SHOP MANUAL

KOMATSU

PC300, 300LC-7
PC350, 350LC-7

MACHINE MODEL	SERIAL NUMBER
PC300-7	**40001 and up**
PC300LC-7	**40001 and up**
PC350-7	**20001 and up**
PC350LC-7	**20001 and up**

- This shop manual may contain attachments and optional equipment that are not available in your area. Please consult your local Komatsu distributor for those items you may require. Materials and specifications are subject to change without notice.
- PC300, 300LC, PC350, 350LC-7 mount the SAA6D114E engine.
  For details of the engine, see the 114 Series Engine Shop Manual.

Printed in Japan 09-05 (01)

How to read the shop manual

Volumes
Shop manuals are issued as a guide to carrying out repairs. They are divided as follows:

Chassis volume: Issued for every machine model
Engine volume: Issued for each engine series

Electrical volume:
Attachments volume:
} Each issued as one volume to cover all models

These various volumes are designed to avoid duplicating the same information. Therefore, to deal with all repairs for any model , it is necessary that chassis, engine, electrical and attachment volumes be available.

Distribution and updating
Any additions, amendments or other changes will be sent to KOMATSU distributors. Get the most up-to-date information before you start any work.

Filing method
1. See the page number on the bottom of the page. File the pages in correct order.
2. Following examples show how to read the page number.

   Example 1 (Chassis volume):

   10 - **3**
   - Item number (10. Structure and Function)
   - Consecutive page number for each item.

   Example 2 (Engine volume):

   12 - **5**
   - Unit number (1. Engine)
   - Item number (2. Testing and Adjusting)
   - Consecutive page number for each item.

3. Additional pages: Additional pages are indicated by a hyphen (–) and number after the page number. File as in the example.

   Example:

   10-4
   10-4-1
   10-4-2
   10-5
   Added pages
   20-203
   12-203-1
   12-203-2
   12-204

Revised edition mark
When a manual is revised, an edition mark ((1)(2)(3)....) is recorded on the bottom of the pages.

Revisions
Revised pages are shown in the **List of revised pages** next to the **Contents** page.

Symbols
So that the shop manual can be of ample practical use, important safety and quality portions are marked with the following symbols.

Symbol	Item	Remarks
	Safety	Special safety precautions are necessary when performing the work.
★	Caution	Special technical precautions or other precautions for preserving standards are necessary when performing the work.
	Weight	Weight of parts of systems. Caution necessary when selecting hoisting wire, or when working posture is important, etc.
	Tightening torque	Places that require special attention for the tightening torque during assembly.
	Coat	Places to be coated with adhesives and lubricants, etc.
	Oil, water	Places where oil, water or fuel must be added, and the capacity.
	Drain	Places where oil or water must be drained, and quantity to be drained.

Conversion table

Method of using the conversion table

The Conversion Table in this section is provided to enable simple conversion of figures. For details of the method of using the Conversion Table, see the example given below.

Example

- Method of using the Conversion Table to convert from millimeters to inches

1. Convert 55 mm into inches.
1) Locate the number 50 in the vertical column at the left side, take this as (A), then draw a horizontal line from (A).
2) Locate the number 5 in the row across the top, take this as (B), then draw a perpendicular line down from (B).
3) Take the point where the two lines cross as (C). This point (C) gives the value when converting from millimeters to inches. Therefore, 55 mm = 2.165 inches.

2. Convert 550 mm into inches.
1) The number 550 does not appear in the table, so divide by 10 (move the decimal point one place to the left) to convert it to 55 mm.
2) Carry out the same procedure as above to convert 55 mm to 2.165 inches.
3) The original value (550 mm) was divided by 10, so multiply 2.165 inches by 10 (move the decimal point one place to the right) to return to the original value. This gives 550 mm = 21.65 inches.

Millimeters to inches

(B)

1 mm = 0.03937 in

	0	1	2	3	4	5	6	7	8	9
0	0	0.039	0.079	0.118	0.157	0.197	0.236	0.276	0.315	0.354
10	0.394	0.433	0.472	0.512	0.551	0.591	0.630	0.669	0.709	0.748
20	0.787	0.827	0.866	0.906	0.945	0.984	1.024	1.063	1.102	1.142
30	1.181	1.220	1.260	1.299	1.339	1.378	1.417	1.457	1.496	1.536
40	1.575	1.614	1.654	1.693	1.732	1.772	1.811	1.850	1.890	1.929
						(C)				
(A) 50	1.969	2.008	2.047	2.087	2.126	2.165	2.205	2.244	2.283	2.323
60	2.362	2.402	2.441	2.480	2.520	2.559	2.598	2.638	2.677	2.717
70	2.756	2.795	2.835	2.874	2.913	2.953	2.992	3.032	3.071	3.110
80	3.150	3.189	3.228	3.268	3.307	3.346	3.386	3.425	3.465	3.504
90	3.543	3.583	3.622	3.661	3.701	3.740	3.780	3.819	3.858	3.898

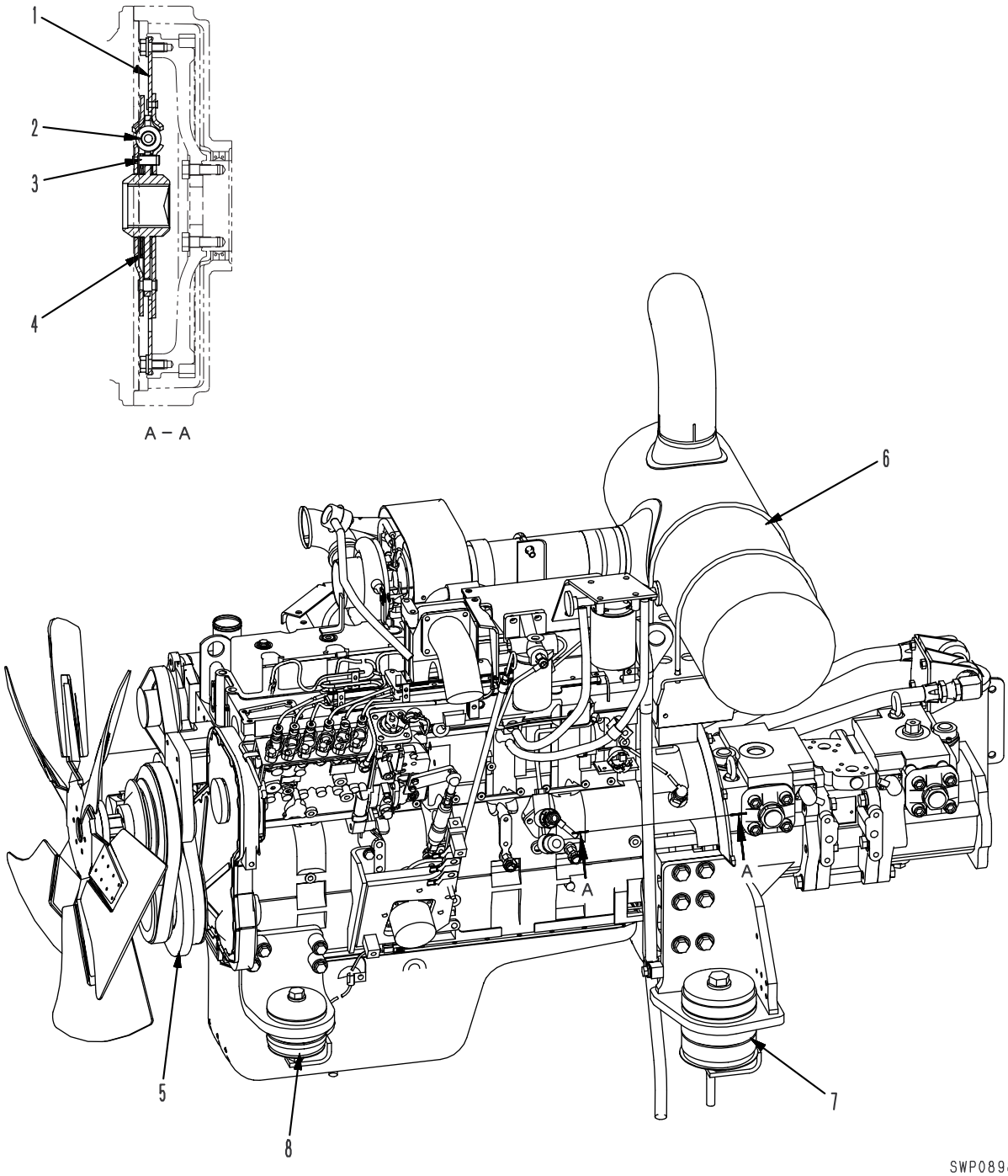
SPECIFICATIONS

PC300-7, PC300LC-7

Machine model				PC300-7	PC300LC-7
Serial Number				40001 and up	
Bucket capacity			m^3	1.4	1.4
Operating weight			kg	30,800	31,900
Performance	Working ranges	Max. digging depth	mm	7,380	7,380
		Max. vertical wall depth	mm	6,480	6,480
		Max. digging reach	mm	11,100	11,100
		Max. reach at ground level	mm	10,920	10,920
		Max. digging height	mm	10,210	10,210
		Max. dumping height	mm	7,110	7,110
	Max. digging force		kN {kg}	211.8 {21,600}	211.8 {21,600}
	(using power max. function)		kN {kg}	(226.5 {23,100})	(226.5 {23,100})
	Swing speed		rpm	9.5	9.5
	Swing max. slope angle		deg.	21	21
	Travel speed		km/h	Lo: 3.2 (※ Mi: 4.5)	Lo: 3.2 (※ Mi: 4.5)
				Hi: 5.5	Hi: 5.5
	Gradeability		deg.	35	35
	Ground pressure		kPa {kg/cm²}	62.8 {0.64}	53.0 {0.54}
	[standard shoe width]		[mm]	[600]	[700]
Dimensions	Overall length (for transport)		mm	11,140	11,140
	Overall width		mm	3,190	3,190
	Overall width of track		mm	3,190	3,290
	Overall height (for transport)		mm	3,280	3,280
	Overall height to chassis		mm	3,130	3,130
	Ground clearance to bottom of upper structure		mm	1,186	1,186
	Min. ground clearance		mm	498	498
	Tail swing radius		mm	3,450	3,450
	Min. swing radius of work equipment		mm	4,310	4,310
	Height of work equipment at min. swing radius		mm	8,520	8,520
	Length of track on ground		mm	3,700	4,030
	Track gauge		mm	2,590	2,590
	Height of machine cab		mm	3,130	3,130

※: The "Mi" mode is on the multi-monitor specification machine only.

ENGINE RELATED PARTS

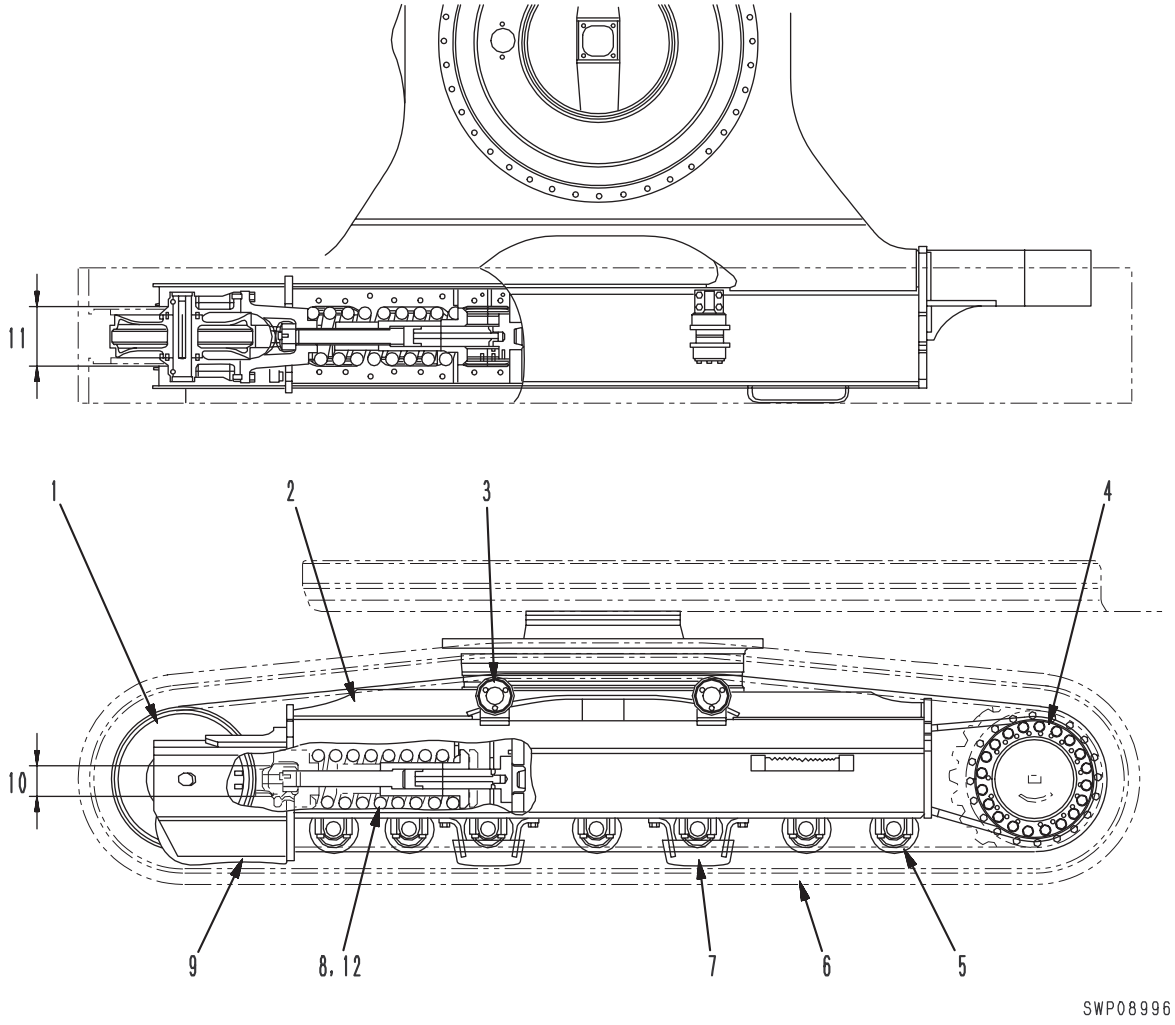


1. Drive plate
2. Torsion spring
3. Stopper pin
4. Friction plate
5. Damper assembly
6. Muffler
7. Rear engine mount
8. Front engine mount

OUTLINE

- The damper assembly is a wet type. Oil capacity: 1.3

TRACK FRAME • RECOIL SPRING



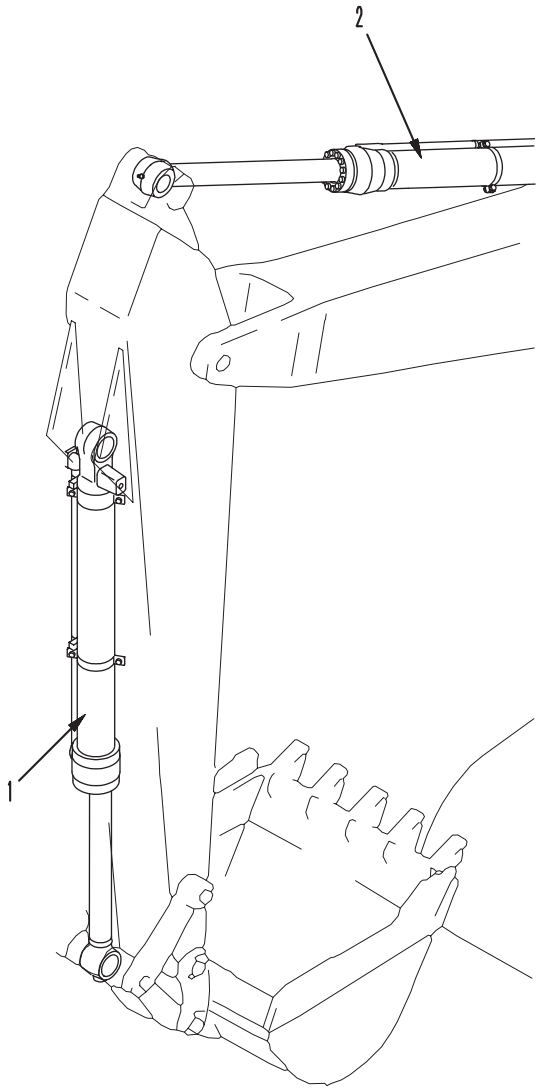
1 Idler
2 Track frame
3 Carrier roller
4 Final drive
5 Track roller
6 Track shoe
7 Center guard
8 Recoil spring
9 Front guard

- The dimensions and the number of track rollers depend on the model, but the basic structure is not different.
- Number of track rollers

Model	Q'ty
PC300-7, PC350-7	7
PC300LC-7, PC350LC-7	8

HYDRAULIC EQUIPMENT LAYOUT DRAWING

1. Bucket cylinder
2. Arm cylinder
3. Boom cylinder
4. Swing motor
5. Control valve
6. Oil cooler
7. Hydraulic filter
8. Hydraulic pump
9. L.H. travel motor
10. Hydraulic tank
11. Multi-pattern selector valve
12. L.H. PPC valve
13. Safety lever (electric type)
14. Center swivel joint
15. R.H. PPC valve
16. Travel PPC valve
17. Attachment circuit selector valve
18. Holding valve
19. Accumulator
20. Solenoid valve assembly
    - 20A PPC lock solenoid
    - 20B Travel junction solenoid
    - 20C Pump merge/divider solenoid
    - 20D Travel speed solenoid
    - 20E Swing brake solenoid
    - 20F Machine push-up solenoid
    - 20G 2-stage relief solenoid



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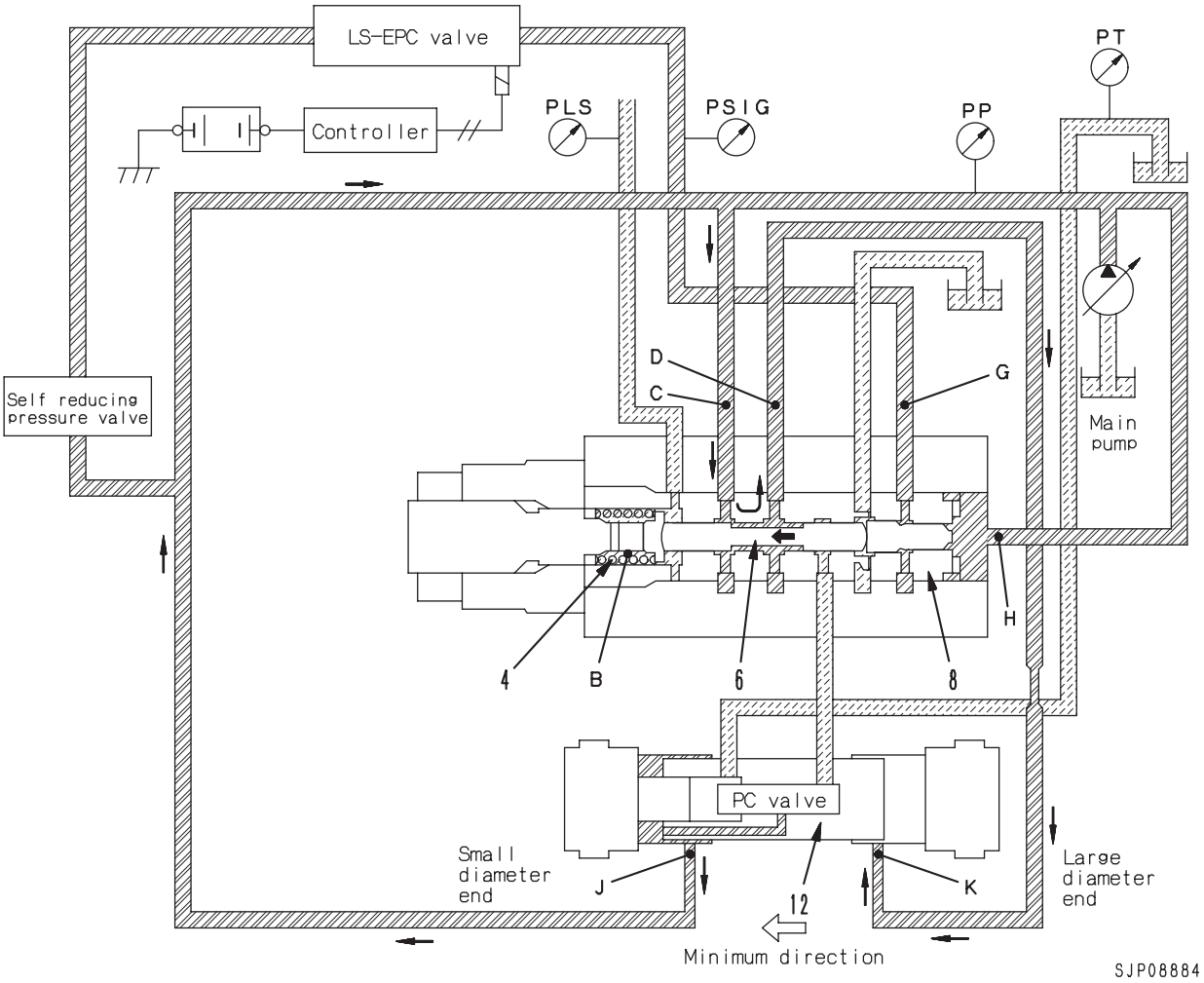
OPERATION

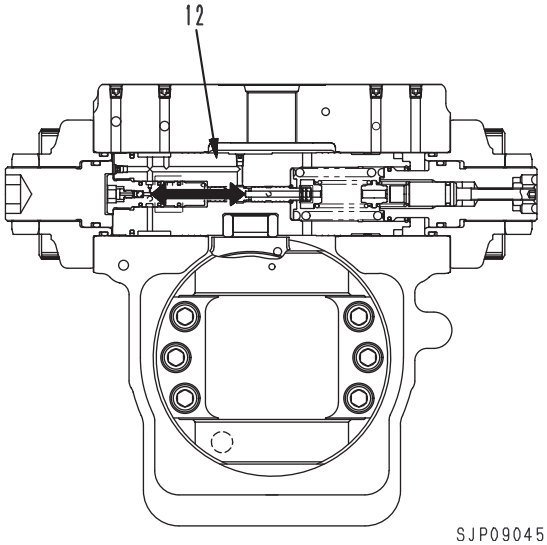


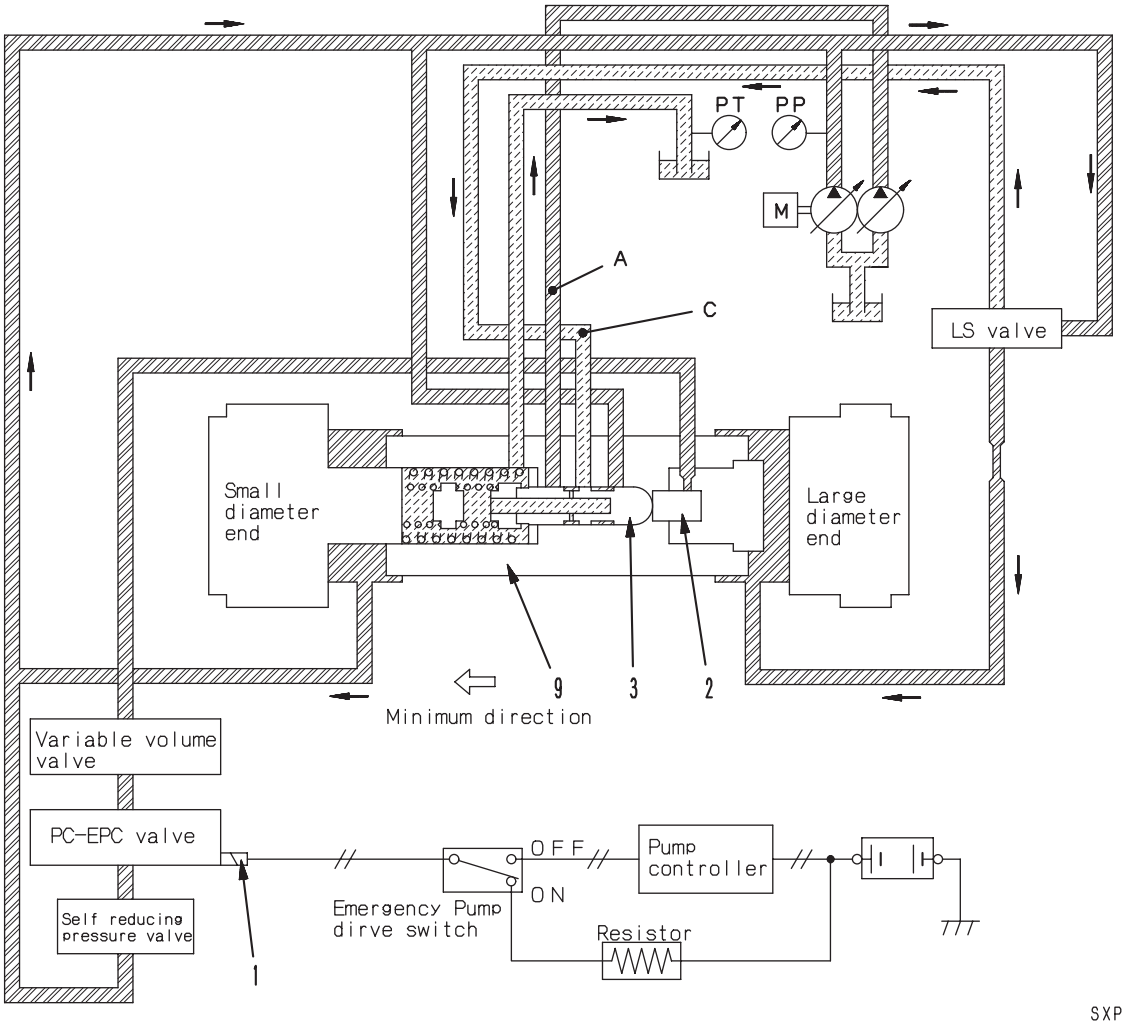
(1) LS valve

1) When control valve is at neutral position

- The LS valve is a three-way selector valve, with pressure **PLS** (LS pressure) from the inlet port of the control valve brought to spring chamber **B**, and main pump discharge pressure **PP** brought to port **H** of sleeve (8). The size of this LS pressure **PLS** + force **Z** of spring (4) and the main pump pressure (self pressure) **PP** determines the position of spool (6). However, the size of the output pressure **PSIG** (the LS selection pressure) of the EPC valve for the LS valve entering port **G** also changes the position of spool (6). (The set pressure of the spring changes).
- Before the engine is started, servo piston (12) is pushed to the right. (See the diagram on the right)
- When the engine is started and the control lever is at the neutral position, LS pressure **PLS** is 0 MPa {0 kg/cm^2}. (It is interconnected with the drain circuit through the control valve spool.)

At this point, spool (6) is pushed to the left, and port **C** and port **D** are connected. Pump pressure **PP** enters the large diameter end of the piston from port **K** and the same pump pressure **PP** also enters port **J** at the small diameter end of the piston, so the swash plate is moved to the minimum angle by the difference in the area of the piston (12).

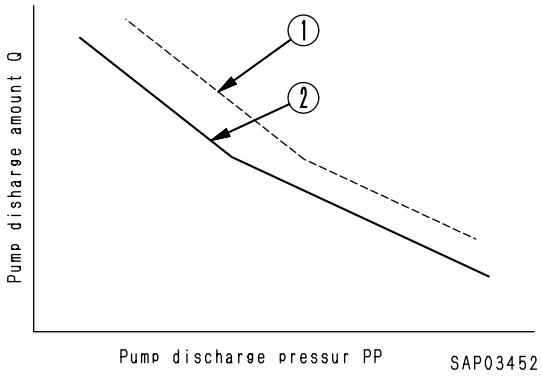




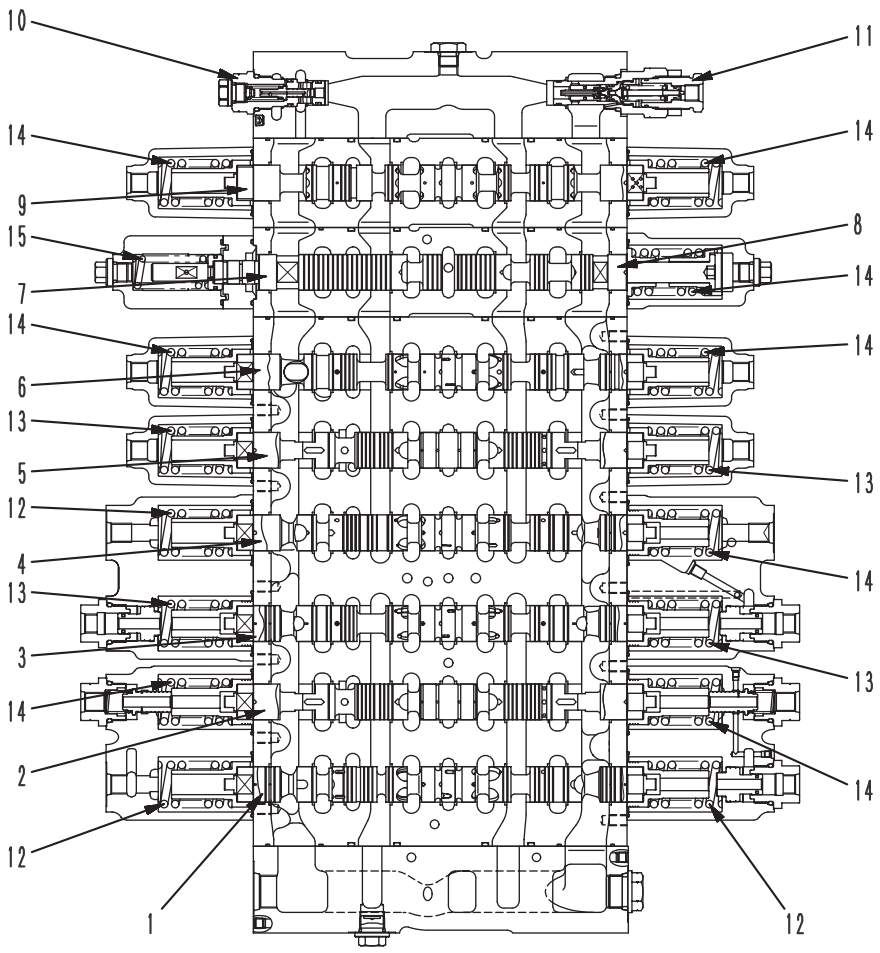
b. When main pump load is heavy

- In the same way as in the previous item, when the emergency pump drive switch is **ON**, the command current sent to PC-EPC valve solenoid (1) becomes constant. For this reason, the force of piston (2) pushing spool (3) is constant.
- If main pump pressures **PP1** and **PP2** increase, spool (3) moves further to the left than when the main pump load is light, and is balanced at the position in the diagram above.
- In this case, the pressure from port **A** flows to port **C**, so servo piston (9) moves to the left (to make the discharge amount smaller) by the same mechanism as explained in item 2)-b, and stops at a position to the left of the position when the load on the pump is light. In other words, even when the emergency pump drive switch is **ON**, the curve for the pump pressure **PP** and discharge amount **Q** is determined as shown in the diagram for the valve of the current sent to the PC-EPC valve solenoid through the resistor.

  The curve when the PC prolix switch is **ON** is curve ②, which is to the left of curve ① for when the pump controller is normal.



(4/9)

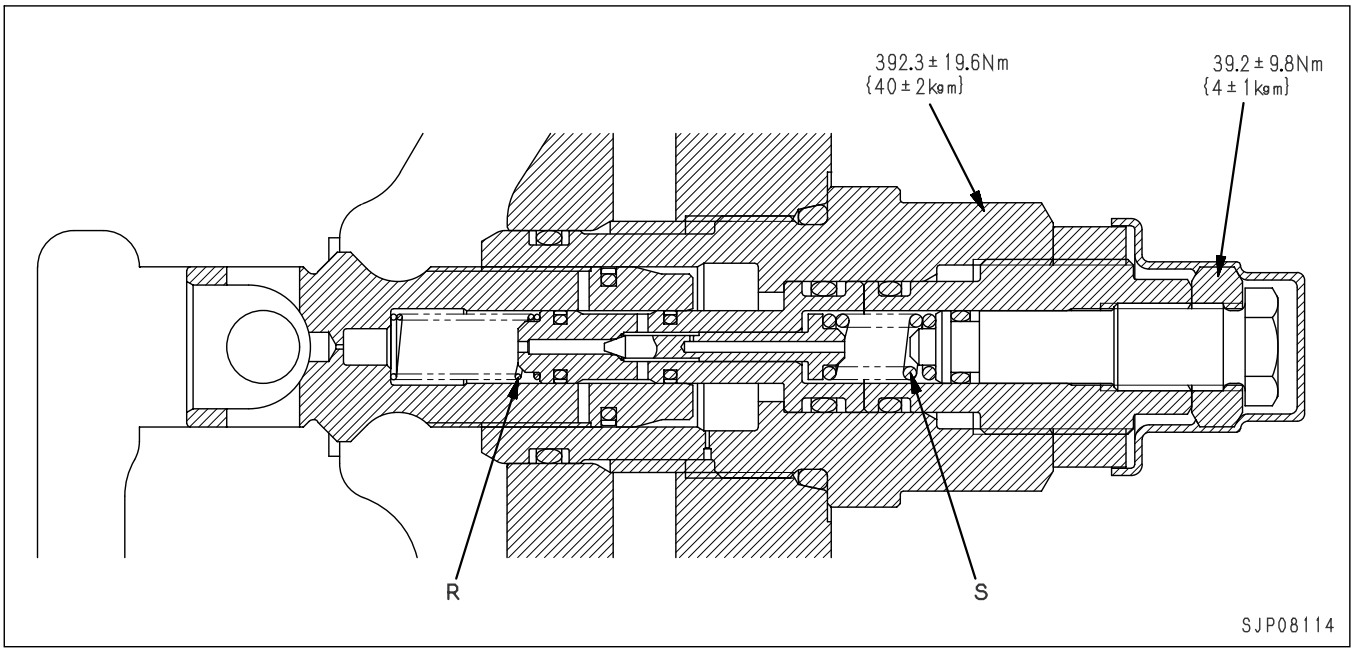


1. Spool (Arm)
2. Spool (Right travel)
3. Spool (Swing)
4. Spool (Boom)
5. Spool (Left travel)
6. Spool (Bucket)
7. Spool (Boom Hi)
8. Spool (Arm Hi)
9. Spool (Service)
10. Unload valve
11. Main relief valve

Unit: mm

No.	Check item	Criteria					Remedy
		Standard size			Repair limit		
12	Spool return spring	Free length x Outside diameter	Installed length	Installed load	Free length	Installed load	If damaged or deformed, replace spring
		54.2 x 34.8	51.2	416.5 N {42.5 kg}	—	333.2 N {34 kg}	
13	Spool return spring	54.6 x 34.8	51.2	429.9 N {42.9 kg}	—	336.1 N {34.3 kg}	
14	Spool return spring	54.5 x 34.8	51.2	393 N {40.1 kg}	—	314.6 N {32.1 kg}	
15	Spool return spring	54.9 x 24.2	51.2	251 N {25.1 kg}	—	201.0 N {20.5 kg}	

VARIABLE PRESSURE COMPENSATION VALVE



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.

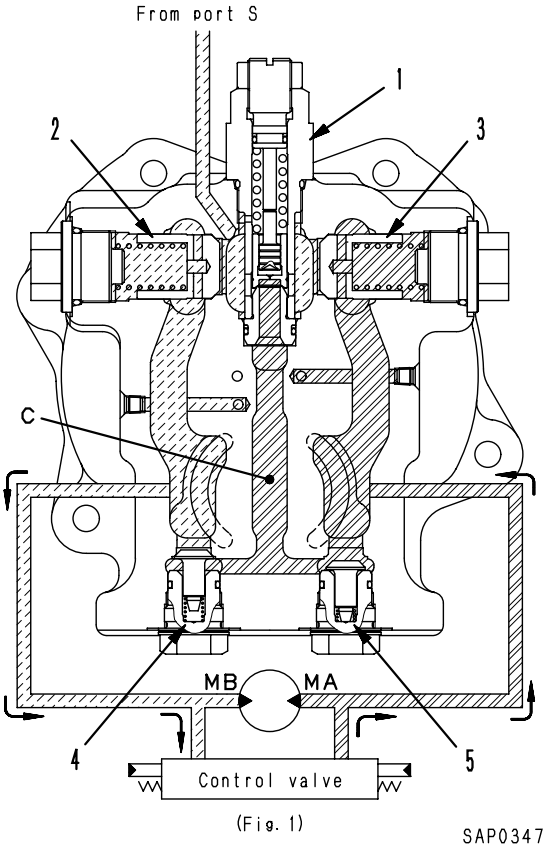
3. Operation

1) When starting swing

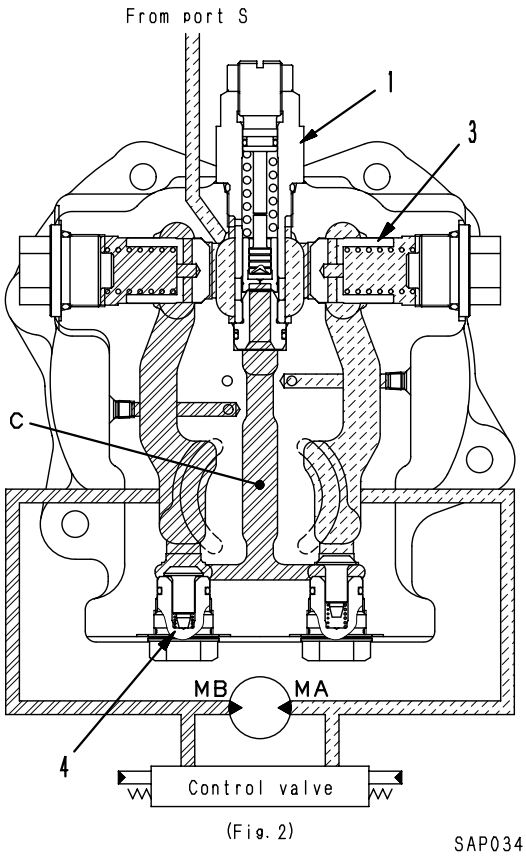
- When the swing control lever is operated to swing right, the pressure oil from the pump passes through the control valve and is supplied to port **MA**. As a result, the pressure at port **MA** rises, the starting torque is generated in the motor, and the motor starts to rotate. The oil from the outlet port of the motor passes from port **MA** through the control valve and returns to the tank. (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. With the oil from the outlet port of the motor, the return circuit to the tank is closed by the control valve, so the pressure at port **MB** rises. 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 at 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 oil from port **S** passes through check valve **B** (3) and is supplied to port **MA**. This prevents cavitation at port **MA**.



(Fig. 1) SAP03473

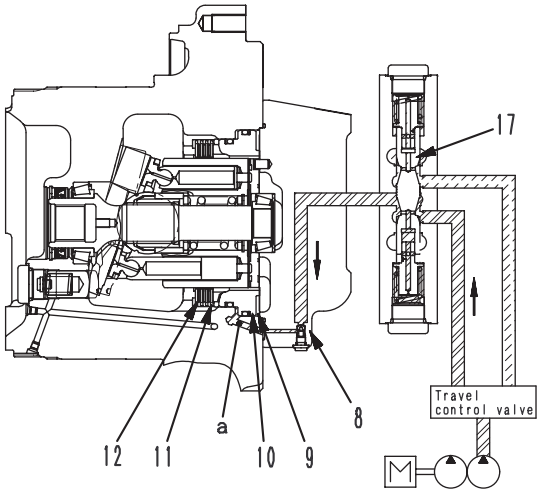


(Fig. 2) SAP03474

OPERATION OF PARKING BRAKE

1) When starting to travel

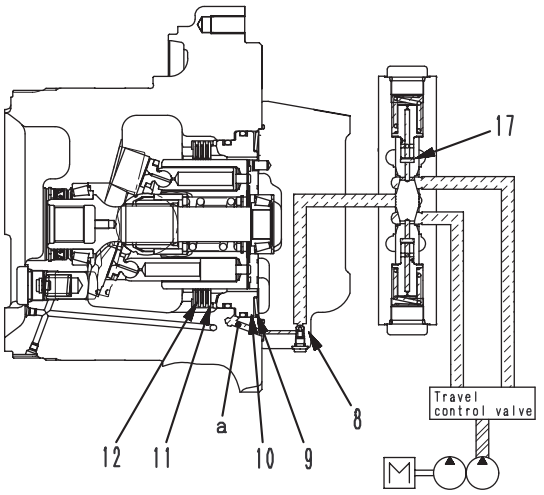
When the travel lever is operated, the pressurized oil from the pump actuates counterbalance valve spool (17), opens the circuit to the parking brake, and flows into chamber **a** of the brake piston (10).
It overcomes the force of spring (9), and pushes piston (10) to the left.
When this happens, the force pushing plate (11) and disc (12) together is lost, so plate (11) and disc (12) separate and the brake is released.



SXP09153

2) When stopping travel

When the travel lever is placed in neutral, counterbalance valve spool (17) returns to the neutral position and the circuit to the parking brake is closed.
The pressurized oil in chamber **a** of brake piston (10) is drained to the case from the orifice in the brake piston, and brake piston (10) is pushed to the right in the direction of the arrow by spring (9).
As a result, plate (11) and disc (12) are pushed together, and the brake is applied.
A time delay is provided by having the pressurized oil pass through a throttle in slow return valve (8) when the brake piston returns, and this ensures that the brake is still effective after the machine stops.



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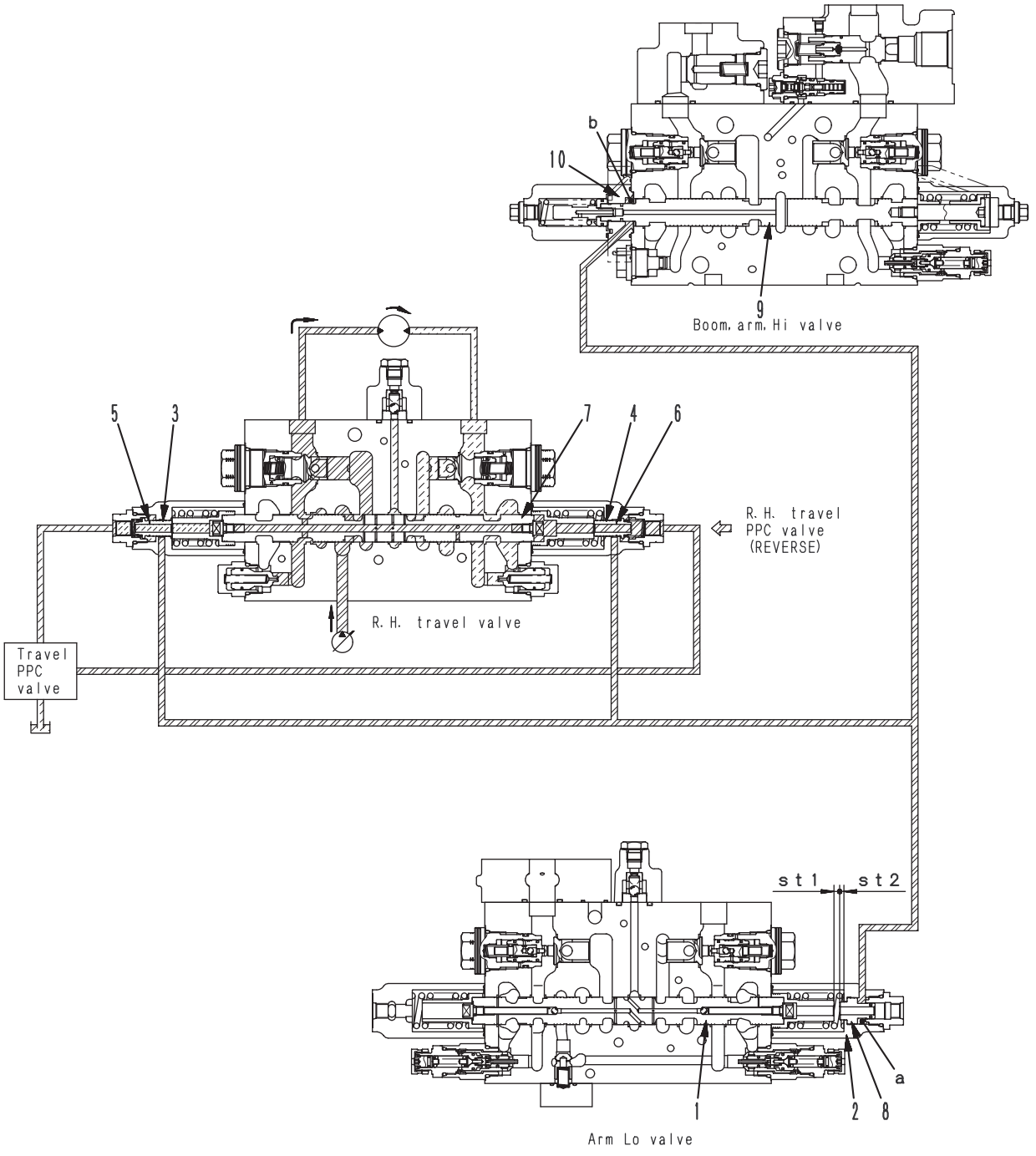

b
10
9
Boom, arm, Hi valve
5
3
7
4
6
R. H. travel
PPC valve
(REVERSE)
R. H. travel valve
Travel
PPC
valve
st 1
st 2
a
1
2
8
Arm Lo valve
SXP09168

3) Fine control (control lever returned)

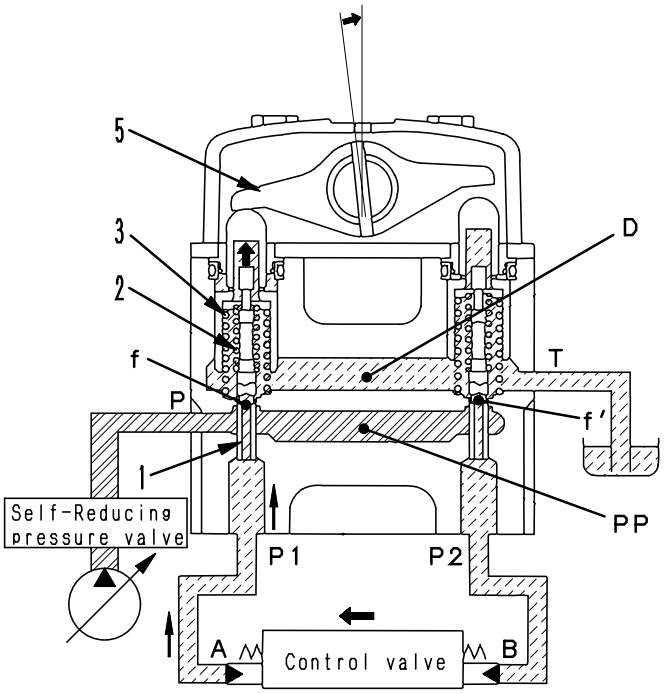
When lever (5) starts to be returned, spool (1) is pushed up by the force of centering spring (3) and the pressure at port **P1**.

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

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

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

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

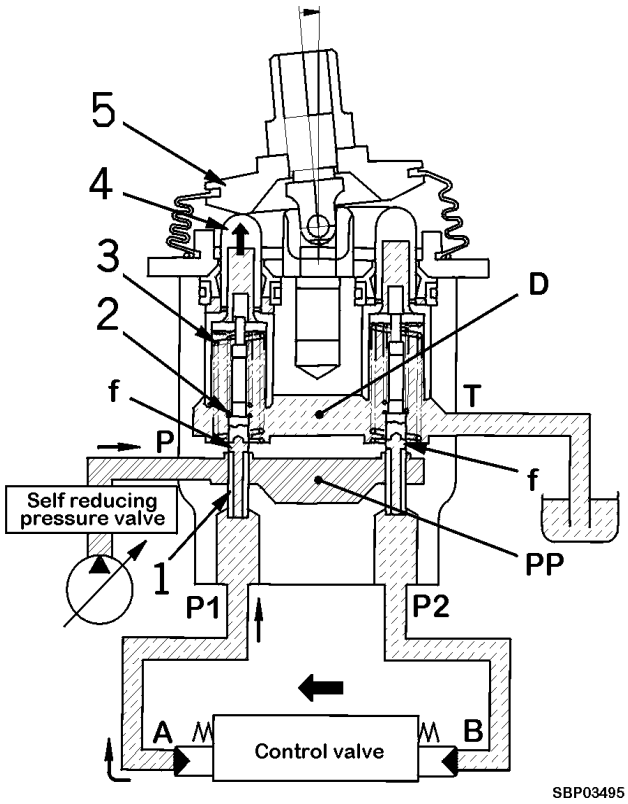


(Fig. 3)

SBP03499

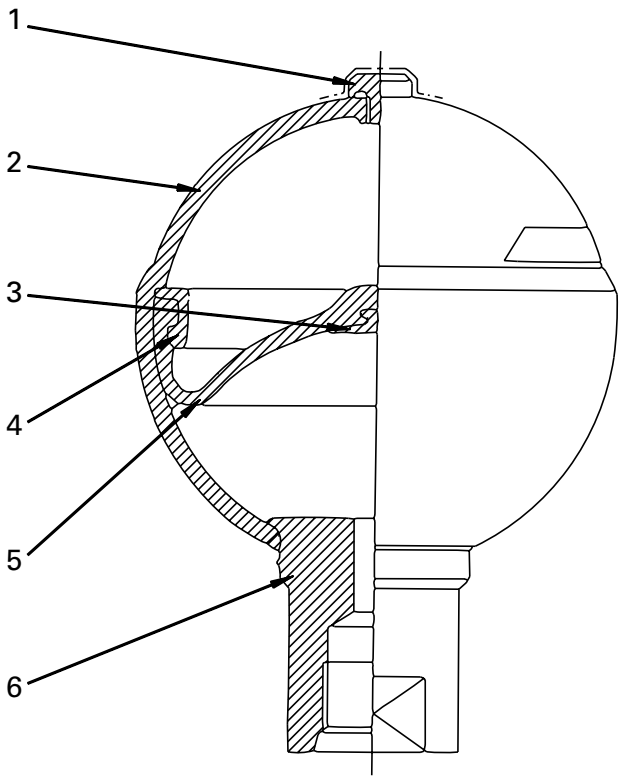
4) At full stroke

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



SBP03495

PPC ACCUMULATOR



SBP00290

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

SPECIFICATIONS

Gas capacity:300 cc (for PPC)

LIFT CHECK VALVE

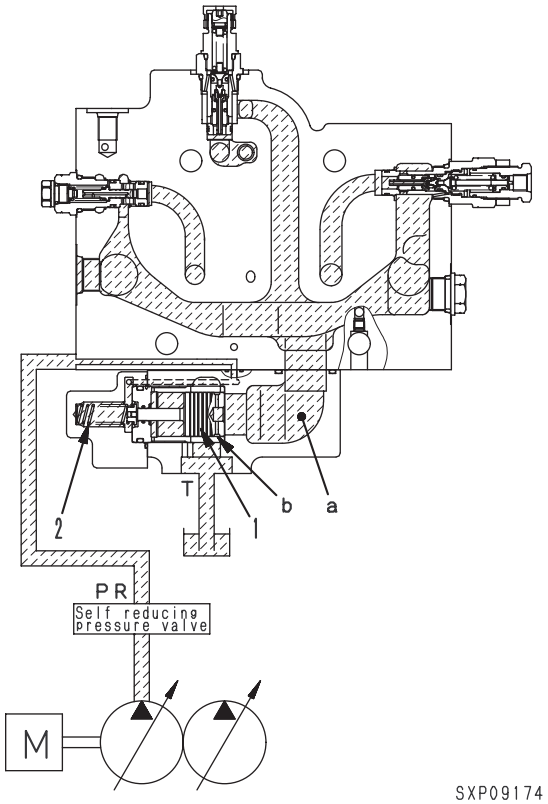
Function

This valve applies back pressure to the drain circuit to prevent generation of negative pressure on the hydraulic devices for the work equipment (motors, cylinders, etc.)

Operation

1. While engine is stopped

Any oil is not supplied from the pump to the self-pressure reducing valve and valve (1) is pressed by only the force of spring (2) toward the right and drain circuit "a" of the control valve is connected through orifice "b" of valve (1) to port T.

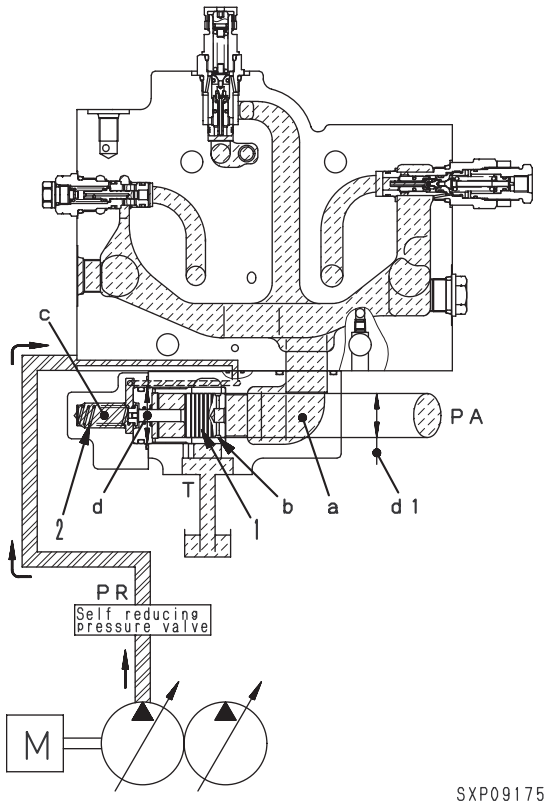


SXP09174

2. While engine is running

- Output pressure PR of the self-pressure reducing valve is applied through the control valve to spring chamber "c" of the back pressure valve.
- Output pressure PR applied to spring chamber "c" is applied to the left end of valve (1) (area of ⌀d) to push valve (1) to the right.
- At this time, pressure PA of drain circuit "a" of the control valve is applied to the right end of valve (1) (area of ⌀d1) to push valve (1) to the left.
- Valve (1) is balanced so that the back pressure PA will be as follows.

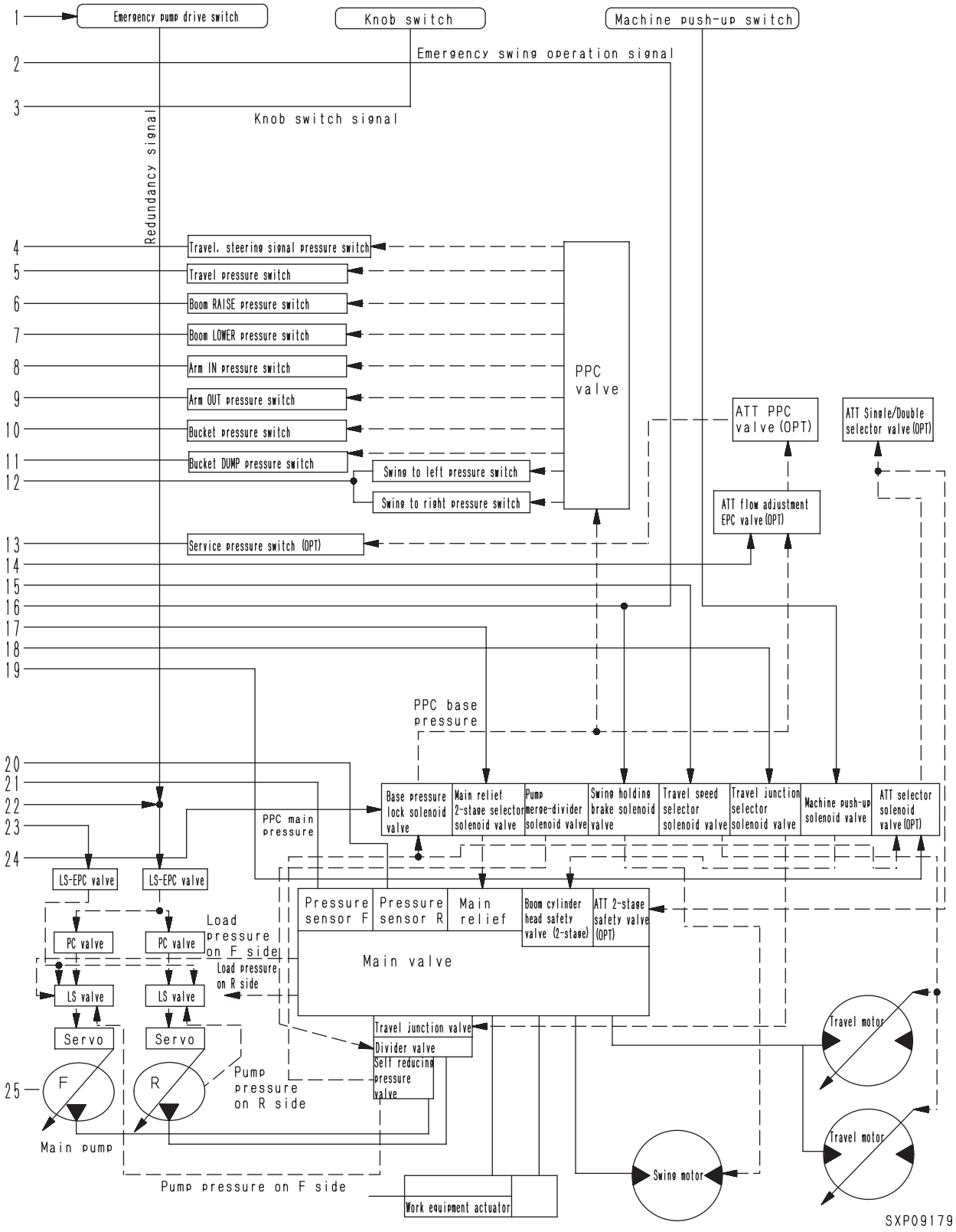
  PA = {(Area of ⌀d) x PR + Force of spring (2)} / (Area of ⌀d1)



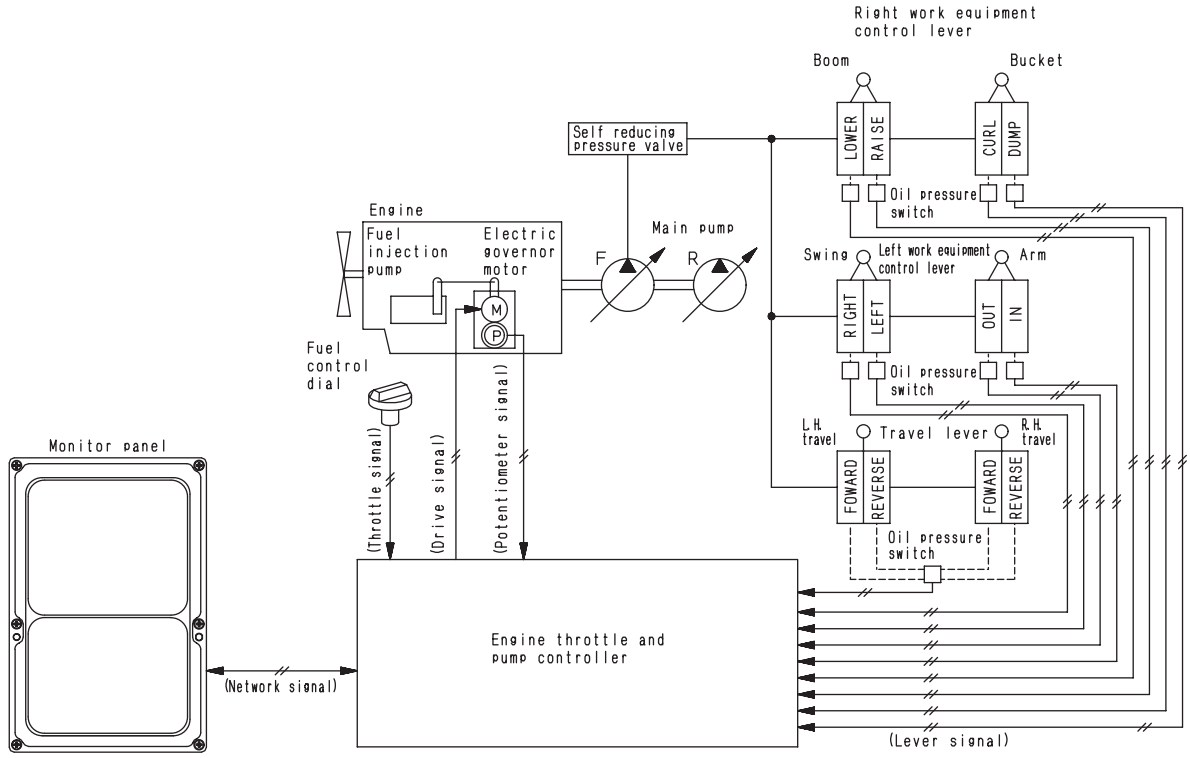
SXP09175

Unit: mm

No.	Model	PC300-7, PC300LC-7	PC350-7, PC350LC-7
1		512.2 ± 0.5	512.2 ± 0.5
2		37.9 ± 0.5	37.9 ± 0.5
3		94° 19′	94° 19′
4		513.6	513.6
5		1,658	1,666
6		193	208
7		—	—
8		50°	42°
9		$\phi 90\ ^{+0.2}_{0}$	
10		$346\ ^{+1}_{0}$	
11		68	68
12		138	138
13		525.5 ± 0.5	525.5 ± 0.5
14		∅ 26	∅ 26
15	A	∅ 165	∅ 165
	B	∅ 150	∅ 150
16		∅ 200	∅ 200
17		146.1	135.5
18		137.6	142.0
19		R115	R115
20		R100	R100
21		$370\ ^{+2}_{0}$	
22		60	60


1
Emergency pump drive switch
Knob switch
Machine push-up switch
2
Emergency swing operation signal
3
Knob switch signal
Redundancy signal
4
Travel, steering signal pressure switch
5
Travel pressure switch
6
Boom RAISE pressure switch
7
Boom LOWER pressure switch
8
Arm IN pressure switch
9
Arm OUT pressure switch
10
Bucket pressure switch
11
Bucket DUMP pressure switch
12
Swing to left pressure switch
Swing to right pressure switch
PPC valve
ATT PPC valve (OPT)
ATT Single/Double selector valve (OPT)
ATT flow adjustment EPC valve (OPT)
13
Service pressure switch (OPT)
14
15
16
17
18
19
PPC base pressure
20
21
22
23
24
Base pressure lock solenoid valve
Main relief 2-stage selector solenoid valve
Pump merge-divider solenoid valve
Swing holding brake solenoid valve
Travel speed selector solenoid valve
Travel junction selector solenoid valve
Machine push-up solenoid valve
ATT selector solenoid valve (OPT)
PPC main pressure
LS-EPC valve
LS-EPC valve
Pressure sensor F
Pressure sensor R
Main relief
Boom cylinder head safety valve (2-stage)
ATT 2-stage safety valve (OPT)
Main valve
Load pressure on F side
Load pressure on R side
PC valve
PC valve
LS valve
LS valve
Servo
Servo
Travel junction valve
Divider valve
Self reducing pressure valve
Travel motor
Travel motor
25
F
R
Pump pressure on R side
Main pump
Pump pressure on F side
Swing motor
Work equipment actuator
SXP09179

4. Auto-deceleration function

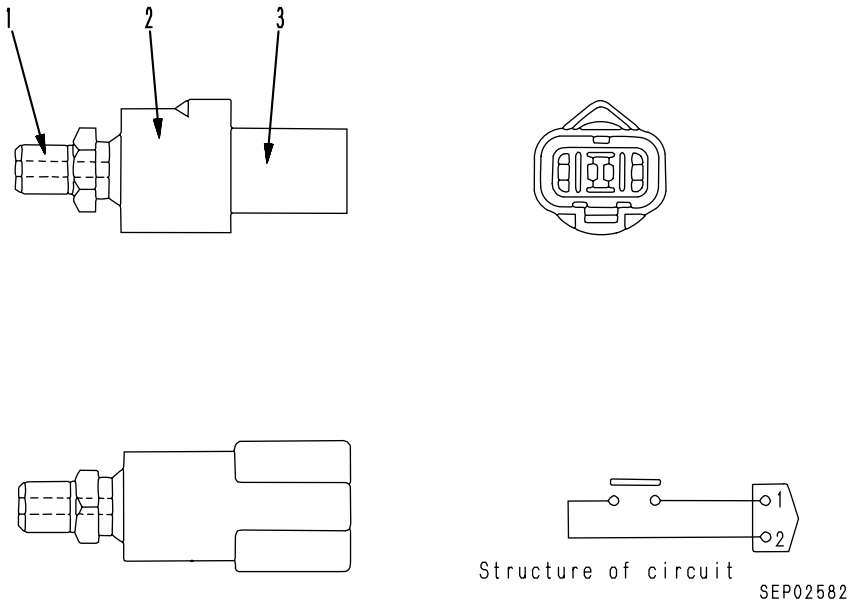


SJP09131

FUNCTION

- If the all control levers are set in NEUTRAL while waiting for a dump truck or work, the engine speed is lowered to the medium level automatically to reduce the fuel consumption and noise.
- If any lever is operated, the engine speed rises to the set level instantly.

2) PPC oil pressure switch



1. Plug
2. Switch
3. Connector

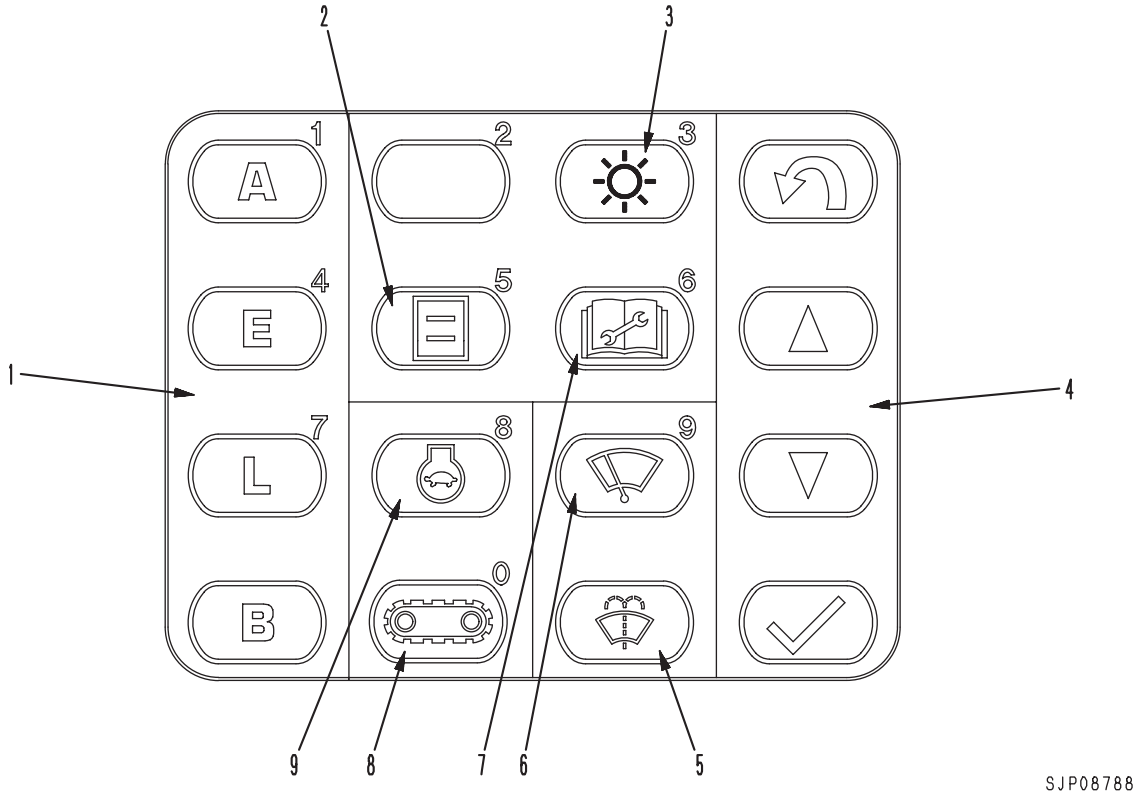
SPECIFICATIONS

Type of contacts: Normally open contacts
Operating (ON) pressure: 0.5 ± 0.1 MPa
{5.0 ± 1.0 kg/cm^2}
Resetting (OFF) Pressure: 0.3 ± 0.5 MPa
{3.0 ± 0.5 kg/cm^2}

FUNCTION

- The junction block has 9 pressure switches, which check the operating condition of each actuator by the PPC pressure and transmit it to the engine throttle and pump controller.

SWITCHES

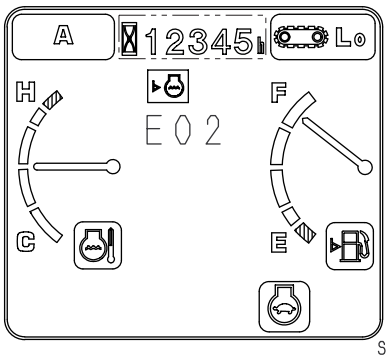


1. Working mode selector switch
2. Selector switch
3. Display brightness, contrast adjustment switch
4. Control switch
5. Window washer switch
6. Wiper switch
7. Maintenance switch
8. Travel speed selector switch
9. Auto-deceleration switch

USER CODE DISPLAY FUNCTION

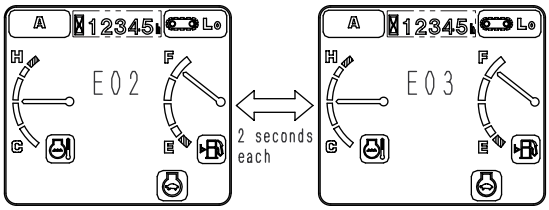
- If there is any problem in operating the machine, the user code is displayed on the monitor to advise the operator of the steps to take.

  This code display appears on the operator screen.
- On the operator screen, the user code is displayed on the portion for the hydraulic oil temperature gauge.



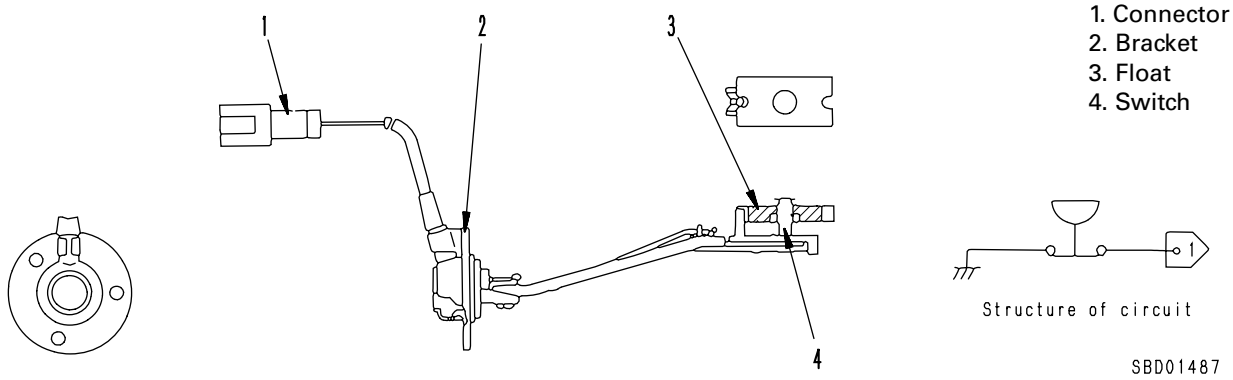
SJP08810

- If more than one user code is generated at the same time, the user codes are displayed in turn for 2 seconds each to display all the user codes.



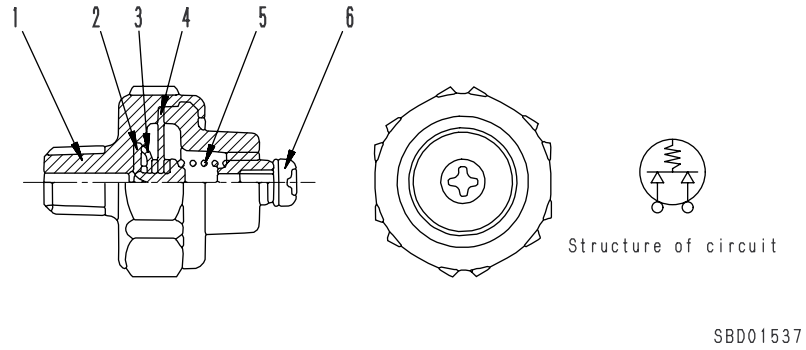
SJP08945

Engine oil level sensor



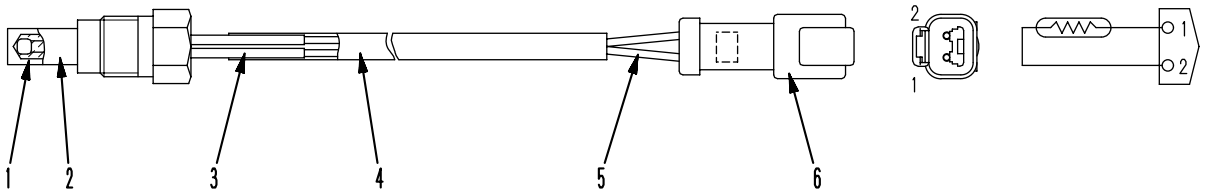
1. Connector
2. Bracket
3. Float
4. Switch

Engine oil pressure sensor (For low pressure)

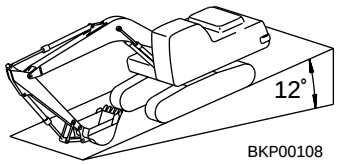
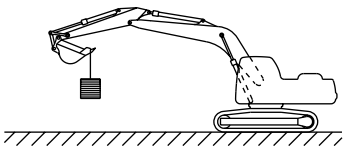


1. Plug
2. Contact ring
3. Contact
4. Diaphragm
5. Spring
6. Terminal

Coolant temperature sensor
Hydraulic oil temperature sensor



1. Thermistor
2. Body
3. Tube
4. Tube
5. Wire
6. Connector

Applicable model					PC300, 300LC, 350, 350LC-7	
Category	Item		Measurement Condition	Unit	Standard value	Permissible value
Travel	Hydraulic drift of travel		 BKP00108 • Hydraulic oil temperature: Within operation range • Engine stopped • Parking machine on slope of 12 degrees with sprocket facing upslope • Sliding distance for 5 minutes	mm	0	0
	Leakage of travel motor		• Hydraulic oil temperature: Within operation range • Engine at high idling • Traveling with sprocket locked • Oil leakage amount for one minute with traveling in relief condition	ℓ/min	Max. 15	Max. 30
Work equipment	Hydraulic drift of work equipment	Whole work equipment (tooth tip fall amount)	 BKP00110 • Hydraulic oil temperature: Within operation range • Flat and level ground • Work equipment in measurement posture as illustrated above • Bucket load: 2,160 kg • Engine stopped • Work equipment control lever in NEUTRAL position • Fall amount for 15 minutes as measured every 5 minutes starting immediately after initial setting	mm	PC300, 300LC: Max. 450 PC350, 350LC: Max. 550	PC300, 300LC: Max. 675 PC350, 350LC: Max. 825
		Boom cylinder (cylinder retraction amount)			PC300, 300LC: Max. 25 PC350, 350LC: Max. 30	PC300, 300LC: Max. 38 PC350, 350LC: Max. 45
		Arm cylinder (cylinder extension amount)			PC300, 300LC: Max. 135 PC350, 350LC: Max. 165	PC300, 300LC: Max. 203 PC350, 350LC: Max. 248
		Bucket cylinder (cylinder retraction amount)			PC300, 300LC: Max. 20 PC350, 350LC: Max. 25	PC300, 300LC: Max. 30 PC350, 350LC: Max. 38

MEASUREMENT OF EXHAUST GAS COLOR

★ Exhaust gas color measurement tool

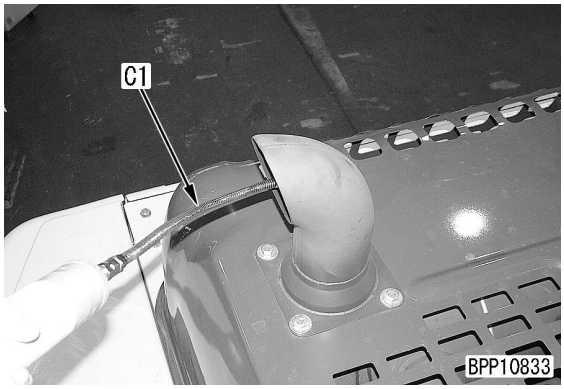
Mark		Part No.	Part name
C	1	799-201-9001	Handy smoke checker
	2	Commercial product	Smoke meter

⚠ Be careful not to touch the highly heated parts, while fitting and detaching a measurement tool.

★ If no compressed air or power is not available in the field, use Handy Smoke Checker **C1**. For recording official data, use Smoke Meter **C2**.

1. Measurement with Handy Smoke Checker C1

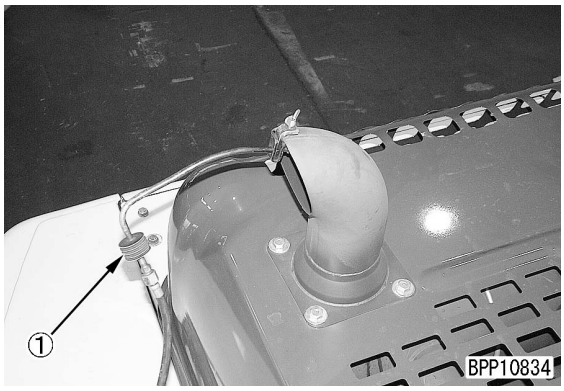
1) Fit a filtering paper to Handy Smoke Checker **C1**.
2) Insert the exhaust gas intake pipe into the exhaust pipe.
3) Start the engine and keep it running until the engine coolant temperature comes within the operating range.
4) Let the exhaust gas stay on the filtering paper by operating a handle of Handy Smoke Checker **C1**, when the engine speed is suddenly accelerated or kept at high idle.



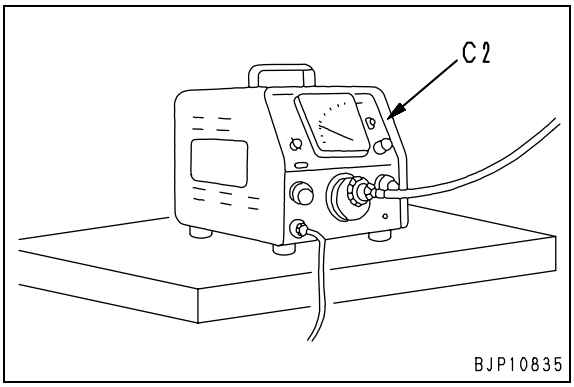
5) Take out the filtering paper and compare it with the attached scale for judgement.
6) Detach the measurement tool after the measurement, and make sure the machine is back to normal condition.

2. Measurement with Smoke Meter C2

1) Insert probe [1] of the Smoke Meter **C2** into the exhaust gas pipe outlet, and fasten it to the outlet with a clip.



2) Connect the probe hose, accelerator switch outlet and air hose to the Smoke Meter **C2**.
   ★ Keep the pressure of the supplied compressed air below 1.5 MPa {15 kg/cm^2}.
3) Connect the power cable to an outlet of AC socket.
   ★ Confirm that the Smoke Meter power switch is in the OFF position, before connecting the power cable to an outlet.
4) Fit a filtering paper by loosening the suction pump cap nut.
   ★ Fit the filtering paper securely so that air may not leak.
5) Move the Smoke Meter **C2** power switch to the ON position.



6) Start the engine and keep it running until the engine coolant temperature rises to the operating range.
7) Let the exhaust gas stay on the filtering paper by depressing the accelerator pedal of Smoke Meter **C2**, when the engine speed is suddenly accelerated or kept at high idle.
8) Put the polluted filtering paper on non-polluted filtering paper (more than 10 sheets) in the filtering paper holder, and read the indicated value.
9) Detach the measurement tool after the measurement, and make sure that the machine is back to normal condition.

MEASUREMENT OF CLEARANCE IN SWING CIRCLE BEARINGS

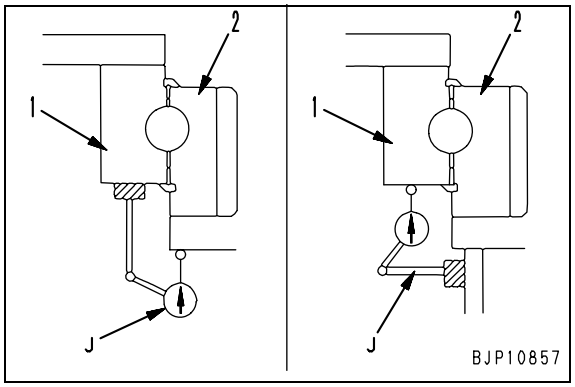
★ Swing circle bearing clearance measurement tools

Mark	Part No.	Part name
J	Commercial product	Dial gauge

★ Follow the steps explained below, when measuring clearance in the swing circle bearing in the actual machine.

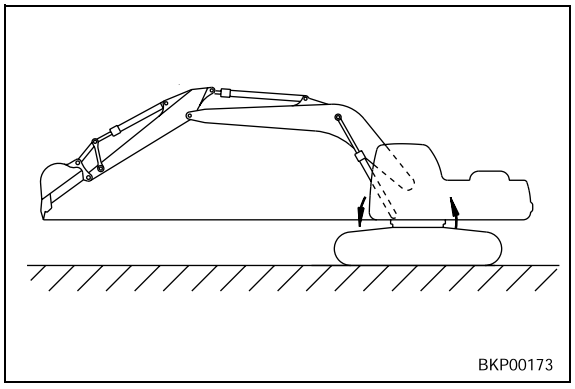
⚠ Be careful not to put a hand or foot under the undercarriage, while taking measurement.

1. Fasten dial gauge **J** to swing circle outer race (1) or inner race (2), and contact the probe with the end surface of inner race (2) or outer race (1) on the opposite side.
★ Set dial gauge **J** at the machine front or rear.



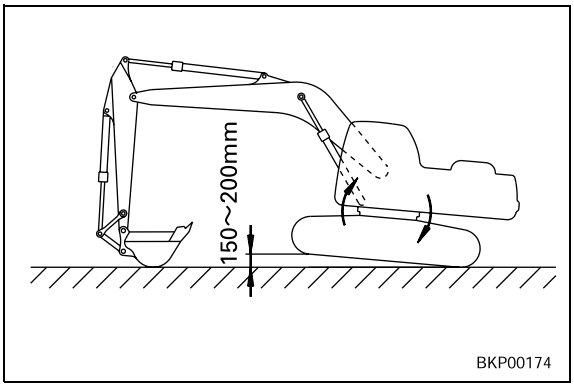
2. Keep the work equipment in the max. reach posture and keep the height of the bucket teeth tip level with the lower height of the revolving frame.
★ The upper structure is lowered at the front and raised at the rear at that time.

3. Set dial gauge **J** at zero point.



4. Hold the arm nearly perpendicular to the ground, and lower the boom until the track shoes will be lifted at the machine front.
★ The upper structure is raised at the front and lowered at the rear at that time.

5. Read off the value in dial gauge **J** in this condition.
★ The value indicated in dial gauge **J** expresses clearance in the bearings.



6. Return the machine to the posture in Item 2 above, and confirm reading of dial gauge **J** is zero.
★ If zero value is not indicated, repeat the steps in Items 3 through 5.

INSPECTION AND ADJUSTMENT OF PUMP LS CONTROL CIRCUIT OIL PRESSURE

★ Pump LS control circuit oil pressure inspection and adjustment tools

Mark		Part No.	Part name
M	1	799-101-5002	Hydraulic tester
		790-261-1204	Digital type hydraulic tester
	2	799-101-5220	Nipple (10 x 1.25 mm)
		07002-11023	O-ring
	3	799-401-2701	Differential pressure gauge

Measurement

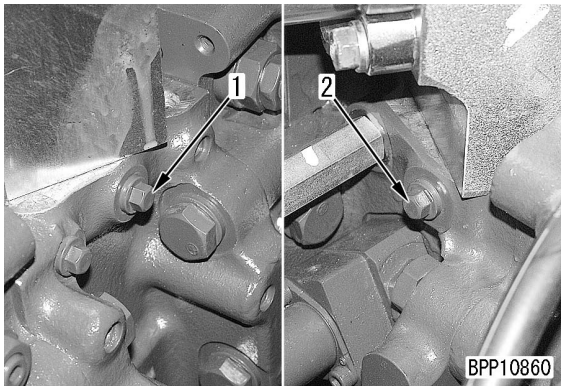
★ Measure pump LS control circuit oil pressure after confirming that the work equipment, swing and travel circuit oil pressure as well as control circuit original pressure are normal.

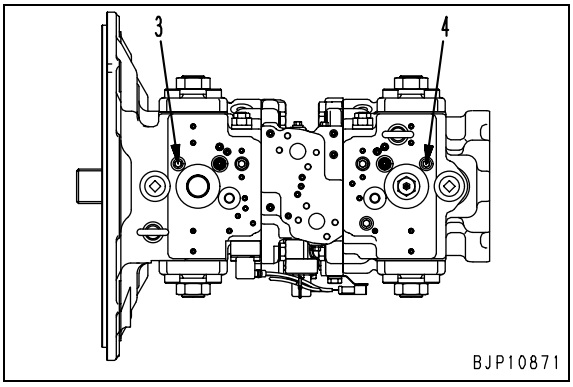
⚠ Lower the work equipment to the ground and stop the engine. After the engine stops, operate the control lever several times to release the remaining pressure in the piping. Then loosen the oil filler cap to release the pressure inside the hydraulic tank.

1. Measurement of LS valve output pressure (servo piston inlet pressure)

★ Measure LS valve output pressure (servo piston inlet pressure) and pump delivery pressure together, and compare both pressures thereafter.

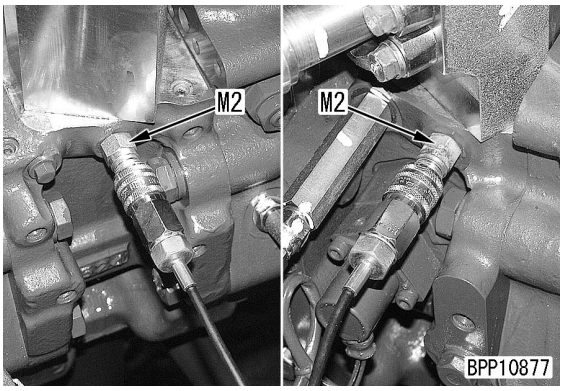
1) Remove oil pressure measurement plugs (1), (2), (3) and (4).
   - Plug (1): For measuring the front pump delivery pressure (at the machine rear part)
   - Plug (2): For measuring the rear pump delivery pressure (at the machine front part)
   - Plug (3): For measuring the front pump LS valve delivery pressure
   - Plug (4): For measuring the rear pump LS valve delivery pressure



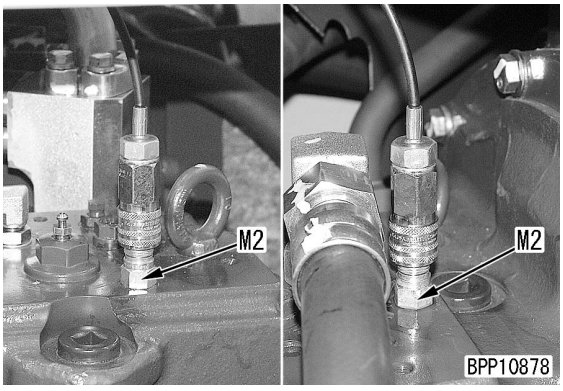


2) Fit nipple **M2** and connect it to oil pressure gauge [1] of hydraulic tester **M1**.
   ★ Use an oil pressure gauge with the capacity of 58.5 MPa {600 kg/cm^2}.

- Photo shows pump delivery pressure side.



- Photo shows LS valve output pressure side.



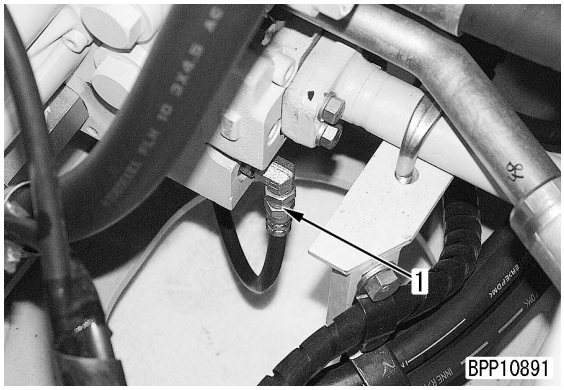
3. Inspection of boom lock valve

1) Set the work equipment at the maximum reach and the boom top horizontal. Then stop the engine.

⚠ Lock the work equipment control levers and release the pressure inside the hydraulic tank.

⚠ Do not allow anyone to come under the work equipment during the work.

2) Disconnect drain hose (1) of the control valve, and install a blind plug in the hose.
   - Part No. for the blind hose: 07376-70210
   - ★ Leave the control valve end open.
   - ★ If any oil leaks out from the port that is left open, following hydraulic drift of the work equipment, the boom lock valve is defective (loose contact).



4. Inspection of PPC valve

Measure the amount of hydraulic drift of the work equipment when the accumulator is charged with pressure and the safety lock lever is put to the LOCK and FREE positions.

- ★ Operate the control lever with the engine starting switch in the ON position.
- ★ If pressure in the accumulator has dropped, run the engine for approx. 10 seconds to charge the accumulator again.
- ★ If there is any difference in the hydraulic drift between LOCK and FREE positions, the PPC valve is defective (some internal failure).

RELEASE OF REMAINING PRESSURE IN HYDRAULIC CIRCUIT

⚠ If the piping between the hydraulic cylinders or the hydraulic motor and control valves is to be disconnected, release the remaining pressure in the following manner.

★ There is no pressure remaining in the swing motor circuit and travel motor circuit, but the internal pressure in the hydraulic tank affects them. So open the oil filler cap of the hydraulic tank.

1. Stop the engine, and loosen the oil filler cap gradually to release the pressure inside the tank.

2. Turn the engine starting switch to the ON position and operate the control levers several times.
   - ★ There must be power supply to the PPC lock valve. Be sure to operate the control levers with the engine starting switch in the ON position.
   - ★ When the levers are operated 2-3 times, the pressure stored in the accumulator is removed.

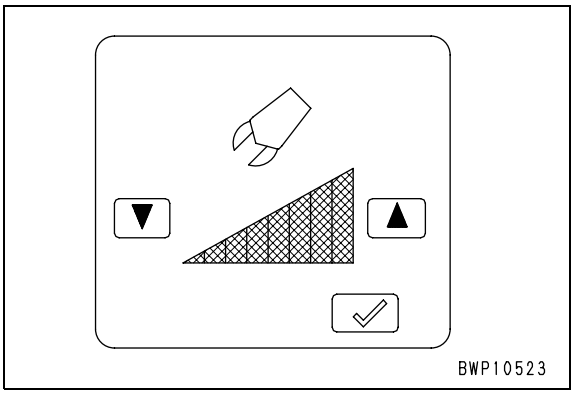
3. Start the engine, run at low idling for approx. 10 seconds to accumulate pressure in the accumulator, then stop the engine.

4. Repeat the steps in Item 2 to 3 above several times.

9. Function for adjusting breaker and attachment flow rate (For machines equipped with breaker attachment)

When a breaker or other attachments are used, hydraulic pump flow rate can be adjusted by operating the select switch.

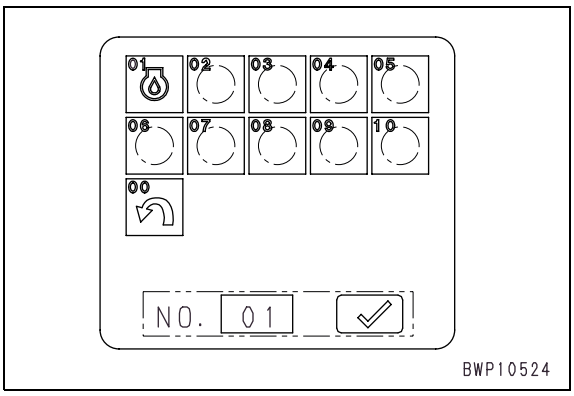
★ Note that the symbol mark and contents of display partially differ between the breaker and the other attachments.



10. Function for confirming maintenance information

Detailed information on maintenance items (set time and elapse of time) can be confirmed and resetting after the confirmation is feasible by operating the maintenance switch.

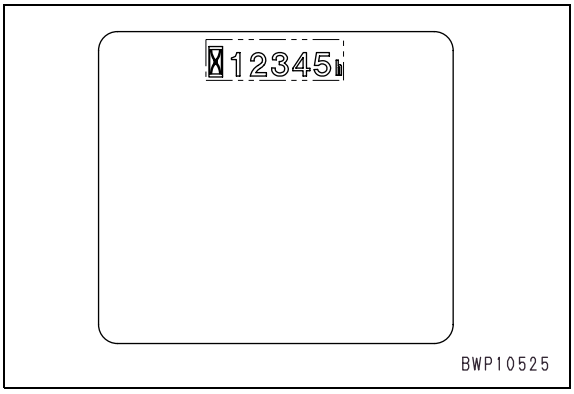
★ Use service Menu for setting or releasing maintenance items and setting maintenance time.



11. Function for showing service meter reading

Only the service meter reading can be shown by the following switching operation, when the engine starting switch is turned OFF.

- Switching operation: [↓] + [△] (synchronized switching operation)



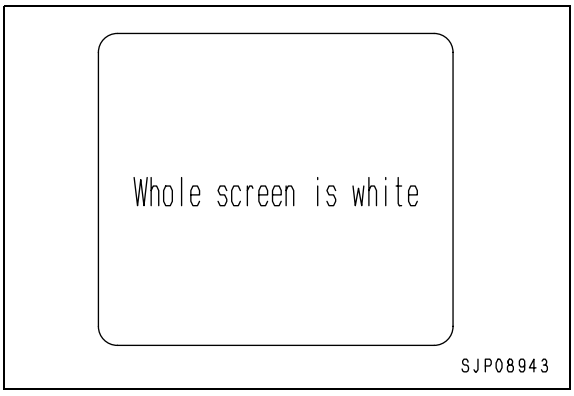
12. Function for checking display LCD

Display of the Display LCD can be confirmed by the following switching operation in the display of inputting and setting password as well as in the display of ordinary items

- Switching operation: [↓] + [A] (synchronized switching operation)

★ All the LCD light up, turning the entire screen white. If there is no showing in black, the display is normal.

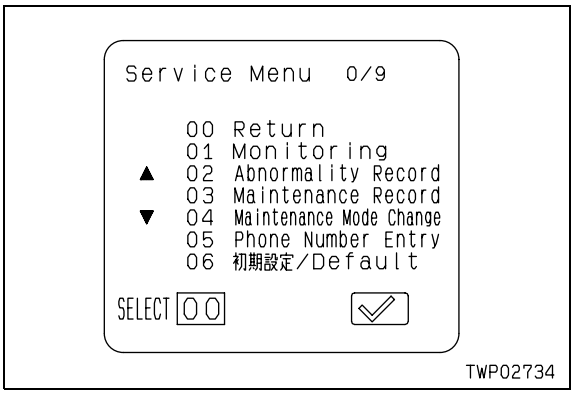
★ This display returns to the immediately preceding one, if making any other switching operation.



17. Function for Abnormality Record [02]

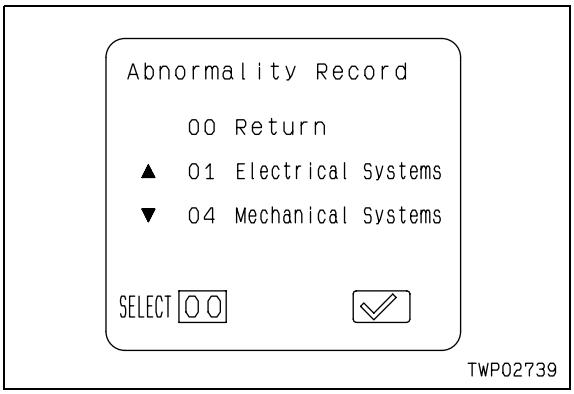
The monitor panel records failures that occurred on the machines in the past after classifying them into failures in the electric system and those in the mechanical system. Information on them can be displayed through the following operation.

1) Selection of menu
Select 02 Abnormality Record in the initial display of Service Menu and depress [✓] switch.

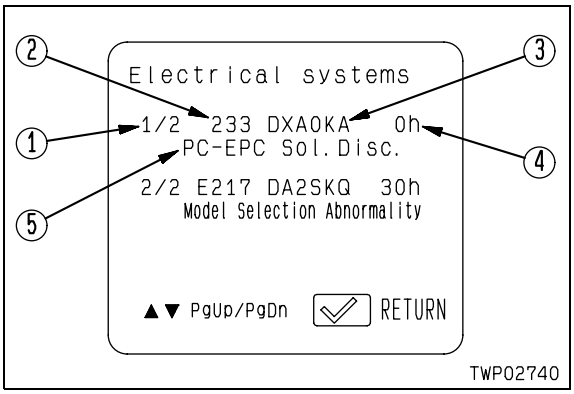


2) Selection of Submenu
Select an appropriate item from Submenu in the Abnormality Record display and depress [✓] switch.

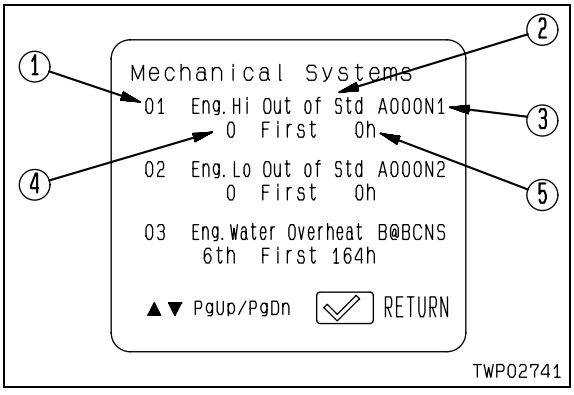
No.	Abnormality Record Submenu
00	Return (termination of Abnormality Record)
01	Electrical System
02	Mechanical Systems



3) Information shown in display of Abnormality Record in the electrical system
- ①: The numerator expresses sequence of failure occurrence, counting from the latest one. The denominator expresses the total number of a specific failure recorded.
- ②: Service Code
- ③: Abnormality Code No. (system in 4 digits and phenomenon in 2 digits)
- ④: Time elapsed since the occurrence of the first failure
- ⑤: Contents of failure
- ★ Refer to "Table for Service Code and Abnormality Code" in Operator's Menu.

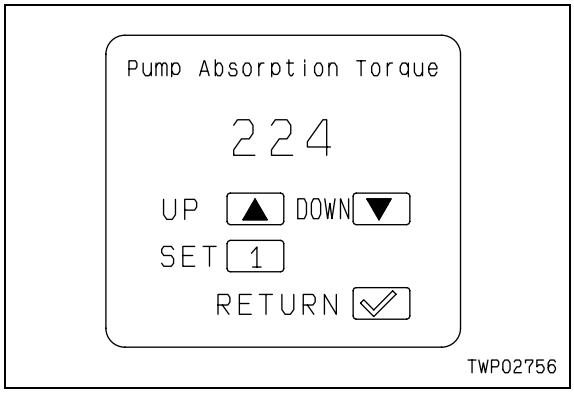


4) Information shown in display of Failure History in the mechanical systems
- ①: Record No.
- ②: Contents of Abnormality
- ③: Abnormality Code No. (system in 4 digits and phenomenon in 2 digits)
- ④: Total number of occurrence
- ⑤: Service meter reading at the initial occurrence
- ★ Refer to "Table for Service Code and Abnormality Code" in Operator's Menu.



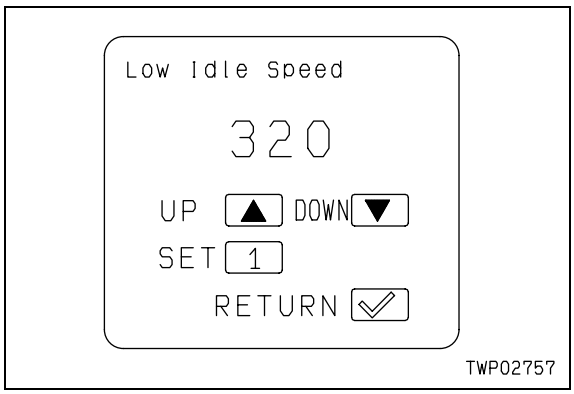
4) Function for Pump Absorption Torque adjustment
The pump absorption torque can be adjusted within the range shown in the table below.

Adjustment value	Torque adjustment value
220	+4.0 kgm
221	+3.0 kgm
222	+2.0 kgm
223	+1.0 kgm
224	0.0 kgm
225	–1.0 kgm
226	–2.0 kgm
227	–3.0 kgm
228	–4.0 kgm



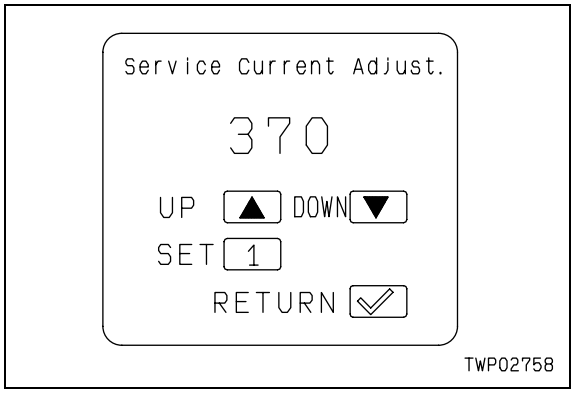
5) Function for Low Idle Speed adjustment
The engine rotation at low idling can be adjusted within the range shown in the table below.

Adjustment value	Low idling rotation
320	900 rpm
321	1,000 rpm
322	1,100 rpm
323	1,200 rpm



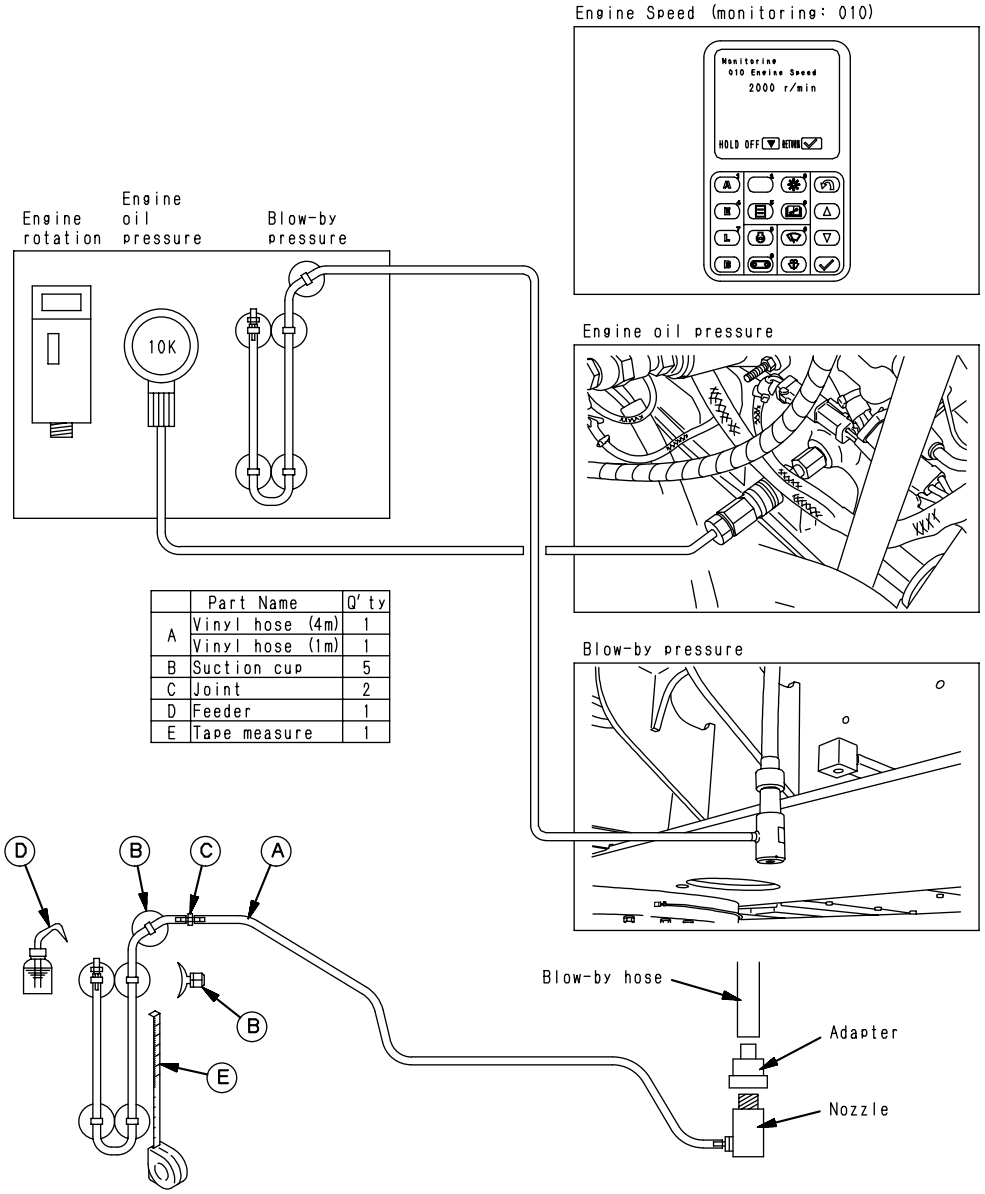
6) Function for Service Current Adjust.
When a machine is used for a compound operation, distribution of hydraulic pump oil flow can be adjusted within the range shown in the table below.

Adjustment value	Distribution of oil flow to attachment
370	0.5 Time
371	0.7 Time
372	1.0 Time
373	0.4 Time



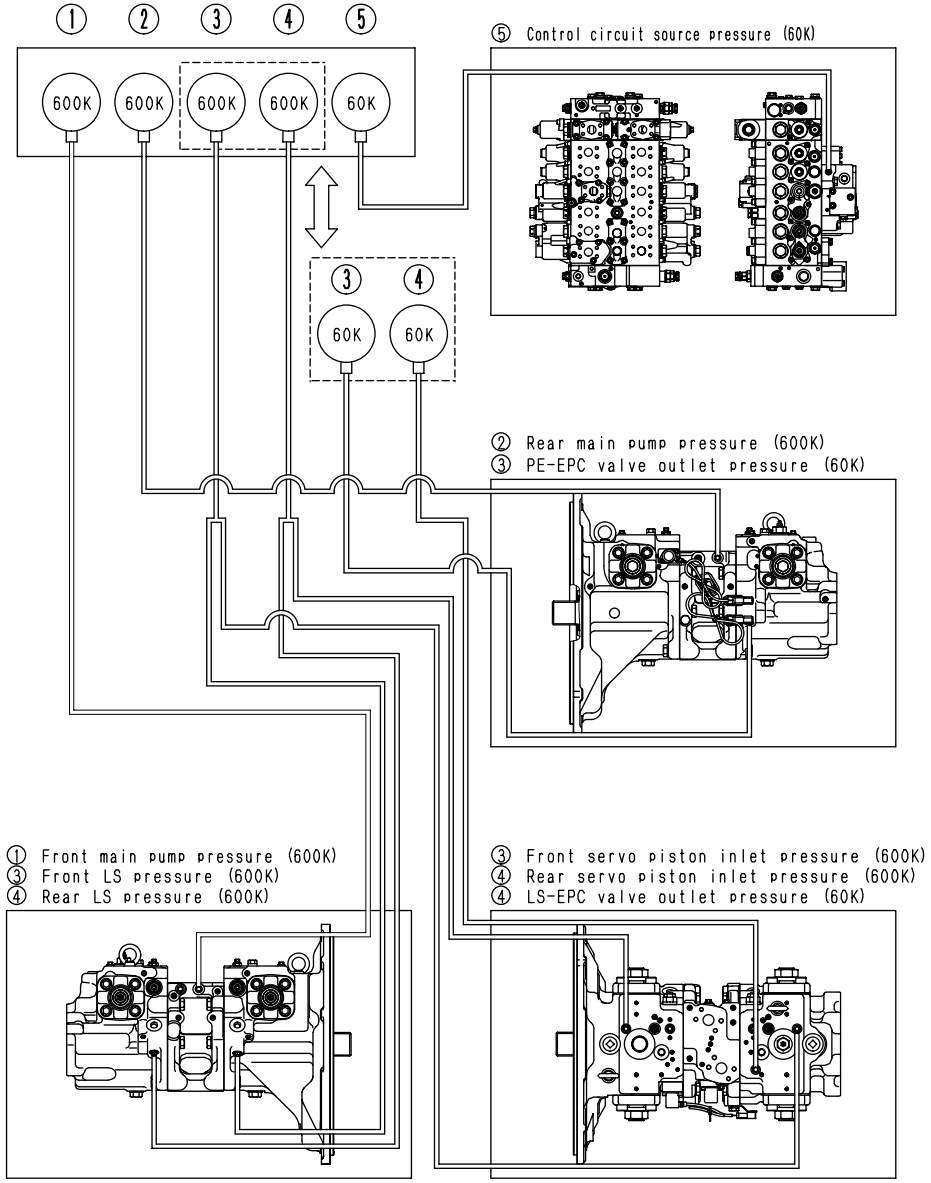
Code	Monitoring item			Unit	Remarks
027	Input condition of model selection signal	a	Model selection 1 (Connected to ground)	(6 bit)	
		b	Model selection 2 (Connected to ground)	(6 bit)	
		c	Model selection 3 (Connected to ground)	(6 bit)	
		d	Model selection 4 (Connected to ground)	(6 bit)	
		e	Model selection 5 (Connected to ground)	(6 bit)	
		f	Kerosene mode (Connected to ground)	(6 bit)	
030	Fuel control dial input voltage			10 mV	
031	Governor potentiometer input voltage			10 mV	
032	Controller power source voltage			100 mV	
033	Governor motor phase A output current			10 mA	
034	Governor motor phase B output current			10 mA	
035	Battery relay BR output voltage			100 mV	
036	Input condition of signal	a	(Unused)	(6 bit)	
		b	(Unused)	(6 bit)	
		c	(Unused)	(6 bit)	
		d	(Unused)	(6 bit)	
		e	Starting switch signal C (START)	(6 bit)	
		f	(Unused)	(6 bit)	
037	Output condition of signal	a	Battery relay (DRIVEN)	(6 bit)	
		b	(Unused)	(6 bit)	
		c	Engine stop solenoid relay (DRIVEN)	(6 bit)	
		d	(Unused)	(6 bit)	
		e	(Unused)	(6 bit)	
		f	(Unused)	(6 bit)	
041	Engine coolant sensor input voltage			10 mV	
042	Fuel level sensor input voltage			10 mV	
043	Alternator input voltage			100 mV	
044	Hydraulic oil temperature sensor input voltage			10 mV	
045	Input condition of switch 4	a	Starting switch signal ACC (ON)	(6 bit)	
		b	Starting switch signal C (START)	(6 bit)	
		c	Starting switch signal R1 (HEAT)	(6 bit)	
		d	Lamp switch (ON)	(6 bit)	
		e	Radiator coolant level switch (OPEN)	(6 bit)	
		f	(Unused)	(6 bit)	
046	Input condition of sensor	a	Air cleaner clogging switch (OPEN)	(6 bit)	
		b	(Unused)	(6 bit)	
		c	Engine oil pressure switch (OPEN)	(6 bit)	
		d	Engine oil level switch (OPEN)	(6 bit)	
		e	(Unused)	(6 bit)	
		f	Alternator (Normal generation)	(6 bit)	

Engine



	Part Name	Q'ty
A	Vinyl hose (4m)	1
	Vinyl hose (1m)	1
B	Suction cup	5
C	Joint	2
D	Feeder	1
E	Tape measure	1

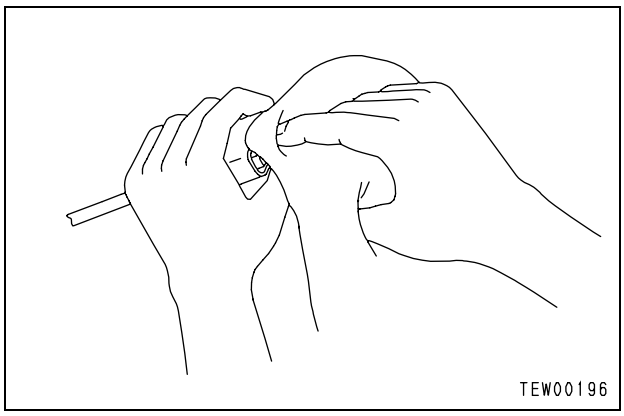
Hydraulic system



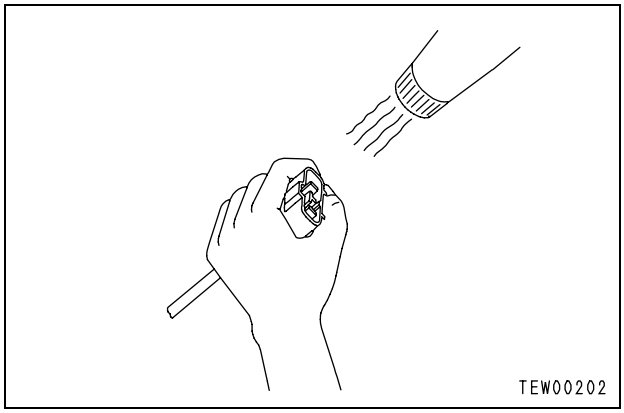
TXP02886

- **Drying wiring harness**
  If there is any oil or dirt on the wiring harness, wipe it off with a dry cloth. Avoid washing it in water or using steam. If the connector must be washed in water, do not use high-pressure water or steam directly on the wiring harness.

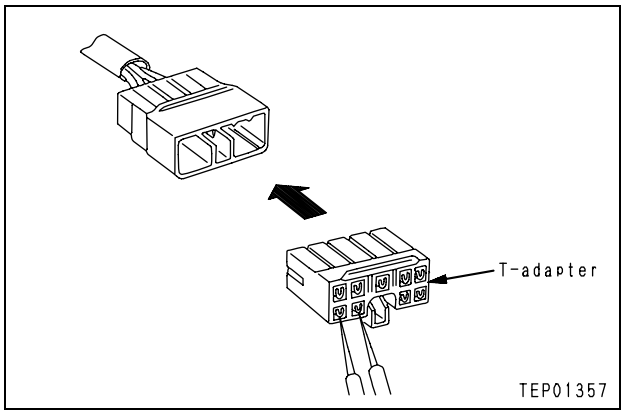
  If water gets directly on the connector, do as follows.
  1) Disconnect the connector and wipe off the water with a dry cloth.
     ★ If the connector is blown dry with compressed air, there is the risk that oil in the air may cause defective contact, so remove all oil and water from the compressed air before blowing with air.



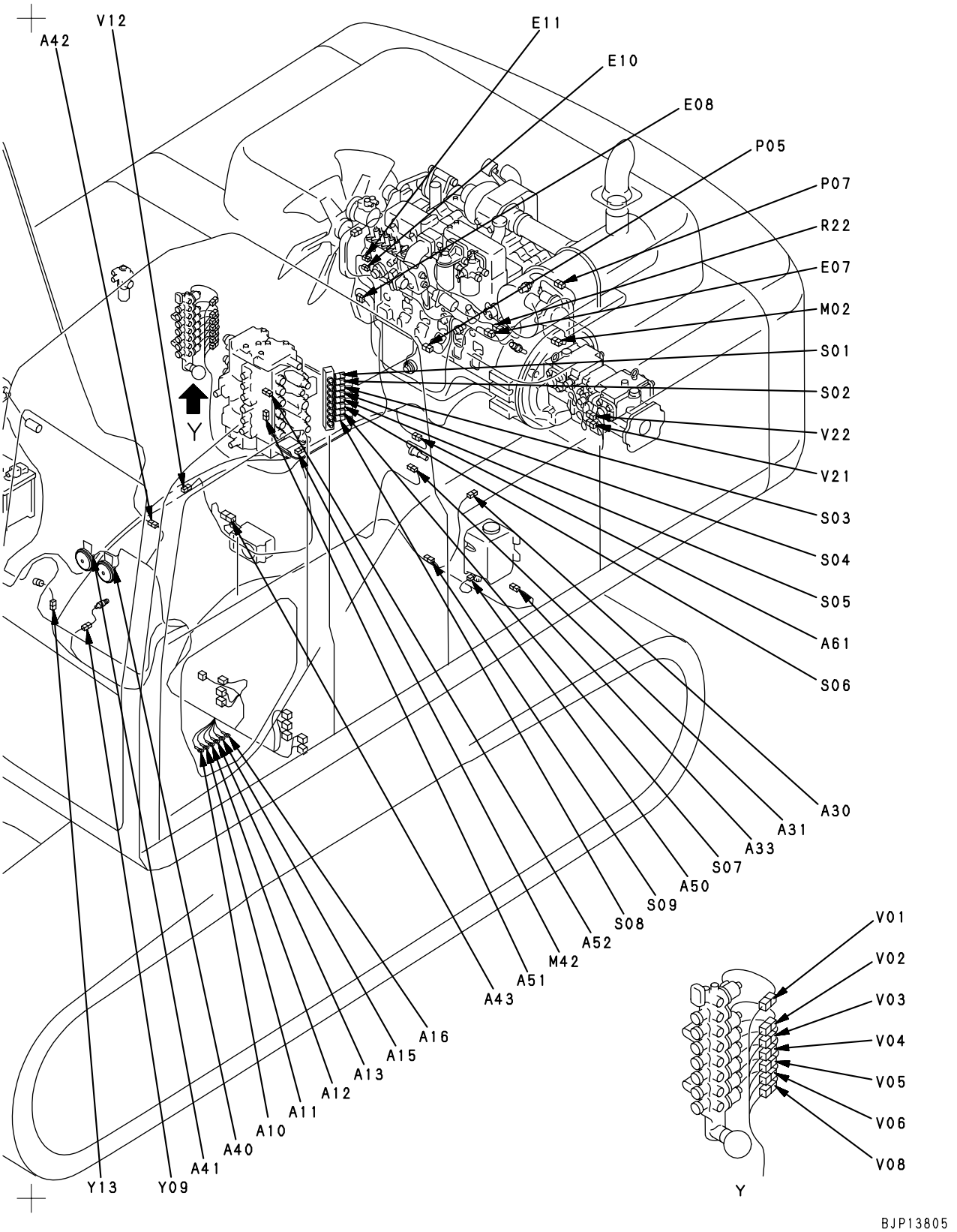
  2) Dry the inside of the connector with a dryer.
     If water gets inside the connector, use a dryer to dry the connector.
     ★ Hot air from the dryer can be used, but regulate the time that the hot air is used in order not to make the connector or related parts too hot, as this will cause deformation or damage to the connector.



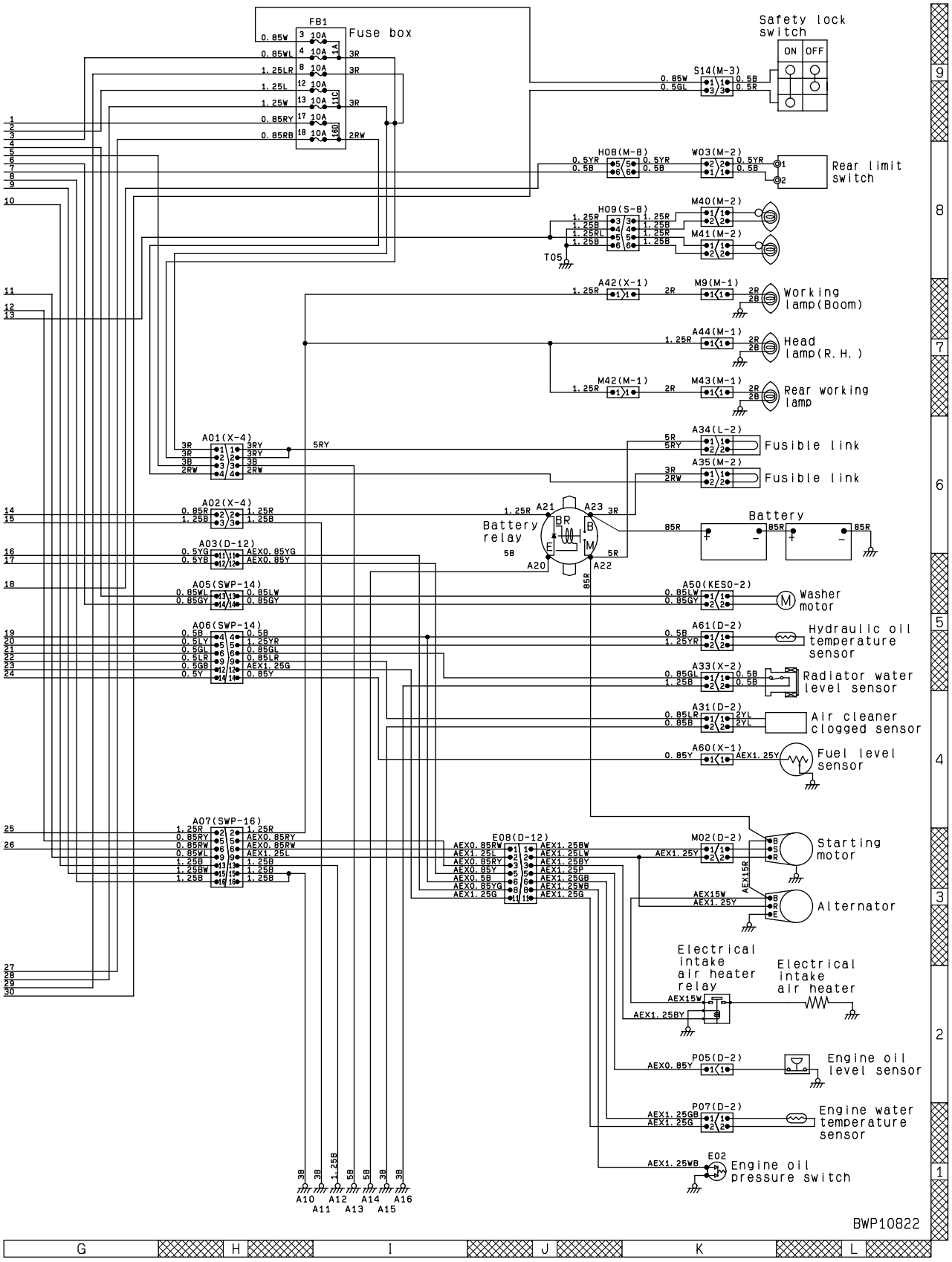
  3) Carry out a continuity test on the connector.
     After drying, leave the wiring harness disconnected and carry out a continuity test to check for any short circuits between pins caused by water.
     ★ After completely drying the connector, blow it with contact restorer and reassemble.



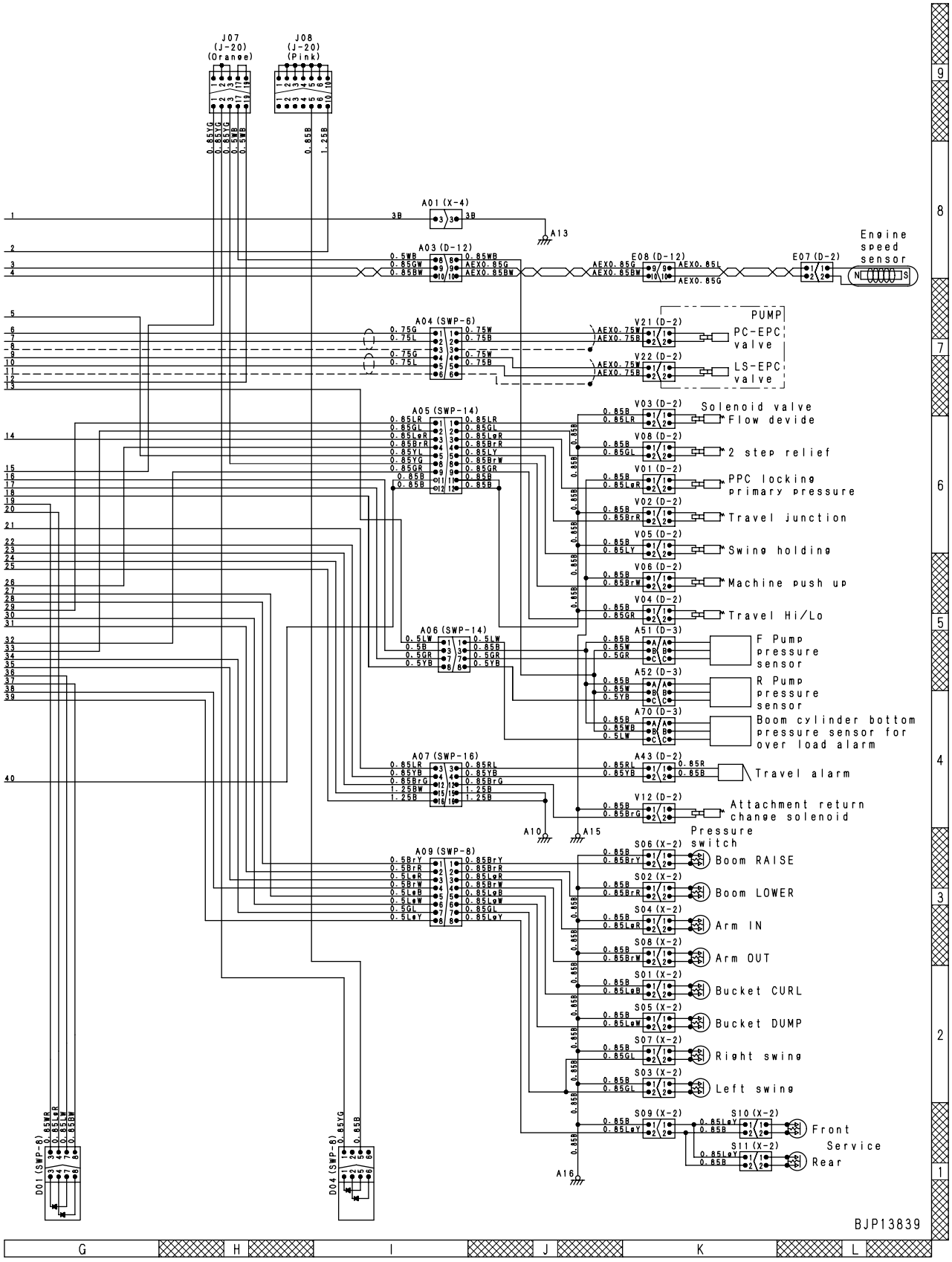
Connector No.	Type	No. of pin	Name of device	Address			
				Stereo -gram	M circuit	G circuit	P circuit
A50	KES0	2	Window washer monitor (tank)	K-3	K-5		
A51	D	3	F pump hydraulic oil pressure sensor	J-3			K-5
A52	D	3	R pump hydraulic oil pressure sensor	J-3			K-4
A60	X	1	Fuel level sensor	D-9	K-4		
A61	D	2	Hydraulic oil temperature sensor	L-5	K-5		
A80	D	8	Intermediate connector	S-1		I-3	
C01	DRC	24	Governor pump controller	V-9	A-3	A-8	A-8
C02	DRC	40	Governor pump controller	W-9		A-7	A-7
C03	DRC	40	Governor pump controller	W-9	A-3	A-4	A-4
C09	S	8	Model selection connector	W-6		C-9	
D01	SWP	8	Assembled type diode	W-7	A-9	D-1	G-1
D02	SWP	8	Assembled type diode	W-7	A-8	D-1	
D03	SWP	8	Assembled type diode	P-1			H-1
D04	SWP	8	Assembled type diode	Q-1	A-8		I-1
E06	M	3	Fuel dial	O-8		H-1	
E07	D	2	Engine speed sensor	L-8			L-8
E08	D	12	Intermediate connector	K-9	J-3	J-3	K-8
E10	D	3	Fuel shut-off valve			K-3	
E10	D	3	Governor potentiometer	J-9		K-2	
E11	D	4	Governor motor	J-9		K-2	
F02	YAZAKI	2	Revolving warning lamp	AA-9			
FB1	–	–	Fuse box	W-5	H-9	C-4	F-9
H08	M	8	Intermediate connector	W-4	J-8		
H09	S	8	Intermediate connector	W-4	J-8		
H10	S	16	Intermediate connector	T-9	D-6	I-8	
H11	S	16	Intermediate connector	S-9	D-5	I-8	B-9
H12	S	12	Intermediate connector	S-9	D-5	I-7	
H15	S090	20	Intermediate connector	N-7	C-2	G-2	C-2

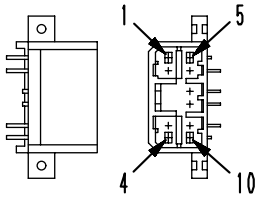
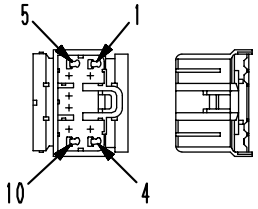
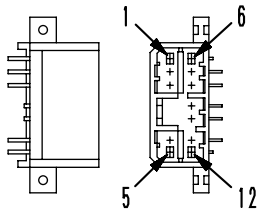
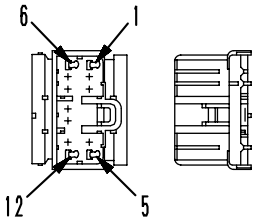
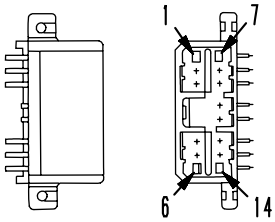
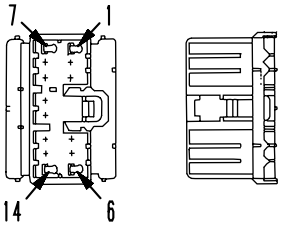
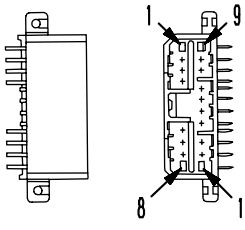
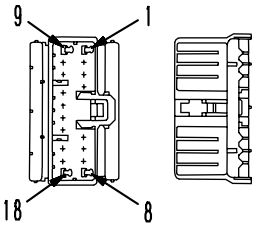
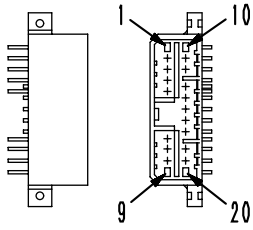
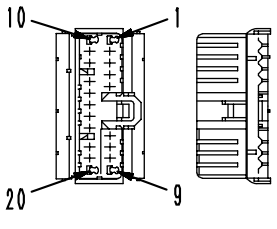

V12
A42
E11
E10
E08
P05
P07
R22
E07
M02
S01
S02
V22
V21
S03
S04
S05
A61
S06
A30
A31
A33
S07
A50
S09
S08
A52
M42
A51
A43
A16
A15
A13
A12
A11
A10
A40
A41
Y09
Y13
Y
V01
V02
V03
V04
V05
V06
V08
Y
BJP13805

★ This circuit diagram has been compiled by extracting the monitor panel system and engine starting system from the overall electrical circuit diagram.

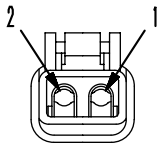
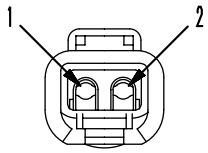
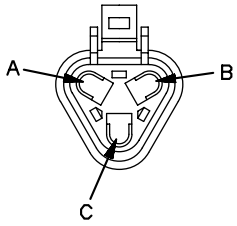
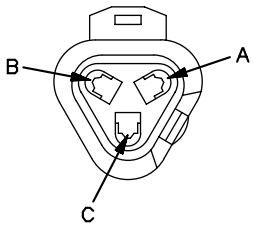
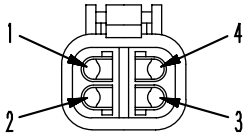
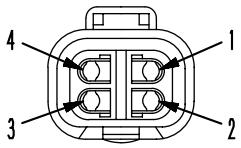
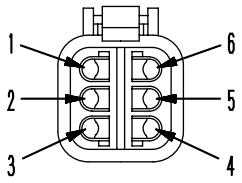
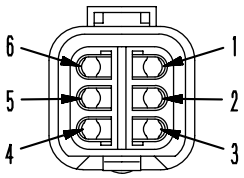


★ This circuit diagram has been compiled by extracting the governor•pump controller system (pump control), PPC lock system, machine push-up system and backup alarm system from the overall electrical circuit diagram.



No.of pins	AMP070 type connector		
	Male (female housing)	Female (male housing)	T-adapter Part No.
10			799-601-7510
	—	Part No.: 7821-92-7330	
12			799-601-7520
	—	Part No.: 7821-92-7340	
14			799-601-7530
	—	Part No.: 7821-92-7350	
18			799-601-7540
	—	Part No.: 7821-92-7360	
20			799-601-7550
	—	Part No.: 7821-92-7370	

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

No.of pins	DT Series connector		
	Body (plug)	Body (receptacle)	T-adapter Part No.
2	 BWP05037	 BWP05038	799-601-9020
	Part No.: 08192-12200 (normal type) 08192-22200 (fine wire type)	Part No.: 08192-12100 (normal type) 08192-22100 (fine wire type)	
3	 BWP05039	 BWP05040	799-601-9030
	Part No.: 08192-13200 (normal type) 08192-23200 (fine wire type)	Part No.: 08192-13100 (normal type) 08192-23100 (fine wire type)	
4	 BWP05041	 BWP05042	799-601-9040
	Part No.: 08192-14200 (normal type) 08192-24200 (fine wire type)	Part No.: 08192-14100 (normal type) 08192-24100 (fine wire type)	
6	 BWP05043	 BWP05044	799-601-9050
	Part No.: 08192-16200 (normal type) 08192-26200 (fine wire type)	Part No.: 08192-16100 (normal type) 08192-26100 (fine wire type)	

Service code	Failure code	Possible causes																										
		Defective battery relay	Defective fuse or fusible link	Defective monitor panel	Defective engine throttle and pump controller	Defective sensor power supply (5 V)	Defective wiper motor	Defective windshield washer motor	Defective swing lock switch	Defective emergency pump drive switch	Defective fuel control dial	Defective governor motor	Defective governor potentiometer	Defective engine stop solenoid relay	Defective engine speed sensor (including adjustment)	Defective engine oil pressure switch	Defective engine oil level switch	Defective engine coolant temperature sensor	Defective radiator coolant level switch	Defective air cleaner clogging switch	Defective alternator	Defective mechanical system of engine	Defective adjustment of governor lever	Defective fuel control of engine	Lowering of engine oil pressure	Lowering of engine oil level
E315	D110KB	●			●																							
E316	DY10K4				●						●	●	●										●	●		
E317	DY10KA				●							●														
E318	DY10KB				●							●														
—	989EKX				●																					
—	A000N1				●																	●				
—	A000N2				●																	●				
— (E104)	AA10NX			●																●						
—	AB00KE			●																	●					
—	B@BAZG			●												●									●	
—	B@BAZK			●													●									●
— (E108)	B@BCNS			●														●								
—	B@BCZK			●															●							
—	B@HANS			●																						
— (E313)	DA80MA																									

★ Service codes (E104), (E108), and (E313) are displayed in only the 7-segment monitor panel. They are not displayed in the multi-monitor panel.

Service Code in Electrical System E112
(Short-circuiting in normal rotation system of windshield wiper motor drive)

User Code	Service Code	Failure Code	Failure phenomenon	Short-circuiting in normal rotation system of windshield wiper motor drive (in monitor panel system)
—	**E112**	**DY2DKB**		
Failure content	• Abnormal current flew to the windshield wiper motor normal rotation circuit, when power is provided.			
Response from Monitor Panel	• Power supply to the windshield wiper motor normal rotation circuit is turned OFF.			
Phenomenon occurring on machine	• The windshield wiper stops moving.			

Presumed cause and standard value in normalcy		Cause	Standard value in normalcy and references for troubleshooting			
	1	Windshield wiper motor defective (Internal short-circuiting or grounding fault)	★Turn the engine starting switch OFF for the preparations, and hold it in the OFF position for the troubleshooting.			
			W04 (female)		Continuity and resistance value	
			Between ③ and ①		Continued	
			Between ③ and grounding		Above 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 for the troubleshooting.			
			Between wiring harness between P01 (female) ⑨ and W04 (male) ③ and grounding		Resistance value	Above 1 MΩ
	3	Monitor panel defective	★Turn the engine starting switch OFF for the preparations, and hold it in the ON position for the troubleshooting.			
			P01	Windshield wiper switch	Voltage	
			Between ⑨ and grounding	OFF	Below 3 V	
				ON	Below 3 V⇔20 – 30 V (at constant cycle)	

Service Code in Electrical System E201
(Short-circuiting in travel interlocking solenoid)

PC300, 300LC-7 Serial No. 40001 – 45000
PC350, 350LC-7 Serial No. 20001 – 25000

User Code	Service Code	Failure Code	Failure phenomenon	Short-circuiting in travel interlocking solenoid (in governor • pump controller system)
—	**E201**	**DW91KB**		
Failure content	• Abnormal current flew to the travel interlocking circuit, when power was supplied to the circuit.			
Response from controller	• Power supply to the travel interlocking circuit is switched OFF. • Even if the failure cause disappears of itself, the solenoid circuit does not return to normalcy, unless the engine starting switch is once turned OFF.			
Phenomenon occurring on machine	• It is difficult to steer the machine at turns. (L.H. and R.H. travel circuits cannot be disconnected.)			
Relative information	• Operation of the travel interlocking solenoid (ON or OFF) can be checked in the monitoring function. (Code No. 023: Solenoid)			

Presumed cause and standard value in normalcy

	Cause	Standard value in normalcy and references for troubleshooting			
1	Travel interlocking solenoid defective (Internal short-circuiting or grounding fault)	★Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
		V02 (male)		Resistance value	
		Between ① and ②		20 – 60 Ω	
		Between ② and grounding		Above 1 MΩ	
2	Assembled-type diode D03 defective (Internal short-circuiting)	★Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
		D03 (male)		Resistance value	
		Between ③ and ⑦		Above 1 MΩ	
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 from C03 (female) ⑦ to J06 to V02 (female) ② and grounding, or between wiring harness between C03 (female) ⑦ and D03 (female) ③ and grounding		Resistance value	Above 1 MΩ
4	Governor • pump controller defective	★Turn the engine starting switch OFF for the preparations, and hold it running during the troubleshooting.			
		C03	Travel control lever	Voltage	
		Between ⑦ and grounding	Straight forward	Below 1 V	
			Steering	20 – 30 V	

PC300, 300LC-7 Serial No. 45001 and up
PC350, 350LC-7 Serial No. 25001 and up

User Code	Service Code	Failure Code	Failure phenomenon	Short-circuiting in merge/divide solenoid (in governor • pump controller system)
—	**E204**	**DWJ0KB**		
Failure content	• Abnormal current flew to the merge/divide solenoid circuit, when power was supplied to the circuit.			
Response from controller	• Power supply to the merge/divide solenoid circuit is switched OFF. • Even after the failure cause disappears of itself, the machine operation does not return to normalcy, unless the engine starting switch is once turned OFF.			
Phenomenon occurring on machine	• In L mode, the work equipment moves slowly, or the swing speed is slow in its single operation. (Front and rear pumps are not separated)			
Relative information	• Operation of the merge/divide solenoid (ON or OFF) can be checked in the monitoring function. (Code No. 023: Solenoid 1)			

Presumed cause and standard value in normalcy	Cause		Standard value in normalcy and references for troubleshooting			
	1	Merge/divide solenoid defective (Internal short-circuiting or grounding fault)	★Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			V03 (male)	Resistance value		
			Between (1) and (2)	20 – 60 Ω		
			Between (1) and grounding	Above 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.			
			Wiring harness from C03 (female) (17) to V03 (female) (2), or between wiring harness between C03 (female) (17) and grounding	Resistance value	Above 1 MΩ	
	3	Governor • pump controller defective	★Turn the engine starting switch OFF for the preparations, and hold it running during the troubleshooting.			
			C03	Travel control lever	Voltage	
			Between (17) and grounding	NEUTRAL	Below 1 V	
				When operating one side only	20 – 30 V	

Service Code in Electrical System E211 (Disconnection in travel interlocking solenoid)

PC300, 300LC-7 Serial No. 40001 – 45000
PC350, 350LC-7 Serial No. 20001 – 25000

User Code	Service Code	Failure Code	Failure phenomenon	Disconnection in travel interlocking solenoid (in governor • pump controller system)
—	**E211**	**DW91KA**		
Failure content	• No current flows to the travel interlocking solenoid circuit, when power is supplied to the circuit.			
Response from controller	• None in particular (The solenoid does not function as there is current flowing to it) • When the failure cause disappears of itself, the machine operation returns to normalcy.			
Phenomenon occurring on machine	• It is difficult to steer the machine while traveling. (L.H. and R.H. travel circuits cannot be disconnected.)			
Relative information	• Operation of the travel interlocking solenoid (ON or OFF) can be checked in the monitoring function. (Code No. 023: Solenoid 1) ★The solenoid detects disconnection, when power is ON. Hence be sure to check it with power ON after the repairs. (For how to turn power ON or OFF, refer to the troubleshooting under Service Code [E201].)			

Presumed cause and standard value in normalcy		Cause	Standard value in normalcy and references for troubleshooting			
	1	Travel interlocking solenoid defective (Internal disconnection)	★Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			V02 (male)	Resistance value		
			Between ① and ②	20 – 60 Ω		
	2	Disconnection of wiring harness (Disconnection or defective contact with connector)	★Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			Wiring harness from C03 (female) ⑦ to J06 to V02 (female) ②	Resistance value	Below 1 Ω	
			Wiring harness between V02 (female) ① and grounding	Resistance value	Below 1 Ω	
	3	Short-circuiting of wiring harness (Contact with 24 V circuit)	★Turn the engine starting switch OFF for the preparations, and hold it in the ON position during the troubleshooting.			
			Wiring harness from C03 (female) ⑦ to J06 to V02 (female) ②, or between wiring harness C03 (female) ⑦ and D03 (female) ③ and grounding	Voltage	Below 1 V	
	4	Governor • pump controller defective	★Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			C03 (female)	Resistance value		
			Between ⑦ and grounding	20 – 60 Ω		

PC300, 300LC-7 Serial No. 45001 and up
PC350, 350LC-7 Serial No. 25001 and up

User Code	Service Code	Failure Code	Failure phenomenon	Disconnection in merge/divide solenoid (in governor • pump controller system)
—	**E214**	**DWJ0KA**		
Failure content	• No current flows to the merge/divide solenoid circuit, when power is supplied to the circuit.			
Response from controller	• None in particular (The solenoid does not function as there is no current flowing to it) • When the failure cause disappears of itself, the machine operation returns to normalcy.			
Phenomenon occurring on machine	• In L mode, speeds of the work equipment and swing in its single operation are too fast (Front and rear pumps are not separated)			
Relative information	• Operation of the merge/divide solenoid (ON or OFF) can be checked in the monitoring function. (Code No. 023: Solenoid 1) ★The solenoid detects disconnection, when power is ON. Hence be sure to check it with power ON after the repairs. (For how to turn power ON or OFF, refer to the troubleshooting under Service Code [E204].)			

Presumed cause and standard value in normalcy		Cause	Standard value in normalcy and references for troubleshooting			
	1	Merge/divide solenoid defective (Internal disconnection)	★Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			V03 (male)	Resistance value		
			Between (1) and (2)	20 – 60 Ω		
	2	Disconnection of wiring harness (Disconnection or defective contact with connector)	★Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			Wiring harness from C03 (female) (17) to V03 (female) (2)	Resistance value	Below 1 Ω	
			Wiring harness between C03 (female) (3) (13) (23) and V03 (female) (1)	Resistance value	Below 1 Ω	
	3	Short-circuiting of wiring harness (Contact with 24 V circuit)	★Turn the engine starting switch OFF for the preparations, and hold it in the ON position during the troubleshooting.			
			Wiring harness from C03 (female) (17) to V03 (female) (2) and grounding	Voltage	Below 1 V	
	4	Governor • pump controller defective	★Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			C03 (female)	Resistance value		
			Between (17) and (3) (13) (23)	20 – 60 Ω		

Service Code in Electrical System E217 (Abnormality in inputting model code)

User Code	Service Code	Failure Code	Failure phenomenon	Abnormality in inputting model code (in governor • pump controller system)
—	**E217**	**DA2SKQ**		
Failure content	• A model code signal was inputted which indicates another model that is not registered in the controller.			
Response from controller	• The controller treats it as a default-set model (PC300). • Even if the failure cause disappears of itself, the machine operation does not return to normalcy, unless the engine starting switch is once turned OFF.			
Phenomenon occurring on machine	• None in particular			
Relative information	• Model names (expressed in number) that the controller recognizes can be confirmed in the monitoring function. (Code No. 002 and 003: Controller Model Code) ★Input of model selecting signals (ON or OFF) can be confirmed in the monitoring function.(Code No. 027:Switch Input 2)			

Presumed cause and standard value in normalcy		Cause	Standard value in normalcy and references for troubleshooting			
	1	Model selecting connector defective (Internal disconnection or short-circuiting)	★Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			C09 (female)	Resistance value		
			Between ②, ③ and ⑧	Below 1 Ω		
			Between ①, ④ and ⑧	Above 1 MΩ		
	2	Disconnection of wiring harness (Disconnection or defective contact with connector)	★Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			Wiring harness between C02 (female) ⑰ and C09 (male) ③	Resistance value	Below 1 Ω	
			Wiring harness between C02 (female) ㉗ and C09 (male) ②	Resistance value	Below 1 Ω	
			Between wiring harness between C09 (male) ⑧ and J05 and grounding	Resistance value	Below 1 Ω	
	3	Grounding fault of wiring harness (Contact with grounding circuit)	★Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			Between wiring harness between C02 (female) ⑦ and C09 (male) ④ and grounding	Resistance value	Above 1 MΩ	
			Between wiring harness between C02 (female) ⑬ and C09 (male) ⑦ and grounding	Resistance value	Above 1 MΩ	
			Between wiring harness between C02 (female) ㊲ and C09 (male) ① and grounding	Resistance value	Above 1 MΩ	
	4	Governor • pump controller defective	★Turn the engine starting switch OFF for the preparations, and hold it in the ON position during the troubleshooting.			
			C02	Voltage		
			Between ⑦, ⑬ or ㊲ and grounding	20 – 30 V		
			Between ⑰, ㉗ and grounding	Below 1 V		

Service Code in Electrical System E226 (Abnormality in Pressure sensor power source)

User Code	Service Code	Failure Code	Failure phenomenon	Abnormality in pressure sensor power source (in governor • pump controller system)
—	**E226**	**DA25KP**		
Failure content	• Abnormal current flew to the power source circuit (5 V) for the pressure sensors and potentiometer.			
Response from controller	• The controller turns OFF power supply to the power source circuit (5 V). • Even when the failure cause disappears of itself, the current does not return to normalcy, unless the engine starting switch is once turned OFF.			
Phenomenon occurring on machine	• Signals from the pressure sensors and potentiometer are not inputted correctly. • The Service Code of "pressure sensor abnormal" and that of "potentiometer abnormal" are displayed at the same time.			

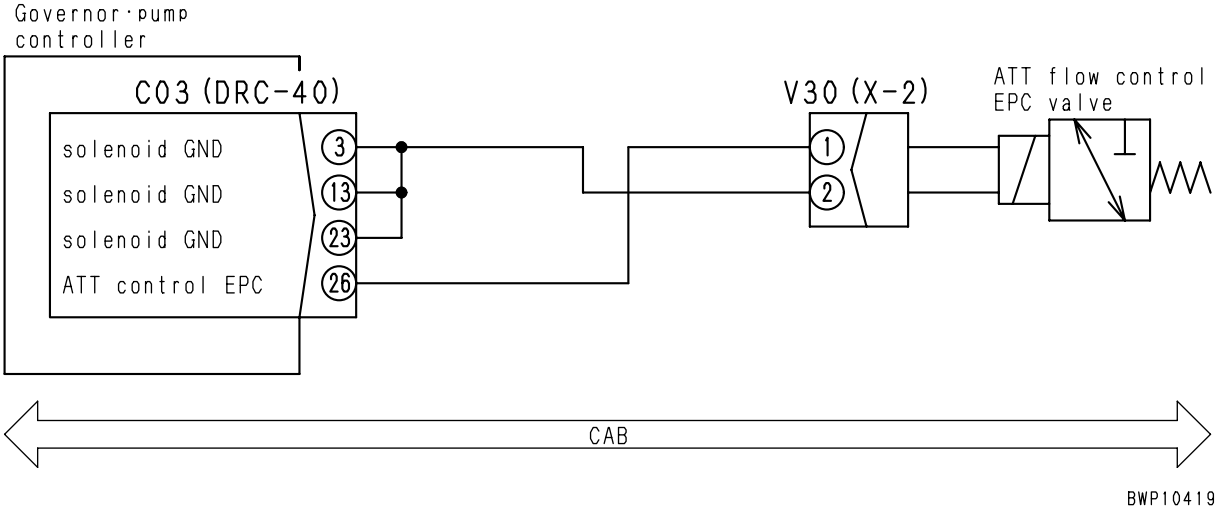
Presumed cause and standard value in normalcy		Cause	Standard value in normalcy and references for troubleshooting			
	1	Pressure sensor or potentiometer defective (Internal short-circuit)	Disconnect the parts shown at right in order. If the error code goes off when one of those parts is disconnected, that part is defective.	★Turn the engine starting switch OFF for the preparations, and hold it in the ON position during the troubleshooting.		
				Fuel dial	E06 Connector	
				Governor motor potentiometer	E10 Connector	
				F pump pressure sensor	A51 Connector	
				R pump pressure sensor	A52 Connector	
	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 from C01 (female) (22) to J07 to E06 (female) (1) and grounding [Fuel dial system]		Resistance value	Min. 1 MΩ
			Between wiring harness from C01 (female) (22) to J07 to E10 (female) (A) and grounding [Governor potentiometer system]		Resistance value	Min. 1 MΩ
			Between wiring harness from C01 (female) (22) to J07 to A51 (female) (B) and grounding [F pump pressure sensor system]		Resistance value	Min. 1 MΩ
	3	Governor • pump controller defective	★Turn the engine starting switch OFF for the preparations, and hold it in the ON position during the troubleshooting.			
			C01	Voltage		
			Between (22) and (10) (21)	4.5 – 5.5 V		

Service Code in Electrical Equipment E245 (Short-circuiting in attachment oil flow rate adjusting EPC) (Multi-monitor only)

User Code	Service Code	Failure Code	Failure phenomenon	Short-circuiting in attachment oil flow rate adjusting EPC (in governor • pump controller system)
—	**E245**	**DXE4KB**		
Failure content	• Abnormal current flew to the attachment oil flow rate adjusting EPC solenoid circuit.			
Response from controller	• The controller reduces to zero (0) power to the attachment oil flow rate adjusting EPC solenoid circuit. • Even when the failure cause disappears, the EPC solenoid circuit does not return to normalcy, unless the engine starting switch is once turned OFF.			
Phenomenon occurring on machine	• The attachments do not move. (The PPC source pressure is not supplied to the service PPC valve.)			
Relative information	• In this code, a failure is diagnosed only when the setting mode is "with ATT". (Check the setting mode shown in the monitor panel) • It can be confirmed in the monitor function how power (ampere) is supplied to the attachment oil flow rate adjusting EPC solenoid circuit. (Code No. 017: Service solenoid current)			

Presumed cause and standard value in normalcy	Cause		Standard value in normalcy and references for troubleshooting			
	1	Attachment oil flow rate adjusting EPC defective (Internal short-circuiting or grounding fault)	★Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			V30 (male)	Resistance value		
			Between ① and ②	7 – 14 Ω		
			Between ① and grounding	Above 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 C03 (female) ㉖ and V30 (female) ① and grounding	Resistance value	Above 1 MΩ	
	3	Governor • pump controller defective	★Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			C03 (female)	Resistance value		
			Between ㉖ and ③ ⑬ ㉓	7 – 14 Ω		
			Between ㉖ and grounding	Above 1 MΩ		

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



Service Code in Electrical System E314 (Disconnection of engine stop solenoid relay)

User Code	Service Code	Failure Code	Failure phenomenon	Disconnection of engine stop (in governor • pump controller system)
—	**E314**	**DY45KA**		
Failure content	• No current flows to the engine stop solenoid relay, when power is supplied to it.			
Response from controller	• No response in particular (The solenoid does not function without current) • When the failure dissolves itself, the relay returns to the normalcy.			
Phenomenon occurring on machine	• The engine cannot be started.			
Relative information	• This code detects only failures occurring on the primary engine stop solenoid relay (coil side). If the engine stop solenoid is suspected of a defect, check the power source, wiring harness or solenoid of the secondary relay (contact side). • It can be checked in the monitoring function how the engine stop solenoid relay works (ON and OFF). (Code 023: Controller output) • If there is nothing abnormal with the relay or wiring harness, the engine can be started again by moving the emergency fuel solenoid driving switch to the EMERGENCY side. ★The solenoid detects disconnection with power ON. Be sure to make a test for checking after the repair with power ON. (For the operation with power ON and OFF, refer to Diagnosis of Service Code [E201].			

Presumed cause and standard value in normalcy		Cause	Standard value in normalcy and references for troubleshooting			
	1	Fault of engine stop solenoid relay (Internal disconnection)	★Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			R22 (male)	Resistance value		
			Between ① and ②	100 – 500 Ω		
	2	Disconnection of wiring harness (Disconnection or defective contact with connector)	★Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			Wiring harness from C03 (female) ⑧ to J01 to R22 (female) ①	Resistance value	Below 1 Ω	
			Wiring harness between R22 (female) to J08 to J04 and grounding	Resistance value	Below 1 Ω	
	3	Short-circuiting of wiring harness (Contact with 24 V circuit)	★Turn the engine starting switch OFF for the preparations, and hold it in the ON position during the troubleshooting.			
			Wiring harness from C03 (female) ⑧ to J01 to R22 (female) ①, or between wiring harness C03 (female) ⑧ and S25 (female) ⑫ and grounding.	Voltage	Below 1 V	
	6	Governor • pump controller defective	★Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.			
			C03	Resistance value		
			Between ⑧ and grounding	100 – 500 Ω		

Failure Code in Mechanical System A000N1 (Out-of-rate engine rotation at high idling)

User Code	Service Code	Failure Code	Failure phenomenon	Out-of-rate engine rotation at high idling (in mechanical system)
—	—	**A000N1**		
Failure content	• Engine rotation above 2,350 rpm was detected for more than 10 seconds, while the engine was running.			
Response from controller	• None in particular • If the failure cause disappears of itself, the engine rotation returns to normalcy.			
Phenomenon occurring on machine	• There is a possibility that the engine is damaged, if is used continuously without adjustment.			
Relative information	• Input from the engine rotation sensor (rpm) can be confirmed in the monitor function. (Code No. 010: Engine rotation)			

		Cause	Standard value in normalcy and references for troubleshooting
Presumed cause and standard value in normalcy	1	Failure in engine mechanical system	Check if there has been an internal or external factor that would cause the engine to overrun at high idling, and troubleshoot the mechanical system of the engine.
	2	Governor • pump controller defective	As this is an internal failure, troubleshooting cannot be conducted. (Unless there is any visible trouble found in the machine, use of the controller may be continued as it is)

Failure Code in Mechanical System A000N2 (Out-of-rate engine rotation at low idling)

User Code	Service Code	Failure Code	Failure phenomenon	Out-of-rate engine rotation at low idling (in mechanical system)
—	—	**A000N2**		
Failure content	• Engine rotation below 500 rpm was detected for more than 10 seconds, while the engine was running.			
Response from controller	• None in particular • If the failure cause disappears of itself, the rotation returns to normalcy.			
Phenomenon occurring on machine	• There is a possibility that the engine is damaged, if it is used continuously without adjustment.			
Relative information	• Input from the engine rotation sensor (rpm) can be confirmed in the monitor function. (Code No. 010: Engine rotation)			

		Cause	Standard value in normalcy and references for troubleshooting
Presumed cause and standard value in normalcy	1	Failure in engine mechanical system	Check if there has been an internal or external factor that would cause the engine to overrun at high idling, and troubleshoot the mechanical system of the engine.
	2	Governor • pump controller defective	As this is an internal failure, troubleshooting cannot be conducted. (Unless there is any visible trouble found in the machine, use of the controller may be continued as it is)

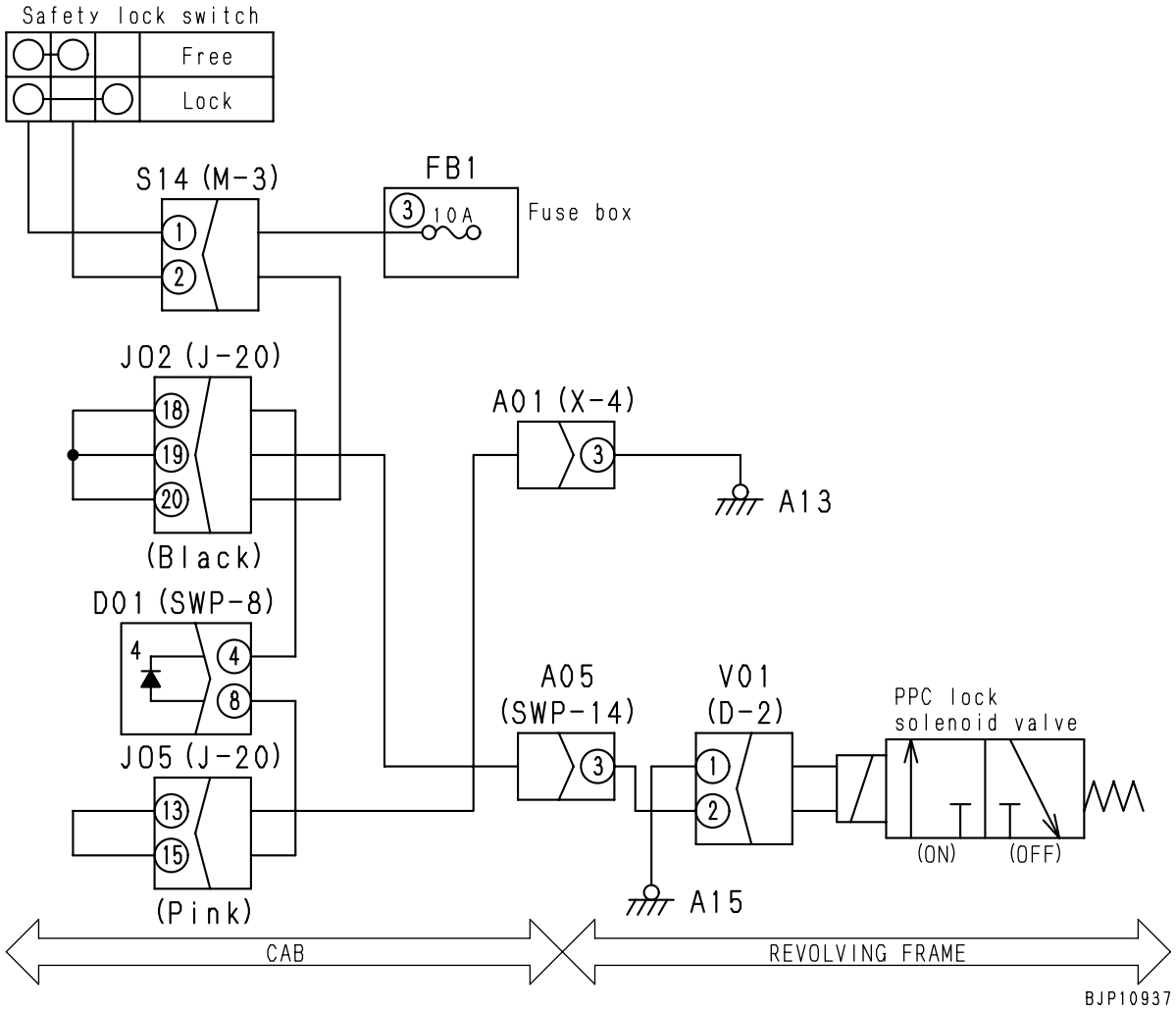
TROUBLESHOOTING OF ELECTRICAL SYSTEM (E-MODE)

E-3 Engine speed is irregular, or there is hunting

Failure information	• Engine speed is irregular at low idling. • There is hunting. • Engine speed is lower than specified at high idling.
Relative information	• Engine rotation can be confirmed in the monitor function. (Code No. 010: Engine rotation)

Presumed cause and standard value in normalcy		Cause	Standard value in normalcy and references for troubleshooting			
	1	Model code signal fault (Internal failure)	If the monitor display is not normal, proceed to Service Code [E217].			
			Monitoring Code	Item	Normal display	
			002 003	Controller model code	200	
	2	Governor lever improperly adjusted	Refer to the section "Special Function of Monitor Panel" in this manual.			
	3	Governor motor improperly working	If the governor motor lever moves smoothly in the following operations, it is judged as normal. • The fuel dial is operated between low idling and high idling. • The engine is stopped with the fuel dial.			
	4	Engine fuel control system defective	Refer to the Engine Shop Manual.			
	5	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 from C01 (female) ㉓ to J07 to H15 (female) ⑤	Resistance value	Below 1 Ω	
	6	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 C01 (female) ㉓ to J17 and H15 (female) ⑤ and grounding	Resistance value	Above 1 MΩ	
	7	Governor • pump controller defective	As this is an internal failure, troubleshooting cannot be conducted. (If there is none of the causes from Item 1 to 6 above, the controller is judged as defective)			

Electrical Circuit Diagram for PPC Lock Solenoid



E-18 When the monitor switch is operated, no display appears

Failure information (1)	• When operating the working mode changing switch, the working mode monitor does not appear.
Relative information	—

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

Failure information (2)	• When operating the auto-decelerator switch, the auto-deceleration monitor does not appear.
Relative information	★If the auto-decelerator itself does not work, either, carry out No. E-5 Troubleshooting.

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

Failure information (3)	• When operating the travel speed shifting switch, the travel speed monitor does not appear.
Relative information	★If the travel speed does not actually change, carry out No. H-21 Troubleshooting.

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

Failure information (4)	• When operating the windshield wiper switch, the windshield wiper monitor does not appear.
Relative information	★If the windshield wiper itself does not work, either, carry out No. E-19 Troubleshooting.

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

Failure information (5)	• When operating the select switch, the adjustment display does not appear. • When operating the LCD monitor adjusting switch, the adjustment display does not appear. • When operating the maintenance switch, the item display does not appear.
Relative information	—

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

E-27 "SWING" is not correctly displayed in monitor function

Failure information	• "SWING" is not correctly displayed in the monitor function (special function) on the monitor panel.
Relative information	—

Presumed cause and standard value in normalcy		Cause	Standard value in normalcy and references for troubleshooting			
	1	Swing PPC hydraulic switch, left, fault (Internal disconnection or short-circuiting)	★Turn the engine starting switch OFF for the preparations, and keep the engine running during the troubleshooting.			
			S03 (male)	Swing control lever	Resistance value	
			Between ① and ②	NEUTRAL	Above 1 MΩ	
				Left	Below 1 Ω	
	2	Swing PPC hydraulic switch, right, fault (Internal disconnection or short-circuiting)	★Turn the engine starting switch OFF for the preparations, and keep the engine running during the troubleshooting.			
			S07 (male)	Swing control lever	Resistance value	
			Between ① and ②	NEUTRAL	Above 1 MΩ	
				Right	Below 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 C03 (female) ㉙ and S03 (female) ②, or wiring harness between C03 (female) ㉙ and S07 (female) ②		Resistance value	Below 1 Ω
			Wiring harness between S03 (female) ① and grounding		Resistance value	Below 1 Ω
			Wiring harness between S07 (female) ① and grounding		Resistance value	Below 1 Ω
	4	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 C03 (female) ㉙ and S03 (female) ②, or wiring harness between C03 (female) ㉙ and S07 (female) ② and grounding		Resistance value	Above 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.			
			Wiring harness between C03 (female) ㉙ and S03 (female) ②, or wiring harness between C03 (female) ㉙ and S07 (female) ② and grounding		Voltage	Below 1 V
	6	Governor • pump controller defective	★Turn the engine starting switch OFF for the preparations, and start the engine during the troubleshooting.			
			C03	Swing control lever	Voltage	
			Between ㉙ and grounding	NEUTRAL	20 – 30 V	
				Right or left	Below 1 V	

PC300, 300LC-7 Serial No. 45001 and up
PC350, 350LC-7 Serial No. 25001 and up

Troubleshooting procedure for air conditioner system

★ The control panel of the air conditioner constantly monitors the sensors and other devices in the system . When it detects any abnormality, “Self-diagnosis notice” is displayed by operating switches specially.
★ If you feel any abnormality in the air conditioner system, check the “Self-diagnosis notice” first according to the procedure for “Troubleshooting by self-diagnosis notice”, and then;
  • If the “Self-diagnosis notice” is displayed, continue the “Troubleshooting by self-diagnosis notice”.
  • If the “Self-diagnosis notice” is not displayed, carry out the “Troubleshooting by failure phenomenon”.

Troubleshooting by self-diagnosis notice

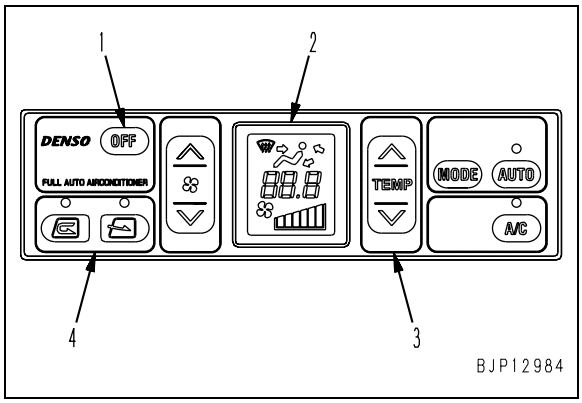
★ Check the “Self-diagnosis notice” on the control panel according to the following procedure.

• How to display “Self-diagnosis notice”
  1) Turn the starting switch ON.
  2) Press OFF switch (1) and check that anything is not displayed on display monitor (2).
  3) Hold the UP switch (∧) and DOWN switch (∨) of temperature setting switch (3) simultaneously for 3 seconds or more.
  4) Check the “Self-diagnosis notice” displayed on display monitor (2).

• How to select “Self-diagnosis notice”
  If multiple “Self-diagnosis notices” are recorded, press the UP switch (∧) or DOWN switch (∨) of temperature setting switch (3) to select another notice.

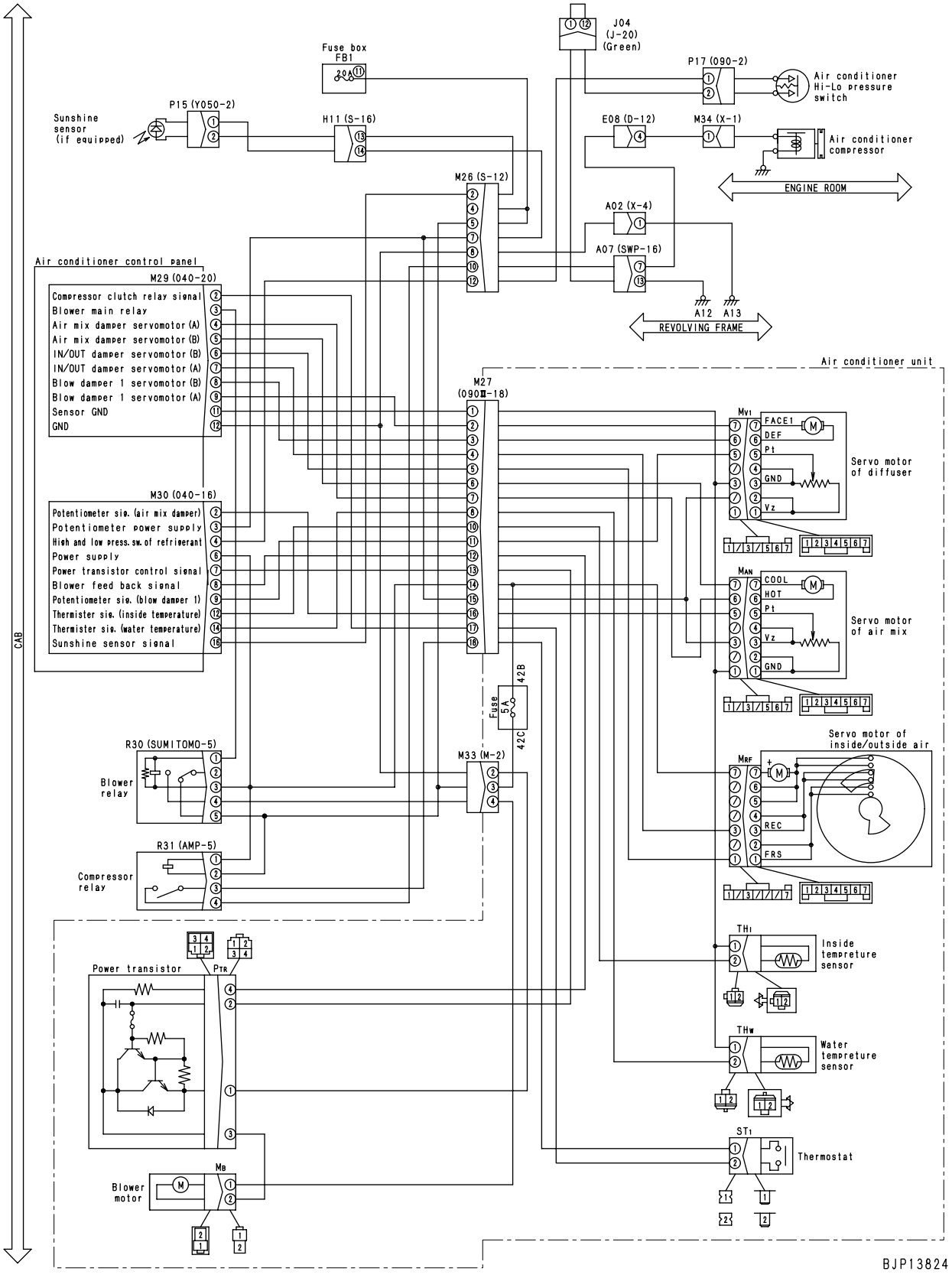
• How to delete “Self-diagnosis notice”
  When reproducing the “Self-diagnosis notices” or after removing the cause of a failure, press the switches on both sides of recirc/fresh air selector switch (4) simultaneously for 3 seconds or more, and all the “Self-diagnosis notices” are deleted.

• Finishing display of “Self-diagnosis notice”
  To finish display of the “Self-diagnosis notice”, press OFF switch (1) or turn the starting switch OFF.



Self-diagnosis notice	Failure mode
E--	No failures
E11	Disconnection in recirculated air sensor
E12	Short-circuit in recirculated air sensor
E15	Disconnection in water temperature sensor
E16	Short-circuit in water temperature sensor
E18	Short-circuit in daylight sensor
E43	Abnormality in air outlet damper
E44	Abnormality in air mix damper
E45	Abnormality in recirculated and fresh air damper

Electrical Circuit Diagram for Air Conditioner



H-5 Auto-decelerator does not work

Failure information	• The auto-decelerator does not work.
Relative information	• This troubleshooting mode is applied when the auto-decelerator does not work, while operating the travel control lever. (A shuttle valve is provided between PPC valve and the hydraulic switch only in the travel circuit -actually located inside PPC valve) • Set the working mode at A mode for the troubleshooting.

Presumed cause and standard value in normalcy	Cause		Standard value in normalcy and references for troubleshooting	
	1	Malfunctioning of travel PPC valve (shuttle valve)	★Stop engine for preparations. Start troubleshooting at engine high idling.	
			Travel control lever	PPC valve output pressure
			NEUTRAL	0{0}
			Operation	Above 2.7 MPa {Above 28 kg/cm^2}

H-6 Fine control mode does not function

Failure information	• The fine control mode poorly functions or its response is slow.
Relative information	• Set the working mode at A mode for the troubleshooting.

Presumed cause and standard value in normalcy	Cause		Standard value in normalcy and references for troubleshooting		
	1	Malfunctioning of LS-EPC valve	★Stop engine for preparations. Start troubleshooting at engine high idling.		
			Travel speed	Travel control lever	LS-EPC valve output pressure
			Lo	NEUTRAL	Approx. 1.4 MPa {Approx. 14 kg/cm^2}
			Hi	Travel control lever	0{0}
	2	Orifice in LS circuit clogged	The orifice in the LS circuit is presumed to be clogged. Check the orifice itself.		
	3	Improper adjustment or malfunctioning of LS valve	★Stop engine for preparations. Start troubleshooting at engine high idling.		
			Oil pressure to be measured	Oil pressure ratio	
				All control levers in NEUTRAL	Travel without load (control lever held at half stroke)
			Pump delivery pressure	Nearly equal oil pressure	1
			PC valve output pressure		Approx. 3/5
			If the oil pressure does not return to normalcy even after the adjustment, malfunctioning of the LS valve or its internal failure is suspected. In that case, check the valve itself.		
	4	Malfunctioning of servo piston	Malfunctioning of the servo piston is suspected. Check the piston itself.		

H-21 Travel speed does not shift, or it is too slow or fast.

Failure information	• Travel speed does not shift, or it is either too fast or slow.
Relative information	• Set the working mode at A mode for the troubleshooting.

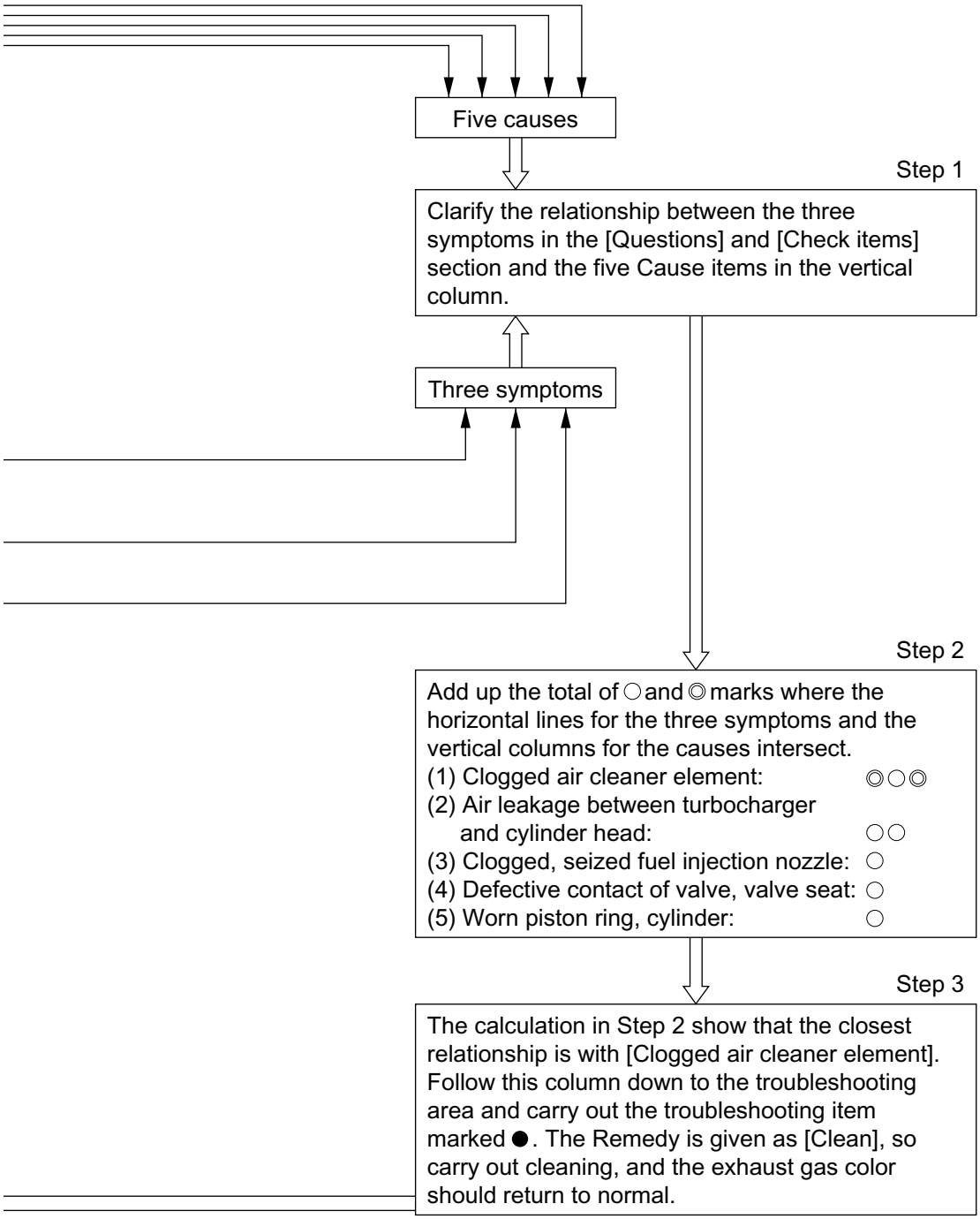
<table>
<tr><td rowspan="12">Presumed cause and standard value in normalcy</td><td colspan="2">Cause</td><td colspan="3">Standard value in normalcy and references for troubleshooting</td></tr>
<tr><td rowspan="8">1</td><td rowspan="8">Malfunctioning of LS-EPC valve</td><td colspan="3">★Stop engine for preparations. Start troubleshooting at engine high idling.</td></tr>
<tr><td>Travel speed</td><td>Travel control lever</td><td>Monitoring [15]</td></tr>
<tr><td>Lo</td><td rowspan="3">Fine control
(to the extent that the decelerator is released)</td><td>690 mA</td></tr>
<tr><td>(※ Mi)</td><td>740 mA</td></tr>
<tr><td>Hi</td><td>0 mA</td></tr>
<tr><td colspan="3">★Stop engine for preparations. Start troubleshooting at engine high idling.</td></tr>
<tr><td>Travel speed</td><td>Travel control lever</td><td>LS-EPC valve output pressure</td></tr>
<tr><td>Lo</td><td>NEUTRAL</td><td>Approx. 1.4 MPa
{approx. 14 kg/cm^2}</td></tr>
<tr><td>Hi</td><td>Operation</td><td>0 {0}</td></tr>
<tr><td rowspan="4">2</td><td rowspan="4">Malfunctioning of travel speed solenoid valve</td><td colspan="3">★Stop engine for preparations. Start troubleshooting at engine high idling.</td></tr>
<tr><td>Travel speed</td><td>Travel control lever</td><td>Solenoid valve output pressure</td></tr>
<tr><td>Lo</td><td>NEUTRAL</td><td>0 {0}</td></tr>
<tr><td>Hi</td><td>Operation</td><td>2.84 – 3.43 MPa
{29 – 35 kg/cm^2}</td></tr>
<tr><td>3</td><td>Malfunctioning of travel motor (speed shifting)</td><td colspan="3">The travel motor is presumed to malfunction when shifting speed. Check the speed shifting portion directly.</td></tr>
</table>

※: The "Mi" mode is on the multi-monitor specification machine only.

H-22 Track shoe does not turn (on one side only)

Failure information	• A track shoe does not turn (only on one side).
Relative information	• Set the working mode at A mode for the troubleshooting.

<table>
<tr><td rowspan="8">Presumed cause and standard value in normalcy</td><td colspan="2">Cause</td><td colspan="2">Standard value in normalcy and references for troubleshooting</td></tr>
<tr><td>1</td><td>Travel control valve (suction valve) seat defective</td><td colspan="2">The suction valve seat in the travel control valve is suspected of defect. Check the seat itself.</td></tr>
<tr><td>2</td><td>Travel motor (safety valve) seat defective</td><td colspan="2">The safety valve seat in the travel motor is suspected of defect. Check the seat itself.</td></tr>
<tr><td>3</td><td>Travel motor (check valve) seat defective</td><td colspan="2">The check valve seat in the travel motor is suspected of defect. Check the seat itself.</td></tr>
<tr><td rowspan="3">4</td><td rowspan="3">Travel Motor speed reduced</td><td colspan="2">★Stop engine for preparations. Start troubleshooting at engine high idling.</td></tr>
<tr><td>Travel control lever</td><td>Amount of oil leakage from travel motor</td></tr>
<tr><td>Travel relief</td><td>30 ℓ/min</td></tr>
<tr><td>5</td><td>Final drive defective</td><td colspan="2">The final drive is suspected of an internal failure. Check the inside of the final drive directly.
★A failure inside the final drive may well be determined by an abnormal noise from within, abnormal heat generated or metal dust or chips contained in the drained oil.</td></tr>
</table>


Five causes
Step 1
Clarify the relationship between the three symptoms in the [Questions] and [Check items] section and the five Cause items in the vertical column.
Three symptoms
Step 2
Add up the total of ○ and ◎ marks where the horizontal lines for the three symptoms and the vertical columns for the causes intersect.
(1) Clogged air cleaner element: ◎○◎
(2) Air leakage between turbocharger and cylinder head: ○○
(3) Clogged, seized fuel injection nozzle: ○
(4) Defective contact of valve, valve seat: ○
(5) Worn piston ring, cylinder: ○
Step 3
The calculation in Step 2 show that the closest relationship is with [Clogged air cleaner element]. Follow this column down to the troubleshooting area and carry out the troubleshooting item marked ●. The Remedy is given as [Clean], so carry out cleaning, and the exhaust gas color should return to normal.

S-7 Exhaust smoke is black (Incomplete combustion)

General causes why exhaust smoke is black

- Insufficient intake of air
- Improper condition of fuel injection
- Excessive injection of fuel

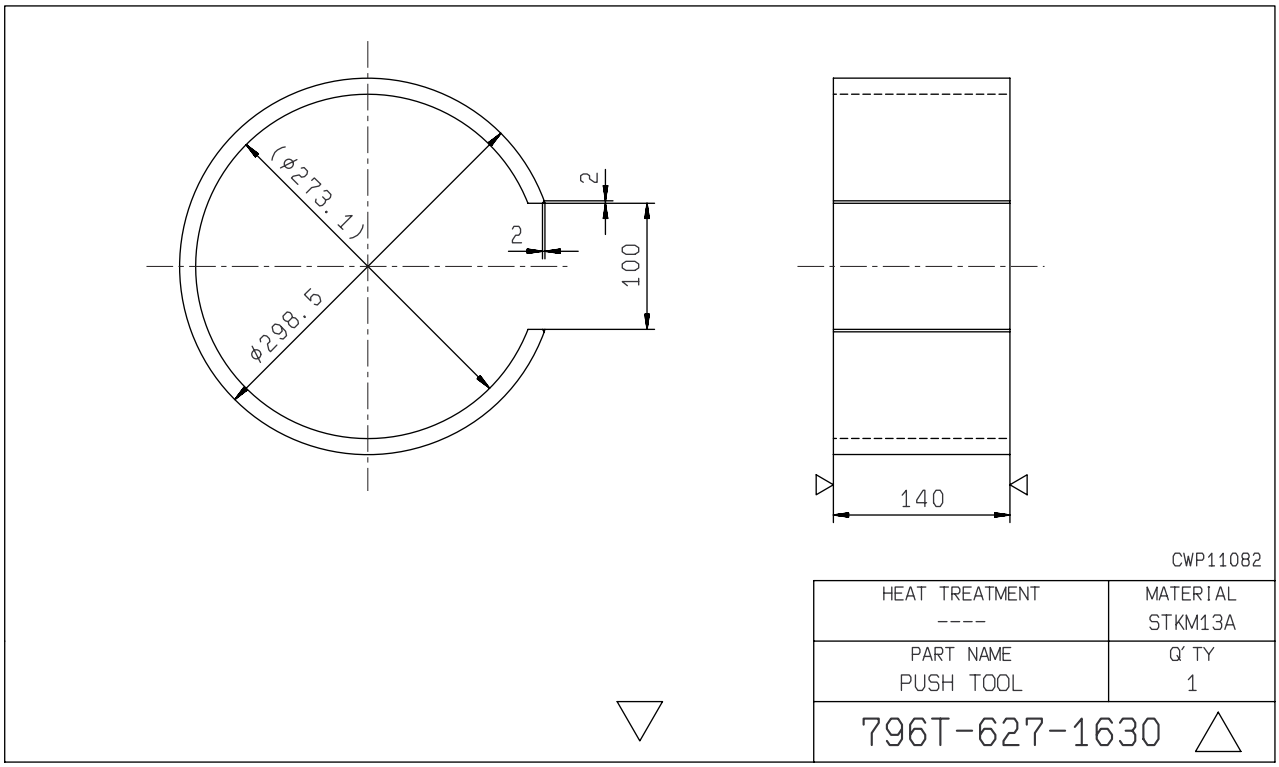
			Causes: Seized turbocharger, interference	Clogged air cleaner element	Worn piston ring, cylinder	Clogged injection nozzle, defective spray	Improper injection timing	Defective injection pump (excessive injection)	Improper valve clearance	Crushed, clogged muffler	Leakage of air between turbocharger and intake manifold	Defective contact of valve and valve seat	Defective injection pump (rack, plunger seized)
Questions	Confirm recent repair history												
	Degree of use of machine	Operated for long period		△	△	△						△	
	Color of exhaust gas	Suddenly became black	◎			○							○
		Gradually became black		◎		○					○		
		Blue under light load			◎								
	Engine oil must be added more frequently				◎								
	Power was lost	Suddenly	◎			○				○			○
		Gradually		○	○						○	○	
	Non-specified fuel is being used					○							○
Check items	Noise of interference is heard from around turbocharger		◎										
	Air cleaner clogging monitor lights up			◎									
	Blow-by gas is excessive				◎								
	Engine pickup is poor and combustion is irregular		○			◎			○	○	○		○
	When exhaust manifold is touched immediately after starting engine, temperature of some cylinders is low					◎							○
	Timing lock on fuel injection pump does not match						◎						
	Seal on injection pump has come off							◎					
	Clanging sound is heard from around cylinder head								◎				
	Exhaust noise is abnormal		○			○				◎			
	Muffler is crushed									◎			
	Leakage of air between turbocharger and head, loose clamp										◎		
Troubleshooting	When turbocharger is rotated by hand, it is found to be heavy		●										
	When air cleaner element is inspected directly, it is found to be clogged			●									
	When compression pressure is measured, it is found to be low				●							●	
	Speed does not change when operation of certain cylinders is stopped					●							
	When check is made using delivery method, injection timing is found to be incorrect						●						
	Injection pump test shows that injection amount is incorrect							●					
	When valve clearance is checked directly it is found to be outside standard value								●				
	When muffler is removed, exhaust color returns to normal									●			
	When control rack is pushed, it is found to be heavy, or does not return												●
		Remedy	Replace	Clean	Replace	Replace	Adjust	Adjust	Adjust	Replace	Correct	Replace	Replace

30 DISASSEMBLY AND ASSEMBLY

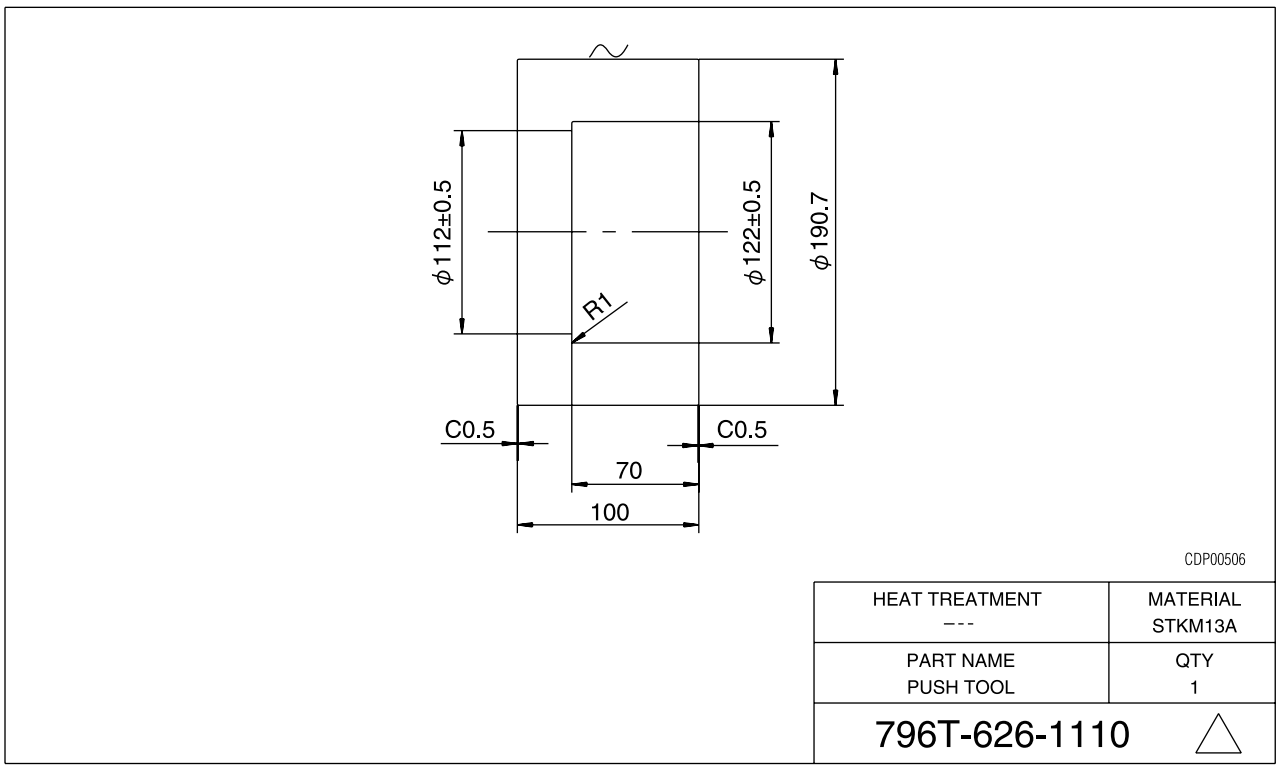
SKETCHES OF SPECIAL TOOLS

Note: Komatsu cannot accept any responsibility for special tools manufactured according to these sketches.

D2 Push tool



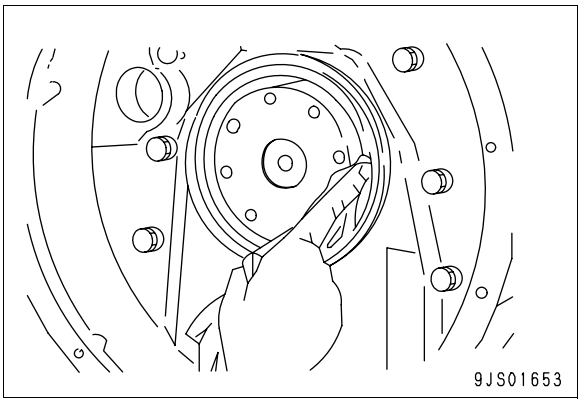
E1 Push tool



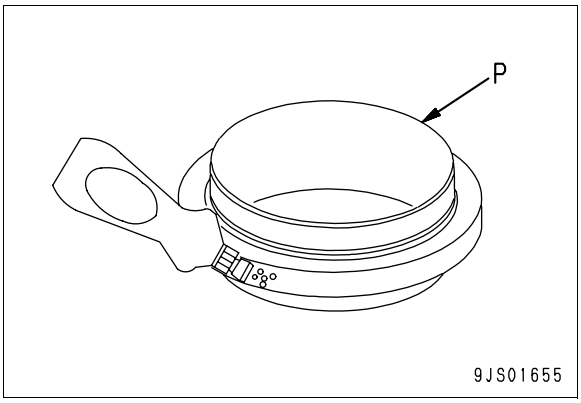
INSTALLATION

1. Clean and degrease the surface of gasket between the rear cover and the cylinder block and let dry.

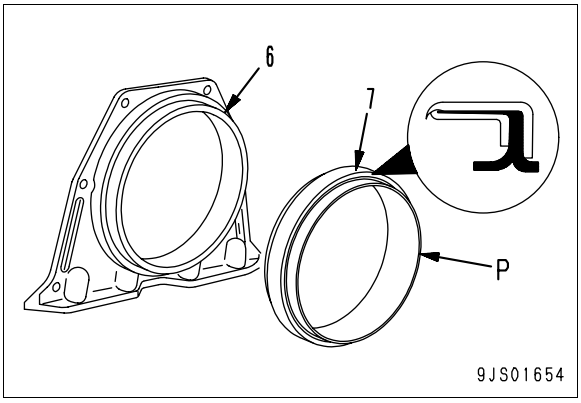
2. Clean and degrease the surface of seal lip (on the crankshaft periphery) and let dry.



3. Apply some amount of neutral detergent to the outer periphery of engine rear seal.
   ★ The plastic part **P** in the engine rear seal is provided as a pilot (guide) that is used in installing the crankshaft. So, do not remove it.

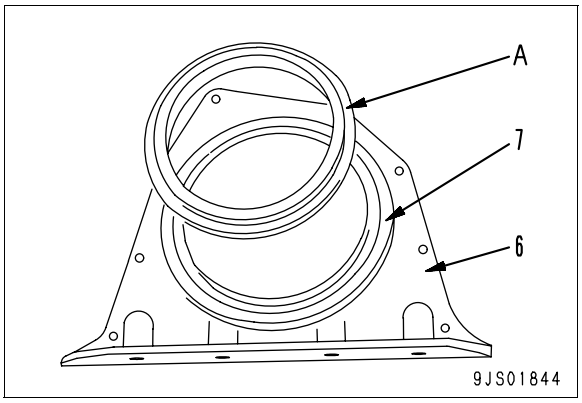


4. Install engine rear seal (7) to rear cover (6).



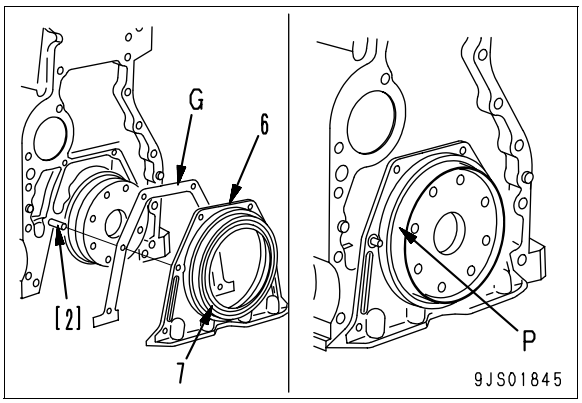
5. Using alignment tool **A** provided with the engine rear seal, push rear seal (7) into rear cover (6) until the desired depth is reached.

6. Remove alignment tool **A**.



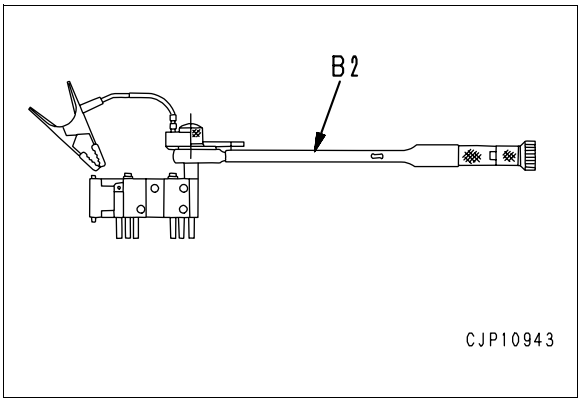
7. Push pilot **P** against the crankshaft and push it together with rear cover (6) into the crankshaft.
   ★ Remember to put gasket **G** between the cylinder block and the rear cover.
   ★ Use guide pin [2].

8. Remove pilot **P**.



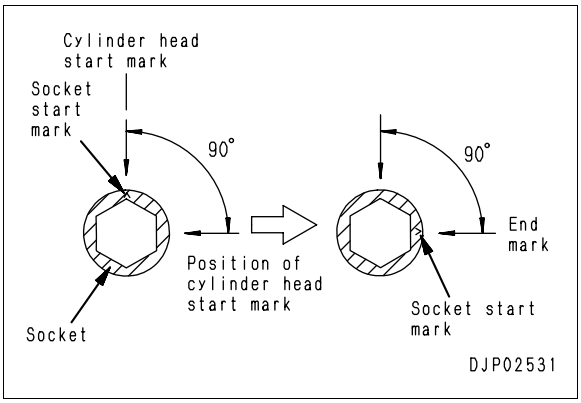
3rd step:

i) When using tool **B2.**
For tightening, turn the bolts with an angle tightening wrench by 90 ± 5° in the sequence of ① to ㉖.



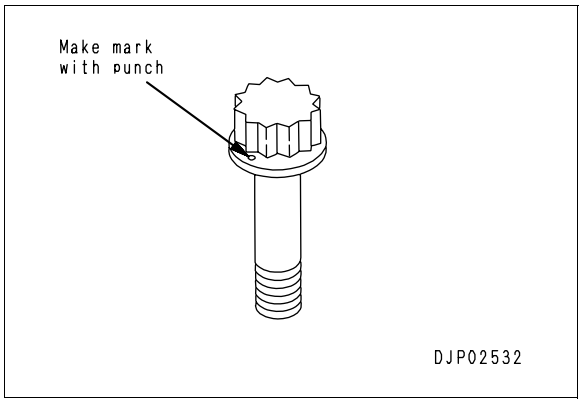
ii) When not using tool **B2.**
Tighten the bolts by turning them to 90 ± 5°. Put a punch mark on the bolt head after tightening the bolt to show the frequency of tightening.

- Do not use a bolt with 5 punch marks. Replace it with a new one.



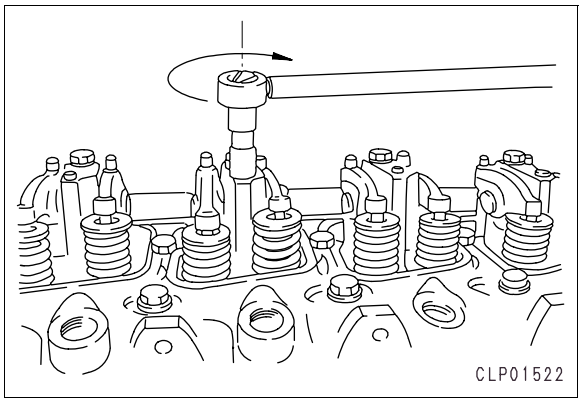
★ Install the rocker arm assembly and tighten the bolts by hand.

- Check that the adjusting screw ball is well seated in the push rod socket.



6) Tighten the rocker arm mounting bolts.

N·m Rocker arm assembly mounting bolt: 65 ± 5 Nm {6.6 ± 0.5 kgm}



7) Adjust the valve clearance.

★ Refer to the Adjustment of Valve Clearance section in the TESTING AND ADJUSTING chapter in this manual.

- **Refilling engine coolant**
Fill engine coolant through the water filler port up to the specified level. Start the engine to allow the coolant to circulate and release any air pockets. Check the water level again.

Engine coolant: Approx. 32 ℓ

DISASSEMBLY AND ASSEMBLY OF FINAL DRIVE ASSEMBLY

SPECIAL TOOLS

Mark		Part No.	Part name	Necessity	Qty	Distinction	Sketch
D	1	796-627-1610	Wrench assembly	■	1	N	
		796-627-1620	• Wrench		1	N	
		796-427-1140	• Pin		3		
		01314-20612	• Screw		3		
	2	796T-627-1630	Push tool	■	1	N	○
		790-101-2510	Block	■	1		
		791-830-1320	Rod	■	2		
		01580-11613	Nut	■	2		
		790-101-2570	Washer	■	2		
		01643-31645	Washer	■	2		
		790-105-2100	Jack ass'y	■	1		
		790-101-1102	Pump	■	1		
	3	791-580-1510	Installer	■	1		
	4	790-331-1110	Wrench	■	1		

DISASSEMBLY

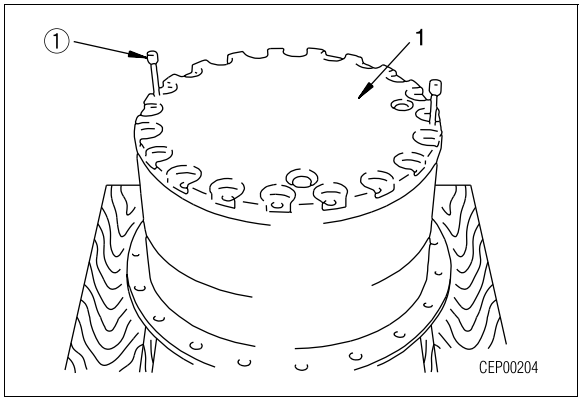
1. Draining Oil

Remove drain plug and drain oil from final drive case.

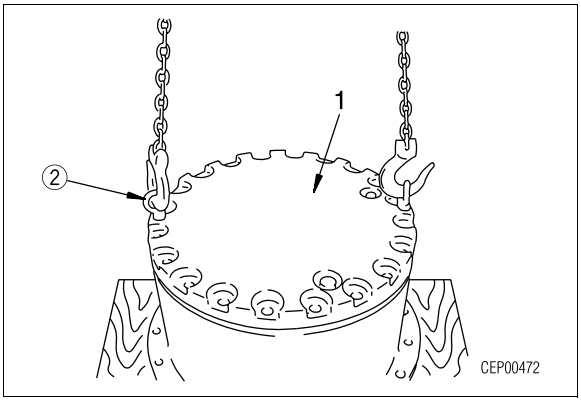
Final drive case: **Approx. 8.5 ℓ**

2. Cover

1) Remove mounting bolts, then use forcing screws [1] to disconnect cover (1).

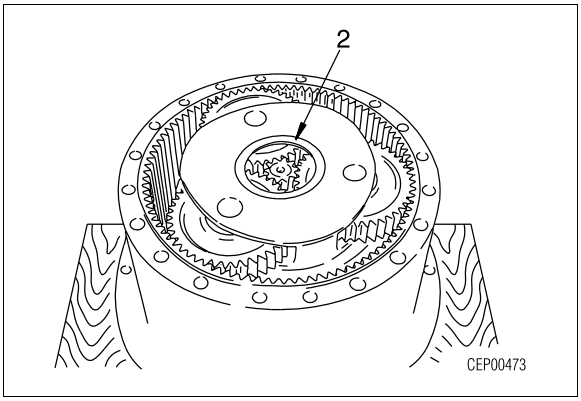


2) Use eyebolts [2] to remove cover (1).



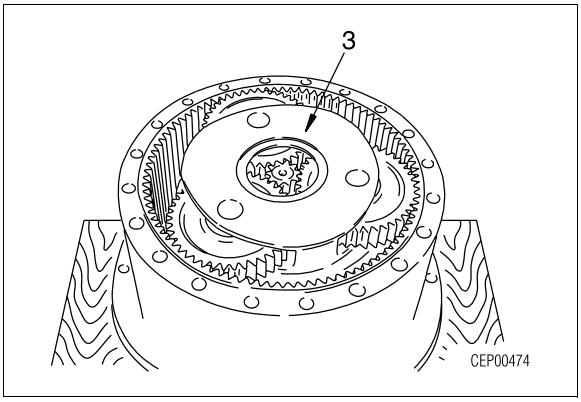
3. Spacer

Remove spacer (2).



4. No. 1 carrier assembly

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



2) Disassemble No. 1 carrier assembly as follows.
   i) Push in pin (4) and pull out shaft (5) from carrier (6).
      ★ After removing the shaft (5), remove pin (4).

DISASSEMBLY AND ASSEMBLY OF SWING MOTOR, SWING MACHINERY ASSEMBLY

PC300, 300LC-7 Serial No. 40001 – 40573
PC350, 350LC-7 Serial No. 20001 – 20337

SPECIAL TOOLS

Mark		Part No.	Part name	Necessity	Qty	Distinction	Sketch
E	1	796T-626-1110	Push tool	●	1		○
	2	796T-626-1140	Push tool	■	1		

DISASSEMBLY

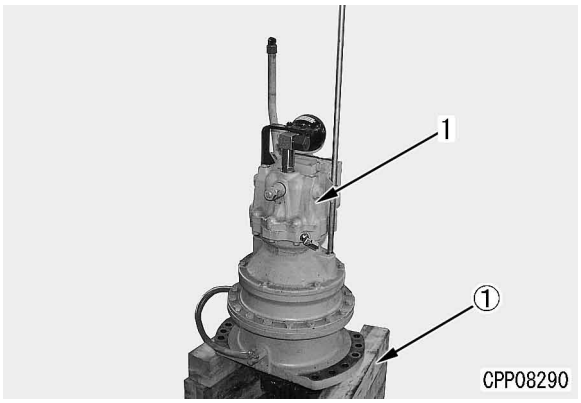
1. Draining oil
Loosen the drain plug and drain oil from the swing machinery case.

Swing machinery case:
Approx. 13.4 ℓ

2. Swing motor assembly

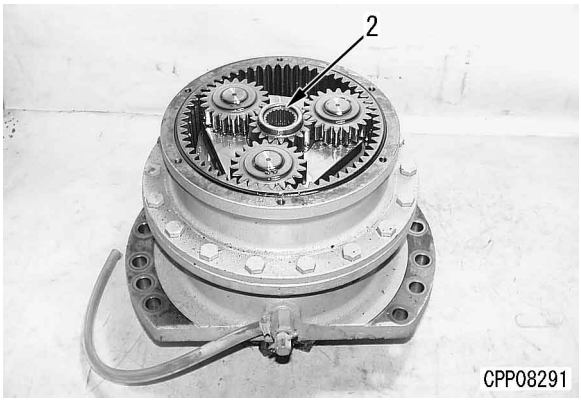
1) Place swing motor and swing machinery assembly on block [1].
2) Remove the 6 mounting bolts to disconnect swing motor assembly (1).

Swing motor assembly: **70 kg**



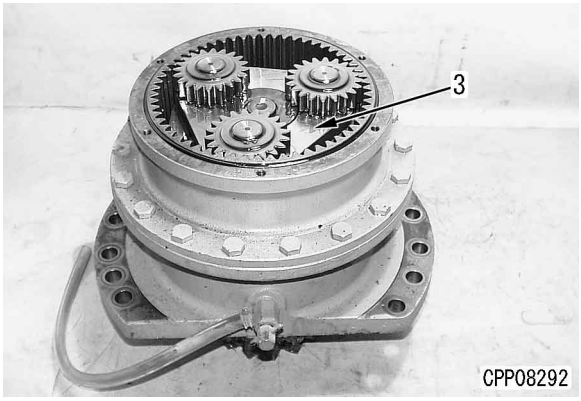
3. No. 1 Sun gear

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

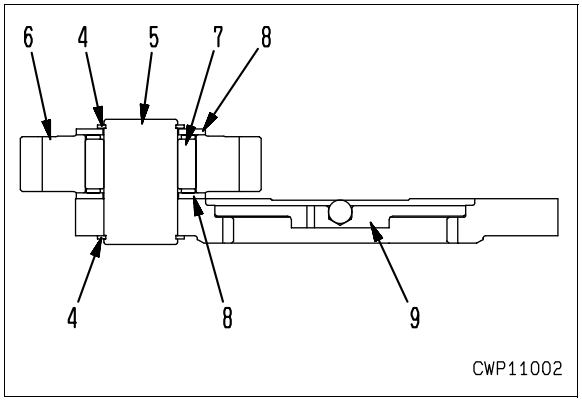


4. No. 1 carrier assembly

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



2) Disassemble the No. 1 carrier assembly in the following manner.
   i) Remove snap ring (4) first and then remove thrust washer (8), gear (6), bearing (7), thrust washer (8) and plate (9).
   ii) Using the press, remove shaft (5).
   ★ Press fitting force for assembly (Reference value)
   29.2 – 54 kN {2,980 – 5,510 kg}



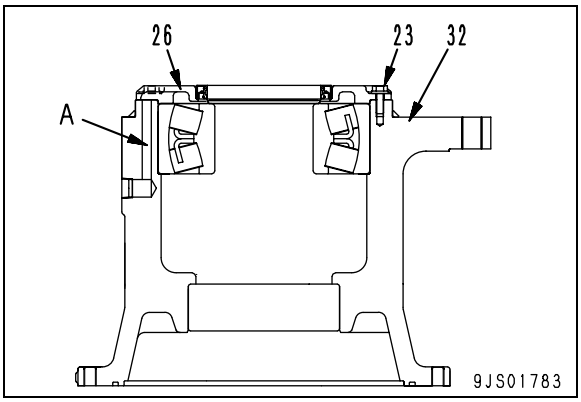
2) Fit cover assembly (26) to case (32), and tighten mounting bolts (23).
   ★ Match the oil passage of cover assembly (26) to drilled hole **A** of case (32).

   Cover mounting surface : **Gasket sealant (LG-6)**

   ★ Take care that LG-6 will not stick to drilled hole **A**.

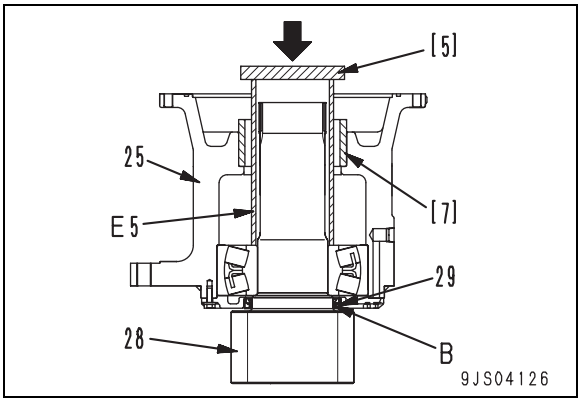
   Mounting bolt : **98 – 123 Nm {10 – 12.5 kgm}**

   Lip of oil seal : **Grease (G2-LI)**

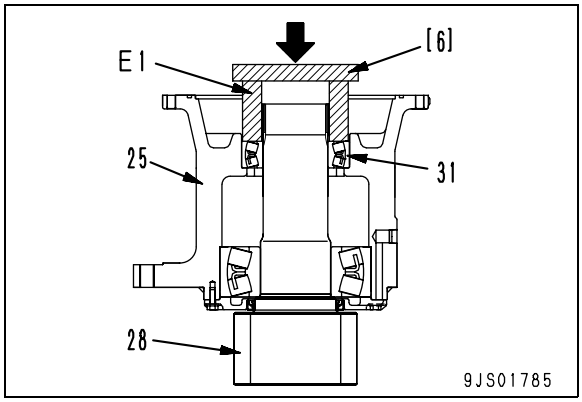


3. Case assembly

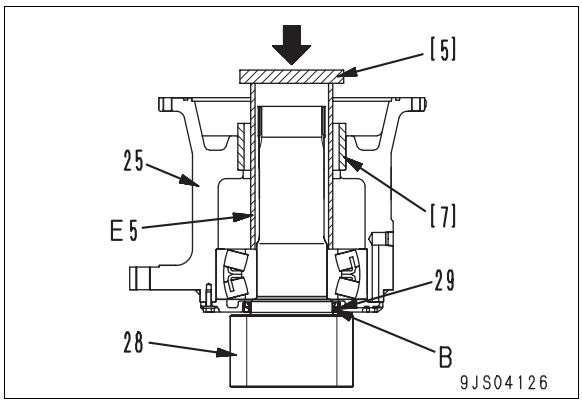
1) Reverse case assembly (25) and set it to shaft (28).
   ★ Take extreme care not to damage the oil seal.
2) Using push tool **E5**, [5], [7], press fit the bearing inner race.
   ★ Using push tool **E5**, [5], hit shaft lightly with a plastic hammer so that it will not come off, and then press fit it with the press.
   ★ Press fitting force (Reference value): **39 – 110 kN {3,980 – 11,260 kg}**
   ★ Set push tool [7] so that case assembly (25) will not slant largely.
   ★ Hit the flange of case assembly (25) lightly and frequently to correct its slant.



3) Press-fit bearing (31), using push tool **E1**, [6].
   ★ Use new bearing (31).
   ★ When press-fitting the bearing, press both inner and outer races of the bearing at the same time. Avoid pressing the inner race only.
   ★ After the bearing is press-fitted, check that the case will turn freely.



   ★ Hit the flange of case assembly (25) frequently and lightly to correct the lean of case assembly (25). In particular, adjust the flange so that oil seal mating face **B** of the shaft will be at the center of oil seal (29).



4) Using push tool **E1**, [6], press fit bearing (31).
   ★ Use a new bearing.
   ★ Press the bearing inner race and outer race simultaneously. Do not press only the inner race.
   ★ After press fitting the bearing, check that the case rotates smoothly.
   ★ Press fitting force (Reference value):
   Inner race side: **15.3 – 43.2 kN {1,560 – 4,410 kg}**
   Outer race side: **0 – 16.2 kN {0 – 1,650 kg}**

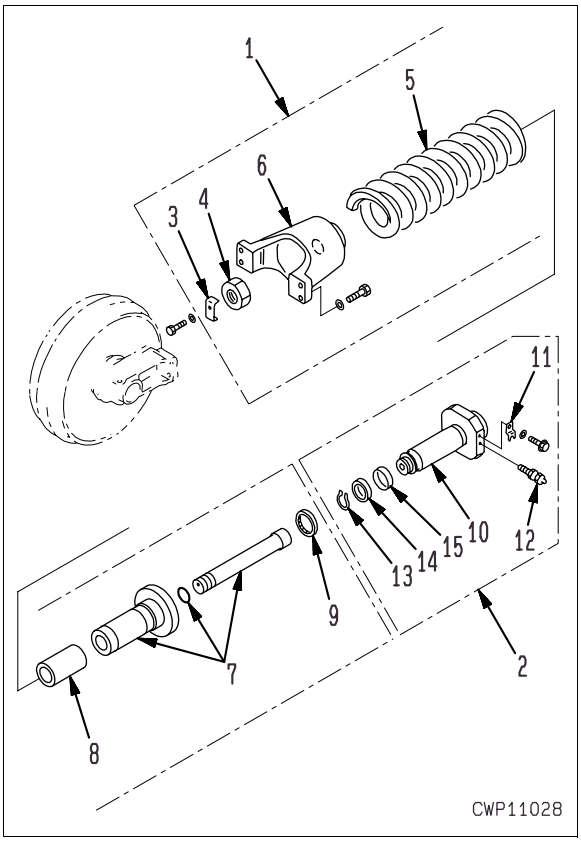
DISASSEMBLY AND ASSEMBLY OF RECOIL SPRING ASSEMBLY

SPECIAL TOOLS

Mark		Part No.	Part Name	Necessity	Qty	Distinction*	Sketch
J	1	791-685-8006	Compressor	■	1		
		791-635-3160	Extension	■	1		
		790-101-1600	Cylinder 686 kN {70 T}	■	1		
		790-101-1102	Pump	■	1		
	2	790-201-1500	Push tool kit	■	1		
		• 790-201-1620	• Plate		1		
		• 790-101-5021	• Grip		1		
		• 01010-50816	• Bolt		1		

*Distinction between new and existing part.

DISASSEMBLY



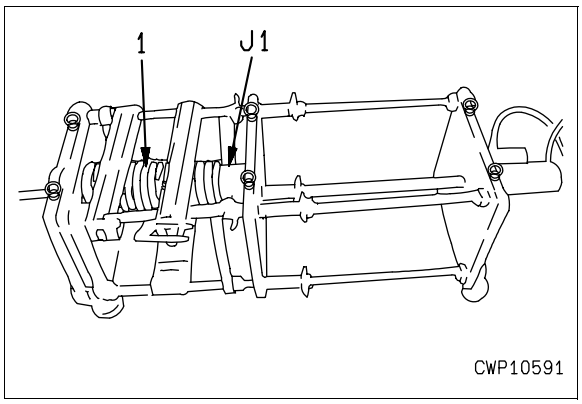
1. Remove piston assembly (2) from recoil spring assembly (1).

2. Disassembly of recoil spring assembly

1) Set tool **J1** to recoil spring assembly (1).

⚠ The recoil spring is under large installed load, so be very sure to set the tool properly.
Failure to do this is dangerous.

★ Installed load of spring: **208.6 kN {21,280 kg}**

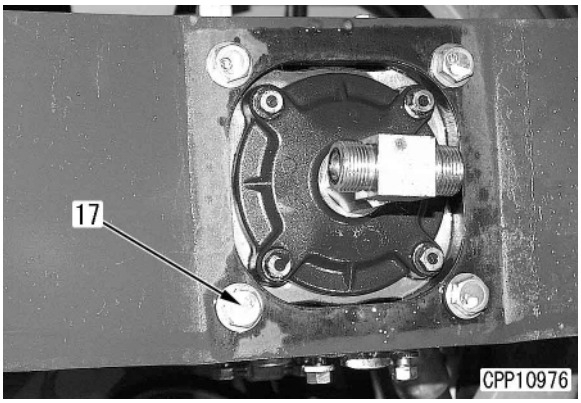


2) Apply hydraulic pressure slowly to compress the spring. Remove lock plate (3). Then remove nut (4).
   - ★ Compress the spring to a point where the nut becomes loose.
   - ★ Release the hydraulic pressure slowly to decompress the spring.
   - ★ Free length of spring: **814 mm**
3) Remove yoke (6), cylinder (7), collar (8), and dust seal (9) from spring (5).

3. Dissassembly of piston assembly

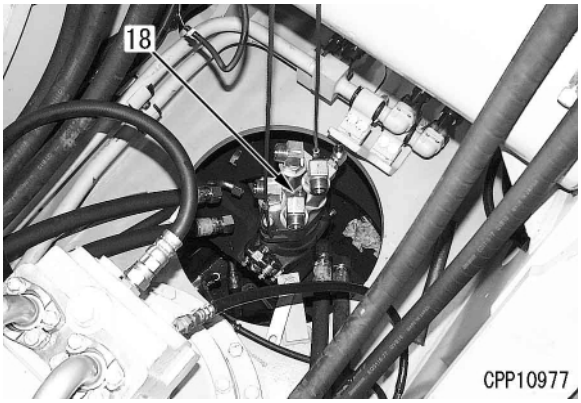
1) Remove lock plate (11) from piston (10), then remove valve (12).
2) Remove snap ring (13), then remove U-packing (14) and ring (15).

4. Remove four mounting bolts (17).



5. Remove center swivel joint assembly (18). ※1

kg Center swivel joint assembly: **40 kg**

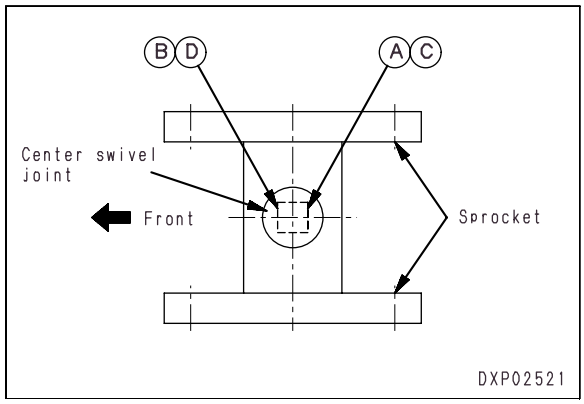


INSTALLATION

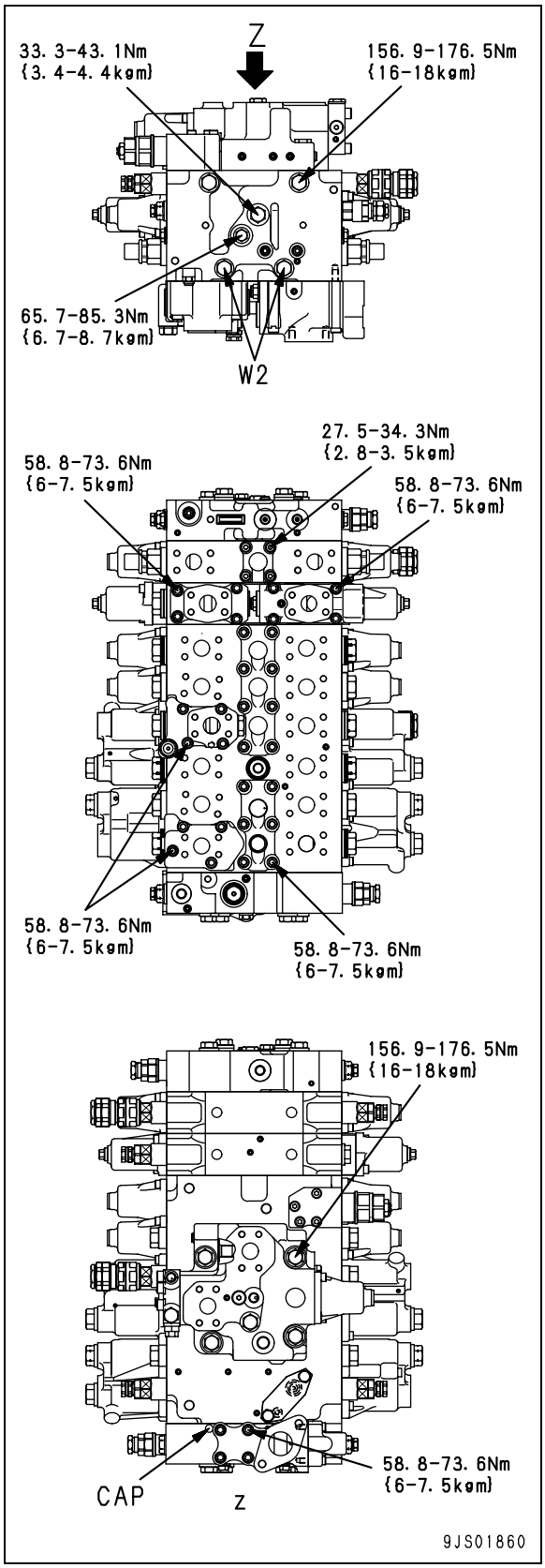
- Install in reverse order of removal.

※1

Install the center swivel joint facing in the direction shown in the diagram.
(The diagram shows the machine as seen from above)



- **Refilling with oil (hydraulic tank)**
  - ★ Add oil through the oil filter to the specified level. Run the engine to circulate the oil through the system. Then check the oil level again.
- **Bleeding air**
  - ★ Bleed the air from the travel motor. For details see TESTING AND ADJUSTING, Air Bleeding of Various Parts.



- Merge-divider valve

  Mating face of merge-divider valve:
  SEALEND 242 or equivalent

- Tighten the mounting bolts of the merge-divider valve similarly to those of the control valve covers.

  Mounting bolt of merge-divider valve:
  156.9 – 176.5 Nm {16 – 18 kgm}

- Tighten the mounting bolts of the boom Hi check valve, quick return valve, lock valve, and arm plate similarly to those of the control valve covers.

  Mounting bolt of boom Hi check valve, quick return valve, lock valve, and arm plate:
  58.8 – 73.6 Nm {6 – 7.5 kgm}

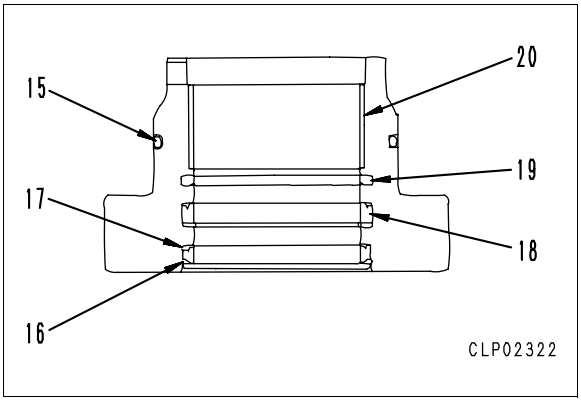
- After assembling, fit the cap so that oil and cleaning liquid will not enter the engine through the ø12 hole.
- Pressure compensation valve

  ★ Install each pressure compensation valve, paying attention to the counter mark that was put when removing it.

- Main relief valve assembly
  After building the main relief valve assembly in the control valves, refer to the Inspection And Adjustment of Hydraulic Oil Pressure In Hydraulic Circuit For "Work equipment, swing and travel" section in the TESTING AND ADJUSTING chapter, in this manual.

3. Disassembly of cylinder head assembly

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

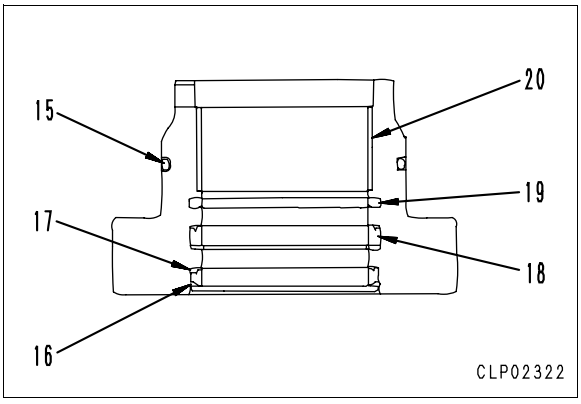


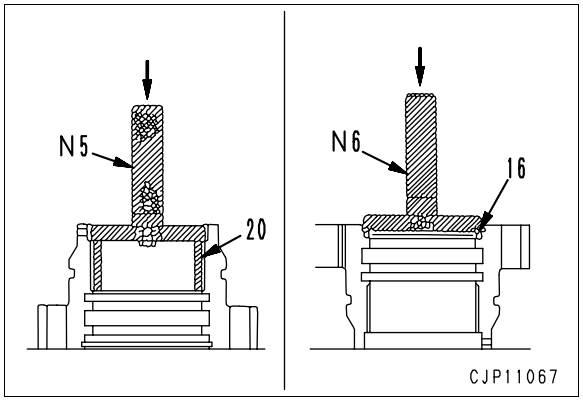
ASSEMBLY

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

1. Assembly of head assembly

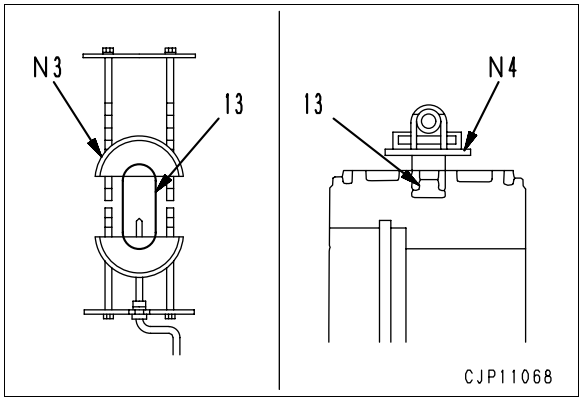
1) Using tool **N5**, press fit bushing (20).
2) Assemble buffer ring (19).
3) Assemble rod packing (18).
4) Using tool **N6**, install dust seal (17), and secure with snap ring (16).
5) Install backup ring and O-ring (15).





2. Assembly of piston assembly

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



REMOVAL AND INSTALLATION OF AIR CONDITIONER UNIT ASSEMBLY

PC300, 300LC-7 Serial No. 45001 and up
PC350, 350LC-7 Serial No. 25001 and up

SPECIAL TOOLS

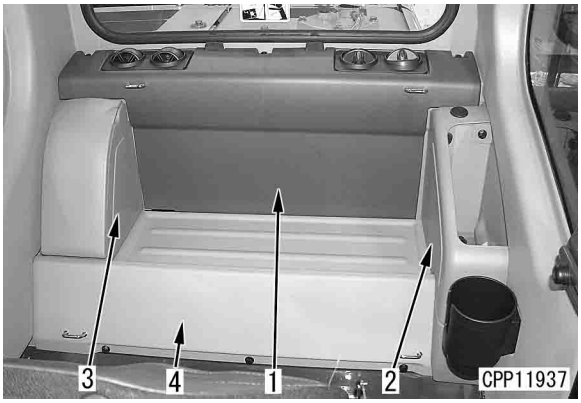
Mark	Part No.	Part name	Necessity	Qty	Distinction	Sketch
Q	799-703-1200	Service tool kit	■	1		
	799-703-1100	Vacuum pump (100V)	■	1		
	799-703-1111	Vacuum pump (220V)	■	1		
	799-703-1121	Vacuum pump (240V)	■	1		
	799-703-1401	Gas leak detector	■	1		

REMOVAL

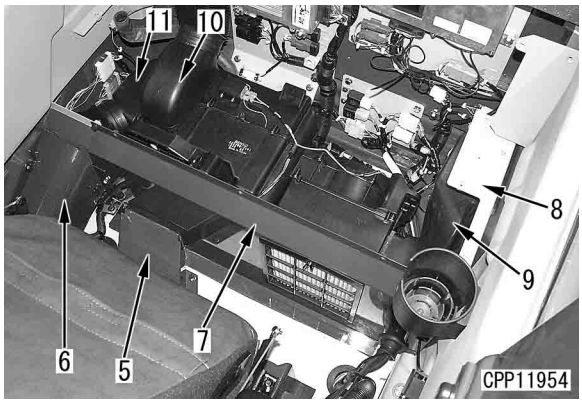
⚠ Disconnect the cable from the negative (–) terminal of the battery.

⚠ Collect the air conditioner refrigerant.

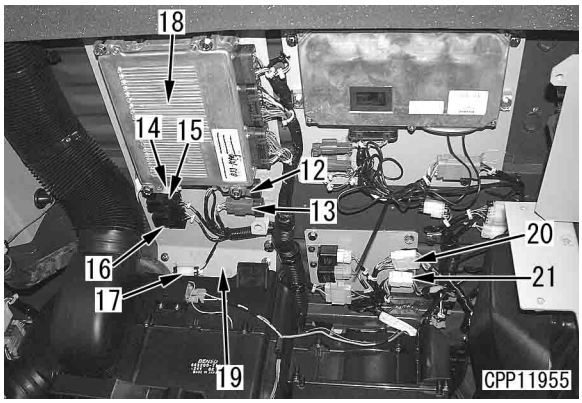
1. Swing the upper structure by 90°.
2. Open the engine hood.
3. Remove rear covers (1), (2), (3), and (4).



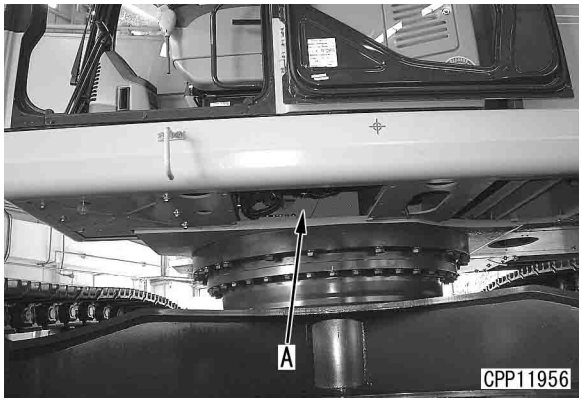
4. Remove duct (5), cover (6), and plate (7).
5. Remove plate (8) and duct (9).
   ★ Remove the duct lock clip.
6. Remove ducts (10) and (11).



7. Disconnect connectors D01 (12), D02 (13), C09 (14), R22 (15), R20 (16), and K19 (17).
8. Remove and sling controller (18).
9. Remove plate (19).
10. Disconnect air conditioner unit connectors M27 (20) and M33 (21).



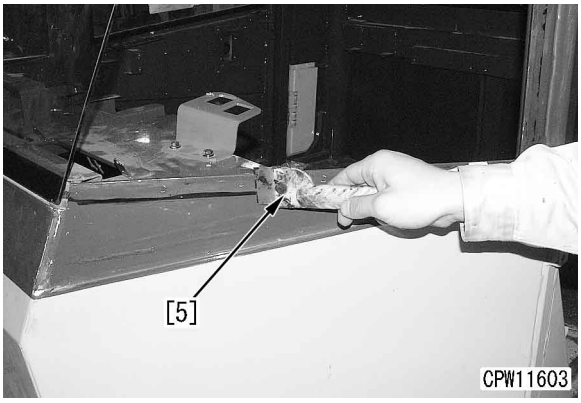
11. Remove the air conditioner unit undercover.
    ★ Part **A**



INSTALLATION

1. Using a knife and scraper [5], remove the remaining adhesive and both-sided adhesive tape from the metal sheets (glass sticking surfaces) of the operator's cab.
   ★ Remove the adhesive and both-sided adhesive tape to a degree that they will not affect adhesion of the new adhesive. Take care not to scratch the painted surfaces. (If the painted surfaces are scratched, adhesion will be lowered.)

   (The figure shows the operator's cab of a wheel loader.)

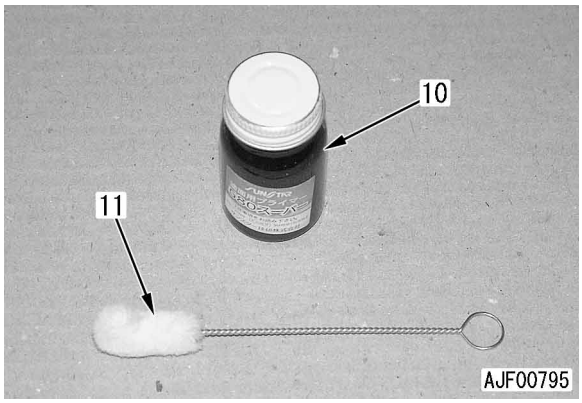


2. Remove oil, dust, dirt, etc. from the sticking surfaces of cab (8) and window glass (9) with white gasoline.
   ★ If the sticking surfaces are not cleaned well, the glass may not be stuck perfectly.
   ★ Clean the all black part on the back side of the window glass.
   ★ After cleaning the sticking surfaces, leave them for at least 5 minutes to dry.

   (The figure shows the operator's cab of a wheel loader.)

3. Apply primer (10).
   ★ The using limit of primer (10) is 4 months after the date of manufacture. Do not use primer (10) after this limit.
   ★ Use the primer within 2 hours after unpacking it.
   ★ Even if the primer is packed again just after it is unpacked, use it within 24 hours after it is unpacked for the first time. (Discard the primer 24 hours after it is packed.)

   1) Stir the primers for paint and glass sufficiently before using them.
      ★ If the primer has been stored in a refrigerator, leave it at the room temperature for at least half a day before stirring it. (If the primer is unpacked just after taken out of the refrigerator, water will be condensed. Accordingly, leave the primer at the room temperature for a sufficient time.)
   2) When reusing primer brush (11), wash it in white gasoline.
      ★ After washing the brush, check it again for dirt and foreign matter.
      ★ Prepare respective brushes for the paint primer glass primer.



INSTALLATION

- Carry out installation in the reverse order to removal.

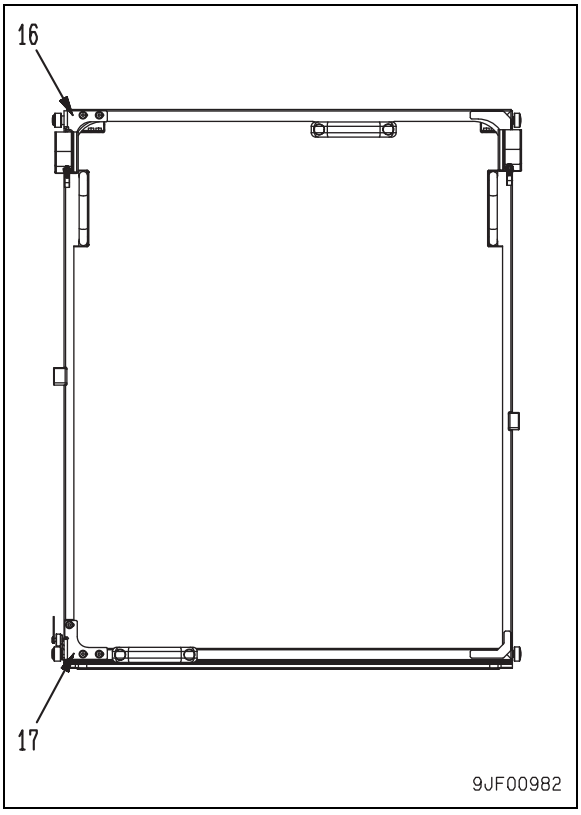
[*1] [*2]

- Adjust opening and closing of the front window assembly according to the following procedure.

1. Open and close the front window to check that it does not interfere with the rails and the rollers are not hitch.

2. If there is any problem in opening or closing of the front window, loosen the mounting bolts of roller adjustment brackets (16) and (17) and adjust the condition of the front window, and then tighten the mounting bolts again.

   Mounting bolt: **9.8 Nm {1.0 kgm}**



3. Raise the front window assembly and fix it with the rear locks (on both sides).
   ★ Check that the locks in the rear of the operator's cab are applied securely.

4. Install right corner block (3) and fix right corner block bracket (7) with right striker bolt (5).
   ★ Tighten the striker bolt securely after adjusting it in step 6.
   ★ Install the right corner block so that there will be no level difference at part "**a**".
   ★ Install the right corner block so that level difference "**b**" between the rail and right corner block (3) will be 0 – 1.0 mm. Check that the right corner block is not projected from the rail at the rolling surface of the roller.
   ★ Secure roller clearance "**c**" at part **P**.