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BUSHING TYPE COUPLING

DYNAFLEX ELASTOMERIC

FLEXIBLE COUPLINGS

VIBRATION, SHOCK & MOTION CONTROL

SOLUTIONS - FOR A WORLD IN MOTION

We offer standardized products to meet most applications. Some control problems, however, require specialized solutions such as a custom-designed mount or a combination of LORD products. Our experts in vibration and noise control can analyze your individual requirements and provide you the most effective and affordable solution ... Ask Us How.

SURFACE EFFECT MOUNTS



Surface-Effect Mounts combine surface-effect damping principles with traditional rubber-bonded-to-metal technology. The result is a soft mount capable of providing effective damping over large deflections and a wide range of frequencies. As cab and engine mounts in on- and off-highway vehicles, Surface-Effect Mounts meet the most demanding requirements for vibration isolation and noise attenuation while controlling motion.

Compression Load Range: 3,115 - 6,987 N (700 - 1,570 lbs)

CONICAL MOUNTS



LORD Conical Mounts provide effective vibration isolation and noise attenuation with a simple, robust mount design. Consistent performance, high load bearing capabilities and a choice of radial stiffness characteristics are key features of these mounts. For more demanding vibration and noise reduction requirements, LORD integrates Conical Mounts with surface-effect technology to form an advanced control solution known as Surface-Effect Systems.

Compression Load Range: 801 - 11,392 N (180 - 2,560 lbs)

SANDWICH MOUNTS - FLEX-BOLT™



Efficient power transmission and driveline component durability are among powertrains designers' most important concerns. Increased durability and up-time are two characteristics demanded by purchasers of today's complex and expensive machinery. These demands can only be met with reliable, trouble-free, smooth-running powertrains free from damaging loads that compromise component life.

Compression Load Range: 27 - 59,808 N (6 - 13,440 lbs)

Shear Load Range: 4.45 - 7,476 N (1 - 1,680 lbs)

CENTER-BONDED MOUNTS



LORD Center-Bonded Mounts isolate vibration, control shock and reduce noise due to structure borne vibrations. Available in a full range of rated load capacities and able to withstand shock loads of 10 g's, these mounts effectively protect equipment and improve operator comfort. They are ideal for automotive, marine, railroad and industrial markets.

Compression Load Range: 334 - 9,345 N (75 - 2,100 lbs)

TWO-PIECE MOUNTS



LORD Two-Piece Mounts are designed for applications involving severe dynamic forces in the static load direction, as well as the rebound direction. Travel is limited in both directions by rubber in compression that provides snubbing.

Compression Load Range: 178 - 15,352 N (40 - 3,450 lbs)

BINOCULAR/SPLIT MOUNTS



LORD Binocular/Split Mounts are designed for applications involving severe dynamic forces in the static load direction, as well as the rebound direction. Travel is limited in both directions by rubber in compression that provides snubbing.

Compression Load Range: 4,450 - 6,675 N (1,000 - 1,500 lbs)

PLATFORM MOUNTS



LORD Platform Mounts provide effective isolation against vibration. The contour of the flexing element was developed to provide uniform stress distribution. This, plus high strength bonding and the use of specially compounded elastomers, provides maximum service life.

Compression Load Range: 2 N - 2,225 N (0.5 - 500 lbs)

GROMMET ISOLATORS



LORD Grommet Isolators provide effective, economical vibration isolation for light loads. They are suitable for commercial and military applications including computers, disk drives, business machines, precision instrumentation and general industrial equipment.

Compression Load Range: 4 - 27 N (1 - 6 lbs)

MACHINERY MOUNTS



LORD Machinery Mounts are designed to support heavy equipment and isolate intermittent or continuous vibration. The result is greater machine accuracy, longer service life, smoother operation and reduced maintenance. These mounts are available in four types to suit different needs.

Compression Load Range: 223 - 33,375 N (50 - 7,500 lbs)

BUSHINGS



LORD Center-Bonded Bushings and Square-Bonded Bushings are used in applications where the absorption shock, attenuation of noise, reduction of wear and elimination of lubrication is required.

Compression Load Range: 890 - 41,385 N (200 - 9,300 lbs)



DYNAFLEX® ELASTOMERIC FLEXIBLE COUPLINGS

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Powertrain component life is determined by the load spectrum each component will experience during the machine's service life. Reciprocating engines, such as spark-ignited gasoline and compression-ignited diesels, produce alternating torque loads which, when superimposed on the steady driving torque, create alternating stresses in driveline system components which shorten component life and reliability. High transient start-up torques and misalignment caused by skewed rotational axes between driver and driven in electric motor, hydraulic and pneumatic drives also cause high imposed forces on driven components. These unwanted forces loosen bolted joints and cause spline fretting, clutch disk wear, bearing failure, gear tooth fatigue and shaft fatigue, among an array of other problems.

Elastomeric flexible couplings solve these problems. They prolong driveline component life because they reduce the magnitude of imposed loads, attenuate vibration in multiple planes, accommodate misalignments in multiple planes, and act as barriers impeding noise created by meshing gears, engaging clutches, etc.

Elastomeric flexible couplings are also maintenance-free. They require no lubrication or other maintenance throughout their service life. Among the large variety of coupling types available, LORD Corporation's elastomeric couplings offer the most comprehensive package of benefits available to the powertrain designer. LORD Corporation's product lines include five different elastomeric coupling styles which cover a wide range of application requirements.

Application

Application requirements suggest the coupling style needed to optimize powertrain performance and component longevity. Misalignment accommodation, torsional vibration isolation, transient shock dissipation and required service life are important parameters to consider when selecting a coupling to fill specific application requirements.

Need assistance with selecting the right mount for your application?

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Dynaflex® Elastomeric Flexible Couplings

- Featuring:** Dynaflex® Shear-Type Couplings
Dynaflex® Spool-Type Couplings
Dynaflex® Bushing-Type Couplings
Dynaflex® LCR Series Couplings
Dynaflex® LCD Series Couplings

Efficient power transmission and driveline component durability are among powertrain designers' most important concerns. Increased durability and up-time are two characteristics demanded by purchasers of today's complex and expensive machinery. These demands can only be met with reliable, trouble-free, smooth-running powertrains free from damaging loads which compromise component life.

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ELASTOMERIC FLEXIBLE COUPLINGS

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LORD engineers can assist you with selecting an appropriate coupling type and configuration. With extensive analytical capability and years of experience in designing products for powertrain vibration, shock and motion control, LORD engineers offer everything from simple application assistance to complex system analysis and specialized product design.

Torsional vibration, transient shock and misalignment load analyses require specialized computer programs and engineering experience. LORD engineers can analyze your system and recommend the right solution, whether it's a selection from the standard product line or a custom design.

LORD Corporation's standard product lines of elastomeric flexible powertrain couplings are presented in the following sections. Many variations of standard products are available, but not listed as 'standard.' Main drive, fan drive, PTO and accessory drive couplings are available in a host of custom designs and variations of standard products. LORD engineers are ready to help you meet your specific application requirements with custom designs where necessary.

Product Lines

LORD offers five major lines of elastomeric flexible couplings. Standard lines are presented on the following pages. In addition to the standards listed, many variations are available in each product line.

Dynaflex® Shear-Type Couplings

LORD Dynaflex Shear-Type Coupling features a durable elastomeric flexing element bonded between two hubs. These couplings are designed for fractional horsepower applications requiring smooth starting transition, torsional vibration isolation and misalignment accommodation. Typical applications are small electric motor drives, low-torque mechanisms, power take-offs and auxiliary equipment drives.

Dynaflex® Spool-Type Couplings

LORD Dynaflex Spool-Type Couplings can be arranged in a variety of configurations to create a wide range of torque-transmitting capability. Elastomeric spool elements can be purchased in lot sizes for customer-assembled coupling designs, or LORD can provide a complete coupling assembly to meet specific application requirements. Typical applications are large drives requiring high torque capacity and low torsional stiffness.

Dynaflex® Bushing-Type Couplings

LORD Dynaflex Bushing-Type Couplings are bonded elastomeric elements designed for use in multiple element coupling configurations where high torque capacity is required. Bushings are available in a variety of stiffnesses. They can be purchased in lots for customer-assembled designs, or LORD can provide complete coupling assemblies designed to meet your specific application requirements. Applications requiring high torque/high torsional stiffness, but angular, axial and parallel misalignment accommodation can be designed using these bushings in a variety of configurations including parallel and series arrangements.

Dynaflex® LCR Series Couplings

LORD Dynaflex LCR Series Couplings features an elastomeric ring with bonded, bush-type inserts allowing various attachment configurations. These couplings offer a soft torsional spring rate which permits smooth transmission of driving torque while attenuating shock torques and providing excellent misalignment accommodation. These couplings are used in PTO drives where torsion and cocking flexibility are required. They can be mated with a variety of hub configurations. Special high-torque designs are available, as well as custom designs to meet special application requirements.

Dynaflex® LCD Series Couplings

LORD Dynaflex LCD Series Couplings are the ultimate coupling for reciprocating engine drives. This coupling features a bonded elastomeric flexing element which is radially precompressed into a flanged outer housing. This design produces a low torsional stiffness for maximum isolation of engine firing-pulse-induced torsional disturbances, torque overload slip protection, misalignment accommodation, superior shock pulse attenuation and fatigue life, and is adaptable to a variety of drive attachment designs. Custom designs are available to fit nearly every SAE flywheel configuration available from most engine manufacturers.

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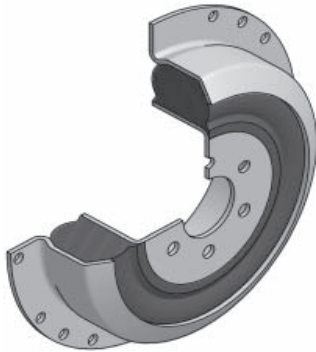
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DYNAFLEX® COUPLING



Dynaflex Elastomeric Flexible Couplings

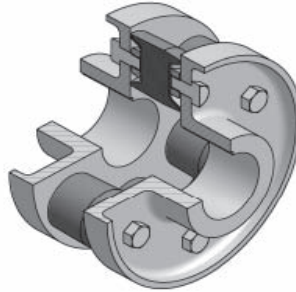
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DYNAFLEX LCD



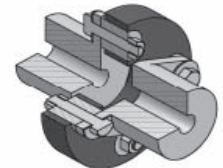
DYNAFLEX SHEAR



DYNAFLEX SPOOL



DYNAFLEX BUSHING



DYNAFLEX LCR

Coupling Application Guide

	Dynaflex Shear-Type	Dynaflex Spool-Type	Dynaflex Bushing-Type	Dynaflex LCR Series	Dynaflex LCD Series
Horsepower	Rated: 1/50 to 1	Rated: 50 to 1000	Rated: 10 to 600	Rated: 4 to 135	Rated: 75 to 2000
Best Application Area	Low-frequency vibration, multidirectional misalignment	Low-frequency vibration, high-power drive systems	Multidirectional misalignment, high capacity	Large misalignment, safetied drive requirements	Diesel engines, low-frequency vibration, multidirectional misalignment
Outstanding Capabilities	Effectively accommodates combinations of misalignment, high torsional resilience	Versatility in design for exact application requirements (stiffness and capacity)	High torque capacity versus size	Angular misalignment capability	Fits many standard flywheels, high torsional
Versatility Factor	Widest application potential of all elastomeric couplings	Capacity and resilience can be varied by changing number and type of spool	Numerous combinations possible simply by changing flexing elements	Torsional spring rate varied by changing modulus or wall thickness	Large horsepower, high horsepower capacity
Fail-Safe Characteristics	Easily incorporated	Easily incorporated	Inherent	Inherent	Slip-torque feature

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BUSHING-TYPE COUPLINGS

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“Accommodate misalignment, cushion high torsional shock, and does not generate or transmit noise...”

Dynaflex® Bushing-Type Couplings

Rated: 10 to 600 hp at 2000 rpm

LORD Dynaflex Bushing-Type Couplings accommodate misalignment, cushion torsional shock, and do not generate or transmit noise. Since relative motion is taken in the elastomer rather than sliding metal surfaces, no lubricant is involved or ever required. Dirt and grit cannot effect the coupling bushings. The elastomer has been compounded to provide long service life.

Typical applications include driveline installations where multi-directional misalignment must be accommodated and torque loads are medium to high.

Specification, selection and dimension information provided on the following pages facilitate design of the coupling assembly. The bushings are standard parts, and the flanges can be supplied by the end user or by LORD as a special design.

COUPLINGS - BUSHING TYPE

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BUSHING-TYPE COUPLINGS

Selection Guide

Compression bushing-type couplings are assembled by pressing the elastomeric bushings into sockets of a coupling flange. Once assembled, the coupling can be used two ways:

- **Parallel Arrangement**

The driving shaft can be connected to all of the bushings, and the driven shaft connected to the coupling flange. This arrangement loads all bushings in parallel and produces maximum torque capacity and a less resilient coupling.

- **Series Arrangement**

This arrangement requires an even number of bushings per flange. Mating flanges of the driving and driven shafts are attached to alternate bushings. This arrangement transmits the torque through the bushings in an N x N series arrangement, thereby making the torque capacity one-half of the parallel arrangement. The coupling is also more flexible.

When high torque and small space are the controlling factors, the parallel arrangement is recommended. When misalignment is the controlling factor, the bushings should be applied in series arrangement.

Table 1 provides selection criteria for parallel arrangement, Table 2 provides data for the series arrangement. Bushing selection is dependent upon torque requirements, angular, parallel and axial misalignments, as well as bolt circle diameter, number of bushings and bushing size. The torque values shown on the charts are nominal. The bushings are capable of withstanding higher torques due to the shock loads or other short duration surges.

Torsional Flexibility

Bushing-type couplings are relatively stiff torsionally compared to other elastomeric couplings. The torsional spring rate of a coupling assembly can be calculated by using the equation and data provided on the curves.

Example

Required torque capacity – 3400 lb-in

Misalignment – Angular – 1.75°

Axial – 1/8 in

Parallel – 1/32 in

Proposed Coupling – 7 x 7 Series, J-5737-1, (N = 7)
8 in bolt circle

Torsional Spring Rate, $K_{\theta} = \frac{N}{2} R^2 K_R$

$$K_{\theta} = \frac{7}{2} (4)^2 4000 = 224,000 \text{ lb-in/rad.}$$

Caution: Shaft length must be considered for potential whirl problems.

Recommended Misalignment Limits

	Misalignment	Bushing Arrangement	
		Parallel	Series
Single Coupling	Angular	1°	1.75°
	Parallel	1/64 in	1/32 in
	Axial	±1/16 in	±1/8 in
Double Coupling	Angular	2°	3.5°
	Parallel	3/16 to 1/2 in*	3/8 to 1 in*
	Axial	±1/8 in	±1/4 in

* Dependent on shaft length (10 to 30 in).

Figure 1 – Parallel Arrangement

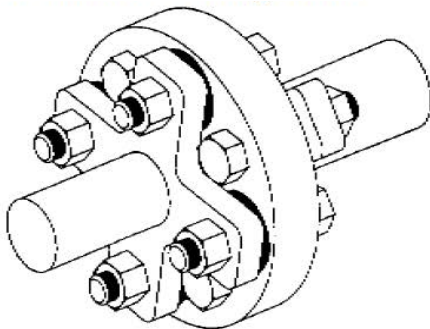
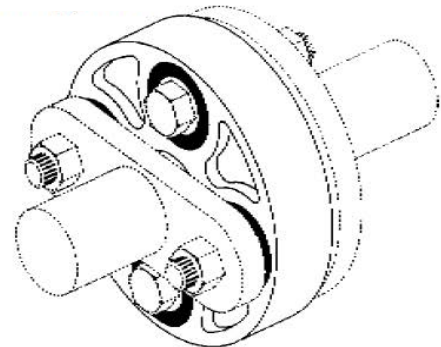


Figure 2 – Series Arrangement



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BUSHING-TYPE COUPLINGS

Dynaflex Bushing-Type Couplings

Table 1 – Parallel Arrangement Selection

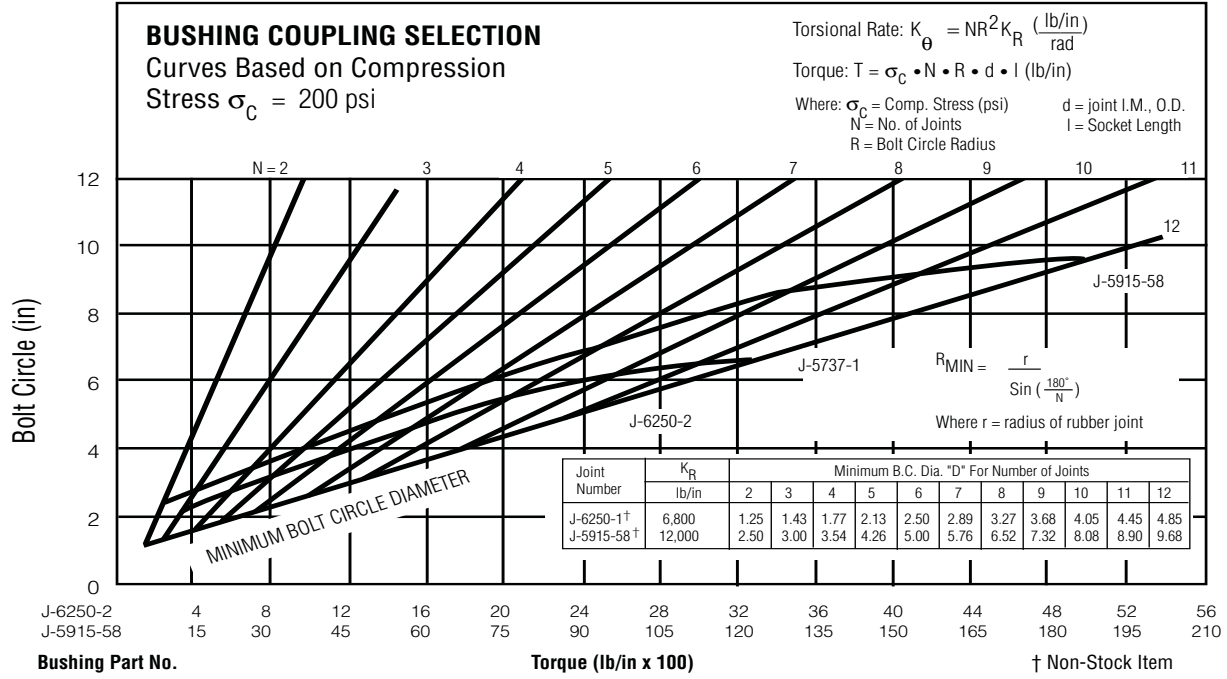
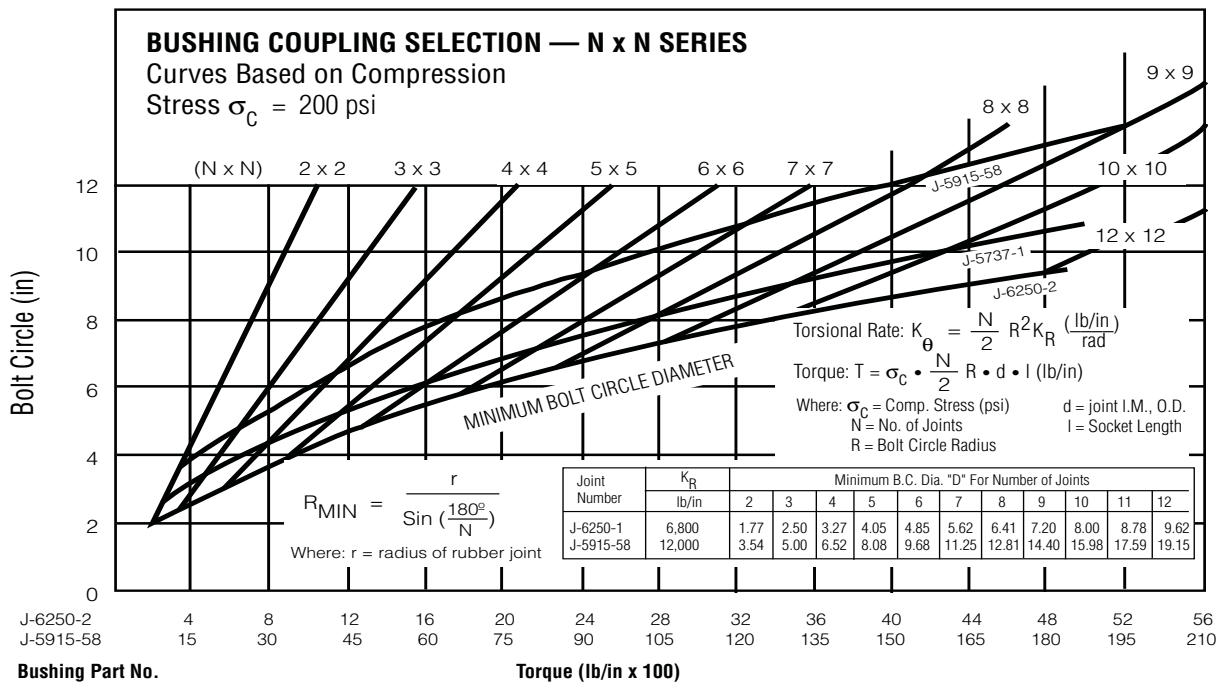


Table 2 – Series Arrangement Selection



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BUSHING-TYPE COUPLINGS

Figure 3 – Joint Dimensions - J-6250-2

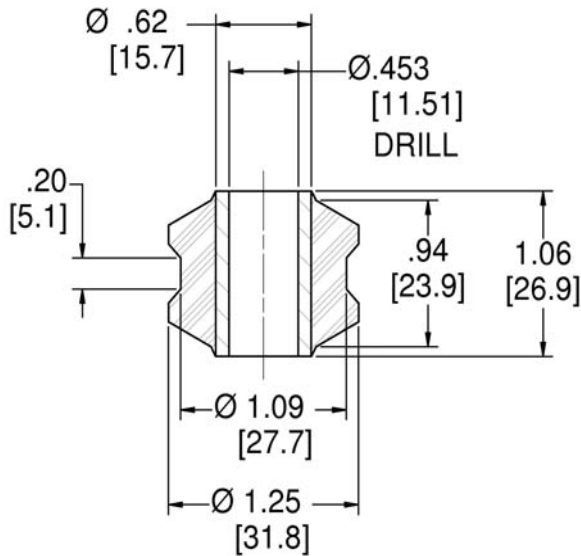


Figure 4 – Joint Dimensions - J-5915-58

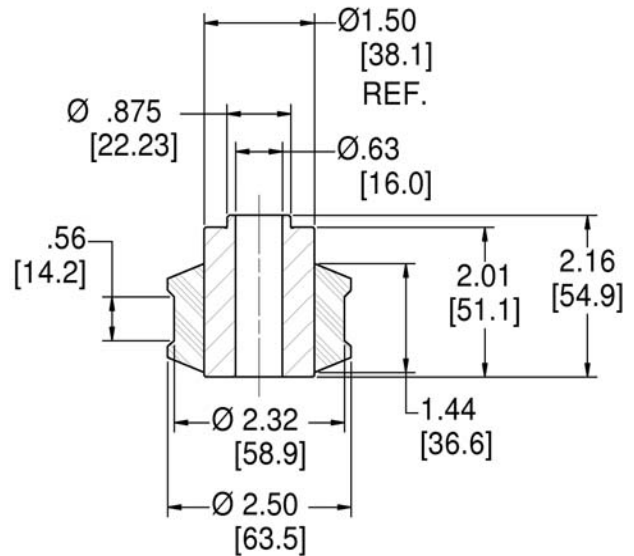
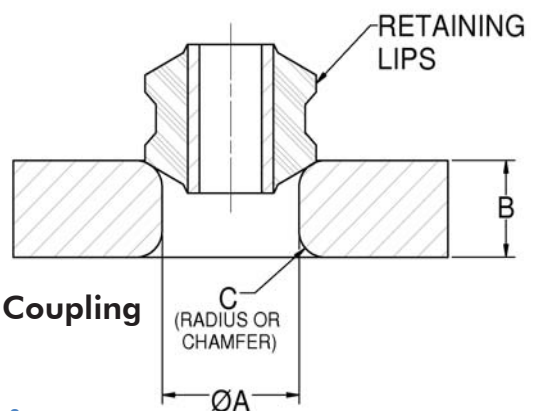


Table 3 – Typical Socket Dimensions

Part Number	A Socket Dia.		B		C			
					Radius		Chamfer x 45°	
	in	mm	in	mm	in	mm	in	mm
J-6250-2	1.00	25.4	0.69	17.5	0.19	4.8	0.13	3.3
J-5915-58	2.19	55.6	1.06	26.9	0.25	6.4	0.19	4.8

LORD does not supply hubs. Rubber elements only.

Figure 5 – Socket Dimensions



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Installation Instructions: Use P-80 lube or equivalent mixed to manufacturer's specifications. Immerse rubber bushing in P-80 solution, making sure entire bushing is wet. Insert bushing into socket by pressing with adequate force to seat the bushing properly between the retaining lips. Appearance of top and bottom should be uniform after assembly.

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LORD COUPLING DATA ANALYSIS FORM



Data Required for LORD Coupling Recommendation

Toll Free Number (in United States and Canada): **DELTA FLEX @ 800.657.0747**

All Information in This Box is Required Data.

Date _____ LORD Recommended P/N _____

Company Name _____ Field Engineer _____

Address _____ Discussed With _____

_____ Title _____

General description of problem and equipment _____

Retrofit New System

APPLICATION

Driving Unit

- * Description _____
- * Model No. _____ * Manufacturer _____
- * 2-Stroke/Cycle 4-Stroke/Cycle
- * Rotational Inertia and Torsional Spring Rate Data (attach tabulated data)
- * Radial Support Needed: Yes No

Driven Unit

- * Description _____
- * Model No. _____ * Manufacturer _____
- * Rotational Inertia and Torsional Spring Rate Data (attach tabulated data)
- * Parasitic Torque required _____ lb-ft

SYSTEM DYNAMICS

- * Mass elastic schematic of entire system (please attach sketch)
- Test data (attach if available)
- Speeds of Driving Unit: Idle _____ RPM Normal _____ RPM Maximum _____ RPM
- % Time: @ Idle _____ @ Normal _____ @ Maximum _____
- Speed Ratio Driving to Driven Unit: _____ to _____
- * Torque: Normal _____ lb-ft Maximum _____ lb-ft (@ _____ RPM)
- Present Vibration: Peak-to-Peak Response Maximum _____ lb-ft @ _____ CPM
- * Transient Shock: Magnitude: _____ lb-ft
- Duration: _____ milliseconds
- How Often: _____ times per hour
- * Briefly describe any peculiarities or special circumstances of the dynamic system _____
- _____
- _____

* Required data

(OVER)

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DYNAFLEX® COUPLING



LORD COUPLING DATA ANALYSIS FORM



COUPLING REQUIREMENTS

Primary Function

Shaft Misalignment

- _____ Axial
- _____ Angular
- _____ Parallel
- _____ Torsional Vibration Isolation
- _____ Torsional Shock Loads
- _____ Noise Attenuation

Specific Requirements

- _____ Inches
- _____ Degrees
- _____ Inches
- _____ % Isolation @ _____ RPM
- _____ Maximum Amplitude

Parameters

- * System Operating Temperature: Normal _____ °F Maximum _____ °F Minimum _____ °F
- * Environment: Oil Immersion _____ Oil Splash _____
- Other _____ Mil Spec _____
- * Space Envelope: Maximum Length _____ Maximum Diameter _____
- * Attachments: Driving Spline Flange Driven Spline Flange
- Keyways Set Screws Keyways Set Screws
- * Shaft Diameters: Driving _____ Driven _____
- Fail-Safe Feature Required: Yes No
- Maximum Allowable Weight: _____
- * Minimum Hours Life Required: _____

Please attach the following:

- A layout of the available space envelope and other pertinent drawings showing connecting drive-line components.**
- A system mass-elastic diagram including all rotational mass moments of inertia and torsional stiffnesses.**

Remarks _____

* Required data

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ELASTOMERIC FLEXIBLE COUPLINGS



NOTES:

SKETCH:

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