



**MITSUBISHI DIESEL ENGINE  
TECHNICAL INFORMATION**

ITEM NO.

T0207-0013E (1/4)

DATE

May, 2012

Specification Sheets of S12R-T2MPTK Engine (IMO-Tier 2 Certified Engine)

Specification Sheets of S12R-T2MPTK Engine that is satisfied with IMO-Tier 2 certified engine are enclosed herein.

Revision	First Edition : June , 2012	Engine Engineering Department Engine System Design Section		
		Approved by	Checked by	Drawn by
		T.HASHIGUCHI	T.OGURA	T.O.

**GENERAL ENGINE DATA**

Type	-----	4-Cycle, Water Cooled	
Aspiration	-----	Turbo-Charged, Inter Cooler (Raw water to Cooler)	
Cylinder Arrangement	-----	60°V	
No. of Cylinders	-----	12	
Bore mm(in.)	-----	170	(6.69)
Stroke mm(in.)	-----	180	(7.09)
Displacement Liter(in. <sup>3</sup> )	-----	49.03	(2992)
Compression Ratio	-----	14.5 : 1	
Dry Weight - Engine only - kg(lb)	-----	5320	(11731)
Wet Weight - Engine only - kg(lb)	-----	5600	(12348)

**PERFORMANCE DATA**

Steady State Speed Stability Band at any Constant Load(Generator Use)			
Hydraulic (std.) or Electric Governor - %	-----	±0.25 or better	
Idling Speed -rpm	-----	600~650	
Maximum Overspeed Capacity - rpm	-----	2100	
Moment of Inertia of Rotating Components J- kg·m <sup>2</sup> (lb·ft <sup>2</sup> )	-----	20.22	(1920)
(Includes 21 inch Flywheel)			
Cyclic Speed Variation with Flywheel at	1800rpm -----	1/683	
	1500rpm -----	1/448	

**ENGINE MOUNTING**

Maximum Bending Moment at Rear Face of Flywheel Housing - N·m(lbf·ft)	-----	4413	(3256)
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**AIR INLET SYSTEM**

Maximum Intake Air Restriction (Includes piping)- kPa (in.H <sub>2</sub> O)	-----	3.92	(15.7)
Maximum Allowable Intake Air Temperature- °C (°F)	-----	45	(113)

**EXHAUST SYSTEM**

Maximum Allowable Back Pressure - kPa (in.H <sub>2</sub> O)	-----	4.41	(17.7)
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**LUBRICATION SYSTEM**

Oil Pressure	at Idle - MPa (psi)	-----	0.2~0.3	(29~43)
	at Rate Speed - MPa (psi)	-----	0.5~0.64	(71~93)
Standard Thermostat (Modulating)Range- °C (°F)	-----	82~95	(180~203)	
Maximum Oil Temperature- °C (°F)	-----	110	(230)	
Oil Capacity of Marine Pan	High - liter (U.S.gal)	-----	200	(52.8)
	Low - liter (U.S.gal)	-----	158	(41.7)
Total System Capacity (Includes Oil Filter) - liter (U.S.gal)	-----	230	(60.8)	
Maximum Installation Angle	Front Up	-----	12.5°	
	Front Down	-----	15°	
Maximum Instantaneous Operating Angle	Front Up	-----	30°	
(Engine Level)	Front Down	-----	30°	
	Side to Side	-----	22.5°	

**COOLING SYSTEM**

Coolant Capacity - liter (U.S.gal)	-----	125	(33.0)
(Engine only)			
Maximum External Friction Head at Engine Outlet-MPa(psi)	-----	0.034	(5.0)
Recommended Static Head of Coolant above Crankshaft Center - m(ft)			
	MAX.	-----	10 (32.8)
	MIN.	-----	7 (23.0)
Standard Thermostat (Modulating)Range- °C (°F)	-----	71~85	(160~185)
Maximum Coolant Temperature at Engine Outlet- °C (°F)	-----	95	(203)
Recommended Coolant Temperature at Engine outlet- °C (°F)	-----	80	(176)
Minimum Coolant Expansion Space-% of System Capacity	-----	10	
Maximum Coolant Temperature at Inter Cooler Inlet, TK type- °C (°F)	-----	see page 4/4	

The specifications are subject to change without notice.

**FUEL SYSTEM**

Fuel Injection Pump	----- Mitsubishi PS6 Type x 2
Maximum Suction Head of Feed Pump - kPa (in. Hg)	----- 14.7 (4.3)
Maximum Level of Fuel Tank - m	----- 5.0
	Continuous Use
	Stand-by Use
	----- 2.0
Minimum Fuel Oil Supply Pipe Inner Diameter - mm(in.)	----- 20 (0.79)
Minimum Fuel Oil Leak Pipe Inner Diameter - mm(in.)	----- 20 (0.79)

**STARTING SYSTEM**

Battery Charging Alternator - V-Ah	----- 24-35
Starting Motor Capacity - V -kW	----- 24-7.5×2
Maximum Allowable Resistance of Cranking Circuit - m Ω	----- 1.5
Recommended Minimum Battery Capacity	
At 5°C (41°F) and above - Ah	----- 300
Below 5°C (41°F) through -5°C (23°F)	----- 600
Cranking Ampere of Starter at 5°C (41°F) / -5°C (23°F)	
Static Ampere -A	380 × 2 / 480 × 2
Momentary Ampere -A	720 × 2 / 920 × 2

**ACCESSORY EQUIPMENT**

Air Cleaner	Silencer Type
Exhaust Manifold	Air Cooled
Turbocharger	Air Cooled
Air Cooler	Raw Water Cooled
Breather	Conduction Type
Governor	Hydraulic PSG Type
Fuel Injection Pump	
Fuel Feed Pump	
Fuel Injection Pipe	Double walled Type
Fuel Injection Nozzle	
Fuel Filter	Paper Element Type
Lubricating Oil Pump	
Lubricating Oil Cooler	
Lubricating Oil Filter(Full-Flow)	Paper Element Type
Lubricating Oil Filter(By-Pass Flow)	Paper Element Type
Oil Pan	Large Capacity,steel
Lubricating Oil Thermostat	
Cooling Water Pump	
Cooling Water Thermostat	
Starter	Earth Float Type
Alternator	Earth Float Type
Stop Solenoid	DC24V-15A
Engine Support	Marine Type
Accessory Drive	Front Drive Pulley

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## ENGINE RATING

All data represent net performance according to ISO3046 with standard accessories such as fuel injection pump, water pump L.O. pump and charging alternator under the condition of 100kPa(750 mm Hg), barometric pressure 298K(25°C) ambient temperature and 30% relative humidity.

ITEM	UNIT	Propulsion use			Generator use		
		L	M	H	60Hz	50Hz	
Engine Speed	min <sup>-1</sup>	1800	1650	1600	1800	1500	
Test cycle (ISO 8178)		E3/E2	E3/E2	E3/E2	D2	D2	
No. of Cylinders		12					
Bore	mm (in.)	170 (6.69)					
Stroke	mm (in.)	180 (7.09)					
Displacement	liter (in. <sup>3</sup> )	49.03 (2992)					
Brake Horse Power	kW (HP)	1210 (1622)	1040 (1394)	940 (1260)	1270 (1702)	1120 (1501)	
Brake Mean Effective Pressure	MPa (psi)	1.64 (238)	1.54 (223)	1.44 (209)	1.73 (251)	1.83 (265)	
Mean Piston Speed	m/s (ft/min)	10.8 (2126)	9.9 (1949)	9.6 (1890)	10.8 (2126)	9.0 (1772)	
Maximum Regenerative Power Absorption Capacity	kW (HP)	178 (239)	140 (187)	128 (172)	178 (239)	109 (146)	
Intake Air Flow	m <sup>3</sup> /min (CFM)	112 (3955)	96 (3390)	85 (3001)	116 (4096)	98 (3460)	
Exhaust Gas Flow	m <sup>3</sup> /min (CFM)	296 (10452)	254 (8969)	226 (7980)	307 (10840)	260 (9181)	
Coolant Flow	liter/min (U.S. GPM)	1850 (489)	1750 (462)	1720 (454)	1850 (489)	1650 (436)	
Coolant(Jacket water) Pressure (water pump outlet)	MPa (psi)	0.17 (25)	0.15 (22)	0.15 (22)	0.17 (25)	0.14 (20)	
Min. Coolant Flow to Inter Cooler (Max. Flow: 460L/min)	liter/min (U.S. GPM)	230 (61)	230 (61)	230 (61)	200 (53)	150 (40)	
Oil Flow	liter/min (U.S. GPM)	580 (153)	530 (140)	510 (135)	580 (153)	480 (127)	
Radiated Heat to Ambient	kJ/hr (BTU/min)	353147 (5580)	302132 (4774)	269288 (4255)	365534 (5775)	310310 (4903)	
Heat Rejection to Coolant (include water cooled manifold)	kJ/hr (BTU/min)	2472026 (39058)	2114926 (33416)	1885018 (29783)	2558736 (40428)	2172167 (34320)	
Heat Rejection to Inter Cooler (TK Version)	kJ/hr (BTU/min)	470862 (7440)	402843 (6365)	359051 (5673)	487378 (7701)	413746 (6537)	
Heat Rejection to Exhaust	kJ/hr (BTU/min)	4120424 (65103)	3507951 (55426)	3079621 (48658)	4201759 (66388)	3416268 (53977)	
Cooling system	Direct Sea Water Cooling Max. sea water temp. at inter cooler inlet	Max. 32°C					
	Intermediate Fresh Water Cooling Max. fresh water temp. at inter cooler inlet	N/A	N/A	N/A	N/A	N/A	
	Radiator Cooling Max. coolant temp. at inter cooler inlet	N/A	N/A	N/A	N/A	N/A	
Noise Level (1 m height & distance) (excludes, Intake, Exhaust)	dB(A)	-	-	-	-	-	
Maximum No Load Governed Speed	min <sup>-1</sup>	1935	1774	1720	1890	1575	

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APPLICATION : MARINE

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