

GEARBOXES

Gearbox Selector Guide

	Part Number	Output Torque (Nm) depends on the speed				
		0 - 1	1 - 5	5 - 20	20 - 100	100 - 1200
Worm and Wheel Reduction Gearbox	P-PF20		1.25 - 5			
	P-PF30		2.5 - 8.8			
	P-PF40			5 - 18		
	P-PF45				10.3 - 40	
	P-PF55				13.4 - 57	
	P-PF60				30 - 118	
	P-PF70				38 - 164	
	PP35		2.2 - 4.1			
	PP50			6.5 - 12.8		
	PP60			17.8 - 34		
	PR5	0.009 - 0.028				
	PR6	0.015 - 0.046				
	BP50			6.6 - 27.5		
	BP60				22.1 - 83	
Crossed Axis Gearbox	E20	0.60 - 3.84				
	E30		1.5 - 9			
	E40			2.3 - 20		
	E50				3 - 41	
	E60				4.5 - 62	
	E60B			4.5 - 24		
Bevel Gearbox	BLH/T/M20	0.66 - 1.41				
	BLH/T/M30		1.65-3.54			
	BLH/T/M40			4 - 8		
	BLH/T/M50			11.5 - 20		
	BLH/T/M60				26 - 52	
	BLH/T/M70				43 - 77	
	BL8	0.2 - 2				
	BL15		1.1 - 6			
	BLSP15			2.2 - 12		
	BL18			4 - 10		
	BLN20		1.6 - 5			
	BLN30			5 - 15.5		
	BLN40				13 - 43	
	BLN50				40.6 - 110	
	BLN60				86 - 270	
	BLN70				215 - 550	
Offset Spur Reduction Gearbox	FF10	0.78 - 3.7				
	FF15		2.2 - 10			
	FF20			5.8 - 23		
	FF30				21.5 - 83	
	FF40				59 - 210	
	FF50				111 - 425	
Internal Epicyclic Servo Gearbox	EHD04		3.4 - 7			
	EHD06			8 - 19		
	EHD08				20 - 50	
	EHD12				60 - 140	
	EHD16				180 - 380	
Planetary Gearbox	PG					36 - 1200
	J27	0.03 - 0.14				
	J/XJ51	0.13 - 0.49				
	JHD/XJHD51		1 - 3			
	J/XJ52	0.27 - 0.90				
	J/XJ53	0.43 - 1.15				
	J/XJ64		0.57 - 2.25			
	J/XJ65		0.80 - 2.95			
	J/XJ66		0.90 - 2.80			
	NT/NH61			5 - 14		
	NT/NH62			6 - 18		
	NT/NH63			8 - 20		
	NT/NH91			10 - 35		
	NT/NH92			15 - 40		
	NT/NH-NTB121				20 - 68	
	NT/NH-NTB122				32 - 85	

GEARBOXES

Gearbox Selector Guide

⊥ Right angle

∥ Parallel

— — Coaxial

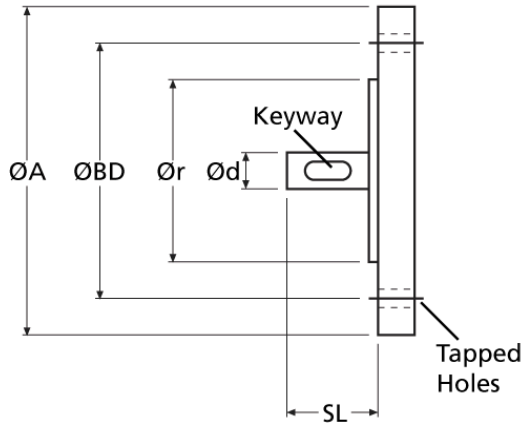
Part Number	Ratio	Efficiency at 1000rpm	Max. input speed rpm	Backlash	Angle of the shafts	Self locking output	Page		
P-PF20	5:1 - 120:1	32 - 90%	6000	≈0°30' Standard	⊥	✖ (≤ 30:1)	16		
P-PF30			5000				17		
P-PF40			4000				18		
P-PF45			3500				19		
P-PF55			3000	≤0°08' A Type		✔ (≥ 60:1)	20		
P-PF60							21		
P-PF70							22		
PP35	25:1 - 900:1	34 - 55%	3000	≈2°	⊥	✖ (≤ 30:1) ✔ (≥ 60:1)	25		
PP50							26		
PP60							27		
PR5	6:1 - 18:1	60 - 82%	4000	≈2°	⊥	✖ (≤ 10:1) ✔ (≤ 15:1)	28		
PR6	1:1 - 30:1						29		
BP50	9.67:1 - 60:1	65 - 85%	3000	≈0°30'	⊥	✖	30		
BP60	6:1 - 18:1						31		
E20	1:1 - 40:1	60 - 94%	4000 / 2000	≈1°	⊥	✖	32		
E30			4000 / 1500				33		
E40			4000 / 1500				34		
E50			3000 / 1500				35		
E60			3000 / 1500				36		
E60B			3000				37		
BLH/T/M20	1:1 - 2:1	88%	4000	≈1°	⊥	✖	48 & 54		
BLH/T/M30							49 & 55		
BLH/T/M40			3000				50 & 56		
BLH/T/M50							51 & 57		
BLH/T/M60							52 & 58		
BLH/T/M70							53 & 59		
BL8	1:1 - 4:1	88%	2000	≈1°	⊥	✖	60		
BL15		88%	2000	≈1°			61		
BLSP15		92%	3000	≈0°15'			62		
BL18	1:1	88%	3000	≈1°	⊥	✖	63		
BLN20	6:1 - 24:1	88%	4000	Depends on ratio			64		
BLN30			4000				65		
BLN40			3000				66		
BLN50			3000				67		
BLN60			3000				68		
BLN70			3000				69		
FF10	2:1 - 7:1	93%	2000	≈1°	∥	✖	70		
FF15							71		
FF20							72		
FF30			1500				73		
FF40							74		
FF50							75		
EHD04	3:1 - 6:1	90%	4000	≈0°30'	— —	✖	76		
EHD06	3:1 - 6:1	92%	4000	≈0°30'			77		
EHD08	3:1 - 36:1	92% / 86%	4000	≈0°30' / 1°30'			78 - 79		
EHD12	3:1 - 6:1	92%	3000	≈0°30'			80		
EHD16	3:1 - 6:1	92%	2000	≈0°30'			81		
PG	4:1 - 10:1	>95%	10000	≤0°06'	— —	✖	82 - 83		
J27	2:1 - 25:1	97%	4000	Depends on ratio	— —	✖	88		
J/XJ51	1:1 - 20:1	92%					89		
JHD/XJHD51	1:1 - 20:1	92%					90		
J/XJ52	1:1 - 130:1	88%					91		
J/XJ53	1:1 - 625:1	85%					92		
J/XJ64	1:1 - 16:1	92%					93		
J/XJ65	1:1 - 64:1	88%					94		
J/XJ66	1:1 - 256:1	85%					95		
NT/NH61	1:1 - 9:1	88-92%	3000	Depends on ratio	— —	✖	98		
NT/NH62	1:1 - 27:1	85%					99		
NT/NH63	1:1 - 120:1	80%					100		
NT/NH91	1:1 - 9:1	90%					101		
NT/NH92	1:1 - 36:1	84%					102		
NT/NH-NTB121	1:1 - 9:1	92% / 95%					103 / 105		
NT/NH-NTB122	1:1 - 27:1	88% / 92%					104 / 106		



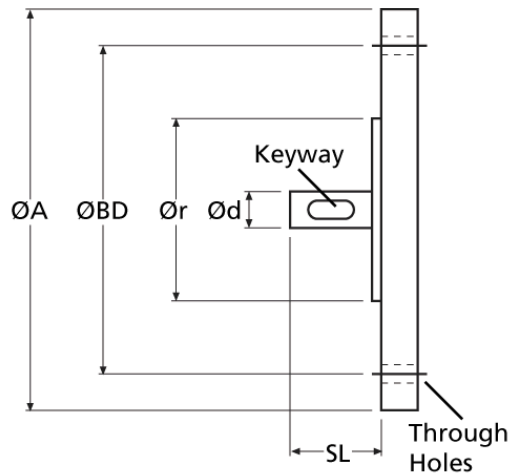
GEARBOXES

Motor Fitting Inputs (Motor Not Included)

B14 Type Motor Details



B5 Type Motor Details



Price

PF Type Gearboxes: Same cost as standard PF gearbox.

E Type Gearboxes: Special flange and input required, add 35% to cost.

NH & XJ Type Gearboxes: Same cost as standard gearbox.

Ordering

For part number add either **B14** or **B5** to end of part number, followed by motor frame size.

For example:

NH63-30 would become **NH63-30B1456** (Frame 56 Motor, B14 Design).

or,

PF60-60 would become **PF60-60B1463** (Frame 63 Motor, B14 Design). Input will then be made to fit this size motor.

Additional Information

Certain restrictions may apply if the size of motor required is too large. Furthermore, the additional redesign required to fit the motor may result in an increased cost for the unit.

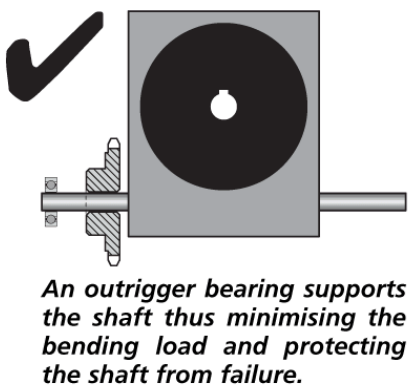
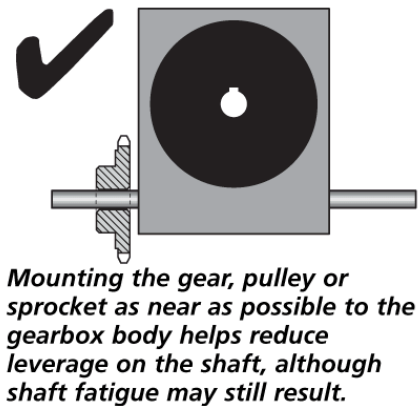
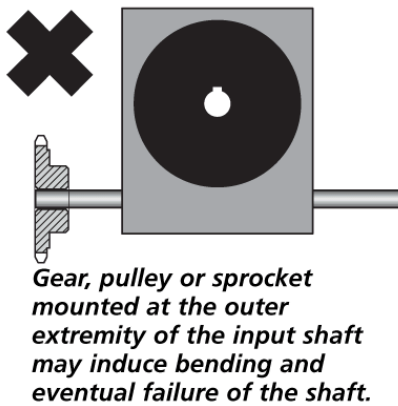
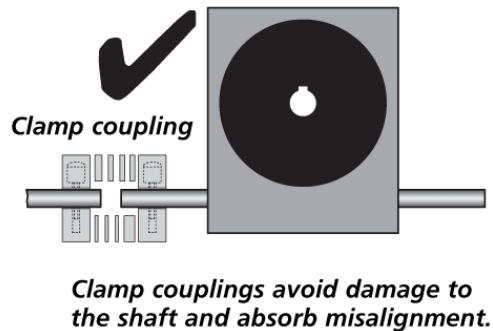
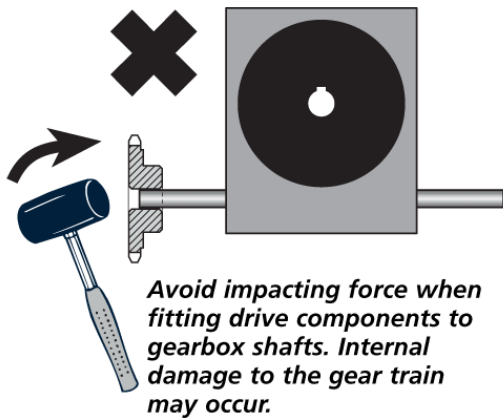
For further information on prices and delivery, please contact the Ondrives Technical Department. We are happy to help with any special or non-standard requirements that you may have. Simply contact our technical department with your specific requirements for an up-to-date and detailed quote.

B14 Motor Frame Sizes	$\varnothing A$	$\varnothing BD$	$\varnothing r$	$\varnothing d$	SL	Tapped Holes	Keyway Width
56	80	65	50	9	20	4 x M5	3
63	90	75	60	11	23	4 x M5	4
71	105	85	70	14	30	4 x M6	5
80	120	100	80	19	40	4 x M6	6
90	140	115	95	24	50	4 x M8	8
100	160	130	110	28	60	4 x M8	8
132	200	165	130	38	80	4 x M10	10

B5 Motor Frame Sizes	$\varnothing A$	$\varnothing BD$	$\varnothing r$	$\varnothing d$	SL	Thru Holes to Suit	Keyway Width
56	120	100	80	9	20	4 x M8	3
63	140	115	95	11	23	4 x M8	4
71	160	130	110	14	30	4 x M8	5
80	200	165	130	19	40	4 x M10	6
90	200	165	130	24	50	4 x M10	8
100	250	215	180	28	60	4 x M12	8
132	300	265	230	38	80	4 x M12	10

GEARBOXES

Gearbox Application



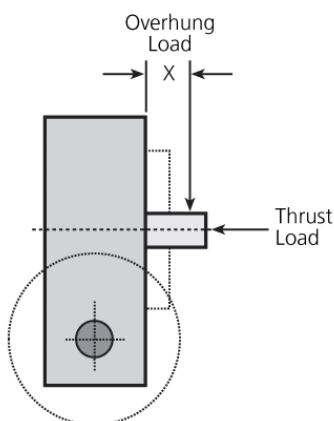
Customer modified gearboxes have an invalidated warranty.

GEARBOXES

Overhung & Thrust Loads



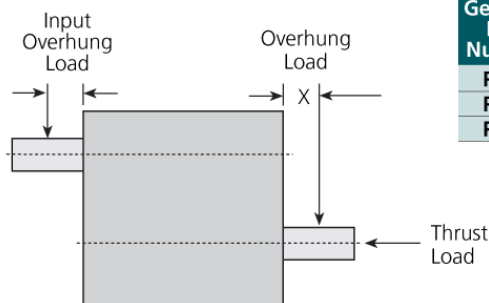
P/PF BP TYPE WORM & WHEEL GEARBOXES



Gearbox Part Number	Distance 'X'mm	OUTPUT SHAFT		INPUT Overhung Load kg
		Overhung Load kg	Thrust Load kg	
P20 PF20	10	12	5	6
P30 PF30	12	20	12	8
P40 PF40	15	30	20	10
P45 PF45	20	45	30	12
P55 PF55	20	60	40	14
P60 PF60	25	70	50	16
P70 PF70	30	80	60	20
BP50	25	60	40	20
BP60	30	80	60	25

Based on an input speed of 1000 Rpm taking a full load torque plus overhung load and thrust load

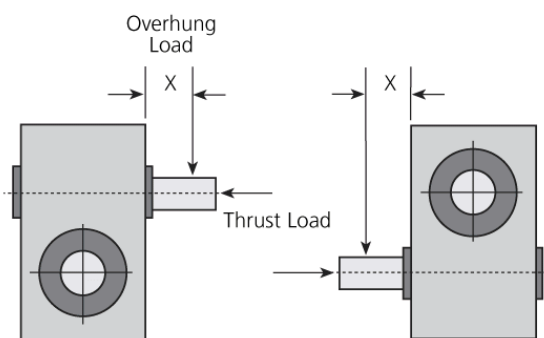
PP TYPE DOUBLE REDUCTION GEARBOXES



Gearbox Part Number	Distance 'X'mm	OUTPUT SHAFT		INPUT Overhung Load kg
		Overhung Load kg	Thrust Load kg	
PP35	12	12	10	6
PP50	20	30	20	10
PP60	25	45	35	15

Based on an input speed of 1000 Rpm taking a full load torque plus overhung load and thrust load

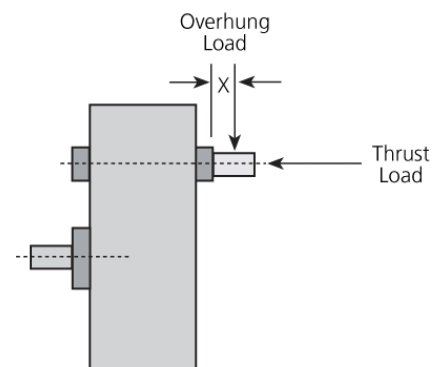
E TYPE CROSSED HELICAL GEARBOXES



Gearbox Part Number	Distance 'X'mm	THRUST LOADS - KG	
		Overhung Load kg	Thrust Load kg
E20	6	15	10
E30	10	20	15
E40	12	40	30
E55	20	60	40
E60	25	80	50

Based on an input speed of 1000 Rpm taking a full load torque plus overhung load and thrust load

FF TYPE SPUR GEAR REDUCTION GEARBOXES



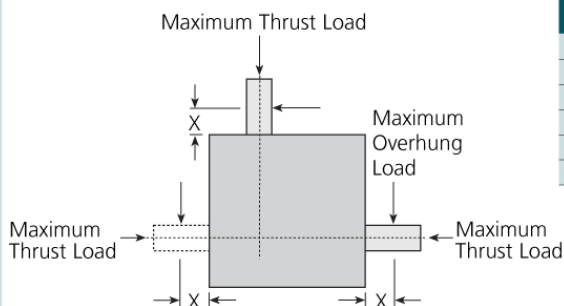
Gearbox Part Number	Distance 'X'mm	OUTPUT SHAFT		INPUT Overhung Load kg
		Overhung Load kg	Thrust Load kg	
FF10	8	10	10	6
FF15	10	20	20	12
FF20	15	40	30	16
FF30	20	60	40	20
FF40	30	80	50	30
FF50	40	100	60	40

Based on an input speed of 1000 Rpm taking a full load torque plus overhung load and thrust load

GEARBOXES

Overhung & Thrust Loads

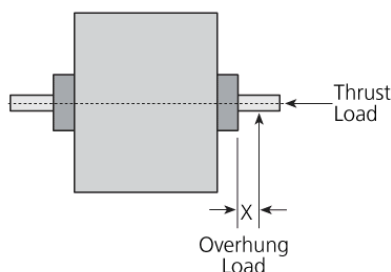
BLH/ BLHT TYPE BEVEL GEARBOXES



Gearbox Part Number	THRUST LOADS - KG		
	Distance 'X' mm	Overhung Load kg	Thrust Load kg
BLH20	6	4	3
BLH30	10	8	6
BLH40	12	12	10
BLH50	20	20	15
BLH60	25	30	25
BLH70	30	40	35

Based on an input speed of 1000 Rpm taking a full load torque plus overhung load and thrust load

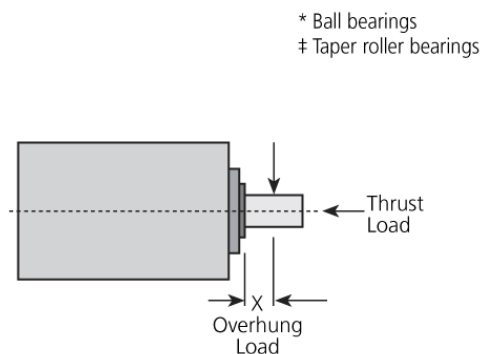
J/XJ NT/ NH TYPE PLANETARY GEARBOXES



Gearbox Part Number	THRUST LOADS - KG		
	Distance 'X' mm	Overhung Load kg	Thrust Load kg
J & XJ 51-52-53	6	5	5
J & XJ 64-65-66	6	5	5
NT & NH 61-62-63	10	12	10
NT & NH 91-92	15	20	15
NT & NH 121-122	20	25	20

Based on an input speed of 1000 Rpm taking a full load torque plus overhung load and thrust load

EHD TYPE EPICYCLIC GEARBOXES



Gearbox Part Number	THRUST LOADS - KG		
	Distance 'X' mm	Overhung Load kg	Thrust Load kg
EHD04*	10	20	15
EHD06*	10	25	15
EHD08*	12	30	20
EHD12‡	20	60	60
EHD16‡	30	100	100

Based on an input speed of 1000 Rpm taking a full load torque plus overhung load and thrust load

Putting loading on bearings may reduce the bearing / gearbox life and alter the running quality of the unit.

Material Near Equivalents (to be used as a guide only)

EN24 817 M40: DIN 34CrNiMo6 equiv. - AISI/SAE/ASTM 4337/4340

EN36 655 M13: DIN 15NiCr13/14NiCr14 equiv. - AISI/SAE/ASTM 3310/3415/9314

EN8 080 M40: DIN C40E/Ck40 - AISI/SAE/ASTM 1040

316 S11: DIN X2CrNiMo 17-2-2 - AISI/SAE/ASTM 316L

303 S31/22: DIN X8CrNiS 18-9 equiv. - AISI/SAE/ASTM 303

Aluminium Housings (square design) 6082-T6 Grade (HE30)

Aluminium Housings (round design) 2014A Grade (HE15)

Delrin DE/E 9446 NC-010 (Dupont)

GEARBOXES

Mass Moment of Inertia

Reflected at Input of Gearboxes



Gearbox Part Number	Mass Moment of Inertia Reflected at Input of Gearbox Kg m ²
P20-10	2.04×10^{-7}
P20-12	1.96×10^{-7}
P20-15	1.90×10^{-7}
P20-20	1.85×10^{-7}
P20-30	1.80×10^{-7}
P20-60	1.80×10^{-7}
P20-120	1.79×10^{-7}



Gearbox Part Number	Mass Moment of Inertia Reflected at Input of Gearbox Kg m ²
P30-10	7.62×10^{-7}
P30-12	7.13×10^{-7}
P30-15	6.71×10^{-7}
P30-20	6.38×10^{-7}
P30-30	6.14×10^{-7}
P30-60	5.98×10^{-7}
P30-120	5.95×10^{-7}



Gearbox Part Number	Mass Moment of Inertia Reflected at Input of Gearbox Kg m ²
P40-10	2.69×10^{-6}
P40-12	2.54×10^{-6}
P40-15	2.42×10^{-6}
P40-20	2.31×10^{-6}
P40-30	2.22×10^{-6}
P40-60	2.20×10^{-6}
P40-120	2.18×10^{-6}



Gearbox Part Number	Mass Moment of Inertia Reflected at Input of Gearbox Kg m ²
P45-10	5.20×10^{-6}
P45-12	4.70×10^{-6}
P45-15	4.29×10^{-6}
P45-20	3.95×10^{-6}
P45-30	3.72×10^{-6}
P45-60	3.57×10^{-6}
P45-120	3.53×10^{-6}



Gearbox Part Number	Mass Moment of Inertia Reflected at Input of Gearbox Kg m ²
P55-10	1.11×10^{-5}
P55-12	1.00×10^{-5}
P55-15	9.10×10^{-6}
P55-20	8.30×10^{-6}
P55-30	7.80×10^{-6}
P55-60	7.40×10^{-6}
P55-120	7.30×10^{-6}



Gearbox Part Number	Mass Moment of Inertia Reflected at Input of Gearbox Kg m ²
P60-10	2.37×10^{-5}
P60-12	2.08×10^{-5}
P60-15	1.85×10^{-5}
P60-20	1.65×10^{-5}
P60-30	1.52×10^{-5}
P60-60	1.42×10^{-5}
P60-120	1.40×10^{-5}



Gearbox Part Number	Mass Moment of Inertia Reflected at Input of Gearbox Kg m ²
PF20-10	2.51×10^{-7}
PF20-12	2.43×10^{-7}
PF20-15	2.36×10^{-7}
PF20-20	2.32×10^{-7}
PF20-30	2.28×10^{-7}
PF20-60	2.25×10^{-7}
PF20-120	2.25×10^{-7}

Gearbox Part Number	Mass Moment of Inertia Reflected at Input of Gearbox Kg m ²
PF30-10	9.20×10^{-7}
PF30-12	8.71×10^{-7}
PF30-15	8.30×10^{-7}
PF30-20	7.96×10^{-7}
PF30-30	7.72×10^{-7}
PF30-60	7.56×10^{-7}
PF30-120	7.53×10^{-7}

Gearbox Part Number	Mass Moment of Inertia Reflected at Input of Gearbox Kg m ²
PF40-10	3.78×10^{-6}
PF40-12	3.62×10^{-6}
PF40-15	3.49×10^{-6}
PF40-20	3.39×10^{-6}
PF40-30	3.32×10^{-6}
PF40-60	3.27×10^{-6}
PF40-120	3.26×10^{-6}

Gearbox Part Number	Mass Moment of Inertia Reflected at Input of Gearbox Kg m ²
PF45-10	7.34×10^{-6}
PF45-12	6.84×10^{-6}
PF45-15	6.43×10^{-6}
PF45-20	6.09×10^{-6}
PF45-30	5.86×10^{-6}
PF45-60	5.70×10^{-6}
PF45-120	5.66×10^{-6}

Gearbox Part Number	Mass Moment of Inertia Reflected at Input of Gearbox Kg m ²
PF55-10	1.96×10^{-5}
PF55-12	1.84×10^{-5}
PF55-15	1.75×10^{-5}
PF55-20	1.67×10^{-5}
PF55-30	1.62×10^{-5}
PF55-60	1.58×10^{-5}
PF55-120	1.57×10^{-5}

Gearbox Part Number	Mass Moment of Inertia Reflected at Input of Gearbox Kg m ²
PF60-10	3.80×10^{-5}
PF60-12	3.68×10^{-5}
PF60-15	3.14×10^{-5}
PF60-20	3.10×10^{-5}
PF60-30	2.88×10^{-5}
PF60-60	2.82×10^{-5}
PF60-120	2.79×10^{-5}

GEARBOXES

Mass Moment of Inertia Reflected at Input of Gearboxes

Gearbox Part Number	Mass Moment of Inertia Reflected at Input of Gearbox Kg m ²
P70-10	4.81 x 10 ⁻⁵
P70-12	4.19 x 10 ⁻⁵
P70-15	3.70 x 10 ⁻⁵
P70-20	3.28 x 10 ⁻⁵
P70-30	3.00 x 10 ⁻⁵
P70-60	2.82 x 10 ⁻⁵
P70-120	2.76 x 10 ⁻⁵

Gearbox Part Number	Mass Moment of Inertia Reflected at Input of Gearbox Kg m ²
E20-1	3.84 x 10 ⁻⁶
E20-2	2.21 x 10 ⁻⁶
E20-3	1.89 x 10 ⁻⁶
E20-4	1.78 x 10 ⁻⁶
E20-5	1.73 x 10 ⁻⁶

Gearbox Part Number	Mass Moment of Inertia Reflected at Input of Gearbox Kg m ²
E40-1	1.49 x 10 ⁻⁴
E40-2	6.99 x 10 ⁻⁵
E40-3	5.40 x 10 ⁻⁵
E40-4	4.83 x 10 ⁻⁵
E40-5	4.62 x 10 ⁻⁵

Gearbox Part Number	Mass Moment of Inertia Reflected at Input of Gearbox Kg m ²
E60-1	1.33 x 10 ⁻³
E60-2	6.79 x 10 ⁻⁴
E60-3	5.52 x 10 ⁻⁴
E60-4	5.07 x 10 ⁻⁴
E60-5	4.90 x 10 ⁻⁴

Gearbox Part Number	Mass Moment of Inertia Reflected at Input of Gearbox Kg m ²
BLH20-1	4.67 x 10 ⁻⁷
BLH30-1	2.26 x 10 ⁻⁶
BLH40-1	6.83 x 10 ⁻⁶
BLH50-1	5.10 x 10 ⁻⁵
BLH60-1	2.04 x 10 ⁻⁴
BLH70-1	4.49 x 10 ⁻⁴

Gearbox Part Number	Mass Moment of Inertia Reflected at Input of Gearbox Kg m ²
PF70-10	7.09 x 10 ⁻⁵
PF70-12	6.47 x 10 ⁻⁵
PF70-15	5.98 x 10 ⁻⁵
PF70-20	5.57 x 10 ⁻⁵
PF70-30	5.28 x 10 ⁻⁵
PF70-60	5.09 x 10 ⁻⁵
PF70-120	5.04 x 10 ⁻⁵

Gearbox Part Number	Mass Moment of Inertia Reflected at Input of Gearbox Kg m ²
E30-1	2.90 x 10 ⁻⁵
E30-2	1.42 x 10 ⁻⁵
E30-3	1.12 x 10 ⁻⁵
E30-4	1.02 x 10 ⁻⁵
E30-5	9.72 x 10 ⁻⁶

Gearbox Part Number	Mass Moment of Inertia Reflected at Input of Gearbox Kg m ²
E50-1	4.65 x 10 ⁻⁴
E50-2	2.39 x 10 ⁻⁴
E50-3	1.94 x 10 ⁻⁴
E50-4	1.78 x 10 ⁻⁴
E50-5	1.72 x 10 ⁻⁵

Gearbox Part Number	Mass Moment of Inertia Reflected at Input of Gearbox Kg m ²
E60B-1	1.25 x 10 ⁻³
E60B-2	6.32 x 10 ⁻⁴
E60B-3	5.10 x 10 ⁻⁴
E60B-4	4.67 x 10 ⁻⁴
E60B-5	4.51 x 10 ⁻⁴

Loctite Products & (Current Food Approvals)

- 603* : Retainer for bearings (-40 to +150°C)
(National Sanitary Foundation (NSF) P1 Approval)
- 567 : Thread sealant (-40 to +200°C)
(WRC potable water Approval Number 9903504)
- 577 : Thread sealant (-50 to +150°C)
(WRC potable water Approval Number 0302507 & NSF P1)
- 5367 : Silicone sealant (-40 to +250°C)
- 641 : Bearing fit (-40 to +150°C)
- 222* : Thread Lock - used on capscrew/grubscrew to prevent loosening
(-40 to +150°C) (NSF P1)

*most frequently used by Ondrives - others dependent on design or by request
Note: FDA Approvals are being phased out and replaced by NSF approvals

Material Properties of Wormwheels used in P & PF Range of Gearboxes

Material: Aluminium Bronze (BS/DGS CA104) (ASTM B150: 63200) (DIN Cu Al 10Ni) (UNS C63200)
Tensile Strength: 700-850N/mm², 0.2% proof stress 350-600 N/mm²
Young's Modulus: 125 N/mm² x 10³
Density: 7.59 g/cm³
Coefficient of Linear Expansion: 17.1°C x 10⁻⁶
Electrical Conductivity: %IACS 8
Thermal Conductivity: 80 W/m °C



GEARBOXES

Grease Technical Data

Shell Nerita Grease HV



Shell Nerita Grease HV - Synthetic High Speed Bearing Grease

A very high performance grease specially designed for the lubrication of heavily loaded, high-speed bearings. It consists of a blend of lithium soap, Shell XHVI synthetic base oil and carefully selected additives recommended for use where conventional greases are inadequate in anti-wear and extreme-pressure properties or in their oxidation resistance. Suitable over a wide temperature range from -30°C to a peak of +130°C, it gives extended bearing and grease life.



Performance Features

- Outstanding mechanical stability
- Long operational life
- Lead and nitrite free
- Wide operating temperature Range
- Excellent wear protection
- Heavy load capability
- Good oil separation



Typical Physical Characteristics

NLGI Consistency	2 to 3
Colour	Light Brown
Soap Type	Lithium
Base Oil (type)	Synthetic
Kinematic Viscosity (IP 71/ASTM-D445)	
40°C cSt	40
100°C cSt	7.2
Dropping Point (IP 132/ASTM-D566-76)	190°C
Cone Penetration Worked @ 25°C (IP 50/ASTM-D217)	
60 Strokes	250 - 280
100,000 Strokes change 0.1mm	+20 max.
Oil Separation on Storage of Grease (IP 121)	
7 days @ 40°C	4.8%
Emcor Steel Corrosion Test (IP 220)	
Distilled water 0 - 5 scale	0 - 0
Mechanical Stability (SKF V2F)	Pass
Bearing Life	
FAG FE9 Test @ 150°C L50 hours	> 250
SKF ROF Test @ 130°C L50 hours	> 1500
Extreme Pressure Properties (IP 239/ASTM-D2596)	
Shell Four Ball Test, Load at which welding occurs	315kg
Timken Wear & Lubricant Testing Machine, OK Load	50lbs
Minimum Operating Temperature	-30°C
Maximum Operating Temperature	+130°C (+140°C peak)



These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health & Safety

Shell Nerita Grease HV is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of industrial and personal hygiene are maintained. For further guidance on Product Health & Safety refer to the appropriate data sheet.

GEARBOXES

Grease Technical Data

Shell Alvania Grease HDX2

Shell Alvania Grease HDX2 - High Performance Grease Containing Solid Lubricant

A very high performance grease the lubrication of industrial bearings subjected to the most arduous conditions. It is based on a high viscosity index mineral oil and a lithium/calcium thickener and contains extreme-pressure, anti-oxidation, anti-wear, anti-corrosion and adhesion additives. It also contains molybdenum disulphide to enhance its EP properties. The essential qualities of Shell Alvania Grease HDX2 are its mechanical stability, water resistance, adhesion and exceptional performance in shock loaded conditions. It is recommended for the lubrication of shock loaded heavy duty bearings working in damp hostile conditions.

Performance Features

- Excellent mechanical stability
- For shock loaded conditions
- Extreme pressure performance
- Good water resistance
- Good adhesion properties

Typical Physical Characteristics

NLGI Consistency	2
Colour	Dark grey
Soap Type	Lithium/Calcium
Base Oil (type)	Mineral
Kinematic Viscosity (IP 71/ASTM-D445)	
40°C cSt	160
100°C cSt	15.5
Cone Penetration	
Worked @ 25°C 0.1mm (IP 50/ASTM-D217)	265 - 295
Dropping Point (IP 132/ASTM-D566-76)	184°C
Water Resistance	
Water Wash-out (ASTM-D1264)	3%
Water Spray-off (ASTM-D4049)	4.2%
Emcor Steel Corrosion Test (IP 220)	
Distilled water 0 - 5 scale	0 - 0
Mechanical Stability (SKF V2F)	
Condition 1 (50g max.)	Pass
Extreme Pressure Properties (IP 239/ASTM-D2596)	
Shell Four Ball Test, Load at which welding occurs	400kg
Minimum Operating Temperature	-25°C
Maximum Operating Temperature	+120°C (+140°C peak)

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health & Safety

Shell Alvania Grease HDX2 is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of industrial and personal hygiene are maintained. For further guidance on Product Health & Safety refer to the appropriate data sheet.



GEARBOXES

Gearbox Grease Filling



- Operating ambient temperature range = 0°C to 70°C
- The grease in most applications will run at 80°C but if speed and load are increased, the temperature of the gearbox will rise and may cause damage to the unit. Hand motion will not cause a problem because no thermal build up will arise until you motor power the unit.
- Gearboxes can be packed with wide-range temperature grease operating between - 55°C to +155°C.
- Rubber seals (nitrile) oil seals: maximum operating temperature = +100°C
- Carbon steel bearings: maximum operating temperature = +150°C (if fitted with high temperature grease and ZZ Steel shields)
- Stainless steel bearings: maximum operating temperature = +288°C (if fitted with high temperature grease and ZZ Steel shields)
- Standard bearings: maximum operating temperature = +80°C (including hand motion)
- Gearboxes are greased for life. Refilling is only required when boxes are disassembled for refurbishment. Overfilling will cause excessive heat build up and potential failure.
- We are able to modify standard gearboxes to customer's specific requirements.
- Damage caused by customer modifications will invalidate the gearbox guarantee.
- We recommend that shafts are connected by flexible couplings.
- Our gearboxes are designed as speed reducing units, not as multipliers. If used in a speed increasing capacity, service life is not guaranteed.
- Customers will always need to test the units themselves in their particular application to ensure it is adequate for the job and has the desired results for them.



**DO NOT FILL !
GREASED FOR LIFE**

***Greasing is only
required if the
gearbox is to be
used in special
applications or if it
is being refurbished***

GEARBOXES

Backlash Adjustment

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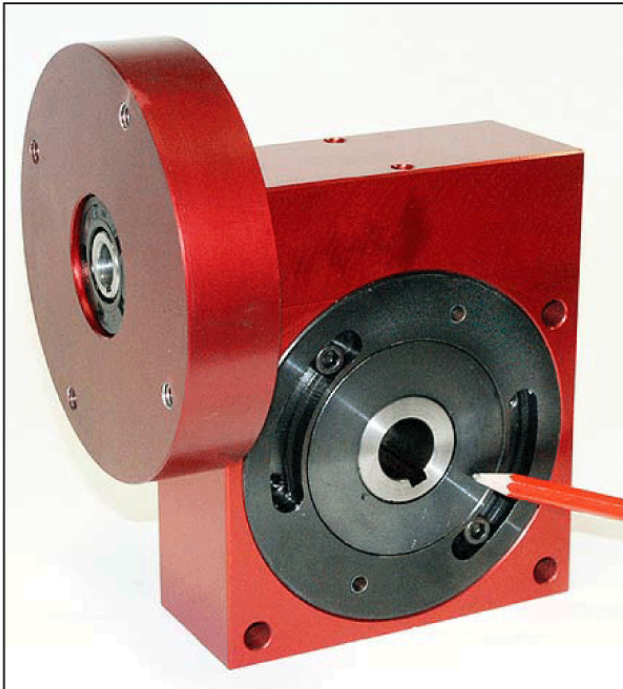
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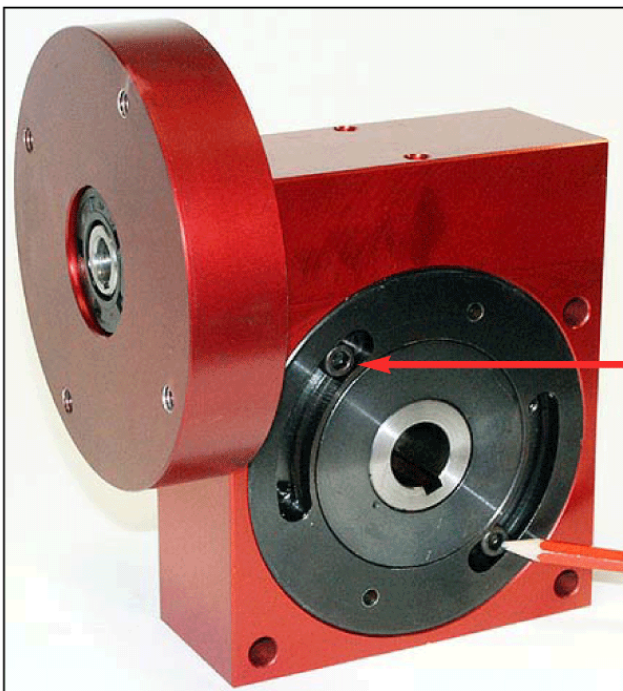
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Inner Cap is eccentric on both sides

(dimple is a guide indication only of area of high point not exact position).



Remove the 2 socket head capscrews on each side of box. Doing this will allow you to rotate both eccentric caps together ie. move to wheel away from worm to increase backlash or closer to worm reduce backlash.

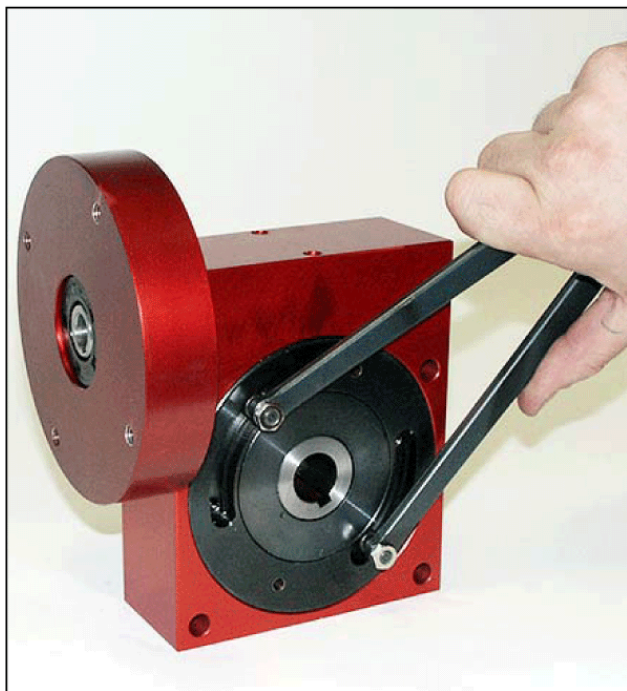
Use small movements on both sides this is done by feel to level up and find smooth motion, we then put on a special test rig to measure output backlash with worm fixed at input. Moving the wheel back and forth.

GEARBOXES

Backlash Adjustment



Callipers used to adjust backlash

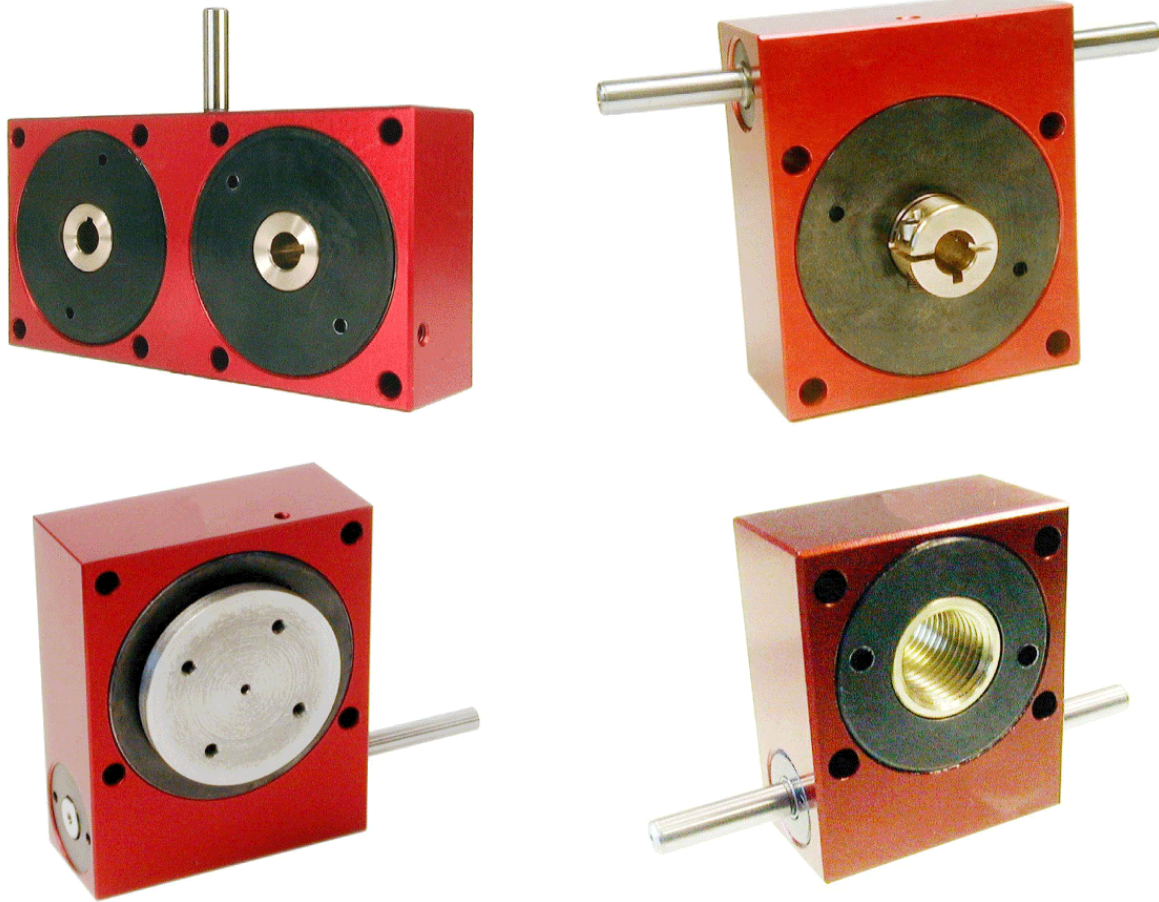


Do not undo any other set screws as this will cause more problems, and allow the outer screw cap to move which will damage major screw cap thread form.



GEARBOXES

Special and Modified Gearboxes



Available from Ondrives are not only an extensive range of standard design reduction units but modifications to this range are available, varying from smaller shaft sizes, longer/shorter shafts, different bore sizes in metric and inches to flats and keyways. In some units, we are able to fit spline and leadscrew bushes. On smaller units, we can supply internally thread cut leadscrew forms. Depending on the type of modification, difficulty and quantity, we will look at whatever you would like us to achieve, either by way of drawings, customer samples or descriptions.

We are also able to make and build new units to your own specifications or from your samples. With regards to the sample units, this is usually when a unit is no longer in production from the original source or it requires manufacture with particular design changes.

We will make or modify quantities from one upwards.
To find out more, please contact our technical team.