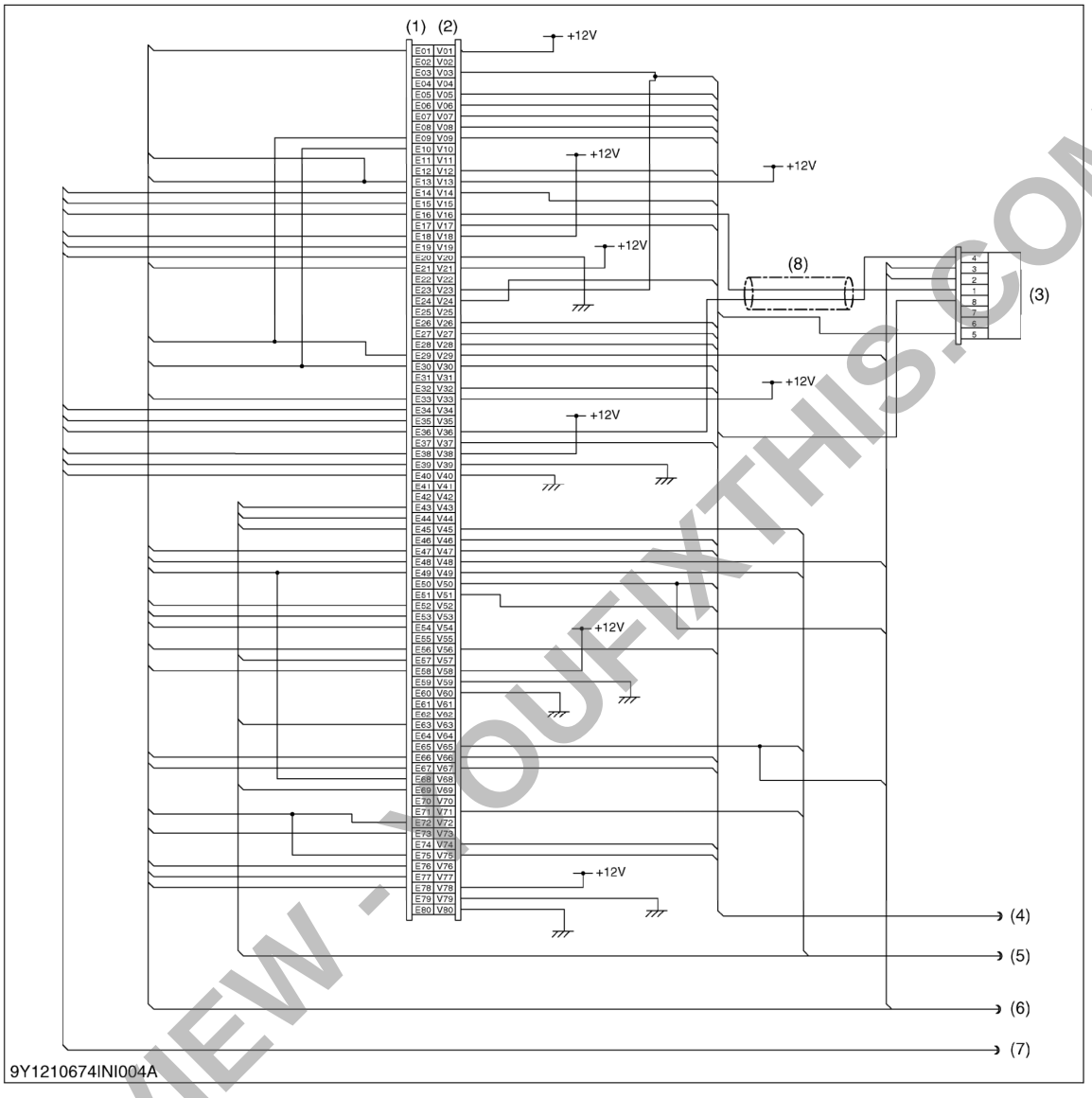
[3] ECU INTERMEDIATE HARNESS (OEM SIDE HARNESS)



(1)	CN501	ECU (1)
(2)	CN502	ECU (2)
(3)	CN503	ECU Joint Connector 1
(4)	–	Power Unit
(5)	–	Diesel Particulate Filter (hereinafter referred to as the "DPF")
(6)	–	Engine
(7)	–	Injector
(8)	–	Shield Cable

■ **NOTE**

- **The picture shows the pin arrangement of the connector housing viewed from wire side, not mating side.**

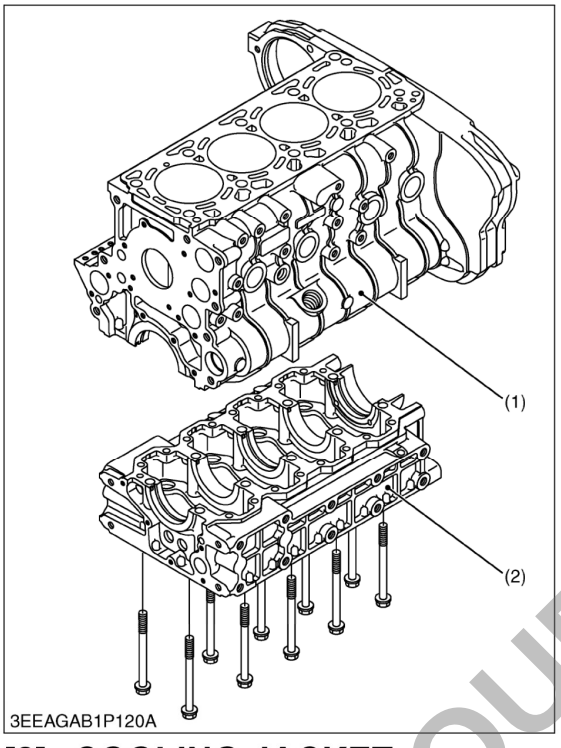
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1. ENGINE BODY

[1] CYLINDER BLOCK



The 07 series DI engine employs ladder frame structure type crankcases - the crankcase 1 (1) with combustion part and the crankcase 2 (2) which supports the crankcase 1 (1).

The following benefits are in the ladder frame structure.

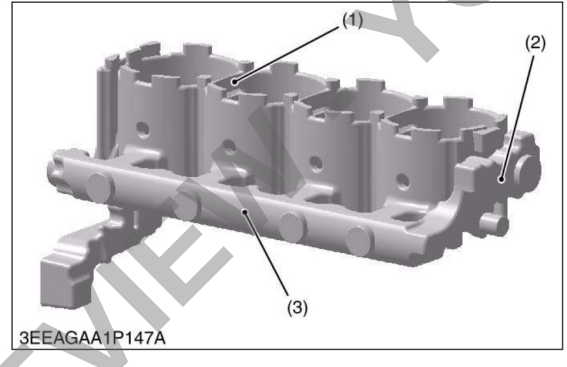
1. Minimizing parts.
2. Noise reduction.
3. Reduction of loss and dispersion on friction thanks to accuracy of axial concentricity.

The cylinder is a linerless type which enables good cooling operation, less strain and good abrasion resistance.

(1) Crankcase 1 (2) Crankcase 2

9Y1210674ENM0033US0

[2] COOLING JACKET



The 07 series DI engine employs coolant evenness distribution type cooling jacket inside crankcase 1. The coolant is evenly supplied to each cylinder through the main gallery (3) in the jacket mold core (2).

(1) Coolant Passage between Cylinder (2) Jacket Mold Core
(3) Main Gallery

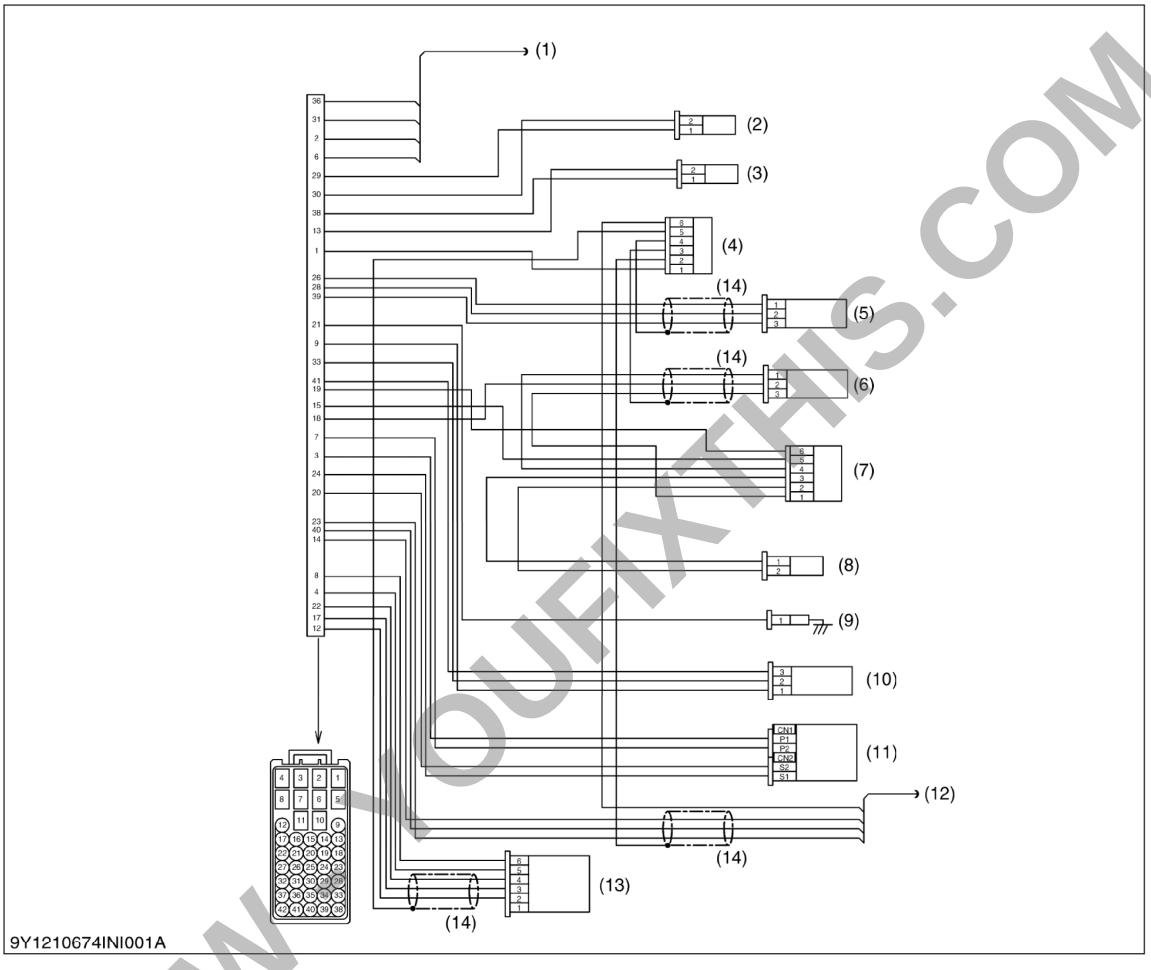
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5. WIRING DIAGRAM

[1] ENGINE INTERMEDIATE HARNESS (ENGINE SIDE HARNESS)



9Y1210674INI001A

(1)	–	CAN and EGR
(2)	CN202	Intake Air Temperature Sensor
(3)	CN203	Coolant Temperature Sensor
(4)	CN215	Engine Joint Connector 1
(5)	CN204	Rail Pressure Sensor
(6)	CN205	Crankshaft Position Sensor
(7)	CN216	Engine Joint Connector 2
(8)	CN206	Resistance Connector (1.1 kΩ)
(9)	CN207	Oil Pressure Switch
(10)	CN208	Boost Pressure Sensor
(11)	CN209 / 210	Supply Pump
(12)	–	Camshaft Position Sensor
(13)	CN212	Intake Throttle Valve (V2607-CR-E4 / V2607-CR-TE4 / V3307-CR-TE4)
(14)	–	Shield Cable

■ **NOTE**

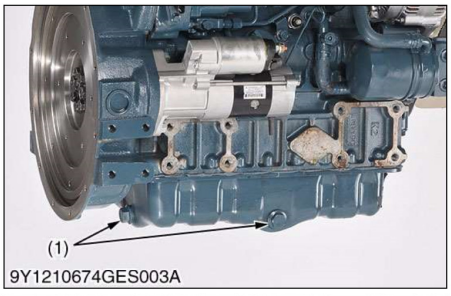
- **The picture shows the pin arrangement of the connector housing viewed from wire side, not mating side.**

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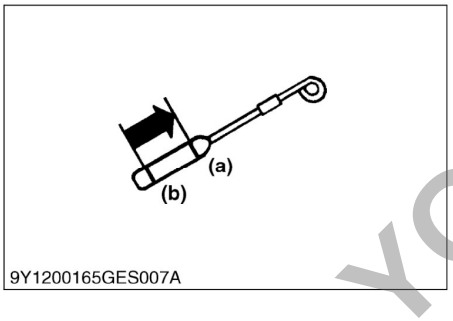
[2] INITIAL 50 HOURS



9Y1210674GES003A



9Y1210674GES002B



9Y1200165GES007A

Change of Engine Oil

CAUTION

- **Make sure that you stop the engine before you change the engine oil.**

1. Start and warm-up the engine for approximately 5 minutes.
2. Put an oil pan below the engine.
3. Remove the drain plug (1) at the bottom of the engine and drain the oil fully.
4. Tighten the drain plug (1).
5. Fill new oil until the upper line on the dipstick (2).

IMPORTANT

- **When you use an oil of different brand or viscosity from the previous, drain the remaining oil.**
- **Do not mix 2 different types of oil.**
- **Engine oil must have the properties of API classification CJ-4. Use the correct SAE Engine Oil by reference to the ambient temperature.**

Above 25 °C (77 °F)	SAE 30 or SAE 10W-30, SAE 15W-40
0 °C to 25 °C (32 °F to 77 °F)	SAE 20 or SAE 10W-30, SAE 15W-40
Below 0 °C (32 °F)	SAE 10W or SAE 10W-30, SAE 15W-40

Engine oil capacity	V2607-CR-E4B, V2607-CR-TE4B, V2607-CR-TIE4B	10.2 L 2.69 U.S.gals
	V3307-CR-TE4B, V3307-CR-TIE4B	11.2 L 2.96 U.S.gals

Tightening torque	Drain plug	45 to 53 N·m 4.5 to 5.5 kgf·m 33 to 39 lbf·ft

(1) Drain Plug
(2) Dipstick
(a) Upper Line
(b) Lower Line

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9Y1210674GES004A

Replacement of Oil Filter Cartridge

CAUTION

- **Make sure that you stop the engine before you replace the oil filter cartridge.**

1. Remove the oil filter cartridge (1) with the filter wrench.
2. Apply a thin layer of oil on the new cartridge gasket.
3. Install the new cartridge by hand. Do not tighten too much because it can cause deformation of the rubber gasket.
4. After you replace the cartridge, the engine oil usually decrease by a small level. Make sure that the engine oil does not flow through the seal and read the oil level on the dipstick. Fill the engine oil until the specified level.

IMPORTANT

- **To prevent serious damage to the engine, replacement element must be highly efficient. Use only a KUBOTA genuine filter or its equivalent.**

(1) Oil Filter Cartridge

9Y1210674GEG0014US0

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1. TROUBLESHOOTING

This "TROUBLESHOOTING" shows only mechanical failures. The failures related to the common rail system (CRS), refer to the diagnosis manual (DM) for common rail system engine (9Y120-01990).

Symptom	Probable Cause	Solution	Reference Page
The engine does not start	No fuel	Fill up the fuel	–
	Air in the fuel system	Bleed the air	–
	Water in the fuel system	Change the fuel and repair or replace the fuel system	G-14
	The fuel pump is damaged	Replace	–
	The fuel hose is clogged	Clean or replace	G-14
	The fuel filter is clogged	Replace	G-17
	The viscosity of fuel at low temperature is too high	Replace the specified fuel	I-5, G-8
	The cetane number of fuel is low	Replace the specified fuel	I-5, G-8
	Fuel leakage because of loose injection pipe retaining nut	Tighten the retaining nut	1-S42
	The injector is clogged	Replace	G-21, 1-S45
	The supply pump is damaged	Replace	1-S53
	Seizure of the crankshaft, camshaft, piston or bearing	Repair or replace	–
	Compression leakage from the cylinder	Replace the head gasket Tighten the cylinder head screw	1-S48, 1-S49, 1-S50
	Incorrect valve timing	Check the timing gear	1-S63, 1-S64
	Piston ring and cylinder are worn out	Replace	1-S90, 1-S91, 1-S98
	Incorrect valve clearance	Adjust valve clearance	1-S19
The starter does not operate	Discharged battery	Charge or replace	–
	Starter is damaged	Repair or replace	1-S24
	The key switch is damaged	Replace	–
	The connection of the wires is incorrect	Check or correct	–

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2. SERVICING SPECIFICATIONS

ENGINE BODY

Item		Factory Specification	Allowable Limit
Cylinder Head Surface	Flatness	–	0.05 mm 0.002 in.
Top Clearance		0.60 to 0.80 mm 0.024 to 0.031 in.	–
Compression Pressure **[V2607-CR-E4B]**		3.20 MPa / 250 min^{-1} (rpm) 32.6 kgf/cm^2 / 250 min^{-1} (rpm) 464 psi / 250 min^{-1} (rpm)	2.20 MPa / 250 min^{-1} (rpm) 22.4 kgf/cm^2 / 250 min^{-1} (rpm) 319 psi / 250 min^{-1} (rpm)
[V2607-CR-TE4B / V3307-CR-TE4B]		3.10 MPa / 250 min^{-1} (rpm) 31.6 kgf/cm^2 / 250 min^{-1} (rpm) 450 psi / 250 min^{-1} (rpm)	2.10 MPa / 250 min^{-1} (rpm) 21.4 kgf/cm^2 / 250 min^{-1} (rpm) 305 psi / 250 min^{-1} (rpm)
[V2607-CR-TIE4 / V3307-CR-TIE4]		2.6 MPa / 250 min^{-1} (rpm) 27 kgf/cm^2 / 250 min^{-1} (rpm) 380 psi / 250 min^{-1} (rpm)	1.6 MPa / 250 min^{-1} (rpm) 16 kgf/cm^2 / 250 min^{-1} (rpm) 230 psi / 250 min^{-1} (rpm)
Variance Among Cylinders		–	10 % or less
Valve Seat	Angle	0.79 rad 45 °	–
	Width	3.3 to 3.6 mm 0.13 to 0.14 in.	–
Valve Face	Angle	0.79 rad 45 °	–
Valve Recessing		0.65 to 0.85 mm 0.026 to 0.033 in.	1.20 mm 0.0472 in.
Valve Stem to Valve Guide **[V2607-CR-E4B / V2607-CR-TE4B / V2607-CR-TIE4B]**	Clearance (Intake)	0.030 to 0.057 mm 0.0012 to 0.0022 in.	0.10 mm 0.0039 in.
• Valve Stem	O.D. (Intake)	5.968 to 5.980 mm 0.2350 to 0.2354 in.	–
• Valve Guide	I.D. (Intake)	6.010 to 6.025 mm 0.2367 to 0.2372 in.	–

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4. MAINTENANCE CHECK LIST

To make sure that the engine operates safely for a long time, refer to the table below to do regular inspections.

Inspection Item		Service Interval									
		Daily	Initial 50 hrs	Every 50 hrs	Every 250 hrs	Every 500 hrs	Every 1000 hrs	Every 1500 hrs	Every 3000 hrs	Every 1 year	Every 2 years
	Check of engine oil level	❍									
	Check of fuel level	❍									
	Check of coolant level	❍									
	Check of fan belt	❍									
	Check of fuel hoses and clamp bands			❍							
	Check of draining of water separator			❍							
	Check of radiator hoses and clamp bands				❍						
	Cleaning of air cleaner element (Replace the element after 6-times cleaning)				❍						
	Adjustment of fan belt tension				❍						
	Check of intake air line				❍						
	Change of engine oil		❍			❍					
	Replacement of oil filter cartridge		❍			❍					
	Replacement of fuel filter cartridge					❍					
	Cleaning of water separator					❍					
★1	Cleaning of fuel tank interior					❍					
★1	Cleaning of water jacket and radiator interior					❍					
★1	Replacement of fan belt					❍					❍
★1	Check of valve clearance						❍				
★1,★2	Check of injector							❍			
★1,★2	Check of EGR cooler							❍			
★2	Replacement of oil separator element							❍			
★1,★2	Check of PCV (Positive Crankcase Ventilation) Valve							❍			
★1,★2	Check of turbocharger								❍		
★1,★2	Cleaning of DPF								❍		
★1,★2	Check of EGR system								❍		
★1	Replacement of air cleaner element									❍	
★1	Check of DPF differential pressure pipes and hoses									❍	
★1	Check of EGR piping									❍	
	Check of intake air line									❍	
	Check of exhaust manifold (Crack, gas leakage and mounting screw)									❍	
★1	Replacement of oil separator rubber hose										❍
★1	Replacement of rubber hose of DPF differential pressure sensor										❍
★1	Replacement of intake hose (After air flow sensor)										❍
★1	Replacement of pressure detection hose of boost sensor										❍
★1	Replacement of EGR cooler hose										❍
★1	Replacement of water hose										❍
★1	Replacement of lubricant hose										❍
	Change of radiator coolant (L.L.C.)										❍
★1	Replacement of radiator hoses and clamp bands										❍
★1	Replacement of fuel hoses and clamps										❍

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SERVICING

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      (8) Starter....1-S100
      (9) Alternator....1-S102

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1. SAFETY FIRST

⚠ SAFETY FIRST

- **This symbol, the industry's "Safety Alert Symbol", is used throughout this manual and on labels on the machine itself to warn of the possibility of personal injury. Read these instructions carefully.**
- **It is essential that you read the instructions and safety regulations before you try to repair or use this unit.**

⚠ DANGER
- **Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.**

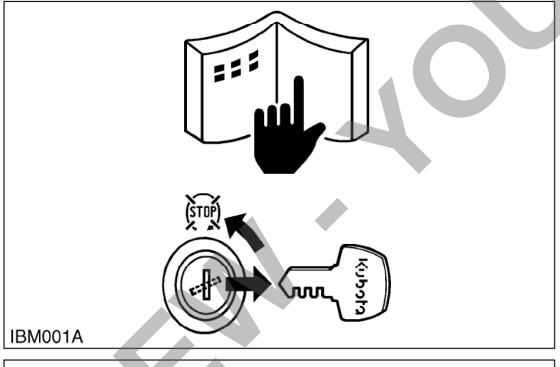
⚠ WARNING
- **Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.**

⚠ CAUTION
- **Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.**

■ IMPORTANT
- **Indicates that equipment or property damage could result if instructions are not followed.**

■ NOTE
- **Gives helpful information.**

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IBM001A


IBM011A

BEFORE YOU START SERVICE

- Read all instructions and safety instructions in this manual and on your engine safety decals.
- Clean the work area and engine.
- Park the machine on a stable and level ground.
- Let the temperature of the engine decrease before you start a job.
- Stop the engine, then remove the key.
- Disconnect the battery negative cable.
- Hang a **"DO NOT OPERATE"** tag in the operator station.

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START SAFELY

- Do not do the procedures below when you start the engine.
  - short across starter terminals
  - bypass the safety start switch
- Do not make unauthorized modifications to the engine. This can cause damage and decrease the engine life.

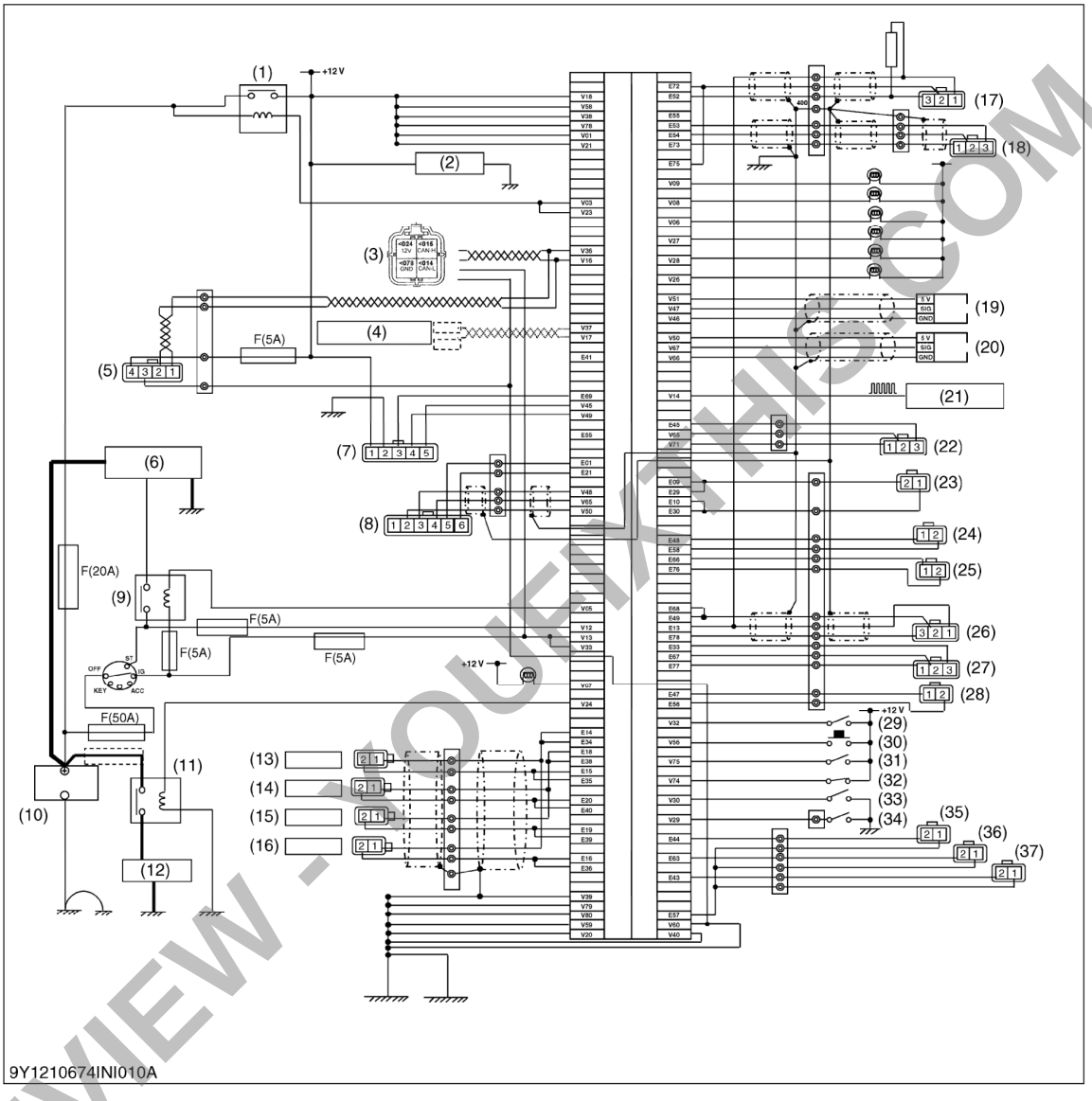
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[4] SYSTEM WIRING DIAGRAM

V2607-CR-E4B, V2607-CR-TE4B, V3307-CR-TE4B



(1) Main Relay
(2) Fuel Feed Pump
(3) CAN1 Connector (For Service)
(4) CAN2 Connector (For OEM Machine)
(5) EGR Valve
(6) Starter
(7) Air Flow Sensor
(8) Intake Throttle Valve
(9) Starter Relay
(10) Battery
(11) Glow Relay
(12) Glow Plug
(13) Injector 1
(14) Injector 2
(15) Injector 3
(16) Injector 4
(17) Crankshaft Position Sensor
(18) Camshaft Position Sensor
(19) Accel Sensor 1
(20) Accel Sensor 2
(21) Vehicle Speed Sensor
(22) DPF Differential Pressure Sensor (ΔP)
(23) SCV (Suction Control Valve)
(24) Fuel Temperature Sensor
(25) Coolant Temperature Sensor
(26) Rail Pressure Sensor
(27) Boost Sensor
(28) Intake Air Temperature Sensor
(29) Stop Switch
(30) Parked Regeneration Switch
(31) Parking Switch
(32) Regeneration Inhibit Switch
(33) Neutral Switch
(34) Oil Switch
(35) DPF Temperature Sensor (T_0)
(36) DPF Temperature Sensor (T_1)
(37) DPF Temperature Sensor (T_2)

DPF: Diesel Particulate Filter

■ **NOTE**

- **Terminal names and terminal numbers marked with * have become invalid.**

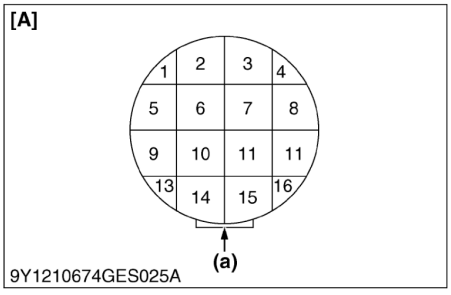
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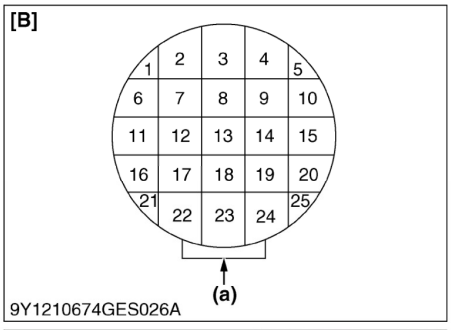
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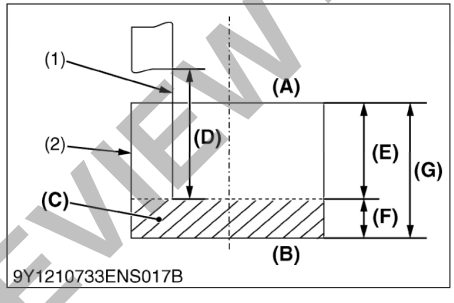
Judgment of Reuse of DPF After Cleaning (Cleaning Contractor) [V2607-CR-E4B / V2607-CR-TE4B / V3307-CR-TE4B]

(1) Decision on Reusability According to the Pin Gauge









Measurement of Actual Cell Depth

■ **IMPORTANT**

- **After the cleaning contractor has cleaned the DPF, measure the quantity of remaining ash in the following procedure, and evaluate the reusability.**

1. After having cleaned the DPF, measure the actual cell depth **(E)** with a pin gauge in the each block shown in the figure. One cell (The measurement point is not specified) is measured in each block.

Model	Measurement total
V2607-CR-E4B	16 blocks
V2607-CR-TE4B	25 blocks
V3307-CR-TE4B	25 blocks

2. If the actual cell depth **(E)** is less than the allowable limit, the DPF cannot be reused.
   If the DPF is judged as non-reusable, report the result of the judgment to the customer that requested the filter cleaning via the service dealer, and replace the DPF with a new one.

(Reference)

Actual Cell Depth **(E)** = Cell Depth **(G)** − Accumulated Ash Depth **(F)**

■ **NOTE**

- **Select a metal pin gauge having a wire size slightly thinner than the cell width (0.60 to 0.80 mm dia., 0.024 to 0.031 in. dia.).**
- **When the pin gauge is inserted into the cell hole, insert it by lightly tapping on the gage end with a finger tip.**
- **If the pin gauge is forcibly pushed in, the pin pierces through the accumulated ash and it cannot be measured accurately. So be careful not to push the pin forcibly.**

Actual Cell Depth (Average of all measurement blocks)	Allowable limit	119 mm (4.68 in.)

(1) Pin Gauge (0.60 to 0.80 mm dia., 0.024 to 0.031 in. dia.)
(2) DPF

(A) Exhaust Inlet Side
(B) Exhaust Outlet Side
(C) Accumulated Ash
(D) 150 mm (5.91 in.)
(E) Actual Cell Depth
(F) Accumulated Ash Depth
(G) Cell Depth

(a) Serial Number

[A] V2607-CR-E4B
[B] V2607-CR-TE4B, V3307-CR-TE4B

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Check of EGR System

1. Perform an EGR actuation test.
2. Based on test results, check that the EGR valve gas passage and coolant passage are not clogged.
3. Clean any soot from the gas passage so that it does not damage the EGR valve.
4. Clean the coolant passage by operating it with water.

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I INFORMATION

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