DM

DIAGNOSIS MANUAL

REFORMER SYSTEM

V1505-T-E4
(FOR ZERO TURN MOWER)

Kubota

KiSC issued 12, 2016 A

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MECHANISM

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SERVICING

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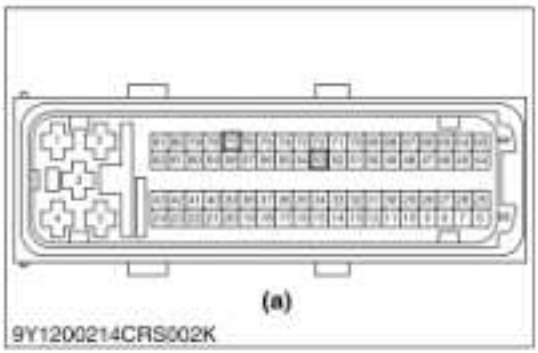
[3] LIST OF MALFUNCTION SYMPTOM

Malfunctions and corresponding symptoms resulting from the fuel reformer may also be generated from other sources, such as the engine (mechanical parts), the fuel system, etc. When performing fuel reformer troubleshooting, the aim is not to quickly determine that the fuel reformer is the cause of a malfunction. Rather, the cause should be exhaustively considered while verifying the causes listed below.

Malfunction symptom	Area of Fault	Cause	Action
Engine overheat	Fuel system	Poor fuel	Switch to the correct fuel (No.2-D diesel fuel).
	Lubrication system	Engine oil deterioration.	Change engine oil.
		Inappropriate engine oil.	Replace with the appropriate engine oil (API Service Classification CJ-4 grade or higher).
		Faulty oil pump.	Replace oil pump.
		Insufficient engine oil level	Add engine oil.
Insufficient output	Intake system	Clogged air cleaner element.	Clean or replace air cleaner element.
	Fuel system	Air mixed with the fuel system.	Perform fuel system air bleeding.
		Faulty fuel filter.	Replace fuel filter.
		Poor or inappropriate fuel.	Switch to the correct fuel (No.2-D diesel fuel).
	Engine	Worn cylinder liner and the piston ring of the piston. (Low compression pressure)	Overhaul engine.
	Other	Overheat	Refer to "Engine Overheat" items.
Faulty starting	Intake system	Clogged air cleaner element.	Clean or replace air cleaner element.
	Fuel system	Insufficient fuel.	Add fuel and perform fuel system air bleeding.
		Fuel system clogged.	Clean the fuel system.
		Large amount of intermixing water to the water separator, element clogging and deformation.	Clean or replace.
		Air being introduced through fuel system connection points.	Tighten connections.
		Clogged fuel filter	Replace fuel filter.
		Fuel feed pump operation fault.	Replace fuel feed pump.
		Injection pipe connection loose.	Tighten connecting nut.
	Electrical system	Battery fault	Inspect battery.
		Faulty starter wiring.	Replace starter wiring.
		Loose battery cable.	Tighten battery terminal connections, or replace cables.
		Faulty starter operation.	Replace starter assembly.
		Starting assist device (glow plug) fault.	Replace starting assist device (glow plug).
	Lubrication system	Excessive engine oil viscosity.	Replace with oil of appropriate viscosity.
	Engine	Burnt pistons.	Replace piston, piston ring and cylinder block.
		Burnt main bearing.	Replace main bearing and crankshaft.
		Low compression pressure.	Overhaul engine.
	Other	Ring gear damage.	Flywheel / starter replacement.
Idle fault	Engine	Poor valve clearance	Adjust valve clearance.
		Poor valve seat contact.	Break in valve and valve seat, or replace.
		Low coolant temperature.	Perform warm-up operation.
		Large difference in cylinder-to cylinder compression pressure.	Overhaul engine.

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2. Check the resistance between terminals

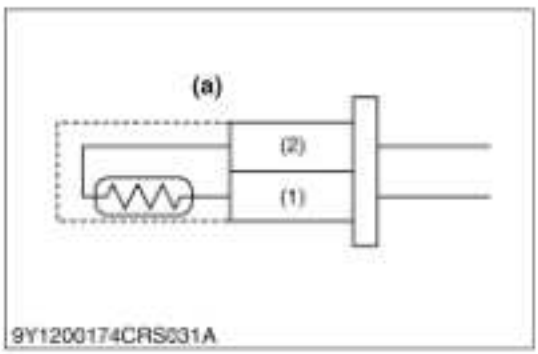
1. Place the key switch in the OFF position, unplug the ECU wiring harness connector from the socket.
2. Measure the resistance between connector terminal No.77 and No.53.

Factory specification	
Temperature	Resistance
100 °C (212 °F)	Approx. 18.3 kΩ
150 °C (302 °F)	Approx. 7.88 kΩ
200 °C (392 °F)	Approx. 4.00 kΩ
250 °C (482 °F)	Approx. 2.30 kΩ

OK	Go to "4. Measure the ECU terminal voltage".
NG	Go to "3. Measure the resistance of burner temperature sensor".

(a) ECU Wiring Harness Connector (Harness Side)

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3. Check the Sensor

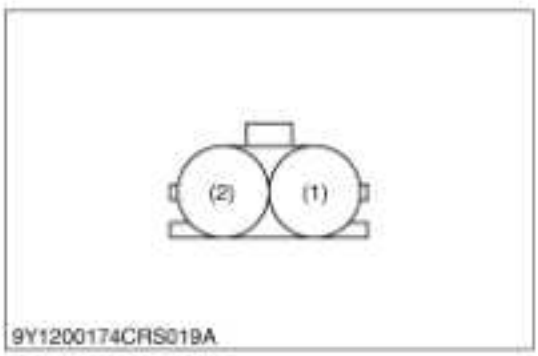
1. Turn the key switch OFF, remove the connector from the sensor side.
2. Measure the resistance between the terminals on the sensor side.

Factory specification	
Temperature	Resistance
100 °C (212 °F)	Approx. 18.3 kΩ
150 °C (302 °F)	Approx. 7.88 kΩ
200 °C (392 °F)	Approx. 4.00 kΩ
250 °C (482 °F)	Approx. 2.30 kΩ

OK	Wiring harness open circuit. Check and repair.
NG	Replace the burner temperature sensor.

(1) Terminal **1** (No.53:GND)
(2) Terminal **2** (No.77:Burner Temp. Sensor)
(a) Burner Temperature Sensor

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4. Measure the ECU terminal voltage

1. Plug the ECU wiring harness connector into socket again, and unplug the sensor connector.
2. Place the key switch in the ON position, and measure the voltage between terminals of the sensor connector (at the wiring harness side).

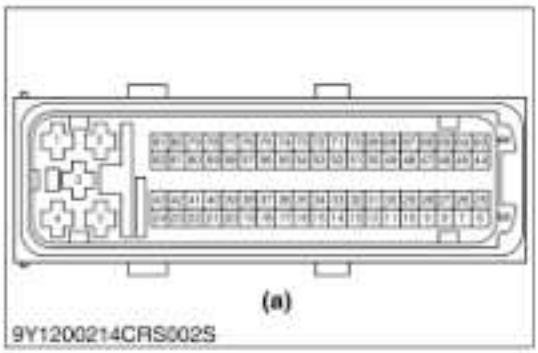
Factory specification	Approx. 5 V

OK	The ECU connector is faulty or its wiring harness is shorted.
NG	Confirm by using other glow plugs that there is no ground short malfunction before replacing the ECU.

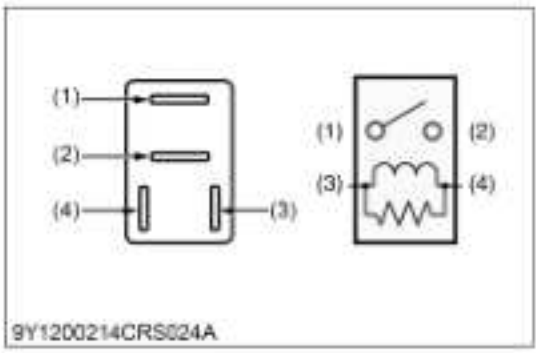
(1) Terminal **1** (No.53: GND)
(2) Terminal **2** (No.77: Burner Temp. Sensor)

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3. Check the wiring harness

1. Unplug the ECU wiring harness connector from socket and unplug the battery.
2. Check conduction between the ECU connector side No.80 and glow relay for fuel reforming connector terminal **86** (3), and reformer glow plug and glow relay for fuel reforming connector terminal **87** (2).

Factory specification	Approx. 0 Ω

OK	Replace the ECU.
NG	Replace the wiring harness.

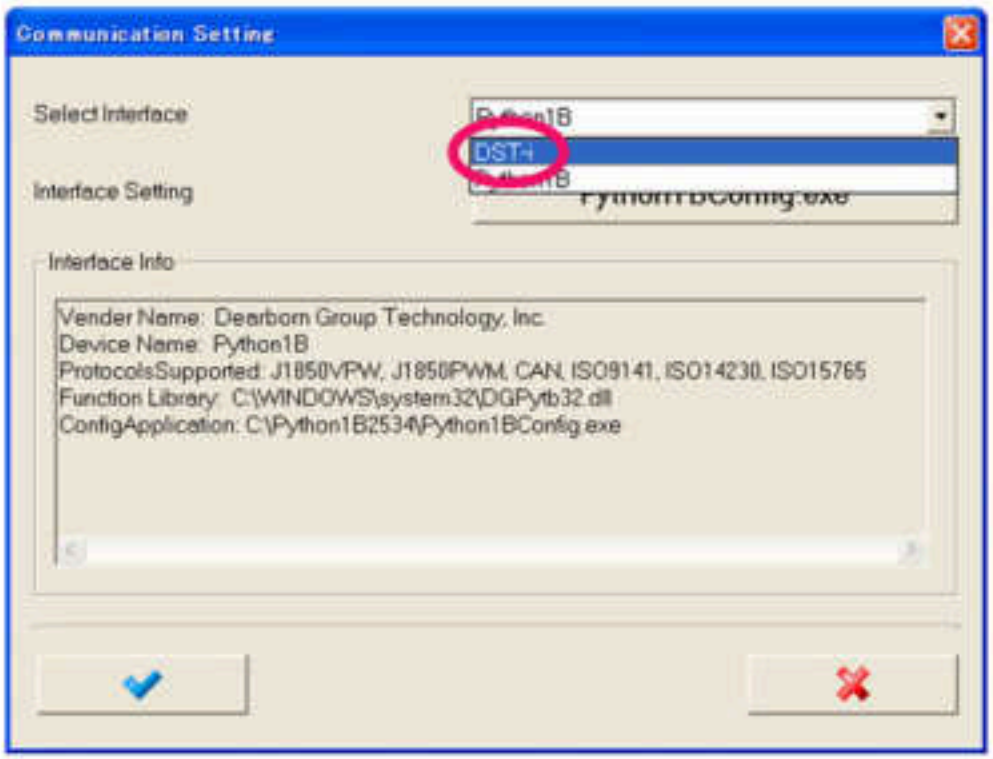
(1) Terminal **30**
(2) Terminal **87**
(3) Terminal **86**
(4) Terminal **85**

(a) ECU Wiring Harness Connector (Harness Side)

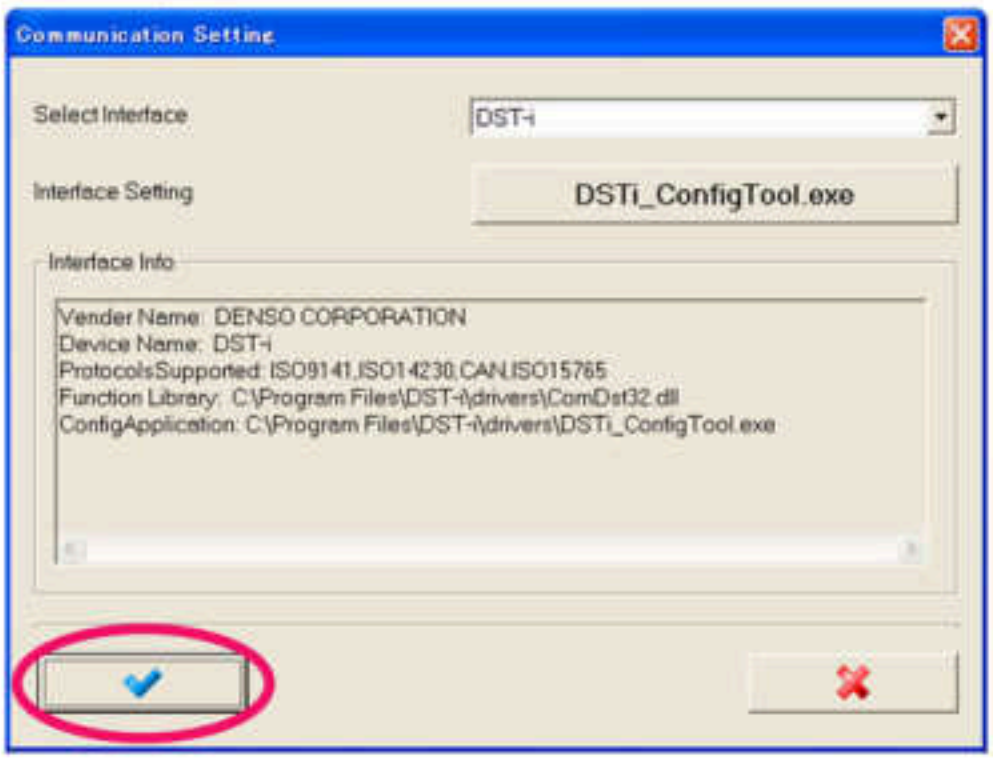
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3. Select "DST-i", and then click the mouse button.



4. Click the  button.



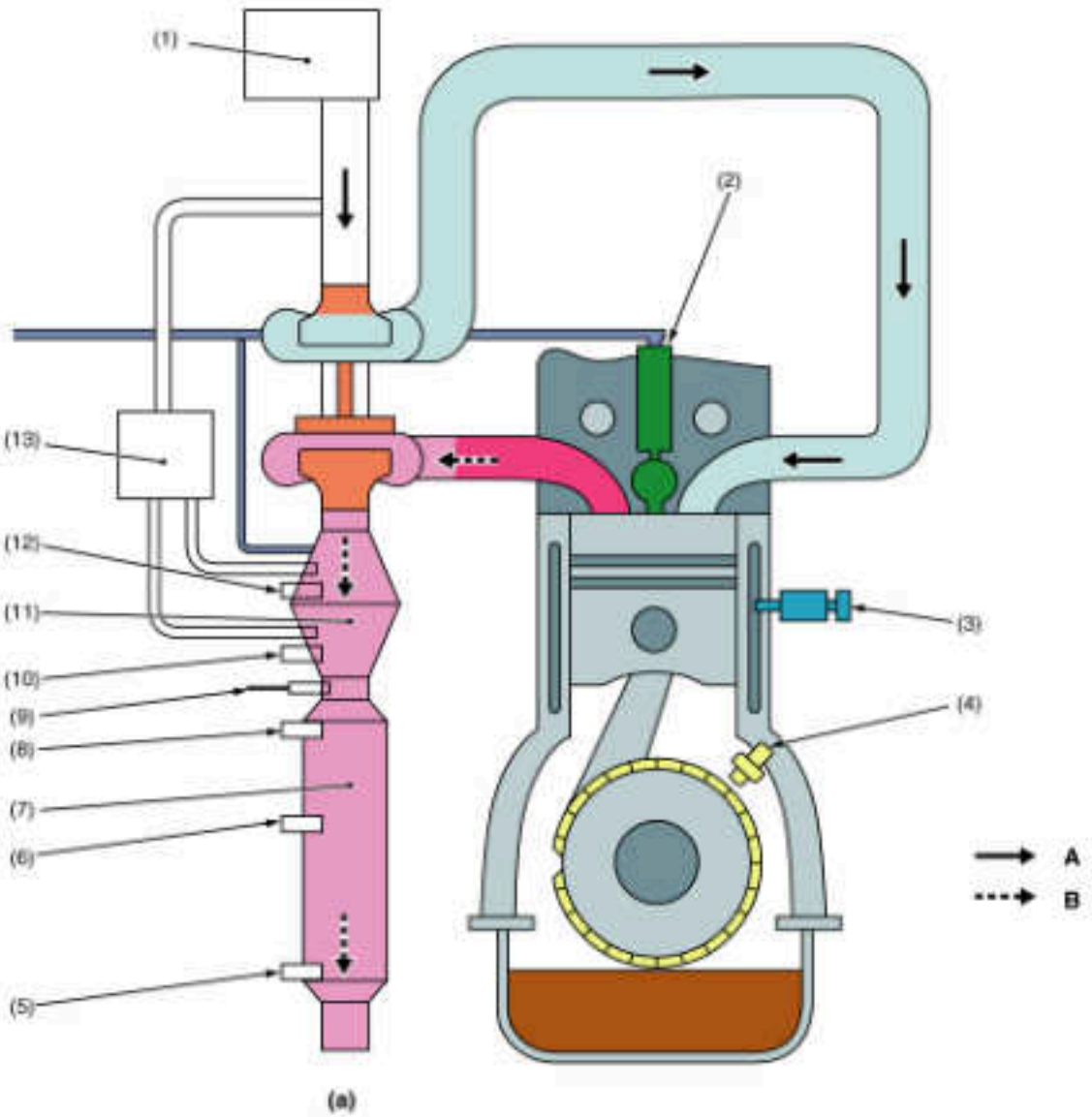
■ **NOTE**

- **If you failed in the setting, confirm the connection and start again from procedure 1. to 4..**

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[3] INTAKE AND EXHAUST SYSTEM



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(1) Air Cleaner
(2) Injection Nozzle
(3) Coolant Temperature Sensor
(4) Engine Speed Sensor
(5) Exhaust Gas Temperature Sensor 2 (T2)
(6) Exhaust Gas Temperature Sensor 1 (T1)
(7) Diesel Particulate Filter
(8) Exhaust Gas Temperature Sensor (T0)
(9) Differential Pressure Sensor
(10) Burner Temperature Sensor (T4)
(11) Reformer
(12) Reformer Temperature Sensor (T3)
(13) Blower

A: Intake Air Flow
B: Exhaust Gas Flow

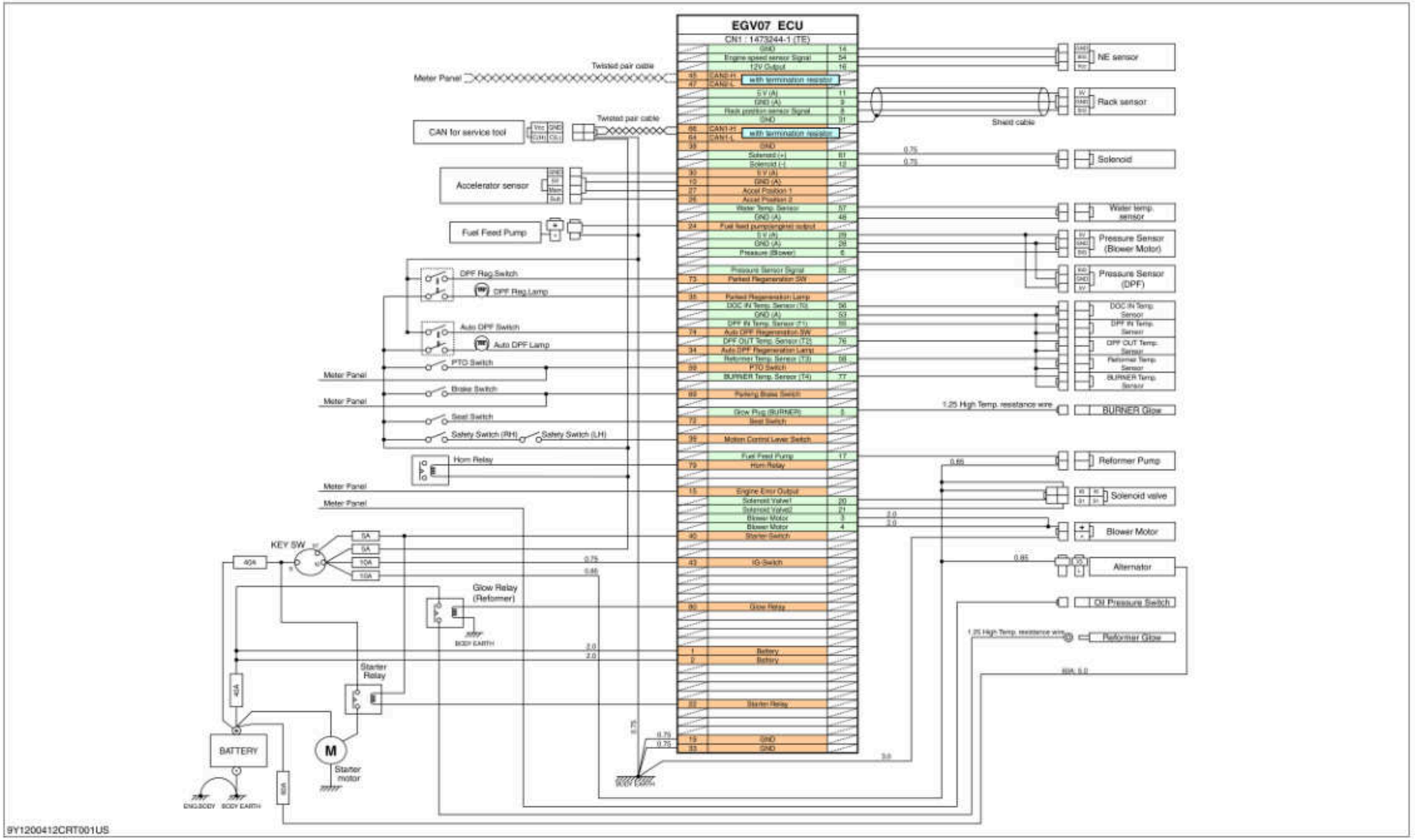
(a) To Muffler

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2. WIRING DIAGRAM

[1] ZD1511



1-M11

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