CASE

REPAIR MANUAL

Isuzu 4LE2 Tier 3 Engine

87495896NA

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General Information

General Information

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Engine

4LE2 Engine Mechanical

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Engine

4LE2 Cooling System

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Specifications

Item \ Engine name			4LE2X
Engine structure type			4-cycle, water cooled-type, inline four-cylinder, OHV type
Cylinder number – bore × stroke (mm {in})			4 – 85{3.35} × 96{3.78}
Total displacement (L {cu·in})			2.179 {133}
Compression ratio			18.3:1
Combustion chamber type			Direct injection
Overall length × overall width × overall height (mm {in})			* 756.3{29.78} × 557{21.93} × 747.3{29.42}
Dry weight (kg)			* 210
Firing order			1 — 3 — 4 — 2
Fuel injection timing (BTDC) (at stop)			* 2°
Compression pressure (MPa {psi})			3.04 {441} / 250 rpm
Valve clearance (at cold condition) (mm {in})		Intake air	0.40 {0.016}
		Exhaust	0.40 {0.016}
Opening/closing period of valve	Intake valve	Open (before top dead center)	15°
		Closed (after bottom dead center)	29°
	Exhaust valve	Open (before bottom dead center)	40°
		Closed (after top dead center)	16°
Injection pump type			Bosch type, PFR1KZ model, four
Governor type			Centrifugal type, all speeds controlled
Nozzle type			Multi-hole type (KBDL model)
Injection pressure (MPa {psi})			* First step: 16.7 {2422} Second step: 25.0 {3626}
Fuel type			Diesel (JIS K2204)
Cooling method			Forced circulation, water cooling pressurization type
Cooling fan			* ϕ500 × 8 pieces
Coolant amount (L {qts})			Approx. 4.3 {4.5} (Engine only)
Lubrication oil amount: total (L {qts})			* Approx. 12.1 {12.8} at MAX, 9.3 {9.8} at MIN
Lubricant type (API service category)			CD or CF-4 * (CE, CF, CH-4, CI-4 or CI-4 Plus)
Generator output (V — A)			* 24 — 30 (Mitsubishi) * 24 — 50 (Nikko)
Starter output (V — kW)			* 24 — 3.2

Caution: This specification may be changed partially without notice.
* mark may vary depending on each machine. Refer to the machine manufacturer specification.

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Handling

Be careful with the following when handling a generator.

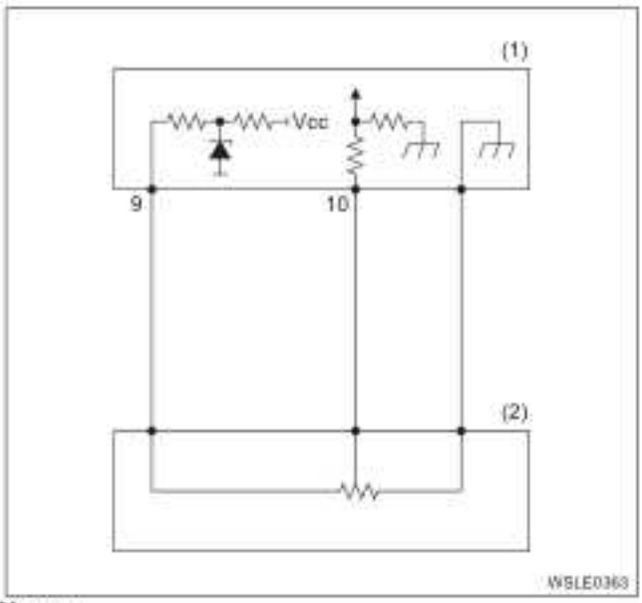
- Connecting the polarities of battery inversely causes generator diode to be broken.
- While the engine runs, Never disconnect the wiring of battery terminal and charging circuit.
- Wiring connection to terminal must be performed properly according to terminal symbol.
- Do not perform megger test on semiconductor device.
- Be sure to disconnect the battery terminal (–) before inspection on equipment.
- Do not open/close the battery relay switch while the engine runs.
- Disconnect the battery terminal when charging from external source such as quick charge.
- Do not pour steam cleaner or water directly on it.
- After connecting to B terminal and E terminal, tighten them to the following torque.
  B terminal: 4.9 — 6.9 N·m {50.0 — 70.4 kgf·cm/ 43.4 — 61.1 lb·in}
  E terminal: 4.9 — 6.9 N·m {50.0 — 70.4 kgf·cm/ 43.4 — 61.1 lb·in}
- Refer to 1A-4, "Function Check, ISUZU Diesel Engine" for tension adjustment of the v-belt.

Trouble and Action

Trouble symptom	Trouble location	Trouble cause	Action to be taken
Charging is impossible.	Wiring and ammeter	Open or short circuit, disconnection	Repair.
	Generator	Open circuit, short to ground, short circuit in each coil	Replace.
		Broken diode	Replace.
	Regulator	Defective regulator	Replace.
		Poor contact in terminal of regulator	Repair.
Insufficient charging	Wiring	Open or short circuit, looseness in connection	Repair.
	Generator	Looseness of generator drive belt	Repair.
		Layer or short circuit in field coil	Replace.
		Layer or short circuit in stator coil	Replace.
		Defective diode	Replace.
		Poor contact in each terminal	Repair.
	Regulator	Defective regulator	Replace.
		Poor contact in terminal of regulator	Repair.
Overcharging	Regulator	Defective regulator	Replace.
Unstable charging current	Wiring	Intermittent contact or nearly disconnected connection in wiring	Repair.
	Generator	Looseness of generator drive belt	Repair.
		Short circuit or nearly disconnected connection in field coil	Repair.
		Short circuit or nearly disconnected connection in stator coil	Repair.
		Poor contact in each terminal	Repair.
	Regulator	Defective regulator	Replace.
		Poor contact in terminal of regulator	Repair.
Noisy generator	Generator	Improper installation of generator	Repair.
		Defective bearing	Replace.
		Contact of rotor core and stator core	Repair.
		Defective diode	Replace.
		Short circuit in stator coil	Replace.

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Boost Pressure Sensor Circuit Diagram



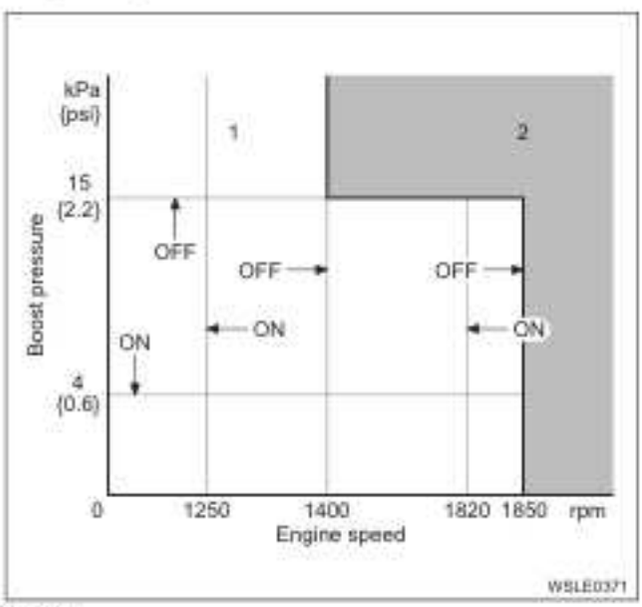
Name

1. EGR Cut Controller
2. Boost Pressure Sensor

Engine Coolant Temperature Control

The EGR valve is opened when the engine coolant temperature becomes 60°C {140°F} or more, and is closed when 55°C {131°F} or less.

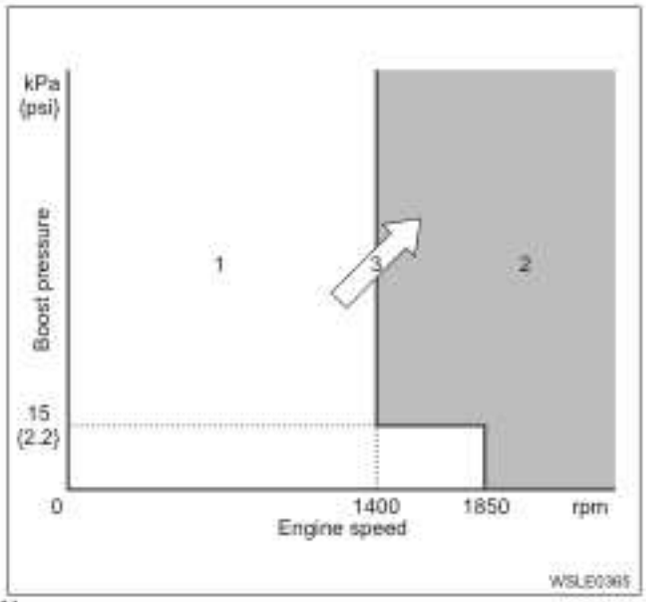
Engine Speed and Boost Pressure Control



Name

1. EGR Valve Closed
2. EGR Valve Open

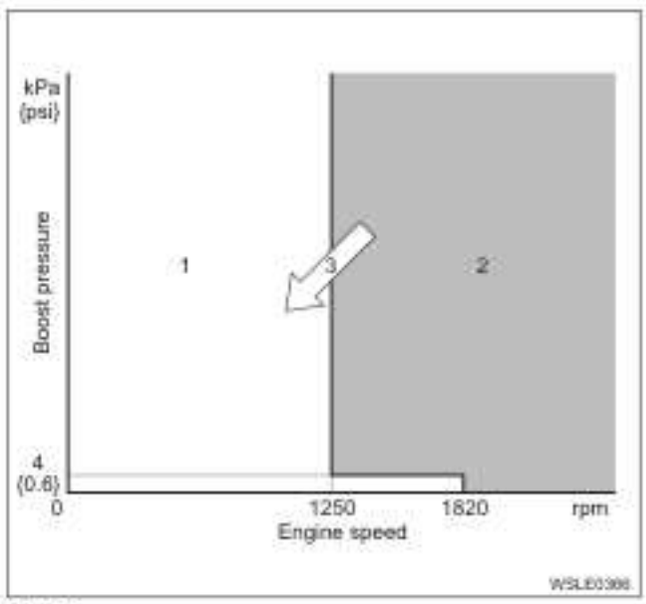
When the engine speed and boost pressure increase



Name

1. EGR Valve Closed
2. EGR Valve Open
3. Engine Speed and Boost Pressure Increase

When the engine speed and boost pressure decrease



Name

1. EGR Valve Closed
2. EGR Valve Open
3. Engine Speed and Boost Pressure Decrease

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