
BETA MARINE

Operator's Maintenance Manual



Heat Exchanger & Keel Cooled Mid Diesel Engine Range Beta 75 & Beta 90

CALIFORNIA – Proposition 65 Warning: Diesel engine exhaust and some of its constituents are known to the state of California to cause cancer, birth defects and other reproductive harm.

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Technical Specifications

Standard Engines	Beta 75	Beta 90
Cylinder	4	4
Bore (mm)	98	100
Stroke (mm)	120.0	120.0
Displacement (cc)	3620	3769
Combustion	3 Vortex	3 Vortex
Cooling	Water	Water
Starter voltage (V)	12	12
Starter output (kW)	3.0	3.0
H/E Starter alternator output (Amps)	65 (standard)	
K/C Starter alternator output (Amps)	65 (standard) & 175 (Domestic)	
Glow plug resistance (each)	1Ω	N/A
Engine speed (RPM)	2,600	2,600
Power output to ISO3046 (BHP)	75.0	90.0
Declared power ISO8665 (kW)	49.8	60.8
Compression Ratio	22.6:1	20.0:1
Fuel timing BTDC	8°	13°
Capacity of standard sump approx. (litres)	13.2	13.2
Nett dry weight with gearbox (kg)	390	392
Fuel	Diesel fuel oil No.2D	
Coolant	33%-50% maximum antifreeze:water	
Coolant capacity approx. (H/E litres)	10.2	10.2
Coolant capacity approx. (K/C litres)	See boat designer	
Min. recommended battery capacity	12V, 180Ah (1,200 CCA Min)	

Maximum Angle of Installation: Trim 15°; Roll 25° (intermittent) or 20° continuous, see page 6.

Rotation: Anti-clockwise on flywheel, clockwise on output gearbox flange for use with right hand propeller in ahead, on mechanical gearboxes. Hydraulic gearboxes can be left or right handed. Diesel fuel must conform to BS2869-1970 class A1 or A2. The fuel must be a distillate and not a residual oil or blend.

Lubricant:

Engine - engine oil must meet API Classification CF (CD or CE), See section 2 for details

Gearbox - see gearbox operator's manual for the gearbox oil type and capacity

Oil pressure - minimum (tickover) 0.5 bar

Power outputs: These comply with BS EN ISO 8665:1996 crankshaft power

Note: Declared Powers to ISO8665:1996

1. The declared powers are at the same engine speed as the ISO 3046 figures. This speed is the speed related to the outputs / powers shown.
2. Declared powers are at the gearbox coupling (coupling to the propeller shaft) as per clause 3.2.1 with standard specifications as per our current price lists. Additional accessories or alternative gearboxes may affect the declared powers.
3. Operation at parameters outside the test parameters may affect the outputs / powers which in any case are subject to the ISO tolerance bands.

Engine Installation at an Angle

Beta Marine propulsion engines can be installed at angles up to a maximum of 15° flywheel up or flywheel down when static, or can be run at up to 25° when heeling. When our engines are installed at varying angles of inclination the normal markings on the dipstick should be disregarded.

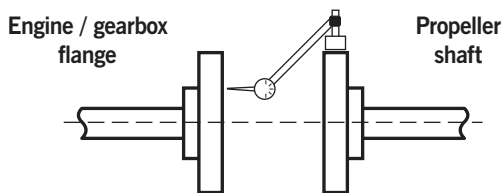
It is probably better to totally drain the lubricating oil from the sump, replacing the oil filter with a new one; then add the recommended amount of lubricating oil – noting its position on the dipstick – and then marking the dipstick. If in doubt ask Beta Marine.

Alignment

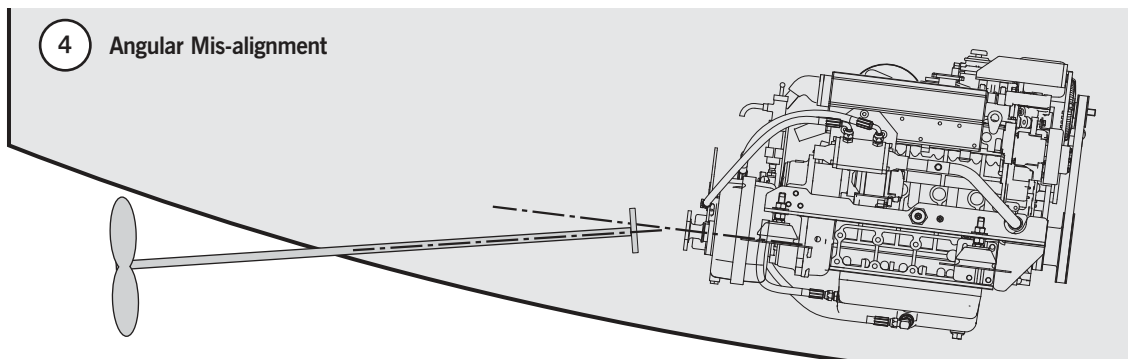
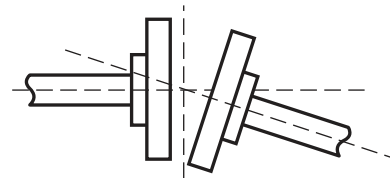
To obtain accurate alignment the flexible mountings must be adjusted until alignment is attained, and the mountings must be locked in position.

The engine/gearbox unit has to be aligned with the propeller shaft in two ways. The traditional engine alignment method involves measuring with either feeler gauges or a DTI (Dial Test Indicator) mounted on a magnetic foot so that they are aligned within 0.125mm (0.005").

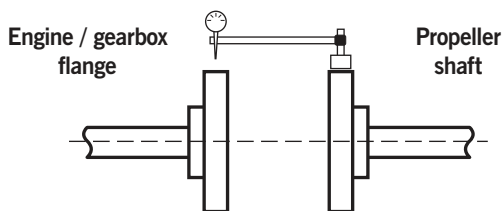
Angular Alignment



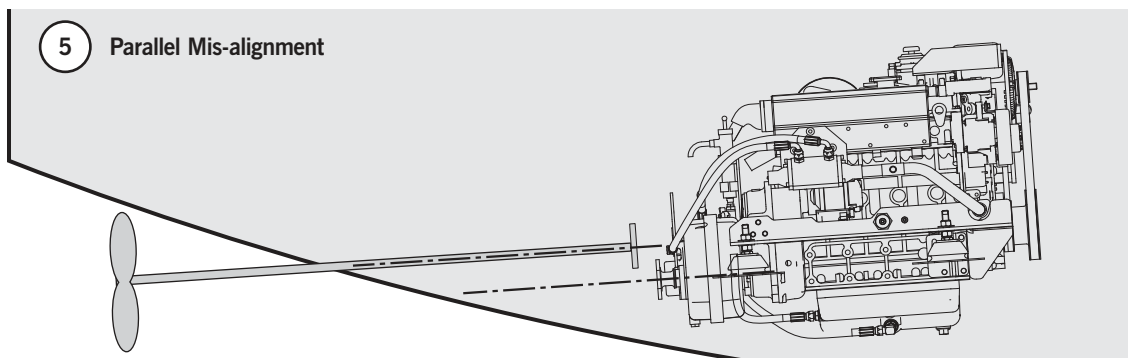
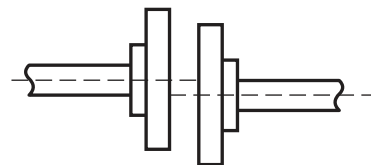
Angular Mis-alignment



Parallel Alignment



Parallel Mis-alignment



The engine mountings and the couplings must now be tightened in position and the alignment re-checked.