SEN06578-10

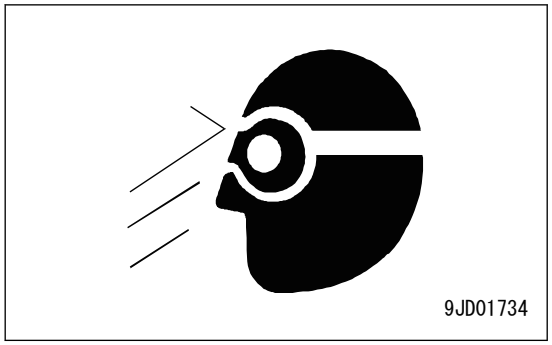
Shop Manual

BULLDOZER

D61EXi -24
D61PXi -24

SERIAL NUMBERS D61EXi- 40001 and up
D61PXi- 40001

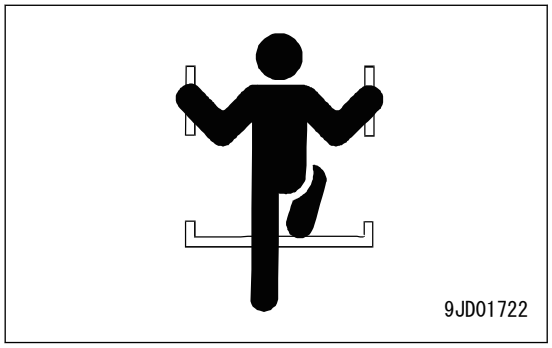
KOMATSU



- Always wear the protective eyeglasses when hitting parts with a hammer.
- Always wear the protective eyeglasses when grinding parts with a grinder, etc.
- When performing any operation with multiple workers, always agree on the operating procedure before starting. Be clear in verbal communication, and observe hand signals. Hang “UNDER REPAIR” warning tag in the operator's compartment Before starting work.
- Only the approved personnel can do the work in a closed environment or in a prohibited area.
- Work and operation which require license or qualification should be performed by qualified workers.
- Welding repairs should be performed by trained and experienced welders. When performing welding work, always wear welding gloves, apron, welding goggles, cap and other clothes suited for welding work.
- Warm up before starting the work with exercise which increases alertness and the range of motion in order to prevent injury.
- Avoid prolonged work, and take a rest at times to keep up a good condition. Take a rest at designated safe area.
- When you work in high places, use a platform.
- Before you start the work, use the personal fall-arrest equipment to prevent falling. There is a danger of personal accident that you fall by slipping.
- Always do the work correctly. If you find the unsafe behavior of co-worker, give him/her a notice and stop it.
- Because there is a danger that you are caught, be very careful when the work is done in dangerous areas such as: when you go in the range where the lifted load possibly falls, or when you stand directly in front of tire, or when you are near the sliding parts.
- When you handle chemical materials (such as nitrogen gas), see the MSDS (safety data sheet) and local guidelines, and get the important information (such as a safe handling method). Also, put on applicable protective equipment (such as protective goggles, gloves, and masks).
- If necessary, cut out all the power sources (electricity, oil pressure, compressed air, etc.) before you start the work. If the machine has a lock mechanism, set it to the LOCK position and install the warning tag in a position where it is easy to see. Do not release the lock until the work is completed.

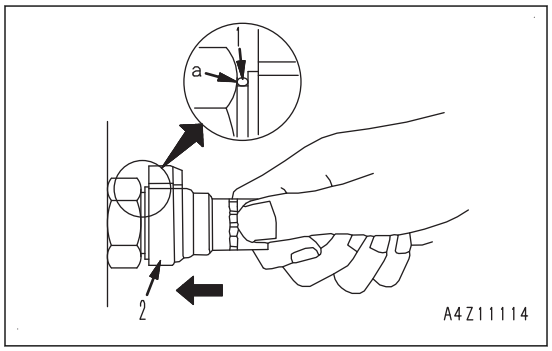
Precautions for Preparatory Work

- Place the machine on a firm and level ground, and apply the parking brake and chock the wheels or tracks to prevent the machine from moving before adding oil or making any repairs.
- Lower the work equipment (blade, ripper, bucket, etc.) to the ground before starting work. If this is not possible, insert the lock pin or use blocks to prevent the work equipment from falling. In addition, be sure to lock all the control levers and hang “UNDER REPAIR” warning tag on them.
- When performing the disassembling or assembling work, support the machine securely with blocks, jacks, or stands before starting the work.
- Remove all mud and oil from the steps or other places for going up and down on the machine. Always use the handrails, ladders or steps when for going up and down on the machine. Never jump on or off the machine. When the scaffold is not provided, use steps or stepladder to secure your footing. Do not use handrails, ladders, or steps if they are damaged or deformed. Repair it or replace it immediately.



Connection

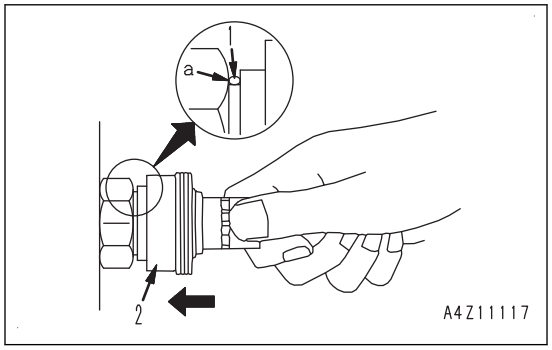
Hold the tightening adapter part, and push body (2) straight until sliding prevention ring (1) contacts contact surface (a) of the hexagonal part at the male end.



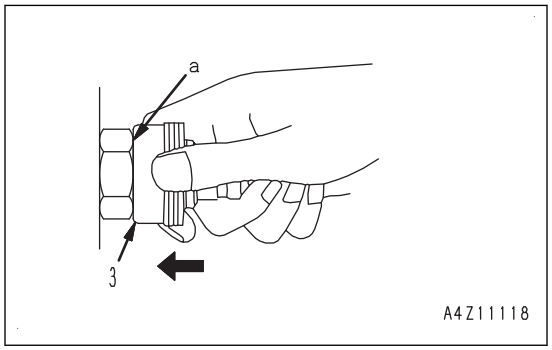
How to Disconnect and Connect Type 3 Push-Pull Type Coupler

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.



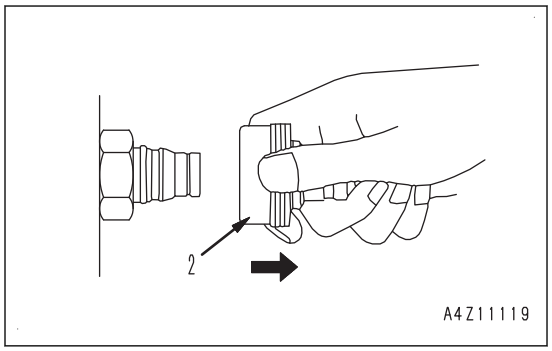
2. While keeping the condition of step 1, push cover (3) straight until it contacts contact surface (a) of the hexagonal portion on the male side.



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

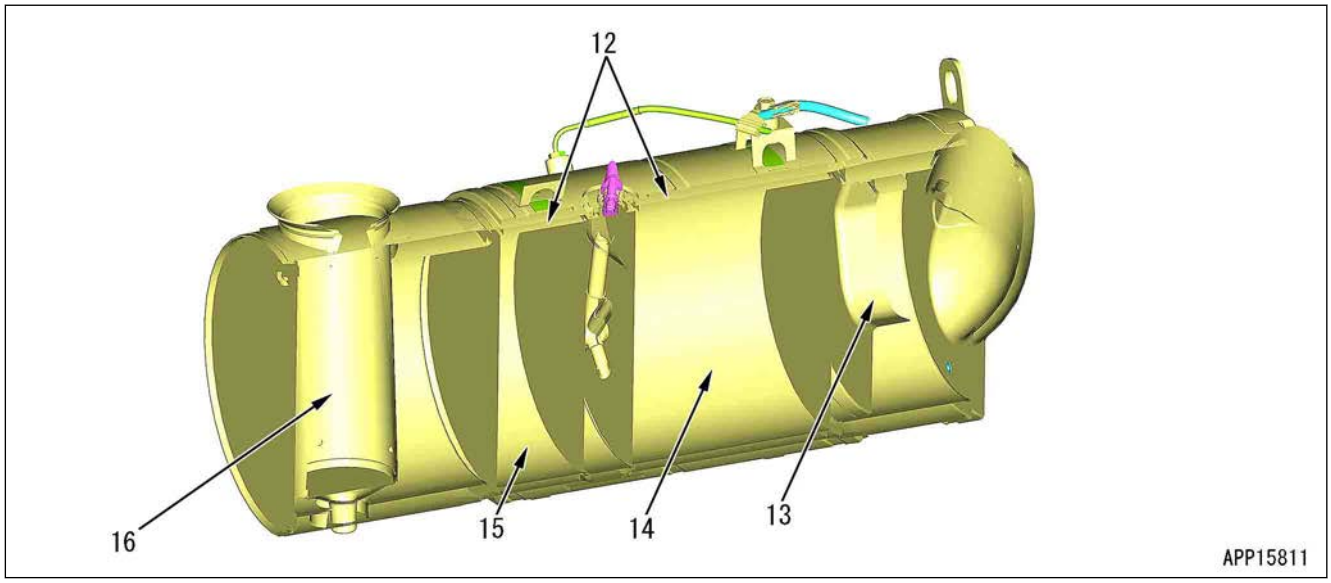
   REMARK

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



1 °C = 33.8 °F

°C		°F	°C		°F	°C		°F	°C		°F
-27.8	-18	-0.4	-8.3	17	62.6	11.1	52	125.6	30.6	87	188.6
-27.2	-17	1.4	-7.8	18	64.4	11.7	53	127.4	31.1	88	190.4
-26.7	-16	3.2	-7.2	19	66.2	12.2	54	129.2	31.7	89	192.2
-26.1	-15	5.0	-6.7	20	68.0	12.8	55	131.0	32.2	90	194.0
-25.6	-14	6.8	-6.1	21	69.8	13.3	56	132.8	32.8	91	195.8
-25.0	-13	8.6	-5.6	22	71.6	13.9	57	134.6	33.3	92	197.6
-24.4	-12	10.4	-5.0	23	73.4	14.4	58	136.4	33.9	93	199.4
-23.9	-11	12.2	-4.4	24	75.2	15.0	59	138.2	34.4	94	201.2
-23.3	-10	14.0	-3.9	25	77.0	15.6	60	140.0	35.0	95	203.0
-22.8	-9	15.8	-3.3	26	78.8	16.1	61	141.8	35.6	96	204.8
-22.2	-8	17.6	-2.8	27	80.6	16.7	62	143.6	36.1	97	206.6
-21.7	-7	19.4	-2.2	28	82.4	17.2	63	145.4	36.7	98	208.4
-21.1	-6	21.2	-1.7	29	84.2	17.8	64	147.2	37.2	99	210.2
-20.6	-5	23.0	-1.1	30	86.0	18.3	65	149.0	37.8	100	212.0
-20.0	-4	24.8	-0.6	31	87.8	18.9	66	150.8	40.6	105	221.0
-19.4	-3	26.6	0	32	89.6	19.4	67	152.6	43.3	110	230.0
-18.9	-2	28.4	0.6	33	91.4	20.0	68	154.4	46.1	115	239.0
-18.3	-1	30.2	1.1	34	93.2	20.6	69	156.2	48.9	120	248.0
-17.8	0	32.0	1.7	35	95.0	21.1	70	158.0	51.7	125	257.0
-17.2	1	33.8	2.2	36	96.8	21.7	71	159.8	54.4	130	266.0
-16.7	2	35.6	2.8	37	98.6	22.2	72	161.6	57.2	135	275.0
-16.1	3	37.4	3.3	38	100.4	22.8	73	163.4	60.0	140	284.0
-15.6	4	39.2	3.9	39	102.2	23.3	74	165.2	62.7	145	293.0
-15.0	5	41.0	4.4	40	104.0	23.9	75	167.0	65.6	150	302.0
-14.4	6	42.8	5.0	41	105.8	24.4	76	168.8	68.3	155	311.0
-13.9	7	44.6	5.6	42	107.6	25.0	77	170.6	71.1	160	320.0
-13.3	8	46.4	6.1	43	109.4	25.6	78	172.4	73.9	165	329.0
-12.8	9	48.2	6.7	44	111.2	26.1	79	174.2	76.7	170	338.0
-12.2	10	50.0	7.2	45	113.0	26.7	80	176.0	79.4	175	347.0



A: From DEF mixing tube
1: SCR body
2: SCR temperature sensor
3: SCR outlet NOx sensor
4: SCR outlet temperature sensor
5: Temperature sensor controller
6: Ammonia sensor
7: Hanger plate
8: water baffle
9: Water drain port
B: To exhaust pipe
10: Sensor table
11: Sensor table band
12: Catalyzer hold mat
13: Water dam
14: Downstream SCR catalyst and ammonia oxidation catalyst (integrated type)
15: Upstream SCR catalyst
16: Rectifier tube

- SCR assembly consists of rectifier tube (16) equalizing the distribution of flow speed by leading exhaust gas, upstream SCR catalyst (15), downstream SCR catalyst, ammonia oxidation catalyst (14), and water dam which prevents rain water from entering into downstream SCR catalyst and ammonia oxidation catalyst (14) while exhausting gas.
- Ammonia oxidation catalyst (a part of 14) oxidizes ammonia to water and nitrogen with ammonia oxidation catalyst (a part of 14) to prevent ammonia which is supplied to SCR assembly from being released out because SCR catalyst (a part of 14, 15)cannot completely consume it.
- Each 1 piece of SCR temperature sensor (2), SCR outlet temperature sensor (4), ammonia sensor (6), and SCR outlet NOx sensor (3) are installed. These sensors are usable for various troubleshooting, such as they are used to control the feedback of denitration efficiency or they monitor that SCR catalyst properly functions or not.
- Rectifying tube (16) equalizes the distribution of exhaust gas flow speed.
- SCR catalyst (15, a part of 14) uses the ceramic honeycomb.
- The catalyzer holding mat (12) is made of a specific fiber and protects the ceramic catalyst against vibrations by the engine and the machine body. It also protects the outer periphery of SCR assembly against a heat transfer of the ceramics during operation.
- Water dam (13) is located at the upstream side of the outlet and prevents rainwater from entering into downstream SCR catalyst unit and ammonia oxidation catalyst (14).
- Water baffle (8) is located at the downstream side of the outlet and prevents rainwater at outlet from splashing over the detection part of NOx sensor.

NOTICE

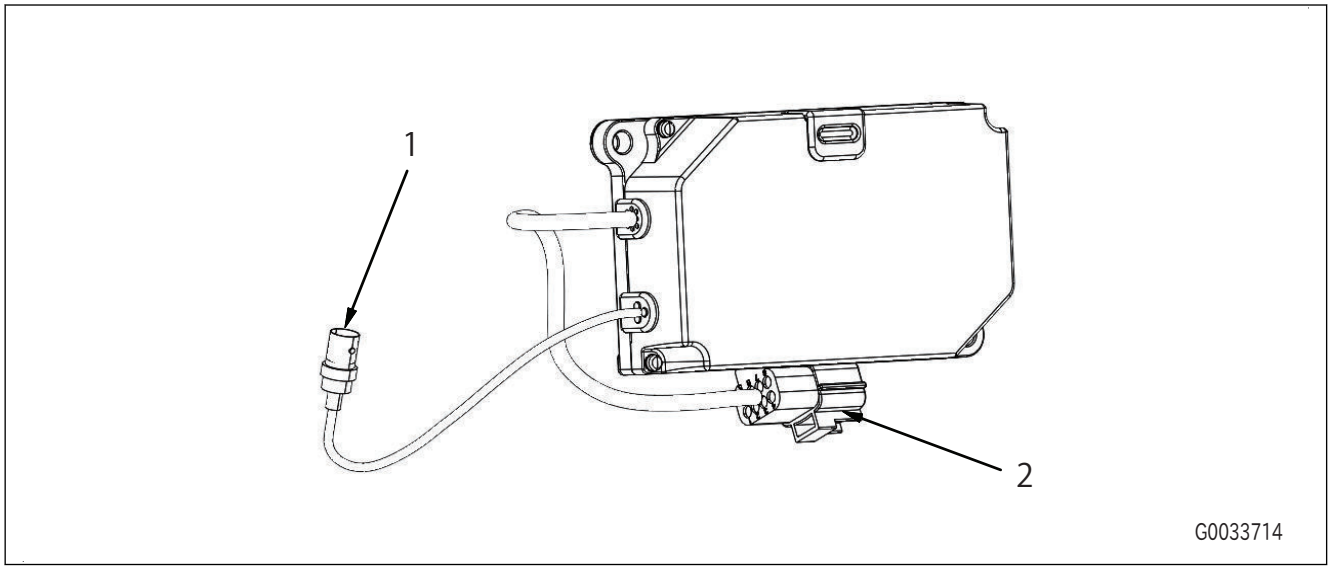
When “Fix to x min.” is selected in the “Auto Idle Stop Time Fixing” (service menu), 60 minutes after the lock lever is set to LOCK position, even when the Service menu is being used, the screen changes to the operator screen automatically and the auto idle stop function operates.
Check the set value of the auto idle stop function before performing the work with the Service menu.

1: Hydraulic oil cooler bypass valve 2: HST charge safety valve

This valve consists of a hydraulic oil cooler bypass valve and a HST charge safety valve.

Structure of Iridium Communication Terminal

General View



1: Iridium antenna connecting part

2: Connecting part of the Gateway Function Controller harness (AMP-8P)

Input and Output Signals of Iridium Communication Terminal

AMP-8P “CN-CK06”

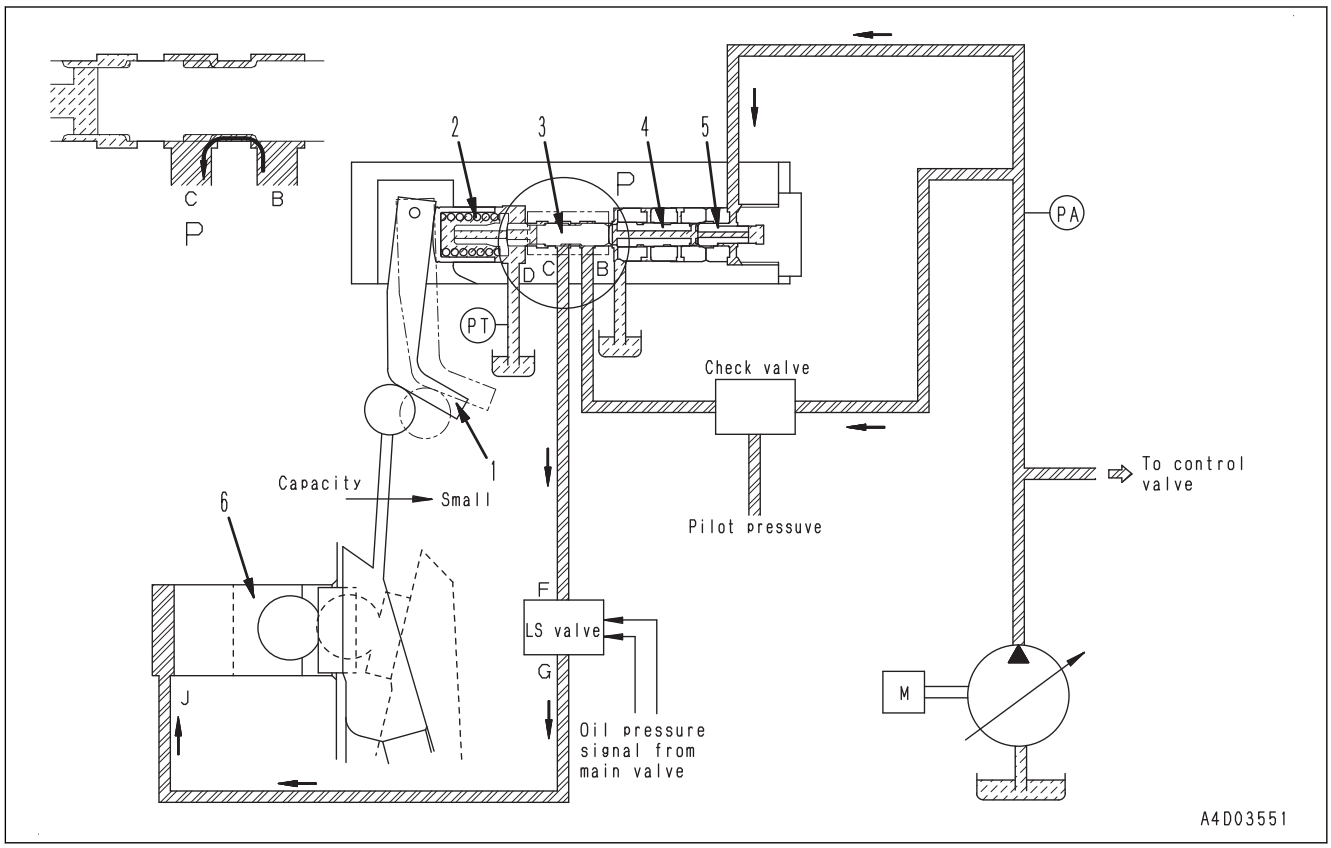
Pin No.	Name of signal	Input and output signals
1	Communication terminal power supply	Input
2	Communication terminal starting signal	Input
3	Communication terminal power supply GND	-
4	Communication terminal call-in start signal	Output
5	Ethernet_100BASE-TX RX+	Input
6	Ethernet_100BASE-TX RX-	Input
7	Ethernet_100BASE-TX TX+	Output
8	Ethernet_100BASE-TX TX-	Output

BNC-1P

Pin No.	Name of signal	Input and output signals
1	Iridium antenna connector	—

2. If servo piston (6) moves to the right, spring (2) is compressed through lever (1), and the spring force changes.
3. The force of pressing piston (5) decreases, and spool (3) is on the right side position.
4. Port (C) is connected to port (D), and the pressure entering LS valve becomes drain pressure (PT).
5. The servo piston (6) moves to the left when port (F) is connected to port (G) of the LS valve, and the pressure in port (J) becomes drain pressure (PT).
6. The pump discharged volume increases.
7. As servo piston (6) moves, lever (1) moves to the left, spring (2) expands, and the spring force decreases.
8. When the spring force decreases, spool (3) moves to the left. Ports (C) and (D) are blocked, and pump discharged pressure ports (B) and (C) are connected.
9. Servo piston (6) stops moving to the left, since the pressure in port (C) rises and the piston pressure increases.

When Pump Pressure (PA) is High



1. The force of pressing piston (5) increases, and spool (3) is on the left side position.
2. Ports (B) and (C) are connected and the pressure entering LS valve becomes pump pressure (PA).
3. When ports(F) and (G) of LS valve are connected, the pressure in port (J) becomes pump pressure (PA) and servo piston (6) moves to the right.
4. The pump discharged volume decreases.
5. As servo piston (6) moves, lever (1) moves to the right.
6. Spring (2) is compressed, and spring force is increased.
7. Consequently, spool (3) moves to the right and port (C) is disconnected from port (B), and drain pressure ports (D) and (C) are connected.

Number of lit segments in gear speed gauge						Set travel speed (km/h)					
F gear speed gauge	R gear speed gauge (reverse travel speed setting)					Forward	Reverse (reverse travel speed setting)				
	A “-1”	B “0”	C “+1”	D “+2”	E “+3”		A “-1”	B “0”	C “+1”	D “+2”	E “+3”
32	29	32	35	38	40	7.1	6.2	7.1	8.0	8.9	9.0
34	31	34	37	40	40	7.5	6.6	7.5	8.4	9.0	9.0
36	33	36	39	40	40	8.0	7.1	8.0	8.9	9.0	9.0
38	35	38	40	40	40	8.5	7.6	8.5	9.0	9.0	9.0
40	37	40	40	40	40	9.0	8.1	9.0	9.0	9.0	9.0

Quick Shift Mode

		Number of lit segments in gear speed gauge						Set travel speed (km/h)					
		F gear speed gauge	R gear speed gauge (reverse travel speed setting)					For-ward	Reverse (reverse travel speed setting)				
			A “-1”	B “0”	C “+1”	D “+2”	E “+3”		A “-1”	B “0”	C “+1”	D “+2”	E “+3”
1st	-2	10	8	10	12	14	16	2.4	2.0	2.4	2.9	3.4	3.8
	-1	12	10	12	15	18	21	2.9	2.3	2.9	3.5	4.1	4.7
	0 (*1)	14	11	14	18	22	25	3.4	2.7	3.4	4.1	4.8	5.5
	+1	16	12	16	20	24	27	3.8	3.0	3.8	4.5	5.2	6.0
	+2	18	14	18	22	26	29	4.1	3.4	4.1	4.9	5.7	6.4
2nd	-2	22	17	22	26	29	32	4.9	4.0	4.9	5.7	6.5	7.4
	-1	24	19	24	28	30	33	5.2	4.4	5.2	6.1	7.0	7.8
	0 (*1)	26	21	26	29	32	35	5.6	4.7	5.6	6.5	7.4	8.3
	+1	28	25	28	31	34	37	6.1	5.2	6.1	7.0	7.9	8.8
	+2	30	27	30	33	36	39	6.6	5.7	6.6	7.5	8.4	9.0
3rd	-2	36	33	36	39	40	40	8.0	7.1	8.0	8.9	9.0	9.0
	-1	38	35	38	40	40	40	8.5	7.6	8.5	9.0	9.0	9.0
	0 (*1)	40	37	40	40	40	40	9.0	8.1	9.0	9.0	9.0	9.0

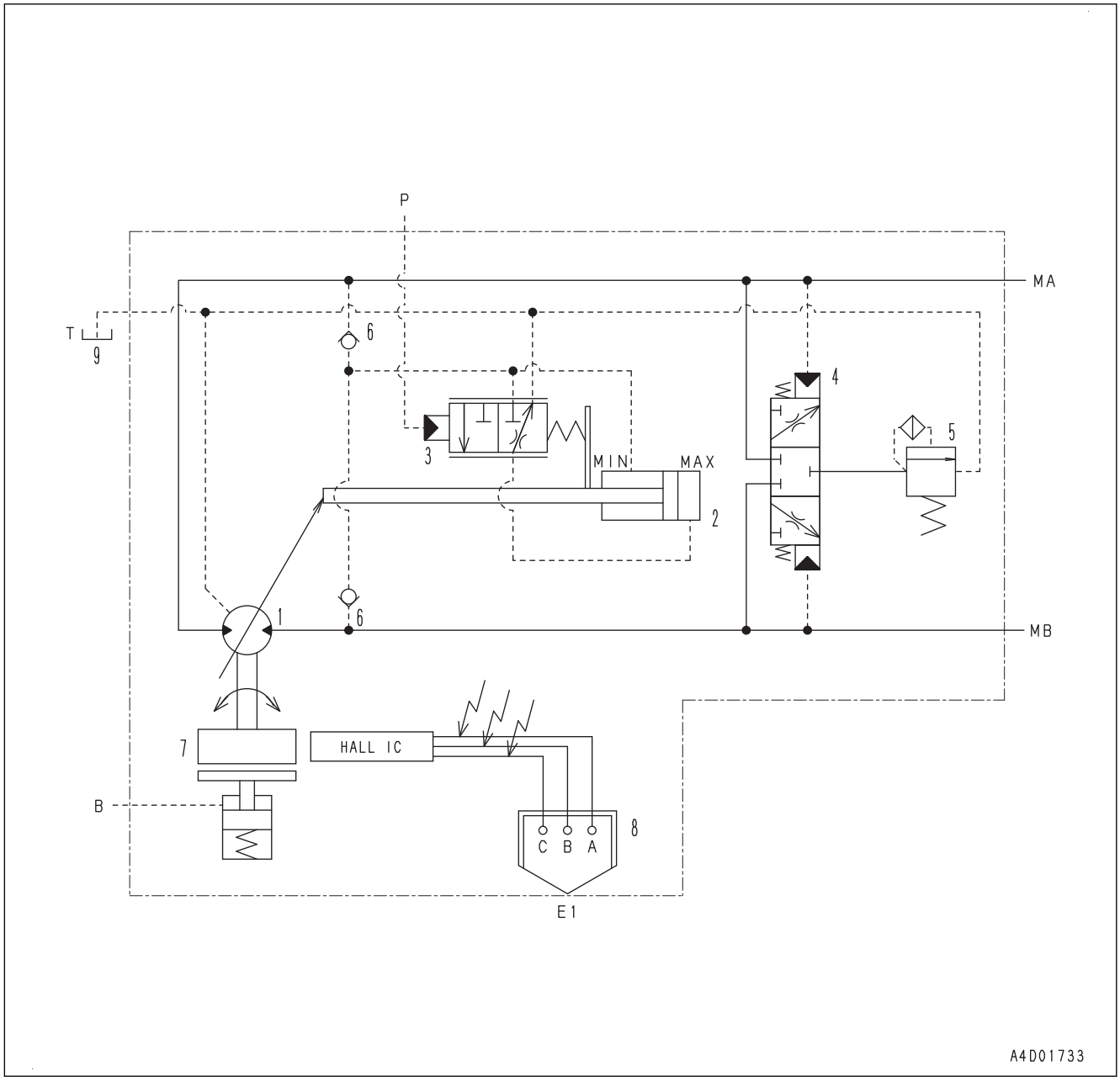
*1: Default in quick shift mode.

Screen Display

The gear shift mode is displayed on the gear speed display portion of the machine monitor as shown below.

Structure

- Pistons (1) (7 pieces) are attached to the disc portion of the drive shaft like a spherical joint. Each of them is stowed in cylinder block (5) at a certain angle to the drive shaft.
- The inclination of cylinder block (5) and piston (6) changes corresponding to the capacity control pressure from EPC valve.



B: Parking brake release signal port

MA: Discharge port (L.H. HST motor: High pressure during reverse travel, R.H. HST motor: High pressure during forward travel)

MB: Discharge port (L.H. HST motor: High pressure during forward travel, R.H. HST motor: High pressure during reverse travel)

1: Continuously variable displacement clinoaxis type piston motor

2: Servo piston

P: Capacity control signal port

T: Drain

3: Servo valve

4: Low pressure selector spool

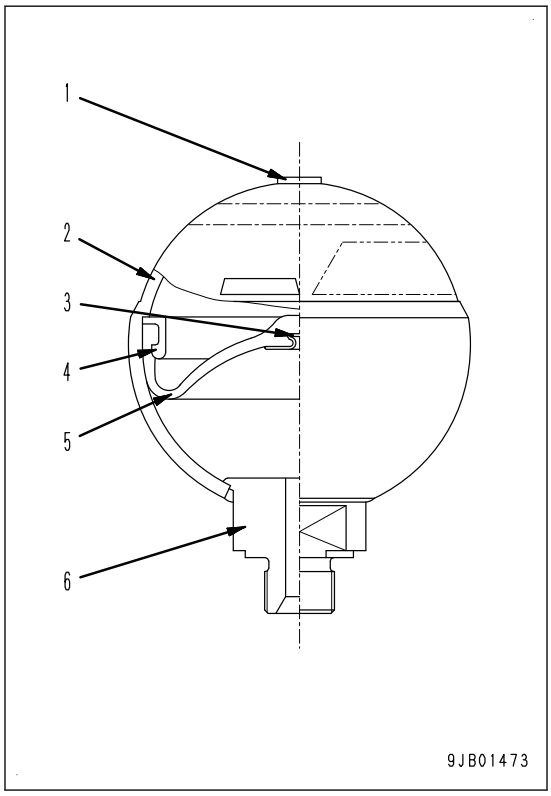
5: Charge relief valve

Pilot Circuit Accumulator

Structure of Pilot Circuit Accumulator

General View and Sectional View

1: Gas plug
2: Shell
3: Poppet
4: Holder
5: Bladder
6: Oil port



Specifications of Pilot Circuit Accumulator

Type of gas: Nitrogen gas

Gas volume: 500 cm^3

Max. actuating pressure: 6.86 MPa {70 kgf/cm^2}

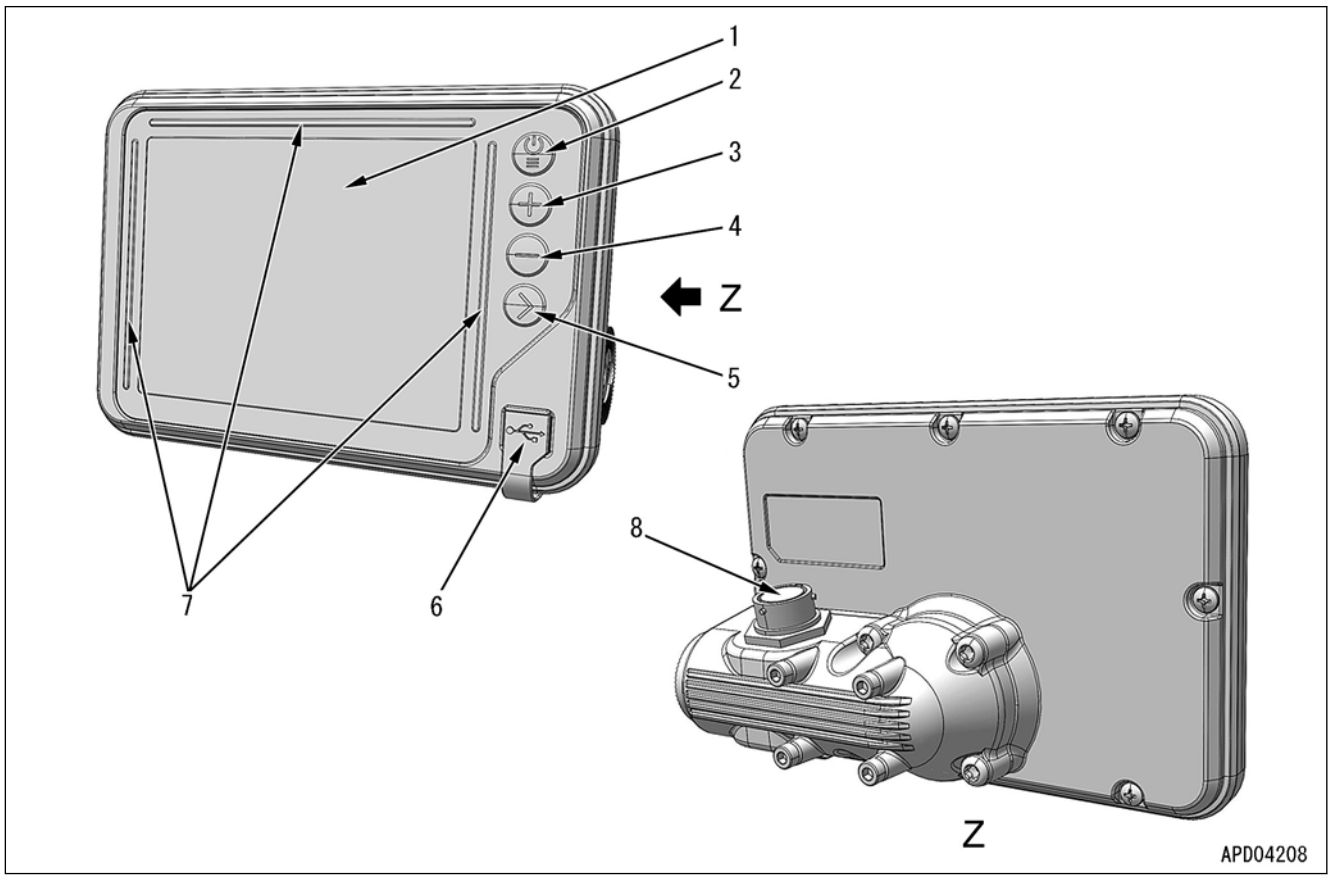
Min. actuating pressure: 0.69 MPa {7 kgf/cm^2}

Function of Pilot Circuit Accumulator

This accumulator (for Pilot circuit) is installed to the solenoid valve. Even if the engine is stopped while the work equipment is raised, pilot oil pressure can be supplied to the work equipment control valve with the pressure of the compressed nitrogen gas in the accumulator to operate the spool and lower the work equipment by its own weight.

Structure of Control Box (For New Control Box)

General View



1: Touch panel
2: Power ON/OFF and menu switch
3: Zoom in switch
4: Zoom out switch
5: Toggle main view switch
6: USB port
7: LED indicator
8: Connector

Structure

This monitor employs the touch panel type monitor.

Function of Control Box

- This monitor processes GNSS positioning data, displays it, and outputs it.
- This monitor displays the blade automatic control condition. Setting and adjusting of it can be performed on this monitor.
- This monitor displays the earthmoving operation designed surface condition. Setting and adjusting of it can be performed on this monitor.

Input and Output Signals of Control Box

PT08SE-19P“MONI”

Pin No.	Signal name	Input and output signals
A	(*1)	-
B	(*1)	-
C	Power supply	-

20 Standard Value Table

Oil Leakage Quantity from Work Equipment Cylinder

Machine model			D61EXI-24	
Engine			SAA6D107E-3	
Item	Measurement condition	Unit	Standard value for new machine	Repair limit
Blade lift cylinder	• HST oil temperature (hydraulic oil temperature)40 to 60 °C • Fuel control dial: MAX (High idle) position • Oil leakage for 1 minute while relieving cylinder to be measured	mℓ	Max. 4	Max. 16
Blade tilt cylinder			Max. 4	Max. 16

ICT Related Items

Machine model				D61EXI-24	
Engine				SAA6D107E-3	
Item	Measurement condition		Unit	Standard value for new machine	Repair limit
Accuracy of blade edge elevation	Perform the items of “CALIBRATE BLADE EDGE POSITION” up to the Machine Cal Step A.		mm	0 ± 25	0 ± 50
	Perform all “CALIBRATE BLADE EDGE POSITION”			0 ± 20	0 ± 40
Accuracy of stroke sensor for lift cylinder	Work equipment: Perform blade raise stroke end operation	Before resetting	mm	0 ± 3	0 ± 3
		After resetting		0	0
	Work equipment: During blade lower stroke end operation	Before resetting		461 ± 3	461 ± 3
		After resetting		461	461
Accuracy of stroke sensor for tilt cylinder	Work equipment: During left tilt stroke end operation	Before resetting	mm	0 ± 3	0 ± 3
		After resetting		0	0
	Work equipment: During right tilt stroke end operation	Before resetting		164 ± 3	164 ± 3
		After resetting		164	164

Abbreviation	Actual word spelled out	Purpose of use (major applicable machine (*1), or component/system)	Explanation
TOPS	Tip-Over Protective Structure	Cab and canopy	This is a protective structure that intended to protect the operator wearing seat belt from suffering injury which may be caused if the cab is crushed when the machine tips over. (Roll-over protective structure of hydraulic excavator) This performance is standardized as ISO 12117.
TWV	2-Way Valve	Hydraulic system	This is a solenoid valve that switches over direction of flow.
VGT	Variable Geometry Turbocharger	Engine	This is a turbocharger on which the cross-section area of the exhaust passage is variable.
VHPC	Variable Horse Power Control	Engine control	This is a function that finely controls the maximum output of the machine so that high work efficiency and low fuel consumption rate are both achieved.

*1: Code for applicable machine model

D: Bulldozer

HD: Dump truck

HM: Articulate dump truck

PC: Hydraulic excavator

WA: Wheel loader

List of Abbreviations Used in the Circuit Diagrams

Abbreviation	Actual word spelled out
A/C	Air Conditioner
A/D	Analogue-to-Digital
A/M	Air Mix Damper
ACC	Accessory
ADD	Additional
AUX	Auxiliary
BR	Battery Relay
CW	Clockwise
CCW	Counter Clockwise
ECU	Electronic Control Unit
ECM	Electronic Control Module
ENG	Engine
EXGND	External Ground
F.G.	Frame Ground
GND	Ground
IMA	Inlet Metering Actuator
NC	No Connection

5. Apply engine oil to the O-ring and the cylinder head side of inlet connector (7).

   O-ring and cylinder head side of inlet connector (7):
   Engine oil

6. Insert inlet connector (7) into injector (9), and tighten retaining nut (6) lightly.

   REMARK

   - Tighten nuts to the specified torque after tightening them lightly. Be sure to tighten each of them to the specified torque. If tightening torque is insufficient or too much, it will cause fuel leakage inside the engine.
   - Install the inlet connector (7) so that its positioning ball fits in guide groove part on the cylinder head side.

   Retaining nut (6) (tightening lightly):
   15±5 Nm {1.53±0.51 kgfm}

7. Tighten mounting bolts (19) of holder (8) alternately.

   Mounting bolt (19):
   8±0.8 Nm {0.82±0.08 kgfm}

8. Tighten retaining nut (6) of inlet connector (7).

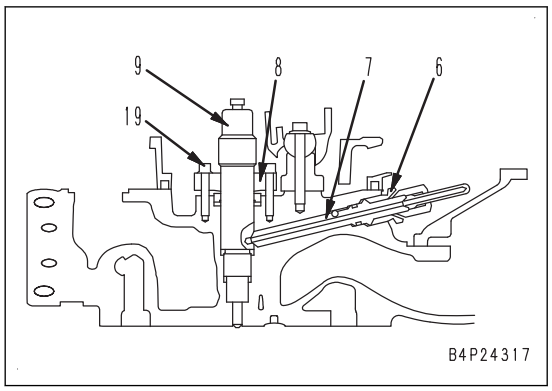
   Retaining nut (6) (tightening to the specified torque):
   50±5 Nm {5.1±0.51 kgfm}

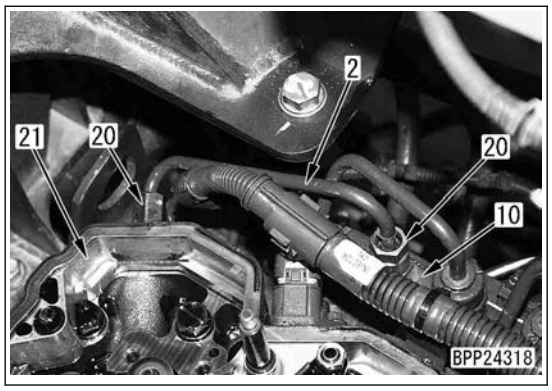
9. Tighten sleeve nuts (20) of high-pressure pipe (2) in the order of cylinder head (21) side and common rail (10) side.

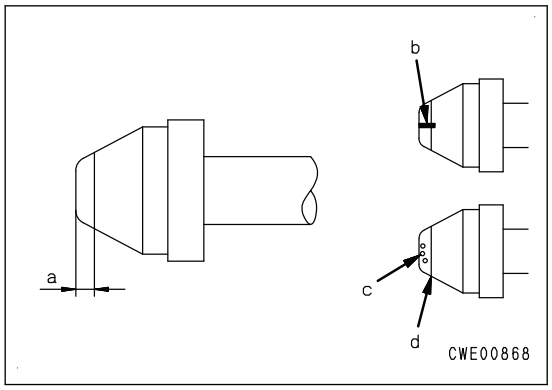
   REMARK

   - Do not bend high-pressure pipe to correct before installing.
   - Komatsu recommends using Komatsu genuine high-pressure pipe and fixing clamps and observe the specified tightening torque.
   - Install each high-pressure pipe and wiring harness 10 mm or more apart from each other.
   - Visually check that taper seal part (a) of the connection part (2 mm area from the tip-end) is free from longitudinal slits (b) or spotty dents (c).
   - Check that part (d) (2 mm from the tip-end) is free from steps (fatigue) which can be felt by your fingernail.

   Sleeve nut (20):
   35±3.5 Nm {3.57±0.36 kgfm}







Examine Automatic Tensioner

How to Examine Automatic Tensioner

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

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

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

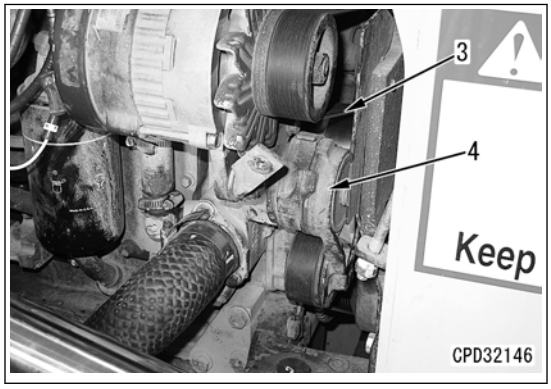
REMARK

- Alternator belt is also used as air compressor belt.
- The auto-tensioner is provided for the alternator belt. Thus, checking and adjusting the belt tension is usually not necessary.

1. Remove alternator belt. For details, see “Remove and Install Alternator Belt”Remove the alternator belt (3).
2. Check that there is no crack on the arm (a), pulley (b), arm stop part (c), and spring case stop parts (d) and (e) of the tensioner assembly (4).

   REMARK

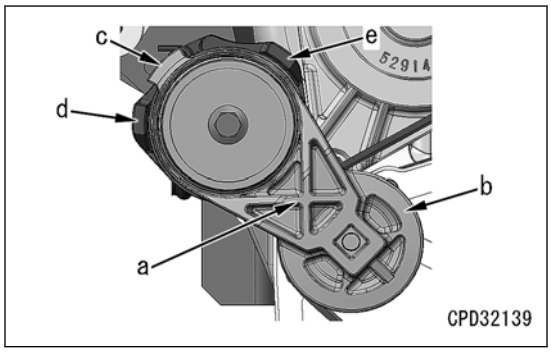
   Replace the tensioner assembly (4) if there is any crack or damage.



3. Check with the alternator belt (3) installed that the arm stop part (c) of the tensioner assembly (4) does not contact with the spring case stop parts (d) or (e).

   REMARK

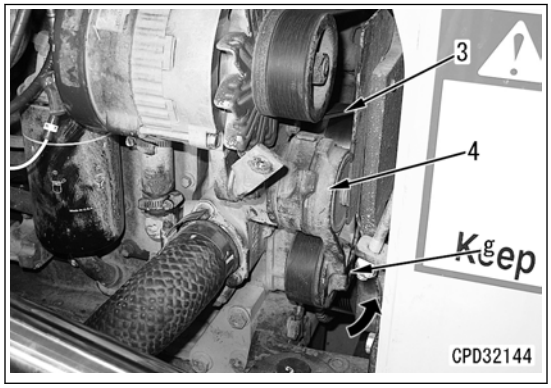
   Replace the alternator belt (3) if the arm stop part (c) contacts with the spring case stop parts (d) or (e).



4. Install the tool (A) to the (g) part (width across flats: 12.7 mm) of the tensioner assembly (1).

   REMARK

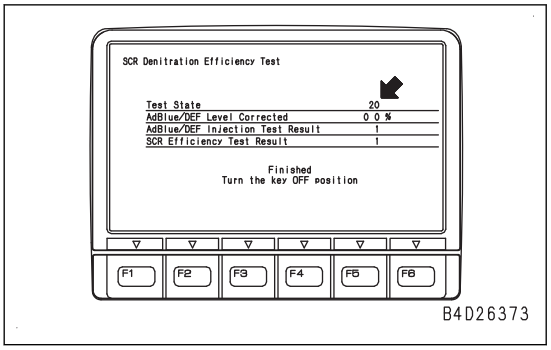
   - Securely insert the tool (A) to (g) portion of the tensioner assembly (4).
   - The spring tension (reaction force) of the tensioner assembly (4) is strong. If the tool (A) is loosely inserted and rotated, it can accidentally come off and this is extremely dangerous.

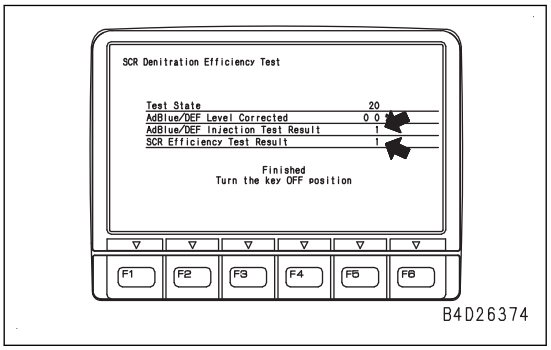


7. When “20” of “Test State” flashes, check the state of “DEF Injection Test Result” and “SCR Efficiency Test Result”.

   REMARK

   - “1” indicates a normal state, “0” indicates an abnormal state, and “4” indicates that the test ends halfway due to a failure.
   - If “0” or “4” are displayed, perform procedure 8 and failure code is displayed.





Test	Test result (indication on monitor)					
DEF injection performance	1	0	1	0	4	4
SCR catalyst performance	1	1	0	0	4	4
Failure code to be displayed	-	[CA3755]	[CA3751]	[CA3755]	[CA1694]	(*1)

*1: Failure codes other than [CA3751], [CA3755] and [CA1694] may be displayed. Take measures to troubleshoot ongoing problem of failure code first.

8. Turn the starting switch to OFF position. Then, turn the starting switch to ON position.

   REMARK

   - If failure codes [CA3751], [CA3755], [CA1694] appear, troubleshoot them.
   - If the test result is “4” but the failure code [CA1694] does not appear, continue to troubleshoot ongoing problem.

3. Set parking brake lever (1) in FREE position and adjust clearance (d) between lever (4) and limit switches (5) (2 pieces).

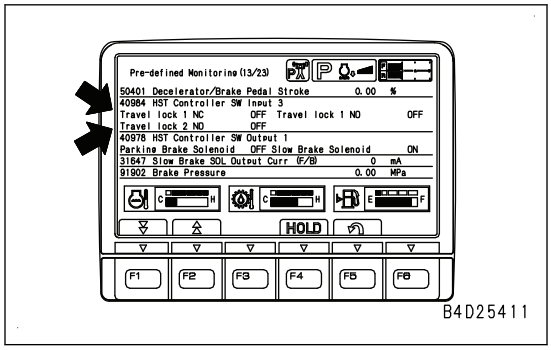
   Clearance (d) between lever (4) and limit switch (5): 0 mm

   REMARK

   Do not stroke limit switch (5) during adjustment.

4. Check that limit switch (5) strokes 2.5 to 3 mm after the operation of parking brake lever (1).
   - Parking brake lever (1) is in LOCK position: Limit switch (5) “ON”
   - Parking brake lever (1) is in FREE position: Limit switch (5) “OFF”

5. Check the parking brake limit switch.
   1) Turn the starting switch to ON position and display “Pre-defined Monitoring” (13/23). For details, see “Set and Operate Machine Monitor”.
   2) Check that the parking brake lever position and displayed value (ON/OFF) of “Travel Lock 1 NC” and “Travel Lock 2 NO” of monitoring code (40984) are in accordance with the “table of parking brake lever position and parking limit switch signal”.



Relations Between Parking Brake Lever Position and Parking Limit Switch Signal

Monitoring code No.	Monitoring item	Parking brake lever position		Remarks
		Lever position: LOCK	Free position	
40984	Travel lock 1 NC	OFF	ON	Parking brake limit switch 1
	Travel lock 1 NO	ON	OFF	
	Travel lock 2 NO	ON	OFF	Parking brake limit switch 2

REMARK

If the above is abnormal, adjust the installation of parking brake limit switch 1 and limit switch 2.

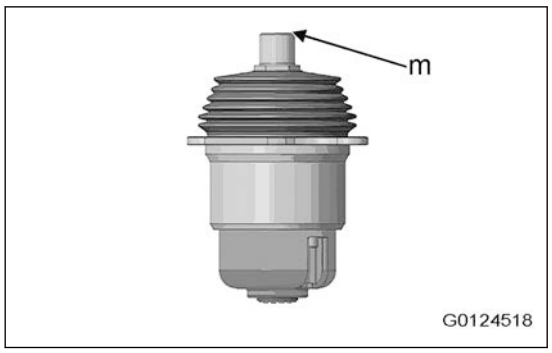
10. Adjust the play at the upper end (m) of the lever at neutral as follows.

    Test play in 1-2 direction and 3-4 direction

    Play of lever at neutral (x): 0 to 0.75 mm

    REMARK

    - When you tighten it by hand, be careful not to let the disc (4) rotate together.
    - You can do the work easily with the deep socket (C) or crowfoot wrench (D).

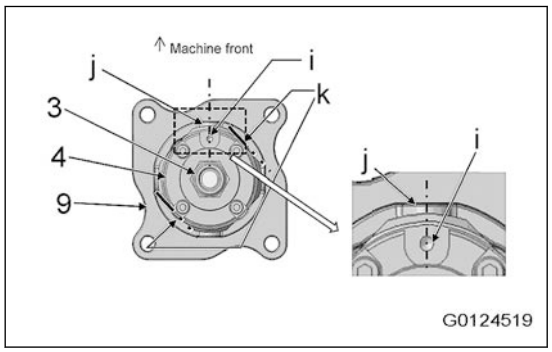


11. Tighten the nut (3).

    REMARK

    - Put the wrench (F) at the part (k) (width across flats: 60mm) of the disc (4), and fix the disc (4) not to rotate together when you tighten it.
    - After you tighten the nut (3), make sure that the identification mark (i) on the upper surface of the disc aligns with the shaft of the stopper (j) on the plate (9).

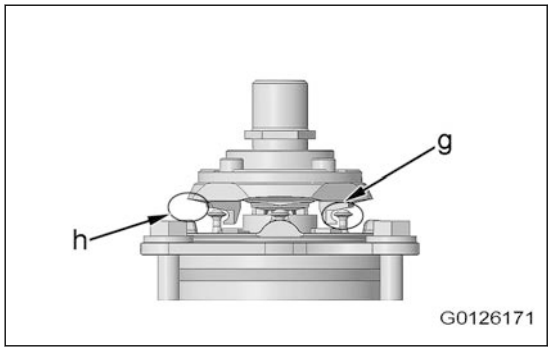
    Nut (3):
    68.6 to 88.2 Nm {7 to 9 kgfm}



12. Apply grease (G2-LI) of 0.3 mℓ to 0.8 mℓ on the part (g) of the rod (6) and disc (4).
13. Apply grease (G2-LI) of 0.1 mℓ to 0.3 mℓ on the part (h) of the disc (4) and plate (9).
14. Install the boot (2).
15. Install the knob switch connector (1b) and clamp (1a).
16. Install the knob (1d) with the bolt (1c).

    REMARK

    Make sure that the slot of the knob (1d) is at the front side of the machine.



17. Install the machine body boot and exterior parts, and then restore the machine.
18. Do the adjustment for the positions that follow. For details, see “Set and Operate Machine Monitor”, “VARIOUS SETTINGS OF MACHINE”.
    - ADJUSTMENT MENU “Blade Lift Lever N Position Adj”
    - ADJUSTMENT MENU “Blade Lift Lever UP Pos Adjust”
    - ADJUSTMENT MENU “Blade Lift Lever UP Pos Adjust”
    - ADJUSTMENT MENU “Blade Tilt Lever N Position Adj”
    - ADJUSTMENT MENU “Blade Tilt Lever LH Pos Adjust”
    - ADJUSTMENT MENU “Blade Tilt Lever RH Pos Adjust”

Replace Universal Joint

1. Remove the exterior parts around the lever.
2. Remove the machine body boot.

Code No.	Self-define Monitoring items (screen display)		Unit			Applicable component	Remarks
			SI	Metric	Imperial		
52408	RF HST Pump EPC Output Curr(F/B)		mA	mA	mA	HST	
52411	LR HST Pump EPC Output Curr(F/B)		mA	mA	mA	HST	
52410	RR HST Pump EPC Output Curr(F/B)		mA	mA	mA	HST	
52300	HST Motor Volume Command Value		cm^3/r	cc/r	in3/r	HST	
52304	L HST Motor EPC Output Curr(F/B)		mA	mA	mA	HST	
52303	R HST Motor EPC Output Curr(F/B)		mA	mA	mA	HST	
70700	Hydraulic Oil Pump Pressure		MPa	kgf/cm^2	PSI	HST	
70701	Hyd Oil Pump Pressure Sens Volt		V	V	V	HST	
10007	Fan Speed		r/min	rpm	rpm	HST	
40965	Fan Speed Sensor Voltage		V	V	V	HST	
73402	Blade Lift Lever Stroke		%	%	%	HST	
73400	Blade Lift Lever Potentio 1 Volt		V	V	V	HST	
73401	Blade Lift Lever Potentio 2 Volt		V	V	V	HST	
73502	Blade Tilt Lever Stroke		%	%	%	HST	
73500	Blade Tilt Lever Potentio 1 Volt		V	V	V	HST	
73501	Blade Tilt Lever Potentio 2 Volt		V	V	V	HST	
70300	Blade Knob SW Input 1	W/E Lock SW NC	ON/OFF			HST	
		W/E Lock SW NO	ON/OFF			HST	
		Float SW NC	ON/OFF			HST	
		Float SW NO	ON/OFF			HST	
70306	Blade Knob SW Input 2	Angle LH SW NO1	ON/OFF			HST	
		Angle LH SW NO2	ON/OFF			HST	
		Angle RH SW NO1	ON/OFF			HST	
		Angle RH SW NO2	ON/OFF			HST	
		iB SW NC	ON/OFF			HST	
		iB SW NO	ON/OFF			HST	
31624	Fan EPC Output Current (F/B)		mA	mA	mA	HST	
71001	Blade RAISE EPC Current (F/B)		mA	mA	mA	HST	
71003	Blade LOWER EPC Current (F/B)		mA	mA	mA	HST	
71005	Blade Tilt LH EPC Current (F/B)		mA	mA	mA	HST	
71007	Blade Tilt RH EPC Current (F/B)		mA	mA	mA	HST	
71013	Blade Angle LH EPC Current (F/B)		mA	mA	mA	HST	
71011	Blade Angle RH EPC Current (F/B)		mA	mA	mA	HST	
60600	Battery Relay Drive Voltage		V	V	V	HST	
31647	Slow Brake SOL Output Curr (F/B)		mA	mA	mA	HST	
40978	HST Controller SW Output 1	Parking Brake Solenoid	ON/OFF			HST	
		Slow Brake Solenoid	ON/OFF			HST	

Adjustment Menu

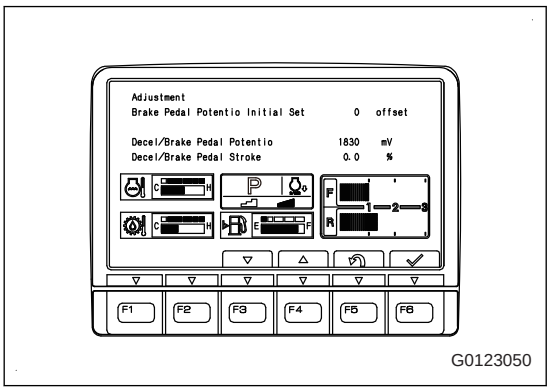
How to do Settings of Machine

Adjustment menu or adjustment ID is used to adjust various settings of the machine.

When performing various adjustments, you can select adjustment items by the following 2 methods.

When You Select Adjustment Items from Adjustment Menu:

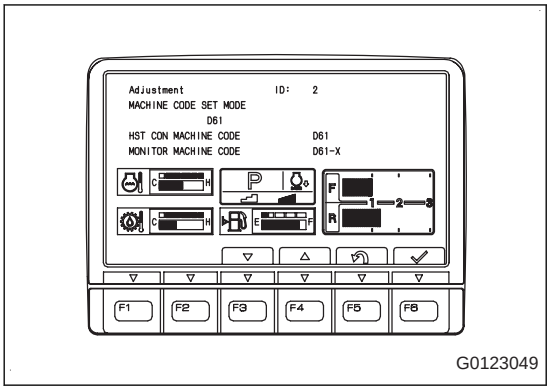
- The functions given to function switches F3 to F6 vary depending on the adjustment item.
- For the method of operating each adjustment item, see the explanation of each adjustment menu.



G0123050

When You Select Adjustment Items from Adjustment ID:

- “000”, “00”, and “0” on the left of the adjustment ID must be filled but they are not displayed on “Adjustment” screen.
- The functions given to function switches F3 to F6 vary depending on the adjustment item.
- For the method of operating each adjustment item, see the explanation of each adjustment ID.



G0123049

Adjustment Item Table

NOTICE

After completion of assembling the machine or during the controller replacement, be sure to perform the adjustment marked with (*) in its “code” column or “Adjustment ID” column.

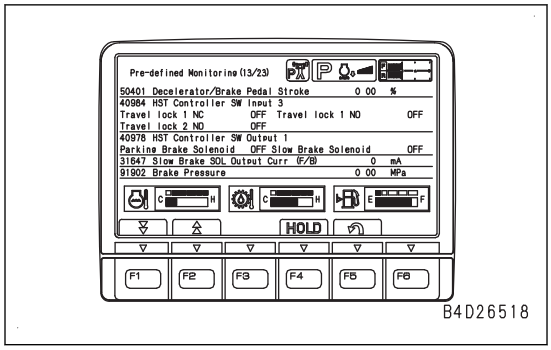
Items to be Selected from “Adjustment Menu”

Code	Adjustment item	Remarks	Reference
02 (*)	Brake Pedal Potentio Initial Set	The control point (zero point) of the decelerator/brake pedal potentiometer is recognized and saved into the HST controller.	METHOD FOR ADJUSTING WITH ADJUSTMENT MENU (BRAKE PEDAL POTENTIO INITIAL SET)
03 (*)	Brake Pedal Potentio Detent Set	The operating effort detent position of the decelerator/brake pedal potentiometer is recognized and saved into the HST controller.	METHOD FOR ADJUSTING WITH ADJUSTMENT MENU (BRAKE PEDAL POTENTIO DETENT SET)
04 (*)	Brake Pedal Potentio Full Set	The full stroke position of the decelerator/brake pedal potentiometer is recognized and saved into the HST controller.	METHOD FOR ADJUSTING WITH ADJUSTMENT MENU (BRAKE PEDAL POTENTIO FULL SET)

6) Display “Pre-defined Monitoring” (13/23). Check that the machine model code of HST controller and machine monitor is normal.

REMARK

- The HST controller and machine monitor may not be compatible between machine models. If a selected machine model is unsupported, settings will not be accepted.
- In this adjustment, the saved setting is effective even when the starting switch is turned to OFF position after the adjustment is completed.



Adjustment ID: 2021 (HST Controller Voltage Check Mode)

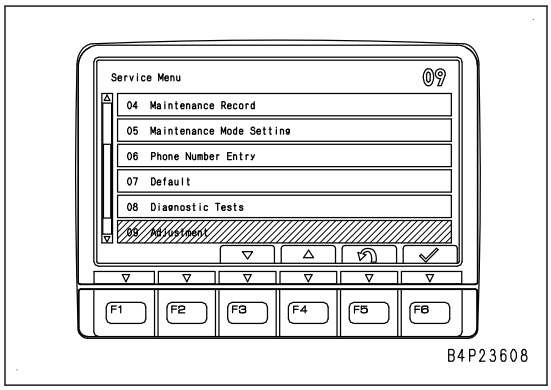
The continuous power supply voltage and switched power supply voltage that are supplied to HST controller can be checked in “HST Controller Voltage Check Mode”.

Perform this testing and adjusting, troubleshooting, etc., as necessary.

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

   REMARK

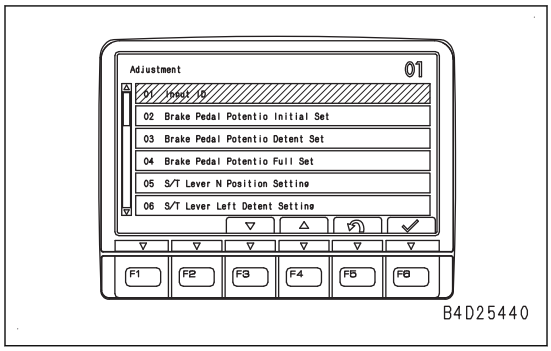
   For selecting method, see “How to Operate Service Mode” in “SERVICE MODE”.



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

   REMARK

   For selecting method, see “How to Operate Service Mode” in “SERVICE MODE”.



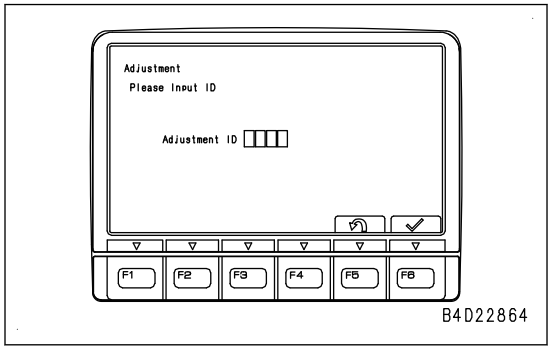
3. On “Input ID” screen, directly input Adjustment ID “2021” by using the numeral input switches.

   F5: Returns the screen to “Adjustment” screen

   F6: Enters input Adjustment ID

   REMARK

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



7. When the option switch specifications confirmation screen is displayed, check whether they are the same as the actual specifications, and then press F6 to enter.

   F3: Switches specifications

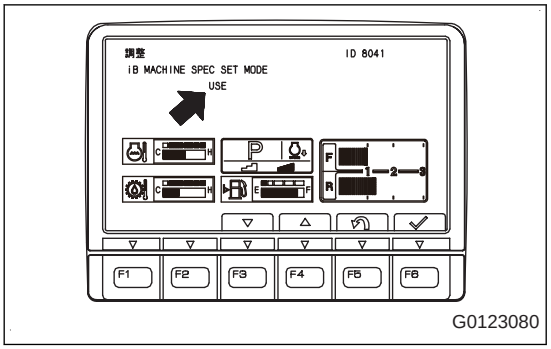
   F4: Switches specifications

   F5: Cancels the adjustment and returns the screen to “Input ID” screen

   F6: Enters the specifications, and moves to next screen

   REMARK

   - If the option switch specifications are incorrect, press F3 or F4 to select the correct specification of option switches, and then press F6 to enter.
   - When the specifications are entered, the buzzer makes a “Beep” sound.



G0123080

Machine Monitor Display and Option Switch Specifications

Display on machine monitor	Specification
NON USE	Offset switch & Back Grade mode switch are not used
USE	Offset switch & Back Grade mode switch are used

8. After the screen for checking the Angle cylinder specifications is displayed, check that they are the same as the actual specifications and press F6 to enter the selected item.

   F3: Switches specifications

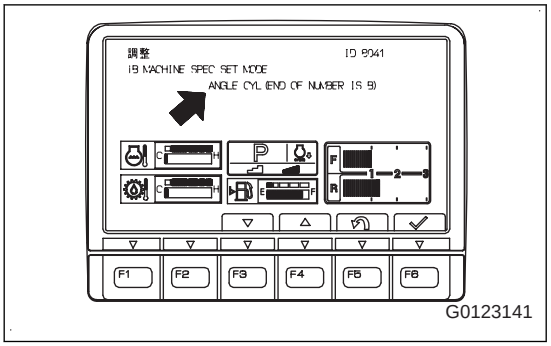
   F4: Switches specifications

   F5: Cancels the adjustment and returns the screen to the “Input ID” screen.

   F6: Enters the specifications, and moves the screen to the next screen

   REMARK

   - If the Angle cylinder specifications are incorrect, press F3 or F4 to select applicable Angle cylinder specifications, and then press F6 to enter the selected item.
   - When the specifications are validated, the buzzer makes the short “Beep” sound once.



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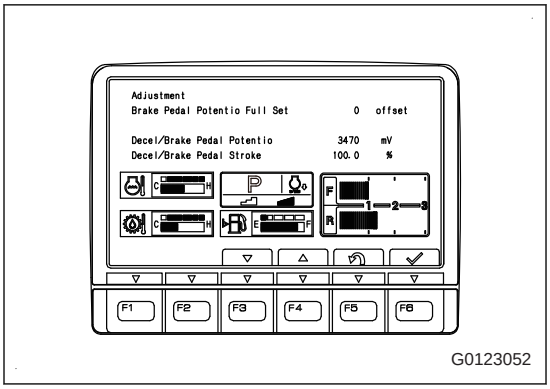
Machine Monitor Display and Angle Cylinder Specifications

Machine monitor display	Specification
ANGLE CYL (END OF NUMBER IS B)	The last digit of manufacturing number punched on the angle cylinder is “B”.
ANGLE CYL (OTHER)	The last digit of manufacturing number punched on the angle cylinder is not “B”

6. Make the HST controller recognize and save the voltage of the decelerator/brake pedal potentiometer at full stroke end position. For details, see “Adjustment Menu (Brake Pedal Potentio Full Set)”.

   REMARK

   For “METHOD FOR ADJUSTING WITH ADJUSTMENT MENU (BRAKE PEDAL POTENTIO FULL SET)”, see “Set and Operate Machine Monitor”, “VARIOUS SETTINGS OF MACHINE”.

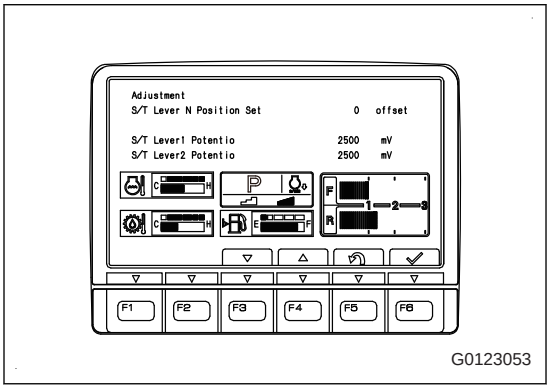


G0123052

7. Make the HST controller recognize and save the voltage of the steering potentiometer of joystick (steering, directional and gear shift lever) (PCCS lever) in the neutral position. For details, see “Adjustment Menu (S/T Lever N Position Setting)”.

   REMARK

   For “METHOD FOR ADJUSTING WITH ADJUSTMENT MENU (S/T LEVER NEUTRAL POSITION SET)”, see “Set and Operate Machine Monitor”, “VARIOUS SETTINGS OF MACHINE”.

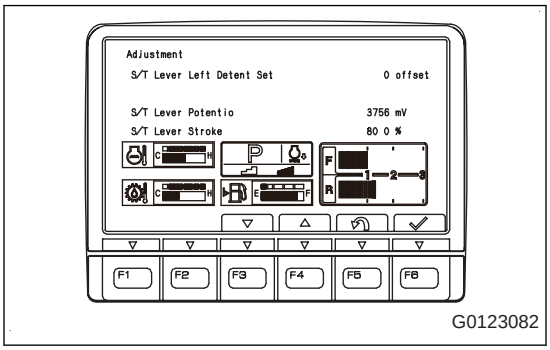


G0123053

8. Make the HST controller recognize and save the voltage of the steering potentiometer of joystick (steering, directional and gear shift lever) (PCCS lever) at leftward operating effort detent position. For details, see “Adjustment Menu (S/T Lever Left Detent Setting)”.

   REMARK

   For “METHOD FOR ADJUSTING WITH ADJUSTMENT MENU (S/T LEVER LEFT DETENT SETTING)”, see “Set and Operate Machine Monitor”, “VARIOUS SETTINGS OF MACHINE”.

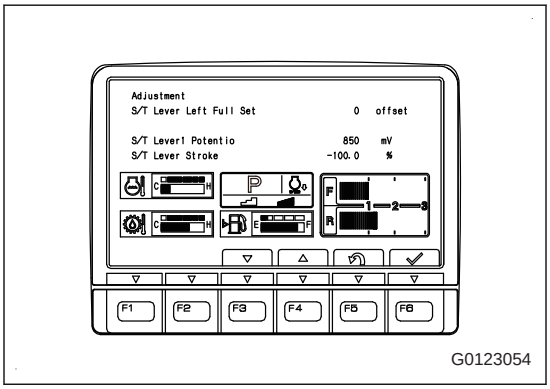


G0123082

9. Make the HST controller recognize and save the voltage of the steering potentiometer of joystick (steering, directional and gear shift lever) (PCCS lever) at leftward maximum position. For details, see “Adjustment Menu (S/T Lever Left Full Set)”.

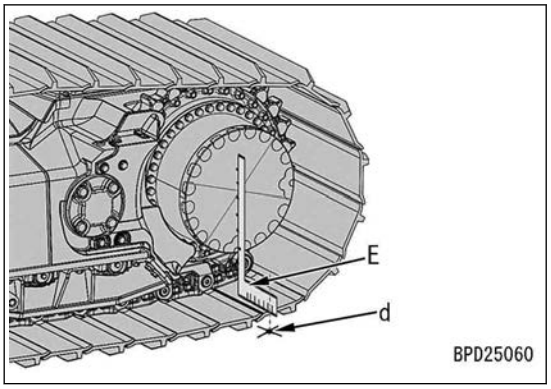
   REMARK

   For “METHOD FOR ADJUSTING WITH ADJUSTMENT MENU (S/T LEVER LEFT FULL SET)”, see “Set and Operate Machine Monitor”, “VARIOUS SETTINGS OF MACHINE”.



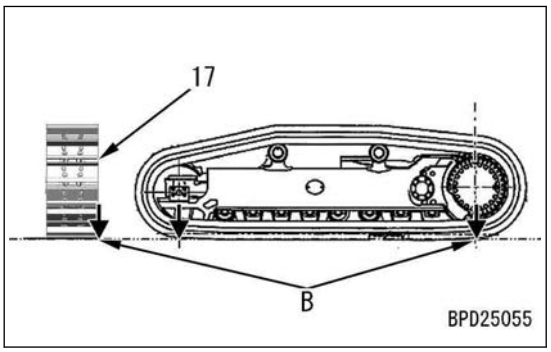
G0123054

14. Measure the coordinates of the sprocket center position according to the following procedure.
    1) Draw two or more lines on the diameter of the final drive case, and calculate the intersection point (sprocket center).
    2) Apply L-square E perpendicularly through the intersection point (sprocket center) parallel to the lengthwise direction of a track shoe.
    3) Install prism B on a point (d) that was calculated by drawing a perpendicular line to the ground from the intersection point of L-square E and track shoe edge.



NOTICE

Push the pole of prism B to track shoe side face (17), and install it.



    4) Set the total station A to the prism mode.

REMARK

For the method of setting the prism mode, see the Operation Maintenance Manual for total station A.

    5) Input the height of prism to total station A.

REMARK

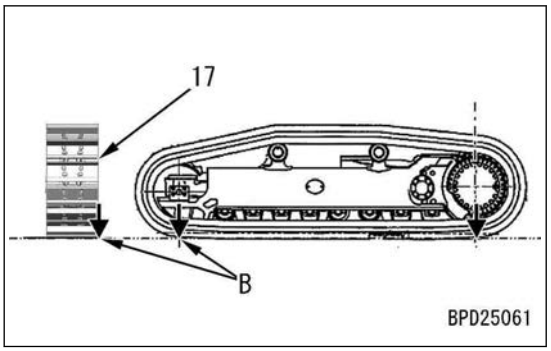
For the method of inputting the prism height, see the Operation and Maintenance Manual for total station A.

    6) Measure the coordinates of the sprocket center position with total station A, and record them.

NOTICE

- **Measure the center position of sprocket accurately because it becomes a basis to calculate the position of the machine.**
- **Measure the coordinates in 1 mm unit.**

15. Measure the coordinates of the idler center position according to the following procedure.
    1) Push the prism B against the side surface of plate when prism B comes to the idler center position, and install it.



NOTICE

It doesn't matter if the idler center position is slightly misaligned in longitudinal direction.

    2) Set the total station A to the prism mode.

REMARK

For the method of setting the prism mode, see the Operation Maintenance Manual for total station A.

    3) Input the height of prism to total station A.

REMARK

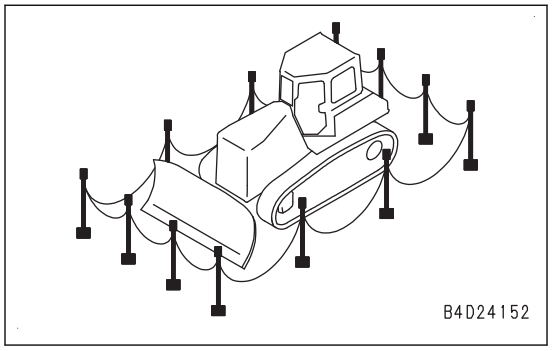
For the method of inputting the prism height, see the Operation and Maintenance Manual for total station A.

    4) Measure the coordinates of the idler center position according to the the following procedure, and record it.

NOTICE

Measure the coordinates in 1 mm unit.

Examine Stroke Sensor for Angle Cylinder



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

⚠ **Since operation of work equipment is required during the test, secure the safety around the machine such as roped-off area before starting the test.**

In “TEST STROKE SENSOR FOR TILT CYLINDER”, test whether the stroke sensor operates.

Make sure to perform this test if any one of these are performed; removal and installation of blade, replacement of stroke sensor, replacement of angle cylinder.

REMARK

Perform this test to clear errors by stroke end reset operation, since the resetting may not be completed due to a large difference between the cylinder length which was saved into ICT sensor controller last time and the actual cylinder length.

How to Examine Stroke Sensor for Angle Cylinder

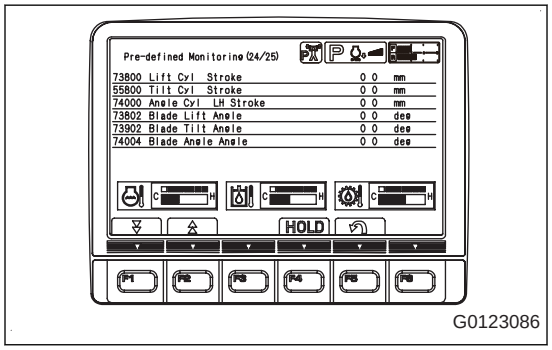
1. Start the engine, and stop the machine on a level firm ground.
2. Adjust the pitch rod position to normal length.

   REMARK

   For the method of adjusting of the pitch rod length, see the Operation and Maintenance Manual of the standard machine.

3. Select and display “Angle Cyl. LH Stroke” from “Pre-defined Monitoring” (24/25) or the monitoring selection menu by referring to the section “SET AND OPERATE MACHINE MONITOR”.

   Monitoring Code: 74000 “Angle Cyl. LH Stroke”



4. Turn on the power supply of the control box.
5. Reset the stroke end of each cylinder. For details, see “Reset Cylinder Stroke End”.

   REMARK

   Stroke end reset operation is performed to reconfirm cylinder stroke.

6. Measure the stroke on the left angle side of the blade in the following procedure.

   REMARK

   Operation of angling the blade right once is performed to make the ICT sensor controller reset errors of the stroke sensor. This reset operation is performed at the stroke end on the opposite side of measurement (if measuring the left ANGLE side, this shall be preformed on the right ANGLE side).

   1) Move the blade to the stroke end by performing the right ANGLE operation and hold it for more than 2 seconds. Check that the stroke value displayed on the machine monitor becomes the standard value.

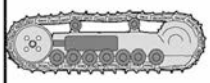
      REMARK

      If the displayed stroke value does not become the standard value, it means that the ICT sensor controller have not cleared all errors. Perform the stroke end reset on the left ANGLE side once. Check again that displayed stroke value at the stroke end on the right ANGLE side becomes the standard value.

Undercarriage Troubleshooting Report (Normal, Shock) PLUS Specification (Program Form No: NJLA195001)

KUC

Komatsu
Undercarriage Inspection



Customer name:						
Address:						
Model	D61EXI/PXI-24	Serial No		Equip No		Work Order No	
Location		SMR				Wet,AR,HD or Dry	Wet
Soil condition		Dealer				Shoe width (mm)	
Working condition		Inspector				Shoe type	SINGLE
Insp.Date(yy/mm/dd)					(yyyy/m/d)	Wear type	NORMAL, IMPACT

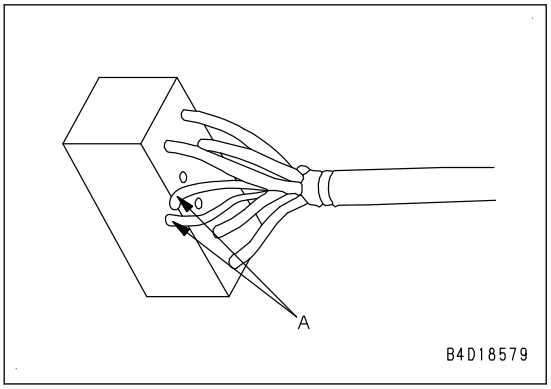
			New	100% Wear	Measured mm	Wear %	SMR New	SMR Rebuilt	Hours on Parts:	Comments/Observation
LINK PITCH L=l/4	R	LH	761.2	773.2						
		RH	761.2	773.2						
	M	LH	190.30	193.30						
		RH	190.30	193.30						
LINK HEIGHT		LH	124.0	108.0						
		RH	124.0	108.0						
BUSHING		LH	65.0	56.0						
		RH	65.0	56.0						
GROUSER HIGHT		LH	57.5	25.0						
		RH	57.5	25.0						
CARRIER	Front	LH	180.0	140.0						
		RH	180.0	140.0						
	Rear	LH	180.0	140.0						
		RH	180.0	140.0						
IDLER		LH	19.0	29.0						
		RH	19.0	29.0						
		LH	19.0	29.0						
		RH	19.0	29.0						
TRACK ROLLER	1	LH	200.0	164.0						
	2	LH	200.0	164.0						
	3	LH	200.0	164.0						
	4	LH	200.0	164.0						
	5	LH	200.0	164.0						
	6	LH	200.0	164.0						
	7	LH	200.0	164.0						
	8	LH	200.0	164.0						
	9	LH	200.0	164.0						
	10	LH	200.0	164.0						
	1	RH	200.0	164.0						
	2	RH	200.0	164.0						
	3	RH	200.0	164.0						
	4	RH	200.0	164.0						
	5	RH	200.0	164.0						
	6	RH	200.0	164.0						
	7	RH	200.0	164.0						
	8	RH	200.0	164.0						
	9	RH	200.0	164.0						
	10	RH	200.0	164.0						
SPROCKET		LH	0.0	9.2						
		RH	0.0	9.2						

Remarks:

BPD26807

Failure code	Detail of failure	North America		EU		The Engine with EU+EPA/CARB dual labelling nameplate	
		DEF level Low Error	Urea SCR system devices abnormality	DEF level Low Error	Urea SCR system devices abnormality	DEF level Low Error	Urea SCR system devices abnormality
CA2357	EGR Valve Servo Error	-	-	-	●	-	●
CA2771	SCR Outlet NOx Sensor Datalink Timeout Error	-	●	-	●	-	●
CA2976	DEF Pump Temperature Sensor Signal Error	-	●	-	●	-	●
CA3142	SCR Temperature Sensor High Error	-	●	-	●	-	●
CA3143	SCR Temperature Sensor Low Error	-	●	-	●	-	●
CA3144	SCR Temperature Sensor In Range Error	-	●	-	●	-	●
CA3146	SCR Outlet Temperature Sensor High Error	-	●	-	●	-	●
CA3147	SCR Outlet Temperature Sensor Low Error	-	●	-	●	-	●
CA3148	SCR Outlet Temperature Sensor In Range Error	-	●	-	●	-	●
CA3151	SCR Catalyst Efficiency Low Error 2	-	●	-	●	-	●
CA3165	SCR Outlet Temperature High Error	-	●	-	●	-	●
CA3229	SCR Temperature High Error	-	●	-	●	-	●
CA3231	SCR Temperature High Error - Non Regeneration	-	●	-	●	-	●
CA3232	Turbo Outlet NOx Sensor Datalink Timeout Error	-	●	-	●	-	●
CA3235	SCR Outlet Temperature High Error - Non Regeneration	-	●	-	●	-	●
CA3319	KDPF Outlet Temperature Sensor High Error	-	●	-	●	-	●
CA3321	KDPF Outlet Temperature Sensor Low Error	-	●	-	●	-	●
CA3322	KDPF Outlet Temperature Sensor In Range Error	-	●	-	●	-	●
CA3497	DEF Level Low Error 1	●	-	●	-	●	-
CA3498	DEF Level Low Error 2	●	-	●	-	●	-
CA3543	DEF Quality Error (SCR Catalyst Efficiency Low)	-	●	-	-	-	●
CA3545	SCR Outlet NOx Sensor Unstable Error	-	-	-	●	-	●
CA3547	DEF Level Low Error 4	●	-	●	-	●	-

19. If it is open as shown as (A), repair or replace the wiring harness or connector.
20. Visually check wiring harnesses for peeling of harness covers and the pins for contact with adjacent pins due to defective crimping.

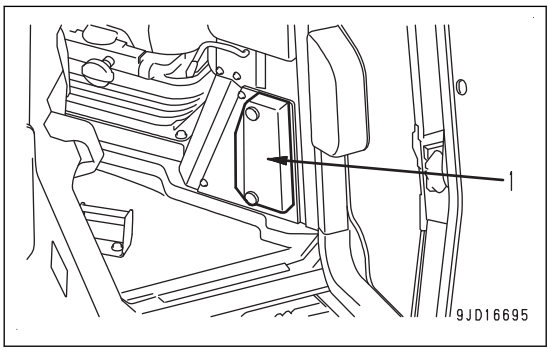


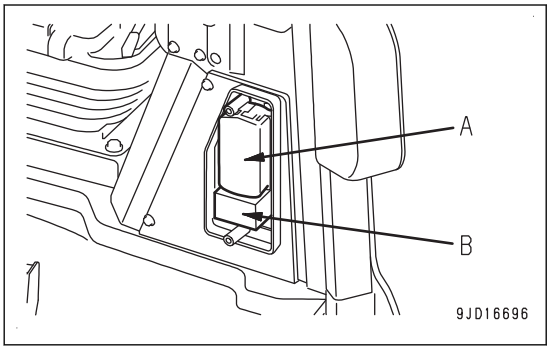
Check of fuse for blowing out and corrosion

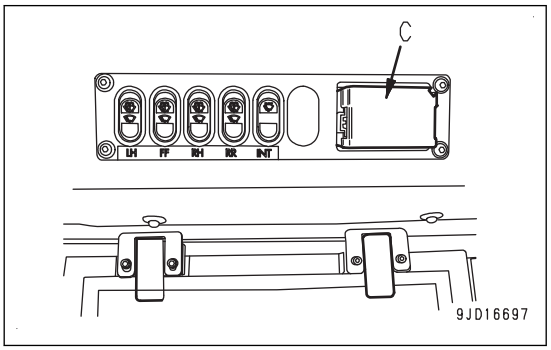
21. If a fuse is corroded and coated with white powder, or there is any play between the fuse and fuse holder, replace the fuse.

    REMARK

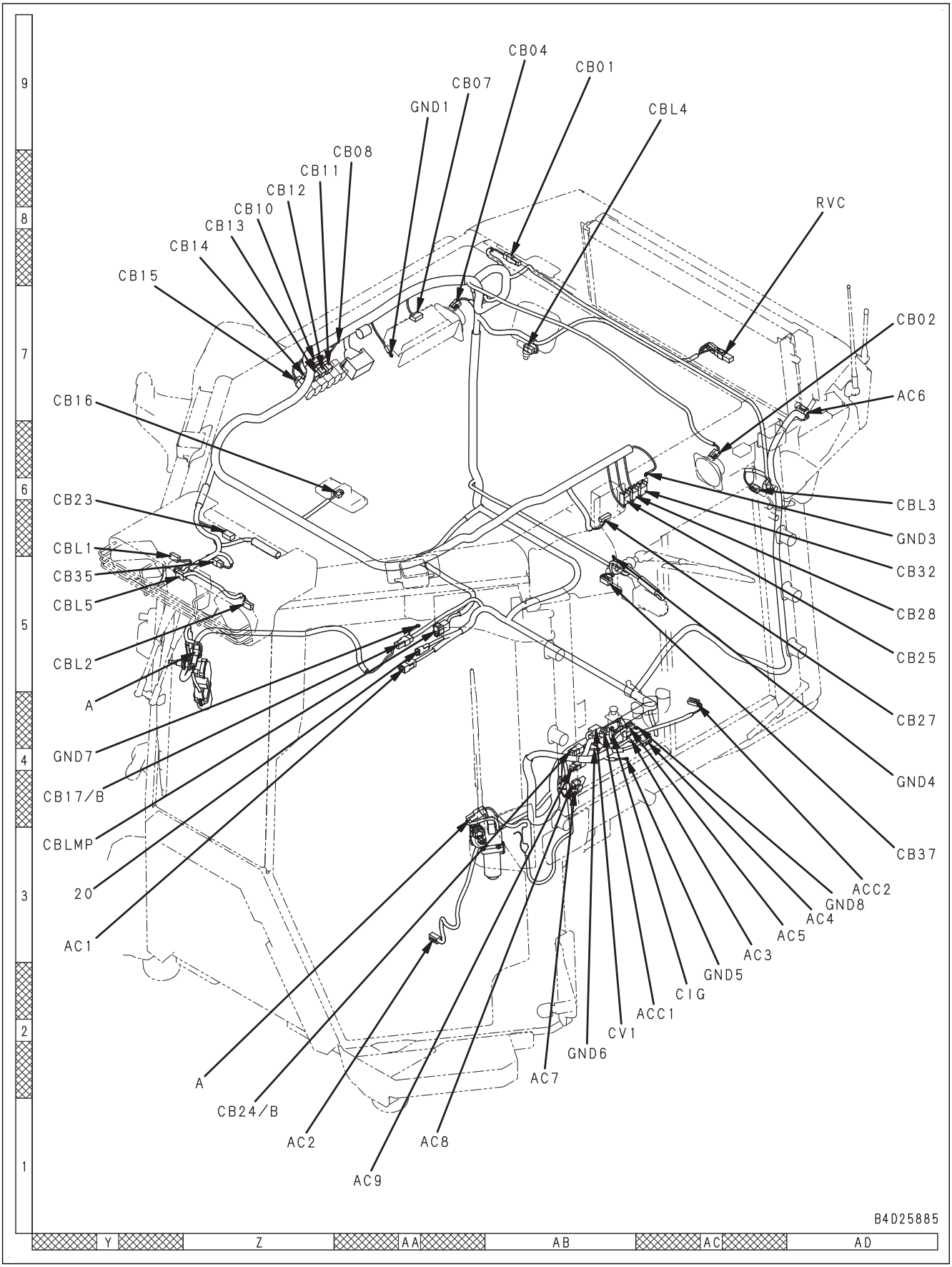
    - Make sure to turn off the power supply (starting switch in OFF position) before performing replacement of the fuse.
    - Replace each fuse with the same capacity ones.
    - Remove fuse box cover (1) at the lower left of operator's seat, and you will see fuse boxes (A) and (B).
    - Fuse box (C) is installed on the overhead panel.

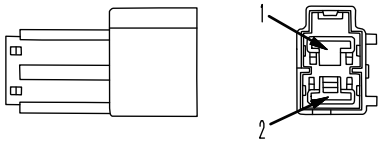
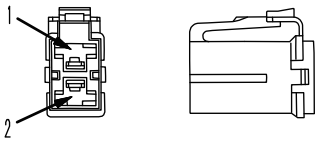


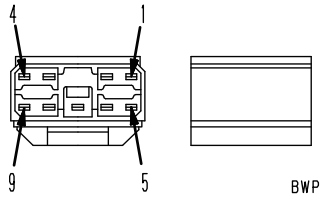
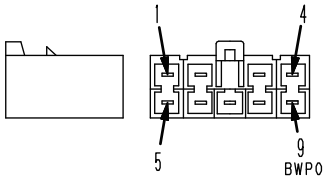


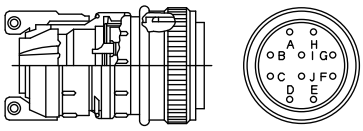
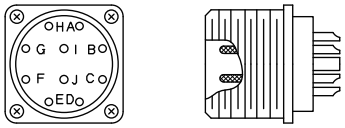


5/8


CB04
CB01
CB07
GND1
CBL4
CB08
CB11
CB12
CB10
CB13
CB14
CB15
RVC
CB02
AC6
CB16
CB23
CBL3
GND3
CBL1
CB35
CB32
CBL5
CB28
CB25
CBL2
A
CB27
GND7
GND4
CB17/B
CBLMP
CB37
20
ACC2
GND8
AC1
AC4
AC5
AC3
GND5
CIG
ACC1
CV1
GND6
AC7
A
CB24/B
AC2
AC8
AC9
B4D25885
9
8
7
6
5
4
3
2
1
Y
Z
AA
AB
AC
AD

No. of pins	L type connector		
	Male (female housing)	Female (male housing)	Testing connection use special tool Part No.
2	 BWP04769	 BWP04770	—
	—	—	

No. of pins	Connector for PA		
	Male (female housing)	Female (male housing)	
9	 BWP04771	 BWP04772	—
	—	—	

No. of pins	Bendix MS connector		
	Male (female housing)	Female (male housing)	
10	 BWP04773	 BWP04774	799-601-3460 (T-adapter)
	—	—	

B4D18401

Part No.	Part name	Number of pins	ID marking	T-adapter kit													Non-kit part
				799-601-2500	799-601-2700	799-601-2800	799-601-7000	799-601-7100	799-601-7400	799-601-7500	799-601-8000	799-601-9000	799-601-9100	799-601-9200	799-601-9300	799-601-4101	799-601-4201	
799-601-7530	Adapter for 070	14	07-14							●								
799-601-7540	Adapter for 070	18	07-18							●								
799-601-7550	Adapter for 070	20	07-20							●								
799-601-7360	Adapter for relay	5	REL-5P															●
799-601-7370	Adapter for relay	6	REL-6P															●
799-601-7380	Adapter for JFC	2																●
799-601-9010	Adapter for DTM	2	DTM2									●		●				
799-601-9020	Adapter for DT	2	DT2									●		●		●	●	
799-601-9030	Adapter for DT	3	DT3									●		●				
799-601-9040	Adapter for DT	4	DT4									●		●		●	●	
799-601-9050	Adapter for DT	6	DT6									●		●				
799-601-9060	Adapter for DT (gray)	8	DT8GR									●		●				
799-601-9070	Adapter for DT (black)	8	DT8B									●		●				
799-601-9080	Adapter for DT (green)	8	DT8G									●		●				
799-601-9090	Adapter for DT (brown)	8	DT8BR									●		●				
799-601-9110	Adapter for DT (gray)	12	DT12GR									●		●				
799-601-9120	Adapter for DT (black)	12	DT12B									●		●				
799-601-9130	Adapter for DT (green)	12	DT12G									●		●				
799-601-9140	Adapter for DT (brown)	12	DT12BR									●		●				
799-601-9210	Adapter for HD30-18	8	D18-8									●	●					
799-601-9220	Adapter for HD30-18	14	D18-14									●	●					
799-601-9230	Adapter for HD30-18	20	D18-20									●	●					
799-601-9240	Adapter for HD30-18	21	D18-21									●	●					
799-601-9250	Adapter for HD30-24	9	D24-9									●	●					
799-601-9260	Adapter for HD30-24	16	D24-16									●	●					
799-601-9270	Adapter for HD30-24	21	D24-21									●	●					
799-601-9280	Adapter for HD30-24	23	D24-23									●	●					
799-601-9290	Adapter for HD30-24	31	D24-31									●	●					
799-601-9310	Plate for HD30 (24 pins)											●	●		●			
799-601-9320	T-box (for ECONO)	24										●	●		●			
799-601-9330	Case											●						
799-601-9340	Case												●					
799-601-9350	Adapter for DRC	40	DRC-40												●			
799-601-9360	Adapter for DRC	24	DRC-24												●			
799-601-9410*	Socket for engine (CRI-T2)	2	G															●

Failure code	Failure (Displayed on screen)	Applicable component	Action level	Category of history	Remarks
DDKAKA	Blade Float SW Open Circuit	HST	L01	Electrical system	
DDKAKB	Blade Float SW Short Circuit	HST	L01	Electrical system	
DDKFL4	Left Angle SW Signal Mismatch	HST	L01	Electrical system	
DDKGL4	Right Angle SW Signal Mismatch	HST	L01	Electrical system	
DDKHKA	iB SW Open Circuit	HST	L01	Electrical system	*
DDKHKB	iB SW Short Circuit	HST	L01	Electrical system	*
DDKQKA	Offset SW UP:Open	ICT	L01	Electrical system	*
DDKQKB	Offset SW UP:Short	ICT	L01	Electrical system	*
DDKRKA	Offset SW DOWN:Open	ICT	L01	Electrical system	*
DDKRKB	Offset SW DOWN:Short	ICT	L01	Electrical system	*
DDKSKA	Back Grade Mode SW:Open	ICT	L01	Electrical system	*
DDKSKB	Back Grade Mode SW:Short	ICT	L01	Electrical system	*
DDNLKA	W/E Lock SW Open Circuit	HST	L03	Electrical system	*
DDNLKB	W/E Lock SW Short Circuit	HST	L03	Electrical system	*
DDP6KA	Brake Pressure Sensor:Open Circuit	HST	L03	Electrical system	*
DDP6KB	Brake Pressure Sensor:Hot Short Circuit	HST	L03	Electrical system	*
DDP6MA	Brake Pressure Sensor:Malfunction	HST	L03	Electrical system	*
DDU1FS	Parking Lever SW2:Signal Mismatch	HST	L03	Electrical system	*
DDU1KA	Parking Lever SW2:Open Circuit	HST	L03	Electrical system	*
DDU1KY	Parking Lever SW2:Hot Short Circuit	HST	L03	Electrical system	*
DFA4KX	Blade Lift Lever Potentiometer 1 and 2 Open Circuit or Hot Short Circuit	HST	L01	Electrical system	*
DFA4KZ	Blade Lift Lever Potentiometer 1 and 2 Open Circuit or Hot Short Circuit	HST	L01	Electrical system	*
DFA4L8	Blade Lift Lever Potentiometer 1 or 2 Signal Abnormality	HST	L01	Electrical system	*

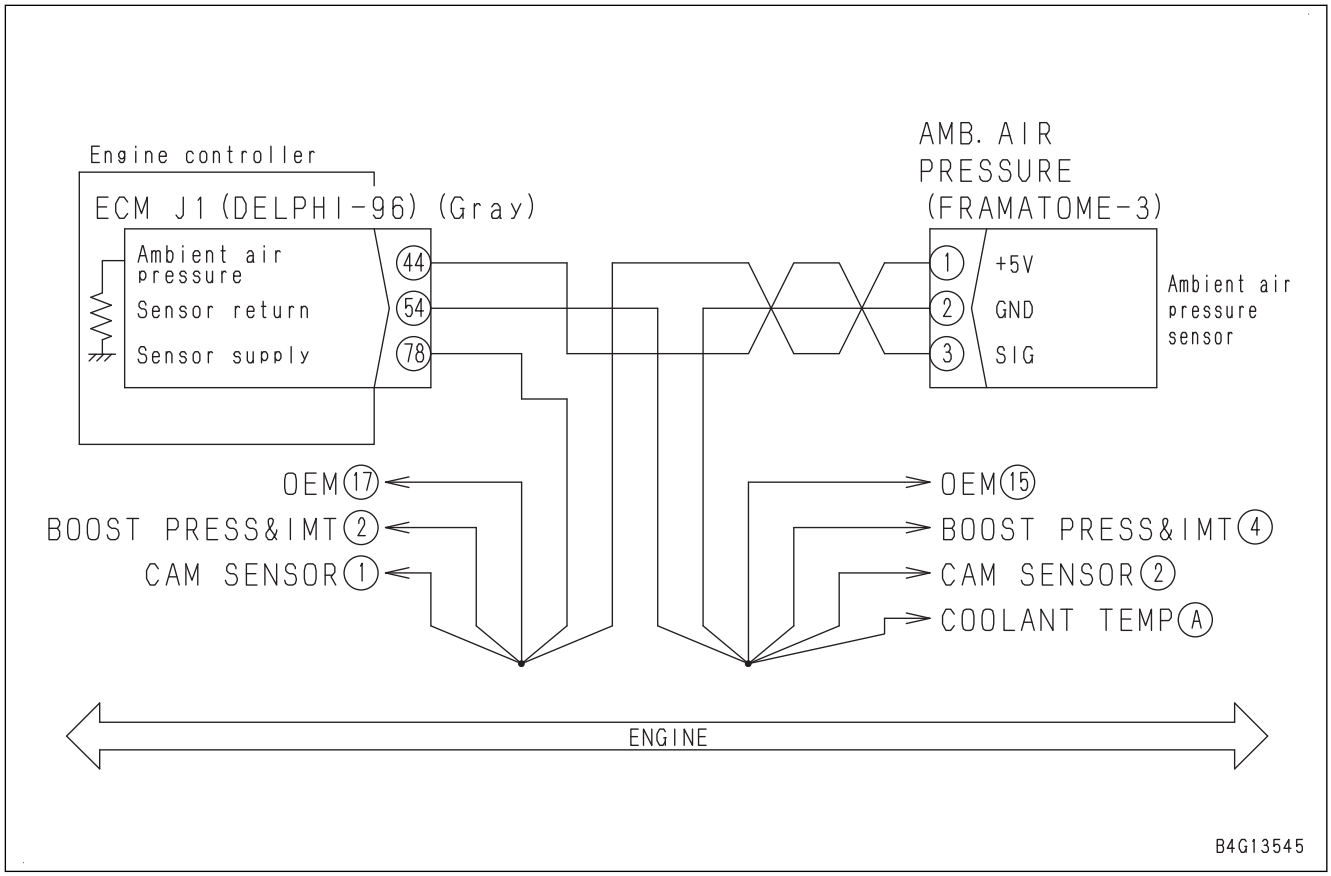
Failure Code [AS00R5]

Action level	Failure code	Failure	Inducement 3 (SCR Device Abnormality) (Engine controller system)
L04	AS00R5		
Detail of failure	Engine power deration.		
Action of controller	• The information related to this failure code is displayed on the monitor screen. • Engine power is restricted to low idle. • Neither Manual Stationary Regeneration nor Active Regeneration for Service can be performed.		
Phenomenon on machine	• Engine speed is fixed at low idle speed.		
Related information	• This failure code is detected during engine operation. • If this failure code displays after SCR system abnormality is repaired and the engine controller is shut down, run the engine for 1 minute to clear the failure code. • After this failure code is cleared, engine power deration continues until the starting switch is turned to OFF position.		

No.	Cause	Procedure, measuring location, criteria and remarks
1	SCR system abnormality	Failure codes of SCR system abnormality are displayed. Perform troubleshooting for them.
2	Engine system abnormality	If any other failure codes than SCR system abnormality are displayed, perform troubleshooting for them.

No.	Cause	Procedure, measuring location, criteria and remarks		
5	Short circuit in wiring harness	1. Turn starting switch to OFF position. 2. Disconnect connectors ECM J1 and AMB.AIR PRESSURE, and connect T-adapter to either female side.		
		Resistance	Between ECM J1 (female) (78) and (44), or between AMB.AIR PRESSURE (female) (1) and (3)	Min. 100 kΩ
6	Hot short circuit in wiring harness	1. Turn starting switch to OFF position. 2. Disconnect connector AMB.AIR PRESSURE, and connect T-adapter to female side. 3. Turn starting switch to ON position.		
		Voltage	Between (2) and AMB.AIR PRESSURE (female) (3)	Max. 1 V
7	Defective engine controller	If no failure is found by above checks, engine controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.)		

Circuit Diagram of Ambient Pressure Sensor



Failure Code [CA352]

Action level	Failure code	Failure	Sensor 1 Supply Voltage Low Error (Engine controller system)
L03	CA352		
Details of failure	Low voltage occurs in sensor power supply 1 (5 V) circuit.		
Action of controller	• Ignores signal from Bkup speed sensor, and operates by NE speed sensor signal. • Ignores signal from ambient pressure sensor, and fixes ambient pressure value to (52.44 kPa {0.53 kgf/cm^2}) for operation. • Ignores signal from charge (boost) pressure sensor, and fixes charge (boost) pressure value to (400 kPa {4.1 kgf/cm^2}) for operation. • Ignores signal from crankcase pressure sensor, and fixes crankcase pressure value to (0 kPa {0 kgf/cm^2}) for operation. • EGR valve closes and fully opens VGT. • Engine power deration • Regeneration control stops.		
Phenomenon on machine	Engine power deration		
Related information	• After repairing, check if the failure code is cleared by the following procedure. Procedure: Turn starting switch to ON position. • Engine power deration is canceled by turning starting switch to OFF position after this failure code is cleared (note the engine power deration is not canceled right after the failure code is cleared).		

No.	Cause	Procedure, measuring location, criteria and remarks
1	Defective wiring harness connector	1. See descriptions of wiring harness and connectors in “c: Electrical equipment” in “CHECKS BEFORE TROUBLESHOOTING” of “RELATED INFORMATION ON TROUBLESHOOTING”, and check it. 2. Turn starting switch to ON position.
		If this failure code is cleared, wiring harness connector is defective.

Failure Code [CA559]

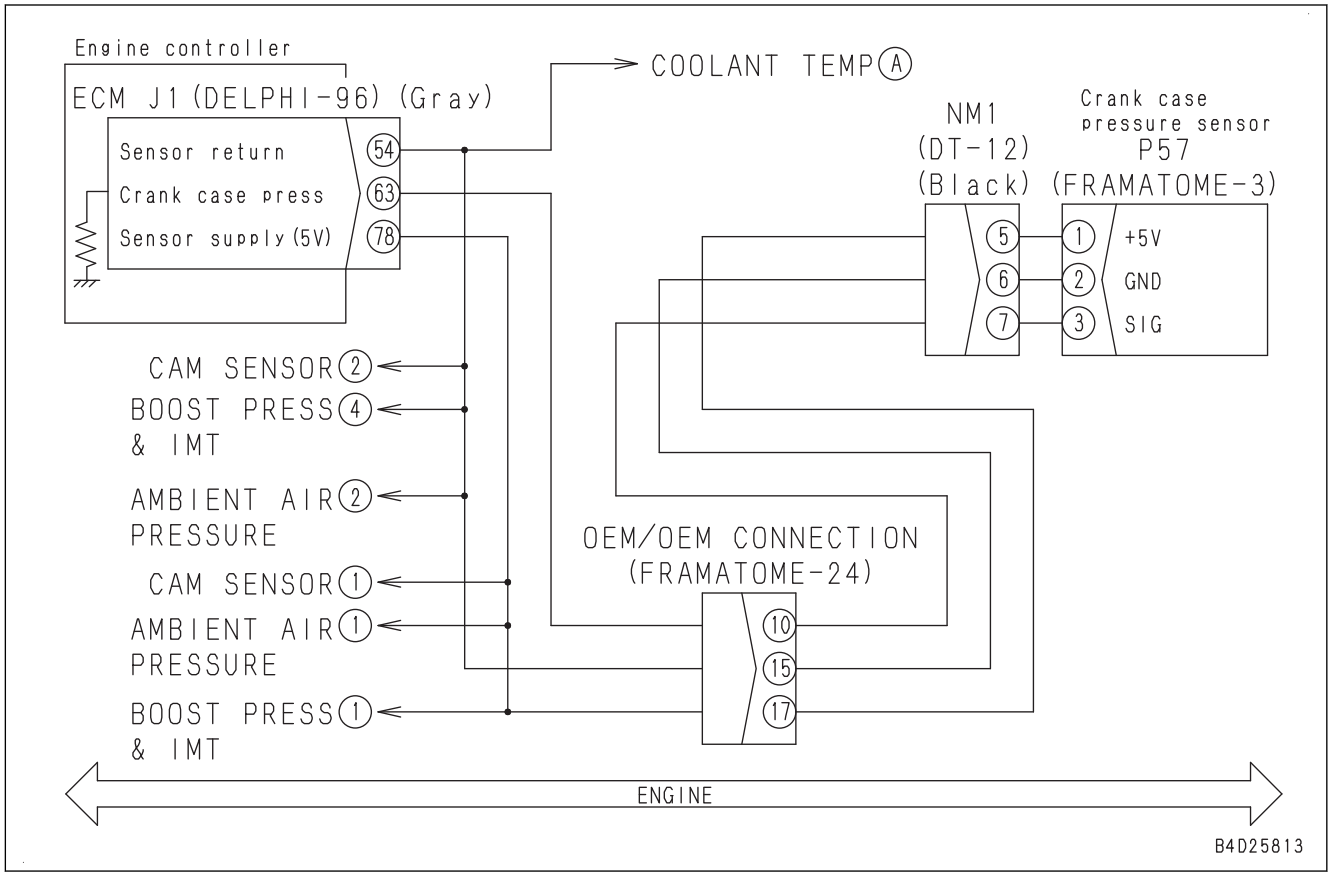
Action level	Failure code	Failure	Common Rail Pressure Low Error 1 (Engine controller system)
L01	CA559		
Details of failure	No-pressure error (level 1) is detected in supply pump.		
Action of controller	• Engine power deration. • Close EGR valve. • Stop regeneration control.		
Phenomenon on machine	Engine power deration		
Related information	• Common rail pressure in common rail pressure sensor can be checked by monitoring function. (Code: 36400 (MPa)) • Engine power deration is canceled by turning starting switch to OFF position after this failure code is cleared (note the engine power deration is not canceled right after failure code is cleared). • After repairing, check if the failure code is cleared by the following procedure. Procedure: Start engine.		

No.	Cause	Procedure, measuring location, criteria and remarks			
1	Defective wiring harness connector	1. Examine the connection state of the common rail pressure sensor connector. 2. See descriptions of wiring harness and connectors in “Electrical Components” in “Checks Before Troubleshooting” of “Related Information to Troubleshooting”, and check it. 3. Start the engine.			
		If this failure code is cleared, wiring harness connector is defective.			
2	Non-fuel	Check the remaining quantity of fuel			
3	Improper fuel is used.	Fuel used may be improper. Check it.			
4	Defective fuel tank breather	Fuel tank breather may be clogged. Check it directly			
5	Fuel leakage to outside	Fuel may be leaking to outside. Check it directly (Check visually while running engine at low idle)			
6	Defective low-pressure circuit component	For the test of the fuel low-tension circuit pressure, see “Examine Fuel Pressure” of TESTING AND ADJUSTING.			
		Pressure	Inlet negative pressure of fuel supply pump (fuel prefilter outlet pressure)	At high idle speed	Max. -40.7 kPa {Max. -305 mmHg}
			Fuel main filter inlet pressure	At cranking	207 to 500 kPa {2.11 to 5.1 kgf/cm^2}
				At high idle speed	207 to 650 kPa {2.11 to 6.63 kgf/cm^2}

No.	Cause	Procedure, measuring location, criteria and remarks		
2	Defective DEF pump system	If failure code [CA3558] or [CA3559] or [CA3571] or [CA3572] is displayed on the abnormality record screen, perform troubleshooting these first.		
3	Open circuit or short circuit in DEF line heater 1	If failure code [CA3713] or [CA5115] is displayed on the abnormality record screen, perform troubleshooting these first.		
4	Defective DEF pump temperature sensor system	If failure code [CA2976] is also displayed, perform checks on causes 2 and after in troubleshooting for this failure code.		
5	Defective DEF level sensor system	If failure code [CA1669] or [CA3868] or [CA4732] or [CA4739] or [CA4769] is displayed, perform troubleshooting these first.		
6	Low DEF level	If failure code [CA1673] or [CA3497] or [CA3498] or [CA3547] is displayed, troubleshoot for those codes first. If the level is low, replenish DEF until it can be seen in the sight gauge, and then “Loaded Diagnostics Operation To Clear Failure Code”.		
7	Open circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect the connectors ECM J2,UHR1, and UHB and connect the T-adapter to each female side.		
		Resistance	Between ECM J2 (female) (39) and UHR1 (female) (8)	Max. 10 Ω
			Between UHR1 (female) (12) and ground	Max. 10 Ω
			Between UHB (female) (1) and UHR1 (female) (5)	Max. 10 Ω
			Between UHB (female) (2) and ground	Max. 10 Ω
8	Hot short circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect the connectors ECM J2,UHR1, and UHB and connect the T-adapter to each female side. 3. Turn the starting switch to ON position.		
		Voltage	Between ground and ECM J2 (female) (39) or UHR1 (female) (8)	VMax. 3 V
			Between ground and UHR1 (female) (5) or UHB (female) (1)	VMax. 3 V
9	Defective DEF line heater	1. Turn starting switch to OFF position. 2. Disconnect connectors UHB, and connect T-adapter to male side of UHB.		
		Resistance	Between UHB (male) (1) and (2)	5 to 40 Ω
10	Hot short circuit in DEF line heater	1. Turn the starting switch to OFF position. 2. Disconnect connectors UHB, and connect T-adapter to male side of UHB. 3. Turn the starting switch to ON position.		
		Voltage	Between UHB (male) (1) and ground	VMax. 3 V
11	Defective DEF heater relay	1. Turn starting switch to OFF position. 2. Check that system operating lamp does not light up, and then turn the battery disconnect switch OFF. 3. Disconnect connector UHR1 and UHR2, and replace DEF heater relay. 4. Turn the battery disconnect switch ON. 5. Turn starting switch to ON position.		
		If this failure code is cleared, the original DEF heater relay is defective.		

No.	Cause	Procedure, measuring location, criteria and remarks			
6	Hot short circuit in wiring harness	1. Turn starting switch to OFF position. 2. Disconnect connector P57 and connect T-adapter to female side. 3. Turn starting switch to ON position.			
		Voltage	Between P57 (female) (3) and (2)		Max. 1 V
7	Defective engine controller	If no failure is found by above checks, engine controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.)			
		Reference 1. Turn starting switch to OFF position. 2. Insert T-adapter into connector ECM J1. 3. Turn starting switch to ON position.			
		Voltage	Between ECM J1 (63) and (54)	Sensor output	0.3 to 4.7 V

Circuit Diagram of Crankcase Pressure Sensor



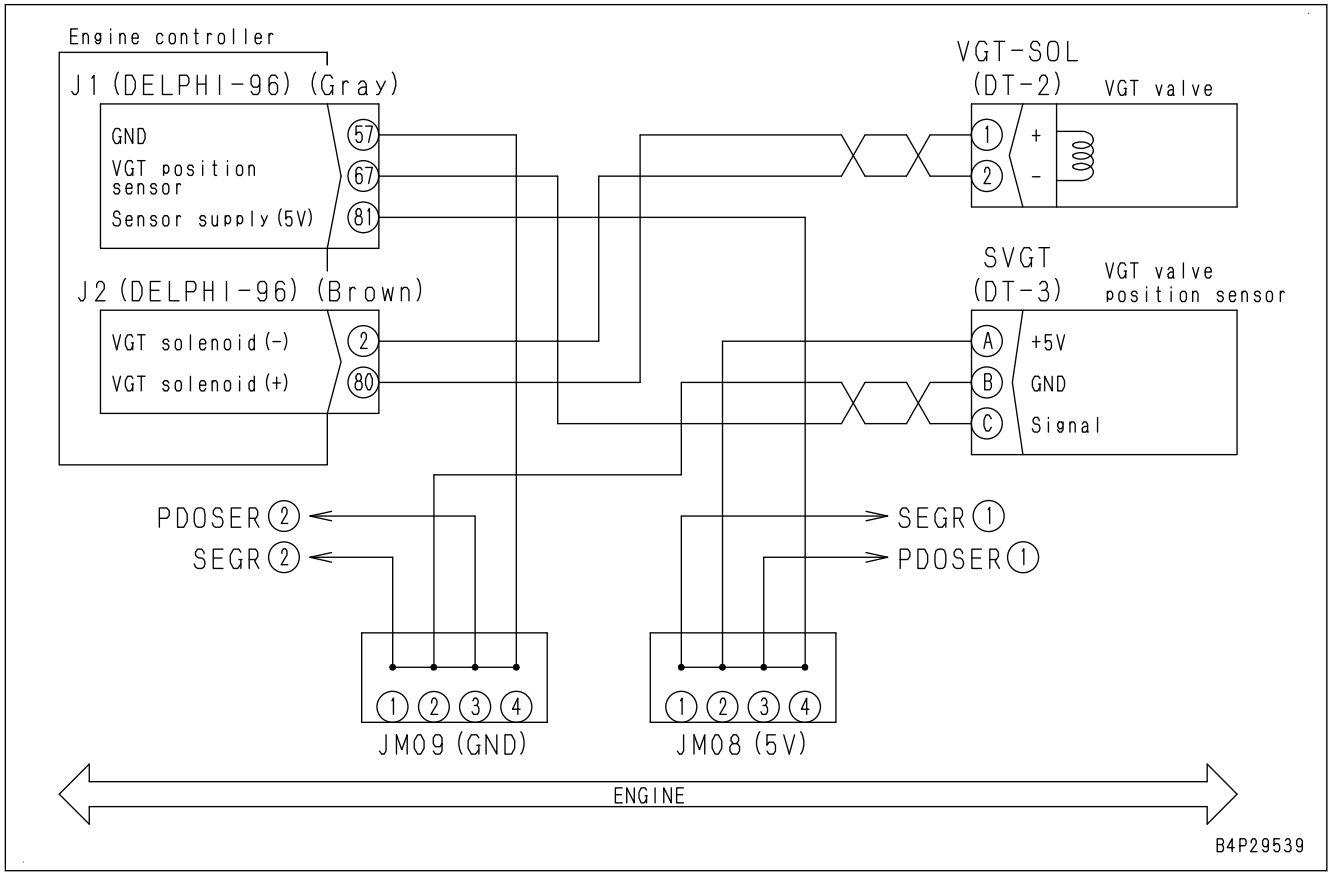
Failure Code [CA2186]

Action level	Failure code	Failure	Throttle Sensor Supply Voltage Low Error (Engine controller system)
L03	CA2186		
Details of failure	Low voltage is detected in throttle sensor power supply (5 V) circuit.		
Action of controller	Signal from decelerator pedal (throttle sensor) is ignored, and engine controller runs at fixed value by decelerator pedal position.		
Phenomenon on machine	Engine speed cannot be controlled by decelerator pedal.		
Related information	After repairing, check if the failure code is cleared by the following procedure. Procedure: Turn starting switch to ON position.		

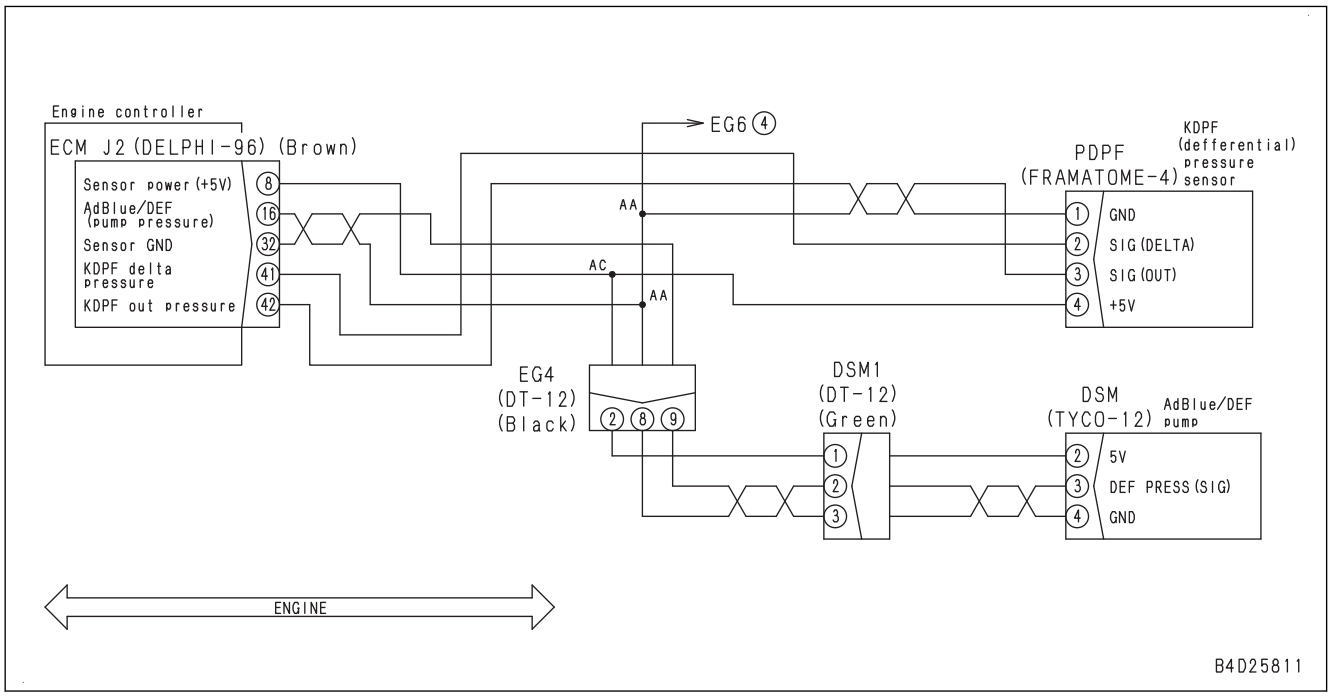
No.	Cause	Procedure, measuring location, criteria and remarks		
1	Defective wiring harness connector	1. Perform checkup referring to descriptions of wiring harness and connectors in “c Electric equipment” of “Checks before troubleshooting” in “General information on troubleshooting”. 2. Turn starting switch to ON position.		
		If this failure code is cleared, wiring harness connector is defective.		
2	Defective throttle sensor (decelerator pedal)	1. Turn the starting switch to OFF position. 2. Disconnect connector FP, and turn starting the starting switch to ON position.		
		If this failure code is cleared, the throttle sensor is defective. **NOTICE** **Other failure codes are displayed at the same time. This is because of disconnection of the connector. Ignore any codes other than this failure code [CA2186].**		
3	Ground fault in wiring harness (contact with ground circuit)	1. Turn the starting switch to OFF position. 2. Disconnect connectors ECM J2 and FP, and connect T-adapter to either female side.		
		Resistance	Between ground and ECM J2 (female) (9) or FP (female) (A)	Min. 100 kΩ
4	Defective engine controller	If no failure is found by above checks, engine controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.)		
		1. Turn starting switch to OFF position. 2. Disconnect connector ECM J2, and connect T-adapter to female side. 3. Turn starting switch to ON position.		
		Voltage	Between ECM J2 (female) (9) and (33)	4.75 to 5.25 V

No.	Cause	Procedures, Measurement, Values, Note	Diagnosis and treatment	
10	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 on the abnormality record of this failure code?	YES	Go back to the first check item.
			NO	The repair is done.

Circuit Diagram of VGT Position Sensor



Circuit Diagram Related to KDPF Outlet Pressure Sensor



No.	Cause	Procedure, measuring location, criteria and remarks		
4	Short circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect connectors ECM J2 and UHR1, and connect T-adapter to female side of ECM J2.		
		Continuity	Between ECM J2 (female) (38) and each pin other than pin (38)	No continuity
5	Defective DEF line heater	1. Turn starting switch to OFF position. 2. Disconnect the connectors UHC, and UHC1 and connect the T-adapter to each male side.		
		Resistance	Between UHC (male) (1) and (2)	5 to 40 Ω
			Between UHC1 (male) (1) and (2)	5 to 40 Ω
6	Ground fault in DEF line heater	1. Turn the starting switch to OFF position. 2. Disconnect the connectors UHC, and UHC1 and connect the T-adapter to each male side.		
		Resistance	Between UHC (male) (1) and ground	Min. 1 MΩ
			Between UHC1 (male) (1) and ground	Min. 1 MΩ
7	Defective power supply to DEF line heater	1. Turn the starting switch to OFF position. 2. Disconnect connectors UHR2, and connect T-adapter to female side of UHR2. 3. Turn the starting switch to ON position.		
		Voltage	Between UHR2 (female) (1) and ground	20 to 30 V
			Between UHR2 (female) (2) and ground	20 to 30 V
8	Defective DEF heater relay	1. Turn the starting switch to OFF position. 2. Check that system operating lamp is not lit, and turn the battery disconnect switch to OFF position. 3. Disconnect connector UHR1 and UHR2 and replace DEF heater relay. 4. Turn the battery disconnect switch to ON position. 5. Start the engine in low temperature (ambient temperature of 5 °C or below) or see “Service Mode” of “SET AND OPERATE MACHINE MONITOR”, and “METHOD FOR OPERATING TESTING MENU (SCR SERVICE TEST)” to perform “DEF Line Heater Relay 2 Test”.		
		If this failure code is no longer displayed, DEF heater relay is defective.		
9	Defective engine controller	If no failure is found by above checks, engine controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.)		

No.	Cause	Procedure, measuring location, criteria and remarks
3	Defective injector	Perform cylinder cutout mode operation to identify disabled cylinder (see “30 Testing and Adjusting”, “HANDLING CYLINDER CUTOUT MODE OPERATION”).
4	Oil leakage to turbocharger exhaust connector	1. Remove turbocharger exhaust connector. 2. Check inside of turbocharger exhaust connector for adhesion of oil and fuel. **NOTICE** • **If oil or fuel is found, visually check for oil leaks from EGR valve and turbocharger. Repair abnormality, if any.** • **Wipe off oil or fuel sticking to piping.**
5	Oil leakage into exhaust connector or duct to KDPF	Check the exhaust system between the turbocharger and KDPF to check for oil or fuel flow into KDPF. • Wipe stained oil or fuel off clean, if any. • If there is a trace of oil or fuel flowing into KDPF, check for KDPF and clean or replace it as necessary.
6	KDOC outlet temperature sensor installation error	For details, see “50 Disassembly and Assembly”, “REMOVE AND INSTALL KDPF ASSEMBLY” and “DISASSEMBLE AND ASSEMBLE OF KDPF ASSEMBLY”. Repair as necessary. For details, see “Remove and Install KDPF Assembly”, and “DISASSEMBLE AND ASSEMBLE OF KDPF ASSEMBLY” in Chapter 50 DISASSEMBLY AND ASSEMBLY. Repair as necessary.
7	Defective KDPF temperature sensor	1. Perform “Loaded Diagnostics Operation To Confirm Failure Correction”. 2. If the failure code displays after performing the preceding troubleshooting, replace the KDPF temperature sensor. 3. Perform “Loaded Diagnostics Operation To Confirm Failure Correction”.
8	Defective engine controller	If this failure code is kept displayed, or is displayed again after above checks are performed, engine controller is defective. (In case of an internal defect, troubleshooting is impossible as an assembly. Replace whole assembly.)

Loaded Diagnostics Operation to Confirm Failure Correction

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

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

REMARK

If this failure code is displayed during “Loaded Diagnostics Operation To Confirm Failure Correction”, return to troubleshooting.

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

1. Turn the starting switch to ON position.
2. Clear this failure code by “Engine Controller Active Fault Clear” from “SERVICE MODE” of the machine monitor.
3. Turn the starting switch to OFF position, and shut down the engine controller.
4. Turn the starting switch to ON position, and start the engine.
5. Run the engine at low idle speed for approximately 1 minute.
6. Perform brake, F3, steering and work equipment relief operation according to the following procedure.
   1) Set Operating mode in P mode, pedal mode in brake mode, and turn the fuel control dial to MAX position.
   2) Move parking brake lever to free position with decelerator/brake pedal depressed to stroke end, and set the joystick (steering, directional and gear shift lever) (PCCS lever) to FORWARD position.

<table>
<tr><th>No.</th><th>Cause</th><th colspan="3">Procedure, measuring location, criteria and remarks</th></tr>
<tr><td rowspan="2">4</td><td rowspan="2">Open circuit in wiring harness (line heater relay drive signal side)</td><td colspan="3">If failure code is still displayed after above checks, this check is not required.
1. Turn starting switch to OFF position.
2. Turn the battery disconnect switch to OFF position.
3. Disconnect connectors ECM J2 and UHR1, and connect T-adapters to each female side.</td></tr>
<tr><td>Resistance</td><td>Between ECM J2 (female) (3) and UHR1 (female) (10)</td><td>Max. 10 Ω</td></tr>
<tr><td rowspan="2">5</td><td rowspan="2">Ground fault in wiring harness (contact with ground circuit)</td><td colspan="3">1. Turn starting switch to OFF position.
2. Turn the battery disconnect switch to OFF position.
3. Disconnect connectors ECM J2 and UHR1, and connect T-adapter to either female side.</td></tr>
<tr><td>Resistance</td><td>Between ECM J2 (female) (3) and ground, or between UHR1 (female) (10) and ground</td><td>Min. 100 kΩ</td></tr>
<tr><td rowspan="2">6</td><td rowspan="2">Short circuit in wiring harness</td><td colspan="3">1. Turn starting switch to OFF position.
2. Turn the battery disconnect switch to OFF position.
3. Disconnect connectors ECM J2 and UHR1, and connect T-adapter to female side of connector ECM J2.</td></tr>
<tr><td>Continuity</td><td>Between ECM J2 (female) (3) and each pin other than pin (3)</td><td>No continuity</td></tr>
<tr><td rowspan="2">7</td><td rowspan="2">Defective DEF heater relay</td><td colspan="3">1. Turn starting switch to OFF position.
2. Check that system operating lamp does not light up, and then turn the battery disconnect switch OFF.
3. Disconnect connector UHR1 and UHR2, and replace DEF heater relay.
4. Turn the battery disconnect switch ON.
5. Turn starting switch to ON position.</td></tr>
<tr><td colspan="3">If this failure code is cleared, the original DEF heater relay is defective.</td></tr>
<tr><td>8</td><td>Defective engine controller</td><td colspan="3">If no failure is found by above checks, engine controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.)</td></tr>
</table>

Failure Code [CA3583]

<table>
<tr><td>Action level</td><td>Failure code</td><td rowspan="2">Failure</td><td rowspan="2">SCR Outlet NOx Sensor Heater Warming up Error
(Engine controller system)</td></tr>
<tr><td>L01</td><td>CA3583</td></tr>
<tr><td>Detail of failure</td><td colspan="3">There is an abnormality in the heater part of the SCR outlet NOx sensor. (It is not heated or the temperature cannot be kept)</td></tr>
<tr><td>Action of controller</td><td colspan="3">• Drive at the default NOx emission value (0 ppm)
• Advances to Inducement strategy.</td></tr>
<tr><td>Phenomenon on machine</td><td colspan="3">• NOx emission may increase or ammonia may be exhausted because DEF injection works inappropriately.
• Engine power deration according to inducement strategy.</td></tr>
<tr><td>Related information</td><td colspan="3">⚠ The KDPF, sensor fitting piping, and sensor probe become hot (Min. 500 °C). Be careful not to get burned.
⚠ The SCR assembly, sensor fitting piping, and sensor probe become hot (Min. 400 °C). Be careful not to get burned.
⚠ Be careful not to get burned by the sensor probe as it is heated by itself even if the ambient temperature is not high.
• For the inducement failure codes, refer “List of failure codes related to Inducement” of “Troubleshooting Points for Urea SCR System”.
• The SCR outlet NOx sensor operates when 19302 SCR outlet temperature is 150 °C or more (19210 SCR outlet NOx sensor measurement state is “1”).
• The SCR outlet NOx sensor is a smart sensor which performs CAN communication with the engine controller together with the other sensors.
• The SCR outlet NOx sensor does not operate when SCR outlet temperature is 150 °C or lower, and correct value is not displayed.
• The Pre-defined Monitoring screen uses the engine operation state diagnosis, SCR catalyst, NOx sensor, and ammonia sensor diagnosis.
• Engine operation state diagnosis
01002 Engine speed
19200 Exhaust gas flow rate
47300 KDOC Inlet Temperature
19300 SCR Temperature
19302 SCR Outlet Temperature
• SCR catalyst, NOx sensor, ammonia sensor diagnosis.
19203 Turbo Outlet NOx Sensor State
19210 SCR Outlet NOx Sensor State
19202 Turbo Outlet Concentration Corrected
19209 SCR Outlet NOx Corrected
19205 Ammonia Concentration Corrected
19120 DEF Injection Quantity
NOTICE
For this failure code, after investigating the cause of the problem and completing the repair, perform “Loaded Diagnostics Operation To Confirm Failure Correction” to make sure the failure code is cleared. (This failure code is not cleared by only turning ON the starting switch.)</td></tr>
</table>

Failure Code [CA3755]

Action level	Failure code	Failure	DEF Dosing Performance Degradation Error (Engine controller system)
L03	CA3755		
Detail of failure	Actual DEF dosing performance is less than that which is indicated.		
Action of controller	None in particular		
Phenomenon on machine	The DEF injection becomes inappropriate, and then NOx emission increases.		
Related information	⚠ **The DEF mixing piping, SCR assembly, sensor fitting piping, and sensor probe become hot (Min. 400 °C). Be careful not to get burned.** ⚠ **Be careful that DEF leaks when removing DEF mixing piping or DEF injector.** • This failure code occurs only in the “SCR Denitration Efficiency Test”(denitration efficiency test time is up to 1.5 hours) implemented to locate the failure points when a failure code such as [CA3151], [CA3543], and [CA3582] is displayed. • For the procedure to remove and change the DEF injector, see “Remove and Install DEF Injector”. **NOTICE** **For this failure code, after investigating the cause of the problem and completing the repair, perform “Loaded Diagnostics Operation To Clear Failure Code” to make sure the failure code is cleared. (This failure code is not cleared by turning ON the starting switch.)**		

No.	Cause	Procedure, measuring location, criteria and remarks
1	Defective DEF injector	1. Turn starting switch to OFF position. 2. Remove the DEF injector. 3. Refer to “Testing and adjusting”, “SETTING AND OPERATION OF MACHINE MONITOR”, “Service mode”, “Operation method of testing menu (SCR Service Test)” to perform an “DEF injector injection amount test” to judge the injector. 4. Perform “Loaded Diagnostics Operation To Clear Failure Code”.
2	Clogged DEF supply line	1. Remove the hose at DEF injector to allow DEF to drain. 2. Prepare a container at the injector to receive drained DEF. 3. See Testing and adjusting, “service modes” of “setting and operating machine monitor”, “operating method of testing menu (SCR service test)” to perform an “DEF pump pressure rising test”. 4. If the DEF pump pressure stays at 900 kPa, there is a clogging in the DEF pressure hose. Clean or replace the DEF hose. **REMARK** Failure code [CA1682] may be displayed if the pressure does not rise within 3 minutes while performing the “DEF pump pressure rising test”.

Loaded Diagnostics Operation to Confirm Failure Correction

Check if the repair has been completed with the following procedure:

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

Clear this failure code by “ Engine Controller Inducement Fault Clear ” before step 1.

1. Turn the starting switch to OFF position, and shut down the engine controller.
2. Turn the starting switch to ON position, and start the engine.
3. Run the engine at high idle speed to raise the exhaust temperature. (Keep the engine speed so that monitoring code 19300 “ SCR temperature ” is 150 °C or higher °C.)
4. Check if this failure code is not displayed after 1 minute.

REMARK

- If this failure code is not displayed, repair is completed.
- In case it is displayed, return to troubleshooting.

Failure Code [CA4166]

Action level	Failure code	Failure	SCR Temperature Sensor ECU High Temperature Error
L01	CA4166		(Engine controller system)
Detail of failure	High temperature error is detected in SCR temperature sensor controller. (Min. 150 °C)		
Action of controller	None in particular		
Phenomenon on machine	• Defective detection of SCR temperature and SCR outlet temperature		
Related information	⚠ **The SCR assembly, sensor fitting piping, and sensor probe become hot (Min. 400 °C). Be careful not to get burned.** • The SCR temperature sensor and SCR outlet temperature sensor are integrated into one sensor controller which provides CAN communication with the engine controller. • For the replacement procedure of the SCR temperature sensor, see “50 Disassembly and Assembly”, “REMOVE AND INSTALL SCR TEMPERATURE SENSOR”. **NOTICE** **For this failure code, after investigating the cause of the problem and completing the repair, perform “Loaded Diagnostics Operation To Confirm Failure Correction” to make sure that the failure code is cleared. (Repair completion cannot be judged without raising the exhaust temperature even if this failure code is cleared by turning ON the starting switch)**		

No.	Cause	Procedure, measuring location, criteria and remarks
1	Exhaust gas leakage (high environmental temperature)	Check if the temperature sensor controller environmental temperature is extraordinary high (150 °C or above).
2	Defective SCR temperature sensor (internal defect)	1. Turn starting switch to OFF position. 2. Replace SCR temperature sensor. 3. Turn starting switch to ON position. 4. Perform “Loaded Diagnostics Operation To Confirm Failure Correction”.
		If this failure code is cleared, the original sensor is defective. (In case of an internal defect, troubleshooting is impossible as an assembly. Replace whole assembly.)
3	Defective engine controller	If no failure is found by above checks, engine controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.)

Loaded Diagnostics Operation to Confirm Failure Correction

REMARK

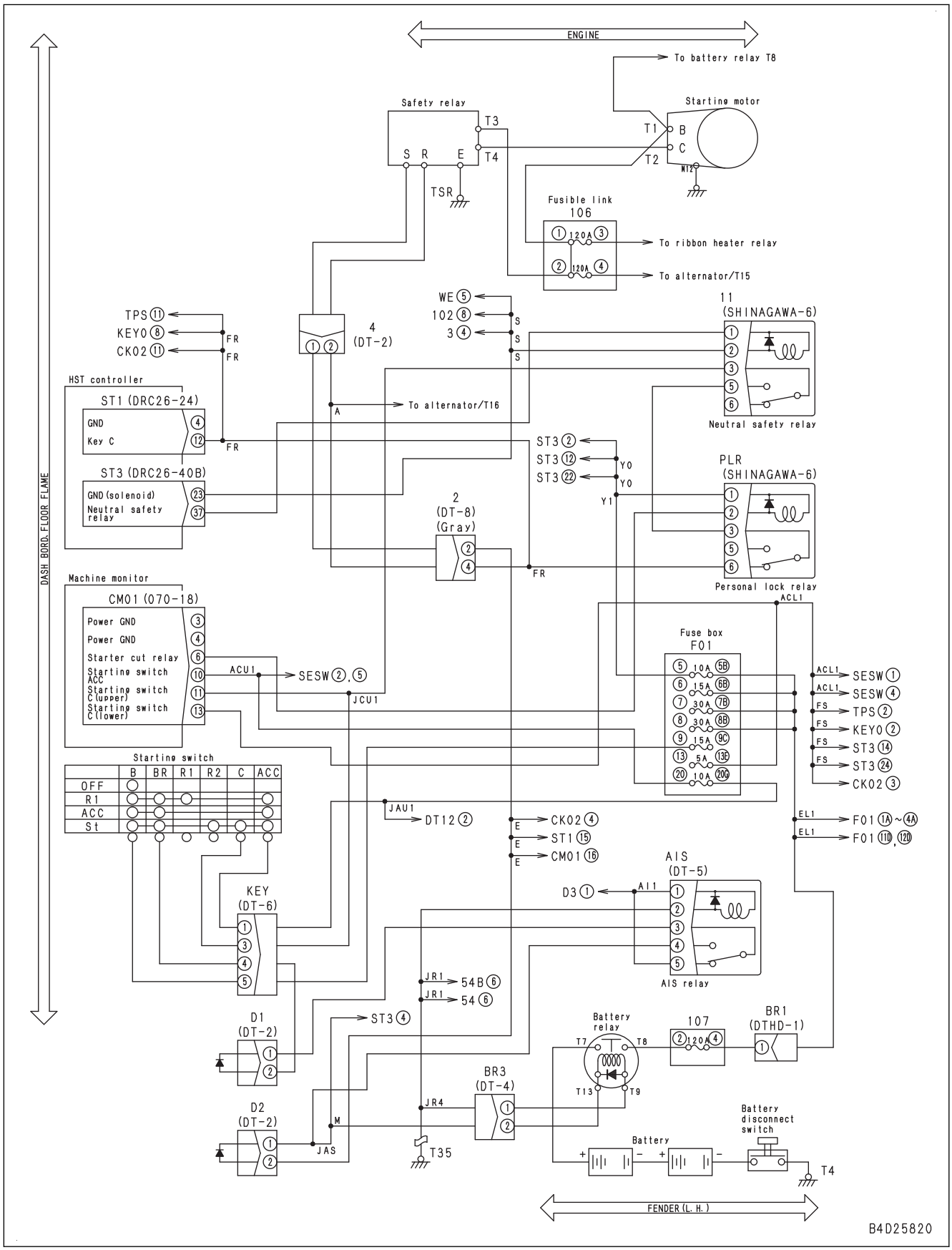
If this failure code is displayed during “Loaded Diagnostics Operation To Confirm Failure Correction”, return to troubleshooting.

Check if the repair has been completed with the following procedure:

1. Turn the starting switch to OFF position, and shut down the engine controller.
2. Turn the starting switch to the ON position, and check the failure code is cleared. If this failure code is displayed, return to troubleshooting.
3. Start the engine.
4. Run the engine at low idle speed for 10 minutes.
5. Run the engine at high idle speed for 10 minutes.

<table>
<tr><th>No.</th><th>Cause</th><th colspan="3">Procedure, measuring location, criteria and remarks</th></tr>
<tr><td rowspan="2">4</td><td rowspan="2">Open circuit in wiring harness (line heater relay drive signal side)</td><td colspan="3">If failure code is still displayed after above checks, this check is not required.
1. Turn starting switch to OFF position.
2. Turn the battery disconnect switch to OFF position.
3. Disconnect connectors ECM J2 and UHR1, and connect T-adapters to each female side.</td></tr>
<tr><td>Resistance</td><td>Between ECM J2 (female) (7) and UHR1 (female) (11)</td><td>Max. 10 Ω</td></tr>
<tr><td rowspan="2">5</td><td rowspan="2">Ground fault in wiring harness (contact with ground circuit)</td><td colspan="3">1. Turn starting switch to OFF position.
2. Turn the battery disconnect switch to OFF position.
3. Disconnect connectors ECM J2 and UHR1, and connect T-adapter to either female side.</td></tr>
<tr><td>Resistance</td><td>Between ECM J2 (female) (7) and ground, or between UHR1 (female) (11) and ground</td><td>Min. 100 kΩ</td></tr>
<tr><td rowspan="2">6</td><td rowspan="2">Short circuit in wiring harness</td><td colspan="3">1. Turn starting switch to OFF position.
2. Turn the battery disconnect switch to OFF position.
3. Disconnect connectors ECM J2 and UHR1, and connect T-adapter to female side of connector ECM J2.</td></tr>
<tr><td>Continuity</td><td>Between ECM J2 (female) (7) and each pin other than pin (7)</td><td>No continuity</td></tr>
<tr><td rowspan="2">7</td><td rowspan="2">Defective DEF heater relay</td><td colspan="3">1. Turn starting switch to OFF position.
2. Check that system operating lamp does not light up, and then turn the battery disconnect switch OFF.
3. Disconnect connector UHR1 and UHR2, and replace DEF heater relay.
4. Turn the battery disconnect switch ON.
5. Turn starting switch to ON position.</td></tr>
<tr><td colspan="3">If this failure code is cleared, the original DEF heater relay is defective.</td></tr>
<tr><td>8</td><td>Defective engine controller</td><td colspan="3">If no failure is found by above checks, engine controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.)</td></tr>
</table>

Circuit Diagram of Neutral Safety Relay



Failure Code [DAFLKA] (Machine with KOMTRAX Terminal)

Action level	Failure code	Failure	System Operating Lamp Open Circuit (Monitor) (Machine monitor system)
-	DAFLKA		
Detail of failure	Machine monitor determines that system operating lamp circuit is open because voltage of output circuit remains at approximately 5 V or less for approximately 3 seconds after starting switch is turned to ON position, during which machine monitor outputs no current to system operating lamp.		
Action of machine monitor	None in particular		
Phenomenon on machine	While system operating lamp is lit, battery disconnect switch must not be turned to OFF position. Turning battery disconnect switch to OFF position may destroy data stored in machine monitor memory.		
Related information	• After completion of repair, check if the failure code is cleared by the following procedure. Procedure: Turn the starting switch to ON position. • Although machine monitor is not able to light up system operating lamp, no trouble will result unless battery disconnect switch is turned to OFF position. • When controller lights up system operating lamp, output circuit voltage is at low level. • Since no controller drives system operating lamp for approximately 3 seconds after starting switch is turned to ON position, open circuit can be detected.		

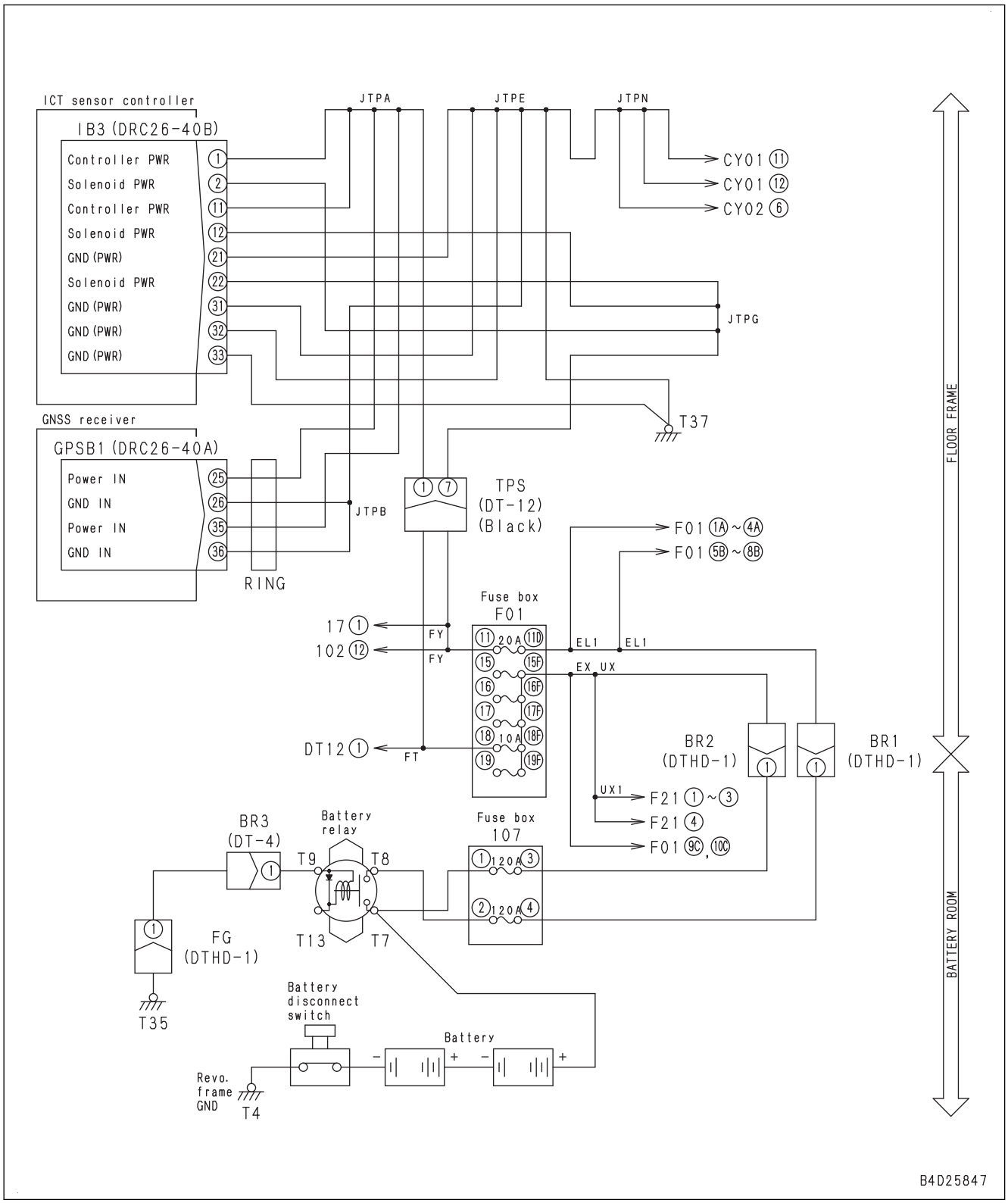
No.	Cause	Procedure, measuring location, criteria and remarks		
1	Defective fuse	If fuse No.17 in fuse box F01 is blown out, circuit probably has ground fault.		
2	Open circuit in wiring harness (wire breakage or defective contact of connector)	1. Turn the starting switch to OFF position. 2. Turn the battery disconnect switch to OFF position 3. Remove fuse No.17 in fuse box F01. 4. Disconnect connectors CM01 and LBU, and connect T-adapter to each female side.		
		Resistance	Between CM01 (female) (8) and LBU (female) (2)	Max. 1 Ω
			Between LBU (female) (1) and F01-17	Max. 1 Ω
3	Defective machine monitor	If no failure is found by above checks, machine monitor is defective. (Since this is an internal defect, troubleshooting cannot be performed.)		

Failure Code [DAJPMA]

Action level	Failure code	Failure	Inconsistency of Option Selection (Hydrostatic Transmission Controller) (HST controller system)
L01	DAJPMA		
Detail of failure	When starting switch is turned to ON position, the option setting information sent from machine monitor differs from that stored in the HST controller.		
Action of controller	• Operates by considering there is no option setting. • Displays system state monitor on machine monitor.		
Phenomenon on machine	Option setting does not operate correctly.		
Related information	• Perform initial setting and initial adjustment similar to those required when HST controller is replaced. • After completion of repair, check that the failure code is cleared by the following procedure. Procedure: Turn the starting switch to ON position.		

No.	Cause	Procedure, measuring location, criteria and remarks
1	Defective option setting of machine monitor	Option setting of machine monitor is probably incorrect. Perform correct setting referring to TESTING AND ADJUSTMENT, “SPECIAL FUNCTIONS OF MACHINE MONITOR”.
2	Defective machine monitor	If no failure is found by above checks, machine monitor is defective. (Since this is an internal defect, troubleshooting cannot be performed.)
3	Defective HST controller	If no failure is found by preceding checks, HST controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.)

Circuit Diagram of ICT Sensor Controller Power Supply



Failure Code [DDKFL4]

Action level	Failure code	Failure	Left Angle Switch Signal Mismatch (HST controller system)
L01	DDKFL4		
Detail of failure	2 lines of NO (Normally Open) of SW1 and SW2 in left angle lever circuit do not match.		
Action of controller	Recognizes that the left angle lever is not pressed.		
Phenomenon on machine	Angle LEFT control of work equipment is disabled.		
Related information	• Signal state of left angle lever can be checked with monitoring function. (Code: 70306) • After completion of repair, check that the failure code is cleared by the following procedure. Procedure: Turn the starting switch to ON position, and perform angle LEFT operation. • While left angle lever is free, both SW1 and SW2 of left angle lever are open (diagram shows free state).		

No.	Cause	Procedure, measuring location, criteria and remarks			
1	Defective left angle switch (wiring harness) (internal open circuit)	1. Turn the starting switch to OFF position. 2. Disconnect connector BNSW, and connect T-adapter to male side. 3. Operate the work equipment control lever to angle LEFT direction to perform troubleshooting.			
		Resistance	Between BNSW (male) (10) and (9)	Free	Min. 1 MΩ
				Left angle	Max. 1 Ω
			Between BNSW (male) (11) and (9)	Free	Min. 1 MΩ
				Left angle	Max. 1 Ω
2	Open circuit or hot short circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect connector BNSW, and connect T-adapter to female side. 3. Turn the starting switch to ON position. **REMARK** • If voltage is 0 V, wiring harness has open circuit. If it is 24 V, wiring harness has hot short circuit. • In HST controller, approximately 9 V of voltage is applied to 2 signal lines of “NO” through resistance.			
		Voltage	Between BNSW (female) (10) and (9)		7 to 11 V
			Between BNSW (female) (11) and (9)		7 to 11 V
3	Open circuit in wiring harness (wire breakage or defective contact)	If no failure is found by check on cause 2, this check is not required. 1. Turn the starting switch to OFF position. 2. Disconnect connectors ST2 and BNSW, and connect T-adapter to each female side.			
		Resistance	Between ST2 (female) (29) and BNSW (female) (9)		Max. 1 Ω
			Between ST2 (female) (13) and BNSW (female) (11)		Max. 1 Ω
			Between ST2 (female) (3) and BNSW (female) (10)		Max. 1 Ω

Failure Code [DDU1FS]

Action level	Failure code	Failure	Parking Lever Switch 2: Signal Mismatch (HST controller system)
L03	DDU1FS		
Detail of failure	The parking brake lever switch 1 signal shows the lock position, but the power is supplied to the slow brake solenoid valve.		
Action of controller	• Displays parking brake abnormality monitor on machine monitor. • Restricts a part of functions. • Even if cause of failure is eliminated, machine does not become normal until starting switch is turned to OFF position.		
Phenomenon on machine	• Once machine stops, engine speed is restricted to medium (half) speed. • Once machine stops, travel speed after restarted is restricted to 50 %.		
Related information	• Input state (ON/OFF) from parking brake lever switches 1 and 2 can be checked with monitoring function. (Code: 40984) • After completion of repair, check that the failure code is cleared by the following procedure. Procedure: Turn the starting switch to ON position, and operate the parking brake lever. • When the parking brake lever is operated, parking brake lever switches 1 and 2 operate simultaneously.		

No.	Cause	Procedure, measuring location, criteria and remarks			
1	Defective parking brake lever switch 1 (internal open circuit)	1. Turn the starting switch to OFF position. 2. Disconnect connector 26, and connect T-adapter to male side. 3. Operate parking brake lever to perform troubleshooting.			
		Resistance	Between 26 (male) (A) and (B)	Lever: FREE	Max. 1 Ω
				Lever: LOCK	Min. 1 MΩ
			Between 26 (male) (A) and (C)	Lever: FREE	Min. 1 MΩ
				Lever: LOCK	Max. 1 Ω
2	Defective parking brake lever switch 2 (internal open circuit)	1. Turn the starting switch to OFF position. 2. Disconnect connector 26B, and connect T-adapter to male side. 3. Operate parking brake lever to perform troubleshooting.			
		Resistance	Between 26B (male) (A) and (B)	Lever: FREE	Max. 1 Ω
				Lever: LOCK	Min. 1 MΩ
			Between 26B (male) (A) and (C)	Lever: FREE	Min. 1 MΩ
				Lever: LOCK	Max. 1 Ω
3	Hot short circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect connector S3, and connect T-adapter to female side. 3. Turn the starting switch to ON position.			
		Voltage	Between S3 (female) (1) and (2) or ground		Max. 4.5 V
4	Defective installation of parking brake lever switches 1 and 2	Defective installation of parking brake lever switches 1 and 2 is suspected. Check it. (See TESTING AND ADJUSTING.)			

Failure Code [DFA9KA]

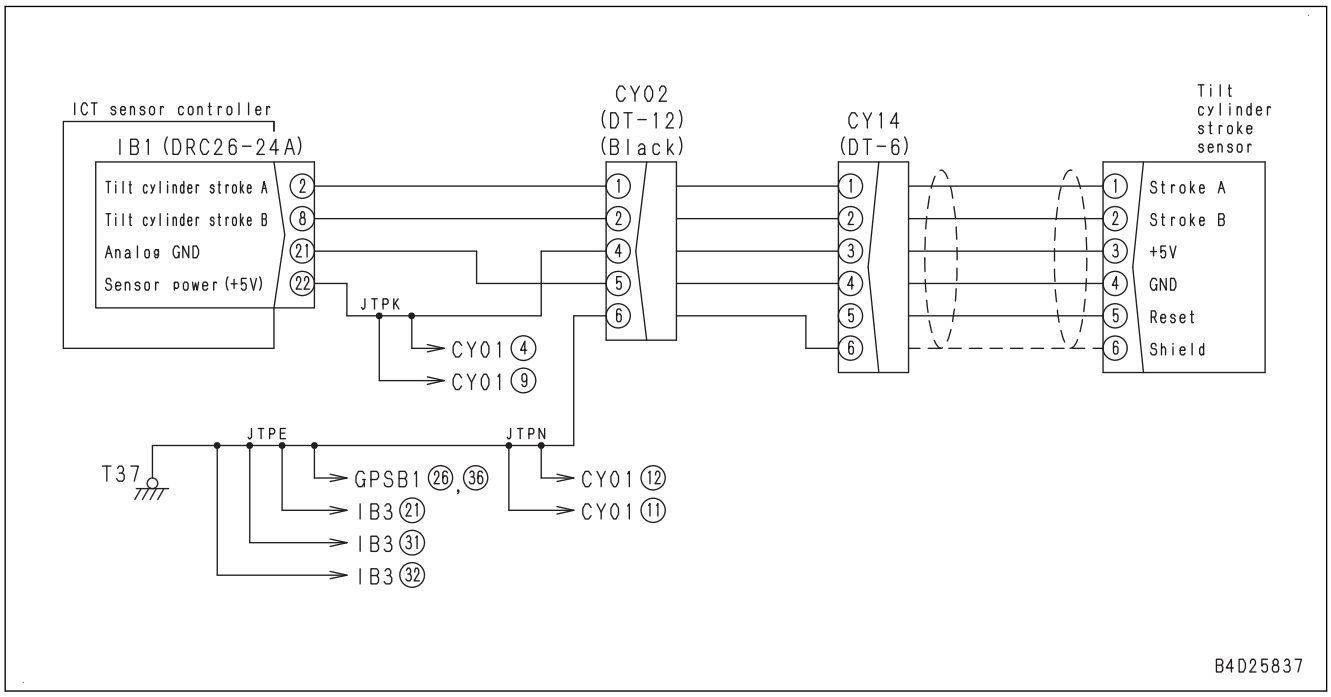
Action level	Failure code	Failure	Blade Tilt Lever Potentiometer 2 Open Circuit (HST controller system)
L01	DFA9KA		
Detail of failure	Signal voltage of blade tilt lever potentiometer system 2 is 0.5 V and below.		
Action of controller	Continues blade control with signal from blade tilt lever potentiometer system 1.		
Phenomenon on machine	None		
Related information	• Signal voltage of blade tilt lever potentiometer 2 can be checked with monitoring function. (Code: 73501) • After completion of repair, check that the failure code is cleared by the following procedure. Procedure: Turn the starting switch to ON position, and operate the blade control lever (left TILT).		

No.	Cause	Procedure, measuring location, criteria and remarks			
1	Defective 5 V sensor power supply system	If failure code [DAJ5KK] is also displayed, perform troubleshooting for it first.			
		1. Turn the starting switch to OFF position. 2. Disconnect connector WLV1 and connect T-adapter to female side. 3. Turn the starting switch to ON position. **REMARK** If power supply voltage is abnormal, go to check on cause 3 and after.			
		Voltage	Between WLV1 (female) (8) and (5)	Power supply	4.5 to 5.5 V
2	Defective blade tilt lever potentiometer 2 (internal open circuit) or ground fault	1. Turn the starting switch to OFF position. 2. Insert T-adapter into connector WLV1. 3. Turn the starting switch to ON position. 4. Operate the blade control lever (left TILT) to perform troubleshooting. **REMARK** • If power supply voltage is normal and potentiometer output voltage is abnormal (0.5 V and below), it cannot be determined whether ground fault or defective potentiometer is the cause. In this case, proceed to check on cause 4. • If no failure is found by check on Cause 4, blade tilt lever potentiometer 2 is defective.			
		Voltage	Between WLV1 (female) (6) and (5)		0.96 to 4.04 V

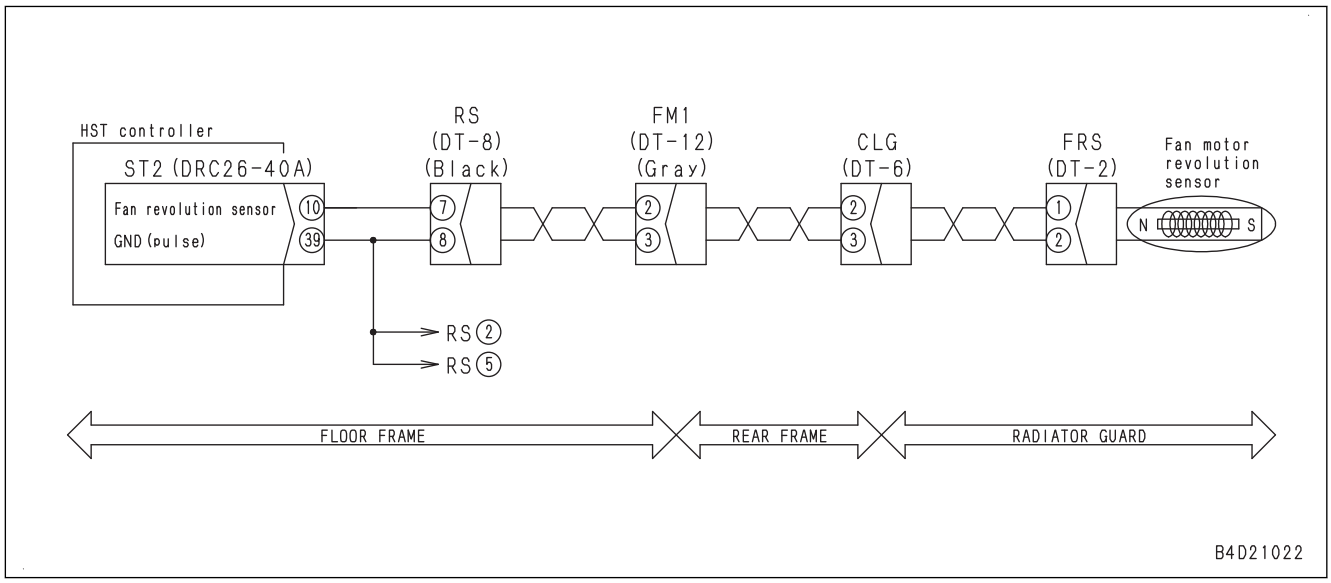
<table>
<tr><th>No.</th><th>Cause</th><th colspan="3">Procedure, measuring location, criteria and remarks</th></tr>
<tr><td rowspan="4">3</td><td rowspan="4">Open circuit in wiring harness (wire breakage or defective contact of connector)</td><td colspan="3">1. Turn the starting switch to OFF position.
2. Disconnect connectors ST1, ST2, and LPR, and connect T-adapter to each female side.</td></tr>
<tr><td rowspan="3">Resistance</td><td>If power supply voltage in check on cause 1 is normal, this check is not required.
Between ST1 (female) (22) and LPR (female) (3)</td><td>Max. 1 Ω</td></tr>
<tr><td>If power supply voltage in check on cause 1 is normal, this check is not required.
Between ST1 (female) (21) and LPR (female) (1)</td><td>Max. 1 Ω</td></tr>
<tr><td>Between ST2 (female) (15) and LPR (female) (2)</td><td>Max. 1 Ω</td></tr>
<tr><td rowspan="3">4</td><td rowspan="3">Ground fault in wiring harness (contact with ground circuit)</td><td colspan="3">If no failure is found by check on cause 2, this check is not required.
1. Turn the starting switch to OFF position.
2. Disconnect connectors ST1, ST2, and LPR, and connect T-adapter to any female side.</td></tr>
<tr><td rowspan="2">Resistance</td><td>Between ST2 (female) (15) and ST1 (female) (21) or between LPR (female) (2) and (1)</td><td>Min. 1 MΩ</td></tr>
<tr><td>Between ST2 (female) (15) and ground, or between LPR (female) (2) and ground</td><td>Min. 1 MΩ</td></tr>
<tr><td rowspan="2">5</td><td rowspan="2">Defective HST controller</td><td colspan="3">If no failure is found by preceding checks, HST controller is defective.
Reference
1. Turn the starting switch to OFF position.
2. Insert T-adapter into connector ST1 and ST2.
3. Turn the starting switch to ON position.</td></tr>
<tr><td>Voltage</td><td>Between ST2 (15) and ST1 (21)</td><td>0.5 to 4.5 V</td></tr>
</table>

<table>
<tr><th>No.</th><th>Cause</th><th colspan="3">Procedure, measuring location, criteria and remarks</th></tr>
<tr><td rowspan="4">3</td><td rowspan="4">Open circuit in wiring harness (wire breakage or defective contact of connector)</td><td colspan="3">1. Turn the starting switch to OFF position.
2. Disconnect connectors ST1 and EL, and connect T-adapter to each female side.</td></tr>
<tr><td rowspan="3">Resistance</td><td>If power supply voltage in check on cause 1 is normal, this check is not required.
Between ST1 (female) (22) and EL (female) (4)</td><td>Max. 1 Ω</td></tr>
<tr><td>If power supply voltage in check on cause 1 is normal, this check is not required.
Between ST1 (female) (4) and EL (female) (1)</td><td>Max. 1 Ω</td></tr>
<tr><td>Between ST1 (female) (13) and EL (female) (3)</td><td>Max. 1 Ω</td></tr>
<tr><td rowspan="3">4</td><td rowspan="3">Ground fault in wiring harness (contact with ground circuit)</td><td colspan="3">If no failure is found by check on cause 2, this check is not required.
1. Turn the starting switch to OFF position.
2. Disconnect connectors ST1 and EL, and connect T-adapter to either female side.</td></tr>
<tr><td rowspan="2">Resistance</td><td>Between ST1 (female) (13) and (4), or between EL (female) (3) and (1)</td><td>Min. 1 MΩ</td></tr>
<tr><td>Between ST1 (female) (13) and ground, or between EL (female) (3) and ground</td><td>Min. 1 MΩ</td></tr>
<tr><td rowspan="2">5</td><td rowspan="2">Defective HST controller</td><td colspan="3">If no failure is found by preceding checks, HST controller is defective.
Reference
1. Turn the starting switch to OFF position.
2. Insert T-adapter into connector ST1.
3. Turn the starting switch to ON position.
4. Operate the joystick (steering, directional and gear shift lever) (forward and reverse) to perform troubleshooting.</td></tr>
<tr><td>Voltage</td><td>Between ST1 (13) and (4)</td><td>0.5 to 4.5 V</td></tr>
</table>

Circuit Diagram of Stroke Sensor for Blade Tilt Cylinder

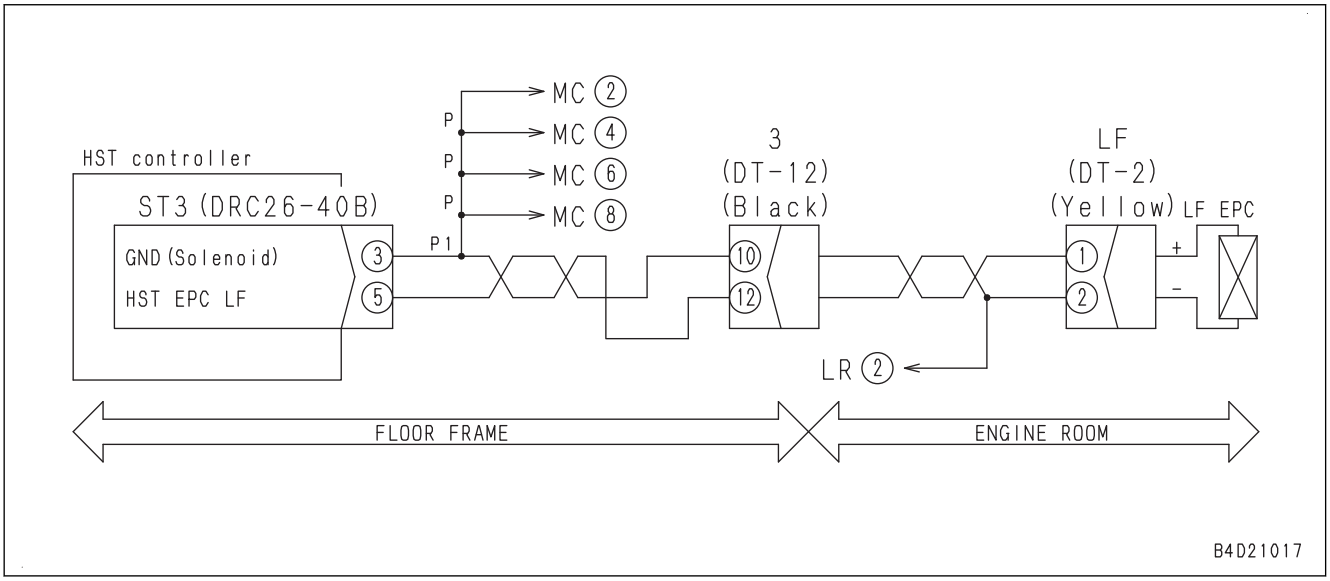


Circuit Diagram of Fan Speed Sensor



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

Circuit Diagram of Lf HST Pump EPC Solenoid



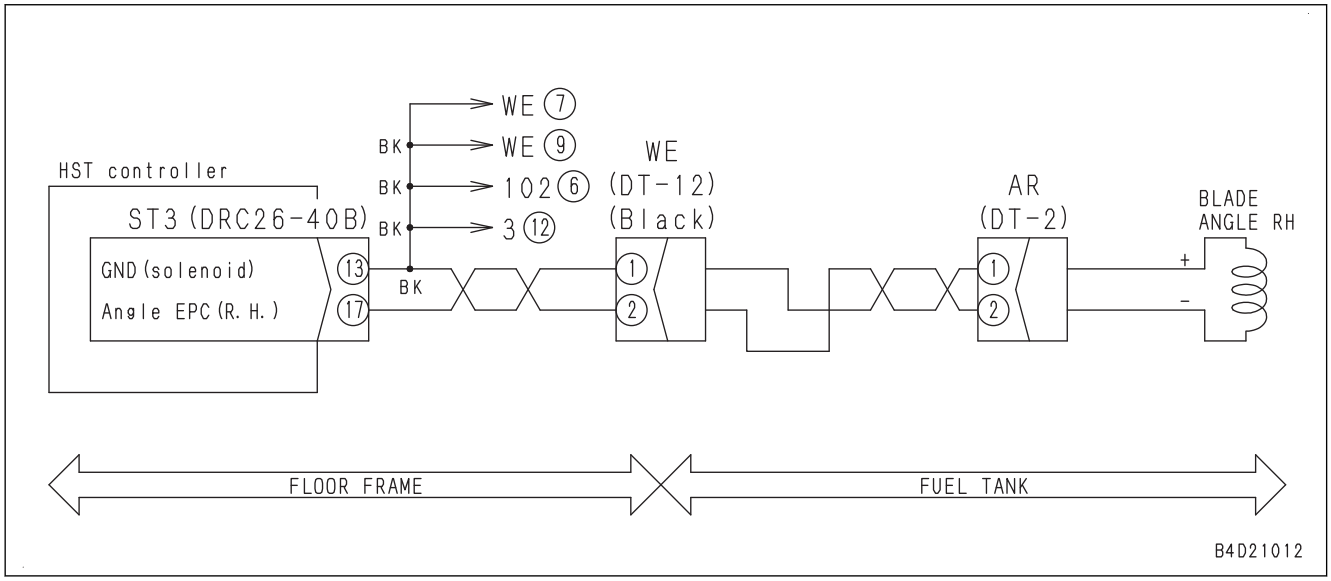
Failure Code [DXHSKB]

Action level	Failure code	Failure	Blade Lift Lower Electromagnetic Proportional Control Solenoid Short Circuit (HST controller system)
L01	DXHSKB		
Detail of failure	When controller drives blade lift LOWER EPC solenoid circuit, abnormal current flows through circuit.		
Action of controller	Stops driving blade lift LOWER EPC solenoid.		
Phenomenon on machine	Blade lift LOWER control is disabled.		
Related information	• Output state to blade lift LOWER EPC solenoid can be checked with monitoring function. (Code: 71003) • After completion of repair, check that the failure code is cleared by the following procedure. Procedure: Turn the starting switch to ON position, and operate the blade control lever (LOWER).		

No.	Cause	Procedure, measuring location, criteria and remarks		
1	Defective blade lift LOWER EPC solenoid (internal open circuit)	1. Turn the starting switch to OFF position. 2. Disconnect connector LD, and connect T-adapter to male side.		
		Resistance	Between LD (male) (1) and (2)	2 to 12 Ω
			Between LD (male) (1) and ground	Min. 1 MΩ
2	Ground fault in wiring harness (contact with ground circuit)	1. Turn the starting switch to OFF position. 2. Disconnect connectors ST3 and LD, and connect T-adapter to either female side.		
		Resistance	Between ground and ST3 (female) (18) or LD (female) (1)	Min. 1 MΩ
3	Short circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect connectors ST3 and LD, and connect T-adapter to either female side.		
		Resistance	Between ST3 (female) (18) and (13), or between LD (female) (1) and (2)	Min. 1 MΩ
4	Defective HST controller	If no failure is found by preceding checks, HST controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.)		

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

Circuit Diagram of Blade Angle Right EPC Solenoid

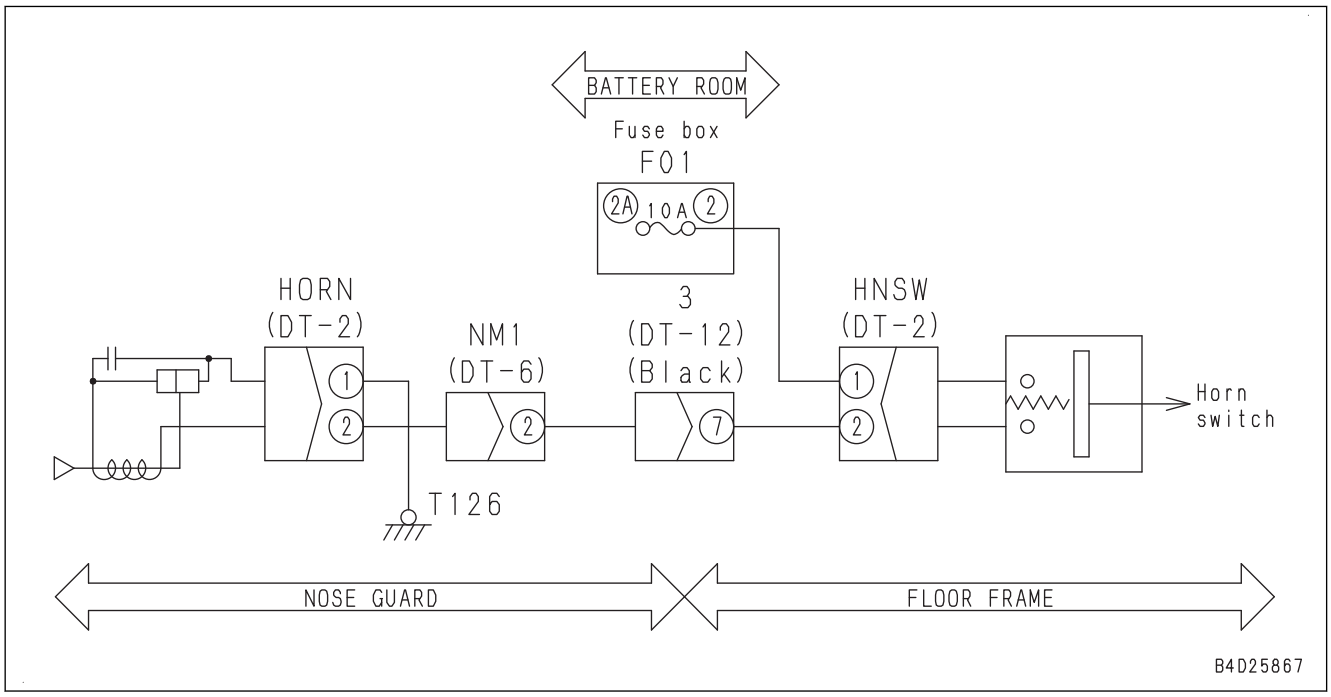


E-5 When Starting Switch is Turned to ON Position, Machine Monitor Shows Nothing

Failure	When starting switch is turned to ON position, machine monitor displays nothing.
Related information	• When starting switch is turned to ON position, machine monitor displays KOMATSU logo, password input screen (if set), check preset setting screen, and standard screen in order. • Battery voltage may drop sharply when engine is started, depending on ambient temperature and battery condition. Under such condition, machine monitor display may disappear temporarily. This phenomenon is not abnormal. • Check that battery disconnect switch is in ON position.

No.	Cause	Procedure, measuring location, criteria and remarks		
1	Omission of turning battery disconnect switch ON	Turn starting switch to OFF position, and check that battery disconnect switch is turned ON.		
2	Loose terminal or open circuit in terminal	1. Turn starting switch to OFF position.		
		Check terminals of battery relay, etc.		
3	Defective fuse	If fuse No.9, 16, 20 in fuse box F01 are blown out, circuit probably has ground fault, etc. (See check on cause 8 and 12.)		
4	Defective fusible link 107-1, defective wiring harness, defective battery	1. Turn the starting switch to OFF position, and turn the battery disconnect switch to OFF position. 2. Remove fuse No.9 and 16 in fuse box F01. 3. Turn the battery disconnect switch to ON position.		
		Voltage	Between F01-9C and ground	20 to 30 V
			Between F01-16F and ground	20 to 30 V
		If voltage is normal, go to checks on cause 8.		
5	Insufficient battery capacity	Be ready with starting switch at OFF, then perform troubleshooting without turning starting switch to ON position.		
		Battery voltage (measure 2 batteries in series)	Min.24 V	
		Gravity of battery (measure gravity in each cell)	Min.1.26	
6	Defective fusible link	If fusible link 107-1 is blown out, circuit probably has ground fault, etc. (See check on cause 12.)		
7	Open circuit in wiring harness (wire breakage or defective contact of connector)	1. Turn the starting switch to OFF position.		
		Resistance	Between battery (-) terminal and ground	Max. 1 Ω

Circuit Diagram of Horn



E-38 Right Door Washer Does Not Operate

Failure	Right door washer does not operate
Related information	• If fuse No.6 in fuse box FUSE (in cab) is blown out, all of right door wiper, left door wiper, right door washer, and left door washer do not operate. • If wiper also does not operate, see “Right Door Wiper Does Not Operate”. • T-adapter is not provided to the connector of a washer motor (check without a T-adapter).

No.	Cause	Procedure, measuring location, criteria and remarks			
1	Defective right door washer motor (internal open circuit)	Check that left door washer fluid comes out. 1. Turn the starting switch to OFF position. 2. Replace connector 361 with 363. 3. Turn the starting switch to ON position. 4. Turn right door washer switch to ON position.			
		If left door washer fluid comes out, originally provided right door washer motor is defective.			
2	Defective right door wiper switch	1. Turn the starting switch to OFF position. 2. Disconnect connector CB13, and connect T-adapter to male side. 3. Turn right door wiper switch to ON and OFF positions, and perform troubleshooting.			
		Resistance	Between CB13 (male) (5) and (6)	Right door wiper switch: OFF	Min. 1 MΩ
				Right door wiper switch: Wash position	Max. 1 Ω
3	Open circuit in wiring harness (wire breakage or defective contact)	1. Turn the starting switch to OFF position. 2. Disconnect connector CB13 and connect T-adapter to female side.			
		Continuity	Between CB13 (female) (6) and ground		Continuity
		1. Turn the starting switch to OFF position. 2. Remove fuse No.6 in fuse box FUSE (in cab). 3. Disconnect connector CB13 and connect T-adapter to female side.			
		Resistance	Between CB13 (female) (5) and FUSE-6		Max. 1 Ω
4	Ground fault in wiring harness (contact with ground circuit)	1. Turn the starting switch to OFF position. 2. Remove fuse No.6 in fuse box FUSE (in cab). 3. Disconnect connectors 363 and CB13, and connect T-adapter to female side.			
		Resistance	Between CB13 (female) (6) and ground		Min. 1 MΩ

E-60 Control Box Does Not Display Design Surface

Failure	Control box does not display design surface.
Related information	• Perform troubleshooting outdoors or at a place open to the sky to acquire a sufficient number of satellites. • Before performing troubleshooting, check that “MACHINE SETTING” is performed correctly as specified in the “Machine Setting” section of the Operation and Maintenance Manual. • Before performing troubleshooting, check that “PROJECT FILE” is set correctly as specified in the “Project File Setting” section of the Operation and Maintenance Manual. • Restart control box. If the failure is changed, perform troubleshooting for it.

No.	Cause	Procedure, measuring location, criteria and remarks
1	Design surface file does not exist	1. On the control box screen, press “iB Logo Key” → “File” → “Surface”, and then dialog screen of “Project Surfaces” is displayed. 2. If there is no design surface file, press “New” to create it, or press “Enter...” to install design surface file into control box.
2	Design surface file not selected	1. On the control box screen, press “iB Logo Key” → “File” → “Surface”, and then dialog screen of “Project Surfaces” is displayed. 2. Select the design surface file to be used, and press “Ok”.
3	Current position is far off from design surface area	Perform troubleshooting for “CONTROL BOX DISPLAYS THE MESSAGE [Out of design area...]”.
4	Defective control box	If no failure is found by above checks, control box is defective. (Since this is an internal defect, troubleshooting cannot be performed).

H-2 R.H. or L.H. Track Cannot Travel FORWARD and Reverse (One of R.H. or L.H. Travel Systems Cannot Operate)

Failure	Either R.H. or L.H. of track cannot travel both forward and reverse. (One of R.H. or L.H. travel systems cannot operate.)
Related information	

<table>
<tr><th>No.</th><th>Cause</th><th colspan="4">Procedure, measuring location, criteria and remarks</th></tr>
<tr><td rowspan="5">1</td><td rowspan="5">Malfunction of HST pump (EPC valve)</td><td colspan="4">Be ready with engine stopped, then perform troubleshooting with engine at high idle.</td></tr>
<tr><td rowspan="3">EPC valve output pressure</td><td rowspan="3">Joystick (steering, directional and gear shift lever)</td><td>When it is in F1 (travel)</td><td>Min.
1.0 MPa
{Min.
10 kgf/cm^2}</td></tr>
<tr><td>When it is in N (NEUTRAL)</td><td>0 MPa
{0 kgf/cm^2}</td></tr>
<tr><td>When it is in R1 (travel)</td><td>Min.
1.0 MPa
{Min.
10 kgf/cm^2}</td></tr>
<tr><td colspan="4">If EPC output current is normal and outlet pressure is low, EPC valve spool may be sticking.</td></tr>
<tr><td>2</td><td>Malfunction of HST pump (servo valve)</td><td colspan="4">If no failure is found by check on cause 1, servo valve of HST pump (one side) may be defective.
Since internal inspection (disassembly) cannot be performed, replace it as an assembly.</td></tr>
<tr><td>3</td><td>Wrong operation of TOW valve (towed)</td><td colspan="4">Wrong operation (wrong shifting) of TOW valve (towed) is suspected. Check it.</td></tr>
<tr><td rowspan="4">4</td><td rowspan="4">Internal defect of HST pump (pump body)</td><td colspan="4">Be ready with engine stopped, then perform troubleshooting with engine at high idle.
Set machine monitor to adjustment menu “Stall Pressure Test Mode”.</td></tr>
<tr><td rowspan="2">HST main circuit pressure</td><td rowspan="2">Joystick (steering, directional and gear shift lever)</td><td>When it is in NEUTRAL</td><td>3.0 to
3.6 MPa {30
to
37 kgf/cm^2}</td></tr>
<tr><td>When it is in FORWARD or REVERSE</td><td>40.2 to
44.1 MPa
{410 to
450 kgf/cm^2
}</td></tr>
<tr><td colspan="4">When HST main circuit pressures both for forward and reverse, on no-traveling side, are both similarly low, pump body may be failed.
Loosen bleeder and check if metallic powder mixes in oil.</td></tr>
</table>

No.	Cause	Procedure, measuring location, criteria and remarks		
8	Malfunction of fan motor (reverse spool)	Check that reverse spool of fan motor is not seized to valve body.		
9	Malfunction of fan motor (suction valve)	Check that suction valve of fan motor is not seized to valve body.		
10	Decrease in fan speed	Be ready with engine stopped, then perform troubleshooting with engine at high idle and fan in normal rotation.		
		Fan motor drive pressure (P mode)	• Hydraulic oil temperature40 to 60 °C • Fan adjustment mode 100%	17.2 MPa {175 kgf/cm^2}
11	Oil cooler bypass valve	When work equipment pump pressure is normal and fan motor driving pressure is low, and if no failure is found by checks on causes 3 to 8, fan motor may have internal defect.		

No.	Cause	Point to check, remarks	Remedy
12	Actual ash accumulation in KDPF is large.	If the check result does not correspond to cause 1 to 11 and frequency of regeneration is not improved, ash accumulation to KDPF is actually large.	Perform “Service modes” and “Inspection menu (Ash in Soot Accumulation Correction)” of “Setting of Machine Monitor” of TESTING AND ADJUSTING.
13	Blocked KDOC	If the check result does not correspond to cause 1 to 12 and frequency of regeneration is not improved, KDOC is blocked.	KDOC cleaning
14	Damaged KDOC	Check for damaged KDOC.	KDOC replacement

Symbol		Part No.	Part name	Necessity	Q'ty	New/Redesign	Sketch	Remarks
C	-	6540-71-1720	Injector cap kit	■	1			Removal and installation of DEF injector
	1	-	DEF cap	■	1			Disconnection and connection of DEF hose
	2	-	Coolant side cap	■	2			Disconnection and connection of coolant hose
	3	-	Injector side cap	■	1			Removal and installation of DEF injector
D		600-919-5050	Plug (for 5/16 inch hose diameter)	■	1			Disconnection and connection of DEF hose
E		Commercially available	Lifting tool	●	1			Removal and installation of DEF mixing tube

Tools for Removal and Installation of DEF Injector

Symbol		Part No.	Part name	Necessity	Q'ty	New/Redesign	Sketch	Remarks
A		Commercially available	Vinyl gloves	●	1			Disconnection and connection of DEF hose
B		6540-71-1310	Cover for DEF injector electric connector	■	1			
C	-	6540-71-1720	Injector cap kit	■	1			Removal and installation of DEF injector
	1	-	DEF cap	■	1			Disconnection and connection of DEF hose
	2	-	Coolant side cap	■	2			Disconnection and connection of coolant hose
	3	-	Injector side cap	■	1			Removal and installation of DEF injector
D		600-919-5050	Plug (for 5/16 inch hose diameter)	■	1			Disconnection and connection of DEF hose

Draining coolant

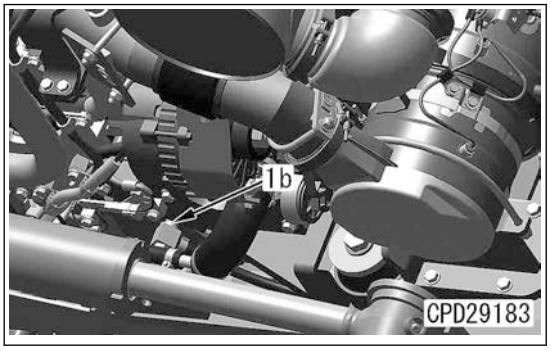
6. Loosen the drain valve (1b), and drain the coolant.

   Radiator:

   45 ℓ

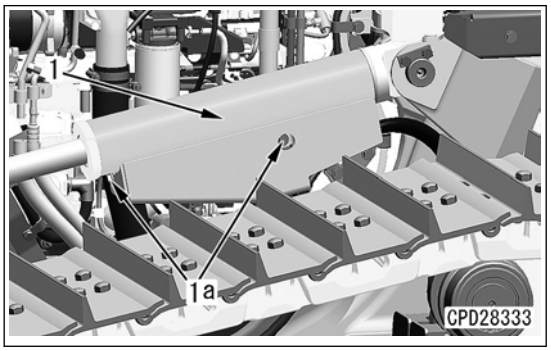
   REMARK

   Check that the coolant is drained completely, and then tighten the drain valve (1b).



Blade lift cylinder assembly

7. Remove the bolts (1a) (2 pieces), and remove the cover (1) of L.H. blade lift cylinder.

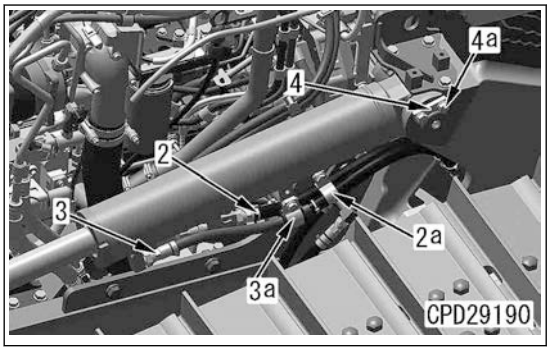


8. Remove the clamps (2a) and (3a), and disconnect the hoses (2) and (3).

   REMARK

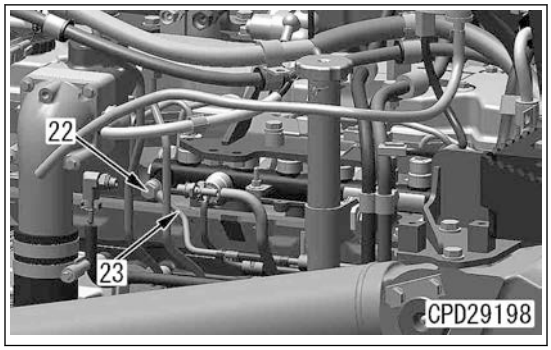
   - Place the oil container (A) under the disconnected hoses.
   - Plug the disconnected hoses and the installing locations to prevent oil from flowing out.

9. Remove the bolt (4a), and remove the lock plate (4).

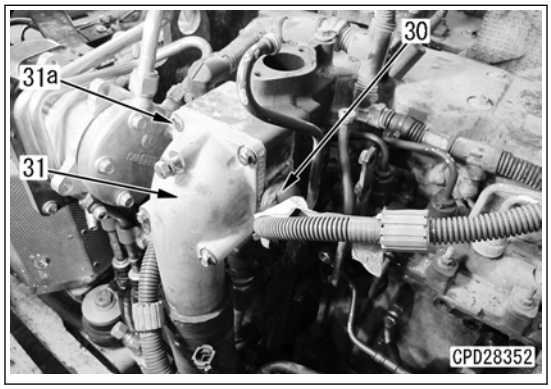


10. Sling the blade lift cylinder assembly (5), hold it, and remove the pin (6).
11. Sling the blade lift cylinder assembly (5), invert the assembly to the blade side, and fix it.

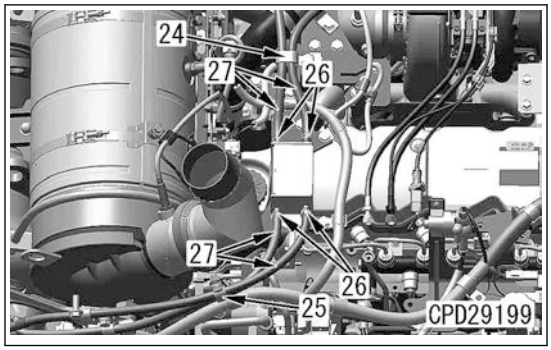
12. Loosen the joint bolt (22), and disconnect the fuel return tube (23).



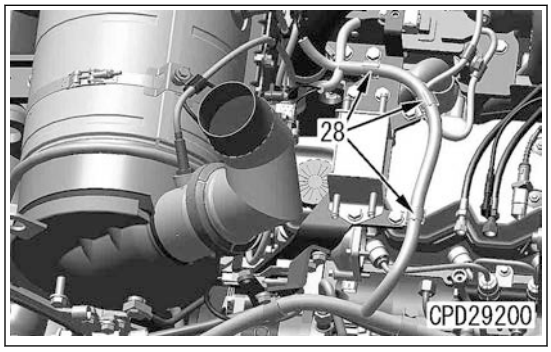
13. Disconnect the connector RH (30).
14. Loosen the bolts (31a) (4 pieces), and disconnect the air connector (31).



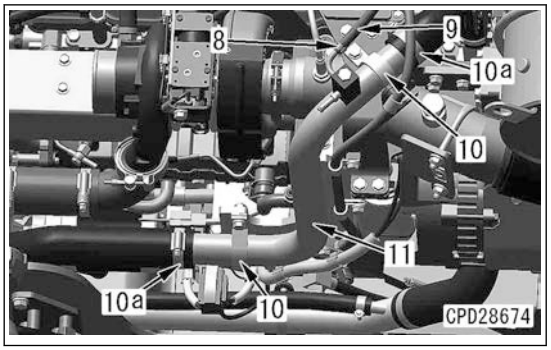
15. Remove the clamps (24) and (25), remove the clips (26) (4 places), and disconnect the hoses (27) (4 pieces).



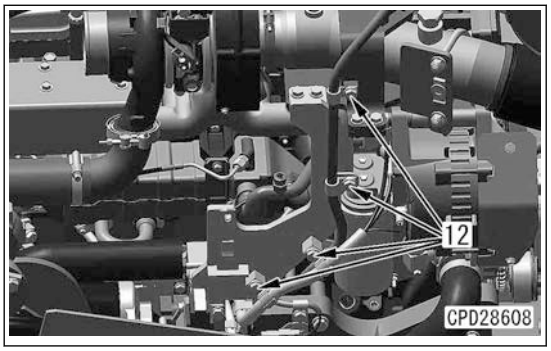
16. Remove the clamps (28) (3 places).



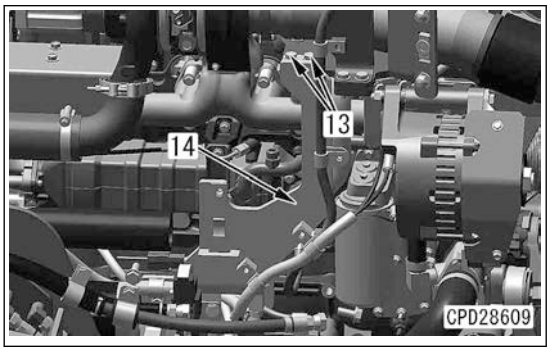
7. Remove the clamp (8), and disconnect the hose (9).
8. Remove the clamps (10) (2 places), loosen the clamps (10a) (2 places), and remove the tube (11).



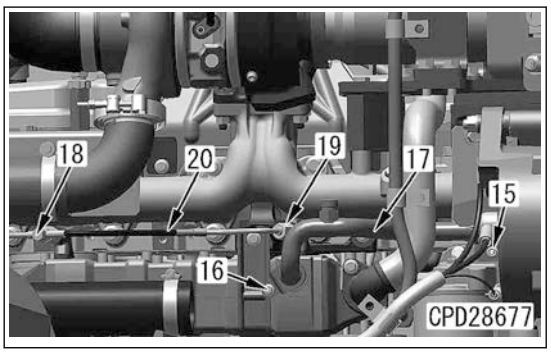
9. Remove the clamps (12) (4 places).



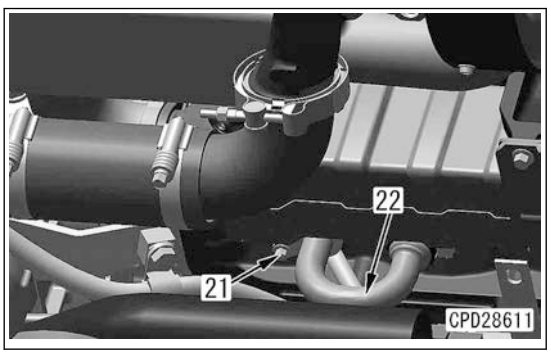
10. Remove the bolts (13) (4 pieces), and remove the bracket (14).



11. Remove the clamp (15).
12. Remove the bolt (16), and disconnect the tube (17).
13. Remove the joint bolt (18), loosen the sleeve nut (19), and remove the tube (20).



14. Remove the bolt (21), and disconnect the tube (22).



Remove and Install Cooling Fan Drive Assembly

⚠ Place the machine on a level ground, and lower the work equipment to the ground in a stable posture.

⚠ Set the work equipment lock lever to LOCK position.

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

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

⚠ If you drain the radiator coolant when it is still hot, you may be scalded. Accordingly, wait for the coolant temperature to drop before draining.

⚠ Loosen the radiator cap slowly to release the pressure inside of the radiator.

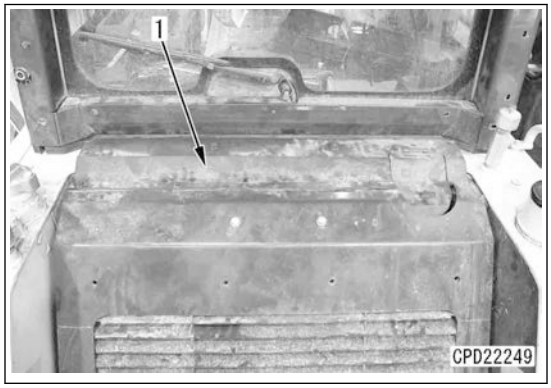
⚠ If you drain the hydraulic oil when it is still hot, you may be scalded. Accordingly, wait for the oil temperature to drop before draining.

⚠ Loosen the hydraulic tank cap slowly, and release the pressure remaining inside of the hydraulic tank.

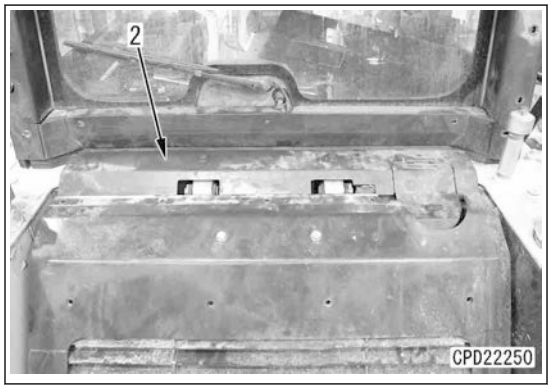
Remove Cooling Fan Drive Assembly

Cover

1. Remove the top rubber cover (1).

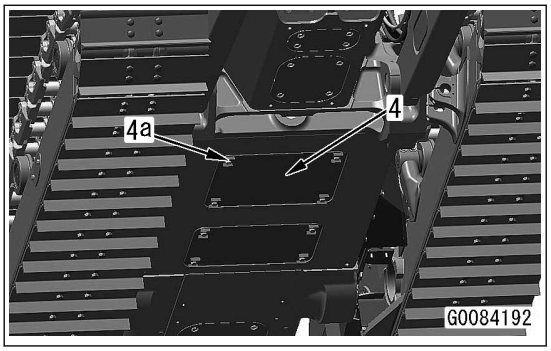


2. Remove the top cover (2).



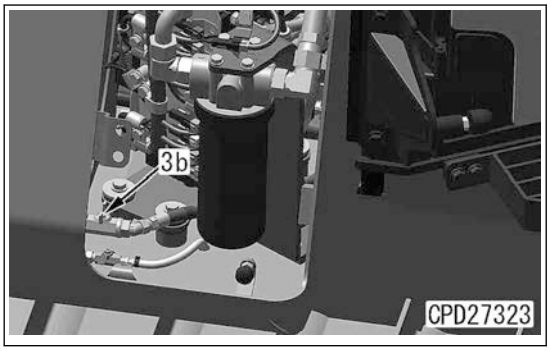
3. Remove the cover (3) of the cooling fan motor part.

34. Install the undercover (4) at the bottom of the machine with the bolts (4a) (4 pieces) by using the transmission jack (A), etc.

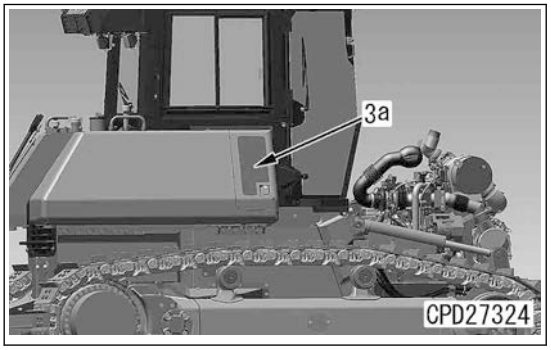


Operator's cab assembly

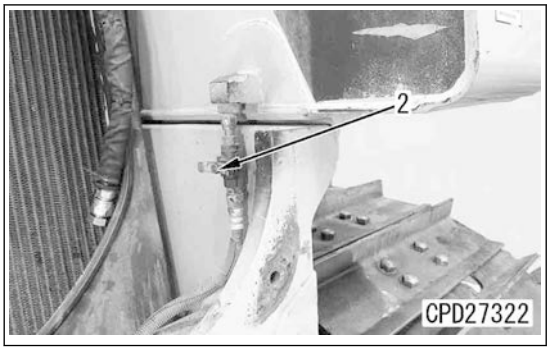
35. Install the operator's cab assembly. For details, see “Remove and Install Operator Cab Assembly”.
36. Open the fuel supply valve (3b).



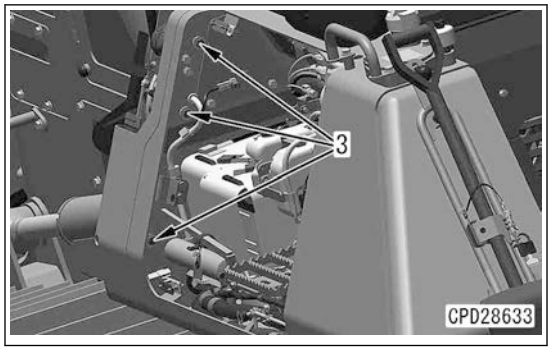
37. Close the cover (3a) on the right side of the machine.



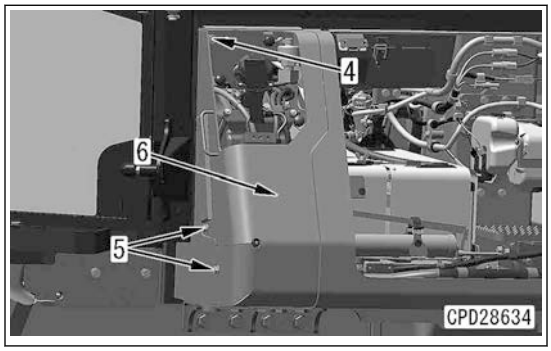
38. Open the fuel supply valve (2).



2. Remove the bolts (3) (3 pieces).



3. Remove the bolts (4) and (5) (2 pieces), and remove the cover (6).

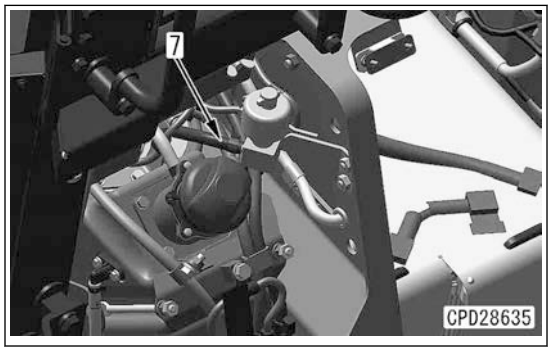


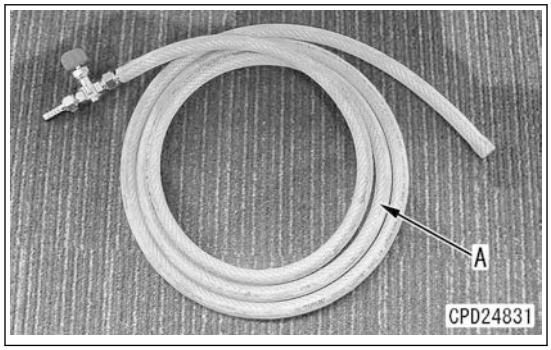
Draining DEF

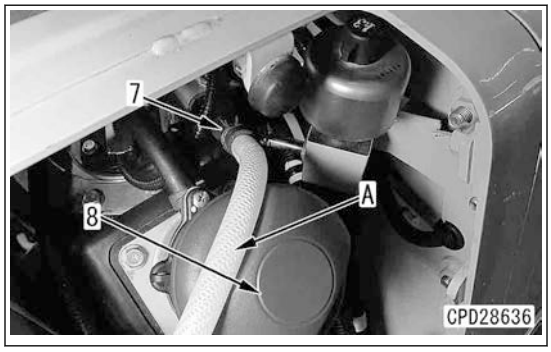
4. Disconnect the breather hose (7), and install the vinyl hose (A).

   NOTICE

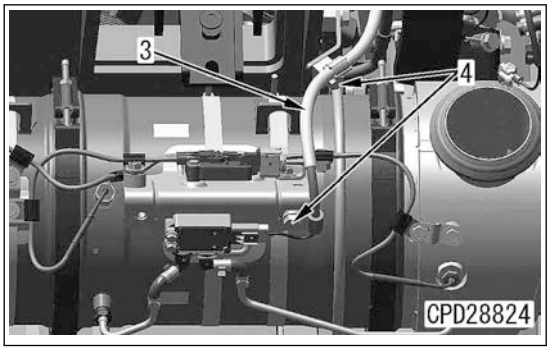
   Close the cap (8) securely so that no air enters DEF tank.





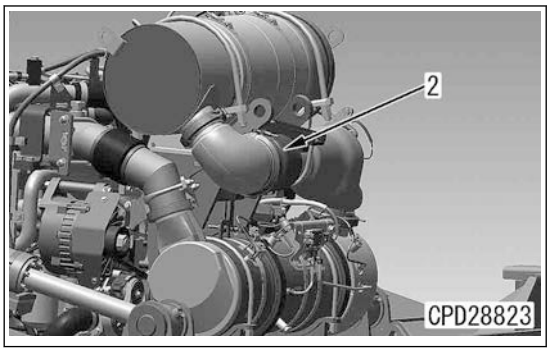


10. Install the clamps (4) (2 places) of the wiring harness (3).



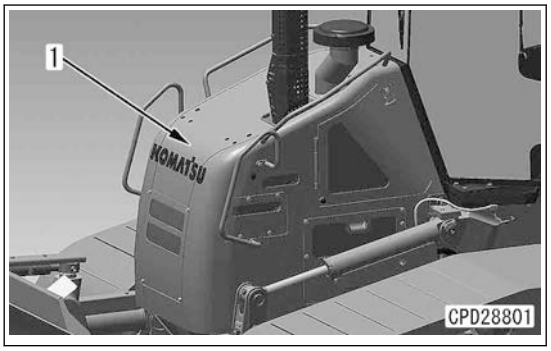
DEF mixing tube

11. Install DEF mixing tube (2). For details, see “Remove and Install DEF Mixing Tube”.



Engine hood

12. Install the engine hood (1). For details, see “Remove and Install Engine Hood Assembly”.



Remove and Install KCCV Assembly

⚠ Place the machine on a level ground, and lower the work equipment to the ground in a stable posture.

⚠ Set the work equipment lock lever to LOCK position.

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

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

⚠ Immediately after the engine is stopped, the parts are very hot. Accordingly, wait until all parts have cooled down, and then start the work.

⚠ Check the connector numbers and installed positions before disconnecting wirings and hoses, and write them down.

⚠ When disconnecting the wirings and hoses, take extreme care not to damage or deform the wirings and hoses by the clips and clamps. If the wirings or hoses may be damaged or deformed, remove the clips and clamps in advance.

⚠ Wrong installation of hoses may damage the engine. Install the hoses carefully.

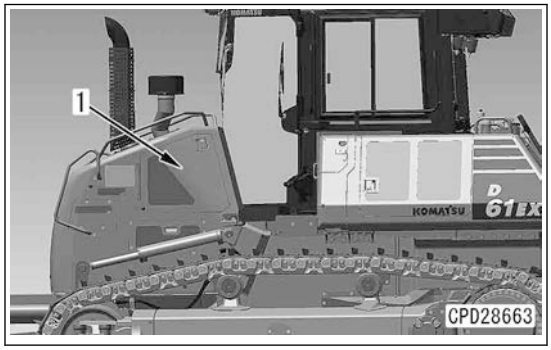
Remove KCCV Assembly

Engine hood

1. Open the cover (1) on the left side of the machine.

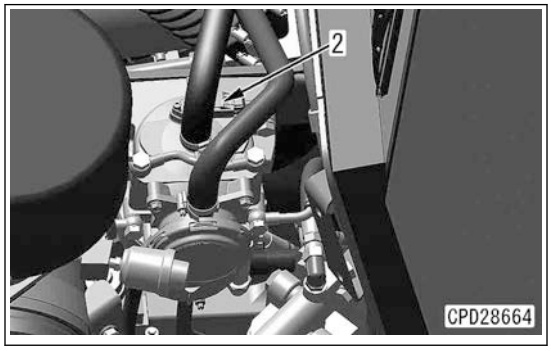
   NOTICE

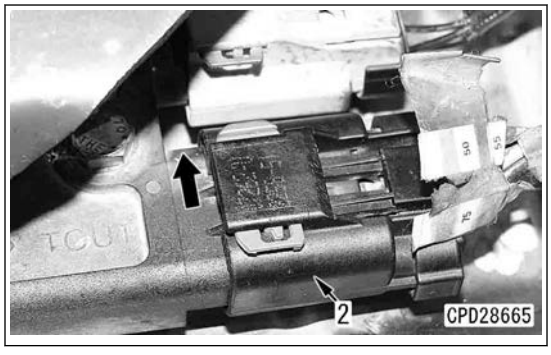
   Check that it is securely fixed with the lock.



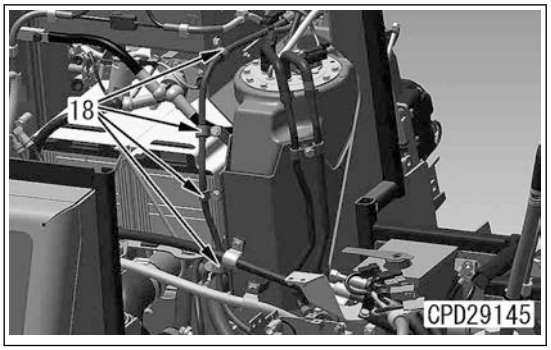
Connector

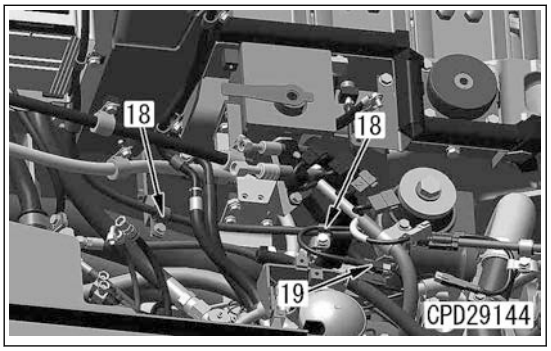
2. Slide the red lever of connector P57 (2) in the direction of the arrow to unlock it.





11. Remove the clamps (18) (6 places), and disconnect the connector (19).

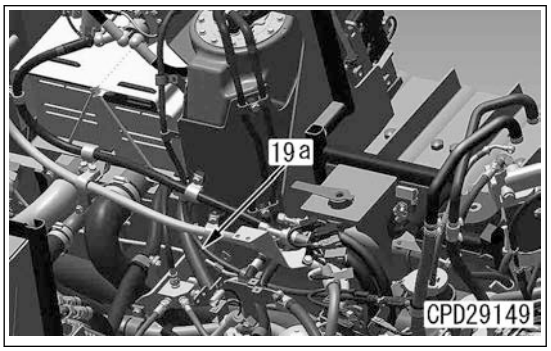


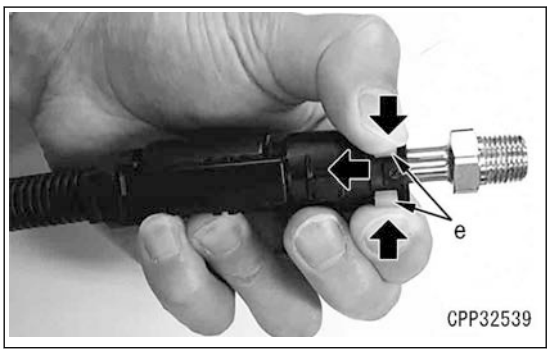


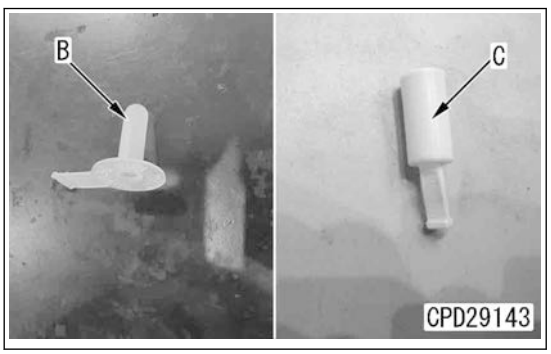
12. Remove DEF hose (19a).

NOTICE

- **Before removing DEF hoses, wash the connecting portions with clean tap water to remove the sticking materials.**
- **Pinch protruding portions (e) of the clip with your fingers, and the lock is unlocked. While they are kept pinched, pull out DEF hose in the opposite direction to that of the DEF tank side.**
- **After disconnecting DEF hose, install the plug (for 3/8 inch of hose diameter) (B) on the hose side, and install the cap kit (C) for DEF pump on the nipple side to prevent leakage.**
- **Cover the connecting portion with a clean plastic sheet, etc. to prevent entering of dusts or sticking of DEF.**





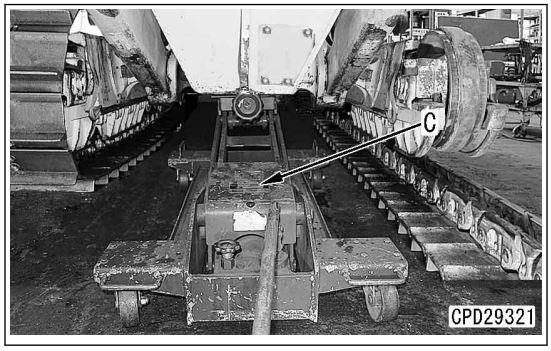


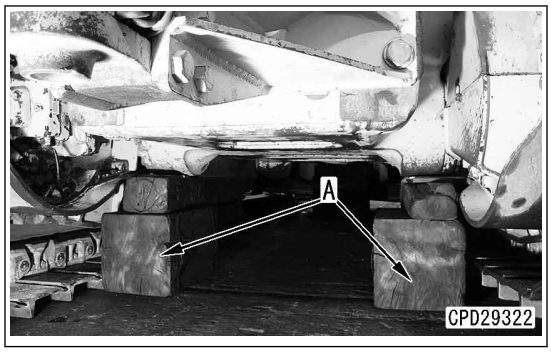
HST motor and final drive assembly

2. Lift up the machine by using the jack (C) from the front of the frame, and support the bottom of the frame rear by using the blocks (A).

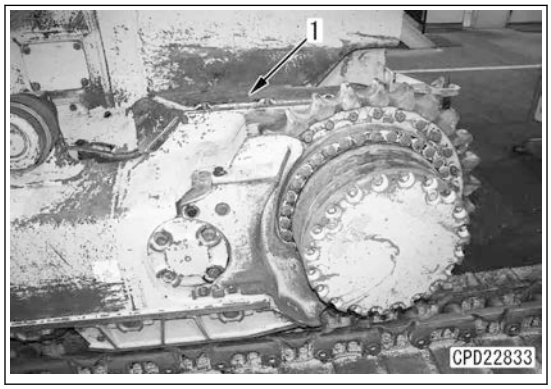
   NOTICE

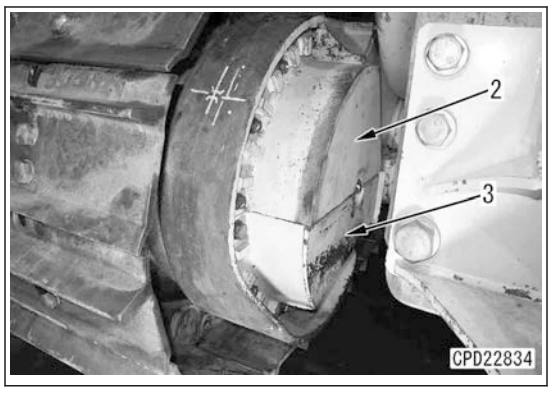
   Securely set the blocks (A).





3. Remove the covers (1) to (3).



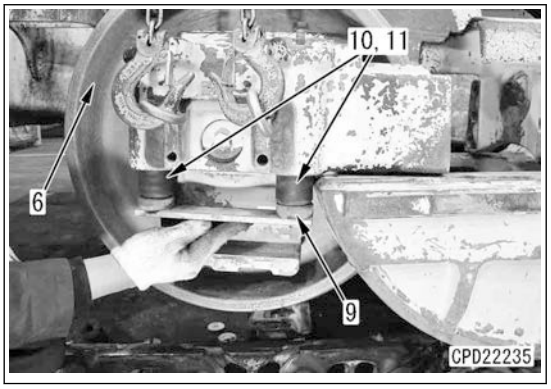


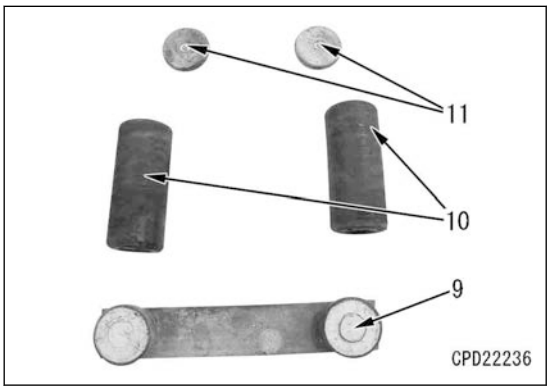
Install Idler Assembly

Idler assembly

1. Sling the idler assembly (6), move it to the position shown in the figure, and install right and left sliders (9), the springs (10) (2 pieces each), and the plates (11) (2 pieces each).

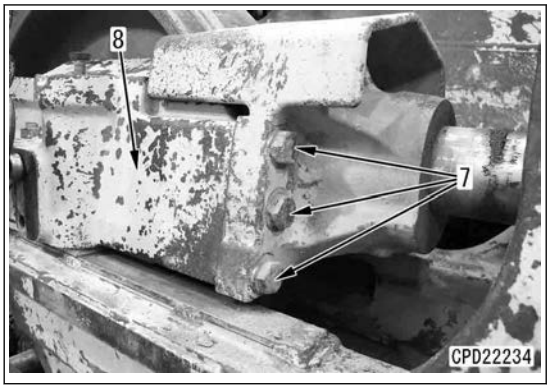
   Idler assembly (6):
   190 kg (One side)



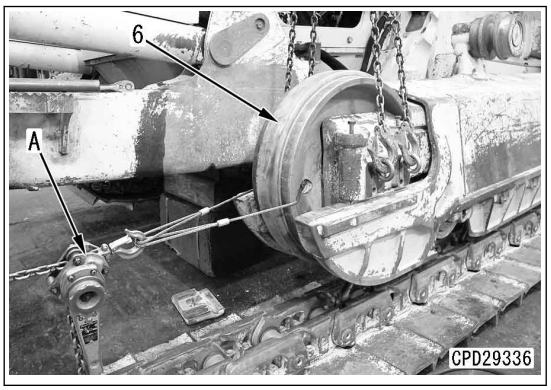


2. Install the yoke (8) with right and left bolts (7) (3 pieces each).

   Bolt (7):
   235 to 285 Nm {23.5 to 29.5 kgfm}

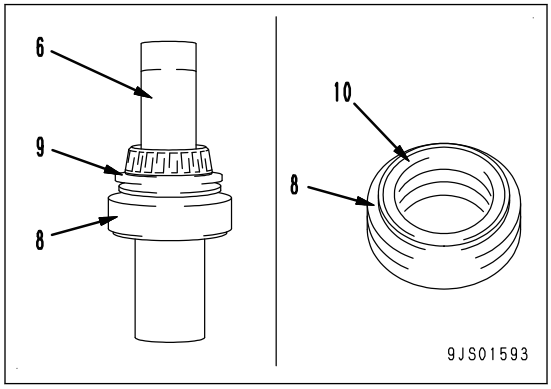


3. Sling the idler assembly (6), slide the assembly along the track frame top edge, and push it in to the rear.

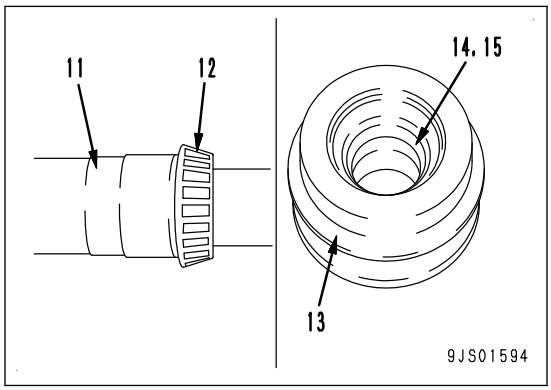


Disassembly of the shaft assembly

7. Remove the collar (8) from the shaft assembly (6).
8. Remove the floating seal (9).
9. Remove the floating seal (10) from the collar (8).



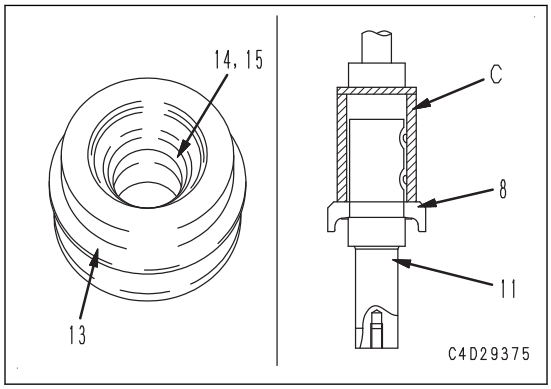
10. Remove the bearing (12) from the shaft (11).
11. Remove the outer race (14) from the roller (13), invert the outer race (15), and remove it.



Assemble Carrier Roller Assembly

Shaft assembly

1. Press fit the outer races (15) and (14) into the roller (13).
2. Press fit the collar (8) into the shaft (11) by using the push tool (C).



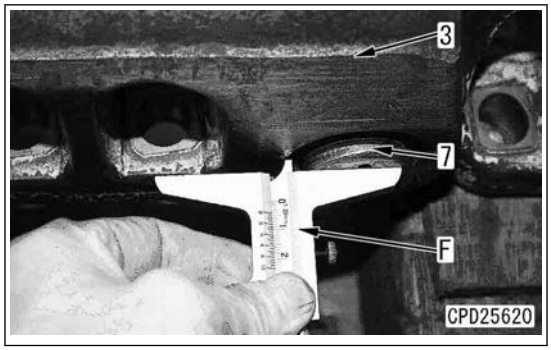
Disassemble and Assemble PLUS Type Track Assembly Generally

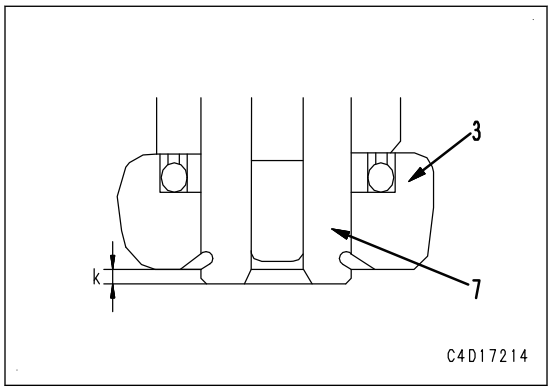
Tools for General Disassembly and Assembly of PLUS Type Track Shoe Assembly

Symbol	Part No.	Part name	Necessity	Q'ty	New/Redesign	Sketch	Remarks
A	791-932-1110	Plug push tool	■	1			Installation of track link pin (for small plug)
B	790-701-3000	Seal checker	■	1			Airtightness test for track link
C	791-601-1000	Oil pump	■	1			Oil filling of track link
D	793T-B32-1200	Push tool assembly	■	1			Installation of wedge ring (for large plug side)
	793T-B32-1230	• Adapter		1			
	793T-B32-1240	• Ring		1			
	793T-B32-1250	• Plate		1			
	793T-B32-1260	• Plate		1			
	793T-B32-1210	• Push tool		1			
	793T-B32-1220	• Adapter		1			
	793T-B32-1280	• Spring		1			
	793T-B32-1270	• Bolt		1			
	793T-B32-1030	• Bar		1			
	01580-11210	• Nut		1			
	01252-10612	• Bolt		4			
E	793T-B32-1300	Push tool assembly	■	1			Installation of wedge ring (for small plug side)
	793T-B32-1310	• Adapter		1			
	793T-B32-1240	• Ring		1			
	793T-B32-1250	• Plate		1			
	793T-B32-1260	• Plate		1			
	793T-B32-1210	• Push tool		1			
	793T-B32-1220	• Adapter		1			
	793T-B32-1280	• Spring		1			
	793T-B32-1270	• Bolt		1			
	793T-B32-1030	• Bar		1			
	01580-11210	• Nut		1			
	01252-10612	• Bolt		4			
F	793T-B32-1100	Push tool assembly	■	2			Press-fit of wedge ring
	793T-B32-1010	• Holder		1			
	793T-B32-1110	• Push tool		2			
	793T-B32-1030	• Bar		2			
	01580-11210	• Nut		2			

9. Measure the protrusion dimension (k) of the pin (7) from the outer link (3) by using the depth gauge (F).

   Standard protrusion dimension (k): 4.7±0.2 mm



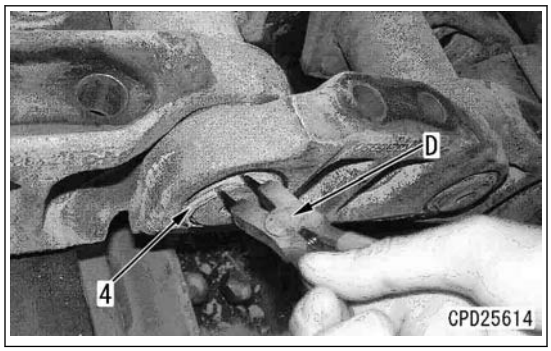


Wedge ring

10. Install the wedge ring (4) by using the snap ring pliers (D).

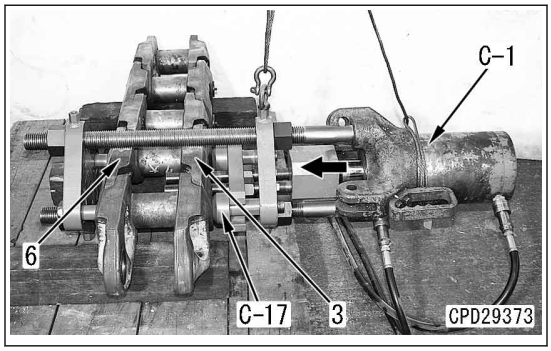
    REMARK

    - Install the wedge ring (4) with its opening facing shoe mounting side of the link.
    - Install the wedge ring so that the even height is secured toward the link side surface.



11. Sling the remover and installer assembly (C-1), and set it on the link.
12. While slinging the remover and installer assembly (C-1), perform centering of the tool so that the center positions of the pins are aligned.
13. Operate the pump assembly (A), and press the push tool (C-17) in the direction of the arrow at the following specified pressure, and bring the pin into close contact with the wedge ring.

    Specified pressure: 118 to 236 kN {12 to 24 t}
14. Remove the remover and installer assembly (C-1).



Work Equipment

Remove and Install Blade Assembly

Tools for Removal and Installation of Blade Assembly

Symbol	Part No.	Part name	Necessity	Q'ty	New/Redesign	Sketch	Remarks
A	Commercially available	Block	●	2			Fixing of U-frame
B	Commercially available	Lifting tool	●	2			Removal and installation of blade assembly
C	Commercially available	Block	●	2			Fixing of angle cylinder assembly

⚠ **Place the machine on a level ground, and lower the work equipment to the ground in a stable posture.**

⚠ **Set the work equipment lock lever to LOCK position.**

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

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

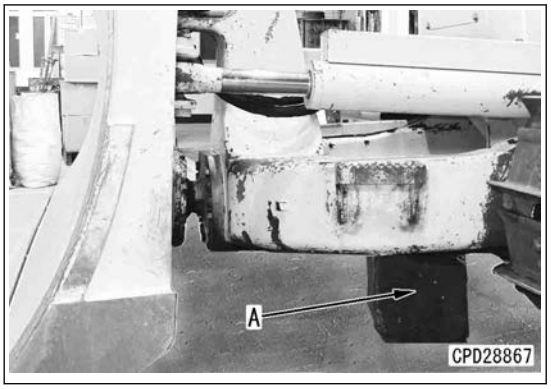
⚠ **When rotating the piston rod, rotate it while it is extended and retracted.**

⚠ **Never insert your fingers into the pin holes when aligning their positions.**

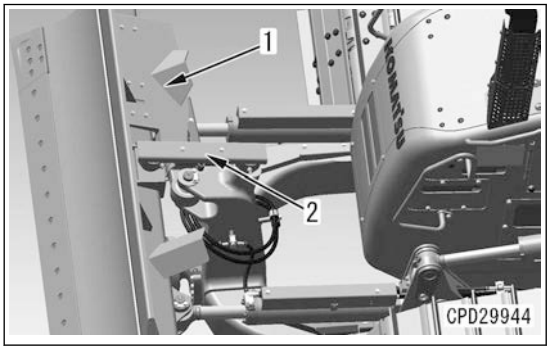
Remove Blade Assembly

Cover

1. Lower the blade on a level ground, and set the blocks (A) at the bottom of U-frame.



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



Remove and Install Stroke Sensing Blade Tilt Cylinder Assembly

Tools for Removal and Installation of Stroke Sensing Blade Tilt Cylinder Assembly

Symbol	Part No.	Part name	Necessity	Q'ty	New/Redesign	Sketch	Remarks
A	Commercially available	Lifting tool (webbing sling)	■	1			Removal and installation of blade tilt cylinder assembly

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

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

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

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

⚠ If you drain the hydraulic oil when it is still hot, you may be scalded. Accordingly, wait for the oil temperature to drop before draining.

⚠ Loosen the cap of the hydraulic tank slowly, and release the pressure remaining inside of the hydraulic tank.

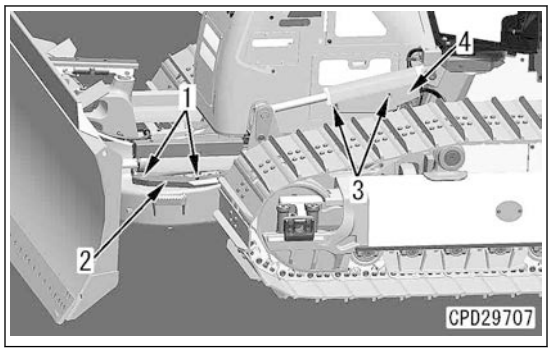
⚠ When rotating the piston rod, rotate it while it is extended and retracted.

⚠ Never insert your fingers into the pin holes when aligning their positions.

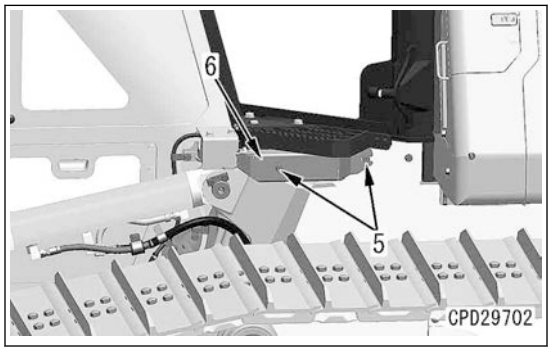
Remove Stroke Sensing Blade Tilt Cylinder Assembly

Cover, connector, hose

1. Remove the bolts (1) (2 pieces), and remove the cover (2).
2. Remove the bolts (3) (2 pieces), and remove the cover (4).



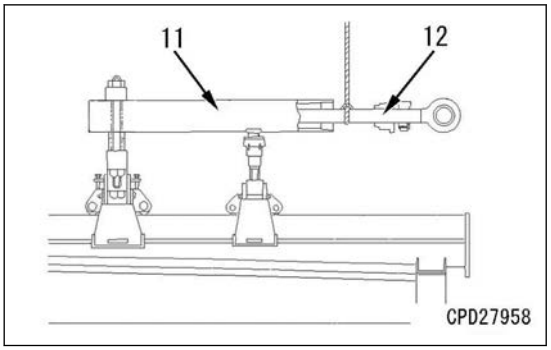
3. Remove the bolts (5) (2 pieces), and remove the cover (6).

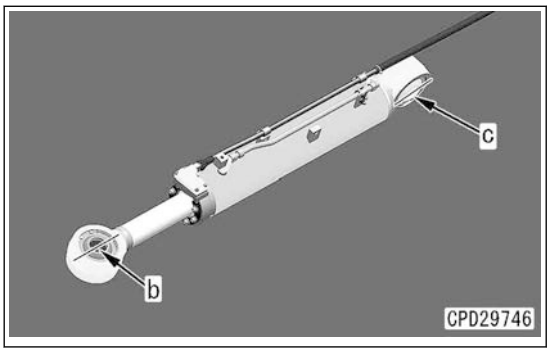


22. Insert the piston rod assembly (12) to the cylinder tube (11).

REMARK

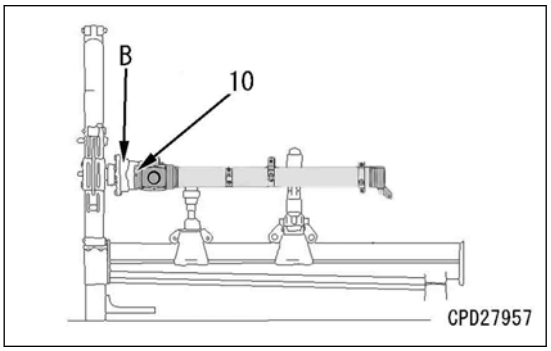
Set the rod head direction (b) 90 ° to the bottom side (c). (Direction when it is installed to the machine)





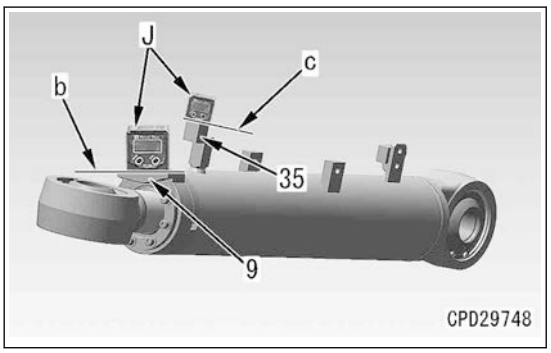
23. Tighten the head assembly (10) by using the wrench assembly (B).

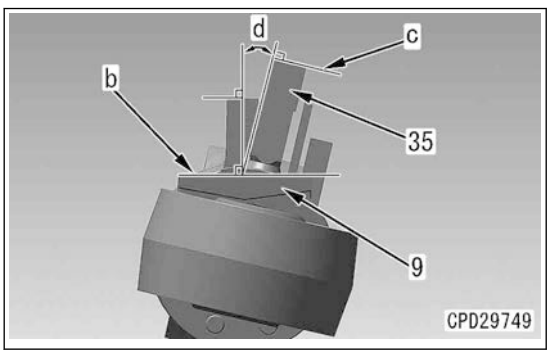
Head assembly (10) :
932±93 Nm {95±9.5 kgfm}



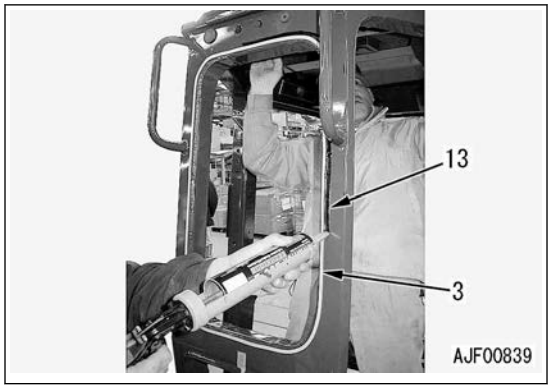
24. Adjust the mounting angle of the end surface (b) of the housing assembly (9) and the end surface (c) of the elbow (35) by using the digital angle gauge (J).

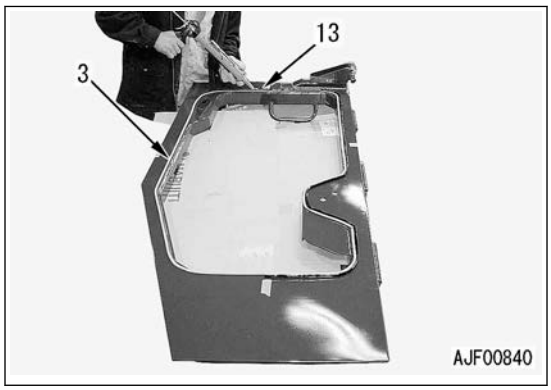
Adjusting angle (d) made by the end surface (b) of the housing assembly (9) and the end surface (c) of the elbow (35): 12±2 °





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



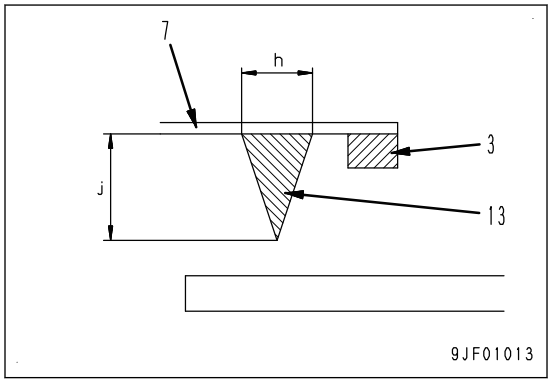


REMARK

- Apply the adhesive (13) to the dam rubber (3) of the operator's cab (7) according to the dimensions (h) and (j) indicated in the figure.
- Thickness of applied adhesive (13) must be higher than that of the dam rubber (3).
- Height of applied adhesive must be even.

  Dimension (h): 10 mm

  Dimension (j): 15 mm



Front window glass

12. Install the operator's cab (7) and the front window glass (1) by using the lifter (suction cup) (F) while aligning the lines (e) of the positioning tape (H) attached in preceding step 4.

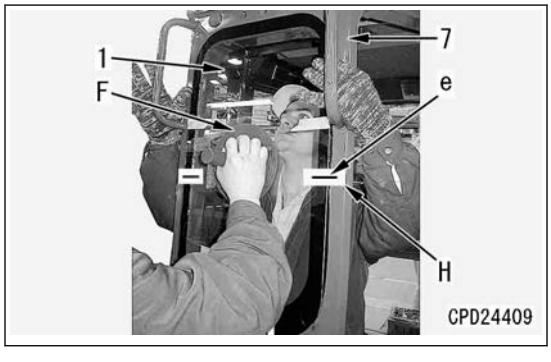
REMARK

- Since the window glass cannot be removed and installed again, install it with utmost caution.
- Window glass bonding work must be finished within 5 minutes from application of the adhesive.

13. After bonding the window glass, press down entire circumference of the window glass until it firmly sticks to the dam rubber.

REMARK

Press the corners of the window glass firmly.



Remove and Install HST Controller Assembly

⚠ Place the machine on a level ground, and lower the work equipment to the ground in a stable posture.

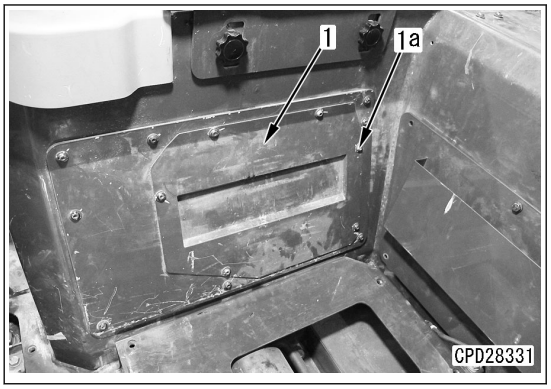
⚠ Set the work equipment lock lever to LOCK position.

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

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

Remove HST Controller Assembly

1. Remove the operator's seat assembly. For details, see "Remove and Install Operator Seat".
2. Remove the bolts (1a) (6 pieces), and remove the cover (1) on the right side of the operator's seat.

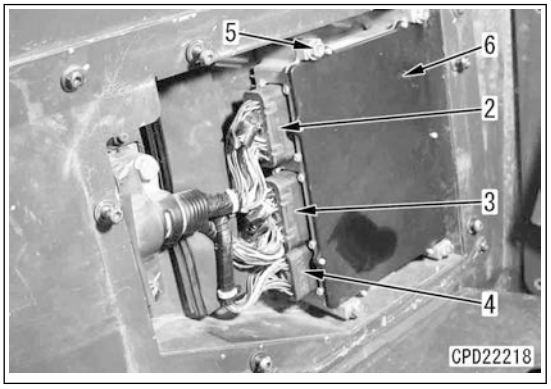


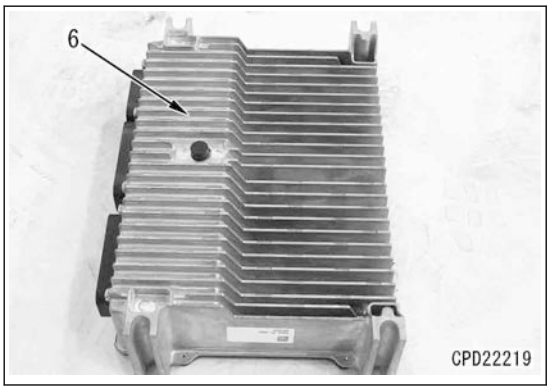
3. Disconnect the connectors ST-3 (2), ST-2 (3), and ST-1 (4).

   REMARK

   - Remove dusts, etc. sticking to each connector before removing.
   - Loosen hexagonal socket head bolts (4 mm) at each connector center, and remove them.

4. Remove the bolts (5) (4 pieces), and remove HST controller assembly (6).





Remove and Install GNSS Receiver

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

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

⚠ **Turn the power supply of control box to OFF position.**

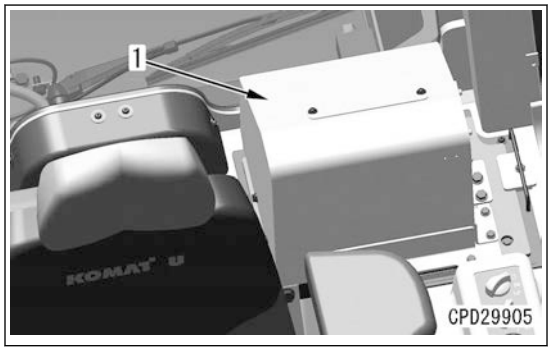
⚠ **Turn the starting switch to OFF position to stop the engine.**

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

Remove GNSS Receiver

Cover

1. Remove the cover (1) of GNSS receiver on the left rear inside of the cab.



GNSS receiver

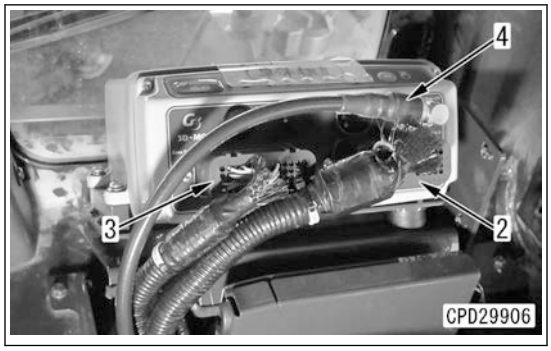
2. Disconnect the wiring harness connector MGA1 (4).
3. Loosen the hexagonal socket head bolts at the center of each of the wiring harness connectors GPSB1 (2) and GPSB2 (3), and disconnect the wiring harness connectors.

   NOTICE

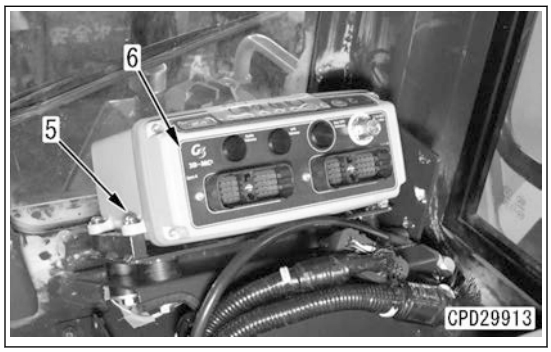
   Clean dirt and dust around the connectors, and remove them completely before disconnecting to prevent them from entering connectors.

   REMARK

   Hexagonal socket head bolt: Width across flats 4 mm



4. Remove the hexagonal socket head bolts (5) (4 pieces), and remove GNSS receiver (6) .

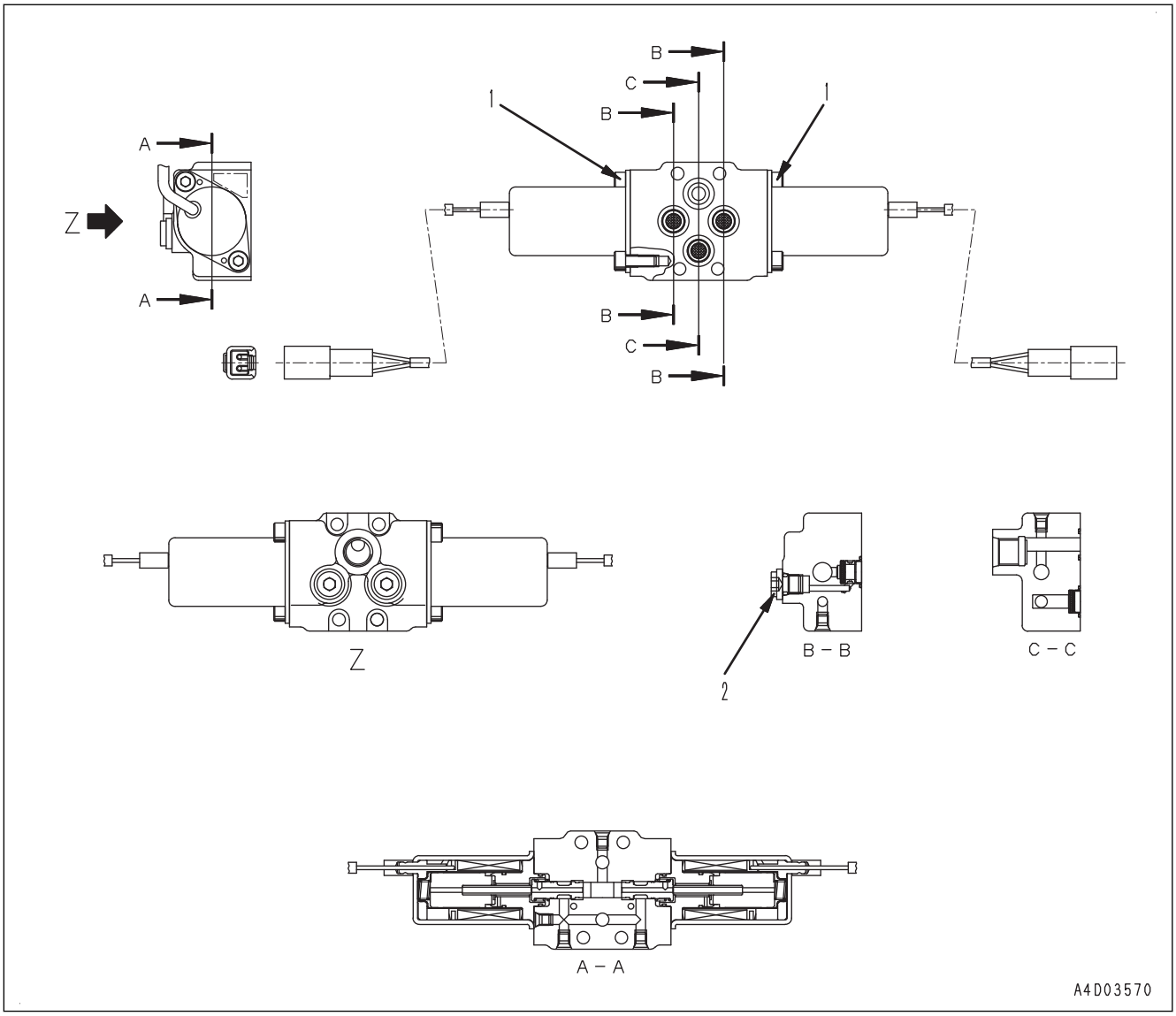


Install GNSS Receiver

NOTICE

Clean dirt and dust around the connectors, and remove them completely before connecting to prevent them from entering connectors.

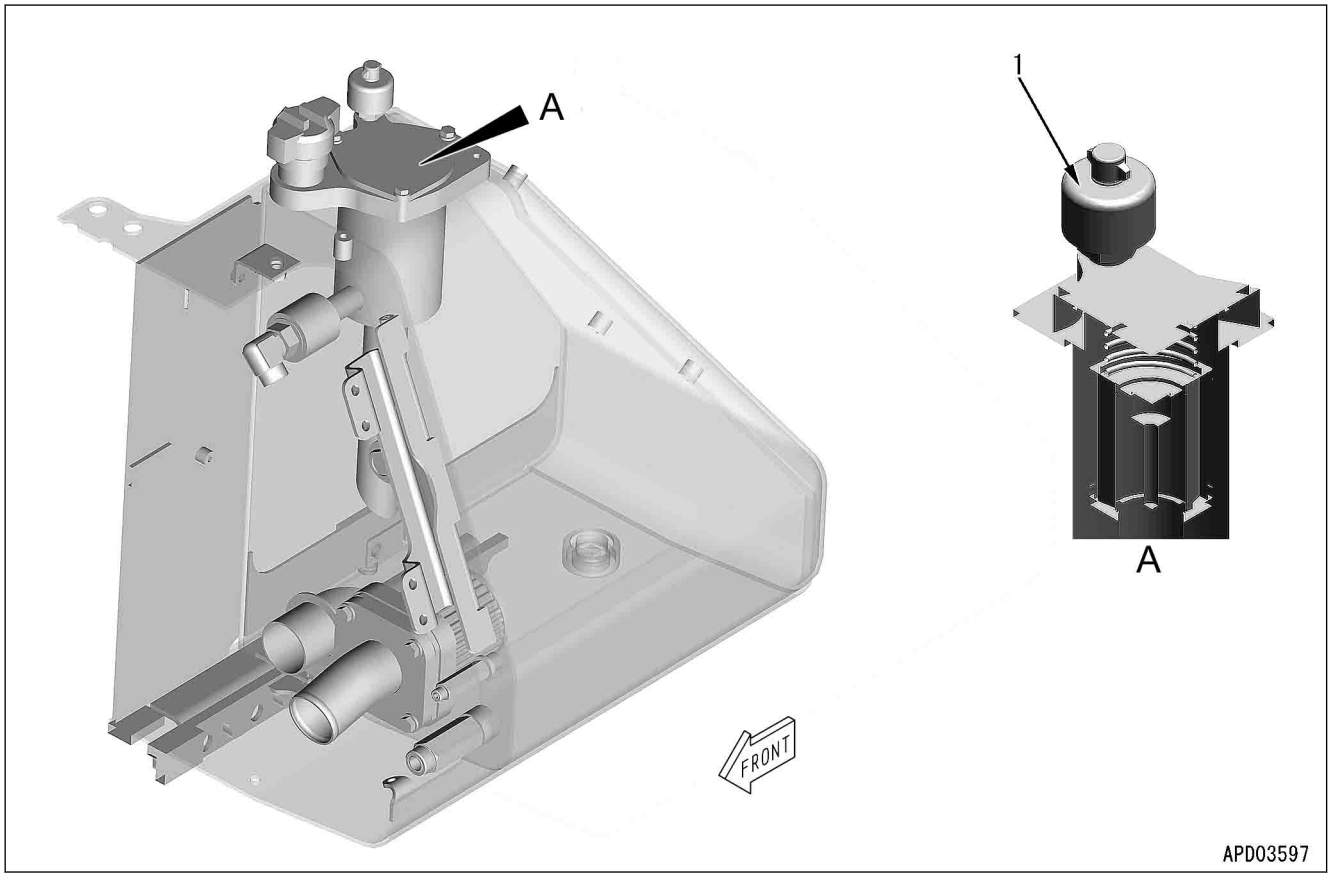
Maintenance Standard for EPC Valve of HST Pump



No.	Item	Judgment criteria	Remedy
1	Tightening torque of bolt	9.8 to 12.7 Nm {1.0 to 1.3 kgfm}	Retighten
2	Tightening torque of plug	9.8 to 12.7 Nm {1.0 to 1.3 kgfm}	

Hydraulic System

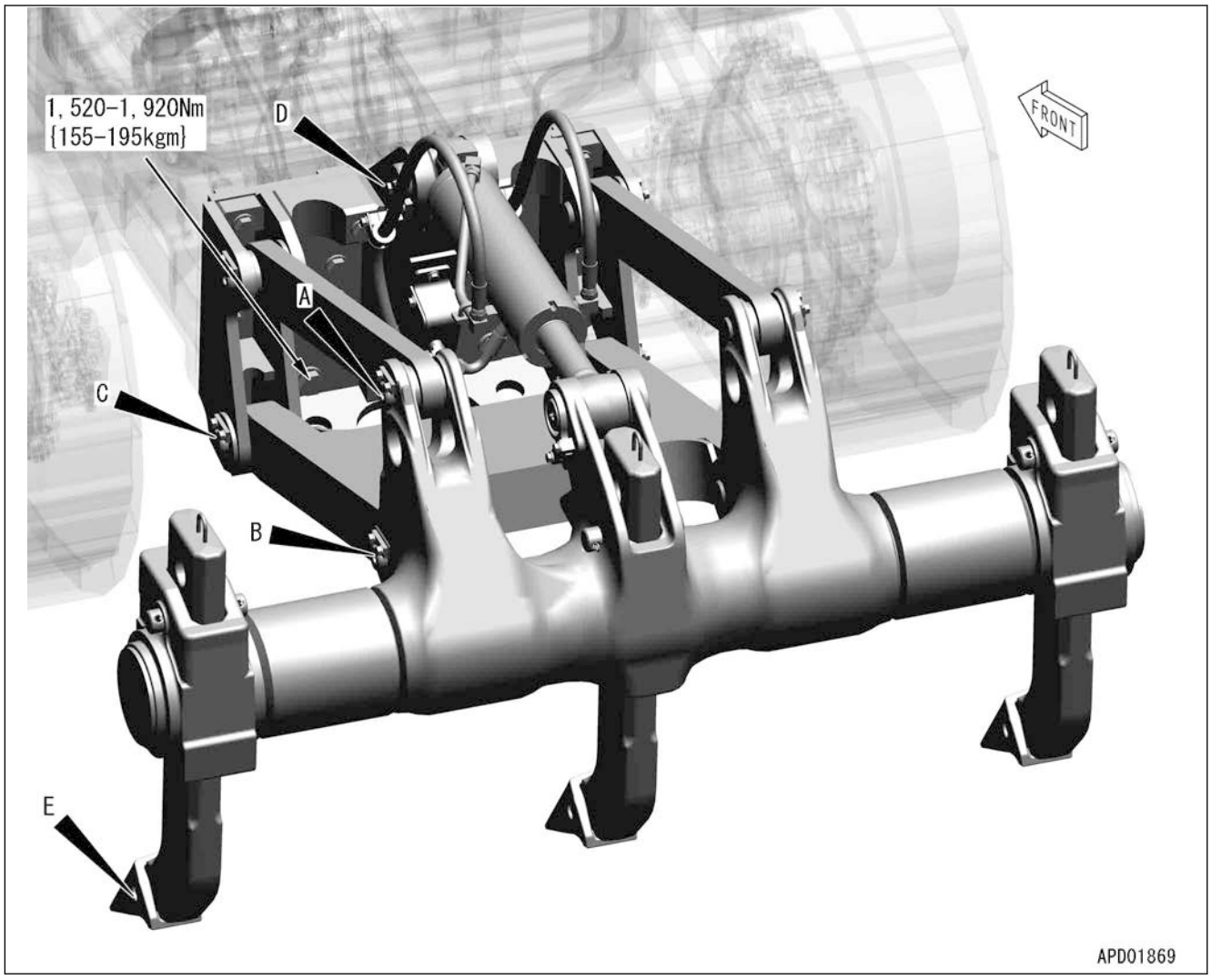
Maintenance Standard for Hydraulic Tank

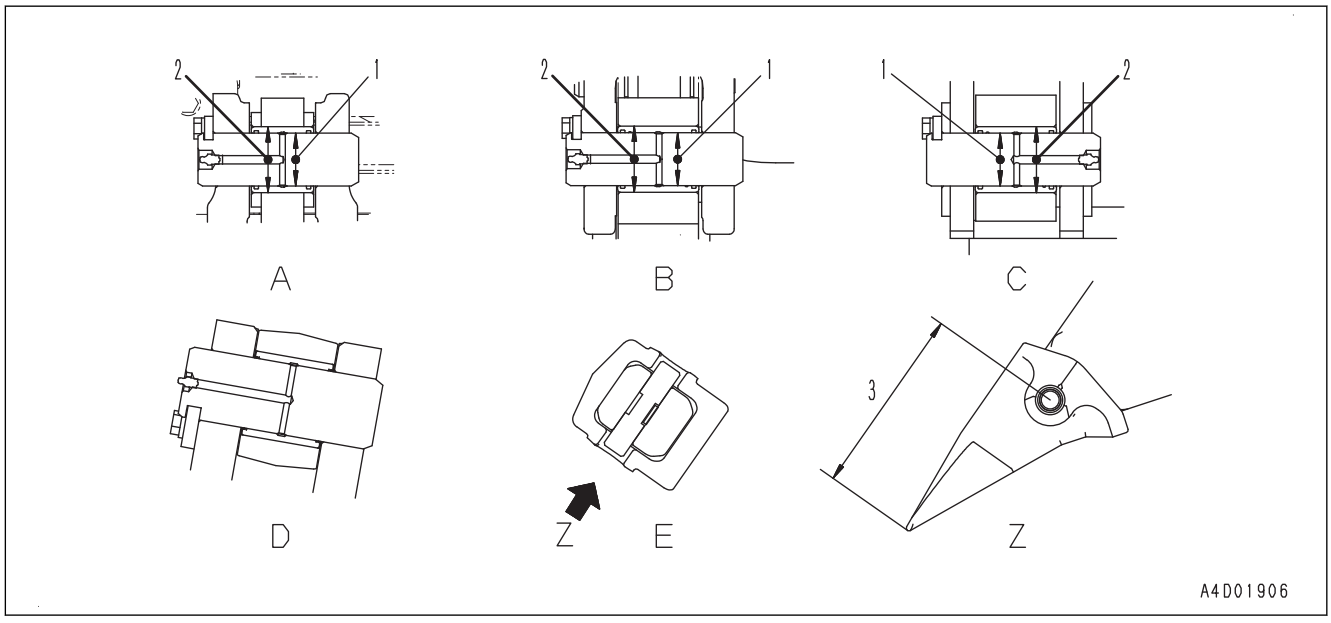


No.	Item	Judgment criteria	Remedy
1	Tightening torque of breather	31.4 to 52.9 Nm {3.2 to 5.4 kgfm}	Retighten

Maintenance Standard for Fixed Multi-Shank Ripper

(machine with ripper)





- The built-in filter and desiccating agent remove foreign material in the circulation circuit and moisture contained in the refrigerant.

Circuit Diagram Related to Temperature Control Function