ALTRA INDUSTRIAL MOTION

Huco Dynatork Flexible Couplings

Huco® Dynatork

An Altra Industrial Motion Company

Huco Dynatork offers a wide variety of couplings for precision industrial and commercial applications worldwide.

Selecting the right shaft coupling can be the difference between a drive system that provides the required dynamic response and one that is catastrophic. The application constraints lead engineers towards products that have different levels of torsional stiffness, vibration dampening, backlash, and low bearing loads. Huco can respond quickly with a wide variety of couplings such as general purpose, beam style, and precision couplings suitable for highly reliable applications.

Precision Couplings

Flex B Bellows, Flex K Large Bellows and Flex M Disc type couplings are ideal for use in high-end servo drives, pulse generators, scanners, X-Y positioning slides, high speed dynamometers, measuring instruments, robots, and machine tools.

Beam Couplings

Step Beam, Single Beam, Three Beam, and Six Beam couplings are available for use in stepper and servo drives, encoders, tachometers, small pumps, motors and drives and light-duty power transmission applications.

General Purpose Couplings

Oldham couplings are designed for use in stepper drives and most applications including positioning slides, pumps, actuators, etc. Uni-Lat models are ideal for encoder, resolver, tachometers, potentiometer drives, as well as small positioning slides, dosing pumps, and general light drives. Flex P units can be utilized in light power drives, pumps and small generators.

Friction Clutches

Vari-Tork™ friction clutches allow slippage when the torque being transmitted reaches a pre-determined threshold. Used in all types of small drives to help protect personnel and equipment.

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Product Overview

Stainless Steel Bellows type	Nickel Bellows type	Membrane type	Multi-Beam type	Single-Beam type
Flex B   **Flex K** 	**Flex Ni**  	**Flex M** Single-stage  Short two-stage  Long two-stage 	**Multi-Beam** 6-Beam   Material Options: Aluminium Stainless Steel Acetal	**Single-Beam**  Material Options: Aluminium Stainless Steel
General description				
Precision couplings with excellent kinematic properties. The 3 types offer differing combinations of stiffness, radial compensation and axial motion.	Precision couplings with excellent kinematic properties. The 3 types offer differing combinations of stiffness, radial compensation and axial motion.	Precision couplings with excellent kinematic properties. Dynamically balanced construction. Single-stage versions make up into 'whirl' free Cardans. The 2-stage versions offer short envelopes and low bearing loads respectively.	General purpose single piece couplings Single stage (3-beam) Two stage (6-beam) Material options for moisture and corrosion resistance.	More flexible than Multi-Beam but less torsional rigidity.
Where to use				
High-end servo drives, pulse generators, scanners, positioning slides, metering valves, etc.	High-end servo drives, pulse generators, scanners, positioning slides, metering valves, etc.	High-end servo drives, pulse generators, scanners, positioning slides, high speed dynamometers, unsupported drive shafts, etc.	Stepper and servo drives, encoders, general purpose light duty power transmission applications.	Stepper drives, encoders, general purpose light duty power transmission applications.
Speeds				
Flex B up to 5000 rpm in standard form. Flex K up to 15000 rpm.	Up to 5000 rpm in standard form.	Up to 5000 rpm in standard form. Up to 30000 rpm in balanced form.	Up to 5000 rpm in standard form. Up to 30000 rpm in balanced form.	Up to 5000 rpm in standard form. Up to 30000 rpm in balanced form.
Peak torque largest size lbs.-in (Nm)				
4425 (500)	110.6 (12.5)	885 (100)	1239 (140)	266 (30)
Standard bores in. (mm)				
1/8"-2 1/2" (3 to 65)	1/8"-3/4" (3 to 20)	1/8"-1 1/4" (3 to 38)	1/8"-1 1/4" (1 to 38)	1/8"-3/4" (3 to 26)
Temperature range °F (°C)				
–40° to +250°F (–40° to +120°C)	–40° to +250°F (–40° to +120°C)	–40° to +250°F (–40° to +120°C)	–40° to +290°F (–40° to +140°)	–40° to +290°F (–40° to +140°)
Electrically isolating				
No, unless used with insulating bore adaptors	No, unless used with insulating bore adaptors	No, unless used with insulating bore adaptors	Aluminium, Stainless Steel } No Acetal Yes	Aluminium, Stainless Steel } No Acetal Yes
Connection				
Clamp, Set Screw or Spiggot	Clamp or Set Screw	Clamp or Set Screw	Clamp or set screw	Clamp or Set Screw
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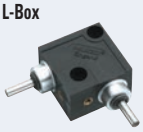
Product Overview

Step-Beam type	Sliding Disc type	Universal / Lateral type	Double Loop type	Jaw Coupling	Universal Joints & Teleshafts	Friction Clutches	Bevel Gearboxes
Step-Beam  Material Options: Nylon	**Oldham** Blind bored  Thru' bored  Thru' bored  Material Options: Aluminium Stainless Steel Brass	**Uni-Lat**  	**Flex-P**   	**Flex-G** 	**Huco-Pol** Single joints  Double joints  Teleshafts 	**Vari-Tork, Polyclutch** Basic clutch  Basic clutch + Oldham coupling 	**L-Box** 
General description							
Unique coupling design gives excellent combination of radial flexibility with torsional stiffness.	General purpose, robust, easy to use 3-part couplings with replaceable wear elements. Generous radial compensation and pull-apart / re-engage facility for blind assemblies.	Unique, general purpose light duty couplings with generous angular and radial misalignment compensation. Resist axial motion, can anchor unrestricted shafts and perform light push/pull duties.	Exceptional flexibility in all three directions, radial, angular and axial.	High torque capacity and high speed are available from this naturally balanced coupling.	Light duty plastic universal joints and extensible drive shafts (teleshafts). Low mass, corrosion resistant, ideal where conventional steel joints would be under-utilised.	Small, user-adjustable torque limiters for concentric or in-line mounting. Operate by friction using interleaved clutch plates.	Small 90° drives encased in molded housings providing electrical isolation between shafts and mounting surface. The L-Box is rated for intermittent use.
Where to use							
Encoders, tachogenerators, small pumps, motors and drives.	Stepper drives for most applications including positioning slides, pumps, actuators, etc.	Encoder, resolver, tacho, potentiometer drives. Small positioning slides, dosing pumps, & light drives generally.	Light power drives, pumps and small generators.	Light power drives where misalignment is small.	Intermittent applications in business machines, instrumentation, lab equipment, analytical apparatus, etc., where steel joints would be under-utilised.	Friction clutches interrupt rotation when the load being transmitted reaches a pre-determined threshold. Used in all kinds of small drives to help protect personnel and equipment.	L-box offers a compact means to route drives thru' 90°.
Speeds							
Up to 10000 rpm.	Up to 3000 rpm.	Up to 3000 rpm.	Up to 3000 rpm.	Up to 40,000 rpm.	Up to 1000 rpm.	Up to 1000 rpm slipping speed.	Up to 1000 rpm.
Peak torque largest size lbs.-in (Nm)							
221 (25)	389 (44)	106 (12)	159 (18)	1177 (133)	95 (10.7)	531 (60)	6 (0.68)
Standard bores in. (mm)							
1/8"-1/2" (3 to 12.7)	1/8"-1" (2 to 30)	1/8"-3/4" (3 to 22)	1/8"-5/8" (3 to 16)	1/8"-5/8" (3 to 16)	1/8"-3/4" (3 to 20)	1/4"-1 1/4" (6 to 32)	5/32" (4)
Temperature range							
–20 to +300°F (–20 to +150°C)	–20 to +140°F (–20 to +60°)	–20 to +140°F (–20 to +60°)	–40 to +210°C (–40 to +100°)	–40 to +180°F (–40 to +80°)	–20 to +140°F (–20 to +60°)	–10 to +180°F (when operating) (–10 to +80°) (when operating)	–20 to +140°F (–20 to +60)
Electrically isolating							
Yes	Yes	Yes	Yes	Yes	Yes	No	*See General Description above*
Connection							
Clamp or Set Screw	Clamp or Set Screw	Clamp or Set Screw	Set Screw	Clamp or Set Screw	Set Screw, Bonding, or Cross-Pinning	Clamp or Set Screw	N/A
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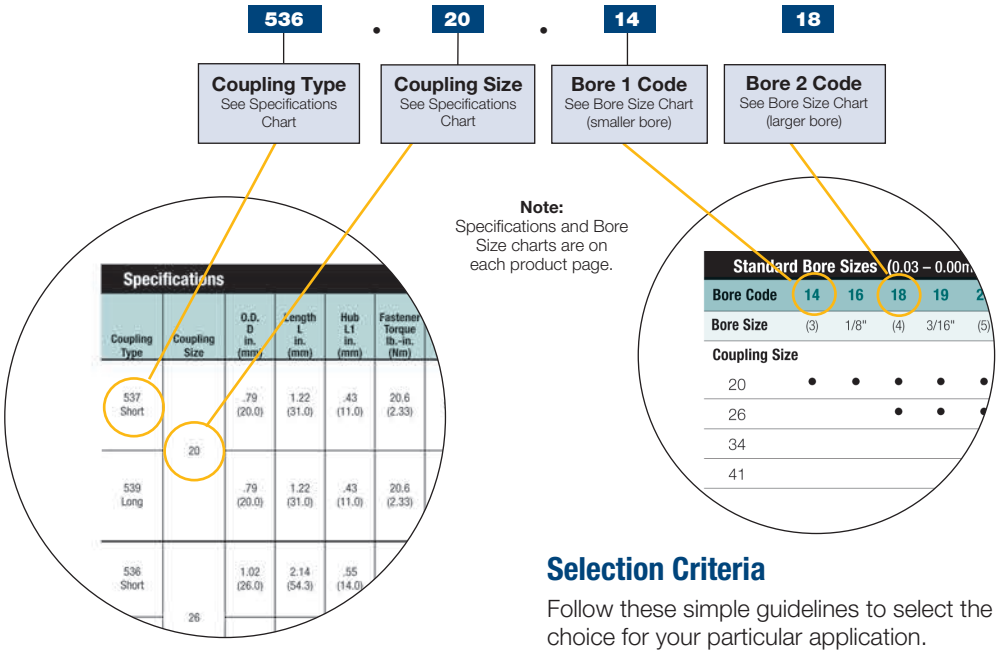
Selecting Flexible Couplings

Building an Ordering Part Number is fast and easy using the Specifications and Bore Size charts on each product page. Simply select the coupling type, coupling size and two bore sizes you require (always place smaller bore first). Always include (.) in Part Number.

Ordering Number System **Example: 536.20.1418**



The following key factors should always be considered when specifying flexible shaft couplings:

- Torsional Stiffness
- Backlash
- Torque
- Life
- Shaft Attachment Type
- Misalignment Requirements

Service Factors

- Torque capacity values shown in the coupling specification charts assume uniform load conditions at a constant speed with no misalignment or axial displacement. See page 48 to provide adequate service factors.
- The torque capacity of flexible couplings will reduce when acceleration is present (eg: stop/start or reverse conditions).
- The more severe the acceleration, the greater reduction in torque capacity.
- The more severe the misalignment, the greater reduction in torque capacity.
- Sliding couplings (Oldham and UniLat) are subject to a wear rate dependant on the number of cycles completed and environmental factors.

Selection Criteria

Follow these simple guidelines to select the optimal coupling choice for your particular application.

- Does the coupling provide adequate misalignment protection?
- Can it transmit the required torque?
- Can it sustain the required rotational speed?
- Will it fit in the available space envelope?
- Can it operate at the designated ambient temperature?
- Will it provide the torsional stiffness required for positional accuracy?
- Does it provide electrical isolation between the shafts?
- Will it provide the required life expectancy?
- Is axial motion or axial stiffness required?

Load					
	Steady State	Stop/Start	Reversing	Shock	Shock & Reversing
Huco Flex B	1.5	2.0	2.0	3.0	4.0
Huco Flex K	1.5	2.0	2.0	3.0	4.0
Huco Flex M	1.5	2.0	2.0	3.0	4.0
Huco Flex Ni	1.0	2.0	2.0	3.0	4.0
Huco Flex P	1.0	1.5	1.5	3.0	4.0
Huco Flex G	1.0	2.0	4.0	4.0	4.0
Huco MultiBeam	1.0	1.5	2.0	(Note 1)	(Note 1)
Huco S-Beam	1.0	1.5	2.0	(Note 1)	(Note 1)
Huco TorqLink	1.0	1.5	2.0	(Note 1)	(Note 1)
Duty (Hours/Day)					
	<1	1-2	3-5	6-12	>12
Huco Oldham	1.0	2.0	4.0	6.0	8.0
Huco Flex-B	1.0	1.5	2.0	3.0	4.0
Uni-Lat	1.0	1.5	2.0	3.0	4.0

* Note 1 - Not recommended in these conditions.

Round & Keywayed Bore Details & Codes

Metric mm	Inch fraction	Inch decimal	Round bore code	Metric keys key size w x h	Inch keys key size w x h	Keywayed bore code
1	–	0.0394	**08**	–	–	–
1.5	–	0.0591	**09**			
1.588	1/16	0.0625	**10**	–	–	–
2	–	0.0787	**11**	–	–	–
2.286	–	0.0900	**12**	–	–	–
2.382	3/32	0.0938	**13**	–	–	–
3	–	0.1181	**14**	–	–	–
3.048	–	0.1200	**15**	–	–	–
3.175	1/8	0.1250	**16**	–	–	–
*3.969	5/32	0.1563	**–**	–	–	–
4	–	0.1575	**18**	–	–	–
4.763	3/16	0.1875	**19**	–	–	–
5	–	0.1969	**20**	–	–	–
5.556	7/32	0.2188	**21**	–	–	–
6	–	0.2362	**22**	–	–	–
6.096	–	0.2400	**23**	–	–	–
6.350	1/4	0.2500	**24**	–	–	–
7	–	0.2756	**25**	2 x 2	–	P25
7.144	9/32	0.2813	**26**	–	–	–
7.938	5/16	0.3125	**27**	–	1/8 x 1/8	R27
8	–	0.3150	**28**	2 x 2	–	P28
8.731	11/32	0.3438	**29**	–	1/8 x 1/8	R29
9	–	0.3543	**30**	3 x 3	–	P30
9.525	3/8	0.3750	**31**	–	1/8 x 1/8	R31
10	–	0.3937	**32**	3 x 3	–	P32
11	–	0.4331	**33**	4 x 4	–	P33
11.113	7/16	0.4375	**34**	–	1/8 x 1/8	R34
12	–	0.4724	**35**	4 x 4	–	P35
12.700	1/2	0.5000	**36**	–	1/8 x 1/8	R36
13	–	0.5118	**37**	5 x 5	–	P37
14	–	0.5512	**38**	5 x 5	–	P38
14.288	9/16	0.5625	**39**	–	3/16 x 3/16	R39
15	–	0.5906	**40**	5 x 5	–	P40
15.875	5/8	0.6250	**41**	–	3/16 x 3/16	R41
16	–	0.6299	**42**	5 x 5	–	P42
17	–	0.6693	**43**	5 x 5	–	P43
17.463	11/16	0.6875	**44**	–	3/16 x 3/16	R44
18	–	0.7087	**45**	6 x 6	–	P45
19	–	0.7480	**46**	6 x 6	–	P46
19.050	3/4	0.7500	**47**	–	3/16 x 3/16	R47
20	–	0.7874	**48**	6 x 6	–	P48
22	–	0.8661	**49**	6 x 6	–	P49
22.225	7/8	0.8750	**50**	–	1/4 x 1/4	R50
24	–	0.9449	**51**	8 x 7	–	P51
25	–	0.9843	**52**	8 x 7	–	P52
25.400	1	1.0000	**53**	–	1/4 x 1/4	R53
28	–	1.1024	**54**	8 x 7	–	P54
28.575	1-1/8	1.1250	**55**	–	5/16 x 1/4	R55
30	–	1.1811	**56**	8 x 7	–	P56
31.750	1-1/4	1.2500	**57**	–	5/16 x 1/4	R57

* Not manufactured. Nearest alternative 4mm.

Round & Keywayed Bore Details & Codes Cont.

Metric mm	Inch fraction	Inch decimal	Round bore code	Metric keys key size w x h	Inch keys key size w x h	Keywayed bore code
32	–	1.2598	**58**	10 x 8	–	P58
34.925	1-3/8	1.3750	**59**	–	3/8 x 1/4	R59
35	–	1.3780	**60**	10 x 8	–	P60
38	–	1.4961	**61**	10 x 8	–	P61
38.10	1-1/2	1.5000	**62**		Specify on Order	
40	–	1.5748	**63**			
41.28	1-5/8	1.6250	**64**			
42	–	1.6535	**65**		Specify on Order	
44.45	1-3/4	1.7500	**66**			
45	–	1.7717	**67**			
47.63	1-7/8	1.8750	**68**		Specify on Order	
48	–	1.8898	**69**			
50	–	1.9685	**70**			
50.80	2	2.0000	**71**		Specify on Order	
53.98	2-1/8	2.1250	**72**			
55	–	2.1654	**73**			
57.15	2-1/4	2.2500	**74**		Specify on Order	
60	–	2.3622	**75**			
60.33	2-3/8	2.3750	**76**			
63.50	2-1/2	2.5000	**77**		Specify on Order	
65	–	2.5591	**78**			
73.03	2-7/8	2.8750	**79**		Specify on Order	
75	–	2.9528	**80**			

Specifying a Keywayed Bore

To specify a keywayed bore, prefix the 2-digit bore code number with a “P” for metric keyways or an “R” for an inch keyway.

Examples:

Metric: 538.34.**P**28**P**28

In this example both bores have a keyway.

Inch: 538.34.24**R**36

In this example only the second bore will have a keyway.

Standard keyways are machined to two specifications:

- Bore Codes prefixed with a “P” denote a metric keyway conforming to ISO 773/774 (BS 4235 Pt. 1).
- Bore Codes prefixed with a “R” denote an inch keyway conforming to BS 46 Pt. 1.

Installing Couplings

Flexible Coupling Types

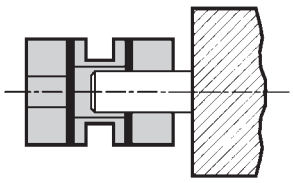
General instructions

1. Ensure that shafts are free of burrs, damage, or foreign matter, and can penetrate the bores.

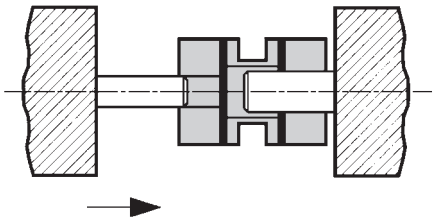
2. Install the coupling by holding the shaft and the related hub, rotating it back and forth as you progress it along the shaft.

3. Do not apply any forces that cause extension, compression or lateral displacement of the coupling beyond its permissible offsets.

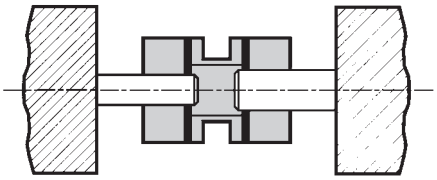
Normal installation



a) Position and secure the larger of the 2 shafts (if different) and progress the coupling onto it.



b) Progress the second shaft into the bore, taking care not to lever either shaft against the inner wall of the spacer.



c) Progress the coupling along the shafts to a position midway between the shaft terminations. Rotate the coupling to ensure it is not binding and is in its natural state, ie., neither extended nor compressed.

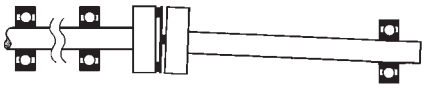
d) Align the second shaft with the first using a straight edge and feeler gauges or a dial indicator.

e) Secure the second shaft and re-check alignment. Final alignment must be within the permissible offsets.

f) Secure one hub, tightening each screw alternately. Repeat for the second hub.

When to use single & two-stage couplings

Single-stage



Example 1. With partially supported (1 bearing) shafts.

Example 2. With unsupported intermediate shafts.

Single-stage couplings are radially supportive and function as supplementary bearings. They are used when the connected shaft lacks a full complement of bearings.

Two-stage

Two-stage couplings are radially compliant and are used when both shafts are fully supported by bearings.

CAUTION

These are precision high couplings that have a limited range of permissible flexure. They can be damaged through careless handling. Avoid gratuitous flexure in any direction.

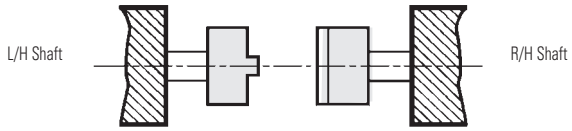
No axial forces are permitted across the membranes when fitting Huco-Flex M couplings. Keyways with interference fits are not recommended.

Bellows couplings are more tolerant of axial motion, but flexure beyond the permissible limits should be avoided.

Note: Bellows couplings do not provide the same level of radial support as Flex M when used with partially or wholly unsupported shafts. When essential for reasons of greater axial motion, use the 3-convolution type for these purposes.

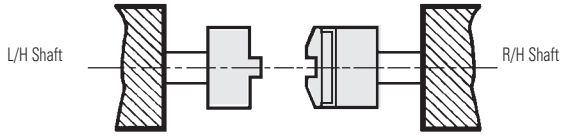
Sliding Disc type (Oldham)

Blind hub

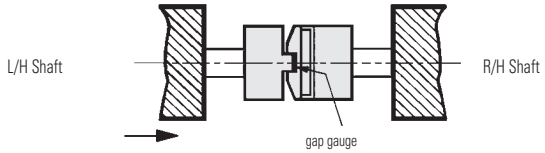


a) Slide hubs on to both shafts until fully seated and tighten screws.

b) Position and secure R/H shaft.



c) Seat disc fully on R/H hub.



d) Place a gap gauge flat against the bottom of the exposed slot in the disc and push the L/H hub into full engagement by manipulating the L/H shaft.

e) Align shafts within the permissible offsets and secure L/H shaft.

f) Check alignment and correct if necessary.

g) Remove gap gauge.

To fit a new disc, withdraw L/H shaft complete with hub and remove old disc. Repeat steps c) to g).

Gap gauges for all hub types

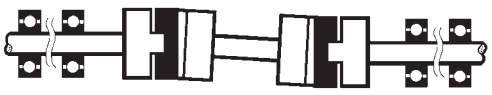
Coupling size		Gap gauge
	06, 09 & 13	0.002 (0.05)
	19 & 25	0.004 (0.10)
	33 & 41	0.006 (0.15)
	50 & 57	0.008 (0.20)

Clearances are set to allow for thermal shaft growth and / or end-float. Gaps may be increased, but total shaft movement should not exceed the values shown under *Axial Compensation* in the Performance Table.

Radial support

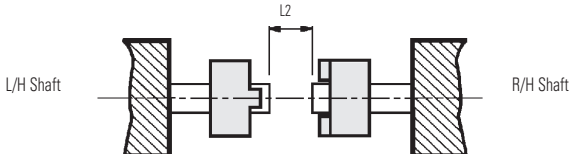
Shafts must be fully supported by 2 bearings and have minimal overhang. Oldham couplings cannot be used in pairs.

right



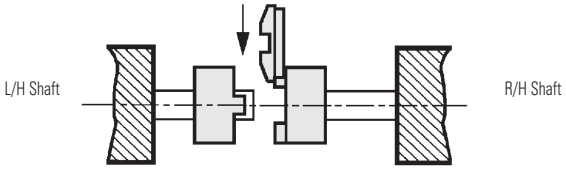
wrong

Thro' hub



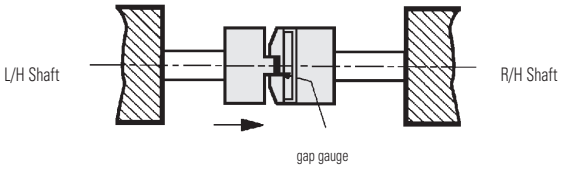
a) Slide hubs on to both shafts.

b) Align shafts to within the permissible offsets and position to leave *minimum* gap 2 between terminations. Secure both shafts, check alignment and correct if necessary.



c) Position R/H hub with inboard face flush with shaft termination and tighten screws.

d) Slide disc radially on to the tenons of the R/H hub. Ensure the disc is fully seated.



e) Place a gap gauge flat against the bottom of the exposed slot in the disc and push the L/H hub into full engagement.

f) Tighten fastening screws and remove gap gauge.

To fit a new disc, slacken the fastening screws on one hub and retract it along the shaft. Slide the old disc out radially and replace with the new. Repeat steps d) to f).

To retain shaft phasing, withdraw L/H shaft and repeat steps c) to g) as for Blind hub couplings.

Over-penetration of shafts can impair function of coupling with solid disc. Min shaft gap L2 must be observed. Specify thro' bored disc for near-butted shafts.

Coupling size	19	25	33	41	50	57
L2 min	0.28 (7.2)	0.36 (9.2)	0.47 (12.0)	0.60 (15.3)	0.72 (18.4)	0.83 (21.2)

Clamp hubs

To improve clamp action, apply a little grease under the head of the clamp screw.

Note: It is important that installed couplings are not end-loaded. To help avoid this, thro' bored hubs are recommended for shafts which have fixed axial locations such as face-mounted motors.

Installing Couplings

Beam Type

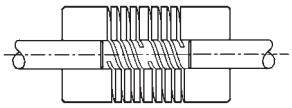
Relief Under The Beams

Most Multi-Beam couplings can be supplied with or without relief under the beams as shown in the diagrams below. When the drive or driven shafts extend under the beams relief is essential to ensure that the coupling remains flexible. Where non-relieved versions are used, shafts must not be allowed to penetrate under the beamed section of the coupling. Unless otherwise specified, relieved versions will be supplied.

Pilot Bores

Couplings can be supplied 'pilot bored' for opening out by the customer. Pilot bores are plain drilled holes, which are not produced with the same accuracy as finished machined bores. The largest bore provided in a pilot bored product is that needed to make the coupling flexible and this will always be larger than the minimum possible bore size 'B1' shown in the bore tables. For sizes 13 to 25, the pilot bore is also larger than the 'B2' minimum shown in the bore tables. Further details are available on request.

Non-Relieved



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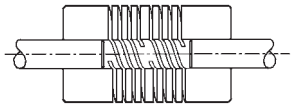

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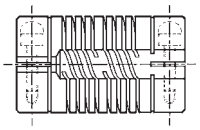

Relieved