SEN00373-12

Shop Manual

HYDRAUIIC
EXCAVATOR

PC800 -8
PC800LC-8
PC800SE-8
PC850 -8
PC850SE-8

SERIAL NUMBERS

PC800- 50001
PC800LC- 50001
PC800SE- 50001 and up
PC850- 10001
PC850SE- 10001

ecot3

KOMATSU

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How to read the shop manual

- Some attachments and optional parts in this shop manual may not be delivered to certain areas. If one of them is required, consult KOMATSU distributors.
- Materials and specifications are subject to change without notice.
- Shop manuals are divided into the “Chassis volume” and “Engine volume”. For the engine unit, see the engine volume of the engine model mounted on the machine.

1. Composition of shop manual

This shop manual contains the necessary technical information for services performed in a workshop. For ease of understanding, the manual is divided into the following sections.

00. Index and foreword

This section explains the shop manuals list, table of contents, safety, and basic information.

01. Specification

This section explains the specifications of the machine.

10. Structure, function and maintenance standard

This section explains the structure, function, and maintenance standard values of each component. The structure and function sub-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. The maintenance standard sub-section explains the criteria and remedies for disassembly and service.

20. Standard value table

This section explains the standard values for new machine and judgement criteria for testing, adjusting, and troubleshooting. This standard value table is used to check the standard values in testing and adjusting and to judge parts in troubleshooting.

30. Testing and adjusting

This section explains measuring instruments and measuring methods for testing and adjusting, and method of adjusting each part. The standard values and judgement criteria for testing and adjusting are explained in Testing and adjusting.

40. Troubleshooting

This section explains how to find out failed parts and how to repair them. The troubleshooting is divided by failure modes. The “S mode” of the troubleshooting related to the engine may be also explained in the Chassis volume and Engine volume. In this case, see the Chassis volume.

50. Disassembly and assembly

This section explains the special tools and procedures for removing, installing, disassembling, and assembling each component, as well as precautions for them. In addition, tightening torque and quantity and weight of coating material, oil, grease, and coolant necessary for the work are also explained.

90. Diagrams and drawings (chassis volume)/Repair and replacement of parts (engine volume)

- Chassis volume
  This section gives hydraulic circuit diagrams and electrical circuit diagrams.
- Engine volume
  This section explains the method of reproducing, repairing, and replacing parts.

2. Revision and distribution

Any additions, revisions, or other change of notices will be sent to KOMATSU distributors. Get the most up-to-date information before you start any work.

Points to remember when handling hydraulic equipment

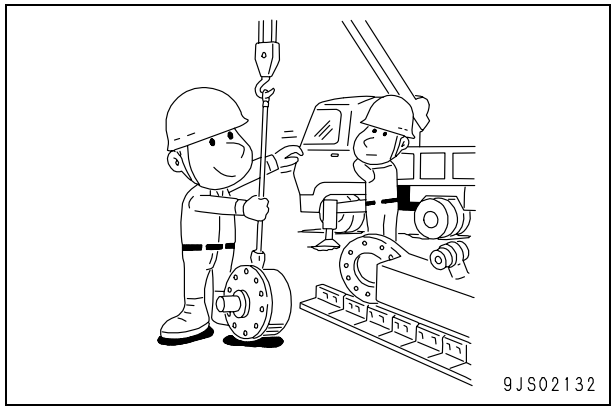
With the increase in pressure and precision of hydraulic equipment, the most common cause of failure is dirt (foreign material) in the hydraulic circuit. When adding hydraulic oil, or when disassembling or assembling hydraulic equipment, it is necessary to be particularly careful.

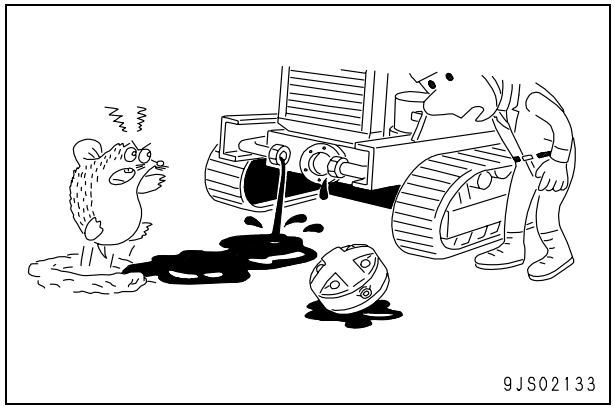
1. **Be careful of the operating environment.**
   Avoid adding hydraulic oil, replacing filters, or repairing the machine in rain or high winds, or places where there is a lot of dust.

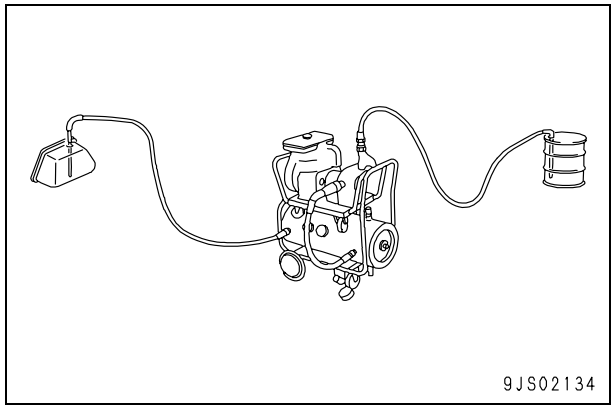
2. **Disassembly and maintenance work in the field**
   If disassembly or maintenance work is carried out on hydraulic equipment in the field, there is danger of dust entering the equipment. It is also difficult to check the performance after repairs, so it is desirable to use unit exchange. Disassembly and maintenance of hydraulic equipment should be carried out in a specially prepared dustproof workshop, and the performance should be checked with special test equipment.

3. **Sealing openings**
   After any piping or equipment is removed, the openings should be sealed with caps, tapes, or vinyl bags to prevent any dirt or dust from entering. If the opening is left open or is blocked with a rag, there is danger of dirt entering or of the surrounding area being made dirty by leaking oil so never do this. Do not simply drain oil out onto the ground, but collect it and ask the customer to dispose of it, or take it back with you for disposal.

4. **Do not let any dirt or dust get in during refilling operations**
   Be careful not to let any dirt or dust get in when refilling with hydraulic oil. Always keep the oil filler and the area around it clean, and also use clean pumps and oil containers. If an oil cleaning device is used, it is possible to filter out the dirt that has collected during storage, so this is an even more effective method.







Method of disassembling and connecting push-pull type coupler

⚠ **Before carrying out the following work, loosen the oil filler cap of the hydraulic tank gradually to release the residual pressure from the hydraulic tank.**

⚠ **Even if the residual pressure is released from the hydraulic tank, some hydraulic oil flows out when the hose is disconnected. Accordingly, prepare an oil receiving container.**

Type 1

1. Disconnection

1) Hold adapter (1) and push hose joint (2) into mating adapter (3). (Fig. 1)
   - ★ The adapter can be pushed in about 3.5 mm.
   - ★ Do not hold rubber cap portion (4).
2) After hose joint (2) is pushed into adapter (3), press rubber cap portion (4) against adapter (3) until it clicks. (Fig. 2)
3) Hold hose adapter (1) or hose (5) and pull it out. (Fig. 3)
   - ★ Since some hydraulic oil flows out, prepare an oil receiving container.

Fig. 1

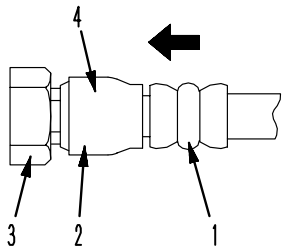


Fig. 2

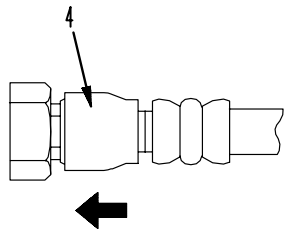
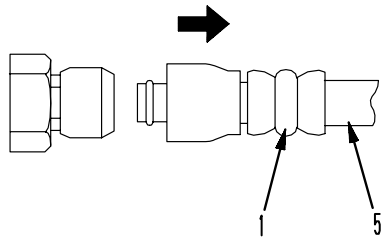


Fig. 3



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2. Connection

1) Hold hose adapter (1) or hose (5) and insert it in mating adapter (3), aligning them with each other. (Fig. 4)
   - ★ Do not hold rubber cap portion (4).
2) After inserting the hose in the mating adapter perfectly, pull it back to check its connecting condition. (Fig. 5)
   - ★ When the hose is pulled back, the rubber cap portion moves toward the hose about 3.5 mm. This does not indicate abnormality, however.

Fig. 4

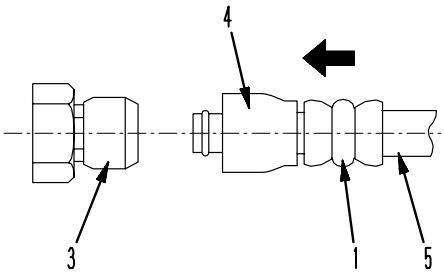
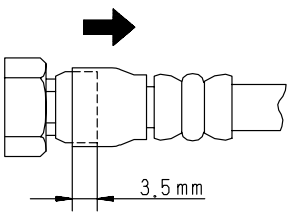


Fig. 5



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Temperature

Fahrenheit-Centigrade conversion: A simple way to convert a Fahrenheit temperature reading into a Centigrade temperature reading or vice versa is to enter the accompanying table in the center (boldface column) of figures. These figures refer to the temperature in either Fahrenheit or Centigrade degrees.
When convert from Fahrenheit to Centigrade degrees, consider the center column to be a table of Fahrenheit temperatures and read the corresponding Centigrade temperature in the column at the left.
When convert from Centigrade to Fahrenheit degrees, consider the center column to be a table of Centigrade values, and read the corresponding Fahrenheit temperature on the right.

1°C = 33.8°F

°C		°F	°C		°F	°C		°F	°C		°F
–40.4	**–40**	–40.0	–11.7	**11**	51.8	7.8	**46**	114.8	27.2	**81**	177.8
–37.2	**–35**	–31.0	–11.1	**12**	53.6	8.3	**47**	116.6	27.8	**82**	179.6
–34.4	**–30**	–22.0	–10.6	**13**	55.4	8.9	**48**	118.4	28.3	**83**	181.4
–31.7	**–25**	–13.0	–10.0	**14**	57.2	9.4	**49**	120.2	28.9	**84**	183.2
–28.9	**–20**	–4.0	–9.4	**15**	59.0	10.0	**50**	122.0	29.4	**85**	185.0
–28.3	**–19**	–2.2	–8.9	**16**	60.8	10.6	**51**	123.8	30.0	**86**	186.8
–27.8	**–18**	–0.4	–8.3	**17**	62.6	11.1	**52**	125.6	30.6	**87**	188.6
–27.2	**–17**	1.4	–7.8	**18**	64.4	11.7	**53**	127.4	31.1	**88**	190.4
–26.7	**–16**	3.2	–7.2	**19**	66.2	12.2	**54**	129.2	31.7	**89**	192.2
–26.1	**–15**	5.0	–6.7	**20**	68.0	12.8	**55**	131.0	32.2	**90**	194.0
–25.6	**–14**	6.8	–6.1	**21**	69.8	13.3	**56**	132.8	32.8	**91**	195.8
–25.0	**–13**	8.6	–5.6	**22**	71.6	13.9	**57**	134.6	33.3	**92**	197.6
–24.4	**–12**	10.4	–5.0	**23**	73.4	14.4	**58**	136.4	33.9	**93**	199.4
–23.9	**–11**	12.2	–4.4	**24**	75.2	15.0	**59**	138.2	34.4	**94**	201.2
–23.3	**–10**	14.0	–3.9	**25**	77.0	15.6	**60**	140.0	35.0	**95**	203.0
–22.8	**–9**	15.8	–3.3	**26**	78.8	16.1	**61**	141.8	35.6	**96**	204.8
–22.2	**–8**	17.6	–2.8	**27**	80.6	16.7	**62**	143.6	36.1	**97**	206.6
–21.7	**–7**	19.4	–2.2	**28**	82.4	17.2	**63**	145.4	36.7	**98**	208.4
–21.1	**–6**	21.2	–1.7	**29**	84.2	17.8	**64**	147.2	37.2	**99**	210.2
–20.6	**–5**	23.0	–1.1	**30**	86.0	18.3	**65**	149.0	37.8	**100**	212.0
–20.0	**–4**	24.8	–0.6	**31**	87.8	18.9	**66**	150.8	40.6	**105**	221.0
–19.4	**–3**	26.6	0	**32**	89.6	19.4	**67**	152.6	43.3	**110**	230.0
–18.9	**–2**	28.4	0.6	**33**	91.4	20.0	**68**	154.4	46.1	**115**	239.0
–18.3	**–1**	30.2	1.1	**34**	93.2	20.6	**69**	156.2	48.9	**120**	248.0
–17.8	**0**	32.0	1.7	**35**	95.0	21.1	**70**	158.0	51.7	**125**	257.0
–17.2	**1**	33.8	2.2	**36**	96.8	21.7	**71**	159.8	54.4	**130**	266.0
–16.7	**2**	35.6	2.8	**37**	98.6	22.2	**72**	161.6	57.2	**135**	275.0
–16.1	**3**	37.4	3.3	**38**	100.4	22.8	**73**	163.4	60.0	**140**	284.0
–15.6	**4**	39.2	3.9	**39**	102.2	23.3	**74**	165.2	62.7	**145**	293.0
–15.0	**5**	41.0	4.4	**40**	104.0	23.9	**75**	167.0	65.6	**150**	302.0
–14.4	**6**	42.8	5.0	**41**	105.8	24.4	**76**	168.8	68.3	**155**	311.0
–13.9	**7**	44.6	5.6	**42**	107.6	25.0	**77**	170.6	71.1	**160**	320.0
–13.3	**8**	46.4	6.1	**43**	109.4	25.6	**78**	172.4	73.9	**165**	329.0
–12.8	**9**	48.2	6.7	**44**	111.2	26.1	**79**	174.2	76.7	**170**	338.0
–12.2	**10**	50.0	7.2	**45**	113.0	26.7	**80**	176.0	79.4	**175**	347.0

PC800SE-8

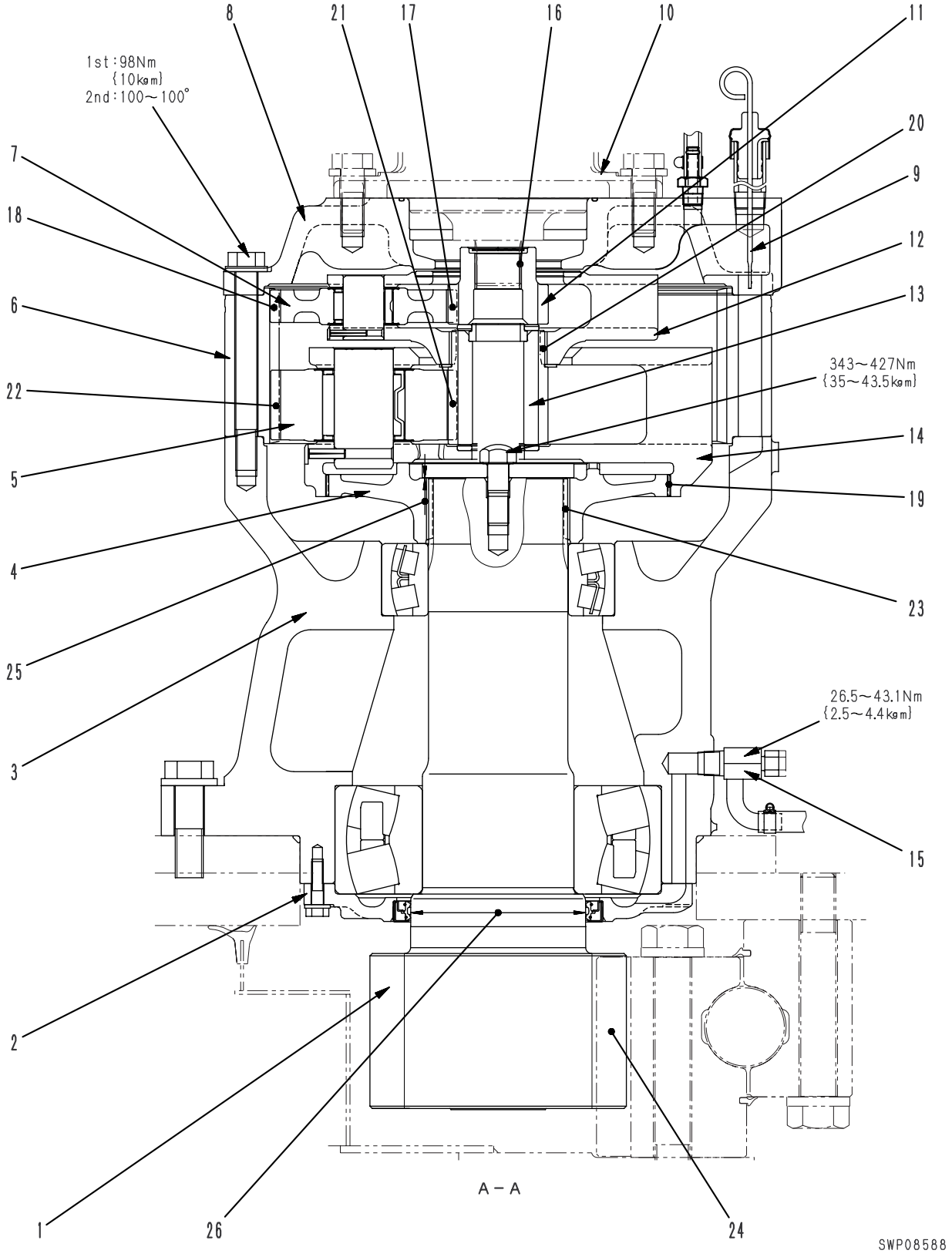
Machine model				PC800SE-8
Serial number				50001 and up
		Bucket capacity	m^3	4.0
		Weight of machine	kg	76,000
Performance	Working ranges	Max. digging depth	mm	7,130
		Max. vertical wall depth	mm	4,080
		Max. digging reach	mm	12,265
		Max. reach at ground level	mm	11,945
		Max. digging height	mm	11,330
		Max. dumping height	mm	7,525
		Max. digging force	kN {kg}	430.5 {43,900}
		Swing speed	rpm	6.8
		Swing max. slope angle	deg.	16
		Travel speed	km/h	Lo : 2.8, Hi : 4.2
		Gradeability	deg.	35
		Ground pressure (standard triple grouser shoe width: 710 mm)	kPa {kg/cm^2}	106.5 {1.09}
Dimensions		Overall length	mm	13,130
		Overall width	mm	4,335
		Overall width of track (when increasing)	mm	3,490 (4,285)
		Overall height	mm	4,615
		Overall height to top of cab	mm	4,000
		Ground clearance of counterweight	mm	1,560
		Min. ground clearance	mm	840
		Tail swing radius	mm	4,400
		Min. swing radius of work equipment	mm	5,645
		Height of work equipment at min. swing radius	mm	9,750
		Length of track on ground	mm	4,500
		Track gauge (when increasing)	mm	2,780 (3,500)
		Height of machine cab	mm	3,670

Machine model				PC850SE-8		
Serial number				10001 and up		
				Boom	Arm	Bucket
Hydraulic system	Hydraulic cylinder	Type		Double-acting piston	Double-acting piston	Double-acting piston
		Inside diameter of cylinder	mm	200	185	225
		Diameter of piston rod	mm	140	120	160
		Stroke	mm	1,950	1,610	1,420
		Max. distance between pins	mm	4,880	3,990	3,910
		Min. distance between pins	mm	2,930	2,380	2,490
	Hydraulic tank Hydraulic filter Hydraulic cooler			Box-shaped, with breather Tank return side CF42-1 (Air cooled)		

Unit: ℓ

Supply point	PC800, PC800SE-8, PC800LC-8, PC850, PC850SE-8	
	Specified capacity	Refill capacity
Engine oil pan	58	53
Coupling case	7	7
Swing machinery case (each)	24.5	24.5
Final drive case (each)	20	20
Hydraulic system	800	470
Fuel tank	980	—
Cooling system	104	—

Swing machinery



Standard shoe

Unit: mm

Model Item	PC800-8	PC800SE-8	PC800LC-8	PC850-8	PC850SE-8
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

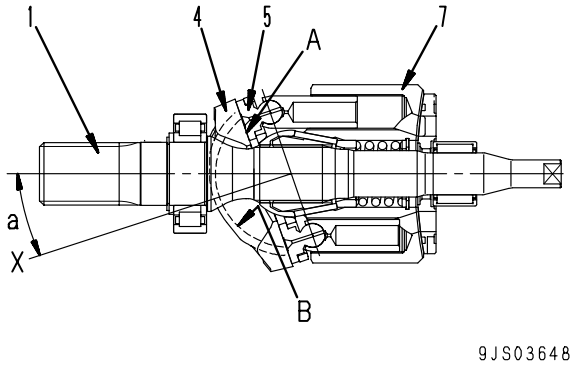
No.	Check item	Criteria				Remedy
10	Top-to-bottom width of idler guide		Standard size	Tolerance	Repair limit	Rebuild or replace
		Track frame	185	185^{+3}_{-2}	190	
		Idler support	180	185 ± 0.5	175	Replace
11	Left-to-right width of idler guide	Track frame	345	345^{+3}_{-2}	355	Rebuild or replace
		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}

PC800-8, PC800SE-8, PC800LC-8, PC850-8, PC850SE-8 Hydraulic excavator

Form No. SEN00382-01

Operation of pump

- Cylinder block (7) rotates together with shaft (1), and shoe (5) slides on flat surface (A).
- When this happens, rocker cam (4) moves along cylindrical surface (B), so angle (a) between center line (X) of rocker cam (4) and the axial direction of cylinder block (7) changes.
- Angle (a) is called the swash plate angle.



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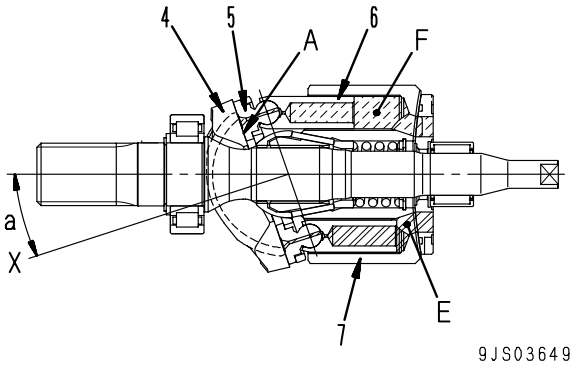
- With center line (X) of rocker cam (4) at swash plate angle (a) in relation to the axial direction of cylinder block (7), flat surface (A) acts as a cam in relation to shoe (5).
- In this way, piston (6) slides on the inside of cylinder block (7), so a difference between volumes (E) and (F) is created inside cylinder block (7).
- A single piston (6) sucks and discharges the oil by the amount (F) – (E).
- As cylinder block (7) rotates and the volume of chamber (E) becomes smaller, the pressurized oil is discharged.
- On the other hand, the volume of chamber (F) grows larger and, in this process, the oil is suctioned.



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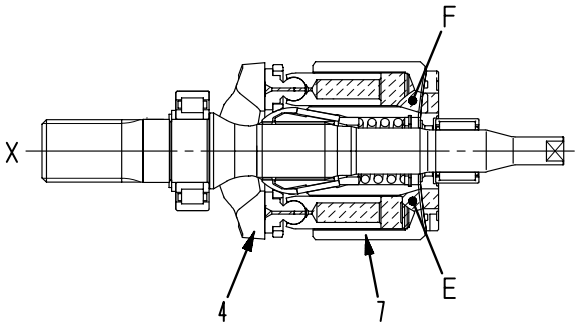
- As center line (X) of rocker cam (4) matches the axial direction of cylinder block (7) (swash plate angle = 0), the difference between volumes (E) and (F) inside cylinder block (7) becomes 0.
- Suction and discharge of pressurized oil is not carried out in this state. Namely pumping action is not performed. (Actually, however, the swash plate angle is not set to 0)



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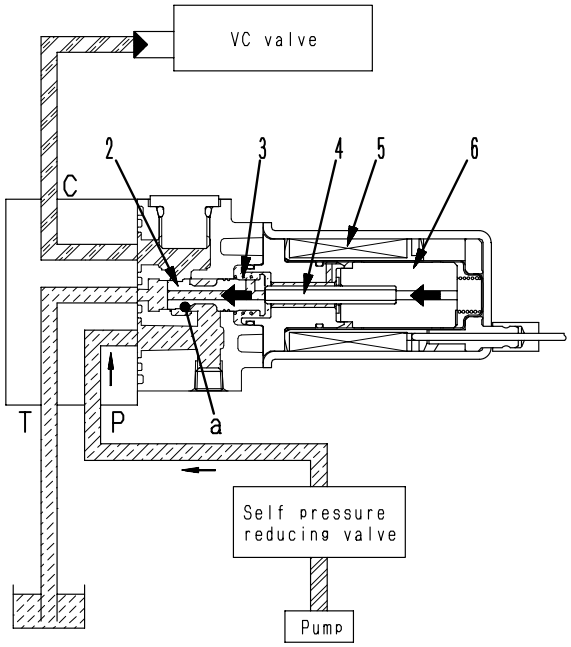
2. When signal current is very small (coil is energized)

- When a very small signal current flows to coil (5), coil (5) is energized, and a propulsion force is generated on the left side of plunger (6).
- Rod (4) pushes spool (2) to the left, and the pressurized oil flows from port (P) to port (C).
- Pressure on port (C) increases and the force to act on surface (a) of spool (2) + the spring load on spring (3) become larger than the propulsion force of plunger (6).
- Spool (2) is pushed to the right, and port (P) is shut off from port (C).
- Port (C) and port (T) are connected.
- Spool (2) moves up and down so that the propulsion force of plunger (6) may be balanced with pressure of port (C) + the spring load of spring (3).
- The circuit pressure between the EPC valve and the VC valve is controlled in proportion to the size of the signal current.



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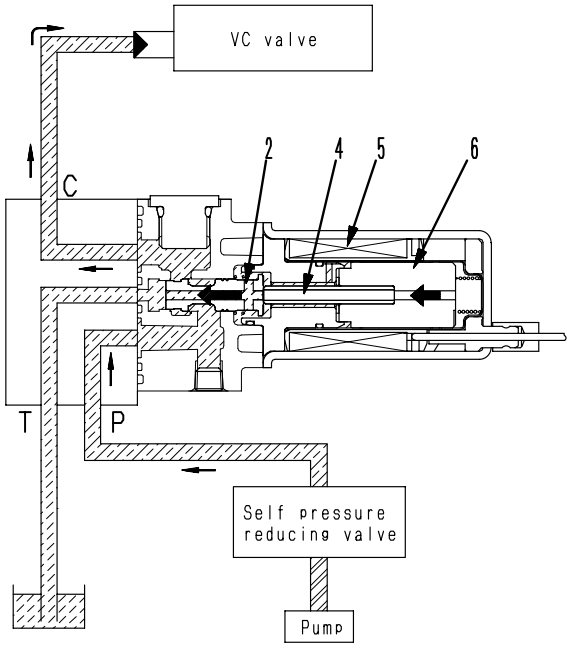
3. When signal current is maximum (coil is energized)

- As the signal current flows to coil (5), coil (5) is energized.
- When this happens, the signal current is at its maximum, so the propulsion force of plunger (6) is also at its maximum.
- Spool (2) is pushed to the left by rod (4).
- The maximum volume of pressurized oil is conducted from port (P) to port (C), increasing the circuit pressure across EPC valve and VC valve to the maximum level.
- Since port (T) is closed, pressurized oil does not flow to the tank.



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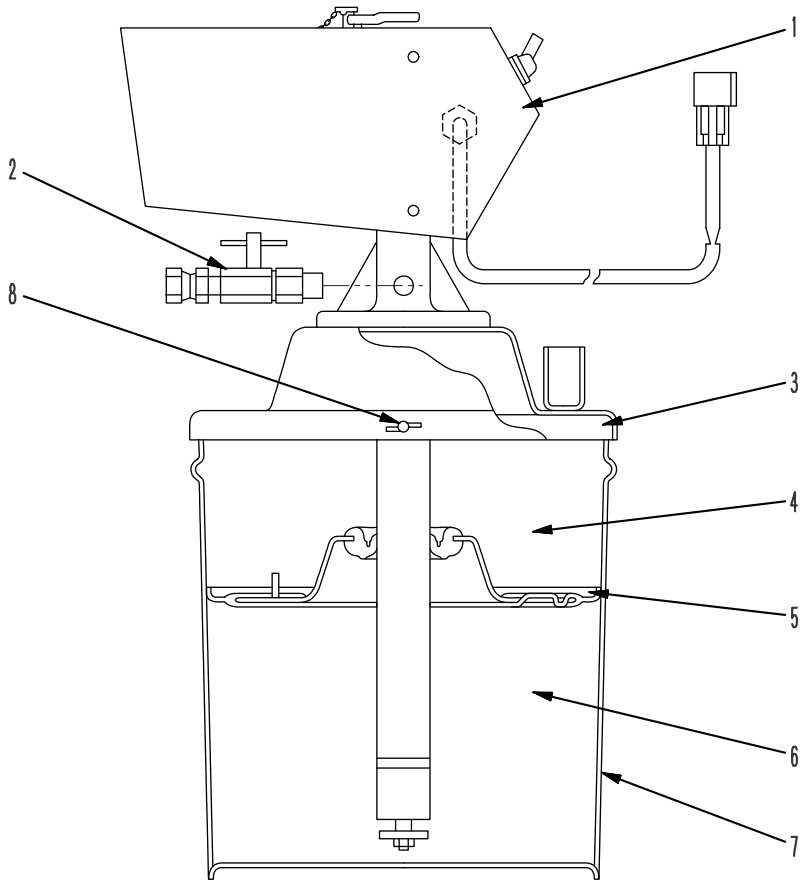
Operation

- The output pressure of the EPC valve is applied to the piston chamber to push piston (6). Piston (6) pushes spool (5) until it is balanced with the spring.
- Then, the land of the servo piston pressure passage is connected to the pump discharge passages by the cut of spool (5) and the discharge pressure is led to the servo piston.
- The servo piston is raised by the rocker cam. The position feedback is applied and the lever moves to compress the spring.
- If spool (5) is pushed back, the pump discharge circuit and the servo piston circuit are shut off.
- The pressure in the servo piston chamber lowers and the rocker cam returns toward the maximum swash plate angle.
- These processes are repeated until the swash plate is fixed to a position where the EPC output pressure is balanced with the spring force.
- Accordingly as the EPC output pressure is heightened, the swash plate angle is decreased. As the EPC output pressure is lowered, the swash plate angle is increased.

Hydraulic system, Part 2

Motor grease pump

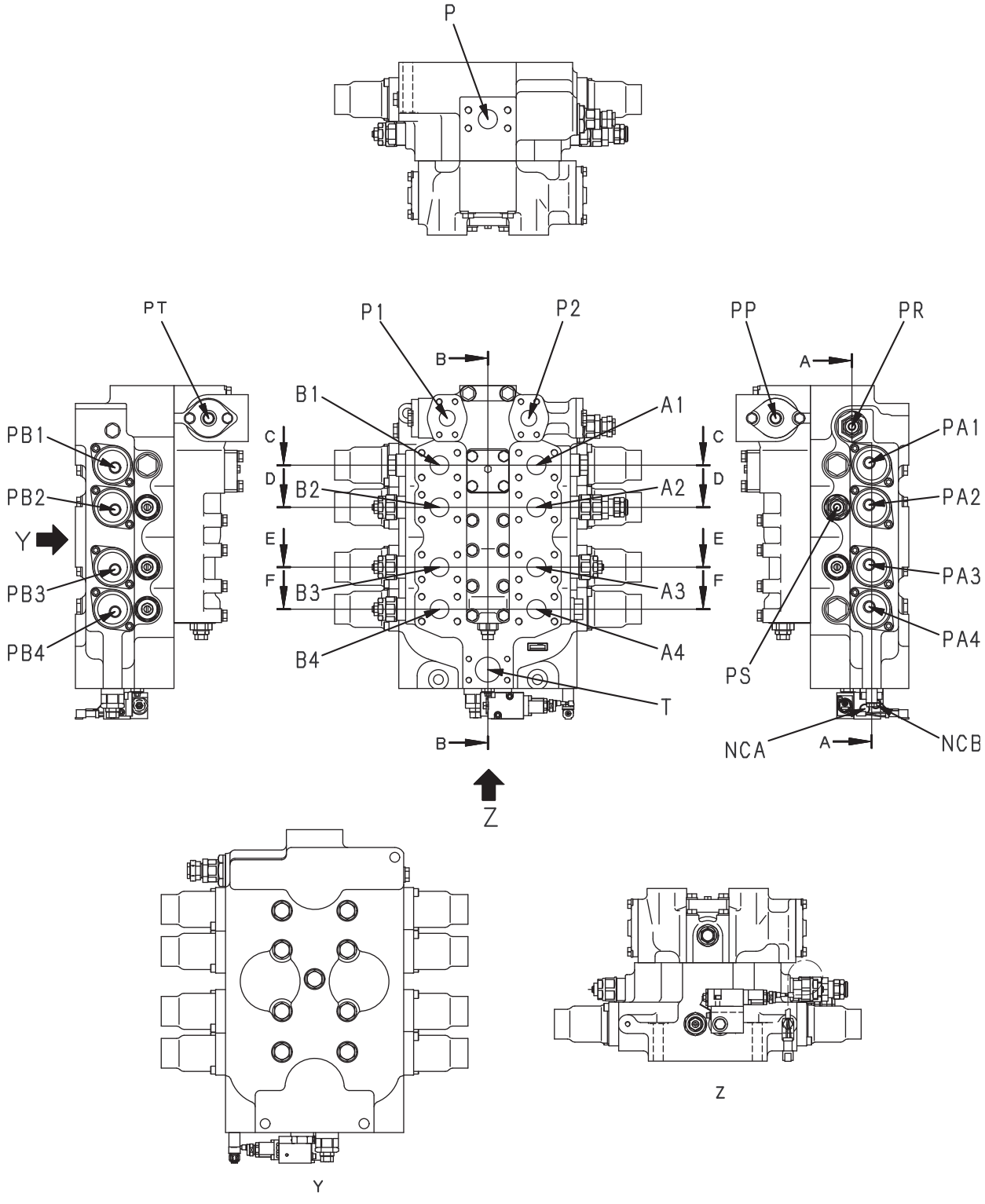


SWP08596

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).


P
PT
P1
P2
PP
PR
B
A
B1
A1
PB1
C
C
PA1
D
B2
A2
D
PB2
PA2
Y
E
E
PA3
F
B3
A3
F
PB3
PA4
B4
A4
PS
PB4
T
B
A
NCA
NCB
Z
Y
Z
9JG02016

Relief valve portion

1. Outline

The relief portion consists of check valves (2) and (3), shuttle valves (4) and (5), and relief valve (1).

2. Function

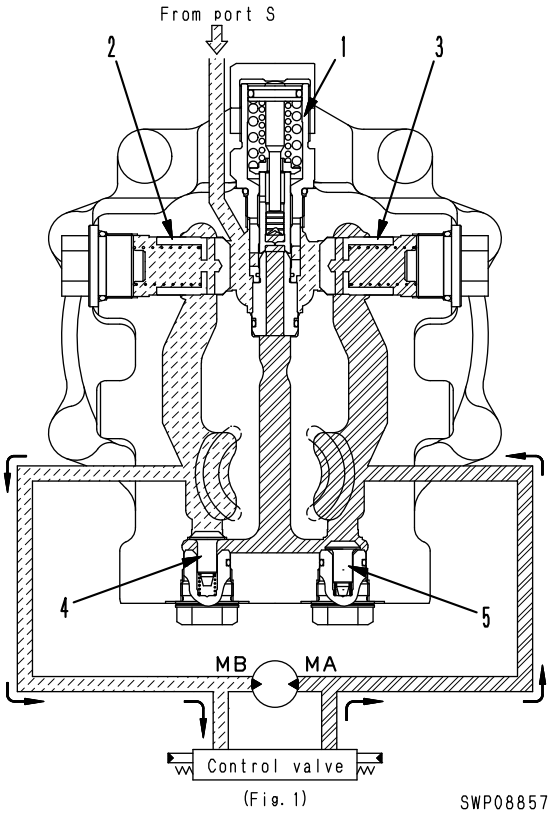
When the swing is stopped, the outlet port circuit of the motor from the control valve is closed, but the motor continues to rotate under inertia, so the pressure at the output side of the motor becomes abnormally high, and this may damage the motor.

To prevent this, the abnormally high pressure oil is relieved to port **S** from the outlet port of the motor (high-pressure side) to prevent any damage.

3. Operation

1) When starting swing

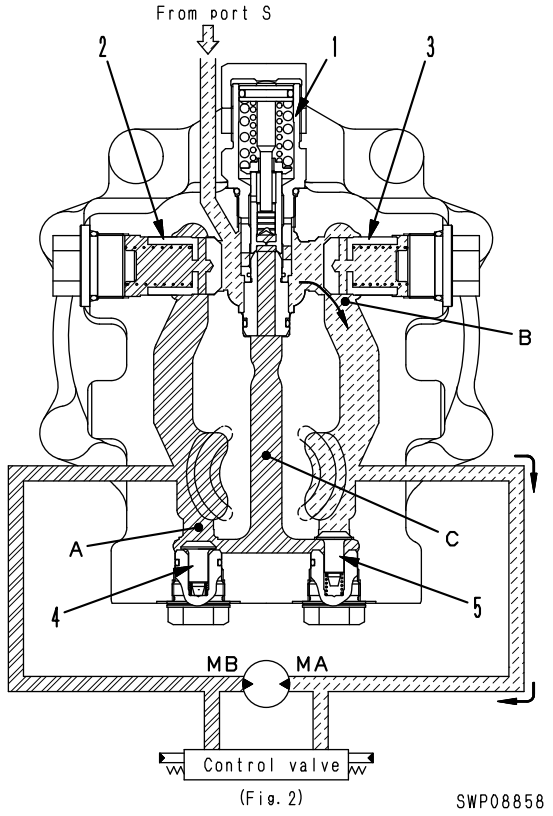
- When the swing control lever is operated to swing right, the pressure oil from the pump passes through the control valve and is supplied to port **MA**. As a result, the pressure at port **MA** rises, the starting torque is generated in the motor, and the motor starts to rotate. The oil from the outlet port of the motor passes from port **MB** thought the control valve and returns to the tank. (Fig. 1)



(Fig. 1)

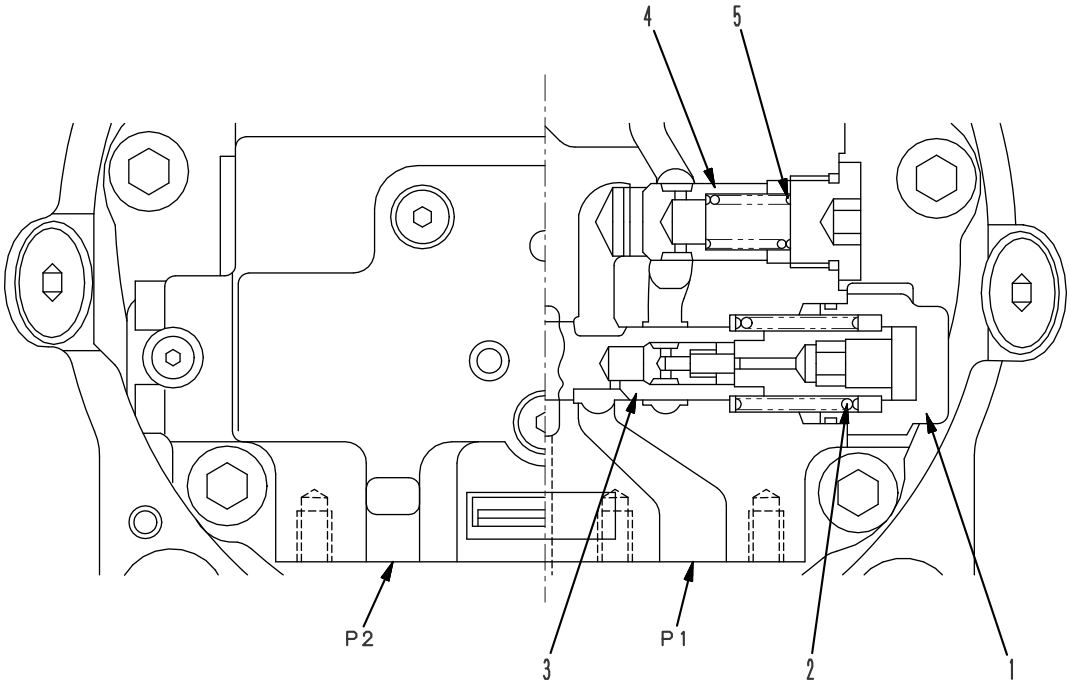
2) When stopping swing

- When the swing control lever is returned to neutral, the supply of pressure oil from the pump to port **MA** is stopped. When the return circuit to the tank is closed by the control valve, the pressure at port **MB** rises with the oil from the outlet port of the motor. As a result, rotation resistance is generated in the motor, so the braking effect starts.
- If the pressure at port **MB** becomes higher than the pressure port **MA**, it pushes shuttle valve **A** (4) and chamber **C** becomes the same pressure as port **MB**. The oil pressure rises further until it reaches the set pressure of relief valve (1). As a result, a high braking torque acts on the motor and stops the motor. (Fig. 2)
- When relief valve (1) is being actuated, the relief oil and the oil from port **S** passes through check valve **B** (3) and is supplied to port **MA**. This prevents cavitation at port **MA**.



(Fig. 2)

1-5 Travel brake valve



SWP08667

Function

- The brake valve consists of counterbalance valve (3) and check valve (4).
- The counterbalance valve acts to prevent the piston motor from stopping or overrunning.
- When traveling downhill, the weight of the machine makes it try to travel at a speed faster than the rotation of the motor.
  For this reason, if the machine is traveling with the engine running at low speed, the motor will rotate under no load or may run away, which is extremely dangerous.
  To prevent this, this valve controls the amount of oil on the return side in order to keep the valve pressure constant, and makes it possible to carry out travel operations which match the oil delivery from the motor.

1. Cap assembly
2. Return spring
3. Counterbalance valve
4. Check valve
5. Check valve spring

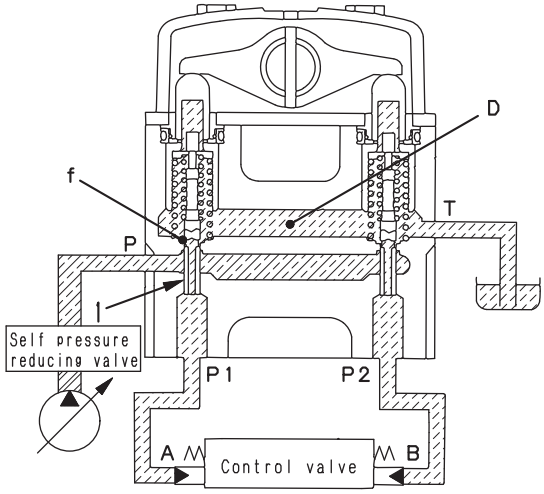
Specification

Safety valve set pressure: 34 MPa {350 kg/cm^2}
Counterbalance switching pressure:
1.0 ± 0.1 MPa {10 ± 1 kg/cm^2}
Check valve switching pressure:
0.02 ± 0.01 MPa {0.2 ± 0.1 kg/cm^2}

Operation

1. At neutral

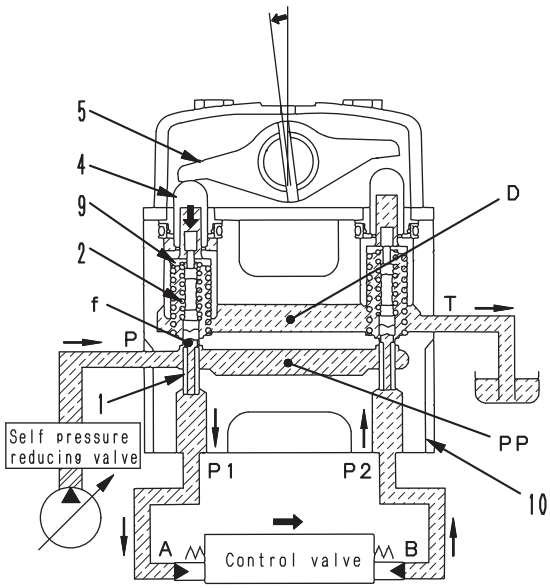
- Ports **A** and **B** of the control valve and ports **P1** and **P2** of the PPC valve are connected to drain chamber **D** through fine control hole **f** in spool (1).



9JS03337

2. During fine control (neutral → fine control)

- When piston (4) starts to be pushed by disc (5), retainer (9) is pushed; spool (1) is also pushed by metering spring (2) and moves down.
- When this happens, fine control hole **f** is shut off from drain chamber **D**. At almost the same time, it is connected to pump pressure chamber **PP**, and the pilot pressure of the control pump is sent from port **A** through fine control hole **f** to port **P1**.
- When the pressure at port **P1** rises, spool (1) is pushed back. Fine control hole **f** is shut off from pump pressure chamber **PP**. At almost the same time, it is connected to drain chamber **D** to release the pressure at port **P1**.
- As a result, spool (1) moves up and down until the force of metering spool (2) is balanced with the pressure of port **P1**.
- The relationship in the position of spool (1) and body (10) (fine control hole **f** is in the middle between drain hole **D** and pump pressure chamber **PP**) does not change until retainer (9) contacts spool (1).
- Therefore, metering spring (2) is compressed in proportion to the travel of the control lever, so the pressure at port **P1** also rises in proportion to the travel of the control lever.
- In this way, the control valve spool moves to a position where the pressure of chamber **A** (same as pressure at port **P1**) and the force of the return spring of the control valve spool are balanced.

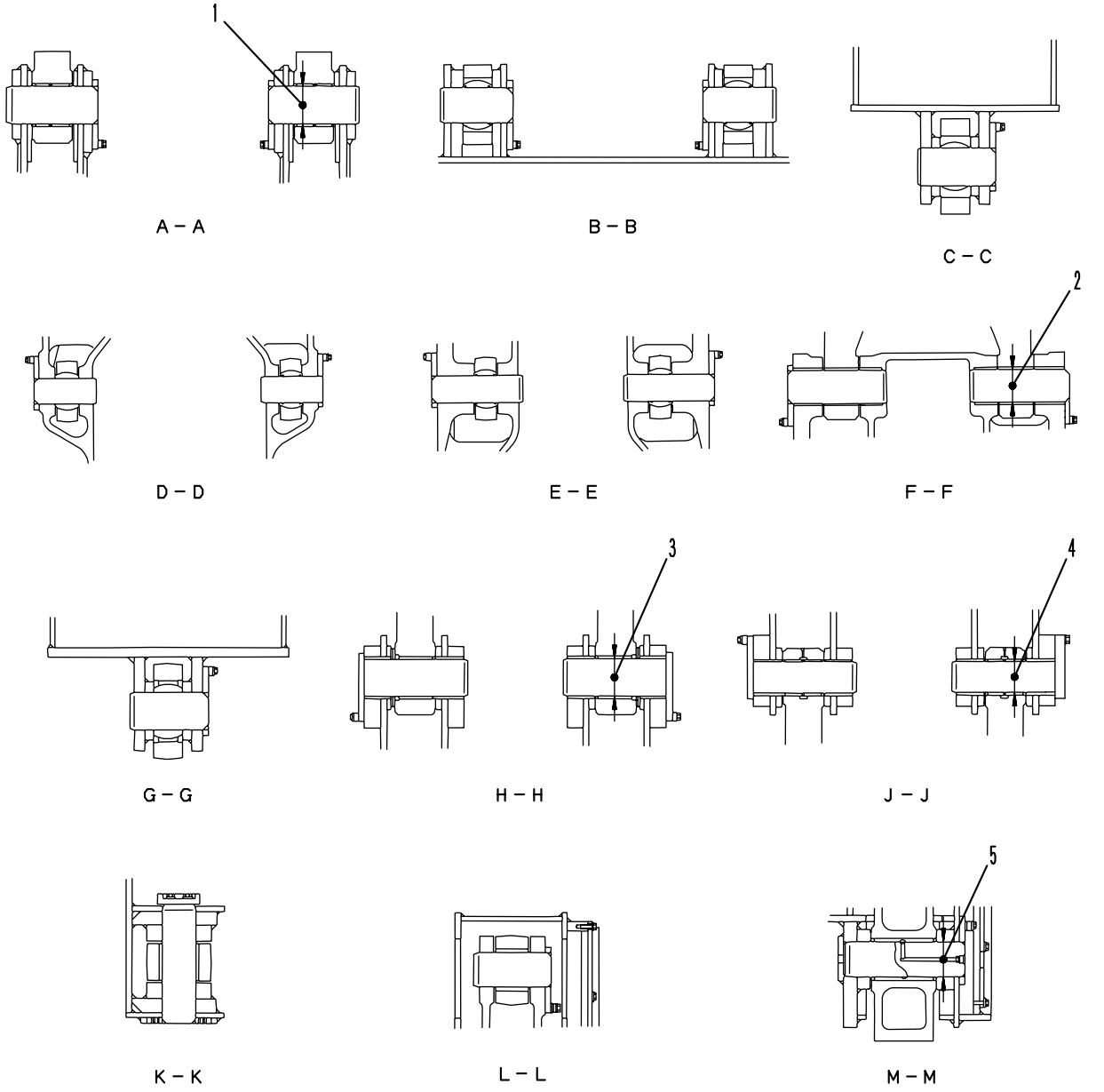


9JS03338

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	140	–0.043 –0.106	+0.256 +0.039	0.082 – 0.362	0.062	
		Bucket	130	–0.036 –0.090	+0.263 +0.048	0.084 – 0.353	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	115	–0.036 –0.090	+0.025 0	0.036 – 0.115	1.5	
		Bucket	110	–0.036 –0.090	+0.457 +0.370	0.406 – 0.547	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	130	–0.043 –0.106	+0.025 0	0.043 – 0.131	1.5	
		Bucket	110	–0.036 –0.090	+0.457 +0.370	0.406 – 0.547	1.5	

Loading shovel specification
PC800-8



HYDRAULIC EXCAVATOR

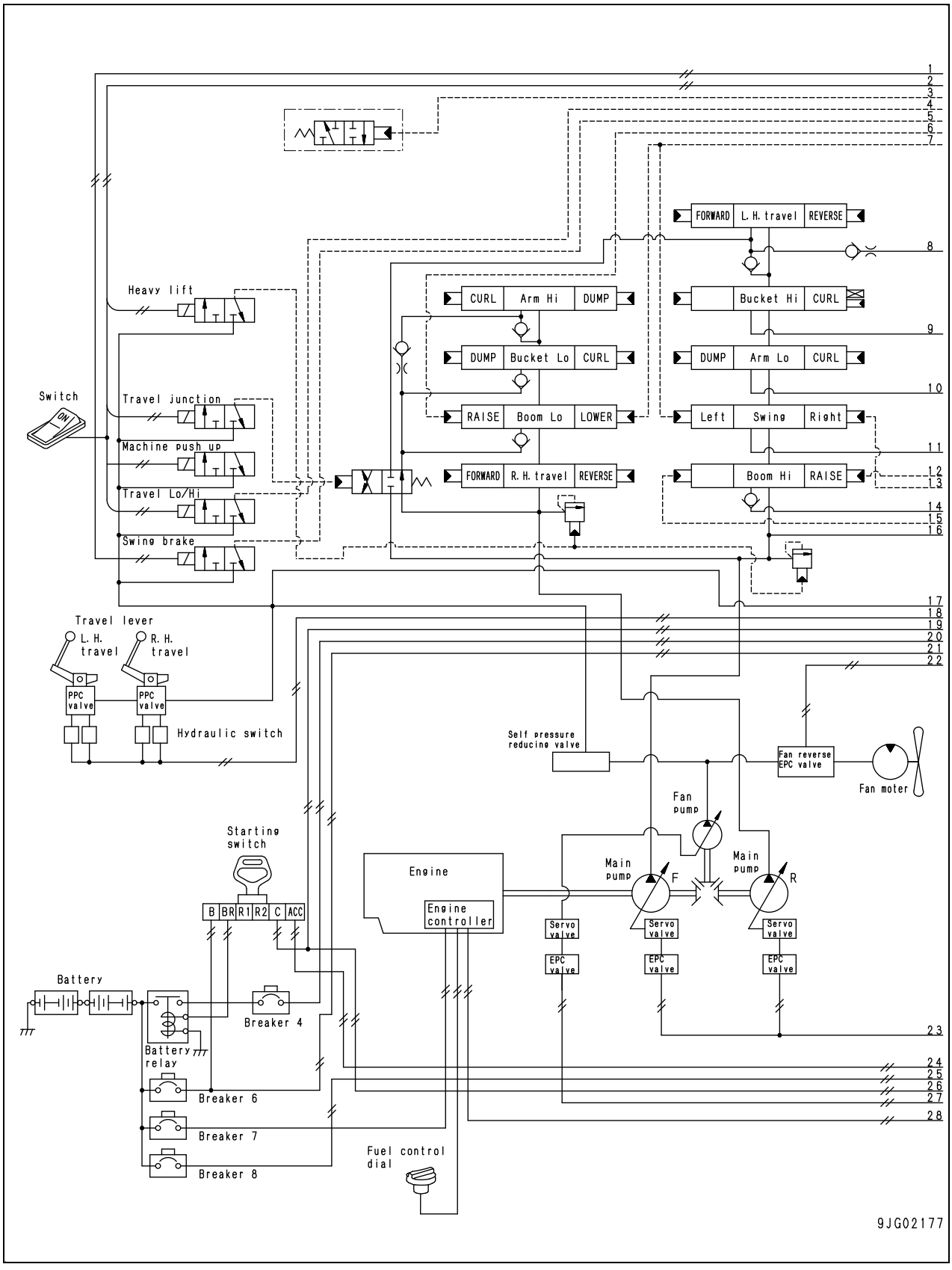
PC800-8
PC800SE-8
PC800LC-8
PC850-8
PC850SE-8

Machine model	Serial number	Machine model	Serial number
PC800-8	50001 and up	PC850SE-8	10001 and up
PC800LC-8	50001 and up		
PC800SE-8	50001 and up		
PC850-8	10001 and up		

10 Structure,function and maintenance standard
Electrical system

Engine control 2
Electric control system 11
Monitor system 45
Sensors 63
KOMTRAX system 67

Machine control system diagram



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}.

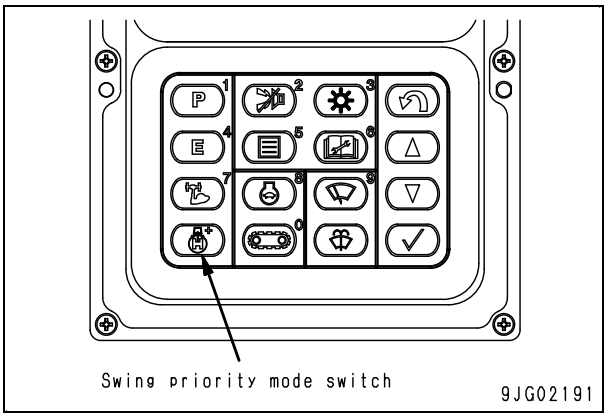
Mode	Machine push-up switch	Machine push-up solenoid valve	Safety valve set pressure	Effect
Boom pushing force (low mode)	 9JG02246	Energized	14.7 MPa {150 kg/cm^2}	By reducing the boom pushing force, it is made easier for the boom to escape automatically in the RAISE direction and to reduce the number of times that the boom is operated. At the same time it also makes the digging operation smoother.
Boom pushing force (high mode)	 9JG02247	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.

10. Swing priority function

- There is a swing priority mode switch on the monitor panel. By turning this switch ON/OFF it is possible to change the matching of the boom RAISE and swing. This divides the flow to provide a swing speed which matches the swing angle, thereby enabling the operator to carry out compound operations easily.

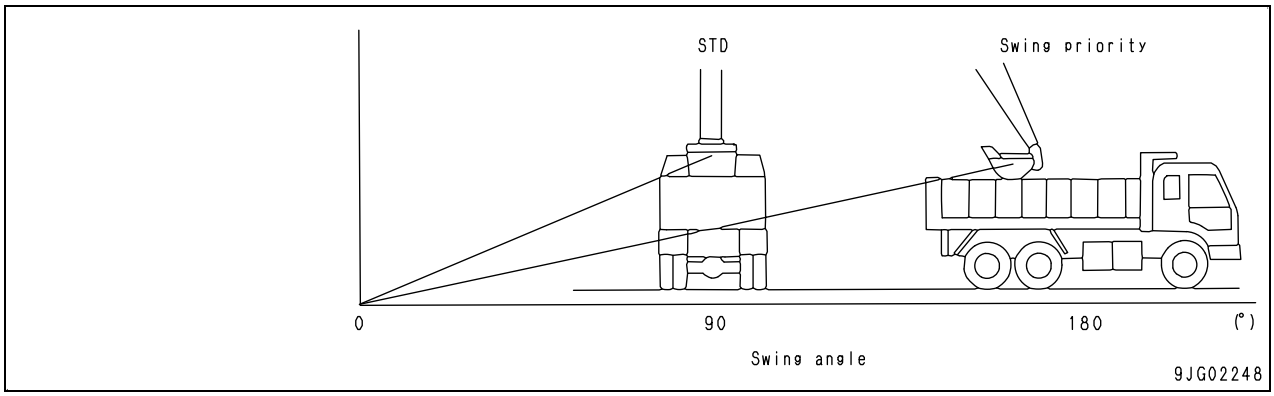


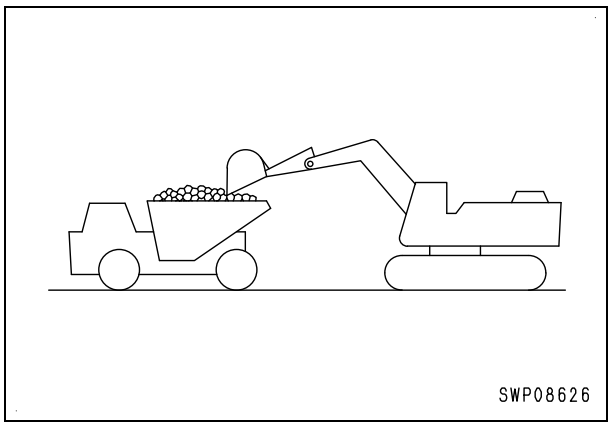
Swing priority mode OFF:

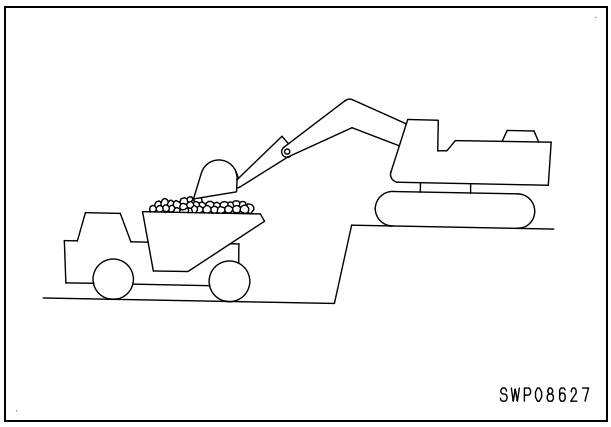
Loading a dump truck on the same ground
Swinging by 90º and loading a dump truck

Swing priority mode ON:

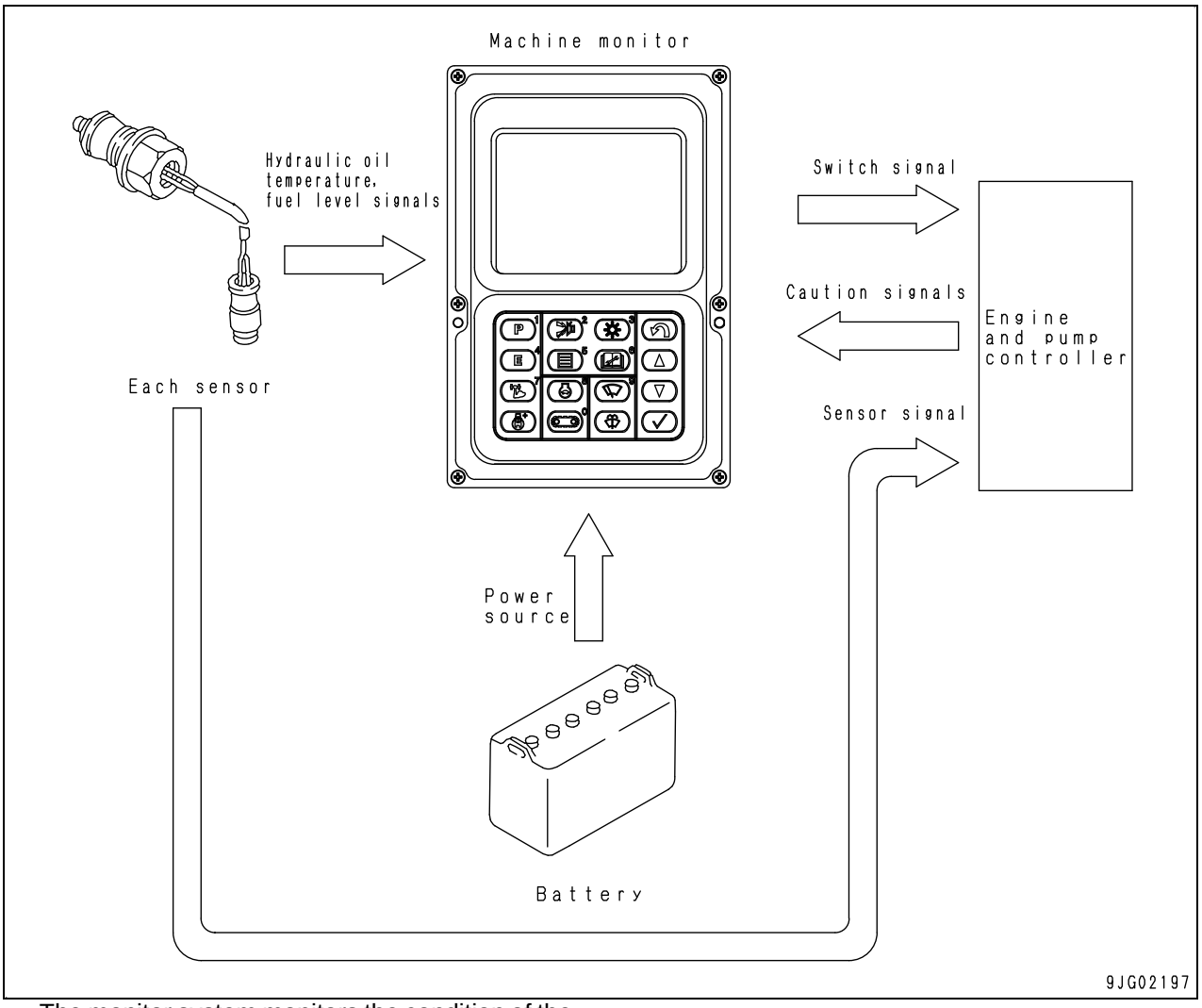
Swinging by 180º and loading a dump truck
Loading a dump truck from a bench







Monitor system



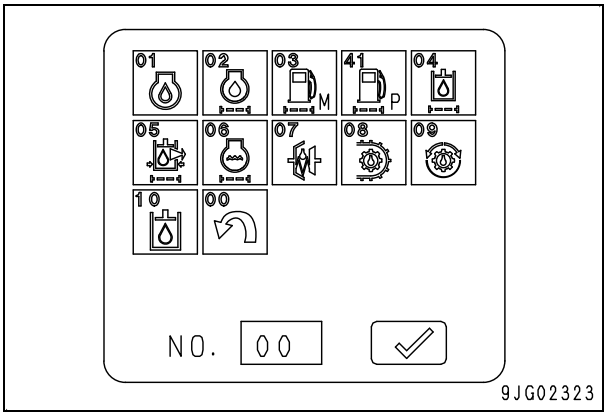
- The monitor system monitors the condition of the machine with sensors installed on various parts of the machine. It processes and immediately displays the obtained information on the panel notifying the operator of the condition of the machine.
  The panel is roughly divided as follows.
  1) Monitor section to output alarms when the machine has troubles
  2) Gauge section to display the condition constantly (Coolant temperature, hydraulic oil temperature, fuel level, etc.)
- The machine monitor also has various mode selector switches and functions to operate the machine control system.

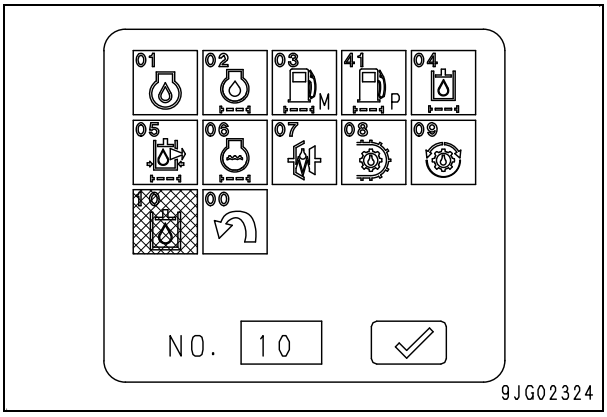
Method of checking status

Maintenance items

★ Operate as follows when on the operator screen.

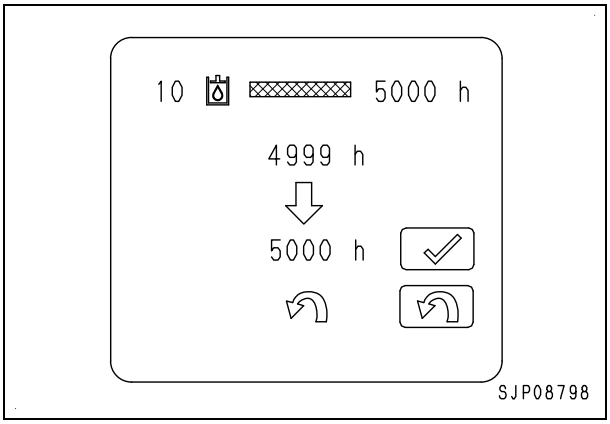
1. Press maintenance switch (1) and switch to the maintenance list display screen.
   ★ The maintenance items are displayed as symbols on the screen.
2. Press control switch (2), or use the 10-key pad to input the number (01 – 10, 30, 31, 41) of the maintenance item to select the item.
   ★ The cursor 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.

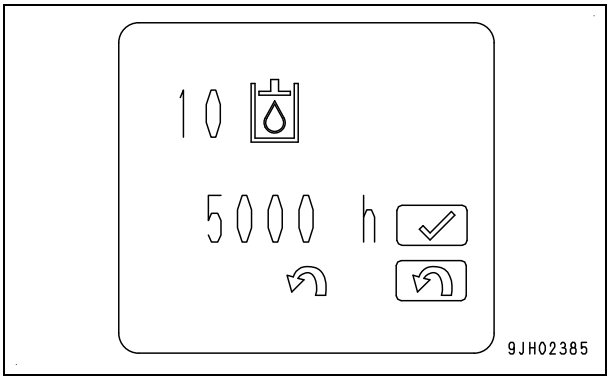




Maintenance operation

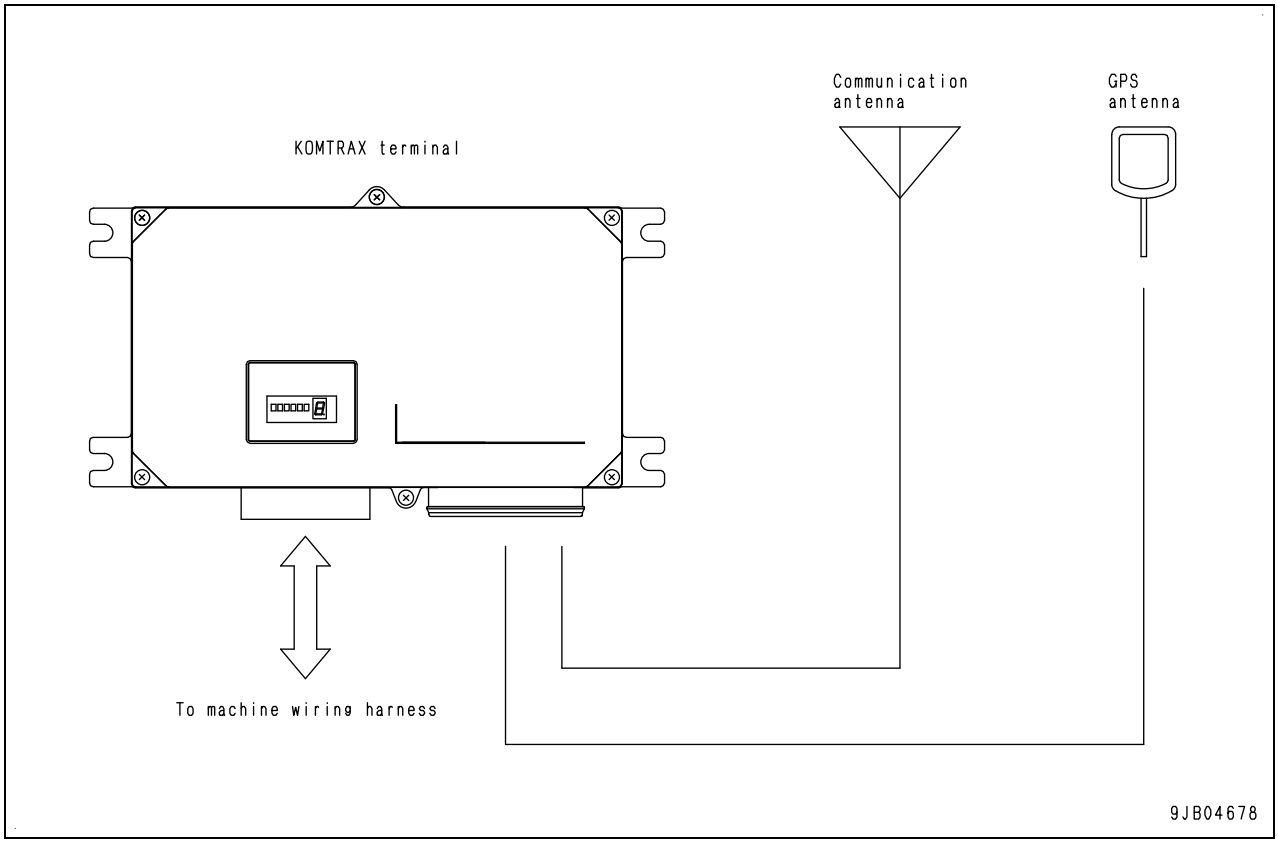
1. After completing the selection, press input confirmation switch (3).
   The screen will change to the maintenance reset screen.
2. Use the maintenance reset screen to check the content, and if there is any problem, press input confirmation switch (3) to move to the check screen.
   If the wrong item 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.





KOMTRAX system

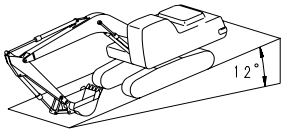
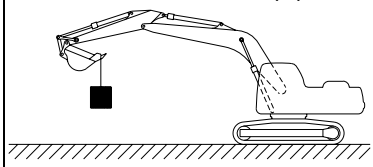
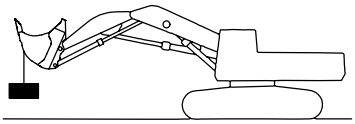
(if equipped)



- The KOMTRAX terminal sends various information on the machine by a wireless communication.The KOMTRAX operator refers to this information in the office, and various services can be provided for the customer.

  ★ To be provided with the KOMTRAX service, it is necessary to sign up separately.

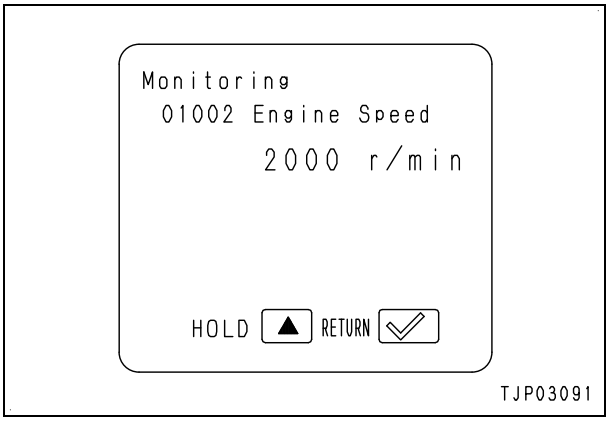
  Information that can be sent from the KOMTRAX terminal is as follows:
  1. Traveling map
  2. Service meter
  3. Location information
  4. Error history

Applicable model					PC800, SE, LC-8 PC850, SE-8			
Category	Item		Measurement conditions	Unit	Standard value for new machine		Service limit value	
Travel	Hydraulic drift of travel		 9JF00663 • Hydraulic oil temperature: 45 – 55°C • Engine stopped • Stop machine on 12° slope with sprocket at uphill end of machine. • Measure the distance the machine moves in 5 minutes.	mm	0		0	
	Leakage of travel motor		• Hydraulic oil temperature: 45 – 55°C • Engine at high idle • Travel: Lock sprocket. • Measure leakage in 1 minute during travel relief.	ℓ/min	Max. 20		Max. 40	
Work equipment	Hydraulic drift of work equipment	Total work equipment (hydraulic drift at tip of bucket teeth)	Posture of backhoe work equipment  9JF00664 Posture of loading shovel work equipment  9JG00347 • Measure extraction or retraction distance of each cylinder and lowering distance of bucket tooth tip from above posture. Rated load on work equipment Backhoe specification: 49 kN {5,000 kg} 64 kN {6,500 kg} (SE specification) Loading shovel specification Without bucket link: 79 kN {8,100 kg} • Measure on level and flat ground. • Set lever in neutral. • Stop engine. • Hydraulic oil temperature: 45 – 55°C • Measure just after setting. • Measure lowering distance every 5 minutes. Judge by lowering distance in 15 minutes. • Values in ( ) are standard values when no load is applied to work equipment.	mm	Backhoe specification	PC800-8 Loading shovel	Backhoe specification	PC800-8 Loading shovel
					Max. 1,400 (Max. 900)	Max. 1,500	Max. 1,800 (Max. 1,000)	Max. 1,800
		Boom cylinder (amount of retraction of cylinder)			Max. 60 (Max. 35)	Max. 150	Max. 90 (Max. 50)	Max. 230
		Arm cylinder (amount of extension of cylinder)			Max. 165 (Max. 70)	Max. 30	Max. 250 (Max. 105)	Max. 45
		Bucket cylinder (amount of retraction of cylinder)			Max. 50 (Max. 15)	Max. 8	Max. 75 (Max. 25)	Max. 12

Measuring engine speed

★ Measure the engine speed under the following condition.
- Engine coolant temperature: Within operating range
- Hydraulic oil temperature: 45 – 55°C

1. **Preparation work**
   Turn the starting switch ON and set the machine monitor to “Monitoring”.
   ★ For the operating method, see “Special functions of machine monitor”.
   ★ Monitoring code: 01002 Engine speed
   01006 Engine speed
   ★ Code 01002 is information of the engine controller and code 01006 is information of the pump controller. The engine speed can be measured with either of those codes.
   ★ The engine speed is displayed in rpm.



2. **Measuring low idle speed**
   1) Start the engine and set the fuel control dial in the low idle position (MIN).
   2) Set the work equipment control, swing control, and travel levers in neutral and measure the engine speed.

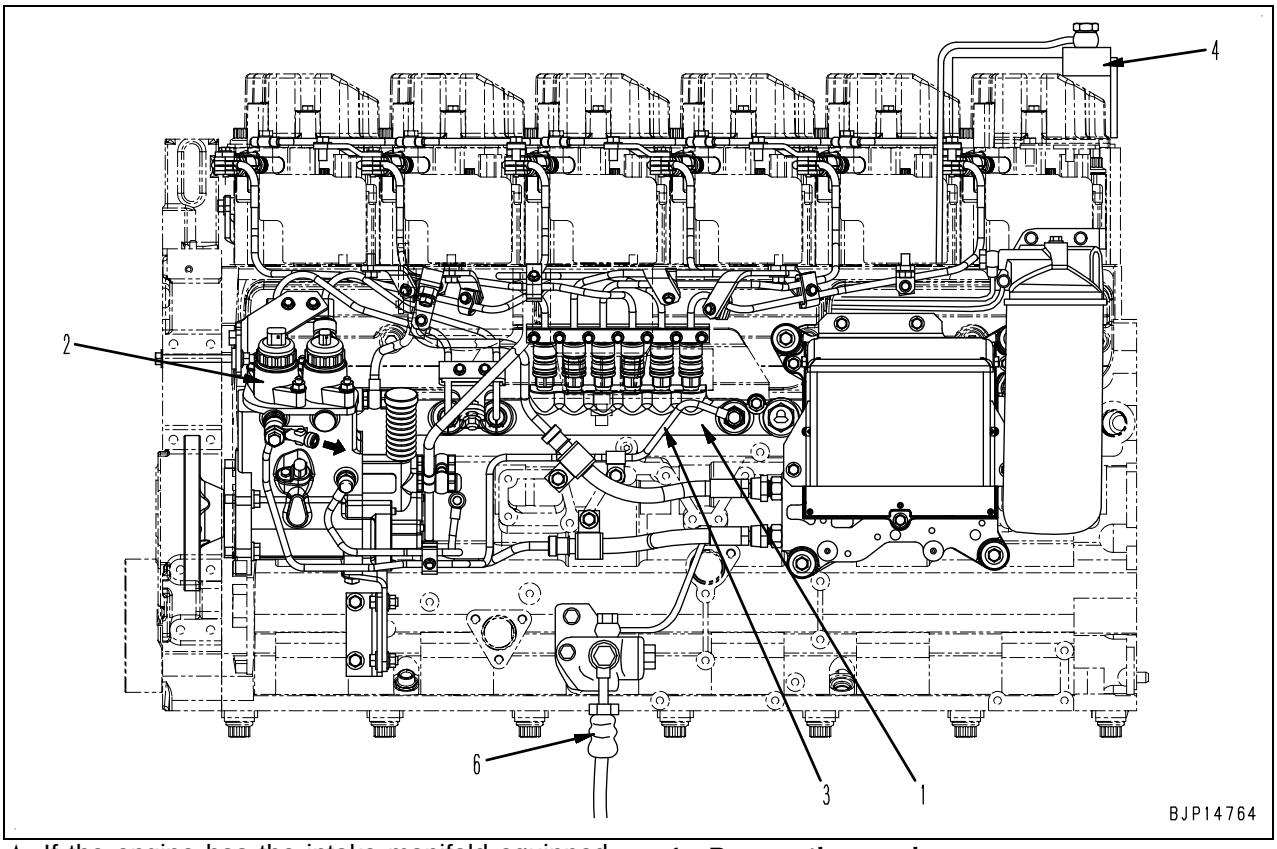
3. **Measuring high idle speed**
   1) Start the engine and set the fuel control dial in the high idle position (MAX).
   2) Set the working mode switch to the P-mode position.
   3) Turn the auto-decelerator switch OFF.

4. **Measuring all-pump relief speed**
   1) Start the engine and set the fuel control dial in the high idle position (MAX).
   2) Set the working mode switch in the P-mode position.
   3) Turn the heavy lift switch OFF.
   4) Relieve the boom circuit by raising the boom and measure the engine speed.

5. **Measuring heavy-lift ON + all-pump relief speed**
   1) Start the engine and set the fuel control dial in the high idle position (MAX).
   2) Set the working mode switch in the P-mode position.
   3) Turn the heavy lift switch ON.
   4) Relieve the boom circuit by raising the boom and measure the engine speed.

6. **Measuring auto-deceleration ON speed**
   1) Start the engine and set the fuel control dial in the high idle position (MAX).
   2) Turn the auto-deceleration switch ON.
   3) Set the work equipment control, swing control, and travel control levers in neutral. When the auto-decelerator operates, measure the engine speed.
      ★ The engine speed lowers to a certain level about 6 seconds after all the levers are set in neutral. This level is the auto-deceleration speed.

Testing fuel return rate and leakage



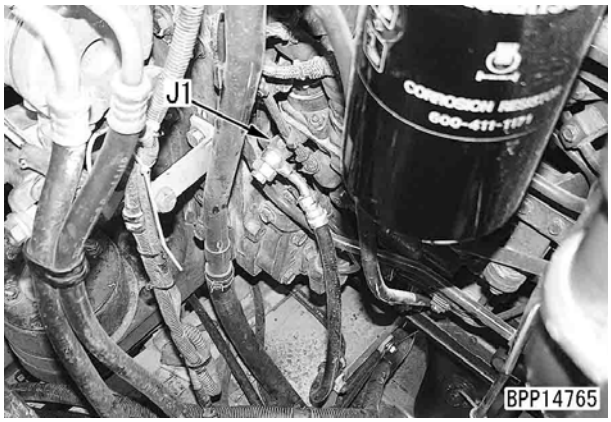
★ If the engine has the intake manifold equipped with the return block on it to return the fuel spilling from the injector to the fuel tank, test the fuel return rate and fuel leakage according to the following procedure.

★ Testing tools for fuel return rate and leakage

Symbol		Part No.	Part name
J	1	6151-51-8490	Spacer
	2	6206-71-1770	Joint
	3	6217-71-8820	Joint
	4	Commercially available	Hose (5 mm × 2 – 3 m)
	5	Commercially available	Hose (15 mm × 2 – 3 m)
	6	Commercially available	Measuring cylinder (2 ℓ)
	7	Commercially available	Stopwatch

★ Prepare an oil pan of about 20 ℓ to receive the fuel flowing out during the test.

1. **Preparation work**
   1) Remove tube (3) between common rail (1) and supply pump (2).
   2) Insert spacer **J1** on supply pump (2) side and tighten the removed joint bolt again.
      ★ Connect the return pipe to the fuel tank again, too.
      ★ Be sure to fit the gaskets to both ends of the spacer.



   3) Insert joint **J2** on common rail (1) side and tighten the removed joint bolt again.
      ★ Be sure to fit the gaskets to both ends of the joint.

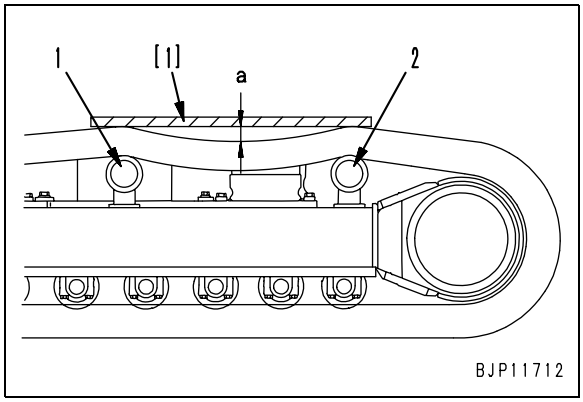
Testing and adjusting track shoe tension

Testing

1. Travel the machine forward by the length of track on ground, keeping the engine at low idle, and stop the machine slowly.

2. Place wood bar [1] on the track shoe between second carrier roller (1) and third carrier roller (2).
   ★ L beam is recommended for bar [1], because of its deflection-free nature.

3. Measure max. clearance (a) between bar [1] and the track shoe.
   • Max. standard clearance (a): 10 – 30 mm



Adjusting

★ If the track shoe tension is not proper, adjust it in the following manner.

1. When the tension is too strong

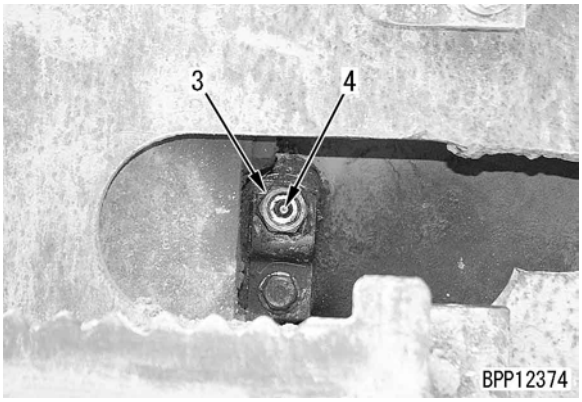
Discharge grease by loosening valve (3).

⚠ Do not loosen valve (3) by more than one turn, because grease will spurt due to its internal high pressure.

2. When the tension is too weak

Add grease through grease fitting (4).

★ If the normal track shoe tension is not restored even after greasing, move the machine slowly back and forth.



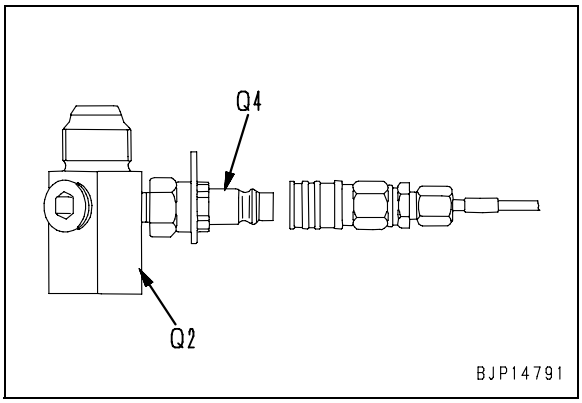
7) While the track is running with no load, measure the VC valve basic pressure and output pressure under the following condition.
   i) Using the boom and arm, push up the track shoe on the side to be measured.
   ii) While the engine is running at high idle, operate the travel lever to the stroke end and measure the basic pressure and output pressure.
      • Left travel : Front pump side
      • Right travel : Rear pump side
8) After finishing measurement, remove the measuring instruments and return the removed parts.

Judgment table

Operation mode	All levers in neutral	Boom circuit relieved in raising operation (With heavy lift OFF)	Track running with no load (Lever at stroke end)
EPC valve output pressure (Pce1 (Pce2)) (VC valve control pressure) MPa {kg/cm^2}	Max. 0.78 {Max. 8}	1.03 – 1.43 {10.5 – 14.5}	Min. 1.23 {Min. 12.5}
Servo piston position	Contact with stopper on min. swash plate angle side	Intermediate between min. and max. swash plate angles	Contact with stopper on max. swash plate angle side
Judgment value of VC valve output pressure (Pce1 (Pce2)) (Servo piston large-diameter pressure)	Approx. 1/2 of basic pressure ≒ 1/2 Pch1 (Pch2) to Pch1 (Pch2)	Approx. 1/2 of basic pressure (≒ 1/2 x Pch1 (Pch2)) *1	Approx. 1/2 of basic pressure to drain pressure ≒ 1/2 Pch1 (Pch2) to Pd

*1. Since the swash plate is at the intermediate point, the pressure is about “0.5 – 0.6 times” (approx. 1/2 of) the relief pressure (discharge pressure).

2) Install the nipple (R1/8) of hydraulic tester **Q1** or nipple **Q4** (10 × 1.25 mm) and connect it to oil pressure gauge [1].
   ★ Use nipple (R1/8) for adapter of size #03 and nipple **Q4** for adapter of size #04.
   ★ Use a pressure gauge of 6.0 MPa {60 kg/cm^2}
   ★ The following figure shows the measuring devices installed to the outlet hose of the PPC lock solenoid valve.



3) Run the engine at high idle, set the condition or operate the control levers as shown in the table, and measure the output pressure.
   ★ When operating the work equipment-swing or travel control lever, operate it finely to a degree that the PPC oil pressure switch is turned ON.
   ★ If the solenoid valve outlet pressure is as shown in the table, the solenoid valve is normal.

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

3. Measuring leakage from bucket cylinder

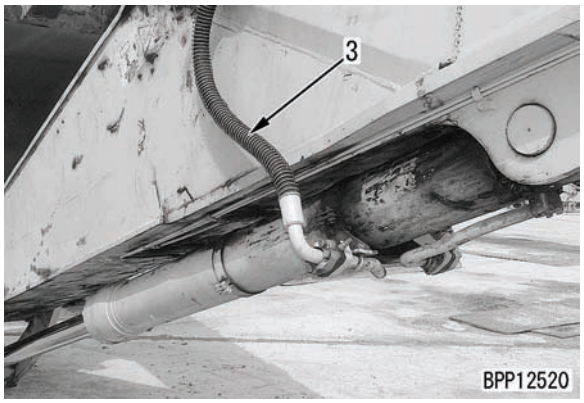
1) Run the engine and curl the bucket to the stroke end.

⚠ Referring to “Release of residual pressure from hydraulic circuit”, release the residual pressure from the piping on the bucket cylinder head side (Operate the lever only in the CURL direction, however).

2) Disconnect hose (3) on the cylinder head side and block it with a flange.

⚠ Take care not to disconnect the hose on the cylinder bottom side.

★ Use the following part to block the hose.
07379-01470 (Flange #14)



3) Run the engine at high idle and relieve the bucket cylinder by operating the bucket control lever in the CURL direction.

⚠ Take care not to operate the bucket control lever in the DUMP direction.

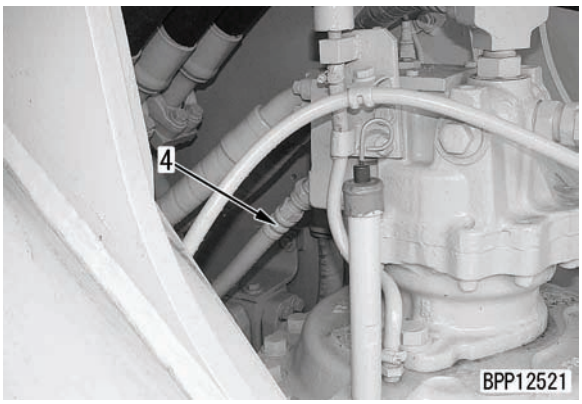
4) Start measuring the oil leakage 30 seconds after the bucket cylinder is relieved and measure for 1 minute.
5) After finishing measurement, return the parts.

4. Measuring leakage from swing motor

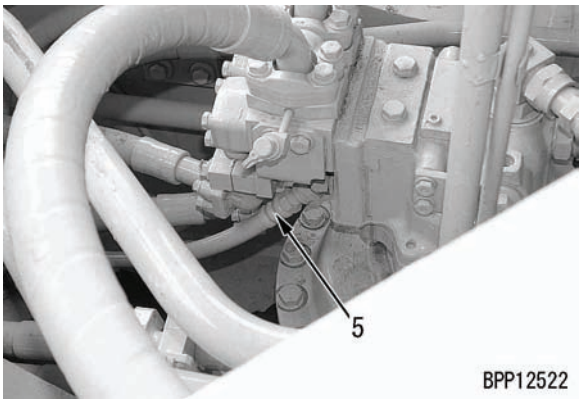
1) Disconnect drain hoses (4) and (5) and plug them.

★ Use the following parts to block the hoses.
07376-70522 (Plug #05)

• (4): Drain hose of front swing motor



• (5): Drain hose of rear swing motor



2) Turn the swing lock switch ON.
3) Run the engine at high idle and relieve the swing circuit and measure the oil leakage.

★ Start measuring the oil leakage 30 seconds after the swing motor circuit is relieved and measure for 1 minute.

4) After measuring 1 time, swing the upper structure 180° and measure again according to steps 2) and 3).
5) After finishing measurement, return the parts.

HYDRAULIC EXCAVATOR

PC800-8 PC850-8
PC800SE-8 PC850SE-8
PC800LC-8

Machine model	Serial number
PC800-8	**50001 and up**
PC800SE-8	**50001 and up**
PC800LC-8	**50001 and up**
PC850-8	**10001 and up**
PC850SE-8	**10001 and up**

30 Testing and adjusting
Testing and adjusting, Part 4

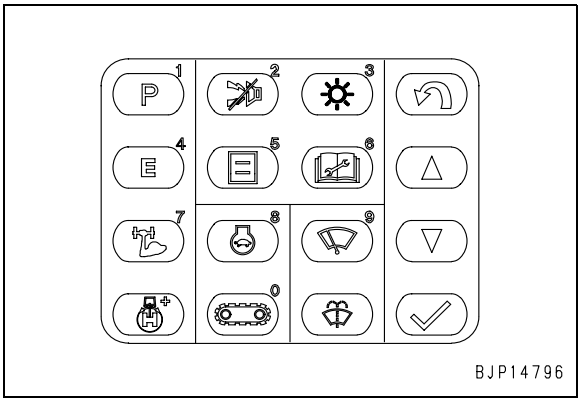
Testing and adjusting, Part 4 2
Special function of machine monitor 2
Handling controller voltage circuit 35

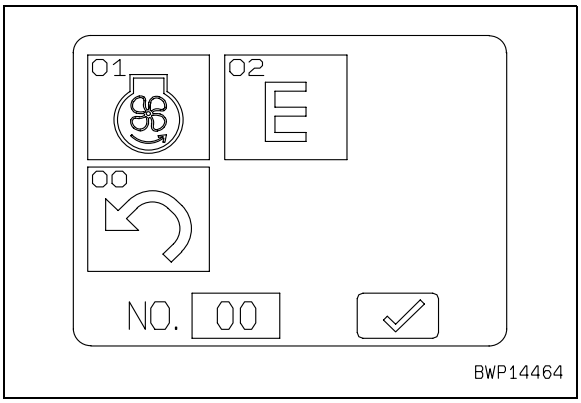
15. Function of reversing fan rotation and adjusting economy mode value

1) Reversing fan rotation

1] Press switch [5] of the monitor, and the following screen appears.

- "01": Fan rotation reversing menu
- "02": Economy mode value adjusting menu



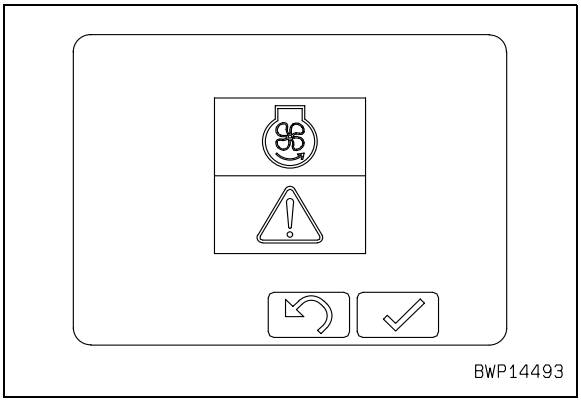


2] Select "1" Fan rotation reversing and press the [✓] switch, and the following screen appears.

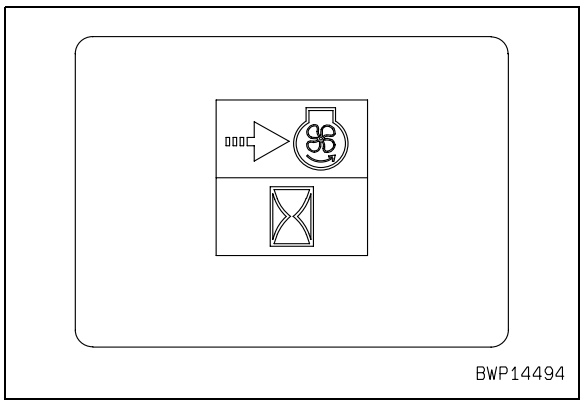
★ The fan mark is green.

3] When reversing the fan rotation, press the [✓] switch.

★ When not reversing the fan rotation, press the return switch [↩], and the previous screen appears.



4] If the [✓] switch is pressed, the screen to wait for change of the fan rotation direction appears and the engine speed is lowered to low idle automatically. After about 15 seconds, the fan rotation is reversed. After 4 seconds, the engine speed returns to the level before the [✓] switch was pressed.

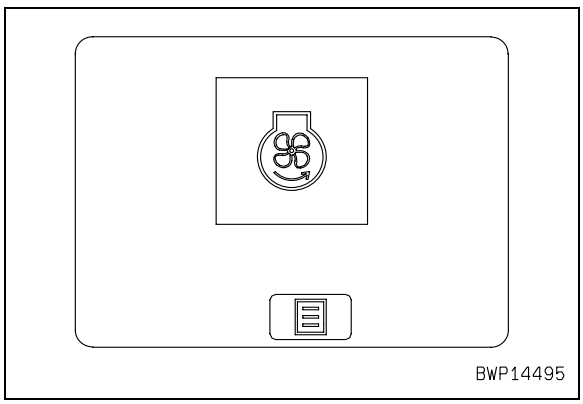


★ The fan speed is in proportion to the engine speed. If the engine speed is low idle, the fan speed is MIN.
To increase the fan speed, increase the engine speed with the fuel control dial.

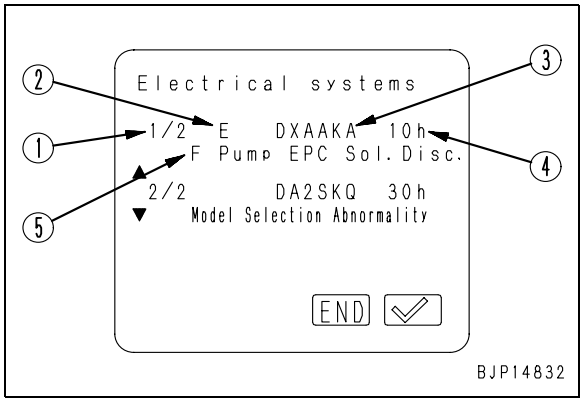
★ When reversing the fan rotation while the engine is stopped, turn the starting switch to the START position after the above screen appears. (This screen does not change until the engine is started. When stopping reversing the fan rotation, turn the starting switch to the OFF position.)

5] If the fan rotation is reversed, the following screen appears automatically and is maintained as long as the fan rotation is in reverse.

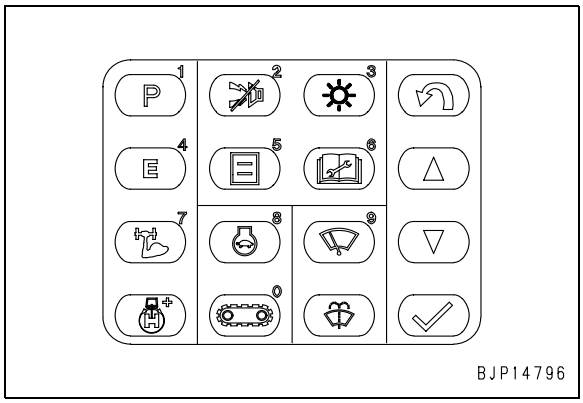
★ The fan mark is yellow.



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.

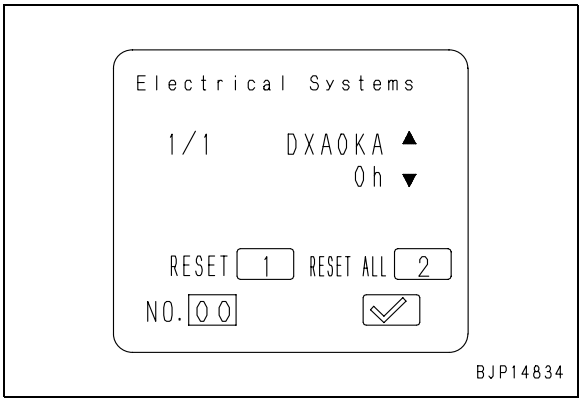


i) Through the following switch operation, call the resetting display in the display of Electrical Systems.
   • Switch operation: [△] +[1] → [2] → [3]



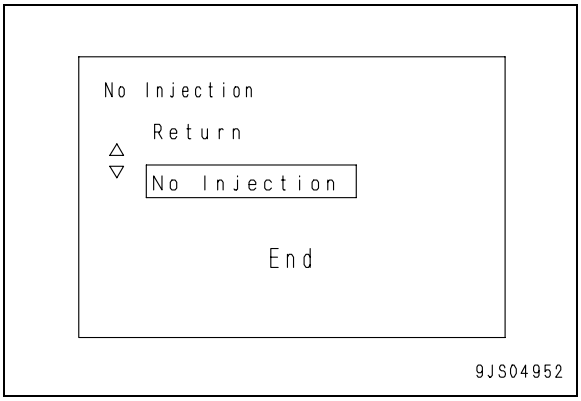
   ★ This is the same switch operation in changing the display to Service Menu.

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.

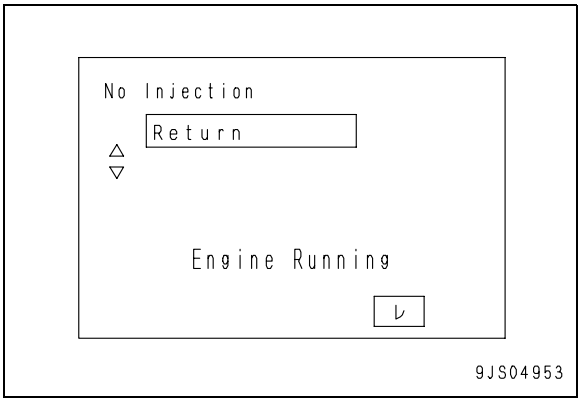


7) After the no injection cranking is over, press [✓] switch from the previous screen and the letters “End” will be displayed for 3 seconds.
   ★ The letters “End” are displayed in green.

8) Press “Return” when ending the no injection cranking.



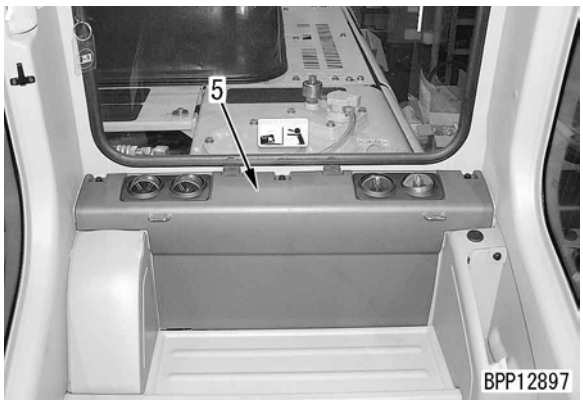
★ If the no injection cranking function is inadvertently selected while the engine is running, “Engine Running” will appear as No Injection in step 4) is selected. This “Engine Running” display remains on the screen even after the engine is stopped. Restoring the service menu screen alone deletes the display.



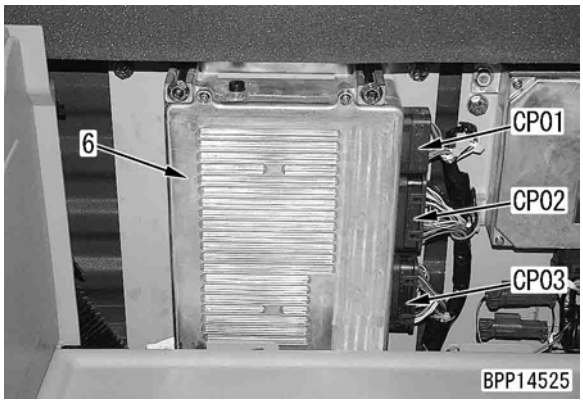
3. Pump controller

★ The pump controller is installed in the cover at the rear of the operator's seat.

1) Remove 3 caps (4) and 3 mounting bolts.
   ★ Remove the caps with a thin flat-head screwdriver.
2) Remove cover (5).



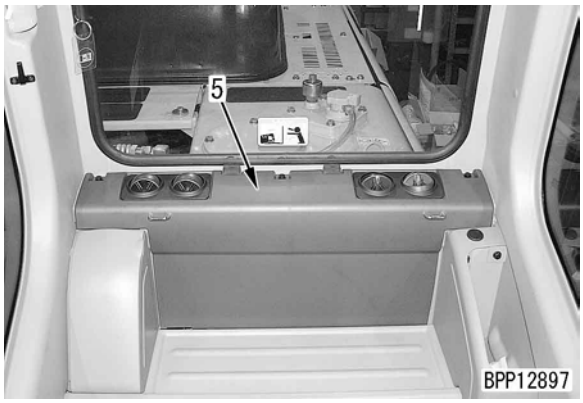
3) Insert or connect T-adapters for troubleshooting to connectors **C01**, **C02**, and **C03** of the pump controller (6).
   ★ Since the connectors are secured with screws, loosen those screws before disconnecting them.
   ★ After returning the connectors, tighten the screws to the specified torque.
   Screw: **2.82 Nm {0.288 kgm}**



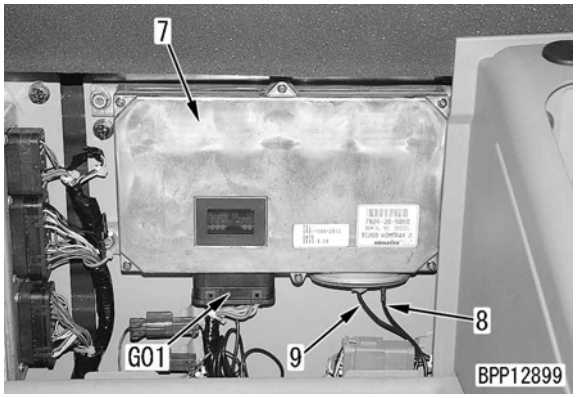
4. KOMTRAX terminal

★ KOMTRAX terminal is installed in the cover situated in the rear side of the operator seat.

1) Slide the operator's seat and seat stand to the forward end.
2) Remove the 4 mounting bolts and cover (7).



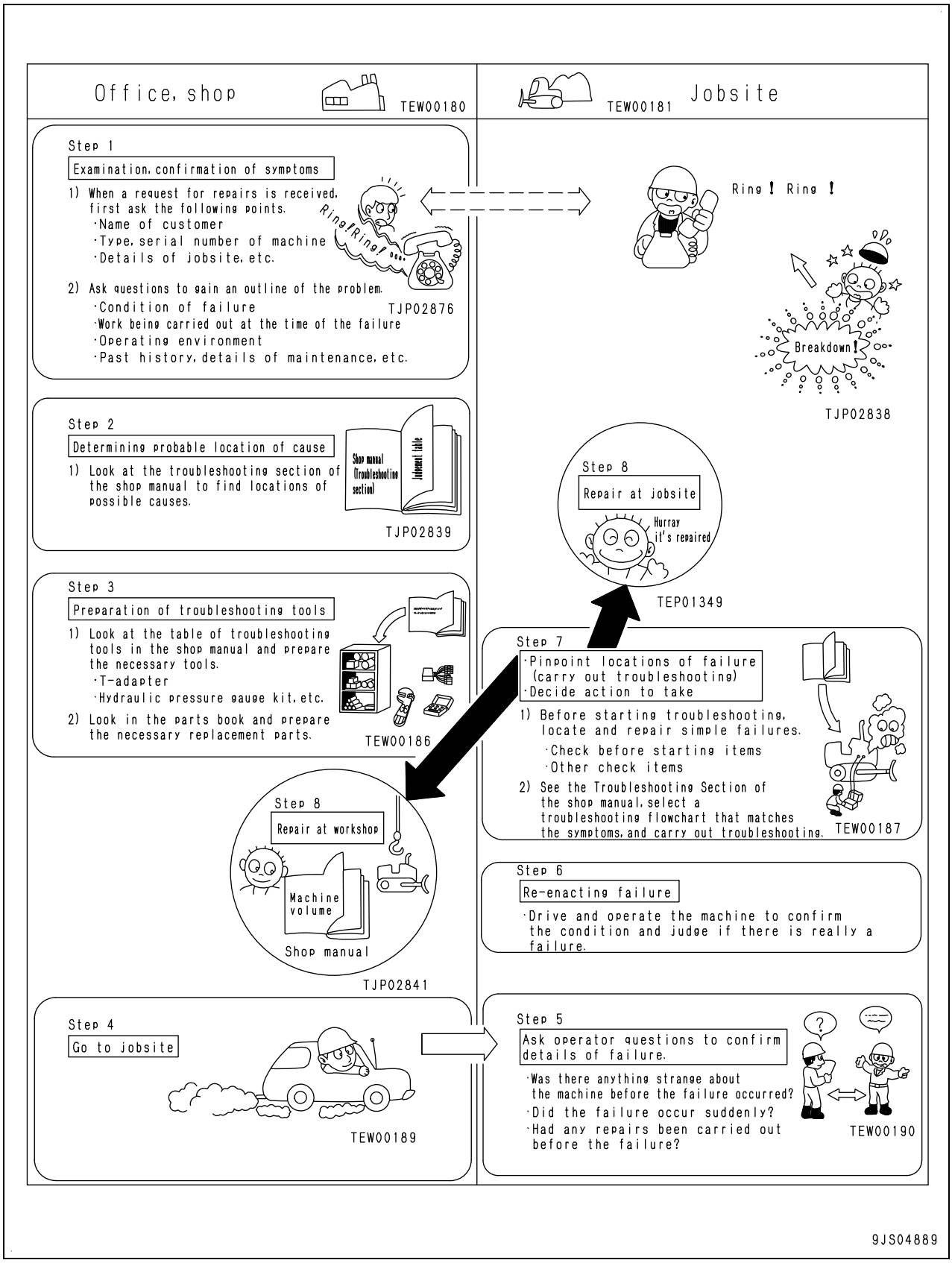
3) Insert or connect troubleshooting T-adapter in or to connector **CK01** KOMTRAX of terminal (8).
   ★ The connectors are fixed with screw. Loosen the screws before disconnecting them.
   ★ When returning the connectors to their original positions, fix them by tightening the screws with the specified torque.
   Screw: **2.82 Nm {0.288 kgm}**
   ★ Cable (9) is for the communication antenna.
   ★ Cable (10) is used for the GPS antenna.

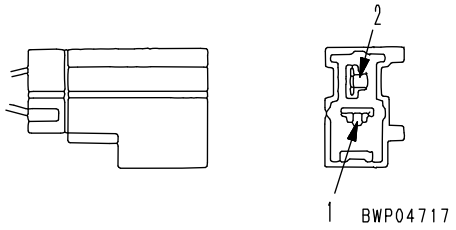
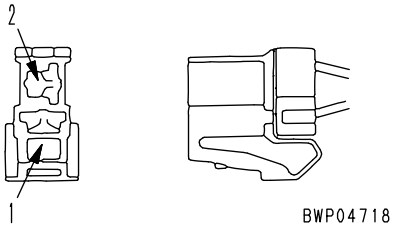
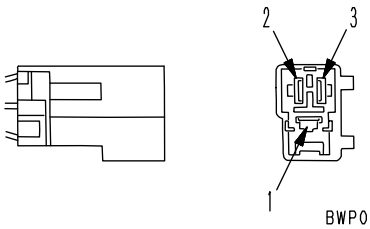
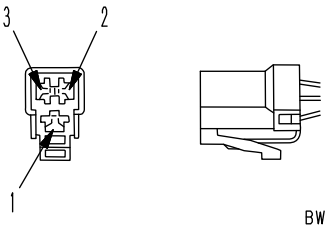
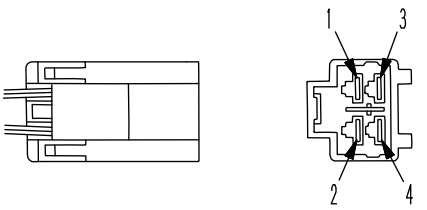
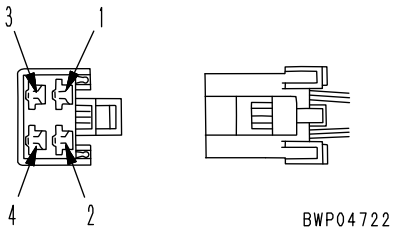
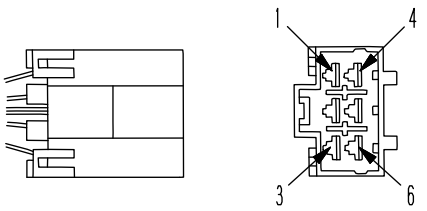
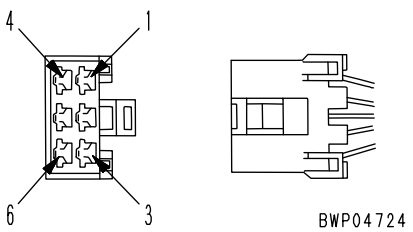
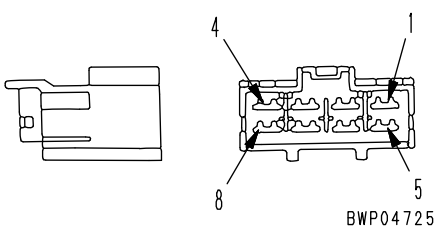
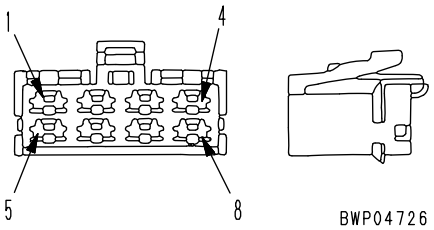


PC800-8, PC800SE-8, PC800LC-8, PC850-8, PC850SE-8 Hydraulic excavator

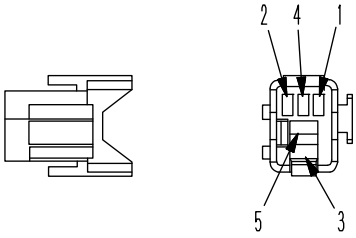
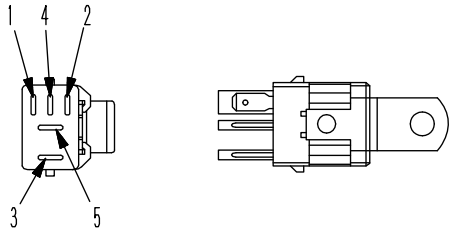
Form No. SEN00914-03

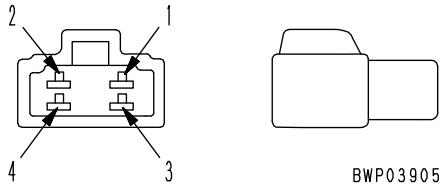
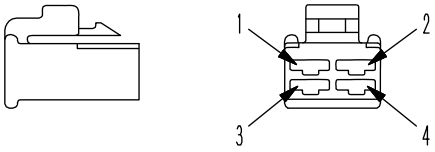
Sequence of events in troubleshooting



No. of pins	M type connector		
	Male (female housing)	Female (male housing)	Testing connection use special tool Part No.
1	Part No. : 08056-00171	Part No. : 08056-00181	799-601-7080 (T-adapter)
2	 BWP04717	 BWP04718	799-601-7090 (T-adapter)
	Part No. : 08056-00271	Part No. : 08056-00281	
3	 BWP04719	 BWP04720	799-601-7110 (T-adapter)
	Part No. : 08056-00371	Part No. : 08056-00381	
4	 BWP04721	 BWP04722	799-601-7120 (T-adapter)
	Part No. : 08056-00471	Part No. : 08056-00481	
6	 BWP04723	 BWP04724	799-601-7130 (T-adapter)
	Part No. : 08056-00671	Part No. : 08056-00681	
8	 BWP04725	 BWP04726	799-601-7340 (T-adapter)
	Part No. : 08056-00871	Part No. : 08056-00881	

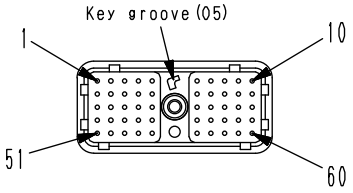
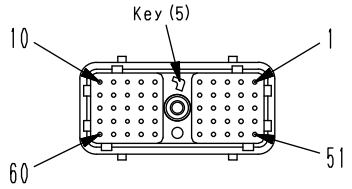
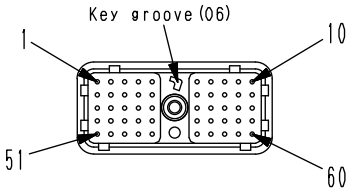
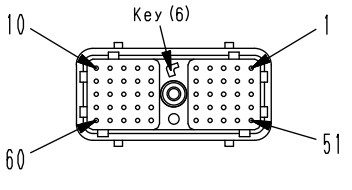
B4D18193

No. of pins	Connector for relay (Socket type)		
	Female (female housing)	Relay (male housing)	Testing connection use special tool Part No.
5			—
	Part No. :7861-74-5300	Part No. :7861-74-5100	

No. of pins	F type connector		
	Male (female housing)	Female (male housing)	
4	 BWP03905	 BWP03906	—
	—	—	

B4D18404

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

No. of pins	DRC26 Series connector		
	Male pin (female housing)	Female pin (male housing)	Testing connection use special tool Part No.
60 -05※	 BJD14063	 BJD14064	799-601-4220 (T-adapter) (Kit:799-601-4101)
	–	Part No. 08194-04104	
	※-05:Key position		
60 -06※			799-601-4390 (Socket)
	–	–	
	※-06:Key position		

B4D18415

T- branch box and T - branch adapter table

(Rev.2009.03)

★ The vertical column indicates a part number of T-branch box or T-branch adapter while the horizontal column indicates a part number of harness checker assembly.

Part number	Part name	Number of pins	Identification symbol	T-adapter kit														Out of kit
				799-601-2500	799-601-2700	799-601-2800	799-601-7000	799-601-7100	799-601-7400	799-601-7500	799-601-8000	799-601-9000	799-601-9100	799-601-9200	799-601-9300	799-601-4101	799-601-4201	
799-601-2600	T-box(for ECONO)	21		●		●		●	●		●							
799-601-3100	T-box(for MS)	37																●
799-601-3200	T-box(for MS)	37																●
799-601-3380	• Plate for MS (14-pin)																	●
799-601-3410	Adapter for BENDIX (MS)	24	MS-24P															●
799-601-3420	Adapter for BENDIX (MS)	24	MS-24P															●
799-601-3430	Adapter for BENDIX (MS)	17	MS-17P															●
799-601-3440	Adapter for BENDIX (MS)	17	MS-17P															●
799-601-3450	Adapter for BENDIX (MS)	5	MS-5P															●
799-601-3460	Adapter for BENDIX (MS)	10	MS-10P															●
799-601-3510	Adapter for BENDIX (MS)	5	MS-5S															●
799-601-3520	Adapter for BENDIX (MS)	17	MS-17P															●
799-601-3530	Adapter for BENDIX (MS)	19	MS-19P															●
799-601-2910	Adapter for BENDIX (MS)	14	MS-14P															●
799-601-3470	Case																	●
799-601-2710	Adapter for MIC	5	MIC-5P	●	●				●									
799-601-2720	Adapter for MIC	13	MIC-13P	●	●				●									
799-601-2730	Adapter for MIC	17	MIC-17P	●	●	●		●	●		●							
799-601-2740	Adapter for MIC	21	MIC-21P	●	●	●		●	●		●							
799-601-2950	Adapter for MIC	9	MIC-9P				●	●	●		●							
799-601-2750	Adapter for ECONO	2	ECONO2P	●	●													
799-601-2760	Adapter for ECONO	3	ECONO3P	●	●													
799-601-2770	Adapter for ECONO	4	ECONO4P	●	●													
799-601-2780	Adapter for ECONO	8	ECONO8P	●	●													
799-601-2790	Adapter for ECONO	12	ECONO12P	●	●													
799-601-2810	Adapter for DLI	8	DLI-8P	●	●													
799-601-2820	Adapter for DLI	12	DLI-12P	●	●													
799-601-2830	Adapter for DLI	16	DLI-16P	●	●													
799-601-2840	Extension cable (ECONO type)	12	ECONO12P	●	●				●									
799-601-2850	Case			●														
799-601-4350	T-box(for DRC 60, ECONO)	60														●		
799-601-4360	Case															●		
799-601-7010	Adapter for X (T-adapter)	1							●		●							
799-601-7020	Adapter for X	2	X2P				●	●	●		●							
799-601-7030	Adapter for X	3	X3P				●	●	●		●							
799-601-7040	Adapter for X	4	X4P				●	●	●		●							
799-601-7050	Adapter for SWP	6	SW6P				●	●	●									
799-601-7060	Adapter for SWP	8	SW8P				●	●	●									
799-601-7310	Adapter for SWP	12	SW12P															●
799-601-7070	Adapter for SWP	14	SW14P						●		●							
799-601-7320	Adapter for SWP	16	SW16P															●
799-601-7080	Adapter for M (T-adapter)	1	-						●		●							
799-601-7090	Adapter for M	2	M2P				●	●	●		●							
799-601-7110	Adapter for M	3	M3P				●	●	●		●							
799-601-7120	Adapter for M	4	M4P				●	●	●		●							
799-601-7130	Adapter for M	6	M6P				●	●	●		●							
799-601-7340	Adapter for M	8	M8P															●
799-601-7140	Adapter for M	8	S8P				●	●	●		●							
799-601-7150	Adapter for S (White)	10	S10P				●	●	●		●							
799-601-7160	Adapter for S (Blue)	12	S12P				●	●	●									

Failure code [B@BAZG] Eng. Oil Press. Low

Action code	Failure code	Trouble	Engine oil pressure low (Engine controller system)
—	**B@BAZG**		
Contents of trouble	• Engine oil pressure drops while engine is running.		
Action of controller	• Limits output and continues operation.		
Problem that appears on machine	• Engine output lowers. • If machine is operated as it is, engine may be damaged.		
Related information	•		

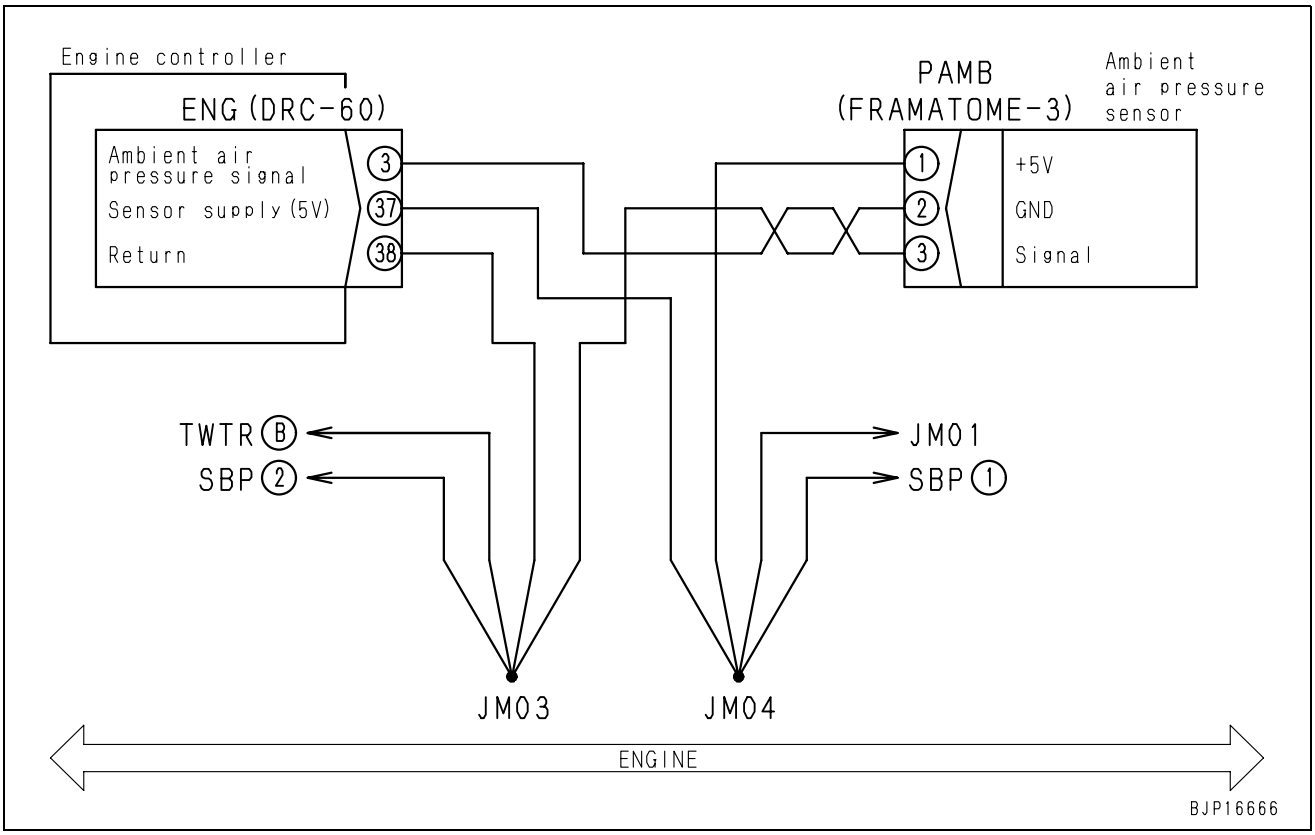
Possible causes and standard value in normal state	Cause		Standard value in normal state/Remarks on troubleshooting
	1	Lowering of engine oil pressure	Engine oil pressure may be low. Check it directly and remove cause if it is low.
	2	Defective engine oil pressure sensor system	If cause 1 is not detected, engine oil sensor system may be detective. Carry out troubleshooting for the failure codes [CA135] and [CA141].

Failure code [CA141] Eng Oil Press Sensor Low Error

Action code	Failure code	Trouble	Eng Oil Press Sensor Low Error (Engine controller system)
E15	**CA141**		
Contents of trouble	• Low pressure error occurred in engine oil pressure sensor circuit.		
Action of controller	• Sets oil pressure to default (250 kPa {2.5 kg/cm^2}) and continues operation.		
Problem that appears on machine	• Starting performance of the engine lowers during low temperature.		
Related information	• The signal voltage of engine oil pressure sensor can be checked in monitoring function. (Code: **37201** Engine oil pressure sensor voltage) • Duplication of failure code: turn ON the starting switch.		

Possible causes and standard value in normal state	Cause	Standard value in normal state/Remarks on troubleshooting
	Carry out troubleshooting for failure code [**CA135**].	

Circuit diagram related to atmospheric pressure sensor

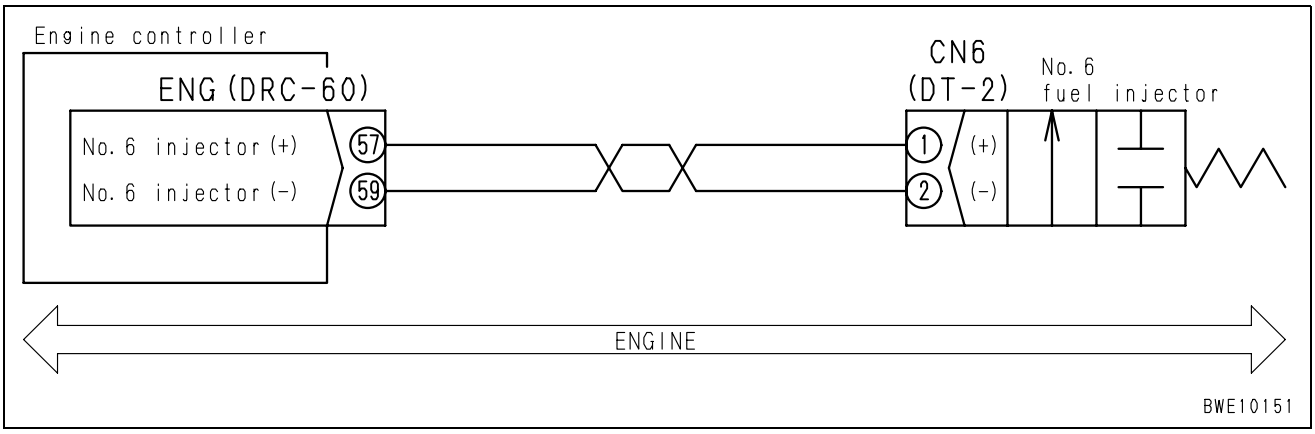


Failure code [CA265] Fuel Temp Sensor Low Error

Action code	Failure code	Trouble	Fuel Temp Sensor Low Error (Engine controller system)
E15	CA265		
Contents of trouble	• Low temperature error occurred in fuel temperature sensor circuit.		
Action of controller	• Fixes fuel temperature value at 90°C and continues operation.		
Problem that appears on machine			
Related information	• The signal voltage of engine fuel temperature sensor can be checked in monitoring function. (Code: **14201** Engine fuel temperature sensor voltage)		

Possible causes and standard value in normal state	Cause	Standard value in normal state/Remarks on troubleshooting
	Carry out troubleshooting for failure code [**CA263**].	

Circuit diagram related to injector #6

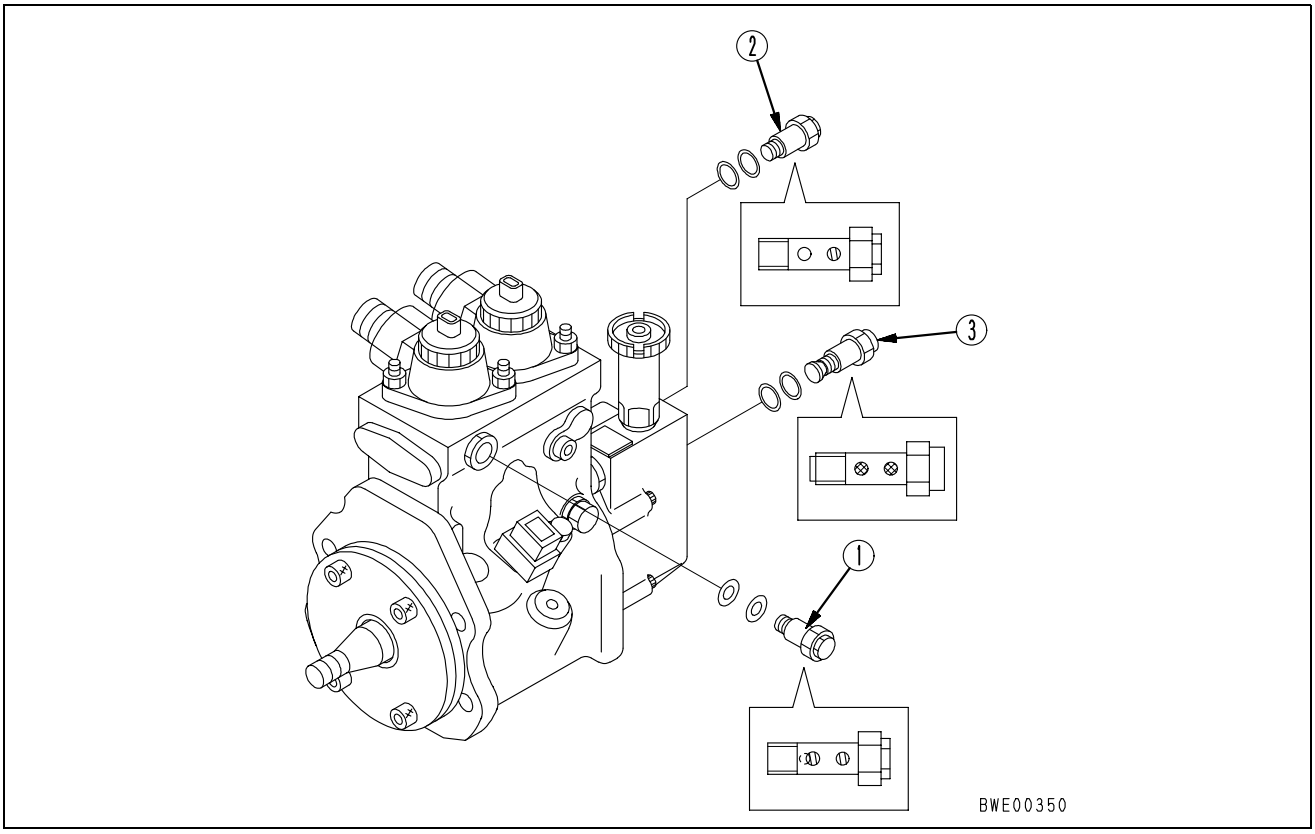


PC800-8, PC800SE-8, PC800LC-8, PC850-8, PC850SE-8 Hydraulic excavator

Form No. SEN00790-03

Note 1: When low-pressure circuit is defective, check the following:
- Fuel level
- Clogged fuel tank breather
- Water separator/Prefilter filled with water
- Clogged fuel filter
- Clogged screen in water separator
- Stuck or worn feed pump, clogged filter
- Leaked or clogged low-pressure fuel pipe
- Bypass valve malfunction, defective assembly of other parts (See Fig. 1.)
- Fuel in oil pan (fuel leakage in head cover)

Fig. 1: Locations of overflow valve (1), bypass valve (2), and fuel inlet joint (3)
- Overflow valve (1): Spring is seen through both holes.
- Bypass valve (2): Spring is seen through hole on nut side.
- Fuel inlet joint (3): Gauze filter is seen through both holes.



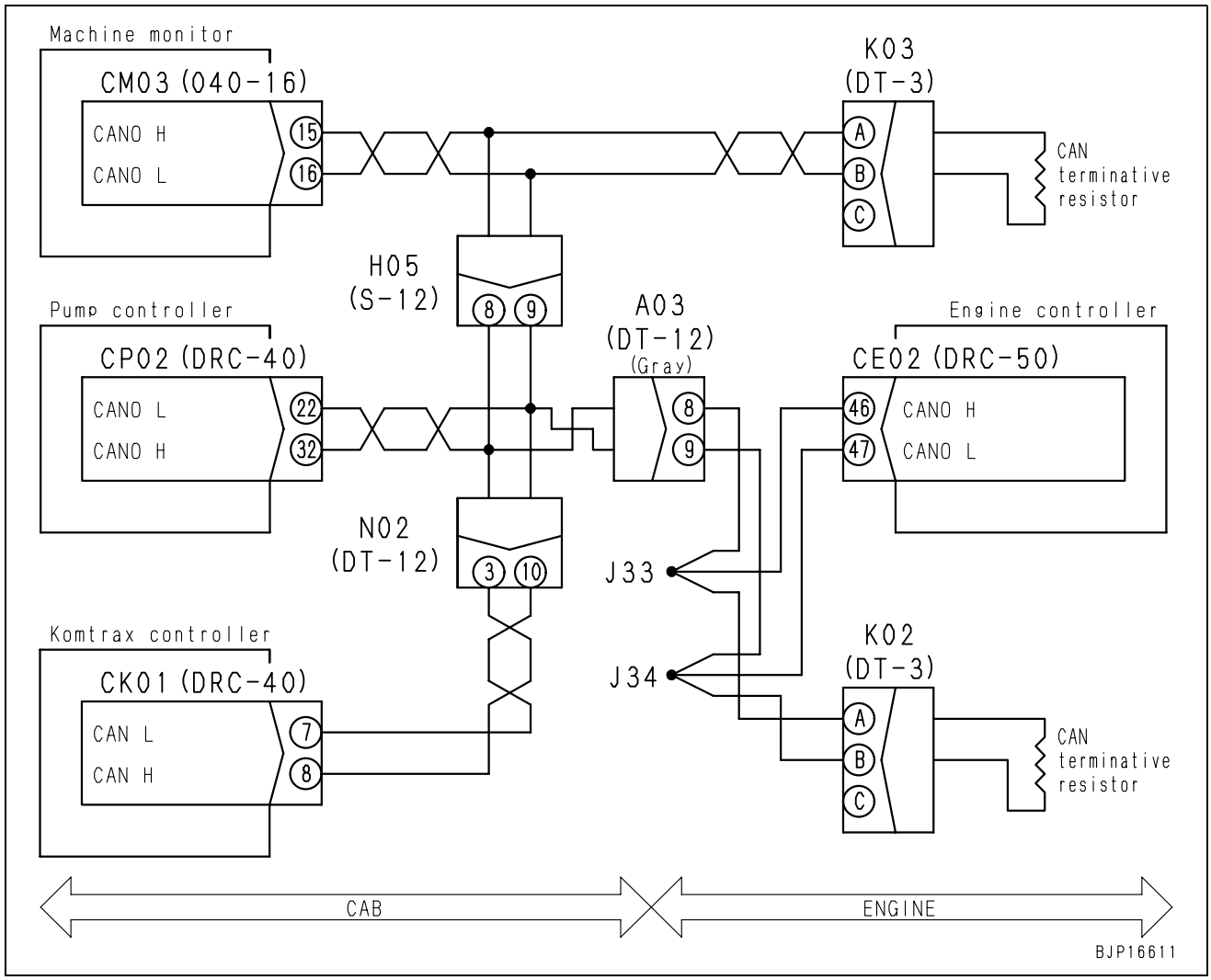
Note 2: Follow the procedure below to check, clean, and replace filter and strainer.
1) Gauze filter: Disassemble this filter for checking. If clogged, clean it
2) Gauze filter upstream strainer: Clean upstream strainer if gauze filter is clogged
3) Fuel filter: If failure is not remedied after steps 1) and 2) above were executed, replace fuel filter

Failure code [CA1626] BP Valve Sol Current High Error

Action code	Failure code	Trouble	BP Valve Sol Current High Error (Engine controller system)
E11	**CA1626**		
Contents of trouble	• There is short circuit in drive circuit of bypass valve solenoid.		
Action of controller	• Limits output and continues operation. • Closes EGR valve and bypass valve.		
Problem that appears on machine	• Output drops.		
Related information			

	Cause		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective bypass valve solenoid (Internal trouble)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			BP (male)	Resistance	
			Between (1) – (2)	10 – 21 Ω	
	2	Disconnection in wiring harness (Disconnection in wiring or defective contact in connector)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between ENG (female) (31) – BP (female) (1)	Resistance	Max. 1 Ω
			Wiring harness between ENG (female) (11) – BP (female) (2)	Resistance	Max. 1 Ω
	3	Ground fault in wiring harness (Short circuit with GND circuit)	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between ENG (female) (31) – BP (female) (1) and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between ENG (female) (11) – BP (female) (2) and chassis ground	Resistance	Min. 1 MΩ
	4	Hot short (Short circuit with 24V circuit) in wiring harness	★ Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			Wiring harness between ENG (female) (31) – BP (female) (1) and chassis ground	Voltage	Max. 1 V
			Wiring harness between ENG (female) (11) – BP (female) (2) and chassis ground	Voltage	Max. 1 V
	5	Defective engine controller	★ Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			ENG (female)	Resistance	
			Between (31) – (11)	10 – 21 Ω	

Circuit diagram related to CAN communication of pump controller

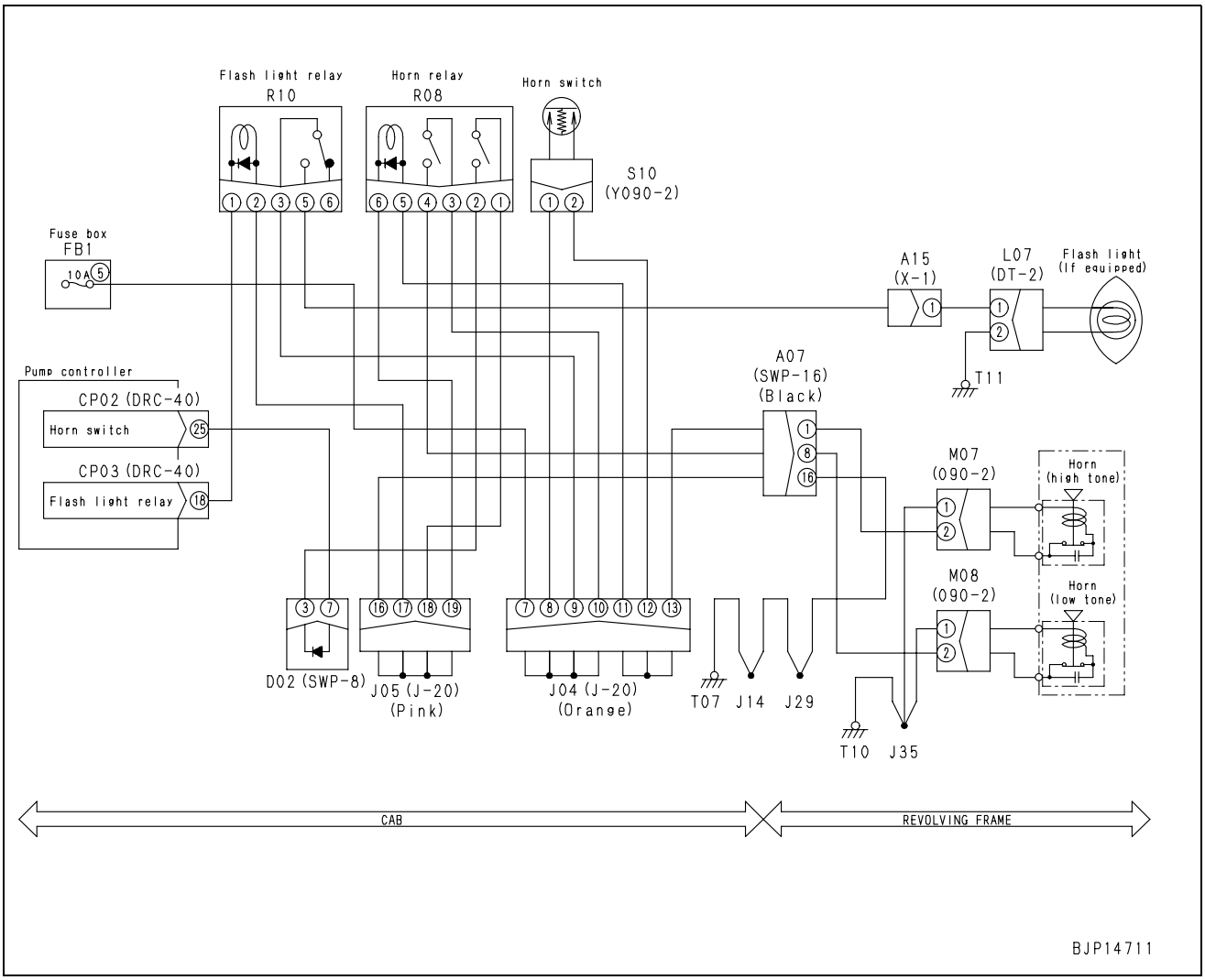


Failure code [CA2272] EGR Valve Pos Sens Low Error

Action code	Failure code	Trouble	EGR Valve Pos Sens Low Error (Engine controller system)
E11	**CA2272**		
Contents of trouble	• Low error occurred in EGR valve lift sensor circuit.		
Action of controller	• Limits output and continues operation. • Close EGR and bypass valves.		
Problem that appears on machine	• Engine output lowers.		
Related information	• Signal voltage of EGR valve position sensor can be checked with monitoring function. (Code: **18101** EGR valve position sensor voltage)		

Possible causes and standard value in normal state	Cause	Standard value in normal state/Remarks on troubleshooting
	Carry out troubleshooting for failure code [**CA2271**].	

Electric circuit diagram related to horn and flash light relay



Failure code [DA2RMC] Pump Comm. Abnormality

Action code	Failure code	Trouble	Pump Comm. Abnormality (Pump controller system)
E0E	**DA2RMC**		
Contents of trouble	• Pump controller detected communication error in CAN communication circuit between machine monitor, engine controller and KOMTRAX controller.		
Action of controller	• Fix engine output to E-mode, and limit pump absorption torque to about 80%. • If cause of failure disappears, system resets itself.		
Problem that appears on machine	• Output lowers. (Pump absorption torque decreases.) • As the working load increases, engine may stall.		
Related information			

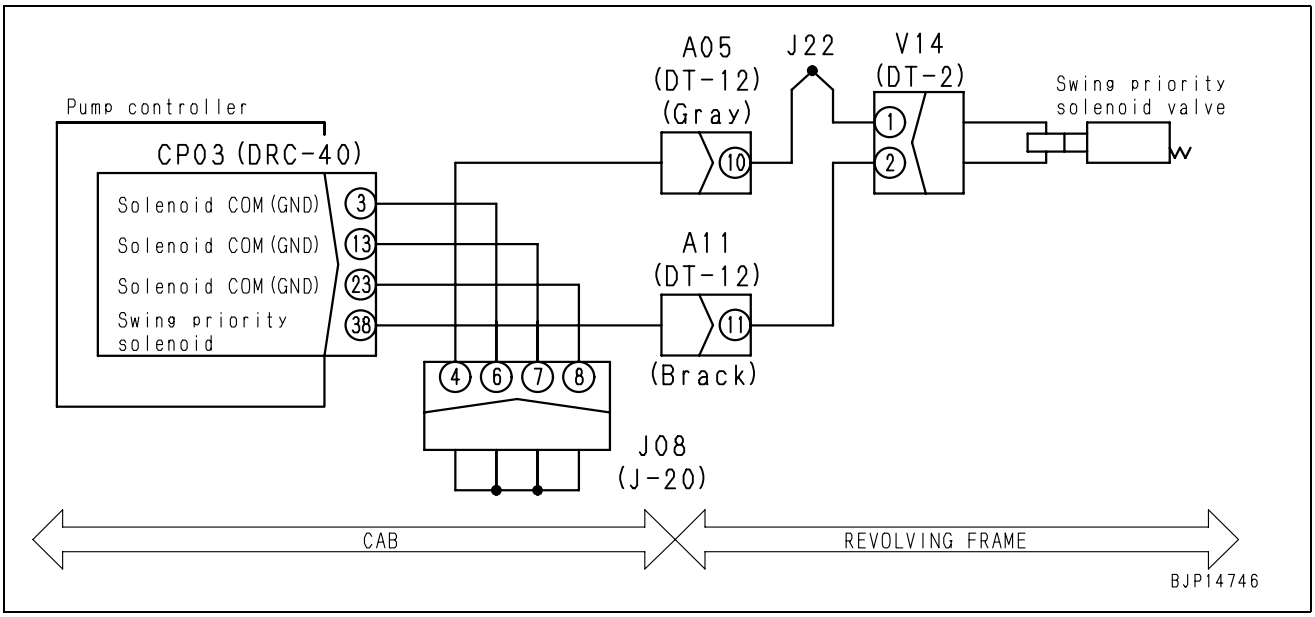
	Cause		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Disconnection in wiring harness (Disconnection in wiring or defective contact in connector)	★Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between CM03 (female) (16) – CE02 (female) (47), – CP02 (female) (22) – CK01 (female) (7)	Resistance	Max. 1 Ω
			Wiring harness between CM03 (female) (15) – CE02 (female) (46), – CP02 (female) (32) – CK01 (female) (8)	Resistance	Max. 1 Ω
	2	Ground fault in wiring harness (Short circuit with GND circuit)	★Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			Wiring harness between CM03 (female) (16) – CE02 (female) (47), – CP02 (female) (22), – CK01 (female) (7) – other related circuit and chassis ground	Resistance	Min. 1 MΩ
			Wiring harness between CM03 (female) (15) – CE02 (female) (46), – CP02 (female) (32), – CK01 (female) (8) – other related circuit and chassis ground	Resistance	Min. 1 MΩ
	3	Hot short (Short circuit with 24V circuit) in wiring harness	★Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.		
			Wiring harness between CM03 (female) (16) – CE02 (female) (47), – CP02 (female) (22), – CK01 (female) (7) – other related circuit and chassis ground	Voltage	Max. 1 V
			Wiring harness between CM03 (female) (15) – CE02 (female) (46), – CP02 (female) (32), – CK01 (female) (8) – other related circuit and chassis ground	Voltage	Max. 1 V
	4	Defective CAN terminal resistance	★Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.		
			K02 (male), K03 (male)	Resistance	
			Between (A) – (B)	120 ± 12 Ω	
	5	Defective machine monitor, engine controller, pump controller, or KOMTRAX controller	If causes 1 – 4 are not detected, machine monitor, engine controller, pump controller, or KOMTRAX controller may be defective. (Since trouble is in system, troubleshooting cannot be carried out.)		

Failure code [DHPEKB] F Pump P. Sensor S/C

Action code	Failure code	Trouble	F Pump P. Sensor S/C (Pump controller system)
E02	**DHPEKB**		
Contents of trouble	• Signal voltage from the front pump pressure sensor is below 0.3 V or above 4.42 V.		
Action of controller	• Fixes travel speed to Lo. • Continues controls, assuming pressure to be constant {350 kg/cm^2}. • Even if cause of failure disappears, system does not reset itself until starting switch is turned OFF.		
Problem that appears on machine	• Front pump pressure cannot be monitored. • Travel speed and work equipment speed do not rise.		
Related information	• Input from the front pump pressure sensor (pressure) can be checked in the monitoring function. (Code No. **01100**: Front pump pressure) • Method of reproducing failure code: Turn starting switch ON or start engine.		

	Cause		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Sensor power supply system defective	If failure code [**DA25KP**] is displayed, carry out troubleshooting for it first.		
	2	Front pump pressure sensor defective (Internal defect)	★Turn the engine starting switch OFF for the preparations, and turn to ON or keep the engine running during the troubleshooting.		
			P25		Voltage
			Between (3) – (1)	Power supply	4.5 – 5.5 V
			Between (2) – (1)	Signal	0.5 – 4.5 V
			The pressure sensor voltage is measured with the wiring harness connected. Accordingly, if the voltage is abnormal, check the wiring harness and controller, too, for another cause of the trouble, and then judge.		
	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 CP01 (female) (8) – P25 (female) (2) and grounding	Resistance	Min. 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 CP01 (female) (22), J24 – P25 (female) (3) and grounding	Voltage	Max. 1 V
			Between wiring harness between CP01 (female) (8) – P25 (female) (2) and grounding	Voltage	Max. 1 V
			Between wiring harness between C01 (female) (8) – P25 (female) (2) and grounding	Voltage	Max. 1 V
	5	Pump controller defective	★If causes 1 – 4 are not detected, pump may be defective. (Since trouble is in system, troubleshooting cannot be carried out.)		

Electric circuit diagram related to swing priority solenoid

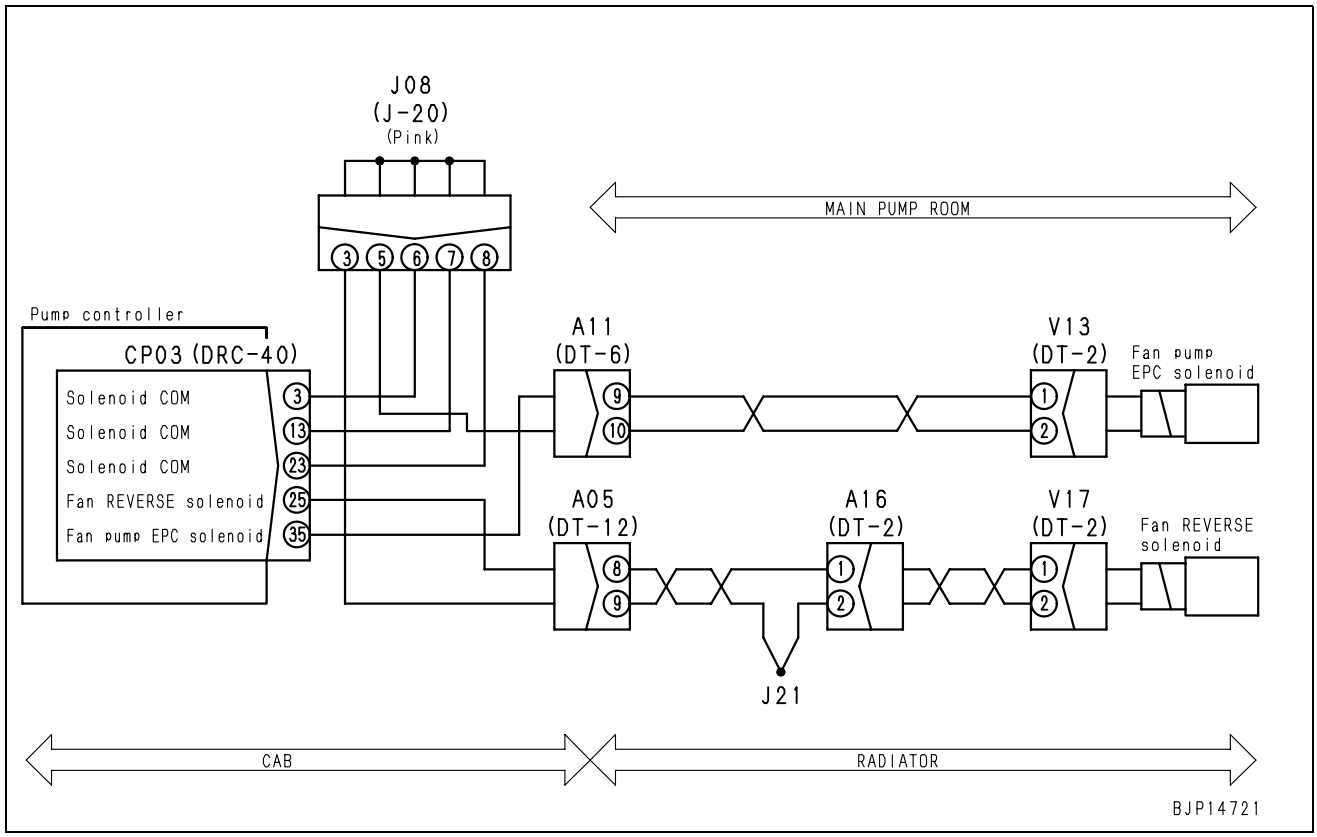


Failure code [DW7BKB] Fan Reverse Sol. S/C

Action code	Failure code	Trouble	Fan Reverse Sol. S/C (Pump controller system)
—	**DW7BKB**		
Contents of trouble	• When signal was output to hydraulic fan reverse solenoid circuit, abnormal current flowed.		
Action of controller	• Turns signal to hydraulic fan reverse solenoid circuit OFF. • When the failure cause disappears of itself, the machine operation returns to normalcy.		
Problem that appears on machine	• Fan does not rotate in reverse.		
Related information	• Operating condition (ON/OFF) of fan reverse solenoid can be checked with monitoring function. (Code 02300: Solenoid 1)		

	Cause		Standard value in normal state/Remarks on troubleshooting		
Possible causes and standard value in normal state	1	Defective hydraulic fan reverse solenoid (Internal disconnection)	★Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.		
			V17 (male)	Resistance	
			Between (1) – (2)	20 – 60 Ω	
			Between (1) and grounding	Min. 1 MΩ	
	2	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 CP03 (female) (25), – V17 (female) (1) and grounding	Resistance	Min. 1 MΩ
	3	Pump controller defective	★Turn the engine starting switch OFF for the preparations, and keep the engine running during the troubleshooting.		
			CP03	Resistance	
			Between (25) and grounding	20 – 60 Ω	

Circuit diagram related to fan pump EPC solenoid

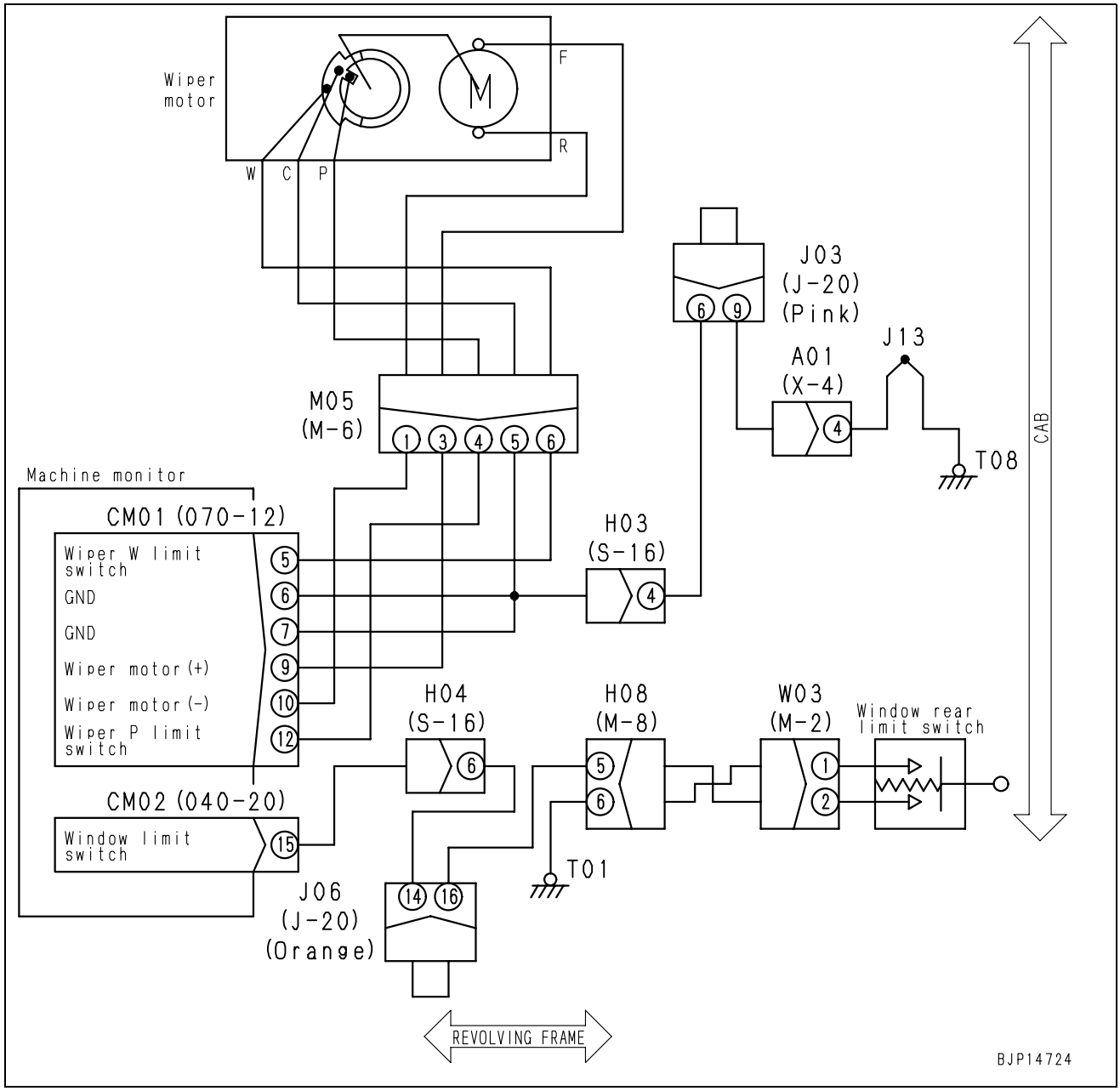


Failure code [DY20KA] Wiper Working Abnormality

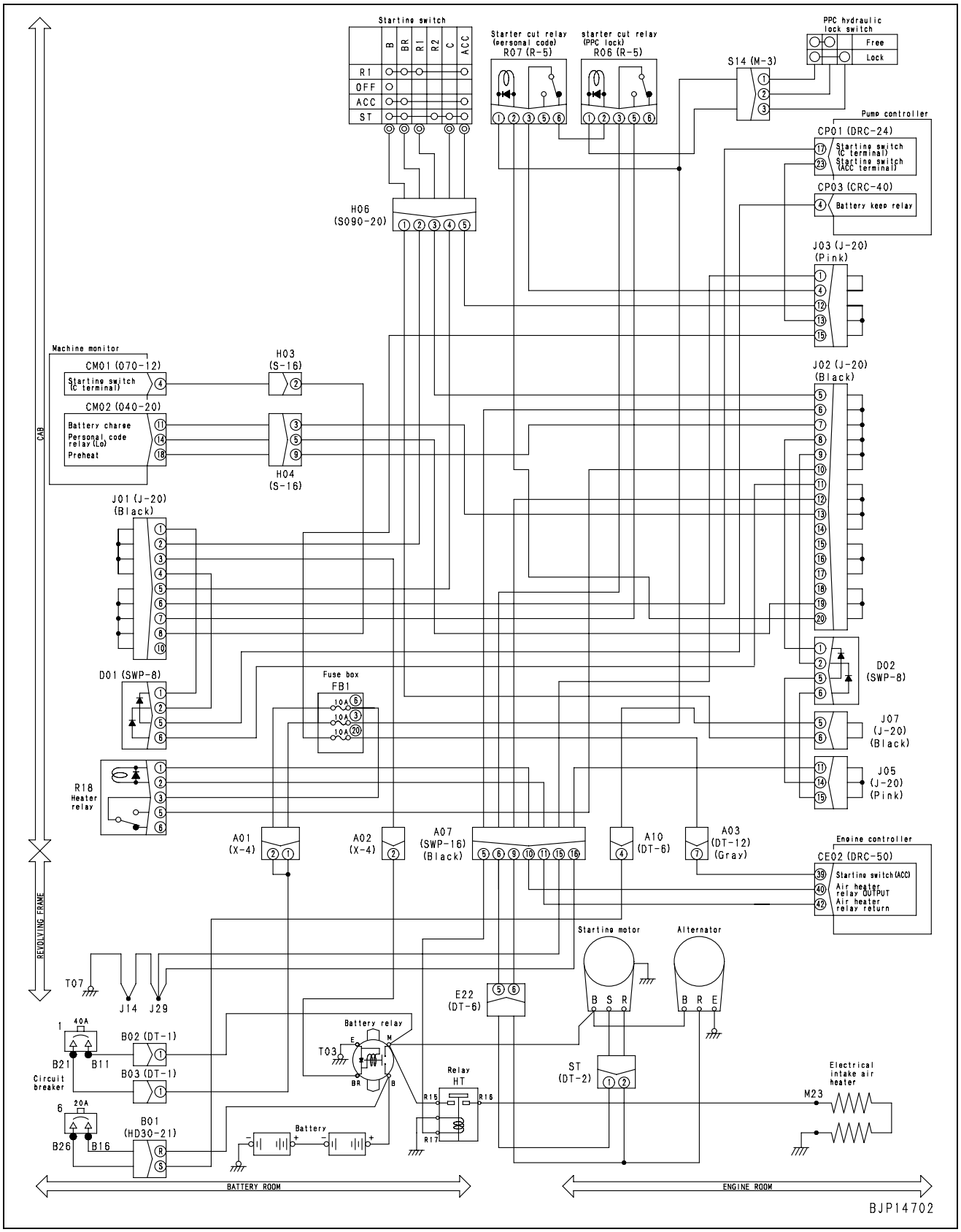
Action code	Failure code	Trouble	Wiper Working Abnormality (Machine monitor system)
—	**DY20KA**		
Contents of trouble	• When windshield wiper works, W signal of working ends is not input.		
Action of controller	• Turns working output to wiper motor OFF.		
Problem that appears on machine	• Windshield wiper motor does not operate.		
Related information	• Input of W signal in wiper working area (ON/OFF) can be checked with monitoring function. (Code **04502** Monitor Input 3)		

	Cause		Standard value in normal state/Remarks on troubleshooting			
Possible causes and standard value in normal state	1	Defective wiper motor (Internal disconnection)	★Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			M05 (female)	Wiper blade	Resistance	
			Between (6) – (5)	Upper operating limit	Max. 1 Ω	
				Other than upper operating limit	Min. 1 MΩ	
	2	Disconnection in wiring harness (Disconnection in wiring or defective contact in connector)	★Prepare with starting switch OFF, then carry out troubleshooting without turning starting switch ON.			
			Wiring harness between CM01 (female) (5) – M05 (male) (6)		Resistance	Max. 1 Ω
			Wiring harness between M05 (male) (5) – chassis ground		Resistance	Max. 1 Ω
	3	Defective machine monitor	★Prepare with starting switch OFF, then turn starting switch ON and carry out troubleshooting.			
			CM01	Wiper blade	Voltage	
			Between (5) – chassis ground	Upper operating limit	Max. 1 V	
				Other than upper operating limit	20 – 30 V	

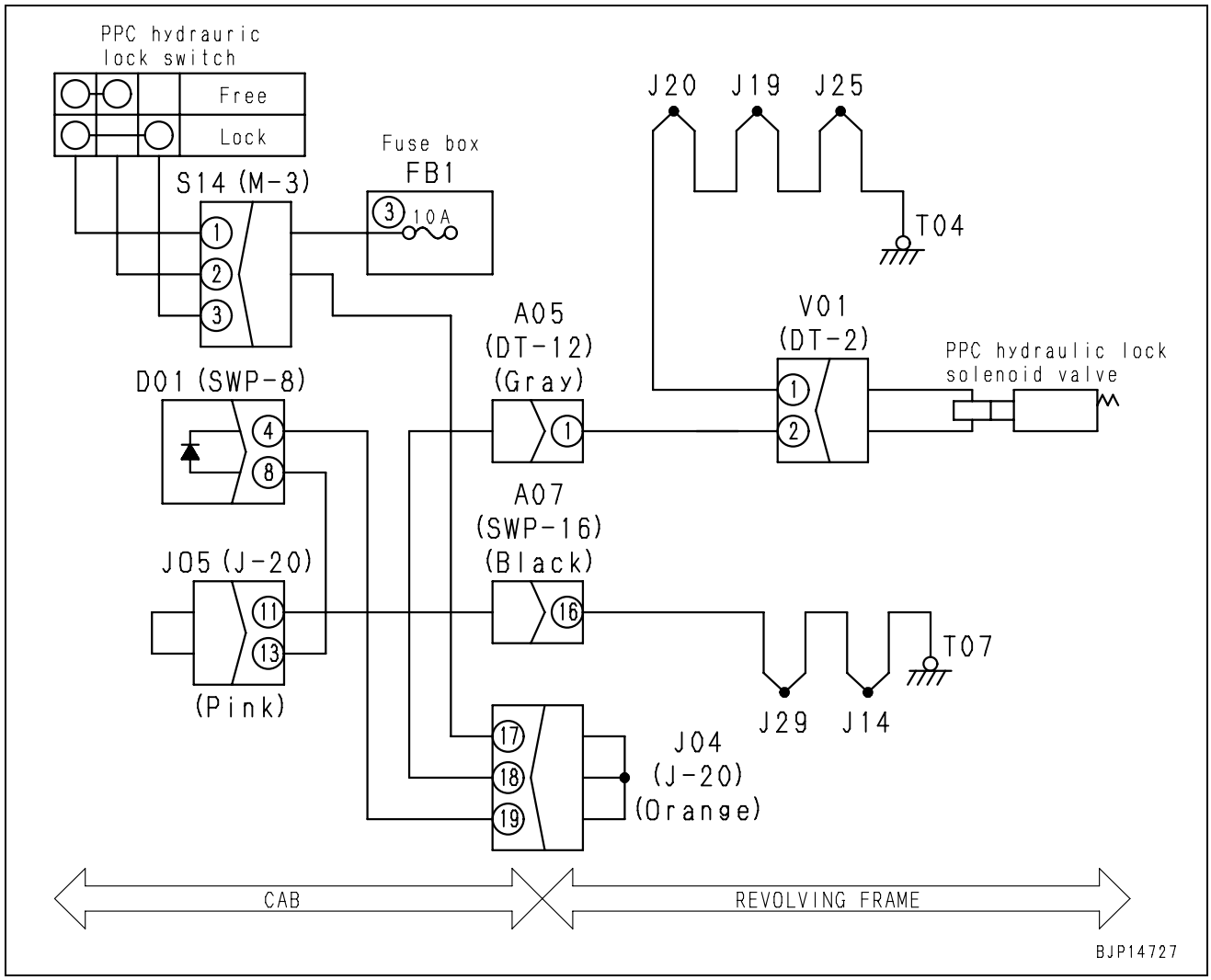
Circuit diagram related to wiper motor of machine monitor (Single-wiper specification)



Circuit diagram related to engine preheat, start and battery charging



Circuit diagram related to PPC lock solenoid

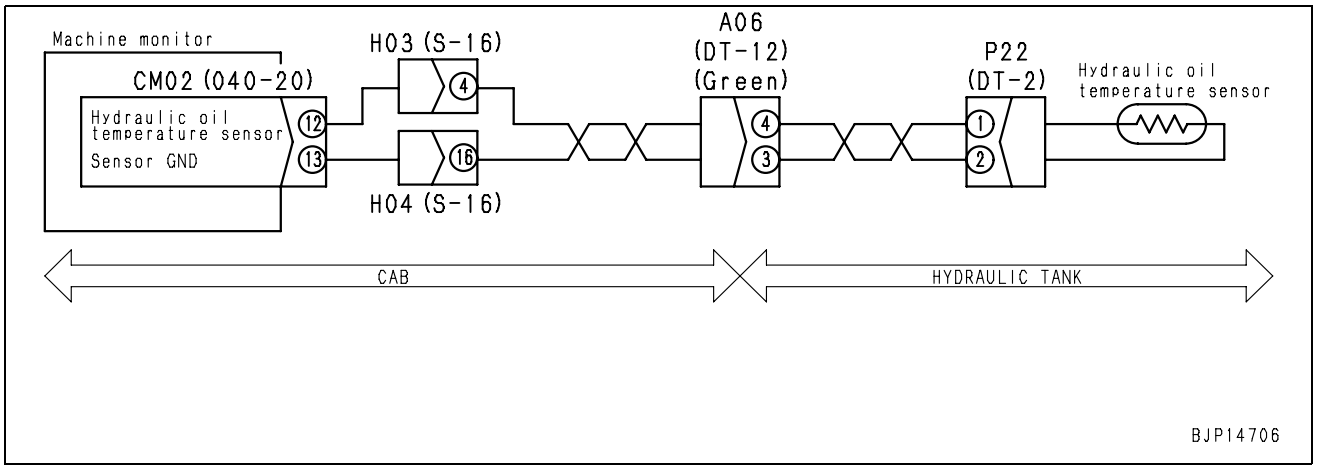


E-13 Hydraulic oil temperature gauge does not display correctly

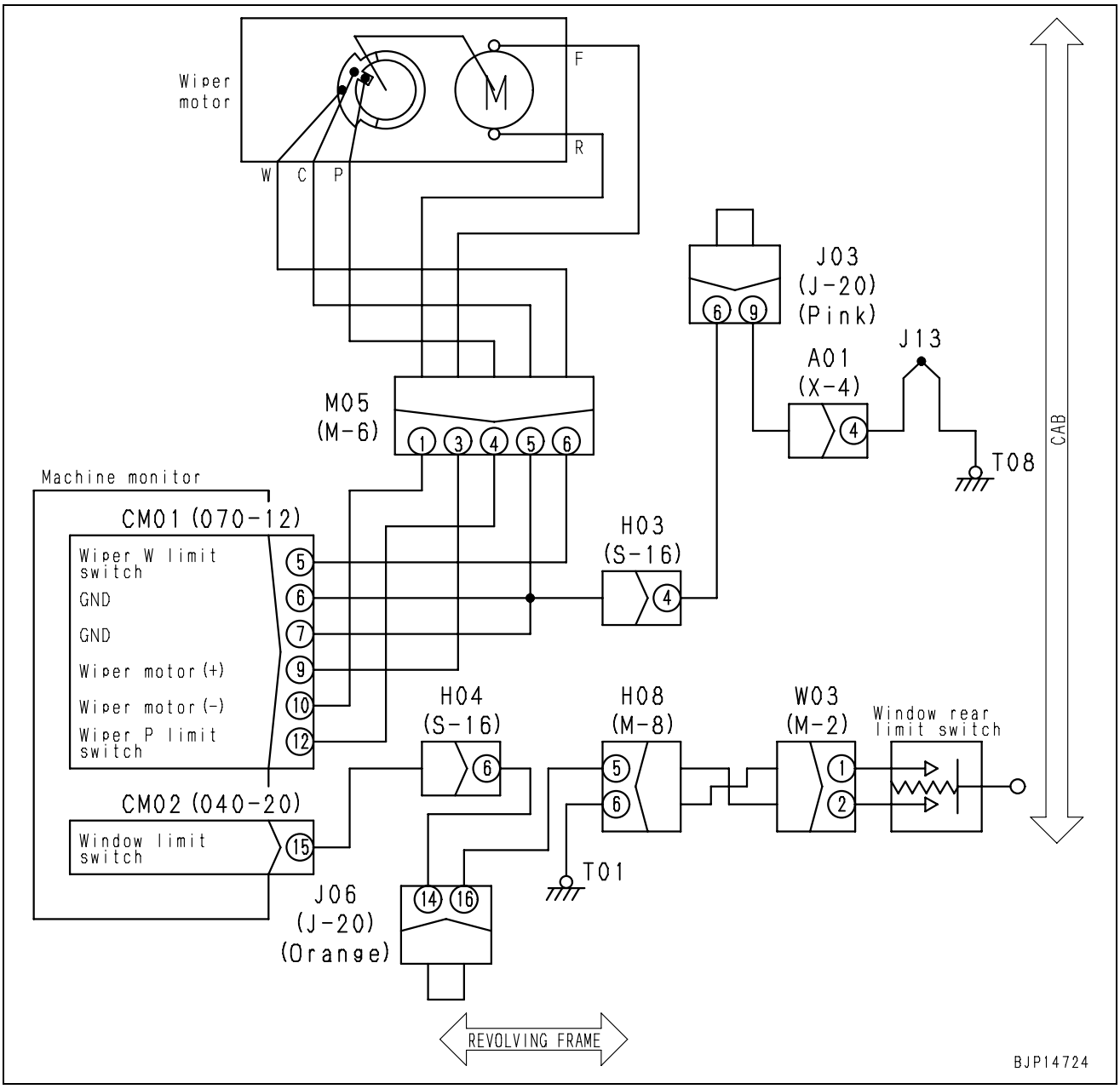
Failure phenomenon	• Hydraulic oil temperature gauge does not display correctly	(1) Hydraulic oil temperature rises normally, but the display does not exceed the white range (C). (2) Hydraulic oil temperature remains stable, but the display rises up the red range (H).
Relative information	• Input from the hydraulic oil temperature sensor can be confirmed in the monitor function. (Code No. **04401**: Hydraulic oil temperature, **04402**: Hydraulic oil temperature sensor voltage)	

	Cause		Standard value in normalcy and references for troubleshooting			
Possible causes and standard value in normal state	1	Hydraulic oil temperature sensor fault (Internal disconnection, short-circuiting or grounding fault)	★Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			P22 (male)	Hydraulic oil temperature	Resistance	
			Between (1) – (2)	10 – 100°C	90 – 3.5 kΩ	
			Between (1) – chassis ground		Min. 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 CM02 (female) (12) – P22 (female) (1)		Resistance	Max. 1 Ω
			Wiring harness between CM02 (female) (13) – P22 (female) (2)		Resistance	Max. 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.			
			Wiring harness between CM02 (female) (12) – P22 (female) (1) and chassis ground		Resistance	Min. 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.			
			Wiring harness between CM02 (female) (12) – P22 (female) (1) and chassis ground		Voltage	Max. 1 V
	5	Defective machine monitor	★Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			CM02 (female)	Hydraulic oil temperature	Resistance	
			Between (12) – (13)	10 – 100°C	90 – 3.5 kΩ	
			Between (12) – chassis ground		Min. 1 MΩ	

Circuit diagram related to hydraulic oil temperature sensor



Circuit diagram related to windshield wiper motor (single-wiper specification)

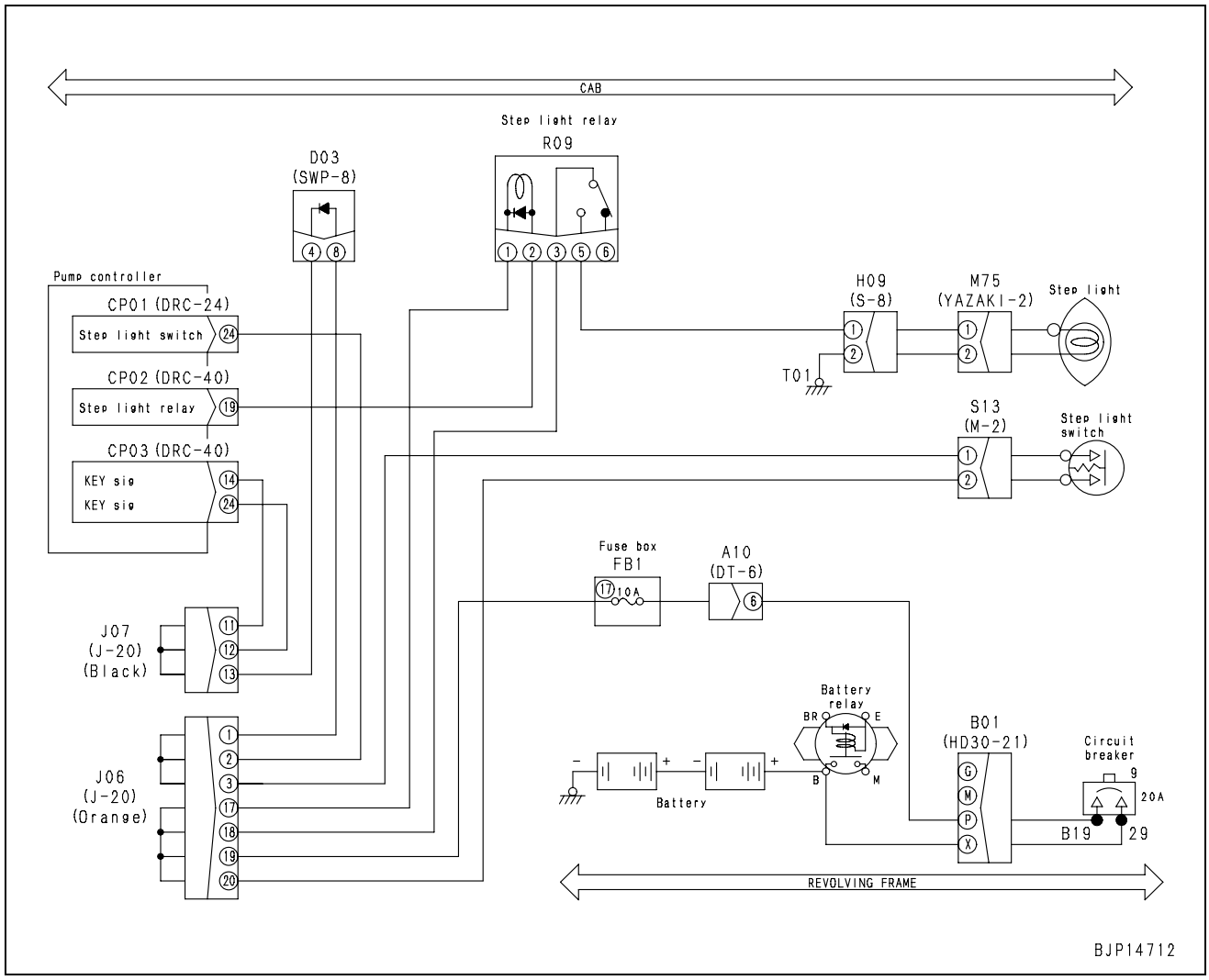


E-25 “Left travel” is not displayed normally in monitoring function

Failure phenomenon	• “Left travel” is not displayed normally in monitoring function.	“Left travel” is not displayed normally in the monitoring function (special function) of the machine monitor.
Relative information	• Monitoring code: **01901** (Pressure switch 2)	

	Cause		Standard value in normalcy and references for troubleshooting			
Possible causes and standard value in normal state	1	Defective left travel forward PPC oil pressure switch (Internal disconnection or short-circuiting)	★Turn the engine starting switch OFF for the preparations, and keep the engine running during the troubleshooting.			
			P09 (male)	Left travel lever	Resistance	
			Between (1) – (2)	Neutral	Min. 1 MΩ	
				Forward	Max. 1 Ω	
	2	Defective left travel reverse PPC oil pressure switch (Internal disconnection or short-circuiting)	★Turn the engine starting switch OFF for the preparations, and keep the engine running during the troubleshooting.			
			P10 (male)	Left travel lever	Resistance	
			Between (1) – (2)	Neutral	Min. 1 MΩ	
				Reverse	Max. 1 Ω	
	3	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 CP02 (female) (16) – J31 – P09 (female) (2) or between CP02 (female) (16) – P10 (female) (2)		Resistance	Max. 1 Ω
			Wiring harness between P09 (female) (1) – J18 – J20 – J19 – J25 – chassis ground		Resistance	Max. 1 Ω
			Wiring harness between P10 (female) (1) – J18 – J20 – J19 – J25 – chassis ground		Resistance	Max. 1 Ω
	4	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 CP02 (female) (16) – J31 – P09 (female) (2) or between CP02 (female) (16) – P10 (female) (2) and chassis ground		Resistance	Min. 1 MΩ
	5	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 CP02 (female) (16) – J31 – P09 (female) (2) or between CP02 (female) (16) – P10 (female) (2) and chassis ground		Voltage	Max. 1 V
	6	Defective pump controller	★Turn the engine starting switch OFF for the preparations, and keep the engine running during the troubleshooting.			
			CP02	Left travel lever	Voltage	
			Between (16) – chassis ground	Neutral	20 – 30 V	
				Forward or reverse	Max. 1 V	

Circuit diagram related to step light



Information in troubleshooting table

★ Tables and related circuit diagrams concerning troubleshooting contains the following information. Please understand the contents sufficiently before carrying out troubleshooting.

Failure phenomenon	Phenomena on machine
Relative information	Information concerning to failure or troubleshooting.

	Cause		Standard value in normalcy and references for troubleshooting
Possible causes and standard value in normal state	1	Possible causes of failure (The sequence number is only for reference and does not state priority.)	<Contents> • Standard values for judgement of possible causes. • Remarks for judgement
	2		
	3		
	4		

H-7 Speed or power of bucket is low

Failure phenomenon	• Speed or power of bucket is low
Relative 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 P. • Before carrying out troubleshooting, check that electric circuit related to bucket control is normal.

	Cause		Standard value in normalcy and references for troubleshooting	
Possible causes and standard value in normal state	1	Malfunction of right PPC valve (bucket circuit)	★Prepare with the engine stopped, then carry out troubleshooting with the engine at high idle.	
			R.H. work equipment control lever (bucket)	PPC valve output pressure
			Bucket CURL, DUMP Full stroke	$2.9^{+0.8}_{-0.2}$ MPa {30^{+8}_{-2} kg/cm^2}
	2	Malfunction of bucket control valve (spool)	Since the spool of the bucket control valve (Lo, Hi) may have a malfunction, check it directly.	
	3	Malfunction of bucket control valve (safety & suction valve)	Since the safety & suction valve of the bucket control valve (Lo, Hi) may have a malfunction, check it directly. (The safety & suction valve may be checked by replacing it with one of another work equipment circuit. After checking, however, be sure to return the safety & suction valve since its set pressure and structure are different from the others.)	
	4	Defective bucket control valve (body)	Since the body of the bucket control valve (Lo, Hi) may have a malfunction, check it directly.	
	5	Defective seal of bucket cylinder	★Prepare with the engine stopped, then carry out troubleshooting with the engine at high idle.	
			R.H. work equipment control lever (bucket)	Leakage from cylinder
			Relieved in bucket CURL position	Max. 20 cc/min

H-20 Machine does not travel (only one track)

Failure phenomenon	• Machine does not travel (only one track)	(1) Machine does not travel in either direction.
Relative information		

		Cause	Standard value in normalcy and references for troubleshooting
Possible causes and standard value in normal state	1	Malfunction of travel motor (parking brake)	Since the parking brake of the travel motor may have a malfunction, check it directly.
	2	Internal defect of travel motor (body)	Since the travel motor may have a defect in it, check it directly.
	3	Internal defect of final drive	Since the final drive may have a defect in it, check it directly. (The defect can be judged by abnormal sound, abnormal heat, metal chips in drained oil, etc.)

Failure phenomenon	• Machine does not travel (only one track)	(2) Machine does not travel forward or in reverse
Relative information	• Carry out all the troubleshooting in working mode P.	

		Cause	Standard value in normalcy and references for troubleshooting	
Possible causes and standard value in normal state	1	Malfunction of travel PPC valve	★Prepare with the engine stopped, then carry out troubleshooting with the engine at high idle.	
			Travel levers	PPC valve output pressure
			FORWARD, REVERSE Full stroke	$2.9^{+0.8}_{-0.2}$ MPa $\{30^{+8}_{-2}$ kg/cm$^2\}$
	2	Malfunction of travel control valve (spool)	Since the spool of the travel control valve may have a malfunction, check it directly.	
	3	Defective travel control valve (suction valve)	Since the suction valve of the travel control valve may have a malfunction, check it directly. (The suction valve can be checked by replacing it with normal one.)	
	4	Malfunction of travel motor (safety valve)	★Prepare with the engine stopped, then carry out troubleshooting with the engine at high idle.	
			Travel levers	Travel relief pressure
			Relieved on one side (Direction in which machine does not travel)	$34.8^{+1.0}_{-2.0}$ MPa $\{355^{+10}_{-20}$ kg/cm$^2\}$
	5	Malfunction of travel motor (counterbalance valve)	Since the counterbalance valve of the travel motor may have a malfunction, 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.
Relative information	• Carry out all the troubleshooting in working mode P.	

	Cause		Standard value in normalcy and references for troubleshooting	
Possible causes and standard value in normal state	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.
Relative information		

	Cause		Standard value in normalcy and references for troubleshooting
Possible causes and standard value in normal state	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.

S-2 Engine does not start

a) Engine does not turn

General causes why engine does not turn

- Internal parts of engine seized
  → See “S-4 Engine stops during operations.”
- Water hammer caused by coolant which entered cylinder
- Defective electrical system
- Defective hydraulic pump

			Causes										
			Cracked EGR cooler (Coolant in exhaust pipe)	Broken flywheel ring gear	Defective or deteriorated battery	Defective connection of battery terminal	Defective battery relay	Defective starting switch	Defective starting motor (safety relay section)	Defective starting motor (motor section)	Defective starting circuit wiring	Defective hydraulic pump
Questions	Confirm recent repair history											
	Degree of use of machine	Operated for long period	△	△	△							
	Condition of horn when starting switch is turned ON	Horn does not sound				○		○			◎	
		Horn volume is low			◎							
	Battery electrolyte is low				◎							
	Battery terminal is loose					◎						
Check items	When starting switch is turned ON, there is no operating sound from battery relay				○		◎					
	When starting switch is turned to START, starting pinion does not move out				○			○			◎	
	When starting switch is turned to START, starting pinion moves out, but	Speed of rotation is low	○		◎							
		Makes grating noise		◎					◎			
		Soon disengages again							◎			
		Makes rattling noise and does not turn	◎		○				○	◎		
Troubleshooting	When EGR cooler outlet gas piping is removed, coolant containing antifreeze flows out (*1).		●								Carry out troubleshooting in E-mode	Carry out troubleshooting in H-mode
	Inspect flywheel ring gear directly			●								
	When specific gravity of electrolyte and voltage of battery are measured, they are low				●							
	Turn starting switch OFF, connect cord, and carry out troubleshooting at ON	There is not voltage (20 – 30 V) between battery relay terminal B and terminal E					●					
		When terminal B and terminal C of starting switch are connected, engine starts						●				
		When terminal B and terminal C at safety relay outlet are connected, engine starts							●			
		Even if terminal B and terminal C at safety relay outlet are connected, engine does not start								●		
		Remedy	Replace	Replace	Replace	Correct	Replace	Replace	Replace	Replace	—	—

S-9 Oil becomes contaminated quickly

General causes why oil becomes contaminated quickly

- Entry of exhaust gas into oil due to internal wear
- Clogging of lubrication passage
- Use of improper fuel
- Use of improper oil
- Operation under excessive load

			Causes										
			Defective turbocharger turbine side seal	Worn EGR valve guide	Worn valve, valve guide	Worn piston ring, cylinder liner	Clogged breather, breather hose	Clogged oil cooler	Clogged oil filter	Defective oil filter safety valve	Clogged turbocharger lubrication drain tube	Exhaust smoke is bad
Questions / Check items	Confirm recent repair history											
	Degree of use of machine	Operated for long period	△	△	△	△						
	Non-specified fuel is being used								○			
	Engine oil must be added more frequently			○		◎						
	Even when engine oil temperature rises, oil filter clogging monitor indicates clogging (if monitor is installed)								◎	○		
	Metal particles are found when oil is drained				○	○			◎			
	Inside of exhaust pipe is dirty with oil				◎							
	Engine oil temperature rises quickly							◎				
	Color of exhaust gas color	Blue under light load				◎						
		Black										◎
	Amount of blow-by gas	Excessive	○		○	◎					○	
		None					◎					
Troubleshooting	Excessive play of turbocharger shaft		●									See S-7
	When EGR valve is removed, exhaust port is found to be dirty with oil			●								
	When compression pressure is measured, it is found to be low				●	●						
	Inspect breather and breather hose directly						●					
	Inspect oil cooler directly							●				
	Inspect oil filter directly								●			
	Spring of oil filter safety valve is hitched or broken									●		
	Inspect turbocharger lubrication drain tube directly										●	
		Remedy	Replace	Replace	Replace	Replace	Clean	Clean	Replace	Replace	Clean	—

PC800-8, PC800SE-8, PC800LC-8, PC850-8, PC850SE-8 Hydraulic excavator

Form No. SEN00795-03

Component	Symbol		Part No.	Part Name	Necessity	Q'ty	New/remodel	Sketch	Nature of work, remarks
Disassembly, assembly of 1 link at field	N	9	791-685-9510	Frame	■	1			
			791-685-9520	Frame	■	1			
			791-685-9530	Rod	■	1			
			791-685-9540	Rod	■	1			
			791-685-9550	Nut	■	3			
			791-685-9560	Bolt	■	4			
			791-126-0150	Adapter	■	1			
			01010-51030	Bolt	■	1			
			791-685-9620	Extension	■	1			
			791-680-5542	Adapter	■	1			
			791-680-5560	Guide	■	1			
			790-101-1102	Pump	■	1			
			790-101-4300	Cylinder	■	1			1,471 kN {150 ton}
		10	791-685-9510	Frame	■	1			Removal, press fitting of master pin and regular pin
			791-685-9520	Frame	■	1			
			791-685-9530	Rod	■	1			
			791-685-9540	Rod	■	1			
			791-685-9550	Nut	■	3			
			791-685-9560	Bolt	■	4			
			791-126-0150	Adapter	■	1			
			01010-51030	Bolt	■	1			
			791-685-9620	Extension	■	1			
			791-680-5560	Guide	■	1			
			791-632-1110	Adapter	■	1			
			791-680-9630	Adapter	■	1			
			790-101-1102	Pump	■	1			
			790-101-4300	Cylinder	■	1			1,471 kN {150 ton}
		11	791-680-1520	Guide	■	1			
		12	791-685-9510	Frame	■	1			
			791-685-9520	Frame	■	1			
			791-685-9530	Rod	■	1			
			791-685-9540	Rod	■	1			
			791-685-9550	Nut	■	3			
			791-685-9560	Bolt	■	4			
			791-126-0150	Adapter	■	1			
			791-680-5560	Guide	■	1			
			791-680-9570	Adapter	■	1			
			01010-51030	Bolt	■	1			
			791-680-1520	Guide	■	1			
			790-101-1102	Pump	■	1			
			790-101-4300	Cylinder	■	1			1,471 kN {150 ton}
		13	790-101-1102	Pump	■	1			Removal, press fitting of master pin and regular pin
			790-101-4200	Puller	■	1			294 kN {30 ton}
		14	791-680-9501	Remover, installer	■	1			KIT
			790-101-1102	Pump	■	1			
			790-101-4200	Puller	■	1			294 kN {30 ton}
			790-101-4300	Cylinder	■	1			1,471 kN {150 ton}

Engine and cooling system

Removal and installation of engine, PTO and hydraulic pump assembly

Special tools

Symbol		Part number	Part name	Necessity	Q'ty	N/R	Sketch
S	**1**	796-770-1301	Oil stopper	●	1		

Removal

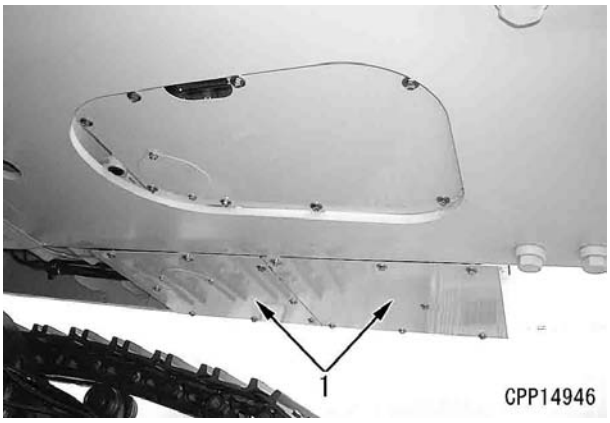
⚠ **Lower the work equipment to the ground and stop the engine. Then, loosen the cap of the hydraulic tank gradually to release the internal pressure of the hydraulic tank.**

⚠ **Disconnect the cable from the negative (–) terminal of the battery.**

★ Before disconnecting the hoses and tubes, make match marks on them. After disconnecting them, install oil stopper plugs to them.

1. Remove the counterweight assembly. For details, see “Removal and installation of counterweight assembly”.

2. Remove undercover (1).



3. Remove undercover (2).

4. Remove the hydraulic tank strainer and stop the oil with oil stopper tool **S1**.
   - When not using tool **S1**, remove the drain plug and drain the oil.

     Hydraulic tank: **470 ℓ**

5. Drain the coolant.

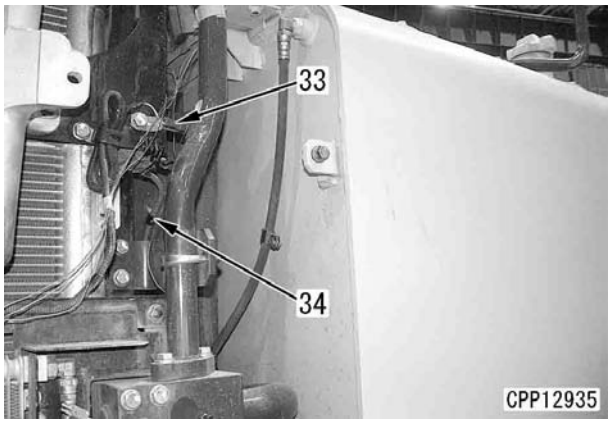
   Coolant: **100 ℓ**

6. Remove 3 covers (3).
   ★ Remove the covers on the rear side, too.

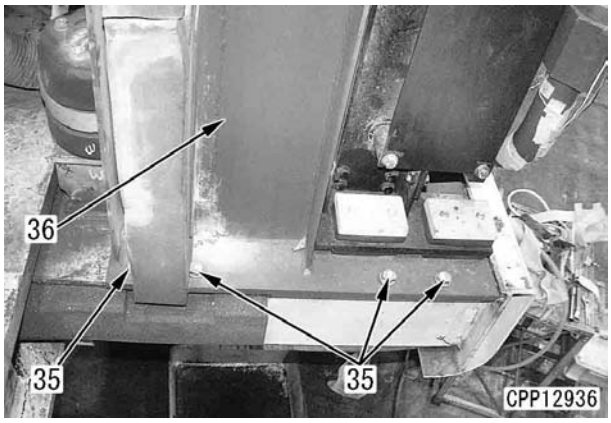
7. Open engine hood (4).
   ★ Open the rear side, too.

28. Disconnect connector (33).

29. Disconnect clamp (34).

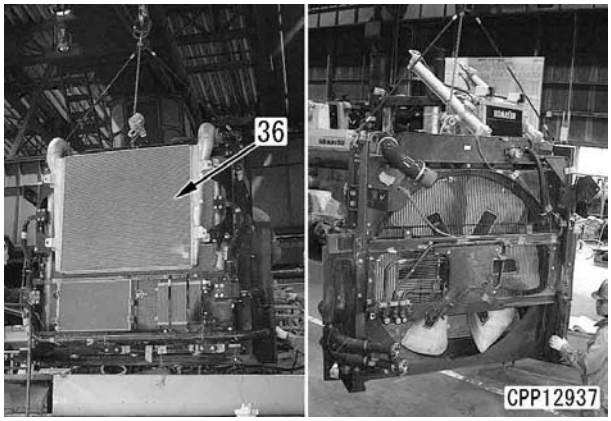


30. Sling cooling assembly (36) temporarily and remove 4 mounting bolts (35) on the right and left sides.



31. Lift off cooling assembly (36).

Cooling assembly: **1,020 kg**



Installation

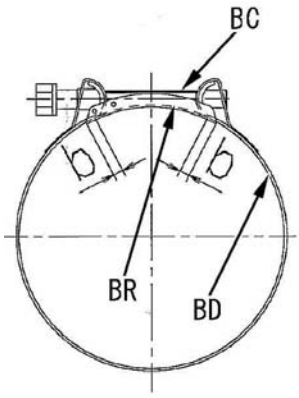
- **Carry out installation in the reverse order to removal.**

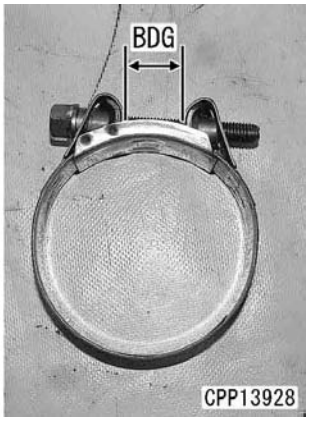
[*1]
Hose insertion depth: **65 mm**
Radiator hose clamp:
10.8 – 11.8 Nm {1.1 – 1.2 kgm}

[*2], [*3]
MIKALOR clamp
★ Use a new MIKALOR clamp.
1) Set the hose to the original position.
(Insertion depth of air hose: **80 mm**)
2) Set the bridge (BR) under the clamp bolt and lap it over band (BD) at least (b) reaches 5 mm.
3) Tightening of the clamp.
★ Do not use an impact wrench.
Clamp bolt (BC): **Lubricating oil (THREE-BOND PANDO 18B)**

- **When reusing the hose**
Install the clamp to the clamp mark made on the hose.
Clamp bolt (BC):
Min. 6 Nm {0.6 kgm}.

- **When using a new hose**
Tighten until dimension (BDG) is **7 – 10 mm**.





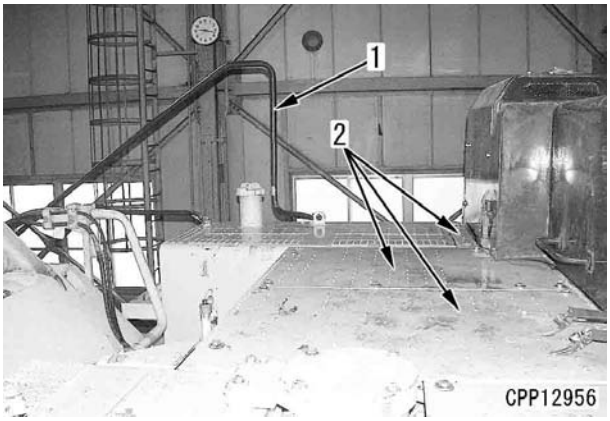
Removal and installation of fuel tank assembly

Removal

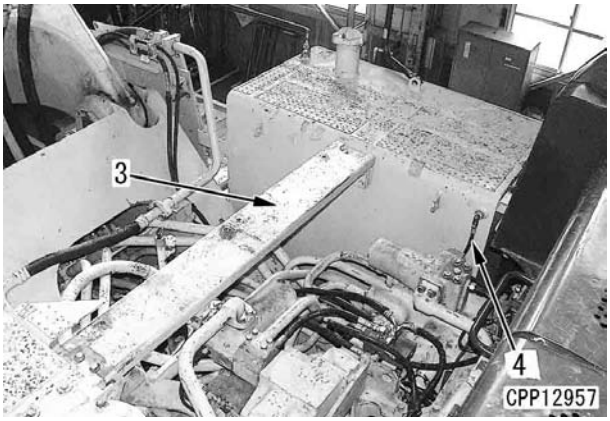
⚠ **Lower the work equipment to the ground and stop the engine.**

⚠ **Disconnect the cable from the negative (–) terminal of the battery.**

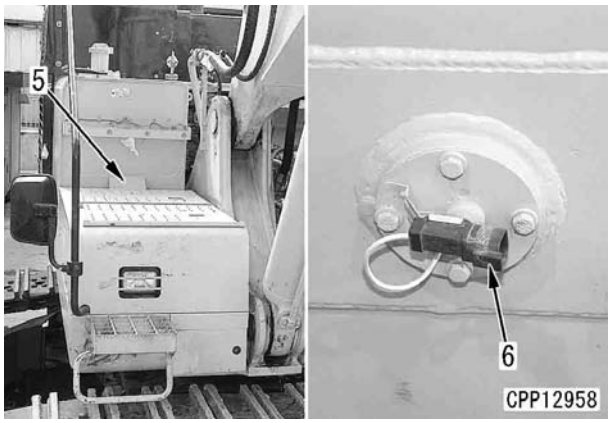
1. Open the drain valve to drain the fuel.
   Fuel tank: **980 ℓ (When full)**
2. Remove handrail (1).
3. Remove cover (2).



4. Remove control valve cover bracket (3).
5. Disconnect fuel return hose (4).
   ★ Disconnect the hose clamp, too.

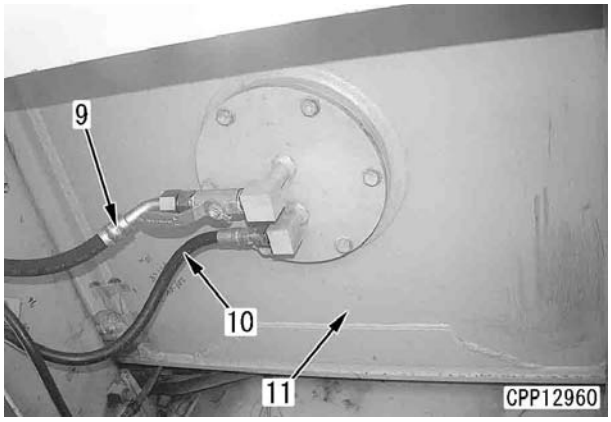


6. Remove fuel level gauge wiring cover (5) and disconnect wiring connector (6).



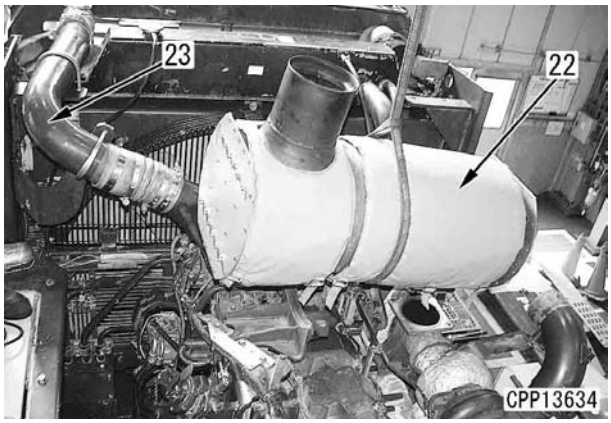
7. Remove cover (7).
8. Disconnect fuel return hose (8) and remove the hose clamp.

9. Disconnect fuel supply hose (9) and drain hose (10) from the bottom of fuel tank assembly (11).



23. Lift off muffler (22).

24. Remove air tube (23). [*4]

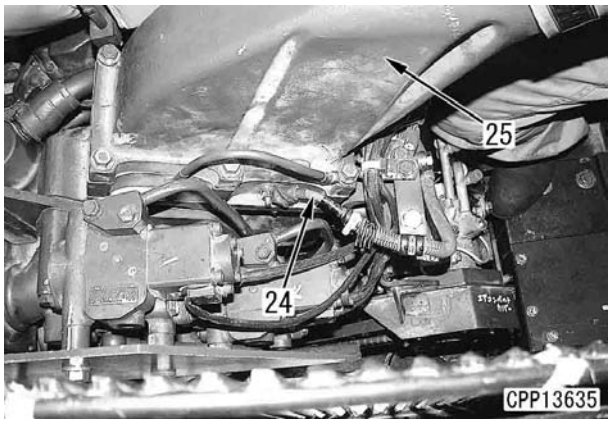


25. Disconnect heater terminal (24) from the bottom of air connector (25).

26. Remove air connector (25).

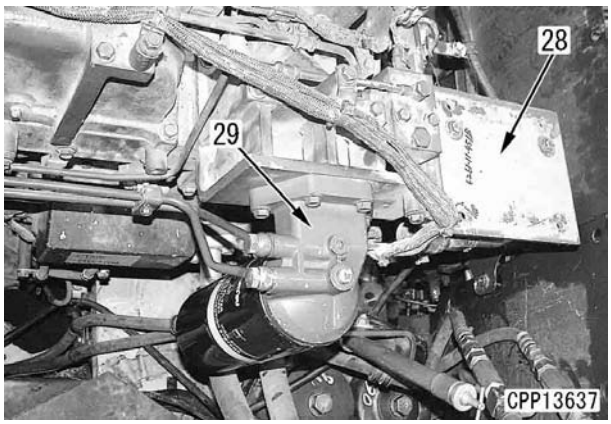
27. Remove bracket (26).

28. Remove cover (27).



29. Remove bracket (28).

30. Remove fuel filter and bracket assembly (29). [*5].

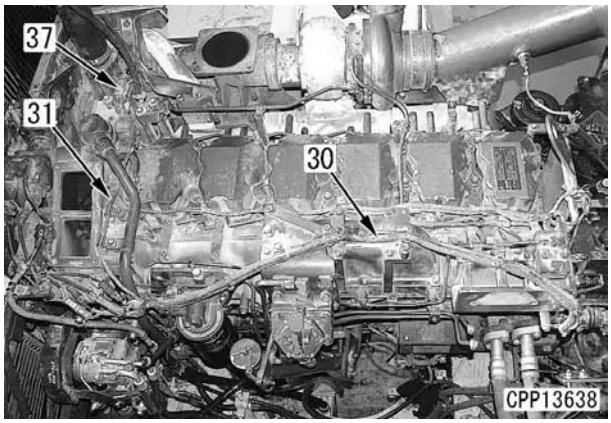


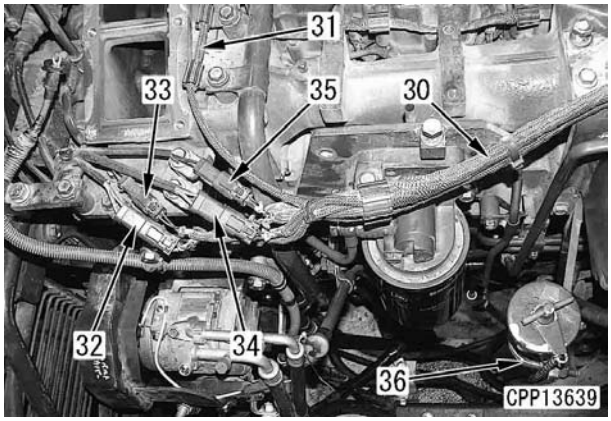
31. Disconnect wiring harnesses (30) and (31).

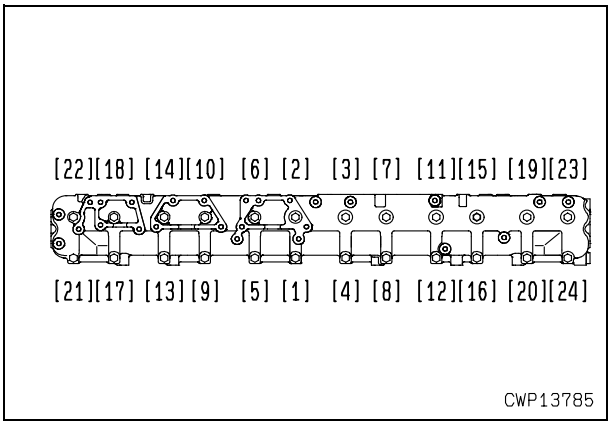
32. Disconnect connectors SBP (32), BP (33), SEGR (34), and EGR (35).

33. Disconnect clamp (36).

34. Disconnect connector PEVA (37).
    ★ Connector PEVA is abolished after serial number 530897.

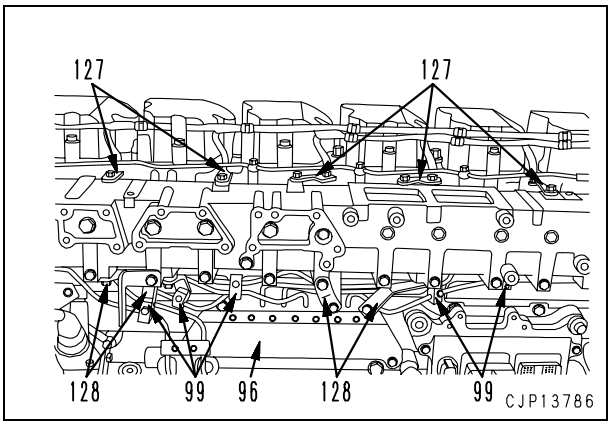


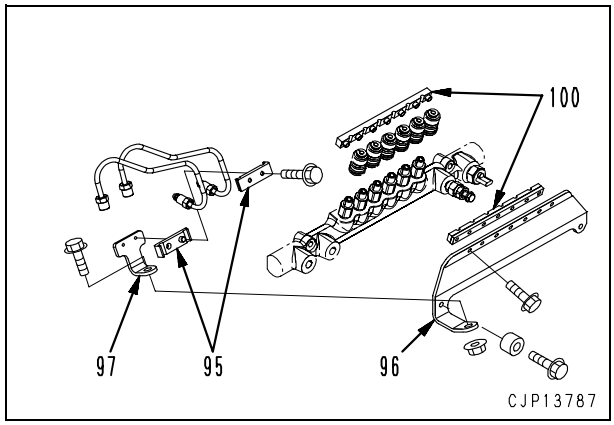




16. High-pressure pipe clamp

1) Tighten high-pressure pipe clamp (126) above the air intake manifold (described above) and stay (127) permanently.
   ★ Bend the rubber in advance.
   Clamping bolt:
   9.8 ± 1 Nm {1 ± 0.1 kgm}
2) Tighten stay (128) of clamps (99) under the air intake manifold (described above) temporarily.
3) Install high-pressure pipe clamp (100) and bracket (96) temporarily with the fingers.
4) Install high-pressure pipe clamp (95) and bracket (97) temporarily.
5) Tighten high-pressure pipe clamps (100) and (95) permanently first.
   Clamping bolt:
   9.8 ± 1 Nm {1 ± 0.1 kgm}
6) Tighten brackets (96) and (97) permanently.
7) Tighten high-pressure pipe clamp (99) permanently.
   Clamping bolt:
   9.8 ± 1 Nm {1 ± 0.1 kgm}
8) Tighten stays (128) permanently.





- **Carry out the following installation in the reverse order to removal.**

[*1]
Air hose clamp:
8.8 ± 0.5 Nm {0.9 ± 0.05 kgm}

[*2]
Air cleaner band:
9.8 – 11.8 Nm {1 – 1.2 kgm}

[*3]
MIKALOR clamp
★ Use a new MIKALOR clamp.
1) Set the hose to the original position.
   (Insertion depth of air hose: **80 mm**)
2) Set the bridge (BR) under the clamp bolt and lap it over band (BD) at least (b) reaches 5 mm.
3) Tightening of the clamp.

★ Do not use an impact wrench.
Clamp bolt (BC): **Lubricating oil (THREEBOND PANDO 18B)**

- **When reusing the hose**
  Install the clamp to the clamp mark made on the hose.
  Clamp bolt (BC): **Min. 6 Nm {0.6 kgm}**
- **When using a new hose**
  Tighten until dimension (BDG) is **7 – 10 mm**.

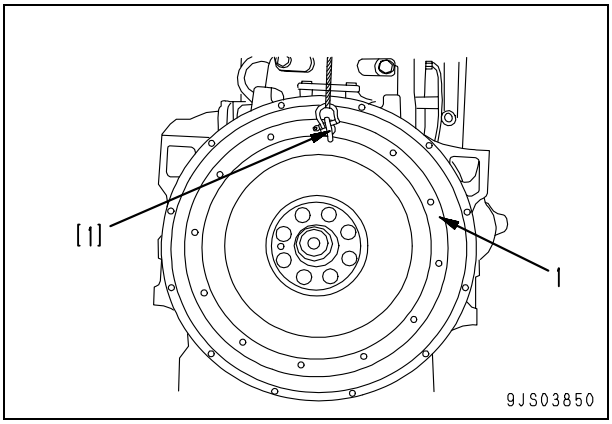
3. Flywheel

Using eyebolt [1] (12 mm, P = 1.75), sling flywheel (1), install it to the crankshaft, and tighten the bolts.

★ If there are 5 punch marks on a bolt, do not use that bolt but replace it.

Threads and seat of bolt: **Engine oil SAE No. 30**

Flywheel: **65 kg**



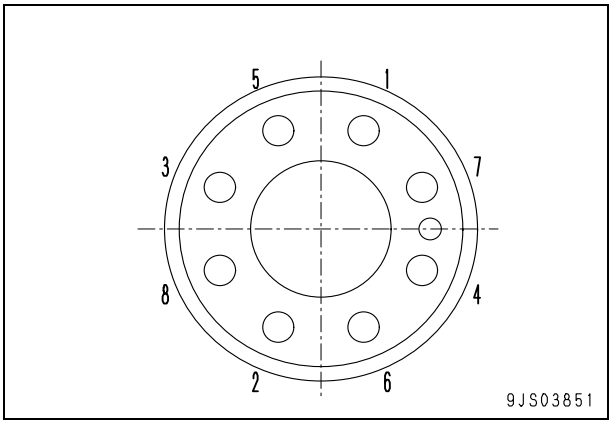
★ Tighten the mounting bolts according to the following procedure.

Flywheel mounting bolts

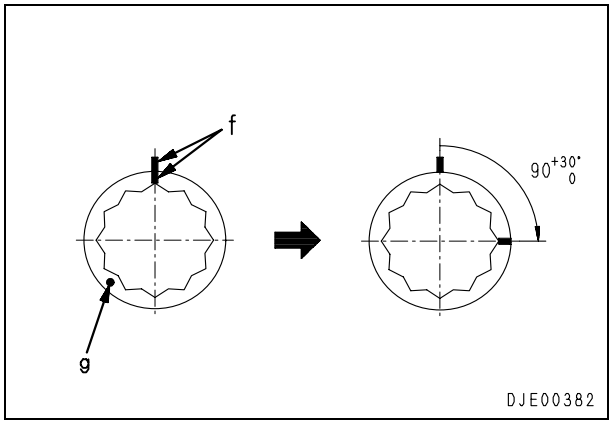
1st time: **118 ± 4.9 Nm {12 ± 0.5 kgm}**

2nd time: 1) When using tool **A2** (See the tools list) Retighten each bolt by $90°^{+30°}_{0}$ in the order of [1] – [8].

2) When not using tool **A2** Make marks on each bolt and flywheel with paint, then retighten each bolt by $90°^{+30°}_{0}$ in the order of [1] – [8].



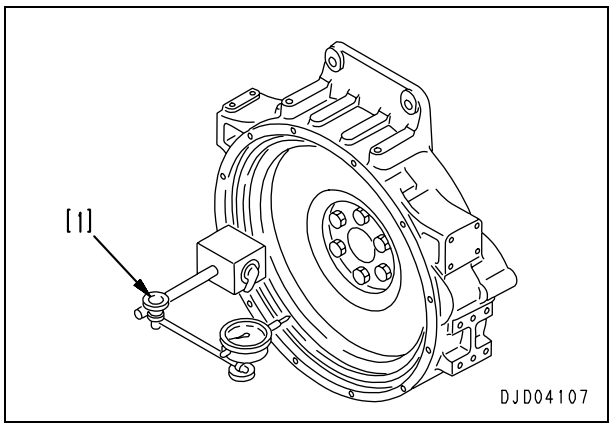
★ After tightening, make 1 punch mark (9) on each bolt head to indicate the number of tightening time.



★ After installing the flywheel, measure the facial runout and radial runout with tool [1].

★ Radial runout: Max. 0.30 mm

★ Facial runout: Max. 0.30 mm

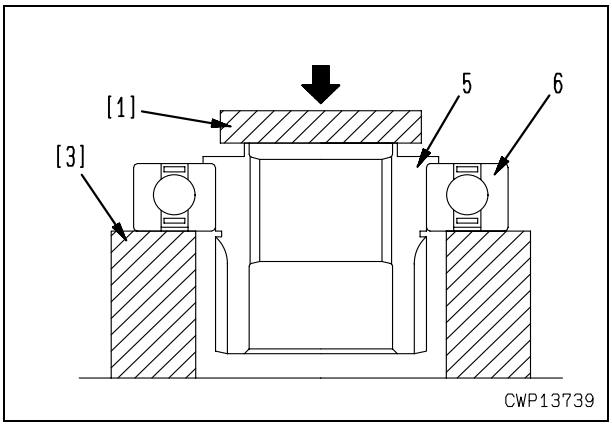


- **Carry out the following installation in the reverse order to removal.**

Assembly

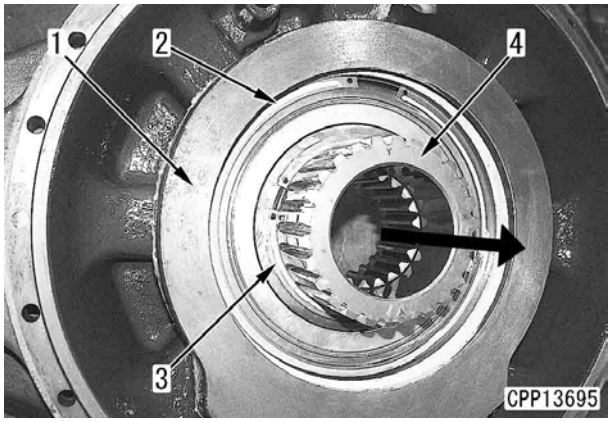
★ Clean all the parts and check them for dirt or damage. Coat their sliding surfaces with engine oil before installing.

1. Using push tools [1] and [3], install bearing (6) to shaft (5).
   Bearing: **Grease (G2-LI)**



2. Install shaft assembly (4) to PTO assembly (1).

3. Install snap rings (2) and (3).



Disassembly and assembly of final drive assembly

Special tools

Symbol		Part number	Part name	Necessity	Q'ty	N/R	Sketch
J	1	796-627-1050	Installer	■	1		
	2	796-627-1030	Push tool	■	1		
	3	790-101-2300	Push-puller	■	1		
		790-101-2310	• Block	■	1		
		790-101-2350	• Leg	■	2		
		790-101-2360	• Plate	■	2		
		02215-11622	• Nut	■	2		
		791-181-1010	Adapter	■	2		
		796T-627-1340	Push tool	■	1		○
		790-101-2102	Puller (294 kN {30 ton})	■	1		
		790-101-1102	Pump	■	1		
	4	790-627-1200	Wrench assembly	■	1		
	5	796-627-1070	Spacer	■	1		
		01017-52450	Bolt	■	1		
		01580-12419	Nut	■	1		
	6	790-201-2830	Spacer	■	1		
		790-101-5151	Plate	■	1		
	7	790-101-5401	Push tool kit (C)	■	1		
		790-101-5441	• Plate	■	1		
		790-101-5421	• Grip	■	1		
		01010-51240	• Bolt	■	1		
	8	790-101-5001	Push tool kit (A)	■	1		
		790-101-5151	• Plate	■	1		
		790-101-5061	• Plate	■	1		
		790-101-5021	• Grip	■	1		

Disassembly

1. Draining oil

Remove drain plug and drain oil from final drive case.

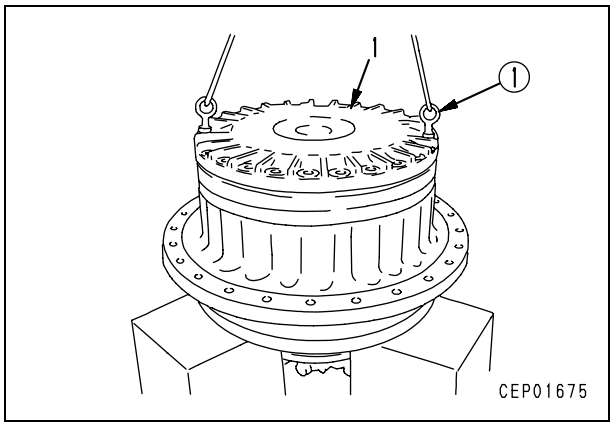
Final drive case: **Approx. 20 ℓ**

2. Put travel motor at bottom and set on block of height approx. 350 mm.

★ However, if the travel motor is removed, No. 1 sun gear will fall off. (See item 15.)

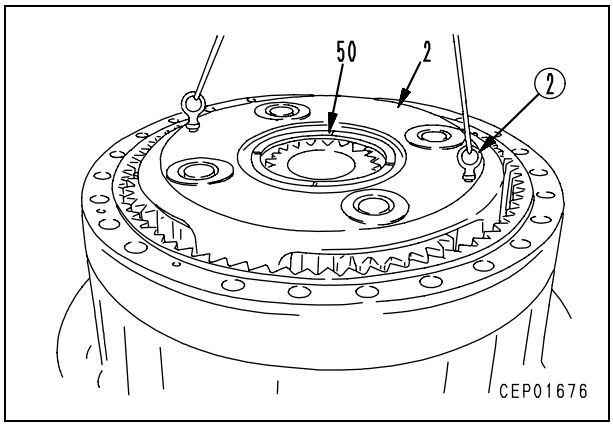
3. Cover

Using forcing screws and eyebolts [1], remove cover (1).



4. No. 3 carrier assembly

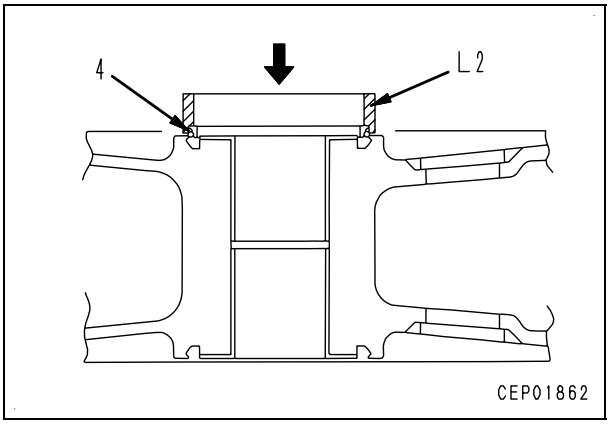
1) Remove thrust washer (50).
2) Using eyebolts [2], remove No. 3 carrier assembly (2).



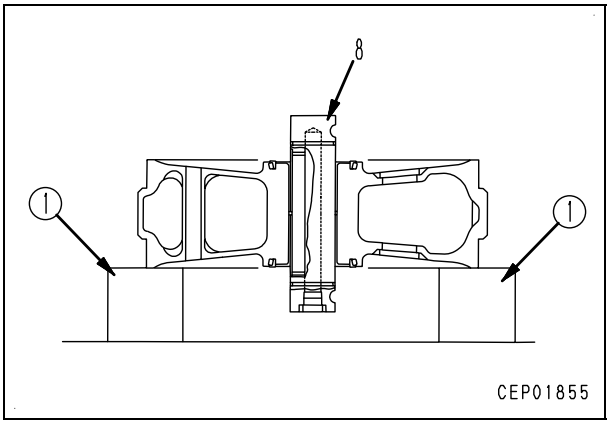
PC800-8, PC800SE-8, PC800LC-8, PC850-8, PC850SE-8 Hydraulic excavator

Form No. SEN01055-02

4. Turn over idler and using tool **L2**, assemble floating seal (4).

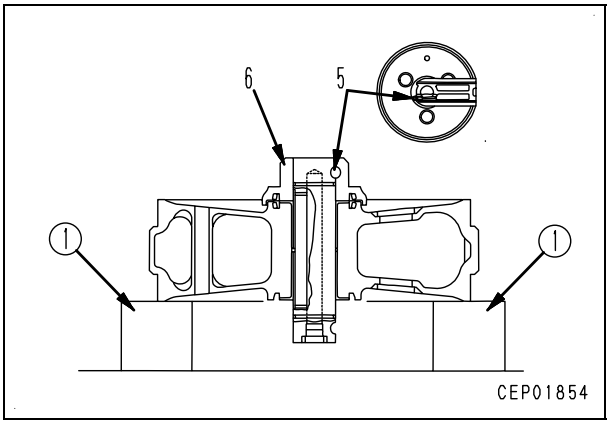


5. Install shaft (8) to idler.
   ★ Assemble the shaft so that the direction of the oil filler plug is as follows.
   - Right side of machine: **Facing outside**
   - Left side of machine: **Facing inside**



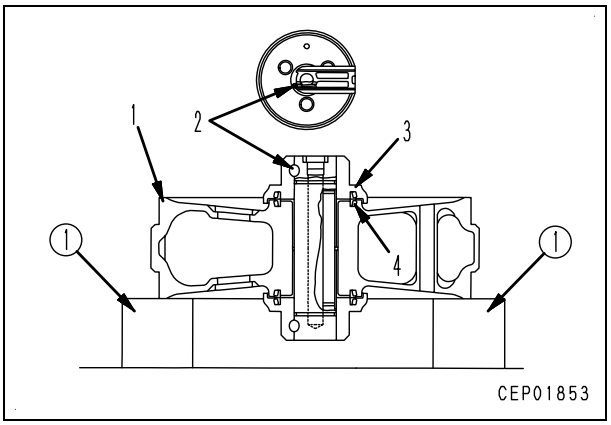
6. Assemble support (6) to shaft.
   ★ Align the groove in the support with the groove in the shaft when assembling.

7. Install bolt and nut (5), and secure support (6).



8. Turn over idler, and assemble support (3) to shaft.
   ★ Align the groove in the support with the groove in the shaft when assembling.

9. Install bolt and nut (2), and secure support (3).



10. Using tool **L11** (refer to special tools table), add oil to specified level, then tighten plug.
    Idler: **550 – 630 cc (GO140)**
    Plug: **210.7 ± 29.4 Nm {21.5 ± 3 kgm}**

Disassembly and assembly of track roller assembly

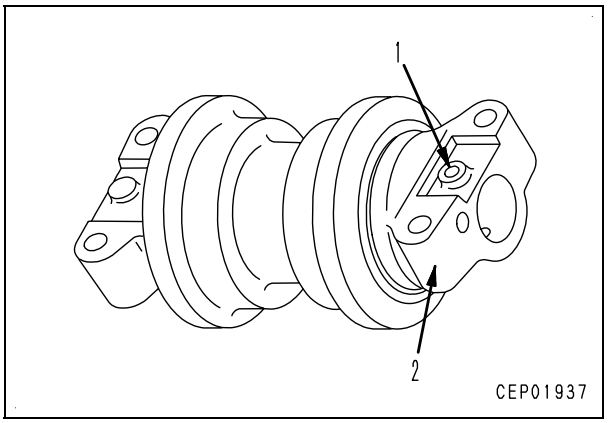
Special tools

Symbol		Part number	Part name	Necessity	Q'ty	N/R	Sketch
L	8	791-580-1520	Installer	■	1		
	9	790-201-2670	Plate	■	1		
	10	791-601-1000 or 791-646-8002	Oil pump assembly Oil lubricator	■	1		
		790-701-3000	Seal checker	■	1		

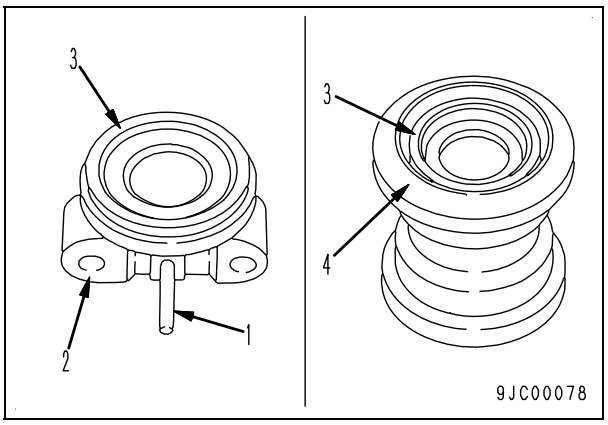
Disassembly

1. Remove plug and drain oil.
   ★ Rotate the shaft while draining the oil.
   Track roller: **Approx. 420 – 480 cc**

2. Remove pin (1), then remove collar (2).

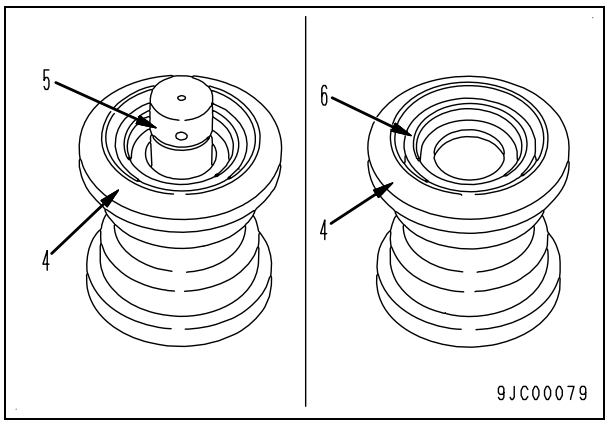


3. Remove floating seal (3) from collar (2) and roller (4).



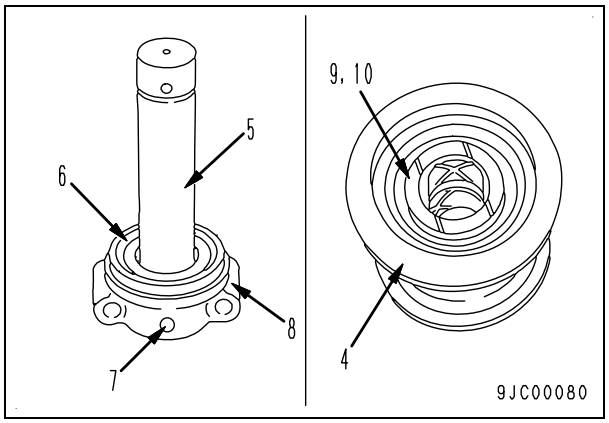
4. Pull out shaft (5) from roller (4).
   ★ It is filled with 420 – 480 cc. of oil, so drain the oil at this point or lay a cloth to prevent the area from becoming dirty.

5. Remove floating seal (6) on opposite side from roller (4) and collar (8).



6. Remove pin (7), then remove collar (8) from shaft (5).

7. Remove bushings (9) and (10) from roller (4).



HYDRAULIC EXCAVATOR
PC800-8 PC850-8
PC800LC-8 PC850SE-8
PC800SE-8

Machine model	Serial number	Machine model	Serial number
PC800-8	50001 and up	PC850SE-8	10001 and up
PC800LC-8	50001 and up		
PC800SE-8	50001 and up		
PC850-8	10001 and up		

50 Disassembly and assembly
Hydraulic system

Hydraulic system 2
Removal and installation of hydraulic tank assembly 2
Removal and installation of main pump assembly 5
Removal and installation of main pump input shaft oil seal 12
Removal and installation of cooling fan pump assembly 13
Removal and installation of control valve assembly 16
Assembly of control valve assembly 19
Removal and installation of swing motor assembly 25
Removal and installation of center swivel joint assembly 27
Disassembly and assembly of center swivel joint assembly 29
Removal and installation of travel motor assembly 31
Removal and installation of solenoid valve assembly 32
Removal and installation of boom damping valve assembly 34
Disassembly and assembly of work equipment PPC valve assembly 35
Disassembly and assembly of travel PPC valve assembly 37
Disassembly and assembly of hydraulic cylinder assembly 40
Disassembly and assembly of grease gun assembly 46

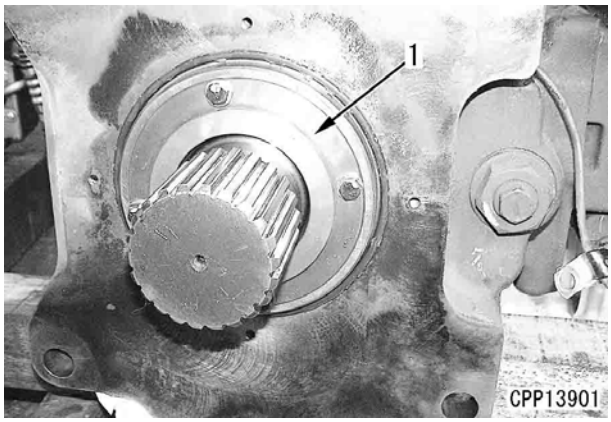
Removal and installation of main pump input shaft oil seal

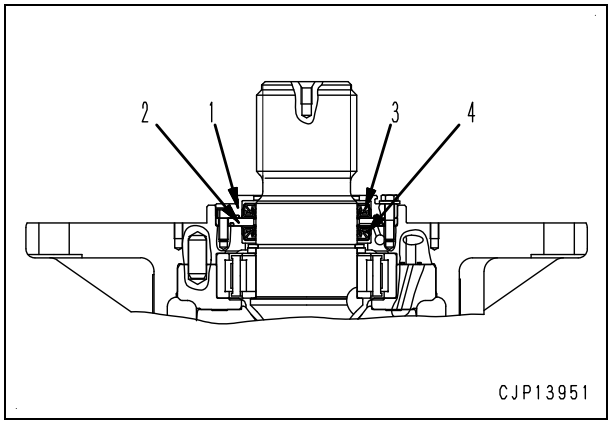
Special tools

Symbol		Part number	Part name	Necessity	Q'ty	N/R	Sketch
S	3	796T-72K-1010	Push tool	■	1		○
	4	708-2K-12350	Spacer	■	1		

Removal

1. Remove the main pump assembly. For details, see “Removal and installation of main pump assembly”.
   ★ After removing the pump assembly, place it horizontally.
   ★ Clean around the pump oil seal and the shaft end.
2. Remove cover (1). [*1]
3. Remove plate (2). [*2]
4. Remove oil seal (3) from cover (1). [*3]
5. Pry off oil seal (4) with a screwdriver. [*4]
   ★ Take care in removing the oil seal so that shaft may not be damaged.





Installation

- **Carry out installation in the reverse order to removal.**

[*1]

★ When installing cover (1), put the special cap to the shaft to protect the oil seal.

Cover mounting bolt:
27 – 34 Nm {2.8 – 3.5 kgm}

[*2]

Cover mounting bolt:
27 – 34 Nm {2.8 – 3.5 kgm}

[*3]

Install the oil seal similarly to [*4].

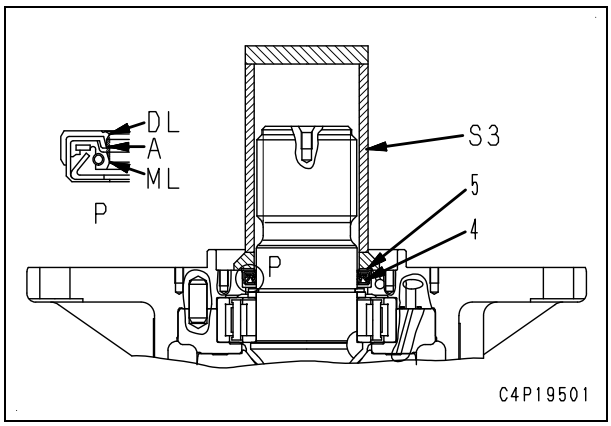
[*4]

Periphery of main lip (ML) and dust lip (DL) of oil seal (Hatch part A):
Lithium grease (G2-LI)

When press fitting the oil seal, apply grease (G2-LI) thinly to its periphery.

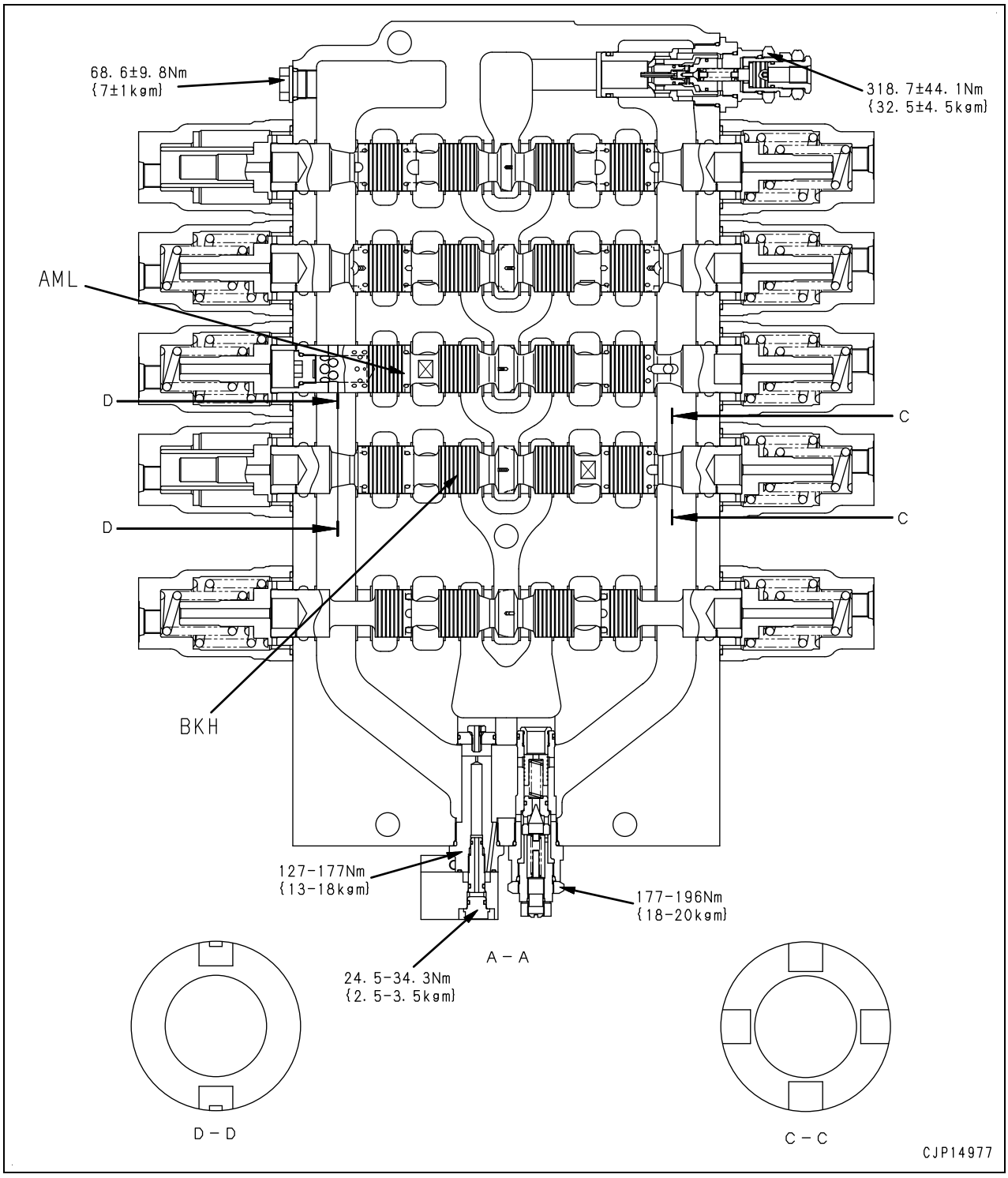
Using tools **S3**, press fit oil seal (4).

★ Insert spacer (5) between tool **S3** and oil seal (4).



Precaution

1. Arm Lo (AML) and bucket Hi (BKH) spools must be installed in the correct directions. Take care.



Removal and installation of boom damping valve assembly

Removal

⚠ **Lower the work equipment to the ground and stop the engine.**

⚠ **Loosen the cap of the hydraulic tank gradually to release the internal pressure of the hydraulic tank.**

⚠ **Disconnect the cable from the negative (–) terminal of the battery.**

★ Release the remaining pressure from the PPC circuit.

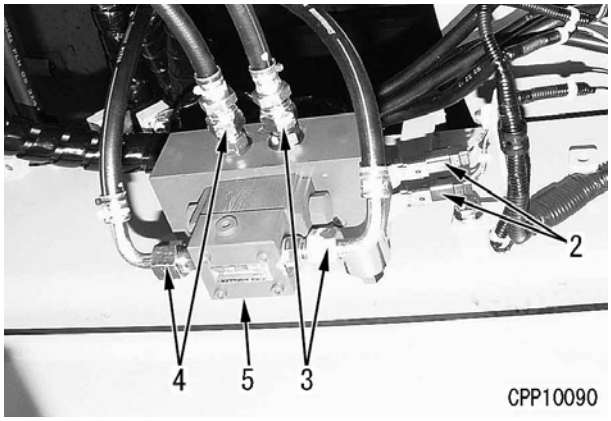
★ Put the plug to the separated hose.

1. Remove tool box (1) positioned in front of the hydraulic oil tank.

2. Disconnect solenoid wiring connectors (2) (V9 and V10).

3. Disconnect 4 pcs. of hoses (3) and (4) between the solenoid valve and the damping valve.
   ★ Separate the hose between the damping valve and the PPC valve, RH and separate the hose between the damping valve and the relay joint.

4. Remove the mounting bolt to remove damping valve assembly (5).

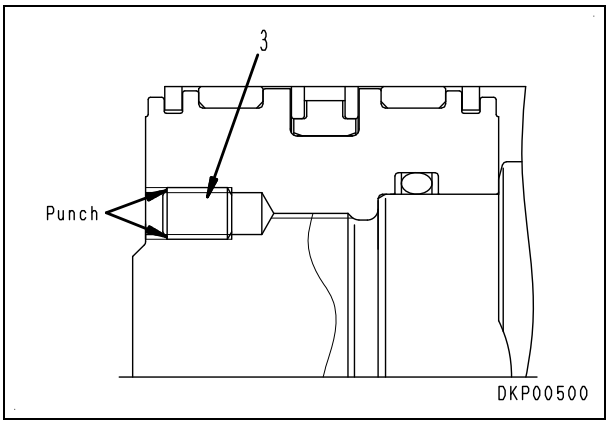


Installation

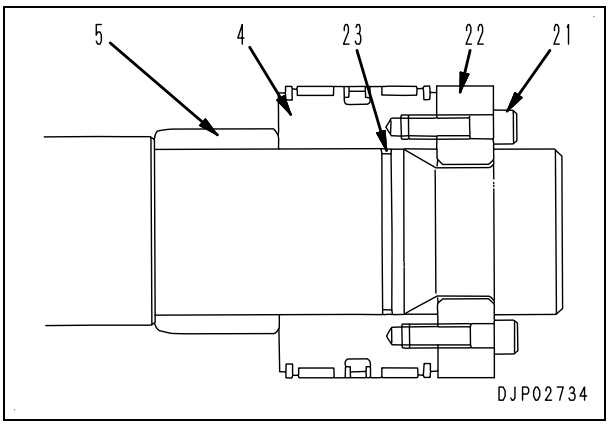
- **Installation shall be made in the reversed procedure of the removal procedure.**

- **Air bleeding**
  Carry out air bleeding of the PPC piping circuit referring to the section “Bleeding air from each part” in the “Testing and adjusting”.

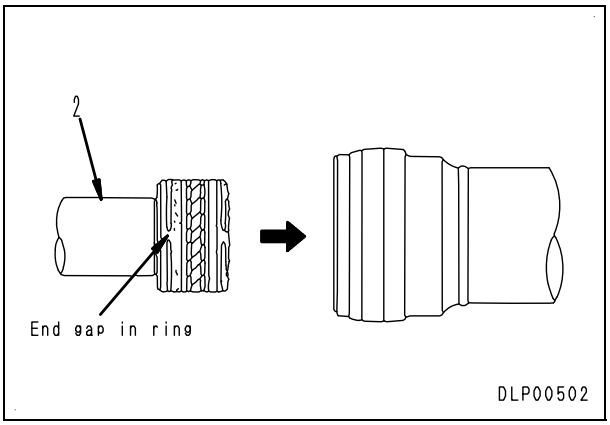
c. After machining, wash thoroughly to remove all metal particles and dust.
d. Tighten screw (3).
Threaded part:
Thread tightener (Loctite No. 262 or equivalent)
Screw (3):
58.9 – 73.6 Nm {6 – 7.5 kgm}
e. Caulk thread at 4 places with punch.



7) Install O-ring, back-up ring (23), piston assembly (4) and spacer (22), then retighten them with screw (21).
Threaded part:
Thread tightener (Loctite No. 262 or equivalent)
Screw (21):
245 – 309 Nm {25 – 31.5 kgm}
- Applicable to bucket cylinder of SE specification

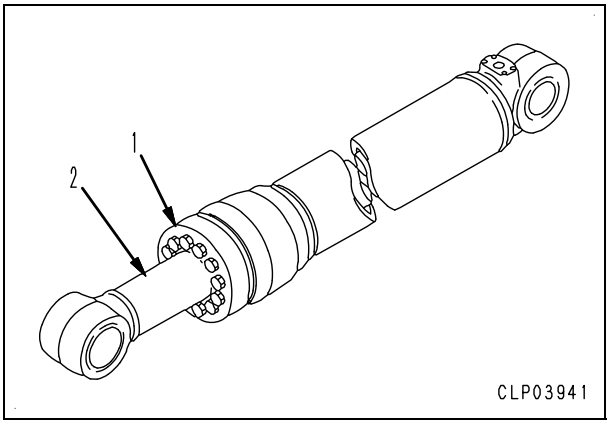


8) Assemble piston rod assembly (2).
Seal portion: **Grease (G2-LI)**
★ Set the end gap of the ring at the horizontal (side) position, align the axial center of shaft and cylinder tube, then insert.
★ After inserting, check that the ring is not broken and has not come out, then push in fully.



9) Tighten head assembly (1) with mounting bolts.
Mounting bolt:

Cylinder	Tightening torque
STD Bucket, SE Arm	**892 ± 137 Nm {91.0 ± 14 kgm}**
STD Arm, Boom	**1,270 ± 200 Nm {130 ± 20 kgm}**
SE Bucket	**1,670 ± 250 Nm {170 ± 25 kgm}**



10) Install piping.

Removal and installation of arm cylinder assembly

Loading shovel

Removal

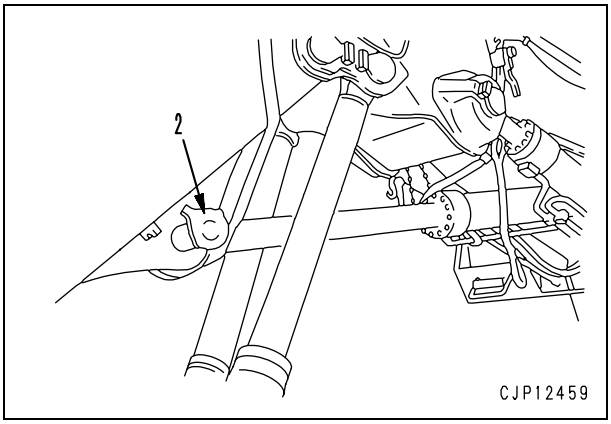
⚠ **Retract boom cylinder fully, and extend arm cylinder, then set the bottom of the bucket horizontal, lower the work equipment completely to the ground and stop the engine. Operate the control levers several times to release the remaining pressure in the hydraulic piping.**

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

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

1. Sling arm cylinder assembly, and remove plate, then using forcing screws (Thread dia. = 16 mm, Pitch = 2.0 mm), pull out pin (2). [*1]
   ★ Pull out the pin to a position where the piston rod can be disconnected.

   Pin: **60 kg**

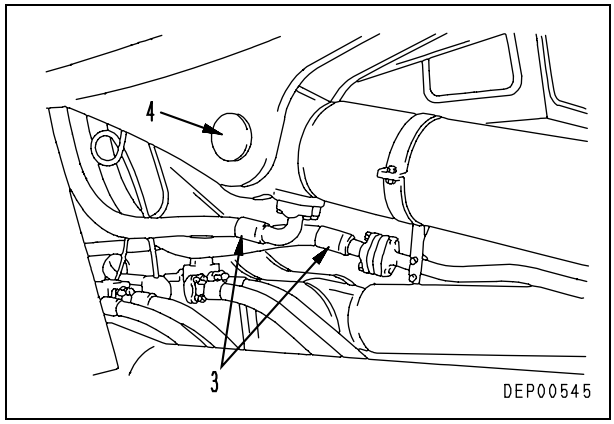


2. Start engine and retract piston rod fully.
   ⚠ **Tie the rod with wire to prevent it from coming out.**
   ⚠ **After stopping the engine, release the pressure inside the piping.**
   For details, see Testing and adjusting, “Releasing pressure in PPC circuit”.

3. Disconnect hoses (3).

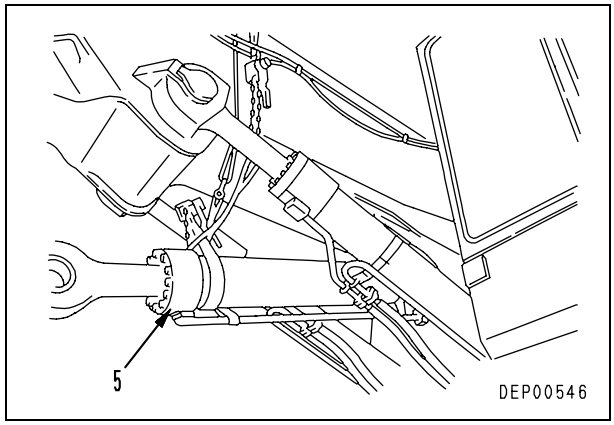
4. Sling piston rod end and bottom end, and remove plate, then using forcing screws (Thread dia. = 16 mm, Pitch = 2.0 mm), pull out pin (4). [*2]
   ★ Pull out the pin to a position where the cylinder bottom can be disconnected.

   Pin: **60 kg**



5. Lift off arm cylinder assembly (5) carefully.

   Arm cylinder assembly: **900 kg**



Removal and installation of arm assembly

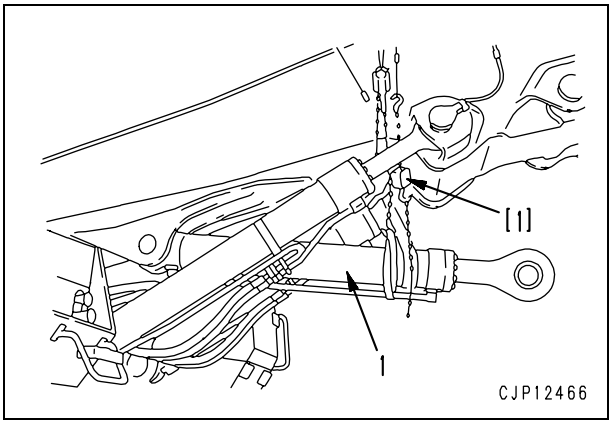
Loading shovel

Removal

1. Remove bucket assembly.
   For details, see “Removal and installation of bucket assembly”.

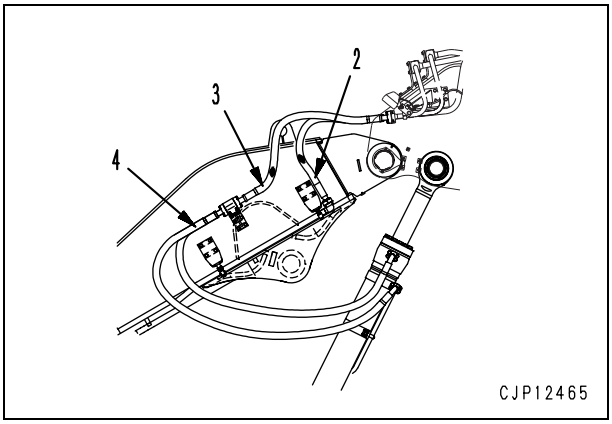
2. Lower the tip of the arm assembly to the ground.

3. Sling arm cylinder assembly (1) temporarily and disconnect the rod side from the arm.
   For details, see “Removal and installation of arm cylinder assembly”.
   ★ Secure the arm cylinder assembly to the boom with lever block [1].
   ⚠ **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”.**



4. Disconnect right and left bottom dump cylinder hoses (2).

5. Disconnect right and left bucket cylinder hoses (3) and (4), 2 pieces on each side.

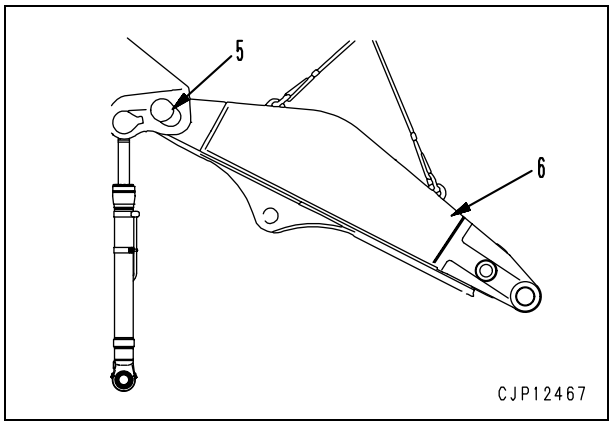


6. Sling arm assembly, and remove 3 mounting bolts, then using forcing screws (Thread dia. = 16 mm, Pitch = 2.0 mm), pull out pin (5). [*1]
   ★ Pull out the pin on the other side in the same way to a position where the arm can be disconnected from the boom.

   Pin: **45 kg**

7. Lift off arm assembly (6).

   Arm assembly: **3,100 kg**



Installation

- **Carry out installation in the reverse order to removal.**

[*1]

⚠ **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.

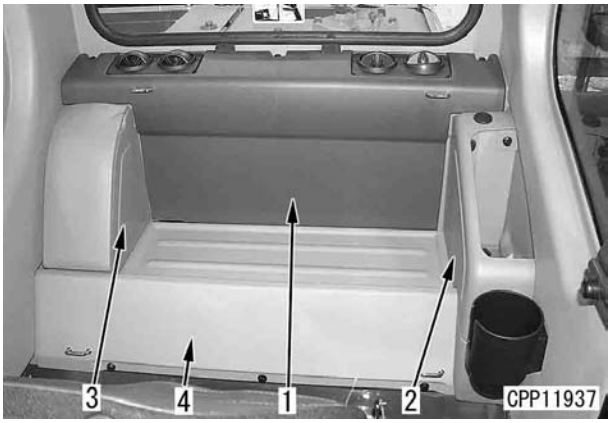
Cab and its attachments

Removal and installation of operator's cab

Removal

⚠ **Disconnect the cable from the negative (–) terminal of the battery.**

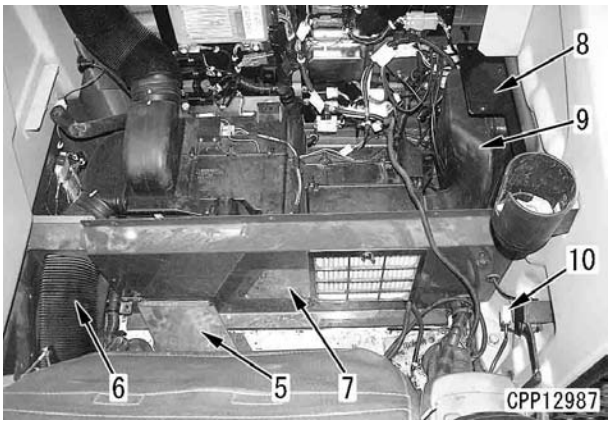
1. Remove rear covers (1), (2), (3), and (4).



2. Remove duct (5), cover (6), and plate (7).

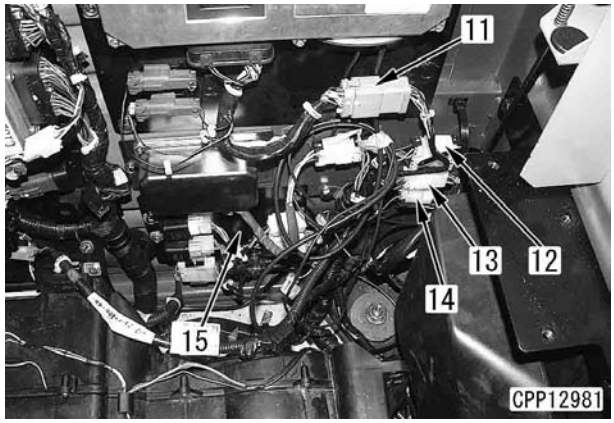
3. Remove plate (8), duct (9) and the element.
   ★ Remove the duct lock clip.

4. Disconnect connector S13 (10).



5. Disconnect cab wiring connectors N02 (11), M10 (12), H08 (13), and H09 (14).
   ★ Remove the clip and separate the wiring harness from the cab.

6. Remove air conditioner connector plate (15).



7. Disconnect connectors L03 (16), H03 (17), H04 (18), and H05 (19).

8. Disconnect upper and lower duct joints (20) and (21).

9. Remove controller sub-plate (22) and incline it against the air conditioner.