

ディーゼル機関仕様書

ENGINE SPECIFICATIONS

機関型式 Engine Model	公式呼称 4LE1(Stage 3A / Interim Tier4) Base Model
	社内呼称 AV-4LE1NYBW-02 Model No.
納入先 Customer	一般輸出 EXPORT
搭載機種 Application	一般動力 General power
添付図面 Drawing No. (3D Data Code)	E3-1037-074-0

Symbol	Date	変更歴 Revision Record	Issue No.
0	2008-2-13	試作仕様確認用として作成 For confirmation of prototype engine specifications.	

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社内呼称 AV-4LE1NYBW-02

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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: 4LE1(Stage 3A / Interim Tier4) Base Model 4LE1(Stage 3A / Interim Tier4)	社内呼称: AV-4LE1NYBW-02 Model No. AV-4LE1NYBW-02
用途 Application	一般動力 General power	
機関型式 Engine type	4サイクル水冷頭上弁式直列、間接噴射式 Four cycle, water cooled, overhead valve, vertical in-line, in-direct injection type	
気筒数 - 径 × 行程 No. of cylinders-bore x stroke	4 - 85.0 mm x 96.0 mm	
総行程容積 Total piston displacement	2.179 L	
圧縮比 Compression ratio	21.5 21.5 to 1	
機関性能 Engine performance	: 仕様値 Rating	: 納入時規格 Rating at delivery from Isuzu factory
試験条件 Test conditions	: 大気標準状態 Standard atmospheric condition	: 大気標準状態 Standard atmospheric condition
準拠規格 Conforming standard JPN;JIS D0006-1 US;SAEJ1349 EU;ISO15550	: すり合わせ充分 Break-in time 30 hrs	: すり合せ 0.5 hr Break-in time 0.5 hr
	: ACジェネレーター付、ファン無 With AC generator and without cooling fan	: ACジェネレーター付、ファン無 With AC generator, without cooling fan
	: エアクリーナー、サイレンサー付 With air cleaner and exh. silencer	: エアクリーナー無、サイレンサー付 Without air cleaner, With exh. silencer
	* Intake restriction -2.45kPa or less	
	* Exhaust restriction 10.0kPa or less (使用燃料: EPA燃料相当)	(使用燃料: JIS 2号軽油相当)
定格出力 Rated Output	: 35.9±3% kW / 2600 min ⁻¹	:
最大トルク Maximum Torque	: 140±5%Nm / approx. 1800 min ⁻¹	:
燃料消費率(定格出力) Fuel consumption at rated.	: 257±5% g/kw.h	:
無負荷最高回転速度 No load max. speed	: 2860±25 min ⁻¹	:
無負荷最低回転速度 Low idle speed	: 1100±25 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 170 kg Approx. 170 kg	
機関寸法 Dimensions	全長 753.7 mm × 全幅 501.2 mm × 全高 601.8 mm (ファン付) L 753.7 x W 501.2 x H 601.8 (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 (OHV) Overhead valve	

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過給装置	なし
Supercharging device	None(Natural aspirated)
過給方式	---
Supercharging system	---
駆動方式	---
Driving system	---
潤滑方式	---
Lubricating system	---
製造業者名	---
Manufacturer	---
名称	---
Name of type	---
燃料装置	
Fuel device	
噴射ポンプ	
Injection pump	
製造業者名	(株)ボッシュオートモーティブシステム
Manufacturer	Bosch automotive system
名称	PFR1KX型
Name of type	PFR1KX type
プランジャー	径 6.5 mm (燃料油潤滑式)
Plunger	Diameter 6.5 mm (Lubricated by fuel oil)
噴射ノズル	
Injection nozzle	
製造業者名	(株)ボッシュオートモーティブシステム
Manufacturer	Bosch automotive system
名称	スロットル式
Name of type	Throttle type
噴射時期調整機	なし
Fuel injection time regulator	None
製造業者名	---
Manufacturer	---
名称	---
Name of type	---
燃料供給ポンプ	付(エンジン装着)
Fuel feed pump	With(Engine attached)
製造業者名	(株)ユーシン
Manufacturer	U-Shin LTD.
名称	電磁式
Name of type	Electromagnetic type
燃料濾過器	付(エンジン装着)
Fuel filter	With(Engine attached)
濾過方式	濾紙式
Filtering system	Paper element type
製造業者名	東京濾器(株)
Manufacturer	TOKYO ROKI
名称	濾紙式
Name of type	Paper element type
調速機	
Governor	
調速方式	遠心式全速制御
Speed control system	Centrifugal variable speed control
潤滑方式	飛沫式
Lubricating system	Splash type
製造業者名	いすゞ自動車(株)
Manufacturer	ISUZU MOTORS LIMITED
名称	---
Name of type	---

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潤滑装置

Lubricating device

潤滑方式

強制循環式

Lubricating system

Full forced pressure feed type

潤滑ポンプ

Lubricating pump

型式

トロコイドポンプ

Type of pump

Trochoid pump type

駆動方式

タイミングギア駆動

Driving system

Driven by timing gear

油圧調整装置

ピストンバネ式

Oil pressure regulating device Piston - spring type

油圧指示装置

油圧ウォーニングランプ用スイッチ付き

Oil pressure indicating device Oil pressure switch for warning lamp(Push-off, 98kPa)

潤滑油濾過器

Oil filter

濾過方式

全流濾紙式

Filtering system

Full flow paper element

製造業者名

東京濾器(株)

Manufacturer

TOKYO ROKI

潤滑油冷却器

付

Oil cooler

With

冷却方式

水冷式

Cooling system

water-cooled

製造業者名

東京濾器(株)

Manufacturer

TOKYO ROKI

冷却装置

Cooling device

冷却方式

水冷式

Cooling system

Pressurized water forced circulation type

冷却ファン

Cooling fan

形式

Φ400-6-吸込み

Type of fan

駆動方式

ベルト駆動 プーリ比=クランク/ファン= 123 / 110 = 1.12

Driving system

Belt driven by crankshaft, speed ratio: 1.12

水ポンプ

Water pump

形式

渦巻式

Type of pump

Impeller type

駆動方式

ベルト駆動

Driving system

Belt driven by crankshaft pulley

水温調節装置

Thermostat

方式

ワックスペレット式

Regulating system

Wax-pellet type

製造業者名

富士精工(株)

Manufacturer

Fuji Bellows Co., Ltd.

水温指示装置

オーバーヒートスイッチ無し

Water temperature indicating device

None

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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	(株)デンソー
Manufacturer	Denso corporation
名称	リダクション型
Name of type	Reduction type
電圧	12V
Voltage	12V
出力	2.0kW
Output	2.0kW
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 グロープラグ)
Preheating device	With Glow plug (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	(株)デンソー
Manufacturer	Denso corporation
電圧	12V
Voltage	12V
出力	35A
Output	35A
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	(株)デンソー
Manufacturer	Denso corporation
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 許容傾斜角度 Allowable inclination angle	付 With フライホイール側から見て 前下がりがり: 0.523rad 後ろ下がりがり: 0.523rad 左下がりがり: 0.523rad 右下下がりがり: 0.523rad 0.523 rad.(30deg) for all directions viewed from flywheel
各種容量 Capacity	
油量 Lubrication oil	MAX: 約 8.4 L MIN: 約 5.9 L (オイルパン内容量) MAX : approx. 8.4 L MIN : approx. 5.9 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	約 2.8 L (エンジンのみ) Approx 2.8 L (Engine only)
その他 Others	---
整備諸元 Maintenance data	
弁整備諸元 Valve clearance and adjustment	項目 : 弁スキマ : 開弁時期 : 閉弁時期 Valve Valve clearance Valve timing: open Valve timing: close 吸気弁 : 冷間時 0.4 mm : 上死点前 0.26 rad(15deg) : 下死点後 0.51 rad(29deg) Inlet 0.4 mm at cold 0.26 rad(15deg) BTDC 0.51 rad(29deg) ABDC 排気弁 : 冷間時 0.4 mm : 下死点前 0.7 rad(40deg) : 上死点後 0.28 rad(16deg) Exhaust 0.4 mm at cold 0.7 rad(40deg) BBDC 0.28 rad(16deg) ATDC
噴射時期 Injection timing	上死点前 0.227 rad (13deg.) BTDC 0.227 rad (13deg)
噴射開始圧力 Initial injection pressure	14.7 MPa
圧縮圧力 Compressive pressure	14.7 MPa
参考諸元 Reference data	
水温調節装置 Thermostat	3.04 MPa (31 kgf/cm ²) (エンジン回転: 250 min ⁻¹ において) (At engine speed 250 min ⁻¹)
塗装色 Painting color	開き始め (大気圧において) : 82.0 °C Initial opening temperature at atmospheric pressure: 82.0 degrees C ストローク 8.0 mm 以上になる温度 : 95.0 °C Temperature at valve lift of 8.0 mm and over: 95.0 °C
出荷時充填潤滑油 Lubricating oil at delivery	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
推奨充填潤滑油 Recommended lubrication oil	出荷時オイル無し There is no engine oil when engine deliver from Isuzu factory. 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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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#4 相当 SAE#4 Level
2	FLYWHEEL	準SAE 10 inch semi-SAE 10" STD type
3	OIL PAN	ドレインプラグ付き With Drain plug
4	OIL LEVEL GAUGE	付き、エンジン右側面 With (Engine RH attached)
5	AC GENERATOR	デンソー A/C 12V-35A Denso corporation A/C 12V-35A
6	STARTER	デンソー 12V-2.0kW Denso corporation 12V-2.0kW
7	FUEL FILTER	付き、エンジン右側面 With (Engine RH attached)
8	OIL FILTER	付き、エンジン右側面 With (Engine RH attached)
9	WATER INLET PIPE	右横向き(F/W側から見て) Right hand sideward (Viewed from Flywheel)
10	WATER OUTLET PIPE	左横向き(F/W側から見て) Left hand sideward (Viewed from Flywheel)
11	AIR INLET	左側後向き(F/W側から見て) Left hand rearward (Viewed from Flywheel)
12	COOLING FAN	Φ400-6-吸込み(同梱品) dia.400-6 blade-Suction(Loose parts)
13	FAN SPACER	t=36.5 (4.5+32) (同梱品) t=36.5 (4.5+32) (Loose parts)
14	POWER TAKE OFF	なし None

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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	894173-9480	CONTROL RESISTANCE	1	
2	897091-5400	CONNECTOR;ACG	1	
3	897068-7781	SAFETY UNIT	1	
4	582550-0290	RELAY;STARTER	1	
5	513660-3041	FAN ASM;COOLING(dia.400-Suc)	1	
6	028050-8500	BOLT;FAN FIX	4	Temporary attached to ENG
7	897063-4003	SPACER;FAN t=4.5	1	Temporary attached to ENG
8	913642-0780	SPACER;FAN t=32.0	1	Temporary attached to ENG
9	897042-0280	GSKT;EXH. PIPE	1	Temporary attached to ENG
10	---	SUPPLEMENT LABEL	1	Temporary attached to ENG
11	898106-4910	FUEL INLET LABEL	1	Temporary attached to ENG

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Engine Model	Base Model :	4LE1(Stage 3A / Interim Tier4)
	Model No. :	AV-4LE1NYBW-02
Customer	EXPORT	
Application	General power	
Drawing No. (3D Data Code)	E3-1037-074-0	

Symbol	Date	Revision Record	Issue No.
0	2008-2-13	For confirmation of prototype engine specifications.	
	:	:	:
	:	:	:
	:	:	:
	:	:	:
	:	:	:

ISUZU MOTORS LIMITED
Powertrain Business Dept.

Manager : Nobuhiro Shimizu

Prepared : Koji Ogawa



Engine Specifications

Model No. AV-4LE1NYBW-02

Rev. 0

Manufacturer	ISUZU MOTORS LIMITED
Engine Model	Base Model: 4LE1(Stage 3A / Interim Tier4) Model No. AV-4LE1NYBW-02
Application	General power
Engine type	Four cycle, water cooled, overhead valve, vertical in-line, in-direct injection type
No. of cylinders-bore x stroke	4 - 85.0 mm x 96.0 mm
Total piston displacement	2.179 L
Compression ratio	21.5 to 1

Engine performance	Rating	Rating at delivery from Isuzu factory
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Test conditions	Standard atmospheric condition	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	Break-in time 0.5 hr
	With AC generator and without cooling fan	With AC generator, without cooling fan
	With air cleaner and exh. silencer	Without air cleaner, With exh. silencer
	* Intake restriction -2.45kPa or less	
	* Exhaust restriction 10.0kPa or less	
Fuel : EPA	Fuel : JPN: JIS-NO.2	

Rated Output	: 35.9±3% kW / 2600 min-1	:
Maximum Torque	: 140±5%Nm / approx. 1800 min-1	:
Fuel consumption at rated.	: 257±5% g/kw.h	:
No load max. speed	: 2860±25 min-1	:
Low idle speed	: 1100±25 min-1	:

Type of fuel	Diesel fuel only (JPN:JIS-NO.2, US:ASTM-2D, EU:EN590)
Engine dry weight	Approx. 170 kg
Dimensions	L 753.7 x W 501.2 x H 601.8 (With cooling fan)
Firing order	1 - 3 - 4 - 2
Rotating direction	Clockwise viewed from cooling fan
Valve device	Overhead valve

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Supercharging device

None(Natural aspirated)

Supercharging system

Driving system

Lubricating system

Manufacturer

Name of type

Fuel device

Injection pump

Manufacturer

Bosch automotive system

Name of type

PFR1KX type

Plunger

Diameter 6.5 mm (Lubricated by fuel oil)

Injection nozzle

Manufacturer

Bosch automotive system

Name of type

Throttle type

Fuel injection time regulator

None

Manufacturer

Name of type

Fuel feed pump

With(Engine attached)

Manufacturer

U-Shin LTD.

Name of type

Electromagnetic type

Fuel filter

With(Engine attached)

Filtering system

Paper element type

Manufacturer

TOKYO ROKI

Name of type

Paper element type

Governor

Speed control system

Centrifugal variable speed control

Lubricating system

Splash type

Manufacturer

ISUZU MOTORS LIMITED

Name of type

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Lubricating device

Lubricating system Full forced pressure feed type

Lubricating pump

Type of pump Trochoid pump type

Driving system Driven by timing gear

Oil pressure regulating device Piston - spring type

Oil pressure indicating device Oil pressure switch for warning lamp(Push-off, 98kPa)

Oil filter

Filtering system Full flow paper element

Manufacturer TOKYO ROKI

Oil cooler

Cooling system With water-cooled

Manufacturer TOKYO ROKI

Cooling device

Cooling system Pressurized water forced circulation type

Cooling fan dia.400-6-Suction

Type of fan ---

Driving system Belt driven by crankshaft, speed ratio: 1.12

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 deviceNone

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Air cleaner

 Cleaning system ---
 Manufacturer ---

Starting device

Starting motor
 Manufacturer Denso corporation
 Name of type Reduction type
 Voltage 12V
 Output 2.0kW

Engine stop device

Fuel cut (Electronic controlled)

Preheating device

With Glow plug (QOS- II)

Alternator

Generating system A/C type
 Manufacturer Denso corporation
 Voltage 12V
 Output 35A
 Driving system Belt driven by crankshaft pulley

Regulator

Regulating system Built-in IC regulator
 Manufacturer Denso corporation
 Charging discharging indicating system: ---

Hour meter

Without
 System ---
 Manufacturer ---
 Fitting position ---
 Driving system ---
 Speed ratio ---
 Rated speed indicator ---

Power Take Off

With
 Maximum torque from PTO 88Nm(9.0kgfm)
 Speed ratio ENG rpm : PTO rpm = 1 : 1.23
 Rotation direction Clockwise viewed from fan side
 Flange type FLAT ROOT SIDE
 Detail of gear spline
 Number of teeth 9
 Diametric pitch 16/32
 Pressure angle 30 deg

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Allowable inclination angle 0.523 rad.(30deg) for all directions viewed from flywheel

Capacity

Lubrication oil MAX : approx. 8.4 L MIN : approx. 5.9 L (Oil pan only)
 Air cleaner ---
 Injection pump ---
 Governor ---
 Cooling water Approx 2.8 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	0.26 rad(15deg) BTDC	0.51 rad(29deg) ABDC	
Exhaust	0.4 mm at cold	0.7 rad(40deg) BBDC	0.28 rad(16deg) ATDC	

Injection timing BTDC 0.227 rad (13deg)
 Initial injection pressure 14.7 MPa
 Compressive pressure 3.04 MPa (31 kgf/cm²) (At engine speed 250 min-1)

Reference data

Thermostat Initial opening temperature at atmospheric pressure: 82.0 degrees C
 Temperature at valve lift of 8.0 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

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

Engine Specifications

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Dress Level

No.	Item	Description
1	HOUSING ; FLYWHEEL	SAE#4 Level
2	FLYWHEEL	semi-SAE 10" STD type
3	OIL PAN	With Drain plug
4	OIL LEVEL GAUGE	With (Engine RH attached)
5	AC GENERATOR	Denso corporation A/C 12V-35A
6	STARTER	Denso corporation 12V-2.0kW
7	FUEL FILTER	With (Engine RH attached)
8	OIL FILTER	With (Engine RH attached)
9	WATER INLET PIPE	Right hand sideward (Viewed from Flywheel)
10	WATER OUTLET PIPE	Left hand sideward (Viewed from Flywheel)
11	AIR INLET	Left hand rearward (Viewed from Flywheel)
12	COOLING FAN	dia.400-6 blade-Suction(Loose parts)
13	FAN SPACER	t=36.5 (4.5+32) (Loose parts)
14	POWER TAKE OFF	None

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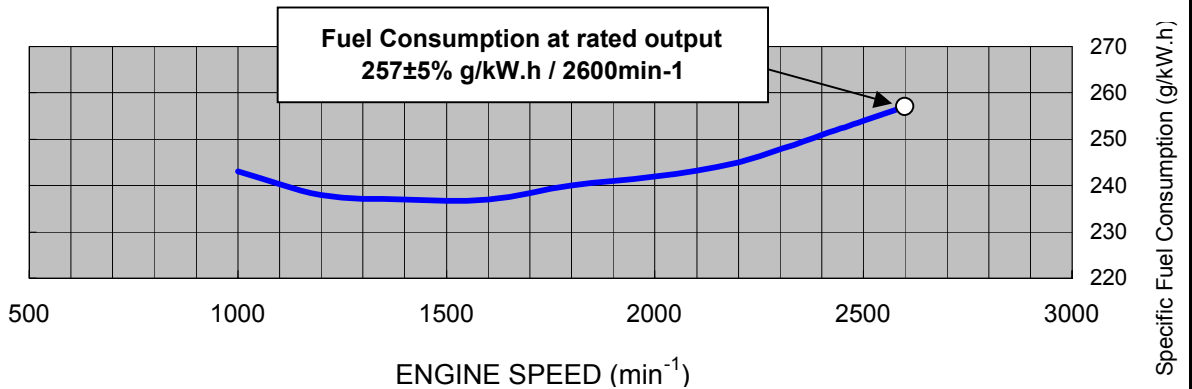
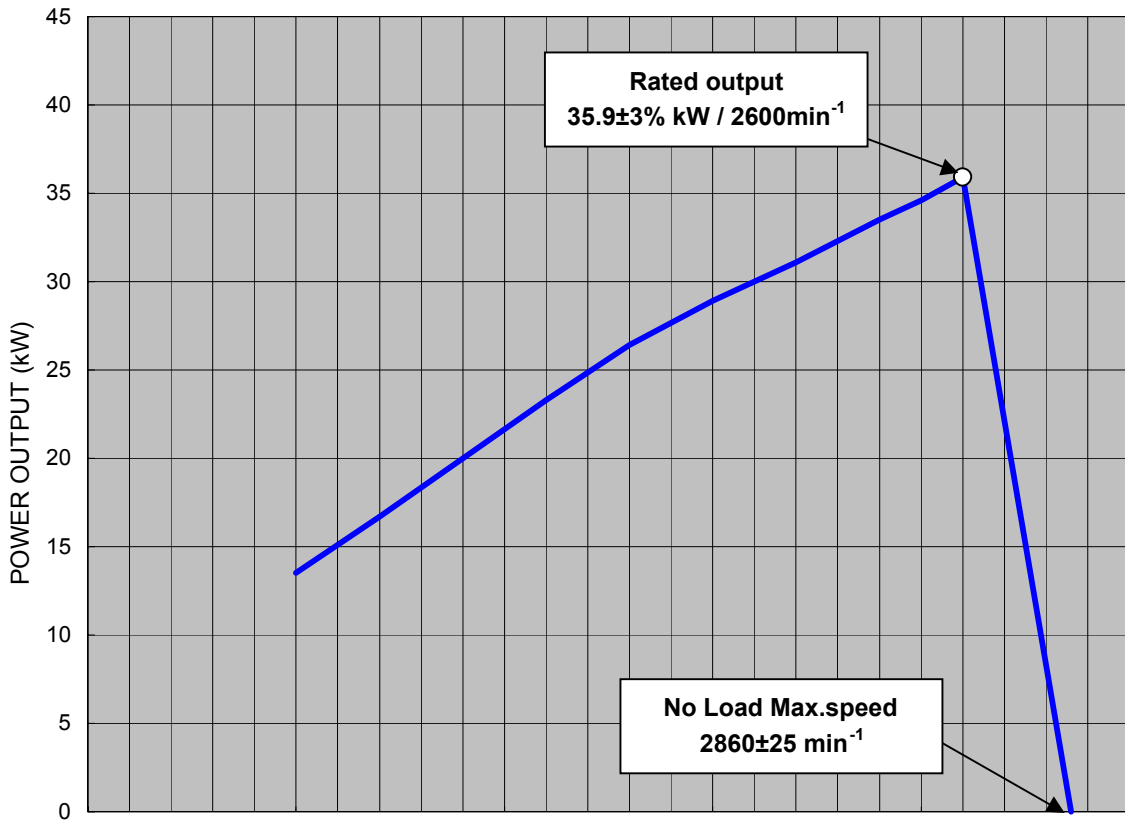
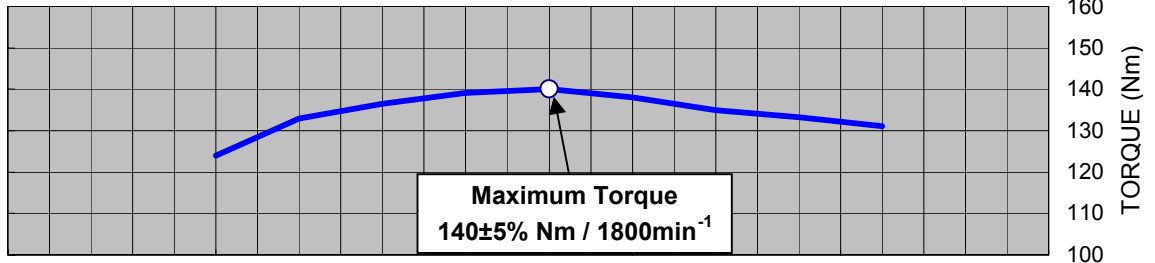
Loose parts

No.	Parts No.	Item	Qty	Remarks
1	894173-9480	CONTROL RESISTANCE	1	
2	897091-5400	CONNECTOR;ACG	1	
3	897068-7781	SAFETY UNIT	1	
4	582550-0290	RELAY;STARTER	1	
5	513660-3041	FAN ASM;COOLING(dia.400-Suc)	1	
6	028050-8500	BOLT;FAN FIX	4	Temporary attached to ENG
7	897063-4003	SPACER;FAN t=4.5	1	Temporary attached to ENG
8	913642-0780	SPACER;FAN t=32.0	1	Temporary attached to ENG
9	897042-0280	GSKT;EXH. PIPE	1	Temporary attached to ENG
10	---	SUPPLEMENT LABEL	1	Temporary attached to ENG
11	898106-4910	FUEL INLET LABEL	1	Temporary attached to ENG

ISUZU

AV-4LE1NYBW-02 (High Speed STD)
Target Performance Curve

conditions	SAE J1349 NET wo/Fan
atmospheric condition	25°C
braking time	30Hr
Pulley Ratio	-
Cooling Fan	without
Air Cleaner	with (2.45kPa)
Alternator	with
EXH. Silencer	with (10kPa)



Engine specifications Revision chart

Customer : EXPORT

Engine Model : AV-4LE1NYBW-02 Application : General power

Rev. No.	IS No.	Date	Page	Item	Previous	Current	Description (Reason of change)
0	IS-08-015-0	13th.Feb.08		For confirmation of prototype engine specifications			