



# mitsubishi S16R2-T2MPTAW

Click on the headlines below to get redirected to the respective sections in this document.

[Technical data](#)  
[Elastic drawing](#)  
[Flywheel & housing drawing](#)  
[Measure of overhaul](#)  
[Connection details](#)  
[Performance curves](#)



**MITSUBISHI DIESEL ENGINE  
TECHNICAL INFORMATION**

ITEM NO.

T0221-0004E Rev.2 (1/4)

DATE

Dec, 2011

Specification Sheets of S16R2-T2MPTAW Engine (IMO-Tier 2 Certified Engine)

Specification Sheets of S16R2-T2MPTAW Engine that is satisfied with IMO-Tier 2 certified engine are enclosed herein.

Revision	First Edition : Dec., 2011	Engine Engineering Department Engine System Designing Section		
	Rev.1 : Mar., 2012			
	Rev.2 : Jan., 2013	Approved by	Checked by	Drawn by

## 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 <sup>3</sup> ) .....	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(Generator Use)		
Hydraulic (std.) or Electric Governor - % .....	±0.25 or better	
Idling Speed -rpm .....	600~650	
Maximum Overspeed Capacity - rpm .....	1750	
Moment of inertia of Rotating Components - kgf·m <sup>2</sup> (lbf·ft <sup>2</sup> ) .....	131.7	(3126)
(Includes Std.Flywheel)		
Cyclic Speed Variation with Flywheel a 1500rpm .....	1/230	
1200rpm .....	1/150	

## ENGINE MOUNTING

Maximum Bending Moment at Rear Face of Flywheel Housing - kgf·m(lbf·ft) .....	450	(3256)
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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) .....	4~6	(57~86)
Maximum Oil Temperature - °C(°F) .....	110	(230)
Oil Capacity of Marine 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 Installation Angle Front Up .....	9.5°	
Front Down .....	10.5°	
Maximum Instantaneous Operating Angle Front Up .....	30°	
(Engine Level) Front Down .....	30°	
Side to Side .....	22.5°	

## 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 <sup>2</sup> (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)
Maximum Coolant Temperature at Engine Inlet- °C(°F) .....	77	(171)
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 Air cooler Inlet, PTAW type- °C(°F) .....	see page 4/4	

**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
Cranking Ampere of Starter at 5°C (41°F) / -5°C (23°F)	
Static Ampere -A	410 × 2 / 540 × 2
Momentary Ampere -A	780 × 2 / 1040 × 2

**ACCESSORY EQUIPMENT**

Air Cleaner	Silencer Type
Exhaust Manifold	Air Cooled
Turbocharger	Air Cooled
Air Cooler	Fresh 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
Cooling Water Pump (Jacket water)	
Cooling Water Thermostat(Jacket water)	
Starter	Earth Float Type
Alternator	Earth Float Type
Stop Solenoid	DC24V-15A
Engine Support	Marine Type
Accessory Drive	Front Drive Pulley

**ACCESSORY EQUIPMENT(LOOSE SUPPLY)**

Relay Safety	For Starter
Jack Bolt	
Companion Flange	
Standard Tools	
Standard Spare Parts	

The specifications are subject to change without notice.

**APPLICATION : MARINE**

Pub. No. T0221-0004E Rev.2 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	Propulsion use			Generator use	
		L	M	H	50Hz	60Hz
Engine Speed	rpm	1500	1400	1350	1500	1200
No. of Cylinders		16				
Bore	mm (in.)	170 (6.69)				
Stroke	mm (in.)	220 (8.66)				
Displacement	liter (in. <sup>3</sup> )	79.9 (4876)				
Brake Horse power without Fan	HP (kW)	2527 (1885)	2145 (1600)	1944 (1450)	2627 (1960)	2102 (1568)
Brake Mean Effective Pressure	kgf/cm <sup>2</sup> (MPa)	19.2 (1.88)	17.5 (1.72)	16.4 (1.61)	20.0 (1.96)	20.0 (1.96)
without Fan	(psi)	(273)	(249)	(233)	(284)	(284)
Mean Piston Speed	m/s (ft/min)	11.0 (2165)	10.3 (2028)	9.9 (1949)	11.0 (2165)	8.8 (1732)
Maximum Regenerative Power	HP	204	190	183	204	163
Absorption Capacity without Fan	(kW)	(152)	(142)	(137)	(152)	(121)
Intake Air flow	m <sup>3</sup> /min (CFM)	168 (5932)	142 (5014)	127 (4484)	172 (6073)	134 (4732)
Exhaust Gas Flow	m <sup>3</sup> /min (CFM)	444 (15678)	376 (13277)	336 (11864)	454 (16031)	355 (12535)
Coolant Flow	liter/min (U.S. GPM)	1650 (436)	1540 (407)	1460 (386)	1650 (436)	1300 (343)
Coolant Flow to Aircooler (Max. Flow: 1340L/min)	liter/min (U.S. GPM)	810 (214)	810 (214)	810 (214)	890 (235)	680 (180)
Coolant(Jacket water) Pressure (water pump outlet)	kgf/cm <sup>2</sup> (MPa) (psi)	1.4 (0.14) (20)	1.25 (0.12) (18)	1.15 (0.11) (16)	1.4 (0.14) (20)	0.9 (0.09) (13)
Oil Flow	kJ/hr (BTU/min)	566 (149)	528 (139)	509 (134)	566 (149)	453 (120)
Radiated Heat to Ambient	kcal/hr (kJ/hr) (BTU/min)	127155 (532276) (8410)	107573 (450305) (7115)	96241 (402869) (6365)	130091 (544567) (8604)	101575 (425197) (6718)
Heat Rejection to Coolant	kcal/hr (kJ/hr) (BTU/min)	635776 (2661387) (42049)	537866 (2251531) (35574)	481204 (2014341) (31826)	650455 (2722834) (43020)	507873 (2125979) (33590)
Heat Rejection to Air Cooler	kcal/hr (kJ/hr) (BTU/min)	432328 (1809744) (28594)	365749 (1531042) (24190)	327219 (1369753) (21642)	442309 (1851525) (29254)	345354 (1445667) (22841)
Heat Rejection to Exhaust	kcal/hr (kJ/hr) (BTU/min)	1422466 (5954506) (94080)	1198857 (5018469) (79291)	1056607 (4423004) (69883)	1428242 (5978685) (94462)	1082804 (4532666) (71615)
Cooling system	Direct Sea Water Cooling	N/A				
	Max. sea water temp. at inter cooler inlet	N/A				
	Intermediate Fresh Water Cooling	Max. 38°C				
	Max. fresh water temp. at inter cooler inlet	(When sea water temp. 32°C)				
Radiator Cooling		N/A	N/A	N/A	Max. 45°C	
	Max. coolant temp. at inter cooler inlet	(When air temp. 25°C)				
Noise Level (1 m height & distance) (excludes, Intake, Exhaust & Fan)	dB(A)	-	-	-	-	-
Maximum No Load Governed Speed	rpm	1613	1505	1451	1575	1260

The specifications are subject to change without notice.

APPLICATION : MARINE

Pub. No. T0221-0004E Rev.2 4/4



**MITSUBISHI DIESEL ENGINE  
TECHNICAL INFORMATION**

ITEM NO.

T0307-0032E (1/2)

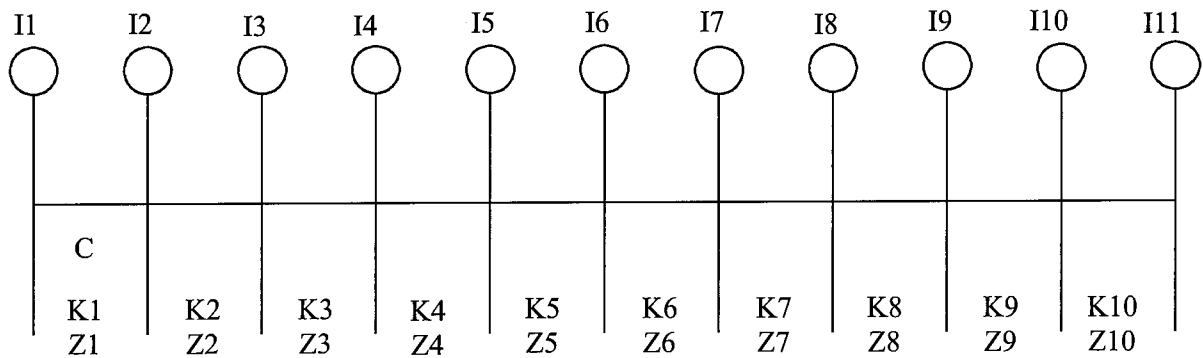
DATE

May, 2013

Elastic data of S16R2-M Engine

Elastic data of S16R2-M Engine are enclosed herein.

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

**S16R2-M ELASTIC DATA**

	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 ×3pcs	3.030	C=1617	K1=0.0	0.0	Z1 =0.0
I2	PULLEY	2.799	—	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

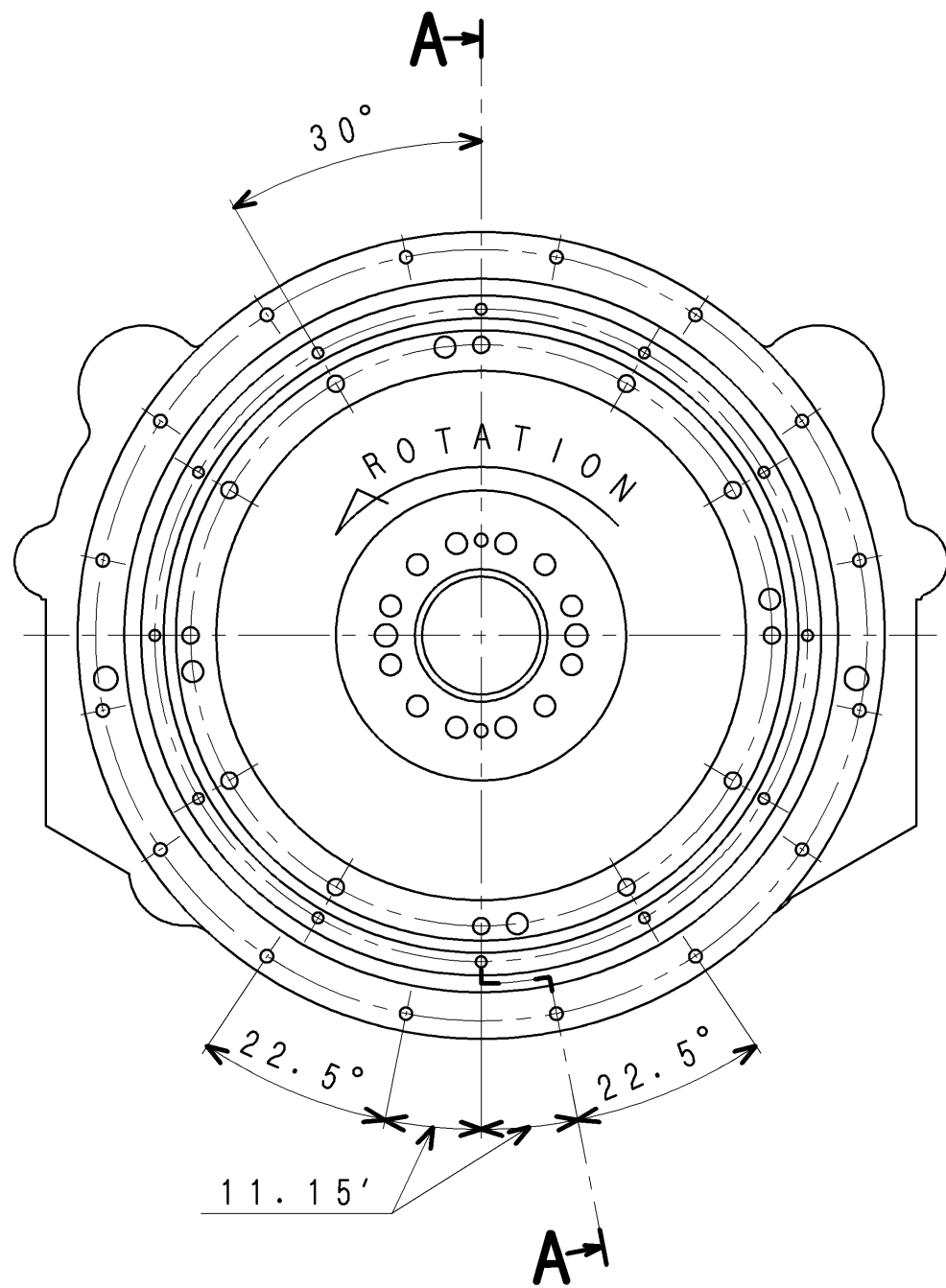
Length of Con-Rod: 400mm Weight of Reciprocating Parts: 12.71 kg

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 : MARINE USE

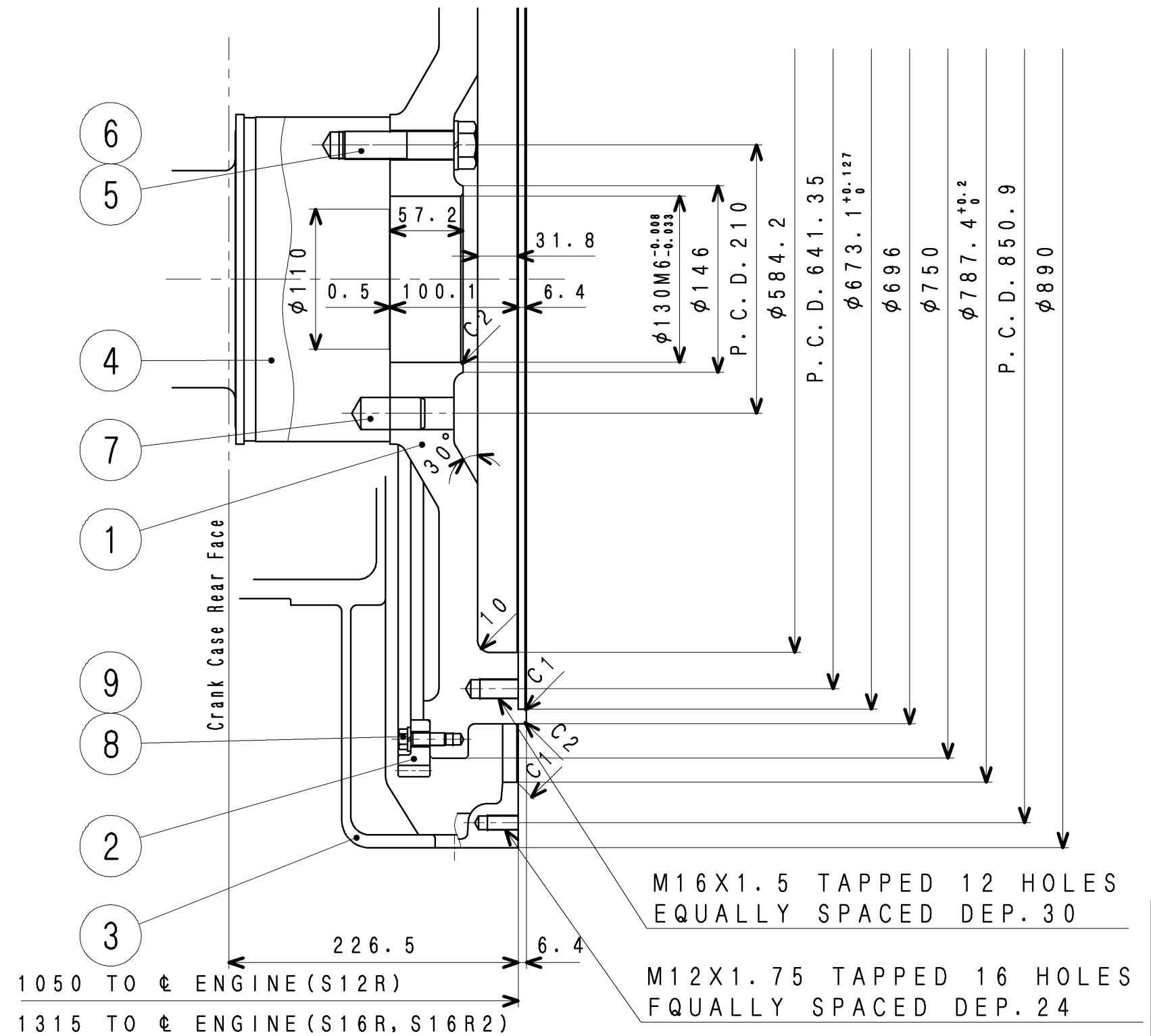
The data is subject to change without notice.



(2) Flywheel SAE (J620d) Standard No. 21

Note: (1) Flywheel Housing SAE (J617c) Standard No. 00

9	SPRING WASHER	12
8	RING GEAR BOLT	12
7	DOWEL PIN	2
6	WASHER	12
5	FLYWHEEL BOLT	12
4	CRANK SHAFT	1
3	FLYWHEEL HOUSING	1
2	RING GEAR	1
1	FLYWHEEL	1
No.	PARTS NAME	Q'TY



SECTION A-A

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MODEL	CHG	ED-NO	DATE	CHK
S12R				
S16R				
S16R2				

3rd ANGLE PROJECTION	
尺度 SCALE	

FLYWHEEL & HOUSING FOR SR-V

三菱重工業株式会社 汎用機・特車事業本部  
GENERAL MACHINERY & SPECIAL VEHICLE HEADQUARTERS, MITSUBISHI HEAVY INDUSTRIES, LTD.

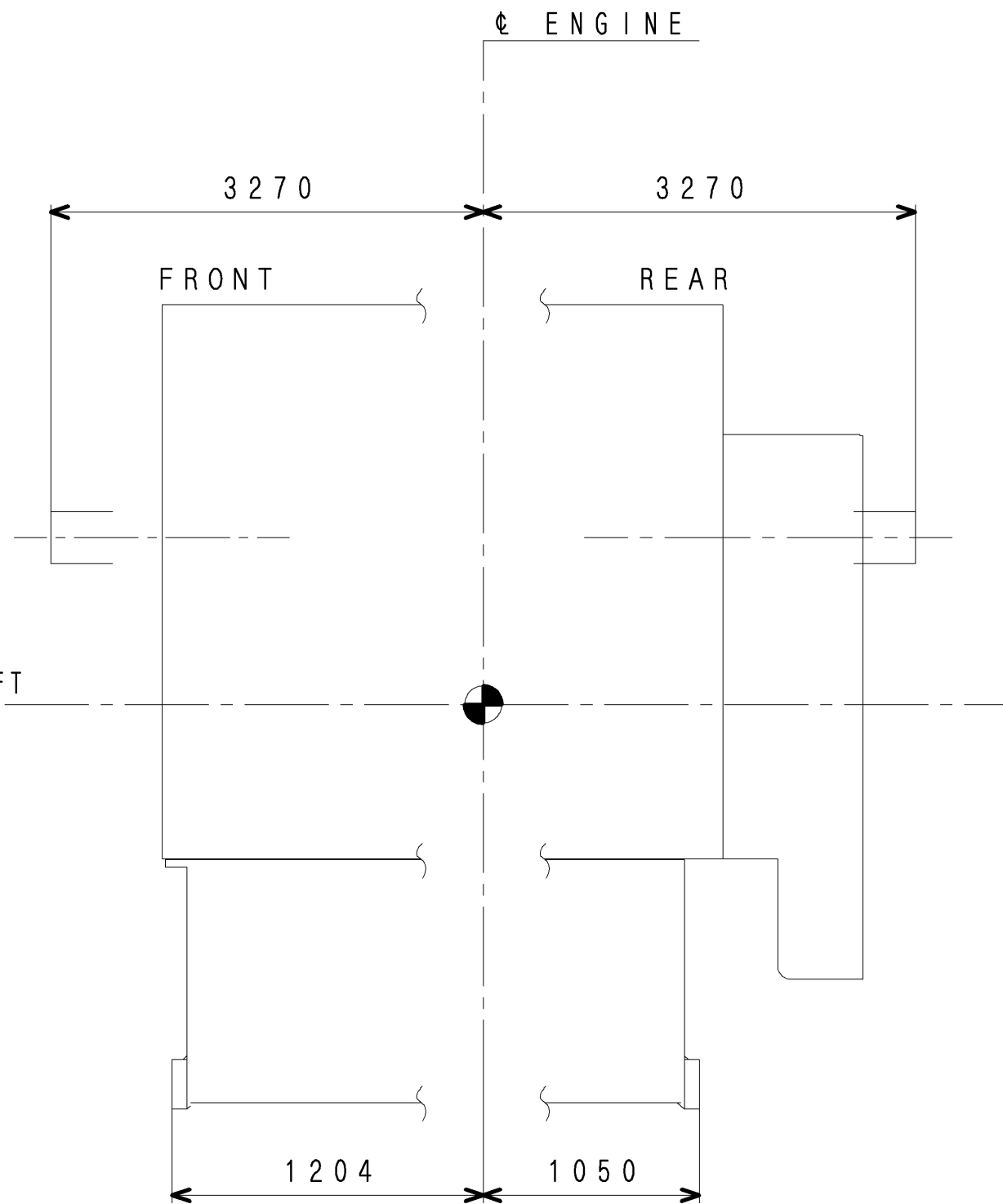
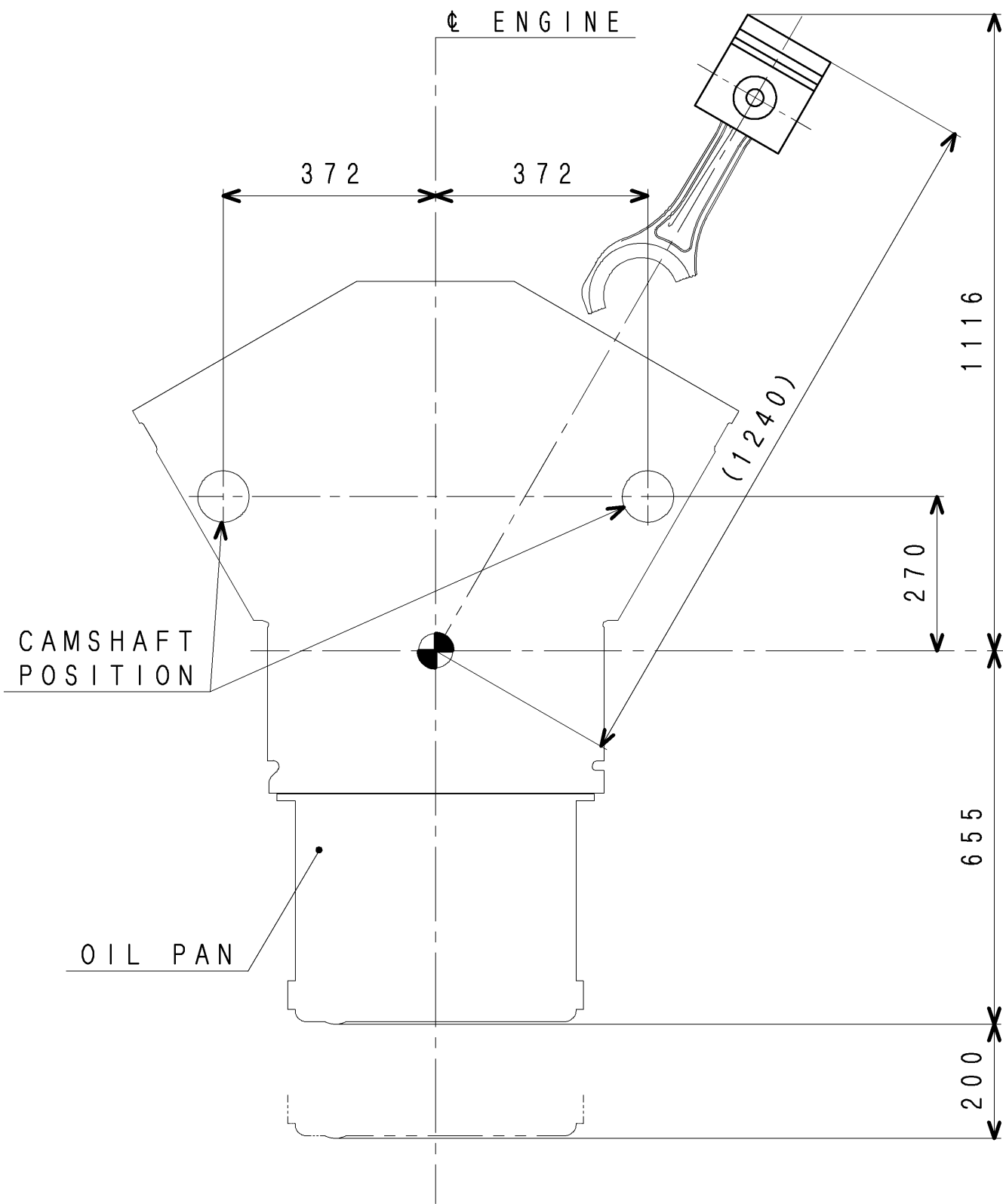
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DRAWING No.

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出図  
汎特  
2013  
5.23

M/C





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△				 3rd ANGLE PROJECTION 尺度 SCALE
△				
△				
△				
CHG	ED-NO	DATE	CHK	

MEASURE OF OVERHAUL FOR S16R2

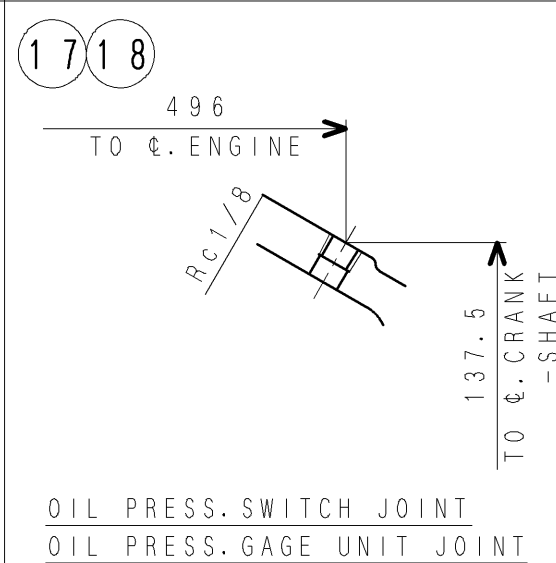
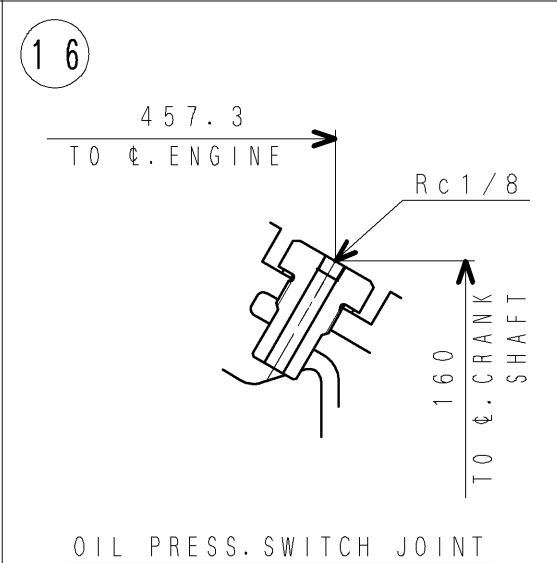
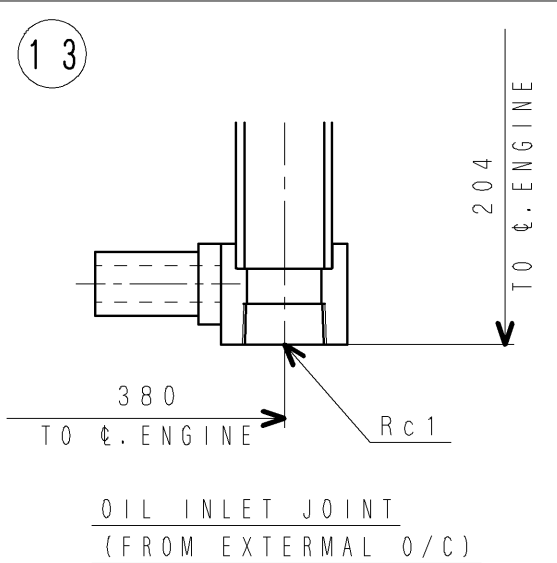
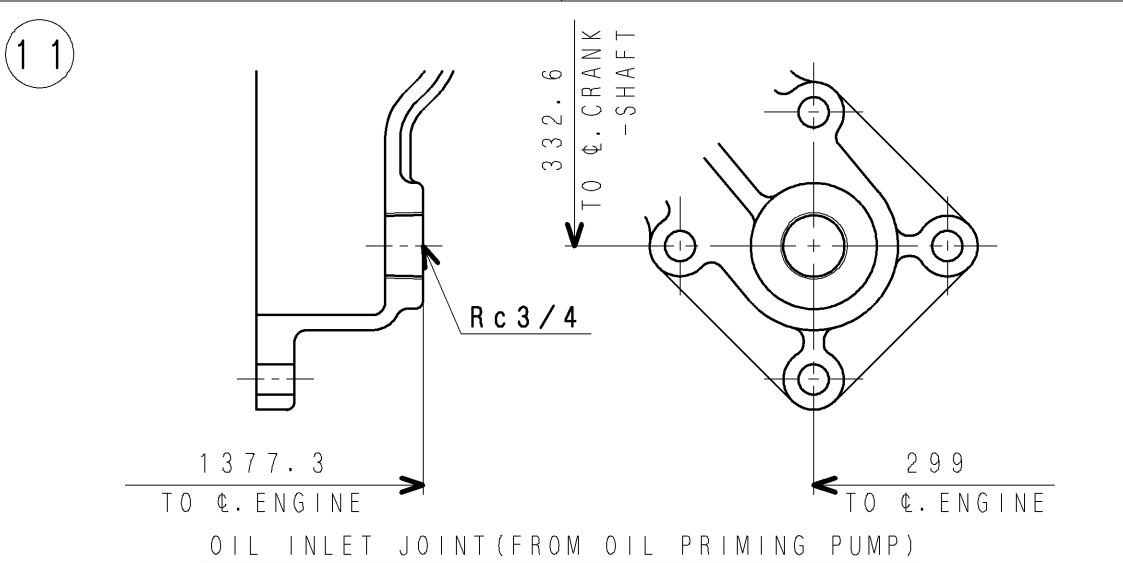
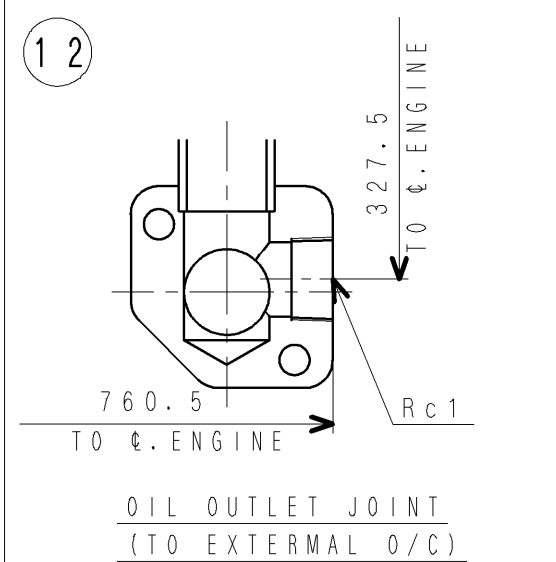
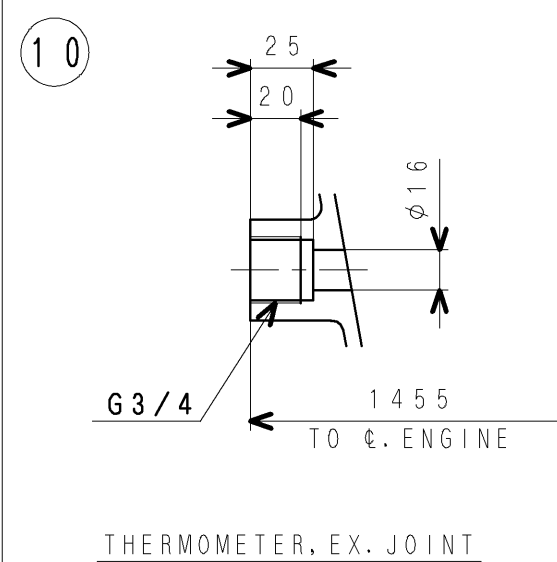
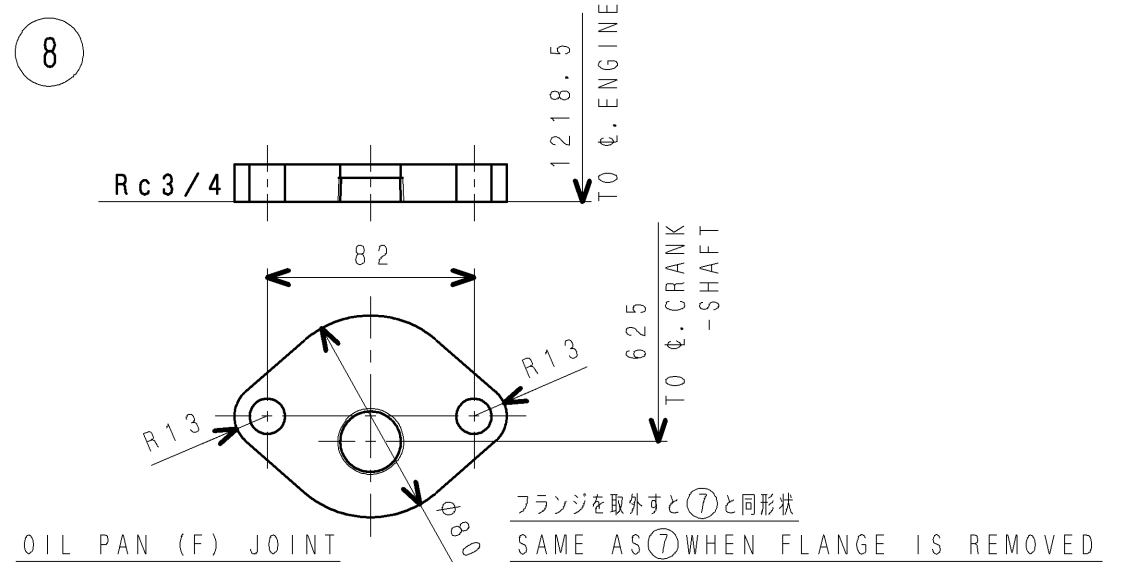
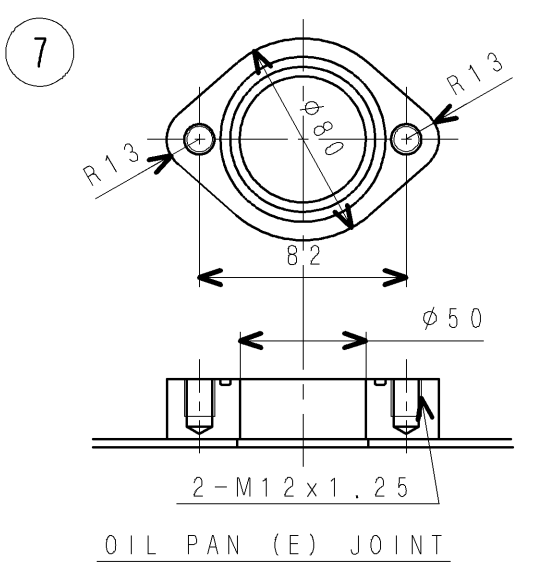
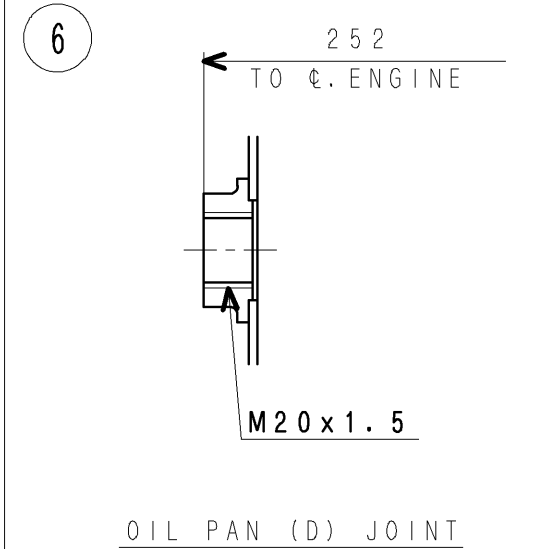
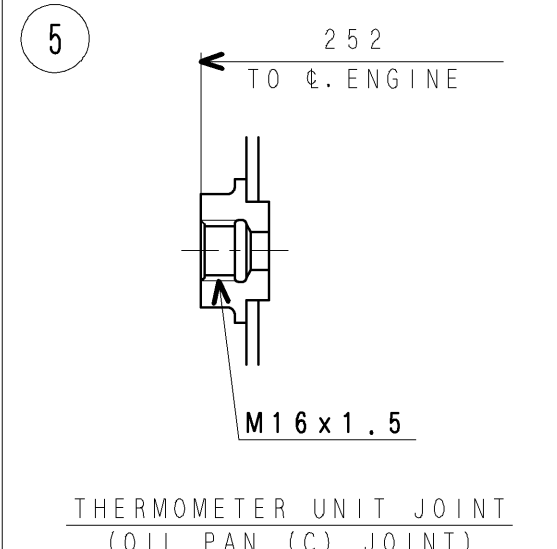
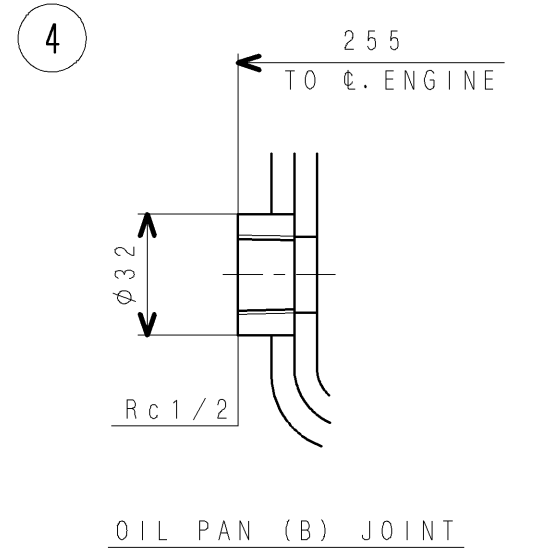
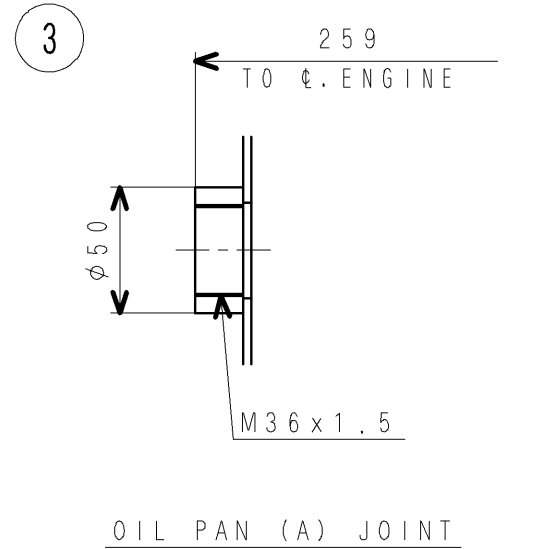
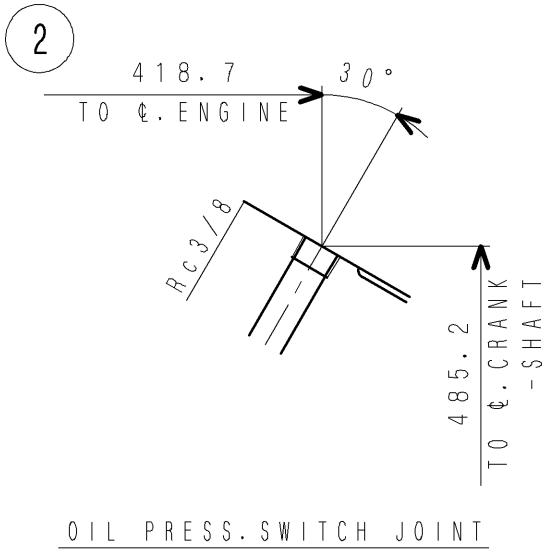
三菱重工業株式会社 汎用機・特車事業本部  
MITSUBISHI HEAVY INDUSTRIES, LTD. GENERAL MACHINERY & SPECIAL VEHICLES.

図面番号 45R96-09053  
DRAWING No.

- ③ 新図    サイズ A 3    ① 組立図    2 鋳鍛歯車品    3 板金溶接品    4 組立品
- 4 旧引図    5 切削品    6 その他(購入品)

出図  
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2013  
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NOTES (1) ALL SYMBOLS ARE INDICATED IN S16R2-(T2)M(P)TAW DIESEL ENGINE 45R00-87300.

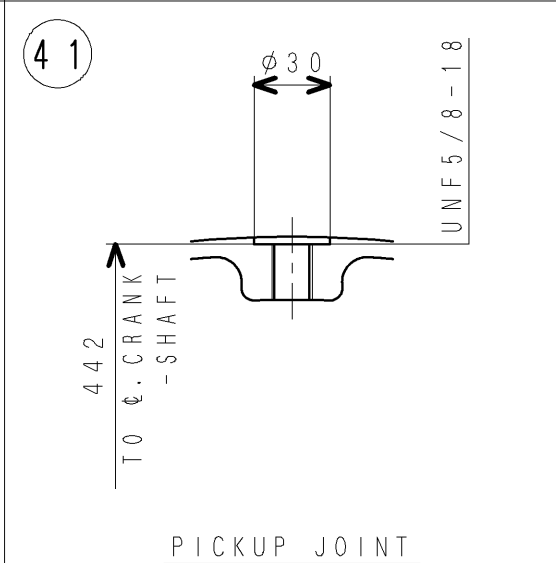
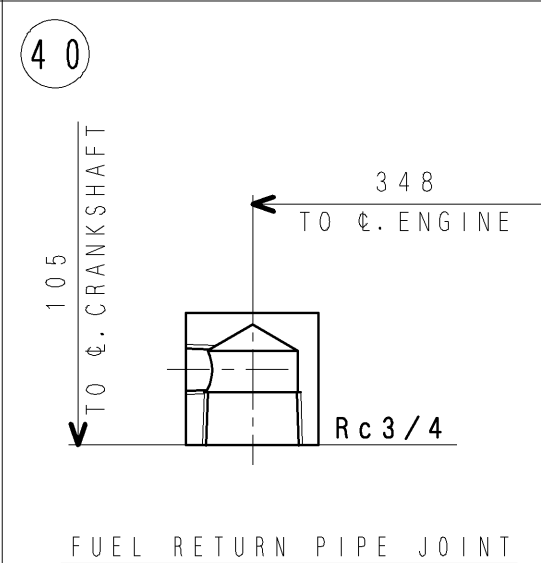
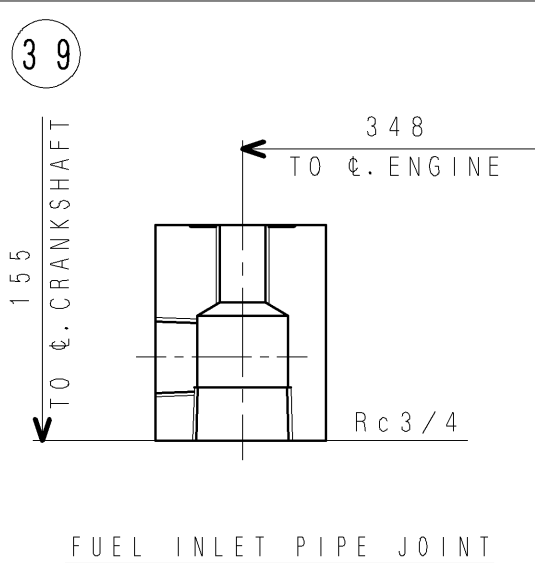
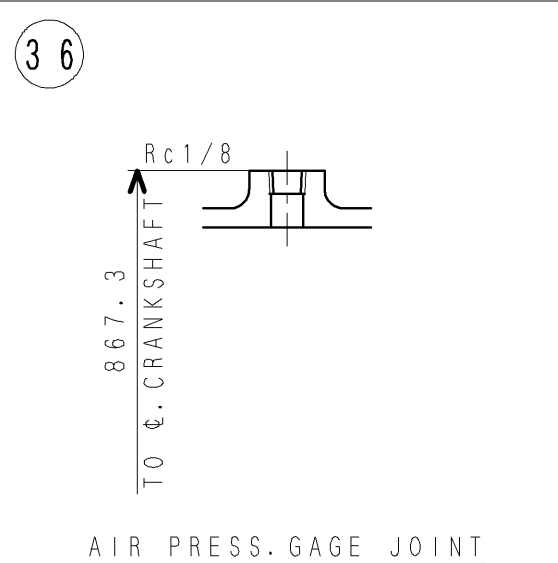
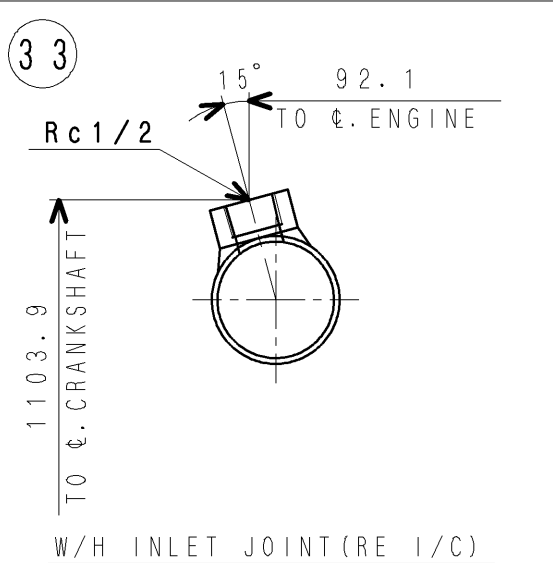
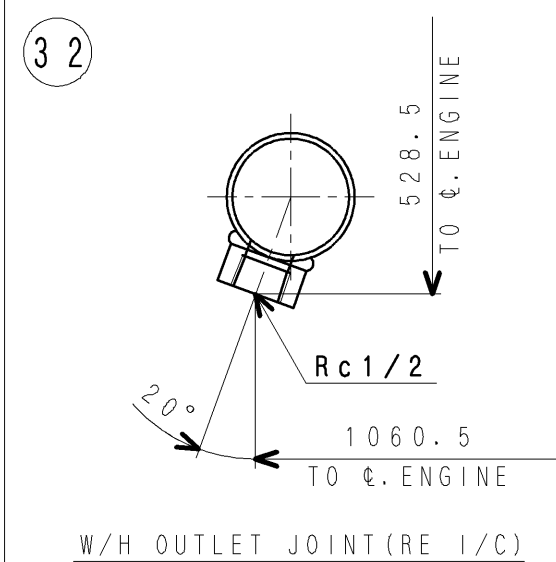
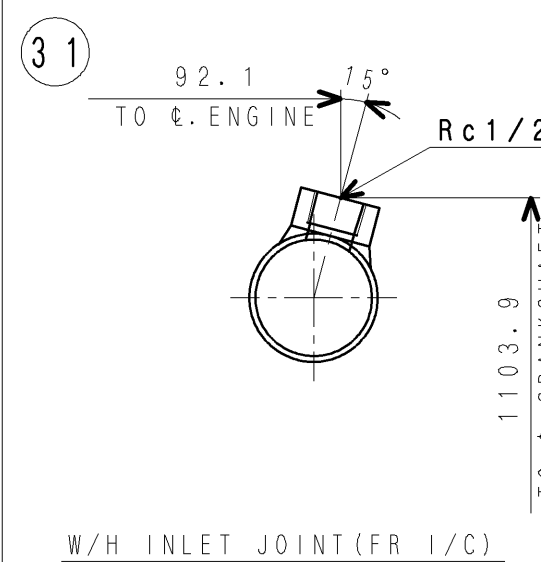
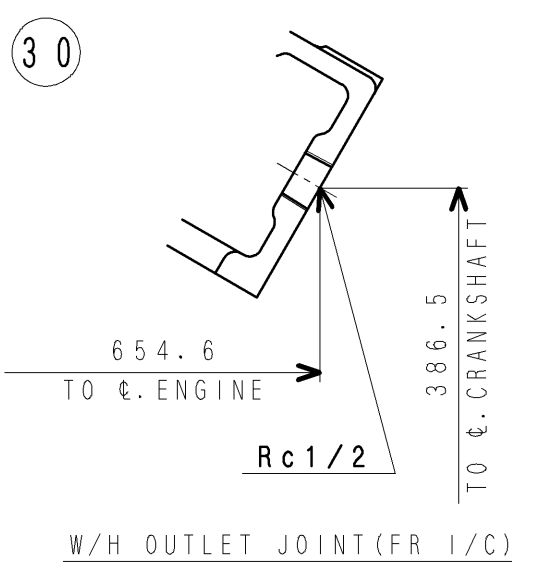
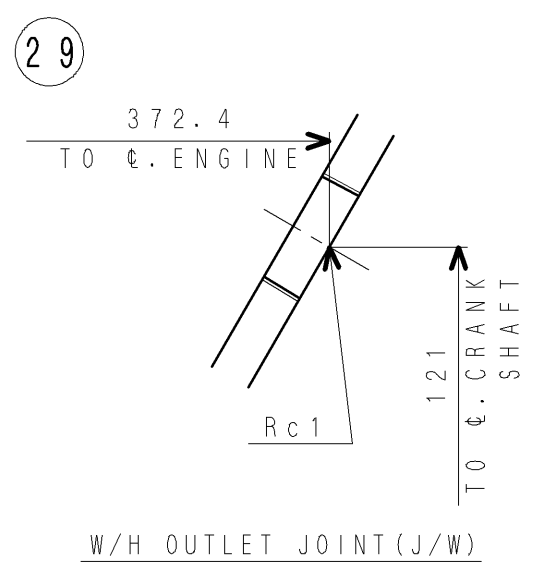
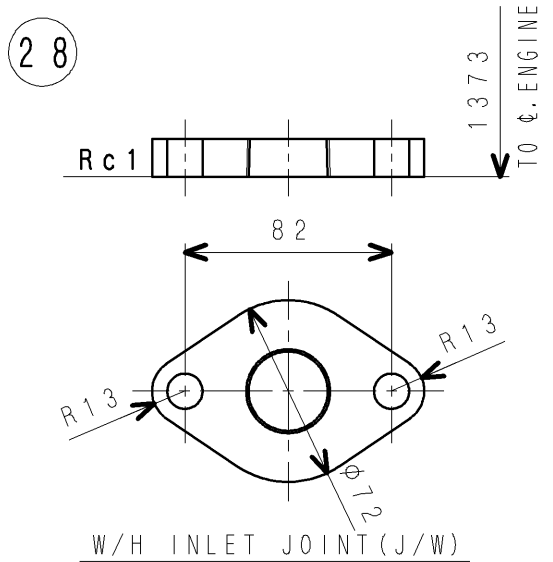
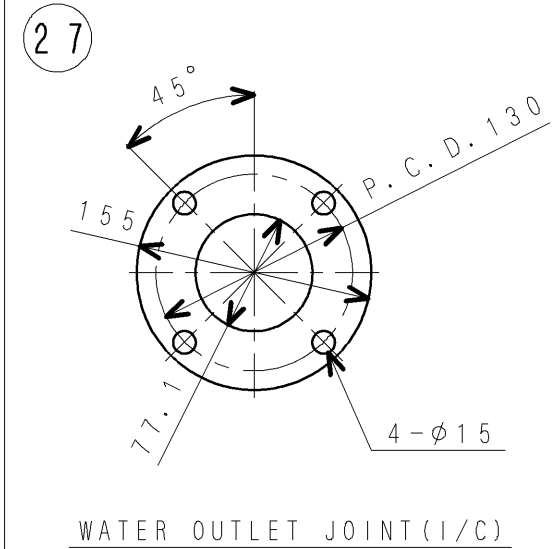
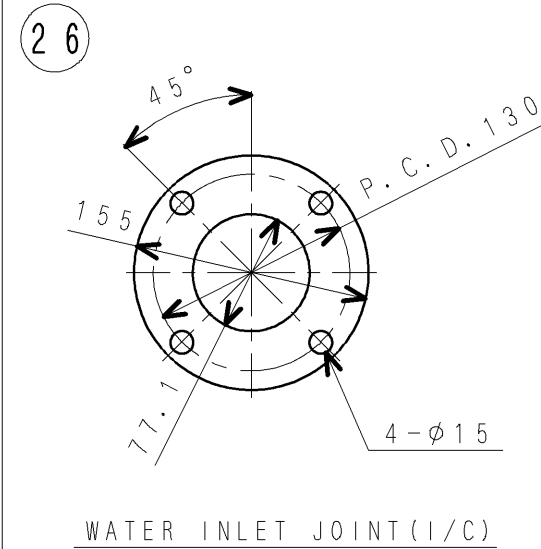
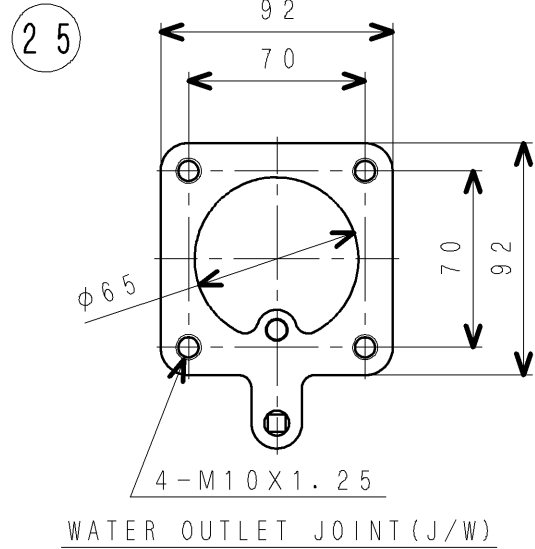
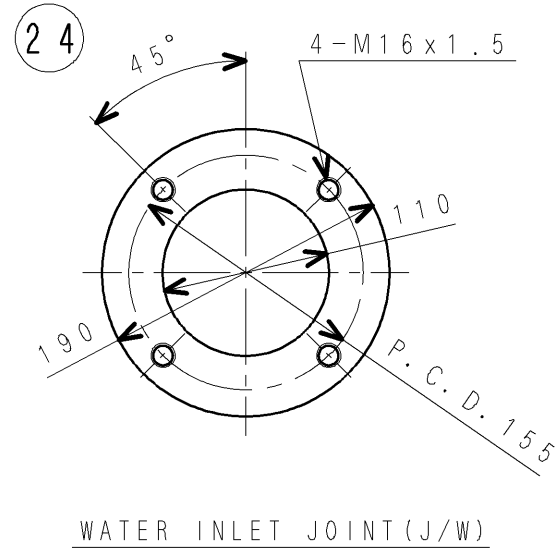
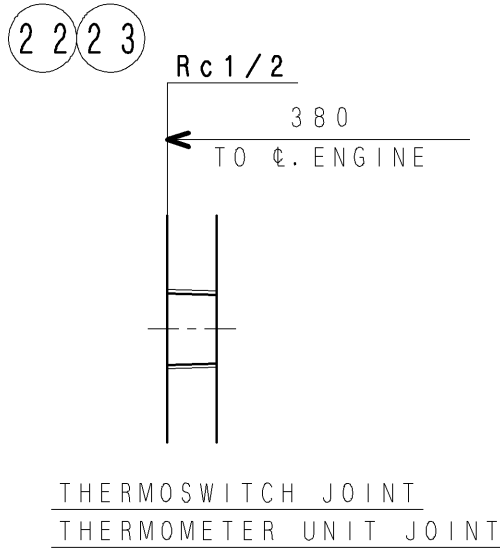
注記 (1) 各符号指示は、S16R2-(T2)M(P)TAW DIESEL ENGINE 45R00-87300による。

S16R2  
JOINT DETAIL  
三菱重工業株式会社 汎用機・特車事業本部  
MITSUBISHI HEAVY INDUSTRIES, LTD. GENERAL MACHINERY & SPECIAL VEHICLE HEADQUARTERS.  
図面番号 45R96-01065 1/2  
DRAWING No.

出図  
汎特  
2011  
7.28

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③ 新図 ④ 旧引図 ① 組立図 ② 鋳鍛歯車品 ③ 板金溶接品 ④ 組立品 ⑤ 切削品 ⑥ その他(購入品)



S16R2  
JOINT DETAIL  
三菱重工業株式会社 汎用機・特車事業本部  
MITSUBISHI HEAVY INDUSTRIES, LTD. GENERAL MACHINERY & SPECIAL VEHICLE HEADQUARTERS.  
図面番号 45R96-01065  
DRAWING No. 45R96-01065 2/2

③ 新図 ④ 組立図 ⑤ 2 鑄鍛歯車品 ⑥ 3 板金溶接品 ⑦ 4 組立品  
⑧ 4 旧引図 A 3 ⑨ 5 切削品 ⑩ 6 その他(購入品)

出図  
汎特  
2011  
7.28

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**MITSUBISHI DIESEL ENGINE  
TECHNICAL INFORMATION**

ITEM NO.

T0407-0032E (1/3)

DATE

July, 2012

Performance Curves of S16R2-T2MPTAW(50Hz, 60Hz)

Performance Curves of S16R2-T2MPTAW(50Hz, 60Hz) Engine that is satisfied with IMO-Tier 2 are enclosed herein. The data are test bench data and not a guaranteed performance.

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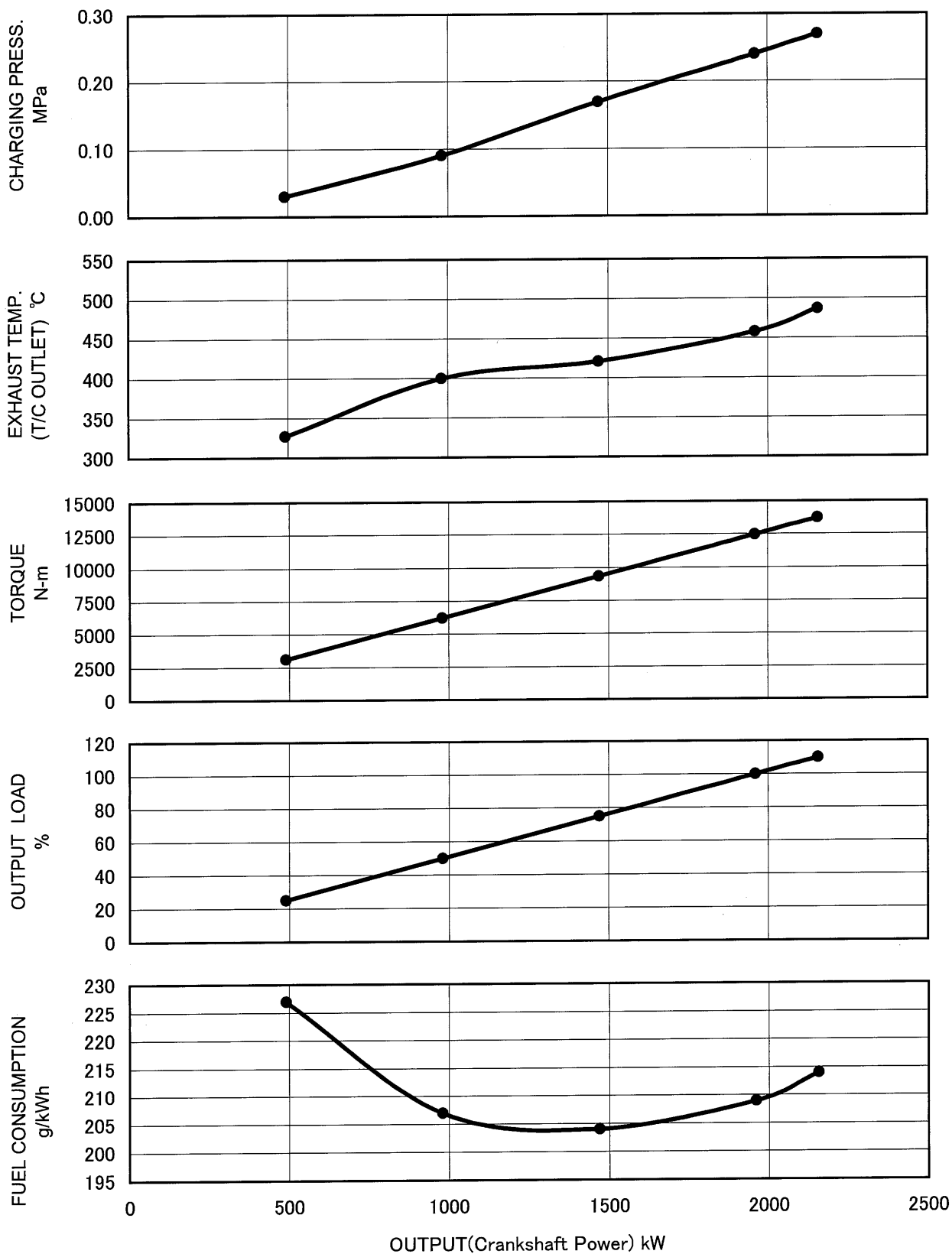
First Edition : July, 2012

Engine Engineering Department  
Engine System Designing Section

Revision

Approved by | Checked by | Drawn by

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



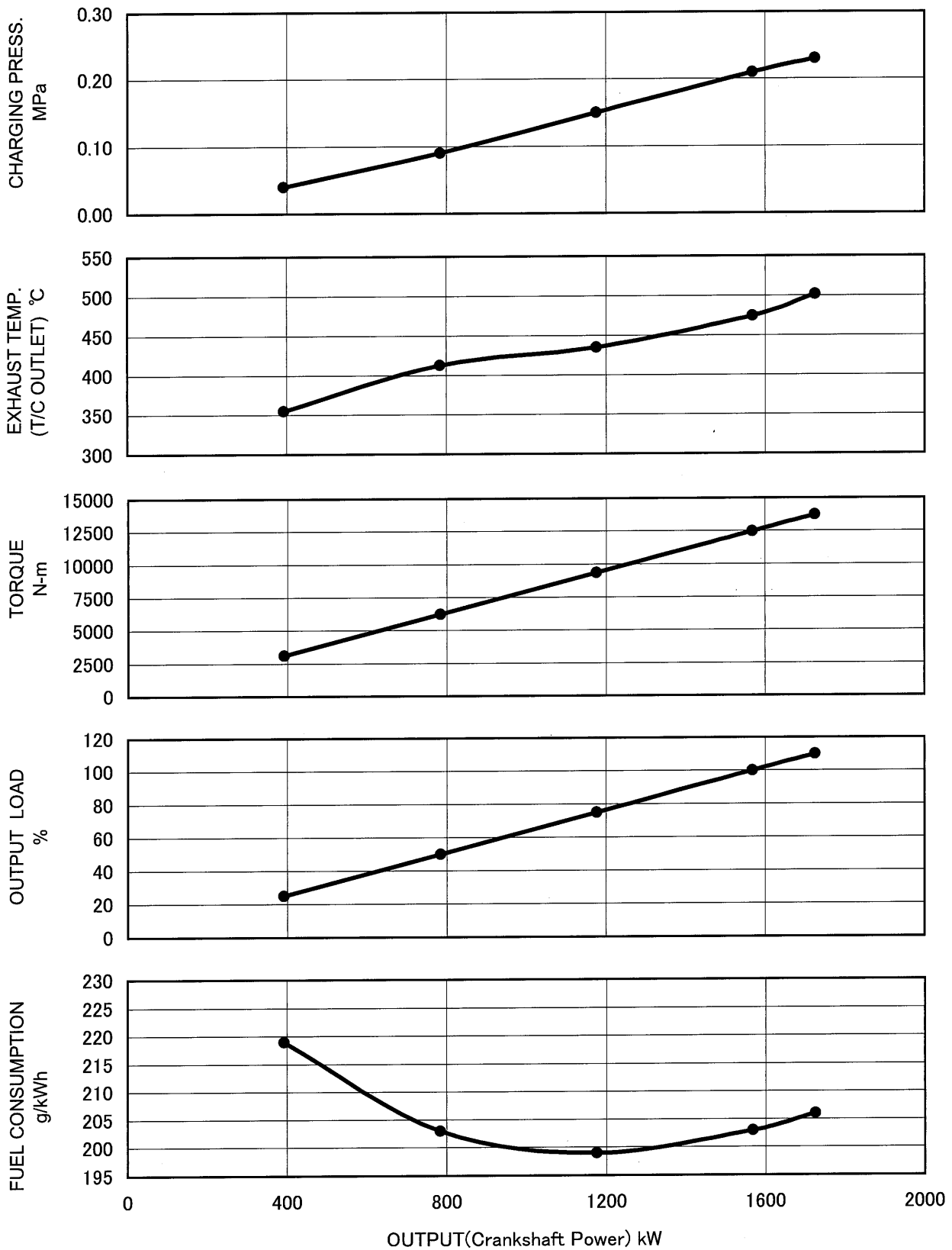
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Fuel Consumption is based on ISO3046/1 with +5% tolerance at rated power.  
The specifications are subject to change without notice.

APPLICATION : GENERATOR

Pub. No.T0407-0032E 2/3

Engine speed: 1200min<sup>-1</sup>



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APPLICATION : GENERATOR

Pub. No.T0407-0032E 3/3