SEN06708-09

Shop Manual

BULLDOZER

D375A-8

SERIAL NUMBERS 80001 and up

KOMATSU

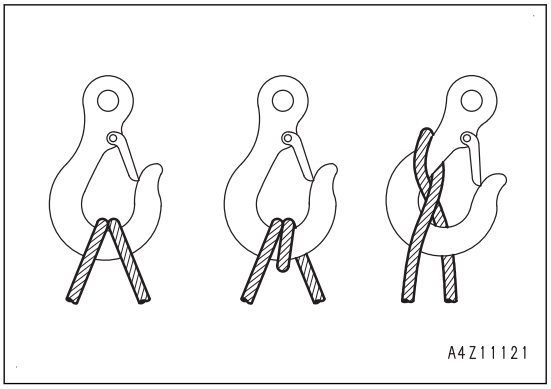
- Apply wire ropes to the middle part of the hook.

  ⚠ Do not use hooks if it does not have a latch system.

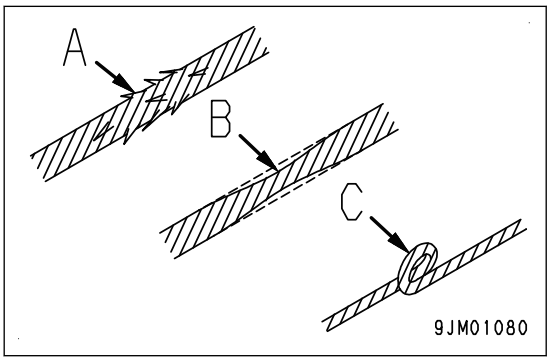
  ⚠ Slinging near the tip of the hook may cause the rope to slip off the hook during hoisting.

  REMARK

  The strength of the hook is maximum at its central part.



- Never use a wire rope which has breaks in strands (A), reduced diameter (B), or kinks (C). There is a danger that the rope may break during the towing operation.



Precautions for slinging up

- Wind in the crane slowly until wire ropes are stretched. When settling the wire ropes with the hand, do not grasp them but press them from above. If you grasp them, your fingers may be caught.
- After the wire ropes are stretched, stop the crane and check the condition of the slung load, wire ropes, and pads.
- If the load is unstable or the wire rope or chains are twisted, lower the load and lift it up again.
- Do not lift up the load at an angle.

Precautions for slinging down

- When slinging down a load, stop it temporarily at 30 cm above the floor, and then lower it slowly.
- Check that the load is stable, and then remove the sling.
- Remove kinks and dirt from the wire ropes and chains used for the sling work, and put them in the specified place.

Precautions When You Use Mobile Crane

REMARK

Read Operation and Maintenance Manual of the crane carefully in advance and operate the crane safely.

Precautions When You Use Overhead Traveling Crane

⚠ When raising a heavy component (heavier than 20kg), use a hoist or crane.

Weight of component whose weight is heavier than 20kg is shown with symbol ▭ in “Disassembly and Assembly”.

REMARK

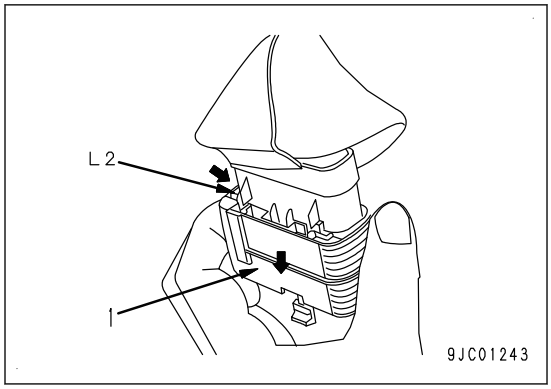
The symbol ▭ shows the weight of the parts with weight of 20kg or more for convenience of workers. But the weight can possibly be shown even if it is less than 20kg in accordance with the work environment.
Do the work safely in response to the work environment and the physical build, preexisting condition, and physical condition of the operator. And obey the laws and regulations of each country.

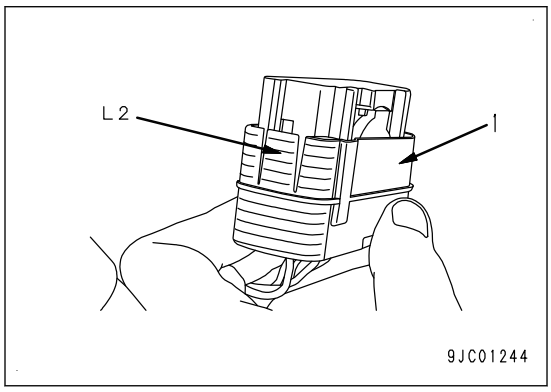
- Before starting work, check the wire ropes, brake, clutch, controller, rails, over winding prevention device, ground fault circuit interrupter for electric shock prevention, crane collision prevention device, and energizing caution lamp, and check the following safety items.
  - Be sure not to touch the lifting tool and lifted load directly. Use push-pull sticks or tagline ropes.
  - Observe the signals for sling work.
  - Operate the hoist at a safe place.

2. While pressing lock (L2), pull out connector (1).

   REMARK

   Lock (L2) is located behind connector (1) in the figure.





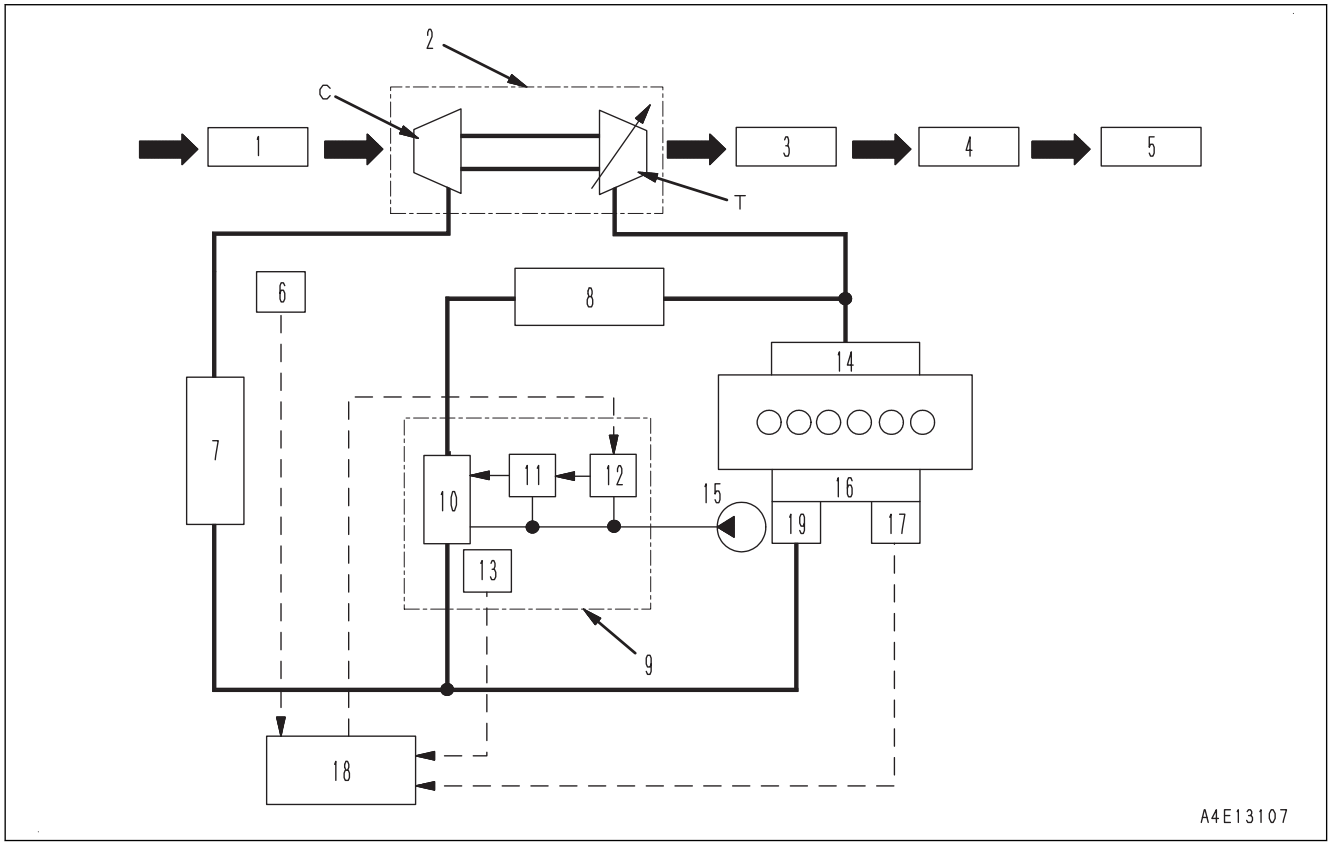
How to Connect Slide Lock Type Connector (FRAMATOME-24)

Insert it straight until it clicks.

Machine model	Unit	D375A-8
Blade		
Type		Hydraulic semi-U tilt dozer Hydraulic full-U tilt dozer
Blade supporting method		
• Single tilt		Left: Brace type Right: Tilt cylinder type
• Dual tilt		Left: Tilt cylinder type (for single tilt, dual tilt, pitch) Right: Tilt cylinder type (for dual tilt, pitch)
Semi-U tilt dozer		
Performance		
• Maximum raising distance (from the ground)	mm	1690
• Maximum lowering distance (below ground)	mm	734
• Maximum tilt amount	mm	Right 1370, left 950
• Hydraulic tilt amount (single)	mm	740
• Blade edge angle adjustable amount	Degree	±5
• Blade capacity (SAE)	m^3	18.5
Dimensions		
• Blade width	mm	4775
• Blade height (With spill guard)	mm (mm)	2265 (2525)
• Blade edge angle	Degree	55
Full-U dozer		
Performance		
• Maximum raising distance (from the ground)	mm	1690
• Maximum lowering distance (below ground)	mm	734
• Maximum tilt amount	mm	Right 1500, left 1040
• Hydraulic tilt amount (single)	mm	810
• Blade edge angle adjustable amount	Degree	±5
• Blade capacity (SAE)	m^3	22.0
Dimensions		
• Blade width	mm	5215
• Blade height (With spill guard)	mm (mm)	2265 (2525)
• Blade edge angle	Degree	55
Semi-U tilt dozer + pitch		
Performance		

- Mixing connector (3) returns the air from the air-cooled aftercooler and the exhaust gas from EGR valve to the intake section.
- Exhaust gas is always clean with this system which controls EGR circuit based on information sent from sensor installed to each part to obtain EGR rate according to the operating condition. (EGR ratio means the ratio of EGR gas contained in the intake gas.)
- Monitors EGR circuit for troubleshooting with sensor installed to each part to prevent a serious failure from occurring.

EGR System Circuit Diagram



C: Blower impeller
1: Air cleaner
2: VGT
3: KDPF
4: DEF mixing tube(*1)
5: SCR assembly(*1)
6: Ambient pressure sensor
7: After cooler
8: EGR cooler
9: EGR unit
10: EGR valve
T: Turbine impeller
11: Hydraulic actuator (power piston)
12: EPC valve (for EGR valve)
13: EGR valve lift sensor
14: Exhaust manifold
15: Engine boost oil pump
16: Intake manifold
17: Charge (boost) pressure and temperature sensor
18: Engine controller
19: Mixing connector

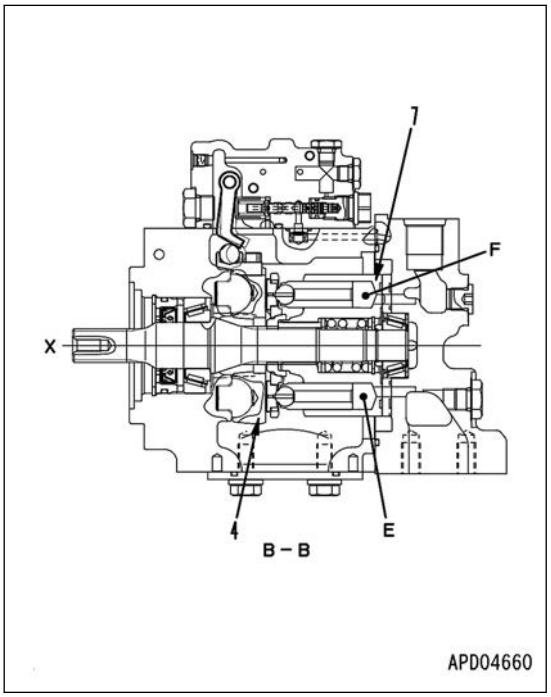
*1: This may not be installed on some machine models and specifications.

Operation of EGR System

1. The engine controller outputs signals in order to open EGR valve (10) most properly in accordance with the engine load, so that both of the clean exhausting gas and low fuel consumption can be achieved.

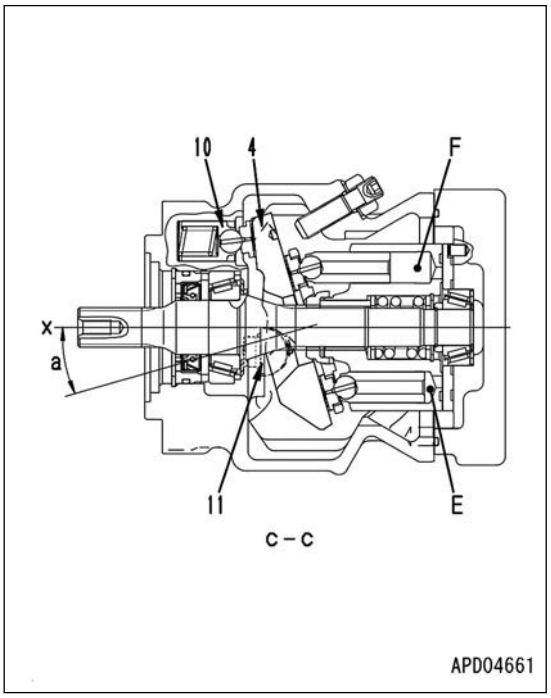
No Pressurized Oil is Suctioned In or Discharged (Swash Plate Angle = 0)

1. The difference between volumes (E) and (F) inside cylinder block (7) is zero when center line (X) of rocker cam (4) matches the axis of cylinder block (7) (the swash plate angle is zero).
2. The suction and discharge of pressurized oil is not performed. The pumping action is not performed. (Angle of swash plate does not become zero actually)
3. Pump discharged volume is in proportion to the swash plate angle (a).



Control of Discharged Volume

1. As the swash plate angle (a) is increased, the difference between volumes (E) and (F) is increased. Accordingly, the discharged volume (Q) is increased.
2. Servo piston (10) changes the swash plate angle (a).
3. Servo piston (10) moves in a linear reciprocating motion corresponding to the signal pressure from the PC valve.
4. This linear motion is transmitted to the rocker cam (4).
5. Being supported by the ball retainer (11), the rocker cam (4) pivots around the ball retainer (11).

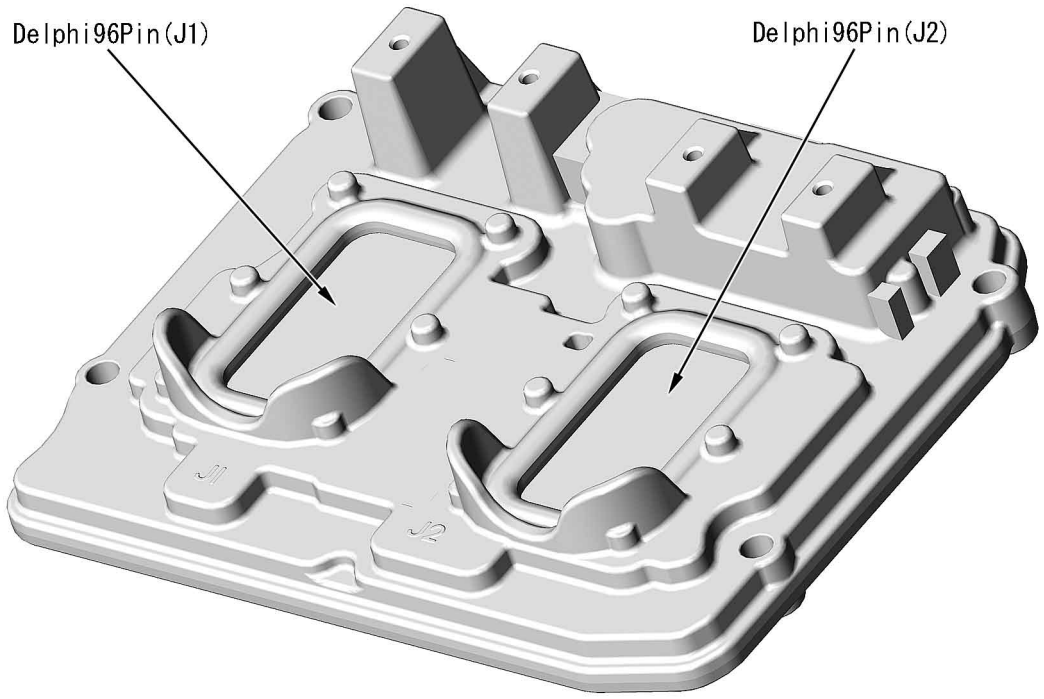


Pilot Lamps Shown on Machine Monitor

<table>
<tr><th>Gauge</th><th>Item to be displayed</th><th colspan="3">Range and method for display</th><th>Remarks</th></tr>
<tr><td rowspan="6"> 
9JC01177</td><td rowspan="6">Preheating</td><td>Automatic preheating</td><td colspan="2">• Operates automatically when temperature is low. (The lamp is lit for approximately 40 seconds at maximum.)
• Goes out after engine is started.</td><td rowspan="6">Displays the operation state of preheating.</td></tr>
<tr><td rowspan="5">Automatic preheating</td><td>Elapsed time after turning starting switch to HEAT (preheat)</td><td>Monitor display</td></tr>
<tr><td>0 to 30 seconds</td><td>Lit</td></tr>
<tr><td>30 to 40 seconds</td><td>Flashing</td></tr>
<tr><td>40 seconds or longer</td><td>Not lit</td></tr>
<tr><td></td></tr>
<tr><td> 
9JC01436</td><td>Work equipment automatic lock</td><td colspan="3">Lights up: Lock position
Flashes: When it is necessary to lock
Not lit: FREE position</td><td>Indicates the work equipment lock lever state</td></tr>
<tr><td> 
9JC01437</td><td>PARKING BRAKE</td><td colspan="3">Lights up: Lock position
Flashes: When it is necessary to lock
Not lit: FREE position</td><td>Indicates the parking brake lever state</td></tr>
<tr><td> 
9JC01175</td><td>Air conditioner</td><td colspan="3">Lit: ON
Not lit: OFF</td><td>Indicates the air conditioner and blower operating state</td></tr>
<tr><td> 
9JC01181</td><td>Seat belt is not fastened.</td><td colspan="3">Lit: Not fastened
Not lit: Fastened</td><td>Displays whether seat belt is fastened.</td></tr>
<tr><td> 
9JC01182</td><td>Engine stop</td><td colspan="3">Lit: When engine is stopped
Not lit: When engine is running</td><td>Displays the operation state of engine.</td></tr>
<tr><td> 
9JC01438</td><td>In fan rotating in reverse</td><td colspan="3">Lit: Cooling fan reverse rotation
Not lit: Cooling fan normal rotation</td><td>Indicates the rotating state of cooling fan.</td></tr>
<tr><td> 
9JC01183</td><td>Aftertreatment devices regeneration</td><td colspan="3">Lit: When the aftertreatment devices regeneration is in progress
Not lit: Aftertreatment devices regeneration has been completed.</td><td>Indicates the regeneration state of aftertreatment devices.</td></tr>
</table>

Structure of Engine Controller -B

General View



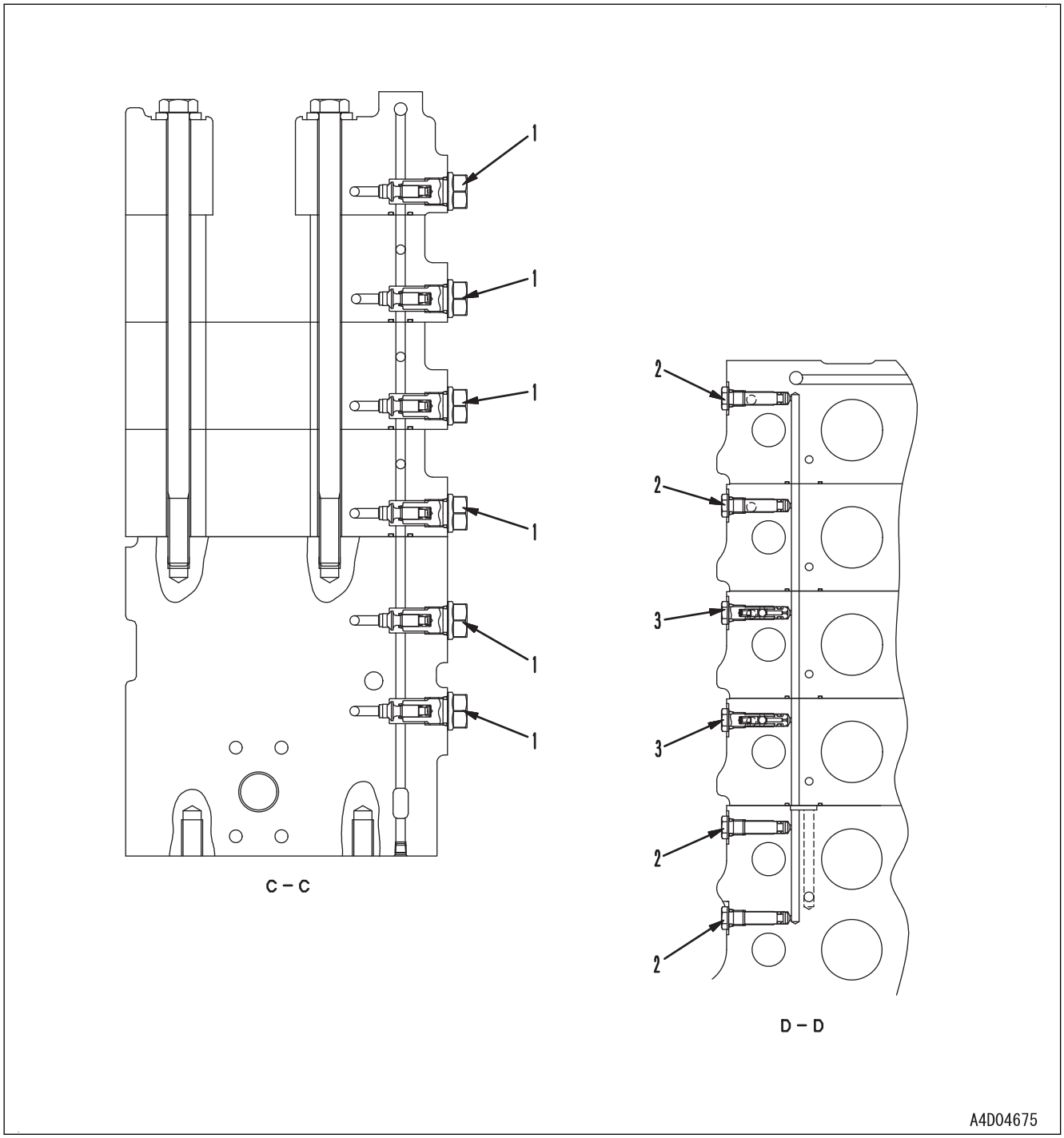
Function of Engine Controller -B

- Engine controller is employed, which was developed in cooperation between Komatsu and Cummins.
- The engine controller calculates the input signals from sensors installed to various portions, and outputs them to control the engine properly.
- The engine controller commonly possesses the information of other controllers mounted on the machine through the network (CAN) and controls the engine and machine properly.
- Since the engine controller is mounted on the engine, its field serviceability is improved.
- It is mounted through rubber vibration isolators to reduce the vibration transmitted to it.

Sectional View (2/4)

REMARK

The figure below shows the 6-spool valve (dual tilt specification).



1: LS check valve

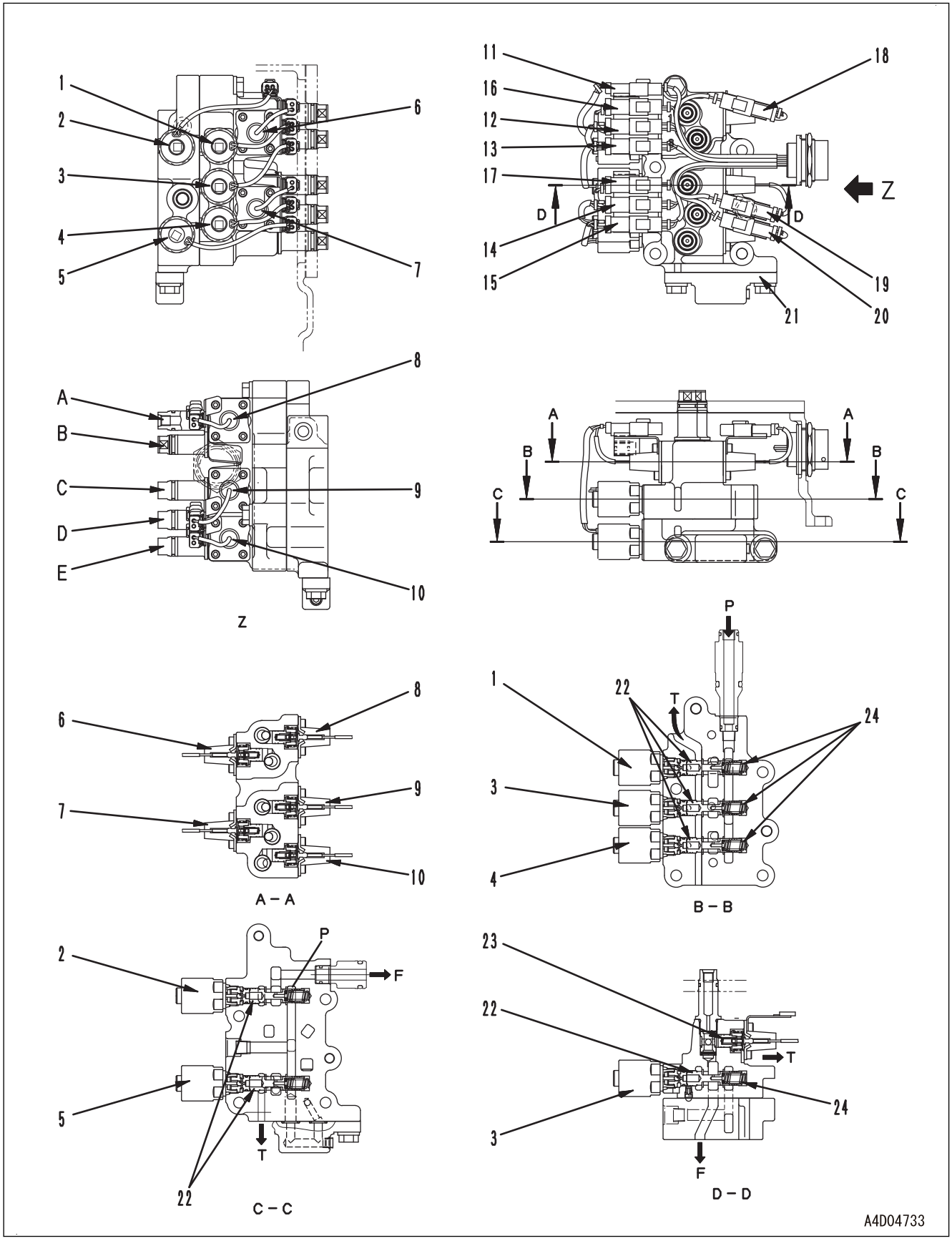
2: Preset plug

3: Preset check valve

Function of Power Train Mount

The mounts are installed at 2 places in the front section and at 2 places in the rear section to secure the main frame and power train.

General View



A: 1st clutch oil pressure pickup port

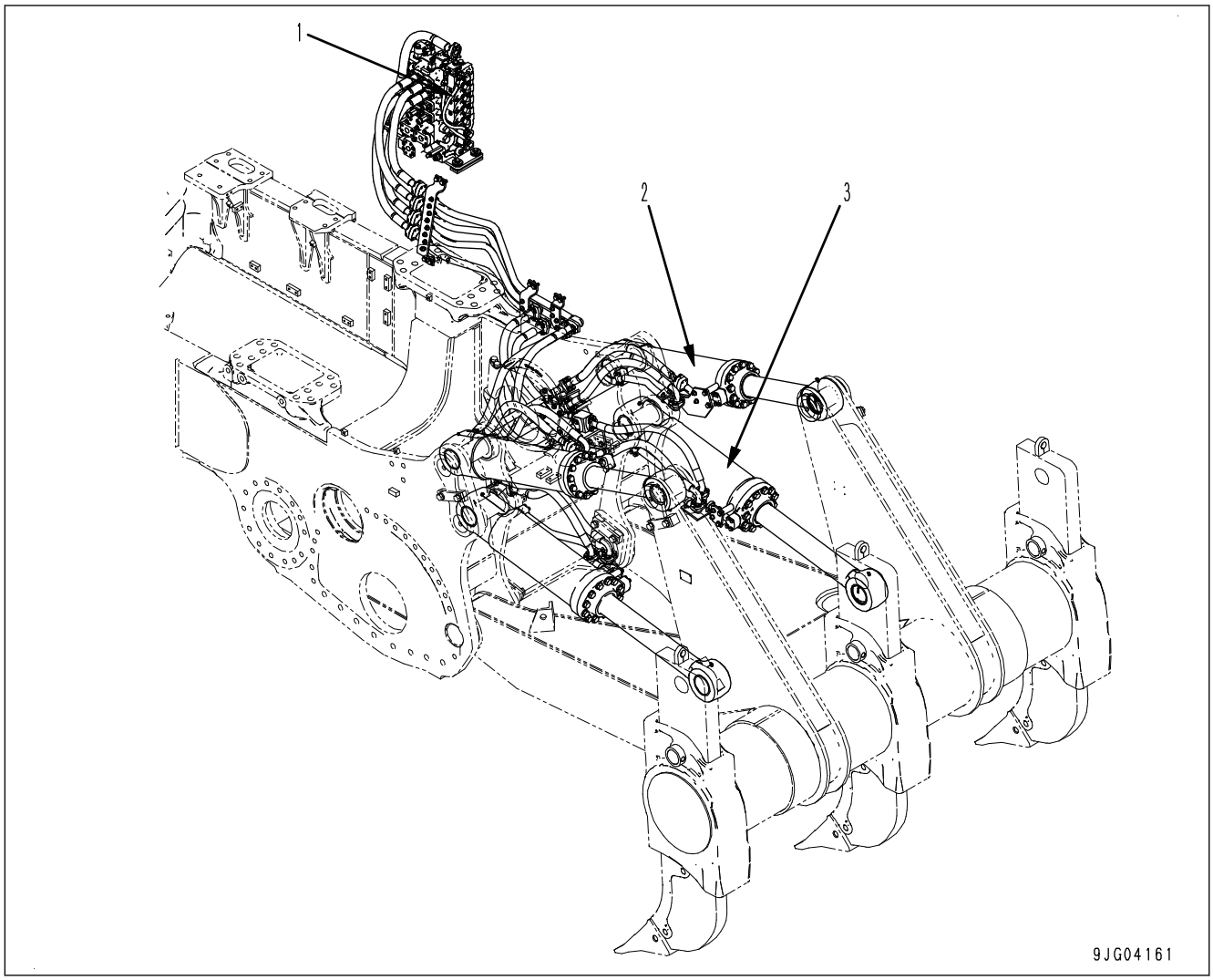
B: 3rd clutch oil pressure pickup port

C: R clutch oil pressure pickup port

D: 2nd clutch oil pressure pickup port

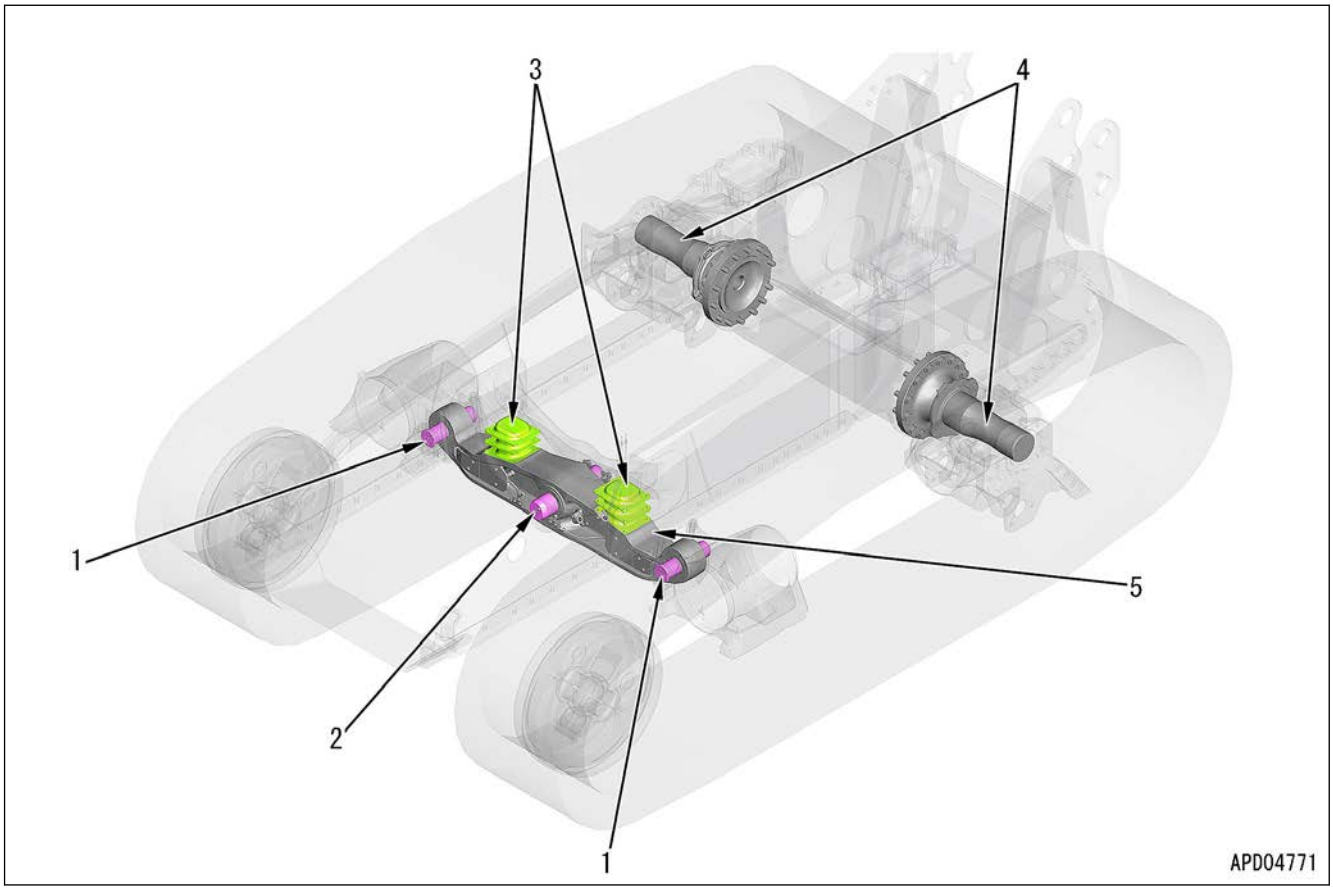
Layout Drawing of Variable Multi-Shank Ripper

Dual Tilt specification



1: Control valve
2: Ripper tilt cylinder
3: Ripper lift cylinder

Function of Suspension



Track frame moves the front portion up and down around the rear end pivot shafts (4). Equalizer bar (5) rocks around the center pin (2). It is connected to the right and left track frames with side pins (4). Shoulder pad (3) is installed so that the impact caused by machine rocking is relieved.

Machine model				D375A-8	
Engine				SAA6D170E-7	
Item	Measurement condition		Unit	Standard value for new machine	Repair limit
Steering L.H. clutch pressure (LC)	• Engine coolant temperature60 to 100 °C • Power train oil temperature70 to 120 °C • Hydraulic oil temperature45 to 100 °C • Operating Mode: P (Power mode) • Parking brake lever: FREE position • Joystick (steering, directional and gear shift lever) (PCCS lever): LEFT stroke end	Fuel control dial: MAX (High idle)	MPa {kgf/cm^2}	2.55 to 2.87 {26.0 to 29.3 }	2.40 to 3.07 {24.4 to 31.3 }
		Fuel control dial: MIN (Low idle)		2.25 to 2.84 {23.0 to 29.0 }	2.20 to 3.04 {22.4 to 31.0 }
	• Engine coolant temperature60 to 100 °C • Power train oil temperature70 to 120 °C • Hydraulic oil temperature45 to 100 °C • Operating Mode: P (Power mode) • Parking brake lever: FREE position • Joystick (steering, directional, and gear shift lever) (PCCS lever): NEUTRAL	Fuel control dial: MAX (High idle)		0 to 0.1 {0 to 1 }	0 to 0.1 {0 to 1 }
		Fuel control dial: MIN (Low idle)		0 to 0.1 {0 to 1 }	0 to 0.1 {0 to 1 }
Torque converter inlet pressure (IN) (*1)	• Engine coolant temperature60 to 100 °C • Power train oil temperature: 70 to 120 °C • Hydraulic oil temperature45 to 100 °C • Operating Mode: P (Power mode) • Joystick (steering, directional, and gear shift lever) (PCCS lever): NEUTRAL	Fuel control dial: MAX (High idle)	MPa {kgf/cm^2}	0.69 to 1.05 {7.0 to 10.7 }	0.69 to 1.05 {7.0 to 10.7 }
		Fuel control dial: MIN (Low idle)		0.03 to 0.25 {0.3 to 2.5 }	0.03 to 0.25 {0.3 to 2.5 }

Examine Boost Pressure

Tools to Examine Boost Pressure

Symbol		Part No.	Part name	Q'ty	Remarks
A	-	799-201-2202	Boost gauge kit	1	
	1	799-401-2311	Gauge	1	Pressure range-101 to 199.5 kPa
	2	799-101-5160	Nipple	1	Size: R1/8
B	-	799-401-2301	Pm kit	1	
	1	790-261-1130	Coupling	1	

⚠ Place the machine on a level ground, lower the work equipment completely to the ground, and stop the engine. Set the parking brake lever and work equipment lock lever to LOCK position.

⚠ Parts and oil are still very hot immediately after the engine is stopped. It may cause burn injury. Wait for the temperature to go down, and then start the work.

Check this item under the following conditions.

- Engine coolant temperature60 to 100 °C
- Power train oil temperature70 to 120 °C
- Hydraulic oil temperature45 to 100 °C

For testing the boost pressure to perform troubleshooting, refer to this section.

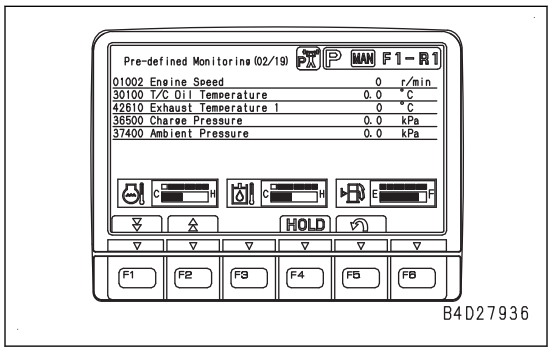
How to Examine Boost Pressure on Machine Monitor

1. Start the engine.
2. Raise the coolant temperature and each oil temperature so that it is within the specified range.
3. Select “Pre-defined Monitoring” (02/19) or the following monitoring items to display it by referring to “Set and Operate Machine Monitor”.

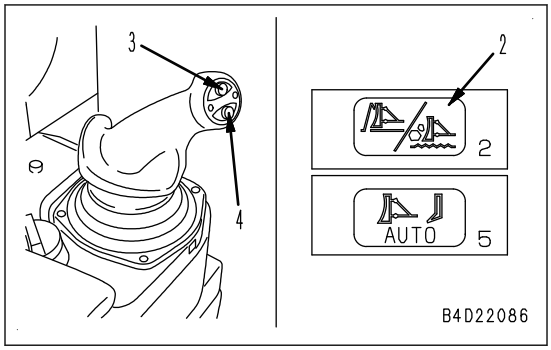
   Monitoring code: 37400 “Ambient Pressure”

   Monitoring code: 36500 “Charge Pressure”

   Monitoring code: 30100 “T/C Oil Temperature”
4. Turn the fuel control dial to MIN (Low idle) position.



5. Set the preset (moving-off gear speed) to “F3-R3” with up switch (3) or down switch (4) of the joystick (steering, directional and gear shift lever) (PCCS lever).
6. Set joystick (steering, directional and gear shift lever) (PCCS lever) directional selection in REVERSE position with the brake pedal depressed securely and the parking brake lever in FREE position.
7. Set the gear speed to “R3” with up switch of the joystick (steering, directional and gear shift lever) (PCCS lever) with the brake pedal depressed securely.



REMARK

Hold the steering of the joystick (steering, directional and gear shift lever) (PCCS lever) in NEUTRAL.

Check that “R3” is displayed in the gear speed display (at the right upper of the screen).

8. Depress the decelerator pedal and set the fuel control dial at MAX (High idle) position.
9. Return the decelerator pedal slowly, perform the torque converter stall.

Bleed Air from Fuel System

⚠ **Place the machine on a level ground, lower the work equipment completely to the ground, and stop the engine. Set the parking brake lever and work equipment lock lever to LOCK position.**

⚠ **Clean the engine and the parts around it, and degrease them in advance so that you can easily find the leakage if any.**

⚠ **Very high pressure is generated in the high-pressure circuit of the fuel system. If fuel leaks while the engine is running, it presents a serious danger that could result in a fire.**

⚠ **Parts and oil are still very hot immediately after the engine is stopped. It may cause burn injury. Wait for the temperature to go down, and then start the work.**

⚠ **Do not loosen the air bleeding plug while the fuel feed pump is in operation since the pressure is applied to the fuel circuit and the fuel may spurt out.**

⚠ **When the fuel circuit is tested or any component is removed from or installed to it, check for fuel leakage according to the following procedure.**

For bleeding air to perform troubleshooting, refer to this section.

How to Bleed Air from Fuel System

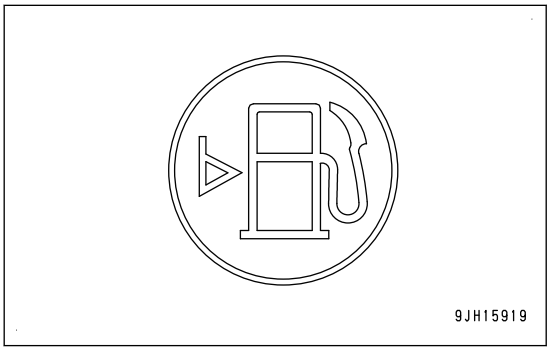
Bleed air according to this procedure in the following cases.

- When the fuel filter has been replaced
- When the fuel has run out
- When starting the engine for the first time after the fuel piping or supply pump was replaced.

1. Turn the starting switch to ON position and check that the fuel level caution lamp is lit in blue.

   REMARK

   If the fuel level caution lamp is lit in any color other than blue, the fuel level is low. In this case, add fuel.

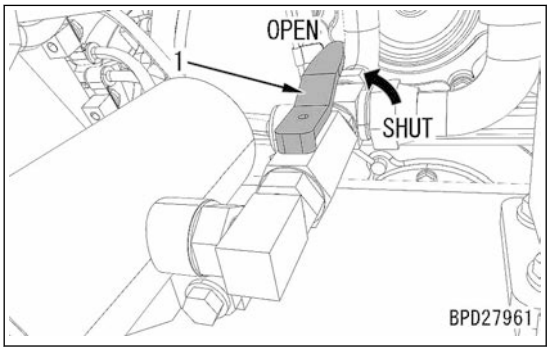


2. Turn the starting switch to OFF position.

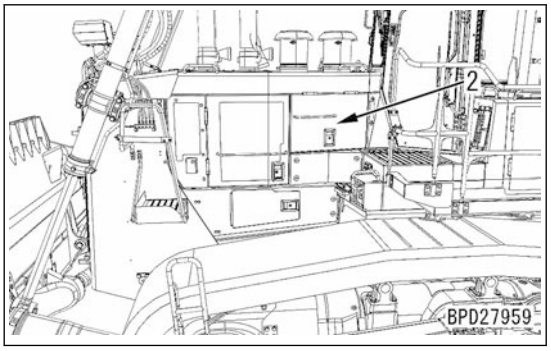
3. Check that fuel supply valve (1) at the bottom of the fuel tank is opened.

   REMARK

   When the fuel supply valve (1) is opened, its lever is in OPEN position as shown in the figure.



4. Open the cover (2).

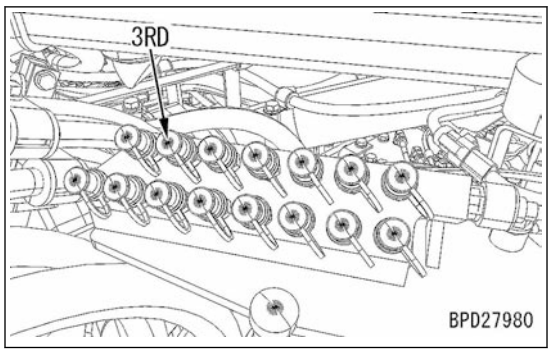


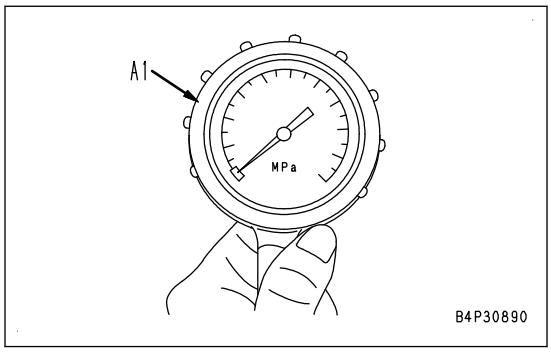
2. Connect the gauge A1 of hydraulic tester A to oil pressure pickup port 3RD nipple.

   REMARK

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

3. Start the engine and set the parking brake lever in FREE position.

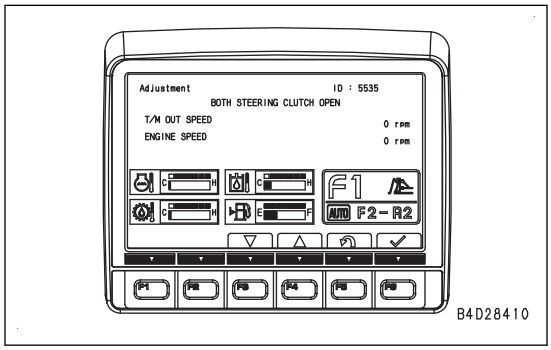




4. Display the screen of Adjustment ID “5535”. For details, see “Set and Operate Machine Monitor”.

   Adjustment ID: 5535 “Both Steering Clutch Release Mode”

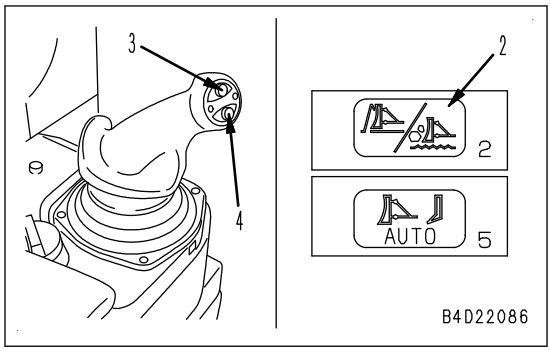
5. Set the operating mode to P (“Power Mode”).



6. Set the gear shift mode and preset as follows with the gear shift mode selector switch (2), UP switch (3), or DOWN switch (4).

   Gear shift mode: Manual gear shift

   Preset: “F2 - R2”



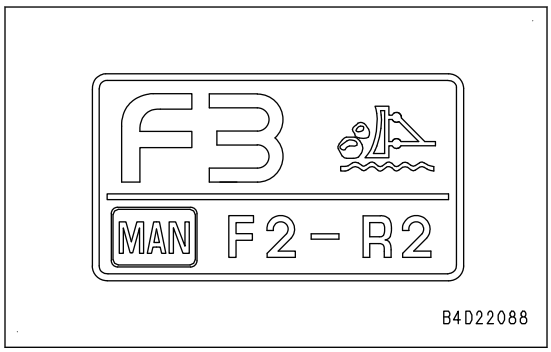
7. With the brake pedal depressed, set the joystick (steering, directional and gear shift lever) (PCCS lever) travel direction to FORWARD and shift up the gear to the 3rd speed.

   REMARK

   Hold the steering of the joystick (steering, directional and gear shift lever) (PCCS lever) in NEUTRAL.

   Check that “F3” is displayed in the gear speed display section.

8. Test the transmission 3rd clutch pressure of the time when the fuel control dial is at MIN (Low idle) position.



Examine Cooling Fan Speed

⚠ Place the machine on a level ground, lower the work equipment completely to the ground, and stop the engine. Set the parking brake lever and work equipment lock lever to LOCK position.

Check this item under the following conditions.

Hydraulic oil temperature: 45 to 100 °C

For testing the cooling fan speed to perform troubleshooting, refer to this section.

How to Examine Cooling Fan Speed

1. Turn the fuel control dial to MIN (Low idle) position, and start the engine.
2. Warm up the machine sufficiently and keep the hydraulic oil temperature in the specified range.

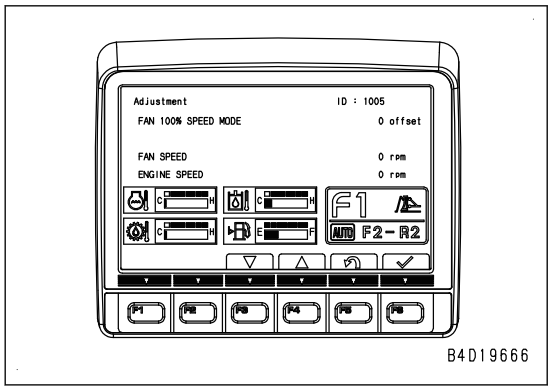
   REMARK

   The cooling fan speed varies if the hydraulic oil temperature is 40 °C or lower.
3. Display the screen of Adjustment ID “1005”. For details, see “Set and Operate Machine Monitor”.

   Adjustment ID: 1005 “Fan 100% Mode”

   REMARK

   - Once the “Fan 100 % mode” screen appears, the function is enabled. Cooling fan speed is controlled to approximately 100 % of the maximum speed.
   - Pressing F5 returns the screen to “Input ID” screen, and disables “Fan 100 % mode”.

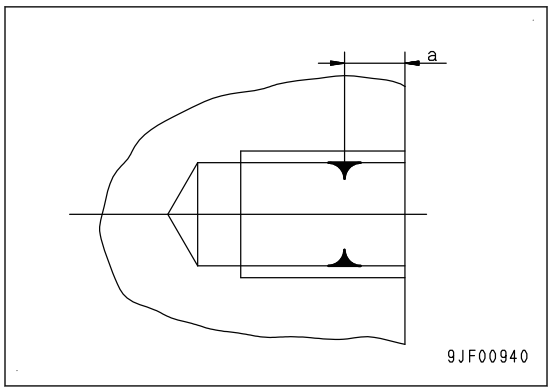


4. Test the fan speed of the time when the fuel control dial is at MAX (High idle) position.

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

15. Apply a drop of Loctite (No.648) (approximately 0.02 g) on the 2 positions at the dimension (a) away from the threaded part of the body end surface.

    Dimension (a): 5 to 7 mm

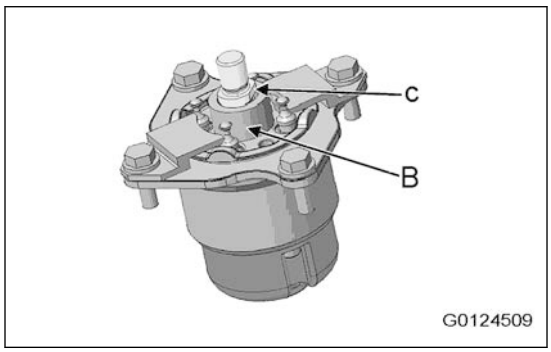


16. Install the new universal joint (1) (grease is removed in step 14) with its male threads (c) (width across flats: 17mm) and female threads of the body.

    Male threads:
    39.2 to 49 Nm {4 to 5 kgfm}

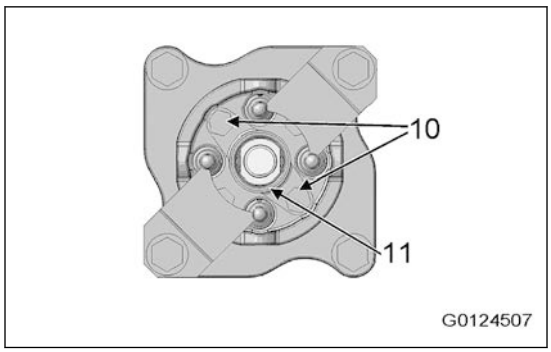
    REMARK

    - If the tool is not engaged to the male threads (c) (width across flats: 17mm) of the universal joint (1) fully, the width across flats can be deformed. Handle it carefully.
    - You can do the work easily with the crowfoot wrench (E).
    - You can apply the torque easily with the universal joint bending prevention tool (B). It also prevents the damage to the rod (6).



17. Remove the universal joint bending prevention tool (B).
18. Install the grease pocket (11) with the 2 bolts (10).

    Bolt (10):
    11.8 to 14.7 Nm {1.2 to 1.5 kgfm}



Code No.	Self-define Monitoring items (screen display)		Unit (Default: SI)			Applicable component	Remarks
			SI	Metric	Imperial		
40912	P/T Controller SW Input 2	R Signal	ON/OFF	ON/OFF	ON/OFF	P/T	
		C Signal	ON/OFF	ON/OFF	ON/OFF	P/T	
40984	P/T Controller SW Input 3	Brake Pedal SW NC	ON/OFF	ON/OFF	ON/OFF	P/T	
		Brake Pedal SW NO	ON/OFF	ON/OFF	ON/OFF	P/T	
31622	T/M Forward Clutch ECMV Current		mA	mA	mA	P/T	
31616	T/M Reverse Clutch ECMV Current		mA	mA	mA	P/T	
31612	T/M 1st Clutch ECMV Current		mA	mA	mA	P/T	
31613	T/M 2nd Clutch ECMV Current		mA	mA	mA	P/T	
31614	T/M 3rd Clutch ECMV Current		mA	mA	mA	P/T	
31642	Lockup ECMV Current		mA	mA	mA	P/T	
90700	S/T Clutch ECMV Current		mA	mA	mA	P/T	
90600	Left S/T Clutch ECMV Current		mA	mA	mA	P/T	
90601	Right S/T Clutch ECMV Current		mA	mA	mA	P/T	
31619	Left Brake ECMV Current		mA	mA	mA	P/T	
31618	Right Brake ECMV Current		mA	mA	mA	P/T	
31628	Sudden Stop Prevention Valve Cur		mA	mA	mA	P/T	
40909	P/T Controller SW Output	Backup Alarm	-	-	-	P/T	
		Neutral Safety	-	-	-	P/T	
		Fan Reverse Solenoid	-	-	-	P/T	
		Preheater	-	-	-	P/T	
40001	Theoretical Travel Speed		km/h	km/h	mile/h	P/T	
60000	Theoretical Traction		W	W	W	P/T	
20244	KomVision Controller Ass'y P/N		-	-	-	W/E	
20245	W/E Controller Program P/N		-	-	-	W/E	
20405	W/E Controller S/N		-	-	-	W/E	
20299	W/E Controller App Version		-	-	-	W/E	
20497	W/E Controller Data Version		-	-	-	W/E	
70700	Hydraulic Oil Pump Pressure 1		MPa	kg/cm2	psi	W/E	
70701	Hyd Oil Pump Pressure Sens Volt		mV	mV	mV	W/E	
04401	Hydraulic Oil Temperature		°C	°C	°F	W/E	
04402	Hydraulic Oil Temp Sensor Volt		V	V	V	W/E	
73400	Blade Lift Lever Potentio 1 Volt		mV	mV	mV	W/E	
73401	Blade Lift Lever Potentio 2 Volt		mV	mV	mV	W/E	
73500	Blade Tilt Lever Potentio 1 Volt		mV	mV	mV	W/E	
73501	Blade Tilt Lever Potentio 2 Volt		mV	mV	mV	W/E	
73700	Ripper Lift Lever Potentio1 Volt		mV	mV	mV	W/E	
73701	Ripper Lift Lever Potentio2 Volt		mV	mV	mV	W/E	
10000	Fan Speed Command		r/min	rpm	rpm	P/T	

*1: Shut down of engine controller will be completed when system operating lamp goes out approximately in one minute after the starting switch is turned to OFF position.

Testing Menu (Reset Number of Abrupt Engine Stop by AIS)

Testing menu is used to check the machine or reset the settings of the machine monitor.

Auto-idle stop is not performed at the high engine speed on this machine. Auto-idle stop is gradually performed since the engine speed is lowered once before the engine stops. Accordingly, “Reset Number of Abrupt Engine Stop by AIS” is displayed, but it does not need to be performed.

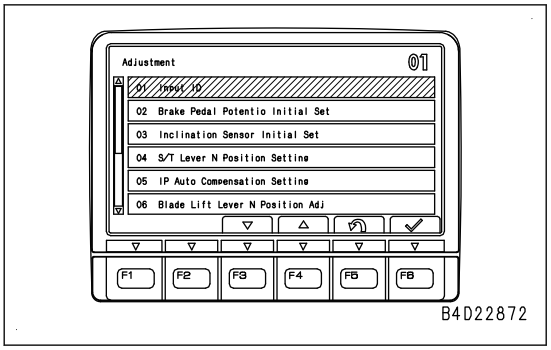
2. On “Adjustment” menu, select “Input ID” to be set.

   F3: Moves the selection downward.

   F4: Moves the selection upward.

   F5: Cancels the adjustment and returns the screen to “Service Menu” screen.

   F6: Enters the selection and moves the screen to the next “Adjustment” screen.



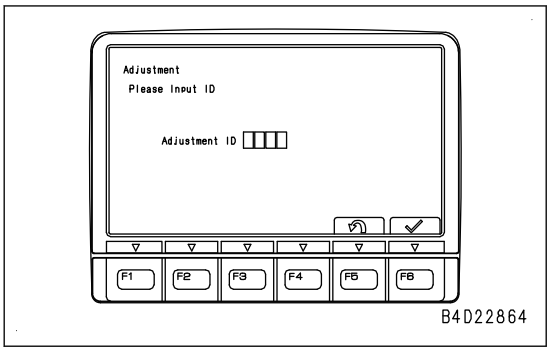
3. On “Input ID” screen, directly input Adjustment ID “1013” with the numeral input switches.

   F5: Returns the screen to “Adjustment” screen.

   F6: Enters input Adjustment ID.

   REMARK

   - For details of Adjustment ID and adjustment items, see “Adjustment Item Table”.
   - When the input Adjustment ID is incorrect, “Incorrect ID” appears, and the screen next to “Input ID” does not appear (you can input Adjustment ID again when this screen is displayed).



4. On “Adjustment” screen, perform adjustment of “S/T Lever Left Full Set” with function switches.

   F3: Not used.

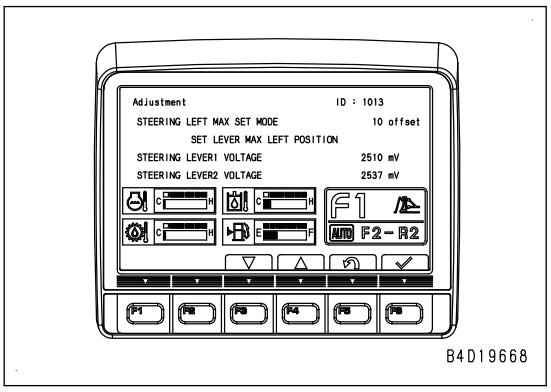
   F4: Not used.

   F5: Returns the screen to “Input ID” screen.

   F6: Saves the adjustment value.

   1) Hold the steering side of the joystick (steering, directional and gear shift lever) (PCCS lever) at the left maximum position (stroke end).

   2) Press F6, and check that warning buzzer sounds.



   REMARK

   - By performing this adjustment, the saved compensation values are effective even while the starting switch is turned to OFF position.
   - By “S/T Lever LEFT Full Set”, the steering performance is not adjusted.

Adjustment ID: 1014 (S/T Lever Right Full Set)

By “S/T Lever RIGHT Full Set”, the power train controller recognizes the right maximum position of the steering potentiometer of the joystick (steering, directional and gear shift lever) (PCCS lever).

Perform this adjustment always when the power train controller, or joystick (steering, directional and gear shift lever) (PCCS lever) has been replaced.

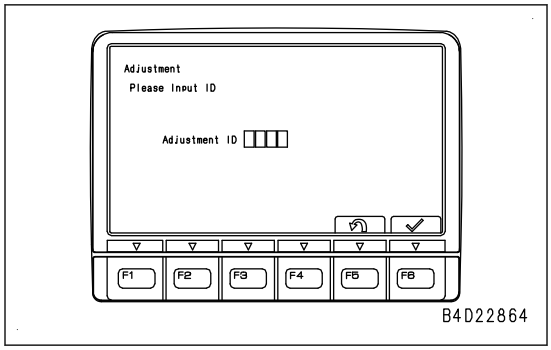
3. On “Input ID” screen, directly input Adjustment ID “8025” with the numeral input switches.

   F5: Returns the screen to “Adjustment” screen.

   F6: Enters input Adjustment ID.

   REMARK

   - For details of Adjustment ID and adjustment items, see “Adjustment Item Table”.
   - When the input Adjustment ID is incorrect, “Incorrect ID” appears, and the screen next to “Input ID” does not appear (you can input Adjustment ID again when this screen is displayed).



4. On “Adjustment” screen, perform adjustment of “Blade Tilt RIGHT Current Value Correction” with function switches.

   F3: Decreases the adjustment value “Current Offset”.

   F4: Increases the adjustment value “Current Offset”.

   F5: Returns the screen to “Input ID” screen.

   F6: Saves the adjustment value.

   1) Press F3 or F4 to increase or decrease the adjustment value.

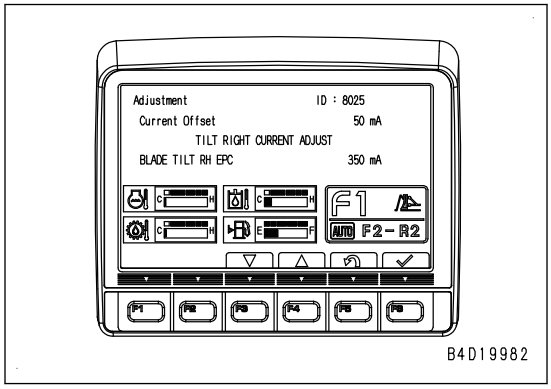
      REMARK

      If the value has already been adjusted, the adjusted value is displayed. You can adjust the value as many times as desired.

   2) Press F6, and check that warning buzzer sounds.

      REMARK

      - Blade operation during adjustment wok is not necessary. However, operate the blade tilt right after the adjustment, and check that there is no problem in the actual operation sensitivity.
      - By performing this adjustment, the saved compensation values are effective even while the starting switch is turned to OFF position.

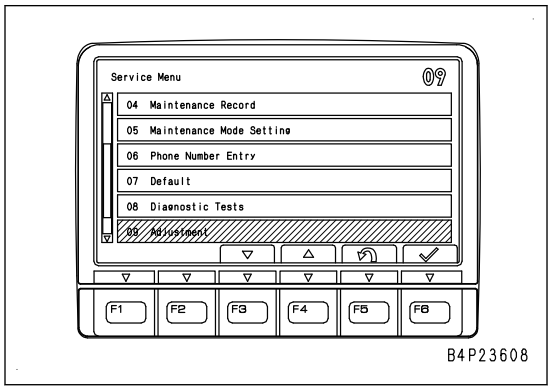


Adjustment ID: 9995 (Control Brake Release Mode)

“Control Brake Release Mode” opens the control brake (R.H. and L.H. brake ECMV) to check the operation of the backup brake (brake pedal solenoid valve).

Perform this adjustment as required when testing, adjusting, troubleshooting, etc.

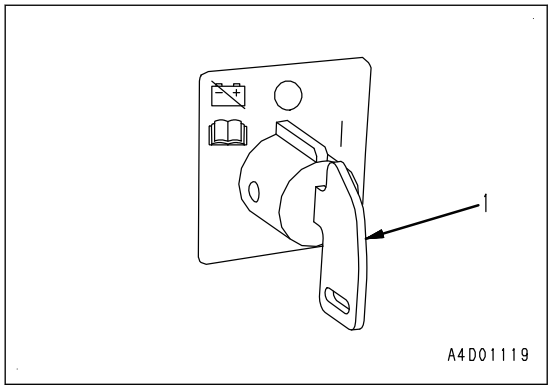
1. Select “Adjustment” on “Service Menu” screen.



Handle Battery Disconnect Switch

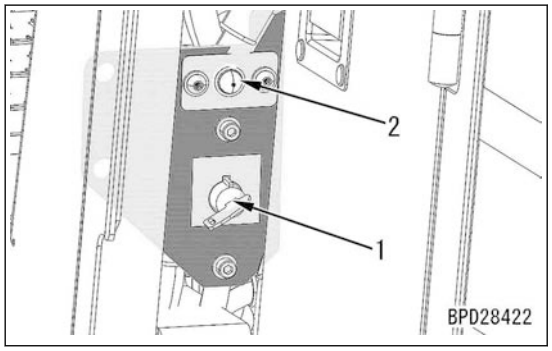
(O): OFF position

(I): ON position



- The battery disconnect switch (1) is a switch that is used for the same purpose as disconnecting the cable from the negative terminal of the battery. It is used in the following cases.
  - When storing the machine for a long period (1 month or longer)
  - When servicing or repairing the electrical system
  - When performing the electric welding
- When battery disconnect switch (1) is at OFF position, all the continuous power supplies for the components including the starting switch B terminal and controllers are all cut out. It is the same state as the time when the battery is not connected. Accordingly, none of the electrical systems of the machine operates.

⚠ If the battery disconnect switch (1) is carelessly turned to ON position by unauthorized person, it is extremely dangerous.



NOTICE

When turning the battery disconnect switch (1) to OFF position, always remove the key.

- The controllers are protected from abnormal disconnection which shuts off the battery power supply circuit even when the controllers are operating. Check that the system operating lamp (2) is not lit to see that no controller is in operation.
- Before shutting off the battery power supply circuit, turn the starting switch to OFF position, and check that system operating lamp (2) goes out, then turn the battery disconnect switch (1) to OFF position.
- Data loss may occur if the battery disconnect switch (1) is turned to OFF position (battery power supply circuit is shut off) while the system operating lamp (2) is lit. Do not operate the battery disconnect switch (1) while the system operating lamp (2) is lit.
- The system operating lamp (2) goes out in a maximum of six minutes after the starting switch is turned to OFF position.
- The system operating lamp (2) may sometimes light up while the starting switch is turned to OFF position because KOMTRAX terminal may maintain communication under this condition.
- Even if the system operating lamp (2) is not lit, it may seem to be slightly lit because of a very little current leakage inside the controller. This phenomenon does not indicate abnormality.
  - The KOMTRAX terminal maintains communication even if the starting switch is kept in OFF position, thus it repeats starting and stopping.
  - The start and stop cycle (sleep cycle) of KOMTRAX terminal varies with the factors such as the communication state and the time when the machine is not in operation. The lamp may be lit continuously for a maximum of approximately one hour.
- If the system operating lamp (2) stays lit when you want to cut off the battery circuit for maintenance, turn the starting switch to ON position first, then turn it to OFF position. The lamp goes out in the maximum of six minutes. Turn the battery disconnect switch (1) immediately to OFF position after the system operating lamp (2) goes out.

Operation table of machine during quick Pm

No.	Start	End	Time (sec)	Operation of machine							
				Operating condition	Transmission	Steering	Work equipment	Fuel control dial	Decelerator pedal	Brake pedal	Parking brake
1	0:00	0:40	40	Low idle	N	LH	N	LOW	Open	Open	Open
2	0:40	1:20	40	Low idle	N	RH	N	LOW	Open	Open	Open
3	1:20	2:00	40	High idle	N	N	N	HI	Open	Open	Open
4	2:00	2:40	40	• Slow deceleration • High idle	N	N	N	HI	Depress	Open	Open
5	2:40	3:10	30	• Work equipment relief • High idle	N	N	Ripper lift	HI	Open	Open	Open
6	3:10	3:40	30	• Work equipment relief • Low idle	N	N	Ripper lift	LOW	Open	Open	Open
7	3:40	4:20	40	• Torque converter stall (*1) • Low idle	N→F1→F2→F3→N→R1→R2→R3→N	N	N	LOW	Open	Depress	Open
8	4:20	5:30	70	• Torque converter stall (F3)(*1) • High idle (*2)	N→F3 ((F3) high idle after shifting)	N	N	HI	Depressing→(F3) Releasing after shifting	Depress	Open
9	5:30	6:00	30	High idle	N	N	N	HI	Open	Open	Open
10	6:00	7:00	60	• Torque converter stall + relief (*1) • High idle	N→F3 ((F3) high idle after shifting)	N	Ripper lift	HI	Depressing→(F3) Releasing after shifting	Depress	Open
11	7:00	7:30	30	High idle to low idle (*3)	N	N	N	HI to LOW	Open	Open	ON

Check that the hydraulic oil temperature is 45 °C or higher. Perform the Snapshot.

*1: Hold the torque converter stalled until the power train oil temperature becomes 118 °C. For torque converter stall, see “Examine Engine Speed”, “TEST TORQUE CONVERTER STALL ENGIN SPEED”.

*2: Fully depress the brake pedal, shift the upshift switch to (F3), and run the engine at high idle.

*3: Keep running the engine at low idle until the oil temperature goes back to normal.

10. Check the seat belt and mounting hardware.

    Check the seat belt and mounting hardware for any abnormality. If any damage is found, ask your Komatsu distributor to replace it with new one.

11. Check and clean of rearview camera. (if equipped)

    Check the rearview camera for any abnormality. If any problem is found, ask your Komatsu distributor for repair.

12. Remove dirt from around the aftertreatment devices.

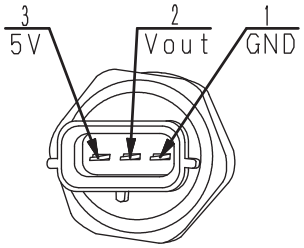
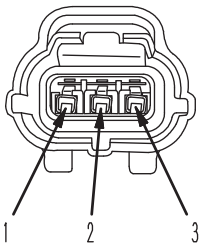
    Check the space around the aftertreatment devices for accumulated dirt and combustible materials (dry leaves and twigs). If any dirt or combustible materials are found, remove them.

13. Check around the aftertreatment devices for exhaust gas leakage.

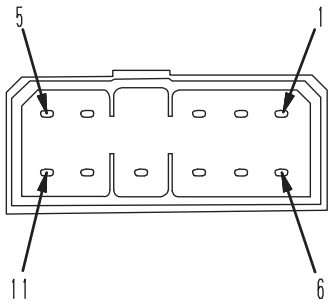
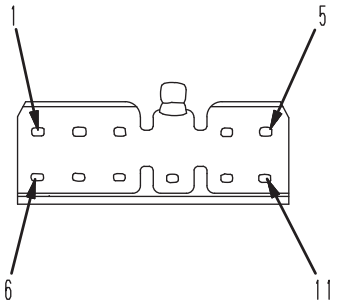
    Check the pipe connecting KDPF to turbocharger and also KDPF connection for leakage of exhaust gas (and deposition of soot). If any problem is found, ask your Komatsu distributor for repair.

Common rail pressure sensor	R2: Between (3) and (1)		R2': Between (82) and (58) (*)	
	R1: Between (1) (+) and (2) (-)		R1': Between (58) (+) and (42) (-)	

AMP/EJ2 connetor

No. of pins	Oil pressure sensor		
	Sensor side (plue)	Harness side (receptacle)	Testing connection use special tool Part No.
3			799-601-9420 (T-adapter) (kit:799-601 -4101) (kit:799-601 -4201)
	—	—	

YAZAKI connector

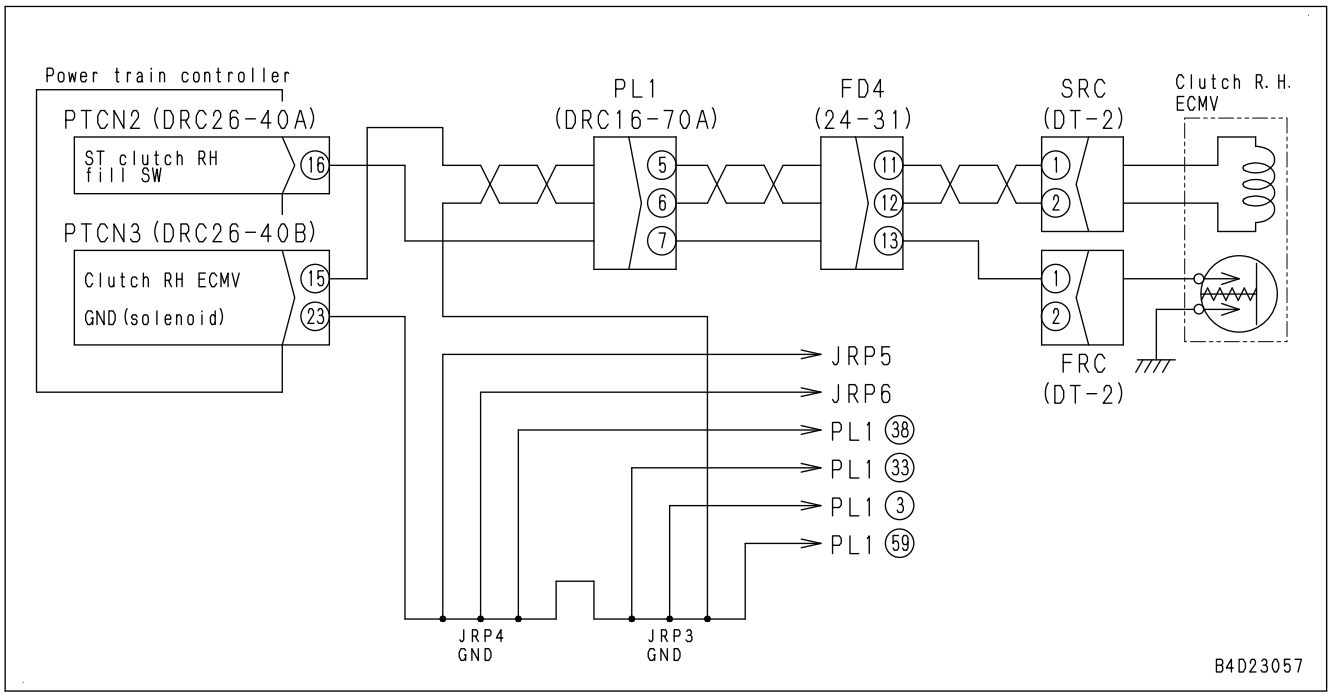
No. of pins	WIPER INTERMITTENT UNIT		
	Male pin (female housing)	Female pin (male housing)	
11			—
	—	—	

B4D18200

Part No.	Part name	Number of pins	ID marking	T-adapter kit													Non-kit part
				799-601-2500	799-601-2700	799-601-2800	799-601-7000	799-601-7100	799-601-7400	799-601-7500	799-601-8000	799-601-9000	799-601-9100	799-601-9200	799-601-9300	799-601-4101	799-601-4201	
799-601-9420	Adapter for engine (CRI-T2) Adapter PFUEL for engine (CRI-T3) Oil pressure sensor	3	A3													●	●	
799-601-9430*	Socket for engine (CRI-T2) Socket PCV for engine (CRI-T3)	2	P													●	●	
799-601-9440*	Socket for engine (CRI-T2)	3	1, 2, 3															●
795-799-5520*	Socket for engine (HPI-T2)	2	S															●
795-799-5530*	Socket for engine (HPI-T2) Socket for engine (CRI-T3) Temperature sensor	2	C													●	●	
795-799-5540*	Socket for engine (HPI-T2) Socket TIM for engine (CRI-T3)	2	A													●	●	
795-799-5460	Cable for engine (HPI-T2)	3																●
795-799-5470	Cable for engine (HPI-T2)	3																●
795-799-5480	Cable for engine (HPI-T2)	3																●
799-601-4110	Adapter PIM for engine (140-T3)	4	ITT3N													●	●	
799-601-4130	Adapter NE, CAM for engine (CRI-T3)	3	FCIN													●	●	
799-601-4140	Adapter for engine (CRI-T3) Ambient pressure	3	FCIG													●	●	
799-601-4150	Adapter POIL for engine (CRI-T3)	3	FCIB													●	●	
799-601-4160	Adapter for engine (CRI-T3) Oil pressure switch	2	4160													●	●	
799-601-4180	Adapter PEVA for engine (CRI-T3)	3	4180													●	●	
799-601-4190*	Socket for engine (CRI-T3) Common rail pressure	3	1, 2, 3L													●	●	
799-601-4230*	Socket for engine (CRI-T3) Intake pressure/temperature	4	1, 2, 3, 4C													●	●	
799-601-4240*	Socket PAMB for engine (CRI-T3)	3	1, 2, 3A													●	●	
799-601-4250*	Socket PIM for engine (CRI-T3)	3	1, 2, 3B													●	●	
799-601-4330*	Socket G for engine (CRI-T3)	3	1, 2, 3G													●	●	

Failure code	Failure (Displayed on screen)	Applicable component	Action level	Category of history	Remarks
DWNYKA	Ladder Clamp Close Solenoid Open Circuit	OPT	L01	Electrical system	
DWNYKB	Ladder Clamp Close Solenoid Short circuit	OPT	L01	Electrical system	
DXH1KA	Lockup Clutch ECMV Solenoid Open Circuit	PT	L03	Electrical system	
DXH1KB	Lockup Clutch ECMV Solenoid Short Circuit	PT	L03	Electrical system	
DXH1KY	Lockup Clutch ECMV Solenoid Hot Short Circuit	PT	L03	Electrical system	
DXH4KA	T/M 1st Clutch ECMV Solenoid Open Circuit	PT	L03	Electrical system	
DXH4KB	T/M 1st Clutch ECMV Solenoid Short Circuit	PT	L03	Electrical system	
DXH4KY	T/M 1st Clutch ECMV Solenoid Hot Short Circuit	PT	L03	Electrical system	
DXH5KA	T/M 2nd Clutch ECMV Solenoid Open Circuit	PT	L03	Electrical system	
DXH5KB	T/M 2nd Clutch ECMV Solenoid Short Circuit	PT	L03	Electrical system	
DXH5KY	T/M 2nd Clutch ECMV Solenoid Hot Short Circuit	PT	L03	Electrical system	
DXH6KA	T/M 3rd Clutch ECMV Solenoid Open Circuit	PT	L03	Electrical system	
DXH6KB	T/M 3rd Clutch ECMV Solenoid Short Circuit	PT	L03	Electrical system	
DXH6KY	T/M 3rd Clutch ECMV Solenoid Hot Short Circuit	PT	L03	Electrical system	
DXH7KA	T/M Reverse Clutch ECMV Solenoid Open Circuit	PT	L03	Electrical system	
DXH7KB	T/M Reverse Clutch ECMV Solenoid Short Circuit	PT	L03	Electrical system	
DXH7KY	T/M Reverse Clutch ECMV Solenoid Hot Short Circuit	PT	L04	Electrical system	
DXH8KA	T/M Forward Clutch ECMV Solenoid Open Circuit	PT	L03	Electrical system	
DXH8KB	T/M Forward Clutch ECMV Solenoid Short Circuit	PT	L03	Electrical system	
DXH8KY	T/M Forward Clutch ECMV Solenoid Hot Short Circuit	PT	L04	Electrical system	
DXH9KA	Right S/T Clutch ECMV Solenoid Open Circuit	PT	L03	Electrical system	
DXH9KB	Right S/T Clutch ECMV Solenoid Short Circuit	PT	L03	Electrical system	
DXH9KY	Right S/T Clutch ECMV Solenoid Hot Short Circuit	PT	L04	Electrical system	

Circuit Diagram of Right Clutch ECMV



Failure Code [8590KY]

Action level	Failure code	Failure	R/C Mode Change SW 1(CAB) or 2(GND):Hot Short Circuit (Optional controller system)
L03	8590KY		
Detail of failure	Hot short circuit is detected in the circuit of the radio control/on-board mode selector switch.		
Action of controller	Retains in the last mode.		
Phenomenon on machine	• The mode selection does not work. • In the case of the radio control mode, the engine stops and enters the radio control mode standby state.		
Related information	• Input from radio control/on-board selector switch can be checked with monitoring function. (Code: 02709)		

No.	Cause	Procedure, measuring location, criteria and remarks			
1	Defective radio control/on-board selector switch (in CAB)	1. Turn the starting switch to OFF position. 2. Disconnect the connector RSW, and connect T-adapter to male side.			
		Resistance	Between RSW (male) (3) and (4)	Radio control/on-board selector switch (in CAB): Radio control operation	Min. 1 MΩ
				Radio control/on-board selector switch (in CAB): On-board operation	Max. 1 Ω
			Between RSW (male) (5) and (6)	Radio control/on-board selector switch (in CAB): Radio control operation	Max. 1 Ω
				Radio control/on-board selector switch (in CAB): On-board operation	Min. 1 MΩ
2	Defective radio control/on-board selector switch (ground side)	1. Turn the starting switch to OFF position.			
		Resistance	Between terminal RMS (1) and (2)	Radio control/on-board selector switch (ground side): Radio control operation	Min. 1 MΩ
				Radio control/on-board selector switch (ground side): On-board operation	Max. 1 Ω
			Between terminal RMS (3) and (4)	Radio control/on-board selector switch (ground side): Radio control operation	Max. 1 Ω
				Radio control/on-board selector switch (ground side): On-board operation	Min. 1 MΩ

Failure Code [AQ10N3]

Action level	Failure code	Failure	Manual Stationary Regeneration Request (KDOC Face Plugging) (Engine controller system)
L01	AQ10N3		
Detail of failure	The “Manual Stationary Regeneration Request” (KDOC) requires the user to perform “Manual Stationary Regeneration” to recover the efficiency effectively because the efficiency of KDOC (catalyst action) (The soot in KCSF does not burn normally because the KDOC inlet temperature in regeneration is normally 250 to 400 °C and the KDOC outlet temperature is normally 450 to 600 °C but the KDOC outlet temperature does not rise).		
Action of controller	Stops fuel dosing.		
Phenomenon on machine	• None		
Related information	⚠ **KDPF and KDOC are heated to 500 °C or higher. Be careful not to get burn injury.** • Temperature detected by KDOC inlet temperature sensor can be checked with monitoring function. (Code: 47300 and 47302) • Temperature detected by KDOC outlet temperature sensor can be checked with monitoring function. (Code: 47400 and 47402) • Temperature detected by KDPF outlet temperature sensor can be checked with monitoring function. (Code: 47200 and 47202) • To restart engine, wait until system operating lamp goes out after turning starting switch to OFF position, and then turn the starting switch to ON position. • All of KDOC inlet temperature, KDOC outlet temperature, and KDPF outlet temperature during idle (non-regeneration) are approximately 100 to 250 °C. Each temperature difference is approximately 10 °C (KDOC inlet temperature > KDOC outlet temperature > KDPF outlet temperature). • During Manual Stationary Regeneration, KDOC inlet temperature is approximately 250 to 400 °C, and both KDOC outlet temperature and KDPF outlet temperature are approximately 450 to 600 °C. • Since “KDOC Face Plugging” ([CA2637], [CB2637]) was repeatedly detected, it is requested the user with this failure code [AQ10N3] to perform “Manual Stationary Regeneration”. • Manual Stationary Regeneration (KDOC Face Plugging) does not perform fuel dosing to recover KDOC efficiently. All of KDOC inlet temperature, KDOC outlet temperature, and KDPF outlet temperature become approximately 250 to 400 °C. How to perform manual stationary regeneration 1. Start the engine. 2. From “Service Menu” of machine monitor, display “Diagnostic Tests” screen, open “02 Active Regeneration for Service”, and then perform “Manual Stationary Regeneration”. **REMARK** Time taken for manual stationary regeneration responding to Manual Stationary Regeneration Request (KDOC Face Plugging) is approximately 1.5 hours.		

No.	Cause	Procedure, measuring location, criteria and remarks
1	Defective engine controller	If this failure code is not cleared from the machine monitor for several hours after the manual stationary regeneration, engine controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.)

Failure Code [CA154]

Action level	Failure code	Failure	Charge Air Temperature Sensor Low Error (Engine controller system)
L03	CA154		
Detail of failure	Low voltage occurs in signal circuit of charge (boost) temperature sensor.		
Action of controller	• Takes it that charge temperature (boost temperature) is at fixed value (70 °C) for operation. • Closes EGR valve. • Engine power deration. • Stops regeneration control.		
Phenomenon on machine	• Engine startability becomes poor in low temperature. • Engine output is reduced.		
Related information	• Connectors of electrical parts around engine may be defective due to heat and vibration. See descriptions of wiring harness and connectors in “Electrical equipment” in “CHECKS BEFORE TROUBLESHOOTING” of “RELATED INFORMATION ON TROUBLESHOOTING”, and check it. • Signal voltage from charge temperature sensor (boost temperature sensor) can be checked by monitoring. (Code: 18501) • Temperature detected by charge temperature sensor (boost temperature sensor) can be checked by monitoring. (Code: 18500) • Engine power deration is canceled by turning the starting switch to OFF position after this failure code is cleared. • After completion of repair, check that the failure code is cleared by the following operation. Procedure: Turn the starting switch to ON position.		

No.	Cause	Procedure, measuring location, criteria and remarks			
1	Defective charge temperature sensor	1. Turn the starting switch to OFF position. 2. Disconnect connector TIM, and connect socket to male side **REMARK** Regard charge temperature sensor as normal if its resistance is 280 Ω to 382 kΩ			
		Resistance	Between TIM (male) (A) and (B) Charge thermal characteristics	-40 °C	291 to 382 kΩ
				-20 °C	85 to 109 kΩ
				0 °C	29 to 36 kΩ
				30 °C	7.3 to 8.8 kΩ
				60 °C	2.3 to 2.7 kΩ
				90 °C	860 to 970 Ω
				130 °C	280 to 320 Ω
			Between ground and TIM (male) (B)	All range	Min. 1 MΩ

Failure Code [CA331]

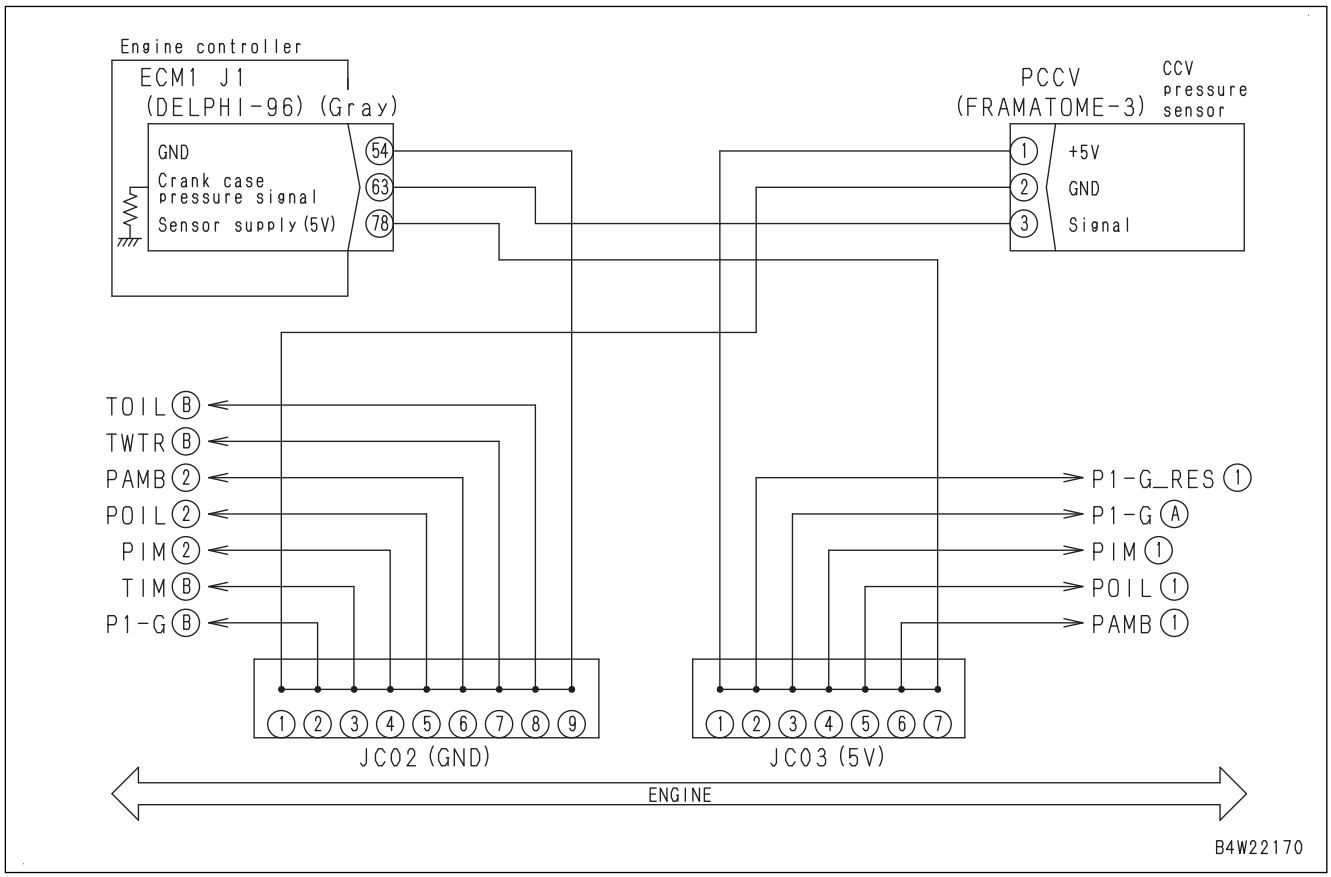
Action level	Failure code	Failure	Injector #2 (L#2) Open Circuit Error or Short Circuit Error (Engine controller system)
L03	CA331		
Detail of failure	Injector #2 circuit has open circuit or short circuit.		
Action of controller	None in particular		
Phenomenon on machine	• The engine power deration. • Engine does not run stably.		
Related information	• Connectors of electrical parts around engine may be defective due to heat and vibration. See descriptions of wiring harness and connectors in “Electrical equipment” in “CHECKS BEFORE TROUBLESHOOTING” of “RELATED INFORMATION ON TROUBLESHOOTING”, and check it. • While engine is running normally, approximately 65 V of pulse voltage is supplied to injector (+) side. Because it is pulse voltage, it cannot be measured by using multimeter. • If ground fault or hot short circuit is detected, failure codes [CA322], [CA331], and [CA324] are displayed at the same time. • After completion of repair, check that the failure code is cleared by the following procedure. Procedure: Start the engine.		

No.	Cause	Procedure, measuring location, criteria and remarks		
1	Defective injector #2	1. Turn the starting switch to OFF position. 2. Disconnect connector CN2, and connect T-adapter to male side.		
		Resistance	Between CN2 (male) (1) and (2)	0.4 to 1.1 Ω
			Between ground and CN2 (male) (1)	Min. 1 MΩ
2	Open circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect connectors ECM1 J1 and CN2, and connect T-adapter to each female side.		
		Resistance	Between ECM1 J1 (female) (26) and CN2 (female) (1)	Max. 1 Ω
			Between ECM1 J1 (female) (2) and CN2 (female) (2)	Max. 1 Ω
3	Ground fault in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect connectors ECM1 J1 and CN2, and connect T-adapter to each female side.		
		Resistance	Between ground and ECM1 J1 (female) (26) or CN2 (female) (1)	Min. 1 MΩ
			Between ground and ECM1 J1 (female) (2) or CN2 (female) (2)	Min. 1 MΩ
4	Hot short circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Insert T-adapter into connector ECM1 J1. 3. Turn the starting switch to ON position.		
		Voltage	Between ground and ECM1 J1 (26)	Max. 6 V

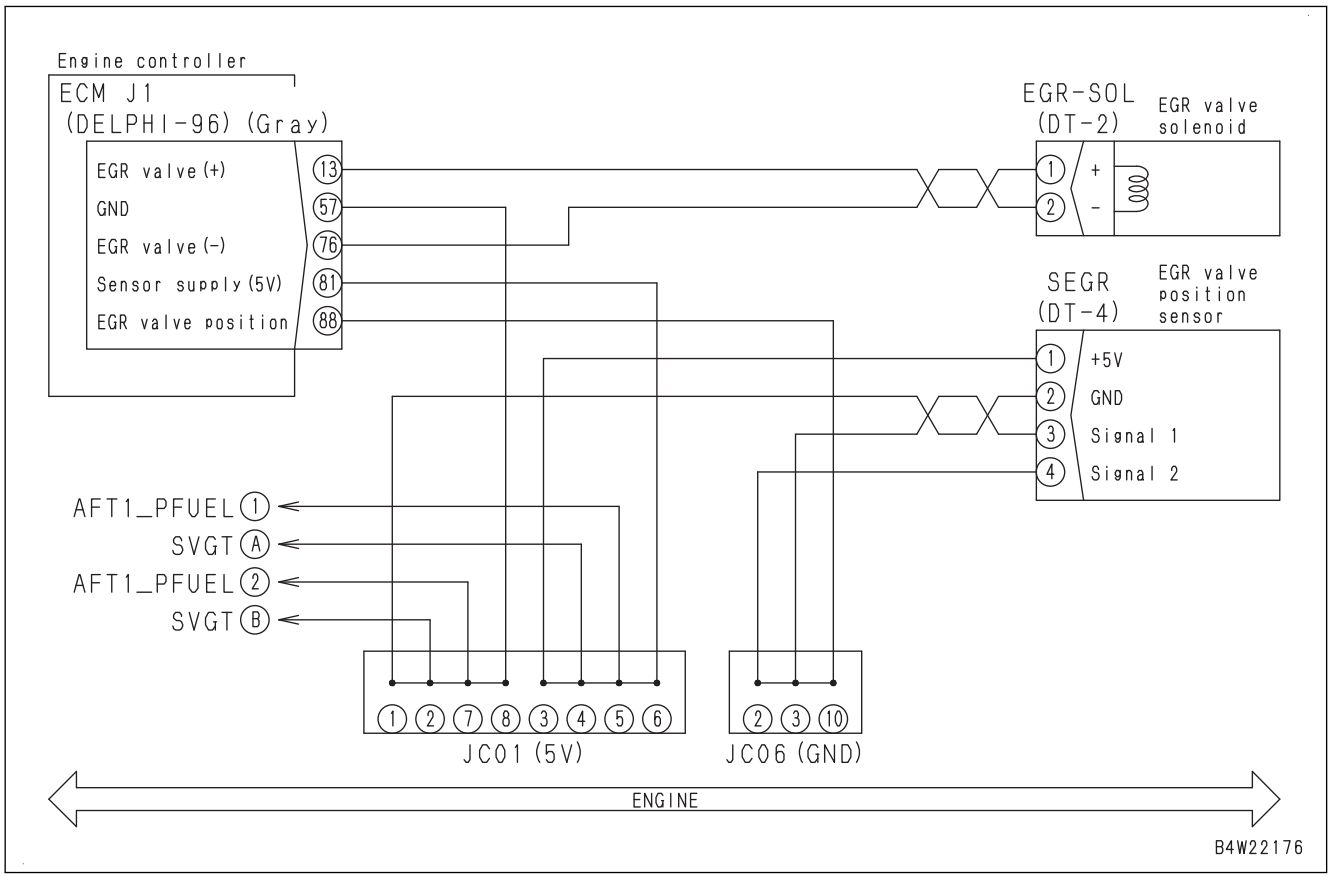
No.	Cause	Procedure, measuring location, criteria and remarks		
6	Ground fault in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect connectors ECM1 J1 and P1_PCV1, and connect T-adapter to each female side.		
		Resistance	Between ground and ECM1 J1 (female) (23)	Min. 1 MΩ
			Between ground and ECM1 J1 (female) (24)	Min. 1 MΩ
7	Hot short circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Insert T-adapter into connector ECM1 J1. 3. Turn the starting switch to ON position.		
		Voltage	Between ground and ECM1 J1 (24)	Max. 1 V
8	Short circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect connector ECM1 J1, and connect T-adapter to female side.		
		Resistance	Between ECM1 J1 (female) (23) and (24) (P1_PCV1 resistance)	2.3 to 5.3 Ω
9	Defective supply pump P1_PCV2	1. Turn the starting switch to OFF position. 2. Disconnect connector P1_PCV2, and connect socket to male side.		
		Resistance	Between P1_PCV2 (male) (1) and (2)	2.3 to 5.3 Ω
			Between ground and P1_PCV2 (male) (1)	Min. 1 MΩ
10	Ground fault in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect connectors ECM1 J1 and P1_PCV2, and connect T-adapter to each female side.		
		Resistance	Between ground and ECM1 J1 (female) (14)	Min. 1 MΩ
			Between ground and ECM1 J1 (female) (48)	Min. 1 MΩ
11	Hot short circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Insert T-adapter into connector ECM1 J1. 3. Turn the starting switch to ON position.		
		Voltage	Between ground and ECM1 J1 (48)	Max. 1 V
12	Short circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect connector ECM1 J1, and connect T-adapter to female side.		
		Resistance	Between ECM1 J1 (female) (14) and (48) (P1_PCV2 resistance)	2.3 to 5.3 Ω
13	Defective common rail pressure sensor	Check for a damage of the wiring harness since the common rail pressure sensor may be defective.		
14	Defective pressure limiter	For details of testing pressure limiter leakage amount, see Testing and Adjusting, “Examine Fuel Return Rate and Leakage”.		
		Pressure limiter leakage amount (rated operation or equivalent (stall load))	Max. 10 cc/min	

No.	Cause	Procedure, measuring location, criteria and remarks
4	Defective KDOC (lowered KDOC catalyzer function)	When not replacing KDOC 1. Turn the starting switch to ON position. 2. Record the initial states of KDOC inlet temperature sensor and KDPF outlet temperature sensor, and temperature during the manual stationary regeneration, and check if KDOC outlet temperature sensor is normal (refer to related information). 3. Start the engine. 4. Secure the safety of the machine. 5. From “Service Menu” of machine monitor, display “Diagnostic Tests screen”, open “Active Regeneration for Service”, and perform “Manual Stationary Regeneration” (manual stationary regeneration finishes in approximately 40 minutes). 6. Turn the starting switch to OFF position. 7. Start the engine, and perform “Manual Stationary Regeneration” again. When the failure code does not appear, perform KDPF Memory Reset and finish the troubleshooting. 8. If failure code [CA2637] appears after finishing the manual stationary regeneration, KDOC is defective. (Catalyzer function of KDOC is lowered. Replace the KDOC.) 9. Perform “KDPF Memory Reset” after replacement of KDOC. For details, see Testing and Adjusting, “Set and Operate Machine Monitor”, “SERVICE MODE”, “METHOD FOR OPERATING TESTING MENU (KDPF MEMORY RESET)”of “DIAGNOSTIC TESTS MENU”. **REMARK** If KDPF Memory Reset is performed, failure codes [CA1691] and [CA2637] do not appear. At this point, a corrective action which is effective when the failure code is displayed and is taken for dosing fuel which is not injected is reset.

Circuit Diagram of Crankcase Pressure Sensor



Circuit Diagram Related to EGR System



Failure Code [CA3133]

Action level	Failure code	Failure	KDPF Outlet Pressure Sensor High Error (Engine controller system)
L03	CA3133		
Detail of failure	High voltage is generated in signal circuit of KDPF outlet pressure sensor.		
Action of controller	• Drives KDPF outlet pressure sensor at 0 kPa. • Closes EGR valve. • Engine power deration. • Stops regeneration control.		
Phenomenon on machine	Engine output is reduced.		
Related information	• Connectors of electrical parts around engine may be defective due to heat and vibration. See descriptions of wiring harness and connectors in “Electrical equipment” in “CHECKS BEFORE TROUBLESHOOTING” of “RELATED INFORMATION ON TROUBLESHOOTING”, and check it. ⚠ **KDPF is heated to 500 °C or higher. Be careful not to get burn injury.** • If failure code [CA1695] or [CA1696] is displayed, sensor power supply system may be defective. Perform troubleshooting for [CA1695] or [CA1696] first. • Signal voltage from KDPF outlet pressure sensor can be checked by monitoring. (Code: 47001) • Differential pressure detected by KDPF outlet pressure sensor can be checked by monitoring. (Code: 47000) • Engine power deration is canceled by turning the starting switch to OFF position after this failure code is cleared. (This deration is not canceled by simply failure code being cleared.) • After completion of repair, check that the failure code is cleared by the following operation. Procedure: Turn the starting switch to ON position.		

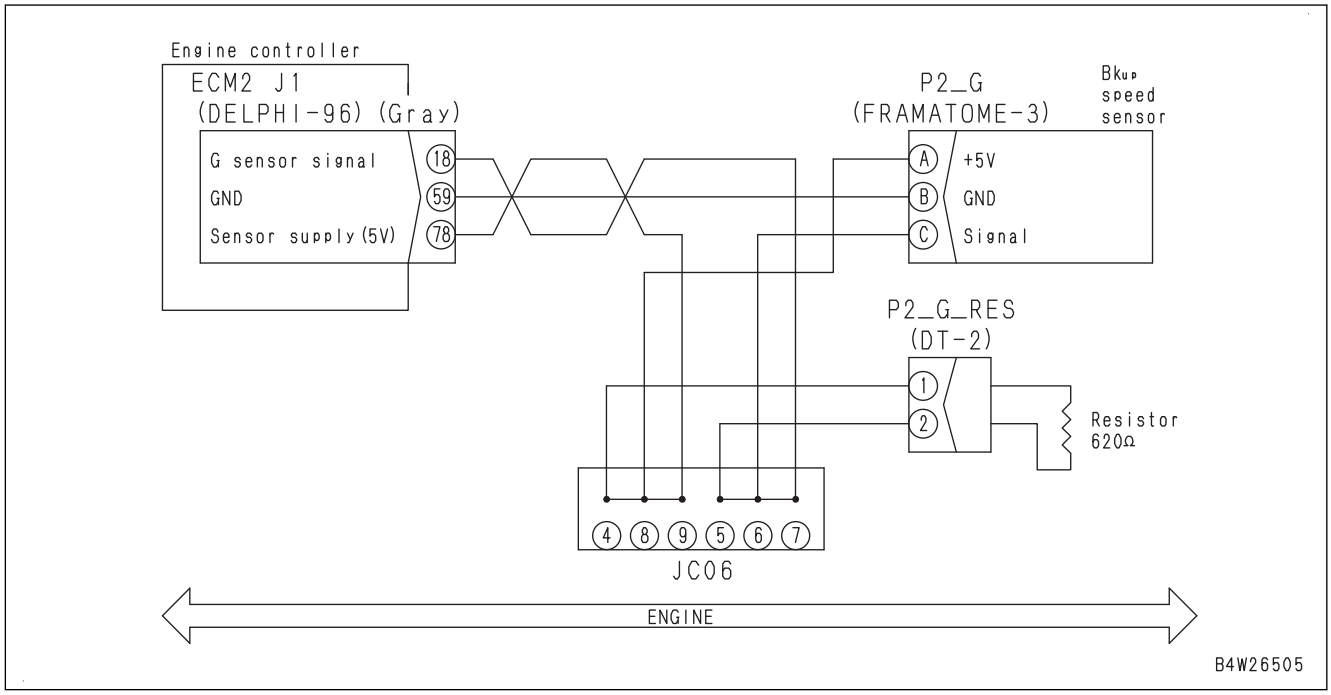
No.	Cause	Procedure, measuring location, criteria and remarks		
1	Defective KDPF outlet pressure sensor	1. Turn the starting switch to OFF position. 2. Disconnect connector PDPF. 3. Turn the starting switch to ON position.		
		If this failure code is changed to [CA3134], KDPF outlet pressure sensor is defective. **REMARK** Ignore other failure codes displayed.		
2	Open circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect connectors ECM1 J2 and PDPF, and connect T-adapter to each female side.		
		Resistance	Between ECM1 J2 (female) (32) and PDPF (female) (1)	Max. 1 Ω

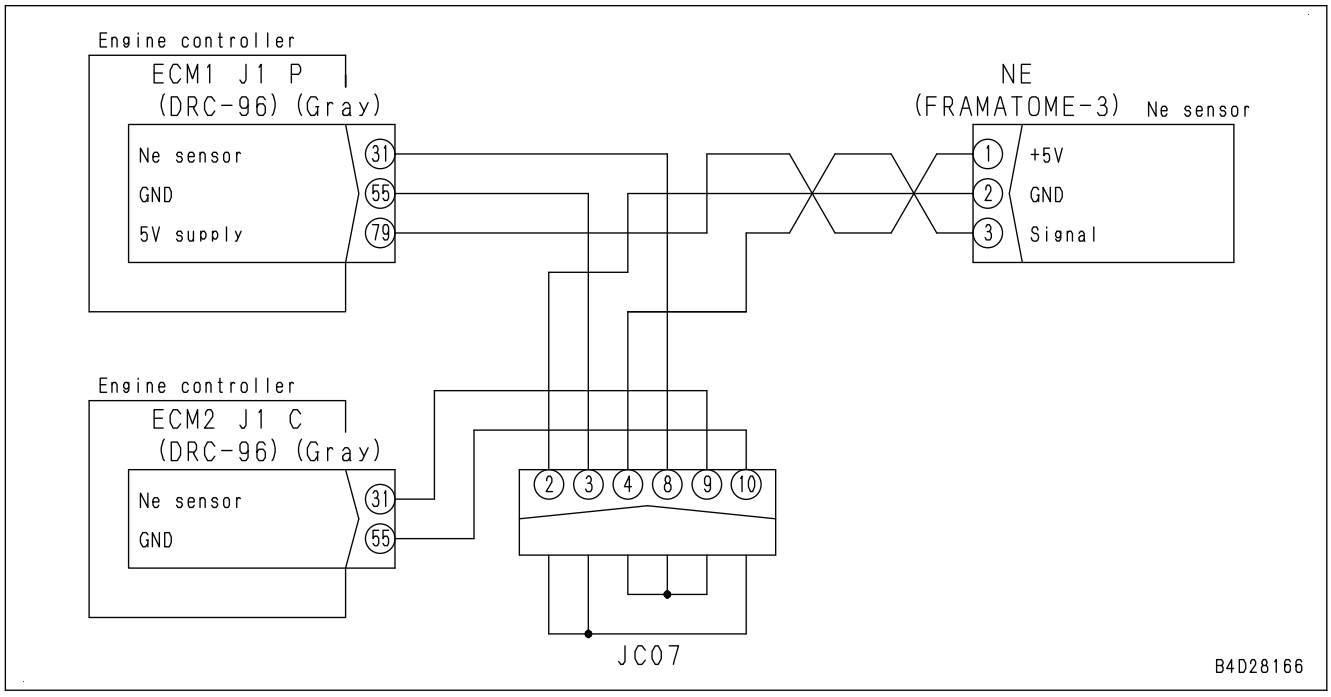
Failure Code [CA3316]

Action level	Failure code	Failure	KDOC Outlet Temperature Sensor Low Error (Engine controller system)
L03	CA3316		
Detail of failure	Ground fault or sensor circuit error in KDOC outlet temperature sensor measuring section or probe (+) side		
Action of controller	• Uses KDOC inlet temperature for KDOC outlet temperature to run engine. (If failure is detected in KDOC inlet temperature sensor, too, controller takes it that KDOC outlet temperature is at default value (250 °C) and allows engine to run.) • Engine power deration. • Closes EGR valve. • Stops regeneration control. • Stops fuel dosing.		
Phenomenon on machine	• Control of active regeneration is defective. • Soot accumulation is high. • Engine output is reduced.		
Related information	• Connectors of electrical parts around engine may be defective due to heat and vibration. See descriptions of wiring harness and connectors in “Electrical equipment” in “CHECKS BEFORE TROUBLESHOOTING” of “RELATED INFORMATION ON TROUBLESHOOTING”, and check it. ⚠ **KDPF and KDOC are heated to 500 °C or higher. Be careful not to get burn injury.** • Engine power deration is canceled by turning the starting switch to OFF position after this failure code is cleared. (This deration is not canceled by simply failure code being cleared.) • After completion of repair, check that the failure code is cleared by the following operation. Procedure: Turn the starting switch to ON position.		

No.	Cause	Procedure, measuring location, criteria and remarks
1	Defective KDOC outlet temperature sensor	1. Check the sensor connector for stain or damage. 2. Turn the starting switch to OFF position. 3. Replace KDPF temperature sensor. 4. Turn the starting switch to ON position. **REMARK** As to procedure for accessing KDOC inlet temperature sensor, KDOC outlet temperature sensor, and KDPF outlet temperature sensor, see Disassembly and Assembly, “Remove and Install KDPF Assembly” and “DISASSEMBLE AND ASSEMBLE OF KDPF ASSEMBLY”.
		If this failure code is not displayed, the original KDOC outlet temperature sensor is defective. (Since this is an internal defect, troubleshooting cannot be performed.)
2	Defective engine controller	If no failure is found by above checks, engine controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.)

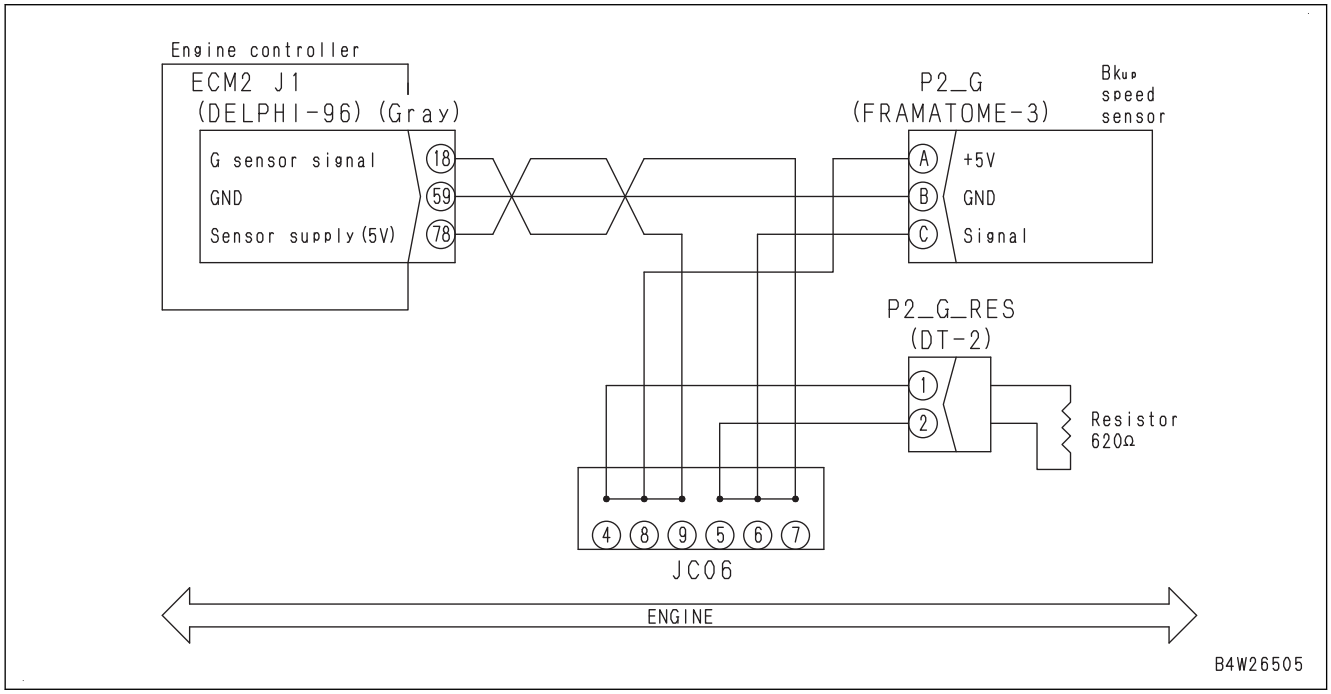
Circuit Diagram Related to Engine Ne Speed Sensor and Bkup Speed Sensor Electric Circuit





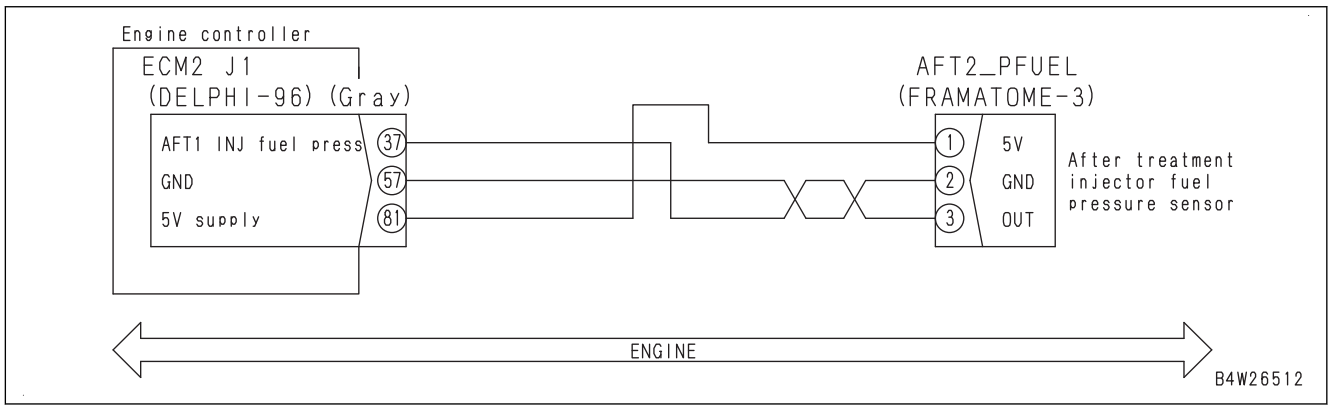
No.	Cause	Procedure, measuring location, criteria and remarks		
5	Short circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect the connectors ECM2 J1, P1_G, and P1_G_RES, and connect the T-adapter to female side of ECM2 J1 or P1_G.		
		Resistance	Between ECM2 J1 (female) (78) and (18) or between P1_G (female) (A) and (C)	Min. 1 MΩ
			Between ECM2 J1 (female) (54) and (18) or between P1_G (female) (B) and (C)	Min. 1 MΩ
6	Damaged engine Bkup speed sensor or defective installation (looseness)	Perform checks since the engine Bkup speed sensor installation (looseness) may be defective.		
7	Defective engine Bkup speed sensor	If no failure is found by above checks, the engine Bkup speed sensor may be defective. (Since this is an internal defect, troubleshooting cannot be performed.) **REMARK** • Since speed sensor output is 5 V of pulse voltage, it cannot be measured by using multimeter. • Because internal speed sensor consists of electronic circuit instead of coil, whether speed sensor is normal or not cannot be determined even if resistance of speed sensor is measured by using multimeter.		
8	Defective engine controller	If no failure is found by above checks, engine controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.)		

Circuit Diagram (Bkup (Camshaft) Speed Sensor)



No.	Cause	Procedure, measuring location, criteria and remarks
5	Defective engine controller	If no failure is found by above checks, engine controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.)

Circuit Diagram of Fuel Doser Pressure Sensor



No.	Cause	Procedure, measuring location, criteria and remarks
6	Defective dosing fuel pressure sensor	1. Turn the starting switch to OFF position. 2. Disconnect fuel supply line (2B) from fuel doser (1B). 3. Turn the starting switch to ON position. 4. Display the dosing fuel pressure and ambient pressure simultaneously by referring to the related information.
		If the dosing fuel pressure and ambient pressure are clearly different, the dosing fuel pressure sensor is defective.
7	Defective engine controller	If no failure is found by above checks, engine controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.)

Loaded Diagnostics Operation to Clear Failure Code

Perform the procedure below to check that the repair is completed.

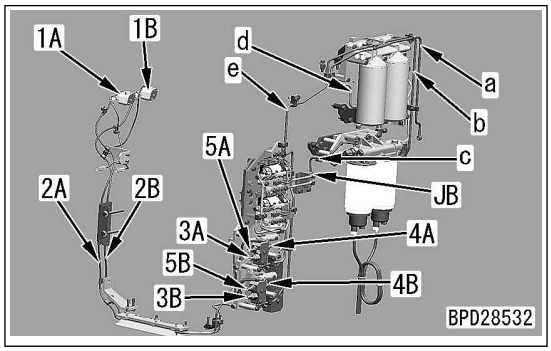
(Make sure that this failure code is cleared after this procedure.)

1. Turn the starting switch from OFF position to ON position.
2. Start the engine and run it at low idle speed for about 1 minute.
3. See “TESTING AND ADJUSTING”, “SERVICE MODE” and “METHOD FOR OPERATING TESTING MENU (REGENERATION FOR SERVICE)” in “SETTING AND OPERATION OF MACHINE MONITOR” to perform“Active Regeneration for Service”.

NOTICE

- **If the failure code is cleared during regeneration for service, repair is complete.**

Diagram of Fuel Doser



1A. Fuel doser-A

1B. Fuel doser-B

2A. Fuel supply line-A

2B. Fuel supply line-B

3A. Dosing fuel solenoid valve 1-A (shut-off valve)

3B. Dosing fuel solenoid valve 1-B (shut-off valve)

4A. Dosing fuel solenoid valve 2-A (drain valve)

4B. Dosing fuel solenoid valve 2-B (drain valve)

5A. Dosing fuel pressure sensor-A

5B. Dosing fuel pressure sensor-B

a: From refueling pump-A

b: From refueling pump-B

c: Fuel return

d: To fuel supply pump

e: From cooling plate of the engine controller

JB: Fuel tube joint bolt

Failure Code [CB3315]

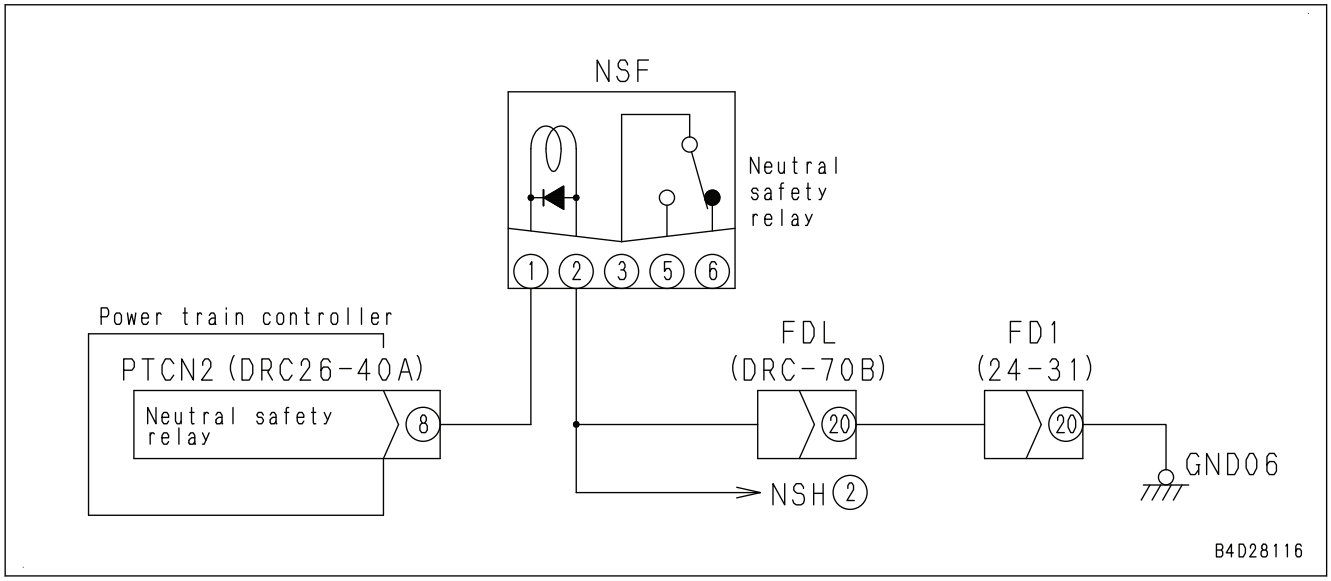
<table>
<tr><td>Action level</td><td>Failure code</td><td rowspan="2">Failure</td><td rowspan="2">KDOC Inlet Temperature Sensor In Range Error_2
(Engine controller system)</td></tr>
<tr><td>L03</td><td>CB3315</td></tr>
<tr><td>Detail of failure</td><td colspan="3">The difference between the temperature detected by KDOC inlet temperature sensor and the temperature detected by KDOC outlet temperature sensor differs from the expected value. (Signal voltage is within input range.)</td></tr>
<tr><td>Action of controller</td><td colspan="3">• Uses KDOC outlet temperature for KDOC inlet temperature to run engine. (If failure is detected in KDOC outlet temperature sensor, too, controller takes it that KDOC inlet temperature is at default value (250 °C) and allows engine to run.)
• Closes EGR valve.
• Engine power deration.
• Stops regeneration control.
• Stops fuel dosing.</td></tr>
<tr><td>Phenomenon on machine</td><td colspan="3">Engine output is reduced.</td></tr>
<tr><td>Related information</td><td colspan="3">• Connectors of electrical parts around engine may be defective due to heat and vibration. See “Related Information to Troubleshooting”, “CHECKS BEFORE TROUBLESHOOTING”, “Electrical equipment”, and check them according to the descriptions of wiring harness and connectors.
⚠ KDPF and KDOC are heated to 500 °C or higher. Be careful not to get burn injury.
• Temperature detected by KDOC inlet temperature sensor can be checked by monitoring. (Code: 47302)
• Temperature detected by KDOC outlet temperature sensor can be checked by monitoring. (Code: 47402)
• Temperature detected by KDPF outlet temperature sensor can be checked by monitoring. (Code: 47202)
• If failure code [CB1925] or [CB1963] is displayed, dosing fuel solenoid valve 1 may be defective. Perform troubleshooting for [CB1925] or [CB1963] first.
• If failure code [CB3313] or [CB3314] is displayed, KDOC inlet temperature sensor may be defective. Perform troubleshooting for [CB3313] or [CB3314] first.
• Engine power deration is canceled by turning the starting switch to OFF position after this failure code is cleared. (This deration is not canceled by simply failure code being cleared.)
• To restart engine, wait until system operating lamp goes out after turning starting switch to OFF position, and then turn the starting switch to ON position.
NOTICE
• This failure code requires “Loaded Diagnostics Operation To Confirm Failure Correction”. After investigating the cause of the problem and completing the repair, perform “Loaded Diagnostics Operation To Confirm Failure Correction” to make sure the failure code is cleared.
• This failure code can be cleared by performing “Engine Controller Active Fault Clear”. (For details, see Testing and Adjusting, “Electrical System”, “SET AND OPERATE MACHINE MONITOR”, “SERVICE MODE” and “METHOD FOR OPERATING TESTING MENU (ENGINE CONTROLLER ACTIVE FAULT CLEAR)” of “DIAGNOSTIC TESTS NENU”.)</td></tr>
</table>

Failure Code [D130KB]

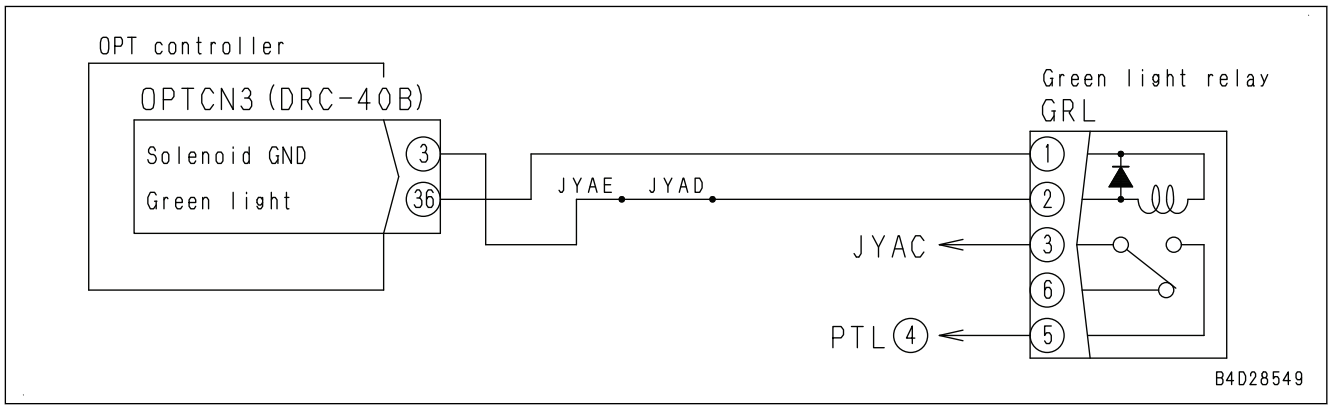
Action level	Failure code	Failure	Neutral Safety Relay Short Circuit (Power train controller system)
L01	D130KB		
Detail of failure	When controller drives primary (coil side) circuit of neutral safety relay, abnormal current flows through circuit.		
Action of controller	Stops driving primary (coil side) circuit of neutral safety relay.		
Phenomenon on machine	Engine does not start.		
Related information	• Output state to primary (coil side) circuit of neutral safety relay can be checked with monitoring code. (Code 40909) • After completion of repair, check that the failure code is cleared by the following operation. Method: Turn the starting switch to ON position + Operate parking brake lever to LOCK position. • This failure code indicates failure in primary (coil side) circuit of neutral safety relay, but does not detects failure in secondary (contact side) circuit.		

No.	Cause	Procedure, measuring location, criteria and remarks		
1	Defective neutral safety relay	1. Turn the starting switch to OFF position. 2. Disconnect the connector NSF, and connect the T-adapter to male side.		
		Resistance	Between NSF (male) (1) and (2)	200 to 400 Ω
2	Ground fault in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect connectors PTCN2 and NSF, and connect the T-adapter to either female side.		
		Resistance	Between ground and either PTCN2 (female) (8) or NSF (female) (1)	Min. 1 MΩ
3	Defective power train controller	If no failure is found by above checks, power train controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.)		

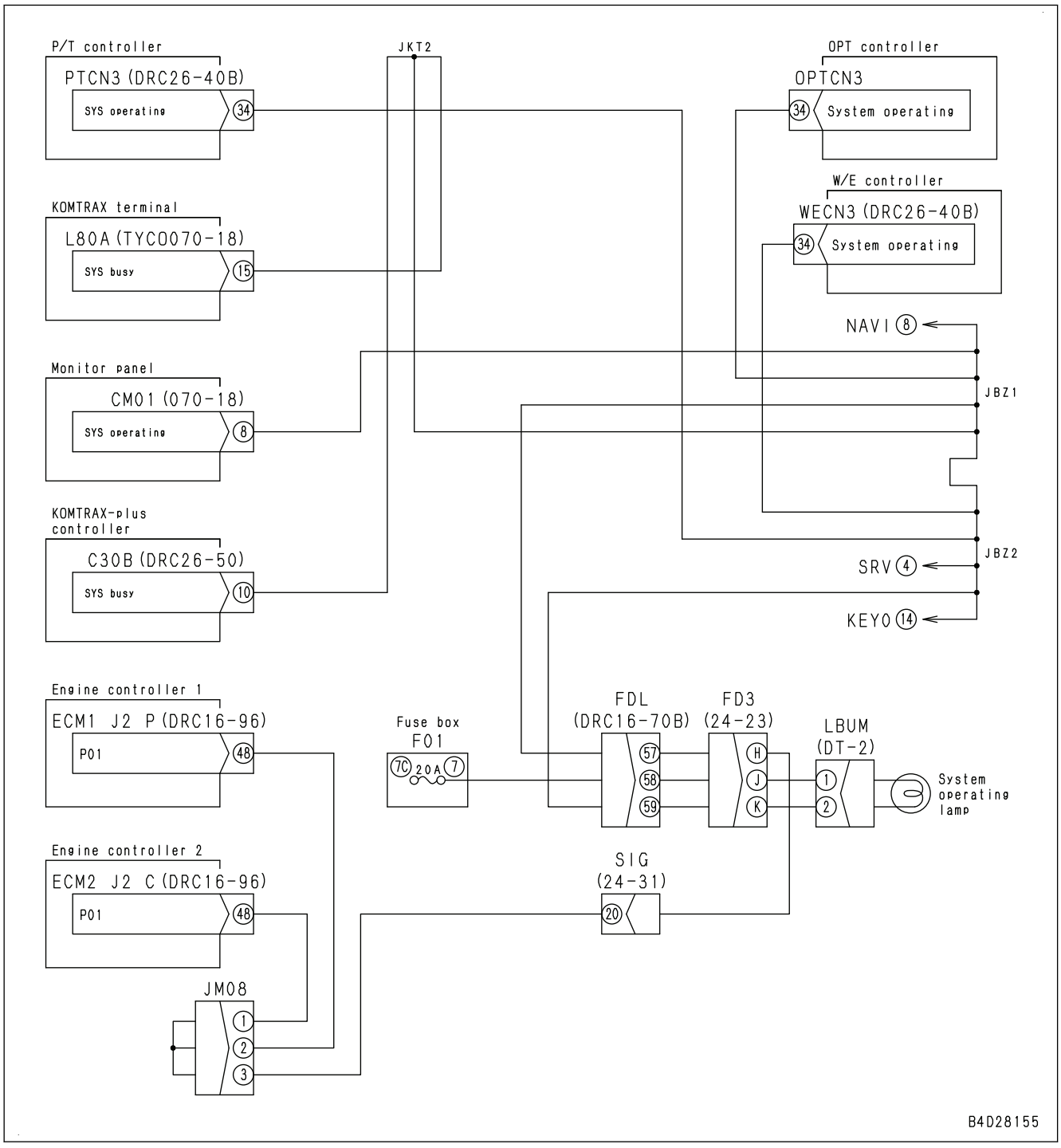
Circuit Diagram of Neutral Safety Relay



Circuit Diagram Related to Green Revolving Lamp



Circuit Diagram of System Operating Lamp



Failure Code [DB95KK]

Action level	Failure code	Failure	Work Equipment Controller 5V Sensor 0 Power Voltage Out of Range (Work equipment controller system)
L03	DB95KK		
Details of failure	• Voltage of 5 V power supply circuit for work equipment controller sensor is below 4.5 V or above 5.5 V. • Unusual current flows in 5 V power supply circuit for work equipment controller sensor.		
Action of controller	• Stops outputting of 5 V power supply circuit for work equipment controller sensor. • Restricts operation of engine and transmission.		
Phenomenon on machine	• System may not operate normally. • Automatic gear shift system does not work. • Once machine stops, engine speed is restricted to medium (half) speed. • Once machine stops, gear speed is restricted to F1 and R2.		
Related information	• After repairing, check if the failure code is cleared by the following procedure. Procedure: Turn starting switch to ON position.		

No.	Cause	Procedure, measuring location, criteria and remarks		
1	Defective 5 V potentiometer	1. Turn the starting switch to OFF position. 2. Disconnect the following connectors one by one in order, and turn the starting switch to ON position each time. 3. If this failure code is not displayed, the disconnected device is defective. Repeat steps 1 to 3 until it is confirmed that there is no device causing failure. **REMARK** Since connector is disconnected, other failure codes are displayed. Ignore all of displayed failure codes other than this one.		
		Connector	Blade control lever	WLV1
			Ripper control lever	WLV2
2	Ground fault in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect the connector WECN1, and connect the T-adapter to female side. 3. Disconnect the connectors, terminals, and fuses of all the devices which branch out from connectors WECN1 (22).		
		Resistance	Between WECN1 (female) (22) and ground	Min. 1 MΩ
3	Hot short circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect the connector WLV2, and connect the T-adapter to female side. 3. Turn the starting switch to ON position.		
		Voltage	Between WLV2 (female) (4) and (1)	4.5 to 5.5 V
4	Defective work equipment controller	If no failure is found by preceding checks, work equipment controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.)		

<table>
<tr><th>No.</th><th>Cause</th><th colspan="3">Procedure, measuring location, criteria and remarks</th></tr>
<tr><td rowspan="2">3</td><td rowspan="2">Ground fault in wiring harness</td><td colspan="3">1. Turn the starting switch to OFF position.
2. Check that system operating lamp is not lit, and then turn the battery disconnect switch to OFF position.
3. Remove the fuse No.7 in fuse box F01.
4. Disconnect the connector LBUM, and connect the T-adapter to female side.</td></tr>
<tr><td>Resistance</td><td>Between ground and either F01-7 or LBUM (female) (1)</td><td>Min. 1 MΩ</td></tr>
<tr><td>4</td><td>Defective power train controller</td><td colspan="3">If no failure is found by above checks, power train controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.)</td></tr>
</table>

Failure Code [DD14KA]

Action level	Failure code	Failure	Parking Brake Lever SW Open Circuit (Power train controller system)
L03	DD14KA		
Detail of failure	NO(Normally Open) and NC(Normally Closed) lines of parking brake lever switch circuit becomes open (switch: OFF) simultaneously.		
Action of controller	• Assumes that parking brake lever is in released position. • Restricts operation of engine and transmission.		
Phenomenon on machine	• Automatic gear shift function does not work. • Once machine stops, engine speed is restricted to medium (half) speed. • Once machine stops, selectable gear speeds are restricted to F1 and R1. • Engine cannot start.		
Related information	• NC line is for detecting operation, and NO line is for detecting errors. • State of parking brake lever switch signal can be checked with monitoring function. (Code: 40905 P/T SW Input 1) • After repairing, check if the failure code is cleared by the following procedure. Procedure: Turn starting switch to ON position and operate parking brake lever. • When parking brake lever is in released position, parking brake lever switch is ON.		

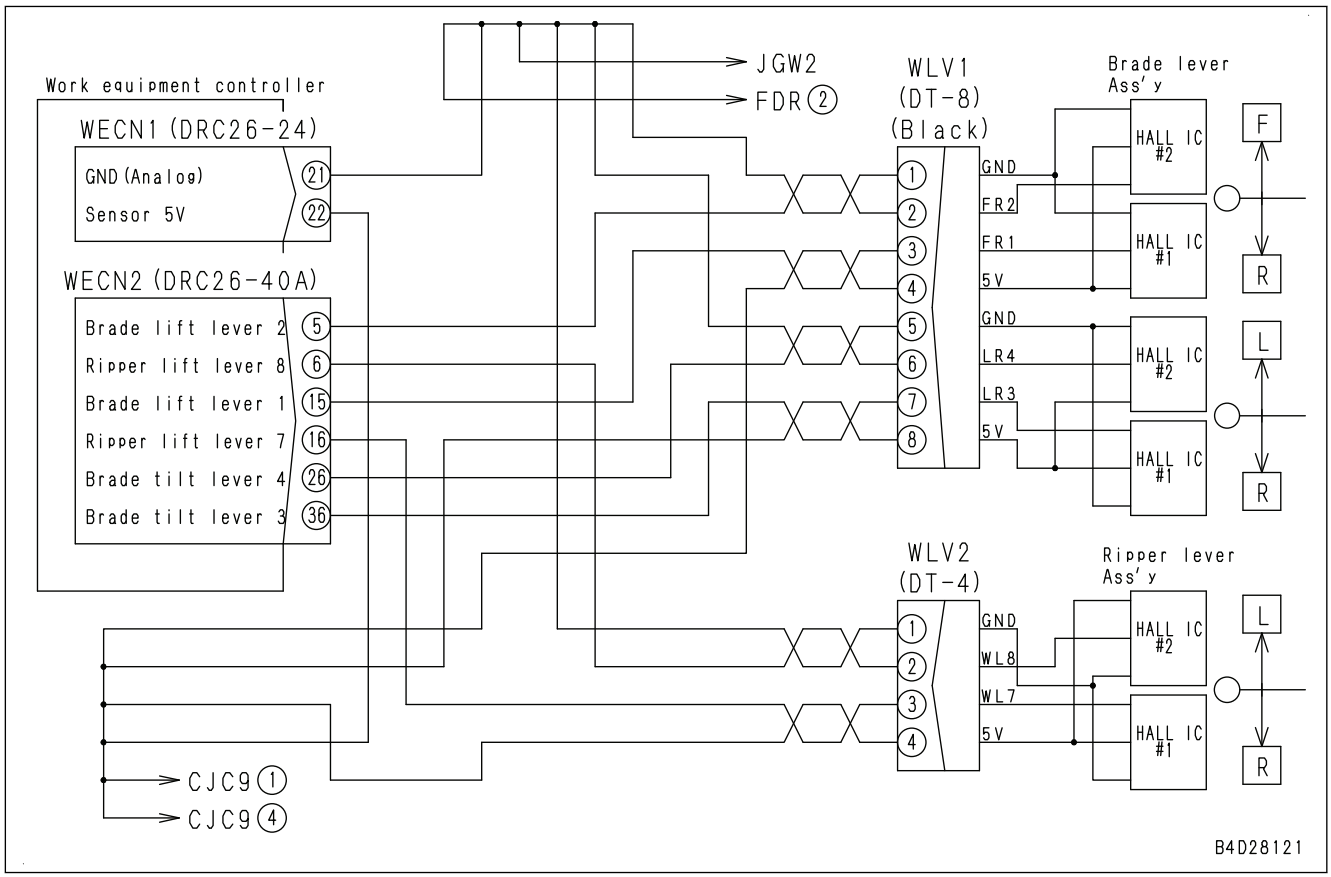
No.	Cause	Procedure, measuring location, criteria and remarks			
1	Defective fuse	1. Turn the starting switch to OFF position. 2. Check that the system operating lamp is not lit, and then turn the battery disconnect switch to OFF position. 3. Remove the fuse No.5 in fuse box F01. Check visually if it is not burnt out. 4. When it is not burnt out, check if it is blown out by continuity test.			
		• When it is burnt out, check the wiring harness for ground fault. • When it is not burnt out but it has no continuity, replace the fuse.			
2	Defective parking brake lever switch	1. Turn the starting switch to OFF position. 2. Disconnect the connector PKSW, and connect the T-adapter to male side. 3. Operate the parking brake lever to perform troubleshooting.			
		Resistance	Between PKSW (male) (A) and (B)	Lever: LOCK	Min. 1 MΩ
				Lever: FREE	Max. 1 Ω
			Between PKSW (male) (A) and (C)	Lever: LOCK	Max. 1 Ω
				Lever: FREE	Min. 1 MΩ
3	Open circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Remove the fuse No. 5 in fuse box F01 3. Disconnect connectors PTCN3 and PKSW, and connect the T-adapter to each female side.			
		Resistance	Between F01-5 and PKSW (female) (A)		Max. 1 Ω
			Between PTCN3 (female) (10) and PKSW (female) (B)		Max. 1 Ω
			Between PTCN3 (female) (20) and PKSW (female) (C)		Max. 1 Ω

Failure Code [DDKEL4]

Action level	Failure code	Failure	Ripper Tilt Back SW Signal Mismatch (Work equipment controller system)
L01	DDKEL4		
Detail of failure	Signals of 2 NO(Normally Open) circuits of ripper tilt-back lever disagree with each other.		
Action of controller	Assumes that ripper tilt back lever is in neutral.		
Phenomenon on machine	Ripper tilt back control is disabled.		
Related information	• State of ripper tilt back lever signal can be checked with monitoring function. (Code: 70307 Ripper knob switch input) • After repairing, check if the failure code is cleared by the following procedure. Procedure: Turn starting switch to ON position and operate ripper control lever (in tilt back direction).		

No.	Cause	Procedure, measuring location, criteria and remarks			
1	Defective ripper tilt back lever	1. Turn the starting switch to OFF position. 2. Disconnect the connector RNSW, and connect the T-adapter to male side. 3. Operate the ripper tilt lever (in tilt back direction) to perform troubleshooting.			
		Resistance	Between RNSW (male) (4) and (3)	FREE	Min. 1 MΩ
				Tilt BACK	Max. 1 Ω
			Between RNSW (male) (5) and (3)	FREE	Min. 1 MΩ
				Tilt BACK	Max. 1 Ω
2	Open circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect connectors WECN1, WECN3 and RNSW, and connect the T-adapter to each female side.			
		Resistance	Between WECN3 (female) (29) and RNSW (female) (5)		Max. 1 Ω
			Between WECN3 (female) (39) and RNSW (male) (4)		Max. 1 Ω
			Between WECN1 (female) (4) and RNSW (female) (3)		Max. 1 Ω
3	Ground fault in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect connectors WECN3 and RNSW, and connect the T-adapter to either female side.			
		Resistance	Between ground and either WECN3 (female) (29) or RNSW (female) (5)		Min. 1 MΩ
			Between ground and either WECN3 (female) (39) or RNSW (female) (4)		Min. 1 MΩ
4	Hot short circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect the connector RNSW, and connect the T-adapter to female side. 3. Turn the starting switch to ON position.			
		Voltage	Between RNSW (female) (4) and (3)		7 to 11 V
			Between RNSW (female) (5) and (3)		7 to 11 V

Circuit Diagram of Blade Tilt Lever Potentiometer

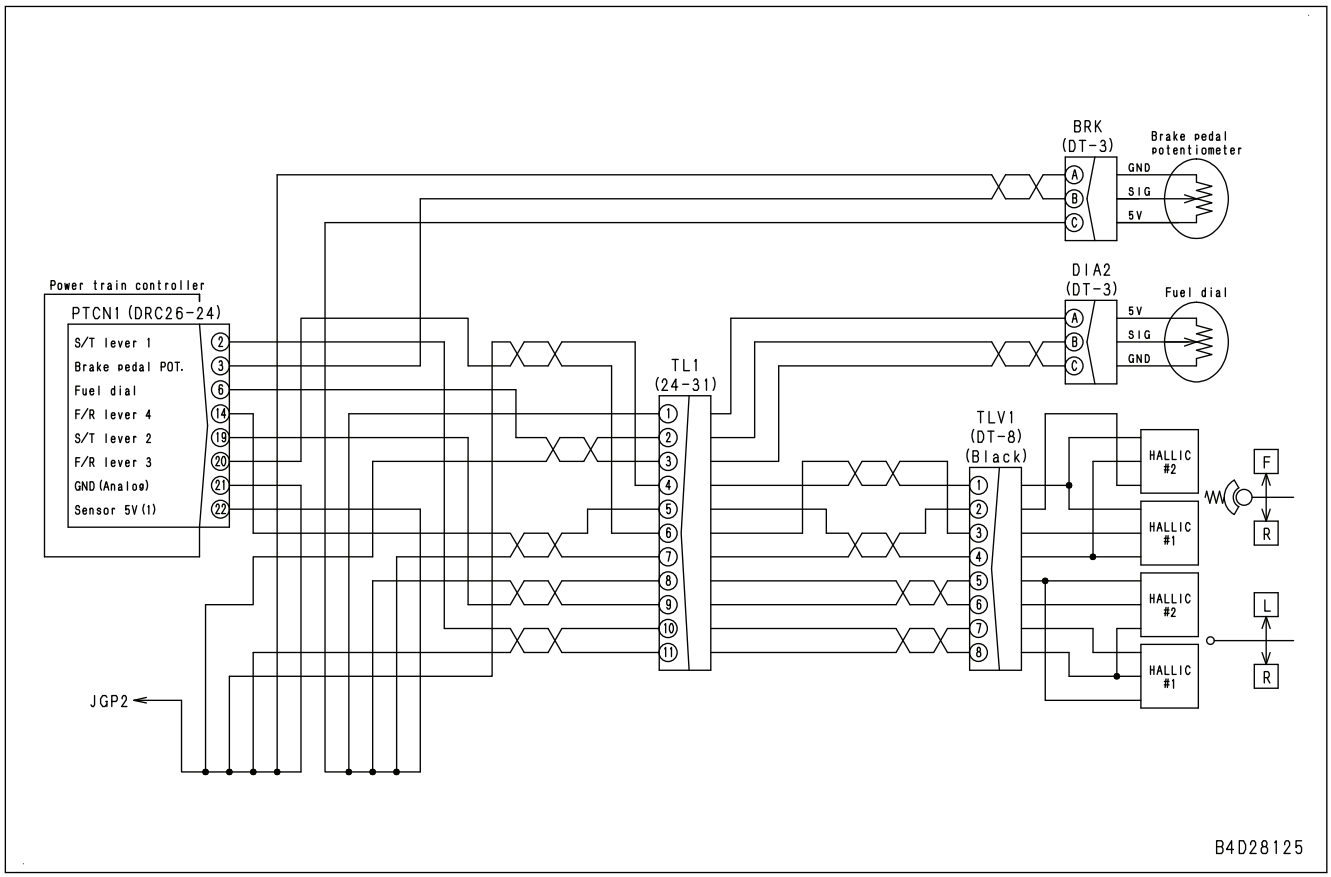


Failure Code [DHA4KA]

Action level	Failure code	Failure	Air Cleaner Clogging Sensor Open Circuit (Machine monitor system)
L01	DHA4KA		
Detail of failure	Controller detects open circuit in Air Cleaner Clogging Sensor.		
Action of controller	Displays system state monitor on machine monitor in yellow.		
Phenomenon on machine	If machine is used as it is, engine may be damaged.		
Related information	• Input state (ON/OFF) from air cleaner clogging switch can be checked with monitoring function. (Code: 04501 “Monitor input 2”) • After repairing, check if the failure code is cleared by the following procedure. Procedure: Turn starting switch to ON position. • Air cleaner suction resistance: Max.-3,430 Pa {-350 mmH_2O}		

No.	Cause	Procedure, measuring location, criteria and remarks			
1	Clogging of air cleaner	Air cleaner may be clogged. Check it for clogging and then clean or replace if clogged.			
2	Defective air cleaner clogging sensor	1. Turn the starting switch to OFF position. 2. Disconnect the connector AF1, and connect the T-adapter to male side. 3. Start the engine. **REMARK** Air cleaner suction resistance value *1: -3430 mmH_2O and below {-350 Pa and below} *2: -7470±490 Pa {-762±50 mmH_2O}			
		Resistance	Between AF1 (male) (1) and (2)	When air cleaner: is normal *1	Max. 1 Ω
				When air cleaner is clogged *2	Min. 1 MΩ
3	Open circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect the connectors CM02 and AF1, and connect the T-adapter to each female side.			
		Resistance	Between CM02 (female) (4) and AF1 (female) (1)		Max. 1 Ω
			Between AF1 (female) (2) and ground		Max. 1 Ω
4	Defective machine monitor	If no failure is found by above checks, machine monitor is defective. (Since this is an internal defect, troubleshooting cannot be performed.)			

Circuit Diagram of Brake Pedal Potentiometer



Failure Code [DKW3KX]

Action level	Failure code	Failure	Left S/T Lever Potentiometer 2 Open Circuit or Hot Short Circuit (Power train controller system)
L03	DKW3KX		
Detail of failure	In left steering lever potentiometer 1 and 2 systems, either failure code [DKW4KA] or [DKW4KY] is displayed with failure code [DKW5KA] or [DKW5KY] at the same time.		
Action of controller	• Makes the alarm lamp light up and alarm buzzer sound. • Restricts operations of engine, transmission, and brake.		
Phenomenon on machine	• Once machine stops, engine speed is limited to medium (half) speed. • Once the machine stops, it becomes unable to travel at all.		
Related information	After completion of repair, check with following operation that the failure code is cleared. Procedure: Turn the starting switch to ON position + Operate right lever.		

No.	Cause	Procedure, measuring location, criteria and remarks
1	Defective circuit related to left steering lever potentiometer	Perform troubleshooting for failure codes [DKW4KA], [DKW4KY], [DKW5KA], and [DKW5KY].

Failure Code [DNDEKB]

Action level	Failure code	Failure	Ladder Clamp Close Limit Switch Hot Short Circuit (Optional controller system)
L01	DNDEKB		
Detail of failure	• NO* and NC* lines of power ladder clamp limit switch circuit becomes CLOSE (switch: ON) simultaneously. • It is always recognized as CLOSE (ON).		
Action of controller	• Keeps the same information at last time for power ladder clamp CLOSE limit switch. • Stops the ladder operation.		
Phenomenon on machine	• Ladder cannot be operated. • Since the service brake remains to be applied, machine cannot travel.		
Related information	• NO* line is for detecting operation, and NC* line is for detecting errors. • The signal condition of power ladder clamp CLOSE limit switch can be checked with monitoring function. (Code: 02711)		

No.	Cause	Procedure, measuring location, criteria and remarks			
1	Defective power ladder clamp CLOSE limit switch	1. Turn the starting switch to OFF position. 2. Disconnect the connector S4, and connect the T-adapter to male side. 3. Operate the switch lever to perform troubleshooting. "Switch OFF": Release the lever, "Switch ON": Tilt the lever			
		Resistance	Between S4 (male) (A) and (B)	Switch OFF	Min. 1 MΩ
				Switch ON	Max. 1 Ω
			Between S4 (male) (A) and (C)	Switch OFF	Max. 1 Ω
				Switch ON	Min. 1 MΩ
2	Short circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect the connectors S4 and OPTCN2, and connect the T-adapter to female side of OPTCN2. Check it by using multimeter in continuity mode.			
		Continuity	Between OPTCN2 (female) (25) and each pin other than (25)		No continuity
3	Defective optional controller	If no failure is found by preceding checks, optional controller may be defective. (Since this is an internal defect, troubleshooting cannot be performed.)			

Failure Code [DWNXKB]

Action level	Failure code	Failure	Ladder Clamp Open Solenoid Short Circuit (Optional controller system)
L01	DWNXKB		
Detail of failure	During clamp operation, clamp does not open.		
Action of controller	• Stops driving the power ladder LOWER solenoid. • Stops driving the power ladder clamp OPEN solenoid. • Under the command of ladder RAISE and clamp OPEN: Stops driving the electrical pump relay. • Turn off the ladder alarm.		
Phenomenon on machine	• Ladder LOWER operation cannot be performed. • Ladder clamp OPEN operation cannot be performed.		
Related information	The signal condition of power ladder clamp CLOSE solenoid can be checked with monitoring function. (Code: 03728)		

No.	Cause	Procedure, measuring location, criteria and remarks		
1	Defective power ladder clamp OPEN solenoid	1. Turn the starting switch to OFF position. 2. Disconnect the connector V2A, and connect the T-adapter to male side.		
		Resistance	Between V2A (male) (1) and (2)	2 to 12 Ω
2	Ground fault in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect the connectors OPTCN2 and V2A, and connect the T-adapter to either female side.		
		Resistance	Between ground and OPTCN2 (female) (8) or V2A (female) (2)	Min. 1 MΩ
3	Defective optional controller	If no failure is found by preceding checks, optional controller may be defective. (Since this is an internal defect, troubleshooting cannot be performed.)		

Failure Code [DXH8KB]

Action level	Failure code	Failure	Transmission Forward Clutch ECMV Solenoid Short Circuit (power train controller system)
L03	DXH8KB		
Detail of failure	• When controller drives transmission F clutch ECMV solenoid, unusual current flows through circuit.		
Action of controller	• Stops driving transmission F clutch ECMV solenoid. Restricts operation of engine and transmission.		
Phenomenon on machine	• Once machine stops, engine speed is restricted to medium (half) speed. • Once machine stops, selectable gear speed is restricted to R1.		
Related information	• Output condition to F clutch ECMV solenoid can be checked with monitoring function. (Code: 31622 T/M Forward Clutch ECMV Current (F/B)) • After repairing, check if the failure code is cleared by the following procedure. Procedure: Start engine and travel forward.		

No.	Cause	Procedure, measuring location, criteria and remarks		
1	Defective F clutch ECMV solenoid	1. Turn the starting switch to OFF position. 2. Disconnect the connector SFT, and connect the T-adapter to male side.		
		Resistance	Between SFT (male) (1) and (2)	3 to 13 Ω
			Between SFT (male) (1) and ground	Min. 1 MΩ
2	Ground fault in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect connectors PTCN3 and SFT, and connect the T-adapter to either female side.		
		Resistance	Between ground and either PTCN3 (female) (18) or SFT (female) (1)	Min. 1 MΩ
3	Short circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect connectors PTCN3 and SFT, and connect the T-adapter to female side of PTCN3.		
		Continuity	Between PTCN3 (female) (18) and each pin other than (18)	No continuity
4	Defective power train controller	If no failure is found by above checks, power train controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.)		

Failure Code [DXHTKA]

Action level	Failure code	Failure	Blade Tilt Right Head EPC Solenoid Open Circuit (Work equipment controller system)
L01	DXHTKA		
Detail of failure	When controller drives blade tilt right head EPC solenoid, no current flows through circuit.		
Action of controller	Stops driving blade tilt right head EPC solenoid.		
Phenomenon on machine	Right cylinder for blade tilt or pitch cannot be retracted.		
Related information	• Output condition to blade tilt right head EPC solenoid can be checked with monitoring function. (Code: 90800 RH Blade Tilt Cyl Head EPC Sol (F/B)) • After repairing, check if the failure code is cleared by the following procedure. Procedure: Turn starting switch to ON position and operate blade control lever (reverse pitch).		

No.	Cause	Procedure, measuring location, criteria and remarks		
1	Defective solenoid of blade tilt RIGHT head EPC	1. Turn the starting switch to OFF position. 2. Disconnect the connector WEP5, and connect the T-adapter to male side.		
		Resistance	Between WEP5 (male) (1) and (2)	2 to 12 Ω
			Between WEP5 (male) (1) and ground	Min. 1 MΩ
2	Defective circuit related to blade tilt RIGHT head EPC solenoid	1. Turn the starting switch to OFF position. 2. Disconnect the connector WEP5, and connect the T-adapter to female side. 3. Turn the starting switch to ON position.		
		Voltage	Between WEP5 (female) (1) and (2)	1 to 4.5 V
3	Open circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect connectors WECN3 and WEP5, and connect the T-adapter to each female side.		
		Resistance	Between WECN3 (female) (27) and WEP5 (female) (1)	Max. 1 Ω
			Between WECN3 (female) (23) and WEP5 (female) (2)	Max. 1 Ω
4	Defective work equipment controller	If no failure is found by preceding checks, work equipment controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.)		

Failure Code [DXJ8KA]

Action level	Failure code	Failure	Blade Tilt Left Bottom EPC Solenoid Open Circuit (Work equipment controller system)
L01	DXJ8KA		
Detail of failure	• When controller drives blade tilt left bottom EPC solenoid, no current flows through circuit.		
Action of controller	• Stops driving blade tilt left bottom EPC solenoid.		
Phenomenon on machine	• Left cylinder for blade tilt or pitch cannot be extended.		
Related information	• Output condition to blade tilt left bottom EPC solenoid can be checked with monitoring function. (Code: 71007 LH Blade Tilt Cyl Bottom EPC Sol (F/B)) • After repairing, check if the failure code is cleared by the following procedure. Procedure: Turn starting switch to ON position and operate blade control lever (forward pitch).		

No.	Cause	Procedure, measuring location, criteria and remarks		
1	Defective solenoid of blade tilt LEFT bottom EPC	1. Turn the starting switch to OFF position. 2. Disconnect the connector WEP4, and connect the T-adapter to male side.		
		Resistance	Between WEP4 (male) (1) and (2)	2 to 12 Ω
			Between WEP4 (male) (1) and ground	Min. 1 MΩ
2	Defective circuit related to blade tilt LEFT bottom EPC solenoid	1. Turn the starting switch to OFF position. 2. Disconnect the connector WEP4, and connect the T-adapter to female side. 3. Turn the starting switch to ON position.		
		Voltage	Between WEP4 (female) (1) and (2)	1 to 4.5 V
3	Open circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect connectors WECN3 and WEP4, and connect the T-adapter to each female side.		
		Resistance	Between WECN3 (female) (38) and WEP4 (female) (1)	Max. 1 Ω
			Between WECN3 (female) (23) and WEP4 (female) (2)	Max. 1 Ω
4	Defective work equipment controller	If no failure is found by preceding checks, work equipment controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.)		

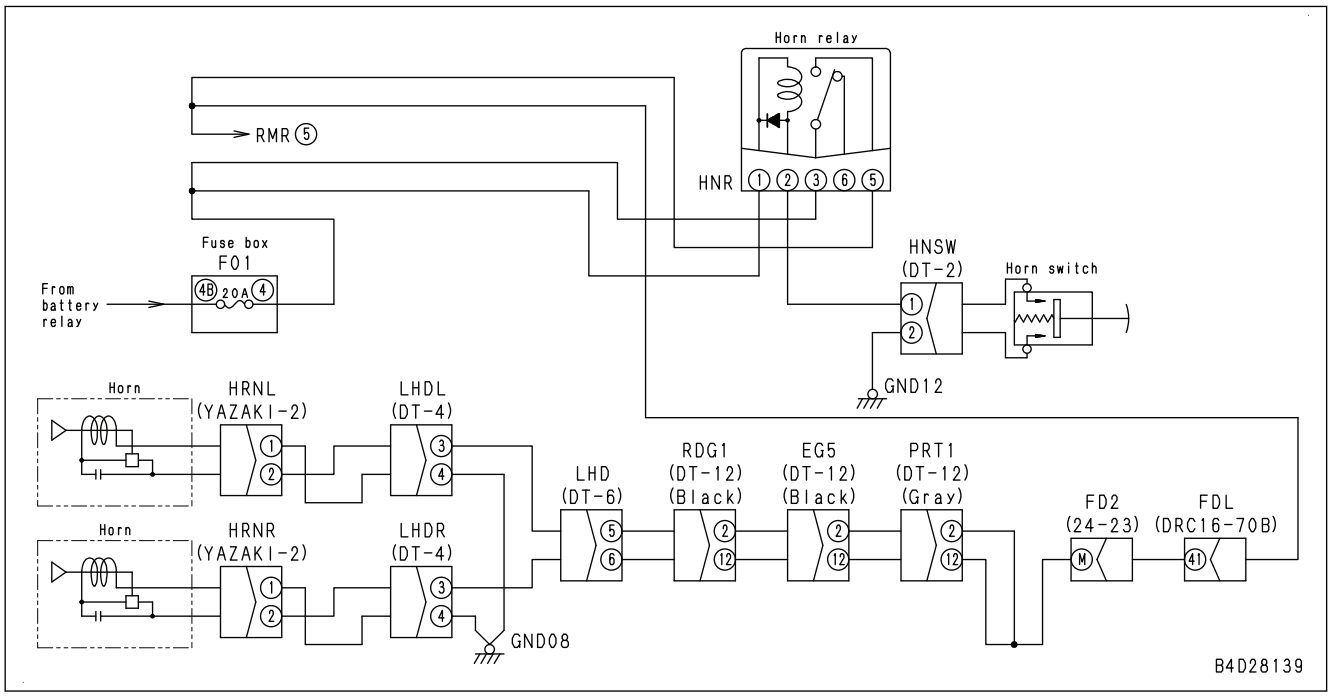
<table>
<tr><th>No.</th><th>Cause</th><th colspan="3">Procedure, measuring location, criteria and remarks</th></tr>
<tr><td rowspan="2">3</td><td rowspan="2">Ground fault in wiring harness</td><td colspan="3">1. Turn the starting switch to OFF position.
2. Check that the system operating lamp is turned off, and then turn the battery disconnect switch to OFF position.
3. Remove the fuse No.7 in the fuse box F01.
4. Disconnect the connector LBUM, and connect the T-adapter to female side.</td></tr>
<tr><td>Resistance</td><td>Between ground and either F01-7 or LBUM (female) (1)</td><td>1 MΩor more</td></tr>
<tr><td>4</td><td>Defective optional controller</td><td colspan="3">If no failure is found by preceding checks, optional controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.)</td></tr>
</table>

E-9 Air Cleaner Clogging Monitor Comes On in Yellow While Engine is in Operation

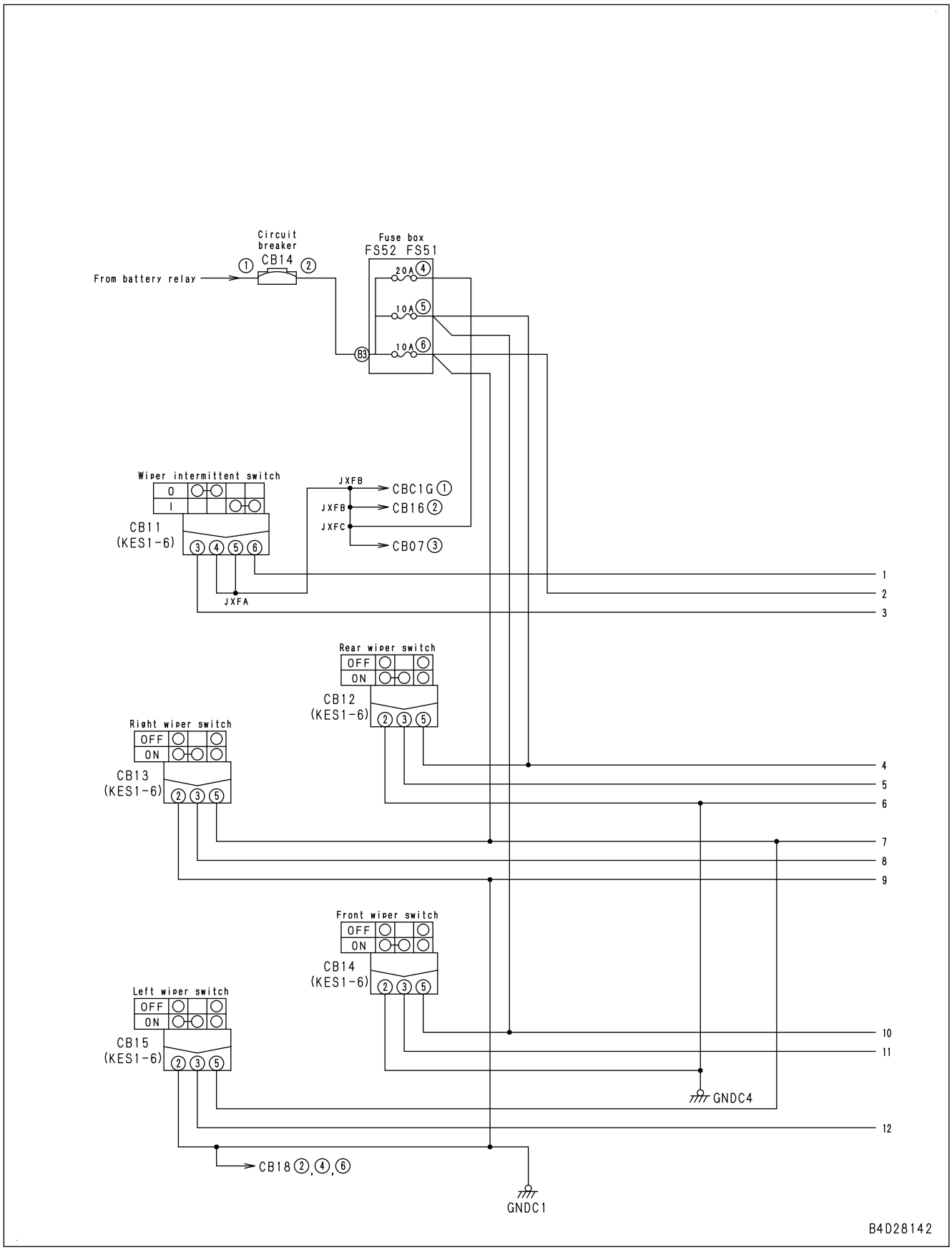
Failure	Air cleaner clogging monitor lights up in yellow while engine is running.
Related information	Signal from air cleaner clogging switch can be checked with monitoring function (Code: 04501).

No.	Cause	Procedure, measuring location, criteria and remarks
1	Clogged air cleaner (when system works properly)	Air cleaner may be clogged. Check it for clogging and then clean or replace if clogged.
2	Defective air cleaner clogging switch system	Perform troubleshooting for failure code [AA10NX].

Circuit Diagram of Horn



Circuit Diagram of Windshield Wiper



<table>
<tr><th>No.</th><th>Cause</th><th colspan="3">Procedure, measuring location, criteria and remarks</th></tr>
<tr><td rowspan="9">8</td><td rowspan="9">Defective steering clutch</td><td colspan="3">1. Check that the transmission main relief pressure is normal.
2. Be ready with turning starting switch to OFF position, then perform troubleshooting with engine at high idle.
If the oil pressure is not normal, perform troubleshooting “H-6 MACHINE CANNOT TURN (STEERING)”.</td></tr>
<tr><td rowspan="2">Left steering clutch pressure</td><td>Lever: Left stroke end</td><td>Min.
2.4 MPa
{Min.
24 kgf/cm^2}</td></tr>
<tr><td>Lever: Right stroke end</td><td>0 MPa
{0 kgf/cm^2}</td></tr>
<tr><td rowspan="2">Right clutch pressure</td><td>Lever: Left stroke end</td><td>0 MPa
{0 kgf/cm^2}</td></tr>
<tr><td>Lever: Right stroke end</td><td>Min.
2.4 MPa
{Min.
24 kgf/cm^2}</td></tr>
<tr><td rowspan="2">Left brake pressure</td><td>Lever: Left stroke end</td><td>0 MPa
{0 kgf/cm^2}</td></tr>
<tr><td>Lever: Right stroke end</td><td>Min.
2.4 MPa
{Min.
24 kgf/cm^2}</td></tr>
<tr><td rowspan="2">Right brake pressure</td><td>Lever: Left stroke end</td><td>Min.
2.4 MPa
{Min.
24 kgf/cm^2}</td></tr>
<tr><td>Lever: Right stroke end</td><td>0 MPa
{0 kgf/cm^2}</td></tr>
<tr><td>9</td><td>Internal defect of transmission</td><td colspan="3">Internal defect of transmission may be occurred. Check it.</td></tr>
</table>

H-25 Seismic Isolation Operator Seat Shakes Abnormally or Receives Shock

Failure	• Operator seat seismic isolation mechanism shakes abnormally • There is an abnormal shock when it shakes greatly.
Related information	-

No.	Cause	Procedure, measuring location, criteria and remarks
1	Breakage of laminated rubber	Laminated rubber may be damaged. See TESTING AND ADJUSTING, and perform “Breakage of rubber”.
2	Malfunction of damper	Malfunction of damper may be occurred. See TESTING AND ADJUSTING, and perform “Oil leakage from damper”.
3	Breakage of stopper rubber	Breakage of stopper rubber is suspected. See TESTING AND ADJUSTING, and perform “Breakage of stopper rubber”.

50 Disassembly and Assembly

Symbol	Part No.	Part name	Necessity	Q'ty	New/Redesign	Sketch	Remarks
B	791-632-1300	Push tool assembly	■	1			
	791-632-1260	• Push tool		1			
	791-632-1270	• Adapter		1			
	791-632-1220	• Pin (small)		1			
	791-632-1230	• Ring		1			
	791-632-1240	• Plate		1			
	791-685-5730	• Bar		1			
	791-632-1250	• Ring		1			
	791-632-1280	• Spring		1			
	01252-30605	• Bolt		1			
	01580-01210	• Nut		1			
C	791-632-1200	Push tool assembly	■	1			Installation of master link on the bushing side, assembly of master link on the pin side
	791-632-1260	• Push tool		1			
	791-632-1270	• Adapter		1			
	791-632-1210	• Pin (large)		1			
	791-632-1230	• Ring		1			
	791-632-1240	• Plate		1			
	791-685-5730	• Bar		1			
	791-632-1250	• Ring		1			
	791-632-1280	• Spring		1			
	01252-30650	• Bolt		1			
	01580-01210	• Nut		1			
D	791-632-1290	Push tool assembly	■	2			
	791-685-5730	Bar		1			
	01580-01210	Nut		1			
E	791-646-7900	Push tool (for large plug)	■	1			Driving-in of plug (large)
F	790-701-3000 or 791-601-1000	Seal checker	■	1			Check of floating seal airtightness
G	791-932-1110	Push tool (for small plug)	■	1			Driving-in of plug (small)
H	791-632-1160	Guide pin	■	1			Pin hole alignment of pin and bushing

Engine and Cooling System

Remove and Install Supply Pump Assembly

Engine hood assembly - Air cleaner bracket assembly - Fuel supply valve - Fuel main filter assembly - Fuel prefilter -A

A- Fuel injection pipe - Supply pump assembly

Tools for Removal and Installation of Supply Pump Assembly

Symbol	Part No.	Part name	Necessity	Q'ty	New/Redesign	Sketch	Remarks
A	Commercially available	Wrench type torque wrench	●	1			Tightening of sleeve nut

⚠ Place the machine on a level ground, and set the parking brake lever to LOCK position.

⚠ Lower the work equipment to the ground, and set the work equipment lock lever to LOCK position.

⚠ Turn the starting switch to OFF position to stop the engine.

⚠ Turn the battery disconnect switch to OFF position, and remove the key. (For details, see Testing and Adjusting, "Handle Battery Disconnect Switch".)

NOTICE

- **Check the connector numbers and installed positions before disconnecting wirings and hoses, and write them down.**
- **Install a plug or flange in the place where a fuel hose is disconnected to prevent oil from flowing out.**
- **When disconnecting the wires and hoses, take extreme care not to damage or deform the wires and hoses by the clips and clamps. If the wires or hoses may be damaged or deformed, remove the clips and clamps before starting the work.**

REMARK

Install the removed joint bolt to the original position loosely not to lose it.

How to Remove Supply Pump Assembly

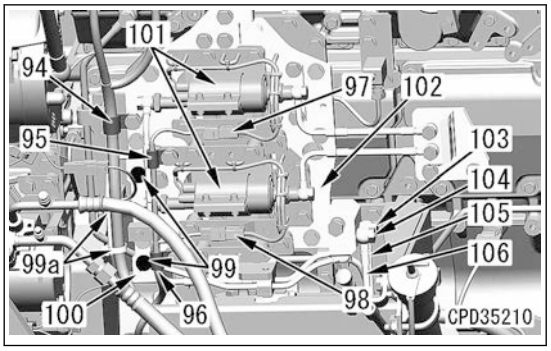
Engine hood assembly

1. Remove the engine hood assembly. See "Remove and Install Engine Hood Assembly".

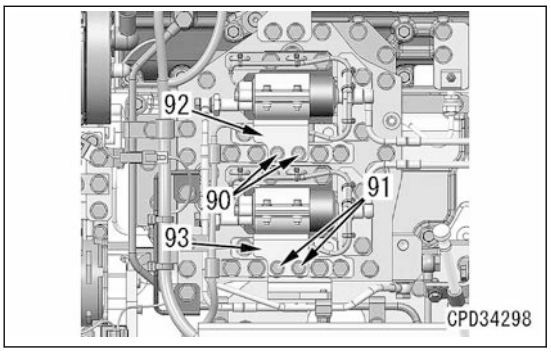
Air cleaner bracket assembly

2. Remove the air cleaner bracket assembly. See "Remove and Install Air Cleaner Assembly".

27. Install the bracket (100) to the bracket (102) of the refueling pump (101) with the bolts (99) (2 pieces).
28. Fix the wiring harness to the bar of the bracket (100) with the bands (99a) (2 pieces).
29. Connect the connectors (97) and (98), and install the clamps (94), (95), and (96).



30. Install the covers (92) and (93) with the bolts (90) and (91) (2 pieces each).



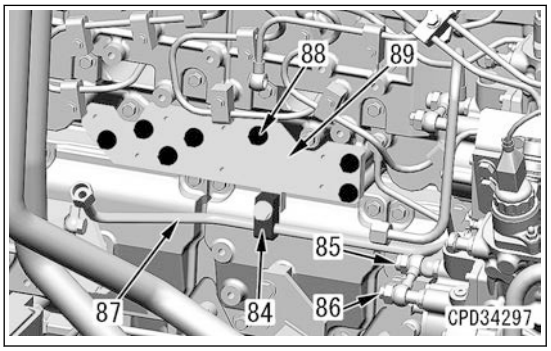
Fuel prefilter

31. Install the bracket (89) with the bolts (88) (7 pieces).
32. Install the tube (87), and install the joint bolts (85) and (86).

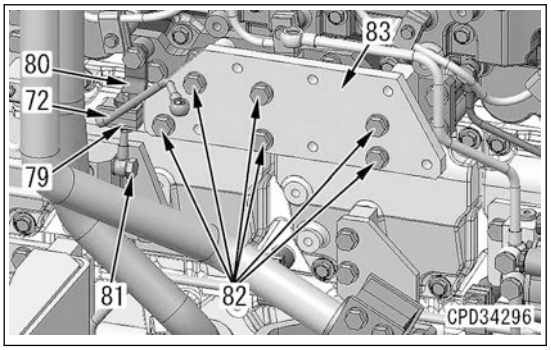
    REMARK

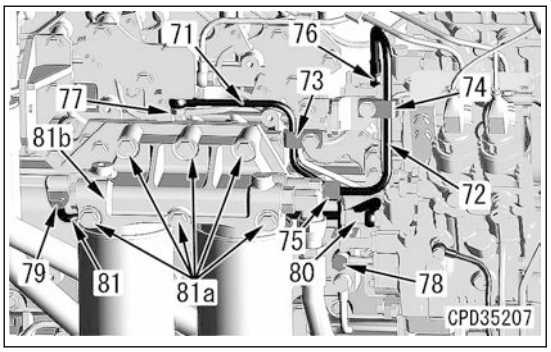
    Replace the seal washer with a new one.

    Joint bolts (85), (86):
    14.8 to 19.6 Nm {1.51 to 1.99 kgfm}
33. Install the clamp (84).



34. Install the bracket (83) with the bolts (82) (6 pieces).





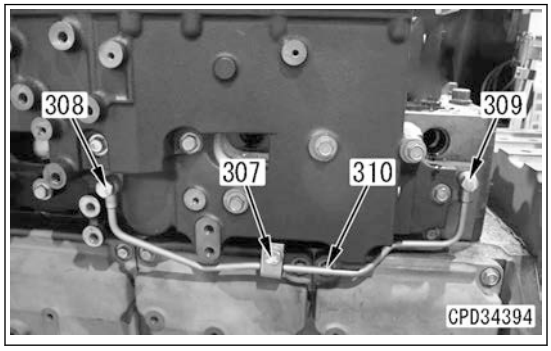
Air intake manifold

159. Remove the clamp (307).

REMARK

The clamp (307) is tightened together with the spacers.

160. Remove the joint bolts (308) and (309), and remove the tube (310).



161. Sling the air intake manifold (311), and hold it.

Air intake manifold (311):

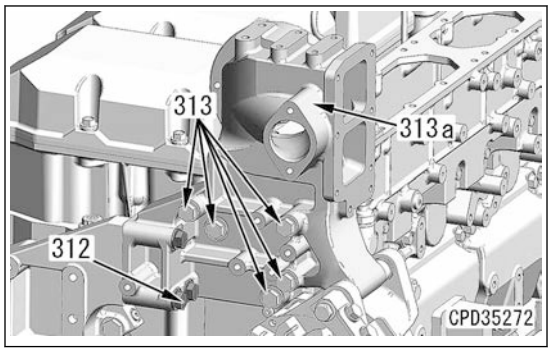
70 kg

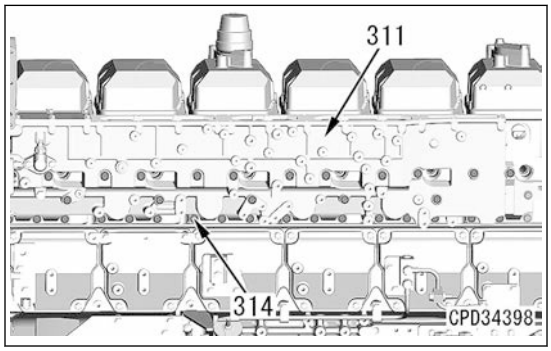
162. Remove the bolts (312) (3 pieces) and (313) (5 pieces), and remove the connector (313a).

163. Remove the bolts (314) (36 pieces), sling the air intake manifold (311), and remove it.

Air intake manifold (311):

70 kg



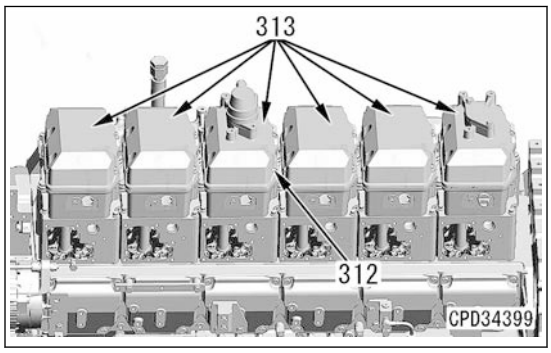


Cylinder head assembly

164. Remove the bolts (312) (6 pieces) per cylinder, and remove the cylinder head cover (313).

REMARK

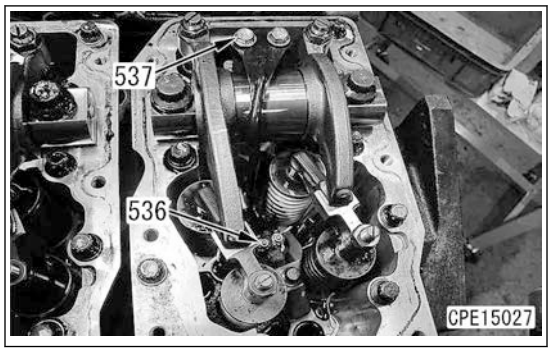
Remove the cylinder head covers (313) from all cylinders (6 pieces) according to the same procedure.



165. Remove the nuts (536) (2 pieces) and the bolts (537) (2 pieces).

REMARK

Loosen the nuts (536) alternately.



7. Check the fuel piping and component for fuel leakage.

   REMARK

   - Check the high-pressure circuit for fuel leakage focusing on the area where the color checker is sprayed.
   - If there is a fuel leakage, repair it, and perform the testing from step 1 again.

8. Start the engine and keep it running at high idle, and apply a load to the engine.

   REMARK

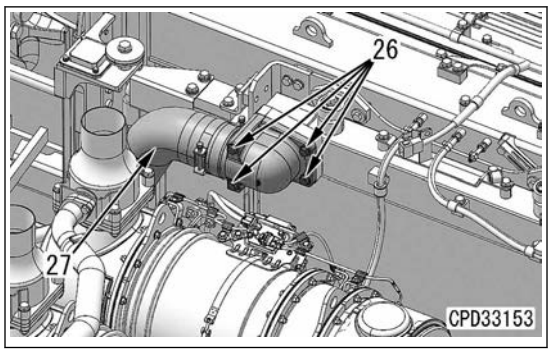
   When checking the engine for leakage as it is installed on the machine, stall the torque converter or relieve the hydraulic pump.

9. Check the fuel piping and component for fuel leakage.

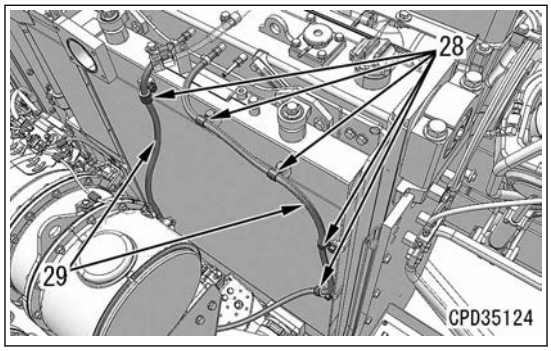
   REMARK

   - Check the high-pressure circuit for fuel leakage focusing on the area where the color checker is sprayed.
   - If there is a fuel leakage, repair it, and perform the testing from step 1 again.
   - If no fuel leakage is detected, check is complete.

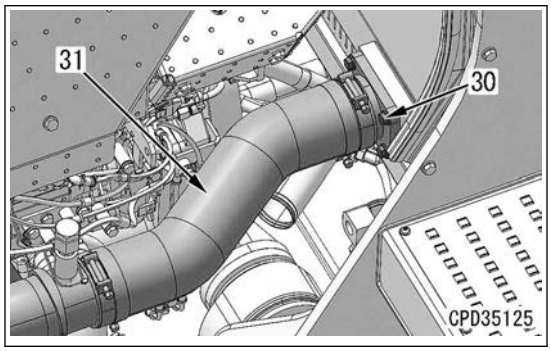
19. Remove the bolts (26) (4 pieces), and disconnect the after-cooler upper hose (27).



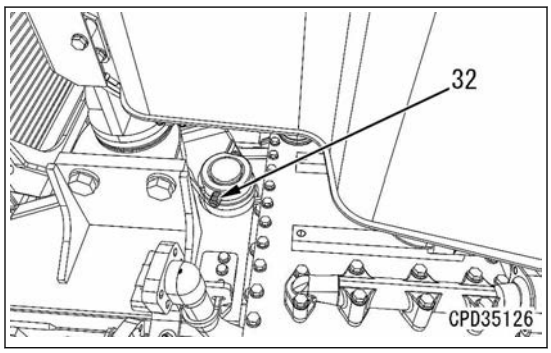
20. Remove the clamps (28) (5 places), and disconnect the hoses (29) (2 pieces).



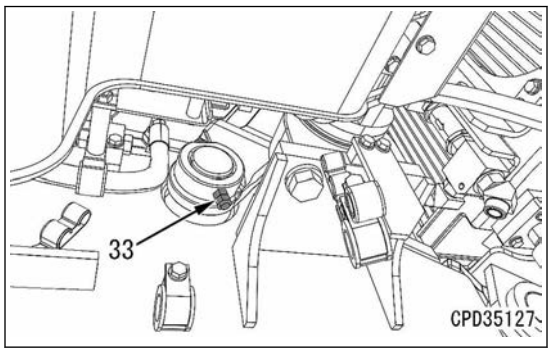
21. Remove the bolts (30) (4 pieces), and disconnect the after-cooler lower hose (31).



22. Sling the radiator guard, hold it, and remove the bolt (32).



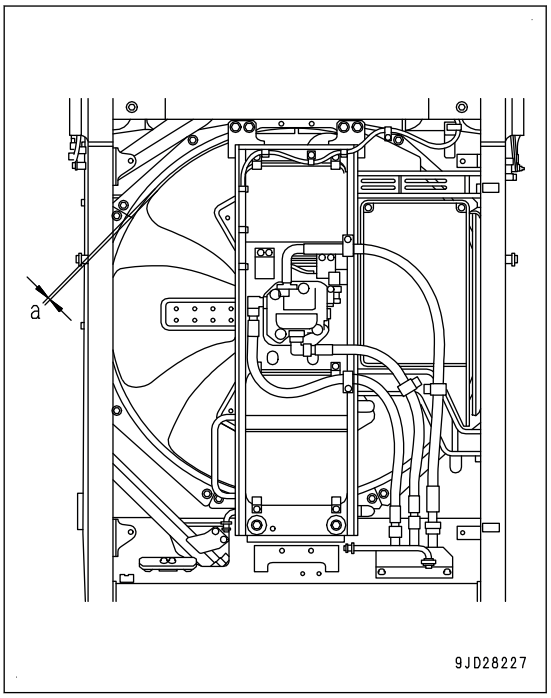
23. Remove the bolt (33).



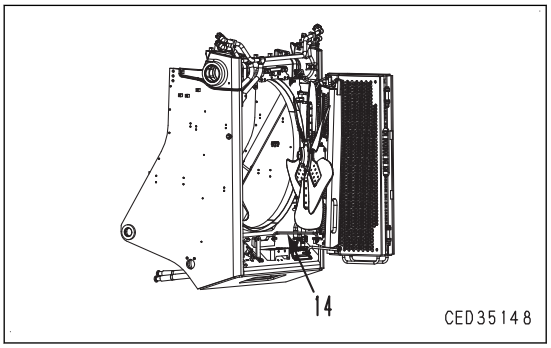
How to Close Cooling Fan Drive Assembly

1. After you install the fan, adjust the clearance (a) between the fan blade and shroud to the specified value.

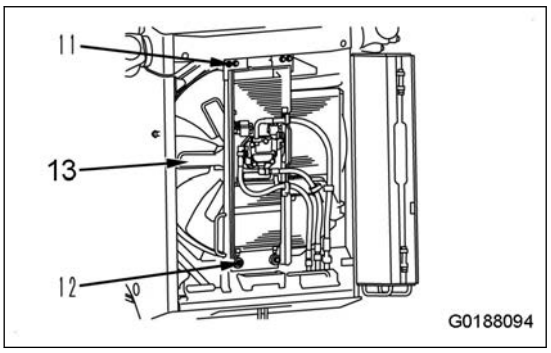
   Clearance (a): 4 to 8 mm

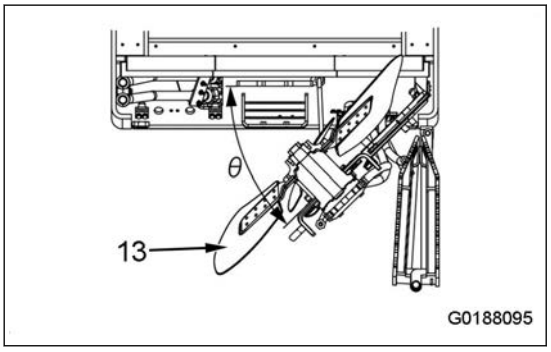


2. Remove the lock bar (14), and release the fan support.

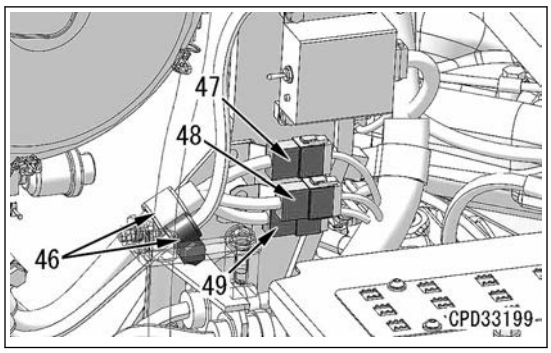


3. Close the fan (13) with the bolts (11) and (12).

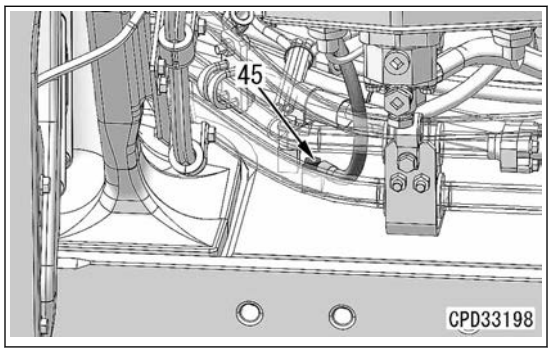




30. Connect the connectors EG3 (47), EG1 (48), and EG2 (49), and install the clamps (46) (2 places).

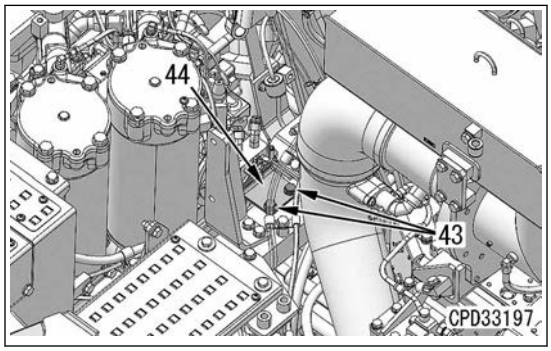


31. Connect the engine ground (45).

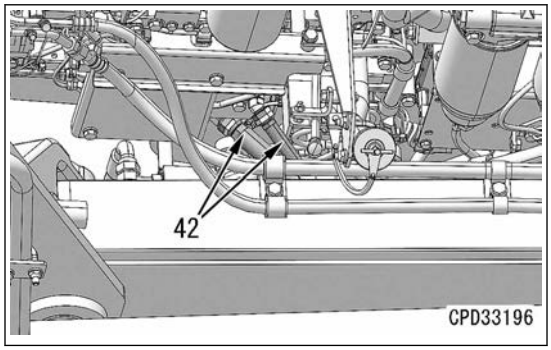


Hose, tube

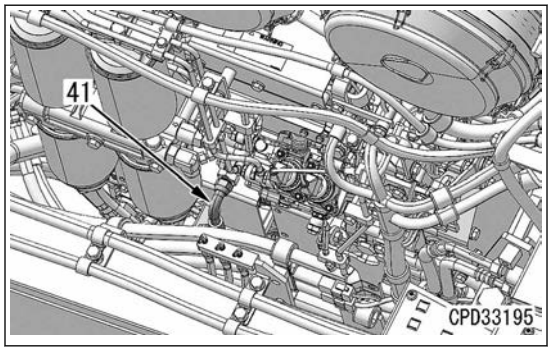
32. Install the bracket (44) with the bolts (43) (2 pieces).



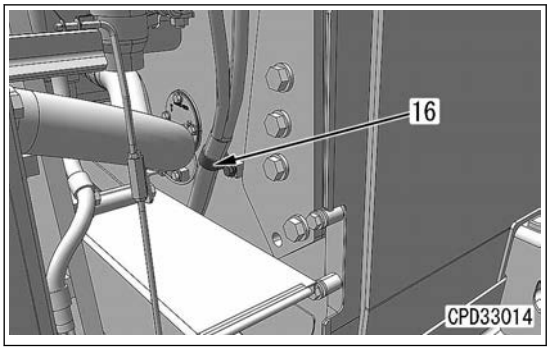
33. Connect the hoses (42) (2 pieces).



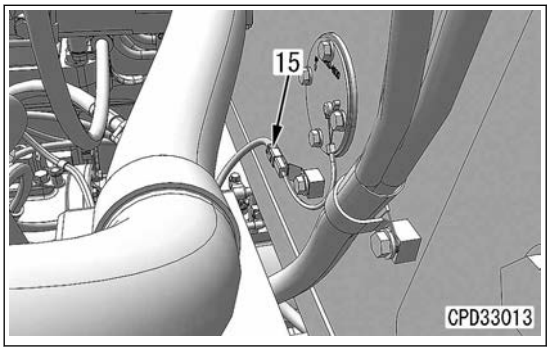
34. Connect the hose (41).



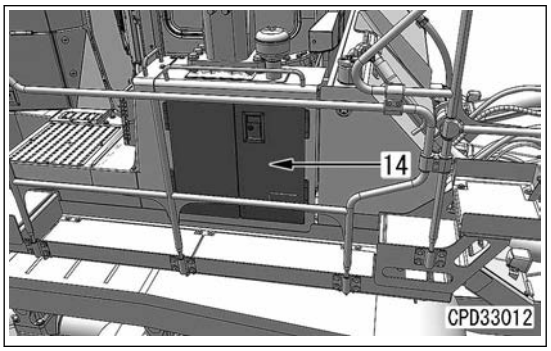
6. Install the clamp (16).



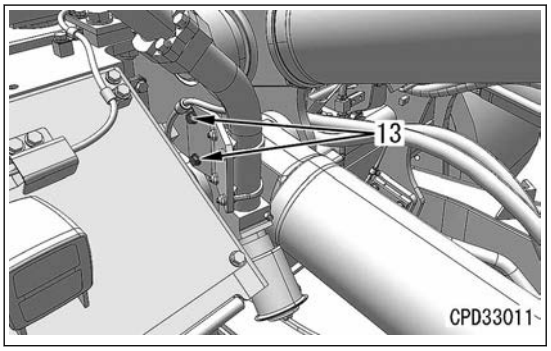
7. Connect the connector FGS (15).



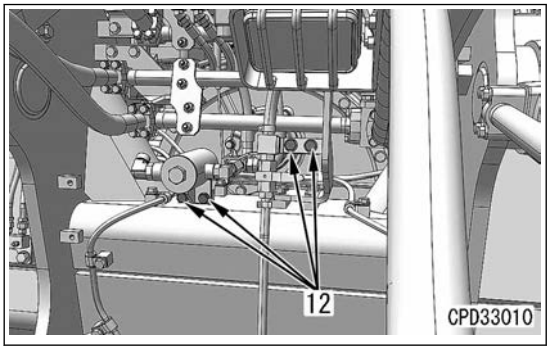
8. Close the cover (14).



9. Install the bolts (13) (2 pieces).

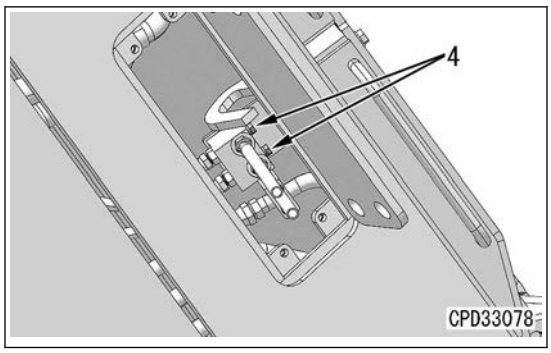


10. Install the bolts (12) (4 pieces).

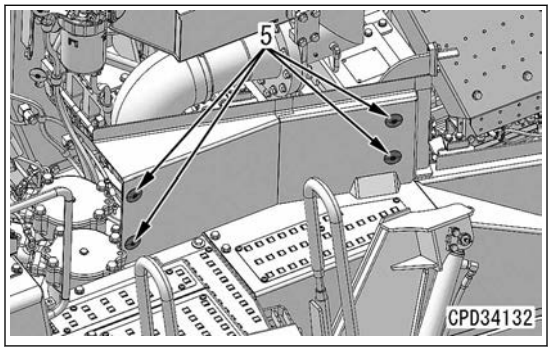


4. Loosen the bolts (4) (2 pieces), and drain coolant.

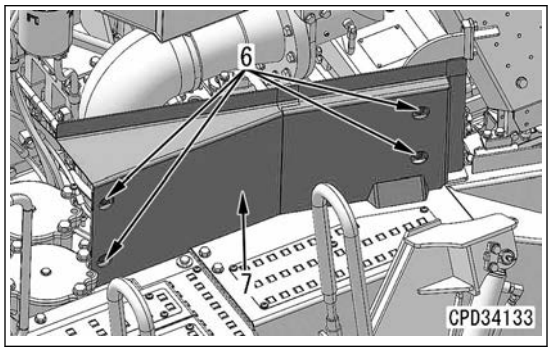
   Radiator:
   157 ℓ



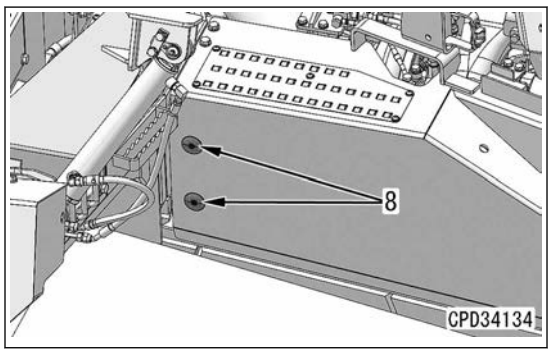
5. Remove the rubber covers (5) (4 places).



6. Remove the bolts (6) (4 pieces), and remove the cover (7).

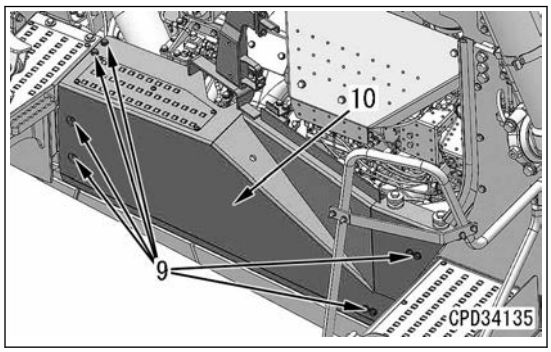


7. Remove the rubber covers (8) (2 places).



8. Remove the bolts (9) (8 pieces), sling the cover (10), and remove it.

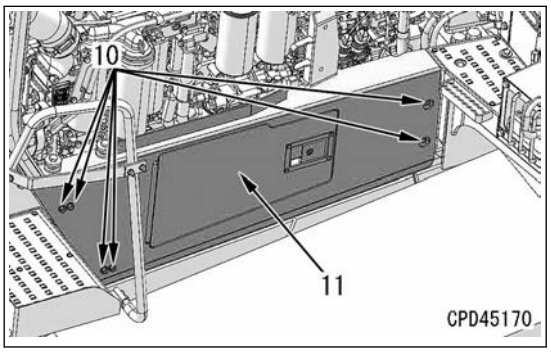
   Cover (10):
   52 kg



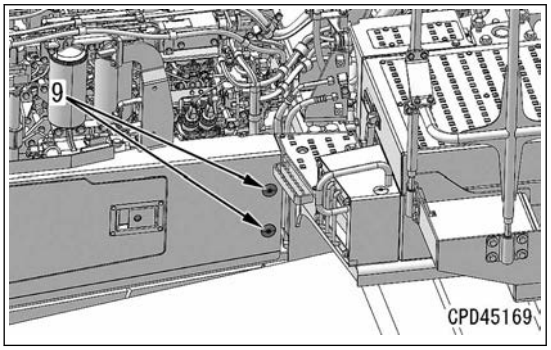
Bolt (12):
8 to 12 Nm {0.8 to 1.2 kgfm}

5. Sling the cover (11), hold it, and install the bolts (10) (6 pieces).

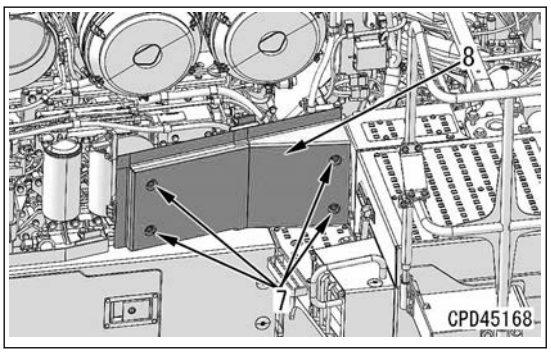
Cover (11):
46 kg



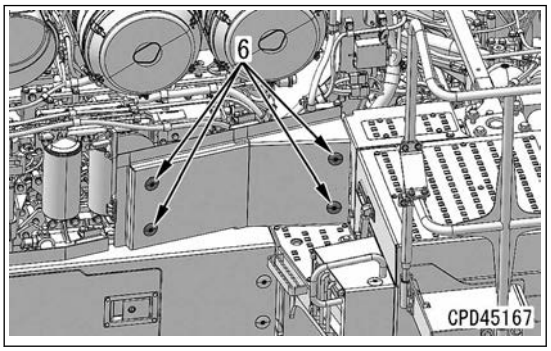
6. Install the rubber covers (9) (2 places).



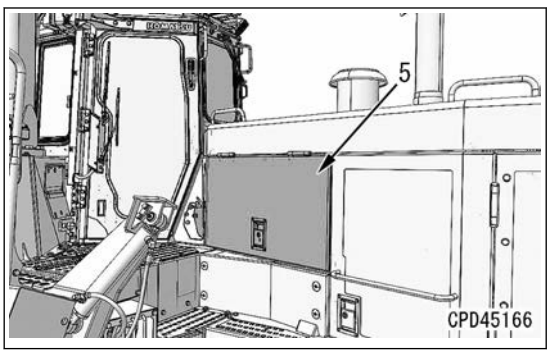
7. Install the cover (8) with the bolts (7) (4 pieces).



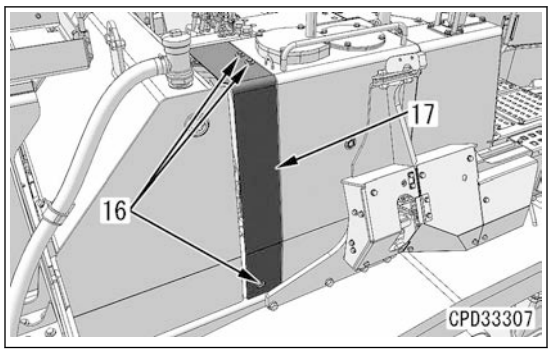
8. Install the rubber covers (6) (4 places).



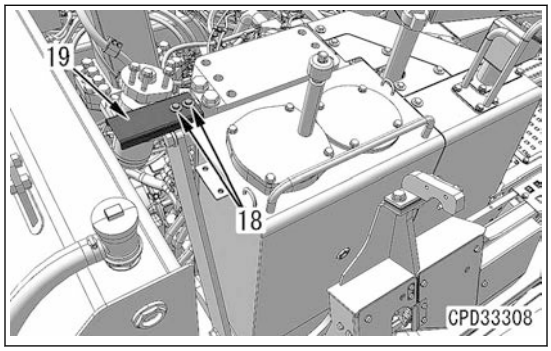
9. Close the cover (5).



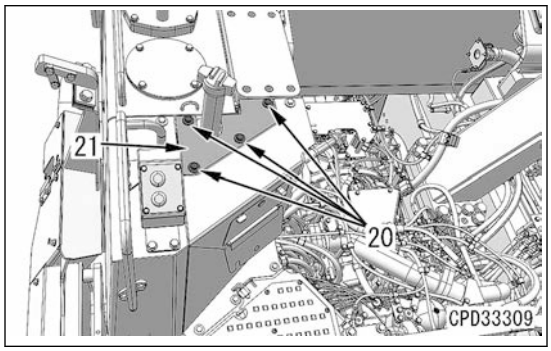
13. Remove the bolts (16) (3 pieces), and remove the cover (17).



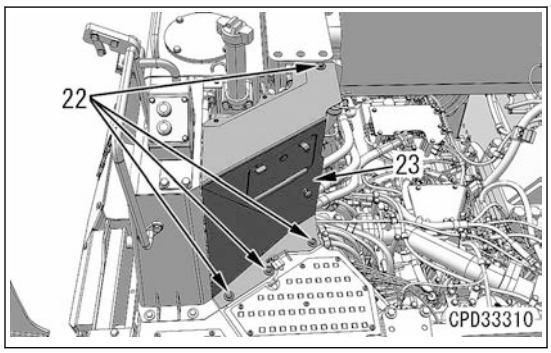
14. Remove the bolts (18) (2 pieces), and remove the cover (19).



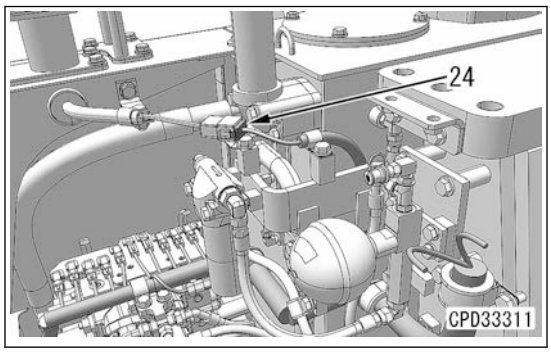
15. Remove the bolts (20) (4 pieces), and remove the cover (21).



16. Remove the bolts (22) (4 pieces), and remove the cover (23).

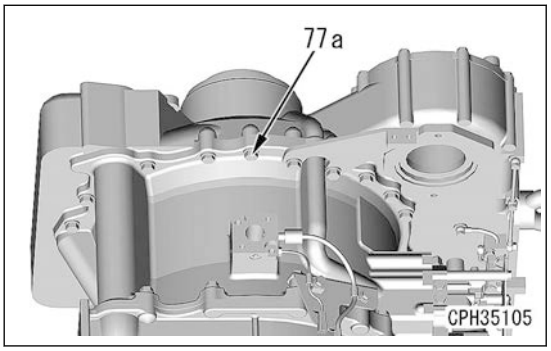


17. Disconnect the connector LS1 (24).

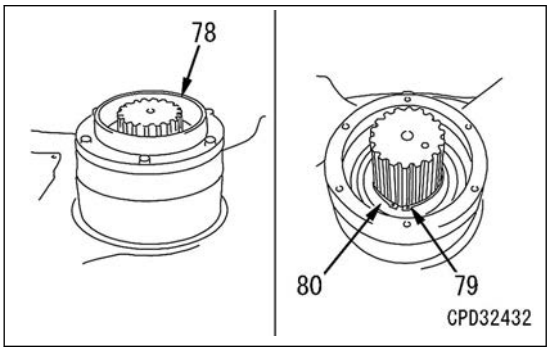


2. Sling PTO assembly (77), and install it with the bolts (77a) (20 pieces).

   Bolt (77a):
   245 to 309 Nm {25 to 31.5 kgfm}



3. Install the spacer (80), and install the snap ring (79).



Retainer

4. Adjust shims to install the retainer according to the following procedure.
   1) Install the retainer (78) (together with the oil seal (83) as a unit) without installing a shim, and install the bolt (84).

      Oil seal (83):
      Grease (G2-LI)

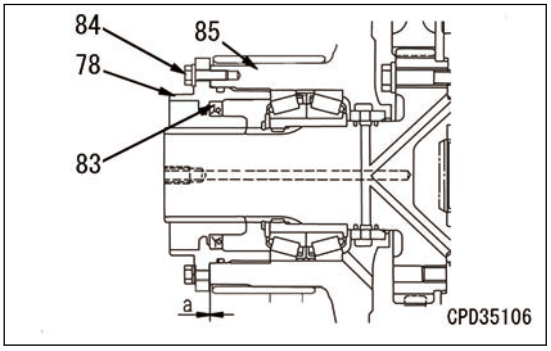
      Bolt (84):
      9.8 Nm {1 kgfm}

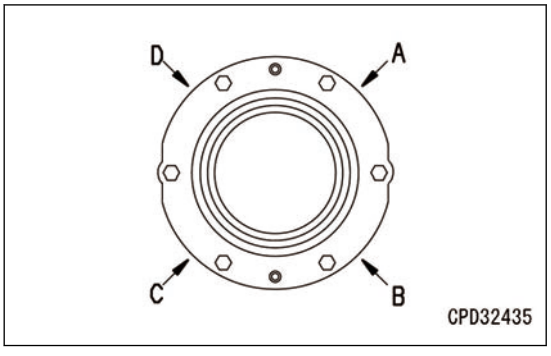
   2) By using the feeler gauge (E), measure the clearance (a) between the retainer (78) and PTO housing (85).

      REMARK

      Measure the clearance (a) at 4 places (A, B, C, and D) on the circumference, and calculate the mean value.

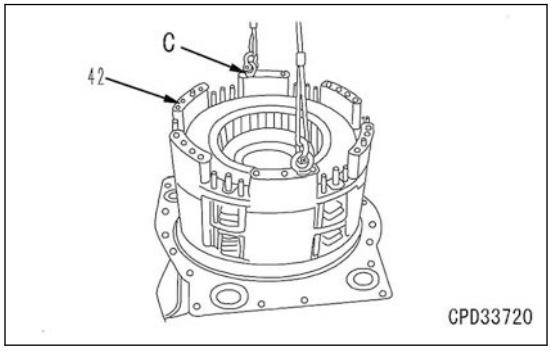
   3) Select shims to be installed to the clearance (a).
      - Total shim thickness: (a) + 0 to 0.05 mm
      - Shim type: 0.15 mm, 0.2 mm, 0.5 mm



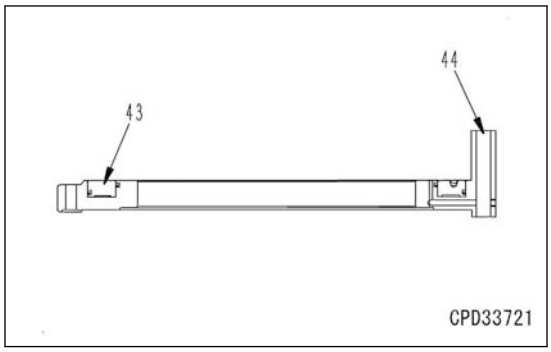


No.1 housing

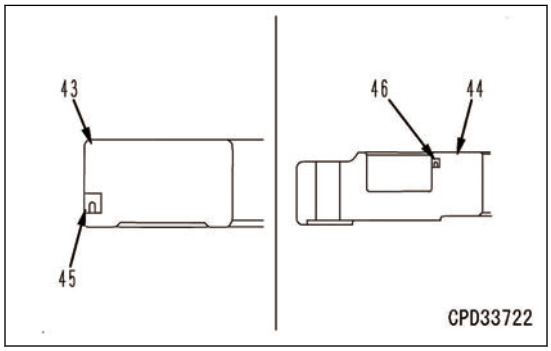
17. Remove the No.1 housing assembly (42) by using the eye-bolt (C).



18. Disassemble the No.1 housing assembly according to the following procedure.
    1) Remove the piston (43) from the housing (44).

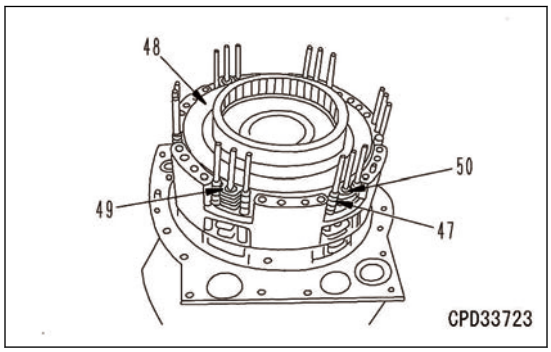


    2) Remove the seal ring (45) from the piston (43).
    3) Remove the seal ring (46) from the housing (44).

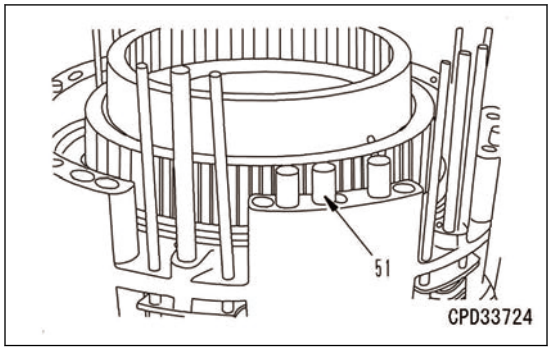


No.2 disc, plate, spring

19. Remove the springs (47) (12 pieces).
20. Remove the discs (48) (6 pieces), plates (49) (5 pieces), and springs (50) (6 pieces) alternately.

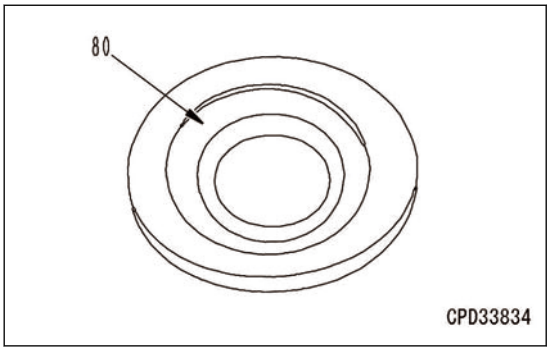


21. Remove the sleeves (51) (17 pieces).



L.H. cage

20. Invert the steering case so that the left side of the case comes to the upper side, and remove the bearing assembly (79).
21. Remove the bearing outer race (80) from the cage and bearing assembly.



How to Assemble Steering Case Assembly

REMARK

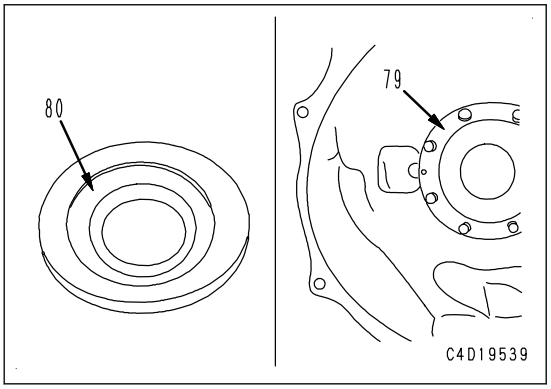
- Clean all parts, check them for dust or damage, and assemble them.
- Apply engine oil to the rotating parts of the bearing, and then rotate it a few times.
- Apply engine oil (for details, see “TABLE OF FUEL, COOLANT, AND LUBRICANTS”) to the sliding surface of each part before assembling.
- Check that the snap ring is fitted securely to the groove.

L.H. cage

1. Press fit the bearing outer race (80) by using the push tool.
2. Install the shim, and install the cage and bearing assembly (79).

   Standard shim thickness: 2 mm

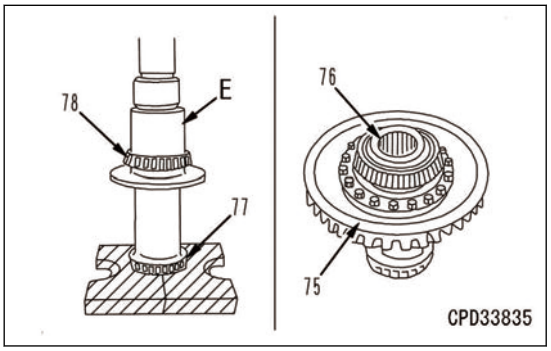
   Bolt:
   176.4±19.6 Nm {18±2 kgfm}



Bevel gear and shaft assembly

3. Assemble the bevel gear and shaft assembly according to the following procedure.
   1) Press fit the bearing inner races (78) and (77) by using the push tool (E).
   2) Set the bevel gear (75) on the shaft (76), and tighten the reamer bolt.

      Reamer bolt:
      274.4±29.4 Nm {28±3 kgfm}



REMARK

Check the hose band color.

- For the single tilt specifications, perform this work only for the R.H. track frame.
  - R.H. track frame

    (12a): Red

    (13a): -
- For the dual tilt specifications, perform this work on both sides.
  - R.H. track frame

    (12a): Red

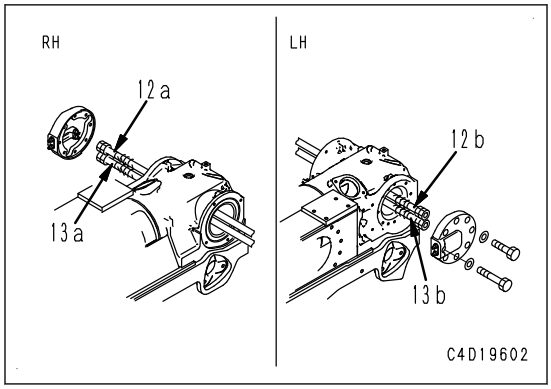
    (13a): -
  - L.H. track frame

    (12a): Blue

    (13a): -

  RH: Dual tilt and single tilt specifications

  LH: Dual tit specifications



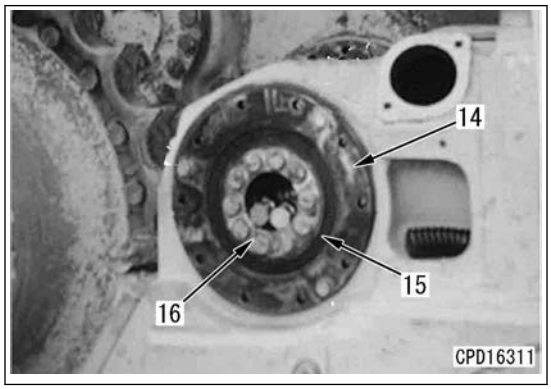
18. Remove the covers (14) (3 places on the track frame side and 6 places on the pivot frame side).

    REMARK

    - Take care not to damage O-ring.
    - Receive oil flowing out of the pivot case with the container (H).

    Pivot shaft case:

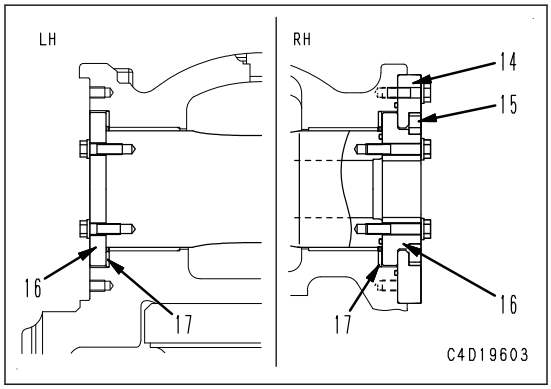
    18 ℓ



19. Remove the seal (15) together with the cover (14) as a unit.
    - For the single tilt specifications, perform this work only for the R.H. track frame.
    - For the dual tilt specifications, perform this work on both sides.
20. Remove the washer (16) and spacer (17).

    LH: Dual tit specifications

    RH: Single tilt and dual tilt specifications



Floating seal

8. Remove the floating seal (9) from the seal guides (2) and (6).

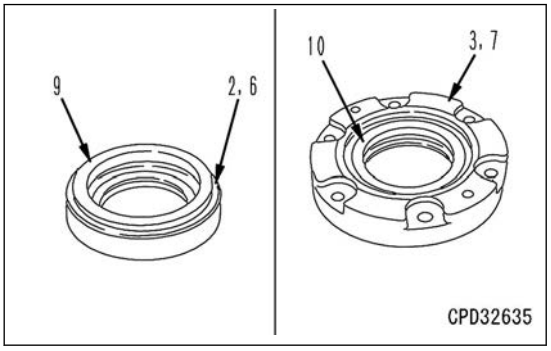
   REMARK

   Keep the floating seal to prevent it from damaging.

9. Remove the floating seal (10) from the retainers (3) and (7).

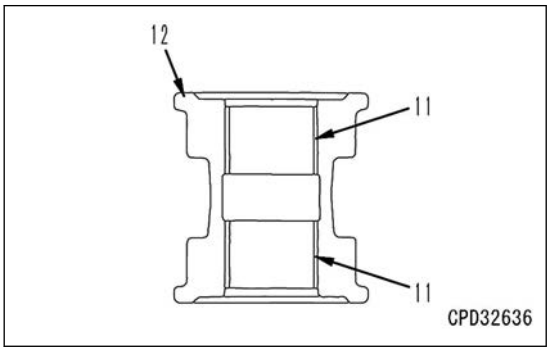
   REMARK

   Keep the floating seal to prevent it from damaging.



Bushing

10. Remove the bushings (11) (2 pieces) from the roller (12).



How to Assemble Track Roller Assembly

REMARK

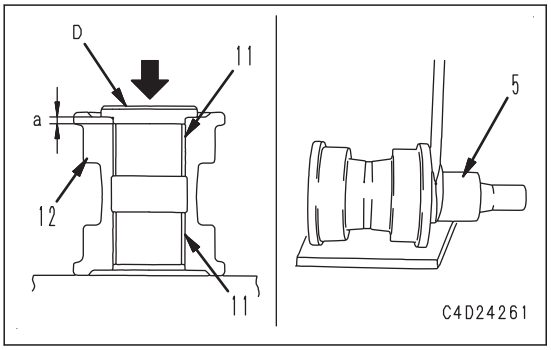
Clean all parts, and check that they are free from dirt or damage before assembling the track roller assembly.

Bushing

1. Set the roller (12) on the press, and press fit the bushing (11) by using the plate (D).

   REMARK

   - Press fit the bushing so that the dimension (a) between the roller end surface and bushing upper surface is 17±0.5 mm.
   - Tap the bushing (11) evenly by using a plastic hammer, etc. for centering, and then press fit the bushing by the press.



Shaft

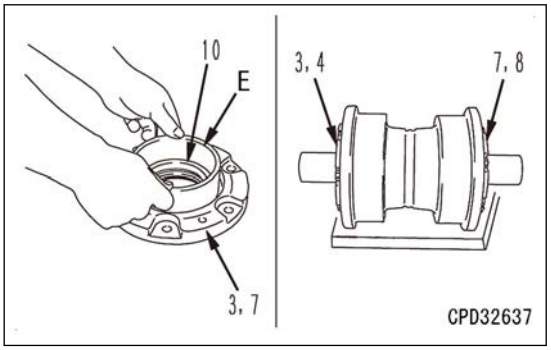
2. Set the shaft (5) to the roller (12).

Retainer

3. Install the floating seal (10) to the retainers (3) and (7) by using the installer (E).
4. Install O-rings to the retainers (3) and (7), and install the retainers (3), (7), plate (4) and (8) to the roller.

   REMARK

   Check that the plate smoothly rotates by hands.



NOTICE

- **Do not remove the seal from the link to prevent rust of the counterbore of the link. Store it without damaging the seal lip.**
- **Take rust prevention measures for the bushing press-fitting portion, shoe mating face, and master link mating face of the link.**
- **Take rust prevention measures for the pin, bushing, and spacer (entire circumference) by applying rust preventive oil, etc. Store it not to damage the bushing end surface especially.**

How to Assemble Full Track Shoes Assembly

REMARK

To perform the assembling work, see “Parts judgment guide, undercarriage, method for inverting sealed and lubricated track shoe”.

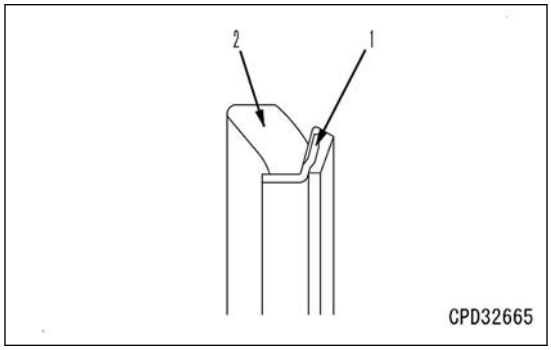
When You Assemble to Sealed and Lubricated Track

Preparatory work

1. Remove the seal assembly from the link, separate the seal ring (1) and load ring (2), and clean them.

   REMARK

   Clean the seal ring (1) and load ring (2) immediately since they are easily deteriorated by the detergent. After cleaning, wipe off the detergent by using cloth, etc.



2. Smoothly chamfer the end surface corner by using a grinder, etc. when reusing the pin. Smooth the protrusion of the press-fit portions by using a grinder.

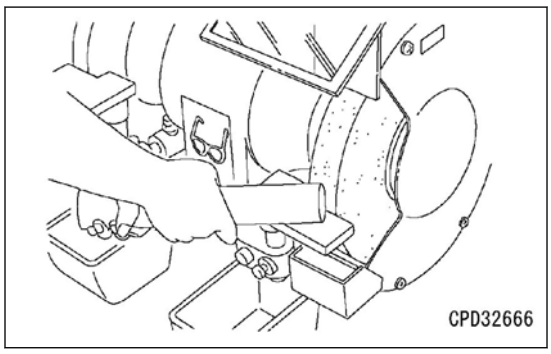
   REMARK

   If the end surface corner is sharp due to wear, the press-fitting portion is scuffed and oil leakage may occur.

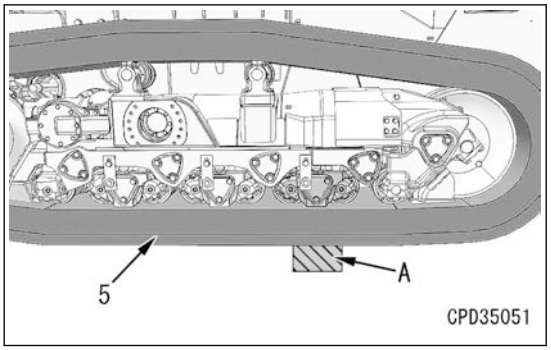
3. Clean the link, pin, bushing and spacer if they are stained. Smooth the protrusions on the link and bushing by using a grinder.

   REMARK

   - Clean them right before the assembly work since they are easily rusted.
   - Do not repair the bushing end surface by grinding, etc. Otherwise, oil leakage may occur.



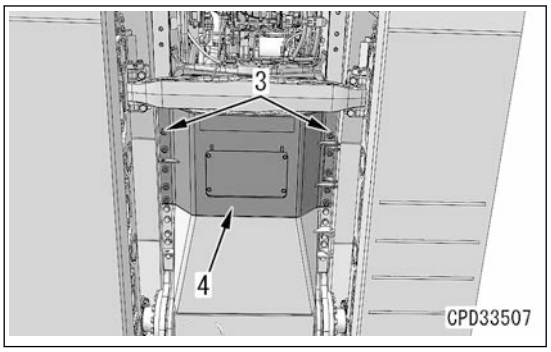
22. Remove the block (A) under the R.H. track (5) of the machine.



Underguard

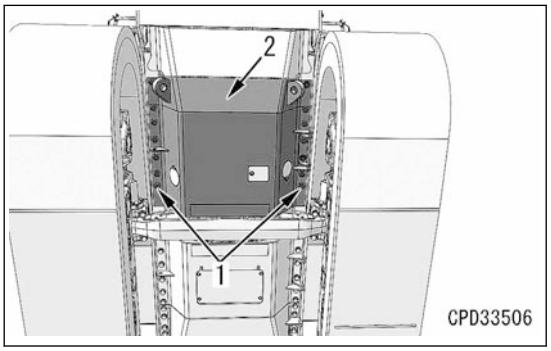
23. Install the underguard (4) with the bolts (3) (10 pieces).

Underguard (4):
270 kg



24. Install the underguard (2) with the bolts (1) (14 pieces).

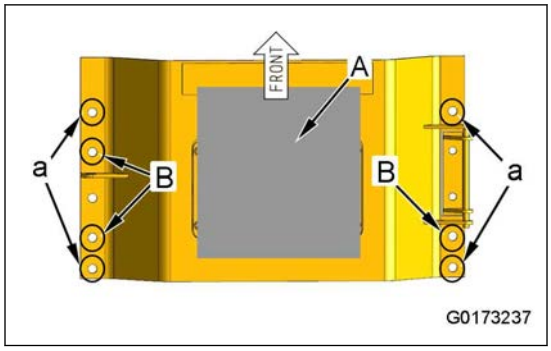
Underguard (2):
319 kg



2. Install the underguard (second one from the front of the machine) as follows.

NOTICE

- **Use the heavy object stand or steel block (A) Make sure the installation position in advance, and prepare an appropriately sized one.**
- **Install the lifting tool (D) and shackle (C) to the lifting position (a). Make sure the installation position in advance.**
- **Install the special bolt to the position (B). Make sure the installation position in advance.**



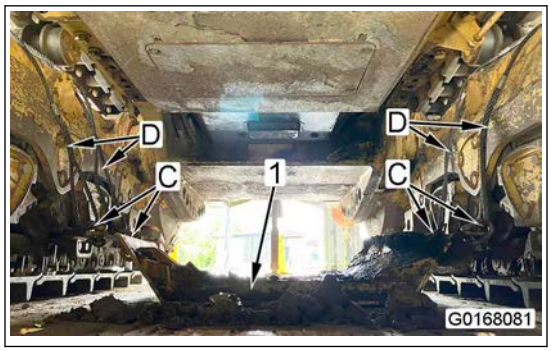
1) Install the shackles (C) and lifting tools (D) to the underguard (1).

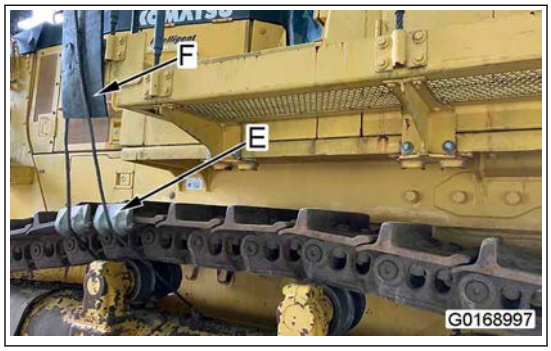
2) Wind up the wire and lift the underguard (1) slowly.

Underguard (1): 290kg

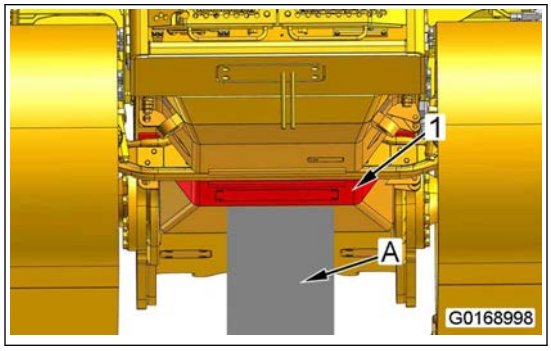
NOTICE

- **It is possible that the weight of the underguard is increased by sediment such as soil and sand. Select the lifting tool to be used in consideration of the weight of the sediment.**
- **Use the corner pad (E) to make sure that a corner of the track does not cause damage to the lifting tool.**
- **If the wire comes in contact with the frame, protect it with sheet (F).**





3) Set the heavy object stand or steel block (A) under the underguard (1).

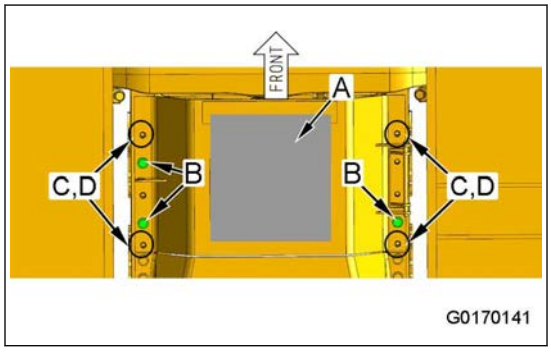


4) Install the 2 bolts (B) on the right side and 1 bolt (B) on the left side.

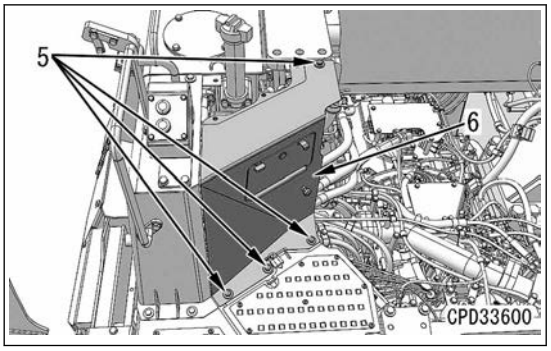
- Length of bolt (B): 100mm

REMARK

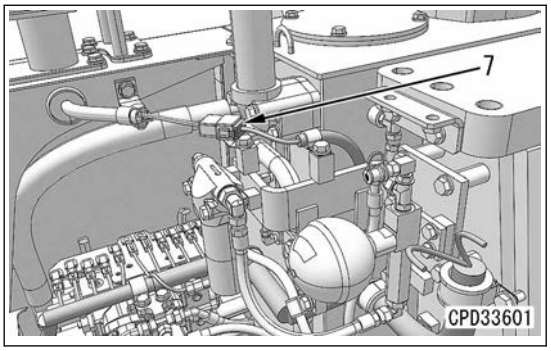
- Use the bolt (B) to secure the clearance to install the shackle between the frame and underguard (1).



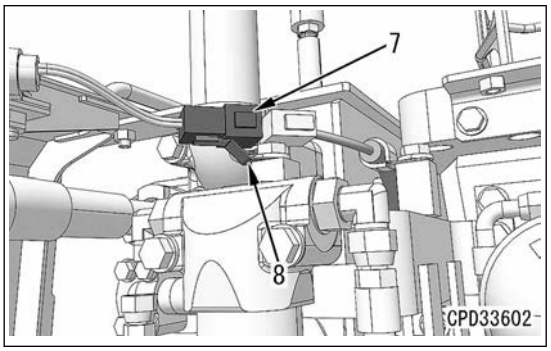
4. Remove the bolts (5) (4 pieces), and remove the cover (6).



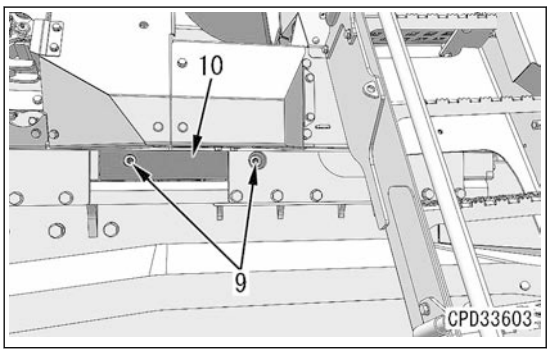
5. Disconnect the connector LS1 (7).

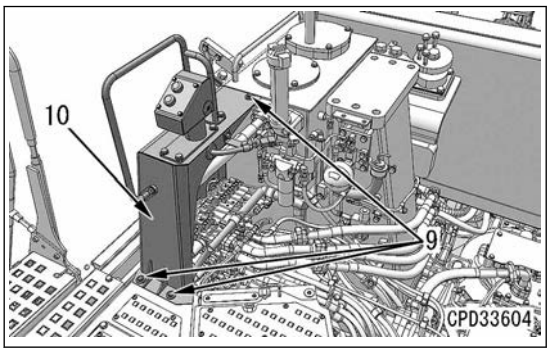


6. Remove the connector LS1 (7) from the connector board (8).

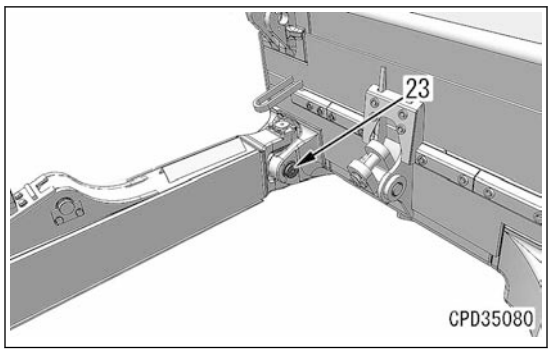


7. Remove the bolts (9) (5 pieces), and remove the cover (10).





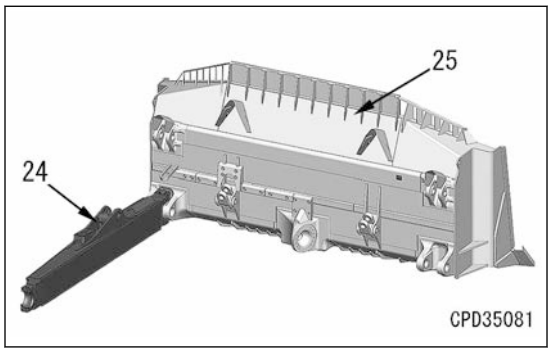
22. Remove the pin (23).



23. Remove the L.H. straight frame assembly (24), and remove the blade assembly (25).

L.H. straight frame assembly (24):
1270 kg

Blade assembly (25):
7810 kg



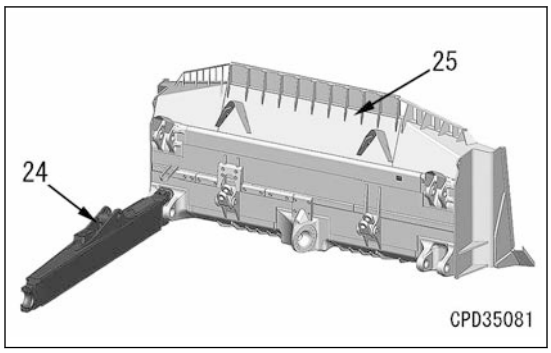
How to Assemble Blade Assembly

L.H. straight frame assembly, blade assembly

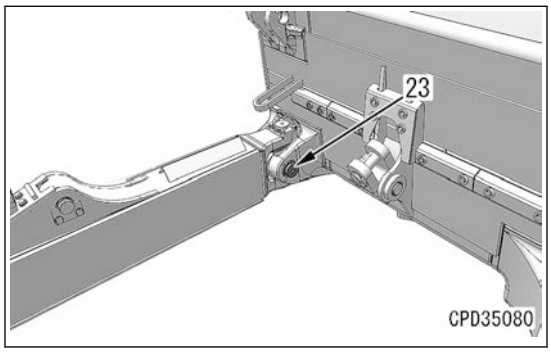
1. Set the blade assembly (25), and install the L.H. straight frame assembly (24).

L.H. straight frame assembly (24):
1270 kg

Blade assembly (25):
7810 kg



2. Install the pin (23).



Fuel tank assembly

14. Install the fuel tank assembly. See “Remove and Install Fuel Tank Assembly”.

Refilling with coolant

15. Refill the radiator with coolant to the specified level through the coolant filler port. Run the engine to circulate the coolant, and then check the coolant level again.

    Radiator:

    157 ℓ

Air conditioner gas

16. Refill with the refrigerant (air conditioner gas: R134a) from the air conditioner circuit.

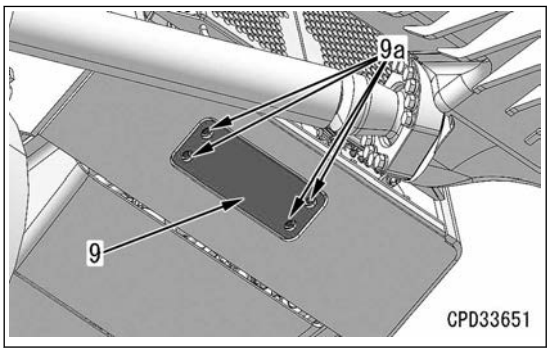
    REMARK

    Refrigerant filling quantity: 1000±50 g

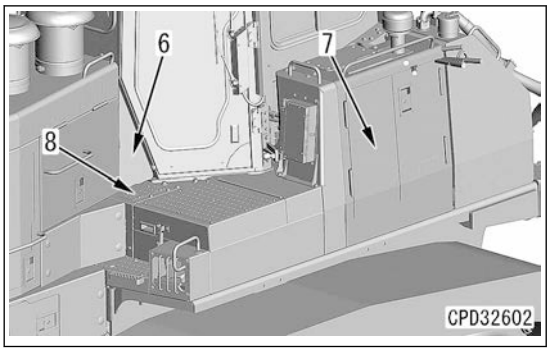
17. Refill with air conditioner compressor oil. See “HANDLE AIR CONDITIONER COMPRESSOR OIL”.

Cover

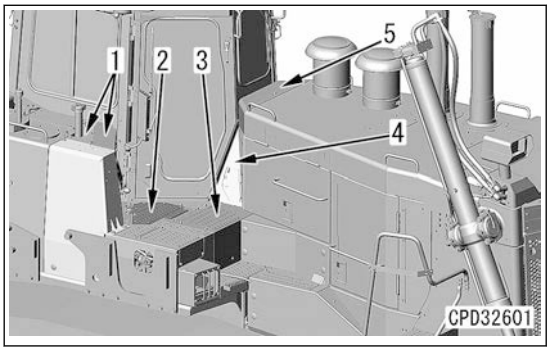
18. Install the undercover (9) with the bolts (9a) (4 pieces).



19. Install the cover (8).
20. Install the covers (6) and (7) on the left side of the machine.



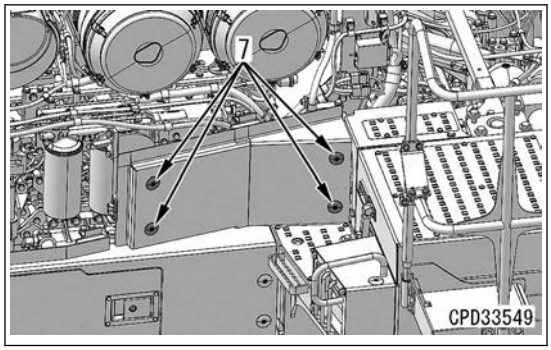
21. Install the covers (1), (2), (3), (4), and (5) on the right side of the machine.



ROPS assembly

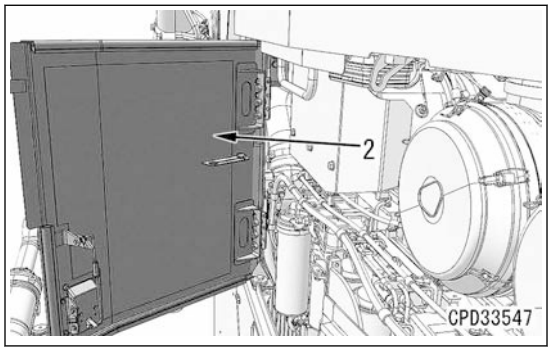
22. Install ROPS assembly. See “Remove and Install ROPS Assembly”.

12. Install the caps (7) (4 places).

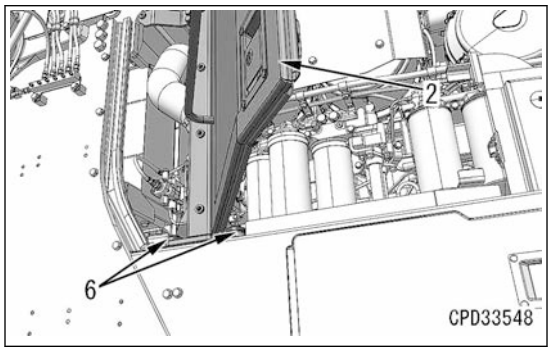


13. By using the lifting tool, sling the cover (2), and hold it.

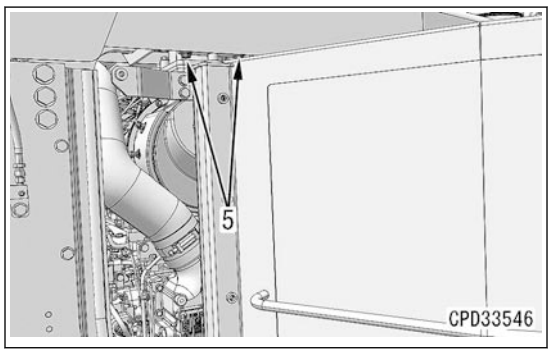
Cover (2):
37 kg



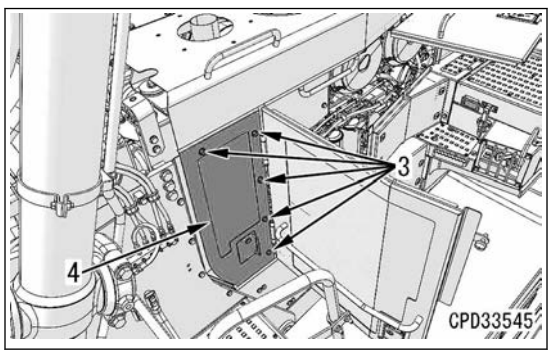
14. Install the cover (2) with the bolts (6) (2 pieces).



15. Install the bolts (5) (2 pieces).



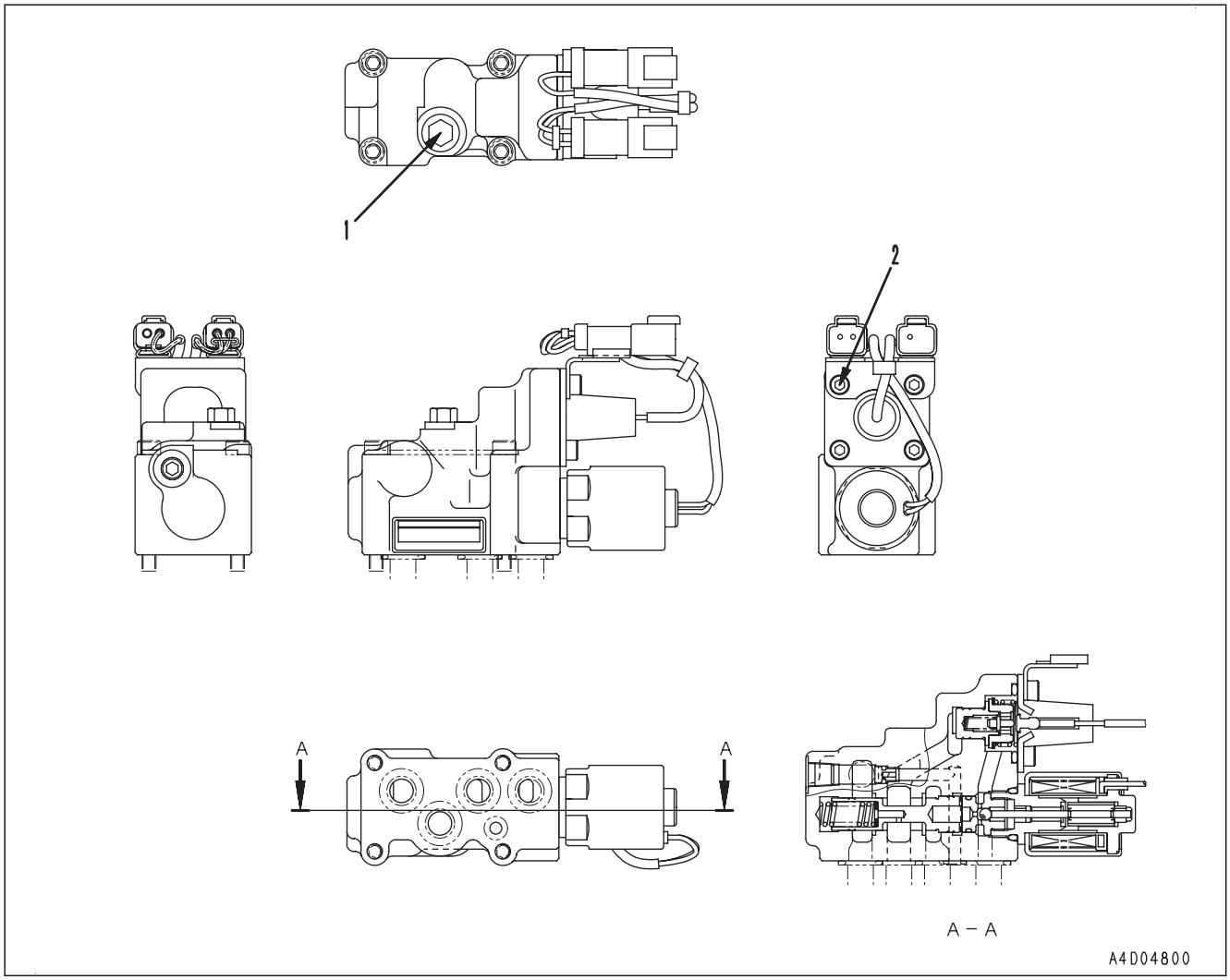
16. Install the cover (4) with the bolts (3) (5 pieces).



Maintenance Standard for Stator Clutch ECMV

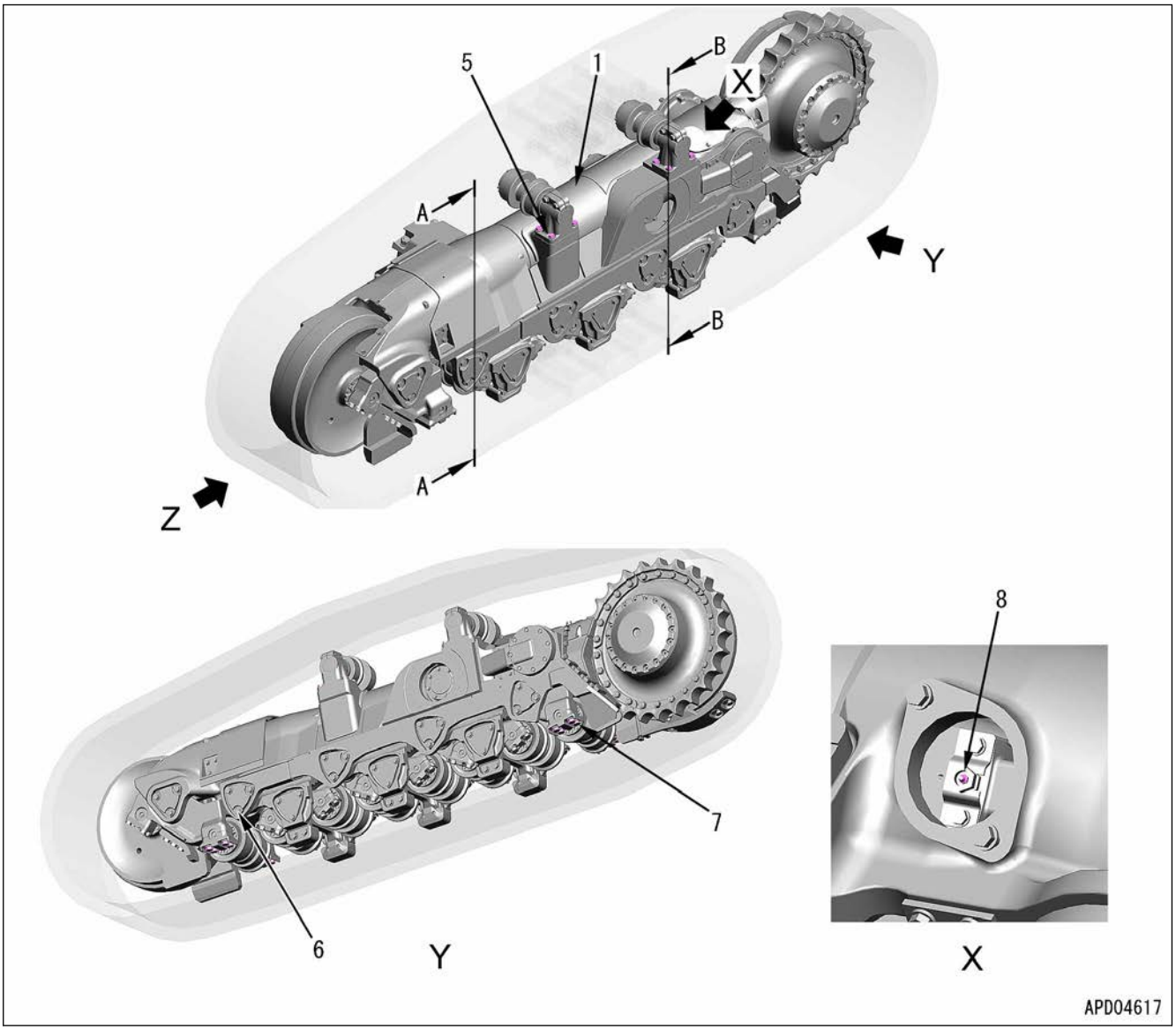
NOTICE

Do not disassemble. It will require adjustment to obtain optimum performance.



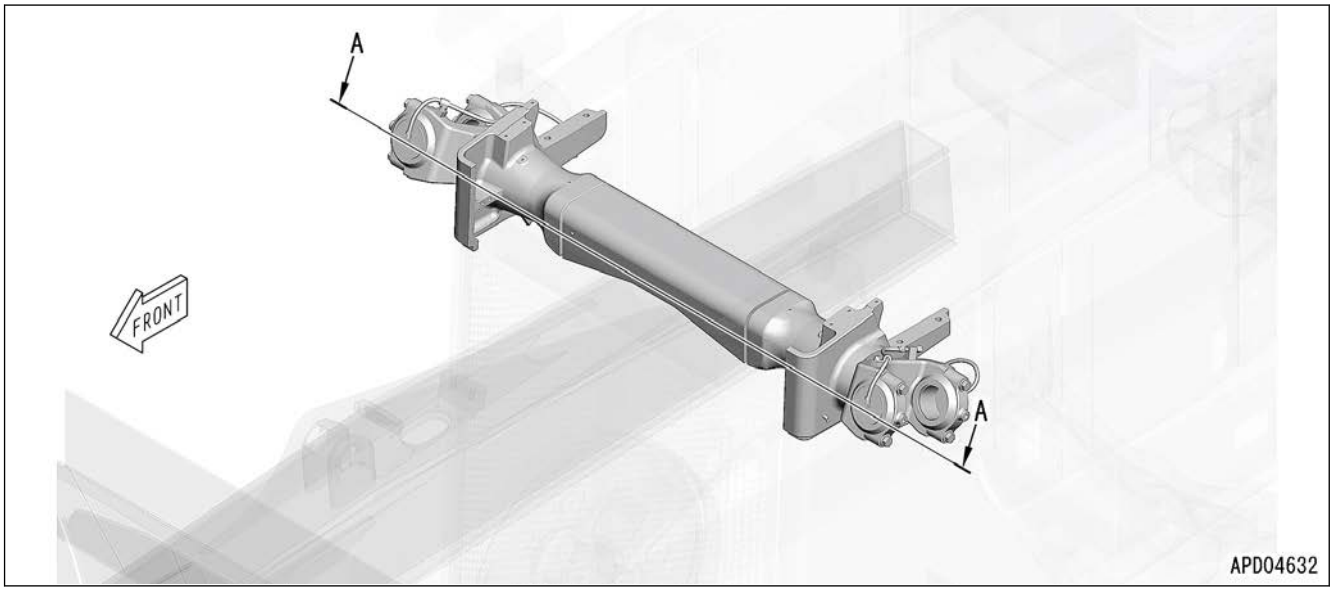
No.	Item	Judgment criteria	Remedy
1	Tightening torque of the bolt	9.8 to 12.74 Nm {1 to 1.8 kgfm}	Re-tighten
2	Tightening torque of the bolt	4.9 to 6.9 Nm {0.5 to 0.7 kgfm}	

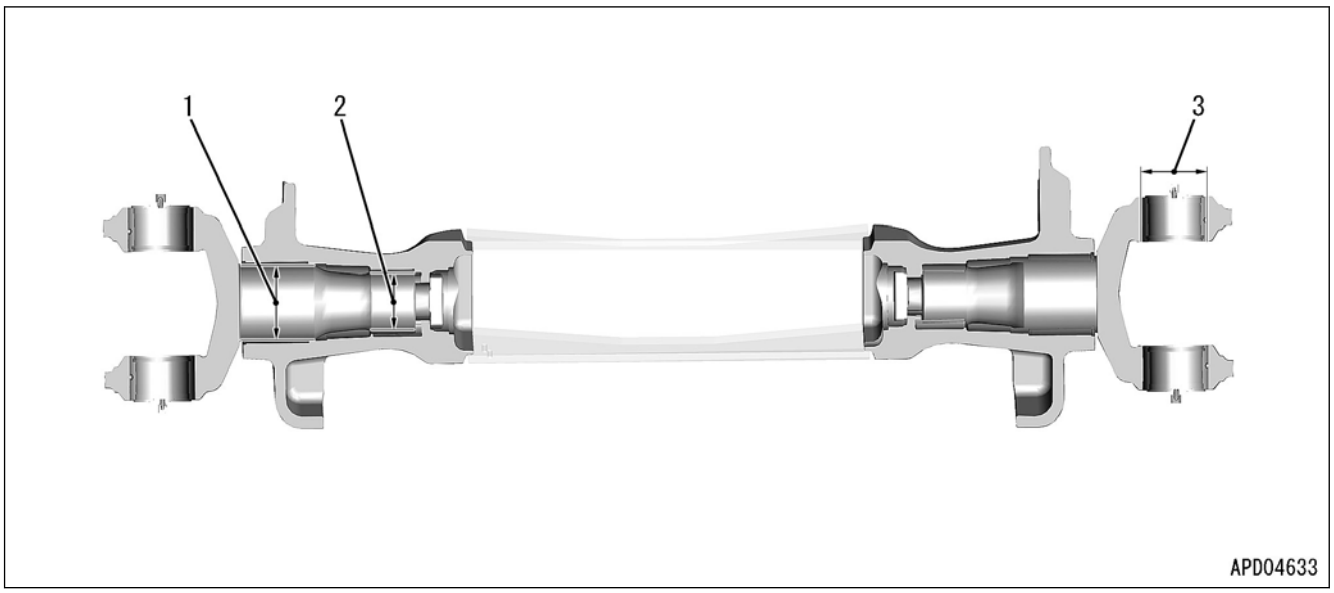
Maintenance Standard for Track Frame and Idler Cushion



Work Equipment

Maintenance Standard for Cylinder Stay





Unitmm

No.	Item	Judgment criteria					Remedy
		Standard dimensions	Tolerance		Standard clearance	Allowable clearance	
			Shaft	Hole			
1	Clearance between cylinder yoke and bushing	150	-0.085 -0.148	+0.063 0	0.085 to 0.211	0.5	Replace
2	Clearance between cylinder yoke and bushing	115	-0.072 -0.126	+0.054 0	0.072 to 0.180	0.5	
3	Clearance between lift cylinder support shaft bushing and yoke	105	-0.120 -0.207	+0.035 0	0.120 to 0.242	0.5	

J: Foot vents
1: Evaporator
2: Heater core
3: Expansion valve
4: Blower fan, blower motor
5: Air mix servomotor
6: Air mix door
7: Vent (mode) changeover servomotor
8: Rear door
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” may be expressed 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, the temperature setting data is sent to the air conditioner controller 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 the change in resistance of evaporator temperature sensor (14) into the change in voltage to determine the temperature of evaporator (1).
- The air conditioner controller operates the compressor clutch relay *1 to stop the compressor so that evaporator (1) does not freeze.

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

Air Flow Adjustment

Whenever an air flow control switch is operated on the machine monitor, air flow setting data is sent to the air conditioner controller. The air conditioner controller controls blower motor (4) by using power transistor (13) in order to adjust the air flow.

Vent (Mode) Changeover

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

FRESH/RECIRC Air Changeover

FRESH/RECIRC air changeover setting data is sent to the air conditioner controller according to the operation of FRESH/RECIRC air changeover switch on the machine monitor. The air conditioner controller controls FRESH/RECIRC air changeover servomotor (11) to open/close FRESH/RECIRC air changeover door (12).

Automatic Mode of Air Conditioner

- Inside air temperature sensor (15) senses the inside temperature by the change in resistance. The air conditioner controller converts the change in resistance of inside air temperature sensor (15) into change in voltage and senses the inside temperature by the change in voltage.
- The air conditioner controller checks the voltage of inside air temperature sensor (15) and controls the inside temperature to the temperature set by the machine monitor.
- Air conditioner considers the information of the sunlight sensor and outside air temperature sensor for control of the inside temperature.

Examine Vent (Mode) Changeover

⚠ **Park the machine on a level ground, lower the work equipment to the ground in a stable posture, set the lock lever to LOCK position, and stop the engine.**

⚠ **Turn the battery disconnect switch to OFF position, and remove the key.**

Write down the connector numbers and installed positions before disconnecting wiring harnesses and hoses.

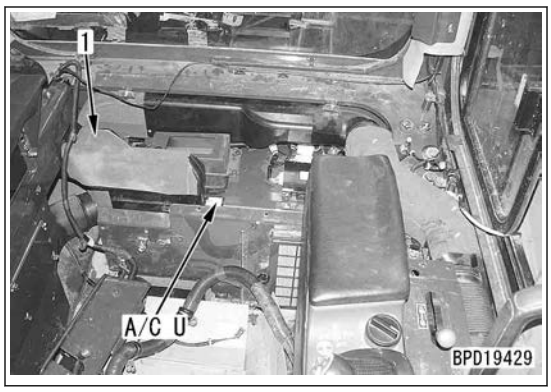
How to Examine Vent (Mode) Changeover

The vents (mode) are selected by changing the angle of three doors (dampers) provided inside. Door (damper) angles are changed by servomotors via internal linkages. These changeover mechanism cannot be seen from the outside. Check the opening and closing operation of the defroster and rear face door (damper) visually.

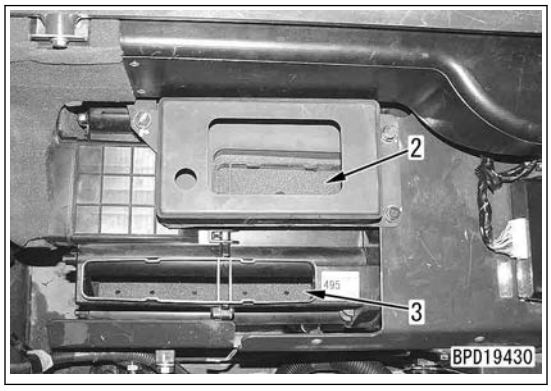
REMARK

To reset the self-diagnosis (clear the air conditioner related failure codes displayed on the “Electrical Systems” (electrical systems abnormality record) screen in the service mode of the machine monitor), the starting switch must be turned OFF (while abnormality is detected by self-diagnosis, no signals are output to the servomotor).

1. Referring to “Air conditioner unit, air conditioner controller” of “INSTALLATION LOCATIONS OF AIR CONDITIONER PARTS AND ARRANGEMENT OF CONNECTORS”, remove the operator's seat rear cover.
2. Remove defroster duct (1).
3. Turn the battery disconnect switch to the “ON” position.
4. Start the engine and turn on the air conditioner power.



5. Press the vent changeover switch on the air conditioner operation screen of the machine monitor and visually check that rear door (damper) (2) and defroster door (damper) (3) move smoothly.



After finishing the inspection, turn the starting switch to the “OFF” position.

Circuit Diagram of FRESH/RECIRC Air Changeover