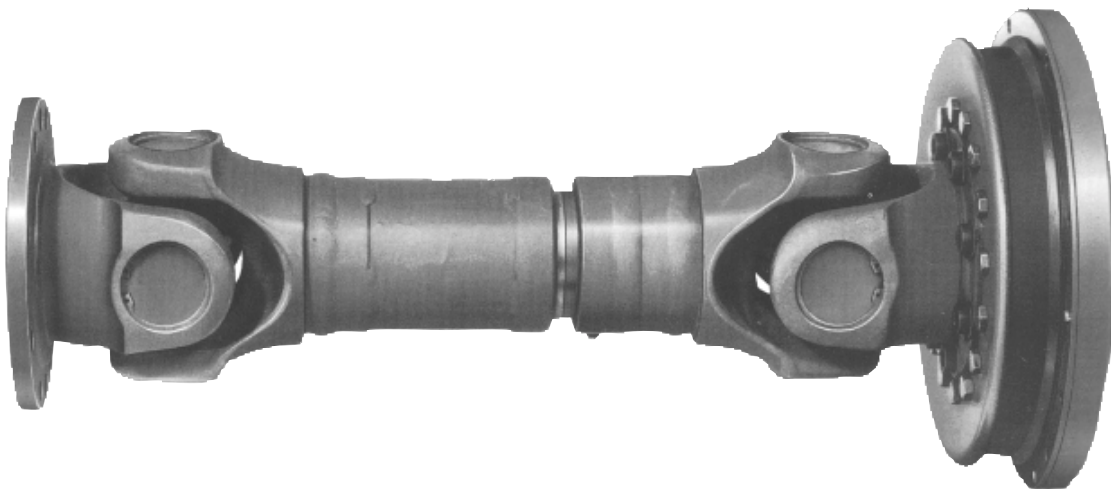
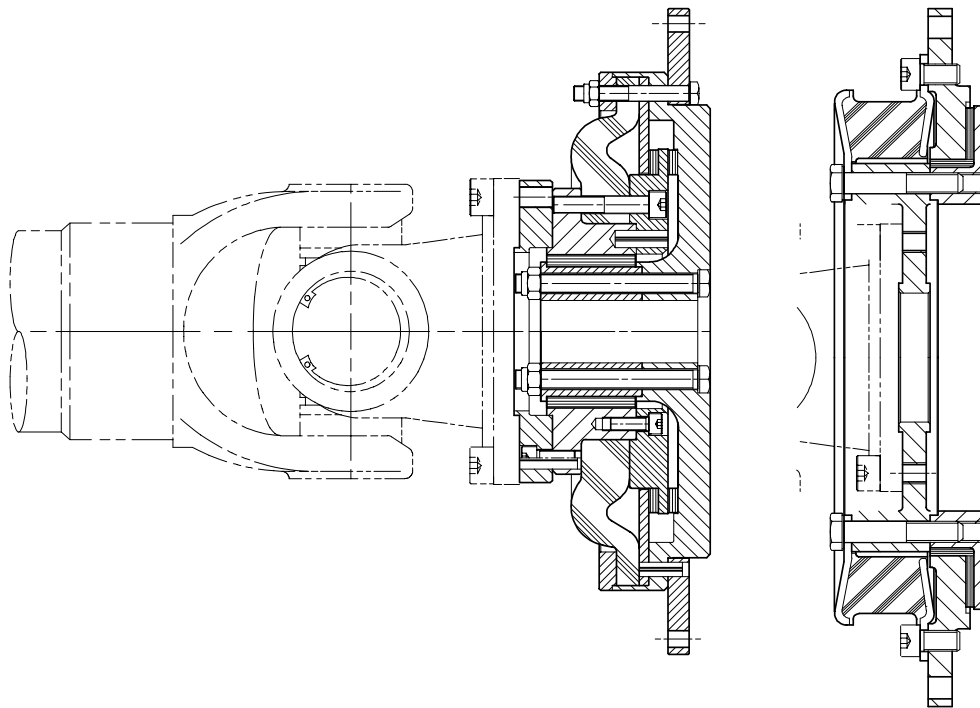
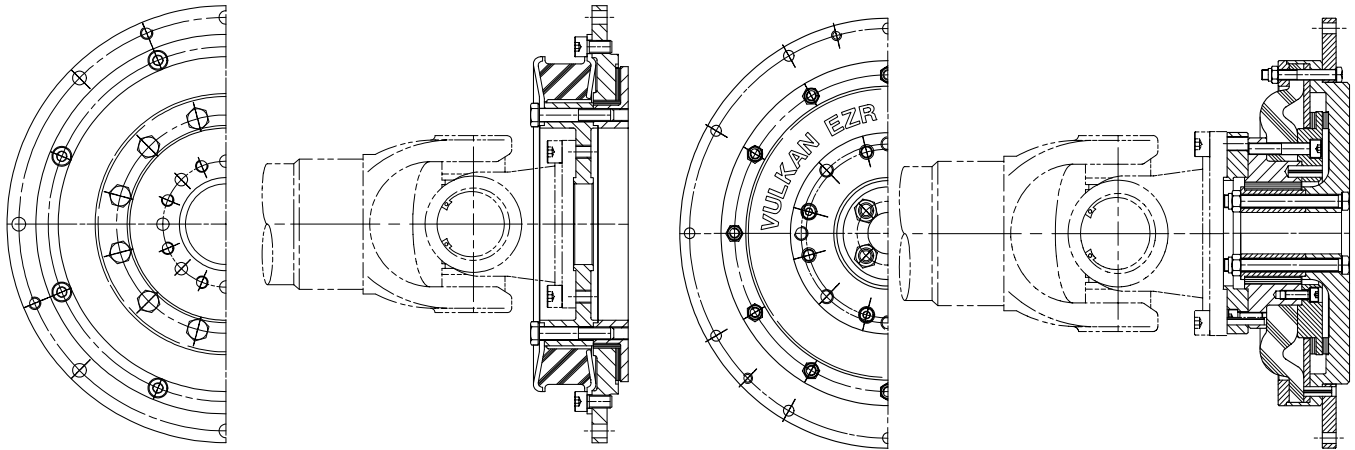


More than just flexible . . .

VULKARDAN-L VULKARDAN-P



VULKARDAN-L VULKARDAN-P for U-Joint Applications



VULKARDAN-L

VKL is a self-supported, bonded, rubber-in-shear coupling with fiber bearings for use with U-joint shafts in marine propulsion systems and industrial applications.

- Sizes available to transmit up to 9,220 lb-ft of torque.
- Linear dynamic torsional stiffness.
- Provides precise system tuning — four torsional stiffnesses for each coupling size.

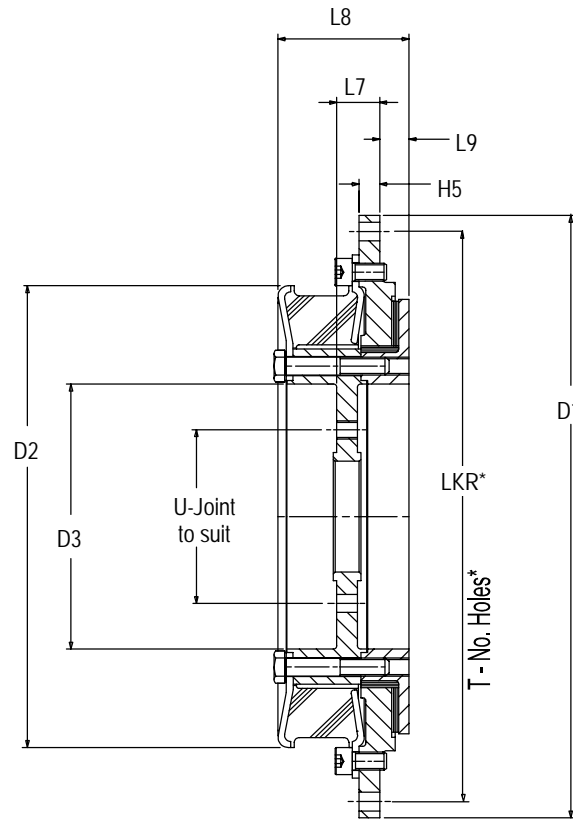
VULKARDAN-P

VKP combines one EZR element with bearings in a self-supported design for use with U-joint shafts in marine propulsion systems and industrial applications.

- Sizes available to transmit up to 23,233 lb-ft of torque.
- Progressive dynamic torsional stiffness.
- Dampens torsional vibrations.
- Absorbs shocks and attenuates noise.
- Rubber-in-shear design serves as a mechanical fuse to protect equipment from excessive torques.
- Requires no lubrication.
- Accommodates SAE flywheels and standard U-joint connections
- Custom configurations available upon request.

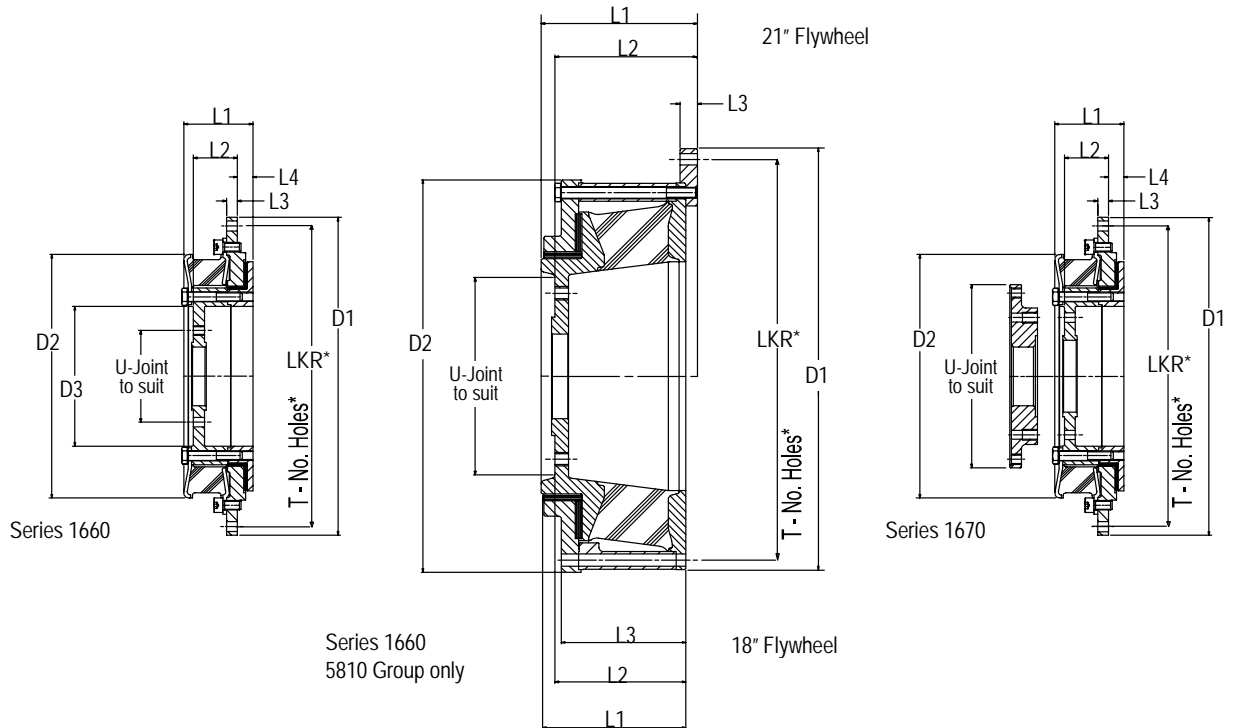
VKL Size (#) (# - See Notes on Prev Page)	Nominal Torque [lb-ft] T _{KN} ⁽¹⁾	Torque Max1 [lb-ft] T _{Kmax1} ⁽²⁾	Torque Max2 [lb-ft] T _{Kmax2} ⁽³⁾	Vibratory Torque [lb-ft] T _{KV} ⁽⁴⁾	Power Loss [KW] P _{KV30} ⁽⁵⁾	Max Speed [RPM] N ⁽⁶⁾	Dyn. Torsional Stiffness (X10 ⁶) [lb-in/rad] C _{Tdyn} ⁽⁷⁾	Relative Damping ψ ⁽⁸⁾
1714	118	177	425	44	0.170	6350	0.006	1.6
1711	118	177	425	44	0.170	6350	0.008	1.6
1715	148	221	531	44	0.170	6350	0.013	1.6
1712	148	221	531	44	0.170	6350	0.018	1.6
1914	184	277	664	74	0.200	5550	0.009	1.6
1911	184	277	664	74	0.200	5550	0.012	1.6
1915	229	343	823	74	0.200	5550	0.021	1.6
1912	229	343	823	74	0.200	5550	0.028	1.6
2114	295	443	1062	118	0.230	4900	0.015	1.6
2111	295	443	1062	118	0.230	4900	0.019	1.6
2115	369	553	1328	118	0.230	4900	0.033	1.6
2112	369	553	1328	118	0.230	4900	0.046	1.6
2514	465	697	1673	184	0.260	4200	0.023	1.6
2511	465	697	1673	184	0.260	4200	0.031	1.6
2515	590	885	2124	184	0.260	4200	0.053	1.6
2512	590	885	2124	184	0.260	4200	0.073	1.6
2914	738	1106	2655	295	0.330	3550	0.036	1.6
2911	738	1106	2655	295	0.330	3550	0.049	1.6
2915	922	1383	3319	295	0.330	3550	0.083	1.6
2912	922	1383	3319	295	0.330	3550	0.115	1.6
3414	1180	1770	4248	472	0.380	3000	0.058	1.6
3411	1180	1770	4248	472	0.380	3000	0.078	1.6
3415	1475	2213	5310	472	0.380	3000	0.133	1.6
3412	1475	2213	5310	472	0.380	3000	0.186	1.6
4114	1844	2766	6638	738	0.480	2500	0.089	1.6
4111	1844	2766	6638	738	0.480	2500	0.120	1.6
4115	2286	3430	8231	738	0.480	2500	0.204	1.6
4112	2286	3430	8231	738	0.480	2500	0.283	1.6
4514	2323	3485	8364	930	0.530	2300	0.115	1.6
4511	2323	3485	8364	930	0.530	2300	0.151	1.6
4515	2950	4425	10621	930	0.530	2300	0.257	1.6
4512	2950	4425	10621	930	0.530	2300	0.363	1.6
4814	2950	4425	10621	1180	0.530	2300	0.146	1.6
4811	2950	4425	10621	1180	0.530	2300	0.195	1.6
4815	3688	5532	13276	1180	0.530	2300	0.332	1.6
4812	3688	5532	13276	1180	0.530	2300	0.460	1.6
5014	3688	5532	13276	1476	0.650	2000	0.177	1.6
5011	3688	5532	13276	1476	0.650	2000	0.239	1.6
5015	4647	6970	16728	1476	0.650	2000	0.407	1.6
5012	4647	6970	16728	1476	0.650	2000	0.566	1.6
5814	7376	11063	26552	2952	0.560	1800	0.265	1.6
5811	7376	11063	26552	2952	0.560	1800	0.338	1.6
5815	9220	13829	33190	2952	0.560	1800	0.549	1.6
5812	9220	13829	33190	2952	0.560	1800	0.658	1.6

A torsional vibration analysis, which considers power loss in the VKL rubber element, should be conducted to confirm coupling selection



VKL Group Size	SAE FW Size	Nominal Torque T _{kN} lb-ft	Overall Dimensions							Weight lb		Inertia lb-in-sec ²	
			D1	D2	D3	L8	L7	H5	L9	Inner	Outer	Inner	Outer
171x	8	118 148	10.374	5.91	3.15	1.73	0.59	0.31	0.39	4	6	0.04	0.27
191x	8	184 229	10.374	6.77	3.74	2.03	0.75	0.43	0.39	6	9	0.09	0.35
211x	8	295 369	10.374	7.68	4.13	2.22	0.87	0.55	0.35	9	10	0.18	0.44
251x	8	465	10.374	8.86	4.92	2.50	1.10	0.79	0.31	12	11	0.27	0.44
	11.5	590	13.874	8.86	4.92	2.50	1.10	0.39	0.31	12	18	0.27	1.15
291x	11.5	738	13.874	10.59	6.10	3.01	0.98	0.47	0.67	22	17	0.80	1.42
	14	922	18.374	10.59	6.10	3.01	0.98	0.39	0.67	22	28	0.80	3.27
341x	11.5	1180	13.874	12.32	7.28	3.45	1.57	1.10	0.31	32	23	1.50	2.03
	14	1475	18.374	12.32	7.28	3.45	1.22	0.39	0.67	32	35	1.50	4.43
411x	14	1844 2286	18.374	14.65	9.06	3.90	1.36	0.39	0.73	51	29	3.45	4.07
451x	14	2323 2950	18.374	16.26	10.04	4.41	1.61	0.98	0.71	69	42	5.66	6.46
481x	14	2950 3688	18.374	16.42	8.98	4.69	1.81	1.26	0.71	71	56	5.31	8.23
501x	18	3688 4647	22.500	18.74	11.42	5.14	2.09	1.34	0.79	113	89	11.95	19.03

* Refer to SAE standard J620 for flywheel connection details; a copy is provided on page 11
Dimensions in inches. VKL group size does not specify stiffness.

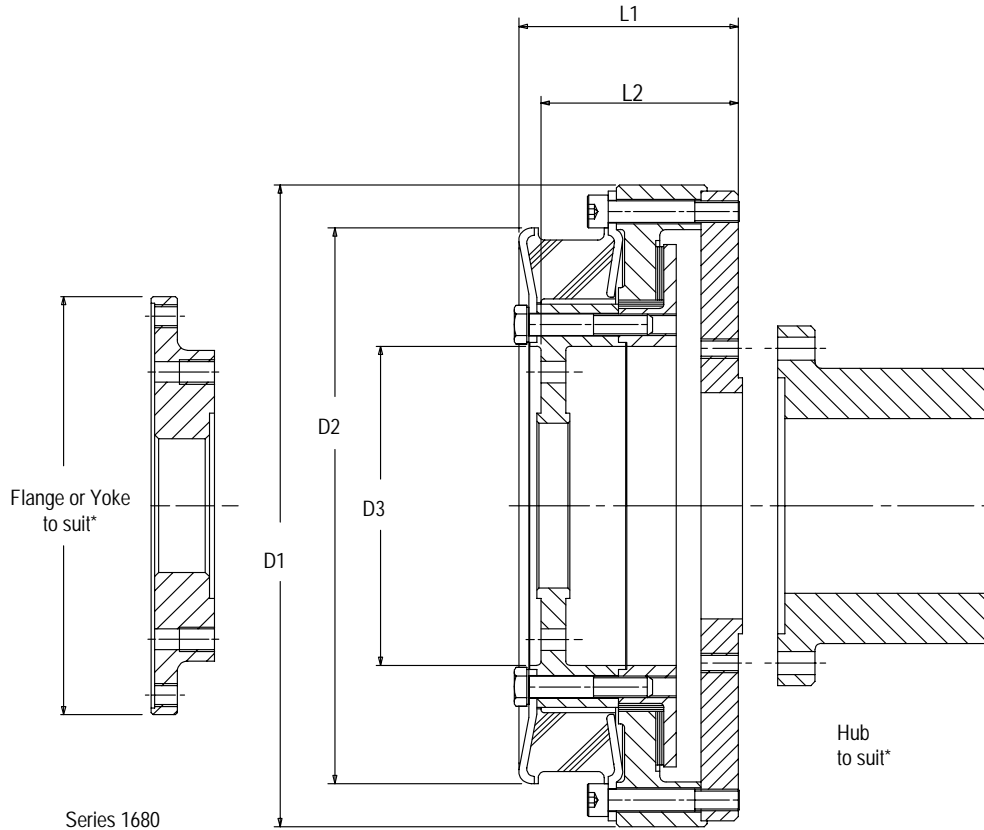


VKL Group Size	SAE FW Size	Nominal Torque T_{KN} lb-ft	Overall Dimensions							Weight lb		Inertia lb-in-sec ²	
			D1	D2	D3	L1	L2	L3	L4	Inner	Outer	Inner	Outer
171x	8	118 148	10.374	5.91	3.15	1.73	1.06	0.31	0.39	4	6	0.04	0.27
191x	8	184 229	10.374	6.77	3.74	2.03	1.30	0.43	0.39	6	9	0.09	0.35
211x	8	295 369	10.374	7.68	4.13	2.27	1.56	0.55	0.35	9	10	0.18	0.44
251x	8	465	10.374	8.86	4.92	2.50	1.81	0.79	0.31	12	11	0.27	0.44
	11.5	590	13.874	8.86	4.92	2.50	1.81	0.39	0.31	12	18	0.27	1.15
291x	11.5	738	13.874	10.59	6.10	3.01	1.91	0.47	0.67	22	17	0.80	1.42
	14	922	18.374	10.59	6.10	3.01	1.91	0.39	0.67	22	28	0.80	3.27
341x	11.5	1180	13.874	12.32	7.28	3.45	2.66	1.10	0.31	32	23	1.50	2.03
	14	1475	18.374	12.32	7.28	3.45	2.30	0.39	0.67	32	35	1.50	4.43
411x	14	1844 2286	18.374	14.65	9.06	3.90	2.64	0.39	0.73	51	29	3.45	4.07
451x	14	2323 2950	18.374	16.26	10.04	4.41	3.11	0.98	0.71	69	42	5.66	6.46
481x	14	2950 3688	18.374	16.42	8.98	4.69	3.23	1.26	0.71	71	56	5.31	8.23
501x	18	3688 4647	22.500	18.74	11.42	5.14	3.60	1.34	0.79	113	89	11.95	19.03
581x	18	7380	22.500	22.83	12.60	8.35	7.40	7.01	—	112	255	14.43	64.52
	21	9220	26.500	22.83	12.60	9.06	8.23	1.02	—	112	356	14.43	100.18

Dimensions in inches. VKL group size does not specify stiffness.

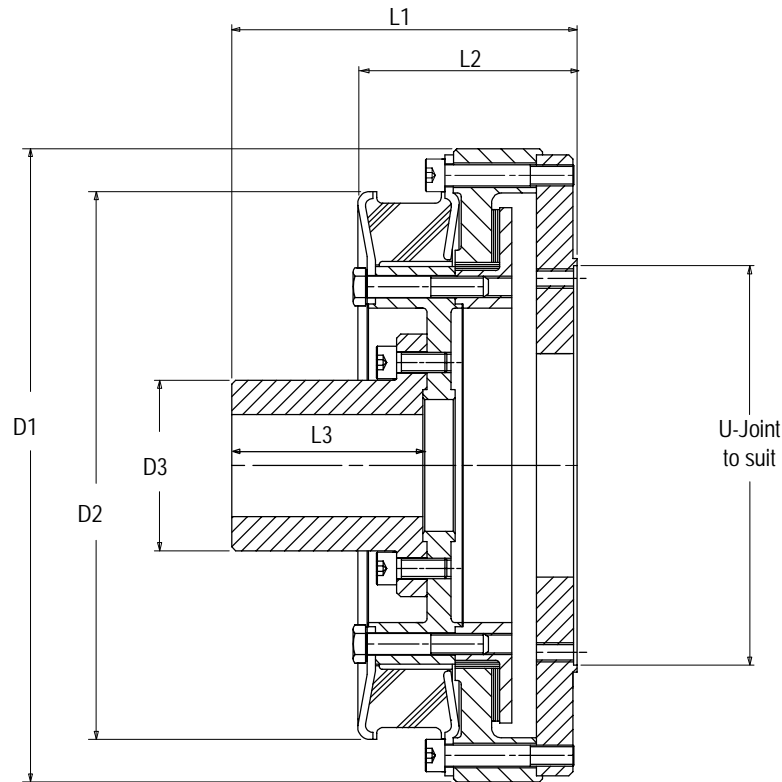
* Refer to SAE standard J620 for flywheel connection details; a copy is provided on page 11

Series 1660 is available in all sizes listed. Series 1670 with companion flange is available in all sizes up to 5010; Series 1670 with Mechanics style yoke is available in size 1910 up to size 4510. Weights and inertias are without companion flange or yoke.



VKL Group Size	Nominal Torque T_{KN} lb-ft	Overall dimensions					Weight lb		Inertia lb-in-sec ²	
		D1	D2	D3	L1	L2	Inner	Outer	Inner	Outer
171x	118 147	7.165	5.91	3.15	2.09	1.71	6	10	0.09	0.18
191x	184 229	8.031	6.77	3.74	2.44	2.07	6	10	0.09	0.27
211x	295 369	9.213	7.68	4.13	2.72	2.34	9	14	0.18	0.53
251x	465 590	10.630	8.86	4.92	3.07	2.68	13	23	0.27	1.06
291x	738 923	12.362	10.59	6.10	3.66	3.21	22	31	0.80	2.04
341x	1181 1476	14.173	12.32	7.28	4.17	3.68	32	46	1.50	3.89
411x	1845 2288	16.535	14.65	9.06	4.72	4.17	51	60	3.45	6.64
451x	2325 2952	18.701	16.26	10.04	5.31	4.72	69	96	5.66	14.07
481x	2952 3690	18.701	16.42	8.98	5.51	4.76	71	109	5.31	15.49
501x	3690 4649	22.835	18.74	11.42	6.18	5.41	111	178	12.04	36.55

Dimensions in inches. VKL group size does not specify stiffness.
 *Weights and inertias are without companion flange, hub or yoke.



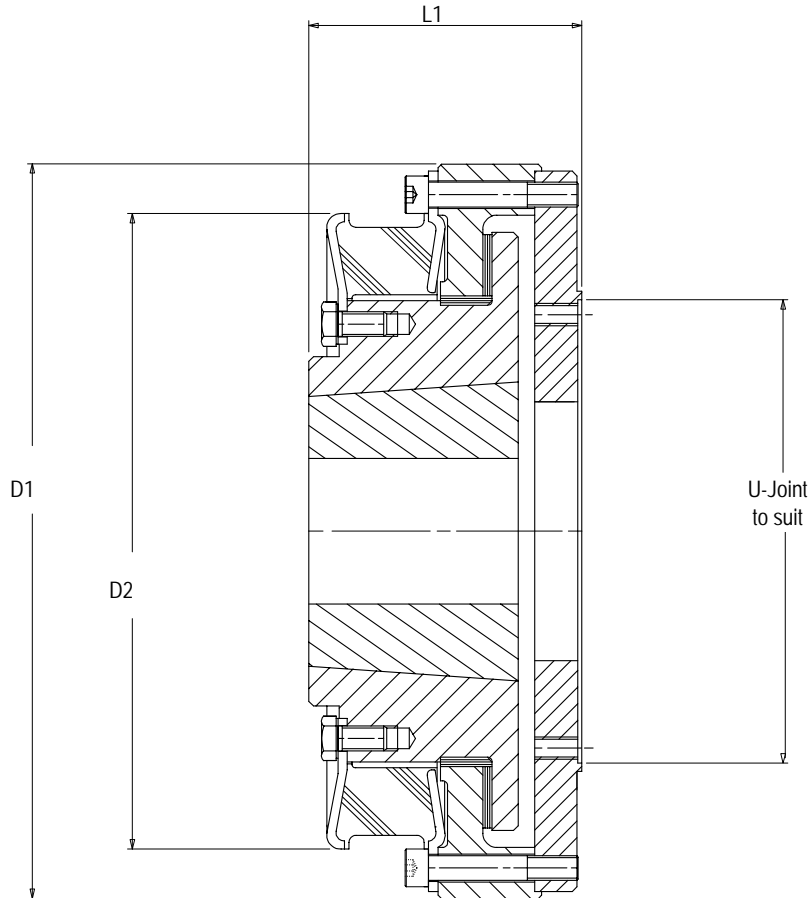
VKL Group Size	Nominal Torque T_{RN} lb-ft	Hub Details			Overall Dimensions				Weight lb		Inertia lb-in-sec ²	
		Max Bore	L3	D3	D1	D2	L1	L2	Inner	Outer	Inner	Outer
171x	118 147	1.250	1.77	1.65	7.165	5.91	3.19	2.08	8	10	0.09	0.18
191x	184 229	1.375	2.24	2.05	8.031	6.77	3.94	2.44	9	10	0.09	0.27
211x	295 369	1.625	2.64	2.44	9.213	7.68	4.41	2.72	13	14	0.18	0.53
251x	465 590	2.000	3.23	3.07	10.630	8.86	5.32	3.07	20	23	0.27	2.04
291x	738 923	2.750	4.41	4.13	12.362	10.59	6.81	3.66	40	31	0.89	3.89
341x	1181 1476	3.250	5.00	4.96	14.173	12.32	7.72	4.17	61	46	1.86	3.72
411x	1845 2288	4.250	6.30	6.30	16.535	14.65	9.39	4.72	108	60	4.43	6.64
451x	2325 2952	4.500	6.85	6.90	18.701	16.26	10.32	5.31	145	96	7.26	14.07
481x	2952 3690	4.250	6.30	6.30	18.701	16.42	9.84	5.51	129	109	6.28	15.49
501x	3690 4649	5.000	7.60	7.72	22.835	18.74	11.77	6.18	217	178	14.96	36.55

All dimensions in inches. VKL group size does not specify stiffness

American VULKAN reserves the right to change or otherwise modify the values on this page; certified prints are available.

Occupational safety and health administration standard 1910.219 requires guards, casings, covers, or other protective devices for mechanical power transmission apparatus.

Hubs machined for Taper-Lock bushings

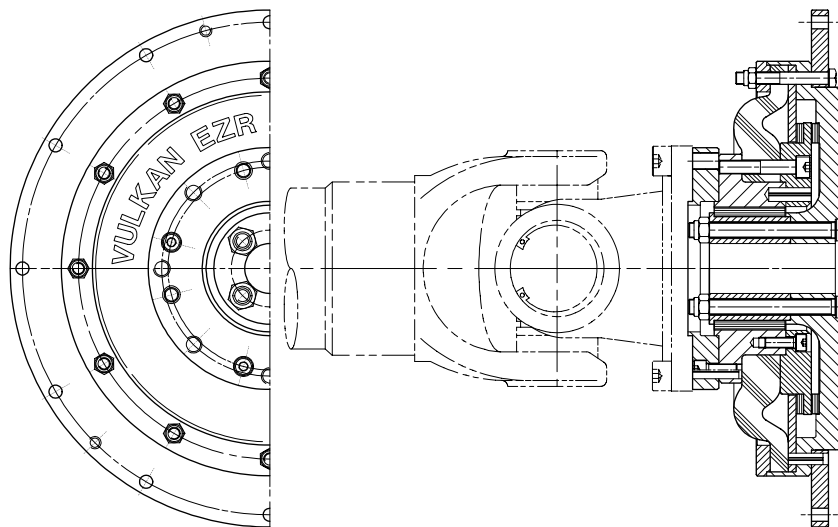


VKL Group Size	Nominal Torque T_{kN} lb-ft	Taper-Lock Bushing		Overall Dimensions			Weight lb		Inertia lb-in-sec ²	
		Size	Max Bore	D1	D2	L1	Inner	Outer	Inner	Outer
211x	295 369	2525	2.50	9.213	7.68	3.13	9	14	0.18	0.53
251x	465 590	3030	3.00	10.630	8.86	4.06	13	23	0.27	1.06
291x	738 922	3535	3.50	12.362	10.59	4.56	22	31	0.80	2.04
341x	1180 1475	3535	3.50	14.173	12.32	4.60	32	46	1.50	3.89
411x	1844 2286	4040	4.00	16.535	14.65	5.00	51	60	3.45	6.64

All dimensions in inches. VKL group size does not specify stiffness
See Taper-lock Mounting Instructions on page 11.

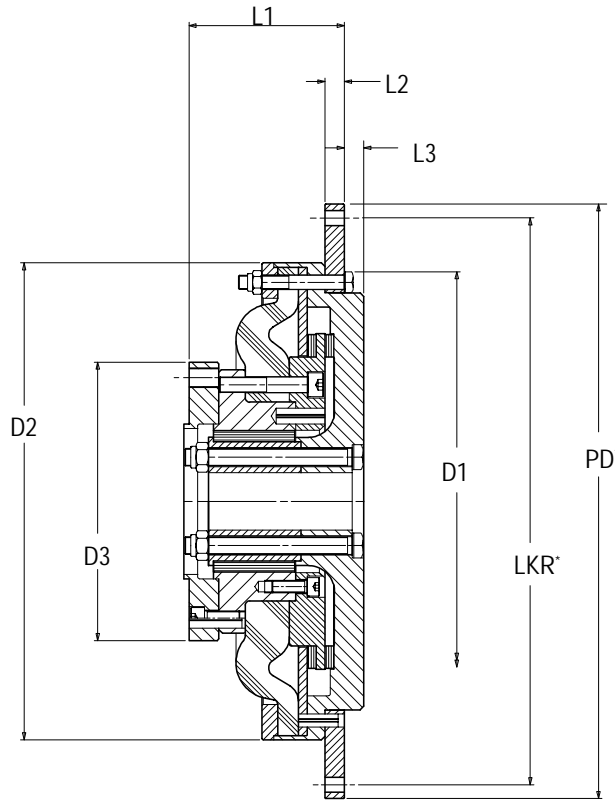
VKP Size (#) (# - See Notes Below)	Nominal Torque [lb-ft] T _{KN} (1)	Torque Max [lb-ft] T _{Kmax}	Vibratory Torque [lb-ft] T _{KW} (4)	Power Loss [KW] P _{KV30} (4)	Max Speed [RPM] N (2)	Dynamic Torsional Stiffness (x10 ⁶) [lb-in/rad] C _{Tdyn} (3, 4, 5)				
						0.10 T _{KN}	0.25 T _{KN}	0.50 T _{KN}	0.75 T _{KN}	1.00 T _{KN}
						0512	236	708	96	0.020
0522	280	841	111	0.020	4100	0.011	0.015	0.025	0.038	0.053
0612	369	1106	148	0.030	3100	0.019	0.024	0.036	0.054	0.080
0622	465	1394	185	0.030	3100	0.020	0.026	0.043	0.068	0.094
0712	590	1770	236	0.070	3100	0.028	0.035	0.056	0.085	0.119
0722	738	2213	295	0.070	3100	0.032	0.043	0.071	0.109	0.154
0732	922	2766	369	0.070	3100	0.034	0.050	0.087	0.139	0.192
0812	1180	3540	472	0.100	3100	0.057	0.065	0.100	0.149	0.208
0822	1475	4425	590	0.100	3100	0.067	0.085	0.145	0.220	0.319
1012	1844	5532	738	0.180	2540	0.100	0.120	0.179	0.266	0.367
1022	2323	6970	923	0.180	2540	0.097	0.122	0.197	0.316	0.447
1212	2950	8851	1181	0.300	2100	0.147	0.185	0.272	0.398	0.553
1222	3688	11063	1476	0.300	2100	0.152	0.200	0.329	0.504	0.726
1232	4610	13829	1845	0.300	2100	0.173	0.232	0.407	0.646	0.907
1411	5900	17701	2362	0.510	1950	0.266	0.333	0.549	0.845	1.181
1422	7376	22127	2952	0.510	1950	0.236	0.633	0.339	1.058	1.549
1712	9220	27659	3688	0.820	1650	0.358	0.487	0.823	1.257	1.757
1722	11653	34960	4661	0.820	1650	0.434	0.611	1.089	1.708	2.376
2012	14751	44254	5900	1.510	1650	0.757	0.934	1.434	2.182	3.173
2022	18439	55317	7376	1.510	1650	0.947	1.075	1.580	2.487	3.708
2032	23233	69700	9293	1.510	1650	0.969	1.159	2.045	3.456	5.178

- When selecting coupling, the permanent output of the engine is to be used as a basis. See page 2 for explanation and calculations of Technical Data.
- The listed permissible speed is based on the maximum flange diameter of the respective coupling size. If a different flange diameter is used, the permissible speed must be corrected accordingly.
- The stated values refer to the dynamic torsional stiffness at f= 10 Hz and t = 86°F. Specific torsional stiffness must be calculated from formula: $C_{Tdyn} = C_{Tdyn} [0.95 + (0.005 \times f)]$
- At ambient temperatures higher than 140°F, a control calculation should be made using $C_{Tdyn140°F} = 0.75 \cdot C_{Tdyn}$. The allowable vibratory torque, T_{KW}, and the allowable power loss, P_{KV}, are then reduced by the factor S • t = 0.6.
- Due to the physical characteristics of the elastic elements. Tolerances are possible in the mentioned values.



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Occupational safety and health administration standard 1910.219 requires guards, casings, covers, or other protective devices for mechanical power transmission apparatus.



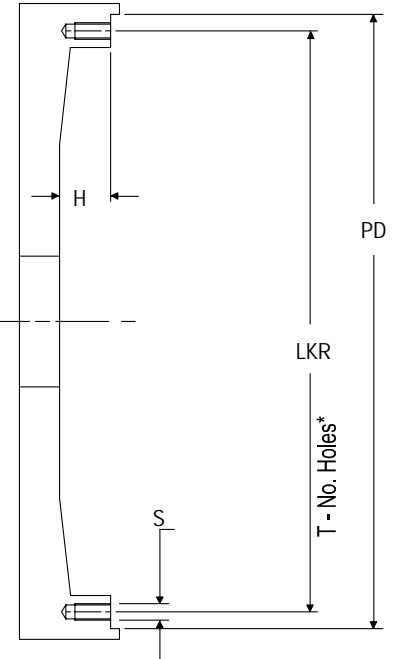
VKP group size does not specify stiffness (e.g. VKP group 0802 includes 0812 and 0822)

VKP Group Size	Nominal Torque T _{KN} lb-ft	SAE FW Size [*]	Overall dimensions						Weight lb		Inertia lb-in-sec ²	
			D1	D2	D3	L1	L2	L3	Inner	Outer	Inner	Outer
0502	236 280	8	7.99	8.43	4.72	2.56	0.35	0.31	9	17	0.08	0.55
		10								21		0.81
		11.5								24		1.17
0602	369 465	8	9.13	9.65	5.91	2.95	0.39	0.35	12	26	0.18	1.15
		10								30		1.56
		11.5								42		3.70
0702	590 922	11.5	10.71	11.26	7.09	3.62	0.47	0.31	20	43	0.38	2.39
		14								56		5.04
0802	1180 1475	14	13.11	13.70	8.86	4.33	0.51	0.39	35	77	1.16	7.28
1002	1844 2323	14	15.16	15.91	9.84	5.12	0.59	0.55	54	107	2.19	10.94
		16								118		13.37
		18								129		16.92
1202	2950 4610	18	17.56	18.43	11.22	5.79	0.63	0.71	91	167	4.89	23.64
		21								194		34.43
1402	5900 7376	21	20.47	21.26	12.40	6.93	0.87	0.87	130	287	9.03	56.20
		24								312		68.77
1702	9220 11653	24	24.21	25.28	14.09	7.48	0.87	0.94	225	410	21.33	103.20
		—								476		145.86
2002	14751 23233	—	28.35	29.69	16.54	9.25	0.98	0.87	357	627	43.55	220.38

*Refer to SAE standard J620 for flywheel connection details on page 11. All dimensions in inches

SAE J620 Flywheel Dimensions

Flywheel size		H	LKR	PD	Tapped holes	
SAE J617C Housing #	Standard SAE J620D Flywheel				T No. of Holes	S Bolt Size
#4	8"	0.50	9.625	10.375	6	3/8-16
#3	10"	0.62	11.625	12.375	8	3/8-16
#2	11.5"	1.12	13.125	13.875	8	3/8-16
#1	14"	1.12	17.250	18.375	8	1/2-13
#1/2	16"	1.12	19.250	20.375	8	1/2-13
#0	18"	1.25	21.375	22.500	6	5/8-11
#00	21"	1.25	25.250	26.500	12	5/8-11



Mounting Instructions for VULKAN VULKARDAN-L Couplings with Taper-Lock Bushings

Assembly of the Element Hub

- 1) Clean shaft, bore of bushing, outside of bushing and hub bore of all oil, paint and dirt. Remove all burrs.
- 2) Insert bushing into element hub. Match the hole pattern, not threaded holes. Each complete hole will be threaded on one side only.
- 3) "LIGHTLY" oil the set or cap screws and thread into those half threaded holes indicated by O in figure 1. Do not lubricate the bushing taper, bushing bore, hub taper or shaft. Doing so could result in breakage of the product.
- 4) Position the assembly onto the shaft. The bushing should be flush with the end of the shaft.
- 5) Alternately torque the set or cap screws to recommended torque setting in chart below.

Bushing #
2012
2517
3030

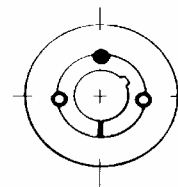
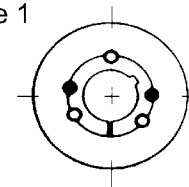


figure 1



Bushing #
3535
4040
4545



Recommended Installation Torques

VULKARDAN-L size	211x	251x	291x	341x	411x
Taper-Lock Bushing No	2525	3030	3535	3535	4040
Set or Cap Screw Size	1/2 x 1	5/8 x 1-1/4	1/2 x 1-1/2	1/2 x 1-1/2	5/8 x 1-3/4
Tightening Torque (lb-ft)	36	67	84	84	142
Wrench Size	1/4	5/16	3/8	3/8	1/2

Nos. 2525 / 3030 have setscrews.

Nos. 3535 / 4040 have socket head cap screws.


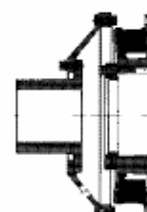


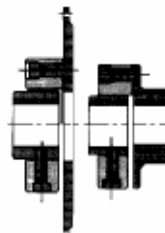
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Occupational safety and health administration standard 1910.219 requires guards, casings, covers, or other protective devices for mechanical power transmission apparatus.

VULKAN

FLEXIBLE COUPLINGS

Other Coupling Designs

 VULKARDAN-E	 VULKARDAN-E Free-standing	 TORFLEX	 VULASTIK-L	 MEGIFLEX-B
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Highly flexible couplings for marine & industrial applications

The highly flexible **VULKARDAN-E** coupling is used to tune the torsional response of a system. It offers a "slip-on" feature and is mainly used in bell-housing installations.

Torque range: 118 – 9220 lb-ft.

Available in both rubber and silicone

The highly flexible **VULKARDAN-E Free-standing** coupling is used to connect flexible/rigid mounted engines with gearboxes or other machinery. It offers the all-round flexibility of the RATO Family in a lower torque range.

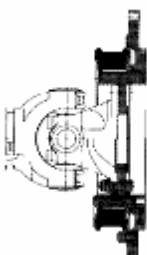
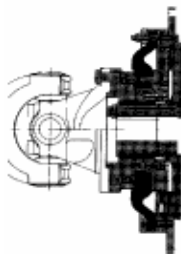

Torque range: 1844 – 9220 lb-ft.

Available in both rubber and silicone

The highly flexible **TORFLEX** coupling with a progressive torsional stiffness is specially designed to combat gear noise in reverse or reduction gearboxes. Torque range: 184 – 1180 lb-ft

The highly flexible **VULASTIK-L** couplings are with "slip-on" features and therefore they are provided mainly for installation in flanged bell-type connections. The installation dimensions correspond to DIN 6281 and SAE standards. Torque range: 295 – 18,439 lb-ft
Available in both rubber and silicone

The highly flexible **MEGIFLEX-B** couplings are flexible in all directions. They are used to connect flywheel to shaft or shaft to shaft. Torque range: 7.4 – 2323 lb-ft.
Available in both rubber and silicone

 VULKARDAN-L	 VULKARDAN-P	 Integral Shaft Support with VULASTIK-L
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Highly flexible VULKAN couplings for use with universal and CV joint shafts.

VULKARDAN-L

Coupling with linear torsional stiffness.

Torque range: 118 – 9220 lb-ft

VULKARDAN-P

Coupling with progressive torsional stiffness.

Torque range: 236 – 23,234 lb-ft

Integral Shaft Support

(With a highly flexible coupling.)

This design will be fitted in installations where the cardan shaft has a large angle of inclination. The lateral and axial reaction forces from the cardan shaft are supported by the bell housing to reduce engine crankshaft loading.

Torque range: 464 – 18,439 lb-ft