KEBM657808

Shop Manual

BULLDOZER

D61EXi-24
D61PXi-24

SERIAL NUMBERS D61EXi-B60001 and up
D61PXi-B60001

KOMATSU

SAFETY NOTICE FOR OPERATION

- Appropriate servicing and repair are extremely important to ensure safe operation of the machine. The shop manuals describe the effective and safe servicing and repair methods recommended by Komatsu. Some of the servicing and repair methods require the use of special tools designed by Komatsu for special purposes.
- The symbol mark ⚠ is indicated for such matters that require special precautions. The work indicated with this warning mark ⚠ should be performed according to the instructions with special attention. Should a hazardous situation occurs or be anticipated during such work, be sure to keep safe first and take every necessary measures.

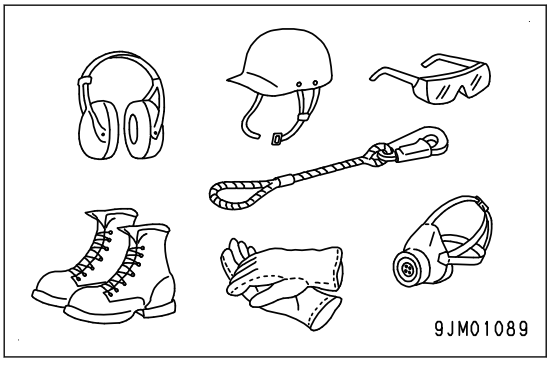
Safety matters

- Well organized work place
- Correct work clothes
- Observance of work standard
- Enforcement of hand signals
- Prohibition against unlicensed persons operating and handling the machine
- Safety check before starting work
- Wear of dust glasses (for cleaning or grinding work)
- Wear of welding goggles and protectors (for welding work)
- Being in good physical condition, and good preparation
- Always be alert and careful.

General precautions

⚠ **If the machine is handled incorrectly, it is dangerous. Read and understand what is described in the operation and maintenance manual before operation. Read and understand what is described in this manual before operation.**

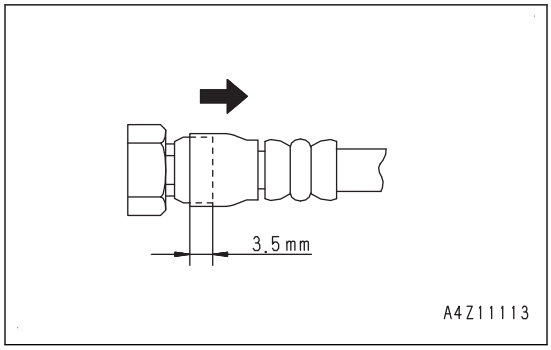
- Read and understand the meaning of all the safety labels stuck to the machine before performing any greasing or repairs. For the locations of the safety labels and detailed explanation of precautions, see Operation and Maintenance Manual.
- Tools and removed parts in the workshop should be well organized. Always keep the tools and parts in their correct places. Always keep the work area clean and make sure that there is no dust, dirt, oil, or water on the floor. Smoke only in the designated areas. Never smoke while working.
- Keep all tools in good condition, learn the correct way to use them, and use the proper ones. Check the tools, machine, forklift truck, service car, etc. thoroughly before starting the work.
- Always wear safety shoes and helmet when performing any operation. Do not wear loose clothes, or clothes with buttons missing.



2. After inserting the hose in the mating adapter perfectly, pull it back to check the connecting condition.

   REMARK

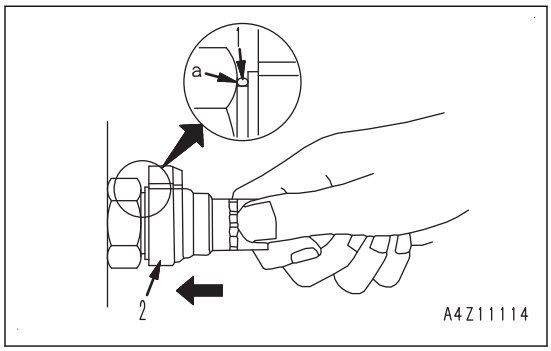
   When the hose fitting is pulled back, the rubber cap moves approximately 3.5 mm toward the hose, but it is not a problem.



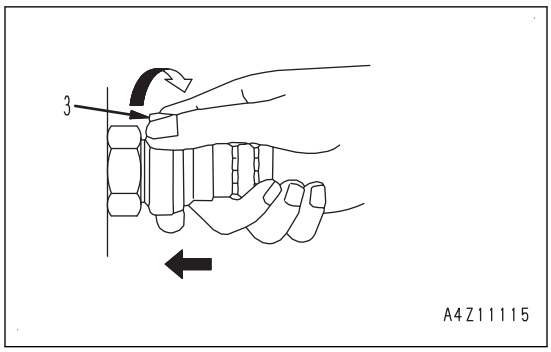
METHOD FOR DISCONNECTING AND CONNECTING TYPE 2 PUSH-PULL TYPE COUPLER

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.



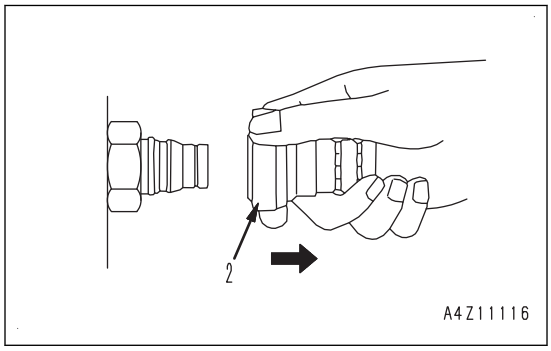
2. While keeping the condition of step 1, turn lever (3) to the right (clockwise).



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 kgf/cm^2 = 14.2233 lb/in^2

	0	1	2	3	4	5	6	7	8	9
30	426.7	440.9	455.1	469.4	483.6	497.8	512.0	526.3	540.5	554.7
40	568.9	583.2	597.4	611.6	625.8	640.1	654.3	668.5	682.7	696.9
50	711.2	725.4	739.6	753.8	768.1	782.3	796.5	810.7	825.0	839.2
60	853.4	867.6	881.8	896.1	910.3	924.5	938.7	953.0	967.2	981.4
70	995.6	1010	1024	1038	1053	1067	1081	1095	1109	1124
80	1138	1152	1166	1181	1195	1209	1223	1237	1252	1266
90	1280	1294	1309	1323	1337	1351	1365	1380	1394	1408
100	1422	1437	1451	1465	1479	1493	1508	1522	1536	1550
110	1565	1579	1593	1607	1621	1636	1650	1664	1678	1693
120	1707	1721	1735	1749	1764	1778	1792	1806	1821	1835
130	1849	1863	1877	1892	1906	1920	1934	1949	1963	1977
140	1991	2005	2020	2034	2048	2062	2077	2091	2105	2119
150	2134	2148	2162	2176	2190	2205	2219	2233	2247	2262
160	2276	2290	2304	2318	2333	2347	2361	2375	2389	2404
170	2418	2432	2446	2460	2475	2489	2503	2518	2532	2546
180	2560	2574	2589	2603	2617	2631	2646	2660	2674	2688
190	2702	2717	2731	2745	2759	2773	2788	2802	2816	2830
200	2845	2859	2873	2887	2901	2916	2930	2944	2958	2973
210	2987	3001	3015	3030	3044	3058	3072	3086	3101	3115
220	3129	3143	3158	3172	3186	3200	3214	3229	3243	3257
230	3271	3286	3300	3314	3328	3343	3357	3371	3385	3399
240	3414	3428	3442	3456	3470	3485	3499	3513	3527	3542

Temperature

Conversion of Fahrenheit to Celsius

- A simple way to convert a Fahrenheit temperature reading into a Celsius temperature reading or vice versa is to see the number in the center column of the following table. The figures in the center of the following table show the temperatures in both Fahrenheit and Celsius.
- When converting from Fahrenheit to Celsius degrees, consider the center column to be a table of Fahrenheit temperatures and read the corresponding Celsius temperature in the column at the left.
- When converting from Celsius to Fahrenheit degrees, consider the center column to be a table of Celsius values, and read the corresponding Fahrenheit temperature on the right.

1 °C = 33.8 °F

°C		°F	°C		°F	°C		°F	°C		°F
-40.4	-40	-40.0	-11.7	11	51.8	7.8	46	114.8	27.2	81	177.8
-37.2	-35	-31.0	-11.1	12	53.6	8.3	47	116.6	27.8	82	179.6
-34.4	-30	-22.0	-10.6	13	55.4	8.9	48	118.4	28.3	83	181.4
-31.7	-25	-13.0	-10.0	14	57.2	9.4	49	120.2	28.9	84	183.2
-28.9	-20	-4.0	-9.4	15	59.0	10.0	50	122.0	29.4	85	185.0
-28.3	-19	-2.2	-8.9	16	60.8	10.6	51	123.8	30.0	86	186.8

10 STRUCTURE AND FUNCTION

COMPONENT PARTS OF UREA SCR SYSTEM

SCR

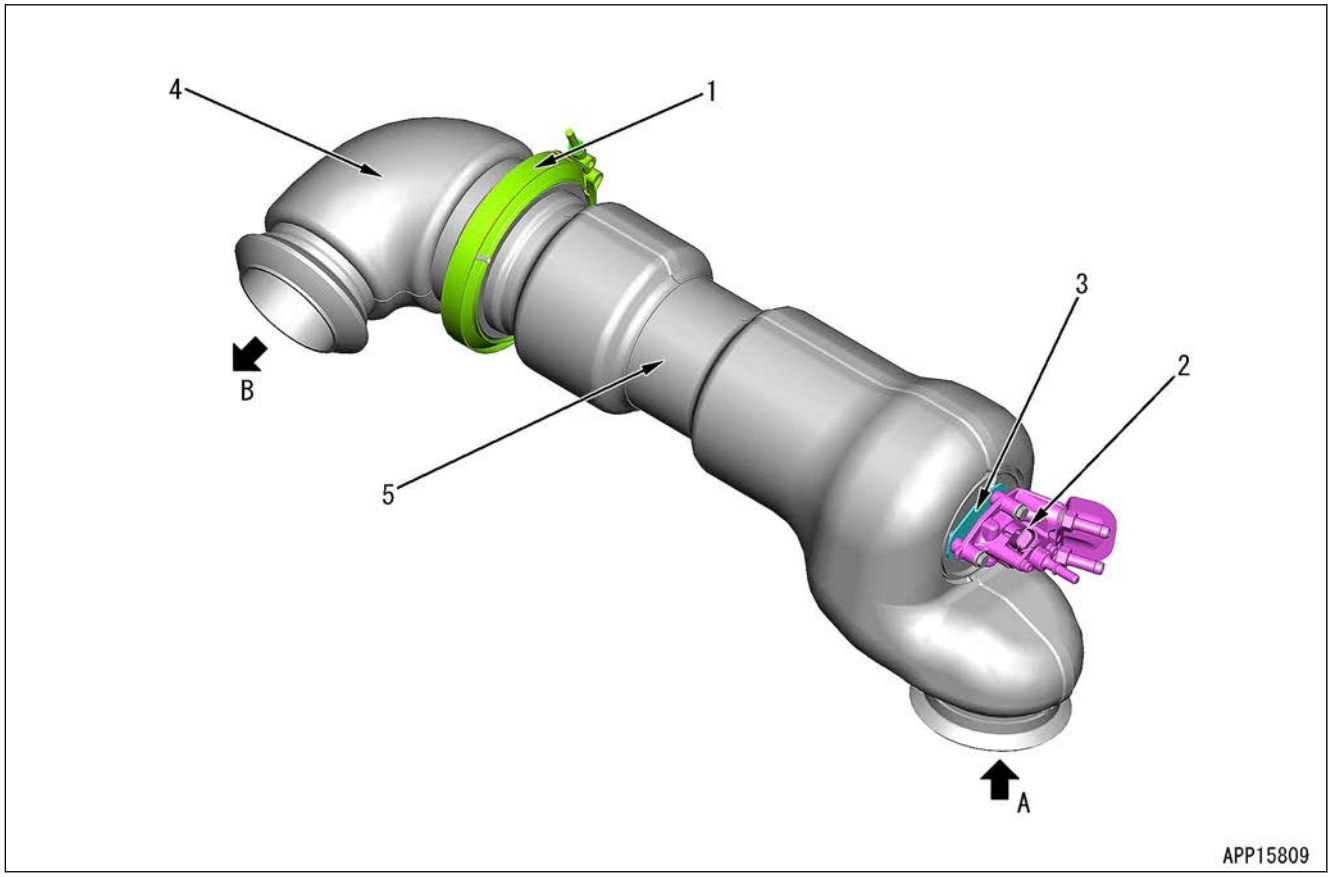
Abbreviation for Selective Catalytic Reduction

AdBlue/DEF MIXING TUBE

STRUCTURE OF AdBlue/DEF MIXING TUBE

REMARK

The shape is subject to machine models.



A: Exhaust gas inlet (from KDPF)

B: Exhaust gas outlet (to SCR)

1: Clamp

4: AdBlue/DEF mixing tube (connector)

2: AdBlue/DEF injector

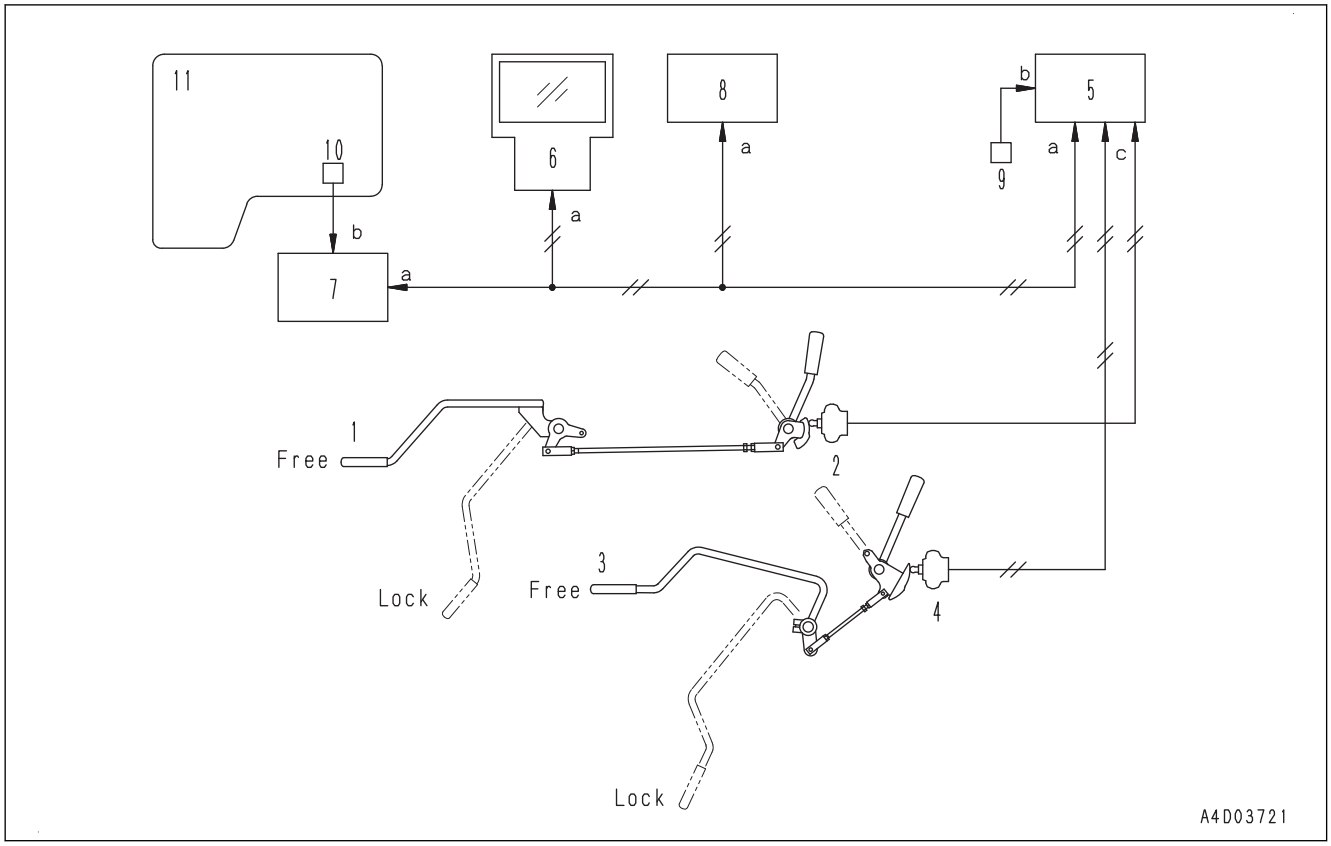
5: AdBlue/DEF mixing tube (tube)

3: Gasket for AdBlue/DEF injector

FUNCTION OF AdBlue/DEF MIXING TUBE

It mixes AdBlue/DEF injected from AdBlue/DEF injector with exhaust gas, and decomposes it to ammonia which is needed to purge NOx from SCR assembly.

AUTOMATIC IDLE STOP SYSTEM DIAGRAM (MACHINE WITH GATEWAY FUNCTION CONTROLLER)



Input and output signals

a: CAN signal

b: Various sensor signal

c: Lock lever signal

1: Work equipment lock lever

2: Work equipment lock lever switch

3: Parking brake lever

4: Parking brake lever switch

5: HST controller

6: Machine monitor

7: Engine controller

8: Gateway Function Controller

9: Hydraulic oil temperature sensor

10: Coolant temperature sensor

11: Engine

FUNCTION OF AUTOMATIC IDLE STOP SYSTEM

- The auto idle stop function stops the engine after a set period of time when the auto idle stop function is enabled.
- While the auto idle stop function is enabled, the engine stops when HST controller sends the engine stop signal to the engine controller.
- When the engine is stopped by the auto idle stop function, if the remaining time of the auto idle stop is less than 30 seconds, the engine speed is fixed to low idle.
- The operating time of the auto idle stop function can be set by the user menu or Service Menu on the machine monitor.

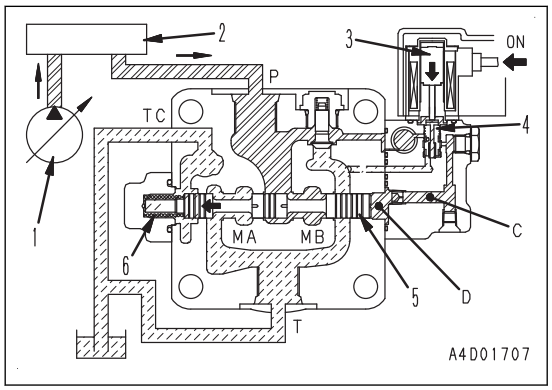
Operating conditions of auto idle stop system

The auto idle stop function operates when all of the following conditions are satisfied at the same time.

- Engine is running.
- Parking brake lever is in “LOCK” position.

When the cooling fan reverse solenoid valve is “energized”

1. When solenoid (3) is “energized”, spool (4) is switched.
2. The pressurized oil from the cooling fan pump flows into port (C), and then into spool chamber (D).
3. The pressurized oil in chamber (D) compresses spring (6).
4. Spool (5) moves to the left.
5. Port (MB) opens and the pressurized oil flows in to drive the motor in a reverse direction (counterclockwise).



Pin No.	Name of signal	Input and output signals
54	(*1)	-
55	(*1)	-
56	Communication terminal power supply output 1	Output
57	Power supply for sensor (24V) boost	Output
58	ENG_WAKE	Output
59	(*1)	-
60	(*1)	-
61	(*1)	-
62	Wake Up signal input and output	Input and output
63	System operating lamp output	Output
64	CAN_L (Komnet/c)	Input and output
65	CAN_L (sensor 1)	Input and output
66	Centralized warning lamp output (basic function side)	Output
67	Ethernet_RX- (additional function component 1)	Input
68	Ethernet_RX+ (additional function component 1)	Input
69	Ethernet_TX- (additional function component 1)	Output
70	Ethernet_TX+ (additional function component 1)	Output
71	Ethernet_RX- (communication terminal 1)	Input
72	Ethernet_RX+ (communication terminal 1)	Input
73	Ethernet_TX- (communication terminal 1)	Output
74	Ethernet_TX+ (communication terminal 1)	Output
75	Communication terminal power supply GND	Input
76	Power supply for sensor (24V) output	Output
77	3rd party component function output	Output
78	(*1)	-
79	(*1)	-
80	(*1)	-
81	Communication terminal call-in start input 1	Input

*1: Never connect, otherwise malfunctions or failures can occur.

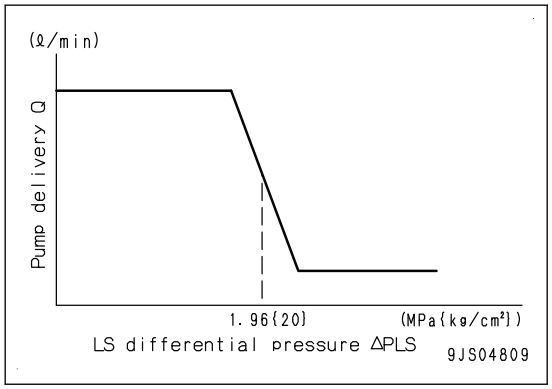
LS VALVE

LS

Abbreviation for Load Sensing

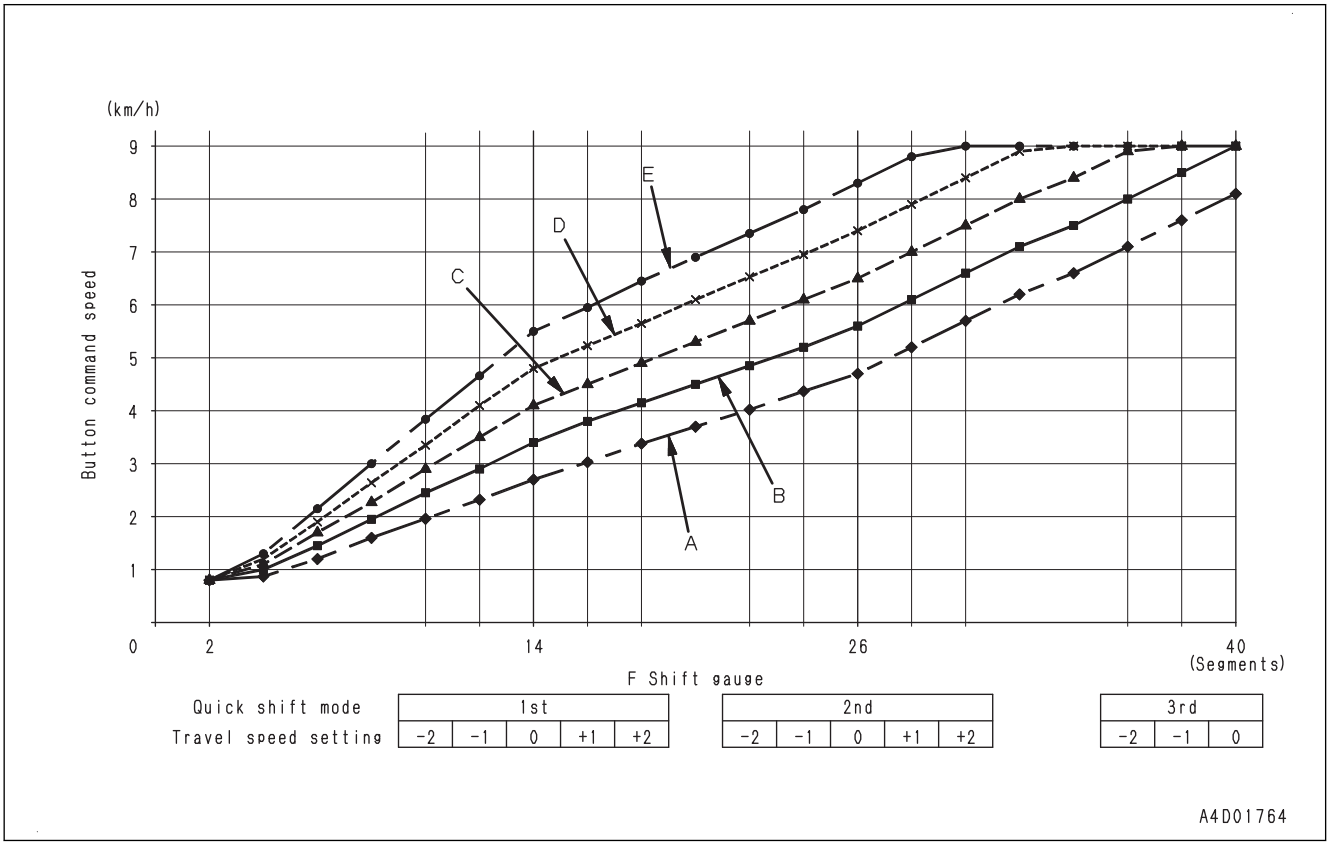
FUNCTION OF LS VALVE

- The LS (load sensing) valve detects the load of the actuator and controls the pump discharged volume.
- This valve controls main pump discharged volume (Q) according to differential pressure ((ΔPLS) = PP – PLS), called the LS differential pressure (the difference between main pump discharge pressure (PP) and control valve outlet port pressure (PLS)).
- This valve receives pump discharge pressure (PP), pressure (PLS) (called the LS pressure) coming from the control valve output.
- The relationship between LS differential pressure ((ΔPLS) = PP – PLS), which is a differential pressure between main pump discharge pressure (PP) and LS pressure (PLS) , and discharged volume (Q) is as shown in the diagram.



GEAR SHIFT CONTROL FUNCTION

Gear shift by operator's operation



A: Reverse Travel Speed Setting “-1”

B: Forward and reverse travel speed setting “0”

C: Reverse travel speed setting “+1”

D: Reverse travel speed setting “+2”

E: Reverse travel speed setting “+3”

- Upon receiving gear shift signals from the upshift switch or downshift switch of the joystick (steering, directional and gear shift lever), HST controller decides the capacity of HST pump and HST motor, and shifts the gear.
- The operator can select quick shift mode or variable shift mode by operating gear shift mode switch (1).
- If the joystick (steering, directional and gear shift lever) is tilted “FORWARD (forward travel)”, the set travel speed corresponding to the gear speed of broken line (B) in the figure above is decided.
- The operator can set the reverse travel to 5 levels of reverse travel speed settings (A) to (E) by operating reverse travel speed setting switch (2).
- If the joystick (steering, directional and gear shift lever) is tilted “REVERSE (reverse travel)”, the set travel speed corresponding to reverse travel speed settings (A) to (E) in the figure above is determined.
- When the joystick (steering, directional and gear shift lever) is in “NEUTRAL”, the set travel speed is 0 km/h.
- The operator can set the travel speed in the 1st, 2nd, and 3rd gear speeds in quick shift mode to 5 levels (for the 1st and 2nd) or 3 levels (for the 3rd) by using “1st Travel Speed Setting”, “2nd Travel Speed Setting”, and “3rd Travel Speed Setting” in the customize menu.

1: Speed sensor
2: Charge relief valve

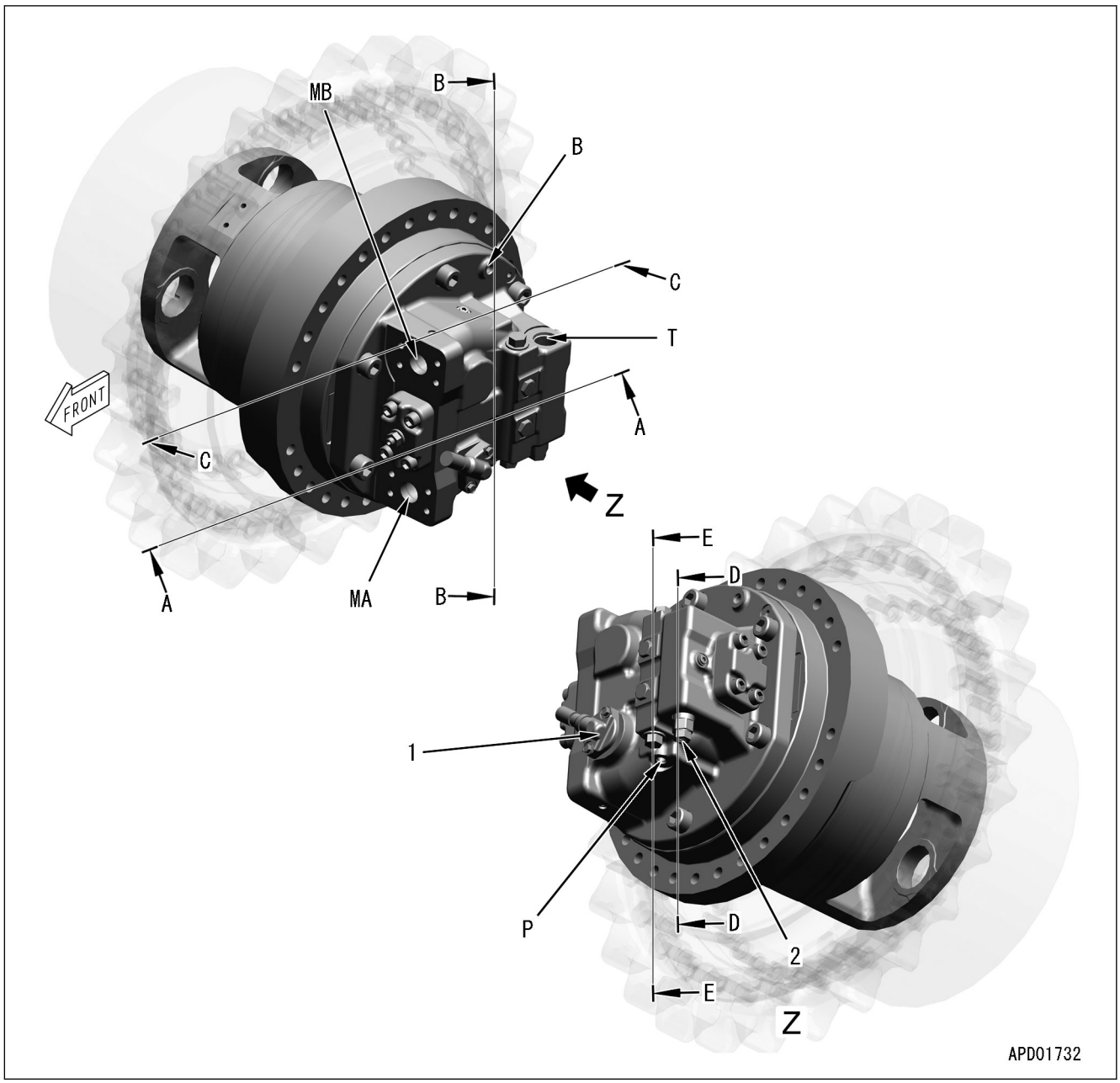
General view

R.H. HST motor

Rotation direction (facing the drive shaft)

Inflow from MA: Counterclockwise rotation

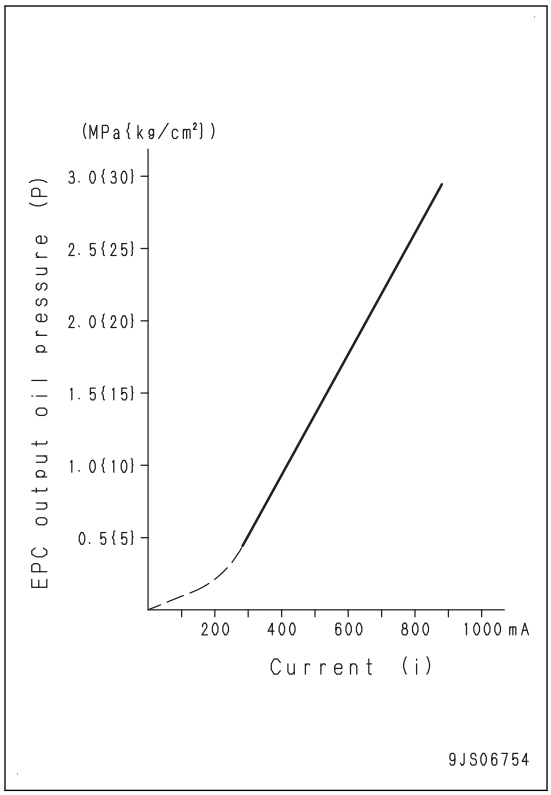
Inflow from MB: Clockwise rotation



B: Parking brake release signal port
P: Capacity control signal port
MA: (High pressure during forward travel) Discharge port
T: Drain
MB: (High pressure during reverse travel) Discharge port
1: Speed sensor
2: Charge relief valve

FUNCTION OF EPC VALVE

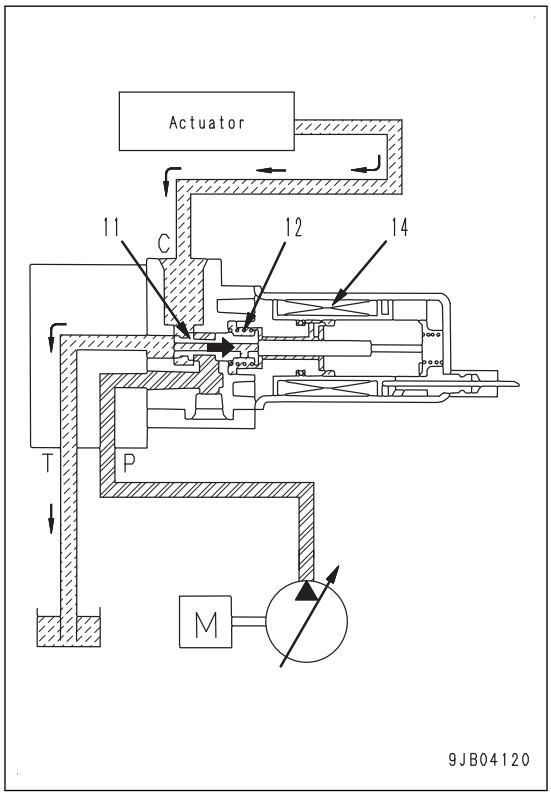
- EPC valve consists of proportional solenoid and hydraulic valve.
- Upon receiving signal current (i) from the controller, EPC valve generates EPC output pressure in proportion to that signal current and outputs it to the actuator.



OPERATION OF EPC VALVE

When signal current is zero (coil is de-energized)

1. When the signal current from the controller does not flow into coil (14), coil (14) is de-energized.
2. Spool (11) is pressed to the right by spring (12).
3. Port (P) is closed and no pressurized oil from the pump flows into the actuator.
4. The pressurized oil from the actuator flows through port (C) and port (T), and drained into the tank.



Pin No.	Signal name	Input and output signals
17	(*1)	-
18	(*1)	-
19	(*1)	-
20	(*1)	-
21	GND (power supply)	-
22	Power supply (24 V)	Input
23	(*1)	-
24	Starting switch ACC signal	Input
25	(*1)	-
26	(*1)	-
27	(*1)	-
28	(*1)	-
29	(*1)	-
30	(*1)	-
31	GND (power supply)	-
32	GND (power supply)	-
33	GND (power supply)	-
34	System operating lamp	Output
35	(*1)	-
36	(*1)	-
37	(*1)	-
38	(*1)	-
39	(*1)	-
40	(*1)	-

*1: Never connect these pins, otherwise it may cause malfunction or failures.

5: GNSS antenna
6: Communication antenna (*1)
7: Door windshield wiper
8: Radio antenna
9: Camera
10: Rear lamp
11: Rear window
12: Rear windshield wiper
*1: Machine with Iridium communication terminal

FUNCTION OF ROPS CAB

ROPS cab is to protect the operator wearing seat belt from being crushed when the machine rolls over.

Machine model			D61EXI-24	
Engine			SAA6D107E-3	
Item	Measurement condition	Unit	Standard value for new machine	Repair limit
Blade right angle	• HST oil temperature (hydraulic oil temperature)40 to 60 °C • Operating Mode: P (Power mode) • Fuel control dial: MAX (High idle) position • Time required to move blade between LEFT angle stroke end and RIGHT angle stroke end • See “MACHINE POSTURE AND PROCEDURE FOR MEASURING PERFORMANCE”, Fig. 5.	Sec.	3.8 ± 0.3	Max. 4.7
Ripper RAISE (if equipped)	• HST oil temperature (hydraulic oil temperature)40 to 60 °C • Operating Mode: P (Power mode) • Fuel control dial: MAX (High idle) position • Time required to move the ripper between ground level and rising end	Sec.	1.0 ± 0.3	Max. 1.7
Ripper LOWER (if equipped)	• HST oil temperature (hydraulic oil temperature)40 to 60 °C • Operating Mode: P (Power mode) • Fuel control dial: MAX (High idle) position • Time required to move the ripper between rising end and ground level	Sec.	1.0 ± 0.3	Max. 1.7

Time lag

Machine model			D61EXI-24	
Engine			SAA6D107E-3	
Item	Measurement condition	Unit	Standard value for new machine	Repair limit
Blade	• HST oil temperature (hydraulic oil temperature)40 to 60 °C • Operating Mode: P (Power mode) • Fuel control dial: MAX (High idle) position • Start lowering operation at blade max. raising position and measure time from when blade reaches ground until idler rises	Sec.	Max. 1.0	Max. 1.5

Abbreviation	Actual word spelled out	Purpose of use (major applicable machine (*1), or component/system)	Explanation
MMS	Multimedia Messaging Service	Communication	This is a service that allows transmission and reception of short messages consisting of characters or voice or images between cell phones.
NC	Normally Closed	Electrical system, hydraulic system	This is a characteristic of electrical or hydraulic circuits. Circuit is normally closed if it is not actuated, and it opens when it is actuated.
NO	Normally Open	Electrical system, hydraulic system	This is a characteristic of electrical or hydraulic circuits. Circuit is normally open if it is not actuated, and it closes when it is actuated.
OLSS	Open-center Load Sensing System	Hydraulic system	This is a hydraulic system that can operate multiple actuators at the same time regardless of the load.
PC	Pressure Compensation	Hydraulic system	This is a function that corrects the oil pressure.
PCCS	Palm command control system	Steering (D Series)	This is a function that electrically controls the engine and transmission in an optimal way with the controller instantly analyzing data from levers, pedals, and dials.
PCV	Pre-stroke Control Valve	Engine	This is a valve that adjusts the fuel intake amount at the pump inlet in order to control fuel discharged volume of supply pump.
PPC	Proportional Pressure Control	Hydraulic system	This is a system that operates actuators in proportion to the oil pressure.
PPM	Piston Pump and Motor	Hydraulic system (D, PC, etc)	Piston type hydraulic pump and motor.
PTO	Power Take Off	Power train system	Power take-off mechanism
PTP	Power Tilt and power Pitch dozer	Work equipment (D Series)	This is a function that performs hydraulic control of the tilt and pitch of the dozer blade of the bulldozer.
ROPS	Roll-Over Protective Structure	Cab and canopy	ROPS 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 rolls over. (Roll-over protective structure) This performance is standardized as ISO 3471 or ISO 12117-2.
SCR	Selective Catalytic Reduction	Urea SCR system	This is an exhaust gas purifier using urea water that converts nitrogen oxides (NOx) into harmless nitrogen and water by oxidation-reduction reaction. It may also be mentioned as exhaust gas purification catalyst or part of the name of related devices.
SI	Le Systeme International d' Unites (International unit system)	Unit	Abbreviation for “International System of Units” It is the universal unit system and “a single unit for a single quantity” is the basic principle applied.
SOL	Solenoid	Electrical system	This is an actuator that consists of a solenoid and an iron core that is operated by the magnetic force when the solenoid is energized.

⚠ It is dangerous if "No-Injection Cranking" mode is not selected because engine will start. Be sure to set the engine in this mode.

17. Measure the compression pressure when the engine is cranked by the starting motor.

NOTICE

Do not crank the engine for 20 seconds or longer to protect the starting motor.

REMARK

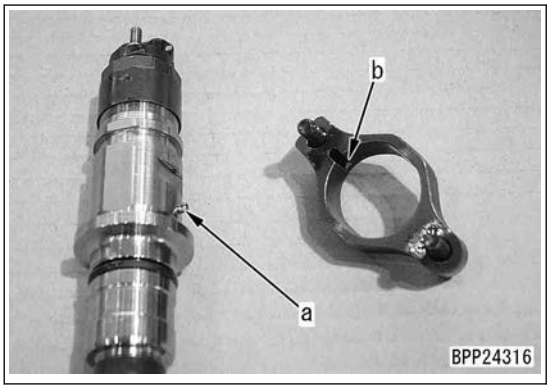
Read the compression pressure when the pointer of gauge is stabilized.

For standard values, see STANDARD VALUE TABLE, "STANDARD VALUE TABLE FOR ENGINE".

After finishing the test, remove the testing tools and restore the machine.

Install the injector and high-pressure pipe according to the following procedure.

1. Align projection (a) of injector and groove (b) of holder.
2. Install the injector to the cylinder head while facing its fuel inlet hole to the air intake manifold.
3. Tighten the holder mounting bolt by 3 to 4 turns.



4. Check inlet connector.

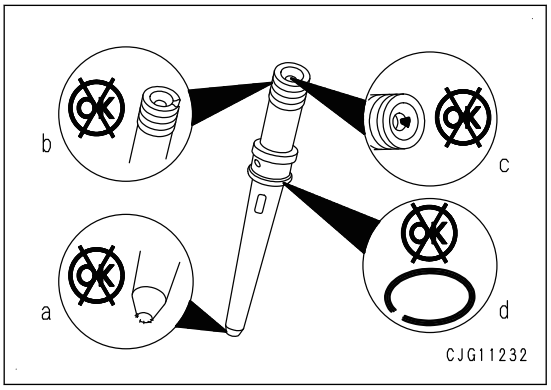
NOTICE

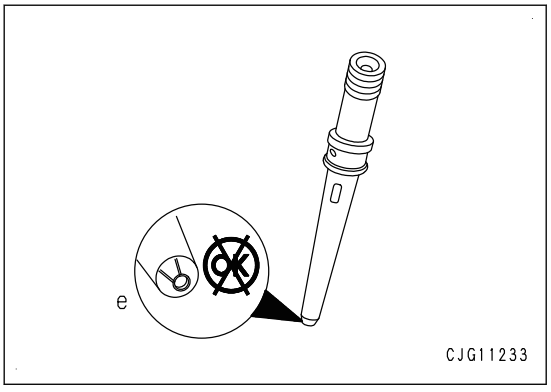
Check inlet connector on the following points. If any abnormality is found, replace it.

- **When burrs or wear are found on front end part (a) or rear end part (b) of inlet connector.**
- **When foreign materials are attached to the edge filter at rear end part (c) of the inlet connector**
- **When cracks or deterioration are found on the O-ring of inlet connector upper part (d)**
- **When wear or uneven contact are found on seat surface (e) at tip-end of the inlet connector.**

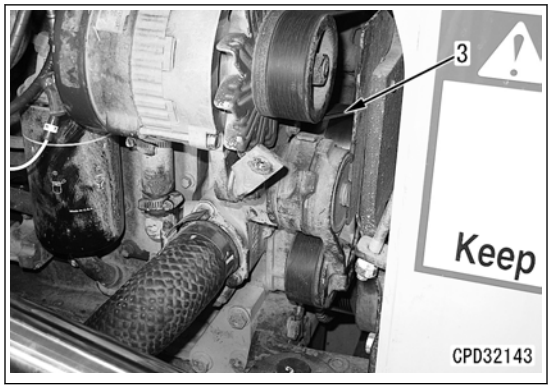
REMARK

If high-pressure fuel leaks through the inlet connector, seat surface has fine streaks or cracks due to erosion.



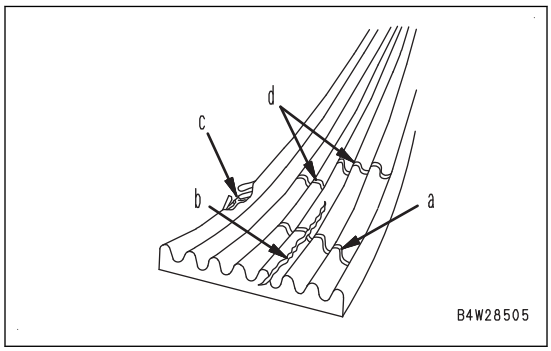


3. Check the alternator belt (3).



REMARK

- Replace the alternator belt has a vertical scratch (b) which crosses the horizontal scratch (a).
- Replace the alternator belt has tears (c).
- Need not to be replaced if it has only a horizontal scratch (d).



REMARK

Possible causes of the damage on the belt

- Improper tension has been applied.
- Part whose size or length is wrong has been used.
- Pulley is out of the position.
- Pulley is damaged.
- Auto-tensioner is damaged.
- Installation state is improper.
- Severe operating environment.
- Oil and grease are attached to the side of the belt.

REMARK

If the belt is obviously worn, there is a possibility that the auto-tensioner is also worn and the surface of the pulley is rough. In that case, the newly replaced belt may be worn early if the pulley is continuously used. Therefore, replacement of the belt and autotensioner as a set is recommended.

5. Check that “0” of “Test State” is flashing.

REMARK

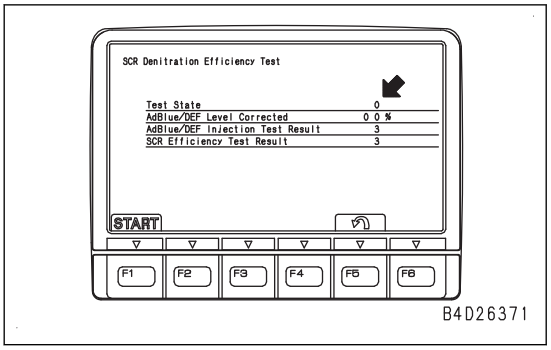
Flashing of “0” indicates “Waiting for the start (default)”, and test can be performed. Screen other than “0” is displayed, follow instructions according to “Parameter list of test state”.

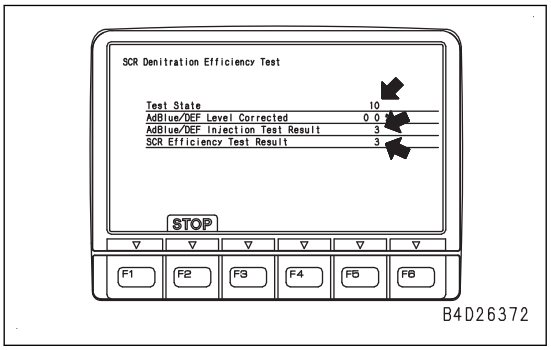
6. Press F1 to start “SCR Denitration Efficiency Test”.

F1: Starts “SCR Denitration Efficiency Test”.

F2: Stops “SCR Denitration Efficiency Test”. (When “STOP” is displayed)

F5: Returns the display to “SCR Service Test” screen





NOTICE

- **“Test State” does not change to “10” and test does not start even if F1 is pressed, turn starting switch to OFF position once, and repeat the procedure from step 1.**
- **When the test is stopped by pressing F2, “0” in “Test State” flashes. The test cannot be restarted by pressing F1. To restart the test, turn the starting switch to OFF position once. System operating lamp goes out, and engine controller shuts down.**
- **If the starting switch is mistakenly turned to OFF position during test, do not turn starting switch to ON position immediately. Check that system operating lamp is off, and turn starting switch to ON position again after engine controller shuts down.**
- **If KOMNET communication error remains less than 1 second, engine controller is unable to detect it. The test may be continued while the machine monitor does not continue the test (standard screen). In that case, once the starting switch is turned to OFF position, system operating lamp goes out, and the engine controller shuts down to reset the test.**

REMARK

- The display of “Test State” changes to the flashing of “10”, and “SCR Denitration Efficiency Test” starts.
- “SCR Denitration Efficiency Test” will be normally completed in approximately 30 minutes, however it may take approximately 90 minutes at maximum depending on the test state.
- When the display of “Test State” is “11” to “41” or “100”, follow “Parameter list of test state”.
- The test results of “AdBlue/DEF Injection Test Result” and “SCR Efficiency Test Result” are displayed as “3” during test.
- When the display of “Test State” changes from flashing of “10” to flashing of “20”, the test is completed.
- “Test State” becomes “14” temporarily at the half way of the test. This state means the temperature is in transition and is not abnormal. Resume the test. (The display changes to “10” in a few minutes.)
- If the test needs to be stopped at halfway, press F2 to return the screen to the standard screen.
- If F2 is pressed and the operation stops halfway through the test, “AdBlue/DEF Injection Test Result” and “SCR Efficiency Test Result” are displayed as “3”.
- The test results of “AdBlue/DEF Injection Test Result” and “SCR Efficiency Test Result” are displayed as “0”, “1” or “4” after the test.

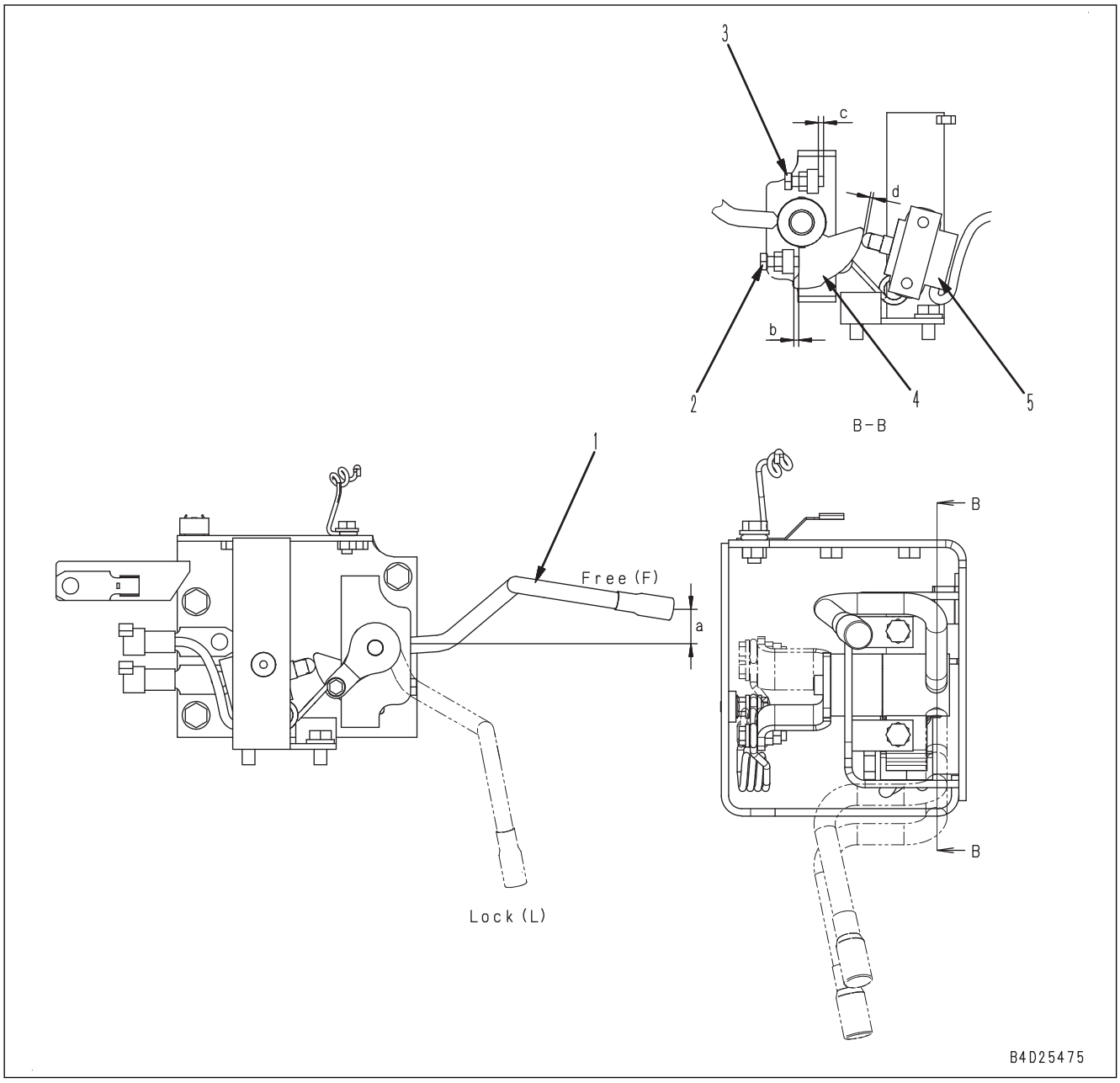
ADJUST PARKING BRAKE LEVER

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

For adjusting of the parking brake lever to perform troubleshooting or others, refer to this section.

METHOD FOR ADJUSTING PARKING BRAKE LEVER

The figure is a structural view for adjustment.



If any parts related to the parking brake lever were removed and installed or replaced, adjust the parking brake lever according to the following procedure.

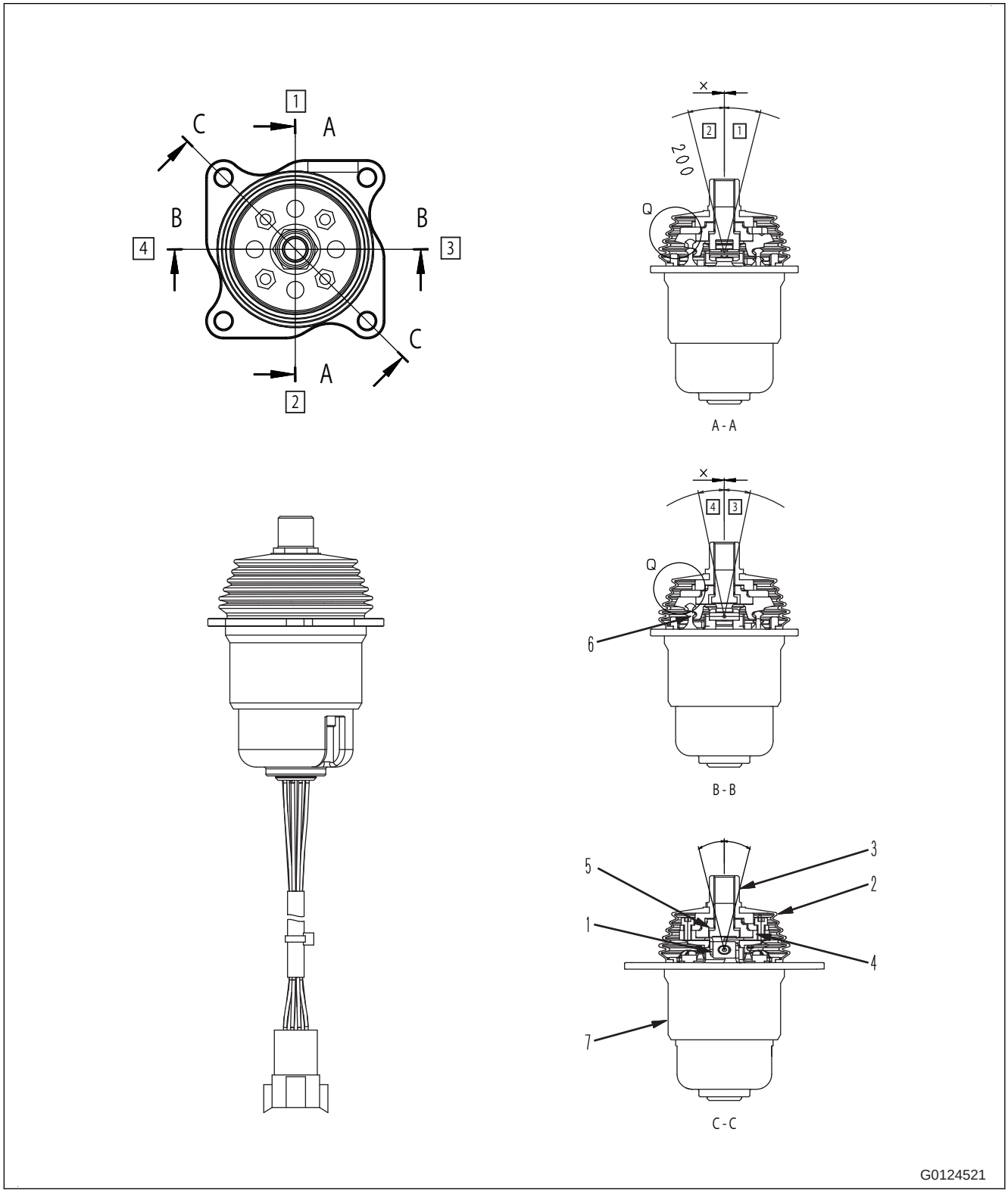
1. Set parking brake lever (1) in the FREE position. Adjust installed height (b) of stopper bolt (2) so that the dimension (a) of lever (1) is 30.7 mm.

   Standard installed height (b) of stopper bolt: 4 mm

2. Set parking brake lever (1) in LOCK position and adjust installed height (c) of stopper bolt (3).

   Standard installed height (c) of stopper bolt: 4 mm

The figure is a structural drawing for test and adjustment.



1: Universal joint
2: Boot
3: Nut
4: Disc
5: Nut
6: Rod
7: Valve body

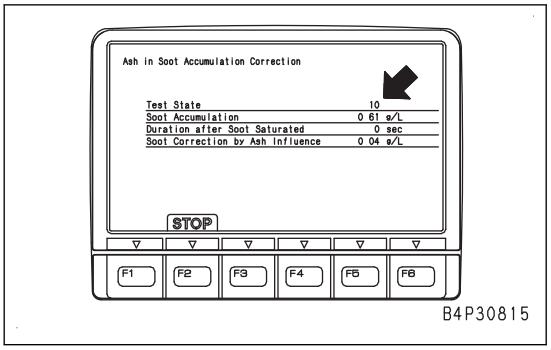
⚠ Stop the machine on a level ground, lower the work equipment to the ground fully, stop the engine, and set the parking lever and work equipment lock lever to the LOCK position.

Code No.	Self-define Monitoring items (screen display)	Unit			Applicable component	Remarks
		SI	Metric	Imperial		
19304	AdBlue/DEF Pump State	-	-	-	SCR	1: Stop injection 2: Pressure-fed 3: Being injected 4: Being purged
19305	AdBlue/DEF Tank Heating State	-	-	-	SCR	1: Being thawed 2: Being kept warm 3: OFF
19306	AdBlue/DEF Line Heater 1 State	-	-	-	SCR	1: Being thawed 2: Being kept warm 3: OFF
19307	AdBlue/DEF Line Heater 2 State	-	-	-	SCR	1: Being thawed 2: Being kept warm 3: OFF
19309	AdBlue/DEF Pump Heater State	-	-	-	SCR	0: OFF 1: Being thawed 2: Being kept warm 3: OFF
19115	AdBlue/DEF Temperature in Tank	°C	°C	°F	SCR	
19119	Total AdBlue/DEF Injection Qty	L	L	gal	SCR	
19120	AdBlue/DEF Injection Quantity	ml/sec	ml/sec	gal/sec	SCR	
19400	Ambient Temperature	°C	°C	°F	SCR	
19401	Ambient Temperature Sensor Volt	V	V	V	SCR	
19130	AdBlue/DEF Key off Refill Count	-	-	-	SCR	
19133	Engine Room Temperature	mA	mA	mA	ENG	
19134	Engine Room Temp Sensor Voltage	V	V	V	ENG	
19135	AdBlue/DEF Line Heater 2 Command	-	-	-	SCR	0: OFF 1: ON
19136	AdBlue/DEF Pump Temperature	°C	°C	°F	SCR	
19137	Total AdBlue/DEF Heating Time	h	h	h	SCR	
00204	HST Controller Model Code	-	-	-	-	
20237	HST Controller Ass'y P/N	-	-	-	-	
20238	HST Controller Program P/N	-	-	-	-	
20406	HST Controller Serial Number	-	-	-	-	
04401	HST Oil Temperature	°C	°C	°F	HST	
04402	HST Oil Temperature Sensor Volt	V	V	V	HST	
60000	Theoretical Traction	W	W	W	HST	
40010	Travel Speed	km/h	km/h	mile/h	HST	

8. Start the calibration process by pressing F1.

   REMARK

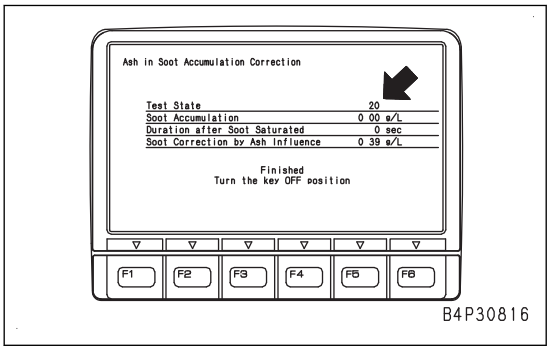
   - The display of “Test State” changes to flashing of “Ash in Soot Accumulation Correction”.
   - “Ash in Soot Accumulation Correction” is completed in approximately 2 hours.



9. When “20” in “Test State” column starts flashing, turn the starting switch to OFF position.

   REMARK

   By turning the starting switch to OFF once, the correction value is written in the engine controller.



METHOD FOR OPERATING TESTING MENU (RESET NUMBER OF ABRUPT ENGINE STOP BY AIS)

Diagnostic Tests menu is used to perform various checks or resetting of the machine monitor and the machine.

Though this item is displayed Diagnostic Tests menu, it is unnecessary to perform “Reset number of abrupt engine stops by AIS”. It is because the engine speed is lowered first and then stopped, auto idle stop will not cause abrupt engine stops since Auto idle stop is not executed immediately at high engine speeds on this machine.

METHOD FOR OPERATING TESTING MENU (ENGINE STOP AdBlue/DEF INJ OVERHEAT COUNT RESET)

NOTICE

When performing this item, see TROUBLESHOOTING, Failure code [AS10NT] “AdBlue/DEF Injector Overheat Caution” or Failure code [AS10KM] “AdBlue/DEF Injector Overheat Warning”, and instruct an operator about operation.

Use the testing menu to check the machine or to reset the settings of machine monitor.

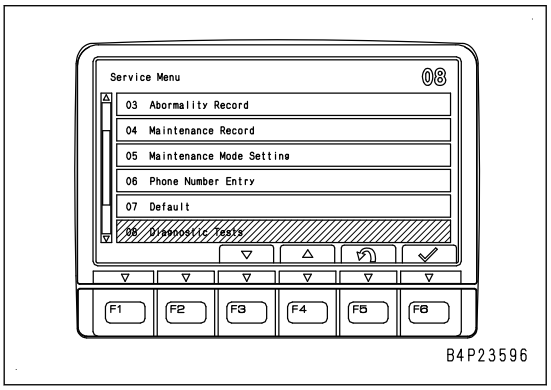
This function is used to reset the number saved in the machine, the number which engine stop performed when the temperature of exhaust gas and coolant is high.

Perform “Engine Stop at AdBlue/DEF Inj Overheat Count Reset” by referring to the procedures in this section.

1. Select “Diagnostic Tests” from the “Service Menu” screen.

   REMARK

   For selecting method, see “Operating method of service mode” in “SERVICE MODE”.



REMARK

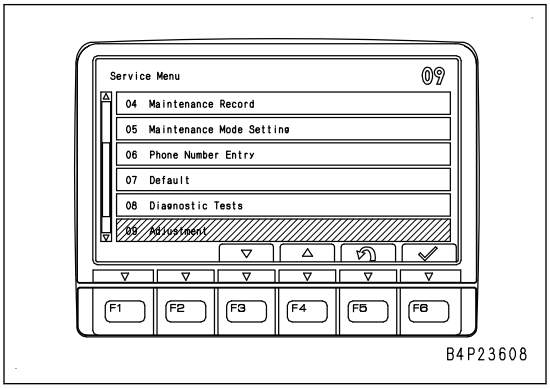
Even if this adjustment mode finishes, the confirmed setting is still effective while the starting switch is in ON position. Turn the starting switch to OFF position when “Control Brake Release Mode” needs to be turned OFF.

METHOD FOR PERFORMING WITH ADJUSTMENT ID: 0002 (MODEL CODE)

“Model Code” makes HST controller and machine monitor save the machine model code.

When HST controller or machine monitor is replaced, always perform this adjustment.

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



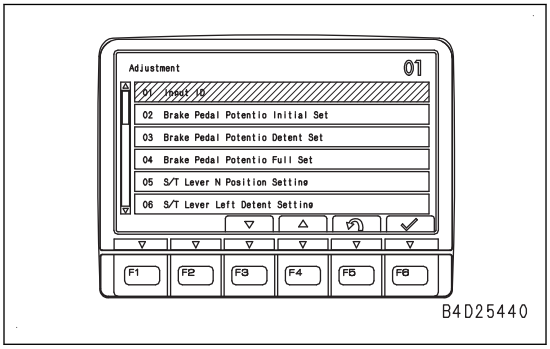
2. On “Adjustment”, select “Input ID” to be set.

   F3: Moves the selection down by one item

   F4: Moves the selection up by one item

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

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



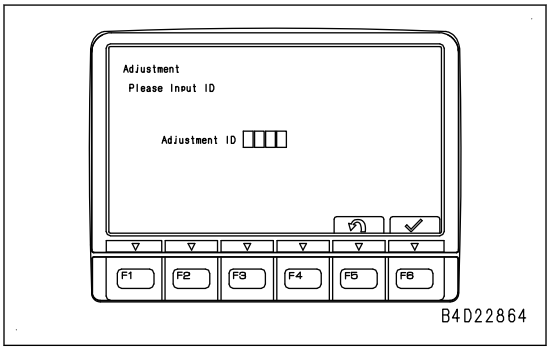
3. On “Input ID” screen, directly input Adjustment ID “0002” by using the numeral input switches.

   F5: Returns the screen to “Adjustment” screen

   F6: Enters input Adjustment ID

   REMARK

   - For details of Adjustment ID and adjustment items, see “ADJUSTMENT ITEMS 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).



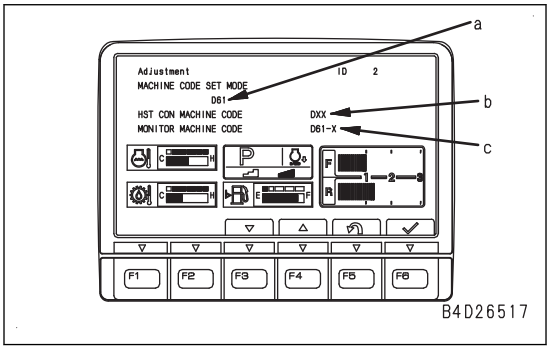
4. On “Adjustment” screen, set “Machine Model Code” according to the following procedure.

   F3: Changes “Machine Model Code”.

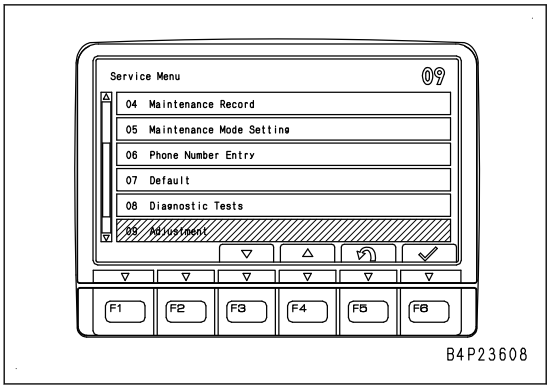
   F4: Changes “Machine Model Code”.

   F5: Returns the screen to “Input ID” screen

   F6: Enters the selection



1. From the “Service Menu” screen, select “Adjustment”.



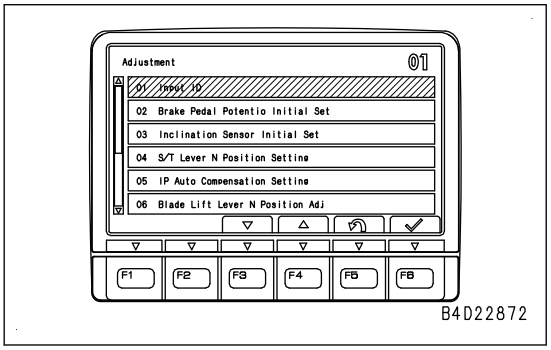
2. After the “Adjustment” menu screen is displayed, select “Input ID”.

   F3: Moves the selection downward

   F4: Moves the selection upward

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

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



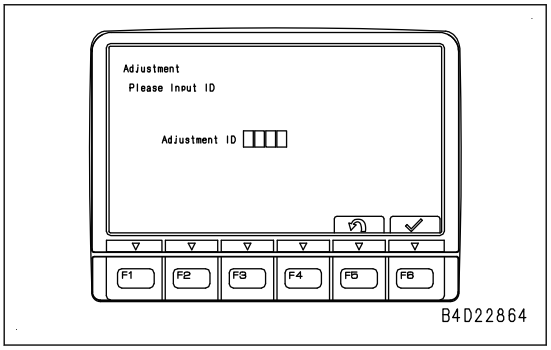
3. After the “Input ID” screen is displayed, directly input Adjustment ID “8041” by using the numeral input switch.

   F5: Returns the screen to the “Adjustment” screen.

   F6: Enters the input Adjustment ID.

   REMARK

   - For details of Adjustment ID and adjustment items, see “ADJUSTMENT ITEMS TABLE”.
   - If the input Adjustment ID is incorrect, “Incorrect ID” will be displayed. and you cannot proceed the “Input ID” screen to the next screen. (You can input Adjustment ID again in this screen display)



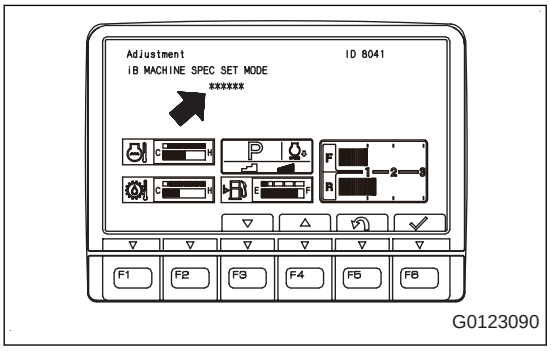
4. The screen for checking the machine specifications is displayed, and the specifications of the machine currently set are displayed. Check that they are the same as the actual specifications, and press F6 to enter.

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

Machine monitor display and machine specifications

Machine monitor display	Machine specifications
EXi	EXi specifications

Date	
Name	

Terminal Replacement Sheet

To: KOMTRAX Support Center, KLTD
E-mail: JP00MB_register_gkom@global.komatsu

Machine	
Model	
Type	
Serial Number	

Faulty Terminal/Monitor		New Terminal/Monitor	
Part Number		Part Number	
Serial Number		Serial Number	

Reason for replacement :	
Date Terminal Replacement will be performed	
Country to use	
Name of distributor	

Note:
If the communication is not canceled for faulty terminal, the communication fee will be charged.

■Only for changing to Orbcomm terminal series(TC3**) :
1. After terminal replacement is completed in KBA, please click 'Apply' button in KBA.
2. KL TD will assign new terminal to the machine based on given terminal info in this form.

■ For changing to Mobile and Iridium communication terminal
1. Please completed terminal replacement in KBA.

■For changing to all KOMTRAX terminal changes (Mobile, Iridium, Orbcomm):
Please ensure to send this 'Terminal Replacement Sheet' to KOMTRAX Support Center, KLTD. because this "Terminal Replacement Sheet" is also used as a deactivation request.

■ "Terminal Replacement Sheet' can be used when faulty terminal and faulty modem.

■For MH801/UM600:
Based on given monitor/K-Plus2 info in this form, KLTD will assign new monitor to the modem.

■New Komtrax terminal is unable to starting communication, unless activation is completed.
*KBA: KOMTRAX application (DFM)

G0078250

6) Set the position to which total station A is installed (machine position) to total station A.

Coordinates of position to which total station A (Station) was installed: 0, 0, 0

REMARK

For details of the method for setting the station, see the Operation and Maintenance Manual for total station A.

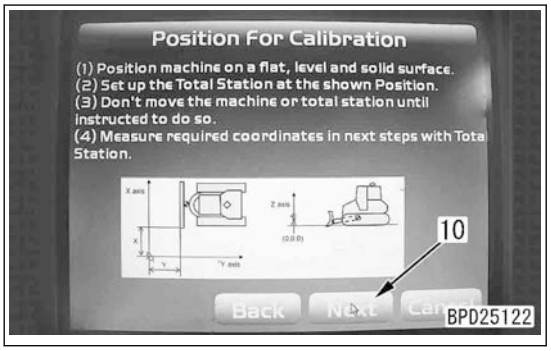
9. After installing the machine and total station A, press "Next" (10).

"Back": Returns the screen to the previous screen

"Next" (10): Moves the screen to the next screen

"Cancel": Cancels "Machine Cal Step B", and returns the screen to the main screen

Pressing "Next" (10) displays the "Blade Position" screen.



10. Measure the coordinates of blade edge position according to the following procedure.

1) Set the prism B at the left edge of the blade.

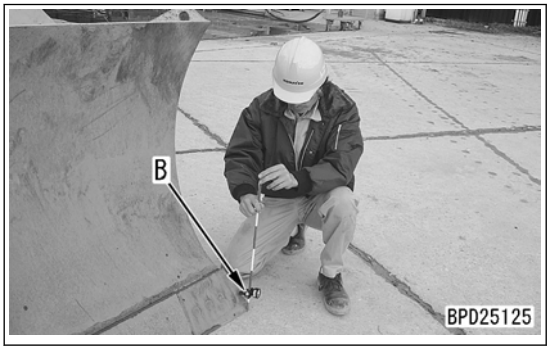
NOTICE

Set the prism B at the top of the cutting edge.

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 cutting edge on the left side of the blade, and record them.

NOTICE

- **Measure them accurately because they become a basis to calculate the longitudinal direction of the machine (pitch angle) and the rolling angle of the ground (of the machine).**
- **Measure the coordinates in 1 mm unit.**

REMARK

If the axis of total station A displays "N, E, Z", read "N" for "X" and "E" for "Y".

5) Set the prism B at the right edge of the blade.

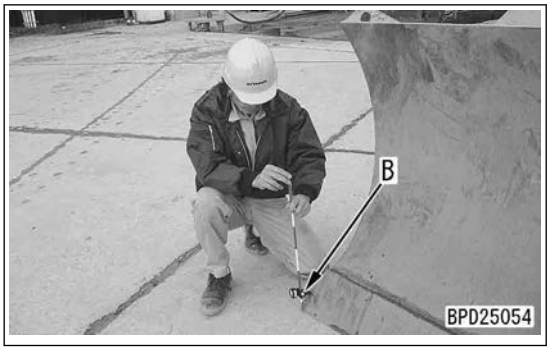
NOTICE

Set the prism B at the top of the cutting edge.

6) Measure the coordinates of cutting edge on the right of the blade, and record them.

NOTICE

- **Measure them accurately because they become a basis to calculate the longitudinal direction of the machine (pitch angle) and the rolling angle of the ground (of the machine).**
- **Measure the coordinates in 1 mm unit.**

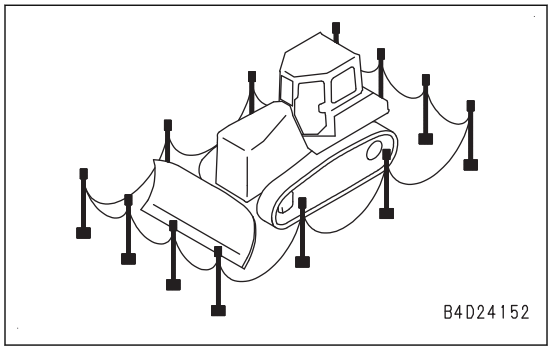


TEST STROKE SENSOR FOR TILT CYLINDER

⚠ 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 tilt cylinder.

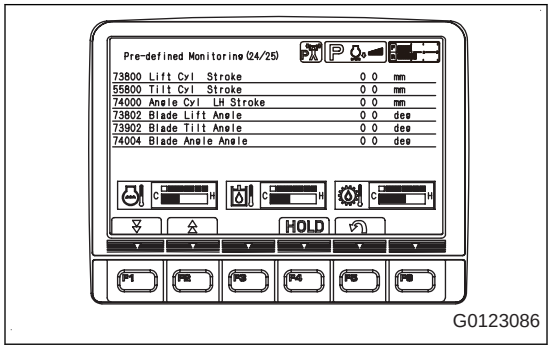
REMARK

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.

METHOD FOR TESTING STROKE SENSOR FOR TILT CYLINDER

1. Start the engine, and stop the machine on a level firm ground.
2. Select and display “Tilt Cyl. Stroke” from “Pre-defined Monitoring” (24/25) or the monitoring selection menu by referring to the section “SET AND OPERATE MACHINE MONITOR”.

   Monitoring Code: 55800 “Tilt Cyl. Stroke”



3. Turn on the power supply of the control box.
4. 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.

5. Measure the stroke on the left tilt side of the blade according to the following procedure.

   REMARK

   Operation of tilting 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 tilt side, this shall be preformed on the right tilt side).

   1) Move the blade to the stroke end by performing right tilt operation and hold it for more than 2 seconds. Confirm that the stroke value 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 of the stroke sensor. Perform stroke end reset on the left TILT side once. Confirm again that the displayed stroke value at the stroke end on the right TILT side becomes the standard value.

Pm CLINIC CHECK SHEET FOR UNDERCARRIAGE: D61PXI-24

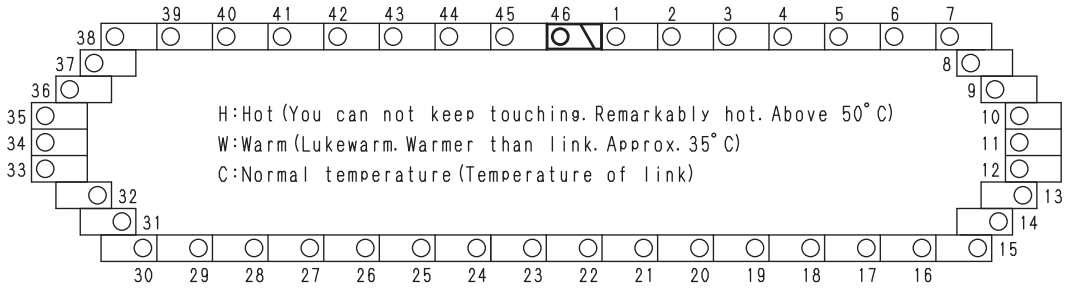
Undercarriage check sheet

Model	Serial No.	Service meter	User name	Date of inspection	Inspector
□D61PXI-24				/ /	

Bushing

Machine model			D61PXI-24	Good	No good
Engine			SAA6D107E-3		
Item	Testing conditions		Measurement result		
Bushing temperature	Measure just after work	Left side of machine			
		Right side of machine			

Left side of the machine



REMARK

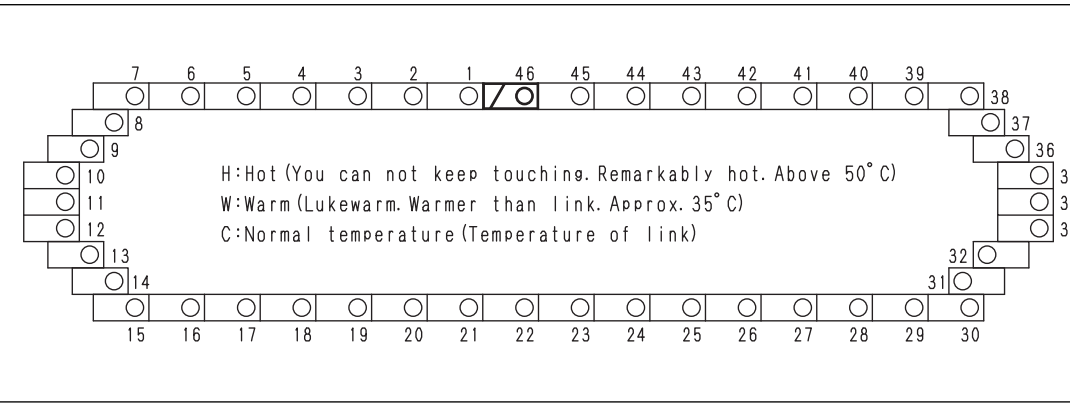
Symbols to be entered in drawing

H: Hot (You cannot keep touching, Remarkably hot, Above 50 °C)

W: Warm (Lukewarm, Warmer than link, Approximately 35 °C)

C: Normal temperature (Temperature of link)

Right side of the machine



REMARK

Symbols to be entered in drawing

H: Hot (You cannot keep touching, Remarkably hot, Above 50 °C)

W: Warm (Lukewarm, Warmer than link, Approximately 35 °C)

C: Normal temperature (Temperature of link)

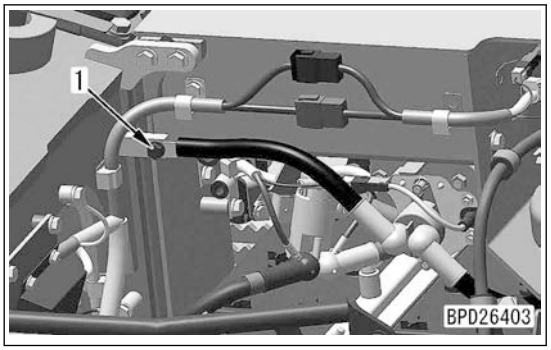
List of failure codes related to Inducement

- "●" mark in the below table shows failure codes which activate Inducement strategy in each territory.
- When activating Inducement strategy, the following failure code is displayed with one of "AdBlue/DEF level Low Error", or "Urea SCR system devices abnormality" on "Current Abnormality" screen of the machine monitor.
- "Urea SCR system devices abnormality" is displayed as Urea SCR System Abnormality on the Abnormality Record screen.
- For the Engine with EU+EPA/CARB dual labelling name-plate, "AdBlue/DEF level Low Error" is the target error code for the North American specification, and "Urea SCR system devices abnormality" applies to error codes that are targeted by either North American or EU specifications.

Failure code	Detail of failure	North America		EU		The Engine with EU+EPA/CARB dual labelling name-plate	
		AdBlue/ DEF level Low Error	Urea SCR system devices abnormality	AdBlue/ DEF level Low Error	Urea SCR system devices abnormality	AdBlue/ DEF level Low Error	Urea SCR system devices abnormality
AS00ZK	AdBlue/DEF Level Low Error 5	●	-	-	-	●	-
CA249	Ambient Air Temp Sensor High Error	-	-	-	●	-	●
CA256	Ambient Air Temp Sensor Low Error	-	-	-	●	-	●
CA1669	AdBlue/DEF Level Sensor Voltage High Error	-	-	-	●	-	●
CA1673	AdBlue/DEF Level Low Error 3	●	-	●	-	●	-
CA1677	AdBlue/DEF Temperature Sensor Low Error	-	-	-	●	-	●
CA1678	AdBlue/DEF Temperature Sensor High Error	-	-	-	●	-	●
CA1682	AdBlue/DEF Pump Priming Error	-	●	-	●	-	●
CA1683	AdBlue/DEF Tank Heating Valve Voltage High Error	-	●	-	●	-	●
CA1684	AdBlue/DEF Tank Heating Valve Voltage Low Error	-	●	-	●	-	●
CA1686	AdBlue/DEF Quality Sensor Voltage High Error	-	-	-	●	-	●
CA1714	AdBlue/DEF Quality Sensor Out of Calibration Error	-	-	-	●	-	●
CA1715	AdBlue/DEF Quality Sensor Internal Circuit Error	-	-	-	●	-	●
CA1885	Turbo Outlet NOx Sensor Circuit Error	-	-	-	●	-	●
CA1887	SCR Outlet NOx Sensor Circuit Error	-	-	-	●	-	●
CA2271	EGR Valve Position Sensor High Error	-	-	-	●	-	●
CA2272	EGR Valve Position Sensor Low Error	-	-	-	●	-	●
CA2349	EGR Valve Solenoid Open Circuit Error	-	-	-	●	-	●

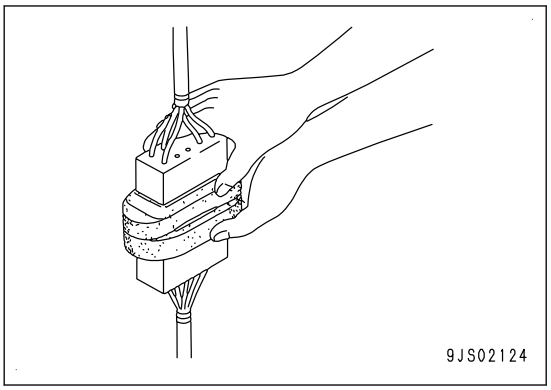
Battery ground cable is shown in the figure as an example.

- For the location of each ground, see “CONNECTORS LIST AND LAYOUT”.



Check for loose connector and damaged lock

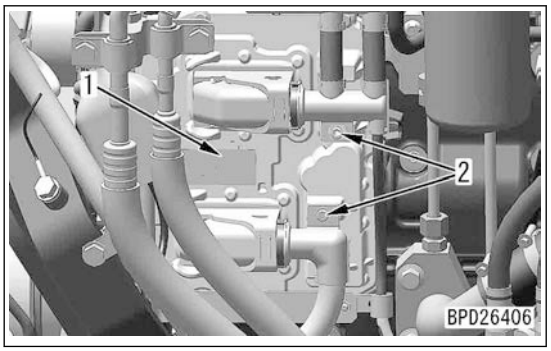
11. Check the connection of male and female connectors by pulling them by hand.
12. If the connection is loose, secure it.
13. Check the connectors for unlocking, and check the lock and connector housing for cracking.



14. Check bolts (2) of engine controller (1) for looseness.

    REMARK

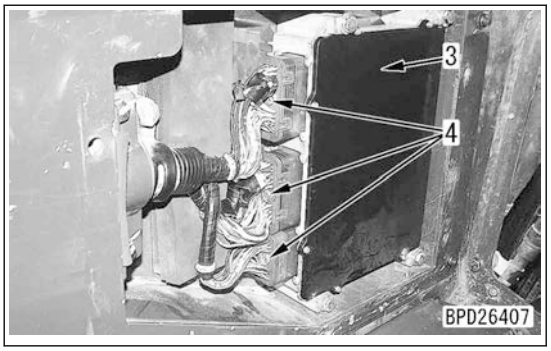
    Use a hexagonal wrench with 5 mm width across flats.



15. Check bolts (4) of HST controller (3) for looseness.

    REMARK

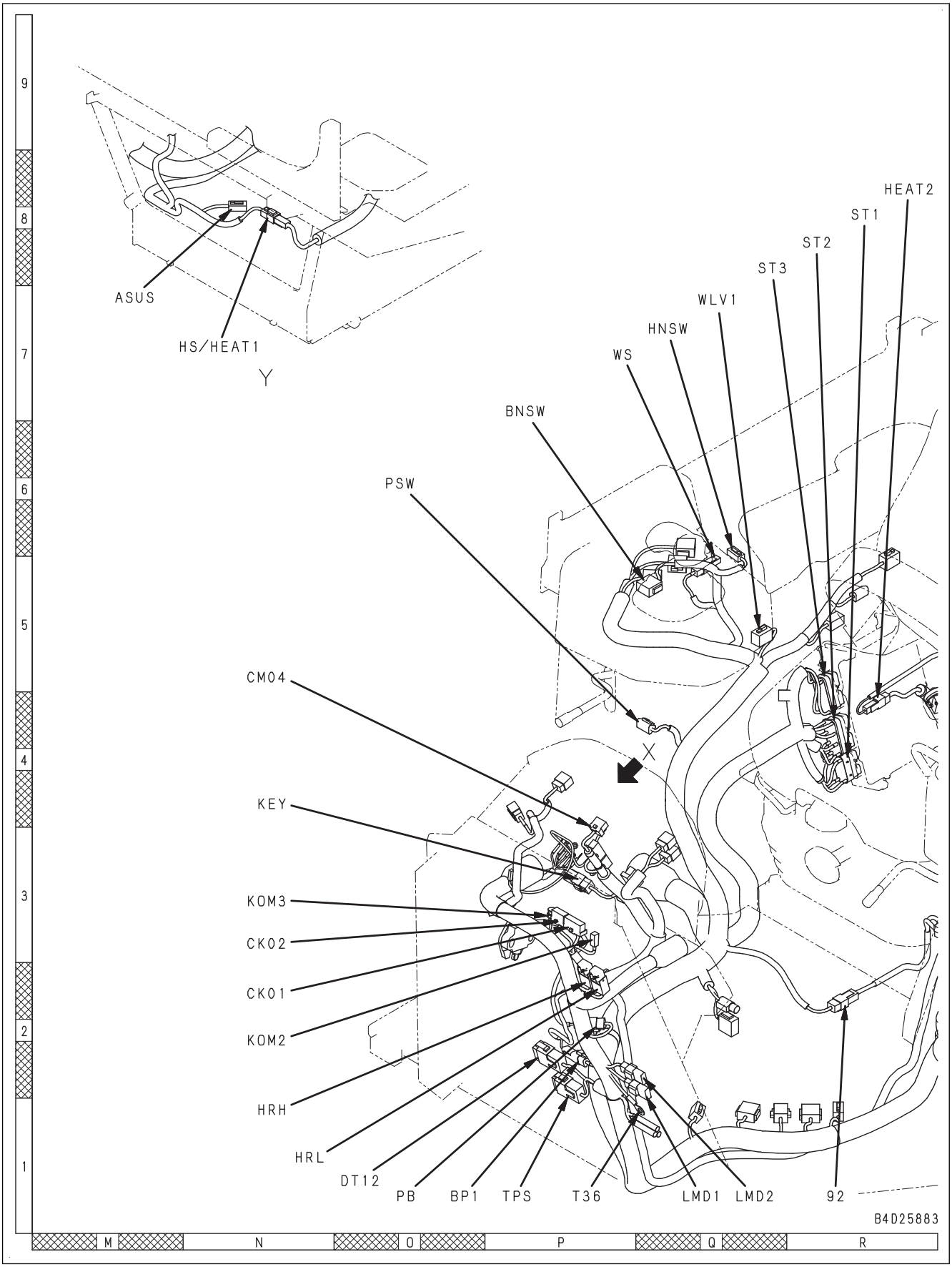
    Use a hexagonal wrench with 4 mm width across flats.



Check of connector pin for corrosion, bends and deformation

16. Disconnect the connectors, and check their pins for corrosion, bending, sinking than other pins, and extension of female pins.
    - If pins are defective, repair or replace them.
    - If the pins are not shiny, apply contact restorer to them and connect and disconnect the connectors several times to shine them. (If the pins do not become shiny, connect and disconnect the connectors 10 times)

3/8


9
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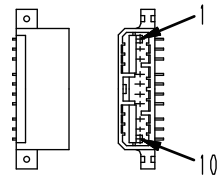
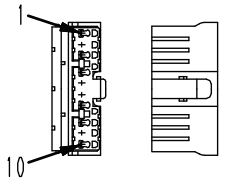
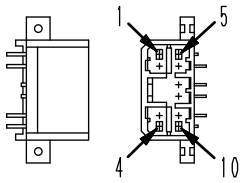
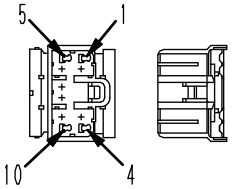
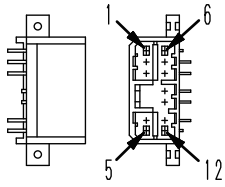
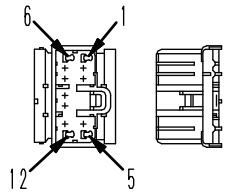
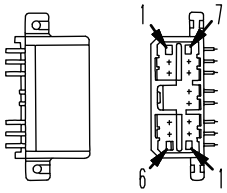
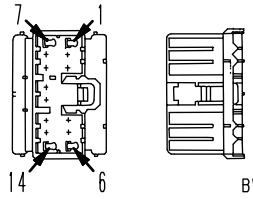
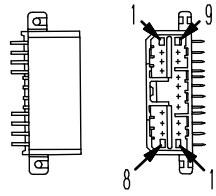
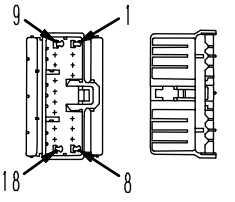
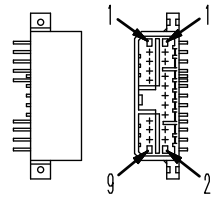
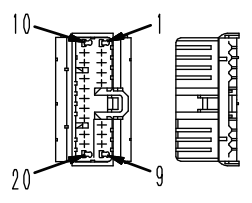
ASUS
HS/HEAT1
Y
HEAT2
ST1
ST2
ST3
WLV1
HNSW
WS
BNSW
PSW
X
CM04
KEY
KOM3
CK02
CK01
KOM2
HRH
HRL
DT12
PB
BP1
TPS
T36
LMD1
LMD2
92
B4D25883

No. of pins	AMP070 type connector		
	Male (female housing)	Female (male housing)	Testing connection use special tool Part No.
10			—
	—	—	
10			799-601-7510 (T-adapter)
	—	Part No. :7821-92-7330	
12			799-601-7520 (T-adapter)
	—	Part No. :7821-92-7340	
14			799-601-7530 (T-adapter)
	—	Part No. :7821-92-7350	
18			799-601-7540 (T-adapter)
	—	Part No. :7821-92-7360	
20			799-601-7550 (T-adapter)
	—	Part No. :7821-92-7370	

B4D18199

T-BRANCH BOX AND T-BRANCH ADAPTER TABLE

(Rev.2014.11)

The part numbers of the T-boxes and T-adapters are listed in the vertical column, and the part numbers of harness checker assemblies are listed in the horizontal line.

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	
799-601-2600	T-box (for ECONO)	21		●		●		●	●		●							
799-601-3100	T-box (for MS)	37																●
799-601-3200	T-box (for MS)	37																●
799-601-3380	Plate for MS (14 pins)																	●
799-601-3410	Adapter for BENDIX (MS)	24	MS-24P															●
799-601-3420	Adapter for BENDIX (MS)	24	MS-24P															●
799-601-3430	Adapter for BENDIX (MS)	17	MS-17P															●
799-601-3440	Adapter for BENDIX (MS)	17	MS-17P															●
799-601-3450	Adapter for BENDIX (MS)	5	MS-5P															●
799-601-3460	Adapter for BENDIX (MS)	10	MS-10P															●
799-601-3510	Adapter for BENDIX (MS)	5	MS-5P															●
799-601-3520	Adapter for BENDIX (MS)	17	MS-17P															●
799-601-3530	Adapter for BENDIX (MS)	19	MS-19P															●
799-601-2910	Adapter for BENDIX (MS)	14	MS-14P															●
799-601-3470	Case																	●
799-601-2710	Adapter for MIC	5	MIC-5P	●	●				●									
799-601-2720	Adapter for MIC	13	MIC-13P	●	●				●									
799-601-2730	Adapter for MIC	17	MIC-17P	●	●	●		●	●		●							
799-601-2740	Adapter for MIC	21	MIC-21P	●	●	●		●	●		●							
799-601-2950	Adapter for MIC	9	MIC-9P				●	●	●		●							
799-601-2750	Adapter for ECONO	2	ECONO 2P	●	●													
799-601-2760	Adapter for ECONO	3	ECONO 3P	●	●													
799-601-2770	Adapter for ECONO	4	ECONO 4P	●	●													
799-601-2780	Adapter for ECONO	8	ECONO 8P	●	●													
799-601-2790	Adapter for ECONO	12	ECONO 12P	●	●													
799-601-2810	Adapter for DLI	8	DLI-8P	●	●													
799-601-2820	Adapter for DLI	12	DLI-12P	●	●													
799-601-2830	Adapter for DLI	16	DLI-16P	●	●													

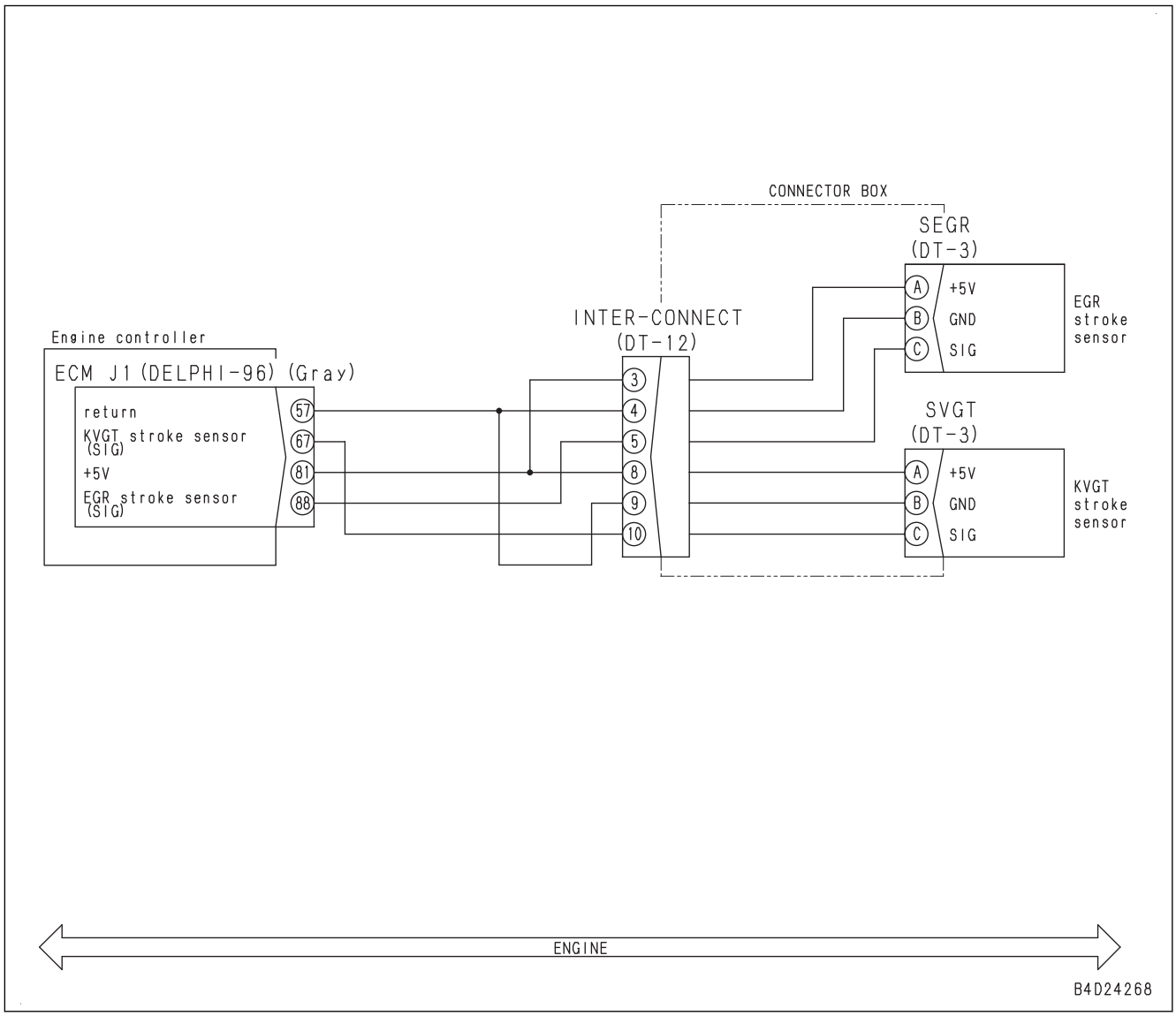
Failure code	Failure (Displayed on screen)	Applicable component	Action level	Category of history	Remarks
D862KA	GPS Antenna Open Circuit	KOM-TRAX/GW	-	Electrical system	
D8ALKA	System Operating Lamp Open Circuit (KOMTRAX)	KOM-TRAX/GW	-	Electrical system	
D8ALKB	System Operating Lamp Short Circuit (KOMTRAX)	KOM-TRAX/GW	-	Electrical system	
D8AQKR	CAN 2 Defective Communication (KOMTRAX)	MON	-	Electrical system	
D8G1KT	Malfunction (Gateway Controller)	GW	-	-	
D8G6KT	Malfunction (Communication terminal)	GW	-	-	
DAF0MB	Monitor ROM Abnormality	MON	-	Electrical system	
DAF0MC	Monitor Malfunction	MON	-	Electrical system	
DAF8KB	Camera Power Supply Short Circuit	MON	L03	Electrical system	*
DAF9KQ	Model Selection Signal Mismatch (Monitor)	MON	L03	Electrical system	*
DAFGMC	GPS Module Malfunction	KOM-TRAX/GW	-	Electrical system	
DAFLKA	System Operating Lamp Open Circuit (Monitor)	MON	-	Electrical system	
DAFLKB	System Operating Lamp Short Circuit (Monitor)	MON	-	Electrical system	
DAFQKR	CAN 2 Defective Communication (Monitor)	KOM-TRAX/GW	-	Electrical system	
DAJ000	HST Controller:Abnormality in Controller	HST	-	Electrical system	
DAJ0KQ	HST Controller:Type Select Signal Error	HST	L03	Electrical system	*
DAJ0KT	HST Controller:Abnormality in Controller	HST	L03	Electrical system	*
DAJ0MC	HST Controller Error	HST	-	Electrical system	
DAJ1KK	HST Controller:Source Voltage Low	HST	L04	Electrical system	*
DAJ2KK	HST Controller:Output Voltage Low	HST	L04	Electrical system	*
DAJ5KK	HST Controller:Sensor Volt 5V (0) Out of Normal Range	HST	L04	Electrical system	*
DAJ6KK	HST Controller:Sensor Volt 5V (1) Out of Normal Range	HST	L03	Electrical system	*
DAJLKA	Operating Lamp Open Circuit (HST Controller)	HST	-	Electrical system	
DAJLKB	Operating Lamp Short Circuit (HST Controller)	HST	-	Electrical system	

FAILURE CODE [AS00R3]

Action level	Failure code	Failure	Inducement 1 (SCR Device Abnormality) (Engine controller system)
L03	AS00R3		
Detail of failure	• A certain time has passed since AS00R2 occurs. • An abnormality of SCR system has occurred again within a certain time since abnormality repair of SCR system. (EU Specification)		
Action of controller	• The information related to this failure code is displayed on the monitor screen. • Engine power deration • [AS00R4] occurs and operates with largely restricted output after a certain time.		
Phenomenon on machine	• Engine power deration • The engine output reduces heavily after a certain time.		
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.

Circuit diagram related to sensor 2 supply circuit



FAILURE CODE [CA343]

Action level	Failure code	Failure	Engine Controller Internal Failure (Engine controller system)
L04	CA343		
Details of failure	Internal defect is detected in engine controller.		
Action of controller	None in particular		
Phenomenon on machine	Engine runs normally. However, engine may be stopped during operation or stopped engine may not be started.		
Related information	• Battery voltage of engine controller can be checked by monitoring function. (Code: 03203) • 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 engine controller system	Perform troubleshooting for failure code [CA441].

FAILURE CODE [CA555]

Action level	Failure code	Failure	Crankcase Pressure High Error 2 (Engine controller system)
L01	CA555		
Details of failure	High pressure error (level 1) in crankcase pressure is detected.		
Action of controller	None in particular		
Phenomenon on machine	None in particular		
Related information	• Signal voltage from crankcase pressure sensor can be checked by monitoring function. (Code: 48401 (V)) • Pressure in crankcase pressure sensor can be checked by monitoring function. (Code: 48400 (kPa)) • This failure code is cleared when failure code [CA1942] is displayed. • After repairing, check if the failure code is cleared by the following procedure. Procedure: Start engine.		

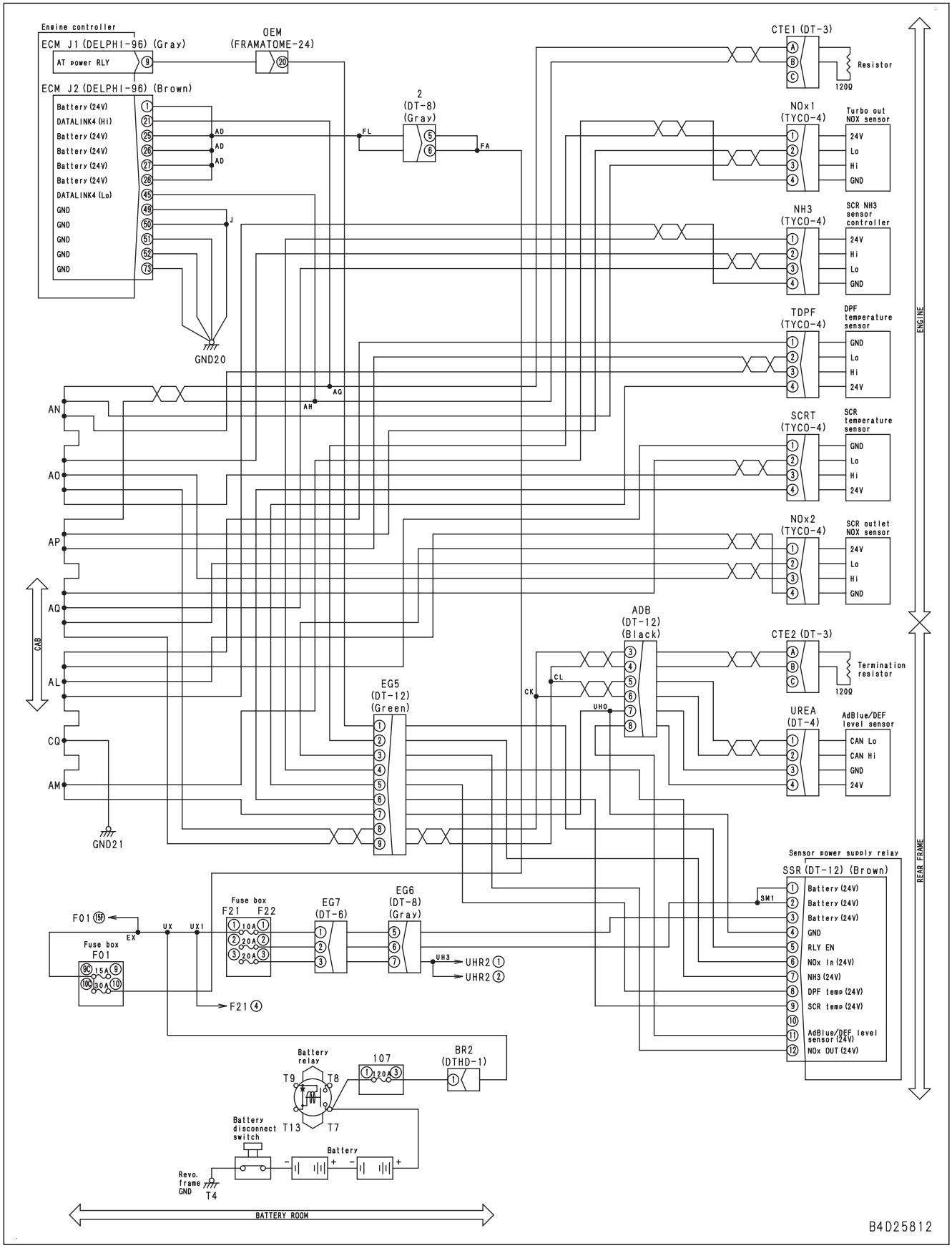
No.	Cause	Procedure, measuring location, criteria and remarks
1	Clogged KCCV filter	Replace the KCCV filter.
2	Blocked KCCV gas piping	If an error persists after replacement of the KCCV filter and emulsions are detected inside KCCV, blocked emulsions may be suspected in KCCV blow by gas piping. Check that there is no coolant leakage.
3	Defective crankcase pressure sensor	Crankcase pressure sensor system may be defective. Perform troubleshooting for failure codes [CA1843] and [CA1844].
4	Increase of blowby gas	The error does not disappear after replacing KCCV filter, and “Crankcase Pressure High Error 1” or “Crankcase Pressure High Error 2” is also displayed, piston ring may be worn or broken, or oil from VGT may be leaked, valve guide and stem seal may be worn or damaged. Perform troubleshooting “TROUBLESHOOTING OF ENGINE (S MODE)”, “Engine oil consumption is excessive”.

FAILURE CODE [CA1678]

Action level	Failure code	Failure	AdBlue/DEF Temperature Sensor High Error (Engine controller system)
L01	CA1678		
Detail of failure	Failure of AdBlue/DEF temperature sensor (Open circuit of thermistor for temperature measurement)		
Action of controller	Advances to Inducement strategy.		
Phenomenon on machine	• Failure to measure AdBlue/DEF level. • Engine power deration according to inducement strategy.		
Related information	• For the inducement failure codes, refer “List of failure codes related to Inducement” of “ TROUBLESHOOTING POINTS FOR UREA SCR SYSTEM ”. • The AdBlue/DEF temperature sensor is one of the AdBlue/DEF tank sensors integrated with the AdBlue/DEF level sensor and AdBlue/DEF quality sensor performs CAN communication with the engine controller. • If the thermistor for temperature measurement is open, this failure code is sent to the engine controller via CAN communication and displayed. • 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. See descriptions of wiring harness and connectors in “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.
2	Defective AdBlue/DEF tank sensor	1. Check the sensor connector for contamination and damage. 2. Turn starting switch to OFF position. 3. Replace the AdBlue/DEF tank sensor. 4. Turn starting switch to ON position.
		If this failure code is cleared, any internal parts in the original AdBlue/DEF tank 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.)

Circuit diagram related to sensor power supply relay circuit



FAILURE CODE [CA2185]

Action level	Failure code	Failure	Throttle Sensor Supply Voltage High Error (Engine controller system)
L03	CA2185		
Details of failure	High 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 [CA2185].**		
3	Short circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect connectors ECM J2 and FP, and connect T-adapter to female side of ECM J2.		
		Continuity	Between ECM J2 (female) (9) and each pin other than ECM J2 (female) (9) pin	No continuity
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.)		

No.	Cause	Procedures, Measurement, Values, Note	Diagnosis and treatment	
3	Engine hydraulic system	1. Do the troubleshooting. For details, see TESTING AND ADJUSTING, “TEST ENGINE OIL PRESSURE”. 2. Does the troubleshooting result agree with the standard value?	YES	• The engine hydraulic system is in the correct state. • Go to the next check item.
			NO	• The engine hydraulic system is defective. • Repair the engine hydraulic system. For details, see S Mode. • Go to “Confirmation of repair”.
4	VGT circuit oil pump	1. Check the VGT circuit oil pump or relief valve. 2. Is the VGT circuit oil pump or relief valve in the correct state?	YES	• The VGT circuit oil pump or relief valve is in the correct state. • Go to the next check item.
			NO	• The VGT circuit oil pump or relief valve is defective. • Replace the VGT circuit oil pump or relief valve. • Go to “Confirmation of repair”.
5	VGT oil pressure supply piping	1. Check the VGT oil pressure supply piping. 2. Is the VGT oil pressure supply piping in the correct state?	YES	• The VGT oil pressure supply piping is in the correct state. • Go to the next check item.
			NO	• The VGT oil pressure supply piping is defective. • Replace the VGT oil pressure supply piping. • Go to “Confirmation of repair”.
6	VGT oil pressure return piping	1. Check the VGT oil pressure return piping. 2. Is the VGT oil pressure return piping in the correct state?	YES	• The VGT oil pressure return piping is in the correct state. • Go to the next check item.
			NO	• The VGT oil pressure return piping is defective. • Replace the VGT oil pressure return piping. • Go to “Confirmation of repair”.

<table>
<tr><th>No.</th><th>Cause</th><th colspan="3">Procedure, measuring location, criteria and remarks</th></tr>
<tr><td rowspan="4">1</td><td rowspan="4">Defective KDPF differential pressure sensor tube</td><td colspan="3">1. Remove KDPF differential pressure sensor tube.
2. Clean and unclog the KDPF differential pressure sensor tube.
3. Check the KDPF differential pressure sensor tube for cracks or damages.
4. Securely connect both ends of the tube and install the KDPF differential pressure sensor tube.</td></tr>
<tr><td colspan="3">Reference
How to check clogged KDPF differential pressure sensor tube
1. Turn starting switch to ON position.
2. Monitor the outlet pressure by using KDPF outlet pressure sensor on Self-define Monitoring screen of the machine monitor.</td></tr>
<tr><td>Code</td><td>47000(kPa)</td><td>0 ± 3(kPa)</td></tr>
<tr><td colspan="3"></td></tr>
<tr><td rowspan="3">2</td><td rowspan="3">Defective sensor power supply system</td><td colspan="3">If failure code [CA1695] or [CA1696] is displayed, perform troubleshooting for [CA1695] or [CA1696] first.</td></tr>
<tr><td colspan="3">1. Turn starting switch to OFF position.
2. Disconnect connector PDPF and connect T-adapter to female side.
3. Turn starting switch to ON position.</td></tr>
<tr><td>Voltage</td><td>Between PDPF (female) (4) and (1)</td><td>4.75 to 5.25 V</td></tr>
<tr><td>3</td><td>Defective wiring harness connector</td><td colspan="3">1. See descriptions of wiring harness and connectors in “Electrical equipment” in “CHECKS BEFORE TROUBLESHOOTING” of “RELATED INFORMATION ON TROUBLESHOOTING”, and check and repair defects, if any.</td></tr>
<tr><td rowspan="4">4</td><td rowspan="4">Defective wiring harness or engine controller</td><td colspan="3">1. Turn starting switch to OFF position.
2. Disconnect connector PDPF.
3. Turn starting switch to ON position.</td></tr>
<tr><td colspan="3">If failure code [CA3134] is cleared, the wiring harness or engine controller is defective.
REMARK
Check on cause 3 again.
REMARK
Ignore other failure codes displayed.</td></tr>
<tr><td colspan="3">1. Turn starting switch to OFF position.
2. Disconnect connector PDPF and connect short socket adapter to female side.
REMARK
Connect 5 V to the signal line. (short-circuit pins (4) and (3) of connector PDPF.)
3. Turn starting switch to ON position.</td></tr>
<tr><td colspan="3">If failure code [CA3313] is cleared, the wiring harness or engine controller is defective.
REMARK
Check on cause 3 again.
REMARK
Ignore other failure codes displayed.</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="3">4</td><td rowspan="3">Defective AdBlue/DEF line heater</td><td colspan="3">1. Turn starting switch to OFF position.
2. Disconnect the connectors UHC, and UHC1 and connect the T-adapter to each male side.</td></tr>
<tr><td rowspan="2">Resistance</td><td>Between UHC (male) (1) and (2)</td><td>5 to 40 Ω</td></tr>
<tr><td>Between UHC1 (male) (1) and (2)</td><td>5 to 40 Ω</td></tr>
<tr><td rowspan="3">5</td><td rowspan="3">Hot short circuit in AdBlue/DEF line heater</td><td colspan="3">1. Turn the starting switch to OFF position.
2. Disconnect the connectors UHC, and UHC1 and connect the T-adapter to each male side.
3. Turn the starting switch to ON position.</td></tr>
<tr><td rowspan="2">Voltage</td><td>Between UHC (male) (1) and ground</td><td>Max. 3 V</td></tr>
<tr><td>Between UHC1 (male) (1) and ground</td><td>Max. 3 V</td></tr>
<tr><td rowspan="2">6</td><td rowspan="2">Defective AdBlue/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 AdBlue/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 AdBlue/DEF heater relay is defective.</td></tr>
<tr><td>7</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 [CA3316]

Action level	Failure code	Failure	KDOC Outlet Temperature Sensor Low Error (Engine controller system)
L03	CA3316		
Detail of failure	Ground fault or sensor circuit error in KDOC outlet temperature sensor measuring section or probe (+)		
Action of controller	• As the KDOC outlet temperature cannot be detected, substitute the KDOC inlet temperature for the KDOC outlet temperature and run the engine (if the KDOC inlet temperature sensor also has an error, use a fixed value (250 °C). • Engine power deration • EGR valve closed. • Regeneration control stops. • Fuel dosing stops.		
Phenomenon on machine	• Defective forcible regeneration control. • KDPF Soot Accumulation High. • Engine power deration.		
Related information	⚠ **Be careful not to get burned as the temperature of KDPF and KDOC rises up over 500 °C.** • The KDOC inlet temperature sensor, the KDOC outlet temperature sensor, and the KDPF outlet temperature sensor are integrated into one sensor controller which provides CAN communication with the engine controller. • Ground fault or sensor circuit error in KDOC outlet temperature sensor measuring section or probe (+) is sent to the engine controller via CAN communication, and this failure code is displayed. • For details of access to the KDOC inlet temperature sensor, the KDOC outlet temperature sensor, and the KDPF outlet temperature sensor, see “Chapter 50 Disassembly and assembly”, “Removal and installation of KDPF assembly” and “Disassembly and assembly of KDPF assembly”. • 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 that the engine power deration is not canceled only by 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 “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.
2	Defective KDOC outlet temperature sensor	1. Check the sensor connector for contamination and damage. 2. Turn starting switch to OFF position. 3. Replace KDPF temperature sensor. 4. Turn starting switch to ON position.
		If this failure code is cleared, the original KDOC outlet temperature 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.)

FAILURE CODE [CA3562]

Action level	Failure code	Failure	AdBlue/DEF LineHeater Relay 1 Voltage High Error
L01	CA3562		(Engine controller system)
Detail of failure	High voltage error occurs in the AdBlue/DEF line heater relay 1 circuit.		
Action of controller	None in particular		
Phenomenon on machine	• AdBlue/DEF line stops thawing. • NOx emission increases because AdBlue/DEF injection is disabled at low temperature.		
Related information	• The AdBlue/DEF line heater relay 1 operates in AdBlue/DEF supply system thawing, warning, or implementation of AdBlue/DEF line heater relay 1 test. • The AdBlue/DEF line heater relay 1 is built in the AdBlue/DEF heater relay. • Troubleshooting of this failure code covers circuits from engine controller through AdBlue/DEF heater relay to power supply. • This failure code is detected only when the AdBlue/DEF line heater relay 1 is ON. • After repairing, check if the failure code is cleared by the following procedure. Procedure: Starting the engine at low temperature (ambient temperature of 5 °C or less) or see “Service mode” and “Testing menu (SCR service test) - Operate” of Setting and operating machine monitor to perform “AdBlue/DEF line heater relay 1 test”.		

No.	Cause	Procedure, measuring location, criteria and remarks		
1	Defective wiring harness connector	1. See descriptions of wiring harness and connectors in “Electrical equipment” in “CHECKS BEFORE TROUBLESHOOTING” of “RELATED INFORMATION ON TROUBLESHOOTING”, and check them. 2. Start the engine in low temperature (ambient temperature of 5 °C or lower) or perform “AdBlue/DEF Line Heater Relay 1 Test”. For details, see SET AND OPERATE MACHINE MONITOR, “SERVICE MODE” and “METHOD FOR SETTING WITH TESTING MENU (SCR SERVICE TEST)”.		
		If this failure code is cleared, the wiring harness connector is defective.		
2	Hot short circuit in wiring harness	1. Turn starting switch to OFF position. 2. Disconnect connector UHR1, and connect T-adapter to female side. 3. Turn starting switch to ON position (with connector UHR1 disconnected).		
		Voltage	Between UHR1 (female) (10) and (12)	Max. 3 V
3	Defective AdBlue/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 AdBlue/DEF heater relay. 4. Turn the battery disconnect switch ON. 5. Perform the “AdBlue/DEF Line Heater Relay 1 Test” by staring the engine in low ambient temperature (5 °C or below), or by referring “SERVICE MODE” of setting and operating machine monitor, “METHOD FOR OPERATING TESTING MENU (SCR SERVICE TEST)”.		
		If this failure code is cleared, the original AdBlue/DEF heater relay is defective.		
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.)		

<table>
<tr><th>No.</th><th>Cause</th><th colspan="3">Procedure, measuring location, criteria and remarks</th></tr>
<tr><td rowspan="4">9</td><td rowspan="4">Hot short circuit in wiring harness</td><td colspan="3">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.</td></tr>
<tr><td rowspan="2">Voltage</td><td>Between ground and ECM J2 (female) (39) or UHR1 (female) (8)</td><td>Max. 3 V</td></tr>
<tr><td>Between ground and UHR1 (female) (5) or UHB (female) (1)</td><td>Max. 3 V</td></tr>
<tr><td rowspan="2">10</td><td rowspan="2">Defective AdBlue/DEF line heater</td><td colspan="3">1. Turn starting switch to OFF position.
2. Disconnect connectors UHB, and connect T-adapter to male side of UHB.</td></tr>
<tr><td>Resistance</td><td>Between UHB (male) (1) and (2)</td><td>5 to 40 Ω</td></tr>
<tr><td rowspan="2">11</td><td rowspan="2">Hot short circuit in AdBlue/DEF line heater</td><td colspan="3">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.</td></tr>
<tr><td>Voltage</td><td>Between UHB (male) (1) and ground</td><td>Max. 3 V</td></tr>
<tr><td rowspan="2">12</td><td rowspan="2">Defective AdBlue/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 AdBlue/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 AdBlue/DEF heater relay is defective.</td></tr>
<tr><td>13</td><td>Damaged AdBlue/DEF hose, AdBlue/DEF leakage at connection</td><td colspan="3">If crystallized AdBlue/DEF is adhered to the surrounding of hose, tank, pump, or engine compartment, it shows AdBlue/DEF may be leaking. Refer to “TESTING AND ADJUSTING”, “SETTING AND OPERATION OF MACHINE MONITOR”, “METHOD FOR SETTING WITH TESTING MENU (SCR SERVICE TEST)” to perform AdBlue/DEF Pump Pressure Up Test and find the location of the AdBlue/DEF leak.
Replace parts as necessary.</td></tr>
</table>

FAILURE CODE [CA3741]

Action level	Failure code	Failure	Common Rail Pressure Valve Trip Error (Engine controller system)
L03	CA3741		
Details of failure	Engine controller determines that common rail pressure limiter valve opens.		
Action of controller	• Lowers set value of common rail pressure. • Regeneration control stops.		
Phenomenon on machine	Engine power deration. Engine may not start again.		
Related information	• Signal voltage from common rail pressure sensor can be checked with monitoring function. (Code: 36401 (V)) • Pressure sensed by common rail pressure sensor can be checked with monitoring function. (Code: 36400 (MPa)) • 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	Common rail pressure limiter valve is open.	Perform troubleshooting for failure code [CA449].

No.	Cause	Procedure, measuring location, criteria and remarks		
2	Defective sensor power supply relay (defective internal circuit)	1. Turn starting switch to OFF position. 2. Check that system operating lamp does not light up, and then turn battery disconnect switch to OFF position. 3. Insert T-adapter into connector SSR. 4. Disconnect connector NH3. 5. Turn the battery disconnect switch ON. 6. Turn starting switch to ON position.		
		Voltage	Between SSR (7) and (4)	Min. 22 V
3	Open circuit in wiring harness	1. Turn starting switch to OFF position. 2. Disconnect connector NH3, and connect T-adapter to female side. 3. Turn starting switch to ON position.		
		Voltage	Between NH3 (female) (1) and (4)	Min. 22 V
4	Defective ammonia sensor controller	1. Perform the above checks and “Loaded Diagnostics Operation To Confirm Failure Correction”. 2. If this failure code is displayed in above diagnosis, replace an ammonia sensor controller. 3. Perform “Loaded Diagnostics Operation To Confirm Failure Correction”.		
		If the failure code is cleared, the original ammonia sensor controller may be defective.		
5	Defective engine controller	1. If the failure code persists after the above checks, replace the engine controller. 2. Perform “Loaded Diagnostics Operation To Confirm Failure Correction”.		
		If the failure code disappeared, the engine controller may be defective.		
6	Defective engine harness	1. If the failure code persists after the above checks, replace the engine harness. 2. Perform “Loaded Diagnostics Operation To Confirm Failure Correction”.		
		If this failure code is cleared, the engine harness may be defective.		

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.

6. If this failure code is cleared, repair is completed.

No.	Cause	Procedure, measuring location, criteria and remarks
10	Defective engine controller	1. If the failure code persists after the above checks, replace the engine controller. 2. Performing “Loaded Diagnostics Operation To Clear Failure Code”.
		If the failure code disappeared, the engine controller may be defective.

Loaded diagnostics operation to clear failure code

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

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

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

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 low idle speed for approximately 1 minute.
4. See TESTING AND ADJUSTING, “METHOD FOR ADJUSTING WITH ADJUSTMENT MENU (STALL PRESSURE TEST MODE)”, and perform HST stall operation.
5. Run the engine at high idle speed for approximately 30 seconds.
6. Repeat above steps 4 and 5 for 20 times.

   NOTICE

   - **Check if monitoring code 19300 “SCR Temperature” is Min. 290 °C and monitoring code 19202 “Turbo Outlet NOx Corrected” is Min. 120 ppm on “Pre-defined Monitoring” screen.**
   - **While stalling HST, check that HST oil Temperature (hydraulic oil) is within 40 to 60 °C range. (Do not perform HST stall operation under out of specified temperature conditions.)**
   - **Pay attention not to overheat of hydraulic oil.**
   - **Since display or cancel of error can not be checked on the “stall pressure test mode” screen, close “stall pressure test mode” screen approximately once every 5 minutes to check error.**
7. Run the engine at high idle speed for 5 minutes.
8. Check that monitoring code 19300 “SCR Temperature” is Min. 250 °C on “Pre-defined Monitoring” screen.
9. Repeat above steps 4 and 5 for 5 times.

   NOTICE

   Pay attention not to overheat of hydraulic oil.
10. Make sure that this failure code is cleared. (If failure code is not cleared, repeat above procedure 7 to 5 for 3 times.)

    REMARK

    - If the failure is cleared, the repair is completed.
    - If this failure code is not cleared, return to troubleshooting.

    REMARK

    Judgment for this failure code is performed by following conditions in two steps.

    - 1. SCR catalyst is in an high temperature state for a certain period of time (approximately 15 minutes). (it is equivalent to steps 4 to 6.)
    - 2. Temperature of SCR catalyst is changed (it is equivalent to steps 7 to 9.). If failure code is not cleared, repeat steps 7 to 9 for 3 times.

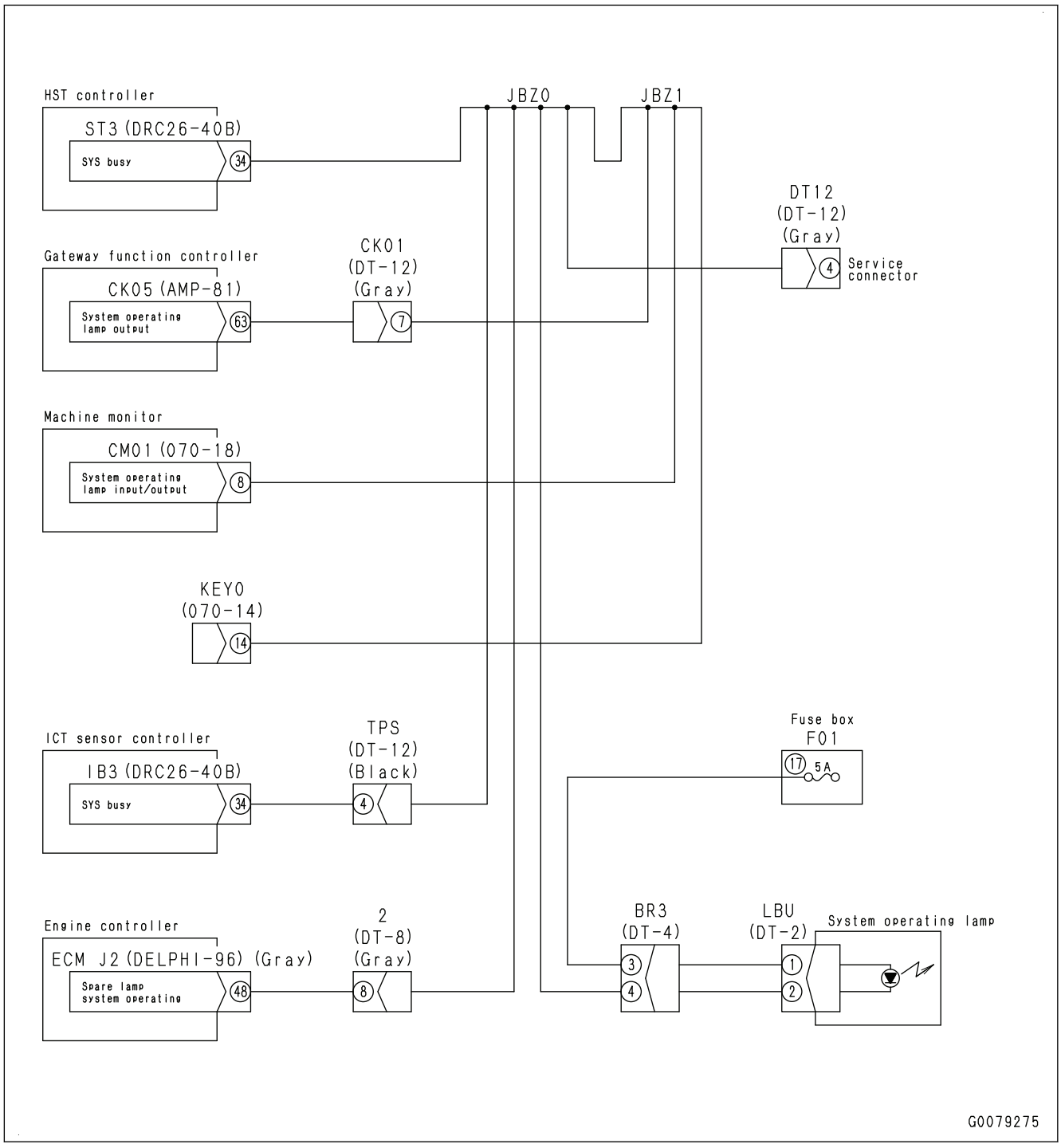
No.	Cause	Procedure, measuring location, criteria and remarks
2	Defective KDPF (KDOC, or KCSF)	Perform troubleshooting for 1 through 11 in “Active regeneration is executed frequently” in S mode.
3	Excessive ash accumulation	**NOTICE** • **Be sure to perform:** 1. Remove KDPF and flush ash accumulated in KDPF (see Related information). 2. Turn starting switch to ON position. 3. Perform Reset after KDPF cleaning (see Related information). 4. Perform Reset after KDPF change (see Related information). 5. Make sure that ash accumulation is 0 on the monitor (see Related information).
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.)

FAILURE CODE [DAF8KB]

Action level	Failure code	Failure	Camera Power Supply Short Circuit (Machine monitor system)
L03	DAF8KB		
Detail of failure	Output power supply voltage (rating: 8 V) from machine monitor to camera is 10 V and above when no current is outputted.		
Action of controller	• Stops output power supply voltage to camera. • Even if cause of failure disappears, machine does not become normal until starting switch is turned to OFF position.		
Phenomenon on machine	Camera image is not displayed on machine monitor.		
Related information	After repair is completed, check if 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 camera (internal short circuit)	1. Turn the starting switch to OFF position. 2. Disconnect camera connector RVC, and turn the starting switch to ON position.		
		If failure code disappears after disconnecting camera to perform operation of reproducing procedure, internal defect of camera is detected.		
2	Defective machine monitor	1. Turn the starting switch to OFF position. 2. Disconnect connector CM04, and connect T-adapter to male side. 3. Turn the starting switch to ON position.		
		Voltage	Between CM04 (male) (1) and ground	6 to 10 V
3	Ground fault in wiring harness (Contact with ground circuit)	1. Turn the starting switch to OFF position. 2. Disconnect connector CM04 and camera connector RVC. 3. Connect T-adapter to female side of connector CM04.		
		Resistance	Between CM04 (female) (1) and ground	Min. 1 MΩ
4	Hot short circuit in wiring harness (contact with 24 V circuit)	1. Turn the starting switch to OFF position. 2. Disconnect connector RVC of camera. 3. Insert T-adapter into connector CM04. 4. Turn the starting switch to ON position. (Disconnect camera and check that it is normal in advance.)		
		Voltage	Between CM04 (1) and (5)	Max. 10 V

Circuit diagram related to system operating lamp



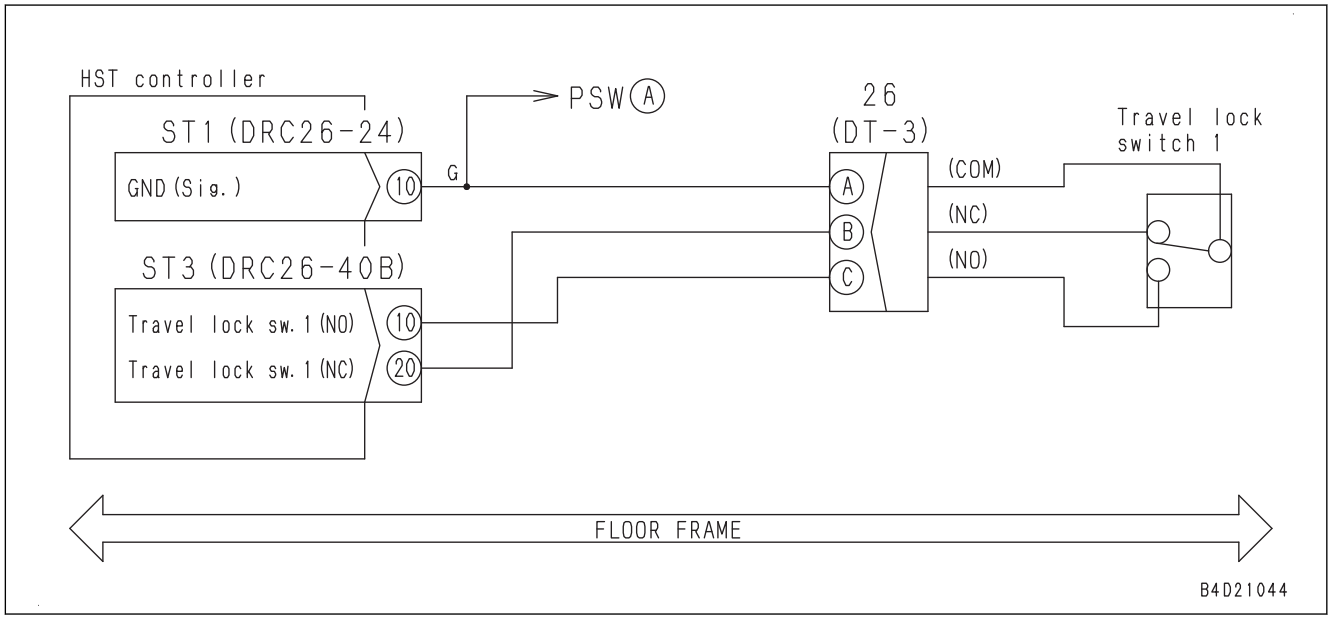
FAILURE CODE [DBR1KK]

Action level	Failure code	Failure	ICT controller: Source voltage low (ICT Sensor Controller System)
L01	DBR1KK		
Detail of failure	Main power supply voltage of ICT sensor controller is Max. 17 V.		
Action of controller	Prohibits automatic control of blade.		
Phenomenon on machine	• Automatic control of blade is turned OFF. • Automatic control of blade does not turn ON even when auto/manual switch is pressed.		
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. • “Komatsu machine trouble” is displayed in “Slope control key” of control box. • Main power supply voltage of ICT sensor controller can be checked with adjusting function. (Code: 2022)		

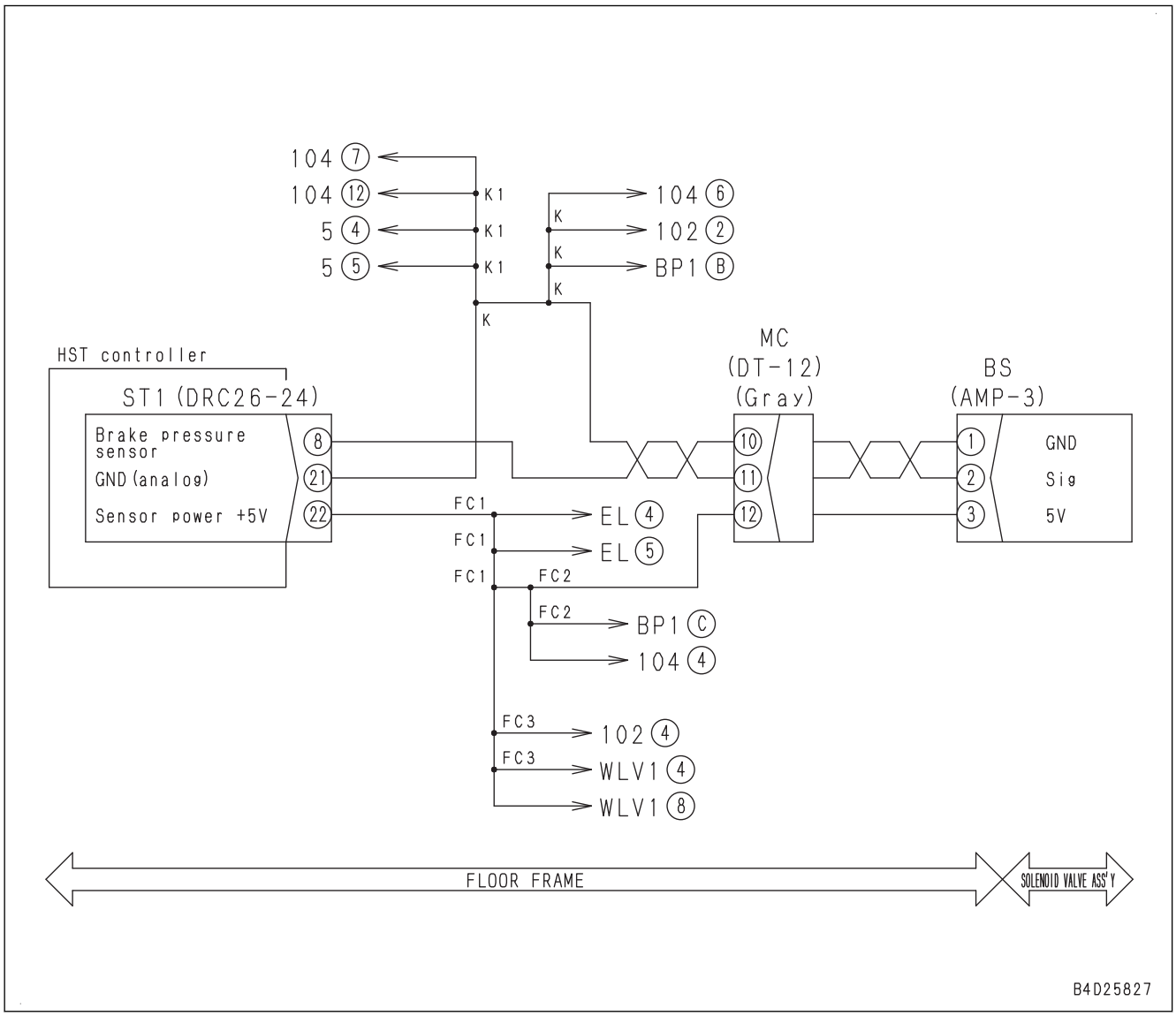
No.	Cause	Procedure, measuring location, criteria and remarks		
1	Defective fuse box	If fuse F01-18 is blown out, the circuit probably has ground fault. In this case, perform check on cause 6 first.		
2	Loose terminal or open circuit at terminal	1. Turn the starting switch to OFF position.		
		Check terminals of battery relay, battery, etc. Check terminal T37 for looseness and rust.		
3	Incorrect battery voltage	1. Perform troubleshooting with starting switch at OFF position and when starting engine.		
		Voltage	Between battery terminals (+) and (-)	20 to 30 V
4	Open or short circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Turn the battery disconnect switch to OFF position. 3. Insert T-adapter into connector IB3. 4. Turn the battery disconnect switch to ON position. **REMARK** If voltage is 0 V, it has open circuit or ground fault.		
		Voltage	Between IB3 (1) and each of (21) and (31)	20 to 30 V
			Between IB3 (11) and each of (32) and (33)	20 to 30 V
5	Open circuit in wiring harness (wire breakage or defective contact)	If there is no failure in check on cause 4, this check is not required. 1. Turn the starting switch to OFF position. 2. Turn the battery disconnect switch to OFF position. 3. If fuse F01-18 is blown out, replace it. 4. Disconnect connector IB3, and connect T-adapter to female side.		
		Resistance	Between ground and each of IB3 (female) (21), (31), (32), and (33)	Max. 1 Ω
			Between battery positive terminal (+) and each of IB3 (female) (1) and (11)	Max. 1 Ω

<table>
<tr><th>No.</th><th>Cause</th><th colspan="4">Procedure, measuring location, criteria and remarks</th></tr>
<tr><td rowspan="6">4</td><td rowspan="6">Defective HST controller</td><td colspan="4">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 ST3.
3. Turn the starting switch to ON position.
4. Operate parking brake lever to perform troubleshooting.
REMARK
Voltage of approximately 9 V is applied to ST3 pin (20) and pin (10) through resistor in HST controller.</td></tr>
<tr><td rowspan="4">Voltage</td><td rowspan="2">Between ST3 (20) and ST1 (10)</td><td>Lever: LOCK</td><td>7 to 11 V</td></tr>
<tr><td>Lever: FREE</td><td>Max. 1 V</td></tr>
<tr><td rowspan="2">Between ST3 (10) and ST1 (10)</td><td>Lever: LOCK</td><td>Max. 1 V</td></tr>
<tr><td>Lever: FREE</td><td>7 to 11 V</td></tr>
</table>

Circuit diagram related to parking brake lever switch and solenoid valve



Circuit diagram related to brake pressure sensor

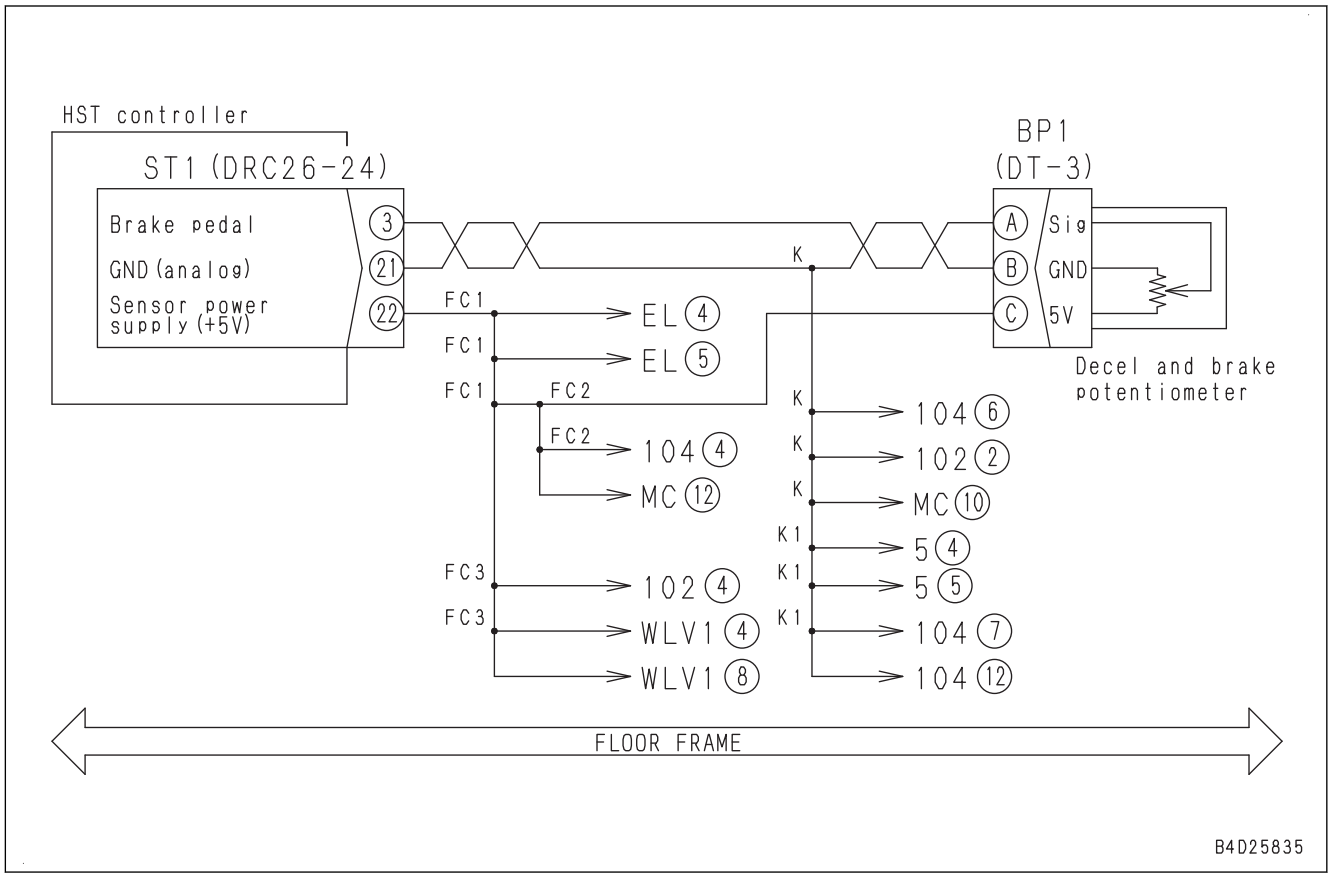


<table>
<tr><th>No.</th><th>Cause</th><th colspan="3">Procedure, measuring location, criteria and remarks</th></tr>
<tr><td rowspan="4">3</td><td rowspan="4">Open circuit in wiring harness (wire breakage or defective contact)</td><td colspan="3">1. Turn the starting switch to OFF position.
2. Disconnect connectors ST1, ST2, and WLV1, 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 WLV1 (female) (8)</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 WLV1 (female) (5)</td><td>Max. 1 Ω</td></tr>
<tr><td>Between ST2 (female) (16) and WLV1 (female) (7)</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 WLV1, and connect T-adapter to any female side.</td></tr>
<tr><td rowspan="2">Resistance</td><td>Between ST2 (female) (16) and ST1 (4) or between WLV1 (female) (7) and (5)</td><td>Min. 1 MΩ</td></tr>
<tr><td>Between ST2 (female) (16) and ground or between WLV1 (female) (7) 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.
4. Operate the blade control lever (right TILT) to perform troubleshooting.</td></tr>
<tr><td>Voltage</td><td>Between ST2 (16) and ST1 (4)</td><td>0.96 to 4.04 V</td></tr>
</table>

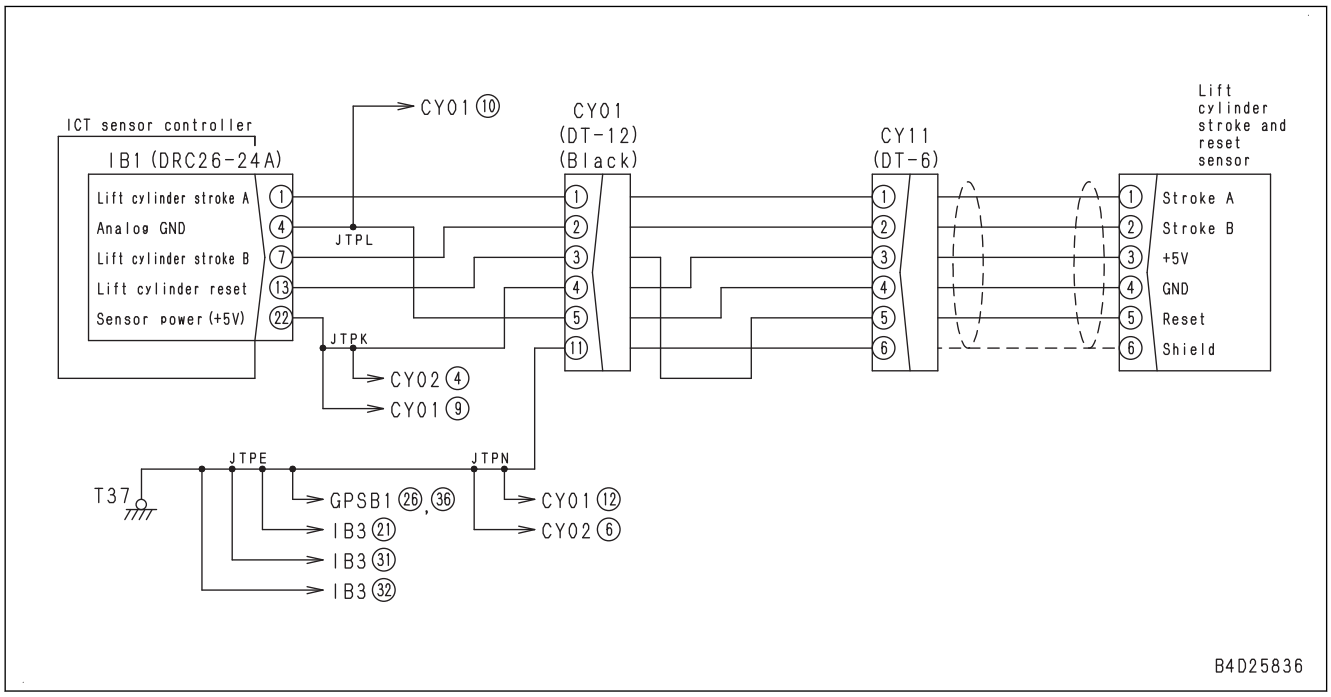
<table>
<tr><th>No.</th><th>Cause</th><th colspan="3">Procedure, measuring location, criteria and remarks</th></tr>
<tr><td rowspan="5">3</td><td rowspan="5">Open circuit in wiring harness (wire breakage or defective contact of connector)</td><td colspan="3">1. Turn the starting switch to OFF position.
2. Disconnect connectors ST1, ST2, and RPF, 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 RPF (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 RPF (female) (1)</td><td>Max. 1 Ω</td></tr>
<tr><td>Between ST2 (female) (25) and RPF (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 and RPF, and connect T-adapter to either female side.</td></tr>
<tr><td rowspan="2">Resistance</td><td>Between ST2 (female) (25) and ST1 (female) (21) or between RPF (female) (1) and (2)</td><td>Min. 1 MΩ</td></tr>
<tr><td>Between ST2 (female) (25) and ground, or between RPF (female) (2) and ground</td><td>Min. 1 MΩ</td></tr>
<tr><td rowspan="3">5</td><td rowspan="3">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 (25) and ST1 (21)</td><td>0.5 to 4.5 V</td></tr>
</table>

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 ST1 and BP1, and connect T-adapter to female side of ST1. **REMARK** Check it by using multimeter in continuity mode.		
		Continuity	Between ST1 (female) (3) and each pin other than pin (3)	No continuity (no sound is heard)
5	Defective HST controller	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. Depress decelerator/brake pedal to perform troubleshooting.		
		Voltage	Between ST1 (3) and (21)	0.5 to 4.5 V

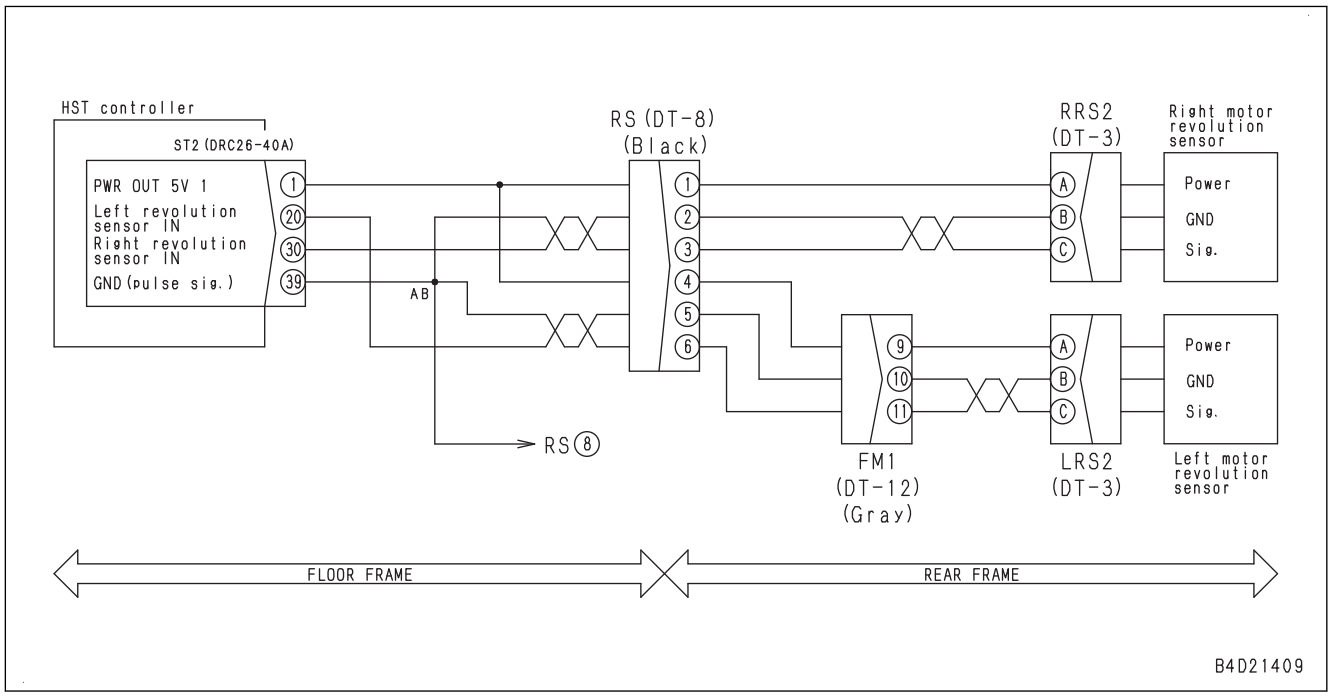
Circuit diagram related to decelerator/brake pedal potentiometer



Circuit diagram related to stroke reset sensor for blade lift cylinder



Circuit diagram related to R.H. HST motor speed sensor

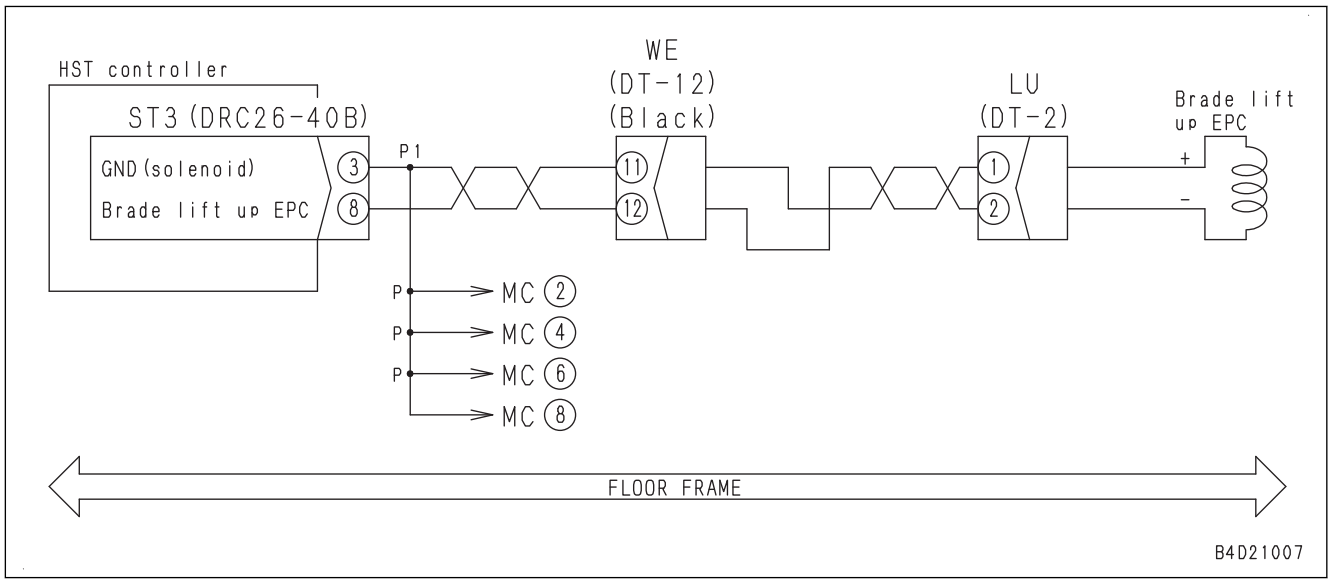


FAILURE CODE [DWN5KB]

Action level	Failure code	Failure	Fan Control Solenoid 1 Short Circuit (HST controller system)
L03	DWN5KB		
Detail of failure	When controller drives fan EPC solenoid circuit, abnormal current flows through circuit.		
Action of controller	Stops driving fan EPC solenoid circuit.		
Phenomenon on machine	• Fan speed always remains at its maximum. • Once machine stops, engine speed is restricted to medium (half) speed. • Once machine stops, selectable speed ranges are restricted to F1 and R1.		
Related information	• Output state to fan EPC solenoid can be checked with monitoring function. (Code: 31624) • 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 fan pump solenoid 1 (internal open circuit)	1. Turn the starting switch to OFF position. 2. Disconnect connector FAC, and connect T-adapter to male side.		
		Resistance	Between FAC (male) (1) and (2)	2 to 12 Ω
			Between FAC (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 FAC, and connect T-adapter to either female side.		
		Resistance	Between ground and ST3 (female) (25) or FAC (female) (1)	Min. 1 MΩ
3	Short circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect connectors ST3 and FAC, and connect T-adapter to either female side.		
		Resistance	Between ST3 (female) (25) and (23), or between FAC (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.)		

Circuit diagram related to blade lift up EPC solenoid

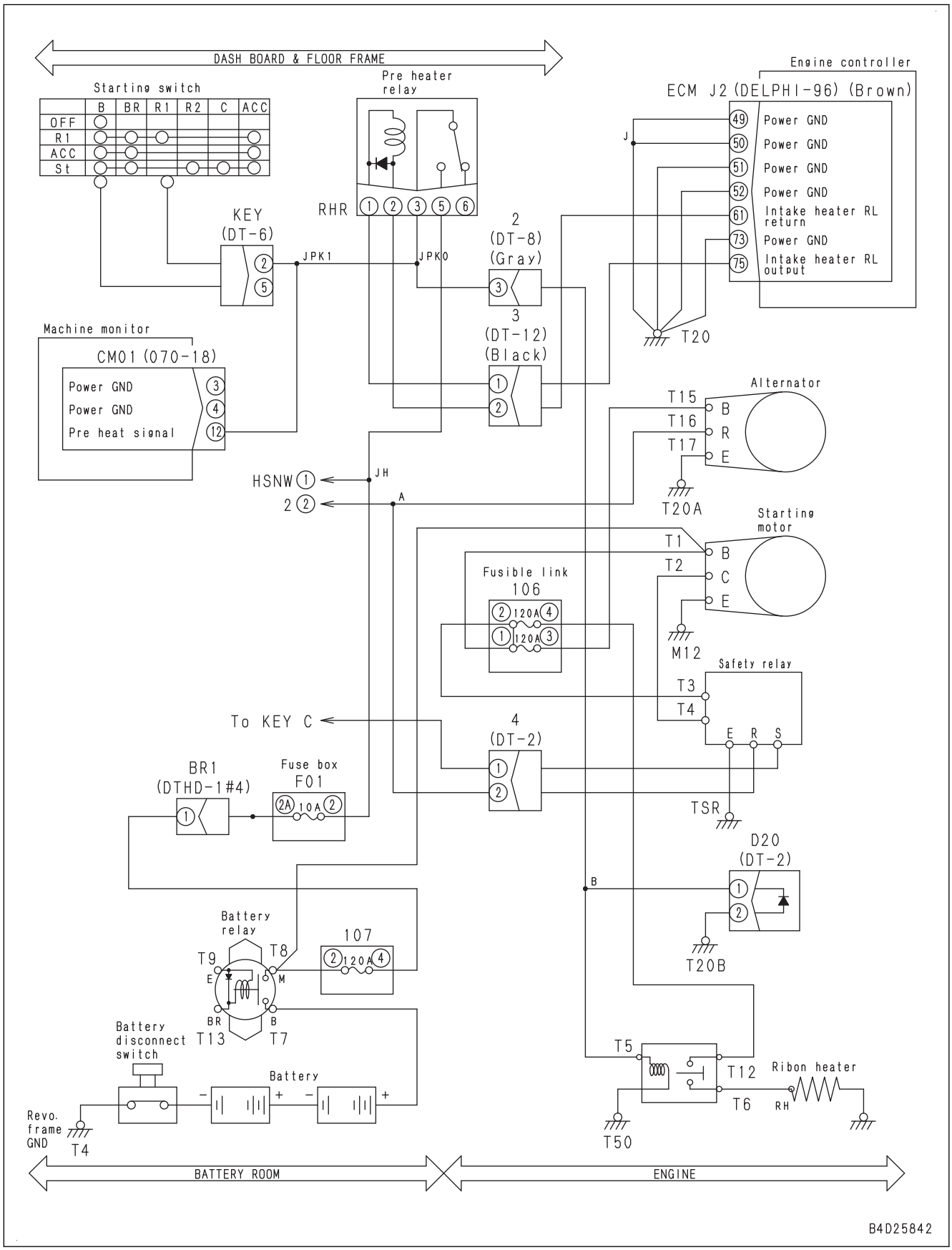


FAILURE CODE [DXJDKA]

Action level	Failure code	Failure	Blade Angle Right Electromagnetic Proportional Control Solenoid Open Circuit (HST controller system)
L01	DXJDKA		
Detail of failure	When controller drives blade angle RIGHT EPC solenoid circuit, no current flows through circuit.		
Action of controller	Stops outputting to blade angle RIGHT EPC solenoid circuit.		
Phenomenon on machine	Blade angle RIGHT control is disabled.		
Related information	• Output state to blade angle RIGHT EPC solenoid can be checked with monitoring function. (Code: 71011) • 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 (angle RIGHT).		

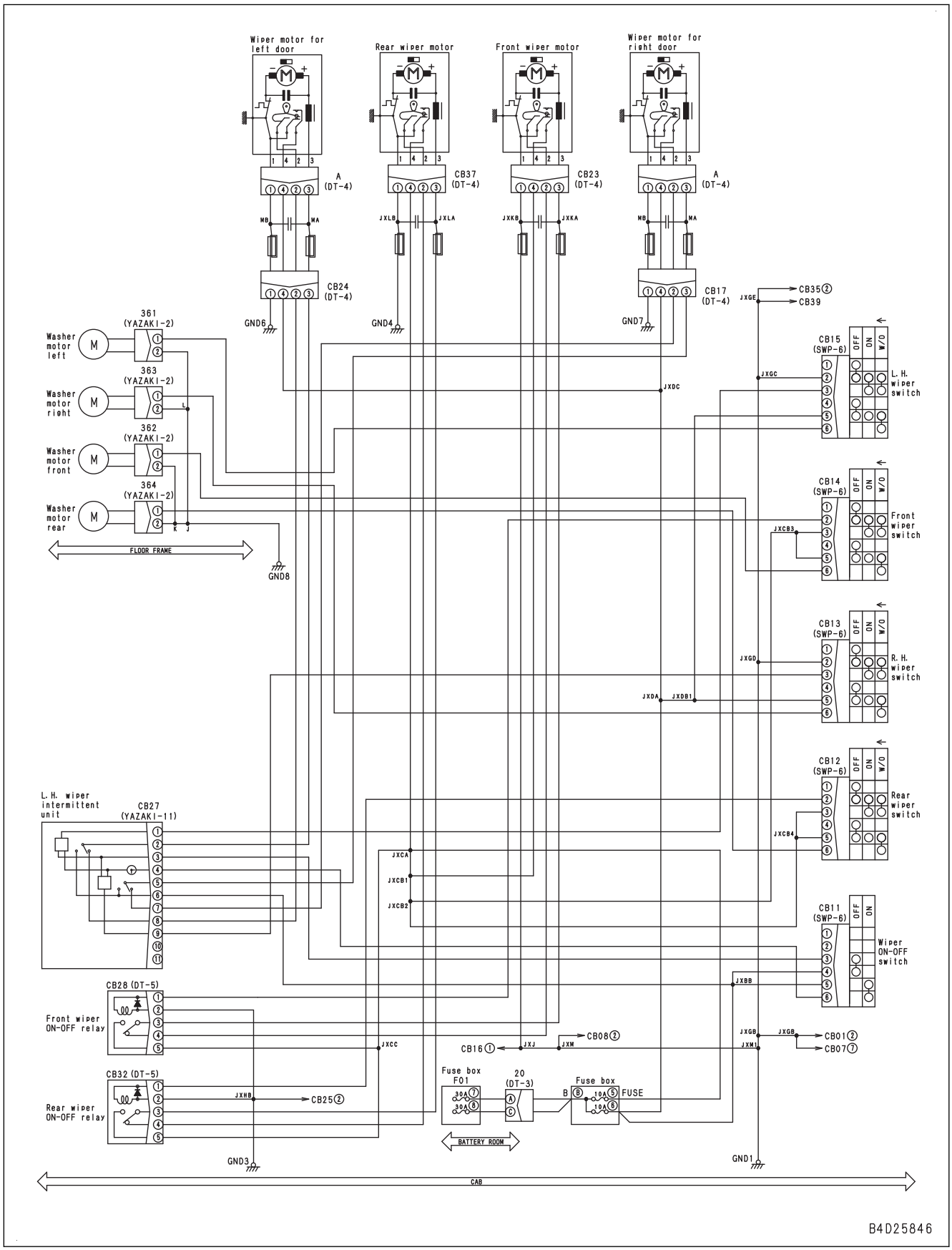
No.	Cause	Procedure, measuring location, criteria and remarks		
1	Defective blade angle RIGHT EPC solenoid (internal open circuit)	1. Turn the starting switch to OFF position. 2. Disconnect connector AR, and connect T-adapter to male side.		
		Resistance	Between AR (male) (1) and (2)	2 to 12 Ω
2	Open circuit, short circuit, ground fault, hot short circuit of wiring harness, or defective HST controller	1. Turn the starting switch to OFF position. 2. Disconnect connector AR, and connect T-adapter to female side. 3. Turn the starting switch to ON position. 4. Shake the wiring harness by hand while measuring the voltage. If the voltage becomes Approx. 0 V while shaking, wiring harness has open circuit at around this point.		
		Voltage	Between AR (female) (1) and (2)	1 to 4.5 V
3	Open or short circuit in wiring harness	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 connector ST3, and connect T-adapter to female side.		
		Resistance	Between ST3 (female) (17) and (13) Coil resistance of solenoid	2 to 12 Ω
4	Open circuit in wiring harness (wire breakage or defective contact of connector)	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 ST3 and AR, and connect T-adapter to each female side.		
		Resistance	Between ST3 (female) (17) and AR (female) (1)	Max. 1 Ω
			Between ST3 (female) (13) and AR (female) (2)	Max. 1 Ω
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 (ENGINE PREHEATING SYSTEM)



<table>
<tr><th>No.</th><th>Cause</th><th colspan="3">Procedure, measuring location, criteria and remarks</th></tr>
<tr><td rowspan="16">9</td><td rowspan="16">Open circuit 1 in wiring harness (wire breakage or defective contact of connector)</td><td colspan="3">If no failure is found by check on cause 6, this check is not required.
1. Turn the starting switch to OFF position.
2. Remove fuse No.3 (15 A) in fuse box F01.
3. Disconnect connectors HET, HRH, HRL, and 92, and connect T-adapter to each female side.</td></tr>
<tr><td rowspan="8">Resistance</td><td>Between F01-3 and HET (female) (5)</td><td>Max. 1 Ω</td></tr>
<tr><td>Between F01-3 and 92 (female) (3)</td><td>Max. 1 Ω</td></tr>
<tr><td>Between ground (T35) and each of HRH (female) (2) and (5)</td><td>Max. 1 Ω</td></tr>
<tr><td>Between HRH (female) (1) and HET (female) (6)</td><td>Max. 1 Ω</td></tr>
<tr><td>Between HRH (female) (3) and 92 (female) (1)</td><td>Max. 1 Ω</td></tr>
<tr><td>Between ground (T35) and each of HRL (female) (2) and (5)</td><td>Max. 1 Ω</td></tr>
<tr><td>Between HRL (female) (1) and HET (female) (4)</td><td>Max. 1 Ω</td></tr>
<tr><td>Between HRL (female) (3) and 92 (female) (2)</td><td>Max. 1 Ω</td></tr>
<tr><td colspan="3">If no failure is found by check on cause 5, this check is not required.
1. Turn the starting switch to OFF position.
2. Disconnect connector 92, and connect T-adapter to male side.
3. Disconnect connectors HEAT1 and HEAT2.</td></tr>
<tr><td rowspan="6">Resistance</td><td>Between 92 (male) (1) and HEAT1 (female) (A)</td><td>Max. 1 Ω</td></tr>
<tr><td>Between 92 (male) (1) and HEAT2 (female) (A)</td><td>Max. 1 Ω</td></tr>
<tr><td>Between 92 (male) (2) and HEAT1 (female) (B)</td><td>Max. 1 Ω</td></tr>
<tr><td>Between 92 (male) (2) and HEAT2 (female) (B)</td><td>Max. 1 Ω</td></tr>
<tr><td>Between 92 (male) (3) and HEAT1 (female) (C)</td><td>Max. 1 Ω</td></tr>
<tr><td>Between 92 (male) (3) and HEAT2 (female) (C)</td><td>Max. 1 Ω</td></tr>
</table>

Circuit diagram related to windshield washer



E-55 CONTROL BOX DISPLAYS THE MESSAGE [Heading Initializing]

Failure	Control box displays “Heading Initializing”.
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. • The message is displayed when the machine is moved with the control box powered OFF, and then turned ON again to start the system. • The message is displayed when the machine is stopped for a certain time with joystick (steering, directional, and gear shift lever) placed in FORWARD. **NOTICE** **Message display location** **“Heading Initializing” (orange): Slope Control Key**

No.	Cause	Procedure, measuring location, criteria and remarks
1	Since the GNSS receiver is failing to calculate the direction in which machine faces, initialization is necessary.	The message disappears when the machine is driven with joystick (steering, directional, and gear shift lever) placed in FORWARD.
2	Defective GNSS receiver	If no failure is found by above checks, GNSS receiver is defective. (Since this is an internal defect, troubleshooting cannot be performed.)

Component causing failure		Pump and motor											Control valve and cylinder							
Failure mode		Charge pump	HST motor (body)	HST motor (initial adjustment)	HST motor EPC valve	HST motor parking brake (disc, plate)	HST motor shaft speed sensor	HST motor charge relief valve	Fan motor (body)	Fan motor (reverse spool)	Fan motor (suction valve)	Fan motor (initial adjustment)	Unload valve	Work equipment (fan) main relief valve	Work equipment EPC valve	Fan EPC valve	Work equipment lock solenoid valve	Safety valve	Suction valve	Fan control valve (spool and pressure compensation valve)
Work equipment system	All work equipments speed or power is low.	○											○	○						
	Blade lift speed or power is low.													○	○				○	
	Blade tilt speed or power is low.													○	○					
	Blade angle speed or power is low.													○	○			○	○	
	Time lag of blade lift is large.																		○	
	Hydraulic drift of lifted blade is large.																			
	Hydraulic drift of tilted blade is large.																			
	Unusual noise is heard from around work equipment and cooling fan pump or control valve.													○						
Fan system	Fan rotation is abnormal (too high or low, or fan does not rotate).								○	○	○	○				○		○		○
	Unusual noise is heard from around fan.								○											

H-17 TIME LAG OF BLADE LIFT IS LARGE

Failure	Time lag of blade lift is large.
Related information	• The maximum speed of the blade when the blade control lever is operated to the lift LOWER direction can be checked in adjustment mode. (Calibration ID: 8030) • Before performing troubleshooting, check that blade is not modified. • Make sure that a work equipment circuit has no oil (fuel) leakage before troubleshooting.

No.	Cause	Procedure, measuring location, criteria and remarks
1	Defective operation of blade lift control valve (suction valve)	Suction valve of blade control valve may malfunction, so check it for flaw. You can also check whether failure symptom changes by replacing it with suction valve of angle circuit.
2	Malfunction of quick drop valve	Check if check valve of quick drop valve is sticking of damaged.

S-17 COOLANT TEMPERATURE RISES TOO HIGH (OVERHEATING)

Failure	Coolant temperature rises too high (overheating)
Related information	If any failure code is displayed, perform troubleshooting for that code first.

No.	Cause	Point to check, remarks	Remedy
1	Clogged radiator core	Check for clogging of radiator core and crushing of fin.	Cleaning of radiator core
2	Malfunction of thermostat	Thermostat does not open at cracking temperature. **REMARK** Cracking temperature of thermostat: 79.4 ± 83.3 °C (Full open temperature: 95 °C)	Thermostat replacement
3	Defective coolant temperature gauge	The error is detected in coolant temperature gauge system, but measured coolant temperature in radiator is normal.	Coolant temperature sensor, monitor or wiring harness replacement
4	Increase of fuel injection amount	Fuel injection amount is excessive.	Perform troubleshooting of “FUEL CONSUMPTION IS EXCESSIVE” in S mode, and take corrective action.
5	Low coolant level	Check coolant level for decrease.	Refilling with coolant
6	Coolant leakage	Check coolant piping for coolant leakage.	Coolant piping replacement
7	Broken water pump	Visually check water pump (check of water leakage through shaft seal, breakage of impeller, breakage of shaft)	Water pump replacement
8	Overheat due to increase in EGR ratio (EGR amount against fresh air intake amount) caused by defective mass air flow and temperature sensor	Check for defective mass air flow and temperature sensor.	Mass air flow and temperature sensor replacement
9	Overheat caused by increase of EGR ratio (quantity of EGR to fresh intake air) caused by deformation of air cleaner	Check air cleaner and rectifying wire net for deformation.	Air cleaner repair or replacement
10	Defective cylinder head or head gasket	Check if there are many bubbles in radiator and if coolant blows back.	Perform troubleshooting of “OIL IS IN COOLANT” in S mode, and take corrective action.
11	Defective piston ring	• Remove plug of bore for measuring the exhaust gas color in front of KDPF, and check color of the exhaust gas coming out of the bore. (Reference: See TESTING AND ADJUSTING “TEST EXHAUST GAS COLOR”) • Measure compression pressure (See standard value table). (Reference: See “TESTING AND ADJUSTING”, “Testing compression pressure”.) • Check piston ring and piston ring groove.	Piston ring and piston replacement

Komatsu code	Part No.	Capacity	Container	Main features and applications
G2-U-SENS Grease	427-12-11871	2 kg	Pail	• Feature: Urea (organic) grease with heat resistance and long service life, inclusion type. • Use for rubber, bearing and oil seal in damper. • Caution: Do not mix with lithium grease.

Primer

Komatsu code	Part No.	Capacity	Container		Main features and applications
Loctite 712	428-99-80080	100 mℓ	Glass container		• Use to accelerate hardening of instantaneous adhesive.
SUNSTAR Paint Surface Primer 435-98	22M-54–27260	150 mℓ	Glass container	For adhered window glass	• Use as primer for cab side (Expiration date: 4 months after its production date)
SUNSTAR PRIMER 435-41 for glass	22M-54-27240	150 mℓ	Steel can		• Use as primer for black ceramic-coated glass surface and for hard polycarbonate-coated surface (Expiration date: 6 days after its production date)
SUNSTAR sash primer GP-402	22M-54-27250	900 mℓ	Steel can		• Use as primer for sash (alumite surface treatment) (Expiration date:6 months after its production date)

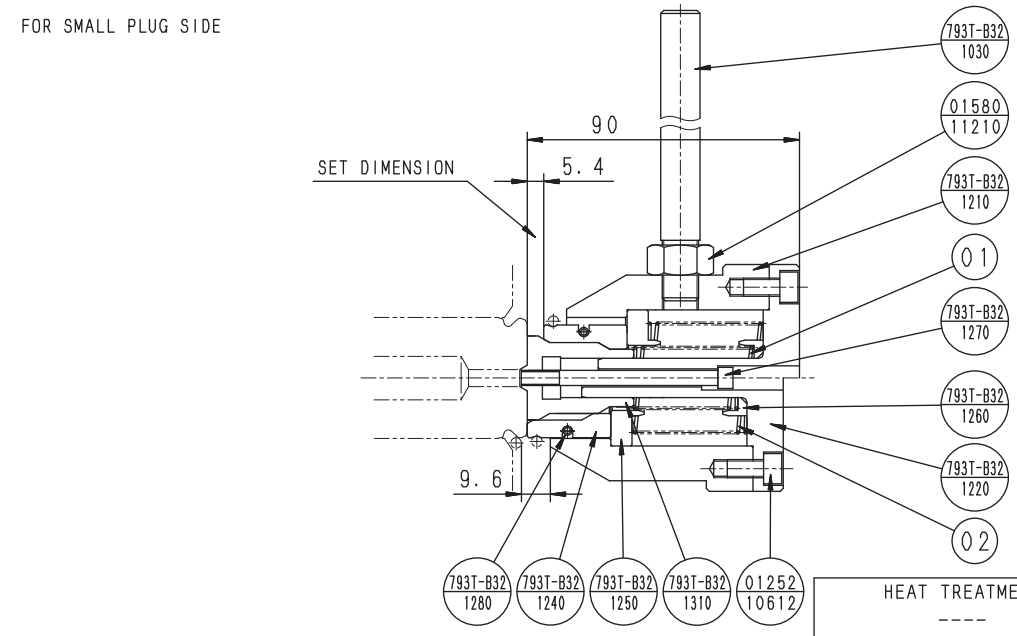
Adhesive

Komatsu code	Part No.	Capacity	Container		Main features and applications
Sika Japan Sikaflex 256HV	20Y-54-39850	310 mℓ	Polyethylene container	For adhered window glass	• Use as adhesive for glass (Expiration date: 6 months after its production date)
SUNSTAR Penguin Super 560	22M-54-27210	320 mℓ	Ecocart (special container)		• Use as adhesive for glass (Expiration date: 6 months after its production date)
SUNSTAR Penguin Seal #560	416–926–6950	320 mℓ	Ecocart (special container)		• Use as adhesive for glass (Expiration date: 6 months after its production date)

Caulking material

Komatsu code	Part No.	Capacity	Container		Main features and applications
SUNSTAR Penguin Seal No. 2505	417-926-3920	320 mℓ	Polyethylene container	For adhered window glass	• Use to seal for joint between glasses (Expiration date: 4 months after its production date)
SEKISUI Silicone Sealant	20Y-54-55130	333 mℓ	Polyethylene container		• Use to seal front window (Expiration date: 6 months after its production)
GE TOSHIBA SILICONES TOSSEAL381	22M-54-27220	333 mℓ	Cartridge		• Translucent white seal used for joint between glasses (Expiration date: 12 months after its production date)

793T-B32–1300: Push tool assembly

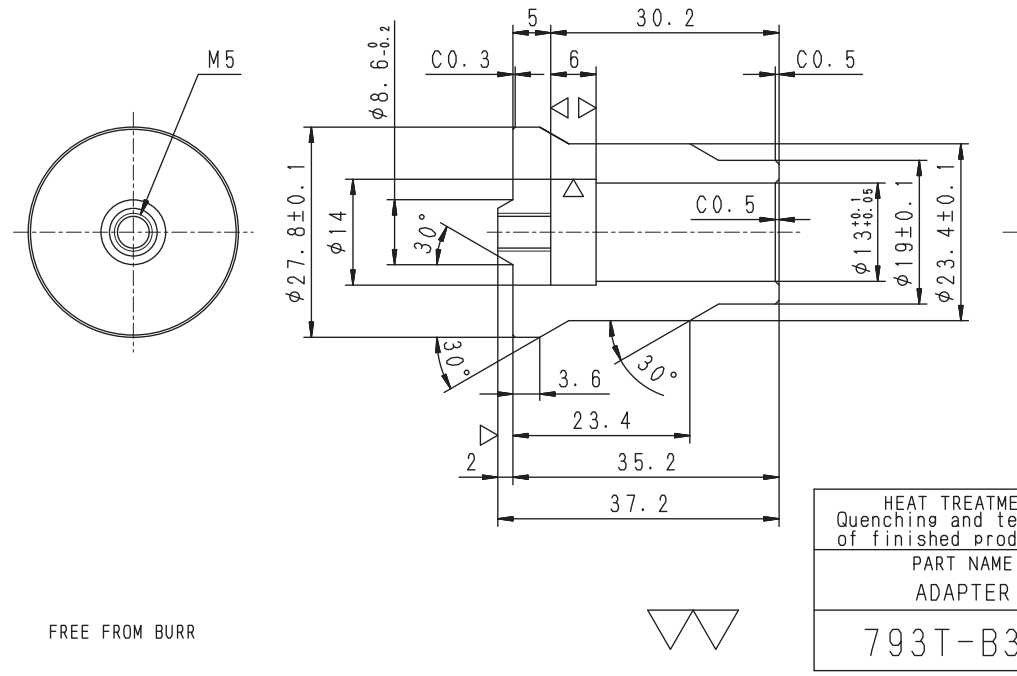


C4D22657

SYM.	PART NAME	MATERIAL	QTY/SET	MASS (kg)	REMARKS
01	SPRING	SWOSC-V	1	-	SWR37-45 (MISUMI)
02	SPRING	SWOSC-V	1	-	SWR21-50 (MISUMI)

HEAT TREATMENT	MATERIAL
----	----
PART NAME	Q'TY
PUSH TOOL ASSEMBLY	1
793T-B32-1300 △	

793T-B32–1310: Adapter



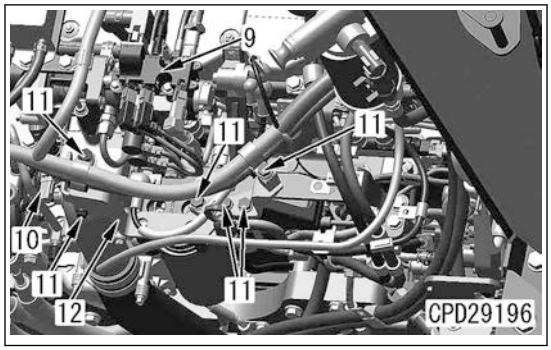
C4D22658

HEAT TREATMENT	MATERIAL
Quenching and tempering of finished products	SCM415
PART NAME	Q'TY
ADAPTER	1
793T-B32-1310 △	

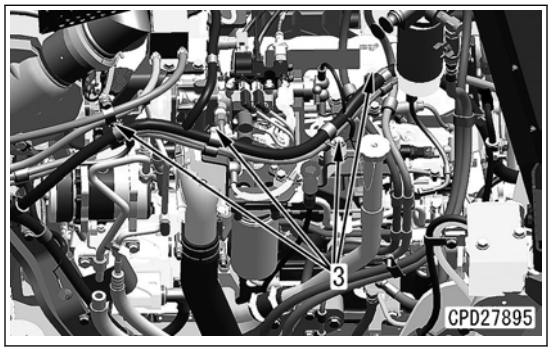
51. Install the bracket (12) with the bolts (11) (6 pieces).
52. Connect the connector CTE1 (10).
53. Install EGR valve assembly (9). For details, see “REMOVE AND INSTALL EGR VALVE ASSEMBLY”.

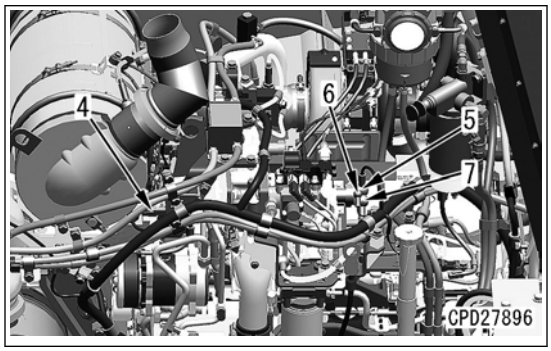
    REMARK

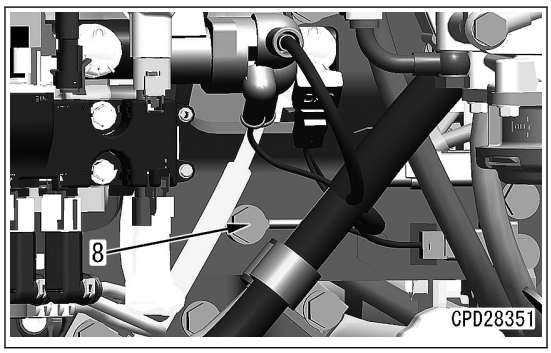
    Replace the gasket with a new one.



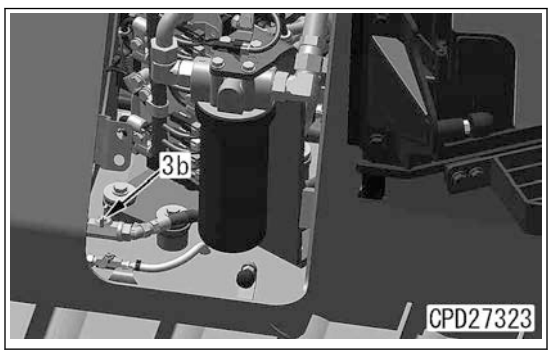
54. Connect the connectors (8), (7), (6), (5), and (4) as described below, and install the clamps (3) (5 pieces).
    - Connector T20B (8)
    - Connector T6 (7)
    - Connector T5 (6)
    - Connector T12 (5)
    - Connector 23 (4)







55. Open the fuel supply valve (3b).



Threaded portion of the common rail pressure sensor (112):
Gear oil (#90)

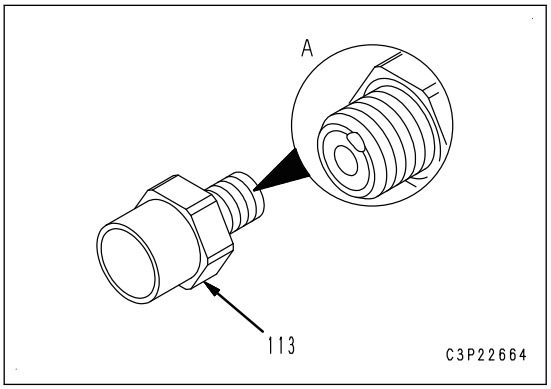
Common rail pressure sensor (112):
70±5 Nm {7.1±0.5 kgfm}

5) Connect the engine wiring harness. At this time, be careful not to connect the connector reversely.

6) Start the engine, and check for oil leakage.

For the testing procedure, see TESTING AND ADJUSTING, “TEST FUEL CIRCUIT FOR LEAKAGE”.

- When replacing the pressure limiter (113)



REMARK

Before removing the pressure limiter (113), thoroughly clean dirt, etc. on and around it.

1) Remove the pressure limiter (113).

REMARK

Do not reuse the pressure limiter (113) if leakage exceeds the specified value.

2) Check that there is no damage on the high-pressure sealing surfaces (A) on the pressure limiter (113) and the common rail.

3) Install a new pressure limiter (113).

Pressure limiter (113):
Gear oil (#90)

Pressure limiter (113):
100±4 Nm {10.2±0.4 kgfm}

REMARK

Excessive tightening may cause leakage. Take care not to tighten excessively.

4) Start the engine, and check for oil leakage.

For the testing procedure, see TESTING AND ADJUSTING, “TEST FUEL CIRCUIT FOR LEAKAGE”.

REMOVE AND INSTALL AFTERCOOLER ASSEMBLY

Collecting refrigerant – Operator's cab assembly – Cooling fan drive assembly – Plate, shroud – Hydraulic oil cooler assembly – A

A – Aftercooler 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.

⚠ If refrigerant gas gets in your eyes, you may lose your sight. And if it touches your skin, you may suffer from frostbite. Put on protective eyeglasses, gloves, and working clothes with long sleeves while collecting the refrigerant or filling the air conditioner circuit with the refrigerant.

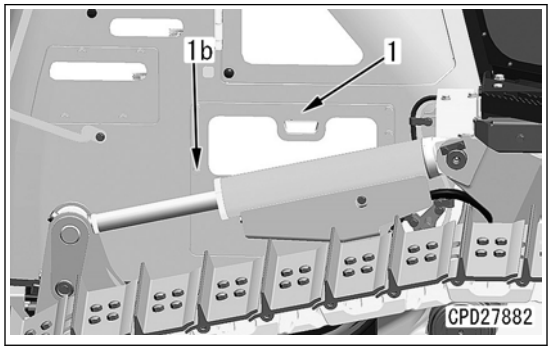
⚠ Ask a qualified person for collecting, adding and filling operations of the refrigerant (air conditioner gas: R134a).

⚠ Never release the refrigerant to the atmosphere.

METHOD FOR REMOVING AFTERCOOLER ASSEMBLY

Collecting refrigerant

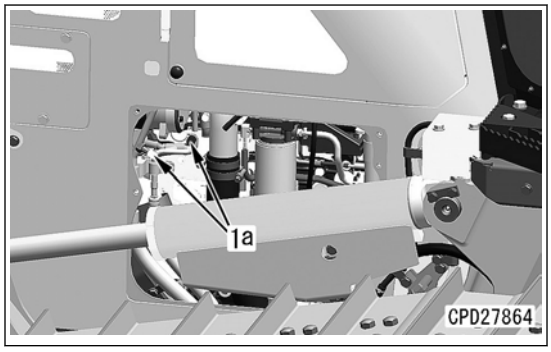
1. Remove the bolts (1b) (4 pieces) on the left of the machine, and remove the cover (1).



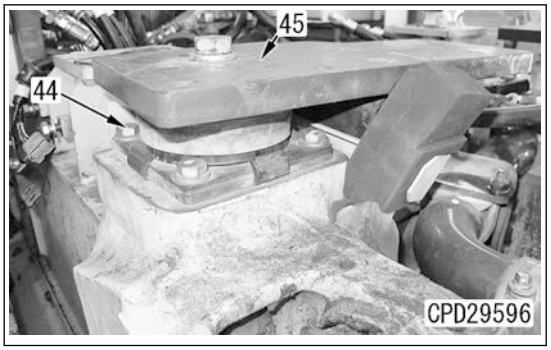
2. Collect the refrigerant (air conditioner gas: R134a) from the ports (1a).

   REMARK

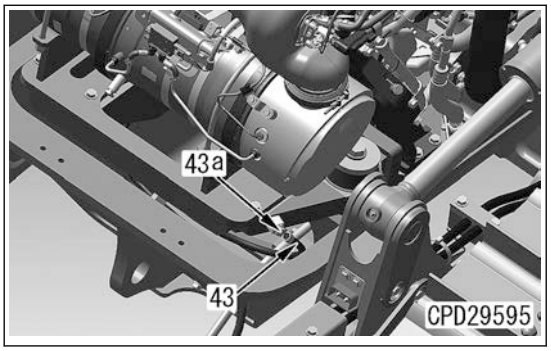
   Quantity of refrigerant to be collected: 1150±50 g



4. Install right and left plate (45) together with the cushions with the bolts (44) (4 pieces each on the right and left sides).



5. Connect the ground terminal (43) at the left front of the engine, and remove the bolt (43a).

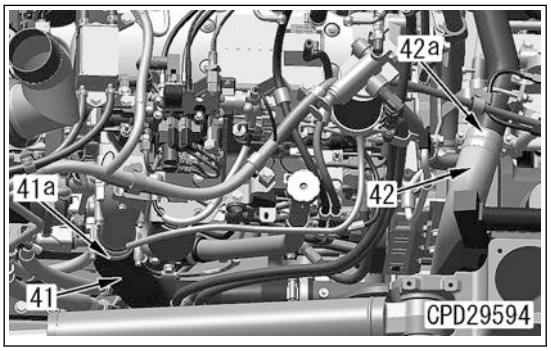


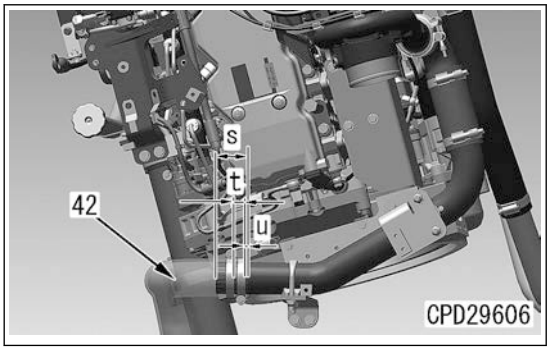
Hose, connector

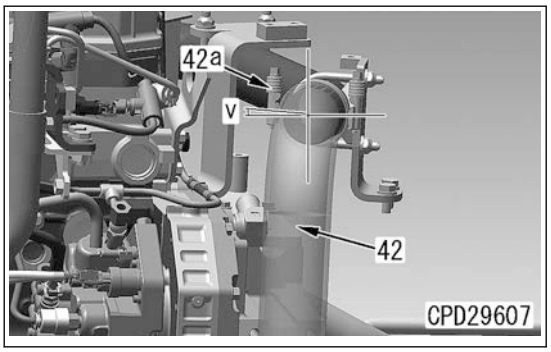
6. Connect the hose (42) on the VGT side at the positions of the following dimensions (s) to (u), and fasten the clamp (42a) at the position at angle (v).

   Clamp (42a):
   10.5±0.5 Nm {1.0±0.05 kgfm}

   - Dimension (s): 63 mm
   - Dimension (t): 22 mm
   - Dimension (u): 5 mm
   - Angle (v): 2 °5’





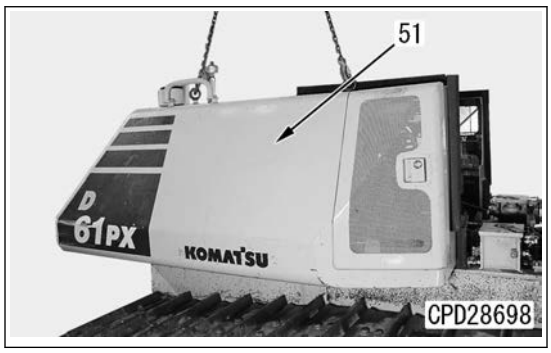


METHOD FOR INSTALLING FUEL TANK ASSEMBLY

Fuel tank assembly

1. Sling the fuel tank assembly (51), and set it on the installing position.

   Fuel tank assembly (51):
   350 kg

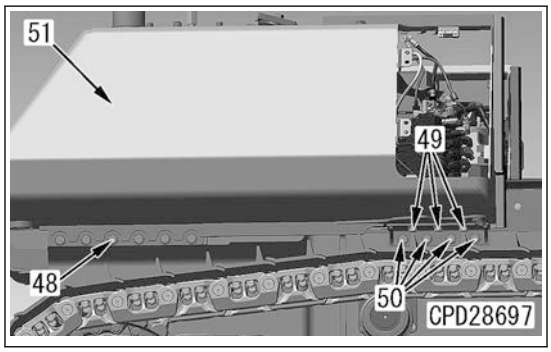


2. Sling the fuel tank assembly (51), hold the assembly, and install it with the bolts (50) (4 pieces), (49) (3 pieces), and (48) (6 pieces).

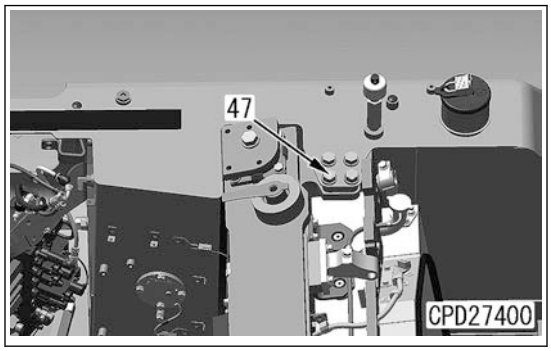
   REMARK

   Tighten the mount bolts (47) (4 pieces) to (50) (4 pieces) in this order to prevent the fuel tank from being distorted when installing the main frame.

   Mounting bolts (47), (48), (49), (50):
   490 to 565 Nm {50 to 58 kgfm}



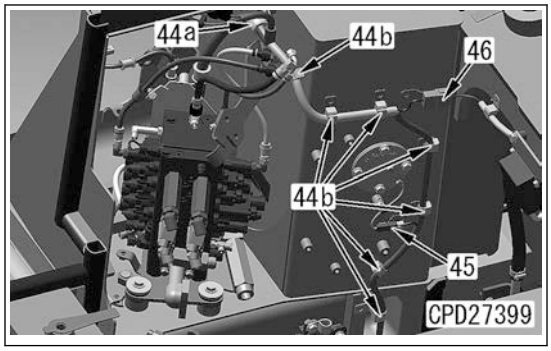
3. Install the bolts (47).



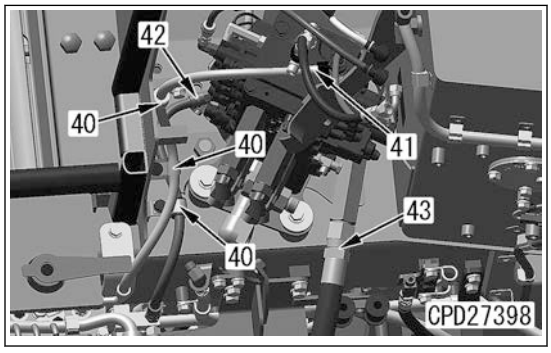
4. Connect the connector FM1 (46) and connector 13 (45), and install the clamps (44b) and (44a) (8 places).

   REMARK

   Connector 13 (45): Fuel level sensor



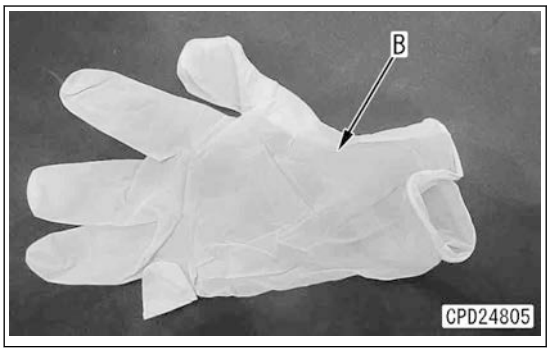
5. Connect the hoses (43), (42), and (41), and install the clamps (40) (3 places).



METHOD FOR INSTALLING AdBlue/DEF TANK STRAINER

NOTICE

When handling AdBlue/DEF, be sure to use the vinyl gloves (B).



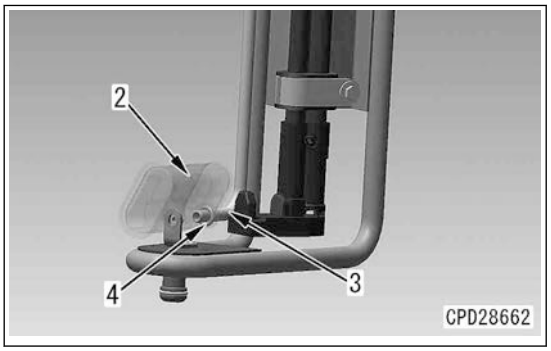
1. Apply distilled water for lubricating O-ring (4).

   O-ring (4):
   Distilled water

   REMARK

   If any foreign material is mixed into AdBlue/DEF tank, it may cause failures. Do not use grease, lubricating oil, or any lubricating substance.

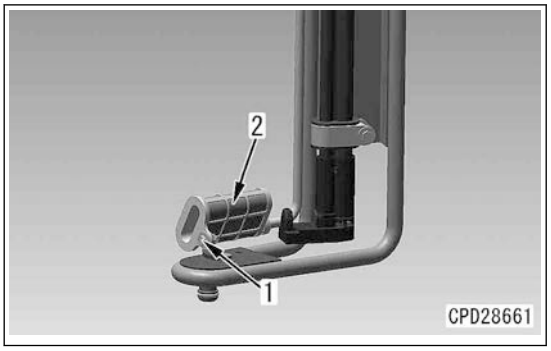
2. Install AdBlue/DEF tank strainer (2) to tube (3).



3. Install AdBlue/DEF tank strainer (2) with mounting bolt (1).

   Mounting bolt (1):
   4.9 to 5.9 Nm {0.5 to 0.6 kgfm}

4. Install AdBlue/DEF tank sensor flange assembly. For details, see “REMOVE AND INSTALL AdBlue/DEF TANK SENSOR FLANGE ASSEMBLY”.
5. Install AdBlue/DEF tank assembly. For details, see “REMOVE AND INSTALL AdBlue/DEF TANK ASSEMBLY”.



12. Disconnect the hoses (13) (2 pieces).

NOTICE

- **Be sure that coolant does not splash to KDPF and SCR assembly when disconnecting hoses (13).**
- **After disconnecting the hose (13), install the cap (C2) on the coolant side to AdBlue/DEF injector side.**

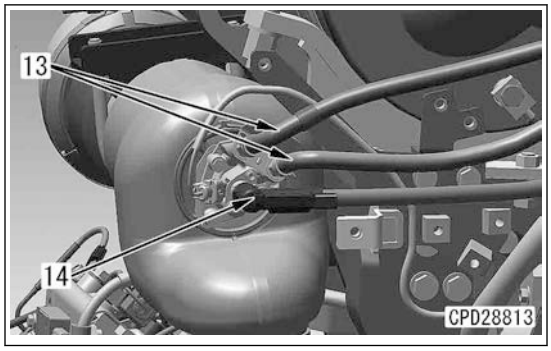
13. Disconnect AdBlue/DEF hose (14).

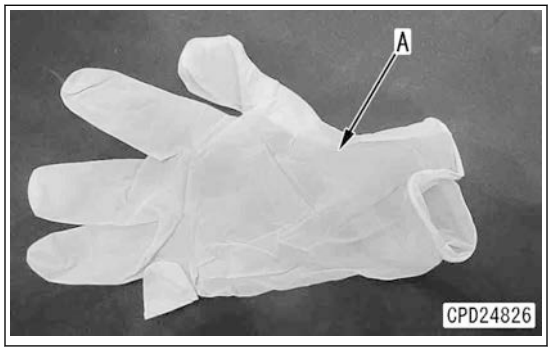
NOTICE

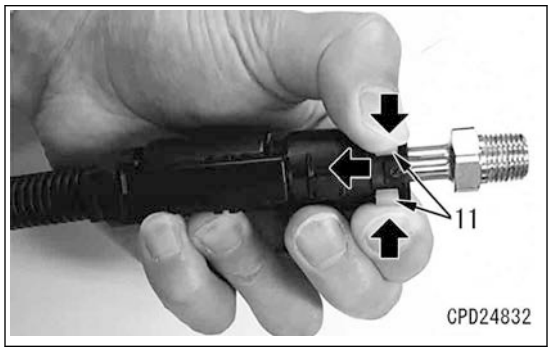
- **Before disconnecting AdBlue/DEF hose (14), wash the connecting portions with clean tap water to remove the fouling.**
- **After disconnecting AdBlue/DEF hose (14), install the plug (for 5/16 inch of hose diameter) (D) on the hose side, and install AdBlue/DEF cap (C1) on AdBlue/DEF injector side to prevent leakage.**
- **When handling AdBlue/DEF hose (14), be sure to use the vinyl gloves (A).**

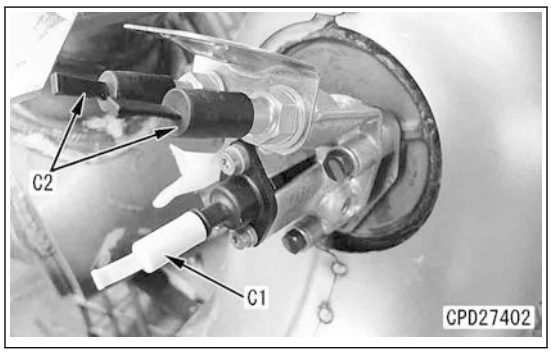
REMARK

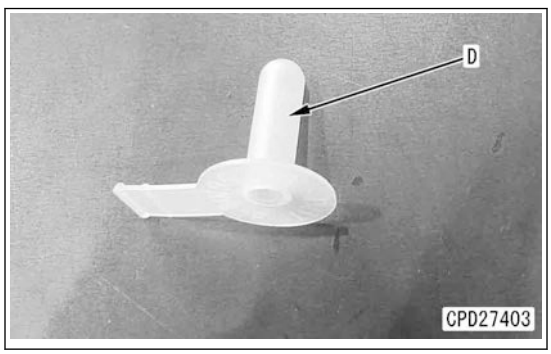
Pinch protruding portions (e) of the clip with your fingers, and the lock is unlocked. While they are kept pinched, pull out the hose in the opposite direction to AdBlue/DEF injector side, and remove AdBlue/DEF hose (14).





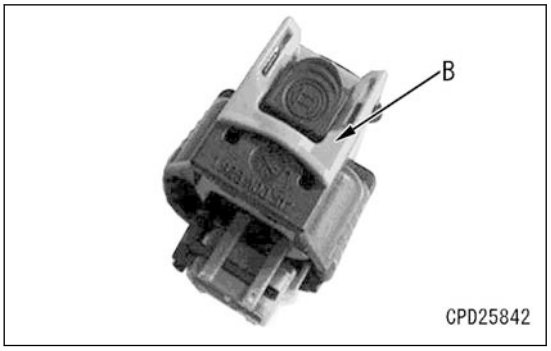


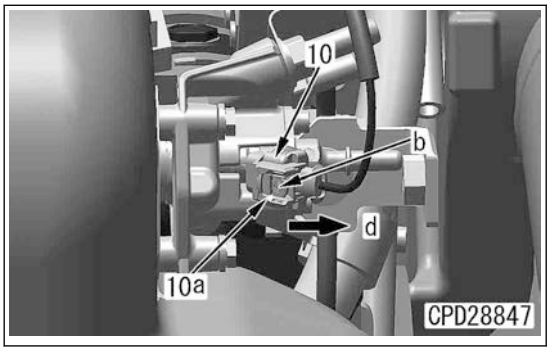




NOTICE

After installing the wiring connector UDM (10), install AdBlue/DEF hose (to prevent AdBlue/DEF from attaching to the wiring connector).





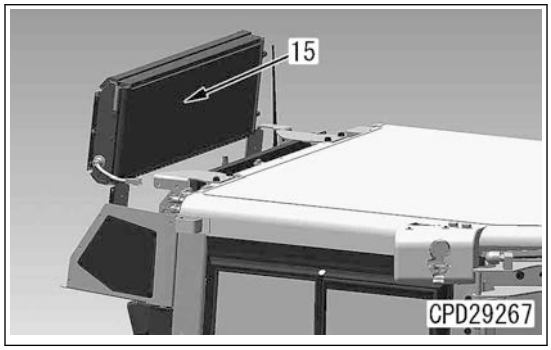
METHOD FOR INSTALLING AIR CONDITIONER CONDENSER ASSEMBLY

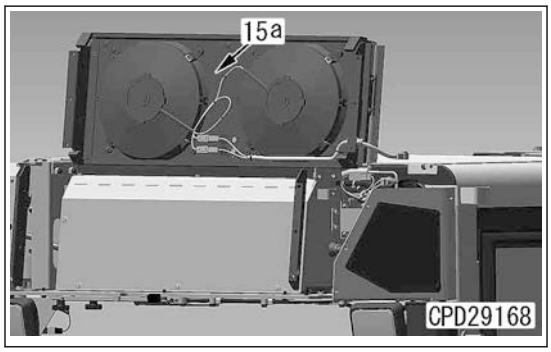
Air conditioner condenser assembly

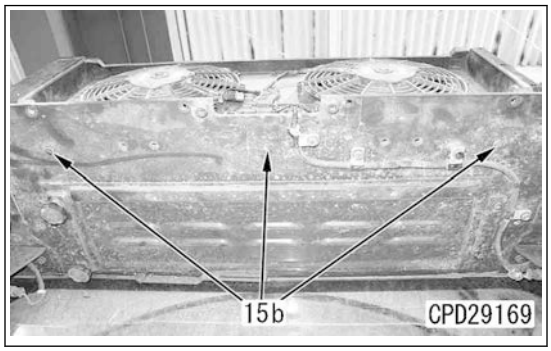
1. Set the air conditioner condenser assembly (15) on the installing position, and install it with the mounting bolts (15b) (3 pieces).

   REMARK

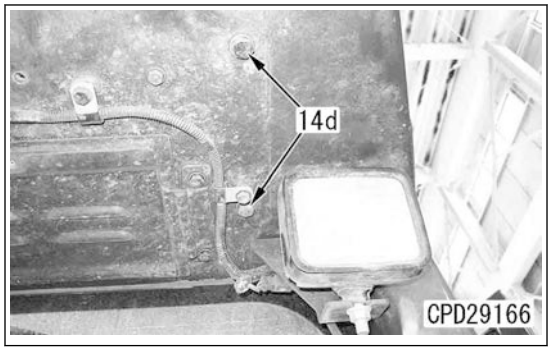
   Air conditioner condenser assembly (15) is integrated with the fan shroud (15a).

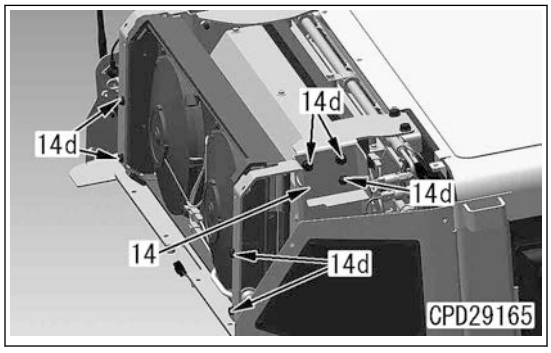






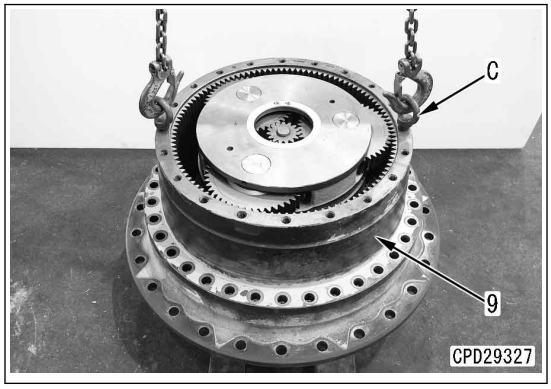
2. Install the bracket (14) with bolts (14d) (7 pieces).





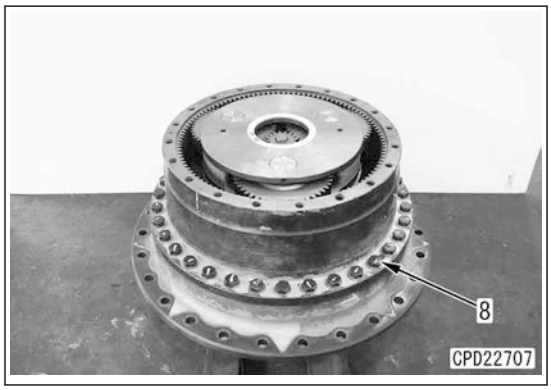
Ring gear

31. Install ring gear (9) with eyebolts (C).



32. Tighten bolts (8) (36 pieces).

Bolt (8):
245 to 309 Nm {25.0 to 31.5 kgfm}



Cover

33. Degrease the mating faces of cover (7) and ring gear, and dry them.

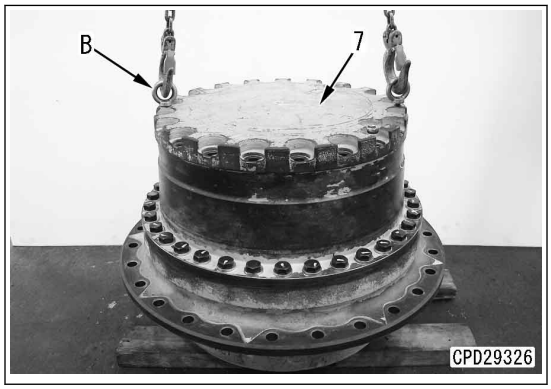
Cover mating face:
Liquid gasket (LG-8)

34. Install cover (7) with eyebolt (B).

REMARK

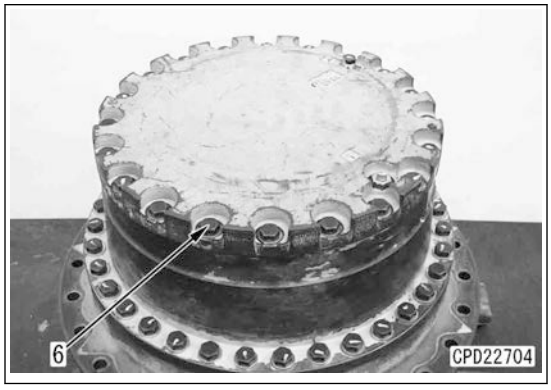
Do not apply liquid gasket to the following parts.

- Tapped holes of the cover and ring gear
- Gear part of the ring gear
- Magnet installation part of the cover

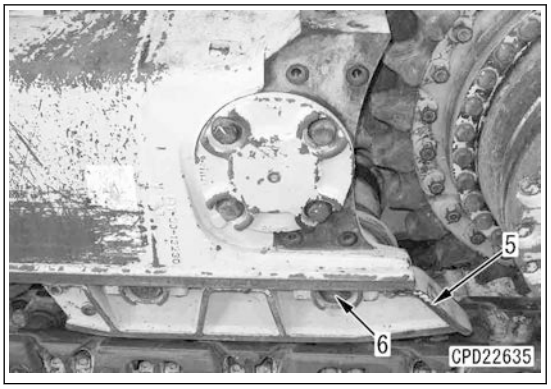


35. Tighten bolts (6) (20 pieces).

Bolt (6):
157 to 196 Nm {16.0 to 20.0 kgfm}



4. Remove the mounting bolt of the track roller guard (5).

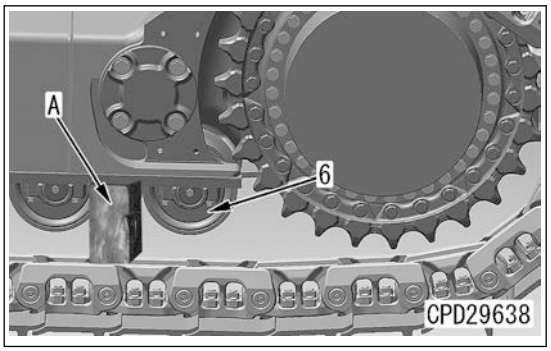


Track roller assembly

5. Remove the mounting bolts of the track roller assembly (6).
6. Start the engine, lift up the machine by using the blade, the ripper, or the hydraulic jack.

   NOTICE

   After the machine is raised, set the block (A) on the track shoe, and lock the work equipment control lever and the brake lock lever.



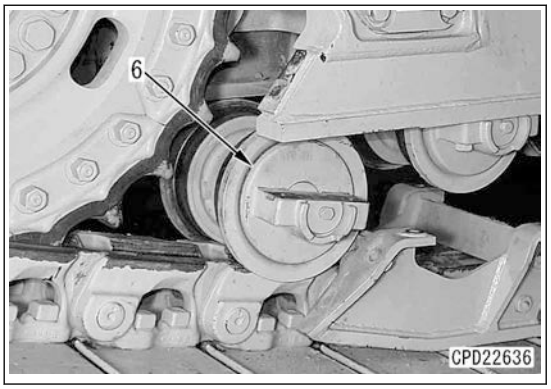
7. Remove the track roller assembly (6).

   REMARK

   The figure shows the right side.

   Track roller assembly (1 piece of single flange): 46 kg

   Track roller assembly (1 piece of double flange): 51 kg



METHOD FOR INSTALLING TRACK ROLLER ASSEMBLY

Track roller assembly

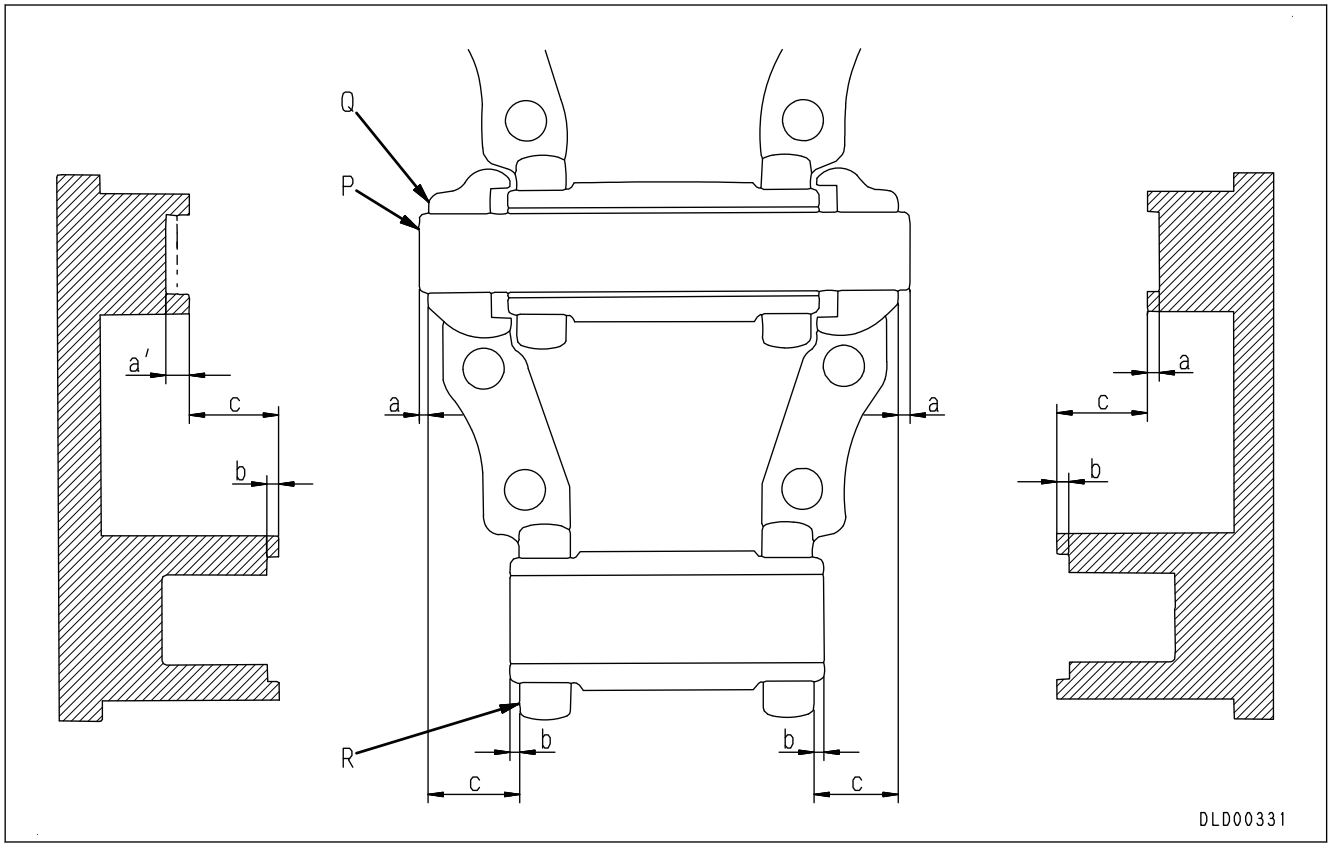
1. Start the engine, lift up the machine by using the blade, the ripper, or the hydraulic jack.

   NOTICE

   After the machine is raised, set the block (A) on the track shoe, and lock the work equipment control lever and the brake lock lever.

METHOD FOR ASSEMBLING TRACK ASSEMBLY GENERALLY

Dimensions of link press press-fitting jig



(a): 4.0±2 mm

(b): 3.05±0.13 mm

(c): 45.8 mm

Regenerating oil sealed track shoe

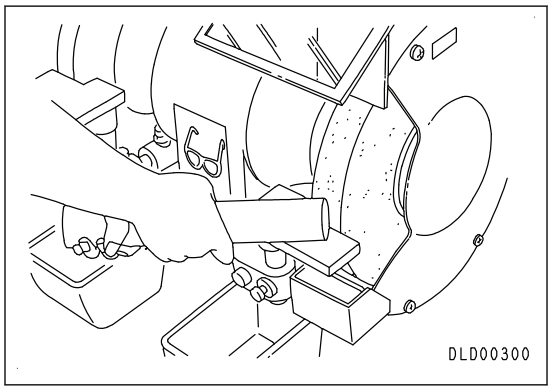
Preparation

1. Do not remove the seal (F5 type seal) to be reused from the link, and do not clean it.
2. Smoothly chamfer the end surface corner by using a grinder when reusing the pin. Smooth the protruding adhesive materials at the press fit area as well.

   ⚠ Be sure to wear the protective eyeglasses always when using the grinder.

   REMARK

   If the end surface corner is sharp due to wear, the press-fitting part may be scuffed. This may case oil leakage.

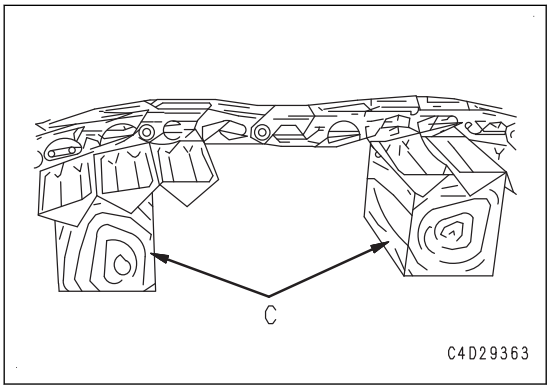


Symbol	Part No.	Part name	Necessity	Q'ty	New/Redesign	Sketch	Remarks
M	791-635-3110	Frame	■	1			Press-fit of bushing
	791-635-3160	Extension	■	1			
	791-635-3170	Nut	■	4			
	791-635-3180	Screw	■	2			
	791-635-3190	Screw	■	1			
	791-645-3520	Adapter	■	1			
	791T-630-3570	Guide	■	1			
	791-630-3560	Pusher	■	1			
P	791-646-3270	Guide	■	1			Connecting of links
R	Commercially available	Spacer (Outside diameter 55 mm, Thickness 47 mm)	●	1			
S	Commercially available	Lever block	●	1			
T	Commercially available	Hand vacuum pump	●	1			Vacuum test

METHOD FOR DISASSEMBLING ONE LINK OF TRACK SHOE ASSEMBLY ON THE FIELD

Track shoe assembly

1. Set the track shoe assembly on the block (C) (Height: Approximately 300 mm).

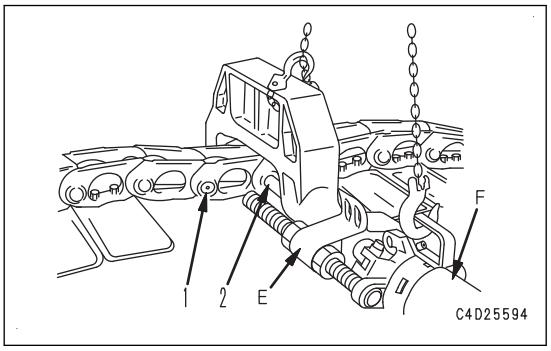


Pin

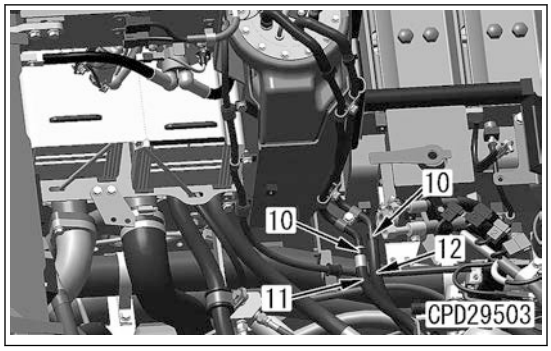
2. Pull out the pins (1) and (2) by using the tool (E) (component parts: frame, extension, nut, screw, screw, adapter, and pusher) and the tool (F) (component parts: pump and cylinder).

   REMARK

   If the pin end surface or the link side surface is unevenly worn, correct it by using a hand grinder, etc. to secure the perpendicularity to the tool (E).



8. Connect the heater hoses (12) and (11), and install the clamps (10) (2 places).



9. Remove the plug (for 3/8 inch of hose diameter) (B) and the cap kit (C) for AdBlue/DEF pump.

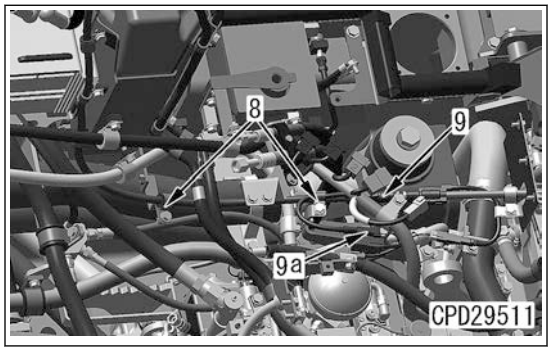
NOTICE

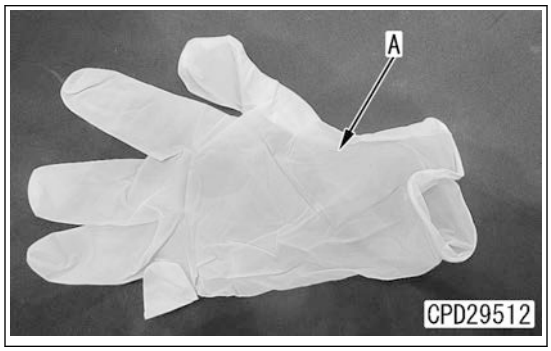
When handling AdBlue/DEF, be sure to use the vinyl gloves (A).

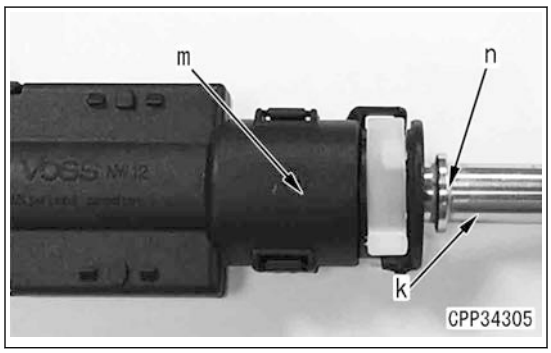
REMARK

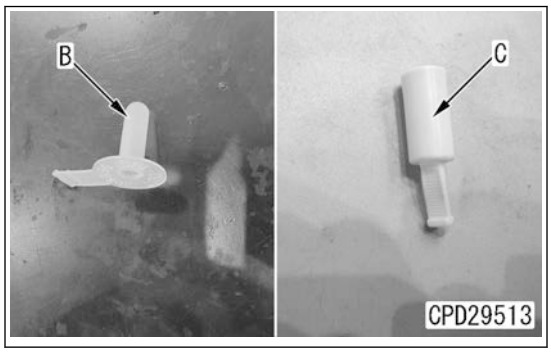
- Clean the connecting portions of AdBlue/DEF hose and pin of AdBlue/DEF injector thoroughly, and check that there are no dust and damage on them.
- Insert connector (m) of AdBlue/DEF hose into pin (k) on the injector side until click sound is heard to install it. (Connect AdBlue/DEF hose on the opposite side to the joint side.)
- When it is inserted so that convex portion (n) of pin (k) passes the convex portion inside of the clip, it can be locked by the clip.

10. Connect AdBlue/DEF hose (9).
11. Connect the connector (9a), and install the clamp (8).









DISASSEMBLE AND ASSEMBLE STROKE SENSING BLADE LIFT CYLINDER ASSEMBLY

Preparation — Stroke and reset sensor assembly — Tube — Piston rod assembly — Disassembly of piston assembly — A

A — Cylinder head assembly — Disassembly of cylinder head assembly — Disassembly of housing assembly

Tools for disassembly and assembly of stroke sensing blade lift cylinder assembly

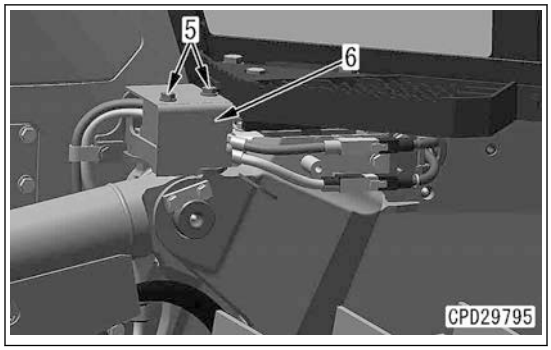
Symbol	Part No.	Part name	Necessity	Q'ty	New/Redesign	Sketch	Remarks
A	790-502-1003	Cylinder repair stand	■	1			Disassembly and assembly of hydraulic cylinder
	790-101-1102	Hydraulic pump	■	1			
B	790-102-3802	Multi-wrench	■	1			Installation of round-shape head (Blade lift)
C	Commercially available	Rubber hammer	●	1			Removal of stroke and reset sensor
D	Commercially available	Spatula	●	1			
E	790-201-1500	Push tool kit	■	1			Press-fit of dust seal
	790-201-1610	• Plate		1			
	790-101-5021	• Grip		1			
	01010-50816	• Bolt		1			
F	790-201-1702	Push tool kit	■	1			Press-fit of bushing
	790-201-1791	• Push tool		1			
	790-101-5021	• Grip		1			
	01010-50816	• Bolt		1			
G	790-720-1000	Expander	■	1			Installation of piston ring
	796-720-1660	Ring	■	1			
	07281-01159	Clamp	■	1			
	796-720-1690	Ring	■	1			
	07281-01919	Clamp	■	1			
H	Commercially available	Digital angle gauge	■	1			For measurement of sensor mounting angle
J	790-302-1270	Socket	■	1			Removal and installation of nut

REMARK

The shape may differ depending on the machine models.

⚠ **Do not rotate the rod while it is at set position when the sensor is installed. (In order not to damage the rod surface with the roller of the stroke sensor)**

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

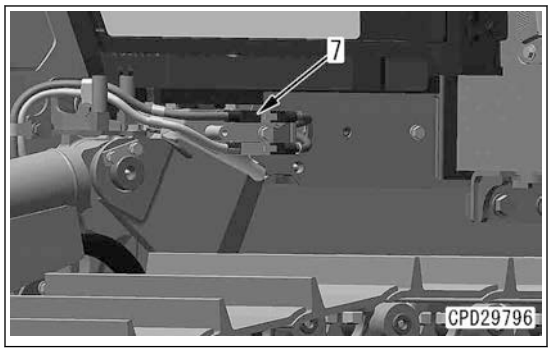


Connector, hose

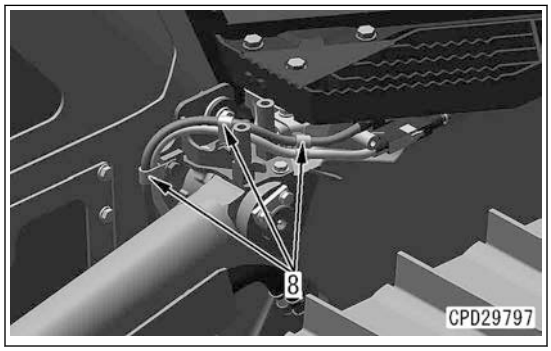
4. Disconnect the connector CY11 (7).

   NOTICE

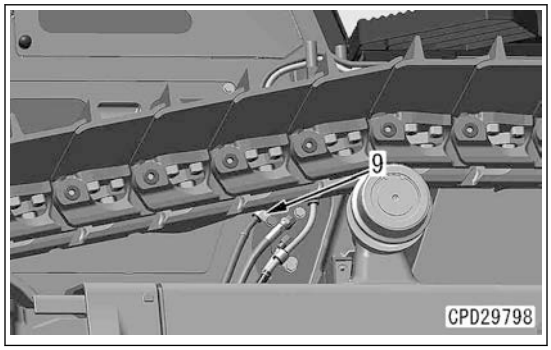
   Cover the disconnected connector to avoid entry of water and dust.

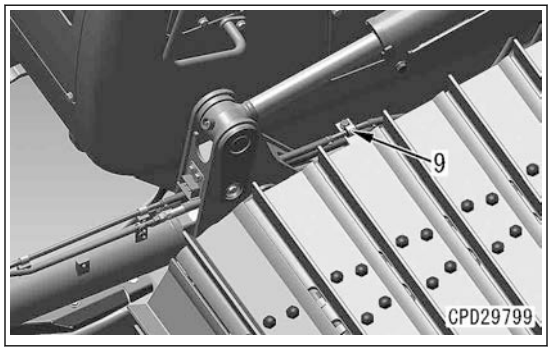


5. Remove the clamps (8) (3 places).

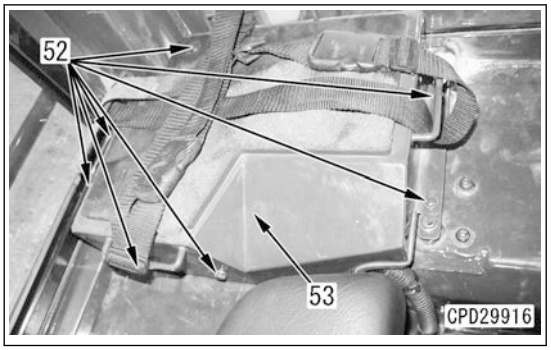


6. Remove the clamps (9) (2 places).





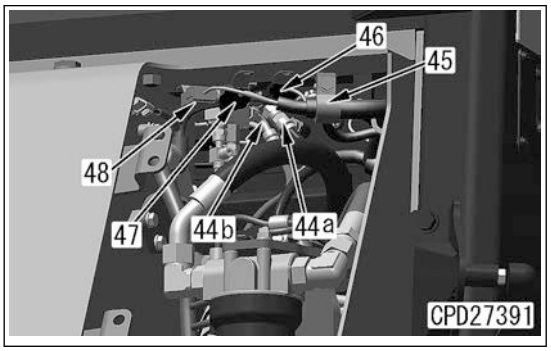
12. Install the cover (53) with the bolts (52) (6 pieces).

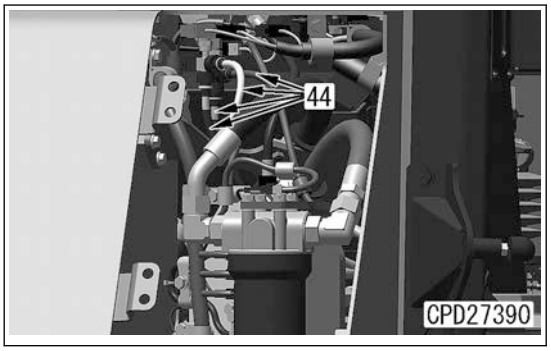


Hose, connector

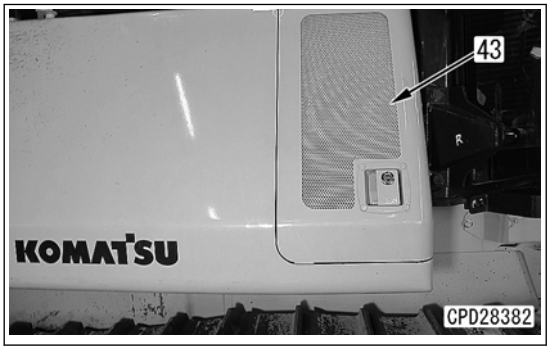
13. Connect the following connectors, and install the clamp (45).
    - Connector 102 (48)
    - Connector RS (47)
    - Connector WE (46)
14. Connect the hoses (44b) and (44a), and connect the hoses (44) (4 pieces).

    Hose (44):
    35 to 44 Nm {3.5 to 4.5 kgfm}

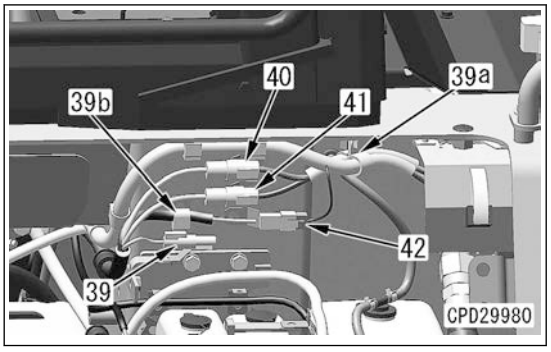




15. Close the cover (43) on the right side of the machine.



16. Connect the following connectors, and install the clamps (39b) and (39a).
    - Connector BR1 (40)
    - Connector BR2 (41)
    - Connector BR3 (42)
    - Connector 17 (39)



REMOVE AND INSTALL FOOT HEATER 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".)

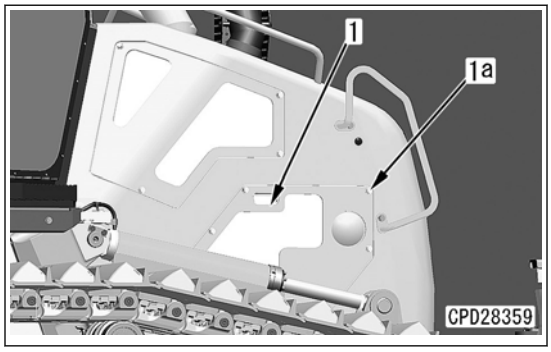
⚠ If you disconnect the heater hose when the coolant in radiator is still hot, you may be scalded. Accordingly, wait for the coolant temperature to drop before disconnecting.

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

METHOD FOR REMOVING FOOT HEATER ASSEMBLY

Draining coolant

1. Remove the bolts (1a) (4 pieces), and remove the cover (1) on the right side of the machine.



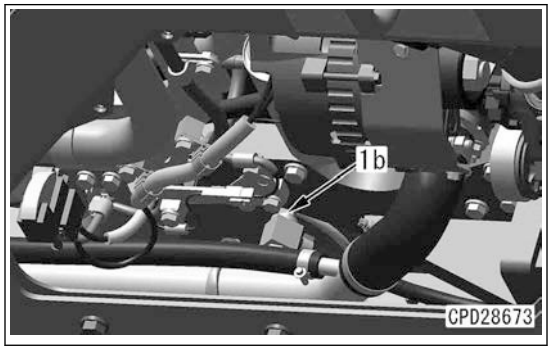
2. Loosen the drain valve (1b), and drain the coolant.

   Radiator:

   45 ℓ

   REMARK

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



Operator's seat

3. Remove the operator's seat assembly. For details, see "REMOVE AND INSTALL OPERATOR'S SEAT ASSEMBLY".

Plate, cover

4. Remove the floor mat (3).

REMOVE AND INSTALL COMMUNICATION TERMINAL

⚠ 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.

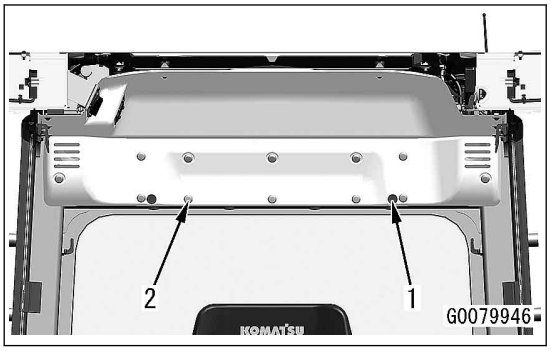
⚠ Turn the starting switch to OFF position to stop the engine.

⚠ Turn the battery disconnect switch to OFF position, and remove the key. (For details, see TESTING AND ADJUSTING, "HANDLE BATTERY DISCONNECT SWITCH".)

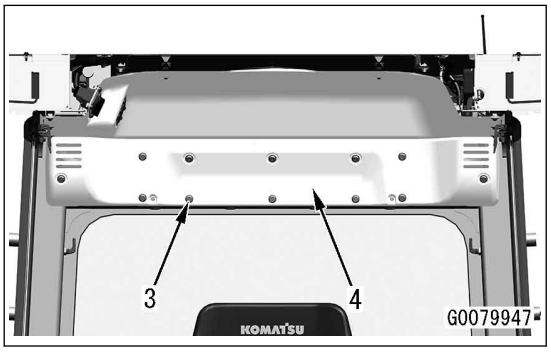
REMOVE COMMUNICATION TERMINAL

Communication terminal

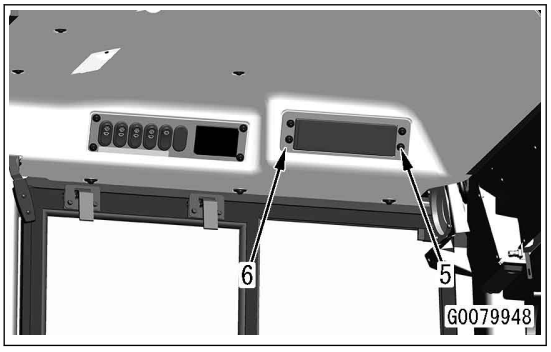
1. Remove the clips (1) (2 pieces).
2. Remove the caps (2) (12 pieces).



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

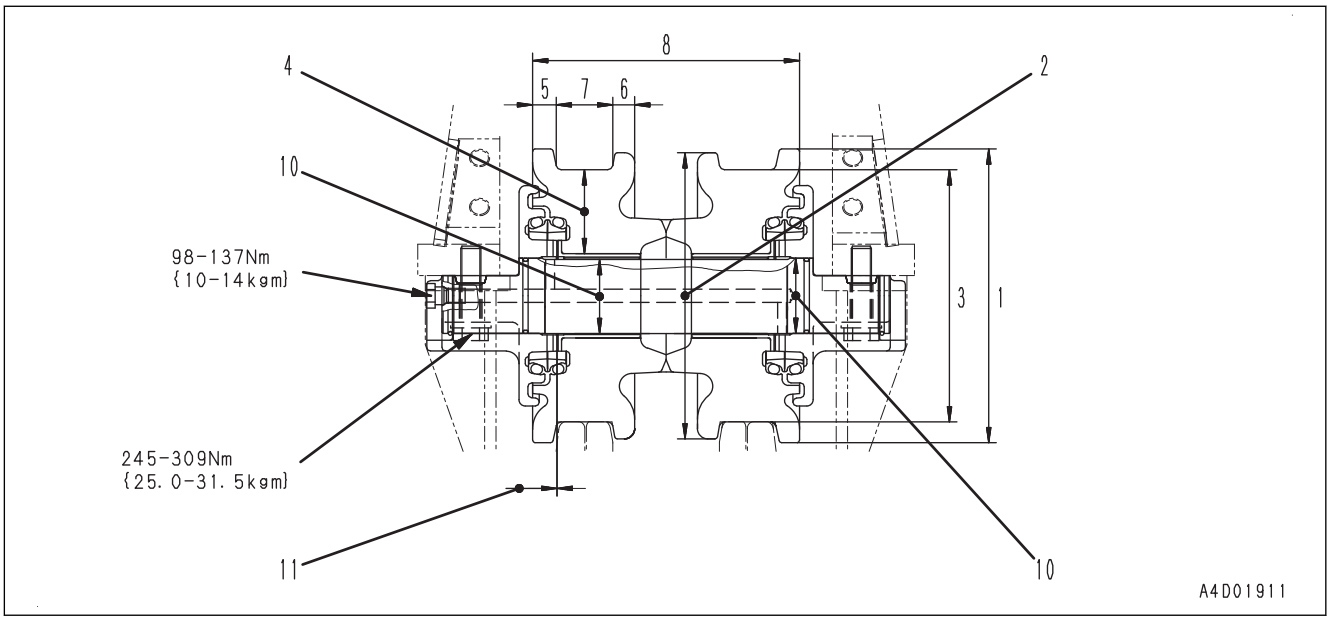


4. Remove the bolts (5) (4 pieces), and remove the cover (6).



Abbreviation	Actual word spelled out	Purpose of use (major applicable machine (*1), or component/system)	Explanation
MMS	Multimedia Messaging Service	Communication	This is a service that allows transmission and reception of short messages consisting of characters or voice or images between cell phones.
NC	Normally Closed	Electrical system, hydraulic system	This is a characteristic of electrical or hydraulic circuits. Circuit is normally closed if it is not actuated, and it opens when it is actuated.
NO	Normally Open	Electrical system, hydraulic system	This is a characteristic of electrical or hydraulic circuits. Circuit is normally open if it is not actuated, and it closes when it is actuated.
OLSS	Open-center Load Sensing System	Hydraulic system	This is a hydraulic system that can operate multiple actuators at the same time regardless of the load.
PC	Pressure Compensation	Hydraulic system	This is a function that corrects the oil pressure.
PCCS	Palm command control system	Steering (D Series)	This is a function that electrically controls the engine and transmission in an optimal way with the controller instantly analyzing data from levers, pedals, and dials.
PCV	Pre-stroke Control Valve	Engine	This is a valve that adjusts the fuel intake amount at the pump inlet in order to control fuel discharged volume of supply pump.
PPC	Proportional Pressure Control	Hydraulic system	This is a system that operates actuators in proportion to the oil pressure.
PPM	Piston Pump and Motor	Hydraulic system (D, PC, etc)	Piston type hydraulic pump and motor.
PTO	Power Take Off	Power train system	Power take-off mechanism
PTP	Power Tilt and power Pitch dozer	Work equipment (D Series)	This is a function that performs hydraulic control of the tilt and pitch of the dozer blade of the bulldozer.
ROPS	Roll-Over Protective Structure	Cab and canopy	ROPS 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 rolls over. (Roll-over protective structure) This performance is standardized as ISO 3471 or ISO 12117-2.
SCR	Selective Catalytic Reduction	Urea SCR system	This is an exhaust gas purifier using urea water that converts nitrogen oxides (NOx) into harmless nitrogen and water by oxidation-reduction reaction. It may also be mentioned as exhaust gas purification catalyst or part of the name of related devices.
SI	Le Systeme International d' Unites (International unit system)	Unit	Abbreviation for “International System of Units” It is the universal unit system and “a single unit for a single quantity” is the basic principle applied.
SOL	Solenoid	Electrical system	This is an actuator that consists of a solenoid and an iron core that is operated by the magnetic force when the solenoid is energized.

MAINTENANCE STANDARD OF TRACK ROLLER FOR CONVENTIONAL TYPE TRACK SHOES (DOUBLE FLANGE TYPE)



Unit: mm

No.	Item	Judgment criteria					Remedy
1	Outside diameter of flange (outside)	Standard dimension			Repair limit		Repair by build-up welding or replace
		233			-		
2	Outside diameter of flange (inside)	227			-		
3	Outside diameter of tread	200			164		
4	Thickness of tread	66.5			48.5		
5	Width of flange (outside)	19.5			13.5		
6	Width of flange (inside)	18			12		
7	Width of tread	43.5			-		
8	Overall width	212			-		
9	Clearance between shaft and bushing	Standard dimension	Tolerance		Standard clearance	Allowable clearance	Replace
			Shaft	Hole			
		60	-0.244 -0.290	+0.208 -0.037	0.207 to 0.498	-	
10	Clearance between shaft and collar	59.7	-0.250 -0.300	-0.160 -0.230	0.020 to 0.140	-	
11	Axial play of roller	Standard clearance			Allowable clearance		
		0.26 to 0.66			-		

Unit: mm

No.	Item	Judgment criteria					Remedy
		Standard dimension	Tolerance		Standard clearance	Allowable clearance	
			Shaft	Hole			
1	Clearance between frame coupling pin and bushing	85	-0.036 -0.090	+0.207 +0.120	0.156 to 0.297	5.0	Replace
2	Clearance between frame coupling pin and U-frame bracket	85	-0.036 -0.090	+0.300 +0.100	0.136 to 0.390	1.0	
3	Clearance between lift cylinder bottom pin and frame bracket	60	-0.030 -0.076	+0.046 0	0.030 to 0.122	1.0	
4	Clearance between lift cylinder head pin and U-frame bracket	60	-0.030 -0.076	+0.300 +0.100	0.130 to 0.376	1.0	
5	Clearance between angle cylinder bottom pin and U-frame bracket	50	-0.025 -0.064	+0.300 +0.100	0.125 to 0.364	1.0	
6	Clearance between angle cylinder head pin and blade bracket	50	-0.025 -0.064	+0.300 +0.100	0.125 to 0.364	1.0	
7	Clearance between tilt cylinder bottom pin and blade bracket	50	-0.025 -0.064	+0.300 +0.100	0.125 to 0.364	1.0	
8	Clearance between tilt cylinder head pin and U-frame bracket	50	-0.025 -0.064	+0.300 +0.100	0.125 to 0.364	1.0	
9	Clearance between pitching rod pin and bushing	55	-0.030 -0.076	0 -0.015	0.015 to 0.076	0.5	
10	Clearance between spherical portion of U-frame center and blade cap	177.5	-0.250 -0.750	+0.500 0	0.250 to 1.250	5.0	Adjustment of shim
11	Standard shim thickness between spherical portion of U-frame center and blade cap	8.0					

- To evaporate the liquid refrigerant at lower temperature, the pressure in the evaporator must be kept as low as possible. For this purpose, the compressor sucks in the evaporated refrigerant.

Relation between refrigerant and cooling trouble

- While repeating the refrigeration cycle, the refrigerant circulates in the refrigeration circuit and dissipates the heat in the cab to the outside of the cab.
- If there is an insufficient quantity of refrigerant, all of it is evaporated while it is passing through the evaporator. This causes evaporator efficiency to deteriorate, which will result in defective air conditioning.
- If there is excessive refrigerant, not all of it is evaporated and part of it will be sucked into the compressor in liquid form, which causes the compressor to compress the liquid and may damage the components.
- If water is contained in the refrigerant circuit, it freezes in the small hole of the expansion valve and blocks the refrigerant flow to cause a cooling trouble.

Circuit diagram related to condenser fan