SEN06781-03

Shop Manual

BULLDOZER

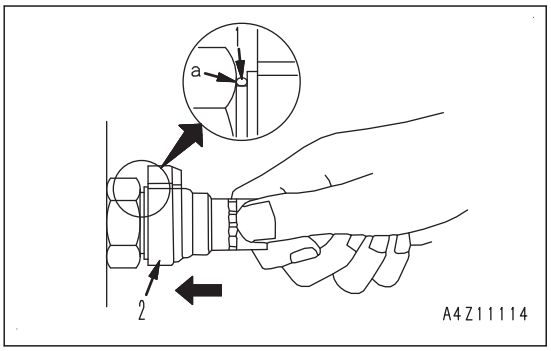
D475A-8E0

SERIAL NUMBERS 50001 and up

KOMATSU

Connection

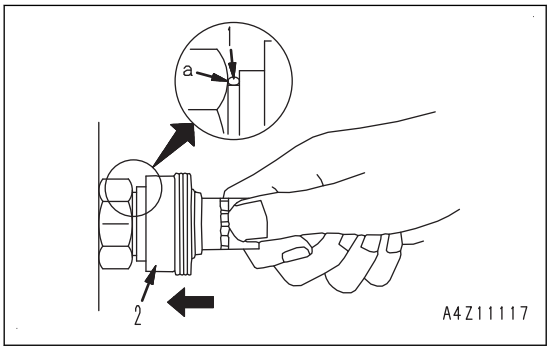
Hold the tightening adapter part, and push body (2) straight until sliding prevention ring (1) contacts contact surface (a) of the hexagonal part at the male end.



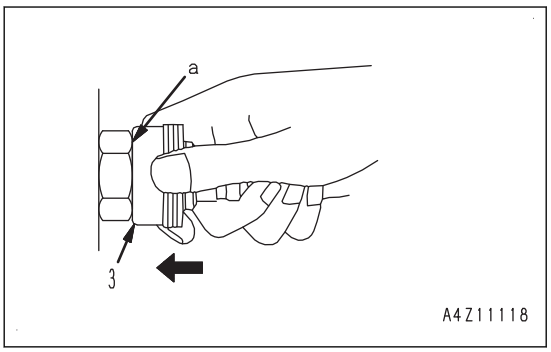
METHOD FOR DISCONNECTING AND CONNECTING TYPE 3 PUSH-PULL TYPE COUPLER

Disconnection

1. Hold the tightening adapter part and push body (2) straight until sliding prevention ring (1) contacts contact surface (a) of the hexagonal part at the male end.



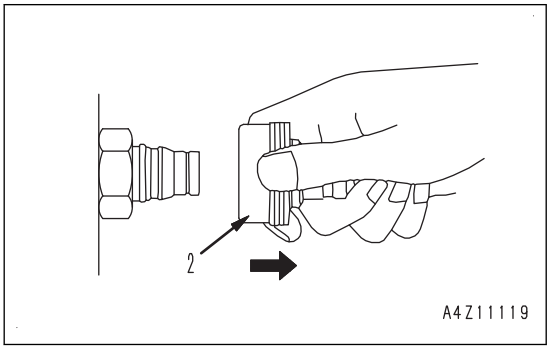
2. While keeping the condition of step 1, push cover (3) straight until it contacts contact surface (a) of the hexagonal portion on the male side.



3. While keeping the conditions of steps 1 and 2, pull out whole body (2) to disconnect it.

   REMARK

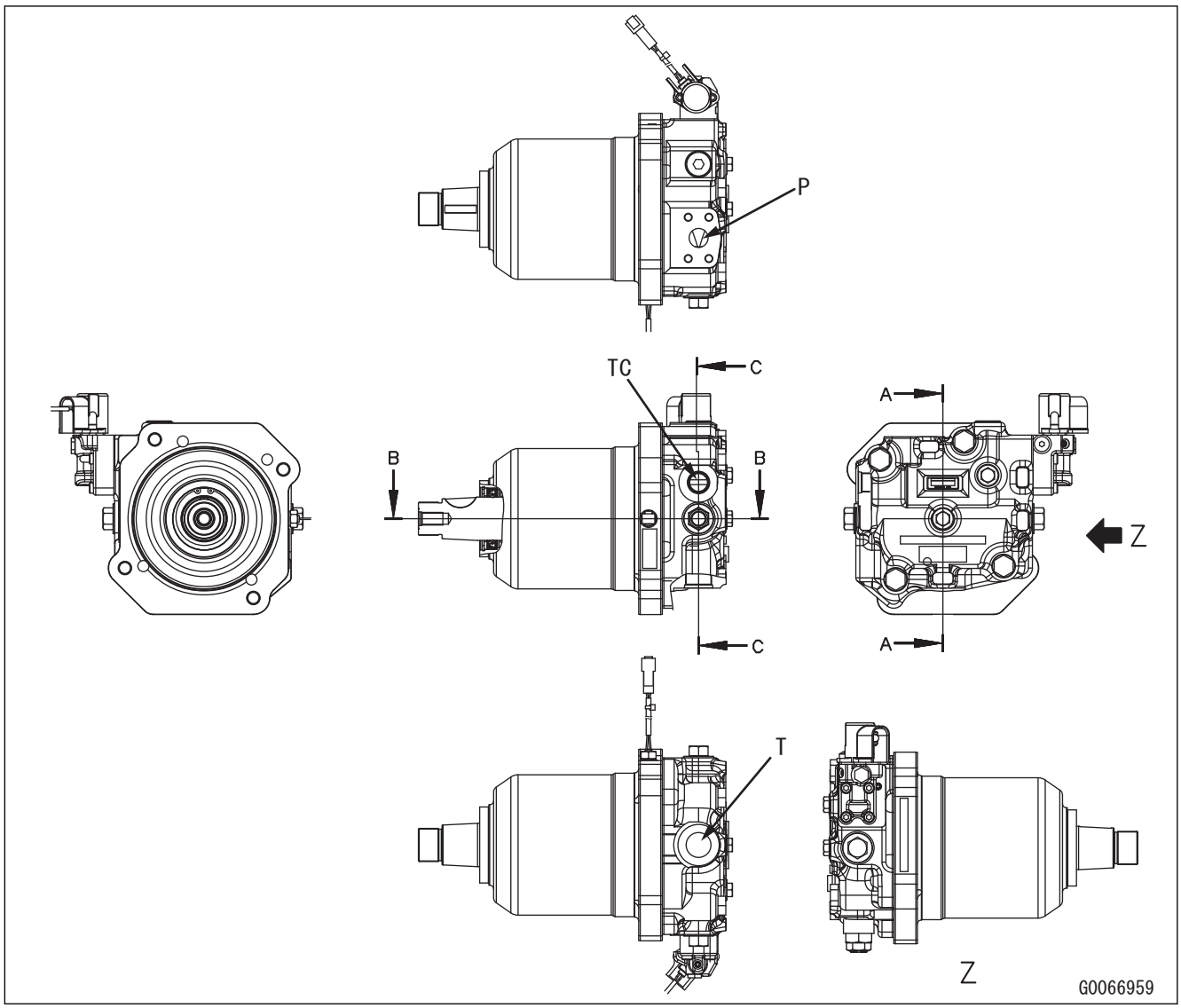
   Provide an container to receive a quantity of hydraulic oil which may flow out.



blocked. When hydraulic pressure in the chamber (B) is lowered, the swash plate angle goes back to the direction of the maximum. The swash plate angle is fixed to the position where oil pressure in the chamber (A) and reaction force of the spring (8) are balanced.

COOLING FAN MOTOR

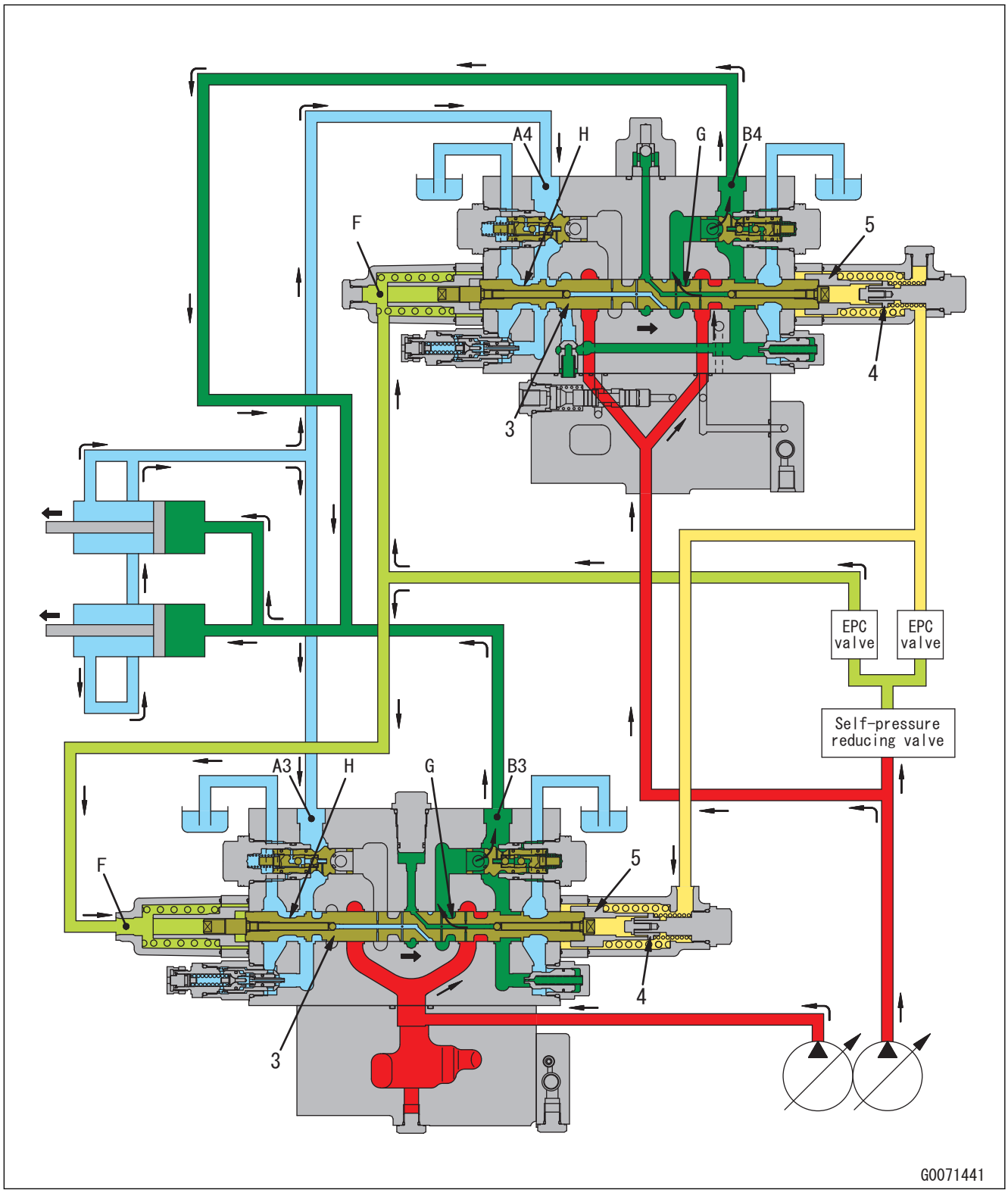
STRUCTURE OF COOLING FAN MOTOR



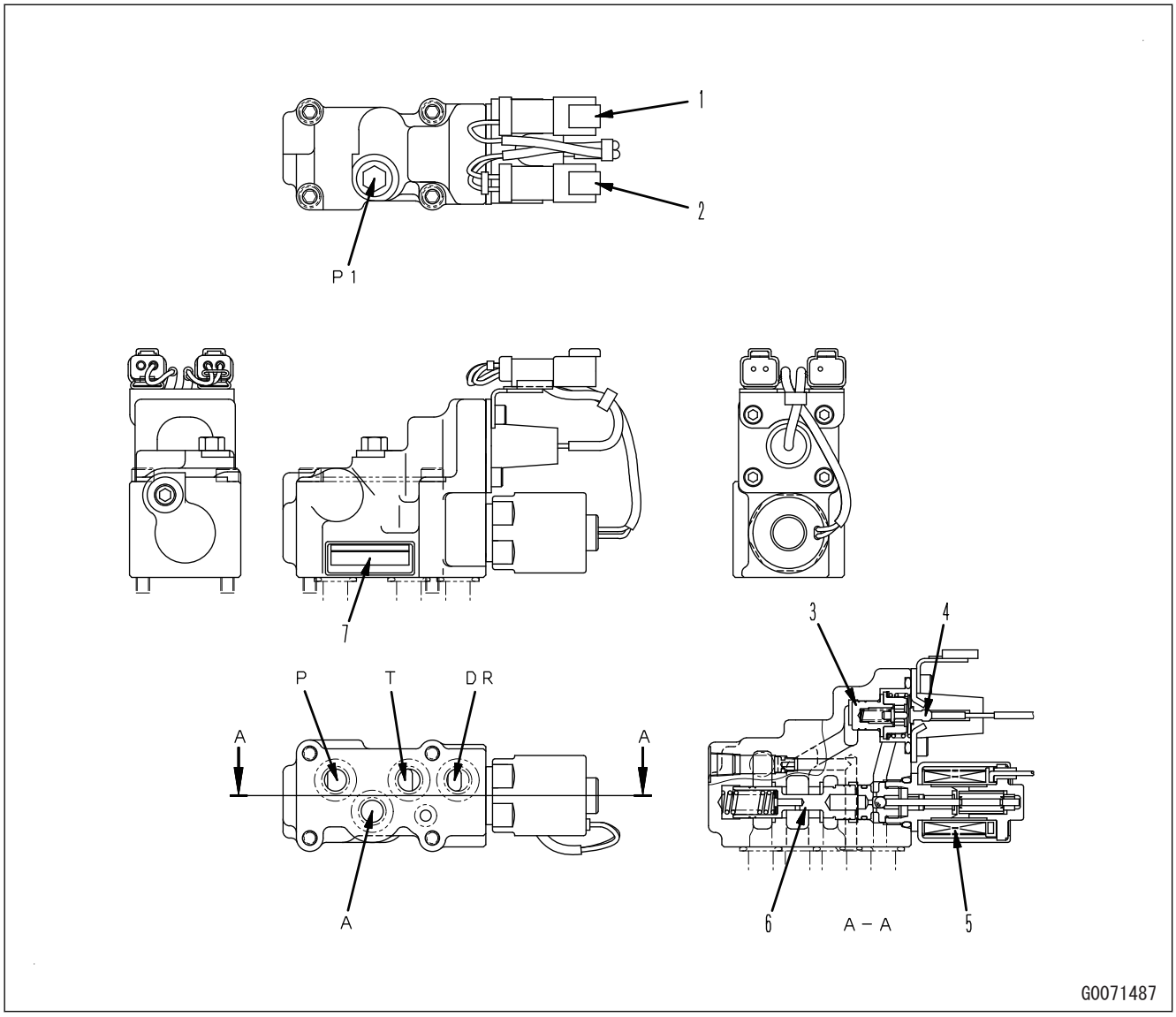
P: From cooling fan pump
TC: To hydraulic tank
T: To hydraulic oil cooler

Pin No.	Signal name	Input and output
56	(*1)	-
57	(*1)	-
58	(*1)	-
59	(*1)	-
60	(*1)	-
61	(*1)	-
62	HARNESS KEY2 (-)	Ground/Shield/ Return
63	(*1)	-
64	(*1)	-
65	(*1)	-
66	(*1)	-
67	(*1)	-
68	(*1)	-
69	(*1)	-
70	(*1)	-
71	(*1)	-
72	(*1)	-
73	GND (continuous power supply)	Ground/Shield/ Return
74	(*1)	-
75	(*1)	-
76	(*1)	-
77	(*1)	-
78	(*1)	-
79	(*1)	-
80	VGT solenoid valve (+)	Output
81	(*1)	-
82	(*1)	-
83	(*1)	-
84	(*1)	-
85	(*1)	-
86	(*1)	-
87	(*1)	-
88	(*1)	-
89	(*1)	-
90	HARNESS KEY2	Input
91	(*1)	-
92	(*1)	-

When the blade lift valve is set to LOWER



When the blade control lever is set to the LOWER position, the pilot pressure from the EPC solenoid valve is applied to the oil chamber (F). The pilot pressure moves the spool (3) to the right. The hydraulic oil flows from the pump to the opening (G), and then flows into the cylinder bottom through the port (B3) and the port (B4). The hydraulic oil flows into the port (A3) and port (A4) from the cylinder head, and returns to the tank through the opening (H).



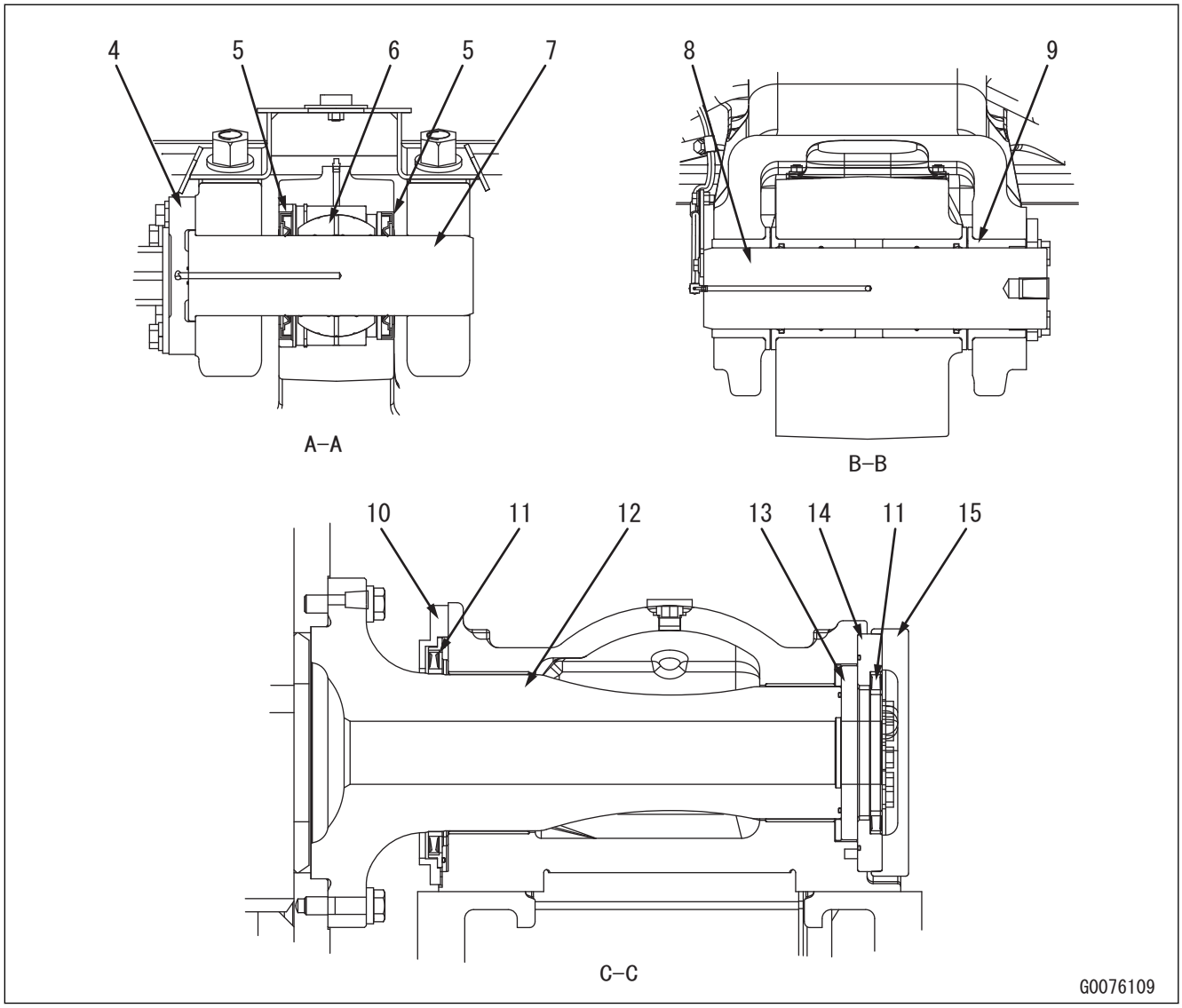
A: To clutch
P: From pump
T: Drain
1: Connector (for fill switch)
2: Connector (for proportional solenoid)
3: Oil pressure pickup valve
4: Fill switch
DR: Drain
P1: Pickup port (clutch oil pressure)
5: Proportional solenoid
6: Pressure control valve
7: Nameplate

FUNCTION OF ECMV(DIRECTIONAL OPERATION CLUTCH, GEAR SPEED CLUTCH)

The ECMV controls the clutch oil pressure by the signal current sent from the power train controller.

Proportional solenoid

When the signal current from the controller is received, the proportional solenoid generates thrust force in proportion to the magnitude of current. The pressure control valve is operated by the thrust force of the solenoid, and the valve controls the oil pressure.



4: Cover
5: Seal
6: Bushing
7: Side pin
8: Center pin
9: Bushing
10: Cover
11: Seal
12: Pivot shaft
13: Thrust plate
14: Thrust plate
15: Cover

Structure

The front part of the track frame moves up and down around the pivot shaft (12). Also, the R.H. and L.H. track frames are connected to the equalizer bar (1) with the side pin (7), and they rock at the center pin (8). The shoulder pads (3) which are installed to the equalizer bar (1) reduce the shock when the machine rocks.

FUNCTION OF SUSPENSION

The suspension supports the weight of the machine, and absorbs the shocks received from the unevenness of the road surface. Thus, the operator comfort is increased. In addition, the tires contact to the road surface constantly to keep the stability of the machine, and the operation performance is increased such as the acceleration, brake, and turn during high-speed travel.

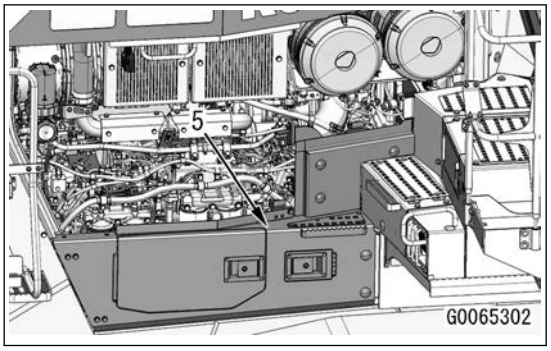
Tools for default setting of wireless LAN modem

Symbol	Part No.	Part name	Q'ty	Remarks
A	Commercially available	Personal computer	1	• Notebook type • Windows®7/8/8.1/10 installed • LAN port installed • Wireless LAN port with access point function installed • Recommended: “Panasonic Let's note” AX/SX/MX series
B	Commercially available	LAN cable	1	• Category: 5e • Connector shape: RJ45
C	-	Tool (network settings for wireless LAN modem)	1	• Software to set up wireless LAN modem • Name on the PC: Network Config Tool for Modem
D	-	Tool (network settings for the access point function)	1	• Software to set up the access point function for personal computer • Name on the PC: Network Config Tool for SoftAP

Tools to download KOMTRAX Plus controller data

Symbol	Part No.	Part name	Q'ty	Remarks
A	Commercially available	Personal computer	1	• Notebook type • Windows®7/8/8.1/10 installed • LAN port installed • Wireless LAN port with access point function installed • Recommended: “Panasonic Let's note” AX/SX/MX series
B	Commercially available	LAN cable	1	• Category: 5e • Connector shape: RJ45
C	-	Tool (network settings for the access point function)	1	• Software to set up the access point function for personal computer • Name on the PC: Network Config-Tool for SoftAP
D	-	Tool (data collection)	1	• Software to download data from KOMTRAX Plus controller • Name on the PC: Data Collection Tool
E	-	Tool (data conversion)	1	• Software to convert downloaded data • Name on the PC: Data Collection Tool

5. Remove the cover (5).



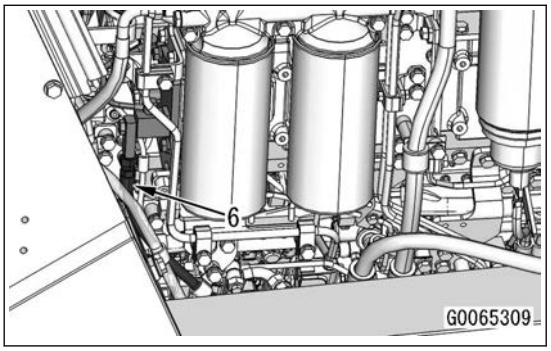
6. Disconnect the fuel return hose (6) of the return block.

REMARK

Plug the fuel return hose side with the plug H.

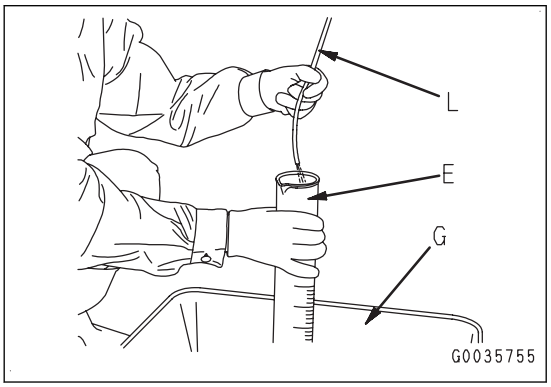
7. Connect the test hose L to the return block (3) side.

Secure the connection part of hose L with a wire not to come off.



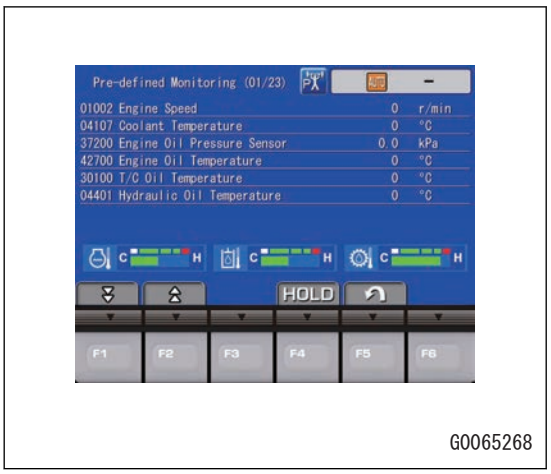
8. Adjust the routing of test hose L to hold tension and insert its front end to the measuring cylinder E.

Catch fuel with the oil container G not to flow out.



Setting of test condition

9. Start the engine.
10. Set the working mode to P mode.
11. Select the “Pre-defined Monitoring”(01/23) and show it. For details, see the “SET AND OPERATE MACHINE MONITOR”.
12. Make sure that the engine coolant temperature and each oil temperature are in the test condition.
    - Engine coolant temperature: 60 to 100 °C
    - Power train oil temperature: 70 to 120 °C
    - Hydraulic oil temperature: 55 to 100 °C



Do the check

13. Stall the torque converter. For details, see “TEST ENGINE SPEED AT TORQUE CONVERTER STALL”.
14. After the engine speed becomes stable, measure the return rate from the injector for 1 minute with the measuring cylinder E.

Check procedure

8. Check the steering right clutch operating pressure when the fuel control dial is in the MIN (low idle) and the MAX (high idle) positions.

Restoration

9. Stop the engine.

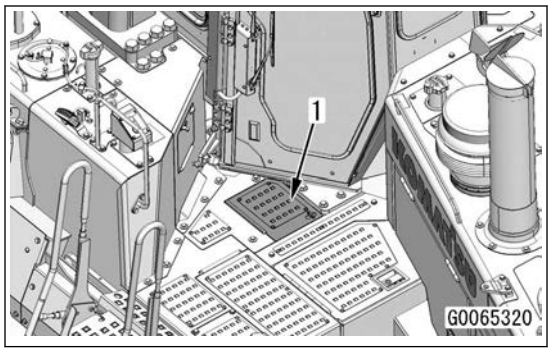
   ⚠ **Immediately after the engine is stopped, the parts and oil are very hot and can cause burn injury. Wait for the temperature to go down, and then start the work.**

10. Remove the gauge A1.
11. Close the cover (1). Restore the machine.

TEST STEERING L.H. CLUTCH OPERATING PRESSURE

Setting the testing device

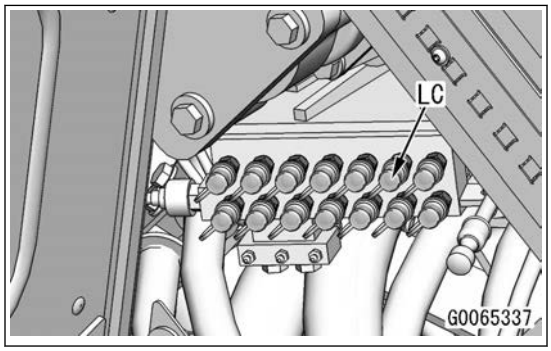
1. Open the cover (1).

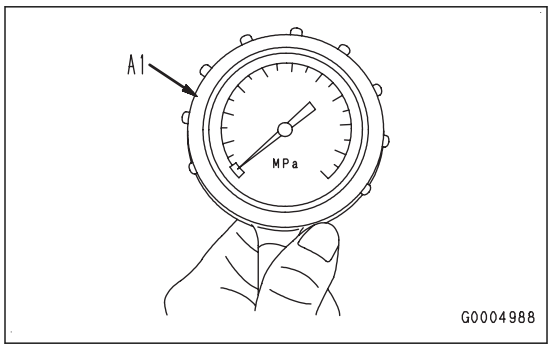


2. Connect gauge A1 of hydraulic tester A to the nipple of oil pressure check part LC.

   REMARK

   The gauge in the digital hydraulic tester B can be used in place of the gauge A1.





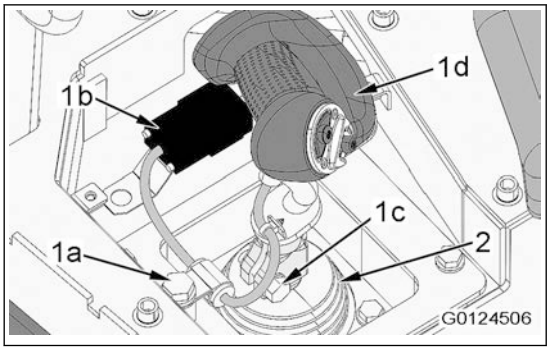
Setting of test condition

3. Start the engine.
4. Set the operating mode to P mode.
5. Select and show Pre-defined Monitoring (01/23) in response to “SET AND OPERATE MACHINE MONITOR”.
6. Make sure that the engine coolant temperature and each oil temperature are in the test condition.
   - Engine coolant temperature: 60 to 100 °C
   - Power train oil temperature: 70 to 120 °C

3. Remove the clamp (1a), and remove the knob switch connector (1b).
4. Remove the bolt (1c), and remove the knob (1d).

   REMARK

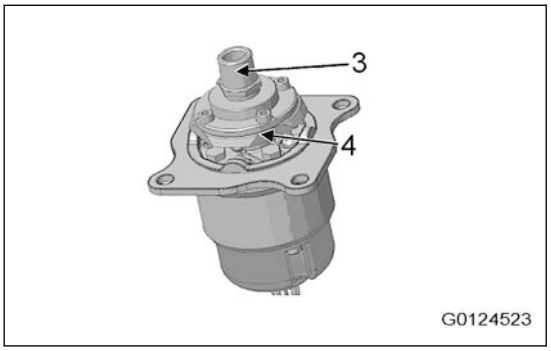
   Fully clean the area around the lever with detergent liquid.
5. Remove the boot (2).



6. Remove the nut (3) (width across flats: 22mm) while you take care not to let the disc (4) (width across flats: 60mm) rotate.

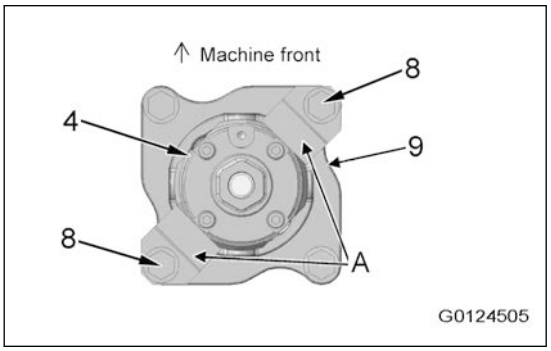
   REMARK

   You can do the work easily with the deep socket (C) or crowfoot wrench (D).



7. Remove the 2 bolts (8) at the front right and rear left of the machine from the 4 bolts that are used to install the lever to the chassis bracket.
8. Insert the rod holding tool (A) between the disc (4) and plate (9), and install it with the removed bolts (8) (2 pieces).

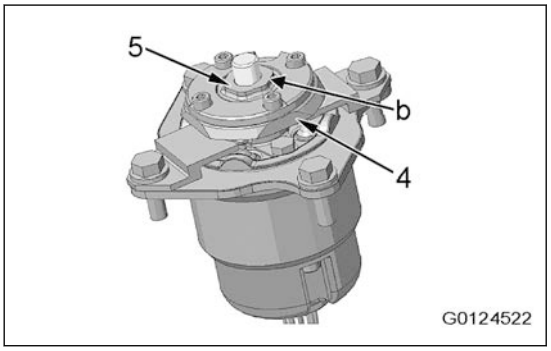
   Bolt (8):
   27 to 34 Nm {2.8 to 3.5 kgfm}



9. Rotate the disc (4) clockwise by 45°, rotate the part (b) (width across flats: 22mm) of the nut (5) counterclockwise, and remove it.

   REMARK

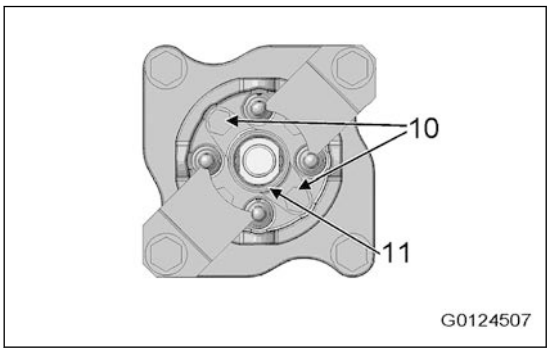
   You can do the work easily with the deep socket (C) or crowfoot wrench (D).



10. Remove the 2 bolts (10), remove the grease pocket (11), and clean it.

    REMARK

    Be very careful not to let sand or dirt attach.



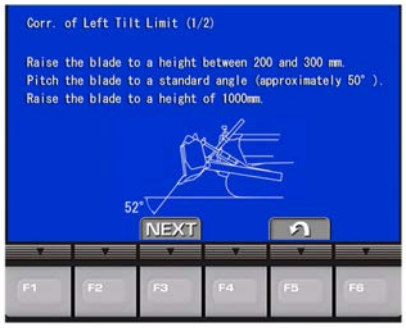
Monitoring code	Table of Pre-defined Monitoring (Shown on screen)		Unit (Default: SI)			Applicable component	Remarks
			SI	Metric	Imperial		
20405	W/E Controller S/N		--	--	--	W/E	
20299	W/E Controller App Version		--	--	--	W/E	
20497	W/E Controller Data Version		--	--	--	W/E	
70700	Hydraulic Oil Pump Pressure 1		MPa	kg/cm^2	psi	W/E	
70701	Hyd Oil Pump Pressure1 Sens Volt		mV	mV	mV	W/E	
70702	Hydraulic Oil Pump Pressure 2		MPa	kg/cm^2	psi	W/E	
70703	Hyd Oil Pump2 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	
10007	Fan Speed		r/min	rpm	rpm	P/T	
10013	Fan Speed Sensor Voltage		V	V	V	P/T	
40981	W/E Controller SW Input 1	Engine Low Idle	ON/OFF	ON/OFF	ON/OFF	W/E	
		R Signal	ON/OFF	ON/OFF	ON/OFF	W/E	
		C Signal	ON/OFF	ON/OFF	ON/OFF	W/E	
70302	Blade Knob SW Input 1	W/E Lock SW NC	ON/OFF	ON/OFF	ON/OFF	W/E	
		W/E Lock SW NO	ON/OFF	ON/OFF	ON/OFF	W/E	
		Float SW NC	ON/OFF	ON/OFF	ON/OFF	W/E	
		Float SW NO	ON/OFF	ON/OFF	ON/OFF	W/E	
70303	Blade Knob SW Input 2	Pitch Dump SW 1 NO	ON/OFF	ON/OFF	ON/OFF	W/E	
		Pitch Dump SW 2 NO	ON/OFF	ON/OFF	ON/OFF	W/E	
		Pitch Back SW 1 NO	ON/OFF	ON/OFF	ON/OFF	W/E	
		Pitch Back SW 2 NO	ON/OFF	ON/OFF	ON/OFF	W/E	
		Auto Pitch SW NC	ON/OFF	ON/OFF	ON/OFF	W/E	
		Auto Pitch SW NO	ON/OFF	ON/OFF	ON/OFF	W/E	
70307	Ripper Knob SW Input	Tilt In SW 1 NO	ON/OFF	ON/OFF	ON/OFF	W/E	
		Tilt In SW 2 NO	ON/OFF	ON/OFF	ON/OFF	W/E	
		Tilt Back SW 1 NO	ON/OFF	ON/OFF	ON/OFF	W/E	
		Tilt Back SW 2 NO	ON/OFF	ON/OFF	ON/OFF	W/E	
01501	Pump LS Solenoid Current		mA	mA	mA	W/E	
08000	Pump MERGE DIVIDE EPC Current		mA	mA	mA	W/E	

2. On the “Corr. of Left Tilt Limit (1/2)” screen, obey the instructions on the screen.

   F3: Proceeds to the next.

   F5: The screen goes back to the “Tilt Limit Setting” screen.

   1) Set the tip of the blade at 52° and at the height of 200 mm to 300 mm above the ground.
   2) Lift the blade to the height of 1000 mm above the ground.
   3) Press F3 to proceed.



G0078226

3. On the “Corr. of Left Tilt Limit (2/2)” screen, obey the instructions on the screen.

   F5: The screen goes back to the “Corr. of Left Tilt Limit (1/2)” screen.

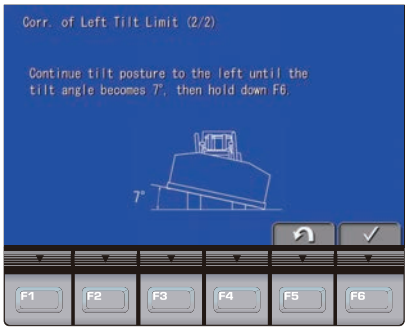
   F6: Records the work equipment position.

   1) Set the left tilt angle to 7°.

      REMARK

      Measure the left tilt angle with the angle gauge A.

   2) Press and hold F6, and make sure that the alarm buzzer sounds.



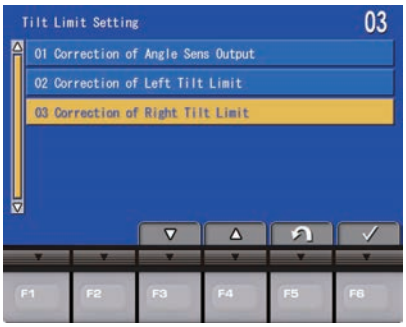
G0078227

Correction of right tilt limit (SUPER DOZER SPECIFICATION)

1. Go back to the “Tilt Limit Setting” screen, and select the “Correction of Right Tilt Limit” by using the function switches or numeral input switches.

   REMARK

   For details about how to select, see “SERVICE MODE”.

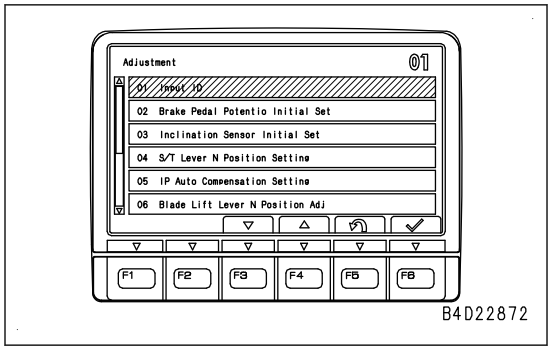


G0065390

2. On the “Adjustment” screen, select “Input ID” with function switches or numeral input switches.

   REMARK

   For details about how to select, see “OPERATE SERVICE MODE”.



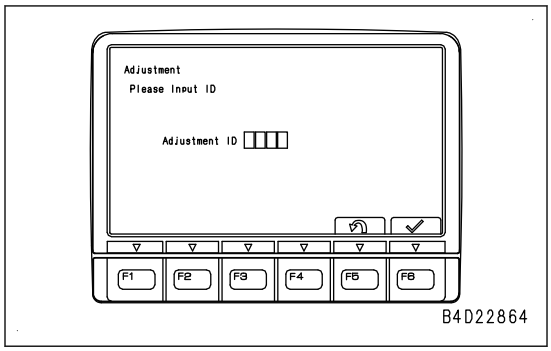
3. On the “Input ID” screen, input adjustment ID “8082” with the numeral input switches.

   F5: The screen moves back to the “Adjustment” screen.

   F6: Validates the input adjustment ID.

   REMARK

   - For information on adjustment IDs and adjustment items, see “ADJUSTMENT ITEM TABLE”.
   - If the input adjustment ID is incorrect, “Incorrect ID” is shown and the screen cannot move to the next screen from the “Input ID” screen. (You can input an ID adjustment again in this screen display state.)



4. On the “Adjustment” screen, do “Correction of Left Tilt Limit” with function switches.

   F3: Not used

   F4: Not used

   F5: The screen moves back to the “Input ID” screen.

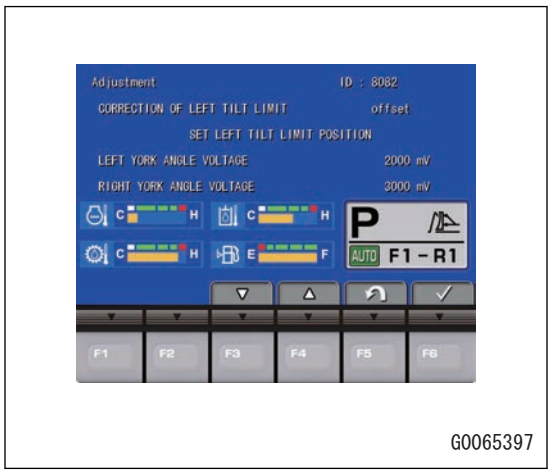
   F6: Records the correction.

   1) For details about how to do, see “ADJUSTMENT MENU”, “ADJUSTMENT MENU (Tilt Limit Setting)”.

   2) Push F6 to check that the alarm buzzer goes off.

   REMARK

   This adjustment can be done in “ADJUSTMENT MENU (Tilt Limit Setting) (DUAL TILT DOZER SPECIFICATION)” and “ADJUSTMENT MENU (Tilt Limit Setting) (SUPER DOZER SPECIFICATION)”. Check the specification before you adjust it since the adjustment method is different by the specification.



ADJUSTMENT ID: 8083 (CORRECTION OF RIGHT TILT LIMIT)

Check and adjust the various settings of the machine with the adjustment ID.

“Correction of right tilt limit” limits the left blade tilt angle. This is done by making the work equipment controller recognize the voltage at the right tilt angle limit position of the blade cylinder potentiometer.

Make sure to do this adjustment when work equipment controller or blade and blade cylinder potentiometer are removed, installed, or replaced.

Item	Test condition		Unit	Standard value for new machine	Judgment criteria value	Measured value	Good	No good
Steering R.H. brake operation pressure (RB)	• Engine coolant temperature: 60 to 100 °C • Power train oil temperature: 70 to 120 °C • Hydraulic oil temperature: 45 to 100 °C • Operation mode: P (power mode) • Gear shift mode Manual gear shift mode • Parking brake switch: FREE position • Joystick (steering, directional, and gear shift lever) (PCCS lever): NEUTRAL • Brake pedal: Push to the stroke end	Fuel control dial MAX (High idle)	MPa {kg/cm^2}	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}			
	• Engine coolant temperature: 60 to 100 °C • Power train oil temperature: 70 to 120 °C • Hydraulic oil temperature: 45 to 100 °C • Operation mode: P (power mode) • Gear shift mode Manual gear shift mode • Parking brake switch: LOCK position • Joystick (steering, directional, and gear shift lever) (PCCS lever): NEUTRAL	Fuel control dial MAX (High idle)	MPa {kg/cm^2}	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}			

No.	Item	Criteria	Remedy
5	Check of battery electrolyte level	Between H and L	Refill or replace.
6	Check of wiring harness for discoloration, burn and cover peeling	-	Repair or replace.
7	Check for coming off of wiring harness clamp and sagging of wiring harness	-	Repair
8	Check of grounding	-	Repair
9	Check of connector for looseness and lock for damage	-	Repair or replace.
10	Check of connector pin for corrosion, bends and deformation	-	Repair or replace.
11	Check of connector for entering of water and foreign material	-	Dry, clean or replace.
12	Check of wiring harness for open or short circuit	-	Repair or replace.
13	Check of fuse for blowing out and corrosion	-	Replace.
14	Check of circuit breaker	-	Push the reset button.
15	Check of alternator voltage (when engine speed is medium or higher)	27.5 to 29.5 V after few minutes of operation	Replace.
16	Check of battery relay for operation sound (when turning the starting switch to ON or OFF position)	-	Replace.

Exterior

No.	Item	Criteria	Remedy
1	Check of undercarriage	-	Repair
2	Check of handrail and step	-	Repair
3	Check of mirror	-	Cleaning or repair.

Interior

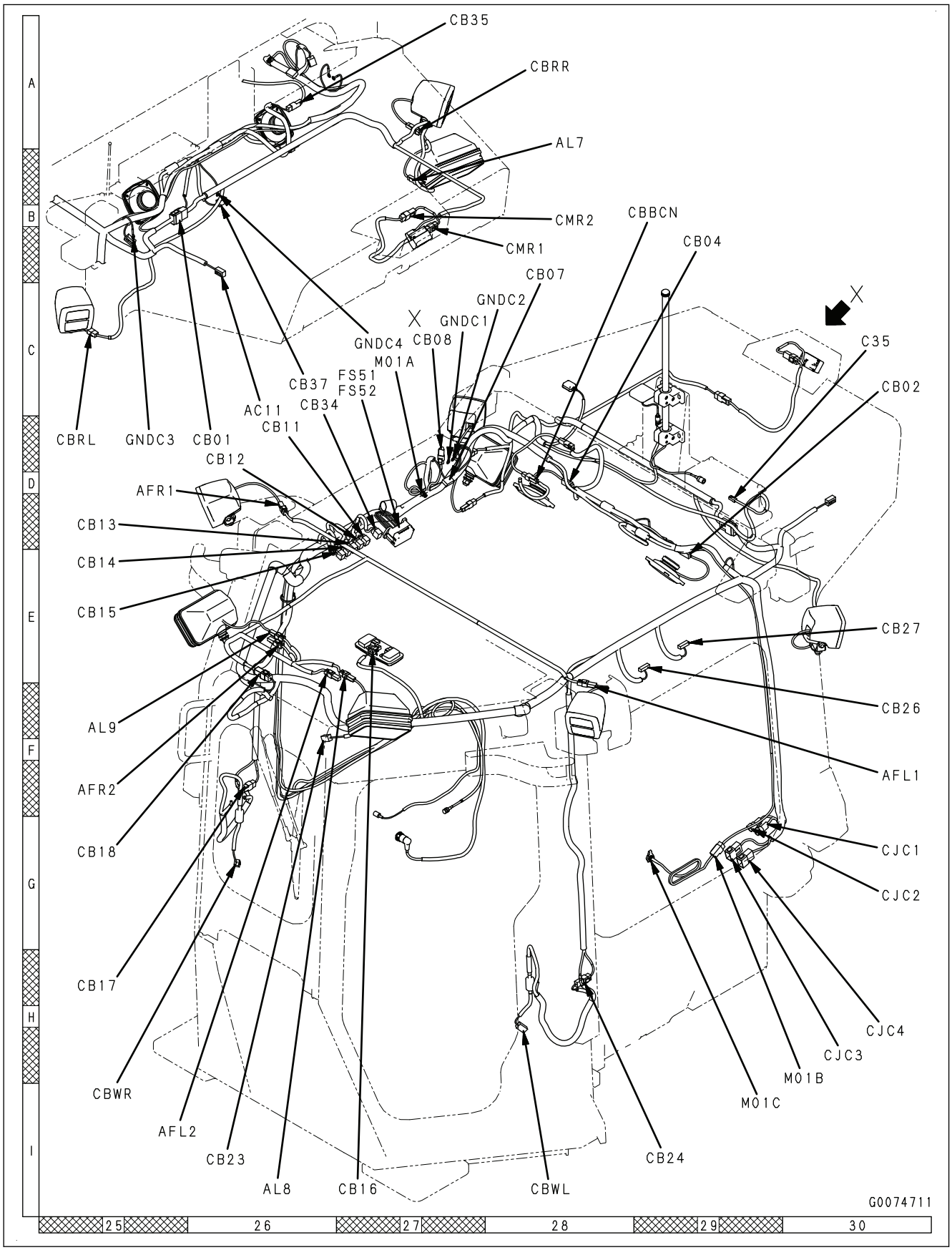
No.	Item	Criteria	Remedy
1	Check of gauge and monitor	-	Clean or replace.
2	Check of seat belt	-	Repair

Connector from							Connector to		Diameter and color of wire
Connector (terminal) No.	Address		Equipment name	Type	Number of pins	Pin number	Connector (terminal) No.	Pin number	
	Connector layout	Connector and wiring harness chart							
CB8	I20	E400	Circuit breaker	-	2	1	JPF3	-	2Y
						2	AUX0	1	2L
CB9	H21	G403	Circuit breaker	-	2	1	JUF2	-	2R
						2	JLDB	-	2R
CB01 (Male)	D26	F1102	Intermediate connector	DT	12	1	CMR1 (Female)	1	0.5R
						2	CMR1 (Female)	2	0.5W
						3	E	-	0.5B
						7	JXLC	-	1.25Br
						8	JXLD	-	1.25B
						9	AL7	1	1.25L
						10	AL7	2	1.25B
CB01 (Female)	D26	I908	Intermediate connector	DT	12	1	CJC3 (Male)	5	0.5R
						2	CJC3 (Male)	6	0.5W
						3	CJC3 (Male)	7	0.5B
						7	CJC4 (Male)	1	1.25Br
						8	JXKA	-	1.25B
						9	JXLE	-	1.25L
						10	JXKA	-	1.25B
CB02	C30	E911	Rear speaker (LH)	-	2	1	CB07	1	0.5RG
						2	CB07	5	0.5RW
CB04	B29	B911	Rear speaker (RH)	-	2	1	CB07	2	0.5RY
						2	CB07	6	0.5RB
CB07	B28	D905	Radio	-	9	1	CB02	1	0.5RG
						2	CB04	1	0.5RY
						3	JXFC	-	1.25RY
						5	CB02	2	0.5RW
						6	CB04	2	0.5RB
						7	GNDC2	-	2B
						8	FS51	-	0.85R
CB08	C27	C906	Service connector	-	3	A	CJC4 (Male)	7	1.25Y
						B	CJC4 (Male)	8	1.25P
						C	CJC4 (Male)	9	1.25B
CB11	I21	L403	Circuit braker	-	2	1	JPF8	-	1.25L
						2	AC04	5	1.25L

Connector from							Connector to		Diameter and color of wire
Connector (terminal) No.	Address		Equipment name	Type	Number of pins	Pin number	Connector (terminal) No.	Pin number	
	Connector layout	Connector and wiring harness chart							
FDR (Female)	D16	N1024	Intermediate connector	DRC-70A	70	1	HHP	C	1.25Y
						2	HHP	A	1.25B
						3	HHP	B	1.25P
						4	HLS2 (Female)	2	1.25W
						5	HLS2 (Female)	1	1.25B
						6	WLK	1	1.25Br
						7	WLK	2	1.25B
						8	WEP11	1	1.25G
						9	WEP11	2	1.25B
						12	WEP21	1	1.25L
						13	WEP21	2	1.25B
						16	WEP3	1	1.25Y
						17	WEP3	2	1.25B
						18	WEP4	1	1.25Y
						19	WEP4	2	1.25B
						20	WEP5	1	1.25Br
						21	WEP5	2	1.25B
						22	WEP6	1	1.25O
						23	WEP6	2	1.25B
						24	WEP7	1	1.25L
						25	WEP7	2	1.25B
						26	WEP8	1	1.25L
						27	WEP8	2	1.25B
						28	WEP9	1	1.25Y
						29	WEP9	2	1.25B
						30	WEPA	1	1.25W
						31	WEPA	2	1.25B
						32	LWKR	1	1.25L
						33	S0 (Female)	2	1.25W
						34	S0 (Female)	3	1.25L
						35	S0 (Female)	5	1.25G
						36	S0 (Female)	6	1.25Gr
						37	S0 (Female)	8	1.25Y
						38	S0 (Female)	9	1.25Br

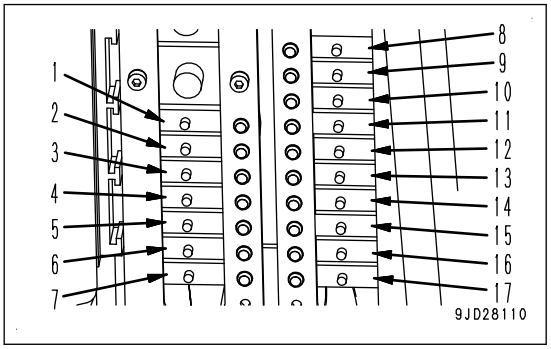
Connector from							Connector to		Diameter and color of wire
Connector (terminal) No.	Address		Equipment name	Type	Number of pins	Pin number	Connector (terminal) No.	Pin number	
	Connector layout	Connector and wiring harness chart							
NVCN2	I52	E988	Navigation controller (opt)	DRC	50	1	NAV3 (Male)	2	0.85B
						2	NAV3 (Male)	1	0.85W
						3	NAV1 (Male)	1	0.85V
						4	NAV1 (Male)	2	0.85Br
						5	NAV1 (Male)	3	0.85Br
						6	NAV1 (Male)	4	0.85B
						7	NAV1 (Male)	5	0.85R
						8	NAV1 (Male)	6	0.85B
						9	NAV1 (Male)	7	0.85R
						10	NAV1 (Male)	8	0.85L
						13	NAV3 (Male)	4	0.85B
						14	NAV3 (Male)	3	0.85W
						17	NAV1 (Male)	9	0.85B
						20	NAV1 (Male)	10	0.85Y
						21	NAV1 (Male)	11	0.85B
						22	NAV1 (Male)	12	0.85W
						27	NAV2 (Male)	7	0.85Y
						31	NAV2 (Male)	1	0.85B
						32	NAV2 (Male)	2	0.85W
						33	NAV2 (Male)	5	0.85B
						36	NAV2 (Male)	8	0.85L
						37	NAV2 (Male)	9	0.85Y
						38	NAV2 (Male)	10	0.85G
						39	NAV2 (Male)	11	0.85Br
						41	NAV2 (Male)	3	0.85B
						42	NAV2 (Male)	4	0.85W
						49	NAV2 (Male)	6	0.85R
NVCN4	I51	N973	Navigation controller (opt)	-	8	1	PORT4	1	OW
						2	PORT4	2	O
						3	PORT4	3	GW
						6	PORT4	6	G
OFS1	D49	C1329	Offset switch up (opt)	C03	3	1	OFSW (Male)	1	0.5L
						2	OFSW (Male)	2	0.5B
						3	OFSW (Male)	3	0.5Y

5/9

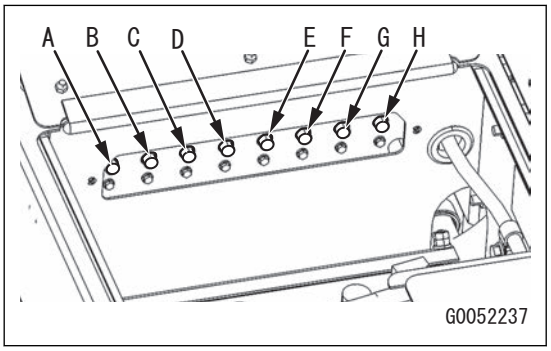

CB35
CBRR
AL7
CMR2
CMR1
CBBCN
CB04
CB07
GNDC2
GNDC1
CB08
GNDC4
M01A
FS51
FS52
CB37
CB34
AC11
CB11
CB12
CBRL
GNDC3
CB01
AFR1
CB13
CB14
CB15
C35
CB02
CB27
CB26
AFL1
CJC1
CJC2
CJC4
CJC3
M01B
M01C
AL9
AFR2
CB18
CB17
CBWR
AFL2
CB23
AL8
CB16
CBWL
CB24
G0074711
A
B
C
D
E
F
G
H
I
25
26
27
28
29
30

Breaker (B)

No.	Fuse capacity	Name of circuit
1	20A	P/T controller power supply
2	20A	W/E controller power supply
3	20A	Headlamp power supply
4	20A	Rear lamp
5	20A	Key B
6	20A	Controller continuous power supply
7	20A	Optional devices 1
8	20A	Option controller continuous power supply
9	20A	Condenser motor 1
10	20A	Condenser motor 2
11	20A	Working lamp
12	20A	Additional working lamp (front)
13	20A	Access light
14	20A	Controller continuous power supply (KTX, NAV)
15	20A	Additional working lamp (rear), engine room lamp
16	5A A	Air conditioner compressor



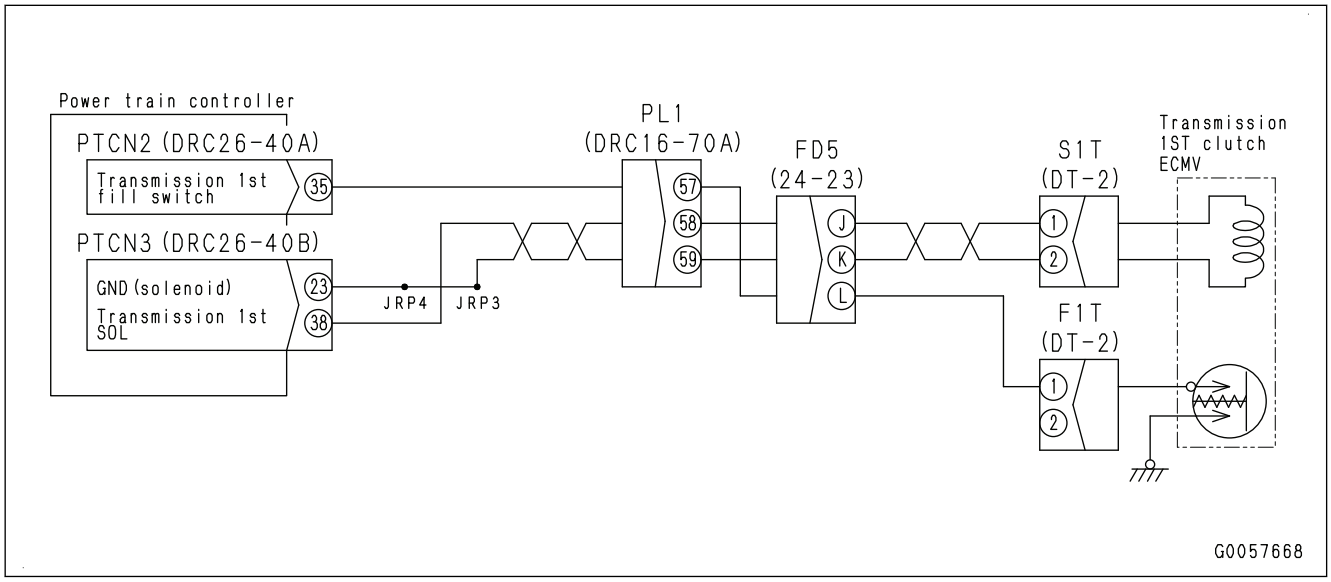
Main power supply circuit breakers



- If the starting motor does not operate when the starting switch is turned to the START position, open the inspection cover of the battery box. Check circuit breakers (A) to (H).
- Circuit breakers open the electrical circuit when an excessive electric current occurs to prevent breakage of the electrical parts and wiring.
- Turn the starting switch to the OFF position. Restore the circuit breaker to its usual state.
- To restore the opened electrical circuit, wait for 5 to 10 minutes. Then push the reset button. When the electrical circuit is opened, the operation force of the reset button is larger than usual. The height of the reset button does not change whether the circuit is opened or closed. Check whether the circuit is restored by the operating force.
- Do not push and hold the circuit breaker reset button.
- If the starting motor does not operate after the circuit breaker is restored, contact your Komatsu distributor.

No.	Cause	Procedures, Measurement, Values, Note	Diagnosis and treatment	
7	Confirmation of repair	1. Turn the starting switch to the OFF position. 2. Connect all the component parts. 3. Start the engine. 4. Do the troubleshooting when the machined is stopped and during travel control. 5. Check the abnormality record. 6. Is “E” shown in the abnormality record of this failure code?	YES	Go back to the first check item.
			NO	The repair is completed.

Circuit diagram of 1st clutch ECMV



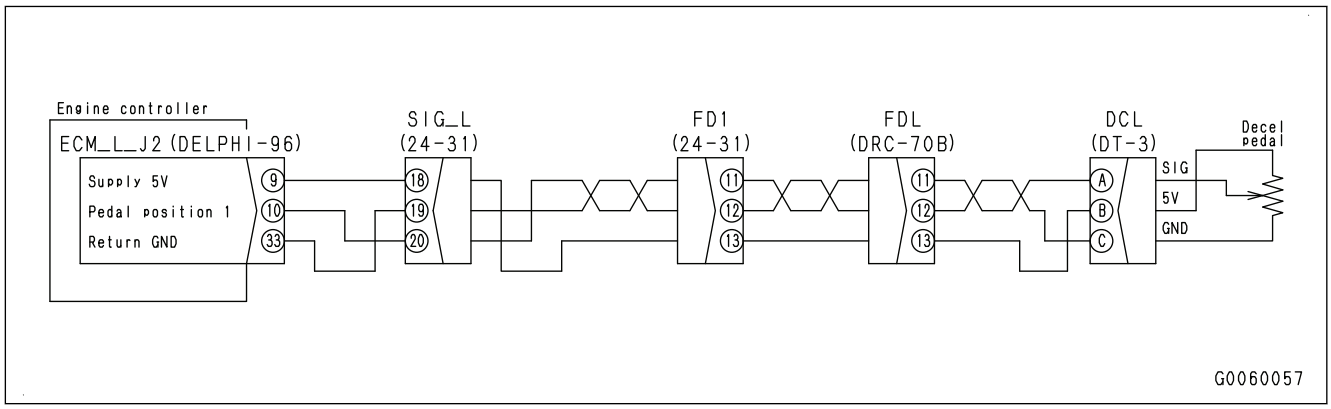
FAILURE CODE [851RKA]

Detail of failure	The neutral detection switch for the forward and reverse inputs from the center control lever on the radio control transmitter found an open or short circuit.
Action level	L03
Action of controller	Controls as if the lever is in neutral. (Ignores input signals)
Phenomenon on machine	The machine does not move according to radio control operation.
Related information	**Monitoring code** You can check the forward and reverse signal inputs from the center control lever of the radio control transmitter with the monitoring function. (Code: 71208)

No.	Cause	Procedures, Measurement, Values, Note	Diagnosis and treatment	
1	Defective radio control transmitter	1. Turn the starting switch to the OFF position. 2. Replace the radio control transmitter. 3. Turn the starting switch to the ON position. 4. Check the abnormality record. 5. Is “E” shown in the abnormality record of this failure code?	YES	• The removed radio control transmitter is in the correct condition. • Restore the removed radio control transmitter to its initial position. • Go to the next check item.
			NO	• The radio control transmitter is defective. • Replace the radio control transmitter. • Go to “Confirmation of repair”.
2	Confirmation of check results	1. Do the preceding troubleshooting again. 2. Have you identified the cause when the inspection is done again?	YES	The repair is completed.
			NO	• The machine monitor can be defective. • Replace the machine monitor. • Go to “Confirmation of repair”.

No.	Cause	Procedures, Measurement, Values, Note	Diagnosis and treatment	
1	Manual stationary regeneration	1. Do a manual stationary regeneration under the instruction of the machine monitor. 2. Take a look in the abnormality record. 3. Is an “E” shown in the abnormality record of this failure code?	YES	Go to the next check item.
			NO	• The manual stationary regeneration is completed. • The repair is completed if the failure code is resolved.
2	Wiring harness and connector	1. Check the wiring harness and connector. For details, see “RELATED INFORMATION TO TROUBLESHOOT”, “CHECKS BEFORE TROUBLESHOOTING”, “ELECTRIC EQUIPMENT”. 2. Are the wiring harness and connectors normal?	YES	• The wiring harness and connectors are normal. • Go to the next check item.
			NO	• The wiring harness or a connector is defective. • Repair or replace the defective wiring harness or connector. • Go to “Confirmation of repair”.
3	KDOC inlet temperature sensor	1. Make the KDPF sufficiently cool, or run the engine at idle (regeneration is not done). 2. Measure the KDOC inlet temperature, KDOC outlet temperature, and KDPF outlet temperature. Do the troubleshooting to see if there is a large difference in the results. 3. Is there a large difference in the results? **REMARK** The KDOC inlet temperature, KDOC outlet temperature, and KDPF outlet temperature at idle (regeneration not done) are 100 to 250 °C. The difference between the temperatures is approximately 10 °C. (KDOC inlet temperature > KDOC outlet temperature > KDPF outlet temperature)	YES	• If there is a large difference in the temperature, the KDOC inlet temperature sensor is defective. • Replace the KDPF temperature sensor. • Go to “Confirmation of repair”.
			NO	• The KDOC inlet temperature sensor is normal. • Go to the next check item.

Circuit diagram of throttle sensor (accelerator pedal)



FAILURE CODE [CA272]

Details of failure	Open circuit occurs in the PCV1_L circuit of the supply pump.
Action level	L03
Action of controller	Stops the PCV1_L operation.
Phenomenon on machine	• The engine output lowers. • The engine startability degrades.
Related information	**Reference information** • Pulse voltage (approx. 24 V) is supplied to the PCV1_L (1) while the engine is in operation normally. Pulse voltage cannot be measured with a multimeter. • The action to limit the engine output is canceled when the starting switch is set to the OFF position after “E” lights off on the abnormal record of this failure code. (This action is not canceled when “E” lights off on the abnormal record of this failure code.)

<table>
<tr><th>No.</th><th>Cause</th><th>Procedures, Measurement, Values, Note</th><th colspan="2">Diagnosis and treatment</th></tr>
<tr><td rowspan="2">1</td><td rowspan="2">Wiring harness and connector</td><td rowspan="2">1. See the section about wiring harness and connector in the “ELECTRIC EQUIPMENT” in “RELATED INFORMATION TO TROUBLESHOOT”, “CHECKS BEFORE TROUBLESHOOTING”.
2. Are the wiring harness and connector normal?</td><td>YES</td><td>• The wiring harness and connector are normal.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The wiring harness and connector are defective.
• Repair or replace the defective wiring harness and connector.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">2</td><td rowspan="2">Supply pump PCV1_L</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Disconnect the connector PCV1_L, and connect the T-adapter to the male side to troubleshoot.
3. Does the troubleshooting result agree with the standard value?
<table><tr><th>Item</th><th>Measurement position/condition</th><th>Standard value</th></tr><tr><td>Resistance</td><td>Between PCV1_L (male) (1) and (2)</td><td>2.3 to 5.3 Ω</td></tr></table></td><td>YES</td><td>• The supply pump PCV1_L is normal.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The supply pump PCV1_L is defective.
• Replace the supply pump PCV1_L.
• Go to “Confirmation of repair”.</td></tr>
</table>

FAILURE CODE [CA441]

Detail of failure	A low voltage occurs in the power supply voltage circuit of the engine controller.
Action level	L04
Action of controller	Operates the machine while the power supply voltage is set to the fixed value (6.0 V).
Phenomenon on machine	The operation can be continued as normal. But the engine stops while it is in operation or the engine cannot be started while it is stopped.
Related information	**Monitoring code** “Battery Power Supply” can be checked with the monitoring function. (Code: 03204)

<table>
<tr><th>No.</th><th>Cause</th><th>Procedures, Measurement, Values, Note</th><th colspan="2">Diagnosis and treatment</th></tr>
<tr><td rowspan="2">1</td><td rowspan="2">Wiring harness and connector</td><td rowspan="2">1. Examine the wiring harness and connector. For details, see “RELATED INFORMATION TO TROUBLESHOOT”, “CHECKS BEFORE TROUBLESHOOTING”, “ELECTRIC EQUIPMENT”.
2. Are the wiring harness and connector normal?</td><td>YES</td><td>• The wiring harness and connector are normal.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The wiring harness or a connector is defective.
• Repair or replace the defective wiring harness or connector.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">2</td><td rowspan="2">Battery</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Check the battery electrolyte level.
3. Measure the battery voltage.
4. Measure the gravity of battery electrolyte.
5. Do the electrolyte level, voltage, and gravity agree with the standard value?
<table>
<tr><th>Judgment item</th><th>Standard value</th></tr>
<tr><td>Battery electrolyte level</td><td>Between UPPER LEVEL and LOWER LEVEL</td></tr>
<tr><td>Battery voltage (1 cell)</td><td>Min. 12 V</td></tr>
<tr><td>Battery voltage (2 cells in-line)</td><td>Min. 24 V</td></tr>
<tr><td>Specific gravity of battery electrolyte</td><td>Min. 1.26 (fluid temperature 20°C)</td></tr>
</table></td><td>YES</td><td>• The battery is normal.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The battery is defective.
• If the battery electrolyte level is low, add battery electrolyte. Charge the battery after it is refilled.
• If the battery power supply is low, charge or replace the battery.
• If the gravity of battery electrolyte is low, charge the battery. If the specific gravity after charge is lower than the specified value, replace the battery.
• Go to “Confirmation of repair”.</td></tr>
</table>

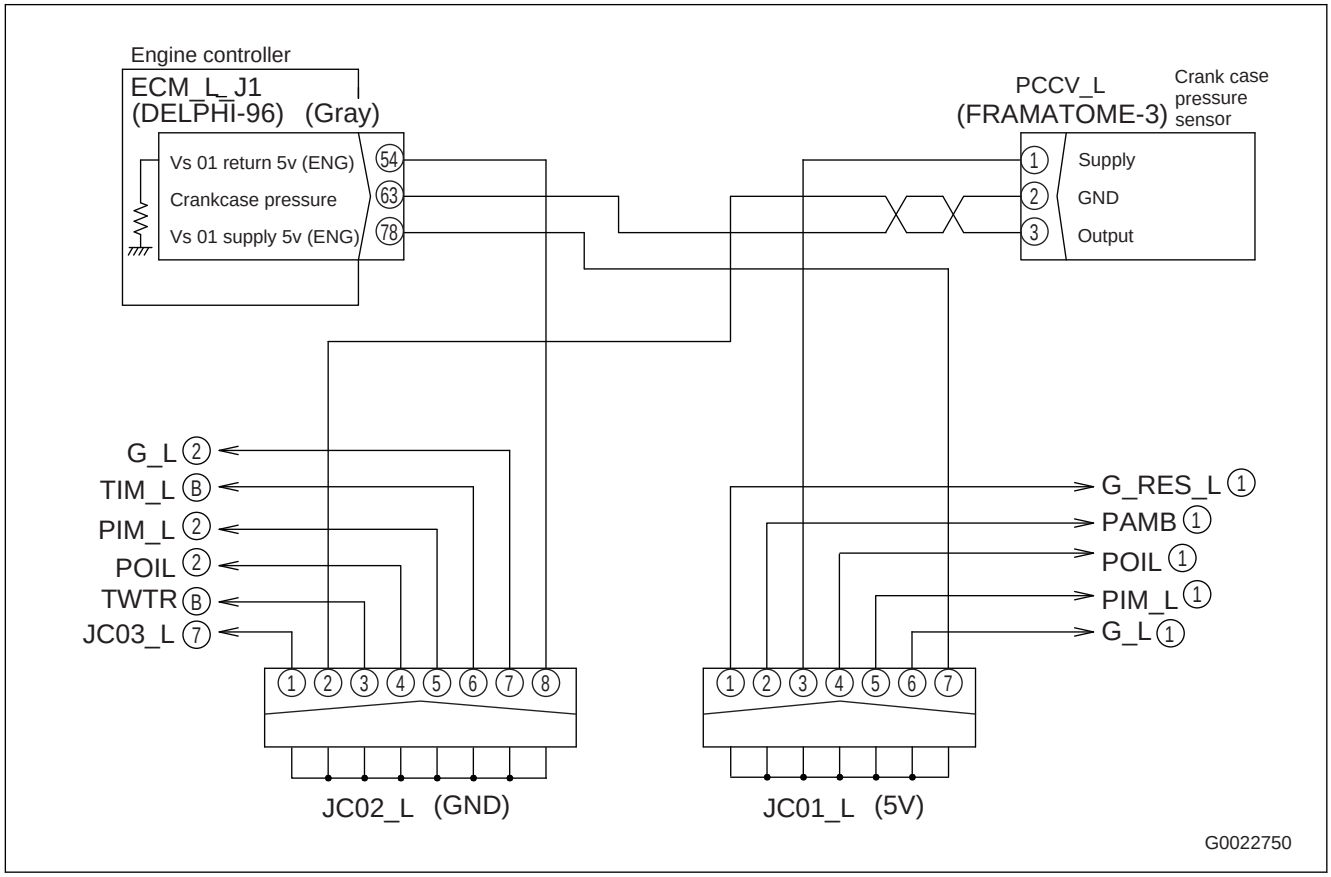
FAILURE CODE [CA697]

Details of failure	High voltage error occurs in the signal circuit of the engine controller internal temperature sensor.
Action level	L01
Action of controller	None in particular.
Phenomenon on machine	None
Related information	**Monitoring code** “Engine Con Internal Temperature” can be checked with the monitoring function. (Code: 18900)

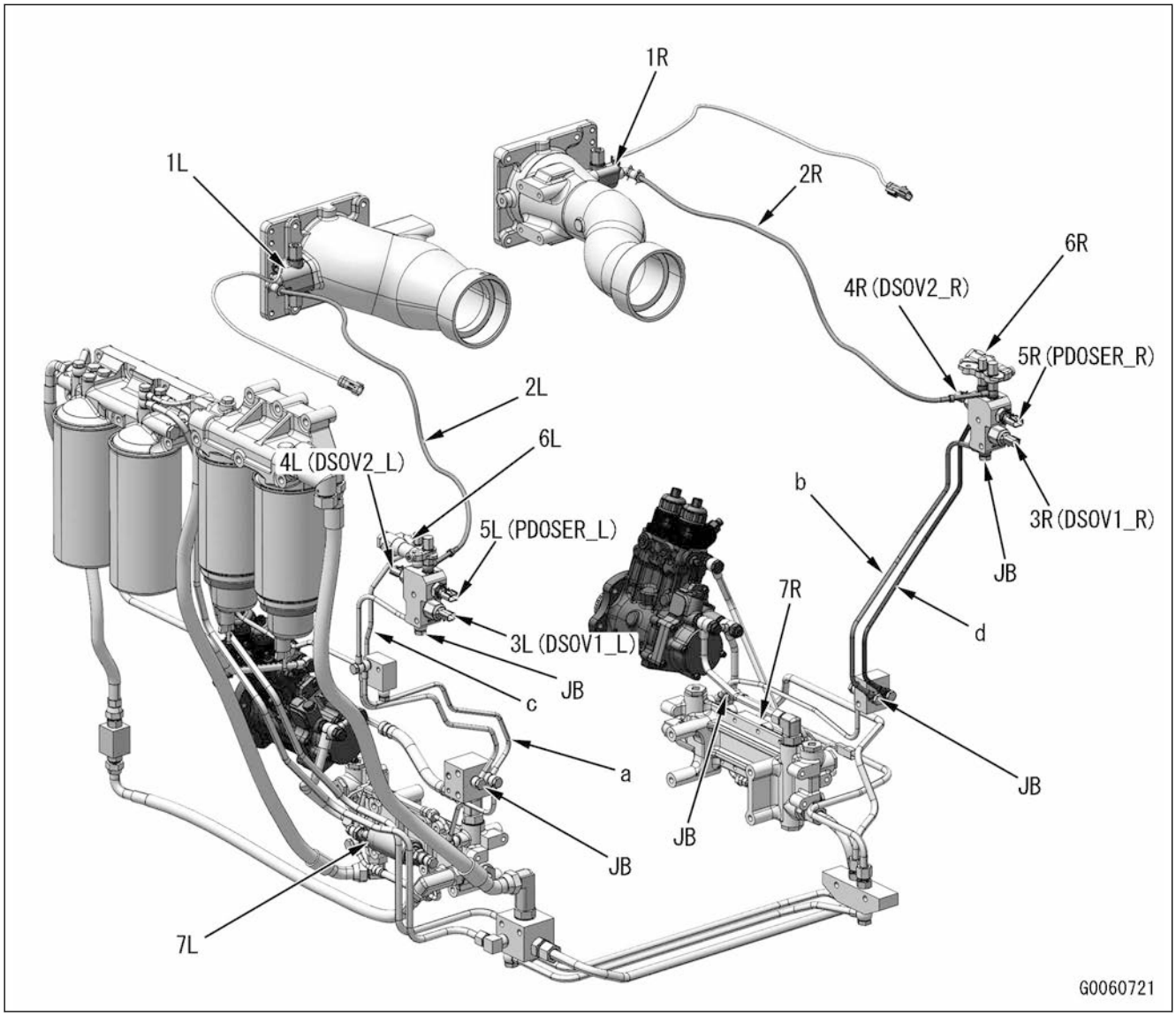
No.	Cause	Procedures, Measurement, Values, Note	Diagnosis and treatment	
1	Wiring harness and connector	1. See the section about wiring harness and connector in the “ELECTRIC EQUIPMENT” in “RELATED INFORMATION TO TROUBLESHOOT”, “CHECKS BEFORE TROUBLESHOOTING”. 2. Are the wiring harness and connector normal?	YES	• The wiring harness and connector are normal. • Go to the next check item.
			NO	• The wiring harness and connector are defective. • Repair or replace the defective wiring harness and connector. • Go to “Confirmation of repair”.
2	Controller operating condition	1. Check if the engine controller is operated in high temperature. 2. Is the temperature around the engine controller normal?	YES	• The controller operating condition is normal. • Go to the next check item.
			NO	• The controller operating condition is not normal. • Cool down the engine controller body and the area around it. • Go to “Confirmation of repair”.
3	Confirmation of check results	1. Do the troubleshooting above again. 2. Can you identify the cause by the check?	YES	The repair is completed.
			NO	• The engine controller can be defective. • Replace the engine controller. • Go to “Confirmation of repair”.

No.	Cause	Procedures, Measurement, Values, Note	Diagnosis and treatment	
7	Confirmation of repair	1. Turn the starting switch to the OFF position. 2. Connect all the component parts. 3. Turn the starting switch to the ON position. 4. Check the abnormality record. 5. Is “E” shown in the abnormality record of this failure code?	YES	Go to the first check item.
			NO	The repair is completed.

Circuit diagram of crankcase pressure sensor



Circuit diagram of fuel doser



1L. Fuel doser (left bank side)

1R. Fuel doser (right bank side)

2L. Fuel supply line (left bank side)

2R. Fuel supply line (right bank side)

3L. Dosing fuel solenoid valve 1 (shut off valve of left bank side)

3R. Dosing fuel solenoid valve 1 (shut off valve of right bank side)

4L. Dosing fuel solenoid valve 2 (drain valve of left bank side)

4R. Dosing fuel solenoid valve 2 (drain valve of right bank side)

5L. Dosing fuel pressure sensor (left bank side)

5R. Dosing fuel pressure sensor (right bank side)

6L. Relief valve (left bank side)

6R. Relief valve (right bank side)

7L. Fuel feed pump (left bank side)

7R. Fuel feed pump (right bank side)

a: From fuel feed pump (left bank side)

b: From fuel feed pump (right bank side)

c: Fuel return (from fuel doser on left bank side)

d: Fuel return (from fuel doser on right bank side)

JB: Joint bolt of fuel supply tube

PDOSER_L: Dosing fuel pressure sensor (left bank side)

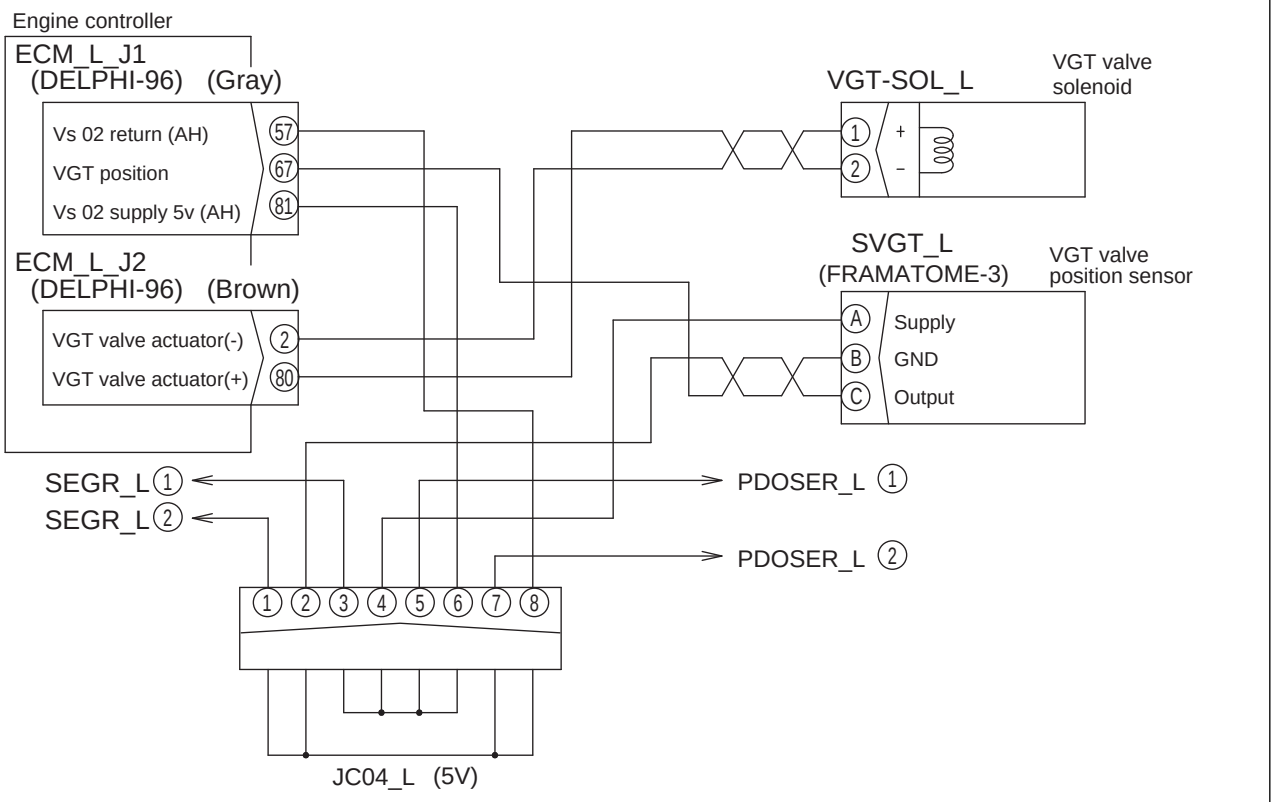
PDOSER_R: Dosing fuel pressure sensor (right bank side)

DSOV1_L: Dosing fuel solenoid valve 1 (shut off valve connector of left bank side)

DSOV2_L: Dosing fuel solenoid valve 2 (drain valve connector of left bank side)

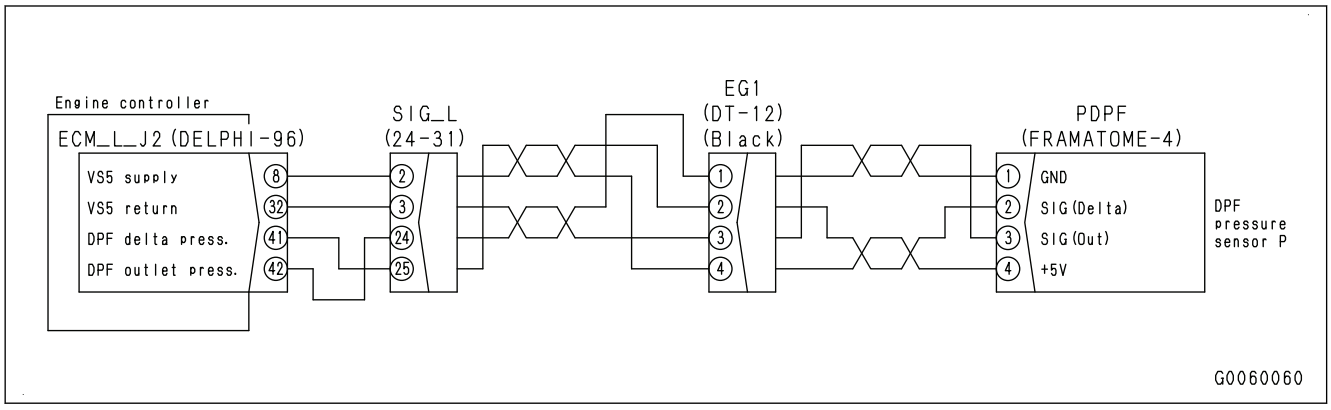
DSOV1_R: Dosing fuel solenoid valve 1 (shut off valve connector of right bank side)

Circuit diagram of VGT solenoid



<table>
<tr><th>No.</th><th>Cause</th><th>Procedures, Measurement, Values, Note</th><th colspan="2">Diagnosis and treatment</th></tr>
<tr><td rowspan="2">5</td><td rowspan="2">KDPF outlet pressure sensor</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Insert the T-adapter into the connector PDPF.
3. Turn the starting switch to the ON position, then do the troubleshooting.
4. Does the troubleshooting result agree with the standard value?
<table><tr><th>Item</th><th>Measurement position, condition</th><th>Standard value</th></tr><tr><td>Voltage</td><td>Between PDPF (3) and (1)</td><td>0.5 to 4.5 V</td></tr></table></td><td>YES</td><td>• The KDPF output pressure sensor is normal.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The KDPF outlet pressure sensor is defective.
• Replace the KDPF outlet pressure sensor.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">6</td><td rowspan="2">Confirmation of check results</td><td rowspan="2">1. Do the troubleshooting above again.
2. Can you find the cause by the check?</td><td>YES</td><td>The repair is completed.</td></tr>
<tr><td>NO</td><td>• The engine controller can be defective.
• Replace the engine controller.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">7</td><td rowspan="2">Confirmation of repair</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Connect all the component parts.
3. Turn the starting switch to the ON position.
4. Check the abnormality record.
5. Is “E” shown in the abnormality record of this failure code?</td><td>YES</td><td>Goes back to the first check item.</td></tr>
<tr><td>NO</td><td>The repair is completed.</td></tr>
</table>

Circuit diagram of KDPF differential pressure sensor



REMARK

If “E” is shown in the abnormality record of this failure code during “Loaded Diagnostics Operation To Confirm Failure Correction”, go back to the troubleshooting.

⚠ **Stop the machine on a level ground. Set the parking brake switch to the ON position. Place chocks under the tracks.**

1. Turn the start switch to the ON position.

   REMARK

   This procedure is done to let the engine controller recognize the sensor variation when the starting switch is turned to the ON position.

2. Delete this failure code. For details, see TESTING AND ADJUSTING, “SETTING AND OPERATION OF MACHINE MONITOR”, “TESTING MENU”, “TESTING MENU (ENGINE CONTROLLER ACTIVE FAULT CLEAR)”.
3. Turn the starting switch to the OFF position to shut down the engine controller.
4. Start the engine.
5. Run the engine at low idle for approximately 1 minute.
6. Set the operating mode setting to P mode. For details, see "TESTING AND ADJUSTING", "SET AND OPERATE MACHINE MONITOR", "DEFAULT SETTING MENU".
7. Select and show “Pre-defined Monitoring” (01/17) or the monitoring items that follow. For details, see TESTING AND ADJUSTING, “SET AND OPERATE MACHINE MONITOR”.

   Monitoring code: 01002 “Engine Speed”

   Monitoring code: 04107 “Coolant Temperature”

   Monitoring code: 30100 “T/C Oil Temperature”

   Monitoring code: 04401 “Hydraulic Oil Temperature”
8. Show the Adjustment ID item that follows. For details, see TESTING AND ADJUSTING, "SET AND OPERATE MACHINE MONITOR".

   Adjustment ID: 0530 “STALL MODE”

   NOTICE

   When the preset (gear speed for moving off) is in “F3-R3”,“STALL MODE” is enabled. Check that the “F3-R3” the preset (gear speed for moving off) is selected on the adjustment ID “0530” screen.
9. Do a full stall operation (torque converter stall + work equipment relief) with the method described as follows.

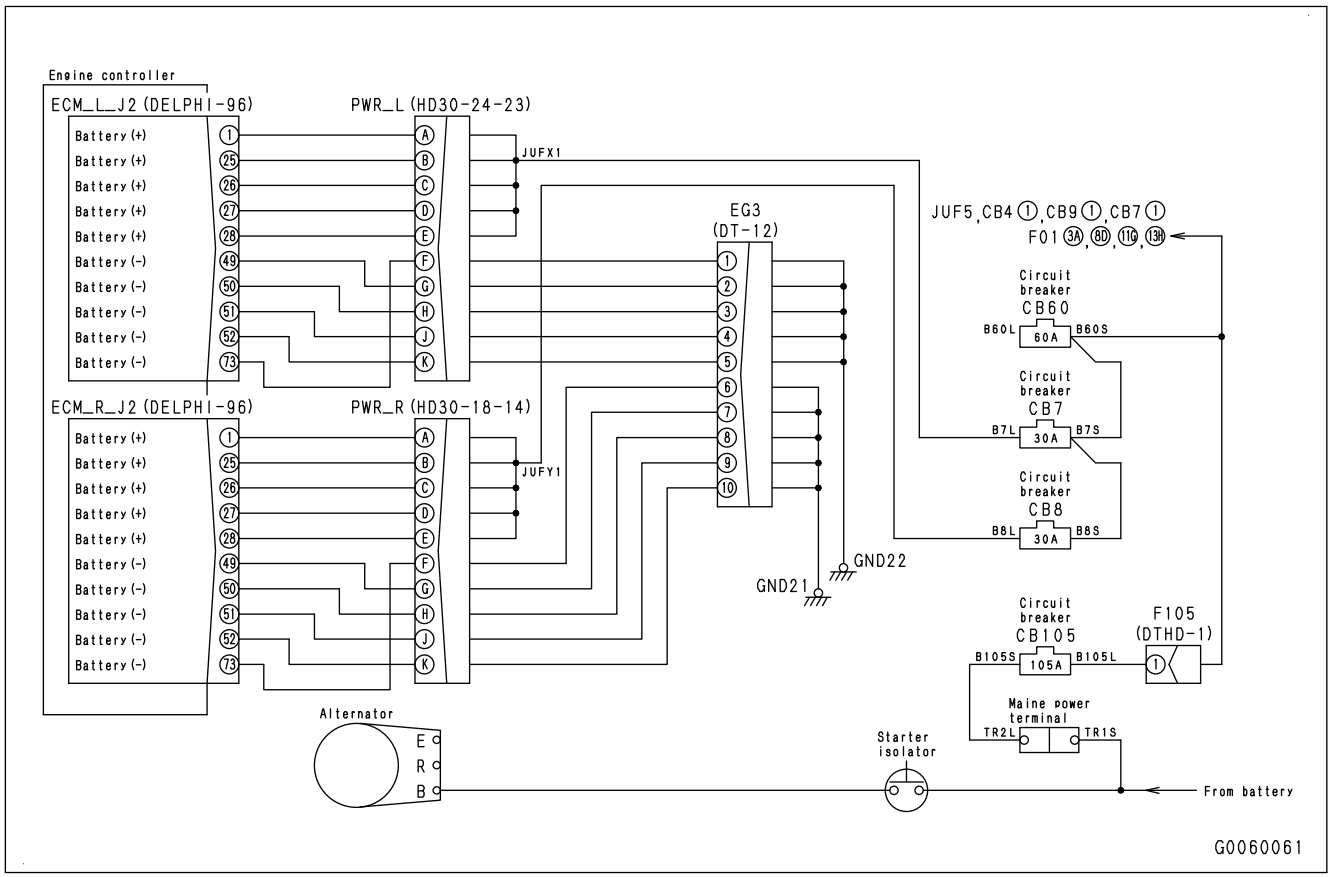
   NOTICE

   - **Do not stall the torque converter 60 seconds or more. Make sure the torque converter oil temperature does not exceed 120 ˚C.**
   - **To clear this failure code, the full stall operation must be done for 50 minutes in total.**

   1) Set the preset (gear speed for moving off) to "F3-R3" with UP switch or DOWN switch of joystick (steering, directional and gear shift lever)(PCCS lever).
   2) Select the "Manual shift mode" with gear shift mode selector switch.
   3) Set the work equipment lock switch to the FREE position.
   4) Operate the ripper control lever to set the ripper lift cylinder to RAISE stroke end.
   5) Push the brake pedal fully to the stroke end with the left foot.
   6) Set the parking brake switch to the FREE position.
   7) Operate the joystick (steering, directional and gear shift lever) (PCCS lever) to set the direction selection to FORWARD side.

<table>
<tr><th>No.</th><th>Cause</th><th>Procedures, Measurement, Values, Note</th><th colspan="2">Diagnosis and treatment</th></tr>
<tr><td rowspan="2">4</td><td rowspan="2">Short circuit in wiring harness</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Disconnect the connectors ECM_R_J1 and TIM_R, and connect the T-adapter to the female side of ECM_R_J1 to troubleshoot.
3. Does the troubleshooting result agree with the standard value?
<table><tr><th>Item</th><th>Measurement position/condition</th><th>Standard value</th></tr><tr><td>Resistance</td><td>Between ECM_R_J1 (female) (62) and each pin other than pin (62)</td><td>Min. 1 MΩ</td></tr></table></td><td>YES</td><td>• Short circuit in wiring harness does not occur.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• Short circuit in wiring harness occurs.
• Repair or replace the wiring harness.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">5</td><td rowspan="2">Confirmation of check results</td><td rowspan="2">1. Do the troubleshooting above again.
2. Can you identify the cause by the check?</td><td>YES</td><td>The repair is completed.</td></tr>
<tr><td>NO</td><td>• The engine controller can be defective.
• Replace the engine controller.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">6</td><td rowspan="2">Confirmation of repair</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Connect all the component parts.
3. Turn the starting switch to the ON position.
4. Check the abnormality record.
5. Is “E” shown in the abnormality record of this failure code?</td><td>YES</td><td>Go to the first check item.</td></tr>
<tr><td>NO</td><td>The repair is completed.</td></tr>
</table>

Circuit diagram of engine controller power supply



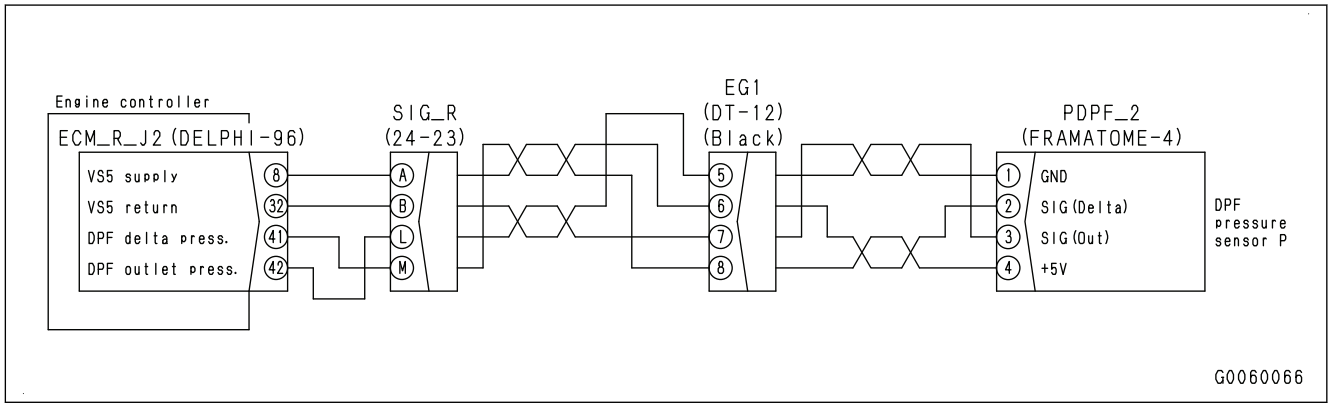
FAILURE CODE [CB698]

Details of failure	Low voltage error occurs in the signal circuit of the engine controller internal temperature sensor.
Action level	L01
Action of controller	None in particular.
Phenomenon on machine	None
Related information	**Monitoring code** "Engine Con Internal Temp_2" can be checked with the monitoring function. (Code: 18902)

No.	Cause	Procedures, Measurement, Values, Note	Diagnosis and treatment	
1	Wiring harness and connector	1. See the section about wiring harness and connector in the "ELECTRIC EQUIPMENT" in "RELATED INFORMATION TO TROUBLESHOOT", "CHECKS BEFORE TROUBLESHOOTING". 2. Are the wiring harness and connector normal?	YES	• The wiring harness and connector are normal. • Go to the next check item.
			NO	• The wiring harness and connector are defective. • Repair or replace the defective wiring harness and connector. • Go to "Confirmation of repair".
2	Controller operating condition	1. Check if the engine controller is operated in low temperature. 2. Is the temperature around the engine controller normal?	YES	• The controller operating condition is normal. • Go to the next check item.
			NO	• The controller operating condition is not normal. • Set to the correct temperature for the engine controller body and the area around it. • Go to "Confirmation of repair".
3	Confirmation of check results	1. Do the troubleshooting above again. 2. Can you identify the cause by the check?	YES	The repair is completed.
			NO	• The engine controller can be defective. • Replace the engine controller. • Go to "Confirmation of repair".

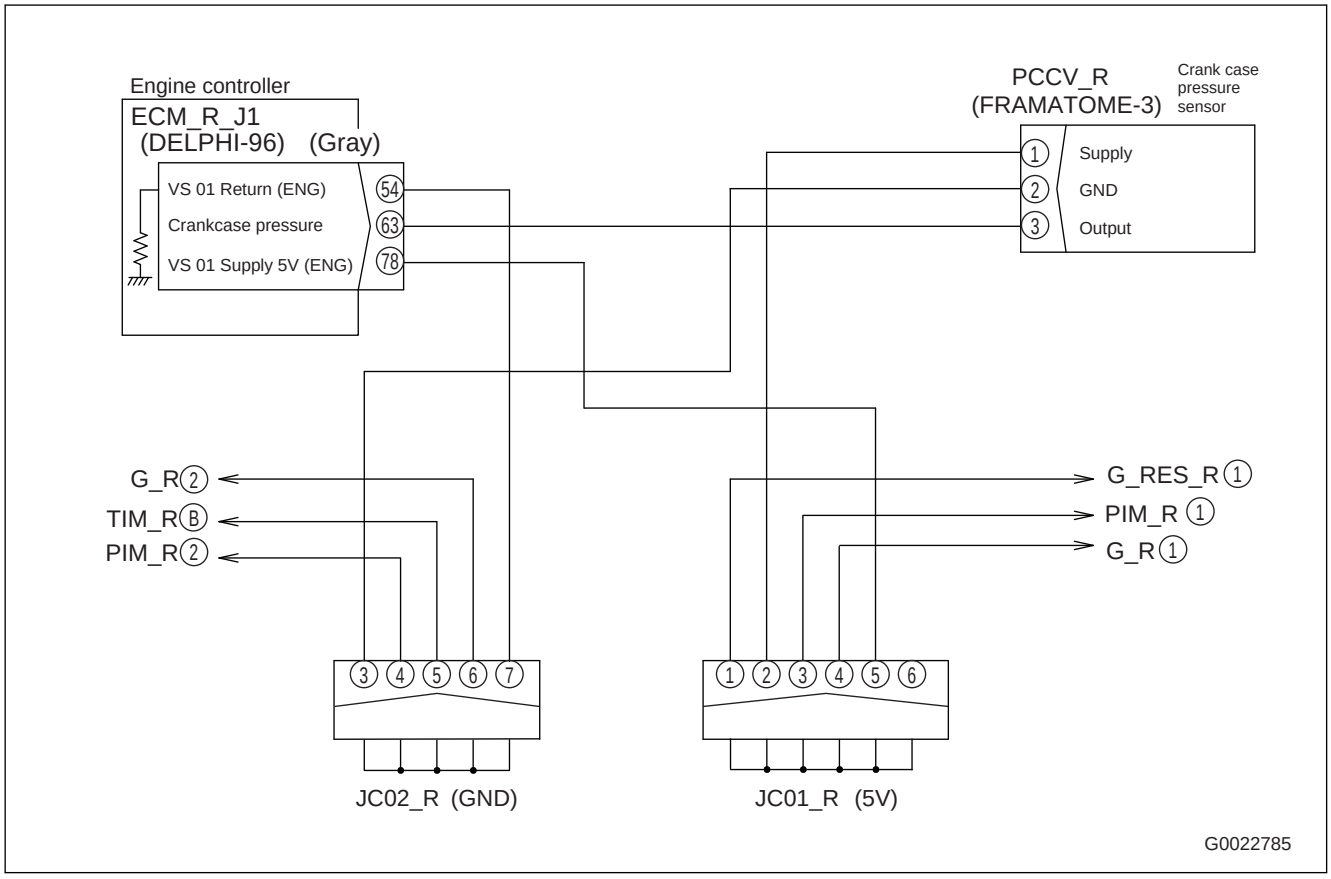
No.	Cause	Procedures, Measurement, Values, Note	Diagnosis and treatment	
5	Confirmation of check results	1. Do the troubleshooting above again. 2. Can you find the cause by the check?	YES	The repair is completed.
			NO	• The engine controller can be defective. • Replace the engine controller. • Go to “Confirmation of repair”.
6	Confirmation of repair	1. Turn the starting switch to the OFF position. 2. Connect all the component parts. 3. Turn the starting switch to the ON position. 4. Check the abnormality record. 5. Is “E” shown in the abnormality record of this failure code?	YES	Goes back to the first check item.
			NO	The repair is completed.

Circuit diagram of sensor power supply 5



No.	Cause	Procedures, Measurement, Values, Note	Diagnosis and treatment	
6	Confirmation of check results	1. Do the troubleshooting above again. 2. Can you identify the cause by the check?	YES	The repair is completed.
			NO	• The engine controller can be defective. • Replace the engine controller. • Go to “Confirmation of repair”.
7	Confirmation of repair	1. Turn the starting switch to the OFF position. 2. Connect all the component parts. 3. Turn the starting switch to the ON position. 4. Check the abnormality record. 5. Is “E” shown in the abnormality record of this failure code?	YES	Go to the first check item.
			NO	The repair is completed.

Circuit diagram of crankcase pressure sensor



<table>
<tr><th>No.</th><th>Cause</th><th>Procedures, Measurement, Values, Note</th><th colspan="2">Diagnosis and treatment</th></tr>
<tr><td rowspan="2">5</td><td rowspan="2">Short circuit in wiring harness</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Make sure that the system operating lamp is not lit. Turn the battery disconnect switch to the OFF position.
3. Disconnect the connectors ECM_R_J2 and VGT-SOL_R. Connect the T-adapter to the female side of ECM_R_J2 to troubleshoot.
4. Does the troubleshooting result agree with the standard value?
<table><tr><th>Item</th><th>Measurement position/condition</th><th>Stand-ard val-ue</th></tr><tr><td rowspan="2">Resist-ance</td><td>Between ECM_R_J2 (female) (80) and each pin other than pin (80)</td><td>At least 1 MΩ</td></tr><tr><td>Between ECM_R_J2 (female) (2) and each pin other than pin (2)</td><td>At least 1 MΩ</td></tr></table></td><td>YES</td><td>• Wiring harness has no short circuit.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• Wiring harness has a short circuit.
• Repair or replace the wiring harness.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">6</td><td rowspan="2">Reconfirmation of check item</td><td rowspan="2">1. Do the previous checks again.
2. Can you find the cause when you check again?</td><td>YES</td><td>The repair is completed.</td></tr>
<tr><td>NO</td><td>• The engine controller can be defective.
• Replace the engine controller.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">7</td><td rowspan="2">Confirmation of repair</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Connect all the component parts.
3. Turn the starting switch to the ON position.
4. Take a look in the abnormality record.
5. Is an “E” shown in the abnormality record of this failure code?</td><td>YES</td><td>Go back to the first check item.</td></tr>
<tr><td>NO</td><td>The repair is completed.</td></tr>
</table>

<table>
<tr><th>No.</th><th>Cause</th><th>Procedures, Measurement, Values, Note</th><th colspan="2">Diagnosis and treatment</th></tr>
<tr><td rowspan="2">2</td><td rowspan="2">Open circuit in wiring harness</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Check that the system operating lamp is not lit, and then turn the battery disconnect switch to the OFF position.
3. Disconnect connectors ECM_R_J2 and PDPF_2. Connect the T-adapter to each female side to do the troubleshooting.
4. Does the troubleshooting result agree with the standard value?
<table><tr><th>Item</th><th>Measurement position, condition</th><th>Standard value</th></tr><tr><td rowspan="2">Resistance</td><td>Between ECM_R_J2 (female) (8) and PDPF_2 (female) (4)</td><td>Max. 1 Ω</td></tr><tr><td>Between ECM_R_J2 (female) (42) and PDPF_2 (female) (3)</td><td>Max. 1 Ω</td></tr></table></td><td>YES</td><td>• The wiring harness does not have an open circuit.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The wiring harness has an open circuit.
• Repair or replace the wiring harness.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">3</td><td rowspan="2">Ground fault in wiring harness</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Check that the system operating lamp is not lit, and then turn the battery disconnect switch to the OFF position.
3. Disconnect connectors ECM_R_J2 and PDPF_2. Connect the T-adapter to the female side of one of them to do the troubleshooting.
4. Does the troubleshooting result agree with the standard value?
<table><tr><th>Item</th><th>Measurement position, condition</th><th>Standard value</th></tr><tr><td>Resistance</td><td>Between ground and one of ECM_R_J2 (female) (42) and PDPF_2 (female) (3)</td><td>Min. 1 MΩ</td></tr></table></td><td>YES</td><td>• The wiring harness does not have a ground fault.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The wiring harness has a ground fault.
• Repair or replace the wiring harness.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">4</td><td rowspan="2">Short circuit in wiring harness</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Check that the system operating lamp is not lit, and then turn the battery disconnect switch to the OFF position.
3. Disconnect connectors ECM_R_J2 and PDPF_2. Connect the T-adapter to the female side of ECM_R_J2 to do the troubleshooting.
4. Does the troubleshooting result agree with the standard value?
<table><tr><th>Item</th><th>Measurement position, condition</th><th>Standard value</th></tr><tr><td>Resistance</td><td>Between ECM_R_J2 (female) (42) and each pin other than pin (42)</td><td>Min. 1 MΩ</td></tr></table></td><td>YES</td><td>• The wiring harness does not have a short circuit.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The wiring harness has a short circuit.
• Repair or replace the wiring harness.
• Go to “Confirmation of repair”.</td></tr>
</table>

REMARK

If “E” is shown in the abnormality record of this failure code during “Loaded Diagnostics Operation To Confirm Failure Correction”, go back to the troubleshooting.

⚠ **Stop the machine on a level ground. Set the parking brake switch to the ON position. Place chocks under the tracks.**

1. Turn the start switch to the ON position.

   REMARK

   This procedure is done to let the engine controller recognize the sensor variation when the starting switch is turned to the ON position.

2. Delete this failure code. For details, see TESTING AND ADJUSTING, “SETTING AND OPERATION OF MACHINE MONITOR”, “TESTING MENU”, “TESTING MENU (ENGINE CONTROLLER ACTIVE FAULT CLEAR)”.
3. Turn the starting switch to the OFF position to shut down the engine controller.
4. Start the engine.
5. Run the engine at low idle for approximately 1 minute.
6. Set the operating mode setting to P mode. For details, see "TESTING AND ADJUSTING", "SET AND OPERATE MACHINE MONITOR", "DEFAULT SETTING MENU".
7. Select and show “Pre-defined Monitoring” (01/17) or the monitoring items that follow. For details, see TESTING AND ADJUSTING, “SET AND OPERATE MACHINE MONITOR”.

   Monitoring code: 01002 “Engine Speed”

   Monitoring code: 04107 “Coolant Temperature”

   Monitoring code: 30100 “T/C Oil Temperature”

   Monitoring code: 04401 “Hydraulic Oil Temperature”
8. Show the Adjustment ID item that follows. For details, see TESTING AND ADJUSTING, "SET AND OPERATE MACHINE MONITOR".

   Adjustment ID: 0530 “STALL MODE”

   NOTICE

   When the preset (gear speed for moving off) is in “F3-R3”,“STALL MODE” is enabled. Check that the “F3-R3” the preset (gear speed for moving off) is selected on the adjustment ID “0530” screen.
9. Do a full stall operation (torque converter stall + work equipment relief) with the method described as follows.

   NOTICE

   - **Do not stall the torque converter 60 seconds or more. Make sure the torque converter oil temperature does not exceed 120 ˚C.**
   - **To clear this failure code, the full stall operation must be done for 50 minutes in total.**

   1) Set the preset (gear speed for moving off) to "F3-R3" with UP switch or DOWN switch of joystick (steering, directional and gear shift lever)(PCCS lever).
   2) Select the "Manual shift mode" with gear shift mode selector switch.
   3) Set the work equipment lock switch to the FREE position.
   4) Operate the ripper control lever to set the ripper lift cylinder to RAISE stroke end.
   5) Push the brake pedal fully to the stroke end with the left foot.
   6) Set the parking brake switch to the FREE position.
   7) Operate the joystick (steering, directional and gear shift lever) (PCCS lever) to set the direction selection to FORWARD side.

FAILURE CODE [D162KB]

Detail of failure	When the controller energizes the primary (coil) circuit of the radio control horn relay, an abnormal current flows.
Action level	L03
Action of controller	Stops to energize the primary (coil) circuit of the radio control horn relay.
Phenomenon on machine	The horn does not operate in radio control mode.
Related information	**Monitoring code** You can check the ON/OFF state of “Horn Relay” with the monitoring function. (Code: 03725) **Reference information** This failure code shows a failure in the primary (coil) circuit of the radio control horn relay, but does not show a failure in the secondary (contact side) circuit.

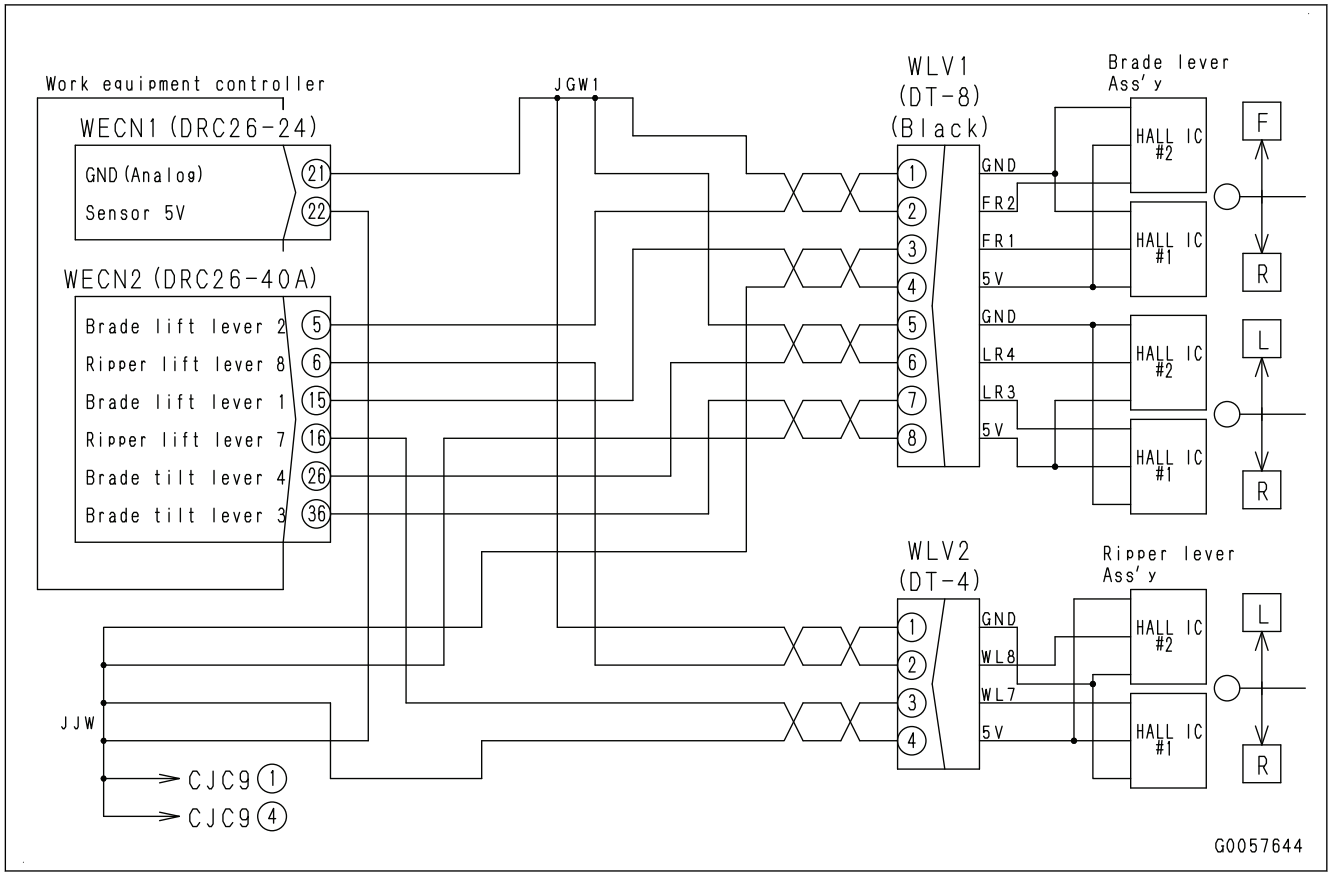
<table>
<tr><th>No.</th><th>Cause</th><th>Procedures, Measurement, Values, Note</th><th colspan="2">Diagnosis and treatment</th></tr>
<tr><td rowspan="2">1</td><td rowspan="2">Wiring harness and connector</td><td rowspan="2">1. Check the wiring harness and connector. For details, see “RELATED INFORMATION TO TROUBLESHOOT”, “CHECKS BEFORE TROUBLESHOOTING”, “ELECTRIC EQUIPMENT”.
2. Are the wiring harness and connectors in the correct condition?</td><td>YES</td><td>• The wiring harness and connectors are in the correct condition.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The wiring harness or a connector is defective.
• Repair or replace the defective wiring harness or connector.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">2</td><td rowspan="2">Radio control horn relay</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Disconnect the connector RHR. Connect the T-adapter to the male side to do the troubleshooting.
3. Does the troubleshooting result agree with the standard value?
<table>
<tr><th>Item</th><th>Measurement position, condition</th><th>Standard value</th></tr>
<tr><td>Resistance</td><td>Between RHR (male) (1) and (2)</td><td>200 to 400 Ω</td></tr>
</table></td><td>YES</td><td>• The radio control horn relay is in the correct condition.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The radio control horn relay is defective.
• Replace the radio control horn relay.
• Go to “Confirmation of repair”.</td></tr>
</table>

<table>
<tr><th>No.</th><th>Cause</th><th>Procedures, Measurement, Values, Note</th><th colspan="2">Diagnosis and treatment</th></tr>
<tr><td rowspan="2">3</td><td rowspan="2">Open circuit in wiring harness</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Check that the system operating lamp is not lit, and then turn the battery disconnect switch to the OFF position.
3. Disconnect the connectors CM01 and PSL. Connect the T-adapter to each female side to do the troubleshooting.
4. Does the troubleshooting result agree with the standard value?
<table><tr><th>Item</th><th>Measurement position, condition</th><th>Standard value</th></tr><tr><td rowspan="2">Resistance</td><td>Between CB1 and PSL (female) (1)</td><td>Max. 1 Ω</td></tr><tr><td>Between PSL (female) (2) and CM01 (female) (6)</td><td>Max. 1 Ω</td></tr></table></td><td>YES</td><td>• Open circuit in wiring harness does not occur.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The wiring harness has an open circuit.
• Repair or replace the wiring harness.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">4</td><td rowspan="2">Ground fault in wiring harness</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Check that the system operating lamp is not lit, and then turn the battery disconnect switch to the OFF position.
3. Disconnect the connectors CM01 and PSL. Connect the T-adapter to the female side on one of them to do the troubleshooting.
4. Does the troubleshooting result agree with the standard value?
<table><tr><th>Item</th><th>Measurement position, condition</th><th>Standard value</th></tr><tr><td>Resistance</td><td>Between ground and one of CB1 and PSL (female) (1)</td><td>Min. 1 MΩ</td></tr></table></td><td>YES</td><td>• Ground fault in wiring harness does not occur.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The wiring harness has a ground fault.
• Repair or replace the wiring harness.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">5</td><td rowspan="2">Personal code relay (secondary side)</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Disconnect the connector PSL. Replace with the same type relay.
3. Turn the starting switch to the ON position.
4. Check the abnormality record.
5. Is “E” shown in the abnormality record of this failure code?</td><td>YES</td><td>• The removed personal code relay is in the correct condition.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The removed personal code relay is defective.
• Replace the personal code relay.
• Go to “Confirmation of repair”.</td></tr>
</table>

No.	Cause	Procedures, Measurement, Values, Note	Diagnosis and treatment	
3	Confirmation of check results	1. Do the troubleshooting above again. 2. Can you find the cause by the check?	YES	The repair is completed.
			NO	• The machine monitor can be defective. • Replace the machine monitor. • Go to “Confirmation of repair”.
4	Confirmation of repair	1. Turn the starting switch to the OFF position. 2. Connect all the component parts. 3. Turn the starting switch to the ON position. 4. Check the abnormality record. 5. Is “E” shown in the abnormality record of this failure code?	YES	Go back to the first check item.
			NO	The repair is completed.

No.	Cause	Procedures, Measurement, Values, Note	Diagnosis and treatment	
5	Confirmation of check results	1. Do the preceding troubleshooting again. 2. Have you found the cause when the inspection is done again?	YES	The repair is completed.
			NO	• The work equipment controller can be defective. • Replace the work equipment controller. • Go to “Confirmation of repair”.
6	Confirmation of repair	1. Turn the starting switch to the OFF position. 2. Install all the configuration equipment and connect them. 3. Turn the starting switch to the ON position. 4. Delete the abnormality record of the electrical system. 5. Turn the starting switch to the OFF position. 6. Shut down the engine controller. (See “PROCEDURE FOR TROUBLESHOOTING” in this chapter.) 7. Turn the starting switch to the ON position. 8. Check the abnormality record. 9. Is this failure code shown in the record?	YES	Go back to the first check item.
			NO	The repair is completed.

Circuit diagram of work equipment controller sensor 5 V power supply



<table>
<tr><th>No.</th><th>Cause</th><th>Procedures, Measurement, Values, Note</th><th colspan="2">Diagnosis and treatment</th></tr>
<tr><td rowspan="2">5</td><td rowspan="2">Sensor</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Disconnect the connector OPS1 and SSA.
3. Install one of the disconnected connectors.
4. Turn the starting switch to the ON position.
5. See if this failure code is shown.
6. Do the procedure from step 1 to 5 until all the connectors are connected.
7. Is the installed connector in the correct condition?
REMARK
• It takes time to start the controller. Wait for approximately 1 minute and check the abnormality record.
• The failure code of the disconnected device is shown because the connector is disconnected.
<table><tr><th>Sensor</th><th>Connector</th></tr><tr><td>Operator present sensor</td><td>OPS1</td></tr><tr><td>Acceleration sensor</td><td>SSA</td></tr></table></td><td>YES</td><td>• The equipment connected to each connector is in the correct condition.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The device that is connected to the connector shown by this failure code is defective.
• Replace the connected device for the shown failure code.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">6</td><td rowspan="2">Confirmation of check results</td><td rowspan="2">1. Do the troubleshooting above again.
2. Can you find the cause by the check?</td><td>YES</td><td>The repair is completed.</td></tr>
<tr><td>NO</td><td>• The power train controller can be defective.
• Replace the power train controller.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">7</td><td rowspan="2">Confirmation of repair</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Connect all the component parts.
3. Turn the starting switch to the ON position.
4. Check the abnormality record.
5. Is “E” shown in the abnormality record of this failure code?
REMARK
It takes time to start the controller. Wait for approximately 1 minute and check the abnormality record.</td><td>YES</td><td>Go back to the first check item.</td></tr>
<tr><td>NO</td><td>The repair is completed.</td></tr>
</table>

<table>
<tr><th>No.</th><th>Cause</th><th>Procedures, Measurement, Values, Note</th><th colspan="2">Diagnosis and treatment</th></tr>
<tr><td rowspan="2">10</td><td rowspan="2">Ground fault in wiring harness (ACC signal circuit of KOMTRAX Plus controller)</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Check that the system operating lamp is not lit, and then turn the battery disconnect switch to the OFF position.
3. Remove fuse No. 9, No. 10, and No. 19 in fuse box F01.
4. Disconnect the connectors WECN3, PTCN3, KEY0, NAV1, OPTCN2, ESR, BCD3, WECN3, PHR, PLUB, RLSW, FLSW, WLSW, and SRV. Connect the T-adapter to the female side of CM01 to do the troubleshooting.
5. Does the troubleshooting result agree with the standard value?
<table><tr><th>Item</th><th>Measurement position, condition</th><th>Standard value</th></tr><tr><td>Resistance</td><td>Between ground and one of F01-19, C30B (female) (4), and (5)</td><td>Min. 1 MΩ</td></tr></table></td><td>YES</td><td>• Ground fault in wiring harness does not occur.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The wiring harness has a ground fault.
• Repair or replace the wiring harness.
• Replace the fuse if it is blown out.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">11</td><td rowspan="2">Short circuit in wiring harness (ACC signal circuit of KOMTRAX Plus controller)</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Check that the system operating lamp is not lit, and then turn the battery disconnect switch to the OFF position.
3. Remove fuse No. 9, No. 10, and No. 19 in fuse box F01.
4. Disconnect the connectors WECN3, PTCN3, KEY0, NAV1, OPTCN2, ESR, BCD3, WECN3, PHR, PLUB, RLSW, FLSW, WLSW, and SRV. Connect the T-adapter to the female side of CM01 to do the troubleshooting.
5. Does the troubleshooting result agree with the standard value?
<table><tr><th>Item</th><th>Measurement position, condition</th><th>Standard value</th></tr><tr><td rowspan="2">Resistance</td><td>Between C30B (female) (4) and each pin other than pin (4) or (5)</td><td>Min. 1 MΩ</td></tr><tr><td>Between C30B (female) (5) and each pin other than pin (4), (5)</td><td>Min. 1 MΩ</td></tr></table></td><td>YES</td><td>• Short circuit in wiring harness does not occur.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The wiring harness has a short circuit.
• Repair or replace the wiring harness.
• Replace the fuse if it is blown out.
• Go to “Confirmation of repair”.</td></tr>
</table>

FAILURE CODE [DDDKKA]

Detail of failure	The NO* and NC* lines of the power ladder raise operation switch 1 (side of cab) circuit are open (switch: OFF) at the same time. (Recognizes as normally open (OFF))
Action level	L01
Action of controller	Fixes the power ladder raise operation switch 1 (side of the cab) to OFF position.
Phenomenon on machine	• Ladder raise operation is disabled. • The ladder cannot be operated by the ladder raise operation switch at side of the cab.
Related information	**Monitoring code** You can check the ON/OFF state of “(Option cntlr) SW Input 3” with the monitoring function. (Code: 02712) **Reference information** The ladder can be raised by using the ground level ladder operation switch.

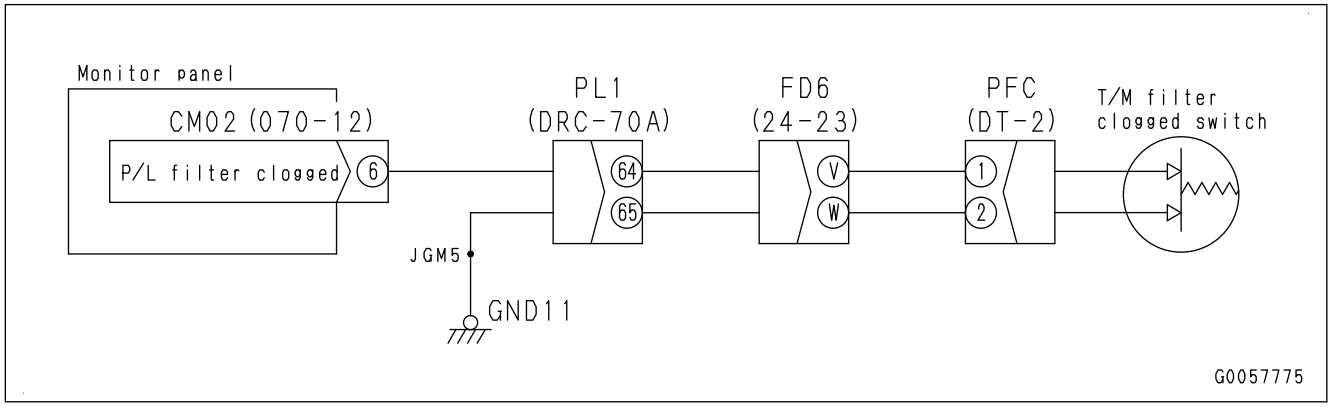
No.	Cause	Procedures, Measurement, Values, Note	Diagnosis and treatment	
1	Wiring harness and connector	1. Check the wiring harness and connector. For details, see “RELATED INFORMATION TO TROUBLESHOOT”, “CHECKS BEFORE TROUBLESHOOTING”, “ELECTRIC EQUIPMENT”. 2. Are the wiring harness and connectors in the correct condition?	YES	• The wiring harness and connectors are in the correct condition. • Go to the next check item.
			NO	• The wiring harness or a connector is defective. • Repair or replace the defective wiring harness or connector. • Go to “Confirmation of repair”.

<table>
<tr><th>No.</th><th>Cause</th><th>Procedures, Measurement, Values, Note</th><th colspan="2">Diagnosis and treatment</th></tr>
<tr><td rowspan="2">2</td><td rowspan="2">Work equipment lock switch</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Disconnect the connector WELK2. Connect the T-adapter to the male side to do the troubleshooting.
3. Operate the work equipment lock switch to do the troubleshooting.
4. Does the troubleshooting result agree with the standard value?
<table><tr><th>Item</th><th colspan="2">Measurement position, condition</th><th>Standard value</th></tr><tr><td rowspan="4">Resistance</td><td rowspan="2">Between WELK2 (male) (4) and (5)</td><td>Switch: Lock</td><td>Min. 1 MΩ</td></tr><tr><td>Switch: Free</td><td>Max. 1 Ω</td></tr><tr><td rowspan="2">Between WELK2 (male) (6) and (5)</td><td>Switch: Lock</td><td>Max. 1 Ω</td></tr><tr><td>Switch: Free</td><td>Min. 1 MΩ</td></tr></table></td><td>YES</td><td>• The work equipment lock switch is in the correct condition.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The work equipment lock switch is possibly defective.
• Replace the work equipment lock switch.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">3</td><td rowspan="2">Hot short circuit in wiring harness</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Disconnect the connector WELK2. Insert the T-adapter to do the troubleshooting.
3. Turn the starting switch to the ON position.
4. Does the troubleshooting result agree with the standard value?
<table><tr><th>Item</th><th colspan="2">Measurement position, condition</th><th>Standard value</th></tr><tr><td rowspan="4">Voltage</td><td rowspan="2">Between WELK2 (female) (4) and (5)</td><td>Switch: Lock</td><td>0V</td></tr><tr><td>Switch: Free</td><td>7 to 11V</td></tr><tr><td rowspan="2">Between WELK2 (female) (6) and (5)</td><td>Switch: Lock</td><td>7 to 11V</td></tr><tr><td>Switch: Free</td><td>0V</td></tr></table></td><td>YES</td><td>• Hot short circuit in wiring harness does not occur.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The wiring harness has a hot short circuit.
• Repair or replace the defective wiring harness.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">4</td><td rowspan="2">Confirmation of check results</td><td rowspan="2">1. Do the troubleshooting above again.
2. Can you find the cause by the check?</td><td>YES</td><td>The repair is completed.</td></tr>
<tr><td>NO</td><td>• The work equipment controller is possibly defective.
• Replace the work equipment controller.
• Go to “Confirmation of repair”.</td></tr>
</table>

<table>
<tr><th>No.</th><th>Cause</th><th>Procedures, Measurement, Values, Note</th><th colspan="2">Diagnosis and treatment</th></tr>
<tr><td rowspan="2">3</td><td rowspan="2">Ground fault in wiring harness</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Disconnect the connectors WECN2 and WLV2. Connect the T-adapter to the female side on one of them.
3. Does the troubleshooting result agree with the standard value?
<table><tr><th>Item</th><th>Measurement position, condition</th><th>Standard value</th></tr><tr><td>Resistance</td><td>Between ground and one of WECN2 (female) (16) and WLV2 (female) (3)</td><td>Min. 1 MΩ</td></tr></table></td><td>YES</td><td>• Ground fault in wiring harness does not occur.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The wiring harness has a ground fault.
• Repair or replace the defective wiring harness.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">4</td><td rowspan="2">Ripper lift lever potentiometer 1</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Disconnect the connector WLV2. Insert the T-adapter.
3. Turn the starting switch to the ON position.
4. Operate the ripper control lever in the lift direction to do the troubleshooting.
5. Does the troubleshooting result agree with the standard value?
<table><tr><th>Item</th><th>Measurement position, condition</th><th>Standard value</th></tr><tr><td>Voltage</td><td>Between WLV2 (3) and (1)</td><td>0.96 to 4.04 V</td></tr></table></td><td>YES</td><td>• The ripper lift lever potentiometer 1 is in the correct condition.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The ripper lift lever potentiometer 1 can be defective.
• Replace the ripper lift lever potentiometer 1.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">5</td><td rowspan="2">Confirmation of check results</td><td rowspan="2">1. Do the troubleshooting above again.
2. Can you find the cause by the check?</td><td>YES</td><td>The repair is completed.</td></tr>
<tr><td>NO</td><td>• The work equipment controller can be defective.
• Replace the work equipment controller.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">6</td><td rowspan="2">Confirmation of repair</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Connect all the component parts.
3. Turn the starting switch to the ON position.
4. Operate the ripper control lever in the lift direction.
5. Check the abnormality record.
6. Is “E” shown in the abnormality record of this failure code?</td><td>YES</td><td>Go back to the first check item.</td></tr>
<tr><td>NO</td><td>The repair is completed.</td></tr>
</table>

<table>
<tr><th>No.</th><th>Cause</th><th>Procedures, Measurement, Values, Note</th><th colspan="2">Diagnosis and treatment</th></tr>
<tr><td rowspan="2">3</td><td rowspan="2">Open circuit in wiring harness</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Disconnect the connectors CM02 and PFC. Connect the T-adapter to each female side.
3. Does the troubleshooting result agree with the standard value?
<table><tr><th>Item</th><th>Measurement position, condition</th><th>Standard value</th></tr><tr><td rowspan="2">Resistance</td><td>Between CM02 (female) (6) and PFC (female) (1)</td><td>Max. 1 Ω</td></tr><tr><td>Between PFC (female) (2) and ground</td><td>Max. 1 Ω</td></tr></table></td><td>YES</td><td>• Open circuit in wiring harness does not occur.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The wiring harness has an open circuit.
• Repair or replace the defective wiring harness.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">4</td><td rowspan="2">Confirmation of check results</td><td rowspan="2">1. Do the troubleshooting above again.
2. Can you find the cause by the check?</td><td>YES</td><td>The repair is completed.</td></tr>
<tr><td>NO</td><td>• The machine monitor can be defective.
• Replace the machine monitor.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">5</td><td rowspan="2">Confirmation of repair</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Connect all the component parts.
3. Start the engine.
4. Check the abnormality record.
5. Is “E” shown in the abnormality record of this failure code?</td><td>YES</td><td>Go back to the first check item.</td></tr>
<tr><td>NO</td><td>The repair is completed.</td></tr>
</table>

Circuit diagram of transmission oil filter

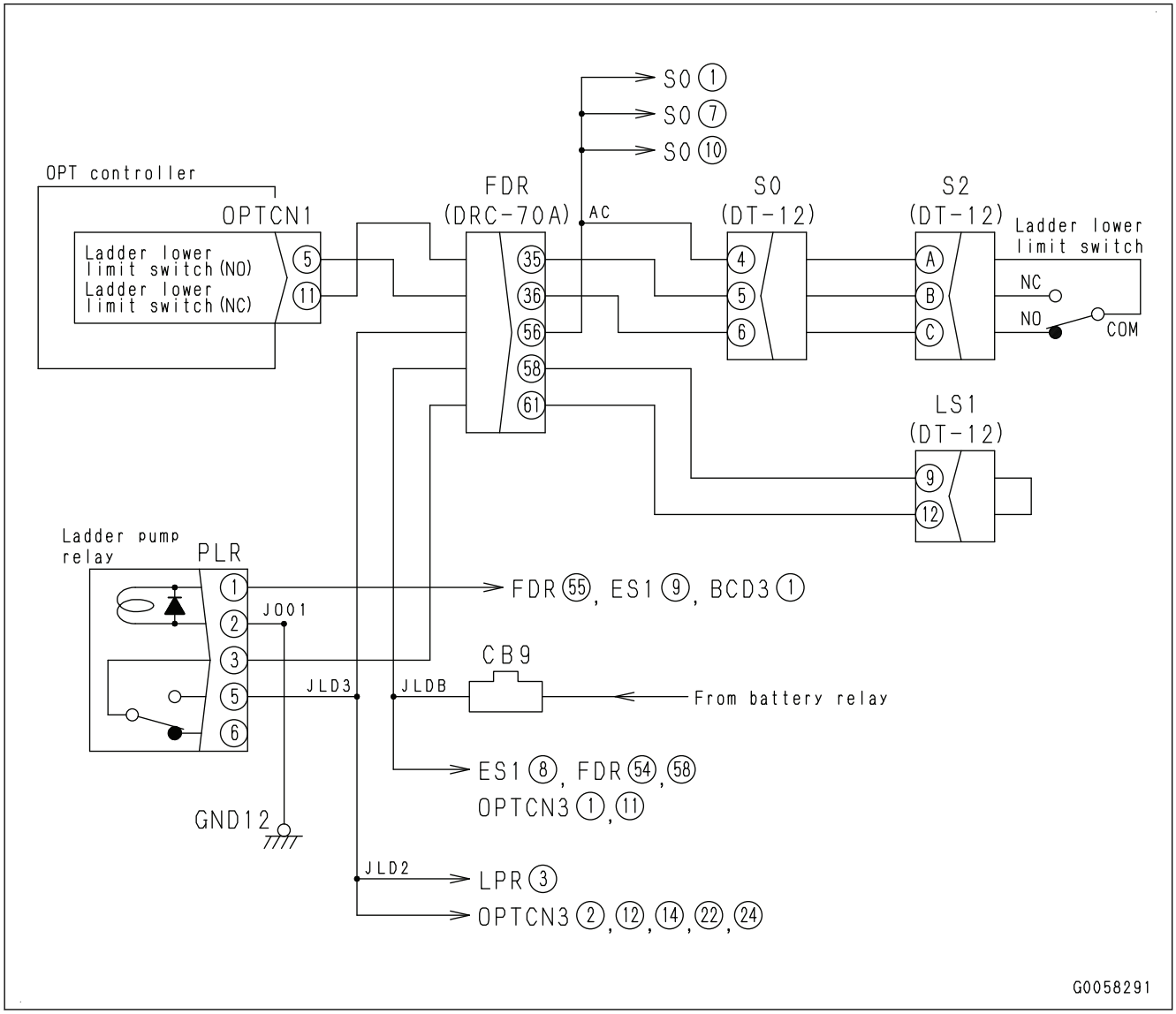


<table>
<tr><th>No.</th><th>Cause</th><th>Procedures, Measurement, Values, Note</th><th colspan="2">Diagnosis and treatment</th></tr>
<tr><td rowspan="2">2</td><td rowspan="2">Brake pedal potentiometer</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Disconnect the connector BRK. Connect the T-adapter to the male side.
3. Operate the brake pedal to do the troubleshooting.
4. Does the troubleshooting result agree with the standard value?
<table><tr><th>Item</th><th>Measurement position, condition</th><th>Standard value</th></tr><tr><td rowspan="4">Resistance</td><td>Between BRK (male) (C) and (A)</td><td>Approx. 5 kΩ</td></tr><tr><td>Between BRK (male) (B) and (A)</td><td>0.25 to 5 kΩ</td></tr><tr><td>Between BRK (male) (B) and (C)</td><td>0.25 to 5 kΩ</td></tr><tr><td>Between BRK (male) (B) and ground</td><td>Min. 1 MΩ</td></tr></table></td><td>YES</td><td>• The brake pedal potentiometer is in the correct condition.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The brake pedal potentiometer can be defective.
• Replace the brake pedal potentiometer.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">3</td><td rowspan="2">Hot short circuit in wiring harness</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Disconnect the connector BRK. Connect the T-adapter to the female side.
3. Turn the starting switch to the ON position.
4. Does the troubleshooting result agree with the standard value?
<table><tr><th>Item</th><th>Measurement position, condition</th><th>Standard value</th></tr><tr><td>Voltage</td><td>Between BRK (female) (B) and (A)</td><td>Max. 1 V</td></tr></table></td><td>YES</td><td>• Hot short circuit in wiring harness does not occur.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The wiring harness has a hot short circuit.
• Repair or replace the defective wiring harness.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">4</td><td rowspan="2">Confirmation of check results</td><td rowspan="2">1. Do the troubleshooting above again.
2. Can you find the cause by the check?</td><td>YES</td><td>The repair is completed.</td></tr>
<tr><td>NO</td><td>• The power train controller can be defective.
• Replace the power train controller.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">5</td><td rowspan="2">Confirmation of repair</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Connect all the component parts.
3. Turn the starting switch to the ON position.
4. Check the abnormality record.
5. Is “E” shown in the abnormality record of this failure code?</td><td>YES</td><td>Go back to the first check item.</td></tr>
<tr><td>NO</td><td>The repair is completed.</td></tr>
</table>

<table>
<tr><th>No.</th><th>Cause</th><th>Procedures, Measurement, Values, Note</th><th colspan="2">Diagnosis and treatment</th></tr>
<tr><td rowspan="2">3</td><td rowspan="2">Ground fault in wiring harness</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Disconnect the connectors PTCN1 and TLV1. Connect the T-adapter to the female side of one of them to do the troubleshooting.
3. Does the troubleshooting result agree with the standard value?
<table><tr><th>Item</th><th>Measurement position, condition</th><th>Standard value</th></tr><tr><td>Resistance</td><td>Between ground and one of PTCN1 (female) (19) and TLV1 (female) (6)</td><td>Min. 1 MΩ</td></tr></table></td><td>YES</td><td>• Ground fault in wiring harness does not occur.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The wiring harness has a ground fault.
• Repair or replace the wiring harness.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">4</td><td rowspan="2">Short circuit in wiring harness</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Disconnect connectors PTCN1 and TLV1. Connect the T-adapter to the female side of PTCN1 to do the troubleshooting.
3. Does the troubleshooting result agree with the standard value?
<table><tr><th>Item</th><th>Measurement position, condition</th><th>Standard value</th></tr><tr><td>Resistance</td><td>Between PTCN1 (female) (19) and each pin other than pin (19)</td><td>Min. 1 MΩ</td></tr></table></td><td>YES</td><td>• Short circuit in wiring harness does not occur.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The wiring harness has a short circuit.
• Repair or replace the wiring harness.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">5</td><td rowspan="2">Right steering lever potentiometer 2</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Insert the T-adapter into the connector TLV1.
3. Turn the starting switch to the ON position.
4. Operate the right steering lever to do the troubleshooting.
5. Does the troubleshooting result agree with the standard value?
<table><tr><th>Item</th><th>Measurement position, condition</th><th>Standard value</th></tr><tr><td>Voltage</td><td>Between TLV1 (6) and (8)</td><td>0.96 to 4.04 V</td></tr></table></td><td>YES</td><td>• The right steering lever potentiometer 2 is in the correct condition.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The right steering lever potentiometer 2 is defective.
• Replace the right steering lever potentiometer 2.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">6</td><td rowspan="2">Confirmation of check results</td><td rowspan="2">1. Do the troubleshooting above again.
2. Can you find the cause by the check?</td><td>YES</td><td>The repair is completed.</td></tr>
<tr><td>NO</td><td>• The power train controller can be defective.
• Replace the power train controller.
• Go to “Confirmation of repair”.</td></tr>
</table>

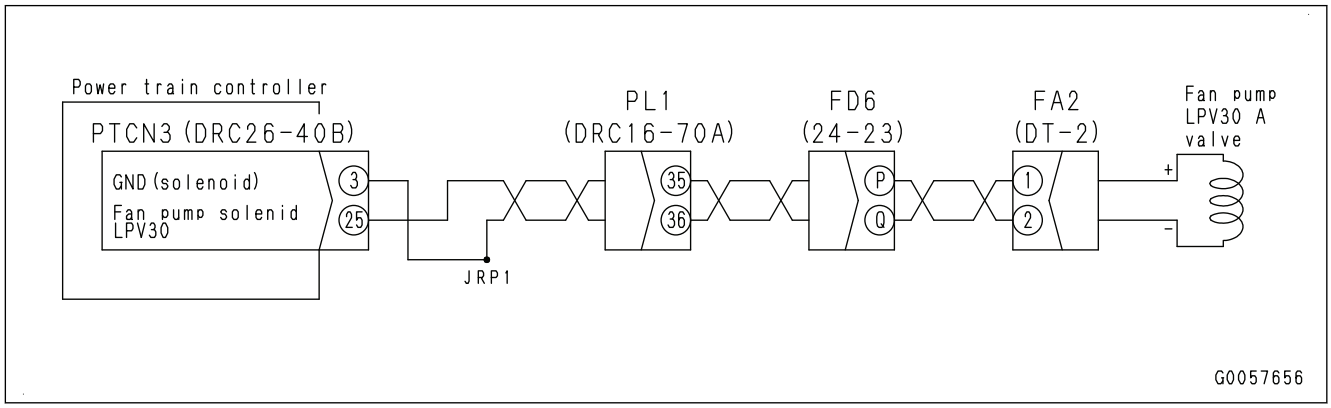
No.	Cause	Procedures, Measurement, Values, Note	Diagnosis and treatment	
5	Confirmation of repair	1. Turn the starting switch to the OFF position. 2. Connect all the component parts. 3. Turn the starting switch to the ON position. 4. Check the abnormality record. 5. Is “E” shown in the abnormality record of this failure code?	YES	Go back to the first check item.
			NO	The repair is completed.

Circuit diagram of power ladder lower limit switch



<table>
<tr><th>No.</th><th>Cause</th><th>Procedures, Measurement, Values, Note</th><th colspan="2">Diagnosis and treatment</th></tr>
<tr><td rowspan="2">3</td><td rowspan="2">Hot short circuit in wiring harness</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Disconnect the connector FA2. Connect the T-adapter to the female side.
3. Turn the starting switch to the ON position, then do the troubleshooting.
4. Does the troubleshooting result agree with the standard value?
<table><tr><th>Item</th><th>Measurement position, condition</th><th>Standard value</th></tr><tr><td>Voltage</td><td>Between FA2 (female) (1) and (2)</td><td>Max. 4.5 V</td></tr></table></td><td>YES</td><td>• Hot short circuit in wiring harness does not occur.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The wiring harness has a hot short circuit.
• Repair or replace the wiring harness.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">4</td><td rowspan="2">Confirmation of check results</td><td rowspan="2">1. Do the troubleshooting above again.
2. Can you find the cause by the check?</td><td>YES</td><td>The repair is completed.</td></tr>
<tr><td>NO</td><td>• The power train controller can be defective.
• Replace the power train controller.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">5</td><td rowspan="2">Confirmation of repair</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Connect all the component parts.
3. Turn the starting switch to the ON position.
4. Check the abnormality record.
5. Is “E” shown in the abnormality record of this failure code?</td><td>YES</td><td>Go back to the first check item.</td></tr>
<tr><td>NO</td><td>The repair is completed.</td></tr>
</table>

Circuit diagram of fan control solenoid 1

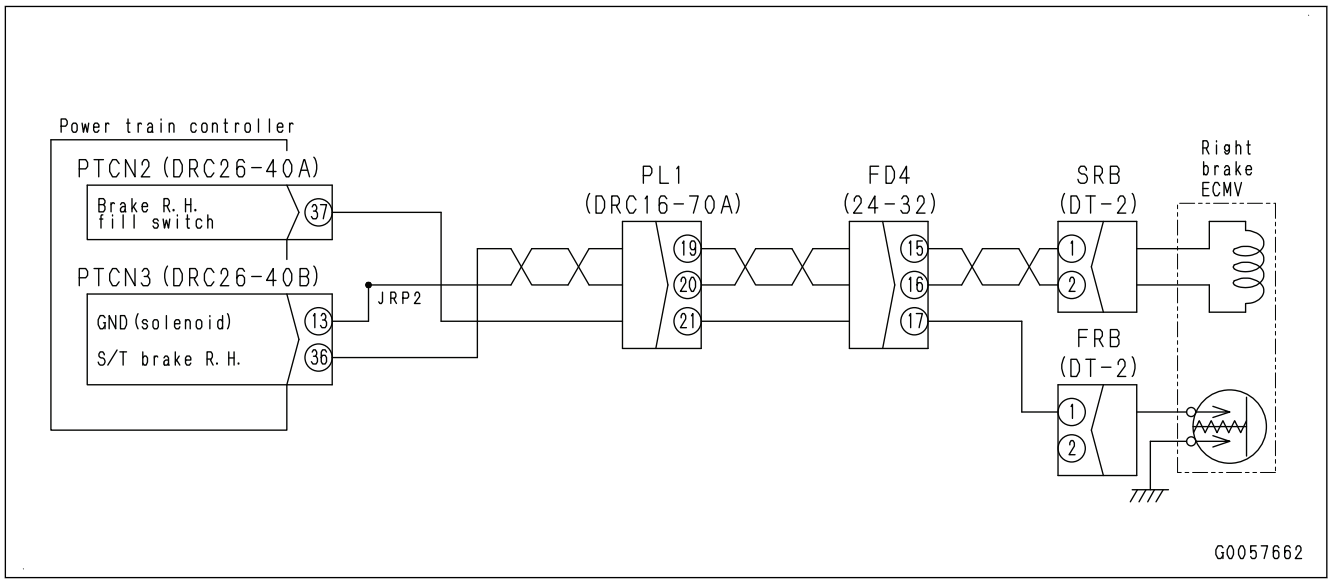


FAILURE CODE [DXH4KY]

Detail of failure	A current continuously flows to the transmission 1st clutch ECMV solenoid because there is a hot short circuit in the transmission 1st clutch ECMV solenoid system.
Action level	L03
Action of controller	• Stops to energize the transmission 1st clutch ECMV solenoid circuit. • Restricts engine and transmission operations.
Phenomenon on machine	• The automatic gear shift function does not operate. • When the machine is stopped, the engine speed is restricted to medium speed. • When the machine is stopped, selectable gear speeds are restricted to F1 and R1.
Related information	**Monitoring code** You can check the ON/OFF state of “T/M 1st Clutch ECMV Current” with the monitoring function. (Code: 31612)

<table>
<tr><th>No.</th><th>Cause</th><th>Procedures, Measurement, Values, Note</th><th colspan="2">Diagnosis and treatment</th></tr>
<tr><td rowspan="2">1</td><td rowspan="2">Wiring harness and connector</td><td rowspan="2">1. Check the wiring harness and connector. For details, see “RELATED INFORMATION TO TROUBLESHOOT”, “CHECKS BEFORE TROUBLESHOOTING”, “ELECTRIC EQUIPMENT”.
2. Are the wiring harness and connectors in the correct condition?</td><td>YES</td><td>• The wiring harness and connectors are in the correct condition.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The wiring harness or a connector is defective.
• Repair or replace the defective wiring harness or connector.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">2</td><td rowspan="2">Transmission 1st clutch ECMV solenoid</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Check that the system operating lamp is not lit, and then turn the battery disconnect switch to the OFF position.
3. Disconnect the connector S1T. Connect the T-adapter to the male side to do the troubleshooting.
4. Does the troubleshooting result agree with the standard value?
<table>
<tr><th>Item</th><th>Measurement position, condition</th><th>Standard value</th></tr>
<tr><td rowspan="2">Resistance</td><td>Between S1T (male) (1) and (2)</td><td>2 to 12 Ω</td></tr>
<tr><td>Between S1T (male) (1) and ground</td><td>Min. 1 MΩ</td></tr>
</table></td><td>YES</td><td>• The transmission 1st clutch ECMV solenoid is in the correct condition.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The transmission 1st clutch ECMV solenoid is defective.
• Replace the transmission 1st clutch ECMV solenoid.
• Go to “Confirmation of repair”.</td></tr>
</table>

Circuit diagram of right steering brake ECMV



FAILURE CODE [DXHYKB]

Detail of failure	When the controller energizes the ripper tilt IN EPC solenoid circuit, an abnormal current flows.
Action level	L01
Action of controller	Stops to energize the ripper tilt IN EPC solenoid circuit.
Phenomenon on machine	Ripper tilt IN control is disabled.
Related information	**Monitoring code** You can check the ON/OFF state of “Ripper Tilt In EPC Sol Current” with the monitoring function. (Code: 71105)

<table>
<tr><th>No.</th><th>Cause</th><th>Procedures, Measurement, Values, Note</th><th colspan="2">Diagnosis and treatment</th></tr>
<tr><td rowspan="2">1</td><td rowspan="2">Wiring harness and connector</td><td rowspan="2">1. Check the wiring harness and connector. For details, see “RELATED INFORMATION TO TROUBLESHOOT”, “CHECKS BEFORE TROUBLESHOOTING”, “ELECTRIC EQUIPMENT”.
2. Are the wiring harness and connectors in the correct condition?</td><td>YES</td><td>• The wiring harness and connectors are in the correct condition.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The wiring harness or a connector is defective.
• Repair or replace the defective wiring harness or connector.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">2</td><td rowspan="2">Ripper tilt IN EPC solenoid</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Disconnect the connector WEP9. Connect the T-adapter to the male side.
3. Does the troubleshooting result agree with the standard value?
<table>
<tr><th>Item</th><th>Measurement position, condition</th><th>Standard value</th></tr>
<tr><td rowspan="2">Resistance</td><td>Between WEP9 (male) (1) and (2)</td><td>2 to 12 Ω</td></tr>
<tr><td>Between WEP9 (male) (1) and ground</td><td>Min. 1 MΩ</td></tr>
</table></td><td>YES</td><td>• The ripper tilt IN EPC solenoid is in the correct condition.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The ripper tilt IN EPC solenoid can be defective.
• Replace the ripper tilt IN EPC solenoid.
• Go to “Confirmation of repair”.</td></tr>
</table>

<table>
<tr><th>No.</th><th>Cause</th><th>Procedures, Measurement, Values, Note</th><th colspan="2">Diagnosis and treatment</th></tr>
<tr><td rowspan="2">10</td><td rowspan="2">Ground fault in wiring harness (ACC signal circuit of navigation controller)</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Check that the system operating lamp is not lit, and then turn the battery disconnect switch to the OFF position.
3. Remove fuse No. 9, No. 10, and No. 19 in fuse box F01.
4. Disconnect the connectors WECN3, PTCN3, KEY0, NAV1, OPTCN2, ESR, BCD3, NVCN2, PHR, PLUB, RLSW, FLSW, WLSW, and SRV. Connect the T-adapter to the female side of CM01 to do the troubleshooting.
5. Does the troubleshooting result agree with the standard value?
<table><tr><th>Item</th><th>Measurement position, condition</th><th>Standard value</th></tr><tr><td>Resistance</td><td>Between ground and one of F01-19, NVCN2 (female) (4), and (5)</td><td>Min. 1 MΩ</td></tr></table></td><td>YES</td><td>• Ground fault in wiring harness does not occur.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The wiring harness has a ground fault.
• Repair or replace the wiring harness.
• Replace the fuse if it is blown out.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">11</td><td rowspan="2">Short circuit in wiring harness
(ACC signal circuit of navigation controller)</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Check that the system operating lamp is not lit, and then turn the battery disconnect switch to the OFF position.
3. Remove fuse No. 9, No. 10, and No. 19 in fuse box F01.
4. Disconnect the connectors WECN3, PTCN3, KEY0, NAV1, OPTCN2, ESR, BCD3, NVCN2, PHR, PLUB, RLSW, FLSW, WLSW, and SRV. Connect the T-adapter to the female side of CM01 to do the troubleshooting.
5. Does the troubleshooting result agree with the standard value?
<table><tr><th>Item</th><th>Measurement position, condition</th><th>Standard value</th></tr><tr><td rowspan="2">Resistance</td><td>Between NVCN2 (female) (4) and each pin other than pin (4) or (5)</td><td>Min. 1 MΩ</td></tr><tr><td>Between NVCN2 (female) (5) and each pin other than pin (4), (5)</td><td>Min. 1 MΩ</td></tr></table></td><td>YES</td><td>• Short circuit in wiring harness does not occur.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The wiring harness has a short circuit.
• Repair or replace the wiring harness.
• Replace the fuse if it is blown out.
• Go to “Confirmation of repair”.</td></tr>
</table>

<table>
<tr><th>No.</th><th>Cause</th><th>Procedures, Measurement, Values, Note</th><th colspan="2">Diagnosis and treatment</th></tr>
<tr><td rowspan="2">16</td><td rowspan="2">Hot short circuit in wiring harness (CAN1 communication circuit)</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Insert the T-adapter into the connector KOM/r_RES.
3. Set the battery disconnect switch to the ON position.
4. Turn the starting switch to the ON position, then do the troubleshooting.
5. Does the troubleshooting result agree with the standard value?
<table><tr><th>Item</th><th>Measurement position, condition</th><th>Standard value</th></tr><tr><td rowspan="2">Voltage</td><td>Between KOM/r_RES (B) and ground</td><td>Max. 4 V</td></tr><tr><td>Between KOM/r_RES (A) and ground</td><td>Max. 4 V</td></tr></table></td><td>YES</td><td>• Hot short circuit in wiring harness does not occur.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The wiring harness has a hot short circuit.
• Repair or replace the wiring harness.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">17</td><td rowspan="2">Controller</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Check that the system operating lamp is not lit, and then turn the battery disconnect switch to the OFF position.
3. Disconnect one of the connectors; power train controller (connector PTCN2), work equipment controller (connector WECN2), engine controller (connector ECM_L_J1), option controller (connector OPTCN2), navigation controller (connector NVCN2), and KOMTRAX Plus controller (connector C30B).
4. Set the battery disconnect switch to the ON position.
5. Turn the starting switch to the ON position, then do the troubleshooting.
6. Does the number of shown failure codes decrease from 6?
REMARK
• If all of 6 failure codes that the monitor controller senses ([DAFQKR], [DAZQKR], [DB2QKR], [DB9QKR], [DBEQKR], [DBVQKR], [F7AQKR], and [F9AQKR]) are shown, disconnect the controllers one by one and troubleshoot as explained in steps 1 to 6 to find the defective controller.
• If the disconnected controller is not defective, install the controller back to its initial position, then do the troubleshooting for the next controller.
• Do not disconnect the machine monitor (connector CM02). (The failure code will not be shown on the machine monitor.)</td><td>YES</td><td>• The removed controller is defective.
• Replace the defective controller.
• Go to “Confirmation of repair”.</td></tr>
<tr><td>NO</td><td>• The removed controller is in the correct condition.
• Restore the removed controller to its initial position.
• Go to the next check item.</td></tr>
</table>

E-8 WHEN STARTING SWITCH IS TURNED TO ON POSITION (WITH ENGINE STOPPED), RADIATOR COOLANT LEVEL CAUTION LAMP LIGHTS UP IN YELLOW

Detail of failure	When the starting switch is turned to the ON position (with the engine stopped), the radiator coolant level caution lamp lights up in yellow.
Related information	**Pre-troubleshooting** If a failure code is shown, do the troubleshooting for that code first.

<table>
<tr><th>No.</th><th>Cause</th><th>Procedures, Measurement, Values, Note</th><th colspan="2">Diagnosis and treatment</th></tr>
<tr><td rowspan="2">1</td><td rowspan="2">Wiring harness and connector</td><td rowspan="2">1. See RELATED INFORMATION TO TROUBLESHOOT, CHECKS BEFORE TROUBLESHOOTING, ELECTRICAL EQUIPMENT. Check according to the descriptions of wiring harnesses and connectors.
2. Are the wiring harness and connectors in the correct condition?</td><td>YES</td><td>• The wiring harness and connectors are in the correct condition.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The wiring harness or a connector is defective.
• Repair or replace the defective wiring harness or connector.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">2</td><td rowspan="2">Coolant level</td><td rowspan="2">1. Check the radiator for coolant level and leakage.
2. Is the radiator coolant level between FULL and LOW of the sub-tank?</td><td>YES</td><td>• The coolant level is correct.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The coolant level is not correct.
• Add coolant to the specified level.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">3</td><td rowspan="2">Coolant level sensor</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Disconnect connector WLD1. Connect the T-adapter to the male side to do the troubleshooting.
3. Does the troubleshooting result agree with the standard value?
<table>
<tr><th>Item</th><th colspan="2">Measurement position, condition</th><th>Standard value</th></tr>
<tr><td rowspan="2">Resistance</td><td rowspan="2">Between WLD1 (male) (1) and (2)</td><td>Between FULL and LOW</td><td>Max. 1 Ω</td></tr>
<tr><td>Below LOW</td><td>Min. 1 MΩ</td></tr>
</table></td><td>YES</td><td>• The coolant level sensor is correct.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The coolant level sensor is defective.
• Replace the coolant level sensor.
• Go to “Confirmation of repair”.</td></tr>
</table>

<table>
<tr><th>No.</th><th>Cause</th><th>Procedures, Measurement, Values, Note</th><th colspan="2">Diagnosis and treatment</th></tr>
<tr><td rowspan="2">3</td><td rowspan="2">Radio control horn relay</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Replace the radio control horn relay with a different relay.
3. Turn the starting switch to the ON position in radio control mode.
4. Operate the horn switch.
5. Does the horn switch operate correctly?</td><td>YES</td><td>• The removed radio control horn relay is defective.
• Go to “Confirmation of repair”.</td></tr>
<tr><td>NO</td><td>• The removed radio control horn relay is in the correct condition.
• Restore the removed radio control horn relay to its initial position.
• Go to the next check item.</td></tr>
<tr><td rowspan="2">4</td><td rowspan="2">Open or short circuit in wiring harness</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Check that the system operating lamp is not lit, and then turn the battery disconnect switch to the OFF position.
3. Insert the T-adapter into the connector RHR.
4. Set the radio control/on-board selector switch to the “Radio control side”.
5. Set the battery disconnect switch to the ON position to do the troubleshooting.
6. Turn the starting switch to the ON position.
7. Does the troubleshooting result agree with the standard value?
<table>
<tr><th>Item</th><th>Measurement position, condition</th><th>Standard value</th></tr>
<tr><td>Voltage</td><td>Between RHR (female) (3) and ground</td><td>20 to 30 V</td></tr>
</table></td><td>YES</td><td>• The wiring harness has no open or short circuit.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The wiring harness has an open or short circuit.
• Repair or replace the wiring harness.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">5</td><td rowspan="2">Open circuit in wiring harness</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Check that the system operating lamp is not lit, and then turn the battery disconnect switch to the OFF position.
3. Disconnect the connectors RHR and HNR. Connect the T-adapter to each female side.
4. Set the battery disconnect switch to the ON position to do the troubleshooting.
5. Does the troubleshooting result agree with the standard value?
<table>
<tr><th>Item</th><th>Measurement position, condition</th><th>Standard value</th></tr>
<tr><td rowspan="2">Resistance</td><td>Between RHR (female) (5) and ground</td><td>Max. 1 Ω</td></tr>
<tr><td>Between RHR (female) (3) and HNR (female) (2)</td><td>Max. 1 Ω</td></tr>
</table></td><td>YES</td><td>• Open circuit in wiring harness does not occur.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The wiring harness has an open circuit.
• Repair or replace the wiring harness.
• Go to “Confirmation of repair”.</td></tr>
</table>

No.	Cause	Procedures, Measurement, Values, Note	Diagnosis and treatment	
9	Confirmation of check results	1. Do the preceding troubleshooting again. 2. Have you found the cause when the inspection is done again?	YES	The repair is completed.
			NO	• The stop position detection of the front wiper motor can be defective. • Replace the front wiper motor. • Go to “Confirmation of repair”.
10	Confirmation of repair	1. Turn the starting switch to the OFF position. 2. Install and connect all the consisting equipment. 3. Turn the starting switch to the ON position. 4. Operate the front wiper switch. 5. Is this problem resolved?	YES	The repair is completed.
			NO	Go back to the first check item.

E-55 DATA DOWNLOAD WITH WIRELESS LAN DOES NOT OPERATE

Details of failure	The wireless LAN unit is abnormal.
Related information	**Prior troubleshooting** If the failure code [DBVWKR] is shown, do the troubleshooting for it first. **Reference information** • Do the troubleshooting that follow if administrator of KOMTRAX Plus system requires to check whether failure occurs in system on the machine. • Even when KOMTRAX Plus system is defective, no problem is shown on the machine. • Check the connection for the wireless LAN unit antenna and LAN cable.

<table>
<tr><th>No.</th><th>Cause</th><th>Procedures, Measurement, Values, Note</th><th colspan="2">Diagnosis and treatment</th></tr>
<tr><td rowspan="2">1</td><td rowspan="2">Wireless LAN unit</td><td rowspan="2">1. Turn the starting switch to the ON position.
2. For details, see Operation Manual for network setting tool C.
3. Do the “WLAN Test” of the network setting tool C to troubleshoot.
4. Does the troubleshooting result agree with the standard value?
REMARK
• If the communication is done normally, the model type and model number are shown on the tool screen.
• If there is another machine that has a wireless LAN unit nearby, the information of the nearby machine can be shown.
<table><tr><th>Item</th><th>Measurement position/condition</th><th>Standard value</th></tr><tr><td>Communication test result</td><td>Model type, model number</td><td>The machine information is shown.</td></tr></table></td><td>YES</td><td>• The Wireless LAN unit is normal.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• If communication is not available in the cab, the wireless LAN unit is defective.
• Replace the wireless LAN unit.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">2</td><td rowspan="2">Confirmation of repair</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Turn the starting switch to the ON position.
3. Is this problem resolved?</td><td>YES</td><td>The repair is completed.</td></tr>
<tr><td>NO</td><td>Go to the first check item.</td></tr>
</table>

No.	Cause	Procedures, Measurement, Values, Note	Diagnosis and treatment	
5	Transmission clutch	1. There can be an internal defect in the transmission clutch. 2. Check the transmission clutches. 3. Is the transmission clutch in the correct condition?	YES	• The transmission clutch is in the correct condition. • Go to the next check item.
			NO	• The transmission clutch is defective. • Repair or replace the transmission clutches. • Go to “Confirmation of repair”.
6	Brake (dragging)	1. Move the machine to a level ground. 2. Turn the starting switch to the ON position. 3. Operate at low idle speed and in F2. 4. Does the machine move?	YES	• The brake is in the correct condition. • Go to the next check item.
			NO	• The brake drags. • Do the troubleshooting for “BRAKE DOES NOT WORK” in H-mode. • The parking brake switch or the brake pedal linkage is possibly defective. Check them. • Go to “Confirmation of repair”.
7	Type of oil used	1. Check the type of the oil used. 2. Is the specified oil (TO30) used?	YES	• The engine oil type is correct. • Go to the next check item.
			NO	• Usage of the incorrect type of engine oil can be a cause. • Change the engine oil to the specified one. • Go to “Confirmation of repair”.
8	Confirmation of repair	1. Turn the starting switch to the OFF position. 2. Connect all the component parts. 3. Start the engine. 4. Let the machine travel to do the troubleshooting. 5. Is this problem resolved?	YES	The repair is completed.
			NO	Go back to the first check item.

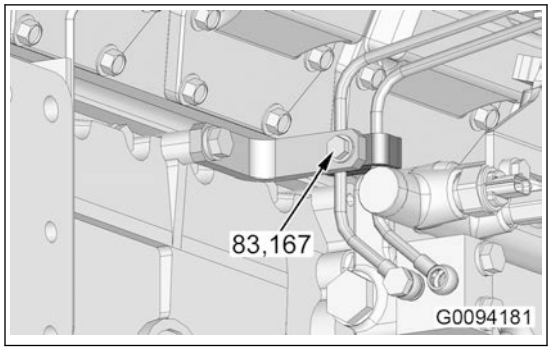
<table>
<tr><th>No.</th><th>Cause</th><th>Procedures, Measurement, Values, Note</th><th colspan="2">Diagnosis and treatment</th></tr>
<tr><td rowspan="2">6</td><td rowspan="2">Work equipment main relief valve</td><td rowspan="2">1. Operate the engine at high idle to do the troubleshooting.
2. Does the troubleshooting result agree with the standard value?
REMARK
If the pressure does not rise to approximately 2.4MPa {25kg/cm^2} or above after the main relief valve is adjusted, the unload valve is possibly kept open.
<table><tr><th>Item</th><th colspan="2">Measurement position, condition</th><th>Standard value</th></tr><tr><td rowspan="4">Blade tilt relief pressure</td><td rowspan="4">• Engine coolant temperature: 60 to 100℃
• Power train oil temperature: 70 to 120℃
• Hydraulic oil temperature: 45 to 55℃
• Operating mode: P (power mode)
• Fuel control dial: MAX (high idle)</td><td rowspan="2">Blade control lever: Pitch back</td><td>Work equipment pump outlet pressure (F)</td></tr><tr><td>27.4±1.4MPa {280±14kg/cm^2}</td></tr><tr><td rowspan="2">Blade control lever: Pitch back</td><td>Work equipment pump outlet pressure (R)</td></tr><tr><td>27.4±1.4MPa {280±14kg/cm^2}</td></tr></table></td><td>YES</td><td>• The work equipment main relief valve is in the correct state.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The work equipment main relief valve is defective.
• Repair or replace the work equipment main relief valve.
• If the main relief valve is in the correct state, the work equipment pump is possibly defective.
• If the work equipment pump is defective, check the ripper and blade lift also.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">7</td><td rowspan="2">Blade tilt safety valve</td><td rowspan="2">1. Operate the engine at high idle to do the troubleshooting.
2. Does the troubleshooting result agree with the standard value?
REMARK
If the pressure does not rise to approximately 2.4MPa {25kg/cm^2} or above after the main relief valve is adjusted, the unload valve is possibly kept open.</td><td>YES</td><td>• The blade tilt control safety valve is in the correct state.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The blade tilt safety valve is defective.
• Repair the blade tilt safety valve or replace it.</td></tr>
</table>

No.	Cause	Procedures, Measurement, Values, Note	Diagnosis and treatment	
8	Fuel type	1. Drain fuel from the fuel tank, and check the fuel type. 2. Is the fuel type correct? **REMARK** • If fuel other than specified is used, it is a failure. • At cold weather, or a fuel that does not fit to the temperature is used, wax can be found when you check the clear bowl of the fuel prefilter. (It becomes milky.)	YES	• The fuel type is correct. • Go to the next check item.
			NO	• Usage of the incorrect type of fuel can be a cause. • Replace fuel to the specified one. • Go to “Confirmation of repair”.
9	Fuel state	1. Drain fuel from the fuel tank, and check the fuel state. 2. Is the fuel normal? **REMARK** If rust or water is mixed in fuel, it is a failure.	YES	• The fuel state is normal. • Go to the next check item.
			NO	• Defective fuel state can be a cause of the failure. • Replace fuel to the specified one. • Go to “Confirmation of repair”.
10	Fuel tank cap	1. Check the fuel tank cap. 2. Blow air to the fuel tank cap, and make sure that air is bled through the hole on the fuel tank cap. 3. Is the fuel tank cap normal? **REMARK** If air is not bled through the hole on the fuel tank cap, it is a failure.	YES	• The fuel tank cap is normal. • Go to the next check item.
			NO	• The hole on the fuel tank cap is clogged. • Clean the hole on the fuel tank cap and around it. • If the hole on the fuel tank cap is still clogged, replace the fuel tank cap. • Go to “Confirmation of repair”.
11	Fuel filter cartridge	1. Check the used period of the fuel filter cartridge. 2. Is the used period of the fuel filter cartridge in the specified range? **REMARK** • If the fuel filter cartridge is used more than the specified period, the fuel filter cartridge can be clogged. • To check the used period of the fuel filter cartridge, see TESTING AND ADJUSTING, “SETTING AND OPERATION OF MACHINE MONITOR”, “CHECK MAINTENANCE RECORD”.	YES	• The fuel filter cartridge is normal. • Go to the next check item.
			NO	• The fuel filter cartridge can be clogged. • Replace the fuel filter cartridge. • Go to “Confirmation of repair”.

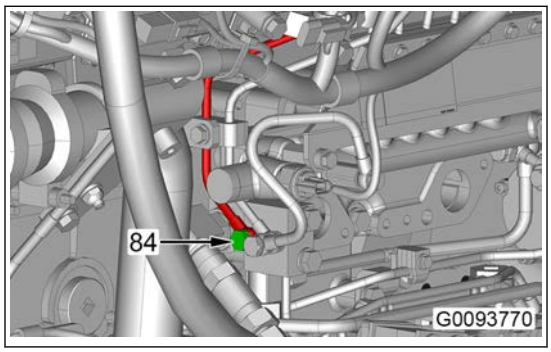
No.	Cause	Procedures, Measurement, Values, Note	Diagnosis and treatment	
5	Fuel injection rate	1. Do the troubleshooting of S MODE, “FUEL CONSUMPTION IS EXCESSIVE”. 2. Is the fuel injection rate correct?	YES	• The fuel injection rate is correct. • Go to the next check item.
			NO	• The fuel injection rate problem can be a cause. • Go to “Confirmation of repair”.
6	Air cleaner element	1. Check the air cleaner element for clogging. 2. Is the air cleaner element normal? **REMARK** If the air cleaner element is clogged, it is a failure.	YES	• The air cleaner element is normal. • Go to the next check item.
			NO	• The air cleaner element is defective. • Clean or replace the air cleaner element. (failure side) • Go to “Confirmation of repair”.
7	Air cleaner	1. Check if the air cleaner is deformed. 2. Is the air cleaner normal? **REMARK** If the air cleaner is deformed, it is a failure.	YES	• The air cleaner is normal. • Go to the next check item.
			NO	• The air cleaner is defective. • Clean or replace the air cleaner. (failure side) • Go to “Confirmation of repair”.
8	Mass air flow and temperature sensor	1. Replace the mass air flow and temperature sensor with the same type of the sensor. 2. Start the engine. 3. Is this problem resolved? **REMARK** • If the mass air flow and temperature sensor becomes defective, the EGR rate (EGR quantity against fresh air intake quantity) increases and it causes overheat. • Replace the mass air flow and temperature sensor. For details, see DISASSEMBLY AND ASSEMBLY, “REMOVE AND INSTALL AIR CLEANER ASSEMBLY”. • The failure code is not shown in some cases when dirt is attached to the mass air flow and temperature sensor.	YES	• The removed mass air flow and temperature sensor is normal. • Return the removed mass air flow and temperature sensor to its initial position. • Go to the next check item.
			NO	• The removed mass air flow and temperature sensor are defective. • The repair is completed.

Symbol	Part number	Part name	Q'ty	Sketch	Remarks
E	Commercially available	Guide bolt	2		Disassembly and assembly of steering case assembly
F	Commercially available	Forcing screw	2		
G	Commercially available	Block	1		
H	Commercially available	Eyebolt	2		
I	Commercially available	Forcing screw	2		
J	Commercially available	Press	1		
K	Commercially available	Puller	1		
L	Commercially available	Push tool	1		
M	Commercially available	Eyebolt	2		
N	Commercially available	Wire sling	1		
O	Commercially available	Push-pull scale	1		Assembly of steering case assembly
P	Commercially available	Dial gauge	1		
Q	Commercially available	Forcing screw	2		Disconnection and connection of steering clutch and brake assembly
R	Commercially available	Puller	1		
S	Commercially available	Eyebolt	2		
T	Commercially available	Forcing screw	2		Disassembly and assembly of clutch assembly
U	Commercially available	Puller	1		
V	791-822-183	Wrench	1		
W	Commercially available	Puller	1		
X	Commercially available	Eyebolt	2		
Y	Commercially available	Puller	1		
Z	Commercially available	Chain sling	1		2-point sling

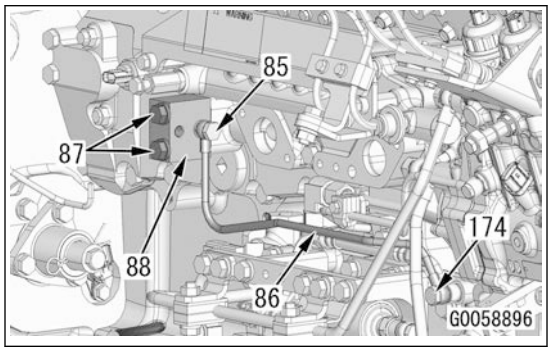
38. Loosen the bolt (83), and loosen the clamp (167).
    Tool: Ratchet handle, socket
    Bolt (83): Width across flats 13mm, M8



39. Remove the joint bolt (84).
    Tool: Ratchet handle, socket
    Joint bolt (84): Width across flats 19mm, M14

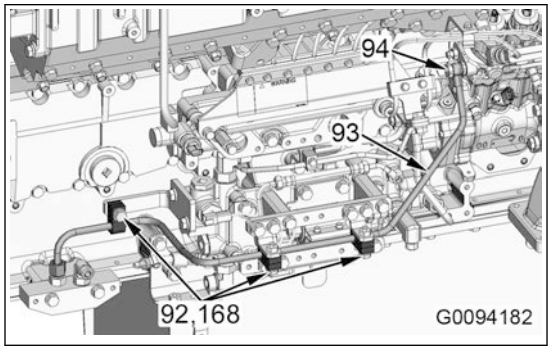


40. Remove the joint bolts (85) and (174), and remove the tube (86).
    REMARK
    Each joint bolt has a different length. Be sure to handle the correct one.
    Tool: Ratchet handle, socket
    Joint bolt (85), (174): Width across flats 17mm, M12
41. Remove the 2 bolts (87), and remove the joint (88).
    Tool: Ratchet handle, socket
    Bolt (87): Width across flats 17mm, M10



42. Remove the 3 bolts (92), and remove the 3 clamps (168).
    Tool: Ratchet handle, socket
    Bolt (92): Width across flats 17mm, M10
43. Loosen the sleeve nut, and disconnect the tube (93).
    Tool: Open-end wrench
    Tube (93): Width across flats 24mm
44. Remove the joint bolt (94), and remove the tube (93).
    REMARK
    - The joint bolt (94) is supplied with the supply pump.
    - Tighten the joint bolt (94) lightly to the supply pump, and store it not to lose when assembled again.

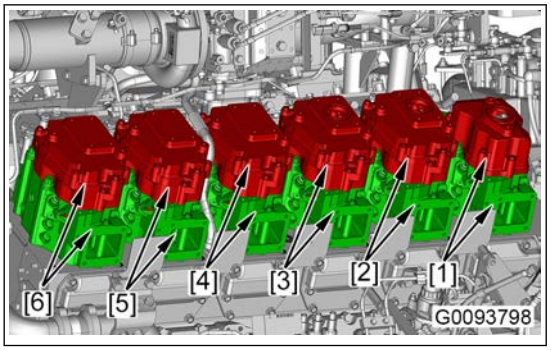
    Tool: Ratchet handle, socket
    Joint bolt (94): Width across flats 22mm, M14

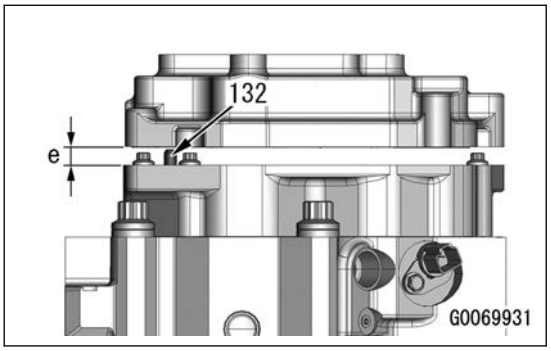


41. Remove the cylinder head cover as follows.

REMARK

- Be careful not to let the gasket fall off.
- Make marks on the cylinder head cover to make it a same set when it is assembled.
- The dowel pin (132) aligns the cylinder head cover of cylinders No.2, 3, 4, 5, and 6 with the housing. Pull out the cylinder head cover at a right angle against the mounting face to the dimension (e) at which the dowel pin (132) can be removed.
  Dimension (e): Approximately 10mm





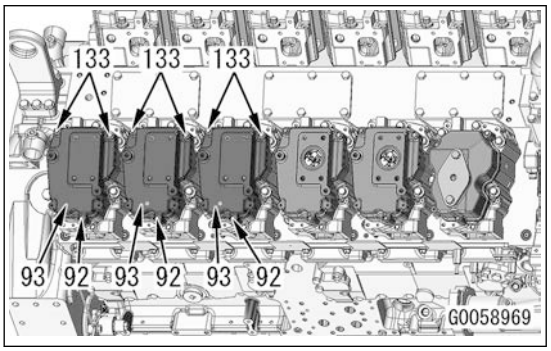
1) Remove the 3 bolts (92) and the 6 bolts (133), and remove the 3 cylinder head covers (93).

REMARK

Each bolt has a different length. Be sure to handle the correct one.

Tool: Ratchet handle, socket

Bolt (92), (133): Width across flats 12mm, M8



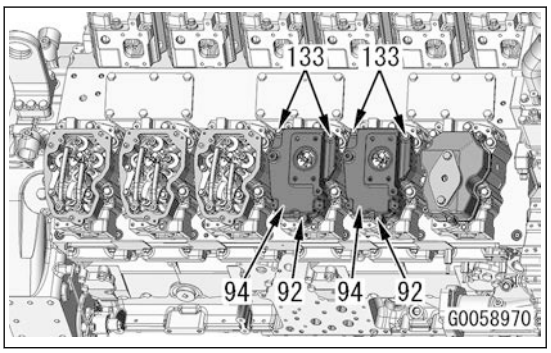
2) Remove the 2 bolts (92) and the 4 bolts (133), and remove the 2 cylinder head covers (94).

REMARK

Each bolt has a different length. Be sure to handle the correct one.

Tool: Ratchet handle, socket

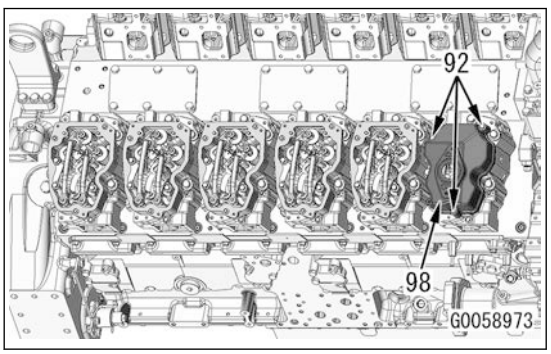
Bolt (92), (133): Width across flats 12mm, M8



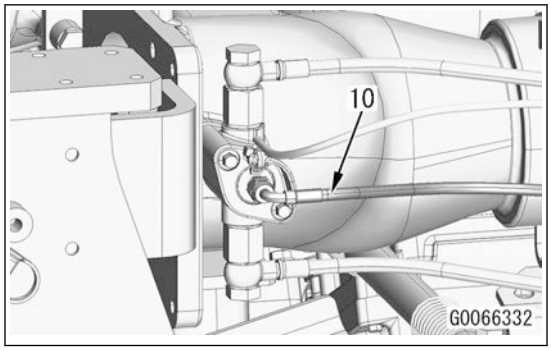
3) Remove the 3 bolts (92), and remove the cylinder head cover (98).

Tool: Ratchet handle, socket

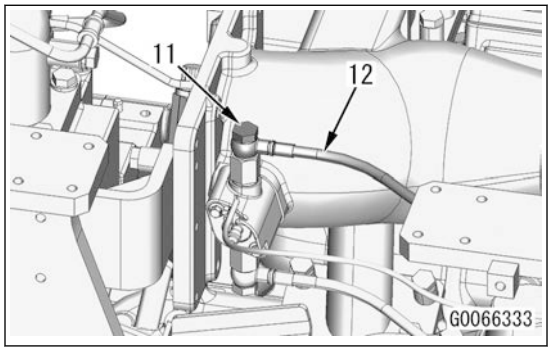
Bolt (92): Width across flats 12mm, M8



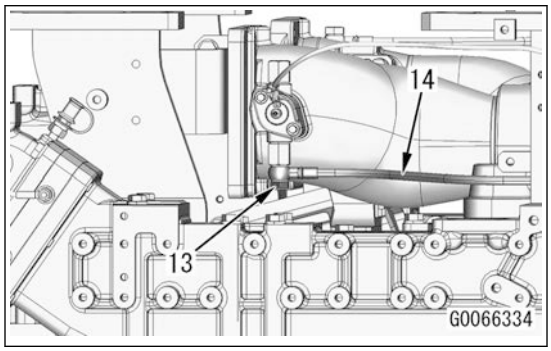
9. Loosen the sleeve nut, and disconnect the tube (10).
   Tool: Open-end wrench
   Tube (10): Width across flats 14mm



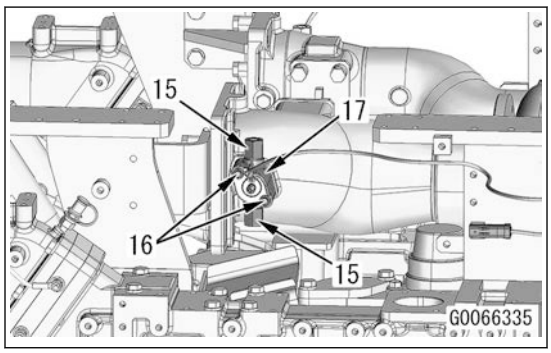
10. Remove the joint bolt (11), and disconnect the fuel doser water tube (12).
    Tool: Ratchet handle, socket
    Joint bolt (11): Width across flats 19mm, M14



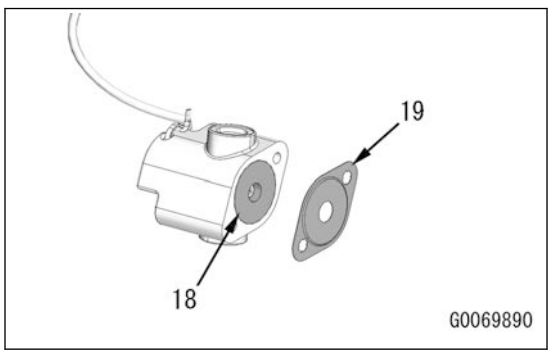
11. Remove the joint bolt (13), and disconnect the fuel doser water tube (14).
    Tool: Ratchet handle, socket
    Joint bolt (13): Width across flats 19mm, M14



12. Remove the 2 nipples (15).
    Tool: Ratchet handle, socket
    Nipple (15): Width across flats 22mm, M16
13. Remove the 2 bolts (16), and remove the fuel doser (17).
    Tool: Ratchet handle, socket
    Bolt (16): Width across flats 8mm, M6



14. Remove the heat insulation material (18) and gasket (19).

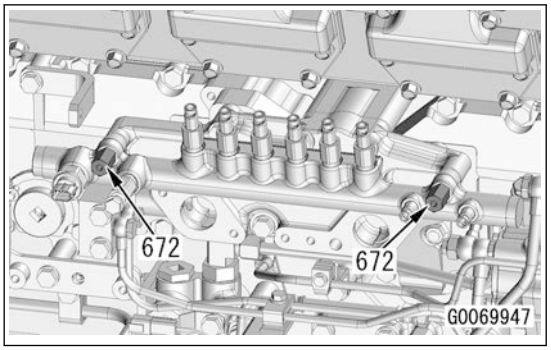


34. Tighten the 2 bolts (672).

    Tool: Ratchet handle, socket, torque wrench

    Bolt (672): Width across flats 17mm, M10

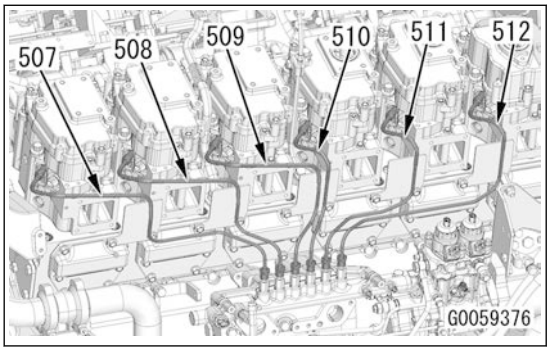
    Bolt (672): 59 to 74Nm{6 to 7.5kgm}



35. Tighten the fuel injection pipes (507), (508), (509), (510), (511), and (512) to the specified torque.

    REMARK

    - Make marks on the sleeve nut at the injector side, injector, and fuel injection pipe, and tighten the pipe to the specified torque. When the marks are not aligned, this shows that the pipe is tightened.
    - Make marks on the sleeve nut at the common rail side, common rail, and fuel injection pipe, and tighten the pipe to the specified torque. When the marks are not aligned, this shows that the pipe is tightened.



    Tool: Open-end wrench, torque wrench (open-end)

    Fuel injection pipe (507), (508), (509), (510), (511), (512) at injector side: Width across flats 17mm

    Fuel injection pipe (507), (508), (509), (510), (511), (512) at common rail side: Width across flats 19mm

    Fuel injection pipe (507), (508), (509), (510), (511), (512): 39.2 to 44.1Nm{4.0 to 4.5kgm}

36. Install the 6 fuel spray prevention caps (506).

    REMARK

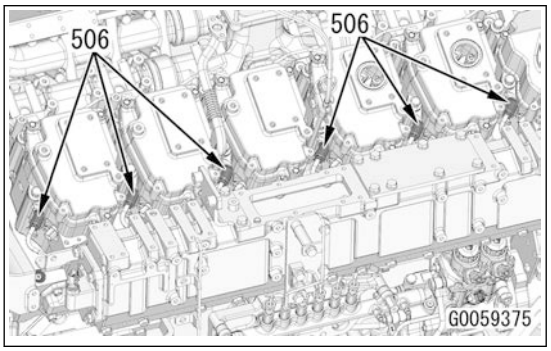
    Install the fuel spray prevention cap (506) with the slit part side down.

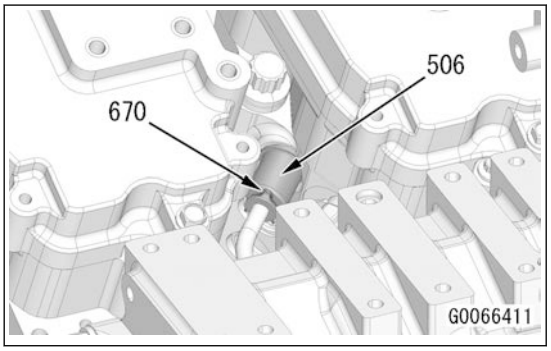
37. Install the 6 clips (670).

    REMARK

    Install the clip (670) from the top.

    Tool: Needle-nose pliers



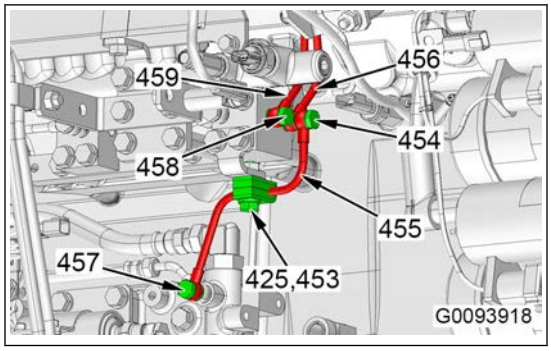


109. Remove the bolt (425), and remove the clamp (453).
Tool: Ratchet handle, socket
Bolt (425): Width across flats 17mm, M10

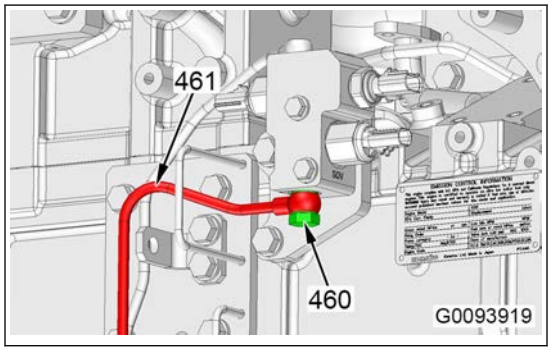
110. Remove the joint bolt (454), and disconnect the tubes (455) and (456).
Tool: Ratchet handle, socket
Joint bolt (454): Width across flats 17mm, M12

111. Remove the joint bolt (457), and remove the tube (455).
Tool: Ratchet handle, socket
Joint bolt (457): Width across flats 17mm, M12

112. Remove the joint bolt (458), and disconnect the tube (459).
Tool: Ratchet handle, socket
Joint bolt (458): Width across flats 17mm, M12

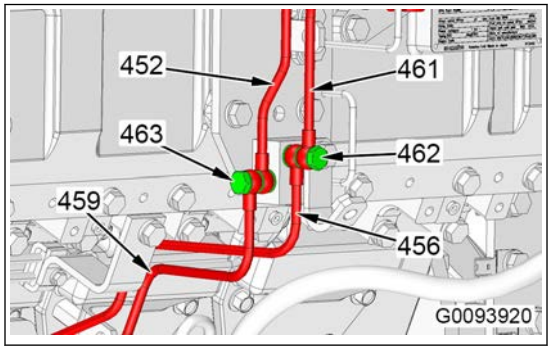


113. Remove the joint bolt (460), and disconnect the tube (461).
Tool: Ratchet handle, socket
Joint bolt (460): Width across flats 19mm, M14

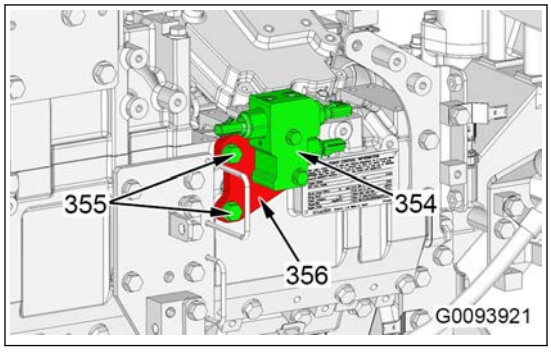


114. Remove the joint bolt (462), and remove the tubes (456) and (461).
Tool: Ratchet handle, socket
Joint bolt (462): Width across flats 17mm, M12

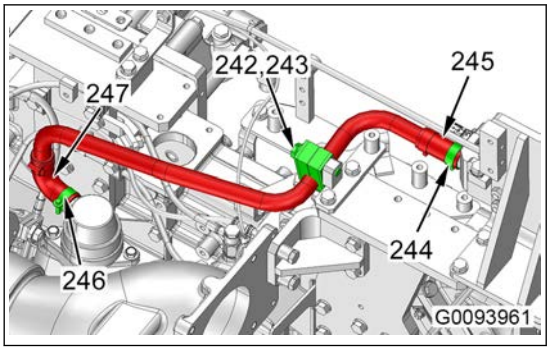
115. Remove the joint bolt (463), and remove the tubes (452) and (459).
Tool: Ratchet handle, socket
Joint bolt (463): Width across flats 17mm, M12



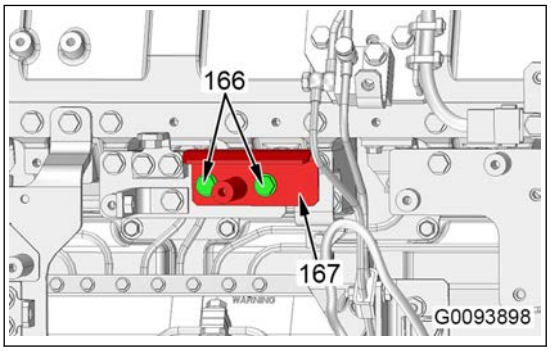
116. Remove the 2 bolts (355), and remove the bracket (356) and dosing fuel solenoid valve (354) together.
Tool: Ratchet handle, socket
Bolt (355): Width across flats 17mm, M10



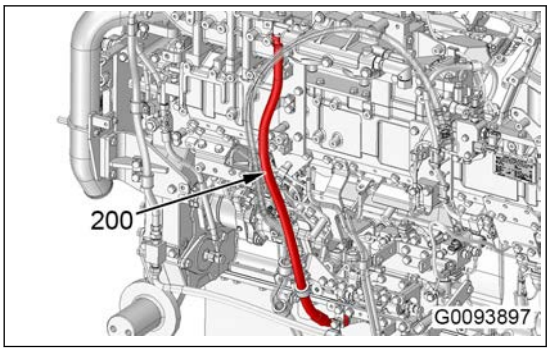
176. Insert the hose (247).
177. Insert the hose (245).
178. Install the clamp (243) with the bolt (242).
Tool: Ratchet handle, socket, torque wrench
Bolt (242): Width across flats 19mm, M12
Bolt (242): 98 to 123Nm{10.0 to 12.5kgm}
179. Tighten the clamps (244) and (246).
Tool: Ratchet handle, socket, torque wrench
Clamp (244), (246): Width across flats 7mm
Clamp (244), (246): 4.4±0.49Nm{0.45±0.05kgm}



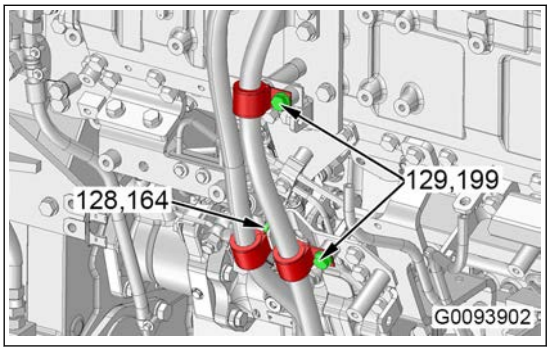
180. Install the bracket (167) with the 2 bolts (166).
Tool: Ratchet handle, socket, torque wrench
Bolt (166): Width across flats 17mm, M10
Bolt (166): 59 to 74Nm{6 to 7.5kgm}



181. Connect the hose (200) at the fuel prefilter head side.
Tool: Open-end wrench, torque wrench (open-end)
Hose (200): Width across flats 32mm
Hose (200): 90 to 95Nm{9.2 to 9.7kgm}



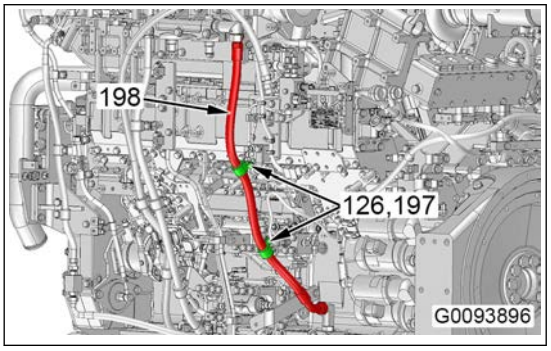
182. Install the clamp (164) with the bolt (128).
Tool: Ratchet handle, socket, torque wrench
Bolt (128): Width across flats 17mm, M10
Bolt (128): 59 to 74Nm{6 to 7.5kgm}
183. Install the 2 clamps (199) with the 2 bolts (129).
Tool: Ratchet handle, socket, torque wrench
Bolt (129): Width across flats 17mm, M10
Bolt (129): 59 to 74Nm{6 to 7.5kgm}



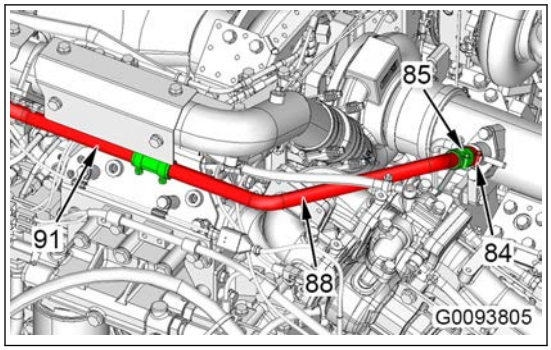
184. Connect the hose (198) at the fuel prefilter head side.
Tool: Open-end wrench, torque wrench (open-end)
Hose (198): Width across flats 36mm
Hose (198): 90 to 95Nm{9.2 to 9.7kgm}
185. Install the 2 clamps (197) with the 2 bolts (126).

REMARK

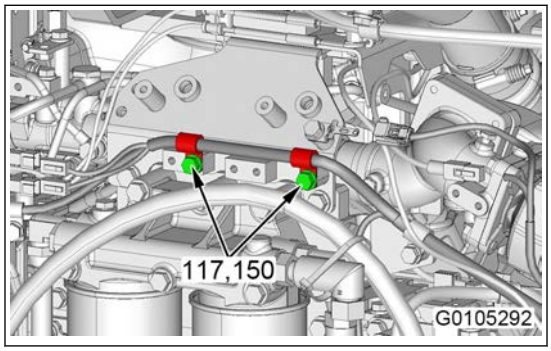
Adjust the angle of the clamp, and install it not to let the hose (198) interfere with the parts around.



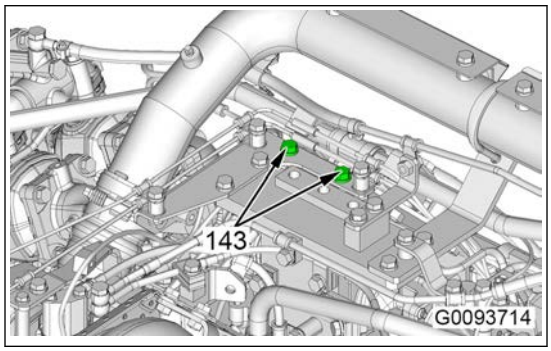
40. Loosen the clamp (84), disconnect the hose (85), and remove the tube (88) and tube (91) together.
    Tool: Ratchet handle, socket
    Clamp (84): Width across flats 7mm



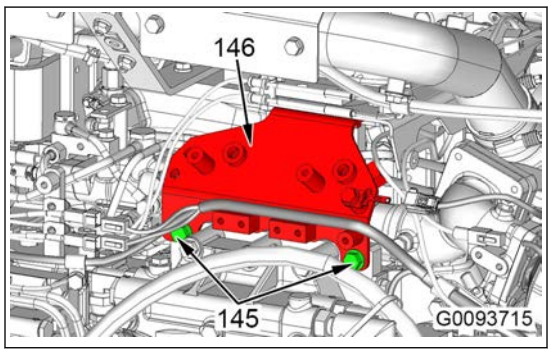
41. Remove the 2 bolts (117), and remove the 2 clamps (150).
    Tool: Ratchet handle, socket
    Bolt (117): Width across flats 17mm, M10



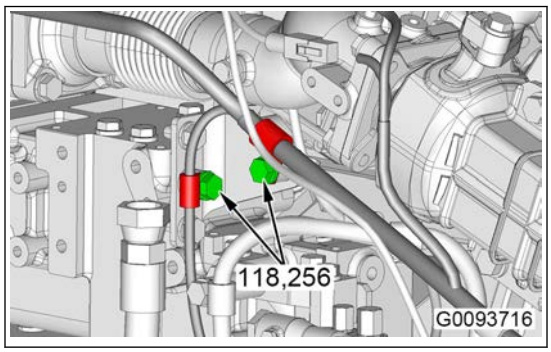
42. Remove the 2 bolts (143).
    Tool: Ratchet handle, socket
    Bolt (143): Width across flats 17mm, M10



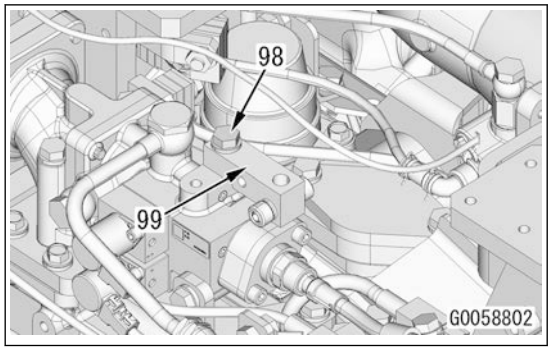
43. Remove the 2 bolts (145), and remove the bracket (146).
    Tool: Ratchet handle, socket
    Bolt (145): Width across flats 19mm, M12

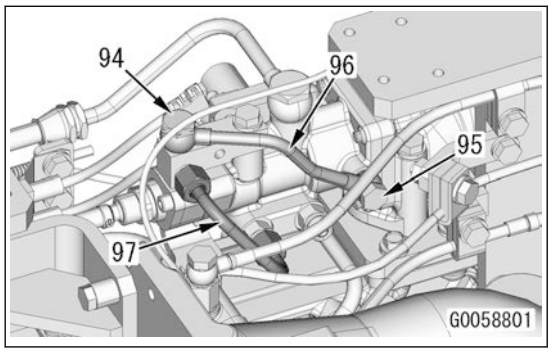


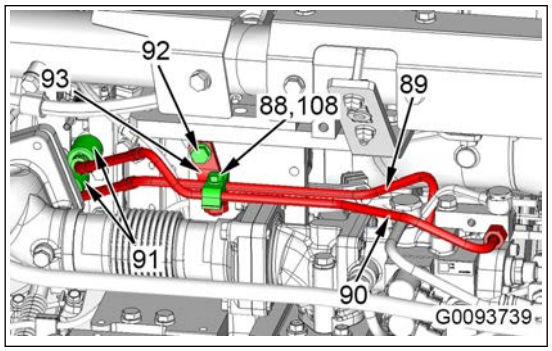
44. Remove the 2 bolts (118), and remove the 2 clamps (256).
    Tool: Ratchet handle, socket
    Bolt (118): Width across flats 17mm, M10

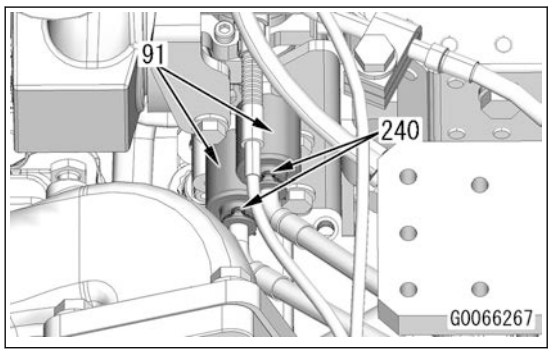


67. Lightly tighten the block (99) with the bolt (98).
    Tool: Ratchet handle, socket
    Bolt (98): Width across flats 17mm, M10
68. Tighten the tube (97) lightly.
    Tool: Open-end wrench
    Tube (97): Width across flats 22mm
69. Lightly tighten the tube (96) with the joint bolts (94) and (95).
    REMARK
    Each joint bolt has a different length. Be sure to handle the correct one.
    Tool: Ratchet handle, socket
    Joint bolt (94): Width across flats 24mm, M14
    Joint bolt (95): Width across flats 19mm, M12
70. Lightly tighten the bracket (93) with the bolt (92).
    Tool: Ratchet handle, socket
    Bolt (92): Width across flats 17mm, M10
71. Tighten the tubes (89) and (90) lightly.
    Tool: Open-end wrench
    Tube (89), (90): Width across flats 21mm
72. Lightly tighten the clamp (108) with the bolt (88).
    Tool: Ratchet handle, socket
    Bolt (88): Width across flats 13mm, M8
73. Tighten the bolt (98) to the specified torque.
    REMARK
    Adjust the block (99) not to apply an excessive force to the tubes (89), (90), (96) and (97), and tighten the bolt (98).
    Tool: Ratchet handle, socket, torque wrench
    Bolt (98): Width across flats 17mm, M10
    Bolt (98): 59 to 74Nm{6 to 7.5kgm}
74. Tighten the tube (97) to the specified torque.
    Tool: Open-end wrench, torque wrench (open-end)
    Tube (97): Width across flats 22mm
    Tube (97): 24 to 27Nm{2.4 to 2.7kgm}
75. Tighten the joint bolts (94) and (95) to the specified torque.
    Tool: Ratchet handle, socket, torque wrench
    Joint bolt (94): Width across flats 24mm, M14
    Joint bolt (95): Width across flats 19mm, M12
    Joint bolt (94): 34.3 to 44.1Nm{3.5 to 4.5kgm}
    Joint bolt (95): 24.5 to 34.3Nm{2.5 to 3.5kgm}
76. Tighten the tubes (89) and (90) to the specified torque.
    Tool: Open-end wrench, torque wrench (open-end)
    Tube (89), (90): Width across flats 20mm
    Tube (89), (90): 24 to 27Nm{2.4 to 2.7kgm}









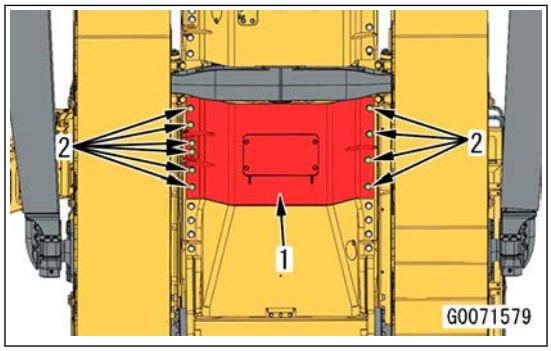
Obey the items that follow when you handle the wirings and hoses.

- ⚠ **Check the connector numbers and installation positions before you disconnect the wirings, hoses, and clamps, and write them down.**
- ⚠ **If it is possible for wirings and hoses to be deformed or damaged, remove clips and clamps before the work.**
- ⚠ **Prepare a container to receive oil before you disconnect the hoses.**
- ⚠ **Install a plug or a flange to parts where a hydraulic hose is disconnected to prevent oil from flowing out.**
- ⚠ **Replace the O-ring, seal washer, and gasket with new ones.**

REMOVE STARTING MOTOR ASSEMBLY

Underguard

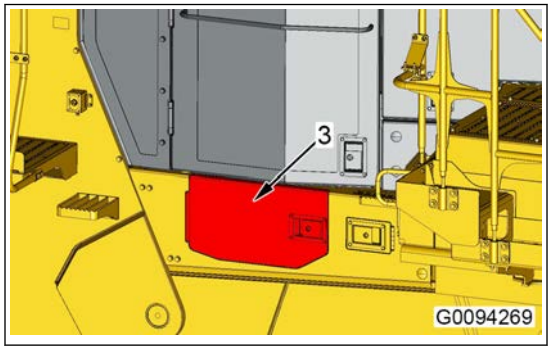
1. Lift the underguard (1), and hold it.
   Tool: Webbing sling (A), chain block (B)
   Underguard: 320kg



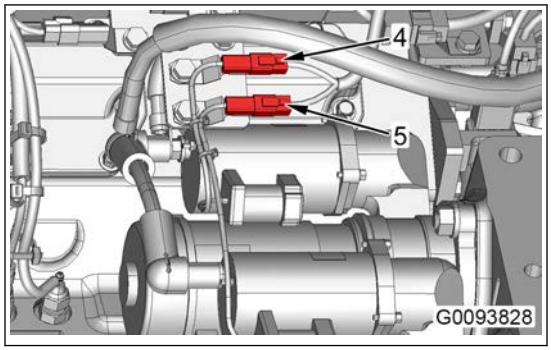
2. Remove the 10 bolts (2), and remove the underguard (1).
   Tool: Ratchet handle, socket
   Bolt (2): Width across flats 46mm, M30

Starting motor assembly

3. Open the cover (3).



4. Disconnect the connectors ST1 (4) and ST2 (5).



19. Remove the 4 bolts (29) and 4 bolts (30), and remove the radiator assembly (24).

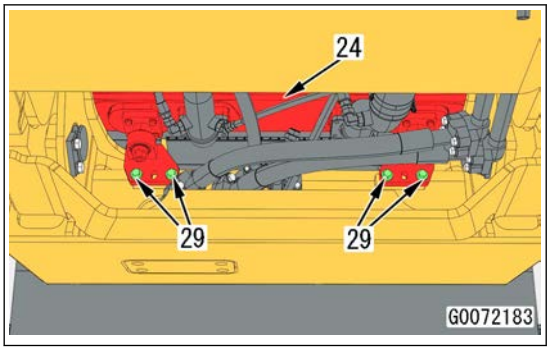
REMARK

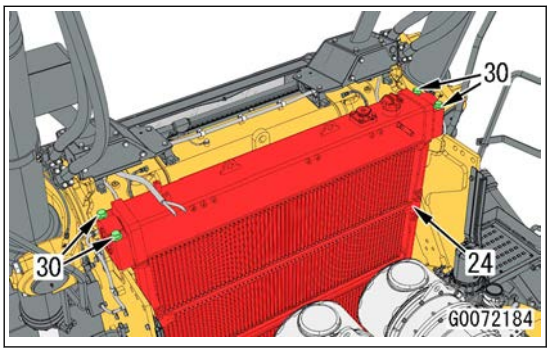
- Balance the assembly (front, back, right, and left) not to let the radiator core tilt.
- Handle the core fin carefully. It can be deformed easily if it is hit.

Tool: Ratchet handle, socket

Bolt (29): Width across flats 24 mm, M16

Bolt (30): Width across flats 36 mm, M24





INSTALL RADIATOR ASSEMBLY

Radiator assembly

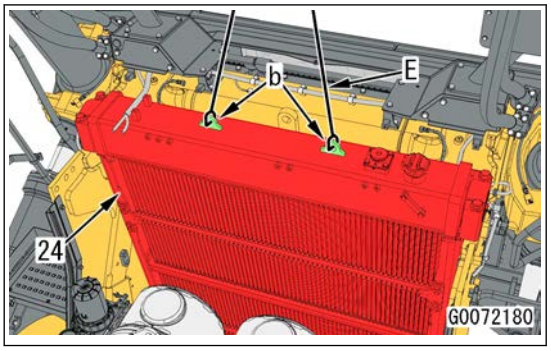
1. Install the wire lifting tool (E) to the lifting points (b), lift the radiator assembly (24), and set it to the installation position.

REMARK

- Balance the assembly (front, back, right, and left) not to let the radiator core tilt.
- Handle the core fin carefully. It can be deformed easily if it is hit.

Tool: Wire lifting tool (E)

Radiator assembly (24): 600 kg



⚠ Check the connector numbers and installation positions before you disconnect the wirings, hoses, and clamps, and write them down.

⚠ If it is possible for wirings and hoses to be deformed or damaged, remove clips and clamps before the work.

⚠ Prepare a container to receive oil before you disconnect the hoses.

⚠ Install a plug and flange to the place where the hydraulic hose is disconnected to prevent flow out of the oil.

⚠ Replace the O-ring, seal washer, and gasket with new ones.

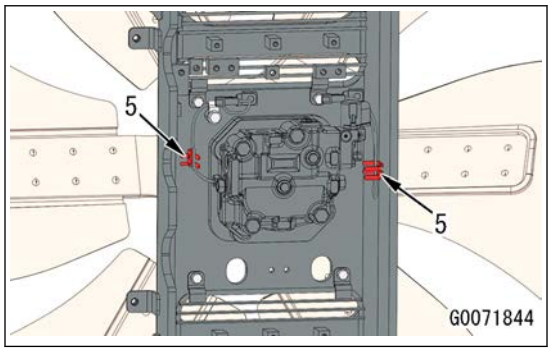
REMOVE COOLING FAN MOTOR ASSEMBLY

Cooling fan drive assembly

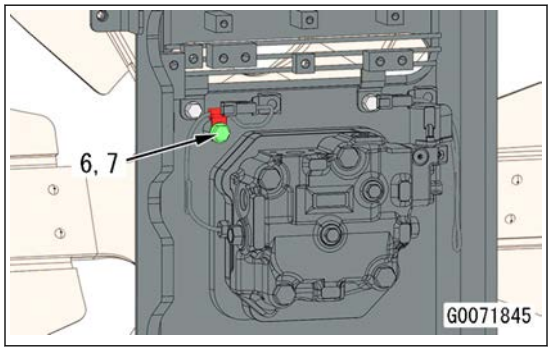
1. Remove the cooling fan drive assembly.
   For removal, see “REMOVE COOLING FAN DRIVE ASSEMBLY”.

Cooling fan motor assembly

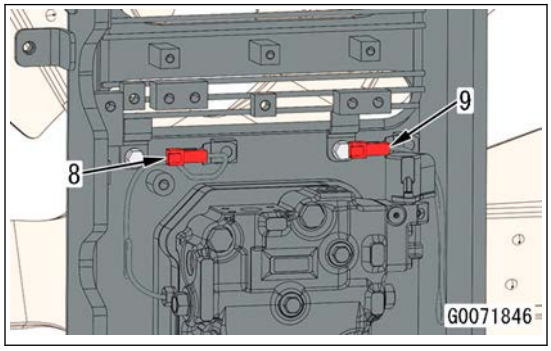
2. Remove the clips (5) (2 pieces).



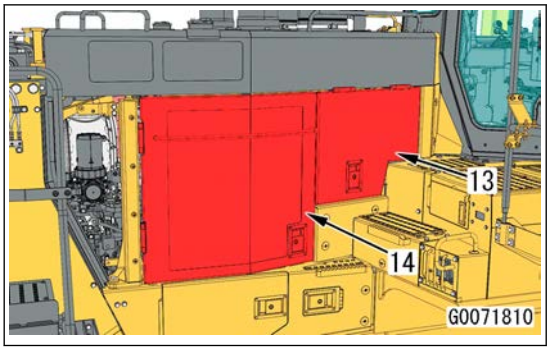
3. Remove the bolt (6), and remove the clamp (7).
   Tool: Ratchet handle, socket
   Bolt (6): Width across flats 19 mm, M12



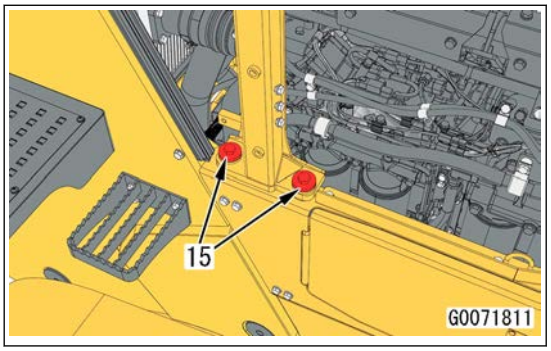
4. Remove the connectors FRV (8) and FAR2 (9) from the clip.



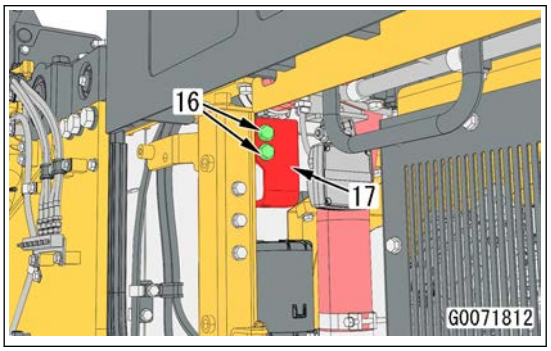
8. Open the covers (13) and (14).



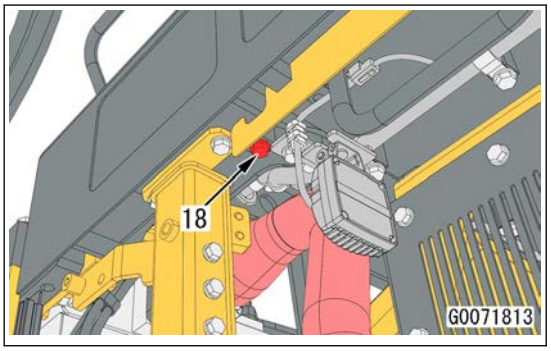
9. Loosen the 2 bolts (15).
   Tool: Ratchet handle, socket
   Bolt (15): Width across flats 24 mm, M16



10. Remove the 2 bolts (16), and remove the bracket (17).
    Tool: Ratchet handle, socket
    Bolt (16): Width across flats 19 mm, M12



11. Remove the bolt (18).
    Tool: Ratchet handle, socket
    Bolt (18): Width across flats 19 mm, M12



12. Change the positon of the bracket (17) to the opposite side, and install it with the 2 bolts (16) and bolt (18).

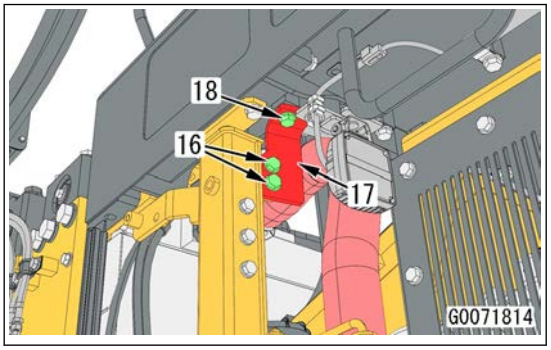
    REMARK

    This is to fix the engine hood and cover support only when you remove the engine hood assembly.

    Tool: Ratchet handle, socket, torque wrench

    Bolt (16), (18): Width across flats 19 mm, M12

    Bolt (16), (18): 98 to 123 Nm {10.0 to 12.5 kgm}



⚠ Immediately after the engine stops, the temperature of the coolant, oil, and parts around the engine is very hot and they can cause burn injury. Wait until the temperature decreases, and then start the work.

REMARK

Special caution is necessary because the temperature of the aftertreatment devices and area around them is 400℃ or above.

⚠ The remaining pressure in the hydraulic tank can cause an accident. Release the remaining pressure carefully.

REMARK

For details, see TESTING AND ADJUSTING, "RELEASE REMAINING PRESSURE IN HYDRAULIC SYSTEM".

⚠ Check for flammable materials such as dry leaves and twigs stuck to the aftertreatment devices. If dirt or flammable materials are found, remove them.

⚠ The aftertreatment devices can be damaged by the shock if they fall. Handle them carefully. Do not use the damaged parts again.

Obey the items that follow when you handle the wirings and hoses.

⚠ Check the connector numbers and installation positions before you disconnect the wirings, hoses, and clamps, and write them down.

⚠ If it is possible for wirings and hoses to be deformed or damaged, remove clips and clamps before the work.

⚠ Prepare a container to receive oil before you disconnect the hoses.

⚠ Install a plug or a flange to parts where a hydraulic hose is disconnected to prevent oil from flowing out.

⚠ Replace the O-ring, seal washer, and gasket with new ones.

NOTICE

- **Before you disconnect the wirings and hoses, check the connector numbers and installed positions and write them down.**
- **Prevent oil from flowing out.**
- **Replace the seal washer with a new one.**
- **Replace the O-ring and gasket with new ones.**

REMOVE VGT ASSEMBLY (RIGHT BANK)

Drain coolant

1. Drain coolant.

   For the procedure to drain coolant, see "DRAIN COOLANT".

Engine hood assembly

2. Remove the engine hood assembly.

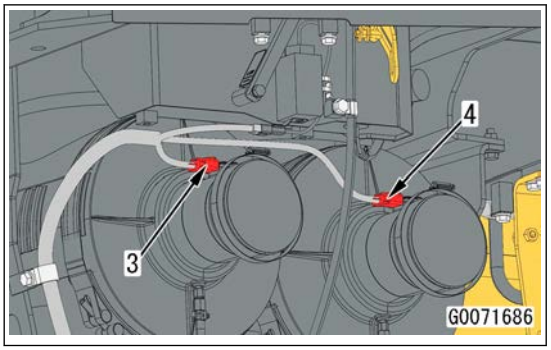
   For removal, see "REMOVE ENGINE HOOD ASSEMBLY".

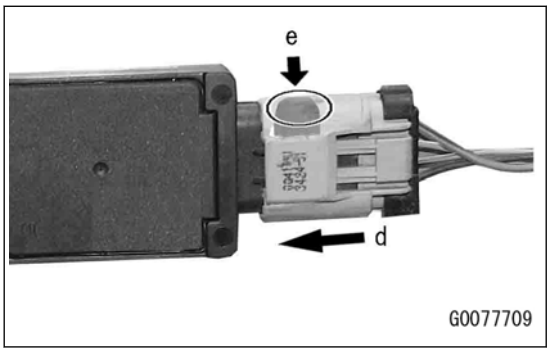
KDPF assembly

3. Remove the KDPF assembly.

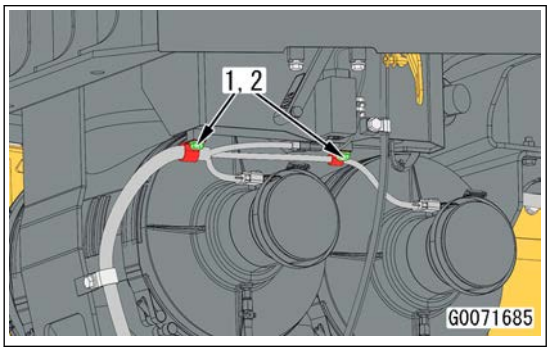
   For removal, see "REMOVE KDPF ASSEMBLY".

14. Connect the connectors MAF2 (3) and MAF1 (4) as follows.
    1) Connect the connector in the direction (d), and slide the lock in the direction (e) to lock it.





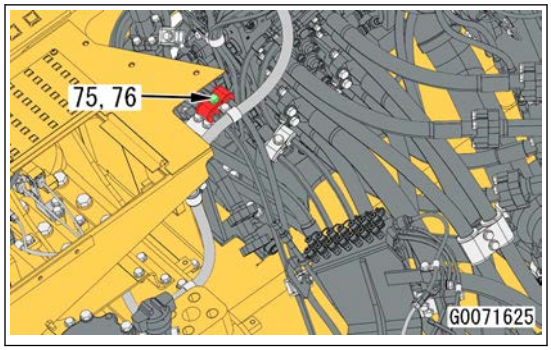
15. Install the 2 clamps (2) with the 2 bolts (1).
    Tool: Ratchet handle, socket, torque wrench
    Bolt (1): Width across flats 19 mm, M12
    Bolt (1): 98 to 123 Nm {10.0 to 12.5 kgm}



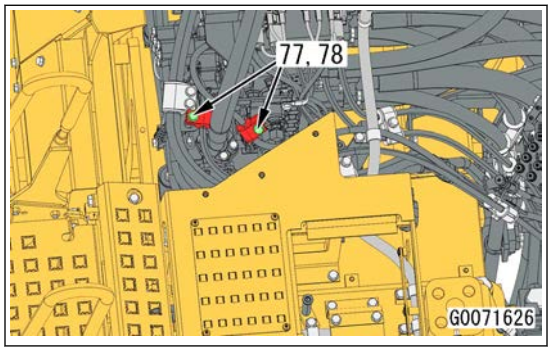
Engine hood assembly

16. Install the engine hood assembly.
    For installation, see “INSTALL ENGINE HOOD ASSEMBLY”.

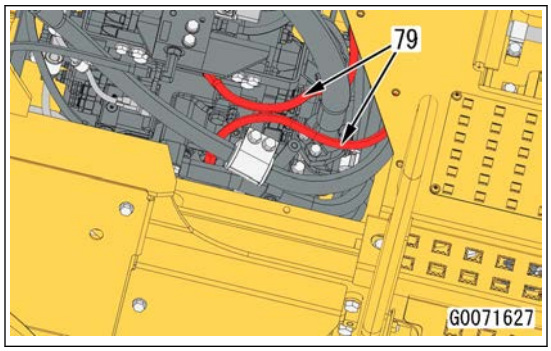
52. Remove the bolt (75), and remove the clamp (76).
Tool: Ratchet handle, socket
Bolt (75): Width across flats 19 mm, M12



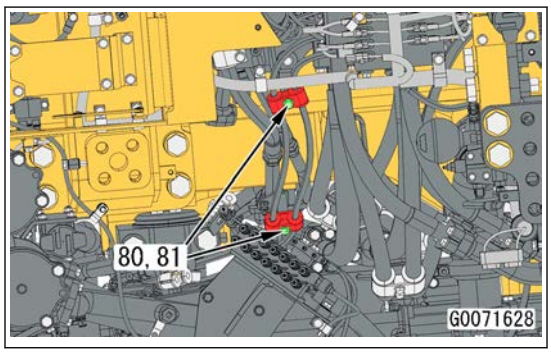
53. Remove the 2 bolts (77), and remove the 2 clamps (78).
Tool: Ratchet handle, socket
Bolt (77): Width across flats 19 mm, M12



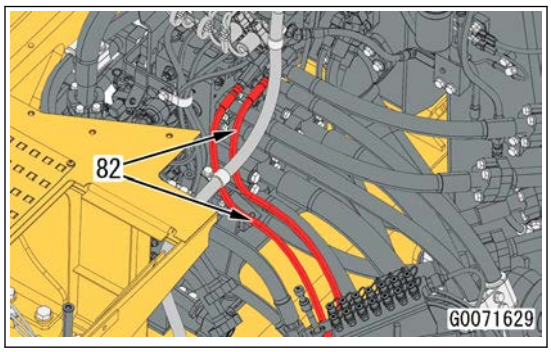
54. Disconnect the hoses (79) (2 pieces).
Tool: Open-end wrench, plug (D1), cap (D2), O-ring (D3)
Hose (79): Width across flats 19 mm, #02 size



55. Remove the 2 bolts (80), and remove the 2 clamps (81).
Tool: Ratchet handle, socket
Bolt (80): Width across flats 19 mm, M12



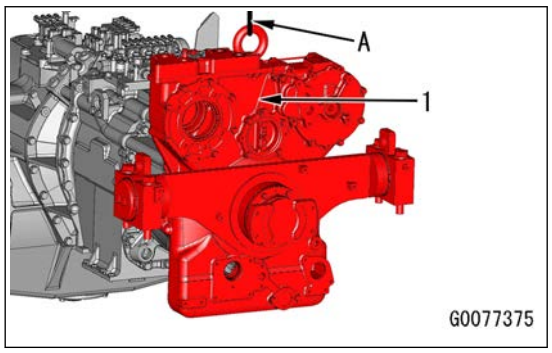
56. Disconnect the hoses (82) (2 pieces).
Tool: Open-end wrench, plug (D1), cap (D2), O-ring (D3)
Hose (82): Width across flats 19 mm, #02 size



DISASSEMBLE PTO ASSEMBLY

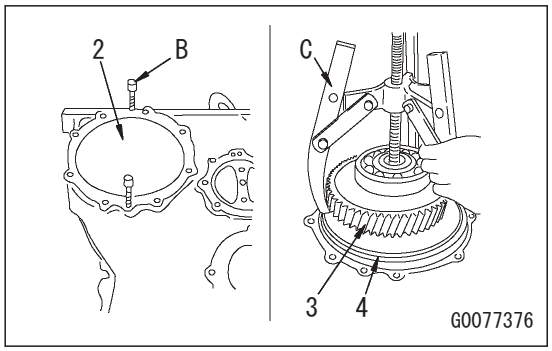
PTO lubrication tube

1. Lift the PTO assembly, and hold it.
   Tool: Wire lifting tool (A)
   PTO assembly: 270 kg
2. Remove the bolt, and remove the lubrication tube (1).
   Tool: Ratchet handle, socket
   Bolt: Width across flats: 17 mm
3. Remove the bolt, and remove the 3 lubrication tubes on the opposite side.
   Tool: Ratchet handle, socket
   Bolt: Width across flats: 17 mm
4. Lower it with its torque converter side faces downward.

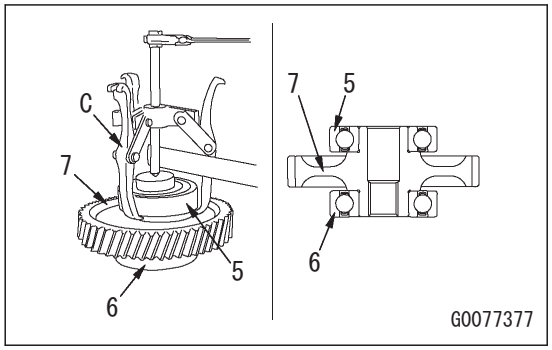


Work equipment pump gear assembly

5. Remove the 8 bolts and install the 2 guide bolts (B). Pull out the cover assembly (2) to remove it.
   Tool: Guide bolt (B), ratchet handle, socket
   Bolt: Width across flats 19 mm, M12
   Guide bolt (B): Width across flats 19 mm, M12
6. Remove the gear assembly (3) from the cover (4).
   Tool: Puller (C)

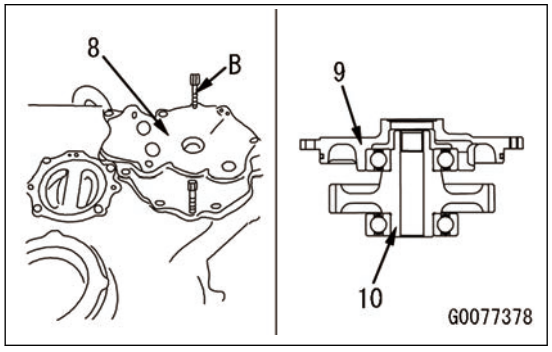


7. Remove the bearings (5) and (6) from the gear (7).
   Tool: Puller (C)

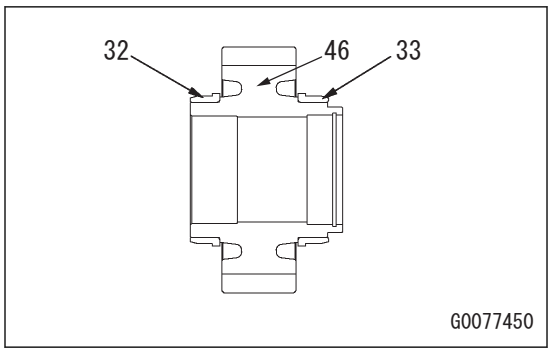


Power train and PPC pump gear assembly

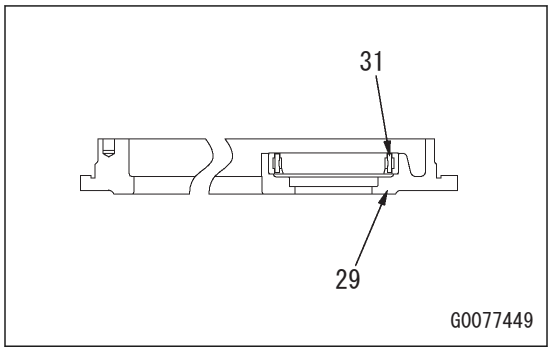
8. Remove the bolt and install the guide bolt (B). Pull out the cover assembly (8) to remove it.
   Tool: Guide bolt (B), ratchet handle, socket
   Bolt: Width across flats 19 mm, M12
   Guide bolt (B): Width across flats 19 mm, M12
9. Remove the gear assembly (10) from the cover (9).
   Tool: Puller (C)



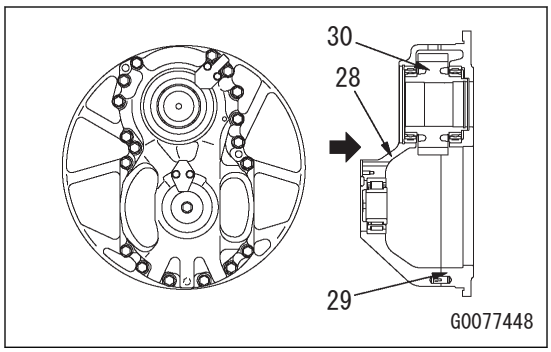
4) Press fit the bearing inner races (32) and (33) into the drive gear (46).
   Tool: Push tool (L)



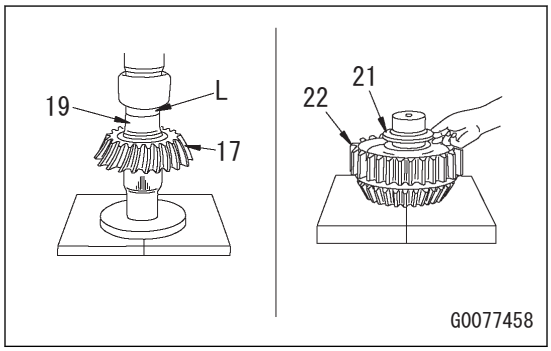
5) Press fit the bearing outer race (31) into the case (29).
   Tool: Push tool (L)
6) Install the drive gear and bearing assembly (30) to the case (29).

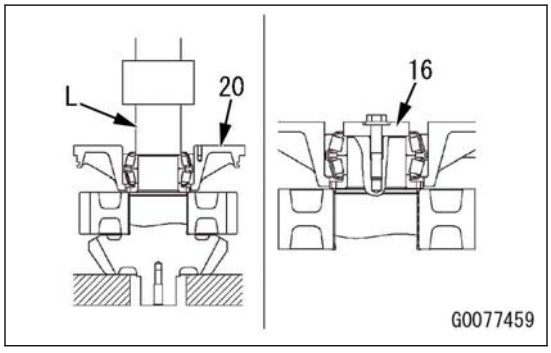


7) Align the housing (28) to the dowel pin, and install it to the case (29). And install the bolt.
   Tool: Ratchet handle, socket, torque wrench
   Bolt: Width across flats 24 mm, M16
   Bolt: 245.0 to 309 Nm {25.0 to 31.5 kgm}



8) Press fit the bearing inner race (19) into the pinion shaft (17).
   Tool: Push tool (L)
9) Install the holder with the bolt.
   Tool: Ratchet handle, socket, torque wrench
   Bolt: Width across flats 24 mm, M16
   Bolt: Liquid adhesive (LT-2)
   Bolt: 245.0 to 309 Nm {25.0 to 31.5 kgm}
10) Install the gear (22) and collar (21) to the pinion shaft (17).
11) Press fit the cage and bearing assembly (20).
    Tool: Push tool (L)
12) Install the holder (16) with the bolt.
    Tool: Ratchet handle, socket, torque wrench
    Bolt: Width across flats 24 mm, M16
    Bolt: Liquid adhesive (LT-2)
    Bolt: 245.0 to 309 Nm {25.0 to 31.5 kgm}



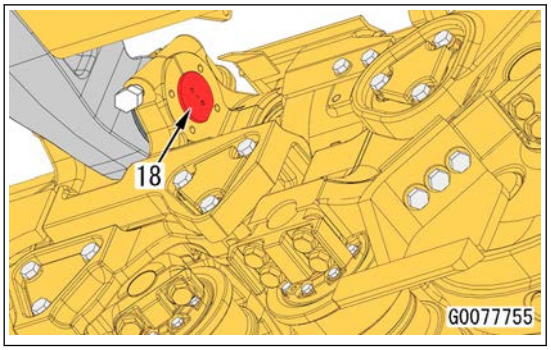


15. Remove the pin (18).

    REMARK

    Adjust the height of the track frame with the lifting tool to align the holes of the equalizer bar and track frame, and then remove the pin.

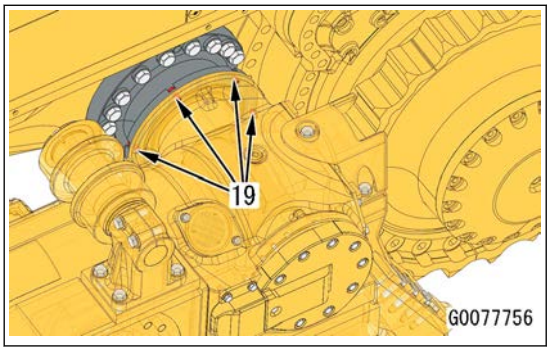
    Tool: Punch (L), hammer



16. Remove the 6 bolts (19).

    Tool: Ratchet handle, socket

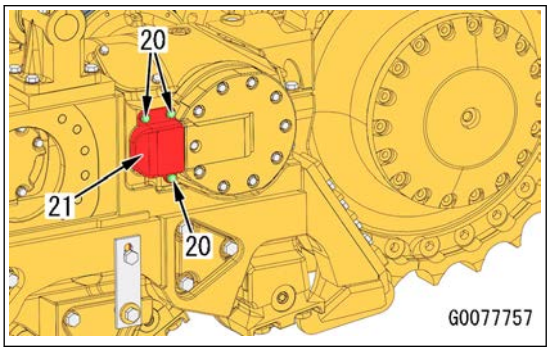
    Bolt (19): Width across flats 24 mm, M16



17. Remove the 3 bolts (20), and remove the cover (21).

    Tool: Ratchet handle, socket

    Bolt (20): Width across flats 24 mm, M16



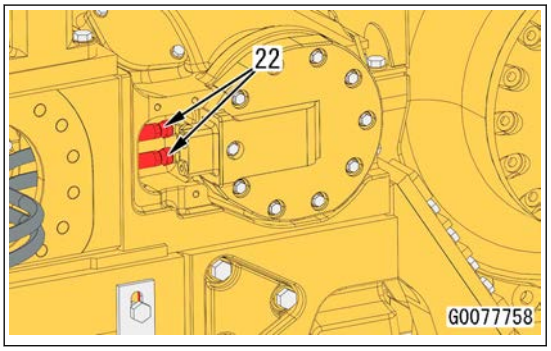
18. Disconnect the hoses (22) (2 pieces).

    Band for upper hose (22): Red

    Band for lower hose (22): Blue

    Tool: Open-end wrench, plug (M1), cap (M2), O-ring (M3)

    Hose (22): Width across flats 36 mm, #06 size

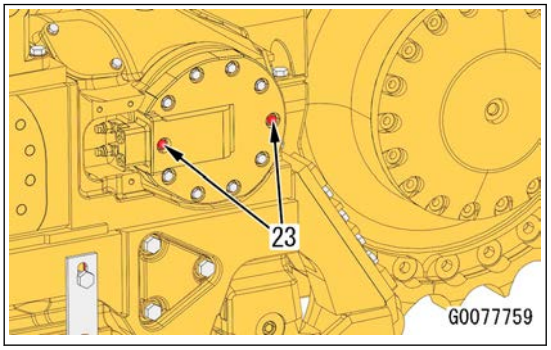


19. Remove the 2 bolts (23), and install the 2 guide bolts (N).

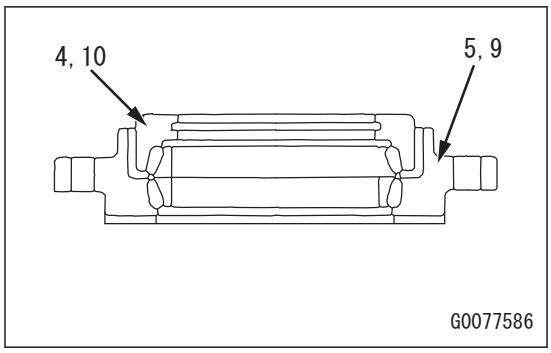
    Tool: Guide bolt (N), ratchet handle, socket

    Bolt (23): Width across flats 24 mm, M16

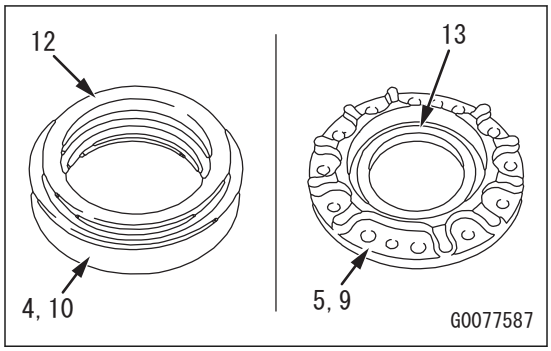
    Guide bolt (N): Width across flats 24 mm, M16



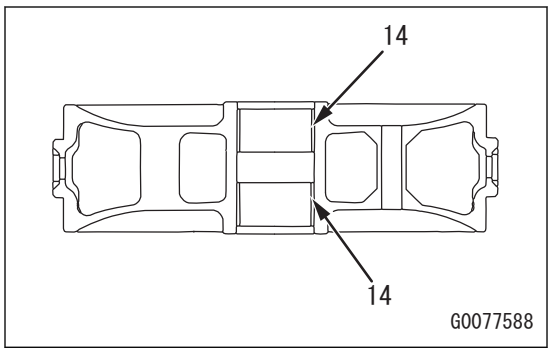
9. Remove the seal guides (4) and (10) from the retainers (5) and (9).



10. Remove the 2 floating seals (12) from the seal guides (4) and (10).
11. Remove the 2 floating seals (13) from the retainers (5) and (9).



12. Remove the 2 bushings (14).
    Tool: Puller (G)



ASSEMBLE IDLER ASSEMBLY

NOTICE

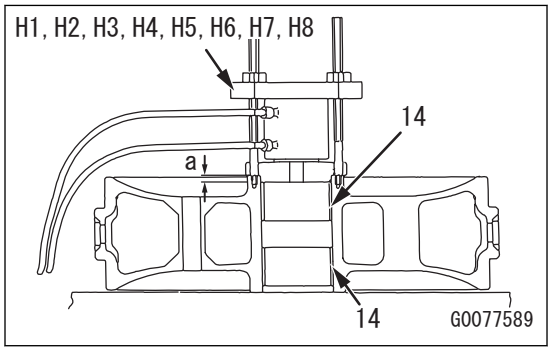
Wash each part and make sure that no dirt or scratch is found.

1. Install the 2 bushings (14).

   NOTICE

   - **Do the centering of the bushing with a plastic hammer, and then press fit it.**
   - **Press fit the bushing until the dimension (a) between the end surface of the idler and top surface of the bushing becomes 17±0.5 mm.**

   Tool: Plastic hammer, plate (H1), rod (H2), block (H3), washer (H4), nut (H5), washer (H6), puller (H7), pump (H8), vernier calipers



REMOVE AND INSTALL EQUALIZER BAR ASSEMBLY

Standard tools to be used when you remove and install the equalizer bar assembly

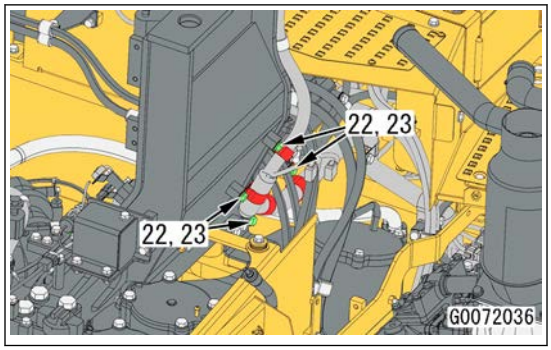
The listed parts are for reference only. You can use the part that is not listed if it is applicable.

No.	Part name	Specifications	Q'ty	Remarks
1	Socket	19 mm	1	
2	Socket	30 mm	1	
3	Socket	36 mm	1	
4	Socket	46 mm	1	
5	Socket	50 mm	1	
6	Open-end wrench	17 mm	1	
7	Open-end wrench	19 mm	1	
8	Ratchet handle		1	
9	Torque wrench	50 to 420 Nm	1	
10	Torque wrench	300 to 1000 Nm	1	
11	Torque wrench	700 to 2000 Nm	1	
12	Torque wrench	2000 to 3000 Nm	1	
13	Torque wrench (open-end)	20 to 200 Nm	1	
14	Hammer		1	

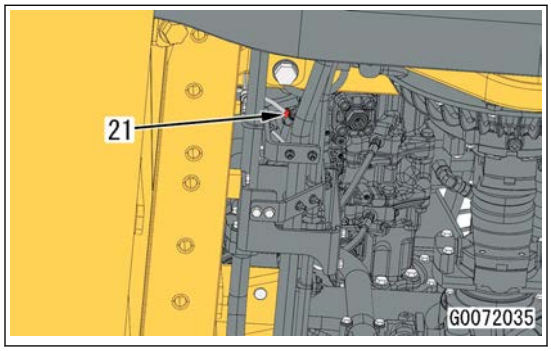
Special tools to be used when you remove and install the equalizer bar assembly

Symbol	Part No.	Part name	Q'ty	Sketch	Remarks
A	Commercially available	Webbing sling	4		Width 25 mm x length 3 m

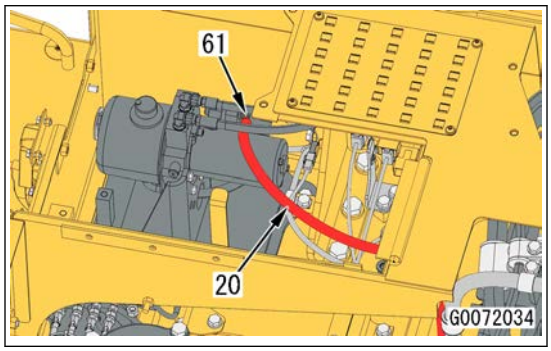
27. Install the 4 clamps (23) with the 4 bolts (22).
    Tool: Ratchet handle, socket, torque wrench
    Bolt (22): Width across flats 19 mm, M12
    Bolt (22): 98 to 123 Nm {10.0 to 12.5 kgm}



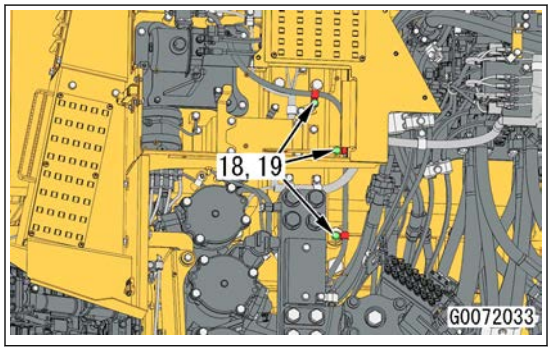
28. Connect the connector LSV (21).



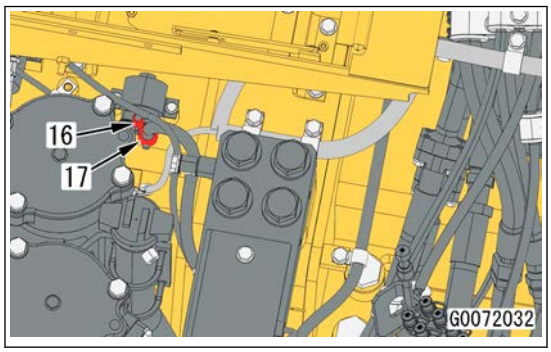
29. Connect the terminal C1 (20) with the nut (61).
    Tool: Ratchet handle, socket, torque wrench
    Nut (61): Width across flats 10 mm



30. Install the 3 clamps (19) with the 3 bolts (18).
    Tool: Ratchet handle, socket, torque wrench
    Bolt (18): Width across flats 19 mm, M12
    Bolt (18): 98 to 123 Nm {10.0 to 12.5 kgm}

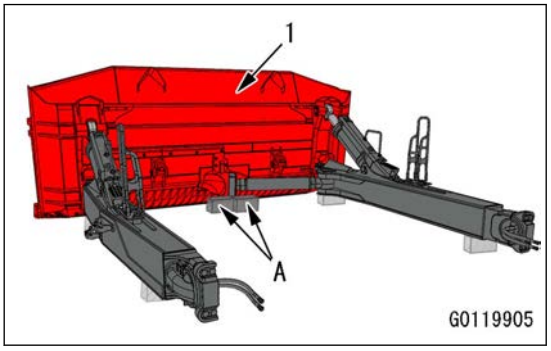


31. Connect the connectors PR3 (16) and PR1 (17).



For removal, see “REMOVE BLADE ASSEMBLY”.

2. Fix the blade assembly (1) with the block (A).
   Tool: Block (A)

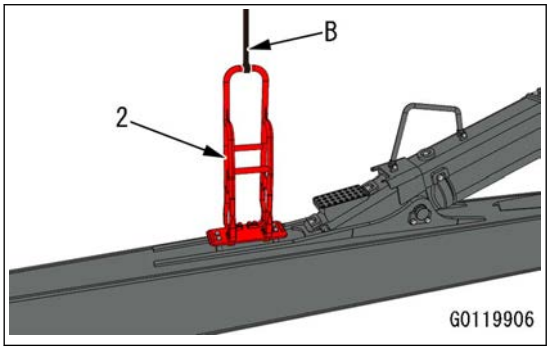


Release remaining pressure in work equipment cylinder

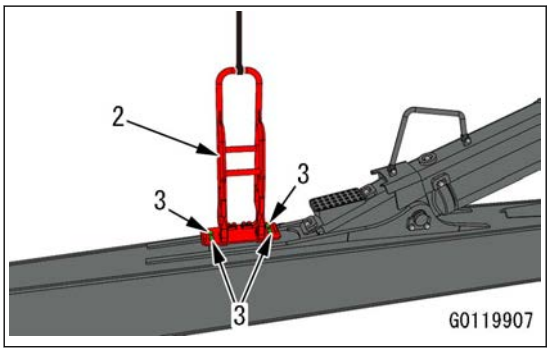
3. Release the remaining pressure in the piping.
   For details how to release the remaining pressure, see TESTING AND ADJUSTING, “RELEASE REMAINING PRESSURE IN WORK EQUIPMENT CYLINDER”.

R.H and L.H. tilt cylinder assemblies

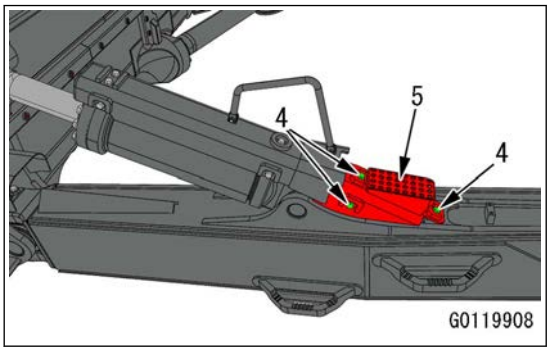
4. Lift the handrail (2), and hold it.
   Tool: Webbing sling (B)
   Handrail (2): 70kg



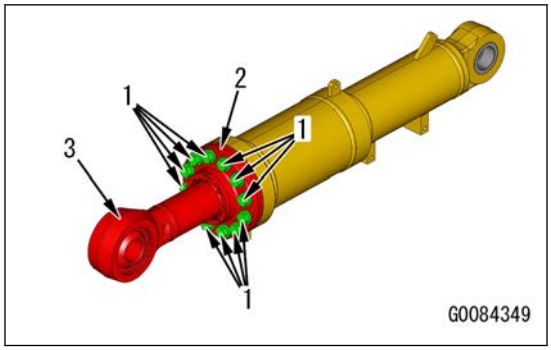
5. Remove the 4 bolts (3), and remove the handrail (2).
   Tool: Ratchet handle, socket
   Bolt (3): Width across flats 24mm, M16



6. Remove the 3 bolts (4), and remove the cover (5).
   Tool: Ratchet handle, socket
   Bolt (4): Width across flats 30mm, M20

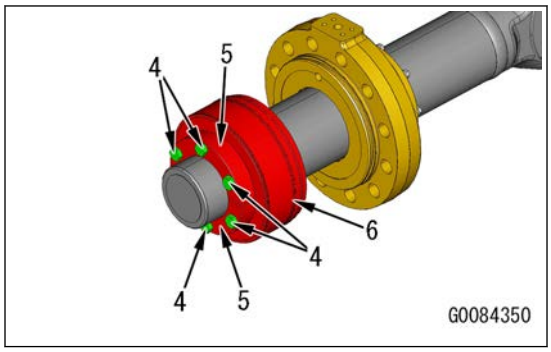


2. Remove the 12 bolts (1), and disconnect the head assembly (2).
   Tool: Ratchet handle, socket
   Bolt (1): Width across flats 41 mm, M27
3. Pull out the piston rod assembly (3).

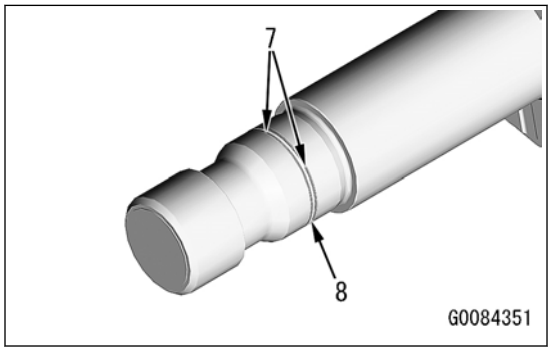


Piston assembly

4. Remove the 6 bolts (4), and remove the 2 spacers (5).
   Tool: Ratchet handle, socket
   Bolt (4): Width across flats 22 mm, M14
5. Pull out the piston assembly (6).

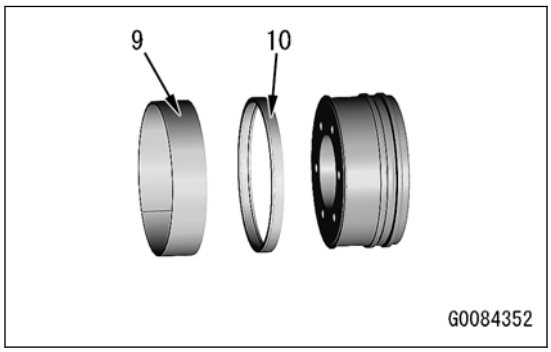


6. Remove the 2 backup rings (7) and O-ring (8).

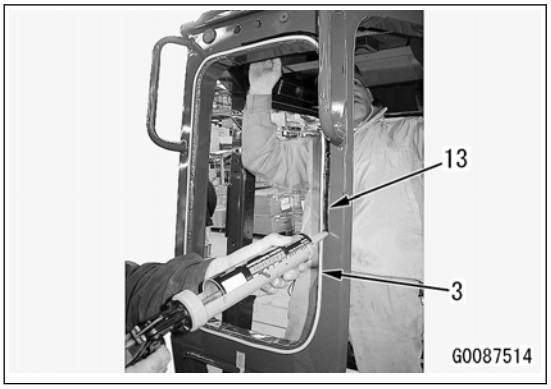


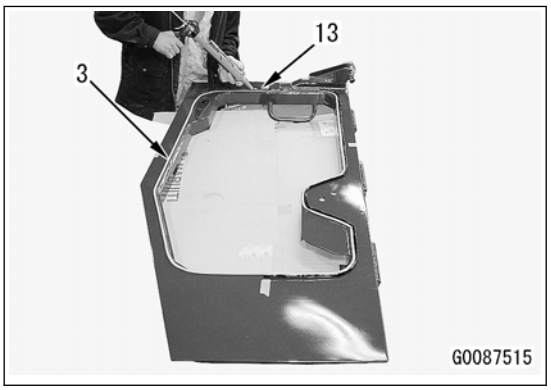
Disassemble the piston assembly

7. Remove the wear ring (9).
8. Remove the piston ring (10).



11. Apply the adhesive (13) to the outside of the dam rubber (3) of the operator cab.



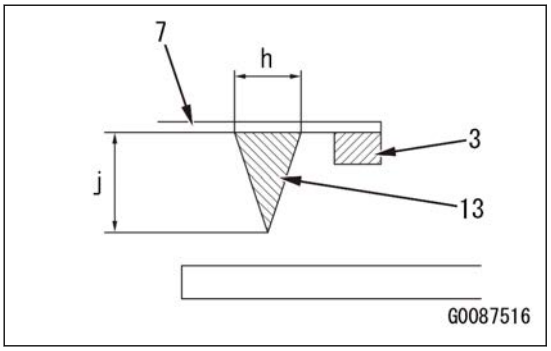


REMARK

- Apply the adhesive (13) in the dimensions (h) and (j) shown in the figure against the dam rubber (3) of the operator cab (7).
- Apply the adhesive (13) to let its height higher than the dam rubber (3).
- Apply the adhesive equally without height difference.

  Dimension (h): 10 mm

  Dimension (j): 15 mm



Glass

12. Install the front window glass (1) to the operator cab (7) with the lifter (adhesive disc) (B) along the line (e) on the tape (C) for positioning prepared in step 4.

REMARK

- As the glass cannot be removed and installed again, install it carefully.
- The glass installation work must be completed in 5 minutes after the adhesive is applied.

Tool: Lifter (adhesive disc) (B)

13. Push the whole glass with the force to be adhered to the dam rubbers after the glass is installed.

REMARK

Hold the corners of the glass securely.

14. Install the right and left door glasses (2) to the doors (9) with the lifter (adhesive disc) (B) along the line (e) on the tape (C) for positioning prepared in step 4.

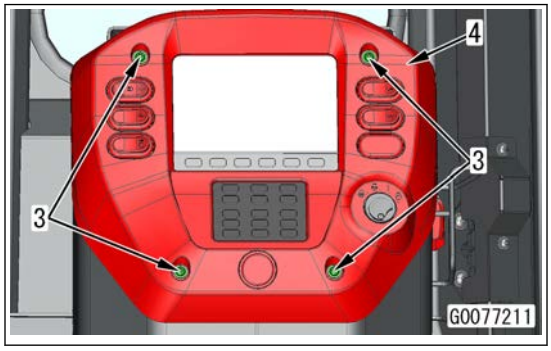
REMARK

- As the glass cannot be removed and installed again, install it carefully.
- The glass installation work must be completed in 5 minutes after the adhesive is applied.

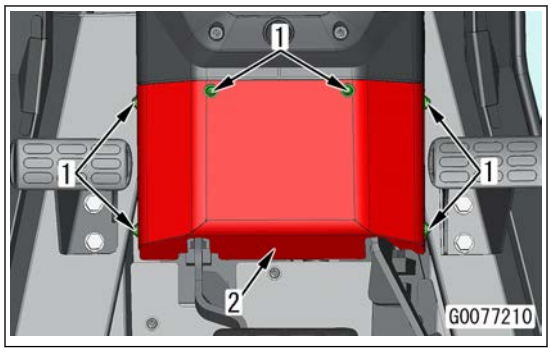
15. Push the whole glass with the force to be adhered to the dam rubbers after the glass is installed.

Monitor cover

6. Install the cover (4) with the 4 bolts (3).
   Tool: Ratchet handle, hexagonal socket, torque wrench
   Bolt (3): Width across flats 4 mm, M6
   Bolt (3): 9.8 Nm {1.0 kgm}



7. Install the cover (2) with the 6 bolts (1).
   Tool: Ratchet handle, hexagonal socket, torque wrench
   Bolt (1): Width across flats 5 mm, M8
   Bolt (1): 25.5 Nm {2.6 kgm}



4. Install the end cap (12) with the nut (11).

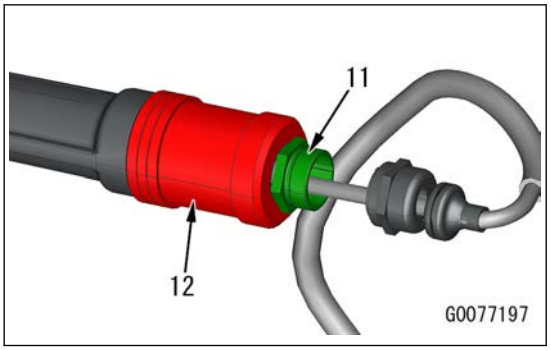
   REMARK

   Tighten the nut by 90 ° after it touches the wireless LAN unit assembly.

   Tool: Open-end wrench

   Nut (11): Width across flats 24 mm

   Nut (11): 5 to 6 Nm {0.51 to 0.61 kgm}



5. Install the insert (10) along the key slot, and install the bushing (9).

   NOTICE

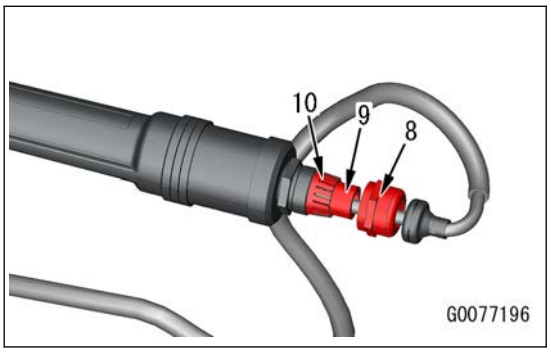
   Install the connector C35, end cap, nut, insert, bushing, and cap nut in this order.

6. Install the cap nut (8).

   Tool: Open-end wrench, torque wrench (open-end)

   Cap nut (8): Width across flats 24 mm

   Cap nut (8): 4 to 4.5 Nm {0.41 to 0.46 kgm}



7. Install the 2 clamps (7) with the 4 bolts (6).

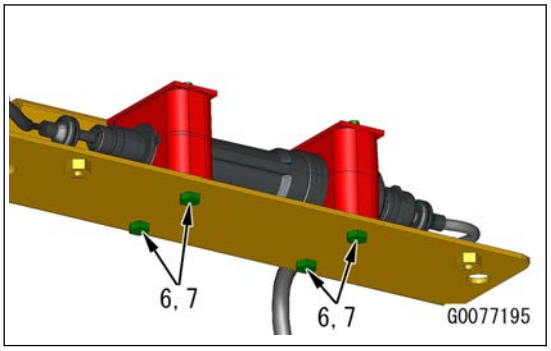
   REMARK

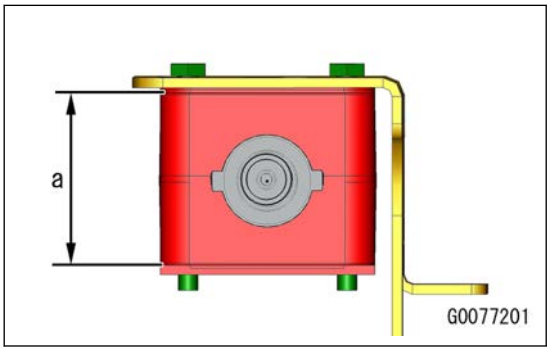
   Install it to let the dimension (a) between the upper and lower end surface of the rubber part become 56.4 mm or below.

   Tool: Ratchet handle, socket, torque wrench

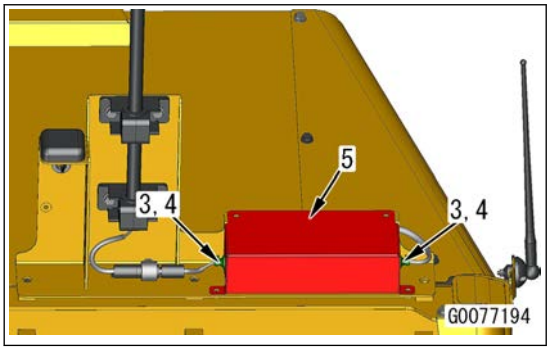
   Bolt (6): Width across flats 7/16 inch (11.1 mm), 1/4 inch (6.35 mm)

   Bolt (6): 9 to 9.5 Nm {0.92 to 0.97 kgm}

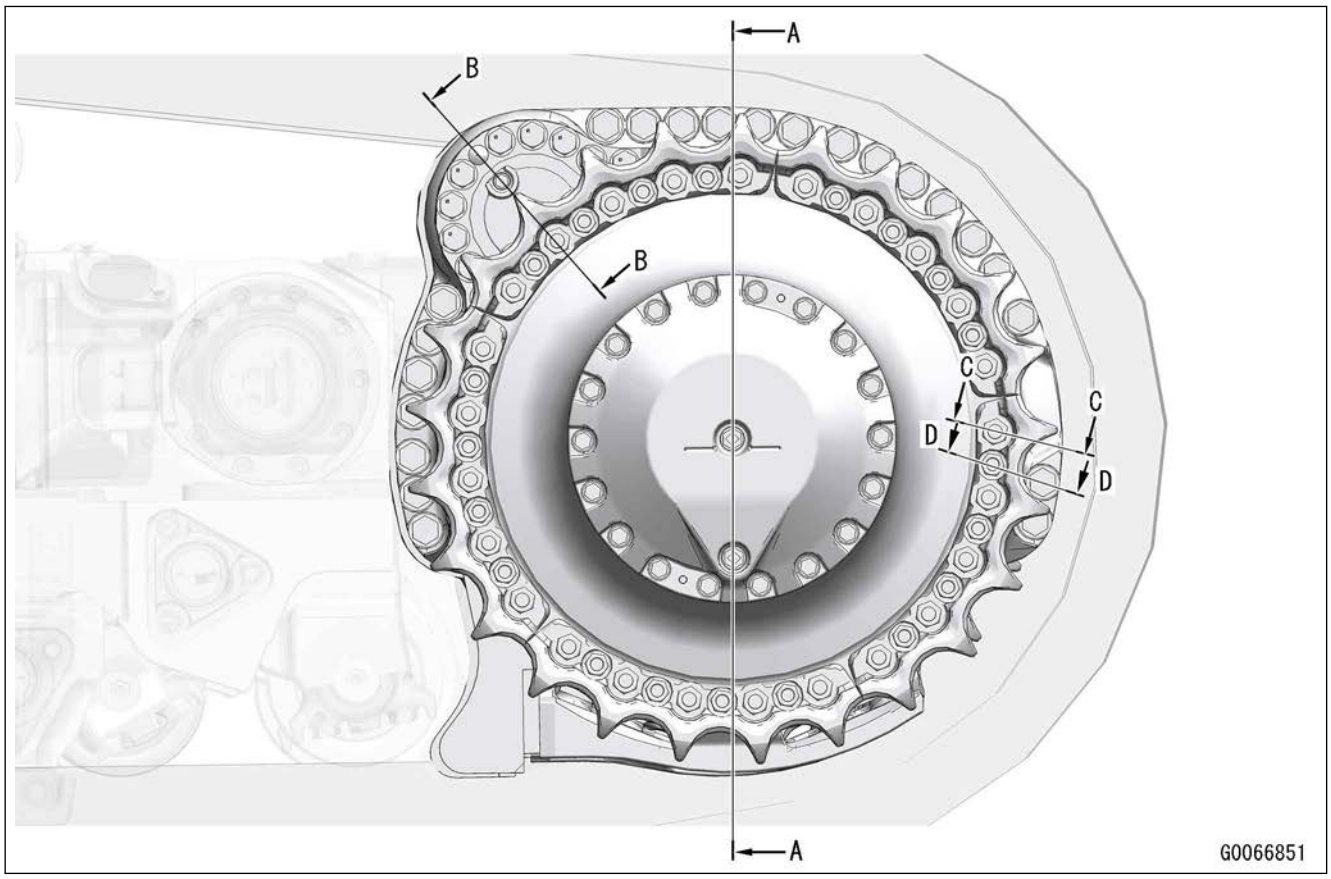




8. Install the 2 grommets (4) and 2 bands (3), and install the cover (5).



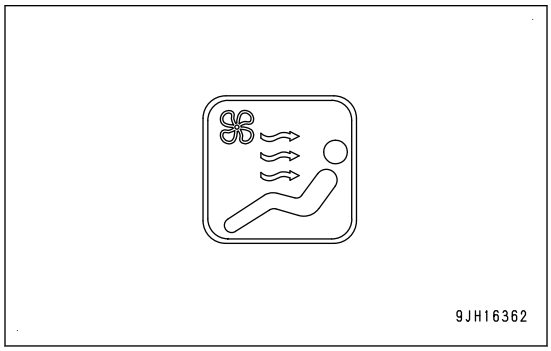
MAINTENANCE STANDARD OF FINAL DRIVE



Unit: mm

No.	Item	Judgment criteria					Remedy
1	Clearance between cylinder pin and bushing	Standard dimensions	Tolerance		Standard clearance	Allowable clearance	Replace
			Shaft	Hole			
		110	-0.036 -0.090	+0.289 +0.123	+0.159 to +0.379	1.5	
2	Clearance between arm mounting pin and bushing	140	-0.043 -0.106	+0.193 +0.050	+0.093 to +0.299	1.5	
3	Clearance between beam mounting pin and bushing	140	-0.043 -0.106	+0.500 +0.300	+0.343 to +0.606	1.5	
4	Clearance between tilt cylinder and beam mounting pin	110	-0.036 -0.090	+0.207 +0.120	+0.156 to +0.297	1.5	
5	Clearance between lift cylinder and beam mounting pin	110	-0.036 -0.090	+0.207 +0.120	+0.156 to +0.297	1.5	
6	Clearance between beam and shank mounting pin	Standard dimensions	Tolerance	Repair limit			
		100	±0.3	-			
7	Wear of ripper point	Standard dimensions	Repair limit				
		460	300				
8	Wear of protector	224	184				

TESTING AIR CONDITIONER USING SELF-DIAGNOSIS FUNCTION



- The air conditioner controller self-checks the refrigerant pressure by using the inside air temperature sensor, outside air temperature sensor, evaporator temperature sensor, temperature control switch, vent selector (mode) switch, and pressure switch. If abnormally related to the temperature control, vent (mode) selection, or refrigerant among them occurs, the machine monitor changes to the warning screen momentarily, and then continues displaying “Air conditioner system state monitor”.
- When the machine monitor fails in communication with the air conditioner controller, it displays system state monitor “!”.
- Once abnormality is detected, the abnormality in the self-diagnosis is not reset when the abnormal portion becomes normal. It is reset when the starting switch to “OFF” position.
- FRESH/RECIRC air changeover servomotor has no self-diagnosis function.
- If the controller detect a failure by self-diagnosis, it displays the failure on “Electrical Sys Abnormality Record” screen in Service Mode of the machine monitor.

Failure code list related to air conditioner

Failure code	Failure (Displayed on screen)	Remarks
879AKA	A/C Inner sensor Open Circuit	While it is mounted, not only the connector check but also troubleshooting cannot be performed. The A/C Inner sensor means the inside air temperature sensor.
879AKB	A/C Inner sensor Short Circuit	
879BKA	A/C Outer sensor Open Circuit	The A/C Outer sensor means the outside air temperature sensor.
879BKB	A/C Outer sensor Short Circuit	
879CKA	Ventilating sensor Open Circuit	While it is mounted, not only the connector check but also troubleshooting cannot be performed. The Ventilating sensor means the evaporator temperature sensor (frost sensor).
879CKB	Ventilating sensor Short Circuit	
879DKZ	Sunlight sensor Open or Short Circuit	
879EMC	Ventilating Damper Abnormality	While it is mounted, not only the connector check but also troubleshooting cannot be performed. The Ventilating Damper means the vent (mode) changeover damper (door).
879FMC	Air Mix Damper Abnormality	While it is mounted, not only the connector check but also troubleshooting cannot be performed. The Air Mix Damper means the temperature control (air mix) damper (door).
879GKX	Refrigerant Abnormality	
DAZ9KQ	Air conditioner model selection abnormality	Troubleshooting is not performed by the air conditioner unit but by the machine monitor. See Chapter 40, “Troubleshooting by failure code”
DAZQKR	CAN2 Discon (Air conditioner)	

<table>
<tr><th>No.</th><th>Cause</th><th>Procedures, Measurement, Values, Note</th><th colspan="2">Diagnosis and treatment</th></tr>
<tr><td rowspan="2">2</td><td rowspan="2">Circuit breaker</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Check that the system operating lamp is not lit, and then turn the battery disconnect switch to the OFF position.
3. Make sure that the circuit breakers CB3 and CB105 are energized.
4. Is the circuit breaker in the correct condition?</td><td>YES</td><td>• The circuit breaker is in the correct condition.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• Check “Ground fault in wiring harness” if the circuit breaker is cut off.
• If the wiring harness has no ground fault, and if the circuit breaker does not reset correctly, the circuit breaker is defective. Replace it.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">3</td><td rowspan="2">Open circuit in wiring harness</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Check that the system operating lamp is turned off. Turn the battery disconnect switch to the OFF position.
3. Disconnect the connector AC02.
4. Connect the T-adapter to female side of connector AC02.
5. Measure the resistance.
6. Does the measurement result agree with the standard value?
<table><tr><th>Item</th><th>Measurement position, condition</th><th>Standard value</th></tr><tr><td>Resistance</td><td>Between CB3-2 and AC02 (female) (4)</td><td>Max. 1 Ω</td></tr></table></td><td>YES</td><td>• Open circuit in wiring harness does not occur.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The wiring harness has an open circuit.
• Repair or replace the defective wiring harness.
• Go to “Confirmation of repair”.</td></tr>
</table>