NSL Technology Resources (s) Pte Ltd
No 280 Woodlands Industrial Park E5,
#09-11 Harvest @ Woodlands,
Singapore 757322
Tel : +65 67957477, 7747 Fax : +65 63162368
Email : sales@nsltechnology.com

HUB CITY

BeVeL GeAR DRIVes
SINCE 1893

HEAVY DUTY CAST IRON CASE MODELS WITH TAPER ROLLER BEARINGS

Model 1000

Model 88

Model 66

Model 150

IntRoDUctIon.
HUB cItY bevel drives have been available in Australia since 1976. The range shown here are the basic models in straight and spiral bevel which we stock in this country. Numerous other variations are available on an indent basis.

APPLIcAtIon.
Bevel Gear Drives transfer power at 90°. Generally this power is transferred at a 1:1 ratio with relation to speed. However these gear drives are capable of increasing or reducing speed depending upon the gear ratio used.

sHAFt Rot AtIon.
Shaft rotation is determined by the relative location of the gears. Right hand (clockwise) or left hand (counter clockwise) rotations are determined by viewing the end of the shaft. Pinion shaft can be rotated in either direction. Refer figures below right.

BAsIc seLectIon.
Bevel gear drives are selected on the basis of speed, ratio, power and torque. FOR quick selection refer to the "POPULAR MODELS" box below. Select the ratio, power in kW and input speed required. Power is shown as kW per 100 RPM. To convert to this scale divide the power (kW) required by the input speed to be used and them multiply answer by 100. Then pick a model which meets or exceeds the power per 100 RPM you have calculated while having suitable ratio and RPM range to meet your requirements.

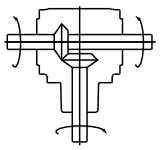
stRAIGHt oR sPIRAL BeVeL.
Both Straight and Spiral bevel drives are available. Straight bevel drives are suitable for lower input speeds while spiral bevel drives are suitable for higher input speeds due to their quietness and smoother gear meshing action. They are also generally able to handle higher power but are more expensive than straight bevels.

POPULAR MODELS

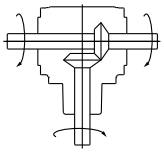
MODEL	GEAR TYPE	RATIO	SHAFT SIZE	kW per 100 RPM*	MAX IN RPM	DRY WT kg	ORDERING CODE
M 3	ST	1:1	0.625"	0.093	2400	4.6	02/20/21101
M 3	ST	1.5:1	0.625"	0.065	3000	4.6	02/20/21106
44	ST	1:1	0.750"	0.850	1750	6.9	02/20/75460
44	ST	2:1	0.750"	0.254	1750	6.9	02/20/75463
150	ST	1:1	1.000"	0.778	1150	11	02/20/00802
150	SP	1:1	1.000"	0.666	3000	11	02/20/00813
150	ST	1.5:1	1.000"	0.393	1750	11	02/20/00826
150	ST	2:1	1.000"	0.280	2400	11	02/20/00818
150	SP	2:1	1.000"	0.381	2400	11	02/20/00849
165	ST	1:1	1.000"	1.102	1150	12	02/20/00901
165	SP	1:1	1.000"	0.667	3000	12	02/20/00906
165	ST	1.5:1	1.000"	0.393	1750	12	02/20/00918
165	ST	2:1	1.000"	0.280	2400	12	02/20/00911
66	ST	1:1	1.250"	1.569	1150	22	02/20/03513
66	SP	1:1	1.250"	1.833	2400	22	02/20/03519
66	SP	1.53:1	1.250"	1.392	3000	22	02/20/03552
66	ST	2:1	1.250"	0.311	1750	22	02/20/03525
66	SP	2:1	1.250"	0.634	3000	22	02/20/03606
66	SP	3:1	1.250"	0.382	3000	22	02/20/03601
600	ST	1:1	1.375"	2.205	1150	24	02/20/03401
600	SP	1:1	1.375"	1.833	2400	24	02/20/03406
600	SP	1.29:1	1.375"	1.439	2400	24	02/20/03431
88	ST	1:1	1.375"	3.860	850	40	02/20/04404
88	SP	1:1	1.375"	3.835	1750	40	02/20/04010
88	ST	1.5:1	1.375"	2.528	1150	40	02/20/04041
88	ST	2:1	1.375"	1.427	1150	40	02/20/04015
88	SP	2:1	1.375"	2.386	1750	40	02/20/04079
88	ST	3:1	1.375"	0.639	1750	40	02/20/04026
800	ST	1:1	1.500"	6.074	690	53	02/20/59301
800	SP	1:1	1.500"	5.625	1750	53	02/20/59346
800	SP	1.5:1	1.500"	2.940	1750	53	02/20/59341
1000	ST	1:1	1.750"	8.646	690	62	02/20/04601
1010	SP	1:1	2.000"	10.695	1750	80	02/20/06301
1010	SP	1.5:1	2.000"	7.372	1750	80	02/20/06306
1010	SP	2:1	2.000"	5.280	1750	80	02/20/06311

seRVIce FActoRs.
The ratings for bevel drives are based on a service factor of 1.00, assuming uniform loads and uniform power source for up to 10 hours operation per day. For other operating conditions, the power or torque must be multiplied by the appropriate service factor, to determine the equivalent rating. AGMA Service factor tables are available upon request.

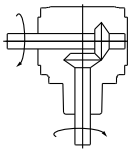
DRIVe stYLes.
Bevel drives have pinion shafts and cross shafts. Normally the input is at the pinion shaft. The type of cross shaft determines the style as can be seen below.



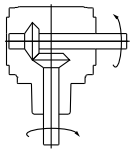
A = Plan View.



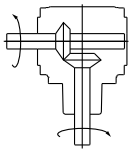
B = Inverted View
So this unit is known as Style A B



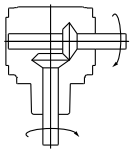
C = Plan View.



F = Inverted View
So this unit is known as Style C F



D = Plan View.

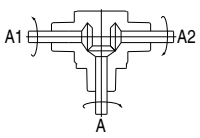


E = Inverted View
So this unit is known as Style D E

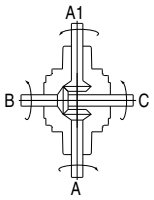
Ordering
Use the ordering codes as shown on the
previous page and add the required style code AB or CF or DE to the end of the ordering code. Eg:- 02/20/00802AB
For configurations or models not shown, factory numbers will be provided at time of order.

Other Styles
To the right are shown two types of directional differential styles which are available in most models to special order.

Hollow Cross Shafts.
Some models are available with hollow cross shafts to special order. Consult us for details.

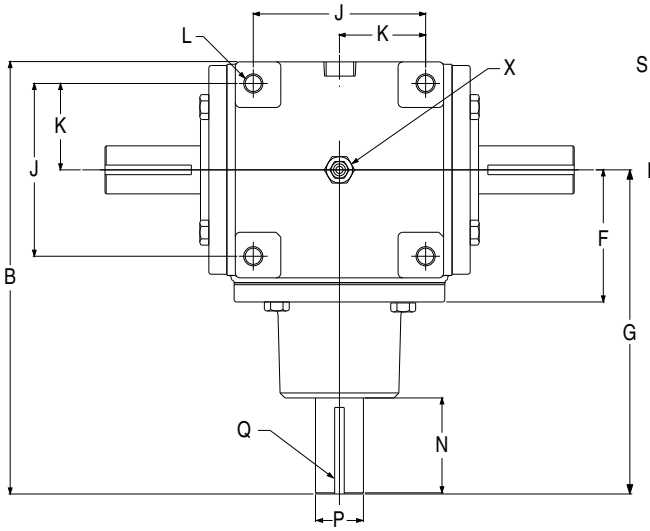


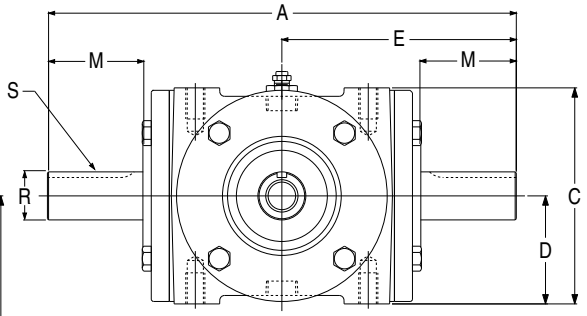
Style G



Style GG

BeVeL GeAR DRIVe DIMensIons





Drawing is typical. Appearance will vary for each model. Dimensions shown are for reference only. Detailed Technical sheets are available for all models.

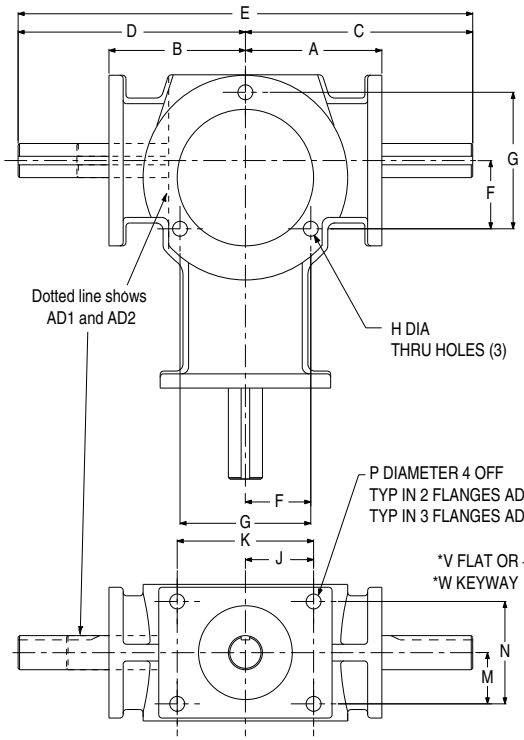
MODEL	A	B	C	D	E	F	G	J	K	L	M	N	ØP	Q	ØR	S
M3	6 15/32	6 3/16	3 3/16	1 19/32	3 15/64	1 3/4	4 9/16	2 1/4	1 1/8	5/16 UNC	1 1/2	1 17/32	5/8	3/16 x 3/32	5/8	3/16 x 3/32
44	7 15/16	7 1/8	3 5/8	1 13/16	3 31/32	2 5/16	5 3/16	3 1/8	1 9/16	5/16 UNC	1 1/2	1 1/2	3/4	3/16 x 3/32	3/4	3/16 x 3/32
150	10 3/16	8 9/32	4 1/8	2 1/16	5 3/32	2 27/32	5 23/32	4 1/4	2 1/8	3/8 UNC	2	2	1	1/4 x 1/8	1	1/4 x 1/8
165	10 3/16	9 23/32	4 1/8	2 1/16	5 3/32	2 7/8	7 5/32	4 1/4	2 1/8	3/8 UNC	2	2 1/32	1	1/4 x 1/8	1	1/4 x 1/8
66	12 1/4	11 1/4	5 5/8	2 13/16	6 1/8	3 7/16	8 7/16	4 1/2	2 1/4	1/2 UNC	2 1/2	2 9/16	1 1/4	1/4 x 1/8	1 1/4	1/4 x 1/8
600	12 1/4	11 7/32	5 5/8	2 13/16	6 1/8	3 7/16	8 13/32	4 1/2	2 1/4	1/2 UNC	2 1/2	2 1/2	1 3/8	5/16 x 5/32	1 3/8	5/16 x 5/32
88	15 13/16	14 23/32	8 3/16	4 3/32	7 29/32	4 19/32	10 7/8	6 1/2	3 1/4	1/2 UNC	3	3 1/16	1 3/8	5/16 x 5/32	1 3/8	5/16 x 5/32
800	16 3/32	15 21/32	8 3/16	4 3/32	8 3/64	4 9/16	11 1/2	6 1/2	3 1/4	1/2 UNC	3 3/32	3 1/16	1 1/2	3/8 x 3/16	1 1/2	3/8 x 3/16
1000	18 9/32	17 3/4	9 1/2	4 3/4	9 9/64	5 1/4	13	8	4	1/2 UNC	3	3	1 3/4	3/8 x 3/16	1 3/4	3/8 x 3/16
1010	21 1/2	19 3/4	9 1/2	4 3/4	10 3/4	5 1/4	15	8	4	1/2 UNC	4	4	2	1/2 x 1/4	2	1/2 x 1/4

All Dimensions are in inches.

otHeR HUB cItY PRoDUcts

Parallel Shaft Drives
These speed reducers provide you with nearly unlimited degree of flexibility. With up to 3 input modes to provide integration with hydraulic, electric or externally coupled drives. Reduction ratio's up to 70:1.

ALUMINIUM CASE, STAINLESS SHAFTS, SPIRAL BEVEL AND BALL BEARINGS

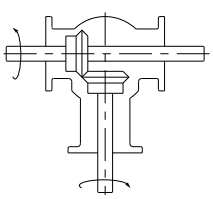


Models AD1 and AD2.

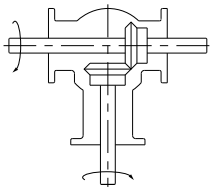
Models AD3 AD4 and AD5

Drawing is typical. Appearance will vary for each model. Dimensions shown are for reference only. Detailed Technical sheets are available for all models.
*Dimensions typical all shaft extensions.

These gearboxes are presealed and are available from stock only in style AB.



A = Plan View.



B = Inverted View

So this unit is known as Style A B

MODEL	A	B	C	D	E	F	G	H	J	K	M	N	P	Q	R	S	T	V	W	X
AD1	1 3/8	31/32	1 31/32	1 9/16	3 17/32	21/32	1 5/16	13/64	19/32	1 3/16	7/16	7/8	11/64	2 5/32	19/32	2 3/4	3/8	1/32 Deep	0.47 Eff flat	1 1/4
AD2	2 1/8	1 9/32	3 5/8	2 25/32	6 13/32	15/16	1 7/8	17/64	15/16	1 7/8	11/16	1 3/8	17/64	3 1/4	1 1/2	4 3/4	5/8	-	3/16 x 3/32	2
AD3	3	3	5	5	10	1 1/2	3	21/64	1 1/2	3	1 1/8	2 1/4	21/64	5	2	3	3/4	-	3/16 x 3/32	3
AD4	1 3/8	1 3/8	1 63/64	1 63/64	3 61/64	21/32	1 5/16	17/64	19/32	1 3/16	7/16	7/8	11/64	2 5/32	19/32	2 3/4	3/8	1/32 Deep	0.47 Eff flat	1 1/4
AD5	2 1/8	2 1/8	3 5/8	3 5/8	7 1/4	15/16	1 7/8	17/64	15/16	1 7/8	11/16	1 3/8	17/64	3 1/4	1 1/2	2	5/8	-	3/16 x 3/32	2

sPIRAL BeVeL GeAR DRIVes

InPUt RPM	RAtIo	oUtPUt RPM	AD1 & AD4 InPUt kW	AD1 & AD4 oUtPUt TORQUE	AD2 & AD5 InPUt kW	AD2 & AD5 oUtPUt TORQUE	AD3 InPUt kW	AD3 oUtPUt TORQUE
3600	1:1	3600	1.35	3.58	3.21	8.53	7.64	20.29
	2:1	1800	0.40	2.07	1.58	8.38	2.84	15.12
2400	1:1	2400	0.92	3.67	2.20	8.74	5.29	21.06
	2:1	1200	0.27	2.11	1.08	8.60	1.95	15.55
1750	1:1	1750	0.68	3.72	1.63	8.89	3.93	21.43
	2:1	875	0.19	2.13	0.80	8.72	1.46	15.93
1150	1:1	1150	0.45	3.77	1.10	9.07	2.65	22.01
	2:1	575	0.13	2.18	0.54	8.88	0.98	16.32
690	1:1	690	0.28	3.83	0.67	9.25	1.63	22.61
	2:1	345	0.08	2.20	0.33	9.04	0.60	16.74
100	1:1	100	0.04	4.02	0.10	9.69	0.25	24.05
	2:1	50	0.01	2.32	0.05	9.40	0.10	17.70

Allowable shaft Loads All Ratios and shafts

Model no	Overhung Load**	Thrust Load
AD3	45 kgs	90 kgs
AD1 & AD4	11 kgs	22 kgs
AD2 & AD5	22 kgs	45 kgs

** Assumes load at midpoint of shaft extension

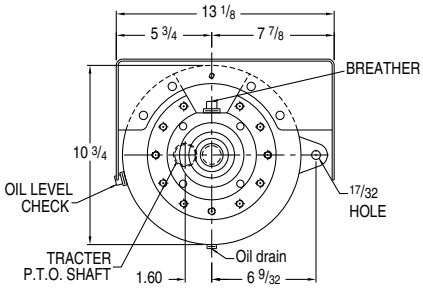
Model no	Ratio	Dry Wt Kg	ordering code
AD1	1:1	0.3	02/20/00201/003
	2:1	0.3	02/20/00203/003
AD2	1:1	0.9	02/20/00301/004
	2:1	0.9	02/20/00304/004
AD3	1:1	3.8	02/20/00403/005
	2:1	3.8	02/20/00404/005
AD4	1:1	0.3	02/20/05301/006
	2:1	0.3	02/20/05304/006
AD5	1:1	0.9	02/20/05401/007
	2:1	0.9	02/20/05404/007

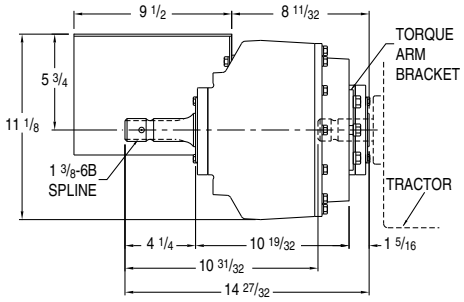
MoDeL 390 Pto sPeeD cHAnGeR - P ARt no. 02/20/06208/390

ADAPTS UP TO 125 HP TRACTOR TO ALL PTO OPERATED FIELD EQUIPMENT

FEATURES
Unit takes input horsepower up to 125 @ 1000 RPM.
Alloy Steel, heat treated gears don't shy away from jolts and shock loads.
Rugged, cast iron housing protects the unit for long, trouble free service.
Tapered roller bearing give quiet performance and long life.
Double lip, spring loaded seals keep lubricant where it belongs.
Alloy shaft and spline sleeve add to strength and dependability.
Unit minimizes PTO shaft overhung load and drive line angularity.
Easily installed and removed.
Safety shield included.
Permanently lubricated at factory.
Minimum offset between tractor PTO and speed changer extension minimizes drive line adjustment.

TECHNICAL SPECIFICATION
Ratio .....1.89:1 Reducer
Tractor RPM 1000
Drive line RPM.....540
Female spline .....1 3/4"-20 Inv.
Male spline .....1 3/8 - 6B
CD Centre distance ....1.60"
Weight 110Lbs





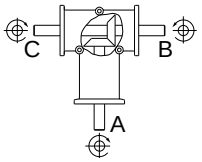
IMPORTANT: The Model 390 Speed Changers can be mounted on most tractor PTO shafts, however, they cannot be mounted on tractors that do not have detachable PTO shields. Units must be used in an approved mounting position with the torque arm bracket also in an approved position otherwise excessive side loading will be exerted on the tractor PTO shaft. The torque arm must always be positioned at 90° to the torque arm bracket.

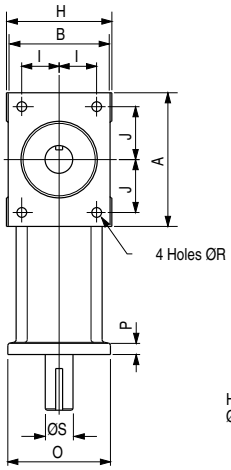
MoDeL DZ1, DZ2 & DZ3

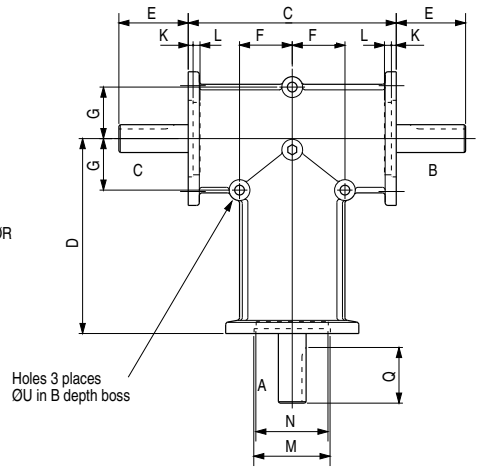
DZ1
Ratio - 1:1
Housing - Aluminium
Part No. DZ11-3FABC

DZ2
Ratio - 1:1
Housing - Aluminium
Part No. DZ21-3FABC

DZ3
Ratio - 1:1
Housing - Aluminium
Part No. DZ31-3FABC







Speed RPM	DZ I Ratio 1:1 Output torque Nm	DZ I Ratio 1:1 Input power kW	DZ 2 Ratio 1:1 Output torque Nm	DZ 2 Ratio 1:1 Input power kW	DZ 3 Ratio 1:1 Output torque Nm	DZ 3 Ratio 1:1 Input power kW
50	4.7	0.026	16.5	0.093	50.5	0.28
100	4.2	0.047	14.5	0.162	44.0	0.49
200	3.7	0.082	12.6	0.280	38.0	0.85
300	3.4	0.113	11.6	0.386	34.7	1.15
400	3.2	0.142	10.6	0.470	32.5	1.44
600	2.9	0.195	10.0	0.665	29.7	1.98
800	2.7	0.242	9.6	0.847	28.4	2.5
1000	2.6	0.287	9.2	1.014	27.1	3.0
1200	2.5	0.331	8.9	1.177	26.2	3.47
1400	2.4	0.368	8.6	1.320	25.2	3.87
1600	2.3	0.407	8.3	1.455	24.3	4.26
1800	2.3	0.442	8.0	1.571	23.5	4.61
2000	2.2	0.476	7.9	I.723	22.8	4.98
2500	2.1	0.556	7.8	2.105	21.3	5.75
3000	2.0	0.632	7.7	2.494	20.2	6.54

Rating are based on 12 hours/day operation with uniform loading. For other service factor consult our sales office

MODEL	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	ØU	Shaft	Key	Weight
DZ1	40	32	68	60	15	16	16	33	11	15	2.5	-	22	-	32	5	-	4.2	5.2	Ø 8	-	0.3
DZ2	66	50	104	90	35	24	24	52	18	26	5	-	35	-	50	7	27	6.2	8.3	Ø 15	5	1.1
DZ3	96	74	150	140	50	38	38	76	27	38	3.5	5	55	52	74	8	40	8.3	8.3	Ø 20	6	3.4