SHOP MANUAL

KOMATSU

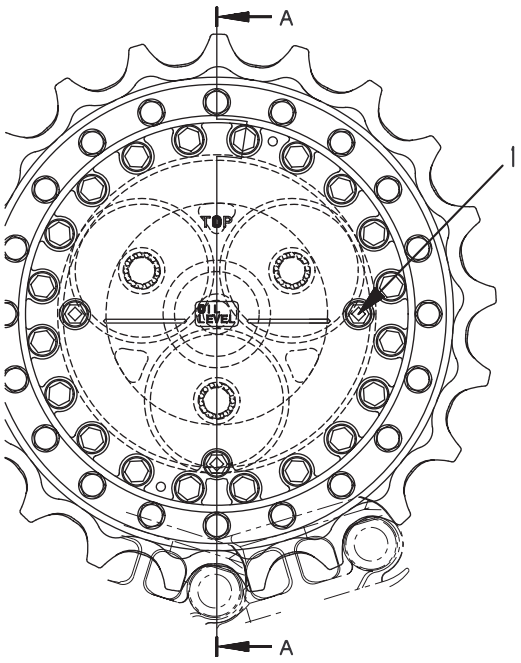
PC340LC, 340NLC-7K

MACHINE MODEL	SERIAL NUMBER
PC340LC-7K	**K40001 AND UP**
PC340NLC-7K	**K40001 AND UP**

- This shop manual may contain attachments and optional equipment that are not available in your area. Please consult your local Komatsu distributor for those items you may require.
  Materials and specifications are subject to change without notice.
- PC340LC/NLC-7K mount the SAA6D114E engine.
  For details of the engine, see the 114 Series Engine Shop Manual.

Printed in Belgium 12-02

Machine model				PC340LC-7	PC340NLC-7
Serial Number				40001 and up	
Engine	Model			SAA6D114E	
	Type			4-cycle, water-cooled, in-line, vertical, direct injection, with turbo charger and aftercooler	
	No. of cylinders - bore x stroke		mm	6 - 114 x 135	
	Piston displacement		l {cc}	8.27 {8,270}	
	Performance	Flywheel horsepower	kW/rpm {HP/rpm}	180.3/1,900 {242/1,900}	
		Max. torque	Nm/rpm {kgm/rpm}	1,079/1,400 {110/1,400}	
		Max. speed at no load	rpm	2,160	
		Min. speed at no load	rpm	900	
		Min. fuel consumption	g/kWh {g/HPh}	205 {153}	
	Starting motor			24V, 7.5 kW	
	Alternator			24V, 35 A	
	Battery			12V, 126 Ah x 2	
	Radiator core type			CF19-4	
Under-carriage	Carrier roller			2 on each side	
	Track roller			7 on each side	8 on each side
	Track shoe			Assembly-type triple grouser, 45 on each side	Assembly-type triple grouser, 48 on each side
Hydraulic system	Hydraulic pump	Type x No.		HPV125+125, variable displacement, Piston type x2	
		Delivery	l/min	267.5 x 2	
		Set pressure	MPa (kg/cm²)	37.8 {380}	
	Control valve	Type x No.		6-spool type + 1-spool type x 1	
		Control method		Hydraulic	
	Hydraulic motor	Travel motor		HMV160ADT-2, Piston type (with brake valve, parking brake): x 2	
		Swing motor		KMF230ABE-5, Piston type (with safety valve, holding brake): x 1 reverse rotation check valve	
	Hydraulic cylinder	Type		Boom: Double acting piston	Arm: Double acting piston / Bucket: Double acting piston
		Inside diameter of cylinder	mm	140	160 / 140
		Diameter of piston rod	mm	100	110 / 100
		Stroke	mm	1,480	1,825 / 1,285
		Max. distance between pins	mm	3,525	4,255 / 3,155
		Min. distance between pins	mm	2,045	2,430 / 1,870
	Hydraulic tank			Closed box type	
	Hydraulic filter			Tank return side	
	Hydraulic cooler			CFT-1 (Air cooled)	



SJP08992

1. Level plug
2. Drain plug
3. No. 1 planetary gear (No. of teeth: 42)
4. No. 1 sun gear (No. of teeth: 11)
5. No. 2 sun gear (No. of teeth: 19)
6. No. 1 planetary carrier
7. No. 2 planetary carrier
8. Cover
9. Ring gear (No. of teeth: 97)
10. Hub
11. Sprocket
12. Floating seal
13. Travel motor
14. No. 2 planetary gear (No. of teeth: 38)

SPECIFICATIONS

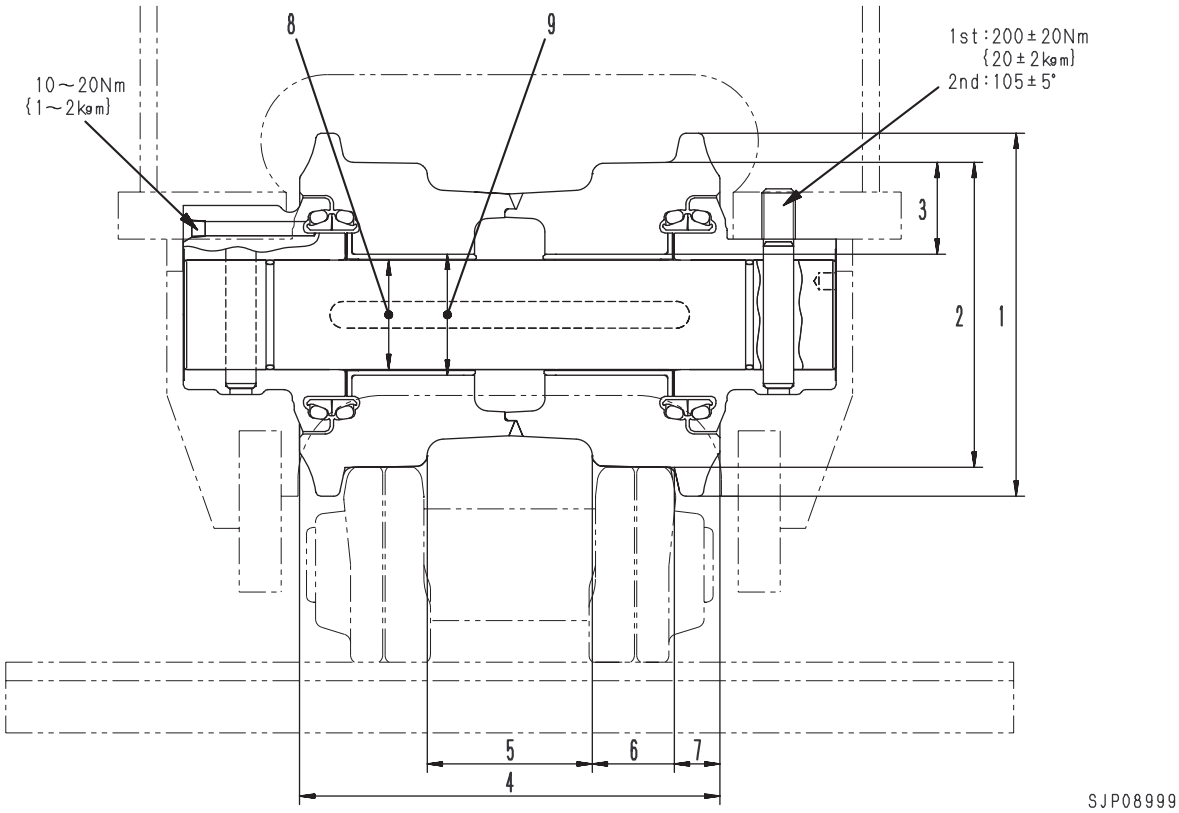
Reduction ratio:

$$-\left(\frac{11+97}{11}\right)\times\left(\frac{19+97}{19}\right)=-58.943$$

Unit: mm

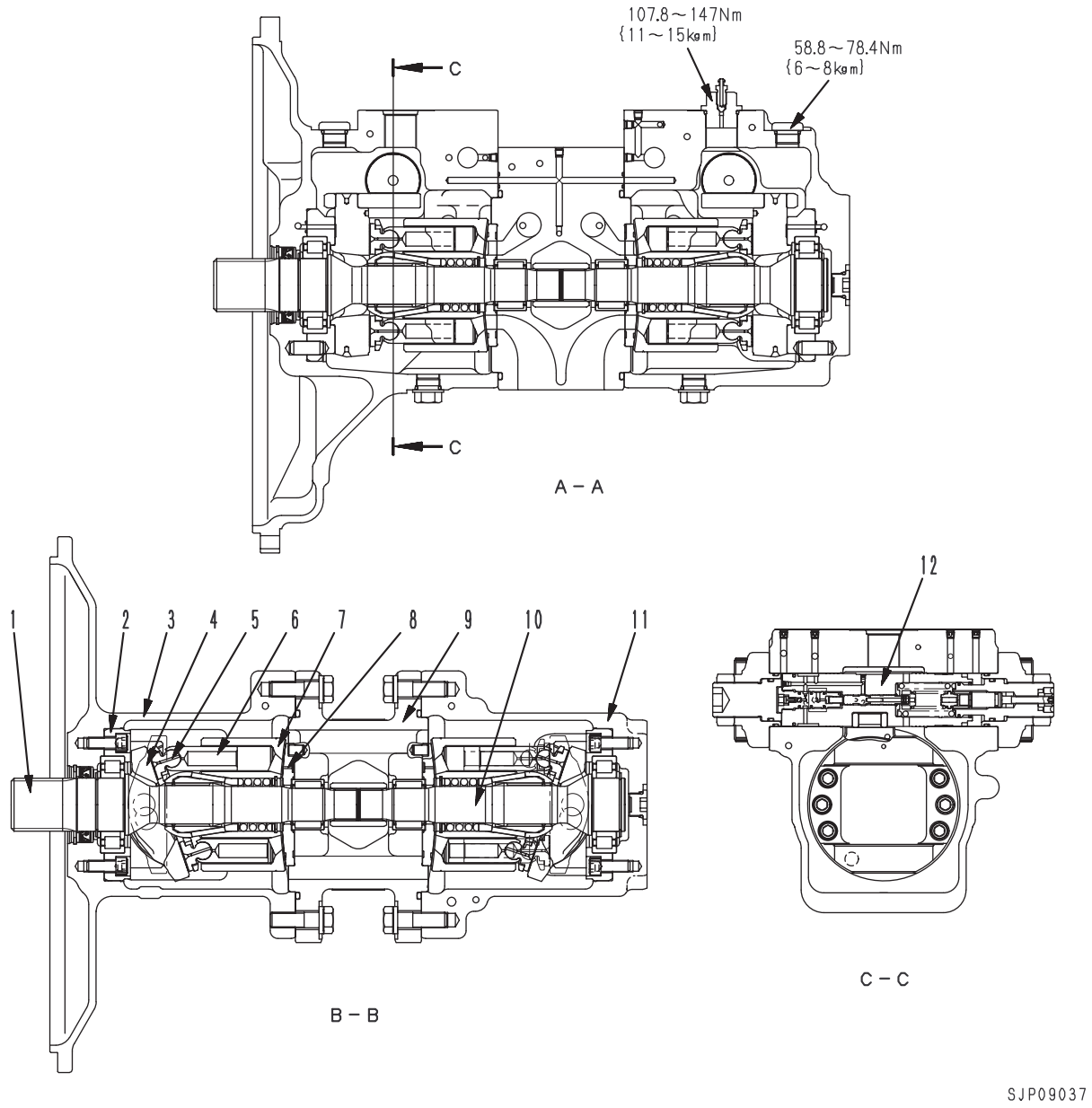
No.	Check item	Criteria		Remedy
15	Backlash between No. 1 sun gear and No. 1 planetary gear	Standard clearance	Clearance limit	Replace
		0.12 ~ 0.44	0.90	
16	Backlash between No. 1 planetary gear and ring gear	0.18 ~ 0.62	1.20	
17	Backlash between No. 2 planetary carrier and motor	0.06 ~ 0.25	—	
18	Backlash between No. 2 sun gear and No. 2 planetary gear	0.15 ~ 0.51	1.00	
19	Backlash between No. 2 planetary gear and ring gear	0.19 ~ 0.66	1.30	
20	Backlash between No. 2 planetary carrier and No. 2 sun gear	0.39 ~ 0.80	1.60	
21	Amount of wear on sprocket tooth	Repair limit: 6		Rebuild or replace
22	Width of sprocket tooth	Standard size	Repair limit	
		87	84	

TRACK ROLLER

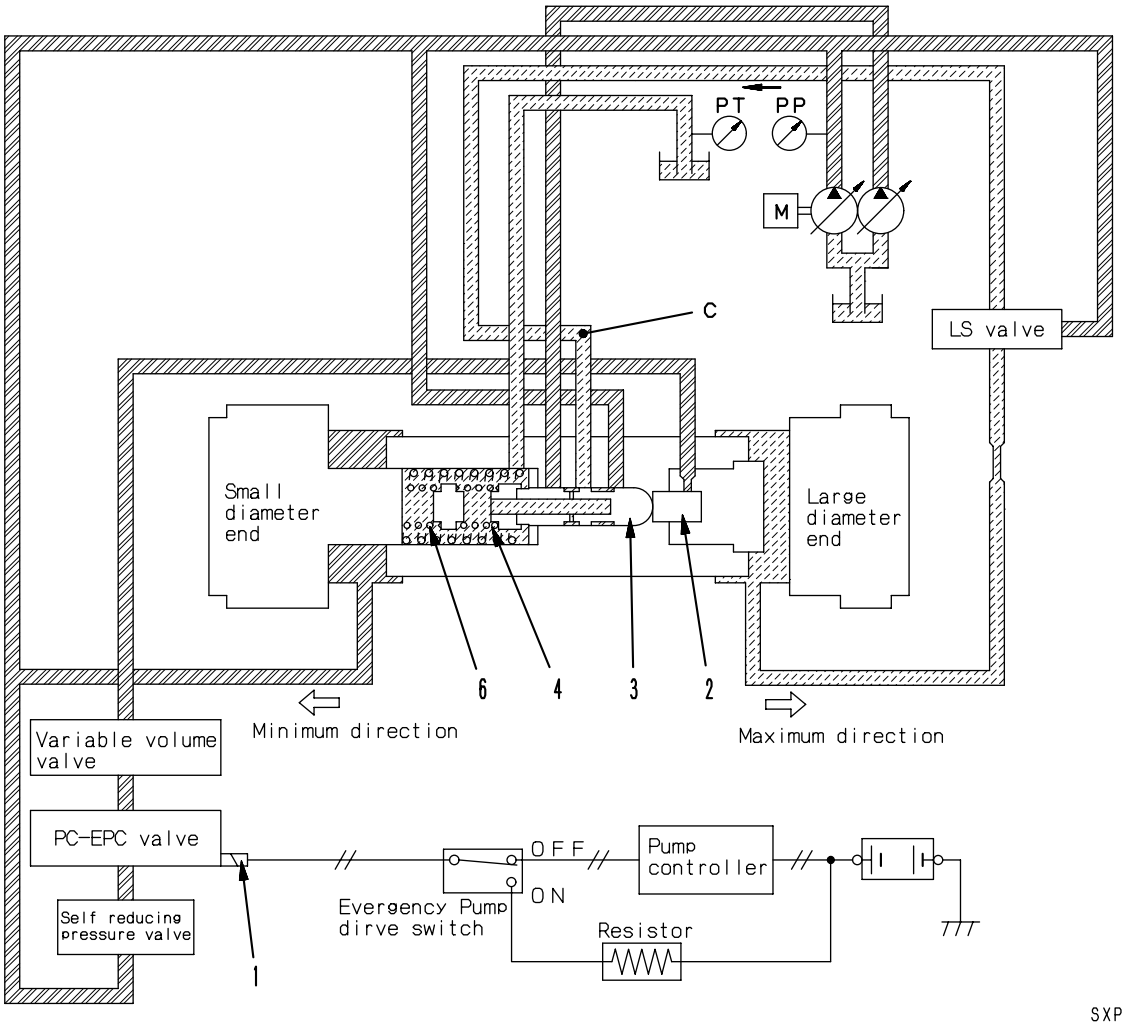


Unit: mm

No.	Check item	Criteria				Remedy
1	Outside diameter of flange	Standard size		Repair limit		Rebuild or replace
		216		—		
2	Outside diameter of tread	180		168		
3	Thickness of tread	44.5		38.5		
4	Overall width	225		—		
5	Inside width	85		—		
6	Width of tread	49		55		
7	Width of flange	27		—		
8	Clearance between shaft and bushing	Standard size	Tolerance		Standard clearance	Clearance limit	Replace bushing
			Shaft	Hole		
		65	-0.250 -0.350	+0.186 -0.064	0.186 ~ 0.536	1.5
9	Interference between roller and bushing	Standard size	Tolerance		Standard interference	Interference limit	
			Shaft	Hole		
		72	+0.108 +0.008	-0.006 -0.036	0.014 ~ 0.144	—



1. Shaft (Front)
2. Cradle
3. Case (Front)
4. Rocker cam
5. Shoe
6. Piston
7. Cylinder block
8. Valve plate
9. End cap
10. Shaft (Rear)
11. Case (Rear)
12. Servo piston



(2) PC Valve

1) When pump controller is normal

a. When the load on the actuator is small and pump pressures PP1 and PP2 are low

① Movement of PC-EPC solenoid (1)

- The command current from the pump controller flows to PC-EPC solenoid (1).This command current acts on the PC-EPC valve and outputs the signal pressure. When this signal pressure is received, the force pushing piston (2) is changed.
- On the opposite side to the force pushing this piston (2) is the spring set pressure of springs (4) and (6) and pump pressure **PP1** (self pressure) and **PP2** (other pump pressure) pushing spool (3). Piston (2) stops at a position where the combined force pushing spool (3) is balanced, and
- the pressure (pressure of port **C**) output from the PC valve changes according to this position.
- The size of command current **X** is determined by the nature of the operation (lever operation), the selection of the working mode, and the set value and actual value for the engine speed.

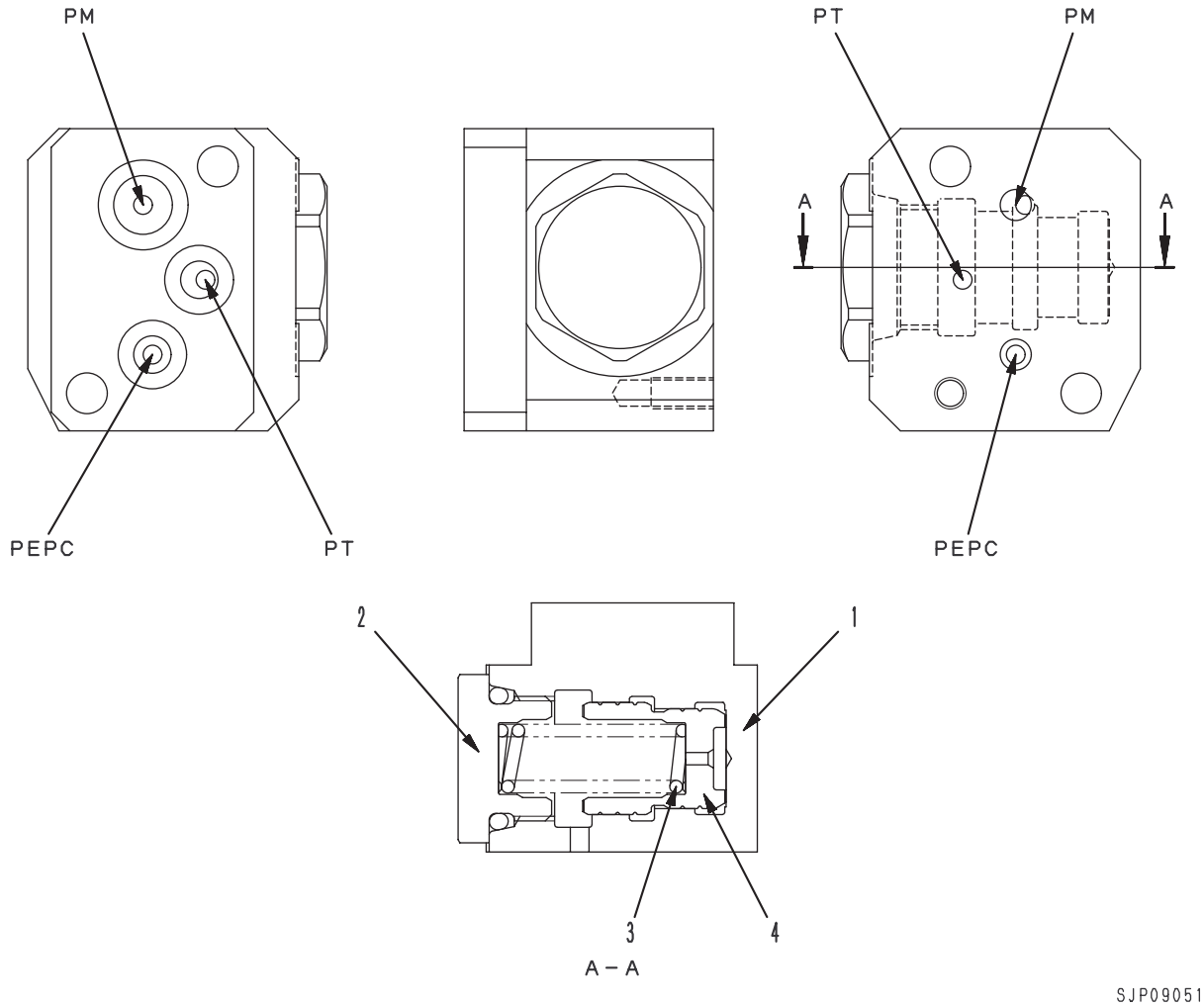
★ Other pump pressure

This is the pressure of the pump at the opposite end.

For the F pump, it is the R pump pressure

For the R pump, it is the F pump pressure

VARIABLE VOLUME VALVE



1. Block
2. Plug
3. Spring
4. Piston

PM: To PC valve
PT: To tank
PEPC: From self-reducing pressure valve

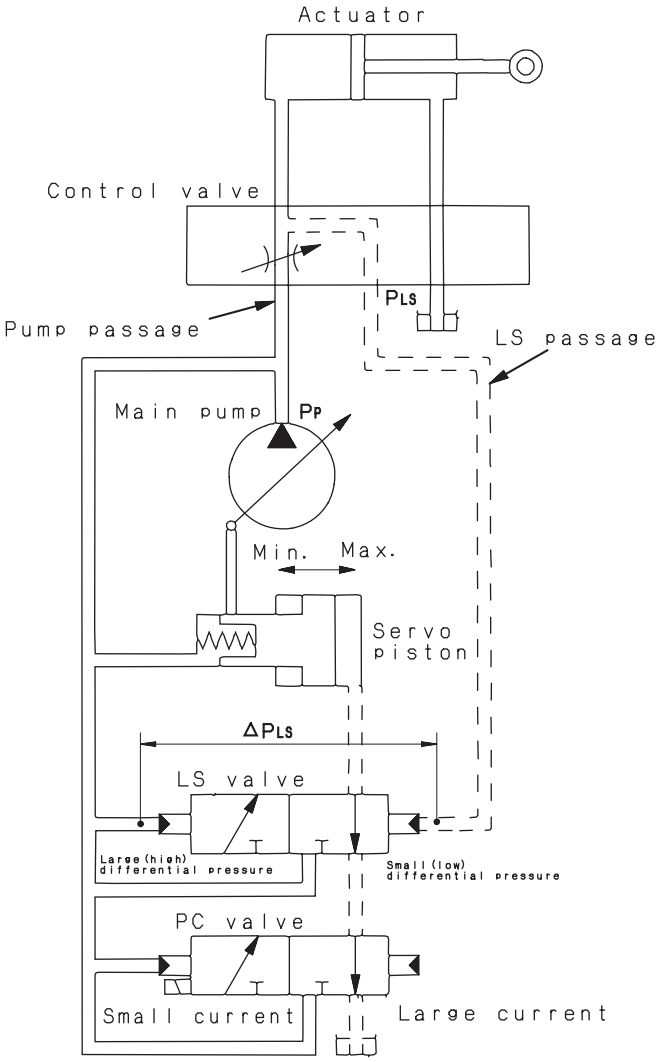
No.	Check item	Criteria					Remedy
		Standard size			Repair limit		
18	Regeneration valve spring	Free length x Outside diameter	Installed length	Installed load	Free length	Installed load	If damaged or deformed, replace spring
		31.5 x 10.3	19.5	6.2 N {0.6 kg}	—	4.9 N {0.5 kg}	
19	Piston return spring	48.1 x 10.8	28	17.5 N {1.8 kg}	—	14.0 N {1.4 kg}	
20	Piston return spring	36.9 x 11.1	28	29.4 N {3 kg}	—	23.5 N {2.4 kg}	

Basic principle

1) Control of pump swash plate

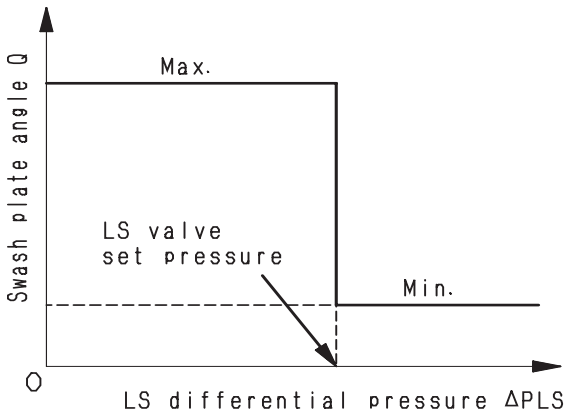
- The pump swash plate angle (pump discharge amount) is controlled so that LS differential pressure **ΔPLS** (the difference between pump pressure **PP** and control valve outlet port LS pressure **PLS**) (load pressure of actuator) is constant.

  (LS pressure **ΔPLS** = Pump discharge pressure **PP** – LS pressure **PLS**)



SBP03454

- If LS differential pressure **ΔPLS** becomes lower than the set pressure of the LS valve (when the actuator load pressure is high), the pump swash plate moves towards the maximum position; if it becomes higher than the set pressure of the LS valve (when the actuator load pressure is low), the pump swash plate moves towards the minimum position.



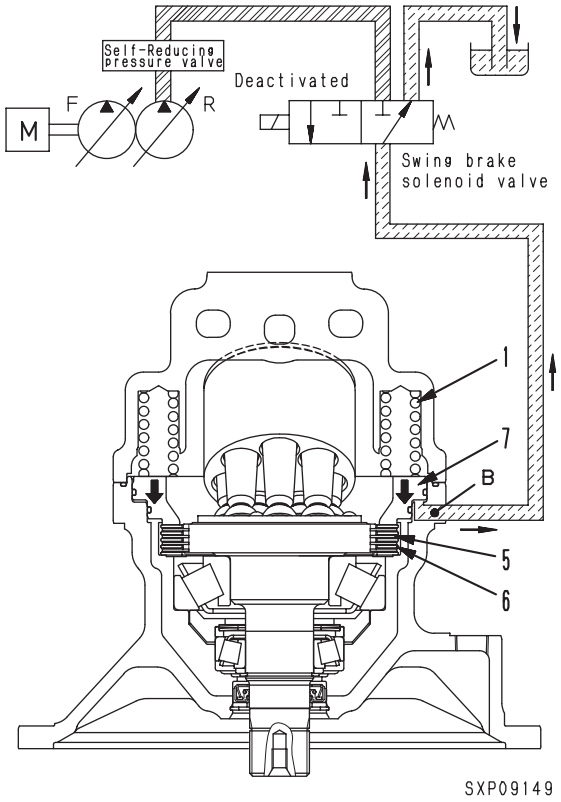
SAP03455

Operation of swing lock

1. When swing lock solenoid valve is deactivated

When the swing lock solenoid valve is deactivated, the pressurized oil from the main pump is shut off and port **B** is connected to the tank circuit.

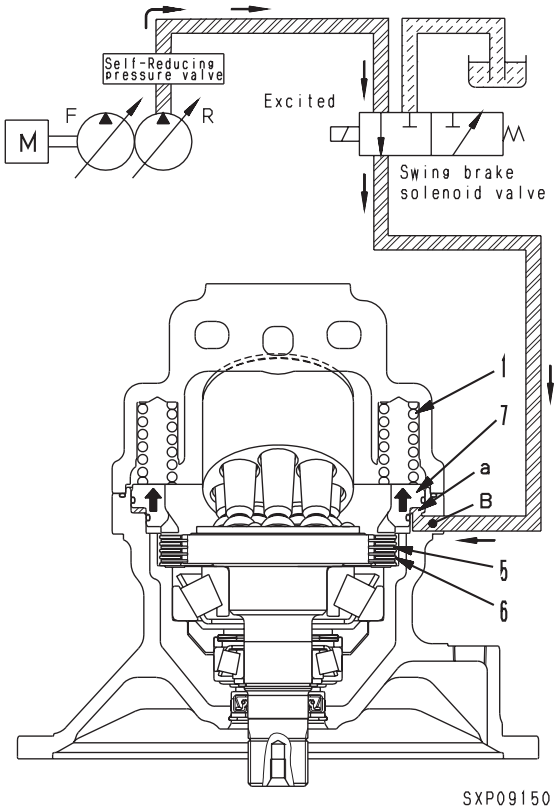
As a result, brake piston (7) is pushed down by brake spring (1), discs (5) and plates (6) are pushed together, and the brake is applied.



2. When swing lock solenoid valve is excited

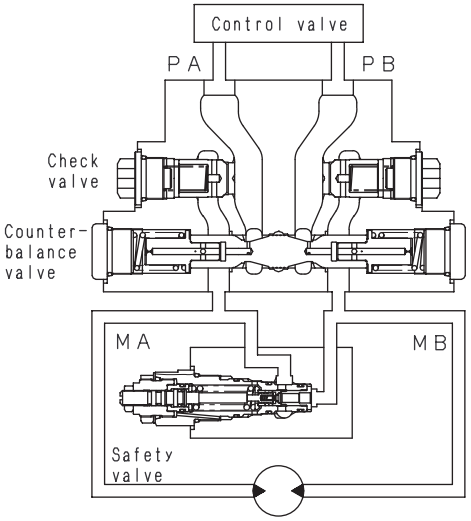
When the swing lock solenoid valve is excited, the valve is switched and the pressure oil from the main pump enters port **B** and flows to brake chamber **a**.

The pressure oil entering chamber **a** overcomes brake spring (1) and pushes brake piston (7) up. As a result, discs (5) and plates (6) are separated and the brake is released.



OPERATION OF BRAKE VALVE

- The brake valve consists of check valve, counterbalance valve, and safety valve in a circuit as shown in the diagram on the right. (Fig. 1)
- The function and operation of each component is as given below.



(Fig. 1)

SXP09155

1) Counterbalance valve, check valve

Function

- When traveling downhill, the weight of the machine makes it try to travel faster than the speed of the motor.

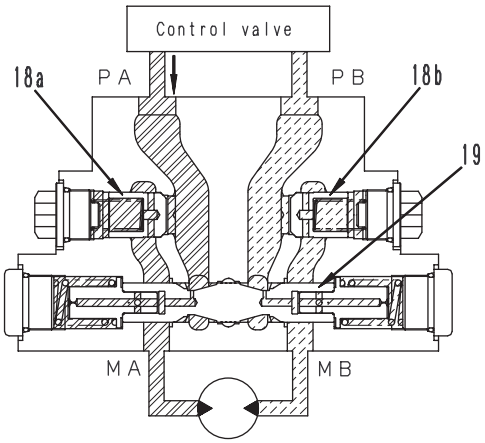
  As a result, if the machine travels with the engine at low speed, the motor will rotate without load and the machine will run away, which is extremely dangerous.

  To prevent this these valves act to make the machine travel according to the engine speed (pump discharge amount).

Operation when pressure oil is supplied

- When the travel lever is operated, the pressurized oil from the control valve is supplied to port **PA**. It pushes open suction safety valve (18a) and flows from motor inlet port **MA** to motor outlet port **MB**.

  However, the motor outlet port is closed by suction safety valve (18b) and spool (19), so the pressure at the supply side rises. (Fig. 2)

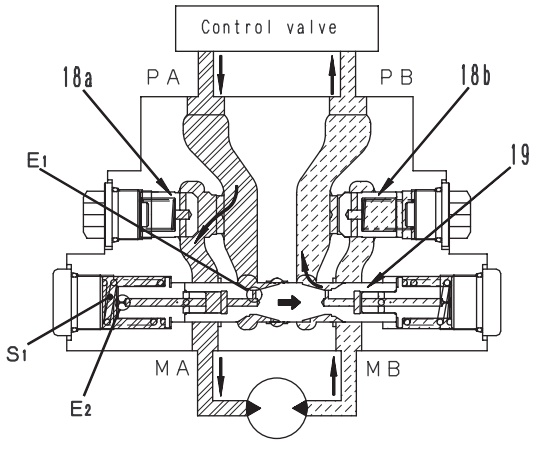


(Fig. 2)

SXP09156

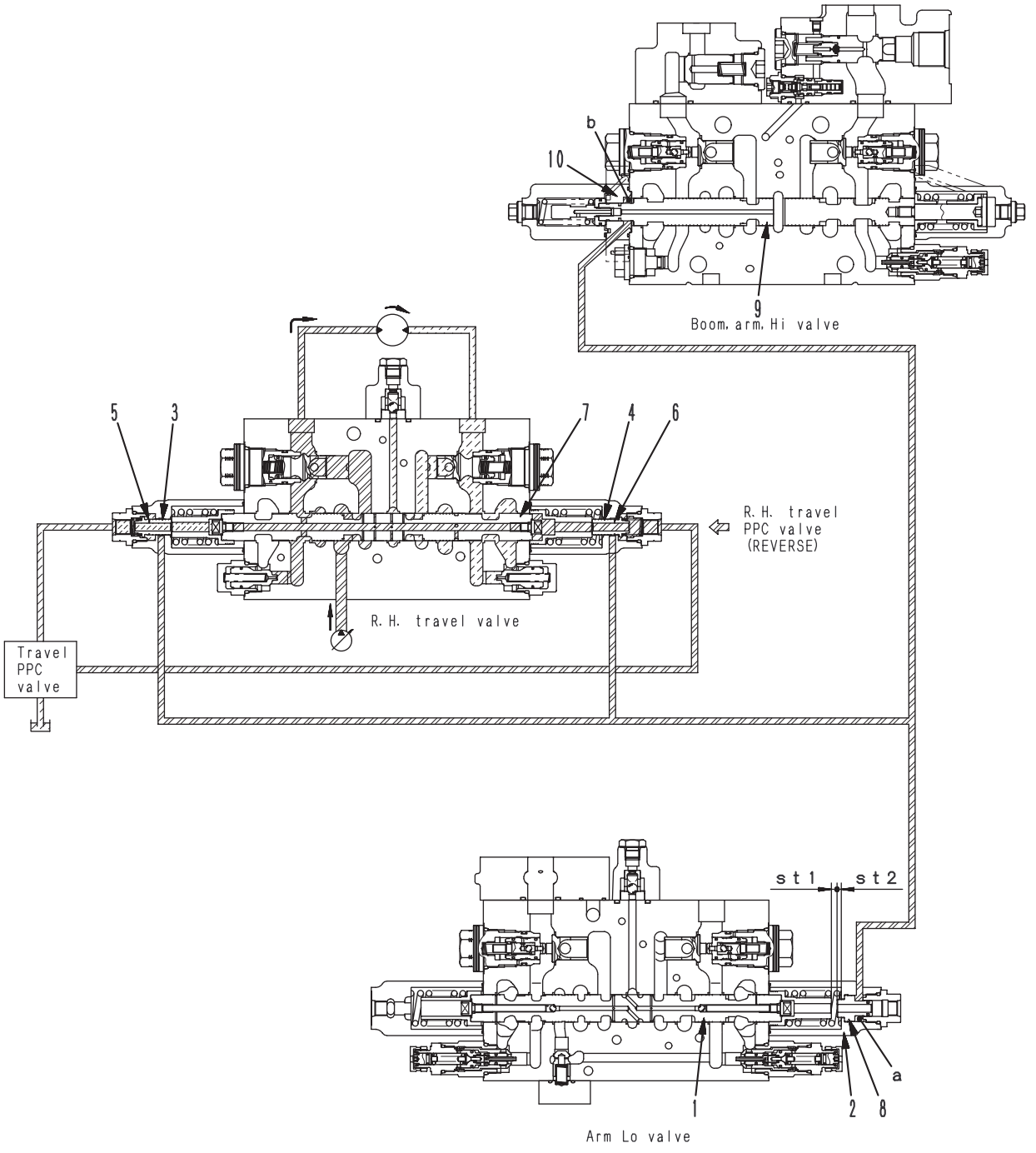
- The pressurized oil at the supply side flows from orifice **E1** and **E2** in spool (19) to chamber **S1**. When the pressure in chamber **S1** goes above the spool switching pressure, spool (19) is pushed to the right in the direction of the arrow.

  As a result, port **MB** and port **PB** are connected, the outlet port side of the motor is opened, and the motor starts to rotate. (Fig. 3)



(Fig. 3)

SXP09157


b
10
9
Boom, arm, Hi valve
5
3
7
4
6
R. H. travel
PPC valve
(REVERSE)
R. H. travel valve
Travel
PPC
valve
st 1
st 2
a
1
2
8
Arm Lo valve
SXP09168

3) Fine control (control lever returned)

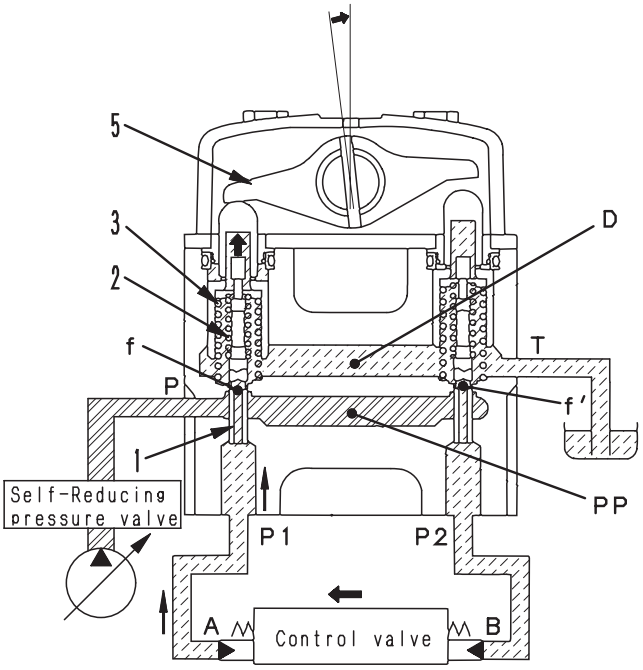
When lever (5) starts to be returned, spool (1) is pushed up by the force of centering spring (3) and the pressure at port **P1**.

Because of this, fine control hole **f** is connected to drain chamber **D**, and the pressurized oil at port **P1** is released.

If the pressure at port **P1** drops too much, spool (1) is pushed up by metering spring (2), so fine control hole **f** is shut off from drain chamber **D**. At almost the same time, it is connected to pump pressure chamber **PP**, so the pressure at port **P1** supplies the pump pressure until the pressure recovers to a pressure equivalent to the position of the lever.

When the control valve returns, oil in drain chamber **D** flows in from fine control hole **f** of the valve on the side that is not moving.

It passes through port **P2** and goes to chamber **B** to charge the oil. (Fig. 3)

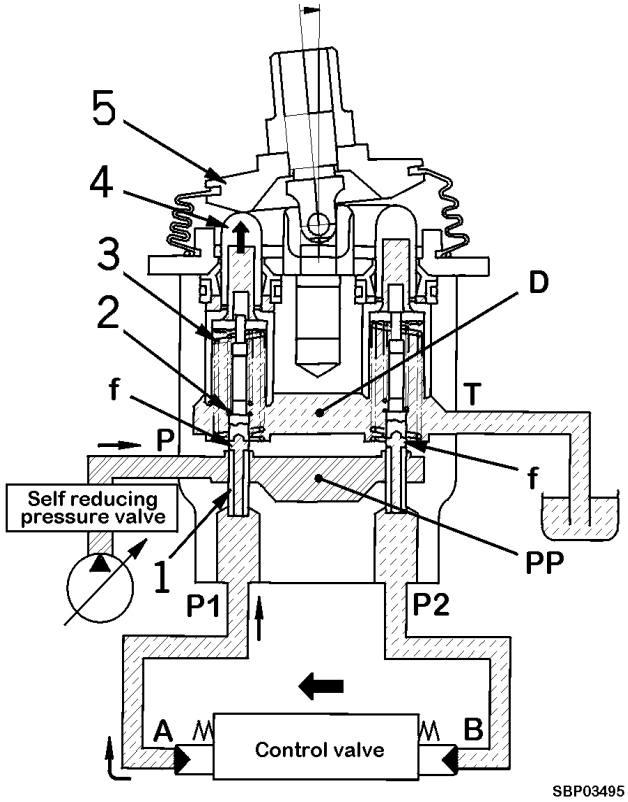


(Fig. 3)

SBP03499

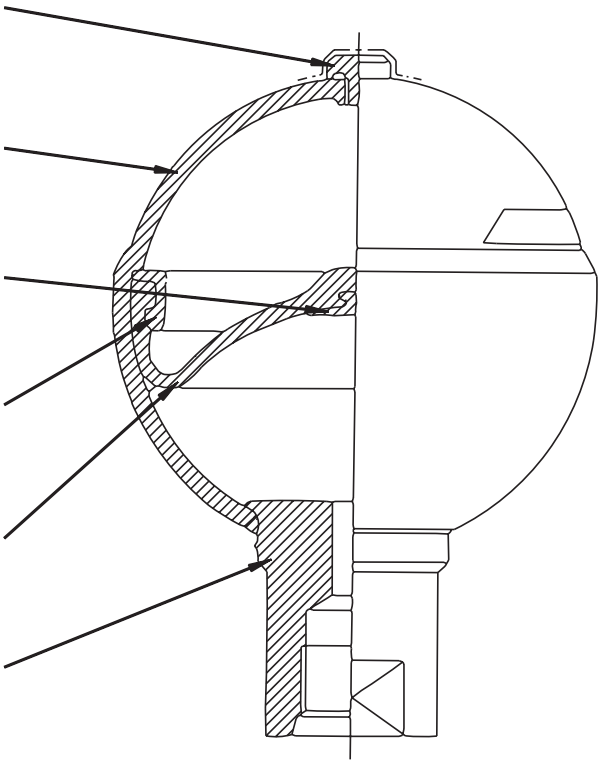
4) At full stroke

Lever (5) pushes down piston (4), and retainer (9) pushes down on spool (1). Fine control hole **f** is shut off from drain chamber **D**, and is connected to pump pressure chamber **PP**. Therefore, the pilot pressure oil from the main pump passes through fine control hole **f** and flows to chamber **A** from port **P1** to push the control valve spool. The return oil from chamber **B** passes from port **P2** through fine control hole **f** and flows to drain chamber **D**. (Fig. 4)



SBP03495

PPC ACCUMULATOR

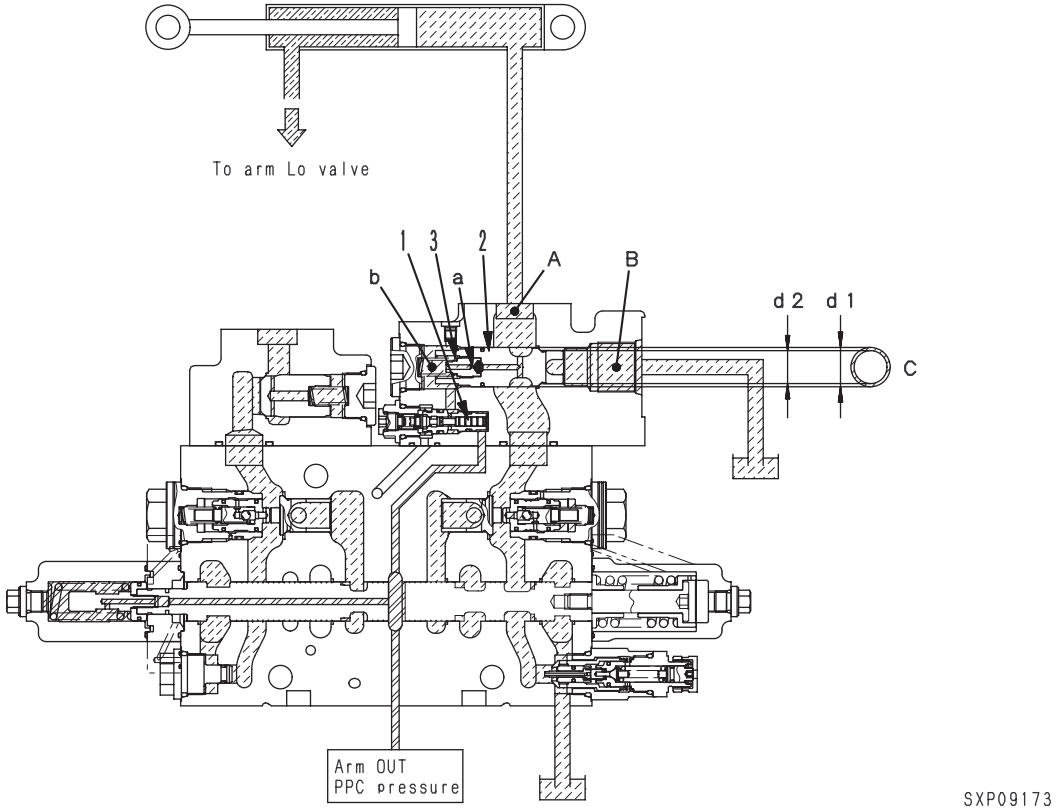


SBP00290

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

SPECIFICATIONS
Gas capacity:300 cc (for PPC)

2. Arm at HOLD
   The oil that has flowed through orifice **a** in valve (2) is closed by pilot piston (1). At the same time, the hold pressure at the bottom end of the arm acts in the right direction on ring-shaped area **C** (= Area of ∅d1 - Area of ∅d2) because of the difference in the outside diameter **d1** of valve (2) and seat diameter **d2**. Valve (2) is closed by the total of this force and the force of spring (3), so port **A** and port **B** are shut off.



Unit: mm

No. \ Model		PC340LC-7, PC340NLC-7
1		$\phi 100\ ^{+0.1}_{0}$ / $^{-0.036}_{-0.071}$
2		$119.3\ ^{+1.5}_{0}$ / 116 ± 1.2
3		$320\ ^{+0.5}_{0}$ / $316\ ^{-0.3}_{-0.8}$
4		$\phi 110\ ^{0}_{-0.5}$ / $^{-0.036}_{-0.090}$
5		470.6 ± 1
6		236.5 ± 0.5
7		1022.4 ±1
8		3,178 ± 3
9		2,975.6 ± 1
10		472.5
11		731.0 ± 0.2
12		728.0 ± 0.5
13		513.6
14		1,670
15		$\phi 90\ ^{+0.2}_{0}$ / $^{-0.036}_{-0.090}$
16		345.0 ± 0.5
17		$\phi 90\ ^{+0.2}_{0}$ / $^{-0.036}_{-0.090}$
18	Arm as individual part	$330\ ^{0}_{-0.5}$
	When pressfitting bushing	345
19	Min.	1,870
	Max.	3,155

Input and output signals

CN-1

Pin No.	Signal name	Input/ output
1	—	
2	R pump pressure sensor	
3	—	Input
4	Signal GND	Input
5	Abnormality in auto-greasing controller	Input
6	NC	Input
7	Overload sensor (analog)	Input
8	F boom pressure sensor	Input
9	—	
10	Signal GND	Input
11	Knob SW	Input
12	NC	Input
13	Governor motor FB potentiometer	Input
14	—	
15	NC	Input
16	SENS_PWR	Output
17	Key Switch (Terminal C)	Input
18	NC	Input
19	Throttle potentiometer	Input
20	NC	Input
21	GND (analog GND)	
22	POT_PWR	Output
23	Key switch (terminal ACC)	Input
24	—	

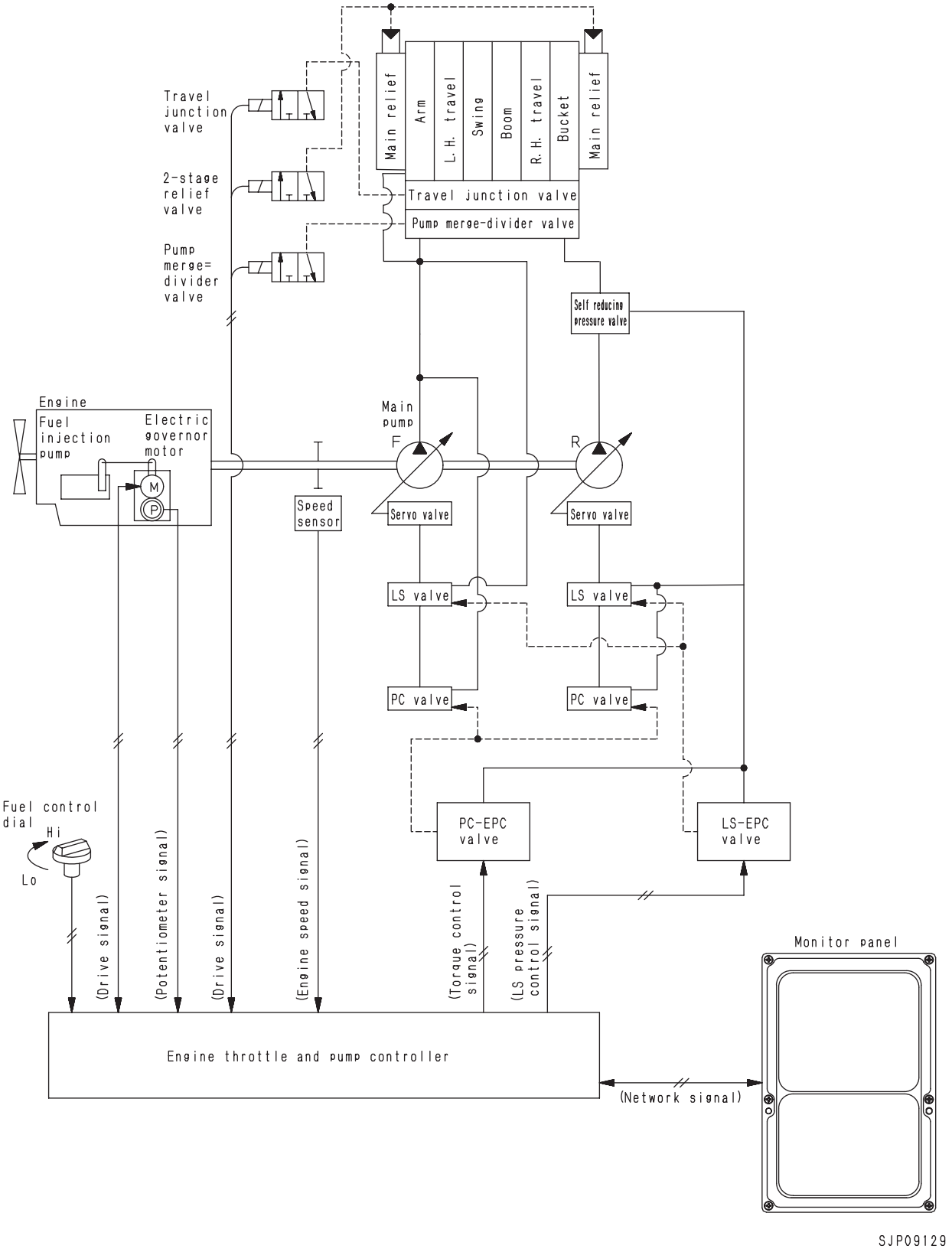
CN-2

Pin No.	Signal name	Input/ output
1	NC	Output
2	Swing emergency switch	Input
3	NC	Input
4	232C_RxD	Input
5	Overload sensor (ON/OFF)	Input
6	Overload alarm valid switch	Input
7	Model selection 4	Input
8	Attachment circuit selector signal	Output
9	NC	Output
10	NC	Input
11	NC	Output
12	CAN shield	
13	Model selection 5	Input
14	232C_TxD	Output
15	NC	Input
16	Travel steering signal pressure SW	Input
17	Model selection 3	Input
18	—	
19	NC	Output
20	NC	Input
21	S_NET	Input/ output
22	CAN0_L	Input/ output
23	CAN1_L	Input/ output
24	—	
25	NC	Input
26	NC	Input
27	Model selection 2	Input
28	NC	Input
29	GND (pulse GND)	
30	NC	Input
31	GND (S_NET GND)	Input
32	CAN0_H	Input/ output
33	CAN1_H	Input/ output
34	GND (232C GND)	
35	Service valve pressure switch	Input
36	NC	Input
37	Model selection switch 1	Input
38	Swing lock switch	Input
39	GND (pulse GND)	
40	Engine speed sensor	Input

CN-3

Pin No.	Signal name	Input/ output
1	VB (controller power)	Input
2	VIS (solenoid power)	Input
3	SOL_COM (solenoid common gnd)	
4	Battery relay drive	Output
5	Governor motor A phase (+)	Output
6	LS-EPC	Output
7	Travel junction SOL	Output
8	Engine stop solenoid (Pull)	Output
9	Bucket CURL pressure SW	Input
10	Boom RAISE pressure SW	Input
11	VB (controller power)	Input
12	VIS (solenoid power)	Input
13	SOL_COM (solenoid common gnd)	
14	KEY_SIG	Input
15	Governor motor A phase (-)	Output
16	PC-EPC	Output
17	Pump merge/divider solenoid	Output
18	Heater relay drive	Output
19	Bucket DUMP pressure switch	Input
20	Boom LOWER pressure switch	Input
21	GND (controller GND)	
22	VIS (solenoid PWR)	Input
23	SOL_COM (solenoid common gnd)	
24	KEY_SIG	Input
25	Governor motor B phase (+)	Output
26	Service flow adjustment EPC (1)	Output
27	Travel Hi/Lo selector solenoid	Output
28	2-stage relief solenoid	Output
29	Swing pressure switch	Input
30	Arm IN pressure switch	Input
31	GND (controller GND)	
32	GND (controller GND)	
33	GND (controller GND)	
34	NC	
35	Governor motor B phase (-)	Output
36	NC	Output
37	Swing parking brake solenoid	Output
38	NC	Output
39	Travel pressure switch	Input
40	Arm OUT pressure switch	Input

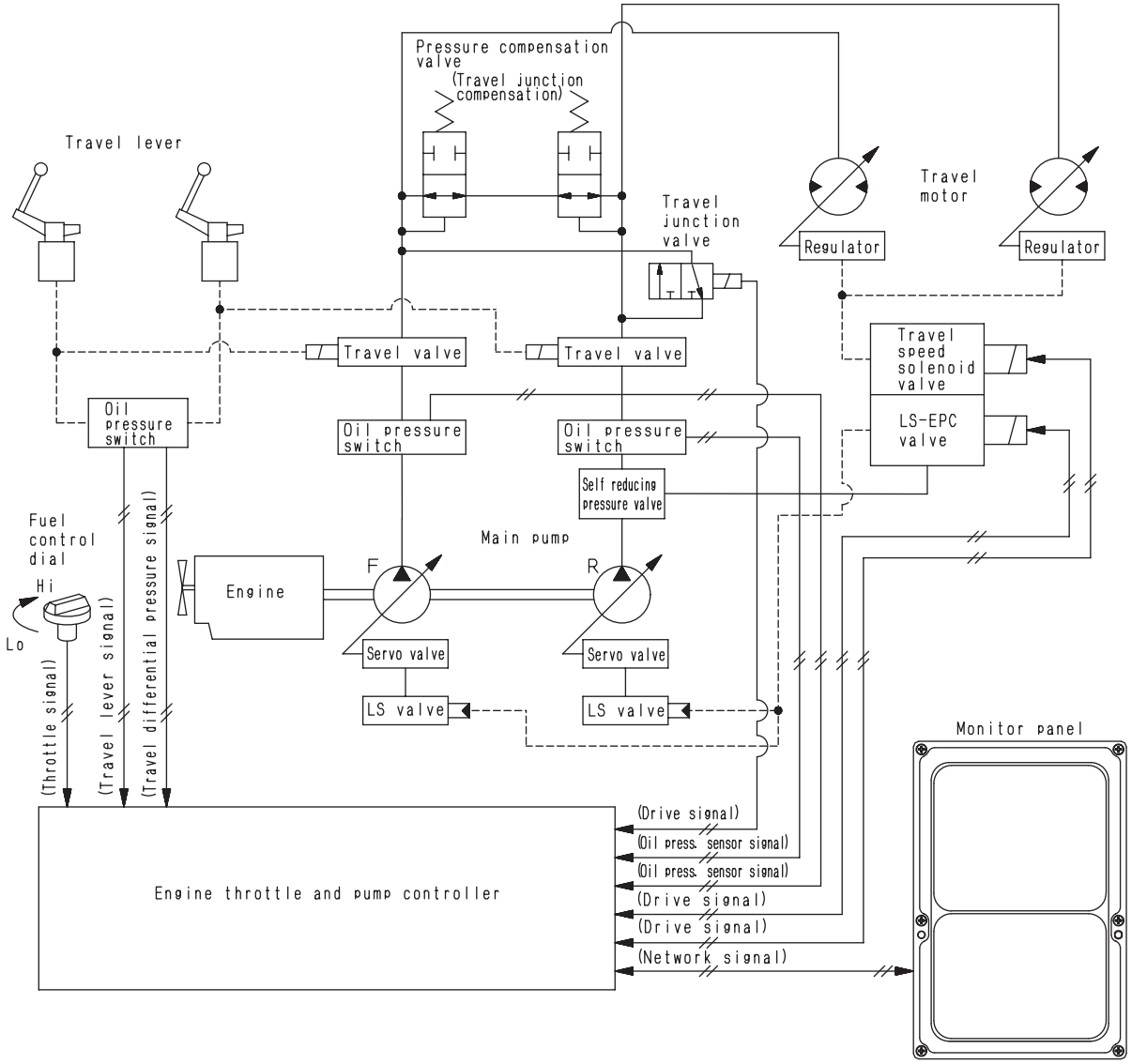
2. Pump/Valve control function



Function

- The machine is matched to various types of work properly with the 2-stage relief function to increase the digging force, etc.

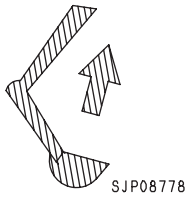
7. Travel control function



FUNCTION

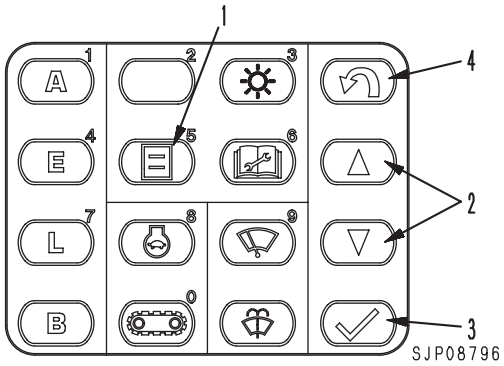
- The pumps are controlled and the travel speed is changed manually or automatically, to secure proper travel performance matched to the type of work and jobsite during travel.

MONITOR ITEMS AND DISPLAY

<table>
<tr><th>Symbol</th><th>Display item</th><th>Display method</th></tr>
<tr><td> 
SAT00098</td><td>Swing lock</td><td>
<table>
<tr><th>Swing lock switch</th><th>Swing holding brake release switch</th><th>Swing lock monitor</th></tr>
<tr><td>OFF</td><td>OFF</td><td>OFF</td></tr>
<tr><td>ON</td><td>OFF</td><td>ON</td></tr>
<tr><td>OFF</td><td>ON</td><td>Flashes</td></tr>
<tr><td>ON</td><td>ON</td><td>ON</td></tr>
</table>
</td></tr>
<tr><td> 
SAP00526</td><td>Preheating</td><td>
<table>
<tr><th>Continuous set time</th><th>Preheating monitor status</th></tr>
<tr><td>Up to 30 sec.</td><td>ON</td></tr>
<tr><td>From 30 sec. to 40 sec.</td><td>Flashes</td></tr>
<tr><td>More than 40 sec.</td><td>OFF</td></tr>
</table>
</td></tr>
<tr><td> 
SJP08778</td><td>Power Max.</td><td>
<table>
<tr><th>Power Max. switch status</th><th>Power max. monitor status</th></tr>
<tr><td>Being pressed</td><td>Lights up but goes out after approx. 9 sec. when kept pressed</td></tr>
<tr><td>Not being pressed</td><td>Flashes</td></tr>
</table>
</td></tr>
<tr><td rowspan="3"></td><td>Engine water temperature</td><td rowspan="3">See gauge display on the next page</td></tr>
<tr><td>Hydraulic oil temperature</td></tr>
<tr><td>Fuel level</td></tr>
</table>

MAINTENANCE FUNCTION

When the maintenance time for replacement, inspection, or filling has approached for the 10 maintenance items, press maintenance switch (1) and the caution display (yellow or red) appears on the monitor display for 30 seconds after the key is turned ON to remind the operator to carry out lubrication maintenance.



★ Maintenance items

No.	Item	Replacement interval (hours)
01	Engine oil	500
02	Engine oil filter	500
03	Fuel filter	500
04	Hydraulic filter	1000
05	Hydraulic tank breather	500
06	Corrosion resistor	❊ (1000)
07	Damper case oil	1000
08	Final case oil	2000
09	Machinery case oil	1000
10	Hydraulic oil	5000

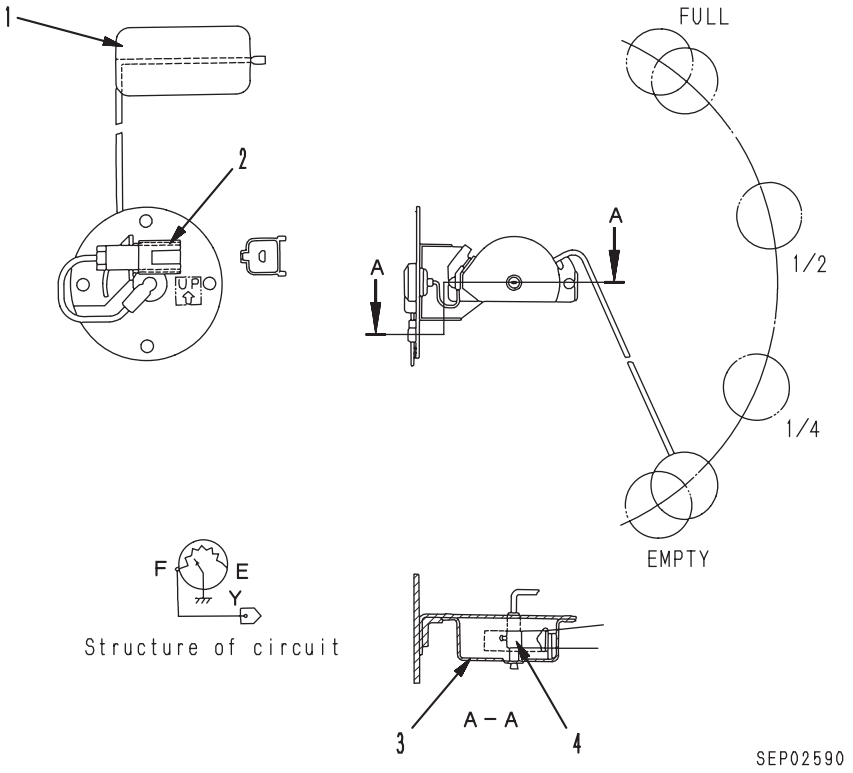
❊ Option, so not set

★ The above replacement intervals are set for each item, and the time remaining to maintenance is reduced as the machine is operated.

The content of the caution display differs according to the remaining time. The relationship is as shown in the table below.

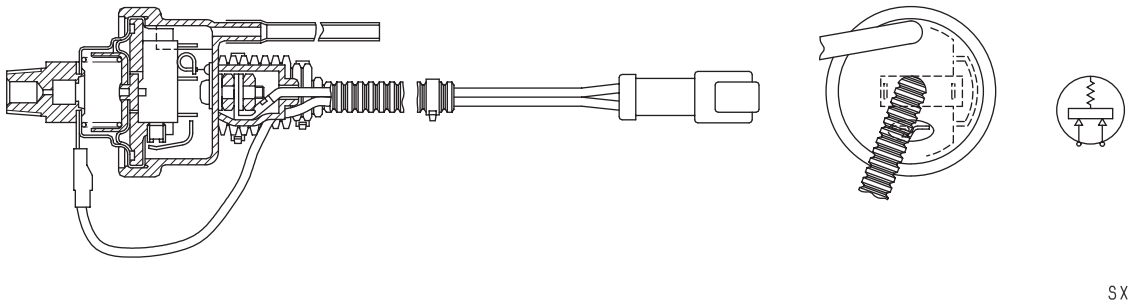
Display	Condition
None	Remaining time for maintenance for all items is more than 30 hours
Notice display (black symbol displayed on yellow background)	There is one or more items with less than 30 hours remaining time for maintenance
Warning display (wiper symbol displayed on red background)	There is one or more items with less than 0 hours remaining time for maintenance

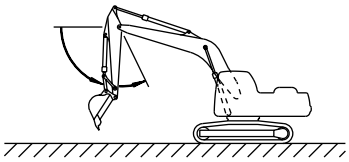
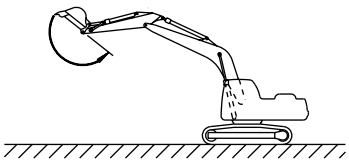
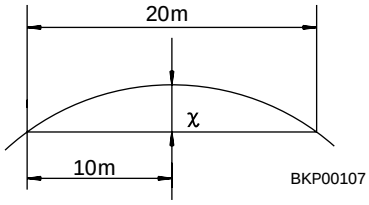
Fuel level sensor



1. Float
2. Connector
3. Cover
4. Variable resistor

Air cleaner clogging sensor



Applicable model					PC340LC,340NLC-7	
Category	Item		Measurement Condition	Unit	Standard value	Permissible value
Work equipment	Time lag	Arm	 BKP00115 • Hydraulic oil temperature: Within operation range • Engine running at low idling • Working mode: A mode • Time required from dumping stroke end till bucket stops momentarily after control lever is tilted to digging and starts to move again	sec.	PC340LC,340NLC Max. 3.0	PC340LC,340NLC Max. 3.6
		Bucket	 BKP00116 • Hydraulic oil temperature: Within operation range • Engine running at low idling • Working mode: A mode • Time required from dumping stroke end till bucket stops momentarily after control lever is tilted to digging and starts to move again		Max. 3.0	Max. 5.0
	Internal leackage	Cylinders	• Hydraulic oil temperature: Within operation range • Engine running at high idling • Leakage amount for one minute with cylinder or travel to be measured in relief condition	cc/min	4.5	20
		Center swivel joint			10	50
Performance in compound operation	Swerving amount in simultaneous operation of work equipment and travel		• Hydraulic oil temperature: Within operation range • Engine at high idling • Working mode: A mode • Traveling speed: Lo • Flat and level ground • Swerving amount (X) when traveling 20 m after initial trial run of 10 m  BKP00107	mm	Max. 400	Max. 440
Performance of hydraulic pump	Hydraulic pump delivery		See next page	¶/min	See next page	

MEASUREMENT OF BLOW-BY PRESSURE

★ Blow-by pressure measurement tools

Mark		Part No.	Part Name
F	1	799-201-1504	Blow-by Kit
	2	795-790-3300	Tool (Nozzle)

1. Remove the engine under cover.

2. Fit tool **F2** to blow-by hose and connect it with gauge ① of blow-by kit **F1**.

3. Start the engine and keep it running until the engine cooling water temperature rises to the operating range.

4. Measure the blow-by pressure at high idling and under the following conditions.
- Working mode: A mode
- Swing lock switch: ON (High pressure relief)
- Work equipment, swing and travel: Arm IN relief

★ Read off the blow-by pressure value, when the needle of the gauge steadies itself.

5. Detach the measurement tools after the measurement, and make sure that the machine is back to normal condition.

Adjustment

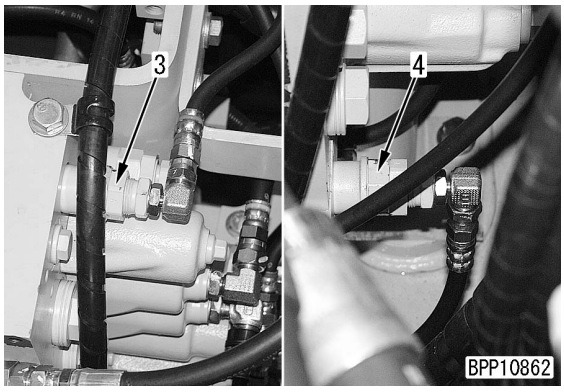
★ The unload valve cannot be adjusted.

1. Adjustment of main relief pressure

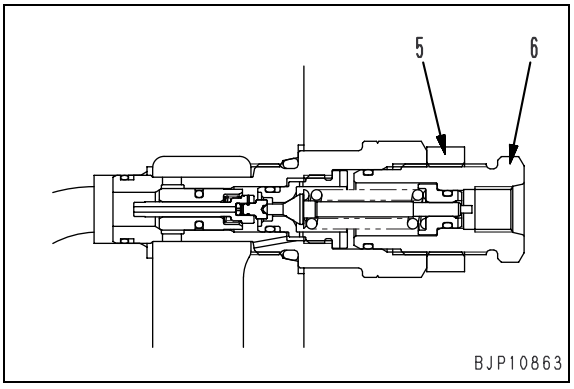
★ If relief pressure in the work equipment and travel circuits is not normal, adjust the high pressure setting side of main relief valves (3) and (4) in the following manner.
- Main relief valve (3): For the front hydraulic pump circuit
- Main relief valve (4): For the rear hydraulic pump circuit

★ The main relief valve adjusts the relief pressure of high pressure. (When the relief pressure of low pressure is adjusted, the relief pressure of high pressure is also adjusted automatically)

★ The relief pressure of low pressure is such condition that the 2-stage relief solenoid valve is in the OFF position and no pilot pressure is applied to the switching port.



1) Disconnect the pilot hose.
2) Loosen lock nut (5) and adjust the pressure by turning holder (6).
   ★ If the holder is turned to the right, the pressure rises.
   If the holder is turned to the left, the pressure falls.
   ★ Adjustment amount per turn of holder:
   Approx. 20.5 MPa{approx. 209 kg/cm^2}
   3 Lock nut:
   49.0–58.8 Nm{5–6 kgm}

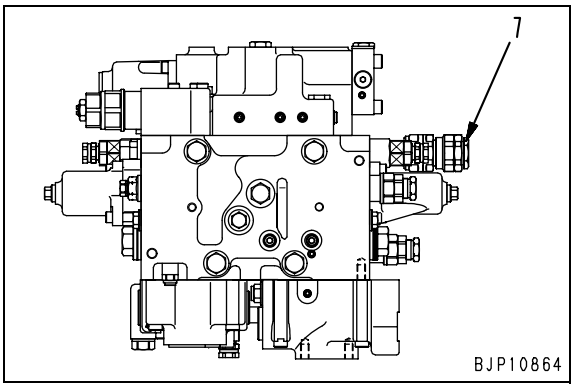


3) Check the pressure again after the adjustment, following the aforementioned steps for measurement.
   ★ When measuring the pressure, connect the pilot hose.

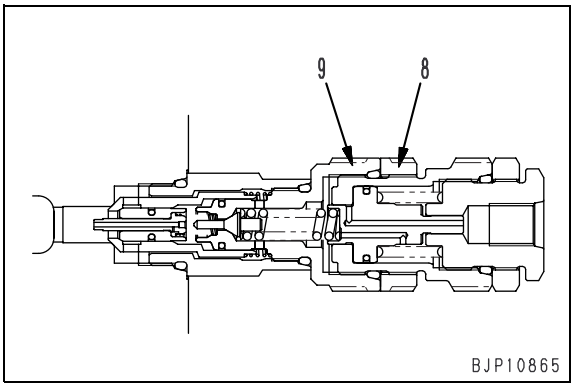
2. Adjustment of relief pressure in boom LOWER (High pressure setting side)

★ If the relief pressure of high pressure in boom LOWER is not normal, adjust the high pressure setting side of safety and suction valve (7) for boom LOWER in the following manner.

★ The relief pressure of high pressure is such condition that the machine push-up switch is in the ON position, and the switching port and the pilot pressure do not function.



1) Disconnect pilot hose.
2) Loosen lock nut (8) and adjust the pressure by turning holder (9).
   ★ If the holder is turned to the right, the pressure rises.
   If the holder is turned to the left, the pressure falls.
   ★ Adjustment amount per turn of holder:
   Approx. 21.8 MPa{approx. 222 kg/cm^2}
   3 Lock nut:
   93–123 Nm{9.5–12.5 kgm}



MEASUREMENT OF SOLENOID VALVE OUTPUT PRESSURE

★ Solenoid valve output pressure measurement tools

Mark		Part No.	Part Name
N	1	799-101-5002	Hydraulic Tester
		790-261-1203	Digital Type Hydraulic Tester
	2	799-401-2910	Nipple (Size 02)
		07002-*1423	O-ring
	3	799-401-2920	Nipple (Size 03)
		07002-*1823	O-ring

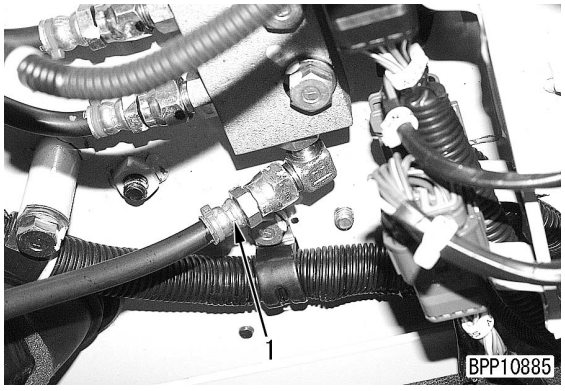
★ Measure solenoid valve output pressure after confirming that control circuit original pressure is normal.

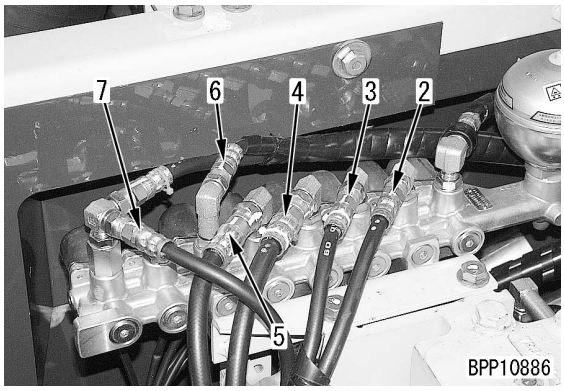
k Lower the work equipment to the ground and stop the engine. After the engine stops, operate the control lever several times to release the remaining pressure in the piping. Then loosen the oil filler cap to release the pressure inside the hydraulic tank.

1. Disconnect the hoses of solenoid valve to be measured at the outlet side.

No.	Solenoid valve to be measured
1	PPC lock solenoid valve
2	Travel interconnection solenoid valve
3	Merge/divide solenoid valve
4	Travel speed shifting solenoid valve
5	Swing and parking brake solenoid valve
6	Machine push-up solenoid valve
7	2-stage relief solenoid valve

★ Hose (1) is installed at the rear of operator's cab, and hoses (2) through (7) are installed at the center of revolving frame.

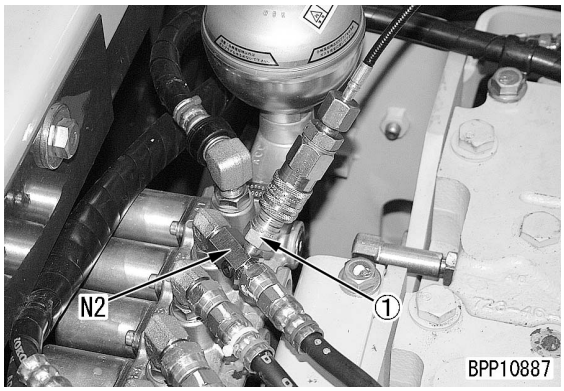




2. Fix nipple **N2** or **N3** and connect the disconnected hose again.

3. Fit fitting ① of hydraulic tester **N1** and connect it to oil pressure gauge ②.

★ Use an oil pressure gauge with the capacity of 5.9 MPa{60 kg/cm^2}.



4. Start the engine and keep it running until the hydraulic oil temperature rises to the operating range.

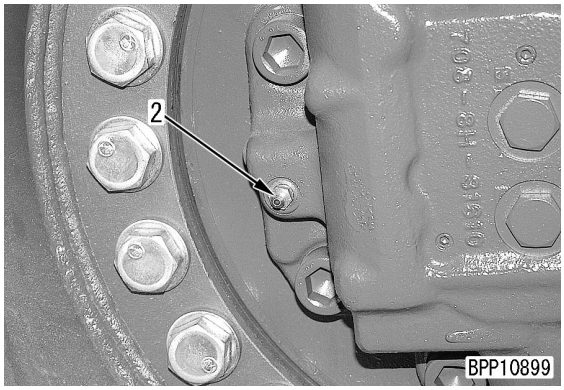
3. Air bleeding from swing motor

1) Start the engine and run it at low idling.
2) Bleed air from the motor by swinging the upper structure slowly.

4. Air bleeding from travel motor

1) Start the engine and run it at low idling.
2) Loosen air bleeding plug (2) and confirm that oil seeps out from the plug.
3) If the oil seepage is confirmed, tighten air bleeding plug (2).

3 Air bleeding plug:
27.5–35.3 Nm{2.8–3.6 kgm}

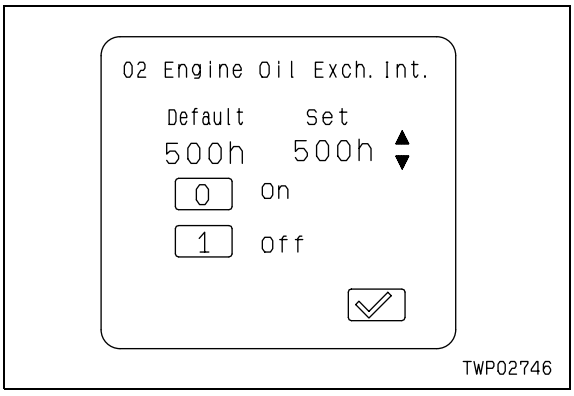


User Code No.	Service Code		Failure Code			Failure Classification
	Code No.	Content	Code No.	Location	Phenomenon	
E05	E308	Abnormality in throttle potentiometer	DK10KZ	Throttle potentiometer	Malfunctioning	Electrical system
–	E314	Disconnection in engine stop solenoid relay	DY45KA	Engine stop solenoid relay	Disconnection	
–	E315	Short circuit in battery relay output	D110KB	Battery relay	Short circuit	
–	E316	Abnormality in governor motor step-out	DY10K4	Governor motor	Out of control	
E05	E317	Disconnection in both governor motors A and B	DY10KA	Governor motor	Disconnection	
E05	E318	Short circuit in both governor motors A and B	DY10KB	Governor motor	Short circuit	
–	None	Engine high idling out of rate	A000N1	Engine	Overrunning	Mechanical system
–	None	Engine low idling out of rate	A000N2	Engine	Low idling out of rate	
–	None	Air cleaner clogged	AA10NX	Air cleaner element	Clogging	
–	None	Charging voltage abnormally low	AB00KE	Alternator	Insufficient charging	
–	None	Engine oil pressure abnormally low	B@BAZG	Engine oil	Oil pressure lowered	
–	None	Engine oil level abnormally low	B@BAZK	Engine oil	Oil level lowered	
–	None	Engine cooling water overheated	B@BCNS	Engine cooling water	Overheating	
–	None	Radiator water level abnormally low	B@BCZK	Engine cooling water	Cooling water level lowered	
–	None	Hydraulic oil overheated	B@HANS	Hydraulic oil	Overheating	
–	None	Auto-lubrication system abnormal	DA80MA	Auto-lubrication system controller	Malfunction	

★ This table is arranged in the sequence of Service Code No.
★ In case there is no number assigned in the column of User Code No., or in case "none" is described in the column of Code No. of Service Code, the corresponding service code or failure code is not shown in the display of ordinary items, even if some abnormality occurs. It is recorded only in the failure history (either in electrical system or mechanical system) of Service Menu.
★ History Classification indicates that a specific failure is classified as belonging to either electrical system or mechanical system, when it is recorded in Service Menu.
★ "E" at the head of Code No. of Service Code means the following status of a specific failure.
- With "E": The failure is yet to be dissolved and continues.
- Without "E": The failure has already been dissolved.

4) Set contents of individual items
   ①: Default: The maintenance time set in the monitor (recommended by the manufacturer and cannot be changed).
   ②: Set: Maintenance time that can be freely set. The maintenance mode program functions based on this maintenance time. (The maintenance time can be increased or decreased by 50 hours with [△] or [▽] switch)
   ③: On: Maintenance display function with this instruction becomes effectual.
   ④: Off: Maintenance display with this instruction becomes ineffectual.
   ★ The lowest maintenance time is 50 h.

5) Set contents of "Use Default Values"
   When selecting this menu and depressing the switch [✓], all individual time settings are reduced to the initial settings.

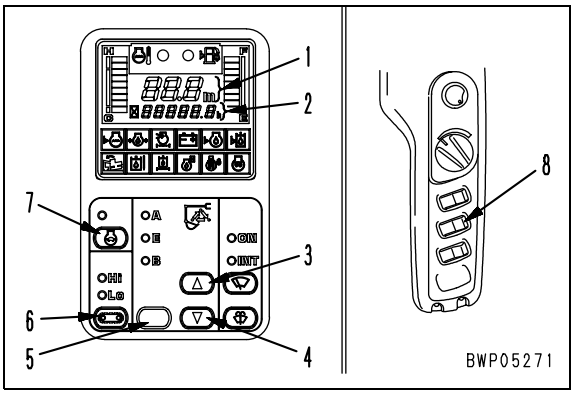


4. Monitoring code display function

The input signals from the sensors to each component and the output signals to drive the solenoid can be checked in real time with the monitoring code.

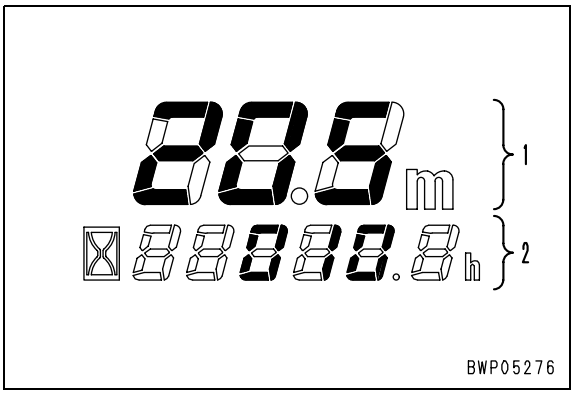
When the following operations are carried out, the monitoring code Nos. are displayed on the 3rd to 5th digits from the left on service meter display (2) and the monitoring data are displayed on digital meter display (1).

1) Method of displaying monitoring codes
   i) To switch to the monitoring code, do as follows.
      ① Keep [Buzzer cancel switch (8)] + [Auto-deceleration switch (7)] pressed for at least 2.5 seconds.
      ② Press [Buzzer cancel switch (8)] + [Working mode selector (UP) switch (3)] (or [Working mode selector (DOWN) switch (4)]) and set so that [02] is displayed in the 2nd and 3rd digits from the left on service meter display (2).
      ③ Press [Setting switch (5)].

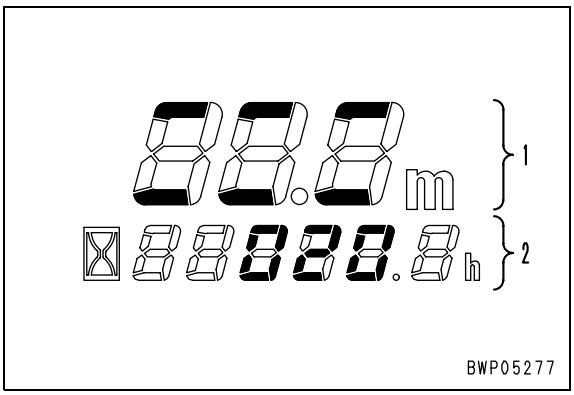


(1) Digital meter display
(2) Service meter display
(3) Working mode selector (UP) switch
(4) Working mode selector (DOWN) switch
(5) Setting switch
(6) Travel speed switch
(7) Auto-deceleration switch
(8) Buzzer cancel switch

Example 1: When a numeric display monitoring code (engine speed: 2050 rpm) is displayed



Example 2: When bit pattern display monitoring code No. 20 (switch input condition (1)) is displayed



   ii) To go on to the next monitoring code display, press [Buzzer cancel switch (8)] + [Working mode selector (UP) switch (3)].
   iii) To go back to the previous service code display, press [Buzzer cancel switch (8)] + [Working mode selector (DOWN) switch (4)].
   iv) To finish using the monitoring code display mode, keep [Buzzer cancel switch (8)] + [Auto-deceleration switch (7)] pressed for at least 2.5 seconds.

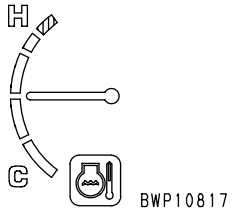
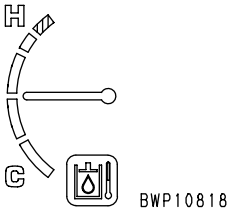
Pm - Tune up Service

Model	Serial No.	Service meter reading
☐ PC300-7 ☐ LC ☐ PC350-7		h

User's name	Implemented on:	Inspected by:
	／ ／	

Specifications		
Work equipment	Attachment	Shoe width
Boom ☐ Standard ☐ ( ) Arm ☐ Standard ☐ ( ) Bucket ☐ Standard ☐ ( )	☐ Breaker ☐ ( )	☐ 600 mm ☐ 700 mm ☐ ( )

Oil and cooling water level check		
☐ Radiator water	As required	
☐ Engine oil	☐ Damper case oil	☐ Final drive case oil
☐ Hydraulic oil	☐ Machinery case oil	☐ ( )

Max. range of engine cooling water temperature	Max. range of hydraulic oil temperature	Ambient temperature
 BWP10817	 BWP10818	˚C **Elevation** m

Operator's comment

Result of visual check

Failure code history

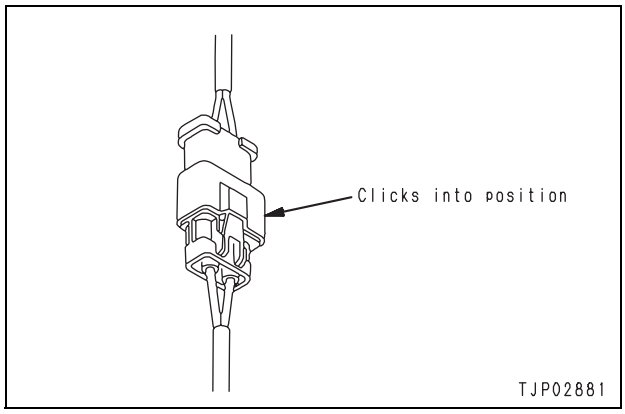
Electrical system	Mechanical system			
			Frequency	SMR at initial occurrence
☐☐☐☐☐☐ h	A000N1	Engine rotation at high idling out of rate		
Content:	A000N2	Engine rotation at low idling out of rate		
☐☐☐☐☐☐ h	B@BCNS	Engine cooling water overheated		
Content:	B@BAZG	Engine oil pressure abnormally low		
☐☐☐☐☐☐ h	B@BAZK	Engine oil level abnormally low		
Content:	B@HANS	Hydraulic oil overheated		
☐☐☐☐☐☐ h	B@BCZK	Radiator water level abnormally low		
Content:	AA10NX	Air cleaner clogged		
☐☐☐☐☐☐ h	AB00KE	Charging voltage abnormally low		
Content:	DA80MA	Auto-lubrication system abnormal		

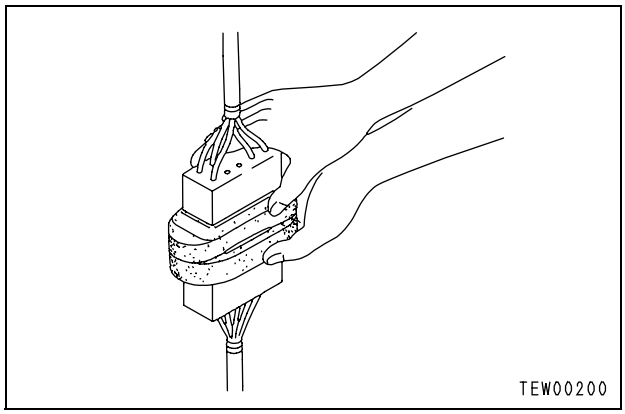
- **Connecting connectors**
  1) Check the connector visually.
     1) Check that there is no oil, dirt, or water stuck to the connector pins (mating portion).
     2) Check that there is no deformation, defective contact, corrosion, or damage to the connector pins.
     3) Check that there is no damage or breakage to the outside of the connector.
     ★ If there is any oil, water, or dirt stuck to the connector, wipe it off with a dry cloth. If any water has got inside the connector, warm the inside of the wiring with a dryer, but be careful not to make it too hot as this will cause short circuits.
     ★ If there is any damage or breakage, replace the connector.

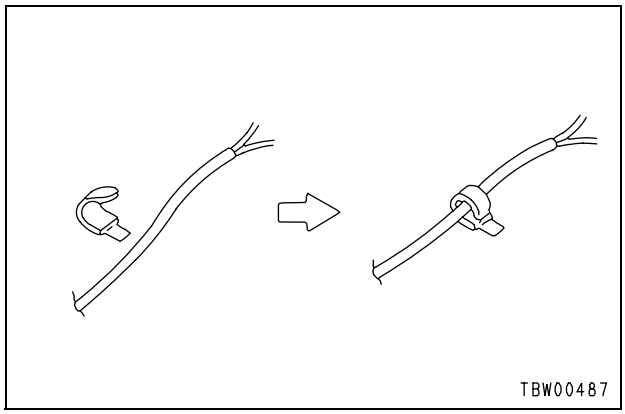
  2) Fix the connector securely.
     Align the position of the connector correctly, then insert it securely.
     For connectors with lock stopper, push in the connector until the stopper clicks into position.

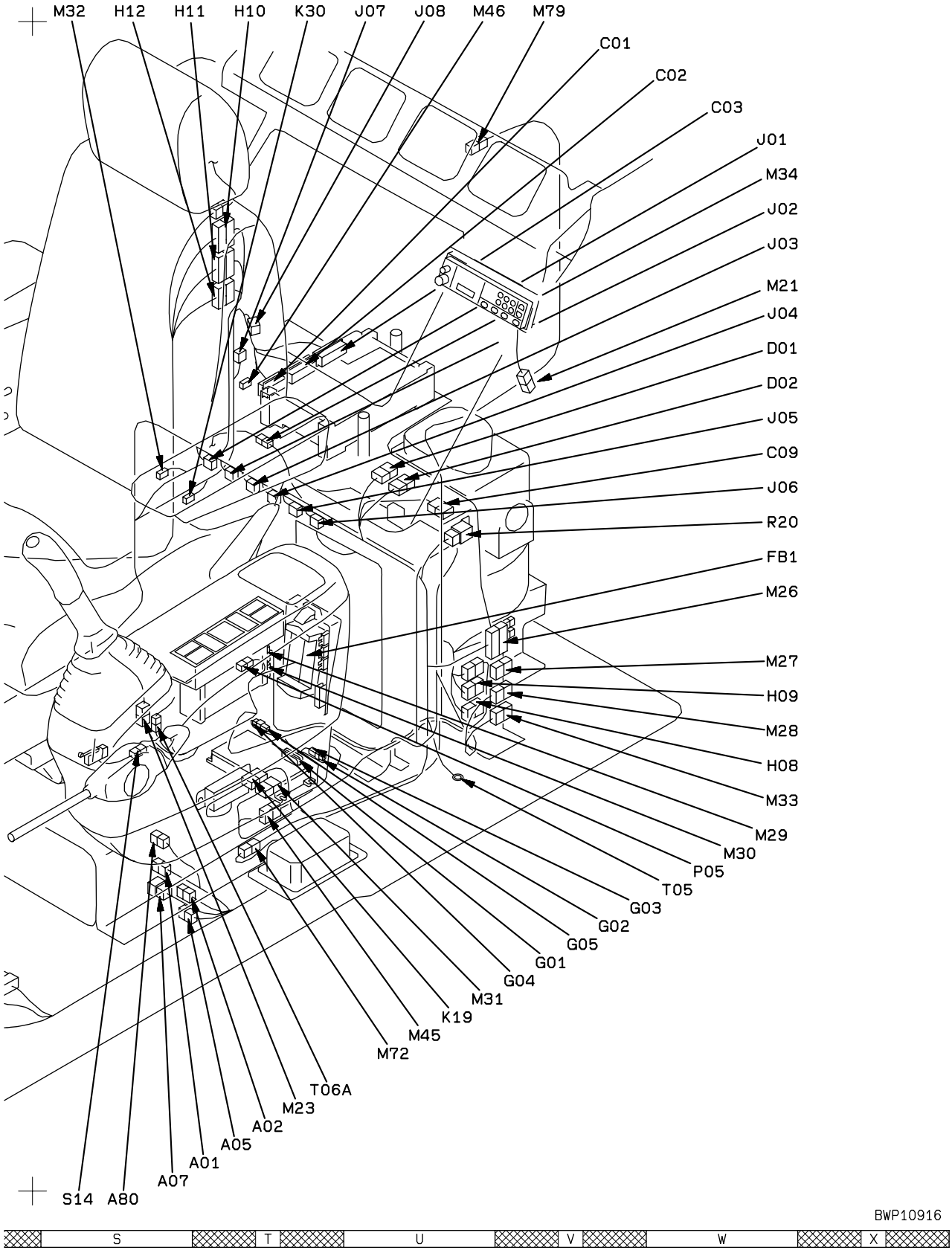
  3) Correct any protrusion of the boot and any misalignment of the wiring harness
     For connectors fitted with boots, correct any protrusion of the boot. In addition, if the wiring harness is misaligned, or the clamp is out of position, adjust it to its correct position.
     ★ If the connector cannot be corrected easily, remove the clamp and adjust the position.

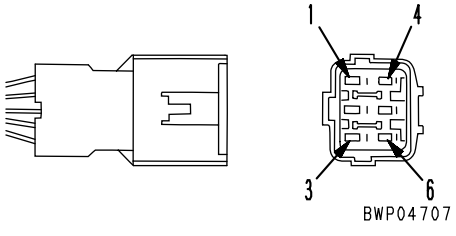
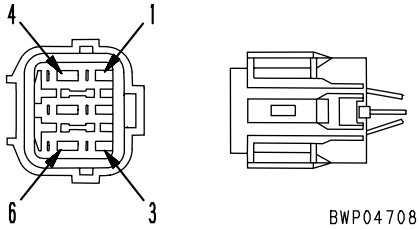
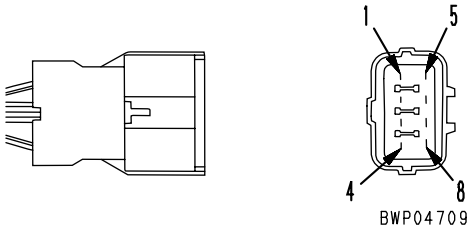
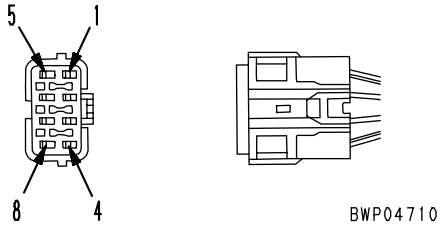
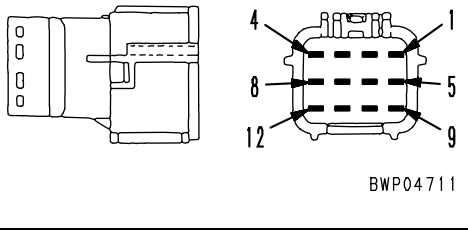
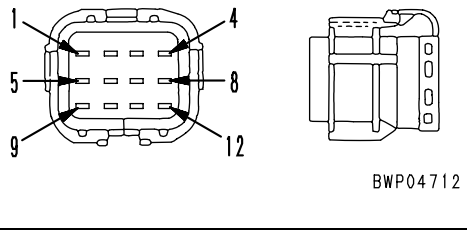
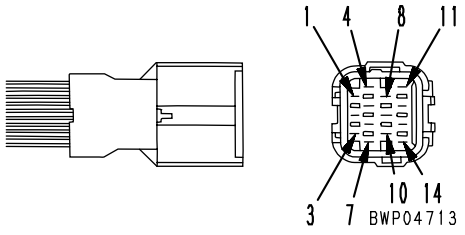
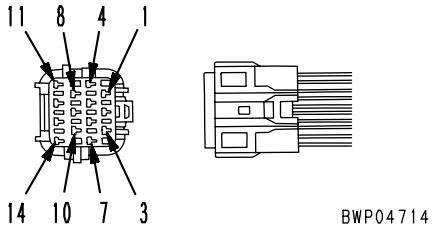
  4) If the connector clamp has been removed, be sure to return it to its original position. Check also that there are no loose clamps.

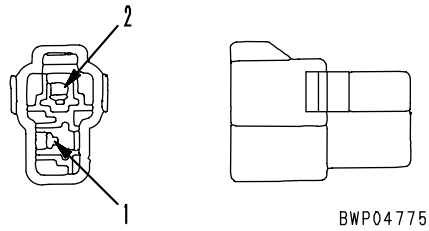
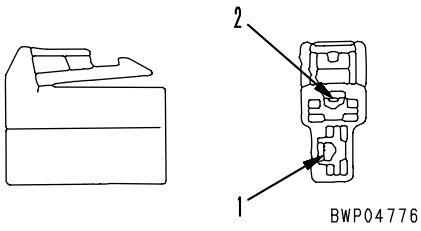
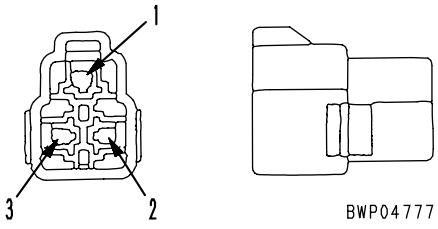
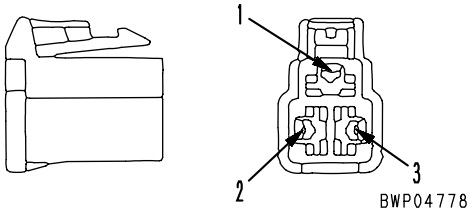
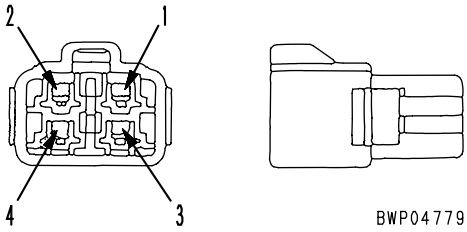
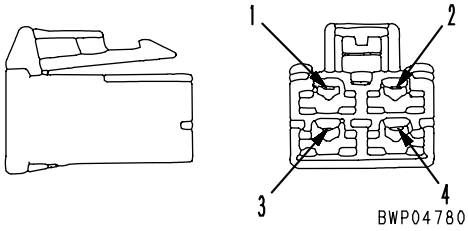
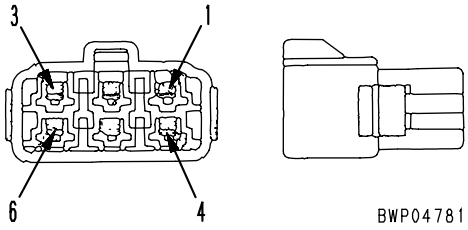
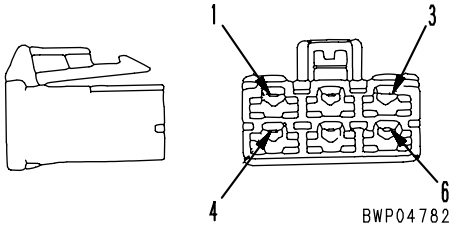




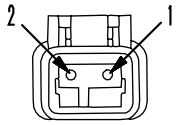
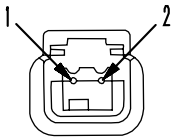



M32
H12
H11
H10
K30
J07
J08
M46
M79
C01
C02
C03
J01
M34
J02
J03
M21
J04
D01
D02
J05
C09
J06
R20
FB1
M26
M27
H09
M28
H08
M33
M29
M30
P05
T05
G03
G02
G05
G01
G04
M31
K19
M45
M72
T06A
M23
A02
A05
A01
A07
S14
A80
BWP10916
S
T
U
V
W
X

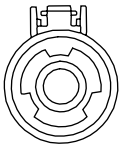
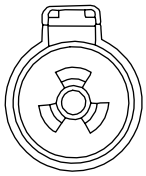
No.of pins	SWP type connector		
	Male (female housing)	Female (male housing)	T-adapter Part No.
6			799-601-7050
	Part No.: 08055-10681	Part No.: 08055-10691	
8			799-601-7060
	Part No.: 08055-10881	Part No.: 08055-10891	
12			799-601-7310
	Part No.: 08055-11281	Part No.: 08055-11291	
14			799-601-7070
	Part No.: 08055-11481	Part No.: 08055-11491	

No.of pins	KES 1 (Automobile) connector		
	Male (female housing)	Female (male housing)	T-adapter Part No.
2			—
	Part No.: 08027-10210 (Natural color) 08027-10220 (Black)	Part No.: 08027-10260 (Natural color) 08027-10270 (Black)	
3			—
	Part No.:08027-10310	Part No.:08027-10360	
4			—
	Part No.: 08027-10410 (Natural color) 08027-10420 (Black)	Part No.: 08027-10460 (Natural color) 08027-10470 (Black)	
6			—
	Part No.: 08027-10610 (Natural color) 08027-10620 (Black)	Part No.: 08027-10660 (Natural color) 08027-10670 (Black)	

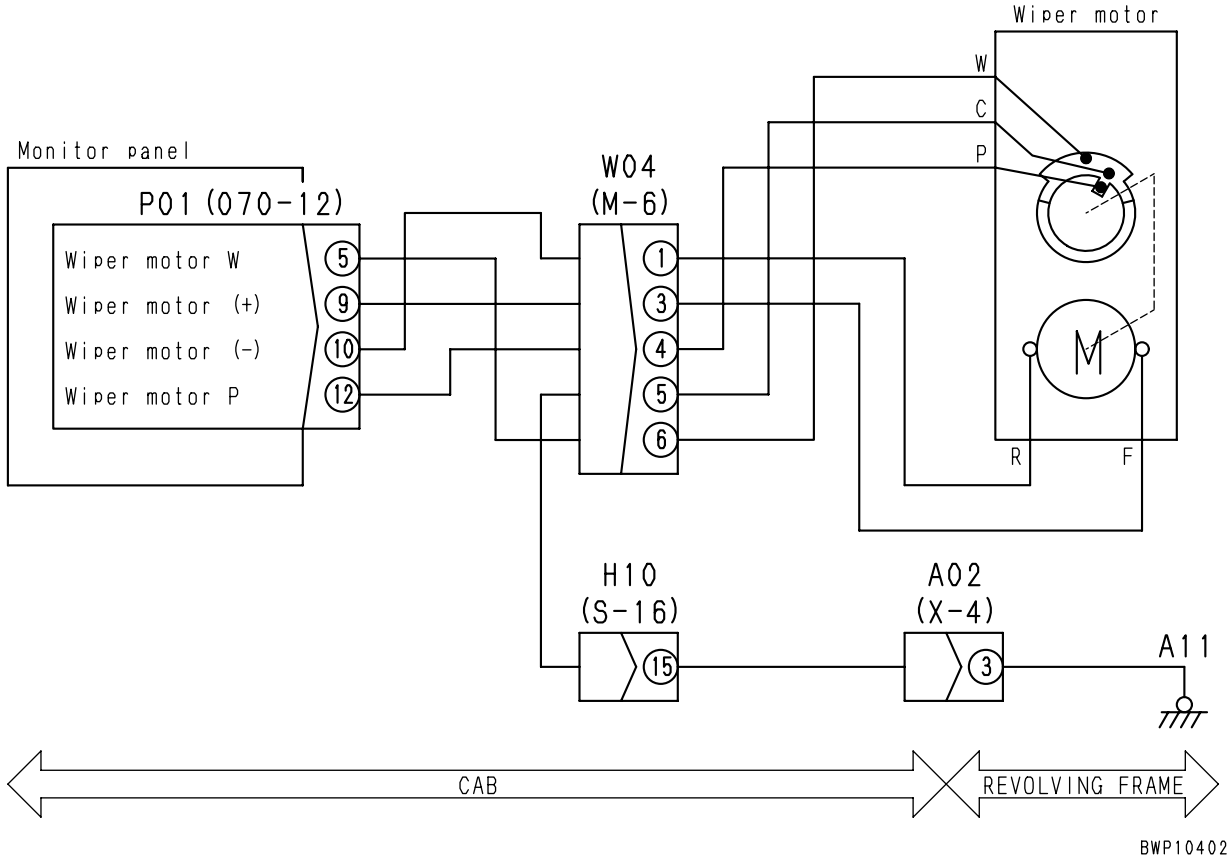
[The pin No. is also marked on the connector (electric wire insertion end)]

No.of pins	DTM Series connector		
	Body (plug)	Body (receptacle)	T-adapter Part No.
2	 BWP05049	 BWP05050	799-601-9010
	Part No.: 08192-02200	Part No.: 08192-02100	

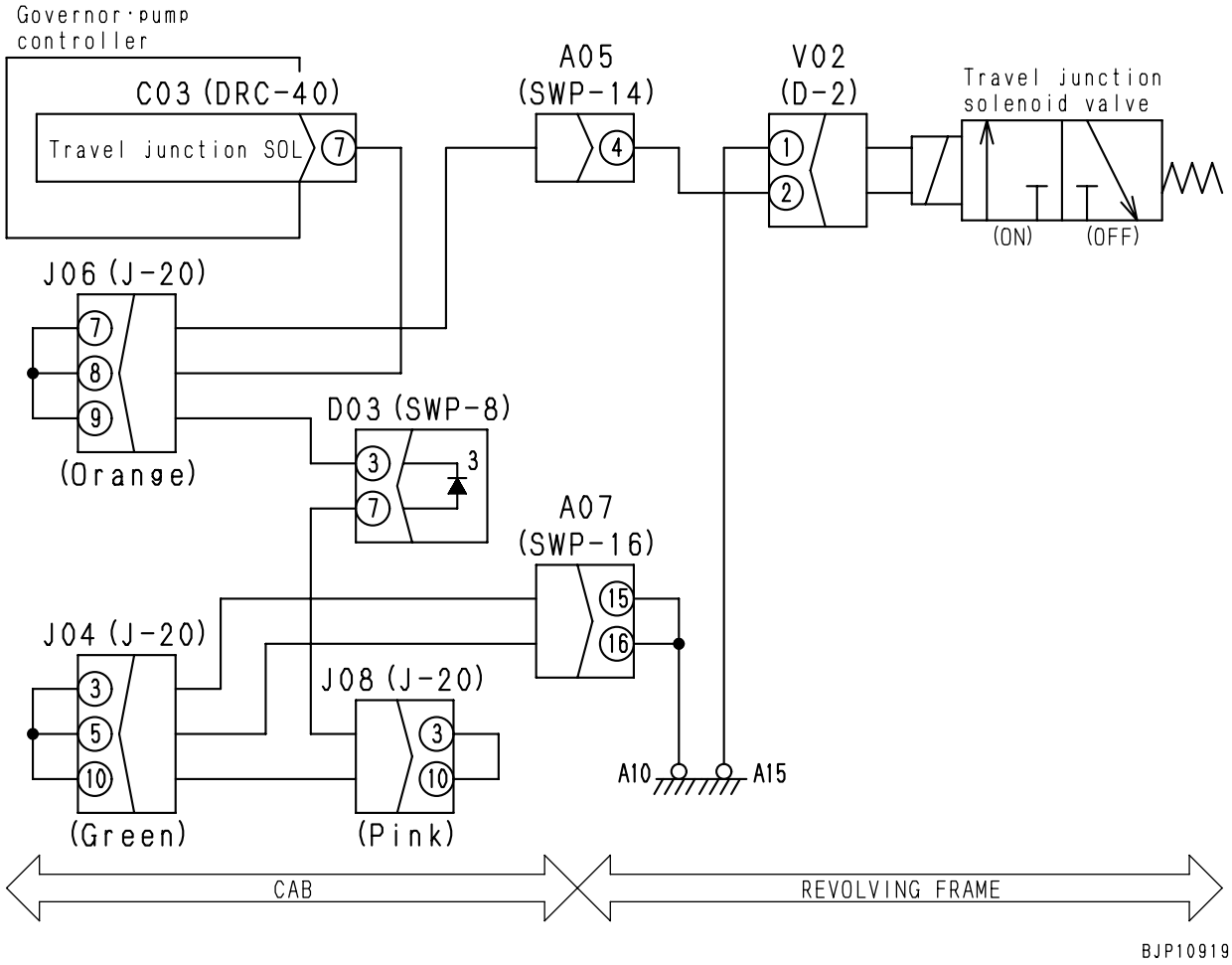
[The pin No. is also marked on the connector (electric wire insertion end)]

No.of pins	DTHD Series connector		
	Body (plug)	Body (receptacle)	T-adapter Part No.
2	 BWP05051	 BWP05052	—
	Part No.: 08192-31200 (Contact size#12) 08192-41200 (Contact size #8) 08192-51200 (Contact size #4)	Part No.: 08192-31100 (Contact size#12) 08192-41100 (Contact size #8) 08192-51100 (Contact size #4)	

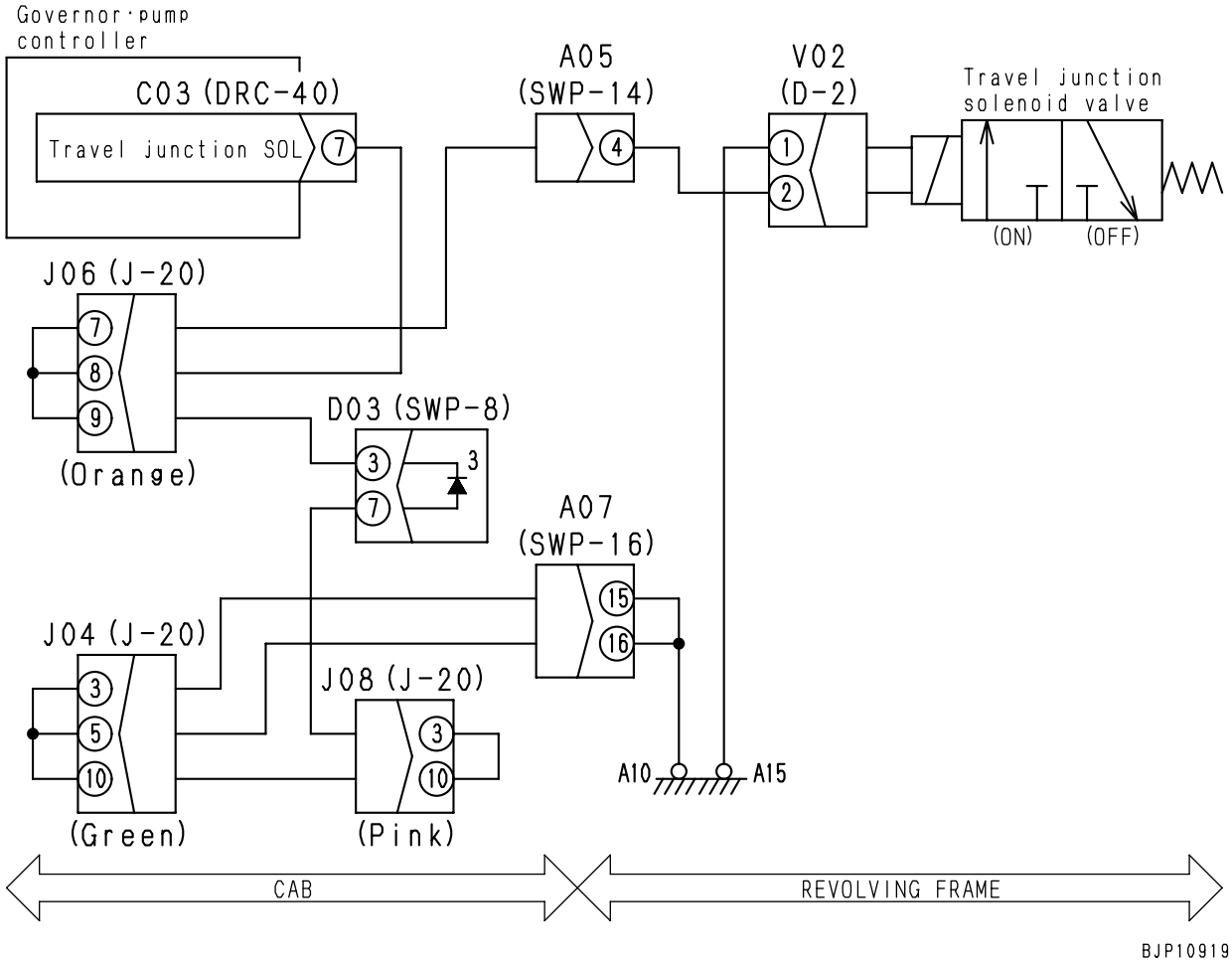
Electric Circuit Diagram for Monitor Panel Windshield Wiper Motor



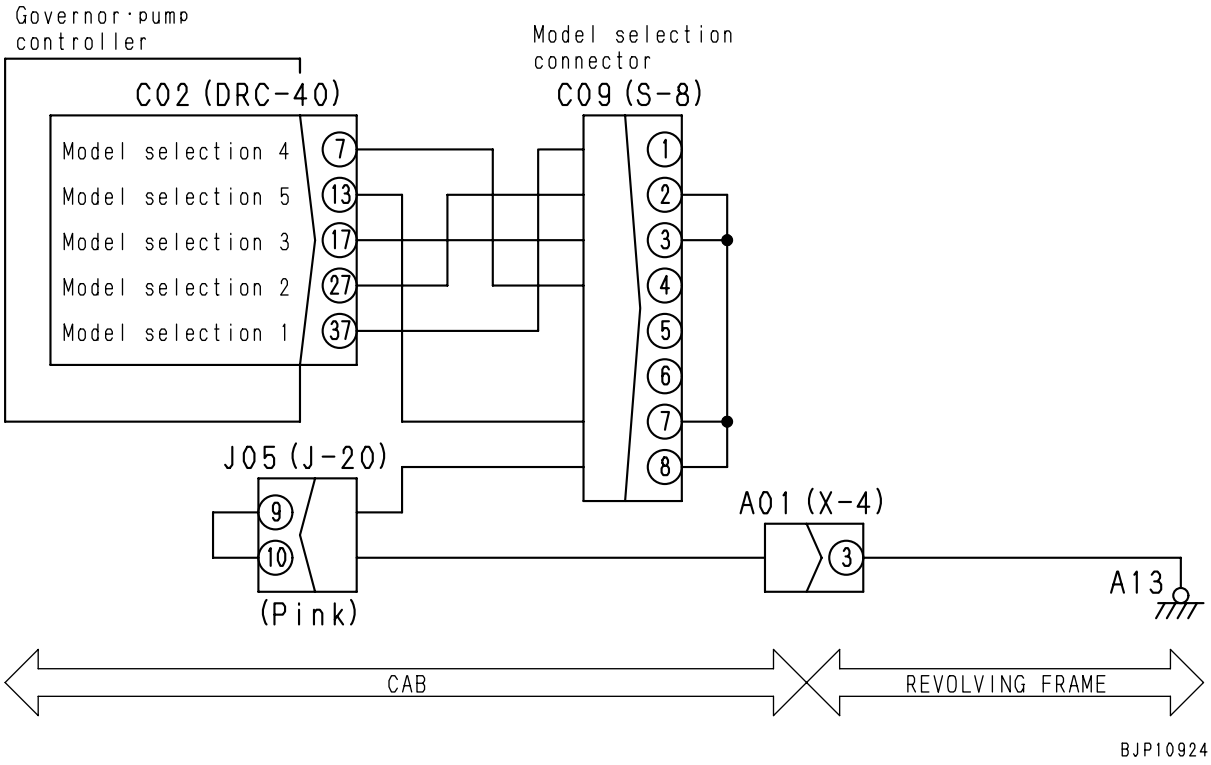
Electrical Circuit for Travel Interlocking Solenoid in Governor • Pump Controller



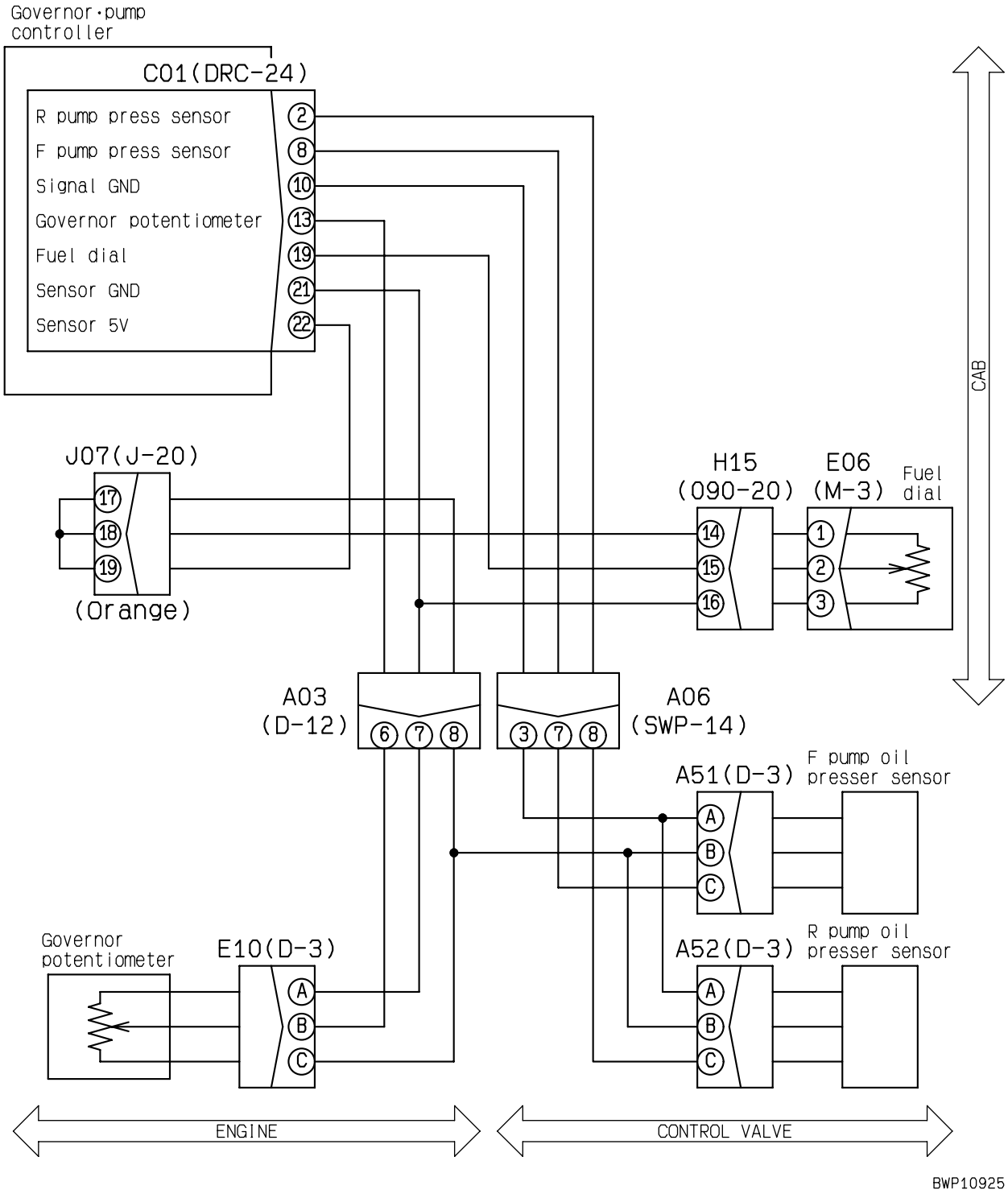
Electrical Circuit Diagram for Travel Interlocking Solenoid in Governor • Pump Controller



Electrical Circuit Diagram for Model Selecting Connector in Governor • Pump Controller



Electrical Circuit Diagram for Sensor Power Source in Governor • Pump Controller

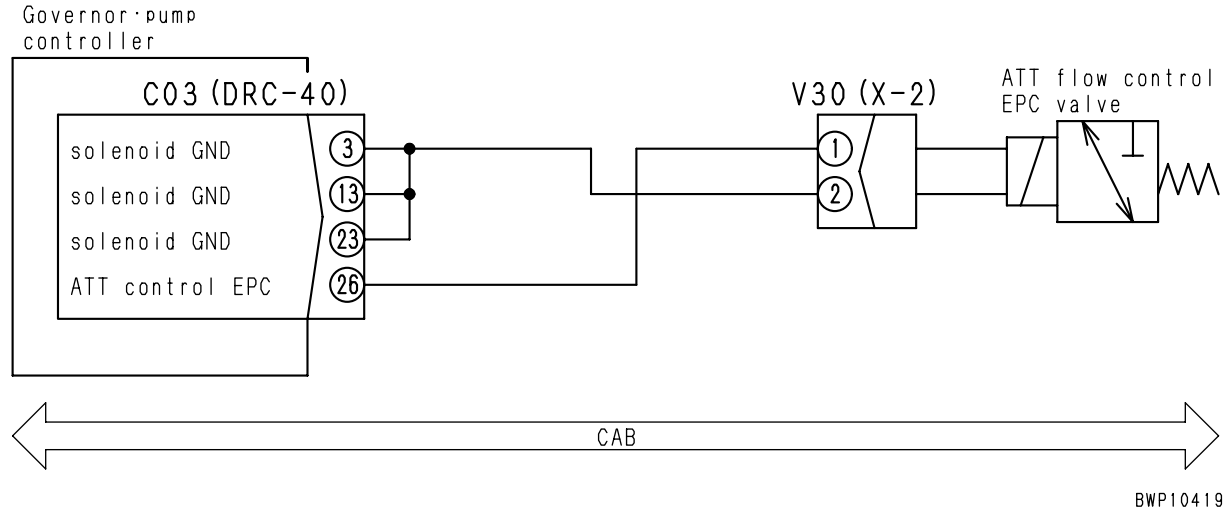


Service Code in Electrical System E246
(Disconnection in attachment oil flow rate adjusting EPC) (Multi-monitor only)

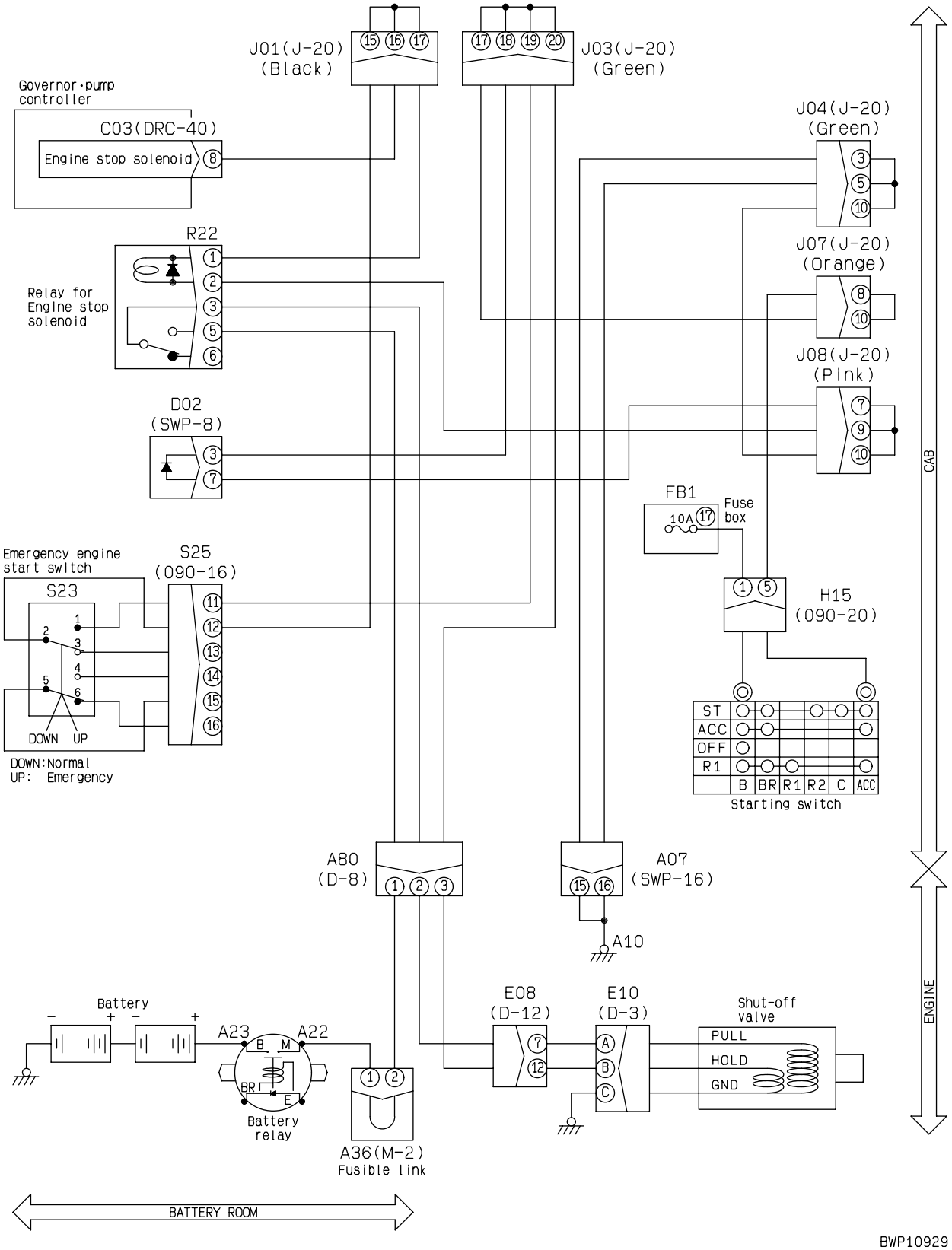
User Code	Service Code	Failure Code	Failure phenomenon	Disconnection in attachment oil flow rate adjusting EPC (in governor • pump controller system)
—	**E246**	**DXE4KA**		
Failure content	• No current flew to the attachment oil flow rate adjusting EPC solenoid circuit.			
Response from controller	• None in particular (The solenoid does not work, as there is no current flowing to it) • If the failure cause disappears, the EPC solenoid circuit returns to normalcy of itself.			
Phenomenon occurring on machine	• The attachments do not move.			
Relative information	• In this code, a failure is diagnosed only when the setting mode is "with ATT". (Check the setting mode shown in the monitor panel) • It can be confirmed in the monitor function how power (ampere) is supplied to the attachment oil flow rate adjusting EPC solenoid circuit. (Code No. 017: Service solenoid current)			

Presumed cause and standard value in normalcy		Cause	Standard value in normalcy and references for troubleshooting			
	1	Attachment oil flow rate adjusting EPC defective (Internal short-circuiting or grounding fault)	★Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			V30 (male)	Resistance value		
			Between ① and ②	7 – 14 Ω		
	2	Disconnection of wiring harness (Disconnection or defective contact with connector)	★Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			Between wiring harness between C03 (female) ㉖ and V30 (male) ① and grounding	Resistance value	Below 1 Ω	
			Between wiring harness between C03 (female) ③ ⑬ ㉓ and V30 (male) ② and grounding	Resistance value	Below 1 Ω	
	3	Short-circuiting of wiring harness (Contact with 24 V circuit)	★Turn the engine starting switch OFF for the preparations, and hold it in the ON position during the troubleshooting.			
			Between wiring harness between C03 (female) ㉖ and V30 (female) ① and grounding	Voltage	Below 1 V	
	4	Governor • pump controller defective	★Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			C03 (female)	Resistance value		
			Between ㉖ and ③ ⑬ ㉓	7 – 14 Ω		

Electrical Circuit Diagram for Attachment Oil Flow Rate Adjusting EPC Solenoid in Governor • Pump Controller



Electrical Circuit Diagram for Engine Stop Solenoid and Relay in Monitor Panel

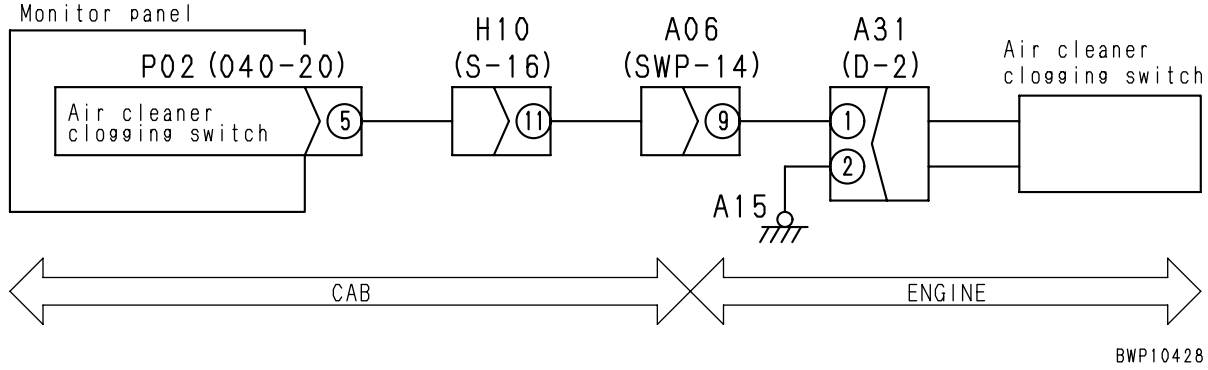


Failure Code in Mechanical System AA10NX (Air cleaner clogging)

User Code	Service Code	Failure Code	Failure phenomenon	Air cleaner clogged (in mechanical system)
—	—	**AA10NX**		
Failure content	• While the engine was running, the signal circuit in the air cleaner clogging switch was opened (i.e. disconnected from grounding circuit).			
Response from controller	• None in particular			
Phenomenon occurring on machine	• There is a possibility that the engine is damaged, if it is used continuously without corrective action.			
Relative information	• This Failure Code is recorded, when the air cleaner clogging caution symbol is displayed in the monitor panel while the engine is running. • Input from the air cleaner clogging switch (ON or OFF) can be confirmed in the monitor panel. (Code No. 046: Monitor input 2)			

Presumed cause and standard value in normalcy	Cause		Standard value in normalcy and references for troubleshooting			
	1	Air cleaner clogged (when the system is in normal condition)	★Check the air cleaner for clogging. If it is clogged, clean or replace it with new one.			
	2	Air cleaner clogging switch defective (Internal disconnection)	★Turn the engine starting switch OFF for the preparations, and keep the engine running during the troubleshooting.			
			A31 (male)	Air cleaner	Resistance value	
			Between ① and ②	When in normal condition	Below 1 Ω	
				When clogged	Above 1 MΩ	
	3	Disconnection of wiring harness (Disconnection or defective contact with connector)	★Turn the engine starting switch OFF for the preparations, and hold it running during the troubleshooting.			
			Wiring harness between P02 (female) ⑤ and A31 (female) ①		Resistance value	Below 1 Ω
			Between wiring harness A31 (female) ② and grounding		Resistance value	Below 1 Ω
	4	Monitor panel defective	★Turn the engine starting switch OFF for the preparations, and keep the engine running during the troubleshooting.			
			P02	Air cleaner	Voltage	
			Between ⑤ and grounding	When in normal condition	Below 1 V	
				When clogged	20 – 30 V	

Electrical Circuit for Air Cleaner Clogging Switch in Monitor Panel



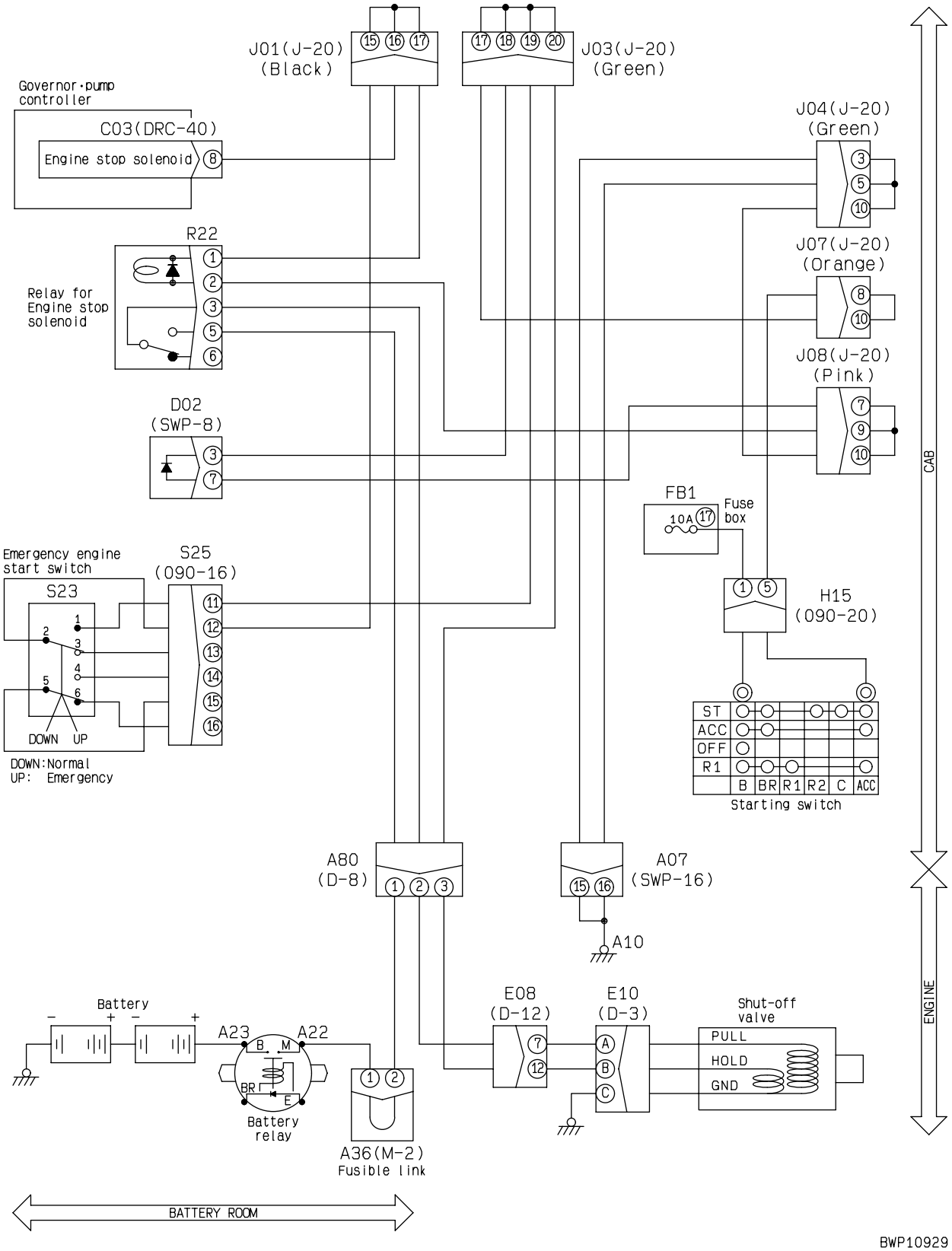
E-1 Engine does not start

Failure information (1)	• The engine does not start (the engine does not rotate).
Relative information	• The following two engine start locking mechanisms are provided in the engine starting circuit. 1) Engine start locking by means of password in the monitor panel (※) 2) Engine start locking by means of safety lock lever

※: The multi-monitor specification machine only.

<table>
<tr><td rowspan="19">Presumed cause and standard value in normalcy</td><td colspan="2">Cause</td><td colspan="4">Standard value in normalcy and references for troubleshooting</td></tr>
<tr><td rowspan="2">1</td><td rowspan="2">Shortage in battery capacity</td><td>Battery voltage</td><td colspan="3">Battery electrolyte specific gravity</td></tr>
<tr><td>Above 24 V</td><td colspan="3">Above 1.26</td></tr>
<tr><td>2</td><td>Fuse Nos. 3 and 18 and Fusible Link A35 fault</td><td colspan="4">When a fuse or fusible link is blown, there is a big possibility that grounding fault occurred in the circuit.
If a monitor lamp does not light up in the monitor panel, check the power source circuit between the battery and the specific fuse.</td></tr>
<tr><td rowspan="3">3</td><td rowspan="3">Engine starting switch fault (Internal disconnection)</td><td colspan="4">★Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.</td></tr>
<tr><td>H15 (male)</td><td>Position</td><td colspan="2">Resistance value</td></tr>
<tr><td>Between ① and ④</td><td>OFF</td><td colspan="2">Above 1 MΩ</td></tr>
<tr><td rowspan="3">4</td><td rowspan="3">Safety lock switch fault (Internal short-circuiting)</td><td colspan="4">★Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.</td></tr>
<tr><td>S14 (female)</td><td>Lock lever</td><td colspan="2">Resistance value</td></tr>
<tr><td>Between ① and ③</td><td>Release</td><td colspan="2">Below 1 Ω</td></tr>
<tr><td rowspan="5">5</td><td rowspan="5">Engine starting motor cut relay, R11 and R13 defective (Internal disconnection or short-circuiting)</td><td colspan="4">★Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.</td></tr>
<tr><td colspan="2">R11 (female) & R13 (male)</td><td colspan="2">Resistance value</td></tr>
<tr><td colspan="2">Between ① and ②</td><td colspan="2">100 – 500 Ω</td></tr>
<tr><td colspan="2">Between ③ and ⑤</td><td colspan="2">Above 1 MΩ</td></tr>
<tr><td colspan="2">Between ③ and ⑥</td><td colspan="2">Below 1 Ω</td></tr>
<tr><td rowspan="4">6</td><td rowspan="4">Engine starting motor fault (Internal disconnection or damage)</td><td colspan="4">★Turn the engine starting switch OFF for the preparations, and keep the engine running during the troubleshooting. (If all of the power source, grounding (GND), generation signal and engine start input are normal and yet the engine start output is not normal, the engine starting motor relay is defective)</td></tr>
<tr><td colspan="2">Engine starting motor</td><td>Engine starting switch</td><td>Voltage</td></tr>
<tr><td colspan="2">Power source: B terminal and grounding</td><td rowspan="2">Start</td><td>20 – 30 V</td></tr>
<tr><td colspan="2">Engine start input: C terminal and grounding</td><td>20 – 30 V</td></tr>
<tr><td rowspan="3">7</td><td rowspan="3">Alternator fault (Internal short-circuit)</td><td colspan="4">★Turn the engine starting switch OFF for the preparations, and hold it in the ON position or running during the troubleshooting.</td></tr>
<tr><td colspan="2">Alternator</td><td colspan="2">Voltage</td></tr>
<tr><td colspan="2">R terminal and grounding</td><td colspan="2">Below 1 V</td></tr>
</table>

Electrical Circuit Diagram for Engine Stop

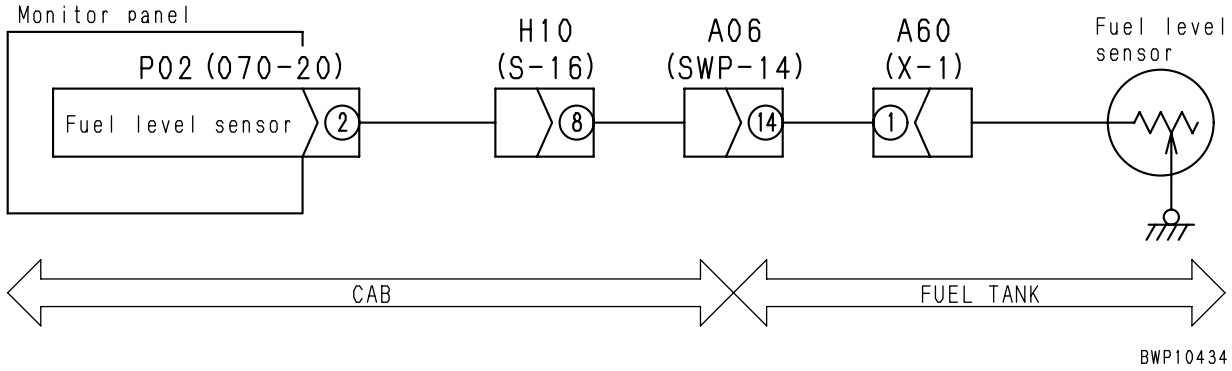


E-13 Fuel level monitor red lamp lights up while engine is running

Failure information	• The fuel level monitor red lamp lighted up while the engine was running.
Relative information	• If the fuel gauge shows in a red range on the monitor panel, the fuel level monitor lamp lights up red. • (5) Input signal from the fuel level sensor (voltage) can be confirmed in the monitor function. (Code No. 042: Fuel level sensor)

Presumed cause and standard value in normalcy	Cause		Standard value in normalcy and references for troubleshooting			
	1	Fuel level lowered (system in normal condition)	★Refill fuel.			
	2	Fuel level sensor fault (Internal disconnection)	★Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			A60 (male)	Fuel level	Resistance value	
			Between ① and grounding	FULL (Upper limit)	Approx. 12 Ω	
				EMPTY (Lower limit)	85 – 110 Ω	
	3	Grounding fault of wiring harness (Contact with grounding (GND) circuit)	★Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			Wiring harness between P02 (female) ② and A60 (female) ①		Resistance value	Below 1 Ω
	4	Monitor panel defective	★Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			P02 (female)	Fuel level	Resistance value	
			Between ② and grounding	FULL (Upper limit)	Approx. 12 Ω	
				EMPTY (Lower limit)	85 – 110 Ω	

Electrical Circuit Diagram for Fuel Level Sensor

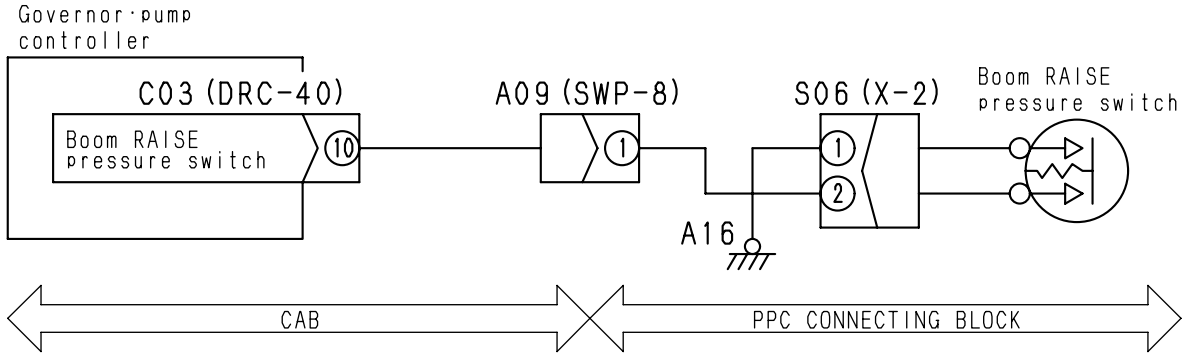


E-21 "Boom RAISE" is not correctly displayed in monitor function

Failure information	• "Boom RAISE" is not correctly displayed in the monitor function on the monitor panel.
Relative information	—

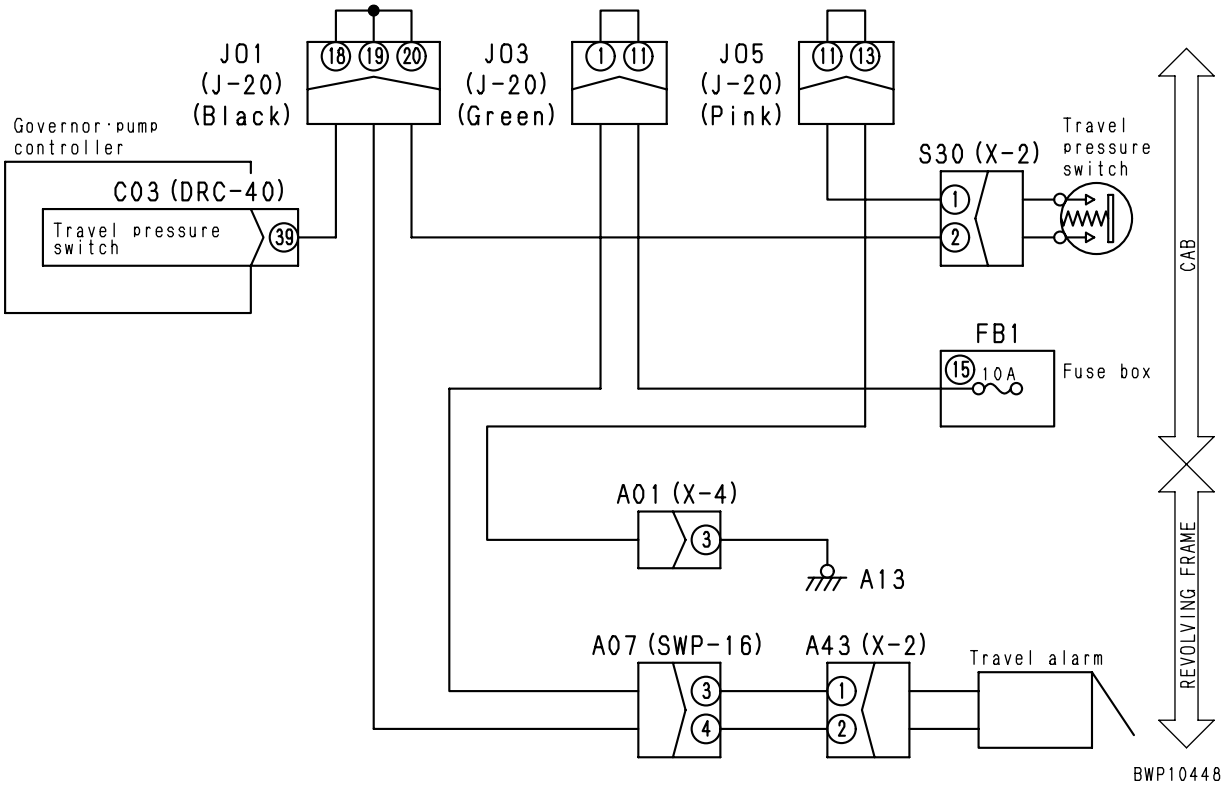
Presumed cause and standard value in normalcy		Cause	Standard value in normalcy and references for troubleshooting			
	1	Boom RAISE PPC hydraulic switch fault (Internal disconnection or short-circuiting)	★Turn the engine starting switch OFF for the preparations, and keep the engine running during the troubleshooting.			
			S06 (male)	Boom control lever	Resistance value	
			Between ① and ②	NEUTRAL	Above 1 MΩ	
				RAISE	Below 1 Ω	
	2	Disconnection of wiring harness (Disconnection or defective contact with connector)	★Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			Wiring harness between C03 (female) ⑩ and S06 (female) ②		Resistance value	Below 1 Ω
			Wiring harness between S06 (female) ① and grounding		Resistance value	Below 1 Ω
	3	Grounding fault of wiring harness (Contact with grounding (GND) circuit)	★Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			Between wiring harness between C03 (female) ⑩ and S06 (female) ② and grounding		Resistance value	Above 1 MΩ
	4	Short-circuiting of wiring harness (Contact with 24 V circuit)	★Turn the engine starting switch OFF for the preparations, and hold it in the ON position during the troubleshooting.			
			Between wiring harness between C03 (female) ⑩ and S06 (female) ② and grounding		Voltage	Below 1 V
	5	Governor • pump controller defective	★Turn the engine starting switch OFF for the preparations, and hold it in the ON position during the troubleshooting.			
			C03	Boom control lever	Voltage	
			Between ⑩ and grounding	NEUTRAL	20 – 30 V	
				RAISE	Below 1 V	

Electrical Circuit Diagram for Boom RAISE PPC Hydraulic Switch



BJP10939

Electrical Circuit Diagram for Travel PPC hydraulic Switch and Travel Alarm



INFORMATION CONTAINED IN TROUBLESHOOTING TABLE

★ Troubleshooting Table and Related Circuit Diagram collectively carry the following information. Carry out troubleshooting work after fully grasping their contents.

Failure information	Phenomena occurring on machine
Relative information	Information on occurred failures and troubleshooting

Presumed cause and standard value in normalcy		Cause	Standard value in normalcy and references for troubleshooting
	1	Cause for presumed failure (The attached No. for filing and reference purpose only. It does not stand for any priority)	<Contents> • The standard values in normalcy by which to judge "good" or "no good" about presumed causes. • References for making judgement of "good" or "no good"
	2		
	3		
	4		
	5		

H-15 In compound operation, work equipment with larger load moves slowly

Failure information	• In a compound operation, work equipment with larger load tends to move slowly.
Relative information	—

Presumed cause and standard value in normalcy	Cause		Standard value in normalcy and references for troubleshooting	
	1	Malfunctioning of pressure compensation valve for work equipment with larger load	The pressure compensation valve for the work equipment with larger load is presumed to malfunction. Check the valve itself.	
			Combination of compound operation	Work equipment with larger load
			Boom RAISE + arm DIGGING	Boom RAISE
			Boom RAISE + arm DUMPING	Arm DUMPING
			Boom RAISE + bucket DIGGING	Boom RAISE
			Arm DUMPING + bucket DIGGING	Arm DUMPING
			Boom LOWER + arm DUMPING	Arm DUMPING

H-16 In swing + boom RAISE operation, boom moves slowly

Failure information	• In a compound operation of swing + boom RAISE, the boom tends to move slowly.
Relative information	• If the boom moves slowly in the single operation of boom RAISE, carry out the H-7 check first.

Presumed cause and standard value in normalcy	Cause		Standard value in normalcy and references for troubleshooting
	1	Malfunctioning of LS select valve or seal defective	The LS select valve is presumed to malfunction, or the seal is suspected to be defective. Check the valve and seal themselves.

H-17 In swing + travel, travel speed drops sharply

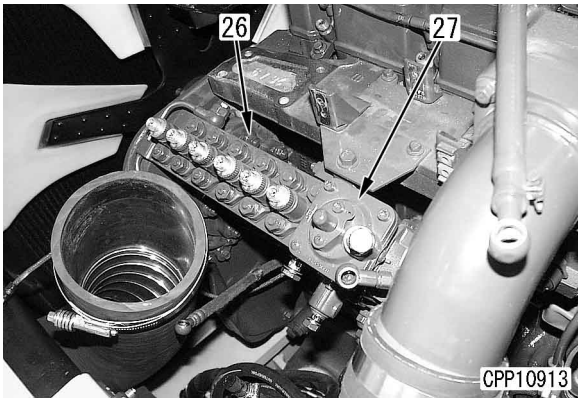
Failure information	• In a compound operation of swing + travel, the travel speed drops sharply.
Relative information	• If the travel speed is slow in the single operation of travel, carry out the H-19 check first.

Presumed cause and standard value in normalcy	Cause		Standard value in normalcy and references for troubleshooting
	1	Malfunctioning of LS shuttle valve (left travel and swing)	The LS shuttle valve in the left travel control valve or the swing control valve is presumed to malfunction. Check both of them directly.

30 DISASSEMBLY AND ASSEMBLY

3) Install the fuel injection pump assembly (27) and secure it with four nuts (26).

N•m Securing nut:
44 ± 6 Nm {4.49 ± 0.61 kgm)

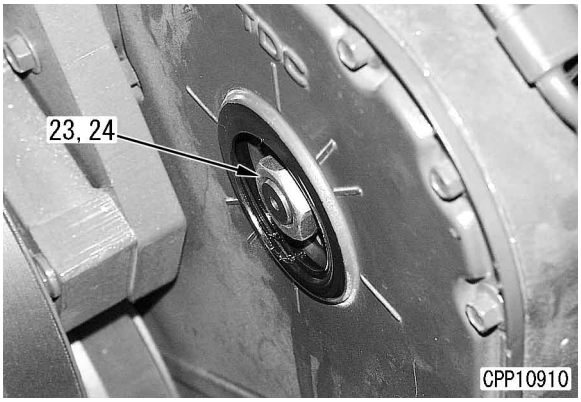


4) Install washer (24) and temporarily secure it with nut (23).

★ When installing the nut and washer, be careful not to let them fall into the case.

⚠ Tighten the nut temporarily to the following torque. Take care not to damage the timing pin.

N•m Nut:
178 ± 13 Nm {18.2 ± 1.3 kgm)



5) Disengage the fuel injector pump timing pin (on the timing gear side) from protrusion **a**, and return the pin to its original position.

- Air bleeding
  Bleed air from the fuel injection system.

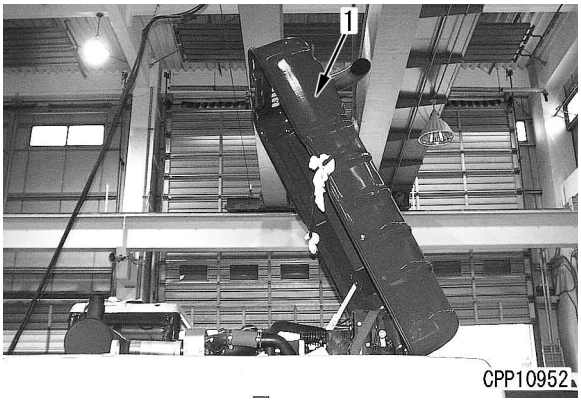
REMOVAL AND INSTALLATION OF RADIATOR ASSEMBLY

REMOVAL

1. Drain the engine coolant.

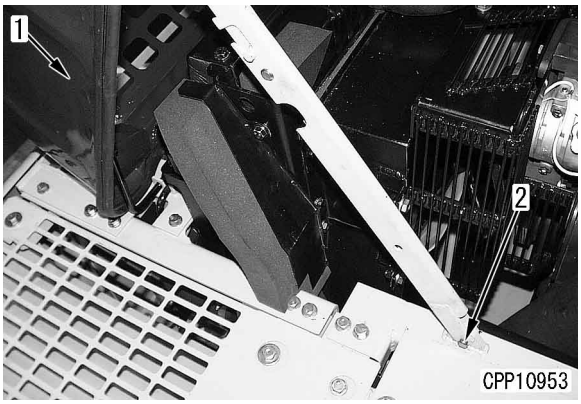
   Engine coolant: Approx. 32 **l**

2. Lift off engine hood (1) temporarily.
   - ★ Be careful not to damage the rubber seal when lifting the engine hood.
   - ★ Support the engine hood with an appropriate sling and lifting device.



3. Remove engine hood mounting bolt to remove pin (2).

4. Lift off engine hood (1).

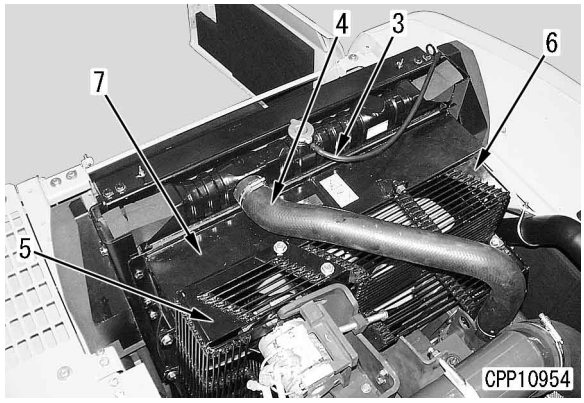


5. Disconnect reservoir tank hose (3).
   - ★ Disconnect the hose on the radiator side.

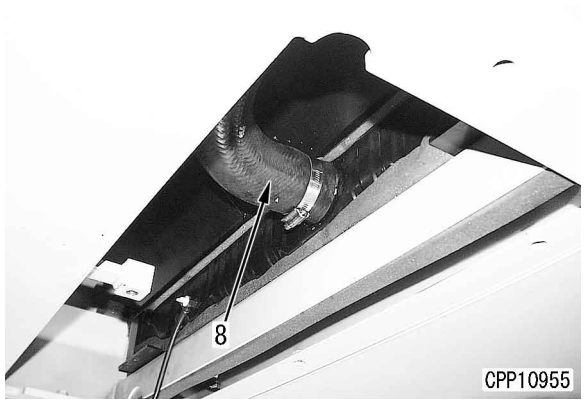
6. Disconnect radiator hose (4).

7. Remove fan guards (5) and (6).

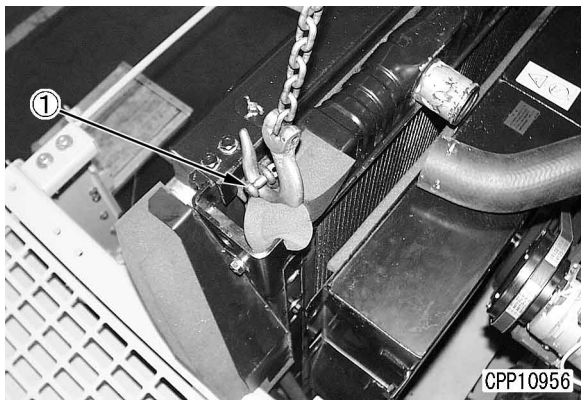
8. Remove fan cover (7).
   - ★ First remove the clamp for mounting the after-cooler hose which is tightened together and then remove the fan cover.



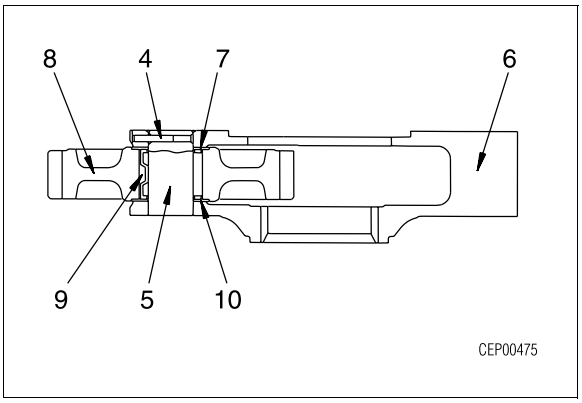
9. Disconnect radiator hose (8).



10. Lift off radiator assembly, using two slings b.

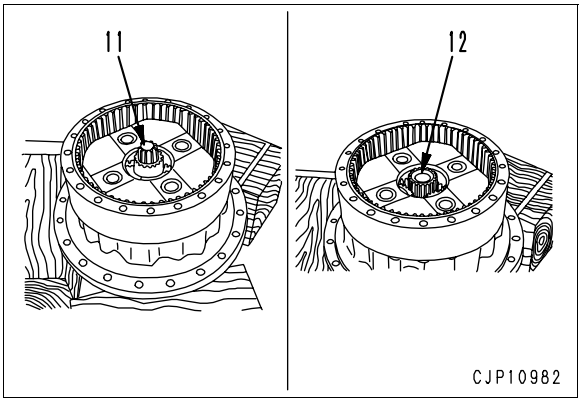


ii) Remove thrust washer (7), gear (8), bearing (9), and thrust washer (10).

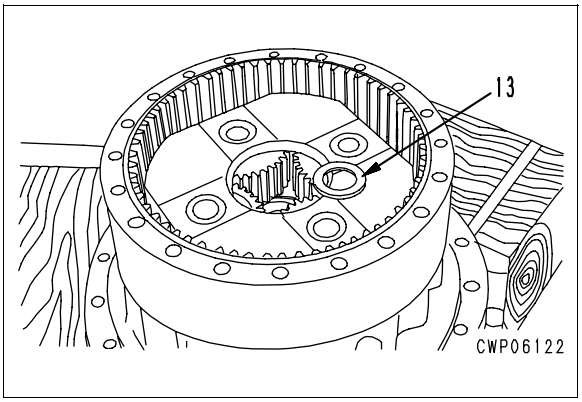


5. No. 1 sun gear shaft
Remove No. 1 sun gear shaft (11).

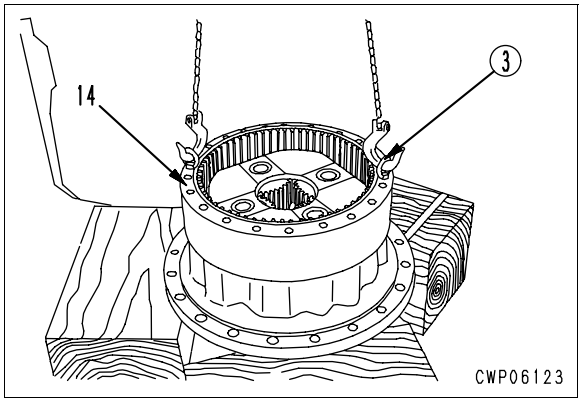
6. No. 2 sun gear
Remove No. 2 sun gear (12).



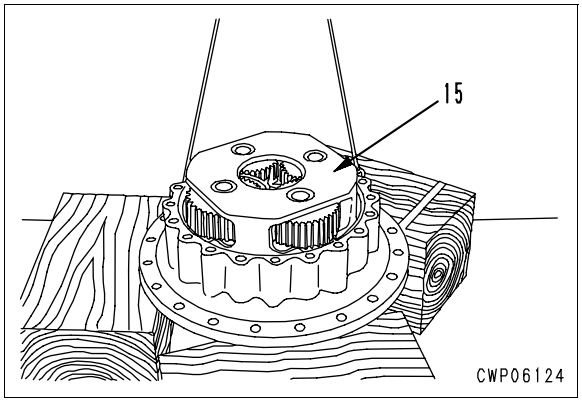
7. Thrust washer
Remove thrust washer (13).



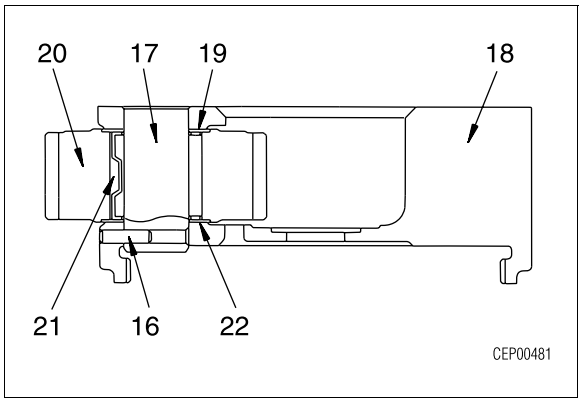
8. Ring gear
Using eyebolts d, remove ring gear (14).



9. No. 2 carrier assembly
1) Remove No. 2 carrier assembly (15)



2) Disassemble No. 2 carrier assembly as follows.
i) Push in pin (16) and pull out shaft (17) from carrier (18).
★ After removing the shaft, remove pin (16).
ii) Remove thrust washer (19), gear (20), bearing (21), and thrust washer (22).



DISASSEMBLY AND ASSEMBLY OF SWING MOTOR, SWING MACHINERY ASSEMBLY

SPECIAL TOOLS

Mark		Part No.	Part Name	Necessity	Qty	Distinction*	Sketch
E	1	796T-626-1110	Push tool	●	1		○
	2	790-101-5401	Push tool kit	■	1		
		• 790-101-5531	• Plate		1		
		• 790-101-5421	• Grip		1		
		• 01010-51240	• Bolt		1		

*Distinction between new and existing part.

DISASSEMBLY

1. Draining oil

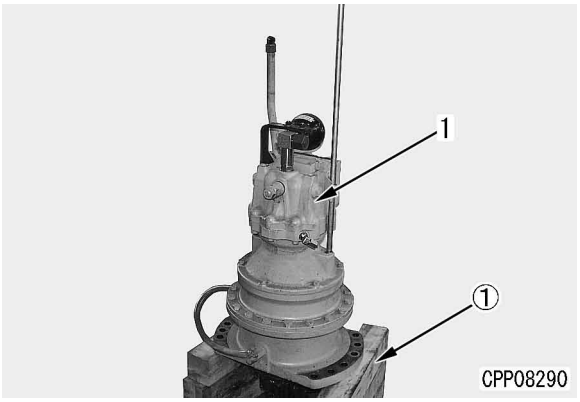
Loosen the drain plug and drain oil from the swing machinery case.

Swing machinery case: Approx. 13.4 **l**

2. Swing motor assembly

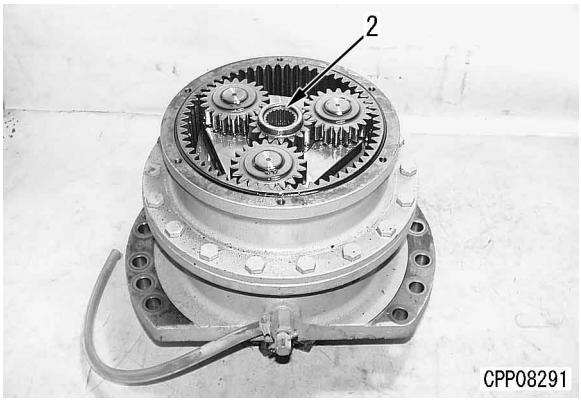
1) Place swing motor and swing machinery assembly on block b.
2) Remove the six mounting bolts to disconnect swing motor assembly (1).

kg Swing motor assembly: 70 kg



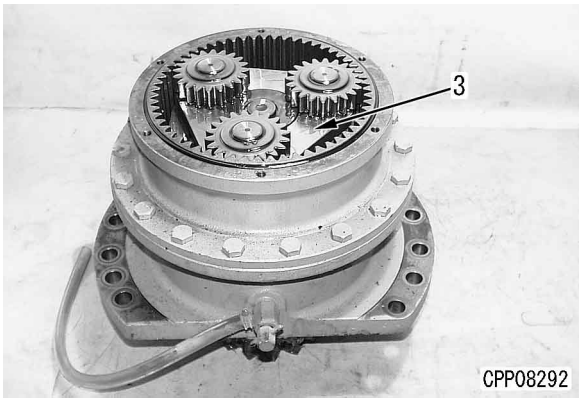
3. No. 1 Sun gear

1) Remove No. 1 sun gear (2).

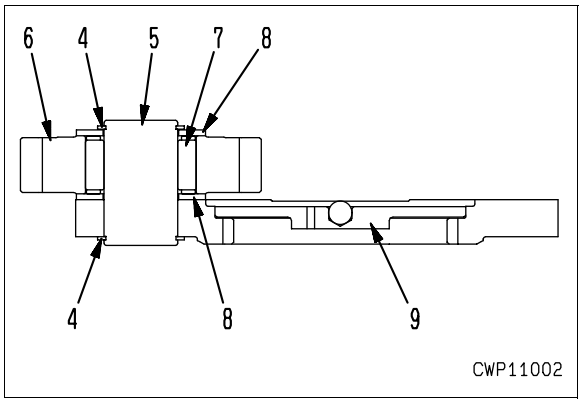


4. No. 1 carrier assembly

1) Disassemble No. 1 carrier assembly (3).



2) Disassemble the No. 1 carrier assembly in the following manner.
Remove snap ring (4) first and then remove shaft (5), gear (6), bearing (7), thrust washer (8) and plate (9).



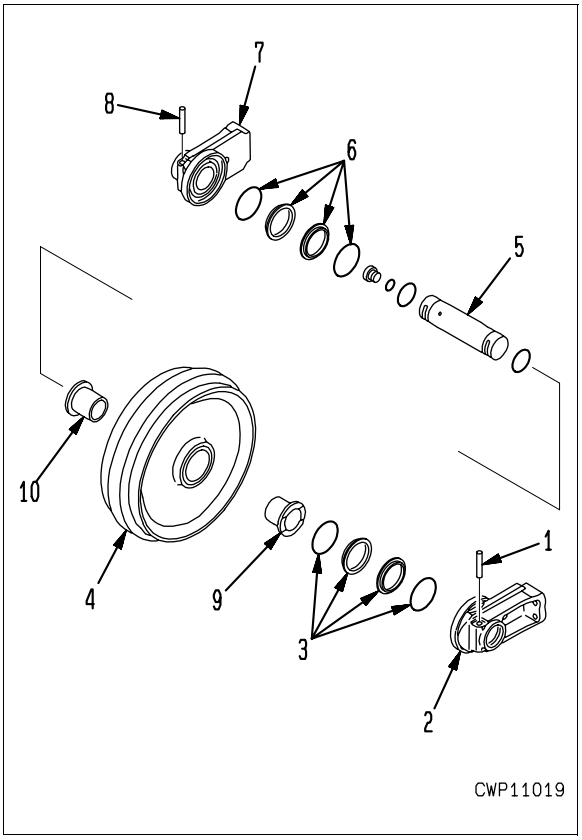
DISASSEMBLY AND ASSEMBLY OF IDLER ASSEMBLY

SPECIAL TOOLS

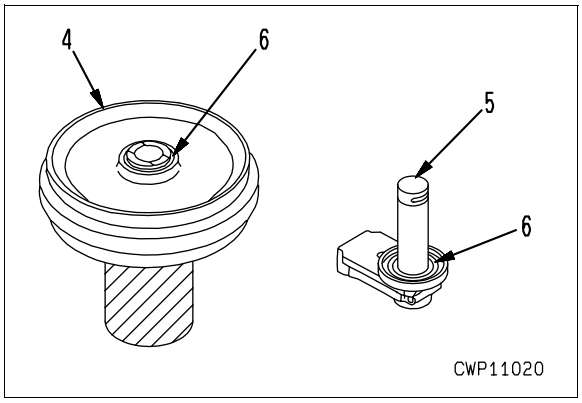
Mark	Part No.	Part Name	Necessity	Qty	Distinction*	Sketch
H	796-570-1020	Installer	■	1		
	791-601-1000	Oil pump	■	1		

*Distinction between new and existing part.

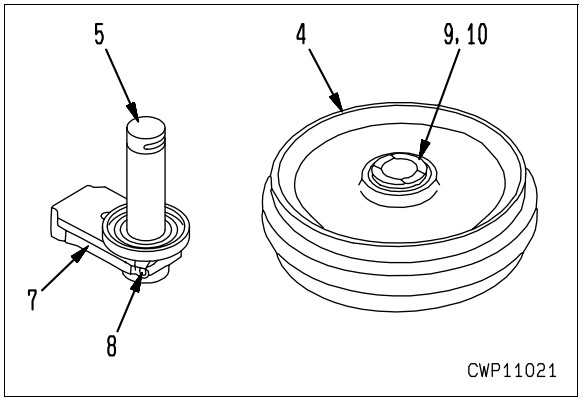
DISASSEMBLY



1. Remove dowel pin (1) and then support (2).
2. Remove floating seal (3) from support (2) and idler (4).
3. Detach idler (4) from shaft (5) and support assembly (7).
   ★ The idler contains 230 ± 10 cc of oil. Drain the oil at this stage of disassembly. Take care and spread a cloth on the floor to prevent smearing the floor with flushing oil.
4. Remove floating seal (6) on the opposite side of idler (4), shaft (5) and support assembly (7).

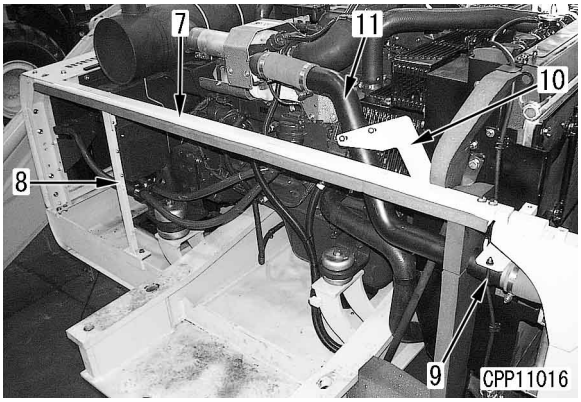


5. Remove dowel pin (8) to detach support (7) from shaft (5).
6. Remove bushings (9) and (10) from idler (4).



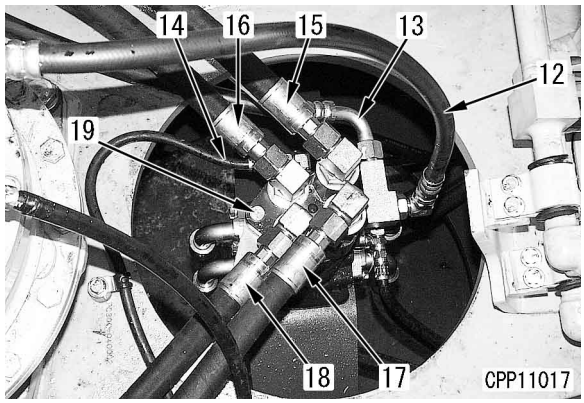
9. Remove plates (7) and (8).

10. Remove U bolt (9) and plate (10) to disconnect after-cooler tube (11).
    ★ If any other parts may interfere with the slings, remove them before lifting the assembly.



11. Disconnect seven hoses (12) through (18).
    - (12): Center swivel joint (D port) - Swing motor (T port)
    - (13): Center swivel joint (D port) - Hydraulic tank
    - (14): Center swivel joint (E port) - Solenoid valve
    - (15): Center swivel joint (B port) - Left travel control lever (B2 port)
    - (16): Center swivel joint (D port) - Right travel control lever (B5 port)
    - (17): Center swivel joint (A port) - Left travel control lever (A2 port)
    - (18): Center swivel joint (C port) - Right travel control lever (A5 port)

12. Pull out pin (19) on the side of center swivel joint and detach turning stopper plate from center swivel joint.



13. Sling revolving frame assembly (20) then remove 40 mounting bolts and lift off revolving frame asser 1

    ★ Use two lever blocks.
    ★ Leave the two mounting bolts at the front and rear and adjust the center of gravity with the lever blocks while lifting off. Remove the mounting bolts afterwards..

    ⚠ When removing the revolving frame assembly, take care so that it will not bump the center swivel joint assembly

    kg Revolving frame assembly: 7,800 kg

DISASSEMBLY AND ASSEMBLY OF CONTROL VALVE ASSEMBLY

★ This chapter deals only with precautions to be followed when disassembling and reassembling the control valve assembly.

SPECIAL TOOLS

Mark		Part No.	Part Name	Necessity	Qty	Distinction*	Sketch
M	1	796-946-1310	Guide		1		
		(For 723-46-40100 & 723-46-40601)					
		796-946-1810	Guide		1		
		(For 723-46-43100 & 723-46-43400)					
		796-946-2110	Guide		1		
		(For 723-46-44100)					
		796-946-2210	Guide		1		
		(For 723-46-45100)					
	2	796-946-1320	Guide		1		
		(For 723-46-40100 & 723-46-40601					
		796-946-1820	Guide		1		
		(For 723-46-43100 & 723-46-43400)					
		796-946-2120	Guide		1		
		(For 723-46-44100)					
		796-946-2220	Guide		1		
		(For 723-46-45100)					
	3	796-946-1330	Sleeve		1		
		(For 723-46-40100 & 723-46-40601)					
		796-946-1830	Sleeve		1		
		(For 723-46-43100 & 723-46-43400)					
		796-946-2130	Sleeve		1		
		(For 723-46-44100)					
		796-946-2230	Sleeve		1		
		(For 723-46-45100)					

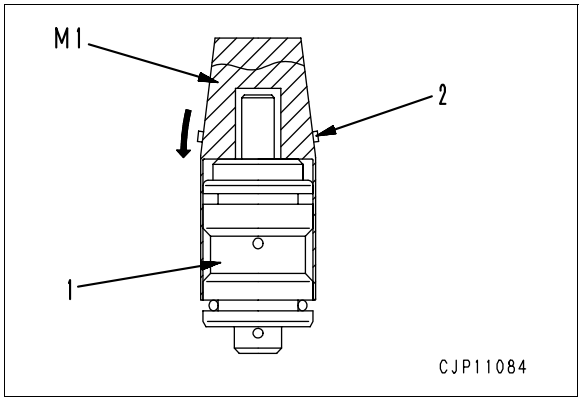
*Distinction between new and existing part.

Procedures for replacing pressure compensation valve seal

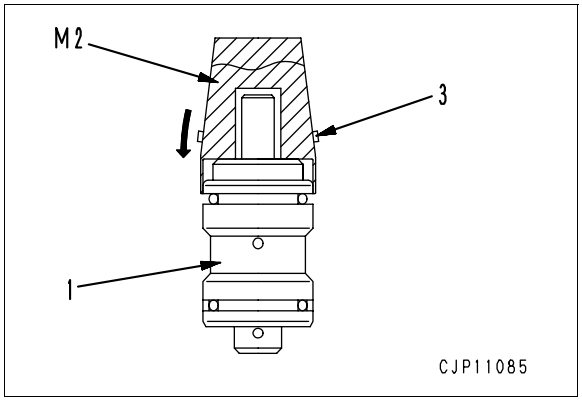
1. Remove the seal from pressure compensation valve.
   ★ Clean the pressure compensation valve thoroughly. Install the seal using a tool, as indicated in the diagram.

2. Install the O-ring onto piston (1).

3. Place tool **M1** onto piston (1) and push it in slowly by hand so that seal (2) spreads out evenly.
   ★ The seal may be also installed by pushing it down to the flat surface of the tool and then pushing it in with the tool fitted to the piston.



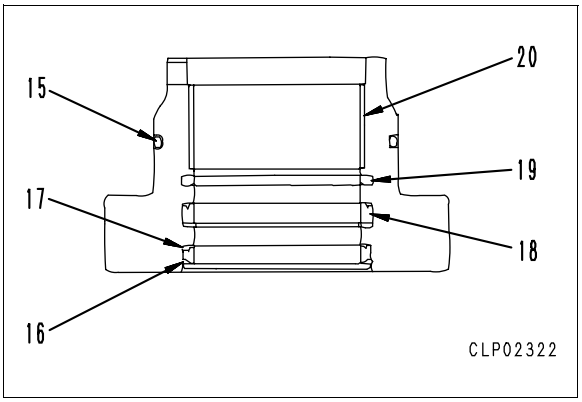
4. Likewise, set tool **M2** to piston (1) in the same direction and push it slowly by hand so that the other seal (3) may be spread out evenly.
   ★ The seal may be also fitted by pushing it down to the flat surface of the tool and then pushing it in with the tool fitted to the piston.



5. Keep compensation tool **M3** fitted to piston (1) for about one minute so that seal (2) and (3) will become well adapted.
   ★ Check that there is no protrusion or cut on the seal.

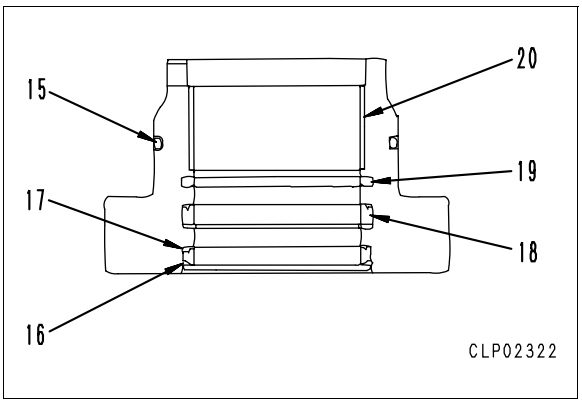
3. Disassembly of cylinder head assembly

1) Remove O-ring and backup ring (15).
2) Remove snap ring (16), then remove dust seal (17).
3) Remove rod packing (18).
4) Remove buffer ring (19).
5) Remove bushing (20).



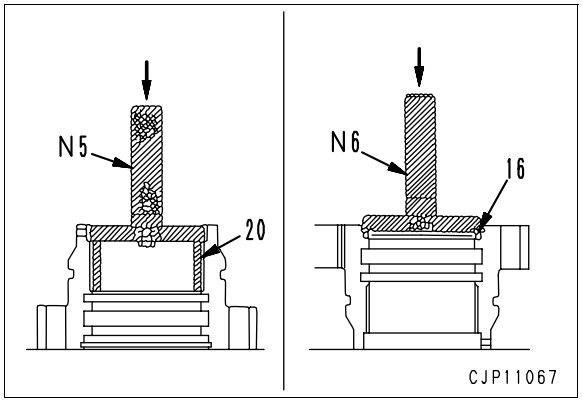
ASSEMBLY

★ Be careful not to damage the packing, dust seals, and O-rings.
★ Clean each part, then cover the piping ports and pin-inserting hole to prevent dust from entering them.
★ Do not try to force the backup ring into position. Warm it in warm water (50 - 60°C) before installing it.



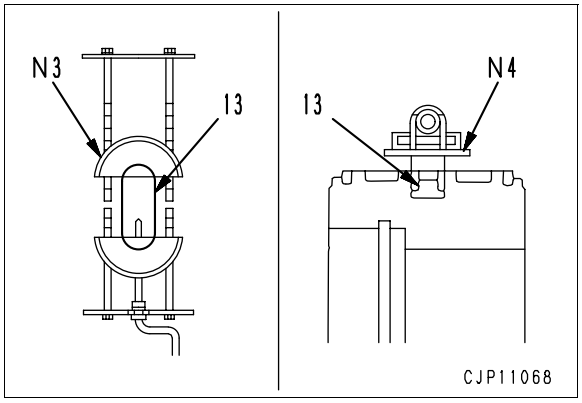
1. Assembly of head assembly

1) Using tool **N5**, press fit bushing (20).
2) Assemble buffer ring (19).
3) Assemble rod packing (18).
4) Using tool **N6**, install dust seal (17), and secure with snap ring (16).
5) Install backup ring and O-ring (15).



2. Assembly of piston assembly

1) Using tool **N3**, expand piston ring (13).
   ★ Set the piston ring on tool **N3**, and turn the handle 8 - 10 times to expand the ring.
2) Set tool **N4** in position, and compress piston ring (13).



REMOVAL AND INSTALLATION OF COUNTERWEIGHT ASSEMBLY

REMOVAL

1. Attach eyebolts b to counterweight assembly (1), and sling.
2. Remove 4 mounting bolts (2) ※1
   ★ Take note of where shims were inserted.
3. Lift off counterweight (1) horizontally with wire or chain block. ※2
   ★ Be careful not to hit the engine, radiator or cooler.

kg Counterweight assembly: 5,500 kg

INSTALLATION

- Install in reverse order of removal.

※1

Thread of counterweight mounting bolt:
Thread tightener (LT-2)

N·m Counterweight mounting bolt:
1,814.1 ± 98.1 Nm {185 ± 10 kgm}

※2

★ Installing and adjusting counterweight
   1) Adjust clearance on the upper and lower sides with shims.
   2) Install counterweight in such a way that clearance between the door and counterweight as well as clearance between the revolving frame and counterweight become 10 ± 5 mm.