

Technical data

General

	MD2010	MD2020	MD2030	MD2040
Engine designation	MD2010	MD2020	MD2030	MD2040
No. of cylinders	2	3	3	3
Bore	67 mm (2.638 in)	67 mm (2.638 in)	75 mm (2.953 in)	84 mm (3.307 in)
Stroke	64 mm (2.520 in)	64 mm (2.520 in)	72 mm (2.835 in)	90 mm (3.543 in)
Swept volume, total	0.45 litre (27.5 in ³)	0.68 litre (41.3 in ³)	0.95 litre (58.2 in ³)	1.50 litres (91.3 in ³)
Output, see sales literature				
Idling speed	850 ±25 r/min.	850 ±25 r/min.	850 ±25 r/min.	850 ±25 r/min.
Compression ratio	23.5:1	23.5:1	23:1	22:1
Direction of rotation, seen from the front	Clockwise	Clockwise	Clockwise	Clockwise
Max. permissible tilt backwards during operation	20°	20°	20°	20°
Max. side tilt during operation	30°	30°	30°	30°
Valve clearance, stationary cold engine:				
inlet and outlet	0.20 mm (0.008 in)	0.20 mm (0.008 in)	0.20 mm (0.008 in)	0.20 mm (0.008 in)
Weight, engine without oil and water	98 kg (216 lbs)	116 kg (256 lbs)	129 kg (285 lbs)	179 kg (395 lbs)

Fuel system

Start of injection, crankshaft position	25.5° ±1° BTDC	25.5° ±1° BTDC	22.5° ±1° BTDC	21° ±1° BTDC
Injectors, opening pressure (when checking)	11.3-12.3 MPa (115-125 kp/cm ² = 1639- 1784 lbf/in ²)	11.3-12.3 MPa (115-125 kp/cm ² =1639- 1784 lbf/in ²)	11.3-12.3 MPa (115-125 kp/cm ² = 1639- 1784 lbf/in ²)	15.2-16.2 MPa (155-165 kp/cm ² =2205- 2347 lbf/in ²)
opening pressure (when setting)	11.8 MPa (120 kp/cm ² 1711 lbf/ in ²)	11.8 MPa (120 kp/cm ² 1711 lbf/ in ²)	11.8 MPa (120 kp/cm ² 1711 lbf/ in ²)	15.7 MPa (160 kp/cm ² 2276 lbf/ in ²)

Lubricating system

Oil capacity, inc. oil filter, approx.: no engine tilt	1.8 litres (3.2 Imp. pints/ 1.9 US quarts)	3.4 litres (6.0 Imp. pints/ 3.6 US quarts)	4.3 litres (7.6 Imp. pints/ 4.5 US quarts)	7.3 litres (12.8 Imp. pints/ 7.7 US quarts)
Oil quality according to the API-system	CD	CD	CD	CD
Viscosity at -5° - +50°C*	SAE 15W/40 SAE 20W/50	SAE 15W/40 SAE 20W/50	SAE 15W/40 SAE 20W/50	SAE 15W/40 SAE 20W/50
Oil drain plug, tightening torque	30-40 Nm (3.0-4.0 kpm = 21.7-28.9 lbf. ft)	30-40 Nm (3.0-4.0 kpm = 21.7-28.9 lbf. ft)	30-40 Nm (3.0-4.0 kpm = 21.7-28.9 lbf. ft)	30-40 Nm (3.0-4.0 kpm = 21.7-28.9 lbf. ft)

*Note! The temperature values bear reference to a constant ambient temperature.

Cooling system

Thermostat, No.	1	1	1	1
The thermostat begins to open at	75° ±2°C (167° ±4°F)	75° ±2°C (167° ±4°F)	82° ±2°C (167° ±4°F)	82° ±2°C (167° ±4°F)
completely open at	87°C (189°F)	87°C (189°F)	95°C (203°F)	95°C (203°F)
Freshwater system capacity, approx	2.1 litres (3.7 Imp. pints/ 2.2 US quarts)	3.0 litres (5.3 Imp. pints/ 3.2 US quarts)	4.0 litres (7.0 Imp. pints/ 4.2 US quarts)	6.9 litres (12.1 Imp. pints/ 7.3 US quarts)