MITSUBISHI S16R-F1PTAW2

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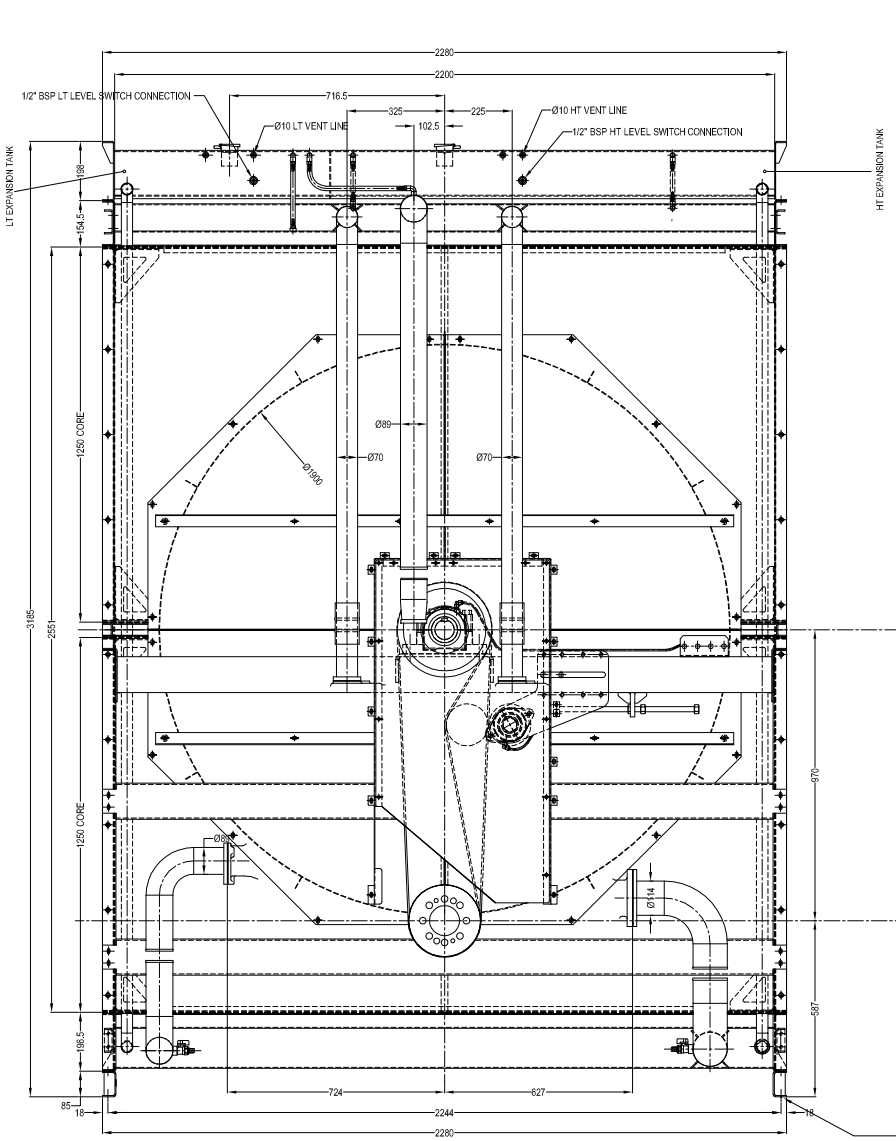
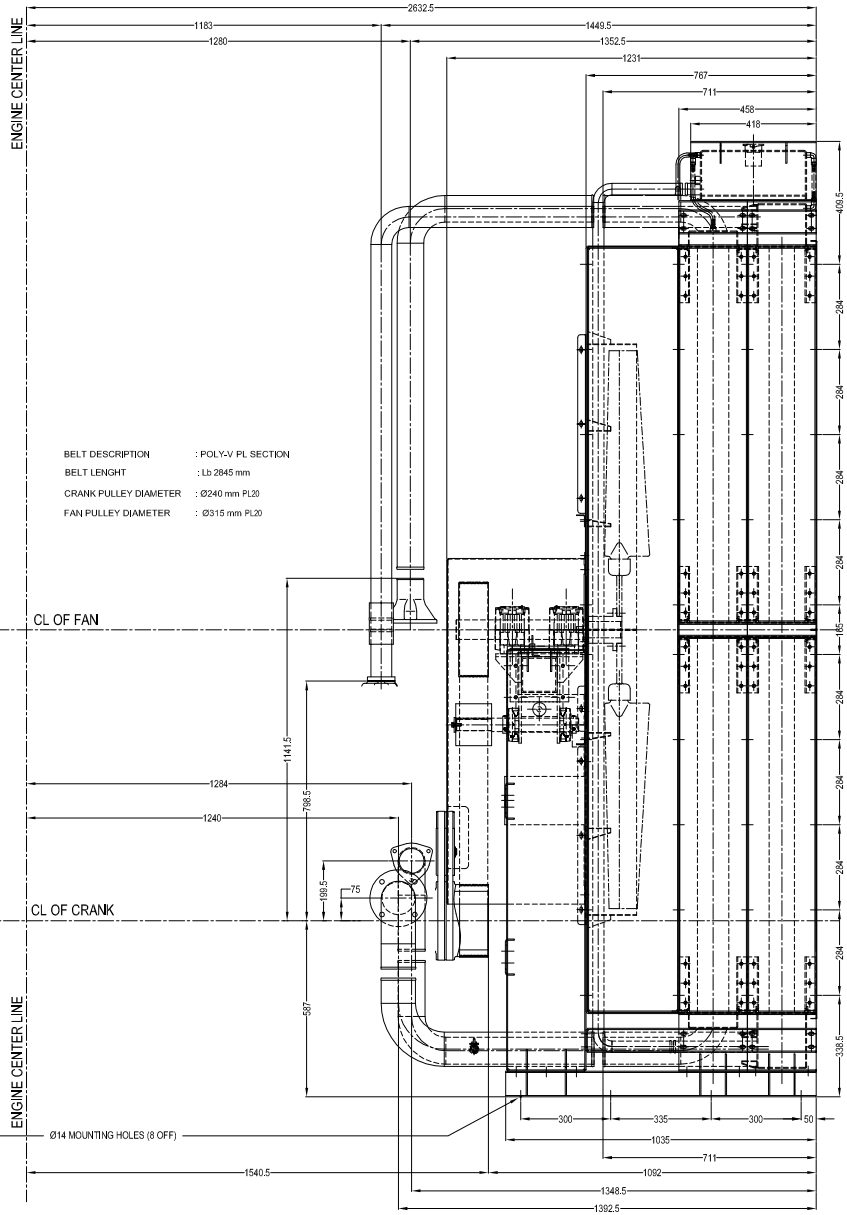
828 1016 DLM - CLM

WORKING PRESSURE 10 PSI
TESTING PRESSURE 15 PSI

DO NOT SCALE





BELT DESCRIPTION : POLY-V PL SECTION
BELT LENGHT : Lb 2845 mm
CRANK PULLEY DIAMETER : Ø240 mm PL20
FAN PULLEY DIAMETER : Ø315 mm PL20

HT RADIATOR COOLANT CAPACITY	: 212 Lt.	LT RADIATOR COOLANT CAPACITY	: 129 Lt.
HT EXPANSION TANK COOLANT CAPACITY	: 49 Lt.	LT EXPANSION TANK COOLANT CAPACITY	: 23 Lt.
HT EXPANSION TANK VOLUME	: 73 Lt.	LT EXPANSION TANK VOLUME	: 35 Lt.
ENGINE BLOCK COOLANT CAPACITY	: 140 Lt.	ENGINE COOLANT CAPACITY	: 30 Lt.
TOTAL SYSTEM COOLANT CAPACITY	: 401 Lt.	TOTAL SYSTEM COOLANT CAPACITY	: 182 Lt.

%70 PURE WATER (WITHOUT LIME) AND %30 ANTIFREEZE MUST BE USED IN THE SYSTEM.

FABRICATION TOLERANCES		ASSEMBLY TOLERANCES	
1 - 200	±1	UP TO 500	±2
201 - 500	±1.5	501 TO 1000	±3
501 - 1000	±2	1001 TO 2000	±5
1001 - 2000	±3	ABOVE 2000	±8
ABOVE 2000	±3.5	ANGULAR	±2°
ANGULAR	±1°	DIMENSIONS IN MM	

ISSUE A
SCALE
DRAWN BY
CHECKED BY
APPROVED BY

NO	PART	QTY	SPEC	DESCRIPTIONS	LETTER	DATE	DESCRIPTION	DRAWN BY	APPROVED BY
1	—	—	—	--	—	—	—	—	—

ENGINE MODEL	MITSUBISHI S16R - F1PTAW2 1500 RPM	
TITLE	50°C BELT DRIVE RADIATOR	
NAME	DATE	SIGNATURE

THIRD ANGLE PROJECTION

PANOTO RADYATÖR MAKİNA ve SAN. TİC. A.Ş.

PART NO 828 1016 DLM - CLM

DRAWING NO

MITSUBISHI DIESEL ENGINE TECHNICAL INFORMATION	ITEM NO.	T0216-0009E Rev.4 (1/4)
	DATE	May, 2014

Specification Sheets of S16R-F1PTAW2 Engine

Specification Sheets of S16R-F1PTAW2 Engine are enclosed herein.

Revision				
	First Edition : April, 2010	Engine Engineering Department High Speed Engine Designing Section		
	Rev.1 : August, 2010			
	Rev.2 : Nov., 2010	Approved by	Checked by	Drawn by
	Rev.3 : Mar., 2013			
	Rev.4 : May, 2014			

GENERAL ENGINE DATA

Type	4-Cycle, Water Cooled	
Aspiration	Turbo-Charged, Inter Cooler (Fresh water to Cooler)	
Cylinder Arrangement	60°V	
No.of Cylinders	16	
Bore mm(in.)	170	(6.69)
Stroke mm(in.)	180	(7.09)
Displacement liter(in^3)	65.37	(3989)
Compression Ratio	14.0:1	
Dry Weight - Engine only - kg(lb)	6680	(14729)
Wet Weight - Engine only - kg(lb)	6830	(15060)

PERFORMANCE DATA

Steady State Speed Stability Band at any Constant Load Electric Governor - %	±0.25 or better	
Maximum Overspeed Capacity - rpm	2100	
Moment of inertia of Rotating Components - kgf·m^2(lbf·ft^2) (Includes Std.Flywheel)	80.83	(1918.5)
Cyclic Speed Variation with Flywheel at 1500rpm	1/138	

ENGINE MOUNTING

Maximum Bending Moment at Rear Face of Flywheel Housing - kgf·m(lbf·ft)	450	(3255.6)

AIR INLET SYSTEM

Maximum Intake Air Restriction (Includes piping)		
With Clean Filter Element - mm H_2O (in.H_2O)	400	(15.7)
With Dirty Filter Element - mm H_2O (in.H_2O)	635	(25.0)

EXHAUST SYSTEM

Maximum Allowable Back Pressure - mm H_2O (in.H_2O)	600	(23.6)

LUBRICATION SYSTEM

Oil Pressure at Idle - kgf/cm^2(psi)	2～3	(29～43)
at Rate Speed - kgf/cm^2(psi)	5～6.5	(71～93)
Maximum Oil Temperature - °C(°F)	110	230
Oil Capacity of Standard Pan High - liter (U.S.gal)	200	(53)
Low - liter (U.S.gal)	140	(37.0)
Total System Capacity (Includes Oil Filter) - liter (U.S.gal)	230	(60.8)
Maximum Angle of Installation (Std. Pan) (Engine Only) Front Down	5°	
Front Up	5°	
Side to Side	22.5°	

COOLING SYSTEM

Coolant Capacity of Jacket (Engine only) - liter (U.S.gal)	140	(37.0)
Coolant Capacity of Air cooler (Engine only) - liter (U.S.gal)	30	(7.9)
Maximum External Friction Head at Engine Outlet - kgf/cm^2(psi) (For Jacket and Air Cooler)	0.35	(5.0)
Maximum Static Head of Coolant above Crankshaft Center - m(ft)	10	(32.8)
Standard Thermostat (modulating)Range of Jacket - °C(°F)	71～85	(160～185)
Standard Thermostat (modulating)Range of Air Cooler - °C(°F)	42～55	(108～131)
Maximum Coolant Temperature at Engine Outlet of Jacket - °C(°F)	98	(208)
Minimum Coolant Expansion Space - % of System Capacity (For Jacket and Air Cooler)	10	(0.4)
Maximum Coolant Temperature at Intercooler Inlet, PTAW type - °C(°F)	45	(113)
Maximum Air Restriction on Discharge Side of Radiator and Fan - mm H_2O(in.H_2O)	10	(0.4)

The specifications are subject to change without notice.

APPLICATION : GENERATOR

May. '14 Printed in Japan

FUEL SYSTEM

Fuel Injector	Mitsubishi PS8 Type × 2	
Maximum Suction Head of Feed Pump - mm Hg (in. Hg)	75	(3.0)
Maximum Static Head of Return Pipe - mm Hg (in.Hg)	150	(5.9)

STARTING SYSTEM

Battery Charging Alternator - V- Ah	24-30
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

Emission Level 100% Load (at STAND-BY POWER)

Values in mg/Nm^3, O_2 content 5%

Nox : 2000mg/Nm^3

CO : 650mg/Nm^3

HC : 150mg/Nm^3

PM : 50mg/Nm^3

Control method of emission level shall be compliant with EPA regulation.

Test Condition

fa	$0.96 \leqq fa \leqq 1.06$	fa: Engine specific parameter considering atmospheric condition which determined according to the following provisions. (See EUROMOT 2004 - EC 1997 68 Consolidated - Annex III)
		$f_a = (99/Ps)^{0.7} (Ta/298)^{1.5}$
		Ps: Dry Atmospheric pressure(kPa)
		Ta:Absolute temperature of the intake air(k)
Fuel	JIS K-2204 Type2	
Tfi	$33℃ \leqq Tfi \leqq 43℃$	Tfi:The fuel temperature at the injection pump inlet.

S16R-F1PTAW2 SPECIFICATION SHEET

ENGINE RATING

All data represent net performance with standard accessories such as air cleaner, inlet /exhaust manifolds, fuel oil system, L.O. pump, etc. under the condition of 100kPa(29.6inHg) barometric pressure, 77°F(25°C) ambient temperature and 30% relative humidity.

ITEM	UNIT	STAND-BY POWER	PRIME POWER		
		50Hz	50Hz		
Engine Speed	rpm	1500	1500		
No. of Cylinders		16			
Bore	mm (in.)	170 (6.69)			
Stroke	mm (in.)	180 (7.09)			
Displacement	liter ($in.^3$)	65.37 (3989)			
Brake Horse power without Fan	HP (kW)	2610 (1947)	2382 (1777)		
Brake Mean Effective Pressure without Fan	kgf/cm^2 (psi)	24.3 (346)	22.2 (316)		
Mean Piston Speed	m/s (ft/min)	9.0 (1772)	9.0 (1772)		
Maximum Regenerative Power Absorption Capacity without Fan	HP (kW)	188 (140)	188 (140)		
Intake Air flow	m^3/min (CFM)	178 (6285)	160 (5650)		
Exhaust Gas Flow	m^3/min (CFM)	471 (16631)	424 (14971)		
Coolant Flow	liter/min (U.S. GPM)	1650 (436)	1650 (436)		
Coolant Flow to Intercooler (PTAW only)	liter/min (U.S. GPM)	750 (198)	750 (198)		
Cooling Air Flow (Std. Fan)	m^3/min (CFM)	—	—		
Allowable Fan Loss Horse Power	HP (kW)	40 (30)	40 (30)		
Radiated Heat to Ambient	kcal/hr (BTU/min)	134051 (8866)	120715 (7984)		
Heat Rejection to Coolant	kcal/hr (BTU/min)	580887 (38419)	523099 (34597)		
Heat Rejection to Air Cooler (PTAW Version)	kcal/hr (BTU/min)	491520 (32508)	442622 (29274)		
Heat Rejection to Exhaust	kcal/hr (BTU/min)	1587816 (105016)	1409483 (93221)		
Noise Level (1 m height & distance) (excludes, Intake,Exhaust & Fan)	dB(A)	TBD	TBD		

The specifications are subject to change without notice.

APPLICATION : GENERATOR

Pub. No. T0216-0009E Rev.4 4/4

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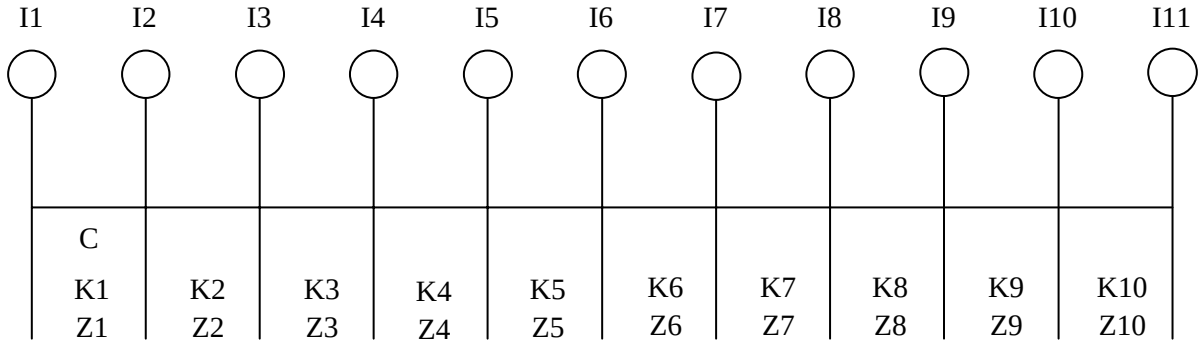
MITSUBISHI DIESEL ENGINE TECHNICAL INFORMATION	ITEM NO.	T0307-0008E Rev.2 (1/2)
	DATE	July, 2006

Elastic data of S16R Engine

Elastic data of S16R Engine are enclosed herein.

Revision				
	First Edition : July, 2006 (Refer to ELASTIC-S16R-PTA Oct.,2003, S16R.0)	Engine Engineering Department Large Engine Design Section		
	Rev.1 : July, 2006(Refer to MTD04-0106, S16R.0)	Approved by	Checked by	Drawn by
	Rev.2 : Feb, 2008			

S16R-PTA ELASTIC DATA



(USE:45R89-19502 CONNECTING ROD)

	Moment of inertia J kg.m^2		Damping coefficient Nm/rad/s	Spring const. x10^7 Nm/rad	Tensil strength N/mm^2	Section modulus cm^3
I1	DAMPER ×2pcs	2.020	C=1049.3	K1=0.0	0.0	Z1 =0.0
I2	PULLEY	2.160	—	K2=1.089	834	Z2 =373.7
I3	No.1 CRANK	1.045	—	K3=0.847	834	Z3 =373.7
I4	No.2 CRANK	1.045	—	K4=0.847	834	Z4 =373.7
I5	No.3 CRANK	1.045	—	K5=0.847	834	Z5 =373.7
I6	No.4 CRANK	1.045	—	K6=0.847	834	Z6 =373.7
I7	No.5 CRANK	1.045	—	K7=0.847	834	Z7 =373.7
I8	No.6 CRANK	1.045	—	K8=0.847	834	Z8 =373.7
I9	No.7 CRANK	1.045	—	K9=0.847	834	Z9 =373.7
I10	No.8 CRANK	1.044	—	K10=1.363	834	Z10=373.7
I11	FLYWHEEL 21in	11.21	—			

Hysteresis constant:130 No. of Cylinder: 16 Bore:170mm Stroke:180mm

Length of Con-Rod: 340mm Weight of Reciprocating Parts: 12.63 kg

Firing order:1-9-6-14-2-10-4-12-8-16-3-11-7-15-5-13

Firing interval:0-60-90-150-180-240-270-330-360-420-450-510-540-600-630-690

APPLICATION : LAND USE

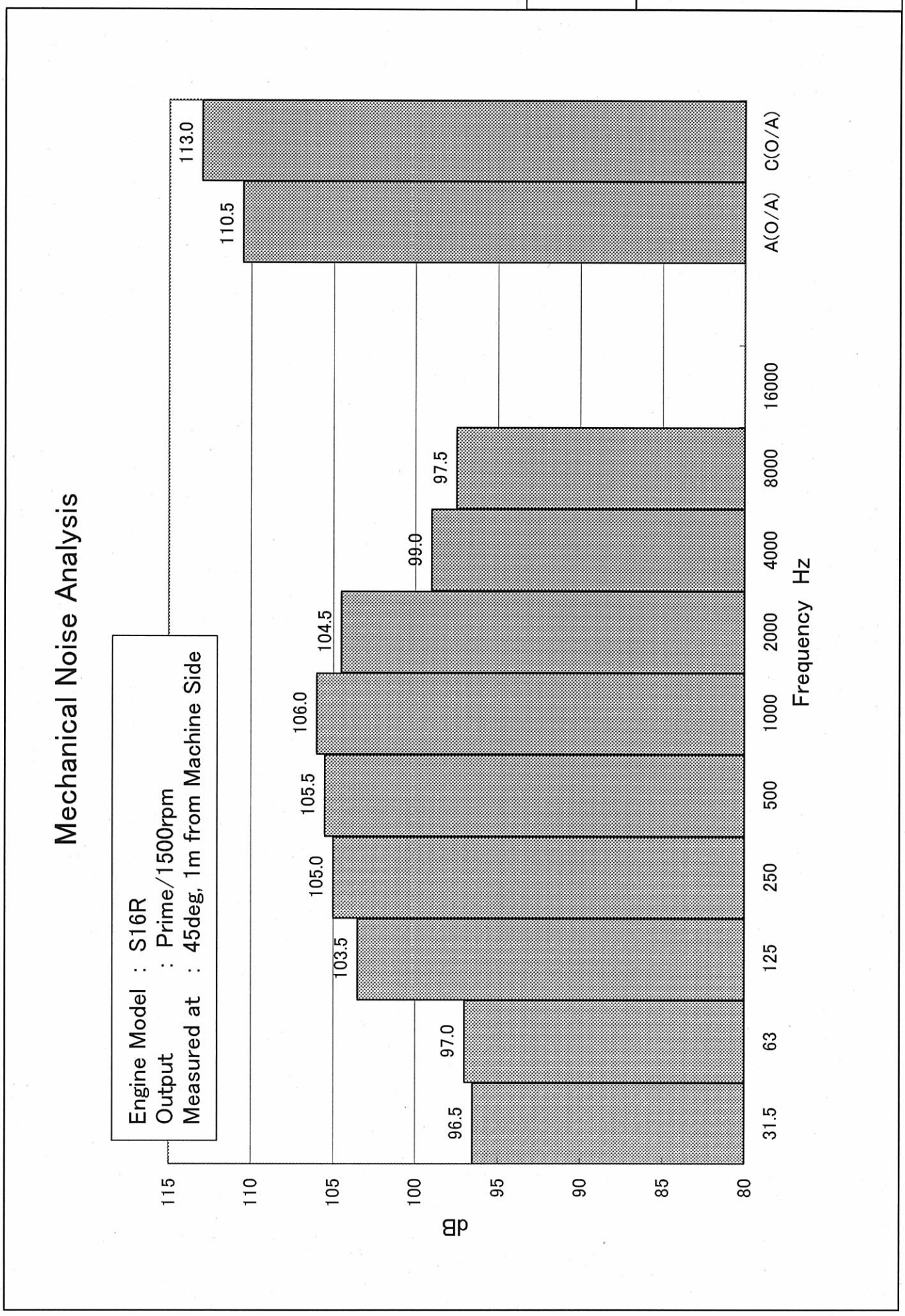
The data is subject to change without notice.

MITSUBISHI DIESEL ENGINE TECHNICAL INFORMATION	ITEM NO.	T0404-0010E (1/3)
	DATE	Sep., 2006

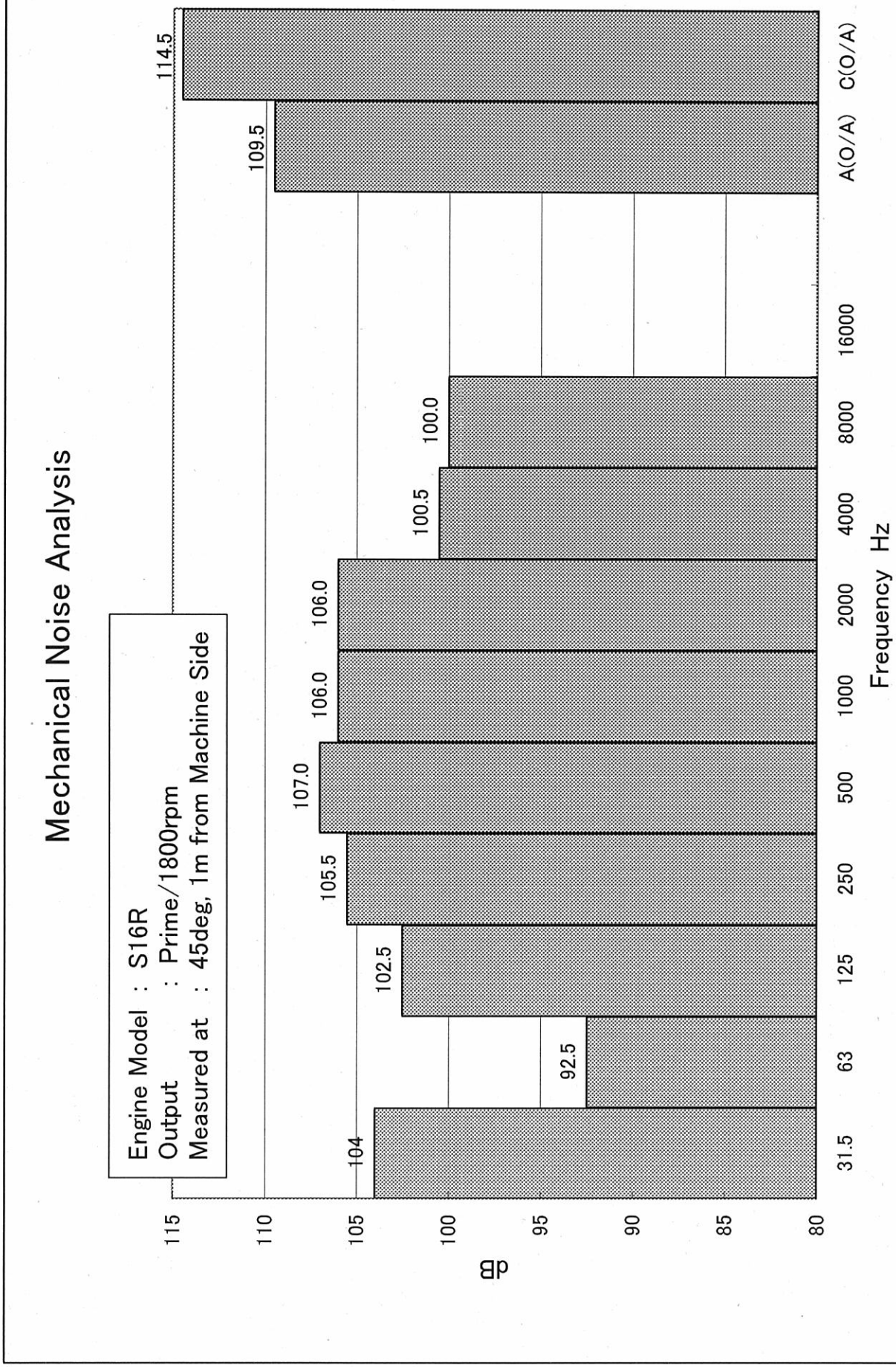
Mechanical Noize Data of S16R

Mechanical Noize Data of S16R is enclosed herein.

Revision	First Edition : Sep.,2006	Engine Engineering Department Large Engine Design Section		
		Approved by	Checked by	Drawn by


Mechanical Noise Analysis
Engine Model : S16R
Output : Prime/1500rpm
Measured at : 45deg, 1m from Machine Side
dB
115
110
105
100
95
90
85
80
Frequency Hz
31.5
63
125
250
500
1000
2000
4000
8000
16000
96.5
97.0
103.5
105.0
105.5
106.0
104.5
99.0
97.5
110.5
113.0
A(O/A)
C(O/A)

ITEM NO.	T0404-0010E (3/3)



MITSUBISHI DIESEL ENGINE TECHNICAL INFORMATION	ITEM NO.	T0409-0001E (1/2)
	DATE	February, 2014

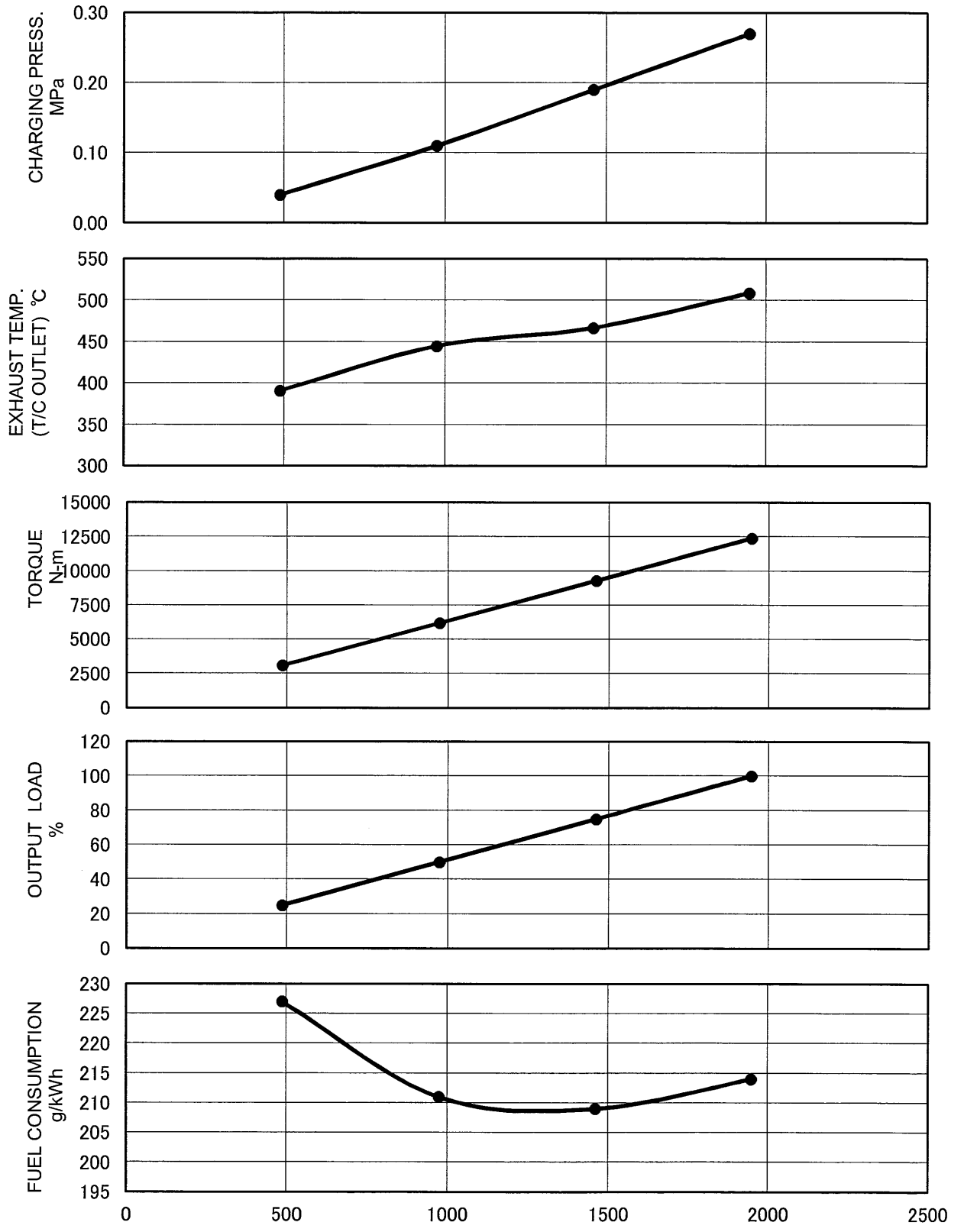
Performance Curves of S16R-F1PTAW2-1

Performance Curves of S16R-F1PTAW2-1 Engine are enclosed herein. The data are test bench data and not a guaranteed performance.

Revision				
	First Edition : February, 2014	Engine Engineering Department Hihg Speed Engine Designing		
		Approved by	Checked by	Drawn by

S16R-F1PTAW2-1(50Hz) PERFORMANCE CURVE

Engine speed: 1500min^{-1}



WITHOUT FAN

MHI CONFIDENTIAL

Fuel Consumption is based on ISO3046/1 with +5% tolerance at rated power.
The specifications are subject to change without notice.

APPLICATION : GENERATOR

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