

Shop Manual

HYDRAULIC
EXCAVATOR

PC500LC-10R

SERIAL NUMBERS 100001 and up

KOMATSU

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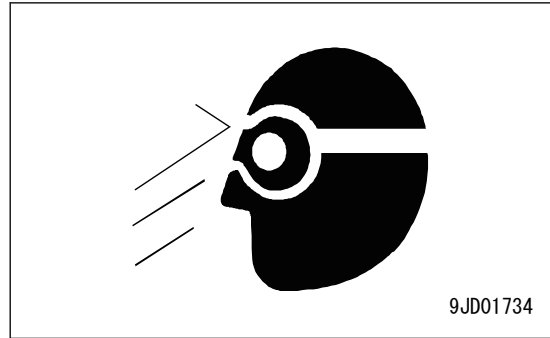
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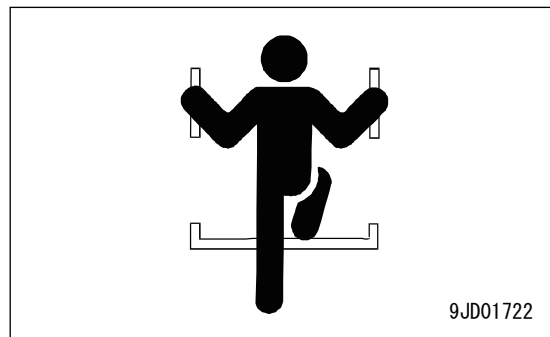
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- Always wear the protective eyeglasses when hitting parts with a hammer.
- Always wear the protective eyeglasses when grinding parts with a grinder, etc.
- When performing any operation with multiple workers, always agree on the operating procedure before starting. Be clear in verbal communication, and observe hand signals. Hang "UNDER REPAIR" warning tag in the operator's compartment Before starting work.
- Work and operation which require license or qualification should be performed by qualified workers.
- Welding repairs should be performed by trained and experienced welders. When performing welding work, always wear welding gloves, apron, welding goggles, cap and other clothes suited for welding work.
- Warm up before starting the work with exercise which increases alertness and the range of motion in order to prevent injury.
- Avoid prolonged work, and take a rest at times to keep up a good condition. Take a rest at designated safe area.



Precautions for preparatory work

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



Precautions during work

- For the machine with the battery disconnect switch, check before starting the work that the system operating lamp is not lit. Then, turn the battery disconnect switch to OFF (○) position.

REMARK

Remove the key after it is turned to OFF (○) position if the battery disconnect switch is a switch key type. For the machine without the battery disconnect switch, turn the starting switch to OFF position, wait for two minutes or more before starting the work. Disconnect the battery cable by starting from the negative (-) terminal first.

- For the machine with the quick release battery terminal (-), check before starting the work that the system operating lamp is not lit. Then, disconnect the quick release battery terminal (-).

REMARK

For the machine without the system operating lamp, turn the starting switch to OFF position, wait for two minutes or more before starting the work. Disconnect the quick release battery terminal (-).

DISCONNECT AND CONNECT PUSH-PULL TYPE COUPLER

REMARK

- Loosen the oil filler cap of the hydraulic tank slowly to release the remaining pressure in the hydraulic tank.
- Provide an oil container to receive oil since some hydraulic oil flows out when the hose is disconnected even after the remaining pressure is released from the hydraulic tank.

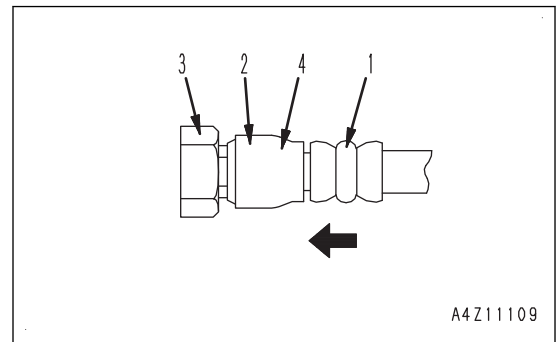
METHOD FOR DISCONNECTING AND CONNECTING TYPE 1 PUSH-PULL TYPE COUPLER

Disconnection

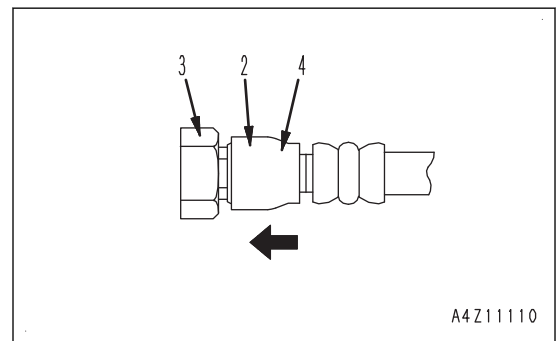
1. Hold adapter (1), and push hose joint (2) into mating adapter (3).

REMARK

- Push it in approximately 3.5 mm.
- Do not hold rubber cap portion (4).



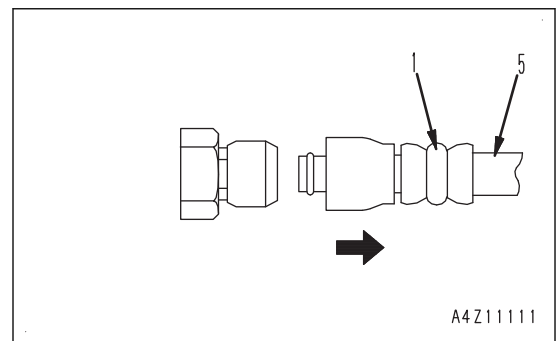
2. While having adapter (3) inserted into hose side joint (2), insert rubber cap (4) to adapter (3) side until it clicks.



3. Hold hose adapter (1) or hose (5), and pull it out.

REMARK

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



Connection

1. Hold hose adapter (1) or hose (5), and insert it in mating adapter (3), aligning the axis.

REMARK

Do not hold rubber cap portion (4).

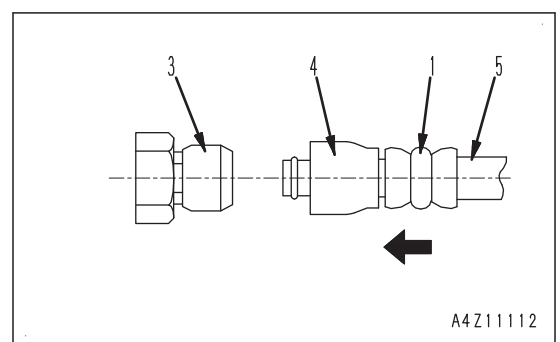
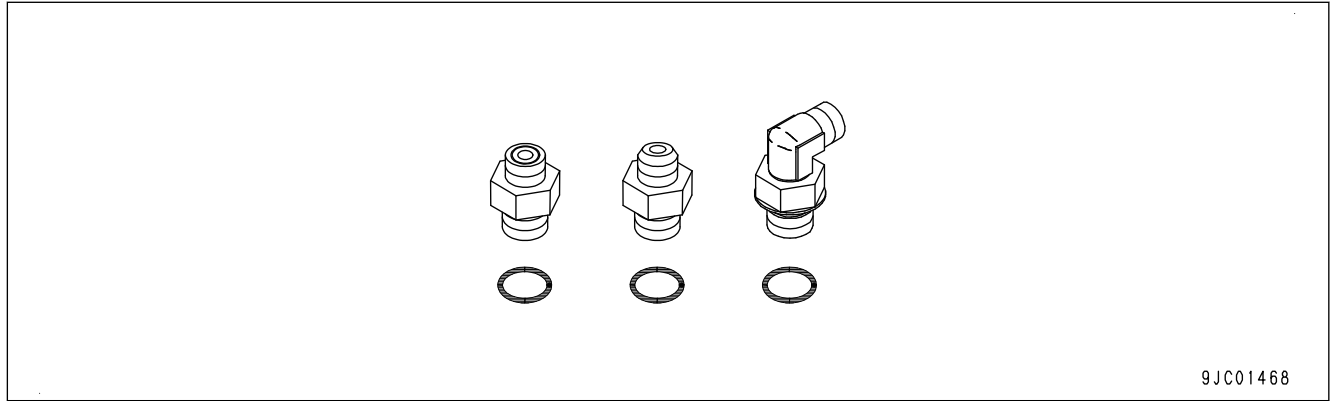


Table of tightening torque for O-ring boss piping joints

REMARK

Tighten the pipe joint for O-ring boss to the torque shown in the table below unless otherwise specified.



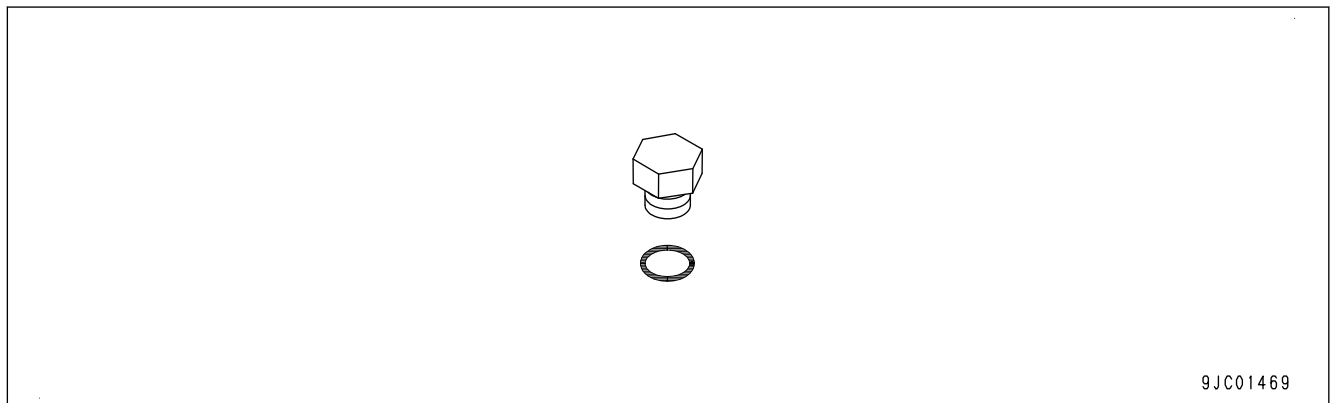
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Nominal No.	Thread diameter (mm)	Width across flats (mm)	Tightening torque (Nm {kgfm})	
			Range	Target
02	14	Varies depending on type of connector.	35 to 63 {3.5 to 6.5}	44 {4.5}
-	18		59 to 98 {6.0 to 10.0}	78 {8.0}
03, 04	20		84 to 132 {8.5 to 13.5}	103 {10.5}
05, 06	24		128 to 186 {13.0 to 19.0}	157 {16.0}
10, 12	33		363 to 480 {37.0 to 49.0}	422 {43.0}
14	42		746 to 1010 {76.0 to 103}	883 {90.0}

Table of tightening torque for O-ring boss plugs

REMARK

Tighten the plug for O-ring boss to the torque shown in the table below unless otherwise specified.



9JC01469

Nominal No.	Thread diameter (mm)	Width across flats (mm)	Tightening torque (Nm {kgfm})	
			Range	Target
08	8	14	5.88 to 8.82 {0.6 to 0.9}	7.35 {0.75}
10	10	17	9.8 to 12.74 {1.0 to 1.3}	11.27 {1.15}
12	12	19	14.7 to 19.6 {1.5 to 2.0}	17.64 {1.8}
14	14	22	19.6 to 24.5 {2.0 to 2.5}	22.54 {2.3}
16	16	24	24.5 to 34.3 {2.5 to 3.5}	29.4 {3.0}

Machine model	Unit	PC500LC-10R
Type	-	4-cycle, water-cooled, in-line, vertical, and direct injection type with turbocharger and air-cooled aftercooler
No. of cylinders - bore x stroke	mm	6-125 x 150
Total piston displacement	ℓ {cc}	11.045 {11045}
Performance		
Rated horsepower		
• Gross (SAE J1995)	kW {HP} /min ⁻¹ {rpm}	270{362}/1900{1900}
• ISO 14396		270{362}/1900{1900}
• Net (ISO 9249/SAE J1349)		269{360}/1900{1900}
Maximum torque	Nm {kgfm} /min ⁻¹ {rpm}	1510{154}/1400{1400}
Max. speed with no load		
• When mounted on machine (*3)	min ⁻¹ {rpm}	1770±50 {1770±50}
• As a bare engine		1930±50 {1930±50}
Min. speed with no load	min ⁻¹ {rpm}	1000±25 {1000±25}
Min. fuel consumption ratio	g/kWh {g/HPh}	209 {156}
Starting motor		24 V, 11 kW
Alternator		24 V, 60 A
Battery (*4)		12 V, 140 Ah x 2 pieces
Radiator type		Corrugated aluminum, 4 lines

*3: Indicates when swing is locked.

*4: The battery capacity (Ah) is indicated in the 5-hour rate.

REMARK

The engine rated horsepower is indicated in the net value and gross value. Gross denotes the rated horsepower measured on the basic engine unit while net denotes the value measured of an engine under the condition nearly the same as that when it is installed on a machine.

Undercarriage

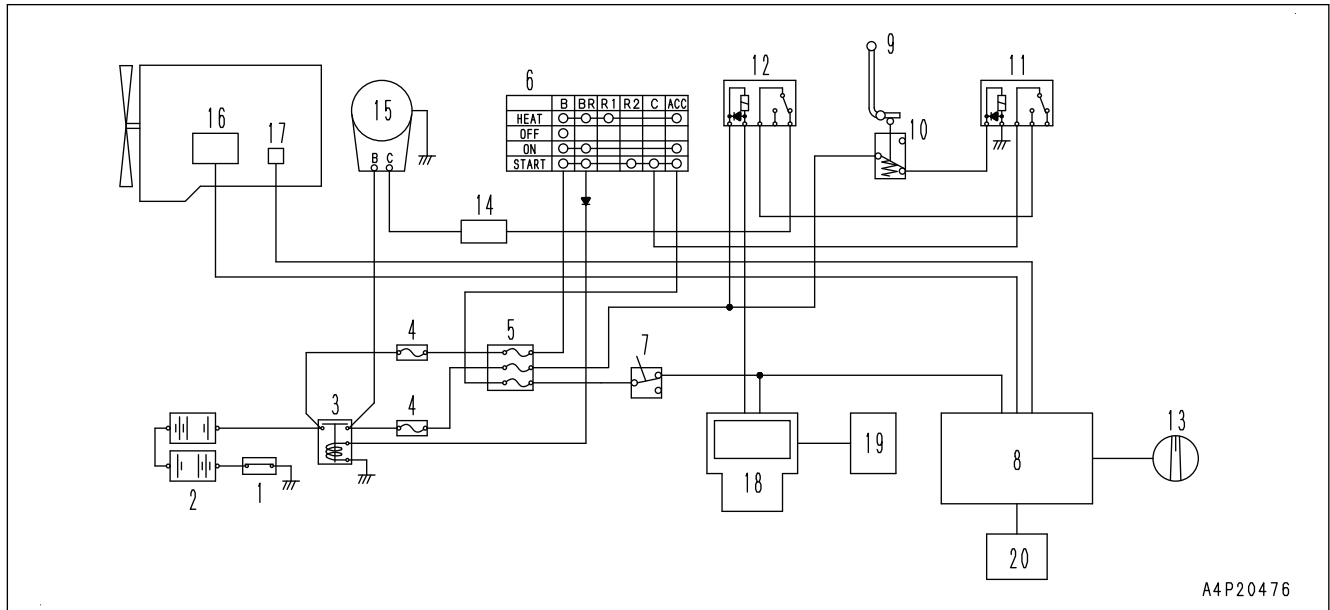
Carrier roller		2 pieces on one side
Track roller		8 pieces on one side
Track shoe		Assembly type triple grouser shoe, 49 pieces on one side

Hydraulic system

Main pump		
Type x quantity	-	Variable displacement piston type x 1 pieces
Discharged volume	ℓ/min	347 x 2
Set pressure	MPa {kgf/cm ² }	37.2 {380}
Control valve		
Type x quantity		7-spool + 1-spool type: 1 piece
Operating method		Hydraulically operated type

FUNCTION OF ENGINE CONTROL SYSTEM

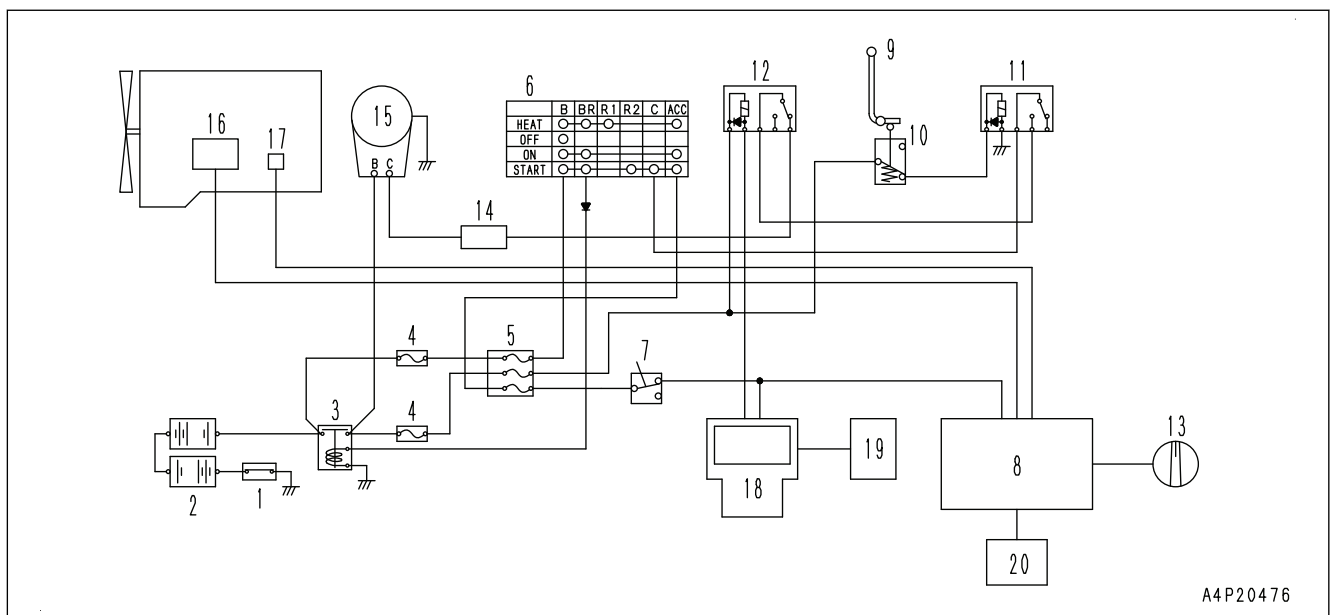
Mechanism and function of engine starting system



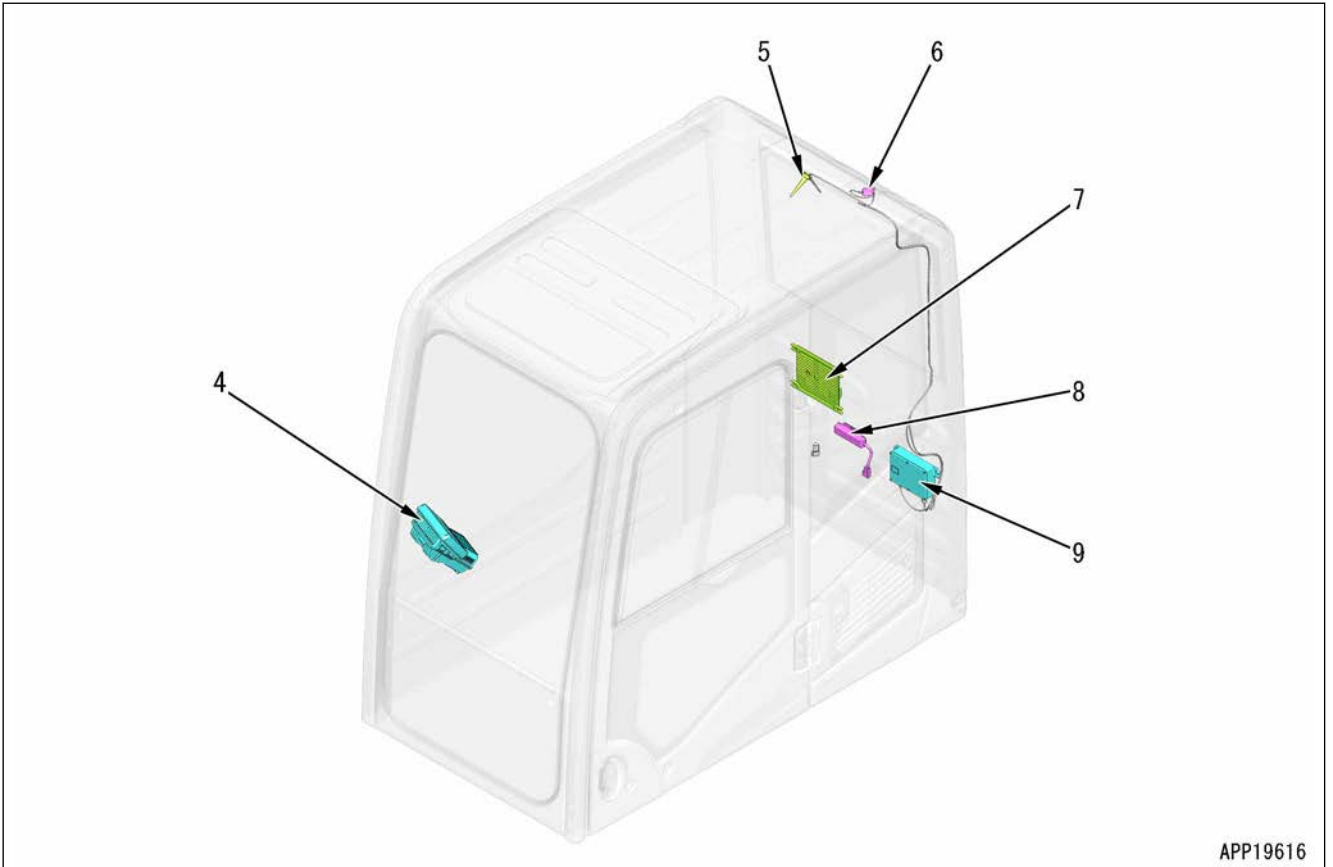
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- When starting switch (6) is turned to ON position, engine controller (8) sends a command current to fuel supply pump (16).
Accordingly, a fail-safe mechanism is provided, that is, the engine stops when the electrical system has trouble.
- When starting switch (6) is turned to START position while lock lever (9) is in LOCK position, the starting current is supplied to starting motor (15) and the engine starts.
If lock lever (9) is in FREE position, starting motor cut-off relay (11) operates to cut off the starting current to starting motor (15) and the engine does not start, that is, a neutral safety mechanism.
- Upon receipt of the engine cut-off command from the external source, KOMTRAX terminal (19) sends the signal to machine monitor (18).
Machine monitor (18) operates starting motor cut-off relay (12) to cut off the starting current to starting motor (15), thus the engine does not start.

Mechanism and function of engine speed control system



A4P20476



4: Machine monitor

5: Communication antenna

6: GPS antenna

7: Pump controller

8: Resistor for PC-EPC valve

9: KOMTRAX terminal

Pin No.	Signal name	Input and output signals
118	Solenoid power supply	Input
119	Wiper motor (+)	Output
120	GND (solenoid)	Input
121	Solenoid power supply	Input

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

*2: Proportional lever specification only

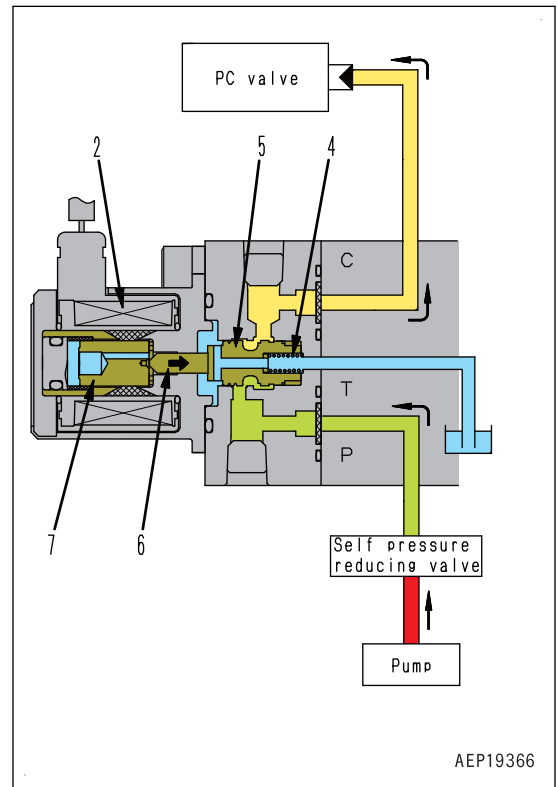
*3: Only for attachment control specification

The pressurized oil is discharged from the large diameter (right) side of the servo piston (9) so that the LS differential pressure (ΔPLS) is equal to the set pressure. Consequently, the pump swash plate angle and the discharged volume increase.

- IMF: Front pump PC mode selector current
- IMR: Rear pump PC mode selector current
- ISIG: LS set pressure selector current
- PAF: Front pump discharge port
- PAR: Rear pump discharge port
- PBR: Rear pump pressure input port
- PBF: Front pump pressure input port
- PD1F: Air bleeder
- PD1R: Case drain port
- PD2F: Drain plug
- PD2R: Drain plug
- PENF: Front pump control pressure pickup port
- PENR: Rear pump control pressure pickup port
- PEPC: EPC source pressure input port
- PEPB: EPC source pressure pickup port
- 1: Front pump
- 2: LS-EPC valve
- 3: Front pump PC-EPC valve
- 4: Rear pump PC-EPC valve
- 5: Rear pump
- PFC: Front pump discharged pressure pickup port
- PLSF: Front pump load pressure input port
- PLSFC: Front pump load pressure pickup port
- PLSR: Rear pump load pressure input port
- PLSRC: Rear pump load pressure pickup port
- PMF: Front pump PC mode selector pressure pickup port
- PMR: Rear pump PC mode selector pressure pickup port
- PRC: Rear pump discharged pressure pickup port
- PS: Pump suction port
- PSIG: LS set selector pressure pickup port
- OCP: Oil level check port
- BMP: Oil filler port
- 6: Rear pump PC valve
- 7: Rear pump LS valve
- 8: Front pump LS valve
- 9: Front pump PC valve

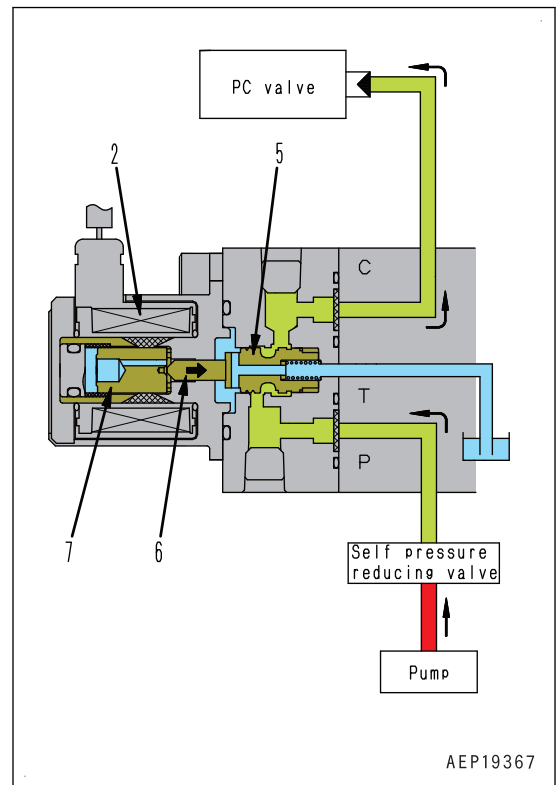
When signal current from pump controller is low (coil energized)

1. When low signal current flows through coil (2), coil (2) is energized, and the thrust force to the right is generated in plunger (7).
2. Rod (6) pushes spool (5) to the right, and the pressurized oil from port (P) flows to port (C).
3. When the pressure in port (C) increases, the total of the force acting on the surface of spool (5) and the reaction force of spring (4) becomes larger than the thrust of plunger (7).
4. Spool (5) is pushed to the left, and port (P) and port (C) are disconnected.
5. Port (C) is connected to port (T).
6. Spool (5) so moves that the thrust of plunger (7) is balanced with the total of the pressure in port (C) and the reaction force of spring (4).
7. The circuit pressure between the EPC valve and the PC valve is controlled in proportion to the amperage of the signal current.



When signal current from pump controller is maximum (coil energized)

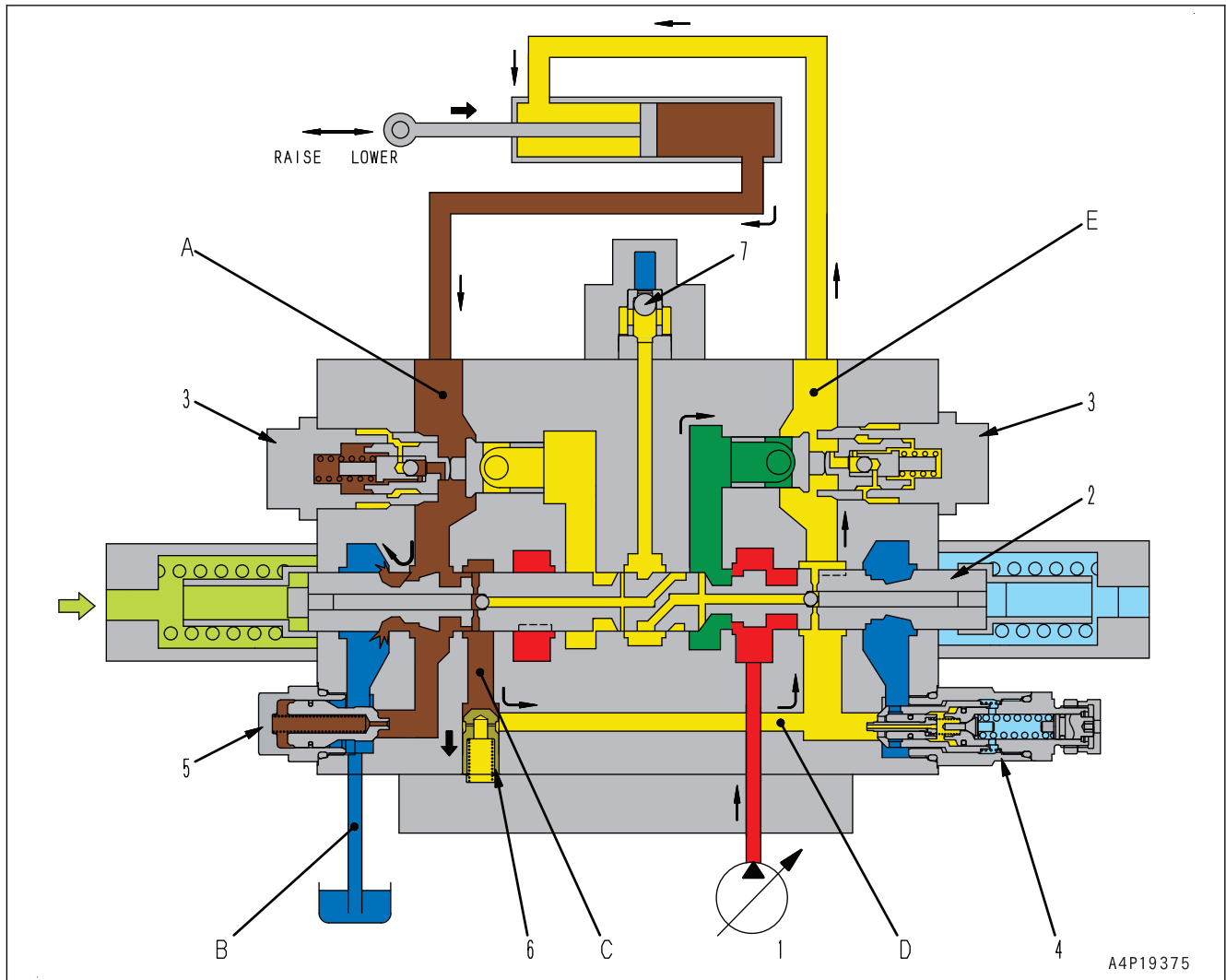
1. When signal current flows through coil (2), coil (2) is energized. Since the signal current is maximum at this time, the thrust force of plunger (7) also becomes the maximum.
2. Spool (5) is pushed to the right by spring (6).
3. The pressurized oil flows from port (P) to port (C) at the maximum rate, and the circuit pressure between the EPC valve and PC valve is maximized.
4. The pressurized oil does not flow to the tank since the port (T) is closed.



BOOM REGENERATION CIRCUIT OF CONTROL VALVE

FUNCTION OF BOOM REGENERATION CIRCUIT OF CONTROL VALVE

When the cylinder head pressure is lower than the bottom pressure (when hydraulic drift, etc.)



- 1: Main pump
- 2: Boom valve spool
- 3: Pressure compensation valve
- 4: Suction safety valve
- 5: Suction valve
- 6: Check valve
- 7: LS shuttle valve

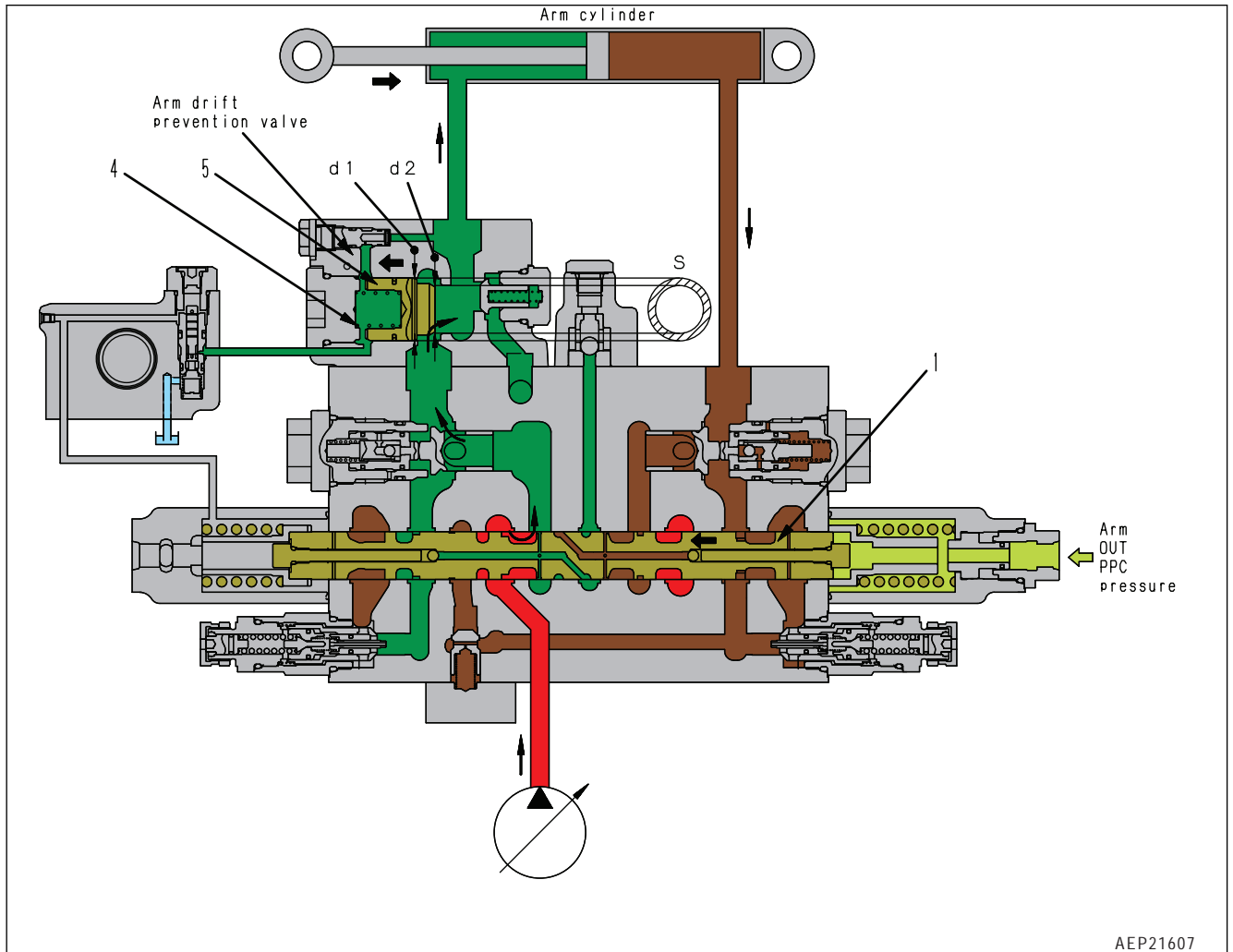
When the boom is lowered, a regeneration circuit is formed from the cylinder bottom to the cylinder head to increase the oil flow to the cylinder head.

ARM HYDRAULIC DRIFT PREVENTION VALVE OF CONTROL VALVE

(Machine with arm hydraulic drift prevention valve)

FUNCTION OF ARM HYDRAULIC DRIFT PREVENTION VALVE OF CONTROL VALVE

(if equipped)



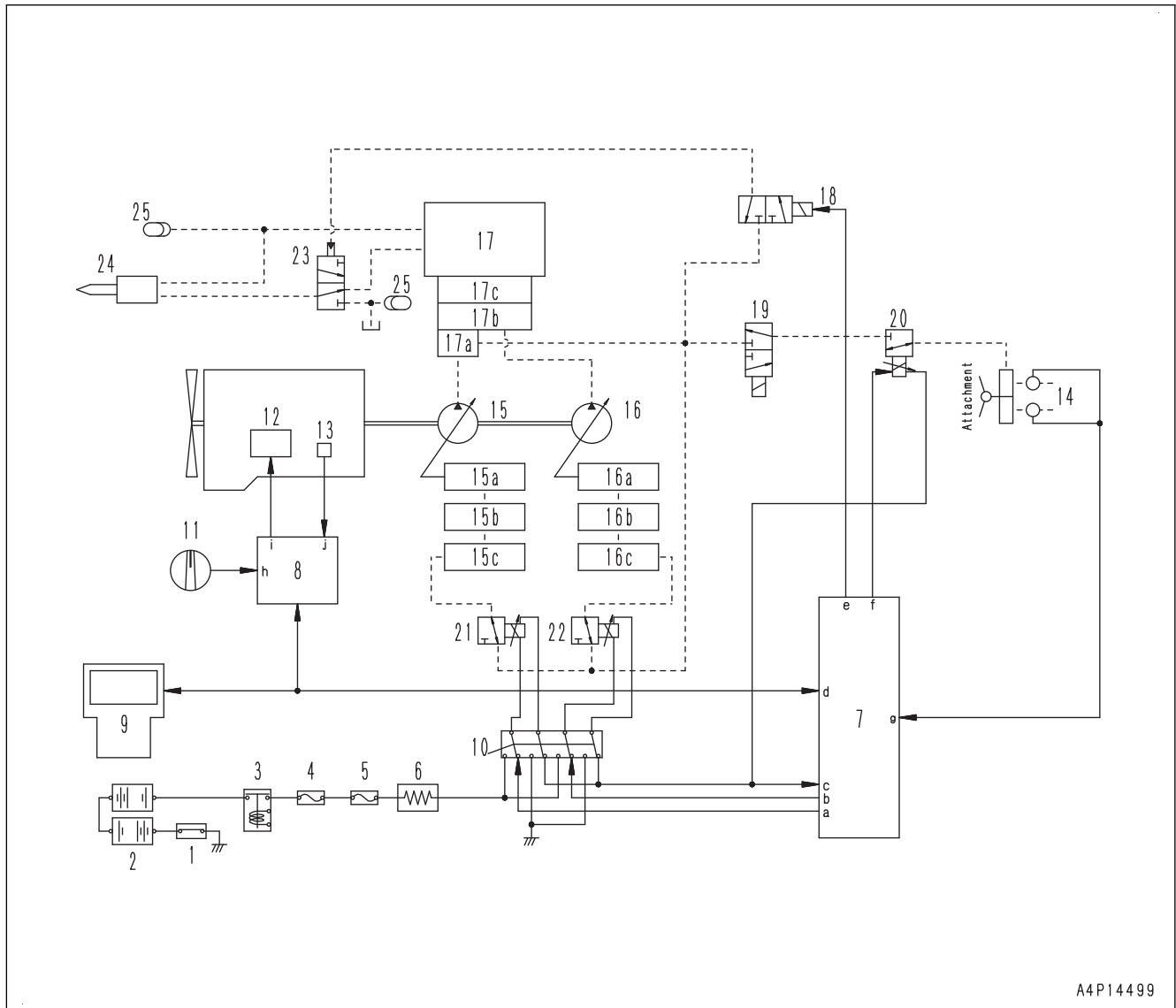
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When the arm is not operated with the L.H. work equipment control lever, this function is used to prevent the pressurized oil in the arm cylinder head from leaking through spool (1) and causing arm hydraulic drift.

OIL FLOW ADJUSTER SYSTEM FOR ATTACHMENT

OIL FLOW ADJUSTER SYSTEM DIAGRAM FOR ATTACHMENT

(Machines ready for installation of attachment)



A4P14499

Input and output signals

- a: Front pump PC-EPC valve drive signal
- b: Rear pump PC-EPC valve drive signal
- c: Solenoid valve GND
- d: CAN signal
- e: Attachment selector solenoid valve drive signal

f: Attachment flow adjustment EPC valve drive signal

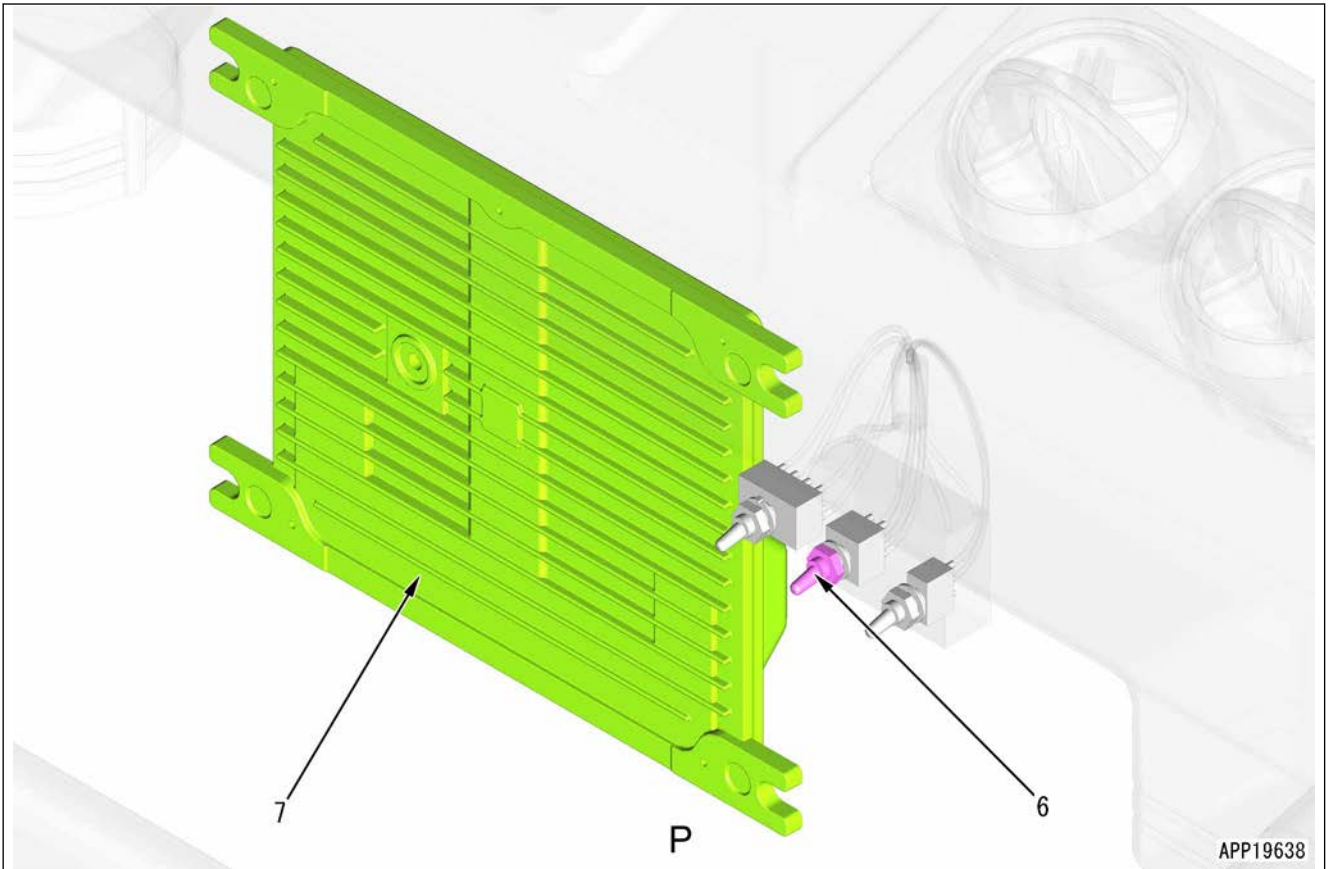
- g: Oil pressure switch signal
- h: 1st throttle signal
- i: Fuel supply pump control signal
- j: Various sensor signals

- 1: Battery disconnect switch
- 2: Battery
- 3: Battery relay
- 4: Fusible link
- 5: Fuse box
- 6: Resistor for PC-EPC valve
- 7: Pump controller

- 8: Engine controller
- 9: Machine monitor
- 10: Pump secondary drive switch
- 11: Fuel control dial
- 12: Fuel supply pump
- 13: Various sensors
- 14: Oil pressure switch

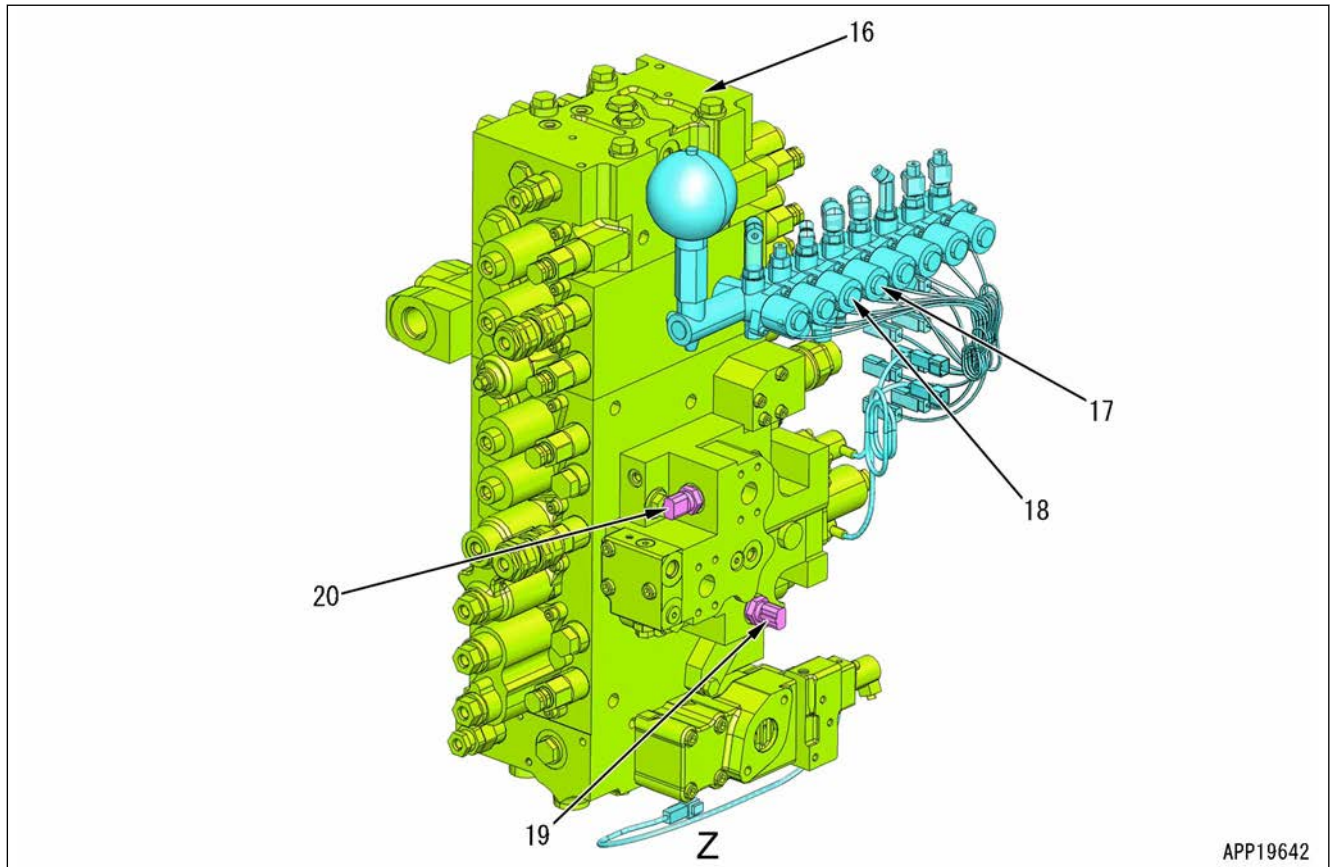
- 1: Machine monitor
- 2. R.H. work equipment PPC valve
- 3: Swing lock switch

- 4: L.H. work equipment PPC valve
- 5: Attachment PPC valve



6: Swing parking brake cancel switch

7: Pump controller



16: Control valve

17: Travel speed increase solenoid valve

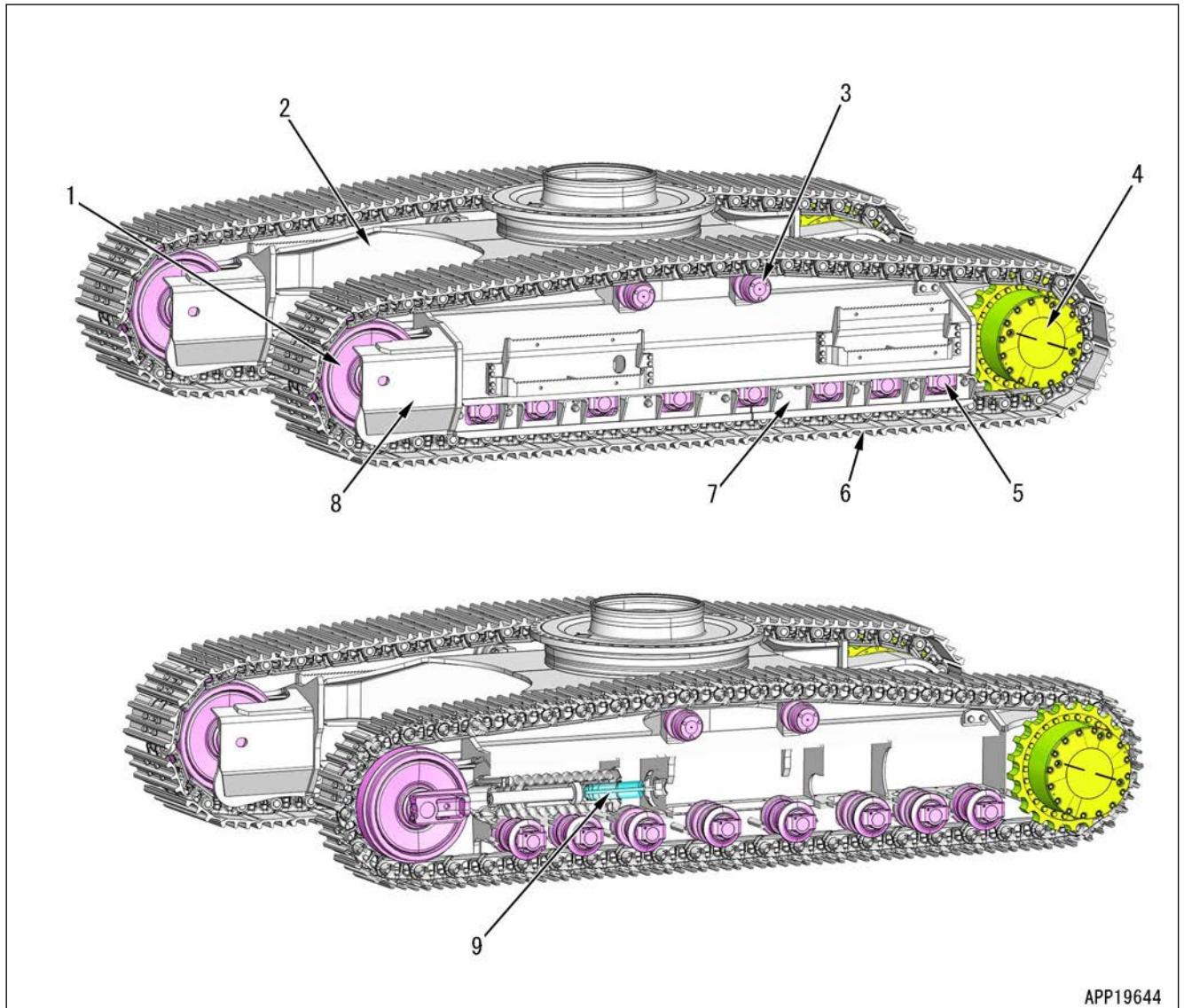
18: Travel junction solenoid valve

19: Rear pump oil pressure sensor

20: Front pump oil pressure sensor

UNDERCARRIAGE AND FRAME

LAYOUT DRAWING OF UNDERCARRIAGE



APP19644

1: Idler

2: Track frame

3: Carrier roller

4: Final drive

5: Track roller

6: Track shoe

7: Roller guard

8: Front guard

9: Idler cushion

SPECIFICATIONS OF UNDERCARRIAGE

Number of track rollers (one side)

8 pieces

Standard shoe

Shoe width: 600 mm

Link pitch: 228.6 mm

Number of shoes (each side): 49 pieces

Machine model			PC500LC-10R	
Engine			SAA6D125E-5	
Item	Measurement condition	Unit	Standard value for new machine	Repair limit
LS-EPC valve outlet pressure (PSIG)	<ul style="list-style-type: none"> Hydraulic oil temperature: 45 to 55 °C Fuel control dial: MAX (High idle) position Working mode: P (Power Mode) Travel control lever: Fine control 	Travel speed: Lo	Approx. 2.9 {30}	Approx. 2.9 {30}
		Travel speed: Hi	MPa {kgf/cm ² }	0 {0}
Solenoid valve outlet pressure	<ul style="list-style-type: none"> Hydraulic oil temperature: 45 to 55 °C Fuel control dial: MAX (High idle) position For energized/De-energized conditions of solenoid, see "TESTING AND ADJUSTING, TEST OUTLET PRESSURE OF SOLENOID VALVE". 	OFF (de-energized)	0 {0}	0 {0}
		ON (energized)	MPa {kgf/cm ² }	2.84 to 3.43 {29 to 35}
PPC valve outlet pressure	<ul style="list-style-type: none"> Hydraulic oil temperature: 45 to 55 °C Fuel control dial: MAX (High idle) position Working mode: P (Power Mode) 	Each control lever and control pedal: NEUTRAL	0 {0}	0 {0}
		Each control lever and control pedal: Stroke end	MPa {kgf/cm ² }	2.9 (+0.6/-0.2) {30 (+5.5/-1.5)}

Swing

Machine model			PC500LC-10R	
Engine			SAA6D125E-5	
Item	Measurement condition	Unit	Standard value for new machine	Repair limit
Overrun when stopping swing	<ul style="list-style-type: none"> Hydraulic oil temperature: 45 to 55 °C Fuel control dial: MAX (High idle) position Working mode: P (Power Mode) Overswing of swing circle after 1 swing Measuring posture: See "Machine posture and procedure for measuring performance", "Fig. 2". 	Deg.	140 or less	170 or less

Tools for testing swing circle bearing clearance

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

Tools for testing track shoe tension

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

Testing tools for releasing remaining pressure from hydraulic system

Symbol	Part No.	Part name	Q'ty	Remarks
A	208-62-22550	Hose	1	Hose inside diameter 6 mm
B	Commercially available	Oil container	1	
C	208-62-22540	Flange	5	Size: 10
D	208-62-22470	Bleeder	5	
E	208-62-22490	Cap	5	

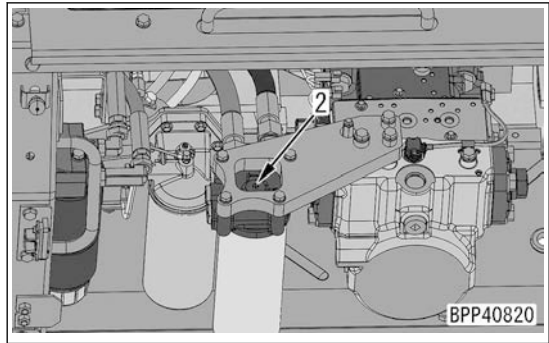
Tools for testing and adjusting oil pressure in work equipment, swing, and travel circuits

Symbol	Part No.	Part name	Q'ty	Remarks	
A	-	799-101-5002	Hydraulic tester	1	
	1	799-101-5110	Gauge	1	Pressure range 60 MPa
	2	799-101-5130	Gauge	1	Pressure range 6 MPa
B	-	790-261-1205	Digital hydraulic tester	1	Pressure range 70 MPa
C	799-101-5220	Nipple	2	Size M10x1.25 mm	
D	07002-11023	O-ring	2		
E	Commercially available	Pin	1	Size: ϕ 200x80	
F	Commercially available	Plate	1	Size: 250x260x32	

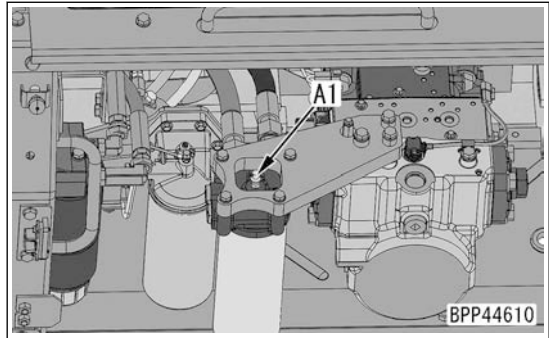
Tools for testing and adjusting oil pressure in control circuit

Symbol	Part No.	Part name	Q'ty	Remarks	
A	-	799-101-5002	Hydraulic tester	1	
	1	799-101-5130	Gauge	1	Pressure range 6 MPa
B	-	790-261-1205	Digital hydraulic tester	1	Pressure range 70 MPa
C	799-101-5220	Nipple	1	Size: M10 x 1.25 mm	
D	07002-11023	O-ring	1		

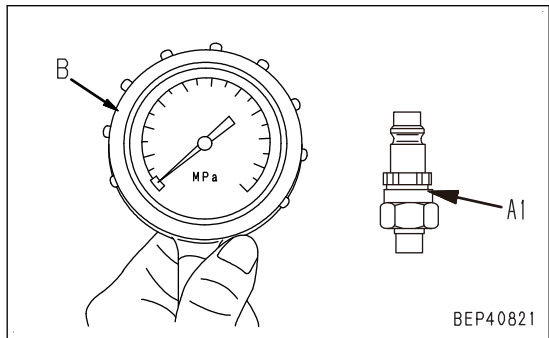
- Remove the oil pressure pickup plug (2) on the upper part of the oil filter.





- Install the nipple A1 of hydraulic tester A and connect them to gauge B.
- Start the engine.
- Select "Pre-defined Monitoring" (01/11) or the following monitoring items to display it by referring to "SET AND OPERATE MACHINE MONITOR".
- Set the engine coolant temperature so that it is within the testing condition range.
- Set the auto-decelerator to be disabled.
- Test the oil pressure with fuel control dial at MIN (Low idle) position, and MAX (High idle) position.



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



Remove the testing tools and restore the machine after the test is finished.

-  Engine oil pressure pickup plug (2):
2.0 to 3.9 Nm {0.2 to 0.4 kgfm}
-  Engine oil pressure pickup plug (2):
Thread locking fluid (LT-2A)

TEST AND ADJUST OIL PRESSURE IN WORK EQUIPMENT, SWING, AND TRAVEL CIRCUITS

Tools for testing and adjusting oil pressure in work equipment, swing, and travel circuits

Symbol	Part No.	Part name	Q'ty	Remarks	
A	-	799-101-5002	Hydraulic tester	1	
	1	799-101-5110	Gauge	1	Pressure range 60 MPa
	2	799-101-5130	Gauge	1	Pressure range 6 MPa
B	-	790-261-1205	Digital hydraulic tester	1	Pressure range 70 MPa
C	799-101-5220	Nipple	2	Size M10x1.25 mm	
D	07002-11023	O-ring	2		
E	Commercially available	Pin	1	Size: ϕ 200x80	
F	Commercially available	Plate	1	Size: 250x260x32	

⚠ Place the machine on a level ground, and then lower the work equipment completely to the ground in a stable posture. Set the lock lever to LOCK position, and then stop the engine.

⚠ Parts and oil are still very hot immediately after the engine is stopped. It may cause burn injury. Wait for the temperature to go down, and then start the work.

⚠ Lower the work equipment to the ground, and stop the engine. Operate the control lever several times to release the remaining pressure in the piping. Loosen the oil filler cap of the hydraulic tank gradually to release the pressure in the tank.

Check this item under the following conditions.

Hydraulic oil temperature: 45 to 55 °C

When the oil flow is divided at pumps, front pump and rear pump act individually to each actuator as following table. The valve to be relieved differs depending on the actuator.

When the pressure is relieved singly from the work equipment circuit, the oil flows from the pumps are merged. When the pressure in swing circuit or travel circuit is relieved singly, the oil flows from the pumps are divided.

The actuators in the following table are arranged in the order that the control valves are viewed from the front of the machine. ("Service" of "Actuator" is for when 1 attachment is installed)

(4) Swing parking brake solenoid valve operation table

Operating condition of solenoid valve		Operating state of solenoid valve
Work equipment signal and swing signal (work equipment including services)	All OFF	OFF (de-energized)
	When any of these is ON	ON (energized)

(5) Travel speed increase solenoid valve operation table

Operating condition of solenoid valve		Operating state of solenoid valve
When overheat 2nd setting is applied		OFF (de-energized)
Engine speed	Max. 1200 rpm	
Travel speed switch at Lo		
Travel speed switch at Mi, Hi	When travel signal is not conducted	ON (energized)
	When travel signal is conducted	
Other than the above conditions		ON (energized)

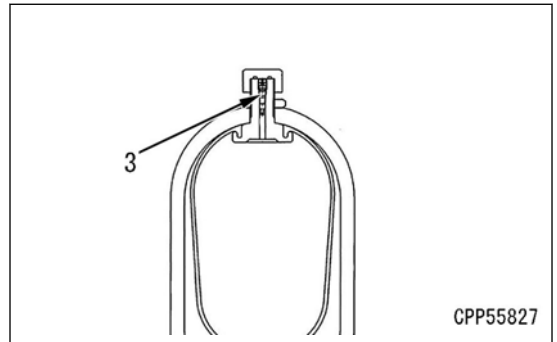
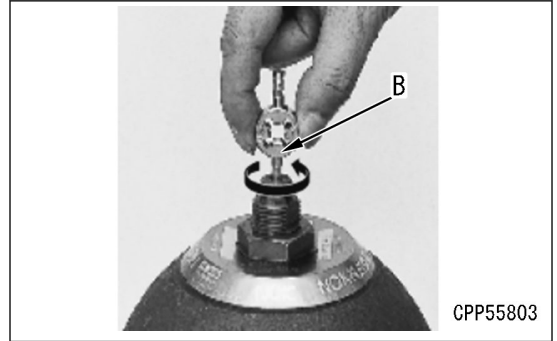
(6) Travel junction solenoid valve operation table

Operating condition of solenoid valve		Operating state of solenoid valve
When travel steering signal is conducted		ON (energized)
When travel steering signal is not conducted	When travel single signal is conducted	
	Other than the above conditions	

(7) Swing 2-stage relief solenoid valve operation table

Operating condition of solenoid valve				Operating state of solenoid valve
When swing signal is conducted except the operation of changing swing direction	When boom raise signal is conducted	Boom RISE PPC pressure is Max. 2.2 MPa {22 kgf/cm ² }	When arm signal is not conducted	F pump pressure is raising and Min. 20.6 MPa {210 kgf/cm ² }
	When the pump flow is divided			F pump pressure is lowering and Min. 25.5 MPa {260 kgf/cm ² } Min.
Other than the above conditions				OFF (de-energized)

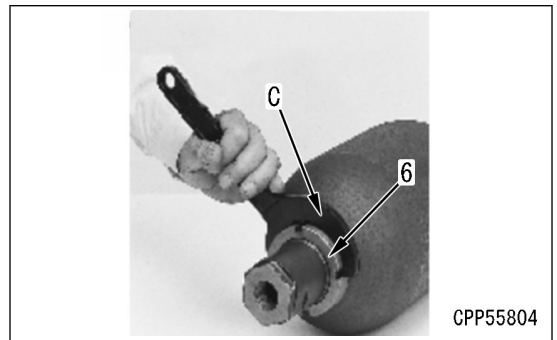
- Remove the valve core (3) with the valve core driver (B).



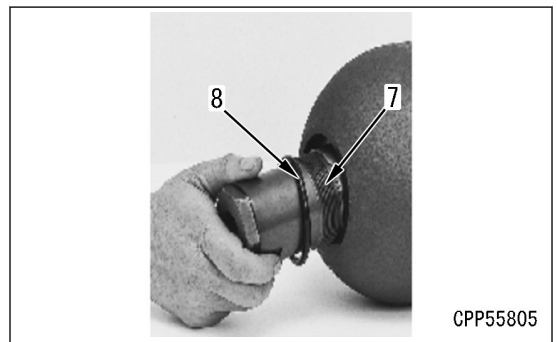
- Remove the lock ring (6) with the hook wrench (C).

REMARK

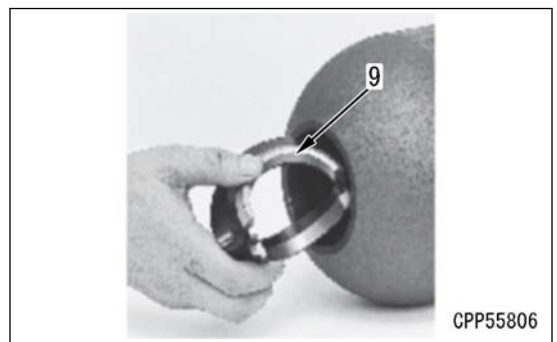
Be careful that the accumulator does not roll over.



- Push the oil port (7) into the shell, and remove the O-ring (8), backup ring (15).



- Fold the anti-extrusion ring (9) in two, and remove it.



No.	Monitoring code	Self-define Monitoring items (screen display)	Unit			Applicable component
			SI	Metric	Imperial	
3	01141	Service Pressure Sensor	MPa	kg/cm ²	psi	PUMP
4	01300	PC-EPC Front Solenoid Current	mA	mA	mA	PUMP
5	01500	LS-EPC Solenoid Current	mA	mA	mA	PUMP

“Pre-defined Monitoring” (07/11) R pump application

No.	Monitoring code	Self-define Monitoring items (screen display)	Unit			Applicable component
			SI	Metric	Imperial	
1	01002	Engine Speed	r/min	rpm	rpm	ENG
2	01101	Rear Pump Pressure	MPa	kg/cm ²	psi	PUMP
3	01141	Service Pressure Sensor	MPa	kg/cm ²	psi	PUMP
4	01302	PC-EPC Rear Solenoid Current	mA	mA	mA	PUMP
5	01500	LS-EPC Solenoid Current	mA	mA	mA	PUMP

“Pre-defined Monitoring” (08/11) PPC pressure (1)

No.	Monitoring code	Self-define Monitoring items (screen display)	Unit			Applicable component
			SI	Metric	Imperial	
1	01002	Engine Speed	r/min	rpm	rpm	ENG
2	07400	Boom Raise PPC Pressure	MPa	kg/cm ²	psi	PUMP
3	07500	Boom Lower PPC Pressure	MPa	kg/cm ²	psi	PUMP
4	07200	Arm IN PPC Pressure	MPa	kg/cm ²	psi	PUMP
5	07600	Arm OUT PPC Pressure	MPa	kg/cm ²	psi	PUMP
6	04401	Hydraulic Oil Temperature	°C	°C	°F	PUMP

“Pre-defined Monitoring”(09/11) PPC pressure (2)

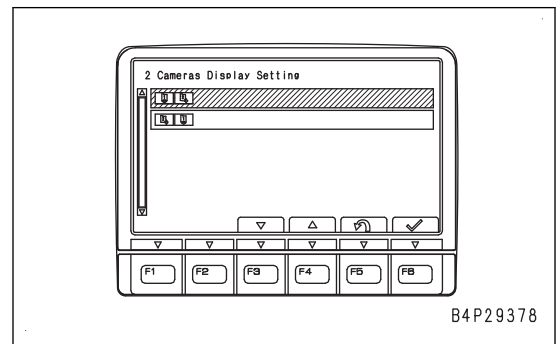
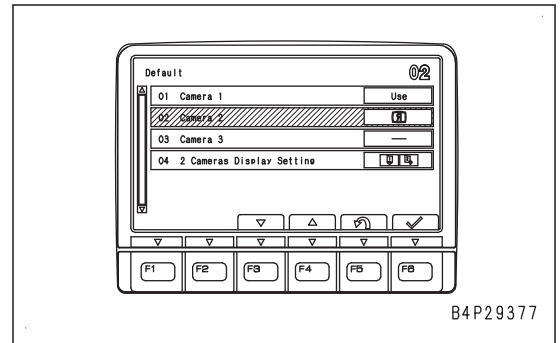
No.	Monitoring code	Self-define Monitoring items (screen display)	Unit			Applicable component
			SI	Metric	Imperial	
1	01002	Engine Speed	r/min	rpm	rpm	ENG
2	09002	Swing Right PPC Pressure	MPa	kg/cm ²	psi	PUMP
3	09001	Swing Left PPC Pressure	MPa	kg/cm ²	psi	PUMP
4	07300	Bucket CURL PPC Pressure	MPa	kg/cm ²	psi	PUMP
5	07301	Bucket DUMP PPC Pressure	MPa	kg/cm ²	psi	PUMP
6	04401	Hydraulic Oil Temperature	°C	°C	°F	PUMP

“Pre-defined Monitoring” (10/11) PPC pressure (3)

No.	Monitoring code	Self-define Monitoring items (screen display)	Unit			Applicable component
			SI	Metric	Imperial	
1	01002	Engine Speed	r/min	rpm	rpm	ENG
2	07102	Travel Forward Left PPC Press	MPa	kg/cm ²	psi	PUMP

REMARK

- By the settings as shown in the figure, movement of a person or object can be displayed continuously in the monitor just like using the rearview mirror up to the right side of the machine body.
- When setting the camera 2 to “R”, the right side of the machine body can be displayed just like a visual image.
- If 2 or more cameras are installed, be sure to set the use of them from camera 1 in order.
- The simultaneous display function of 2 images becomes enabled when camera 1 and camera 2 are set for use.
- You cannot switch camera 1 between “Я” and “R”.
- After entering selected item on each line with F6, return the screen to “Default” screen with F5, and the setting is enabled.
- Unless setting is normally set with this function when the camera is connected, the graphic mark of camera is not displayed at F3 in the operator mode. Accordingly, the image of the camera cannot be used.
- When the camera is installed, check that the right and left portions of the displayed image are correct.



METHOD FOR OPERATING TESTING MENU (AUTO IDLE STOP TIME FIXING)

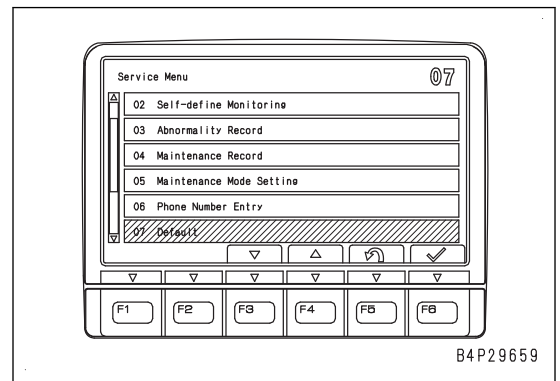
Default setting menu is used to check or change default values of the machine monitor and the machine.

“Auto Idle Stop Timer Fixing” function is used to set the time selectable on auto idle stop time setting in the operator mode.

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

REMARK

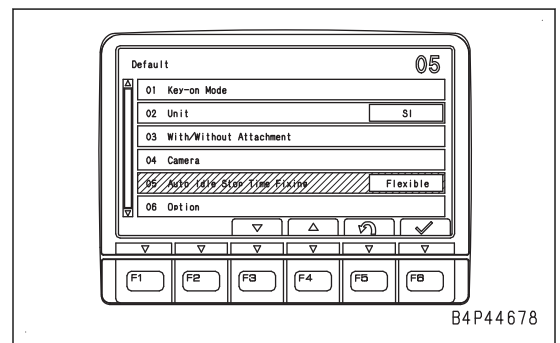
See “METHOD FOR OPERATING SERVICE MODE” in “SERVICE MODE” for selecting method.



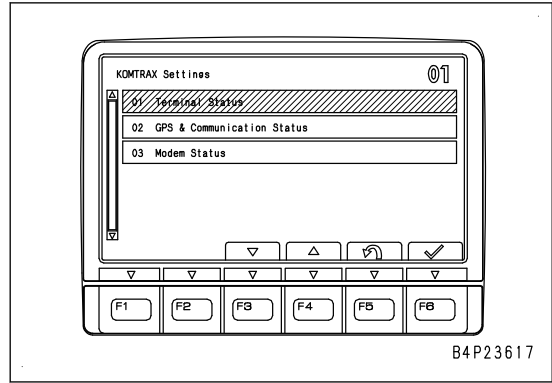
2. Select “Auto Idle Stop Time Fixing” with the function switches or numeral input switches on “Default” screen.

REMARK

See “METHOD FOR OPERATING SERVICE MODE” in “SERVICE MODE” for selecting method.



- 2) On "KOMTRAX Settings" screen, select "Terminal Status" with the function switches or numeral input switches.

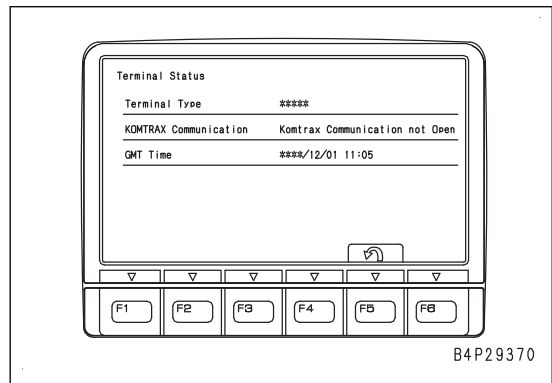


- 3) On "Terminal Status" screen, check the state of "KOMTRAX Communication Inspection".

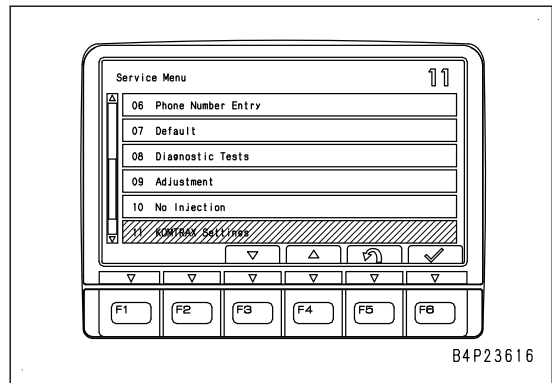
If "KOMTRAX Communication Not Open" is displayed on the state of "KOMTRAX Communication Inspection", Perform step 2. If "Already Open" is displayed, KOMTRAX Communication Inspection is not needed.

2. KOMTRAX Communication Inspection

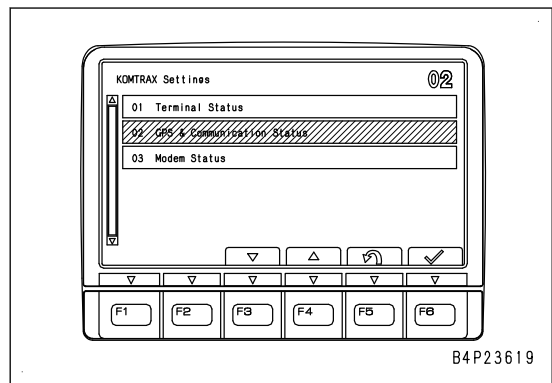
Observe the following when performing KOMTRAX Communication Inspection.



- 1) On "Service Menu" screen, select "KOMTRAX Settings" with function switches or numeral input switches.



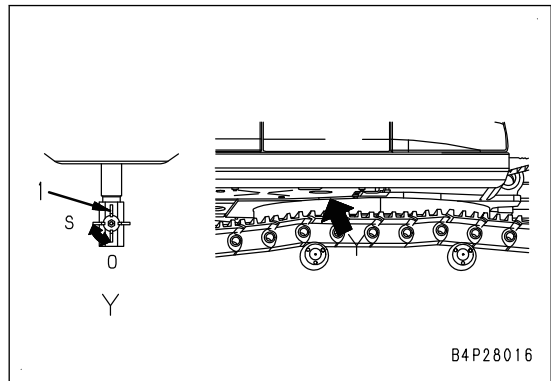
- 2) On "KOMTRAX Settings" screen, select "GPS & Communication State" with the function switches or numeral input switches.



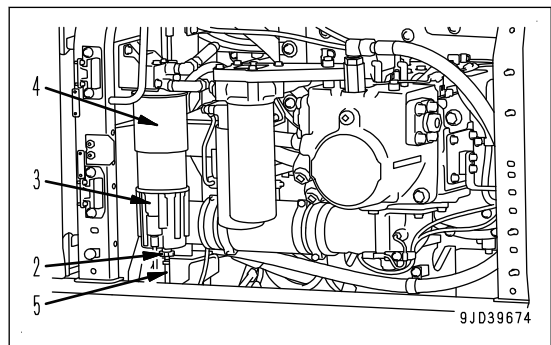
40 TROUBLESHOOTING

Method for adjusting drain valve

6. Turn the valve (1) at the bottom of the fuel tank to CLOSE position (S).
7. Place a container under the fuel prefilter cartridge to catch the fuel.



8. Loosen the drain valve (2) and drain water and sediment from transparent cup (3), and also drain all the fuel accumulated in the fuel prefilter cartridge (4).
9. Check that nothing more comes out from the drain hose (5), then remove the drain valve (2).



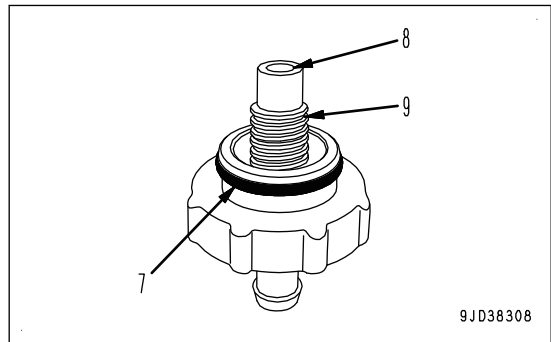
10. Apply a suitable amount of grease to the O-ring (7).

REMARK

When applying the grease, be careful not to allow the grease to adhere to the water drain port (8) and threaded part (9) of the drain valve.

11. Tighten the drain valve (2) by hand until it contacts the bottom of transparent cup (3), and install it.

Tightening torque : 2.5 to 3.5 Nm {0.25 to 0.36 kgfm, 1.81 to 2.6 lbft}



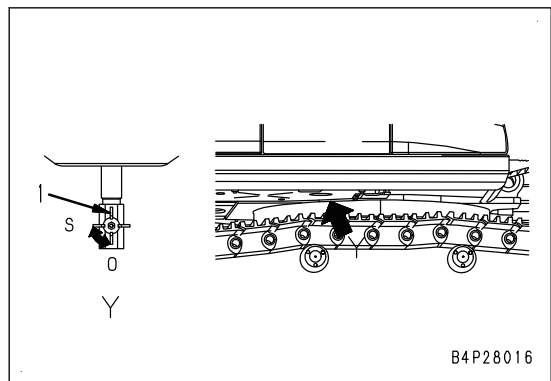
12. Remove the fuel container.
13. Turn the valve (1) at the bottom of the fuel tank to OPEN position (O).
14. Bleed air from the fuel.

REMARK

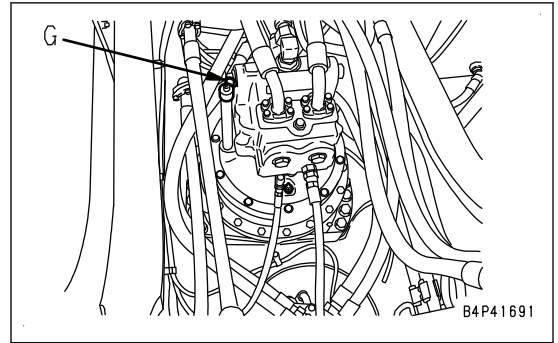
For details, see the Operation and Maintenance Manual, "PROCEDURES FOR BLEEDING AIR FROM FUEL CIRCUIT"

FUEL PREFILTER CARTRIDGE - REPLACE

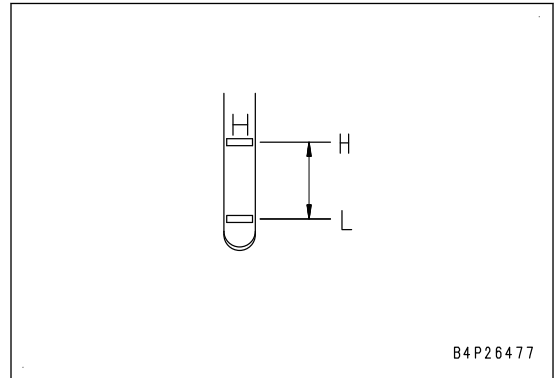
1. Turn valve (1) at the bottom of the fuel tank to CLOSE position (S).
2. Open the engine hood.



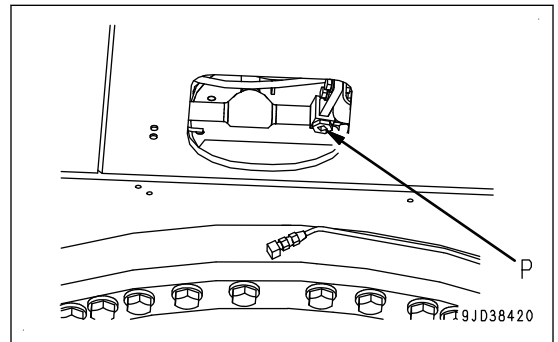
1. Remove dipstick (G) and wipe off oil on it with a cloth.
2. Insert dipstick (G) fully into the guide.



3. Pull out dipstick (G) and check the oil level. If the oil level is between marks (H) and (L) on the dipstick, it is proper.
4. If the oil level is below mark (L) on dipstick (G), add oil through oil filler port.



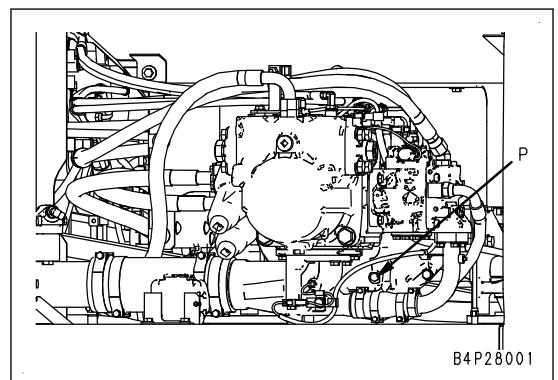
5. If the oil level is above mark (H) of dipstick (G), loosen drain valve (B) and drain the excessive oil.
6. When draining the oil, place an oil container under drain valve (P).
7. After checking the oil level and adding oil, install dipstick (G) and oil filler cap .



CHECK OIL LEVEL IN DAMPER CASE

⚠ Park the machine on flat ground and stop the engine. When more than 30 minutes elapse after stopping the engine, check the oil level.

1. Open the cover on the left side of the machine.
2. Open the side cover.
3. Remove plug (G) and check if the oil level is near the bottom line of the plug hole, it is correct.



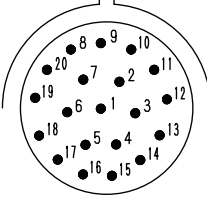
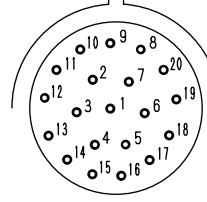
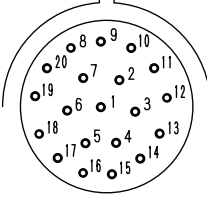
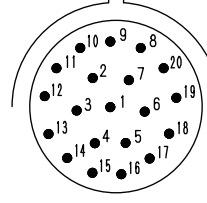
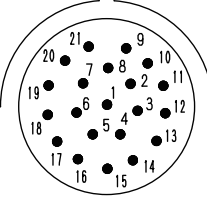
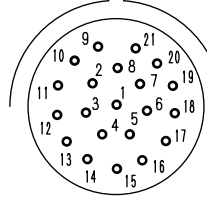
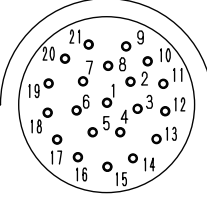
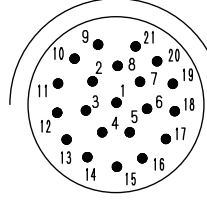
CONNECTOR AND WIRING HARNESS IDENTIFICATION TABLE

Connector From							Connector To		Wire dia./ color
Connector (terminal) No.	Address		Equipment name	Type	Number of pins	Pin No.	Connector (terminal) No.	Pin No.	
	Connector layout	Wiring harness drawing							
A	-	-	Joint (Camera 2) (if equipped)	-	-	-	A46	4	0.5B
							B (Camera 2)	-	0.5B
A	-	D466	Joint (Engine shutdown secondary switch)	-	-	-	H16 (male)	13	0.5LR
							S18	1	0.5LR
							S18	4	0.5LR
A	-	N526	Joint (Service oil pressure switch) (if equipped)	-	-	-	P13 (male) (Pressure switch (1ATT))	1	0.85LgY
							P14 (Service oil pressure switch (front))	1	0.85LgY
							P15 (Service pressure switch (rear))	1	0.85LgY
A	-	I538	Joint (2ATT) (if equipped)	-	-	-	C (2ATT)	-	0.85LgY
							P13 (male) (Pressure switch (2ATT))	1	0.85LgY
							P14 (2ATT service pressure switch (front))	1	0.85LgY
A1	-	-	Joint	-	-	-	CE01	19	0.85G
							SEGR	3	0.85G
							SEGR	4	0.85G
A13 (male)	H1	O329	Intermediate connector (Working lamp (boom))	DT	2	1	AA	-	2R
						2	CC	-	2B
A13 (female)	H1	H503	Intermediate connector (Working lamp (boom))	DT	2	1	L01	1	2R
						2	L01	2	2B
A15 (male)	F12	B540	Intermediate connector (Working lamp (rear)) (if equipped)	DT	2	1	L09	1	2R
						2	L09	2	2B
A15 (female)	F12	E425	Intermediate connector (Working lamp (rear)) (if equipped)	DT	2	1	R10	5	2RL
						2	BB	-	2B
A40 (male)	E12	C421	Intermediate connector (Rear monitor camera 1)	DT	4	1	HA	-	0.5R
						2	CM04	2	0.5W
						4	RH	-	0.5B

Connector From						Connector To			
Connector (terminal) No.	Address		Equipment name	Type	Number of pins	Pin No.	Connector (terminal) No.	Pin No.	Wire dia./ color
	Connector layout	Wiring harness drawing							
H15 (male)	A19	K501	Intermediate connector (R.H. console upper harness)	090	22	1	S01	B	1.25RB
						2	S01	BR	0.85RB
						3	S01	R1	0.85LB
						4	S01	C	0.85RW
						5	S01	AC C	0.85LB
						6	S02	5	0.5LR
						7	C (R.H. console upper harness)	-	0.5G
						8	D (R.H. console upper harness)	-	0.5GR
						9	S02	2	0.5B
						10	S04	3	0.5WR
						11	S04	4	0.5YL
						12	S04	5	0.5RW
						13	S04	6	0.5B
						14	P20	1	0.5WB
						15	P20	2	0.5L
						16	P20	3	0.5B
						17	S07	5	0.85GL
						18	S07	6	0.85Y
						19	E	-	0.85GY
						20	M22 (R.H. knob switch)	2	0.85GW
						21	M22 (R.H. knob switch)	4	0.85G
						22	S10	2	0.85GW

Connector (terminal) No.	Address		Connector From				Connector To		Wire dia./ color
	Connector layout	Wiring harness drawing	Equipment name	Type	Number of pins	Pin No.	Connector (terminal) No.	Pin No.	
T04	I6	O251	Revolving frame ground	Terminal	1	-	GP	-	5B
T05	I6	O250	Revolving frame ground	Terminal	1	-	PR	-	3B
T06	I6	O250	Revolving frame ground	Terminal	1	-	MI	-	2B
T07	I6	O249	Revolving frame ground	Terminal	1	-	MN	-	8B
T08	C3	I321	Revolving frame ground	Terminal	1	-	R01	-	5B
T09	I6	O248	Revolving frame ground	Terminal	1	-	PP	-	3B
T10	I5	O247	Revolving frame ground	Terminal	1	-	CD	-	5B
T11	I8	I374	Engine body ground	Terminal	1	-	M22 (Alternator)	-	20B
T20	I8	H374	Engine body ground	Terminal	1	-	CE03	1	3B
TFUEL	G36	M492	Fuel temperature sensor	PACK-ARD	2	A	CE01	30	0.85G
						B	JM02	9	0.85B
TIM	F36	M490	Boost temperature sensor	PACK-ARD	2	A	CE01	23	0.85G
						B	JM02	8	0.85B
TWTR	B34	K477	Engine coolant temperature sensor	PACK-ARD	2	A	CE01	15	0.85G
						B	JM03	3	0.85B
V01	G11	K362	PPC source pressure lock solenoid valve	DT	2	1	J06	2	0.85LgR
						2	CN	-	0.85B
V02	G10	I362	Swing pressure cut-off solenoid valve	DT	2	1	CP02	94	0.85BrW
						2	DC	-	0.85B
V03	G11	K363	Travel junction valve solenoid valve	DT	2	1	CP02	85	0.85BrR
						2	DA	-	0.85B
V04	G10	I364	Travel Hi/Lo solenoid valve	DT	2	1	CP02	93	0.85GR
						2	DB	-	0.85B
V05	G10	K364	Swing parking brake solenoid valve	DT	2	1	J06	12	0.85YL
						2	J06	15	0.85B
V06	H10	I365	Machine push-up solenoid valve	DT	2	1	J03	3	0.85BrW
						2	CN	-	0.85B
V07	H10	I366	ATT return selector solenoid valve (if equipped)	DT	2	1	CP02	86	0.85BrG
						2	DX	-	0.85B
V08	H10	K366	2-stage relief solenoid valve	DT	2	1	CP02	109	0.85GL
						2	DB	-	0.85B
V11	I9	I410	F-PC-EPC valve	DT	2	1	S25 (female)	2	0.85GW
						2	S25 (female)	5	0.85B

[The pin No. is also marked on the connector (electric wire insertion end)]

Type (shell size code)	HD30 Series connector		Testing connection use special tool Part No.
	Body (plug)	Body (receptacle)	
18-20 (3)	Pin (male terminal)	Socket (female terminal)	799-601-9230 (T-adapter)
	 <p style="text-align: right;">BWP05009</p>	 <p style="text-align: right;">BWP05010</p>	
	Part No. :08191-31201, 08191-31202	Part No. :08191-34101, 08191-34102	
	Socket (female terminal)	Pin (male terminal)	799-601-9230 (T-adapter)
 <p style="text-align: right;">BWP05011</p>	 <p style="text-align: right;">BWP05012</p>		
	Part No. :08191-32201, 08191-32202	Part No. :08191-33101, 08191-33102	
18-21 (4)	Pin (male terminal)	Socket (female terminal)	799-601-9240 (T-adapter)
	 <p style="text-align: right;">BWP05013</p>	 <p style="text-align: right;">BWP05014</p>	
	Part No. :08191-41201, 08191-42202	Part No. :08191-44101, 08191-44102	
	Socket (female terminal)	Pin (male terminal)	799-601-9240 (T-adapter)
 <p style="text-align: right;">BWP05015</p>	 <p style="text-align: right;">BWP05016</p>		
	Part No. :08191-42201, 08191-42202	Part No. :08191-43101, 08191-43102	

B4D18406

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	
799-601-2840	Extension cable (ECONO type)	12	ECONO 12P	•	•					•									
799-601-2850	Case			•															
799-601-4350	T-box (for DRC60, ECONO)	60																	•
799-601-4360	Case																		•
799-601-7010	Adapter for X (T-adapter)	1								•		•							
799-601-7020	Adapter for X	2	X2P				•	•	•		•								
799-601-7030	Adapter for X	3	X3P				•	•	•		•								
799-601-7040	Adapter for X	4	X4P				•	•	•		•								
799-601-7050	Adapter for SWP	6	SW6P				•	•	•										
799-601-7060	Adapter for SWP	8	SW8P				•	•	•										
799-601-7310	Adapter for SWP	12	SW12P																•
799-601-7070	Adapter for SWP	14	SW14P							•		•							
799-601-7320	Adapter for SWP	16	SW16P																•
799-601-7080	Adapter for M (T-adapter)	1								•		•							
799-601-7090	Adapter for M	2	M2P				•	•	•		•								
799-601-7110	Adapter for M	3	M3P				•	•	•		•								
799-601-7120	Adapter for M	4	M4P				•	•	•		•								
799-601-7130	Adapter for M	6	M6P				•	•	•		•								
799-601-7340	Adapter for M	8	M8P																•
799-601-7140	Adapter for S	8	S8P				•	•	•		•								
799-601-7150	Adapter for S (white)	10	S10P				•	•	•		•								
799-601-7160	Adapter for S (blue)	12	S12P				•	•	•										
799-601-7170	Adapter for S (blue)	16	S16P				•	•	•		•								
799-601-7330	Adapter for S (white)	16	S16PW								•								
799-601-7350	Adapter for S (white)	12	S12PW																•
799-601-7180	Adapter for AMP040	8	A8P							•									
799-601-7190	Adapter for AMP040	12	A12P							•		•							
799-601-7210	Adapter for AMP040	16	A16P				•	•	•		•								
799-601-7220	Adapter for AMP040	20	A20P				•	•	•		•								
799-601-7230	Short socket adapter for X	2					•	•	•		•								
799-601-7240	Case						•	•											
799-601-7270	Case									•									
799-601-7510	Adapter for 070	10	07-10								•								
799-601-7520	Adapter for 070	12	07-12								•								

Failure code	Failure (Displayed on screen)	Applicable component	Action level	Category of history	Remarks
CA3899	SCR NH3 Sensor Circuit Error	ENG	L01	Electrical System	
CA3911	SCR NH3 Sensor Datalink Timeout Error	ENG	L01	Electrical System	
CA3912	SCR NH3 Sensor Heater Warming up Error	ENG	L01	Electrical System	
CA3932	SCR NH3 Sensor Heater Voltage High Error	ENG	L01	Electrical System	
CA3933	SCR NH3 Sensor Heater Voltage Low Error	ENG	L01	Electrical System	
CA3934	SCR NH3 Sensor Power Interrupt Error	ENG	L01	Electrical System	
CA3935	SCR NH3 Sensor Trim Resistance Error	ENG	L01	Electrical System	
CA3936	SCR NH3 Sensor Internal Circuit Error	ENG	L01	Electrical System	
CA4151	KDOC and KDPF Temperature Sensor Datalink Timeout Error	ENG	L03	Electrical System	
CA4152	SCR Temperature Sensor Datalink Timeout Error	ENG	L01	Electrical System	
CA4155	AdBlue/DEF Pump Heater Relay Voltage High Error	ENG	L01	Electrical System	
CA4156	AdBlue/DEF Pump Heater Relay Voltage Low Error	ENG	L01	Electrical System	
CA4157	AdBlue/DEF FCV Malfunction	ENG	L01	Electrical System	
CA4158	KDOC and KDPF Temperature Sensor Internal Circuit Error	ENG	L03	Electrical System	
CA4159	SCR Temperature Sensor Internal Circuit Error	ENG	L01	Electrical System	
CA4161	KDOC and KDPF Temperature Sensor ECU Voltage High Error	ENG	L03	Electrical System	
CA4162	KDOC and KDPF Temperature Sensor ECU Voltage Low Error	ENG	L03	Electrical System	
CA4163	KDOC and KDPF Temperature Sensor ECU Over Temperature Error	ENG	L01	Electrical System	
CA4164	SCR Temperature Sensor ECU Voltage High Error	ENG	L01	Electrical System	
CA4165	SCR Temperature Sensor ECU Voltage Low Error	ENG	L01	Electrical System	
CA4166	SCR Temperature Sensor ECU High Temperature Error	ENG	L01	Electrical System	
CA4168	AdBlue/DEF Pump Heater ON Stuck Error	ENG	L01	Electrical System	
CA4169	AdBlue/DEF Pump Heater OFF Stuck Error	ENG	L01	Electrical System	

No.	Check item	Procedure of troubleshooting	Judgment and remedy	
4	Confirmation of repair	1. Turn the starting switch to OFF position.	YES	Return to the first check item.
		2. Connect all the consisting equipment. 3. Turn the starting switch to ON position. 4. Delete the electrical system abnormality record by machine monitor. 5. Turn the starting switch to OFF position. 6. Shut down the engine controller. (See "PROCEDURE FOR TROUBLESHOOTING" in this chapter.) 7. Turn the starting switch to ON position. 8. Check the abnormality record. 9. Is this failure code displayed in the record?	NO	The repair is completed.

No.	Check item	Procedure of troubleshooting			Judgment and remedy	
3	Engine oil pressure switch	1. Turn the starting switch to OFF position. 2. Disconnect the connector POIL, and connect the T-adapter to male side to troubleshoot. 3. Does the troubleshooting result match with the judgment criteria?			YES	<ul style="list-style-type: none"> The engine oil pressure switch is normal. Proceed to next check item.
		Item	Measuring point and measurement condition	Judgment criteria		
		Resistance	Between POIL (male) (1) and ground	Max. 1 Ω	NO	<ul style="list-style-type: none"> The engine oil pressure switch is defective. Replace the engine oil pressure switch. Proceed to “Confirmation of repair”.
4	Open circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect the connectors CE01 and POIL, and connect the T-adapter to each female side to troubleshoot. 3. Does the troubleshooting result match with the judgment criteria?			YES	<ul style="list-style-type: none"> Wiring harness has no open circuit. Proceed to next check item.
		Item	Measuring point and measurement condition	Judgment criteria		
		Resistance	Between CE01 (female) (37) and POIL (female) (1)	Max. 1 Ω	NO	<ul style="list-style-type: none"> Wiring harness has an open circuit. Repair or replace the wiring harness. Proceed to “Confirmation of repair”.
5	Ground fault in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect the connectors CE01 and POIL, and connect the T-adapter to either female side to troubleshoot. 3. Does the troubleshooting result match with the judgment criteria?			YES	<ul style="list-style-type: none"> Wiring harness has no ground fault. Proceed to next check item.
		Item	Measuring point and measurement condition	Judgment criteria		
		Resistance	Between ground and either CE01 (female) (37) or POIL (female) (1)	Min. 1 MΩ	NO	<ul style="list-style-type: none"> Wiring harness has a ground fault. Repair or replace the wiring harness. Proceed to “Confirmation of repair”.

FAILURE CODE [CA131]

Detail of failure	High voltage occurs in signal circuit of fuel control dial.
Action level	L03
Action of controller	<ul style="list-style-type: none"> If abnormality occurs while the starting switch is set to ON position, controller fixes the voltage at the value before detection of abnormality and runs engine. If starting switch is turned to ON position after the abnormality has occurred, controller runs engine at the value of 100 %.
Phenomenon on machine	Engine speed cannot be controlled by using fuel control dial.
Related information	<p>Pre-diagnosis</p> <ul style="list-style-type: none"> If failure codes [CA2185] and [CA2186] are also displayed at the same time, perform the troubleshooting for them first. <p>Monitoring code</p> <ul style="list-style-type: none"> Signal voltage of fuel control dial can be checked by monitoring. (Code: 03000)

No.	Check item	Procedure of troubleshooting			Judgment and remedy		
1	Wiring harness and connector	1. See "Related information of troubleshooting", "Check before troubleshooting", "Electrical equipment", and check them according to the descriptions of wiring harness and connector. 2. Are the wiring harnesses and connectors normal?			YES	<ul style="list-style-type: none"> Wiring harnesses and connectors are normal. Proceed to next check item. 	
					NO	<ul style="list-style-type: none"> Wiring harnesses or connector is defective. Repair or replace the defective wiring harness or connector. Proceed to "Confirmation of repair". 	
2	Fuel control dial	1. Turn the starting switch to OFF position. 2. Disconnect the connector P20, and connect the T-adaptor to male side to troubleshoot. 3. Does the troubleshooting result match with the judgment criteria?			YES	<ul style="list-style-type: none"> The fuel control dial is normal. Proceed to next check item. 	
		Item	Measuring point and measurement condition	Judgment criteria	NO	<ul style="list-style-type: none"> The fuel control dial is defective. Repair or replace the fuel control dial. Proceed to "Confirmation of repair". 	
		Resistance	Between P20 (male) (1) and (3)				4.0 to 6.0 kΩ
			Between P20 (male) (1) and (2)				0.25 to 5.0 kΩ
Between P20 (male) (2) and (3)			0.25 to 5.0 kΩ				

No.	Check item	Procedure of troubleshooting			Judgment and remedy		
3	Short circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect the connectors CE01, G, POIL, PIM, PAMB, and SEGR, and connect the T-adapter to female side of CE01 to troubleshoot. 3. Does the troubleshooting result match with the judgment criteria?			YES	<ul style="list-style-type: none"> Wiring harness has no short circuit. Proceed to next check item. 	
		Item	Measuring point and measurement condition	Judgment criteria			
		Resistance	Between CE01 (female) (37) and each pin other than (37)	Min. 1 MΩ	NO	<ul style="list-style-type: none"> Wiring harness has a short circuit. Repair or replace the wiring harness. Proceed to "Confirmation of repair". 	
4	Sensor	1. Turn the starting switch to OFF position. 2. Disconnect all the following connectors. 3. Connect one of disconnected connectors. 4. Turn the starting switch to ON position to troubleshoot. 5. Check that this failure code is displayed. 6. Repeat the steps 1 to 5 until all connectors are connected. 7. Are the connected connectors normal? REMARK Because the connector is disconnected, the failure code of disconnected equipment is displayed.			YES	<ul style="list-style-type: none"> The equipment connected to each connector is normal. Proceed to next check item. 	
		Sensor		Connector			
		Bkup speed sensor		G		NO	<ul style="list-style-type: none"> If this failure code is displayed for a connector, the equipment connected to that connector is defective. Replace the equipment connected to the connector (indicated by failure code). Proceed to "Confirmation of repair".
		Oil pressure sensor		POIL			
		Charge (boost) pressure sensor		PIM			
		Ambient pressure sensor		PAMB			
EGR valve lift sensor		SEGR					
5	Reconfirmation of check item	1. Reconfirm the preceding troubleshooting. 2. Can you identify the cause by reconfirmation?			YES	The repair is completed.	
					NO	<ul style="list-style-type: none"> Engine controller can be suspected to be defective. Replace the engine controller. Proceed to "Confirmation of repair". 	

FAILURE CODE [CA272]

Detail of failure	Open circuit occurs in supply pump actuator (IMV) drive circuit.
Action level	L03
Action of controller	None in particular.
Phenomenon on machine	Engine output is reduced.
Related information	<p>Reference information</p> <ul style="list-style-type: none"> While engine is running normally, Approx. 24 V of pulse voltage is supplied to PCV1(1). Because it is pulse voltage, it cannot be measured by using multimeter. Because female connector alone is provided in "Socket" for troubleshooting for this sensor, socket cannot be connected to female connector on wiring harness side of sensor, and open circuit cannot be checked. (T-adaptor is not provided.)

No.	Check item	Procedure of troubleshooting			Judgment and remedy	
					YES	NO
1	Wiring harnesses, connectors and terminals	1. Check the wiring harnesses, connectors and terminals. For details, see "Related information of troubleshooting", "Check before troubleshooting", "Check method of electrical parts". 2. Are the wiring harnesses, connectors and terminals normal?			YES	<ul style="list-style-type: none"> The wiring harnesses, connectors and terminals are normal. Proceed to next check item.
					NO	<ul style="list-style-type: none"> The wiring harness, connector or terminal is defective. Repair or replace the defective wiring harness, connector or terminal. Proceed to "Confirmation of repair".
2	Actuator of supply pump	1. Turn the starting switch to OFF position. 2. Disconnect the connector PCV1, and connect the T-adaptor to male side to troubleshoot. 3. Does the troubleshooting result match with the judgment criteria?			YES	<ul style="list-style-type: none"> The actuator of supply pump is normal. Proceed to next check item.
		Item	Measuring point and measurement condition	Judgment criteria	NO	<ul style="list-style-type: none"> The actuator of supply pump is defective. Replace the actuator of supply pump. Proceed to "Confirmation of repair".
		Resistance	Between PCV1 (male) (1) and (2)	2.3 to 5.3 Ω		

FAILURE CODE [CA342]

Detail of failure	Data matching error is occurring in engine controller.
Action level	L04
Action of controller	None in particular
Phenomenon on machine	Engine operates normally but it may stop during operation, or it cannot be started while it is stopped.
Related information	Monitoring code Power supply voltage of engine controller can be checked by monitoring. (Code: 03203)

No.	Check item	Procedure of troubleshooting			Judgment and remedy	
1	Wiring harnesses, connectors and terminals	1. Check the wiring harnesses, connectors and terminals. For details, see "Related information of troubleshooting", "Check before troubleshooting", "Check method of electrical parts". 2. Are the wiring harnesses, connectors and terminals normal?			YES	<ul style="list-style-type: none"> The wiring harnesses, connectors and terminals are normal. Proceed to next check item.
					NO	<ul style="list-style-type: none"> The wiring harness, connector or terminal is defective. Repair or replace the defective wiring harness, connector or terminal. Proceed to "Confirmation of repair".
2	Battery voltage	1. Check the battery voltage. 2. Does the battery voltage match with the judgment criteria?			YES	<ul style="list-style-type: none"> The battery output voltage is normal. Proceed to next check item.
		Item	Measuring point and measurement condition	Judgment criteria	NO	<ul style="list-style-type: none"> The battery output voltage is low. Charge or replace the battery. Proceed to "Confirmation of repair".
		Voltage	Between battery terminals (+) and (-)	20 to 30 V		
3	Alternator	1. Turn the starting switch to OFF position. 2. Start the engine. 3. Set the engine speed to medium or higher and troubleshoot. 4. Does the troubleshooting result match with the judgment criteria?			YES	<ul style="list-style-type: none"> The alternator is normal. Proceed to next check item.
		Item	Measuring point and measurement condition	Judgment criteria	NO	<ul style="list-style-type: none"> The alternator is defective. Replace the alternator. Proceed to "Confirmation of repair".
		Voltage	Between ground and alternator terminal R	26 to 30.5 V		

No.	Check item	Procedure of troubleshooting			Judgment and remedy	
5	Ground fault in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect the connectors CE01 and PFUEL, and connect the T-adapter to either female side to troubleshoot. 3. Does the troubleshooting result match with the judgment criteria?			YES	<ul style="list-style-type: none"> Wiring harness has no ground fault. Proceed to next check item.
		Item	Measuring point and measurement condition	Judgment criteria		
		Resistance	Between ground and either CE01 (female) (25) or PFUEL (female) (2)	Min. 1 MΩ		
6	Short circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect the connectors CE01 and PFUEL, and connect the T-adapter to female side of CE01. 3. Does the troubleshooting result match with the judgment criteria?			YES	<ul style="list-style-type: none"> Wiring harness has no short circuit. Proceed to next check item.
		Item	Measuring point and measurement condition	Judgment criteria		
		Resistance	Between CE01 (female) (25) and each pin other than (25)	Min. 1 MΩ		
7	Hot short circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect the connector PFUEL, and connect the T-adapter to female side. 3. Turn the starting switch to ON position to troubleshoot. 4. Does the troubleshooting result match with the judgment criteria?			YES	<ul style="list-style-type: none"> Wiring harness has no hot short circuit. Proceed to next check item.
		Item	Measuring point and measurement condition	Judgment criteria		
		Voltage	Between PFUEL (female) (2) and (3)	Approx. 5 V		

No.	Check item	Procedure of troubleshooting			Judgment and remedy	
5	Ground fault in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect the connectors CE01 and NE, and connect the T-adapter to either female side to troubleshoot. 3. Does the troubleshooting result match with the judgment criteria?			YES	<ul style="list-style-type: none"> Wiring harness has no ground fault. Proceed to next check item.
		Item	Measuring point and measurement condition	Judgment criteria		
		Resistance	Between ground and either CE01 (female) (27) or NE (female) (3)	Min. 1 MΩ	NO	<ul style="list-style-type: none"> Wiring harness has a ground fault. Repair or replace the wiring harness. Proceed to "Confirmation of repair".
6	Short circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect the connectors CE01 and NE, and connect the T-adapter to female side of CE01 to troubleshoot. 3. Does the troubleshooting result match with the judgment criteria?			YES	<ul style="list-style-type: none"> Wiring harness has no short circuit. Proceed to next check item.
		Item	Measuring point and measurement condition	Judgment criteria		
		Resistance	Between CE01 (female) (27) and each pin other than (27)	Min. 1 MΩ	NO	<ul style="list-style-type: none"> Wiring harness has a short circuit. Repair or replace the wiring harness. Proceed to "Confirmation of repair".
7	Hot short circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect the connector NE, and connect the T-adapter to female side. 3. Turn the starting switch to ON position to troubleshoot. 4. Does the troubleshooting result match with the judgment criteria?			YES	<ul style="list-style-type: none"> Wiring harness has no hot short circuit. Proceed to next check item.
		Item	Measuring point and measurement condition	Judgment criteria		
		Voltage	Between NE (female) (3) and (2)	Max. 1 V	NO	<ul style="list-style-type: none"> Wiring harness has a hot short circuit. Repair or replace the wiring harness. Proceed to "Confirmation of repair".
8	Reconfirmation of check item	1. Reconfirm the preceding troubleshooting. 2. Can you identify the cause by reconfirmation?			YES	The repair is completed.
					NO	<ul style="list-style-type: none"> Engine controller can be suspected to be defective. Replace the engine controller. Proceed to "Confirmation of repair".

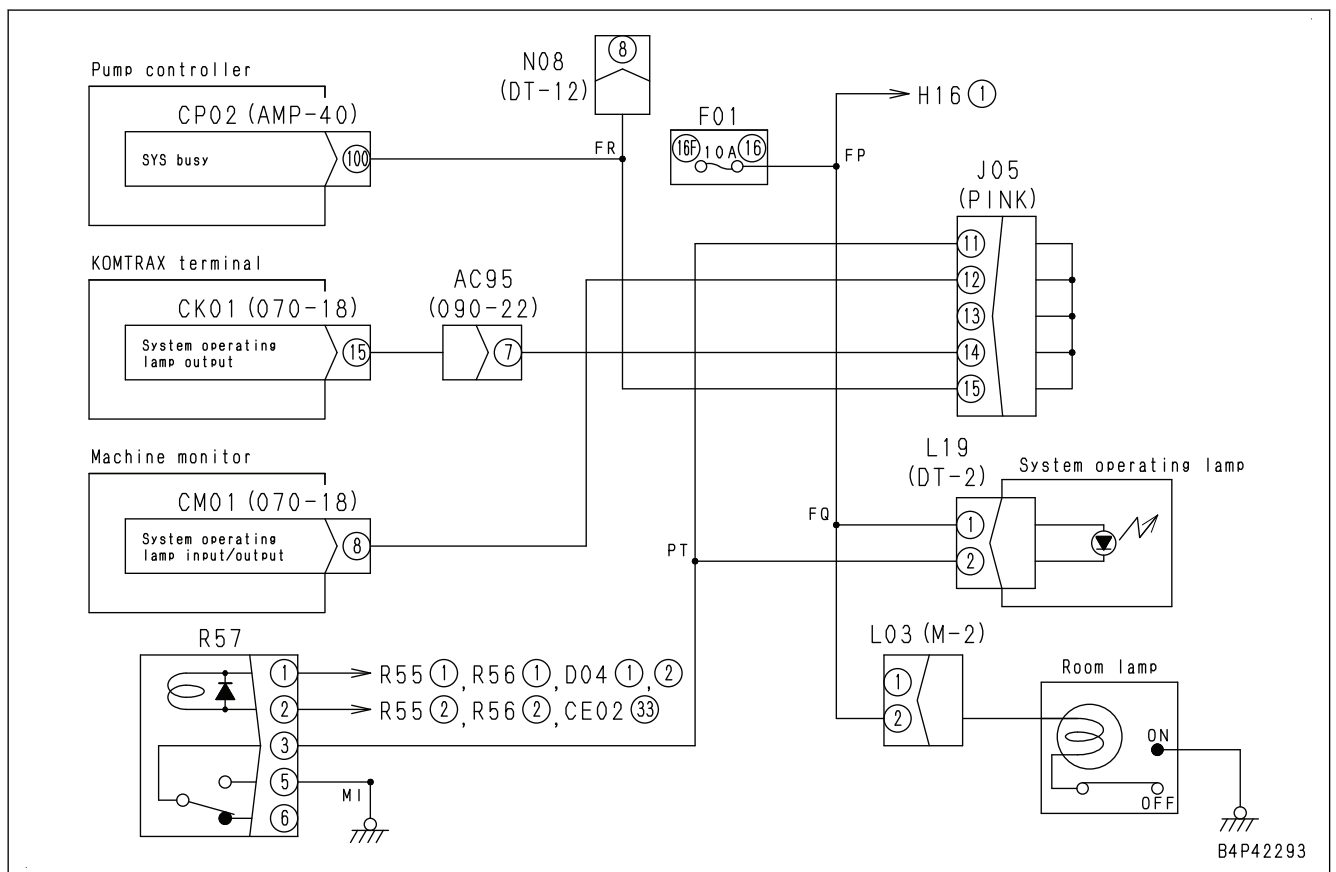
FAILURE CODE [CA2555]

Detail of failure	Short circuit is detected in the preheating relay drive circuit (primary side).
Action level	L01
Action of controller	None in particular.
Phenomenon on machine	The intake air heater does not work in the auto preheating mode (resulting in degraded startability and emission of white smoke at low temperature).
Related information	<p>Monitoring code Temperature detected by the engine coolant temperature sensor can be checked by monitoring. (Code: 04107 (°C))</p> <p>Reference information This failure code is detected only when the relay is OFF.</p>

No.	Check item	Procedure of troubleshooting			Judgment and remedy	
1	Wiring harnesses, connectors and terminals	1. Check the wiring harnesses, connectors and terminals. For details, see “Related information of troubleshooting”, “Check before troubleshooting”, “Check method of electrical parts”. 2. Are the wiring harnesses, connectors and terminals normal?			YES	<ul style="list-style-type: none"> The wiring harnesses, connectors and terminals are normal. Proceed to next check item.
					NO	<ul style="list-style-type: none"> The wiring harness, connector or terminal is defective. Repair or replace the defective wiring harness, connector or terminal. Proceed to “Confirmation of repair”.
2	Preheating relay	1. Turn the starting switch to OFF position. 2. Disconnect the connector R18, and connect the T-adaptor to male side to troubleshoot. 3. Does the troubleshooting result match with the judgment criteria?			YES	<ul style="list-style-type: none"> The preheating relay is normal. Proceed to next check item.
		Item	Measuring point and measurement condition	Judgment criteria	NO	<ul style="list-style-type: none"> The preheating relay is defective. Replace the preheating relay. Proceed to “Confirmation of repair”.
		Resistance	Between R18 (male) (1) and (2)	200 to 400 Ω		

No.	Check item	Procedure of troubleshooting	Judgment and remedy	
3	Reconfirmation of check item	1. Reconfirm the preceding troubleshooting. 2. Can you identify the cause by reconfirmation?	YES	The repair is completed.
			NO	<ul style="list-style-type: none"> • KOMTRAX terminal can be suspected to be defective. • Replace the KOMTRAX terminal. • Proceed to "Confirmation of repair".
4	Confirmation of repair	1. Turn the starting switch to OFF position. 2. Connect all the consisting equipment. 3. Turn the starting switch to ON position to troubleshoot. 4. Is this failure code displayed?	YES	Return to the first check item.
			NO	The repair is completed.

Circuit diagram related to system operating lamp



No.	Check item	Procedure of troubleshooting			Judgment and remedy	
3	Open circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect the connectors CP01 and S30, and connect the T-adapter to female side of CP01 and male side of S30 to troubleshoot. 3. Does the troubleshooting result match with the judgment criteria?			YES	<ul style="list-style-type: none"> • Wiring harness has no open circuit. • Proceed to next check item.
		Item	Measuring point and measurement condition	Judgment criteria		
		Resistance	Between CP01 (female) (21) and S30 (male) (3)	Max. 1 Ω		
			Between CP01 (female) (40) and S30 (male) (2)	Max. 1 Ω		
			Between CP01 (female) (58) and S30 (male) (7)	Max. 1 Ω		
			Between CP01 (female) (59) and S30 (male) (1)	Max. 1 Ω		
			Between CP01 (female) (77) and S30 (male) (4)	Max. 1 Ω		
Between S30 (male) (8) and ground	Max. 1 Ω					
4	Ground fault in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect the connectors CP01 and S30, and connect the T-adapter to either female side or male side to troubleshoot. 3. Does the troubleshooting result match with the judgment criteria?			YES	<ul style="list-style-type: none"> • Wiring harness has no ground fault. • Proceed to next check item.
		Item	Measuring point and measurement condition	Judgment criteria		
		Resistance	Between ground and either CP01 (female) (21) or S30 (male) (3)	Min. 1 MΩ		
			Between ground and either CP01 (female) (40) or S30 (male) (2)	Min. 1 MΩ		
			Between ground and either CP01 (female) (58) or S30 (male) (7)	Min. 1 MΩ		
			Between ground and either CP01 (female) (59) or S30 (male) (1)	Min. 1 MΩ		
			Between ground and either CP01 (female) (77) or S30 (male) (4)	Min. 1 MΩ		

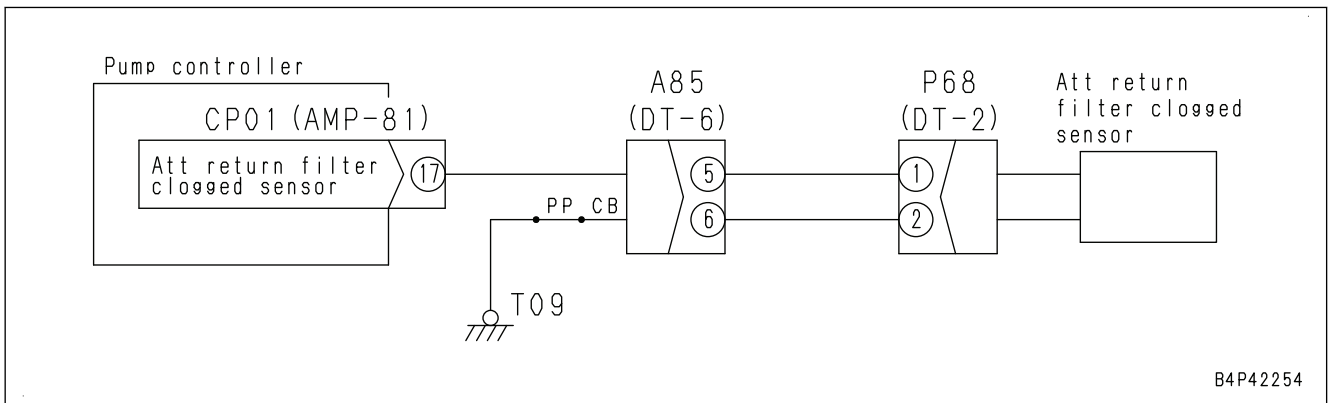
FAILURE CODE [DAF0MB]

Detail of failure	Machine monitor program is rewritten. (program error)
Action level	-
Action of controller	Even if cause of failure is eliminated, machine does not become normal until starting switch is turned to OFF position once.
Phenomenon on machine	<ul style="list-style-type: none"> Machine monitor display is unreliable. It can neither transmit the data to controllers nor receive the data from them.
Related information	-

No.	Check item	Procedure of troubleshooting	Judgment and remedy	
1	Wiring harnesses, connectors and terminals	<ol style="list-style-type: none"> Check the wiring harnesses, connectors and terminals. For details, see "Related information of troubleshooting", "Check before troubleshooting", "Check method of electrical parts". Are the wiring harnesses, connectors and terminals normal? 	YES	<ul style="list-style-type: none"> The wiring harnesses, connectors and terminals are normal. Proceed to next check item.
			NO	<ul style="list-style-type: none"> The wiring harness, connector or terminal is defective. Repair or replace the defective wiring harness, connector or terminal. Proceed to "Confirmation of repair".
2	Reconfirmation of check item	<ol style="list-style-type: none"> Reconfirm the preceding troubleshooting. Can you identify the cause by reconfirmation? 	YES	The repair is completed.
			NO	<ul style="list-style-type: none"> Machine monitor can be suspected to be defective. Replace the machine monitor. Proceed to "Confirmation of repair".
3	Confirmation of repair	<ol style="list-style-type: none"> Turn the starting switch to OFF position. Connect all the consisting equipment. Turn the starting switch to ON position. Delete the electrical system abnormality record by machine monitor. Turn the starting switch to OFF position. Shut down the engine controller. (See "PROCEDURE FOR TROUBLESHOOTING" in this chapter.) Turn the starting switch to ON position. Check the abnormality record. Is this failure code displayed in the record? 	YES	Return to the first check item.
			NO	The repair is completed.

No.	Check item	Procedure of troubleshooting			Judgment and remedy	
2	Air conditioner controller ACC signal circuit	1. Turn the starting switch to OFF position. 2. Disconnect the connector AC02, and connect the T-adaptor to female side. 3. Turn the starting switch to ON position to troubleshoot. 4. Does the troubleshooting result match with the judgment criteria?			YES	<ul style="list-style-type: none"> The air conditioner controller ACC signal circuit is normal. Proceed to check item of "CAN TERMINATING RESISTOR".
		Item	Measuring point and measurement condition	Judgment criteria		
		Voltage	Between AC02 (female) (4) and (1)	20 to 30 V		
3	Open circuit in wiring harness (air conditioner controller ACC signal circuit)	1. Turn the starting switch to OFF position. 2. Check that the system operating lamp is turned off, and then turn the battery disconnect switch to OFF position. 3. Remove the fuse No.13 in the fuse box F01. 4. Disconnect the connector AC02, and connect the T-adaptor to female side to troubleshoot. 5. Does the troubleshooting result match with the judgment criteria?			YES	<ul style="list-style-type: none"> Wiring harness has no open circuit. Proceed to next check item.
		Item	Measuring point and measurement condition	Judgment criteria		
		Resistance	Between F01-13 and AC02 (female) (4)	Max. 1 Ω	Between AC02 (female) (1) and ground	Max. 1 Ω
4	CAN terminating resistor		1. Turn the starting switch to OFF position. 2. Disconnect the connectors CM02 and K02, and connect the T-adaptor to each male side to troubleshoot. 3. Does the troubleshooting result match with the judgment criteria?			YES
		Item	Measuring point and measurement condition	Judgment criteria	NO	
		Resistance	Between CM02 (male) (7) and (9)	120±12 Ω		Between K02 (male) (A) and (B)

Circuit diagram related to hydraulic oil additional filter clogging sensor



No.	Check item	Procedure of troubleshooting			Judgment and remedy	
3	Ground fault in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect the connectors CP01 and P06, and connect the T-adapter to either female side to troubleshoot. 3. Does the troubleshooting result match with the judgment criteria?			YES	<ul style="list-style-type: none"> Wiring harness has no ground fault. Proceed to next check item.
		Item	Measuring point and measurement condition	Judgment criteria		
		Resistance	Between ground and either CP01 (female) (32) or P06 (female) (2)	Min. 1 MΩ	NO	<ul style="list-style-type: none"> Wiring harness has a ground fault. Repair or replace the wiring harness. Proceed to "Confirmation of repair".
4	Short circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect the connectors CP01 and P06, and connect the T-adapter to female side of CP01 to troubleshoot. 3. Does the troubleshooting result match with the judgment criteria?			YES	<ul style="list-style-type: none"> Wiring harness has no short circuit. Proceed to next check item.
		Item	Measuring point and measurement condition	Judgment criteria		
		Resistance	Between CP01 (female) (32) and each pin other than (32)	Min. 1 MΩ	NO	<ul style="list-style-type: none"> Wiring harness has a short circuit. Repair or replace the wiring harness. Proceed to "Confirmation of repair".
5	Hot short circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect the connector P06, and connect the T-adapter to female side. 3. Turn the starting switch to ON position to troubleshoot. 4. Does the troubleshooting result match with the judgment criteria?			YES	<ul style="list-style-type: none"> Wiring harness has no hot short circuit. Proceed to next check item.
		Item	Measuring point and measurement condition	Judgment criteria		
		Voltage	Between P06 (female) (2) and (1)	Max. 1 V	NO	<ul style="list-style-type: none"> Wiring harness has a hot short circuit. Repair or replace the wiring harness. Proceed to "Confirmation of repair".

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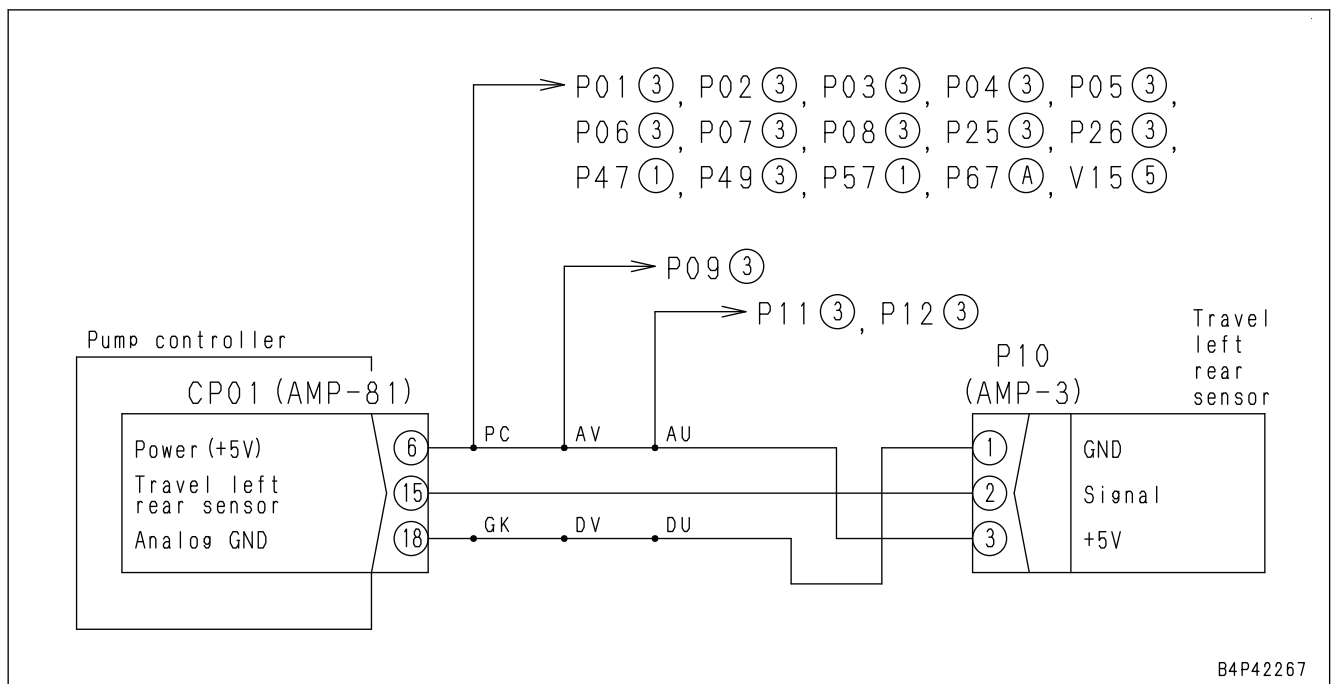


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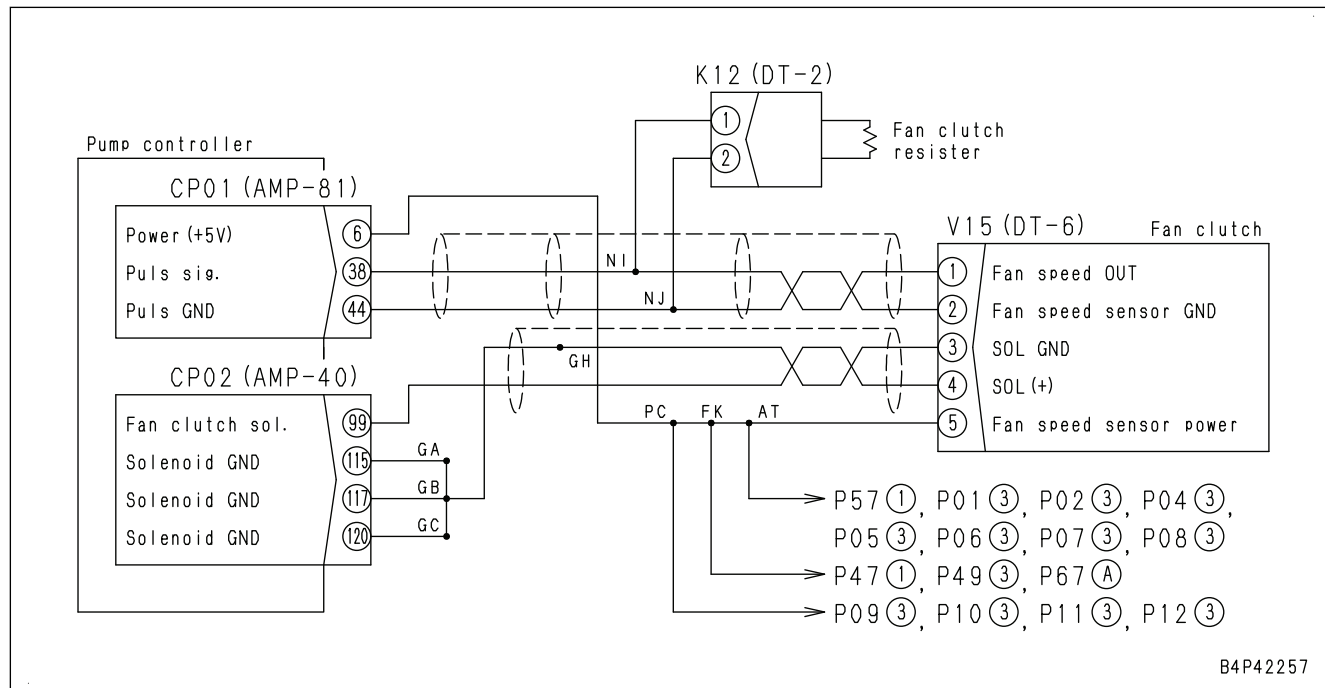
No.	Check item	Procedure of troubleshooting	Judgment and remedy		
6	Travel reverse left PPC pressure sensor	1. Turn the starting switch to OFF position. 2. Insert the T-adapter into connector P10. 3. Turn the starting switch to ON position. 4. Does the troubleshooting result match with the judgment criteria?	YES	<ul style="list-style-type: none"> Travel reverse LEFT PPC pressure sensor is normal. Proceed to next check item. 	
		Item	Measuring point and measurement condition	Judgment criteria	<ul style="list-style-type: none"> Travel reverse LEFT PPC pressure sensor is defective. Replace the travel reverse LEFT PPC pressure sensor. Proceed to "Confirmation of repair".
		Voltage	Between P10 (2) and (1)	0.5 to 4.5 V	
7	Reconfirmation of check item	1. Reconfirm the preceding troubleshooting. 2. Can you identify the cause by reconfirmation?	YES	The repair is completed.	
			NO	<ul style="list-style-type: none"> Pump controller can be suspected to be defective. Replace the pump controller. Proceed to "Confirmation of repair". 	
8	Confirmation of repair	1. Turn the starting switch to OFF position. 2. Connect all the consisting equipment. 3. Turn the starting switch to ON position to troubleshoot. 4. Is this failure code displayed?	YES	Return to the first check item.	
			NO	The repair is completed.	

Circuit diagram related to travel reverse LEFT PPC pressure sensor



No.	Check item	Procedure of troubleshooting	Judgment and remedy	
9	Confirmation of repair	1. Turn the starting switch to OFF position. 2. Connect all the consisting equipment. 3. Start the engine to troubleshoot. 4. Is this failure code displayed?	YES	Return to the first check item.
			NO	The repair is completed.

Circuit diagram related to fan clutch



No.	Check item	Procedure of troubleshooting	Judgment and remedy	
6	Reconfirmation of check item	<ol style="list-style-type: none"> 1. Reconfirm the preceding troubleshooting. 2. Can you identify the cause by reconfirmation? 	YES	The repair is completed.
			NO	<ul style="list-style-type: none"> • Pump controller can be suspected to be defective. • Replace the pump controller. • Proceed to “Confirmation of repair”.
7	Confirmation of repair	<ol style="list-style-type: none"> 1. Turn the starting switch to OFF position. 2. Connect all the consisting equipment. 3. Turn the starting switch to ON position to troubleshoot. 4. Is this failure code displayed? 	YES	Return to the first check item.
			NO	The repair is completed.

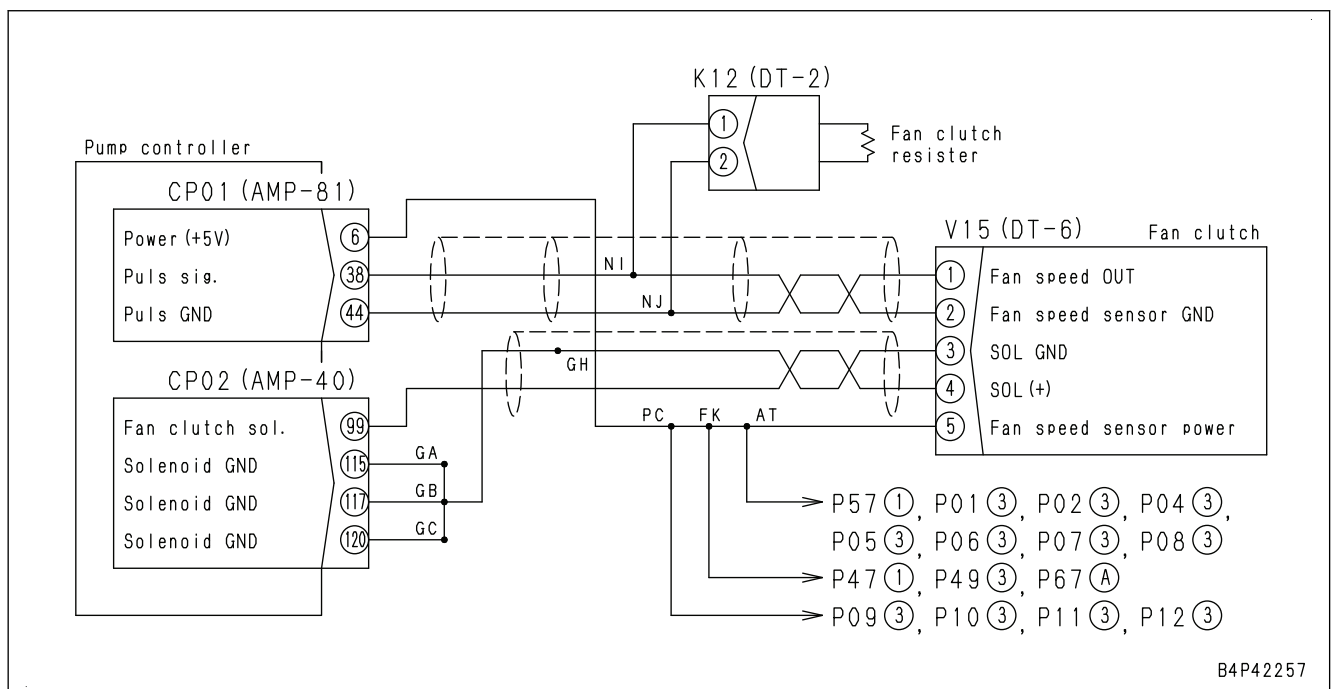
FAILURE CODE [DWK0KA]

Detail of failure	Pump controller detects an open circuit in 2-stage relief solenoid circuit.
Action level	L01
Action of controller	<ul style="list-style-type: none"> • None in particular (Since no current flows, solenoid is not energized.) • If cause of failure is eliminated, machine becomes normal by itself.
Phenomenon on machine	<ul style="list-style-type: none"> • Travel power is low. (Main relief valve cannot be set to high-pressure.) • One-touch power maximizing function does not operate.
Related information	<p>Monitoring code Controller's command (ON/OFF) to 2-stage relief solenoid can be checked by monitoring. As long as controller's command to solenoid is ON, sensor state displayed on monitoring screen is ON even if solenoid is not energized due to open circuit.) (Code: 02300)</p> <p>Reference information Controller detects an open circuit when solenoid output is OFF.</p>

No.	Check item	Procedure of troubleshooting			Judgment and remedy	
1	Wiring harness and connector	1. See "Related information of troubleshooting", "Check before troubleshooting", "Electrical equipment", and check them according to the descriptions of wiring harness and connector. 2. Are the wiring harnesses and connectors normal?			YES	<ul style="list-style-type: none"> • Wiring harnesses and connectors are normal. • Proceed to next check item.
					NO	<ul style="list-style-type: none"> • Wiring harness or connector is defective. • Repair or replace the defective wiring harness or connector. • Proceed to "Confirmation of repair".
2	2-stage relief solenoid	1. Turn the starting switch to OFF position. 2. Disconnect the connector V08, and connect the T-adaptor to male side to troubleshoot. 3. Does the troubleshooting result match with the judgment criteria?			YES	<ul style="list-style-type: none"> • The 2-stage relief solenoid is normal. • Proceed to next check item.
		Item	Measuring point and measurement condition	Judgment criteria	NO	<ul style="list-style-type: none"> • The 2-stage relief solenoid is defective. • Replace the 2-stage relief solenoid. • Proceed to "Confirmation of repair".
		Resistance	Between V08 (male) (1) and (2)	20 to 60 Ω		

No.	Check item	Procedure of troubleshooting	Judgment and remedy		
4	Short circuit in wiring harness	1. Turn the starting switch to OFF position.	YES	<ul style="list-style-type: none"> Wiring harness has no short circuit. Proceed to next check item. 	
		2. Disconnect the connectors CP02 and V15, and connect the T-adaptor to female side of CP02 to troubleshoot.			
		3. Does the troubleshooting result match with the judgment criteria?			
	Item	Measuring point and measurement condition	Judgment criteria	NO	<ul style="list-style-type: none"> Wiring harness has a short circuit. Repair or replace the wiring harness. Proceed to "Confirmation of repair".
	Resistance	Between CP02 (female) (99) and each pin other than (99)	Min. 1 MΩ		
5	Reconfirmation of check item	1. Reconfirm the preceding troubleshooting.	YES	The repair is completed.	
		2. Can you identify the cause by reconfirmation?	NO	<ul style="list-style-type: none"> Pump controller can be suspected to be defective. Replace the pump controller. Proceed to "Confirmation of repair". 	
6	Confirmation of repair	1. Turn the starting switch to OFF position.	YES	Return to the first check item.	
		2. Connect all the consisting equipment.	NO	The repair is completed.	
		3. Turn the starting switch to ON position to troubleshoot.			
		4. Is this failure code displayed?			

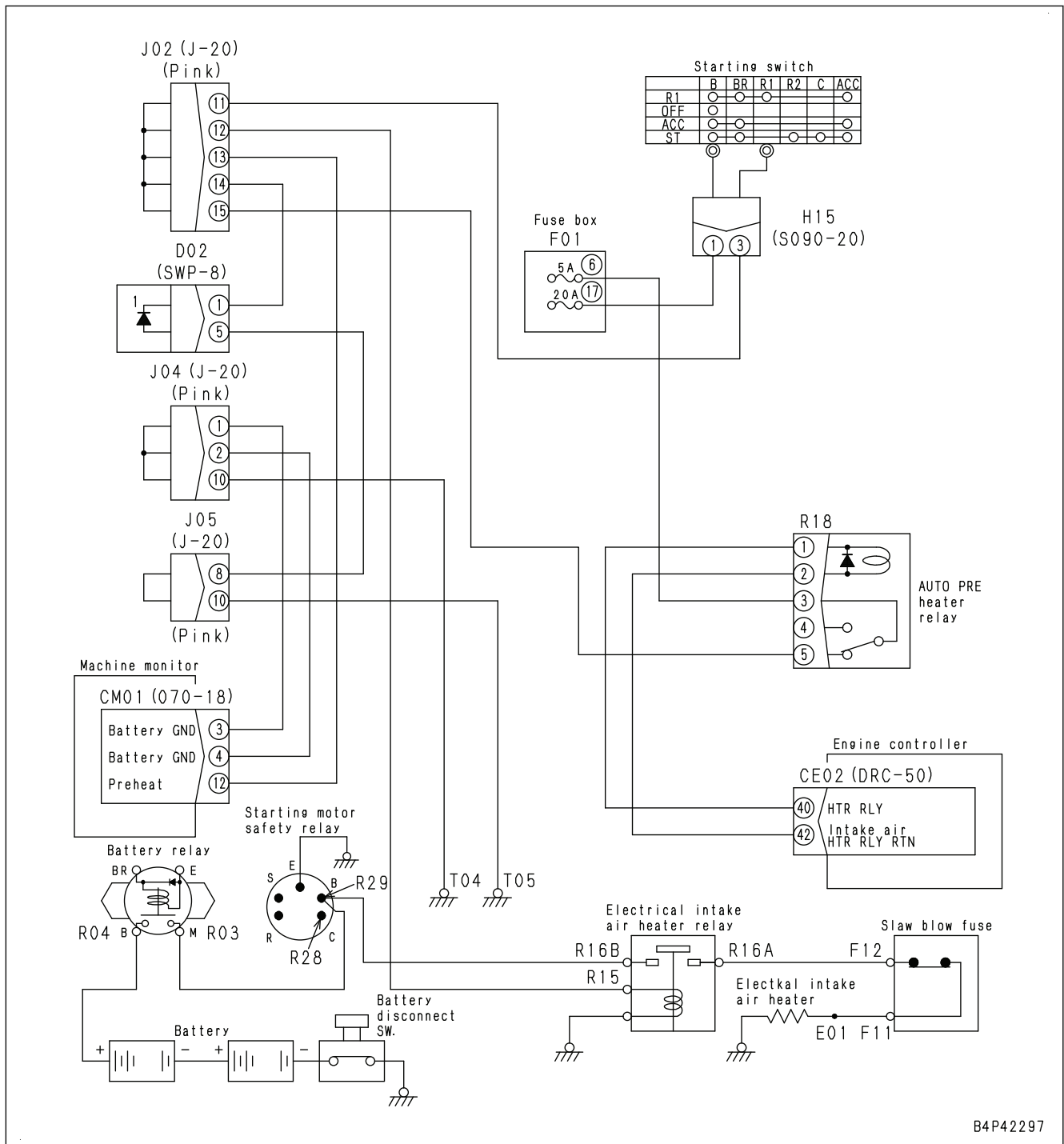
Circuit diagram related to fan clutch



No.	Check item	Procedure of troubleshooting			Judgment and remedy	
3	Ground fault in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect the connectors CP02 and V30, and connect the T-adapter to either female side to troubleshoot. 3. Does the troubleshooting result match with the judgment criteria?			YES	<ul style="list-style-type: none"> Wiring harness has no ground fault. Proceed to next check item.
		Item	Measuring point and measurement condition	Judgment criteria		
		Resistance	Between ground and either CP02 (female) (97) or V30 (female) (1)	Min. 1 MΩ	NO	<ul style="list-style-type: none"> Wiring harness has a ground fault. Repair or replace the wiring harness. Proceed to “Confirmation of repair”.
4	Short circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect the connectors CP02 and V30, and connect the T-adapter to female side of CP02 to troubleshoot. 3. Does the troubleshooting result match with the judgment criteria?			YES	<ul style="list-style-type: none"> Wiring harness has no short circuit. Proceed to next check item.
		Item	Measuring point and measurement condition	Judgment criteria		
		Resistance	Between CP02 (female) (97) and each pin other than (97)	Min. 1 MΩ	NO	<ul style="list-style-type: none"> Wiring harness has a short circuit. Repair or replace the wiring harness. Proceed to “Confirmation of repair”.
5	Reconfirmation of check item	1. Reconfirm the preceding troubleshooting. 2. Can you identify the cause by reconfirmation?			YES	The repair is completed.
					NO	<ul style="list-style-type: none"> Pump controller can be suspected to be defective. Replace the pump controller. Proceed to “Confirmation of repair”.
6	Confirmation of repair	1. Turn the starting switch to OFF position. 2. Connect all the consisting equipment. 3. Turn the starting switch to ON position. 4. Set the breaker mode to other than (B), and troubleshoot. 5. Is this failure code displayed?			YES	Return to the first check item.
					NO	The repair is completed.

No.	Check item	Procedure of troubleshooting			Judgment and remedy	
3	Ground fault in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect the connectors CP02 and M05, and connect the T-adaptor to either female side or male side to troubleshoot. 3. Does the troubleshooting result match with the judgment criteria?			YES	<ul style="list-style-type: none"> Wiring harness has no ground fault. Proceed to next check item.
		Item	Measuring point and measurement condition	Judgment criteria		
		Resistance	Between ground and either CP02 (female) (119) or M05 (male) (3)	Min. 1 MΩ	NO	<ul style="list-style-type: none"> Wiring harness has a ground fault. Repair or replace the wiring harness. Proceed to "Confirmation of repair".
4	Short circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect the connectors CP02 and M05, and connect the T-adaptor to female side of CP02 to troubleshoot. 3. Does the troubleshooting result match with the judgment criteria?			YES	<ul style="list-style-type: none"> Wiring harness has no short circuit. Proceed to next check item.
		Item	Measuring point and measurement condition	Judgment criteria		
		Resistance	Between CP02 (female) (119) and each pin other than (119)	Min. 1 MΩ	NO	<ul style="list-style-type: none"> Wiring harness has a short circuit. Repair or replace the wiring harness. Proceed to "Confirmation of repair".
5	Reconfirmation of check item	1. Reconfirm the preceding troubleshooting. 2. Can you identify the cause by reconfirmation?			YES	The repair is completed.
					NO	<ul style="list-style-type: none"> Pump controller can be suspected to be defective. Replace the pump controller. Proceed to "Confirmation of repair".
6	Confirmation of repair	1. Turn the starting switch to OFF position. 2. Connect all the consisting equipment. 3. Turn the starting switch to ON position. 4. Turn the wiper switch to INT or ON position to troubleshoot. 5. Is this failure code displayed?			YES	Return to the first check item.
					NO	The repair is completed.

Circuit diagram related to engine preheating



B4P42297

No.	Check item	Procedure of troubleshooting	Judgment and remedy	
3	Confirmation of repair	1. Turn the starting switch to OFF position. 2. Turn the starting switch to ON position. 3. Does "Engine coolant temperature monitor lights up in red while engine is running" disappear?	YES	The repair is completed.
			NO	Return to the first check item.

E-30 WHEN TRAVEL SPEED SWITCH IS OPERATED, TRAVEL SPEED MONITOR DOES NOT CHANGE

Detail of failure	When travel speed switch is operated, travel speed monitor does not change.
Related information	<p>Pre-diagnosis If any failure code is displayed, perform troubleshooting for that code first.</p> <p>Monitoring code State of travel speed switch signal can be checked with monitoring. (Code: 04504)</p>

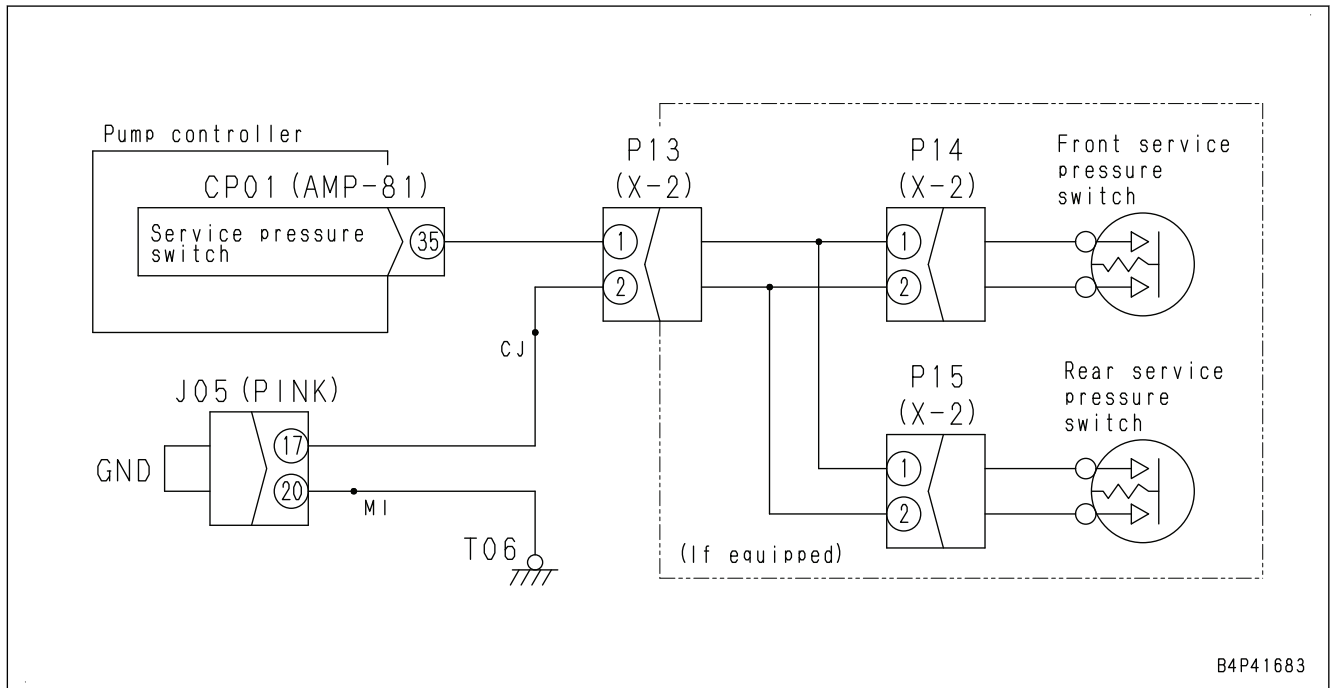
No.	Check item	Procedure of troubleshooting	Judgment and remedy	
			YES	NO
1	Reconfirmation of problem	<ol style="list-style-type: none"> 1. Reconfirm problem. 2. Is any other unsolved problem found by reconfirmation? 	YES	Solve other problems first.
			NO	<ul style="list-style-type: none"> • Machine monitor can be suspected to be defective. • Replace the machine monitor. • Proceed to “Confirmation of repair”.
2	Confirmation of repair	<ol style="list-style-type: none"> 1. Turn the starting switch to OFF position. 2. Connect all the consisting equipment. 3. Turn the starting switch to ON position. 4. Does “When travel speed switch is operated, travel speed monitor does not change” disappear? 	YES	The repair is completed.
			NO	Return to the first check item.

E-41 HORN DOES NOT STOP SOUNDING

Detail of failure		Horn does not stop sounding.				
Related information		<p>Pre-diagnosis If any failure code is displayed, perform troubleshooting for that code first.</p>				
No.	Check item	Procedure of troubleshooting			Judgment and remedy	
1	Wiring harnesses, connectors and terminals	<ol style="list-style-type: none"> 1. Check the wiring harnesses, connectors and terminals. For details, see “Related information of troubleshooting”, “Check before troubleshooting”, “Check method of electrical parts”. 2. Are the wiring harnesses, connectors and terminals normal? 			YES	<ul style="list-style-type: none"> • The wiring harnesses, connectors and terminals are normal. • Proceed to next check item.
					NO	<ul style="list-style-type: none"> • The wiring harness, connector or terminal is defective. • Repair or replace the defective wiring harness, connector or terminal. • Proceed to “Confirmation of repair”.
2	Hot short circuit in wiring harness	<ol style="list-style-type: none"> 1. Turn the starting switch to OFF position. 2. Disconnect the connectors M07 and M08, and connect the T-adaptor to female side. 3. Turn the starting switch to ON position to troubleshoot. 4. Does the measurement result match with the judgment criteria? 			YES	<ul style="list-style-type: none"> • Wiring harness has no hot short circuit. • Proceed to next check item.
		Item	Measuring point and measurement condition	Judgment criteria	NO	<ul style="list-style-type: none"> • Wiring harness has a hot short circuit. • Repair or replace the wiring harness. • Proceed to “Confirmation of repair”.
		Voltage	Between M07 (female) (2) and (1)	Max. 1 V		
			Between M08 (female) (2) and (1)	Max. 1 V		
3	Horn relay	<ol style="list-style-type: none"> 1. Turn the starting switch to OFF position. 2. Disconnect the connector R08, and replace the relay with same type. 3. Turn the starting switch to ON position. 4. Press L.H. knob switch and start troubleshooting. 5. Is phenomenon reproduced accurately? 			YES	<ul style="list-style-type: none"> • Horn relay is normal. • Proceed to next check item.
					NO	<ul style="list-style-type: none"> • Horn relay is defective. • Replace horn relay. • Proceed to “Confirmation of repair”.
4	Confirmation of repair	<ol style="list-style-type: none"> 1. Turn the starting switch to OFF position. 2. Connect all the consisting equipment. 3. Turn the starting switch to ON position, and press horn. 4. Does “Horn does not stop sounding” disappear? 			YES	The repair is completed.
					NO	Return to the first check item.

No.	Check item	Procedure of troubleshooting	Judgment and remedy	
6	Reconfirmation of check item	1. Reconfirm the preceding troubleshooting. 2. Can you identify the cause by reconfirmation?	YES	The repair is completed.
			NO	<ul style="list-style-type: none"> • Pump controller can be suspected to be defective. • Replace the pump controller. • Proceed to “Confirmation of repair”.
7	Confirmation of repair	1. Turn the starting switch to OFF position. 2. Connect all the consisting equipment. 3. Turn the starting switch to ON position. 4. Does “Service is not displayed correctly with monitoring function” disappear?	YES	The repair is completed.
			NO	Return to the first check item.

Circuit diagram related to service switch



H-4 ENGINE SPEED DROPS LARGELY OR ENGINE STOPS

Detail of failure	Engine speed drops largely or engine stalls.
Related information	<p>Pre-diagnosis If any failure code is displayed, perform troubleshooting for that code first.</p> <p>Monitoring code</p> <ul style="list-style-type: none"> The front pump pressure can be checked by monitoring (Code: 01100) The rear pump pressure can be checked by monitoring (Code: 01101) <p>Reference information For operations other than swinging, check whether speed is normal when the swing lock switch is in ON position.</p>

No.	Check item	Procedure of troubleshooting			Judgment and remedy		
1	Front pump main relief valve	1. Test it by referring to TESTING AND ADJUSTING, "TEST AND ADJUST OIL PRESSURE IN WORK EQUIPMENT, SWING, AND TRAVEL CIRCUITS". 2. Does the troubleshooting result match with the judgment criteria?			YES	<ul style="list-style-type: none"> The front pump main relief valve is normal. Proceed to next check item. 	
		Item	Measuring point and measurement condition		Judgment criteria	NO	<ul style="list-style-type: none"> The front pump main relief valve is defective. Adjust the front pump main relief valve. Repair or replace the front pump main relief valve if oil pressure remains abnormal after adjusting it. Proceed to "Confirmation of repair".
		Main relief pressure	Front pump discharge pressure pickup port	<ul style="list-style-type: none"> Boom RAISE relief Hydraulic oil temperature: 45 to 55 °C 	33.1 to 36.8 MPa {338 to 375 kgf/cm ² }		
2	Rear pump main relief valve	1. Test it by referring to TESTING AND ADJUSTING, "TEST AND ADJUST OIL PRESSURE IN WORK EQUIPMENT, SWING, AND TRAVEL CIRCUITS". 2. Does the troubleshooting result match with the judgment criteria?			YES	<ul style="list-style-type: none"> The rear pump main relief valve is normal. Proceed to next check item. 	
		Item	Measuring point and measurement condition		Judgment criteria	NO	<ul style="list-style-type: none"> The rear pump main relief valve is defective. Adjust the rear pump main relief valve. Repair or replace the rear pump main relief valve if oil pressure remains abnormal after adjusting it. Proceed to "Confirmation of repair".
		Main relief pressure	Rear pump discharge pressure pickup port	<ul style="list-style-type: none"> Arm IN relief Hydraulic oil temperature: 45 to 55 °C 	33.1 to 36.8 MPa {338 to 375 kgf/cm ² }		

No.	Check item	Procedure of troubleshooting	Judgment and remedy	
2	Attachment return selector valve	1. Release the pressure remaining in hydraulic tank and piping, then perform troubleshooting. For details, see TESTING AND ADJUSTING, "RELEASE PRESSURE REMAINING IN HYDRAULIC SYSTEM". 2. Is attachment return selector valve free from prying, sticking, scratches, or fatigued spring, and clean?	YES	<ul style="list-style-type: none"> • Attachment return selector valve is normal. • Proceed to next check item.
			NO	<ul style="list-style-type: none"> • Attachment return selector valve is defective. • Repair or replace attachment return selector valve. • Proceed to "Confirmation of repair".
3	Safety valve of service control valve	1. Adjust safety valve. 2. Is oil pressure still abnormal?	YES	<ul style="list-style-type: none"> • Safety valve of service control valve is normal. • Proceed to next check item.
			NO	<ul style="list-style-type: none"> • Safety valve of service control valve is defective. • Repair or replace safety valve of service control valve. • Proceed to "Confirmation of repair".
4	Confirmation of repair	1. Stop the engine. 2. Connect all the consisting equipment. 3. Start the engine to troubleshoot. 4. Does the attachment change normally?	YES	The repair is completed.
			NO	Return to the first check item.

No.	Check item	Procedure of troubleshooting	Judgment and remedy	
8	Merge-divider LS spool	1. Release the remaining pressure in the hydraulic tank and piping, and troubleshoot it. For details, see TESTING AND ADJUSTING, RELEASE REMAINING PRESSURE FROM HYDRAULIC SYSTEM. 2. Are the merge-divider valve body and LS spool clean without prying, sticking, flaw or dirt? (They must be moved smoothly and must not be caught.) REMARK When restoring, be careful to prevent dirt from entering.	YES	<ul style="list-style-type: none"> The merge-divider valve body and LS spool are normal. Proceed to next check item.
			NO	<ul style="list-style-type: none"> The merge-divider valve body and LS spool are defective. Repair or replace the merge-divider valve body and LS spool. Proceed to "Confirmation of repair".
9	Travel RIGHT control valve	1. Release the remaining pressure in the hydraulic system, and troubleshoot it. For details, see TESTING AND ADJUSTING, RELEASE REMAINING PRESSURE FROM HYDRAULIC SYSTEM. 2. Are the control valve body and travel spool clean without prying, sticking, flaw or dirt? (They must be moved smoothly and must not be caught.) REMARK When restoring, be careful to prevent dirt from entering.	YES	<ul style="list-style-type: none"> The travel RIGHT control valve is normal. Proceed to next check item.
			NO	<ul style="list-style-type: none"> The travel RIGHT control valve is defective. Repair or replace the travel RIGHT control valve. Proceed to "Confirmation of repair".
10	Travel LEFT control valve	1. Release the remaining pressure in the hydraulic system, and troubleshoot it. For details, see TESTING AND ADJUSTING, RELEASE REMAINING PRESSURE FROM HYDRAULIC SYSTEM. 2. Are the control valve body and travel spool clean without prying, sticking, flaw or dirt? (They must be moved smoothly and must not be caught.) REMARK When restoring, be careful to prevent dirt from entering.	YES	<ul style="list-style-type: none"> The travel LEFT control valve is normal. Proceed to next check item.
			NO	<ul style="list-style-type: none"> The travel LEFT control valve is defective. Repair or replace the travel LEFT control valve. Proceed to "Confirmation of repair".

No.	Check item	Procedure of troubleshooting	Judgment and remedy	
10	Travel RIGHT motor check valve	<ol style="list-style-type: none"> 1. Replace the forward and reverse check valves of the same travel motor. 2. Does it reproduce the phenomenon without any change? 	YES	<ul style="list-style-type: none"> • The travel RIGHT motor check valve is normal. • Proceed to next check item.
			NO	<ul style="list-style-type: none"> • The travel RIGHT motor check valve is defective. • Replace the travel RIGHT motor check valve. • Proceed to “Confirmation of repair”.
11	Travel LEFT motor check valve	<ol style="list-style-type: none"> 1. Replace the forward and reverse check valves of the same travel motor. 2. Does it reproduce the phenomenon without any change? 	YES	<ul style="list-style-type: none"> • The travel LEFT motor check valve is normal. • Proceed to next check item.
			NO	<ul style="list-style-type: none"> • The travel LEFT motor check valve is defective. • Replace the travel LEFT motor check valve. • Proceed to “Confirmation of repair”.
12	Travel RIGHT motor parking brake	<ol style="list-style-type: none"> 1. Operate R.H. travel off ground while brake is applied, and troubleshoot it. 2. Is the travel RIGHT stopped? 	YES	<ul style="list-style-type: none"> • The travel RIGHT motor parking brake is normal. • Proceed to next check item.
			NO	<ul style="list-style-type: none"> • The travel RIGHT motor parking brake is defective. • Replace the travel RIGHT motor parking brake. • Proceed to “Confirmation of repair”.

H-25 UPPER STRUCTURE OVERRUNS EXCESSIVELY WHEN IT STOPS SWINGING (ONLY ONE DIRECTION EITHER RIGHT OR LEFT)

Detail of failure	Upper structure overruns excessively when it stops swinging (both right and left).
Related information	<p>Pre-diagnosis If any failure code is displayed, perform troubleshooting for that code first.</p> <p>Monitoring code</p> <ul style="list-style-type: none"> • Front pump pressure can be checked by monitoring. (Code: 01100) • Rear pump pressure can be checked by monitoring. (Code: 01101)

No.	Check item	Procedure of troubleshooting			Judgment and remedy	
1	Swing PPC valve	1. Measure it by referring TESTING AND ADJUSTING, "TEST PPC VALVE OUTLET PRESSURE". 2. Does the measurement result match with the judgment criteria?			YES	<ul style="list-style-type: none"> • Swing PPC valve is normal. • Proceed to next check item.
		Item	Measuring point and measurement condition	Judgment criteria	NO	<ul style="list-style-type: none"> • Swing PPC valve is defective. • Replace swing PPC valve. • Proceed to "Confirmation of repair".
		PPC outlet pressure	Swing PPC valve outlet hose	<ul style="list-style-type: none"> • Fuel control dial: Hi • Control lever: All levers in NEUTRAL • Hydraulic oil temperature: 45 to 55 °C 		
			<ul style="list-style-type: none"> • Fuel control dial: Hi • Control lever: Swing LEFT, swing RIGHT • Hydraulic oil temperature: 45 to 55 °C 	2.84 to 3.43 MPa {29 to 35 kgf/cm ² }		

No.	Check item	Procedure of troubleshooting			Judgment and remedy	
9	Regeneration valve of the boom control valve	1. Release the remaining pressure in the hydraulic tank and piping, and test it. For details, see TESTING AND ADJUSTING, RELEASE REMAINING PRESSURE FROM HYDRAULIC SYSTEM. 2. Are the control valve body and boom regeneration valve clean without prying, sticking, flaw or dirt? Is the check valve spring is normal without fatigue or deformation? (They must be moved smoothly and must not be caught.) REMARK When restoring, be careful to prevent dirt from entering.			YES	<ul style="list-style-type: none"> The regeneration valve of the boom control valve is normal. Proceed to next check item.
					NO	<ul style="list-style-type: none"> The regeneration valve of the boom control valve is defective. Repair or replace the regeneration valve of the boom control valve. Proceed to "Confirmation of repair".
10	Safety valve for the lock valve of the boom control valve	1. Test it by referring to TESTING AND ADJUSTING, "TEST AND ADJUST OIL PRESSURE IN WORK EQUIPMENT, SWING, AND TRAVEL CIRCUITS". 2. Does the troubleshooting result match with the judgment criteria?			YES	<ul style="list-style-type: none"> The safety valve for the lock valve of the boom control valve is normal. Proceed to next check item.
		Item	Measuring point and measurement condition		Judgment criteria	NO
Main relief pressure	Front pump discharge pressure pickup port	<ul style="list-style-type: none"> Control lever: Boom RAISE, arm IN, or DUMP relief 	33.1 to 36.8 MPa {338 to 375 kgf/cm ² }			
11	Lock valve of the boom control valve	1. Are the lock valve body, pilot piston and poppet clean without prying, sticking, flaw or dirt? REMARK When restoring, be careful to prevent dirt from entering.			YES	<ul style="list-style-type: none"> The lock valve of the boom control valve is normal. Proceed to next check item.
					NO	<ul style="list-style-type: none"> The lock valve of the boom control valve is defective. Repair or replace the lock valve of the boom control valve. Proceed to "Confirmation of repair".

No.	Check item	Procedure of troubleshooting	Judgment and remedy	
3	Lock valve of boom control valve	1. Are lock valve body, pilot piston, and puppet free from prying, sticking, scratches, or dirt and clean? REMARK When restoring, be careful about the dirt to enter.	YES	<ul style="list-style-type: none"> • Lock valve of boom control valve is normal. • Proceed to next check item.
			NO	<ul style="list-style-type: none"> • Lock valve of boom control valve is defective. • Repair or replace lock valve of boom control valve. • Proceed to "Confirmation of repair".
4	Confirmation of repair	1. Stop the engine. 2. Connect all the consisting equipment. 3. Start the engine. 4. Operate the levers to troubleshoot. 5. Does boom operate normally?	YES	The repair is completed.
			NO	Return to the first check item.

No.	Check item	Procedure of troubleshooting	Judgment and remedy	
13	Piston ring	1. Test it by referring to TESTING AND ADJUSTING, TEST EXHAUST GAS COLOR. 2. Test it by referring to TESTING AND ADJUSTING, TEST COMPRESSION PRESSURE. 3. Check the piston ring and piston ring groove. 4. Is the piston ring normal? Abnormal phenomenon <ul style="list-style-type: none"> • Exhaust gas color is abnormal. (See STANDARD VALUE TABLE.) • The compression pressure is abnormal. (See STANDARD VALUE TABLE.) • The piston ring is defective. 	YES	<ul style="list-style-type: none"> • The piston ring is normal. • Proceed to next check item.
			NO	<ul style="list-style-type: none"> • The piston ring is defective. • Replace the piston ring and piston. • Proceed to “Confirmation of repair”.
14	Reconfirmation of check item	1. Reconfirm the preceding troubleshooting. 2. Was the cause of the problem identified by reconfirming?	NO	<ul style="list-style-type: none"> • The engine controller is defective. • Replace the engine controller. • Proceed to “Confirmation of repair”.
15	Confirmation of repair	1. Stop the engine. 2. Connect all the consisting equipment. 3. Start the engine. 4. Does the engine pick up smoothly?	YES	The repair is completed.
			NO	Return to the first check item.

S-12 FUEL CONSUMPTION IS EXCESSIVE

Failure	Fuel consumption is excessive.		
Related information	If any failure code is displayed, perform troubleshooting for that code first.		
No.	Check item	Procedure of troubleshooting	Judgment and remedy
1	Injector (The spill volume from the injector is large.)	<ol style="list-style-type: none"> Test it by referring to TESTING AND ADJUSTING, "TEST FUEL DISCHARGE, RETURN AND LEAKAGE". Is the spill volume from the injector normal? Abnormal phenomenon <ul style="list-style-type: none"> The exhaust gas color is abnormal. The spill volume from the injector is large. <p>REMARK If the spill volume from the injector is large, excessive dust may be in fuel. Check the fuel control condition.</p>	<p>YES</p> <ul style="list-style-type: none"> The injector is normal. Proceed to next check item.
			<p>NO</p> <ul style="list-style-type: none"> The injector is defective. Replace the injector. Proceed to "Confirmation of repair".
2	Fuel return piping	<ol style="list-style-type: none"> Check the fuel return piping for clogging. Is the fuel return piping is normal? <p>REMARK The clogged fuel return piping increases the injection rate.</p>	<p>YES</p> <ul style="list-style-type: none"> The fuel return piping is normal. Proceed to next check item.
			<p>NO</p> <ul style="list-style-type: none"> The fuel return piping is defective. Repair or replace the fuel return piping. Proceed to "Confirmation of repair".
3	Injector	<ol style="list-style-type: none"> Touch the exhaust manifold right after the engine starts. Test it by referring to TESTING AND ADJUSTING, "HANDLE CYLINDER CUT-OUT MODE OPERATION". Are the exhaust manifold temperature and cylinder cutout mode operation normal? Abnormal phenomenon <ul style="list-style-type: none"> A low-temperature cylinder is found when touching the exhaust manifold right after the engine starts. A cylinder running at the unchanged speed is found during operation in the cylinder cut-out mode. 	<p>YES</p> <ul style="list-style-type: none"> The injector is normal. Proceed to next check item.
			<p>NO</p> <ul style="list-style-type: none"> The injector is defective. Replace the injector. Proceed to "Confirmation of repair".

No.	Check item	Procedure of troubleshooting	Judgment and remedy	
5	Fuel piping (fuel leakage)	1. Test it by referring to TESTING AND ADJUSTING, TEST FUEL CIRCUIT FOR LEAKAGE. 2. Is the fuel piping normal without fuel leakage? Abnormal phenomenon Fuel leaks from the fuel piping.	YES	<ul style="list-style-type: none"> • The fuel piping is normal. • Return to the first check item.
			NO	<ul style="list-style-type: none"> • The fuel piping is defective. • Repair or replace the fuel piping. • Proceed to “Confirmation of repair”.
6	Confirmation of repair	1. Stop the engine. 2. Connect all the consisting equipment. 3. Bleed air from the fuel circuit. 4. Can air be bled from the fuel circuit?	YES	The repair is completed.
			NO	Return to the first check item.

Tools to be used when disassembling and assembling the center swivel joint assembly

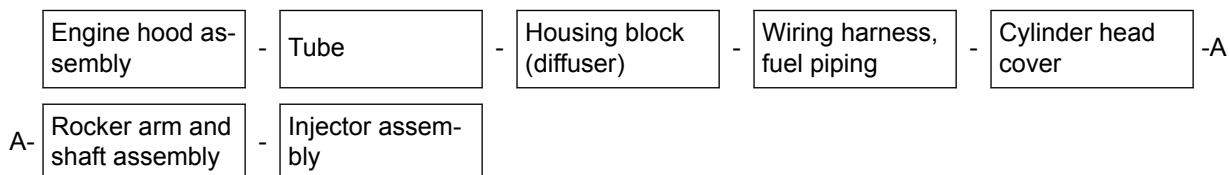
Symbol	Part No.	Part name	Necessity	Q'ty	New/Redesign	Sketch	Remarks
A	790-101-2501	Push puller	•	1			
	790-101-2510	• Block	•	1			
	790-101-2520	• Screw	•	1			
	790-112-1180	• Nut	•	1			
	790-101-2540	• Washer	•	1			
	790-101-2630	• Leg	•	2			
	790-101-2570	• Plate	•	4			
	790-101-2560	• Nut	•	2			
	790-101-2680	• Adapter	•	2			
	790-201-1410	Plate	•	1			

Tools to be used when removing and installing the hydraulic tank assembly

Symbol	Part No.	Part name	Necessity	Q'ty	New/Redesign	Sketch	Remarks
A	07376-70315	Plug (#03)	•	2			Removing and installing the hydraulic tank assembly
	02789-00315	Cap (#03)	•	2			
	02896-11009	O-ring (#03)	•	2			
B	07376-70422	Plug (#04)	•	1			
	02789-00422	Cap (#04)	•	1			
	02896-11012	O-ring (#04)	•	1			
C	07376-70628	Plug (#06)	•	1			
	02789-00628	Cap (#06)	•	1			
	02896-11018	O-ring (#06)	•	1			
D	21W-629-9895	Plug (#10)	•	2			
	21W-629-9915	Cap (#10)	•	2			
	11Y-62-11980	O-ring (#10)	•	2			

REMOVE AND INSTALL INJECTOR ASSEMBLY

REMOVE AND INSTALL INJECTOR ASSEMBLY



Standard tool list

The listed tools are just for reference. Other tools not on the list can also be used if purpose of use is the same.

No.	Part name	Part No.	Specifications	Q'ty	Remarks
1	Socket	Commercially available	9.5 mm	1	
2	Socket	Commercially available	10 mm	1	
3	Socket	Commercially available	11 mm	1	
4	Socket	Commercially available	12 mm	1	
5	Socket	Commercially available	13 mm	1	
6	Socket	Commercially available	14 mm	1	
7	Socket	Commercially available	17 mm	1	
8	Ratchet handle	Commercially available		1	
9	Open-end wrench	Commercially available	7 mm	1	
10	Open-end wrench	Commercially available	10 mm	1	
11	Open-end wrench	Commercially available	17 mm	1	
12	Open-end wrench	Commercially available	19 mm	1	
13	Flat-head screwdriver	Commercially available		1	
14	L-shaped bar	Commercially available		1	
15	Torque wrench	Commercially available	5 to 50 Nm	1	
16	Torque wrench	Commercially available	20 to 200 Nm	1	
17	Torque wrench (open-end)	Commercially available	1 to 5 Nm	1	
18	Torque wrench (open-end)	Commercially available	5 to 50 Nm	1	


4. Tighten the bolts of each cylinder head assembly in the numerical order from (1) to (6).


REMARK


When not using the wrench with angle gauge (B), put the mark (b) on the cylinder head and bolt with paint, and then retighten the bolts 90 to 120 °.


Tool: Ratchet handle, socket, torque wrench, wrench with angle gauge

Bolt: Width across flats 17 mm, M14

 Cylinder head bolt (threaded portion and seat surface):
Molybdenum disulfide lubricant (LM-P) or engine oil (SAW30 or equivalent)

 Cylinder head bolt (1st time):
88.2 to 107.8 Nm {9.0 to 11 kgfm}

 Cylinder head bolt (2nd time):
166.6 to 176.4 Nm {17 to 18 kgfm}

 Cylinder head bolt (3rd time):
90 ° (+30/0 °)

Re-tighten

5. Put the punch mark (c) on each bolt head to indicate the number of tightening.


REMARK

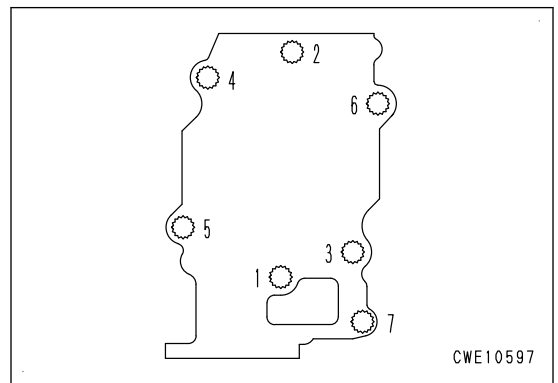
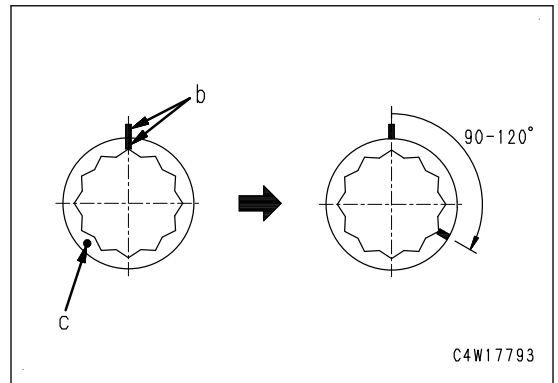
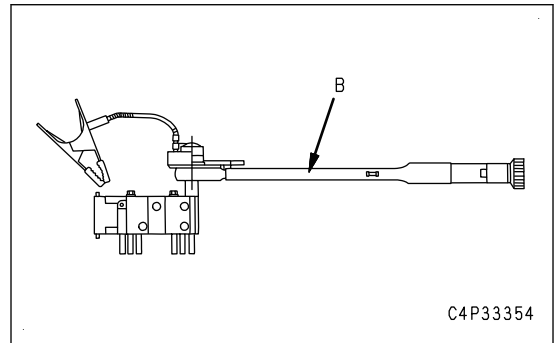
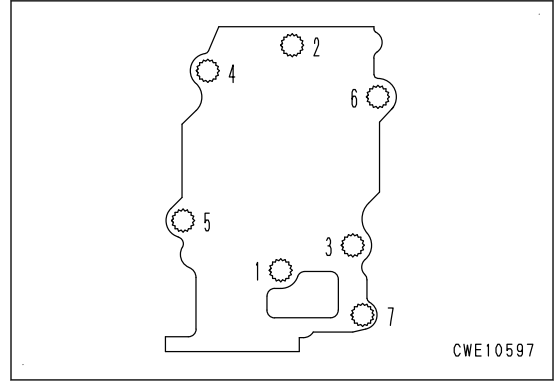
When a new bolt is used, do not put the punch mark (c).

6. Install the bolt (7).

Tool: Ratchet handle, socket, torque wrench

Bolt (7): Width across flats 17 mm, M14

 Bolt (7):
58.8 to 73.5 Nm {6.0 to 7.5 kgfm}



METHOD FOR INSTALLING ALTERNATOR BELT

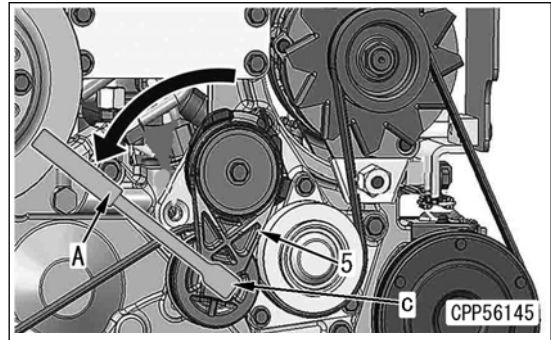
Alternator belt

1. Insert the spinner handle (A) into the portion (c) (width across flats 12.7 mm) of the tensioner assembly (5).

NOTICE

Securely insert the spinner handle (A) into the portion (c) of the tensioner assembly (5). (The spring tension (reaction force) of the tensioner assembly (5) is strong. If the spinner handle (A) is loosely inserted and rotated, it can accidentally come off and this is extremely dangerous.)

Tool: Spinner handle



2. Rotate the spinner handle (A) counterclockwise, decrease the tension (reaction force) of the tensioner assembly (5), rotate the tensioner assembly (5) until the screw hole (d) of the auto-tensioner mount bracket, and then hold it.

Tool: Spinner handle

3. Install the guide bolt (B) to the screw hole (d) of the auto-tensioner mount bracket.

Tool: Guide bolt, ratchet handle, socket

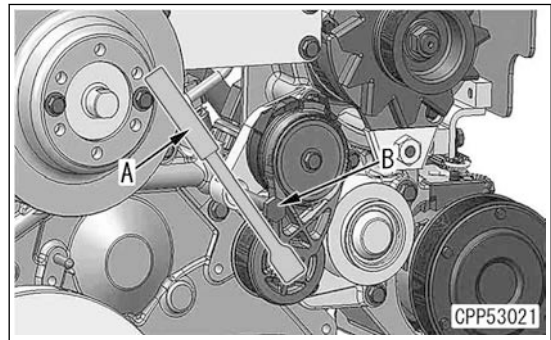
Guide bolt (B): Width across flats 19 mm, M12

4. Rotate the spinner handle (A) clockwise slowly and carefully, attach it to the guide bolt (B), and then hold it.

REMARK

At this time, the spinner handle is held with the tension (reaction force) of the tensioner assembly (5) weakened.

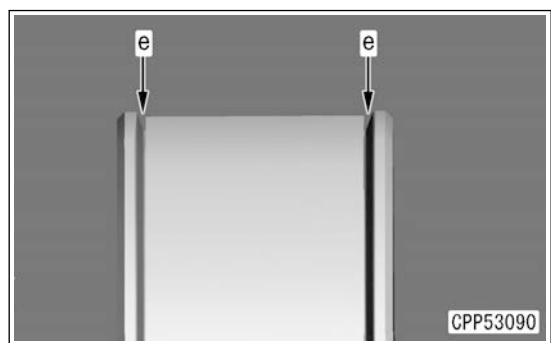
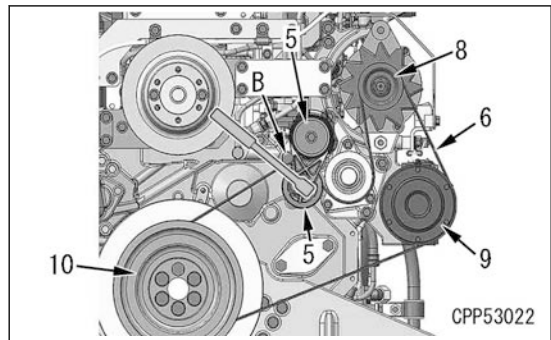
Tool: Spinner handle



5. Install the alternator belt (6) to each pulley of the tensioner assembly (5), alternator (8), air conditioner compressor (9), and crank damper (10).

NOTICE

- Check that the alternator belt (6) is correctly routed.
- Check that the alternator belt (6) is installed to the pulley grooves of the tensioner assembly (5), alternator (8), and air conditioner compressor (9) without thread displacement. And also check that the clearances (e) on the both ends of the belt are even.

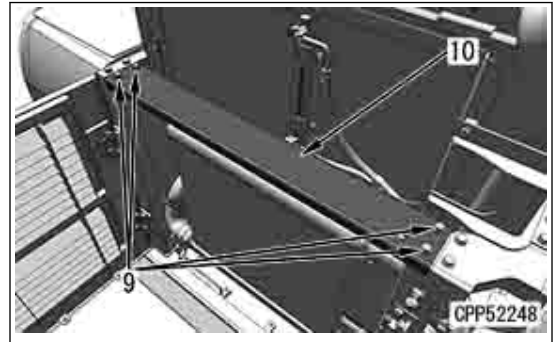


Aftercooler assembly

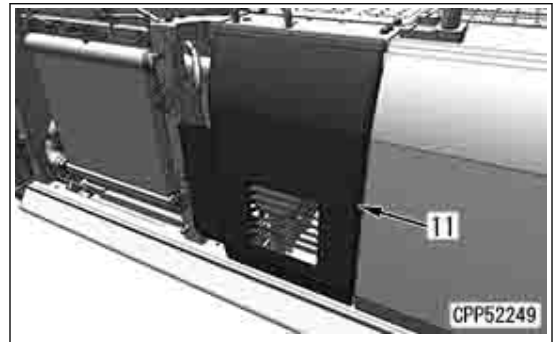
8. Remove the bolts (9) (4 pieces), and remove the frame (10).

Tool: Impact wrench, socket

Bolt (9): Width across flats 19 mm, M12



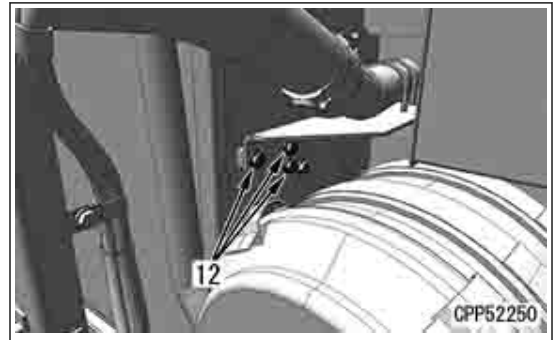
9. Open the cover (11).



10. Remove the bolts (12) (3 pieces).

Tool: Impact wrench, socket

Bolt (12): Width across flats 19 mm, M12



11. Remove MIKALOR clamps (13) (2 pieces), and disconnect the hose (14) according to the following procedure.

Tool: Impact wrench, socket

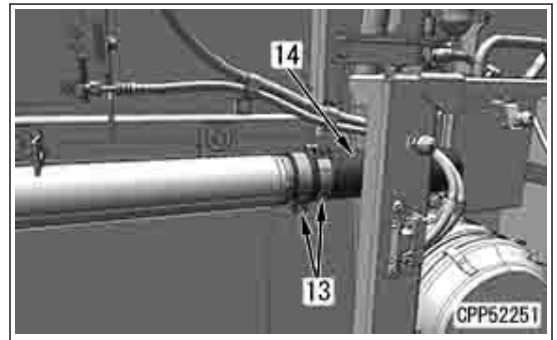
MIKALOR clamp (13): Width across flats 11 mm

- 1) Put matchmarks on the hose end and tube.

NOTICE

This is to connect them correctly again.

- 2) Disconnect the hose.



12. Remove MIKALOR clamps (15) (2 pieces), and disconnect the hose (16) according to the following procedure.

Tool: Impact wrench, socket

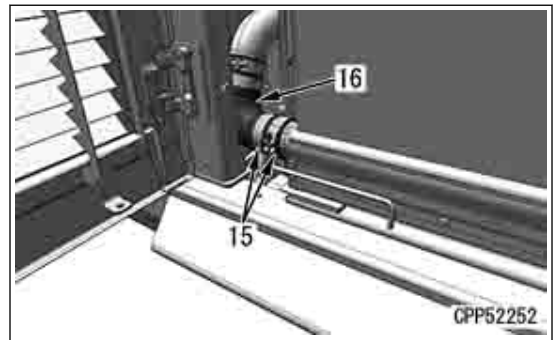
MIKALOR clamp (15): Width across flats 11 mm

- 1) Put matchmarks on the hose end and tube.

NOTICE

This is to connect them correctly again.

- 2) Disconnect the hose.

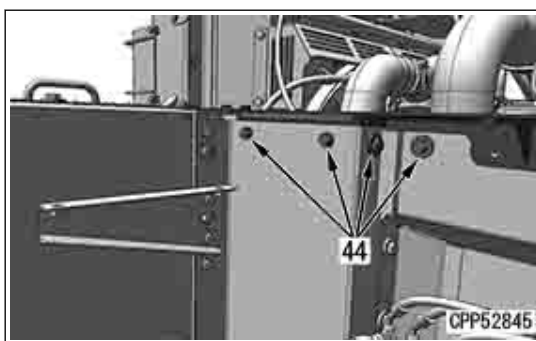
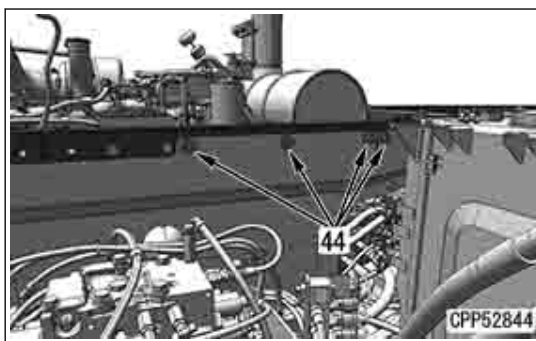
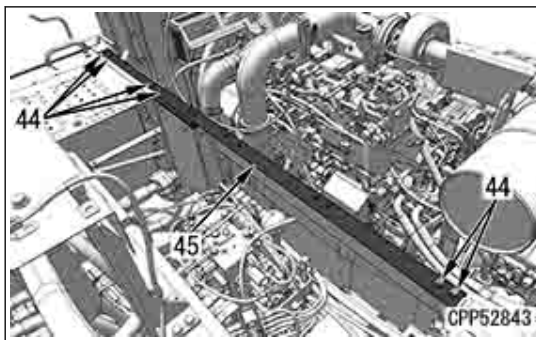


REMOVE AND INSTALL ENGINE AND MAIN PUMP ASSEMBLY

35. Remove the bolts (44) (14 pieces), and remove the bracket (45).

Tool: Impact wrench, socket

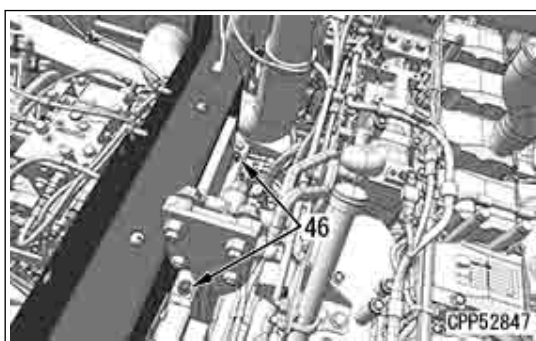
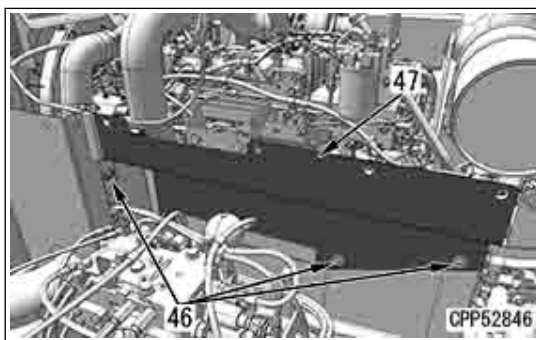
Bolt (44): Width across flats 19 mm, M12



36. Remove the bolts (46) (5 pieces), and remove the cover (47).

Tool: Impact wrench, socket

Bolt (46): Width across flats 19 mm, M12



- ⚠ Place the machine on a level ground, lower the work equipment completely to the ground in a stable posture, 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”.)
- ⚠ Release the remaining pressure in the hydraulic circuit. For details, see TESTING AND ADJUSTING, “RELEASE REMAINING PRESSURE FROM HYDRAULIC SYSTEM”.

NOTICE

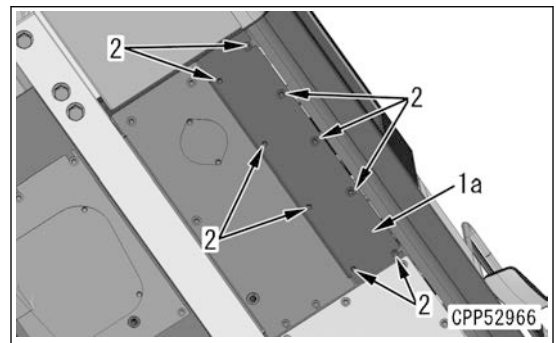
- When removing and installing the fuel piping, be careful to prevent foreign materials from entering the fuel piping. If any dust sticks to any part, clean that part completely with clean fuel.
- Install a plug or flange in the place where a hydraulic hose is disconnected to prevent oil from flowing out.
- Write down the connector numbers and installed positions before disconnecting electric wirings and hoses.

METHOD FOR REMOVING ENGINE FRONT OIL SEAL**Undercover**

1. Remove the bolts (2) (9 pieces), and remove the undercover (1a).

Tool: Impact wrench, socket

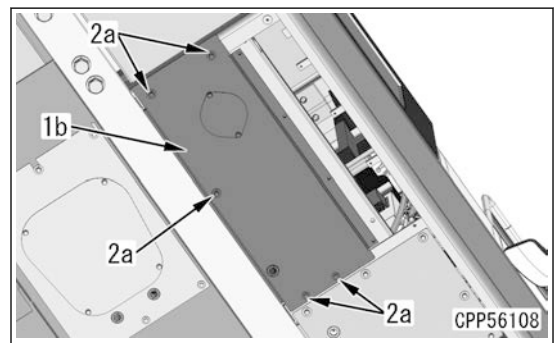
Bolt (2): Width across flats 19 mm, M12



2. Remove the bolts (2a) (5 pieces), and remove the undercover (1b).

Tool: Impact wrench, socket

Bolt (2a): Width across flats 19 mm, M12

**Engine hood assembly**

3. Remove the engine hood assembly. See “REMOVE AND INSTALL ENGINE HOOD ASSEMBLY”.

Fan clutch assembly

4. Remove the fan clutch assembly. See “REMOVE AND INSTALL FAN CLUTCH ASSEMBLY”.

Fan belt

5. Remove the fan belt. See “REMOVE AND INSTALL FAN BELT”.

Alternator belt

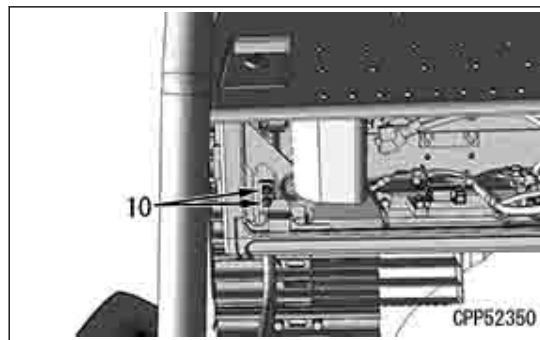
6. Remove the alternator belt. See “REMOVE AND INSTALL ALTERNATOR BELT”.

REMOVE AND INSTALL FUEL TANK ASSEMBLY

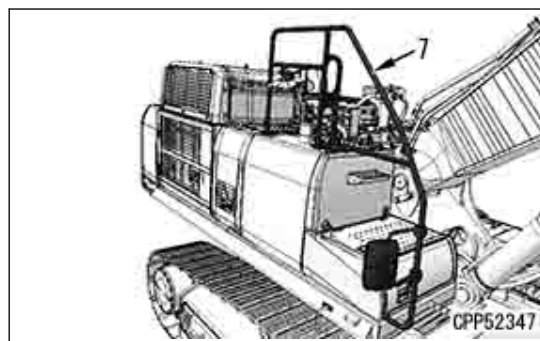
10. Remove the bolts (10) (2 pieces).

Tool: Impact wrench, socket

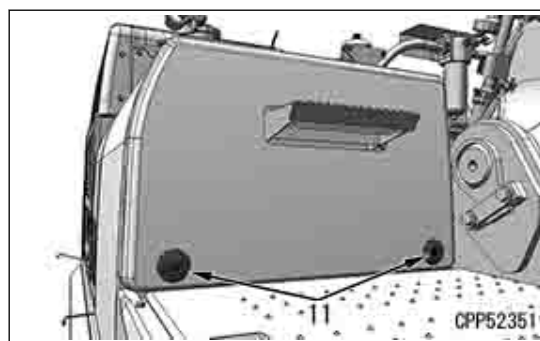
Bolt (10): Width across flats 19 mm, M12



11. Sling the handrail (7), and remove it.



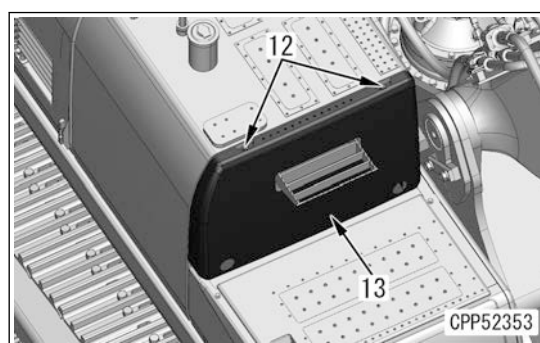
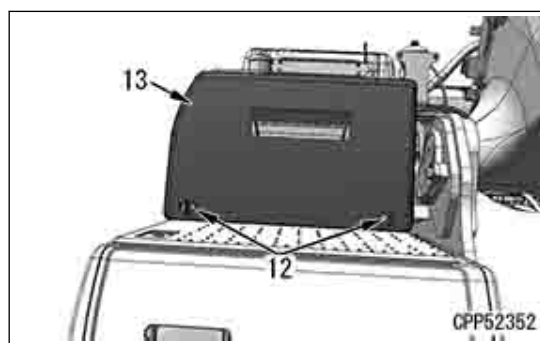
12. Remove the caps (11) (2 pieces).



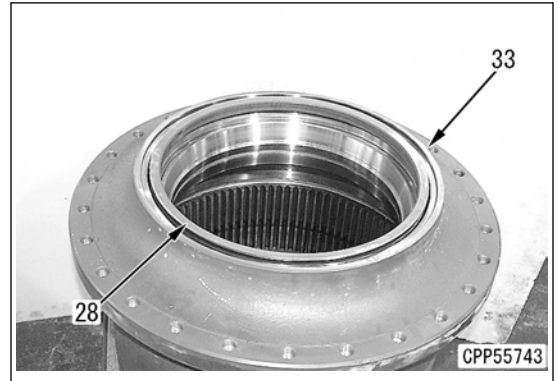
13. Remove the bolts (12) (4 pieces), and remove the cover (13).

Tool: Impact wrench, socket

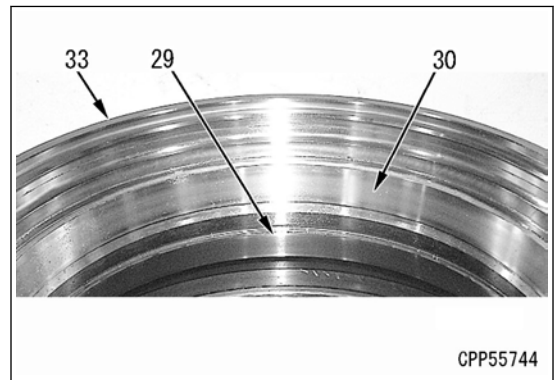
Bolt (12): Width across flats 19 mm, M12



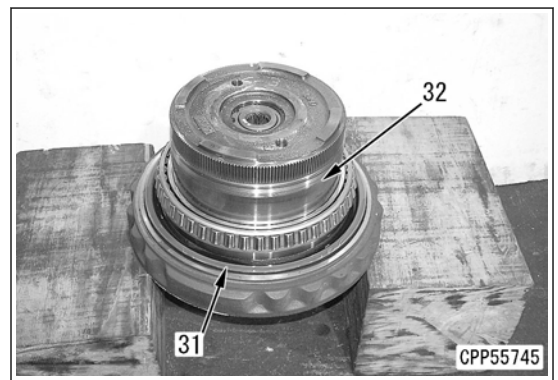
23. Remove the floating seal (28) from the hub (33).



24. Remove the bearing outer races (29) and (30) from the hub (33).

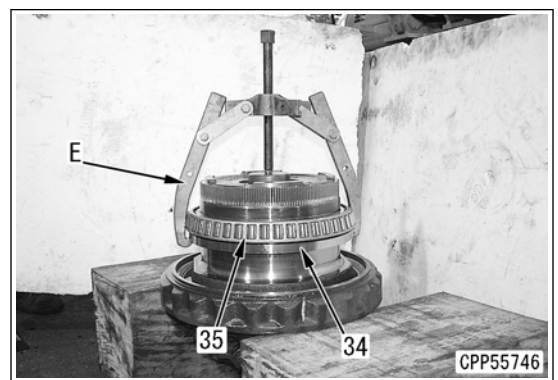


25. Remove the floating seal (31) from the travel motor (32).



26. Remove the bearing (35) together with the collar (34) by using the gear puller (E).

Tool: Gear puller (E)



METHOD FOR ASSEMBLING FINAL DRIVE ASSEMBLY

NOTICE

Clean the parts, and check that they are free from dirt or damage. Then apply the power train oil (TO30) to the sliding surface, and assemble them.

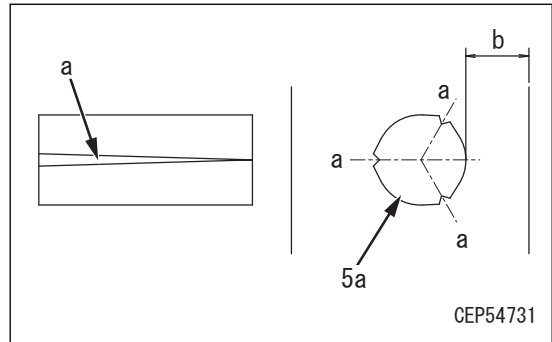
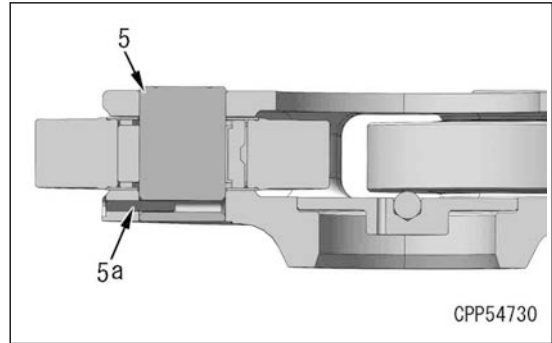
23. Align the shaft with the pin hole positions of the carrier, and lightly tap the shaft (5) with a plastic hammer, etc. to install it.

Tool: Plastic hammer

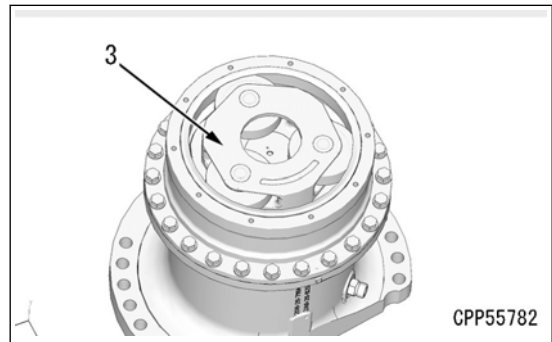
24. Insert the pin (5a).

NOTICE

- When inserting the pin (5a), take care that the claws (a) (3 places) on the periphery are not placed on the thin-wall parts (b) of the carrier. However, the thin-wall part may be on the opposite side depending on carriers. Check each carrier and be careful that the claws of the pin are not placed on the thin-wall side.
- After inserting the pin (5a), punch the pin of the carrier.

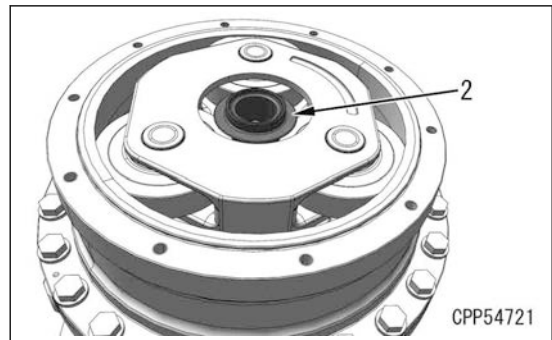
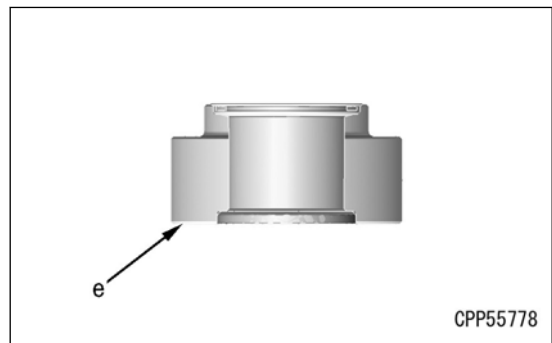


25. Install the No.1 carrier assembly (3).



No.1 sun gear assembly

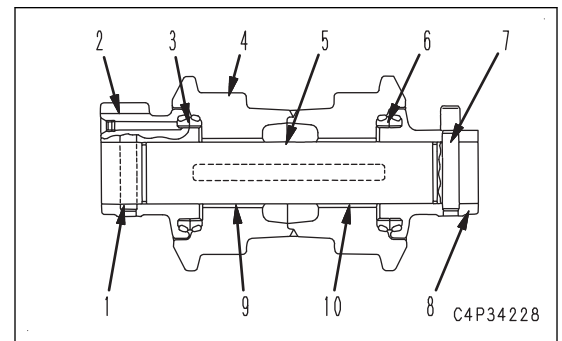
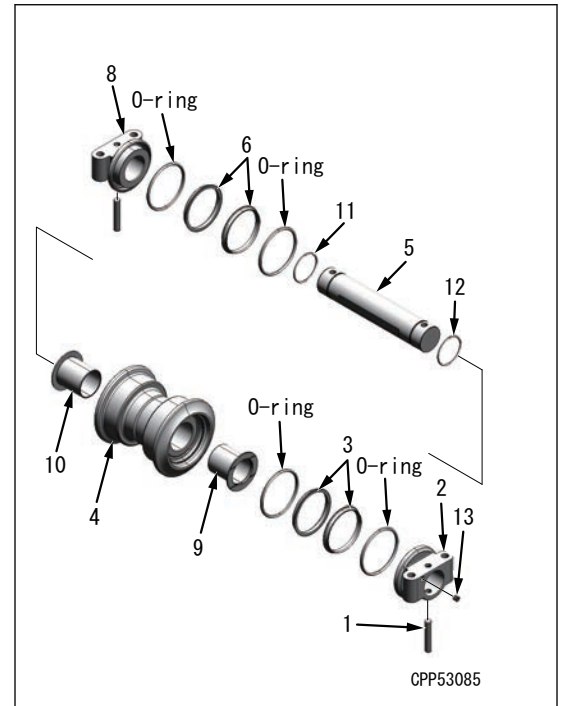
26. Install the No.1 sun gear (2) so that the blade (e) is located at the bottom.



METHOD FOR DISASSEMBLING TRACK ROLLER ASSEMBLY

Pin

1. Remove the pin (1), and remove the collar (2).



Floating seal

2. Remove the floating seals (3) from the collar (2) and roller (4).

Roller

3. Pull out the roller (4) from the shaft (5) and collar (8) assembly.

REMARK

Approximately <data datatype="cc">195</data> oil is filled and sealed. Drain it at this timing or spread a cloth to keep the ground clean.

Floating seal

4. Remove the floating seals (6) on the other side from the roller (4), and the shaft (5) and collar (8) assembly.

Collar

5. Remove the pin (7), and remove the collar (8) from the shaft (5).

Bushing


6. Remove the bushings (9) and (10) from the roller (4).

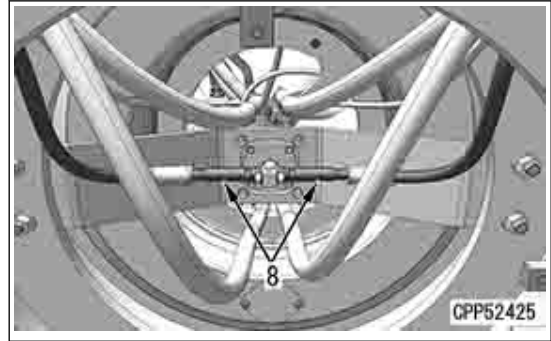
REMOVE AND INSTALL CENTER SWIVEL JOINT ASSEMBLY

10. Connect the hoses (8) (2 pieces).

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

Hose (8): Width across flats 32 mm, #05


 Hose (8):
128 to 186 Nm {13 to 19 kgfm}

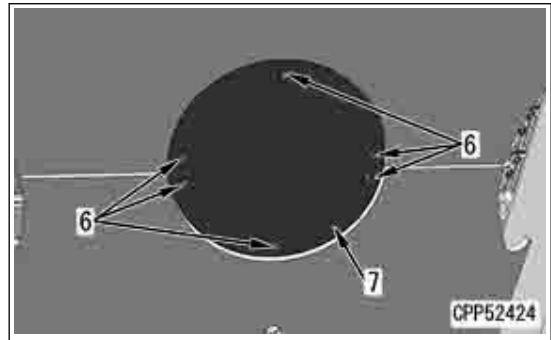
**Undercover**

11. Install the undercover (7) with the bolts (6) (6 pieces).


Tool: Impact wrench, socket, torque wrench

Bolt (6): Width across flats 19 mm, M12

 Bolt (6):
98 to 123 Nm {10.0 to 12.5 kgfm}

**Refilling with hydraulic oil**

12. Refill the hydraulic tank with Komatsu genuine oil to the specified level through the oil filler port. Start the engine to circulate the oil through the piping, and check the oil level again. (For details, see Operation and Maintenance Manual, SPECIFICATIONS, "TABLE OF FUEL, COOLANT, AND LUBRICANTS".)

 Hydraulic tank:
280 ℓ


Air bleeding

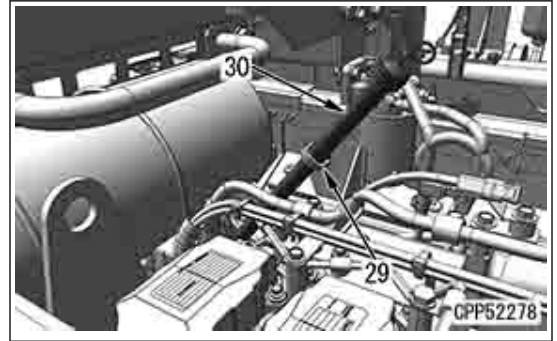
13. Bleed air from the hydraulic circuit. See TESTING AND ADJUSTING, "BLEED AIR FROM HYDRAULIC CIRCUIT".

7. Install the dipstick pipe (30) with the nuts (2 pieces) of U-clamp (29).

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

Nut of U-clamp (29): Width across flats 17 mm


 Nut of U-clamp (29):
10.8 to 26.0 Nm {1.1 to 2.7 kgfm}

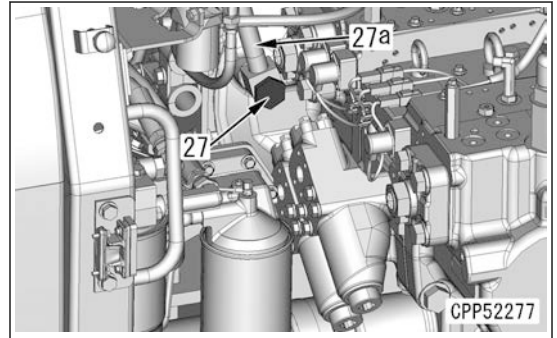


8. Install the tube (27) with the bolt (27a).

Tool: Impact wrench, socket, torque wrench

Bolt (27a): Width across flats 41 mm, M30


 Bolt (27a):
127 to 167 Nm {13 to 17 kgfm}

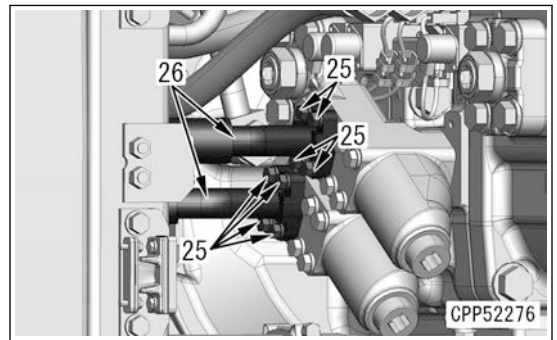


9. Connect the hoses (26) (2 pieces) with the bolts (25) (8 pieces).

Tool: Impact wrench, socket, torque wrench

Bolt (25): Width across flats 14 mm, M10


 Bolt (25):
59 to 74 Nm {6.0 to 7.5 kgfm}

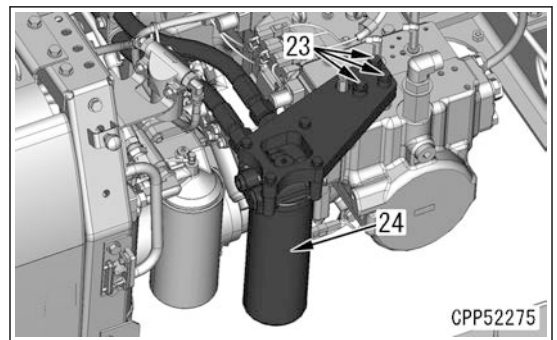


10. Install the engine oil filter assembly (24) with the bolts (23) (3 pieces).

Tool: Impact wrench, socket, torque wrench

Bolt (23): Width across flats 19 mm, M12


 Bolt (23):
98 to 123 Nm {10.0 to 12.5 kgfm}

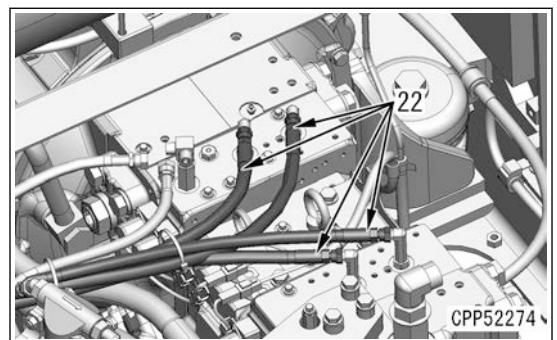


11. Connect the hoses (22) (4 pieces).

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

Hose (22): Width across flats 19 mm, #02

 Hose (22):
34 to 54 Nm {3.5 to 5.5 kgfm}

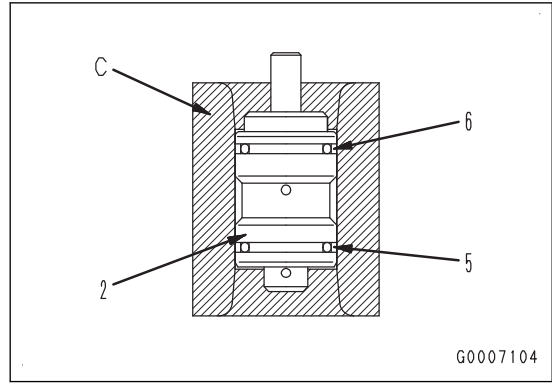


5. Install the sleeve (C) to the piston assembly (2) for approximately 1 minute to make the seals (5) and (6) settle.

REMARK

Check that the seal has no extrusion or defect.

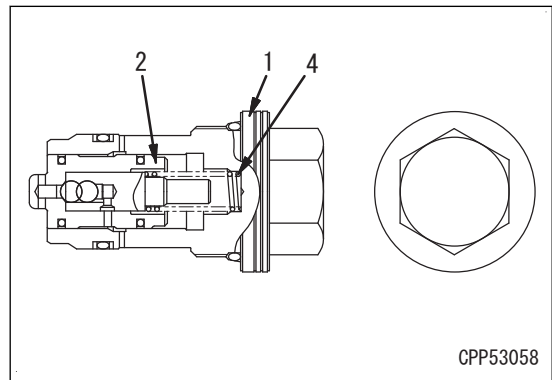
Tool: Sleeve (C)



6. Install the spring (4) to the piston assembly (2), and assemble the pressure compensation valve (1).

REMARK


After completing assembly, push the piston (2) by hand to check that the piston returns only by the spring force.

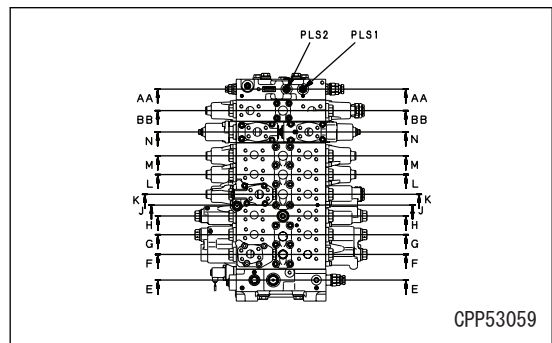


METHOD FOR ASSEMBLING CONTROL VALVE ASSEMBLY

Applying oil

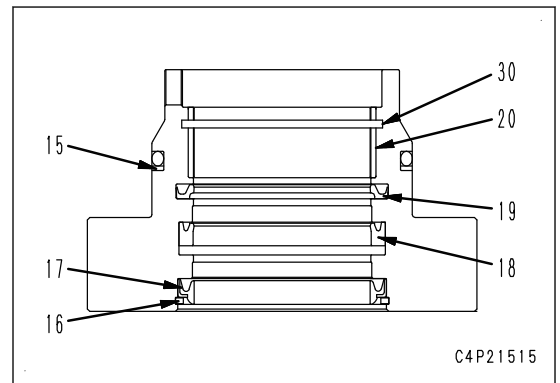
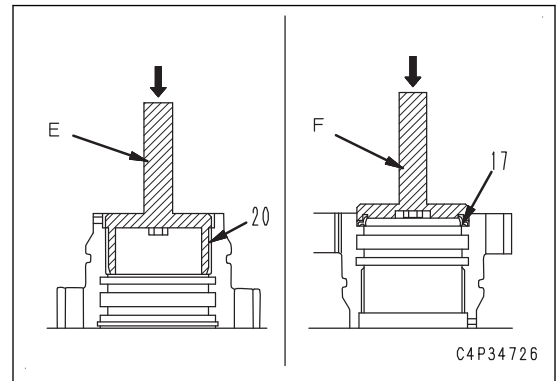
1. Apply oil to the sliding surface for assembling.

 Sliding surface:
Engine oil (EO30-DH or equivalent)



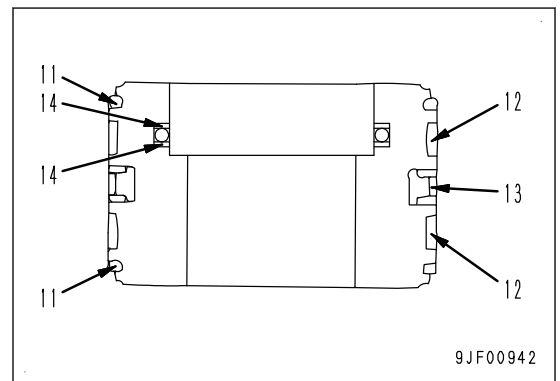
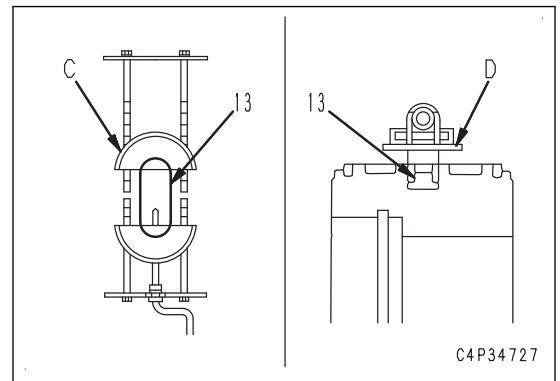
Assembling the cylinder head assembly


3. Press fit the bushing (20) by using the push tool kit (E).
Tool: Push tool kit (E)
4. Install the snap ring (30).
Tool: Snap ring pliers
5. Install the buffer ring (19) and rod packing (18).
6. Install the dust seal (17) by using the push tool kit (F), and fix it with the snap ring (16).
Tool: Push tool kit (F)
7. Install the backup ring and O-ring (15).



Assembling the piston assembly

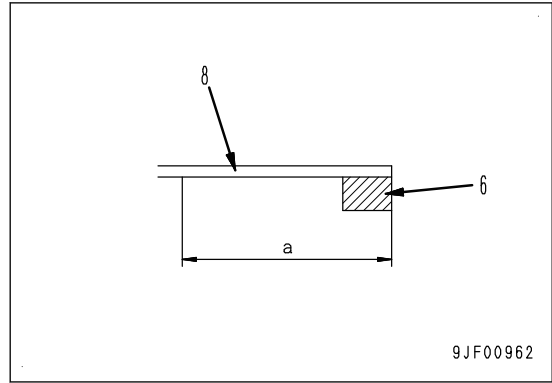
8. Expand the piston ring (13) by using the expander (C).
REMARK
Set the piston ring to the clamp (D), and then rotate the handle by 8 to 10 turns to expand it.
Tool: Expander (C), clamp (D)
9. Remove the piston ring (13) from the expander (C), and install it to the piston.
10. Compress the piston ring (13) by using the ring (D).
Tool: Ring (D)
11. Install the backup ring and O-ring (14).
12. Install the wear rings (12) (2 pieces).
13. Install the rings (11) (2 pieces).
REMARK
Take care not to expand the ring mating part excessively.
14. Apply grease to the groove of the ring (11).



 Ring groove:
Grease (G2-LI)

REMARK

Area to be applied: Dimension (a): Entire area of range of 30 mm.

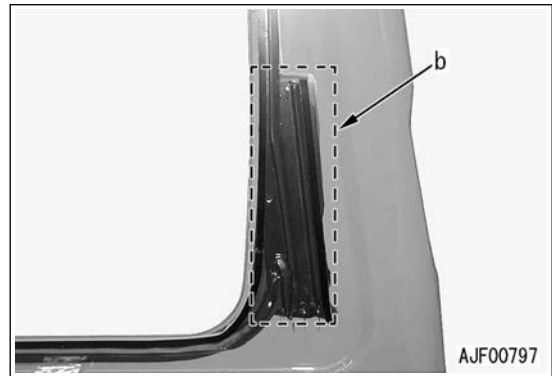


REMARK

In addition to the above, apply additional primer to R.H. window glass (1) and door lower window glass (3).

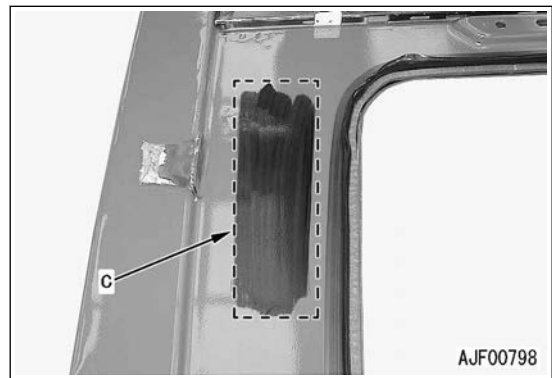
Additional primer application area for R.H. window glass (1): (b)

Additional primer application area for door lower window glass (3): (c)




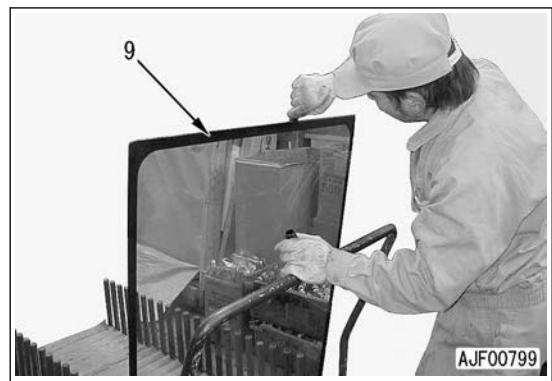
NOTICE

- After applying the primer, leave it for at least 5 minutes (maximum 24 hours) for air drying.
- Never apply wrong primer. If a wrong primer such as the primer for glass is applied, wipe it out completely by using white gasoline.




- 4) Apply the glass primer to the mounting surface of the glass (9).

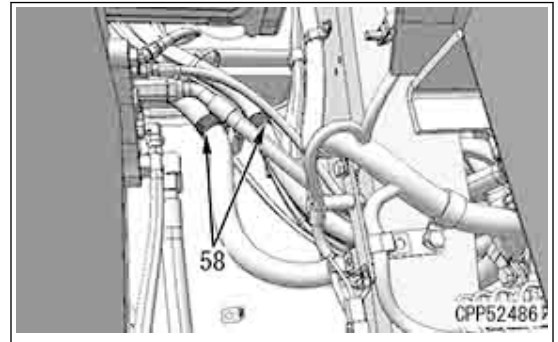
 Primer for glass:
SUNSTAR Primer 453-40 for glass



Hose

2. Install the clamp (58) with the bolts (2 pieces).
Tool: Impact wrench, socket, torque wrench
Bolt of clamp (58): Width across flats 19 mm, M12

 Bolt of clamp (58):
98 to 123 Nm {10.0 to 12.5 kgfm}




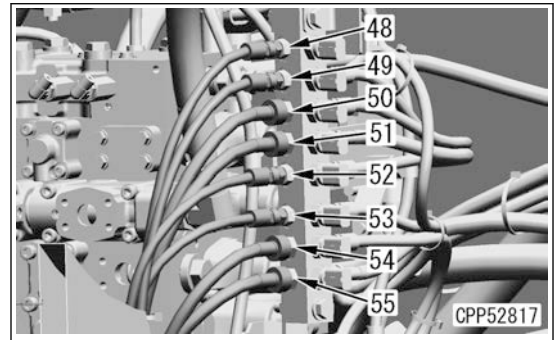
3. Connect the work equipment PPC valve hoses (48), (49), (50), (51), (52), (53), (54), and (55) to the junction block (56).

The band colors of the hoses are as shown below.

- (48): White (bucket CURL circuit) (sleeve nut)
- (49): Brown (boom LOWER circuit) (sleeve nut)
- (50): No band (swing RIGHT circuit) (quick coupler)
- (51): Blue (arm IN circuit) (quick coupler)
- (52): Black (bucket DUMP circuit) (sleeve nut)
- (53): Green (boom RAISE circuit) (sleeve nut)
- (54): Red (swing LEFT circuit) (quick coupler)
- (55): Yellow (arm OUT circuit) (quick coupler)

Tool: Open-end wrench, torque wrench (open-end)
Hoses (48), (49), (52), (53): Width across flats 19 mm, #02


 Hoses (48), (49), (52), (53):
34 to 54 Nm {3.5 to 5.5 kgfm}

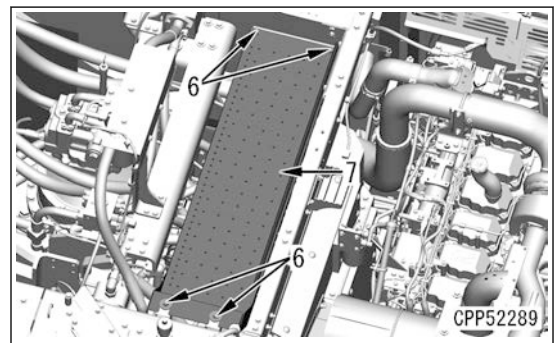


Cover

4. Install the cover (7) with the bolts (6) (4 pieces).

Tool: Impact wrench, socket, torque wrench
Bolt (6): Width across flats 19 mm, M12


 Bolt (6):
98 to 123 Nm {10.0 to 12.5 kgfm}

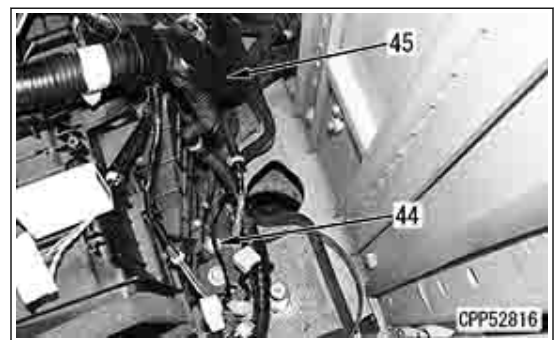


Ground cable, clamp

5. Install all the clamps of the main wiring harness (45) that is fixed to the floor frame.
6. Install the ground cable T01 (44).

Tool: Impact wrench, socket, torque wrench
Bolt of ground cable T01 (44): Width across flats 17 mm, M10

 Bolt of ground cable T01 (44):
59 to 74 Nm {6.0 to 7.5 kgfm}



REMOVE AND INSTALL SEAT BELT

Standard tool list

The listed tools are just for reference. Other tools not on the list can also be used if purpose of use is the same.

No.	Part name	Part No.	Specifications	Q'ty	Remarks
1	Socket	Commercially available	5/8 inch	1	
2	Impact wrench	Commercially available		1	
3	Torque wrench	Commercially available	10 to 50 Nm	1	

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

⚠ Removal and installation work must be done in pairs.

METHOD FOR REMOVING SEAT BELT

Operator's seat

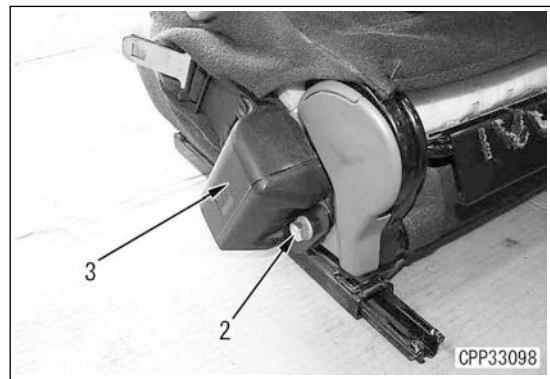
- Remove the operator's seat. See "REMOVE AND INSTALL OPERATOR'S SEAT".

Seat belt

- Remove the bolt (2), and remove the seat belt (3).

Tool: Impact wrench, socket

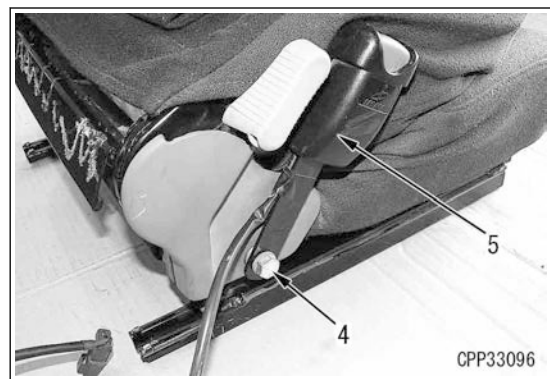
Bolt (2): Width across flats 5/8 inch (15.9 mm)



- Remove the bolt (4), and remove the seat belt (5).

Tool: Impact wrench, socket


Bolt (4): Width across flats 5/8 inch (15.9 mm)

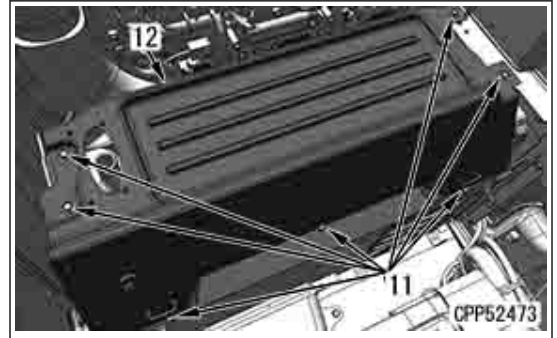


6. Install the cover (12) with the bolts (11) (7 pieces).

Tool: Impact wrench, socket, torque wrench

Bolt (11): Width across flats 12 mm, M8


 Bolt (11):
27 to 34 Nm {2.8 to 3.5 kgfm}

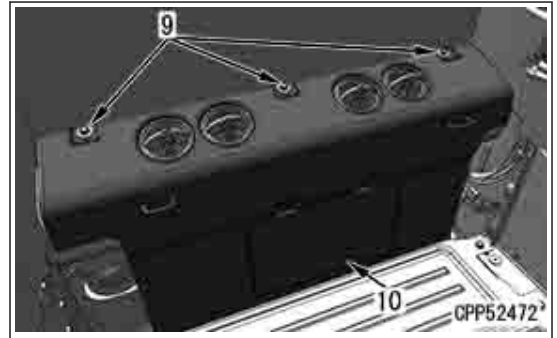


7. Install the cover (10) with the bolts (9) (3 pieces).

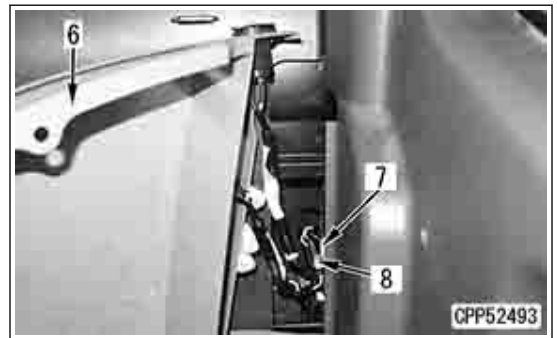
Tool: Impact wrench, socket, torque wrench

Bolt (9): Width across flats 10 mm, M6

 Bolt (9):
11.8 to 14.7 Nm {1.2 to 1.5 kgfm}




8. Connect the connectors M13A (7) and M13B (8), and align the box (6) with the machine.

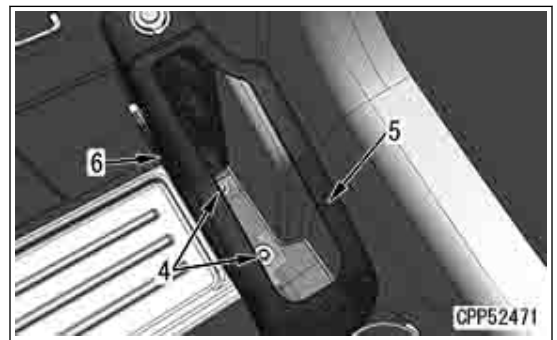


9. Install the box (6) with the bolts (4) (2 pieces) and rivet (5).

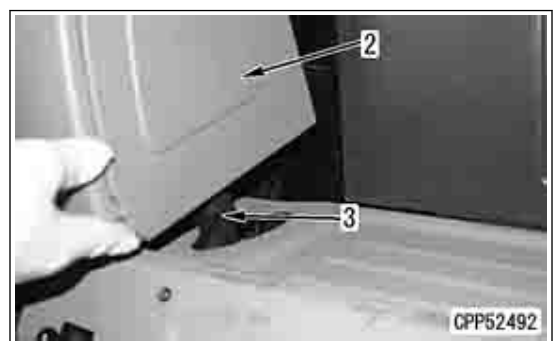
Tool: Impact wrench, socket, torque wrench

Bolt (4): Width across flats 10 mm, M6

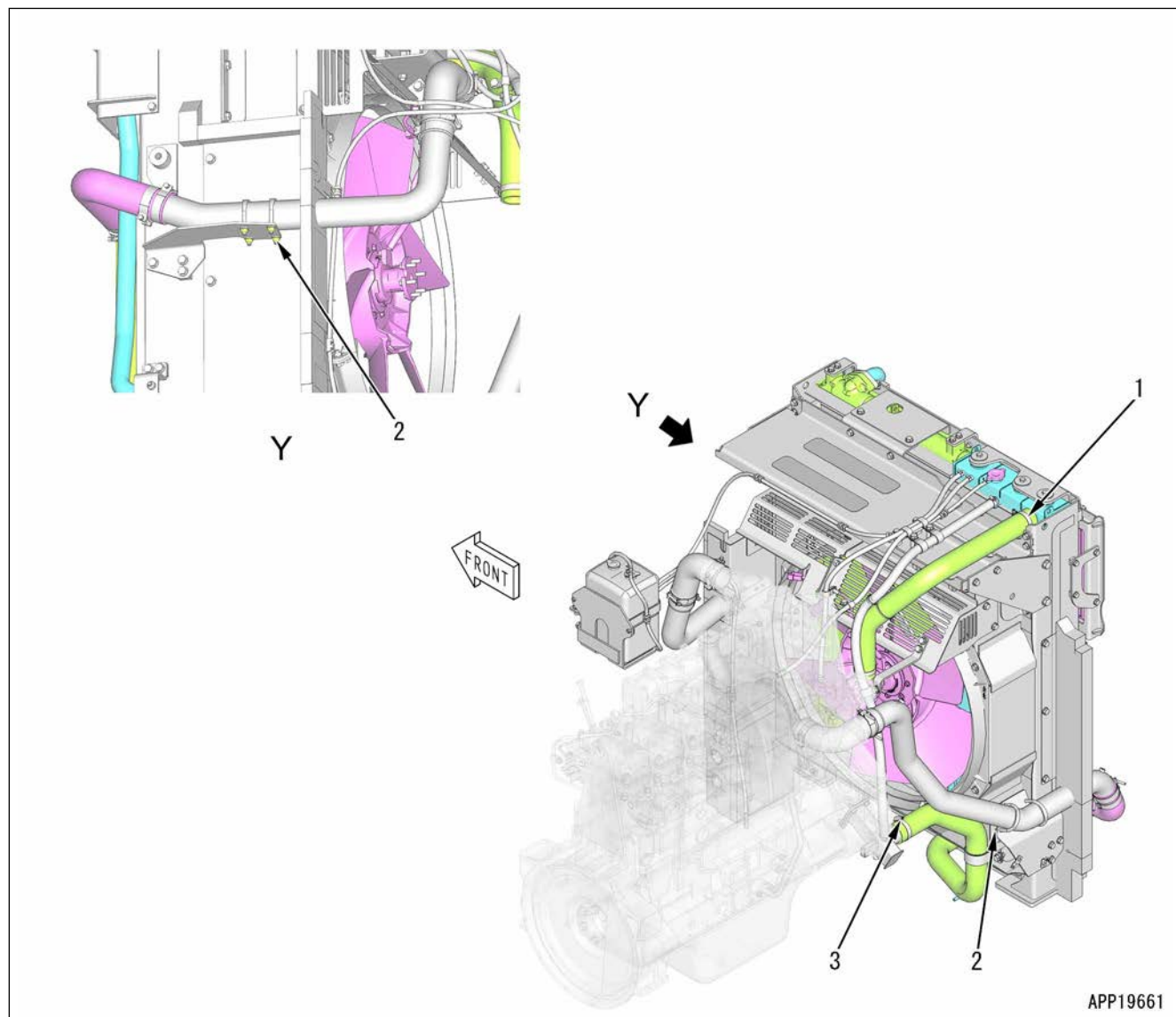
 Bolt (4):
11.8 to 14.7 Nm {1.2 to 1.5 kgfm}



10. Connect the hose (3), and align the box (2) with the machine.



MAINTENANCE STANDARD OF COOLING SYSTEM



No.	Item	Judgment criteria	Remedy
1	Tightening torque of the clamp	10.8 to 11.8 Nm {1.1 to 1.2 kgfm}	Re-tighten
2	Tightening torque of the nut	10.8 to 26.5 Nm {1.1 to 2.7 kgfm}	
3	Tightening torque of the clamp	10.8 to 11.8 Nm {1.1 to 1.2 kgfm}	

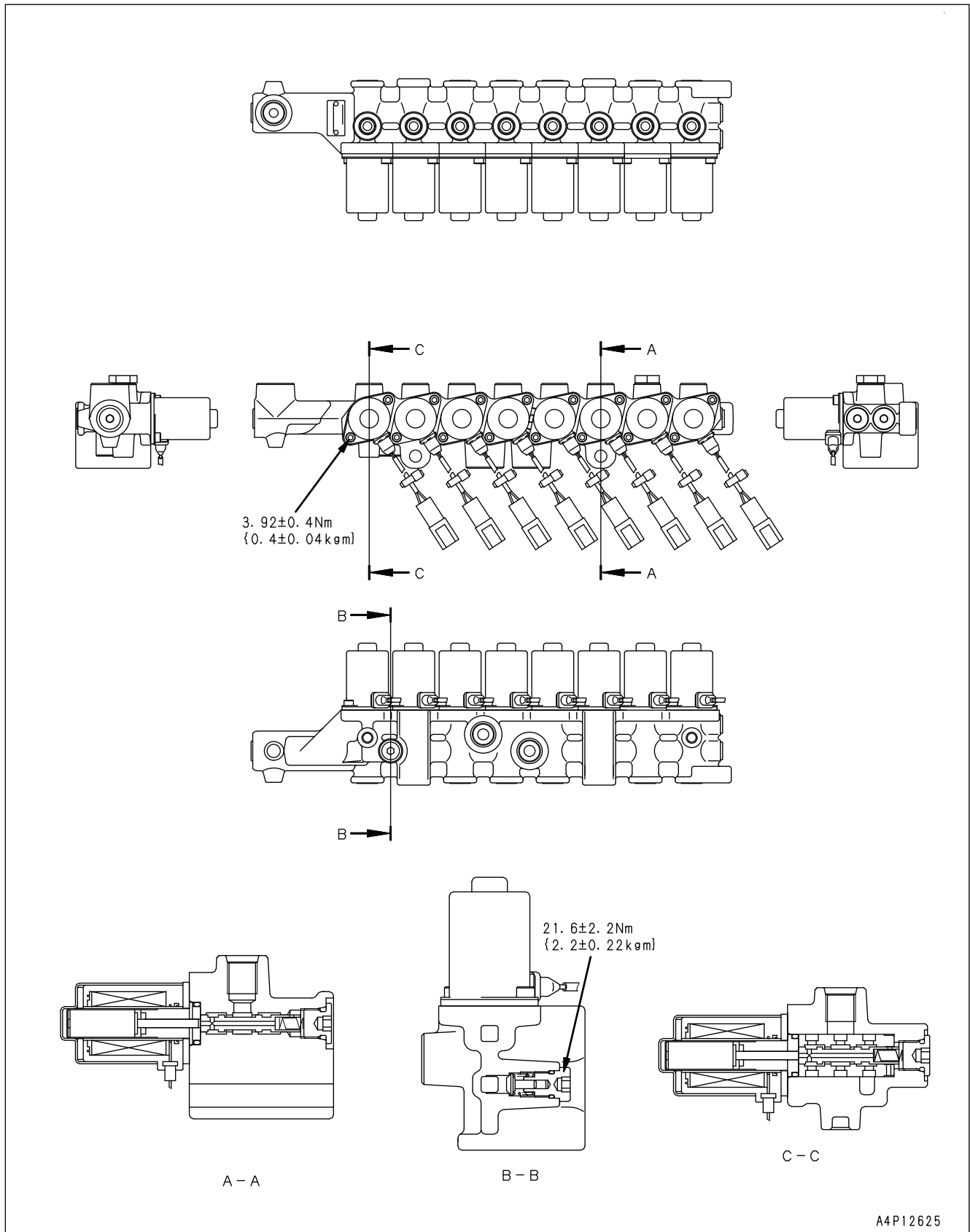
Unit: mm

No.	Item	Criteria					Remedy
		Standard dimension			Repair limit		
1	Check valve spring	Free height x outside di- ameter	Installed height	Load at in- stalled height	Free height	Load at in- stalled height	Replace spring if damaged or de- formed
		66.5 x 25.6	45.0	6.96 N {0.71 kg}	-	5.59 N {0.57 kg}	
2	Shuttle valve spring	24.5 x 11.6	14.5	7.75 N {0.79 kg}	-	6.20 N {0.63 kg}	

MAINTENANCE STANDARD OF SOLENOID VALVE

REMARK

The figure is for the machines ready for installation of attachment.

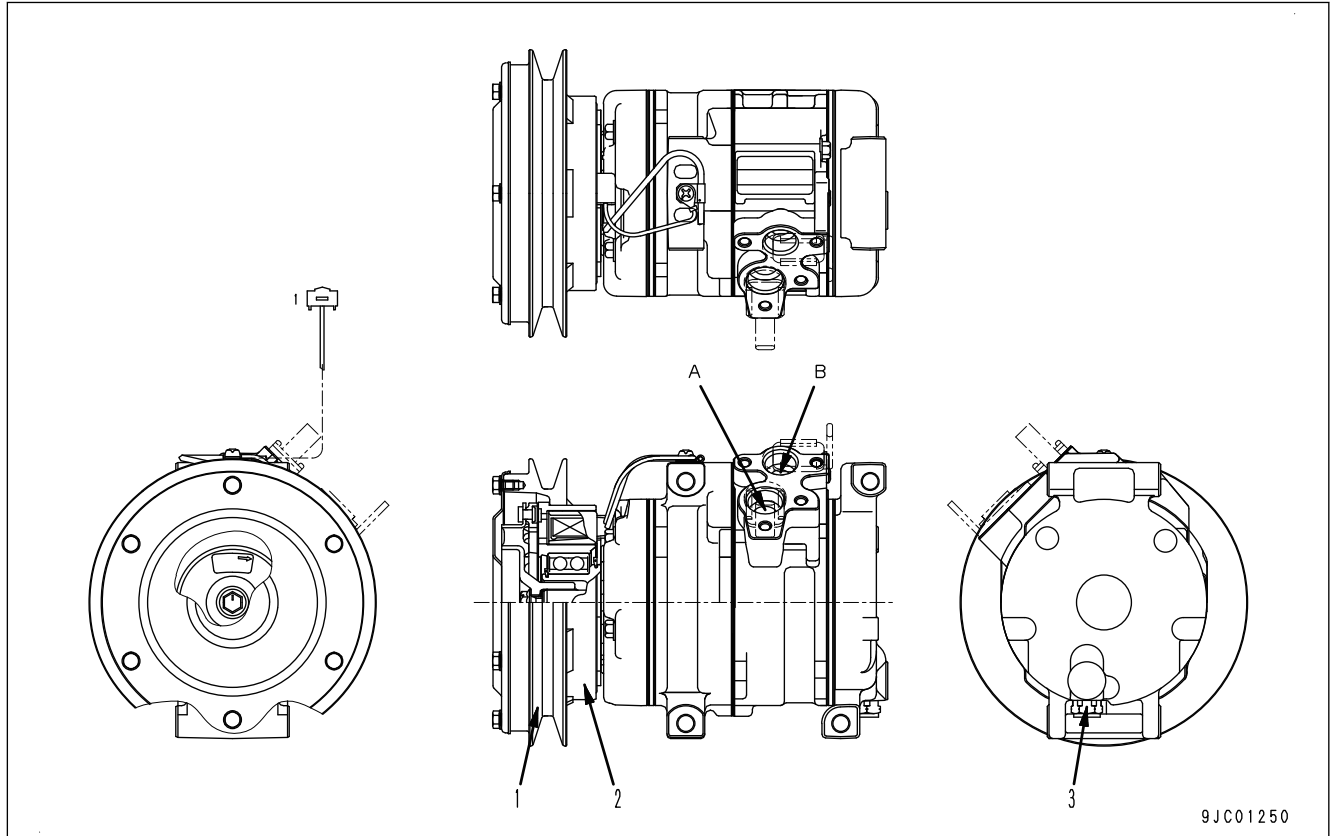


80 APPENDIX

COMPRESSOR

STRUCTURE OF COMPRESSOR

General view



A: Refrigerant inlet (from air conditioner unit)

B: Refrigerant outlet (to condenser)

1: Pulley

3: Relief valve

2: Magnetic clutch

SPECIFICATIONS OF COMPRESSOR

Number of cylinders - Cylinder bore x Stroke: : 10 - 32x20.8 mm

Delivery: : 157.3 cc/rev

Allowable max. speed: : 6000 rpm

Compressor oil: DENSO: ND-OIL8 (for R134a)

Compressor oil quantity: : 180 cc

FUNCTION OF COMPRESSOR

- The compressor circulates the refrigerant and compresses the gaseous refrigerant from the evaporator into a misty refrigerant at high pressure and high temperature so that it is easily regenerated (liquefied) at the normal temperature.
- The air conditioner controller operates magnetic clutch (2) inside the compressor, according to the evaporator temperature and refrigerant pressure.
- When magnetic clutch (2) is engaged, the compressor shaft is turned together with pulley (1) by the engine power, and the compressor is driven.

TEST RELAYS

⚠️ Park the machine on a level ground, lower the work equipment to the ground in a stable posture, set the lock lever to LOCK position, and stop the engine.

⚠️ Turn the battery disconnect switch to OFF position, and remove the key.

- Write down the connector numbers and installed positions before disconnecting wiring harnesses and hoses.
- If the air conditioner compressor is normal (it cools air), skip this troubleshooting.
- Compressor clutch relay R21 turns air conditioner compressor (clutch) ON/OFF. For the location, see “Air conditioner parts locations and connector layout”.

METHOD FOR TESTING RELAYS

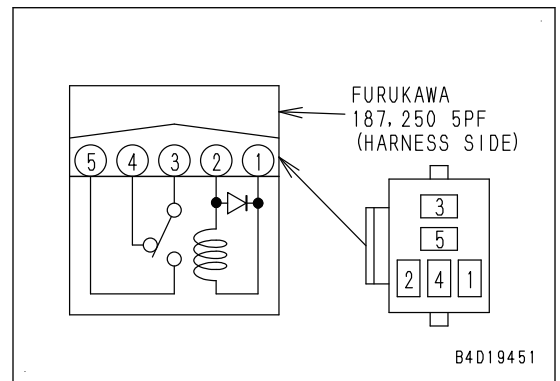
1. Check connector R21 for poor contact. (Check that they are connected securely)



2. Turn the starting switch to ON position (with the engine stopped), turn the main switch of the air conditioner ON, and turn the air conditioner switch ON. If the air conditioner is normal, the compressor relay turns ON to make clicking sound.

Do not turn ON the compressor clutch relay if the air conditioner controller is in the following conditions.

- When the evaporator temperature is 3°C or below (by the evaporator temperature sensor)
- When the pressure switch senses abnormality (pressure switch OFF)



REMARK

The coil resistance between compressor clutch relay (CCRL) terminals (1) and (2) is 300 to 500 Ω.

No.	Check item	Procedure of troubleshooting			Judgment and remedy			
5	Open circuit in wiring harness	<ol style="list-style-type: none"> 1. Turn the starting switch to OFF position. 2. Check that the system operating lamp is turned off, and then turn the battery disconnect switch to OFF position. 3. Remove the fuses No.10 and 13 in the fuse box F01. 4. Disconnect the connector AC02. 5. Disconnect the connectors R21 and AC01. 6. Connect the T-adaptor to female side of each connector. 7. Measure resistance. 8. Does the measurement result match with the judgment criteria? 			YES	<ul style="list-style-type: none"> Wiring harness has no open circuit. Proceed to next check item. 		
		Item	Measuring point and measurement condition	Judgment criteria			NO	<ul style="list-style-type: none"> Wiring harness has an open circuit. Repair or replace the wiring harness. Proceed to "Confirmation of repair".
		Resistance	Between F01-10 and R21 (female) (5)	Max. 1Ω				
			Between R21 (female) (3) and ground	Approx. 15 Ω				
			Between F01-13 and R21 (female) (1)	Max. 1 Ω				
Between R21 (female) (2) and AC01 (female) (4)	Max. 1 Ω							
6	Ground fault in wiring harness	<ol style="list-style-type: none"> 1. Turn the starting switch to OFF position. 2. Disconnect the connectors AC03 and R21. 3. Connect the T-adaptor to female side of either connector. 4. Measure resistance. 5. Does the measurement result match with the judgment criteria? 			YES	<ul style="list-style-type: none"> Wiring harness has no ground fault. Proceed to next check item. 		
		Item	Measuring point and measurement condition	Judgment criteria			NO	<ul style="list-style-type: none"> Wiring harness has a ground fault. Repair or replace the wiring harness. Replace the fuse if it is blown. Proceed to "Confirmation of repair".
		Resistance	Between ground and either AC03 (female) (1) or R21 (female) (3)	Min. 1 MΩ				

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.

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