

ディーゼル機関仕様書

ENGINE SPECIFICATIONS

機関型式	公式呼称 AH-4HK1X (Intercooler turbo)
Engine Model	Base Model
	社内呼称 AH-4HK1XYBW-02
	Model No.
納入先	
Customer	EXPORT
搭載機種	一般動力
Application	General power
添付図面	E4-1033-028-0
Drawing No. (3D Data Code)	

Symbol	Date	変更歴	Revision Record	Issue No.
0	22 Sep. 2008	:	試作仕様確認用として作成 For confirmation of prototype specification	:

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Engine Specifications

社内呼称 AH-4HK1XYBW-02
Model No.

変更経歴 Rev.
0

製造業者名 Manufacturer	いすゞ自動車株式会社 ISUZU MOTORS LIMITED
機関名称 Engine Model	公式呼称: 4HK1 インタークーラーホ [®] 社内呼称: AH-4HK1XYBW-02 Base Model 4HK1X Intercooler Turbo Model No.
用途 Application	一般動力 General power
機関型式 Engine type	4サイクル水冷頭上カム軸式直列、直接噴射式、排気ターボ過給機付 Four cycle, water cooled, overhead camshaft, vertical in-line, direct injection type, with turbocharger
気筒数 - 径 × 行程 No. of cylinders - bore x stroke	4 - 115.0 mm x 125.0 mm
総行程容積 Total piston displacement	5.193 L
圧縮比 Compression ratio	17.5 17.5 to 1
機関性能 Engine performance	: 仕様値 Rating
試験条件 Test conditions	: 大気標準状態 Standard atmospheric condition
準拠規格 Conforming standard	: すり合わせ充分 Break-in time 30 hrs
JPN;JIS D0006-1	: ACジェネレーター付、ファン無 With AC generator and without cooling fan
US;SAEJ1349	: エアクリーナー、サイレンサー付 With air cleaner and exh. silencer
EU;ISO15550	(使用燃料: JIS 2号軽油相当)
定格出力 Rated Output	: 147.0 ± 3 kW / 2100 min ⁻¹
最大トルク Maximum Torque	: 686 ± 60 Nm / approx. 1500 min ⁻¹
燃料消費率(定格出力) Fuel consumption at rated.	: 211 ± 13.6 g/kw.h
無負荷最高回転速度 No load max. speed	: 2100 ± 20 min ⁻¹
無負荷最低回転速度 Low idle speed	: 800 ± 20 min ⁻¹
使用燃料 Type of fuel	軽油 (JIS 2号軽油相当) Diesel fuel only (JPN:JIS-NO.2, US:ASTM-2D, EU:EN590)
機関乾燥質量 Engine dry weight	約 470 kg Approx. 470 kg
機関寸法 Dimensions	全長 1019.6 mm × 全幅 776 mm × 全高 1033.8 mm (ファン付) L 1019.6 x W 776 x H 1033.8 (with cooling fan)
着火順序 Firing order	1 - 3 - 4 - 2
回転方向 Rotating direction	ファン側からみて時計方向 Clockwise viewed from cooling fan
弁装置 Valve device	頭上カム軸式 (OHC) Overhead camshaft

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過給装置	付
Supercharging device	With
過給方式	排気ターボ
Supercharging system	Exhaust turbocharger
駆動方式	—
Driving system	---
潤滑方式	強制循環式 (油冷式 及び 水冷式)
Lubricating system	Full forced pressure feed type (Oil-cooled)
製造業者名	石川島播磨重工
Manufacturer	ISIKAWAJIMA HARIMA HEAVY INDUSTRIES, LTD.
名称	RHF55型 (ウエストゲート無)
Name of type	RHF55 without waist gate
燃料装置	
Fuel device	
噴射ポンプ	
Injection pump	
製造業者名	(株) デンソー
Manufacturer	Denso corporation
名称	コモンレール式 HP3型
Name of type	Common rail HP3 type
プランジャー	2 - 径 8.5 mm X カムリフト 8.8 mm (燃料油潤滑式)
Plunger	2 - Diameter 8.5 mm x Stroke 8.8 mm (Lubricated by fuel oil)
噴射ノズル	
Injection nozzle	
製造業者名	(株) デンソー
Manufacturer	Denso corporation
名称	電気式多孔インジェクター (G2タイプ)
Name of type	Electrical multi-hole type
噴射時期調整機	電子制御式
Fuel injection time regulator	Electrical controlled
製造業者名	---
Manufacturer	---
名称	---
Name of type	---
燃料供給ポンプ	付
Fuel feed pump	With
製造業者名	(株) デンソー
Manufacturer	Denso corporation
名称	ロータリー式 (燃料油潤滑式)
Name of type	Rotary type (Lubricated by fuel oil)
燃料濾過器	付 (付属納入)
Fuel filter	With (Loose part)
濾過方式	濾紙式 (プライミングポンプ、セジメンター付)
Filtering system	Paper element type (With priming pump and water separator)
製造業者名	和興産業(株)
Manufacturer	WAKO INDUSTRIAL CO.,LTD
名称	カートリッジ式
Name of type	Cartridge type
調速機	
Governor	
調速方式	電子式全速制御
Speed control system	Electrical variable speed control
潤滑方式	---
Lubricating system	---
製造業者名	(株) トランストロン
Manufacturer	TRANSTRON Inc.
名称	電子制御式
Name of type	Electrical control type

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潤滑装置	Lubricating device	
潤滑方式	Lubricating system	強制循環式 Full forced pressure feed type
潤滑ポンプ	Lubricating pump	
型式	Type of pump	ギヤポンプ Gear pump
駆動方式	Driving system	クランクギア駆動 Crank gear driven
油圧調整装置	Oil pressure regulating device	ピストンバネ式 Piston - spring type
油圧指示装置	Oil pressure indicating device	油圧センサ付 With engine oil pressure sensor
潤滑油濾過器	Oil filter	
濾過方式	Filtering system	全流濾紙式、バイパス式併用(スピンオンタイプ、ドレインプラグ 無) Full flow paper element, Remoto type
製造業者名	Manufacturer	日本ドナルドソン(株) Nippon Donaldson, Ltd
潤滑油冷却器	Oil cooler	
冷却方式	Cooling system	水冷内蔵式 Water cooled type (Built-in Engine)
製造業者名	Manufacturer	東京濾器(株) TOKYO ROKI CO.,LTD
冷却装置	Cooling device	
冷却方式	Cooling system	水冷式 Pressurized water forced circulation type
冷却ファン	Cooling fan	径 650 mm - 吸込 - 7枚羽根 Dia 650 mm - Suction - 7 Blade
形式	Type of fan	
駆動方式	Driving system	ベルト駆動 プーリ比=クランク/ファン=166/164.4 = 1.01 Belt driven by crankshaft, speed ratio: 1.01
水ポンプ	Water pump	
形式	Type of pump	渦巻式 Impeller type
駆動方式	Driving system	ベルト駆動 Belt driven by crankshaft pulley
水温調節装置	Thermostat	
方式	Regulating system	ワックスペレット式 Wax-pellet type
製造業者名	Manufacturer	富士精工(株) Fuji Bellows Co., Ltd.
水温指示装置	Water temperature indicating device	水温センサ付 With engine coolant water temperature sensor

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空 気 清 浄 器	---
Air cleaner	---
方 式	---
Cleaning system	---
製造業者名	---
Manufacturer	---
始 動 装 置	
Starting device	
電動機	
Starting motor	
製造業者名	日興電機工業(株)
Manufacturer	Nikko Electric Industry Co.,Ltd
名称	リダクション型
Name of type	Reduction type
電圧	12V
Voltage	
出力	2.5 kW
Output	
停 止 装 置	燃料遮断 (電子制御による)
Engine stop device	Fuel cut (Electronic controlled)
予 熱 装 置	有 (QOS- II)
Preheating device	QOS- II
充 電 (点 灯) 発 電 機	
Alternator	
方式	交流式
Generating system	A/C type
製造業者名	日立製作所
Manufacturer	HITACHI Ltd.
電圧	12V
Voltage	
出力	110A
Output	
駆動方式	ベルト駆動
Driving system	Belt driven by crankshaft pulley
充 電 自 動 調 整 器	
Regulator	
方式	IC式 (発電機に内蔵)
Regulating system	Built-in IC regulator
製造業者名	日立製作所
Manufacturer	HITACHI Ltd.
充放電指示方式	---
Charging discharging indicating system:	---
時 間 計	なし
Hour meter	Without
方式	---
System	---
製造業者名	---
Manufacturer	---
取付位置	---
Fitting position	---
駆動方式	---
Driving system	---
回転比	---
Speed ratio	---
定格運転速度目盛	---
Rated speed indicator	---

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Power Take Off Power Take Off	なし Without
許容傾斜角度 Allowable inclination angle	フライホイール側から見て 前下がり: 0.61rad 後ろ下がり: 0.61rad 左下がり: 0.61rad 右下がり: 0.61rad 0.61 rad. for all directions viewed from flywheel
各種容量 Capacity	
油量 Lubrication oil	MAX: 約 20.5 L MIN: 約 13.0 L (オイルパン内容量) MAX: approx. 20.5 L MIN: approx. 13.0 L (Oil pan only)
空気清浄器 Air cleaner	---
噴射ポンプ室 Injection pump	---
調速器室 Governor	---
冷却水 Cooling water	14.0 L (エンジンのみ) 14.0 L (Engine only)
その他 Others	---
整備諸元 Maintenance data	項目 : 弁スキマ : 開弁時期 : 閉弁時期 Valve Valve clearance Valve timing: open Valve timing: close
弁整備諸元 Valve clearance and adjustment	吸気弁 : 冷間時 0.4 mm : 上死点前 0.33rad : 下死点後 0.93rad Inlet 0.4 mm at cold 0.33 rad BTDC 0.93 rad ABDC
噴射時期 Injection timing	排気弁 : 冷間時 0.4 mm : 上死点前 0.84rad : 下死点後 0.24rad Exhaust 0.4 mm at cold 0.84 rad BBDC 0.24 rad ATDC
噴射開始圧力 Initial injection pressure	全域電子制御式 Electrical control
圧縮圧力 Compressive pressure	---
参考諸元 Reference data	3.04 MPa (31 kgf/cm ²) (エンジン回転: 200 min ⁻¹ において) (At engine speed 200 min ⁻¹)
水温調節装置 Thermostat	開き始め (大気圧において) : 82.0℃ Initial opening temperature at atmospheric pressure: 82.0 °C ストローク 10.0 mm 以上になる温度 : 95.0℃ Temperature at valve lift of 10.0 mm and over: 95.0 °C
塗装色 Painting color	クリア塗装 但し、クーリングファンは白色、機械側接続部及び電装品端子、ラベル類は除く Clear, except for cooling fan, electrical part connectors, and labels
出荷時充填潤滑油 Lubricating oil at delivery	出荷時オイル無し There is no engine oil when engine deliver from Isuzu factory.
推奨充填潤滑油 Recommended lubrication oil	APIグレード CD, CE, CF, CF-4 or ACEAグレード B2/B3, E2/E3 API Grade CD, CE, CF, CF-4 or ACEA Grade B2/B3, E2/E3 *Please refer to "Engine Instruction Manual" for details.

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Engine Specifications

社内呼称 AH-4HK1XYBW-02
Model No.

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仕様概要: 本エンジンの主な特殊仕様は下記の通り。

Dress Level

No.	部品名称 Item	概要 Description
1	HOUSING ; FLYWHEEL	SAE J617c #3 SAE J617c #3
2	FLYWHEEL	SAE J620 10" & 11.5" Combined type SAE J620 10" & 11.5" Combined type
3	OIL PAN	後膨みタイプ Rear sump type
4	COOLING FAN	Dia 650mm-Suction-7Blade Dia 650mm-Suction-7Blade
5	AC GENERATOR	12V-110A 12V-110A
6	STARTER	12V-2.5kW 12V-2.5kW
7	FUEL FILTER	付属納入 Loose parts (Remote type)
8	WATER SEDIMENTER	付き (フューエルフィルター一体型) With (Integrated with fuel filter)
9	OIL FILTER	スピノオン、バイパス一体式 (エンジン別置型) Spin-on type, Combined type (Remote)

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付属納入部品（エンジン本体に取り付かずに納入される部品）

Loose parts

No.	部品番号 Parts No.	部品名称 Item	個数 Qty	備考 Remarks
1	898077-7801	ECM	1	
2	812146-8300	SENSOR;Inlet air temp.	1	
3	897324-3861	OIL FILTER ASM	1	
4	898013-9863	FILTER ASM;MAIN, FUEL	1	
5	897383-4270	PIPE ASM;FUEL	4	
6	109630-0860	PACKING;FUEL PIPE	8	
7	109675-0951	BOLT;EYE	4	
8	897217-7780	SENSOR;Barometrical press.	1	
9	114145-1840	GASKET;Exhaust pipe	1	
10	898068-2750	FEED PUMP ASM;Electric	1	
11	898075-8551	FILTER ASM;PRE, FUEL	1	
12	897173-9510	RELAY;GLOW	1	
13	582550-0290	RELAY;MAIN	1	
14	582550-0290	RELAY;STARTER CUT	1	
15	582553-0444	RELAY;STARTER	1	
16	582550-0290	RELAY;FUEL PUMP	1	
17	894402-5000	SWITCH ASM;STARTER	1	

ENGINE SPECIFICATIONS

Engine Model	Base Model :	AH-4HK1X (Intercooler turbo)
	Model No. :	AH-4HK1XYBW-02
Customer	EXPORT	
Application	General power	
Drawing No. (3D Data Code)	E4-1033-028-0	

Symbol	Date	Revision Record	Issue No.
0	22 Sep. 2008	: For confirmation of prototype specification	
	:	:	
	:	:	
	:	:	
	:	:	
	:	:	

ISUZU MOTORS LIMITED
Powertrain Business Dept.

Approval

S.Nogami

S.Nogami
Group Leader

Check

H.Harada

H.Harada
Manager

Issue

K.Ogawa

K.Ogawa

Engine Specifications

Model No. AH-4HK1XYBW-02

Rev. 0

Manufacturer	ISUZU MOTORS LIMITED	
Engine Model	Base Model: 4HK1X Intercooler Turbo	Model No.: AH-4HK1XYBW-02
Application	General power	
Emission regulation	EPA Tier-3 / EC Stage-III A	
Engine type	Four cycle, water cooled, overhead camshaft, vertical in-line, direct injection type, with turbocharger	
No. of cylinders - bore x stroke	4 - 115.0 mm x 125.0 mm	
Total piston displacement	5.193 L	
Compression ratio	17.5 to 1	

Engine performance	Rating
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Test conditions	Standard atmospheric condition
<div style="border: 1px solid black; padding: 2px;"> Conforming standard JPN;JIS D0006-1 US;SAEJ1349 EU;ISO15550 </div>	Break-in time 30 hrs
	With AC generator and without cooling fan
	With air cleaner and exh. silencer
	Fuel : JPN: JIS-NO.2

Rated Output	: 147.0 ± 3 kW / 2100 min-1
Maximum Torque	: 686 ± 60 Nm / approx. 1500 min-1
Fuel consumption at rated.	: 211 ± 13.6 g/kw.h
No load max. speed	: 2100 ± 20 min-1
Low idle speed	: 800 ± 20 min-1

Type of fuel	Diesel fuel only (JPN:JIS-NO.2, US:ASTM-2D, EU:EN590)
Engine dry weight	Approx. 470 kg
Dimensions	L 1019.6 x W 776 x H 1033.8 (with cooling fan)
Firing order	1 - 3 - 4 - 2
Rotating direction	Clockwise viewed from cooling fan
Valve device	Overhead camshaft

Engine Specifications

Model No. AH-4HK1XYBW-02

Rev. 0

Supercharging device

Supercharging system	With Exhaust turbocharger
Driving system	---
Lubricating system	Full forced pressure feed type (Oil-cooled)
Manufacturer	SIKAWAJIMA HARIMA HEAVY INDUSTRIES, LTD.
Name of type	RHF55 without waist gate

Fuel device

Injection pump	
Manufacturer	Denso corporation
Name of type	Common rail HP3 type
Plunger	2 - Diameter 8.5 mm x Stroke 8.8 mm (Lubricated by fuel oil)
Injection nozzle	
Manufacturer	Denso corporation
Name of type	Electrical multi-hole type
Fuel injection time regulator	Electrical controlled
Manufacturer	---
Name of type	---
Fuel feed pump	With
Manufacturer	Denso corporation
Name of type	Rotary type (Lubricated by fuel oil)
Fuel filter	With (Loose part)
Filtering system	Paper element type (With priming pump and water separator)
Manufacturer	WAKO INDUSTRIAL CO.,LTD
Name of type	Cartridge type
Governor	
Speed control system	Electrical variable speed control
Lubricating system	---
Manufacturer	TRANSTRON Inc.
Name of type	Electrical control type

Engine Specifications

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Lubricating device

Lubricating system Full forced pressure feed type

Lubricating pump

Type of pump Gear pump

Driving system Crank gear driven

Oil pressure regulating device Piston - spring type

Oil pressure indicating device With engine oil pressure sensor

Oil filter

Filtering system Full flow paper element, Remoto type

Manufacturer Nippon Donaldson,Ltd

Oil cooler

Cooling system Water cooled type (Built-in Engine)

Manufacturer TOKYO ROKI CO.,LTD

Cooling device

Cooling system Pressurized water forced circulation type

Cooling fan

Type of fan Dia 650 mm - Suction - 7 Blade

Driving system Belt driven by crankshaft, speed ratio: 1.01

Water pump

Type of pump Impeller type

Driving system Belt driven by crankshaft pulley

Thermostat

Regulating system Wax-pellet type

Manufacturer Fuji Bellows Co., Ltd.

Water temperature
indicating deviceWith engine coolant water temperature sensor

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Air cleaner

Cleaning system ---
Manufacturer ---

Starting device

Starting motor
Manufacturer Nikko Electric Industry Co.,Ltd
Name of type Reduction type
Voltage 12V
Output 2.5 kW

Engine stop device Fuel cut (Electronic controlled)

Preheating device QOS- II

Alternator

Generating system A/C type
Manufacturer HITACHI Ltd.
Voltage 12V
Output 110A
Driving system Belt driven by crankshaft pulley

Regulator

Regulating system Built-in IC regulator
Manufacturer HITACHI Ltd.
Charging discharging indicating system: ---

Hour meter Without

System ---
Manufacturer ---
Fitting position ---
Driving system ---
Speed ratio ---
Rated speed indicator ---

Power Take Off Without

Flange type ---
Speed ratio ---
Spline number of teeth ---

Engine Specifications

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Allowable inclination angle 0.61 rad. for all directions viewed from flywheel

Capacity

Lubrication oil MAX: approx. 20.5 L MIN: approx. 13.0 L (Oil pan only)
 Air cleaner ---
 Injection pump ---
 Governor ---
 Cooling water 14.0 L (Engine only)
 Others ---

Maintenance data

Valve clearance and adjustment	Valve	Valve clearance	Valve timing: open	Valve timing: close
Inlet		0.4 mm at cold	0.33 rad BTDC	0.93 rad ABDC
Exhaust		0.4 mm at cold	0.84 rad BBDC	0.24 rad ATDC

Injection timing Electrical control
 Initial injection pressure ---
 Compressive pressure 3.04 MPa (31 kgf/cm²) (At engine speed 200 min⁻¹)

Reference data

Thermostat Initial opening temperature at atmospheric pressure: 82.0°C
 Temperature at valve lift of 10.0 mm and over: 95.0°C

Painting color Clear, except for cooling fan, electrical part connectors, and labels

Lubricating oil at delivery There is no engine oil when engine deliver from Isuzu factory.

Recommended lubrication oil API Grade CD, CE, CF, CF-4 or ACEA Grade B2/B3, E2/E3
 *Please refer to "Engine Instruction Manual" for details.

Engine Specifications

Model No. AH-4HK1XYBW-02

Rev. 0

Dress Level

No.	Item	Description
1	HOUSING ; FLYWHEEL	SAE J617c #3
2	FLYWHEEL	SAE J620 10" & 11.5" Combined type
3	OIL PAN	Rear sump type
4	COOLING FAN	Dia 650mm-Suction-7Blade
5	AC GENERATOR	12V-110A
6	STARTER	12V-2.5kW
7	FUEL FILTER	Loose parts (Remote type)
8	WATER SEDIMENTER	With (Integrated with fuel filter)
9	OIL FILTER	Spin-on type, Combined type (Remote)

Engine Specifications

Model No. AH-4HK1XYBW-02

Rev. 0

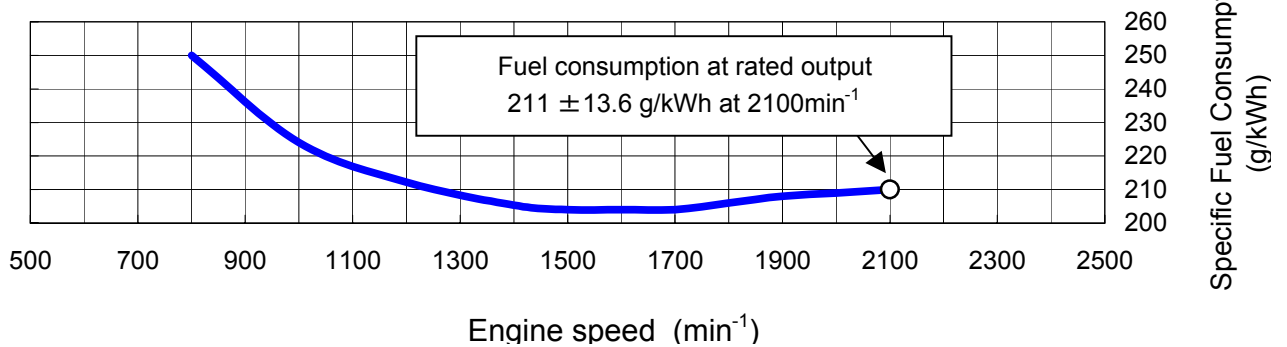
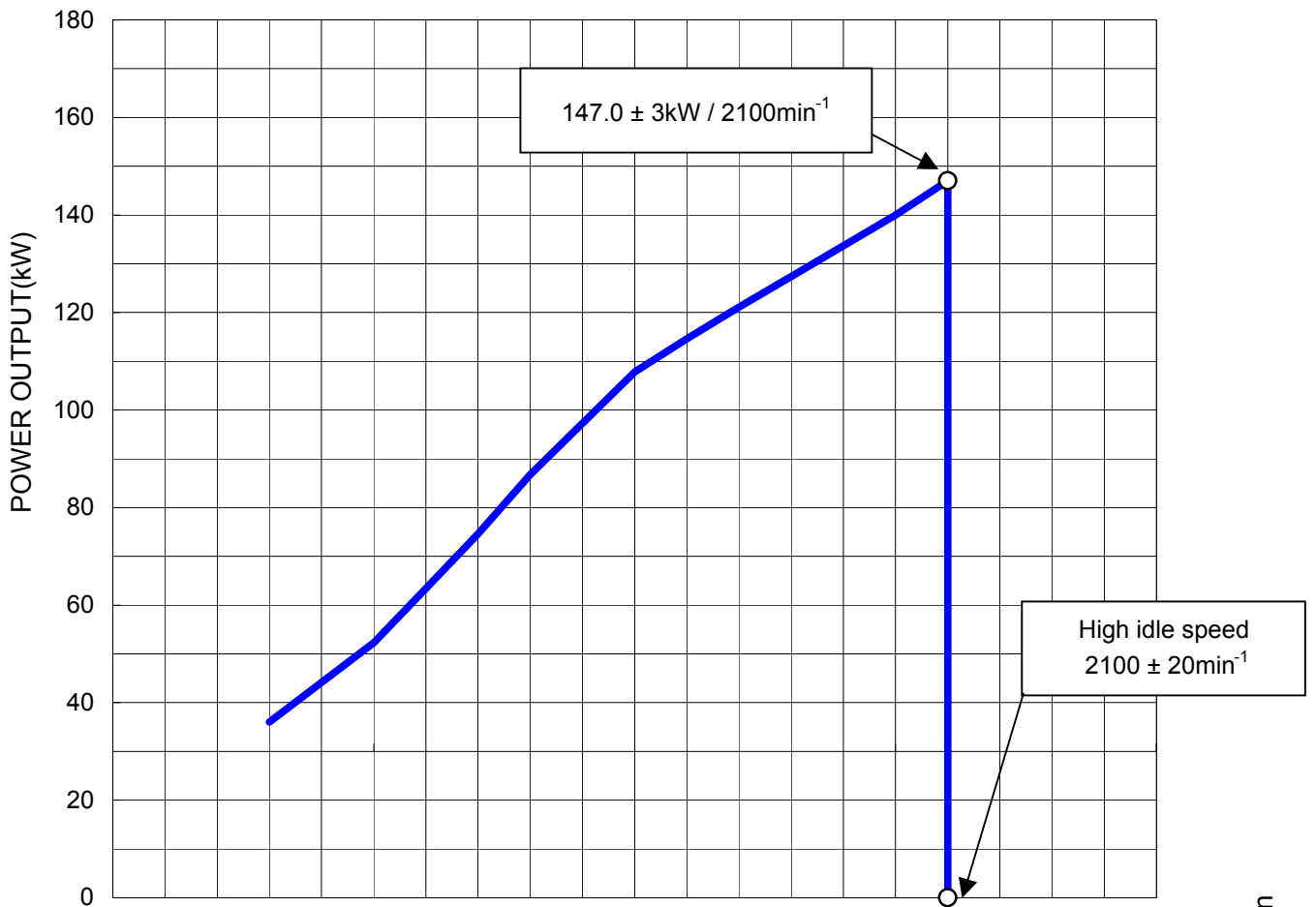
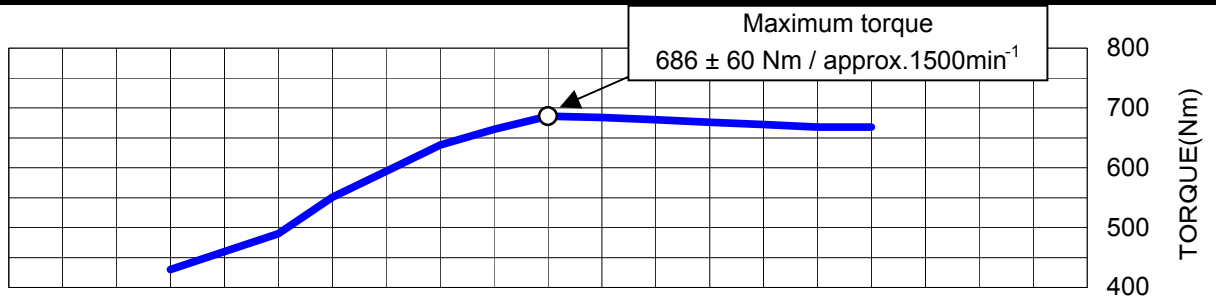
Loose parts

No.	Parts No.	Item	Qty	Remarks
1	898077-7801	ECM	1	
2	812146-8300	SENSOR;Inlet air temp.	1	
3	897324-3861	OIL FILTER ASM	1	
4	898013-9863	FILTER ASM;MAIN, FUEL	1	
5	897383-4270	PIPE ASM;FUEL	4	
6	109630-0860	PACKING;FUEL PIPE	8	
7	109675-0951	BOLT;EYE	4	
8	897217-7780	SENSOR;Barometrical press.	1	
9	114145-1840	GASKET;Exhaust pipe	1	
10	898068-2750	FEED PUMP ASM;Electric	1	
11	898075-8551	FILTER ASM;PRE, FUEL	1	
12	897173-9510	RELAY;GLOW	1	
13	582550-0290	RELAY;MAIN	1	
14	582550-0290	RELAY;STARTER CUT	1	
15	582553-0444	RELAY;STARTER	1	
16	582550-0290	RELAY;FUEL PUMP	1	
17	894402-5000	SWITCH ASM;STARTER	1	



AH-4HK1XYBW-02
For General power

Condition	JIS D0006 / SAE J1349 / ISO15550
Ambient temp.	25 deg.C
Test hour	30Hr
Cooling fan	Without (Fan disengaged)
Air cleaner	With (Intake restriction 3.4kPa)
Exh.silencer	With (Exhust restriction13.3kPa)
Generator	With (No load)



Engine specifications Revision chart

Customer : EXPORT

Engine Model : AH-4HK1XYBW-02 Application : General power

Rev. No.	IS No.	Date	Page	Item	Previous	Current	Description (Reason of change)
0	IS-08-147-0	22.Sep.08		For confirmation of prototype engine specifications			