SHOP MANUAL

KOMATSU

PC750-7
PC800-7

MACHINE MODEL	SERIAL NUMBER
PC750-7	**20001 and up**
PC750SE-7	**20001 and up**
PC750LC-7	**20001 and up**
PC800-7	**40001 and up**
PC800SE-7	**40001 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.
- PC750, 800-7 mounts the SAA6D140E-3 engine.
  For details of the engine, see the 6D140-3 Series Engine Shop Manual.

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FOREWORD
GENERAL

This shop manual has been prepared as an aid to improve the quality of repairs by giving the serviceman an accurate understanding of the product and by showing him the correct way to perform repairs and make judgements. Make sure you understand the contents of this manual and use it to full effect at every opportunity.

This shop manual mainly contains the necessary technical information for operations performed in a service workshop. For ease of understanding, the manual is divided into the following chapters; these chapters are further divided into the each main group of components.

STRUCTURE AND FUNCTION

This section explains the structure and function of each component. It serves not only to give an understanding of the structure, but also serves as reference material for troubleshooting.
In addition, this section may contain hydraulic circuit diagrams, electric circuit diagrams, and maintenance standards.

TESTING AND ADJUSTING

This section explains checks to be made before and after performing repairs, as well as adjustments to be made at completion of the checks and repairs.
Troubleshooting charts correlating "Problems" with "Causes" are also included in this section.

DISASSEMBLY AND ASSEMBLY

This section explains the procedures for removing, installing, disassembling and assembling each component, as well as precautions for them.

MAINTENANCE STANDARD

This section gives the judgment standards for inspection of disassembled parts.
The contents of this section may be described in STRUCTURE AND FUNCTION.

OTHERS

This section mainly gives hydraulic circuit diagrams and electric circuit diagrams.
In addition, this section may give the specifications of attachments and options together.

NOTICE

The specifications contained in this shop manual are subject to change at any time and without any advance notice. Use the specifications given in the book with the latest date.

ELECTRIC WIRE CODE

In the wiring diagrams, various colors and symbols are employed to indicate the thickness of wires.
This wire code table will help you understand WIRING DIAGRAMS.
Example: 5WB indicates a cable having a nominal number 5 and white coating with black stripe.

CLASSIFICATION BY THICKNESS

Norminal number	Copper wire			Cable O.D. (mm)	Current rating (A)	Applicable circuit
	Number of strands	Dia. of strands (mm^2)	Cross section (mm^2)			
0.85	11	0.32	0.88	2.4	12	Starting, lighting, signal etc.
2	26	0.32	2.09	3.1	20	Lighting, signal etc.
5	65	0.32	5.23	4.6	37	Charging and signal
15	84	0.45	13.36	7.0	59	Starting (Glow plug)
40	85	0.80	42.73	11.4	135	Starting
60	127	0.80	63.84	13.6	178	Starting
100	217	0.80	109.1	17.6	230	Starting

CLASSIFICATION BY COLOR AND CODE

Priority	Classification \ Circuits		Charging	Ground	Starting	Lighting	Instrument	Signal	Other
1	Primary	Code	W	B	B	R	Y	G	L
		Color	White	Black	Black	Red	Yellow	Green	Blue
2	Auxiliary	Code	WR	—	BW	RW	YR	GW	LW
		Color	White & Red	—	White & Black	Red & White	Rellow & Red	Green & White	Blue & White
3		Code	WB	—	BY	RB	YB	GR	LR
		Color	White & Black	—	Black & Yellow	Red & Black	Yellow & Black	Green & Red	Blue & Yellow
4		Code	WL	—	BR	RY	YG	GY	LY
		Color	White & Blue	—	Black & Red	Red & Yellow	Yellow & Green	Green & Yellow	Blue & Yellow
5		Code	WG	—	—	RG	YL	GB	LB
		Color	White & Green	—	—	Red & Green	Yellow & Blue	Green & Black	Blue & Black
6		Code	—	—	—	RL	YW	GL	—
		Color	—	—	—	Red & Blue	Yellow & White	Green & Blue	—

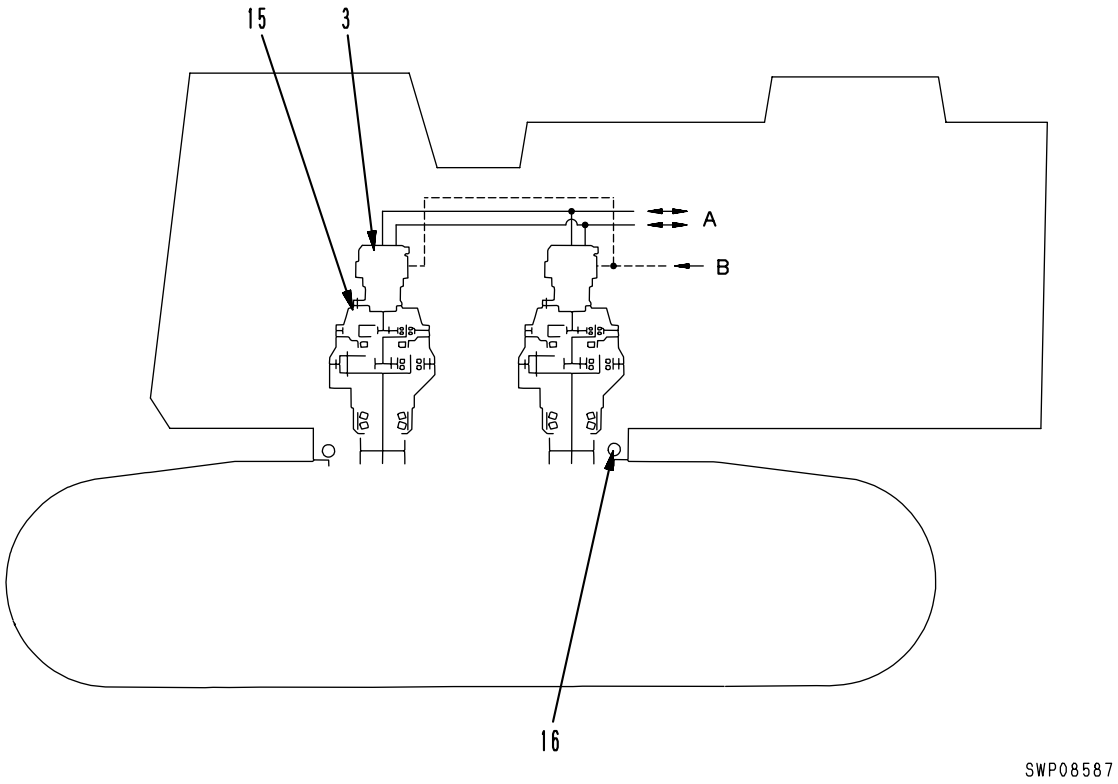
DIMENSIONS

	Item	Unit	PC750-7	PC750SE-7	PC750LC-7	PC800-7	PC800SE-7
A	Overall length	mm	14,305	13,030	14,305	13,895	13,030
B	Overall height	mm	4,660	4,615	4,660	4,850	4,615
C	Overall width	mm	4,210	4,210	4,310	4,210	4,210
D	Track shoe width	mm	710	710	810	710	710
E	Height of machine cab	mm	3,560	3,560	3,560	3,640	3,640
F	Tail swing radius	mm	4,300	4,300	4,300	4,300	4,300
G	Track overall length	mm	5,810	5,810	6,330	5,810	5,810
H	Length of track on ground	mm	4,500	4,500	5,020	4,500	4,500
	Min. ground clearance	mm	840	840	840	840	840

WORKING RANGES

	Working range	Unit	PC750-7	PC750SE-7	PC750LC-7	PC800-7	PC800SE-7
A	Max. digging reach	mm	13,740	12,265	13,740	13,660	12,265
B	Max. digging depth	mm	8,600	7,130	8,600	8,445	7,130
C	Max. digging height	mm	11,840	11,330	11,840	11,955	11,330
D	Max. vertical wall depth	mm	5,575	4,080	5,575	5,230	4,080
E	Max. dumping height	mm	8,145	7,525	8,145	8,235	7,525
F	Max. reach at ground level	mm	13,460	11,945	13,460	13,400	11,945

Machine model				PC750-7			
Serial Number				20001 and up			
Engine		Model		SAA6D140E-3			
		Type		4-cycle, water-cooled, in-line, vertical, direct injection, with turbocharger and aftercooler (air cooled)			
		No. of cylinders – bore × stroke	mm	6 – 140 × 165			
		Piston displacement	ℓ {cc}	15.24 {15,240}			
	Performance	Flywheel horsepower	kW/rpm {HP/rpm}	338/1,800 {460/1,800}			
		Max. torque	Nm/rpm {kgm/rpm}	2,138/1,350 {218/1,350}			
		High idle	rpm	1,980			
		Low idle	rpm	825			
		Min. fuel consumption	g/kWh {g/HPh}	196 {144}			
		Starting motor		24 V, 11 kW			
		Alternator		24 V, 50 A			
		Battery		12 V, 170 Ah × 2			
		Radiator core type		CWX-4			
Undercarriage		Carrier roller		3 on each side			
		Track roller		8 on each side			
		Track shoe		Assembly-type double grouser, 47 on each side			
Hydraulic system	Hydraulic pump	Type		Variable displacement piston type: HPV95+95, HPV95+95, gear type: SAR80+8			
		Delivery	ℓ /min	Piston type: 490+490, gear type: 136+16			
		Set pressure	MPa {kg/cm^2}	Piston type: 31.4 {320}, gear type: 2.9 {30}			
	Control valve	Type × No.		4-spool + 5-spool type × 1			
		Control method		Hydraulic			
	Hydraulic motor	Travel motor		Piston type (with brake valve, shaft brake): × 2 (MSF-340VP)			
		Swing motor		Piston type (with safety valve, shaft brake): × 2 (KMF125AB-5)			
	Hydraulic cylinder			Boom	Arm	Bucket	Bottom dump
		Cylinder type		Double-acting piston			
		Inside diameter of cylinder	mm	200	225	185	140
		Outside diameter of piston rod	mm	140	160	130	90
		Stroke	mm	1,490	1,530	1,550	335
		Max. distance between pins	mm	4,340	4,130	4,275	1,235
		Min. distance between pins	mm	2,850	2,600	2,725	900
		Hydraulic tank		Box-shaped, sealed with breather			
		Hydraulic filter		Tank return side			
		Hydraulic cooler		Air cooled (J4)			



1. Idler
2. Center swivel joint
3. Swing motor (KMF125AB-5)
4. L.H. 5-spool control valve
5. R.H. 4-spool control valve
6. Final drive, sprocket
7. Travel motor
8. Engine
9. PTO
10. No. 1 pump (HPV95 + 95)
11. No. 2 pump (HPV95 + 95)
12. Control, PTO lubricating pump
13. Swing brake solenoid valve
14. Travel speed solenoid valve
15. Swing machinery
16. Swing circle

A. L.H. 5-spool control valve
B. Swing brake solenoid valve

Standard shoe

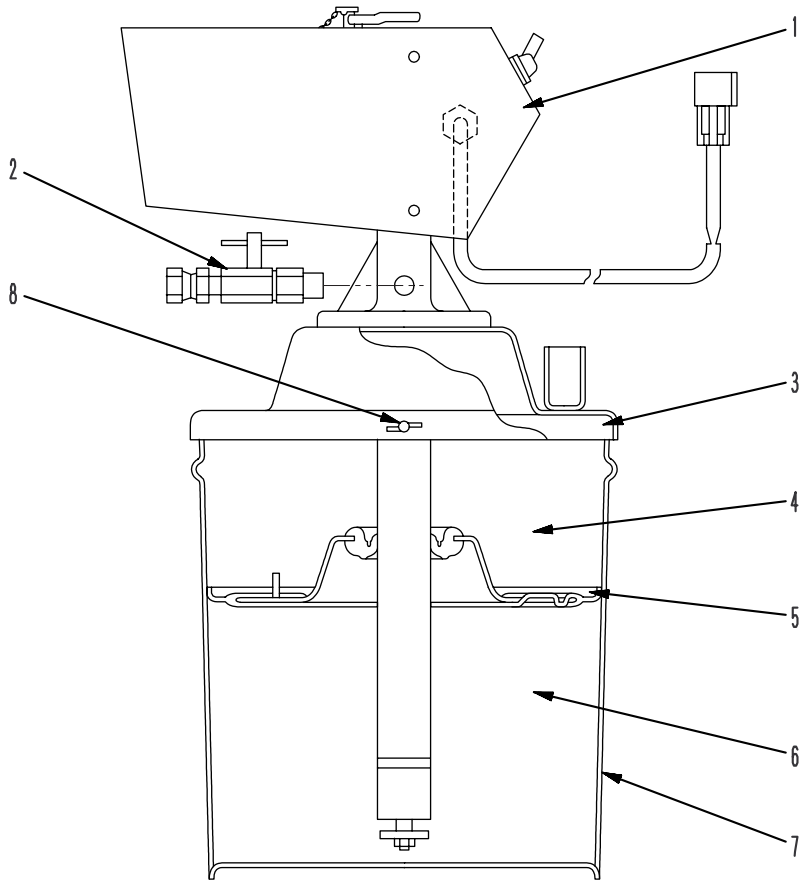
Unit: mm

Item \ Model	PC750-7	PC750SE-7	PC750LC-7	PC800-7	PC800SE-7
Shoe width (double shoe)	710	710	810	710	710
Link pitch	260.6	260.6	260.6	260.6	260.6
No. of shoes (each side)	47	47	51	47	47

Unit: mm

No.	Check item	Criteria					Remedy
10	Top-to-bottom width of idler guide		Standard size	Tolerance	Repair limit		Rebuild or replace
		Track frame	185	185 $^{+3}_{-2}$	190		
		Idler support	180	185±0.5	175		Replace
11	Left-to-right width of idler guide	Track frame	345	345 $^{+3}_{-2}$	355		Rebuild or replace
		Idler support	340	—	332		Replace
12	Recoil spring	Standard size			Repair limit		
		Free length × OD	Installation length	Installation load	Free length	Installation load	
		1,553 × 308	1,290	489.8 kN {49,986 kg}	—	392 kN {40,000 kg}	

MOTOR GREASE PUMP

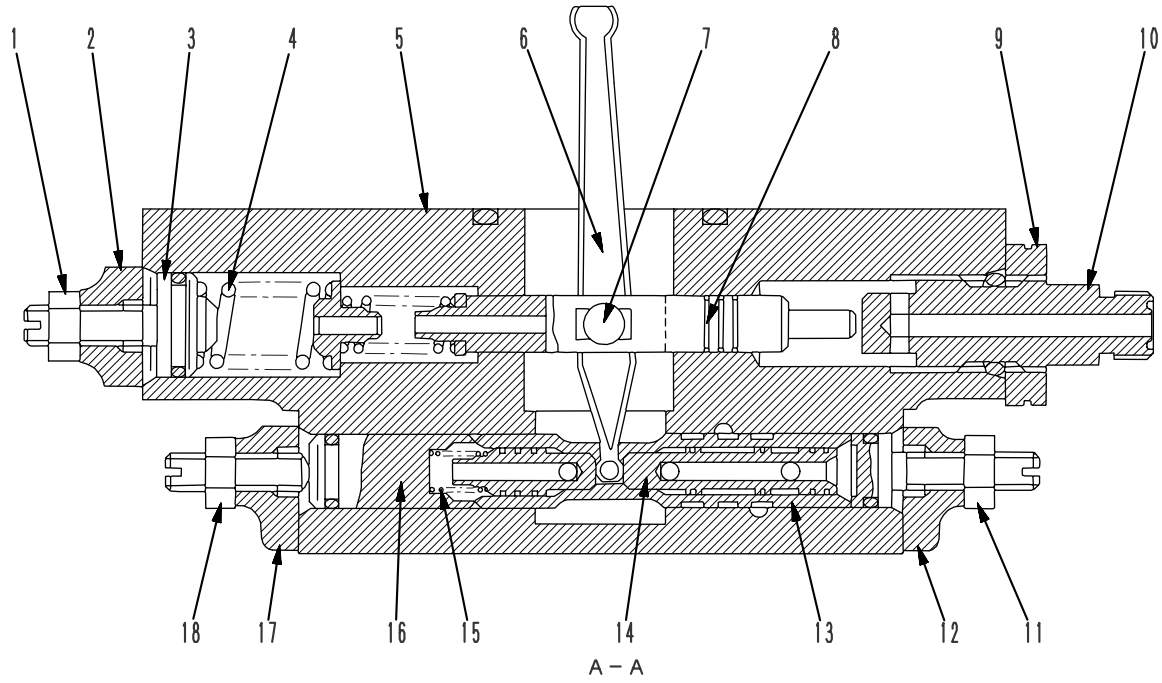


SWP08596

1. Motor grease pump unit
2. Valve
3. Cover
4. Air chamber
5. Follower plate
6. Grease chamber
7. Grease tank
8. Wing nut

Function

- The pump unit is divided into air chamber (4) and grease chamber (6). As the grease level in grease chamber (6) lowers, follower plate (5) is pulled down to push down the grease sticking to the rim of grease chamber (6).



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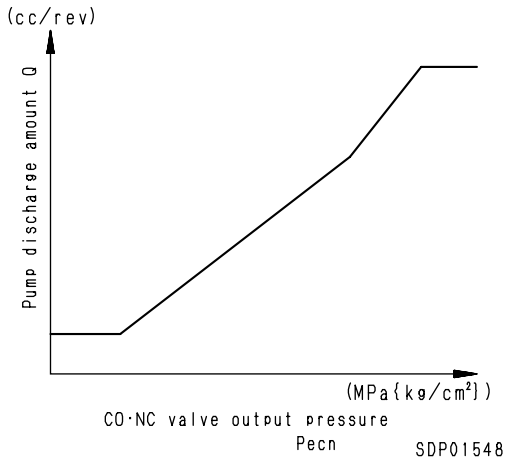
1. Locknut
2. Cover
3. Plug
4. Spring
5. Valve body
6. Arm
7. Pin
8. Control piston
9. Locknut
10. Plug
11. Locknut
12. Cover
13. Sleeve
14. Guide spool
15. Spring
16. Plug
17. Cover
18. Locknut

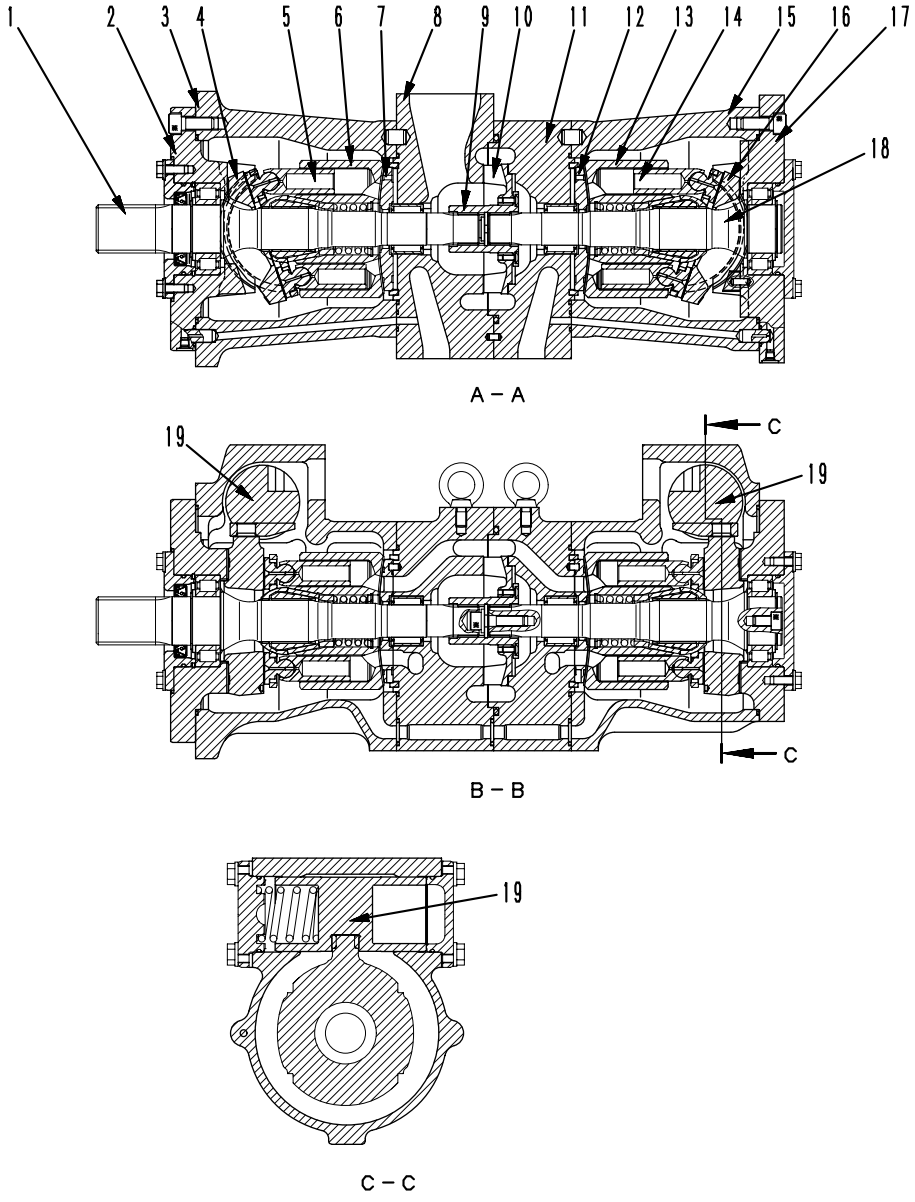
Function

Discharge amounts **Q1** and **Q2** of main pumps **PA1** and **PA2** are controlled individually by the respective servo valves. The relationship between pump discharge amount **Q** and input signal **Pecn** to the servo valve is as shown in the graph on the right. **Q** varies in proportion to **Pecn**.

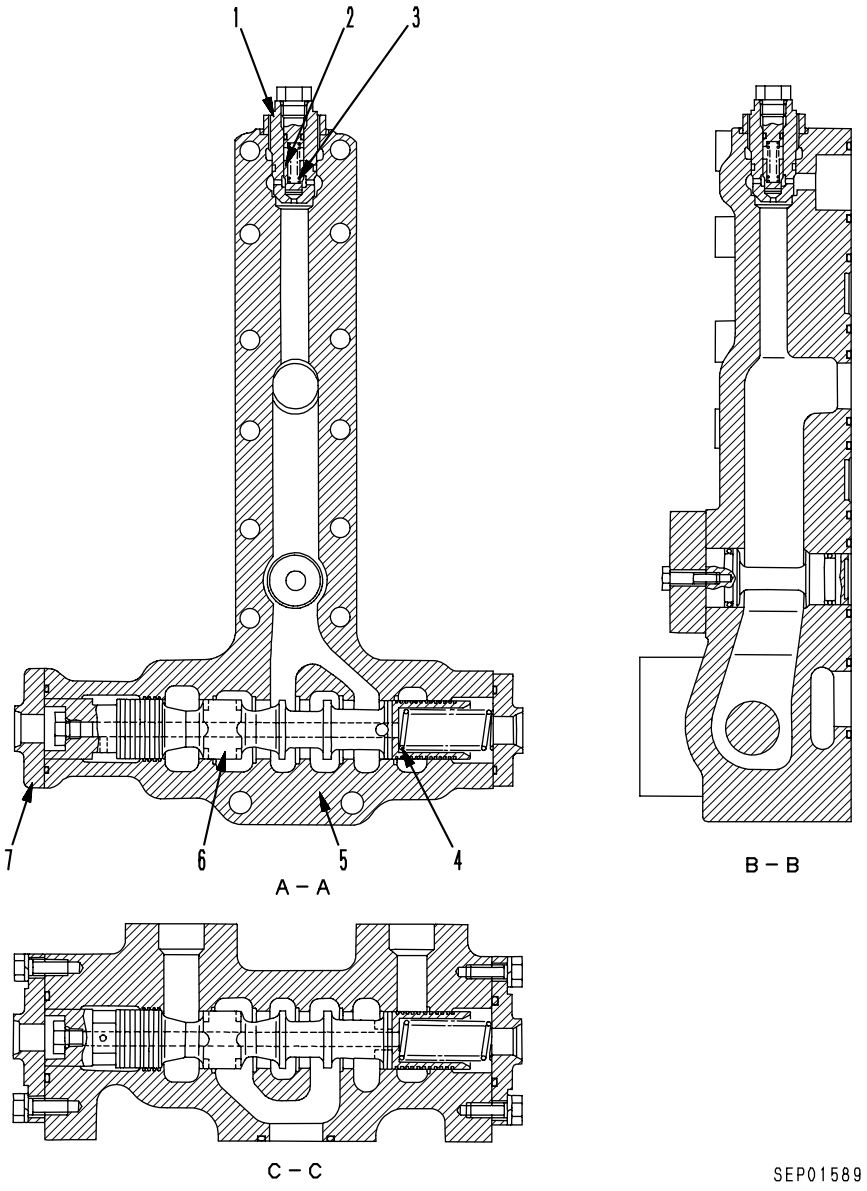


CO valve	NC valve
1. Plug	7. Plug
2. Piston	8. Sleeve
3. Spring	9. Piston
4. Spool	10. Spool
5. Piston	11. Spring
6. Plug	12. Plug

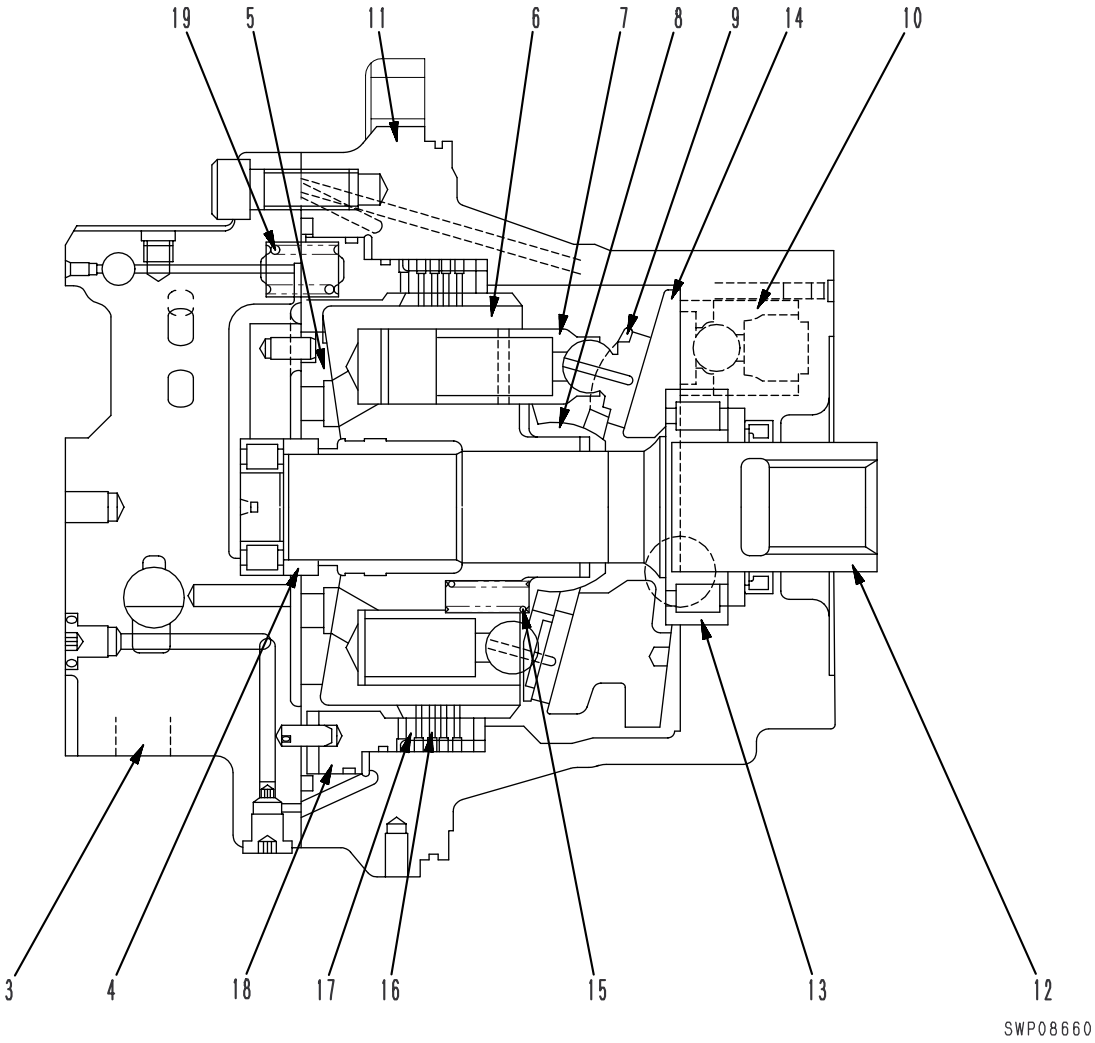
PA1 : Main pump pressure IN port
Pe1 : TVC valve output pressure front, rear interconnection port
Pc : CO selector port
Pd : Jet sensor downstream pressure IN port
Pt : Jet sensor upstream pressure IN port
Pdr2 : CO, NC valve drain OUT port
Pecn : CO, NC valve output pressure OUT port



1. Front shaft
2. Front cradle
3. Front case
4. Rocker cam
5. Piston
6. Cylinder block
7. Valve plate
8. Front end cap
9. Coupling
10. Impeller
11. Rear end cap
12. Valve plate
13. Cylinder block
14. Piston
15. Rear case
16. Rocker cam
17. Rear cradle
18. Rear shaft
19. Servo piston

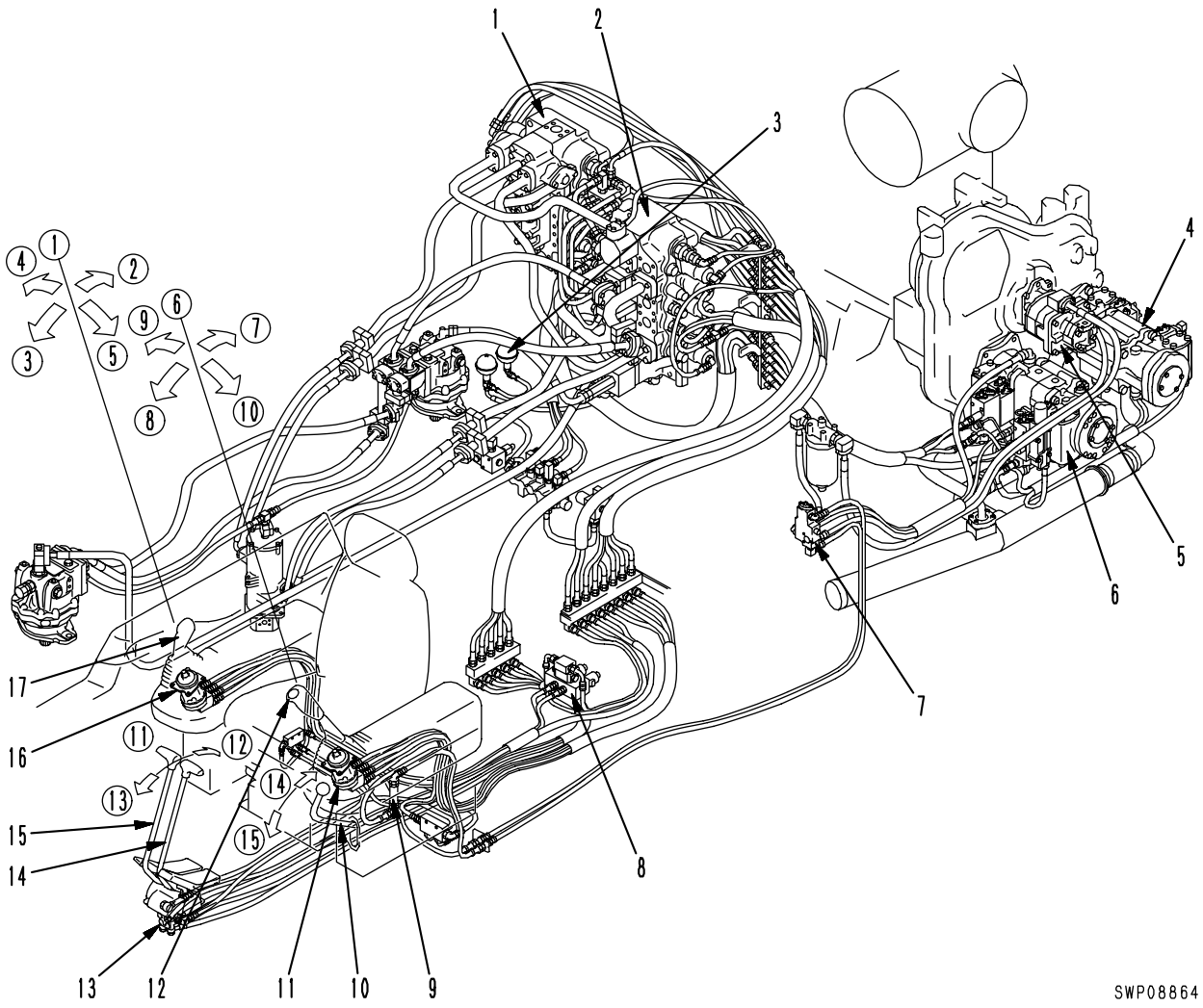


1. Orifice
2. Check valve
3. Spring
4. Spool return spring
5. Body
6. Spool
7. Cover



3. Rear cover
4. Collar
5. Valve plate
6. Cylinder block assembly
7. Piston assembly
8. Holder
9. Retainer
10. Piston assembly
11. Case
12. Shaft
13. Bearing collar
14. Rocker cam
15. Preload spring
16. Disc
17. Plate
18. Brake piston
19. Spring

VALVE CONTROL



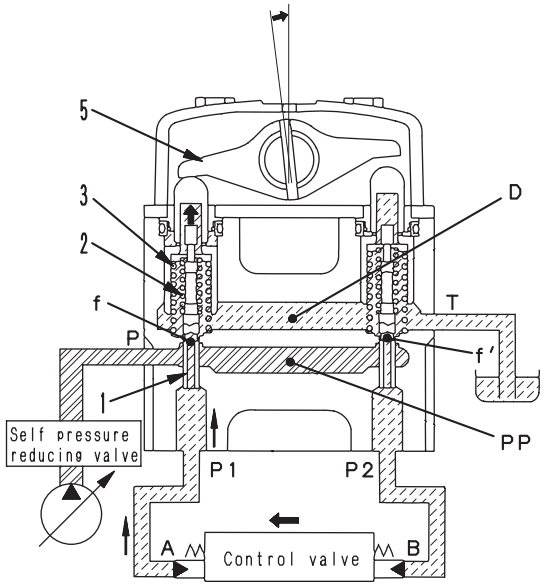
1. R.H. 4-spool control valve
2. L.H. 5-spool control valve
3. Accumulator
4. No. 1 pump
5. Control pump
6. No. 2 pump
7. PPC control relief valve
8. Shockless boom valve
9. Lock valve
10. Lock lever
11. Left PPC valve
12. Left work equipment lever
13. Travel PPC valve
14. L.H. travel lever
15. R.H. travel lever
16. Right PPC valve
17. Right work equipment lever

Lever positions

[1] HOLD
[2] Boom RAISE
[3] Boom LOWER
[4] Bucket DUMP
[5] Bucket CURL
[6] HOLD
[7] Arm IN
[8] Arm OUT
[9] Swing right
[10] Swing left
[11] Neutral
[12] Travel REVERSE
[13] Travel FORWARD
[14] LOCK
[15] FREE

3. Fine control (control lever returned)

- When disc (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 enters chamber **B** to fill the chamber with oil. (Fig. 3)



(Fig. 3)

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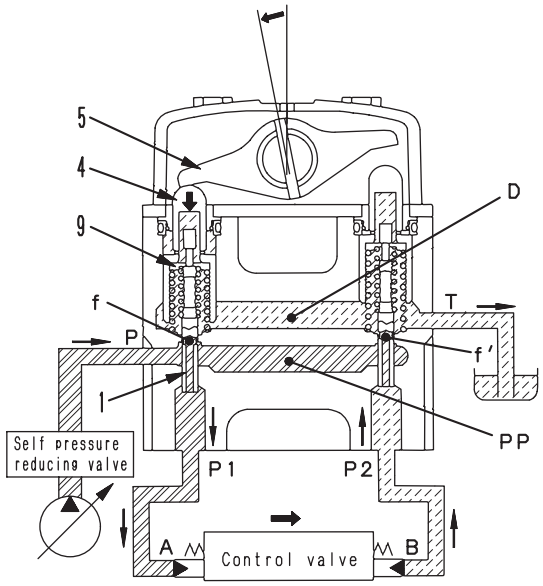
4. At full stroke

- Disc (5) pushes down piston (4), and retainer (9) pushes down 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 chamber **B** passes from port **P2** through fine control hole **f'** and flows to drain chamber **D**. (Fig. 4)



(Fig. 4)

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Unit: mm

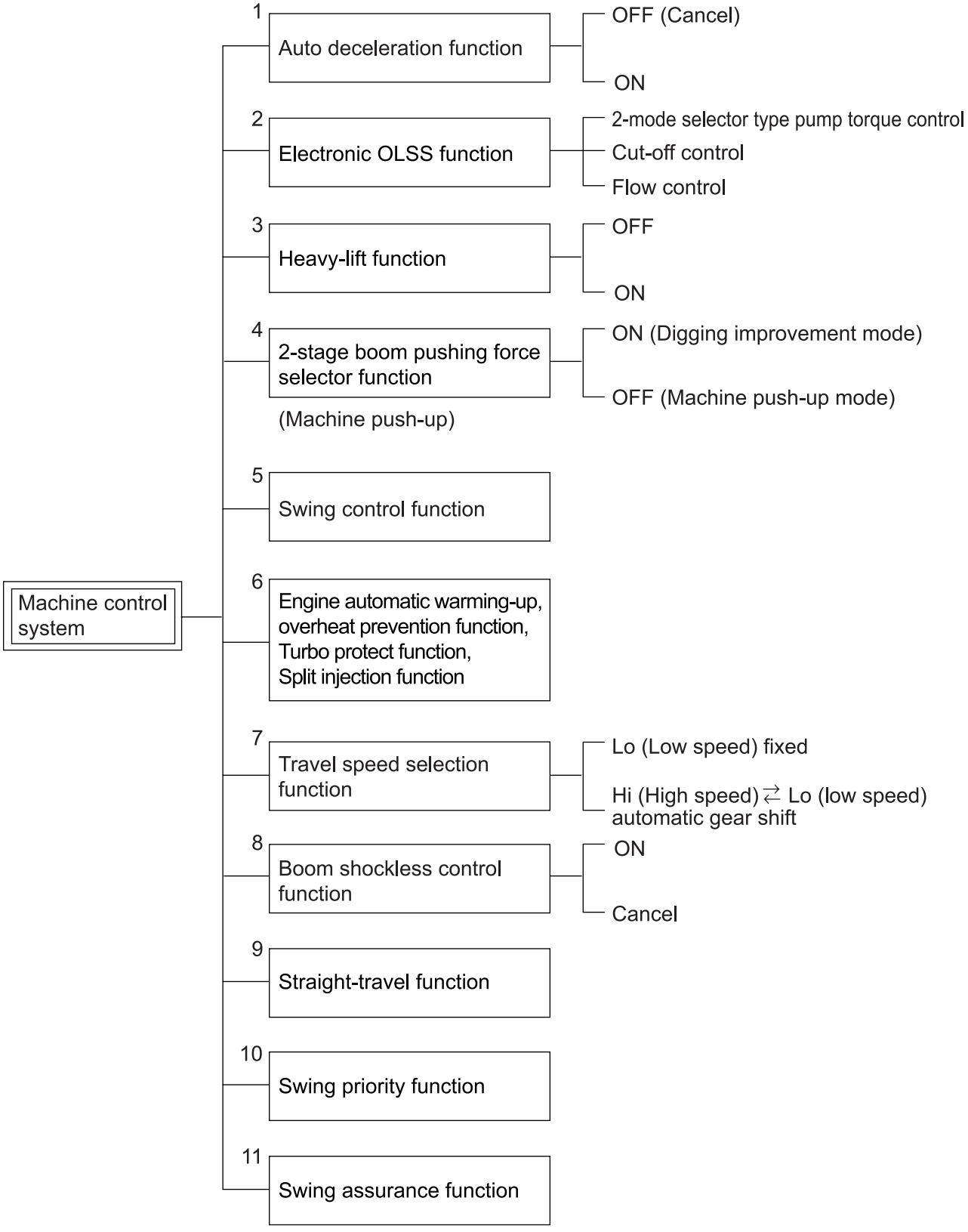
No.	Check item		Criteria					Remedy
		Name of cylinder	Standard size	Tolerance		Standard clearance	Clearance limit	
				Shaft	Hole			
1	Clearance between piston rod and bushing	Boom	140	–0.043 –0.106	+0.256 +0.039	0.082 – 0.362	0.062	Replace bushing
		Arm	120	–0.036 –0.090	+0.263 +0.048	0.084 – 0.353	0.062	
		Bucket	160	–0.043 –0.106	+0.256 +0.039	0.082 – 0.362	0.062	
2	Clearance between piston rod support shaft and bushing	Boom	115	–0.036 –0.090	+0.025 0	0.036 – 0.115	1.5	Replace pin, bushing
		Arm	110	–0.036 –0.090	+0.457 +0.370	0.406 – 0.547	1.5	
		Bucket	140	–0.043 –0.106	+0.025 0	0.043 – 0.131	1.5	
3	Clearance between cylinder bottom support shaft and bushing	Boom	130	–0.043 –0.106	+0.025 0	0.043 – 0.131	1.5	
		Arm	110	–0.036 –0.090	+0.457 +0.370	0.406 – 0.547	1.5	
		Bucket	140	–0.043 –0.106	+0.025 0	0.043 – 0.131	1.5	

Unit: mm

No.	Model	PC750-7			PC800-7	PC750SE-7 PC800SE-7	PC800SE-7
		with 3.6 m arm	with 4.6 m arm	with 5.6 m arm	with 3.6 m heavy-duty arm	with 2.9 m short arm	with 3.6 m arm
1		ø115	ø115	ø115	ø110	ø110	ø110
2		100	100	100	129	129	129
3		531	531	531	531	531	531
4		ø140	ø140	ø140	ø140	ø140	ø140
5		580	620	639	663	750	663
6		397	467	530	329	401	329
7		1,332	1,389	1,328	925	916	925
8		3,578	4,569	5,575	3,585	2,917	3,585
9		3,675	3,688	3,673	4,011	3,580	4,011
10		585	570	585	585	500	585
11		950	950	950	1,035	840	1,035
12		740	740	740	865	640	865
13		756	756	756	765	670	765
14		2,237	2,237	2,237	2,237	2,233	2,237
15		ø115	ø115	ø115	ø115	ø115	ø115
16		519	519	519	519	519	519
17		ø130	ø130	ø130	ø130	ø130	ø130
18	Arm as one part	519	519	519	519	519	519
	When press-fitting bushing	535	535	535	535	535	535
19	Min.	2,380	2,380	2,380	2,590	2,490	2,590
	Max.	3,990	3,990	3,990	4,410	3,910	4,410

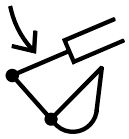
MACHINE CONTROL SYSTEM

CONTROL FUNCTIONS



Operation

- This function acts to change the set pressure of the safety valve at the boom cylinder end of the R.H. 4-spool control valve boom Lo in 2 ways: to low pressure (14.7 MPa {150 kg/cm^2}) and high pressure (33.3 MPa {340 kg/cm^2}.

Mode	Machine push-up switch	Machine push-up solenoid valve	Safety valve set pressure	Effect
Boom pushing force (low mode)	 NDP00178	Energized	14.7 MPa {150 kg/cm^2}	By reducing the boom pushing force, it is made easier for the boom to escape automatically in the RAISE direction and to reduce the number of times that the boom is operated. At the same time it also makes the digging operation smoother.
Boom pushing force (high mode)	 NDP00179	De-energized	33.3 MPa {340 kg/cm^2}	By increasing the thrust force for boom LOWER, the ease of operation is improved for excavation, digging square holes, carrying out twist turns, or escaping from soft ground.

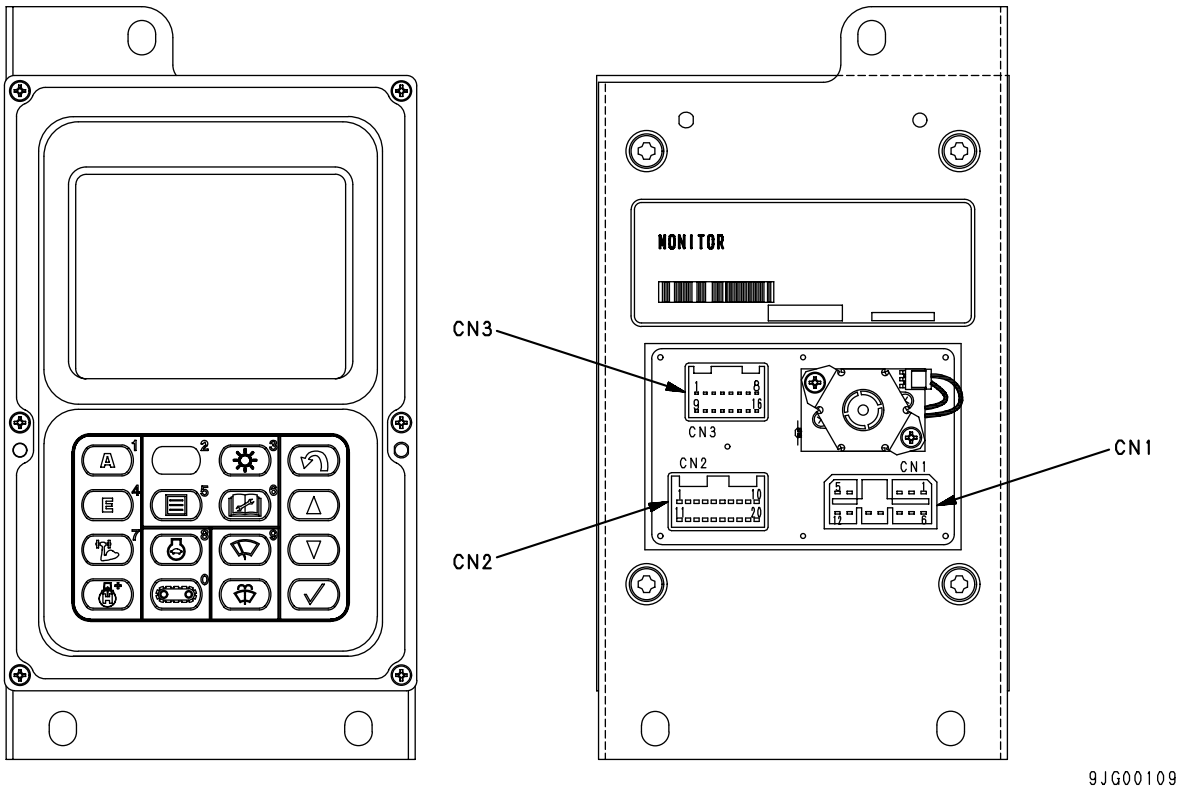
★ Machine push-up solenoid valve
For details of the structure and function, see SOLENOID VALVE.

★ Boom safety valve
For details of the structure and function, see R.H. 4-SPOOL CONTROL VALVE.

Operation

Left and right travel levers	Work equipment control lever, swing lever	Straight-travel solenoid valve	Straight-travel valve	Remarks
Operation	Neutral	De-energized	Not actuated	Left and right travel motor circuits independent
	Operated	Energized	Actuated	Left and right travel motor circuits assist

1. Monitor panel



Outline

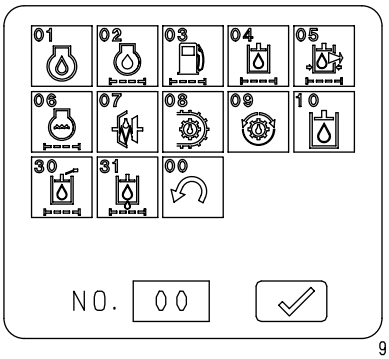
- The monitor panel has the functions to display various items and the functions to select modes and electric parts.
  The monitor panel has a CPU (Central Processing Unit) in it to process, display, and output the information.
  The monitor display unit consists of LCD (Liquid Crystal Display). The switches are flat sheet switches.

METHOD OF CHECKING STATUS

MAINTENANCE ITEMS

★ Operate as follows when on the operator screen.

1. Press maintenance switch (1) and switch to the maintenance list display screen.
   ★ The maintencance items are displayed as symbols on the screen.
2. Press control switch (2), or use the 10-key pad to input the number (01 – 10, 30, 31) of the maintenance item to select the item.
   ★ The cursor moves and the item is highlighted.
   ★ The display method is the same as described on the previous page (relationship between remaining time and caution display). If the remaining time is less than 30 hours, the item is displayed in yellow, and if it is less than 0 hours, it is displayed in red.



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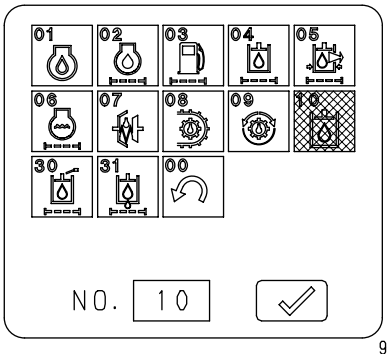

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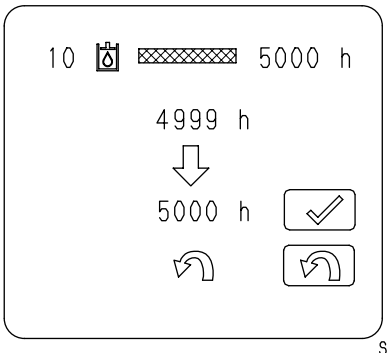
MAINTENANCE OPERATION

1. After completing the selection, press input confirmation switch (3).
   The screen will change to the maintenance reset screen.
2. Use the maintenance reset screen to check the content, and if there is any problem, press input confirmation switch (3) to move to the check screen.
   If the wrong item is selected, press return switch (4) to return to the maintenance list screen.
3. Check the content on the check screen, and if there is no problem, press input confirmation switch (3) to reset the maintenance time.
   After the reset is completed, the screen returns to the maintenance list display screen. To check the remaining time, or if the wrong item is selected, press return switch (4) to return to the maintenance list screen.
   ★ The check screen shows the symbol for the maintenance item and the set time in large letters.
   ★ The background color of the symbol for the item where the maintenance item was reset is the same as the background of the screen, so it is possible to check that it has been reset.



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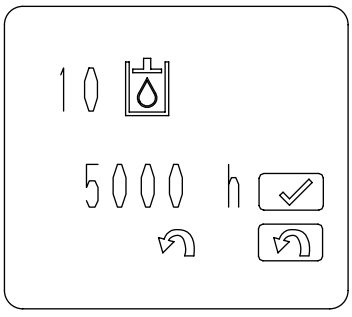


9JH02385

STANDARD VALUE TABLE FOR CHASSIS

Applicable model					PC750, SE, LC-7 PC800, SE-7	
Cate-gory	Item	Measurement conditions		Unit	Standard value for new machine	Service limit value
Engine speed	All pumps at relief	• Engine coolant temperature: Within operating range • Hydraulic oil temperature: Within operating range • Engine at high idle • Working mode: A • Boom up relief		rpm	Min. 1,700	Min. 1,700
	Heavy lift ON + All pumps at relief	• Engine coolant temperature: Within operating range • Hydraulic oil temperature: Within operating range • Engine at high idle • Working mode: A & heavy lift • Boom up relief			Min. 1,700	Min. 1,700
	High idle-cut ON	• Engine at high idle • Auto-deceleration switch OFF • All control levers at neutral			1,880 ± 100	1,880 ± 100
	Auto-deceleration actuated	• Engine at high idle • Auto-deceleration switch ON • All control levers at neutral			1,400 ± 100	1,400 ± 100
Spool stroke	Boom Lo control valve	• Stroke of each side		mm	16 ± 0.5	16 ± 0.5
	Boom Hi control valve					
	Arm Lo control valve					
	Arm Hi control valve					
	Bucket Lo control valve					
	Bucket Hi control valve					
	Swing control valve					
	Travel control valve					
Travel of control levers	Boom control lever	• Center of lever knob • Read max. value to end of travel (Exclude play at neutral.) • Engine stopped	N → Raise, Lower		85 ± 10	85 ± 10
	Arm control lever		N → In, Out		85 ± 10	85 ± 10
	Bucket control lever		N → Curl, Dump		85 ± 10	85 ± 10
	Swing control lever		N → R.H., L.H.		85 ± 10	85 ± 10
	Travel control lever		N → F, R (L.H., R.H.)		115 ± 12	115 ± 12
	Play of control levers		Work equipment, swing, travel		Max. 10	Max. 15

TESTING AND ADJUSTING

MEASURING BLOW-BY PRESSURE

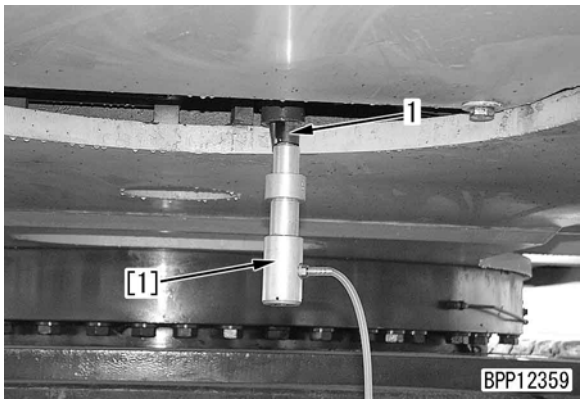
★ Measuring instruments for blow-by pressure

Symbol	Part No.	Part Name
F	799-201-1504	Blow-by checker

★ Measure the blow-by pressure under the following conditions.
- Coolant temperature: Within operating range
- Hydraulic oil temperature: Within operating range

1. Install the nozzle of blow-by checker **F** to blow-by hose (1).

2. Connect the nozzle [1] and gauge [2] with the hose.



3. Start the engine and set the working mode switch to the A-mode position.

4. Run the engine at high idle, relieve the arm circuit by moving the arm IN, and measure the brake oil pressure.

5. After finishing measurement, remove the measuring instruments and return the removed parts.

INSPECTION OF LEAKAGE FROM FUEL SYSTEM

⚠ Since very high pressures are generated in the high pressure fuel circuit, there is a danger of getting fire if fuel leaks while the engine is running.

After inspecting the fuel circuit or mounting or removing equipment to or from the fuel circuit, execute the following procedures to check if fuel is leaking.

★ Clean and degrease the engine body and the area around before inspection so that fuel leakage can be checked easily.

1. Spray color checker (developer) to the connections of the fuel supply pump, the common rail, the fuel injector and the high pressure pipe.

2. Start the engine, keep the speed below 1,000 rpm and stop the engine when the rotation became stable.

3. Check if fuel is leaking from the fuel pipe and equipment.
   - ★ Check if fuel is leaking from the high pressure circuit, mainly from the area where color checker was sprayed.
   - ★ When finding fuel leakage, repair the relevant portions. Then, repeat the procedures from Step 2 to check that there is no leakage from the relevant portions.

4. Start the engine and keep low idle.

5. Check if fuel is leaking from the fuel pipe and equipment.
   - ★ Check if fuel is leaking from the high pressure circuit, mainly from the area where color checker was sprayed.
   - ★ When finding fuel leakage, repair the relevant portions. Then, repeat the procedures from Step 2 to check that there is no leakage from the relevant portions.

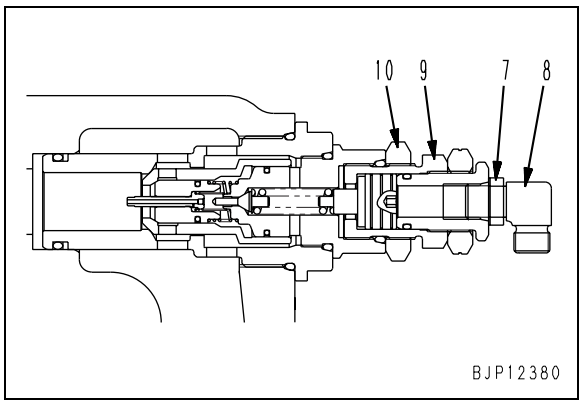
6. Start the engine and keep high idle.

7. Check if fuel is leaking from the fuel pipe and equipment.
   - ★ Check if fuel is leaking from the high pressure circuit, mainly from the area where color checker was sprayed.
   - ★ When finding fuel leakage, repair the relevant portions. Then, repeat the procedures from Step 2 to check that there is no leakage from the relevant portions.

8. Start the engine and keep low idle. Apply any load to the engine.
   - ★ Relieve the arm IN.

9. Check if fuel is leaking from the fuel pipe and equipment.
   - ★ Check if fuel is leaking from the high pressure circuit, mainly from the area where color checker was sprayed.
   - ★ When finding fuel leakage, repair the relevant portions. Then, repeat the procedures from Step 2 to check that there is no leakage from the relevant portions.
   - ★ When no leakage is found, end the inspection.

5) Fix holder (9) and tighten locknut (10).
   Locknut:
   93 – 123 Nm {9.5 – 12.5 kgm}
   ★ If the high-pressure setting side is adjusted, the low-pressure setting side changes. Accordingly, adjust the low-pressure setting side, too.



6) Fix elbow (8) and tighten locknut (7).
7) Connect hose (6).
8) After finishing adjustment, check the oil pressure again according to the above described measurement procedure.

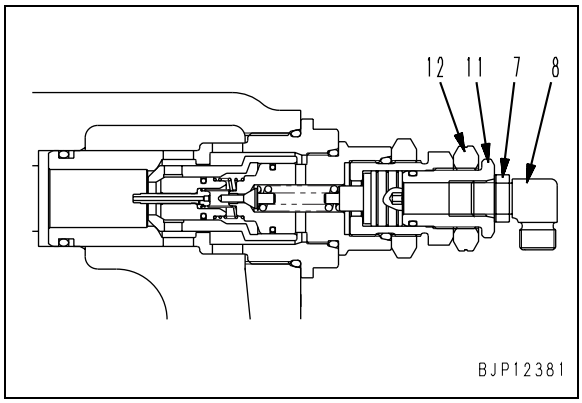
2. Adjusting main relief valve (low-pressure setting) of left 5-spool control valve

★ If the work equipment oil pressure in the front pump circuit (during normal relief operation) is abnormal or the high-pressure setting side was adjusted, adjust the low-pressure setting side of main relief valve (5) of the left 5-spool control valve according to the following procedure.
★ The low-pressure setting is the state in which the 2-stage relief solenoid valve is turned OFF and the pilot pressure is not applied to the changeover port.

1) Disconnect hose (6).
2) Loosen locknut (7) and set elbow (8) free.
3) Fix union (11) and loosen locknut (12).
4) Turn union (11) to adjust the pressure.
   ★ If the union is
   - turned to the right, the pressure rises.
   - turned to the left, the pressure lowers.

   ★ Pressure changed by 1 turn of union:
   21.8 MPa {222 kg/cm^2}

5) Fix union (11) and tighten locknut (12).
   Locknut:
   78 – 93 Nm {8.0 – 9.5 kgm}



6) Fix elbow (8) and tighten locknut (7).
7) Connect hose (6).
8) After finishing adjustment, check the oil pressure again according to the above described measurement procedure.

MEASUREMENT OF PPC VALVE OUTPUT PRESSURE

★ Devices for measuring PPC valve output pressure

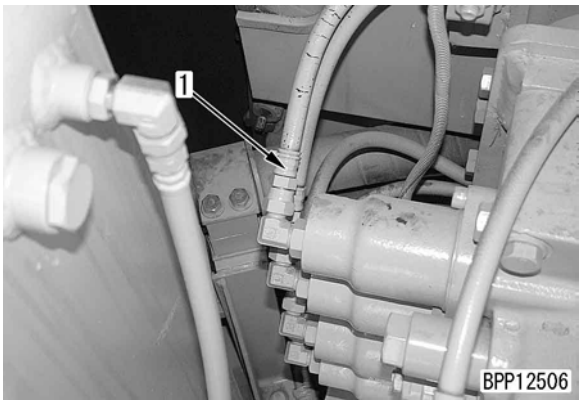
Symbol		Part Number	Part Name
P	1	799-101-5002	Hydraulic tester
		790-261-1204	Digital hydraulic tester
	2	799-401-3200	Adapter (Size: 03)

★ Measure the PPC valve output pressure under the following conditions:
- Hydraulic oil temperature: Within operating range

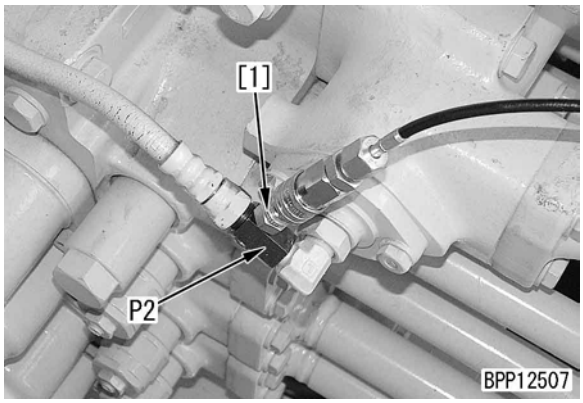
⚠ Lower the work equipment to the ground and stop the engine. Operate the control levers several times to release the residual pressure in the piping, and then loosen the oil filler cap of the hydraulic tank slowly to release the internal pressure of the hydraulic tank.

1. Remove the control valve top cover.

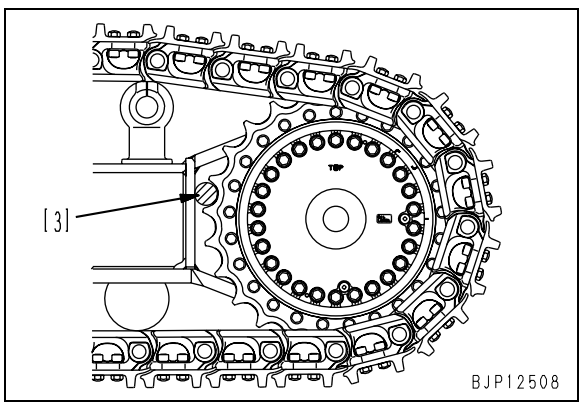
2. Disconnect hose (1) of the PPC circuit to be measured. Install adapter **P2** and connect the hose again.
   ★ For the hose to be disconnected, see the connection diagram on the next page.



3. Install nipple [1] of hydraulic tester **P1** and connect it to oil pressure gauge [2].
   ★ Use a pressure gauge of 5.9 MPa {60 kg/cm²}
   ★ The figure shows the measuring instruments installed to the right travel (reverse) circuit of the left 5-spool control valve.



4. Run the engine at high idle, operate the control lever of the PPC circuit to be measured, and measure the oil pressure.
   ★ Move the control lever to the stroke end.
   ★ Condition of actuator to be measured
   - When measuring the pressure for the work equipment, move each cylinder to the stroke end.
   - When measuring the pressure for swing, turn the swing lock switch ON.
   - When measuring the pressure for travel, put pin [3] between the sprocket and track frame to lock the track shoe.



5. After the measurement, remove the measuring devices and return the valve to the original state.

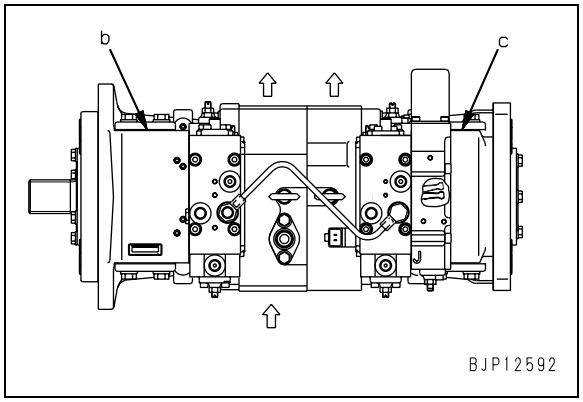
Adjusting

★ If the travel deviation is abnormal, adjust the thickness of the shim at the servo piston according to the following procedure.

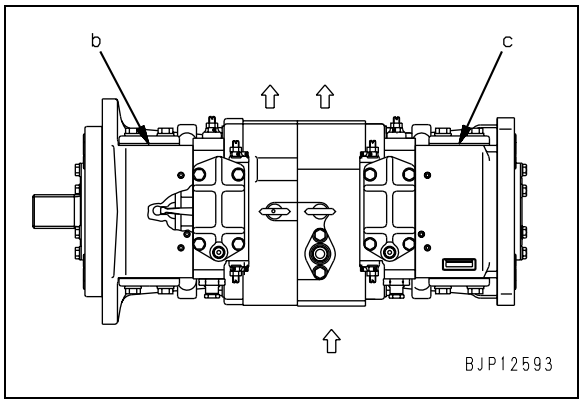
1. Determine where to add a shim from the direction of the travel deviation.
   ★ Adjustment method

When machine deviates to left	When machine deviates to right
Add shim on front pump side (b).	Add shim on rear pump side (c).

   • No. 1 pump

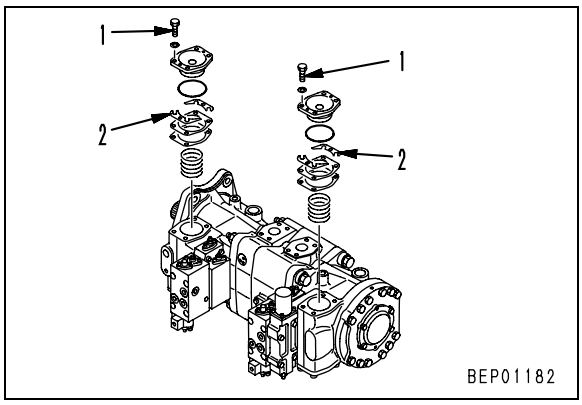


   • No. 2 pump

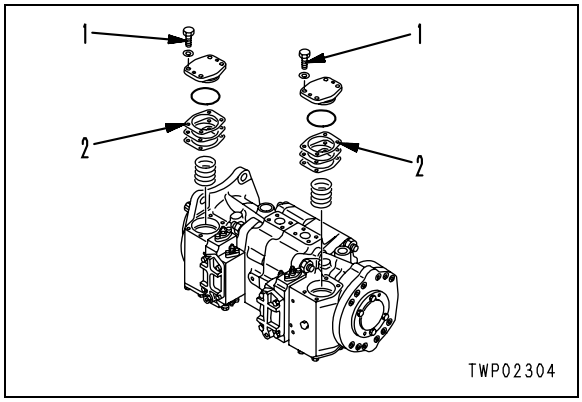


2. Loosen 4 bolts (1) on the side to adjust the shim.
   ★ Since the shim is of split type, you do not need to remove the cap.
   ★ Since the cap is pressed by the spring, loosen the bolt to a degree that you can insert the shim.

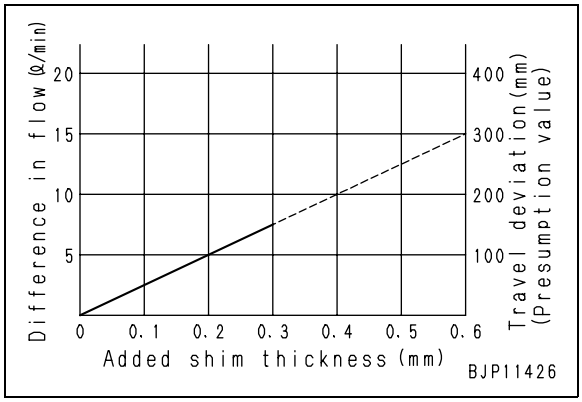
   • No. 1 pump



   • No. 2 pump



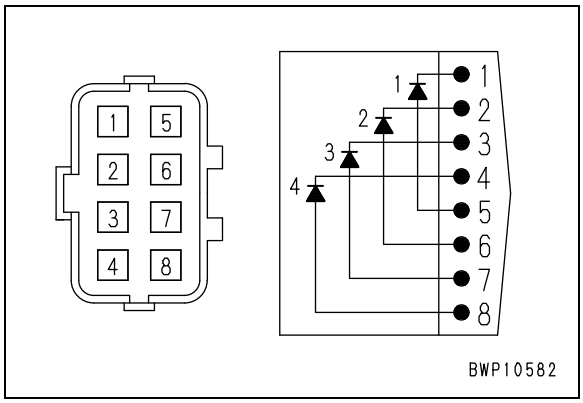
3. Add shim (2) according to the deviation and tighten bolt (1).
   ★ Limit the thickness of the added shim to 3 mm for each pump.
   Bolt: **59 – 74 Nm {6.0 – 7.5 kgm}**
   ★ Travel deviation and thickness of added shim



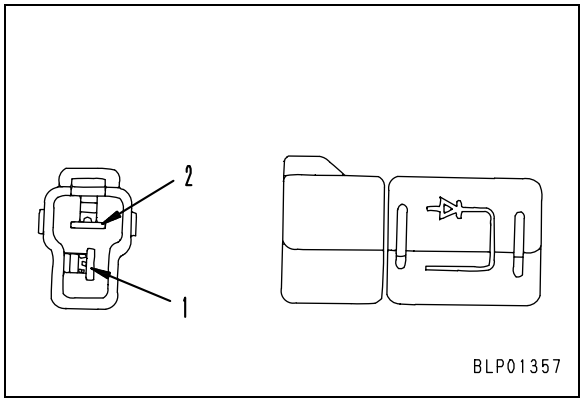
4. After finishing adjustment, check the travel deviation again according to the above described procedure.

INSPECTION PROCEDURES FOR DIODE

★ Check an assembled-type diode (8 pins) and single diode (2 pins) in the following manner.
★ The continuity direction of an assembled-type diode is as shown in the diagram below.



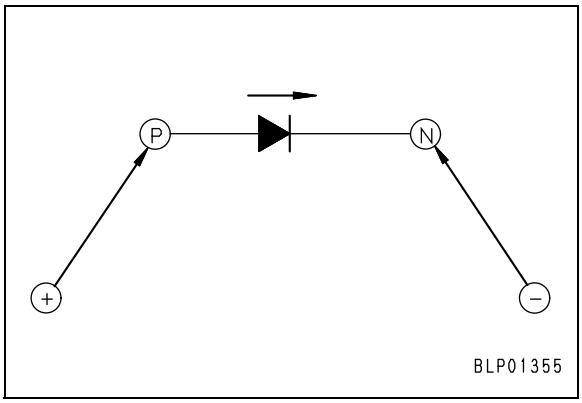
★ The continuity direction of a single diode is shown on the diode surface.



1. When using digital type circuit tester

1) Switch the testing mode to diode range and confirm the indicated value.
   ★ Voltage of the battery inside is displayed with conventional circuit testers.
2) Put the red probe (+) of the test lead to the anode (P) and the black probe (–) to the cathode (N) of diode, and confirm the displayed value.
3) Determine if a specific diode is good or no good with the indicated value.
   • No change in the indicated value: No continuity (defective).
   • Change in the indicated value: Continuity established (normal) (Note)

   Note: A silicon diode shows a value between 400 and 600.



2. When using analog type circuit tester

1) Switch the testing mode to resistance range.
2) Check the needle swing in case of the following connections.
   i) Put the red probe (+) of the test lead to the anode (P) and the black probe (–) to the cathode (N) of diode.
   ii) Put the red probe (+) of the test lead to the cathode (N) and the black probe (–) to the anode of diode.
3) Determine if a specific diode is good or no good by the way the needle swings.
   • If the needle does not swing in Case i), but swings in Case ii): Normal (but the breadth of swing (i.e. resistance value) will differ depending on a circuit tester type or a selected measurement range)
   • If the needle swings in either case of i) and ii): Defective (short-circuited internally)
   • If the needle does not swing in any case of i) and ii): Defective (short-circuited internally)

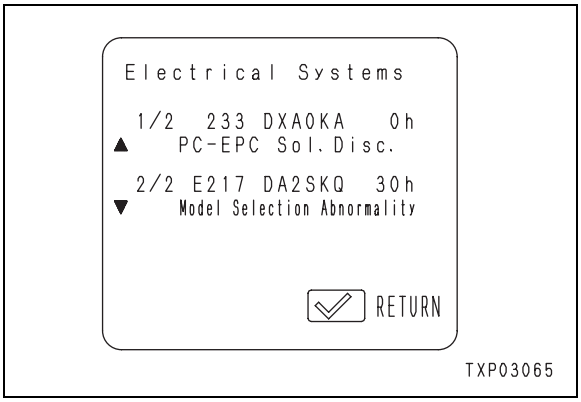
Table for Error Code and Failure Code Nos.

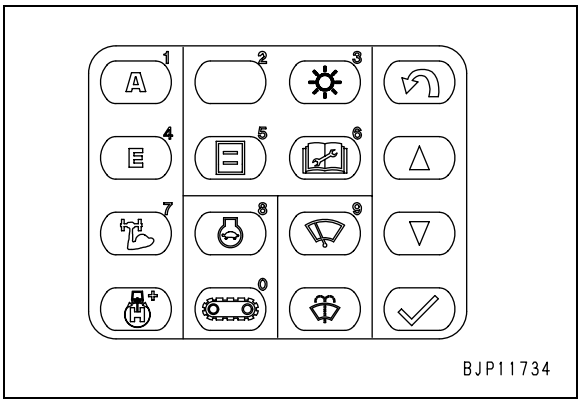
User code	Error code		Failure code			History division
	Code	Contents	Code	Component	Trouble	
—	E112	Wiper Drive (For) S/C	DY2DKB	Wiper motor (Forward)	Short circuit	Electrical system
—	E113	Wiper Drive (Rev) S/C	DY2EKB	Wiper motor (Reverse)	Short circuit	
—	E114	Washer Drive S/C	DY2CKB	Windshield washer motor	Short circuit	
—	E115	Wiper Working Abnormality	DY20KA	Wiper motor	Disconnection	
—	E116	Wiper Parking Abnormality	DY20MA	Wiper motor	Malfunction	
—	E117	Eng. Controller S-NET Comm Err.	DAC0KR	Engine controller	Communication trouble (Abnormality in objective component system)	
—	E118	Pump Controler S-NET Comm Err.	DAB0KR	Pump controller	Communication trouble (Abnormality in objective component system)	
E0E	E128	Monitor Comm. Abnormality	DAFRMC	Monitor CAN communi-cation	Defective operation	
—	E201	CO Cancel Sol. S/C	DW48KB	Cut-off cancel solenoid valve	Short circuit	
—	E202	Travel Junction Sol. S/C	DW91KB	Travel neutral solenoid valve	Short circuit	
E03	E203	Swing Brake Sol. S/C	DW45KB	Swing holding brake solenoid valve	Short circuit	
—	E204	2-stage Relief Sol. S/C	DWK0KB	2-stage relief solenoid valve	Short circuit	
—	E205	Swing Priority Sol. S/C	DW41KB	Swing solenoid valve	Short circuit	
—	E206	Travel Speed Sol. S/C	DW43KB	Travel high-low selector solenoid valve	Short circuit	
—	E207	Flash Light Relay S/C	D163KB	Flash light drive relay	Short circuit	
—	E211	CO Cancel Sol. Disc.	DW48KA	Cut-off cancel solenoid valve	Disconnection	
—	E212	Travel Junction Sol. Disc.	DW91KA	Travel neutral solenoid valve	Disconnection	
E03	E213	Swing Brake Sol. Disc.	DW45KA	Swing holding brake solenoid valve	Disconnection	
—	E214	2-stage Relief Sol. Disc.	DWK0KA	2-stage relief solenoid valve	Disconnection	
—	E215	Swing Priority Sol. Disc.	DW41KA	Swing solenoid valve	Disconnection	
—	E216	Travel Speed Sol. Disc.	DW43KA	Travel high-low selector solenoid valve	Disconnection	
—	E217	Model selection Abnormality	DA2SKQ	Pump controller model selection wiring harness	Disagreement of model selection signals	
E0E	E218	S-Net Comm. Disc.	DA2SKA	Pump controller S-NET communication	Disconnection	
—	E221	Travel Alarm S/C	DV20KB	Backup alarm buzzer	Short circuit	
—	E224	F Pump P. Sensor Abnormality	DHPAMA	Front pump pressure sensor	Malfunction	
—	E225	R Pump P. Sensor Abnormality	DHPBMA	Rear pump pressure sensor	Malfunction	
—	E226	Press. Sensor Power Abnormality	DA25KP	Output of pump control-ler power supply	Lowering of output voltage	

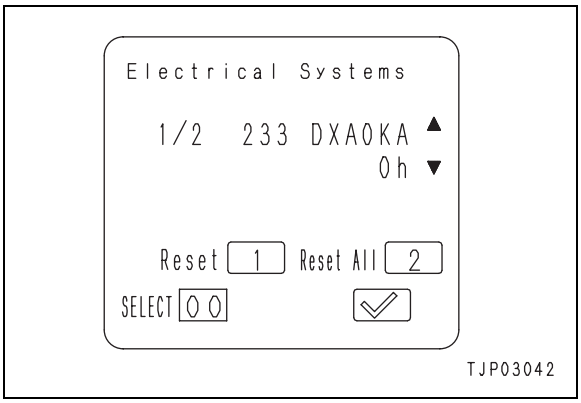
5) Resetting Electrical Systems
   - ★ Resetting Electrical Systems (deletion) is possible only with the electrical system. The failure history in the mechanical system cannot be reset.
   - ★ For resetting any specific or all information in the Electrical Systems, follow the operation explained below.

   i) Through the following switch operation, call the resetting display in the display of Electrical Systems.
      - Switch operation: [△] +[1] → [2] → [3]
      - ★ This is the same switch operation in changing the display to Service Menu.

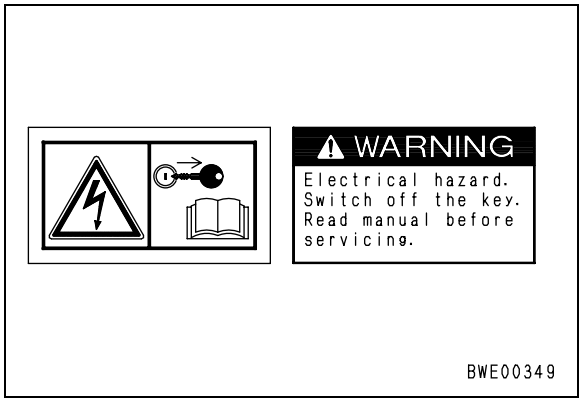
   ii) Operate the switch, following the instructions shown in the resetting display.
      - ★ When resetting specific information only, call the display of that specific information and reset it with either [△] switch or [▽] switch.
      - ★ When resetting all the information, a display of any information will do.







HANDLING ENGINE CONTROLLER HIGH VOLTAGE CIRCUIT



⚠ The engine controller is equipped with high voltage circuits (110-130 V) for driving the fuel injector.
They are connected to the connectors and harnesses between the engine controller and the fuel injector.

★ Normally, a high voltage is only output while the engine is running. Once the engine is stopped, the output ceases.

⚠ Touching the high voltage circuit directly may cause an electric shock. To avoid this, observe the following precautions when inspecting the circuits.

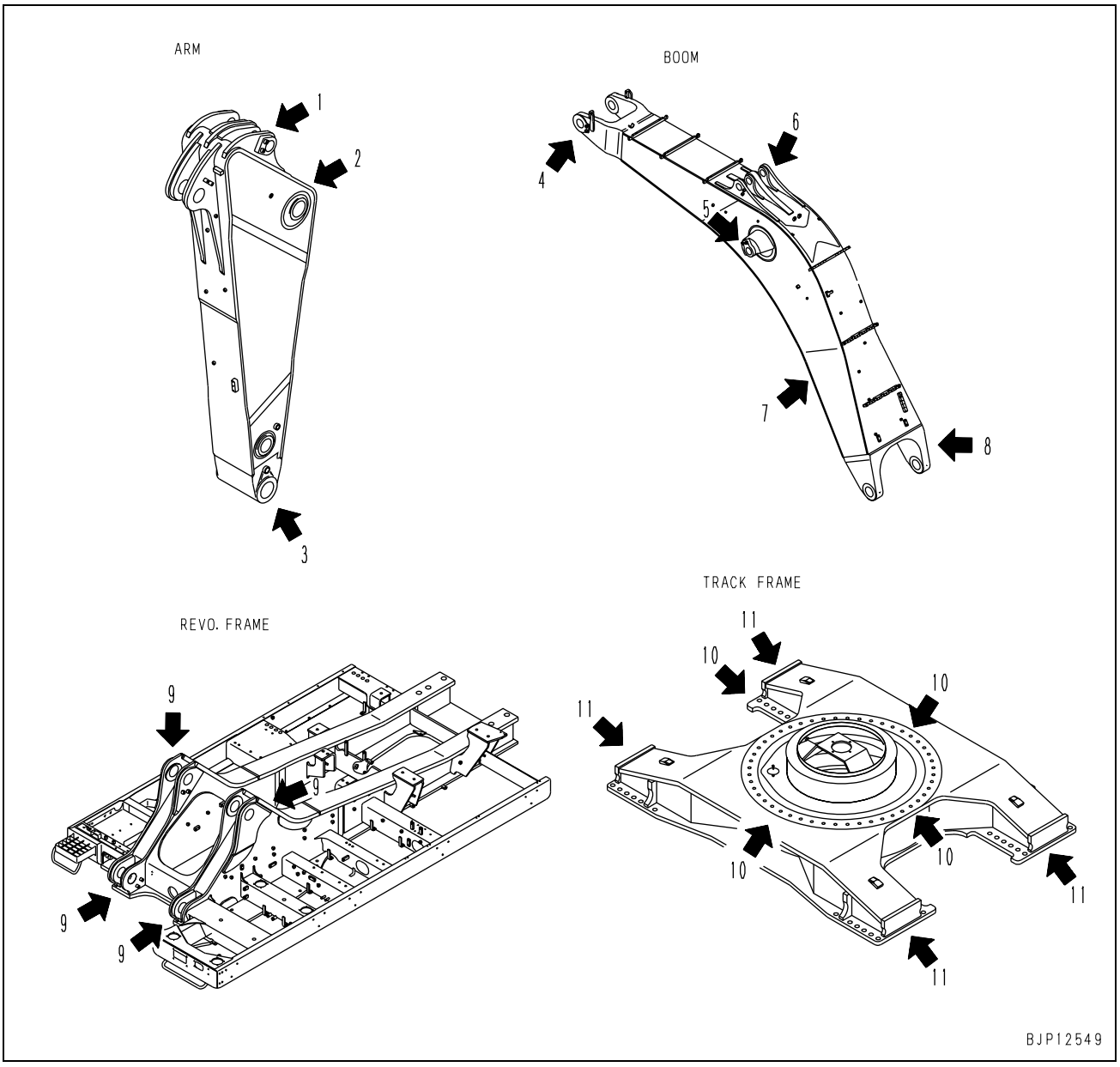
1. Connectors containing high voltage circuits:
   - Engine controller connector: E13
   - Relay connector: A13, A14
   - Injector connector: CN1, CN2, CN3, CN4, CN5, CN6
   - Injector head terminal (in head cover)

2. Be sure to connect and disconnect the relevant connectors with the starting switch off.

3. When diagnosing, do not start the engine with the T-adapter inserted in or connected to the relevant connector.
   ★ At that time, the starting switch can be set to ON and OFF only, but not to START.

Visual check of welded structures (For PC750SE, 800SE-7)

★ If any crack is found, draw its shape below.



Arm

1. Arm cylinder bracket
☐ Left ☐ Right

2. Arm foot
☐ Left ☐ Right ☐ End plate

3. Arm top boss
☐ Left ☐ Right

Boom

4. Boom top bracket
☐ Left ☐ Right

5. Boom cylinder bracket
☐ Left ☐ Right

6. Arm cylinder bracket
☐ Left ☐ Right

7. Boom lower plate
☐ Left ☐ Right

8. Boom foot
☐ Left ☐ Right

Revolving frame

9. Boom bracket
☐ Left ☐ Right

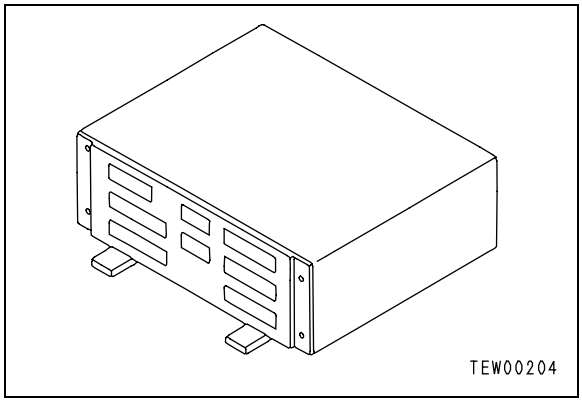
Track frame

10. Circle bracket
☐ Front ☐ Rear
☐ Left ☐ Right

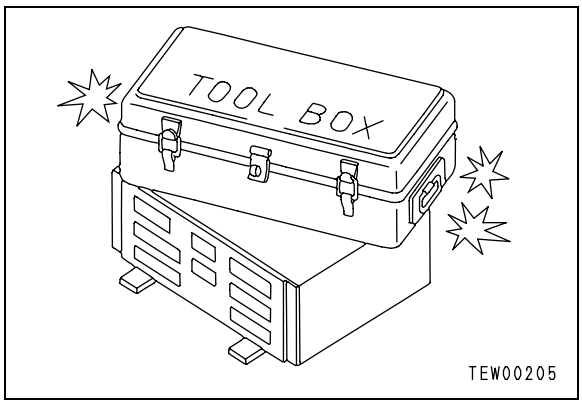
11. Track frame mounting section
☐ Front ☐ Rear
☐ Left ☐ Right

3) Handling control box

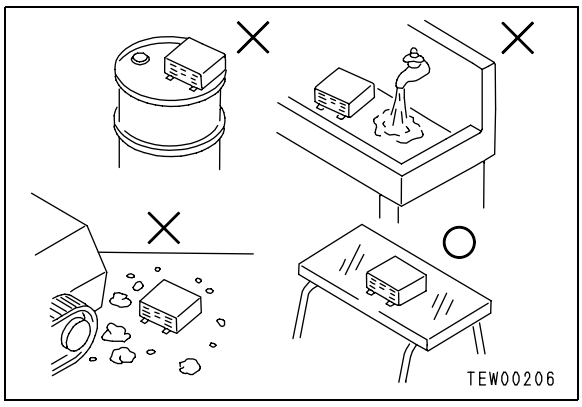
1) The control box contains a microcomputer and electronic control circuits. These control all of the electronic circuits on the machine, so be extremely careful when handling the control box.
2) Do not open the cover of the control box unless necessary.



3) Do not place objects on top of the control box.
4) Cover the control connectors with tape or a vinyl bag.
   Never touch the connector contacts with your hand.
5) During rainy weather, do not leave the control box in a place where it is exposed to rain.



6) Do not place the control box on oil, water, or soil, or in any hot place, even for a short time.
   (Place it on a suitable dry stand).
7) Precautions when carrying out arc welding
   When carrying out arc welding on the body, disconnect all wiring harness connectors connected to the control box. Fit an arc welding ground close to the welding point.

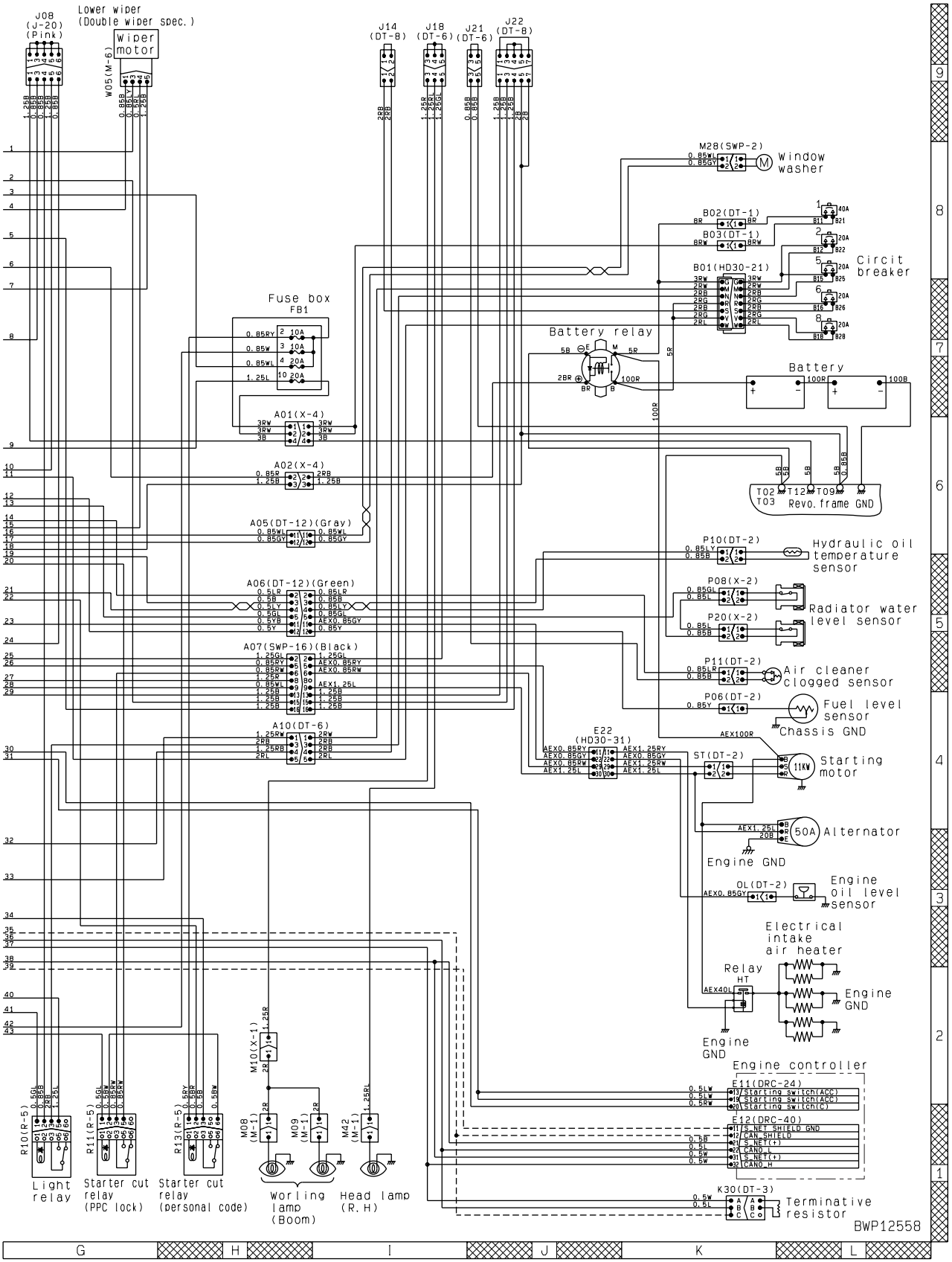


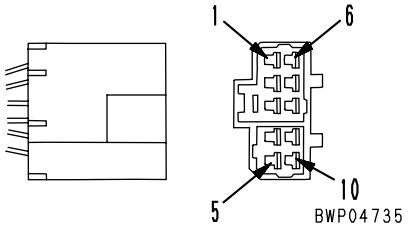
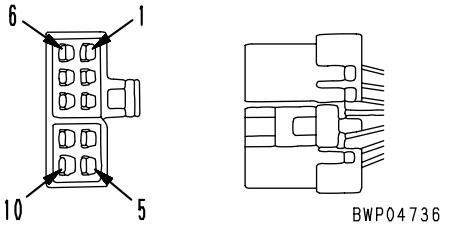
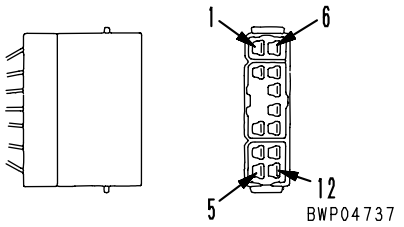
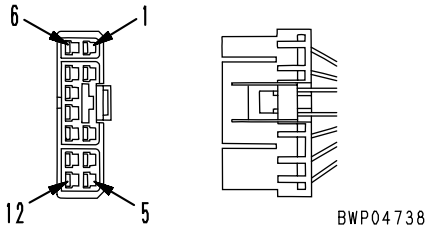
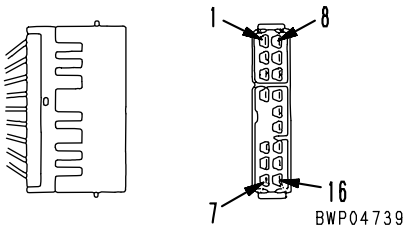
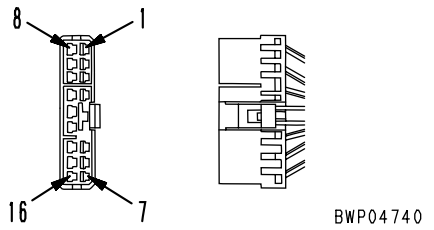
2. Points to remember when troubleshooting electric circuits

1) Always turn the power OFF before disconnecting or connect connectors.
2) Before carrying out troubleshooting, check that all the related connectors are properly inserted.
   ★ Disconnect and connect the related connectors several times to check.
3) Always connect any disconnected connectors before going on to the next step.
   ★ If the power is turned ON with the connectors still disconnected, unnecessary abnormality displays will be generated.
4) When carrying out troubleshooting of circuits (measuring the voltage, resistance, continuity, or current), move the related wiring and connectors several times and check that there is no change in the reading of the tester.
   ★ If there is any change, there is probably defective contact in that circuit.

Connector No.	Connector Type	No. of pin	Place of use	Address			
				Stereo-gram	M circuit	E circuit	P circuit
J19	DT	6	Joint connector	H-1			J-9
J20	DT	6	Joint connector	L-7		I-9	J-9
J21	DT	6	Joint connector	I-9	J-9		J-9
J22	DT	8	Joint connector	D-1	J-9		J-9
K19	M	2	Pump resistor (for driving pump in emergency)	U-2			B-1
K30	DT	3	CAN terminal resistor	W-2	K-1	A-1	F-3
K31	DT	3	CAN terminal resistor	N-4	A-4	K-7	E-1
M	Terminal	1	Battery relay terminal M	C-9	J-7	I-2	L-7
M07	M	3	Light switch	P-8	D-1		
M08	M	1	Working lamp (Boom)	B-9	H-1		
M09	M	1	Working lamp (Boom)	A-9	H-1		
M10	X	1	Intermediate connector	E-9	H-2		
M13	KES0	2	Speaker (Right)	AC-8			
M16	Terminal	1	Horn (High tone)	C-1			G-9
M17	Terminal	1	Horn (Low tone)	B-1			H-9
M19	YAZAKI	2	Cigarette lighter	N-3			
M21	PA	9	Radio	U-2			
M22	Y090	2	Horn switch	N-7			B-1
M26	S	12	Air conditioner unit	W-5			
M28	SWP	2	Windshield washer motor	I-1	K-8		
M31	M	2	Optional power supply (2)	U-2			
M32	M	2	Optional power supply (1)	S-9			
M33	M	2	Optional power supply (3)	W-3			
M34	X	1	Air conditioner compressor electromagnetic clutch	AG-2			
M37	Terminal	1	Horn (High tone)	D-1			G-9
M38	Terminal	1	Horn (Low tone)	C-1			
M38	M	2	Machine push-up switch	R-9			A-1
M39	M	3	Boom shockless control switch	W-4			F-1
M40	YAZAKI	2	Headlamp	Z-8	A-8		
M41	YAZAKI	2	Headlamp	Y-7	A-8		
M42	M	1	Right headlamp	A-3	I-1		
M45	DT	12	Intermediate connector	U-2			
M46	X	4	RS232C junction connector	N-3			A-4
M71	M	2	Room lamp	Z-8			
M72	M	4	DC/DC converter	U-2			
M73	KES0	2	Speaker (Left)	AD-8			
M75	YAZAKI	2	Step light	AB-1			D-1
M79	YAZAKI	2	12-V accessory socket	V-9			
M80	X	1	Intermediate connector	E-1			G-9
M81	M	2	Step light switch	AD-2			F-1
M82	M	1	Flash light	E-1			G-9
M95	X	4	Intermediate connector	D-1			G-9
NE	YAZAKI	2	Engine Ne sensor	AJ-4		K-5	
OL	DT	2	Engine oil level sensor	AH-2	K-3		
P01	070	12	Monitor panel	N-6	A-7 A-1	K-8	E-1
P02	040	20	Monitor panel	N-5	A-6 A-1	K-8	E-1
P03	M	2	Alarm buzzer stop switch	P-9	D-1		
P05	M	2	Rotary lamp switch	W-4			
P06	DT	2	Fuel level sensor	C-9	K-4		

★ This circuit diagram is made by extracting the monitor panel system, engine preheating/starting/charging system, light system, and communication network system from the general electric circuit diagram.



No.of pins	S type connector		
	Male (female housing)	Female (male housing)	T-adapter Part No.
10 (Blue)			—
	—	—	
12 (Blue)			799-601-7160
	Part No.: 08056-11272	Part No.: 08056-11282	
16 (Blue)			799-601-7170
	Part No.: 08056-11672	Part No.: 08056-11682	

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

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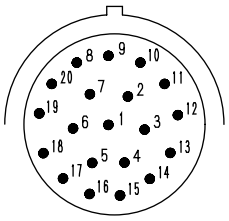
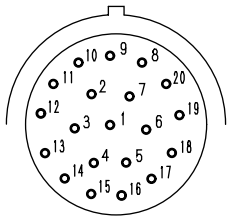
<tr><td rowspan="2">Type (shell size code)</td><td colspan="3">HD30 Series connector</td></tr>
<tr><td>Body (plug)</td><td>Body (receptacle)</td><td>T-adapter Part No.</td></tr>
<tr><td rowspan="4">18-20 (3)</td><td>Pin (male terminal)</td><td>Pin (female termial)</td><td rowspan="2">799-601-9230</td></tr>
<tr><td> 
BWP05009</td><td> 
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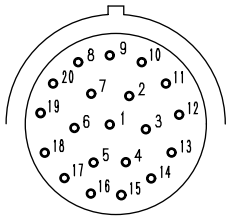
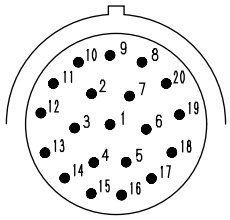
<tr><td>Part No.:08191-31201, 08191-31202</td><td>Part No.:08191-34101, 08191-34102</td></tr>
<tr><td>Pin (female terminal)</td><td>Pin (male termial)</td><td rowspan="3">799-601-9230</td></tr>
<tr><td> 
BWP05011</td><td> 
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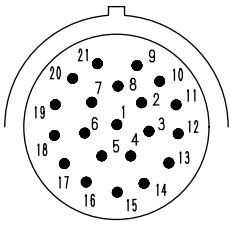
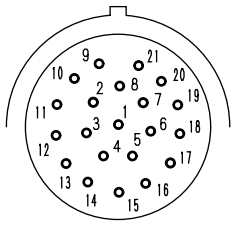
<tr><td>Part No.:08191-32201, 08191-32202</td><td>Part No.:08191-33101, 08191-33102</td></tr>
<tr><td rowspan="4">18-21 (4)</td><td>Pin (male terminal)</td><td>Pin (female termial)</td><td rowspan="3">799-601-9240</td></tr>
<tr><td> 
BWP05013</td><td> 
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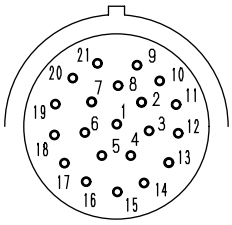
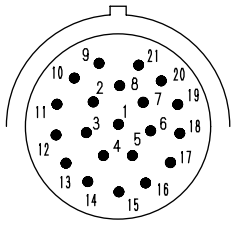
<tr><td>Part No.:08191-41201, 08191-42202</td><td>Part No.:08191-44101, 08191-44102</td></tr>
<tr><td>Pin (female terminal)</td><td>Pin (male termial)</td><td rowspan="3">799-601-9240</td></tr>
<tr><td> 
BWP05015</td><td> 
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<tr><td>Part No.:08191-42201, 08191-42202</td><td>Part No.:08191-43101, 08191-43102</td></tr>
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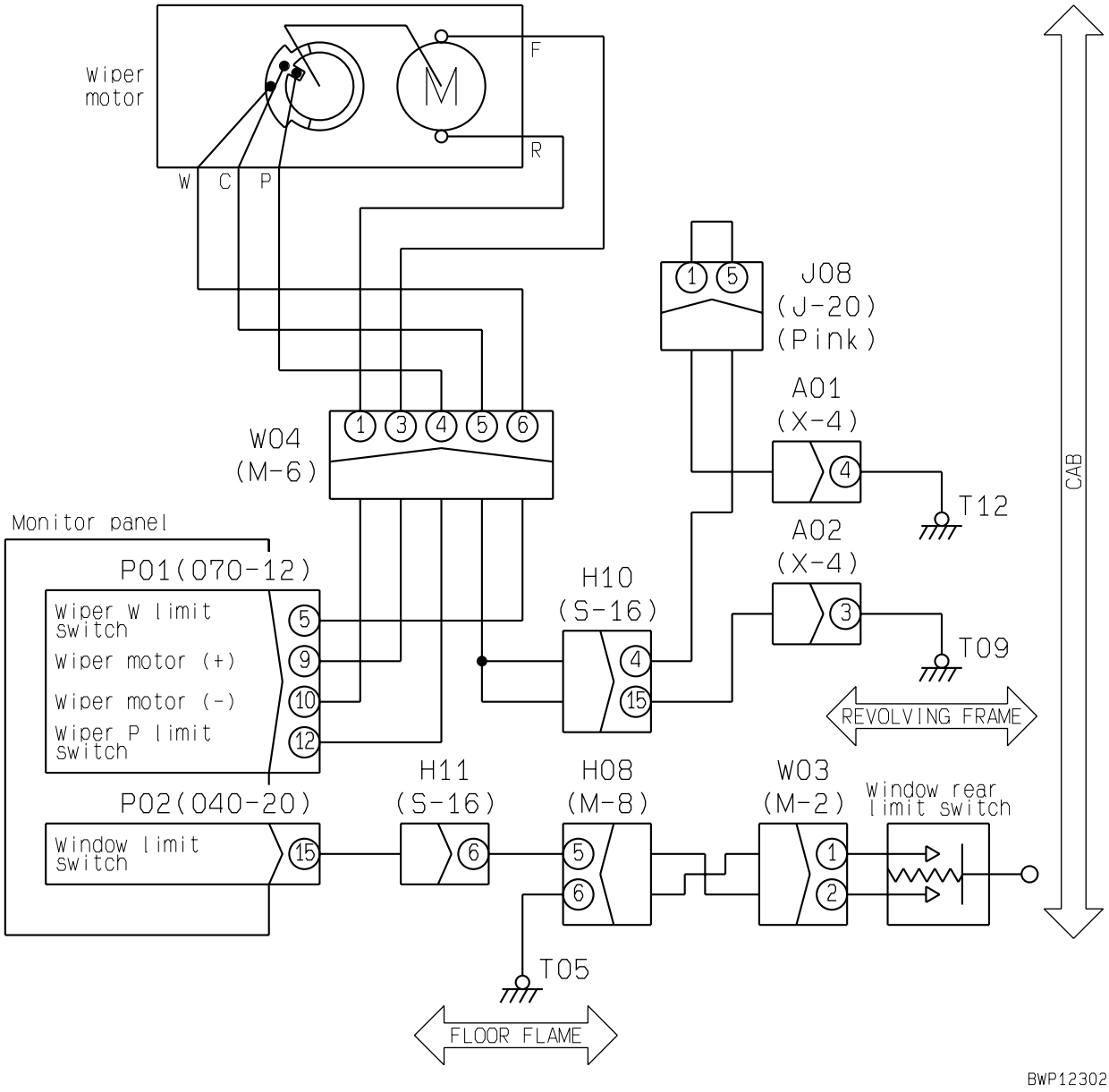
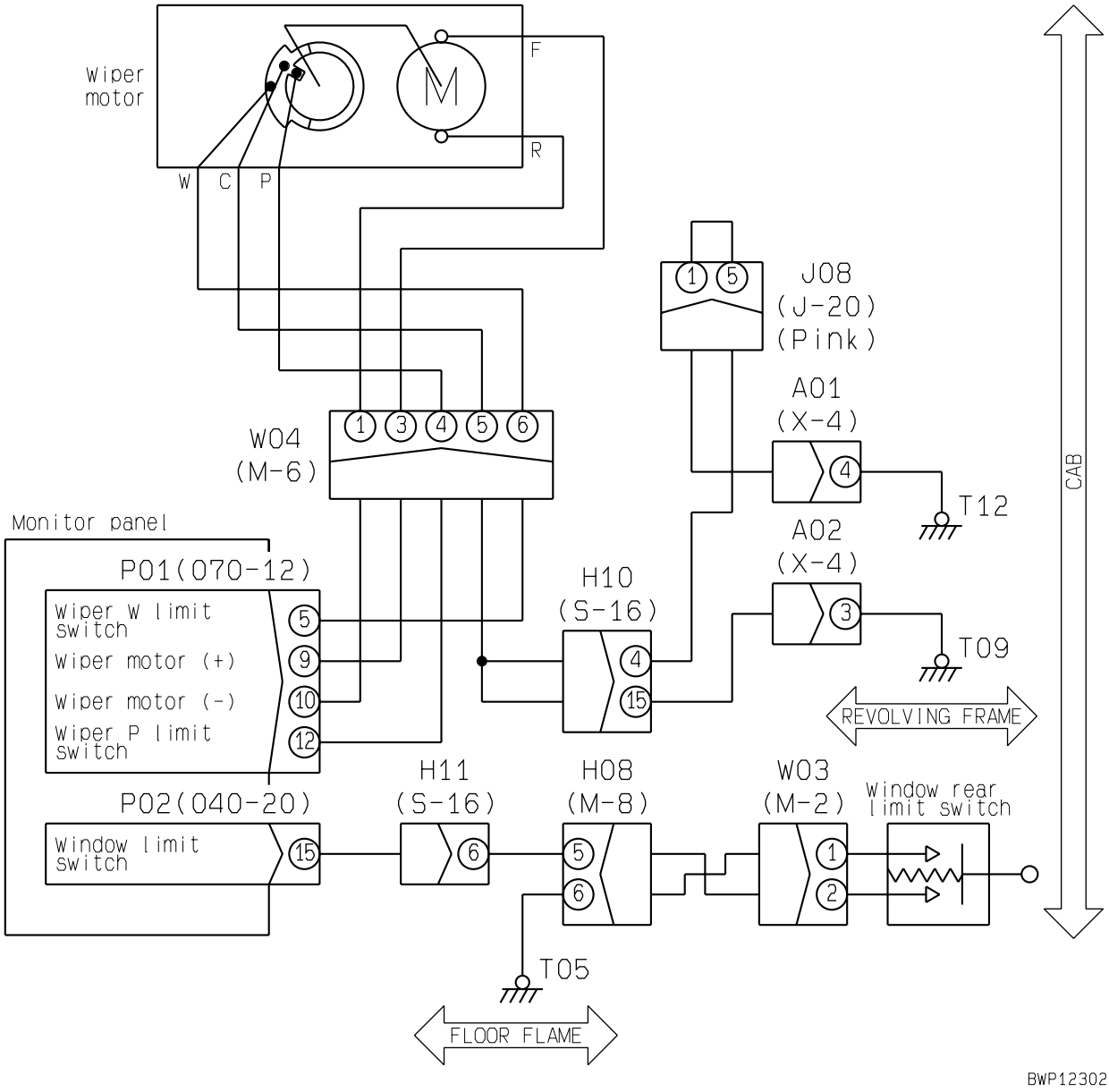
TROUBLESHOOTING WHEN ERROR CODE "ELECTRICAL SYSTEM" AND FAILURE CODE "MECHANICAL SYSTEM" ARE DISPLAYED

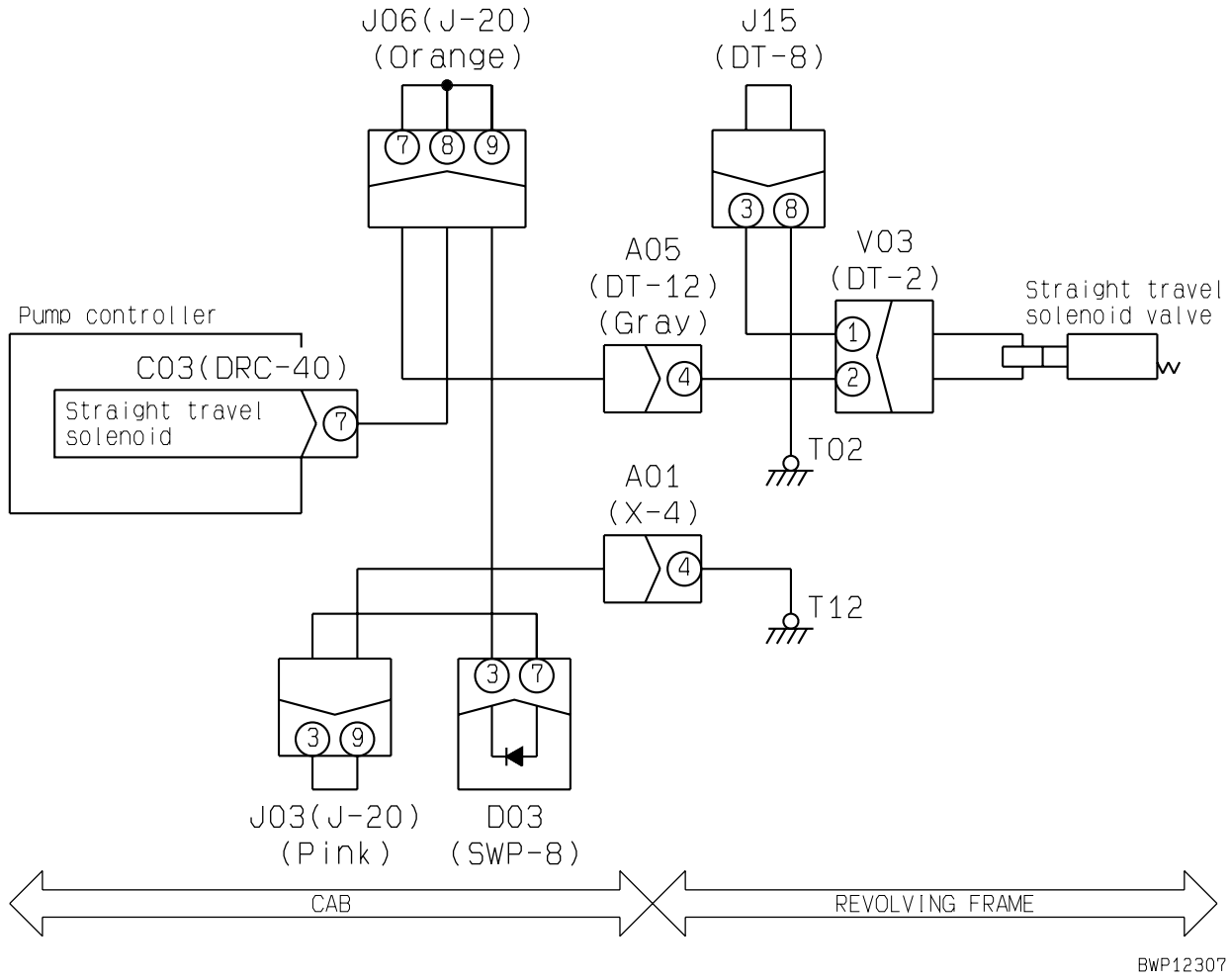
Electric Circuit Diagram for Windshield Wiper Motor (Single wiper spec.)



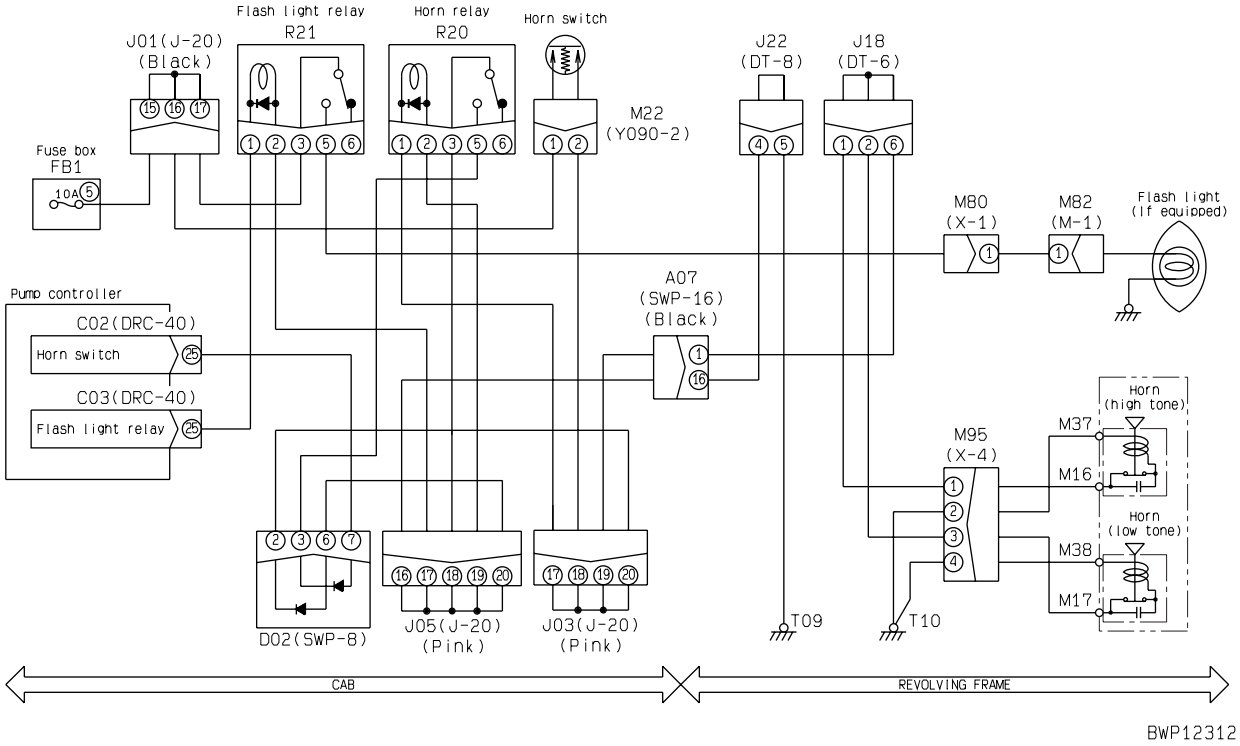
Windshield Wiper Motor Electrical Circuit Diagram (Single wiper spec.)



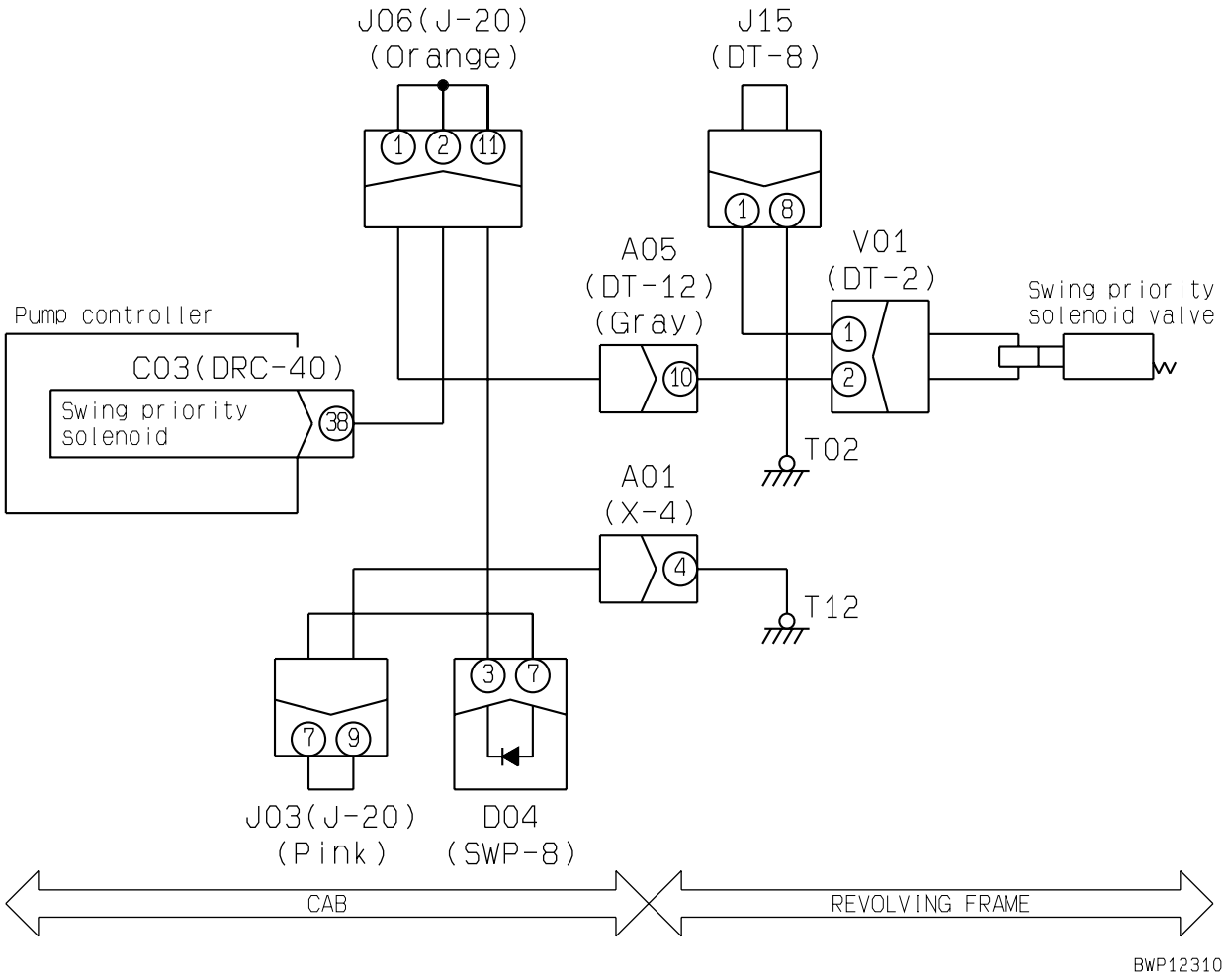
Electric circuit diagram related to travel junction solenoid



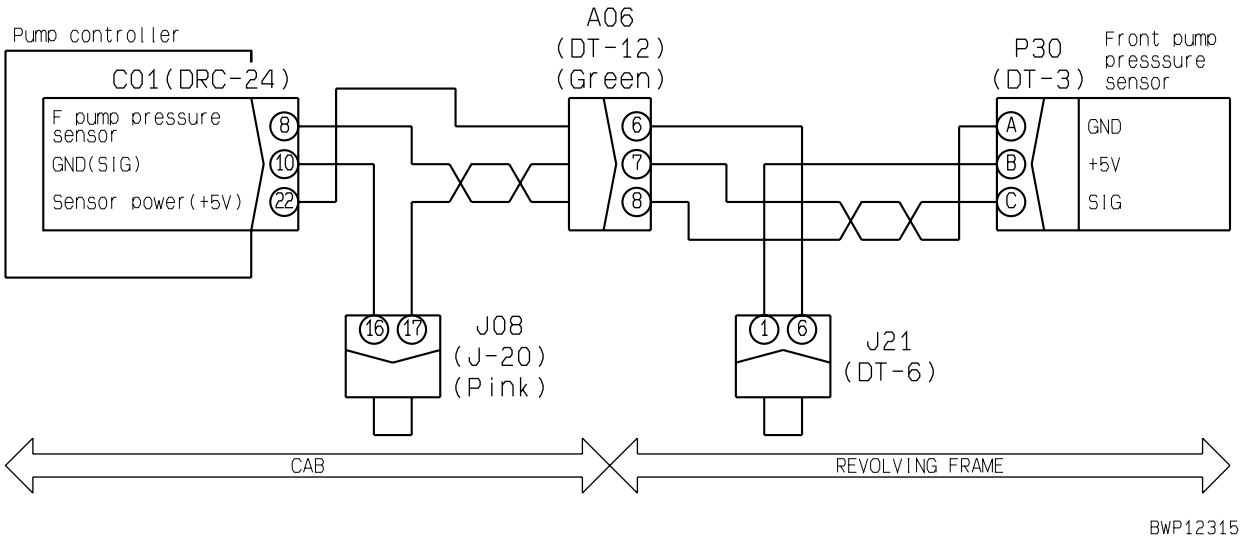
Electric circuit diagram related to horn and flash light relay



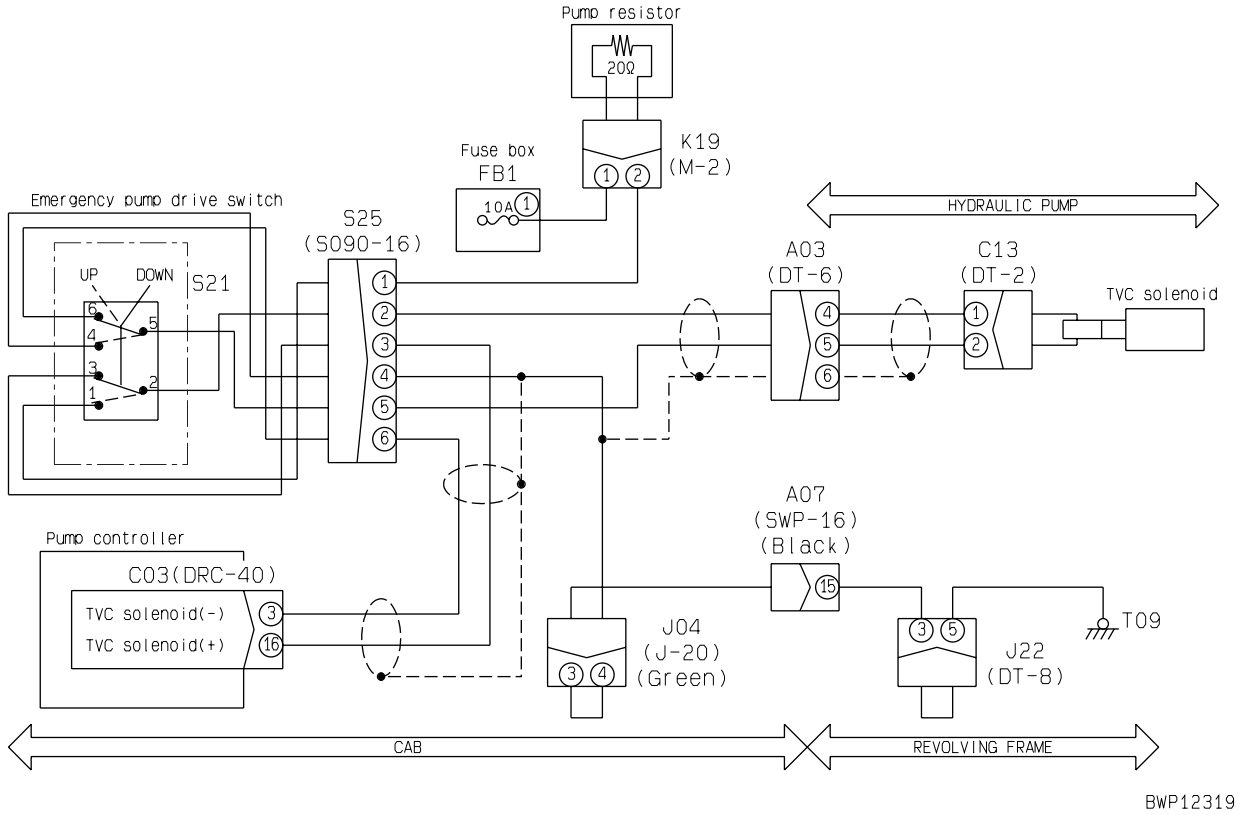
Electric circuit diagram related to swing priority solenoid



Circuit diagram related to front pump pressure sensor



Electric circuit diagram related to TVC solenoid

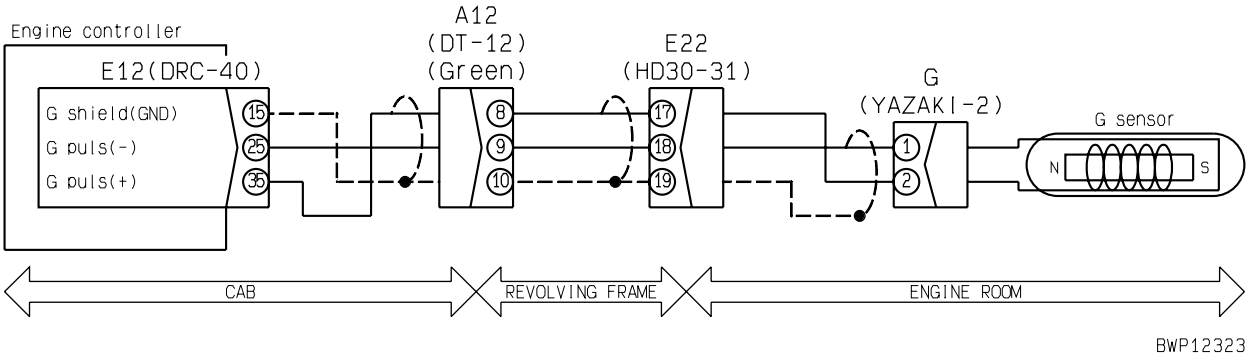


Error Code in Electrical System E91C (Engine G sensor problem)

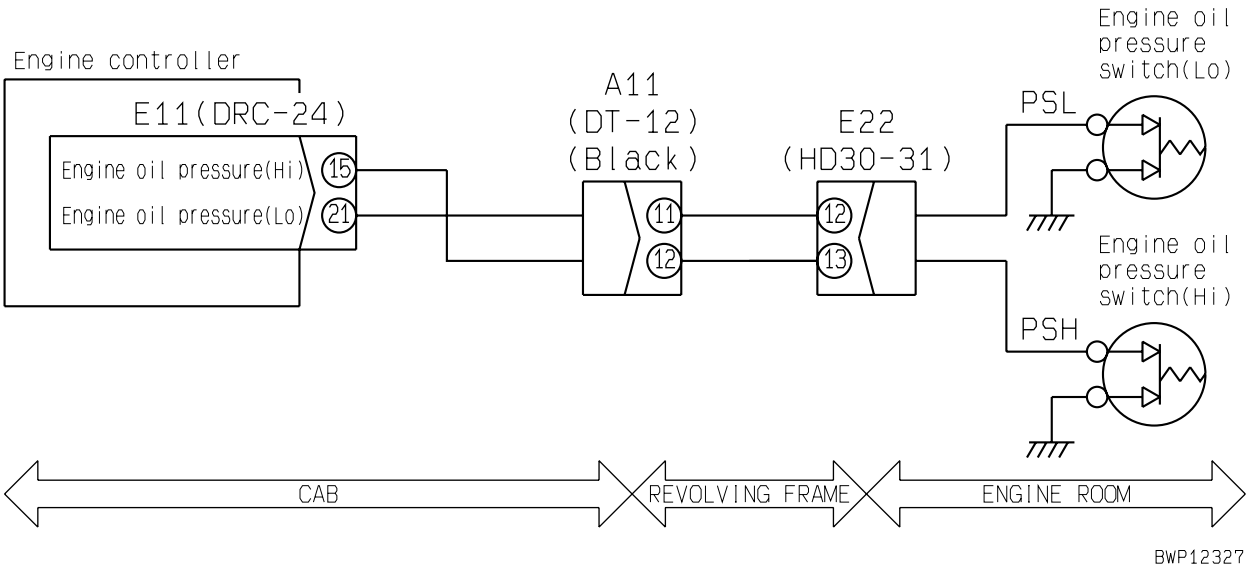
User Code	Error Code	Failure Code	Failure phenomenon	Engine G sensor problem (Engine controller system)
E11	**E91C**	**DLH1LC**		
Failure content	• Cylinder cannot be judged from the engine G speed sensor signal.			
Response from controller	• The machine is driven with limited output. • Control is carried out with the Ne speed sensor signal. • When the failure cause disappears of itself, the machine operation returns to normalcy.			
Phenomenon occurring on machine	• The output lowers (The engine output lowers about 20% and the pump absorption torque is reduced). • The output lowers (Only the pump absorption torque is reduced). • The engine speed does not rise above low idle.			
Relative information	• Special adapter (799-601-9410) is necessary for troubleshooting for the engine G speed sensor.			

Presumed cause and standard value in normalcy		Cause	Standard value in normalcy and references for troubleshooting			
	1	Engine G speed sensor defective (Internal disconnection or short-circuiting)	★ Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			G (male)	Resistance value		
			Between (1) and (2)	1.4 k – 3.5 kΩ		
			Between (1), (2) and grounding	Above 1 MΩ		
	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 E12 (female) (35) and G (female) (2)	Resistance value	Below 1 Ω	
			Wiring harness between E12 (female) (25) and G (female) (1)	Resistance value	Below 1 Ω	
	3	Grounding fault of wiring harness (Contact with grounding circuit)	★ Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			Between wiring harness between E12 (female) (35) and G (female) (2) and grounding	Resistance value	Above 1 MΩ	
			Between wiring harness between E12 (female) (25) and G (female) (1) and grounding	Resistance value	Above 1 MΩ	
	4	Engine controller defective	★ Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			E12 (female)	Resistance value		
			Between (35) and (25)	1.4 k – 3.5 kΩ		
			Between (35), (25) and grounding	Above 1 MΩ		

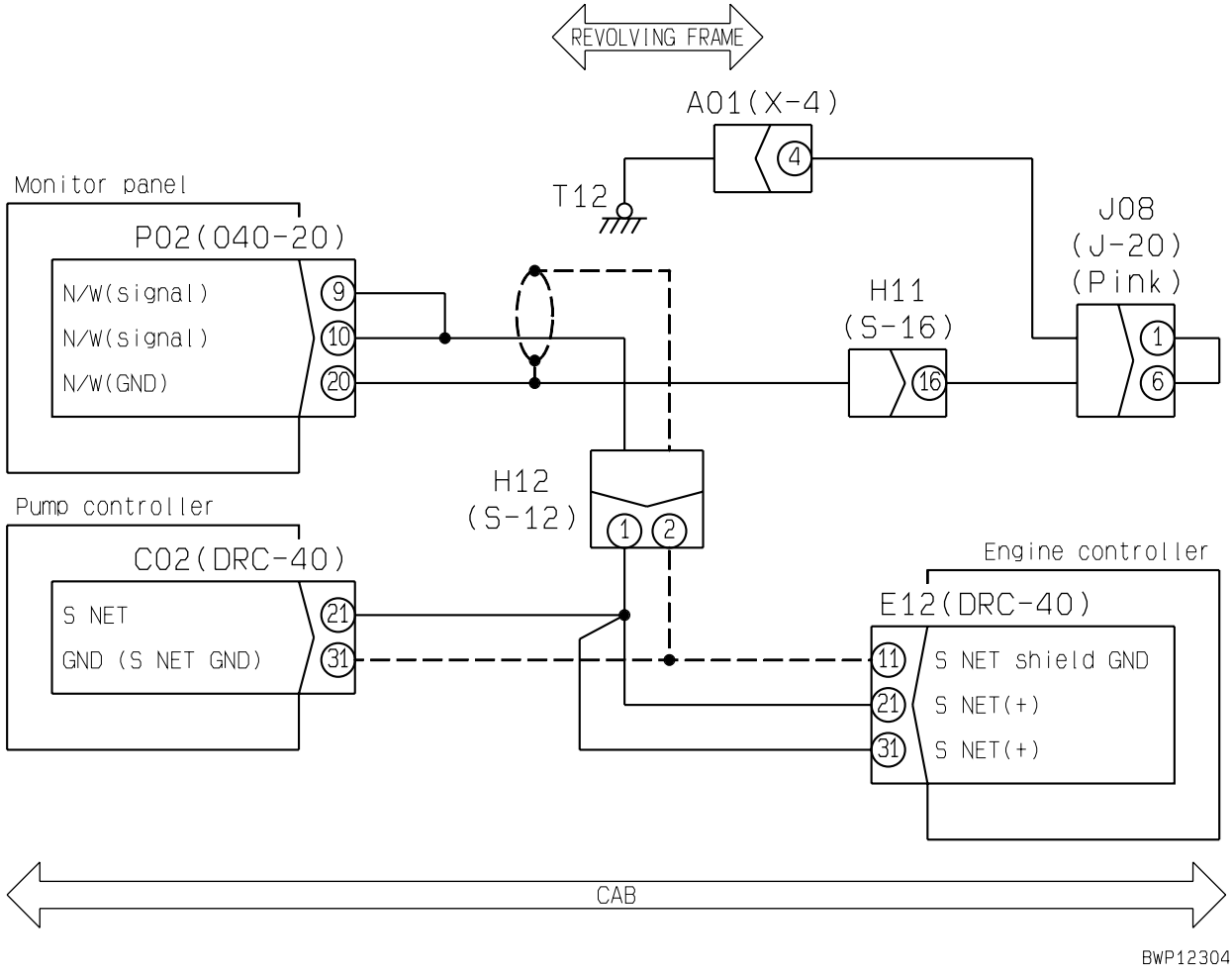
Circuit diagram related to engine G speed sensor



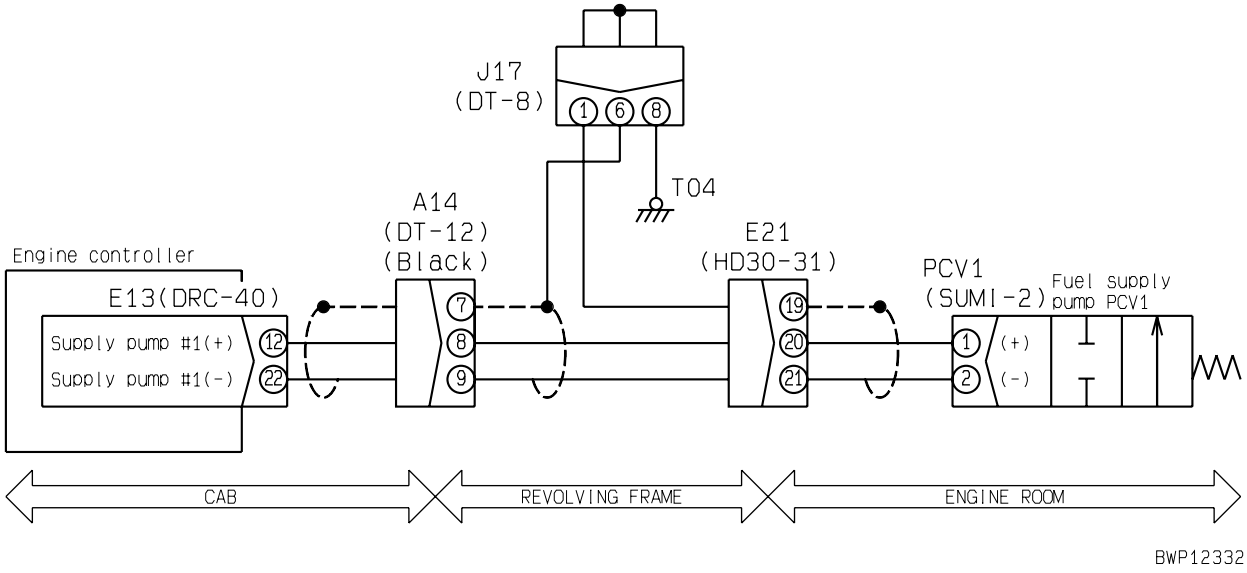
Circuit diagram related to engine coolant temperature sensor (for low pressure and high pressure)



Circuit diagram related to S-NET communication



Circuit diagram related to fuel supply pump PCV1



Error Code in Electrical System E97B (No-pressure fuel feed by supply pump 1)

User Code	Error Code	Failure Code	Failure phenomenon	No-pressure fuel feed by supply pump 1 (Engine controller system)
E15	**E97B**	**AD10L3**		
Contents of trouble	• The fuel pump does not supply fuel (Level 1).			
Action of controller	• Operates by normal control method. • Even if cause of failure disappears, system does not reset itself until engine is stopped.			
Problem that appears on machine	• Engine does not start easily. • Engine output and speed lower. • Black smoke is produced.			
Relative information				

Presumed cause and standard value in normalcy		Cause	Standard value in normalcy and references for troubleshooting	
	1	Trouble in related system	If any other error code or failure code is displayed, carry out troubleshooting for it.	
	2	Use of improper fuel	Fuel used may be improper. Check it directly.	
	3	Defective low-pressure circuit parts	★ For contents of troubleshooting, see Note 1. For measurement of pressure, see TESTING AND ADJUSTING (Measurement of fuel pressure).	
			Fuel low-pressure circuit pressure	0.15 – 0.3 MPa {1.5 – 3.0 kg/cm^2}
	4	Clogging of filter/strainer	★ For contents of troubleshooting, see Note 2.	
	5	Trouble in electrical system of fuel supply pump PCV	Perform troubleshooting for error codes [**E970**], [**E971**], [**E974**], and [**E975**].	
	6	Defective common rail pressure sensor	Since common rail pressure sensor may be defective, check wiring harness for breakage.	
	7	Defective pressure limiter	★ See TESTING AND ADJUSTING (Testing leakage through pressure limiter and return rate from injector).	
			Leakage through pressure limiter	Max. 10 cc/min (at 1,600 rpm)
	8	Defective injector	★ See TESTING AND ADJUSTING (Testing leakage through pressure limiter and return rate from injector).	
			Relief speed (rpm)	Return (Spill) rate limit (cc/min)
			1,600	960
			1,700	1,020
			1,800	1,080
			1,900	1,140
			2,000	1,200
	9	Defective fuel supply pump	If none of causes 1 – 8 is the cause of the trouble, the fuel supply pump may be defective.	

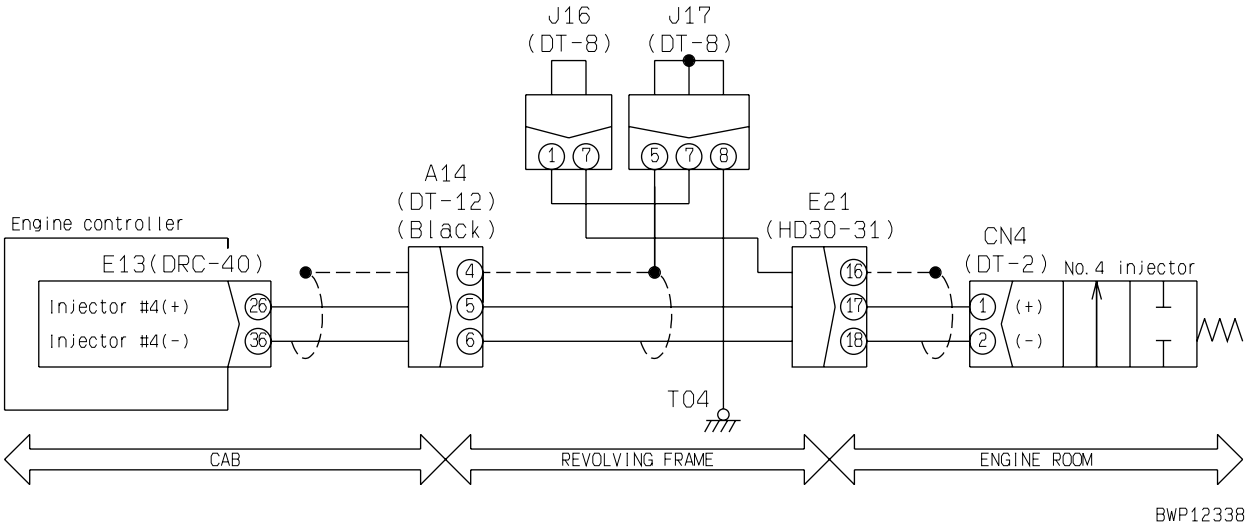
<How to use check sheet>
Perform the above troubleshooting and take a record of the contents of the attached "Check sheet for no-pressure fuel feed".

Error Code in Electrical System E984 (Fuel Injector 4 Disc.)

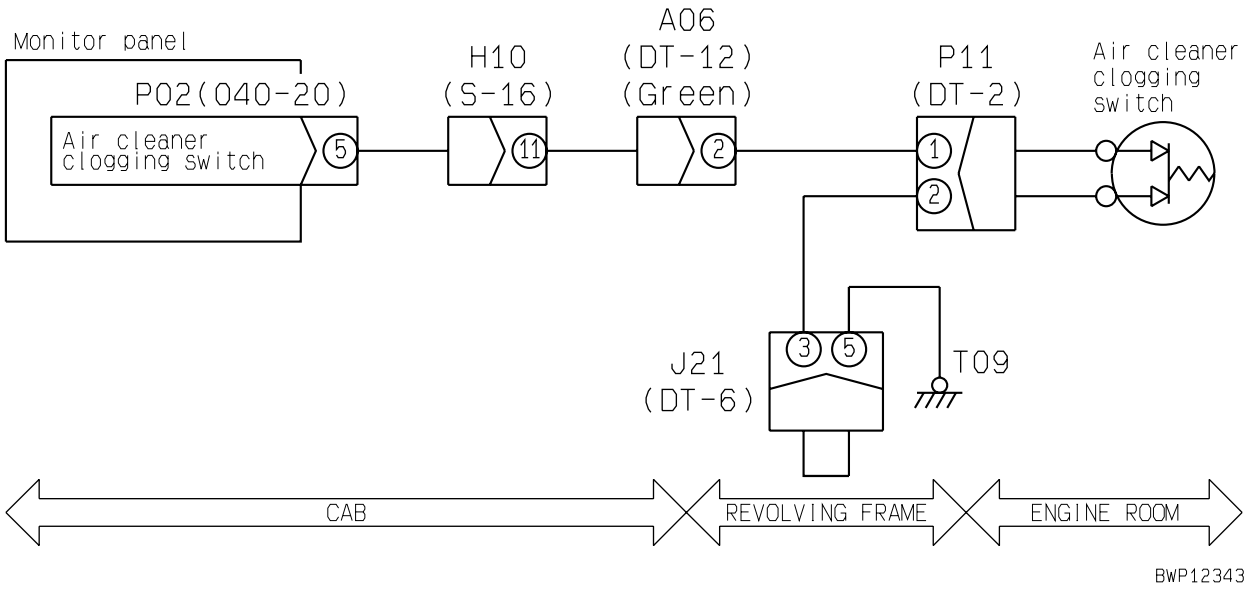
User Code	Error Code	Failure Code	Failure phenomenon	Fuel Injector 4 Disc. (Engine controller system)
E11	**E984**	**ADD1KA**		
Failure content	• Fuel injector 4 circuit is disconnected.			
Response from controller	• Power to the fuel injector 4 circuit is switched OFF. • Even after the failure cause disappears of itself, the machine operation does not return to normalcy, unless the engine starting switch is once turned OFF.			
Phenomenon occurring on machine	• The output lowers (The engine output lowers about 20% and the pump absorption torque is reduced). • The output lowers (Only the pump absorption torque is reduced). • The engine speed does not rise above low idle. • The engine stops and it cannot be started (when user code [E10] is displayed).			
Relative information				

Presumed cause and standard value in normalcy		Cause	Standard value in normalcy and references for troubleshooting			
	1	Fuel injector 4 defective (Internal disconnection)	★ Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			CN4 (male)	Resistance value		
			Between (1) and (2)	0.4 – 1.1 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 E13 (female) (26) and CN4 (female) (1)	Resistance value	Below 1 Ω	
			Wiring harness between E13 (female) (36) and CN4 (female) (2)	Resistance value	Below 1 Ω	
	3	Engine controller defective	★ Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			E13 (female)	Resistance value		
			Between (26) and (36)	0.4 – 1.1 Ω		

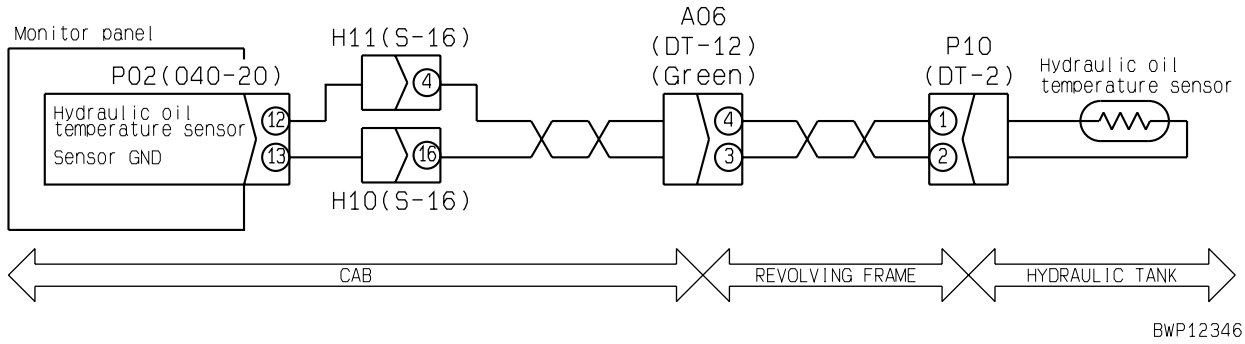
Circuit diagram related to fuel injector 4



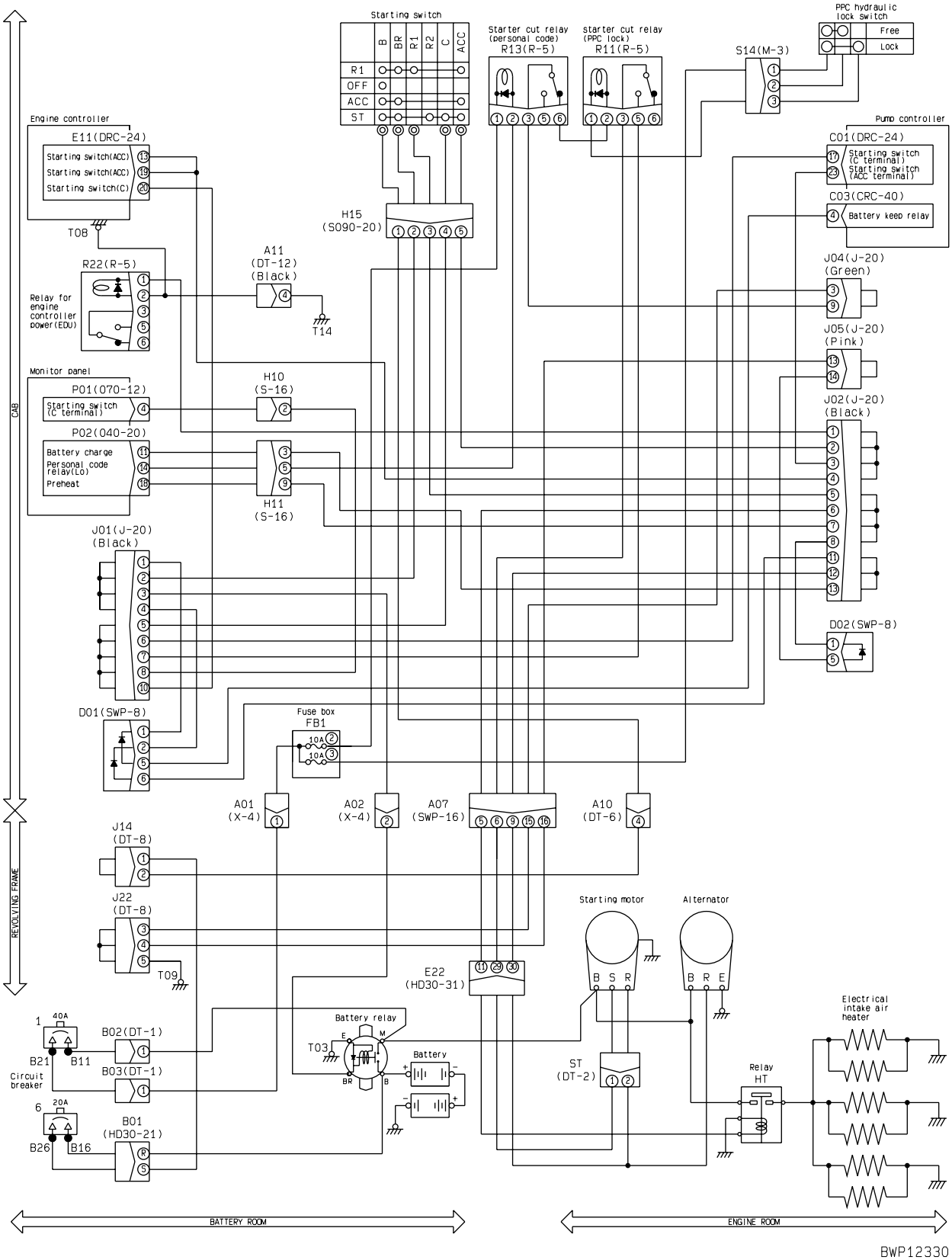
Circuit diagram related to air cleaner clogging switch



Circuit diagram related to hydraulic oil temperature sensor



Electrical Circuit Diagram for Engine Preheat, Start and Battery Charging



E-9 Part of display on monitor panel is missing

Failure information	• Part of display on monitor panel is missing	Part of the display in the monitor panel is missing during starting switch in ON.
Relative information	—	

Presumed cause and standard value in normalcy	Cause		Standard value in normalcy and references for troubleshooting
	1	Monitor panel LCD fault	★ Turn the starting switch ON during the troubleshooting.
			If all the LCD (Liquid Crystal Display) in the monitor panel light up (i.e. the screen becomes totally white) by the following switching operation, then the monitor panel is normal. • Switching operation: [↓] + [A] (push swiches simultaneously.)
	2	Monitor panel defective	If cause 1 is not detected, the monitor panel may be defective. (Since trouble is in the monitor panel, troubleshooting cannot be carried out.)

E-10 Monitor panel displays contents irrelevant to the model

Failure information	• The monitor panels displays contents that have nothing to do with the model on which it is installed.
Relative information	—

Presumed cause and standard value in normalcy	Cause		Standard value in normalcy and references for troubleshooting		
	1	Model code signal fault (Internal failure)	★ Turn the starting switch in ON during the troubleshooting (monitoring).		
			Monitoring code	Item	Normal display
			00200	Controller model code	PC750-a
			If the display on the monitor panel is normal, troubleshoot Error Code [E217].		
	2	Monitor panel defective	If cause 1 is not detected, the monitor panel may be defective. (Since trouble is in the monitor panel, troubleshooting cannot be carried out.)		

Failure information	• When monitor switch is operated, nothing is displayed.	(6) When wiper switch is operated, wiper monitor is not displayed.
Relative information	• When the wiper does not operate either, conduct the troubleshooting for "Windshield wiper and window washer do not work".	

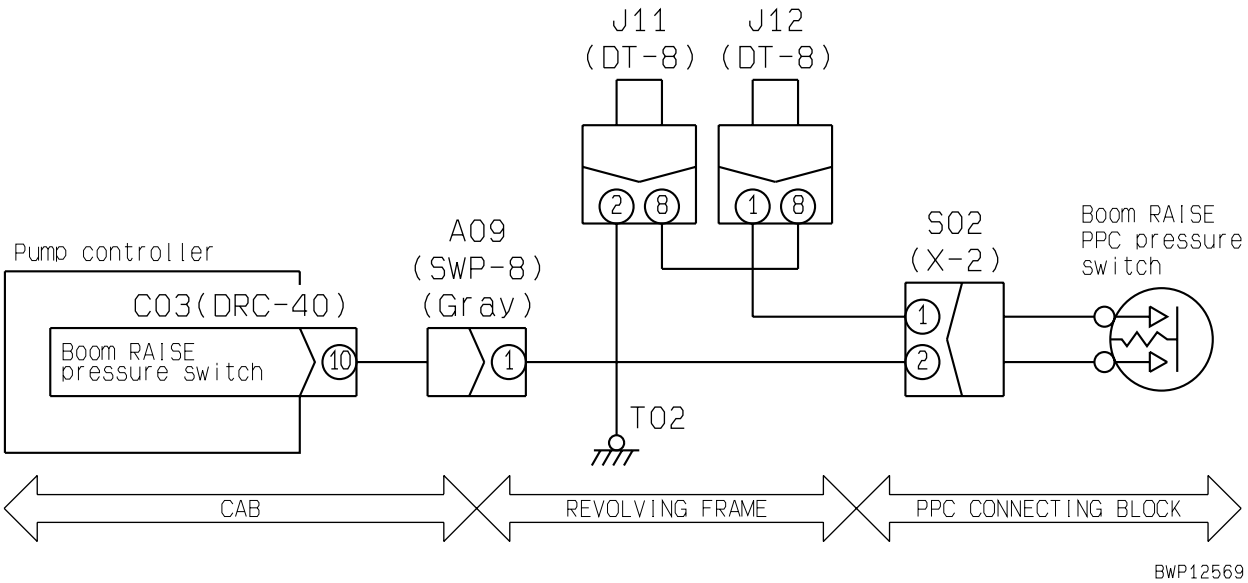
Presumed cause and standard value in normalcy	Cause		Standard value in normalcy and references for troubleshooting
	1	Monitor panel defective	As this is an internal failure, troubleshooting cannot be conducted.

E-19 "Boom RAISE" is not correctly displayed in monitor function

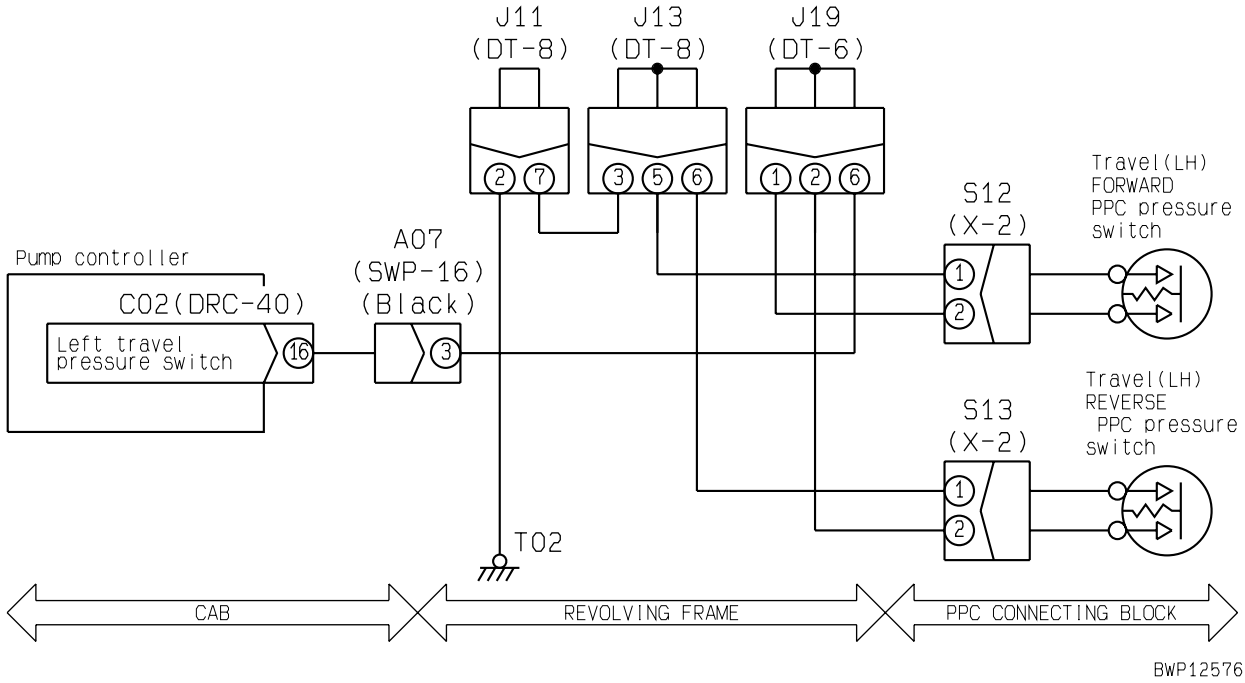
Failure information	• "Boom RAISE" is not correctly displayed in monitor function	"Boom RAISE" is not correctly displayed in the monitor function on the monitor panel.
Relative information	—	

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.			
			S02 (male)	R.H. work equipment control lever	Resistance value	
			Between (1) and (2)	NEUTRAL	Above 1 MΩ	
				Boom 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 S02 (female) (2)		Resistance value	Below 1 Ω
			Wiring harness between S02 (female) (1) to J12 to J11 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 S02 (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 S02 (female) (2) and grounding		Voltage	Below 1 V
	5	Pump controller defective	★ Turn the engine starting switch OFF for the preparations, and start the engine during the troubleshooting.			
			C03	R.H. work equipment control lever	Voltage	
			Between (10) and grounding	NEUTRAL	20 – 30 V	
				Boom RAISE	Below 1 V	

Electrical Circuit Diagram for Boom RAISE PPC Hydraulic Switch



Circuit diagram related to left travel forward PPC oil pressure switch and left travel reverse PPC oil pressure switch



Remedy A: Adjust
X: Repair or replace

No.	Diagnosis \ Remedy		Causes: No. 1 pump, Front pump: CO-NC valve defective	No. 1 pump, Front pump: Servo valve defective	No. 1 pump, Front pump: Pump unit defective	No. 1 pump, Rear pump: CO-NC valve defective	No. 1 pump, Rear pump: Servo valve defective	No. 1 pump, Rear pump: Pump unit defective	No. 2 pump, Front pump: Servo valve defective	No. 2 pump, Front pump: Pump unit defective	No. 2 pump, Rear pump: Servo valve defective	No. 2 pump, Rear pump: Pump unit defective	Left 5-spool valve: Main relief valve defective	Left 5-spool valve: Jet sensor defective	Right 4-spool valve: Main relief valve defective	Right 4-spool valve: Jet sensor defective	Left travel motor	Right travel motor
			A X	X	X	A X	X	X	X	X	X	X	A X	A X	A X	A X	X	X
1	Machine "deviates to left"	Machine "deviates to left" and work equipment speed and swing speed are low.	●	●	●				●	●			●	●				
2		Machine "deviates to left" and single swing speed is particularly low.	●	●	●				●	●				●				
3		Machine "deviates to left" and single swing speed is normal.															●	
4		Travel relief pressure of front pump circuit is low.											●					
5		When result of 4 is normal, exchange front and rear outlet hoses of No. 2 pump. Machine "deviates to left" (Deviation does not change).		●	●												●	
6		When result of 4 is normal, exchange front and rear outlet hoses of No. 2 pump. Machine "deviates to right" (Deviation changes).							●	●								
7		When result of 4 is normal, exchange front and rear outlet hoses of No. 2 pump. Speed of both travel motors is low.	●											●				
8		When phenomenon of 5 occurs, servo valve of No. 1 front pump is normal.			●													
9		When phenomenon of 6 occurs, servo valve of No. 2 front pump is normal.								●								
10		When phenomenon of 7 occurs, jet sensor differential pressure of left 5-spool valve is abnormal.												●				
11		When result of 10 is normal, No. 1 front NC valve output pressure is abnormal.	●															
12	Machine "deviates to right"	Machine "deviates to right" and work equipment speed is low.				●	●	●			●	●			●	●		
13		Machine "deviates to right" and bucket dump speed is particularly low.				●	●	●			●	●				●		
14		Machine "deviates to right" and bucket dump speed is normal.																●
15		Travel relief pressure of rear pump circuit is low.													●			
16		When result of 15 is normal, exchange front and rear outlet hoses of No. 2 pump. Machine "deviates to right" (Deviation does not change).					●	●										●
17		When result of 15 is normal, exchange front and rear outlet hoses of No. 2 pump. Machine "deviates to left" (Deviation changes).									●	●						
18		When result of 15 is normal, exchange front and rear outlet hoses of No. 2 pump. Speed of both travel motors is low.				●												
19		When phenomenon of 16 occurs, servo valve of No. 1 rear pump is normal.						●										
20		When phenomenon of 17 occurs, servo valve of No. 2 rear pump is normal.										●						
21		When phenomenon of 18 occurs, jet sensor differential pressure of right 4-spool valve is abnormal.														●		
22		When result of 18 is normal, No. 1 front NC valve output pressure is abnormal.				●												

H-6 Speed or power of arm is low

Failure Phenomenon	• Speed or power of arm is low
Related Information	• Check that the speeds of the other work equipment, travel, and swing are normal. (If they are abnormal, carry out the related troubleshooting.) • Check that the machine does not deviate. (If the machine deviates, carry out the related troubleshooting.) • Carry out all the troubleshooting in working mode A.

Presumed cause and standard value in normalcy		Cause	Standard value in normalcy and references for troubleshooting	
	1	Malfunction of left PPC valve (arm circuit)	★ Prepare with the engine stopped, then carry out troubleshooting with the engine at high idle.	
			L.H. work equipment control lever	PPC valve output pressure
			Arm IN, OUT Full stroke	Min. 2.74 MPa {Min. 28 kg/cm^2}
	2	Malfunction of arm control valve (spool)	Since the spool of the arm control valve (Lo, Hi) may have a malfunction, check it directly.	
	3	Malfunction of arm control valve (safety & suction valve)	The safety-suction valve of the arm control valve (Lo, Hi) may malfunction. Check it directly. (After checking the safety-suction valve by exchanging it with a valve of another work equipment circuit, be sure to return it since its set pressure is different from others.)	
	4	Defective arm control valve (body)	Since the body of the arm control valve (Lo, Hi) may have a malfunction, check it directly.	
	5	Defective seal of arm cylinder	★ Prepare with the engine stopped, then carry out troubleshooting with the engine at high idle.	
			L.H. work equipment control lever	Leakage from cylinder
			Relieved in arm IN position	Max. 20 cc/min

H-18 Machine deviates largely during compound operation

Failure Phenomenon	• Machine deviates largely during compound operation
Related Information	• Check that the machine does not deviate when the work equipment is not operated. (If the machine deviates under that condition, carry out the related troubleshooting.) • Carry out all the troubleshooting in working mode A.

Presumed cause and standard value in normalcy		Cause	Standard value in normalcy and references for troubleshooting	
	1	Malfunction of travel junction solenoid valve	Prepare with the engine stopped, then carry out troubleshooting with the engine at high idle.	
			Control levers	Solenoid valve outlet pressure
			All levers in neutral	0 MPa {0 kg/cm^2}
			Operation of work equipment or swing + Travel	Min. 2.74 MPa {Min. 28 kg/cm^2}
	2	Malfunction of travel junction valve	Since the travel junction valve of the travel control valve may have a malfunction, check it directly.	

H-19 Travel speed or power is low

Failure Phenomenon	• Travel speed or power is low
Related Information	• Check that the machine does not deviate. (If the machine deviates, carry out the related troubleshooting.) • Carry out all the troubleshooting in working mode A.

Presumed cause and standard value in normalcy		Cause	Standard value in normalcy and references for troubleshooting	
	1	Malfunction of travel PPC valve	★ Keep the engine stopped for the preparations, and run it at high idle during troubleshooting.	
			Travel lever	PPC valve output pressure
			Forward/Reverse stroke end	Min. 2.74 MPa {Min. 28 kg/cm^2}
	2	Malfunction of CO cancel solenoid valve	★ Keep the engine stopped for the preparations, and run it at high idle during troubleshooting.	
			Travel lever	Solenoid valve outlet pressure
			Neutral	0 MPa {0 kg/cm^2}
			Operated	Min. 2.74 MPa {Min. 28 kg/cm^2}
	3	Malfunction of 2-stage relief solenoid valve	★ Keep the engine stopped for the preparations, and run it at high idle during troubleshooting.	
			Travel lever	Solenoid valve outlet pressure
			Neutral	0 MPa {0 kg/cm^2}
			Operated	Min. 2.74 MPa {Min. 28 kg/cm^2}
	4	Wrong adjustment or malfunction of main relief valve	★ Keep the engine stopped for the preparations, and run it at high idle during troubleshooting.	
			Travel lever	Travel relief pressure
			Either side relieved	$34.3^{+1.0}_{-2.0}$ MPa {350^{+10}_{-20} kg/cm^2}
			If the main relief valve is still abnormal after adjustment, its operation (on the high pressure set side) may be defective. Check it directly.	

H-28 Hydraulic drift of swing is large

Failure Phenomenon	• Hydraulic drift of swing is large	(1) While the swing holding brake is applied.
Related Information		

Presumed cause and standard value in normalcy	Cause		Standard value in normalcy and references for troubleshooting	
	1	Malfunction of swing holding brake solenoid valve	★ Keep the engine stopped for the preparations, and run it at high idle during troubleshooting.	
			Left work equipment control lever	Solenoid valve outlet pressure
			Neutral (After 5 seconds or more)	0 MPa {0 kg/cm^2}
			Operated to swing (in either direction)	Min. 2.74 MPa {Min. 28 kg/cm^2}
	2	Malfunction of swing motor (parking brake)	The parking brake of the swing motor may malfunction. Check it directly.	

Failure Phenomenon	• Hydraulic drift of swing is large	(2) While the swing holding brake is released.
Related Information		

Presumed cause and standard value in normalcy	Cause		Standard value in normalcy and references for troubleshooting
	1	Malfunction of swing control valve (spool)	The spool of the swing control valve may malfunction. Check it directly.
	2	Malfunction of swing control valve (suction valve)	The suction valve of the swing control valve may malfunction. Check it directly.
	3	Malfunction of swing motor (safety valve)	The safety valve of the swing motor may malfunction. Check it directly.
	4	Malfunction of swing motor (suction valve)	The suction valve of the swing motor may malfunction. Check it directly.
	5	Malfunction of swing motor (check valve)	The check valve of the swing motor may malfunction. Check it directly.

c) Exhaust smoke comes out but engine does not start (Fuel is being injected)

General causes why exhaust smoke comes out but engine does not start

- Lack of rotating force due to defective electrical system
- Insufficient supply of fuel
- Insufficient intake of air
- Improper selection of fuel

			Causes												
			Clogged air cleaner element	Defective, broken dynamic valve system (valve, rocker lever, etc.)	Worn piston ring, cylinder liner	Improper fuel used	Clogged air breather hole in fuel tank cap	Leakage, clogging, air in fuel system	Clogged fuel filter, strainer	Clogged fuel feed pump strainer	Stuck, seized fuel supply pump plunger	Clogged injector, defective spray	Defective or deteriorated battery	Defective low-temperature coolant temperature sensor disconnection	Defective intake air heater system
Questions	Confirm recent repair history														
	Degree of use of machine	Operated for long period			△				△	△		△			
	Suddenly failed to start			◎							◎			○	
	Non-specified fuel is being used										○	○			
	Replacement of filters has not been carried out according to Operation Manual		◎						◎	◎					
	Engine oil must be added more frequently				◎										
	Preheating indicator lamp does not light up during preheating														◎
	Dust indicator lamp is red		◎												
	Air breather hole in fuel tank cap is clogged						○								
	Rust and water are found when fuel tank is drained								◎	◎					
	When fuel filter is removed, there is no fuel in filter					◎									
	There is leakage from fuel piping							◎							
	When fuel priming pump is operated, there is no response, or operation is too heavy							◎	○	○					
	Starting motor cranks engine slowly												◎		
	When engine is cranked, abnormal noise is heard from around cylinder head			◎											
Check items	When engine is cranked with starting motor,	No fuel comes out even when fuel filter air bleed plug is removed				○			◎	◎					
		When hose at collection portion for spill flow from fuel injector is disconnected, spill flow is small (See code "E97B".)									◎				
	When exhaust manifold is touched immediately after starting engine, temperature of some cylinders is low											◎			
Troubleshooting	Check air cleaner element directly		●												
	Remove head cover and check directly			●											
	When compression pressure is measured, it is found to be low				●										
	When air is bled from fuel line, air comes out							●							
	Check fuel filter, strainer directly								●						
	Check fuel feed pump strainer directly									●					
	Carry out troubleshooting for codes "E97B" and "E97C".										●				
	Spray condition is poor when fuel injector is tested as individual part											●			
	When specific gravity of electrolyte or voltage of battery is measured, it is found to be low												●		
	Defective water temperature gauge display on machine													●	
	Intake air heater mount does not become warm during preheating														●
		Remedy	Clean	Replace	Replace	Replace	Clean	Correct	Clean	Clean	Replace	Clean	Replace	Replace	Replace

S-12 Oil pressure caution lamp lights up (drop in oil pressure)

General causes why oil pressure drops
- Leakage, clogging, wear of lubricating system
- Defective oil pressure control
- Improper oil used (improper viscosity)
- Deterioration of oil due to overheating

			Causes										
			Worn bearing, journal	Lack of oil in oil pan	Water, fuel in oil	Clogged strainer inside oil pan	Clogged, broken pipe inside oil pan	Defective oil pump	Defective oil pump relief valve	Clogged oil filter	Leaking, crushed, clogged hydraulic piping	Defective oil pressure sensor	Defective oil level sensor
Questions	Confirm recent repair history												
	Degree of use of machine	Operated for long period	△					△		△			
	Oil pressure caution lamp lights up								○	◎			
	Non-specified oil is being used		○							○			
	Replacement of filters has not been carried out according to Operation Manual									◎			
	Condition when oil pressure lamp lights up	Lights up at low idle	◎						○				
		Lights up at low idling and high idle		○		◎	◎	◎	○				
		Lights up on slopes		◎									
		Sometimes lights up							◎			○	○
	Oil level caution lamp lights up			◎									◎
	Oil level in oil pan is low			◎									
Check items	There is crushing, external leakage from hydraulic piping										◎		
	Oil is cloudy white or smells of diesel oil				◎								
	Metal particles are found when oil is drained		◎										
	Metal particles are found when oil inside oil filter is drained		◎					○					
Troubleshooting	Metal particles are found in oil filter		●		See S-13.								
	Check oil pan strainer pipe directly					●	●						
	Oil pump rotation is heavy, there is play							●					
	Deterioration, damage of valve, spring in oil pump relief valve								●				
	Check oil filter directly									●			
	Carry out troubleshooting for code "E936".											●	
	When oil level sensor is replaced, oil pressure caution lamp goes out												●
		Remedy	Clean	Add	—	Clean	Clean	Replace	Adjust	Clean	Correct	Replace	Replace

PRECAUTIONS WHEN CARRYING OUT OPERATION

[When carrying out removal or installation (disassembly or assembly) of units, be sure to follow the general precautions given below when carrying out the operation.]

1. Precautions when carrying out removal work

- If the coolant contains antifreeze, dispose of it correctly.
- After disconnecting hoses or tubes, cover them or fit blind plugs to prevent dirt or dust from entering.
- When draining oil, prepare a container of adequate size to catch the oil.
- Confirm the match marks showing the installation position, and make match marks in the necessary places before removal to prevent any mistake when assembling.
- To prevent any excessive force from being applied to the wiring, always hold the connectors when disconnecting the connectors. Do not pull the wires.
- Fit wires and hoses with tags to show their installation position to prevent any mistake when installing.
- Check the number and thickness of the shims, and keep in a safe place.
- When raising components, be sure to use lifting equipment of ample strength.
- When using forcing screws to remove any components, tighten the forcing screws uniformly in turn.
- Before removing any unit, clean the surrounding area and fit a cover to prevent any dust or dirt from entering after removal.

★ Precautions when handling piping during disassembly

Fit the following blind plugs into the piping after disconnecting it during disassembly operations.

1) Face seal type hoses and tubes

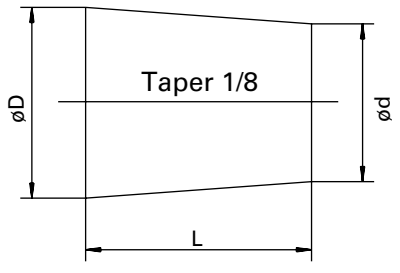
Nominal number	Plug (nut end)	Nut (elbow end)
02	07376-70210	02789-00210
03	07376-70315	02789-00315
04	07376-70422	02789-00422
05	07376-70522	02789-00522
06	07376-70628	02789-00628

2) Split flange type hoses and tubes

Nominal number	Flange (hose end)	Sleeve head (tube end)	Split flange
04	07379-00400	07378-10400	07371-30400
05	07379-00500	07378-10500	07371-30500

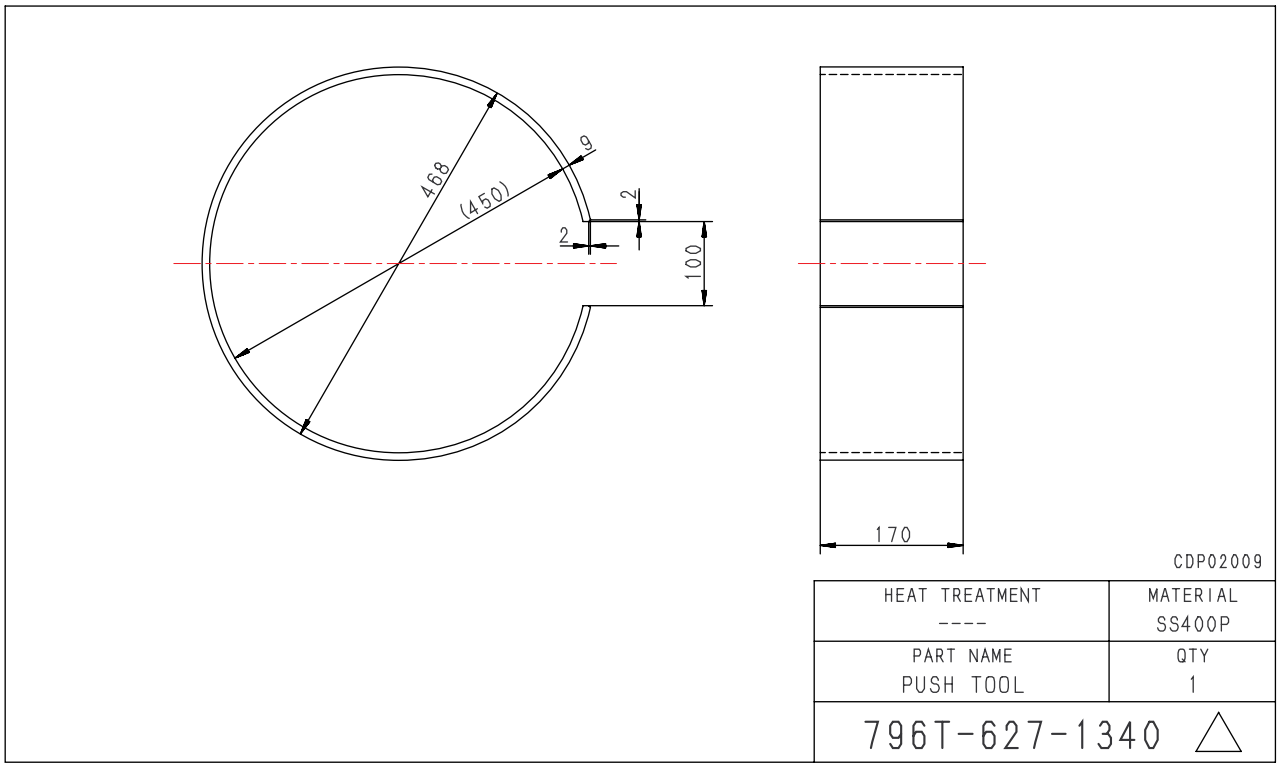
3) If the part is not under hydraulic pressure, the following corks can be used.

Nominal number	Part Number	Dimensions		
		D	d	L
06	07049-00608	6	5	8
08	07049-00811	8	6.5	11
10	07049-01012	10	8.5	12
12	07049-01215	12	10	15
14	07049-01418	14	11.5	18
16	07049-01620	16	13.5	20
18	07049-01822	18	15	22
20	07049-02025	20	17	25
22	07049-02228	22	18.5	28
24	07049-02430	24	20	30
27	07049-02734	27	22.5	34

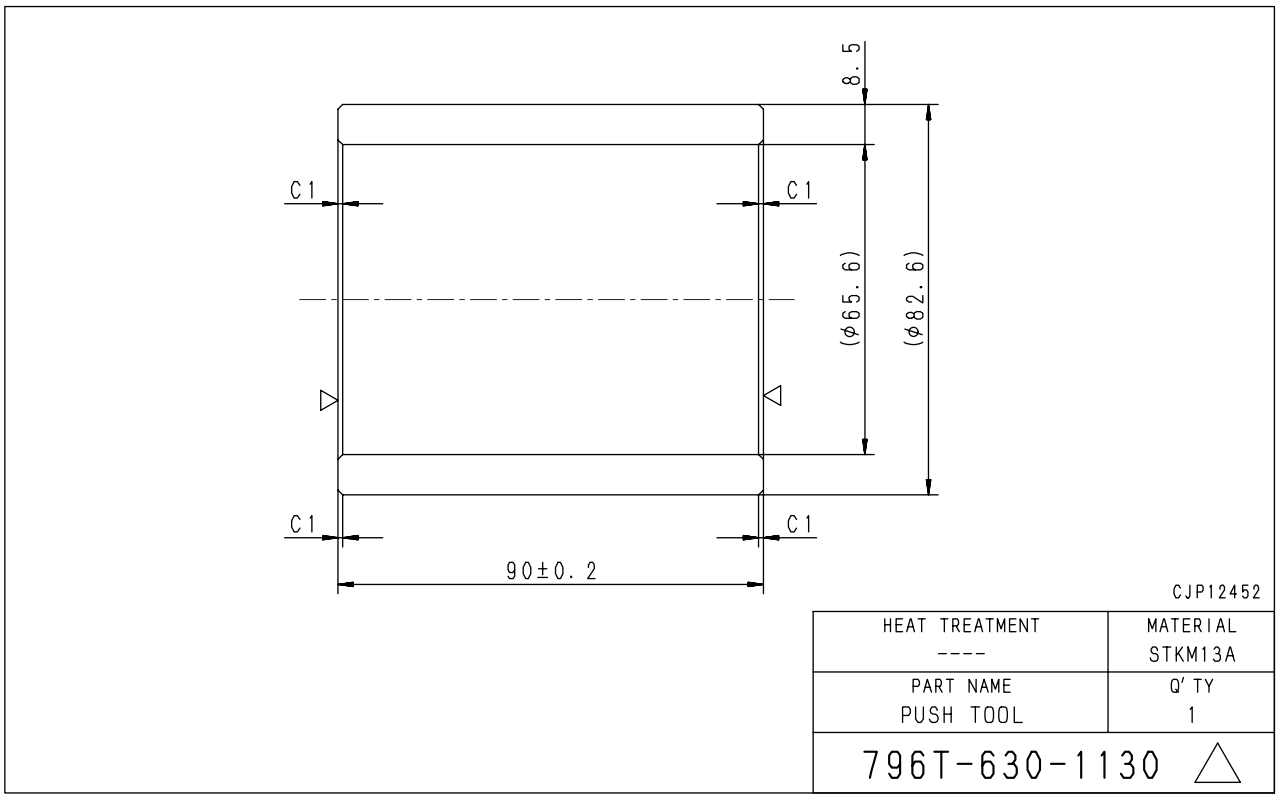


DEW00401

J3 Push tool



L4 Push tool



REMOVAL AND INSTALLATION OF ENGINE FRONT SEAL

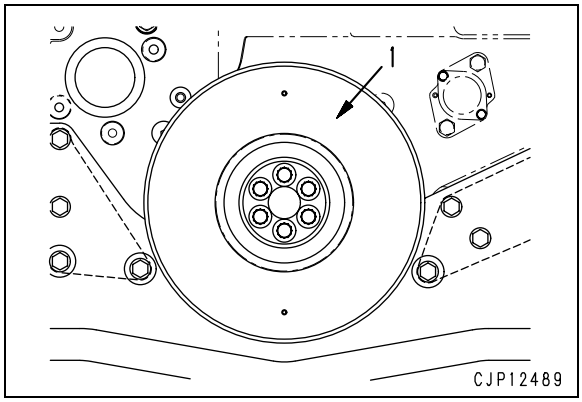
SPECIAL TOOLS

Symbol	Part No.	Part Name	Necessity	Q'ty	New/remodel	Sketch
C	795-521-1110	Push tool	■	1		
	790-101-5221	Grip	■	1		
	01010-51225	Bolt	■	1		
	01010-31640	Bolt	■	3		

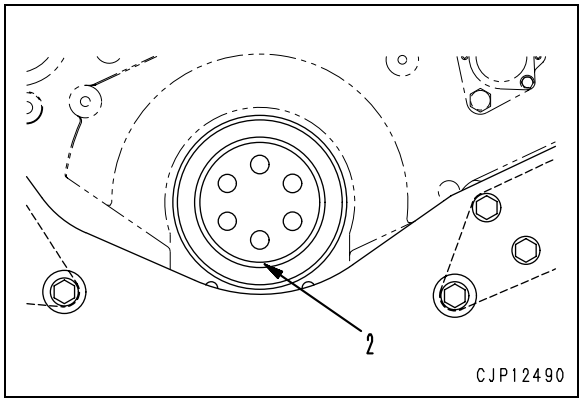
REMOVAL

1. Removal the radiator and oil cooler assembly. For details, see REMOVAL OF RADIATOR AND OIL COOLER ASSEMBLY.

2. Remove damper (1).



3. Remove front seal (2).



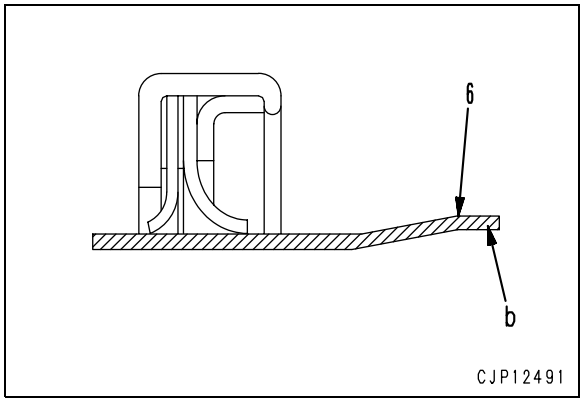
INSTALLATION

1. Installation of front seal (2)

★ Before assembling the seal, check that there are no scratches, burrs, flashes, or rust on the housing, lip sliding surface, or at the corner of the end face of the crankshaft.

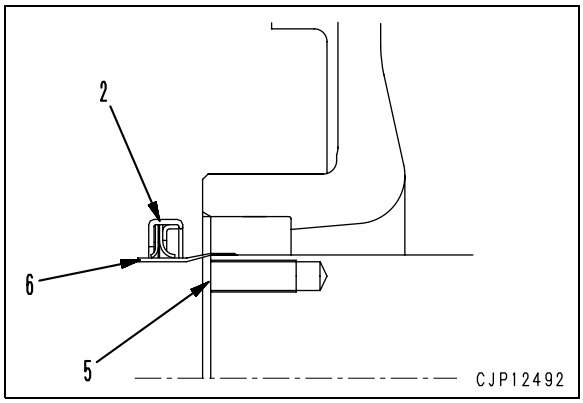
★ When assembling the seal, do not coat the shaft and seal lip with oil or grease. Wipe off all oil from the shaft.

★ Do not remove internal plastic tube (6) from the standard seal until the seal is assembled.



1) Put large inside diameter (b) end of internal plastic tube (6) in contact with end of crankshaft (5).

★ Be particularly careful to assemble facing in the correct direction.



※ 8 ※10

- Assembly procedure for common rail injection pipe (Between common rail and injector)

1. Install high-pressure pipe (61).

Sleeve nut: **39.2 – 49 Nm {4 – 5 kgm}**

★ Precautions for installing sleeve nut on injector side

1) Insert the sleeve nut in the head hole from outside.

★ Check that the O-rings are fitted to both injector side and sleeve nut side.

2) After sleeve nut catches the threads of the injector, turn it 2 turns with fingers, then tighten it with a spanner.

★ Control the tightening torque with a torque wrench of spanner type.

Sleeve nut: **39.2 – 49 Nm {4 – 5 kgm}**

★ If the sleeve nut does not catch the threads, push its end with a small spanner and turn its hexagonal part with the torque wrench.

★ After tightening the sleeve nut, check that the O-ring is not projected from the sleeve nut end.

2. Tighten the stay and upper and lower clamps of high-pressure pipe clamp (57) with fingers.

3. Tighten upper and lower clamps (57) securely.

★ Bend the rubber first.

Clamp bolt: **9.8 ± 1 Nm {1 ± 0.1 kgm}**

4. Tighten the stay securely.

5. Tighten the stay and upper and lower clamps of high-pressure pipe side clamp (57) with fingers.

6. Install high-pressure pipe clamp (66) and gate frame (67) temporarily.

1) Tighten high-pressure pipe clamp (66) securely first.

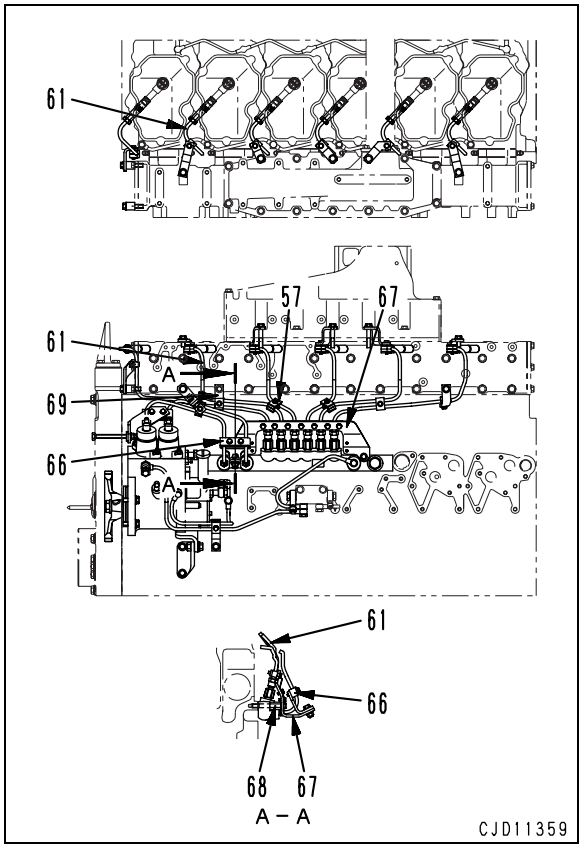
2) Install gate frame (67) to special bolt (68) securely.

Clamp bolt: **9.8 ± 1 Nm {1 ± 0.1 kgm}**

7. Tighten high-pressure pipe side clamp (57) securely.

Clamp bolt: **9.8 ± 1 Nm {1 ± 0.1 kgm}**

8. Tighten stay (69) securely



※ 9

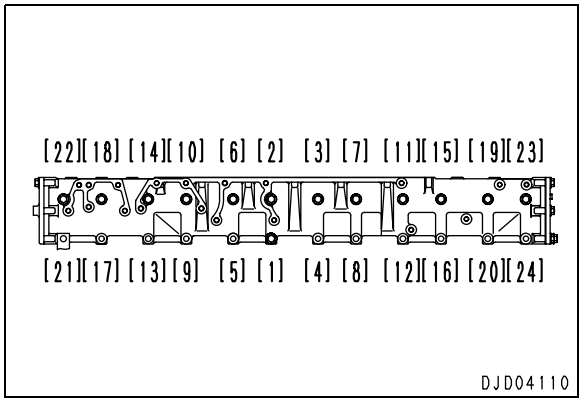
- Procedure for mounting air intake manifold assembly

1) Install the gaskets to both sides of the electrical intake air heater.

2) Install the wiring harness to the electrical intake air heater and make them one with the air intake manifold.

3) Tighten the mounting bolts of the air intake manifold assembly in order from [1] to [24] as shown below.

Mounting bolt of air intake manifold assembly: **59 – 74 Nm {6 – 7.5 kgm}**

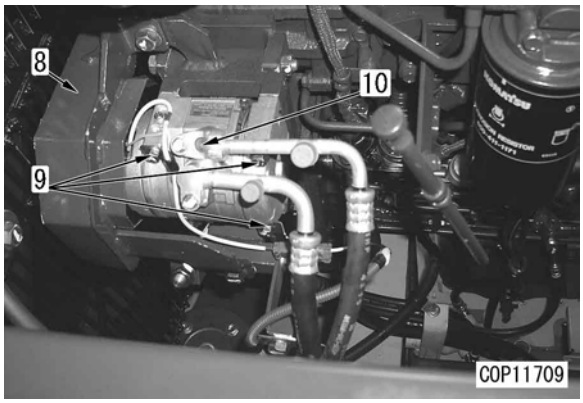


Engine Left Side

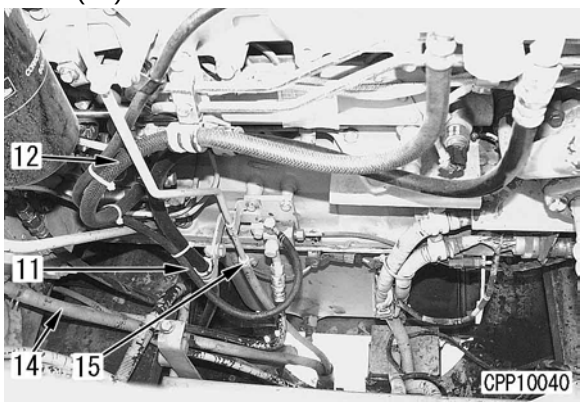
8. Remove the air compressor cover (8) and loosen the belt adjustment bolt to remove the belt.

9. Loosen 4 pieces of the compressor mounting bolt (9), remove the compressor (10) and place it on the control valve side.

10. Disconnect the aftercooler hose.

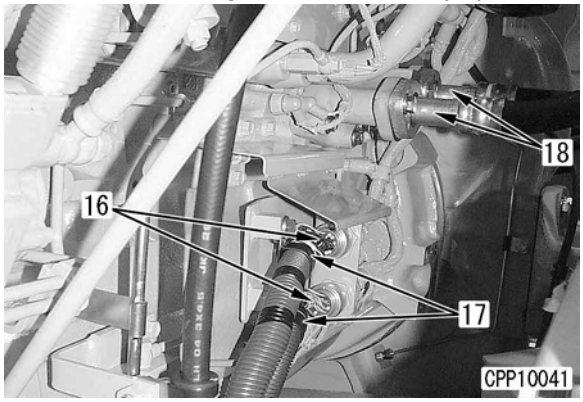


11. Remove the fuel cooler hose (11), the fuel hose (12), the hose clamp (13), the engine breather hose (14) and the clamp of the muffler drain hose (15).

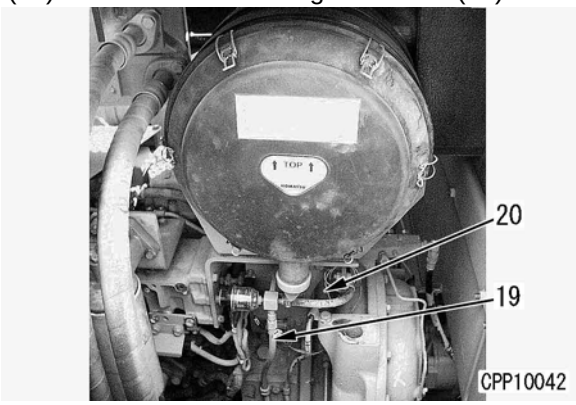


12. Remove the wiring connector (16) and the wiring clamp (17).

13. Disconnect the engine oil filter hose (18).



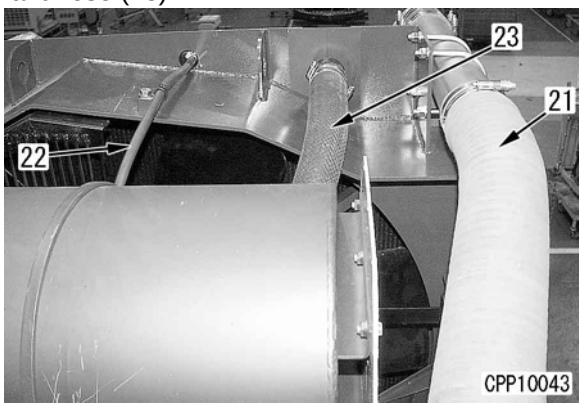
14. Disconnect the air cleaner dust indicator hose (19) and remove the wiring connector (20).



Engine Right Side

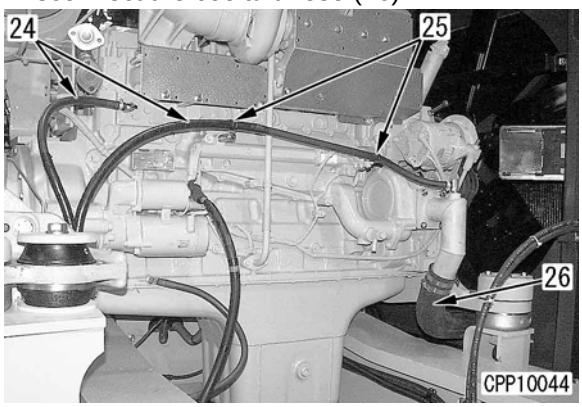
15. Disconnect the aftercooler hose (21).

16. Disconnect the aeration hose (22) and the coolant hose (23).

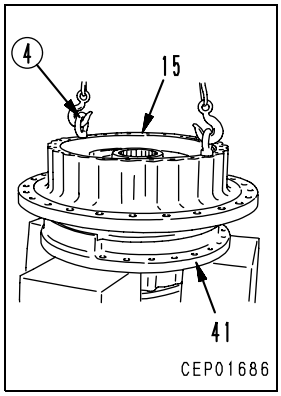


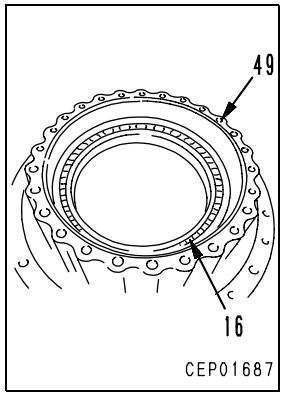
17. Disconnect the car heater hose (24) and the hose clamp (25).

18. Disconnect the coolant hose (26).



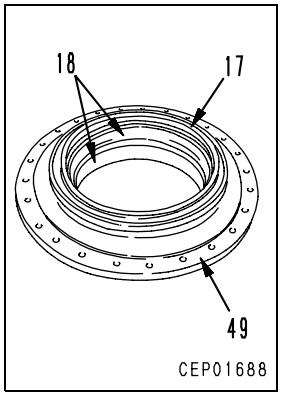
3) Using eyebolts ④, remove hub assembly (15) together with bearing (16) from shaft (41).
4) Remove bearing (16) from hub (49).

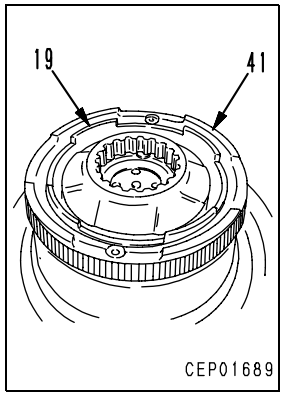




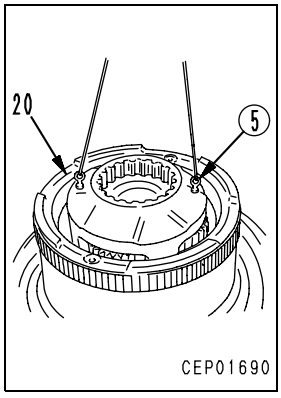
5) Remove floating seal (17) from hub (49).
★ If the seal is to be used again, be careful not to damage the contact surface, and keep in a safe place.
6) Remove outer races (18).

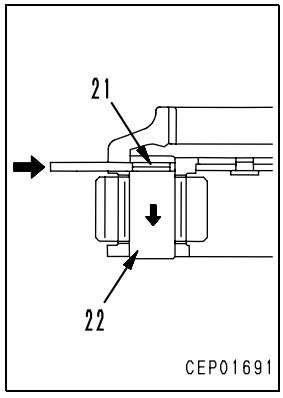
8. Spacer
Remove spacer (19) from shaft (41).



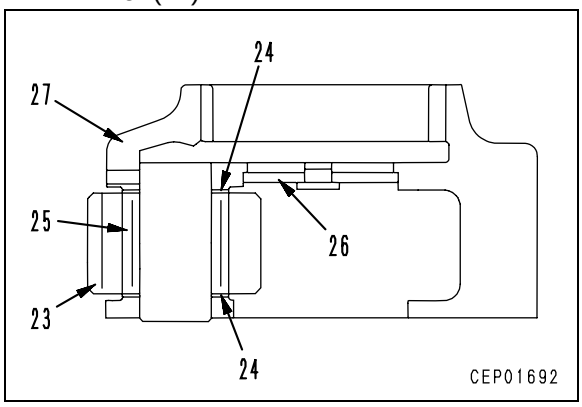


9. No. 2 carrier assembly
1) Using eyebolts ⑤, remove No. 2 carrier assembly (20).
2) Disassemble No. 2 carrier assembly as follows.
   i) Knock pin (21) into shaft (22).
   ii) Push shaft (22) from pin side to remove.
   ★ Remove the pin from the shaft.





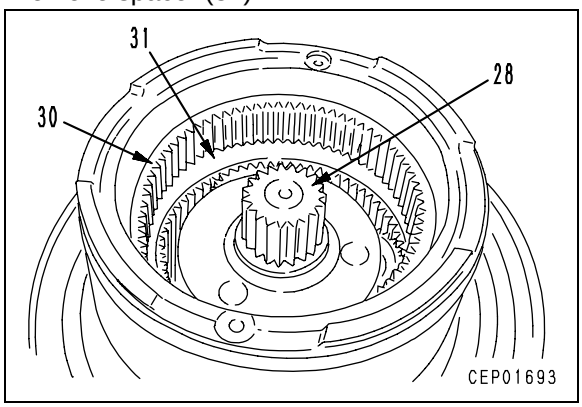
iii) Pull out gear (23) from carrier (27), and remove thrust washer (24) and bearing (25).
iv) Remove thrust assembly (26) from carrier (27).



10. No. 2 sun gear
Remove No. 2 sun gear (28).

11. No. 2 ring gear
Remove No. 2 ring gear (30).

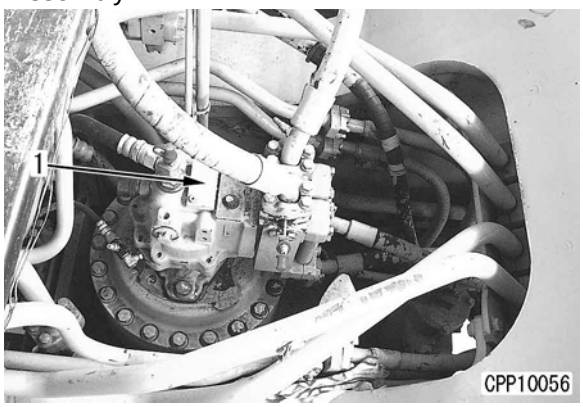
12. Spacer
Remove spacer (31).



REMOVAL AND INSTALLATION OF SWING MACHINERY ASSEMBLY

REMOVAL

1. Remove the swing motor assembly (1) referring to the paragraph of "Removal of Swing Motor Assembly".

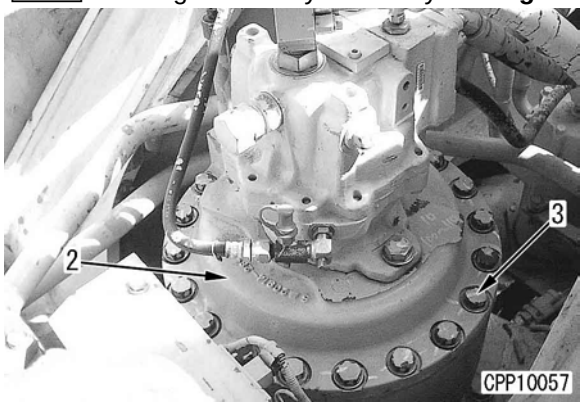


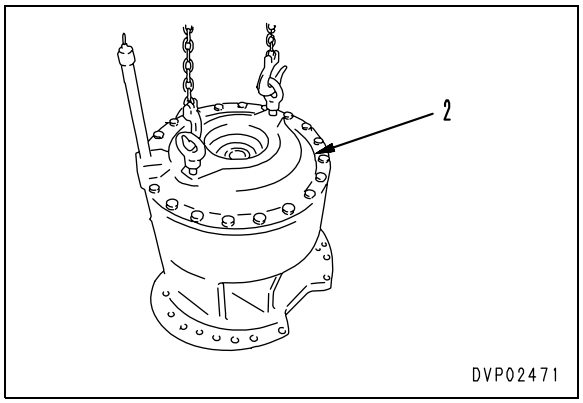
2. Drain oil from the swing machinery.

Oil in case: **Approx. 24.5 ℓ x 2**

3. Lift the swing machinery assembly (2) temporarily, loosen the mounting bolt (3), screw in the forcing screw, pull out the faucet joint portion and remove the assembly.

Swing machinery assembly: **510 kg x 2**





INSTALLATION

- To install this assembly, reverse the removing procedures.

  Mounting bolt:
  926.7 ± 102.9 Nm {94.5 ± 10.5 kgm}

- **Oil Filling**

  ★ Fill oil up to the specified level through the oil filler port.

  Oil amount in swing machinery case: **Approx. 30 ℓ x 2**

INSTALLATION

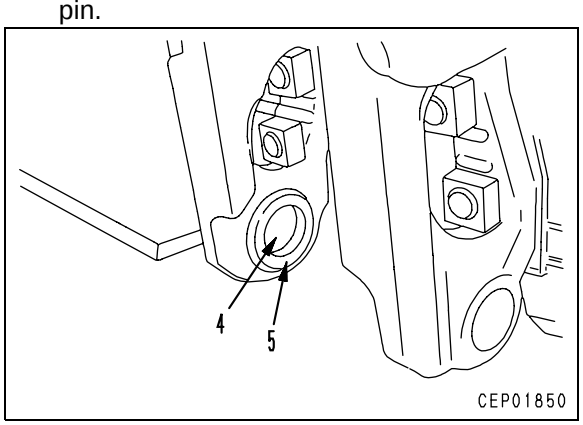
- Carry out installation in the reverse order to removal.

※ 1

★ Adjust the track shoe tension.
For details, see TESTING AND ADJUSTING, Adjusting track shoe tension.
Lubricator:
73.5 ± 14.7 Nm {7.5 ± 1.5 kgm}

※ 2

★ Assemble spacer (4) and washer (5) to the link, connect to bottom link, then install guide pin.



REMOVAL AND INSTALLATION OF RECOIL SPRING ASSEMBLY

REMOVAL

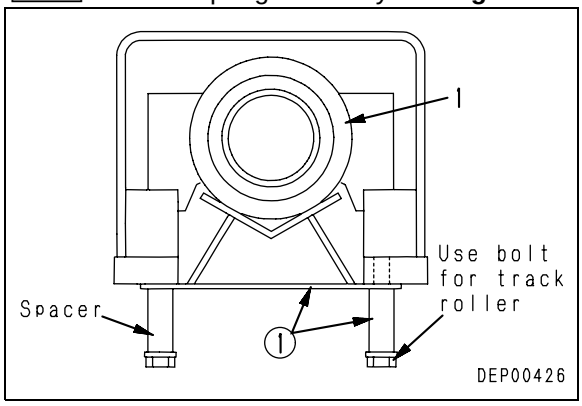
★ The coil portion of the recoil spring assembly is hooked on the rib inside the track frame, so prepare a special tool for disassembly.

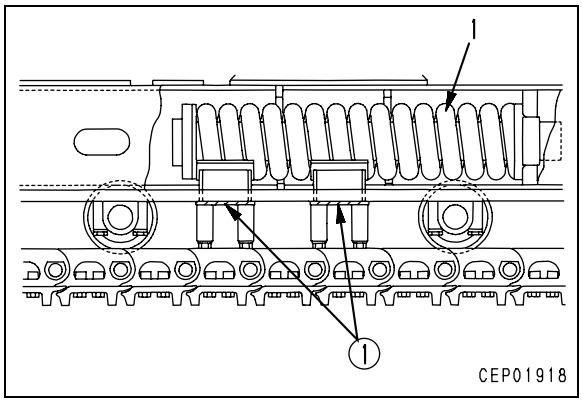
1. Remove track shoe assembly.
For details, see REMOVAL OF TRACK SHOE ASSEMBLY.

2. Remove idler assembly.
For details, see REMOVAL OF IDLER ASSEMBLY.

3. Recoil spring assembly
1) Remove No. 2 and No. 3 track roller assemblies. For details, see REMOVAL OF TRACK ROLLER ASSEMBLY.
2) After removing track roller assembly, install tool ①.
   ★ When making tool ①, see Fig. 1.
   ★ Lower the track frame on top of the track shoe.
3) Using eyebolts (Thread dia. = 16 mm, Pitch = 2.0 mm), pull out recoil spring assembly (1) and lift off.

Recoil spring assembly: **250 kg**





INSTALLATION

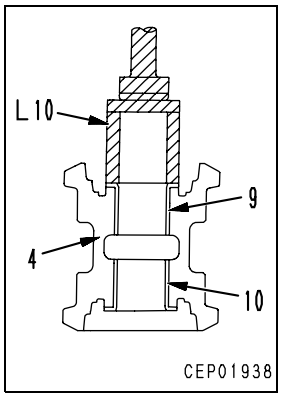
• Carry out installation in the reverse order to removal.
   ★ To check that the spring is securely fitted inside the track frame, check through the side hole on the inside (at the 5th track roller from the front).

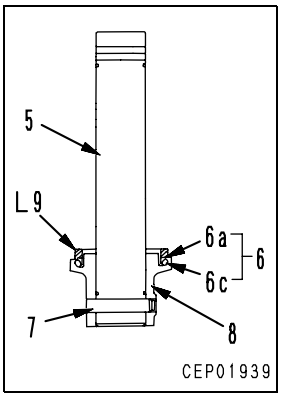
ASSEMBLY

1. Using tool **L10**, press fit bushings (9) and (10) to roller (4).

2. Assemble collar (8) to shaft (5), and install pin (7).

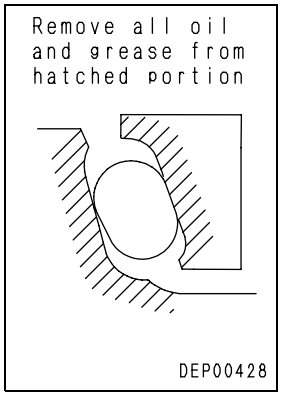
3. Using tool **L9**, install floating seal (6) to shaft (5).

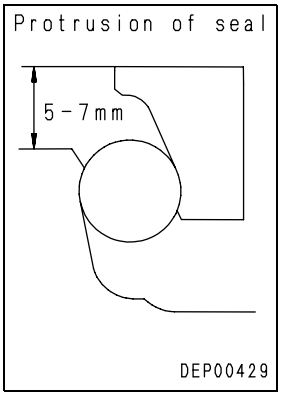




★ When assembling the floating seal, clean the contact surface of O-ring (6c) and floating seal (6a), remove all grease and oil, and dry it. Make sure that no dirt or dust sticks to the contact surface of the floating seal.

★ After inserting the floating seal, check that the angle of the seal is less than 1 mm and that the protrusion of the seal is within a range of 5 – 7 mm.

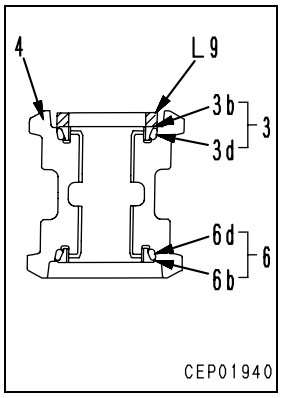


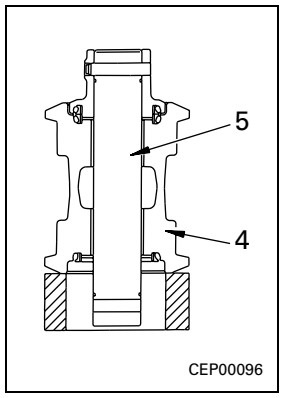


4. Using tool **L9**, install floating seals (6) and (3) to roller (4).

★ For details of the precautions when installing floating seals (6b) and (6d), and (3b) and (3d), see the precautions marked ★ for Step 3.

5. Assemble shaft (5) to roller (4).

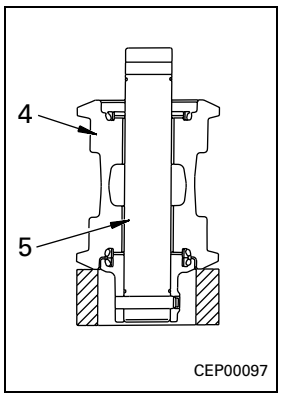


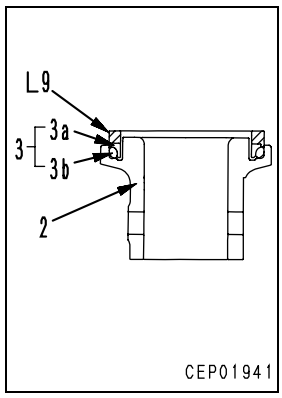


6. Turn over roller (4) and shaft (5) assembly.

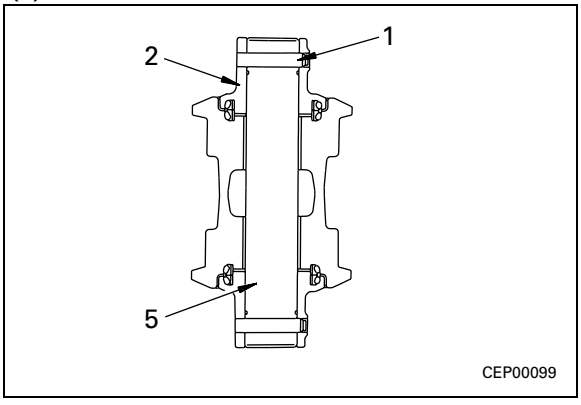
7. Using tool **L9**, install floating seal (3) to collar (2).

★ For details of the precautions when installing floating seals (3a) and (3c), see the precautions marked ★ for Step 3.





8. Assemble collar (2) to shaft (5), and install pin (1).



DISASSEMBLY AND ASSEMBLY OF MAIN RELIEF VALVE ASSEMBLY

DISASSEMBLY

1. Remove sleeve assembly (1) from sleeve (2).

2. Remove springs (3) and (4), pistons (5) and (6), and sleeve (7).

3. Disassembly of sleeve assembly (1)
- ★ Do not disassemble except when replacing parts. Measure the protrusion of sleeves (9) and (12) when disassembling.
- ★ Loosen locknut (8), and remove sleeve (9) and piston (10).
- ★ Loosen locknut (11), and remove sleeve (12), spring (13), and piston (14) from sleeve (15).

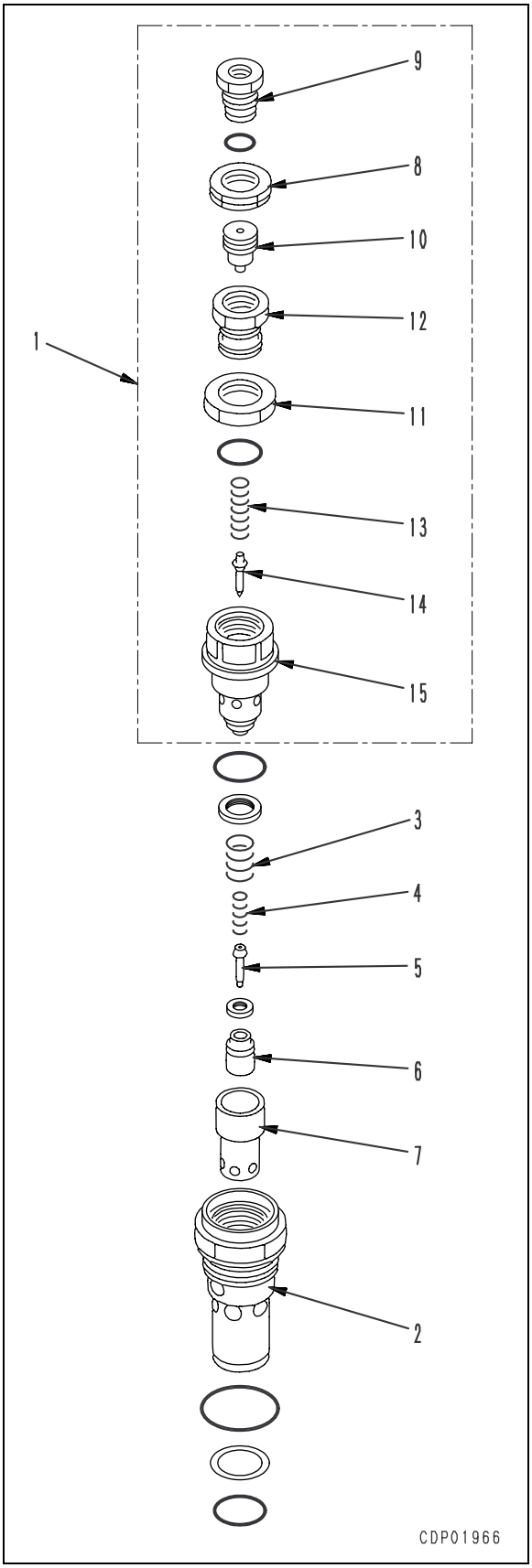
ASSEMBLY

1. Assembly of sleeve assembly (1)
- ★ Set sleeves (12) and (9) to the protrusion measured when disassembling. After installing to the control valve, adjust the relief pressure.
  For details, see TESTING AND ADJUSTING.

1) Assemble piston (14) and spring (13) to sleeve (15), then screw in sleeve (12) and tighten locknut (11).
   Locknut: **107.8 ± 14.7 Nm {11 ± 1.5 kgm}**
2) Assemble piston (10) and sleeve (9) to sleeve (12), and tighten locknut (8).
   Locknut: **85.75 ± 7.35 Nm {8.75 ± 0.75 kgm}**

2. Assemble sleeve (7), pistons (6) and (5), and springs (4) and (3) to sleeve (2).

3. Install sleeve assembly (1).
Sleeve: **186.2 ± 9.8 Nm {19 ± 1 kgm}**



REMOVAL AND INSTALLATION OF SWING MOTOR ASSEMBLY

REMOVAL

⚠ Lower the work equipment to touch the ground completely and stop the engine.

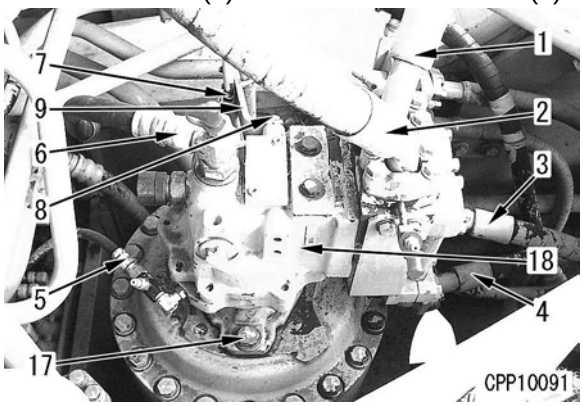
⚠ 1) Referring to the section "Releasing the remaining pressure from the hydraulic circuit on PPC valve installed machines" in the "Testing and adjusting", release the remaining pressure from the hydraulic circuit.
2) Slowly loosen the cap of the hydraulic oil tank to release the inside pressure of the hydraulic oil tank.

★ **Center side of the machine body**

1. Separate the hoses (1) and (2) from the control valve and separate the hoses (3) and (4) to the swing motor positioned in the front section of the machine body.

2. Separate the swing holding brake hose (5) and the drain hose (6).

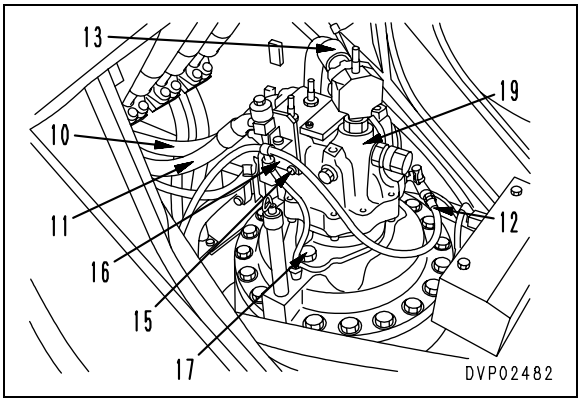
3. Remove the U-bolt (7) of the oil gauge tube, remove the bolt (8) and remove the bracket (9).



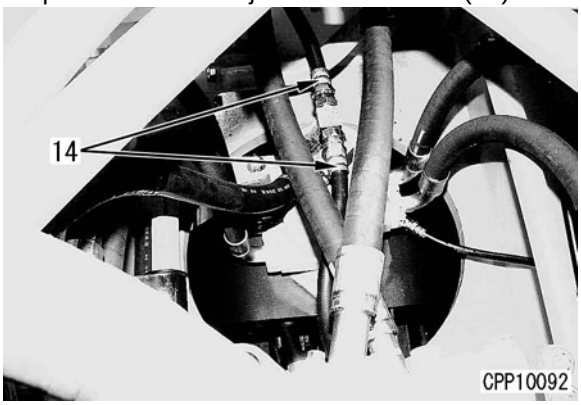
★ **Front side of the machine body**

1. Separate the hoses (10) and (11) from the swing motor positioned in the central section of the machine body.

2. Separate the swing holding brake hose (12) and the drain hose (13).



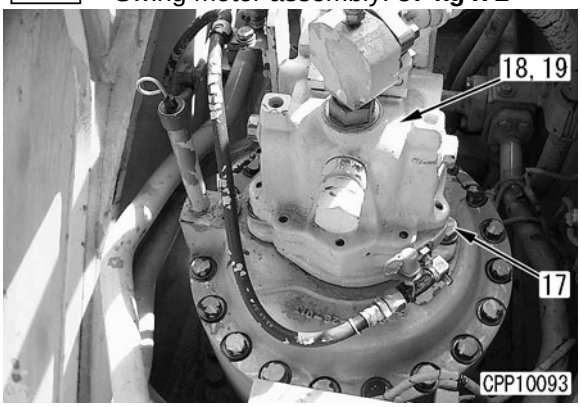
3. Separate the swivel joint section hose (14).



4. Remove the bolt (15) and remove the bracket (16).

5. Loosen the 4 pcs. of the bolt (17) and remove the swing motor assembly (18)/(19).

Swing motor assembly: **57 kg x 2**



REMOVAL AND INSTALLATION OF BUCKET CYLINDER ASSEMBLY

BACK HOE

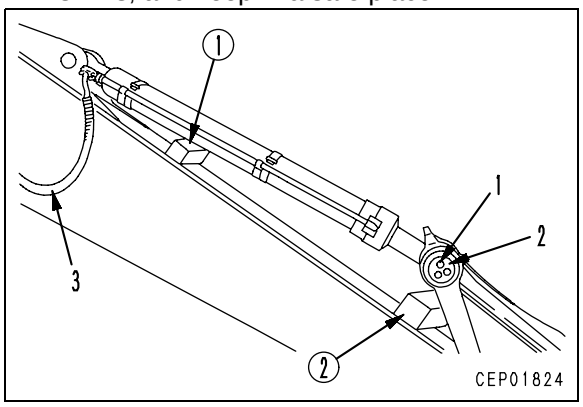
REMOVAL

⚠ Retract the arm and bucket cylinder piston rods, lower the work equipment completely to the ground, then set the lock lever to the LOCK position.

1. Set block ① between bucket cylinder and arm, and block ② between link and arm.

2. Remove 3 pin lock bolts (1) and cover (2), then using forcing screws, pull out. ※1

★ Check the number and thickness of the shims, and keep in a safe place.



3. Start engine, and retract piston rod, then tie piston rod with wire to prevent it from coming out.

⚠ Stop the engine and release the remaining pressure in the circuit. For details, see TESTING AND ADJUSTING, Releasing pressure in hydraulic circuit.

4. Disconnect 2 hoses (3).

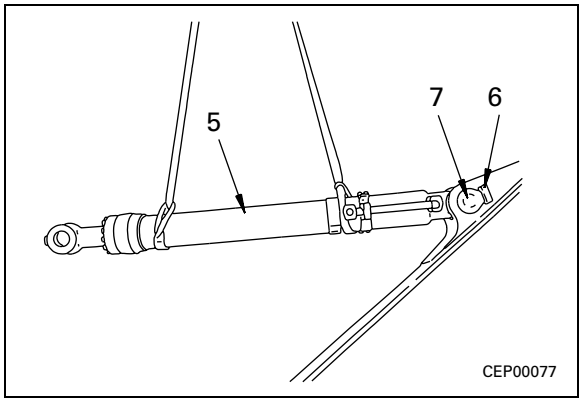
★ Fit plugs in the hoses to prevent dust or dirt from entering.

5. Sling bucket cylinder assembly (5), then remove plate (6) and pull out pin (7). ※2

★ There are shims installed, so check the number, thickness, and position, and keep in a safe place.

6. Remove bucket cylinder assembly (5).

Bucket cylinder assembly:
550 kg (PC750)
980 kg (PC750SE, PC800SE)
600 kg (PC800)



INSTALLATION

• Carry out installation in the reverse order to removal.

※1

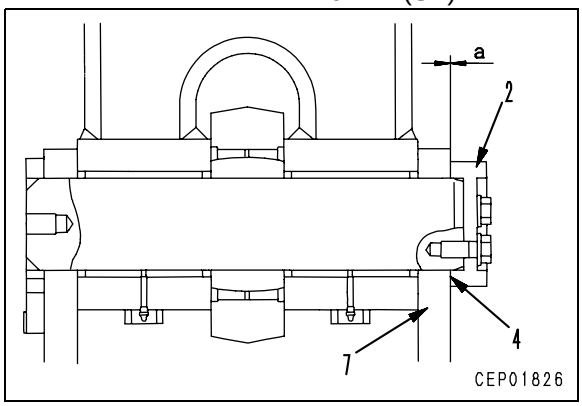
Inside surface of bushing when assembling pin: **Anti-friction compound (LM-P)**

Grease after assembling pin: **Grease (LM-G)**

⚠ When aligning the position of the pin hole, never insert your fingers in the hole.

★ Adjust with shims (4) so that the clearance **a** between link (7) and cover (2) is less than 1 mm.

• Shim thickness: 0.8 mm (STD)
1.0 mm (SE)



REMOVAL AND INSTALLATION OF BOOM CYLINDER ASSEMBLY
LOADING SHOVEL

REMOVAL

⚠ Extend the arm and bucket fully, lower the work equipment completely to the ground and stop the engine. Operate the control levers several times to release the remaining pressure in the hydraulic piping.

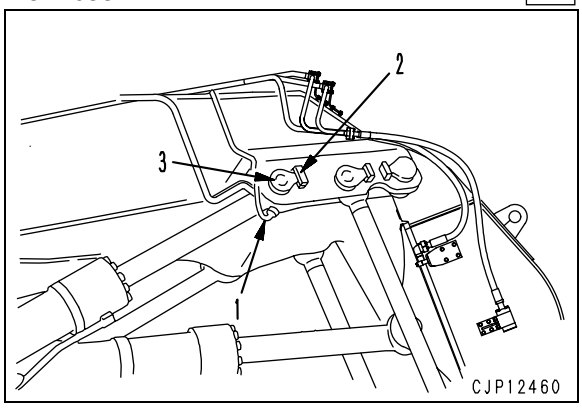
⚠ Loosen the oil filler cap slowly to release the pressure inside the hydraulic tank.

★ Fit plugs in the hoses after disconnecting them, to prevent dirt or dust from entering.

1. Disconnect grease hose (1).

2. Remove plate (2).

3. Sling boom cylinder assembly, then using forcing screws (Thread dia. = 16 mm, Pitch = 2.0 mm), pull out pin (3), and disconnect piston rod from boom. ※ 1



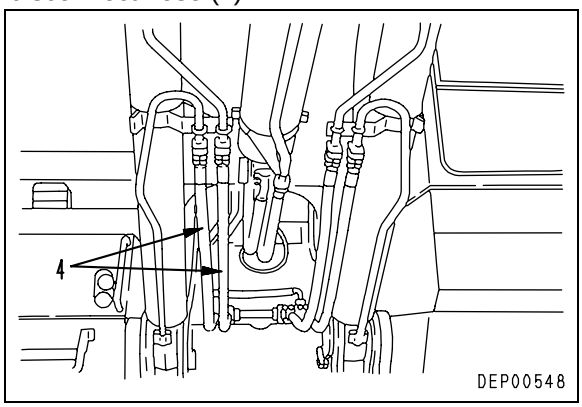
4. Start engine and retract piston rod fully.

⚠ Tie the rod with wire to prevent it from coming out.

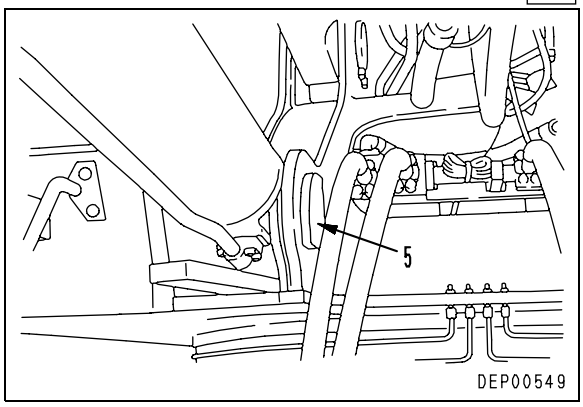
⚠ After stopping the engine, release the pressure inside the piping.

For details, see TESTING AND ADJUSTING, Releasing pressure in PPC circuit.

5. Lower boom cylinder assembly onto stand, then disconnect hose (4).

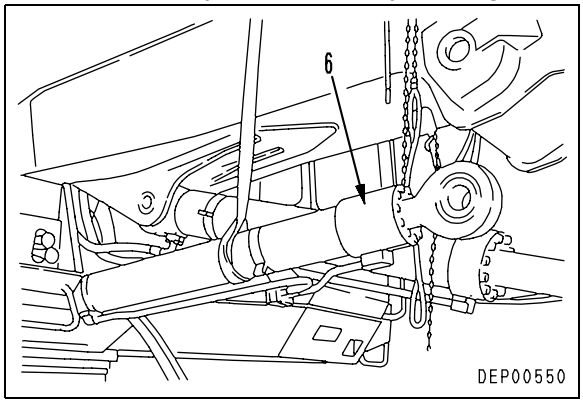


6. Sling boom cylinder assembly, and remove plate, then using forcing screws (Thread dia. = 16 mm, Pitch = 2.0 mm), pull out foot pin (5). ※ 2



7. Remove boom cylinder assembly (6).

Boom cylinder assembly: **750 kg**



REMOVAL AND INSTALLATION OF BUCKET ASSEMBLY
LOADING SHOVEL

REMOVAL
⚠ Set the bottom of the bucket horizontal, lower the work equipment completely to the ground and stop the engine. Operate the control levers several times to release the remaining pressure in the hydraulic piping.

⚠ Loosen the oil filler cap slowly to release the pressure inside the hydraulic tank.

★ Fit plugs in the hoses after disconnecting them, to prevent dirt or dust from entering.

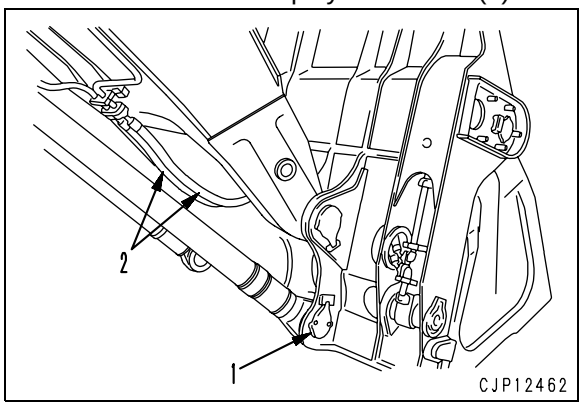
1. Sling bucket cylinder assembly, and remove plate, then using forcing screws (Thread dia. = 16 mm, Pitch = 2.0 mm), pull out pin (1). ※ 1
★ Remove the pin on the other side in the same way.

2. Start the engine and retract the piston rod fully.
⚠ Bind the piston rod with wires, etc., to prevent it from coming out.

Pin: **37 kg**

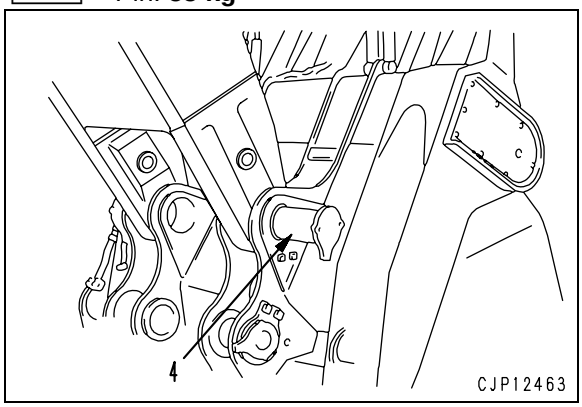
⚠ After stopping the engine, release the residual pressure in the piping. For details, see TESTING AND ADJUSTING, Releasing residual pressure in PPC valve hydraulic circuit.

3. Disconnect bottom dump cylinder hose (2).



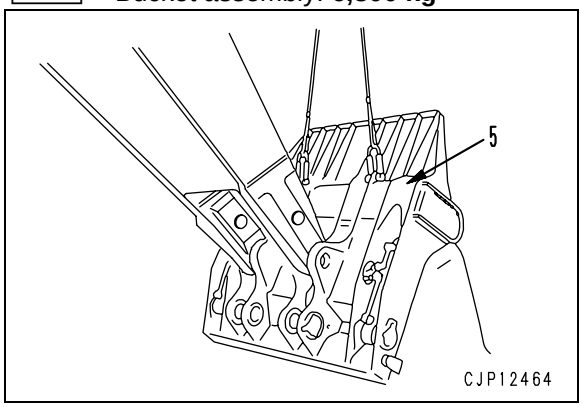
4. Sling bucket assembly, and remove 3 mounting bolts, then using forcing screws (Thread dia. = 16 mm, Pitch = 2.0 mm), pull out pin (4). ※ 2
★ Remove the pin on the other side in the same way.

Pin: **55 kg**



5. Lift off bucket assembly (5).

Bucket assembly: **6,800 kg**



INSTALLATION
• Carry out installation in the reverse order to removal.

※ 1 ※ 2

⚠ When aligning the mounting position of the pin, do not insert your fingers in the pin hole.

★ Bleed the air from the work equipment circuit.
For details, see TESTING AND ADJUSTING, Bleeding air from hydraulic cylinder.
After completion of the air bleeding operation, add engine oil to the hydraulic tank to the specified level.

INSTALLATION

- Installation shall be made in the reversed procedure of the removal procedure.

※ 1

To the inner surface of the bushing when assembling the pin:

Anti-friction material (LM-P)

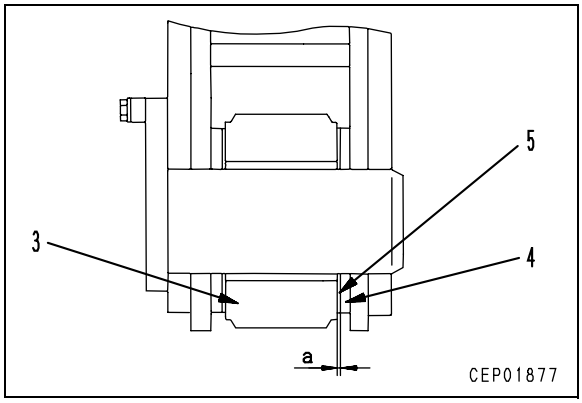
Greasing after assembling the pin:

Grease (LM-G)

⚠ When matching the position of the pin hole, never insert finger into the pin hole.

★ Make adjustment so that the clearance **a** between the end face of the foot of the boom (3) and the bracket (4) may become 1 mm or less, using the shim (5).

- Shim thickness: 1.0 and 1.5 mm



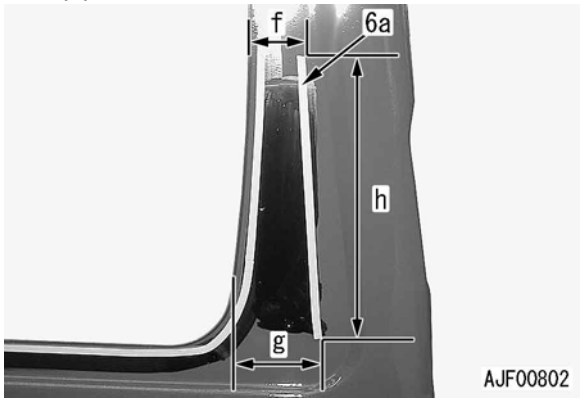
- **Air Bleeding**

★ Carry out air bleeding referring to the section "Air bleeding of each section" in the "Testing and adjusting".

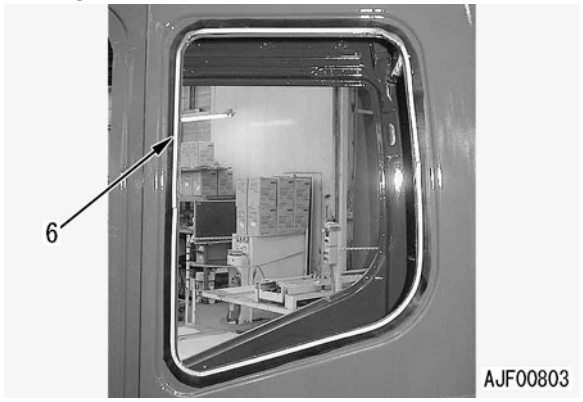
- **Filling the oil (Hydraulic oil tank)**

★ Fill the oil to the stipulated level from the oil filler port, start the engine to circulate the oil inside the piping and, after that, re-check the oil level.

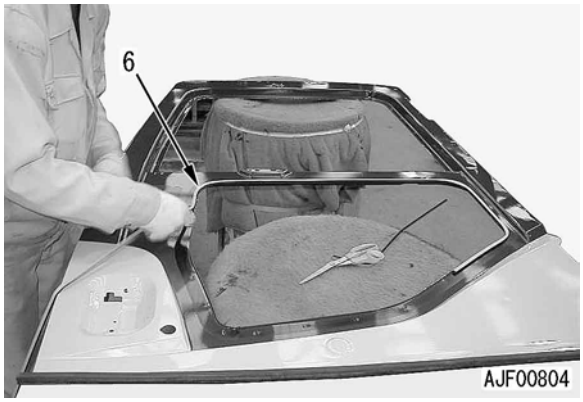
★ Stick both-sided adhesive tape (6a) additionally for right side window glass (1).
• Positions to stick additional both-sided adhesive tape for right side window glass:
(**f**) : **50 mm**
(**g**) : **90 mm**
(**h**) : **250 mm**



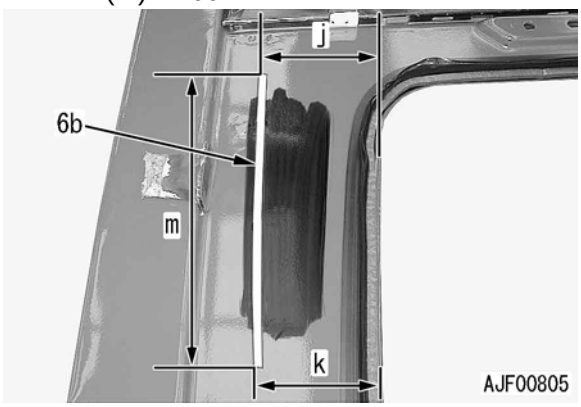
2) Stick both-sided adhesive tape (6) for left side rear window glass (2) as shown in the figure.



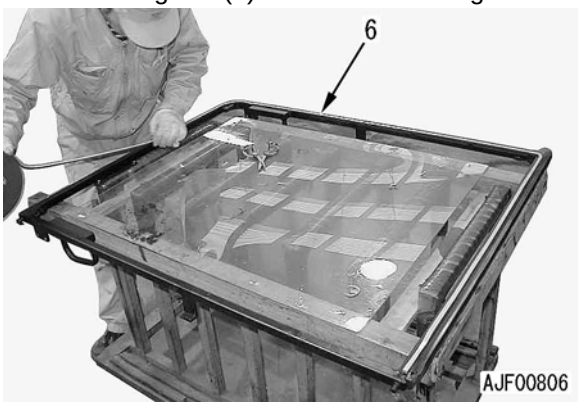
3) Stick both-sided adhesive tape (6) for door lower window glass (3) as shown in the figure.



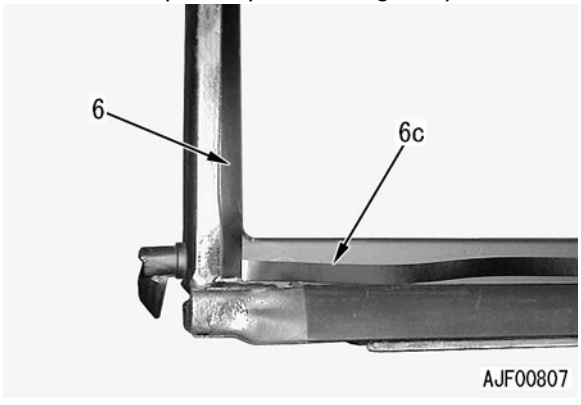
★ Stick both-sided adhesive tape (6b) additionally for door lower window glass (3).
★ Positions to stick additional both-sided adhesive tape for door lower window glass:
(**j**) : **110 mm**
(**k**) : **90 mm**
(**m**) : **200 mm**



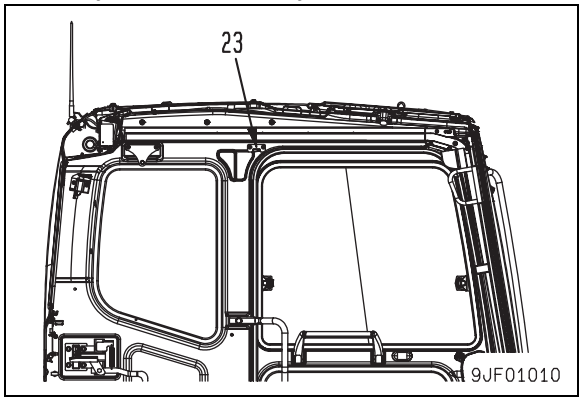
4) Stick both-sided adhesive tape (6) for front window glass (4) as shown in the figure.



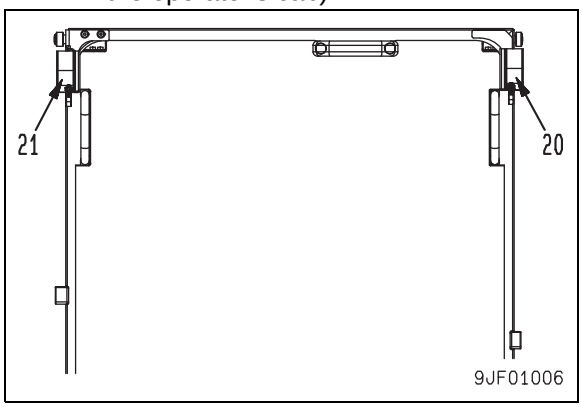
★ Stick both-sided adhesive tape (6c) of the lower side of the front window glass along the outside edge of the lower line, differently from other both-sided adhesive tapes (6). (If it is stuck along the inside, it will be seen through the transparent part of the glass.)



10. Adjust the front window stoppers.
1) After adjusting "closing" lock of the front window assembly in step 9, check the contact of both front window stoppers (23).
2) If both stoppers (23) do not contact normally, adjust and fix them at places where they contact normally.



11. Check the latching effort of the front window assembly.
1) After finishing steps 6 – 10, check that latching efforts of both locks (20) and (21) are even.
★ Check the latching efforts on both "closing" side (in the front of the operator's cab) and "opening" side (in the rear of the operator's cab).



※ 3

Left lower pin:
27 – 34 Nm {2.75 – 3.47 kgm}

Mounting bolt: **Adhesive (LT-2)**

ELECTRICAL CIRCUIT DIAGRAM (2/6)

PC750-7, PC750SE-7
PC800-7, PC800SE-7