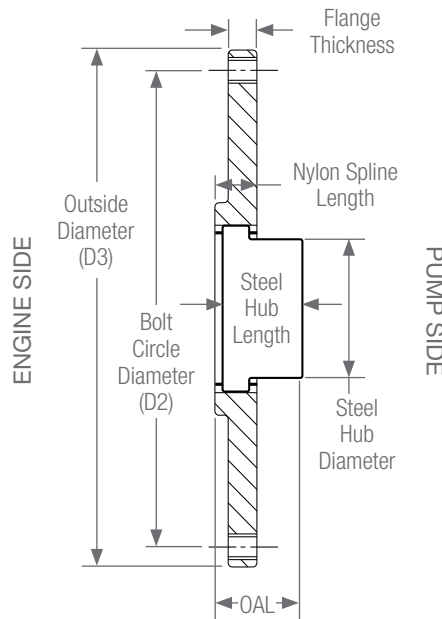
In most assemblies, the steel hub gear passes through the pilot hole of the pump mounting plate. This allows for quick assembly without the need for a view or hand ports.



FL Flywheel Coupling Reference Data

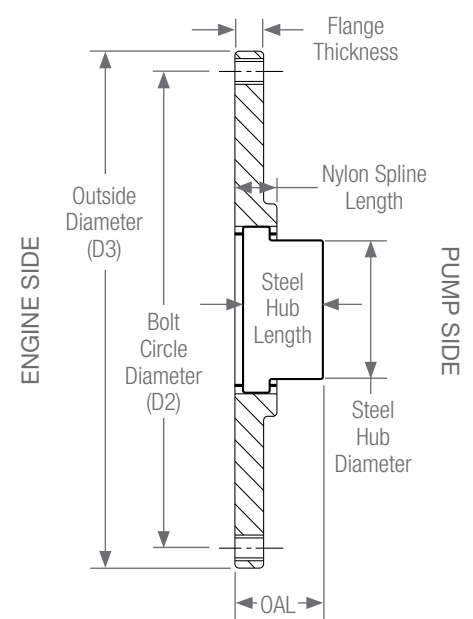
ARRANGEMENT 1

Typical arrangement for SAE 6-1/2, SAE 7-1/2, and SAE 11-1/2



ARRANGEMENT 2

Typical arrangement for SAE 8 and SAE 10

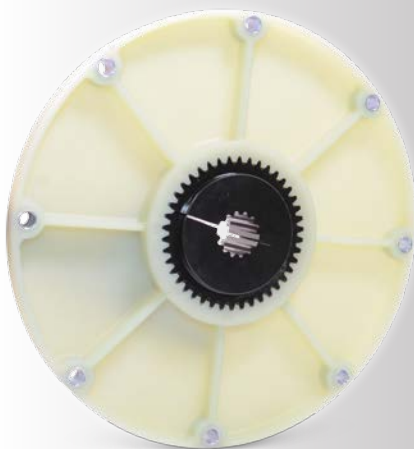


*Consult Guardian for specific product installation instructions!

Dimensions

Coupling Size	Steel Hub Dimensions					SAE Nylon Flange Dimensions		Coupling Assembly Dimensions	
	Available Bore Range		Steel Hub Length	Steel Hub Diameter	Number of Gear Teeth	Flange Thickness	Nylon Spline Length	Overall Length Arrangement 1	Overall Length Arrangement 2
	Min.	Max.							
FL42	.625" 16mm	1.625" 42mm	1.50" 38.1mm	2.56" 65mm	50	.51" 13mm	.78" 20mm	1.30" 33mm	1.65" 42mm
FL45	.625" 16mm	1.625" 42mm	2.19" 55.6mm	2.56" 65mm	50	.51" 13mm	.78" 20mm	2.00" 51mm	2.36" 60mm
FL48	.625" 16mm	1.875" 48mm	1.80" 45.7mm	2.68" 68mm	50	.51" 13mm	.78" 20mm	1.61" 41mm	1.97" 50mm
FL48\ TSB	.625" 16mm	1.875" 48mm	2.20" 56mm	2.60" 66mm	50	.51" 13mm	.78" 20mm	1.93" 49mm	2.20" 56mm
FL65\ TSB 10	.625" 16mm	2.500" 65mm	2.17" 55mm	3.78" 96mm	42	.82" 21mm	1.05" 27mm	1.90" 49mm	2.20" 55mm
FL65\ TSB 11-1/2	.625" 16mm	2.500" 65mm	1.92" 48.7mm	3.78" 96mm	42	.84" 21.3mm	1.20" 30.5mm	1.89" 48mm	1.92" 48.7mm
FL80\ TSB 11-1/2	.875" 22mm	3.125" 80mm	1.92" 48.7mm	4.88" 124mm	46	.84" 21.3mm	1.20" 30.5mm	1.89" 48mm	1.83" 48.7mm

Interchangeable with other FLE flywheel couplings



SAE Flanges

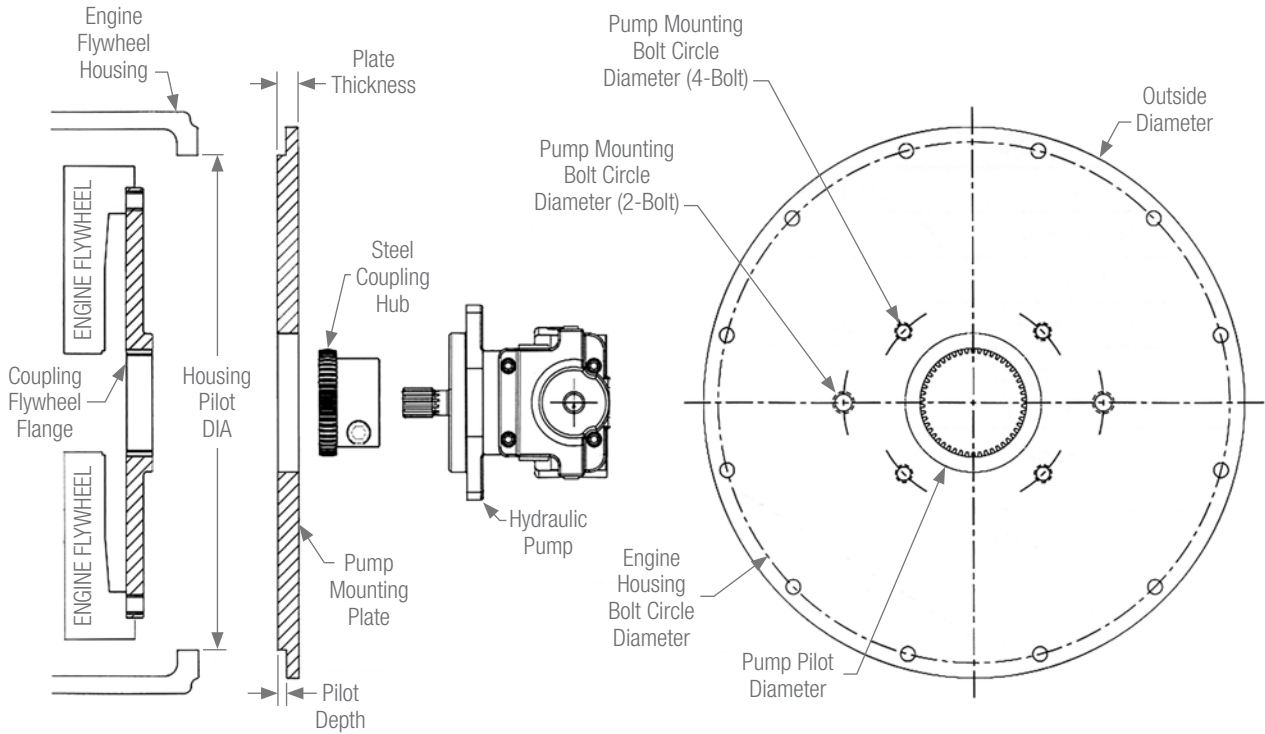
SAE Flywheel Size	Mating Hub Size	Bolt Circle Diameter	Outside Diameter	Number of Bolt Holes	Torque		Max Speed
		(D2)	(D3)		T _{KN}	T _{Kmax}	RPM
6-1/2	M-42	7.875" 200.02mm	8.500" 215.90mm	6	2,100 in-lbs 237 Nm	5,300 in-lbs 599 Nm	5,000
7-1/2	M-42	8.750" 222.25mm	9.500" 241.30mm	8	2,100 in-lbs 237 Nm	5,300 in-lbs 599 Nm	5,000
8	I-45	9.625" 244.47mm	10.375" 263.52mm	6	2,100 in-lbs 237 Nm	5,300 in-lbs 599 Nm	5,000
10	M-48	11.625" 295.27mm	12.375" 314.32mm	8	2,100 in-lbs 237 Nm	5,300 in-lbs 599 Nm	5,000
10	M-48 TSB	11.625" 295.27mm	12.375" 314.32mm	8	2,700 in-lbs 305 Nm	6,600 in-lbs 745 Nm	5,000
10	M-65	11.625" 295.27mm	12.375" 314.32mm	8	5,700 in-lbs 644 Nm	14,200 in-lbs 1,605 Nm	3,600
10	M-65 TSB	11.625" 295.27mm	12.375" 314.32mm	8	7,000 in-lbs 791 Nm	17,700 in-lbs 2,000 Nm	3,600
11-1/2	M-65	13.125" 333.37mm	13.875" 352.42mm	8	5,700 in-lbs 644 Nm	14,200 in-lbs 1,605 Nm	3,600
11-1/2	M-65 TSB	13.125" 333.37mm	13.875" 352.42mm	8	7,000 in-lbs 791 Nm	17,700 in-lbs 2,000 Nm	3,600
11-1/2	M-80	13.125" 333.37mm	13.875" 352.42mm	8	10,600 in-lbs 1,198 Nm	26,600 in-lbs 3,006 Nm	3,600
11-1/2	M-80 TSB	13.125" 333.37mm	13.875" 352.42mm	8	13,700 in-lbs 1,458 Nm	34,300 in-lbs 3,875 Nm	3,600

Special & Metric Nylon Flanges

Outside Diameter	Bolt Circle	Number and Size of Bolts	Pilot Diameter	Engines
96mm (3.78")	50mm (1.97")	4 x M10	70mm (2.76")	Hatz-Z788, 789, 790
125mm (4.92")	100mm (3.94")	3 x M10	80mm (3.15") 125mm (4.92")	Deutz F2L511-1338, F1L210 (125mm Pilot) Perkins-4.108, Lister-Petter "ALPHA" Series
135mm (5.32")	100mm (3.94")	3 x M10	135mm (5.32")	Kubota-650, 750, 850, 950, V1100, 1200 and Super 5 Series (905 thru 1505), Perkins 103-10
150mm (5.91")	130mm (5.12")	5 x M8	106mm (4.17")	Kubota-D600B, Z400, D722, V800, WG600, WG750, D902, Z602, WG972 (Super Mini Series), Briggs Daihatsu DM700, DM950, Yanmar 3TNM68, Yanmar 3TNM72
152mm (5.98")	122mm (4.80") 125mm (4.92")	3 x M12 3 x M12	105mm (4.13")	Hatz 573, 673, 780, 786, E71, E75, E79, (122mm B.C.) Perkins 4108 (125mm B.C.), 504-2T/2LR Deutz F2L511 (125mm B.C.)
155mm (6.10")	125mm (4.11")	3 x M12	155mm (6.10")	Perkins 103-12/13/15, 104-22
170mm (6.69")	165mm (6.50")	3 x M16	104mm (4.09")	Yanmar 4TNN88/4TNN99
210mm (8.27")	185mm (7.28")	3 x M16	104mm (4.09")	Isuzu-CC-4JG1PAC, Mitsubishi-M40-EA
210mm/220mm (8.66")	210mm/220mm (8.66")	3 x M10 6 x M12	125mm (4.92") 220mm (8.66")	Kubota Super 3 Series, D1403, D1703, V1903, V2203, V2403
252mm (9.92")	234mm (9.21") 218mm (8.58")	6 x M8 6 x M8	252mm (9.92") 234mm (9.21")	VW-068, 126, 127 (218mm B.C.), Kubota 950
327mm (12.88")	308mm (12.13")	6	287mm (11.30")	John Deere Flywheel 123203
279mm (11.00")	260mm (10.25")	6	260mm (10.25")	Ford LRG425, Ford DSG423

Notes:

- Several hub lengths are available, or the steel hubs can be machined to specific lengths to meet other mounting dimensions.
- Axial adjustment of the steel gear in flange gear is +/- .08" (+/- 2mm), parallel misalignment to .03", angular misalignment to 2°.
- Steel hub bores are available with shaft keyways, tapers, and SAE or metric splines with cross-bolt clamping.
- The TSB hubs have a wider tooth form than standard hubs and yield approximately 30% greater torque-carrying capacity.



Steel Pump Mounting Plates

Housing Size	Housing Pilot Diameter	Outside Diameter	Housing Bolt Circle Diameter	Number of Bolt Holes	Plate Thickness	Pilot Depth
SAE 1	20.125"	21.750"	20.875"	12	.625" & .750"	.125"
SAE 2	17.625"	19.250"	18.375"	12	.625" & .750"	.125"
SAE 3	16.125"	17.750"	16.875"	12	.500" & .750"	.125"
SAE 4	14.250"	15.875"	15.000"	12	.500" & .750"	.125"
SAE 5	12.375"	14.000"	13.125"	8	.500"	.125"
SAE 6	10.500"	12.125"	11.250"	8	.500"	.125"

All plates come standard with a black rust preventative finish.

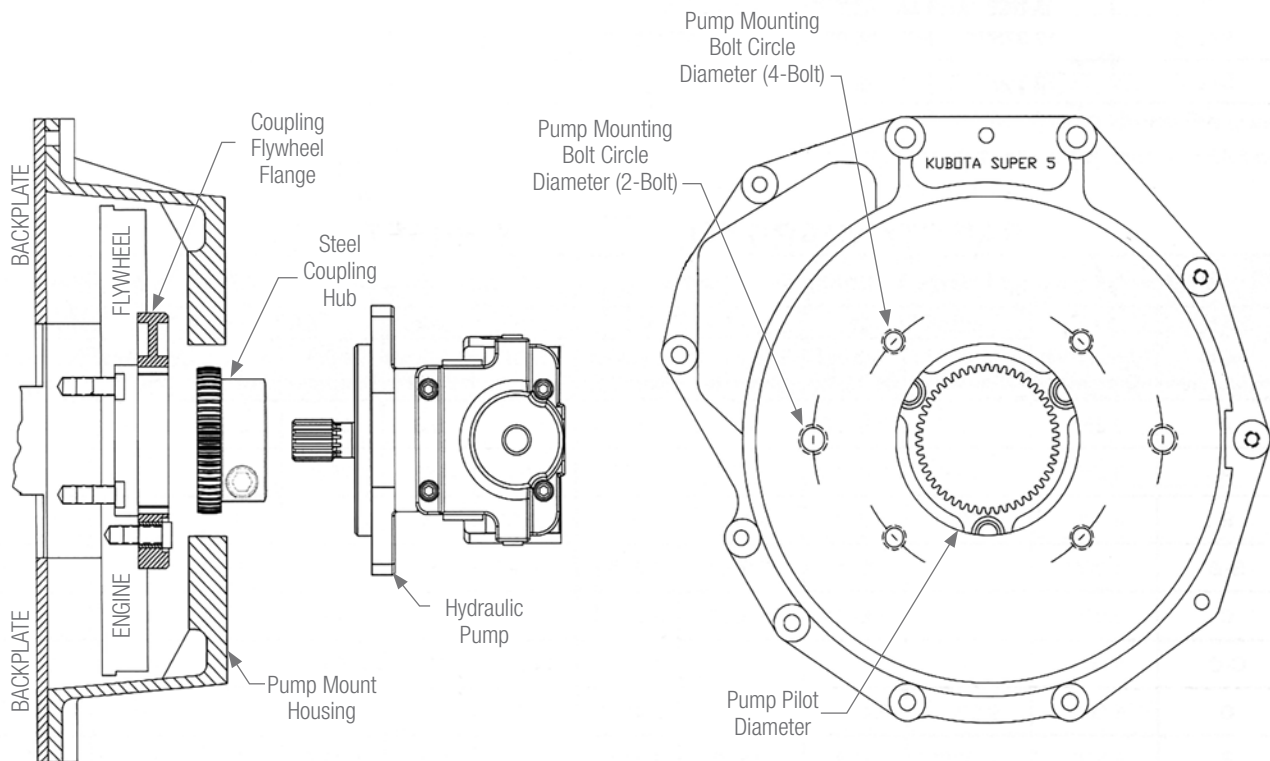
SAE Standard Pump Pilot & Shaft Data

Typical SAE Pump Flange Mounting Dimensions						Pump Shaft Dimensions (Straight & Splined)					
SAE Pump Designation	SAE Pump Pilot Diameter	2-Bolt Flange		4-Bolt Flange		Straight Shafts		SAE Splined Pump Shafts			
		Bolt Circle Diameter	Typical Bolt Size	Bolt Circle Diameter	Typical Bolt Size	Shaft Diameter	Keyway Width	Major Diameter	No. of Teeth	Diametral Pitch	Pressure Angle
A	3.250"	4.188"	3/8"-16	4.125"	3/8"-16	.625"	.188"	.625"	9	16/32	30°
AH	3.250"	4.188"	3/8"-16	4.125"	3/8"-16	.750"	.188"	.750"	11	16/32	30°
B	4.000"	5.750"	1/2"-13	5.000"	1/2"-13	.875"	.188"	.875"	13	16/32	30°
BB	4.000"	5.750"	1/2"-13	5.000"	1/2"-13	1.000"	.250"	1.000"	15	16/32	30°
C	5.000"	7.125"	5/8"-11	6.375"	1/2"-13	1.250"	.250"	1.250"	14	12/24	30°
CC	5.000"	7.125"	5/8"-11	6.375"	1/2"-13	1.500"	.375"	1.500"	17	12/24	30°
D	6.000"	9.000"	3/4"-10	9.000"	3/4"-10	1.750"	.375"	1.750"	13	8/16	30°
E	6.500"	12.500"	1"-8	12.500"	3/4"-10	1.750"	.375"	1.750"	13	8/16	30°
F	7.000"	13.781"	1"-8	13.781"	1"-8	-	-	2.000"	15	8/16	30°

Other SAE, DIN and JIS spline sizes are available - Inquire!

Aluminum & Cast Iron Pump Mount Housings

Engine	Reference Information
Deutz L1011/L2011	Used on Deutz engines equipped with housing #0553
Briggs Daihatsu	Used on DM700D, DM950D, DM700G, and DM950G engines.
Cummins B3.3	Used on engines equipped with semi-SAE #4 housings.
Ford	Used on DSG-423 and LRG-425 engines.
GM 3.0/4.3L	Used with GM flywheel #93422872 on GM 3.0L & 4.3L engines.
Isuzu	Used on 4LE2 engines.
John Deere	Used on 3011D, 3015D, 4020D, and 4020T engines.
Kubota Super 3 (B-1 mounting)	Used on D1403, D1703, V1903, and V2203 engines.
Kubota Super 5 (B-1 mounting)	Used on D905, D1005, D1105, V1205, V1305, and V1505 engines.
Kubota Super Mini (B-1 mounting)	Used on Z400, D600, D722, V800, WG600, and WG750 engines.
Kubota Super Mini (K106 NSM series)	Used on WG972, D902, and Z602 engines.
Perkins 103-13-15 Perkins 403C-13-15	Used on these Perkins engines with the rear end plate design.
Perkins 103-9-10 Perkins 403C-10-11	Used on these Perkins engines with the rear end plate design.
Perkins 104-19-22 Perkins 404C-19-22	Used on these Perkins engines with the rear end plate design.
Yanmar	Used on 3TNE78A, 3TNE82A, 3TNE84, 3TNE88, 4TNE84T, and 4TNE88 engines.



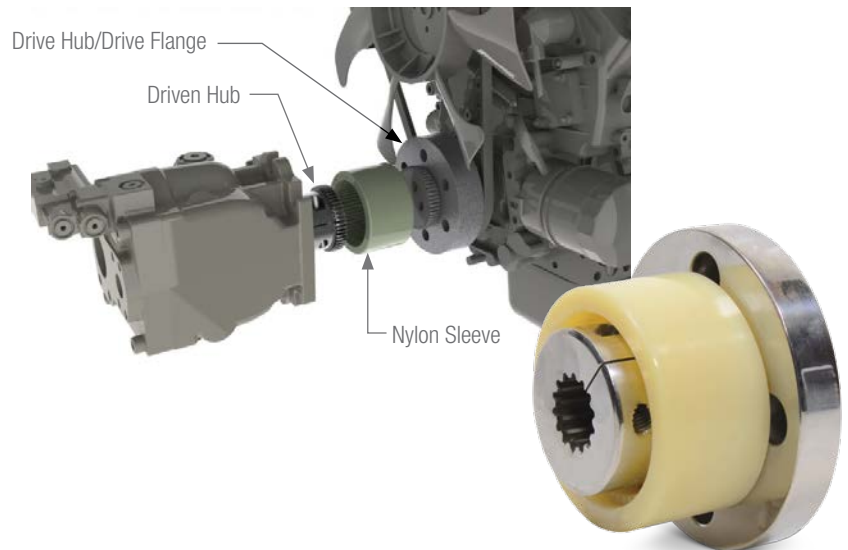
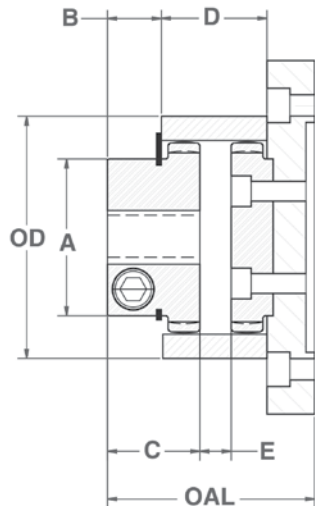
*Consult Guardian for specific product installation instructions!

GUARDEX™ TYPE FLD PULLEY COUPLINGS (FOR GAS & DIESEL ENGINE PULLEY-END OPERATION)

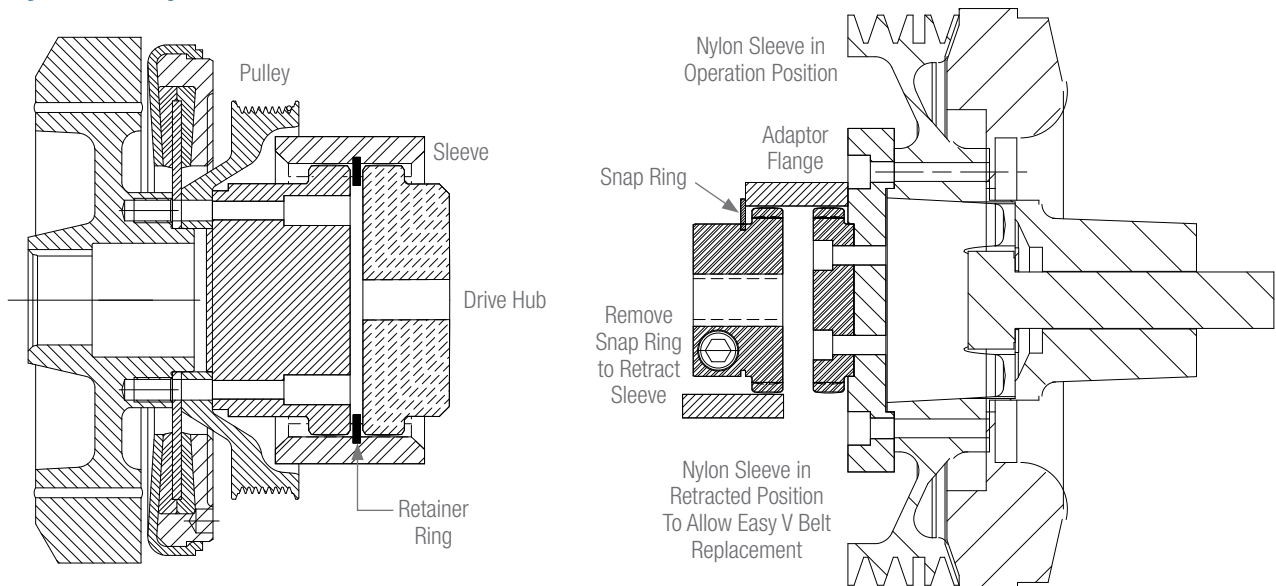
The FLD coupling provides a shiftable sleeve that can be retracted to allow for easy V-belt replacement without disassembling the pump.

Series	Torque IN-LBS		Finish Bore		Dimensions						
	T _{KN}	T _{Kmax}	Min	Max	OAL	OD	A	B	C	D	E
FLD 28	400	800	.39" 10mm	1.02" 26mm	3.19" 81mm	2.75" 69.8mm	1.73" 43.9mm	.89" 22.5mm	1.40" 35.5mm	1.54" 39mm	.51" 13mm
FLD 32	530	1,060	.47" 12mm	1.18" 30mm	3.19" 81mm	3.31" 84mm	1.95" 49.5mm	.85" 21.5mm	1.40" 35.5mm	1.57" 40mm	.51" 13mm
FLD 45	1,240	2,480	.79" 20mm	1.65" 42mm	3.39" 86mm	3.94" 100mm	2.68" 68mm	.89" 22.5mm	1.80" 45.7mm	1.69" 43mm	.51" 13mm
FLD 65	3,360	6,720	.98" 25mm	2.56" 65mm	4.88" 124mm	5.51" 140mm	3.78" 96mm	1.65" 42mm	2.52" 64mm	2.36" 60mm	.63" 16mm
FLD 80	6,000	12,000	1.18" 30mm	3.15" 80mm	6.38" 162mm	6.89" 175mm	4.88" 124mm	2.30" 58.5mm	3.27" 83mm	2.72" 69mm	.79" 20mm

NOTE: Flange dimensions are made specific to the engine pulley.



Designed For Minimum Overall Length And Easy V-Belt Replacement





ABOUT GUARDIAN COUPLINGS

For more than 70 years, Guardian has been designing and manufacturing world-class couplings and other power transmission components. Utilizing advanced manufacturing technologies and processes, Guardian provides highly-reliable coupling and component solutions to meet the most challenging industrial application requirements.

Guardian provides a wide range of standard and custom products including flywheel couplings, hydraulic pump mounts, bearing supported stub shafts, flexible shaft-to-shaft couplings, motion control couplings as well as compression pipe couplings.

Durable Guardian products are utilized in key industries including mobile hydraulics, farm & ag, tree care, concrete, food & beverage, material handling, automation, power generation, and oil & gas on applications such as skid steers, aerial lifts, harvesters, wood chippers, concrete pumps, dewatering pumps, baggage handlers, conveyors, robotics, compressors, and generator sets.



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Altra Couplings offers the largest selection of industrial couplings available from a single source...worldwide. For over 150 years, **TB Wood's**, **Ameridrives**, **Bibby Turboflex**, **Lamiflex**, **Guardian** and **Huco**, the industry-leading brands of Altra Couplings have been providing innovative coupling solutions to meet the requirements for a broad variety of drivetrain applications spanning many industries including energy, metals, mining, oil & gas, and food processing. Highly-engineered Altra coupling products represent the latest in coupling technology, featuring superior design and exceptional quality to ensure long-lasting performance in all types of environments.

Belted Drives and Sheaves	Couplings Cont.	Gearing	Linear Products
<p>TB Wood's <i>Belted Drives</i> Chambersburg, PA - USA 1-888-829-6637 – Press #5 <i>For application assistance:</i> 1-888-829-6637 – Press #7</p>	<p>TB Wood's <i>Elastomeric Couplings</i> Chambersburg, PA - USA 1-888-829-6637 – Press #5 <i>For application assistance:</i> 1-888-829-6637 – Press #7 <i>General Purpose Disc Couplings</i> San Marcos, TX - USA 1-888-449-9439</p>	<p>Bauer Gear Motor <i>Geared Motors</i> Esslingen, Germany +49 (711) 3518-0 Middlesex, NJ - USA 1-732-469-8770</p>	<p>Warner Linear <i>Linear Actuators</i> New Hartford, CT - USA 1-800-825-6544 <i>For application assistance:</i> 1-800-825-9050 Saint Barthélemy d'Anjou, France +33 (0)2 41 21 24 24</p>
<p>Couplings</p> <p>Ameridrives <i>Mill Spindles, Ameriflex, Ameridisc</i> Erie, PA - USA 1-814-480-5000 <i>Gear Couplings</i> San Marcos, TX - USA 1-800-458-0887 <i>Universal Joints, Drive Shafts, Mill Gear Couplings</i> Erie, PA - USA 1-920-593-2444</p> <p>Bibby Turboflex <i>Disc, Gear, Grid Couplings, Overload Clutches</i> Dewsbury, England +44 (0) 1924 460801 Boksburg, South Africa +27(0) 11 918 4270</p> <p>Guardian Couplings <i>Engineered Flywheel Couplings, Engine Housings and Pump Mounts, Flexible Shaft Couplings</i> Michigan City, IN - USA 1-219-874-5248</p> <p>Huco <i>Precision Couplings and Air Motors</i> Hertford, England +44 (0) 1992 501900 Chambersburg, PA - USA 1-888-829-6637</p> <p>Lamiflex Couplings <i>Flexible Couplings, Bearing Isolators, and Coupling Guards</i> Cotia, SP - Brasil +55 (11) 4615-6300</p>	<p>Electromagnetic Clutches and Brakes</p> <p>Inertia Dynamics <i>Spring Set Brakes; Power On and Wrap Spring Clutch/Brakes</i> New Hartford, CT - USA 1-800-800-6445</p> <p>Matrix <i>Electromagnetic Clutches and Brakes, Pressure Operated Clutches and Brakes</i> Brechin, Scotland +44 (0) 1356 602000 New Hartford, CT - USA 1-800-825-6544</p> <p>Warner Electric <i>Electromagnetic Clutches and Brakes</i> New Hartford, CT - USA 1-800-825-6544 <i>For application assistance:</i> 1-800-825-9050 Saint Barthélemy d'Anjou, France +33 (0)2 41 21 24 24 <i>Precision Electric Coils and Electromagnetic Clutches and Brakes</i> Columbia City, IN - USA 1-260-244-6183</p> <p>Engineered Bearing Assemblies</p> <p>Kilian <i>Engineered Bearing Assemblies</i> Syracuse, NY - USA 1-315-432-0700</p>	<p>Boston Gear <i>Enclosed and Open Gearing, Electrical and Mechanical P.T. Components</i> Charlotte, NC - USA 1-800-825-6544 <i>For application assistance:</i> 1-800-816-5608</p> <p>Nuttall Gear and Delroyd Worm Gear <i>Worm Gear and Helical Speed Reducers</i> Niagara Falls, NY - USA 1-716-298-4100</p> <p>Heavy Duty Clutches and Brakes</p> <p>Industrial Clutch <i>Pneumatic and Oil Immersed Clutches and Brakes</i> Waukesha, WI - USA 1-262-547-3357</p> <p>Svendborg Brakes <i>Industrial Brakes and Brake Systems</i> Vejstrup, Denmark +45 63 255 255</p> <p>Twiflex <i>Caliper Brakes and Thrusters</i> Wichita Falls, TX - USA 1-844-723-3483 Twickenham, England +44 (0) 20 8894 1161</p> <p>Wichita Clutch <i>Pneumatic Clutches and Brakes</i> Wichita Falls, TX - USA 1-800-964-3262 Bedford, England +44 (0) 1234 350311</p>	<p>Overrunning Clutches</p> <p>Formsprag Clutch <i>Overrunning Clutches and Holdbacks</i> Warren, MI - USA 1-800-348-0881 – Press #1 <i>For application assistance:</i> 1-800-348-0881 – Press #2</p> <p>Marland Clutch <i>Roller Ramp and Sprag Type Overrunning Clutches and Backstops</i> Warren, MI - USA 1-800-216-3515</p> <p>Stieber Clutch <i>Overrunning Clutches and Holdbacks</i> Heidelberg, Germany +49 (0) 6221-30470</p> <p><small>For information concerning our sales offices in Asia Pacific check our website www.altramotion.com.cn</small></p>

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