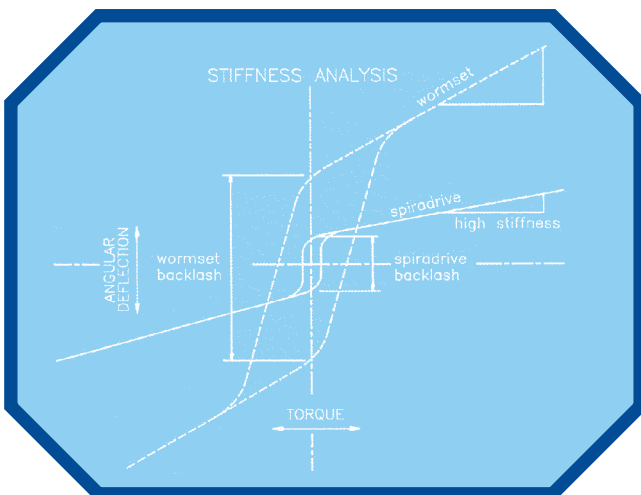
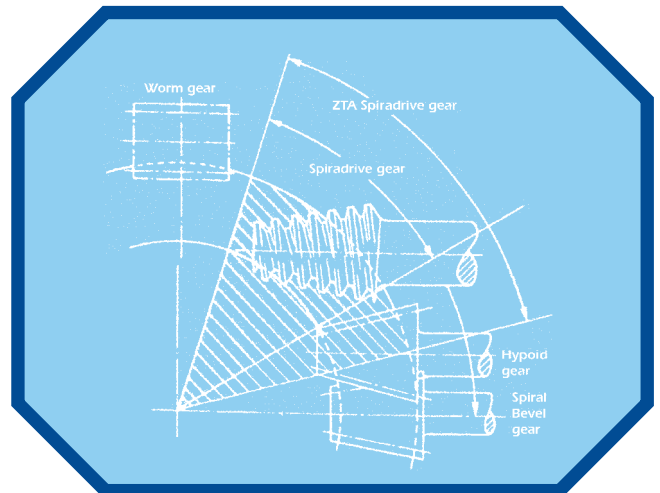


SPIRADRIVE®

Gear Systems

DAVAL GEARS



HIGH PRECISION • POSITIVE BACKLASH CONTROL • COMPACT • RATIO 6:1 to 360:1

Driven By Quality.

CAPABILITY & VERSATILITY

Davall **SPIRADRIVE**® Gear Systems meet the ever increasing needs of industry for high power transmission and positive backlash control in a compact unit

The versatility of **SPIRADRIVE**® makes it the choice of designers in a wide range of applications:

FOR AEROSPACE

Compact size, low weight and high torque capacity for a given size with less than 3' of arc backlash; **SPIRADRIVE**® can actuate flight control surfaces, missile fins, engine nozzles, fuselage utilities, including screw jacks, hoists, engine stands, cameras, etc.



FOR DEFENCE

High shock strength, positive backlash and self locking control, and a rugged design – less sensitive to mounting errors than worm gears - **SPIRADRIVE**® can accurately control azimuth and elevation motion of gun systems or satellite antennae and electro-mechanically operate doors, hatches and ancillary equipment, especially where hydraulic systems are impractical.



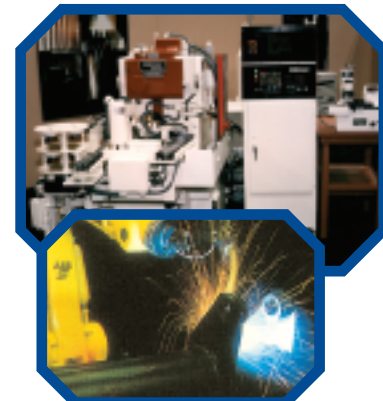
FOR TRANSPORT

Combining strength and smooth running, with a greater efficiency at high ratios than worm gears; **SPIRADRIVE**® can be applied to urban transport, electric vehicles, golf trolleys, stair lifts and passenger conveyor systems.



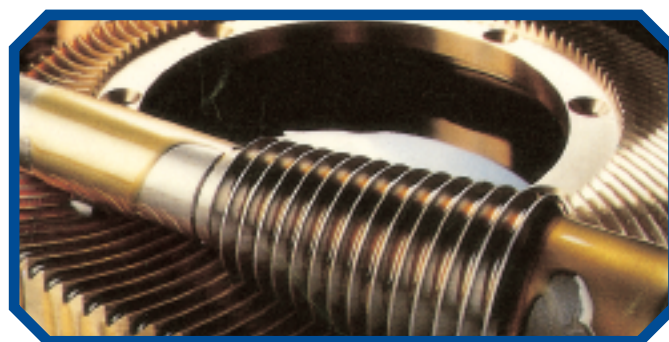
FOR MACHINE CONTROL

Offering a wide choice of ratios from 6:1 to 360:1 (in a single pair of gears), self locking capability, and fractional gear ratios (e.g. 10.25:1) if required; **SPIRADRIVE**® is an automatic choice for machine tool measuring machines, and robotic system manufacturers.



AND MANY MORE

SPIRADRIVE® offers a capability and versatility that can be put to work in rotary translation and power transmission applications across the industrial spectrum.



ADVANCED TECHNOLOGY - HIGH PERFORMANCE

Davall **SPIRADRIVE**® is a right angled/offset drive, consisting of a gear and pinion. The pinion has fewer teeth than the gear and is of parallel or tapered screw form. The gear is a face type similar to a hypoid-offset spiral bevel.

This arrangement offers a wide range of gear ratios, with a greater number of continuously meshing teeth (than for a worm gear of similar size), resulting in higher strength and smoothness of action from a compact design. Also, mounting requirements for **SPIRADRIVE**® are not as critical as for bevel or hypoid gears, ensuring maximum accuracy and positive backlash control.

SPIRADRIVE® is available in a standard range of gearboxes (motorised and overload protected), loose gear sets, or custom-designed and manufactured to specification.

STANDARD GEARBOXES

High power transmission, Controlled backlash, Universal mounting, High torsional stiffness, Sealed for life design, Smooth, quiet running.



GEAR SETS

Wide range of ratios, fractional ratios, choice of materials, self locking, small size for given power, high shock strength.



MOTORISED ANGLE DRIVE

SPIRADRIVE® is also available as a high precision no backdrive high torsional stiffness power drive unit.



CUSTOM SYSTEMS

SPIRADRIVE® gearboxes for gear sets designed, wherever possible, to meet specific customer requirements/applications.



ZERO BACKLASH OVERLOAD

The standard **SPIRADRIVE**® gearbox is also available with a zero backlash torque limiting clutch.



DESIGN & SUPPORT SERVICES

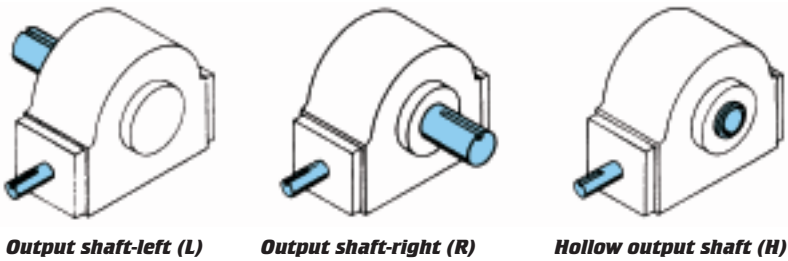
With over 100 years in the design and production of high quality gears, Davall is your natural partner for precision drives. Davall engineers can advise on application, configuration, material, testing – and provide on-site technical support during product development.

QUALITY

Davall operates a fully approved quality system which meets the requirements of ISO 9001, BS 5750:Pt 1, AQAP 1, and the approval of many notable prime contractors in aerospace, defence and industry.



SPIRADRIVE® - COMPACT, ACCURATE, POWER TRANSMISSION BY DESIGN.



Shaft configurations

The shaft permutations as shown above are available as standard.

Where double ended shafts are required the dimensions will mirror those for a single ended shaft.

Torque capacity

Derate performance characteristics for gearboxes/gearsets by dividing stated capacity by Service Factor from the table (Page 6).

Lubrication

The type of lubrication required is to a certain extent dictated by the input speed of the application. This has been overcome by offering two versions of each size of gearbox. The grease packed version is recommended for use where input speeds up to 500 rpm are involved – this version may also be used for intermittent duty applications where the performance figures stated (pages 5 7 6) are not to be exceeded. For higher speed and for continuous applications we recommend the use of the oil filled versions. All steel gearsets require an EP lubricant.

How to order

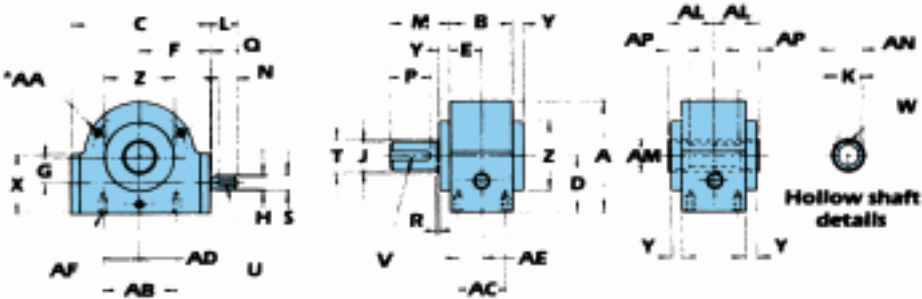
The possible permutations of shafts, ratio, lubrication and backlash are such that it is essential that the correct catalogue number is quoted in any enquiry or order.

The number has been designed to enable us to clearly identify the exact model required and is made up as follows:

Components of the number: e.g.

- 1st group 19SGB – this identifies it as a 19mm Spiradrive gearbox
- 2nd group 19SGB-60 – this group is the required ratio (60:1)
- 3rd group 19SGB-60-S – “S” for single ended input shaft
- “D” for double ended input shaft
- 4th group 19SGB-60-S-L – “L” for output shaft left
- “R” for output shaft right
- “H” for hollow output shaft
- “D” for double ended output shaft
- 5th group 19SGB-60-S-L-G – “G” for grease lubrication
- “O” for oil lubrication
- 6th group 19SGB-60-S-L-G-BL10 – BL10 for 10 minutes of arc backlash
- BL3 for 3 minutes or arc backlash*

* only available for bronze wheel



DIMENSIONS IN MILLIMETRES – Drawings available on disk

SGB	A	B	C	D	E	F	G	H dia	J dia	K dia	L	M	N	P	Q	R	S dia	T dia
12	56.5	44	70	29	22	35	12	6.995 6.986	9.995 9.986	7.022 7.000	15	25	11	18	1	1	8	12
16	70	46	90	36	23	45	16	8.995 8.986	13.994 13.983	10.000	17.5	33.5	14	21	0.5	1	10	17
19	83	48	105	42	24	52.5	19	9.995 9.986	21.993 21.980	16.027 16.000	20.5	45	15	30	0.5	1	12	25
25	110	70	132	55	35	66	25	14.994 14.983	27.993 27.972	20.021 20.000	34	49	29	36	1	1	17	30
38	160	90	184	80	45	92	38	21.993 21.980	37.991 37.966	30.033 30.000	51	78	40	60	1	1.0 0.3	25	45
50	214	135	256	105	67.5	128	50	29.993 29.980	49.991 49.975	38.025 38.000	62	100	50	82	2	2	32	55
70	297	165	335	150	82.5	167.5	70	37.991 37.975	69.990 69.971	55.030 55.000	81	133	70	105	1	2	40	80

SGB	U	V	W	X	Y	Z dia	AA	AB	AC	AD	AE	AF	AL	AM dia	AN dia	AP	Ma kgs	F ₁	F ₀	F _a
12	2 wide 1.25 deep	3 wide 1.85 deep	2 wide 1.10 deep	33	4.5 3.5	36.00 35.95	M4x8 on 47 P.C.D.	34	34	17	17	M4x8	27	12	10	13	0.6	70	540	850
16	3 wide 1.85 deep	5 wide 3.05 deep	3 wide 1.45 deep	39.5	8.0 7.0	47.00 46.95	M5x10 on 60 P.C.D.	45	35	22.5	17.5	M5x10	31.5	17	14	14	1.1	110	880	930
19	3 wide 1.75 deep	6 wide 3.5 deep	5 wide 2.3 deep	46	8.5 7.5	52.00 51.92	M6x12 on 72 dia.	55	36	27.5	18	M6x12	34	25	21.4	15	1.4	145	1200	1825
25	5 wide 3.0 deep	8 wide 4.0 deep	6 wide 2.8 deep	55.4	6.5 5.5	75.00 74.95	M8x16 on 95 dia.	94	54	47	27	M8x16	42.5	30	–	–	3.5	220	1900	1800
38	6 wide 3.5 deep	10 wide 5.0 deep	8 wide 3.3 deep	80	6.5 5.5	99.99 99.95	M8x16 on 140 dia.	140	70	70	35	M8x20	52.5	45	–	–	10	400	3800	1275
50	8 wide 4.0 deep	14 wide 5.7 deep	10 wide 3.3 deep	103	8.5 7.5	130.00 129.94	M10x20 on 185 dia.†	190	105	95	52.5	M12x24	77.5	55	–	–	30	840	8400	6180
70	10 wide 5.0 deep	20 wide 7.5 deep	16 wide 4.3 deep	140	11.5 10.5	185.00 184.93	M12x24 on 255 dia.†	258	128	129	64	M16x32	95.5	80	–	–	63	1000	11000	9850

† 4 Holes

Maximum dynamic tangential load at 1500rpm (input) at G radius and at centre of keyway:

Input shaft F₁ Newtons.
Output shaft F₀ Newtons.

Axial thrust at 60rpm (gear over pinion).
Output shaft F_a Newtons.

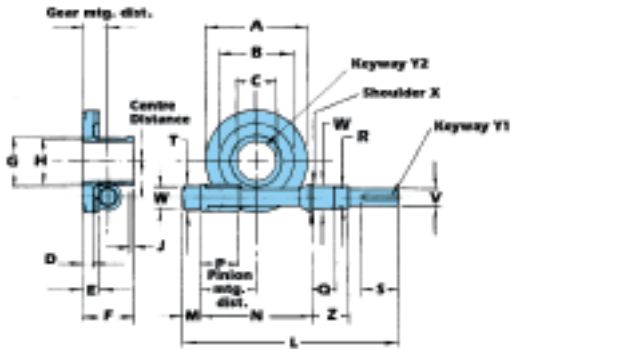
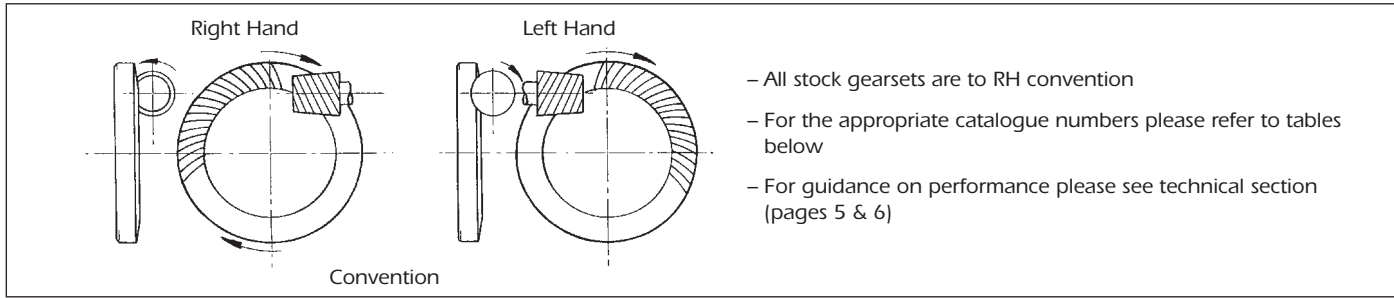
For guidance on performance see Technical Section (pages 5 & 6)

Shaft Configurations – see notes above.

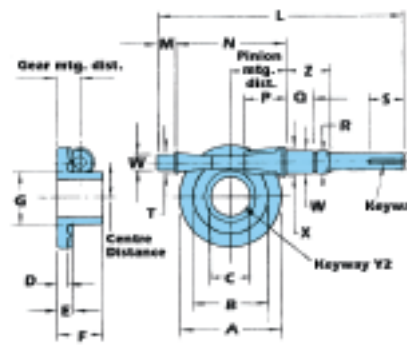
Construction:
Housing – cast aluminium alloy.
Shafts – high tensile steel.
Seals – lip type.

Bearings, input shaft – angular ball/taper roller.
Bearings, output shaft – ball bearings.
Gears – hardened high tensile steel or steel/bronze

Lubrication:
Oil-filled gearbox – Optigear BM 220
Grease-filled – Optigear PDO
Weight – Ma kg.
General tolerance unless stated ±0.25mm.



CONFIGURATION A



CONFIGURATION B

ALL DIMENSIONS IN MILLIMETRES – Drawings available on disk
N.B. All standard gearsets and gearboxes are right hand gearing

Centre distance	Ratio	No. threads Pinion	No. teeth Gear	Mounting dist Pinion	dist Gear	Catalogue Number	A dia	B dia	C dia	D	E	F	G	H	J
12 CONFIG. A	10.20	4	41	19.00	9.00	012A1025	36.00	26.40	12.013 12.000	3.5	5.63	18.0	16.95	–	–
	16.33	3	49		9.00	012A1633									
	25.50	2	51		9.00	012A2550									
	36.00	1	36		9.00	012A3600									
16 CONFIG. A	10.20	4	41	26.00	11.63	016A1025	48.00	35.20	17.018 17.000	4.1	6.94	22.0	23.31	–	–
	16.33	3	49		11.69	016A1633									
	25.50	2	51		11.66	016A2550									
	36.00	1	36		11.00	016A3600									
19 CONFIG. A	60.00	1	60	31.00	11.93	016A6000	57.15	43.20	24.988 24.961	4.0	6.0	23.5	32.0	28.0	1.5
	8.17	4	32		11.97	019A0817									
	10.25	4	40		11.37	019A1025									
	12.33	3	37		11.16	019A1233									
	25.50	2	51		11.68	019A2550									
	36.00	1	36		11.10	019A3600									
	60.00	1	60		12.00	019A6000									
	90.00	1	90		11.01	019A9000									
108.00	1	108	11.38	019A10800											
25 CONFIG. A Tapered	10.25	4	41	41.00	19.42	025A1025	76.20	55.88	30.021 30.000	9.5	13.48	39.0	39.0	–	–
	16.33	3	49		19.60	025A1633									
	25.50	2	51		19.62	025A2550									
	36.00	1	36		18.60	025A3600									
	58.00	1	60		19.82	025A5800									
100.00	1	100	20.75	025A10000											
38 CONFIG. B	10.20	5	51	60.00	24.04	038A1020	114.30	83.82	45.025 45.000	11.0	16.11	50.0	60.0	–	–
	17.33	3	52		23.92	038A1733									
	25.50	2	51		23.70	038A2550									
	31.00	1	31		21.62	038A3100									
	36.50	2	73		24.78	038A3650									
	58.00	1	58		24.34	038A5800									
	90.00	1	90		25.42	038A9000									
	120.00	1	120		25.35	038A12000									
50 CONFIG. B	10.20	5	51	81.00	34.28	050A1020	152.4	111.8	55.030 55.000	16.0	23.00	68.0	78.0	–	–
	17.33	3	52		33.50	050A1733									
	25.50	2	51		33.56	050A2550									
	38.00	1	38		33.78	050A3800									
	58.00	1	58		34.09	050A5800									
	90.00	1	90		36.06	050A9000									
120.00	1	120	36.79	050A12000											
70 CONFIG. B	10.20	5	51	109.00	43.88	070A1020	209.55	153.67	80.03 80.00	20.00	29.58	87.0	112.0	–	–
	17.33	3	52		43.87	070A1733									
	25.50	2	51		43.27	070A2550									
	36.50	2	73		45.62	070A3650									
	58.00	1	58		43.70	070A5800									
	87.00	1	87		45.98	070A8700									
	120.00	1	120		46.57	070A12000									

Centre distance	Gear Form	L	M	N	P	Q	R	S	T dia	V dia	W dia	X dia	Y1	Y2	Z
12	Parallel	77	8	38.00	14.10	8.0	7.95 7.90	11.0	10.17	6.995 6.986	8.004 7.998	10.17	2.00 wide 1.25 deep	3.00 wide 1.40 deep	17.0
16	Parallel	98.5	10	52.00	19.46	10.0	9.95 9.91	14.0	12.8	8.995 8.986	10.004 9.998	12.8	3.00 wide 1.8 deep	4.00 wide 1.80 deep	19.8
19	Parallel	118	14	62.00	22.33	15.75	11.92 11.87	15.0	15.24	9.995 9.986	12.005 11.997	15.24	3.00 wide 1.8 deep	4.00 wide 1.80 deep	22.0
25	Tapered	154	13	82.00	29.92	12.0	16.95 16.90	29.0	23.0	14.994 14.983	17.005 16.997	23.0	5.00 wide 3.0 deep	6.00 wide 2.80 deep	25.0
38	Tapered	221	18	120.00	43.38	18.0	24.92 24.87	40.0	31.0	21.990 21.980	25.015 25.002	30.363 30.313	6.00 wide 3.60 deep	14.00 wide 3.80 deep	33.0
50	Tapered	297	26	162.00	81.00	26.0	29.993 31.84	50.0	42.0	29.993 29.980	35.018 35.002	41.5	8.00 wide 4.00 deep	16.00 wide 4.30 deep	49.0
70	Tapered	392	34.5	218.00	78.5	45.0	40.00 39.84	70.0	55.0	37.991 37.975	40.018 40.002	55.07	10.00 wide 5.00 deep	22.00 wide 5.40 deep	59.5



SPIRADRIVE® GEARBOX & GEAR SET PERFORMANCE

SPIRADRIVE® 12mm

		Gearbox & gearset		1		250		500		1000		1500		3000		Separating factor		
Ratio		Characteristics (steel)		N.m.	lb.f.ins.	N.m.	lb.f.ins.	N.m.	lb.f.ins.	N.m.	lb.f.ins.	N.m.	lb.f.ins.	N.m.	lb.f.ins.	Force	LoSide	HiSide
10.2	Output Torque Efficiency	Continuous Intermittent (Approx.) %Lo Side	8.12 75	71.84	6.36	56.29	3.64	32.22	2.07	18.29	1.42	12.56	0.79	7.01	Fx	1.702	1.505	
					6.65	58.82	6.07	53.7	5.37	47.5	4.89	43.32	4.06	39.95	Fy	0.515	0.884	
					80		82		83		85		88		Fz	0.766	1.19	
16.33	Output Torque Efficiency	Continuous Intermittent (Approx.) %	11.41 63	101.02	8.81	78.01	5.02	44.46	2.83	25.08	1.94	17.16	1.07	9.51	Fx	1.891	1.689	
					9.21	81.51	8.37	74.1	7.36	65.14	6.69	59.17	5.51	47.79	Fy	0.37	0.921	
					70		72		74		77		80		Fz	0.508	1.09	
25.5	Output Torque Efficiency	Continuous Intermittent (Approx.) %	11.21 50	99.2	8.58	75.95	4.88	43.19	2.74	24.26	1.87	16.57	1.03	9.15	Fx	2.01	1.79	
					8.97	79.36	8.13	71.98	7.12	63.02	6.46	57.14	5.3	46.92	Fy	0.377	0.992	
					58		60		63		67		71		Fz	0.431	1.095	
36	Output Torque Efficiency	Continuous Intermittent (Approx.) %	11.17 39	98.9	8.44	74.71	4.78	42.32	2.67	23.6	1.82	16.08	1	8.82	Fx	2.086	1.858	
					8.82	78.07	7.97	70.54	6.93	61.3	6.27	55.46	5.11	45.23	Fy	0.382	1.039	
					47		49		53		56		61		Fz	0.402	1.11	

SPIRADRIVE® 16mm

		Gearbox & gearset		1		250		500		1000		1500		3000		Separating factor		
Ratio		Characteristics (steel)		N.m.	lb.f.ins.	N.m.	lb.f.ins.	N.m.	lb.f.ins.	N.m.	lb.f.ins.	N.m.	lb.f.ins.	N.m.	lb.f.ins.	Force	LoSide	HiSi
Output 10.2	Continuous Torque Efficiency	Intermittent (Approx.) %	18.55 74	14 164.2	123.9	7.914	70.02	4.4	38.96	3	26.52	1.64	14.45	Fx	1.283	1.137		
					14.63	129.5	13.19	116.7	11.43	101.2	10.33	91.45	8.4	74.33	Fy	0.388	0.741	
					81		82		85		86		89		Fz	0.571	0.946	
16.33	Output Torque Efficiency	Continuous Intermittent (Approx.) %	26.56 64	235.1	19.93	176.5	11.26	99.6	6.24	55.28	4.25	37.61	2.32	20.48	Fx	1.399	1.261	
					20.83	184.4	18.76	166	16.22	143.6	14.65	129.7	11.89	105.2	Fy	0.276	0.688	
					72		73		77		79		82		Fz	0.393	0.817	
25.5	Output Torque Efficiency	Continuous Intermittent (Approx.) %	26.85 49	237.6	19.71	174.5	11.24	97.86	6.07	53.75	4.11	36.4	2.22	19.66	Fx	1.512	1.359	
					20.6	182.3	18.73	163.1	15.77	139.6	14.18	125.5	11.39	100.8	Fy	0.283	0.755	
					58		60		65		67		73		Fz	0.322	0.824	
36	Output Torque Efficiency	Continuous Intermittent (Approx.) %	25.84 41	288.7	19.03	168.4	10.69	94.62	5.88	52.05	3.98	35.26	2.16	19.08	Fx	1.548	1.388	
					19.89	176	17.82	157.7	15.28	135.2	13.74	121.6	11.06	97.87	Fy	0.285	0.776	
					50		52		57		60		65		Fz	0.301	0.83	
60	Output Torque Efficiency	Continuous Intermittent (Approx.) %	26.4 26	233.7	19.09	169	10.66	94.4	5.83	51.55	3.93	34.77	2.11	18.65	Fx	1.606	1.441	
					19.95	176.6	17.77	157.33	15.13	133.9	13.55	119.9	10.8	95.62	Fy	0.289	0.812	
					35		36		42		44		51		Fz	0.292	0.846	

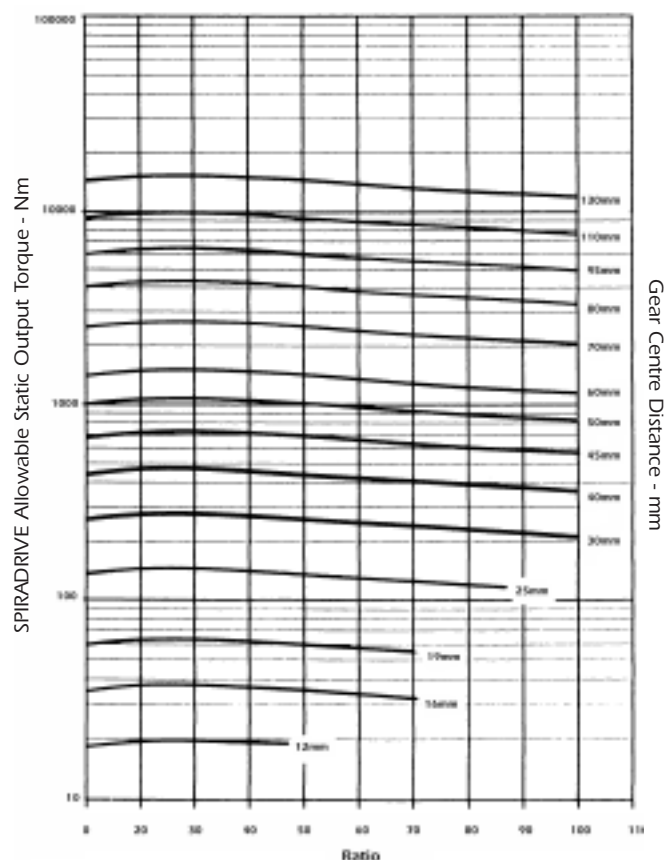
SPIRADRIVE® 19mm

		Gearbox & gearset		1		250		500		1000		1500		3000		Separating factor		
Ratio		Characteristics (steel)		N.m.	lb.f.ins.	N.m.	lb.f.ins.	N.m.	lb.f.ins.	N.m.	lb.f.ins.	N.m.	lb.f.ins.	N.m.	lb.f.ins.	Force	LoSide	HiSi
8.17	Output Torque Efficiency	Continuous Intermittent (Approx.) %	27.9 0.79	247	16.8	149	11.6	103	6.4	56.6	4.5	39.8	2.1	18.7	Fx	0.934	0.936	
					22.3	197	19.3	171	16.6	147	15	133	12.1	107	Fy	0.452	0.763	
					0.84		0.86		0.88		0.89		0.92		Fz	0.472	0.424	
10.25	Output Torque Efficiency	Continuous Intermittent (Approx.) %	34.2 0.75	303	20.7	183	14.3	127	7.8	69.3	5.5	48.4	2.6	22.9	Fx	1.045	1.054	
					27.3	242	23.7	210	20.3	180	18.3	162	14.8	131	Fy	0.372	0.765	
					0.81		0.83		0.86		0.87		0.9		Fz	0.386	0.258	
12.33	Output Torque Efficiency	Continuous Intermittent (Approx.) %	34.2 0.7	303	20.7	183	14.1	125	7.8	69	5.4	48	2.6	22.6	Fx	1.078	1.0861	
					27.2	241	23.6	209	20.2	179	18.2	161	14.6	129	Fy	0.354	0.747	
					0.77		0.79		0.81		0.84		0.85		Fz	0.341	0.218	
25.5	Output Torque Efficiency	Continuous Intermittent (Approx.) %	45.3 0.48	401	26.2	232	18.1	160	9.8	87	6.8	60.1	3.1	27.8	Fx	1.179	1.179	
					35	310	29.9	265	25.4	225	22.7	201	18	159	Fy	0.222	0.719	
					0.57		0.6		0.66		0.68		0.74		Fz	0.205	0.122	
36	Output Torque Efficiency	Continuous Intermittent (Approx.) %	40.7 0.4	360	25.5	226	16.3	144	8.8	78.14	6.1	54.1	2.8	25.2	Fx	1.202	1.197	
					31.5	279	27	239	22.9	203	20.5	181	16.3	144	Fy	0.220	0.783	
					0.48		0.52		0.58		0.6		0.67		Fz	0.172	0.131	
60	Output Torque Efficiency	Continuous Intermittent (Approx.) %	44.6 0.26	395	27.6	244	17.5	155	9.4	83.2	6.5	57.4	3	26.4	Fx	1.152	1.124	
					34	301	28.9	256	24.4	216	21.7	192	17.1	151	Fy	0.183	0.556	
					0.34		0.37		0.43		0.45		0.53		Fz	0.153	0.360	
90	Output Torque Efficiency	Continuous Intermittent (Approx.) %	45.1 0.27	399	29	257	18	159	9.8	85.9	6.8	60.2	3.1	27.4	Fx	1.235	1.230	
					35	310	30	266	25.4	22.5	22.6	200	17.8	158	Fy	0.110	0.647	
					0.29		0.31		0.36		0.39		0.45		Fz	0.122	0.108	
108	Output Torque Efficiency	Continuous Intermittent (Approx.) %	46 0.18	407	27.3	242	18.5	164	10	88.5	7	61.6	3.2	28.5	Fx	1.236	1.229	
					35.7	316	30.6	271	26	230	23.3	206	18.4	163	Fy	0.219	0.644	
					0.23		0.26		0.31		0.33		0.4		Fz	0.113	0.108	

SPIRADRIVE® 25mm

			Gearbox & gearset		1		250		500		1000		1500		3000		Separating factor		
Ratio	Characteristics (steel)		N.m.	lb.f.ins.	N.m.	lb.f.ins.	N.m.	lb.f.ins.	N.m.	lb.f.ins.	N.m.	lb.f.ins.	N.m.	lb.f.ins.	N.m.	lb.f.ins.	Force	LoSide	HiSi
10.25	Output Torque Efficiency	Continuous Intermittent (Approx.) %	108.56	606.8	49.2	435.4	27.27	241.4	14.85	131.4	9.97	88.25	5.32	47.05	Fx	0.81	0.737		
			108.56	606.8	51.41	455	45.45	402.3	38.56	341.3	34.38	304.3	27.26	241.3	Fy	0.248	0.478		
			76		83		84		87		88		91		Fz	0.392	0.622		
16.33	Output Torque Efficiency	Continuous Intermittent (Approx.) %	92.9	822.2	65.25	577.6	35.9	317.8	19.84	175.6	12.97	114.8	6.86	60.68	Fx	0.894	0.81		
			92.9	822.2	68.18	603.4	59.84	529.6	51.52	456	44.72	395.8	35.16	311.2	Fy	0.176	0.491		
			63		72		75		78		80		85		Fz	0.252	0.564		
25.5	Output Torque Efficiency	Continuous Intermittent (Approx.) %	97.81	865.7	67.83	600.3	37.13	328.7	19.99	176.9	13.33	117.9	7.01	62.05	Fx	0.956	0.869		
			97.81	865.7	70.88	627.3	61.89	547.8	51.92	459.5	45.95	406.7	35.95	318.2	Fy	0.18	0.483		
			50		60		64		68		71		78		Fz	0.21	0.527		
36	Output Torque Efficiency	Continuous Intermittent (Approx.) %	93.71	829.4	65.22	577.3	35.8	316.8	19.29	170.7	12.87	113.9	6.79	60.06	Fx	0.982	0.889		
			93.71	829.4	68.15	603.2	59.66	528	50.1	443.4	44.39	392.9	34.8	308	Fy	0.181	0.497		
			42		52		56		61		63		71		Fz	0.197	0.53		
58	Output Torque Efficiency	Continuous Intermittent (Approx.) %	102.3	905.1	69.93	618.9	38.06	336.9	20.41	180.6	13.56	120	7.1	62.82	Fx	1.02	0.929		
			102.3	905.1	73.07	646.7	63.44	561.5	53.01	469.2	46.76	413.9	36.4	322.13	Fy	0.184	0.472		
			28		37		41		46		49		58		Fz	0.187	0.492		
100	Output Torque Efficiency	Continuous Intermittent (Approx.) %	77.73	688	63.74	564.2	35.91	317.8	19.32	170.9	12.73	112.7	6.35	56.24	Fx	0.985	0.927		
			77.73	688	66.6	589.5	59.85	529.7	50.17	444	43.89	388.5	32.58	288.4	Fy	0.182	0.482		
			18		25		29		32		36		44		Fz	0.192	0.491		

GEAR TORQUES



Allowable static gear torque (steel) for gear centre distances 12-130mm)

NOTE:

NOTE: We reserve the right to make changes and corrections without notice. Every effort has been made to provide accurate technical and product information. The company disclaims responsibility for any error or omission regarding technical and product information published.

Customers are advised to conform 'fitness for purpose' for their specific application by suitable testing

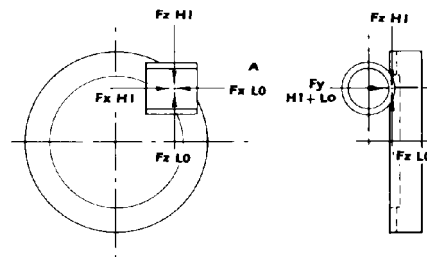
BEARING THRUSTS

$$\begin{aligned}\text{Axial Thrust (Pinion)} &= TQ \times F_x \times 39.37 \text{ Newtons} \\ &= TQ (\text{lbf ins}) \times F_x \text{ lbf}\end{aligned}$$

$$\begin{aligned}\text{Radial Thrust (Pinion)} &= TQ \text{ (Nm) } \times F_z \times 39.37 \text{ Newtons} \\ &= TQ \text{ (lbf ins) } \times F_z \text{ lbf}\end{aligned}$$

* Axial Thrust (Gear) = TQ (Nm x Fy x 39.37 Newtons
= TQ (lbf ins) x Fy ibf

*Radial Thrust (Gear) = Axial Thrust (Pinion)



(TQ = Torque)

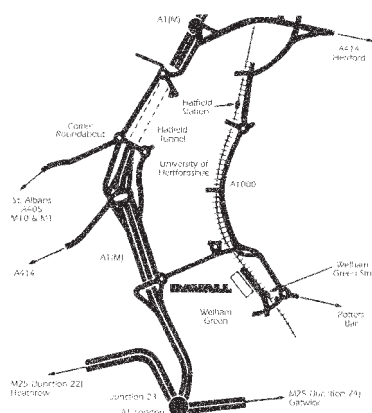
*NB Gear thrusts are offset forces. Refer to table above for appropriate separating force factors and obtain thrust components using above formula.

(Torque required = output torque.)

NOTE: Clockwise pinion drive (viewed from A) results in Hi side drive and anticlockwise pinion drive in Lo side drive.

SERVICE FACTORS

Prime Mover	Duration of service	Driven machine load classifications		
		Uniform	Moderate shock	Heavy shock
Electric Motor (normal service)	Occasional - 1/2 hr/day total	0.80	0.90	1.00
	Intermittent - 2 hr/day total	0.90	1.00	1.25
	10 hours per day	1.00	1.25	1.50
	24 hours per day	1.25	1.50	1.75
Electric Motor (more than 10 starts per hour)	Occasional - 1/2 hr/day total	0.90	1.00	1.25
	Intermittent - 2 hr/day total	1.00	1.25	1.50
	10 hours per day	1.25	1.50	1.75
	24 hours per day	1.50	1.75	2.00
Multi-cylinder internal combustion engine	Occasional - 1/2 hr/day total	0.90	1.00	1.25
	Intermittent - 2 hr/day total	1.00	1.25	1.50
	10 hours per day	1.25	1.50	1.75
	24 hours per day	1.50	1.75	2.00
Single cylinder internal combustion engine	Occasional - 1/2 hr/day total	1.00	1.25	1.50
	Intermittent - 2 hr/day total	1.25	1.50	1.75
	10 hours per day	1.50	1.75	2.00
	24 hours per day	1.75	2.00	2.25
Depending upon applications, modify the charted figures by dividing them by the appropriate service factor above.				



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