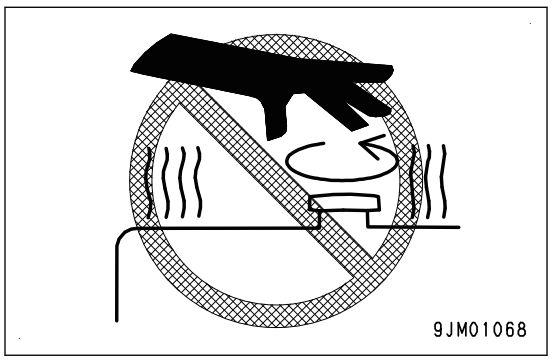
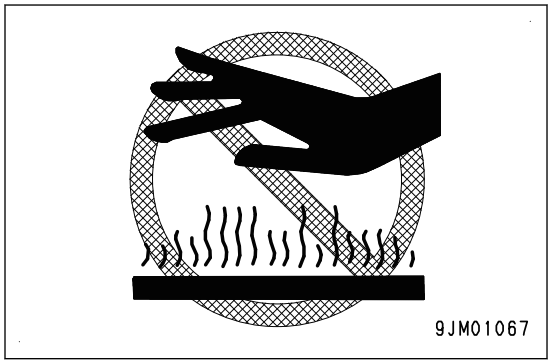
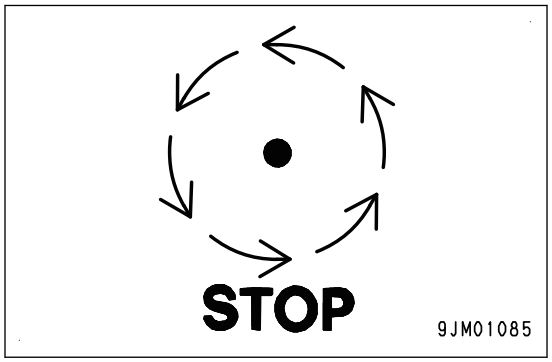
Abbreviation	Actual word spelled out	Purpose of use (major applicable machine (*1), or component/system)	Explanation
ICT	Information and Communication Technology	Communication and electronic control	A general term for the engineering and its socially applied technology of information processing and communication.
IMA	Inlet Metering Actuator	Engine	This is a valve that adjusts the fuel intake amount at the pump inlet in order to control the supply pump fuel discharged volume. (Same as IMV)
IMU	Inertial Measurement Unit	Engine	This is a device to detect the angle (or angular velocity) and acceleration of the 3 axes that control motions.
IMV	Inlet Metering Valve	Engine	This is a valve that adjusts the fuel intake amount at the pump inlet in order to control the supply pump combustion discharged volume. (Same as IMA)
KCCV	Komatsu Closed Crankcase Ventilation	Engine	This is a mechanism that burns the blowby gas again by separating oil from blowby gas and returning it to the intake side. It primarily consists of filters.
KCSF	Komatsu Catalyzed Soot Filter	Engine	This is a filter that captures soot in exhaust gas. It is built in to KDPF.
KDOC	Komatsu Diesel Oxidation Catalyst	Engine	This is a catalyst that is used for purifying exhaust gas. It is built in to KDPF or assembled with the muffler.
KDPF	Komatsu Diesel Particulate Filter	Engine	This is a component that is used to purify the exhaust gas. KDOC (catalyst) and KCSF (filter to capture soot) are built-in it. It is installed instead of the conventional muffler.
KTCS	Komatsu Traction Control System	Travel and brake (HM)	This is a function that performs braking with the optimum force and recovers the driving force of the wheels by actuating the inter-axle differential lock when the wheels runs idle while the machine travels on the soft ground.
LCD	Liquid Crystal Display	Machine monitor	This is an image display equipment such as a monitor in which the liquid crystal elements are assembled.
LED	Light Emitting Diode	Electronic parts	This is a semiconductor element that emits light when the voltage is applied in forward direction.
LIN	Local Interconnect Network	Communication and electronic control	This is one of communication standards that are used in the network on the machine.
LS	Load Sensing	Hydraulic system	This is a function that detects differential pressure of pump, and controls discharged volume corresponding to load.
LVDS	Low Voltage Differential Signaling	Communication and electronic control	This is one of communication standards that are used in the network on the machine.
MAF	Mass Air Flow	Engine	This indicates engine intake air flow. This is not used independently but is used as combined with sensor. Mass air flow sensor can be called as MAF sensor.

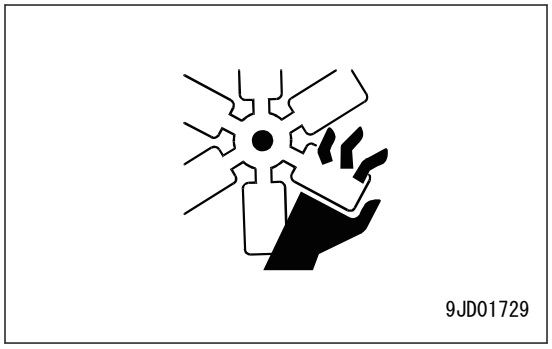
- Release the remaining pressure from the circuit before starting the work of disconnecting and removing of oil, fuel, water, or air from the circuit. When removing the cap of oil filter, drain plug, or oil pressure plug, it should be done slowly otherwise the oil spills.
- When removing or installing the checking plug or the piping in the fuel circuit, wait 30 seconds or longer after the engine is shut down and start the work after the remaining pressure is released from the fuel circuit.
- The coolant and oil in the circuits are hot when the engine is shut down. Be careful not to get scalded. Wait for the oil and coolant to cool before performing any work on the oil or coolant circuits.





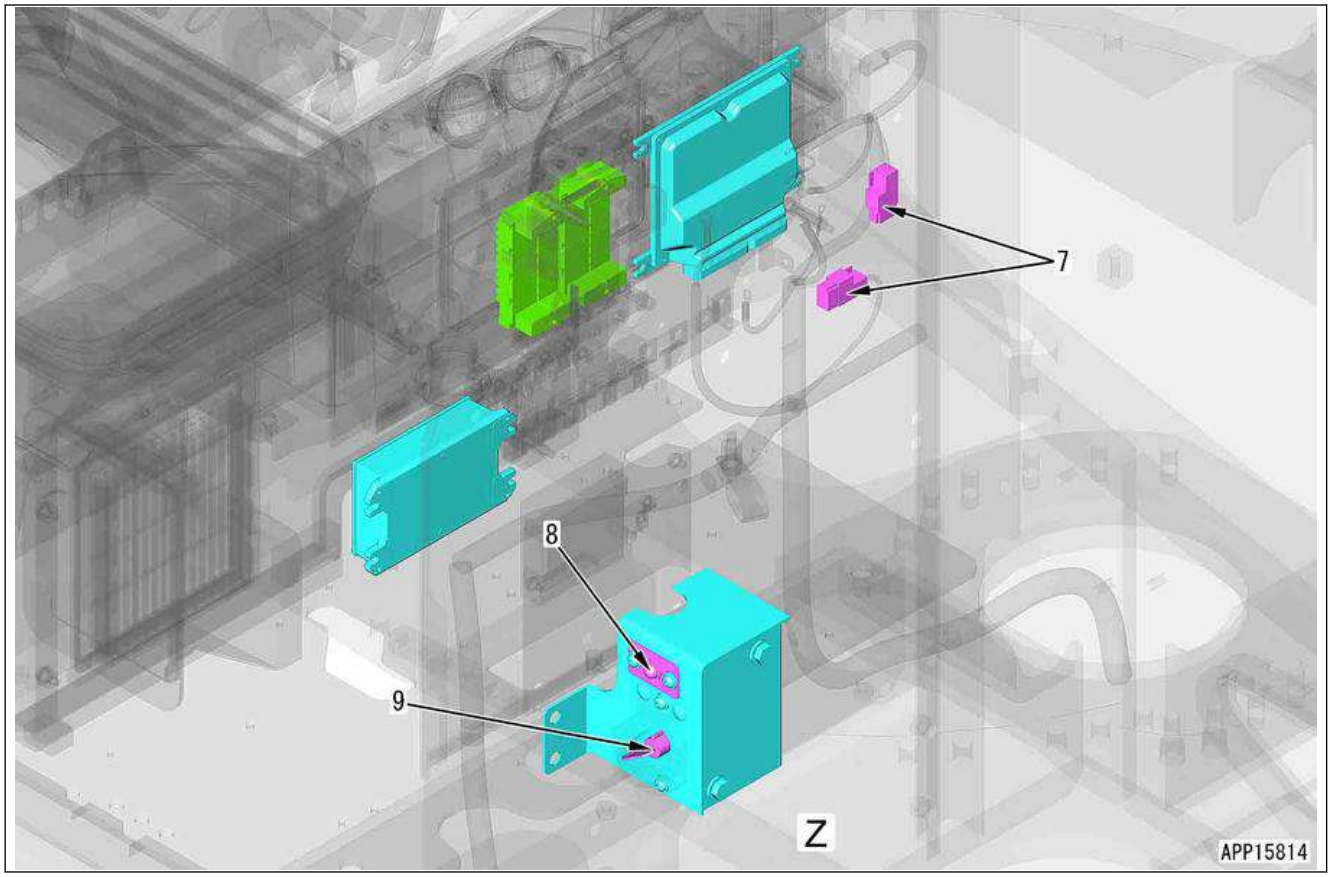
- Before starting work, shut down the engine. When working on or around a rotating part, in particular, shut down the engine. When checking the machine without shutting down the engine (measuring oil pressure, revolving speed, temperature, etc.), take extreme care not to get caught in rotating parts or moving parts.
- When raising a heavy component (heavier than 25 kg), use a hoist or crane. Before starting work, check that the slings (wire ropes, webbing slings, chains, and hooks) are free from damage. Always use slings which have ample capacity and install them to proper places. Operate the hoist or crane slowly to prevent the component from hitting any other part. Do not work with any part still raised by the hoist or crane.
- When removing a part which is under internal pressure or under reaction force of a spring, always leave 2 bolts in diagonal positions. Loosen those 2 bolts gradually and alternately to release the pressure, and then remove the part.
- When removing components, do not break or damage the electrical wiring. Damaged wiring may cause a fire.
- When removing piping, do not spill the fuel or oil. If any fuel or oil drips onto the floor, wipe it off immediately. Fuel or oil on the floor can cause you to slip and can even cause fires.





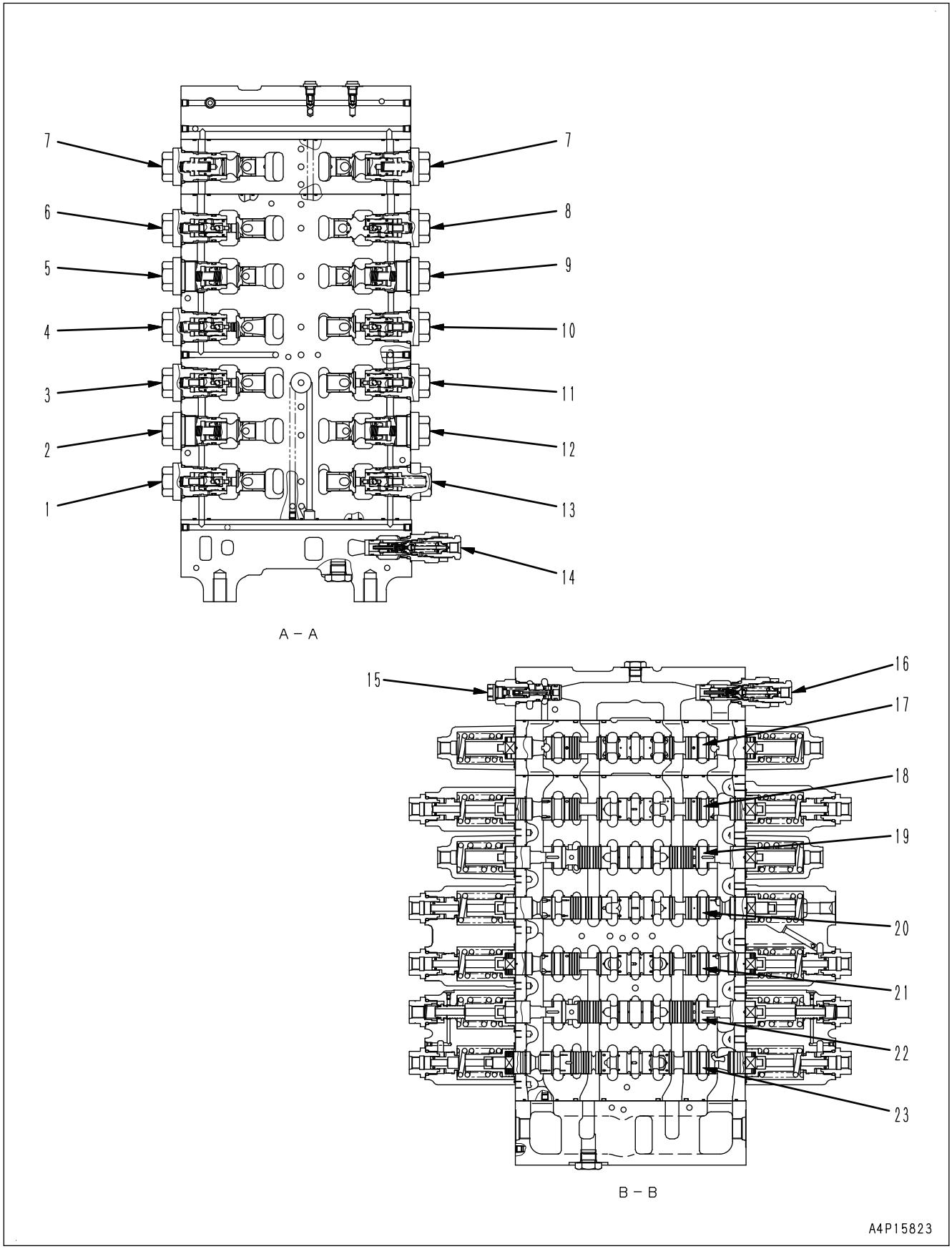
- Do not use gasoline to wash parts as a general rule. Do not use gasoline to clean electrical parts, in particular.

1: Fuse box
2: Pump controller
3: Engine controller
4: Battery
5: KOMTRAX terminal
6: Machine monitor



7: Fusible link
8: System operating lamp
9: Battery disconnect switch

Sectional views (A-A, B-B)



1: Pressure compensation valve (arm OUT)

2: Pressure compensation valve (right travel REVERSE)

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

REMARK

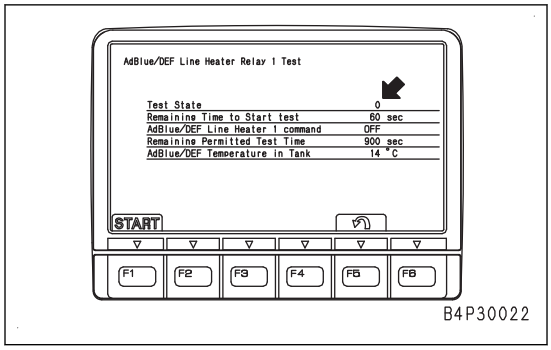
Flashing of “0” indicates “Waiting for the start (default)”, and test can be performed. Screen other than “0” is displayed, follow “Parameter list of Test State”.

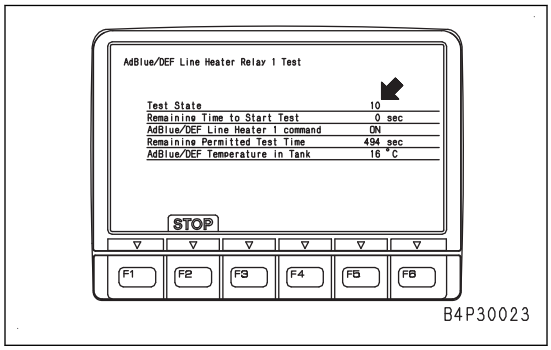
9. Press F1 to start “AdBlue/DEF Line Heater Relay 1 Test”.

F1: Starts “AdBlue/DEF Line Heater Relay 1 Test”.

F2: Stops “AdBlue/DEF Line Heater Relay 1 Test”. (When “STOP” is displayed.)

F5: Returns the screen 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 testing procedure from step 5.**
- **If you turn starting switch to OFF position by mistake 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.**
- **When the KOMNET communication error occurs within 1 second which the engine controller can not detect, the test may be continued although the machine monitor does not continue the test (standard screen). In that case, turn the starting switch to OFF position once, and then system operating lamp goes out, and the engine controller shuts down to reset the test.**

REMARK

- Display of “Test State” changes to flashing of “10”, and display of “Remaining Time to Start Test” is counted down from “60” to “0 sec”, and when it reaches to “0 sec”, the power is supplied automatically.
- When the display of “Test State” is “11” to “41”, follow “Parameter list of test state”.
- When the display of “Remaining Time to Start Test” becomes “0 sec”, “Line Heater 1 Command” is “ON” and voltage will be outputted to the heater relay.
- The test stops automatically in the elapsed time of 16 minutes after F1 is pressed.

10. Measure the voltage between pin 1 and pin 2.

REMARK

- If an abnormality occurs during measurement, failure codes [CA3713], [CA5115], [CA3562], and [CA3563] are displayed. If these failure codes are displayed, perform troubleshooting.
- If 24.5±1.5 V is measured within 900 seconds of “Remaining Permitted Test Time”, you can finish the measurement by pressing F2.

For standard values, see STANDARD VALUE TABLE, “STANDARD VALUE TABLE FOR MACHINE”.

FAILURE CODE [CA692]

(ALL-K-A96G-410-30-B)

Action level	Failure code	Failure	Intake Air Temperature Sensor Low Error (Engine controller system)
L01	CA692		
Details of failure	Low voltage occurs in signal circuit of intake air temperature sensor.		
Action of controller	Sets intake air temperature to fixed value (25 °C) for operation.		
Phenomenon on machine	None in particular		
Related information	• Mass air flow sensor and intake air temperature sensor are provided as a unit. • 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 “RELATED INFORMATION ON TROUBLESHOOTING”. 2. Turn starting switch to ON position.			
		If this failure code is cleared, wiring harness connector is defective.			
2	Defective intake air temperature sensor (internal defect)	1. Starting switch: OFF 2. Disconnect connector P55. 3. Starting switch: ON			
		If this failure code changes to failure code [CA691]. intake air temperature sensor is defective.			
		1. Starting switch: OFF 2. Disconnect connector P55 and connect T-adapter to male side.			
		Resistance	Between P55 (male) (3) and (4) Characteristic of intake temperature - resistance value	-30 °C	25 to 28 kΩ
				0 °C	5.5 to 6.1 kΩ
				25 °C	1.9 to 2.1 kΩ
				40 °C	1.1 to 1.2 kΩ
				100 °C	180 to 185 Ω
			Between P55 (male) (3) and ground (sensor body)	Entire area	Min. 100 kΩ
3	Ground fault in wiring harness (contact with ground circuit)	1. Starting switch: OFF 2. Disconnect connectors ECM J1 and P55, and connect T-adapter to either female side.			
		Resistance	Between ground and ECM J1 (female) (61) or P55 (female) (4)		Min. 100 kΩ

FAILURE CODE [CA3596]

(ALL-K-AFH0-410-30-B)

Action level	Failure code	Failure	AdBlue/DEF Pump Pressure Unstable Error (Engine controller system)
L01	CA3596		
Detail of failure	A failure of the AdBlue/DEF pump pressure sensor, clogging of each AdBlue/DEF hose, or AdBlue/DEF pump is found.		
Action of controller	Advances to Inducement strategy.		
Phenomenon on machine	Engine power deration according to inducement strategy.		
Related information	• The engine controller does not display this failure code during thawing control of the AdBlue/DEF supply system (AdBlue/DEF injection is disabled, which disables judgment). • Make sure that the value of the following 4 states are other than 1 (Thawing) 3 minutes after the engine is started. (This failure cannot be repaired until thawing control is completed) • The state of each heater is 1: Thawing, 2: Warming, or 0: OFF. (Enter the numbers directly and confirm the values on the monitoring code screen.) • 19305 AdBlue/DEF Tank Heating State 19306 AdBlue/DEF suction and purge line heater state 19307 AdBlue/DEF pressure line heater state 19308 AdBlue/DEF pump heater state • This failure code is cleared if the AdBlue/DEF pump pressure rises to around 900 kPa on the AdBlue/DEF pump “Pre-defined Monitoring screen”. • The “Pre-defined Monitoring screen” uses the AdBlue/DEF pump diagnosis. (The following numbers are the monitoring codes) • AdBlue/DEF pump diagnosis 19304 AdBlue/DEF pump state 19108 AdBlue/DEF Pump Pressure 19136 AdBlue/DEF Pump Temperature 19109 AdBlue/DEF Pump Pressure Sensor Voltage 19120 AdBlue/DEF Injection Quantity **NOTICE** **This failure code requires a inducement error and “Loaded Diagnostics Operation To Clear Failure Code”. After investigating the cause of the problem and completing the repair, perform a“Loaded Diagnostics Operation To Clear Failure Code” to make sure the failure code is cleared.(This failure code is not cleared by only turning starting switch to ON position.)**		

No.	Cause	Procedure, measuring location, criteria and remarks
1	Defective AdBlue/DEF pump system	If failure code [CA3558] or [CA3559] or [CA3571] or [CA3572] or [CA4169] or [CA4171] or [CA4249] or [CA4251] is displayed on the abnormality record screen, perform troubleshooting these first.
2	AdBlue/DEF pump pressure raise	Perform checks on causes 1 to 3 for failure code [CA3575]. (This failure code may be displayed with “[CA3575] AdBlue/DEF pump pressure high error”.)
3	AdBlue/DEF pump pressure drop	Perform checks on causes 1 to 10 for failure code [CA3574]. (This failure code may be displayed in place of “[CA3574] AdBlue/DEF pump pressure low error”.)
4	Defective AdBlue/DEF pressure sensor	AdBlue/DEF pump pressure sensor in AdBlue/DEF pump may be defective. Replace the AdBlue/DEF pump.

No.	Cause	Procedure, measuring location, criteria and remarks
2	Defective sensor power supply system	If failure code [CA1776] or [CA1777] is displayed, perform troubleshooting for [CA1776] or [CA1777] first.
3	Defective turbocharger outlet NOx sensor system (internal circuit abnormality)	If failure code [CA1885] or [CA3682] or [CA3718] is displayed, perform troubleshooting for these failure codes first.
4	Defective turbocharger outlet NOx sensor	If failure code is still displayed after above checks, the turbocharger outlet NOx sensor may be defective. (Offset/drift due to sulfur-poisoned turbocharger outlet NOx sensor) 1. Turn starting switch to OFF position. 2. NOx sensor fails, therefore, replace the turbocharger outlet NOx sensor. 3. Turn starting switch to ON position. 4. Perform “Loaded Diagnostics Operation To Confirm Failure Correction”.
5	Defective engine controller	If no failure is found by above checks, engine controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.)

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. (EU Specification)

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 safely to raise the exhaust temperature. (Keep the engine speed so that monitoring code 47300 “KDOC 1 Inlet Temperature” becomes 150 °C or higher. Check that monitoring code 19203 “Turbo Outlet NOx Sensor State” changes from 0 to 1).
4. Repair is completed if failure code is not displayed after 3 minutes has passed.

REMARK

If the turbocharger outlet NOx sensor does not activate (that is, 19203 “Turbo Outlet NOx Sensor State” remains as 0), return to troubleshooting.

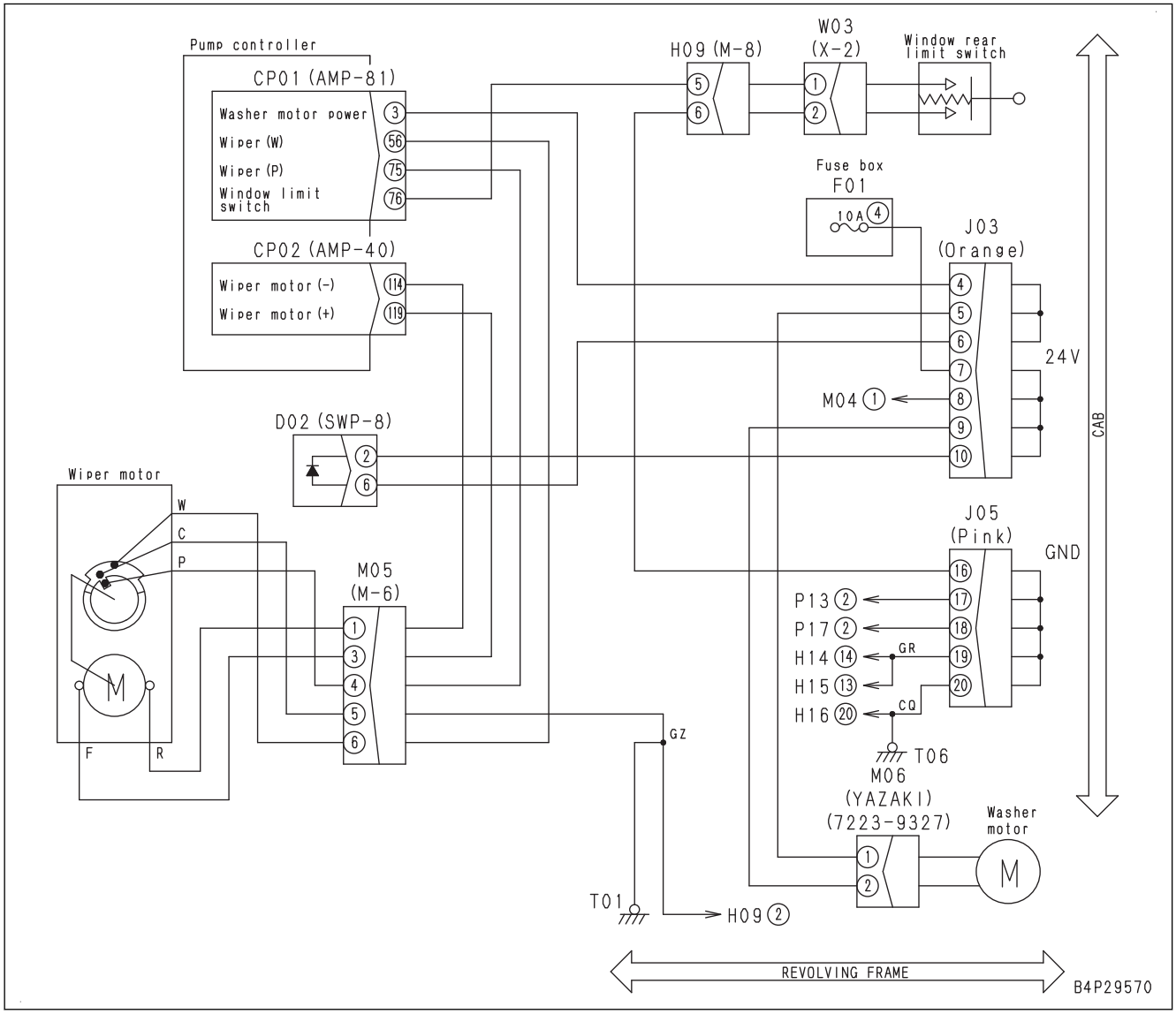
FAILURE CODE [DHSJMA]

(ALL-K-C6V7-410-00-B)

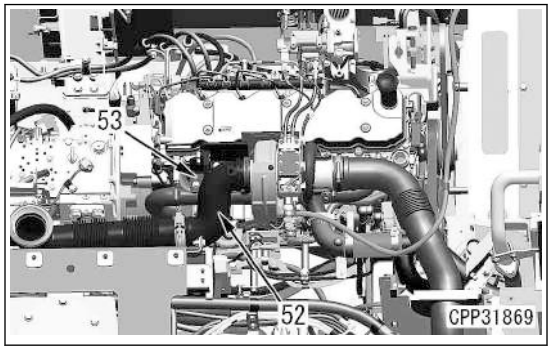
Action level	Failure code	Failure	Travel Reverse Right PPC Pressure Sensor Defective Function (Pump controller system)
L01	DHSJMA		
Detail of failure	Signal voltage of travel reverse right PPC pressure sensor circuit is 0.3 V or less or 4.5 V or above.		
Action of controller	Controls machine by regarding travel reverse right PPC pressure sensor as 0 MPa. If cause of failure disappears, machine becomes normal by itself.		
Phenomenon on machine	Auto-deceleration function cannot be reset. Poor operability of travel		
Related information	**REMARK** If 5 V circuit (3) and ground circuit (1) of pressure sensor are connected inversely, pressure sensor will break. Accordingly, take extreme care when checking. • As T-adapter for pump controller connector is “socket-type box”, operating voltage cannot be measured at pump controller connector. • Travel reverse right PPC pressure can be checked with monitoring function. (Code: 07105 Travel reverse right PPC pressure) • After repairing, check if the failure code is cleared by the following procedure. Procedure: Turn starting switch to ON position or start engine.		

No.	Cause	Procedure, measuring location, criteria and remarks			
1	Defective 5 V sensor power supply 1 system	If failure code [DA25KP] is also displayed, perform troubleshooting these first.			
		1. Turn starting switch to OFF position. 2. Disconnect connector P12, and connect T-adapter to female side. 3. Turn starting switch to ON position. If power supply voltage is abnormal, proceed to check on cause 3.			
		Voltage	Between P12 (female) (3) and (1)	Power supply	4.5 to 5.5 V
2	Defective travel reverse right PPC pressure sensor (Internal defect)	1. Turn starting switch to OFF position. 2. Insert T-adapter into connector P12. 3. Turn starting switch to ON position.			
		Voltage	Between P12 (2) and (1)	Sensor output	0.5 to 4.5 V
		REMARK If power supply voltage is normal and sensor output voltage is abnormal, it is difficult to judge whether cause of failure is defective sensor, ground fault or hot short circuit in wiring harness. Check as below. 1. Turn starting switch to OFF position. 2. Interchange connector P12 with connector of another PPC pressure sensor. 3. Turn starting switch to ON position and display the Electrical Sys Abnormality Record screen of machine monitor. 4. If E mark is not displayed again in this failure code column, Travel Reverse Right PPC Press sensor is defective. **REMARK** After finishing test, restore connector.			

Circuit diagram related to wiper



62. Install hose (54).
63. Install bracket (53).



64. Install tube (52) with V-clamp by using tool A12 (long socket).

NOTICE

Although the V-clamp is reusable, replace it with a new one when it is under the following condition.

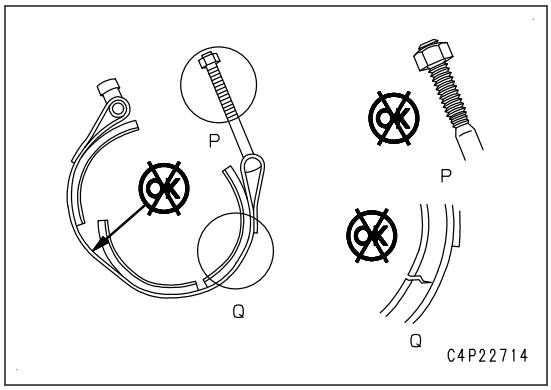
- **V-clamp is deformed.**
- **Threads of T-bolt are crushed.**
- **V-groove is cracked.**
- **V-groove is flaked.**

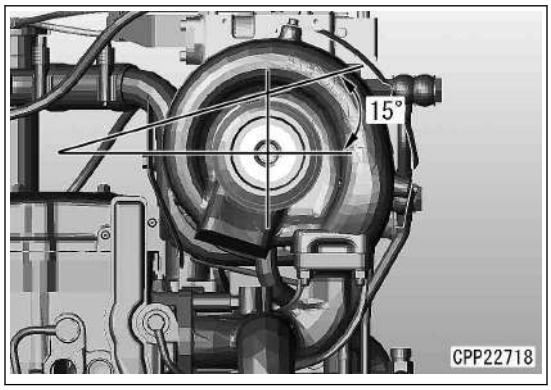
Width across flats of V-clamp fastening nut: 7/16 inch. (11.1 mm)

V-clamp fastening bolt:
13.6±0.5 Nm {1.38±0.05 kgm}

NOTICE

V-clamp mounting angle: 15 °



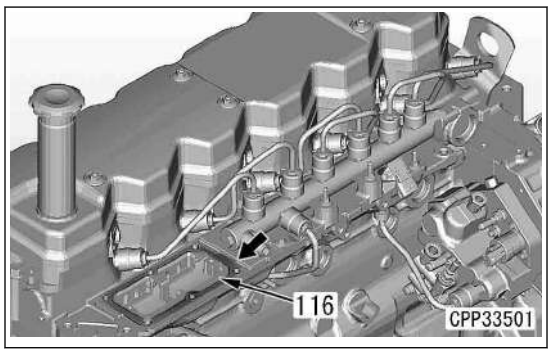


EGR valve

65. Install gasket (116).

REMARK

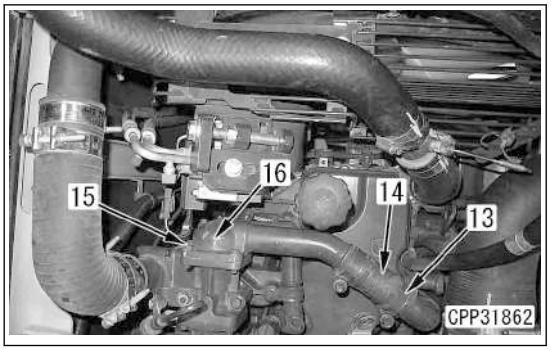
When installing gasket, be careful about direction of part number tag.



83. Install hose (14) with hose clamp (13).

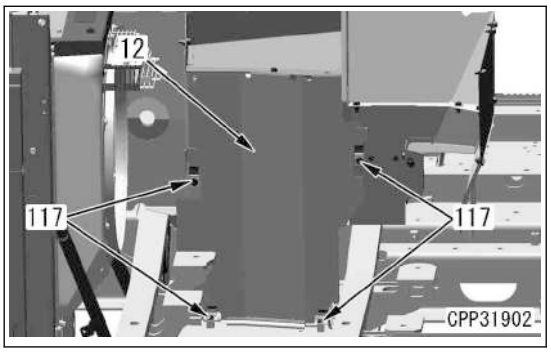
    Hose clamp:
    10.5±0.5 Nm {1.1±0.05 kgm}

84. Install KCCV assembly. For details, see “REMOVE AND INSTALL KCCV ASSEMBLY”.

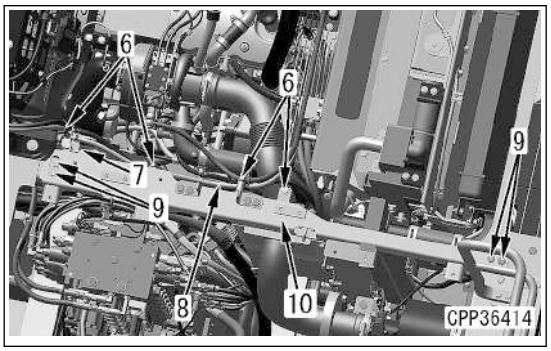


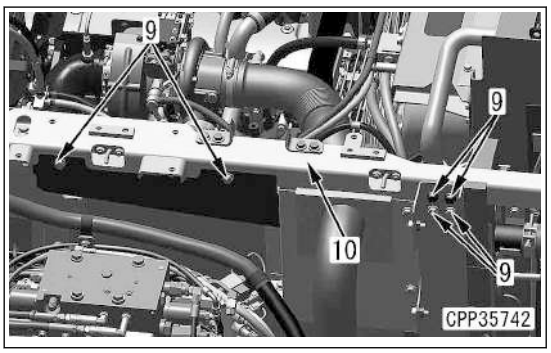
85. Install cover (12).

    Insert cover (12) into the position of clip (117), and tighten it with the mounting bolt.

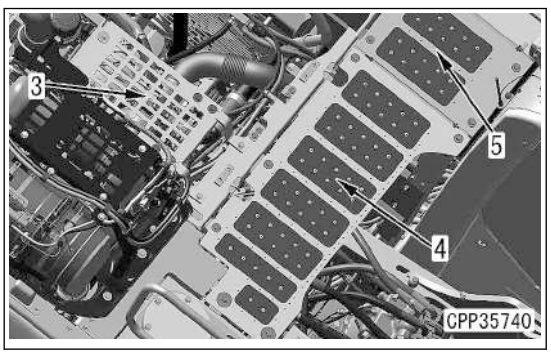


86. Install frame (10) with mounting bolts (9) (10 pieces).
87. Install bracket (7).
88. Install AdBlue/DEF hose (8).
89. Install clips (6) (4 places).





90. Install step (3), and covers (4) and (5).
91. Install KDPF and SCR assembly. For details, see “REMOVE AND INSTALL KDPF-SCR ASSEMBLY”.
92. Install the engine hood assembly. For details, see “REMOVE AND INSTALL ENGINE HOOD ASSEMBLY”.

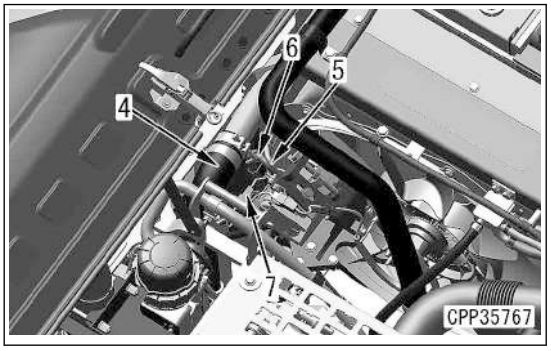


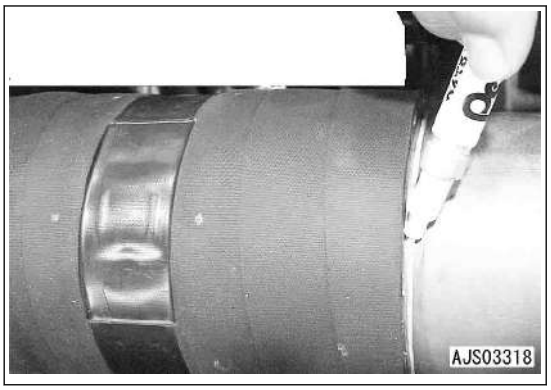
Air hose

3. Remove air hose (4).

   REMARK

   Make matchmarks on the hose end and tube so that they can be reconnected correctly.





Air conditioner hose

4. Disconnect air conditioner hoses (5) and (6) (2 pieces).

   REMARK

   - Plug the hoses to prevent any dirt, dust and water from entering.
   - Be careful not to damage or lose O-ring.

Air conditioner compressor solenoid clutch connector

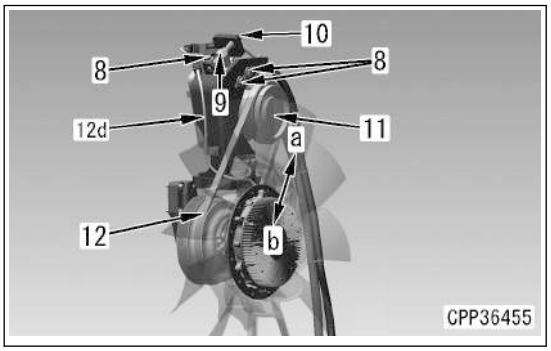
5. Disconnect connector AC03 (7).

Air conditioner compressor belt

6. Remove air conditioner compressor belt (12) according to the following procedure.
   1) Loosen bolts (8) (3 pieces).
   2) Loosen lock nut (9).
   3) Rotate jack bolt (10) and slide air conditioner compressor assembly (11) in direction (b) in which the compressor is loosened.
   4) Reduce the tension of air conditioner compressor belt (12) to remove it.

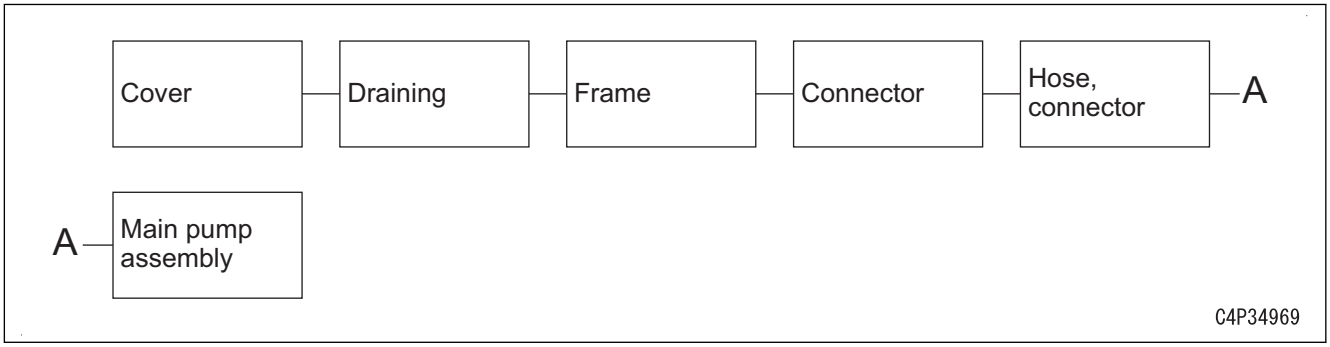
      NOTICE

      Take care not to damage wiring harness (12d) of the fan clutch.



REMOVE AND INSTALL MAIN PUMP ASSEMBLY

(PC220_11-K-C200-924-00-B)



Tools for removal and installation of main pump assembly

Symbol	Part No.	Part name	Necessity	Q'ty	New/Redesign	Sketch	Remarks
A	796-460-1210	Oil stopper	●	1			
B	796-770-1320	Adapter	●	1			

⚠ Place the machine on a level ground, and swing the upper structure 45 ° to the right.

⚠ Place the machine on a level ground, lower the work equipment to the ground so that it is stable, and set the lock lever to LOCK position, and then stop the engine.

⚠ 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".)

⚠ Operate the work equipment lock lever to LOCK position.

⚠ Release the remaining pressure in the hydraulic circuit referring to TESTING AND ADJUSTING, "RELEASING REMAINING PRESSURE FROM HYDRAULIC SYSTEM".

NOTICE

- **Fit a plug or flange in the place where a hydraulic hose is disconnected to prevent oil from flowing out.**
- **Write down the connector numbers and installed positions before disconnecting electric wiring harnesses and hoses.**

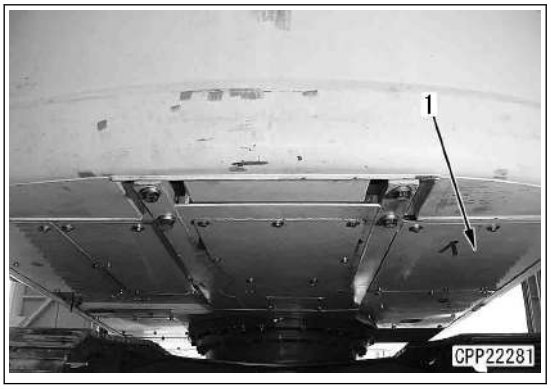
METHOD FOR REMOVING MAIN PUMP ASSEMBLY

(PC220_11-K-C200-520-00-B)

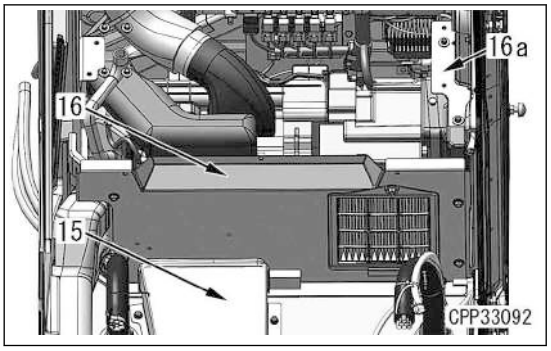
1. Remove KDPF and SCR assembly. For details, see "REMOVE AND INSTALL KDPF, SCR ASSEMBLY".

Cover

2. Remove undercover (1).



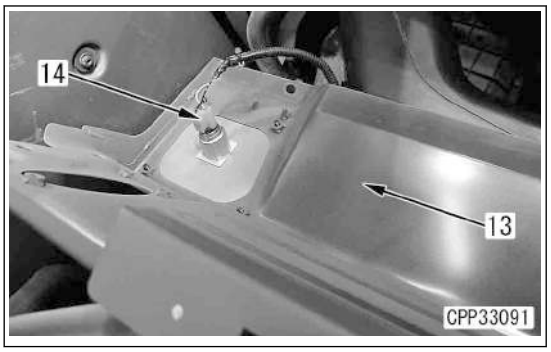
15. Install cover (16) (3 bolts) and bracket (16a) (2 bolts).
16. Install duct (15) (2 bolts).



Box, Cover

17. Connect connectors (14) connected to the back of cover (13).

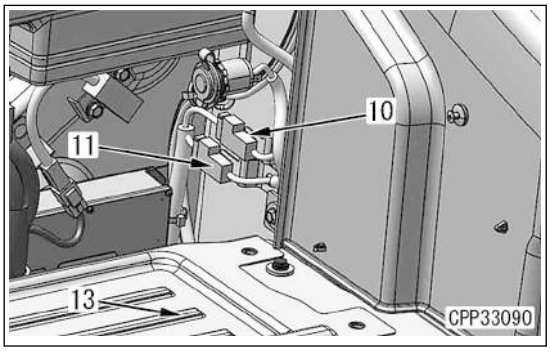
    Connector (14): Cigarette lighter M04



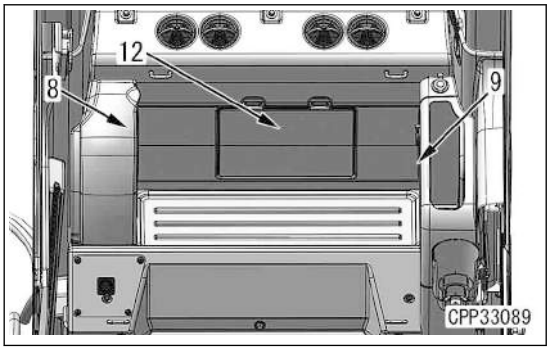
18. Install cover (13) (7 bolts).
19. Install cover (12) (3 bolts).
20. Install box (9) (3 bolts) while paying attention to connectors (10) and (11) which are connected to the back side of box (9).

    Connector (10): 12 V power socket intermediate harness M13A

    Connector (11): 12 V power socket intermediate harness M13A



21. Connect the hose connected to the bottom of box (8).
22. Install box (8) (5 bolts).



Front window

23. Install floor mat (3).
24. Install front lower window (2).
25. Release the lock, and lower front window assembly (1) from the ceiling.