

# *Crownpin Couplings*



**RENOLD**  
Superior Coupling Technology

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# RENOLD

## Strength through Service

Renold Gears has been manufacturing high quality, high specification gear units for over 100 years and has always been at the leading edge of gear technology with innovative products and power transmission solutions.

## Interchangeability

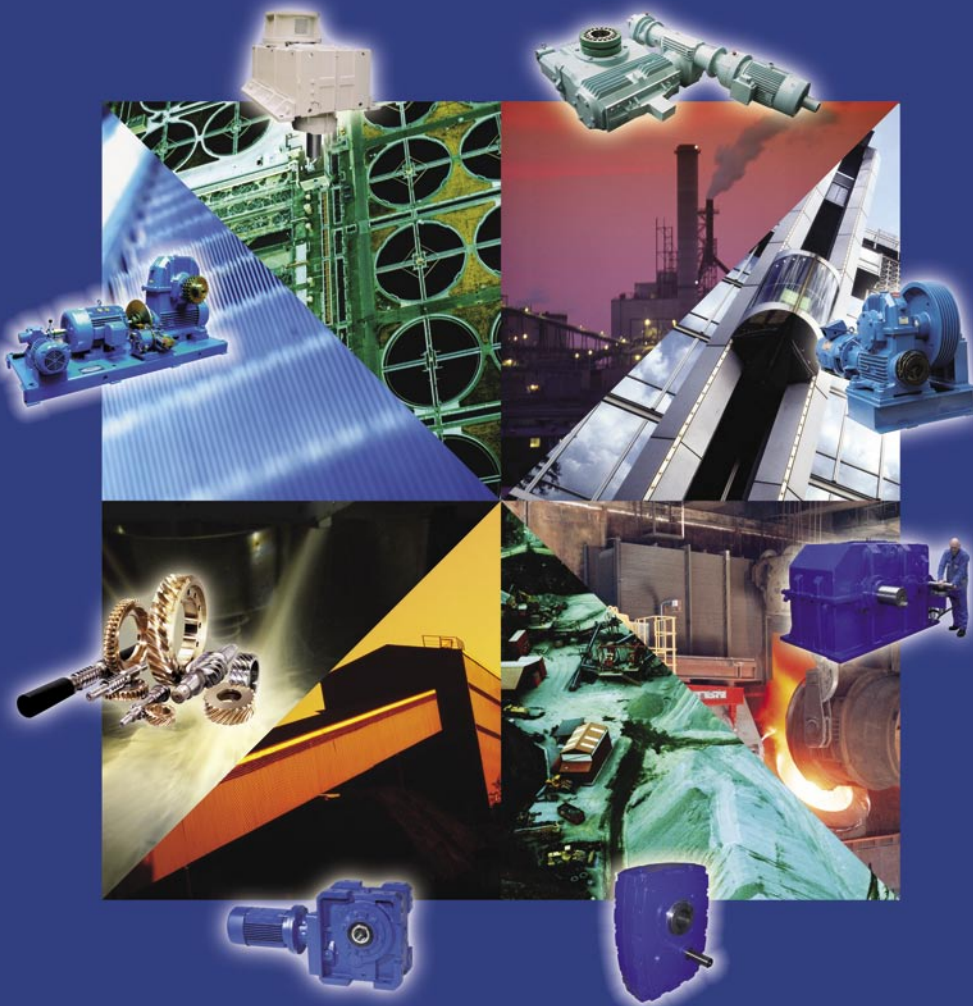
Many of the products from Renold Gears are dimensionally interchangeable with other manufacturers gear units, allowing a trouble free replacement of gearboxes, in most cases upgrading the capacity through state of the art technology and materials.

## Custom Made

Renold Gears is unique in it's ability to offer custom made products designed to meet customers exacting requirements without compromise on availability and cost. From complete package solutions to individual precision replacement gears, all can be tailor made to meet specific applicational requirements.

## Available

The most popular ranges of gearboxes are available from local distribution stock, backed up by extensive stocks from our manufacturing plant in the UK.



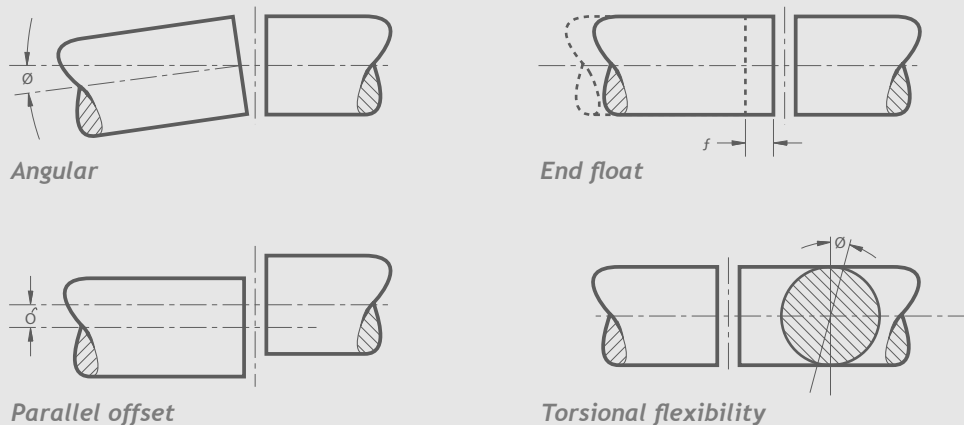
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# Contents

	<i>Page No</i>
<b>Renold Gears</b>	<b>inside front cover</b>
<b>Coupling Selection Guide</b>	<b>02</b>
<b>Load Classification by Application</b>	<b>03</b>
<b>Service Factors and Selection</b>	<b>04</b>
<b>Key and Keyway Dimensions</b>	<b>05</b>
<b>Crownpin</b>	<b>06</b>
<b>Renold Chain</b>	<b>inside back cover</b>

## Coupling Selection Guide



Flexible Couplings should be used to accommodate any combination of misalignment conditions described below.

At installation all couplings should be aligned as near to perfect as possible.

### 1. Angular

Angular misalignment is present when the shaft axes are inclined one to the other. Its magnitude can be measured at the coupling faces.

### 2. Parallel Offset

Axial misalignment is present when the axes of the driving and driven shafts are parallel but laterally displaced.

### 3. End float (axial)

End float is the ability to accommodate a relative axial displacement of the connected shafts; achieved by sliding members or flexing of resilient components.

### 4. Torsional flexibility

Torsional flexibility is a design feature necessary to permit shock and impulsive loadings to be suitably dampened. It is achieved by the provision of a flexible medium such as rubber, springs, etc., between the two halves of the coupling.

### Selection

In order to select the correct type and size of coupling, the following basic information should be known:

#### Power to be transmitted

- Normal.
- Maximum.
- Whether continuous or intermittent.

#### Characteristics of the drive

- Type of prime mover and associated equipment.
- Degree of impulsiveness of driven load.

#### Speed in revolutions per minute

- At which normal power is transmitted.
- At which maximum power is transmitted.
- Maximum speed.

#### Dimensions of shafts to be connected

- Actual diameter.
- Length of shaft extension.
- Full keyway particulars.

### Selection

When the input drive is not steady (i.e. not from an electric motor), and/or the driven load is impulsive, the actual power is multiplied by a Service Factor from the Table 2 (page 13).

### Selection Procedure

- Nominal power in kW to be transmitted =  $K$ .
- Select appropriate load classification from Table 1, denoted as either S, M or H.
- From Table 2, establish Service Factor(s) to be applied, taking into account hours of operation/day and prime mover =  $fD$ .
- From Table 3 select factor for the required frequency of starts/hr =  $fS$ .
- Selection Power  $K_s = K \times fD \times fS$
- Equivalent power at 100 RPM =  $\frac{K_s \times 100}{\text{RPM}}$
- Check that coupling selected will accept the required shaft diameters. Should shaft diameter exceed maximum permissible, then re-select using next larger size of coupling.

## Load Classification by Application

Table 1

<b>Agitators</b>		<b>Dry dock cranes</b>		Planer feed chains	M	Presses	M
Pure liquids	S	Main hoist	(2)	Planer floor chains	M	Pulp machine reel	M
Liquids and solids	M	Auxiliary hoist	(2)	Planer tilting hoist	M	Stock chest	M
Liquids - variable density	M	Boom, luffing	(2)	Re-saw merry-go-round conveyor	M	Suction roll	M
<b>Blowers</b>		Rotating, swing or slew	(3)	Roll cases	H	Washers and thickeners	M
Centrifugal	S	Tracking, drive wheels	(4)	Slab conveyor	H	Winders	M
Lobe	M	<b>Elevators</b>		Small waste conveyor-belt	S	<b>Printing presses</b>	*
Vane	S	Bucket - uniform load	S	Small waste conveyor-chain	M	<b>Pullers</b>	
<b>Brewing and distilling</b>		Bucket - heavy load	M	Sorting table	M	Barge haul	H
Bottling machinery	S	Bucket - continuous	S	Tipple hoist conveyor	M	<b>Pumps</b>	
Brew kettles - continuous duty	S	Centrifugal discharge	S	Tipple hoist drive	M	Centrifugal	S
Cookers - continuous duty	S	Escalators	S	Transfer conveyors	M	Proportioning	M
Mash tubs - continuous duty	S	Freight	M	Transfer rolls	M	Reciprocating	
Scale hopper - frequent starts	M	Gravity discharge	S	Tray drive	M	single acting: 3 or more cylinders	M
<b>Can filling machines</b>	S	Man lifts	*	Trimmer feed	M	double acting: 2 or more cylinders	M
Cane knives (1)	M	Passenger	*	Waste conveyor	M	single acting: 1 or 2 cylinders	*
<b>Car dumpers</b>	H	<b>Extruders (plastic)</b>		<b>Machine tools</b>		double acting: single cylinder	*
<b>Car pullers</b>	M	Film	S	Bending roll	M	Rotary - gear type	S
<b>Clarifiers</b>	S	Sheet	S	Punch press - gear driven	H	Rotary - lobe, vane	S
<b>Classifiers</b>	M	Coating	S	Notching press - belt drive	*	<b>Rubber and plastics industries</b>	
<b>Clay working machinery</b>		Rods	S	Plate planners	H	Crackers (1)	H
Brick press	H	Tubing	S	Tapping machine	H	Laboratory equipment	M
Briquette machine	H	Blow moulders	M	Other machine tools		Mixed mills (1)	H
Clay working machinery	M	Pre-plasticiers	M	Main drives	M	Refiners (1)	M
Pug mill	M	<b>Fans</b>		Auxiliary drives	S	Rubber calenders (1)	M
<b>Compressors</b>		Centrifugal	S	<b>Metal mills</b>		Rubber mill, 2 on line (1)	M
Centrifugal	S	Cooling towers		Drawn bench carriage and main drive	M	Rubber mill, 3 on line (1)	S
Lobe	M	Induced draft	*	Pinch, dryer and scrubber rolls, reversing	*	Sheeter (1)	M
Reciprocating - multi-cylinder	M	Forced draft	*	Slitters	M	Tyre building machines	*
Reciprocating - single cylinder	H	Induced draft	M	Table conveyors nonreversing group drives	M	Tyre and tube press openers	*
<b>Conveyors - uniformly loaded or fed</b>		Large, mine etc.	M	Individual drives	H	Tubers and strainers (1)	M
Apron	S	Large, industrial	M	Reversing	*	Warming mills (1)	M
Assembly	S	Light, small diameter	S	Wire drawing and flattening machine	M	<b>Sand muller</b>	M
Belt	S	<b>Feeders</b>		Wire winding machine	M	<b>Screens</b>	
Bucket	S	Apron	M	<b>Mills, rotary type</b>		Air washing	S
Chain	S	Belt	M	Ball (1)	M	Rotary, stone or gravel	M
Flight	S	Disc	S	Cement kilns (1)	M	Travelling water intake	S
Oven	S	Reciprocating	H	Dryers and coolers (1)	M	<b>Sewage disposal equipment</b>	
Screw	S	Screw	M	Kilns other than cement	M	Bar screens	S
<b>Conveyors - heavy duty not uniformly fed</b>		<b>Food industry</b>		Pebble (1)	M	Chemical feeders	S
Apron	M	Beef slicer	M	Rod, plain & wedge bar (1)	M	Collectors	S
Assembly	M	Cereal cooker	S	Tumbling barrels	H	Dewatering screws	M
Belt	M	Dough mixer	M	<b>Mixers</b>		Scum breakers	M
Bucket	M	Meat grinder	M	Concrete mixers continuous	M	Slow or rapid mixers	M
Chain	M	<b>Generators - not welding</b>	S	Concrete mixers intermittent	M	Thickeners	M
Flight	M	<b>Hammer mills</b>	H	Constant density	S	Vacuum filters	M
Live roll	*	<b>Hoists</b>		Variable density	M	<b>Slab pushers</b>	M
Oven	M	Heavy duty	H	<b>Oil industry</b>		<b>Steering gear</b>	*
Reciprocating	H	Medium duty	M	Chillers	M	<b>Stokers</b>	S
Screw	M	Skip hoist	M	Oil well pumping	*	<b>Sugar industry</b>	
Shaker	H	<b>Laundry</b>		Paraffin filter press	M	Cane knives (1)	M
<b>Crane Drives - not dry dock</b>		Washers - reversing	M	Rotary kilns	M	Crushers (1)	M
Main hoists	S	Tumblers	M	<b>Paper mills</b>		Mills (1)	M
Bridge travel	*	<b>Line shafts</b>		Agitators (mixers)	M	<b>Textile industry</b>	
Trolley travel	*	Driving processing equipment	M	Barker - auxiliaries hydraulic	M	Batchers	M
<b>Crushers</b>		Light	S	Barker - mechanical	H	Calenders	M
Ore	H	Other line shafts	S	Barking drum	H	Cards	M
Stone	H	<b>Lumber industry</b>		Beater and pulper	M	Dry cans	M
Sugar (1)	M	Barkers, hydraulic, mechanical	M	Bleacher	S	Dryers	M
<b>Dredges</b>		Burner conveyor	M	Calenders	M	Dyeing machinery	M
Cable reels	M	Chain saw and drag saw	H	Calenders - super	H	Looms	M
Conveyors	M	Chain transfer	H	Converting machine except cutters, platers	M	Mangles	M
Cutter head drives	H	Craneway transfer	H	Conveyors	S	Nappers	M
Jig drives	H	De-barking drum	H	Couch	M	Pads	M
Manoeuvring winches	M	Edger feed	M	Cutters, platers	H	Range drives	*
Pumps	M	Gang feed	M	Cylinders	M	Slashers	M
Screen drive	H	Green chain	M	Dryers	M	Soapers	M
Stackers	M	Live rolls	H	Fell stretchers	M	Spinners	M
Utility winches	M	Log deck	H	Fell whipper	H	Tenter frames	M
		Log haul - incline	H	Jordans	M	Washers	M
		Log haul - well type	H	Log haul	H	Winders	M
		Log turning device	H			Windlass	*
		Main log conveyor	H				
		Off bearing rolls	M				

## Key

S = Steady  
M = Medium Impulsive  
H = Highly Impulsive  
\* = Refer to Renold

(1) = Select on 24 hours per day service factor only.  
(2) = Use service factor of 1.00 for any duration of service.  
(3) = Use service factor of 1.25 for any duration of service.  
(4) = Use service factor of 1.50 for any duration of service.

## Note

Machinery characteristics and service factors listed in this catalogue are a guide only. Some applications (e.g. constant power) may require special considerations. Please consult Renold.

## Service Factors and Selection

Table 2 Service Factor ( $f_D$ )

Prime mover (Drive input)	Driven machinery characteristics			
	Duration service hours/day	Steady load	Medium impulsive	Highly impulsive
Electric, air & hydraulic Motors or steam turbine (Steady input)	Intermittent - 3hrs/day max	0.90	1.00	1.50
	3 - 10	1.00	1.25	1.75
	over 10	1.25	1.50	2.00
Multi-cylinder I.C. engine (Medium impulsive input)	Intermittent - 3hrs/day max	1.00	1.25	1.75
	3 - 10	1.25	1.50	2.00
	over 10	1.50	1.75	2.25
Single-cylinder I.C. engine (Highly impulsive input)	Intermittent - 3hrs/day max	1.25	1.50	2.00
	3 - 10	1.50	1.75	2.25
	over 10	1.75	2.00	2.50

Table 3 Factor for Starts/Hour( $f_S$ )

No of starts per hour	0-1	1-30	30-60	60-
Factor	1,0	1,2	1,3	1,5

### Example of Selection

Coupling is required to transmit 7.5kW at 1440 RPM to connect an electric motor to a gear box driving a chain conveyor running for 18 hours/day and starting 15 times/hour. Shaft diameters /55mm respectively.

$$K = 7.5\text{kW}$$

From Table 1 Load Classification = M (medium impulsive)

From Table 2 Service Factor  $f_D = 1.5$

From Table 3  $f_S = 1.2$

Therefore selection kW is:-

$$\begin{aligned} K_s &= K \times f_D \times f_S \\ &= 7.5 \times 1.5 \times 1.2 \\ &= 13.5 \text{ kW} \end{aligned}$$

$$\begin{aligned} \text{Equivalent power at 100 RPM} &= \frac{K_s \times 100}{\text{RPM}} \\ &= \frac{13.5 \times 100}{1440} \\ &= 0.9375\text{kW @ 100RPM} \end{aligned}$$

From page 17 selection is RSC110 (644911)  
(maximum bore 55 mm).

### Key Stress

1. Permissible key stress = 70N/mm<sup>2</sup>
2. Nominal torque  $T_{KM} = K \times 9550 / \text{RPM Nm}$
3. Force at key  $F = T_{KM} / r$
4. Shaft Rad r. metres
5. Key area  $A = J \times \text{HUB length mm}$   
(Obtain from relevant catalogue page).
6. Key stress  $f_k = F/A \text{ N/mm}^2$
7. If resultant stress is less than 70 N/mm<sup>2</sup> key stress is acceptable.  
If resultant  $f_k$  is greater than 70, consider either two keyways or extending hub length.
8. Example:

$$T_{KM} = 7.5 \times 9550 / 1440 = 49.7\text{Nm}$$

$$r = 55/2 = 27.5\text{mm} \div 1000 = 0.0275\text{m}$$

$$F = 49.7 / 0.0275 = 1741\text{N}$$

$$A = 16 \times 45 = 720\text{mm}^2$$

$$f_k = 1741 / 720 = 2.4\text{M/mm}^2$$

Selection is therefore good.

For operation above 80% of the declared maximum coupling speed it is recommended that the coupling is dynamically balanced.



WARNING

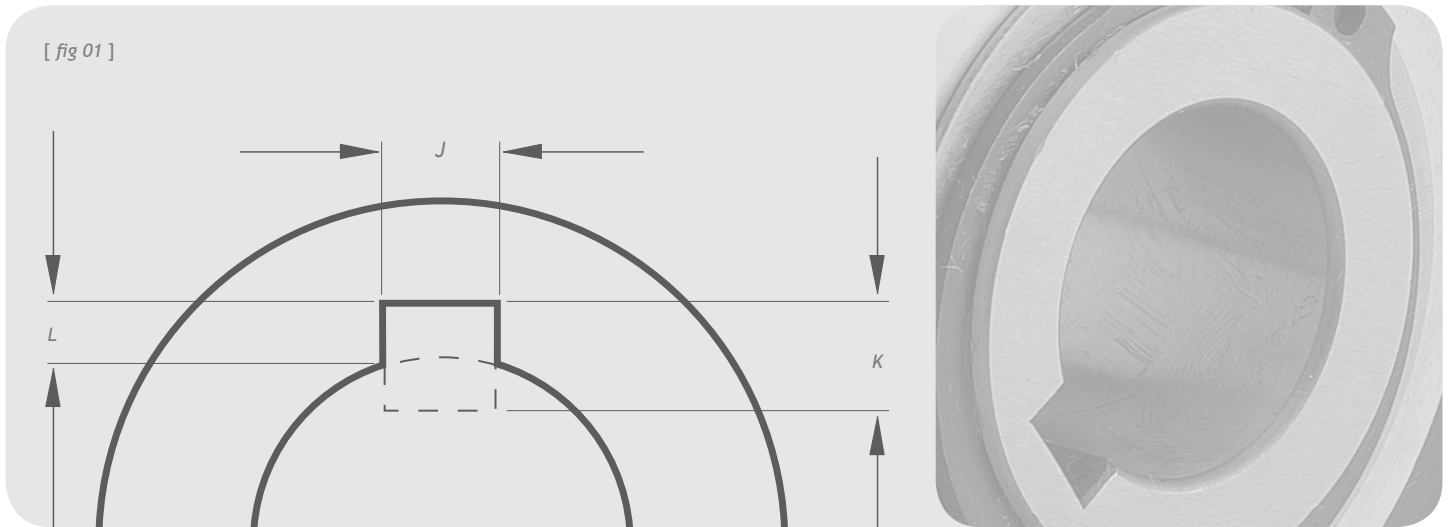
*It is the responsibility of the system designer to ensure that the application of the coupling does not endanger the other constituent components in the system. Service factors given are an initial selection guide.*



WARNING

*Rotating equipment must be provided with a suitable guard before operating or injury may result.*

## Key and Keyway Dimensions



## Metric (mm)

Keyways comply with BS4235: Part 1: 1972

Shaft dia.		Key & keyway		
Over	Incl.	J	K	L
6	8	2	2	1.0
8	10	3	3	1.4
10	12	4	4	1.8
12	17	5	5	2.3
17	22	6	6	2.8
22	30	8	7	3.3
30	38	10	8	3.3
38	44	12	8	3.3
44	50	14	9	3.8
50	58	16	10	4.3
58	65	18	11	4.4
65	75	20	12	4.9
75	85	22	14	5.4
85	95	25	14	5.4
95	110	28	16	6.4
110	130	32	18	7.4
130	150	36	20	8.4
150	170	40	22	9.4
170	200	45	25	10.4
200	230	50	28	11.4

## Imperial (inches)

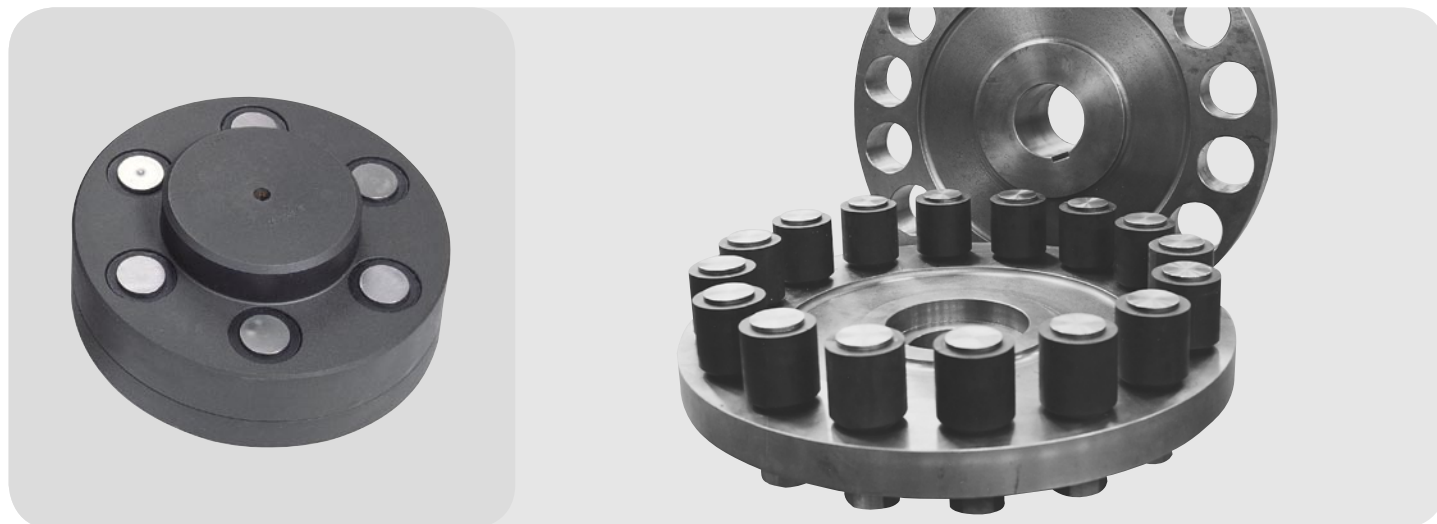
Keyways comply with BS46: Part 1: 1958

Shaft dia.		Key & keyway		
Over	Incl.	J	K	L
0.25	0.05	0.125	0.125	0.060
0.50	0.75	0.187	0.187	0.088
0.75	1.00	0.250	0.250	0.115
1.00	1.25	0.312	0.250	0.090
1.25	1.50	0.375	0.250	0.085
1.50	1.75	0.437	0.312	0.112
1.75	2.00	0.500	0.312	0.108
2.00	2.50	0.625	0.437	0.162
2.50	3.00	0.750	0.500	0.185
3.00	3.50	0.875	0.625	0.245
3.50	4.00	1.000	0.750	0.293
4.00	5.00	1.250	0.875	0.340
5.00	6.00	1.500	1.000	0.384

## Keyway dimensions [ fig 01 ]

Parallel keyways are supplied unless customer states otherwise.

## Crownpin



**An established pin/buffer coupling, offering extended power capacity where the demand for long life and simplicity of construction make it suitable for working in arduous conditions.**

### Coupling capacity

- Maximum power @ 100RPM: 2611kW
- Maximum torque: 249,400Nm

### Features and benefits

- Heavy duty coupling suitable for shock load conditions.
- Neoprene rubber buffers for robust flexibility.
- Torsionally flexible - shock absorbing, extending machine life.
- Maintenance free - minimum number of wearing parts.
- Misalignment capabilities allowing flexibility installation.

### Standard range comprises

- Shaft to Shaft
- Shear Pin
- Brake Drum

### Construction details

Cast Iron Half Bodies  
Neoprene Buffers:  
Temp range - 30° to + 95°c

### Applications

- Conveyors
- Cranes
- Fans
- Leisure Rides
- Lifts
- Pumps
- Screens
- Washers
- General Industrial Applications



**Ordering code**

CP 77 # # 8

Crownpin ————

Size ————

Pin half type ————

B - Plain bore  
F - Taper bush

No of pins ————

Buffer half type ————

B - Plain bore  
F - Taper bush

Max angular misalignment 0.15°  
Max offset misalignment: -  
CP36 to CP135 - 0.13mm  
CP150 to CP480 - 0.18mm

Renold continue to supply the following components as spares and replacement parts but recommend Pinflex for new applications.

Catalogue number	Product number	Power/100rpm kW	Torque nominal Nm	Speed max rpm	Type B		Bush size	Type F		Dimensions								No of Pins	Spare Parts Code
					Bore A			Bore		B mm	C1 mm	C2 mm	D mm	E mm	F mm	G mm	Mass kg		
					Max	Min		Max	Min										
CP36BB3	7032303	0.37	35	6210	20	0	N/A	-	-	37	32	-	94	15	2.4	23	1.9	3	A
CP48BB4	7032105	0.74	71	4760	35	0	N/A	-	-	62	38	-	122	15	2.4	23	3.7	4	A
CP48BB8	7032305	1.48	142	4760	35	0	N/A	-	-	62	38	-	122	15	2.4	23	3.7	8	A
CP57# #4	7032106	1.85	177	3980	45	0	TB1215	32	11	73	45	38	146	19	2.4	29	6.6	4	B
CP57# #8	7032306	3.7	354	3980	45	0	TB1215	32	11	73	45	38	146	19	2.4	29	6.6	8	B
CP65# #8	7032307	5.21	497	3520	50	0	TB1615	42	14	83	51	38	165	22	3.2	35	10	8	C
CP77# #8	7032308	7.45	711	2950	65	0	TB2017	50	18	103	60	45	197	22	3.2	35	15	8	D
CP91# #4	7032309	10.44	997	2510	75	38	TB2525	60	19	121	70	64	232	29	4.8	46	30	4	E
CP91# #8	7032309	20.9	1995	2510	75	38	TB2525	60	19	121	70	64	232	29	4.8	46	30	8	E
CP106# #10	7032310	32.8	3134	2510	90	38	TB3030	75	35	156	83	76	270	29	4.8	46	45	10	E
CP120# #8	7032312	41.8	3990	1900	95	45	TB3535	90	35	165	95	89	305	33	6.4	54	63	8	F
CP135# #10	7032313	62.7	5984	1690	115	50	TB4040	100	40	203	108	102	343	33	6.4	54	90	10	F
CP150BB10	7032315	97	9262	1520	120	60	N/A	-	-	222	121	-	381	40	6.4	65	130	10	G
CP165BB10	7032316	112	10690	1380	140	65	N/A	-	-	254	133	-	419	40	6.4	65	168	10	G
CP180BB10	7032318	164	15660	1270	145	70	N/A	-	-	267	146	-	457	48	7.9	71	218	10	H
CP210BB12	7032321	246	23490	1090	150	70	N/A	-	-	279	172	-	533	48	7.9	71	295	12	H

The following Crownpin components are recommended for high torque applications as they exceed the Pinflex range.

Catalogue number	Product number	Power/100rpm kW	Torque nominal Nm	Speed max rpm	Type B		Bush size	Type F		Dimensions								No of Pins	Spare Parts Code
					Bore A			Bore		B mm	C1 mm	C2 mm	D mm	E mm	F mm	G mm	Mass kg		
					Max	Min		Max	Min										
CP240BB12	7032324	373	35620	950	180	85	N/A	-	-	330	197	-	609	56	8.7	83	450	12	K
CP270BB14	7032327	496	46990	840	200	85	N/A	-	-	368	216	-	686	56	8.7	83	587	14	K
CP300BB14	7032330	746	71240	760	230	95	N/A	-	-	406	229	-	762	67	9.5	102	825	14	L
CP360BB18	7032336	1194	114000	630	250	95	N/A	-	-	470	254	-	914	67	9.5	102	1160	18	L
CP420BB16	7032342	1716	163900	540	280	110	N/A	-	-	482	279	-	1067	83	12.7	127	1700	16	M
CP480BB20	7032348	2611	249400	470	300	110	N/A	-	-	533	305	-	1220	83	12.7	127	2250	20	M

Other pin configurations are available - please consult Renold.

## Crownpin



### Component Spares

Coupling number	Product number	Pin half body		Buffer half body		Pin & nut	Neoprene buffer
		Pilot bored	Taper bored	Pilot bored	Taper bored		
CP36BB3	7032303	7032303/1	N/A	7032303/2	N/A	7030003/60	7030003/3
CP48BB4	7032105	7032105/1	N/A	7032105/2	N/A	7030003/60	7030003/3
CP48BB8	7032305	7032305/1	N/A	7032305/2	N/A	7030003/60	7030003/3
CP57##4	7032106	7032106/1	7032106/177	7032106/2	7032106/277	7030006/60	7030006/3
CP57##8	7032306	7032306/1	7032306/177	7032306/2	7032306/277	7030006/60	7030006/3
CP65##8	7032307	7032307/1	7032307/177	7032307/2	7032307/277	7030007/60	7030007/3
CP77##8	7032308	7032308/1	7032308/177	7032308/2	7032308/277	7030008/60	7030008/3
CP91##4	7032109	7032109/1	7032109/177	7032109/2	7032109/277	7030009/60	7030009/3
CP91##8	7032309	7032309/1	7032309/177	7032309/2	7032309/277	7030009/60	7030009/3
CP106##10	7032310	7032310/1	7032310/177	7032310/2	7032310/277	7030009/60	7030009/3
CP120##8	7032312	7032312/1	7032312/177	7032312/2	7032312/277	7030012/60	7030012/3
CP135##10	7032313	7032313/1	7032313/177	7032313/2	7032313/277	7030012/60	7030012/3
CP150BB10	7032315	7032315/1	N/A	7032315/2	N/A	7030015/60	7030015/3
CP165BB10	7032316	7032316/1	N/A	7032316/2	N/A	7030015/60	7030015/3
CP180BB10	7032318	7032318/1	N/A	7032318/2	N/A	7030018/60	7030018/3
CP210BB12	7032321	7032321/1	N/A	7032321/2	N/A	7030018/60	7030018/3
CP240BB12	7032324	7032324/1	N/A	7032324/2	N/A	7030024/60	7030024/3
CP270BB14	7032327	7032327/1	N/A	7032327/2	N/A	7030024/60	7030024/3
CP300BB14	7032330	7032330/1	N/A	7032330/2	N/A	7030030/60	7030030/3
CP360BB18	7032336	7032336/1	N/A	7032336/2	N/A	7030030/60	7030030/3
CP420BB16	7032342	7032342/1	N/A	7032342/2	N/A	7030042/60	7030042/3
CP480BB20	7032348	7032348/1	N/A	7032348/2	N/A	7030042/60	7030042/3