



## **mitsubishi S16R-F1PTAW2**

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<b>MITSUBISHI DIESEL ENGINE TECHNICAL INFORMATION</b>	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 <sup>3</sup> )	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 <sup>2</sup> (lbf·ft <sup>2</sup> )	80.83	(1918.5)
(Includes Std. Flywheel)		
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)
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## AIR INLET SYSTEM

Maximum Intake Air Restriction (Includes piping)		
With Clean Filter Element - mm H <sub>2</sub> O (in. H <sub>2</sub> O)	400	(15.7)
With Dirty Filter Element - mm H <sub>2</sub> O (in. H <sub>2</sub> O)	635	(25.0)

## EXHAUST SYSTEM

Maximum Allowable Back Pressure - mm H <sub>2</sub> O (in. H <sub>2</sub> O)	600	(23.6)
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## LUBRICATION SYSTEM

Oil Pressure at Idle - kgf/cm <sup>2</sup> (psi)	2~3 (29~43)	
at Rate Speed - kgf/cm <sup>2</sup> (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)	Front Down	5°
(Engine Only)	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 <sup>2</sup> (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 <sub>2</sub> O(in. H <sub>2</sub> O)	10	(0.4)

The specifications are subject to change without notice.

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## 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<sup>3</sup>, O<sub>2</sub> content 5%

Nox : 2000mg/Nm<sup>3</sup>

CO : 650mg/Nm<sup>3</sup>

HC : 150mg/Nm<sup>3</sup>

PM : 50mg/Nm<sup>3</sup>

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

## Test Condition

fa	$0.96 \leq fa \leq 1.06$	fa: Engine specific parameter considering atmospheric condition which determined according to the following provisions. ( See EUROMOT 2004 - EC 1997 68 Consolidated - Annex III)
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$$f_a = (99/P_s)^{0.1} (T_a/298)^{1.5}$$

Ps: Dry Atmospheric pressure(kPa)

Ta: Absolute temperature of the intake air(k)

Fuel	JIS K-2204 Type2
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Tfi	$33^\circ\text{C} \leq Tfi \leq 43^\circ\text{C}$ Tfi: The fuel temperature at the injection pump inlet.
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## 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. <sup>3</sup> )	65.37 (3989)			
Brake Horse power without Fan	HP (kW)	2610 (1947)	2382 (1777)		
Brake Mean Effective Pressure without Fan	kgf/cm <sup>2</sup> (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 <sup>3</sup> /min (CFM)	178 (6285)	160 (5650)		
Exhaust Gas Flow	m <sup>3</sup> /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 <sup>3</sup> /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		

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**MITSUBISHI DIESEL ENGINE  
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T0307-0008E Rev.2 (1/2)

DATE

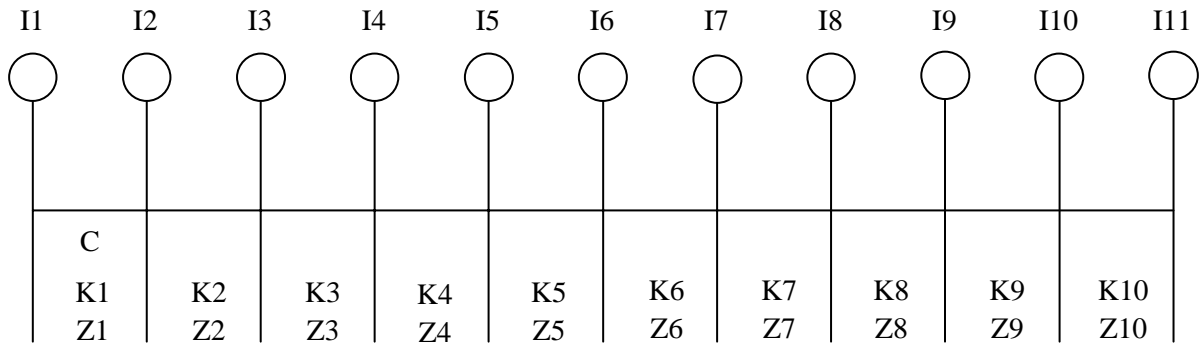
July, 2006

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 <sup>2</sup>	Damping coefficient Nm/rad/s	Spring const. x10 <sup>7</sup> Nm/rad	Tensile strength N/mm <sup>2</sup>	Section modulus cm <sup>3</sup>	
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

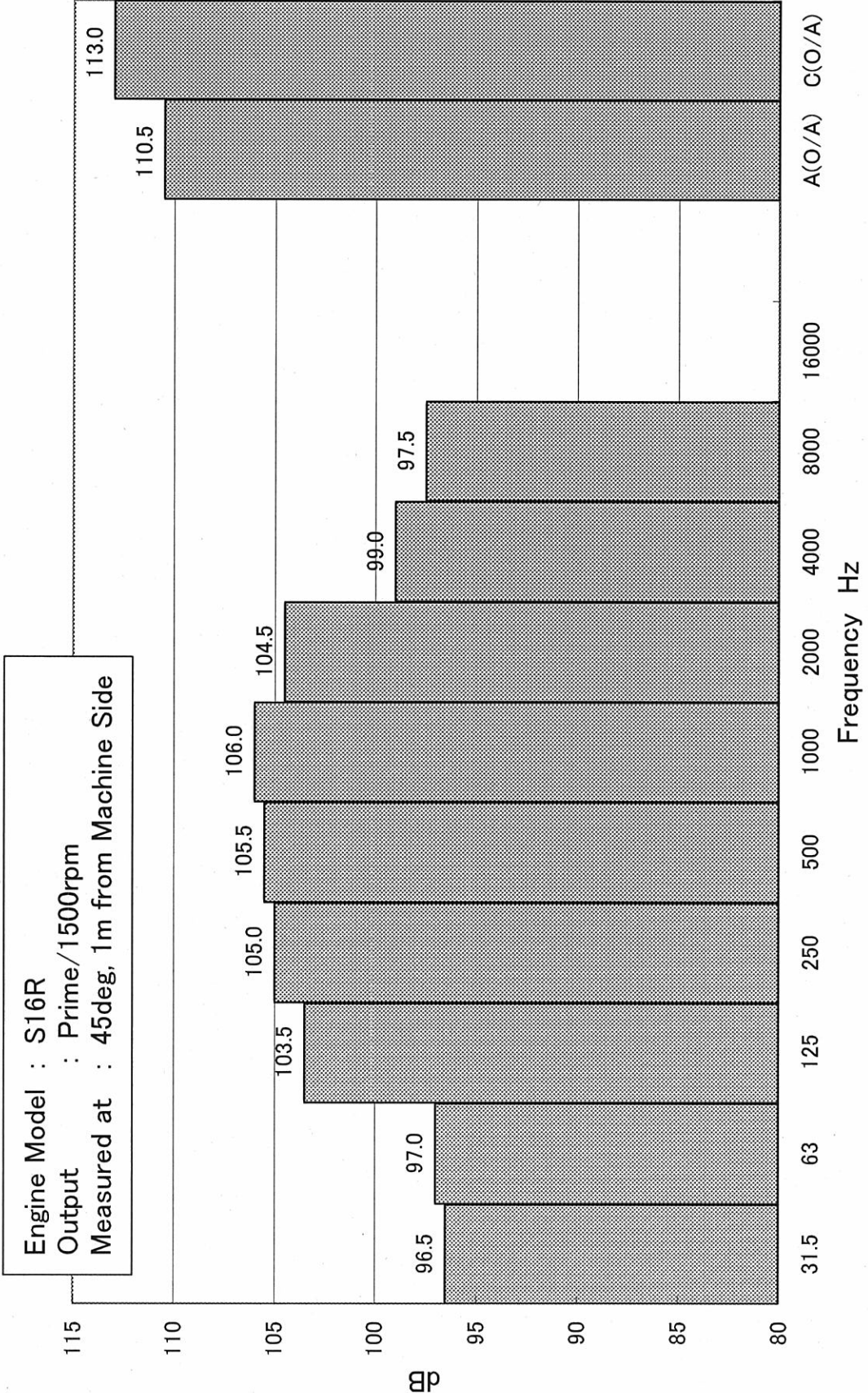
**Mechanical Noize Data of S16R**

Mechanical Noize Data of S16R is enclosed herein.

Revision	First Edition : Sep.,2006	Engine Engineering Department Large Engine Design Section		

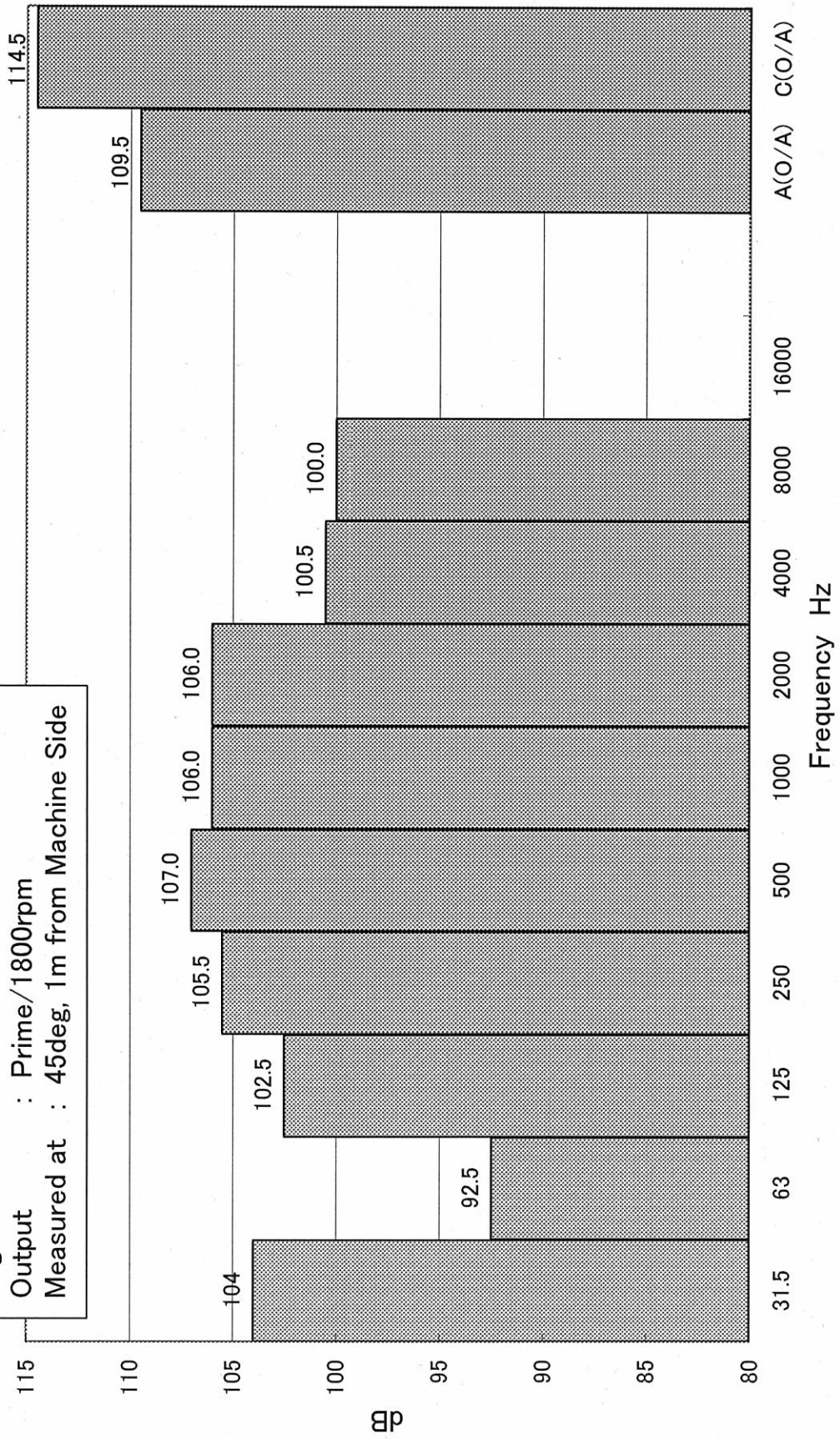


### Mechanical Noise Analysis



### Mechanical Noise Analysis

Engine Model : S16R  
 Output : Prime/1800rpm  
 Measured at : 45deg, 1m from Machine Side





**MITSUBISHI DIESEL ENGINE  
TECHNICAL INFORMATION**

ITEM NO.

T0409-0001E (1/2)

DATE

February, 2014

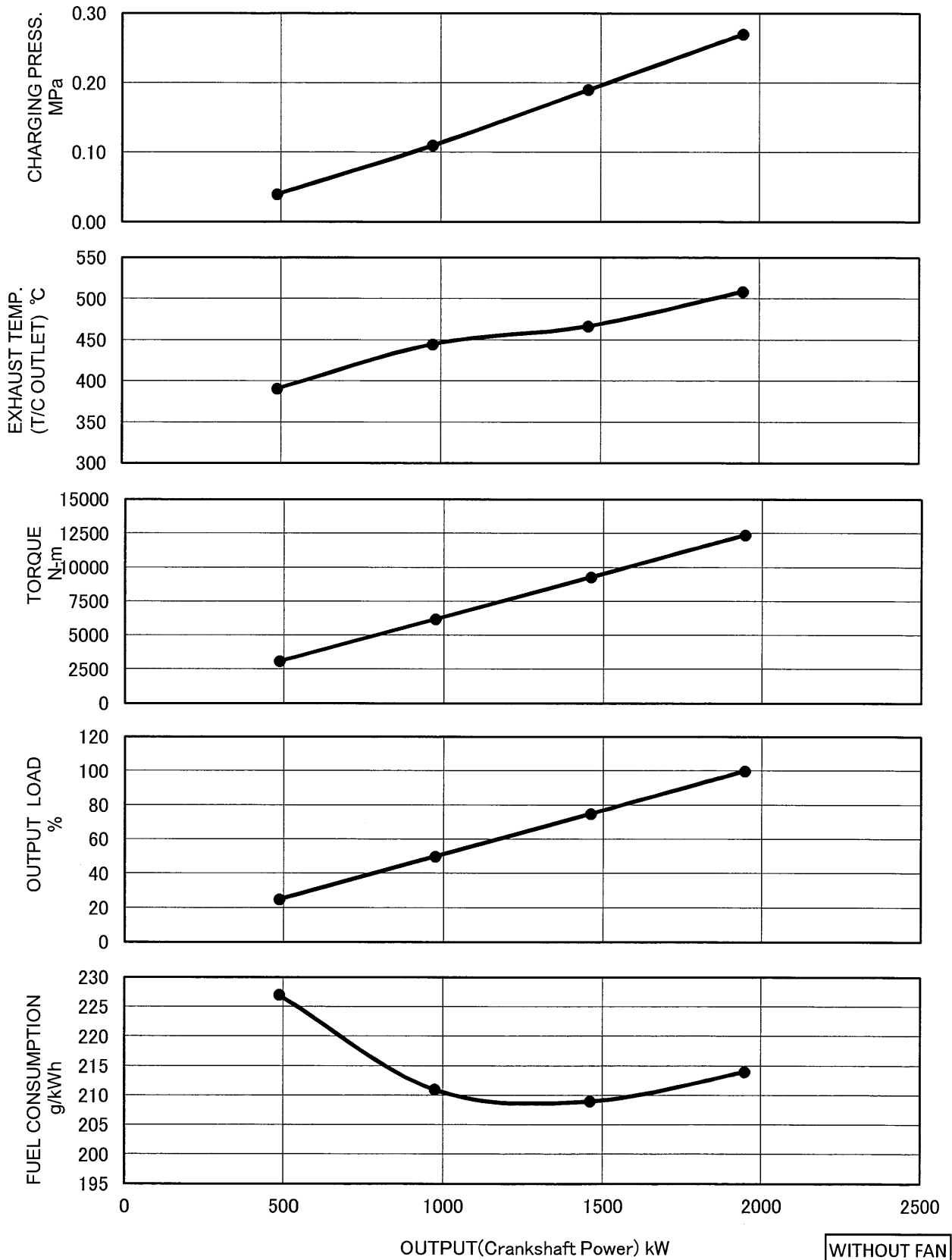
Performance Curves of S16R-F1PTAW2-1

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

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

Engine speed: 1500min<sup>-1</sup>



WITHOUT FAN

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

APPLICATION : GENERATOR