

SPECIFICATIONS

MITSUBISHI HIGH SPEED DIESEL ENGINE
 MODEL MITSUBISHI S4S-Z3DT61SD △

EU EMISSION CONTROL ENGINE (STAGE 3A)

APPLICATION
FOR APPROVAL



PLEASE RETURN AFTER APPROVAL

APPROVED		REMARKS		
DATE • SIGNATURE				
DATE Oct. 19. 2009 MITSUBISHI HEAVY INDUSTRIES, LTD.				
CHG	DATE	APPROVED	CHECKED	DRAWN
△	Jul. 16. 2012	<i>R. Nagase</i>	<i>K. Taketani</i>	A. IZAKA
△	Nov. 30. 2010		<i>K. Sawazaki</i>	

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1. Principal Particulars of Diesel Engine

General Specification

Standard	All items, unless otherwise specified, are in accordance with JIS and maker's standards
△ Model	Mitsubishi S4S-Z3DT61SD
△△	MHI No. 32A00-07311 1/2-CHG0,2/2-CHG0
△ Regulations	97/68/EC Stage3A certified engine family S4S-DTDG3A (engine type ; S4S-DT DG 36kW-A1) 97/68/EC as last amended by 2010/26/EC
Type	4 cycle water-cooled, vertical overhead valve, cylinder in line, direct injection type
Number of cylinders	4
Bore × Stroke	94mm × 120mm
Piston displacement	3.331 liters
Compression ratio	19.5 : 1
Rotation	Anti-Clockwise rotation as viewed from flywheel side
Firing order	1-3-4-2
Engine weight(Dry)	Approx. 255kgf
Dimensions(Length)	Approx. 780mm
(Width)	Approx. 602mm
(Height)	Approx. 821mm
Inclination(Continuous)	15°
(Temporary)	25°
Fuel	ASTM diesel fuel oil No.2-D(JIS K2204 gas oil specification No.2 or 3)
Lubricating oil	API classification service CF, CF-4 or CH-4 class
Output(Without fan)	Prime ; 36.0kW{49.0PS}/1500rpm (With Fan Prime ; 35.3kW{48.0PS}/1500rpm) Out Put Tolerance ; ±5%
△ Idling engine speed	Max 1598rpm (Governor lever is fixed)
Speed regulation	Steady state speed regulation at rated speed, within 6.5%
Rating conditions(Without fan)	ISO 15550 Total barometric pressure : 100kPa Air temperature : 298K Relative humidity : 30%
Fuel consumption(Without fan)	Approx. 245g/kW-h {180g/PS · h} at Prime output and standard air conditions
△ Oil consumption	Approx. 0.1 ~ 0.3% of fuel consumption <reference value> @ Full load rated speed
Fuel injection timing	4°BTDC
Mean effective pressure	0.86MPa{8.8kgf/cm ² } at Prime(Without fan)
Piston speed	6.0m/s at 1500rpm

Fuel system

Fuel injection pump	In-Line type
Fuel injection nozzle	Multi-Hole type
Governor	Mechanical centrifugal type
Fuel filter	Filtering paper type
△ Fuel pump	Yes(Built in injection pump)

Lubricating system

Lubricating system	Forced lubrication by trochoid gear pump
Lubricating oil filter	Filtering paper type, full flow
Oil pressure	0.19~0.39MPa (2~4kgf/cm ²) at duty run 0.1MPa (1.0kgf/cm ²) min. at low idling
Oil capacity	Approx. 10.0 liters (Oil pan high level 9.0 liters, Oil filter etc.) Approx. 1.0 liters, High ~ Low Approx. 3.0 liters)
Oil dipstick	Standard dipstick
Oil pressure switch	Yes
Oil pressure unit	No
△ Oil cooler	Plate type

Cooling system

Cooling system	Forced circulation of fresh water by centrifugal pump with thermostat
Engine water capacity	Approx. 5.5 liters
Cooling fan	Yes; 440mm diameter, pusher
Water pump pulley	PCD 116mm
Pulley ratio	1.38 (Crankpulley : Water pump pulley = 160 : 116)
Fan spacer	22mm thickness
Water temp. switch	Yes
Water temp. sensor	Yes
Thermo. Unit	No
Thermostat	Open at 76.5deg.C - full open at 90deg.C

Electrical system

Alternator	12V - 75A
Voltage regulator	IC type (Built in alternator)
Regulator set voltage	14.7 ±0.3 V at Reg. temp:20°C, Na=5000rpm, I _{load} =5~10A(Batt+R)
Alternator pulley	PCD 70mm
Starting system	Electric starting
Starter motor	12V-2.2kW
△ Glow plug	11V,5.5A x 4
Air heater	11V-0.96kW

Engine shut off system	Electric solenoid (ETR)
Eng. stop solenoid (Rated)	12V
Pull coil current	46.5 A(20 deg C)
Hold coil current	1.10 A(20 deg C)

No permitted to use S-terminal(starter) in the pull coil circuit.Before closing starter circuit,stop lever must be energized to run position.
Recommendatory pull in coil timer:31A66-06100

Intake and Exhaust system

Air intake	Engine rear side of turbo charger
Exhaust outlet	Engine front side of turbo charger
Induction Resistance	Max 1.96kPa{200mmH ₂ O}
Exhaust Back Pressure	Max 4.0 kPa{410mmH ₂ O}

Turbo system

Manufacturer	Mitsubishi Heavy Industries,Ltd.
Type	TD04L

<Remarks>

Engine color	Black
Flywheel	11-1/2 inch
Flywheel housing	SAE #3

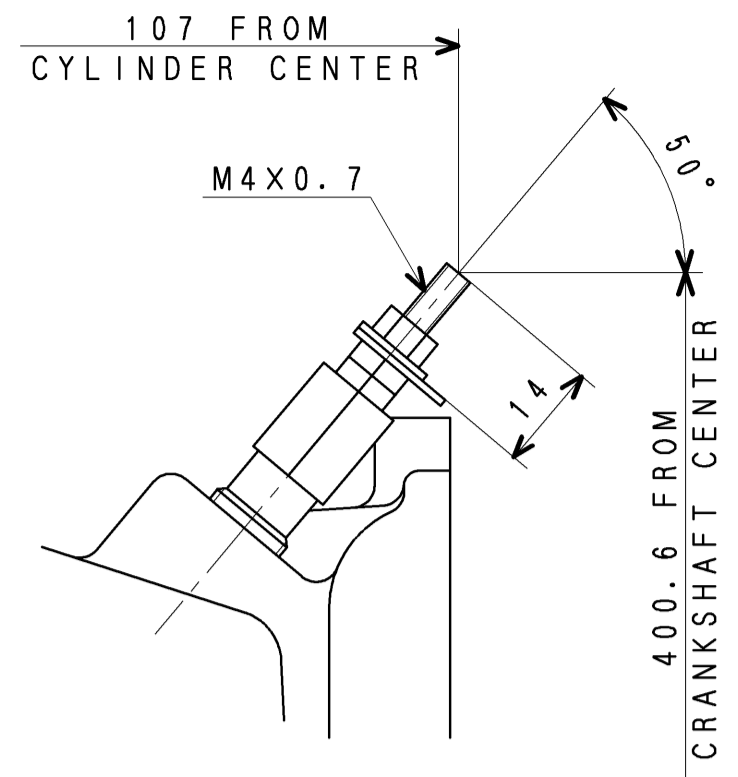
2. Engine attached items&Reference drawings

	Parts Name	Parts No.	Q'ty	Remarks	
	1 SWITCH,OIL PRESSURE	31A90-00500	1		A4
	2 SWITCH,THERMO	MC880-901	1	MC880-900(Writing together)	A4
	3 UNIT,PRESSURE GAGE	—	—		
	4 UNIT,THERMOMETER	—	—		
△	5 OIL FILTER	32A40-00400	1		A4
△	6 COOLING FAN(6P-440)	32A48-00400	1		A4
△	7 FILTER ASSY,FUEL	34462-00011	1		A4
△△	8 STARTER(12V-2.2kW)	32A66-20100	1		A4
△	9 PLUG,GLOW	32A66-07011	4		A4
△	10 ALTERNATOR(12V-75A)	32A68-16501	1		A4
	11 STOP SOLENOID	32A87-03010	1		A4
	12 SENSOR,WATER TEMP	32A90-00300	1		A4
△	13 AIR HEATER ASSY	32B66-06100	1		A4

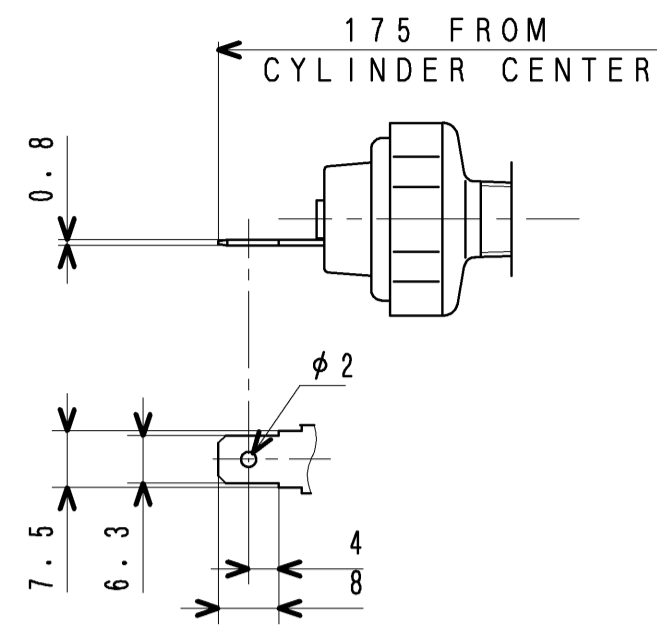
3. Accessories(Loose supply parts)

	Parts Name	Parts No.	Q'ty	Remarks	
	1 GASKET	32A32-03300	1		A4
	2 RADIATOR ASSY	32A47-06010	1	Radiator Kit 32A47-03010	A3
	3 HOSE,RUBBER	32A47-06700	1		
	4 HOSE,RUBBER	32A47-06800	1		
	5 CLAMP	05317-01700	2		
	6 CLAMP	F4300-05701	2		
	7 CUSHION	31A47-03100	4		
	8 CONTROLLER,AIR HEATER	32B66-06500	1		A4

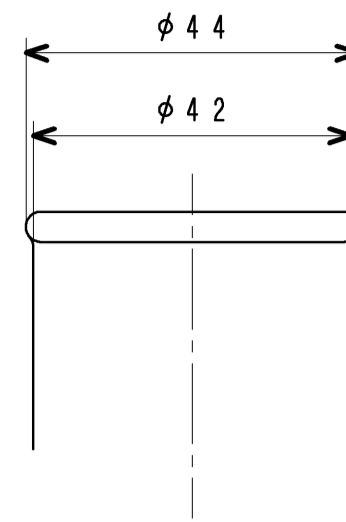
Note: Drawing No. subject to alteration without notice.



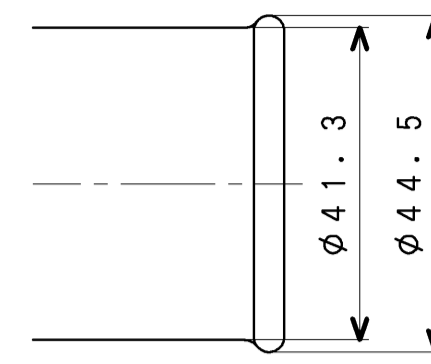
G-DETAIL



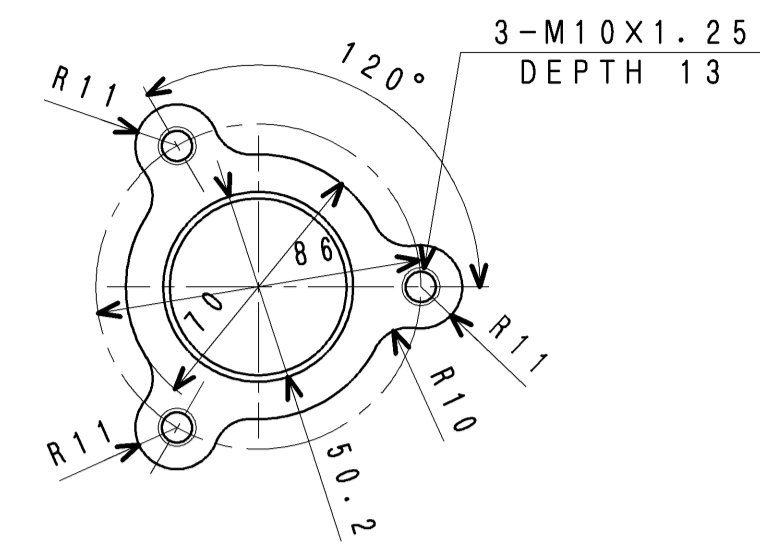
F-DETAIL



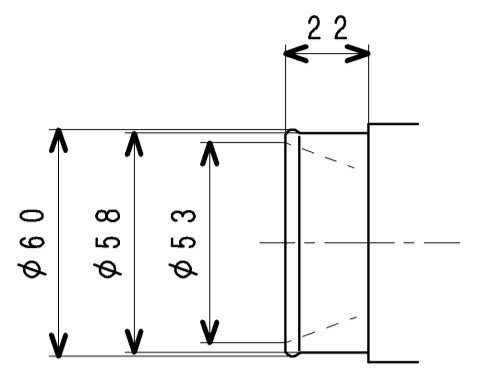
D-DETAIL



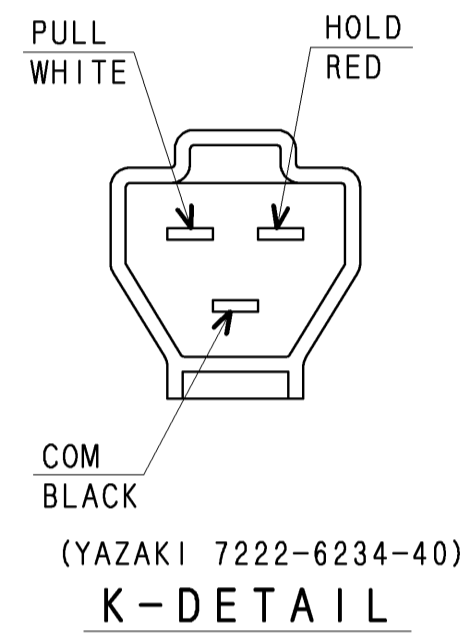
C-DETAIL



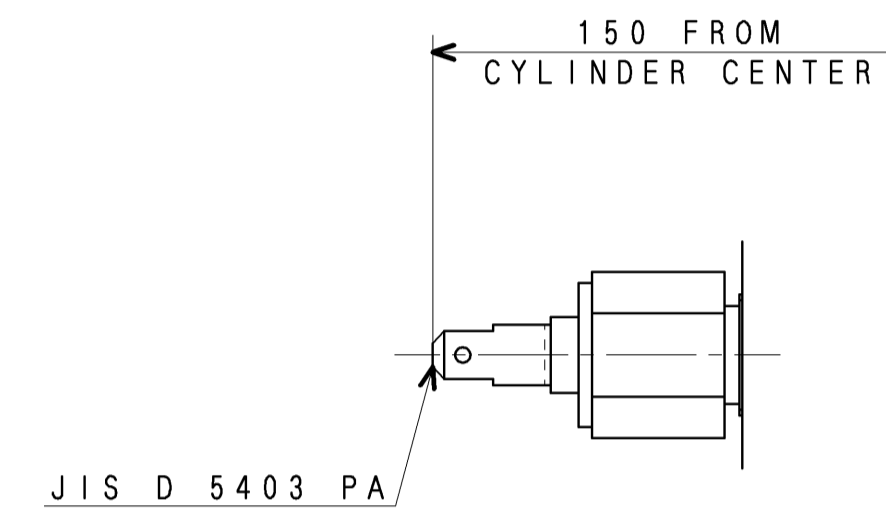
B-DETAIL (1:2)



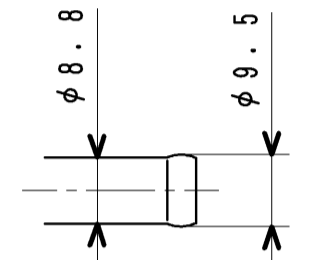
A-DETAIL (1:2)



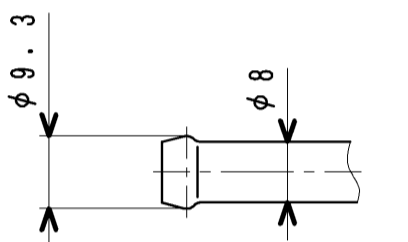
K-DETAIL



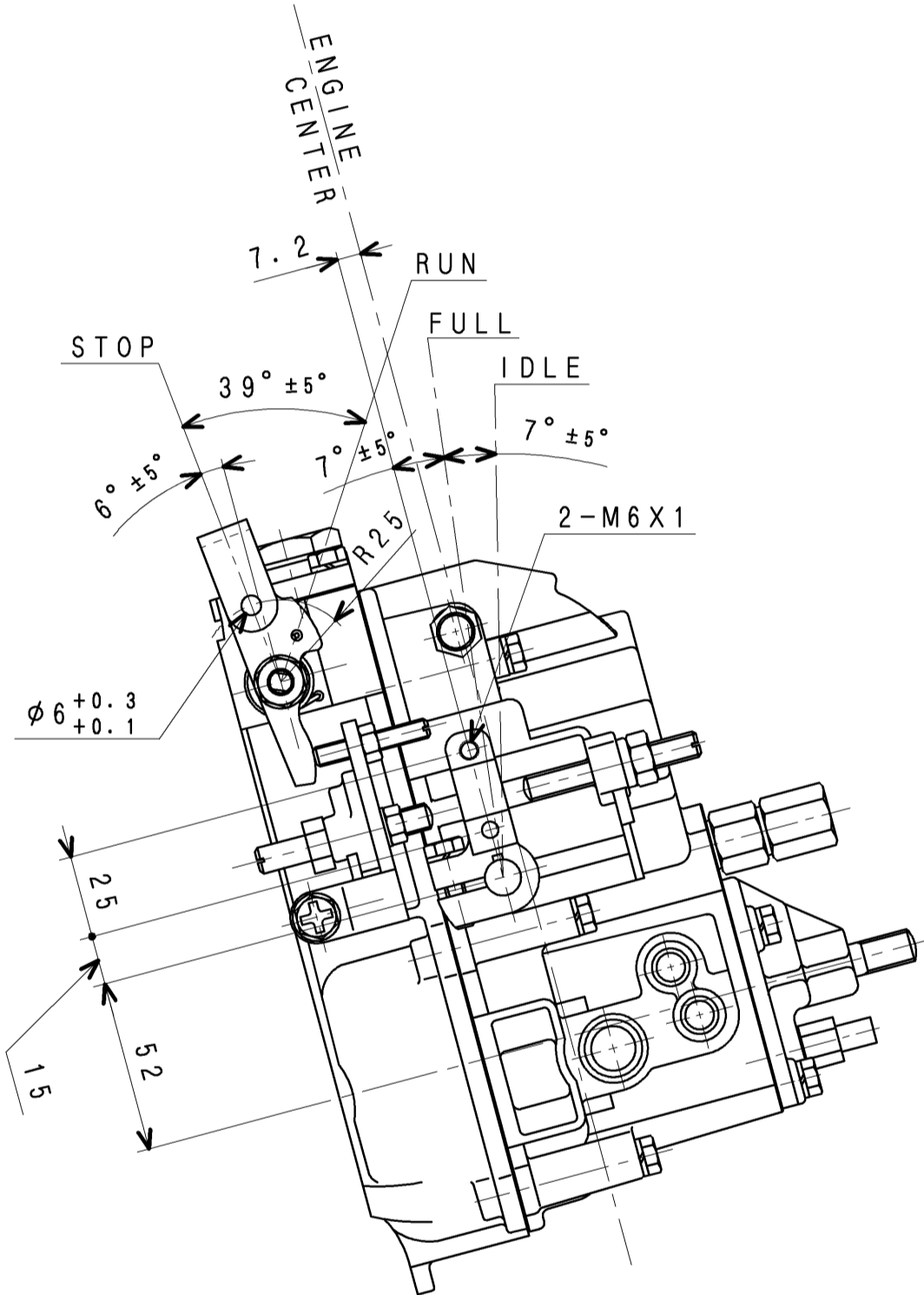
J-DETAIL



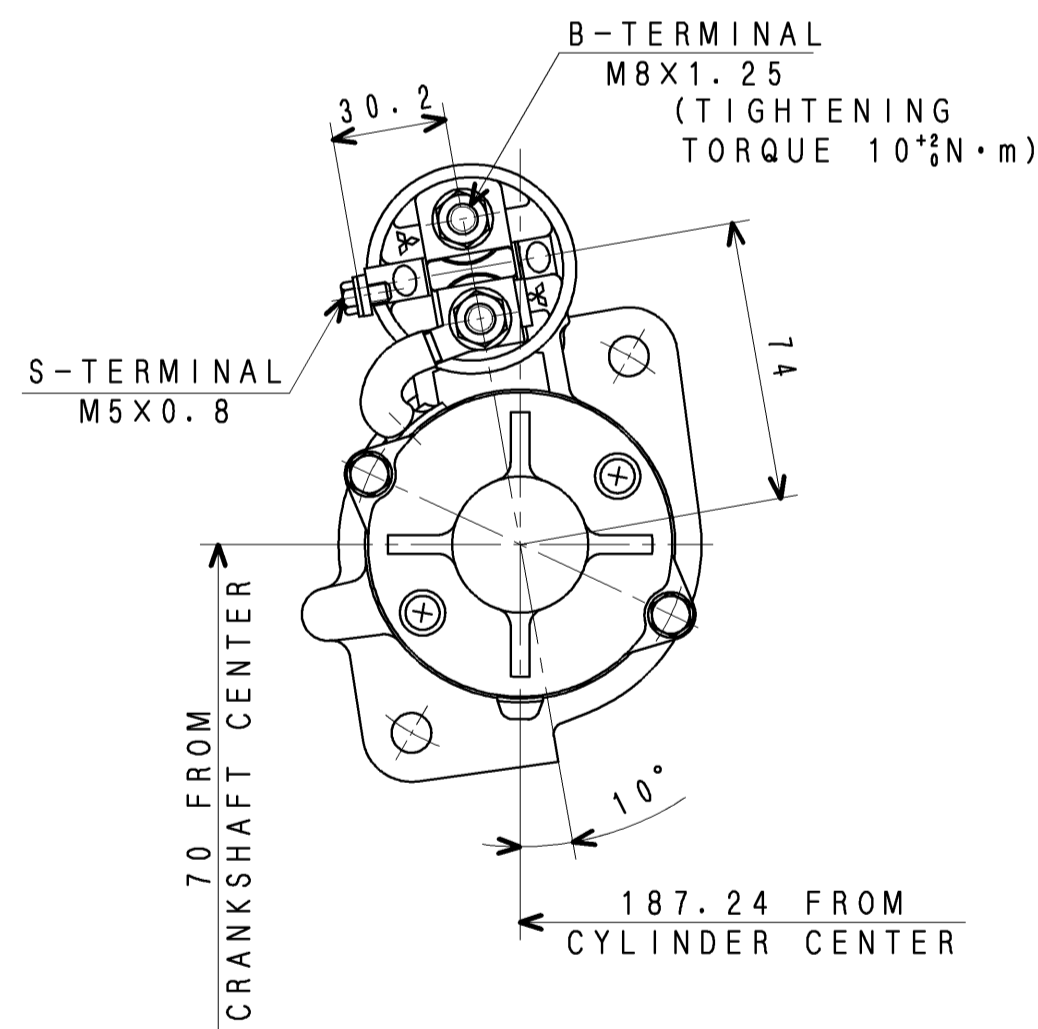
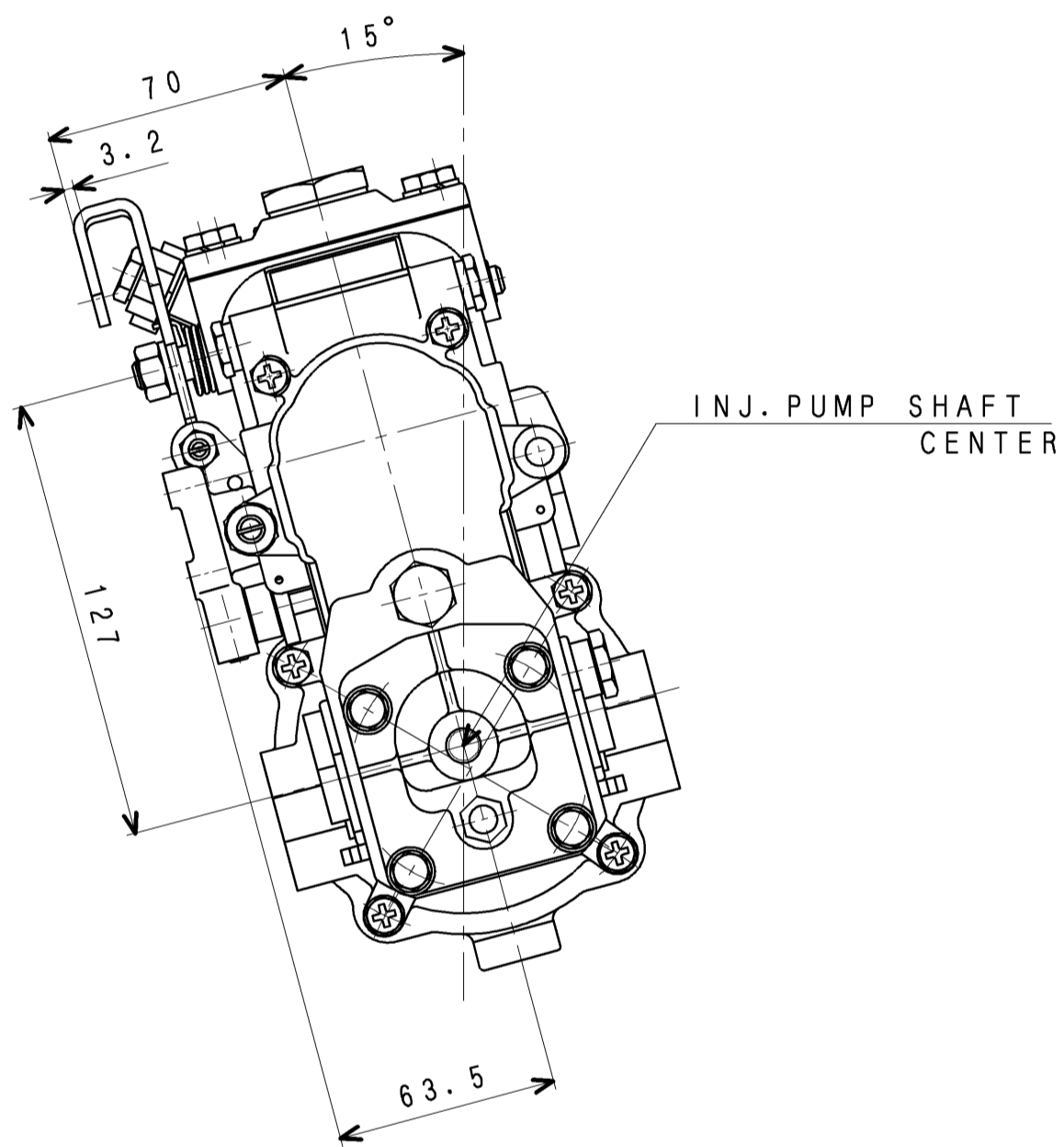
H-DETAIL



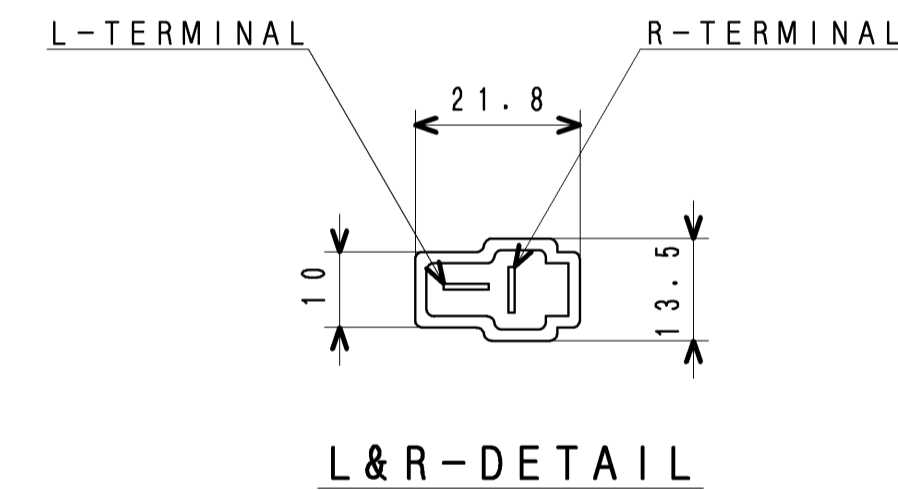
N-DETAIL



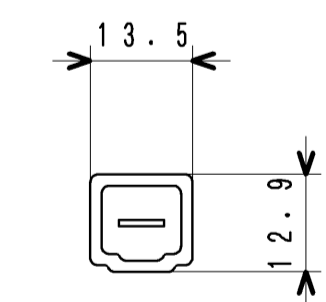
W-VIEW (1:2)



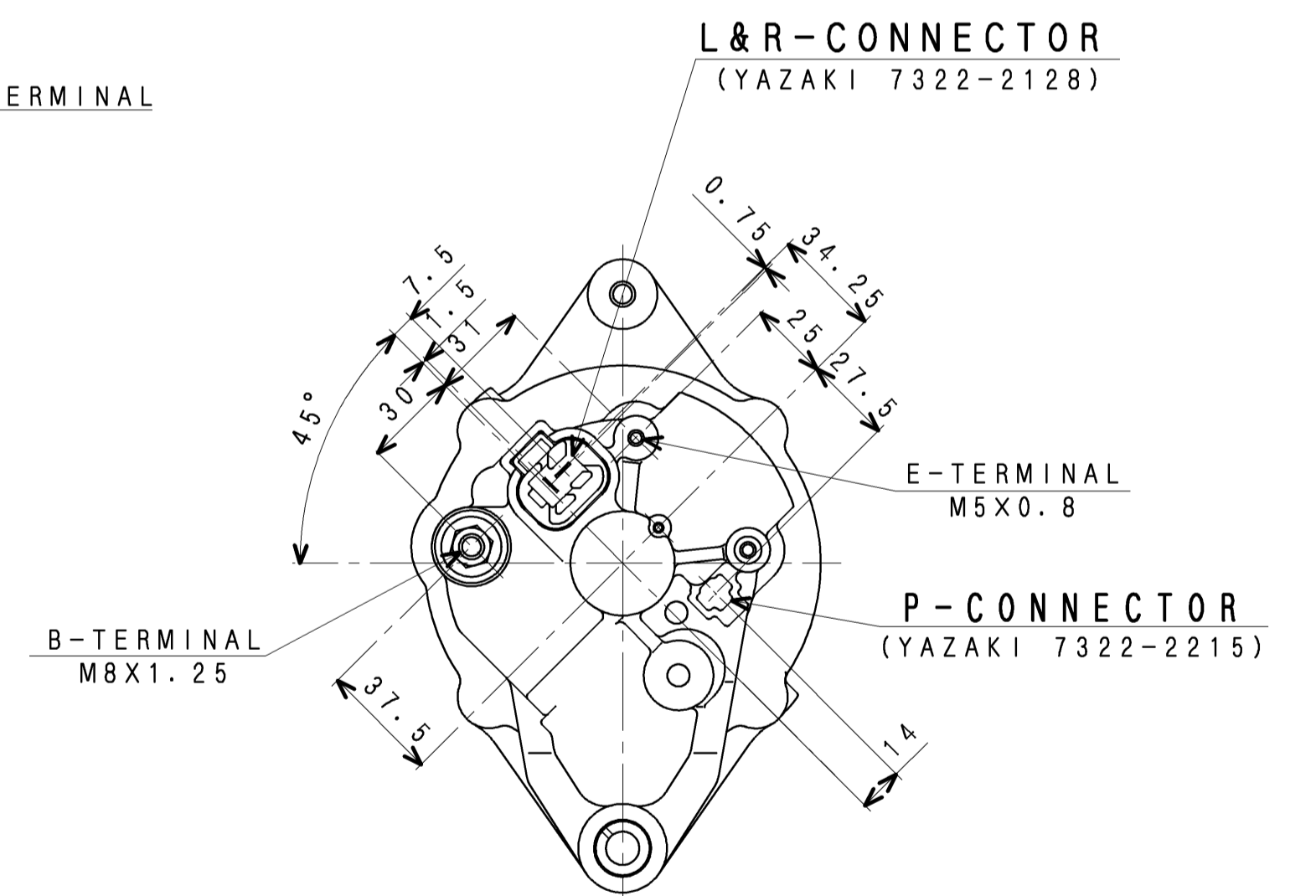
Y-VIEW (1:2)



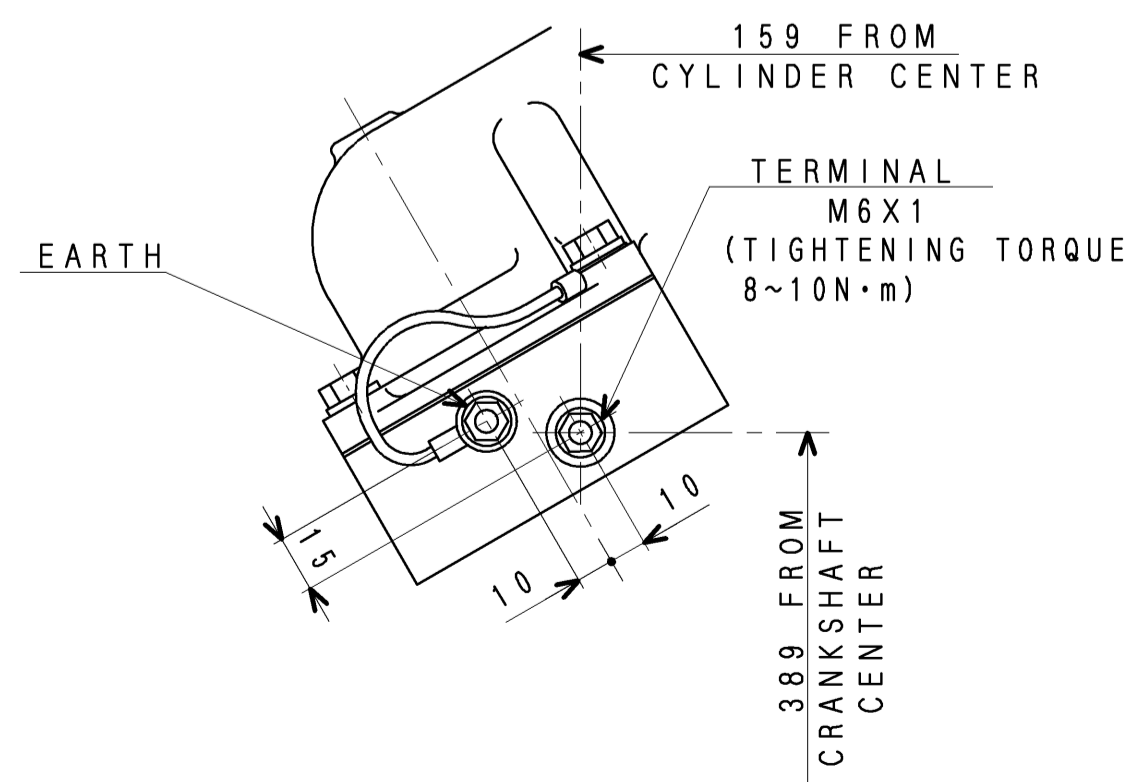
L&R-DETAIL



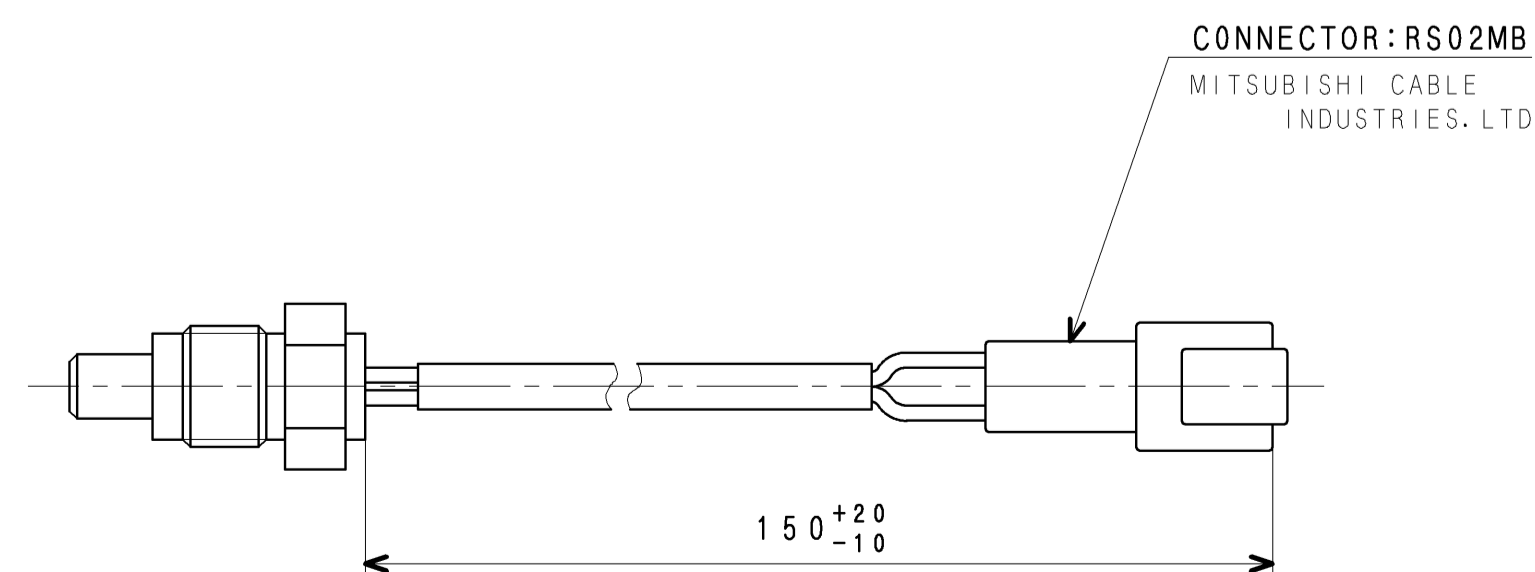
P-DETAIL



X-VIEW (1:2)



M-DETAIL (1:2)

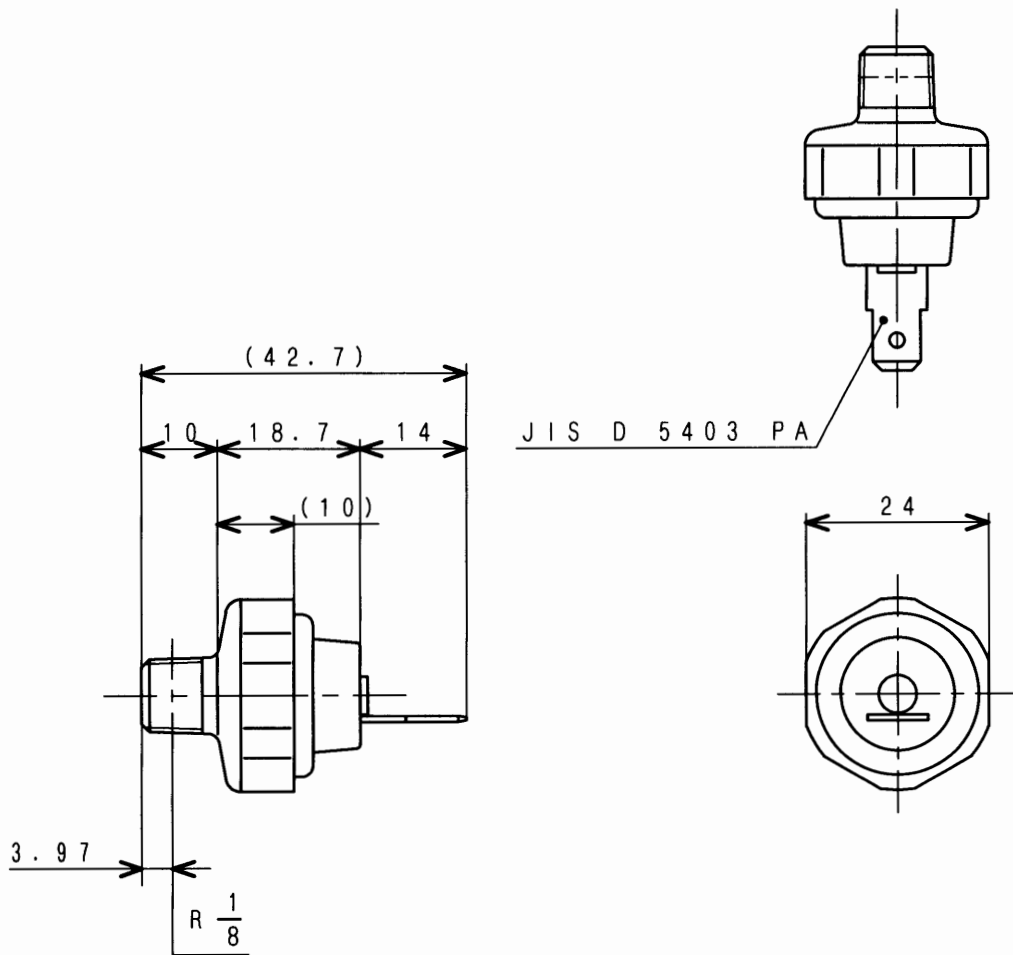


E-DETAIL

CHG		ED-NO	DATE	CHK	製図 (MSH)	3rd ANGLE PROJECTION		S4S-Z3DT61SD ENG ASSY	
承認		検図			尺規 SCALE	1:1		三菱重工業株式会社 汎用機・特車事業本部	
R. Nagase		K. TAKETANI			製図 (MSH)	T. HIROSE		MITSUBISHI HEAVY INDUSTRIES, LTD. GENERAL EQUIPMENT & SPECIAL VEHICLE HEADQUARTERS.	
		K. SAWAZAKI			製図 (MSH)	2012. 6. 14		図面番号 32A00-07311	
					製図 (MSH)	A 1		DRAWING NO. 2	
					MHI CONFIDENTIAL		1 2 3 4 5 6		

出図
汎特
2012
6.18

M/C



仕 様
SPECIFICATIONS

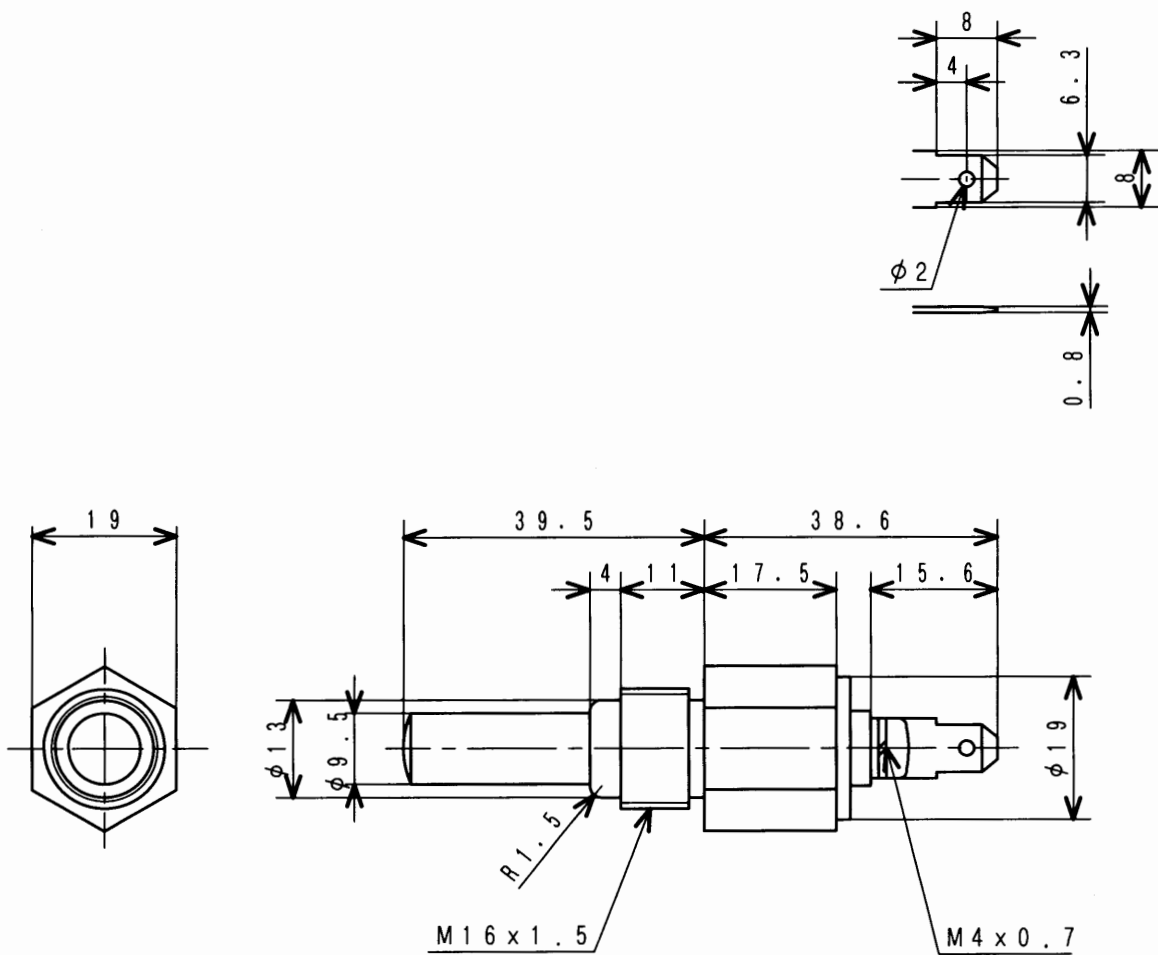
作 動 圧 力 OPERATING PRESS.	98 kPa {1.0 kgf/cm ² }
接 点 容 量 CURRENT CAPACITY	12V-5W
結 線 様 式 CONNECTION	b (—○—)

オイルプレッシャスイッチ

SWITCH, OIL PRESSURE

31A90-00500

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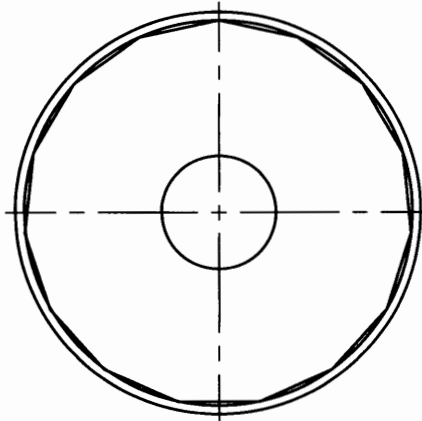
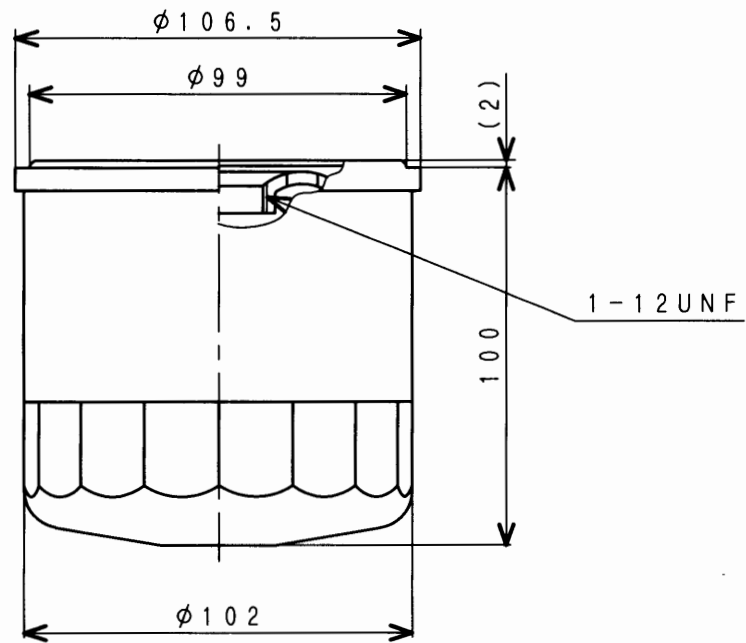
部品番号 PART No.	作動温度 OPERATING TEMP.		
MC880-900	温度下降時 DECREASE	$\leq 100^{\circ}\text{C} \pm 4^{\circ}\text{C}$	で接点開 OPEN
	温度上昇時 RISE	$\geq 100^{\circ}\text{C} \pm 2^{\circ}\text{C}$	で接点閉 CLOSE
MC880-901	温度下降時 DECREASE	$\leq 105^{\circ}\text{C} \pm 4^{\circ}\text{C}$	で接点開 OPEN
	温度上昇時 RISE	$\geq 105^{\circ}\text{C} \pm 2^{\circ}\text{C}$	で接点閉 CLOSE

定格負荷 RATED LOADED	1A以上 MIN.	0.5A以上 MIN.
定格電圧 RATED VOLT.	12V	24V

サーモスイッチ
SWITCH, THERMO

MC880-900

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仕 様
SPECIFICATIONS

濾過面積 FILTRATION AREA	0.2 m ²
圧力損失 PRESSURE LOSS	29 kPa (0.3 kgf/cm ²) Max. (at 80±3℃, SAE #30, 17ℓ/min.)
破壊圧力 PRESS. AT FRACTURE	2 MPa (20 kgf/cm ²)
エレメント差圧強度 ELEMENT RESISTANCE TO PRESS. DIFFERENCE	686 kPa (7 kgf/cm ²)
逃し弁調整圧力 RELIEF VALVE PRESSURE	98±20 kPa (1.0±0.2 kgf/cm ²)

3. START ENGINE AND CHECK FOR OIL LEAKAGE.
2. THEN TIGHTEN 3/4 TURN AFTER GASKET CONTACTS BASE.
NOTE 1. APPLY FILM OF ENGINE OIL TO GASKET AND SCREW ON.

3. 取付け後、エンジンを始動してガスケット面からのオイル洩れを点検して下さい。
2. 取付けはシール面にガスケットが接触してから3/4回転締付けて下さい。
注 記 1. 取付け前、ガスケットにエンジンオイルを薄く塗布して下さい。

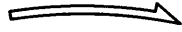
オイルフィルター

CARTRIDGE ASSY, OIL

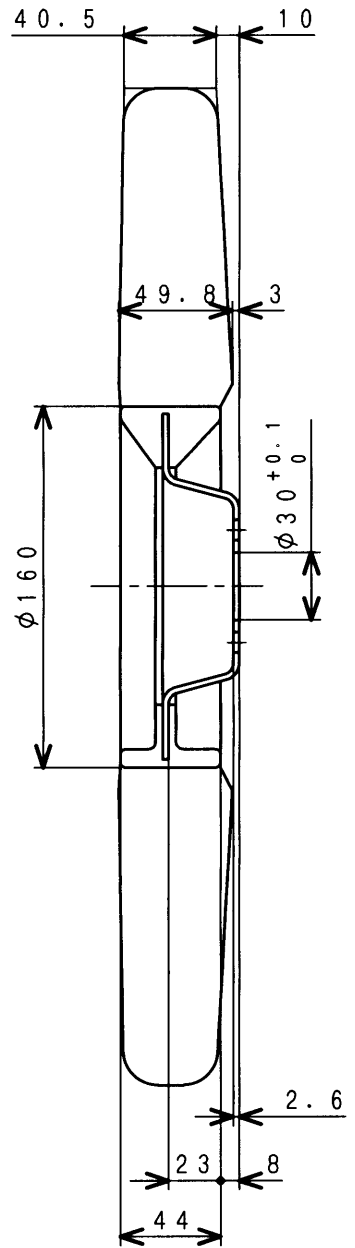
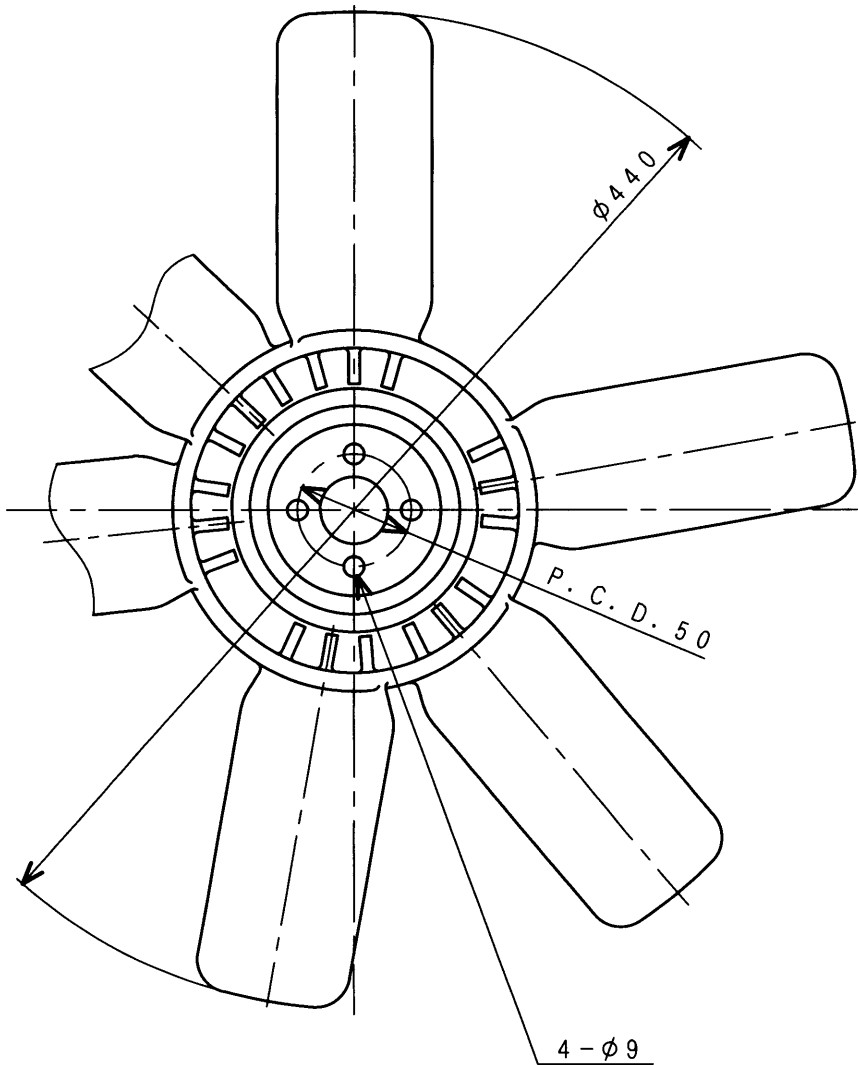
32A40-00400

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DIRECTION OF ROTATION
回転方向



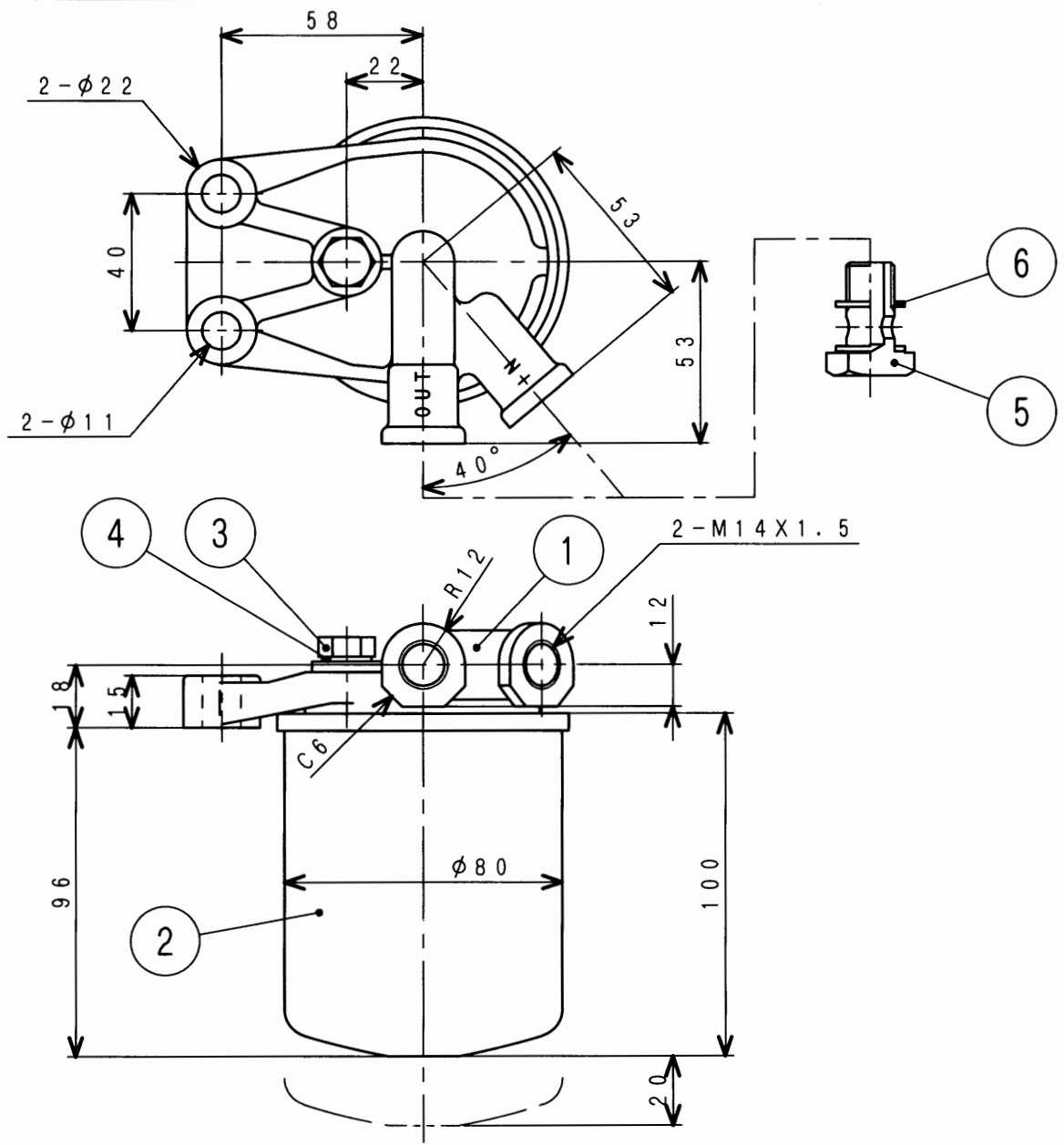
AIR FLOW
風向き



ファン (プッシュャー)
FAN, COOLING (6P-440)

32A48-00400

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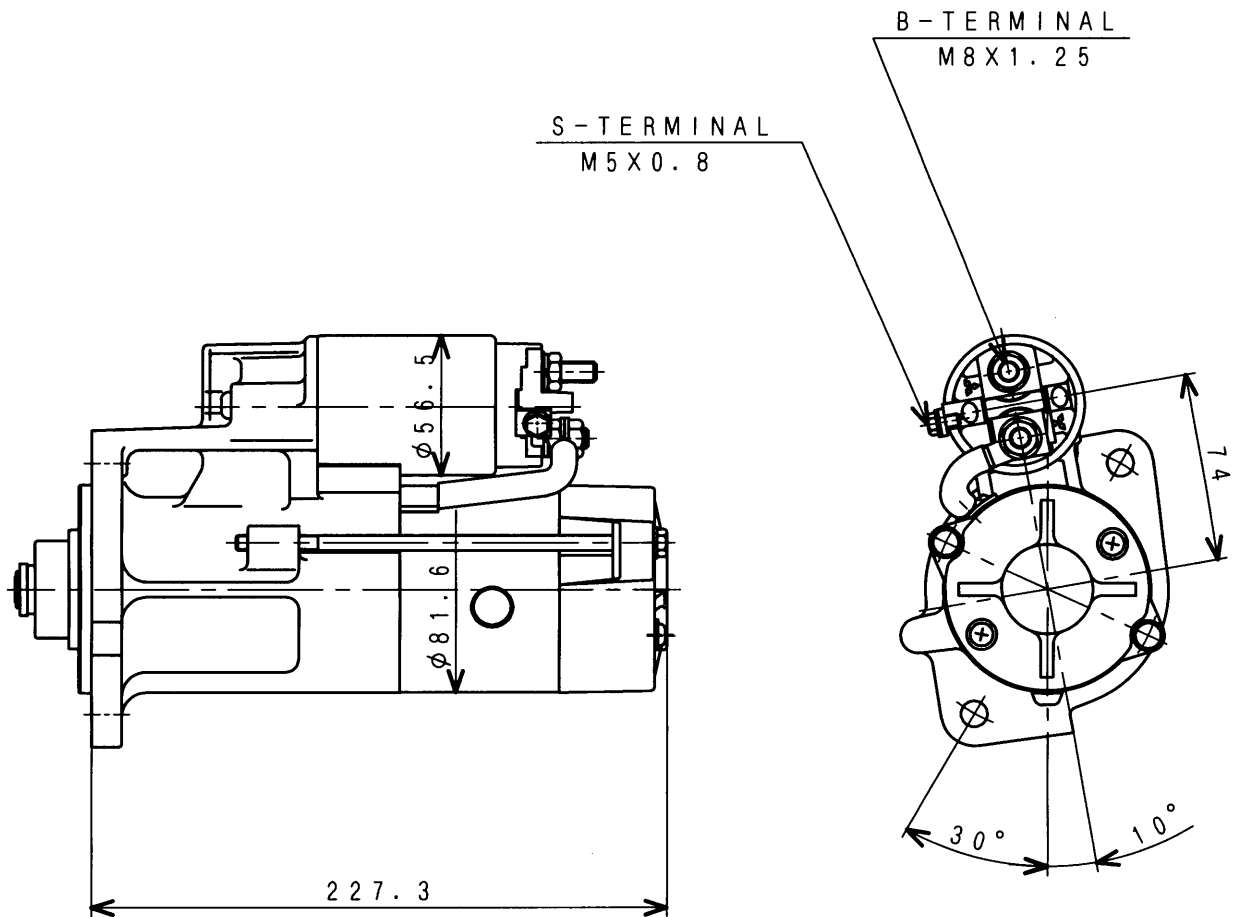
仕様
SPECIFICATIONS

ろ過面積 FILTRATION AREA	1500 cm ²
ろ過精度 FILTER MESH SIZE	6 μ
定格流量 RATED FLOW	3 l/min
圧力損失 PRESS. LOSS	6.7 kPa以下 (流量3 l/min) MAX CAPACITY
乾燥重量 WEIGHT	650 g

6	05946-01401	WASHER, SEALING	4
5	MH037-087	BOLT, EYE	2
4	05946-00801	WASHER, SEALING	1
3	MH037-084	PLUG, AIR	1
2	34462-00300	ELEMENT ASSY	1
1	34462-00201	BRACKET	1
SYM	PART No.	PART NAME	QTY

ヒュエルフィルタアッシ
FUEL FILTER ASSY

34462-00011

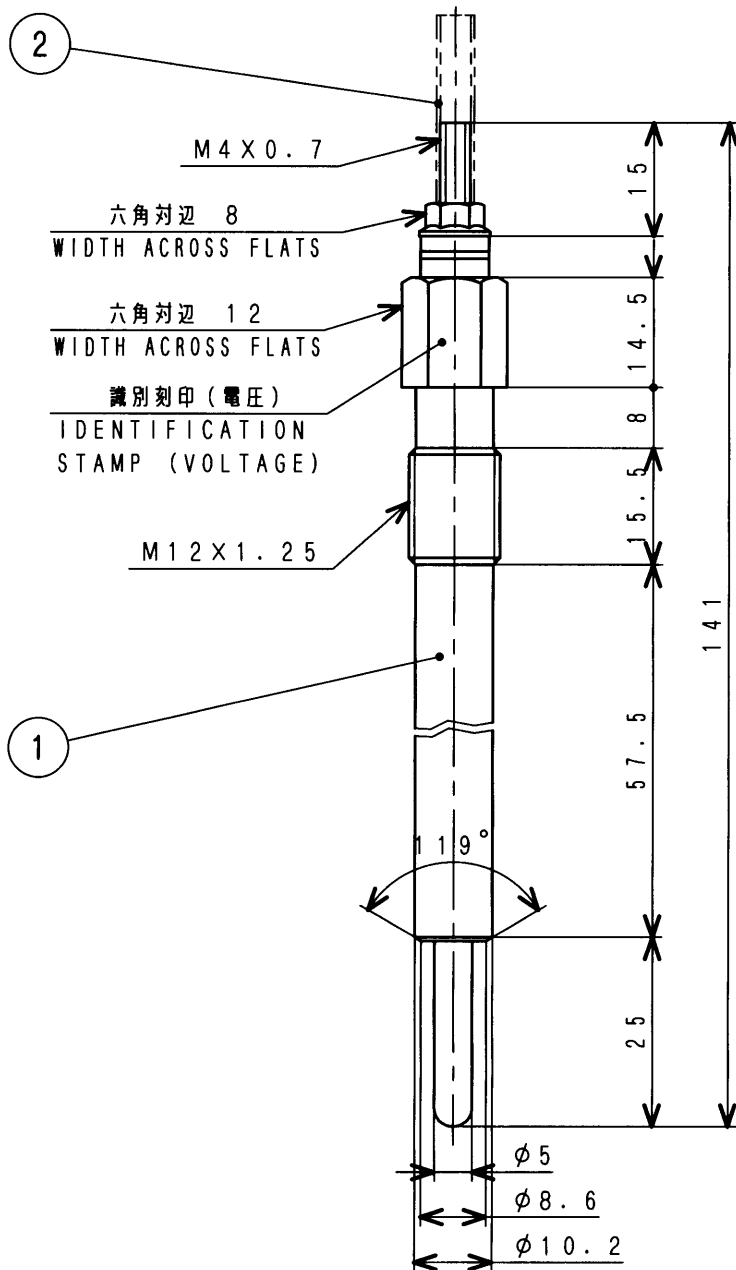


MODEL	PART NO.	RATED OUTPUT OF STARTER	BATTERY (REFERENCE)
S4S	32A66-20100	DC12V-2.2KW	92AH

スターター
STARTER (DC12V-2.2kW)

32A66-20100

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定 格 電 圧 RATED VOLT	DC11V
電 流 値 CURRENT	定 格 電 圧 印 加 30 秒 時 AT RATED VOLTAGE FOR 30 sec
	5.5 A (参考値) (REF)
温 度 上 昇 TEMPERATURE	定 格 電 圧 印 加 800℃ 到 達 時 間 TIME TO REACH 800℃ (AT RATED VOLTAGE)
	7 ^{+1.5} _{-1.0} sec
締 付 トルク TIGHTENING TORQUE	BODY (M12X1.25) : 20~30 N·m
	TERMINAL (M4X0.7) : 1.0~1.5 N·m

2	32A66-07301	CAP	1
1	32A66-07101	PLUG, GLOW	1
SYM	PART No.	PART NAME	QTY

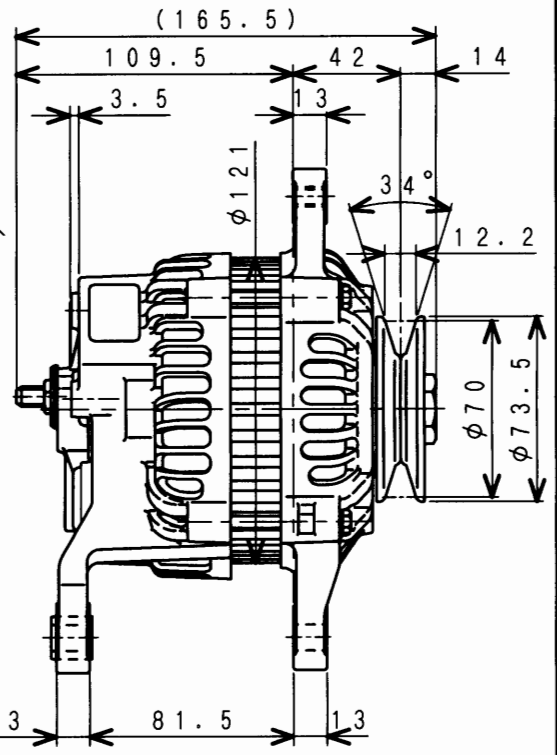
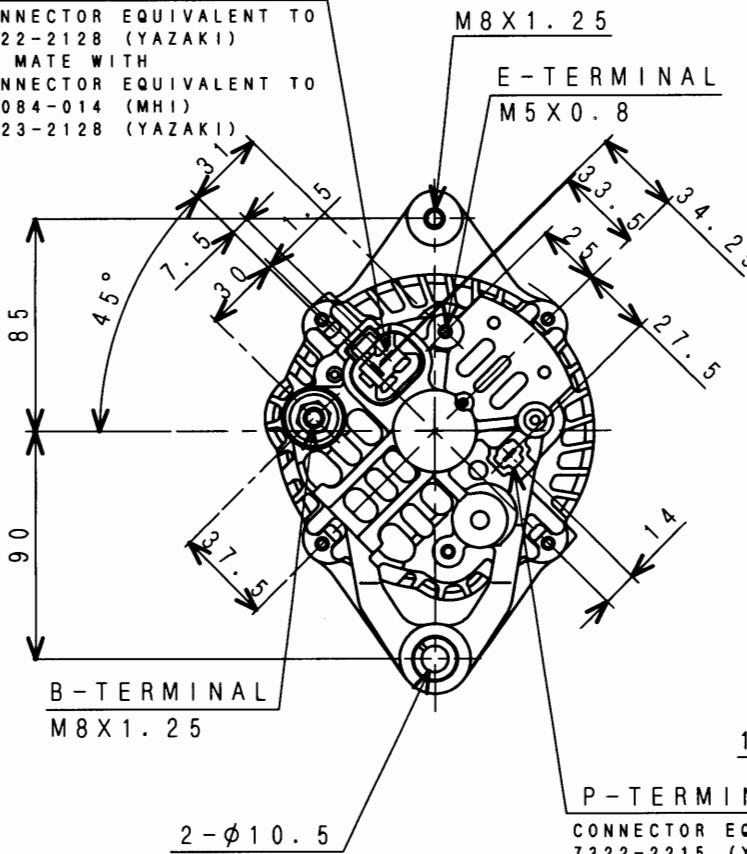
グロープラグアッシー
PLUG ASSY, GLOW

32A66-07011

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L & R - TERMINAL

CONNECTOR EQUIVALENT TO 7322-2128 (YAZAKI) TO MATE WITH CONNECTOR EQUIVALENT TO M8084-014 (MHI) 7323-2128 (YAZAKI)



P - TERMINAL
CONNECTOR EQUIVALENT TO 7322-2215 (YAZAKI) TO MATE WITH CONNECTOR EQUIVALENT TO MM409-660 (MHI) 7323-2215 (YAZAKI)

仕 様 SPECIFICATIONS

定 格 RATING	連 続 CONTINUOUS
電 池 電 圧 BATT. VOLT.	12V
運 転 時 の 周 囲 温 度 AMB. TEMP. IN USE	100°C MAX.
レギュレータ性能 REG. PERFORMANCE	調整電圧 SET VOLT 14.7±0.3V
使用回転速度 SPEED IN USE	1,000~18,000rpm

出力性能 OUTPUT PERFORMANCE

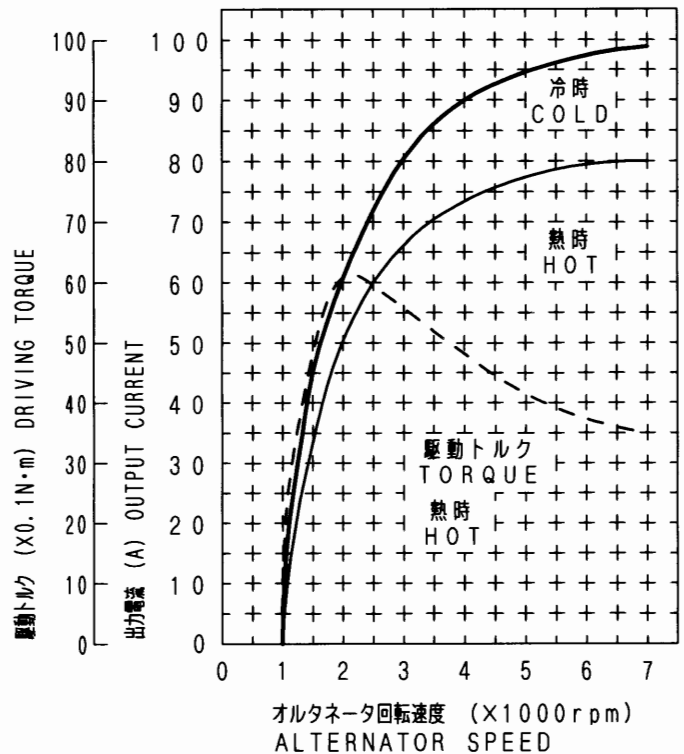
1. 保証出力性能 GUARANTEE 20°C

電 圧 (V) VOLTAGE	TYPE 回転速度 SPEED (rpm)	CA-0027-1 出力電圧 OUTPUT CURRENT (A)	
		冷 時 COLD	熱 時 HOT
13.5	1500	-	24以上 MIN.
	2500	-	54以上 MIN.
	5000	-	73以上 MIN.
ヒートラン速度 TEMP. STAB. SPEED 5000rpm			

注記：キー-OFF時外部ユニットを介してL端子にまわり込み電流がないこと。

NOTE: WHEN THE KEY SWITCH IS OFF, NO CURRENT FLOWS FROM OTHER UNITS TO L AND R TERMINAL PERMITTED.

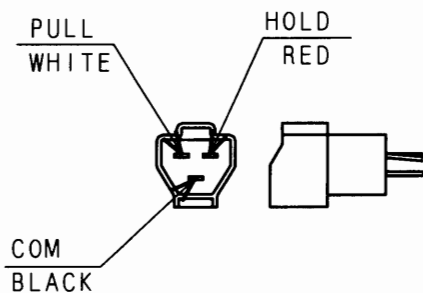
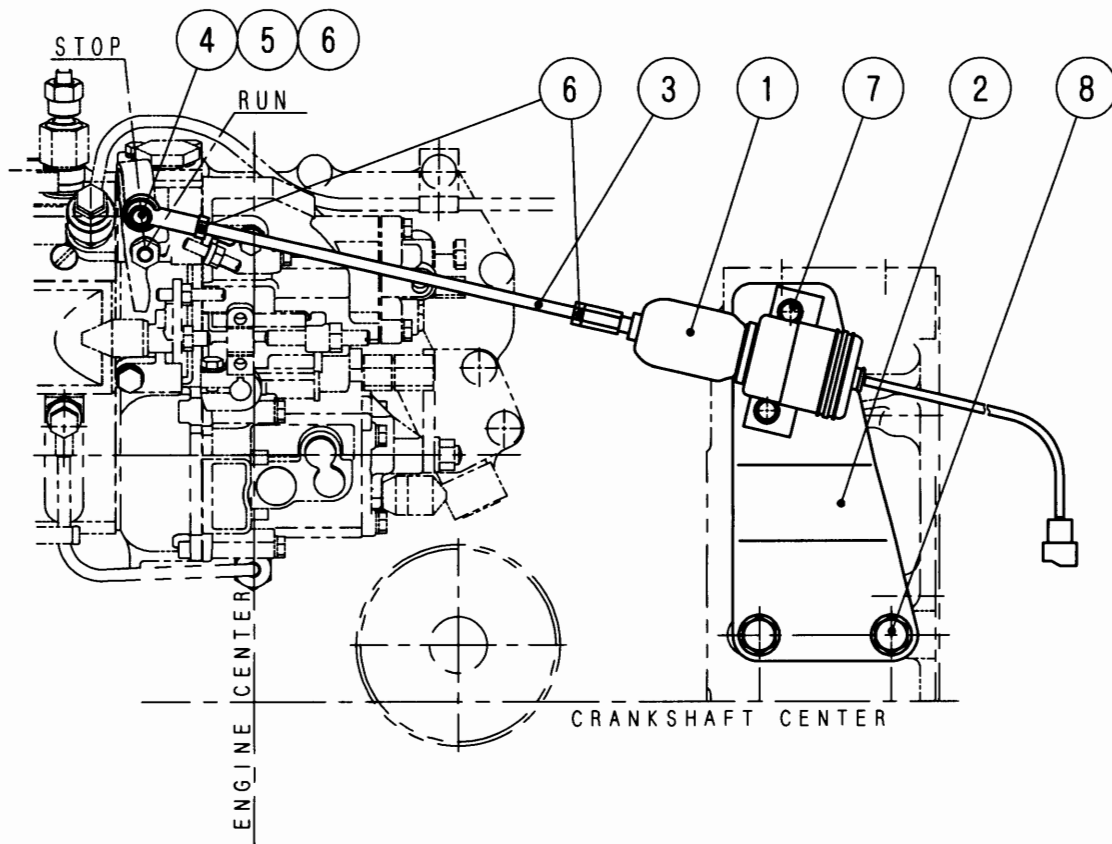
2. 実力平均特性曲線 ACTUAL; AVERAGE CHARACTERISTIC CURVE



オルタネータ

ALTERNATOR (12V-75A)

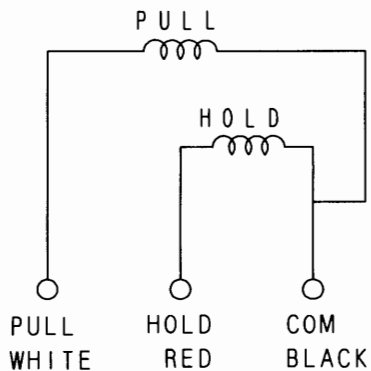
32A68-16501



DETAIL OF CONNECTOR
 CONNECTOR EQUIVALENT TO
 7222-6234-40 (YAZAKI)
 TO MATE WITH
 30A87-00600 (MHI)
 7123-6234-40 (YAZAKI)

仕様(20℃にて)
 SPECIFICATIONS (AT 20℃)

定格電圧 RATED VOLT.	DC12V	
定格電流 RATED CURRENT	プルインコイル PULL IN COIL	ホールディングコイル HOLD IN COIL
	46.5A	1.1A
引張力 TENSILE FORCE	ソレノイド引き始め PULL RATING AT 25.4mm	ソレノイド引き終わり HOLD RATING
	89N {9kgf}	178N {18kgf}



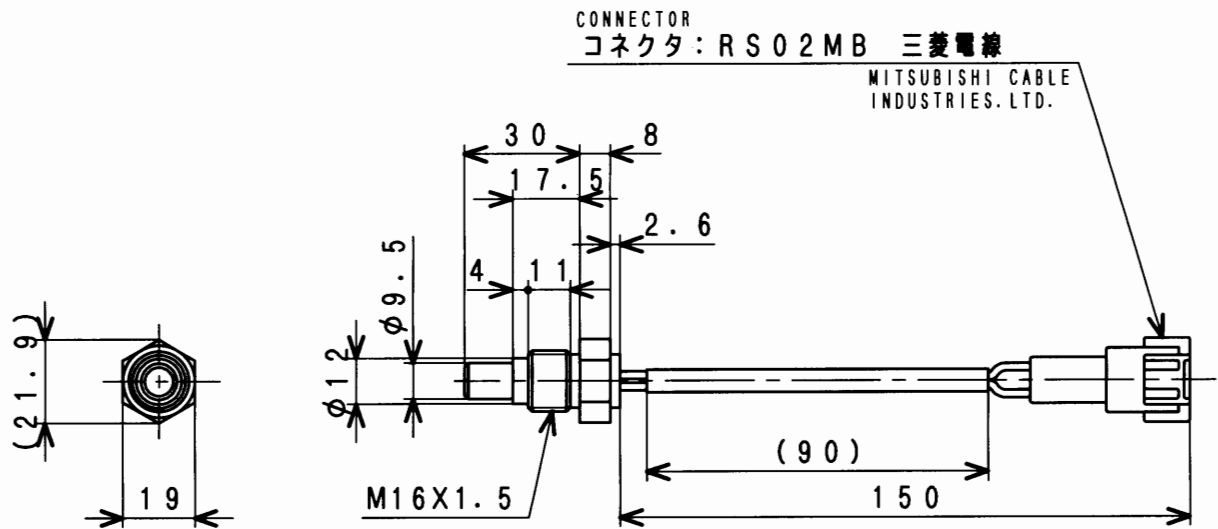
配線図
 WIRING DIAGRAM

8	F2005-12025	BOLT W/ASSY	2
7	F1825-06012	BOLT W/ASSY	2
6	F2300-06000	NUT	3
5	F2515-06000	WASHER, SPRING	1
4	32563-06100	L-JOINT	1
3	05901-06220	ROD	1
2	32A87-03200	BRACKET, SOLENOID	1
1	32A87-03100	SOLENOID	1
SYM	PART No.	PART NAME	QTY

ストップ ソレノイド キット
 STOP SOLENOID KIT

32A87-03010

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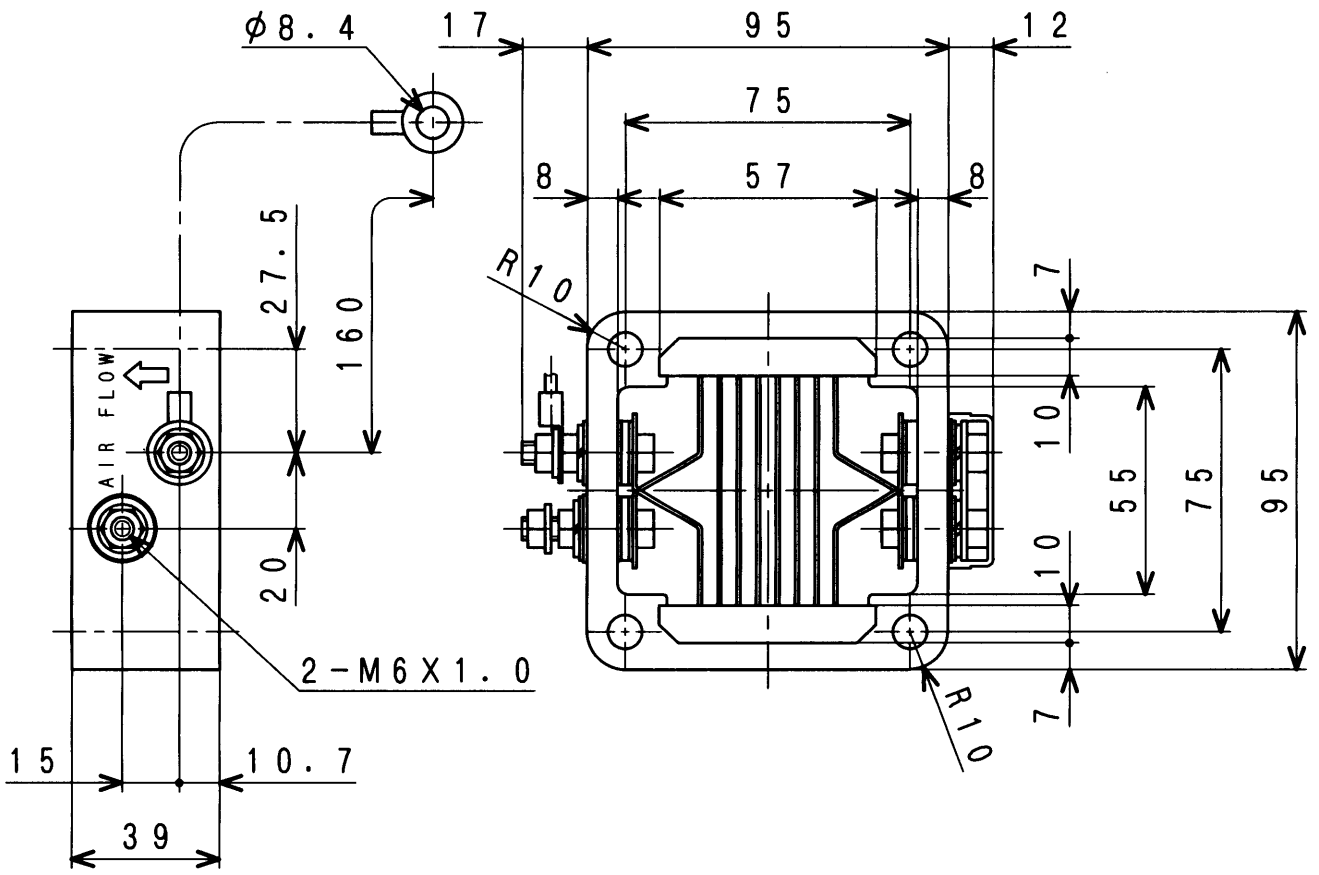


温度 (°C)	-30	-20	0	20	40	60	80	90
TEMPERATURE	-30	-20	0	20	40	60	80	90
抵抗値 (kΩ)	26.65	15.64	5.95	2.54	1.20	0.613	0.333	0.250
RESISTANCE	26.65	15.64	5.95	2.54	1.20	0.613	0.333	0.250

水温センサ
SENSOR, WATER TEMP

32A90-00300

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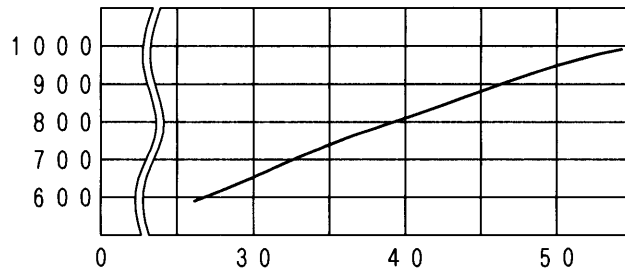
仕様
SPECIFICATIONS

容量 CAPACITY	0.96 kW
定格電圧 RATED VOLTAGE	DC 11V
定格電流 RATED CURRENT	87 A ± 10%

温度特性曲線

TEMP. CHARACTERISTIC CURVE (at 11V, 20°C)

エレメント表面温度
ELEMENT SURFACE
TEMPERATURE (°C)



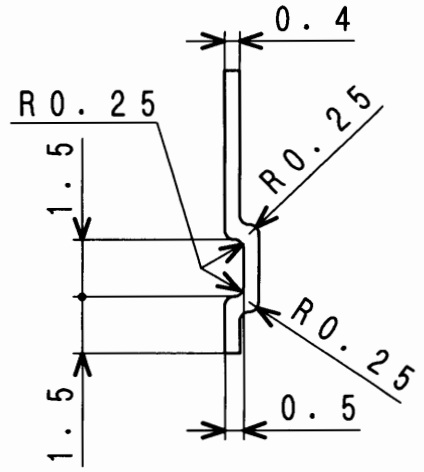
予熱時間 PREHEATING TIME (sec)

エア ヒータ アッシー
AIR HEATER ASSY

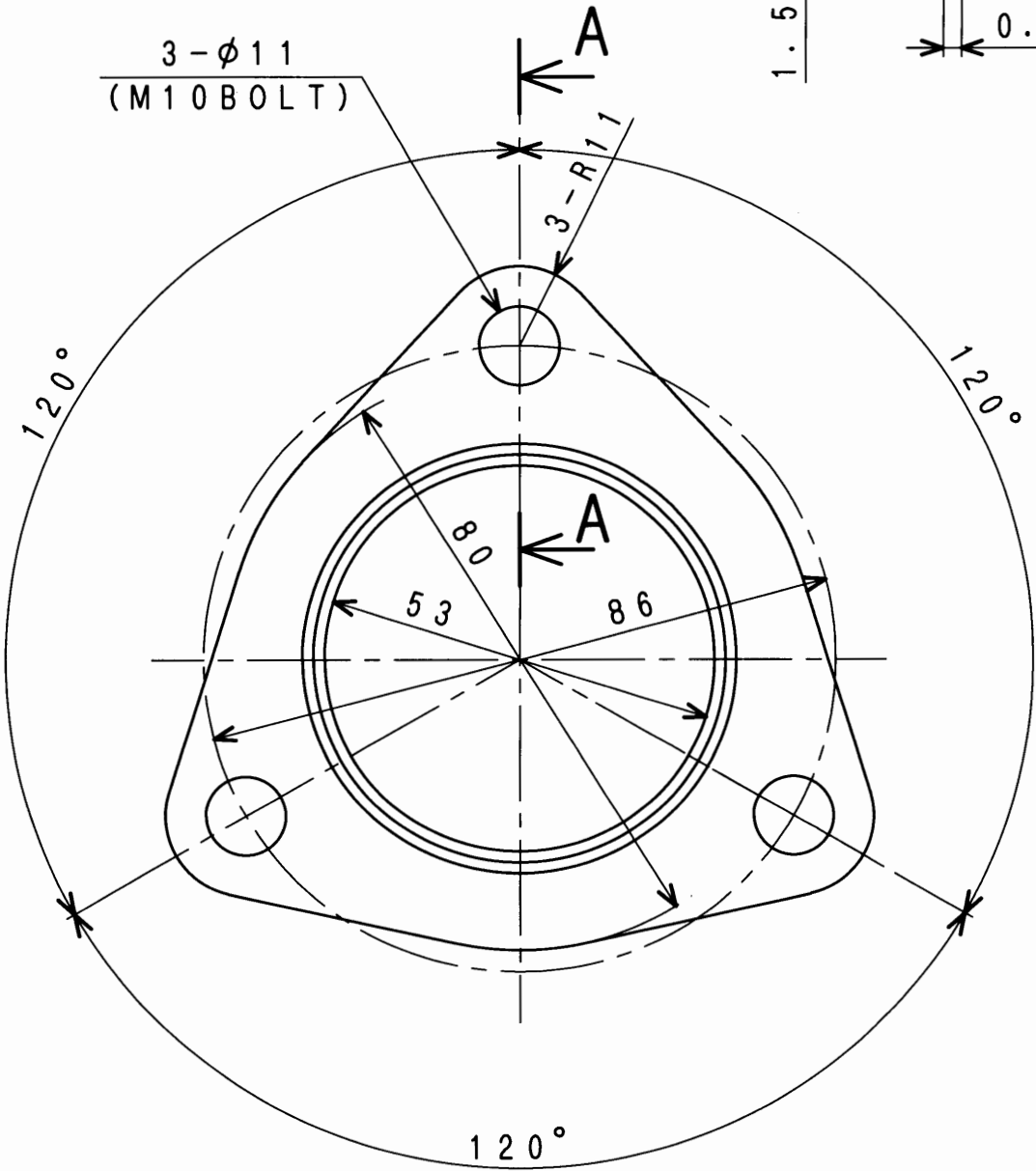
32B66-06100

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A - A (5 : 1)



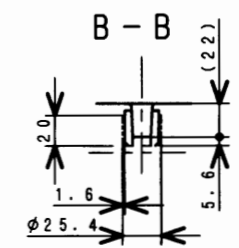
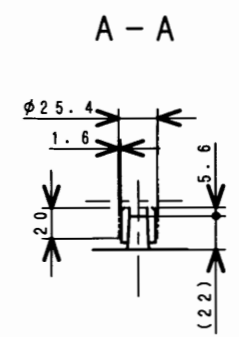
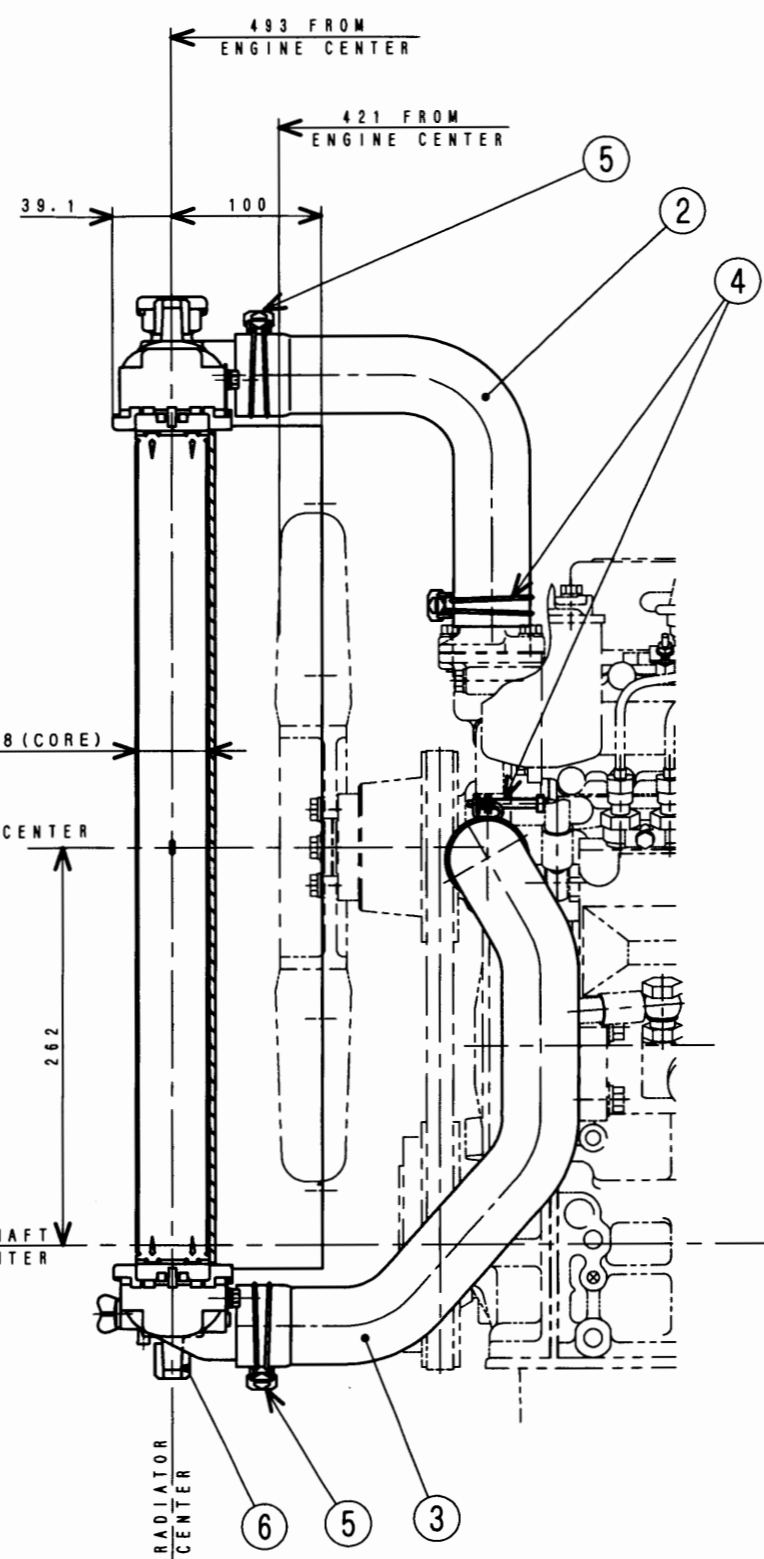
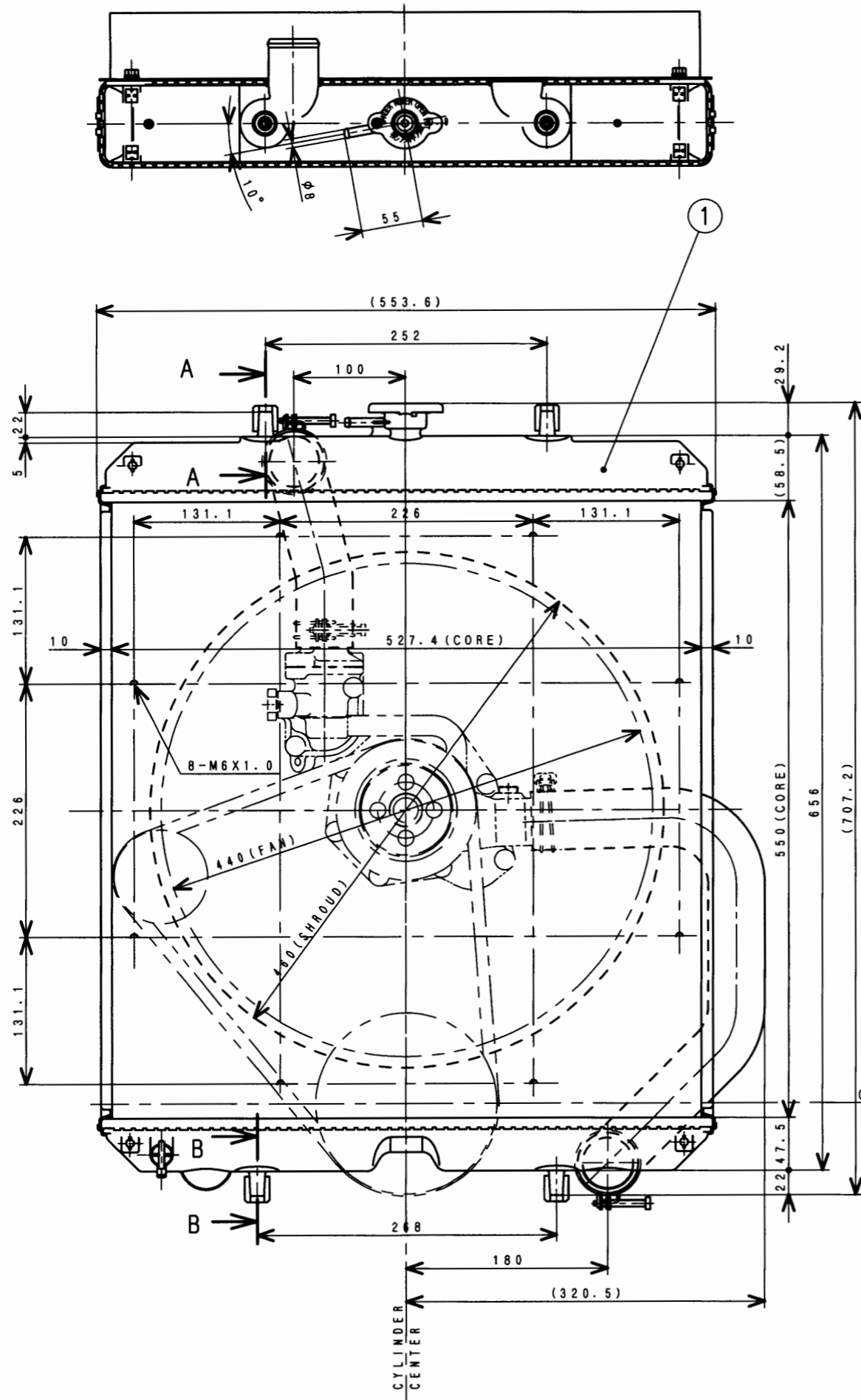
3- ϕ 11
(M10BOLT)



ガスケット
GASKET (TD04HL)

32A32-03300

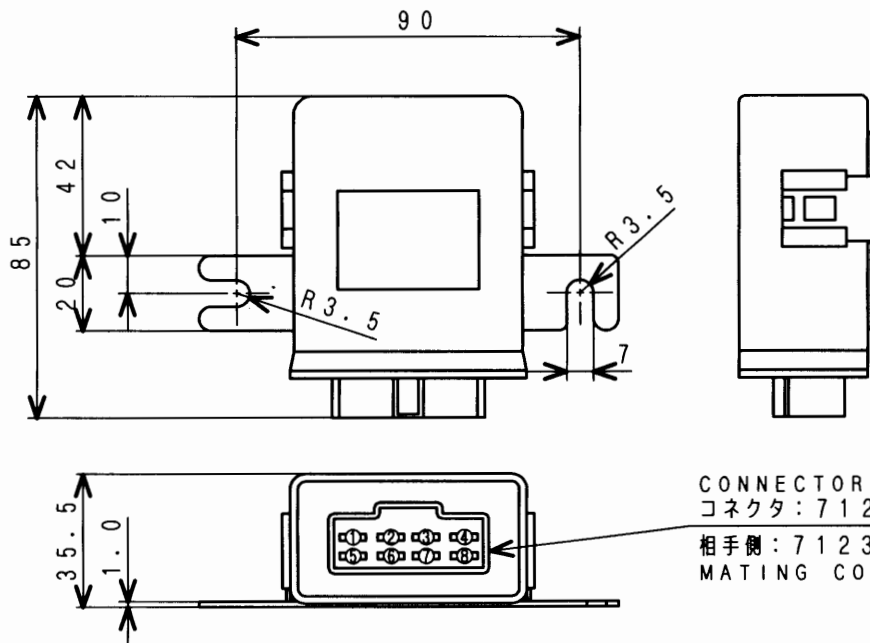
MHI CONFIDENTIAL



RADIATOR WEIGHT: APPROX 7kg
 COOLANT: APPROX 4L

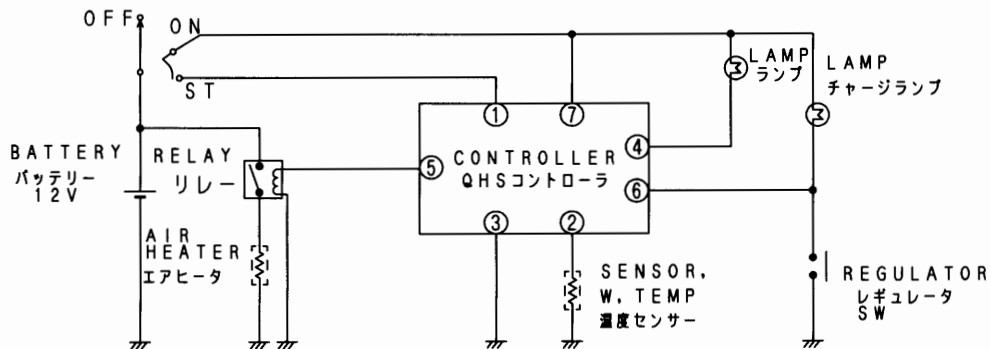
6	31A47-03100	CUSHION	4
5	F4300-05701	CLAMP	2
4	05317-01700	CLAMP	2
3	32A47-06800	HOSE, RUBBER	1
2	32A47-06700	HOSE, RUBBER	1
1	32A47-06010	RADIATOR ASSY	1
SYM	PART No.	PART NAME	QTY

ラジエタ キット
RADIATOR KIT (S4S-DT) **32A47-03010**

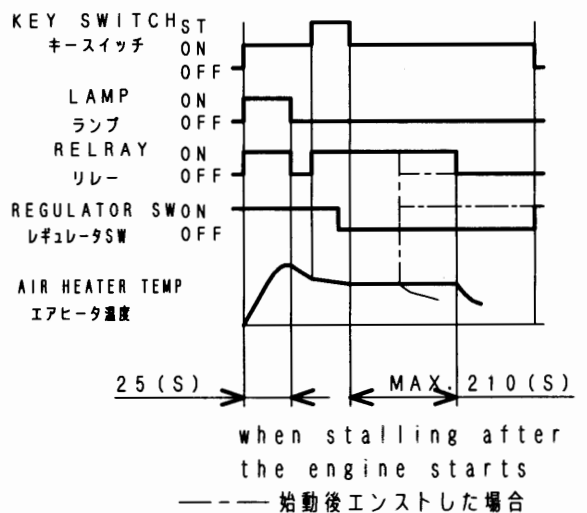


CONNECTOR B (YAZAKI)
 コネクタ: 7122-2186 (矢崎) 相当
 相手側: 7123-2186 (矢崎)
 MATING CONNECTOR (YAZAKI)

KEY SWITCH キースイッチ
 WIRING DIAGRAM 接続図



TIMING CHART 作動シーケンス



タイマー特性 TIMER CHARACTERISTICS		
冷却水温 WAETR. TEMP (°C)	プレヒータ PRE. HEAT (sec)	アフターヒータ AFTER HEAT (sec)
40以下 below	25	210
40以上 over	0	0
仕様 SPECIFICATIONS		
RATED VOLTAGE 定格電圧 DC12V		
OPERATING VOLTAGE 使用電圧範囲 DC8V~16V		
AMBIENT TEMPERATURE 使用温度範囲 -40°C~+80°C		
RATED LOADED 定格負荷	TERMINAL ④-端子	LAMP ランプ 12V, 4W
	TERMINAL ⑥-端子	RELAY リレー (1A以下)
REGULATOR SWITCH レギュレータスイッチ	SWITCH	MAX. SWITCH MIN. スイッチ-ON時4V以下、スイッチ-OFF時4V以上

エアヒータコントローラ

CONTROLLER, AIR HEATER

32B66-06500