



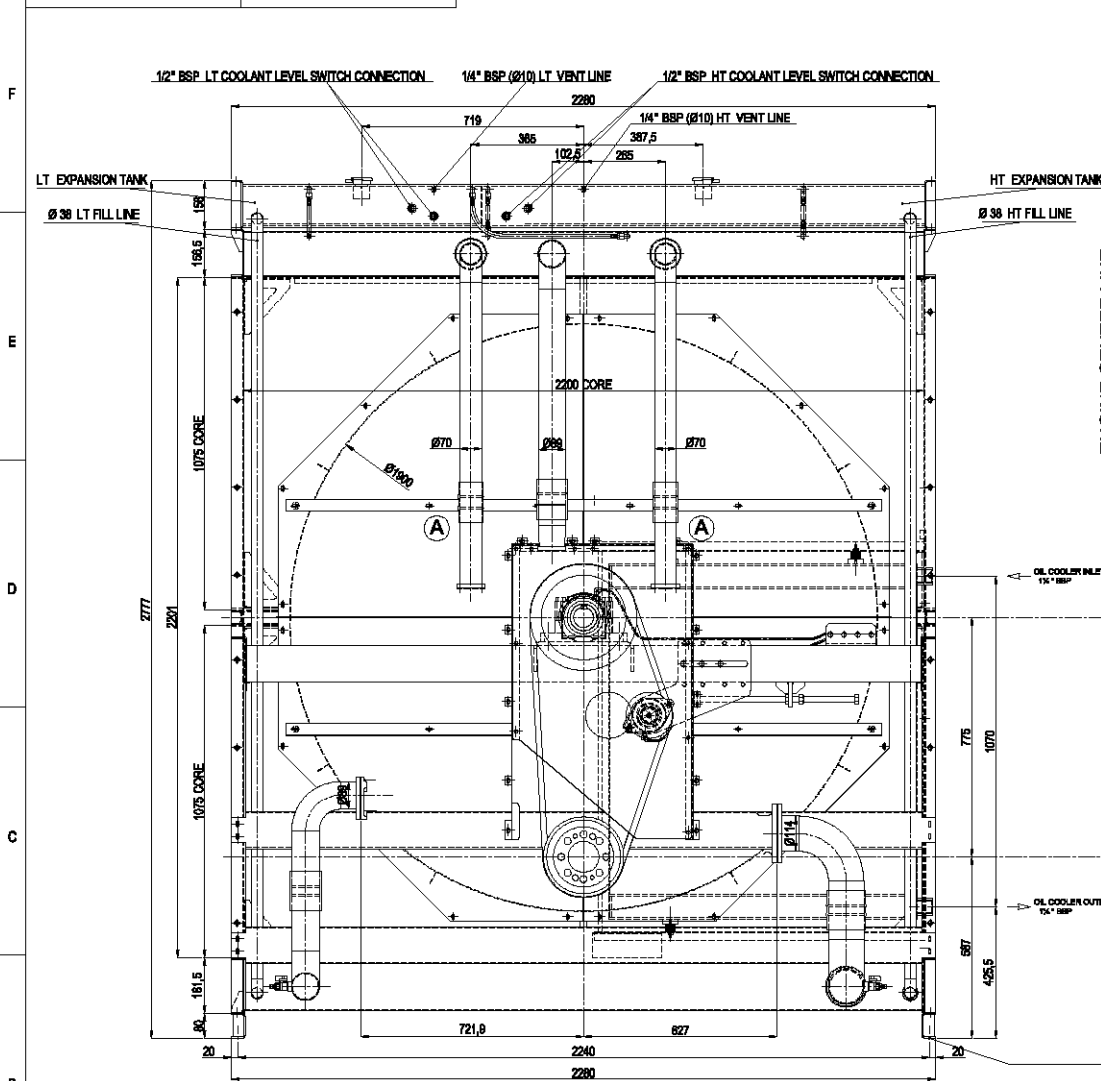
mitsubishi S16R2-PTAW

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[Radiator drawing](#)
[Technical data](#)
[Elastic drawing](#)
[Exhaust gas emission](#)
[Mechanical noise data](#)

828 978 CLM - ELM - O

WORKING PRESSURE 10 PSI
TESTING PRESSURE 15 PSI



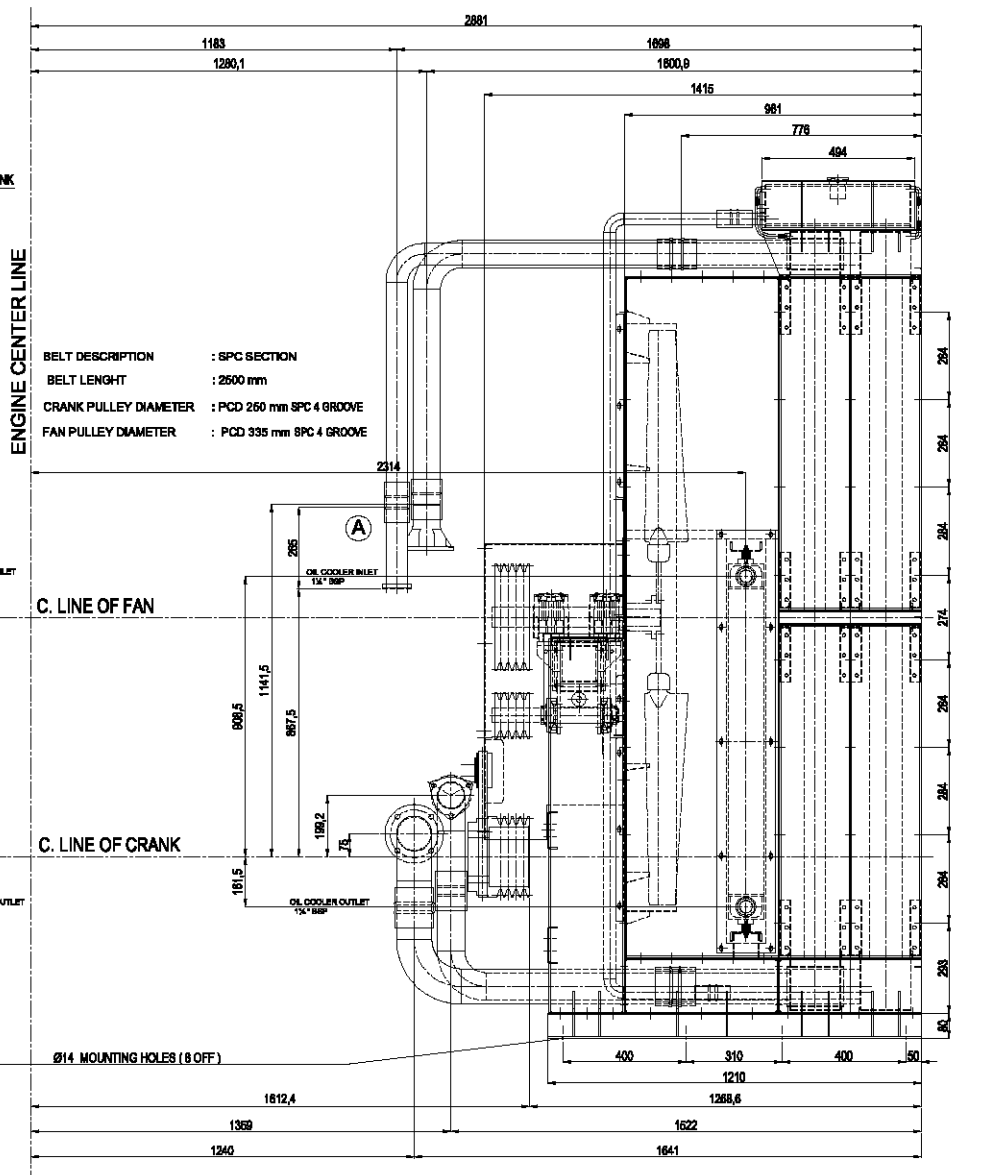
- | | |
|---------------------------------------------|---------------------------------------------|
| HT RADIATOR COOLANT CAPACITY : 210 Lt. | LT RADIATOR COOLANT CAPACITY : 174 Lt. |
| HT EXPANSION TANK COOLANT CAPACITY : 55 Lt. | LT EXPANSION TANK COOLANT CAPACITY : 29 Lt. |
| HT EXPANSION TANK CAPACITY : 82 Lt. | LT EXPANSION TANK CAPACITY : 44 Lt. |
| ENGINE BLOCK COOLANT CAPACITY : 157 Lt. | ENGINE COOLANT CAPACITY : 33 Lt. |
| TOTAL SYSTEM COOLANT CAPACITY : 422 Lt. | TOTAL SYSTEM COOLANT CAPACITY : 236 Lt. |

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

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© BU ÇİZİMİN TÜM Telif HAKKI PANOTO RADYATÖRE AİTTİR. YAZILI İZİN OLMASIZIN ÇOGALTIMAZ VE DÜDÜMÇÜ ŞAHİSLARA VERİLEMEZ.

A	17.04.2015	CONNECTION PIPE WITH FLANGE HAS BEEN ADDED. DIAMETER OF PIPE HAS BEEN REVISED FROM Ø78mm to Ø70mm.	HASAN BİLGİN
LETTER	DATE	DESCRIPTION	DRAWN BY
			APPROVED BY



- BELT DESCRIPTION : SPC SECTION
 BELT LENGHT : 2500 mm
 CRANK PULLEY DIAMETER : PCD 250 mm SPC 4 GROOVE
 FAN PULLEY DIAMETER : PCD 335 mm SPC 4 GROOVE

ASSEMBLY TOLERANCES	ISSUE A	ENGINE MODEL	MITSUBISHI S16R2 PTAW 1500 RPM	THIRD ANGLE PROJECTION
UP TO 120 : ±0,8	SCALE	TITLE	45°C BELT DRIVEN RADIATOR	PART NO 828 978 CLM - ELM - O
120 TO 300 : ±1,2		NAME	DATE SIGNATURE	
300 TO 500 : ±1,5				DRAWING NO
500 TO 1000 : ±2	DRAWN BY			
ABOVE 1000 : ±2,5	CHECKED BY			
ANGULAR : ±0,25°	APPROVED BY			

NO	PART	QTY	SPEC	DESCRIPTIONS	LETTER	DATE	DESCRIPTION	DRAWN BY	APPROVED BY
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**MITSUBISHI DIESEL ENGINE
TECHNICAL INFORMATION**

ITEM NO.

T0221-0002E Rev.3 (1/4)

DATE

March, 2013

Specification Sheets of S16R2-PTAW Engine

Specification Sheets of S16R2-PTAW Engine are enclosed herein.

Revision	First Edition : January, 2011	Engine Engineering Department Engine System Designing Section		
	Rev.1 : February, 2012			
	Rev.2 : May, 2012	Approved by	Checked by	Drawn by
	Rev.3 : March, 2013			

GENERAL ENGINE DATA

Type	4-Cycle, Water Cooled	
Aspiration	Turbo-Charged, Aircooler (Fresh Water)	
Cylinder Arrangement	60°V	
No.of Cylinders	16	
Bore mm(in.)	170	(6.69)
Stroke mm(in.)	220	(8.66)
Displacement liter(in ³)	79.90	(4876)
Compression Ratio	14.0:1	
Dry Weight - Engine only - kg(lb)	7750	(17089)
Wet Weight - Engine only - kg(lb)	8200	(18081)

PERFORMANCE DATA

Steady State Speed Stability Band at any Constant Load

Electric Governor - %	±0.25 or better	
Maximum Overspeed Capacity - rpm	1750	
Moment of inertia of Rotating Components - kgf·m ² (lbf·ft ²)	32.92	(781)
(Includes Std.Flywheel)		
Cyclic Speed Variation with Flywheel at 1500rpm	1/210	

ENGINE MOUNTING

Maximum Bending Moment at Rear Face of Flywheel Housing - kgf·m(lbf·ft)	450	(3256)
-------------------------------------------------------------------------------	-----	--------

AIR INLET SYSTEM

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

EXHAUST SYSTEM

Maximum Allowable Back Pressure - mm H ₂ O (in.H ₂ O)	600	(23.6)
-----------------------------------------------------------------------------------	-----	--------

LUBRICATION SYSTEM

Oil Pressure at Idle - kgf/cm ² (psi)	2~3	(29~43)
at Rate Speed - kgf/cm ² (psi)	4~6	(57~86)
Maximum Oil Temperature - °C(°F)	110	(230)
Oil Capacity of Standard Pan High - liter (U.S.gal)	260	(68.7)
Low - liter (U.S.gal)	200	(52.8)
Total System Capacity (Includes Oil Filter) - liter (U.S.gal)	290	(76.6)
Maximum External Friction Head at External Oil Cooler - kgf/cm ² (psi)	0.82	(11.7)
Maximum Angle of Installation (Std. Pan) Front Down	6°	
(Engine Only) Front Up	6°	
Side to Side	25°	

COOLING SYSTEM

Coolant Capacity of Jacket (Engine Only) - liter (U.S.gal)	157	(41.5)
Coolant Capacity of Air Cooler (Engine Only) - liter (U.S.gal)	33	(8.7)
Maximum External Friction Head at Engine Outlet - kgf/cm ² (psi)	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- °C(°F)	98	(208)
Minimum Coolant Expansion Space - % of System Capacity	10	
Maximum Coolant Temperature at Air cooler Inlet, PTAW type- °C(°F) (at ambient 40°C)	65	(149)

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 & Leak Pipe - mm Hg (in.Hg)	150 (5.9)

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	400
Below 5°C(41°F) through - 5°C(23°F)	600

The specifications are subject to change without notice.

APPLICATION : GENERATOR

Pub. No. T0221-0002E Rev.3 3/4

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	CONTINUOUS C	CONTINUOUS D
		50Hz	50Hz	50Hz	50Hz
Engine Speed	rpm	1500	1500	1500	1500
No. of Cylinders		16			
Bore	mm (in.)	170 (6.69)			
Stroke	mm (in.)	220 (8.66)			
Displacement	liter (in. ³)	79.9 (4876)			
Brake Horse power without Fan	HP (kW)	2905 (2167)	2627 (1960)	2252 (1680)	2001 (1493)
Brake Mean Effective Pressure without Fan	kgf/cm ² (MPa) (psi)	22.1 (2.17) (314)	20.0 (1.96) (284)	17.1 (1.68) (243)	15.2 (1.49) (216)
Mean Piston Speed	m/s (ft/min)	11.0 (2165)	11.0 (2165)	11.0 (2165)	11.0 (2165)
Maximum Regenerative Power Absorption Capacity without Fan	HP (kW)	204 (152)	204 (152)	204 (152)	204 (152)
Intake Air flow	m ³ /min (CFM)	188 (6638)	168 (5932)	141 (4979)	125 (4414)
Exhaust Gas Flow	m ³ /min (CFM)	498 (17584)	445 (15713)	372 (13135)	331 (11688)
Coolant Flow	liter/min (U.S. GPM)	1650 (436)	1650 (436)	1650 (436)	1650 (436)
Coolant Flow to Aircooler (PTAW only)	liter/min (U.S. GPM)	920 (243)	920 (243)	920 (243)	920 (243)
Oil Flow to External Oil Cooler	liter/min (U.S. GPM)	70 (18)	70 (18)	70 (18)	70 (18)
Allowable Fan Loss Horse Power	HP (kW)	82 (61)	82 (61)	82 (61)	82 (61)
Radiated Heat to Ambient	kcal/hr (kJ/hr) (BTU/min)	142702 (597357) (9438)	127286 (532825) (8419)	106554 (446040) (7047)	94693 (396389) (6263)
Heat Rejection to Coolant	kcal/hr (kJ/hr) (BTU/min)	647619 (2710962) (42833)	575086 (2407334) (38035)	479491 (2007171) (31713)	426119 (1783753) (28183)
Heat Rejection to Air Cooler	kcal/hr (kJ/hr) (BTU/min)	479718 (2008121) (31728)	425990 (1783211) (28174)	355179 (1486795) (23491)	315644 (1321300) (20876)
Heat Rejection to External Oil Cooler (external oil cooler, mounted on radiator)	kcal/hr (kJ/hr) (BTU/min)	71957 (301215) (4759)	63898 (267479) (4226)	53277 (223020) (3524)	47347 (198197) (3131)
Heat Rejection to Exhaust	kcal/hr (kJ/hr) (BTU/min)	1561603 (6536940) (103282)	1369607 (5733236) (90584)	1112770 (4658105) (73597)	988908 (4139613) (65405)
Noise Level (1 m height & distance) (excludes, Intake, Exhaust & Fan)	dB(A)	TBD	TBD	TBD	TBD

The specifications are subject to change without notice.

APPLICATION : GENERATOR

Pub. No. T0221-0002E Rev.3 4/4



**MITSUBISHI DIESEL ENGINE
TECHNICAL INFORMATION**

ITEM NO.

T0307-0030E Rev.1 (1/2)

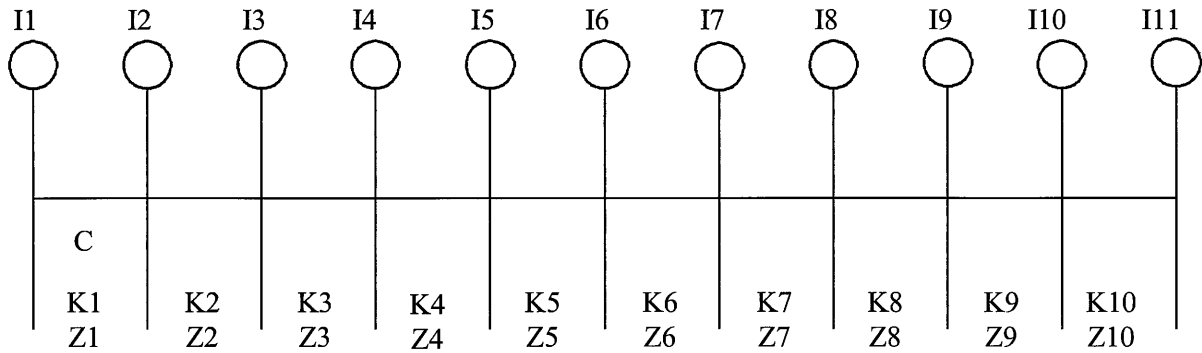
DATE

May, 2013

Elastic data of S16R2 Engine

Elastic data of S16R2 Engine are enclosed herein.

Revision	First Edition : March, 2013	Engine Engineering Department Engine System Designing Section		
	Rev.1 : May, 2013			
		Approved by	Checked by	Drawn by

S16R2-PTAW ELASTIC DATA

	Moment of inertia, J [kg.m ²]	Damping coefficient [Nm/rad/s]	Spring const. x10 ⁷ [Nm/rad]	Tensile strength [N/mm ²]	Section modulus [cm ³]	
I1	DAMPER ×3pcs	3.030	C=1617	K1=0.0	0.0	Z1 =0.0
I2	PULLEY	2.861	—	K2=1.206	834	Z2 =360.9
I3	No.1 CRANK	1.803	—	K3=0.814	834	Z3 =360.9
I4	No.2 CRANK	1.803	—	K4=0.814	834	Z4 =360.9
I5	No.3 CRANK	1.803	—	K5=0.814	834	Z5 =360.9
I6	No.4 CRANK	1.803	—	K6=0.814	834	Z6 =360.9
I7	No.5 CRANK	1.803	—	K7=0.814	834	Z7 =360.9
I8	No.6 CRANK	1.803	—	K8=0.814	834	Z8 =360.9
I9	No.7 CRANK	1.803	—	K9=0.814	834	Z9 =360.9
I10	No.8 CRANK	1.803	—	K10=1.432	834	Z10=360.9
I11	FLYWHEEL 21in	12.66	—			

Hysteresis constant:173 No. of Cylinder: 16 Bore:170mm Stroke:220mm

Length of Con-Rod: 400mm Weight of Reciprocating Parts: 12.71 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.

T0402-0001E Rev.1 (1/2)

DATE

May, 2008

Exhaust Gas Emission Data

Exhaust Gas Emission Data is enclosed herein.

These data are subject to change without notice.

Revision	First Edition : May, 2008	Engine Engineering Department Engine System Designing Section		
	Rev.1: February, 2013			
		Approved by	Checked by	Drawn by

EXHAUST GAS EMISSION DATA OF DIESEL ENGINE FOR GENERATOR
For Reference

MODEL	S6A3-P/A		S12A2-P/A		S12H-P/A		S6R-P/A		S12R-P/A		S12R-PTA2		S12R-PTAA2 (W/FAN)		S16R-P/A		S16R-PTA2		S16R-PTAA2 (W/FAN)		S16R2-PTAW
	400/ 1500	890	679/ 1500	825	935/ 1500	877	515/ 1500	940	1110/ 1500	1190/ 1800	1195/ 1500	1340/ 1800	1277/ 1500	1387/ 1800	1480/ 1500	1590/ 1800	1630/ 1500	1775/ 1800	1684/ 1500	1895/ 1800	
Prime Rating kW/min ⁻¹ (without fan)																					
NOx	3.7	3.7	3.5	3.4	3.8	3.6	3.7	3.5	3.7	3.5	3.9	3.7	3.5	3.2	3.8	3.7	3.9	3.7	3.4	3.1	3.6
	g/Nm ³	g/Nm ³	g/Nm ³	g/Nm ³	g/Nm ³	g/Nm ³	g/Nm ³	g/Nm ³	g/Nm ³	g/Nm ³	g/Nm ³	g/Nm ³	g/Nm ³	g/Nm ³	g/Nm ³	g/Nm ³	g/Nm ³	g/Nm ³	g/Nm ³	g/Nm ³	g/Nm ³
	8.6	8.6	7.7	7.7	8.8	8.2	8.4	8.4	7.7	8.4	8.8	7.7	8.4	7.3	8.7	7.7	8.8	7.7	7.7	7.1	5.8
CO	(220)	(210)	(220)	(210)	(310)	(210)	310	210	(310)	(210)	(310)	(210)	(320)	(200)	(310)	(210)	(310)	(210)	(320)	(200)	119
	(0.44)	(0.45)	(0.44)	(0.45)	(0.59)	(0.43)	0.52	0.39	(0.59)	(0.43)	(0.59)	(0.43)	(0.55)	(0.42)	(0.56)	(0.43)	(0.59)	(0.43)	(0.55)	(0.42)	0.4
	(1.2)	1.4	(1.2)	1.4	(1.8)	(1.4)	1.5	1.2	(1.8)	(1.4)	(1.8)	(1.2)	(1.5)	(1.2)	(1.6)	(1.4)	(1.8)	(1.2)	(1.5)	(1.2)	0.5
HC	(50)	(50)	(50)	(50)	(110)	(120)	110	120	(110)	(120)	(110)	(120)	(110)	(120)	(110)	(120)	(110)	(120)	(110)	(120)	35
	(0.05)	(0.06)	(0.05)	(0.06)	(0.11)	(0.13)	0.09	0.11	(0.11)	(0.13)	(0.11)	(0.13)	(0.10)	(0.13)	(0.10)	(0.13)	(0.11)	(0.13)	(0.10)	(0.13)	0.19
	(0.15)	(0.18)	(0.15)	(0.18)	(0.31)	(0.38)	0.27	0.34	(0.31)	(0.38)	(0.31)	(0.38)	(0.29)	(0.38)	(0.29)	(0.38)	(0.31)	(0.38)	(0.29)	(0.38)	0.10
CO ₂	6.7	6.2	6.7	6.2	6.9	6.5	8.0	7.1	6.9	6.5	6.7	6.5	6.7	6.5	6.7	6.5	6.7	6.5	6.7	6.5	8.0
	g/AW·h	g/AW·h	g/AW·h	g/AW·h	g/AW·h	g/AW·h	g/AW·h	g/AW·h	g/AW·h	g/AW·h	g/AW·h	g/AW·h	g/AW·h	g/AW·h	g/AW·h	g/AW·h	g/AW·h	g/AW·h	g/AW·h	g/AW·h	g/AW·h
PM	0.12	0.12	0.12	0.11	0.12	0.11	0.10	0.12	0.12	0.11	0.10	0.09	0.09	0.08	0.11	0.12	0.11	0.12	0.09	0.07	0.03
	g/AW·h	g/AW·h	g/AW·h	g/AW·h	g/AW·h	g/AW·h	g/AW·h	g/AW·h	g/AW·h	g/AW·h	g/AW·h	g/AW·h	g/AW·h	g/AW·h	g/AW·h	g/AW·h	g/AW·h	g/AW·h	g/AW·h	g/AW·h	g/AW·h
	0.37	0.37	0.38	0.37	0.38	0.37	0.34	0.35	0.35	0.37	0.34	0.33	0.33	0.31	0.33	0.39	0.33	0.33	0.31	0.31	0.04

Notes

- Allowance: +25%
- Condition: 100kPa(750mmHg) barometric pressure, 298K(25°C) ambient temperature and 30% relative humidity.
- NOx, CO, HC[PPM]: with 13% O₂ Level.
NOx, CO, HC, Particulates[$\mu\text{g}/\text{Nm}^3$]: with 5% O₂ Level.
NOx, CO, HC, Particulates[$\mu\text{g}/\text{PS}\cdot\text{h}$]: with 13% O₂ Level.
CO₂[%]: Calculated Data.
(): Estimated Data.
- *1: Standby Rating
- These data are subject to change without notice.





**MITSUBISHI DIESEL ENGINE
TECHNICAL INFORMATION**

ITEM NO.

T0404-0011E (1/2)

DATE

Oct., 2012

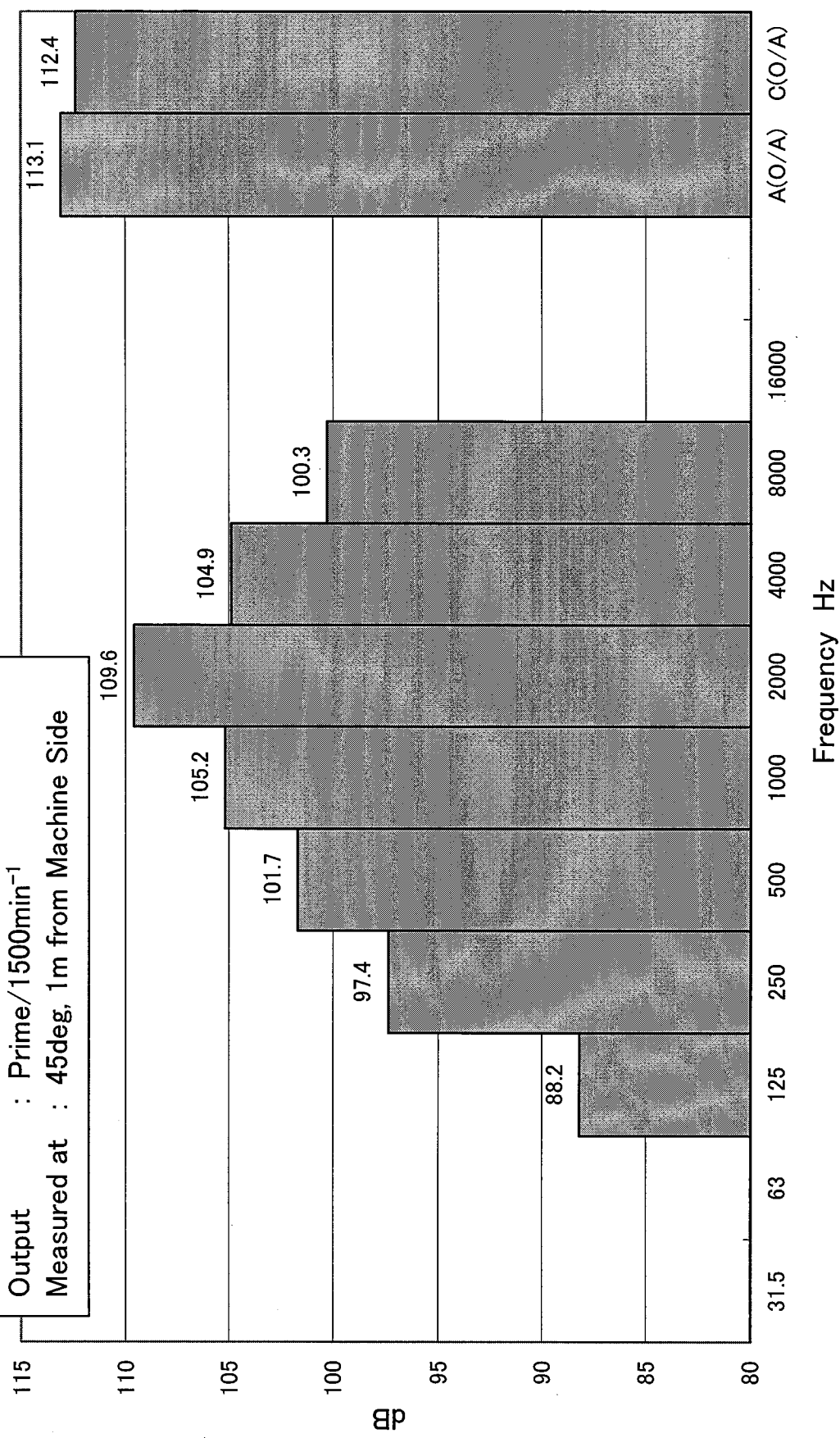
Mechanical Noize Data of S16R2

Mechanical Noize Data of S16R2 is enclosed herein.

Revision	First Edition : Oct.,2012	Engine Engineering Department Engine System Designing Section		
		Approved by	Checked by	Drawn by

Mechanical Noise Analysis

Engine Model : S16R2
 Output : Prime/1500min⁻¹
 Measured at : 45deg, 1m from Machine Side



(2)The specifications are subject to change without notice.

(1)The data are test bench data and not a guaranteed performance.