SEN06750-13

Shop Manual

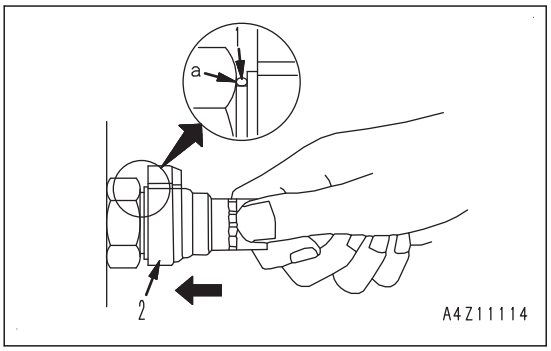
WHEEL LOADER **WA900-8R**

SERIAL NUMBERS 95001 and up

KOMATSU

Connection

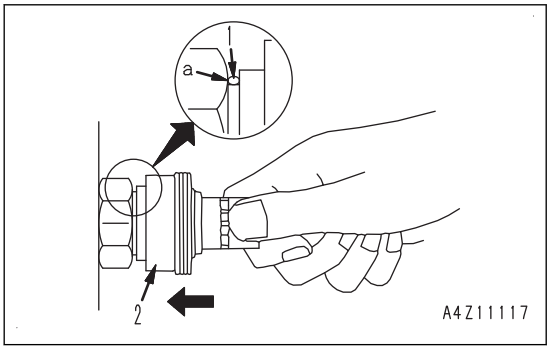
Hold the tightening adapter part, and push body (2) straight until sliding prevention ring (1) contacts contact surface (a) of the hexagonal part at the male end.



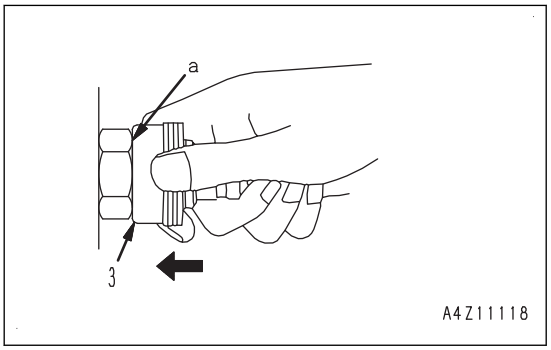
How to Disconnect and Connect Type 3 Push-Pull Type Coupler

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.



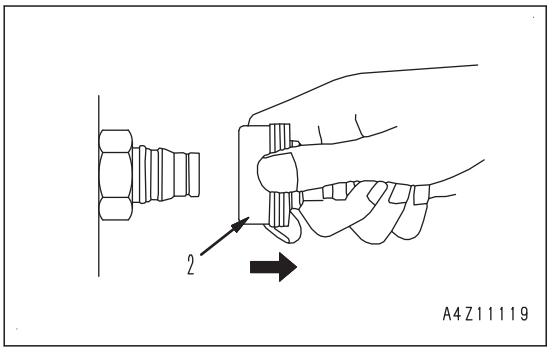
2. While keeping the condition of step 1, push cover (3) straight until it contacts contact surface (a) of the hexagonal portion on the male side.



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.



Operation of Pre-lubrication System

When the starting switch of the machine is turned to the START position, the pre-lube function operates. The operation time changes in response to the status of the engine oil pressure switch or the engine oil temperature.

1. Status judgment of the engine oil pressure switch

   The transmission controller recognizes the stopped state of the pre-lube operation by the signal of the engine oil pressure switch.

Oil pressure switch	Pressure threshold	Status judgment
Without pressure (CLOSE)	Below 29.4 Pa (0.3 kg/cm^2)	Pre-lube required
With pressure (OPEN)	29.4 Pa (0.3 kg/cm^2) or above	Pre-lube stopped (not required)

2. Judgment of operation time

   Maximum pre-lube operation time is set by the signal of the temperature sensor (engine oil) that is taken through the network.

Engine oil temperature	Maximum operation time
44 °C or below	60 seconds
45 °C or above	10 seconds

3. Conditions to complete pre-lube

   When all the conditions that follow are satisfied, the system recognizes that pre-lube is completed and the pre-lube operation stops.
   - When the signal of the engine oil pressure switch is "with pressure" (OPEN) regardless of the remaining operation time after pre-lube starts to operate.
   - When the engine oil temperature is 45 ºC or more, and after 10 seconds from the start of the pre-lube operation
   - When the engine oil temperature is 44 ºC or below, and after 60 seconds from the start of the pre-lube operation
   - When the engine oil temperature is 44 ºC or below, after 10 seconds from the start of the pre-lube operation, and a problem is found in the network
   - If a failure is sensed on the relay (pre-lube)

4. Engine startup permission

   When the pre-lube stops by the satisfied conditions to complete pre-lube, the transmission controller outputs the engine startup permission signal for 70 seconds. You can crank during the period if you turn the starting switch to the START position again.
   But you cannot start the engine until the permission signal of the engine startup is output.
   Also, if the engine does not start for 70 seconds, pre-lube operation is required again.

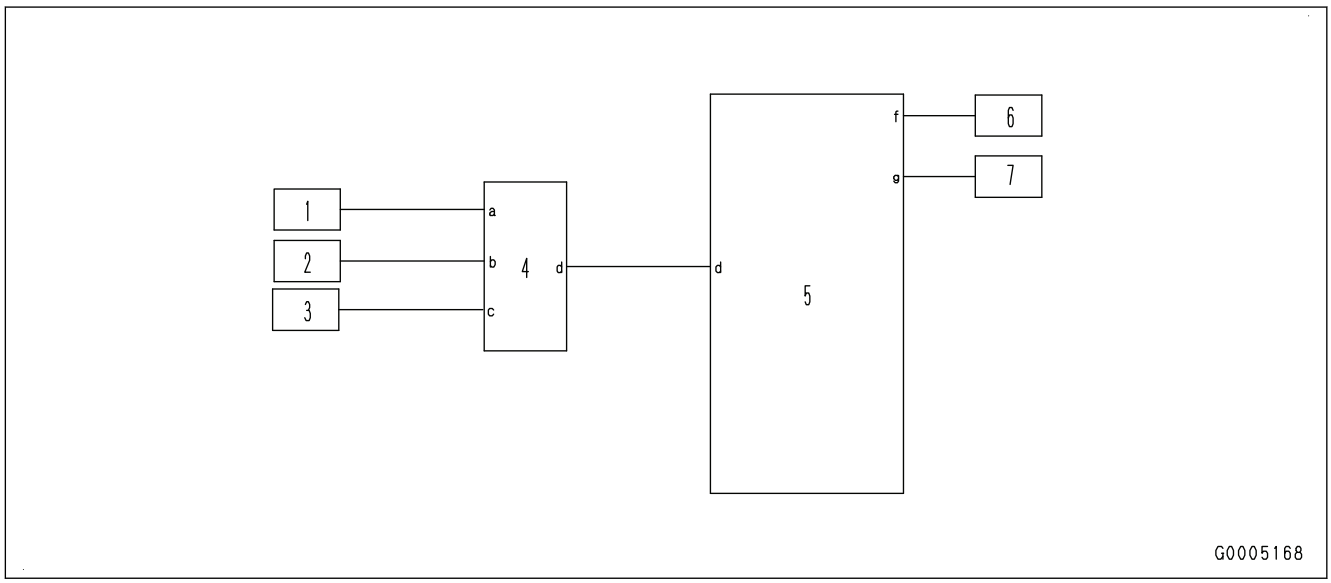
5. Operation display

   The status of the pre-lube function is shown with the pilot lamp on the monitor.

State	Pilot lamp	Operation conditions
Pre-lube operation in standby	Lit	From the starting switch is turned to the ON position to pre-lube actuation
During pre-lube	Lit	Pre-lube in operation
Pre-lube is completed	Not lit	Pre-lube is completed

Load Meter System

System Diagram of Load Meter



Input and output signals

a: Boom angle sensor input signal
b: Lift cylinder head pressure input signal
c: Lift cylinder bottom pressure input signal
1: Boom angle sensor
2: Pressure sensor (lift cylinder head)
3: Pressure sensor (lift cylinder bottom)
4: Work equipment controller
d: CAN signal
f: Load meter cancel/subtotal reset input signal
g: CAN signal
5: Monitor controller
6: Load meter switch (for cancel and subtotal reset)
7: KOMTRAX Plus controller

Function of Load Meter System

- The load meter system classifies the material into 5 types, weighs the load weight in the bucket, and shows the total load weight or the target remaining load weight.
- You can set the modes of the load meter system that follow on the user menu of the machine monitor.
  - Handled Material Selection
  - Addition or Subtraction Mode Select
  - Target Production Setting
  - Production Display and Reset
  - Total Load Weight
  - Calibration
  - Load Meter Display

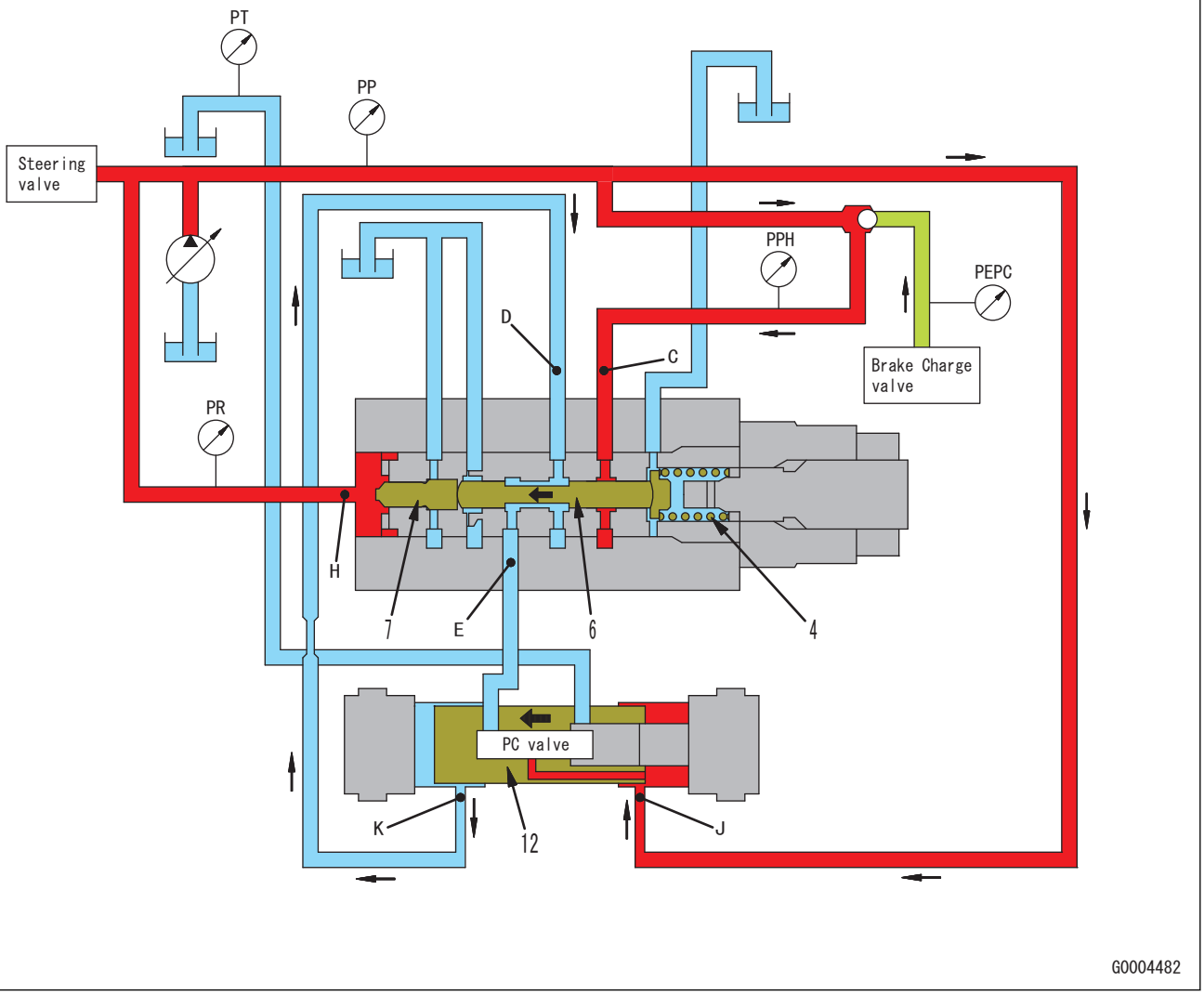
REMARK

For the operation method of the load meter, see the “Operation and Maintenance Manual”.

Pin No.	Signal name	Input/output
42	(*1)	-
43	(*1)	-
44	Pressure sensor (ambient pressure)	Input
45	Pressure sensor (charge pressure)	Input
46	(*1)	-
47	(*1)	-
48	PCV2(-)	Ground/Shield/ Return
49	Injector #4 (+)	Output
50	Injector #5 (+)	Output
51	Injector #6 (+)	Output
52	(*1)	-
53	(*1)	-
54	Various sensors (-)	Ground/Shield/ Return
55	Speed sensor (engine)	Ground/Shield/ Return
56	(*1)	-
57	(*1)	-
58	Pressure sensor (common rail) (-)	Ground/Shield/ Return
59	(*1)	-
60	(*1)	-
61	(*1)	-
62	Temperature sensor (charge)	Input
63	Pressure sensor (crankcase)	Input
64	(*1)	-
65	(*1)	-
66	(*1)	-
67	(*1)	-
68	(*1)	-
69	Datalink2 (+) (between engine controllers)	Communication
70	Datalink3 (+) (KOMNET/r)	Communication
71	(*1)	-
72	(*1)	-
73	Injector #4 (-)	Ground/Shield/ Return
74	Injector #5 (-)	Ground/Shield/ Return
75	Injector #6 (-)	Ground/Shield/ Return

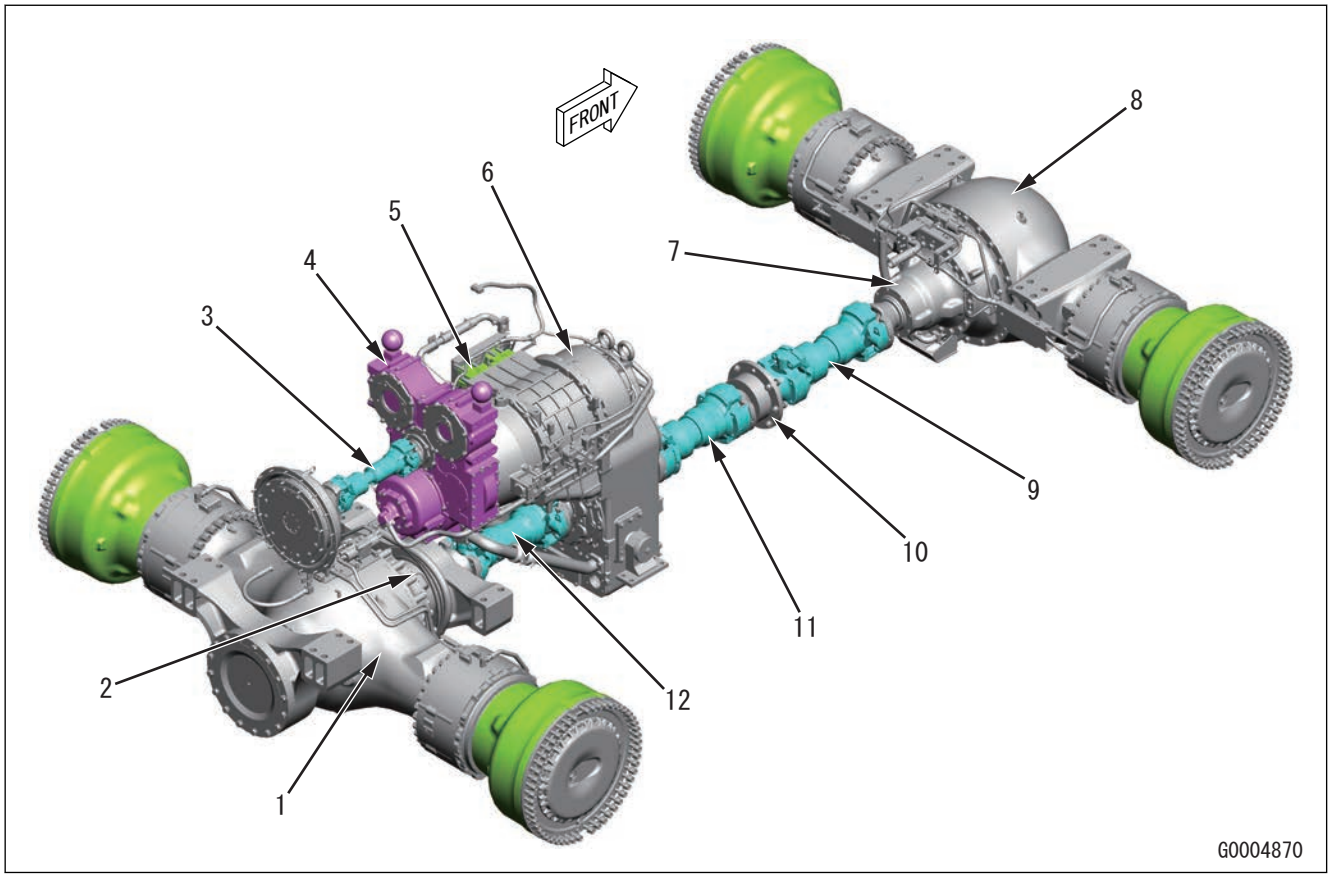
8. It moves in the direction which makes the swash plate angle minimum by the area difference of the servo piston (12).

Operation in the Direction to Increase the Pump Discharged Volume



1. If signal pressure (PR) from the steering pump decreases, the spool (6) is pushed to the left by the force of the spring (4) .
2. As the spool (6) moves, the oil flows from the port (D) and to the port (E), and to the PC valve.
3. The PC valve is connected to the drain port, and the oil pressure between circuits (D) and (K) is set to the drain pressure (PT).
4. The pressure at the large diameter side of the servo piston (12) becomes the drain pressure (PT) and the pump pressure (PP) is constantly transmitted to the port (J) at the small diameter side. Accordingly, the servo piston (12) is pushed to the left and moves the swash plate in the direction to increase the discharged volume.

Operation of Power Train System



1. The power from the engine is sent to the damper through the flywheel.
2. The damper output shaft is connected to the modulation clutch through the upper drive shaft (3).
3. The output of the modulation clutch is connected to the pump of the torque converter (4).
4. The torque converter (4) uses oil as a medium in response to the load fluctuations and changes the received torque and transmits it to the input shaft of the transmission (6). The engine power is also transmitted through pump drive gear of the torque converter to the work equipment pump, cooling fan pump, steering pump, and power train pump to drive those pumps.
5. The directional valve and gear shift valve of the transmission control valve are controlled by the transmission (6), and the transmission activates 5 hydraulic clutches to selects the speed from 3 gear speeds each in forward and reverse directions .
6. The parking brake is installed on the rear side of the output shaft. The solenoid valve is activated by the parking brake switch, and the wet-type multiple-disc brake stops the machine.
7. The power of the transmission (6) is sent to front axle (8) and rear axle (1).
   The power on the front side is sent to the front axle (8) through the center drive shaft (11), center support (10), and front drive shaft (9).
   The power on the rear side is sent to the rear axle (1) through the rear drive shaft (12).
8. The power transmitted to the front axle (8) and rear axle (1) is decreased in speed by the pinions of differentials (2) and (7), and it is sent to the sun gear shafts through the differentials.
9. The power of the sun gear is further decreased in speed by the final drives, and it transmits to the tires through the axle shafts.

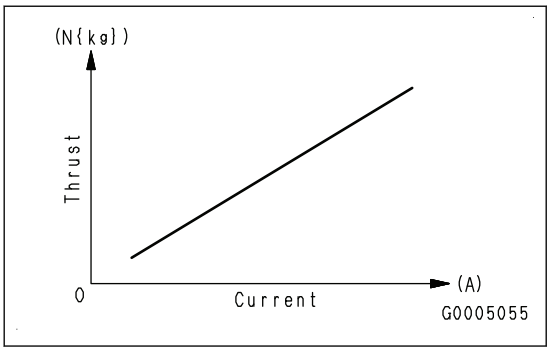
The proportional solenoid receives the electric current from the transmission controller, and this valve changes it into the oil pressure.

Modulation Clutch ECMV and Proportional Solenoid

One piece of the proportional solenoid is installed to each ECMV.

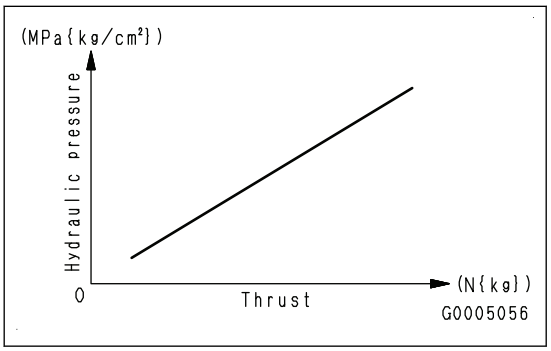
Proportional Solenoid Thrust Force - Oil Pressure Properties

- The thrust force is generated by the command current from the transmission controller as shown in the figure below.



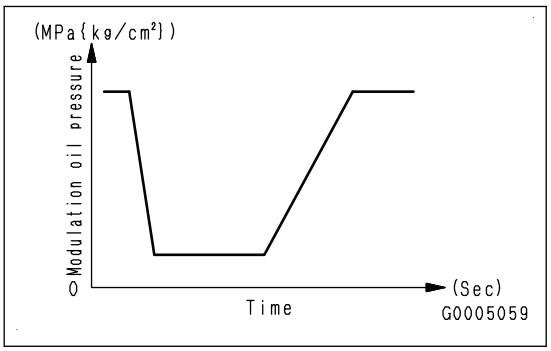
Thrust Force - Oil Pressure Properties of Proportional Solenoid

- The thrust force generated by the proportional solenoid is applied to the pressure control valve spool, and the hydraulic pressure is generated as shown in the figure below.
- The valve controls the command current of the proportional solenoid to change the thrust force and operate the pressure control valve. Accordingly, it controls the oil pressure.



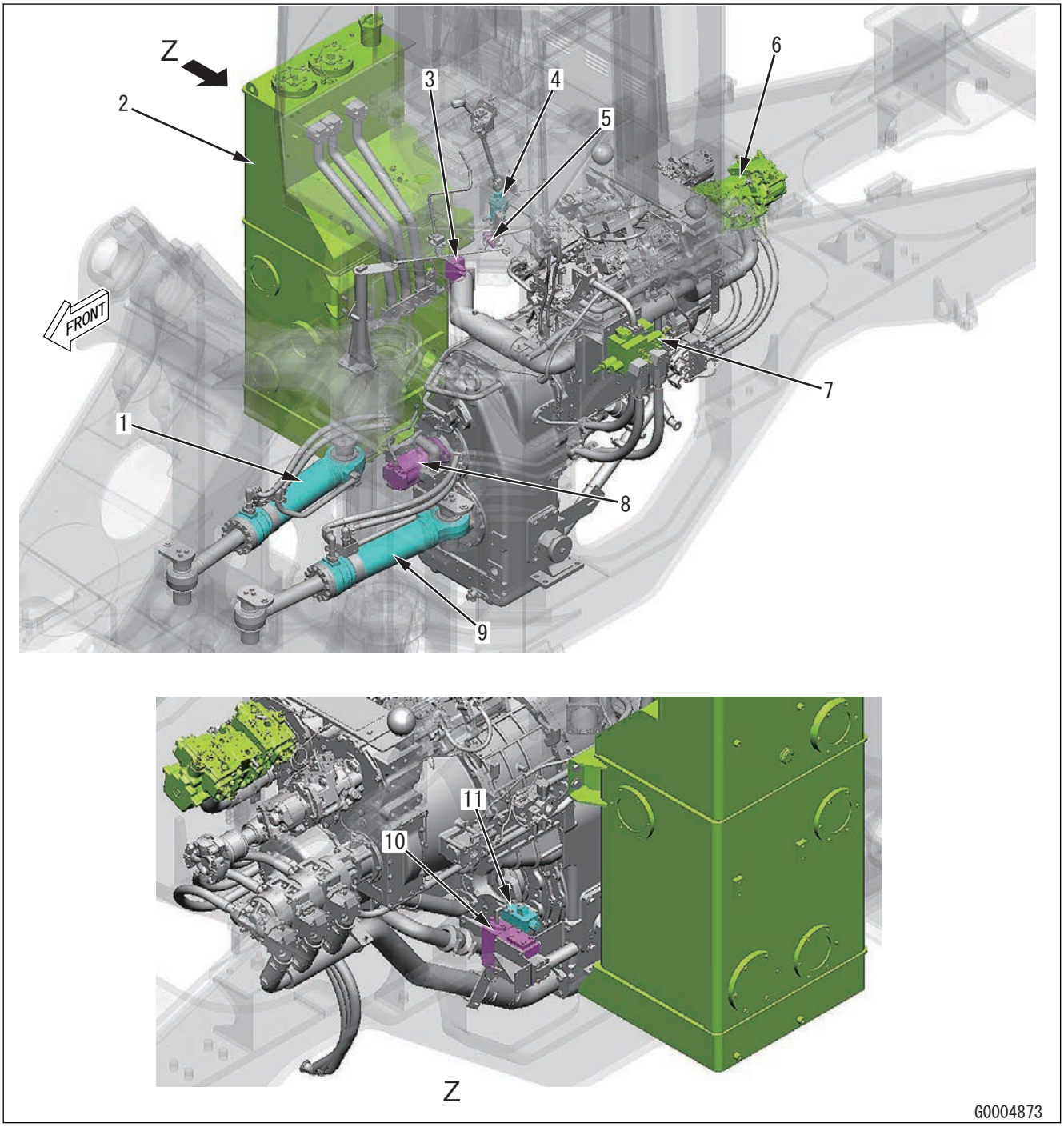
Operation of Modulation Clutch ECMV

- The ECMV is controlled by the command current sent from the transmission controller to the proportional solenoid.
- The control of the modulation clutch oil pressure is as shown in the figure.



Steering System

Layout Drawing of Steering System



1: Steering cylinder (right)
2: Hydraulic tank
3: AJSS EPC valve
4: Rotary valve
5: Steering lock valve
6: Steering pump
7: Steering valve
8: Secondary steering pump
9: Steering cylinder (left)
10: Diverter valve
11: Secondary steering relief valve

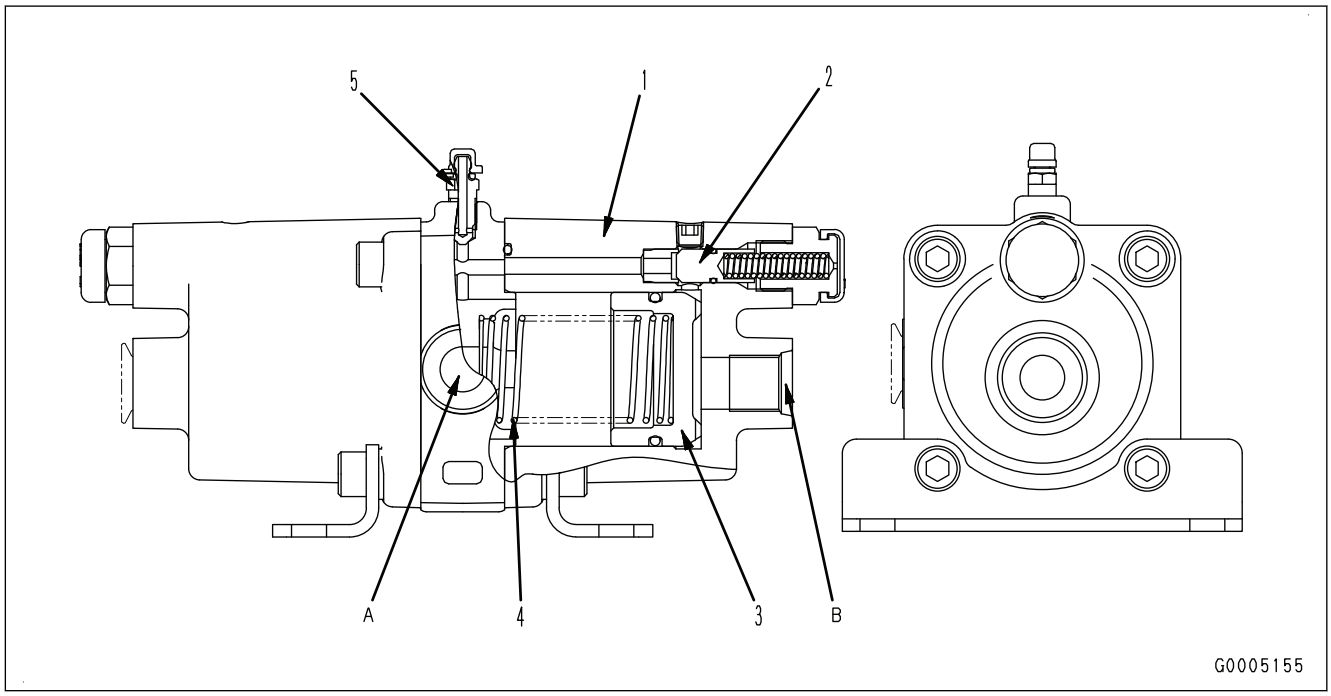
Slack Adjuster

Structure of Slack Adjuster

REMARK

The figure shows the front slack adjuster.

General View and Sectional View



A: Inlet port
B: Outlet port
1: Cylinder
4: Spring
2: Check valve
5: Bleeder
3: Piston

Specifications of Slack Adjuster

Piston operating pressure: 9.8 to 19.6kPa {0.1 to 0.2kgf/cm^2}

Cracking pressure of check valve: 1.74±0.05MPa {17.8±0.5kgf/cm^2}

Closing pressure of check valve: 1.09±0.05MPa {11.1±0.5kgf/cm^2}

Function of Slack Adjuster

The slack adjuster is installed between the brake valve and brake. The slack adjuster keeps the time lag constant when the brake is applied regardless of the wear of the brake disc.

Standard Value Table for Machine

Standard Value Table for Machine: WA900-8R

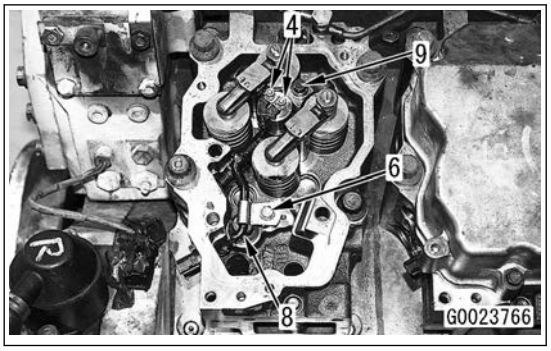
Engine: SAA12V140E-7

The standard value for new machine and repair limit are the value when the machine is normal.

Engine Speed

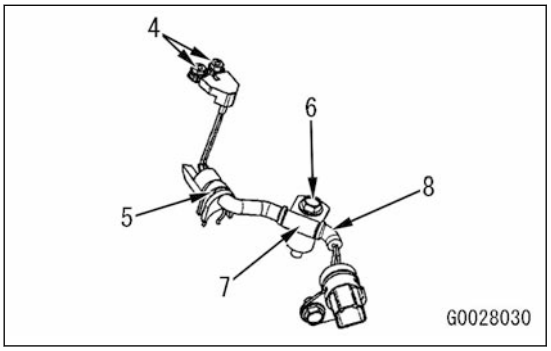
Item	Test condition		Unit	Standard value for new machine	Failure criterion
Engine speed with the torque converter at stall	• Engine coolant temperature: 60 to 100 ˚C • Hydraulic oil temperature: 45 to 55 ˚C • Torque converter oil temperature: 60 to 80 ˚C	Power mode: Economy mode	r/min {rpm}	1640 to 1920 {1640 to 1920}	1540 to 2020 {1540 to 2020}
		Power mode: Power mode		1900 to 2100 {1900 to 2100}	1800 to 2200 {1800 to 2200}
Engine speed with the torque converter at stall	• Engine coolant temperature: 60 to 100 ˚C • Hydraulic oil temperature: 45 to 55 ˚C • Torque converter oil temperature: 60 to 80 ˚C • Accelerator pedal: Push the pedal fully to the stroke end (high idle) • Operation of the work equipment: During bucket tilt back relief	Power mode: Economy mode	r/min {rpm}	2050 to 2250 {2050 to 2250}	1950 to 2350 {1950 to 2350}
		Power mode: Power mode		2100 to 2300 {2100 to 2300}	2000 to 2400 {2000 to 2400}
Engine speed at full stall (torque converter at stall + hydraulic stall)	• Engine coolant temperature: 60 to 100 ˚C • Hydraulic oil temperature: 45 to 55 ˚C • Torque converter oil temperature: 60 to 80 ˚C • Operation of the work equipment: During bucket tilt back relief	Power mode: Economy mode	r/min {rpm}	1385 to 1665 {1385 to 1665}	1285 to 1765 {1285 to 1765}
		Power mode: Power mode		1720 to 1920 {1720 to 1920}	1620 to 2020 {1620 to 2020}

8. Loosen the injector terminal mounting nut (4) alternately to remove it.
9. Remove the spring clamp (5).
10. Loosen the bolt (6), and remove it together with the spacer (7).
11. Disconnect the injector harness (8) from the injector.
12. Remove the injector holder mounting bolt (9).
13. Put a wire through the lower part of the fuel path projected sideways and pull out the injector.



NOTICE

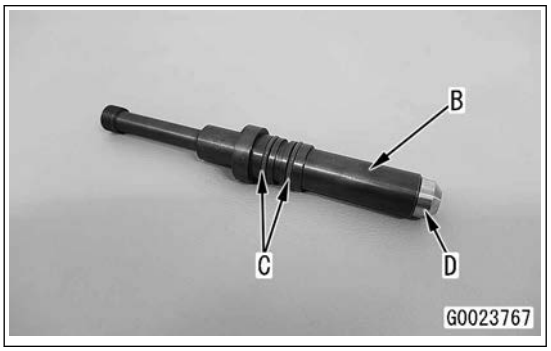
There is a 2D code label on the top of the injector.
Do not remove or damage this label.



14. Install the O-ring C and gasket D to the adapter B.
15. Insert the adapter B into the injector mounting hole.
16. Connect the gauge assembly A to the adapter B.

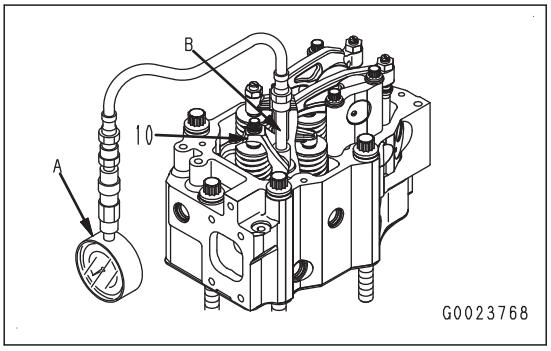
REMARK

Apply a small quantity of engine oil to the connecting part of the gauge assembly A and adapter B to prevent air leakage.



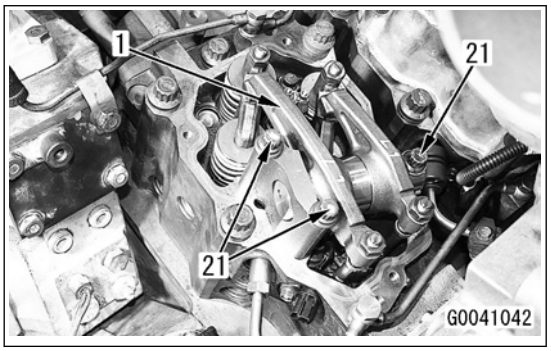
17. Fix the adapter B with the injector holder (10).

Injector holder mounting bolt (9): 58.9 to 73.5 Nm {6.0 to 7.5 kgm}



18. Install the rocker arm assembly (1).

Rocker arm assembly mounting bolt (21): 93 to 103 Nm {9.5 to 10.5 kgm}



Setting of test condition

19. Set the battery disconnect switch to the ON position.

4. Set the power mode setting to the Power mode. For details, see “Default Setting Menu” in “SET AND OPERATE MACHINE MONITOR”.
5. Select and show “Pre-defined Monitoring” (01/14). For details, see “Set and Operate Machine Monitor”.
6. Make sure the torque converter oil temperature are in the specified range.

   Torque converter oil temperature: 60 to 80 ˚C
7. Make sure that the directional selector switch is in the NEUTRAL (N) position.

Check procedure

8. Check the oil pressure when the accelerator pedal is pushed to the stroke end (high idle).

Restoration

9. Remove the gauge A2 or B1, and restore it.

How to Examine Modulation Clutch Pressure on Machine Monitor

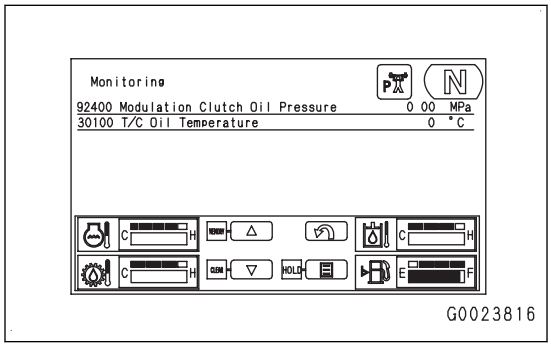
Setting of test condition

1. Start the engine.
2. Turn off the air conditioner.
3. Set the power mode setting to Power mode. For details, see “Default Setting Menu” in “SETTING AND OPERATION OF MACHINE MONITOR”.
4. Select and show the monitoring items that follow. For details, see “Set and Operate Machine Monitor”.

   Monitoring code: 92400“Modulation Clutch Oil Pressure”

   Monitoring code: 30100“T/C Oil Temperature”
5. Make sure the torque converter oil temperature are in the specified range.

   Torque converter oil temperature: 60 to 80 °C



Test procedure

6. Make sure that the directional selector switch is in the NEUTRAL position.
7. Measure “Modulation Clutch Oil Pressure” when the accelerator pedal is pushed to the stroke end (High idle).

Examine Wear of Wheel Brake Disc

Tools to Examine Wheel Brake Disc Wear

Symbol	Part No.	Part name	Q'ty	Remarks
A	Commercially available	Scale	1	

⚠ Stop the machine on a level ground, lower the work equipment to the ground, set the parking brake switch to ON position, lock the work equipment lock switch, and stop the engine.

⚠ Chock the tires to prevent machine movement.

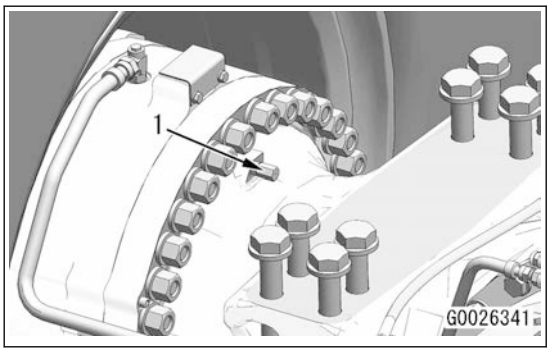
The wear check for the wheel brake disc must be done with 2 person.

There are 4 pickup plugs at the right and left side of the front and rear axle. Check all the plugs in the same procedure.

If you need to check the wear of the brake disc with the troubleshooting, Pm Clinic, or periodic maintenance, see this section.

How to Examine Wear of Wheel Brake Disc

1. Remove the cap (1).
2. Push the brake pedal to the stroke end.

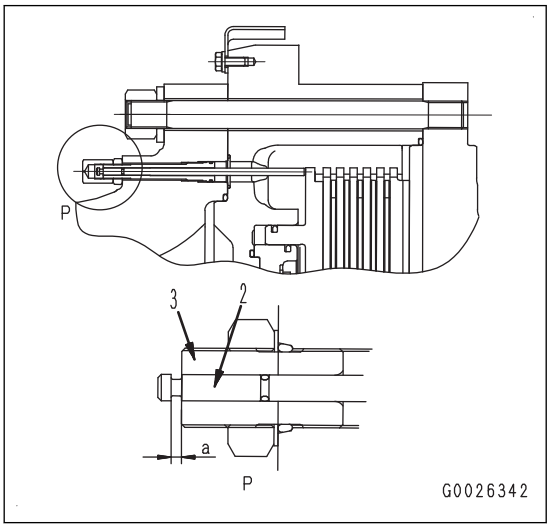


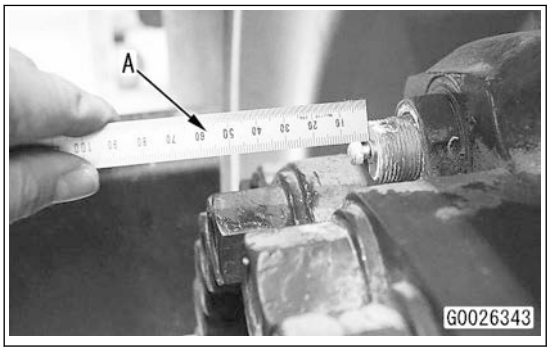
3. While the shaft (2) is pushed, check the projected quantity (a) from the end surface of the guide (3) with the scale A.

   REMARK

   - Hold the brake pedal pushed during the measurement of the projected quantity (a).
   - If the projected quantity (a) is 0 mm or below, replace the brake disc.
   - Subtract the projected quantity (a) mm from the 4.0 mm. This value is the wear quantity.

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





CAB Related Parts

Examine Work Equipment Control Lever

Tools to Examine Work Equipment Control Lever

Symbol	Part No.	Part name	Q'ty	Remarks
A	79A-264-0021	Push-pull scale	1	Measurement range: 0 to 300 N
B	Commercially available	Scale	1	

⚠ Stop the machine on a level ground, lower the work equipment to the ground, set the parking brake switch to the ON position, lock the work equipment lock switch, and stop the engine.

⚠ Chock the tires to prevent machine movement.

⚠ Apply the frame lock bar.

If you need to check the work equipment control lever with the troubleshooting, Pm Clinic, or periodic maintenance, see this section.

How to Examine Work Equipment Control Lever

How to Examine Operating Force of Work Equipment Control Lever

1. Start the engine.
2. Hold the engine speed at low idle with the accelerator pedal not pushed.
3. Make sure that the RPM set pilot lamp is not lit.

   REMARK

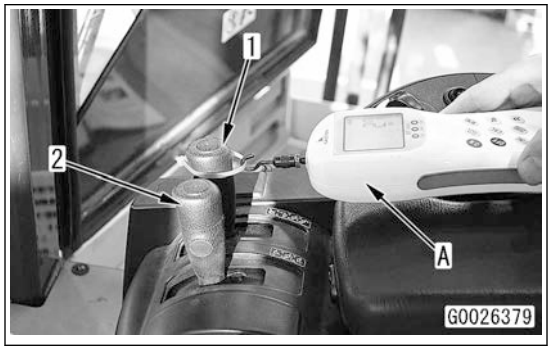
   - The engine speed at low idle becomes higher than the standard value while the RPM set pilot lamp is lit (active). Make sure that the RPM set pilot lamp is not lit (disabled) before you measure the engine speed at low idle.
   - When the RPM set pilot lamp is lit, cancel the set engine speed.

4. Install the push-pull scale A to the boom control lever (1) or bucket control lever (2).
5. Pull the push-pull scale A to the operating direction at the position of 12 mm below from the upper end of the boom control lever (1) or bucket control lever (2) to check the.operating force.

   REMARK

   Operate the work equipment control lever at the minimum speed for the normal operation.

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



How to Examine Work Equipment Control Lever Stroke on Machine Monitor

1. Start the engine.
2. Hold the engine speed at low idle with the accelerator pedal not pushed.
3. Make sure that the RPM set pilot lamp is not lit.

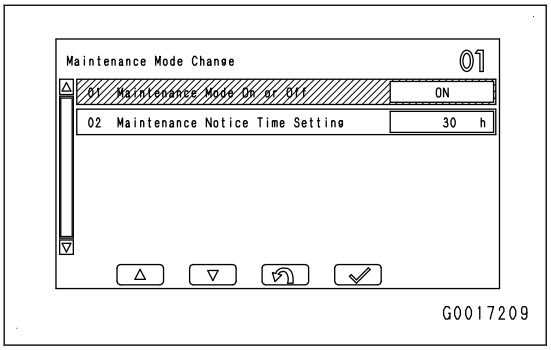
   REMARK

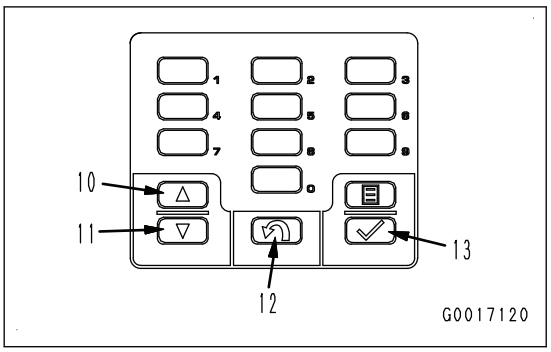
   - The engine speed at low idle becomes higher than the standard value while the RPM set pilot lamp is lit (active). Make sure that the RPM set pilot lamp goes off (disabled) before you measure the engine speed at low idle.
   - When the RPM set pilot lamp is lit, cancel the set engine speed.

Code	Item
03	Fuel Main Filter Change Interval
12	T/M Oil Change Interval
44	Fuel Tank Breather Change Interval
15	Axle Oil Change Interval
16	Brake Cooling Oil Filter Change Interval
10	Hydraulic Oil Change Interval
04	Hydraulic Oil Filter Change Interval
05	Hydraulic Oil Tank Breather Change Interval
81	Coolant Filter Change Interval
99	All Default Value

MAINTENANCE MODE CHANGE (CODE: 00)
All the maintenance items setting can be changed at the same time.

1. Select item on “Maintenance Mode Change” screen.
   UP switch (10): Moves the selection up by one item.
   DOWN switch (11): Moves the selection down by one item.
   RETURN switch (12): Cancels the selection and returns to “Maintenance Mode Setting” screen
   ENTER switch (13): Enters the selection

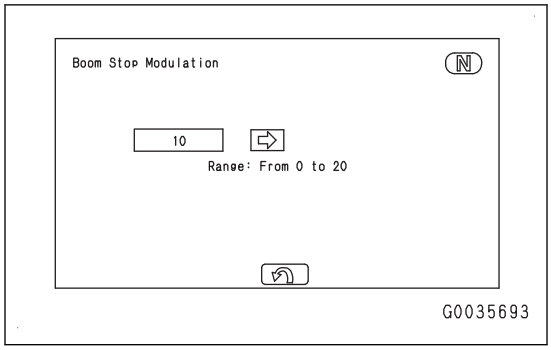


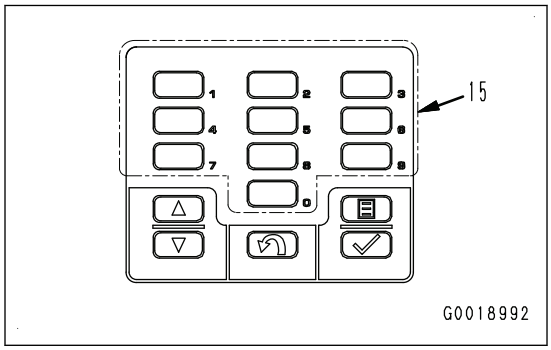


3. When the “Boom Stop Modulation” screen is shown, push the numeral input switch (15) on the switch panel to show the “Numeric Input of New Value” screen.

REMARK

“Numeric Input of New Value” is shown when one of 0 to 9 numeral input switch is pushed.





4. When the “Numeric Input of New Value” screen is shown, use the switch on the switch panel to set the table.

UP switch (10): Changes between + and -.

DOWN switch (11): Inputs a decimal point

RETURN switch (12): The screen returns to the “Adjustment” screen

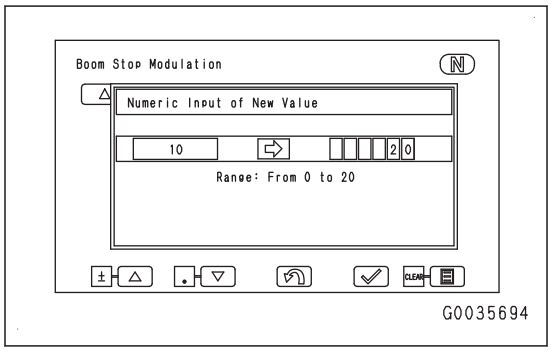
ENTER switch (13): Validates the setting

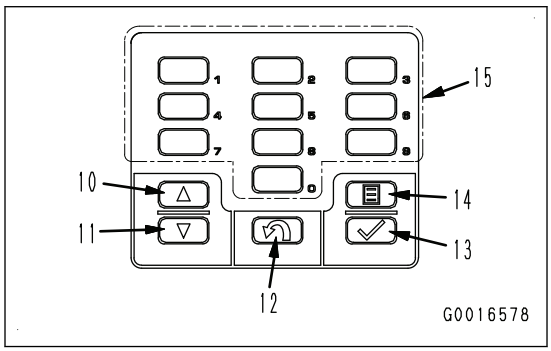
MENU switch (14): Changes the inputted setting values to “0”

Numerical input switch (15): Enters a numerical value

REMARK

The default modulation quantity is set to “10”.





Modulation Quantity and State

Modulation quantity	State	Remarks
0	It stops with no delay against the boom lever stroke without stop modulation.	The stop shock can be occurred if the operator operates without care.
10	It is balanced response delay when the machine stops with the stop shock.	-
20	The stop shock is reduced even when the operator stops the operation suddenly.	The stop operation will delay even the lever is set in the NEUTRAL position. Accordingly, it stops beyond the target position.

Item	Test conditions	Unit	Standard value for new machine	Failure criterion	Measured value	Good	No good
Engine speed at hydraulic stall (*1)	• Engine coolant temperature: 60 to 100 ˚C • Hydraulic oil temperature: 45 to 55 ˚C • Torque converter oil temperature: 60 to 80 ˚C • Power mode: Power mode • Accelerator pedal: Push the pedal fully to the stroke end (high idle) • Operation of the work equipment: When the oil pressure in the bucket tilt circuit is relieved	r/min {rpm}	2100 to 2300 {2100 to 2300}	2000 to 2400 {2000 to 2400}			
Engine speed at full stall (torque converter stall + hydraulic stall) (*1)	• Engine coolant temperature: 60 to 100 ˚C • Hydraulic oil temperature: 45 to 55 ˚C • Torque converter oil temperature: 60 to 80 ˚C • Power mode: Power mode • Operation of the work equipment: When the oil pressure in the bucket tilt circuit is relieved	r/min {rpm}	1720 to 1920 {1720 to 1920}	1620 to 2020 {1620 to 2020}			
Blowby pressure	• Engine coolant temperature: 60 to 100 ˚C • Torque converter oil temperature: 60 to 80 ˚C • Power mode: Power mode • At the torque converter stall	kPa {mmH_2O}	Max. 2.94 {Max. 300}	Max. 5.88 {Max. 600}			

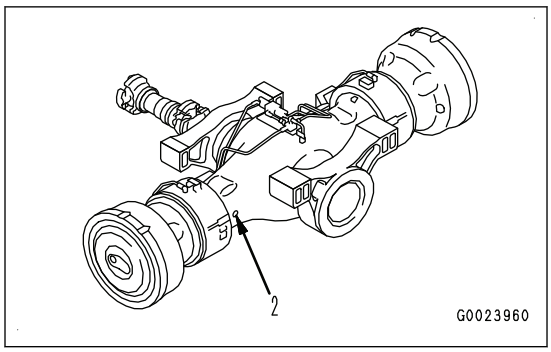
1) Remove the plug (1) or level plug (2).

When the oil level is near the lower edge of the plug hole, it is correct.

If the oil level is below lower edge of the plug hole, add oil through the plug (1) or level plug (2).

8. Install the plug (1) or level plug (2) when the oil level is correct.

Tightening torque: 152±24 Nm {15.5±2.5 kgm}



Bleed Air from Fuel System

To bleed air from the fuel system, see Testing and Adjusting, “Bleed Air from Fuel System”.

Bleed Air from Hydraulic System

To bleed air from the hydraulic system, see Testing and Adjusting, “Bleed Air from Brake Circuit”, “BLEED AIR FROM HYDRAULIC CIRCUIT”, and “BLEED AIR FROM COOLING FAN CIRCUIT”.

How to Examine Electric Equipment

Check battery terminal for looseness and corrosion

1. Check the battery terminal for looseness and corrosion.
2. Check around the battery for dirt and check the battery for accumulated flammable materials (dry leaves, twigs, or such). If they are found, remove them.

Check alternator terminal for looseness and corrosion

3. Check the terminal B (E09_B), terminal R (E09_R), and terminal E (E09_E) of the alternator for breakage, looseness, and corrosion.

Check starting motor terminal for looseness and corrosion

4. Check the terminal B of the starting motor for breakage, looseness, and corrosion.

Check battery voltage (with engine stopped)

5. Check the battery voltage with the battery tester while the engine is stopped.

Check battery electrolyte level

6. Check the battery electrolyte level as follows.

⚠ Check the battery electrolyte level before you start the machine.

⚠ Do not use the battery while the battery electrolyte level is below LOWER LEVEL line. Inside the battery becomes deteriorate, and its service life is shortened, and it can cause an explosion.

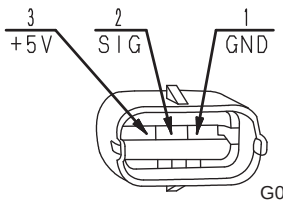
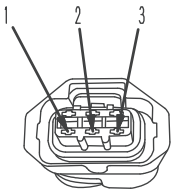
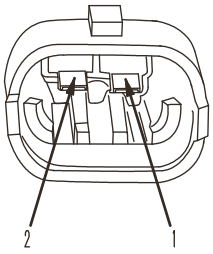
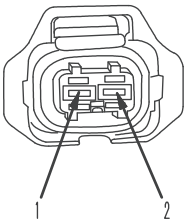
⚠ The battery generates flammable gas that can explode, do not bring open flame near it.

⚠ Battery electrolyte is dangerous. Be careful that it does not come in contact with your eyes or skin. If it does, wash it away with a large quantity of water and consult your doctor.

NOTICE

- **Do not add battery electrolyte above UPPER LEVEL line. Excessive battery electrolyte can leak and cause damage to the paint surface or corrode parts.**
- **Add the purified water (such as a commercial battery replenisher) before starting the work in the next day to prevent freezing.**
- When check battery electrolyte level through side of battery

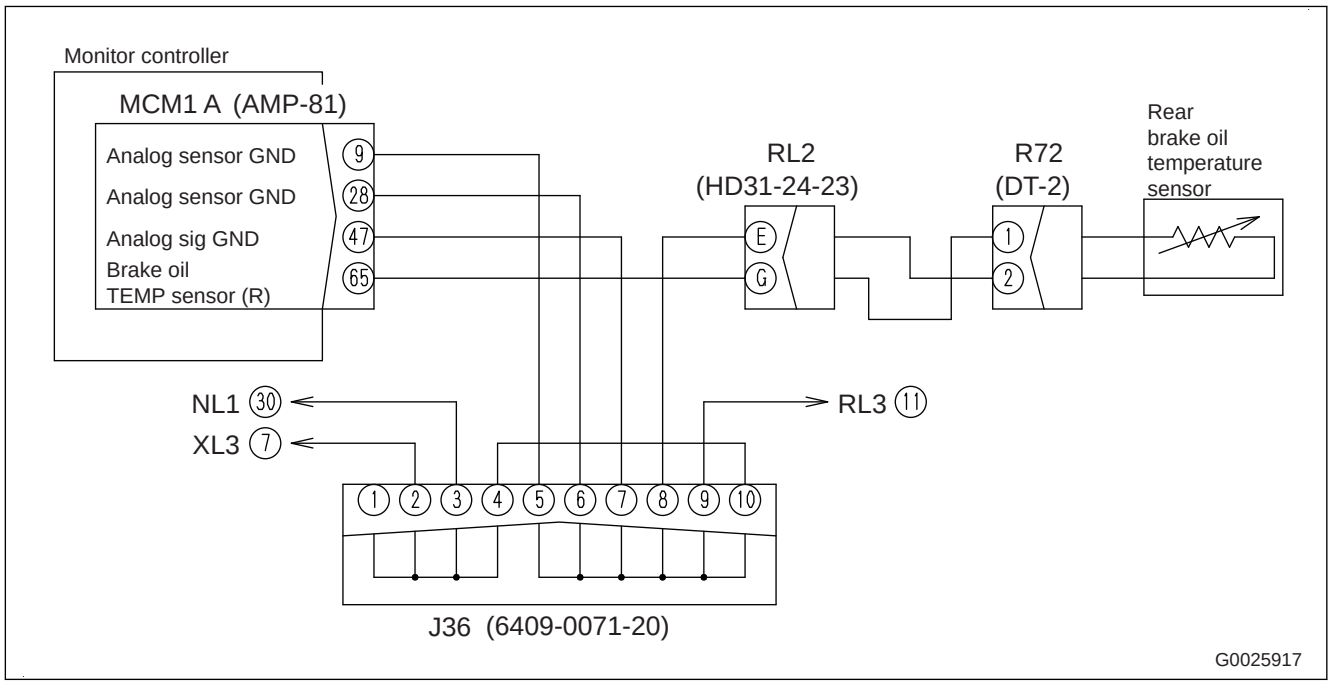
Connector No.	Connector type	Number of pins	Location	Address
P01	DT	2	Side working lamp (right)	B4
P01L	DT	2	Side working lamp (left)	I12
P02	DT	2	Side working lamp (right)	B4
P02L	DT	2	Side working lamp (left)	I12
P03	DT	4	KomVision camera (right side camera)	B83
P03L	DT	4	KomVision camera (left side camera)	H87
P05	8027	2	Rear window washer motor	I12
P07	8027	2	Front window washer motor	I11
P09	8027	2	Side window washer motor	I11
P11	-	2	Front heated wire mirror (right) (option)	C4
P12	-	2	Side heated wire mirror (right) (option)	C4
P13	-	2	Front heated wire mirror (left) (option)	A7
P14	-	2	Side heated wire mirror (left) (option)	A7
PAMB	FRAMATOME	3	Ambient pressure sensor	D78
PCCV_L	FRAMATOME	3	Crankcase pressure sensor (left bank)	A77
PCV1_L	SUMITOMO	2	Supply pump PCV1_L (left bank)	I75
PCV1_R	SUMITOMO	2	Supply pump PCV1_R (right bank)	F72
PCV2_L	SUMITOMO	2	Supply pump PCV2_L (left bank)	I75
PCV2_R	SUMITOMO	2	Supply pump PCV2_R (right bank)	G72
PD1	-	2	Diode (for rear window washer motor)	H12
PD3	-	2	Diode (for front window washer motor)	H12
PD5	-	2	Diode (for side window washer motor)	H12
PDPF	FRAMATOME	4	KDPF differential pressure sensor (left bank)	-
PDPF_2	FRAMATOME	4	KDPF differential pressure sensor (right bank)	-
PFL1	DT	2	Intermediate connector (heated wire mirror (left)) (option)	I31
PFL2	DT	2	Intermediate connector (heated wire mirror (right)) (option)	I27
PFUEL_L	AMP	3	Common rail pressure sensor (left bank)	G78
PFUEL_R	AMP	3	Common rail pressure sensor (right bank)	I70
PIM_L	FRAMATOME	3	Charge pressure sensor	B78
PIM_R	FRAMATOME	3	Charge pressure sensor	I69
PL1	Terminal	3	Ladder pump unit (option)	I14
PL2	DT	6	Intermediate connector (power ladder lower switch) (option)	H13
PL3	-	-	Power ladder lower switch (UP)	-
PL4	Relay	5	Ladder pump relay (option)	A16
PL5	Relay	5	Flow rate throttle relay (option)	A16

BOSCH connector (for engine)			
Total number of pins	Common rail (fuel) pressure sensor (107, 114 engines)		Special tool number for connection checks
	Sensor side (plug)	Harness side (receptacle)	
3	 G0042571	 G0042572	799-601-4190 (socket) (Kit: 799-601-4101) (Kit: 799-601-4201)
	-	-	
Total number of pins	Fuel supply pump (107 engine)		
	Valve side (plug)	Harness side (receptacle)	
2	 G0042573	 G0042574	799-601-4340 (socket) (Kit: 799-601-4101) (Kit: 799-601-4201)
	-	-	

Failure code	Failure (Shown on screen)	Applicable component for failure (Shown on screen)	Action level	History category	Remarks
DW4PKY	Boom RAISE EPC Solenoid Hot Short Circuit	WRK	L03	Electrical system	
DW4QKA	Boom LOWER EPC Solenoid Open Circuit	WRK	L03	Electrical system	
DW4QKB	Boom LOWER EPC Solenoid Ground Fault	WRK	L03	Electrical system	
DW4QKY	Boom LOWER EPC Solenoid Hot Short Circuit	WRK	L03	Electrical system	
DW4RKA	Bucket TILT EPC Solenoid Open Circuit	WRK	L03	Electrical system	
DW4RKB	Bucket TILT EPC Solenoid Ground Fault	WRK	L03	Electrical system	
DW4RKY	Bucket TILT EPC Solenoid Hot Short Circuit	WRK	L03	Electrical system	
DW4SKA	Bucket DUMP EPC Solenoid Open Circuit	WRK	L03	Electrical system	
DW4SKB	Bucket DUMP EPC Solenoid Ground Fault	WRK	L03	Electrical system	
DW4SKY	Bucket DUMP EPC Solenoid Hot Short Circuit	WRK	L03	Electrical system	
DW5PKA	Boom RAISE EPC Solenoid 2 Open Circuit	WRK	L03	Electrical system	
DW5PKB	Boom RAISE EPC Solenoid 2 Ground Fault	WRK	L03	Electrical system	
DW5PKY	Boom RAISE EPC Solenoid 2 Short Circuit	WRK	L03	Electrical system	
DW5QKA	Boom LOWER EPC Solenoid 2 Open Circuit	WRK	L03	Electrical system	
DW5QKB	Boom LOWER EPC Solenoid 2 Ground Fault	WRK	L03	Electrical system	
DW5QKY	Boom LOWER EPC Solenoid 2 Short Circuit	WRK	L03	Electrical system	
DW5RKA	Bucket TILT EPC Solenoid 2 Open Circuit	WRK	L03	Electrical system	
DW5RKB	Bucket TILT EPC Solenoid 2 Ground Fault	WRK	L03	Electrical system	
DW5RKY	Bucket TILT EPC Solenoid 2 Short Circuit	WRK	L03	Electrical system	
DW5SKA	Bucket DUMP EPC Solenoid 2 Open Circuit	WRK	L03	Electrical system	
DW5SKB	Bucket DUMP EPC Solenoid 2 Ground Fault	WRK	L03	Electrical system	
DW5SKY	Bucket DUMP EPC Solenoid 2 Short Circuit	WRK	L03	Electrical system	

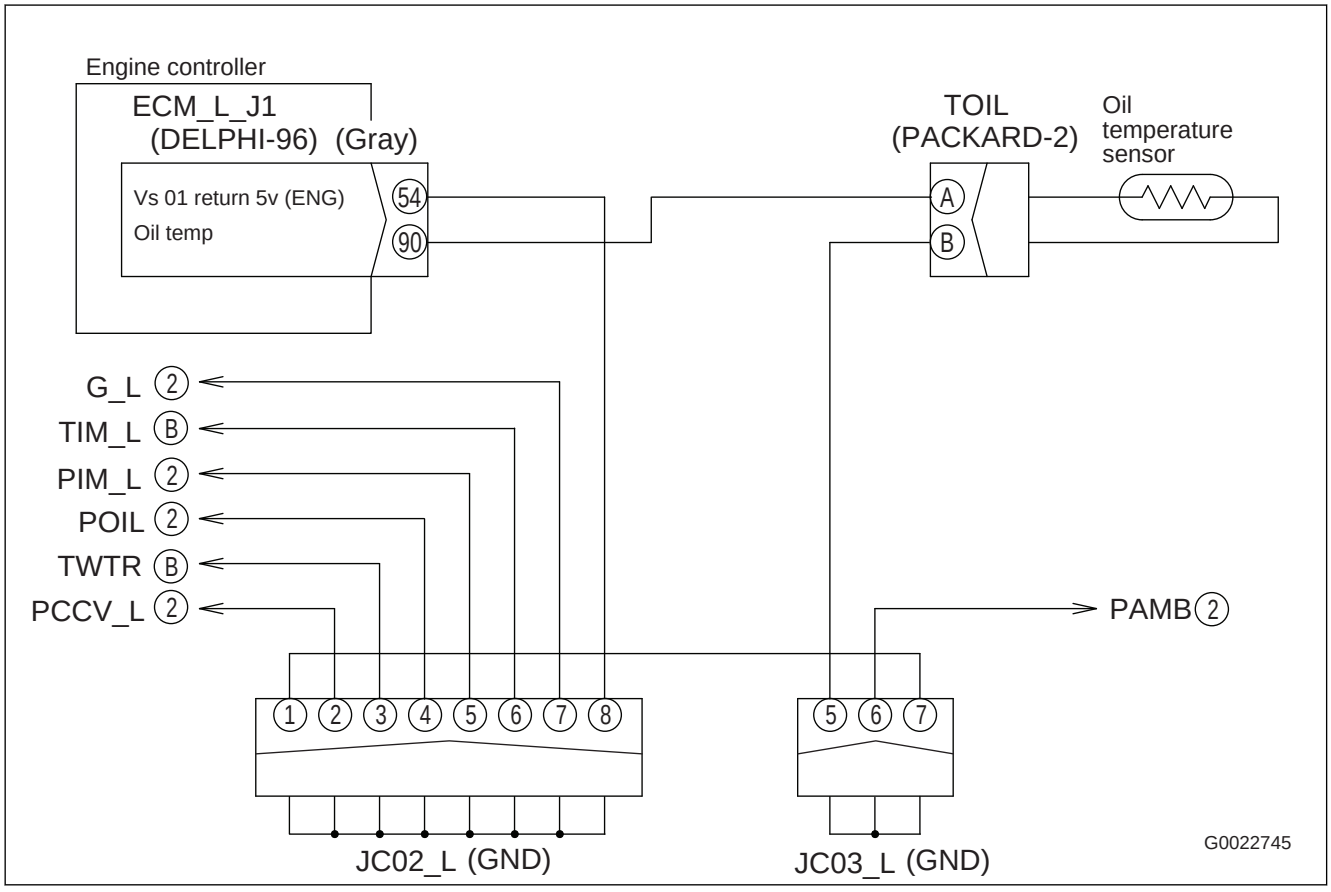
<table>
<tr><th>No.</th><th>Cause</th><th>Procedures, Measurement, Values, Note</th><th colspan="2">Diagnosis and treatment</th></tr>
<tr><td rowspan="2">3</td><td rowspan="2">Front brake accumulator low pressure detection switch</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Disconnect the connector X08, and connect the T-adapter to the male 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 colspan="2">Measurement position/condition</th><th>Standard value</th></tr><tr><td rowspan="2">Resistance</td><td rowspan="2">Between X08 (male) (1) and (2)</td><td>Front brake oil pressure > 5 MPa</td><td>Max. 1 Ω</td></tr><tr><td>Front brake oil pressure ≦ 5 MPa</td><td>Min. 1 MΩ</td></tr></table></td><td>YES</td><td>• The front brake accumulator low pressure detection switch is normal.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The front brake accumulator low pressure detection switch is defective.
• Replace the front brake accumulator low pressure detection switch.
• 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 identify the cause by the check?</td><td>YES</td><td>The repair is completed.</td></tr>
<tr><td>NO</td><td>• The monitor controller can be defective.
• Replace the monitor 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. 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 to the first check item.</td></tr>
<tr><td>NO</td><td>The repair is completed.</td></tr>
</table>

Circuit Diagram of Rear Brake Oil Temperature Sensor



No.	Cause	Procedures, Measurement, Values, Note	Diagnosis and treatment	
5	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”.
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	Go to the first check item.
			NO	The repair is completed.

Circuit Diagram of Engine Oil Temperature 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">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>
<tr><td rowspan="2">3</td><td rowspan="2">Alternator</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Insert the T-adapter into the connector ER1.
3. Start the engine.
4. Run the engine at medium speed or above to troubleshoot.
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 ER1 (29) and ground</td><td>26 to 30.5 V</td></tr></table></td><td>YES</td><td>• The alternator is normal.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The alternator is defective.
• Replace the alternator.
• 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">13</td><td rowspan="2">Injector</td><td rowspan="2">1. Do the troubleshooting. See Testing and Adjusting, “Examine Fuel Return Rate and Leakage”.
2. Does the troubleshooting result agree with the standard value?
<table><tr><th>Item</th><th colspan="2">Measurement condition</th><th>Standard value</th></tr><tr><td rowspan="5">Fuel return rate from injector</td><td rowspan="5">• Engine coolant temperature: 60 to 100 °C
• Torque converter oil temperature: 60 to 80 °C
• With torque converter stalled</td><td>1600 rpm</td><td>960 mℓ/min</td></tr><tr><td>1700 rpm</td><td>1020 mℓ/min</td></tr><tr><td>1800 rpm</td><td>1080 mℓ/min</td></tr><tr><td>1900 rpm</td><td>1140 mℓ/min</td></tr><tr><td>2000 rpm</td><td>1200 mℓ/min</td></tr></table></td><td>YES</td><td>• The injector is normal.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The injector is defective.
• Replace the injector.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">14</td><td rowspan="2">Supply pump</td><td rowspan="2">1. Do the troubleshooting. See Testing and Adjusting, “Examine Supply Pump”.
2. Is the supply pump normal?</td><td>YES</td><td>• The supply pump is normal.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The supply pump is defective.
• Repair or replace the supply pump.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">15</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">16</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 to the first check item.</td></tr>
<tr><td>NO</td><td>The repair is completed.</td></tr>
</table>

Failure Code [CA1942]

Detail of failure	The output from the crankcase pressure sensor shows a value out of the correct range.
Action level	L01
Action of controller	None in particular.
Phenomenon on machine	None in particular.
Related information	**Pre-troubleshooting** If failure code [CA1843] or [CA1844] is also shown, do the troubleshooting for it first. **Monitoring code** • “Crankcase Pressure Sensor Volt” can be checked with the monitoring function. (Code: 48401) • “Crankcase Pressure” can be checked with the monitoring function. (Code: 48400) **Reference information** This failure code is shown if the sensor value is abnormal when the starting switch is turned to the ON position.

<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 for Troubleshooting”, “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">Crankcase pressure sensor</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Insert the T-adapter into the connector PCCV_L.
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 PCCV_L (3) and (2)</td><td>0.3 to 4.7 V</td></tr>
</table></td><td>YES</td><td>• The crankcase pressure sensor is correct.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The crankcase pressure sensor is defective.
• Replace the crankcase pressure 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">Ground fault in wiring harness</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Disconnect the connectors ECM_R_J1 and PCV1_R, and connect the T-adapter to the female side of one of them 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 rowspan="2">Resistance</td><td>Between ground and ECM_R_J1 (female) (23) or PCV1_R (female) (1)</td><td>Min. 1 MΩ</td></tr><tr><td>Between ground and ECM_R_J1 (female) (24) or PCV1_R (female) (2)</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>• Ground fault in wiring harness occurs.
• 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 the connectors ECM_R_J1 and PCV1_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 rowspan="2">Resistance</td><td>Between ECM_R_J1 (female) (23) and each pin other than pin (23)</td><td>Min. 1 MΩ</td></tr><tr><td>Between ECM_R_J1 (female) (24) and each pin other than pin (24)</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">Hot short circuit in wiring harness</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Insert the T-adapter into the connector PCV1_R.
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 PCV1_R (2) and ground</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>• Hot short circuit in wiring harness occurs.
• Repair or replace the wiring harness.
• Go to “Confirmation of repair”.</td></tr>
</table>

No.	Cause	Procedures, Measurement, Values, Note	Diagnosis and treatment	
2	Common rail pressure sensor	1. Check the mechanical problem on the common rail pressure sensor. 2. Is the common rail pressure sensor normal? **REMARK** If there is mechanical problem on the common rail pressure sensor, it is a failure.	YES	• The common rail pressure sensor is normal. • Go to the next check item.
			NO	• The common rail pressure sensor is defective. • Replace the common rail. **REMARK** Replace the common rail to replace the common rail pressure sensor. (For details, see the DISASSEMBLY AND ASSEMBLY in the shop manual Engine 12V140E-7 series.) • Go to “Confirmation of repair”.
3	Supply pump overflow valve	1. Remove the supply pump overflow valve. 2. Check the mechanical problem on the supply pump overflow valve. 3. Is the supply pump overflow valve normal? **REMARK** If the spring is damaged, seat is worn, or ball is seized, it is a failure.	YES	• The supply pump overflow valve is normal. • Go to the next check item.
			NO	• The supply pump overflow valve is defective. • Replace the supply pump overflow valve. • Go to “Confirmation of repair”.
4	Supply pump overflow valve piping	1. Remove the overflow valve piping of the supply pump. 2. Check the overflow valve piping of the supply pump for clogging. 3. Is the supply pump overflow valve piping normal? **REMARK** If the piping is clogged, it is a failure.	YES	• The supply pump overflow valve piping is normal. • Go to the next check item.
			NO	• The supply pump overflow valve piping is defective. • Remove or replace the overflow valve piping of the supply pump. • Go to “Confirmation of repair”.

Failure Code [CB1622]

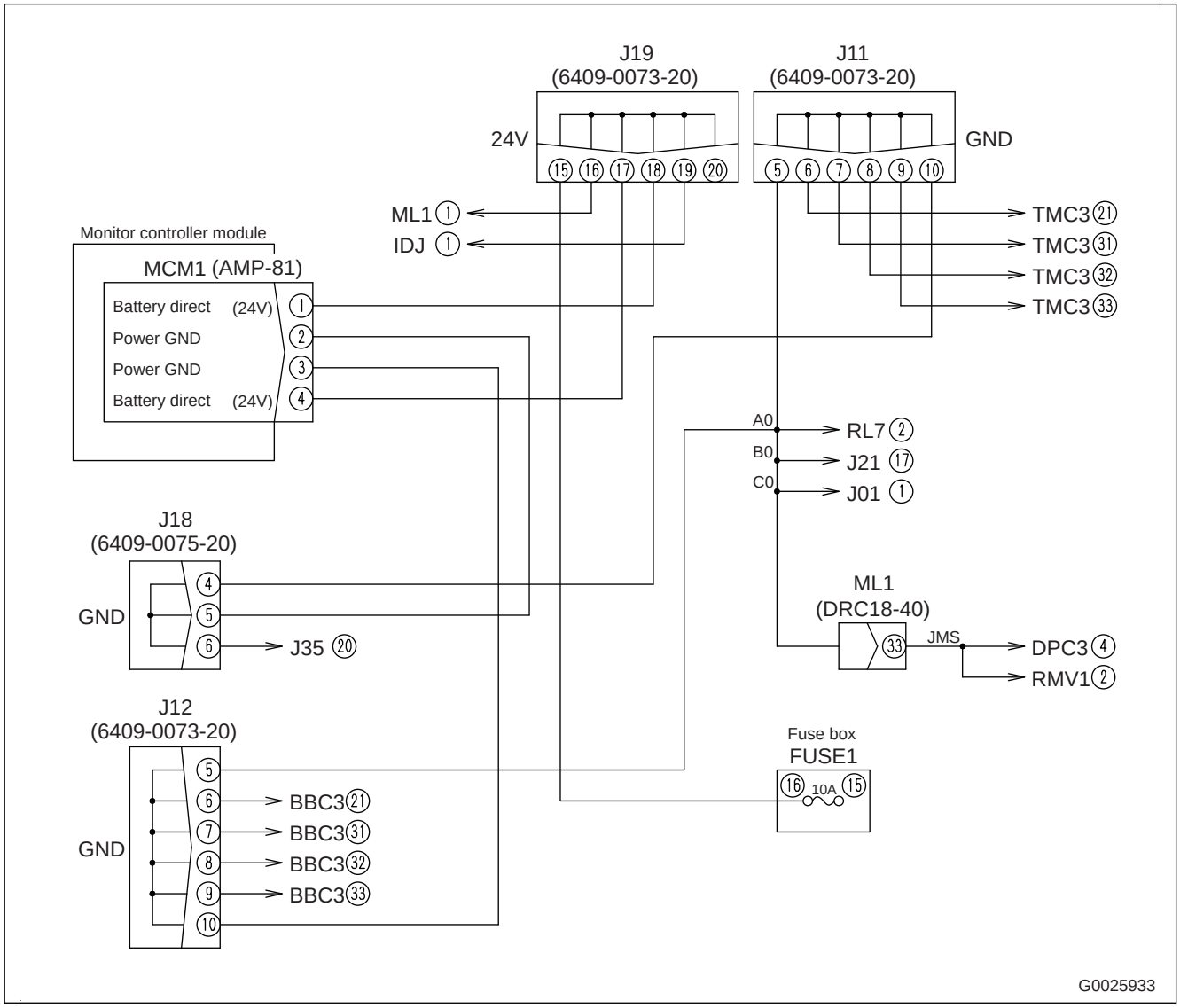
Details of failure	Open circuit or short circuit occurs in the injector #9 (R/B#3) circuit.
Action level	L03
Action of controller	None in particular.
Phenomenon on machine	• The engine output lowers. • The engine speed does not become stable.
Related information	**Reference information** • Pulse voltage (approx. 65 V) is supplied to the injector (+) side while the engine is in operation normally. Pulse voltage cannot be measured with a multimeter. • If ground fault or short circuit is sensed, [CB1548], [CB1549], and [CB1622] are shown at the same time.

<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 for Troubleshooting”, “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 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">Injector #9 (R/B#3)</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Disconnect the connector INJ3_R, 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 rowspan="2">Resistance</td><td>Between INJ3_R (male) (1) and (2)</td><td>0.4 to 1.1 Ω</td></tr>
<tr><td>Between INJ3_R (male) (1) and ground</td><td>Min. 1 MΩ</td></tr>
</table></td><td>YES</td><td>• The injector #9 (R/B#3) is normal.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The injector #9 (R/B#3) is defective.
• Replace the injector #9 (R/B#3).
• 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. Make sure that the system operating lamp is not lit, the set the battery disconnect switch to the OFF position.
3. Disconnect the connectors TMC3 and N13, and connect the T-adapter to the female side of one of them to troubleshoot.
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 TMC3 (female) (15) or N13 (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>• Ground fault in wiring harness occurs.
• 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. Make sure that the system operating lamp is not lit, the set the battery disconnect switch to the OFF position.
3. Disconnect the connectors TMC3 and N13, and connect the T-adapter to the female side of TMC3 to troubleshoot.
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 TMC3 (female) (15) and each pin other than pin (15)</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 transmission controller can be defective.
• Replace the transmission controller.
• Go to “Confirmation of repair”.</td></tr>
</table>

No.	Cause	Procedures, Measurement, Values, Note	Diagnosis and treatment	
8	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 Monitor Power Supply

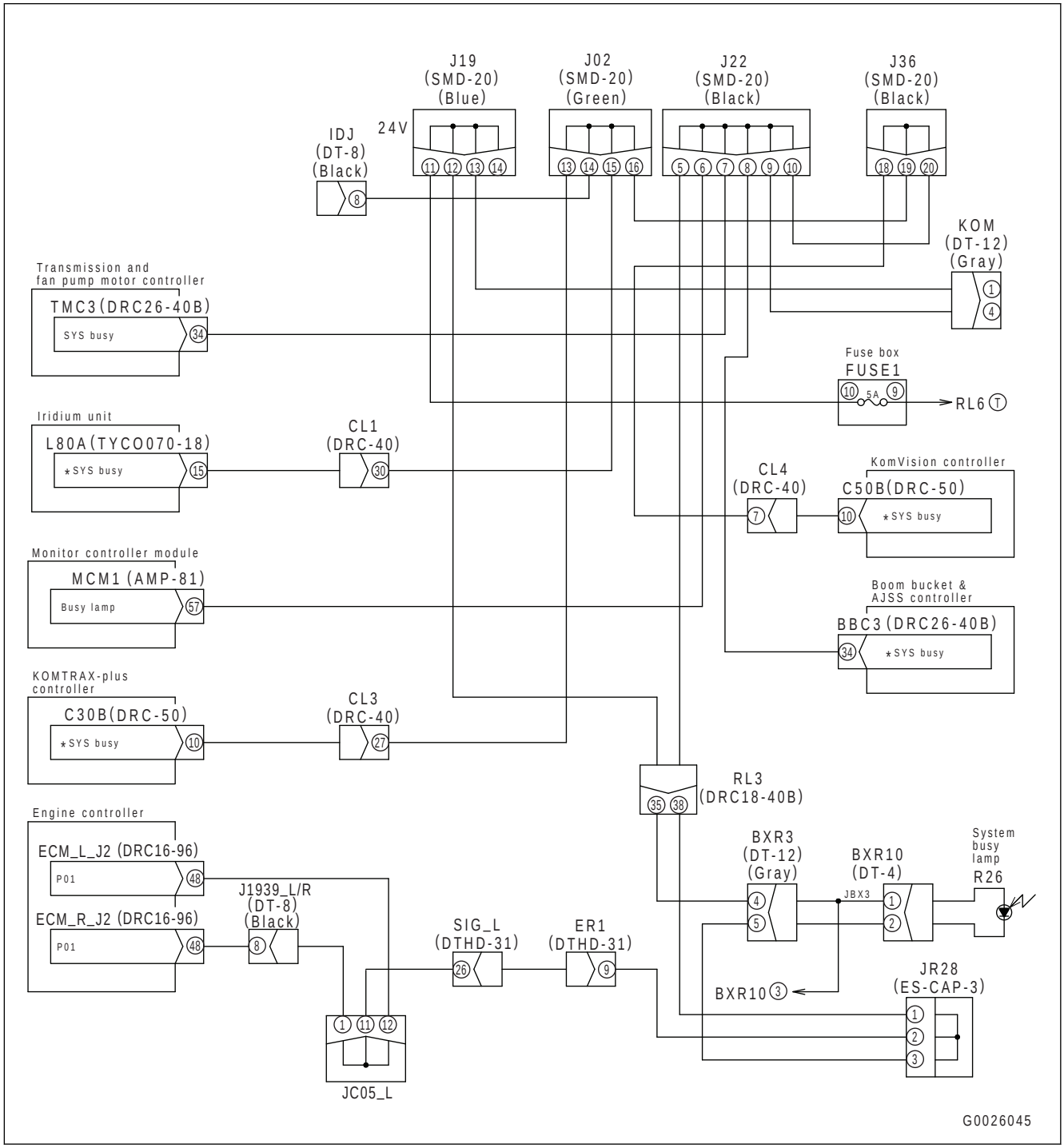


<table>
<tr><th>No.</th><th>Cause</th><th>Procedures, Measurement, Values, Note</th><th colspan="2">Diagnosis and treatment</th></tr>
<tr><td rowspan="2">6</td><td rowspan="2">Short circuit in wiring harness (Power supply circuit of transmission controller)</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Make sure that the system operating lamp is not lit, the set the battery disconnect switch to the OFF position.
3. Remove the fuse No.6 in the fuse box FUSE1.
4. Disconnect the connectors TMC3 and L122, and connect the T-adapter to the female side of TMC3 to troubleshoot.
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 TMC3 (female) (1) and each pin other than pin (1) or (11)</td><td>Min. 1 MΩ</td></tr><tr><td>Between TMC3 (female) (11) and each pin other than pin (1), (11)</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.
• Replace the fuse if it is blown out.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">7</td><td rowspan="2">Fuse
(ACC signal circuit of transmission controller)</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Make sure that the system operating lamp is not lit, the set the battery disconnect switch to the OFF position.
3. Remove the fuse No.1 in the fuse box FUSE1, and visually check it for blown out, then do the continuity test.
4. Is the fuse normal?</td><td>YES</td><td>• The fuse is normal.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The fuse is defective.
• Go to “Ground fault in wiring harness (ACC signal circuit of transmission controller)” if it is blown out.
• If the fuse is not blown out but has no continuity, replace it.
• 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">15</td><td rowspan="2">Short circuit in wiring harness (CAN2 communication circuit)</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 TMC2, AC1, BBC2, ECM_L_J2, ECM_R_J2, C50B, C30B, DPC3, MCM2, L80A and KOM/c_RES, and connect the T-adapter to the female side of TMC2, AC1, BBC2, ECM_L_J2, ECM_R_J2, C50B, C30B, DPC3, MCM2, L80A to troubleshoot.
4. Does the troubleshooting result agree with the standard value?
REMARK
The connectors C50B (female) (42) and (41) are not provided for machines without KomVision. Use the connectors CL4 (female) (15) and (14) toward you to troubleshoot.
<table><tr><th>Item</th><th>Measurement position, condition</th><th>Standard value</th></tr><tr><td rowspan="4">Resistance</td><td>Between ECM_L_J2 (female) (22) and each pin other than pin (22)</td><td>Min. 1 MΩ</td></tr><tr><td>Between ECM_L_J2 (female) (46) and each pin other than pin (46)</td><td>Min. 1 MΩ</td></tr><tr><td>Between ECM_R_J2 (female) (22) and each pin other than pin (22)</td><td>Min. 1 MΩ</td></tr><tr><td>Between ECM_R_J2 (female) (46) and each pin other than pin (46)</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>
<tr><td rowspan="2">16</td><td rowspan="2">Hot short circuit in wiring harness (CAN2 communication circuit)</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Insert the T-adapter into connector KOM/c_RES.
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 rowspan="2">Voltage</td><td>Between KOM/c_RES (B) and ground</td><td>Max 4 V</td></tr><tr><td>Between KOM/c_RES (A) and ground</td><td>Max 4 V</td></tr></table></td><td>YES</td><td>• The wiring harness does not have a hot short circuit.
• 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>
</table>

No.	Cause	Procedures, Measurement, Values, Note	Diagnosis and treatment	
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	Go to the first check item.
			NO	The repair is completed.

Circuit Diagram of System Operating Lamp



Failure Code [DBP5KP]

Details of failure	The KomVision controller senses low voltage (ground fault) in the camera power output. (The controller senses 6 V or below.)
Action level	L01
Action of controller	Does not show the bird's eye view and camera image on the KomVision monitor.
Phenomenon on machine	The bird's eye view and camera view image on the KomVision monitor are hidden.
Related information	-

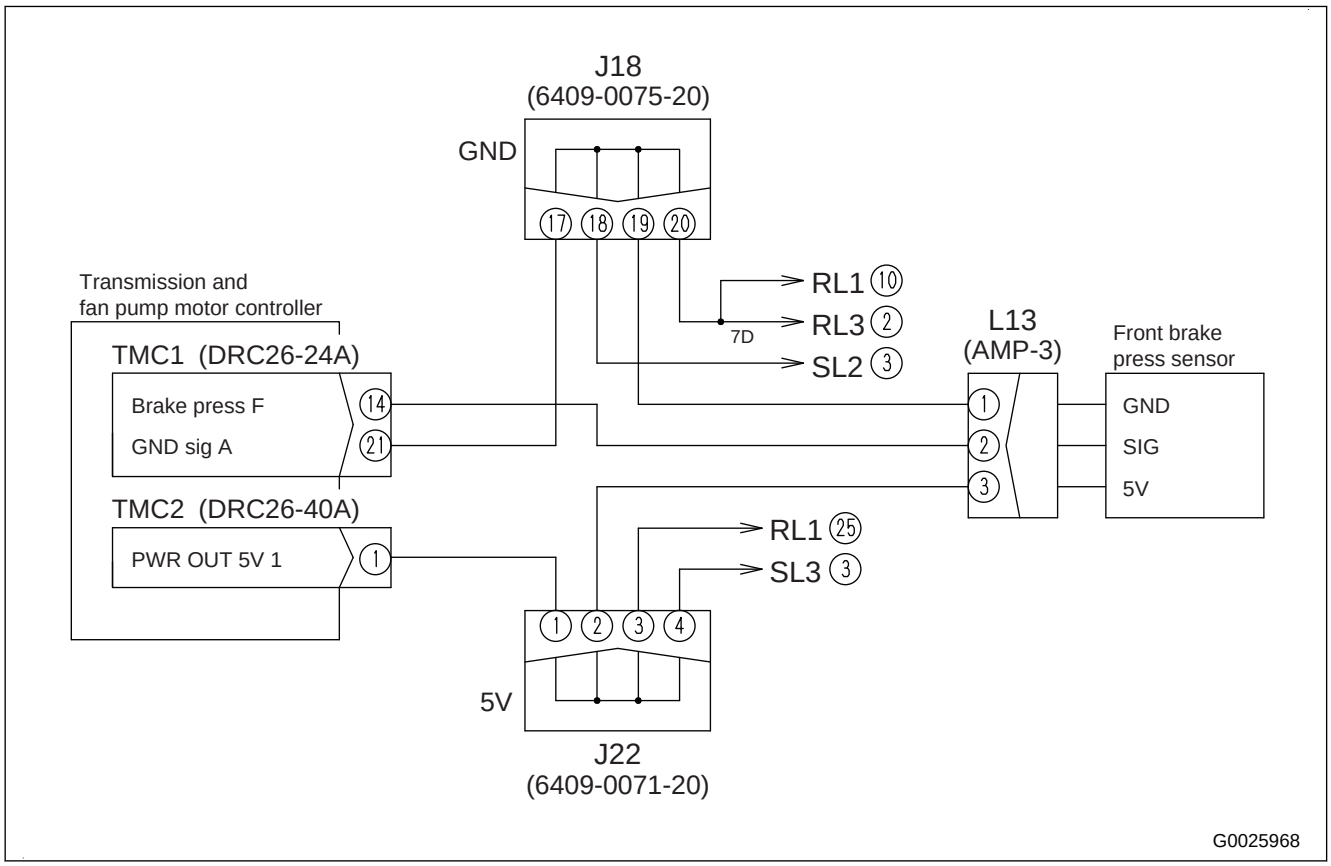
<table>
<tr><th>No.</th><th>Cause</th><th>Procedures, Measurement, Values, Note</th><th colspan="2">Diagnosis and treatment</th></tr>
<tr><td rowspan="2">1</td><td rowspan="2">Wiring harness and connector</td><td rowspan="2">1. Check the wiring harness and connector. For details, see “Related Information for Troubleshooting”, “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 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">Ground fault in wiring harness</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Disconnect the connectors C55, N52, P03, G35, G37, G36 and P03L, and connect the T-adapter to the female side of one of them 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 ground and C55 (female) (A), N52 (female) (1), P03 (female) (1), G35 (female) (1), G37 (female) (1), G36 (female) (1), or P03L (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>• Ground fault in wiring harness occurs.
• Repair or replace the wiring harness.
• 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">11</td><td rowspan="2">CAN termination resistor</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Disconnect the connector N51, 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 N51 (male) (2) and (3)</td><td>324 to 396 Ω</td></tr></table></td><td>YES</td><td>• The CAN terminating resistor is normal.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The CAN terminating resistor is defective.
• Replace the CAN terminating resistor.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">12</td><td rowspan="2">Open circuit in wiring harness (CAN communication circuit)</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Make sure that the system operating lamp is not lit, the set the battery disconnect switch to the OFF position.
3. Disconnect the connectors C50B and N51, and connect the T-adapter to the each female side to troubleshoot.
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 C50B (female) (2) and N51 (female) (2)</td><td>Max. 1 Ω</td></tr><tr><td>Between C50B (female) (1) and N51 (female) (3)</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>• Open circuit in wiring harness occurs.
• Repair or replace the wiring harness.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">13</td><td rowspan="2">Ground fault in wiring harness (CAN communication circuit)</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Make sure that the system operating lamp is not lit, the set the battery disconnect switch to the OFF position.
3. Disconnect the connectors C50B and N51, and connect the T-adapter to the female side of one of them to troubleshoot.
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 ground and C50B (female) (2) or N51 (female) (2)</td><td>Min. 1 MΩ</td></tr><tr><td>Between ground and C50B (female) (1) or N51 (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>• Ground fault in wiring harness occurs.
• Repair or replace the wiring harness.
• 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">14</td><td rowspan="2">Ground fault in wiring harness (CAN2 communication circuit)</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Make sure that the system operating lamp is not lit, the set the battery disconnect switch to the OFF position.
3. Disconnect the connectors TMC2, AC1, BBC2, ECM_L_J2, ECM_R_J2, C50B, C30B, DPC3, MCM2, L80A and KOM/c_RES, and connect the T-adapter to the female side of one of them to troubleshoot.
4. Does the troubleshooting result agree with the standard value?
REMARK
The connectors C50B (female) (42) and (41) are not provided for machines without KomVision. Use the connectors CL4 (female) (15) and (14) toward you to troubleshoot.
<table><tr><th>Item</th><th>Measurement position/condition</th><th>Standard value</th></tr><tr><td rowspan="2">Resistance</td><td>Between ground and TMC2 (female) (32), AC1 (female) (9), BBC2 (female) (32), ECM_L_J2 (female) (22), ECM_R_J2 (female) (22), C50B (female) (42), C30B (female) (42), DPC3 (female) (3), (7), MCM2 (female) (97), L80A (female) (10), or KOM/c_RES (female) (A)</td><td>Min. 1 MΩ</td></tr><tr><td>Between ground and TMC2 (female) (22), AC1 (female) (10), BBC2 (female) (22), ECM_L_J2 (female) (46), ECM_R_J2 (female) (46), C50B (female) (41), C30B (female) (41), DPC3 (female) (8), MCM2 (female) (89), L80A (female) (11), or KOM/c_RES (female) (B)</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>• Ground fault in wiring harness occurs.
• Repair or replace the wiring harness.
• 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">4</td><td rowspan="2">Open circuit in wiring harness</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Make sure that the system operating lamp is not lit, the set the battery disconnect switch to the OFF position.
3. Disconnect the connectors TMC2, MCM1, M06 and X18, and connect the T-adapter to the each female side to troubleshoot.
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="3">Resistance</td><td>Between TMC2 (female) (6) and M06 (female) (3)</td><td>Max. 1 Ω</td></tr><tr><td>Between MCM1 (female) (71) and X18 (female) (1)</td><td>Max. 1 Ω</td></tr><tr><td>Between X18 (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>• Open 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 transmission controller can be defective.
• Replace the transmission 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. Set the parking brake switch to the ON position.
5. Check the abnormality record.
6. 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 Brake Pressure Sensor

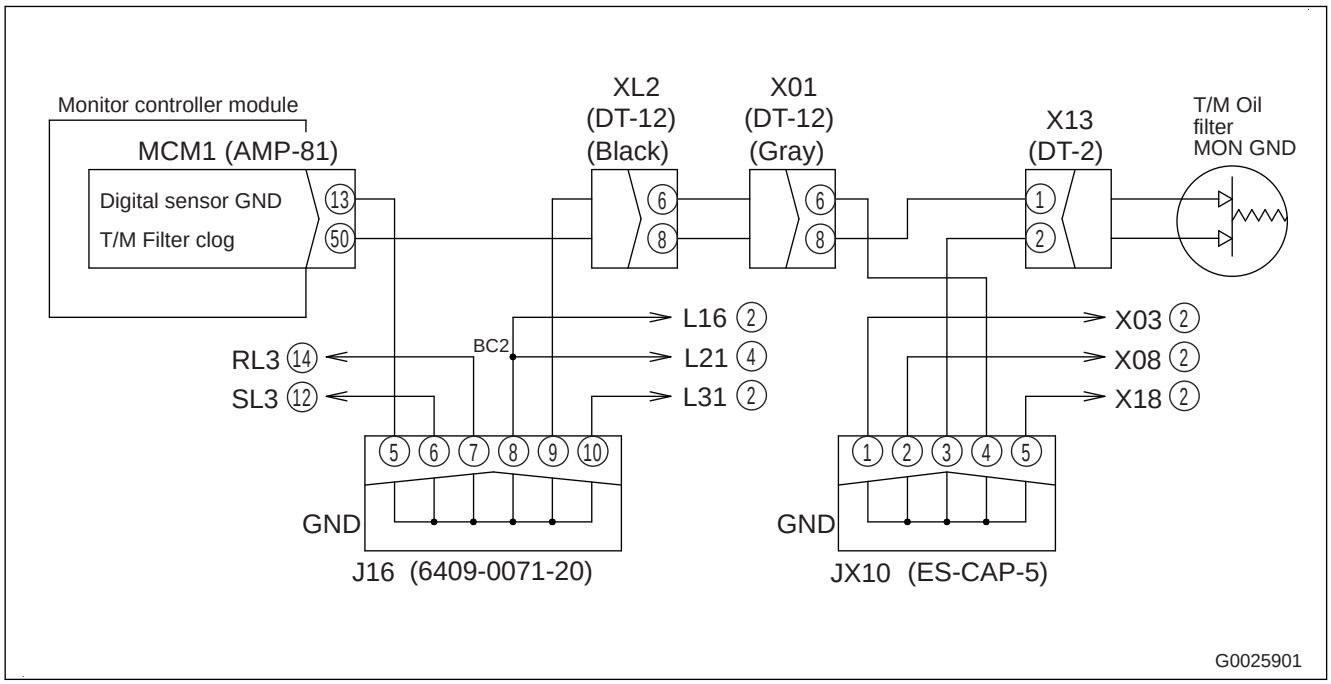


Failure Code [DGT5KY]

Details of failure	The KOMTRAX Plus controller senses hot short circuit in the exhaust temperature sensor (L).
Action level	-
Action of controller	• Failure is only shown. • After the cause of failure is corrected, the machine will return to normal.
Phenomenon on machine	Failure is only shown.
Related information	**Monitoring code** • “Exhaust Temp (L) Sensor Voltage” can be checked with the monitoring function. (Code: 42650) • “Exhaust Temperature (L)” can be checked with the monitoring function. (Code: 42649)

<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. For details, see the section of wiring harness and connector of “Electrical component” 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">Hot short circuit in wiring harness</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Disconnect the connector X22, and 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 X22 (female) (B) and (C)</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>• Hot short circuit in wiring harness occurs.
• Repair or replace the wiring harness.
• Go to “Confirmation of repair”.</td></tr>
</table>

Circuit Diagram of Transmission Filter Clogging 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">2</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 BBC1, BBC2 and S30, and connect the T-adapter to the each female 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 rowspan="3">Resistance</td><td>Between BBC2 (female) (1) and S30 (female) (B)</td><td>Max. 1 Ω</td></tr><tr><td>Between BBC1 (female) (1) and S30 (female) (A)</td><td>Max. 1 Ω</td></tr><tr><td>Between BBC1 (female) (21) and S30 (female) (C)</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>• Open circuit in wiring harness occurs.
• 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. Disconnect the connectors BBC1, BBC2 and S30, and connect the T-adapter to the female side of one of them 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 ground and BBC1 (female) (1) or S30 (female) (A)</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>• Ground fault in wiring harness occurs.
• 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 the connectors BBC1, BBC2, and S30, and connect the T-adapter to the female side of BBC1, BBC2 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 BBC1 (female) (1) and each pin other than pin (1)</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>
</table>

Failure Code [DKA0L0]

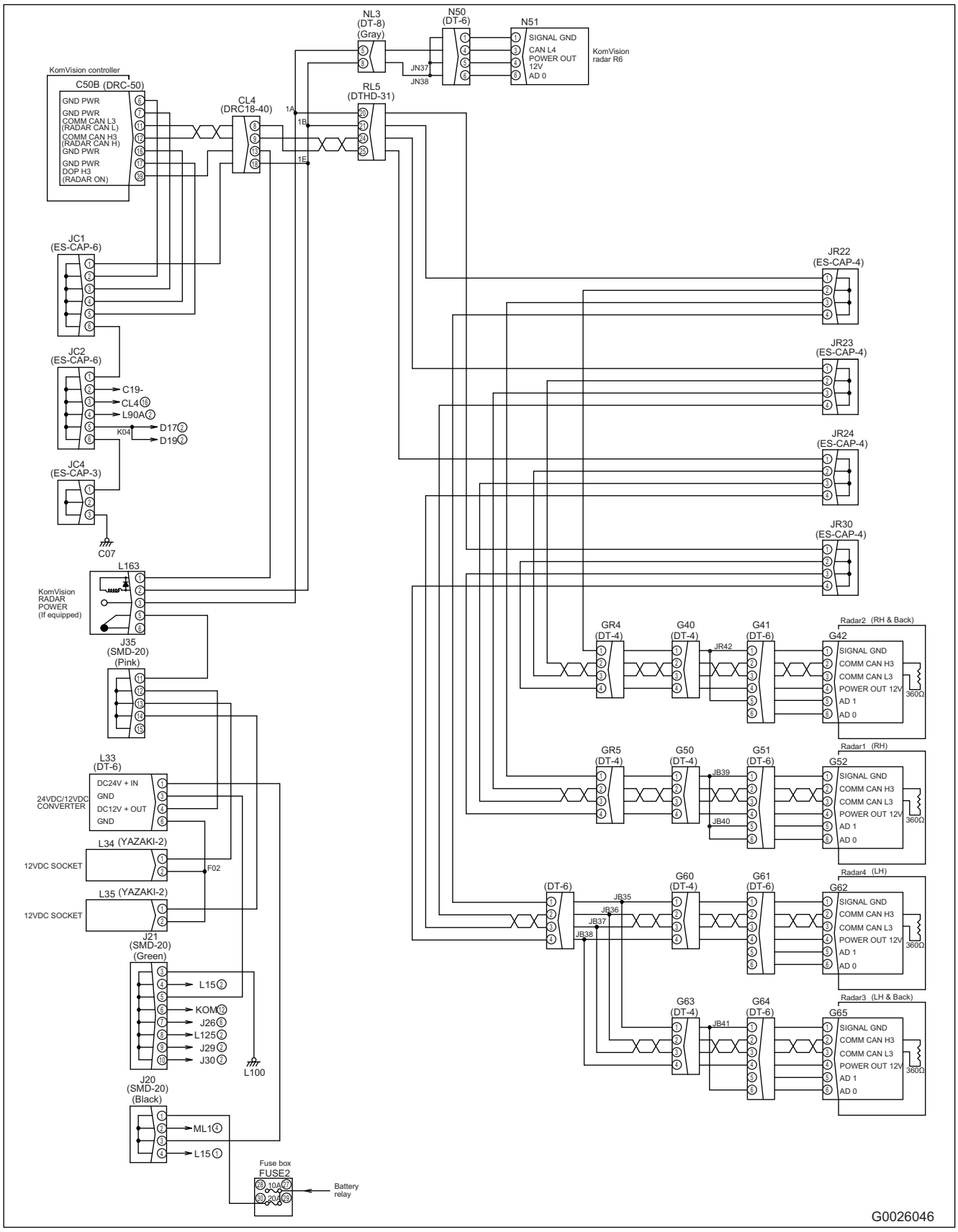
Details of failure	The work equipment controller senses boom angle abnormality. (Boom angle exceeds its upper limit +5 ° or boom angle does not reach its lower limit -5 °)
Action level	L01
Action of controller	• Cancels the remote positioner function. • Cancels the bucket positioner function. • Cancels the semi auto digging function. • Disables the boom FLOAT detent function when the remote positioner LOWER function is ON, and allows boom FLOAT detent function to operate normally when remote positioner LOWER stop function is OFF. • Does not drive the boom RAISE. • Does not drive the bucket detent. • After the cause of failure is corrected, the machine will return to normal. (When adjustment of the angle sensor is defective) • Even if the cause of failure is resolved, the machine does not return to normal until the starting switch is turned to the OFF position. (When the cause is other than it)
Phenomenon on machine	• Malfunction occurs in the bucket positioner. (The function does not stop.) • The operation failure occurs in the semi auto digging. (The function does not operate.) • Malfunction occurs in the Komatsu SmartLoader Logic. (Fuel efficiency becomes worse because the engine control cannot be optimized.)
Related information	**Prior troubleshooting** If the failure code [DB95KX] is shown at the same time, do the troubleshooting for it first. **Monitoring code** • “Boom Angle Sensor Voltage” can be checked with the monitoring function. (Code: 06005) • “Boom Angle” can be checked with the monitoring function. (Code: 06002) **Reference information** If the boom angle sensor is not installed correctly, this failure code can be occurred. In this case, do the adjustment. For details, see TESTING AND ADJUSTING.

Failure Code [DLT4KB]

Details of failure	The transmission controller senses ground fault in the transmission output shaft speed sensor 2. (Sensed when conditions 1 to 3 of [A] or [B] below are satisfied.) [A] 1. Speed of transmission output shaft speed sensor 1 is 200 rpm or above 2. No pulse in transmission output shaft speed sensor 2 3. The transmission output shaft speed sensor 2 has no open circuit [B] 1. Difference in speed between the output shaft speed sensor 1 and transmission output shaft speed sensor 2 is 200 rpm or above 2. Pulse is in transmission output shaft speed sensor 1 3. Pulse is in transmission output shaft speed sensor 2
Action level	L03
Action of controller	• Continues control by transmission output shaft speed sensor 1. • Lights up the centralized warning lamp and operates the alarm buzzer. • Even after the cause of failure is corrected, the machine will not return to normal until the starting switch is turned to the OFF position.
Phenomenon on machine	None
Related information	**Monitoring code** • “T/M Output Shaft Speed” can be checked with the monitoring function. (Code: 31400) • “T/M Output Shaft Speed 2” can be checked with the monitoring function. (Code: 31404)

No.	Cause	Procedures, Measurement, Values, Note	Diagnosis and treatment	
1	Wiring harness and connector	1. For details, see the section of wiring harness and connector of “Electrical component” 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”.

Circuit Diagram of KomVision Radar



Failure Code [DQ14NR]

Details of failure	The KomVision controller receives a high temperature error from inside radar 4.
Action level	L01
Action of controller	Stops radar detection.
Phenomenon on machine	• A obstacle cannot be sensed by the radar. • If radar 4 is used as it is, it can be damaged.
Related information	-

No.	Cause	Procedures, Measurement, Values, Note	Diagnosis and treatment	
1	High temperature inside radar 4	1. Turn the starting switch to the OFF position. 2. Turn the starting switch turned to the OFF position for a while to cool the radar. 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** As it takes time to activate the controller, wait for approximately 1 minute and check the abnormality record.	YES	Go to the next check item.
			NO	The repair is completed.
2	Radar 4	1. Turn the starting switch to the OFF position. 2. Disconnect the connector G62, and replace it with the same type of the radar. 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** As it takes time to activate the controller, wait for approximately 1 minute and check the abnormality record.	YES	• The removed radar 4 is normal. • Return the removed radar 4 to its initial position. • Go to the next check item.
			NO	• The removed radar 4 is defective. • The repair is completed.
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 KomVision controller can be defective. • Replace the KomVision controller. • 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">3</td><td rowspan="2">Ground fault 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, the set the battery disconnect switch to the OFF position.
3. Disconnect the connectors BBC3 and N09, and connect the T-adapter to the female side of one of them to troubleshoot.
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 BBC3 (female) (6) or N09 (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>• Ground fault in wiring harness occurs.
• 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. Make sure that the system operating lamp is not lit, the set the battery disconnect switch to the OFF position.
3. Disconnect the connectors BBC3 and N09, and connect the T-adapter to the female side of BBC3 to troubleshoot.
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 BBC3 (female) (6) and each pin other than pin (6)</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 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. Start the engine.
4. Set the boom control lever to “RAISE” position.
5. Check the abnormality record.
6. 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>

Failure Code [DW5RKB]

Details of failure	Because of ground fault in the bucket TILT EPC solenoid 2 signal system, abnormal voltage is generated when the controller drives the bucket TILT EPC solenoid.
Action level	L03
Action of controller	• Does not drive the bucket TILT EPC solenoid 2. • Does not drive the bucket TILT detent solenoid. • Lights up the centralized warning lamp and operates the alarm buzzer. • Even if the cause of failure is resolved, the machine does not return to normal until the starting switch is turned to the OFF position.
Phenomenon on machine	The bucket tilt speed decreases.
Related information	**Monitoring code** "Bucket Tilt EPC Sol Current 2" can be checked with the monitoring function. (Code: 41911)

<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. For details, see the section of wiring harness and connector of "Electrical component" 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">Bucket TILT EPC solenoid 2</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Disconnect the connector N16, 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 rowspan="2">Resistance</td><td>Between N16 (male) (1) and (2)</td><td>9 to 11 Ω</td></tr>
<tr><td>Between N16 (male) (1) and ground</td><td>Min. 1 MΩ</td></tr>
</table></td><td>YES</td><td>• The bucket TILT EPC solenoid 2 is normal.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The bucket TILT EPC solenoid 2 is defective.
• Replace the bucket TILT EPC solenoid 2.
• 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">Diode</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Disconnect the connector RD78, 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 rowspan="2">Continuity</td><td>Between RD78 (male) (1) (+) and (2) (-)</td><td>Continuity</td></tr><tr><td>Between RD78 (male) (2) (+) and (1) (-)</td><td>No continuity</td></tr></table></td><td>YES</td><td>• The diode is normal.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The diode is defective.
• Replace the diode.
• 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. Make sure that the system operating lamp is not lit, the set the battery disconnect switch to the OFF position.
3. Disconnect the connectors TMC3, R78 and RD78, and connect the T-adapter to the female side of one of them to troubleshoot.
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 TMC3 (female) (7) or R78 (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>• Ground fault 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">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, the set the battery disconnect switch to the OFF position.
3. Disconnect the connectors TMC3, R78 and RD78, and connect the T-adapter to the female side of TMC3 to troubleshoot.
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 TMC3 (female) (7) and each pin other than pin (7)</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>
</table>

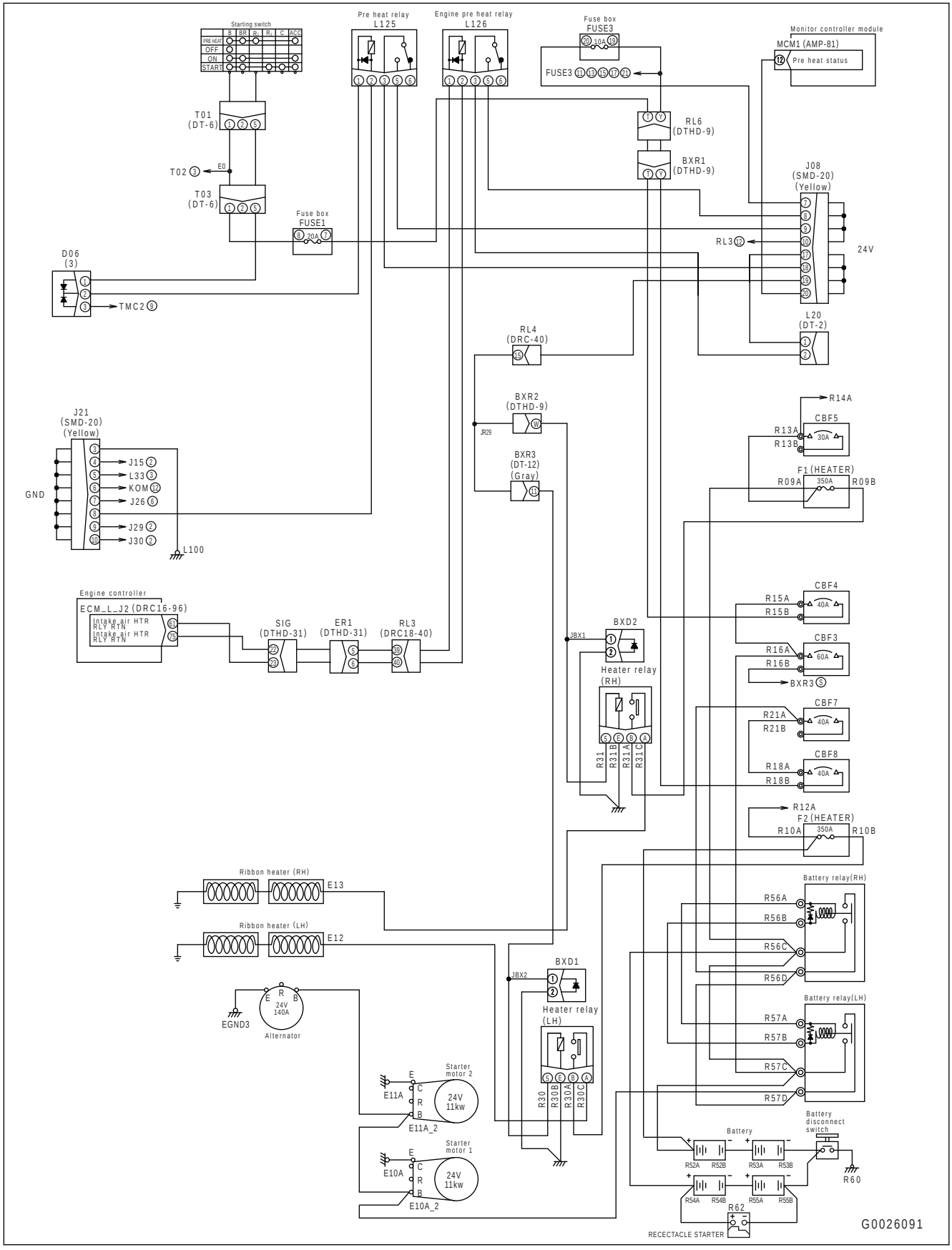
<table>
<tr><th>No.</th><th>Cause</th><th>Procedures, Measurement, Values, Note</th><th colspan="2">Diagnosis and treatment</th></tr>
<tr><td rowspan="2">3</td><td rowspan="2">Open circuit in wiring harness</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Make sure that the system operating lamp is not lit, the set the battery disconnect switch to the OFF position.
3. Disconnect the connectors BBC3 and X26, and connect the T-adapter to the each female side to troubleshoot.
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 BBC3 (female) (15) and X26 (female) (1)</td><td>Max. 1 Ω</td></tr><tr><td>Between BBC3 (female) (23) and X26 (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>• Open circuit in wiring harness occurs.
• 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 identify 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">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. Set the machine lockout operation switch to the ON position.
5. Check the abnormality record.
6. 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>

Failure Code [DXH8KY]

Details of failure	Because of hot short circuit in F (forward) clutch ECMV solenoid system, abnormal voltage is generated when the controller does not drive F (forward) clutch ECMV solenoid.
Action level	L03
Action of controller	• When the directional selector switch is set to F (forward), the controller drives F (forward) clutch ECMV solenoid normally. • Sets the transmission to N (neutral) when the gear shift lever is in the N (neutral), or R (reverse) position. • Lights up the centralized warning lamp and operates the alarm buzzer. • Even after the cause of failure is corrected, the machine will not return to normal until the directional selector (FNR) lever, or R.H. directional selector (FNR) switch is set to the NEUTRAL position.
Phenomenon on machine	The machine can travel in only F (forward).
Related information	**Monitoring code** "ECMV Solenoid Current (F Clutch)" can be checked with the monitoring function. (Code: 31608)

<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. For details, see the section of wiring harness and connector of "Electrical component" 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">Hot short circuit in wiring harness</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Disconnect the connector T-F.PS, and 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 T-F.PS (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>• Hot short circuit in wiring harness occurs.
• Repair or replace the wiring harness.
• Go to "Confirmation of repair".</td></tr>
</table>

Circuit Diagram of Engine Preheat (Machine with Pre-lubrication System)



E-16 Some Items of Gauges and Caution Lamps on Machine Monitor are Not Shown Correctly

Details of failure	The switches or sensors on the machine monitor are abnormal.
Related information	**Prior troubleshooting** If the machine related failure code is shown, do the troubleshooting for it first.

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 for Troubleshooting”, “Checks Before Troubleshooting”, “ELECTRIC EQUIPMENT”. 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	Switch and sensor	1. See the failure code applicable to the sensor and switch to troubleshoot. 2. If there is a failure on the sensor and switch, repair or replace the sensor and switch. 3. Is this problem resolved?	YES	• The switch and sensor are defective. • The repair is completed.
			NO	• The switch and senor are normal. • Go to the next check item.
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 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. Is this problem resolved?	YES	The repair is completed.
			NO	Go 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">3</td><td rowspan="2">Open circuit in wiring harness</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Make sure that the system operating lamp is not lit, the set the battery disconnect switch to the OFF position.
3. Disconnect the connectors MCM1 and L16, and connect the T-adapter to the each female side to troubleshoot.
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 MCM1 (female) (29) and L16 (female) (1)</td><td>Max. 1 Ω</td></tr><tr><td>Between MCM1 (female) (13) and L16 (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>• Open circuit in wiring harness occurs.
• 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. Make sure that the system operating lamp is not lit, the set the battery disconnect switch to the OFF position.
3. Disconnect the connectors MCM1 and L16, and connect the T-adapter to the female side of one of them to troubleshoot.
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 MCM1 (female) (29) or L16 (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>• Ground fault 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 monitor controller can be defective.
• Replace the monitor 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. 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	
7	Side working lamp relay	1. Turn the starting switch to the OFF position. 2. Disconnect the connector L143, and replace with the same type relay. 3. Turn the starting switch to the ON position. 4. Operate the lamp switch to troubleshoot. 5. Is this problem resolved?	YES	• The removed side working lamp relay is defective. • The repair is completed.
			NO	• The removed side working lamp relay is normal. • Return the removed relay to its initial position. • Go to the next check item.
8	Lamp	1. Turn the starting switch to the OFF position. 2. Disconnect the connector P01, P01L, P02, and P02L, and replace with the same type lamp. 3. Turn the starting switch to the ON position. 4. Operate the lamp switch to troubleshoot. 5. Is this problem resolved?	YES	• The removed lamp is defective. • The repair is completed.
			NO	• The removed lamp is normal. • Return the removed lamp to its initial position. • Go to the next check item.
9	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. Operate the working lamp switch to troubleshoot. 5. Is this problem resolved?	YES	The repair is completed.
			NO	Go 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">7</td><td rowspan="2">Hot 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, the set the battery disconnect switch to the OFF position.
3. Remove the fuse No.13 in the fuse box FUSE1.
4. Disconnect the connectors H01, H02, H04, and H05, and connect the T-adapter to the female side of one of them.
5. Set the battery disconnect switch to the ON position.
6. Turn the starting switch to the ON position, then do the troubleshooting.
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 rowspan="2">Voltage</td><td>Between ground and H02 (female) (C) or H01 (female) (1)</td><td>Max. 1 V</td></tr><tr><td>Between ground and H05 (female) (C) or H04 (female) (1)</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>• Hot short circuit in wiring harness occurs.
• Repair or replace the wiring harness.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">8</td><td rowspan="2">Lamp</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Disconnect the connectors H01 and H04, and replace with the same type lamp.
3. Turn the starting switch to the ON position.
4. Operate the engine room lamp switch to troubleshoot.
5. Is this problem resolved?</td><td>YES</td><td>• The removed lamp is defective.
• The repair is completed.</td></tr>
<tr><td>NO</td><td>• The removed lamp is normal.
• Return the removed lamp to its initial position.
• Go to the next check item.</td></tr>
<tr><td rowspan="2">9</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 engine room lamp switch to troubleshoot.
5. 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>

<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">RAISE switch of the power ladder switch</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Disconnect the connector B19, and connect the T-adapter to the male side.
3. Operate the power ladder switch to troubleshoot.
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="2">Resistance</td><td rowspan="2">Between B19 (male) (1) and (4)</td><td>RAISE switch: OFF</td><td>Min. 1 MΩ</td></tr><tr><td>RAISE switch: ON</td><td>Max. 1 Ω</td></tr></table></td><td>YES</td><td>• The RAISE switch of the power ladder switch is normal.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The RAISE switch of the power ladder switch is defective.
• Replace the power ladder switch.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">6</td><td rowspan="2">LOWER switch of the power ladder switch</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Disconnect the connector PL2, and connect the T-adapter to the male side.
3. Operate the power ladder switch to troubleshoot.
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="2">Resistance</td><td rowspan="2">Between PL2 (male) (1) and (4)</td><td>LOWER switch: OFF</td><td>Min. 1 MΩ</td></tr><tr><td>LOWER switch: ON</td><td>Max. 1 Ω</td></tr></table></td><td>YES</td><td>• The LOWER switch of the power ladder switch is normal.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The LOWER switch of the power ladder switch is defective.
• Replace the power ladder switch.
• Go to “Confirmation of repair”.</td></tr>
</table>

No.	Cause	Procedures, Measurement, Values, Note	Diagnosis and treatment	
4	Calibration	1. Turn the starting switch to the ON position. 2. For details, see OTHERS, “TEST AND ADJUST KomVision SYSTEM”, “CAMERA CALIBRATION”. 3. Do the calibration of the defective camera to troubleshoot. 4. Is “Part of the camera image is not displayed on the KomVision monitor” resolved? **REMARK** • If one KomVision camera is defective, do the 1 Camera Calibration for the defective camera. For details, see “1 Camera Calibration”. • If two or more KomVision cameras are defective or if the failure is not resolved even after the 1 Camera Calibration is done, do the 5 Camera Calibration. For details, see “5 Camera Calibration”.	YES	The repair is completed.
			NO	• The calibration is normal. • Go to the next check item.
5	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 KomVision controller can be defective. • Replace the KomVision 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. Is this problem resolved?	YES	The repair is completed.
			NO	Go to the first check item.

H-6 Machine Does Not Turn

Details of failure	The steering circuit is abnormal.
Related information	⚠ **Be sure to release the remaining pressure from the brake accumulator circuit. For details, see Testing and Adjusting, "Release Remained Pressure in Brake Accumulator Circuit".** **Monitoring code** • "S/T Pump Pressure" can be checked with the monitoring function. (Code: 95302) • "Radiator Fan Speed" can be checked with the monitoring function. (Code: 10009) • "AJSS Pilot Pressure" can be checked with the monitoring function. (Code: 94302) **Reference information** • Make sure that the hydraulic tank oil level is correct. • Make sure that the frame lock bar is removed. • Make sure that there is no unusual noise from the steering components.

No.	Cause	Procedures, Measurement, Values, Note	Diagnosis and treatment	
1	PTO	1. If there is a malfunction on the work equipment or cooling fan while the machine cannot turn right and left, the PTO can be defective. 2. Disassemble the PTO and check further. 3. Is the PTO normal?	YES	• The PTO is normal. • Go to the next check item.
			NO	• The PTO is defective. • Repair or replace the PTO. • Go to "Confirmation of repair".
2	Steering pump strainer	1. The strainer of the steering pump can be clogged or deformed. 2. Check the steering pump strainer. 3. Is the steering pump strainer normal?	YES	• The steering pump strainer is normal. • Go to the next check item.
			NO	• The steering pump strainer is clogged or deformed. • Clean or replace it. • 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">7</td><td rowspan="2">Unload valve of control valve</td><td rowspan="2">1. Do the troubleshooting. For details, see Testing and Adjusting, “Examine and Adjust Work Equipment Oil Pressure”, “TEST UNLOAD PRESSURE ON MACHINE MONITOR”.
2. 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>Unload pressure</td><td>• Hydraulic oil temperature: 45 to 55 °C
• Power mode: P mode
• Bucket control lever and boom control lever: NEUTRAL position
• Accelerator pedal: Push to stroke end (High idle)
REMARK
If the work equipment relief pressure does not increase, the unload valve can be released because of the seizure. Check the unload valve.</td><td>2.55 to 3.73 MPa {26 to 38 kgf/cm^2}</td></tr></table></td><td>YES</td><td>• The unload valve of the control valve is normal.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• The unload valve of the control valve is defective.
• Repair or replace the unload valve of the control valve.
• Go to “Confirmation of repair”.</td></tr>
<tr><td rowspan="2">8</td><td rowspan="2">Main relief pressure of control valve</td><td rowspan="2">1. Do the troubleshooting. For details, see Testing and Adjusting, “Examine and Adjust Work Equipment Oil Pressure”, “TEST WORK EQUIPMENT OIL PRESSURE”.
2. 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>Work equipment relief pressure</td><td>• Hydraulic oil temperature: 45 to 55 °C
• Power mode: P mode
• Bucket control lever: TILT END
• Accelerator pedal: Push to stroke end (High idle)</td><td>32.83 to 35.77 MPa {335 to 365 kgf/cm^2}</td></tr></table></td><td>YES</td><td>• The main relief pressure of the control valve is normal.
• Go to the check item of “Spool of bucket valve”.</td></tr>
<tr><td>NO</td><td>• The main relief pressure of the control valve is defective.
• Adjust the relief pressure.
• Go to “Confirmation of repair”.</td></tr>
</table>

No.	Cause	Procedures, Measurement, Values, Note	Diagnosis and treatment	
11	Fuel low-pressure side piping	1. Bleed air from the fuel system circuit and check the fuel low-pressure side piping for fuel leakage. For details, see Testing and Adjusting, “Bleed Air from Fuel System”. 2. Is the fuel low-pressure side piping normal? **REMARK** • If fuel leaks from the fuel low-pressure side piping, it is a failure. • To check the leakage from the fuel low-pressure side piping, spray the color checker over the part.	YES	• The fuel low-pressure side piping is normal. • Go to the next check item.
			NO	• The fuel low-pressure side piping is defective. • Repair or replace the fuel low-pressure side piping. • Go to “Confirmation of repair”.
12	Feed pump gauze filter	1. Check the feed pump gauze filter for clogging. 2. Is the feed pump gauze filter normal? **REMARK** If the feed pump gauze filter is clogged, it is a failure.	YES	• The feed pump gauze filter is normal. • Go to the next check item.
			NO	• The feed pump gauze filter is defective. • Clean or replace the feed pump gauze filter. (failure side) • Go to “Confirmation of repair”.
13	Common rail	1. Turn the starting switch to the STRAT position, and check the common rail pressure limiter for leakage while the engine cranks. 2. Is there leakage from the common rail pressure limiter? **REMARK** • If there is leakage from the common rail pressure limiter, it is a failure. • Prepare to check the leakage from the common rail pressure limiter. For details, see Testing and Adjusting, “How to Examine Fuel Return Rate and Leakage”, “TEST FUEL RETURN RATE AND LEAKAGE”.	YES	• The common rail is defective. • Replace the common rail. (failure side) • Go to “Confirmation of repair”.
			NO	• The common rail is normal. • Go to the next 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="3">3</td><td rowspan="3">Confirmation of check results</td><td rowspan="3">1. Do the troubleshooting above again.
2. Can you identify the cause by the check?
REMARK
• If you cannot identify the cause by the check, failure can be occurred in the items that follow.
• Engine oil cooler
• Cylinder head
• Cylinder head gasket
• Cylinder block
• Cylinder liner</td><td>YES</td><td>The repair is completed.</td></tr>
<tr><td rowspan="2">NO</td><td>• Remove the engine assembly. For details, see Disassembly and Assembly, “Remove and Install Engine Assembly”. And disassemble the engine assembly. For details, see the DISASSEMBLY AND ASSEMBLY in the shop manual Engine 12V140E-7 series. Then check further, and repair or replace the defective part.
• Go to “Confirmation of repair”.
REMARK
This troubleshooting cannot be done on some working jobsites.</td></tr>
<tr><td></td></tr>
<tr><td rowspan="2">4</td><td rowspan="2">Confirmation of repair</td><td rowspan="2">1. Connect all the component parts.
2. Operate the machine for a while and check the condition.
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>

Symbol		Part name	Part No.	Specifications	Q'ty	Remarks
D	1	Push tool kit	790-201-1702		1	For cylinder head dust seal
	2	• Grip	790-101-5021		1	
	3	• Bolt	01010-80816		1	
	4	Plate	790-201-1660		1	
E	1	Push tool kit	790-201-1702		1	For cylinder head bushing
	2	• Grip	790-101-5021		1	
	3	• Bolt	01010-80816		1	
	4	• Push tool	790-201-1851		1	

Special Tools to be Used When You Disassemble and Assemble the Bucket Cylinder Assembly

Symbol		Part name	Part No.	Specifications	Q'ty	Remarks
A	1	Cylinder repair stand	790-502-1003		1	Disassembly and assembly of bucket cylinder assembly
	2	Hydraulic pump	790-101-1102		1	
B	1	Wrench assembly	790-102-4300		1	For cylinder piston
	2	Pin	790-102-4310		1	
C	1	Expander	790-720-1000		1	For installation of piston ring
	2	Ring	796-720-1730		1	
	3	Clamp	07281-03209		1	
D	1	Push tool kit	790-201-1500		1	For cylinder head dust seal
	2	• Grip	790-101-5021		1	
	3	• Bolt	01010-80816		1	
	4	• Plate	791-863-1140		1	
E	1	Push tool kit	790-201-1702		1	For cylinder head bushing
	2	• Grip	790-101-5021		1	
	3	• Bolt	01010-80816		1	
	4	Push tool	792-625-1300		1	

Special Tools to be Used When You Disassemble and Assemble the Lift Cylinder Assembly

Symbol		Part name	Part No.	Specifications	Q'ty	Remarks
A	1	Cylinder repair stand	790-502-1003		1	Disassembly and assembly of lift cylinder assembly
	2	Hydraulic pump	790-101-1102		1	
B	1	Wrench assembly	790-102-4300		1	For cylinder piston
	2	Pin	790-102-4310		1	
C	1	Expander	790-720-1000		1	For installation of piston ring
	2	Ring	796-720-1730		1	
	3	Clamp	07281-02809		1	

Bleed air

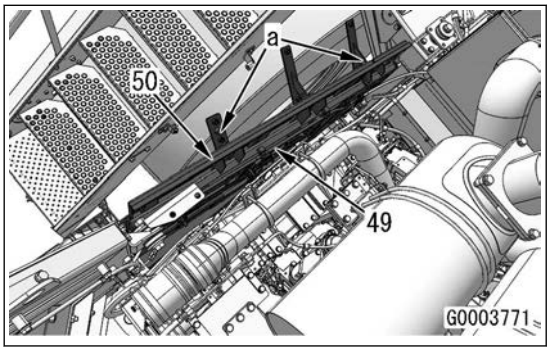
94. Bleed air from the fuel circuit. For details, see Testing and Adjusting, “Bleed Air from Fuel System”.

Check for fuel leakage

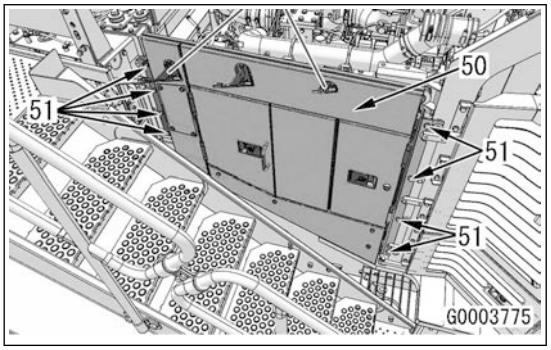
95. Check the fuel system for leakage. For details, see Testing and Adjusting, “Examine Fuel Circuit for Leakage”.

L.H. cover assembly

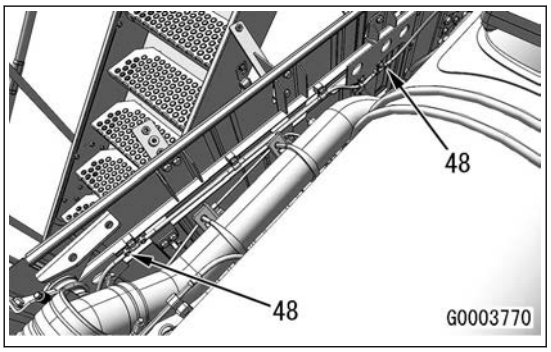
96. Lift the cover assembly (50) and hose (49) together at the points (a), and set them to the installation position.
    Tool: Eyebolt (M12), webbing sling
    Cover assembly (50): 100kg



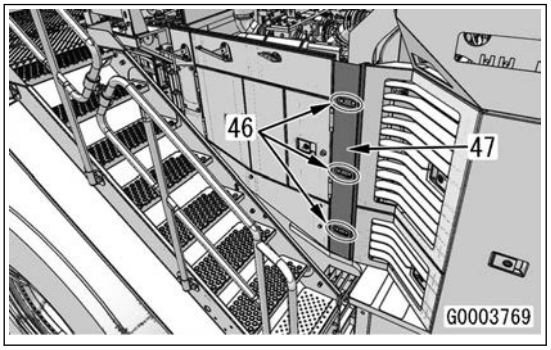
97. Install the cover assembly (50) with the bolts (51) (8 pieces).
    Tool: Torque wrench (socket)
    Bolt (51): Width across flats 19mm, M12
    Bolt (51): 98 to 123Nm{10 to 12.5kgm}



98. Install the hose clamps (48) (2 pieces).
    Tool: Torque wrench (socket)
    Hose clamp (48): Width across flats 7mm
    Hose clamp (48): 3.3±0.49Nm{0.34±0.05kgm}



99. Install the cover (47) with the bolts (46) (6 pieces).
    Tool: Torque wrench (socket)
    Bolt (46): Width across flats 19mm, M12
    Bolt (46): 98 to 123Nm{10 to 12.5kgm}



2) Remove the bolts (94) (3 pieces), and remove the rocker arm assembly (91).

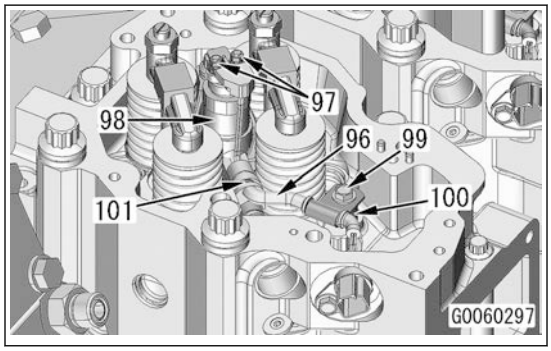
REMARK

- Make marks on the rocker arm assembly and cylinder head to make them a same set when they are assembled.
- Keep the rocker arm and shaft as a set when you store the rocker arm assembly.
- Use the dodecagonal socket to remove the bolt (94).

Tool: Socket wrench (dodecagonal)

Bolt (94): Width across flats 12mm, M12

41. Remove the wiring harness (96) as follows.



REMARK

Do the same work for each of the 6 cylinders.

1) Loosen the nuts (97) (2 pieces) alternately, and remove them from the injector (98).

Tool: Socket wrench

Nut (97): Width across flats 7mm

2) Remove the bolt (99).

REMARK

The spacer (100) and wiring harness (96) are tightened together.

Tool: Socket wrench

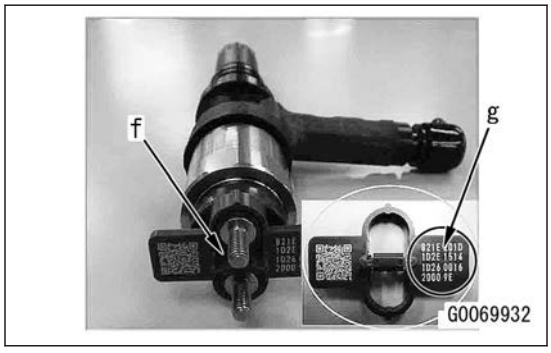
Bolt (99): Width across flats 10mm, M6

3) Remove the clip (101).

REMARK

Move the wiring harness (96) to a safe place not to interfere with the work.

42. Check the items that follow before you remove the injector assembly.



REMARK

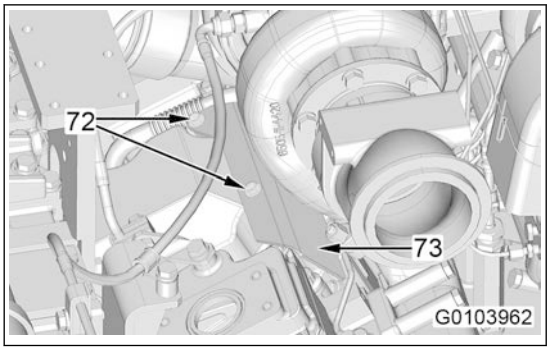
- Write down the cylinder number (to which the injector assembly is installed) and character strings (g) on the 2D code tab (f) as a set, and remove the injector assembly.
- Make sure that the recorded character string is correct.
- Do not remove the 2D code tab (f) on the injector assembly head.
- Do not scratch the 2D code tab (f) on the injector assembly head.
  (Reference: The 2D code or character strings show the compensation value of the fuel injection for the injector assembly. They are different for each injector assembly.)

5) Install the cover (73) with the bolts (72) (2 pieces).

Tool: Torque wrench (socket)

Bolt (72): Width across flats 17mm, M10

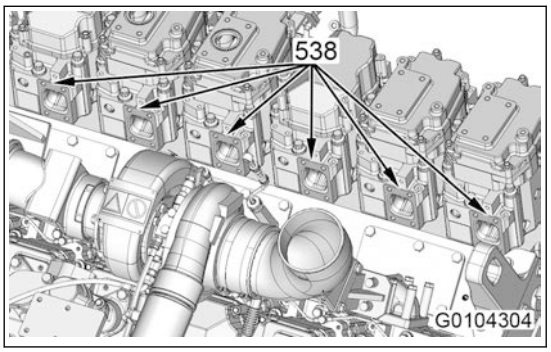
Bolt (72): 59 to 74Nm{6 to 7.5kgm}



18. Set the exhaust manifold gaskets (538) (6 pieces) to the installation positions.

REMARK

Put the identification mark “OUT” of the gasket (538) toward the exhaust manifold.



19. Lift the exhaust manifold (537), and install it with the bolts (534) (24 pieces).

REMARK

- Lift the exhaust manifold (537) at 2 ends, and tighten the bolt (534).
- Tighten the bolts (534) in the order as shown in the figure.
- Tighten all of the bolts (534), and tighten them again.
- The spacers (536) (24 pieces) and exhaust manifold (537) are tightened together.

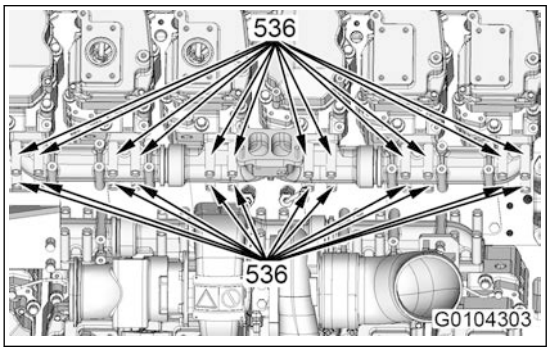
Tool: Torque wrench (socket)

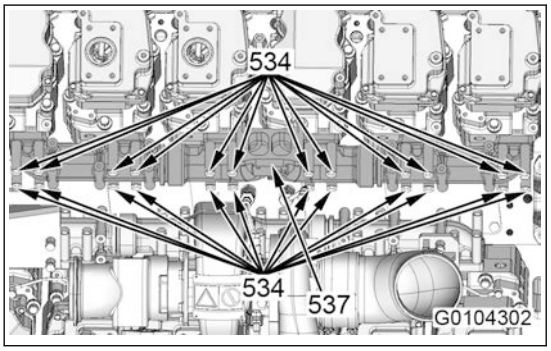
Bolt (534): Width across flats 17mm, M10

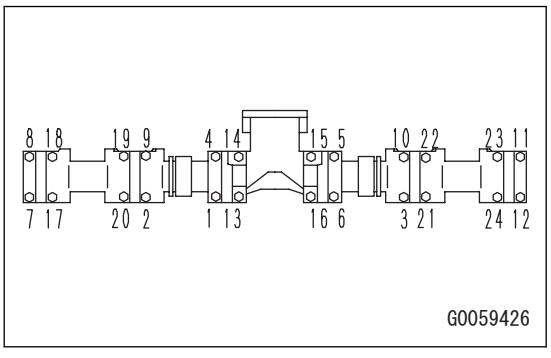
Exhaust manifold (537): 25kg

Threaded part and seat surface of bolt (534): Seizure prevention compound (LC-G)

Bolt (534): 44.1 to 53.9Nm{4.5 to 5.5kgm}



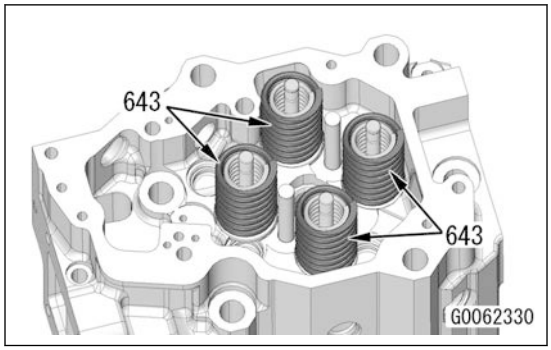




3) Remove the outer springs (643) (4 pieces).

REMARK

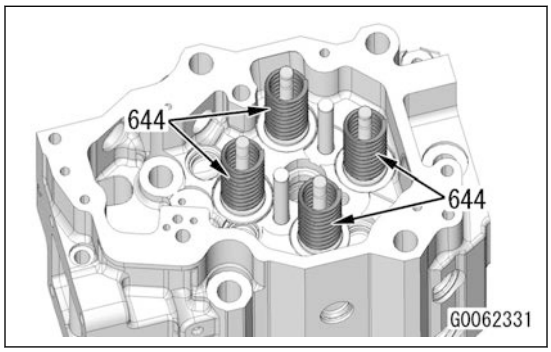
Make marks on the outer spring (643) to make it a same set when it is assembled.



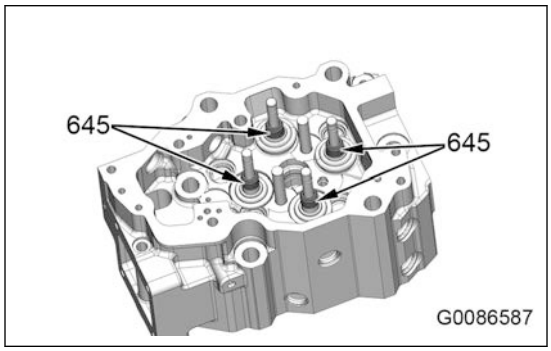
4) Remove the inner springs (644) (4 pieces).

REMARK

Make marks on the inner spring (644) to make it a same set when it is assembled.



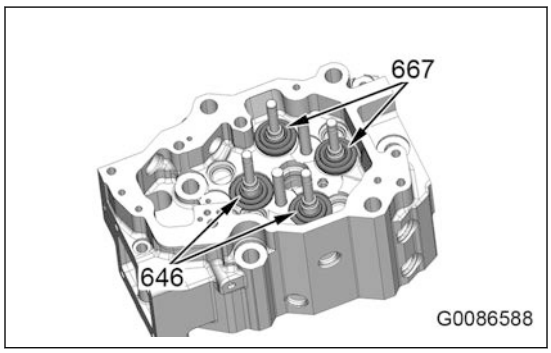
5) Remove the stem seals (645) (4 pieces).



6) Remove the lower spring seats (646) (2 pieces) and (667) (2 pieces).

REMARK

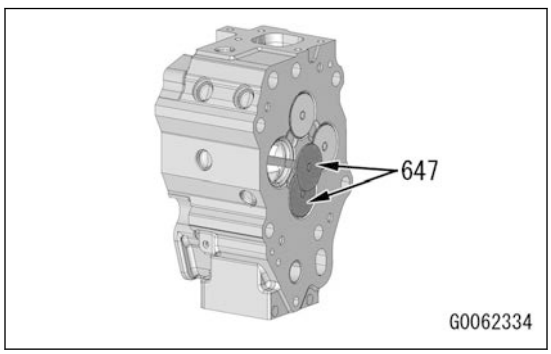
Make marks on the lower spring seats (646) and (667) to make it a same set when it is assembled.



7) Set the cylinder head vertically, and remove the intake valves (647) (2 pieces).

REMARK

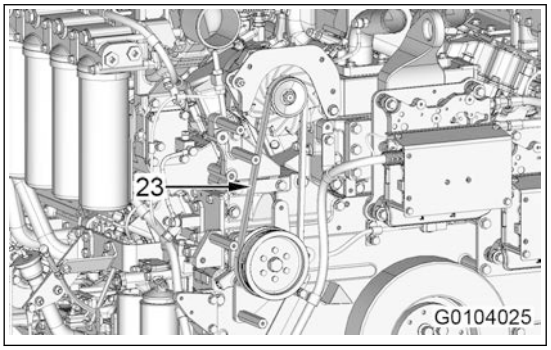
Make marks on the intake valve (647) to make it a same set when it is assembled.



How to Install Alternator Belt

Alternator belt

1. Install the alternator belt (23).



2. Adjust the tension of the alternator belt (23).

   REMARK

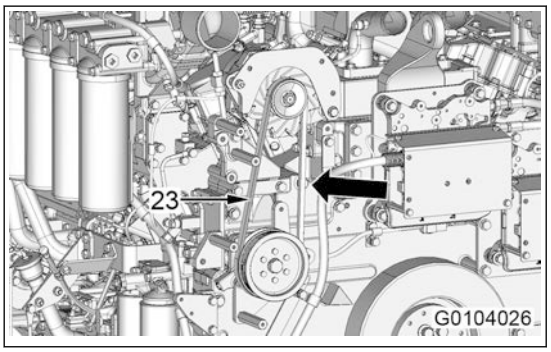
   Use the nut (15) to adjust the deflection when you push at a center point of the alternator belt (23) by your finger.

   Push force: Approximately 59N {Approximately 6kg}

   Deflection: Approximately 10mm

   Tool: Open-end wrench

   Nut (15): Width across flats 22mm



3. Tighten the bolt (13) to the specified torque to let the rod (24) and plate (25) cross at a right angle.

   Tool: Torque wrench (socket)

   Bolt (13): Width across flats 19mm

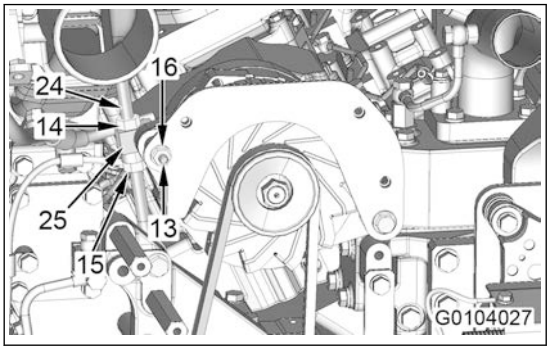
   Bolt (13): 53.9 to 122.6Nm{5.5 to 12.5kgm}

4. Tighten the nut (16) to the specified torque while you hold the bolt (13).

   Tool: Torque wrench (socket), socket wrench

   Nut (16): Width across flats 17mm

   Nut (16): 58.8 to 73.5Nm{6 to 7.5kgm}



5. Tighten the nut (14) to fix the plate (25).

   Tool: Torque wrench (open-end)

   Nut (14): Width across flats 22mm

   Nut (14): 108 to 132Nm{11 to 13.5kgm}

6. Check the deflection of the alternator belt (23) again.

   Push force: Approximately 59N {Approximately 6kg}

   Deflection: Approximately 10mm

   REMARK

   If deflection is out of the standard value, adjust the belt tension as follows.

   1) Loosen the nut (16).

      Tool: Socket wrench

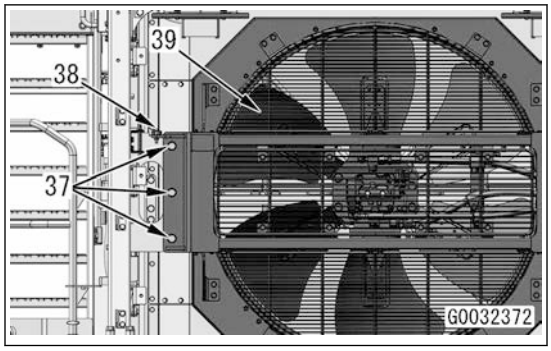
      Nut (16): Width across flats 17mm

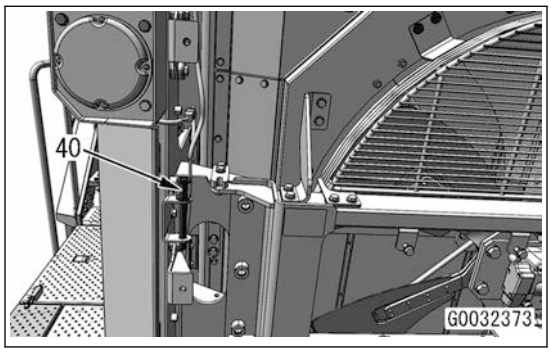
   2) Loosen the bolt (13).

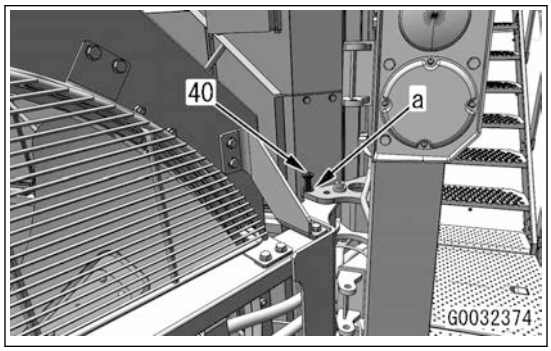
      Tool: Socket wrench

      Bolt (13): Width across flats 19mm

12. Remove the bolts (37) (3 pieces).
    Tool: Socket wrench
    Bolt (37): Width across flats 30 mm, M20
13. Loosen the bolt (38), and open the cooling fan assembly (39).
    REMARK
    The bolt (38) is used to for adjustment to keep the cooling fan assembly (39) horizontal.
    Tool: Socket wrench
    Bolt (38): Width across flats 19 mm, M12
14. Pull out the lock pin (40), fix the cooling fan assembly (39) at the points (a).

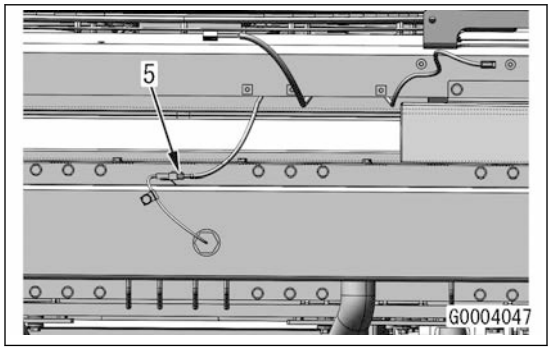




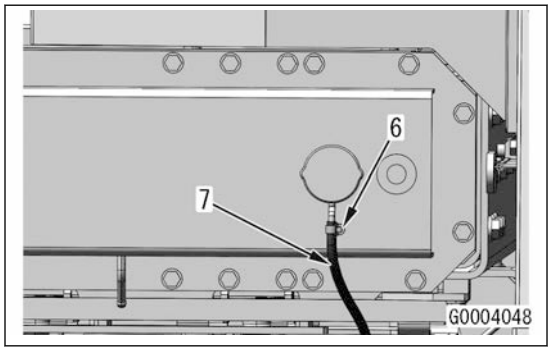


Upper tank assembly

15. Disconnect the connector G06 (5).



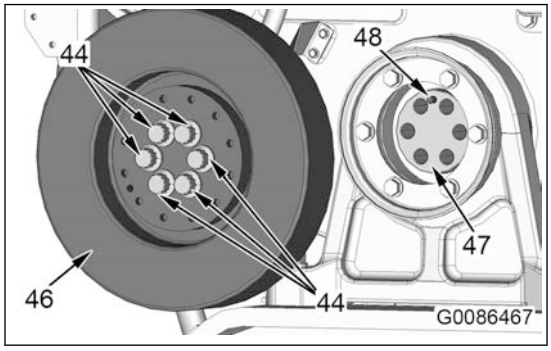
16. Remove the hose clamp (6), and disconnect the hose (7).
    Tool: Socket wrench
    Hose clamp (6): Width across flats 7 mm



No.	Part name	Part No.	Specifications	Q'ty	Remarks
19	Open-end wrench	Commercially available	36 mm	1	
20	Open-end wrench	Commercially available	41 mm	1	
21	Torque wrench (socket)	Commercially available	5.9±0.49 Nm 8.8±0.5 Nm 10.58±0.5 Nm 8 to 12 Nm 10.8 to 26.5 Nm 11.8 to 17.6 Nm 14.7 to 44.1 Nm 49.0 to 78.5 Nm 59 to 74 Nm 98 to 123 Nm 157 to 196 Nm 455 to 565 Nm 785 to 980 Nm	As required	
22	Torque wrench (open-end)	Commercially available	4.90 to 6.86 Nm 11.8 to 14.7 Nm 34 to 63 Nm 49.0 to 78.5 Nm 54 to 93 Nm 59 to 98 Nm 128 to 186 Nm 177 to 245 Nm	As required	
23	Torque screwdriver (flat-head)	Commercially available	1.5 to 2.0 Nm	1	
24	Flat-head screwdriver	Commercially available		1	
25	Webbing sling	Commercially available	25 mm (800 kg)	As required	(50 kg)
26	Coolant container	Commercially available		As required	
27	Eyebolt	Commercially available	M12	2	
28	2-point chain	Commercially available		As required	(30 kg), (4500 kg)

Vibration damper

2. Remove the bolts (44) (6 pieces), lift the vibration damper (46), and remove it.



REMARK

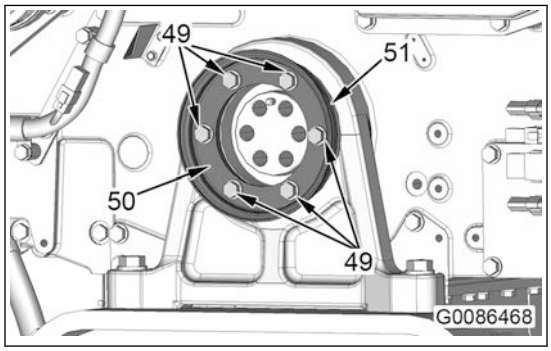
- Use the dodecagonal socket to remove the bolt (44).
- Be careful when you remove the vibration damper (46). It is installed together with the pin (48) of the crankshaft (47).

Tool: Socket wrench (dodecagonal), wire sling

Bolt (44): Width across flats 24mm, M22

Vibration damper (46): 50kg

3. Remove the bolts (49) (6 pieces), and remove the cover (50) and plate (51).

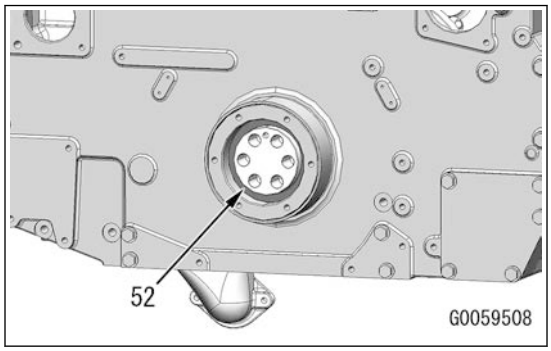


Tool: Socket wrench

Bolt (49): Width across flats 19mm, M12

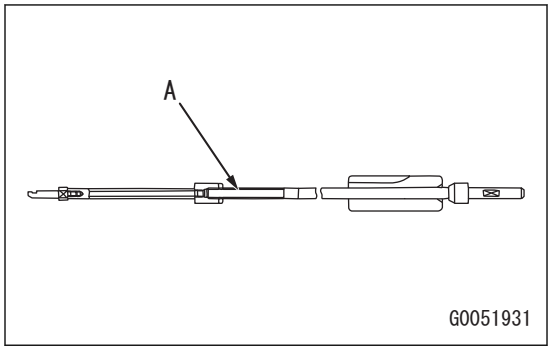
Engine front oil seal

4. Remove the engine front oil seal (52) as follows.



1) Change the front part of the seal puller (A) to hook type.

Tool: Seal puller (A)



Remove and Install Top Hood Assembly

Standard Tools to be Used When You Remove and Install the Top Hood Assembly

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

No.	Part name	Part No.	Specifications	Q'ty	Remarks
1	Socket wrench	Commercially available	7 mm	1	
2	Socket wrench	Commercially available	19 mm	1	
3	Torque wrench (socket)	Commercially available	4.4±0.49 Nm 98 to 123 Nm	As required	
4	Webbing sling	Commercially available		1	(650 kg)
5	Lever block	Commercially available		1	(650 kg)

⚠ **Stop the machine on a level ground, and set the parking brake switch to the ON position.**

⚠ **Set the frame lock bar to the LOCK position, and chock the tires.**

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

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

⚠ **Push the brake pedal to release the remaining pressure. (For details, see Testing and Adjusting, "Release Remained Pressure in Brake Accumulator Circuit".)**

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

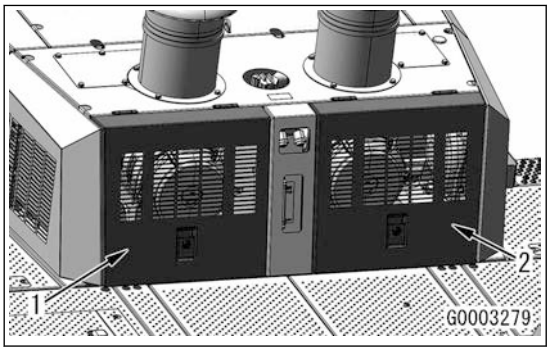
NOTICE

- **Install a plug or flange to the place where the hydraulic hose or tube is disconnected. If there is no plug or flange, cover it with the plastic bag and fix with the band.**
- **Before you disconnect the wirings and hoses, check the connector numbers and installed positions, and record them.**
- **If it is possible for the hoses to be deformed or damaged, remove the clips and clamps before you disconnect them.**

How to Remove Top Hood Assembly

Top hood assembly

1. Open the covers (1) and (2).



Damper

1. Install the plate (20) and washers (19) (8 pieces) to the inner body (15), and tighten the bolts (18) (8 pieces).

   REMARK

   - When you replace the spacer (11), press-fit it to the inner body (15).
   - Install the spacer (11) with the chamfer side (a) opposite to the flange (10).

   Tool: Torque wrench (socket)

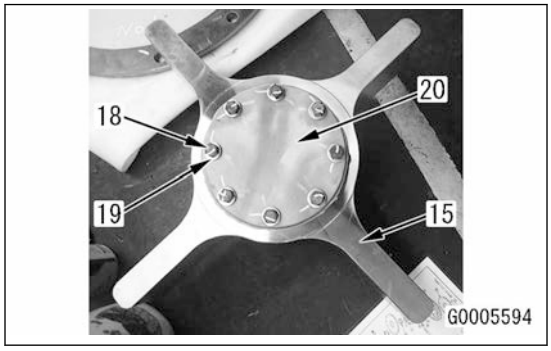
   Bolt (18): Width across flats 13 mm, M8

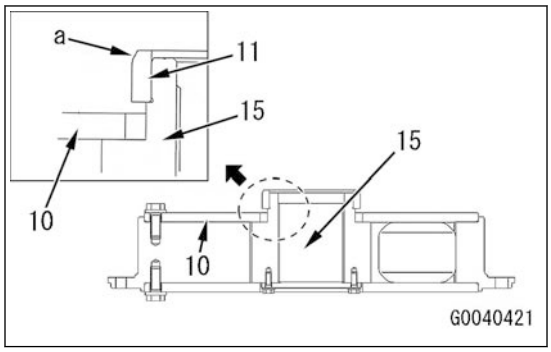
   Inner body (15): 25 kg

   Inner periphery of spacer (11): Liquid adhesive (Loctite #601)

   Contact surface of inner body (15) and plate (20): Liquid gasket (LG-6)

   Bolt (18): 27 to 34 Nm {2.8 to 3.5 kgm}





2. Install the flange (17) to the outer body (14), and tighten it with the bolts (16) (12 pieces).

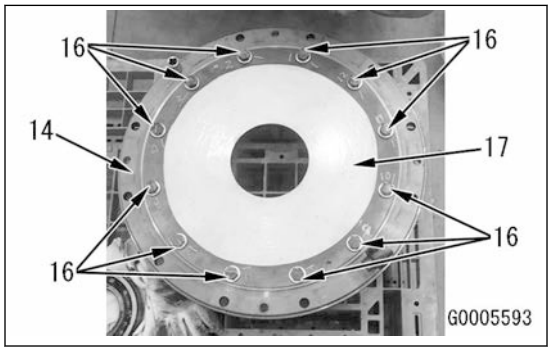
   Tool: Torque wrench (socket)

   Bolt (16): Width across flats 22 mm, M14

   Flange (17): 18 kg

   Contact surface of outer body (14) and flange (17): Liquid gasket (LG-6)

   Bolt (16): 157 to 196 Nm {16 to 20 kgm}



3. Turn over the outer body (14), and install the inner body (15).

   Outer body (14): 65 kg

   Inner body (15): 30 kg

   Inner periphery of outer body (14): Grease (G2-U-S)

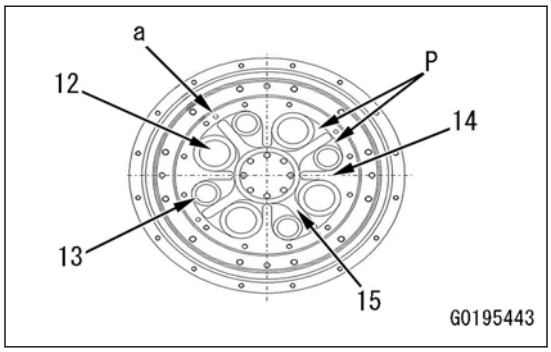
   Outside perimeter of inner body (15): Grease (G2-U-S)

4. Install the large rubbers (12) (4 pieces) and small rubbers (13) (4 pieces) as follows.

   REMARK

   - Large rubber (12): diameter 110 mm
   - Small rubber (13): diameter 75 mm

   1) Install the large rubbers (12) (4 pieces) and small rubbers (13) (4 pieces) alternately between the inner body (15) and outer body (14).

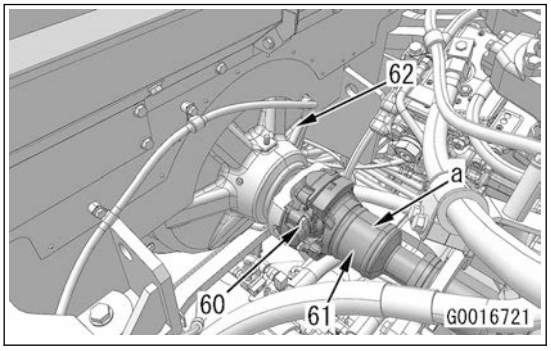


Drive shaft assembly

106. Lift the drive shaft assembly (61) at the points (a), and set it to the installation position.

Tool: Webbing sling

Drive shaft assembly (61): 65 kg



107. Connect the drive shaft assembly (61) with the bolts (60) (4 pieces).

REMARK

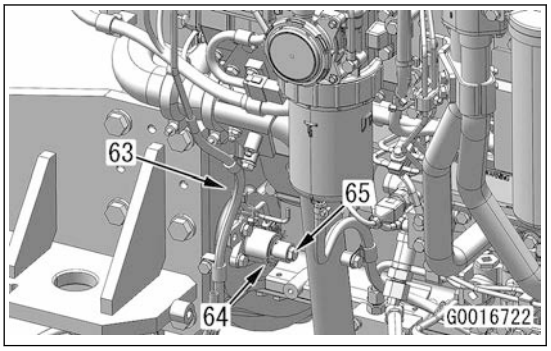
If the bolt hole position of the bolt (60) is not aligned, turn the barring device (65) on the flywheel (63) at the back of the damper assembly (62) to adjust the bolt hole position as follows.

Tool: Torque wrench (socket)

Bolt (60): Width across flats 22 mm, M14

Bolt (60): Liquid adhesive (LT-2)

Bolt (60): 157 to 196 Nm {16 to 20 kgm}



1) Remove the cotter pin (64).
2) Turn the barring device (65).

Tool: Open-end wrench

Barring device (65): Width across flats 19 mm

3) Connect the drive shaft (61), then install the cotter pin (64).

Top hood assembly

108. Install the top hood assembly. For details, see “Remove and Install Top Hood Assembly”.

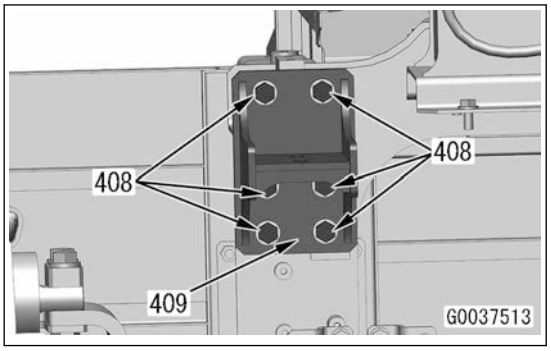
Support

109. Install the bracket (409) with the bolts (408) (6 pieces) at the right side of the machine.

Tool: Torque wrench (socket)

Bolt (408): Width across flats 24 mm, M16

Bolt (408): 235 to 285 Nm {23.5 to 29.5 kgm}

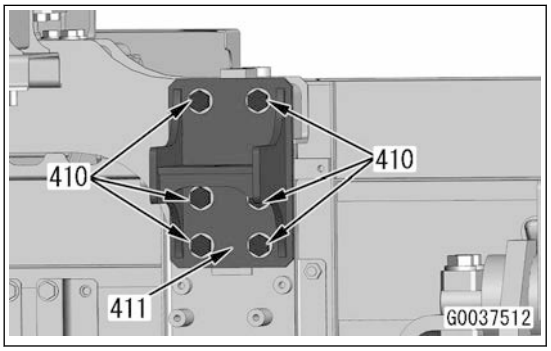


110. Install the bracket (411) with the bolts (410) (6 pieces) at the left side of the machine.

Tool: Torque wrench (socket)

Bolt (410): Width across flats 24 mm, M16

Bolt (410): 235 to 285 Nm {23.5 to 29.5 kgm}



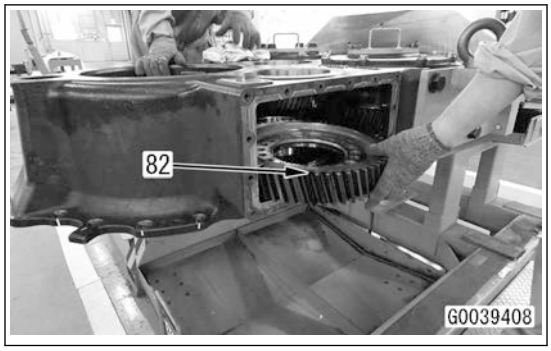
17. Set the drive gear (82) inside the input transfer and PTO case.

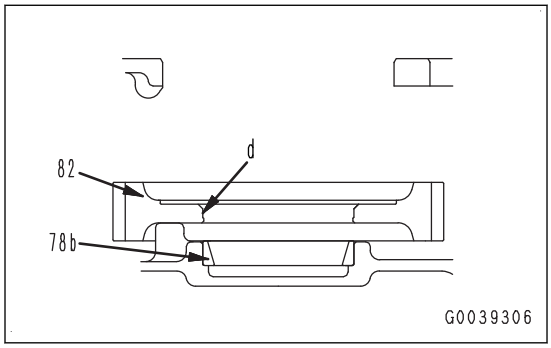
REMARK

- Insert it carefully. The gear can hit the case and be damaged.
- Set the drive gear (82) on the concentric of the outer race of bearing (78b).

Drive gear (82): 21 kg

Entire periphery (d) of drive gear (82): Grease (G0-LI or G2-LI)





18. Set the input shaft (80) to the input transfer and PTO case.

REMARK

- Insert it carefully. The bearing can hit the case and be damaged.
- Insert it while aligned with the hole of the drive gear (82) not to damage.

Tool: Eyebolt (M10, stem) (2 pieces), 2-point wire

Input shaft (80): 25 kg

19. Rotate the input shaft (80) to align the drive gear (82) with the bolt hole position, and install the bolts (81) (20 pieces).

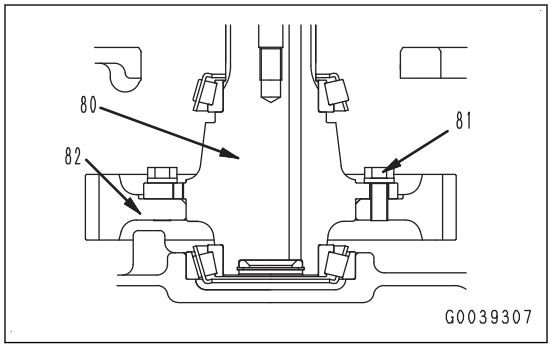
REMARK

Screw each bolt gradually not to tilt the drive gear (82) until it touches the input shaft (80).

Tool: Torque wrench (socket), extension bar

Bolt (81): Width across flats 24 mm, M16

Bolt (81): Liquid adhesive (LT-2)



20. Fix the input shaft (80).

Tool: Socket wrench, box-end combination wrench, bar (Q)

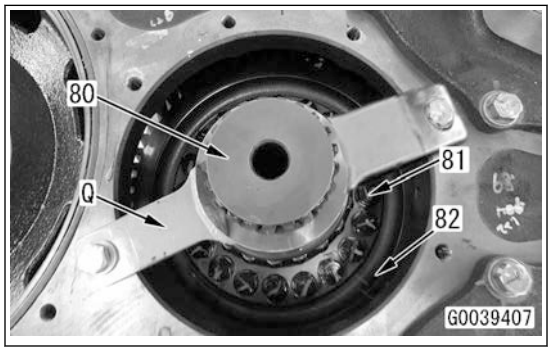
Mounting bolt (2 pieces) for bar (Q): Width across flats 19 mm, M12

21. Tighten the bolts (81) (20 pieces).

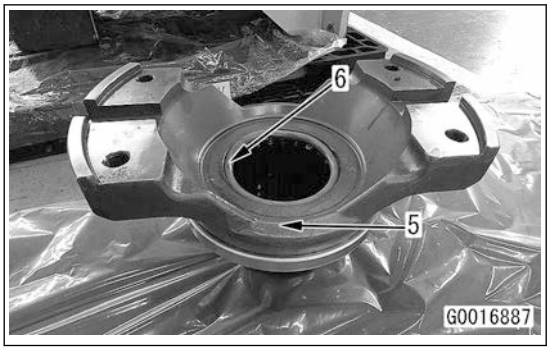
Tool: Torque wrench (socket), extension bar

Bolt (81): Width across flats 24 mm, M16

Bolt (81): 245 to 309 Nm {25 to 31.5 kgm}



4. Remove the O-ring (6) from the coupling (5).



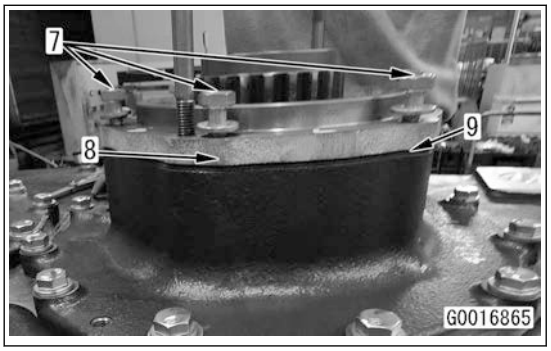
5. Remove the bolts (7) (6 pieces), and remove the cage (8).

REMARK

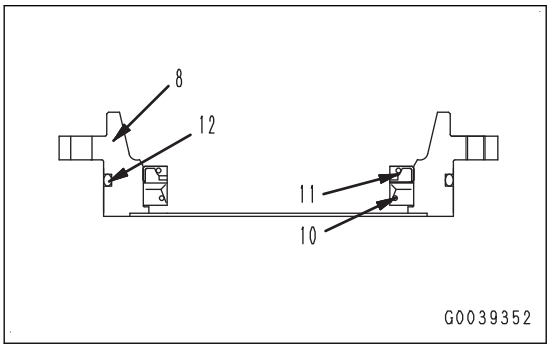
The shims (9) are installed. Write down the quantity and thickness of them.

Tool: Socket wrench, box-end combination wrench

Bolt (7): Width across flats 19 mm, M12



6. Remove the oil seal (10) and dust seal (11) from the cage (8).
7. Remove the O-ring (12) from the cage (8).



Strainer

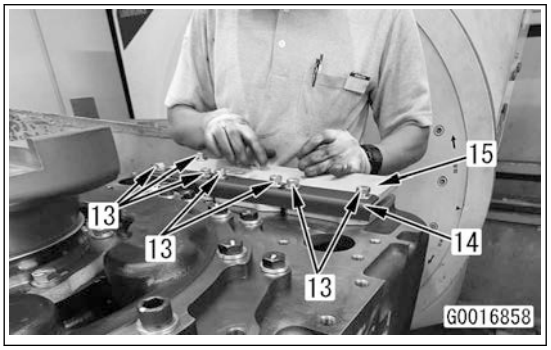
8. Turn over the transfer assembly.
9. Remove the bolts (13) (12 pieces), and remove the cover (14) and covers (15) (3 pieces).

REMARK

Remove the O-ring of the cover (15).

Tool: Socket wrench, box-end combination wrench

Bolt (13): Width across flats 19 mm, M12

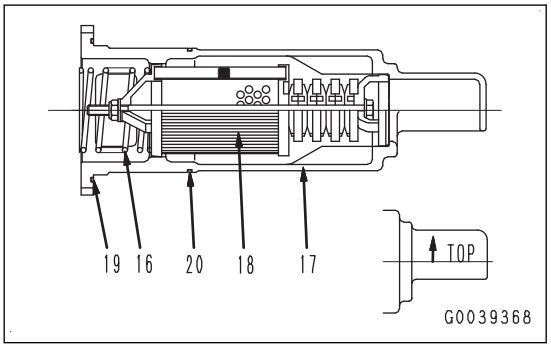


10. Remove the spring (16), and remove the case (17) and strainer (18).

REMARK

The springs (16), cases (17), and strainer (18) are provided 3 pieces for each.

11. Remove the O-rings (19) and (20) from the case (17).

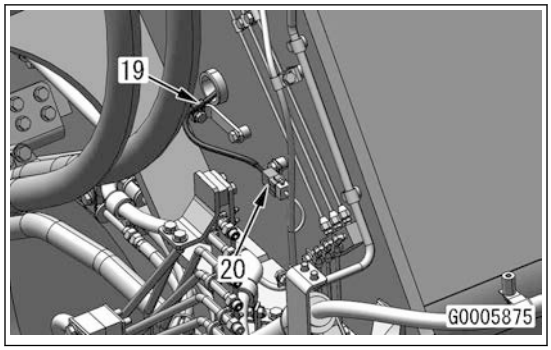


28. Connect the connector N20 (20) of the right headlamp wiring harness, and install the clamp (19).

    Tool: Torque wrench (socket)

    Bolt for clamp (19): Width across flats 17 mm, M10

    Bolt for clamp (19): 59 to 74 Nm {6 to 7.5 kgm}



Fill axle oil

29. Fill with Komatsu genuine oil to the specified level through the oil filler port of the axle housing. Start the engine to circulate the oil through the piping, and check the oil level again. (For details, see Specifications, “Fuel, Coolant, Lubricant”.)

9. Fix the pinion gear assembly (37), and tighten the lock nut (38) with the socket tool.

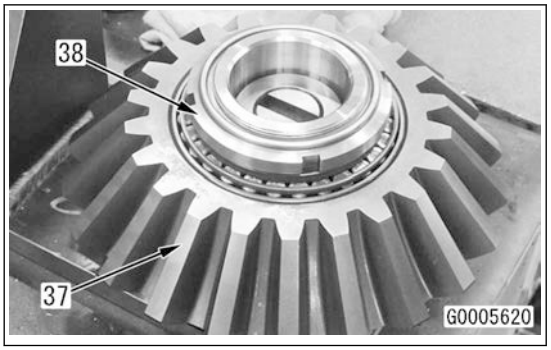
REMARK

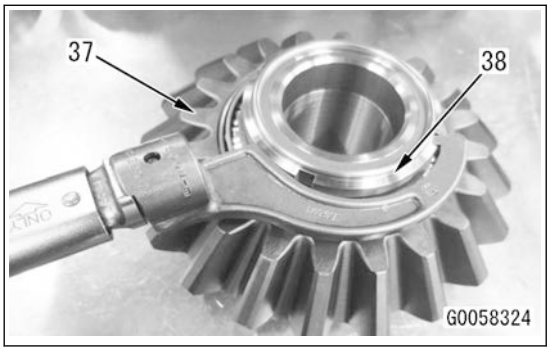
Make sure that the pinion turns smoothly after installation.

Tool: Torque wrench (socket), socket tool

Lock nut (38): Liquid adhesive (LT-2)

Lock nut (38): 882 to 1080 Nm {90 to 110 kgm}



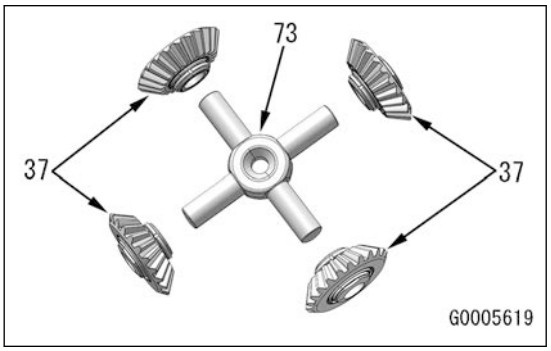


10. Install the pinion gear assemblies (37) (4 pieces) to the cross shaft (73).

REMARK

Be careful not to fall off the pinion gear assembly.

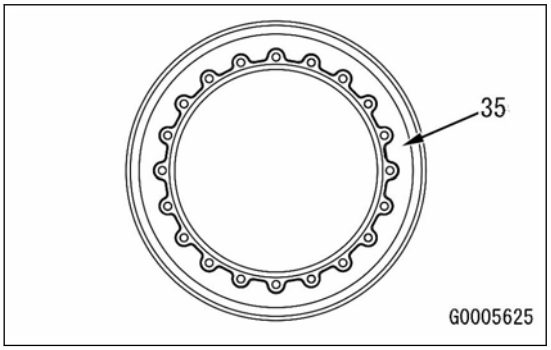
Pinion gear assembly (37): 20 kg



Assembly of bevel gear assembly

11. Apply Loctite around the thread hole of the bevel gear (35) in width of 2 to 3 mm as shown in the right figure.

Around thread hole of bevel gear (35): Liquid adhesive (Loctite #648)



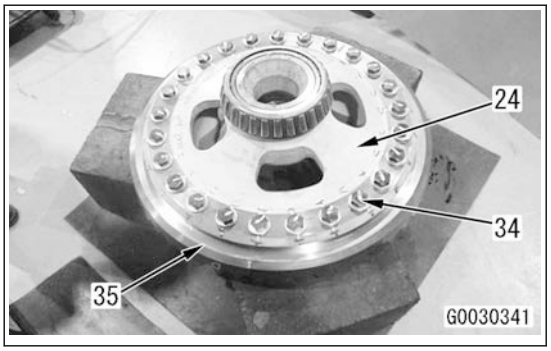
12. Install the flange case (24) to the bevel gear (35), and tighten it with the bolt (34).

REMARK

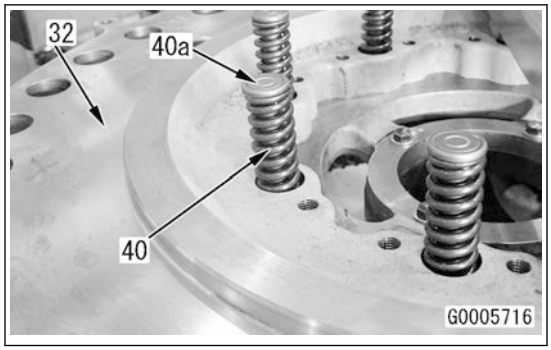
- Align the matchmarks of the bevel gear (35) and flange case (24).
- Make sure that there is no clearance between the bevel gear (35) and flange case (24).

Tool: Torque wrench (socket), webbing sling

Bolt (34): Width across flats 36 mm, M24



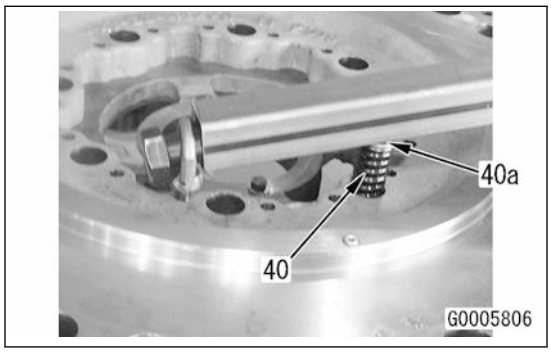
11. Install the spring (40) to the brake housing (32), and put the guide (40a) through the spring (40).
12. Push the guide (40a) to compress the spring (40).

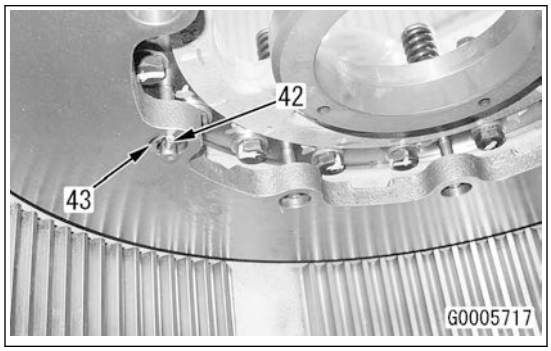


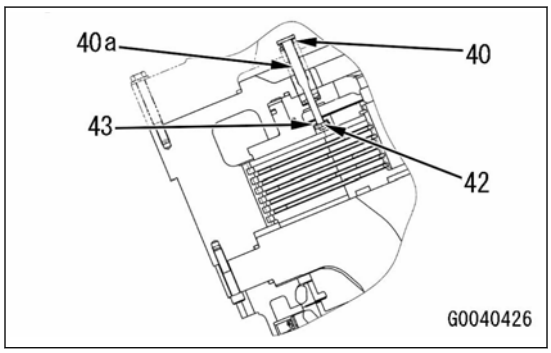
13. Install the washer (43) and pin (42) to the guide (40a) below the piston (41), and put the spring (40) to its initial position.

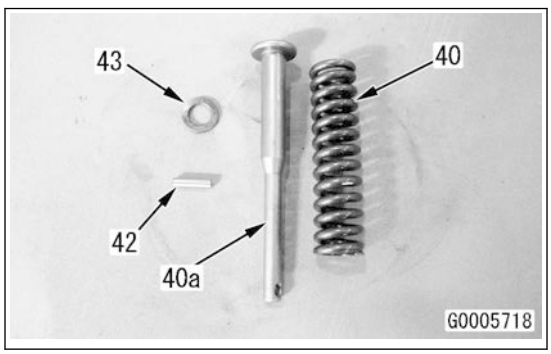
REMARK

- Make sure that the pin (42) and washer (43) do not lie on the piston (41) when the spring (40) returns to its initial position.
- Do the procedure from the step 11 to 13 for 8 places.

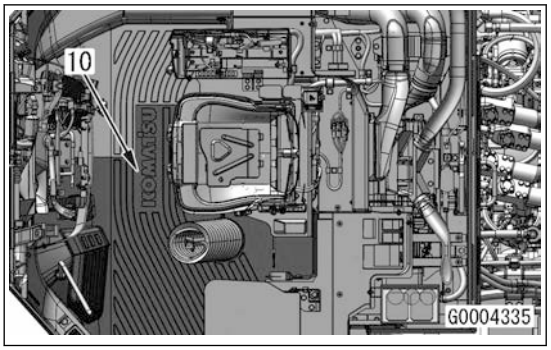








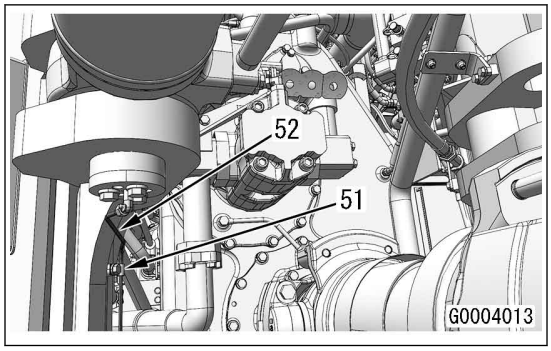
8. Install the left side floor mat (10).

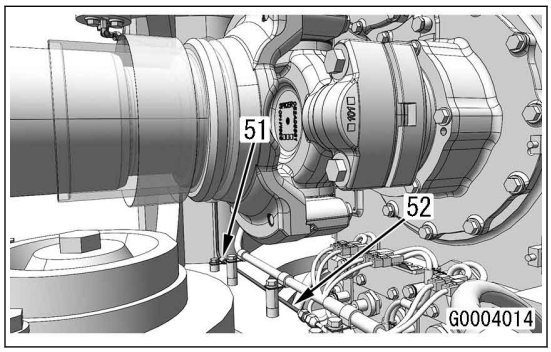


Bleed air from brake circuit

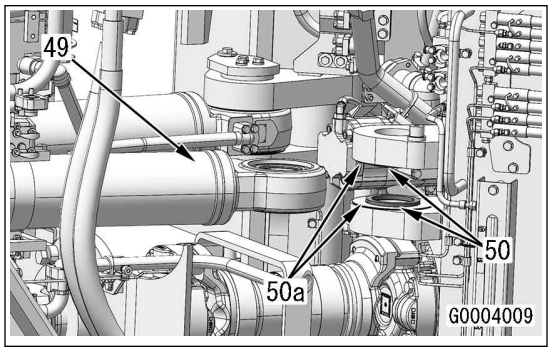
9. Bleed air from the brake circuit. (For details, see Testing and Adjusting, “Bleed Air from Brake Circuit”.)

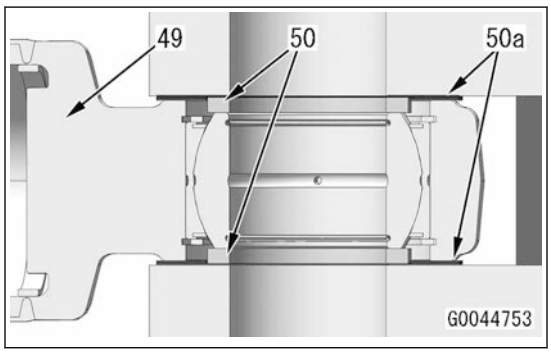
60. Install the lubrication tube (52).
    Tool: Torque wrench (open-end)
    Lubrication tube (52): Width across flats 17 mm
    Lubrication tube (52): 15.7 to 23.5 Nm {1.6 to 2.4 kgm}
61. Install the clamps (51) (2 pieces).
    Tool: Torque wrench (socket)
    Bolt for clamp (51): Width across flats 17 mm, M10
    Bolt for clamp (51): 59 to 74 Nm {6.0 to 7.5 kgm}





62. Expand the left steering cylinder assembly (49) to align it with the pin hole.
    ⚠ You must not put your finger into the pin hole when you align the pin holes.
63. Install the spacer (50) and shim (50a).
    REMARK
    Install the shims that are recorded.





Drain hydraulic oil

2. Drain hydraulic oil. For details, see “Drain and Add Hydraulic Oil”.

Top hood assembly

3. Remove the top hood assembly. For details, see “Remove and Install Top Hood Assembly”.

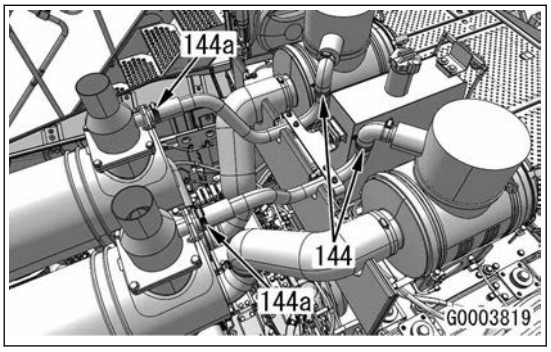
Air cleaner assembly

4. Remove the hose clamps (144) (2 pieces) and (144a) (2 pieces).

   Tool: Socket wrench

   Hose clamp (144): Width across flats 8 mm

   Hose clamp (144a): Width across flats 7 mm



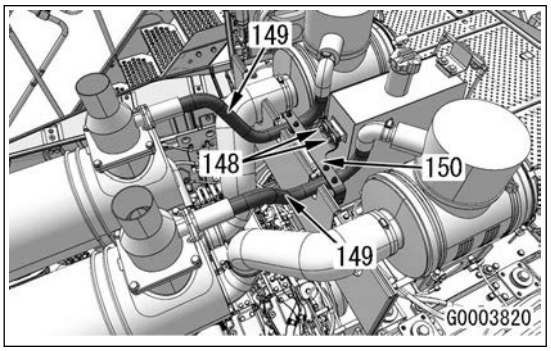
5. Remove the bolts (148) (2 pieces), and remove the hoses (149) (2 pieces) and bracket (150) together.

   REMARK

   The bracket (150) is attached to the hoses (149) (2 pieces) at this time.

   Tool: Socket wrench

   Bolt (148): Width across flats 19 mm, M12

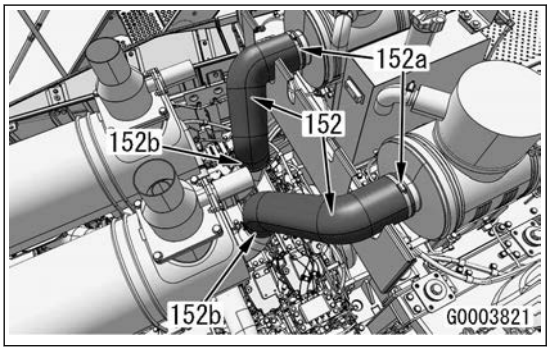


6. Remove the hose clamps (152a) (2 pieces) and (152b) (2 pieces), and disconnect the hoses (152) (2 pieces).

   Tool: Socket wrench

   Hose clamp (152a): Width across flats 8 mm

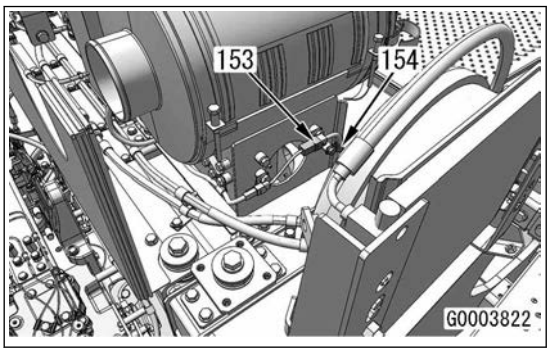
   Hose clamp (152b): Width across flats 8 mm



7. Disconnect the connector B24 (153).
8. Remove the connector B24 (153) from the connector stand.
9. Remove the clamp (154).

   Tool: Socket wrench

   Bolt for clamp (154): Width across flats 17 mm, M10



Symbol		Part name	Part No.	Specifications	Q'ty	Remarks
B	1	Plug (female)	02789-00628	#06	1	
	2	Plug (male)	07376-70628	#06	1	
	3	O-ring	02896-11018		1	

⚠ Stop the machine on a level ground, and set the parking brake switch to the ON position.

⚠ Set the frame lock bar to the LOCK position, and chock the tires.

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

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

⚠ Push the brake pedal to release the remaining pressure. (For details, see Testing and Adjusting, "Release Remained Pressure in Brake Accumulator Circuit".)

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

NOTICE

- **Install a plug or flange to the place where the hydraulic hose or tube is disconnected. If there is no plug or flange, cover it with the plastic bag and fix with the band.**
- **Before you disconnect the wirings and hoses, check the connector numbers and installed positions, and record them.**
- **If it is possible for the hoses to be deformed or damaged, remove the clips and clamps before you disconnect them.**

How to Remove Diverter Valve Assembly

Drain hydraulic oil

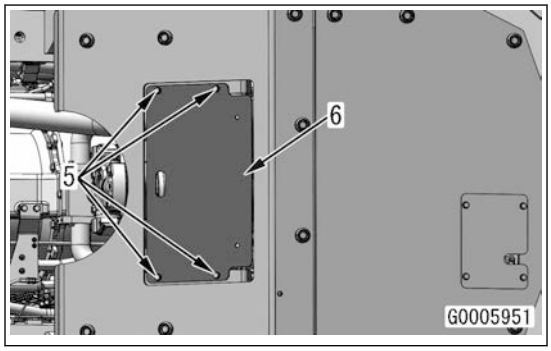
1. Drain hydraulic oil. For details, see "Drain and Add Hydraulic Oil".

Diverter valve assembly

2. Remove the bolts (5) (4 pieces), and open the cover (6) at the bottom of the machine.

   Tool: Socket wrench

   Bolt (5): Width across flats 19 mm, M12

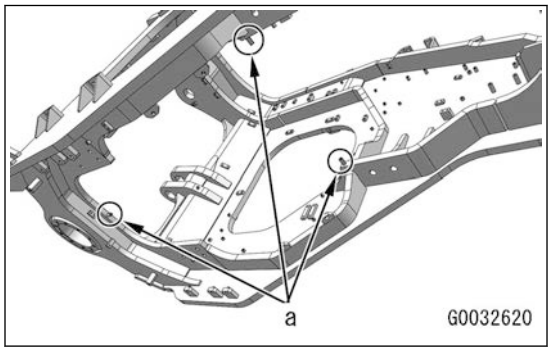


3. Install the lever block to the points (a).

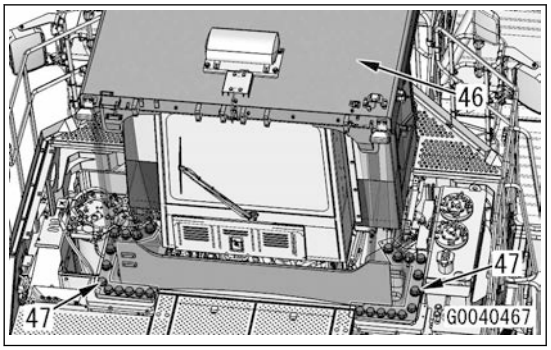
   REMARK

   Install the lever block to the right and left holes at the upper side.

   Tool: Lever block, flexible eyebolt (M12)



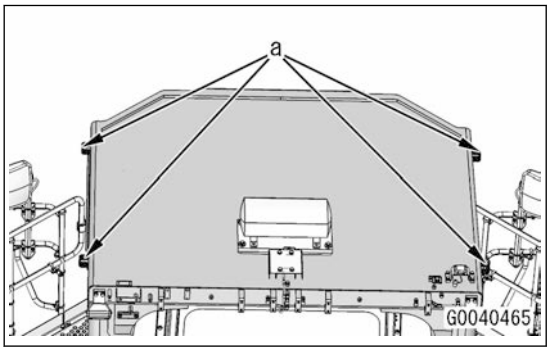
25. Remove the bolts (47) (24 pieces), lift the ROPS assembly (46), and remove it.
    Tool: Socket wrench
    Bolt (47): Width across flats 60 mm, M39



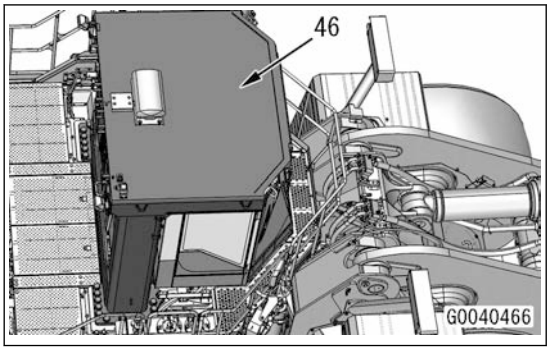
How to Install ROPS Assembly

ROPS assembly

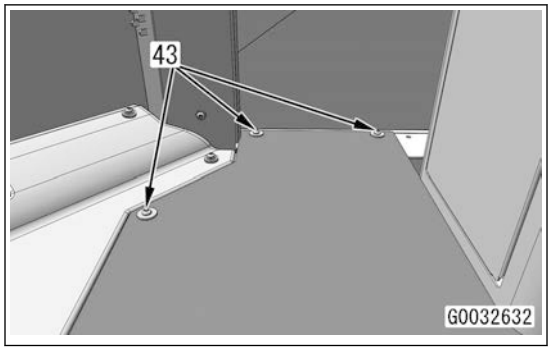
1. Attach the lifting tool to the points (a) (4 places).
    Tool: 4-point chain
    ROPS assembly (47): 2250 kg

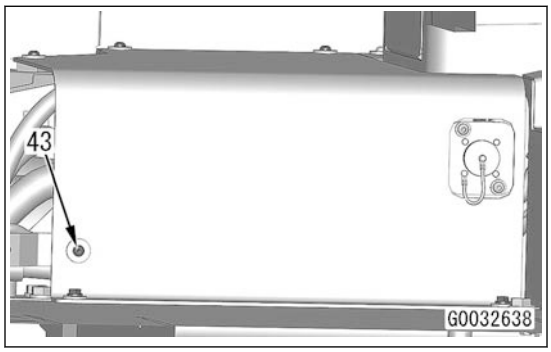


2. Lift the ROPS assembly (46), and set it to the installation position.

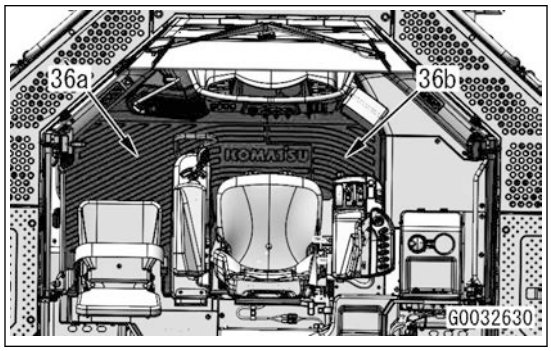


41. Install the hexagonal socket head screws (43) (4 pieces).
    Tool: Torque wrench (hexagonal)
    Hexagonal socket head screw (43): Width across flats 4 mm, M6
    Hexagonal socket head screw (43): 9.8 Nm {1.05 kgm} (target value)

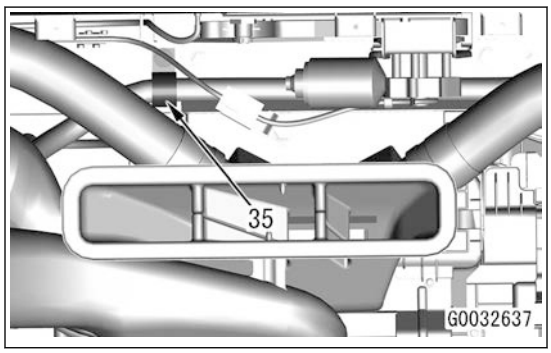




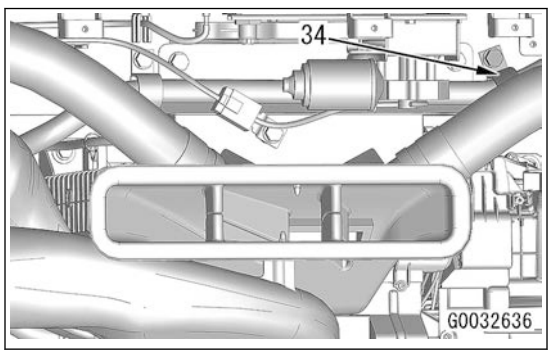
42. Install the floor mats (36a) and (36b).



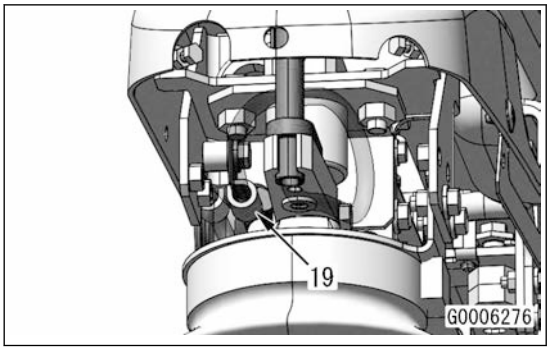
43. Install the clamp (35).
    Tool: Torque wrench (socket)
    Bolt for clamp (35): Width across flats 17 mm, M10
    Bolt for clamp (35): 59 to 74 Nm {6 to 7.5 kgm}



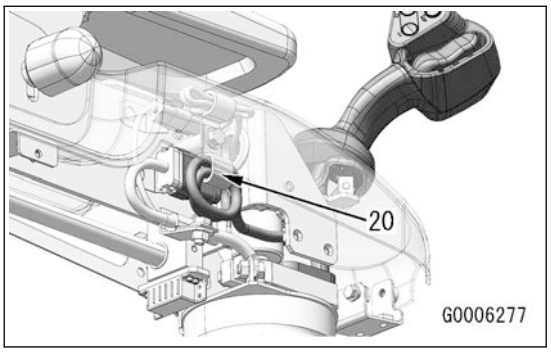
44. Install the clamp (34).
    Tool: Torque wrench (socket)
    Bolt for clamp (34): Width across flats 17 mm, M10
    Bolt for clamp (34): 59 to 74 Nm {6 to 7.5 kgm}



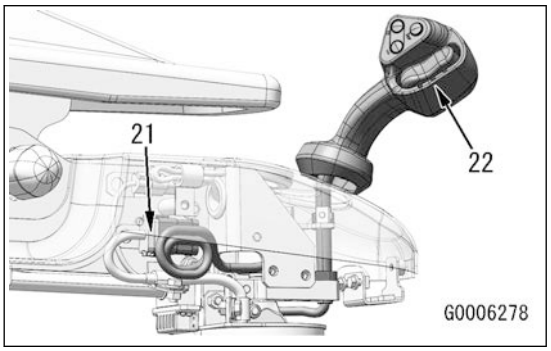
13. Remove the clamp (19).
    Tool: Box-end combination wrench
    Bolt for clamp (19): Width across flats 13 mm, M8



14. Remove the clamp (20).
    Tool: Open-end wrench
    Bolt for clamp (20): Width across flats 13 mm, M8



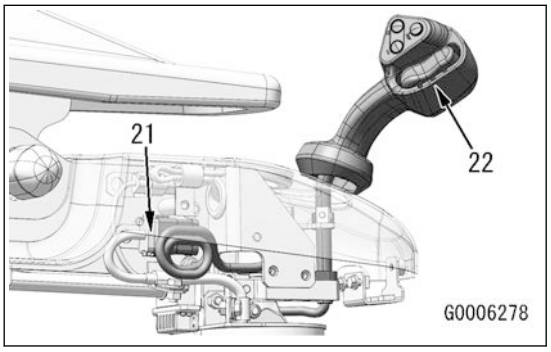
15. Disconnect the connector S31 (21), and remove the AJSS lever switch assembly (22).



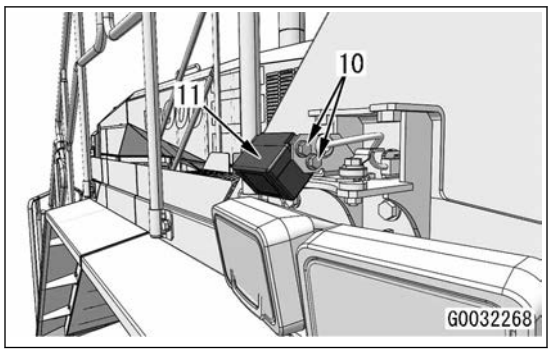
How to Install AJSS Lever Switch Assembly

AJSS lever switch assembly

1. Install the AJSS lever switch assembly (22), and connect the connector S31 (21).

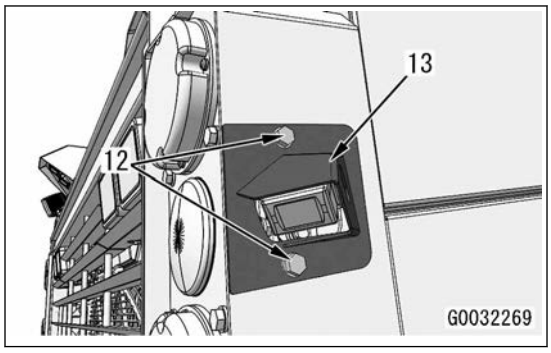


15. Remove the bolts (10) (2 pieces), and remove the camera assembly (11).
    Tool: Socket wrench
    Bolt (10): Width across flats 10 mm, M6

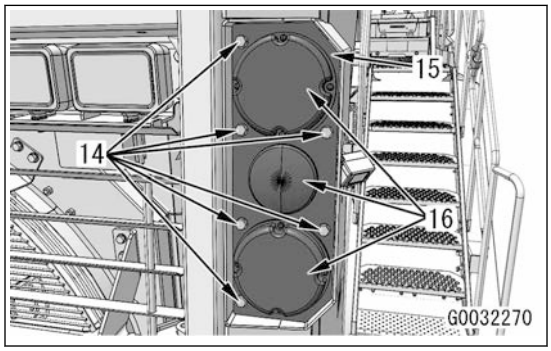


Right rear camera

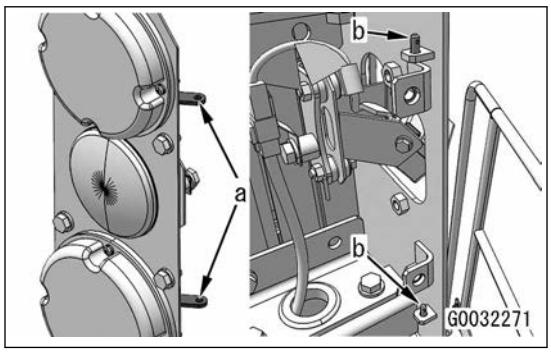
16. Remove the bolts (12) (2 pieces), and remove the cover (13).
    Tool: Socket wrench
    Bolt (12): Width across flats 17 mm, M10



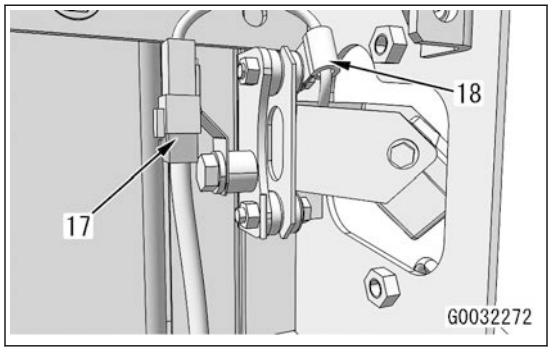
17. Remove the bolts (14) (6 pieces), and remove the cover (15) and tail lamp (16) together.
    REMARK
    The wiring harness is attached to the tail lamp (16) at this time.
    Tool: Socket wrench
    Bolt (14): Width across flats 17 mm, M10



18. Engage the (a) part of the cover with the pin (b) part.
    REMARK
    The pin (b) part is slightly below the (a) part of the cover.



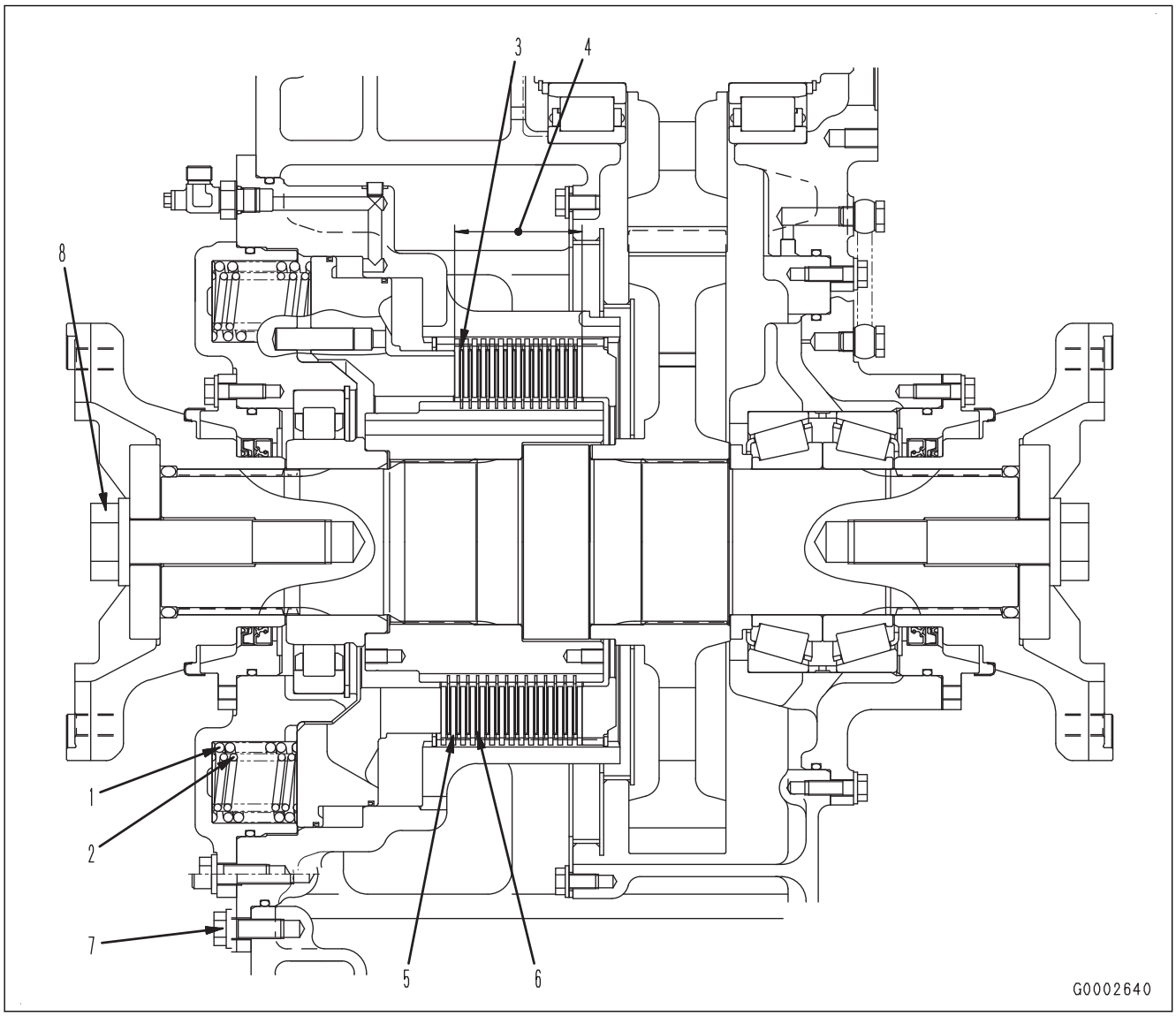
19. Disconnect the connector G35 (17), and remove it from the connector stand.
20. Remove the clamp (18).
    Tool: Socket wrench
    Bolt for clamp (18): Width across flats 13 mm, M8



Unit: mm

<table>
<tr><th>No.</th><th>Item</th><th colspan="5">Judgment criteria</th><th>Remedy</th></tr>
<tr><td>1</td><td>Tightening torque of bolt</td><td colspan="5">2450 to 3040 Nm {250 to 310 kgm}</td><td rowspan="4">Retighten</td></tr>
<tr><td>2</td><td>Tightening torque of bolt</td><td colspan="5">98 to 123 Nm {10 to 12.5 kgm}</td></tr>
<tr><td>3</td><td>Tightening torque of breather</td><td colspan="5">3 to 4 Nm {0.3 to 0.5 kgm}</td></tr>
<tr><td>4</td><td>Tightening torque of bolt</td><td colspan="5">98 to 123 Nm {10 to 12.5 kgm}</td></tr>
<tr><td rowspan="2">5</td><td rowspan="2">Clearance between case and bearing</td><td rowspan="2">Standard dimensions</td><td colspan="2">Tolerance</td><td rowspan="2">Standard clearance</td><td rowspan="2">Allowable clearance</td><td rowspan="5">Replace</td></tr>
<tr><td>Shaft</td><td>Hole</td></tr>
<tr><td>230</td><td>0
-0.030</td><td>-0.022
-0.051</td><td>-0.051 to 0.008</td><td>0.011</td></tr>
<tr><td>6</td><td>Clearance between case and bearing</td><td>215</td><td>0
-0.030</td><td>-0.022
-0.051</td><td>-0.051 to 0.008</td><td>0.011</td></tr>
<tr><td>7</td><td>Clearance between coupling shaft and bearing</td><td>130</td><td>+0.052
+0.027</td><td>0
-0.025</td><td>-0.077 to -0.027</td><td>-0.024</td></tr>
<tr><td>8</td><td>Clearance between coupling shaft and bearing</td><td>120</td><td>+0.045
+0.023</td><td>0
-0.020</td><td>-0.065 to -0.023</td><td>-0.020</td></tr>
<tr><td rowspan="2">9</td><td rowspan="2">Wear of oil seal contact surface</td><td colspan="2">Standard dimensions</td><td colspan="2">Tolerance</td><td colspan="2">Repair limit</td><td rowspan="3">Repair the chrome plating, and finish it with grinder, or replace it.</td></tr>
<tr><td colspan="2">160</td><td colspan="2">0
-0.100</td><td colspan="2">-0.20</td></tr>
<tr><td>10</td><td>Wear of oil seal contact surface</td><td colspan="2">160</td><td colspan="2">0
-0.100</td><td colspan="2">-0.20</td></tr>
<tr><td>11</td><td>End play of coupling shaft</td><td colspan="5">0.05 to 0.15</td><td>Adjust</td></tr>
</table>

Maintenance Standard for Parking Brake



- When the triple pressure switch is turned “off” in high and low-pressure line, the air conditioner controller turn the compressor clutch relay “off”, and the compressor magnetic clutch is released to protect the air conditioner components.
- When the triple pressure switch is turned “ON” in middle-pressure line, the electric fan of the condenser activates and controls the fan correctly.

Failure Code [879GKX]

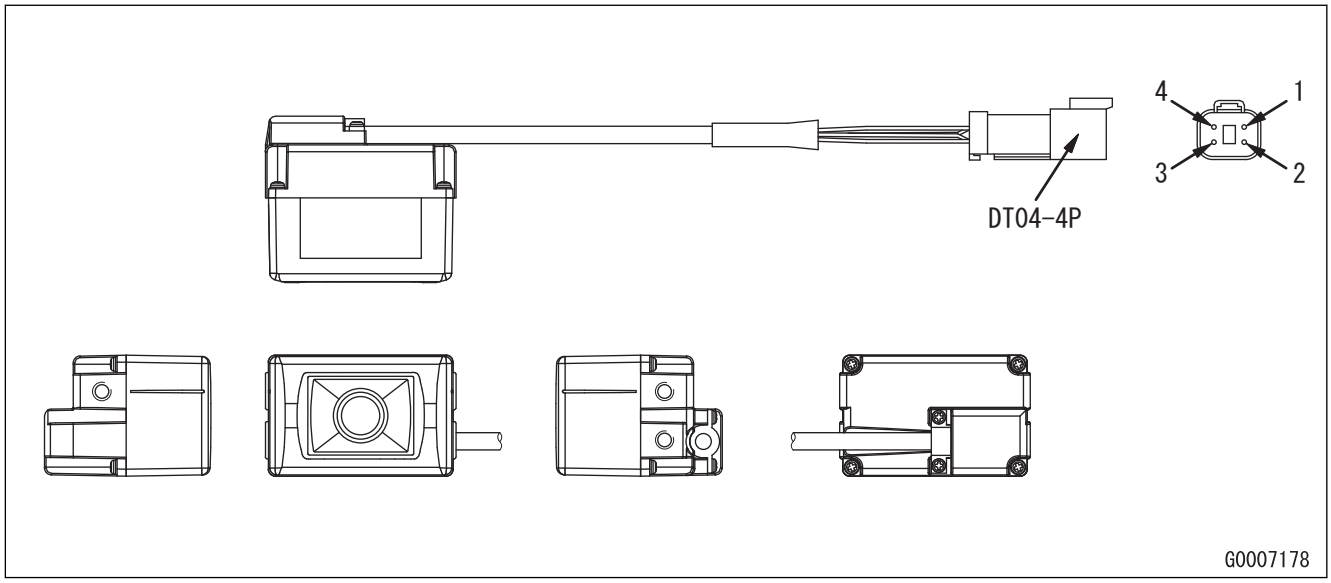
Details of failure	The air conditioner controller senses refrigerant abnormality.
Action level	L01
Action of controller	• The air conditioner controller transmits abnormality information of the refrigerant pressure to the machine monitor through CAN communication. • Air conditioner controller turns OFF the compressor clutch relay since the refrigerant pressure is abnormal. (Air conditioner compressor stops.)
Phenomenon on machine	The air conditioner does not operate effectively.
Related information	**Reference information** • Check if this failure code is shown on the Electrical Sys Abnormality Record screen of the service mode on the machine monitor. • For the connectors, see OTHERS, “LOCATIONS OF AIR CONDITIONER PARTS AND ARRANGEMENT OF CONNECTORS”. • The T-adapter is not provided on the connector ACECU of the air conditioner controller and its pin is small. So do the troubleshooting on the intermediate connector. (The T-adapter is not provided on the intermediate connector, but the pin is large.) • When you replace the connector ACECU of the air conditioner controller and air conditioner harness between the intermediate connectors, replace it as the air conditioner unit. • The T-adapter is not provided on the triple pressure switch connector.

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 for Troubleshooting”, “Checks Before Troubleshooting”, “ELECTRIC EQUIPMENT”. 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”.

KomVision Camera

Structure of KomVision Camera

General View



Input and Output Signals of KomVision Camera

DT04-4P

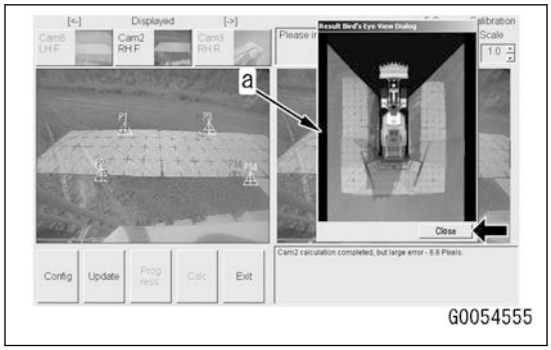
Pin No.	Signal name	Input/output signal
1	KomVision camera power supply (8 V)	Input
2	KomVision camera NTSC signal	Output
3	Image inversion signal	Input
4	GND (KomVision camera power supply)	-

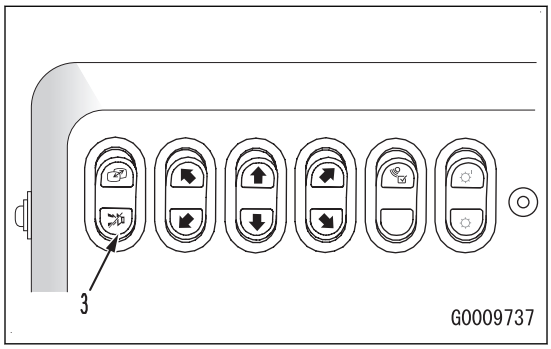
*1: Do not connect these pins. Malfunctions or failures can occur.

9. Check that the bird's eye view display made from all the cameras is correctly shown without gross distortion on the “Result Bird's Eye View Dialog” screen (a).
10. Select the “Close” button, and push the obstacle warning cancel switch (3).

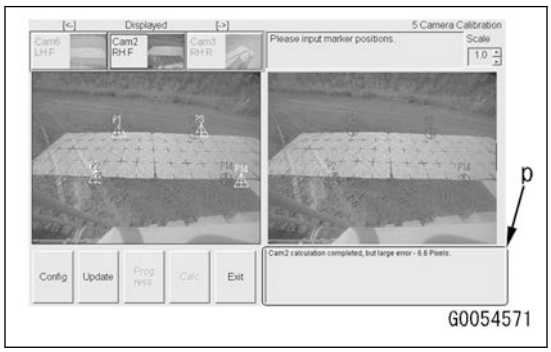
    The “Result Bird's Eye View Dialog” screen (a) is closed.

    Obstacle warning cancel switch (3): Validates the selection





11. When the result text window (p) is shown, do the operation that follows.
    - When the “Calculation Completed Successfully.” is shown:
      Go to step 12.
    - “Calculation completed, but large error - x.x Pixels. ”is shown:
      Set the marker positions again from step 6.

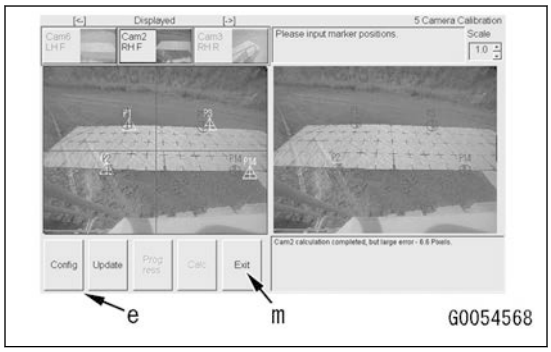


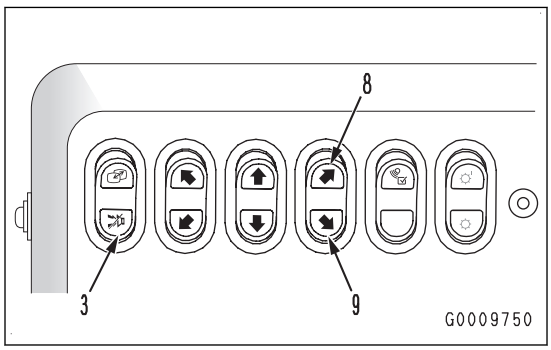
12. Push the right rear camera selector switch (9) to move the screen to the various setting window (e).
13. Push the right front camera selector switch (8) to select the “Exit” button (m), and push the obstacle warning cancel switch (3).

    Obstacle warning cancel switch (3): Validates the selection

    Right front camera selector switch (8): Moves the selection to the item on the right

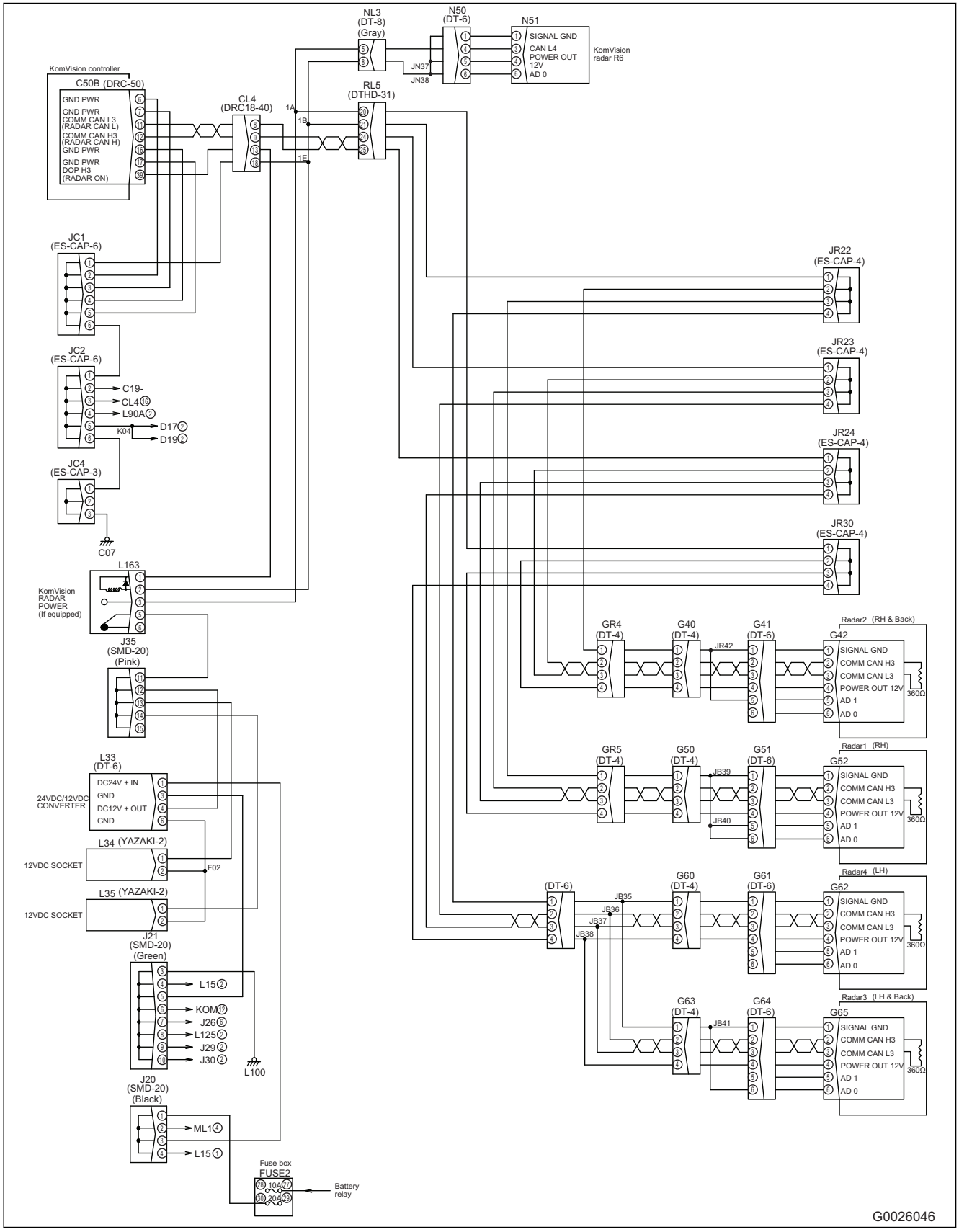
    Right rear camera selector switch (9): Moves the selection to the next item.





<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">14</td><td rowspan="2">Ground fault in wiring harness (CAN2 communication circuit)</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Make sure that the system operating lamp is not lit, set the battery disconnect switch to the OFF position.
3. Disconnect the connectors TMC2, AC1, BBC2, ECM_L_J2, ECM_R_J2, C50B, C30B, DPC3, MCM2, L80A, KOM/c_RES, and connect the T-adapter to the female side to troubleshoot.
4. Does the troubleshooting result agree with the standard value?
REMARK
Connectors C50B (female) (42) and (41) are not installed to the machines without KomVision. For troubleshooting, use connectors CL4 (female) (15) and (14).
<table>
<tr><th>Item</th><th>Measurement position/condition</th><th>Standard value</th></tr>
<tr><td rowspan="2">Resistance</td><td>Between TMC2 (female) (32), AC1 (female) (9), BBC2 (female) (32), ECM_L_J2 (female) (22), ECM_R_J2 (female) (22), C50B (female) (42), C30B (female) (42), DPC3 (female) (3), (7), MCM2 (female) (97), L80A (female) (10), KOM/c_RES (female) (A) and ground</td><td>Min. 1 MΩ</td></tr>
<tr><td>Between TMC2 (female) (22), AC1 (female) (10), BBC2 (female) (22), ECM_L_J2 (female) (46), ECM_R_J2 (female) (46), C50B (female) (41), C30B (female) (41), DPC3 (female) (8), MCM2 (female) (89), L80A (female) (11), KOM/c_RES (female) (B) and ground</td><td>Min. 1 MΩ</td></tr>
</table>
</td><td>YES</td><td>• There is no ground-fault being occurred in wiring harness.
• Go to the next check item.</td></tr>
<tr><td>NO</td><td>• There is ground-fault being occurred in wiring harness.
• Repair or replace the wiring harness.
• Go to “Confirmation of repair”.</td></tr>
</table>

Circuit Diagram of KomVision Radar



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? **REMARK** As it takes time to activate the controller, wait for approximately 1 minute and check the abnormality record.	YES	Go to the first check item.
			NO	The repair is completed.

<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">ACC signal circuit of KomVision monitor</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Make sure that the system operating lamp is not lit, the set the battery disconnect switch to the OFF position.
3. Insert the T-adapter into the connector L90A.
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 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 L90A (12) and (2)</td><td>20 to 30 Ω</td></tr></table></td><td>YES</td><td>• The ACC signal circuit of KomVision monitor is normal.
• Go to “KomVision monitor”.</td></tr>
<tr><td>NO</td><td>• The ACC signal circuit of the KomVision monitor is abnormal.
• Go to the next check item.</td></tr>
<tr><td rowspan="2">5</td><td rowspan="2">Open circuit in wiring harness
(ACC signal circuit of KomVision monitor)</td><td rowspan="2">1. Turn the starting switch to the OFF position.
2. Make sure that the system operating lamp is not lit, the set the battery disconnect switch to the OFF position.
3. Disconnect the connectors L14 and L90A, and connect the T-adapter to the each female side to troubleshoot.
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="3">Resistance</td><td>Between L14 (female) (1) and L90A (female) (12)</td><td>Max. 1 Ω</td></tr><tr><td>Between L14 (female) (4) and L90A (female) (12)</td><td>Max. 1 Ω</td></tr><tr><td>Between L90A (female) (2) and ground C05, C07</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>• Open circuit in wiring harness occurs.
• Repair or replace the wiring harness.
• Go to “Confirmation of repair”.</td></tr>
</table>