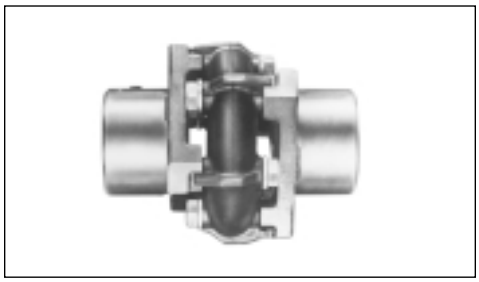
Saga Coupling Design

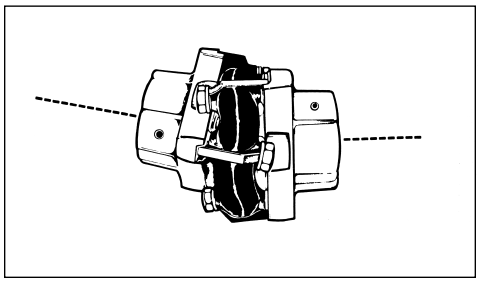
Elastomeric Pre-compression Type

Saga is a general purpose, torsionally soft coupling with high tolerance to all forms of misalignment. The design features hexagonal or octagonal rubber donut-shaped elements with metal inserts positioned at each apex during the vulcanization process. These metal inserts carry actual bolts which fix the element to tines on cast, cylindrical hubs. Embedded inserts also have tines which connect with mating surfaces on hubs so that axial bolts can be easily torqued during assembly without twisting the rubber beyond the limits of its elasticity. The rubber between each apex is precompressed, so it is much more durable to the stresses arising from the various forms of misalignment and torsional vibrations.



SAGA TYPE

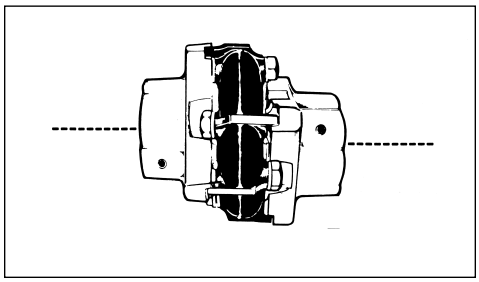
While the Saga coupling is normally associated with shaft-to-shaft applications, adaptations for flange and flywheel mountings can be made. In addition, a floating shaft version for use in lieu of a u-joint drive shaft with separate torsional coupling is available. Its elements can also be stacked in series for use in applications with extreme transient or permanent parallel misalignment, or where torsional dynamics demand an extremely soft element for proper damping and/or vibratory decoupling. The rubber's stiffness of 60 as measured against Shore A by durometer, covers the majority of such situations.



ANGULAR OFFSET (EXAGGERATED)

Performance benefits of this coupling include:

- No end thrust in misalignment position.
- Absorbs misalignment and shock.
- No axial reaction force to damage or accelerate wear in system bearings.
- Accepts constant angular misalignment of up to 3°
- Parallel tolerance of 0.060″ (1.5mm), while reaction force remains low.
- Lateral softness without complication, or sacrifice of performance or durability.
- Natural rubber can operate in temperatures from -60° to +200° F (-51° to 93° C).



PARALLEL OFFSET (EXAGGERATED)

Note: For applications requiring simultaneous angular and parallel misalignment, consult Lovejoy Engineering to ensure that heat generated from all three forms of stress do not exceed the coupling's ability to dissipate heat.

Selection Process

Step 1: Establish torque or HP rating of the driver and operating and maximum RPM (for electric motors, these are essentially the same).

Step 2: Determine the horsepower 100RPM:

$$\frac{\text{HP} \times 100}{\text{RPM}} = \text{HP per 100 RPM}$$

or establish driver torque at operating RPM.

Step 3: Using the service factor selected from the table on JW-6, multiply torque or HP/100 RPM by the factor. Using the result, select a coupling from the Performance Data chart on the next page. The coupling's rating must be equal to or greater than adjusted HP/100RPM or torque.

Step 4: Compare the maximum driver RPM to the Performance Data chart on the next page to insure that the coupling's speed limit is not exceeded.

Step 5: Finally, determine shaft diameters of both driving and driven equipment and check them against maximum bore diameters from the Dimensional Data chart on the next page to ensure that these values are not exceeded.

Saga Coupling Data

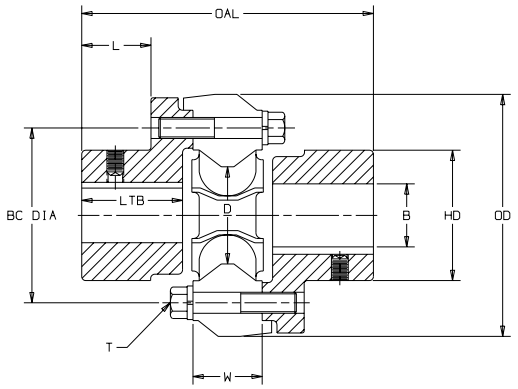
Performance Data

Size	HP/100 RPM for 1.0 service factor	Rated Torque for 1.0 S.F. in-lbs	Nm	Max. Shock Load in-lbs	Nm	Dynamic Torsional Stiffness in-lbs/Deg	in-lbs/Rad	Specific Torsional Stiffness	Max. Speed RPM[1]	Approx. Weight lbs	kg.	Moment of Inertia WR² lb in²
S-11	0.56	350	40	1,000	113	47	2,693	7.69	10,000	4.75	2.2	3.0
S-13	0.95	600	68	1,800	203	67	3,839	6.40	8,400	6.50	2.9	6.6
S-15	1.59	1,000	113	3,000	339	120	6,875	6.88	7,000	10	4.5	14.3
S-18	3.17	2,000	226	6,000	678	200	11,459	5.73	5,600	17	7.7	40.0
S-22	4.76	3,000	339	9,000	1017	400	22,918	7.64	5,000	31	14.1	102.0
S-26	7.93	5,000	565	15,000	1695	590	33,805	6.76	4,000	46	20.9	234.0
S-30	11.11	7,000	791	21,000	2373	800	45,837	6.55	3,500	64	29.0	384.0
S-34	19.04	12,000	1356	36,000	4067	2,000	114,592	9.55	2,800	122	55.3	832.0
S-40	31.73	20,000	2260	60,000	6779	3,500	200,535	10.03	2,200	175	79.4	1,200.0

Note: **1.** For higher speeds, balancing may be necessary.

Bolt Data

Size	Bolt Grade No. 5 T Qty.	Size	Rec. Tightening Torque of Bolts Wet ft-lb	Nm	Dry ft-lb	Nm
S-11	6	5⁄16 - 18 x 1¾	13	18	17	23
S-13	6	⅜ - 16 x 2	23	31	30	41
S-15	6	⅜ - 16 x 2 ½	23	31	30	41
S-18	6	½ - 13 x 3	55	75	75	102
S-22	6	⅝ - 11 x 3 ¼	110	149	150	203
S-26	6	¾ - 10 x 4	200	271	260	353
S-30	6	¾ - 10 x 4 - ½	200	271	260	353
S-34	8	¾ - 10 x 4- ½	200	271	260	353
S-40	8	1 -8 x 5 - ½	480	651	640	868



Dimensional Data

Size	Rough Stock Bore² B in	mm	Max Bore B in.	mm	OAL in	OD in	HD in	W in	LTB in	BC Dia. in	D in	L in
S-11	0.63	15.88	1.19	30.16	4.56	3.56	1.84	1.06	1.50	2.56	1.38	1.13
S-13	0.75	19.05	1.38	34.93	5.22	4.28	2.25	1.22	1.75	3.06	1.63	1.31
S-15	0.88	22.22	1.88	47.63	6.41	5.09	2.88	1.53	2.13	3.69	2.00	1.63
S-18	1.00	25.40	2.25	57.15	7.44	6.28	3.44	1.81	2.50	4.56	2.33	1.81
S-22	1.00	25.40	2.50	63.50	8.69	7.31	3.88	2.06	3.00	5.20	2.75	2.06
S-26	1.50	38.10	2.88	73.02	9.88	8.63	4.59	2.38	3.38	6.20	3.25	2.25
S-30	1.63	41.28	3.38	85.73	11.38	9.63	5.31	2.63	3.88	6.94	3.63	2.75
S-34	2.13	53.97	4.00	101.60	12.66	11.09	6.25	2.95	4.34	8.25	4.75	3.44
S-40	2.25	57.15	4.75	120.65	14.81	13.38	7.50	3.56	5.00	10.00	6.00	3.88

Note: **2.** Standard bores available by $^1/_{16}$″ increments. Some metric sizes also available as standard.

SP