Hi-Tec Couplings
General Catalog

RENOLD
Superior Coupling Technology

www.renold.com

RENOLD Hi-Tec Couplings

Renold Hi-Tec Couplings has been a world leader in the design and manufacture of flexible couplings for over 40 years.

- Measurement of torsional stiffness up to 162,300 ft.lb
- Full scale radial and axial stiffness measurement
- Misalignment testing of couplings up to 69 inches in diameter
- Noise attenuation testing
- Latest CAD technology
- Torsional vibration analysis

- World class manufacturing
- Total quality system
- Latest machining and tooling technology
- Static and dynamic balance capability
- Integrated cellular manufacturing
- Synchronized work flow

Contents

Product Range

The product range comprises of rubber in compression couplings, developed over 40 years for the complete range of diesel and industrial applications. In particular, our design capability and innovation is recognized in customizing couplings to meet customers specific requirements

RENOLD Hi -Tec Couplings deliver the durability, reliability and long life that customers demand.

RENOLD Hi-Tec Couplings is "the complete solution".

DCB Range

The unrivalled quality and endurance capability designed into every DCB coupling make it ideally suited for marine propulsion, power generation and reciprocating compressor applications where long life, fail safe operation and control of resonant torsional vibrations are essential. Maximum torque range 4,000,000 ft.lb.

Applications

- Marine Propulsion
- Reciprocating Compressors
- High Power Generator Sets
- Rail Traction

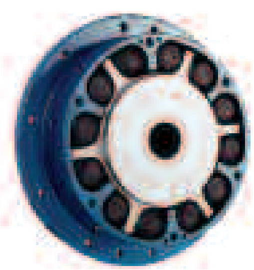
HTB Range

The HTB Coupling is a high temperature blind assembly coupling designed for mounting inside bell housings

Applications

- Marine Propulsion
- Compressors
- Generator and Pump Sets
- Rail Traction

RB Range

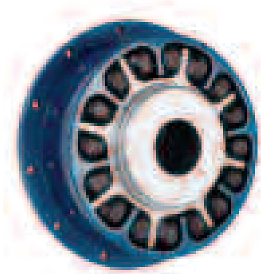


General purpose, cost effective range available in either shaft to shaft or flywheel to shaft configurations with a maximum torque of 30,240 ft.lb.

Applications

- Generator and Pump Sets
- Metal Manufacture
- Pulp and Paper Industry
- Compressors
- Bulk Handling
- General Industrial Applications

PM Range

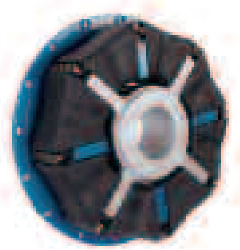


This range of couplings is specially designed for heavy industrial applications providing exceptional protection against severe shock loads and vibration. Maximum torque 4,350,000 ft.lb.

Applications

- Metal Manufacture
- Pumps, Fans and Compressors
- Power Generation
- General Heavy Duty Industrial Applications
- Mining
- Cranes and Hoists
- Pulp and Paper Industry

MSC Range



This innovative coupling has been designed to satisfy a vast spectrum of diesel drive and compressor applications providing low linear stiffness and control of resonant torsional vibration with intrinsically fail safe operation. Maximum torque 272,000 ft.lb.

Applications

- Marine Propulsion
- Compressors
- High Power Generator Sets

DCB Range

RENOLD

Hi-Tec Couplings

The Complete Solution

DCB Flexible Coupling

Fail safe coupling for use on reciprocating machinery up to 4,000,000 ft.lb.

The Standard Coupling Arrangements

- Flywheel to shaft
- Flywheel to flange
- Flywheel to U-joint
- Shaft to shaft

Applications

- Marine propulsion
- High power generator sets
- Reciprocating compressors
- Mining

Features

- Intrinsically fail safe
- Control of resonant torsional vibration
- Severe shock load protection
- Maintenance free
- Misalignment capability
- Noise attenuation
- Selection of Rubber

Benefits

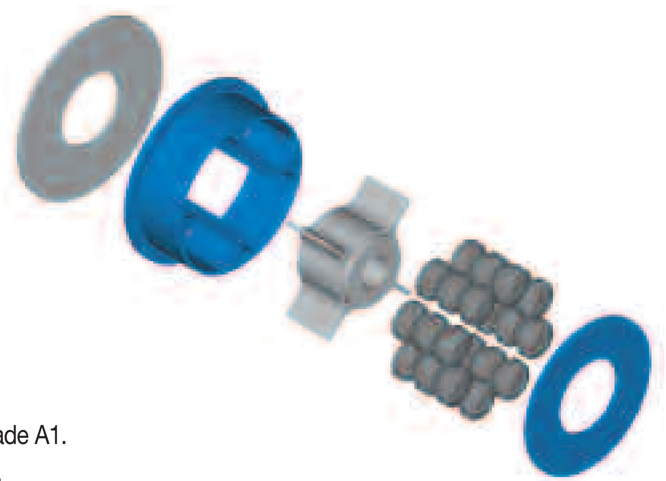
- Ensuring continuous operation of the driveline in the unlikely event of rubber damage.
- Achieving low vibratory loads in the driveline components by selection of optimum stiffness characteristics.
- Avoiding failure of the driveline under short circuit and other transient conditions.
- With no lubrication or adjustment required resulting in low running costs.
- Allows axial and radial misalignment between the driving and driven machines.
- Giving quiet running conditions in sensitive applications by the elimination of metal to metal contact.
- Variety of rubber materials and hardness are available for optimum reduction of drive vibration and maximum block life.

Construction Details

8 | 3 | 5.5

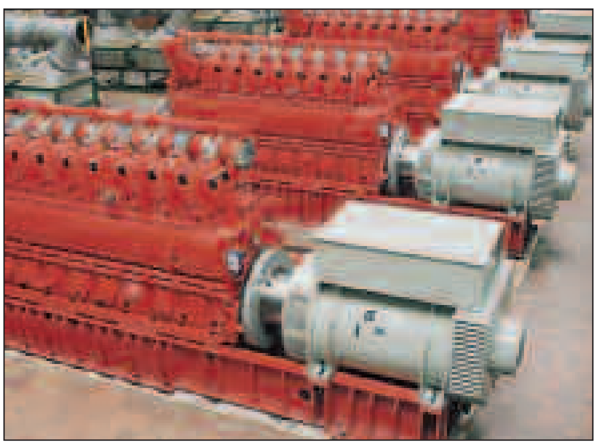
- 5.5 ← Each rubber element would be 5.5 inch diameter.
- 3 ← Each cavity would house three rubber elements.
- 8 ← Eight rubber element cavities radially spaced around coupling diameter referred to as "Series 8" coupling.

- Available options are: Series 6, Series 8, Series 10, Series16.
- 2, 3, 4 or 5 rubber elements per cavity are available.
  Rubber elements up to 15" diameter are manufactured.
- The inner and outer members are manufactured in steel to BS3100 Grade A1.
- Some sizes are available in SG Iron Castings to BS2789 Grade 420/12.



DCB Typical Applications

Main propulsion. DCB819.5 and 1652.5's couplings fitted between main engine and gearbox, gearbox and thrust block, and between thrust block and propulsion unit.



Bio-gas generator sets. DCB845.5's couplings fitted between gas engines and alternators.

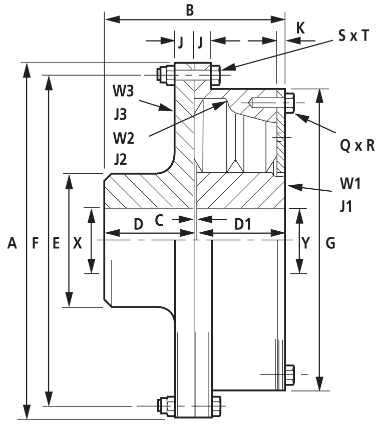
Natural gas powered wartsila generator sets.

Rail traction. Coupling fitted between diesel engine and transmission via a universal joint shaft.

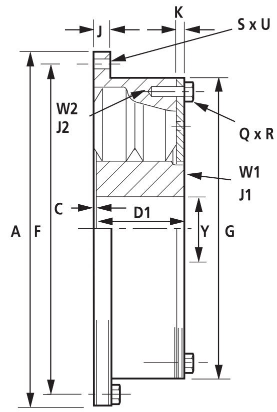
Diesel generator sets. Couplings fitted between diesel engines and alternators, to provide electrical supply for ice breaker.

DCB Series 6

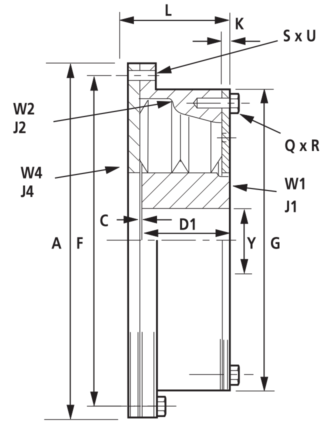
Full Coupling



Flex Half



Flex Half & Keep Plate



Dimensions, Weight, Inertia and Alignment

COUPLING SIZE		622.5	632.5	623.5	633.5	624.5	625.5	626.5	628.0	638.0
DIMENSIONS (inch)	A	11.02	11.02	14.57	14.57	17.91	22.24	26.57	31.89	31.89
	B	5.55	8.07	7.64	11.10	9.72	12.05	14.29	17.48	25.51
	C	0.12	0.12	0.16	0.16	0.20	0.24	0.28	0.31	0.31
	D	2.72	3.98	3.74	5.47	4.76	5.91	7.01	8.58	12.60
	D1	2.72	3.98	3.74	5.47	4.76	5.91	7.01	8.58	12.60
	E	3.23	3.23	4.41	4.41	5.59	7.09	8.46	10.24	10.24
	F	10.04	10.04	13.58	13.58	16.93	20.87	24.80	30.12	30.12
	G	8.86	8.86	12.40	12.40	15.75	19.29	22.83	28.15	28.15
	J	0.55	0.55	0.55	0.55	0.55	0.71	0.98	0.98	0.98
	K	0.33	0.33	0.39	0.39	0.45	0.63	0.79	0.91	0.91
	L	3.19	4.45	4.29	6.02	5.43	6.77	8.07	9.80	13.82
	Q (QTY)	6	6	6	6	6	6	6	6	6
	R	M10	M10	M10	M10	M10	M16	M20	M20	M20
	S (QTY)	8	12	12	18	16	8	8	12	18
	T	M10	M10	M10	M10	M10	M16	M20	M20	M20
	U	0.41	0.41	0.41	0.41	0.41	0.67	0.83	0.83	0.83
	MAX. X	1.97	1.97	2.76	2.76	3.54	4.33	5.12	6.50	6.50
	MAX. Y	1.97	1.97	2.76	2.76	3.54	4.33	5.12	6.50	6.50
MAXIMUM SPEED (rpm)(1)		4150	4150	3150	3150	2570	2080	1730	1440	1440
WEIGHT (3) (lb)	W1	7.3	11.0	19.6	29.5	40.6	74.1	127.2	228.8	343.3
	W2	22.5	32.0	52.7	74.7	96.8	187.4	322.1	575.8	817.0
	W3	21.8	24.7	33.3	42.8	55.3	113.8	216.3	320.3	367.5
	W4	8.8	8.8	16.8	16.8	30.2	62.4	111.1	183.4	183.4
INERTIA (3) ($lb.in^2$)	J1	30	45	164	246	569	1550	3752	10347	15520
	J2	364	518	1557	2209	4486	13159	31946	84232	119497
	J3	263	287	556	823	1674	5159	14522	30139	31095
	J4	143	143	481	481	1329	4237	10798	25662	25662
ALLOWABLE MISALIGNMENT (2)										
RADIAL (inch)		0.06	0.06	0.08	0.08	0.10	0.12	0.14	0.16	0.16
AXIAL (inch)		0.06	0.06	0.08	0.08	0.10	0.12	0.14	0.16	0.16
CONICAL (degree)		0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

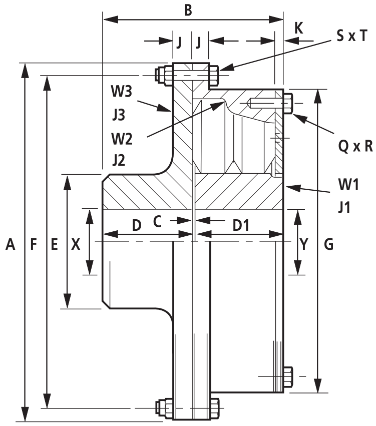
(1) For operation above 80% of the declared maximum coupling speed, it is recommended that the coupling is dynamically balanced.

(2) Installations should be initially aligned as accurately as possible. In order to allow for deterioration in alignment over time, it is recommended that initial alignment should not exceed 25% of the above noted data. The forces on the driving and driven machinery should be calculated to ensure that these do not exceed the manufacturers allowables.

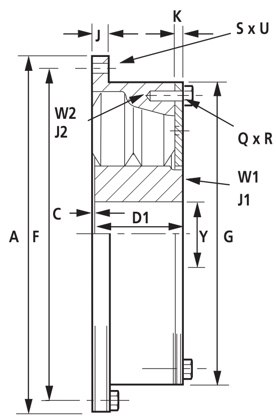
(3) Weights and inertias are based on the maximum bore size.

DCB Series 6

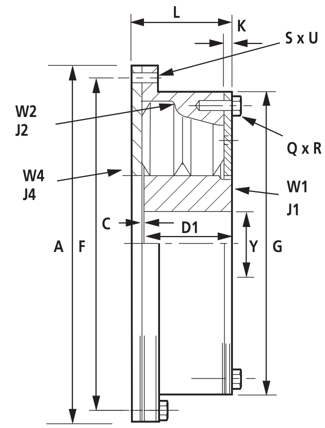
Full Coupling



Flex Half



Flex Half & Keep Plate



Dimensions, Weight, Inertia and Alignment

COUPLING SIZE		629.5	639.5	6211.0	6311.0	6213.0	6313.0	6215.0	6315.0
DIMENSIONS (inch)	A	39.17	39.17	44.69	44.69	53.74	53.74	61.42	61.42
	B	20.87	30.39	24.25	29.76	28.58	35.08	33.07	40.55
	C	0.39	0.39	0.47	0.47	0.63	0.63	0.79	0.79
	D	10.24	15.00	11.89	17.40	13.98	20.47	16.14	23.62
	D1	10.24	15.00	11.89	17.40	13.98	20.47	16.14	23.62
	E	12.20	12.20	14.37	14.37	16.77	16.77	19.49	19.49
	F	36.61	36.61	42.13	42.13	50.00	50.00	57.68	57.68
	G	33.46	33.46	38.98	38.98	45.87	45.87	53.46	53.46
	J	1.38	1.38	1.38	1.38	2.17	2.17	2.17	2.17
	K	1.12	1.12	1.34	1.34	1.61	1.61	1.93	1.93
	L	11.77	16.54	13.98	19.49	16.22	22.72	18.86	26.34
	Q (QTY)	6	6	6	6	6	6	6	6
	R	M30	M30	M30	M30	M42	M42	M42	M42
	S (QTY)	8	12	12	18	8	12	12	18
	T	M30	M30	M30	M30	M42	M42	M42	M42
	U	1.22	1.22	1.22	1.22	1.69	1.69	1.69	1.69
	MAX. X	7.68	7.68	9.06	9.06	10.55	10.55	12.20	12.20
	MAX. Y	7.68	7.68	9.06	9.06	10.55	10.55	12.20	12.20
MAXIMUM SPEED (rpm)(1)		1180	1180	1030	1030	860	860	750	750
WEIGHT (3) (lb)	W1	390	585	609	914	978	1490	1553	2390
	W2	1023	1452	1485	2106	2691	3892	4266	5642
	W3	634	714	889	1033	1797	2028	2502	2851
	W4	351	351	644	644	935	935	1455	1455
INERTIA (3) ($lb.in^2$)	J1	24.9	37.3	52.6	79.9	116.0	179.0	248.8	388.5
	J2	215.7	306.2	444.2	594.6	1086.7	1568.5	2272.4	3010.5
	J3	94.7	96.7	163.0	172.6	546.7	570.7	902.1	926.0
	J4	73.8	73.8	176.7	176.7	369.1	369.1	751.8	751.8
ALLOWABLE MISALIGNMENT (2)									
RADIAL (inch)		0.20	0.20	0.24	0.24	0.31	0.31	0.39	0.39
AXIAL (inch)		0.20	0.20	0.24	0.24	0.31	0.31	0.39	0.39
CONICAL (degree)		0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

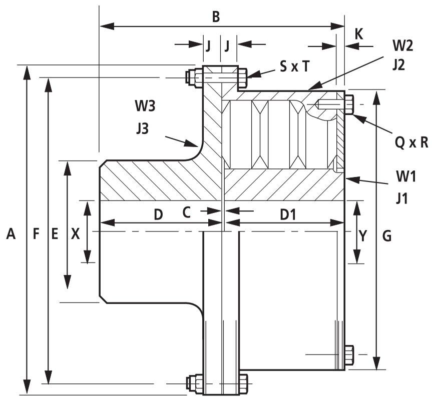
(1) For operation above 80% of the declared maximum coupling speed, it is recommended that the coupling is dynamically balanced.

(2) Installations should be initially aligned as accurately as possible. In order to allow for deterioration in alignment over time, it is recommended that initial alignment should not exceed 25% of the above noted data. The forces on the driving and driven machinery should be calculated to ensure that these do not exceed the manufacturers allowables.

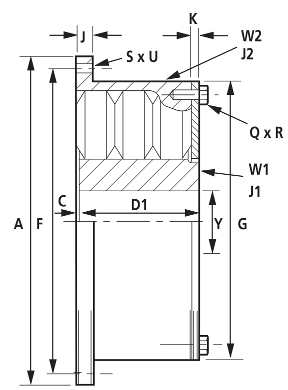
(3) Weights and inertias are based on the maximum bore size.

DCB Series 8

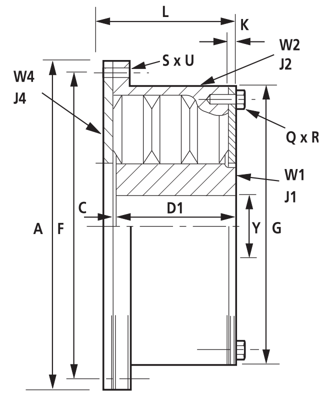
Full Coupling



Flex Half



Flex Half & Keep Plate



Dimensions, Weight, Inertia and Alignment

COUPLING SIZE		822.5	823.5	823.5 SAE14	833.5	833.5 SAE14	824.5	824.5 SAE18	834.5	834.5 SAE18	844.5	844.5 SAE18
DIMENSIONS (inch)	A	12.80	16.73	18.37	16.73	18.37	21.65	22.50	21.65	22.50	21.65	22.50
	B	5.47	7.64	-	11.10	-	9.80	-	14.29	-	16.54	-
	C	0.12	0.16	0.16	0.16	0.16	0.20	0.20	0.20	0.20	0.20	0.20
	D	2.68	3.74	-	5.47	-	4.80	-	7.05	-	7.05	-
	D1	2.68	3.74	3.74	5.47	5.47	4.80	4.80	7.05	7.05	9.29	9.29
	E	5.12	6.89	-	6.89	-	8.86	-	8.86	-	8.86	-
	F	11.81	15.75	17.24	15.75	17.24	20.28	21.38	20.28	21.38	20.28	21.38
	G	10.63	14.57	14.57	14.57	14.57	18.70	18.70	18.70	18.70	18.70	18.70
	J	0.55	0.55	0.55	0.55	0.55	0.71	0.71	0.71	0.71	0.71	0.71
	K	0.31	0.39	0.39	0.39	0.39	0.49	0.49	0.49	0.49	0.49	0.49
	L	3.11	4.25	4.25	6.02	6.02	5.51	5.51	7.76	7.76	10.00	10.00
	Q (QTY)	8	8	8	8	8	8	8	8	8	8	8
	R	M10	M10	M10	M10	M10	M16	M16	M16	M16	M16	M16
	S (QTY)	8	12	8	24	8	8	6	16	6	16	6
	T	M10	M10	-	M10	-	M16	-	M16	-	M16	-
	U	0.41	0.41	0.53	0.41	0.53	0.67	0.67	0.67	0.67	0.67	0.67
	MAX. X	3.15	4.25	-	4.25	-	5.51	-	5.51	0.00	5.51	-
	MAX. Y	3.15	4.25	4.25	4.25	4.25	5.51	5.51	5.51	5.51	5.51	5.51
MAXIMUM SPEED (rpm)(1)		3600	2760	2760	2760	2760	2130	2130	2130	2130	2130	2130
WEIGHT (3) (lb)	W1	13.5	35.2	35.2	52.5	52.5	76.3	76.3	114.0	114.0	151.9	151.9
	W2	28.0	66.8	67.2	85.1	89.9	123.9	129.6	170.4	176.1	208.3	214.1
	W3	26.9	53.4	-	64.8	-	113.3	-	137.6	-	137.6	-
	W4	9.7	18.5	22.9	18.5	22.9	44.5	48.7	44.5	48.7	44.5	48.7
INERTIA (3) ($lb.in^2$)	J1	95	464	464	697	697	1681	1681	2525	2525	3379	3379
	J2	666	3277	3632	4127	4479	9544	10063	12089	12609	14666	15185
	J3	420	1370	-	1664	-	4920	-	5228	-	5228	-
	J4	228	748	1100	748	1100	3034	3553	3034	3553	3034	3553
ALLOWABLE MISALIGNMENT (2)												
RADIAL (inch)		0.06	0.08	0.08	0.08	0.08	0.10	0.10	0.10	0.10	0.10	0.10
AXIAL (inch)		0.06	0.08	0.08	0.08	0.08	0.10	0.10	0.10	0.10	0.10	0.10
CONICAL (degree)		0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6

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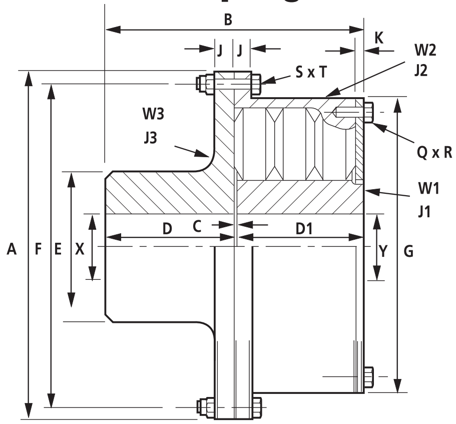
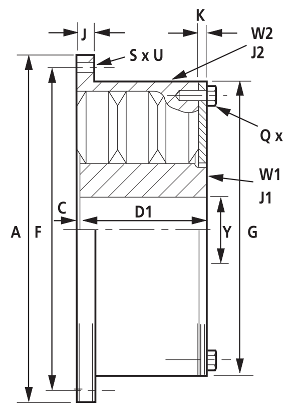
DCB Series 8

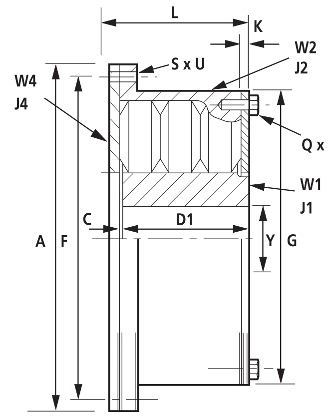
Full Coupling



Flex Half



Flex Half & Keep Plate



Dimensions, Weight, Inertia and Alignment

COUPLING SIZE		825.5	825.5 SAE21	835.5	835.5 SAE21	845.5	845.5 SAE21	855.5	855.5 SAE21	826.5	836.5	846.5
DIMENSIONS (inch)	A	25.98	26.50	25.98	26.50	25.98	26.50	25.98	26.50	30.91	30.91	30.91
	B	11.97	-	17.48	-	20.24	-	22.99	-	14.06	20.59	23.82
	C	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.28	0.28	0.28
	D	5.87	-	8.62	-	8.62	-	8.62	-	6.89	10.16	10.16
	D1	5.87	5.87	8.62	8.62	11.38	11.38	14.13	14.13	6.89	10.16	13.39
	E	10.83	-	10.83	-	10.83	-	10.83	-	12.80	12.80	12.80
	F	24.61	25.25	24.61	25.25	24.61	25.25	24.61	25.25	29.13	29.13	29.13
	G	23.03	23.03	23.03	23.03	23.03	23.03	23.03	23.03	27.17	27.17	27.17
	J	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.98	0.98	0.98
	K	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.69	0.69	0.69
	L	6.73	6.73	9.49	9.49	12.24	12.24	15.00	15.00	7.87	11.14	14.37
	Q (QTY)	8	8	8	8	8	8	8	8	8	8	8
	R	M16	M16	M16	M16	M16	M16	M16	M16	M20	M20	M20
	S (QTY)	12	12	24	12	24	12	24	12	12	24	24
	T	M16	-	M16	-	M16	-	M16	-	M20	M20	M20
	U	0.67	0.67	0.67	0.069	0.69	0.69	0.69	0.69	0.86	0.86	0.86
	MAX. X	6.77	-	6.77	-	6.77	-	6.77	-	8.07	8.07	8.07
	MAX. Y	6.77	6.77	6.77	6.77	6.77	6.77	6.77	6.77	8.07	8.07	8.07
MAXIMUM SPEED (rpm)(1)		1800	1800	1800	1800	1800	1800	1800	1800	1490	1490	1490
WEIGHT (3) (lb)	W1	157.0	157.0	207.5	207	258	258	308	308	354	466	577
	W2	229.9	232.4	303.6	308	377	382	451	455	370	489	606
	W3	180.8	-	224.4	-	224	-	224	-	324	396	396
	W4	78.5	82.2	78.5	82	78	82	78	82	125	125	125
INERTIA (3) ($lb.in^2$)	J1	4640	4640	7029	7029	9386	9386	11744	11744	10716	16207	25785
	J2	23858	24541	31509	32192	39160	39843	46746	47429	53717	70837	87717
	J3	10593	-	11481	-	11481	-	11481	-	28430	30583	30583
	J4	7722	8371	7722	8371	7722	8371	7722	8371	17393	17393	17393
ALLOWABLE MISALIGNMENT (2)												
RADIAL (inch)		0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.14	0.14	0.14
AXIAL (inch)		0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.14	0.14	0.14
CONICAL (degree)		0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6

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

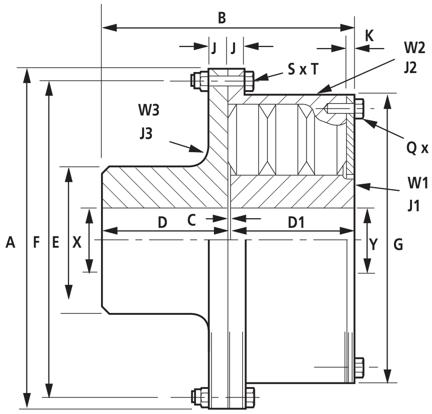
(2) Installations should be initially aligned as accurately as possible. In order to allow for deterioration in alignment over time, it is recommended that initial alignment should not exceed 25% of the above noted data. The forces on the driving and driven machinery should be calculated to ensure that these do not exceed the manufacturers allowables.

(3) Weights and inertias are based on the maximum bore size.

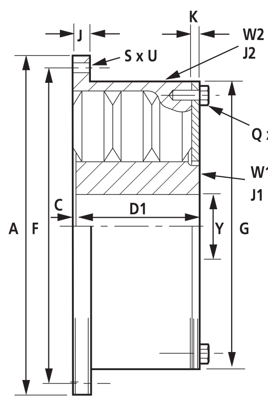
RENOLD Hi-Tec Couplings

DCB Series 8

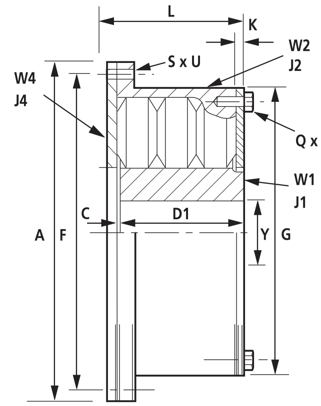
Full Coupling



Flex Half



Flex Half & Keep Plate



Dimensions, Weight, Inertia and Alignment

COUPLING SIZE		827.5	837.5	847.5	857.5	828.0	838.0	848.0	858.0	829.5	839.5	849.5	859.5	8211.0
DIMENSIONS (inch)	A	35.04	35.04	35.04	35.04	37.01	37.01	37.01	37.01	45.67	45.67	45.67	45.67	52.36
	B	16.30	23.86	27.60	31.34	17.32	25.35	29.37	33.39	20.79	30.31	35.08	39.84	24.09
	C	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.39	0.39	0.39	0.39	0.47
	D	7.99	11.77	11.77	11.77	8.50	12.52	12.52	12.52	10.20	14.96	14.96	14.96	11.81
	D1	7.99	11.77	15.51	19.25	8.50	12.52	16.54	20.51	10.20	14.96	19.72	24.49	11.81
	E	14.96	14.96	14.96	14.96	15.55	15.55	15.55	15.55	18.70	18.70	18.70	18.70	22.05
	F	33.27	33.27	33.27	33.27	35.24	35.24	35.24	35.24	43.11	43.11	43.11	43.11	49.80
	G	31.30	31.30	31.30	31.30	33.27	33.27	33.27	33.27	39.96	39.96	39.96	39.96	46.65
	J	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	1.38	1.38	1.38	1.38	1.38
	K	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	1.10	1.10	1.10	1.10	1.30
	L	9.09	12.87	16.61	20.35	9.65	13.66	17.68	21.65	11.69	16.46	21.22	26.22	13.58
	Q (QTY)	8	8	8	8	8	8	8	8	8	8	8	8	8
	R	M20	M20	M20	M20	M20	M20	M20	M20	M30	M30	M30	M30	M30
	S (QTY)	16	32	32	32	16	32	32	32	12	24	24	24	16
	T	M20	M20	M20	M20	M20	M20	M20	M20	M30	M30	M30	M30	M30
	U	0.86	0.86	0.86	0.86	0.86	0.86	0.83	0.83	1.22	1.22	1.22	1.22	1.22
	MAX. X	9.45	9.45	9.45	9.45	9.84	9.84	9.84	9.84	11.81	11.81	11.81	11.81	13.78
	MAX. Y	9.45	9.45	9.45	9.45	9.84	9.84	9.84	9.84	11.81	11.81	11.81	11.81	13.78
MAXIMUM SPEED (rpm)(1)		1315	1315	1315	1315	1240	1240	1240	1240	1010	1010	1010	1010	880
WEIGHT (3) (lb)	W1	345	513	680	848	423	633	843	1,053	735	1,099	1,463	18.47	1,151
	W2	557	740	922	1103	649	866	1,084	1,299	1,224	1,609	1,993	2,377	1,909
	W3	458	571	571	571	520	520	650	650	1,008	1,230	1,230	1,230	1,466
	W4	177	177	177	177	207	207	207	207	423	423	423	423	648
INERTIA (3) (lb.in^2)	J1	21.4	32.0	42.6	53.2	29.5	44.4	59.4	74.4	73.4	110.6	147.8	185.0	156.0
	J2	105.1	140.3	174.8	209.6	137.9	185.0	231.8	278.2	382.7	502.3	621.9	741.5	799.6
	J3	49.5	53.6	53.6	53.6	61.5	66.6	66.6	666.3	191.4	204.3	204.3	204.3	345.1
	J4	31.9	31.9	31.9	31.9	41.7	41.7	41.7	41.7	129.2	129.2	129.2	129.2	261.4
ALLOWABLE MISALIGNMENT (2)														
RADIAL (inch)		0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.20	0.20	0.20	0.20	0.24
AXIAL (inch)		0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.20	0.20	0.20	0.20	0.24
CONICAL (degree)		0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6

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

(2) Installations should be initially aligned as accurately as possible. In order to allow for deterioration in alignment over time, it is recommended that initial alignment should not exceed 25% of the above noted data. The forces on the driving and driven machinery should be calculated to ensure that these do not exceed the manufacturers allowables.

(3) Weights and inertias are based on the maximum bore size.

DCB Technical Data

1.1 Torque Capacity - Diesel Engine Drives

The full torque capacity of the coupling for transient vibration while passing through major criticals on run up is published as the Maximum Torque T_{KMAX}
($T_{KMAX} = 3 \times T_{KN}$.)

There is additional torque capacity built within the coupling for transient shock.

The published "Vibratory Torque, T_{KW} ", relates to the amplitude of the permissible continous torque fluctuation. The vibratory torque values shown in the Technical Data are at a frequency of 10Hz. The measure of acceptability of the coupling for vibrating drives is published as "Allowable Dissipated Heat at Ambient Temperature 86°F".

1.2 Transient Torques

Prediction of transient torques in marine drives can be complex. Normal installations are well provided for by selecting couplings based on the "Nominal Torque T_{KN} ." Transients, such as start up and clutch maneuver, are usually within the "Maximum Torque, T_{KMAX}" for the coupling.

Care needs to be taken in the design of couplings with shaft brakes, to ensure coupling torques are not increased by severe deceleration.

Sudden torque applications of propulsion devices, such as thrusters or waterjets, need to be considered when designing the coupling connection.

2.0 Stiffness Properties

The Renold Hi-Tec Coupling remains fully flexible under all torque conditions. The DCB series is a non-bonded type operating with the Rubber-in-Compression principle.

2.1 Axial Stiffness

When subject to axial misalignment, the coupling will have an axial resistance which gradually reduces due to the effect of vibratory torque.

The axial stiffness of the coupling is torque dependent. The variation is as shown in the Technical Data

2.2 Radial Stiffness

The radial stiffness of the coupling is torque dependent, and is as shown in the Technical Data

2.3 Torsional Stiffness

The torsional stiffness of the coupling is dependent upon applied torque and temperature as shown in the Technical Data

2.4 Prediction of the System Torsional Vibration Characteristics.

An adequate prediction of the system's torsional vibration characteristics, can be made by the following method.

2.4.1 Use the torsional stiffness, as published in the catalog, which is based upon data measured at 86°F ambient temperature.

2.4.2 Repeat the calculation made in 2.4.1 but using the maximum temperature correction factor S_{t212}, and dynamic magnifier correction factor, M_{212}, for the selected rubber. Use tables to adjust values for both torsional stiffness and dynamic magnifier. ie, $C_{T212} = C_{Tdyn} \times S_{t212}$

2.4.3 Review calculations 2.4.1 and 2.4.2 and if the speed range is clear of criticals which do not exceed the allowable heat dissipation value as published in the catalog then the coupling is considered suitable for the application, with respect to the torsional vibration characteristics. If there is a critical in the speed range, then the actual temperature of the coupling should be calculated at this speed.

DCB Technical Data

Rubber Grade	$Temp_{max}$ °F	S_t
NM 45	212	St_{212} = 0.71
SM 50	212	St_{212} = 0.65
SM 60	212	St_{212} = 0.61
SM 70	212	St_{212} = 0.44
SM 80	212	St_{212} = 0.37
SM 60 is considered "standard"		

Rubber Grade	Dynamic Magnifier at 86°F (M_{86})	Dynamic Magnifier at 212°F (M_{212})
NM 45	15	21.1
SM 50	10	15.4
SM 60	8	13.1
SM 70	6	13.6
SM 80	4	10.8
SM 60 is considered "standard"		

2.5 Prediction of the Actual Coupling Temperature and Torsional Stiffness

2.5.1 Use the torsional stiffness as published in the catalog. This is based upon data measured at 86°F and the dynamic magnifier at 86°F. (M_{86})

2.5.2 Compare the synthesis value of the calculated heat load in the coupling (P_K) at the speed of interest, to the "Allowable Heat Dissipation" (P_{KW}).

The coupling temperature rise = ΔF

$$\Delta F = Temp_{coup} = \left(\frac{P_K}{P_{KW}}\right) \times 126$$

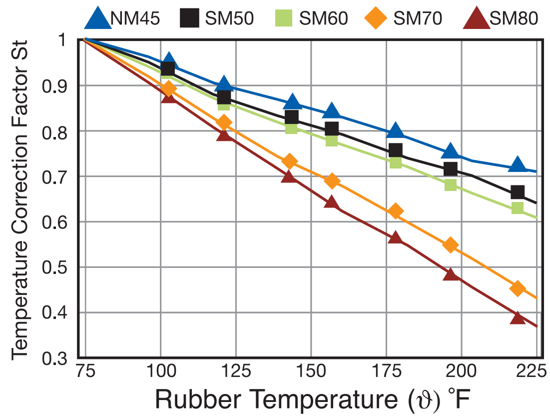
The coupling temperature = ϑ

$$\vartheta = Temp_{coup} + \text{Ambient Temp.}$$

2.5.3 Calculate the temperature correction factor, S_t, from 2.6 (if the coupling temperature > 212°F, then use S_{t212}). Calculate the dynamic Magnifier as per 2.7. Repeat the calculation with the new value of coupling stiffness and dynamic magnifier.

2.5.4 Calculate the coupling temperature as per 2.5. Repeat calculation until the coupling temperature agrees with the correction factors for torsional stiffness and dynamic magnifier used in the calculation.

2.6 Temperature Correction Factor



2.7 Dynamic Magnifier Correction Factor

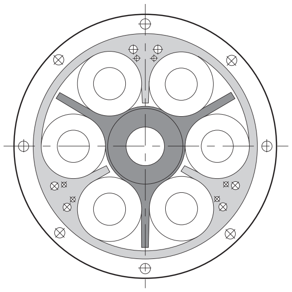
The Dynamic Magnifier of the rubber is subject to temperature variation in the same way as the torsional stiffness.

$$M_T = \frac{M_{86}}{S_t} \qquad \psi_T = \psi_{86} \times S_t$$

Rubber Grade	Dynamic Magnifier (M_{86})	Relative Damping ψ_{86}
NM 45	15	0.42
SM 50	10	0.63
SM 60	8	0.78
SM 70	6	1.05
SM 80	4	1.57
SM 60 is considered "standard"		

DCB Series 6 Technical Data

End View - Series 6



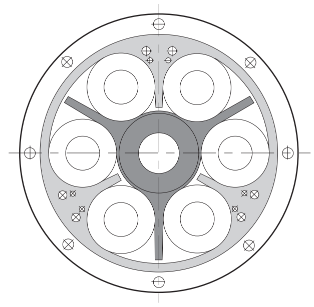
COUPLING SIZE		622.5	632.5	623.5	633.5	624.5	625.5	626.5	628.0	638.0
NOMINAL TORQUE T_{KN} (lb.ft)		376	561	1,025	1,534	2,139	3,909	6,468	12,170	18,292
MAXIMUM TORQUE T_{KMAX} (lb.ft)		1,121	1,682	3,054	4,580	6,395	11,727	19,472	36,509	54,727
VIBRATORY TORQUE T_{KW} (lb.ft)		140	214	384	575	797	1,468	2,449	4,588	6,881
ALLOWABLE DISSIPATED HEAT AT AMB. TEMP. 86°F. (W)	NM 45	69	103	97	146	125	153	181	223	335
	SM 50	77	115	108	162	139	170	201	248	372
	SM 60	87	130	122	183	158	193	228	281	422
	SM 70	98	147	137	206	176	215	254	314	471
	SM 80	108	162	152	228	195	238	282	347	521
MAXIMUM SPEED (rpm) (1)		4,150	4,150	3,150	3,150	2,570	2,080	1,730	1,440	1,440
DYNAMIC TORSIONAL STIFFNESS C_{Tdyn} (lb.in/rad x 10^6)										
@ 0.25 T_{KN}	NM 45	0.027	0.035	0.062	0.089	0.133	0.195	0.327	0.690	0.982
	SM 50	0.027	0.044	0.071	0.106	0.159	0.239	0.398	0.743	1.168
	SM 60	0.035	0.053	0.089	0.133	0.186	0.310	0.504	0.938	1.513
	SM 70	0.044	0.071	0.124	0.186	0.266	0.496	0.823	1.540	2.319
	SM 80	0.080	0.124	0.212	0.319	0.443	0.664	1.089	2.027	3.231
@ 0.5 T_{KN}	NM 45	0.035	0.053	0.097	0.142	0.204	0.319	0.522	0.974	1.558
	SM 50	0.044	0.071	0.124	0.186	0.266	0.425	0.699	1.301	1.903
	SM 60	0.053	0.080	0.142	0.212	0.301	0.469	0.770	1.434	2.195
	SM 70	0.062	0.097	0.168	0.257	0.354	0.558	0.920	1.717	2.726
	SM 80	0.115	0.177	0.319	0.478	0.673	0.859	1.416	2.646	4.204
@ 0.75 T_{KN}	NM 45	0.053	0.071	0.133	0.204	0.292	0.496	0.823	1.540	2.425
	SM 50	0.062	0.097	0.177	0.266	0.381	0.611	1.009	1.876	2.815
	SM 60	0.071	0.106	0.204	0.310	0.425	0.682	1.124	2.098	3.169
	SM 70	0.089	0.133	0.230	0.345	0.487	0.770	1.275	2.381	3.673
	SM 80	0.159	0.239	0.451	0.682	0.956	1.195	1.965	3.664	5.824
@ 1.0 T_{KN}	NM 45	0.071	0.106	0.195	0.292	0.407	0.752	1.239	2.310	3.602
	SM 50	0.089	0.133	0.239	0.363	0.522	0.850	1.407	2.620	3.965
	SM 60	0.097	0.142	0.266	0.398	0.566	0.903	1.496	2.788	4.231
	SM 70	0.106	0.159	0.301	0.451	0.637	1.027	1.690	3.160	4.788
	SM 80	0.212	0.319	0.584	0.876	1.239	1.629	2.699	5.027	7.815
RADIAL STIFFNESS NO LOAD (lb/in x 10^3)	NM 45	4.17	6.25	5.82	8.74	7.49	9.14	10.83	13.33	19.98
	SM 50	4.76	7.14	6.63	9.95	8.56	10.45	12.37	15.22	22.84
	SM 60	7.14	10.71	9.98	14.97	12.85	15.70	18.56	22.84	34.26
	SM 70	9.51	14.27	13.32	19.97	17.13	20.93	24.74	30.45	45.68
	SM 80	11.18	16.77	15.65	23.47	20.13	24.61	29.07	35.78	53.67
RADIAL STIFFNESS @ T_{KN} (lb/in x 10^3)	NM 45	7.21	10.79	10.06	15.09	12.97	15.84	18.73	23.04	34.54
	SM 50	7.14	10.71	9.99	14.99	12.85	15.70	18.56	22.84	34.26
	SM 60	9.51	14.27	13.32	19.97	17.13	20.93	24.74	30.45	45.68
	SM 70	11.90	17.85	16.65	24.98	21.41	26.16	30.92	38.06	57.10
	SM 80	16.65	24.98	23.30	34.94	29.98	36.63	43.29	53.29	79.94
AXIAL STIFFNESS (lb/in x 10^3)	NM 45	1.63	2.44	2.28	3.43	2.94	3.60	4.25	5.23	7.85
	SM 50	1.92	2.88	2.68	4.03	3.45	4.32	5.08	6.28	9.42
	SM 60	3.08	4.63	4.33	6.49	5.57	6.81	8.05	9.90	14.85
	SM 70	4.26	6.40	5.96	8.94	9.94	12.14	14.34	17.66	26.48
	SM 80	9.64	14.46	13.49	20.23	17.30	21.13	24.96	30.72	46.08
MAXIMUM AXIAL (2) LOAD AT POINT OF SLIP @ T_{KN} (lb)	NM 45	88	133	121	182	153	187	220	270	405
	SM 50	106	160	148	223	211	259	306	378	567
	SM 60	146	220	207	310	270	328	387	477	715
	SM 70	189	283	265	398	337	411	486	598	897

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

(2) The Renold Hi-Tec Coupling will "slip" axially when the maximum axial force is reached.

DCB Series 6 Technical Data

End View - Series 6



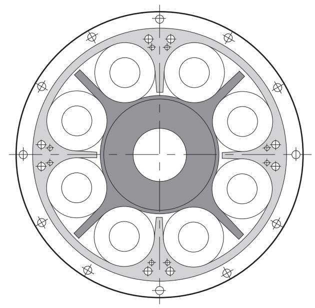
COUPLING SIZE		629.5	639.5	6211.0	6311.0	6213.0	6313.0	6215.0	6315.0
NOMINAL TORQUE T_{KN} (lb.ft)		20,283	30,461	31,789	47,720	52,662	78,919	81,132	122,435
MAXIMUM TORQUE T_{KMAX} (lb.ft)		60,923	91,458	95,883	143,087	157,838	236,757	244,133	366,568
VIBRATORY TORQUE T_{KW} (lb.ft)		7,671	11,506	11,948	17,923	19,693	29,502	30,461	45,729
ALLOWABLE DISSIPATED HEAT AT AMB. TEMP. 86°F. (W)	NM 45	265	398	306	459	362	543	418	627
	SM 50	294	441	340	510	402	603	464	696
	SM 60	333	500	386	579	456	684	526	789
	SM 70	372	558	431	646	510	765	588	882
	SM 80	412	618	477	716	563	845	650	975
MAXIMUM SPEED (rpm) (1)		1,180	1,180	1,030	1,030	860	860	750	750
DYNAMIC TORSIONAL STIFFNESS C_{Tdyn} (lb.in/rad x 10^6)									
@ 0.25 T_{KN}	NM 45	1.03	1.65	1.58	2.55	2.62	4.20	4.02	6.46
	SM 50	1.25	1.96	1.94	3.04	3.20	5.02	4.91	7.71
	SM 60	1.58	2.53	2.44	3.93	4.04	6.48	6.20	9.96
	SM 70	2.58	3.89	4.00	6.05	6.59	9.97	10.13	15.32
	SM 80	3.40	5.41	5.28	8.41	8.72	13.85	13.39	21.27
@ 0.5 T_{KN}	NM 45	1.62	2.61	2.52	4.05	4.16	6.69	6.39	10.28
	SM 50	2.19	3.19	3.39	4.95	5.59	8.17	8.59	12.56
	SM 60	2.40	3.67	3.72	5.71	6.14	9.43	9.43	14.48
	SM 70	2.89	4.56	4.48	7.08	7.39	11.68	11.36	17.94
	SM 80	4.43	7.05	6.87	10.94	11.34	18.05	17.42	27.73
@ 0.75 T_{KN}	NM 45	2.58	4.05	3.99	6.30	6.59	10.40	10.13	15.97
	SM 50	3.14	4.72	4.87	7.32	8.04	12.08	12.35	18.56
	SM 60	3.51	5.30	5.45	8.23	9.00	13.59	13.83	20.88
	SM 70	3.98	6.16	6.19	9.56	10.21	15.77	15.42	24.23
	SM 80	6.14	9.75	9.53	15.14	15.74	24.99	24.17	38.39
@ 1.0 T_{KN}	NM 45	3.87	6.04	6.00	9.36	9.91	15.46	15.22	23.75
	SM 50	4.39	6.64	6.81	10.30	11.24	17.01	17.26	26.13
	SM 60	4.66	7.09	7.24	11.01	11.95	18.18	18.36	27.92
	SM 70	5.28	8.02	8.21	12.44	13.55	20.54	20.82	31.56
	SM 80	8.42	13.09	13.06	20.33	21.56	33.55	33.12	51.56
RADIAL STIFFNESS NO LOAD (lb/in x 10^3)	NM 45	15.8	23.7	18.3	27.5	21.7	32.5	25.1	37.7
	SM 50	18.1	27.1	20.9	31.4	24.7	37.1	28.5	42.8
	SM 60	27.1	40.7	31.4	47.1	37.1	55.7	42.8	64.2
	SM 70	36.1	54.2	41.9	62.8	49.4	74.1	57.1	85.6
	SM 80	42.5	63.7	49.2	73.8	58.1	87.2	67.1	100.6
RADIAL STIFFNESS @ T_{KN} (lb/in x 10^3)	NM 45	27.4	41.1	31.7	47.5	37.4	56.2	43.3	64.9
	SM 50	27.1	40.7	31.4	47.1	37.1	55.7	42.8	64.2
	SM 60	36.1	54.2	41.9	62.8	49.4	74.2	57.1	85.6
	SM 70	45.2	67.8	52.3	78.5	61.8	92.8	71.4	107.1
	SM 80	63.3	94.9	73.3	109.9	86.6	129.9	99.9	149.9
AXIAL STIFFNESS (lb/in x 10^3)	NM 45	6.21	9.32	7.19	10.79	8.50	12.76	9.81	14.71
	SM 50	7.46	11.19	8.63	12.95	10.20	15.30	11.77	17.64
	SM 60	11.76	17.63	13.61	20.42	16.09	24.14	18.56	27.84
	SM 70	20.97	31.45	24.28	36.42	28.69	43.04	33.11	49.68
	SM 80	36.49	54.73	42.25	63.38	49.93	74.89	57.61	86.42
MAXIMUM AXIAL (2) LOAD AT POINT OF SLIP @ T_{KN} (lb)	NM 45	321	481	373	562	441	661	508	764
	SM 50	447	674	517	776	611	917	706	1057
	SM 60	567	850	656	985	776	1165	899	1349
	SM 70	710	1066	823	1236	971	1457	1124	1686

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

(2) The Renold Hi-Tec Coupling will "slip" axially when the maximum axial force is reached.

DCB Series 8 Technical Data

End View - Series 8

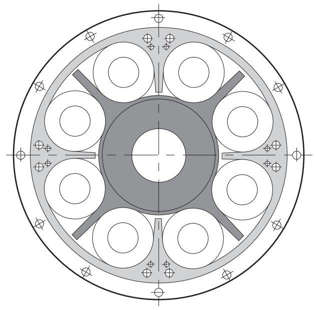


COUPLING SIZE		822.5	823.5	833.5	824.5	834.5	844.5	825.5	835.5
NOMINAL TORQUE T_{KN} (lb.ft)		612	1,660	2,486	3,570	5,355	7,140	6,623	9,935
MAXIMUM TORQUE T_{KMAX} (lb.ft)		1,859	4,971	7,449	10,709	16,064	21,419	19,870	29,812
VIBRATORY TORQUE T_{KW} (lb.ft)		229	620	929	1,335	2,014	2,677	2,486	3,725
ALLOWABLE	NM 45	93	130	195	166	250	332	204	306
DISSIPATED	SM 50	103	144	216	185	278	370	227	340
HEAT AT AMB.	SM 60	117	163	245	210	315	420	257	385
TEMP. 86°F. (W)	SM 70	131	182	274	234	352	468	287	430
	SM 80	144	202	303	260	390	520	317	475
MAXIMUM SPEED (rpm) (1)		3,600	2,760	2,760	2,130	2,130	2,130	1,800	1,800
DYNAMIC TORSIONAL STIFFNESS C_{Tdyn} (lb.in/rad x 10^6)									
	NM 45	0.053	0.142	0.212	0.345	0.505	0.620	0.531	0.797
	SM 50	0.062	0.177	0.266	0.416	0.566	0.735	0.673	1.000
@ 0.25 T_{KN}	SM 60	0.089	0.230	0.354	0.522	0.779	0.974	0.885	1.363
	SM 70	0.142	0.372	0.566	0.788	1.195	1.567	1.505	2.222
	SM 80	0.221	0.602	0.894	1.337	2.195	2.815	2.036	3.178
	NM 45	0.080	0.221	0.327	0.505	0.717	0.903	0.823	1.266
	SM 50	0.106	0.292	0.434	0.690	0.929	1.204	1.151	1.629
@ 0.5 T_{KN}	SM 60	0.133	0.354	0.531	0.841	1.213	1.514	1.328	1.983
	SM 70	0.168	0.460	0.690	1.053	1.620	2.018	1.682	2.602
	SM 80	0.274	0.735	1.098	2.027	2.992	3.620	2.638	4.142
	NM 45	0.124	0.327	0.487	0.726	1.053	1.319	1.283	1.965
	SM 50	0.159	0.425	0.628	1.000	1.372	1.761	1.637	2.407
@ 0.75 T_{KN}	SM 60	0.186	0.505	0.752	1.168	1.708	2.124	1.930	2.859
	SM 70	0.230	0.620	0.938	1.443	2.195	2.717	2.310	3.514
	SM 80	0.372	0.991	1.496	2.885	4.071	4.859	3.647	5.735
	NM 45	0.177	0.478	0.717	1.018	1.478	1.912	1.912	2.930
	SM 50	0.221	0.584	0.876	1.363	1.912	2.461	2.275	3.390
@ 1.0 T_{KN}	SM 60	0.248	0.673	1.009	1.567	2.301	2.877	2.549	3.824
	SM 70	0.301	0.814	1.221	1.876	2.850	3.567	3.054	4.576
	SM 80	0.496	1.345	2.018	3.744	5.364	6.426	4.983	7.700
	NM 45	5.55	7.77	11.65	9.99	14.99	19.98	12.22	18.33
RADIAL STIFFNESS	SM 50	6.34	8.85	13.28	11.42	17.13	22.84	13.95	20.93
NO LOAD (lb/in x10^3)	SM 60	9.51	13.30	19.96	17.13	25.69	34.26	20.93	31.40
	SM 70	12.69	17.76	26.64	22.84	34.26	45.68	27.91	41.86
	SM 80	14.90	20.87	31.30	26.84	40.25	53.67	32.80	49.20
	NM 45	9.61	13.42	20.13	17.30	25.95	34.60	21.13	31.69
RADIAL STIFFNESS	SM 50	9.51	13.32	19.98	17.13	25.69	34.26	20.93	31.40
@ T_{KN} (lb/in x10^3)	SM 60	12.69	17.76	26.64	22.84	34.26	45.68	27.91	41.86
	SM 70	15.86	22.20	33.30	28.55	42.82	57.10	34.89	52.33
	SM 80	22.20	31.06	46.59	39.97	59.95	79.94	48.85	73.27
	NM 45	2.17	3.05	4.57	3.92	5.88	7.85	4.80	7.19
AXIAL STIFFNESS	SM 50	2.56	3.59	5.38	4.61	6.91	9.22	5.63	8.45
(lb/in x10^3)	SM 60	4.12	5.77	8.65	7.42	11.13	14.85	9.07	13.60
	SM 70	5.68	7.95	11.91	13.25	19.87	26.49	16.19	24.28
	SM 80	12.85	17.99	26.98	23.07	34.60	46.14	28.19	42.31
	NM 45	117	162	243	205	310	409	250	373
MAXIMUM AXIAL (2)	SM 50	142	198	297	281	423	562	344	515
LOAD AT POINT	SM 60	196	274	411	360	540	719	450	674
OF SLIP @ T_{KN} (lb)	SM 70	252	353	531	450	674	899	549	823

(1) For operation above 80% of the declared maxiumum coupling speed, it is recommended that the coupling is dynamically balanced.
(2) The Renold Hi-Tec Coupling will “slip” axially when the maximum axial force is reached.

DCB Series 8 Technical Data

End View - Series 8



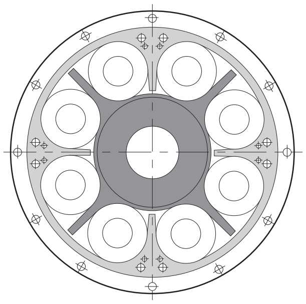
COUPLING SIZE		845.5	855.5	826.5	836.5	846.5	827.5	837.5	847.5
NOMINAL TORQUE T_{KN} (lb.ft)		13,247	16,558	10,820	16,234	21,640	16,499	24,745	32,991
MAXIMUM TORQUE T_{KMAX} (lb.ft)		39,747	49,682	32,460	48,694	64,927	49,490	74,236	98,981
VIBRATORY TORQUE TKW (lb.ft)		4,971	6,210	4,057	6,085	8,113	6,188	9,265	12,369
ALLOWABLE	NM 45	409	510	241	363	482	278	418	556
DISSIPATED	SM 50	454	566	268	402	536	309	464	618
HEAT AT AMB.	SM 60	514	642	304	456	608	351	526	702
TEMP. 86°F. (W)	SM 70	574	716	340	510	680	392	588	784
	SM 80	634	792	375	563	750	433	650	866
MAXIMUM SPEED (rpm) (1)		1,800	1,800	1,490	1,490	1,490	1,315	1,315	1,315
DYNAMIC TORSIONAL STIFFNESS C_{Tdyn} (lb.in/rad x 10^6)									
	NM 45	1.062	1.275	0.929	1.390	1.850	1.416	2.124	2.832
	SM 50	1.301	1.664	1.124	1.691	2.257	1.726	2.584	3.452
@ 0.25 T_{KN}	SM 60	1.823	2.222	1.505	2.266	3.018	2.310	3.461	4.611
	SM 70	2.992	3.602	2.425	3.629	4.841	3.709	5.558	7.408
	SM 80	4.682	5.443	3.868	5.797	7.736	5.912	8.878	11.834
	NM 45	1.682	2.036	1.407	2.107	2.806	2.151	3.222	4.293
	SM 50	2.204	2.629	1.868	2.797	3.735	2.859	4.284	5.709
@ 0.5 T_{KN}	SM 60	2.620	3.186	2.275	3.408	4.549	3.478	5.213	6.957
	SM 70	3.452	4.328	2.983	4.470	5.957	4.558	6.842	9.117
	SM 80	5.638	6.939	4.735	7.099	9.462	7.240	10.860	14.480
	NM 45	2.540	3.133	2.115	3.169	4.222	3.231	4.841	6.461
	SM 50	3.231	3.903	2.726	4.080	5.443	4.160	6.249	8.329
@ 0.75 T_{KN}	SM 60	3.709	4.585	3.239	4.859	6.470	4.948	7.426	9.904
	SM 70	4.585	5.718	4.027	6.036	8.046	6.151	9.232	12.312
	SM 80	7.506	9.488	6.435	9.656	12.869	9.842	14.763	19.685
	NM 45	3.815	4.726	3.098	4.629	6.178	4.726	7.090	9.453
	SM 50	4.443	5.399	3.779	5.665	7.559	5.780	8.674	11.559
@ 1.0 T_{KN}	SM 60	4.965	6.125	4.328	6.497	8.665	6.629	9.940	13.250
	SM 70	6.028	7.435	5.257	7.886	10.515	8.046	12.064	16.091
	SM 80	10.046	13.082	8.683	13.020	17.366	13.277	19.924	26.562
	NM 45	24.44	30.55	14.43	21.7	28.9	17.1	25.6	34.1
RADIAL STIFFNESS	SM 50	27.91	34.89	16.49	24.7	33.0	19.5	29.2	39.0
NO LOAD (lb/in x 10^3)	SM 60	41.86	52.33	24.74	37.1	49.5	29.2	43.9	58.5
	SM 70	55.82	69.77	32.99	49.5	66.0	39.0	58.5	78.0
	SM 80	65.60	81.99	38.76	58.1	77.5	45.8	68.7	91.6
	NM 45	42.25	52.82	24.99	37.5	50.0	29.5	44.3	59.0
RADIAL STIFFNESS	SM 50	41.86	52.33	24.74	37.1	49.5	29.2	43.9	58.5
@ T_{KN} (lb/in x 10^3)	SM 60	55.82	69.77	32.99	49.5	66.0	39.0	58.5	78.
	SM 70	69.77	87.22	41.27	61.8	82.5	48.7	73.1	97.5
	SM 80	97.70	122.12	57.73	86.6	115.5	68.2	102.3	136.4
	NM 45	9.59	11.99	5.66	8.5	11.3	6.5	9.8	13.1
AXIAL STIFFNESS	SM 50	11.26	14.07	6.66	10.0	13.3	7.7	11.5	15.4
(lb/in x 10^3)	SM 60	18.13	22.67	10.72	16.1	21.4	12.4	18.6	24.7
	SM 70	32.38	40.47	19.13	28.7	38.3	22.1	33.1	44.1
	SM 80	56.38	70.47	33.32	50.0	66.6	38.4	57.7	76.9
	NM 45	499	625	294	443	589	342	513	683
MAXIMUM AXIAL (2)	SM 50	688	859	405	607	809	468	704	935
LOAD AT POINT	SM 60	899	1124	531	798	1061	611	922	1223
OF SLIP @ T_{KN} (lb)	SM 70	1097	1371	652	975	1324	749	1124	1497

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

(2) The Renold Hi-Tec Coupling will "slip" axially when the maximum axial force is reached.

DCB Series 8 Technical Data

End View - Series 8



COUPLING SIZE		857.5	828.0	838.0	848.0	858.0	829.5	839.5	849.5	859.5	8211.0
NOMINAL TORQUE T_{KN} (lb.ft)		41,244	19,936	29,908	39,873	49,844	33,766	50,648	67,531	84,451	53,060
MAXIMUM TORQUE T_{Kmax} (lb.ft)		123,726	59,816	89,717	119,625	149,533	101,297	151,945	202,593	253,352	159,180
VIBRATORY TORQUE T_{KW} (lb.ft)		15,467	7,678	11,218	14,950	18,690	12,782	18,992	25,328	27,954	19,899
ALLOWABLE	NM 45	696	297	446	594	743	353	529	706	883	409
DISSIPATED	SM 50	773	330	495	660	825	392	588	784	980	454
HEAT AT AMB.	SM 60	877	374	561	748	935	444	666	888	1,110	515
TEMP. 86°F. (W)	SM 70	980	418	627	836	1045	497	745	994	1,243	575
	SM 80	1083	462	693	924	1155	550	823	1,100	1,375	635
MAXIMUM SPEED (rpm) (1)		1,315	1,240	1,240	1,240	1,240	1,010	1,010	1,010	1,010	880
DYNAMIC TORSIONAL STIFFNESS C_{Tdyn} (lb.in/rad x 10^6)											
@ 0.25 T_{KN}	NM 45	3.540	1.726	2.593	3.461	4.319	2.903	4.346	5.797	7.249	4.532
	SM 50	4.310	2.107	3.160	4.213	5.257	3.532	5.293	7.063	8.824	5.514
	SM 60	5.762	2.815	4.222	5.629	7.037	4.726	7.081	9.444	11.807	7.382
	SM 70	9.258	4.523	6.789	9.046	11.312	7.585	11.382	15.171	18.968	11.860
	SM 80	14.790	7.222	10.834	14.445	18.056	12.177	18.171	24.225	30.279	18.941
@ 0.5 T_{KN}	NM 45	5.373	2.620	3.939	5.249	6.559	4.399	6.594	8.798	10.993	6.877
	SM 50	7.143	3.487	5.231	6.975	8.718	5.851	8.771	11.701	14.622	9.143
	SM 60	8.692	4.248	6.373	8.488	10.612	7.125	10.683	14.241	17.799	11.135
	SM 70	11.400	5.567	8.346	11.135	13.914	9.338	14.002	18.667	23.340	14.595
	SM 80	18.100	8.842	13.259	17.675	22.101	14.825	22.234	29.642	37.059	23.172
@ 0.75 T_{KN}	NM 45	8.072	3.939	5.912	7.886	9.860	6.612	9.922	13.223	16.534	10.338
	SM 50	10.409	5.080	7.630	10.170	12.710	8.524	12.790	17.056	21.322	13.330
	SM 60	12.374	6.045	9.063	12.090	15.109	10.134	15.206	20.278	25.340	15.852
	SM 70	15.392	7.514	11.276	15.029	18.791	12.604	18.906	25.208	31.510	19.702
	SM 80	24.606	12.020	18.029	24.039	30.049	20.154	30.235	40.307	50.389	31.510
@ 1.0 T_{KN}	NM 45	11.816	5.771	8.656	11.542	14.416	9.674	14.516	19.348	24.190	15.126
	SM 50	14.454	7.054	10.586	14.117	17.640	11.834	17.755	23.676	29.589	18.507
	SM 60	16.569	8.090	12.135	16.180	20.225	13.569	20.348	27.137	33.917	21.216
	SM 70	20.109	9.825	14.737	19.649	24.562	16.472	24.712	32.952	41.184	25.756
	SM 80	33.200	16.215	24.323	32.430	40.538	27.190	40.785	54.389	67.985	42.511
RADIAL STIFFNESS NO LOAD (lb/in x 10^3)	NM 45	42.7	17.8	26.7	35.5	44.4	21.1	31.7	42.2	52.8	24.4
	SM 50	48.7	20.3	30.4	40.6	50.7	24.1	36.1	48.2	60.2	27.9
	SM 60	73.1	30.4	45.7	60.9	76.1	36.2	54.2	72.3	90.4	41.9
	SM 70	97.5	40.6	60.9	81.2	101.5	48.2	72.3	96.4	120.5	55.8
	SM 80	114.5	47.7	71.5	95.4	119.3	56.6	85.0	113.3	141.6	65.6
RADIAL STIFFNESS @ T_{KN} (lb/in x 10^3)	NM 45	73.8	30.7	46.1	61.4	76.8	36.5	54.7	73.0	91.2	42.3
	SM 50	73.1	30.4	45.7	60.9	76.1	36.2	54.2	72.3	90.4	41.9
	SM 60	97.5	40.6	60.9	81.2	101.5	48.2	72.3	96.4	120.5	55.8
	SM 70	121.8	50.7	76.1	101.5	126.9	60.3	90.4	120.5	150.6	69.8
	SM 80	170.6	71.1	106.6	142.1	177.6	84.4	126.5	168.7	210.9	97.7
AXIAL STIFFNESS (lb/in x 10^3)	NM 45	16.3	7.0	10.5	13.9	17.4	8.3	12.4	16.6	20.7	9.6
	SM 50	19.2	8.2	12.3	16.4	20.5	9.7	14.6	19.4	24.3	11.3
	SM 60	30.9	13.2	19.8	26.4	33.0	15.7	23.5	31.3	39.2	18.1
	SM 70	55.2	23.5	35.3	47.1	58.9	28.0	42.0	55.9	69.9	32.4
	SM 80	96.1	41.0	61.5	82.0	102.5	48.7	73.0	97.4	121.7	56.4
MAXIMUM AXIAL (2) LOAD AT POINT OF SLIP @ T_{KN} (N)	SM 45	854	364	546	728	910	432	647	863	1079	499
	SM 50	1169	499	749	998	1248	593	890	1187	1484	688
	SM 60	1529	638	958	1277	1596	760	1140	1520	1900	879
	SM 70	1873	798	1198	1596	1996	949	1423	1897	2372	1097

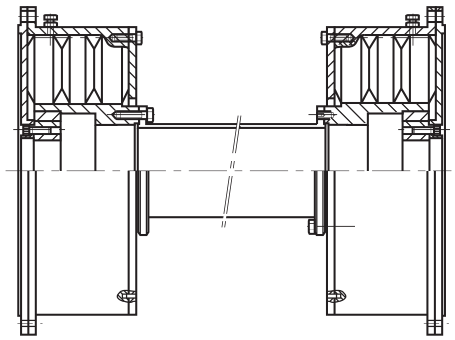
(1) For operation above 80% of the declared maximum coupling speed, it is recommended that the coupling is dynamically balanced.

(2) The Renold Hi-Tec Coupling will “slip” axially when the maximum axial force is reached.

DCB Design Variations

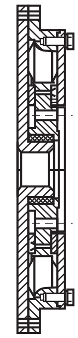
The DCB coupling can be adapted to meet customer requirements, as can be seen from the design variations shown below. For a more comprehensive list contact Renold Hi-Tec.

Cardan Shaft Coupling



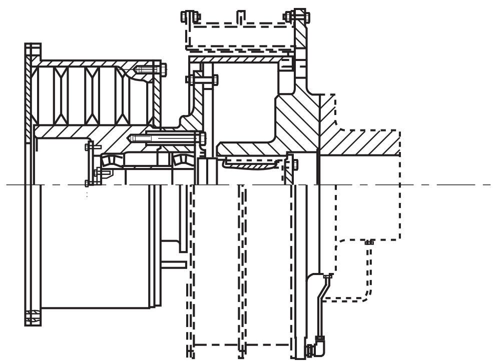
Cardan shaft coupling to give high misalignment capability, low axial and angular stiffness and high noise attenuation.

Universal Joint Shaft Coupling



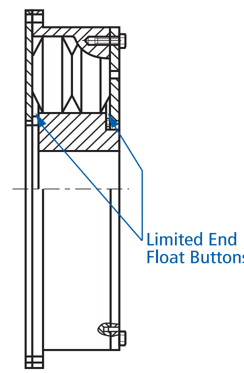
Coupling for use with a universal joint shaft. The coupling has radial and axial bearings to accept the sinusoidal loads from the universal joint shaft.

Clutch Coupling



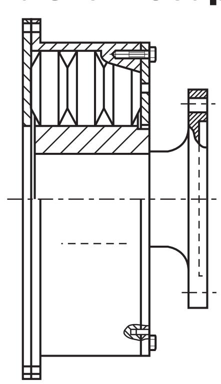
Clutch coupling to allow the drive to be engaged and disengaged.

Limited End Float Coupling



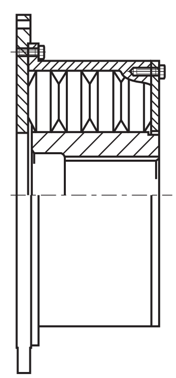
Limited end float coupling for use on applications where axial restraint is required, such as alternators with sleeve bearings.

Stub Shaft Coupling



Stub shaft coupling for flywheel to flange application or when increased distance between the driving and driven machines is required.

Adaptor Plate Coupling



Adaptor plate coupling for adapting the standard DCB coupling to meet customer requirements.

HTB Range

RENOLD

Hi-Tec Couplings

The Complete Solution

HTB Flexible Coupling

High temperature blind assembly, coupling designed for bell housing applications.

Standard Coupling Arrangements

- Flywheel to Shaft
- Shaft to Shaft
- Flywheel to U-joint
- Flywheel to Flange

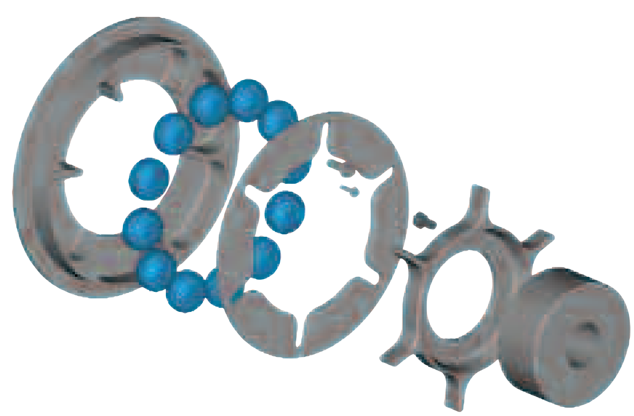
Applications

- Marine propulsion
- Generator sets
- Pump sets
- Compressors
- Rail/People moving

Features	Benefits
Unique blind assembly	Allows easy assembly for applications in bell housings.
High temperature capability (up to 400°F)	Allows operation in bell housings where ambient temperatures can be high.
Severe shock load protection	Avoiding failure of the driveline under short circuit and other transient conditions.
Intrinsically fail safe	Ensuring continuous operation of the driveline in the unlikely event of rubber damage.
Low maintenance	Easy block removal
Noise attenuation	Giving quiet running conditions in sensitive applications by the elimination of metal to metal contact.

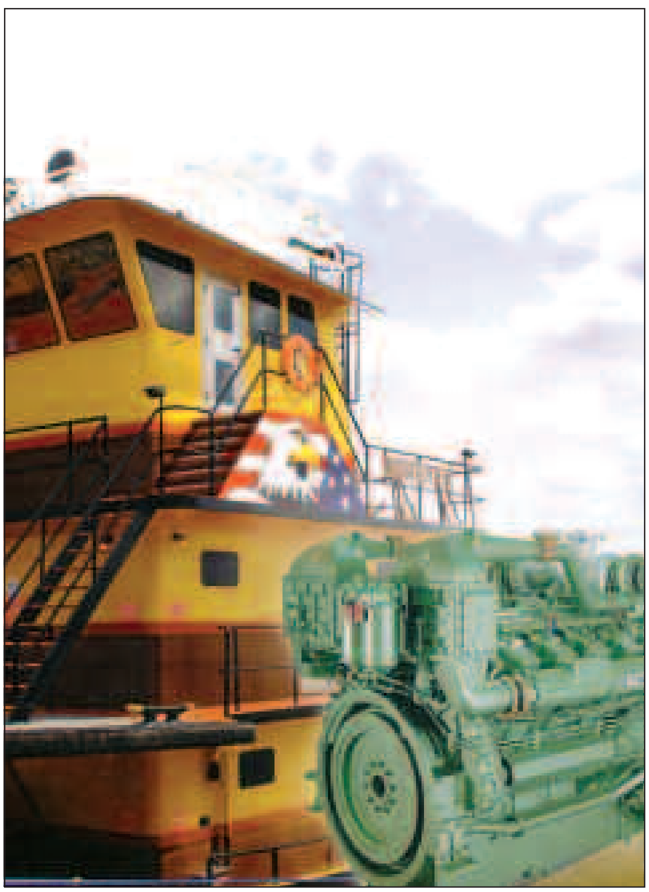
Construction Details

- Spheroidal Iron Graphite to BS 2789 Grade 420/12.
- High temperature elastomer with a 400°F temperature capability.
- Keep plate integral with outer member.
- Steel Hub manufactured to meet application requirements.

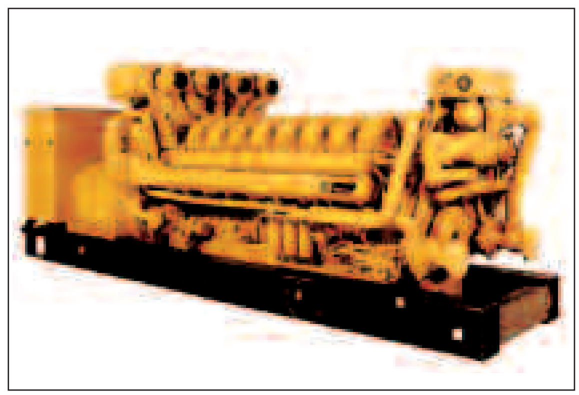


HTB Typical Applications

Diesel electric main propulsion. Coupling fitted between electric motors and the reintjes gearboxes to kort nozzle propellors.



Main propulsion. Coupling fitted between Guascor engine and Twin Disc gearbox.



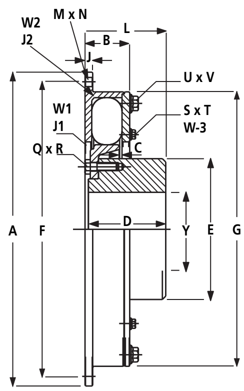
Diesel generator sets. Coupling fitted between diesel engine and alternator.

Main propulsion coupling HTB fitted between 3508 Cat engine and Twin Disc 540 gearbox.

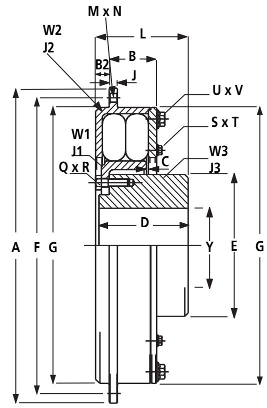
RENOLD Hi-Tec Couplings

HTB Standard SAE Flywheel to Shaft

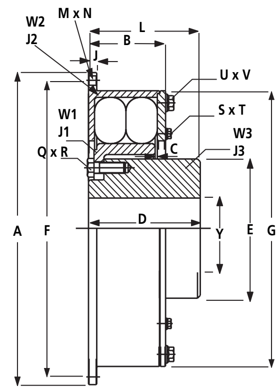
HTB1200 - HTB10000



HTB4500



HTB12000 - HTB20000



Dimensions, Weight, Inertia and Alignment

COUPLING SIZE		1200		3000		4500		6000		10000	12000		20000	40000
		SAE11.5	SAE14	SAE14	SAE18	SAE14	SAE18	SAE18	SAE21	SAE21	SAE18	SAE21	SAE21	
DIMENSIONS (inch)	A	13.875	18.375	18.375	22.5	18.375	22.5	22.5	26.5	26.5	22.5	26.5	26.5	33.858
	B	1.97	1.97	2.64	2.64	2.74	2.74	3.31	3.31	4.06	5.55	5.55	6.81	8.46
	B2	-	-	-	-	0.79	0.79	-	-	-	-	-	-	-
	C	0.16	0.16	0.16	0.16	0.16	0.16	0.20	0.20	0.20	0.20	0.20	0.20	0.28
	D	3.94	3.94	4.53	4.53	5.16	5.16	5.91	5.91	6.85	8.07	7.64	9.61	10.87
	E	6.14	6.14	8.27	8.27	8.27	8.27	10.08	10.08	12.13	10.08	10.08	12.13	16.38
	F	13.13	17.25	17.25	21.37	17.25	21.37	21.37	25.25	25.25	21.37	25.25	25.25	32.28
	G	11.97	11.97	16.10	16.10	16.10	16.10	19.88	19.88	23.62	19.88	19.88	23.62	30.63
	J	0.39	0.39	0.47	0.47	0.47	0.47	0.63	0.63	0.79	0.63	0.63	0.79	0.87
	L	4.20	4.20	4.72	4.72	5.35	5.35	5.91	5.91	7.09	8.07	8.07	9.84	11.81
	M (QTY)	8	8	8	6	8	6	6	12	12	6	12	12	32
	N	0.41	0.53	0.53	0.67	0.53	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.83
	Q (QTY)	12	12	12	12	16	16	12	12	12	12	12	12	16
	R	M12	M12	M16	M16	M16	M16	M20	M20	M24	M20	M20	M24	M24
	S (QTY)	6	6	6	6	6	6	6	6	6	6	6	6	-
	T	M6	M6	M8	M8	M8	M8	M10	M10	M10	M10	M10	M10	-
	U (QTY)	6	6	6	6	6	6	6	6	6	6	6	6	6
	V	M12	M12	M14	M14	M14	M14	M16	M16	M20	M16	M16	M20	M24
	Y (MAX)	3.15	3.15	4.53	4.53	4.53	4.53	5.91	5.91	6.69	5.91	5.91	6.69	8.66
	Y (MIN)	1.57	1.57	1.97	1.97	1.97	1.97	2.36	2.36	2.36	2.36	2.36	2.36	4.33
	Z	0.63	0.63	0.79	0.79	0.00	0.00	1.14	1.14	1.42	1.14	1.14	1.42	1.42
RUBBER ELEMENTS	Per Cavity	1	1	1	1	2	2	1	1	1	2	2	2	2
	Per Coupling	12	12	12	12	24	24	12	12	12	24	24	24	24
MAXIMUM SPEED (rpm) (1)		3730	2820	2820	2300	2820	2300	2300	1950	1950	2300	1950	1950	1500
WEIGHT (lb)	W1	6	6	15	15	23	23	35	35	53	91	91	123	216
	W2	22	33	48	64	58	76	95	121	171	129	155	247	440
	W3	26	26	50	50	50	50	92	92	102	143	143	252	578
	TOTAL (W1+W2)	28	40	64	79	81	99	103	156	225	221	247	370	656
INERTIA ($lb.in^2$)	J1	102	102	307	307	512	512	888	888	2186	3348	3348	6560	20400
	J2	649	1435	2562	3177	3007	3143	7722	11447	18418	9533	13497	22655	80917
	J3	136	136	478	478	580	580	1264	1264	3417	1981	1981	5023	20366
ALLOWABLE MISALIGNMENT														
RADIAL (inch)	ALIGN	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
	MAX	0.04	0.04	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
AXIAL (inch)	ALIGN	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
	MAX	0.08	0.08	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CONICAL (degree)		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

HTB Technical Data

1.1 Torque Capacity - Diesel Engine Drives

The HTB Coupling is selected on the "Nominal Torque, T_{KN}" without service factors.

The full torque capacity of the coupling for transient vibration whilst passing through major criticals on run up is published as the Maximum Torque T_{KMAX}.
($T_{KMAX} = 3 \times T_{KN}$).

There is additional torque capacity built within the coupling for transient and shock torques.

The published "Vibratory Torque T_{KW}", relates to the amplitude of the permissible continous torque fluctuation. The vibratory torque values shown in the technical data are at the frequency of 10Hz. The measure of acceptability of the coupling for vibrating drives is published as "Allowable Dissipated Heat at Ambient Temperature 86°F.

1.2 Transient Torques

Prediction of transient torques in marine drives can be complex. Normal installations are well provided for by selecting couplings based on the "Nominal Torque T_{KN}". Transients, such as start up and clutch maneuver, are usually within the "Maximum Torque T_{KMAX}" for the coupling.

Care needs to be taken in the design of couplings with shaft brakes, to ensure coupling torques are not increased by severe deceleration.

Sudden torque applications of propulsion devices such as thrusters or waterjets, need to be considered when designing the coupling connection.

2.0 Stiffness Properties

The Renold Hi-Tec Coupling remains fully flexible under all torque conditions. The HTB series is a non-bonded type operating with the Rubber-in-Compression principle.

2.1 Axial Stiffness

When subject to axial misalignment, the coupling will have an axial resistance which gradually reduces due to the effect of vibratory torque.

The axial stiffness of the coupling is torque dependent, the variation is as shown in the Technical Data.

2.2 Radial Stiffness

The radial stiffness of the coupling is torque dependent, and is as shown in the Technical Data.

2.3 Torsional Stiffness

The torsional stiffness of the coupling is dependent upon applied torque and temperature as shown in the Technical Data.

2.4 Prediction of the System Torsional Vibration Characteristics

An adequate prediction of the systems torsional vibration characteristics, can be made by the following method:

2.4.1 Use the torsional stiffness, as published in the catalog which is based upon data measured at 86°F ambient temperature.

2.4.2 Repeat the calculation made as 2.4.1, but using the maximum temperature correction factor S_{t212}, and dynamic magnifier correction factor, M_{212}, for the selected rubber. Use tables on page 4 to adjust values for both torsional stiffness and dynamic magnifier. ie. $C_{T212} = C_{Tdyn} \times S_{t212}$

2.4.3 Review calculations 2.4.1 and 2.4.2 and if the speed range is clear of criticals which do not exceed the allowable heat dissipation value as published in the catalog, then the coupling is considered suitable for the application with respect to the torsional vibration characteristics. If there is a critical in the speed range, then the actual temperature of the coupling should be calculated at this speed.

HTB Technical Data

Rubber Grade	$Temp_{max}$ °F	S_t
Si 70	212	$St_{212} = 0.79$
Si 70 is considered "standard"		

Rubber Grade	Dynamic Magnifier at 86°F (M_{86})	Dynamic Magnifier at 212°F (M_{212})
Si 70	7.5	9.70
Si 70 is considered "standard"		

2.5 Prediction of the Actual CouplingTemperature and Torsional Stiffness

2.5.1 Use the torsional stiffness as published in the catalog. This is based upon data measured at 86˚F and the dynamic magnifier at 86˚F (M_{86})

2.5.2 Compare the synthesis value of the calculated heat load in the coupling (P_K) at the speed of interest, to the "Allowable Heat Dissipation" (P_{KW}).

The coupling temperature rise = ΔF

$$\Delta F = Temp_{coup} = \left(\frac{P_K}{P_{KW}}\right) \times 306$$

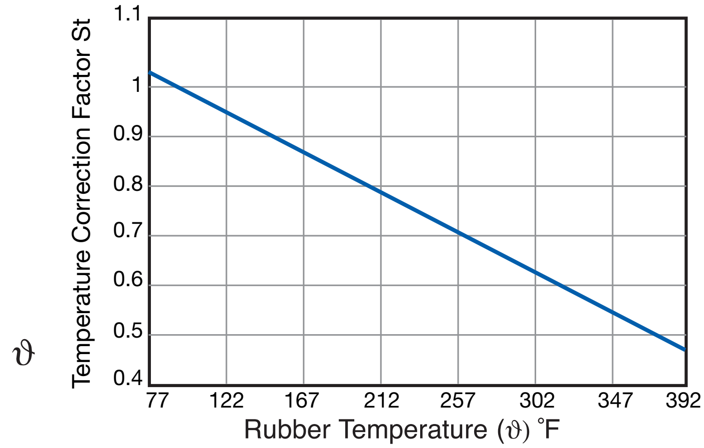
The coupling temperature = ϑ

$$\vartheta = Temp_{coup} + \text{Ambient Temp.}$$

2.5.3 Calculate the temperature correction factor, S_t, from 2.6 (if the coupling temperature > 212°F, then use S_{t212}). Calculate the dynamic Magnifier as per 2.7. Repeat the calculation with the new value of coupling stiffness and dynamic magnifier

2.5.4 Calculate the coupling temperature as per 2.5.2 Repeat calculation until the coupling temperature agrees with the correction factors for torsional stiffness and dynamic magnifier used in the calculation.

2.6 Temperature Correction Factor - Si-70



2.7 Dynamic Magnifier Correction Factor

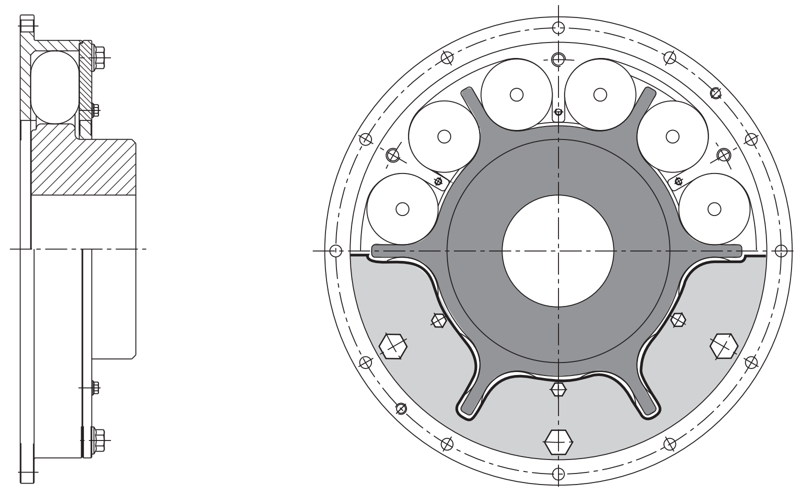
The Dynamic Magnifier of the rubber is subject to temperature variation in the same way as the torsional stiffness.

$$M_T = \frac{M_{86}}{S_t} \qquad \psi_T = \psi_{86} \times S_t$$

Rubber Grade	Dynamic Magnifier (M_{86})	Relative Damping ψ_{86}
Si 70	7.5	0.83
Si 70 is considered "standard"		

HTB Technical Data

End view



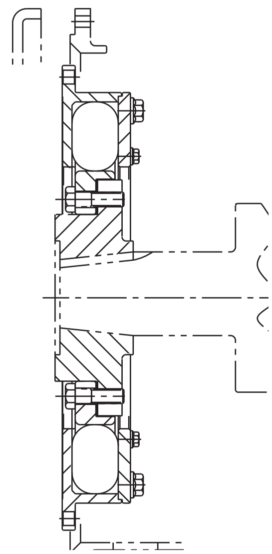
Dimensions, Weight, Inertia and Alignment

COUPLING SIZE	1200		3000		4500		6000		10000	12000		20000	40000
	SAE11.5	SAE14	SAE14	SAE18	SAE14	SAE18	SAE18	SAE21	SAE21	SAE18	SAE21	SAE21	SAE21
Nominal Torque T_{KN} (ft.lb)	885	885	2213	2213	3319	3319	4425	4425	7376	8851	8851	14751	29,500
Maximum Torque T_{KMAX} (ft.lb)	2655	2655	6638	6638	9957	9957	13276	13276	22127	26552	26552	44254	88,500
Vibratory Torque T_{KW} (ft.lb)	295	295	738	738	1106	1106	1475	1475	2434	2950	2950	4868	9,832
Stiffness C_{Tdyn} (lb.in/radx10^6)													
10% Nominal Torque	0.027	0.027	0.071	0.071	0.106	0.106	0.133	0.133	0.239	0.266	0.266	0.478	1.036
25% Nominal Torque	0.071	0.071	0.186	0.186	0.283	0.283	0.354	0.354	0.637	0.708	0.708	1.266	2.744
50% Nominal Torque	0.195	0.195	0.496	0.496	0.761	0.735	0.929	0.929	1.664	1.859	1.859	3.328	7.249
75% Nominal Torque	0.381	0.381	0.965	0.965	1.434	1.434	1.814	1.814	3.248	3.629	3.629	6.496	14.135
100% Nominal Torque	0.655	0.655	1.575	1.575	2.345	2.345	2.965	2.965	5.310	5.930	5.930	10.621	23.092
Allowable Heat Loading @ 86°F (W)	430	430	600	600	760	760	735	735	900	1150	1150	1425	1800
Dynamic Magnifier (M)	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Maximum Speed (RPM)	3730	2820	2820	2300	2820	2300	2300	1950	1950	2300	1950	1950	1500
Radial Stiffness (lb/in x 10^3):													
@ No Load	2.969	2.969	4.054	4.054	5.995	5.995	5.139	5.139	5.938	10.278	10.278	11.877	13.875
@ T_{KN}	9.450	9.450	12.990	12.990	19.185	19.185	16.416	16.416	18.985	32.775	32.775	37.914	44.252
Axial Stiffness (lb/in x 10^3):													
@ No Load	1.113	1.113	1.570	1.570	2.941	2.941	1.970	1.970	2.370	5.596	5.596	6.566	15.132
@ T_{KN}	4.796	4.796	6.738	6.738	12.619	12.619	8.508	8.508	10.221	24.153	24.153	27.236	48.875

HTB Design Variations

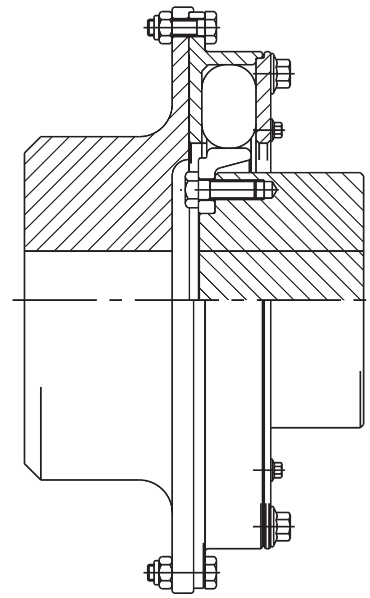
The HTB coupling can be adapted to meet customer requirements, as can be seen from some of the design variations below. For a more comprehensive list contact Renold Hi-Tec.

Coupling to Suit Existing Hub



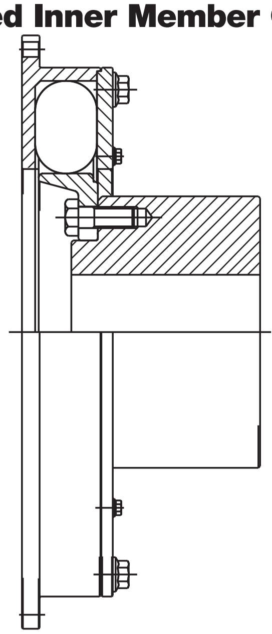
Existing hub fitment. Coupling inner member designed to suit existing hub design.

Shaft to Shaft Coupling



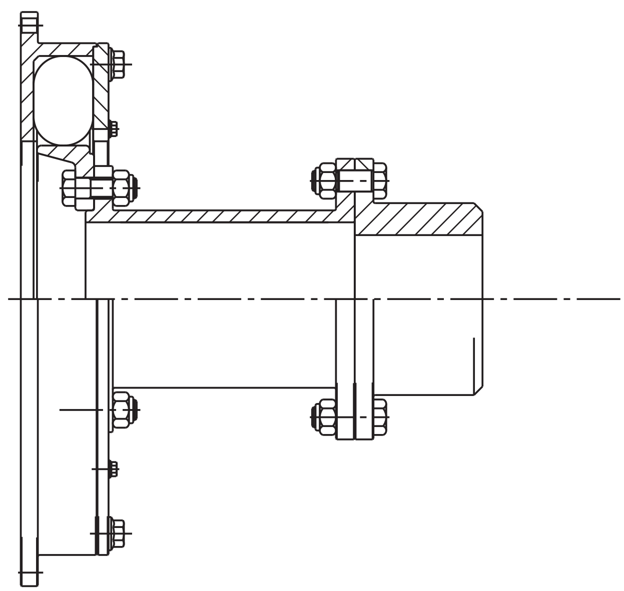
Shaft to Shaft Coupling. Designed for use on electric motor drives and power take off applications.

Reversed Inner Member Coupling



Coupling with reversed inner member to increase distance between flywheel face and shaft end.

Spacer Coupling



Spacer coupling. Used to increase the distance between shaft ends and allow easy access to driven and driving machine.

RB Range

RENOLD

Hi-Tec Couplings

The Complete Solution

RB Flexible Coupling

General purpose, cost effective coupling range manufactured from SG iron for torques up to 30,240 lb-ft.

Standard Coupling Arrangements

- Shaft to shaft
- Shaft to shaft with increased shaft engagement
- Flywheel to shaft
- Flywheel to shaft with increased shaft engagement

Applications

- Generator sets
- Pump sets
- Compressors
- Wind turbines
- Metal manufacture
- Bulk handling
- Pulp and paper industry
- Marine propulsion
- General heavy duty industrial applications

Features

- Intrinsically fail safe
- Control of resonant torsional vibration
- Maintenance free
- Severe shock load protection
- Misalignment capability
- Zero backlash
- Low cost
- Selection of Rubber

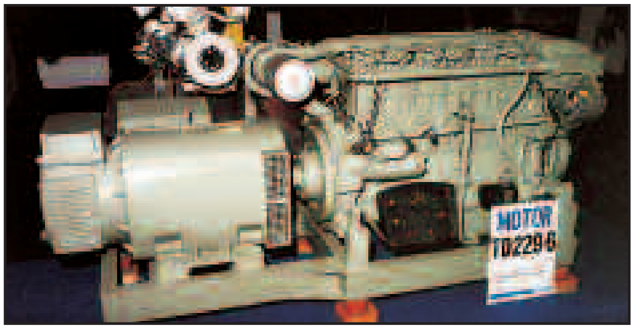
Benefits

- Ensures continuous operation of the driveline in the unlikely event of rubber damage.
- Achieves low vibratory loads in the driveline components by selection of optimum stiffness characteristics.
- No lubrication or adjustment required resulting in low running costs.
- Avoids failure of the driveline under short circuit and other transient conditions.
- Allows axial, angular and radial misalignments between the driving and driven machines.
- Eliminates torque amplifications through pre-compression of the rubber elements.
- The RB coupling gives the lowest lifetime cost.
- Variety of rubber materials and hardness are available for optimum reduction of drive vibration and maximun block life.

Construction details

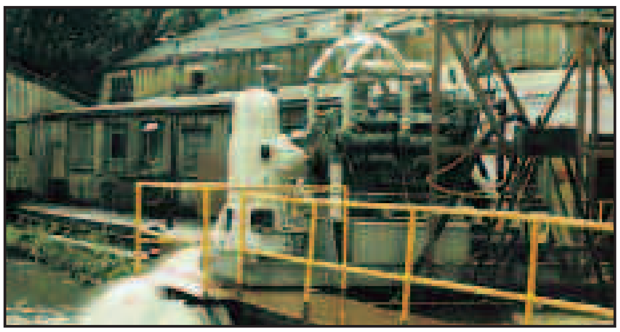
- Spheroidal graphite iron to BS 2789 Grade 420/12
- Separate rubber elements with a choice of grade and hardness, styrene butadiene with 70 shore hardness (SM70) is standard.
- Rubber elements which are totally enclosed and loaded in compression.

RB Typical Applications



RB 0.24 flywheel mounted coupling on a Deutz TD 229 - 6 diesel generator set in Spain.

RB 0.37 flywheel mounted coupling on an ADE - HML ground power unit.

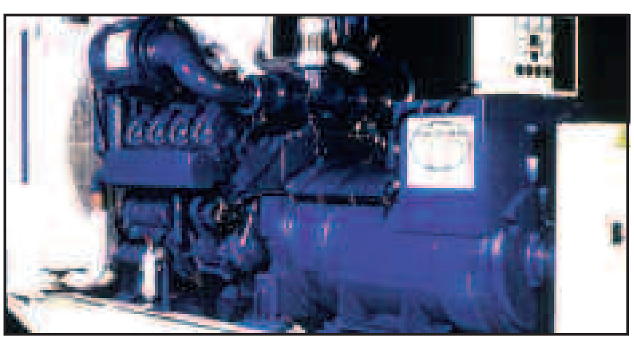


RB 2.15 flywheel mounted coupling on a Detroit Diesel driven Peerless pump

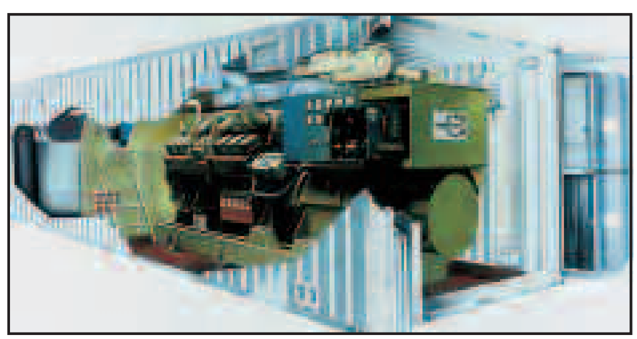
RB 0.73 flywheel mounted coupling on a diesel engine driven Weir pump.

RB 2.15 shaft to shaft coupling on a Howden Donkin blower.

RB 0.73 Cardan shaft and RB 0.73 shaft to shaft couplings with long boss inner members on wind turbines in the Netherlands.



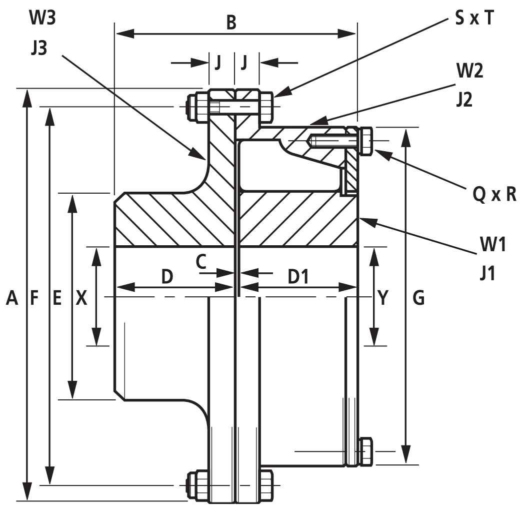
RB 1.15 flywheel mounted coupling on an FG Wilson diesel generator set.



RB 3.86 flywheel mounted coupling on an Aggreko rental diesel generator set.

RB Shaft to Shaft

Rigid half / Flex half



Features

- Can accommodate a wide range of shaft diameters
- Easy disconnection of the outer member and driving flange
- Coupling available with limited end float

Benefits

- Allows the optimum coupling to be selected
- Allows the driving and driven machines to be disconnected
- Provides axial location for motors with sleeve bearings

Dimensions, Weight, Inertia and Alignment

COUPLING SIZE		0.12	0.2	0.24	0.37	0.73	1.15	2.15	3.86	5.5
DIMENSIONS (inch)	A	7.87	8.75	9.37	10.25	12.13	14.13	18.37	20.00	22.5
	B	4.13	4.38	4.87	5.37	6.87	7.63	9.19	10.25	11.25
	C	0.13	0.13	0.13	0.13	0.13	0.13	0.19	0.25	0.25
	D	2.00	2.13	2.37	2.63	3.37	3.75	4.50	5.00	5.50
	D1	2.00	2.13	2.37	2.63	3.37	3.75	4.50	5.00	5.50
	E	3.13	3.75	4.00	4.75	6.00	7.25	8.75	11.00	13.00
	F	7.00	7.87	8.37	9.25	11.00	12.75	17.25	18.50	21.375
	G	6.16	7.01	7.34	8.27	9.88	11.61	14.25	17.13	19.74
	J	0.50	0.56	0.63	0.69	0.75	0.75	0.75	0.87	1.00
	Q (QTY)	5	6	6	6	6	6	6	7	8
	R	M8	M8	M8	M10	M10	M12	M12	M12	M12
	S (QTY)	6	6	6	8	8	10	16	12	12
	T	M8	M8	M10	M10	M12	M12	M12	M16	M16
	MAX. X	1.97	2.36	2.56	3.15	3.74	4.53	5.51	6.69	8.27
	MAX. Y	2.17	2.76	2.95	3.35	3.74	4.53	5.51	6.69	8.27
	MIN. X & Y	1.18	1.38	1.57	1.57	2.17	2.17	2.76	3.15	3.54
RUBBER ELEMENTS	Per Cavity	1	1	1	1	1	1	1	1	1
	Per Coupling	10	12	12	12	12	12	12	14	16
MAXIMUM SPEED	(rpm)(1)	5250	4725	4410	4035	3410	2925	2250	2070	1820
WEIGHT (3) (lb)	W1	6.2	8.9	11.7	16.5	28.3	51.6	79.1	138.5	225.1
	W2	8.8	11.1	14.1	17.9	29.3	40.6	74.9	96.7	130.1
	W3	9.0	12.8	16.4	23.0	39.7	60.3	104.6	166.2	249.8
	TOTAL	24.0	32.8	42.2	57.4	97.3	152.5	258.6	401.4	605
INERTIA (3) ($lb.in^2$)	J1	15	28	44	79	192	478	1102	2900	6708
	J2	79	128	186	303	683	1255	3770	6547	11751
	J3	52	92	135	220	504	977	2733	5166	10181
ALLOWABLE MISALIGNMENT (2)										
RADIAL (inch)		0.03	0.03	0.03	0.03	0.04	0.06	0.06	0.06	0.06
AXIAL (inch) ±		0.06	0.06	0.06	0.06	0.06	0.06	0.08	0.12	0.12
CONICAL (degree)		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

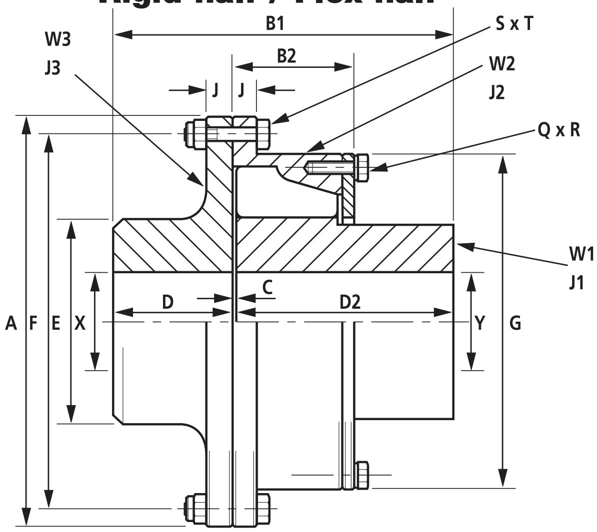
(1) For operation above 80% of the declared maximum coupling speed, it is recommended that the coupling be dynamically balanced.

(2) Installations should be initially aligned as accurately as possible. In order to allow for deterioration in alignment over time, it is recommended that initial alignment should not exceed 25% of the above noted data. The forces on the driving and driven machinery should be calculated to ensure that they do not exceed the manufacturers allowables.

(3) Weights and inertias are based on the minimum bore size.

RB Shaft to Shaft with Increased Shaft Engagement

Rigid half / Flex half



Features

- Long boss inner member

Benefits

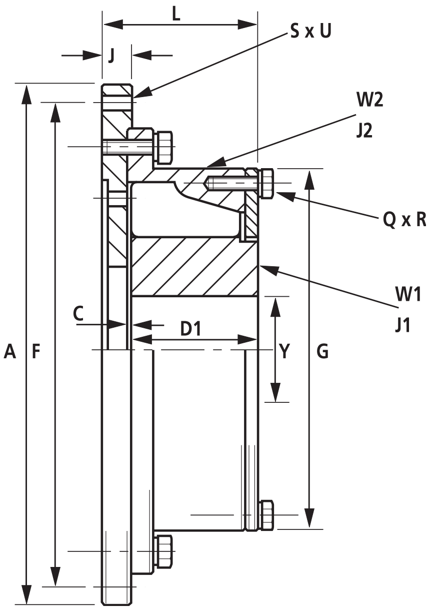
- Allows small diameter, long length shafts to be used
- Reduces key stress
- Allows increased distances between shaft ends
- Full shaft engagement avoids the need for spacer collars

Dimensions, Weight, Inertia and Alignment

COUPLING SIZE		0.12	0.2	0.24	0.37	0.73	1.15	2.15	3.86	5.5
DIMENSIONS (inch)	A	7.87	8.75	9.37	10.25	12.13	14.13	18.37	20.00	22.50
	B1	5.47	5.99	6.83	7.48	9.21	10.57	12.17	13.52	15.20
	B2	2.13	2.25	2.50	2.75	3.50	3.87	4.69	5.25	5.75
	C	0.13	0.13	0.13	0.13	0.13	0.13	0.19	0.25	0.25
	D	2.00	2.13	2.37	2.63	3.37	3.75	4.50	5.00	5.50
	D2	3.35	3.74	4.33	4.72	5.71	6.69	7.48	8.27	9.45
	E	3.13	3.75	4.00	4.75	6.00	7.25	8.75	11.00	13.00
	F	7.00	7.87	8.37	9.25	11.00	12.75	17.25	18.50	21.375
	G	6.16	7.01	7.34	8.27	9.88	11.61	14.25	17.13	19.74
	J	0.50	0.56	0.63	0.69	0.75	0.75	0.75	0.87	1.00
	Q (QTY)	5	6	6	6	6	6	6	7	8
	R	M8	M8	M8	M10	M10	M12	M12	M12	M12
	S (QTY)	6	6	6	8	8	10	16	12	12
	T	M8	M8	M10	M10	M12	M12	M12	M16	M16
	MAX. X	1.97	2.36	2.56	3.15	3.74	4.53	5.51	6.69	8.27
	MAX. Y	2.17	2.76	2.95	3.35	3.74	4.53	5.51	6.69	8.27
	MIN. X & Y	1.18	1.38	1.57	1.57	2.17	2.17	2.76	3.15	3.54
RUBBER ELEMENTS	PER CAVITY	1	1	1	1	1	1	1	1	1
	PER COUPLING	10	12	12	12	12	12	12	14	16
MAXIMUM SPEED	(rpm)(1)	5250	4725	4410	4035	3410	2925	2250	2070	1820
WEIGHT (3) (lb)	W1	9.3	14.2	19.1	26.1	42.8	77.8	118.6	210.5	358.9
	W2	8.8	11.1	14.1	17.9	29.3	40.6	74.9	96.7	130.1
	W3	9.0	12.8	16.4	23.0	39.7	60.3	104.6	166.2	249.8
	TOTAL	27.1	38.1	49.6	67	111.8	178.7	298.1	473.4	738.8
INERTIA (3) (lb.in^2)	J1	20	41	65	111	263	647	1485	4043	9893
	J2	79	128	186	303	683	1255	3770	6547	11751
	J3	52	92	135	220	504	977	2733	5166	10181
ALLOWABLE MISALIGNMENT (2)										
RADIAL (inch)		0.03	0.03	0.03	0.03	0.04	0.06	0.06	0.06	0.06
AXIAL (inch) ±		0.06	0.06	0.06	0.06	0.06	0.06	0.08	0.12	0.12
CONICAL (degree)		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

RB SAE Flywheel to Shaft

0.24 to 1.15



Features

- Wide range of adaptor plates
- Choice of rubber compound and hardness
- Short axial length

Benefits

- Allows the coupling to be adapted to suit most engine flywheels
- Allows control of the torsional vibration system
- Allows the coupling to fit in bell housed applications

Dimensions, Weight, Inertia and Alignment

COUPLING SIZE		0.24		0.37		0.73		1.15	
		SAE 10	SAE 11.5	SAE 11.5	SAE 14	SAE 11.5	SAE 14	SAE 14	SAE 18
DIMENSIONS (inch)	A	12.375	13.875	13.875	18.375	13.875	18.375	18.375	22.50
	C	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
	D1	2.37	2.38	2.63	2.63	3.37	3.37	3.75	3.75
	F	11.625	13.125	13.125	17.25	13.125	17.25	17.25	21.375
	G	7.34	7.34	8.27	8.27	9.88	9.88	11.61	11.61
	J	0.79	0.79	0.79	0.79	0.79	0.79	0.79	1.10
	L	3.13	3.13	3.38	3.38	4.13	4.13	4.50	4.82
	Q (QTY)	6	6	6	6	6	6	6	6
	R	M8	M8	M10	M10	M10	M10	M12	M12
	S (QTY)	8	8	8	8	8	8	8	6
	U	0.41	0.41	0.41	0.53	0.41	0.53	0.53	0.66
	MAX. Y	2.95	2.95	3.35	3.35	3.74	3.74	4.53	4.53
	MIN. Y	1.57	1.57	1.57	1.57	2.17	2.17	2.17	2.17
RUBBER ELEMENTS	Per Cavity	1	1	1	1	1	1	1	1
	Per Coupling	12	12	12	12	12	12	12	12
MAXIMUM SPEED (rpm) (1)		3710	3305	3305	2500	3310	2500	2500	2040
WEIGHT (3) (lb)	W1	11.7	11.7	16.5	16.5	28.3	28.3	51.6	51.6
	W2	34.6	37.7	44.0	63.4	52.9	77.8	86.0	134.5
	TOTAL	46.3	49.4	60.5	79.9	81.2	106.1	137.6	186.1
INERTIA (3) (lb.in^2)	J1	44	44	79	79	192	192	478	478
	J2	656	870	1054	2558	1366	3041	3510	8192
ALLOWABLE MISALIGNMENT (2)									
RADIAL (inch)		0.03	0.03	0.03	0.03	0.04	0.04	0.06	0.06
AXIAL (inch) ±		0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
CONICAL (degree)		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

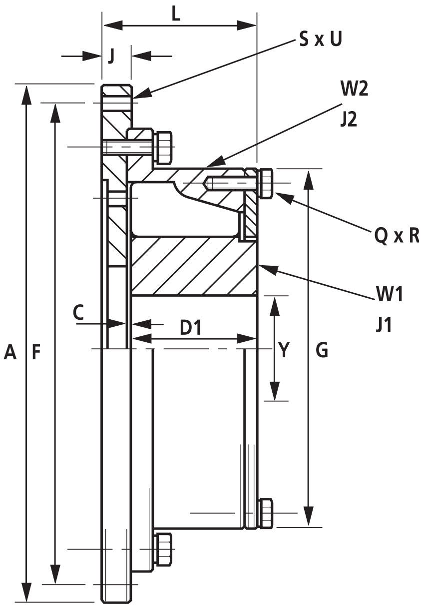
(1) For operation above 80% of the declared maximum coupling speed, it is recommended that the coupling be dynamically balanced.

(2) Installations should be initially aligned as accurately as possible. In order to allow for deterioration in alignment over time, it is recommended that initial alignment should not exceed 25% of the above noted data. The forces on the driving and driven machinery should be calculated to ensure that they do not exceed the manufacturers allowables.

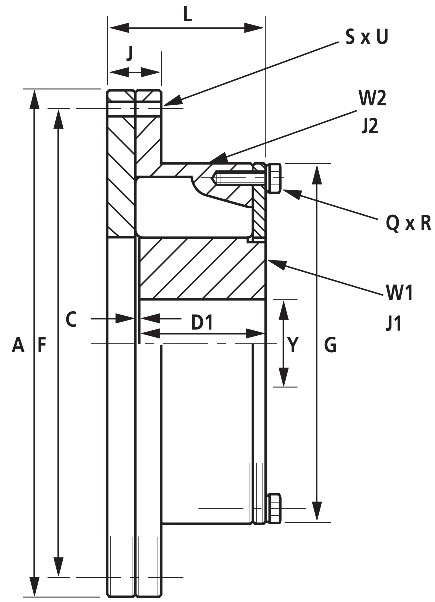
(3) Weights and inertias are based on the minimum bore size.

RB SAE Flywheel to Shaft

2.15 - 5.5



Keep Plate (2.15 SAE 14 and 5.5 SAE 18)



Dimensions, Weight, Inertia and Alignment

COUPLING SIZE		2.15			3.86			5.5		
		SAE 14	SAE 18	SAE 21	SAE 18	SAE 21	SAE 24	SAE 18	SAE 21	SAE 24
DIMENSIONS (inch)	A	18.375	22.50	26.50	22.50	26.50	28.875	22.50	26.50	28.875
	C	0.19	0.19	0.19	0.25	0.25	0.25	0.25	0.25	0.25
	D1	4.50	4.50	4.50	5.00	5.00	5.00	5.50	5.50	5.50
	F	17.25	21.375	25.25	21.375	25.25	27.25	21.375	25.25	27.25
	G	14.25	14.25	14.25	17.13	17.13	17.13	19.74	19.74	19.74
	J	1.38	1.10	1.10	1.10	1.22	1.22	1.63	1.10	1.22
	L	5.32	5.63	5.63	6.20	6.32	6.32	6.38	6.69	6.81
	Q (QTY)	6	6	6	7	7	7	8	8	8
	R	M12	M12	M12	M12	M12	M12	M12	M12	M12
	S (QTY)	8	6	12	6	12	12	12	12	12
	U	0.52	0.66	0.66	0.66	0.66	0.87	0.68	0.67	0.87
	MAX. Y	5.51	5.51	5.51	6.69	6.69	6.69	8.27	8.27	8.27
	MIN. Y	2.76	2.76	2.76	3.15	3.15	3.15	3.54	3.54	3.54
RUBBER ELEMENTS	Per Cavity	1	1	1	1	1	1	1	1	1
	Per Coupling	12	12	12	14	14	14	16	16	16
MAXIMUM SPEED (rpm)(1)		2500	2040	1800	2040	1800	1590	2040	1800	1590
WEIGHT (3) (lb)	W1	79.1	79.1	79.1	138.5	138.5	138.5	225.1	225.1	225.1
	W2	111.2	174.5	203.2	190.6	243.3	265.3	174.5	258.4	298.6
	TOTAL	190.3	253.6	282.3	329.1	381.8	403.8	399.6	483.5	523.7
INERTIA (3) (lb.in^2)	J1	1102	1102	1102	2900	2900	2900	6708	6708	6708
	J2	5650	11254	17063	13484	22095	27836	15610	25044	33040
ALLOWABLE MISALIGNMENT (2)										
RADIAL (inch)		0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
AXIAL (inch) ±		0.08	0.08	0.08	0.12	0.12	0.12	0.12	0.12	0.12
CONICAL (degree)		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

(1) For operation above 80% of the declared maximum coupling speed, it is recommended that the coupling be dynamically balanced.

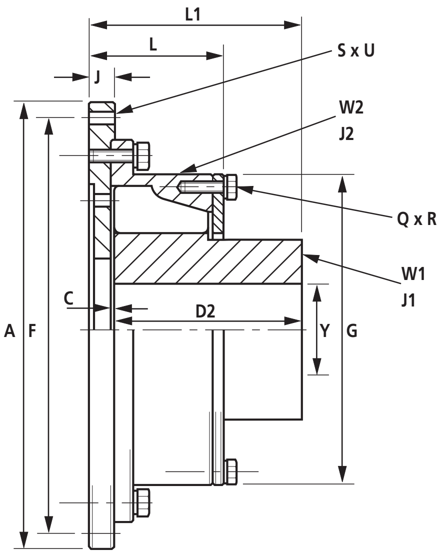
(2) Installations should be initially aligned as accurately as possible. In order to allow for deterioration in alignment over time, it is recommended that initial alignment should not exceed 25% of the above noted data. The forces on the driving and driven machinery should be calculated to ensure that they do not exceed the manufacturers allowables.

(3) Weights and inertias are based on the minimum bore size.

RENOLD Hi-Tec Couplings

RB SAE Flywheel to Shaft with Increased Shaft Engagement

0.24 - 1.15



Features

- Long boss inner members

Benefits

- Allows small diameter long length shafts to be used
- Reduces key stress
- Allows increased distance between shaft end and flywheel
- Full shaft engagement avoids the need for spacer collars

Dimensions, Weight, Inertia and Alignment

COUPLING SIZE		0.24		0.37		0.73		1.15	
		SAE 10	SAE 11.5	SAE 11.5	SAE 14	SAE 11.5	SAE 14	SAE 14	SAE 18
DIMENSIONS (inch)	A	12.375	13.875	13.875	18.375	13.875	18.375	18.375	22.50
	C	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
	D2	4.33	4.33	4.72	4.72	5.71	5.71	6.69	6.69
	F	11.625	13.125	13.125	17.25	13.125	17.25	17.25	21.375
	G	7.34	7.34	8.27	8.27	9.88	9.88	11.61	11.61
	J	0.79	0.79	0.79	0.79	0.79	0.79	0.79	1.10
	L	3.13	3.13	3.38	3.38	4.13	4.13	4.50	4.82
	L1	5.09	5.09	5.48	5.48	6.46	6.46	7.45	7.76
	Q (QTY)	6	6	6	6	6	6	6	6
	R	M8	M8	M10	M10	M10	M10	M12	M12
	S (QTY)	8	8	8	8	8	8	8	6
	U	0.41	0.41	0.41	0.53	0.41	0.53	0.53	0.66
	MAX. Y	2.95	2.95	3.35	3.35	3.74	3.74	4.53	4.53
	MIN. Y	1.57	1.57	1.57	1.57	2.17	2.17	2.17	2.17
RUBBER ELEMENTS	PER CAVITY	1	1	1	1	1	1	1	1
	PER COUPLING	12	12	12	12	12	12	12	12
MAXIMUM SPEED (rpm)(1)		3710	3305	3305	2500	3305	2500	2500	2040
WEIGHT (3) (lb)	W1	19.1	19.1	26.1	26.1	42.8	42.8	77.8	77.8
	W2	34.6	37.7	44.0	63.4	52.9	77.8	86.0	134.5
	TOTAL	53.7	56.8	70.1	89.5	95.7	120.6	163.8	212.3
INERTIA (3) ($lb.in^2$)	J1	65	65	111	111	263	263	647	647
	J2	656	870	1054	2558	1366	3041	3510	8192
ALLOWABLE MISALIGNMENT (2)									
RADIAL (inch)		0.03	0.03	0.03	0.03	0.04	0.04	0.06	0.06
AXIAL (inch) ±		0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
CONICAL (degree)		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

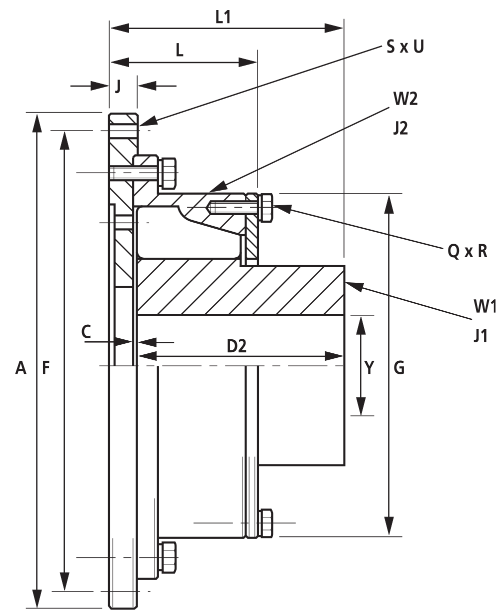
(1) For operation above 80% of the declared maximum coupling speed, it is recommended that the coupling be dynamically balanced.

(2) Installations should be initially aligned as accurately as possible. In order to allow for deterioration in alignment over time, it is recommended that initial alignment should not exceed 25% of the above noted data. The forces on the driving and driven machinery should be calculated to ensure that they do not exceed the manufacturers allowables.

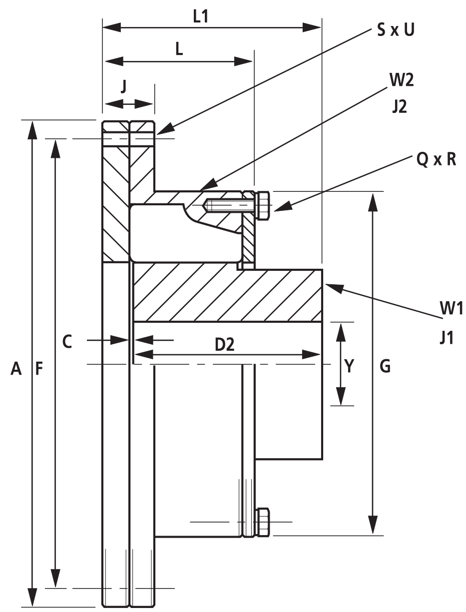
(3) Weights and inertias are based on the minimum bore size.

RB SAE Flywheel to Shaft with Increased Shaft Engagement

2.15 - 5.5



Keep Plate (2.15 SAE 14 and 5.5 SAE 18)



Dimensions, Weight, Inertia and Alignment

COUPLING SIZE		2.15			3.86			5.5		
		SAE 14	SAE 18	SAE 21	SAE 18	SAE 21	SAE 24	SAE 18	SAE 21	SAE 24
DIMENSIONS (inch)	A	18.375	22.50	26.50	22.50	26.50	28.875	22.50	26.50	28.875
	C	0.19	0.19	0.19	0.25	0.25	0.25	0.25	0.25	0.25
	D2	7.48	7.48	7.48	8.27	8.27	8.27	9.45	9.45	9.45
	F	17.25	21.375	25.25	21.375	25.25	27.25	21.375	25.25	27.25
	G	14.25	14.25	14.25	17.13	17.13	17.13	19.74	19.74	19.74
	J	1.38	1.10	1.10	1.10	1.22	1.22	1.63	1.10	1.22
	L	5.32	5.63	5.63	6.20	6.32	6.32	6.38	6.69	6.81
	L1	8.30	8.66	8.66	9.47	9.59	9.59	10.34	10.69	10.77
	Q (QTY)	6	6	6	7	7	7	8	8	8
	R	M12	M12	M12	M12	M12	M12	M12	M12	M12
	S (QTY)	8	6	12	6	12	12	12	12	12
	U	0.53	0.66	0.66	0.66	0.66	0.87	0.68	0.67	0.87
	MAX. Y	5.51	5.51	5.51	6.69	6.69	6.69	8.27	8.27	8.27
	MIN. Y	2.76	2.76	2.76	3.15	3.15	3.15	3.54	3.54	3.54
RUBBER ELEMENTS	Per Cavity	1	1	1	1	1	1	1	1	1
	Per Coupling	12	12	12	14	14	14	16	16	16
MAXIMUM SPEED (rpm)	(1)	2500	2040	1800	2040	1800	1590	2040	1800	1590
WEIGHT (3) (lb)	W1	118.6	118.6	118.6	210.5	210.5	210.5	358.9	358.9	358.9
	W2	111.2	174.5	203.2	190.6	243.3	265.3	174.5	258.4	298.6
	TOTAL	229.8	293.1	321.8	401.1	453.8	475.8	533.4	617.3	657.5
INERTIA (3) ($lb.in^2$)	J1	1485	1485	1485	4043	4043	4043	9893	9893	9893
	J2	5650	11254	17063	13484	22095	27836	15610	25044	33040
ALLOWABLE MISALIGNMENT (2)										
RADIAL (inch)		0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
AXIAL (inch) ±		0.08	0.08	0.08	0.12	0.12	0.12	0.12	0.12	0.12
CONICAL (degree)		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

RB Technical Data

1.1 Diesel Engine Drives

The RB coupling is selected using the "nominal torque (T_{KN})" without service factors for diesel drive applications.

The full torque capacity of the coupling for transient vibration while passing through major criticals on run up is published as the maximum torque (T_{KMAX}). (T_{KMAX} = 3 x T_{KN}).

There is an additional torque capacity built into the coupling for short circuit and shock torques equal to 3 x T_{KMAX}.

The published "Vibratory torque (T_{KW})" is a fatigue function according to DIN740 and not significant in diesel engine drives. The vibratory torque values shown in the Technical Data are at the frequency of 10Hz. The measure used for acceptability of the coupling under vibratory torque is heat dissipation of the rubber elements. The maximum allowable heat dissipation shown in the Technical Data is at a 86°F ambient temperature.

1.2 Industrial Drives

For industrial electrical motor applications, refer to the "Selection Procedure" and base the selection on TKmax with the appropriate service factors.

The service factors used in the "Selection Procedure" are based upon 40 years experience of drives and their shock frequency/amplitude. The stated T_{KMAX} quoted should not be exceeded by design without reference to Renold Hi-Tec Couplings.

Care needs to be taken in the design of couplings with shaft brakes to ensure the coupling torques are not increased by severe deceleration.

2.0 Stiffness Properties

The Renold Hi-Tec coupling remains fully flexible under all torque conditions because of its non-bonded "Rubber-in-Compression" style of design.

2.1 Axial Stiffness

When subject to misalignment forces in the axial direction, the coupling will have an axial resistance which gradually reduces due to the effect of vibratory torques.

Given sufficient axial force as shown in the catalog, the coupling will slip to its new position immediately.

2.2 Radial Stiffness

The radial stiffness of the coupling is torque dependent, and is as shown in the "Technical Data".

2.3 Torsional Stiffness

The torsional stiffness of the coupling is dependent upon applied torque (see "Technical Data") and temperature.

2.4 Prediction of the System Torsional Vibration Characteristics

An adequate prediction of the system torsional vibration characteristics can be made by the following method.

2.4.1 Use the torsional stiffness as published in the catalog (K_{86}) which is based upon data measured at a 86°F ambient temperature.

2.4.2 Repeat the calculation made in 2.4.1, but use the maximum temperature correction factor St_{212} and M_{212} for the rubber selected for both torsional stiffness and dynamic magnifier from the tables.

$$K_{212} = K_{86} \times St_{212}$$

2.4.3 Review the calculations 2.4.1 and 2.4.2. If the speed range is clear of criticals which do not exceed the allowable heat dissipation value as published in the catalog, then the coupling is considered suitable for the application with respect to the torsional vibration characteristics. If there is a critical in the speed range, the actual temperature of the coupling will need to be calculated at this speed.

RB Technical Data

Rubber Grade	$Temp_{max}$	S_t
SM 60	212	$St_{212} = 0.75$
SM 70	212	$St_{212} = 0.63$
SM 80	212	$St_{212} = 0.58$
SM 70 is considered "standard"		

Rubber Grade	Dynamic Magnifier at 86ºF (M_{86})	Dynamic Magnifier at 212ºF (M_{212})
SM 60	8	10.7
SM 70	6	9.5
SM 80	4	6.9
SM 70 is considered "standard"		

2.5 Prediction of the Actual Coupling Temperature and Torsional Stiffness

2.5.1 Use the torsional stiffness as published in the catalog (K_{86}), which is based upon data measured at 86˚F and the dynamic magnifier (M_{86}) at 86˚F.

2.5.2 Compare the synthesis value of the calculated heat load in the coupling (PK) at the speed of interest to the "Allowable Heat Dissipation (PKW)."

The coupling temperature rise = ΔF

$$\Delta F = Temp_{coup} = \left(\frac{P_K}{P_{KW}}\right) \times 126$$

The coupling temperature = ϑ

$$\vartheta = Temp_{coup} + \text{Ambient Temp.}$$

2.5.3 Calculate the temperature correction factor (S_t) from 2.6 (if the coupling temperature > 212°F, then use S_{t212}). Calculate the dynamic magnifier as per 2.7. Repeat the calculation with the new value of coupling stiffness (K_T) and dynamic magnifier (M_T).

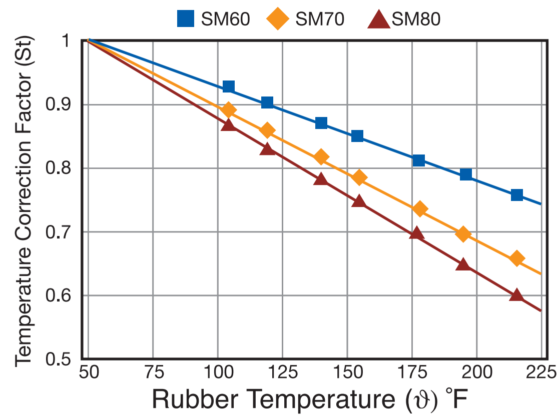
2.5.4 Calculate the coupling temperature as per 2.5. Repeat calculation until the coupling temperature agrees with the correction factors for torsional stiffness and dynamic magnifier used in the calculation.

2.6 Temperature Correction Factor

$$K_T = K_{86} \times S_t$$

2.7 Dynamic Magnifier Correction Factor

The dynamic magnifier of the rubber is subject to temperature variation in the same way as the torsional stiffness.



$$M_T = \frac{M_{86}}{S_t} \qquad \varphi_T = \varphi_{86} \times S_t$$

Rubber Grade	Dynamic Magnifier (M_{86})	Relative Damping φ_{86}
SM 60	8	0.78
SM 70	6	1.05
SM 80	4	1.57
SM 70 is considered "standard"		

RB Technical Data

COUPLING SIZE		0.12	0.2	0.24	0.37	0.73	1.15	2.15	3.86	5.5
NOMINAL TORQUE T_{KN} (lb-ft)		232	356	420	648	1276	2014	3773	6755	9625
MAXIMUM TORQUE T_{KMAX}(lb-ft)		682	1051	1269	1943	3946	5974	11287	20209	30240
HP/rpm		0.13	0.20	0.24	0.37	0.75	1.14	2.15	3.85	5.76
VIBRATORY TORQUE T_{KW} (lb-ft)		90	139	164	252	496	783	1467	2626	3743
ALLOWABLE DISSIPATED	SM 60	90	112	125	140	185	204	246	336	426
HEAT AT 86°F AMBIENT TEMP	SM 70	98	123	138	155	204	224	270	369	465
PKW (W)	SM 80	100	138	154	173	228	250	302	410	520
DYNAMIC TORSIONAL STIFFNESS ($x10^6$ lb-in/rad)										
25% T_{KN}	SM 60	0.062	0.080	0.089	0.142	0.283	0.434	0.823	1.257	1.646
	SM 70	0.097	0.124	0.150	0.230	0.460	0.699	1.328	2.036	2.655
	SM 80	0.142	0.186	0.221	0.345	0.699	1.053	1.991	3.062	4.009
50% T_{KN}	SM 60	0.142	0.186	0.221	0.336	0.690	1.044	1.974	3.036	3.974
	SM 70	0.195	0.248	0.301	0.460	0.929	1.407	2.655	4.071	5.328
	SM 80	0.230	0.292	0.354	0.549	1.106	1.673	3.169	4.859	6.364
75% T_{KN}	SM 60	0.310	0.398	0.478	0.726	1.478	2.239	4.240	6.505	8.514
	SM 70	0.381	0.487	0.584	0.894	1.814	2.744	5.187	7.966	10.426
	SM 80	0.434	0.558	0.673	1.036	2.106	3.186	6.018	9.231	12.090
100% T_{KN}	SM 60	0.504	0.646	0.779	1.186	2.416	3.655	6.904	10.594	13.869
	SM 70	0.584	0.752	0.912	1.390	2.823	4.275	8.072	12.391	16.223
	SM 80	0.690	0.885	1.071	1.637	3.337	5.045	9.532	14.630	19.153
RADIAL STIFFNESS NO LOAD ($x10^3$ lb/in)	SM 60	5.82	7.19	8.19	9.10	12.08	13.19	16.38	21.35	26.99
	SM 70	7.16	8.85	10.07	11.20	14.76	16.24	20.15	26.26	33.17
	SM 80	9.86	12.19	13.87	15.41	20.86	22.35	27.75	36.14	45.72
Radial Stiffness @T_{KN} ($x10^3$ lb/in)	SM 60	11.68	14.48	16.44	18.31	24.26	26.55	33.00	42.94	54.30
	SM 70	12.18	15.06	17.13	19.61	25.10	27.60	34.26	44.65	56.47
	SM 80	13.19	16.30	18.55	20.61	27.89	29.89	37.11	48.33	61.09
AXIAL STIFFNESS NO LOAD ($x10^3$ lb/in)	SM 60	5.88	7.13	7.99	9.13	11.96	13.19	16.27	21.12	26.83
	SM 70	6.281	7.70	8.62	9.76	12.56	14.27	17.70	23.41	29.69
	SM 80	16.78	21.07	23.18	26.38	34.60	38.25	46.93	61.44	77.54
MAX AXIAL FORCE (1) (lb) @T_{KN}	SM 60	243	303	337	382	495	553	674	877	1,124
	SM 70	259	324	360	405	531	584	719	922	1,191
	SM 80	292	360	396	450	584	652	787	1,034	1,304

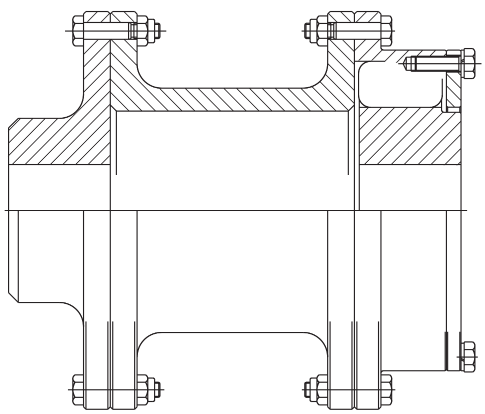
Note. SM70 is supplied as the standard rubber grade. Options of rubber grades SM60 or SM80 are available if these are considered a better solution to a dynamic application problem. It should be noted that for operation above 80% of the declared maximum coupling speed, the coupling should be dynamically balanced.

(1) The Renold Hi-Tec coupling will "slip" axially when the maximum axial force is reached.

RB Design Variations

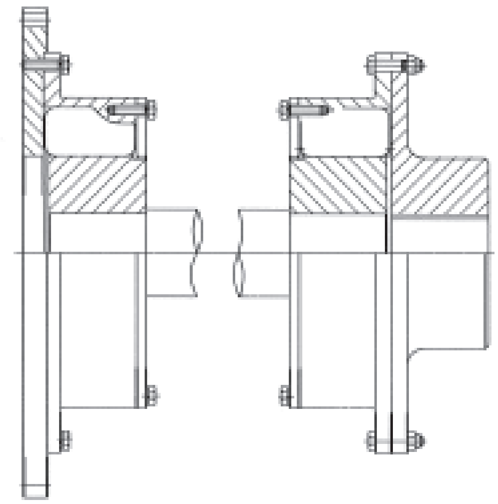
The RB coupling range can be adapted to meet customer needs. Below are some of the arrangements that have been produced. For more a comprehensive list, contact Renold Hi-Tec Couplings.

Spacer Coupling



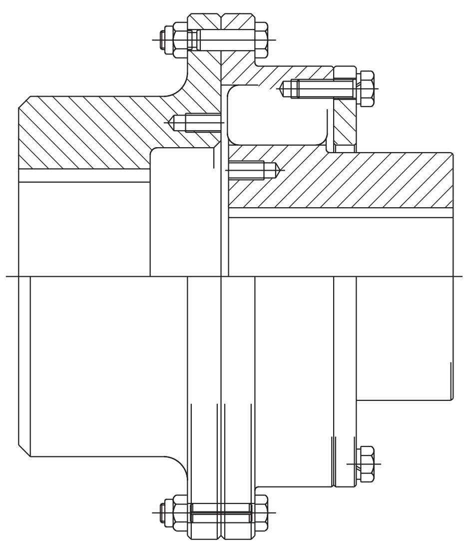
Spacer coupling used to increase the distance between shaft ends and allow easy access to the driven and driving machines.

Cardan Shaft Coupling



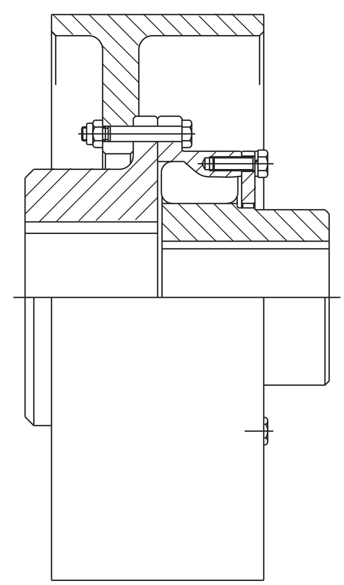
Cardan shaft coupling used to increase the misalignment capability and halve the torsional stiffness.

Coupling with Long Boss Inner Member



Coupling with large boss driving flange and long boss inner member for vertical applications.

Brake Drum Coupling



Coupling with brake drum for use on cranes, fans and conveyor drives.

PM Range

RENOLD

Hi-Tec Couplings

The Complete Solution

PM Flexible Coupling

Heavy duty steel coupling with unlimited torque capacity

Standard Coupling Arrangements

- Shaft to shaft
- Flange to shaft
- Limited end float coupling
- Drop out spacer

Applications

- Metal manufacture
- Mining and mineral processing
- Pumps and compressors
- Fans
- Cranes and hoists
- Pulp and paper industry
- General heavy duty industrial applications

Features

- Severe shock load protection
- Intrinsically fail safe
- Maintenance free
- Vibration control
- Zero backlash
- Misalignment capability
- Selection of Rubber

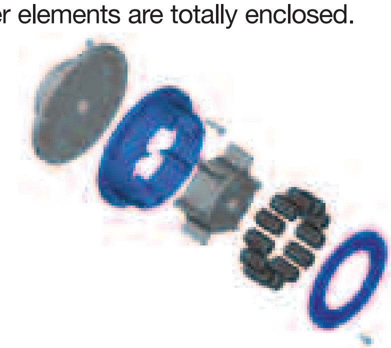
Benefits

- Gives protection and avoids failure of the driveline under high transient torques.
- Ensures continuous operation of the driveline in the unlikely event of rubber failure or damage.
- No lubrication or adjustment required resulting in low running costs.
- Achieves low vibratory loads in the driveline components by selection of optimum stiffness characteristics.
- Eliminates torque amplifications through pre-compression of the rubber elements.
- Allows axial, angular and radial misalignment between the driving and driven machines.
- Variety of rubber materials and hardness are available for optimum reduction of drive vibration and maximum block life

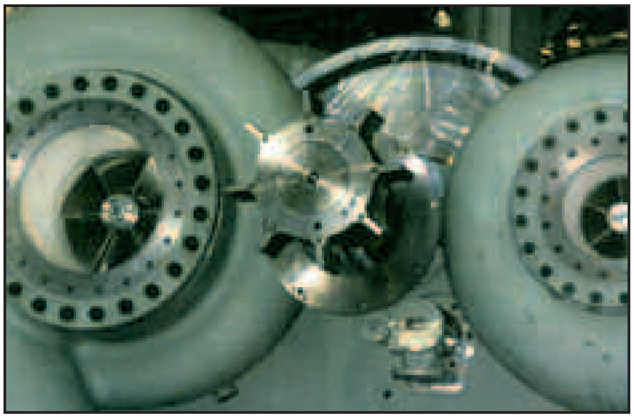
Construction Details

- PM couplings up to and including PM600 are manufactured from steel. Driving flanges up to and including PM60 are steel forgings to BS970 grade 070 M55. Driving flanges PM90 to PM600 and all inner and outer members up to PM600 are steel casting to BS 3100 grade A4.
- PM couplings above PM900 are made from spheroidal graphite iron to BS2789 grade 420/12 unless otherwise specified.
- Separate rubber elements with a choice of grade and hardness, styrene butadiene with 60 shore hardness (SM60) is standard.

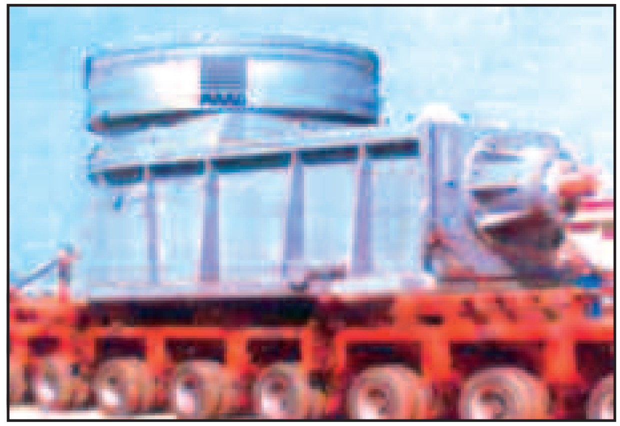
- Rubber elements loaded in compression.
- Rubber elements are totally enclosed.



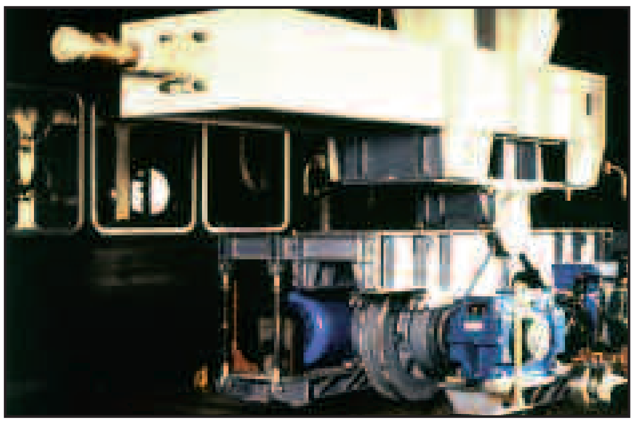
PM Typical Applications



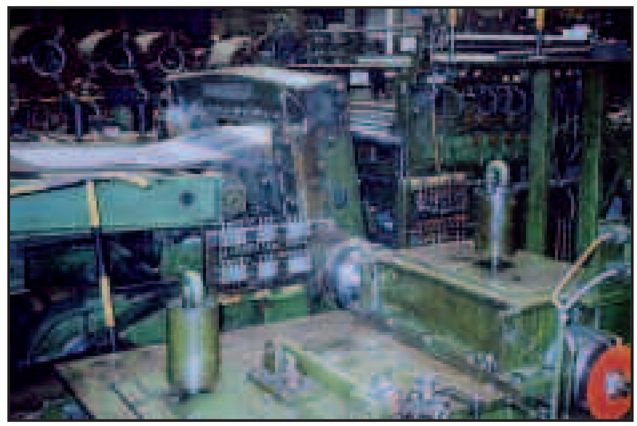
PM 130 spacer coupling on an IHI Turbo compressor in Japan.



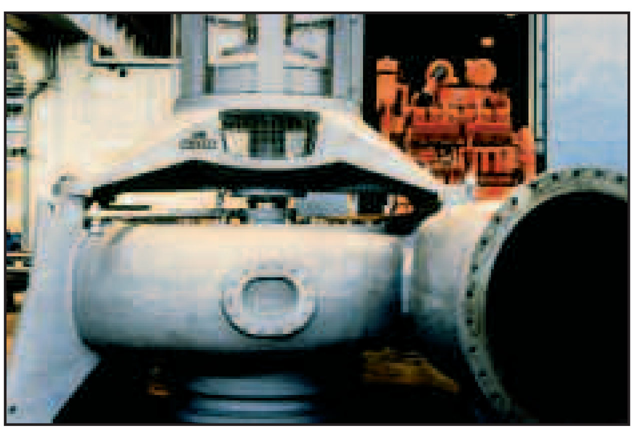
PM 90 coupling fitted between electric motor and Maag gearbox on grinding mills.



PM 0.7 brake drum coupling and a PM 0.7 spacer coupling on a John Henderson coal charging car at CORUS Dawes Lane.



PM 18 and PM 27 coupling on a Hallden-Robertson type 56 flying shear in Portugal.

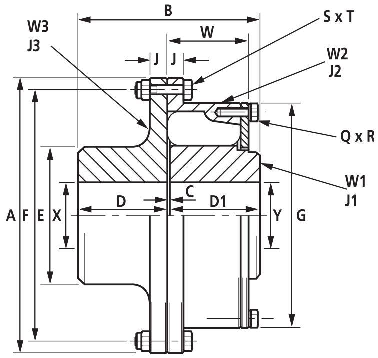


PM 40 spacer coupling, PM 40 LEF coupling and PM 40 cardan shaft couplings on electric motor driven Sulzer pumps in Egypt.

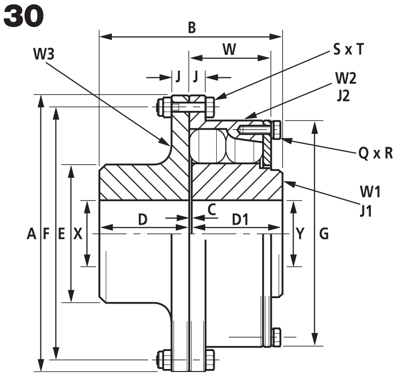
Two PM 600 Couplings on a nickel grinding mill at Leinster in Western Australia.

PM Shaft to Shaft PM 0.4 to PM 130 Data

0.7 - 60



90 - 130



Dimensions, Weight, Inertia and Alignment

COUPLING SIZE		0.4	0.7	1.3	3	6	8	12	18	27	40	60	90	130
DIMENSIONS (inch)	A	6.37	7.37	8.50	10.25	10.24	11.89	13.31	15.43	17.32	19.29	22.36	25.12	28.66
	B	4.06	4.33	5.12	5.63	6.89	7.60	8.72	10.00	11.44	12.95	14.86	17.03	19.17
	C	0.04	0.08	0.08	0.12	0.12	0.12	0.14	0.16	0.18	0.20	0.22	0.26	0.28
	D	2.01	2.13	2.52	2.76	3.39	3.74	4.29	4.92	5.63	6.38	7.32	8.39	9.45
	D1	2.01	2.13	2.52	2.76	3.39	3.74	4.29	4.92	5.63	6.38	7.32	8.39	9.45
	E	2.99	3.62	4.25	4.80	5.31	5.83	6.61	7.68	8.66	9.92	11.42	12.99	14.69
	F	5.75	6.75	7.75	9.25	9.45	10.87	12.28	14.17	16.02	18.03	20.79	23.54	26.77
	G	5.24	6.18	7.13	8.70	8.74	9.65	11.02	12.60	14.45	16.46	18.86	21.57	24.41
	J	0.37	0.43	0.47	0.57	0.43	0.53	0.55	0.63	0.73	0.83	0.94	1.04	1.22
	Q (QTY)	5	5	6	6	8	8	8	8	8	8	8	8	8
	R	M8	M8	M8	M8	M8	M10	M12	M16	M16	M16	M20	M20	M24
	S (QTY)	8	8	8	8	12	12	12	12	12	16	12	16	16
	T	M8	M8	M8	M8	M8	M12	M12	M16	M16	M16	M20	M20	M24
	W	1.42	1.54	1.81	2.36	3.19	3.50	4.02	4.65	5.28	6.01	6.85	7.87	8.90
	MAX. X & Y (4)	1.61	2.01	2.52	2.88	3.35	3.74	4.29	4.93	5.63	6.38	7.33	8.39	9.46
	MIN. X (5)	1.06	1.06	1.38	1.46	1.97	2.44	2.68	3.15	3.55	4.14	4.73	5.52	6.30
	MIN. Y	1.06	1.06	1.46	1.58	1.97	2.17	2.56	2.76	3.35	4.14	4.33	5.52	6.30
RUBBER ELEMENTS	Per Cavity	1	1	1	1	1	1	1	1	1	1	1	2	2
	Per Coupling	10	10	12	12	16	16	16	16	16	16	16	32	32
MAXIMUM SPEED (rpm) (1)		7200	6300	5400	4500	4480	3860	3450	2975	2650	2380	2050	1830	1600
WEIGHT (3) (lb)	W1	4.2	6.2	9.9	15.2	19.6	25.6	39.1	59.5	88.6	131.2	197.2	291.0	421.3
	W2	4.4	6.4	10.1	13.2	14.4	24.1	35.0	54.2	77.9	111.3	171.5	246.8	364.3
	W3	6.2	9.5	14.6	22.0	23.9	33.4	46.8	72.8	105.4	152.8	230.7	334.6	490.3
	TOTAL	14.8	22.0	34.6	50.5	58.0	83.1	120.8	186.5	271.8	395.3	599.4	872.4	1275.8
INERTIA (3) ($lb.in^2$)	J1	6	13	27	62	88	171	345	693	1339	2583	5094	9814	18213
	J2	21	48	165	167	246	509	932	1913	3557	6485	13214	24562	46746
	J3	17	45	85	171	198	396	662	1387	2556	4596	9291	16931	32684
ALLOWABLE MISALIGNMENT (2)														
RADIAL (inch)		0.03	0.03	0.03	0.05	0.06	0.06	0.06	0.06	0.07	0.08	0.09	0.11	0.13
AXIAL (inch) ±		0.03	0.05	0.05	0.05	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.13	0.14
CONICAL (degree)		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

(1) For operation above 80% of the declared maximum coupling speed, it is recommended that the coupling be dynamically balanced.

(2) Installations should be initially aligned as accurately as possible. In order to allow for deterioration in alignment over time, it is recommended that initial alignment should not exceed 25% of the above noted data. The forces on the driving and driven machinery should be calculated to ensure that they do not exceed the manufacturers allowables.

(3) Weights and inertias are calculated with mean bore for couplings up to and including PM600 and with maximum bore for PM900 and above.

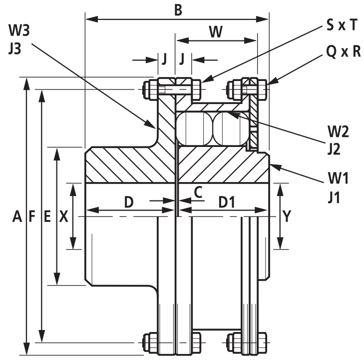
(4) Oversize shafts can be accommodated in large boss driving flanges manufactured to customer's requirements.

(5) PM0.7 - PM3 driving flanges are available with solid bores on request.

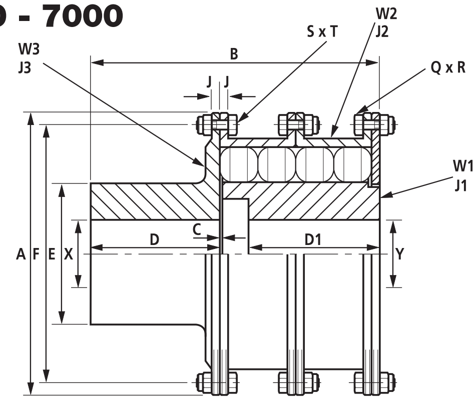
RENOLD Hi-Tec Couplings

PM Shaft to Shaft PM 180 to PM 7000 Data

180 - 600



850 - 7000



Dimensions, Weight, Inertia and Alignment

COUPLING SIZE		180	270	400	600	850	1200	2000	3500	4700	7000
DIMENSIONS (inch)	A	31.42	36.42	41.93	47.05	45	52	62	794	79	79
	B	21.42	24.53	27.97	31.97	32.72	34.21	40.75	49.02	56.97	73.90
	C	0.31	0.35	0.41	0.47	0.25	0.25	0.25	0.5	0.5	0.5
	D	10.55	12.09	13.78	15.75	15.98	16.73	20	20	28	34.4
	D1	10.55	12.09	13.78	15.75	15.98	16.73	20	20	28	34.4
	E	16.34	18.70	21.34	24.41	25.5	30	38	40	48	53.9
	F	29.53	34.06	39.06	44.17	42	458.8	58	74.5	74.5	74.5
	J	1.32	1.42	1.69	2.05	1.75	2	2.5	3	3	3
	Q (QTY)	12	12	12	12	20	20	20	24	24	24
	R	M24	M30	M36	M36	M30	M30	M36	M36	M36	M36
	S (QTY)	20	20	20	24	20	20	20	24	24	24
	T	M24	M30	M36	M36	M36	M36	M45	M48	M48	M48
	W	9.92	11.36	12.91	14.80	16.75	17.5	20.25	20.5	25.3	39.5
	MAX. X&Y (4)	10.55	12.09	13.78	15.75	15.75	18	22	24.1	28	32
	MIN. X	6.57	7.56	9.13	11.23	13.5	15	18	21	24	27
	MIN. Y	6.70	7.68	9.26	11.23	13.5	15	18	21	24	27
RUBBER ELEMENTS	Per Cavity	2	2	2	2	2	3	3	3	4	6
	Per Coupling	32	32	32	32	48	78	84	96	128	192
MAXIMUM SPEED (rpm) (1)		1,460	1,260	1,090	975	1,000	870	725	580	580	580
WEIGHT (3) (lb)	W1	578	858	1,240	1,793	2,337	3,600	5,721	11,603	14,221	19,057
	W2	588	913	1,396	2,004	1,565	2,127	3,684	6,023	8,645	10,794
	W3	656	964	1,436	2,087	2,050	3,062	5,800	9,228	15,864	17,070
	TOTAL	1,822	2,734	4,072	5,884	5,952	8,790	15,205	26,854	38,730	46,921
INERTIA (3) ($lb.in^2 \times 10^3$)	J1	31.23	61.09	116.3	224.0	355.3	756.4	1687	5650	7332	10470
	J2	98.41	202.6	408.3	752.5	560.0	1048	2540	7092	10444	12835
	J3	52.45	102.1	207.3	395.4	358.8	725.3	2008	5011	9013	10004
ALLOWABLE MISALIGNMENT (2)											
RADIAL (inch)		0.14	0.15	0.18	0.20	0.11	0.13	0.13	0.13	0.13	0.13
AXIAL (inch)±		0.16	0.18	0.21	0.24	0.13	0.13	0.19	0.25	0.25	0.25
CONICAL (degree)		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

(1) For operation above 80% of the declared maximum coupling speed, it is recommended that the coupling be dynamically balanced.

(2) Installations should be initially aligned as accurately as possible. In order to allow for deterioration in alignment over time, it is recommended that initial alignment should not exceed 25% of the above noted data. The forces on the driving and driven machinery should be calculated to ensure that they do not exceed the manufacturers allowables.

(3) Weights and inertias are calculated with mean bore for couplings up to and including PM600 and with maximum bore for PM900 and above.

(4) Oversize shafts can be accommodated in large boss driving flanges manufactured to customer's requirements.

PM Technical Data

1.1 Prediction of the System Torsional Vibration Characteristics.

A prediction of the system torsional vibration characteristics can be made by the following method.

1.1.1 Use the torsional stiffness as published in the catalog, (K_{86}) which is based upon data measured at a 86˚F ambient temperature.

1.1.2 Repeat the calculation made in 1.1.1, but use the maximum temperature correction factor St_{212} and M_{212} for the rubber selected for both torsional stiffness and dynamic magnifier from the tables below.

$$K_{212} = K_{86} \times S_{t212}$$

Rubber Grade	$Temp_{max}$	S_t
SM 60	212	$S_{t212} = 0.60$
SM 70	212	$S_{t212} = 0.44$
SM 80	212	$S_{t212} = 0.37$
SM 60 is considered "standard"		

Rubber Grade	Dynamic Magnifier at 86ºF (M_{86})	Dynamic Magnifier at 212ºF (M_{212})
SM 60	8	10.67
SM 70	6	9.53
SM 80	4	6.9
SM 60 is considered "standard"		

1.1.3 Review the calculations 1.1.1 and 1.1.2. If the speed range is clear of criticals which do not exceed the allowable heat dissipation value as published in the catalog, the coupling is then considered suitable for the application with respect to the torsional vibration characteristics. If there is a critical in the speed range, the actual temperature of the coupling will need to be calculated at this speed.

1.2 Prediction of the Actual Coupling Temperature and Torsional Stiffness

1.2.1 Use the torsional stiffness as published in the catalog (K_{86}), which is based upon data of measured at 86˚F and the dynamic magnifier (M_{86}) at 86˚F.

1.2.2 Compare the synthesis value of the calculated heat load in the coupling (P_K) at the speed of interest to the "Allowable Heat Dissipation (P_{KW})".

The coupling temperature rise = ΔF

$$\Delta F = Temp_{coup} = \left(\frac{P_K}{P_{KW}}\right) \times 126$$

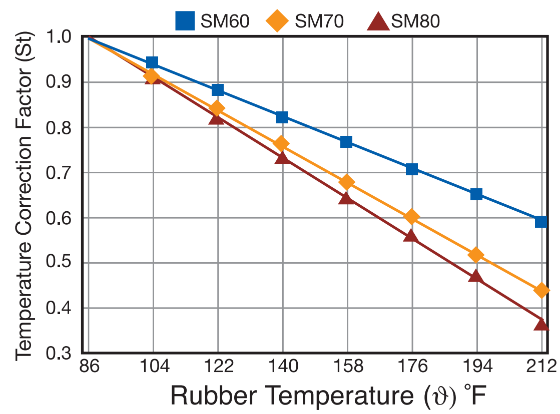
The coupling temperature = ϑ

$$\vartheta = Temp_{coup} + \text{Ambient Temp.}$$

1.2.3 Calculate the temperature correction factor (S_t) from 1.3 (if the coupling temperature > 212ºF, then use S_{t212}). Calculate the dynamic Magnifier as per 1.4. Repeat the calculation with the new value of coupling stiffness (K_T) and dynamic magnifier (M_T).

1.2.4 Calculate the coupling temperature as per 1.2. Repeat calculation until the coupling temperature agrees with the correction factors for torsional stiffness and dynamic magnifier used in the calculation.

1.3 Temperature Correction Factor



$$K_T = K_{86} x S_t$$

1.4 Dynamic Magnifier Correction Factor

The dynamic magnifier of the rubber is subject to temperature variation in the same way as the torsional stiffness.

$$M_T = \frac{M_{86}}{S_t} \qquad \varphi_T = \varphi_{86} \times S_t$$

Rubber Grade	Dynamic Magnifier (M_{86})	Relative Damping φ_{86}
SM 60	8	0.78
SM 70	6	1.05
SM 80	4	1.57
SM 60 is considered "standard"		

RENOLD Hi-Tec Couplings

PM Technical Data - Standard Blocks

PM 0.4 - PM 130

COUPLING SIZE		0.4	0.7	1.3	3	6	8	12	18	27	40	60	90	130
NOMINAL TORQUE (ft.lb) (1)		106	164	319	737	1,475	1,966	2,833	4,425	6,638	9,834	14,751	22,127	31,961
HP/RPM		0.06	0.09	0.18	0.42	0.84	1.12	1.68	2.53	3.79	5.62	8.42	12.64	18.26
MAXIMUM TORQUE T_{KMAX} (ft.lb)		317	494	959	2,213	4,425	5,900	8,851	13,276	19,914	29,502	44,254	66,381	95,883
VIBRATORY TORQUE T_{KW} (ft.lb) (2)		40	62	120	277	553	738	1,106	1,660	2,489	3,688	5532	8,298	11,985
ALLOWABLE DISSIPATED HEAT(PKW) AT 86°F AMB. TEMP. (W)		266	322	365	458	564	562	670	798	870	1,018	1,159	1,209	1,369
MAXIMUM SPEED (rpm)		7200	6,300	5,400	4,500	4,480	3,860	3,450	2,975	2,650	2,380	2,050	1,830	1,600
DYNAMIC TORSIONAL (3) STIFFNESS (x10^6 lb-in/rad)														
@ 0.25 T_{KN}	SM 60	0.03	0.04	0.11	0.26	0.65	0.86	1.29	1.93	2.90	4.29	6.44	9.66	13.96
	SM 70	0.04	0.07	0.16	0.38	0.92	1.22	1.83	2.75	4.12	6.12	9.17	13.75	19.87
	SM 80	0.08	0.12	0.27	0.64	1.19	1.58	2.38	3.57	5.35	7.93	11.90	17.84	25.77
@ 0.50 T_{KN}	SM 60	0.04	0.07	0.17	0.41	0.92	1.22	1.83	2.75	4.12	6.12	9.17	13.75	19.87
SM	70	0.06	0.09	0.22	0.51	1.23	1.64	2.45	3.68	5.52	8.18	12.27	18.40	26.58
SM	80	0.09	0.13	0.32	0.76	1.60	2.13	3.20	4.80	7.20	10.66	15.98	23.98	34.63
@ 0.75 T_{KN}	SM 60	0.07	0.11	0.26	0.61	1.36	1.81	2.73	4.09	6.13	9.09	13.63	20.45	29.53
	SM 70	0.08	0.12	0.29	0.69	1.76	2.35	3.52	5.28	7.92	11.73	17.60	26.39	38.12
SM	80	0.11	0.16	0.38	0.90	2.35	3.12	4.68	7.03	10.54	15.61	23.42	35.13	50.74
@ 1.0 T_{KN}	SM 60	0.10	0.16	0.38	0.90	1.98	2.65	3.97	5.95	8.92	13.21	19.83	29.74	42.95
SM	70	0.11	0.16	0.39	0.93	2.45	3.27	4.90	7.36	11.04	16.36	24.53	36.80	53.16
SM	80	0.12	0.19	0.45	1.08	3.38	4.51	6.76	10.15	15.22	22.55	33.83	50.74	73.29
RADIAL STIFFNESS	SM 60	3.91	4.13	7.08	11.71	35.84	39.78	45.57	52.19	59.73	63.21	72.41	82.80	93.65
@ NO LOAD	SM 70	6.11	6.45	11.13	18.50	47.97	53.22	60.98	69.84	79.94	91.13	104.38	119.43	135.02
(lb/in x 10^3)	SM 80	9.94	10.39	18.33	29.64	65.10	72.23	82.80	94.79	108.49	123.68	141.67	161.03	183.30
RADIAL STIFFNESS	SM 60	8.17	8.62	14.85	24.55	75.26	83.54	95.82	109.64	125.45	143.04	163.88	187.41	211.90
@ 50% T_{KMAX}	SM 70	10.05	10.62	18.27	29.92	78.80	87.48	100.21	114.77	131.33	149.72	171.53	196.20	221.84
(lb/in x 10^3)	SM 80	14.33	15.13	25.58	42.54	94.22	104.61	119.80	137.04	157.03	179.01	205.05	234.69	265.24
AXIAL STIFFNESS	SM 60	2.62	2.87	4.08	5.54	6.05	6.72	7.69	8.81	10.08	11.48	13.17	15.06	17.02
@ NO LOAD	SM 70	4.30	4.73	6.74	9.19	15.69	17.42	19.96	22.84	26.15	29.81	34.15	39.06	44.20
(lb/in x 10^3)	SM 80	5.94	6.62	9.54	12.73	23.53	26.11	29.92	34.26	39.21	44.70	51.21	58.59	66.24
AXIAL STIFFNESS	SM 60	5.25	6.00	8.79	11.53	13.13	14.28	16.67	18.90	21.87	24.90	28.44	32.66	36.89
@ 50% T_{KMAX}	SM 70	6.28	7.77	10.96	14.90	15.70	17.42	19.99	22.84	26.15	29.81	34.15	39.06	44.20
(lb/in x 10^3)	SM 80	7.14	8.28	11.76	15.70	23.53	26.10	29.92	34.26	39.23	44.71	51.22	58.59	66.24
MAX. AXIAL FORCE	SM 60	14.8	16.2	22.9	28.8	337	375	430	490	562	640	734	838	948
(lb) @ 50% T_{KMAX} (4)	SM 70	17.5	18.0	25.2	31.5	370	410	472	534	648	706	805	922	1,043
	SM 80	19.1	23.8	33.3	41.6	303	558	640	732	838	959	1,094	1,253	1,416

(1) These values apply to systems which have a service factor of 3; ie. $T_{KN} = \frac{T_{KMAX}}{3}$
For other applications see "Selection Procedure".

(2) At 10Hz only, allowable vibratory torque at higher or lower frequencies (fe) = Vib. Torque $\sqrt{\frac{10Hz}{fe}}$

(3) These values should be corrected for rubber temperature as shown in the design information section. These values apply to conditions of low amplitude, steady vibration at a mean torque. Consult Renold Hi-Tec Couplings for values applying to high amplitude transient vibration.

(4) The couplings will 'slip' axially when the maximum axial force is reached.

PM Technical Data - Standard Blocks

PM 180 - PM 7000

COUPLING SIZE		180	270	400	600	850	1200	2000	3500	4700	7000
NOMINAL TORQUE (ft.lb) (1)		44,254	66,380	93,841	147,512	208,976	295,024	491,707	860,488	1,155,512	1,720,976
HP/RPM		25.3	37.9	56.2	84.3	119.4	168.5	280.9	491.5	660.1	983.0
MAXIMUM TORQUE T_{KMAX}, (ft.lb)		132,760	199,141	295,024	442,536	626,926	885,073	1,475,122	2,581,463	3,466,536	5,162,927
VIBRATORY TORQUE T_{KW} (ft.lb) (2)		16,595	24,893	36,878	55,317	78,329	110,634	184,390	322,683	433,317	645,366
ALLOWABLE DISSIPATED HEAT AT AMB. TEMP. 86°F P_{KW} (W)		1,526	1,735	1,985	2,168						
MAXIMUM SPEED (rpm)		1,460	1,260	1,090	975	1,000	870	725	580	580	580
DYNAMIC TORSIONAL (3) STIFFNESS (x10^6 lb-in/rad)											
@ 0.25 T_{KN}	SM 60	19.3	29.0	43.0	64.4	129.2	199.1	361.1	662.9	902.8	1,309.9
	SM 70	27.5	41.3	60.5	91.7	194.7	300.9	546.1	1,009.0	1,363.0	1,991.4
	SM 80	35.7	53.5	79.3	119.0	323.9	500.1	902.8	1,725.9	2,274.6	3,327.9
@ 0.50 T_{KN}	SM 60	27.5	41.3	60.5	91.7	204.5	314.2	566.4	1,035.5	1,425.0	2,053.4
	SM 70	36.8	55.2	81.8	122.7	264.6	408.0	737.3	1,354.2	1,849.8	2,690.6
	SM 80	48.0	71.9	106.6	159.8	387.7	598.3	1,088.6	2,000.3	2,717.2	3,920.9
@ 0.75 T_{KN}	SM 60	40.9	59.5	90.9	136.3	318.6	489.4	877.1	1,575.4	2,203.8	3,168.6
	SM 70	52.8	79.2	117.3	176.0	359.3	552.3	1,017.8	1,814.4	2,053.4	3,619.
	SM 80	70.3	105.4	156.1	234.4	464.7	716.0	1,301.1	2,372.0	3,248.2	4,726.3
@ 1.0 T_{KN}	SM 60	59.5	89.2	132.2	198.3	477.9	733.7	1,318.8	2,345.4	3,292.5	4,717.4
	SM 70	73.6	110.4	163.6	245.3	484.1	744.3	1,336.5	2,407.4	3,354.4	4,832.5
	SM 80	101.5	152.2	225.5	338.3	557.6	859.4	1,548.9	2,832.2	3,885.5	5,646.8
RADIAL STIFFNESS	SM 60	104.3	119.5	136.0	155.9	215.8	239.2	313.5	328.3	436.8	656.6
(lb/in x 10^3)	SM 70	150.5	172.3	196.1	224.8	344.3	378.0	498.5	520.2	696.6	1,039.2
@ NO LOAD	SM 80	204.1	233.8	266.1	304.9	547.0	599.5	799.4	832.5	1,113.5	1,661.6
RADIAL STIFFNESS	SM 60	236.1	270.4	307.7	352.8	488.4	541.4	709.4	743.0	989.8	1,486.0
(lb/in x 10^3)	SM 70	247.2	283.0	322.2	369.3	565.7	621.0	819.0	854.6	1,144.5	1,707.4
@ 50% T_{KMAX}	SM 80	295.5	338.4	385.2	441.5	221.1	868.1	1,157.5	1,205.5	1,612.2	2,406.1
AXIAL STIFFNESS	SM 60	19.0	21.7	24.7	28.4	103.9	118.8	158.2	162.2	215.8	323.8
(lb/in x 10^3)	SM 70	49.2	56.4	64.1	73.5	173.0	195.8	260.4	268.4	358.0	536.7
@ NO LOAD	SM 80	73.8	84.5	96.2	110.3	199.8	227.3	281.5	428.2	571.0	856.5
AXIAL STIFFNESS	SM 60	41.1	47.0	53.6	61.4	225.2	257.4	342.7	351.4	467.7	701.6
(lb/in x 10^3)	SM 70	49.2	56.4	64.1	73.5	173.0	195.8	260.4	268.4	358.0	536.7
@ 50% T_{KMAX}	SM 80	73.8	84.5	96.2	110.3	199.8	227.3	281.5	428.2	571.0	856.5
MAX. AXIAL FORCE (lb)	SM 60	1,059	1,213	1,378	1,,581	-	--	-	-	-	
@ 50% T_{KMAX} (4)	SM 70	1,160	1,330	1,513	1,735	-	--	-	-	-	
	SM 80	1,577	1,804	2,055	2,355	-	--	-	-	-	

(1) These values apply to systems which have a service factor of 3; ie. $T_{KN} = \frac{T_{KMAX}}{3}$
For other applications see "Selection Procedure".

(2) At 10Hz only, allowable vibratory torque at higher or lower frequencies (fe) = Vib. Torque $\sqrt{\frac{10Hz}{fe}}$

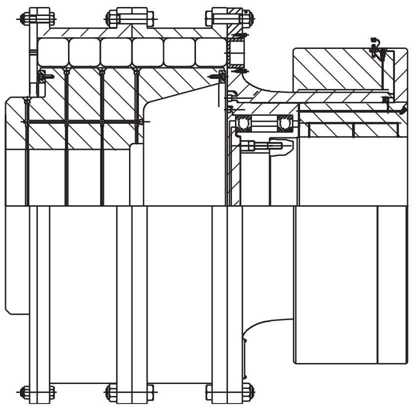
(3) These values should be corrected for rubber temperature as shown in the design information section. These values apply to conditions of low amplitude, steady vibration at a mean torque. Consult Renold Hi-Tec Couplings for values applying to high amplitude transient vibration.

(4) The couplings will 'slip' axially when the maximum axial force is reached.

PM Design Variations

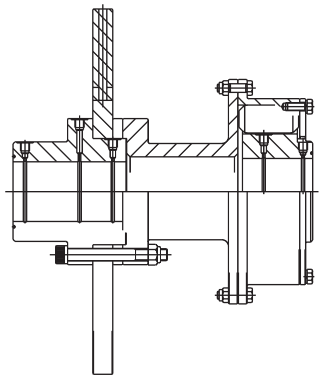
The PM coupling range can be adapted to meet customer needs. Below are some of the arrangements that have been produced. For a more comprehensive list contact Renold Hi-Tec Couplings.

Torque Limiting Coupling



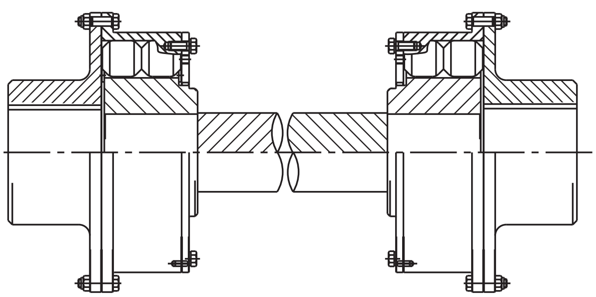
Combination with a torque limiting device to prevent damage to driving and driven machines under shock loads.

Brake Disk Coupling



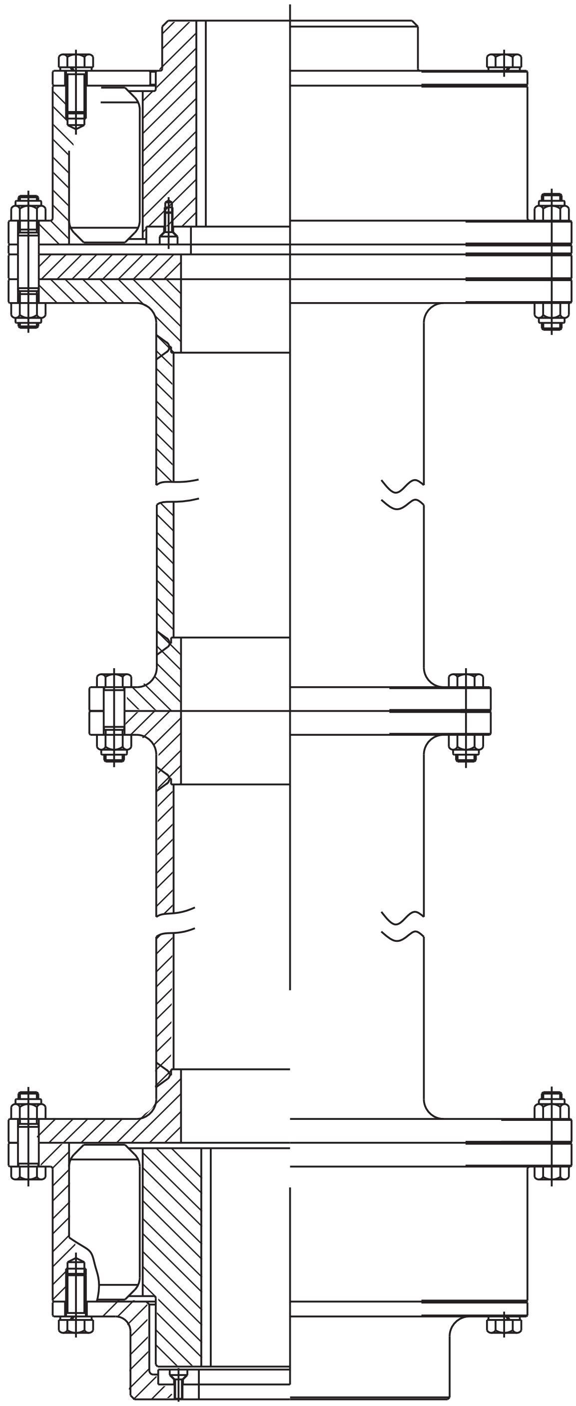
Combination with a brake disc, for use on cranes, fans and conveyor drives. (Brake drum couplings also available).

Cardan Shaft Coupling



Cardan Shaft Coupling. Used to increase the distance between shaft ends and give a higher misalignment capability

Vertical Spacer Coupling



Spacer Couplings. Used to increase the distance between shaft ends and allow access to driven and driving machine.

Coupling Selection

RENOLD

Hi-Tec Couplings

The Complete Solution

Coupling Selection

Coupling Selection Checklist

Photocopy this page and complete the following checklist to ensure the correct coupling selection is achieved, then fax it to the Renold Hi-Tec Coupling Sales Fax Line below for a speedy response.

Customer:	
Project:	
Prime mover: (see page 53)	**Service factor:**
Driven equipment: (see page 54)	**Service factor:**
Continuous power:	**Maximum power:**
Operating speed:	**Overspeed:**
Driving shaft diameter:	**Driven shaft diameter:**
Driving shaft length:	**Driven shaft length:**
Flywheel location diameter:	**Hole size and PCD:**
Continuous misalignment:	**Transient misalignment:**
Diameter constraints:	**Length constraints:**
Distance between shaft ends:	

If you require help with coupling selections contact Renold Hi-Tec Couplings:

Tel: 800-879-2529 **Fax: (716) 326-8229**

Selection Procedure

- From the continuous Power (HP) and operating Speed (n) calculate the Application Torque (T_{NORM}) from the formula:

$$\frac{HP \times 5252}{n} \text{ lb-ft}$$

- Select Prime Mover Service Factor (Fp) from table below.
- Select Driven Equipment Service Factor (Fm) from table on page 54 of this section.
- The minimum Service Factor is 1.5.

  Calculate T_{MAX} from the formula:

$$T_{MAX} = T_{NORM}\,(Fp + Fm)$$

- Select Coupling such that $T_{MAX} < T_{Kmax}$
- Check **n < Coupling Maximum Speed** (from catalog data).
- Check **Coupling Bore Capacity** such that **dmin < d < dmax.**
- Consult the factory for alternatives if catalog limits are exceeded.

Note: If you are within 80% of maximum speed, dynamic balancing is required.

Prime Mover Service Factors

Prime Mover Factors		Fp
Diesel Engine	1 Cylinder	*
	2 Cylinder	*
	3 Cylinder	2.5
	4 Cylinder	2.0
	5 Cylinder	1.8
	6 Cylinder	1.7
More than	6 Cylinder	1.5
Vee Engine		1.5
Gasoline Engine		1.5
Turbine		0
Electric Motor		0
Induction Motor		0
Synchronous Motor		1.5
Variable Speed*		
Synchronous Converter (LCI)	- 6 pulse	1.0
	- 12 pulse	0.5
PWM/Quasi Square		0.5
Cyclo Converter		0.5
Cascade Recovery (Kramer, Scherbius)		1.5

T_{NORM} = Application Torque (lb-ft)

T_{MAX} = Peak Application Torque (lb-ft)

T_{KN} = Nominal Coupling Rating (lb-ft) according to DIN 740
(with service factor = 3 according to Renold Hi-Tec Couplings standard)

T_{Kmax} = Maximum Coupling Rating (lb-ft) according to DIN 740

HP = Continuous Power to be transmitted by coupling (HP)

n = Speed of coupling application (rpm)

Fp = Prime Mover Service Factor

Fm = Driven Equipment Service Factor

dmax = Coupling Maximum Bore (in)

dmin = Coupling Minimum Bore (in)

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.

*The application of these drive types is highly specialized and it is recommended that Renold Hi-Tec Couplings is consulted for further advice.

The final selection should be made by Renold Hi-Tec Couplings.

For confirmation of coupling selection complete the checklist and fax to Renold Hi-Tec Couplings.
Fax: (716) 326 - 8229

Driven Equipment Service Factors

Application	Typical Driven Equipment Factor(Fm)
Agitators	
Pure liquids	1.5
Liquids and solids	2.0
Liquids-variable density	2.0
Blowers	
Centrifugal	1.5
Lobe (Roots type)	2.5
Vane	2.0
Brewing and Distilling	
Bottling machinery	1.5
Lauter Tub	1.75
Briquetter machines	3.0
Can filling machines	1.5
Cane knives	3.0
Car dumpers	3.0
Car pullers - Intermittent Duty	2.5
Clay working machinery	2.5
Compressors	
Axial Screw	1.5
Ce ntrifugal	1.5
Lobe	2.5
Reciprocating - multi-cylinder	3.0
Rotary	2.0
Conveyors - uniformly loaded or fed	
Ap ron	2.0
Assembly	1.5
Belt	1.5
Bucket	2.0
Ch ain	2.0
Flight	2.0
Oven	2.5
Screw	2.0
Conveyors - heavy duty not uniformly fed	
Ap ron	2.0
Assembly	2.0
Belt	2.0
Bucket	2.5
Ch ain	2.5
Flight	2.5
Oven	2.5
Reciprocating	3.0
Screw	3.0
Shaker	4.0
Cranes & hoists	
All motions	3.0
Crushers	
Ore	3.0
Stone	3.5
Sugar	3.5
Dredgers	
Ca ble reels	2.5
Conveyors	2.0
Cutter head drives	3.5
Jig drives	3.5
Maneuvring winches	3.0
Pumps	3.0
Screen drive	3.0
Stackers	3.0
Utility winches	2.0
Dynamometer	1.5
Elevators	
Bucket	3.0
Centrifugal discharge	2.0
Escalators	1.5
Freight	2.0
Gravity discharge	2.0
Fans	
Centrifugal	1.5
Cooling towers	2.0
Forced draft	2.0
Induced draft (without damper control)	2.0
Feeders	
Apron	2.0
Belt	2.0
Disc	2.0
Reciprocating	3.0
Sc rew	2.0
Generators	
Alternating	1.5
Not welding	1.5
Welding	2.2
Hammer mills	4.0
Lumber industry	
Barkers - drum type	3.0
Ed ger feed	2.5
Live rolls	2.5
Lo g haul-incline	2.5
Log haul-well type	2.5
Off bearing rolls	2.5
Planer feed chains	2.0
Pl aner floor chains	2.0
Planer tilting hoist	2.0
Sawing machine	2.0
Slab conveyor	2.0
Sorting table	2.0
Trimmer feed	2.0
Metal manufacture	
Bar reeling machine	2.5
Cr usher-ore	4.0
Feed rolls	*
Fo rging machine	2.0
Rolling machine	*
Roller table	*
Sh ears	3.0
Tube mill (pilger)	*
Wire Mill	2.0
Metal mills	
Drawn bench - carriage	2.5
Drawn bench - main drive	2.5
Fo rming machines	2.5
Slitters	2.0
Ta ble conveyors - non-reversing	*
- reversing	*
Wire drawing and flattening machine	2.0
Wire winding machine	2.0
Metal rolling mills	
Blooming mills	*
Co ilers - hot mill & cold mill	2.5
Co ld mills	*
Cooling mills	*
Door openers	2.0
Draw benches	2.5
Ed ger drives	2.5
Feed rolls, reversing mills	*
Fu rnace pushers	2.5
Ho t mills	*
Ingot cars	2.0
Manipulators	3.0
Merchant mills	*
Pi ercers	3.0
Pu shers rams	2.5
Reel drives	2.0
Reel drums	2.0
Bar mills	*
Roughing mill delivery table	*
Runout table	*
Saws - hot, cold	2.0
Screwdown drives	2.5
Skelp mills	*
Slitters	2.0
Slabbing mills	*
Soaking pit cover drives	2.5
Straighteners	3.0
Table transfer & runabout	2.5
Thrust block	3.0
Traction drive	2.0
Tube conveyor rolls	2.0
Unscramblers	2.5
Wire drawing	2.0
Mills, rotary type	
Ball	2.5
Cement kilns	2.5
Dryers and coolers	2.5
Kilns	2.5
Hammer	3.5
Pebble	2.5
Pug	3.0
Rod	2.5
Tumbling barrels	2.5
Mining	
Conveyor - armoured face	3.0
- belt	1.5
- bucket	1.5
- chain	1.75
- screw	1.5
Dintheader	3.0
Fan - ventilation	2.0
Haulages	2.0
Lump breakers	1.5
Pulverizer	2.0
Pump - rotary	2.0
- ram	3.0
- reciprocating	3.0
- centrifugal	1.5
Roadheader	2.0
Shearer - Longwall	2.0
Winder Colliery	2.5
Mixers	
Concrete mixers	2.0
Drum type	2.0
Oil industry	
Chillers	2.0
Oil well pumping	3.0
Paraffin filter press	2.0
Rotary kilns	2.5
Paper mills	
Barker-auxiliaries hydraulic	3.0
Barker-mechanical	3.5
Barking drum (Spur Gear only)	3.5
Beater and pulper	3.5
Bleacher	2.0
Calenders	2.0
Chippers	2.5
Coaters	2.0
Converting machine (not cutters, platers)	2.0
Couch	2.0
Cutters, platers	3.0
Cylinders	2.0
Dryers	2.0
Felt stretcher	2.0
Felt whipper	2.0
Jordans	2.25
Line shaft	2.0
Log haul	2.5
Presses	2.5
Pulp grinder	3.5
Reel	2.0
Stock chests	2.0
Suction roll	2.0
Washers and thickeners	2.0
Winders	2.0
Printing presses	2.0
Propeller	
Marine - fixed pitch	2.0
- controllable pitch	2.0
Pullers	
Barge haul	2.5
Pumps	
Centrifugal	1.5
Reciprocating - double acting	3.0
single acting - 1 or 2 cylinders	3.0
3 or more cylinders	3.0
Rotary - gear, lobe, vane	2.0
Rubber industry	
Mixed - banbury	3.0
Rubber calender	2.0
Rubber mill (2 or more)	2.5
Sheeter	2.5
Tire building machines	2.5
Tire and tube press openers	2.0
Tubers and strainer	2.5
Screens	
Air washing	1.5
Grizzly	2.5
Rotary, stone or gravel	2.0
Travelling water intake	1.5
Vibrating	2.5
Sewage disposal equipment	2.0
Textile industry	2.0
Windless	2.5

* Use 1.75 with motor cut-out power rating

Selection Examples

Example 1

- **Selection of 6 cylinder diesel engine 1000 HP at 900 rpm driving a centrifugal pump.**

The coupling is flywheel mounted
pump shaft diameter = dm

HP = 1000HP n = 900 rpm
dm = 3.75in temp = 86°F

T_{NORM} = (HP/n) x 5252
= (1000/900) x 5252
= 5836 lb-ft

- The application is considered light industrial and RB type coupling should be selected. Examination of RB catalog shows RB 3.86 as:

  T_{KN} = 6755 lb-ft

  which satisfies the condition

- $T_{NORM} < T_{KN}$ (5836 < 6755) lb-ft
- n < coupling maximum speed (900 < 2500) rpm
- dmin < dm < dmax (3.15 < 3.75 < 6.70) in

Example 2

- Selection of induction motor 1080 HP at 1498 rpm driving a rotary pump.

Motor shaft = dp Pump shaft = dm
HP = 1080Hp n = 1498 rpm
dp = 3.75in dm = 3.375in
temp = 30°C Fp = 0
Fm = 2

T_{NORM} = (HP/n) x 5252 lb-ft
= (1080/1498) x 5252 lb-ft
= 3786 lb-ft

T_{MAX} = T_{NORM} (Fp + Fm)
= 3786 (0 + 2) lb-ft
= 7572 lb-ft

- The application requires a steel coupling (by customer specification) and PM type coupling should be selected. Examination of PM catalog shows PM12 as:

  T_{Kmax} = 8851 lb-ft

  which satisfies the conditions:-

- $T_{MAX} < T_{Kmax}$ (7572 < 8851) lb-ft
- n < coupling maximum speed (1498 < 3450) rpm
- dmin < dp < dmax (2.56 < 3.75 < 4.29) in
- dmin < dm < dmax (2.56 < 3.375 < 4.29) in

Calculation Service

- For over 40 years we have been a world leader in torsional vibration analysis for all types of machinery and have developed sophisticated in-house computer programs specifically for this purpose.

- A consultancy service is also available to customers in the selection of the correct product for their specific application.
- Renold Hi-Tec Couplings is well known in the diesel engine industry for its analysis techniques.
- In the heavy industrial sector, Renold Hi-Tec Couplings' engineers have made many torsional vibration analyses. For example, steady state, transient and Torque Amplification Factors (TAF) on electric motor drivelines in cement mills, rolling mills, compressor drive trains, synchronous motor start ups and variable frequency (LCI Kramer/Scherbius/PWM) applications.
- Two examples of torsional vibration analysis that have been produced by Renold Hi-Tec Couplings' engineers are shown on page 56 of this section.

Transient Analysis

Calculated Examples

Illustrated below are two different types of transient torsional vibration analysis that can be produced by Renold Hi-Tec Couplings' engineers.

This ensures optimum solutions are reached by the correct selection of torsional stiffness and damping characteristics of the coupling.

Synchronous resonance and synchronous convertor (LCI) examples are shown, however, Renold Hi-Tec Couplings' experience also includes: Diesel drives, Torque Amplification, electrical speed control devices, PWM, Scherbius/ Kramer, short-circuit and any re-connection of electrical circuits on the mechanical systems.

Example 1

Since June 1962 we have engineered flexible couplings for synchronous motor applications to reduce, by damping, the damaging vibratory torques imposed into the system when accelerating through the first resonant frequency. See Tables A and B.

Table A

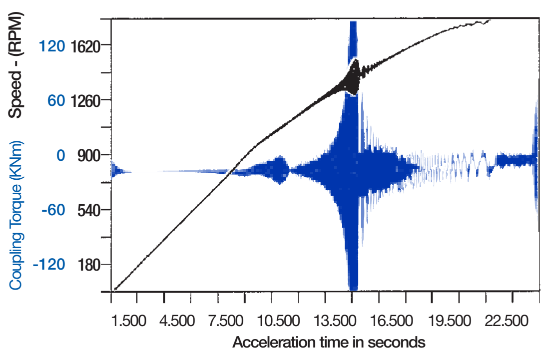


Table A shows vibrating torque experienced in the motor shaft when the system is connected rigidly (or by a gear or membrane coupling) to the driven system.

Table B

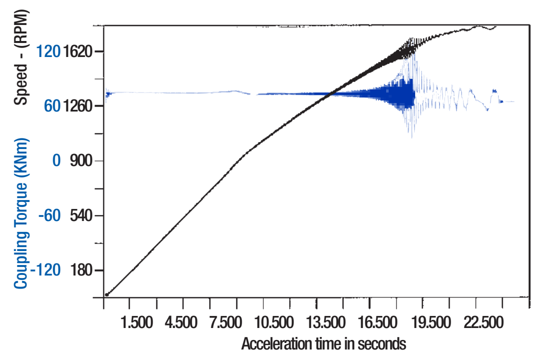


Table B shows the same system connected by a DCB coupling. PM type couplings are also used in such applications.

Example 2

Since 1981 we have been engineering flexible couplings for synchronous convertor (LCI) drives to control the forced mode conditions through the first natural frequency by judicial selection of torsional stiffness and damping. See Tables C and D.

Table C

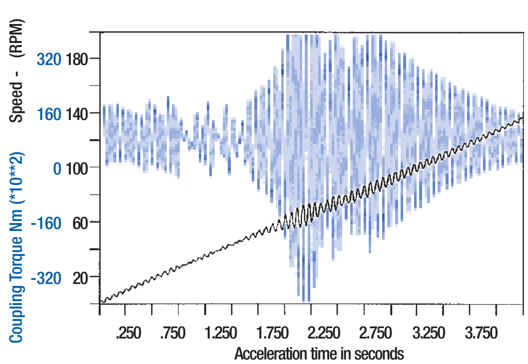


Table C shows a typical motor/fan system connected rigidly (or through a gear or membrane coupling) when damaging torques would have been experienced in the motor shaft.

Table D

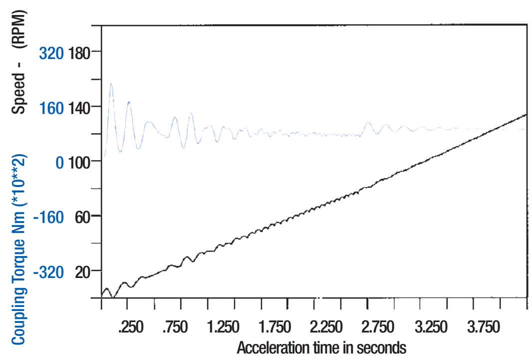


Table D shows the equivalent Renold Hi-Tec Couplings' engineered solution using a PM coupling.

Rubber Information

The rubber blocks and elements used in Renold Hi-Tec Couplings are key elements in the coupling design. Strict quality control is applied in the manufacture, and frequent testing is part of the production process.

Rubber-in-Compression

These designs use non-bonded components, which allows for many synthetic elastomers to be employed.

These elastomers offer considerable advantages over others for specific applications, giving Renold Hi-Tec Couplings a distinctive lead in application engineering in specialized areas.

Rubber in Shear

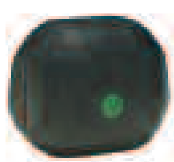
These designs use high tear strength, low creep, natural rubber developed for diesel engine drives. All rubber in shear couplings are 100% tested to ensure bond/molding integrity.

Rubber compound Identification label	Natural Red (F, NM)	Styrene-Butadiene Green (SM)	Neoprene Yellow (CM)	Nitrile White (AM)	Stryene-Butadiene Blue* (S)
Resistance to Compression Set	Good	Good	Fair	Good	Fair
Resistance to Flexing	Excellent	Good	Good	Good	Good
Resistance to Cutting	Excellent	Good	Good	Good	Fair
Resistance to Abrasion	Excellent	Good	Good	Good	Good
Resistance to Oxidation	Fair	Fair	Very Good	Good	Fair
Resistance to Oil & Gasoline	Poor	Poor	Good	Good	Poor
Resistance to Acids	Good	Good	Fair	Fair	Good
Resistance to Water Swelling	Good	Good	Good	Good	Good
Service Temp. Maximum; Continuous	176°F (80°C)	212°F(100°C)	212°F (100°C)	212°F (100°C)	212°F (100°C)
Service Temperature Minimum	-58°F (-50°C)	-40°F (-40°C)	-22°F (-30°C)	-40°F (-40°C)	-40°F (-40°C)
* High Damping					

Rubber Block Types

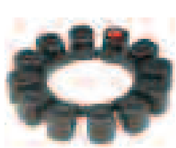
DCB

PM



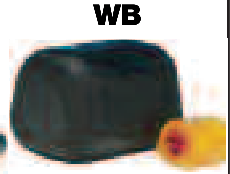
RB

SM/SB



SPECIAL

WB

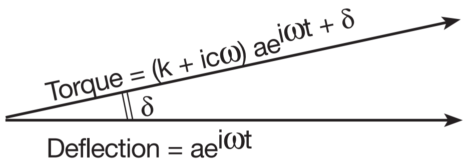


NM	SM	CM	AM	S
Renold 45	Renold 50	Renold 50	Renold 70	Renold 50
Renold 60	Renold 60	NCB A1976/7	Renold 90	Renold 60
Renold 70	Renold 70	Renold A833/7		Renold 70
Renold 80	Renold 80	Renold 60		Renold 80
		Renold 70		

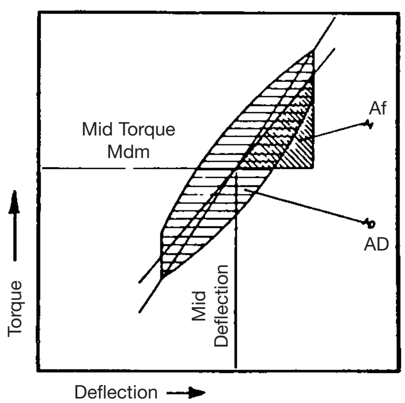
Damping Characteristics

Coupling damping varies directly with torsional stiffness and inversely with frequency for a given rubber grade. This relationship is conventionally described by the dynamic magnifier (M), varying with hardness for the various rubber types.

$$M = \frac{K}{C\omega}$$



$$\tan\delta = \frac{C\omega}{K} = \frac{I}{M}$$



$$\psi = \frac{AD}{Af} = \frac{2\pi}{M}$$

This property may also be expressed as the Damping Energy Ratio or Relative Damping (ψ), which is the ratio of the damping energy (AD), produced mechanically by the coupling during a vibration cycle and converted into heat energy, to the flexible strain energy (Af), with respect to the mean position.

Where C = Specific Damping (lb-ft s/rad)

K = Torsional Stiffness (lb-ft/rad)

ω = Frequency (Rad/s)

M = Dynamic Magnifier

δ = Phase Angle (Rad)

ψ = Damping Energy Ratio

The rubber compound dynamic magnifier values are shown in the table below.

Rubber grade	M
NM 45	15
SM 50	10
SM 60	8
SM 70	6
SM 80	4

Health and Safety at Work

Customers are reminded that when purchasing Renold Hi-Tec Couplings products, for use at work or otherwise, additional and up-to-date information which is not possible to include in Renold Hi-Tec Couplings publications is available from your local Sales Company in relation to:

(a) guidance on individual product suitability based on the various existing applications of the extensive range of Renold Hi-Tec Couplings products.

(b) guidance on safe and proper use provided that full disclosure is made of the precise details of the intended or existing application. All relevant information should be passed on to the persons engaged in, likely to be affected by, and those responsible for the use of the product. Nothing contained in this publication shall constitute a part of any contract, expressed or implied.

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The performance levels and tolerances of our product stated in this catalog (including without limitation, serviceability, wearlife, resistance to fatigue, corrosion protection) have been shown in a program of testing and quality control in accordance with Renold Hi-Tec Couplings, independent and or international standard recommendations.

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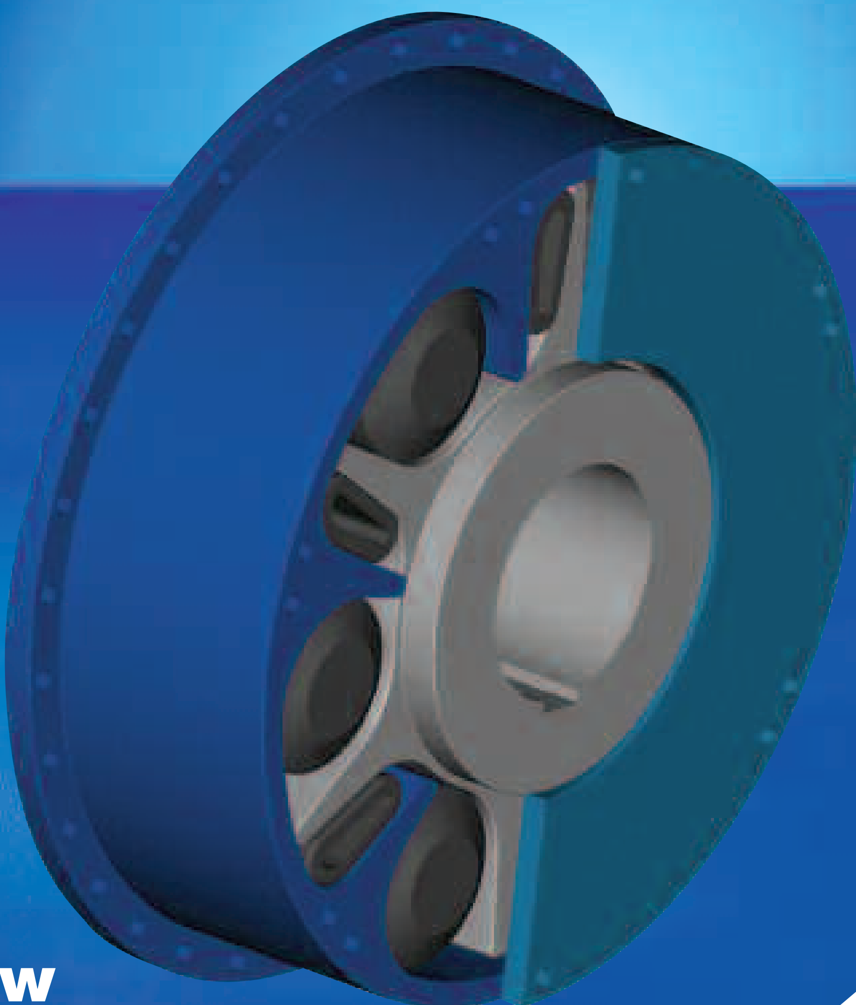
DCB-GS Coupling



The New Generator Set Coupling

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