MITSUBISHI S12R-F1PTAW2

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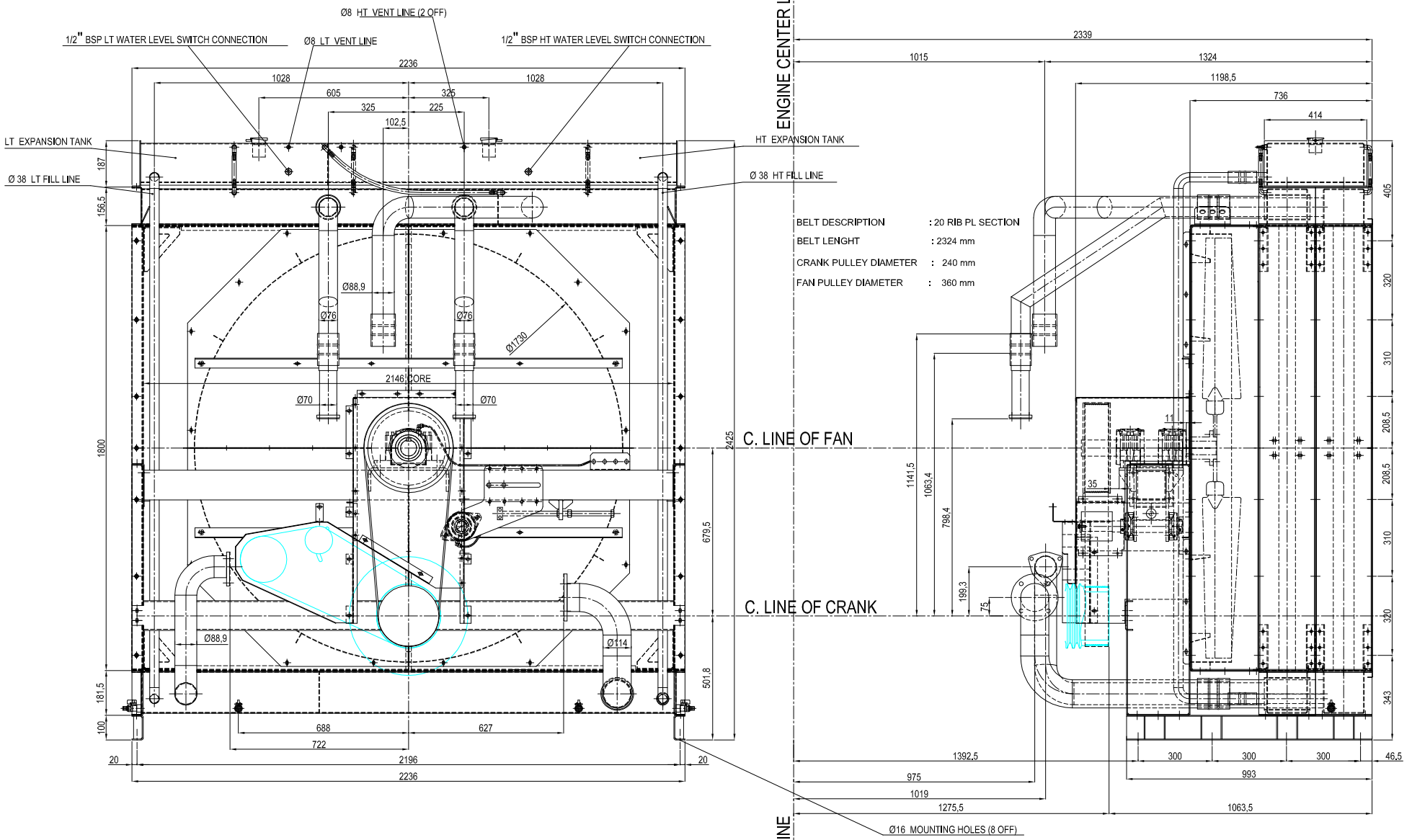
828 827 DLM - ELM

WORKING PRESSURE 10 PSI
TESTING PRESSURE 15 PSI



HT RADIATOR COOLANT CAPACITY	: 170 Lt.		LT RADIATOR COOLANT CAPACITY	: 147 Lt.	
HT EXPANSION TANK COOLANT CAPACITY	: 55 Lt.		LT EXPANSION TANK COOLANT CAPACITY	: 30 Lt.	
HT EXPANSION TANK CAPACITY	: 84 Lt.		LT EXPANSION TANK CAPACITY	: 45 Lt.	
ENGINE BLOCK COOLANT CAPACITY	: 116 Lt.		ENGINE COOLANT CAPACITY	: 14 Lt.	
TOTAL SYSTEM COOLANT CAPACITY	: 341 Lt.		TOTAL SYSTEM COOLANT CAPACITY	: 191 Lt.	

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

ASSEMBLY TOLERANCES		ISSUE A / SCALE	ENGINE MODEL	MITSUBISHI S12R - F1PTAW2 1500RPM MITSUBISHI S12R - Y2PTAW-1 1800RPM	THIRD ANGLE PROJECTION	PANOTO RADYATÖR MAKİNA ve SAN. TİC. A.Ş.
UP TO 120	±0,8		TITLE	50°C BELT DRIVEN RADIATOR		
120 TO 300	±1,2		NAME	DATE	SIGNATURE	PART NO: 828 827 DLM - ELM
300 TO 500	±1,5					
500 TO 1000	±2	DRAWN BY				DRAWING NO
ABOVE 1000	±2,5	CHECKED BY				
ANGULAR	±0,25°	APPROVED BY				

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

MITSUBISHI DIESEL ENGINE TECHNICAL INFORMATION	ITEM NO.	T0218-0001E Rev.4 (1/4)
	DATE	March, 2013

Specification Sheets of S12R-F1PTAW2 Engine

Specification Sheets of S12R-F1PTAW2 Engine are enclosed herein.

Revision				
	First Edition : July, 2007	Engine Engineering Department Engine System Designing Section		
	Rev.1 : Sep., 2008			
	Rev.2 : July, 2009	Approved by	Checked by	Drawn by
	Rev.3 : Sep., 2009			
	Rev.4 : Mar., 2013			

GENERAL ENGINE DATA

Type	4-Cycle, Water Cooled	
Aspiration	Turbo-Charged, Inter Cooler (Fresh 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^3)	49.03	(2992)
Compression Ratio	14.5:1	
Dry Weight - Engine only - kg(lb)	5270	(11620)
Wet Weight - Engine only - kg(lb)	5555	(12249)

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)	75.3	(1787.2)
Cyclic Speed Variation with Flywheel at 1500rpm	1/320	

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 ldle - 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)	150	(40)
Low - liter (U.S.gal)	108	(28.5)
Total System Capacity (lncludes Oil Filter) - liter (U.S.gal)	180	(47.6)
Maximum Angle of lnstallation (Std. Pan) Front Down	6.5°	
(Engine Only) Front Up	6.5°	
Side to Side	22.5°	

COOLING SYSTEM

Coolant Capacity of Jacket (Engine only) - liter (U.S.gal)	116	(30.6)
Coolant Capacity of Air cooler (Engine only) - liter (U.S.gal)	14	(3.7)
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 lnlet, 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

Mar, '13 Printed in Japan

FUEL SYSTEM

Fuel Injector	Mitsubishi PS6 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

f	$0.98 < f < 1.02$	f: Engine specific parameter considering atmospheric condition which determined according to the following provisions. (See CODE OF FEDERAL REGULATIONS 40 CRF ch.1)
		$f = (99/Ps)^{0.7} (Ta/289)^{1.5}$
		Ps: Dry Atmospheric pressure(kPa)
		Ta:Absolute temperature of the intake air(k)
Fuel	JIS K-2204 Type2	

S12R-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		12			
Bore	mm (in.)	170 (6.69)			
Stroke	mm (in.)	180 (7.09)			
Displacement	liter ($in.^3$)	49.03 (2992)			
Brake Horse power without Fan	HP (kW)	1960 (1462)	1782 (1329)		
Brake Mean Effective Pressure without Fan	kgf/cm^2 (psi)	24.3 (346)	22.1 (314)		
Mean Piston Speed	m/s (ft/min)	9.0 (1772)	9.0 (1772)		
Maximum Regenerative Power Absorption Capacity without Fan	HP (kW)	141 (105)	141 (105)		
Intake Air flow	m^3/min (CFM)	131 (4626)	117 (4131)		
Exhaust Gas Flow	m^3/min (CFM)	346 (12217)	308 (10875)		
Coolant Flow	liter/min (U.S. GPM)	1650 (436)	1650 (436)		
Coolant Flow to Intercooler (Max.Flow 320L/min)	liter/min (U.S. GPM)	220 (58)	220 (58)		
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)	98350 (6505)	87767 (5805)		
Heat Rejection to Coolant	kcal/hr (BTU/min)	426183 (28187)	380326 (25154)		
Heat Rejection to Air Cooler (PTAW Version)	kcal/hr (BTU/min)	360616 (23851)	321814 (21284)		
Heat Rejection to Exhaust	kcal/hr (BTU/min)	1136108 (75141)	992959 (65673)		
Noise Level (1 m height & distance) (excludes, Intake,Exhaust & Fan)	dB(A)	TBD	TBD		

The specifications are subject to change without notice.

APPLICATION : GENERATOR

Mar., '13 Printed in Japan

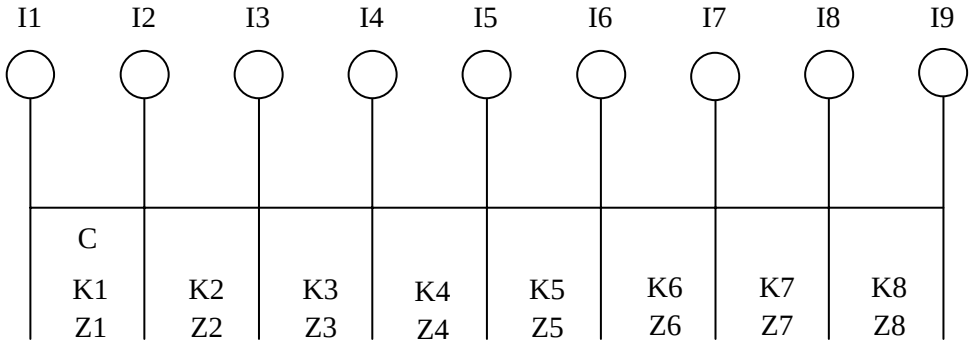
MITSUBISHI DIESEL ENGINE TECHNICAL INFORMATION	ITEM NO.	T0307-0007E Rev.2 (1/2)
	DATE	April, 2009

Elastic data of S12R Engine

Elastic data of S12R Engine are enclosed herein.

Revision				
	First Edition : July, 2006 (Refer to ELASTIC-S12R-PTA Oct.,2003, S12R.0)	Engine Engineering Department Large Engine Design Section		
	Rev.1 : July, 2006	Approved by	Checked by	Drawn by
	Rev.2 : April, 2009			

S12R-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 ×1pc. ×2pcs.	1.01 2.02	C=524.6 C=1049.3	K1=0.0	0.0	Z1 =0.0
I2	PULLEY Damper 1pc. Damper 2pcs.	1.37 2.16	—	K2=1.089	834	Z2 =373.7
I3	No.1 CRANK	0.999	—	K3=0.735	834	Z3 =373.7
I4	No.2 CRANK	0.610	—	K4=0.735	834	Z4 =373.7
I5	No.3 CRANK	0.999	—	K5=0.735	834	Z5 =373.7
I6	No.4 CRANK	0.999	—	K6=0.735	834	Z6 =373.7
I7	No.5 CRANK	0.610	—	K7=0.735	834	Z7 =373.7
I8	No.6 CRANK	0.998	—	K8=1.304	834	Z8 =373.7
I9	FLYWHEEL 21in	11.21	—			

Hysteresis constant: 92 No. of Cylinder: 12 Bore:170mm Stroke:180mm

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

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

Firing interval:0-60-120-180-240-300-360-420-480-540-600-660

APPLICATION : LAND USE

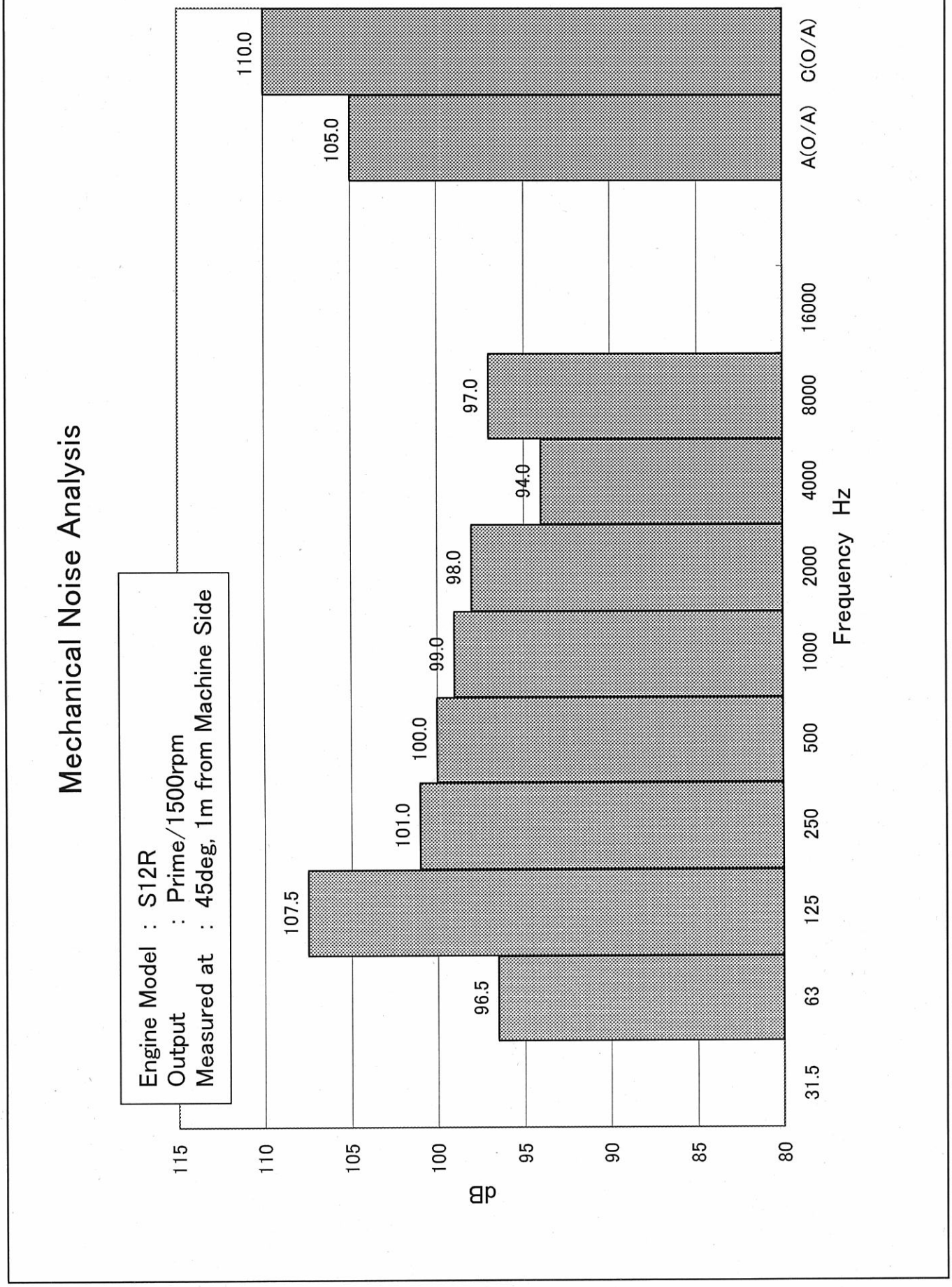
The data is subject to change without notice.

MITSUBISHI DIESEL ENGINE TECHNICAL INFORMATION	ITEM NO.	T0404-0009E (1/3)
	DATE	Sep., 2006

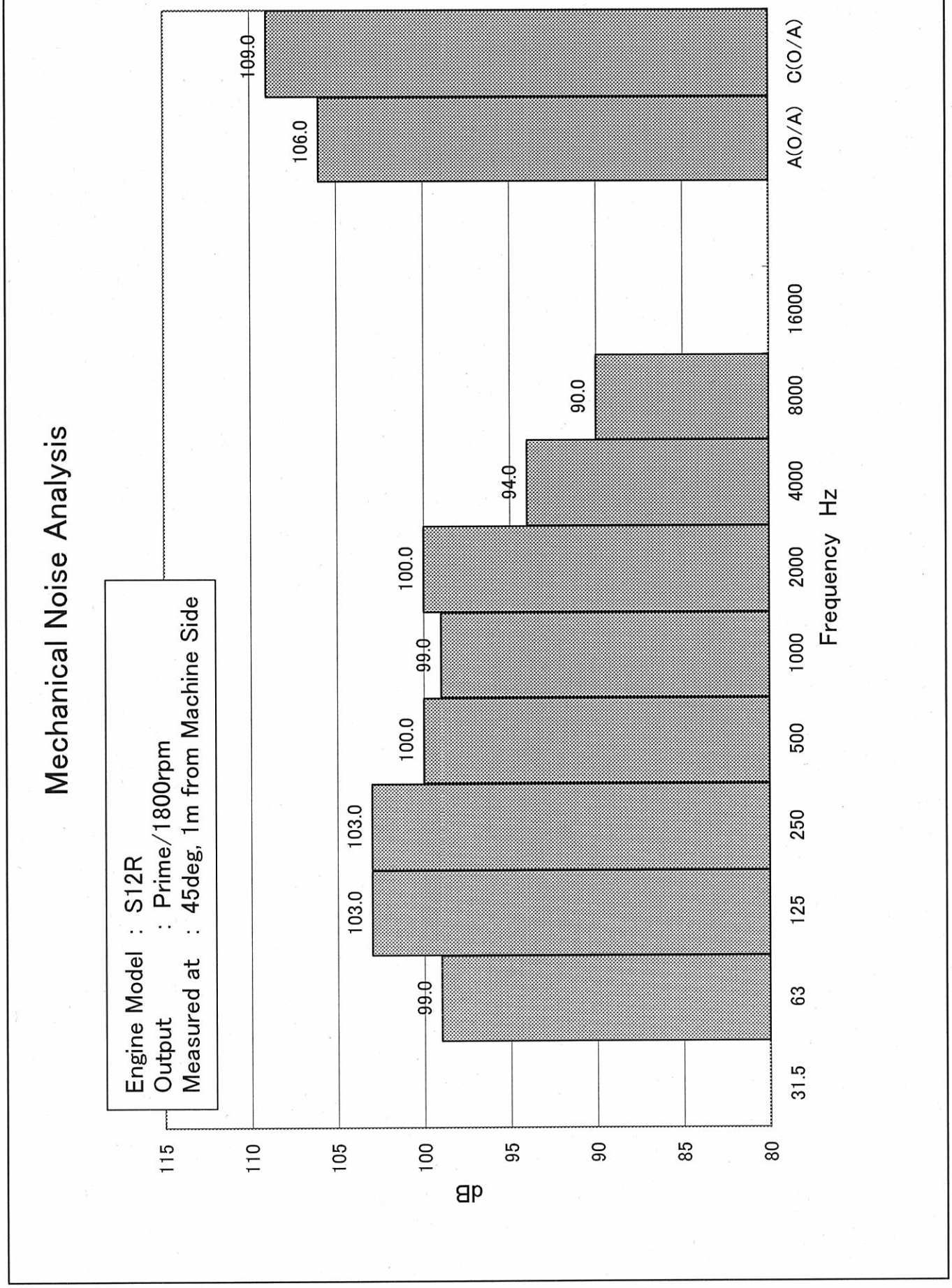
Mechanical Noize Data of S12R

Mechanical Noize Data of S12R 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 : S12R
Output : Prime/1500rpm
Measured at : 45deg, 1m from Machine Side
dB
115
110
105
100
95
90
85
80
31.5
63
125
250
500
1000
2000
4000
8000
16000
Frequency Hz
A(O/A)
C(O/A)
110.0
105.0
97.0
94.0
98.0
99.0
100.0
101.0
107.5
96.5

ITEM NO.	T0404-0009E (3/3)



MITSUBISHI DIESEL ENGINE TECHNICAL INFORMATION	ITEM NO.	T0409-0002E (1/2)
	DATE	February, 2014

Performance Curves of S12R-F1PTAW2-1

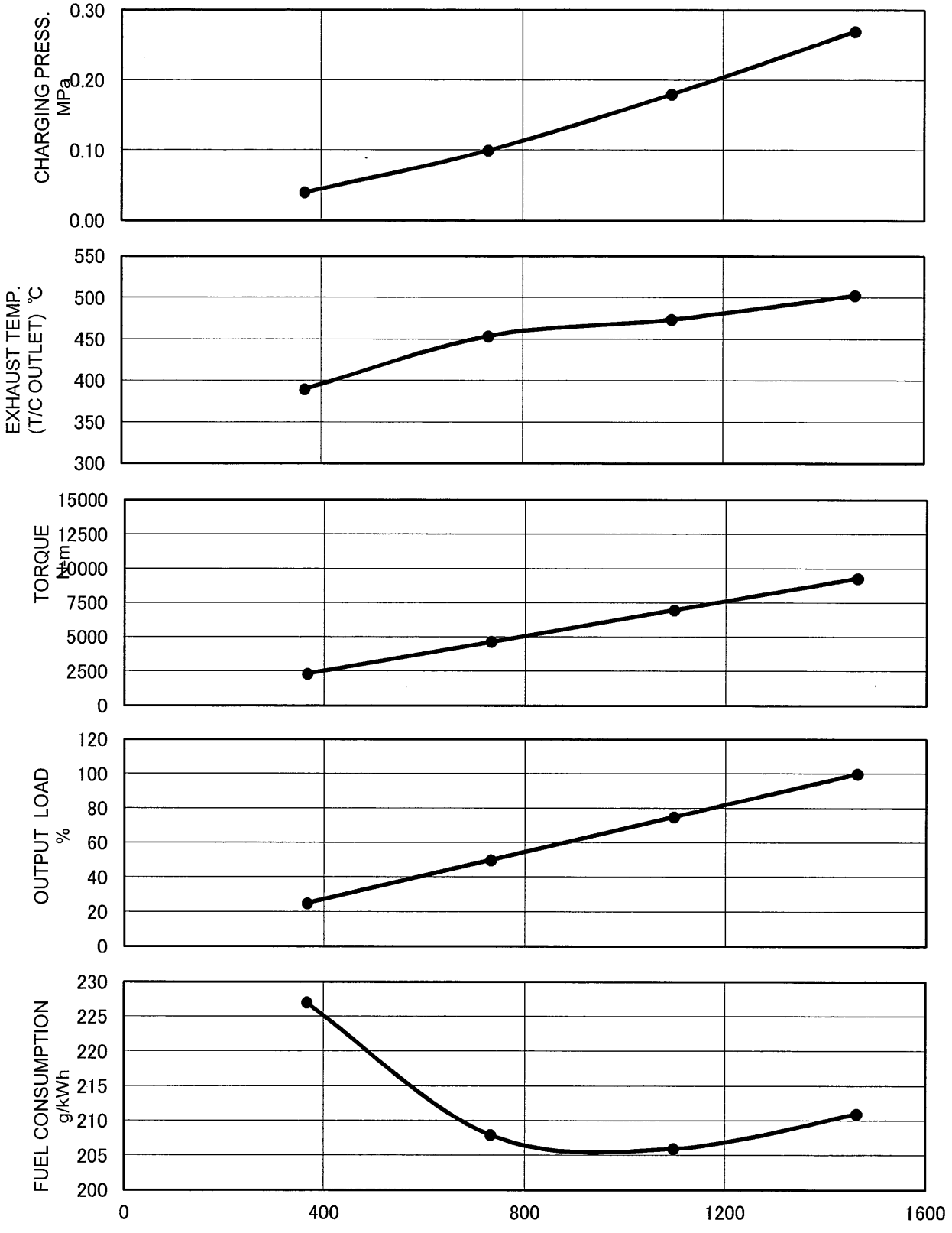
Performance Curves of S12R-F1PTAW2-1 Engine are enclosed herein. The data are test bench data and not a guaranteed performance.

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

MITSUBISHI HEAVY INDUSTRIES, LTD.
GENERAL MACHINERY & SPECIAL VEHICLES

S12R-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

Feb.'14 Printed in Japan

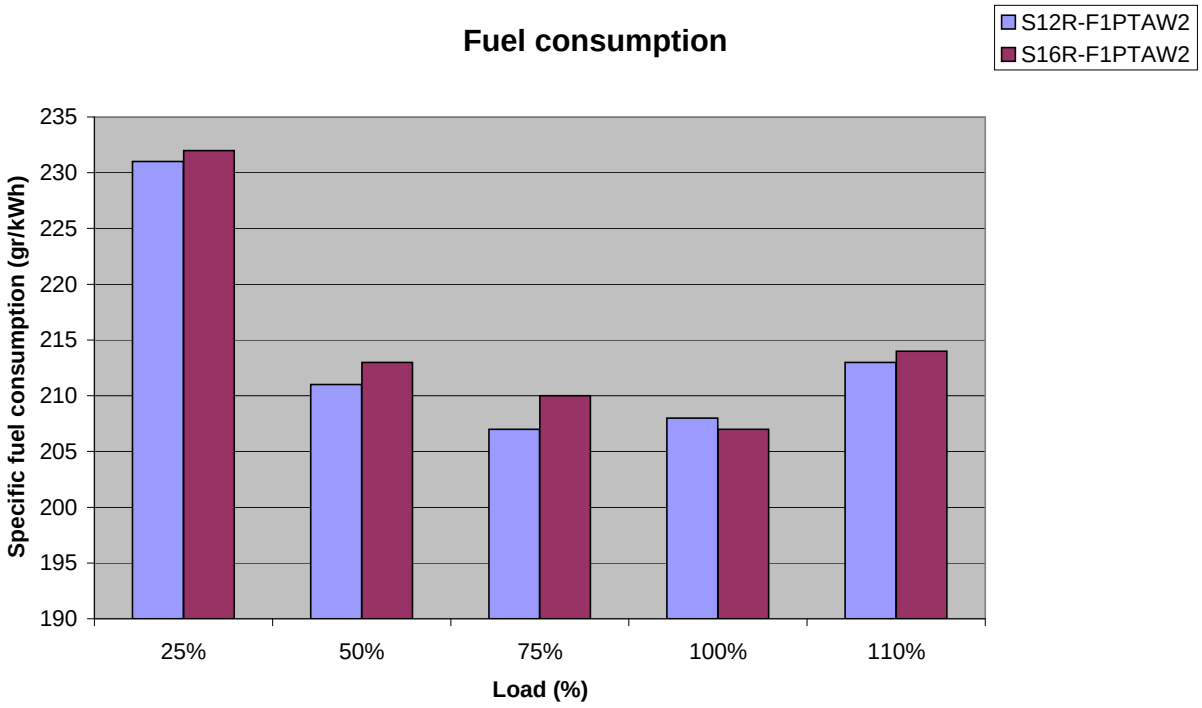
Engineering Bulletin

Subject: Fuel consumption S12R-F1PTAW2 & S16R-F1PTAW2

This document is issued to give information about fuel consumption.

Conditions:
Fuel specification according JIS K-2204 Type 2
Output correction according: 100kPa barometric pressure, 25ºC ambient temperature and 30% humidity.

	S12R-F1PTAW2		S16R-F1PTAW2	
Load	**Output kW**	**Fuel cons gr/kwh**	**Output kW**	**Fuel cons gr/kwh**
25%	366	231	487	232
50%	731	211	974	213
75%	1097	207	1460	210
100%	1329	208	1777	207
110%	1462	213	1947	214



Note: The specifications are subject to change without any notice.

Revision		Technology Department Engine Division		
		Approved by	Checked by	Drawn