SEN06768-13

Shop Manual

DUMP TRUCK

HD465-8E0
HD605-8E0

SERIAL NUMBERS

HD465-35001 and up
HD605-35001 and up

KOMATSU

⚠ **Put on the protective eyeglasses, gloves and working clothes with long sleeves while you are collecting or filling the refrigerant. Otherwise, when refrigerant gas (R134a) gets in your eyes, you may lose your sight, and when it touches your skin, you may suffer from frostbite.**

- When loosening the nuts fixing air conditioner hoses and tubes, be sure to use 2 wrenches; use one wrench to fix and use the other one to loosen the nut.

Precautions for Air Conditioner Piping

- When installing the air conditioner piping, be careful so that dirt, dusts and water do not enter the hose.
- Check that the O-rings are fitted to the joints when connecting the air conditioner piping.
- Do not reuse an O-ring because it is deformed and deteriorated if it is used once.
- When removing the O-rings, use a soft tool so that the piping is not damaged.
- Check that the O-ring is not damaged or deteriorated.
- Apply compressor oil for refrigerant (R134a) to O-ring.

REMARK

Do not apply oil to the threaded portion of a bolt, nut or union.

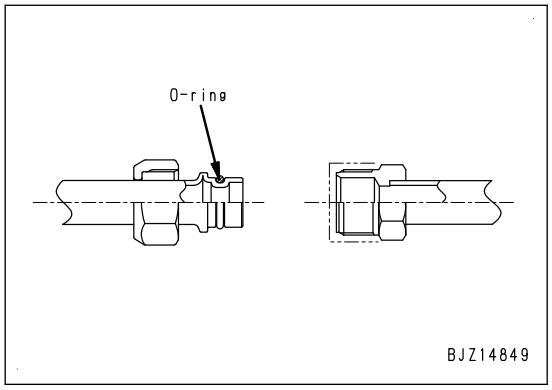
Manufacturer	Part name
DENSO	ND-OIL8
VALEO THERMAL SYSTEMS	ZXL100PG (PAG46 or equivalent)
SANDEN	SP-10

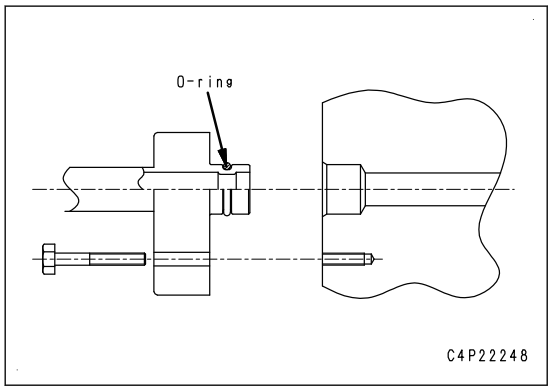
When tightening nuts of the air conditioner hoses and tubes, be sure to use 2 wrenches. Use one wrench to fix and tighten the nut with the other wrench to the specified torque (Use a torque wrench for tightening).

REMARK

- The figure shows an example of fitting of O-ring.
- An O-ring is fitted to every joint of the air conditioner piping.

For tightening torques, see Others, “Precautions for Disconnection and Connection of Air Conditioner Piping”.





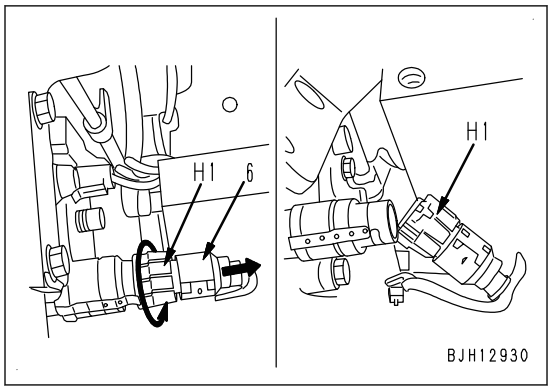
How to Disconnect and Connect Connector with Housing to Rotate

How to Disconnect Connector with Housing to Rotate

Turn housing (H1) to the left, and pull it out.

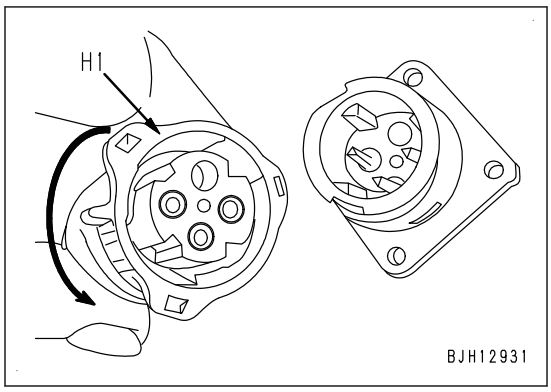
REMARK

Housing (H1) is left on the wiring harness side.



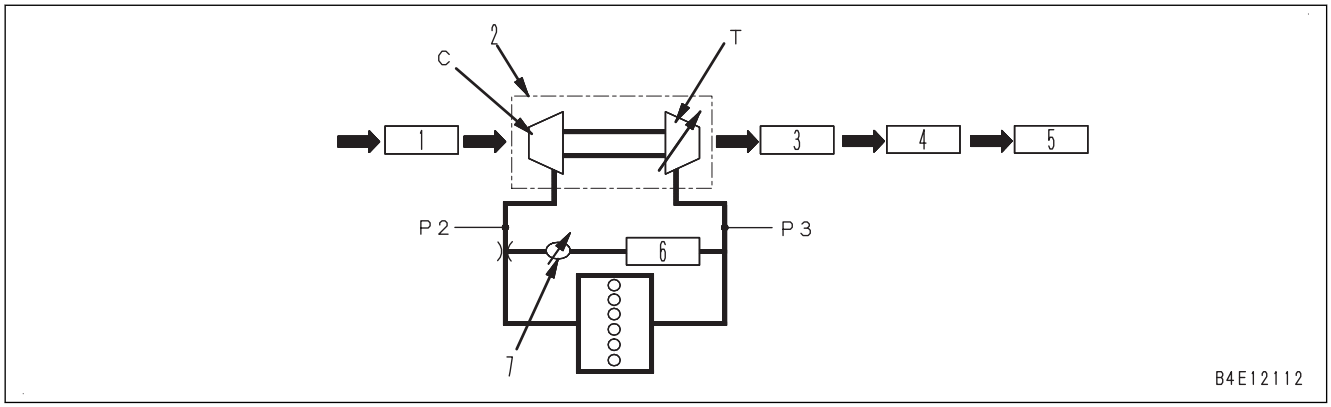
Connect Connector with Housing to Rotate

1. Insert the connector to the end while aligning its groove to the other.
2. Turn housing (H1) clockwise until it clicks.



Item	Unit	HD605-8E0
Cooling fan motor		
Type	-	Fixed displacement, swash plate, piston type
Motor capacity	cc/rev	90.3
Secondary steering motor		
Type	-	DC motor type
Hoist cylinder		
Type	-	Double-acting piston type
Cylinder bore (1st)	mm	185
Cylinder bore (2nd)	mm	150
Piston rod diameter (1st)	mm	170
Piston rod diameter (2nd)	mm	100
Stroke	mm	887
Max. distance between pins	mm	3161
Min. distance between pins	mm	1367
Steering cylinder		
Type	-	2-stage piston type (double-acting piston type for second cylinder only)
Cylinder bore	mm	85
Piston rod diameter	mm	55
Stroke	mm	410
Max. distance between pins	mm	1295
Min. distance between pins	mm	885
Hydraulic tank	-	Enclosed box type
Hydraulic oil filter	-	Hydraulic tank return side
Hydraulic oil cooler	-	Air-cooled type

Function of VGT



C:Blower impeller
T:Turbine impeller
1:Air cleaner
5:SCR assembly (*1)
2:VGT
6:EGR cooler
3:KDPF
7:EGR valve
4:DEF mixing tube (*1)

*1:This may not be installed on some machine models and specifications.

- The exhaust gas regulations are applied to the exhaust gas from engine operation at low speed, and at high speed. To meet this, the EGR ratio is improved. (EGR ratio = Ratio of amount of EGR to amount of fresh suction air)
- To attain high EGR ratio, it is necessary that turbine inlet pressure (P3) is set higher than boost pressure (P2) (P3 > P2). For this reason, the variable turbocharger (VGT) is employed, in which the exhaust gas pressure acting on turbine impeller (T) is adjustable.
  Also, since the boost pressure increases more quickly, generation of particulates caused by lack of oxygen during low-speed operation (rotation) is reduced.
- The shaft attached to the turbine (T) operates the blower (C) and pushes air to the cylinder for combustion.
  If VGT (2) sends more air, the fuel injection rate increases, thus the engine output is increased.
  In addition, the air cooled by the aftercooler contains more oxygen thus the fuel injection rate increases result in increased engine output.

NOTICE

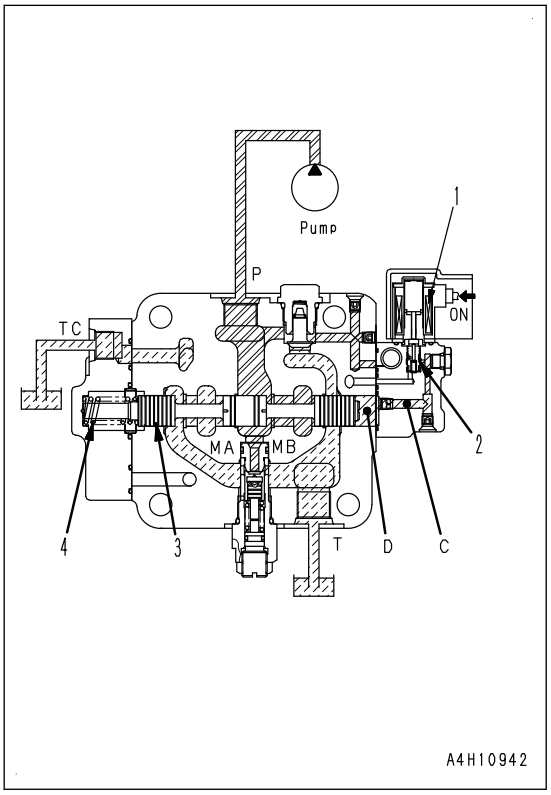
Adequate quantity of clean high-quality oil is required to maintain VGT performance. Be sure to use Komatsu genuine high quality oil. Follow the procedures in the Operation and Maintenance Manual when you replace oil or oil filter.

REMARK

It may sound like an air leak from the VGT or a boost pipe, but this is normal.

When the ON-OFF Solenoid is Energized

- When ON-OFF solenoid (1) is energized, ON-OFF selector valve (2) is operated, pressurized oil from the pump flows into port (C), and then into spool chamber (D).
- The pressurized oil goes into spool chamber (D), compresses spring (4), and pushes spool (3) to left.
- Motor port (MB) opens and the pressurized oil flows in, and the motor reversely turns (counterclockwise).



Input and Output Signals of Machine Monitor

JAE-8P “DPC1” (For LC Unit)

Pin No.	Signal name	Input/output signal
1	LC unit LVDS +	Input
2	LC unit LVDS -	Input
3	GND (LC unit power supply)	-
4	LC unit backlight adjustment	Input
5	LC unit power supply	Input
6	LC unit ON/OFF control	Input
7	LC unit backlight ON/OFF control	Input
8	LC unit temperature sensor	Input

AMP-6P “DPC2” (For LED Unit)

Pin No.	Signal name	Input/output signal
1	LED unit power supply (+12V)	Input
2	GND (LED unit power supply)	-
3	LIN	Input/output
4	LED unit power supply (+5V)	Input
5	(*1)	-
6	(*1)	-

*1:Never connect these pins. Malfunctions or failures may occur.

AMP-8P “DPC3” (For Meter Unit)

Pin No.	Signal name	Input/output signal
1	Continuous power supply (24V)	Input
2	Start switch ACC signal	Input
3	CAN2_H	Input/output
4	GND (continuous power supply)	-
5	Monitor intensity selection switch (night mode signal)	Input
6	(*1)	-
7	CAN2 terminating resistor	Input
8	CAN2_L	Input/output

*1:Never connect these pins. Malfunctions or failures may occur.

Pin No.	Signal name	Input/output signal
8	Steering pump lock-out solenoid valve (option)	Output
9	Steering/hoist pump lock-out solenoid valve (option)	Output
10	Radiator fan speed sensor	Input
11	(*1)	-
12	Fill switch 1st	Input
13	Transmission oil filter 2	Input
14	(*1)	-
15	Gear shift lever position 6 signal	Input
16	Gear shift lever position 2 signal	Input
17	(*1)	-
18	(*1)	-
19	Radiator fan reverse solenoid valve	Output
20	Transmission intermediate shaft speed sensor	Input
21	Machine lock-out operation lamp (option)	Output
22	CAN2_L	Input/output
23	CAN1_L	Input/output
24	External start-up signal	Input
25	Gear shift lever position D signal	Input
26	Gear shift lever position 3 signal	Input
27	Fill switch High	Input
28	Battery relay drive signal	Output
29	GND (pulse)	-
30	Transmission output shaft speed sensor	Input
31	(*1)	-
32	CAN2_H	Input/output
33	CAN1_H	Input/output
34	(*1)	-
35	Gear shift lever position R signal	Input
36	Gear shift lever position 4 signal	Input
37	Fill switch Low	Input
38	Fill switch 4th	Input
39	GND (pulse)	-
40	Transmission input shaft speed sensor	Input

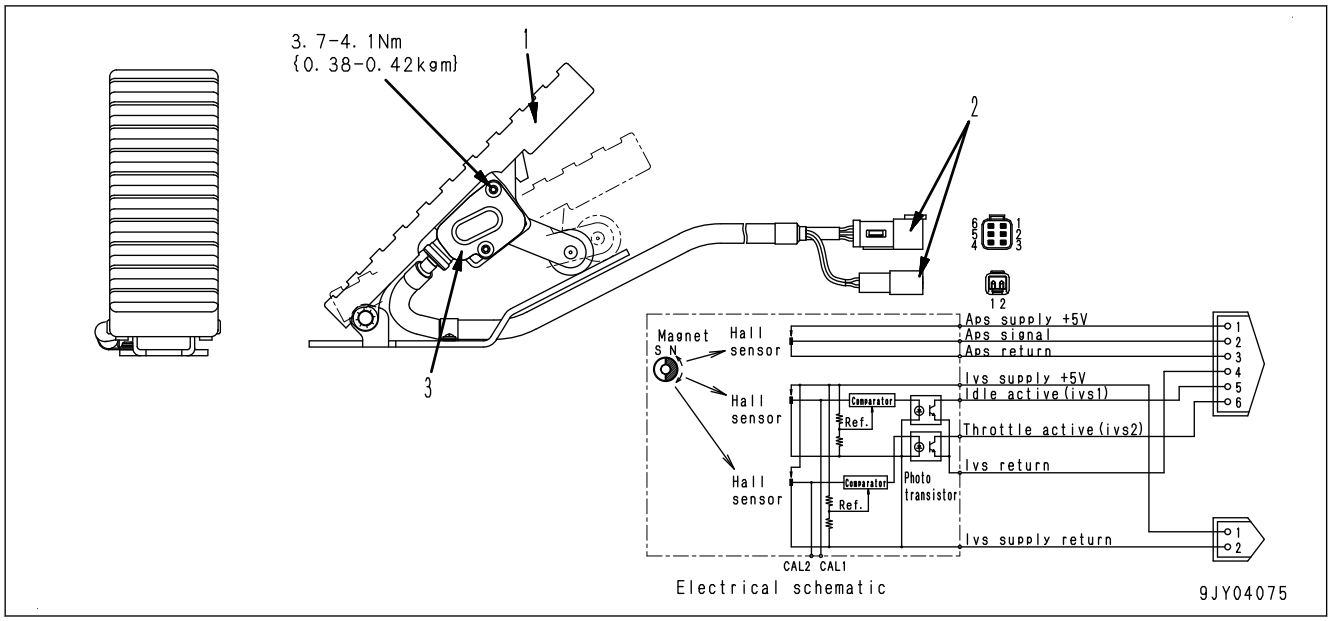
*1: Do not connect these pins. Malfunctions or failures can occur.

DEUTSCH-40P(2)[ATC3]

Pin No.	Signal name	Input/output signal
1	Continuous power supply (24V)	Input
2	Solenoid power supply (24V)	Input

Accelerator Pedal

Structure of Accelerator Pedal



1:Pedal

2:Connector

3:Sensor

Function of Accelerator Pedal

This pedal is installed on the upper surface of the floor. It sends acceleration signal and idle signal in reference to the angle of accelerator pedal.

Acceleration Signal

Sensor senses the quantity of movement of the accelerator pedal, and it sends the adjusted voltage from pin No.2.

Idling Validation Signal

Sensor senses the condition of accelerator pedal operation. When the accelerator pedal is released, it sends the signal from pin No.5. When the accelerator pedal is depressed, it sends the signal from pin No.6.

While the dump body is not against frame after dump, upshift operation is limited. When the gear shift lever is in position D to L, the machine starts in F1. The gear will not upshifted until the dump body is seated.

- Neutral coast prevention function
  During travel at speed of 4km/h or higher, if the gear shift lever is set in N (NEUTRAL), the gear will not go to neutral. At this time, the centralized warning lamp flashes and the alarm buzzer sounds. Also, during downhill travel with the gear shift lever in N (NEUTRAL) position, if the travel speed exceeds 17 km/h, the gear is shifted automatically to a gear speed suitable for the travel speed, and the centralized warning lamp flashes and the alarm buzzer sounds.

REMARK

Do not operate the gear shift lever to N (NEUTRAL) position while you travel on flat ground or downhill. Always set the gear shift lever to any position of D to L before you start travel.

Protection Function of Transmission Control System

- Downshift limit function
  Gear shift lever operated as follows during travel, from D to any position 6 to L. For example, when you travel in D (F7), if the gear shift lever is operated to 4, the transmission does not shift directly from F7 to F4. It shifts down from F7 to F6, from F6 to F5, then to F4 in sequence, corresponding to the travel speed.
  (If a mistake is made in operation, the gear does not miss shift.) (Engine overrun prevention function)
- Directional selection limit function
  While the machine travels in reverse at a speed of 4.0km/h or higher, if the gear shift lever is set to position D or any one 6 to L, the gear is not immediately moved to the forward gear, but the gear is set to N and the engine speed is decreased to lower the travel speed. When the travel speed is decreased below 4.0km/h, the gear is moved to the forward gear.
  (Prevention of overload on the power train and improvement of durability and reliability)
  While the machine is traveling forward at a speed of 4.0km/h or higher, even if the gear shift lever is set to position R, the gear is not immediately shifted to the reverse gear, but the gear is set to N and the engine speed is decreased to decrease the travel speed. When the travel speed is decreased below 4.0km/h, the gear is shifted to the reverse gear.
  If the machine has started with the gear shift lever in position N and is moving forward or in reverse at a speed of 4.0km/h or higher with the gear shift lever still in position N, the gear is not moved but kept in N even if the gear shift lever is set to R. When the travel speed is decreased below 4.0km/h, a start is permitted.
  (Prevention of overload on the power train and improvement of durability and reliability)
- Power train overrun prevention retarder brake function
  If the engine speed or transmission input shaft speed increases to 2400rpm or higher, the centralized warning lamp illuminates and the alarm buzzer operates. If the transmission input shaft speed increases to the auto brake (for overrun prevention) “ON” point, the retarder brake operates automatically. (To prevent overrun of the engine, torque converter, and transmission, and improve durability and reliability.)

Self-Diagnosis Function of Transmission Control System

The controller performs the self-diagnosis on the system and shows sensed abnormality. The contents of the self-diagnosis are shown on the monitor. If any abnormality sensed by the self-diagnosis, the information on it is transmitted to the network and the monitor shows the action level. The transmission system caution lamp, other caution lamps, and alarm buzzer may operate in this case.

↓ ↓

2nd planetary pinion (25) ← ←

↓

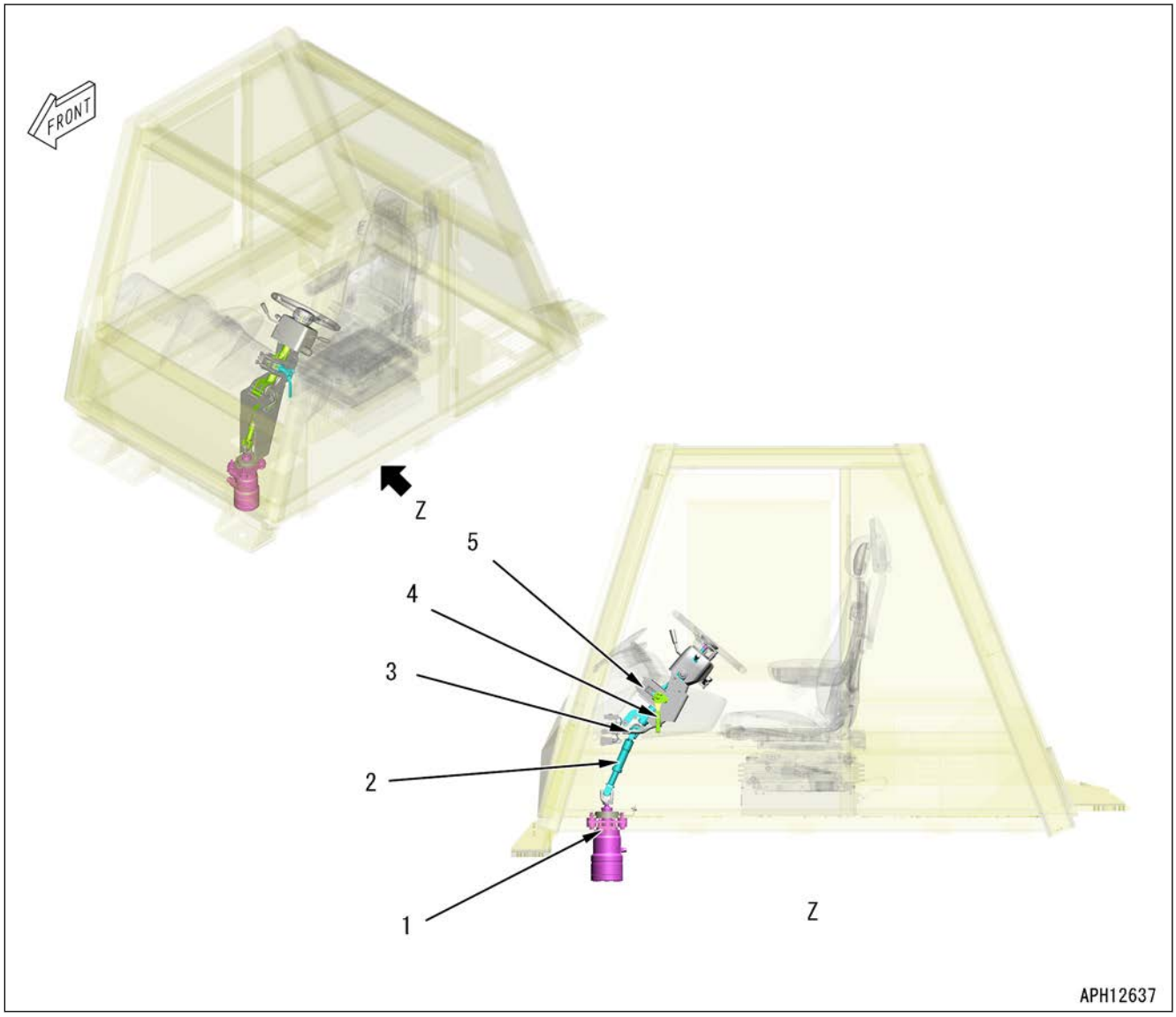
2nd, 1st carrier (27)

↓

Transmission output shaft (31)

Steering Column

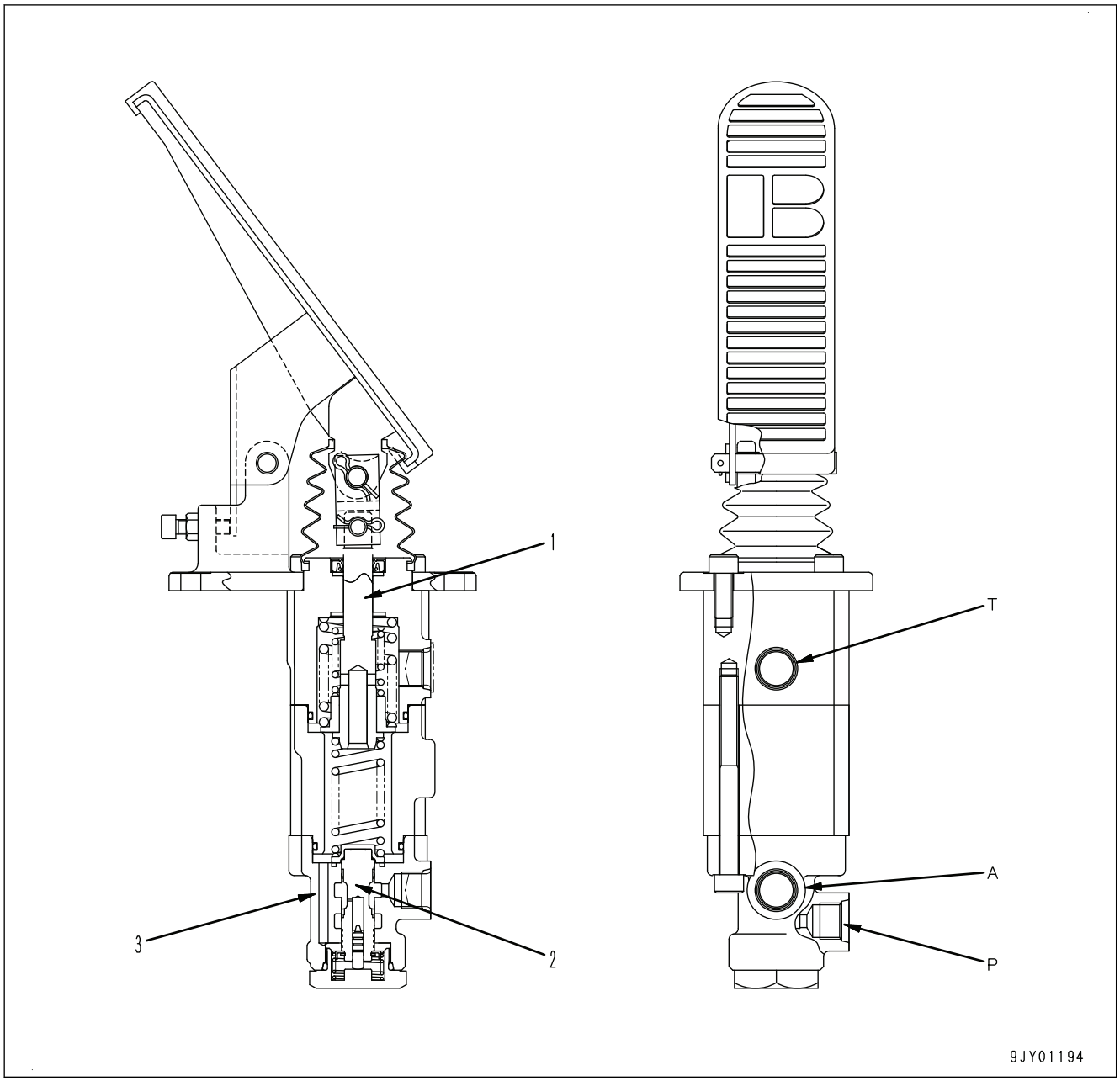
Structure of Steering Column



1.Steering shaft
2.Steering column
3.Lock lever
4.Yoke
5.Joint shaft
6.Orbitrol valve

Secondary Brake Valve

Structure of Secondary Brake Valve



A:To parking brake valve
T:To brake sub-tank
P:From accumulator
1:Rod
3:Cylinder
2:Spool

Function of Secondary Brake Valve

- When the pedal is depressed, the parking brake pressure decreases, and the parking brake operates corresponding to the pedal angle.

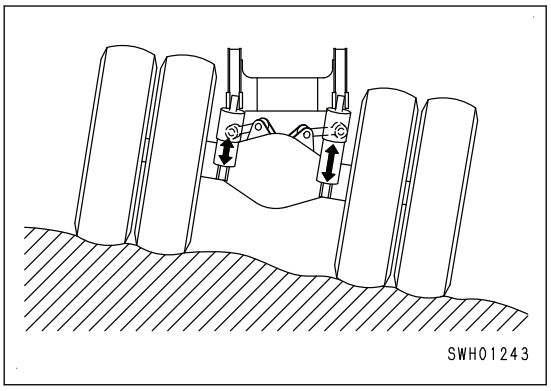
Function of Rear Suspension

The body supported by the frame, two radius rods at the lower side, two V-shaped rods at the higher side, and two suspension cylinders.

Each edge is connected with spherical bearing.

It transmits the load and force through the top and bottom rods. The V-shaped rods at the top also function to maintain the middle of the machine (axle).

The use of the V-shaped rod improves the roll steering properties.



Machine model				HD605-8E0	
Engine				SAA6D170E-7	
Item	Test condition		Unit	Standard value for new machine	Repair limit
Downshift	• Engine coolant temperature:65 to 100℃ • Transmission oil temperature:60 to 80℃ • Hydraulic oil temperature:45 to 55℃ • Foot brake:OFF • Accelerator pedal:OFF	Gear speed:F7 to F6	rpm	1175±35	1175±35
		Gear speed:F6 to F5			
		Gear speed:F5 to F4			
		Gear speed:F4 to F3			
		Gear speed:F3 to F2		1225±35	1225±35
		Gear speed:F2 to F1		1509±50	1509±50

Engine Speed at Auto Gearshift (Brake Mode)

Machine model				HD605-8E0	
Engine				SAA6D170E-7	
Item	Test condition		Unit	Standard value for new machine	Repair limit
Upshift	• Engine coolant temperature:65 to 100℃ • Transmission oil temperature:60 to 80℃ • Hydraulic oil temperature:45 to 55℃ • Foot brake:ON • Accelerator pedal:OFF	Gear speed:F1 to F2	rpm	2450±50	2450±50
		Gear speed:F2 to F3			
		Gear speed:F3 to F4			
		Gear speed:F4 to F5			
		Gear speed:F5 to F6			
		Gear speed:F6 to F7			

Engine and Cooling System

Examine Engine Speed

⚠ **Stop the machine on a level ground, set the parking brake switch to the PARKING position (P), and stop the engine.**

⚠ **Chock the tires to prevent machine movement.**

Obey the conditions that follow to test this item.

- Engine coolant temperature: 60 to 100℃ (Engine speed at low idle: 65 to 100℃)
- Transmission oil temperature: 70 to 90℃
- Steering oil temperature: 45 to 55℃
- Torque converter oil temperature: 60 to 80℃

When you need to test the engine speed during the troubleshooting, see this section to do the work.

How to Examine Engine Speed

Test engine high idle speed

1. Start the engine.
2. Select and show “Pre-defined Monitoring” (01/28) or monitoring items that follow. For details, see “Set and Operate Machine Monitor”.

   Monitoring code: 01002 “Engine Speed”

   Monitoring code: 04107 “Coolant Temperature”

   Monitoring code: 32701 “S/T Oil Temperature”

   Monitoring code: 30100 “T/C Oil Temperature”
3. Make sure that the engine coolant temperature and each oil temperature are in the specified range.
4. Make sure that the dump body is securely seated.
5. Set each control lever to the NEUTRAL position.
6. Measure the engine speed when the accelerator pedal is pushed to the stroke end (high idle).

   For the standard values, see Standard Value Table, “Standard Value Table for Engine”.

Test engine high idle speed (Machines with engine power mode selector system)

1. Start the engine.
2. Change the power mode to the P mode.
3. Select and show “Pre-defined Monitoring” (01/28) or monitoring items that follow. For details, see “Set and Operate Machine Monitor”.

   Monitoring code: 01002 “Engine Speed”

   Monitoring code: 04107 “Coolant Temperature”

   Monitoring code: 32701 “S/T Oil Temperature”

   Monitoring code: 30100 “T/C Oil Temperature”
4. Make sure that the engine coolant temperature and each oil temperature are in the specified range.
5. Make sure that the dump body is securely seated.
6. Set each control lever to the NEUTRAL position.
7. Measure the engine speed when the accelerator pedal is pushed to the stroke end (high idle).

   For the standard values, see Standard Value Table, “Standard Value Table for Engine”.

Bleed Air from Fuel System

⚠ Put the machine on a level ground, set the parking brake switch to (P), and stop the engine.

⚠ Block the tires to prevent machine movement.

⚠ While the fuel feed pump is in operation, pressure is applied to the fuel circuit. Do not loosen the air bleeding plug at this time, since the fuel may spurt out.

⚠ Immediately after the engine is stopped, its parts and oil are still very hot and may cause burn injury. Wait until all parts cool down before you start the work.

To perform the air bleed from fuel system to troubleshoot, refer to this section.

How to Bleed Air from Fuel System

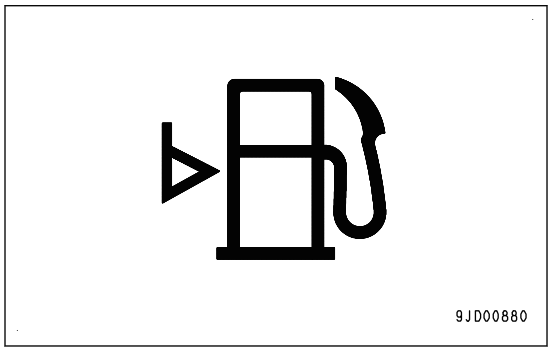
In these cases, bleed air corresponding to this procedure.

- When the fuel filters are replaced
- When the machine run out of fuel
- When you start the engine for the initial time after you replace fuel piping or supply pump

1. Turn the start switch to ON position, and make sure the fuel level caution lamp is not illuminated in red.

   REMARK

   If the fuel level caution lamp is illuminated in red, the fuel level is low. In this case, add fuel.

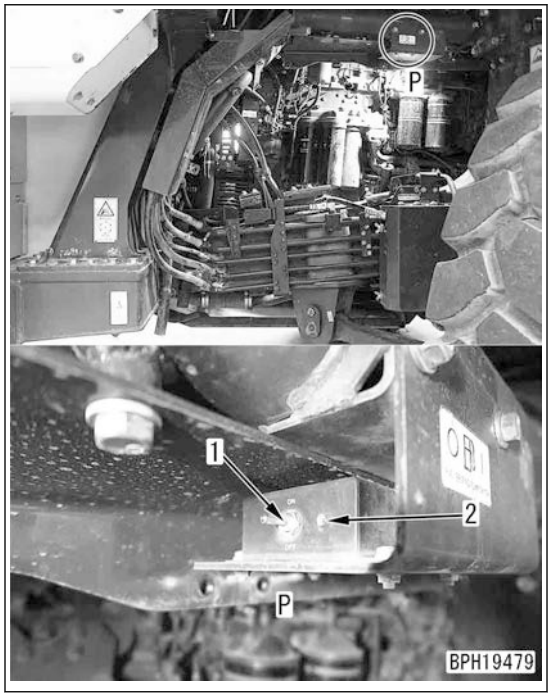


2. Turn the start switch to OFF position.
3. Set the fuel feed pump switch (1) to ON position.

   REMARK

   - The fuel feed pump switch has a timer in it. After the switch is turned to the ON position, the fuel feed pump repeats operation and stops automatically 10 times.
   - The fuel feed pump stops while the lamp flashes, but this is normal, not an error.
   - If the switch is turned to OFF position while the lamp flashes, the lamp goes out and the fuel feed pump stops.
4. After the specified time (approximately 6 minutes 30 seconds), the lamp (2) goes out and the fuel feed pump stops automatically.

   When the fuel filter alone is replaced, the air bleed procedure is completed.
5. When fuel in the fuel circuit is lost in the cases as fuel has run out or the fuel piping or supply pump is replaced, set the switch (1) to ON position again immediately after the fuel feed pump stops automatically.
6. When the lamp (2) goes out, air bleed procedure is completed.

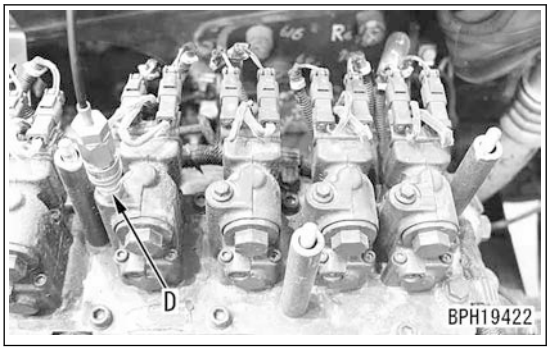


3. Install the fitting D, and connect it to the gauge A1 of hydraulic tester A.

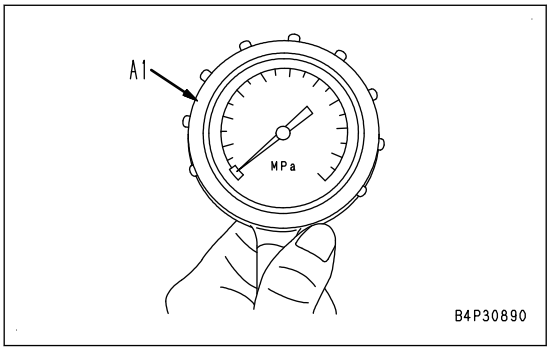
   Fitting D:9.8 to 12.7Nm{1.0 to 1.3kgm}

   REMARK

   Gauge in digital hydraulic tester B can also be used in place of gauge A1.



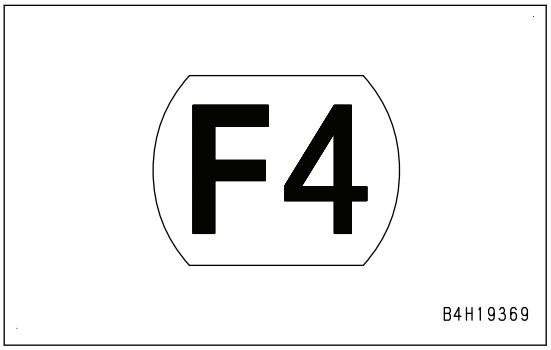
4. Put the body pivot pin back in the initial position and seat the dump body.
5. Make sure each oil temperature is in the specified range.
6. Set the parking brake switch to TRAVEL position.
7. Shift the gear shift lever to 4 position with the brake pedal depressed.



8. Depress the accelerator pedal with the brake pedal released.
9. Measure the oil pressure when the engine speed gets to 2000rpm (target value) and “F4” is shown on the shift indicator.

   ⚠ **As the maximum speed increases to 29.5km/h when the gear speed is F4, operate the machine with extreme care for the safety.**

   For standard values, see Standard Value Table, “Standard Value Table for Machine”.

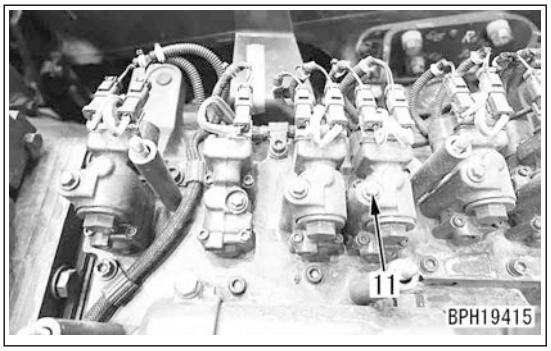


After you finish the test, remove the test tools and assemble the machine.

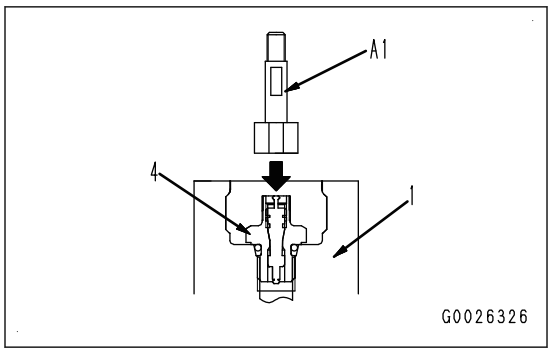
Oil pressure pickup plug (10):9.8 to 12.7Nm{1.0 to 1.3kgm}

Procedure to test transmission 4th clutch operating pressure

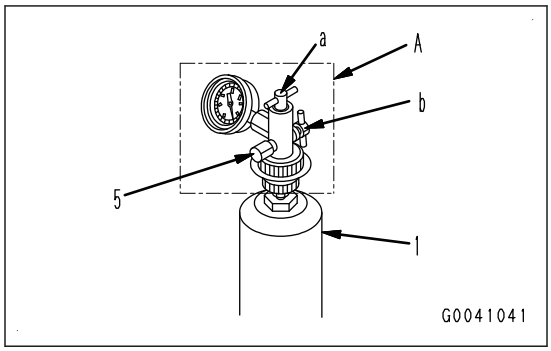
1. Lift the dump body and lock with body pivot pins.
2. Remove the oil pressure pickup plug (11).



1) Install the extension A1 which is attached to the gas charging tool A to the gas valve (4).



2) Turn the handle (a) of the gas charging tool A fully to the let (Between accumulator (1) and gas charging tool A:Close). Turn the handle (b) fully to the right, and make it closed.



REMARK

- The gas does not leak from the hose connection to the atmosphere, since the valve (5) on the hose connection side of the gas charging tool A is a check valve (one way).
- The valve is closed by turning the handle (a) counterclockwise. The valve is open by turning the handle (a) clockwise (Between charge valve and accumulator:Open).
- The handle (a) is a screw-in type to open the valve.
- The valve is open (open to the atmosphere) by turning the handle (b) to the left (counterclockwise). The valve is closed (close to the atmosphere) by turning the handle (b) to the right (clockwise).
- The handle (b) is a screw-in type to close the valve.

3) Connect the gas charging tool A to the the extension A1.

4) Put the cover to the valve (5) so that no rain, snow, sand, or dust enters.

4. Slowly turn the handle (a) of gas charging tool A clockwise and read the value of the gauge.

NOTICE

Do not turn the handle (a) more than 1.5 turns after the charge gas pressure is shown. Gas valve (4) may break.

REMARK

Make sure that gas does not leak.

1) The nitrogen gas pressure varies with the ambient temperature at the time you measure it. Refer to the table 1 below to measure pressure.

REMARK

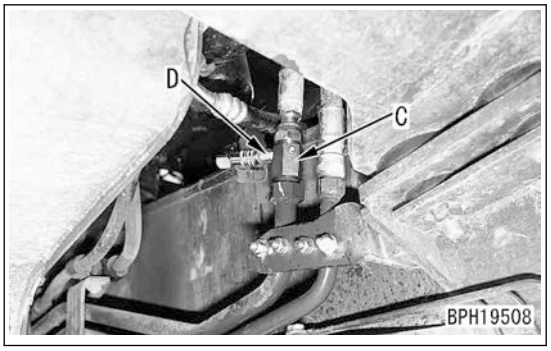
Specified gas pressure = Standard gas pressurex((273+t)/(273+20))

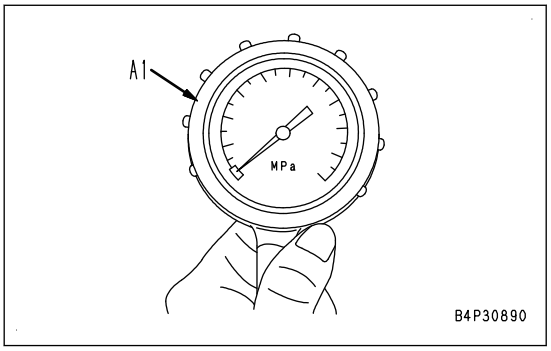
- All values in the formula are℃.
- t:Gas temperature in testing (it can be considered as ambient temperature)

3. Install the adapter C, and connect the hose (1) again.
4. Install the fitting D, and connect it to the gauge A1 of hydraulic tester A.

   REMARK

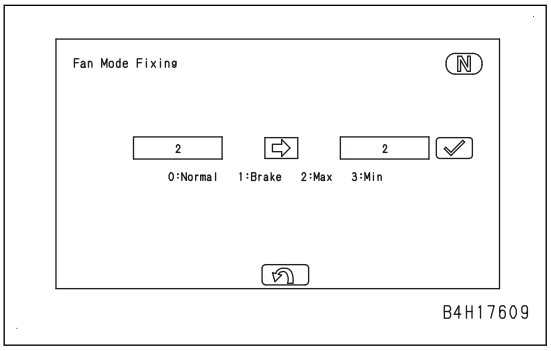
   Gauge in digital hydraulic tester B can also be used in place of gauge A1.
5. Start the engine.
6. Select and display “Pre-defined Monitoring” (01/28). For details,see “Set and Operate Machine Monitor”.
7. Make sure the steering oil temperature is in the specified range.

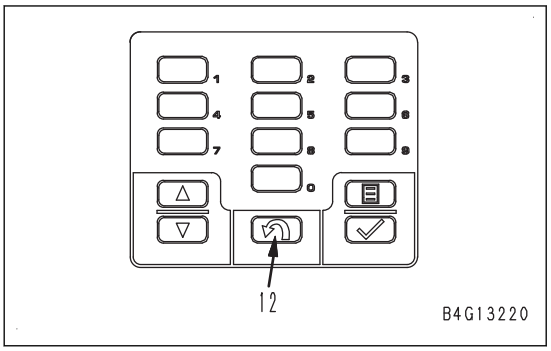




8. Push the RETURN switch (12) to go back to “Service Menu” screen. Set the fan mode to “2:Max”. For details, see “Set and Operate Machine Monitor”, “PROCEDURE TO ADJUST (FAN MODE FIXING)”.
9. Measure the oil pressure when the accelerator pedal is fully depressed (high idle).

   For standard values, see Standard Value Table, “Standard Value Table for Machine”.





After you finish the test, remove the test tools and assemble the machine.

2. After the “Usage Limitation Password” screen is shown, use a switch on the switch panel to input and validate the current password.

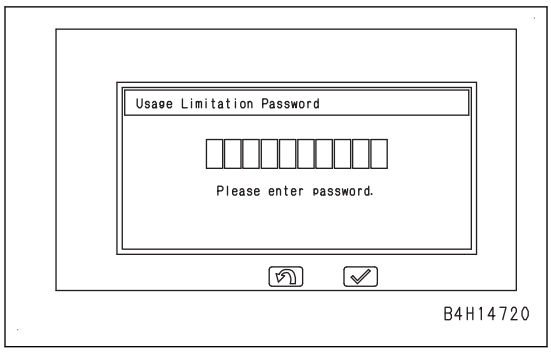
   RETURN switch (12):Deletes an input numeric/Returns to the standard screen

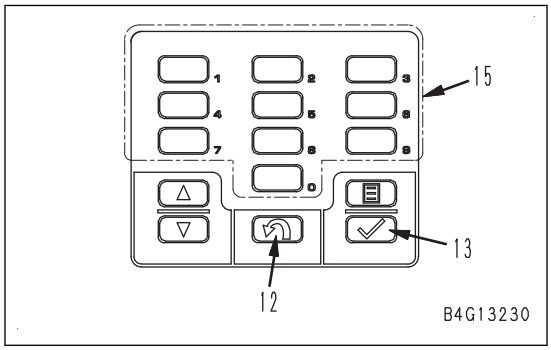
   ENTER switch (13):Validates the inputted password

   Numerical input switch (15):Enters a numerical value

   REMARK

   - Default password:000000
   - When the password entry is correct, the screen changes to the next screen.
   - When the password entry is incorrect, a message to request password entry again is shown.
   - The password for the usage limitation and the engine start lock password are the same in default setting.





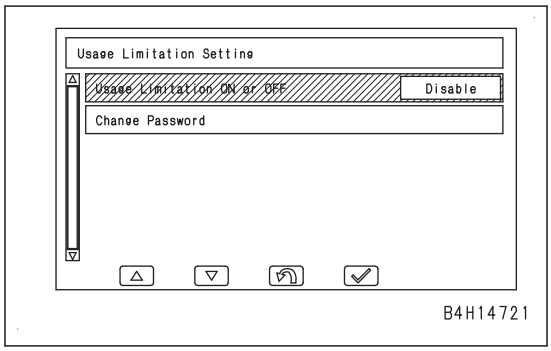
3. After the “Usage Limitation Setting” screen is shown, use a switch on the switch panel to select and validate “Usage Limitation ON or OFF”.

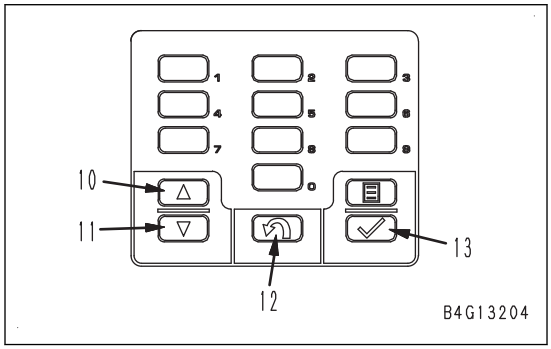
   UP switch (10):Moves the selection up by one item

   DOWN switch (11):Moves the selection down by one item

   RETURN switch (12):Cancels the selection and returns to the previous screen

   ENTER switch (13):Validates the selection



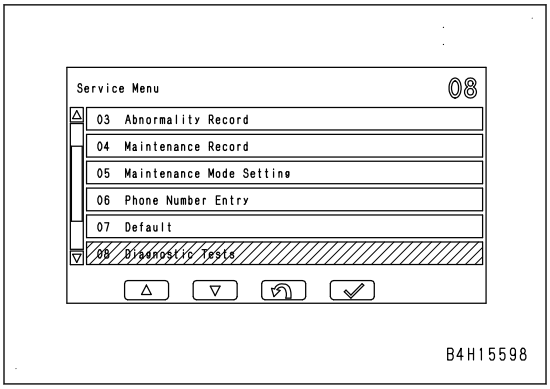


Monitoring code	Table of self-define monitoring (Displayed on screen)		Unit		Relevant component	Remarks
			SI	Non SI		
04506	Monitor 5th Row SW	SW13	ON/OFF	ON/OFF	MON	
		SW14	ON/OFF	ON/OFF		
		SW15	ON/OFF	ON/OFF		
04700	Monitor Output	Buzzer	ON/OFF	ON/OFF	MON	
		Personal Code Relay	ON/OFF	ON/OFF		
		Night SW Lamp	ON/OFF	ON/OFF		
		Night Shift Lever Lamp	ON/OFF	ON/OFF		
		Parking Brake SW Lamp	ON/OFF	ON/OFF		
		Head Lamp (High) Relay	ON/OFF	ON/OFF		
00205	Selected Model (Monitor)		-	-	MON	
20227	Assembly P/N (Monitor)		-	-	MON	
20402	S/N (Monitor)		-	-	MON	
20228	Program P/N (Monitor)		-	-	MON	
20221	Program Version (Monitor)		-	-	MON	
20222	Data Version (Monitor)		-	-	MON	
55300	A/C Compressor State		ON/OFF	ON/OFF	MON	
55000	A/C Fresh Air Temp Code		-	-	MON	
55100	A/C Recirc Air Temp Code		-	-	MON	
55200	A/C Control Mode Data (Monitor)		-	-	MON	
55201	A/C Control Mode Data (A/C ECU)		-	-	MON	
20266	Assembly P/N (Rearview Monitor)		-	-	MON	
20421	Program P/N (Rearview Monitor)		-	-	MON	
20267	Program P/N (Rearview Monitor)		-	-	MON	
20268	Program Version (Rearview Mon)		-	-	MON	

*1:Instantaneous fuel consumption (code No:37300) is a theoretical fuel consumption ratio. (This is a theoretical value and it slightly differs from the real fuel consumption ratio.)

- Description order of table
  This is the displayed order of the “Monitoring Selection Menu”screen.
- Unit
  As a display unit, you can select “SI” or “Non SI”. (To switch the display unit, perform it on the “Unit Selection” in “Default” of “Service Menu” screen.)
  Display unit “mg/st” is the quantity (milligram/stroke) per 1 stroke.
- Relevant component
  ENG:The engine controller detects monitoring information.
  KDPF:The engine controller detects monitoring information related to KDPF.
  T/M:The transmission controller detects monitoring information.
  RHC:The retarder and hoist controller detects monitoring information.
  KOM PLS:The KOMTRAX Plus controller detects monitoring information.

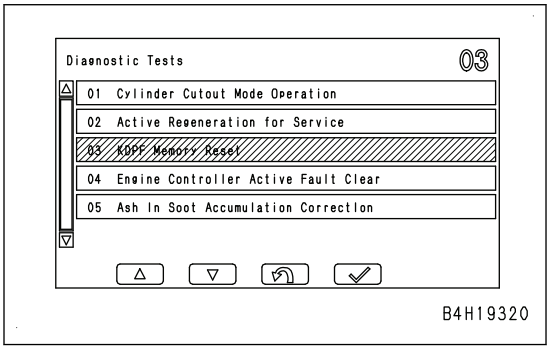
1. Select “Diagnostic Tests” on “Service Menu” screen.



2. Select “KDPF Memory Reset” with the switches after “Diagnostic Tests” screen appears.

REMARK

Selection procedure is the same as on “Service Menu” screen.



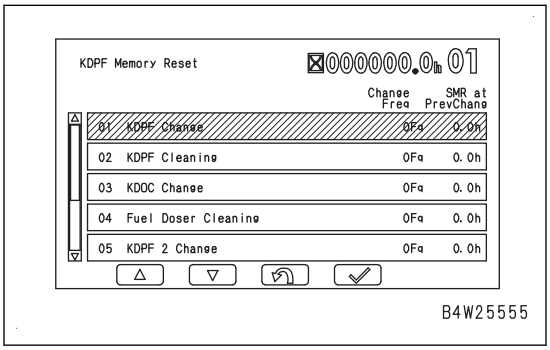
3. On the “KDPF Memory Reset” screen, select an item to be reset.

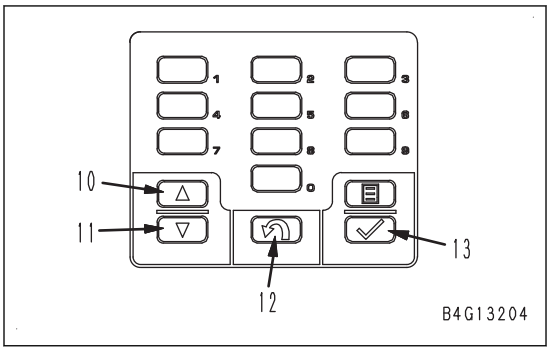
UP switch (10):Moves the selection up by one item

DOWN switch (11):Moves the selection down by one item

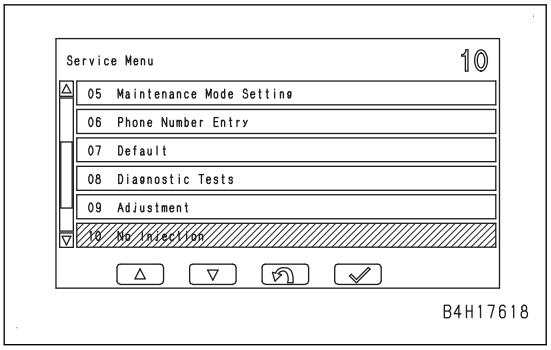
RETURN switch (12):Returns to the “Diagnostic Tests” screen

ENTER switch (13):Validates the selection





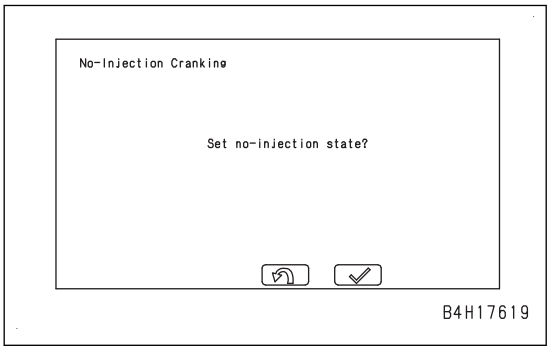
1. Select “No-Injection Cranking” on “Service Menu” screen.

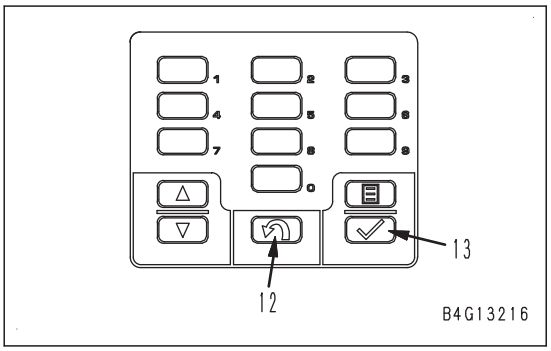


2. After the “No-Injection Cranking” screen is shown, confirmation for the execution of no-injection cranking is shown. Use a switch on the switch panel to select the action.

   RETURN switch (12):Does not execute (returns the screen to the “Service Menu” screen)

   ENTER switch (13):Validates





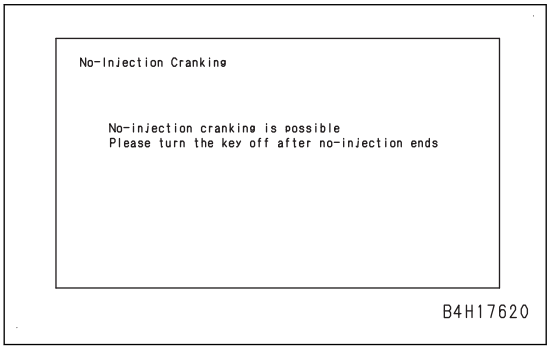
3. If no-injection cranking (no fuel injection on every cylinder) is enabled, “No-injection cranking is possible. Please turn the key off after no-injection ends.” is displayed on the screen. Crank the engine with the starting motor.

   NOTICE

   To protect the starting motor, do not crank the engine for longer than 20 seconds.

   REMARK

   While the screen is changing to the screen as shown in the figure, the screen of under preparation is shown.



4. After the cranking is completed, turn the start switch to OFF position.

   You cannot change the screen described above to another screen.

Default Setting of KOMTRAX Plus Controller

Tools to Set the Default of KOMTRAX Plus Controller

Symbol	Part No.	Part name	Q'ty	Remarks
A	Commercially available	Personal computer	1	• Notebook type • Windows®7/8/8.1 based • Equipped with LAN port
B	Commercially available	LAN cable	1	• Category:5e • Shape of connector:RJ45
C	-	Initial Configuration Tool	1	Software for setting KOMTRAX Plus controller
D	-	Data Collection Tool	1	Software for downloading the data from KOMTRAX Plus controller
E	-	Data Conversion Tool	1	Software for converting the downloaded data

⚠ Put the machine on a level ground, set the parking brake switch to (P), and stop the engine.

⚠ Block the tires to prevent machine movement.

NOTICE

The following is the work order for each setting. For details of each setting, see Operation and Maintenance Manual for each tool.

Obtain each tool (software) from “KOMTRAX Support,KLTD”.

E-mail address:JP00MB_webcare@global.komatsu

After assembling the machine, be sure to initialize KOMTRAX Plus controller.

How to do the Default Setting of KOMTRAX Plus Controller

1. Install default setting tool C to personal computer A. For details, see Operation and Maintenance Manual for default setting tool C.
2. Install data collection tool D to personal computer A. For details, see Operation and Maintenance Manual for data collection tool D.
3. Install data conversion tool E to personal computer A. For details, see Operation and Maintenance Manual for data conversion tool E.
4. Set the IP address to personal computer A.

   REMARK

   The IP address of personal computer A must be set since the default setting tool C and the data collection tool D perform the setting of KOMTRAX Plus controller and the data downloading through LAN cable.

   1) Open “Control Panel”from Start Menu.
   2) Open “Network And Sharing Center” and “Change Adapter Settings”on the control panel.
   3) Right-click the LAN adapter of mounted LAN port (local area connection), and open “Property”.
   4) Push the button of “Property”on the displayed dialog.
   5) Select “Internet Protocol Version 4 (TCP/IPv4)” on the displayed dialog, and push the button of “Property”.
   6) Select “Use the following IP address”, input the following value, and push “OK”.

      IP address:192.168.0.240

      Subnet mask:255.255.255.0

      Default gateway:192.168.0.200

How to Do Operation Check of Driver Status Monitor

1. Insert the SD memory card with the machine setting value file into the driver status monitor.
2. Turn the starting switch to the ON position. Make sure that the driver status monitor is activated with the machine states that follow.
   - The driver status monitor LED is ON.
   - A short beep sound comes out 3 times.

   REMARK

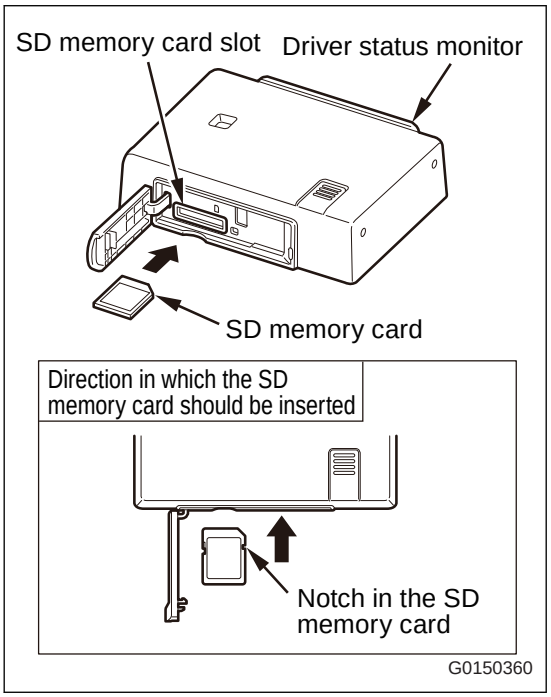
   It comes out immediately after the starting switch is turned to the ON position.

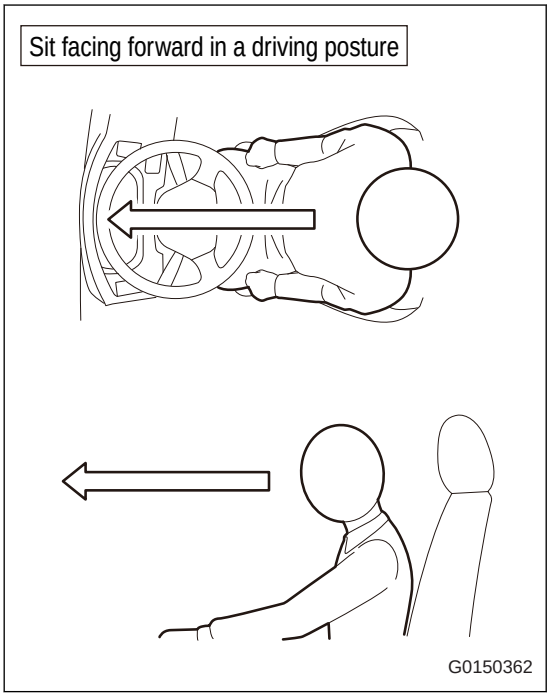
   NOTICE

   When a long beep sound comes out 1 time and the camera LED flashes at the activation of the driver status monitor, it is activated in the test mode (installed condition confirmation mode). When the system is activated in the test mode (installed condition confirmation mode), the result of the test mode (image confirmation) is initialized. Do the installation and test mode (image confirmation) again.
3. For approximately 30 seconds, keep the operating posture while the machine is in the travel direction as shown in the figure.

   NOTICE

   - **If the camera LED flashes continuously, the system does not recognize the face. The test mode (image confirmation) is not completed correctly. Adjust the camera position. For details, see "How to Adjust Drowsiness Detection Camera Angle". After the adjustment, do the test mode (image confirmation) again, and complete it correctly.**
   - **Stop the machine at the area where the operator's seat is not exposed to direct sunlight.**
   - **Adjust the steering position not to let it hide your face.**
   - **Do not put on the personal equipment such as sunglasses, mask, cap, hard hat, or such that hides the appearance of your face.**





No.	Start	End	Operating time (Sec.)	Operation of machine							
				Operation status	AISS LOW switch	Accelerator pedal	Brake pedal	Gear shift lever position	Parking brake switch position	Retarder control lever position	Dump lever position
2	2:00	3:00	60	Low idle (High)	↑	-	Depress (Continue)	↑	Travel	Return	Keep
3	3:00	3:30	30	High idle	↑	Depress	-	↑	Parking	Pull	Up (*1)
4	3:30	4:00	30	High idle	↑	↑	-	↑	↑	↑	Keep (*1)
5	4:00	5:00	60	Low idle (Low)	↑	-	-	↑	↑	↑	Float
6	5:00	5:30	30	High idle	↑	Depress	-	↑	↑	↑	Keep
7	5:30	6:00	30 (*2)	Torque converter stalled	↑	↑ (*3)	-	D (*3)	↑	↑	↑
8	6:00	6:30	30	High idle	↑	↑	-	N	↑	↑	↑
9	6:30	7:00	30 (*2)	Torque converter stalled	↑	↑ (*3)	-	D (*3)	↑	↑	↑
10	7:00	7:30	30	High idle	↑	↑	Depress (Repeat 20 times)	N	↑	↑	↑

*1:If the dump body is not able to be lifted up in a maintenance garage, perform No.5 (alternative to No.3 and No.4) for 120 seconds.

*2:30 seconds is an estimate. If the torque converter is too hot, lift your right foot off the accelerator pedal, and set the gear shift lever to N.

*3:Lift your foot off the accelerator pedal and set the engine speed at low idle, then set the gear shift lever to D.

NOTICE

Be careful of the increase in the torque converter oil temperature during a stall test. Do not allow the torque converter to become too hot.

REMARK

- AISS LOW switch operation is not necessary.
- When you operate the accelerator pedal, brake pedal, or retarder control lever, operate the pedals and lever to their full travel.
- The torque converter stall is performed at F2 gear speed, make sure to set the moving-off gear speed to “F2” in “F1 Start at D Position Setting”.

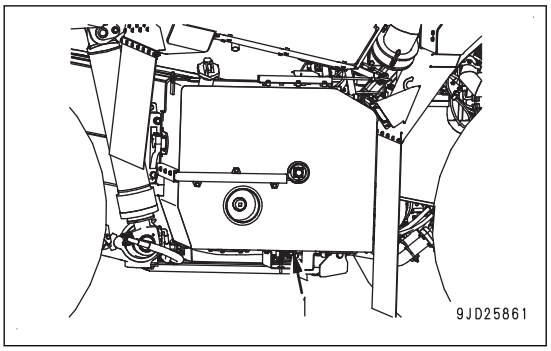
NOTICE

- **Komatsu genuine fuel filter cartridges adopt a special filter with high-efficiency filter properties. Use Komatsu genuine parts when you replace them.**
- **The common rail fuel injection system used on this machine has more precise parts than those in the standard injection pump and nozzle. If any filter cartridge other than a Komatsu genuine fuel filter cartridge is used, unwanted materials may enter. Thus, a problem may occur in the injection system. Do no use alternative parts.**
- **During test or maintenance of the fuel system, be sure that any unwanted material does not enter the fuel system. If any dust or other material attaches to any part, clean the part fully with clean fuel.**
- **When the filter cartridge is removed, fuel drops from the filter head. To prevent the flow of fuel, do not leave the machine with the filter cartridge removed.**

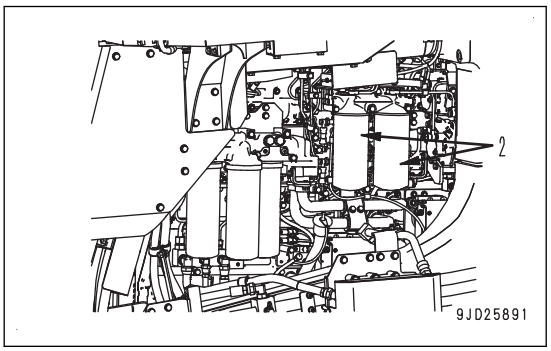
Items to be prepared

- Container to receive the fuel
- Filter wrench

1. Close the fuel supply valve (1) of the fuel tank.



2. Put a container below the filter cartridge (2) to catch the fuel.
3. Turn the filter cartridge (2) counterclockwise by using the filter wrench, and remove it.
4. Clean the filter head.
5. Cover the seal surface with a thin layer of oil.



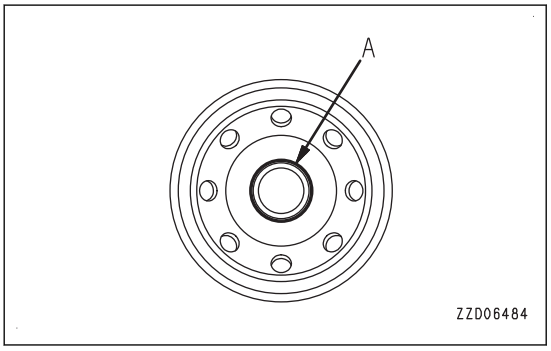
6. Install the new filter cartridge to the filter head.

   When you install the filter cartridge, tighten it hand tight until its surface touches the seal surface of the filter head. Then tighten the filter cartridge 1/2 to 3/4 turns.

   NOTICE

   - **Do not fill the new filter cartridge with fuel.**
   - **Remove the cap (A) at the middle and install the filter cartridge.**

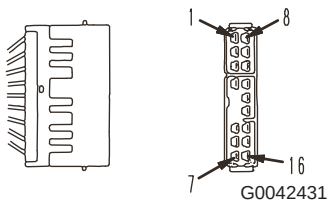
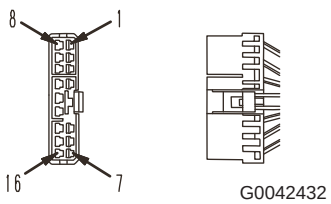
   If the filter cartridge is tightened too much, the gasket is damaged and this will cause the leakage of fuel. If it is not tightened enough, fuel will drain through the opening in the gasket. Be sure to observe the angle to tighten.

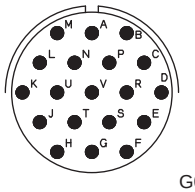


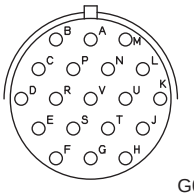
   When you tighten the filter cartridge using the filter wrench, be careful not to scratch or otherwise damage the filter.

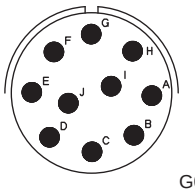
7. After you complete the replacement of filter cartridge (2), bleed air from the circuit.

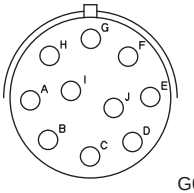
Connector No.	Connector type	Number of pins	Location	Address
B06	Terminal	1	Backup alarm buzzer	K-9
B07	DT	3	Dump body position sensor	J-9
B08	DT	2	Added backup lamp (if equipped)	K-9
B10	Terminal	1	Ground (frame)	L-8
B1L	DT	2	Payload meter green indicator lamp (L.H.)	L-1
B1R	DT	2	Payload meter green indicator lamp (R.H.)	C-8
B2L	DT	2	Payload meter orange indicator lamp (L.H.)	L-1
B2R	DT	2	Payload meter orange indicator lamp (R.H.)	C-8
B3L	DT	2	Payload meter red indicator lamp (L.H.)	L-2
B3R	DT	2	Payload meter red indicator lamp (R.H.)	C-8
BCF	DT	2	Brake cool filter switch (if equipped)	-
BCVR2	DT	2	BCV solenoid	I-9
BK	DT	12	Middle connector	L-5
BL	SWP	6	Revolving lamp switch (if equipped)	R-9
BPFL	DT	3	ABS control valve pressure sensor (front left) (if equipped)	AX-9
BPFR	DT	3	ABS control valve pressure sensor (front right) (if equipped)	AY-9
BPRL	DT	3	ABS control valve pressure sensor (rear left) (if equipped)	BB-8
BPRR	DT	3	ABS control valve pressure sensor (rear right) (if equipped)	BA-8
BR	Terminal	1	Start switch connector BR	N-1
BRC1	DRC26	24	Retarder and hoist controller	P-6
BRC2	DRC26	40	Retarder and hoist controller	O-6
BRC3	DRC26	40	Retarder and hoist controller	O-6
BT	DT	8	Middle connector	A-1
BT-1A	Terminal	1	Battery	A-9
BT-1B	Terminal	1	Battery	A-9
BT-2A	Terminal	1	Battery	A-9
BT-2B	Terminal	1	Battery	A-9
BT1	Terminal	30	Fuse case	S-9
BT2	Terminal	30	Fuse case	S-9
BT3	Terminal	30	Fuse case	S-9
BT4	Terminal	30	Fuse case	S-9
BT5	Terminal	30	Fuse case	T-9
BZ2	M	2	Buzzer	R-1
C	Terminal	1	Start switch connector C	O-1
CAB2	SWP	8	Middle connector	M-4

Total number of pins	S type connector		Special tool number for connection checks
	Male (concave engaging portion)	Female (convex engaging portion)	
16 (Blue)	 G0042431	 G0042432	799-601-7170 (T-branch)
	Part No.: 08056-11672	Part No.: 08056-11682	

<table>
<tr><td colspan="4">Amphenol connector (for ICT)</td></tr>
<tr><td rowspan="2">Total number of pins</td><td colspan="2">PT series connector</td><td rowspan="2">Special tool number for connection checks</td></tr>
<tr><td>Male (concave engaging portion)</td><td>Female (convex engaging portion)</td></tr>
<tr><td rowspan="2">19</td><td> 

G0042627</td><td> 

G0042628</td><td rowspan="2">799-902-9310 (T-branch)</td></tr>
<tr><td>-</td><td>-</td></tr>
<tr><td rowspan="2">Total number of pins</td><td colspan="2">AC series connector</td><td rowspan="4">799-902-9320 (T-branch)</td></tr>
<tr><td>Male (concave engaging portion)</td><td>Female (convex engaging portion)</td></tr>
<tr><td>10</td><td> 

G0042629</td><td> 

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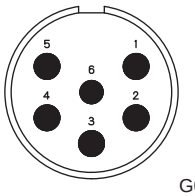
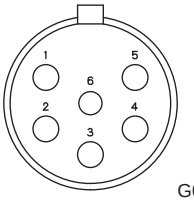
<tr><td>6</td><td> 

G0042631</td><td> 

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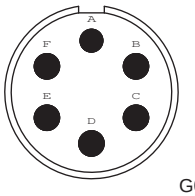
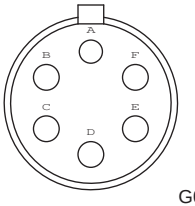
<tr><td>6</td><td> 

G0041851</td><td> 

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Failure code	Failure (Shown on screen)	Applicable component	Action level	History category	Remarks
989N00	Engine Controller Lock Caution 3	MON	-	Electrical system	
989X00	Overspeed Warning	TM	-	Mechanical system	
989Y00	Overload Warning	TM	-	Mechanical system	
98A000	Drowsiness Detection	DSMC	-	Electrical system	
98A100	Inappropriate Driving Posture Detection	DSMC	-	Electrical system	
98A200	Dozing Detection	DSMC	-	Electrical system	
98A300	Inattention to Upside Detection	DSMC	-	Electrical system	
98A400	Inattention to Downside Detection	DSMC	-	Electrical system	
98A500	Inattention to Left Detection	DSMC	-	Electrical system	
98A600	Inattention to Right Detection	DSMC	-	Electrical system	
A1U0N3	HC Desorb Request 1	ENG	L01	Mechanical system	
A1U0N4	HC Desorb Request 2	ENG	L03	Mechanical system	
AA10NX	Air Cleaner Clogging	MON	L01	Mechanical system	
AB00KE	Charge Voltage Low	TM	L03	Electrical system	
AB00KY	Alternator R Terminal Hot Short Circuit	TM	L03	Electrical system	
AQ00N3	KDPF System Imbalance Soot Accumulation 1	ENG	-	Mechanical system	
AQ00N4	KDPF System Imbalance Soot Accumulation 2	ENG	-	Mechanical system	
AQ10N3	Manual Stationary Regeneration Request (KDOC Face Plugging)	ENG	L01	Mechanical system	
AS00R2	Warning 2 (NOx Control Device Abnormality)	ENG	L01	Electrical system	
AS00R3	Inducement 1 (NOx Control Device Abnormality)	ENG	L03	Electrical system	
AS00R4	Inducement 2 (NOx Control Device Abnormality)	ENG	L04	Electrical system	
AS00R6	Temporary Recovery of Inducement	ENG	-	Electrical system	
B@BAZG	Eng Oil Press Low	ENG	L03	Mechanical system	

Gear speed when a failure is sensed		Unusual clutch	Solution when a failure is sensed		
			Action of controller (Selected clutch, gear speed)		ON/OFF condition of lockup clutch
F1	1st	1st	2L	F2	OFF
	Low	Low	2H	F3	OFF
R (RL)	Reverse	Reverse	OFF	NEUTRAL	OFF
	Low	Low	RH	R	OFF

Gear speed when a failure is sensed		Unusual clutch	Solution when a failure is sensed		
			Action of controller (Selected clutch, gear speed)		ON/OFF condition of lockup clutch
F1	1st	1st	2L	F2	OFF
	Low	Low	2H	F3	OFF
R (RL)	Reverse	Reverse	OFF	NEUTRAL	OFF
	Low	Low	RH	R	OFF

Failure Code [989X00]

Action level	Failure code	Failure	Overspeed Warning (Transmission controller system)
-	989X00		
Details of failure	Travel speed exceeds the speed set by the maximum speed limit, and has no limit by the accelerator control alone.		
Action of controller	• Operate the alarm. • Operates the retarder brake by the retarder and hoist controller.		
Effect to the machine	The travel speed is reduced to the set speed by the retarder and hoist control.		
Related information	When the speed has no limit with only the accelerator correction with the transmission controller, while the speed limit works. The travel speed has a limit when the retarder brake works by the retarder and hoist controller.		

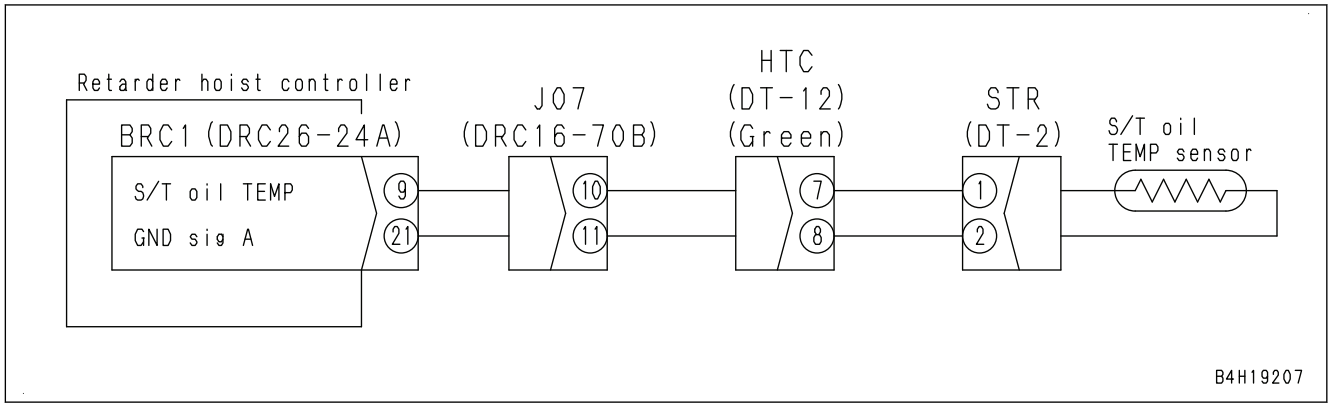
No.	Cause	Procedure, test locations, specifications and remarks
1	Wrong operation	Although the speed limit works, release the accelerator pedal during downhill travel. (Instruct operators on the proper operating procedures.)

Failure Code [B@JANS]

Action level	Failure code	Failure	Steering Oil Overheat (Retarder and hoist controller system)
L02	B@JANS		
Details of failure	The voltage of the steering oil temperature sensor signal circuit is 2.2V (100℃ and higher) and lower.		
Action of controller	None in particular		
Effect to the machine	If the machine is used as it is, oil may leak.		
Related information	The monitor function examines the input signal from the steering oil temperature sensor. (Code: 32701 (℃), 32702 (V))		

No.	Cause	Procedure, test locations, specifications and remarks			
1	Overheating of steering oil (when the system operation is correct)	Steering oil becomes too hot. If it is too hot, repair the cause of failure.			
2	Defective steering oil temperature sensor	1. Turn the start switch to the OFF position. 2. Disconnect connector STR, and connect T-adapter to the male side.			
		Resistance	Between STR (male) (1) and (2) (Oil temperature sensor heat properties)	Oil temperature:25℃	38.1 to 47.8kΩ
				Oil temperature:30℃	31.0 to 40.0kΩ
				Oil temperature:80℃	6.1 to 7.0kΩ
				Oil temperature:90℃	4.6 to 5.2kΩ
				Oil temperature:100℃	3.6 to 4.0kΩ
			Between ground and STR (male) (1) or STR (male) (2)	Oil temperature:All range	Min.1MΩ
3	Defective retarder and hoist controller	If there is no failure with the checks above, the retarder and hoist controller is defective. (Since this is an internal problem, you cannot troubleshoot.)			

Circuit Diagram of Steering Oil Temperature Sensor



Failure Code [CA227]

Action level	Failure code	Failure	Sensor 2 Supply Voltage High Error (Engine controller system)
L03	CA227		
Details of failure	A high voltage is generated in the sensor 2 power supply (5V) circuit.		
Action of controller	• Ignores signals from the EGR valve lift sensor and VGT position sensor. Sets values before it senses an error for operation. • Ignores signal from the doser fuel pressure sensor, and sets values before it senses an error for operation. • Derates the engine power for operation.		
Effect to the machine	Engine power decreases.		
Related information	• Engine power deration is canceled by turning the starting switch to OFF position after this failure code is cleared. (This deration is not canceled only by clearing the failure code.) • After the repair is completed, make sure the failure code is removed. Use the procedure which follows. Procedure:Turn the start switch to the ON position		

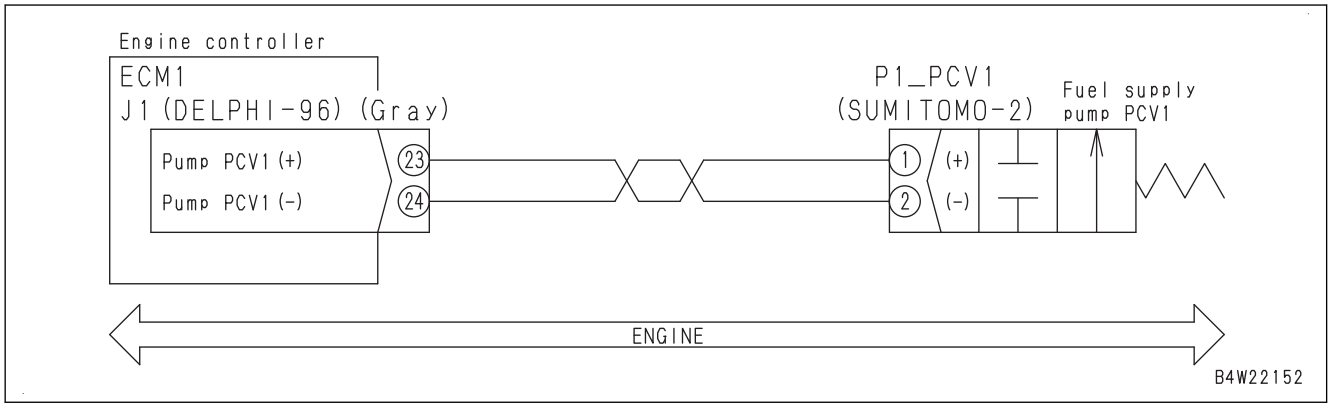
No.	Cause	Procedure, test locations, specifications and remarks		
1	Defective wiring harness connector	This failure code is displayed if the connectors of electrical parts around the engine are defective, disconnected, or loosened due to heat and vibration. See descriptions of wiring harnesses and connectors in the table “Electrical equipment” in “CHECKS BEFORE TROUBLESHOOTING” under “RELATED INFORMATION ON TROUBLESHOOTING”, and check the connectors.		
2	Defective sensor or wiring harness	1. Turn the start switch to the OFF position. 2. Disconnect these connectors one by one, and turn the start switch to the ON position each time. 3. If this failure code is not shown, the disconnected device is defective. Repeat steps 1 to 3 until you make sure that defective devices which caused the failure are no longer found. **REMARK** Since the connector is disconnected, other failure codes appear. Ignore all of the shown failure codes other than this one.		
		Connector	Dosing fuel pressure sensor	AFT1_PFUE L
			EGR valve lift sensor	SEGR
			VGT position sensor	SVGT
			Engine wiring harness	ECM1 J1
3	Defective engine controller	If there is no failure with the checks above, the engine controller is defective. (Since this is an internal problem, you cannot troubleshoot.)		

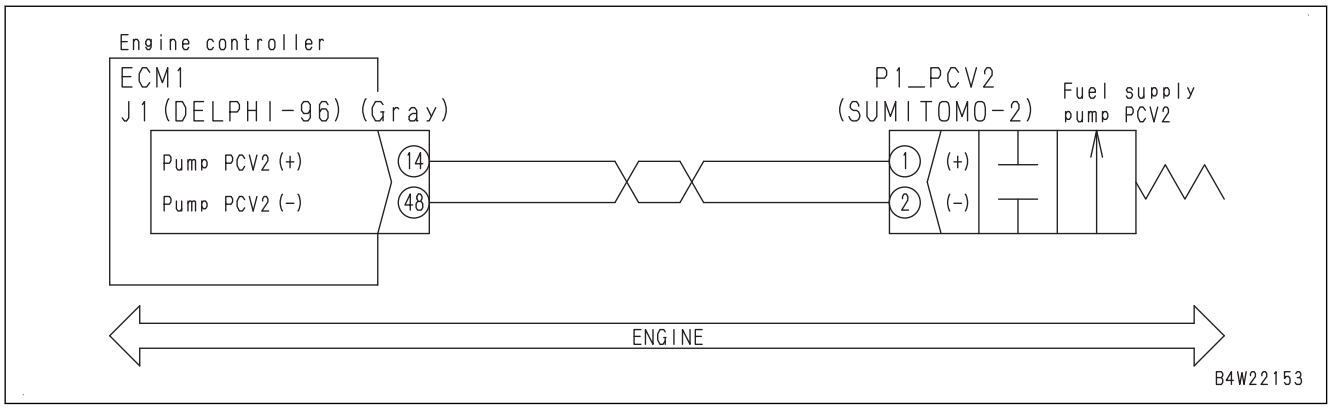
Failure Code [CA357]

Action level	Failure code	Failure	MAF Sensor Low Error (Engine controller system)
L03	CA357		
Details of failure	Low frequency input error occurs in signal circuit of mass air flow sensor.		
Function of Controller	• Sets mass air flow to fixed value (10kg/min.) or operation. • Closes EGR valve. • Derates the engine power for operation. • Stops regeneration control.		
Effect on the machine	Engine power decreases.		
Related information	• If failure code [CA3419] or [CA3421] is shown, troubleshoot for it first. • When the sensor connector is disconnected, this failure code and [CA691] are shown at the same time. • Sensor output is pulse waveform of approximately 5V, which cannot be measured with a multimeter. • Engine power deration is canceled by turning the starting switch to OFF position after this failure code is cleared. (This deration is not canceled only by clearing the failure code.) • After the repair is completed, use this procedure to remove the failure code. Procedure:Turn the starting switch to the ON position.		

No.	Cause	Procedure, test location, specifications and remarks		
1	Defective wiring harness connector	This failure code is displayed if the connectors of electrical parts around the engine are defective, disconnected, or loosened due to heat and vibration. See descriptions of wiring harnesses and connectors in the table “Electrical equipment” in “CHECKS BEFORE TROUBLESHOOTING” under “RELATED INFORMATION ON TROUBLESHOOTING” and check the connectors.		
2	Defective mass air flow sensor (internal defect)	1. Turn the starting switch to the OFF position. 2. Replace the Mass air flow sensor 3. Turn the starting switch to the ON position.		
		If this failure code is not displayed, the original mass air flow sensor is defective.		
3	Open circuit in wiring harness	1. Turn the starting switch to the OFF position. 2. Disconnect connectors ECM1 J1 and MAF, and connect T adapter to each female side.		
		Resistance	Between ECM1 J1 (female) (80) and MAF (female) (2)	Max.1Ω
			Between ECM1 J1 (female) (56) and MAF (female) (3)	Max.1Ω
			Between ECM1 J1 (female) (32) and MAF (female) (1)	Max.1Ω
4	Ground fault in wiring harness	1. Turn the start switch to the OFF position. 2. Disconnect connectors ECM1 J1 and MAF, and connect T adapter to either female side.		
		Resistance	Between ground and ECM1 J1 (female) (32) or MAF (female) (1)	Min.1MΩ

Circuit Diagram of Fuel System





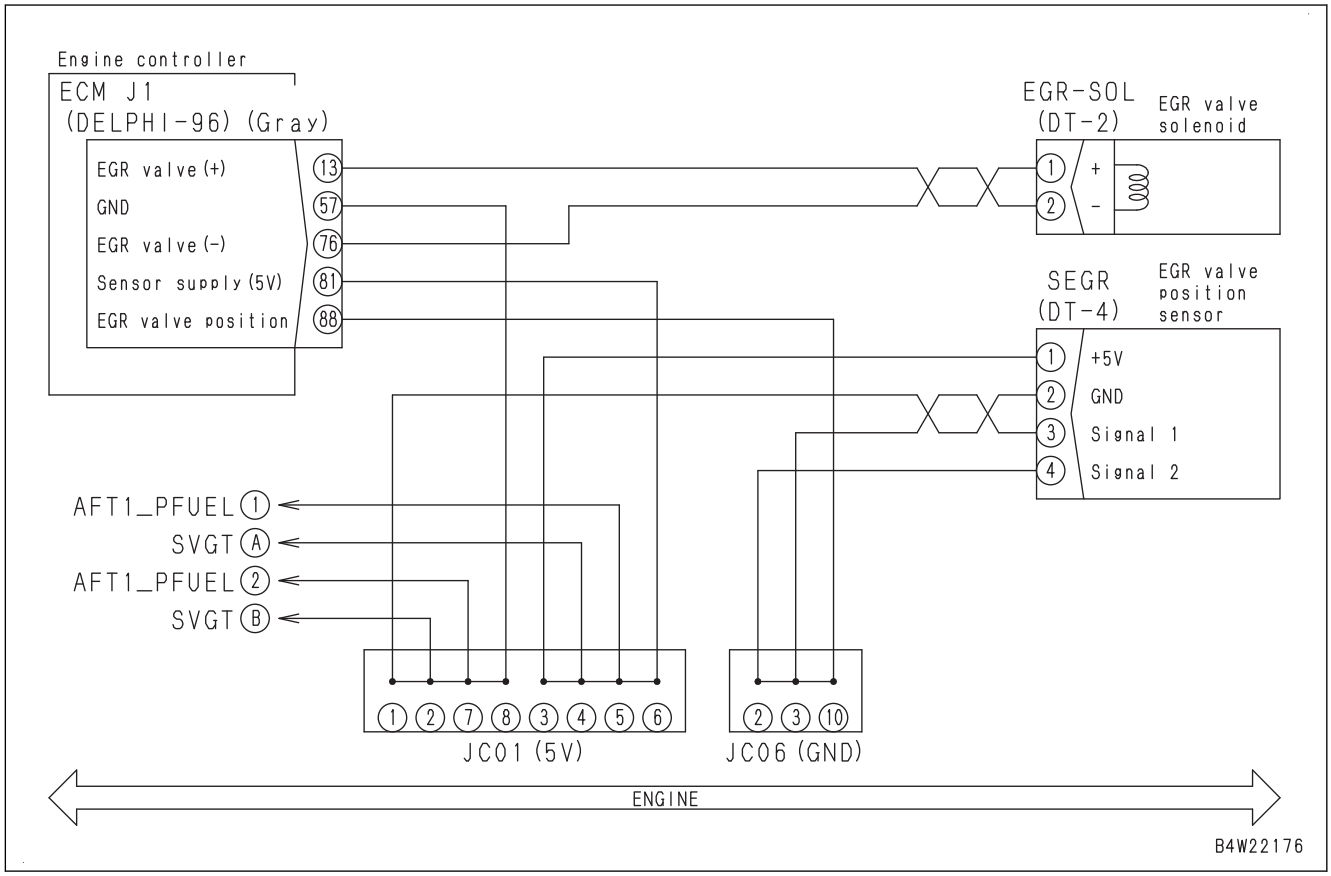
Failure Code [CA1843]

Action level	Failure code	Failure	Crankcase Pressure Sensor High Error (Engine controller system)
L01	CA1843		
Details of failure	High pressure error in the signal circuit of the crankcase pressure sensor.		
Function of Controller	Sets the crankcase pressure sensor to the specified value (approximately 0kPa) for operation.		
Effect on the machine	None in particular		
Related information	• If the failure code [CA352] or [CA386] is shown, the sensor power supply system may be defective. Troubleshoot for it first. • Signal voltage from the crankcase pressure sensor can be checked by the monitoring function. (Code:48401) • Pressure detected by the crankcase pressure sensor can be checked by the monitoring function. (Code:48400) • After the repair is completed, check that the failure code is cleared by the following procedure. Procedure:Turn the start switch to the ON position.		

No.	Cause	Procedure, test location, specifications and remarks		
1	Defective wiring harness connector	This failure code is displayed if the connectors of electrical parts around the engine are defective, disconnected, or loosened due to heat and vibration. See descriptions of wiring harnesses and connectors in the table “Electrical equipment” in “CHECKS BEFORE TROUBLESHOOTING” under “RELATED INFORMATION ON TROUBLESHOOTING”, and check the connectors.		
2	Defective crankcase pressure sensor	1. Turn the starting switch to the OFF position. 2. Disconnect connector PCCV. 3. Turn the start switch to the ON position.		
		If the failure code changes from [CA1843] to [CA1844], crankcase pressure sensor is defective.		
3	Open circuit in wiring harness	1. Turn the starting switch to the OFF position. 2. Disconnect connectors ECM1 J1 and PCCV, and connect T adapter to each female side.		
		Resistance	Between ECM1 J1 (female) (54) and PCCV (female) (2)	Max.1Ω
4	Hot short circuit in wiring harness	1. Turn the start switch to the OFF position. 2. Disconnect connector PCCV, and connect T adapter to the female side. 3. Turn the start switch to the ON position.		
		Voltage	Between PCCV (female) (3) and (2)	Max.1V
5	Short circuit in wiring harness	1. Turn the start switch to the OFF position. 2. Disconnect connectors ECM1 J1 and PCCV, and connect T adapter to either female side.		
		Resistance	Between ECM1 J1 (female) (78) and (63), or between PCCV (female) (1) and (3)	Min.1MΩ
6	Defective engine controller	If there is no failure found by these checks, the engine controller is defective. (Since this is an internal failure, you cannot troubleshoot.)		

No.	Cause	Procedure, test location, specifications and remarks
9	Defective fuel doser solenoid valve 1-A	• Replace the dosing fuel solenoid valve assembly. • Perform “Loaded Diagnostics Operation To Clear Failure Code” after replacement. If this failure code is not displayed, the replaced dosing fuel solenoid valve 1-A (3A) is defective.
10	Defective joint bolt	• Replace the joint bolt (JB). • Perform “Loaded Diagnostics Operation To Clear Failure Code” after replacement. If the failure code is not displayed, the replaced joint bolt (JB) is defective.
11	Defective fuel feed pump-A	• Replace the fuel feed pump-A (6A). • Perform “Loaded Diagnostics Operation To Clear Failure Code” after replacement. If the failure code is not displayed, the replaced fuel feed pump-A (6A) is defective.
12	Defective fuel feed pump switch	• Replace the fuel feed pump switch. • Perform “Loaded Diagnostics Operation To Clear Failure Code” after replacement. If the failure code is not displayed, the replaced fuel feed pump switch is defective.
13	Defective engine controller	Start the engine, and leave it for approximately 3 minutes. (Implementation of related information, “Method of clearing failure code”.)
		If this failure code is still displayed and no failure is found by preceding checks, engine controller is defective. (In case of an internal defect, troubleshooting is impossible as an assembly. Replace whole assembly.)

Circuit Diagram Related to EGR System



6A. Fuel feed pump-A

6B. Fuel feed pump-B

7A. Relief valve-A

7B. Relief valve-B

a: From fuel pump-A

b: From fuel pump-B

c: Fuel return

d: From fuel supply pump

e: To fuel supply pump

JB: Fuel pipe joint bolt

AFT1_PFUEL: Fuel doser pressure sensor-A connector

AFT1_SOV1: Fuel doser solenoid valve 1-A (shut-off valve) connector

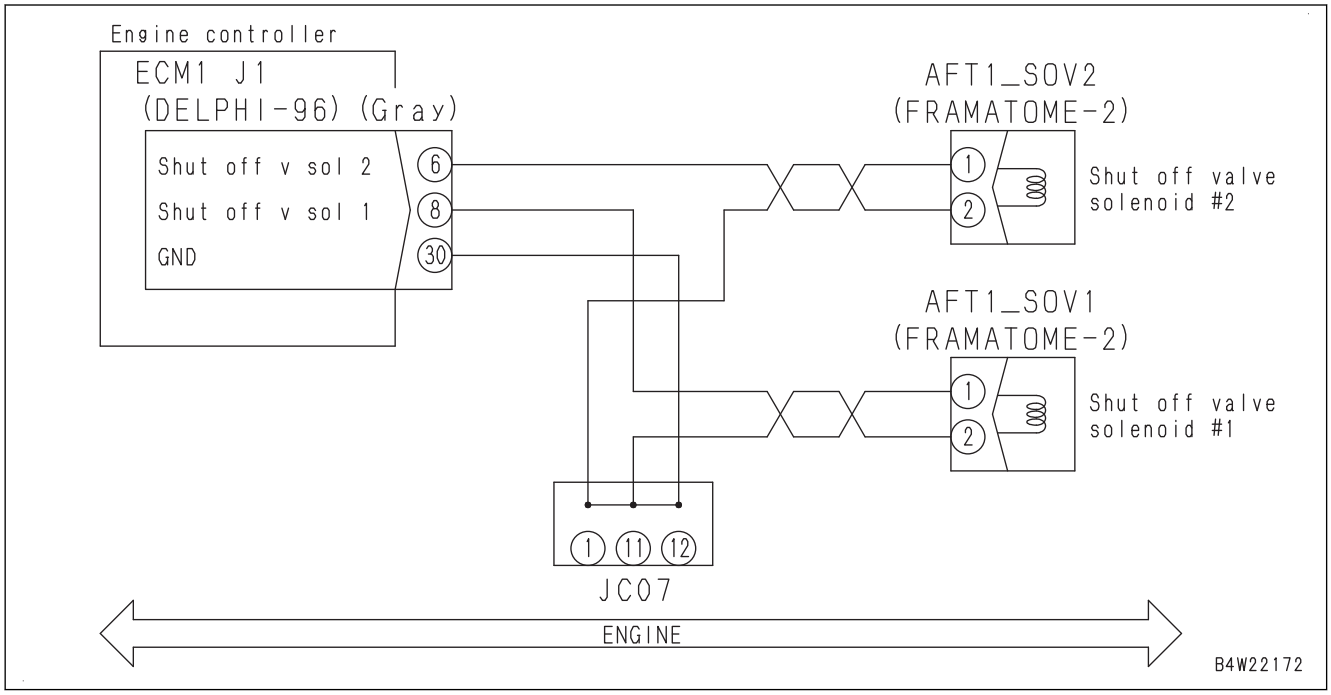
AFT1_SOV2: Fuel doser solenoid valve 2-A (drain valve) connector

AFT2_PFUEL: Fuel doser pressure sensor-B connector

AFT2_SOV1: Fuel doser solenoid valve 1-B (shut-off valve) connector

AFT2_SOV2: Fuel doser solenoid valve 2-B (drain valve) connector

Circuit Diagram of Fuel Doser Solenoid Valve 2



No.	Cause	Procedures, measured location, measured standards and remarks.
4	Oil leaks into the exhaust connector or pipe to KDPF	Examine the exhaust system between the turbocharger and KDPF for entry of oil or fuel. • If oil or fuel is stuck, clean it completely. • If there are signs that oil or fuel flowed into the KDPF, inspect the KDPF, and then clean or replace as required.
5	Defective installation of KDOC outlet temperature sensor	For details, see Disassembly and Assembly, “Remove and Install KDPF Assembly” and “DISASSEMBLE AND ASSEMBLE OF KDPF ASSEMBLY”. Repair as necessary.
6	Defective KDPF temperature sensor	If the failure code is not removed with the above procedures, replace the KDPF temperature sensor.
7	Defective engine controller	If no failure is found with these procedures, the engine controller is defective. (Since this is an internal problem, you cannot troubleshoot.)

Loaded Diagnostics Operation to Confirm Failure Correction

Make sure the repair is completed using these procedures:

(Make sure this failure code is not shown after this procedure.)

1. Turn the start switch from the OFF to the ON position.

   NOTICE

   The failure code is removed once when the start switch is turned from the OFF to ON position. Make sure that the failure code does not show again when the engine runs at low idle speed.

2. Start the engine and run it at low idle for 2 minutes.

   NOTICE

   When this failure code shows when the start switch is turned ON, engine not started, troubleshoot and repair this failure code initially. Then troubleshoot the other failure codes.

   - [CA3316] KDOC Outlet Temperature Sensor Low Error
   - [CA3317] KDOC Outlet Temperature Sensor High Error

Failure Code [CA4952]

Action level	Failure code	Failure	System Operating Lamp Short Circuit (Engine Controller) (Engine controller system)
-	CA4952		
Details of failure	Engine controller senses a short circuit. This occurs when the voltage output circuit does not go to a Low level while the engine controller outputs current to the system operating lamp.		
Procedure of controller	Stops driving system operating lamp.		
Machine Event	None in particular		
Related information	After the repair is completed, remove the failure code by these procedures. Turn the start switch to the ON position.		

No.	Cause	Procedures, measured location, measured standards and remarks.		
1	Defective wiring harness connector	This failure code is displayed if the connectors of electrical parts around the engine are defective, disconnected, or loosened due to heat and vibration. See descriptions of wiring harnesses and connectors in the table “Electrical equipment” in “CHECKS BEFORE TROUBLESHOOTING” under “RELATED INFORMATION ON TROUBLESHOOTING”, and check the connectors.		
2	Hot short circuit in wiring harness	1. Turn the start switch to the OFF position. 2. While this failure code is shown, the system in operation lamp function is off. Turn the battery disconnect switch OFF for 3 minutes or longer, after you turn the start switch to the OFF position. 3. Disconnect connector OPL, and connect T-adapter to female side. 4. Turn the start switch to the ON position.		
		Voltage	Between OPL (female) (2) and ground	Max.1V
3	Short circuit in wiring harness	1. Turn the start switch to the OFF position. 2. While this failure code is shown, the system in operation lamp function is off. Turn the battery disconnect switch OFF for 3 minutes or longer, after you turn the start switch to the OFF position. 3. Remove the fuse No.14 in fuse box BT4. 4. Disconnect connectors ATC3, KOM1A, MCM1, ECM1 J2, ECM2 J2, BRC3, OPC3, KPS2, OPL, and CAB2 and connect T-adapter to female side of OPL. **REMARK** Connector OPC3 is only for the machine with ABS system.		
		Resistance	Between OPL (female) (1) and (2)	Minimum 1MΩ
4	Defective engine controller	If no failure is found with these procedures, the engine controller is defective. (Since this is an internal problem, you cannot troubleshoot.)		

Failure Code [CB697]

Action level	Failure code	Failure	Engine Controller Internal Temperature Sensor High Error_2 (Engine controller system)
L01	CB697		
Details of failure	High voltage error is generated in signal circuit of the engine controller internal temperature sensor.		
Procedure of controller	None in particular		
Machine Event	None in particular		
Related information	• Temperature detected by the engine controller internal temperature sensor can be checked by the monitoring function. (Code:18901) • After the repair is completed, remove the failure code by these procedures. Procedure:Turn the start switch to the ON the position.		

No.	Cause	Procedures, measured location, measured standards and remarks.
1	Incorrect use of controller	Check if the controller is used in high temperature environment.
2	Defective engine controller	If no failure is found with these procedures, the engine controller is defective. (Since this is an internal problem, you cannot troubleshoot.)

Failure Code [CB1924]

Action level	Failure code	Failure	Fuel Doser Solenoid 1 Low Error_2 (Engine controller system)
L03	CB1924		
Details of failure	Low voltage error is sensed in the solenoid valve (shut off valve) 1 circuit of the fuel doser.		
Procedure of controller	Stops regeneration control.		
Machine Event	• Automatic regeneration is not performed. • Manual stationary regeneration is disabled.		
Related information	⚠ **Exhaust connector and KDPF become hot (Minimum 500℃). Be careful not to become burned.** • This failure code stops after the failure is eliminated. Then solenoid valve 1 of the fuel operates again when you cycle the start switch to the ON and then to the OFF position. • After the repair is completed, remove the failure code by these procedures. Procedure:Start the engine.		

No.	Cause	Procedures, measured location, measured standards and remarks.		
1	Defective wiring harness connector	This failure code is displayed if the connectors of electrical parts around the engine are defective, disconnected, or loosened due to heat and vibration. See descriptions of wiring harnesses and connectors in the table “Electrical equipment” in “CHECKS BEFORE TROUBLESHOOTING” under “RELATED INFORMATION ON TROUBLESHOOTING”, and check the connectors.		
2	Defective fuel doser solenoid valve1	1. Turn the start switch to the OFF position. 2. Disconnect connector AFT2_SOV1, and connect T-adapter to male side.		
		Resistance	Between AFT2_SOV1 (male) (1) and (2)	4 to 6Ω
			Between AFT2_SOV1 (male) (1) and ground	Min.1MΩ
3	Open circuit in wiring harness	1. Turn the start switch to the OFF position. 2. Disconnect connectors ECM2 J1 and AFT2_SOV1, and connect T-adapter to each female side.		
		Resistance	Between ECM2 J1 (female) (8) and AFT2_SOV1 (female) (1)	Maximum 1Ω
			Between ECM2 J1 (female) (30) and AFT2_SOV1 (female) (2)	Maximum 1Ω
4	Ground fault in wiring harness	1. Turn the start switch to the OFF the position. 2. Disconnect connectors ECM2 J1 and AFT2_SOV1, and connect T-adapter to either female side.		
		Resistance	Between ground and ECM2 J1 (female) (9) or AFT2_SOV2 (female) (1)	Minimum 1MΩ
5	Short circuit in wiring harness	1. Turn the start switch to the OFF the position. 2. Disconnect connectors ECM2 J1 and AFT2_SOV1, and connect T-adapter to female side of ECM2 J1.		
		Continuity	Between ECM2_J1 (female) (8) and each pin other than pin (8)	No continuity
6	Defective engine controller	If no failure is found with these procedures, the engine controller is defective. (Since this is an internal problem, you cannot troubleshoot.)		

Failure Code [CB2732]

Action level	Failure code	Failure	Fuel Doser Solenoid_2 High Error_2 (Engine controller system)
L03	CB2732		
Details of failure	High voltage error is detected in circuit of fuel doser solenoid valve 2 (drain valve).		
Action of controller	Stops regeneration control.		
Effect to the machine	• Automatic regeneration is not performed. • Manual stationary regeneration is disabled.		
Related information	⚠ **Exhaust connector and KDPF become hot (Min.500℃). Be careful not to get burned.** • The circuit is configured so that this failure code is displayed, not the one indicating a “Low Error” when the sensor connector is disconnected. • After the repair is completed, check that the failure code is cleared by the following procedure. Procedure:Turn the start switch to the ON position.		

No.	Cause	Procedures, test location, specifications and remarks.		
1	Defective wiring harness connector	This failure code is displayed if the connectors of electrical parts around the engine are defective, disconnected, or loosened due to heat and vibration. See descriptions of wiring harnesses and connectors in the table “Electric equipment” in “CHECKS BEFORE TROUBLESHOOTING” under “RELATED INFORMATION ON TROUBLESHOOTING”, and check the connectors.		
2	Defective fuel doser solenoid valve 2	1. Turn the start switch to the OFF position. 2. Disconnect connector AFT2_SOV2, and connect T-adapter to male side. 3. Turn the start switch to the ON position.		
		Resistance	Between AFT2_SOV2 (male) (2) and (1)	4 to 6Ω
			Between AFT2_SOV2 (male) (1) and ground	Min.1MΩ
3	Open circuit in wiring harness	1. Turn the start switch to the OFF position. 2. Disconnect connectors ECM2 J1 and AFT2_SOV2, and connect T-adapter to each female side. **REMARK** When the failure code [CB1923] is shown, an open circuit may occur in GND line.		
		Resistance	Between ECM2 J1 (female) (6) and AFT2_SOV2 (female) (1)	Max.1Ω
			Between ECM2 J1 (female) (30) and AFT2_SOV2 (female) (2)	Max.1Ω
4	Hot short circuit in wiring harness	1. Turn the start switch to the OFF position. 2. Disconnect connector AFT2_SOV2, and connect T-adapter to female side. 3. Turn the start switch to the ON position.		
		Voltage	Between AFT2_SOV2 (female) (1) and (2)	Max.4.7V
5	Defective engine controller	1. Start the engine and run at low idle for approximately 1 minute. 2. If any other failure codes are shown, troubleshoot those codes.		
		If the failure code is shown and no failure found with these procedures, the engine controller is defective. (Since this is an internal problem, you cannot troubleshoot.)		

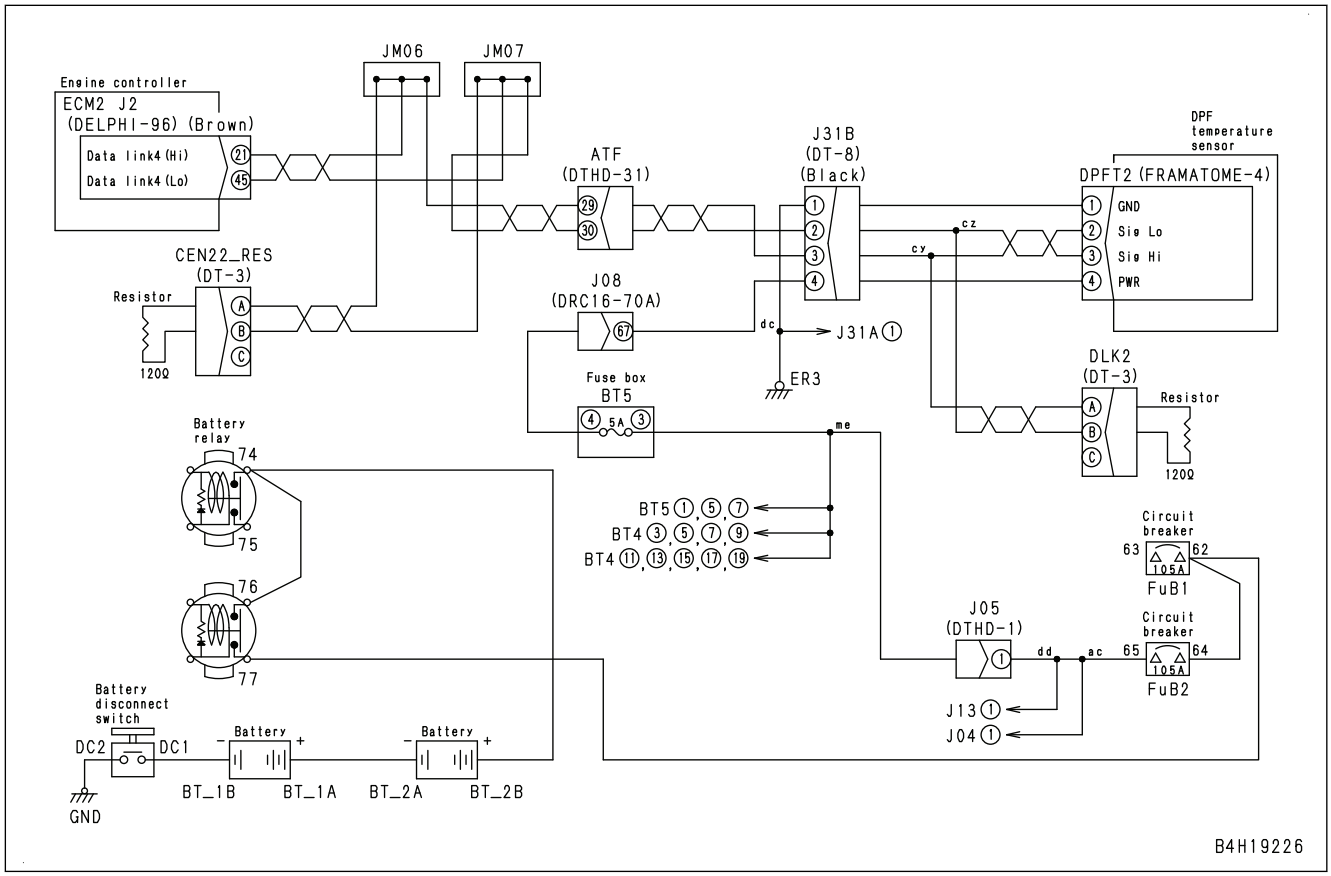
Failure Code [CB3253]

Action level	Failure code	Failure	KDOC Temperature Error-Non Regeneration_2 (Engine controller system)
L03	CB3253		
Details of failure	KDOC outlet temperature remains at high level when Active Regeneration is not performed.		
Action of controller	• Closes EGR valve. • Derates the engine power. • Stops the fuel dosing. • Stops regeneration control.		
Effect to the machine	Engine power decreases.		
Related information	**⚠ KDPF and KDOC become hot (Minimum 500℃). Be careful not to become burned.** • If failure codes [CB3313], [CB3314], or [CB3315] display, KDOC inlet temperature sensor may be defective. Troubleshoot them. • If failure codes [CB3316], [CB3317], or [CB3318] are shown, KDOC outlet temperature sensor may be defective. Troubleshoot them. • If failure codes [CB1925] or [CB1963] are shown, the fuel doser solenoid valve 1 may be defective. Troubleshoot them first. • When a cylinder misfire occurs: 1. A cylinder misfire impairs combustion and causes higher exhaust temperature. 2. The other cylinders compensate for the torque drop because of a defective cylinder and increase fuel injection. This may cause higher exhaust temperature. • Engine power derate is stopped when you turn the start switch to the OFF position after this failure code is removed. (This derate is not removed when you remove the failure code.) **NOTICE** **If this failure code is shown, KCSF damage may occur. Examine these after you repair the failure code. Replace the KCSF if the black smoke comes out of the exhaust pipe outlet (tale pipe outlet).** • Start the engine, quickly accelerate the engine from low idle speed to high idle speed twice, and then keep the engine at high idle speed for 5 seconds. • Make sure that black smoke does not come out of the exhaust pipe outlet during acceleration and at high idle. **NOTICE** • **This failure code requires the “Loaded Diagnostics Operation To Remove the Failure Code”. After you investigate the problem cause and complete the repair, perform “Loaded Diagnostics Operation To Clear Failure Code” and make sure the failure code is removed. (This failure code is not removed when you only turn the start switch to the ON position.)** • **This failure code is removed when you perform this procedure, see TEST AND ADJUST, “SERVICE MODE” and “OPERATE ENGINE CONTROLLER ACTIVE FAULT CLEAR TEST MENU” in the “SET AND OPERATE OF MACHINE MONITOR”.**		

No.	Cause	Procedures, test location, specifications and remarks.
1	Defective wiring harness connector	This failure code is displayed if the connectors of electrical parts around the engine are defective, disconnected, or loosened due to heat and vibration. See descriptions of wiring harnesses and connectors in the table “Electric equipment” in “CHECKS BEFORE TROUBLESHOOTING” under “RELATED INFORMATION ON TROUBLESHOOTING”, and check the connectors.

No.	Cause	Procedures, test location, specifications and remarks.
5	Defective engine controller	If no failures are found with these procedures, the engine is controller defective. (Since this is an internal problem, you cannot troubleshoot.)

Circuit Diagram Related to KDOC/KDPF Temperature Sensor

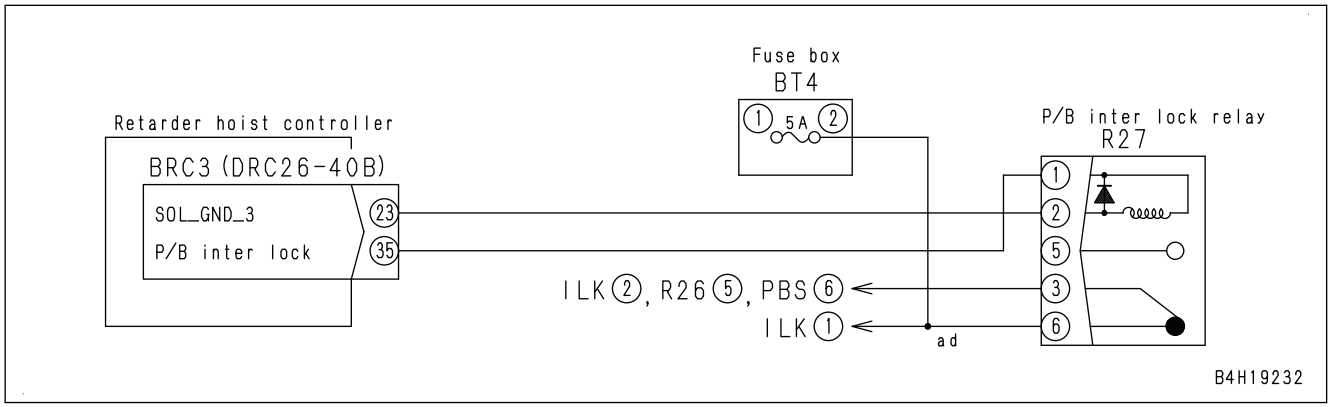


Failure Code [D1EMKA]

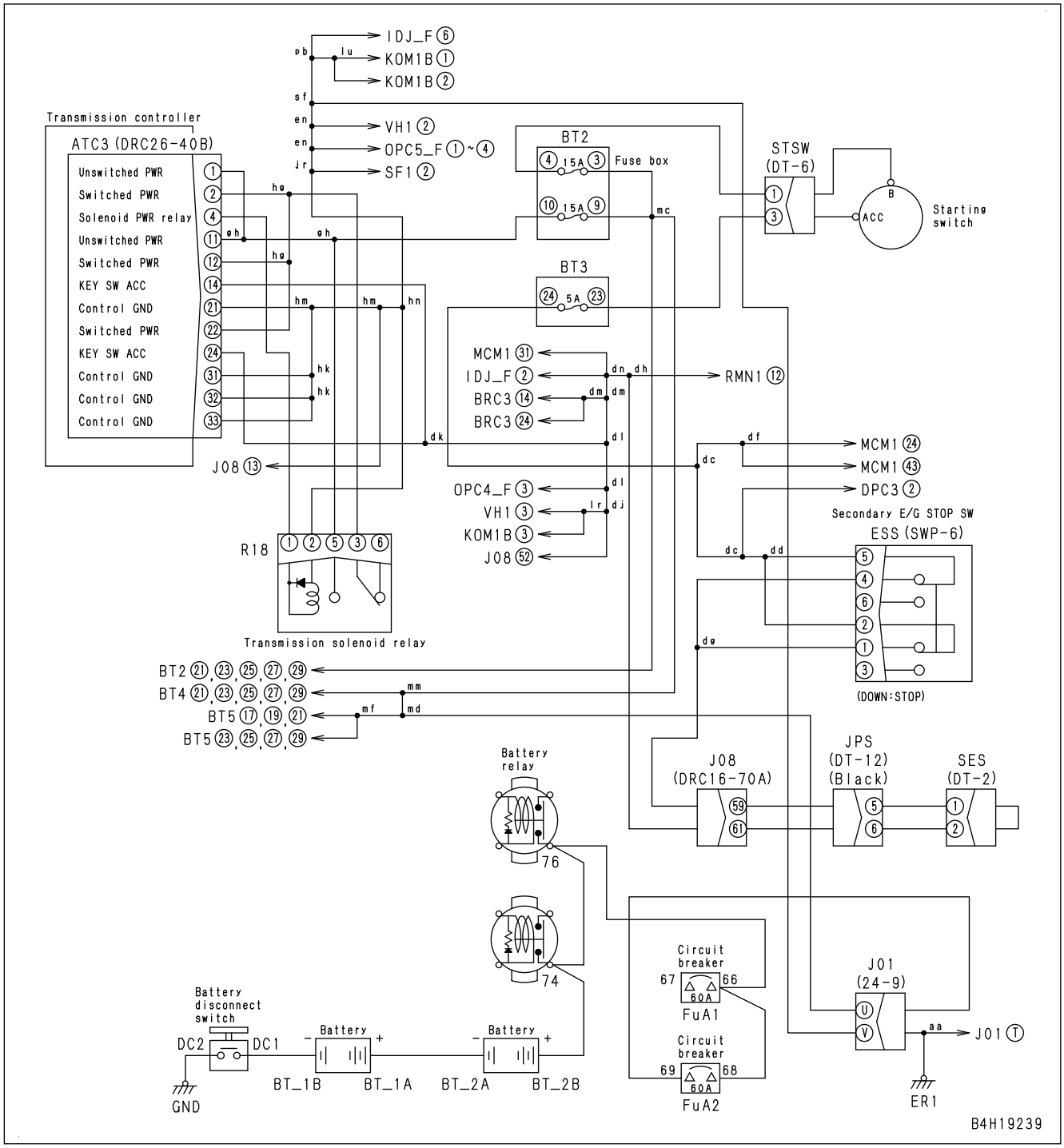
Action level	Failure code	Failure	Parking Brake Interlock Relay Output Open Circuit (Retarder and hoist controller system)
L03	D1EMKA		
Details of failure	When the controller operates the primary circuit (coil) of the park brake interlock relay, no current flows through the circuit.		
Action of controller	None in particular		
Effect on the machine	Automatic idle stop function does not operate.		
Related information	After the repair is completed, make sure the failure code is removed with these procedures. Procedure:Actuate the auto idle stop function.		

No.	Cause	Procedures, test location, specifications and remarks.		
1	Defective parking brake interlock relay	1. Turn the start switch to the OFF position. 2. Disconnect connector R27, and connect T-adapter to male side.		
		Resistance	Between R27 (male) (1) and (2)	290±30Ω
2	Open or short circuit in wir-ing harness	1. Turn the start switch to the OFF position. 2. Disconnect connector BRC3, and connect T-adapter to female side.		
		Resistance	Between BRC3 (female) (35) and (23) Relay coil resistance	290±30Ω
3	Open circuit in wiring harness	If no failure is found with the previous checks, these checks are not required. 1. Turn the start switch to the OFF position. 2. Disconnect connectors BRC3 and R27, and connect T-adapter to each female side.		
		Resistance	Between BRC3 (female) (35) and R27 (female) (1)	Max.1Ω
			Between BRC3 (female) (23) and R27 (female) (2)	Max.1Ω
4	Defective retarder and hoist controller	If no failure is found with these procedures, the retarder and hoist controller is defective. (Since this is an internal problem, you cannot troubleshoot.)		

Circuit Diagram of Parking Interlock Relay



Circuit Diagram of Transmission Controller Key Switch ACC Signal



Failure Code [DB1LKA]

Action level	Failure code	Failure	System Operating Lamp Open Circuit (RHC) (Retarder and hoist controller system)
-	DB1LKA		
Details of failure	Retarder and hoist controller detected an open circuit because the output line voltage of the system operating lamp is 5V or less during approximately 3 seconds when the retarder and hoist controller is not driven after the starting switch is turned to ON position.		
Effect of controller	• Turns the system operating lamp to OFF. • Although the cause of failure is eliminated, the machine does not resume normal operation until the start switch is turned to OFF.		
Effect on the machine	System operation lamp may not illuminate.		
Related information	• Do not turn the battery disconnect switch to “OFF” position while the system operation lamp is illuminated. If the battery disconnect switch is set to OFF, the data kept in the retarder and hoist controller memory is not stable. • Although the retarder and hoist controller cannot light the system operating lamp, no trouble will occur unless the battery disconnect switch is turned to OFF. • An open circuit can be detected because no controllers drive the system operating lamp for approximately 3 seconds after the starting switch is turned to ON position. • After the repair is completed, check that the failure code is removed by the procedures that follow. Turn the start switch to the ON position.		

No.	Cause	Procedure, test location, specifications, and remarks		
1	Defective fuse	If fuse No.14 in fuse case BT4 is broken, the circuit probably has ground fault.		
2	Open circuit in wiring harness	1. Turn the start switch to the OFF position. 2. While this failure code is shown, the condition of the system operating lamp is not known. Turn the battery disconnect switch to OFF 3 minutes or later after you turn the start switch to OFF. 3. Disconnect connectors BRC3 and OPL, and connect T-adapter to each female side.		
		Resistance	Between BRC3 (female) (34) and OPL (female) (2)	Max.1Ω
			Between OPL (female) (1) and battery relay terminal 76	Max.1Ω
3	Ground fault in wiring harness	1. Turn the start switch to the OFF position. 2. While this failure code is shown, the condition of the system operating lamp is not known. Turn the battery disconnect switch to OFF 3 minutes or later after you turn the start switch to OFF. 3. Remove the fuse No.14 in fuse box BT4. 4. Disconnect connector OPL, and connect T-adapter to the female side.		
		Resistance	Between ground and BT4-28 or OPL (female) (1)	Min.1MΩ
4	Defective retarder and hoist controller	If no failure is found by the previous checks, the retarder and hoist controller is defective. (Since this is an internal defect, you cannot troubleshoot.)		

<table>
<tr><th>No.</th><th>Cause</th><th colspan="2">Procedure, test location, specifications, and remarks</th></tr>
<tr><td rowspan="2">7</td><td rowspan="2">Defective transmission controller, retarder and hoist controller, engine controller, and KOMTRAX Plus controller</td><td colspan="2">When all of these 4 failure codes [DAQRKR], [DB1RKR], [DB2RKR], and [DBVRKR] are displayed:
REMARK
To identify the defective controller, repeat the following steps 1 to 3 to disconnect controllers one by one from CAN communication line.
1. Turn the start switch to the OFF position.
2. Check that system operation lamp is not illuminated, then turn the battery disconnect switch to the OFF position.
3. Disconnect each CAN communication connector of the engine controller (connector ECM1 J1), the retarder and hoist controller (connector BRC2), the transmission controller (connector ATC2), and the machine monitor (MCM2) one by one in order.
4. Turn the battery disconnect switch to ON and then turn the start switch to ON to make sure.
5. Back to step 1, and examine next controller.</td></tr>
<tr><td>Has the number of the shown failure codes decreased from 4?</td><td>If YES, the disconnected controller is defective.</td></tr>
<tr><td>8</td><td>Defective engine controller</td><td colspan="2">If there is no failure with the checks above, the engine controller is defective. (Since this is an internal problem, you cannot troubleshoot.)</td></tr>
<tr><td>9</td><td>Defective monitor controller</td><td colspan="2">If there is no failure with the checks above, the monitor controller is defective. (Since this is an internal problem, you cannot troubleshoot.)</td></tr>
</table>

Failure Code [DBCRKR]

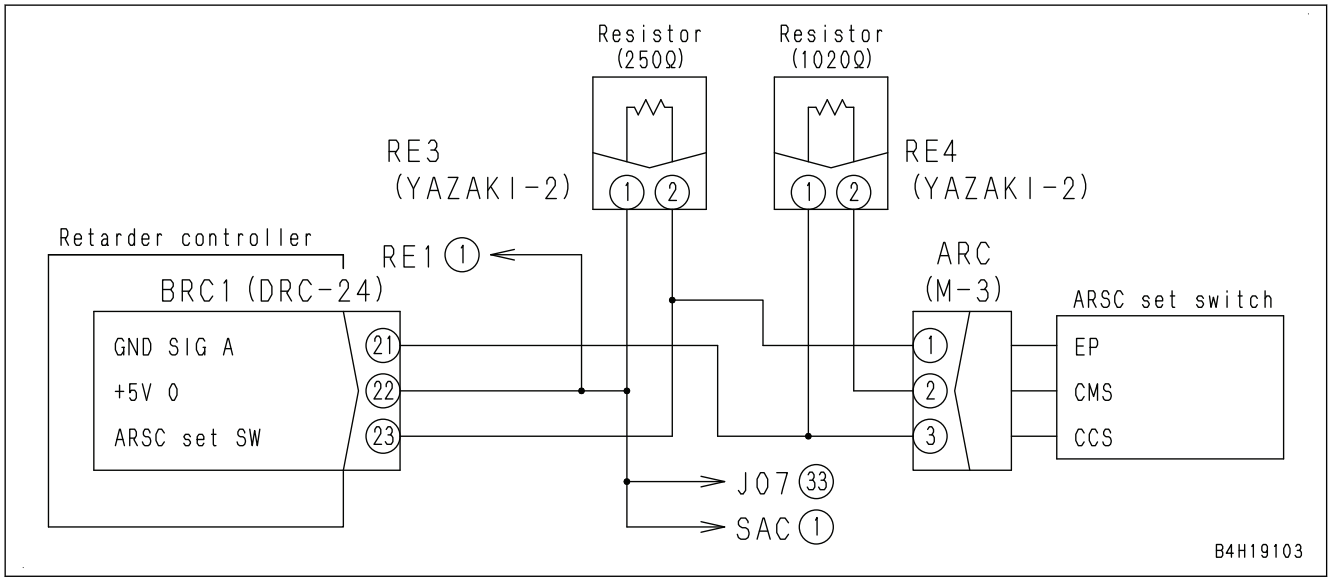
Action level	Failure code	Failure	CAN1 Defective Communication (ABS Controller) (Detected by monitor controller) (Machine monitor system)
L03	DBCRKR		
Details of failure	Monitor controller does not obtain information from the ABS controller on CAN1 communication line (KOMNET/r).		
Effect of controller	Retain information before the failure occurrence.		
Effect on the machine	• ABS system may not be operating normally. • Machine monitor does not display information from the ABS controller.		
Related information	• ACC signal from the start switch informs each controller of the start of the CAN communication. • Other failure codes of the defective CAN communication through CAN1, detected by the monitor controller are [DAQRKR], [DB1RKR], [DB2RKR], and [DBVRKR]. When the failure codes [DAQRKR], [DB1RKR], [DB2RKR], and [DBVRKR] are also displayed, ground fault, short circuit, or hot short in wiring harness (CAN communication line) can be suspected. **REMARK** Machine with Drowsiness Detection system also displays failure code [DCRRKR]. • CAN1 terminating resistors are located in the monitor controller on operator's cab side. • Since each controller and the monitor controller are connected directly to the battery, they are supplied with power even after starting switch is turned to OFF position. • After the repair is completed, check that the failure code is cleared by the following procedure. Turn the start switch to the ON position.		

No.	Cause	Procedure, test location, specifications, and remarks
1	Defective power supply to ABS controller	Perform troubleshooting for failure code [DBC3KK].
2	Defective CAN1 communication line	Perform checks on causes 2 to 7 for failure code [DB2RKR].
3	Defective ABS controller	If no failure is found by the above checks, the ABS controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.)
4	Defective monitor controller	If there is no failure found with the previous checks, the monitor controller is defective. (Since this is an internal problem, you cannot troubleshoot.)

<table>
<tr><th>No.</th><th>Cause</th><th>Procedures, Measurement, Values, Note</th><th colspan="2">Diagnosis and treatment</th></tr>
<tr><td rowspan="2">5</td><td rowspan="2">Open circuit in wiring harness (Power supply circuit of translator controller)</td><td rowspan="2">1. Turn the start switch to the OFF position.
2. Make sure that the system operating lamp does not come on, and then turn the battery disconnect switch to the OFF position.
3. Remove fuse No.15 in the fuse box BT2.
4. Disconnect the connector TLC3 and connect a T-adapter to the female side to do the troubleshooting.
5. Does the troubleshooting result agree with the judgment criteria value?
<table><tr><th>Item</th><th>Measurement position, condition</th><th>Standard value</th></tr><tr><td rowspan="6">Resistance</td><td>Between BT2-30 and TLC3 (female) (1)</td><td>Max. 1 Ω</td></tr><tr><td>Between BT2-30 and TLC3 (female) (11)</td><td>Max. 1 Ω</td></tr><tr><td>Between TLC3 (female) (21) and ground</td><td>Max. 1 Ω</td></tr><tr><td>Between TLC3 (female) (31) and ground</td><td>Max. 1 Ω</td></tr><tr><td>Between TLC3 (female) (32) and ground</td><td>Max. 1 Ω</td></tr><tr><td>Between TLC3 (female) (33) and ground</td><td>Max. 1 Ω</td></tr></table></td><td>YES</td><td>• The wiring harness does not have an open circuit.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The wiring harness has an open circuit.
• Repair or replace the wiring harness.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">6</td><td rowspan="2">Ground fault in wiring harness (Power supply circuit of translator controller)</td><td rowspan="2">1. Turn the start switch to the OFF position.
2. Make sure that the system operating lamp does not come on, and then turn the battery disconnect switch to the OFF position.
3. Remove fuse No.15 in the fuse box BT2.
4. Disconnect the connectors TLC3 and DDS1. Connect a T-adapter to the female side on one of the connectors to do the troubleshooting.
5. Does the troubleshooting result agree with the judgment criteria value?
<table><tr><th>Item</th><th>Measurement position, condition</th><th>Standard value</th></tr><tr><td>Resistance</td><td>Between ground and one of BT2-30, TLC3 (female) (1), (11), and DDS1 (female) (7)</td><td>Min. 1MΩ</td></tr></table></td><td>YES</td><td>• The wiring harness does not have a ground fault.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The wiring harness has a ground fault.
• Repair or replace the wiring harness.
• Go to “Confirmation of repair”.</td></tr>
</table>

No.	Cause	Procedure, test location, specifications, and remarks		
6	Defective retarder and hoist controller	1. Turn the start switch to the OFF position. 2. Disconnect connector RE1, RE3, RE4, J07, and SAC. 3. Put a T-adapter into connector BRC1. 4. Turn the start switch to the ON position.		
		Voltage	Between BRC1 (22) and (21)	4.6 to 5.4V
		If no failure is found by the previous checks, the retarder and hoist controller is defective. (Since this is an internal defect, you cannot troubleshoot.)		

Circuit Diagram Related to Travel Speed Setting Switch

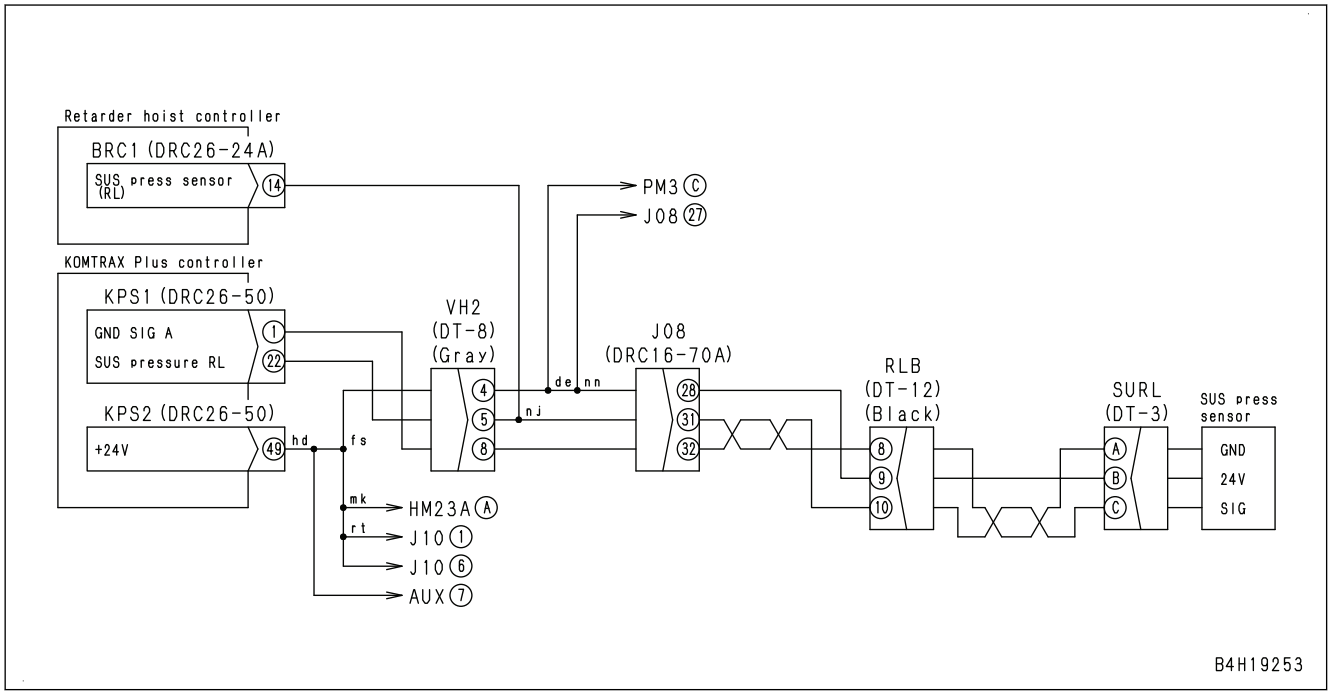


Failure Code [DGT1KX]

Action level	Failure code	Failure	T/C Oil Temperature Sensor Input Signal Out of Range (Transmission controller system)
L01	DGT1KX		
Details of failure	The signal voltage of transmission valve oil temperature is 3.7V and below (55℃ and lower). Then the signal circuit voltage of torque converter oil temperature sensor is 0.97V and below (150℃ and higher) or, 4.56V and higher (15℃ and lower).		
Effect of controller	None in particular		
Effect on the machine	• Torque converter oil temperature gauge is not shown. • Automatic idle stop function does not work.		
Related information	⚠ **Before you perform this procedure, raise the body to the maximum height. Make sure to set the hoist lever to "HOLD". Set the lock knob to the LOCK position, and engage the body pivot pin.** • The monitor function checks the torque converter oil temperature. (Code:30100(℃), 30101(V)) • After the repair is completed, check that the failure code is removed by the procedures that follow Procedure:Start the engine.		

No.	Cause	Procedure, test location, specifications, and remarks			
1	Defective torque converter oil temperature sensor	1. Turn the start switch to the OFF position. 2. Disconnect connector T/C, T, and connect T-adapter to the male side.			
		Resistance	Between T/C, T (male) (1) and (2) (Oil temperature sensor heat properties)	Oil temperature:25℃	38.1 to 47.8kΩ
				Oil temperature:30℃	30.1 to 40.0kΩ
				Oil temperature:80℃	6.1 to 7.0kΩ
				Oil temperature:90℃	4.6 to 5.2kΩ
				Oil temperature:100℃	3.6 to 4.0kΩ
			Between ground and T/C, T (male) (1) or (2)	Oil temperature:All range	Min.1MΩ
2	Open circuit in wiring harness	1. Turn the start switch to the OFF position. 2. Disconnect connectors ATC1 and T/C,T, and connect T-adapter to each female side.			
		Resistance	Between ATC1 (female) (21) and T/C,T (female) (2)		Min.1MΩ
			Between ATC1 (female) (9) and T/C,T (female) (1)		Min.1MΩ
3	Ground fault in wiring harness	1. Turn the start switch to the OFF position. 2. Disconnect connectors ATC1 and T/C,T, and connect T-adapter to either female side.			
		Resistance	Between ground and ATC1 (female) (9) or T/C,T (female) (1)		Min.1MΩ
4	Short circuit in wiring harness	1. Turn the start switch to the OFF position. 2. Disconnect connectors ATC1 and T/C,T, and connect T-adapter to female side of ATC1.			
		Continuity	Between ATC1 (female) (9) and each pin other than pin (9)		No continuity

Circuit Diagram of Suspension Pressure Sensor (Rear L.H.)



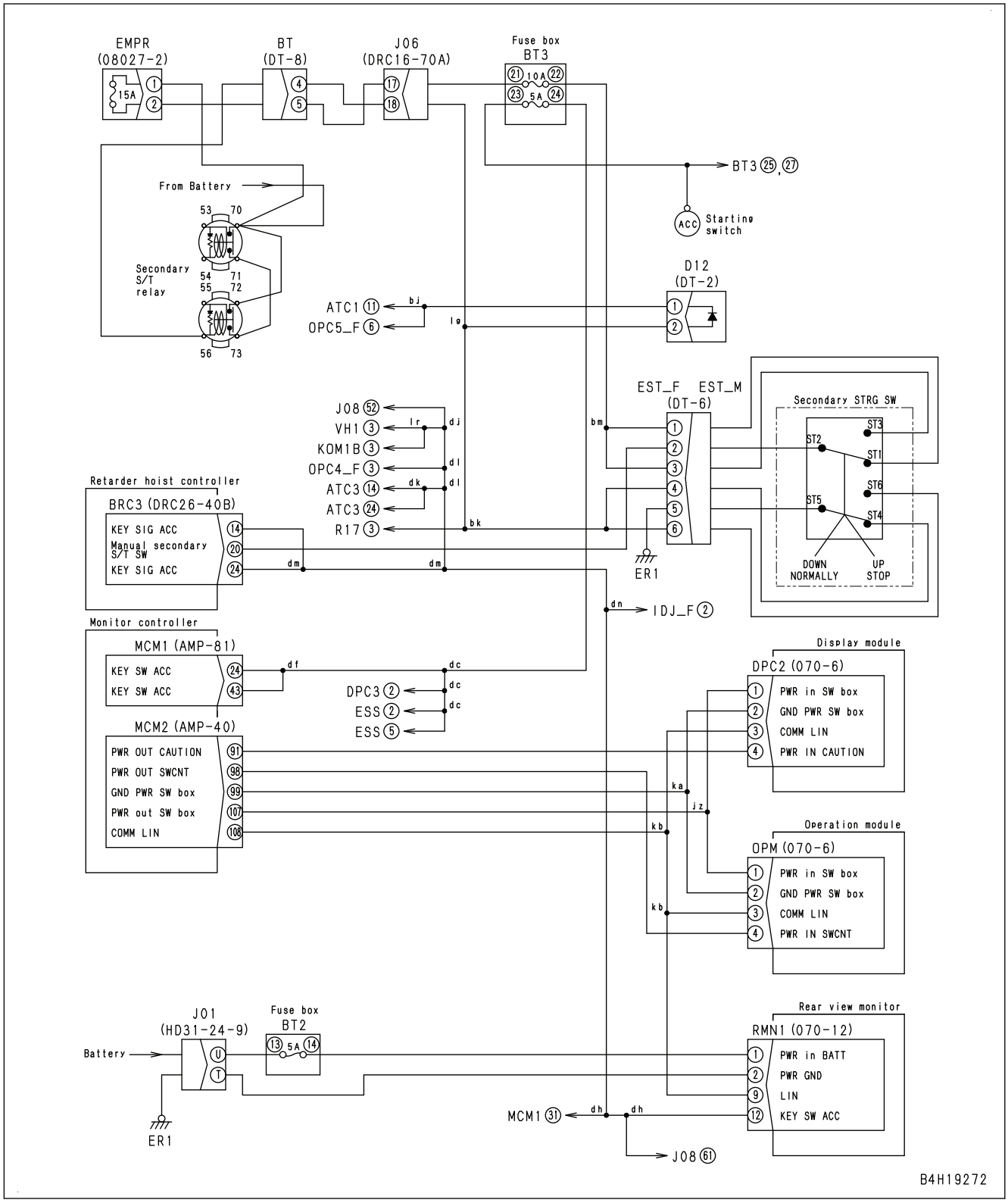
<table>
<tr><th>No.</th><th>Cause</th><th colspan="4">Procedure, test location, specifications, and remarks</th></tr>
<tr><td rowspan="4">5</td><td rowspan="4">Defective KTCS oil pressure Sensor (rear right)</td><td colspan="4">1. Turn the start switch to the OFF position.
2. Put a T-adapter into connector TCS5.
3. Start the engine.
REMARK
For details of KTCS valve set mode, see “Adjustment Menu (KTCS Valve Setting)”.</td></tr>
<tr><td rowspan="2">Voltage</td><td rowspan="2">Between TCS5 (1) and (2)</td><td>KTCS:OFF</td><td>0.30 to 0.59V</td></tr>
<tr><td>KTCS:ON
(When set to ON with KTCS Valve Setting mode)</td><td>1.09 to 1.26V</td></tr>
<tr><td colspan="4"></td></tr>
<tr><td rowspan="5">6</td><td rowspan="5">Defective retarder and hoist controller</td><td colspan="4">1. Turn the start switch to the OFF position.
2. Put a T-adapter into connectors BRC1 and BRC2.
3. Start the engine.
REMARK
For details of KTCS valve set mode, see “Adjustment Menu (KTCS Valve Setting)”.</td></tr>
<tr><td rowspan="3">Voltage</td><td colspan="2">Between BRC2 (1) and BRC1 (4)</td><td>4.6 to 5.4V</td></tr>
<tr><td rowspan="2">Between BRC2 (16) and BRC1 (4)</td><td>KTCS:OFF</td><td>0.30 to 0.59V</td></tr>
<tr><td>KTCS:ON
(When set to ON with KTCS Valve Setting mode)</td><td>1.09 to 1.26V</td></tr>
<tr><td colspan="4">If no failure is found by the previous checks, the retarder and hoist controller is defective. (Since this is an internal defect, you cannot troubleshoot.)</td></tr>
</table>

Failure Code [DLF2KA]

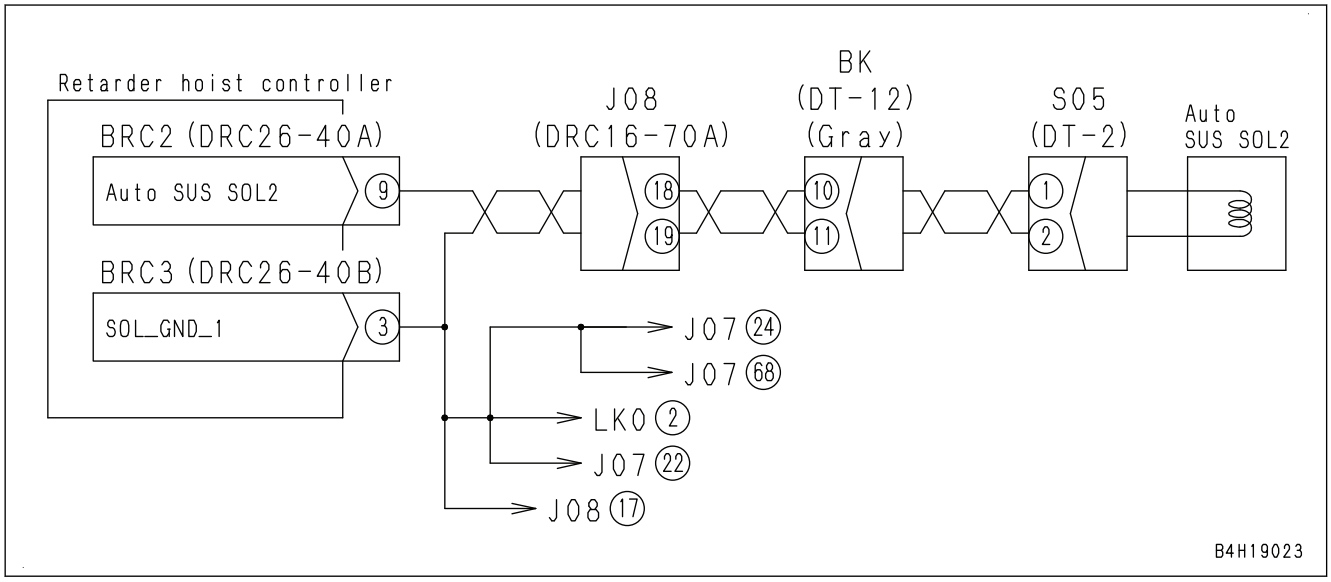
Action level	Failure code	Failure	T/M Intermediate Speed Sensor Open Circuit (Transmission controller system)
L03	DLF2KA		
Details of failure	No signal is input from the transmission middle shaft speed sensor because of an open circuit in its signal circuit.		
Effect of controller	• Maintains the same gear speed during travel. • Transmission will stay in neutral when the gear shift lever is set to the “N” position. • Although the cause of failure is eliminated, the machine is not normal until the start switch is turned to the OFF position.		
Effect on the machine	• The gear will not shift • If the gear shift lever is set to “N” during travel, and the lever is moved from the “N” position, the gear will not shift. The machine must stop before the gear will shift. • After the machine stops, it can move forward when the gear speed is set to F2 by setting the gear shift lever to a position between D and L. The machine can move backward when the gear speed is set to R by setting the gear shift lever to R position.		
Related information	⚠ **Before you perform this procedure, raise the body to the maximum height. Make sure to set the hoist lever to the “HOLD” position and set the lock knob to the LOCK position. Make sure to engage the body pivot pin.** • Examine the transmission intermediate shaft speed with monitor function. (Code: 31300(rpm)) • After the repair is completed, remove the failure code by this procedure. Procedure:Turn the start switch to the ON position.		

No.	Cause	Procedure, test location, specifications and remarks		
1	Defective transmission intermediate shaft speed sensor	1. Turn the start switch to the OFF position. 2. Disconnect connector N2, and connect T-adapter to the male side.		
		Resistance	Between N2 (male) (1) and (2)	500 to 1000Ω
			Between ground and N2 (male) (1) or (2)	Min.1MΩ
2	Open circuit in wiring harness	1. Turn the start switch to the OFF position. 2. Disconnect connectors ATC1, ATC2, and N2, and connect T-adapter to each female side.		
		Resistance	Between ATC2 (female) (20) and N2 (female) (1)	Max.1Ω
			Between ATC1 (female) (10) and N2 (female) (2)	Max.1Ω
3	Defective transmission controller	If there is no failure found by the previous checks, the transmission controller is defective. (Since this is an internal failure, you cannot troubleshoot.)		

Circuit Diagram of LIN Communication (Rear View Monitor)



Circuit Diagram of Auto Suspension Solenoid 2



Failure Code [DWD7KB]

Action level	Failure code	Failure	Steering/Hoist Pump Lockout Solenoid Ground Fault (Transmission controller system)
L03	DWD7KB		
Details of failure	When the controller drives the steering/hoist pump lockout solenoid circuit, excessive current flows through the circuit.		
Effect of controller	• Stops driving the steering/hoist pump lockout solenoid. • Determines that conditions for activating the machine lockout function are not established. • Even if the cause of failure is eliminated, the machine does not return to normal until the starting switch is turned to OFF position.		
Effect on the machine	• Machine lockout function cannot be activated. • If the machine lockout function is working, the steering returns to the operation state.		
Related information	• Check the output state of the steering/hoist pump lockout solenoid (ON/OFF) with monitoring function. (Code:03705) • After the repair is completed, check that the failure code is cleared by the following procedure. Procedure:Turn the starting switch to ON position and activate the machine lockout work function.		

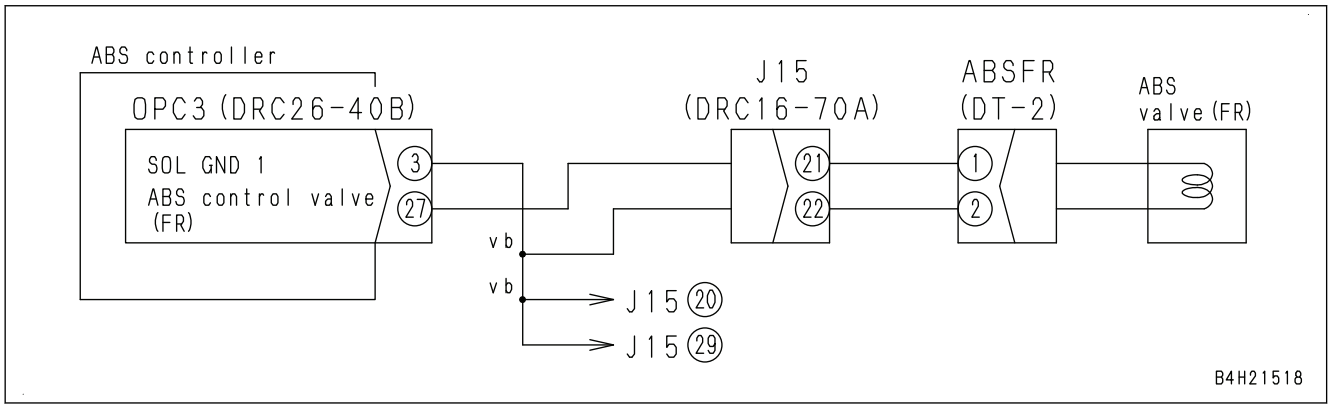
No.	Cause	Procedure, test location, specifications and remarks		
1	Defective steering/hoist pump lockout solenoid	1. Turn the starting switch to OFF position. 2. Disconnect connector WPCS, and connect T-adapter to male side.		
		Resistance	Between WPCS (male) (1) and (2)	10 to 30Ω
			Between ground and WPCS (male) (1) or (2)	Min.1MΩ
2	Open or short circuit in wiring harness	1. Turn the start switch to the OFF position. 2. Disconnect connectors ATC2 and ATC3, and connect T-adapter to each female side.		
		Resistance	Between ATC2 (female) (9) and ATC3 (female) (13) Solenoid coil resistance	10 to 30Ω
3	Ground fault in wiring harness	1. Turn the start switch to the OFF position. 2. Disconnect connectors ATC2, ATC3, and WPCS, and connect T-adapter to each female side.		
		Resistance	Between ground and ATC2 (female) (9) or WPCS (female) (1)	Min.1MΩ
4	Short circuit in wiring harness	If there is no failure found by check on cause 2, this check is not required. 1. Turn the starting switch to OFF position. 2. Disconnect connectors ATC2, ATC3, and WPCS, and connect T-adapter to any female side.		
		Voltage	Between ATC2 (female) (8) and ATC3 (female) (3) or between WPCS (female) (1) and (2)	Min.1MΩ
5	Defective transmission controller	If no failure is found by preceding checks, the transmission controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.)		

Failure Code [DX21KY]

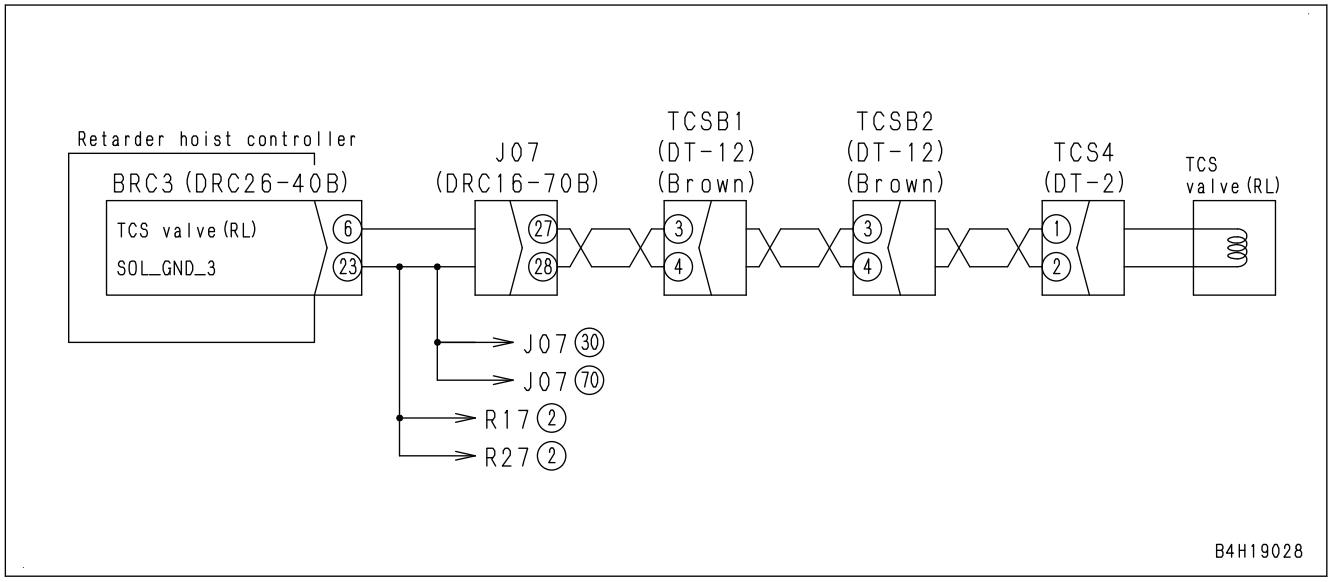
Action level	Failure code	Failure	ABS control valve solenoid (Front Right) Hot short (ABS controller system)
L03	DX21KY		
Details of failure	When the controller does not drive the ABS control valve (front right) circuit, current flows through the circuit.		
Effect of controller	• Cancels ABS control. • Even if the cause of failure is eliminated, the machine does not return to normal until the starting switch is turned to OFF position.		
Effect on the machine	• ABS does not work. • Front brake cut does not function and the front brake works.		
Related information	After the repair is completed, remove the failure code by this procedure. Procedure:Turn the starting switch to ON position and disable the ABS setting.		

No.	Cause	Procedure, test location, specifications and remarks		
1	Hot short circuit in wiring harness	Perform the following procedure with the ABS setting disabled. 1. Turn the starting switch to OFF position. 2. Disconnect connector ABSFR, and connect T-adapter to female side. 3. Turn the starting switch to ON position.		
		Resistance	Between ABSFR (female) (1) and (2)	Max.4.5V
2	Defective ABS controller	If no failure is found by the above checks, the ABS controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.)		

Circuit Diagram Related to ABS Control Valve (Front Right)



Circuit Diagram Related to KTCS EPC Valve (Rear Left)



Circuit Diagram of 2nd Clutch

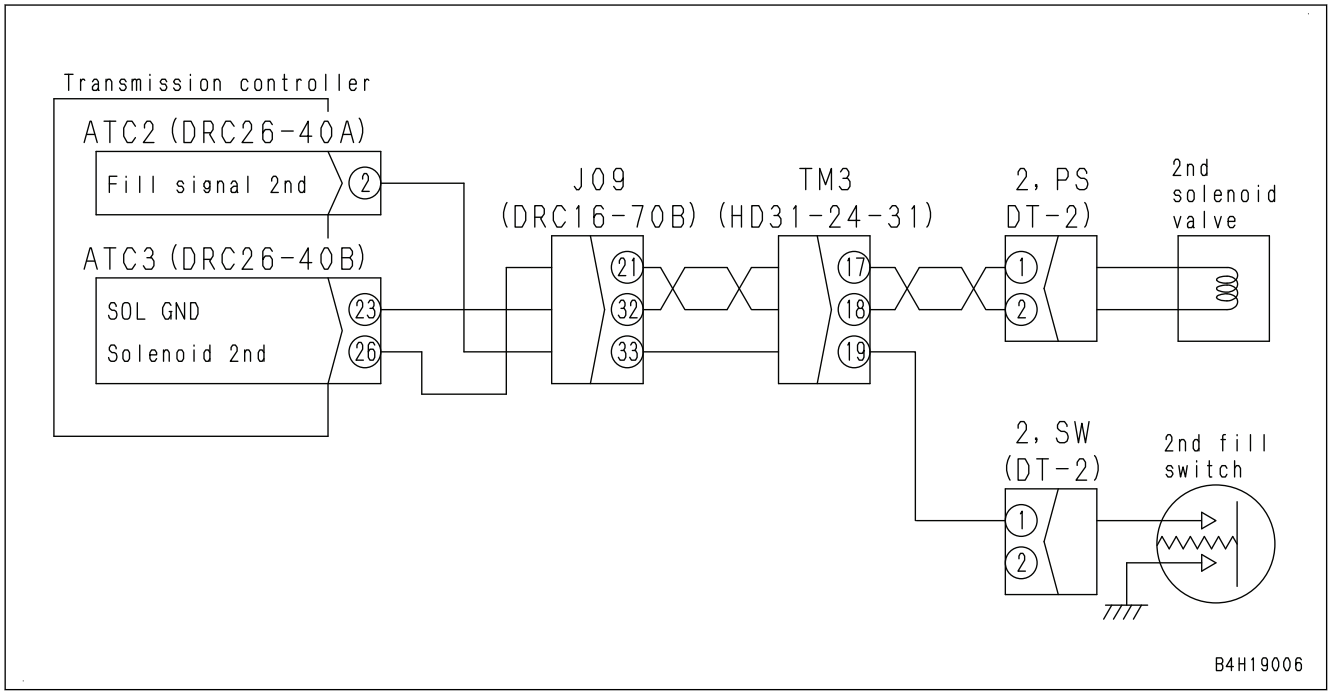
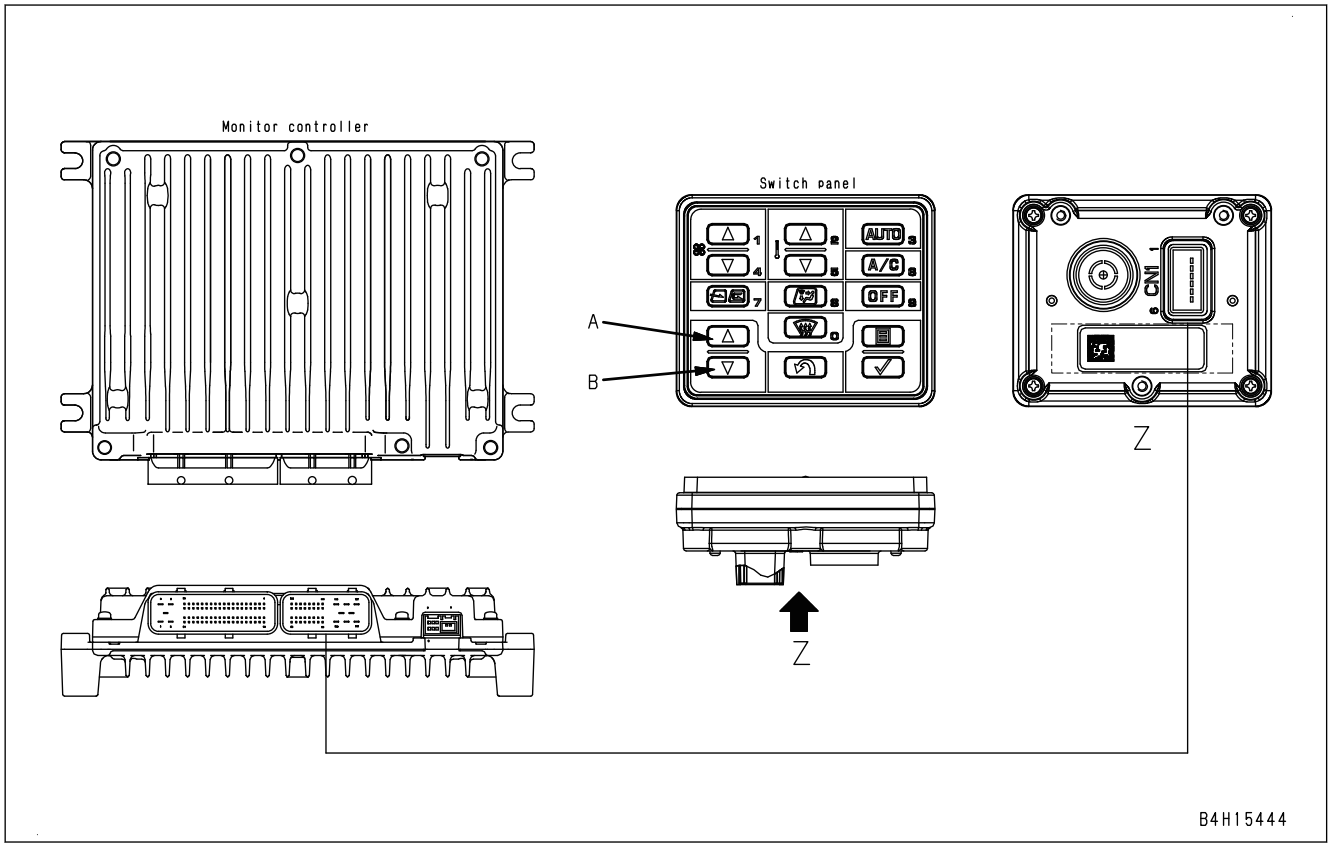


Table 2

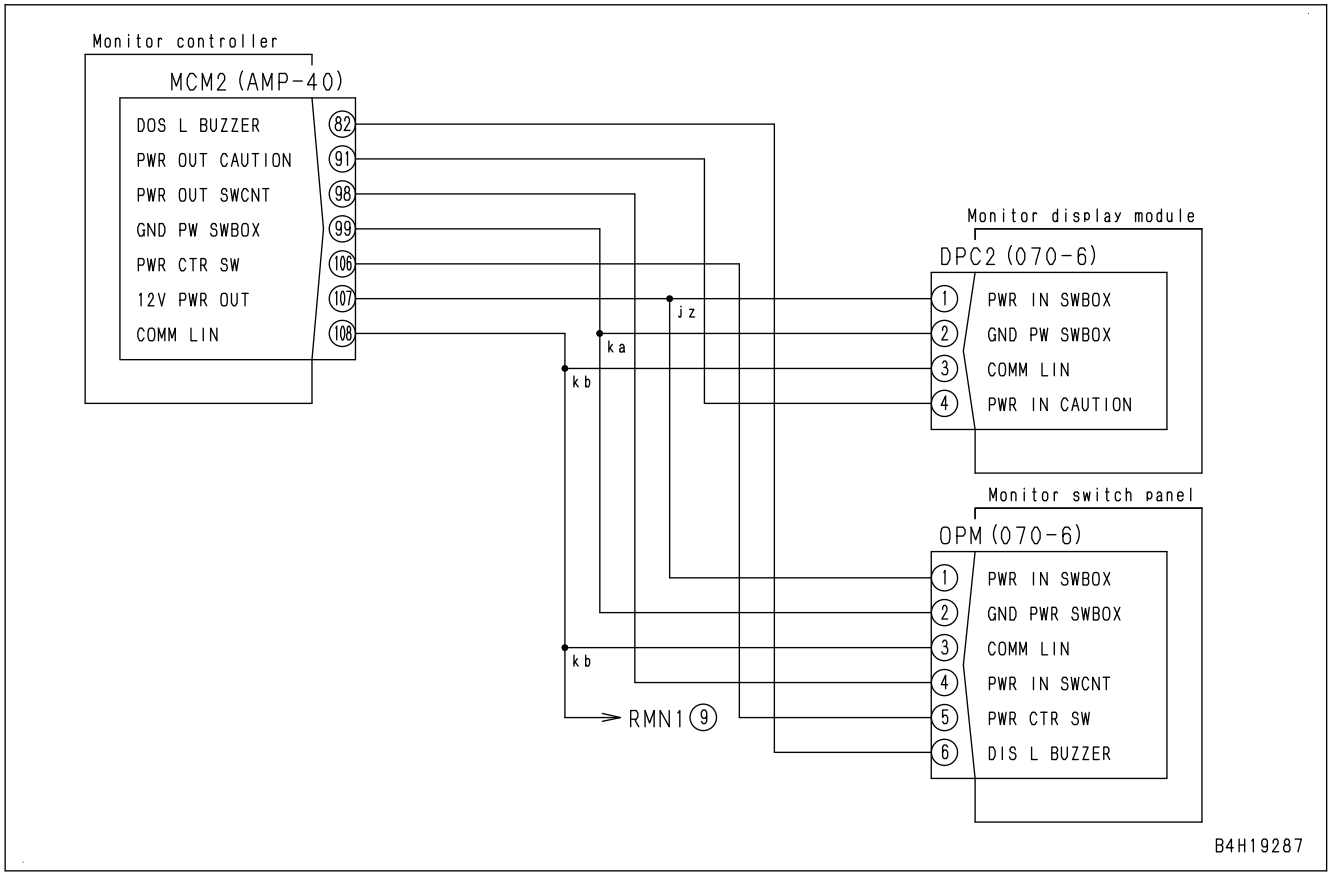
Gear speed when failure is sensed		Incorrect clutch	Remedy when failure is found		
			Effect of controller (Selected clutch, gear speed)		ON/OFF state of lockup clutch
F7	4th High	3rd	OFF	NEUTRAL	OFF
		2nd	OFF	NEUTRAL	OFF
		1st	OFF	NEUTRAL	OFF
		Reverse	OFF	NEUTRAL	OFF
		Low	OFF	NEUTRAL	OFF
F6	4th Low	3rd	OFF	NEUTRAL	OFF
		2nd	OFF	NEUTRAL	OFF
		1st	OFF	NEUTRAL	OFF
		Reverse	OFF	NEUTRAL	OFF
		High	4H	F7	OFF
F5	3rd High	4th	4L	F6	OFF
		2nd	OFF	NEUTRAL	OFF
		1st	OFF	NEUTRAL	OFF
		Reverse	OFF	NEUTRAL	OFF
		Low	4L	F6	OFF
F4	3rd Low	4th	4L	F6	OFF
		2nd	OFF	NEUTRAL	OFF
		1st	OFF	NEUTRAL	OFF
		Reverse	OFF	NEUTRAL	OFF
		High	3H	F5	OFF

No.	Cause	Procedure, test location, specifications and explanations.		
25	Open circuit in wiring harness 3	Alternator and starting motor safety relay 1. Turn the start switch to the OFF position. 2. Turn the start switch to the ON position.		
		Voltage	Between alternator terminal B and ground	20 to 30V
			Between starting motor safety relay terminal B and ground	20 to 30V

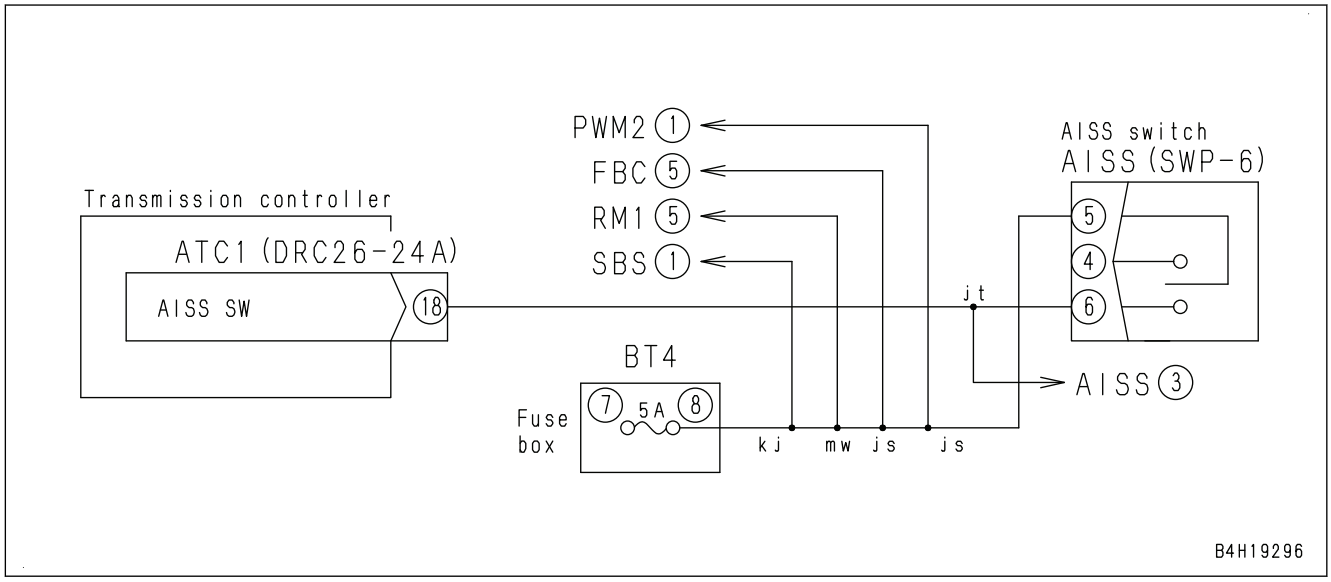
Wiring Harness Between Monitor Controller and Machine Monitor Switch Panel



Circuit Diagram Between Monitor Controller and Machine Monitor Switch Panel



Circuit Diagram Related to AISS



<table>
<tr><th>No.</th><th>Cause</th><th>Procedures, Measurement, Values, Note</th><th colspan="2">Diagnosis and treatment</th></tr>
<tr><td rowspan="2">8</td><td rowspan="2">Open circuit in wiring harness</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Make sure that the system operating lamp is not lit, and then turn the battery disconnect switch to the OFF position.
3. Disconnect the connectors TRM1, DCTRM, R40, and DL_F, and connect the T-adapter to each female side to do the troubleshooting.
4. Does the troubleshooting result agree with the standard value?
<table><tr><th>Item</th><th>Measurement position, condition</th><th>Standard value</th></tr><tr><td rowspan="14">Resistance</td><td>Between DL_F (female) (1) and DCTRM (female) (1)</td><td>Max. 1Ω</td></tr><tr><td>Between DL_F (female) (2) and R40 (female) (1)</td><td>Max. 1Ω</td></tr><tr><td>Between DCTRM (female) (4) and TRM1 (female) (1)</td><td>Max. 1Ω</td></tr><tr><td>Between DCTRM (female) (4) and R40 (female) (6)</td><td>Max. 1Ω</td></tr><tr><td>Between DCTRM (female) (6) and TRM1 (female) (3)</td><td>Max. 1Ω</td></tr><tr><td>Between DCTRM (female) (6) and R40 (female) (5)</td><td>Max. 1Ω</td></tr><tr><td>Between DL_F (female) (7) and DCTRM (female) (3)</td><td>Max. 1Ω</td></tr><tr><td>Between DL_F (female) (9) and R40 (female) (2)</td><td>Max. 1Ω</td></tr><tr><td>Between TRM1 (female) (5) and KPS5 (female) (1)</td><td>Max. 1Ω</td></tr><tr><td>Between TRM1 (female) (6) and KPS5 (female) (2)</td><td>Max. 1Ω</td></tr><tr><td>Between TRM1 (female) (7) and KPS5 (female) (3)</td><td>Max. 1Ω</td></tr><tr><td>Between TRM1 (female) (8) and KPS5 (female) (6)</td><td>Max. 1Ω</td></tr></table></td><td>YES</td><td>• Open circuit in wiring harness does not occur.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The wiring harness has an open circuit.
• Repair or replace the wiring harness.
• Go to “Confirmation of repair”.</td></tr>
</table>

H-6 Travel Speed in All Gear Speed is Low or Power is Low During Travel with Lockup Function

Failure	Machine lacks travel speed or power when traveling in lockup drive mode at all gear speeds.
Related information	• If any failure code is shown, troubleshoot for that failure code first. ([15B0NX], [15SJMA], [DXH1KA], [DXH1KB], [DXH1KY], [2F00KM]) • Measure that the parking brake is released completely and the retarder brake does not pull. • Make sure that tire air pressure is normal.

No.	Cause	Procedure, test location, specifications and explanations.			
1	Defective power train and brake cooling duplex pump strainer	Inspect for a restriction in the power train and brake cooling duplex pump strainer.			
2	Air drawn in on the suction side of power train and brake cooling duplex pump strainer.	Inspect for air pulled in to the suction pipes of the power train and brake cooling duplex pump.			
3	Defective main relief valve of the power train and brake cooling duplex pump.	To troubleshoot refer to TEST AND ADJUST, “POWER TRAIN OIL PRESSURE TEST” in the “TEST POWER TRAIN OIL PRESSURE” section. **REMARK** Engine speed can be checked by the monitoring function. (Code:01002)			
		Main relief pressure of power train	Engine speed	2000rpm (target value)	3.53±0.20MPa{36±2kg/cm^2}
		When pressure cannot be adjusted to normal level, the main relief valve may malfunction. Check for malfunction of the main relief valve (fatigue of spring), internal defect (defective valve seat), etc.			
4	Malfunction of lockup clutch ECMV	To troubleshoot refer to TEST AND ADJUST, “POWER TRAIN OIL PRESSURE TEST” in the “TEST POWER TRAIN OIL PRESSURE” section. Engine speed can be checked by the monitoring function. (Code:01002)			
		Torque converter lockup clutch operating pressure	Engine speed	2000rpm (target value)	1.91±0.20MPa{19.5±2.0kg/cm^2}
5	Lockup clutch slips	• If measured oil pressure is low in the cause 4 test, there may be an oil leak from the gear speed piston or the ring groove may be worn. • If oil pressure is found normal when you test cause 4, the cause may be the clutch discs slip.			
6	Defective power train and brake cooling duplex pump	• When oil pressure is incorrect on when you test cause 3, but there is normal main relief pressure, do as follows. Disconnect the outlet hose of the power train and brake cooling duplex pump. Turn the engine, to see whether oil flows out. • Examine the line filter for attached unwanted material and contamination.			
7	Reduced engine output	When there is no failure during tests (1) to (6), and torque converter stall (1920±100rpm) is below specification, engine performance may be degraded. **REMARK** Engine speed can be checked by the monitoring function. (Code:01002)			

S-10 Engine Oil Consumption is Excessive

Failure	Engine oil consumption is excessive.
Related information	If any failure code is shown, troubleshoot that code first.

No.	Cause	Point to inspect, remarks	Remedy
1	Dust intake from the air intake system	If the air intake piping between the air cleaner and engine is removed, dust is found in the piping.	Clean or replace the air intake piping
2	Broken or worn piston ring	• Measured blowby pressure is higher than standard value. • Blowby pressure is high after KCCV filter element is replaced. • Measure compression pressure. (See the standard value table.) (Refer:See TEST AND ADJUST, “COMPRESSION TEST”.)	Repair or replace the piston ring
3	Oil leakage from the oil return piping of the KCCV.	Inspect the oil return piping of the KCCV for leaks.	Oil piping repair or replacement
4	Oil leaks out of the engine	Inspect for oil leaks.	Repair the part that leak oil
5	Oil leaks from the oil filter	Inspect for oil leaks from the oil filter.	Replace the oil filter or install it again
6	Oil leaks from the oil piping	Inspect for oil leaks from the oil piping.	Repair or replace the oil piping
7	Oil leaks from the oil drain plug	Inspect for oil leaks from the oil drain plug.	Make sure the drain plug is tight
8	Oil leaks from the oil pan	Inspect for oil leaks from the oil pan.	Repair or replace the oil pan
9	Oil leaks from the cylinder head	Inspect for oil leaks from the cylinder head.	Repair or replace the cylinder head
10	Worn or damaged rear oil seal	Oil in the clutch or damper increases.	Repair or replace the rear oil seal
11	Oil leaks from the VGT	• Oil remains in the Inlet or outlet of the blower and outlet of the turbine in the VGT. • Check if the VGT shaft turns (manually move the VGT's blade axially and vertically).	VGT replacement
12	Oil leaks from the oil cooler	• Oil is mixed in the coolant. • Remove the oil cooler, and visually inspect for oil leaks from the oil cooler surface. • Pressure test the oil cooler to inspect for leaks.	Oil cooler replacement
13	Oil leaks from the EGR valve system	Oil remains in the outlet port after the EGR valve is disconnected.	EGR valve replacement
14	Worn or damaged valve guide or seal	• Inspect the valve guide and seal. • Remove the cylinder head and inspect the internal guide surface and seal for damage. (Refer:See the Maintenance standard.)	Replace the valve guide and seal

Symbol	Part name	Part No.	Specifications	Q'ty	Remarks
C	Socket	790-302-1270		1	Removal and installation of nut
D	Push tool kit	790-201-1702		1	Press-fit of bushing
	• Push tool	790-101-1771		1	
	• Grip	790-101-5021		1	
	• Bolt	01010-80816		1	
E	Push tool kit	790-201-1500		1	Installation of dust seal
	• Push tool	790-101-1580		1	
	• Grip	790-101-5021		1	
	• Bolt	01010-80816		1	
F	Expander	790-720-1000		1	Installation of piston ring
G	Ring	796-720-1650		1	Installation of piston ring
H	Clamp	07281-01029		1	Installation of piston ring

Special Tools to be Used When You Remove and Install the Front Suspension Cylinder Assembly

Symbol		Part name	Part No.	Specifications	Q'ty	Remarks
A	1	Plug	07376-70210	Nominal 02	1	
	2	Cap	02789-00210	Nominal 02	1	

Special Tools for Disassembly and Assembly of Front Suspension Cylinder Assembly (Cylinder with Buffer Ring)

No.		Part name	Part No.	Specifications	Q'ty	Remarks
A	1	Push tool	792-625-1300		1	Press-fit of bushing
	2	• Grip	790-101-5421		1	
	3	• Bolt	01010-81240		1	
B	1	Suspension tool	792-610-1001		1	Adjustment of gas
	2	• Pump assembly	792-610-1101		1	
	3	• Charging tool	792-610-1200		1	

Special Tools to be Used When You Disassemble and Assemble the Rear Suspension Cylinder Assembly (Cylinder with Buffer Ring)

No.		Part name	Part No.	Specifications	Q'ty	Remarks
A	1	Push tool	792-625-1300		1	Press-fit of bushing
	2	• Grip	790-101-5421		1	
	3	• Bolt	01010-81240		1	

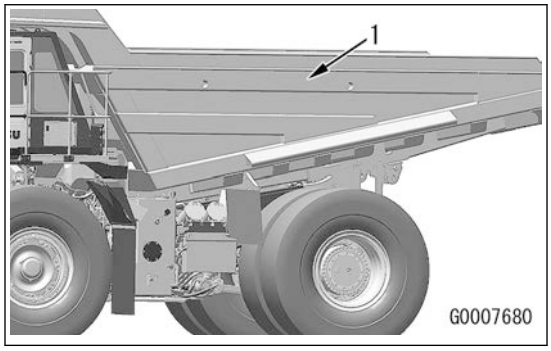
How to Remove Injector Assembly

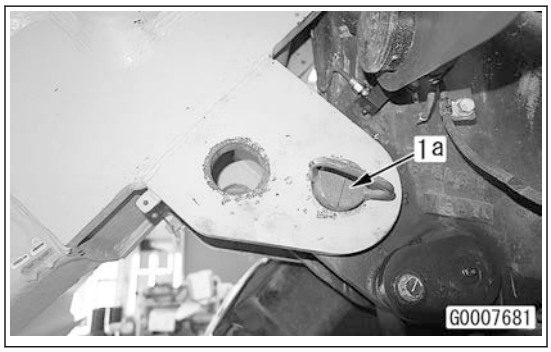
Dump body

1. Raise the dump body (1).

NOTICE

Be sure to lock the dump body (1) with the right and left dump body pivot pins (1a).





High-pressure pipe

64. Install the high-pressure pipe as follows.

1) Tighten the bracket (90) lightly with the bolt (89).

Tool: Torque set wrench (socket)

Bolt (89): Width across flats 17mm, M10

Bolt (89): 59 to 74Nm {6 to 7.5kgfm}

2) Tighten the bracket (92) lightly with the bolt (91).

Tool: Torque set wrench (socket)

Bolt (91): Width across flats 17mm, M10

Bolt (91): 59 to 74Nm {6 to 7.5kgfm}

3) Tighten the high-pressure pipes (74), (75), (87), and (88) to the common rail and supply pump lightly with the sleeve nuts (72) (2 pieces), (73) (2 pieces), (85) (2 pieces), and (86) (2 pieces).

Tool: Torque set wrench (socket)

Sleeve nut (72), (73), (85), (86): Width across flats 19mm

4) Install the bracket (81) with the bolts (81b) (2 pieces).

Tool: Torque set wrench (socket)

Bolt (81b): Width across flats 10mm, M6

Bolt (81b): 11.8 to 14.7Nm {1.2 to 1.5kgfm}

5) Tighten the clamps (66), (67), (68), (81c), (82), and (83) lightly.

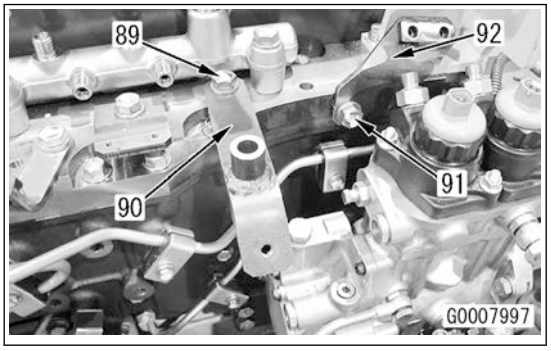
Tool: Torque set wrench (socket)

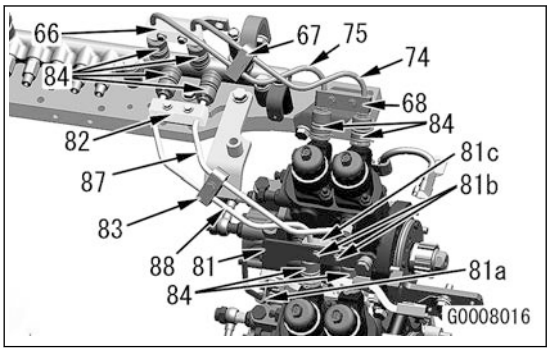
Bolt for clamp (66), (68), (81c), (82): Width across flats 10mm, M6

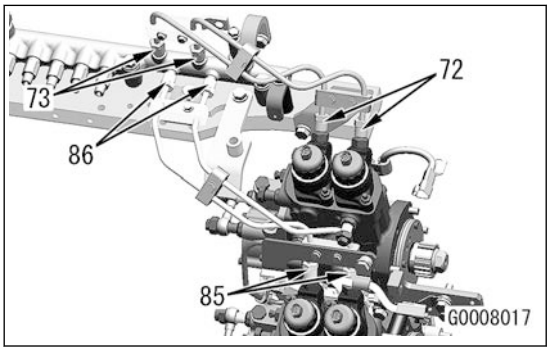
Bolt for clamp (67), (83): Width across flats 13mm, M8

Bolt for clamp (66), (68), (81c), (82): 11.8 to 14.7Nm {1.2 to 1.5kgfm}

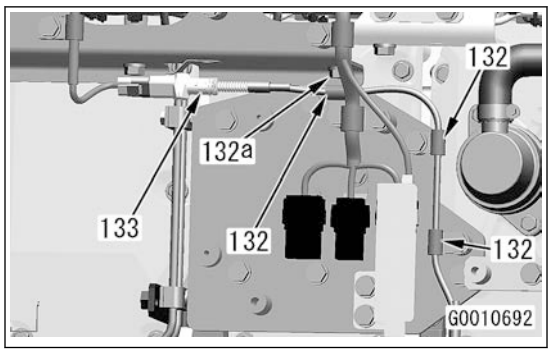
Bolt for clamp (67), (83): 27 to 34Nm {2.8 to 3.5kgfm}



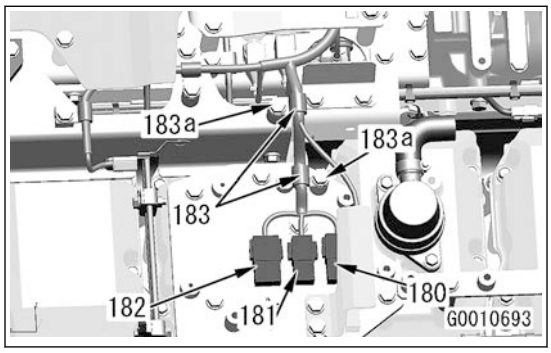




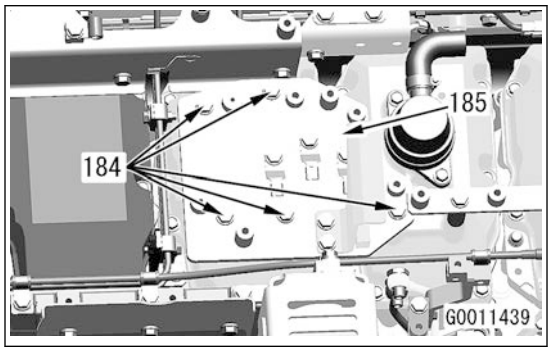
92. Remove the bolt (132a), remove the clamps (132) (3 pieces), and disconnect the connector SVGT (133).
    Tool: Socket wrench
    Bolt (132a): Width across flats 17mm, M10



93. Disconnect the connectors JCO2 (180), JCO3 (181), and JCO7 (182).
94. Remove the bolts (183a) (2 pieces), and remove the clamps (183) (2 pieces).
    Tool: Socket wrench
    Bolt (183a): Width across flats 17mm, M10

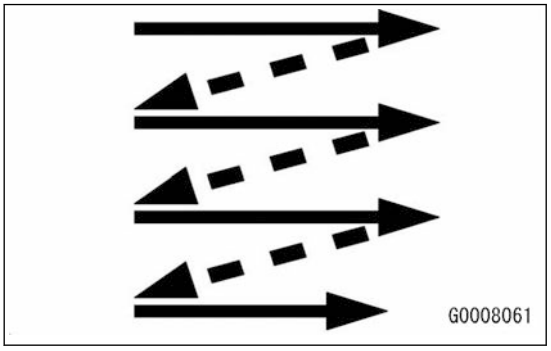


95. Remove the bolts (184) (5 pieces), and remove the bracket (185).
    Tool: Socket wrench
    Bolt (184): Width across flats 17mm, M10



- Be sure that the recorded character strings are correct.

2) Save the recorded character strings in the engine controller.
   - Be sure to save the recorded character string in the column of the cylinder number correctly.
   - If the character string is not saved correctly, it can cause the engine problem.
     (Reference: The 2D code or character strings shows the compensation value of the fuel injection for the injector assembly. They are different for each injector assembly.)



7. Make sure that there is no dirt inside the injector hole.

NOTICE

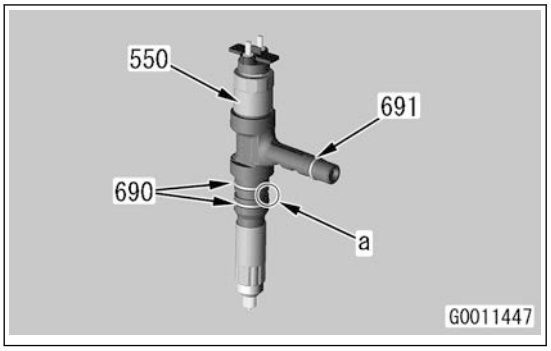
- **Fully wash and remove mud attached around the wiring harness connector to prevent its entry into the connector.**
- **Apply clean engine oil to the O-ring and lubrication part.**

8. Install the O-rings (690) and (691) to the injector (550).

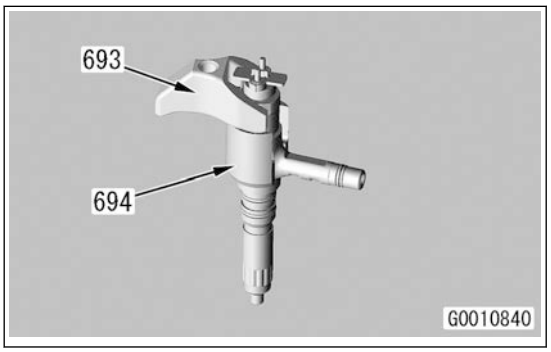
NOTICE

Be careful not to install the O-ring to the groove (a).

O-ring (690), (691): Engine oil (EO30)



9. Install the injector holder (693) and adapter (694).



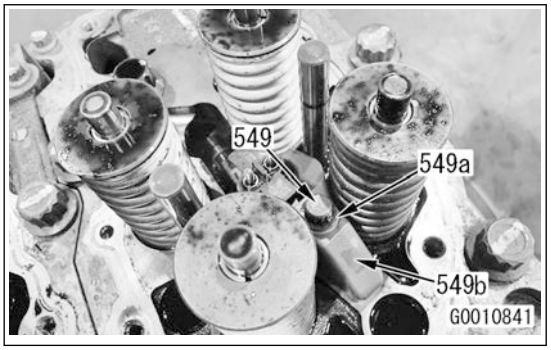
10. Tighten injector holder (549b) lightly with the spherical washer (549a) and the bolt (549).

NOTICE

After the fuel injection pipe is installed, tighten the bolt (549) to the specified torque.

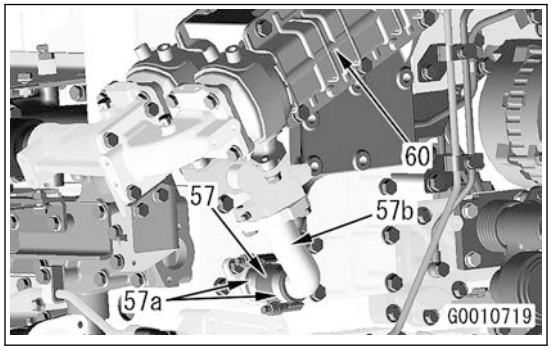
Bolt (549): Width across flats 10mm, M10

Spherical washer (549a): Engine oil (EO30)



EGR cooler assembly

198. Lift the EGR cooler assembly (60) with the webbing sling, and set it to the installation position.



REMARK

Replace an O-ring with a new one.

Tool: Webbing sling

EGR cooler assembly (60): 120kg

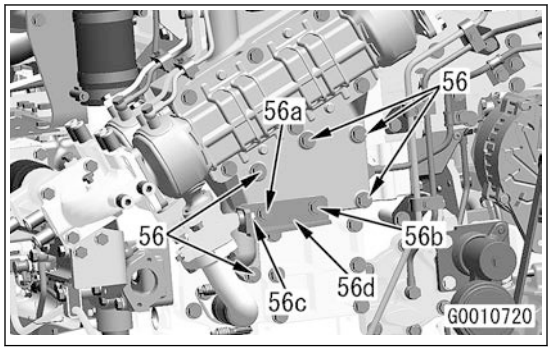
199. Install the bolts (56) (5 pieces).

Tool: Torque set wrench (socket)

Bolt (56): Width across flats 19mm, M12

Bolt (56): 98 to 123Nm {10 to 12.5kgfm}

200. Tighten the bolts in the order of (56a), (56b), and (56c) to install the brackets (56d).



Tool: Torque set wrench (socket)

Bolt (56a), (56b): Width across flats 19mm, M12

Bolt (56c): Width across flats 17mm, M10

Bolt (56a), (56b): 98 to 123Nm {10 to 12.5kgfm}

Bolt (56c): 59 to 74Nm {6 to 7.5kgfm}

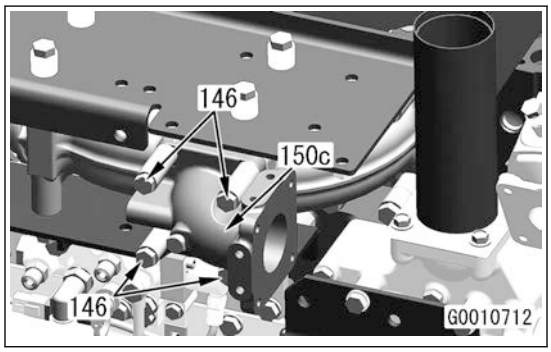
201. Connect the hose (57) and tube (57b), and install the hose clamps (57a) (2 pieces).

Tool: Torque set wrench (socket)

Hose clamp (57a): Width across flats 9.5mm

Hose clamp (57a): 10.5±0.5Nm {1.07±0.05kgfm}

202. Tighten the inlet connector (150c) lightly with the bolts (146) (4 pieces).



NOTICE

- **Replace a gasket with a new one.**
- **Install the gasket to make the side with the mark "OUT" toward the downstream flow of gas.**
  Exhaust manifold side: Upstream flow of gas
  EGR cooler side: Downstream flow of gas
- **The inlet connector (150c) and spacer are tightened together.**

Tool: Torque set wrench (socket)

Bolt (146): Width across flats 17mm, M10

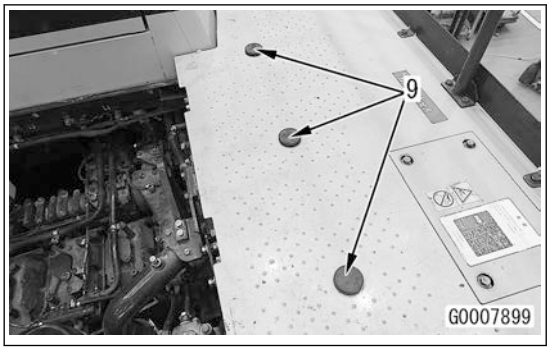
Bolt (146): Seizure prevention compound (LC-G)

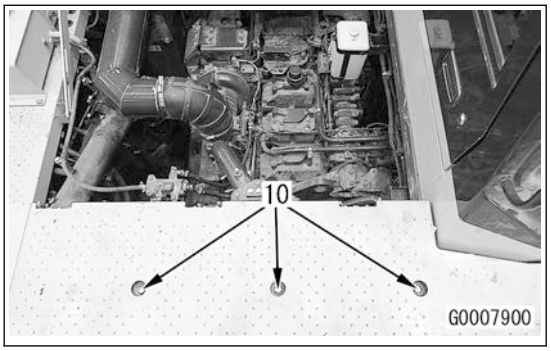
Bolt (146): 44.1 to 53.9Nm {4.5 to 5.5kgfm}

10. Remove the caps (9) (3 pieces), and remove the bolts (10) (3 pieces).

    Tool: Socket wrench

    Bolt (10): Width across flats 19mm, M12





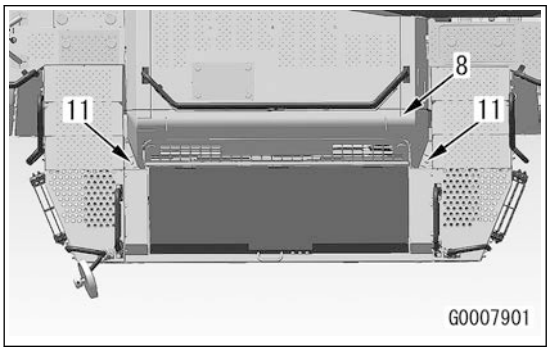
11. Remove the bolts (11) (2 pieces) at the front of the radiator guard (8).

    REMARK

    - Be careful not to let the shims fall off.
    - Write down the installation position and quantity of the shims.

    Tool: Socket wrench

    Bolt (11): Width across flats 24mm, M16



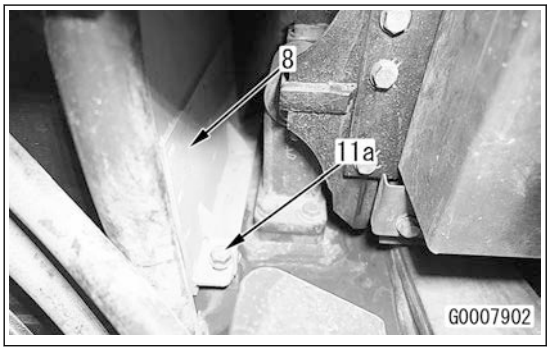
12. Remove the bolt (11a) at the left rear side of the radiator guard (8).

    REMARK

    - Be careful not to let the shims fall off.
    - Write down the installation position and quantity of the shims.

    Tool: Socket wrench

    Bolt (11a): Width across flats 24mm, M16



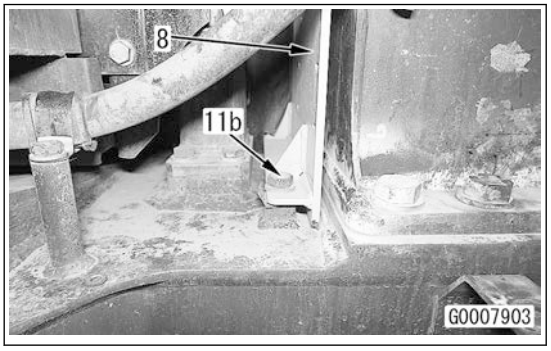
13. Remove the bolt (11b) at the right rear side of the radiator guard (8).

    REMARK

    - Be careful not to let the shims fall off.
    - Write down the installation position and quantity of the shims.

    Tool: Socket wrench

    Bolt (11b): Width across flats 24mm, M16



64. Put an oil container below the tube (84).
65. Remove the clamps (82) (2 pieces).

    Tool: Socket wrench

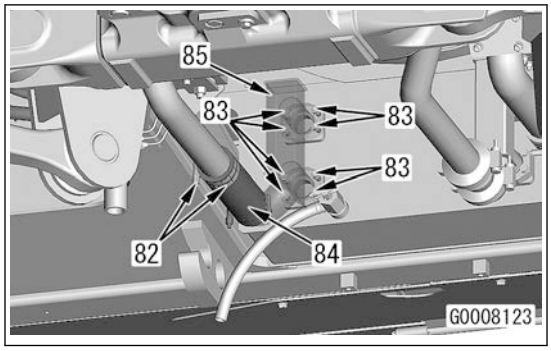
    Hose clamp (82): Width across flats 9.5mm
66. Remove the bolts (83) (8 pieces), and disconnect the hose (85) and tube (84) together.

    REMARK

    Install the plug (86) to the power train oil cooler (87) to prevent oil leakage.

    Tool: Socket wrench

    Bolt (83): Width across flats 19mm, M12



67. Loosen the nuts (90) (4 pieces).

    REMARK

    Loosen it until the U-bolt (91) moves.

    Tool: Socket wrench

    Nut (90): Width across flats 17mm, M10
68. Remove the bolts (92) (2 pieces), and move the bracket (93) to a safe place not to interfere with the removal work of the cooler assembly (102).

    Tool: Socket wrench

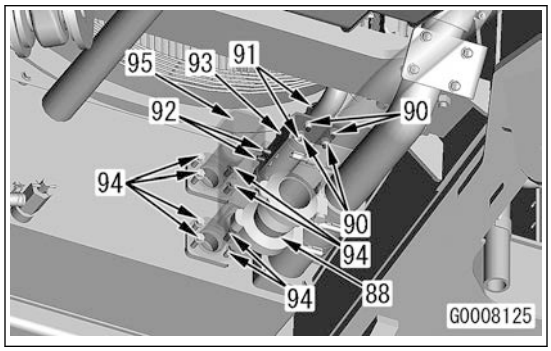
    Bolt (92): Width across flats 19mm, M12
69. Remove the coupling (88).
70. Remove the bolts (94) (8 pieces), and disconnect the tube (95).

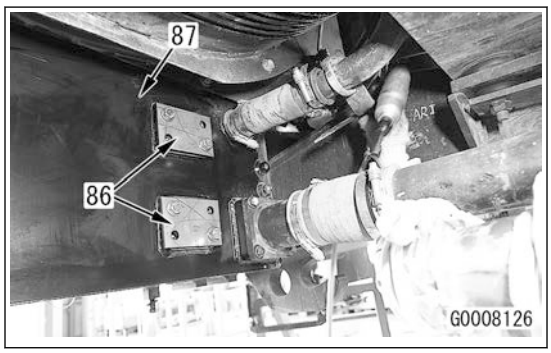
    REMARK

    Install the plug (86) to the power train oil cooler (87) to prevent oil leakage.

    Tool: Socket wrench

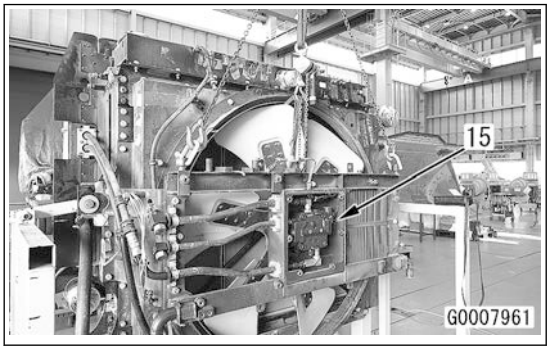
    Bolt (94): Width across flats 19mm, M12



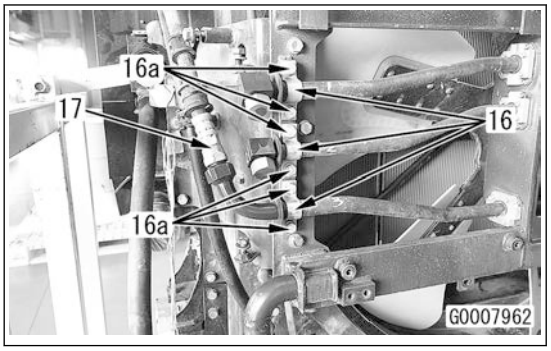


Cooling fan and fan motor

6. Lift the cooling fan and fan motor assembly (15) with the 3 points, and install it.
   Tool: 2-point chain, lever block
   Cooling fan and fan motor assembly (15): 130kg

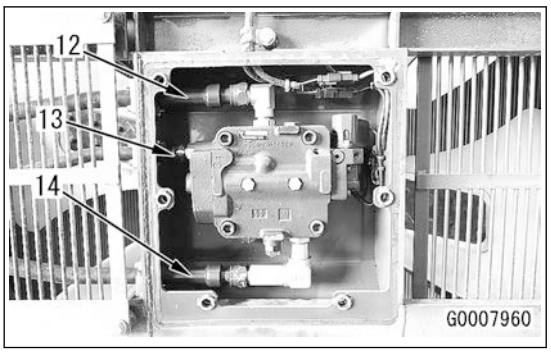


7. Connect the hose (17).
   Tool: Torque set wrench (crowfoot)
   Hose (17): Width across flats 36mm, #06 size
   Hose (17): 177 to 245Nm {18.0 to 25.0kgfm}
8. Install the clamps (16) (3 pieces) with the bolts (16a) (6 pieces).
   Tool: Torque set wrench (socket)
   Bolt (16a): Width across flats 17mm, M10
   Bolt (16a): 59 to 74Nm {6 to 7.5kgfm}

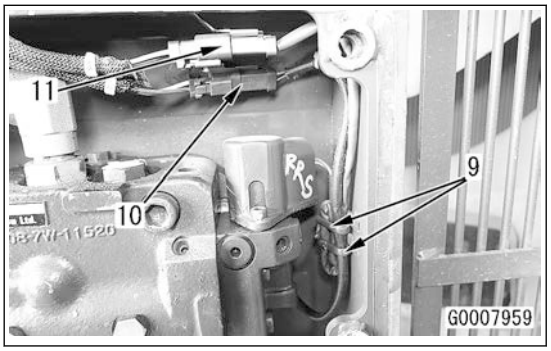


Connector, hose

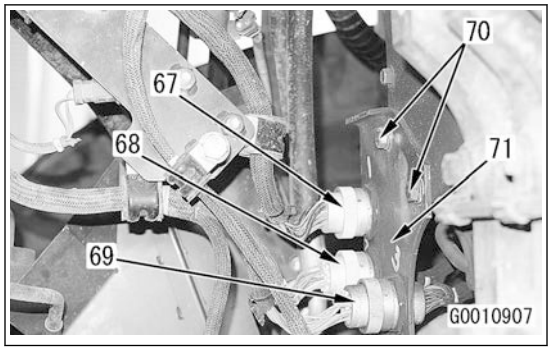
9. Connect the hoses (12), (13), and (14).
   Tool: Torque set wrench (crowfoot)
   Hose (12), (14): Width across flats 36mm, #06 size
   Hose (13): Width across flats 27mm, #04 size
   Hose (12), (14): 177 to 245Nm {18.0 to 25.0kgfm}
   Hose (13): 84 to 132Nm {8.5 to 13.5kgfm}



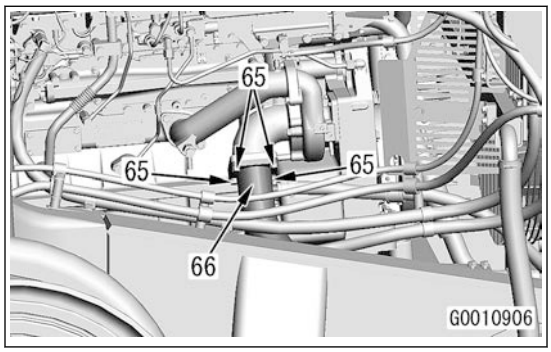
10. Install the clamps (9) (2 pieces).
11. Connect the connectors RRS (10) and RSS (11).



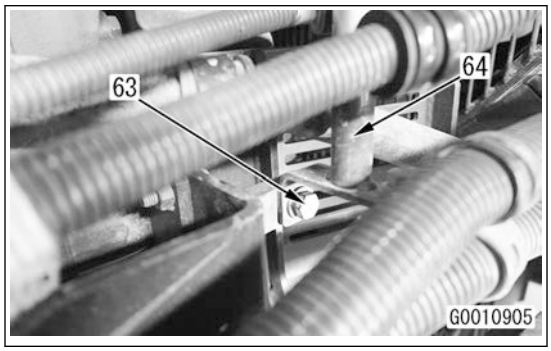
18. Install the bracket (71) with the bolts (70) (4 pieces).
    Tool: Torque set wrench (socket)
    Bolt (70): Width across flats 19mm, M12
    Bolt (70): 98 to 123Nm {10 to 12.5kgfm}
19. Connect the connectors ER1 (67), ER3 (68), and ER4 (69).



20. Connect the water pipe (66) with the bolts (65) (4 pieces).
    Tool: Torque set wrench (socket)
    Bolt (65): Width across flats 17mm, M10
    Bolt (65): 59 to 74Nm {6 to 7.5kgfm}

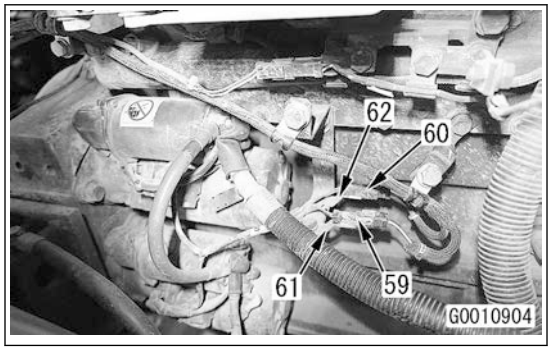


21. Install the bracket (64) and wiring harness together with the bolt (63).
    Tool: Torque set wrench (socket)
    Bolt (63): Width across flats 19mm, M12
    Bolt (63): 98 to 123Nm {10 to 12.5kgfm}

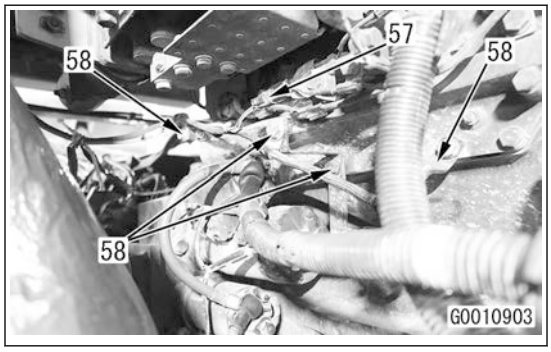


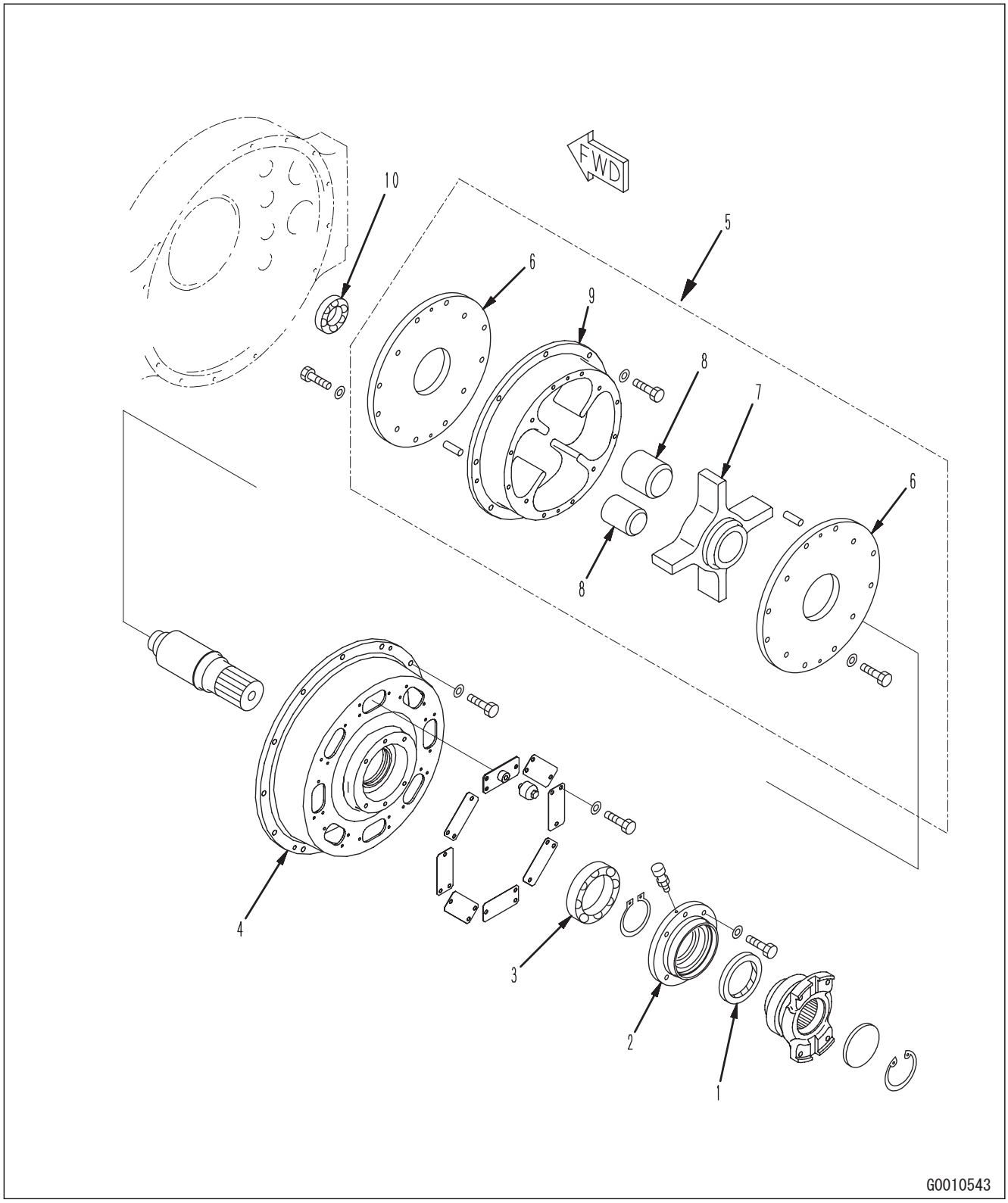
Connector, wiring harness

22. Connect the connectors E02B (59) and E02A (60).
    REMARK
    Install the connectors E02B (59) and E02A (60) to the clips (61) and (62).



23. Connect the connector HM21A (57), and install the clamps (58) (4 pieces).
    Tool: Torque set wrench (socket)
    Bolt for clamp (58): Width across flats 17mm, M10
    Bolt for clamp (58): 59 to 74Nm {6 to 7.5kgfm}





How to Disassemble Damper Assembly

Oil cage assembly

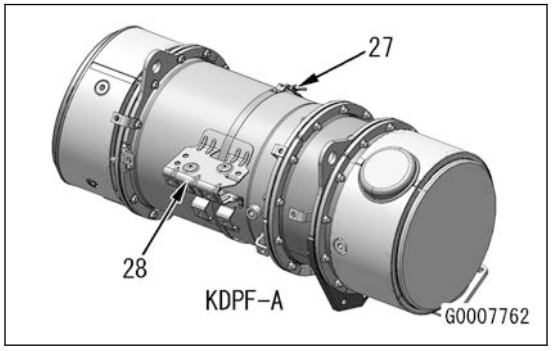
1. Remove the oil seal (1) from the cover (2).

Cover assembly

2. Remove the bearing (3) from the cover (4).

Sensor table

17. Remove the clamp (27), and remove the sensor table (28).



NOTICE

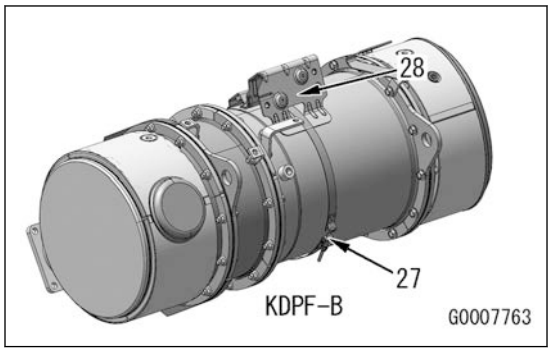
- **Make marks at the installation position of the sensor table (28).**
- **As the clamp (27) is made of stainless steel, do not use the impact wrench.**
- **Discard the clamp (27) as it cannot be used again.**

REMARK

Those installation positions of the KDPF-A are different from those of the KDPF-B.

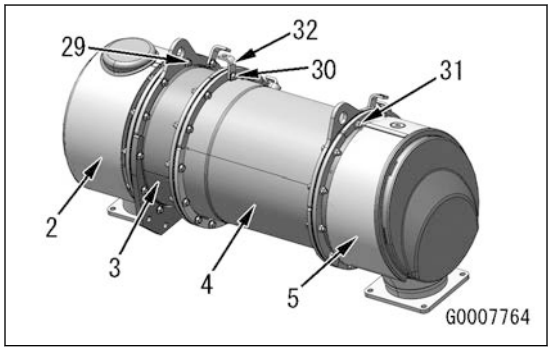
Tool: Socket wrench (long socket)

Nut for clamp (27): Width across flats 11.1mm {7/16 inch}, M6.35



KDPF assembly

18. Remove the bolts and nuts (29) (12 pieces) of the inlet (2) and KDOC (3), bolts and nuts (30) (13 pieces) of the KDOC (3) and KCSF (4), and bolts and nuts (31) (12 pieces) of the KCSF (4) and outlet (5).



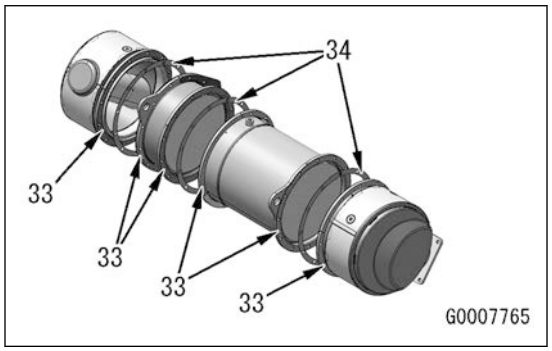
REMARK

- Make marks as a reference of the initial installation angle of the bracket (32).
- Be careful that the length of the bolt that installs the bracket (32) is different from other bolt.

Tool: Socket wrench

Bolt, nut (29), (30), (31) (flanged): Width across flats 14mm, M10

19. Remove the backup plates (33) (6 pieces) and gaskets (34) (3 pieces).
20. Disconnect the inlet part (2), KDOC (3), KCSF (4), and outlet part (5).



NOTICE

Be careful that each body does not fall.

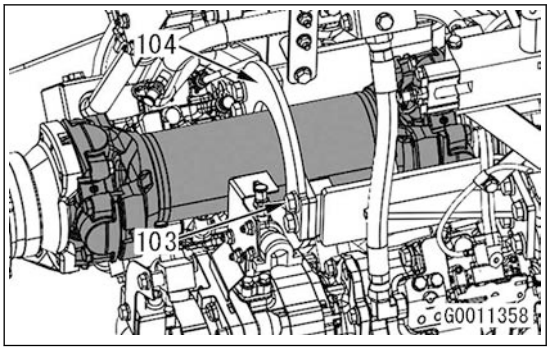
Inlet part (2), outlet part (5): 13kg

KCSF (4): 23kg

3) Remove the bolts (103) (4 pieces), and remove the guard (104).

Tool: Socket wrench

Bolt (103): Width across flats 24mm, M16



4) Install the eyebolt (Y) to the webbing sling (Z).

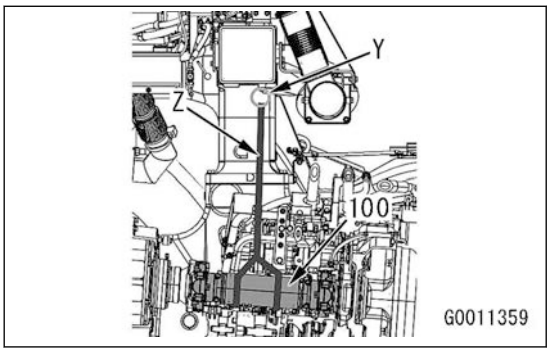
REMARK

Use a lever block to make the length of the webbing sling (Z) adjustable.

5) Lift the front drive shaft assembly (100) with the eyebolt (Y), and hold it.

Tool: Webbing sling

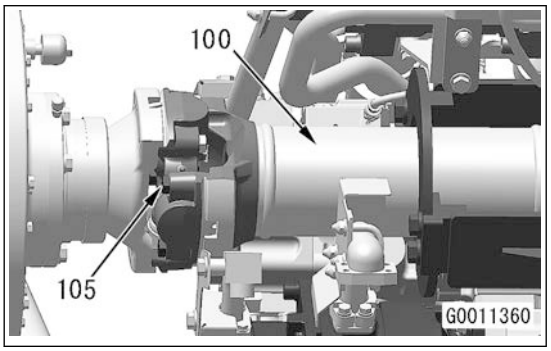
Front drive shaft assembly (100): 48kg



6) Remove the bolts (105) (8 pieces).

Tool: Socket wrench

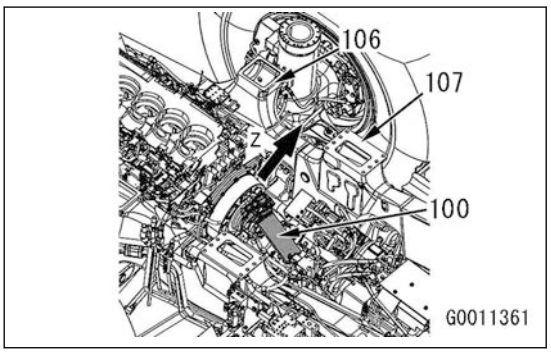
Bolt (105): Width across flats 22mm, M14

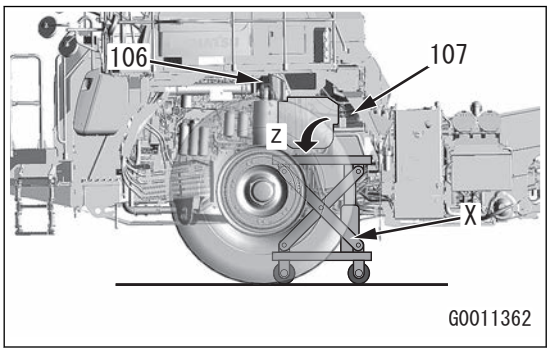


7) Lift the front drive shaft assembly (100), move it in the direction of (z) between the vertical (106) and rear support (107) at the right side of the machine, put it on the lifting cart (X), and then remove it.

Tool: Lifting cart, webbing sling

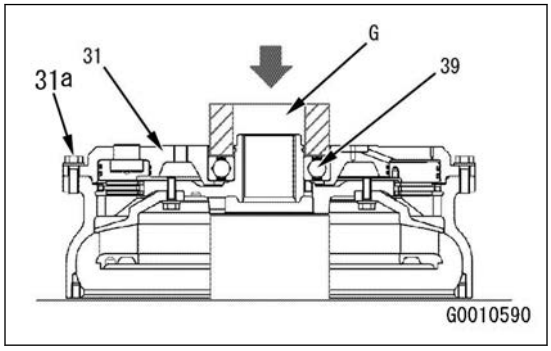
Front drive shaft assembly (100): 48kg





Piston and clutch housing assembly

24. Lift the clutch housing assembly (31), install it to the drive case with the bolts (31a) (30 pieces), and press fit the bearing (39) with the spacer (G).



REMARK

- Lift the clutch housing assembly with the eyebolt.
- Press fit the bearing until it comes into full contact with the end surface of the shaft and end face of the housing.
- Press fit the bearing while you push the inner race side and outer race side at the same time.

Tool: Torque set wrench (socket), chain with hook, spacer (G)

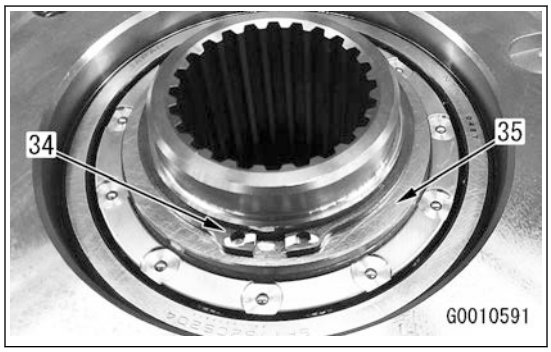
Bolt (31a): Width across flats 19mm, M12

Clutch housing assembly (31): 30kg

Bolt (31a): Liquid adhesive (LT-2)

Bolt (31a): 98.1 to 122.6Nm {10 to 12.5kgfm}

25. Install the plate (35) to the shaft, and install the snap ring (34).

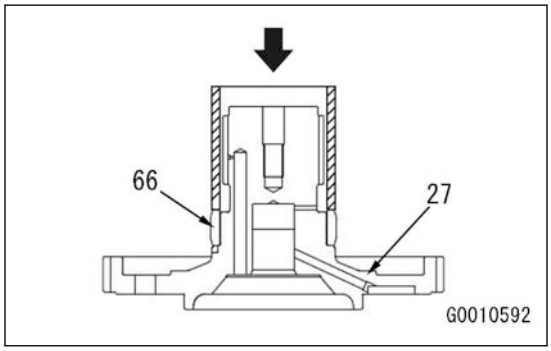


Input shaft

26. Press fit the inner race (66) with the push tool.

REMARK

The inner race (66) is an assembly. Make sure that the manufacturing number and match symbol (A or B) on its end surface are the same as those on the mating bearing.



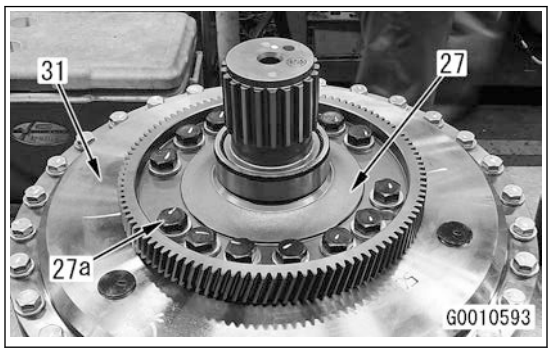
27. Install the input shaft assembly (27) to the clutch housing assembly (31) with the bolts (27a) (14 pieces).

Tool: Torque set wrench (socket)

Bolt (27a): Width across flats 24mm, M16

Bolt (27a): Liquid adhesive (LT-2)

Bolt (27a): 269.7 to 308.9Nm {27.5 to 31.5kgfm}



No.4 (3rd) and No.5 (R) carrier assembly

39. Put the collar (130) between the bearings (129) (2 pieces), install it to the No.5 planetary gear (128), attach the thrust washers (131) to the two sides, and then set it to the carrier.
40. Align the shaft (126) with the bearing and thrust washer, and install it to the carrier by expansion-fit.

    REMARK

    - Before you install the shaft, insert the pin into the shaft hole, do the centering of the carrier, bearing, and thrust washer as you align them with the shaft hole. Insert the guide bar (L) (φ34.8mm) to make sure that it is aligned.
    - Make sure that the shaft is aligned with the holes of the bearing, thrust washer, and carrier, and install it carefully not to damage the bearing and thrust washer.
    - Make sure that the gear rotates smoothly.

    Tool: Push tool, pin, guide bar (L)
41. Drive out the shaft (126) until the overall ball hole can be seen, install the ball (127), drive in the shaft to the carrier side, and install it.

    Tool: Push tool
42. Install the bearing (135) to the No.4 planetary gear (134), and set it to the carrier with the thrust washers (136) attached each side.
43. Put the collar (130) between the bearings (129), install it to the No.5 planetary gear (128), attach the thrust washers (131) to the two sides, and then set it to the carrier.
44. Align the shaft (132) with the bearing and thrust washer, and install it to the ball (133) and carrier by expansion-fit.

    REMARK

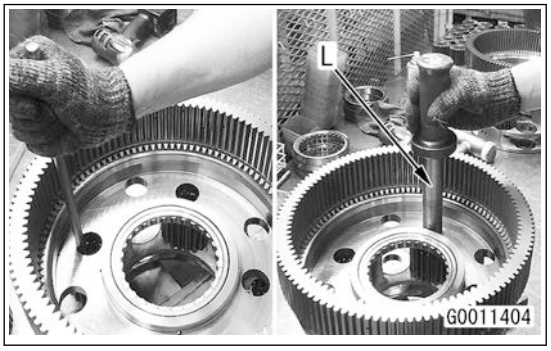
    - Before you install the shaft, insert the pin into the shaft hole, do the centering of the carrier, bearing, and thrust washer as you align them with the shaft hole. Insert the guide bar (L) (φ34.8mm) to make sure that it is aligned.
    - Make sure that the shaft is aligned with the holes of the bearing, thrust washer, and carrier, and install it carefully not to damage the bearing and thrust washer.

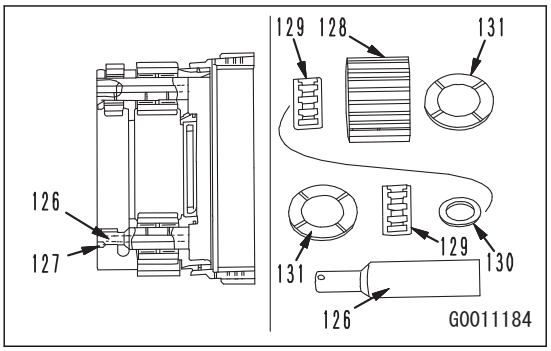
    Tool: Push tool, guide bar (L)
45. Install the ball (133), and then install the shaft (132).
46. Make sure that the gear rotates smoothly.
47. Press fit the bearing (124) to the carrier assembly with the push tool.

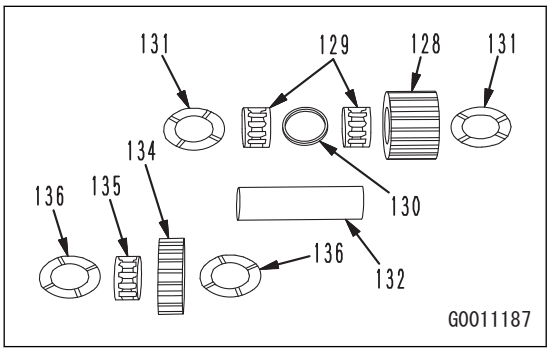
    Or install it by expansion-fit.

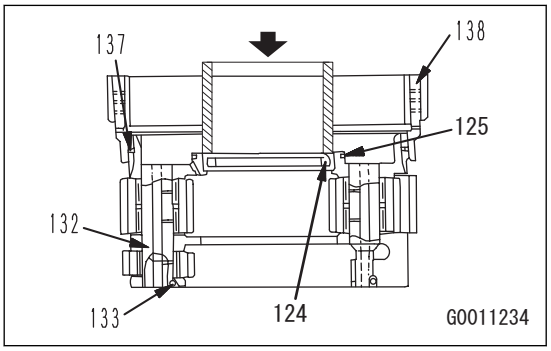
    Tool: Push tool
48. Install the seal ring (125).

    Periphery of seal ring: Grease (G0-LI or G2-LI)
49. Install the ring gear (138) to the carrier, and fix it with the snap ring (137).





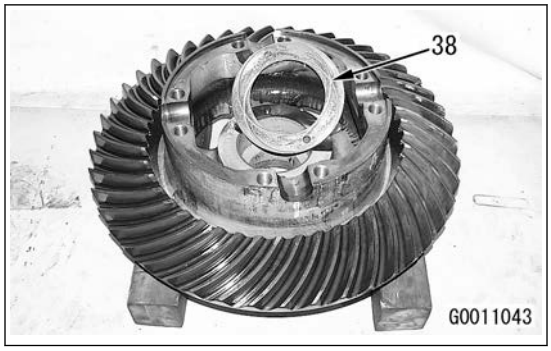


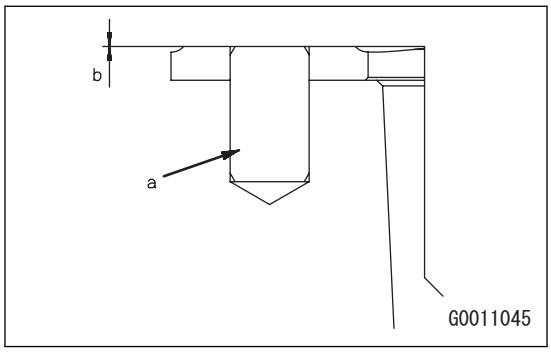


4. Install the washer (38).

NOTICE

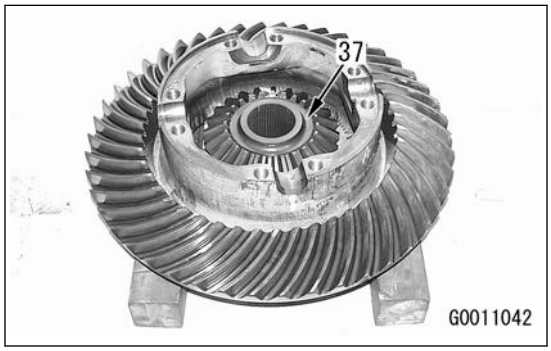
- **Install it with the groove side up.**
- **Make sure that the distance (b) between the end surfaces of the washer and dowel pin (a) is 0.35 to 0.75mm after installation. (If the dowel pin is removed, drive it in as the dimension above.)**





5. Install the side gear (37).

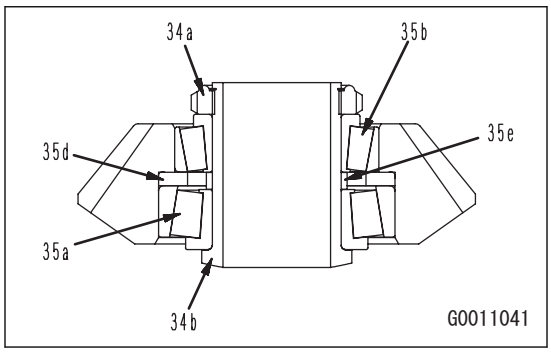
Side gear (37): 11kg



6. Install the bearing to the pinion gear.

NOTICE

- **Apply engine oil (EO30-CD) over the sliding part.**
- **The bearing is an assembly that consists of the large bearing (35a), small bearing (35b), outer race spacer (35d), and inner race spacer (35e).**
- **Do not replace any of them with one of the other assemblies. (The assembly symbol is put on each part.)**



7. Install the sleeve (34b) as shown in the figure.
8. Tighten the nut (34a) with the wrench (F).

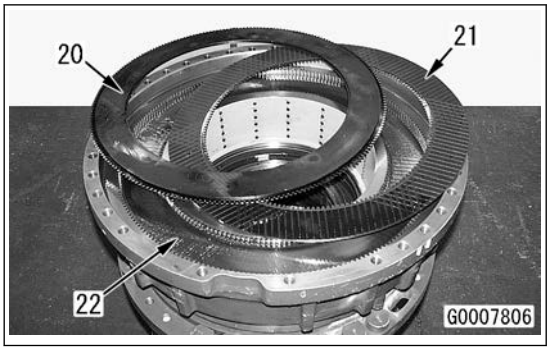
NOTICE

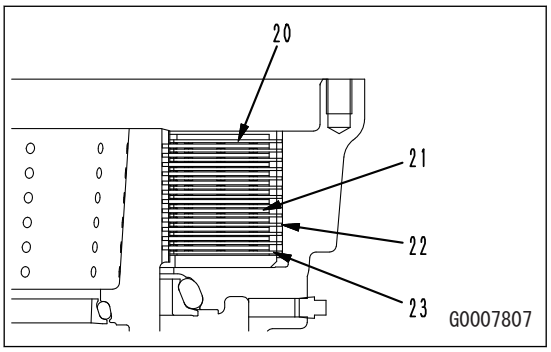
After it is tightened, rotate the bearing by 5 turns or more, and make sure that it rotates smoothly.

Tool: Wrench (F)

Nut (34a): 490 to 608Nm {50 to 62kgfm}

17. Remove the damper (20), discs (21) (12 pieces), plates (22) (11 pieces), and damper (23).

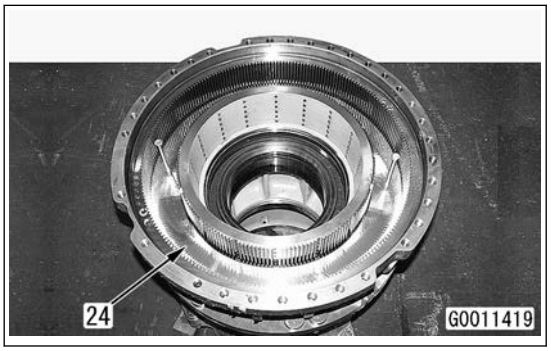




18. Install the guide bolt to the tapped hole, and remove the spacer (24).

    Tool: Guide bolt

    Spacer (24): 12kg



Outer gear

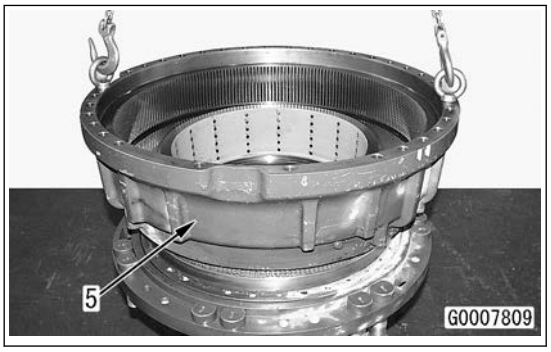
19. Lift the outer gear (5), and remove it.

    REMARK

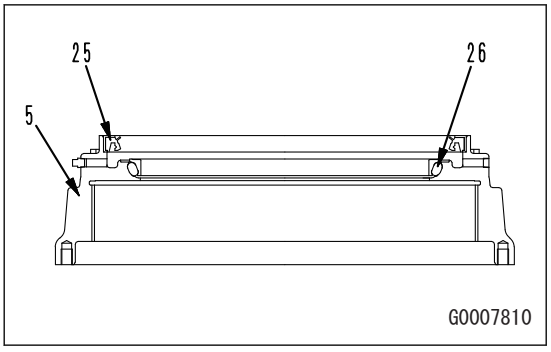
    Be careful not to let the floating seal at the bottom fall off.

    Tool: 2-point chain

    Outer gear (5): 140kg



20. Remove the oil seal (25) and floating seal (26) from the outer gear (5).



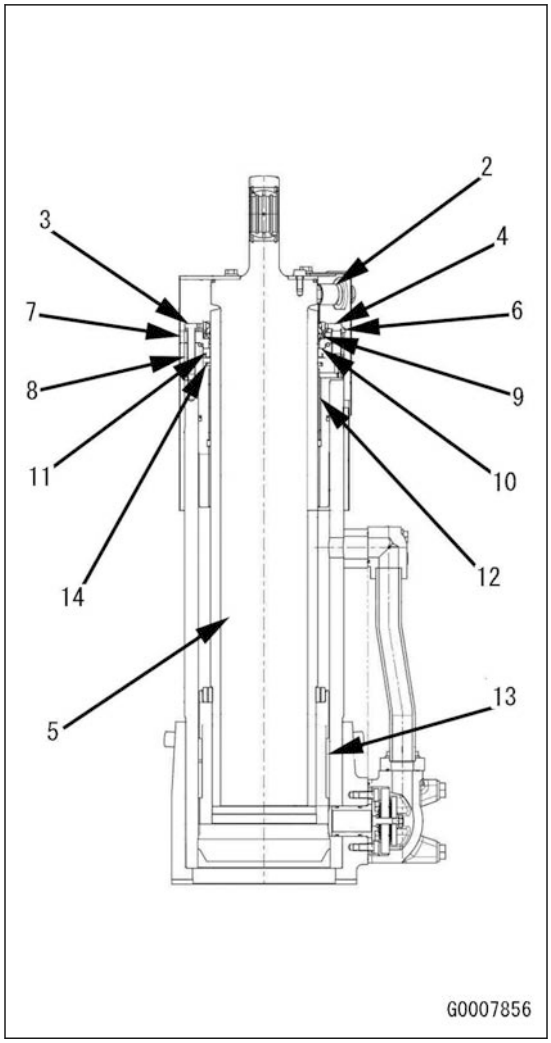
6. Lift the cylinder rod assembly (5) with the webbing sling, and install it to the cylinder.

REMARK

- If the rod assembly is engaged too far, the oil spouts out. Stop at a position where the oil does not spout out.
- After you install the suspension assembly to the dump body, adjust the oil and gas with the suspension tool (B). For details, see Testing and Adjusting, “Adjust Front Suspension Cylinder”.

Tool: Webbing sling, suspension tool (B)

Cylinder rod assembly (5), plate (6), retainer (7), flange (8): 130kg

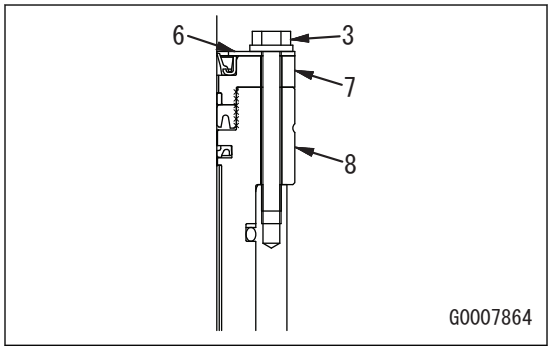


7. Install the flange (8), retainer (7), and plate (6) together to the cylinder with the bolts (3) (15 pieces).

Tool: Torque set wrench (socket)

Bolt (3): Width across flats 19mm, M12

Bolt (3): 98.1 to 122.6Nm {10 to 12.5kgfm}

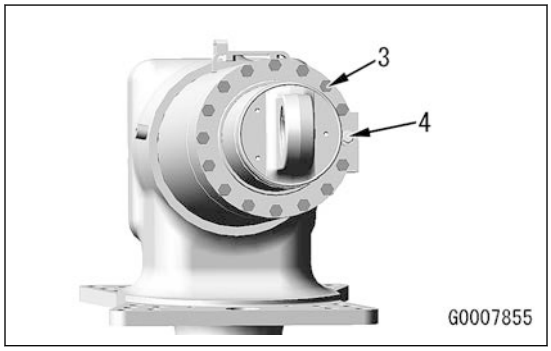


8. Install the air bleed valve (4).

Tool: Torque set wrench (socket)

Air bleed valve (4): Width across flats 17mm

Air bleed valve (4): 39.2 to 49.0Nm {4 to 5kgfm}



Tool: Socket wrench

Bolt (68): Width across flats 17mm, M10

36. Remove the bolts (70) (4 pieces), and remove the KOMTRAX Plus controller assembly (71).

Tool: Socket wrench

Bolt (70): Width across flats 13mm, M8

37. Remove the cable (72).

38. Remove the hexagonal socket head screws (73) (3 pieces).

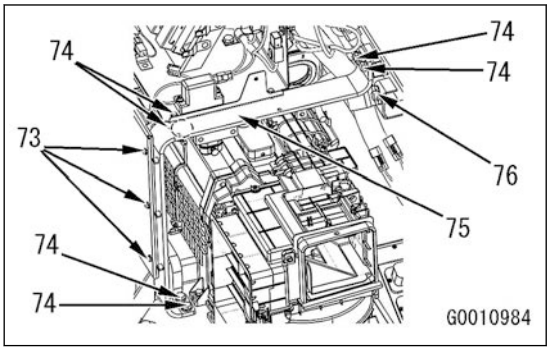
Tool: Hexagonal wrench

Hexagonal socket head screw (73): Width across flats 4mm, M6

39. Remove the bolts (74) (6 pieces), and remove the bracket (75).

Tool: Socket wrench

Bolt (74): Width across flats 17mm, M10



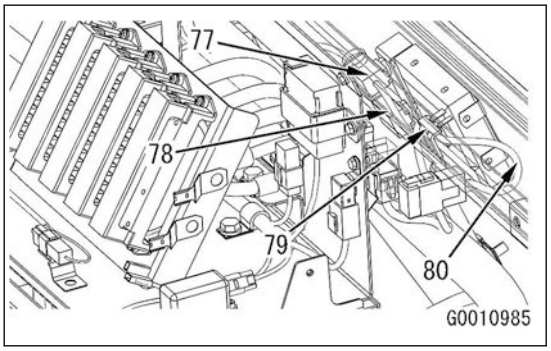
40. Remove the clamp (76).

Tool: Socket wrench

Bolt for clamp (76): Width across flats 17mm, M10

41. Disconnect the connectors AC2 (77) and AC1 (78).

42. Remove the wiring harness (80) from the clip (79).



43. Remove the bolts (81) (6 pieces), and disconnect the relay (82).

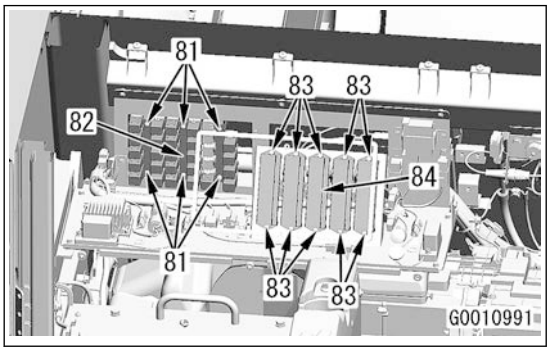
Tool: Socket wrench

Bolt (81): Width across flats 10mm, M6

44. Remove the bolts (83) (10 pieces), and disconnect the fuse box (84).

Tool: Socket wrench

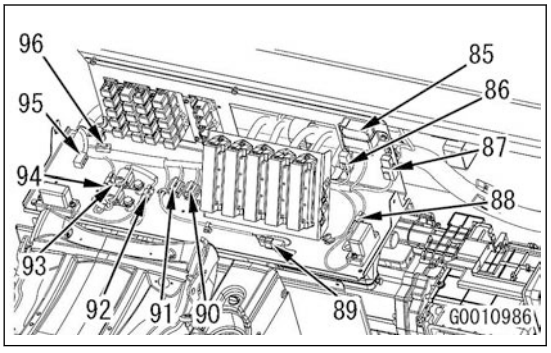
Bolt (83): Width across flats 10mm, M6



45. Disconnect the connectors R30 (85), SPARE (86), CCR (87), PM3 (88), A1 (89), DEFR (90), HMR (91), T10A (92), T10 (93), AS3 (94), DCC (95), and UNT (96).

REMARK

Make marks at the connection position.



3) Install the clips (2a) and (2b) (right and left).

REMARK

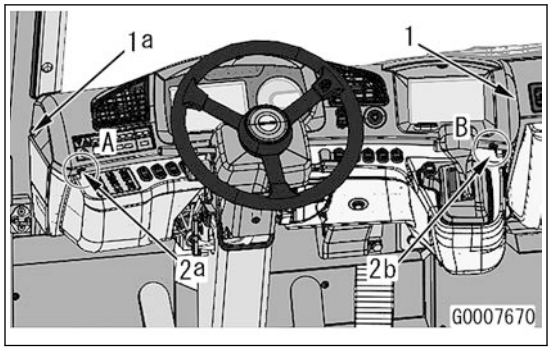
Push the button at the center of the clip in the direction of the arrow (P) to install it.

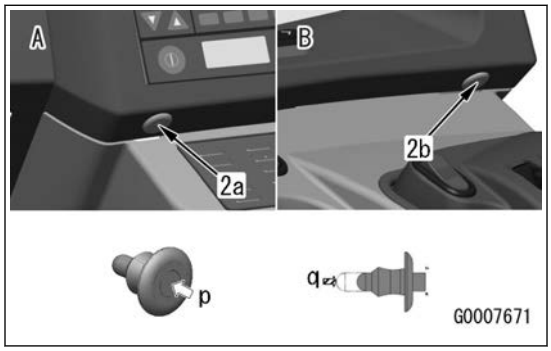
4) Install the hexagonal socket head screw (1a) at the left side.

Tool: Torque set wrench (hexagonal)

Hexagonal socket head screw (1a): Width across flats 4mm, M6

Hexagonal socket head screw (1a): 11.8 to 14.7Nm {1.2 to 1.5kgfm}





Remove and Install Driver Status Monitor

Precautions before and during work

⚠ Stop the machine on a level ground, set the parking brake switch to the PARKING (P) position, and stop the engine.

⚠ Put chocks on the tires to prevent unexpected movement of the machine.

⚠ Set the battery disconnect switch to the OFF position. (For details, see the shop manual for the standard machine, Structure and Function, Maintenance Standard, "Battery Disconnect Switch".)

⚠ When you disconnect the wirings and hoses, be careful not to deform or cause damage to them with the clips and clamps.

⚠ If the wirings and hoses can be deformed or have damage, remove the clips and clamps before the work.

NOTICE

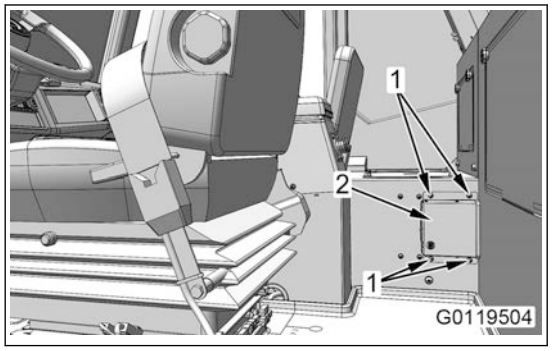
Write down the connector numbers and installed positions before you disconnect the wirings and hoses.

How to Remove Driver Status Monitor

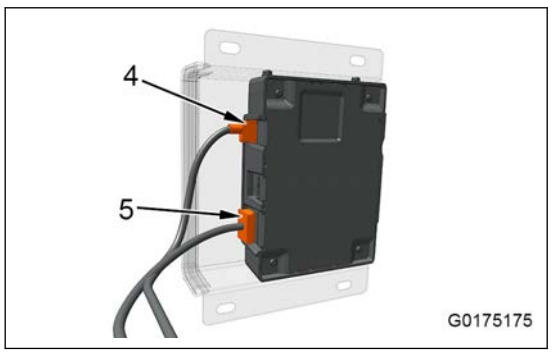
1. Remove the hexagonal socket head screws (1) (4 pieces), and remove the bracket (2).

   REMARK

   - Be careful not to lose the washer.
   - The driver status monitor (3) and wiring harness are attached to the bracket (2) at this time.

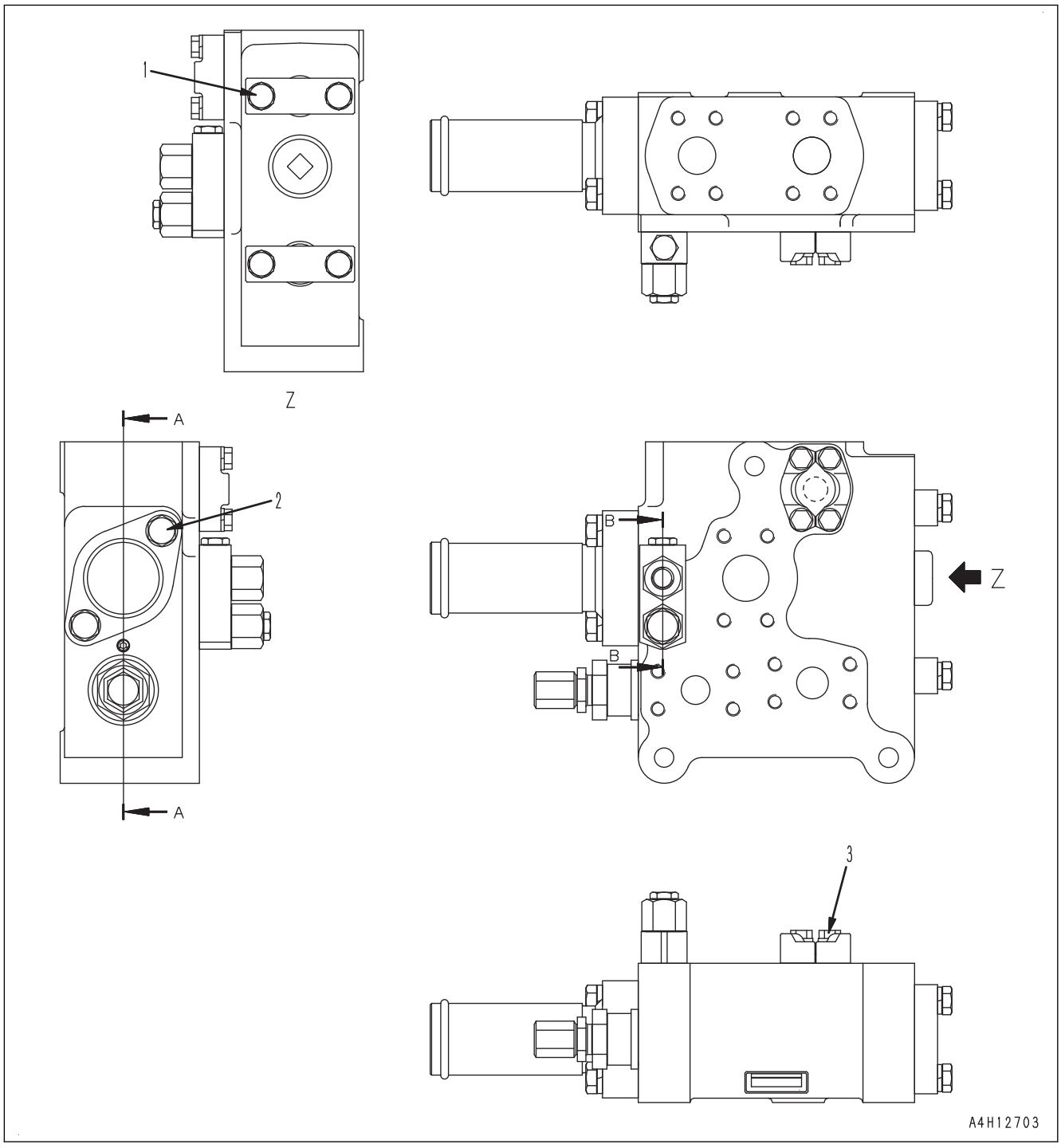


2. Disconnect the drowsiness detection camera cable connector (4) and connector DDS1 (5).



60 Maintenance Standard

Maintenance Standard for Demand Valve



A:Refrigerant inlet (from condenser)
B:Refrigerant outlet (to compressor)
C:Hot water inlet
D:Hot water outlet
E:Recirculation air inlet
1:Evaporator
2:Heater core
3:Expansion valve
4:Blower fan, blower motor
5:Air mix servomotor
6:Air mix door
7:Vent (mode) servomotor
8:Rear door
F:Fresh air inlet
G:Front vents
H:Rear vents
J:Foot vents
K:Defroster vents
9:Foot door
10:Defroster door
11:FRESH/RECIRC air changeover servomotor
12:FRESH/RECIRC air changeover door
13:Power transistor
14:Evaporator temperature sensor
15:Recirculation air temperature sensor

REMARK

“Door” is also referred to as “damper”.

Function of Air Conditioner Unit

The air conditioner unit consists of evaporator (1) and heater core (2) to heat or cool the air in the operator's cab.

Temperature Control

When the temperature control switch on the machine monitor is operated, temperature setting data is sent to the air conditioner controller. The controller is located at the rear of the operator's seat. The air conditioner controller controls air mix servomotor (5) and changes the angle of air mix door (6) to control the temperature

Over-cool (Freeze) Prevention

- Evaporator temperature sensor (14) varies the resistance of its resistor corresponding to temperature.
- The air conditioner controller converts change in resistance of evaporator temperature sensor (14) into change in voltage to determine the temperature of evaporator (1).
- The air conditioner controller operates the compressor clutch relay *1 to stop the compressor to prevent a frozen evaporator (1).

*1:For the compressor clutch relay, see “Locations of Air Conditioner Parts and Layout of Connectors”.

Air Flow Adjustment

Whenever a control switch for airflow is operated on the machine monitor, setting data of the airflow is sent to the air conditioner controller. The air conditioner controller controls blower motor (4) by using power transistor (13) to adjust the airflow.

Vent (Mode) Changeover

The vent switch operation on the machine monitor sends mode data to the air conditioner controller. The air conditioner controller controls vent (mode)servomotor (7) to adjust the opening angles of vent (mode) doors (8) to (10) and change the vents.

FRESH/RECIRC Air Changeover

FRESH/RECIRC air setting data is sent to the air conditioner controller corresponding to operation of FRESH/RE- CIRC air switch on the monitor. The air conditioner controller controls FRESH/RECIRC air motor (11) to open or close FRESH/RECIRC air door (12).

REMARK

When you release the cab door, fresh air inlet is selected automatically, and selection with switch operation is not available. The setting mode is back after the cab door is closed.

Air Conditioner Troubleshooting Chart 2

Blower Fan Motor Does Not Turn in Cooling and Heating Modes, or Its Speed is Different from Flow Setting in Cooling Mode.

Probable cause	Check procedure	Remedy
Open circuit or defective connection in wiring	Check for disconnection of connector.See “INSTALLATION LOCATIONS OF AIR CONDITIONER PARTS AND ARRANGEMENT OF CONNECTORS”.	Repair the open circuit. Connect it correctly.
Defective blower fan motor	Operate fan switches in order and check that fan turns.See “Air Conditioner Unit”.	Replace
Defective power transistor (PTR)	Operate fan switches in order and check that fan turns.	Replace

Blower Fan Motor is Correct but Air Flow is Not Sufficient During Cooling.

Probable cause	Check procedure	Remedy
High resistance to airflow.	Inspect for clog in filter and for crush and clog of duct.	Repair
Air leakage through connection part of duct	Inspect connection part of duct. See “Examine Air Leakage (Duct)”.	Repair
Obstruction in the suction side of the evaporator	Check evaporator for dirt and obstruction.	Clean it to remove obstacles.
Defective evaporator temperature sensor, defective contact of evaporator temperature sensor, or defective expansion valve*1	Evaporator is frozen. Inspect the sensor clip, examine the sensor for dirt and dust. Inspect the air conditioner hose near pressure switch is frosted (when in low temperature area)	Replacement or repair

*1:Evaporator temperature sensor and expansion valve are located in the air conditioner unit.

Pressure is Abnormal in Cooling Mode (Low/High Pressure)

Probable cause	Check procedure	Remedy
Not enough refrigerant	Examine refrigerant volume through sight gauge during normal operation. For better accuracy, confirm using the manifold gauges.	Repair leaking point and refill with proper volume of refrigerant.
Too much refrigerant		Collect refrigerant, then refill with proper volume of refrigerant.
Pressure incorrect at outlet and inlet of the compressor	Normal refrigerant pressure range Low pressure:Approx.0.13 to 0.2MPa{1.3 to 2.0kg/cm^2} High pressure:Approx.1.5 to 1.7MPa{15 to 17kg/cm^2} Temperature in operator's cab:30 to 35℃ Engine speed:Approx. 1500rpm	See “TROUBLESHOOT USING GAUGE PRESSURE”.

Compressor Does Not Turn at All or Does Not Turn Correctly in Cool Mode.

See “TROUBLESHOOT COMPRESSOR AND REFRIGERANT SYSTEM (AIR IS NOT COOLED)”.

90 Circuit Diagrams