SHOP MANUAL

KOMATSU

PC750-6
PC800-6

MACHINE MODEL	SERIAL NUMBER
PC750-6	**10001 and up**
PC750SE-6	**10001 and up**
PC750LC-6	**10001 and up**
PC800-6	**30001 and up**
PC800SE-6	**30001 and up**

- This shop manual may contain attachments and optional equipment that are not available in your area. Please consult your local Komatsu distributor for those items you may require. Materials and specifications are subject to change without notice.
- PC750, 800-6 mount the SAA6D140-2 engine.
  For details of the engine, see the 6D140-2 Series Engine Shop Manual.

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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

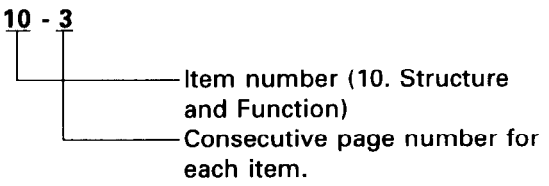
These various volumes are designed to avoid duplicating the same information. Therefore, to deal with all repairs for any model , it is necessary that chassis, engine, electrical and attachment volumes be available.

DISTRIBUTION AND UPDATING

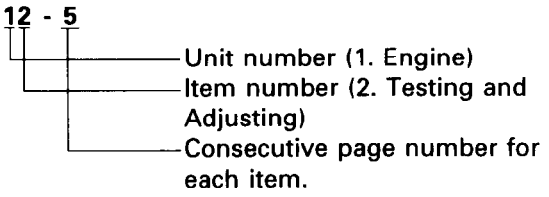
Any additions, amendments or other changes will be sent to KOMATSU distributors. Get the most up-to-date information before you start any work.

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):



   Example 2 (Engine volume):



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



REVISED EDITION MARK

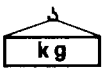
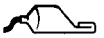
When a manual is revised, an edition mark (①②③....) is recorded on the bottom of the pages.

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 Ⓐ, then draw a horizontal line from Ⓐ.
   (2) Locate the number 5 in the row across the top, take this as Ⓑ, then draw a perpendicular line down from Ⓑ.
   (3) Take the point where the two lines cross as Ⓒ. This point Ⓒ 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.

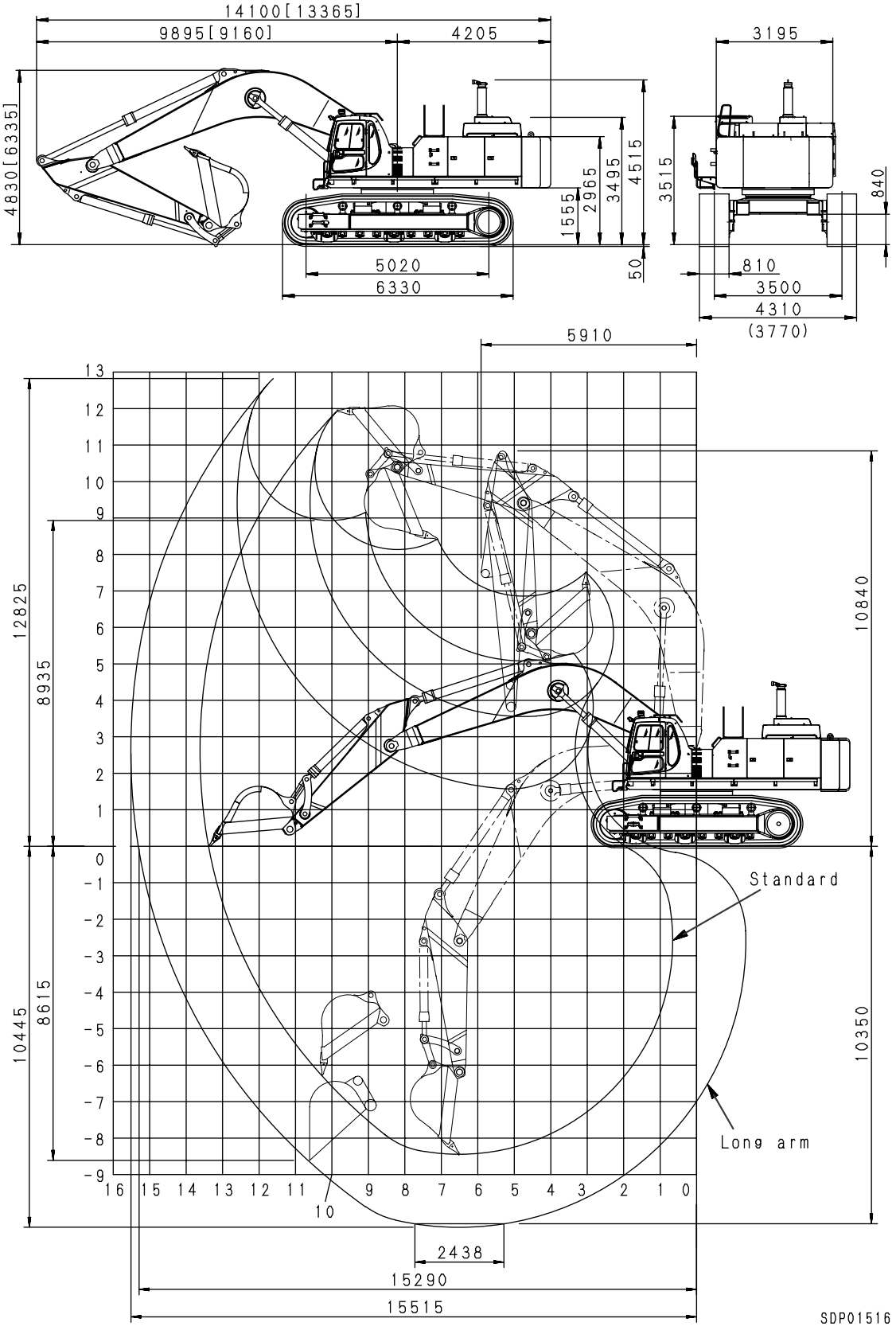
Millimeters to inches

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
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

PC750LC-6

Unit: mm



★ The figures in ( ) show the value when the track width is reduced.
★ The figures in [ ] show the value for the long arm specification.

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LOADING SHOVEL

Machine model				PC750-6
Serial Number				10001 – 10238
Bucket capacity			m^3	3.8
Weight of machine			kg	74,435
Performance	Working ranges	Max. digging depth	mm	3,455
		Max. vertical wall depth	mm	–
		Max. digging reach	mm	9,960
		Max. reach at ground level	mm	9,595
		Max. digging height	mm	10,565
		Max. dumping height	mm	6,825
	Max. digging force		kN {kg}	431.5 {44,000}
	Swing speed		rpm	5.7
	Swing max. slope angle		deg.	14
	Travel speed		km/h	Low speed: 2.7 High speed: 4.2
	Gradeability		deg.	35
	Ground pressure (standard double grouser shoe width: 710 mm)		kPa {kg/cm^2}	101.99 {1.04}
Dimensions	Overall length		mm	9,760
	Overall width		mm	–
	Overall width of track (when extended)		mm	3,490 (4,210)
	Overall height		mm	5,375
	Overall height to top of machine		mm	4,490
	Ground clearance of upper structure		mm	1,555
	Min. ground clearance		mm	840
	Tail swing radius		mm	4,300
	Min. swing radius of work equipment		mm	5,940
	Height of work equipment at min. swing radius		mm	6,925
	Length of track on ground		mm	4,500
	Track gauge (when extended)		mm	2,780 (3,500)
	Height of machine cab		mm	3,495

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WEIGHT TABLE

⚠ This weight table is a guide for use when transporting or handling components

BACK HOE

Unit: kg

Machine model	PC750-6	PC750SE-6	PC750LC-6
Serial Number	10001 – 10238	10001 – 10238	10001 – 10238
Engine assembly	2,347	2,347	2,347
• Engine	1,475	1,475	1,475
• PTO (incl. lubricating piping)	500	500	500
• No. 1 pump	198	198	198
• No. 2 pump	156	156	156
• Control, PTO lubrication pump	18	18	18
Radiator assembly	260	260	260
Oil cooler assembly	200	200	200
Hydraulic tank (excl. hydraulic oil)	474	474	474
Revolving frame (incl. left and right decks)	6,340	6,340	6,340
Operator's cab	290	290	290
Swing machinery	900	900	900
Swing motor assembly	85	85	85
Travel motor assembly	145 x 2	145 x 2	145 x 2
L.H. 5-spool control valve	245	245	245
R.H. 4-spool control valve	240	240	240
Center swivel joint	69	69	69
Counterweight	9,000	9,000	9,000
Track frame assembly	19,546	19,546	19,970
• Center frame	5,200	5,200	5,200
• Track frame	2,630 x 2	2,630 x 2	2,820 x 2
• Carrier roller	71.5 x 6	71.5 x 6	71.5 x 6
• Track roller	136 x 16	136 x 16	136 x 18
• Idler cushion assembly	782 x 2	782 x 2	782 x 2
• Idler	450 x 2	450 x 2	450 x 2
• Final drive assembly	1,341 x 2	1,341 x 2	1,341 x 2
• Swing circle assembly	1,335	1,335	1,335

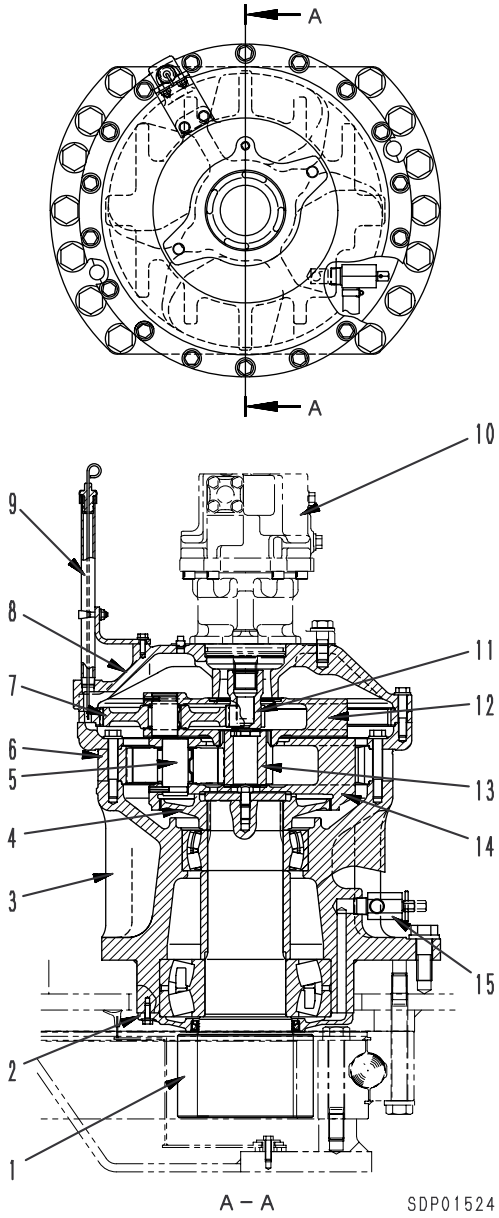
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FUEL, COOLANT AND LUBRICANTS

RESERVOIR	KIND OF FLUID	AMBIENT TEMPERATURE -22 -4 14 32 50 68 86 104°F -30 -20 -10 0 10 20 30 40°C	CAPACITY (ℓ)	
			Specified	Refill
Engine oil pan	Engine oil	SAE 30 SAE 10W SAE 10W-30 SAE 15W-40	38	32
PTO case	Engine oil	SAE 30 SAE 10W	13.5	13.5
Swing machinery case	Engine oil	SAE 30	30	30
Final drive case (each side)	Engine oil	SAE 30	20	20
Hydraulic system	Engine oil	SAE 10W	800	440
Idler (1 each)	Gear oil	GO 140B	0.55	—
Track roller (1 each)	Gear oil	GO 140B	0.42	—
Carrier roller (1 each)	Gear oil	GO 140B	0.62	—
Fuel tank	Diesel fuel	ASTM D975 No. 2 ASTM D975A No.1	880	—
Cooling system	Coolant	Add antifreeze	85	—

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SWING MACHINERY



1. Swing pinion (No. of teeth: 12)
2. Cover
3. Case
4. Coupling
5. No. 2 planet gear (No. of teeth: 32)
6. No.2 ring gear (No. of teeth: 83)
7. No. 1 ring gear (No. of teeth: 83)
8. Cover
9. Dipstick
10. Swing motor
11. No. 1 sun gear (No. of teeth: 23)
12. No. 1 planetary carrier
13. No. 2 sun gear (No. of teeth: 17)
14. No. 2 planetary carrier
15. Drain plug

Specification

Reduction ratio: $\frac{23 + 190}{23} \times \frac{17 + 83}{17}$

$= 54.4757$

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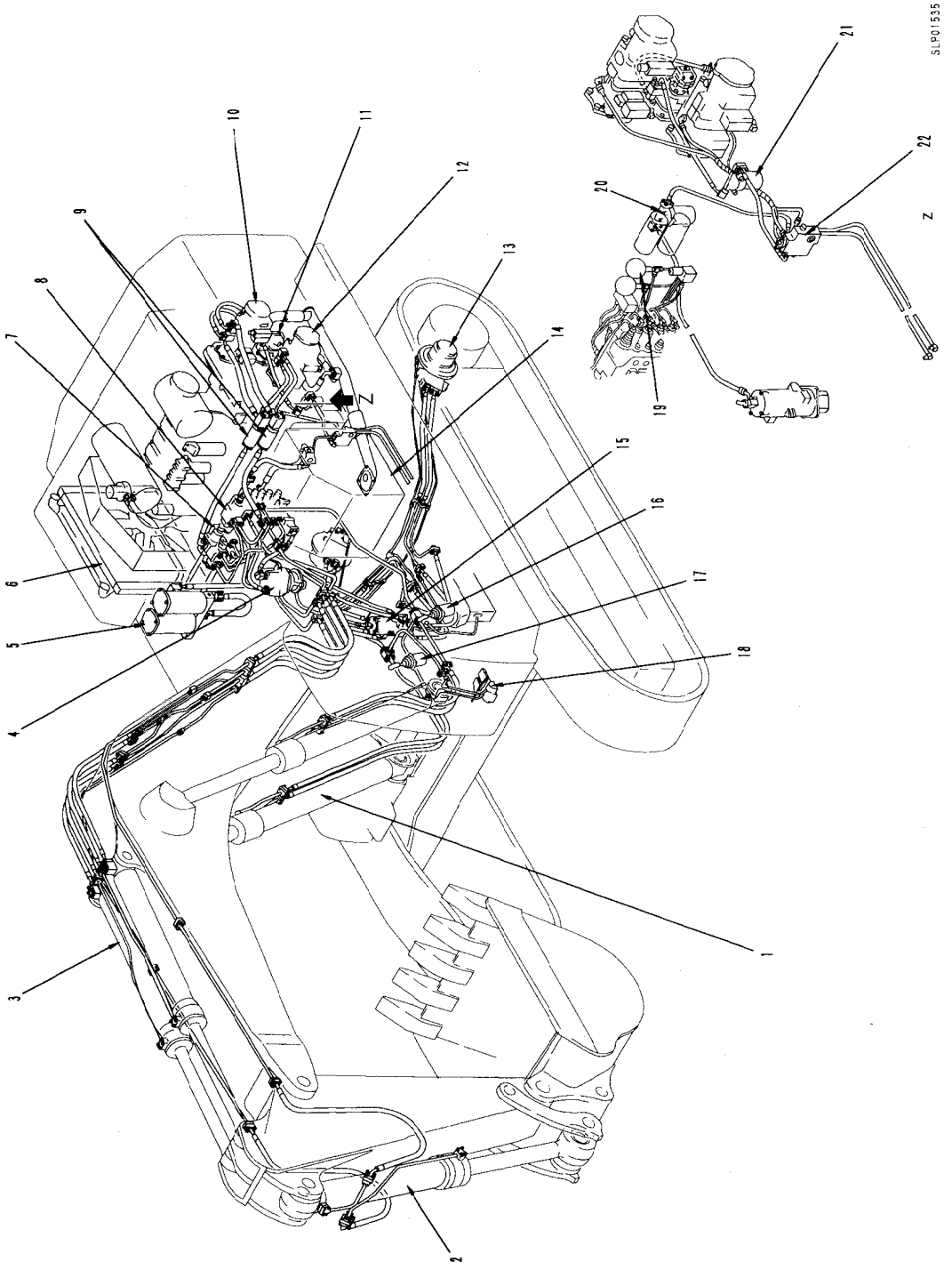
HYDRAULIC PIPING DRAWING

BACK HOE

PC750, PC750SE, PC750LC-6 Serial No.: 10001 – 10238

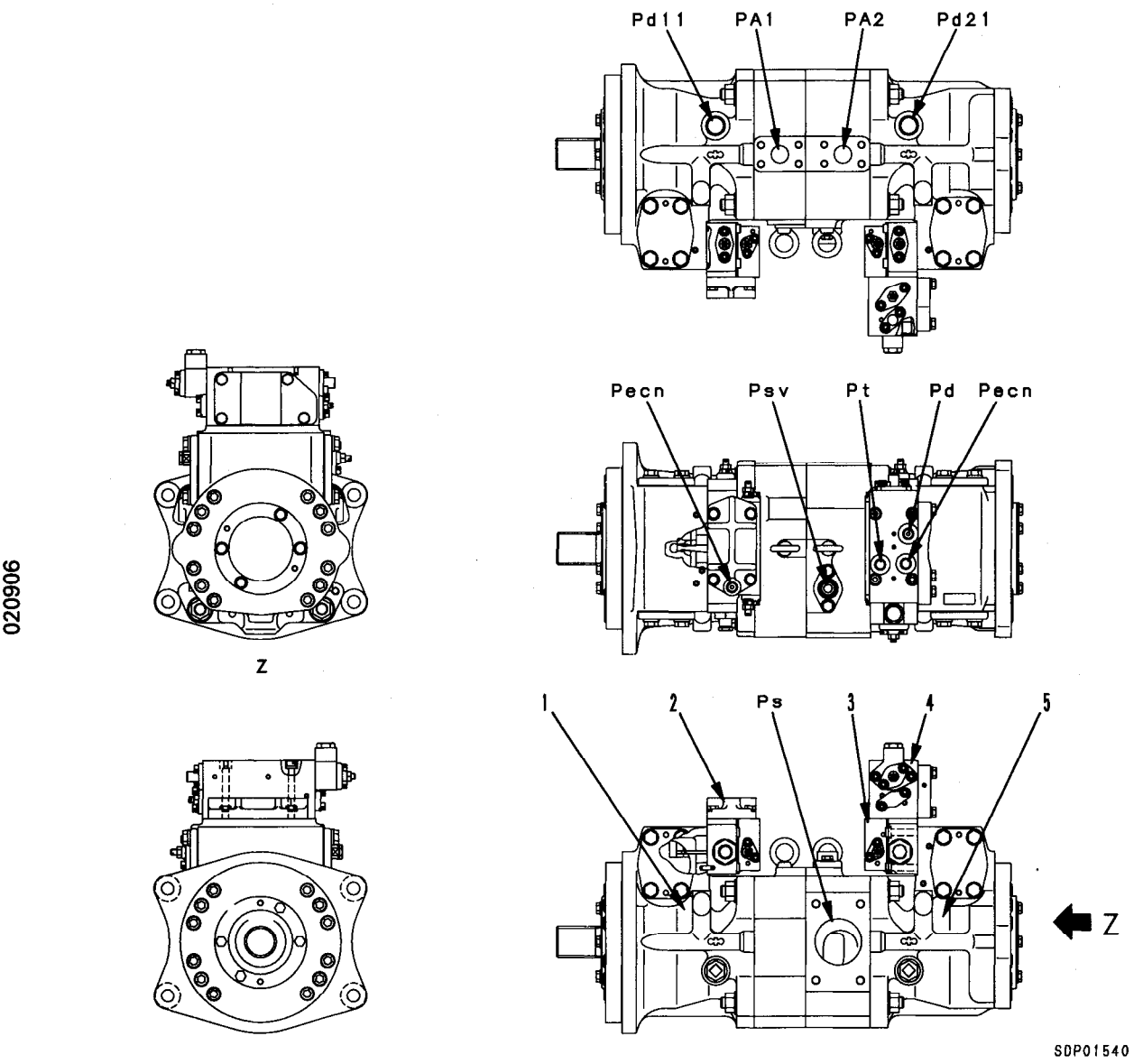
PC800, PC800SE-6 Serial No.: 30001 – 30174

★ For details of this page, see page 90-3.



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- **No. 2 pump**
  HPV95+95



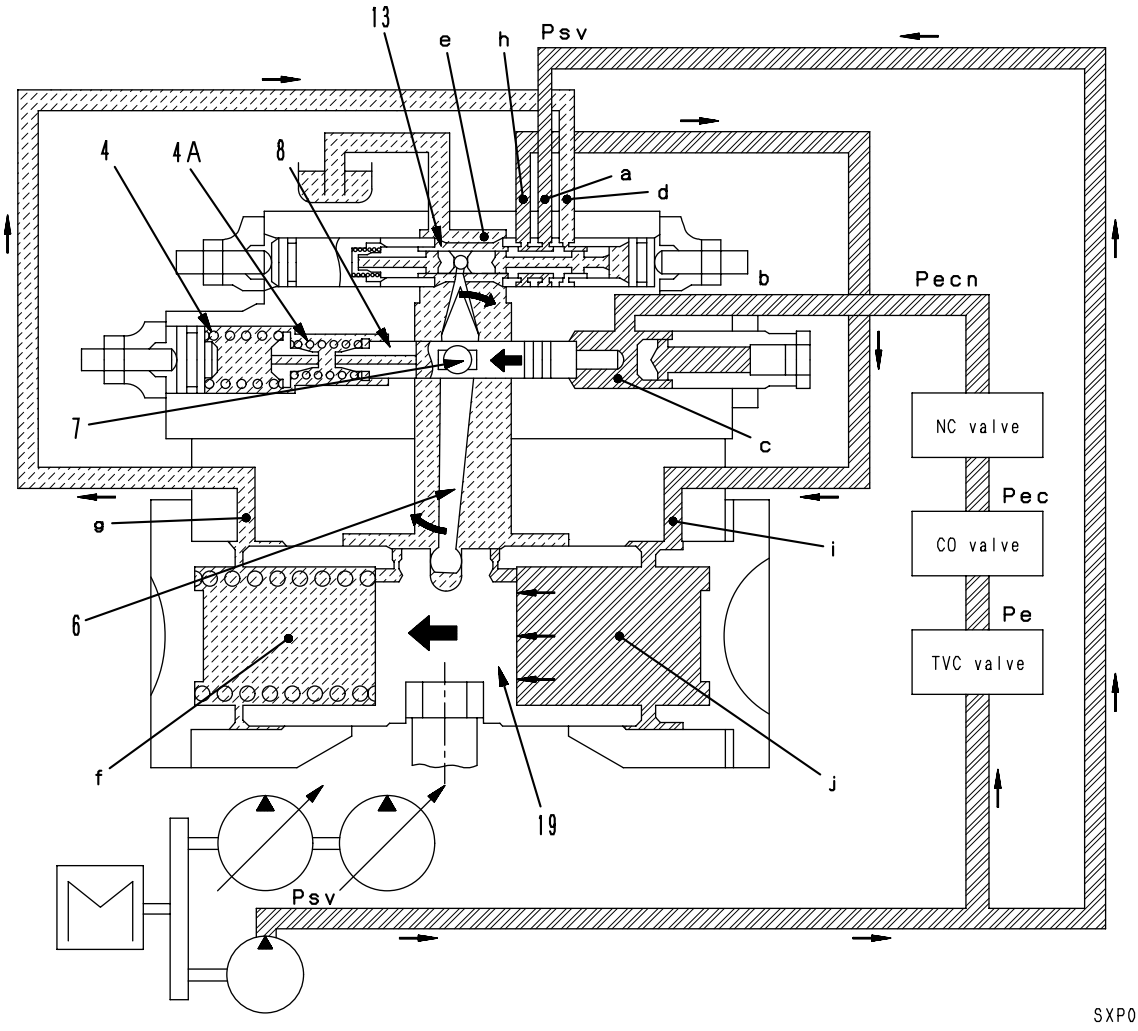
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1. Front pump
2. Front servo valve
3. Rear servo valve
4. NC valve
5. Rear pump

PA1. Discharge port
PA1. Discharge port
PA2. Discharge port
Ps. Suction port
Pt. Jet sensor upstream pressure IN port
Pd. Jet sensor downstream pressure IN port
Psv. Servo basic pressure supply port
Pecn. CO, NC valve output pressure detection port
Pd11. Drain port
Pd21. Drain port

Operation

1) Operation in direction of increase of pump discharge amount (max. angle)



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- The control pump pressure **Psv** is taken to port **a**.
  Signal pressure **Pecn** from the NC valve is taken from port **b** to chamber **c**.
- When signal pressure **Pecn** rises, control piston (8) is pushed to the left by the hydraulic pressure in chamber **c**, and stops at a point where it balances the pressure of springs (4) and (4A).
  At the same time, arm (6) uses servo piston (19) as a fulcrum and sways to the left in the same way as control piston (8). This moves guide spool (13) to the left.
- When guide spool (13) moves, port **a** and port **d** are closed and port **d** is connected to drain chamber **e**. As a result, servo piston chamber **f** is also interconnected with chamber **e** through port **g** and port **d**.
  At the same time, port **a** is interconnected with port **h**, so the oil flows through port **i** to servo piston chamber **j**, pushes servo piston (19) to the left, increases the swash plate angle in the main piston pump and increases the pump discharge amount.
- When servo piston (19) moves, arm (6) rotates clockwise with its center at pin (7). Guide spool (13) is moved to the right and closes port **a**, port **d** and port **h**, so the discharge increases by an amount that matches signal pressure **Pecn**.

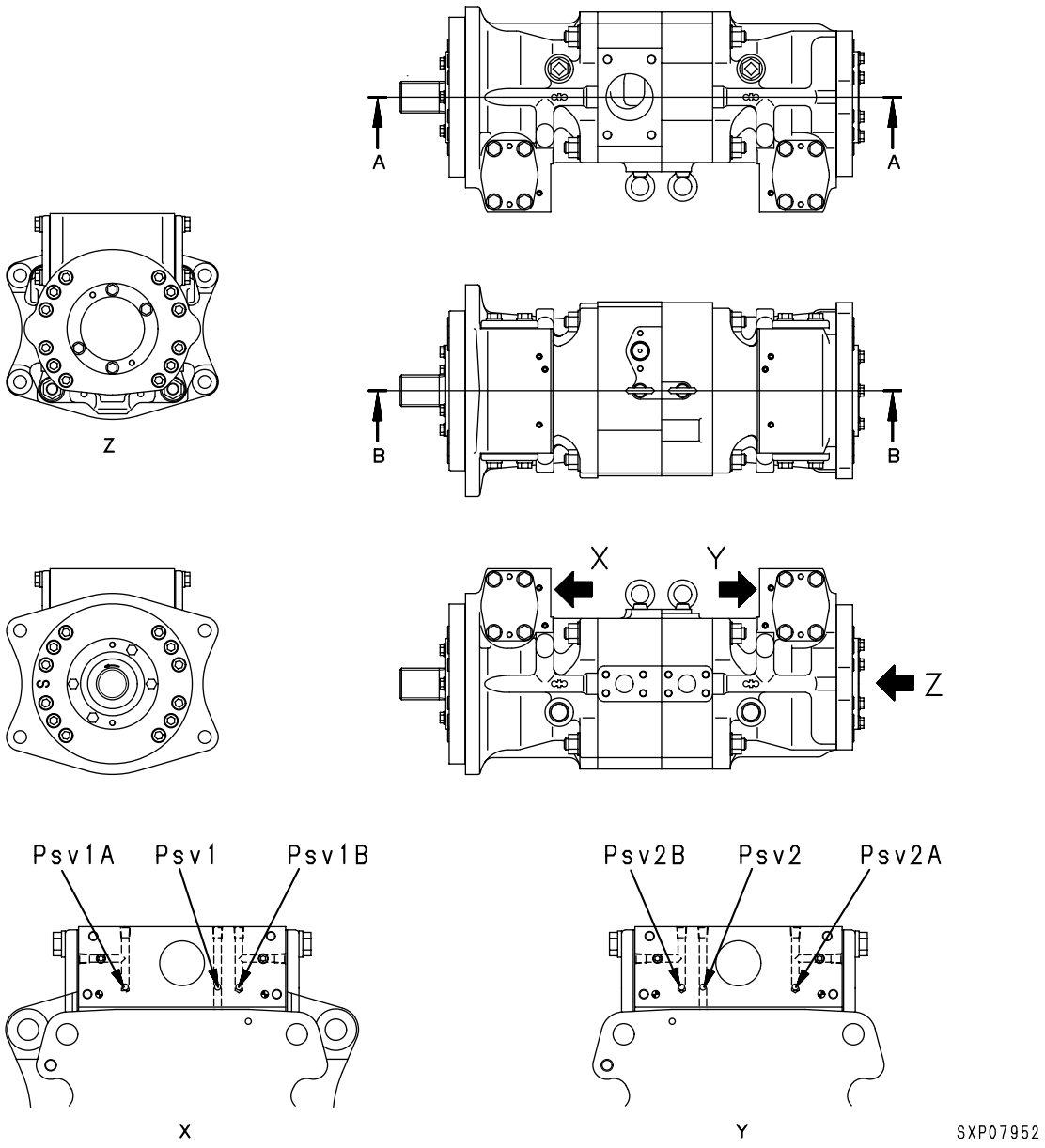
CO valve
1. Plug
2. Piston
3. Spring
4. Spool
5. Piston
6. Plug

NC valve
7. Plug
8. Sleeve
9. Piston
10. Spool
11. Spring
12. Plug

PA1I : Main pump pressure IN port
PA1o : Main pump pressure OUT port
PA2I : Main pump pressure IN port
PA2o : Main pump pressure OUT port
Pe1 : TVC valve output pressure front, rear interconnection port
Pe2 : TVC valve output pressure IN port
Pc : CO selector pilot port
Pd : Jet sensor downstream pressure IN port
Pt : Jet sensor upstream pressure IN port
Pdr1 : TVC valve drain IN port
Pdr2 : CO, NC valve drain OUT port
Psv1 : Servo basic pressure IN port
Psv2 : Servo basic pressure OUT port
Pecn : CO, NC valve output pressure OUT port

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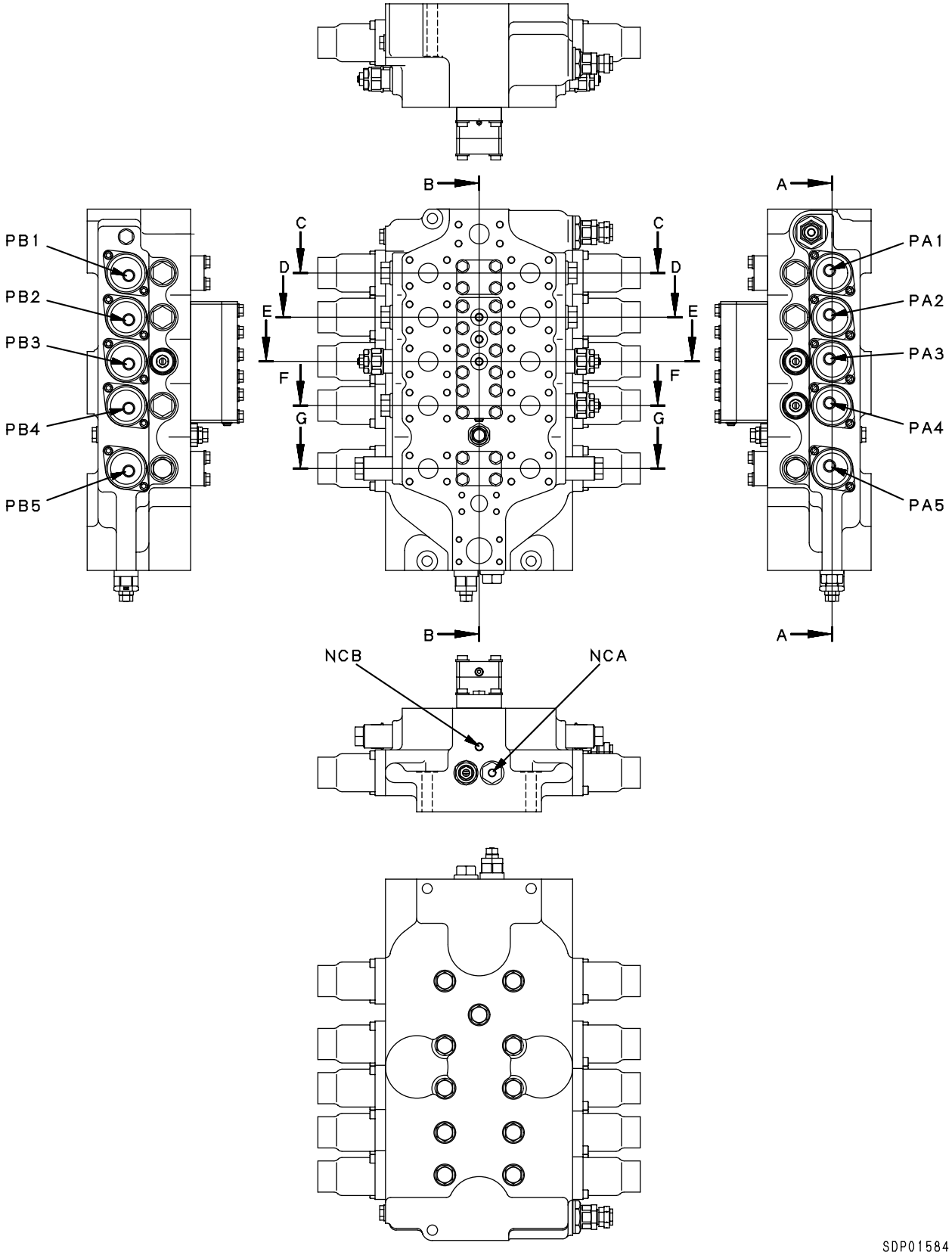
PC750, PC750SE, PC750LC-6 Serial No.: 10239 and up
PC800, PC800SE-6 Serial No.: 30175 and up



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Psv1 : Servo valve basic pressure port
Psv1A : Servo piston output pressure port
Psv1B : Servo valve output pressure port
Psv2 : Servo valve basic pressure port
Psv2A : Servo piston output pressure port
Psv2B : Servo valve output pressure port

L.H. 5-SPOOL CONTROL VALVE

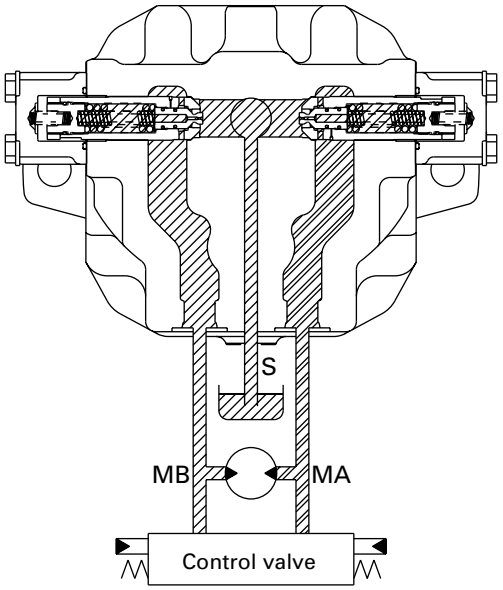


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SUCTION-SAFETY VALVE

Function

- When the swing is stopped, the outlet port circuit of the motor is closed by the control valve, but the motor continues to be turned by the inertia of the swing. As a result, the pressure at the outlet port of the motor becomes abnormally high and there is danger that the motor will be damaged.
- The safety valve is installed to prevent this problem. It acts to release the abnormally high pressure oil from the outlet port of the motor and send it to port **S**. At the same time, it also functions as a swing brake.
- The suction valve supplies an amount of oil equivalent to the amount of oil released by the safety valve. It sends this oil from port **S** to the inlet port of the motor to prevent any cavitation.



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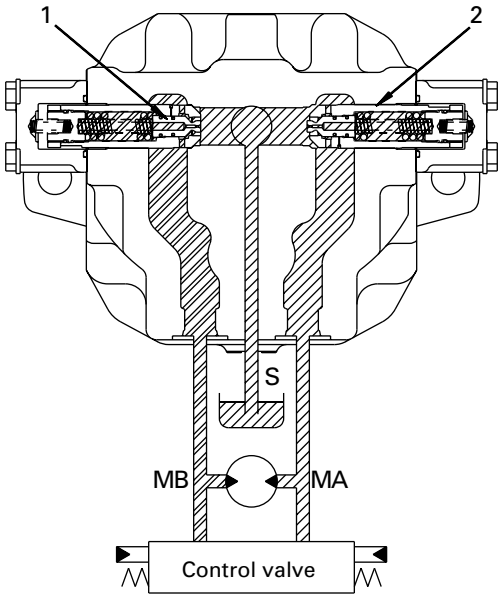
Operation

1. **When starting swing**

- If the swing control lever is operated to swing to the right, the pressurized oil from the pump passes through the control valve and it supplied to port **MA**.
- When this happens, the pressure at port **MA** rises and the starting force is generated in the motor, so the motor starts to turn.
  The oil from the outlet port of the motor flows from port **MB** through the control valve and returns to the tank.

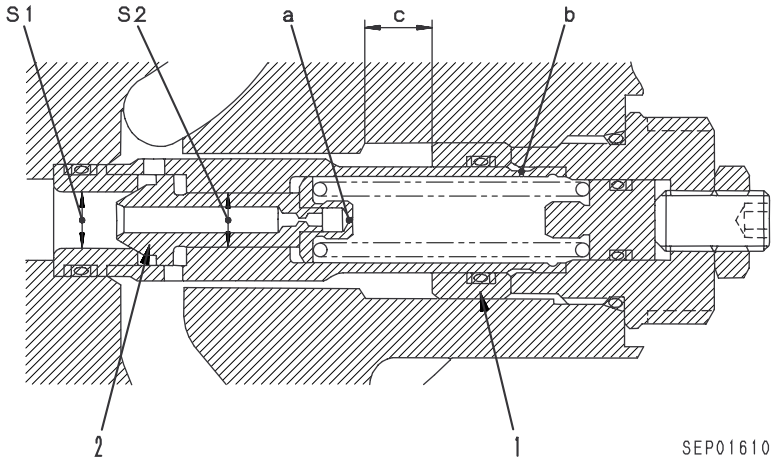
2. **When stopping swing**

- When the swing control lever is returned to the neutral position, no more pressurized oil is supplied from the pump to port **MA**.
  At the same time, the oil from the outlet port of the motor returns from the control valve to the tank, and the circuit is closed.
- The pressure at port **MB** rises, and rotating resistance to the motor is generated, so the brake starts to take effect.
  If the pressure at port **MB** rises to the set pressure of safety valve (1), safety valve (1) opens and releases the pressurized oil at port **MB** to port **S**.
- No pressurized oil is supplied at port **MA**, but the swing continues, so negative force is generated.
  When this negative pressure drops to the set pressure of suction valve (2), suction valve (2) opens and oil is supplied from port **S** to prevent cavitation.



SAP00246

1-4 Relief valve



1. Shockless piston
2. Poppet
a. Poppet orifice
b. Relief housing orifice
c. Piston stroke

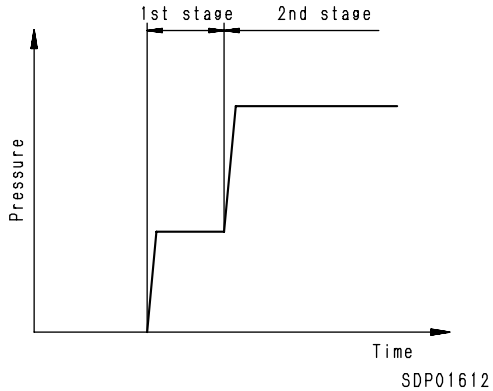
Function
In addition to the pressure control function, this relief valve has a shockless function (2-stage pressure increase function). This acts to reduce the shock generated at the beginning when the speed is reduced (when the machine is stopped).

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Operation
1) When relief valve starts to be actuated (1st stage)
   The area receiving the pressure which lifts poppet (2) becomes area **S1** of the poppet seat.
   For this reason, it has a much larger pressure-receiving area than the pressure-receiving area when it is set (**S1** – **S2**), so the relief actuating pressure becomes a low pressure of approx. 15.7 MPa {160 kg/cm²}.
   This condition is maintained until the movement of shockless piston (1) is completed (approx. 0.25 sec).

2) When movement of shockless piston is completed (2nd stage)
   The pressure in the relief valve spring chamber rises, the pressure on both sides of poppet (2) becomes the same, and it becomes the specified set pressure.

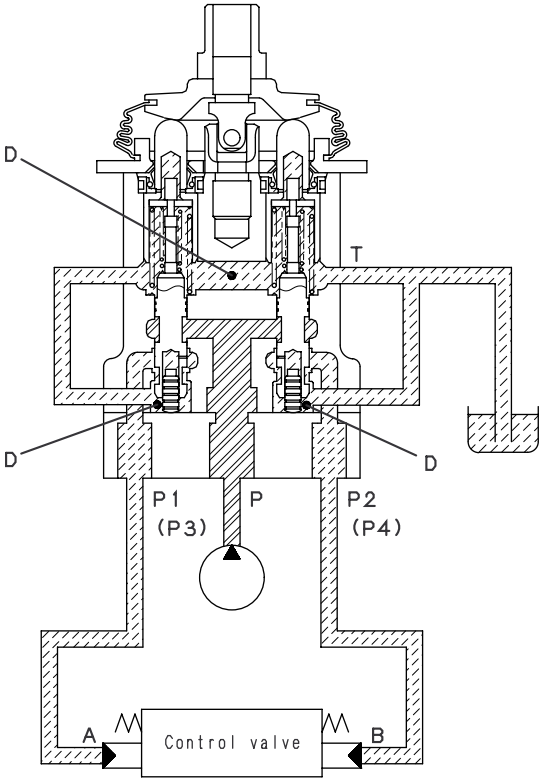
   ★ Set pressure and amount of adjustment
   Amount of adjustment for one turn:
   Approx. 7.8 MPa {80 kg/cm²}



Operation

1) At neutral

Ports **A** and **B** of the control valve and ports **P1**, **P2**, **P3**, and **P4** of the PPC valve are connected to drain chamber **D** at the bottom. (Fig. 1)



(Fig1) SDP01633

2) Fine control (neutral → fine control)

When piston (4) starts to be pushed by disc (5), retainer (9) is pushed. Spool (1) is also pushed by metering spring (2) and moves down.

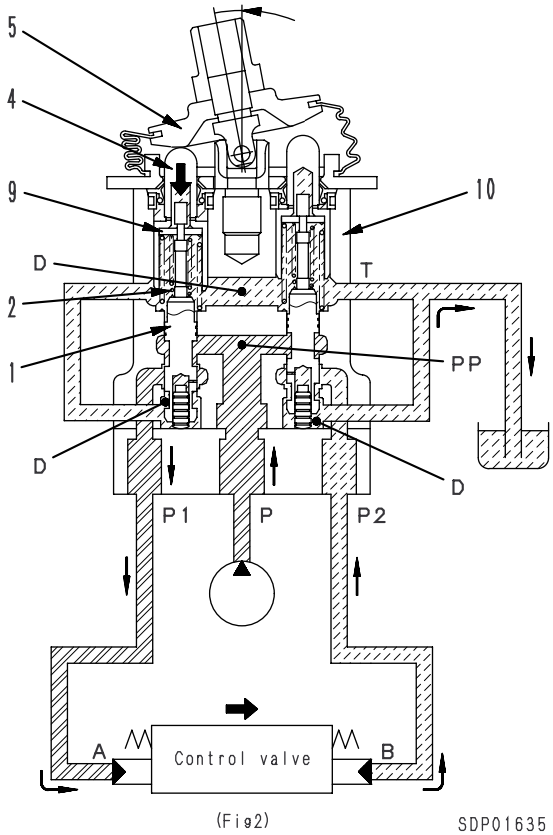
When this happens, port **P1** is shut off from drain chamber **D**. At almost the same time, it is connected to pump pressure chamber **PP**, and the pilot pressure of the control pump is sent from port **P1** to port **A**.

When the pressure at port **P1** rises, spool (1) is pushed back. Fine control hole f is shut off from pump pressure chamber **PP**. At almost the same time, it is connected to drain chamber **D**, so the pressure at port **P1** escapes.

As a result, spool (1) moves up and down until the force of metering spool (2) is balanced with the pressure of port **P1**.

The relationship of the positions of spool (1) and body (10) does not change until retainer (9) contacts spool (1).

Therefore, metering spring (2) is compressed in proportion to the travel of the control lever, so the pressure at port **P1** also rises in proportion to the travel of the control lever. In this way, the spool of the control valve moves to a position where the pressure of chamber **A** (same as pressure at port **P1**) and the force of the return spring of the control valve spool are balanced. (Fig. 2)

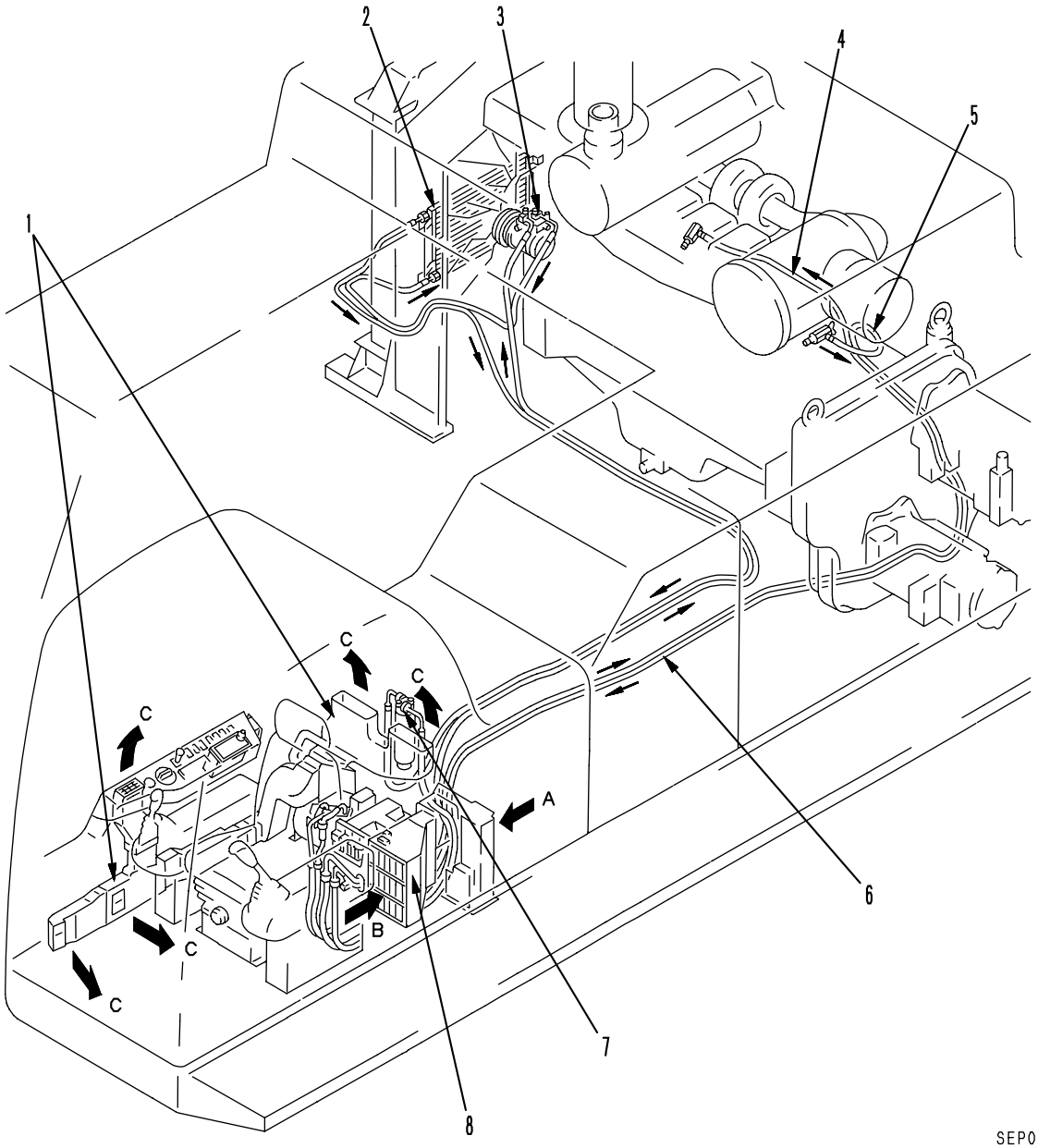


(Fig2) SDP01635

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AIR CONDITIONER

AIR CONDITIONER PIPING
STD CAB SPECIFICATION

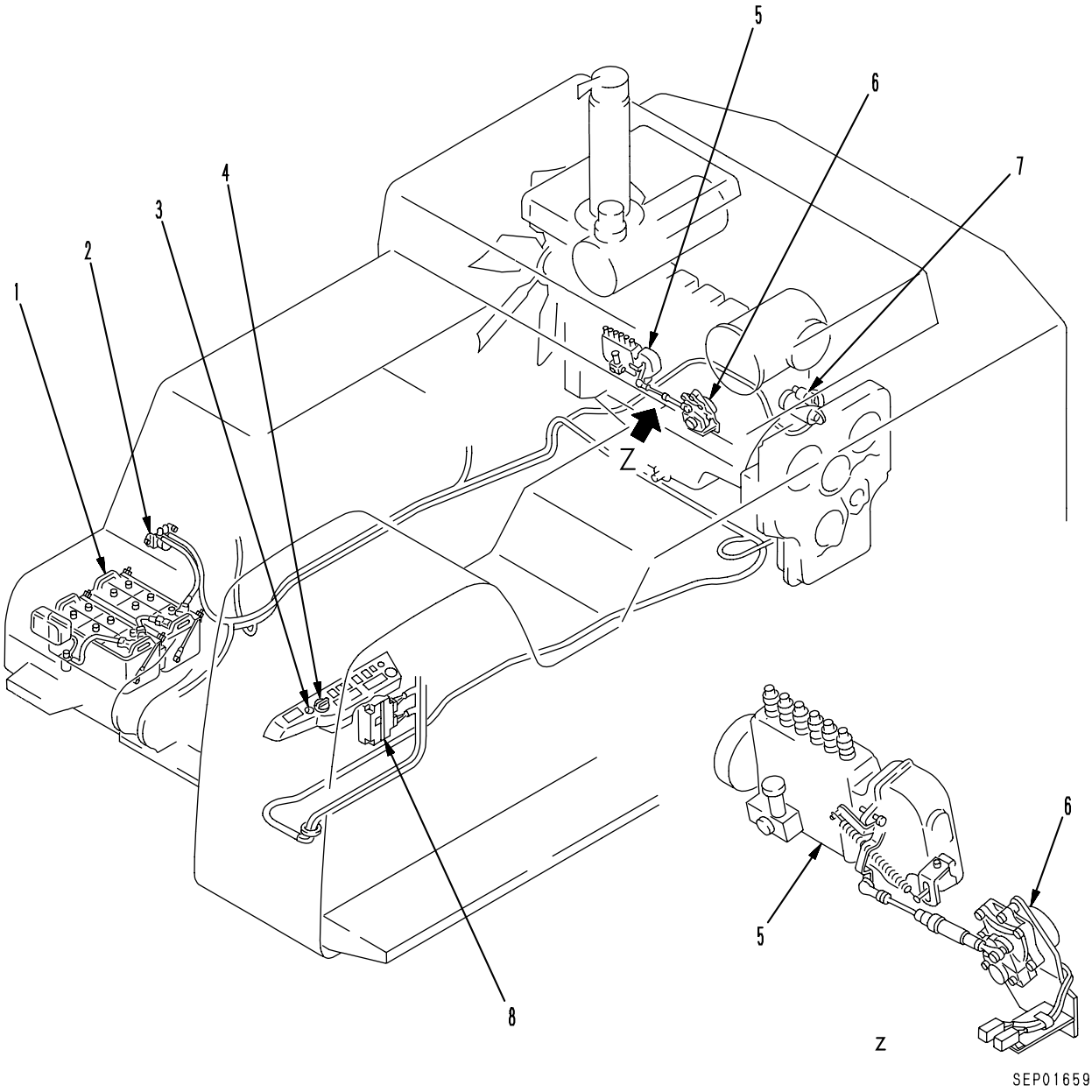


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1. Duct
2. Condenser
3. Air conditioner compressor
4. Hot water return piping
5. Hot water pickup piping
6. Refrigerant piping
7. Receiver tank
8. Air conditioner unit

A. Fresh air
B. Recirculated air
C. Hot air/cold air

ENGINE CONTROL



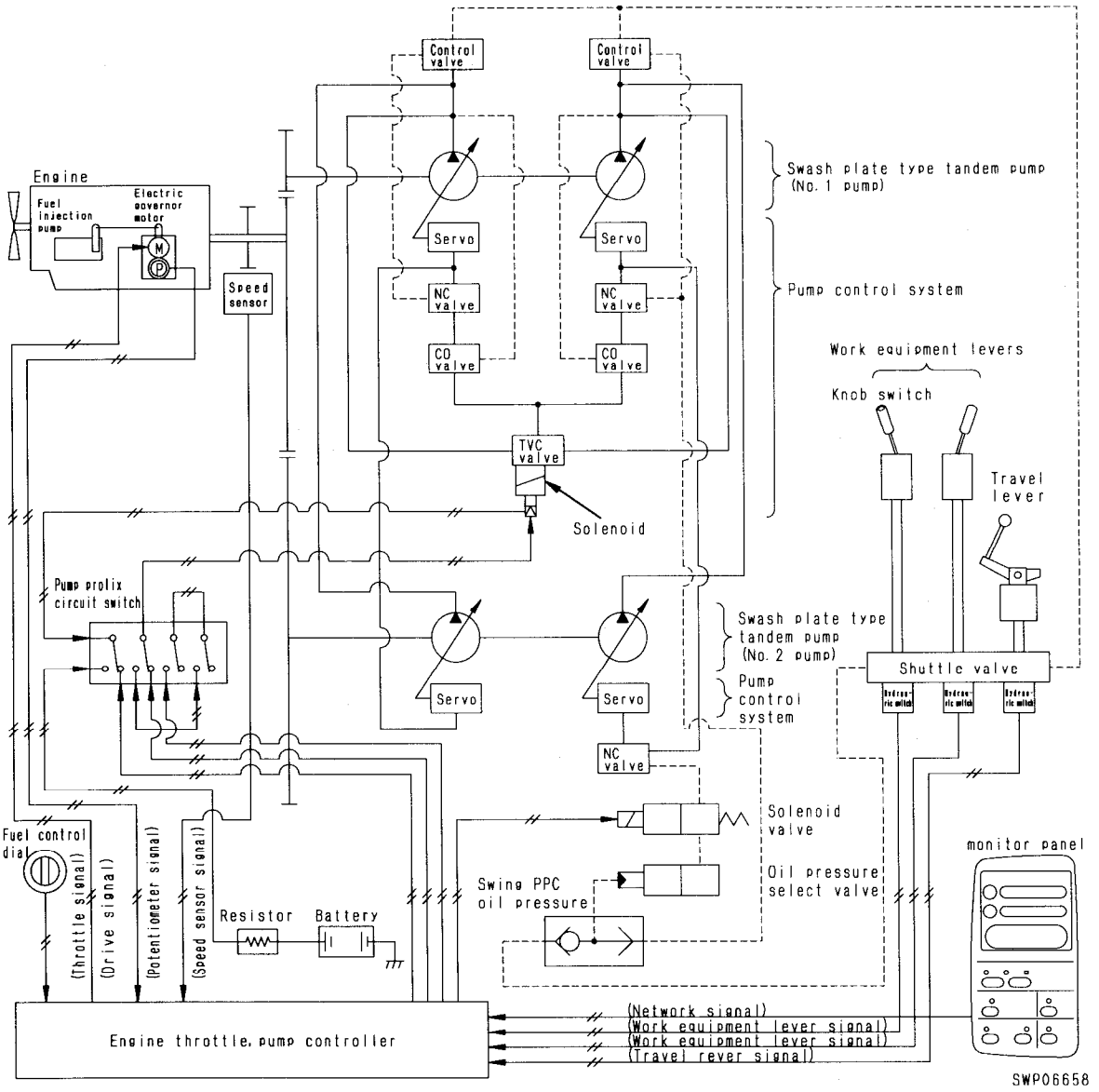
020906

1. Battery relay
2. Battery
3. Starting switch
4. Fuel control dial
5. Fuel injection pump
6. Governor motor
7. Starting motor
8. Engine throttle, pump controller

Function

- The engine can be started and stopped simply by using starting switch (3).
- A dial-type engine control is used to control the engine speed. Engine throttle and pump controller (8) receives the control signal from fuel control dial (4), sends a drive signal to governor motor (6), and controls the angle of the governor lever in fuel injection pump (5).

2. Electronic OLSS function
Pump control system



020906

- Interconnected control of all pumps is carried out by one TVC valve.
- DH mode: Total horsepower control by engine speed sensing
  H mode: Total horsepower control by engine speed sensing
  G Mode: Constant torque control
- Prolix circuit: Absorption torque equivalent to G mode

2) Swing speed limit function
- The pump discharge flow is large, so if all the oil for the work equipment flows to the swing circuit, the swing motor will overrun. To prevent this, a swing speed limit function is provided.

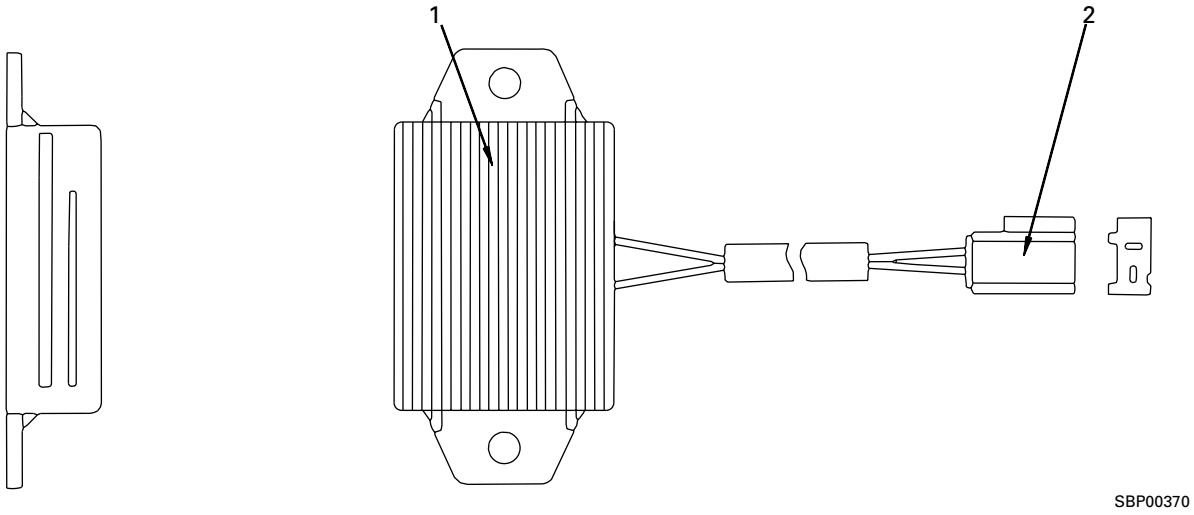
Actuation

Conditions	Speed limit solenoid valve	Swing pilot pressure	Swing speed limit	Control of P2R pump
1) When swing is operated independently 2) When swing speed goes above 5.6 rpm or goes below 2.5 rpm 3) When swing sensor itself is broken or wiring is disconnected (safety software)	OFF (De-energized)	1.5 MPa {15 kg/cm²} or more	Yes	Min. discharge amount
		1.5 MPa {15 kg/cm²} or less	No	Normal OLSS control
1) When swing is not being operated 2) Any case other than above [When below 5.6 rpm even during compound operations with swing]	ON (Excited)	1.5 MPa {15 kg/cm²} or more	Yes	Normal OLSS control
		1.5 MPa {15 kg/cm²} or less	No	Normal OLSS control

★ A pilot selector valve (switching pressure: 1.5 MPa {15 kg/cm²}) is provided to carry out control of the pump discharge amount when the swing lever is partially operated and to reduce the overall flow to prevent any drop in the overall speed.

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3) TVC prolix resistor



1. Resistor
2. Connector

020906

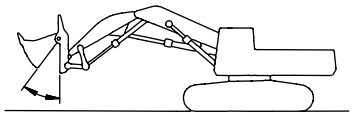
Specification
Resistance: 30 Ω

Function
- This resistor acts to allow a suitable current to flow to the TVC solenoid when the TVC prolix switch is ON.
- No current flows when the TVC prolix switch is OFF.

4) Fuel control dial, governor motor, engine throttle and pump controller
★ See ENGINE CONTROL.

5) Monitor panel
★ See MACHINE MONITOR SYSTEM.

6) TVC valve
★ See HYDRAULIC PUMP.

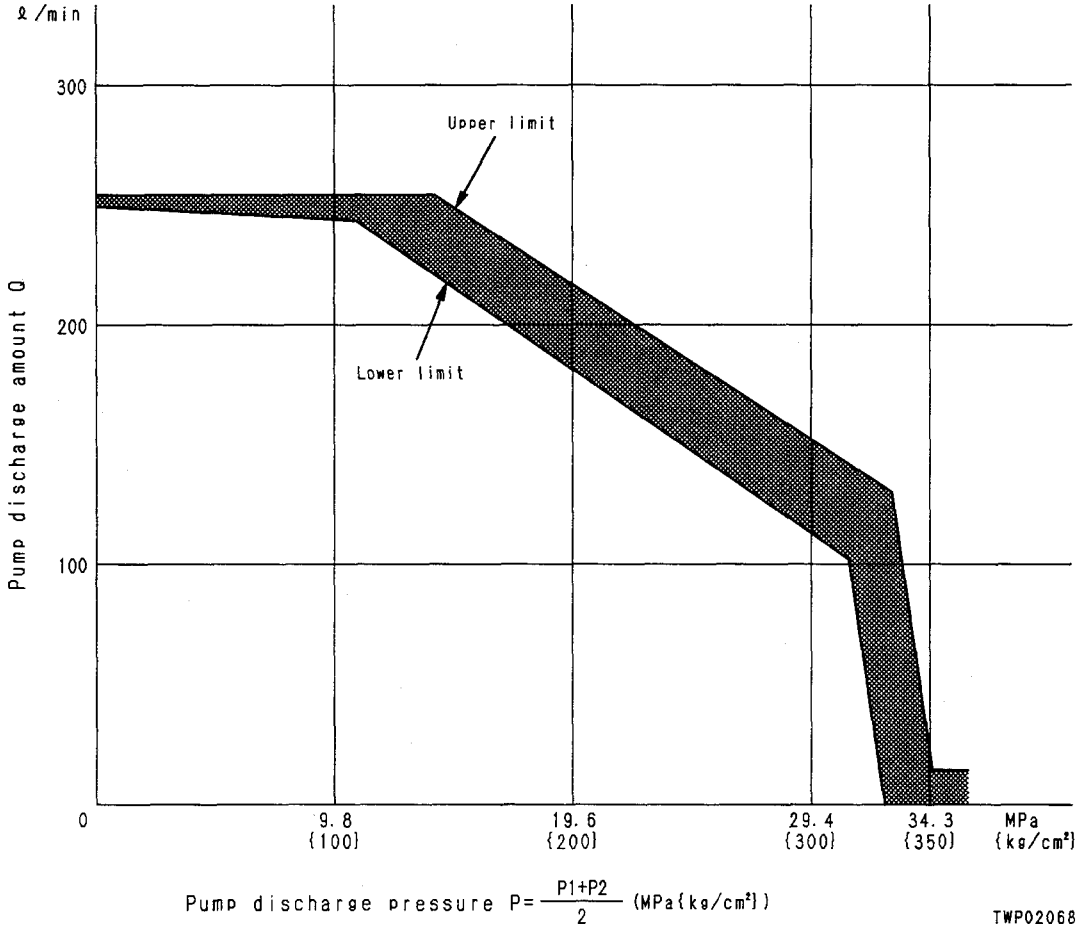
Applicable model					PC750-6 PC800-6			
Category		Item	Measurement conditions	Unit	Standard value for new machine		Service limit value	
					Back hoe	PC750-6 Loading shovel	Back hoe	PC750-6 Loading shovel
Work equipment	Time lag	Bottom dump	 TEP01129 · Time taken for bottom dump to move again when opereted from max. bottom open position to close position and stopped temporarily. · Engine at low idling · Hydraulic oil temperature: 45 – 55°C	sec	—	Max. 3	—	Max. 3
	Internal oil leakage	Cylinders	· Hydraulic oil temperature: 45 – 55°C · Hydraulic oil pressure: 31.4 ± 1.0 MPa {320 ± 10 kg/cm²}	cc/min	Max. 5	Max. 5	Max. 20	Max. 20
		Center swivel joint			Max. 10	Max. 10	Max. 100	Max. 100

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HPV95 + 95 (No.1 pump)
PC750-6 Serial No.: 10239 and up
PC800-6 Serial No.: 30175 and up

Category: Performance of hydraulic pump

PC750, 800-6: Discharge amount of one main piston pump (in H mode)



020906

- TVC current : 0.4A
- Pump speed: At 2,400 rpm (Engine rated speed at 1,800 rpm)

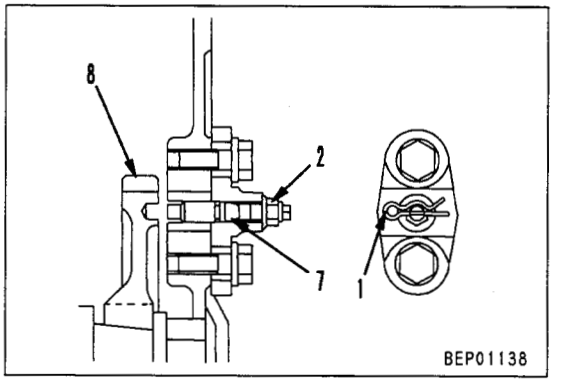
Check point	Test pump discharge pressure (MPa {kg/cm²})	Discharge pressure of other pump (MPa {kg/cm²})	Average pressure (MPa {kg/cm²})	Standard value for discharge amount Q (ℓ/min)	Judgement standard lower limit Q (ℓ/min)
As desired	P1	P2	$\frac{P1 + P2}{2}$	See graph	See graph

★ As far as possible, bring pump discharge pressure P1 and P2 as close as possible to the average pressure when measuring.
The error is large near the point where the graph curves, so avoid measuring at this point.
★ When measuring with the pump mounted on the machine, if it is impossible to set the engine speed to the specified speed with the fuel control dial, take the pump discharge amount and the engine speed at the point of measurement, and use them as a base for calculating the pump discharge amount at the specified speed.

<table>
<tr><th>Name of component</th><th>Connector No.</th><th>Inspection method</th><th>Judgment table</th><th>Measurement conditions</th></tr>
<tr><td>Alternator</td><td>Between alternator terminal R and chassis</td><td>Measure voltage</td><td>When engine is running (1/2 throttle or above)
→ 27.5 – 29.5 V
★ If the battery is old, or after starting in cold areas, the voltage may not rise for some time.</td><td>1) Start engine.</td></tr>
<tr><td rowspan="2">Gauges
(PC750-6 Serial No.: 10001 – 10238
PC800-6 Serial No.: 30001 – 30174)</td><td colspan="3">
<table>
<tr><th rowspan="2"></th><th colspan="2">Position of gauge display</th><th>Display level resistance kΩ (Monitor panel input resistance)</th></tr>
<tr><th colspan="2">Starting switch ON</th><th>Starting switch OFF</th></tr>
<tr><td rowspan="18">Measure coolant temperature gauge resistance C03 (female) ① – C03 (female) ⑯</td><td rowspan="18">Right side
↑
Display position
↓
Left side</td><td>All OFF (15)</td><td>Min. – Max.
– 0.646</td></tr>
<tr><td>14</td><td>0.575 – 3.420</td></tr>
<tr><td>13</td><td>3.156 – 3.708</td></tr>
<tr><td>12</td><td>3.422 – 3.804</td></tr>
<tr><td>11</td><td>3.512 – 3.900</td></tr>
<tr><td>10</td><td>3.600 – 4.125</td></tr>
<tr><td>9</td><td>3.807 – 4.349</td></tr>
<tr><td>8</td><td>4.015 – 5.122</td></tr>
<tr><td>7</td><td>4.728 – 5.899</td></tr>
<tr><td>6</td><td>5.445 – 6.818</td></tr>
<tr><td>5</td><td>6.294 – 7.910</td></tr>
<tr><td>4</td><td>7.302 – 9.210</td></tr>
<tr><td>3</td><td>8.502 – 10.774</td></tr>
<tr><td>2</td><td>9.946 – 36.535</td></tr>
<tr><td>1</td><td>33.725 –</td></tr>
</table>
★ Levels 13 and 14 flash
</td><td>1) Insert a dummy resistance with the starting switch OFF, or measure the resistance of the sensor.
2) Check the display with the starting switch ON.</td></tr>
<tr><td colspan="3">
<table>
<tr><th rowspan="2"></th><th colspan="2">Position of gauge display</th><th>Display level resistance kΩ (Monitor panel input resistance)</th></tr>
<tr><th colspan="2">Starting switch ON</th><th>Starting switch OFF</th></tr>
<tr><td rowspan="18">Measure fuel level gauge resistance C03 (female) ② – chassis</td><td rowspan="18">Right side
↑
Display position
↓
Left side</td><td>14</td><td>Min. – Max.
– 13.82</td></tr>
<tr><td>13</td><td>11.71 – 17.43</td></tr>
<tr><td>12</td><td>15.18 – 21.25</td></tr>
<tr><td>11</td><td>18.90 – 25.05</td></tr>
<tr><td>10</td><td>22.59 – 28.45</td></tr>
<tr><td>9</td><td>25.82 – 31.85</td></tr>
<tr><td>8</td><td>29.18 – 35.22</td></tr>
<tr><td>7</td><td>32.45 – 39.91</td></tr>
<tr><td>6</td><td>37.00 – 44.60</td></tr>
<tr><td>5</td><td>41.77 – 48.72</td></tr>
<tr><td>4</td><td>45.52 – 55.14</td></tr>
<tr><td>3</td><td>50.42 – 64.35</td></tr>
<tr><td>2</td><td>60.61 – 77.07</td></tr>
<tr><td>1</td><td>72.98 – 691.5</td></tr>
<tr><td>All OFF (0)</td><td>638.00 –</td></tr>
</table>
★ Level 1 flashes
</td><td>1) Insert a dummy resistance with the starting switch OFF, or measure the resistance of the sensor.
2) Check the display with the starting switch ON.</td></tr>
</table>

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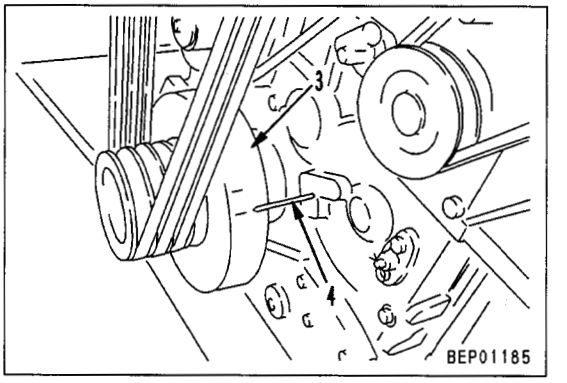
TESTING AND ADJUSTING FUEL INJECTION TIMING



1. Testing

1) Procedure for fixing crankshaft in position
   i) Pull out pin (1), and remove nut (2).
   ii) Rotate the crankshaft in the normal direction and align pointer (4) with the fuel injection line (19° position) on top of damper (3).
      ★ When doing this, check that line (5) on the injection pump camshaft is near the line on the pump case. If it cannot be seen, rotate the crankshaft one more turn.
   iii) Push in lock pin (7) towards the engine and rotate the crankshaft to insert pin (7) into the hole in gear (8).
2) In this position, check the position of line (5) on the injection pump camshaft and line (6) on the pump case.

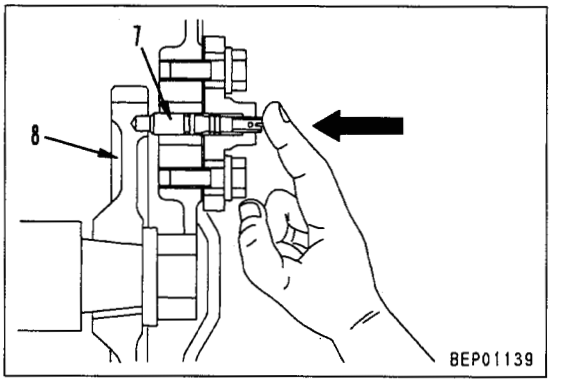
⚠ While the pin is inserted, do not start the engine or try to crank it by force.



2. Adjusting

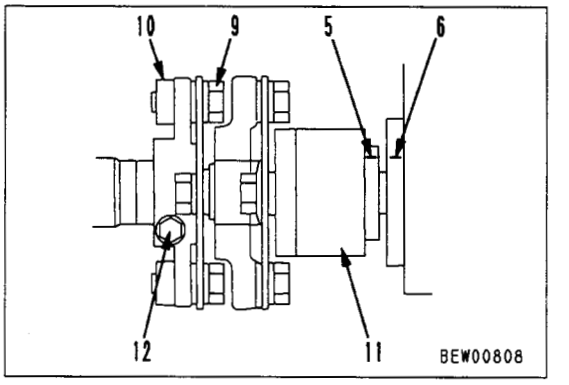
If the line in Step 1-2) is not aligned, adjust as follows.

1) Loosen coupling bolts (9), nuts (10), and bolt (12) at two places.
2) Rotate camshaft (11) to align line (5) on the camshaft completely with line (6) on the injection pump case.
3) Tighten bolts (9), nuts (10) and bolt (12).
   kgm Nut : **88.2 ± 4.9 Nm {9.0 ± 0.5 kgm}**



3. Procedure for releasing crankshaft

1) Remove lock pin (7) from the hole in gear (8).
   ★ If pin (7) is stiff, tighten nut (2) before removing the pin.
   ★ Pull the pin out completely toward this side to a position where it does not move.
2) Tighten nut (2).
   kgm Nut, bolt :
   31.4 ± 5.53 Nm {3.2 ± 0.36 kgm}
3) Install pin (1).



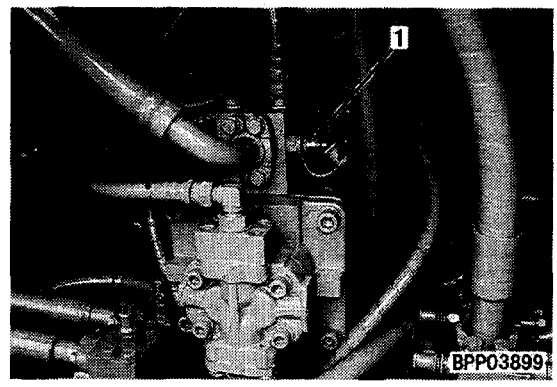
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PC750-6 Serial No.: 10239 and up
PC800-6 Serial No.: 30175 and up

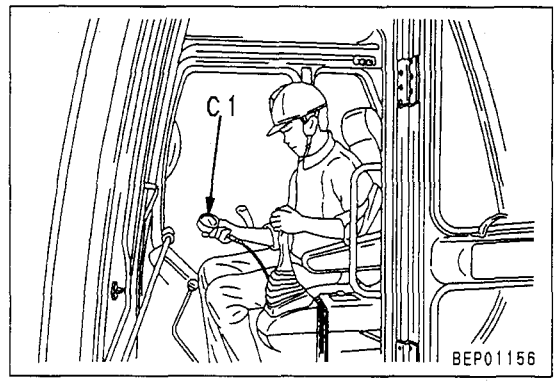
Measuring

★ Oil temperature when measuring: **45 – 55°C**

1. Remove pressure pick-up plug (1) (Thread dia.=10mm, Pitch=1.25mm), and install oil pressure gauge **C1** (5.88 MPa {60 kg/cm²}).

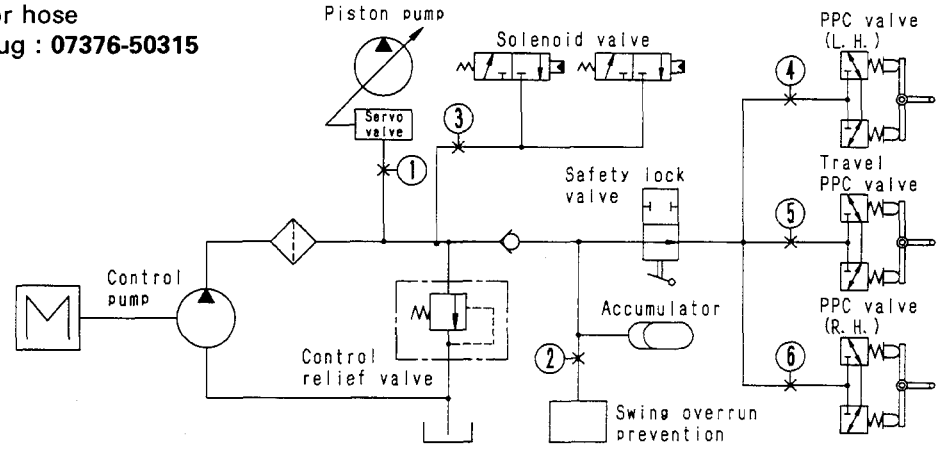


2. Start the engine and measure with the engine at full throttle.
   ★ When testing for internal leakage of the equipment in the control circuit, use the parts given below to shut off the circuit for the following sections when measuring the relief pressure.



No.	Section of hydraulic circuit shut off	Component that can be checked
1	Piston pump inlet port	Piston pump
2	Swing overrun prevention valve inlet port	Swing overrun prevention valve
3	Solenoid valve inlet port	Solenoid valve
4	L.H. PPC valve inlet port	L.H. PPC valve
5	Travel PPC valve inlet port	Travel PPC valve
6	R.H. PPC valve inlet port	R.H. PPC valve

   ★ Items No. 2 and below can be checked if the equipment in the previous number is normal.
   ★ Use the following parts to shut off the circuit.
   - For elbow
     Sleeve nut : **07221-20315**
     Plug : **07222-00315**
   - For hose
     Plug : **07376-50315**

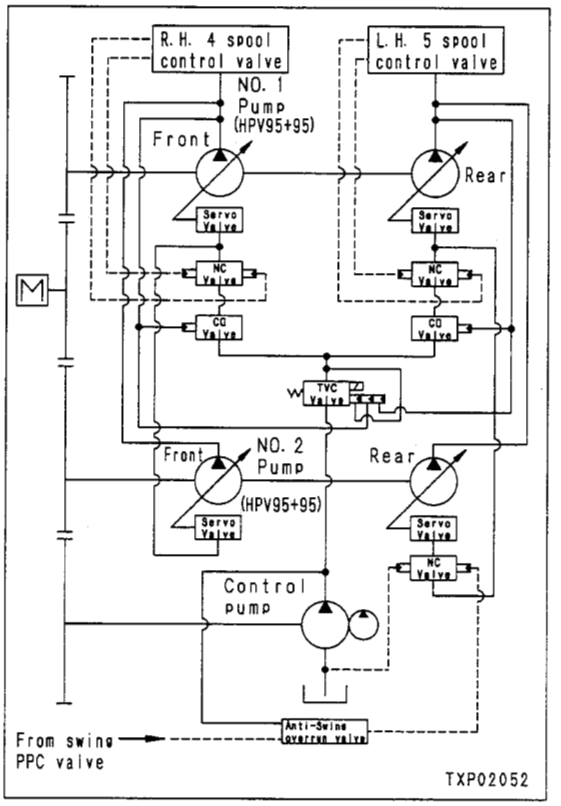


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2. Output pressure of CO valve and NC valve

- The output pressure of the NC valve goes to the servo valve and controls the amount of oil discharged from the piston pump.
  The oil flows as follows: TVC valve → CO valve → NC valve → servo valve. The output pressure varies as follows according to the operation of the control lever for work equipment.
  1) Control levers at neutral
     Because of the differential pressure of the jet sensor, the NC valve is actuated and the output pressure drops below 0.54 MPa {5.5 kg/cm²}.
     (The pump discharge becomes the minimum.)
  2) Hydraulic cylinder relieved
     The CO valve moves and reduces the pressure below 0.54 MPa {5.5 kg/cm²} before the oil enters the NC valve. The NC valve supplies the oil at this pressure to the servo valve.
     (The pump discharge amount in this case is also the minimum.)
  3) Work equipment, swing, travel operated
     The output pressure of the TVC valve is not influenced by the CO valve or the NC valve, and supplies oil as it is to the servo valve.
     (The pump discharge amount varies from the maximum to the point where the CO valve is actuated.)
  4) CO cancel operated
     In the D.H mode, the CO valve is not actuated even near the relief pressure. Therefore, in the same way as in Item 3), the output pressure of the TVC valve is supplied as it is to the servo valve.

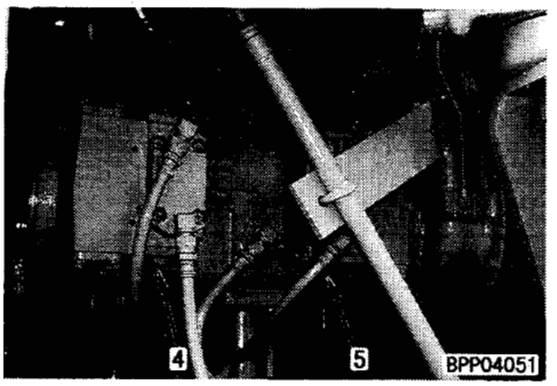


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Measuring

★ Oil temperature when measuring: **45 – 55°C**

- Remove pressure pickup plug (4) or (5) (Thread dia.=10mm, Pitch=1.25mm), then install oil pressure gauge **C1** (5.88 MPa {60 kg/cm²}).
  - Plug (4): For front pump (on bottom of No. 1 pump)
  - Plug (5): For rear pump (on bottom of No. 1 pump)
  - ★ The plugs are under the body of the servo valve.



2. **Adjusting**
PC750-6 Serial No.: 10001 – 10238
PC800-6 Serial No.: 30001 – 30174
If the result of the measurement is not within the standard value, adjust as follows.
★ Adjustment procedure

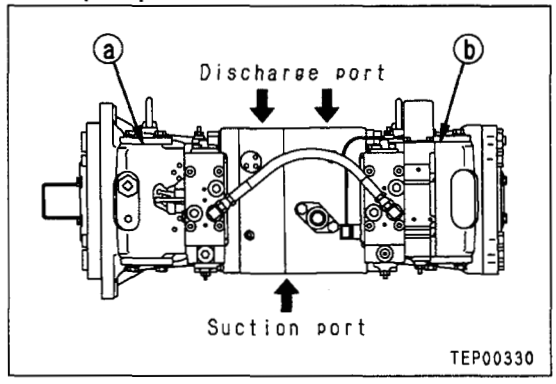
Deviation to right	Deviation to left
Adjust by adding shim at front pump end ⓐ	Adjust by adding shim at rear pump end ⓑ

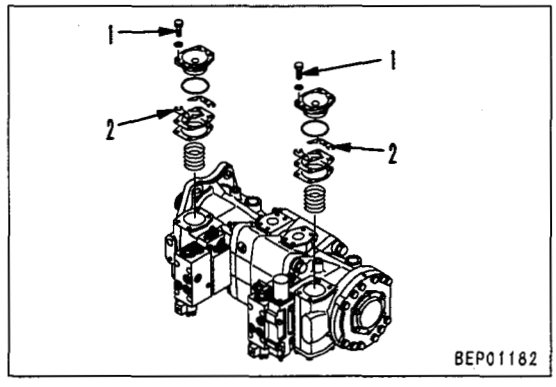
- If the above adjustment procedure is followed but the travel deviation is still not within the standard value after adjustment, see "TROUBLESHOOTING - Excessive travel deviation".

1) Loosen 4 bolts (1).
★ The shim is a split type, so it is not necessary to remove the cap.
2) Add a thickness of shim (2) that matches the amount of the deviation, then tighten bolt (1).
★ Add a maximum shim thickness of 0.3 mm.
kgm Mounting bolt :
66.15 ± 7.35 Nm {6.75 ± 0.75 kgm}
★ Amount of deviation and shim thickness to add
See graph

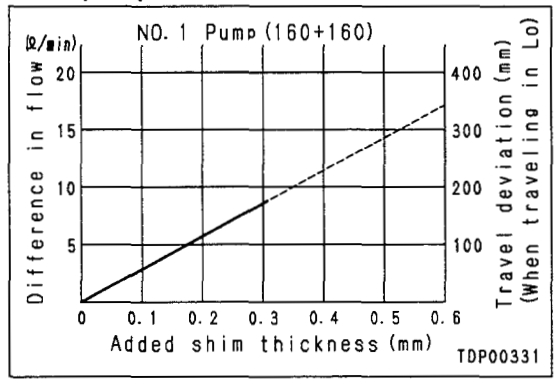
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No. 1 pump





No. 1 pump (160+160)

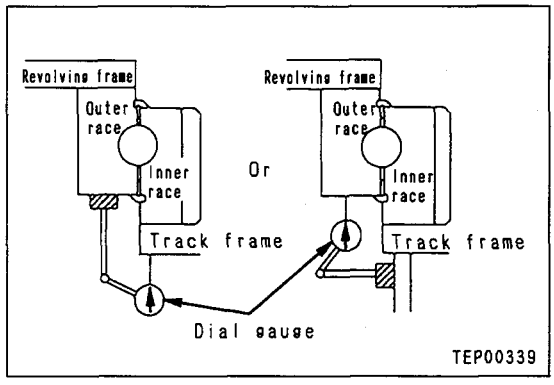


TESTING CLEARANCE OF SWING CIRCLE BEARING

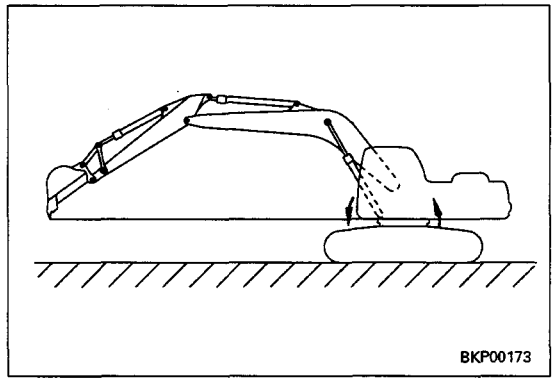
PC750-6 Serial No.: 10001 – 10238
PC800-6 Serial No.: 30001 – 30174

★ Measure the clearance of the swing circle bearing as follows when it is mounted on the machine.

1. Fix a magnet-type dial gauge to the outer race (or inner race) of the swing circle, then put the tip of the probe in contact with the inner race (or outer race).
   Set the dial gauge at the front or rear.



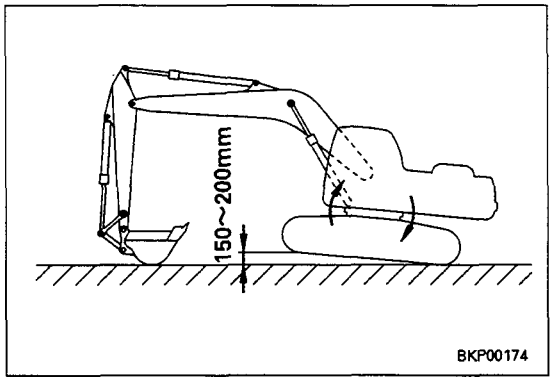
2. Extend the work equipment to the maximum reach, and set the tip of the bucket to the same height as the bottom of the revolving frame.
   When this is done, the upper structure will tilt forward, so the front will go down and the rear will rise.



3. Set the dial gauge to the zero point.

4. Set the arm more or less at right angles to the ground surface, then lower the boom until the front of the machine comes off the ground.
   When this is done, the upper structure will tilt back, so the front will rise and the rear will go down.

5. Read the value on the dial gauge at this point. The value on the dial gauge is the clearance of the swing circle bearing.
   ⚠ When carrying out the measurement, do not put your hand or feet under the undercarriage.



6. Return to the condition in Step 2, and check that the dial gauge has returned to the zero point. If it has not returned to the zero point, repeat Steps 2 to 5.

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POINTS TO REMEMBER WHEN TROUBLESHOOTING

⚠ Stop the machine in a level place, and check that the safety pin, blocks, and parking brake are securely fitted.

⚠ When carrying out the operation with two or more workers, keep strictly to the agreed signals, and do not allow any unauthorized person to come near.

⚠ If the radiator cap is removed when the engine is hot, hot water may spurt out and cause burns, so wait for the engine to cool down before starting troubleshooting.

⚠ Be extremely careful not to touch any hot parts or to get caught in any rotating parts.

⚠ When disconnecting wiring, always disconnect the negative (–) terminal of the battery first.

⚠ When removing the plug or cap from a location which is under pressure from oil, water, or air, always release the internal pressure first. When installing measuring equipment, be sure to connect it properly.

The aim of troubleshooting is to pinpoint the basic cause of the failure, to carry out repairs swiftly, and to prevent reoccurrence of the failure.
When carrying out troubleshooting, and important point is of course to understand the structure and function. However, a short cut to effective troubleshooting is to ask the operator various questions to form some idea of possible causes of the failure that would produce the reported symptoms.

1. When carrying out troubleshooting, do not hurry to disassemble the components.
   If components are disassembled immediately any failure occurs:
   - Parts that have no connection with the failure or other unnecessary parts will be disassembled.
   - It will become impossible to find the cause of the failure.

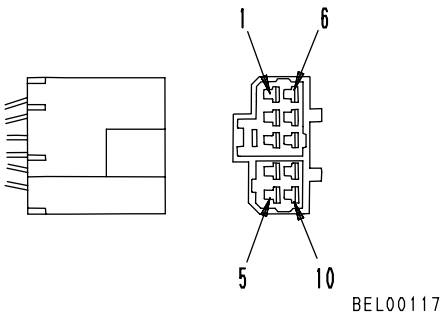
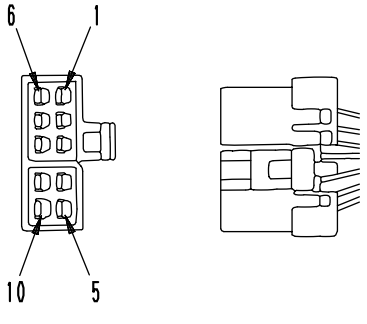
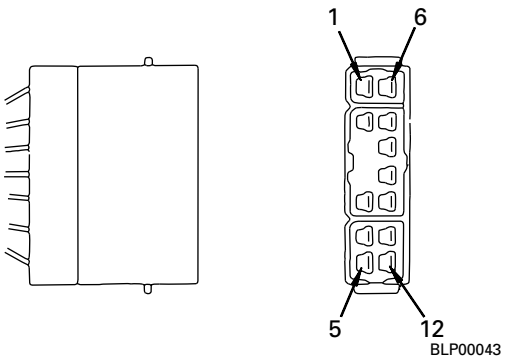
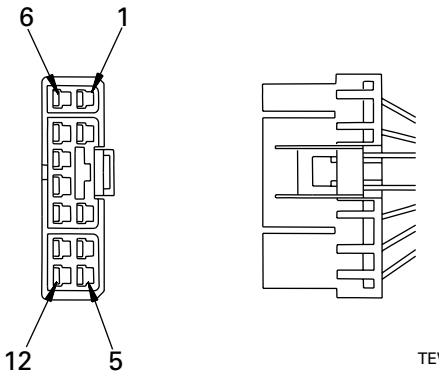
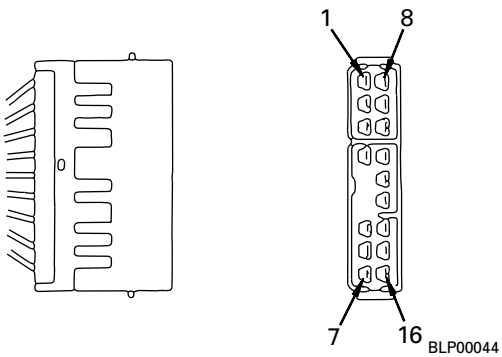
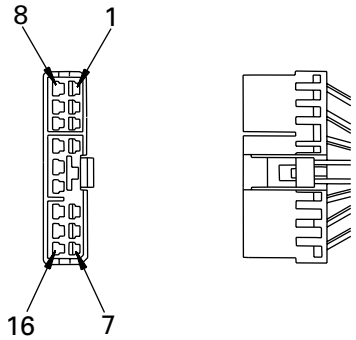
   It will also cause a waste of manhours, parts, or oil or grease, and at the same time, will also lose the confidence of the user or operator.
   For this reason, when carrying out troubleshooting, it is necessary to carry out thorough prior investigation and to carry out troubleshooting in accordance with the fixed procedure.
2. Points to ask user or operator
   1) Have any other problems occurred apart from the problem that has been reported?
   2) Was there anything strange about the machine before the failure occurred?
   3) Did the failure occur suddenly, or were there problems with the machine condition before this?
   4) Under what conditions did the failure occur?
   5) Had any repairs been carried out before the failure?
      When were these repairs carried out?
   6) Has the same kind of failure occurred before?
3. Check before troubleshooting
   1) Check the oil level
   2) Check for any external leakage of oil from the piping or hydraulic equipment.
   3) Check the travel of the control levers.
   4) Check the stroke of the control valve spool.
   5) Other maintenance items can be checked externally, so check any item that is considered to be necessary.
4. Confirming failure
   - Confirm the extent of the failure yourself, and judge whether to handle it as a real failure or as a problem with the method of operation, etc.
     ★ When operating the machine to reenact the troubleshooting symptoms, do not carry out any investigation or measurement that may make the problem worse.
5. Troubleshooting
   - Use the results of the investigation and inspection in Items 2 – 4 to narrow down the causes of failure, then use the troubleshooting flowchart to locate the position of the failure exactly.
     ★ The basic procedure for troubleshooting is as follows.
       1) Start from the simple points.
       2) Start from the most likely points.
       3) Investigate other related parts or information.
6. Measures to remove root cause of failure
   - Even if the failure is repaired, if the root cause of the failure is not repaired, the same failure will occur again.
     To prevent this, always investigate why the problem occurred. Then, remove the root cause.

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CHECKS BEFORE TROUBLESHOOTING

	Item	Judgement value	Action
Lubricating oil, coolant	1. Check fuel level, type of fuel	—	Add fuel
	2. Check for impurities in fuel	—	Clean, drain
	3. Check hydraulic oil level	—	Add oil
	4. Check hydraulic strainer	—	Clean, drain
	5. Check swing machinery oil level	—	Add oil
	6. Check engine oil level (oil pan oil level), type of oil	—	Add oil
	7. Check coolant level	—	Add water
	8. Check dust indicator for clogging	—	Clean or replace
	9. Check hydraulic filter	—	Replace
	10. Check final drive oil level	—	Add oil
Electrical equipment	1. Check for looseness, corrosion of battery terminal, wiring	—	Tighten or replace
	2. Check for looseness, corrosion of alternator terminal, wiring	—	Tighten or replace
	3. Check for looseness, corrosion of starting motor terminal, wiring	—	Tighten or replace
Hydraulic, mechanical equipment	1. Check for abnormal noise, smell	—	Repair
	2. Check for oil leakage	—	Repair
	3. Carry out air bleeding	—	Bleed air
Electrics, electrical equipment	1. Check battery voltage (engine stopped)	20 – 30V	Replace
	2. Check battery electrolyte level	—	Add or replace
	3. Check for discolored, exposed wiring	—	Replace
	4. Check for missing wiring clamps, hanging wiring	—	Repair
	5. Check for water leaking on wiring (be particularly careful attention to water leaking on connectors or terminals)	—	Disconnect connector and dry
	6. Check for blown, corroded fuses	—	Replace
	7. Check alternator voltage (engine running at 1/2 throttle or above)	After running for several minutes: 27.5 - 29.5 V	Replace
	8. Check operating sound of battery (when switch is turned ON/OFF)	—	Replace

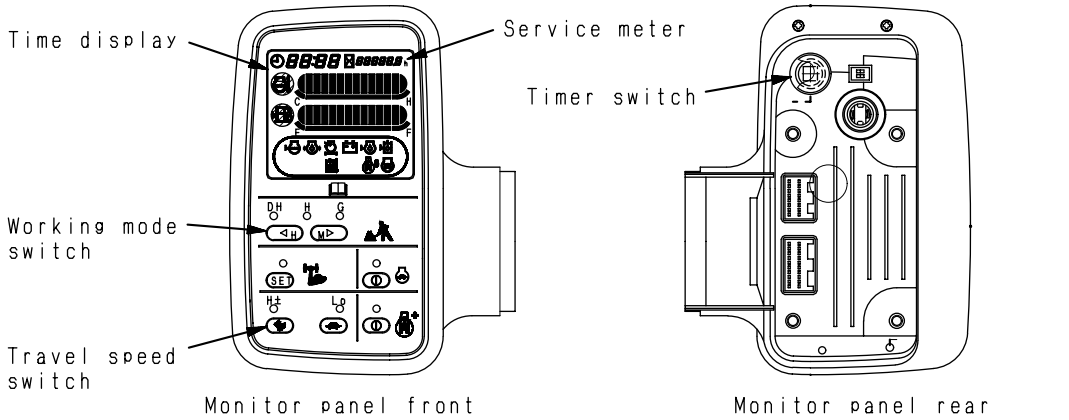
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No. of pins	S type connector	
	Male (female housing)	Female (male housing)
10 (Blue)		
12 (Blue)		
16 (Blue)		

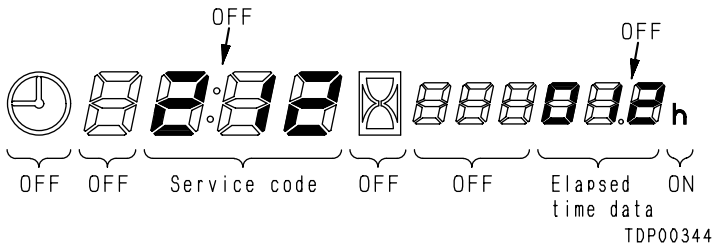
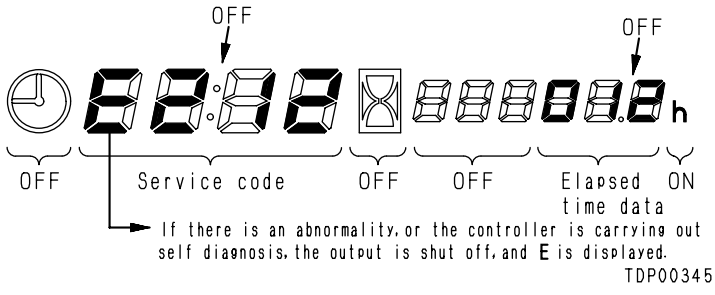
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4) Display of trouble data
The monitor panel records both service codes which are included in the user code, and service codes which are not included. This data can be displayed on the time display as follows.

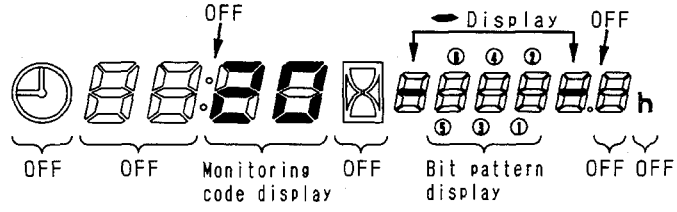
★ For details of the service codes that are not included in the user code, see ACTION TAKEN BY CONTROLLER WHEN ABNORMALITY OCCURS AND PROBLEMS ON MACHINE or the JUDGEMENT TABLE



i) Method of displaying trouble data

Operation	Display
1. To set to the trouble data display mode, Keep the TIME switch + L.H. travel speed switch pressed for 2.5 seconds. Note: It is possible to call it up at the following times. 1) In the normal mode 2) In the user code display mode 3) In the machine data monitoring mode 4) In the time adjustment mode 2. To go to the next service code display, press the time switch + R.H. woking mode switch. 3. To go back to the previous service code display, press the time switch + L.H. woking mode switch.	1. On the time display and service meter display, the service code and number of hours (service meter hours) that have elapsed since the occurrence of the abnormality are displayed. • Example of display : When E212 has occurred 12 hours before (service meter) 1) Display of service code 2) Display of elapsed time  3) If any abnormality exists at this time, the E mark is displayed. 

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Operation	Display
2. To go to the next monitoring code display, press the time switch + R.H. working mode switch. 3. To go back to the previous monitoring code display, press the time switch + L.H. working mode switch. 4. To finish with the machine data monitoring mode, keep the time switch + knob button switch pressed for 2.5 sec.	2) When bit pattern is displayed • If the monitoring code is 08, 20 – 24, 36, 37, 47 – 49, 4A, the bit pattern is displayed. • Example when monitoring code is 20  TDP00348 • The code number is displayed in the monitoring code portion, and is displayed by the lighted display of bit patterns (1) – (6).

2) Table of machine data monitoring codes

★ For details of the B in the Unit column, see the bit pattern chart (on the next pages).

No.	Item	Unit	Name of component
01	Monitor model code	—	Monitor panel
02	Engine throttle, pump controller model code	—	Engine throttle, pump controller
03	Engine throttle, pump controller model code	—	Engine throttle, pump controller
08	S-NET component condition display	B	Engine throttle, pump controller
10	Engine speed	10rpm	
11	Spare	—	Engine throttle, pump controller
12	Spare	—	Engine throttle, pump controller
13	TVC current output	10mA	Engine throttle, pump controller
14	Spare	—	Engine throttle, pump controller
15	Spare	—	Engine throttle, pump controller
16	No. 2 throttle command	10rpm	Engine throttle, pump controller
20	Engine throttle, pump controller PPC oil pressure switch input signal (1)	B	Engine throttle, pump controller
21	Engine throttle, pump controller PPC oil pressure switch input signal (2)	B	Engine throttle, pump controller
22	Engine throttle, pump controller PPC oil pressure switch input signal (3)	B	Engine throttle, pump controller
23	Engine throttle, pump controller solenoid actuation (1)	B	Engine throttle, pump controller
24	Engine throttle, pump controller monitor warning sensor input condition (1)	B	Engine throttle, pump controller
25	Engine throttle, pump controller monitor warning sensor input condition (2)	B	Engine throttle, pump controller
26	Engine throttle, pump controller solenoid actuation (2)	B	Engine throttle, pump controller
30	Fuel control dial input value	10mV	Engine throttle, pump controller

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If there is no abnormality display in the communications system transmitted in S-NET, it can be taken that the output signal from the monitor panel has been transmitted. However, even if there is no abnormality display, if the operation is defective, use the following procedure when checking directly. If any abnormality occurs in the S-NET system, the system is automatically switched to the following default mode, so be careful when carrying out troubleshooting.

Default Mode when communications cannot be carried out for the monitor and governor, pump controller

Set mode		Pump control	Governor control
1	Working mode	H mode	DH mode
2	Throttle signal	FULL	FULL
3	Auto-deceleration	ON (deceleration mode	ON (deceleration mode)
4	Priority mode	OFF	—
5	Heavy lift	OFF	—
6	Travel speed	Lo	—
7	Automatic warming up	—	ON (automatic warming-up mode)

1. Procedure for checking monitor panel output signal

★ For details of operating the monitoring mode, see MONITOR PANEL DISPLAY AND SPECIAL FUNCTIONS.

1. Connection condition of components
   1) Set to the monitoring mode and display monitoring code 08.
   2) The time display (bits) will light up to display the components that are connected.
      ★ Engine throttle, pump controller (pump control system) (1) and engine throttle, pump controller (governor control system) (2) will light up.

2. Checking working mode signal {check No. 2 throttle signal (monitoring code 16) at the same time}
   1) Set to the monitoring mode and display monitoring code 10.
   2) Max. speed at no load are approx. 1,900 rpm for all modes.

Working mode		Rated speed (rpm) (Matching point)
DH	rpm	1,800
H		1,830
G		1,885

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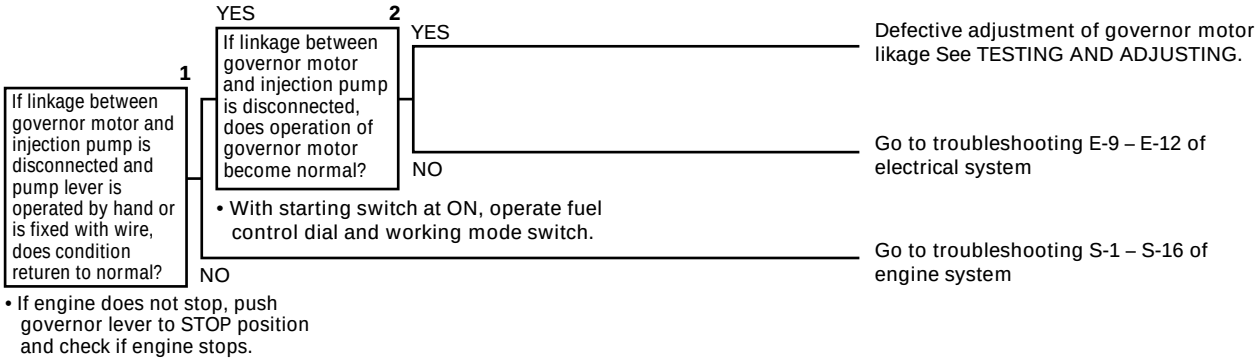
POINTS TO REMEMBER WHEN CARRYING OUT TROUBLE-SHOOTING OF GOVERNOR, PUMP CONTROLLER SYSTEM

1. Points to remember when there is abnormality which is not displayed by user code

The engine is controlled by the governor and pump controller.
The problems that may occur with this system include the following.

1. Idling speed is too high (too low)
2. High idling speed is too low
3. Auto-deceleration speed is too high (too low)
4. Engine speed for automatic warming-up operation is too high (too low)
5. There is hunting
6. Engine does not stop

If any abnormality occurs, and the abnormality is displayed on the time display portion of the monitor panel, use the troubleshooting table to determine the appropriate troubleshooting flow chart from E-1 to E-12.However, if there is any abnormality in the machine and no abnormality display is given, it is necessary to determine whether the problem is in the mechanical system or in the electrical system. If the linkage between the governor motor and the injection pump is not properly adjusted, problems 1 to 6 listed above may occur. Therefore, if there is no abnormality display, but one of problems 1 to 6 above has occurred, carry out troubleshooting as follows.



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Disconnect the linkage as explained above, or check the adjustment and go to the troubleshooting flow chart for the mechanical system or electrical system.
For details of the procedure for adjusting the linkage, see TESTING AND ADJUSTING.

2. Points to remember if abnormality returns to normal by itself

In the following two cases, there is a high probability that the same problem will occur again, so it is desirable to follow up this problem carefully.

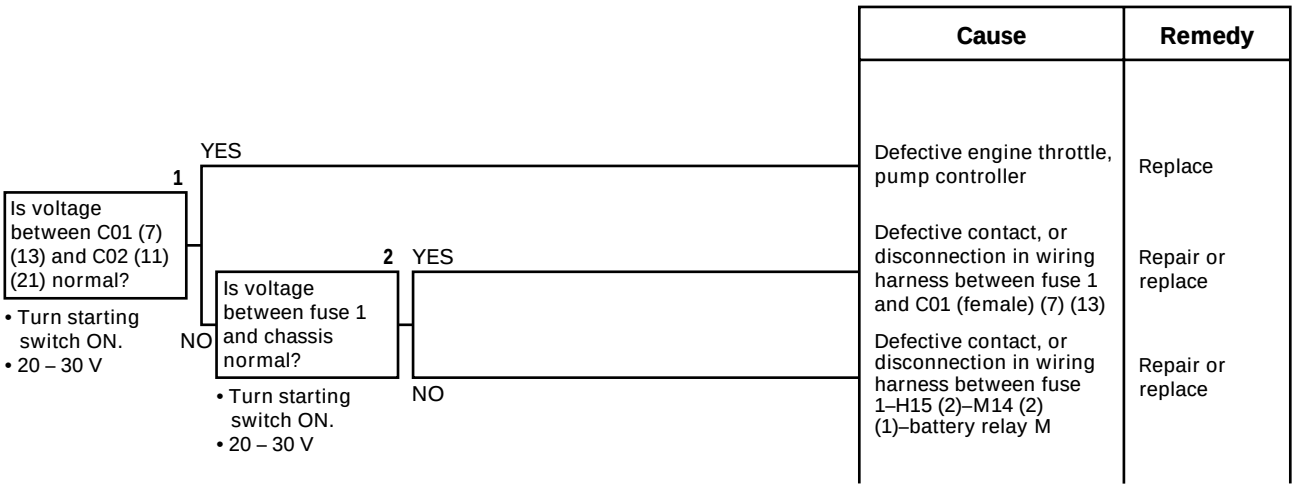
1) If any abnormality returns to normal by itself, or
2) If the connector is disconnected and the T-adapter is inserted, or if the T-adapter is removed and the connector is returned to its original position when carrying out troubleshooting of the failure, and the service code is no longer displayed, or if the monitor display returns to normal.
3) After completing troubleshooting, always erase the service code from memory.

3. User code memory retention function

When displaying the abnormality code in memory and carrying out troubleshooting, note down the content of the display, then erase the display. After trying to re-enact the problem, carry out troubleshooting according to the failure code that is displayed.
(There are cases where mistaken operation or abnormalities that occur when the connector is disconnected are recorded by the memory retention function. Erasing the data in this way saves any wasted work.)

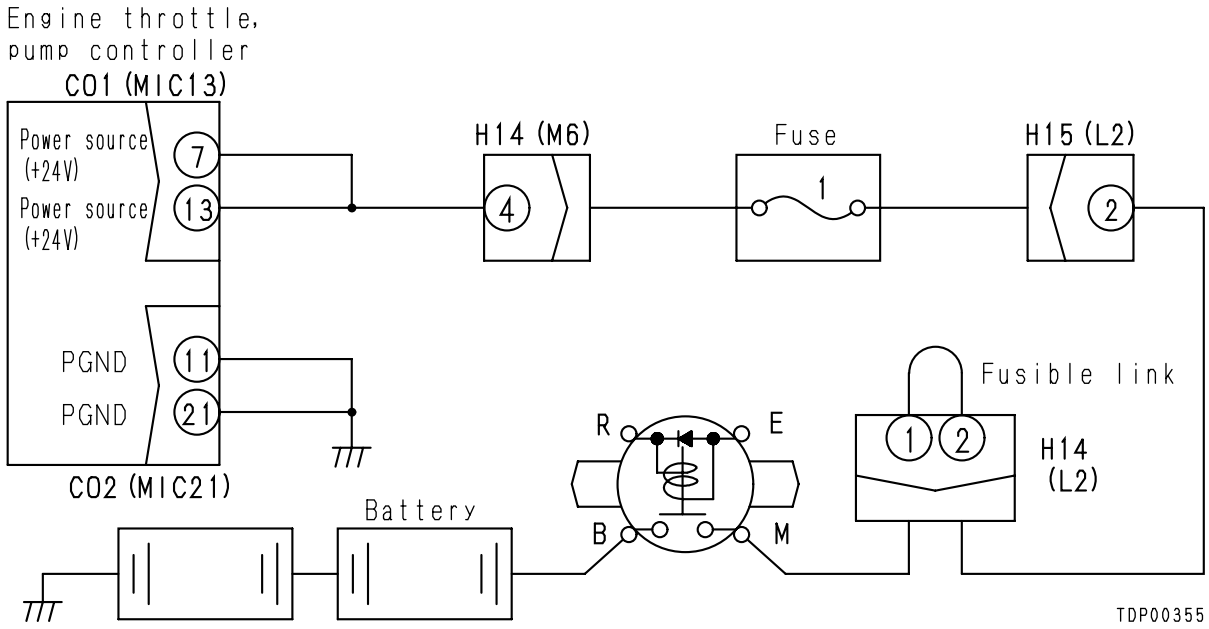
E-1 Abnormality in engine throttle, pump controller power source (controller LED is OFF)

★ **This troubleshooting is carried out when there is still an abnormality, so when disconnecting the connector and inserting the T-adapter, or when removing the T-adapter and returning the connector to its original position, if the service code E is not displayed, the problem has been removed.**
★ Check that fuse 1 is not blown.
★ Before carrying out troubleshooting, check that all the related connectors are properly inserted.
★ Always connect any disconnected connectors before going on to the next step.
★ When the starting motor rotates correctly. (If the starting motor also does not rotate, go to E-8.)



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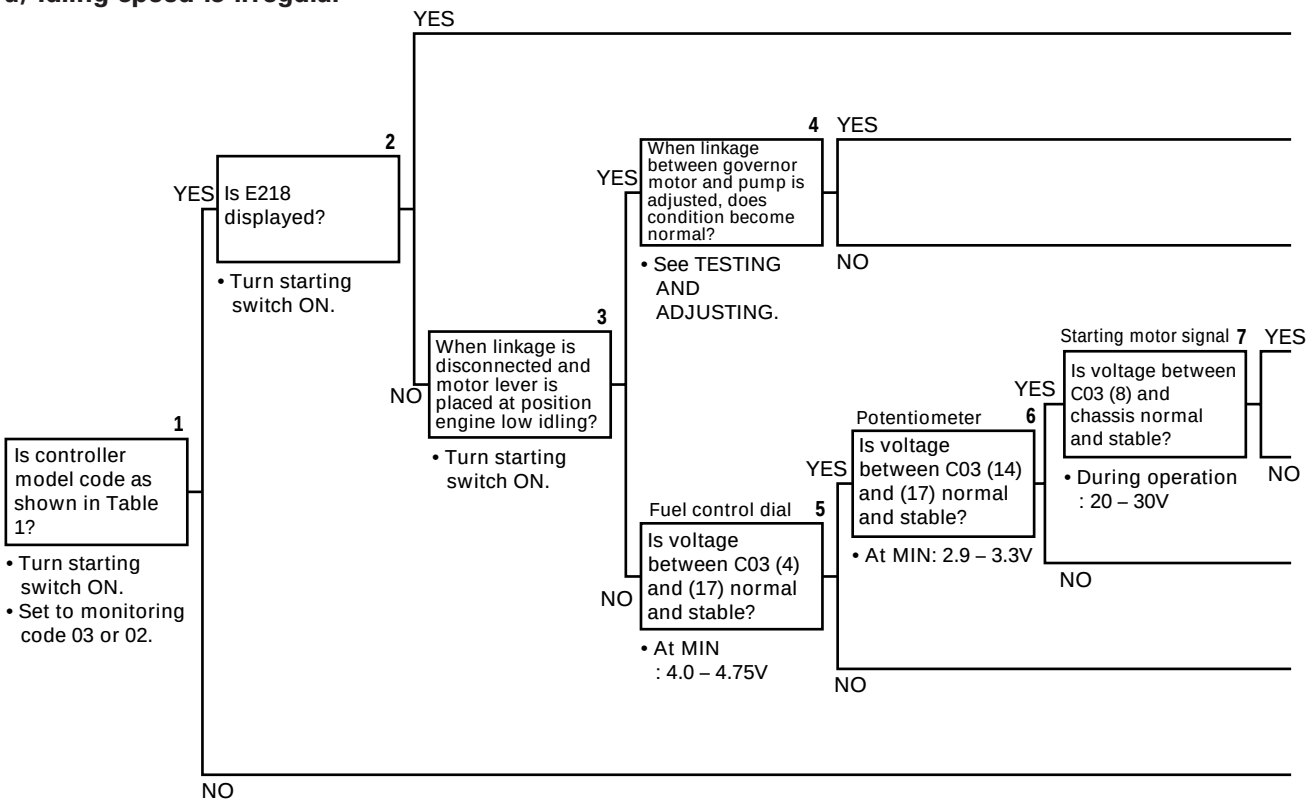
E-1 Related electric circuit diagram



E-9 Engine speed is irregular

★ Before carrying out troubleshooting, check that all the related connectors are properly inserted.
★ Always connect any disconnected connectors before going on to the next step.

a) Idling speed is irregular



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Table 1

Controller model code


★ The diagram shows monitoring code 03.

S-3 Engine does not pick up smoothly (follow-up is poor)

★ Confirm that no abnormality of electric governor control system is displayed.

General causes why engine does not pick up smoothly.

- Insufficient intake of air.
- Insufficient supply of fuel.
- Improper condition of fuel injection.
- Use of improper fuel.

			Causes: Clogged air cleaner element	Clogged fuel filter, strainer	Clogged feed pump strainer	Clogged injection nozzle, defective spray	Seized injection pump plunger	Worn piston ring, cylinder	Seized turbocharger, interference	Improper valve clearance	Clogged fuel tank air breather hole	Clogged, leaking fuel piping	Defective contact of valve, valve seat
Question	Confirm recent repair history												
	Degree of use	Operated for long period	△	△	△			△					△
	Replacement of filters has not been carried out according to operation manual		◎	◎	◎								
	Non-specified fuel has been used			◎	◎	◎	◎						
	Engine oil must be added more frequently							◎					
	Dust indicator lamp is ON		◎										
Check item	Rust and water are found when fuel is drained			◎	◎								
	Interference sound heard around turbocharger								◎				
	Engine pick-up suddenly became poor					○			◎		○	○	
	Color of exhaust gas	Blue under light load						◎					
		Black	◎			◎			◎				○
	Clanging sound is heard from around cylinder head									◎			
	Mud is stuck to fuel tank cap										◎		
	There is leakage from fuel piping											◎	
	High idling speed under no load is normal, but speed suddenly drops when load is applied			◎	◎						○		
	There is hunting from engine (rotation is irregular)			○	◎	○					○		
	When exhaust manifold is touched immediately after starting engine, temperature of some cylinders is low					◎	○						
	Blow-by gas is excessive							◎					
Troubleshooting	When air cleaner is inspected directly, it is found to be clogged		●										
	When fuel filter, strainer are inspected directly, they are found to be clogged			●									
	When feed pump strainer is inspected directly, it is found to be clogged				●								
	Stop fuel injection to one cylinder at a time. If there is no change in engine speed, that cylinder is not working.					●							
	When control rack is pushed, it is found to be heavy or does not return						●						
	When compression pressure is measured, it is found to be low							●					●
	Turbocharger cannot be hand-rotated smoothly								●				
	When valve clearance is checked directly, it is found to be outside standard value									●			
	When fuel cap is inspected directly, it is found to be clogged										●		
	When feed pump is operated, operation is too light or too heavy											●	
		Remedy	Clean	Clean	Clean	Repair	Replace	Replace	Replace	Adjust	Clean	Repair	Replace

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S-13 Oil level rises (water mixed with fuel)

★ If there is oil in the cooling water, carry out troubleshooting for "Oil is in cooling water".

General causes why oil level rises.
- Water in oil.
- Fuel in oil. (diluted, and smells of diesel fuel)

			Cause: Broken oil cooler core, O-ring	Defective nozzle holder sleeve	Broken head, head gasket	Clogged water pump breather hole, defective seal	Defective seal of main pump	Leakage of fuel from connection inside head cover	Defective inside injection pump (flange type)	Defective thermostat seat	Damaged liner O-ring, holes made by pitting	Cracks inside cylinder block
Question	Confirm recent repair history											
	Degree of use	Operated for long period		△		△	△				△	
	When engine is first started, drops of water come from muffler			◎								
	Exhaust gas is white			◎				○				
Check item	There is oil in radiator cooling water		◎	○	○						○	○
	Leave radiator cap open. When engine is run at idling, an abnormal number of bubbles appear, or water spurts back				◎						○	
	Water pump breather hole is clogged with mud					◎						
	When water pump breather hole is clean, water comes out					◎						
	Oil level goes down in hydraulic tank						◎					
	Engine oil smells of diesel fuel							◎	◎	○		
	Fuel is added more frequently							◎	◎	○		
Troubleshooting	Pressure-tightness test of oil cooler shows there is leakage		●									
	Pressure-tightness test of cylinder head shows there is leakage			●								
	When compression pressure is measured, it is found to be low				●							
	Remove water pump and check directly					●						
	When pump is removed, seal is found to be broken						●		●			
	Remove head cover and check directly							●				
	Remove thermostat cover and check directly									●		
	Remove oil pan and check directly										●	●
		Remedy	Replace	Replace	Replace	Replace	Repair	Replace	Repair	Replace	Repair	Replace

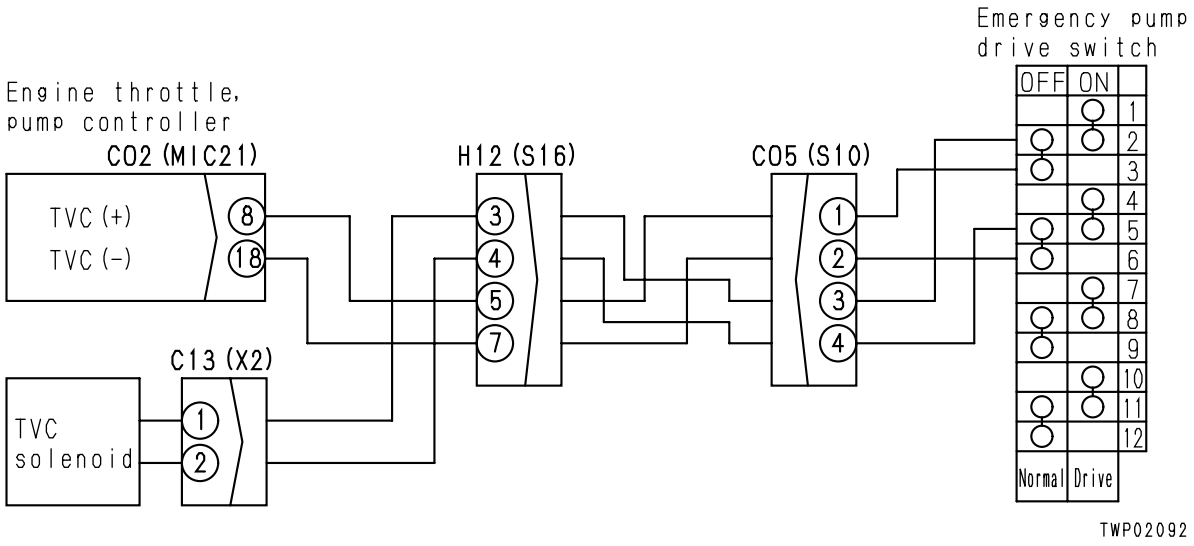
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ACTION TAKEN BY CONTROLLER WHEN ABNORMALITY OCCURS AND PROBLEMS ON MACHINE

User code	Service code	Abnormal system	Nature of abnormality
E02	E232	Short circuit in TVC solenoid system	1. Short circuit with ground, short circuit inside TVC solenoid 2. Short circuit with power source, short circuit with ground in wiring harness between controller C02 (8) and TVC solenoid C13 (1) ((+) side) 3. Short circuit with power source in wiring harness between controller C02 (18) and TVC solenoid C13 (2) ((–) side) 4. Defective engine throttle, pump controller
	E233	Disconnection in front pump TVC solenoid system	1. Disconnection, defective contact inside TVC solenoid 2. Disconnection, defective contact in wiring harness between controller C02 (8) and TVC solenoid C13 (1) ((+) side) 3. Disconnection, defective contact, short circuit with ground in wiring harness between controller C02 (18) and TVC solenoid C13 (2) ((–) side) 4. Defective engine throttle, pump controller
E03	E203	Short circuit in swing holding brake solenoid system	1. Short circuit with ground, short circuit inside swing holding brake solenoid 2. Short circuit with ground in wiring harness between controller C01 (3) and solenoid V04 (2) ((+) side) 3. Defective engine throttle, pump controller
	E213	Disconnection in swing holding brake solenoid system	1. Disconnection, defective contact inside swing holding brake solenoid 2. Disconnection, defective contact, short circuit with power source in wiring harness between controller C01 (3) and solenoid V04 (2) ((+) side) 3. Disconnection, defective contact in wiring harness between solenoid V04 (1) and chassis ground ((–) side) 4. Defective engine throttle, pump controller
——	E202	Short circuit in straight travel solenoid system	1. Short circuit with ground, short circuit inside straight travel solenoid 2. Short circuit with ground in wiring harness between controller C01 (2) and solenoid V03 (2) ((+) side) 3. Defective engine throttle, pump controller
——	E204	Short circuit in 2-stage relief solenoid system	1. Short circuit with ground, short circuit inside 2-stage relief solenoid 2. Short circuit with ground in wiring harness between controller C01 (10) and solenoid V02 (2) ((+) side) 3. Defective engine throttle, pump controller

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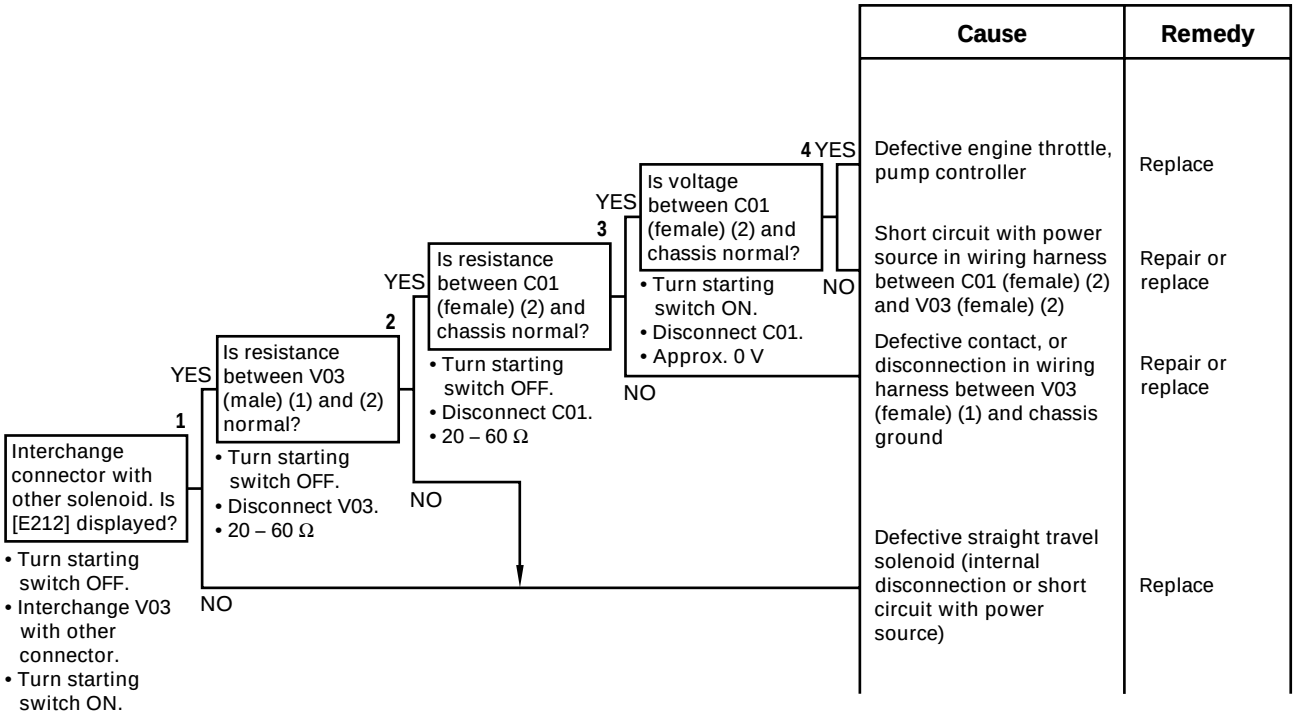
C-2 Related electric circuit diagram



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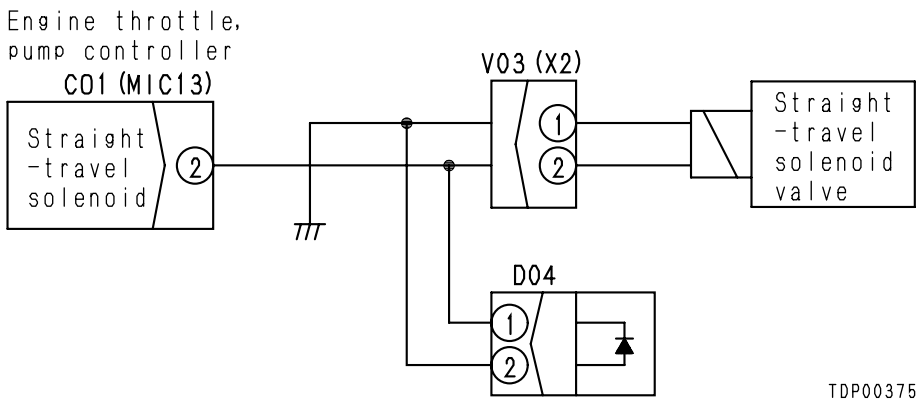
C-9 [E212] Disconnection in straight travel solenoid system is displayed

★ **This troubleshooting is carried out when there is still an abnormality, so when disconnecting the connector and inserting the T-adapter, or when removing the T-adapter and returning the connector to its original position, if an E service code is not displayed, the problem has been removed.**
★ If the starting switch is turned OFF after an abnormality occurs, turn the starting switch ON and check if an E service code is displayed. (If it is not displayed, the problem has been removed.)
★ Before carrying out troubleshooting, check that all the related connectors are properly inserted.
★ Always connect any disconnected connectors before going on to the next step.



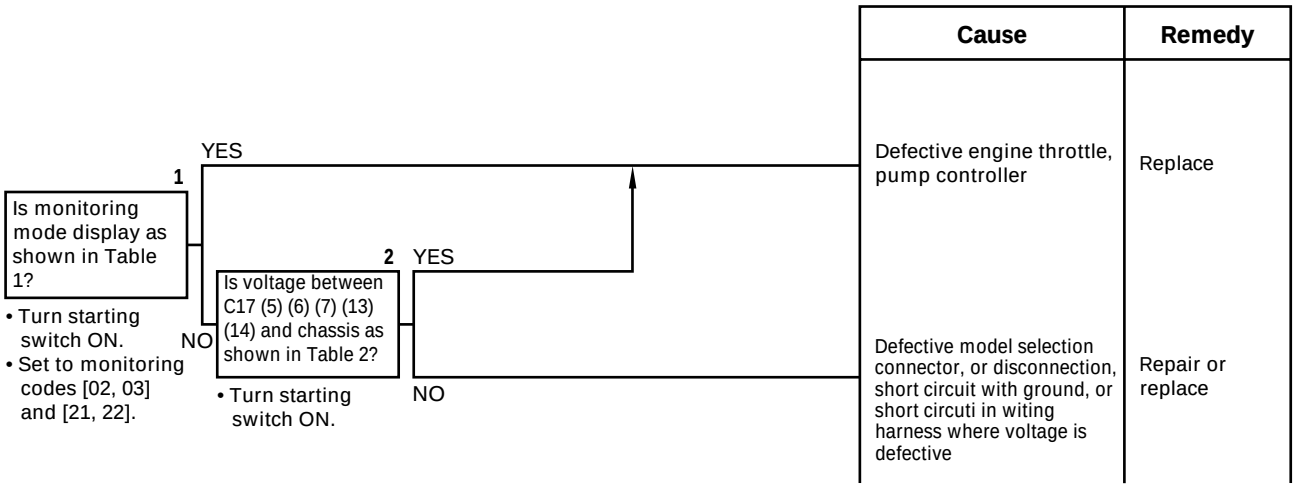
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C-9 Related electric circuit diagram



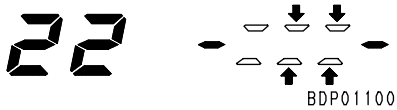
C-19 [E217] Model selection input error is displayed

★ **This troubleshooting is carried out when there is still an abnormality, so when disconnecting the connector and inserting the T-adapter, or when removing the T-adapter and returning the connector to its original position, if an E service code is not displayed, the problem has been removed.**
★ If the starting switch is turned OFF after an abnormality occurs, turn the starting switch ON and check if an E service code is displayed. (If it is not displayed, the problem has been removed.)
★ Before carrying out troubleshooting, check that all the related connectors are properly inserted.
★ Always connect any disconnected connectors before going on to the next step.



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Table 1 Monitoring code display

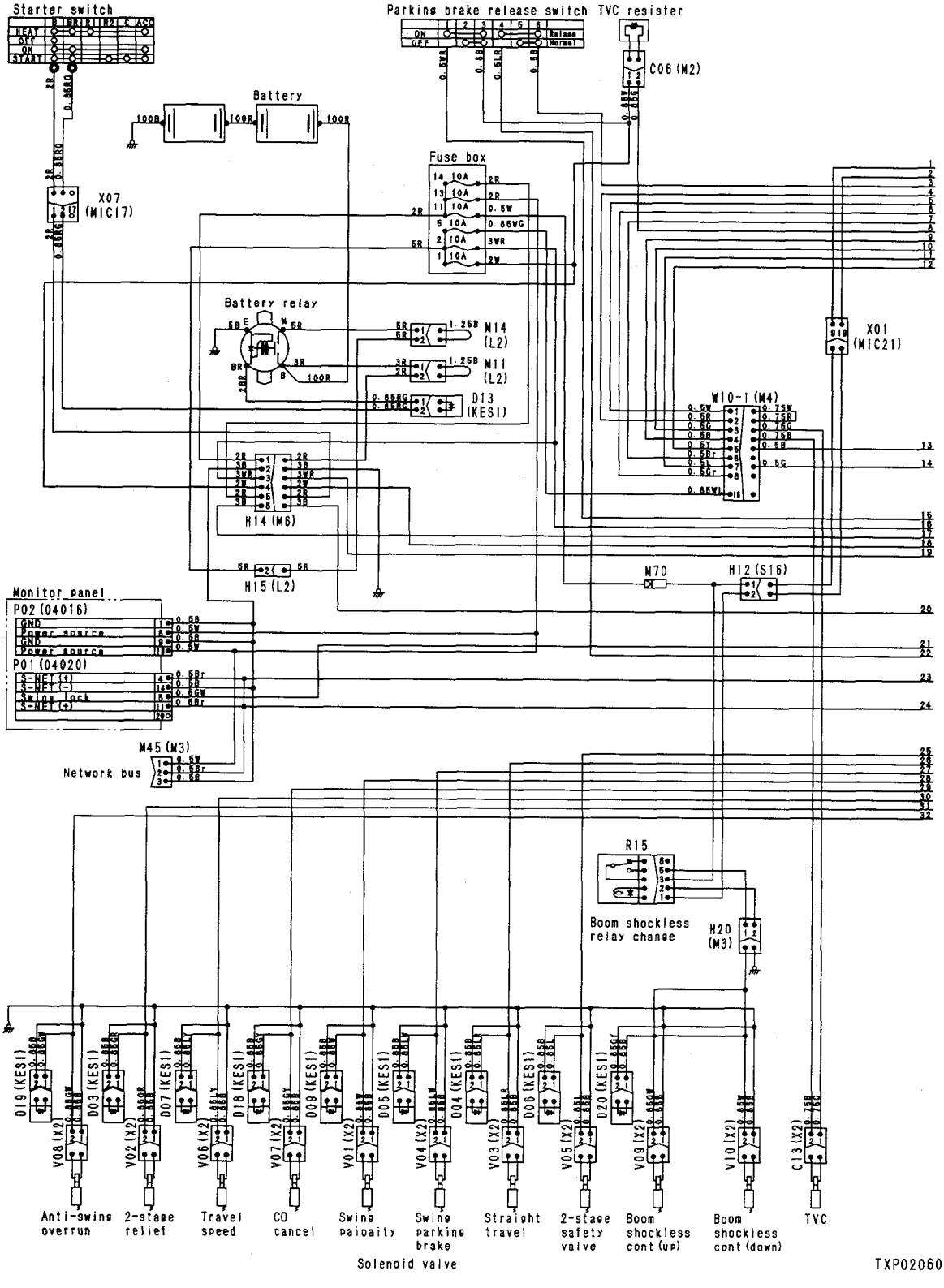
Model code display	Model selection signal input display	
Monitoring codes 02, 03	Monitoring code 21	Monitoring code 22
 BDP01153	 BKP00194	 BDP01100

★ The diagram shows monitoring code 02.
★ Check the bit pattern display marked with [.

Table 2 Voltage of wiring harness

C17	Between (5) – chassis	Between (6) – chassis	Between (7) – chassis	Between (13) – chassis	Between (14) – chassis
Voltage	20 – 30 V	20 – 30 V	20 – 30 V	20 – 30 V	20 – 30 V

ELELCTRICAL CIRCUIT DIAGRAM FOR F MODE



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F-9 Bit pattern 21-(5) L.H. travel oil pressure switch does not light up

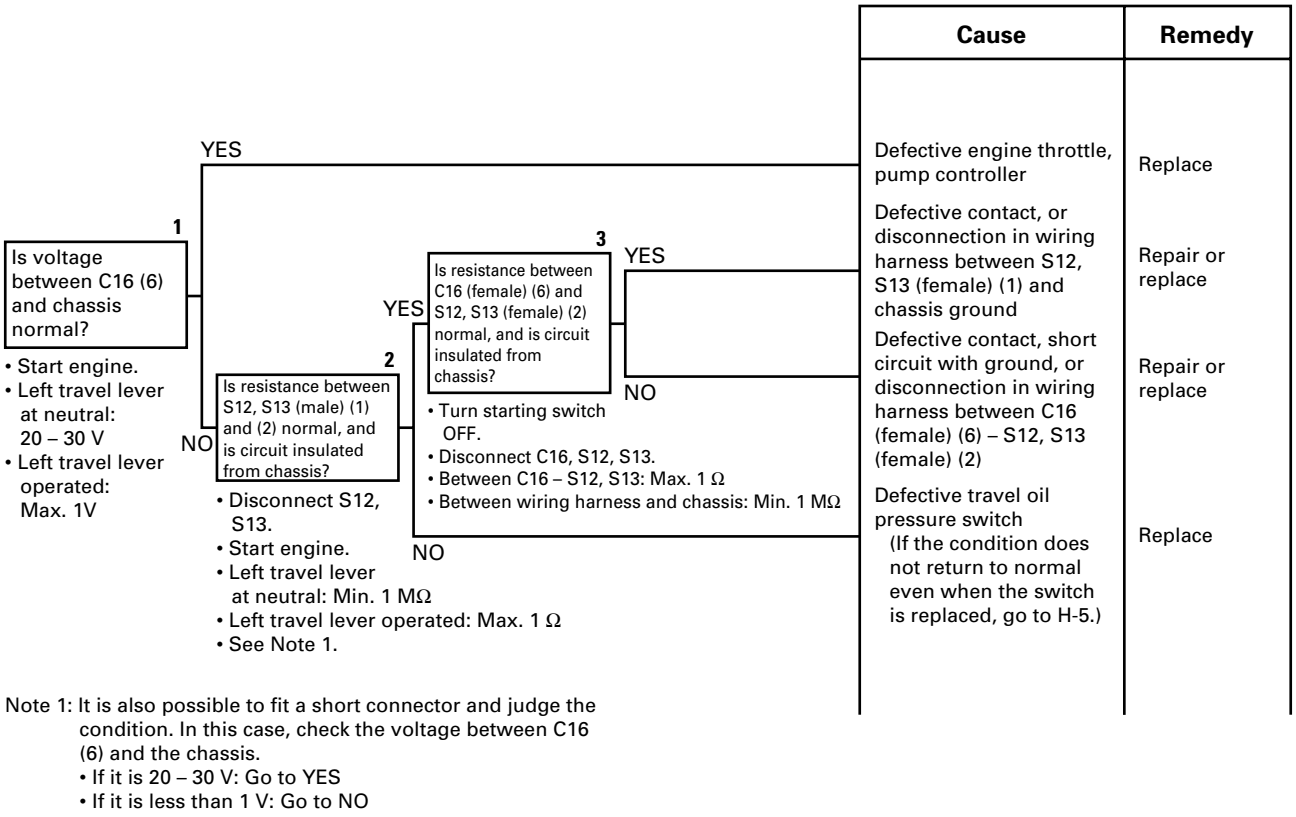
★ **This troubleshooting is carried out when there is still an abnormality, so when disconnecting the connector and inserting the T-adapter, or when removing the T-adapter and returning the connector to its original position, if the monitoring mode display returns to normal, the problem has been removed.**

⚠ Check that the surrounding area is safe before operating the travel lever.

★ Check all the travel lever operations: if there is a display for some operations and no display for other operations, the PPC shuttle valve is defective. (See H-5)
(When measuring with the engine stopped, charge the accumulator first.)

★ Before carrying out troubleshooting, check that all the related connectors are properly inserted.

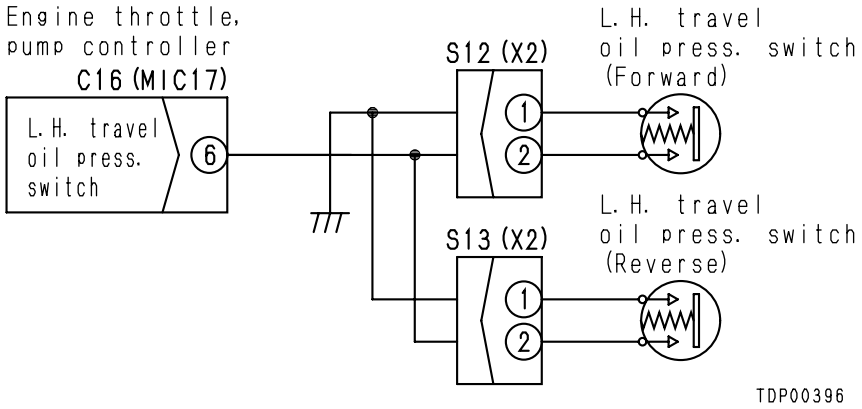
★ Always connect any disconnected connectors before going on to the next step.



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Note 1: It is also possible to fit a short connector and judge the condition. In this case, check the voltage between C16 (6) and the chassis.
- If it is 20 – 30 V: Go to YES
- If it is less than 1 V: Go to NO

F-9 Related electric circuit diagram



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H-1 Speeds of all work equipment, swing, travel are slow or lack power

★ Carry out troubleshooting in the D.H mode.
★ Check that no abnormal noise is being generated from the main pump before carrying out troubleshooting.
(If there is any abnormal noise, carry out troubleshooting for H-4.)

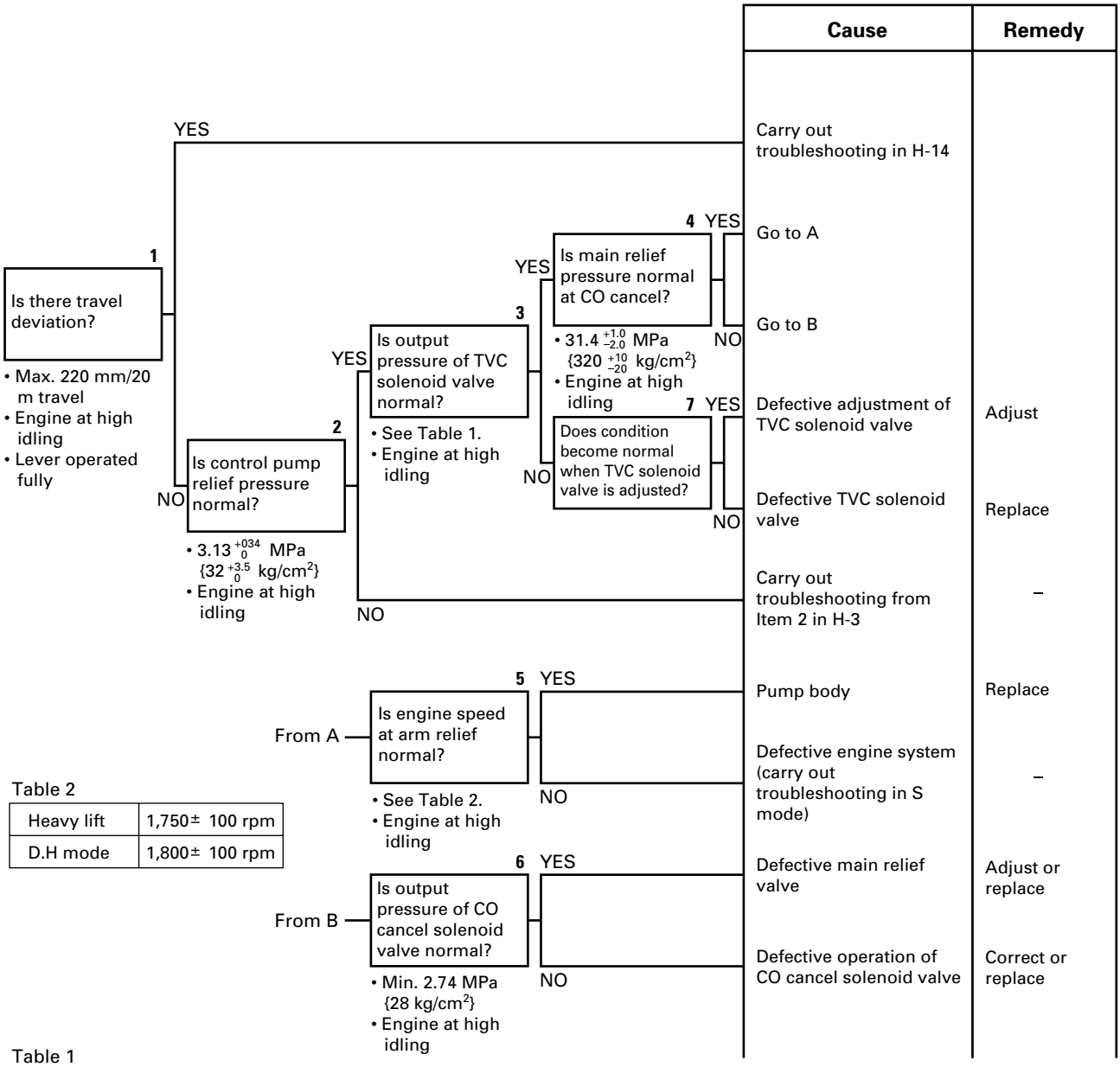


Table 2

Heavy lift	1,750± 100 rpm
D.H mode	1,800± 100 rpm

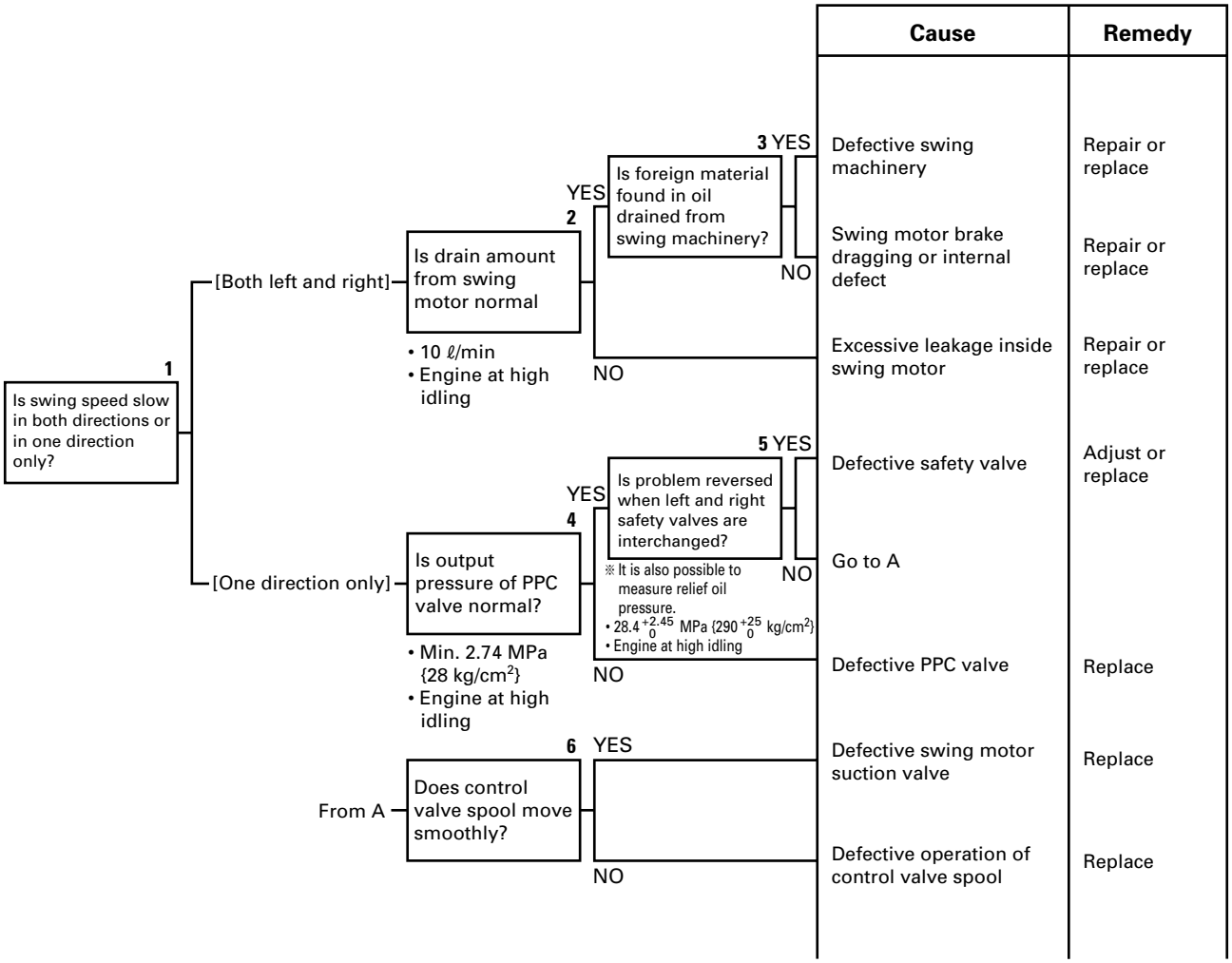
Table 1

Control lever at neutral	Min. 1.76 MPa {18 kg/cm²}
H mode, boom RAISE relief	1.37 ± 0.2 MPa {14 ± 2 kg/cm²}
Heavy lift ON, boom RAISE relief	1.2 ± 0.2 MPa {12 ± 2 kg/cm²}

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H-20 Swing speed is slow or swing acceleration is poor

★ When other work equipment and travel are normal.
(However, if there is travel deviation (deviation to right), carry out troubleshooting first for H-14 Machine deviates naturally to one side during travel operations.
★ Carry out troubleshooting in the D.H mode.



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Condition when normal (voltage, current, resistance)	Action by controller when abnormality is detected	Problem that appears on machine when there is abnormality
· When starting switch is turned ON, keep time switch pressed for 5 seconds to actuate clear function	—	1. Service code cannot be cleared 2. Time becomes 00:00.
	—	1. Service code cannot be cleared 2. Time becomes 00:00. 3. Clock does not advance.
· Voltage between P01 (7) – chassis Buzzer ON: Max. 1V Buzzer OFF: 20 – 30V ★ When there is a disconnection, E103 is not displayed and the buzzer does not sound	—	1. Buzzer does not sound
· Resistance between P11 (male) – P12 (male): Min. 1 Ω (engine started)	—	1. If abnormality detection continues, air cleaner clogging caution lamp flashes and buzzer sounds
· Resistance between sensor terminal and chassis: Min. 1 MΩ (engine at mid-range speed or above)	—	1. If abnormality detection continues, engine oil pressure caution lamp flashes and buzzer sounds
· Resistance between P07 (1) – (2): Min. 3.156 Ω (engine started)	—	1. If abnormality detection continues, coolant temperature caution lamp flashes and buzzer sounds 2. If abnormality detection continues, engine speed is reduced to low idling

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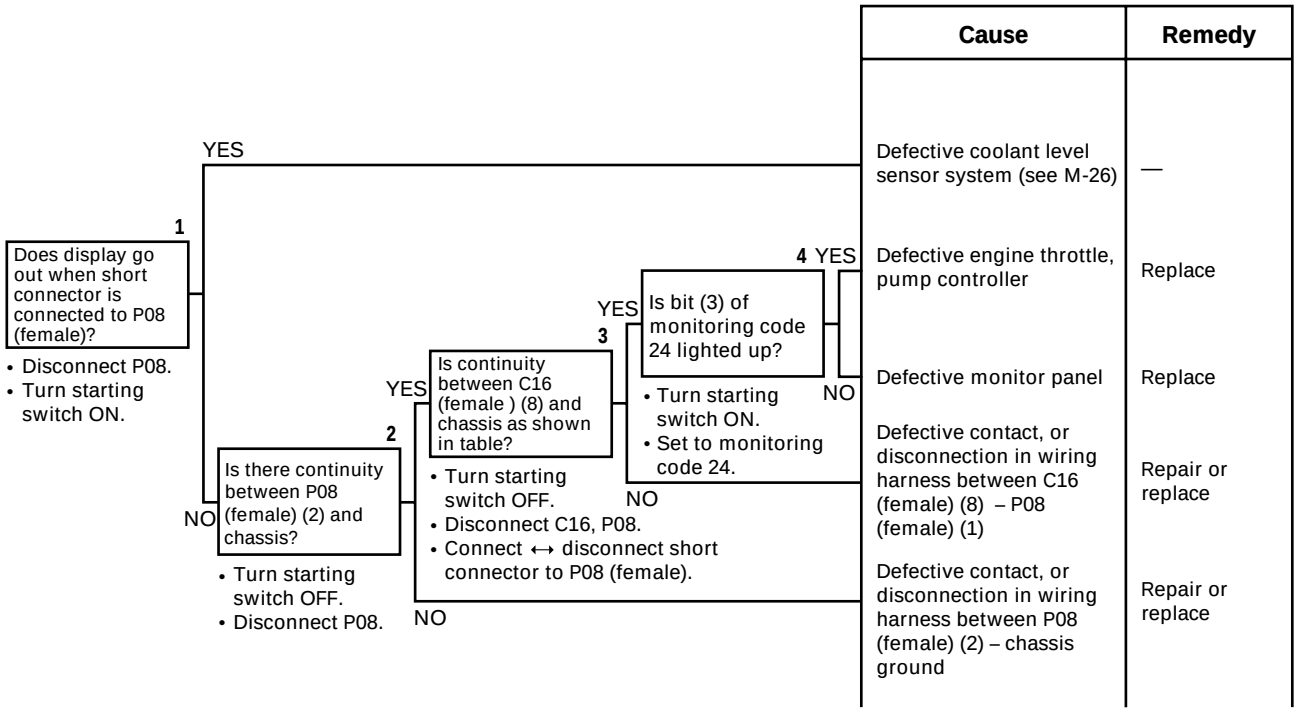
M-9 When starting switch is turned ON (engine stopped), basic check items flash

★ Before carrying out troubleshooting, check that all the related connectors are properly inserted.
★ Always connect any disconnected connectors before going on to the next step.

a) (coolant level) flashes

SAP00519

★ Check that the coolant is at the specified level before carrying out troubleshooting.

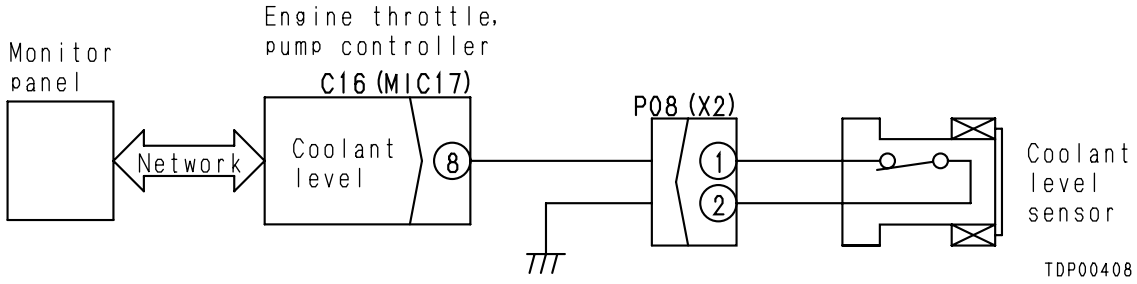


Table

Short connector	Continuity
Connected	Yes
Disconnected	No

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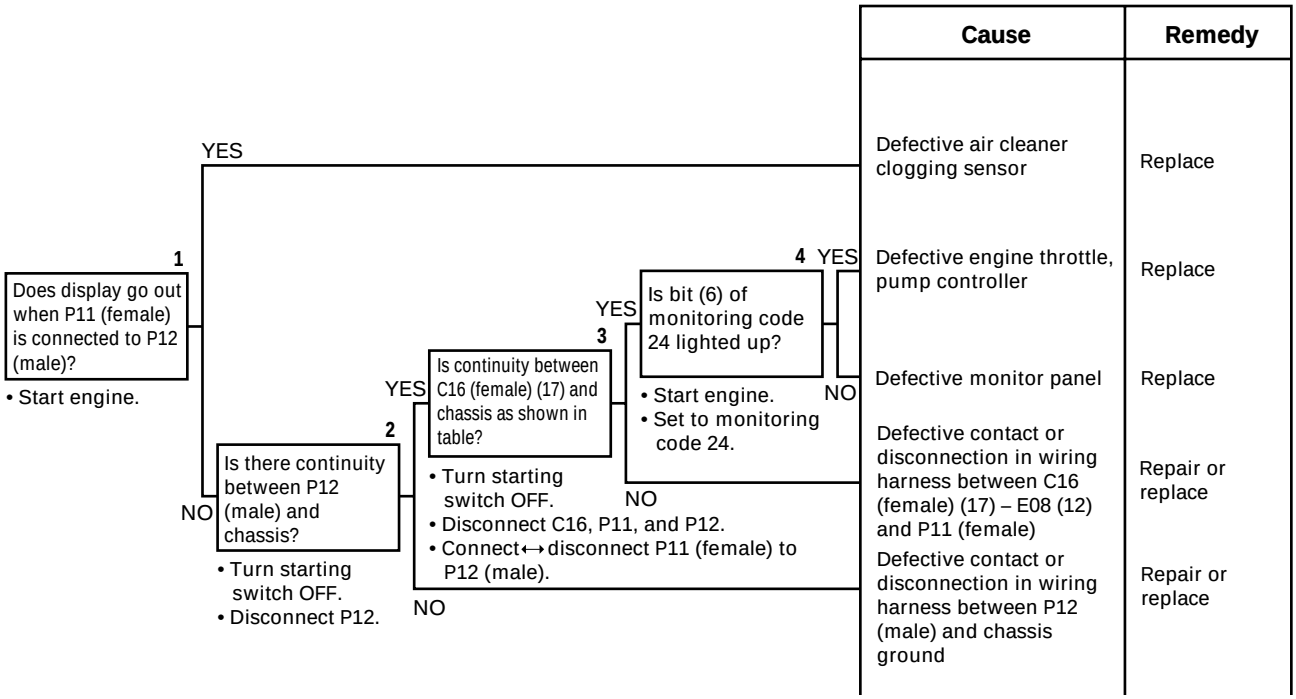
M-9 a) Related electric circuit diagram



f)  **(air cleaner clogging) flashes**

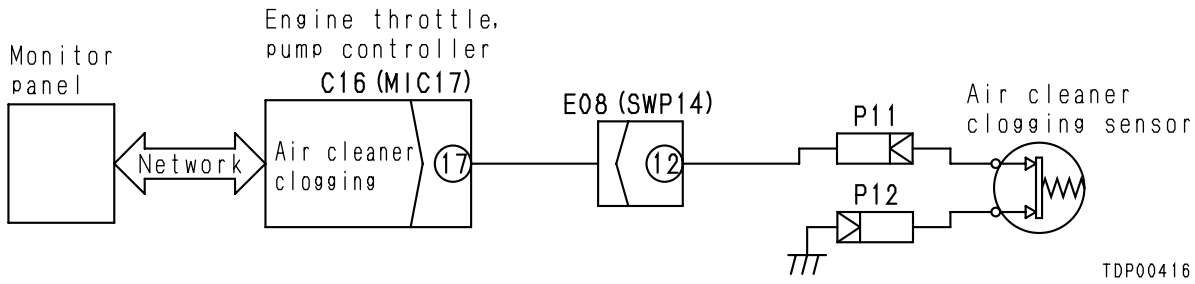
SAP00521

★ Check that the air cleaner is not clogged before carrying out troubleshooting.



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M-13 f) Related electric circuit diagram

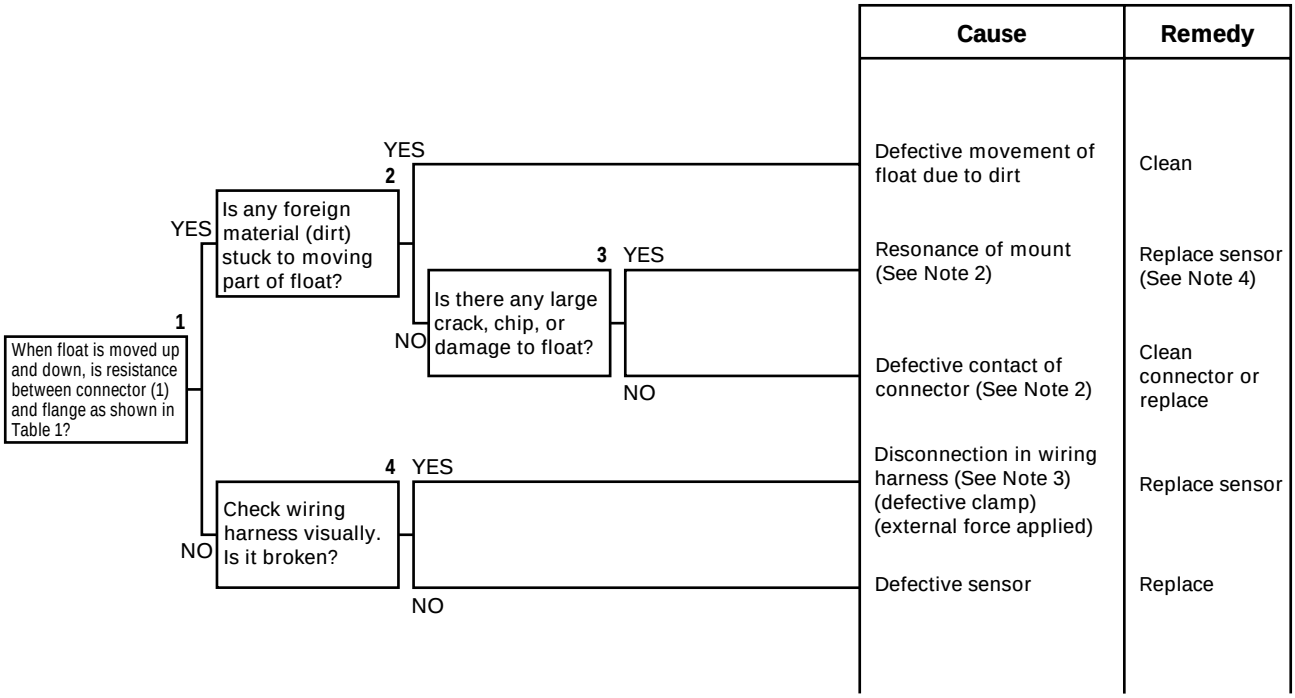


Table

Condition of P11 and P12	Continuity between C16(17) and chassis
Disconnected	No
Connected	Yes

M-27 Defective engine oil level sensor system

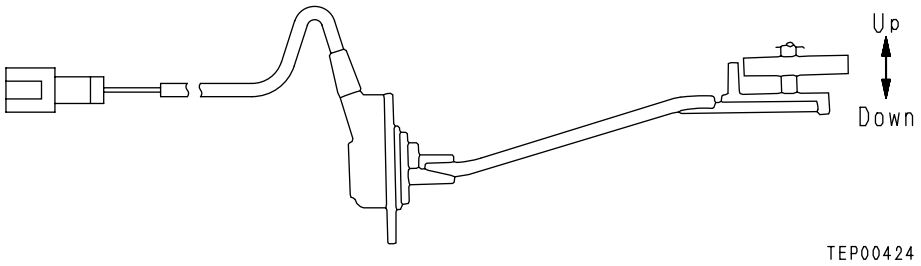
★ Remove the engine oil level sensor when carrying out troubleshooting.



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Table

Float UP	Max. 1 Ω
Float DOWN	Min. 1 MΩ



Note 1: Variations in oil level
The oil level may change according to the angle of the machine, the engine speed, or the temperature of the oil, so if there is any display, check the oil level again with the machine at a horizontal place.

Note 2: If the problem occurs again, the connector (female) at the chassis end is probably defective, so check the connector and wiring harness at the chassis end.

Note 3: Check for vibration at the connector mount. If there is excessive vibration, take the appropriate action.

Note 4: Defective installation is a possible cause, so be careful when installing. If the problem occurs again, check for any vibration of the mount, and if there is excessive vibration, take the appropriate action.

METHOD OF USING MANUAL

1. When removing or installing unit assemblies

① When removing or installing a unit assembly, the order of work and techniques used are given for the removal operation; the order of work for the installation operation is not given.

② Any special techniques applying only to the installation procedure are marked [※ 1], and the same mark is placed after the relevant step in the removal procedure to indicate which step in the installation procedure it applies to.

(Example)

REMOVAL OF ○ ○ ○ ○ ASSEMBLY ..... Title of operation

⚠ ..... Precautions related to safety when carrying out the operation

1. XXXX (1) ..... Step in operation

★ ..... Technique or important point to remember when removing XXXX (1).

2. △ △ △ △ (2): ..... [※ 1] Indicates that a technique is listed for use during installation

3. □ □ □ □ assembly (3)

..... Quantity of oil or water drained

INSTALLATION OF ○ ○ ○ ○ ASSEMBLY ....Title of operation

- Carry out installation in the reverse order to removal.

[※ 1] ..... Technique used during installation

★ ..... Technique or important point to remember when installing △ △ △ △ (2).

- Adding water, oil ..... Step in operation

★ ..... Point to remember when adding water or oil

..... Quantity when filling with oil and water

2. General precautions when carrying out installation or removal (disassembly or assembly) of units are given together as PRECAUTIONS WHEN CARRYING OUT OPERATION, so be sure to follow these precautions when carrying out the operation.

3. Listing of special tools

① For details of the description, part number, and quantity of any tools (**A1**, etc.) that appear in the operation procedure, see the SPECIAL TOOLS LIST given in this manual.

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Component	Symbol		Part No.	Part Name	Q'ty	New/ remodel	Sketch	Nature of work, remarks	
Track link remover	N	1	791-680-9580	Adapter	1			Disassembly, assembly	
			791-680-9590	Guide	1				
			01010-52760	Bolt	2				
			01010-51440	Bolt	2				
		2	790-101-1102	Pump	1				
			790-101-4300	Cylinder	1				1,471 kN {150 ton}
		3	791-685-9510	Frame	1			Assembly	
			791-685-9520	Frame	1				
			791-685-9530	Rod	1				
			791-685-9550	Nut	1				
			791-685-9560	Bolt	4				
			791-685-9570	Adapter	1				
			01010-51030	Bolt	1			Disassembly, assembly	
			04530-12030	Eyebolt	1				
			790-101-1102	Pump	1				
			790-101-4300	Cylinder	1				1,471 kN {150 ton}
		4	791-685-9540	Rod	1				
			791-685-9550	Nut	3				
		5	791-685-9510	Frame	1				
			791-685-9520	Frame	1				
			791-685-9530	Rod	1				
			791-685-9550	Nut	1				
			791-685-9560	Bolt	4				
			791-126-0150	Adapter	1				
			791-680-5520	Guide	1				
			791-126-0140	Pusher	1				
			791-680-9570	Adapter	1				
			01010-51030	Bolt	1				
			04530-12030	Eyebolt	1				
			791-685-9620	Extension	1				
			791-101-1102	Pump	1				
			790-101-4300	Cylinder	1				1,471 kN {150 ton}
		6	790-101-1102	Pump	1				
			790-101-4200	Pulley	1				294 kN {30 ton}
Track link installer		7	791-680-5542	Adapter	1			Disassembly	Press fitting of regular pin
			791-632-1110	Adapter	1				Press fitting of bushing
		8	791-680-5580	Guide	1				

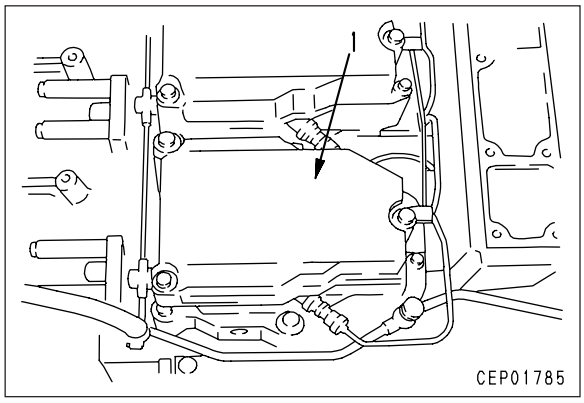
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REMOVAL OF NOZZLE HOLDER ASSEMBLY

★ When removing the No. 2 nozzle holder assembly, remove the muffler assembly.
For details, see REMOVAL OF CYLINDER HEAD ASSEMBLY.

1. Open engine hood.

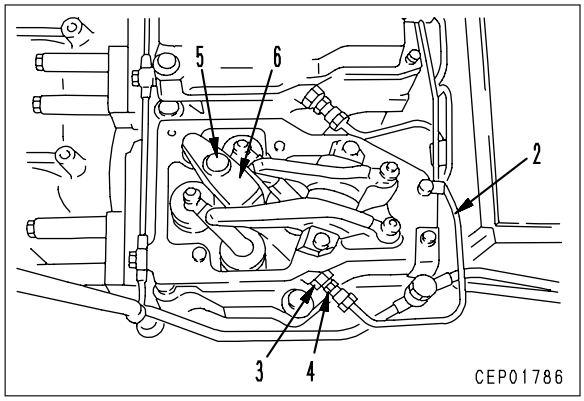
2. Remove head cover (1). ※ 1



3. Disconnect injection tube (2).

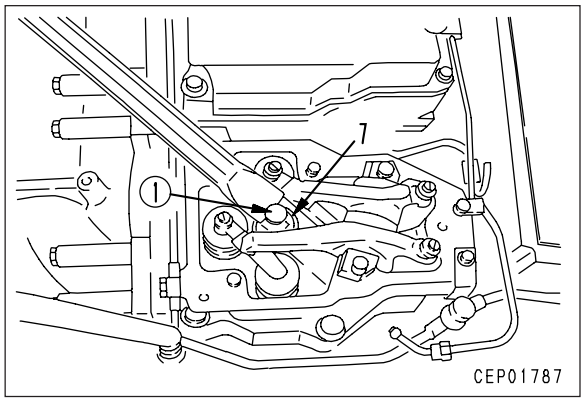
4. Loosen locknut (3) and remove connection (4). ※ 2

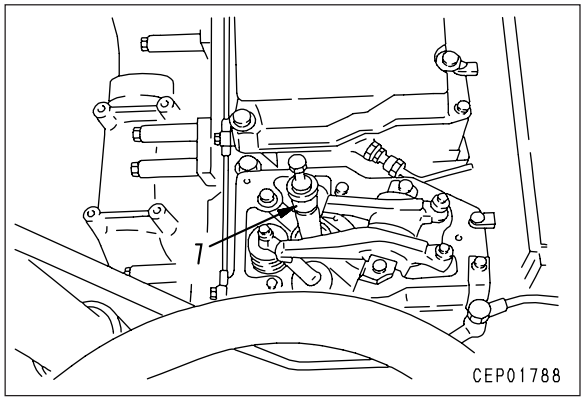
5. Remove bolt (5) and holder (6). ※ 3



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6. Remove nozzle holder assembly (7).
★ Screw forcing screw ① fully into the nozzle holder, then use a bar to twist and remove nozzle holder assembly (7).
★ When removing the nozzle holder assembly, clean the surrounding area and be careful not to let any dirt or dust get inside.
★ Check that there is a gasket installed to the tip of the nozzle holder.





INSTALLATION OF ENGINE REAR SEAL

- Carry out installation in the reverse order to removal.

※ 1

★ When tightening the mounting bolts, follow the order in diagram A.

Mounting bolt: **Lubricating oil (EO30)**

★ Tighten the mounting bolts as follows.

kgm Coupling bolt, nut:

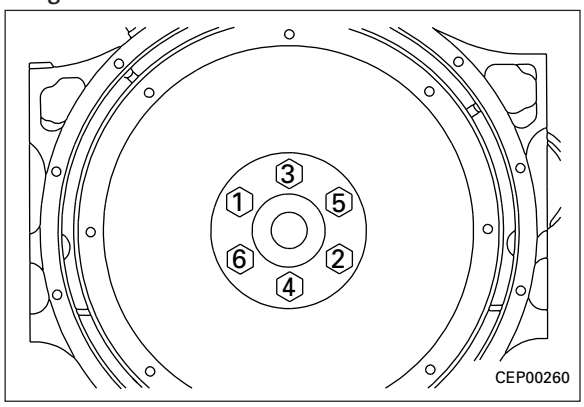
1st pass:	Tighten to 117.7 ± 4.9 Nm {12 ± 0.5 kgm}
2nd pass:	Make start marks with a felt pen on bolt and flywheel, then tighten bolt 90° $^{+30°}_{-0}$

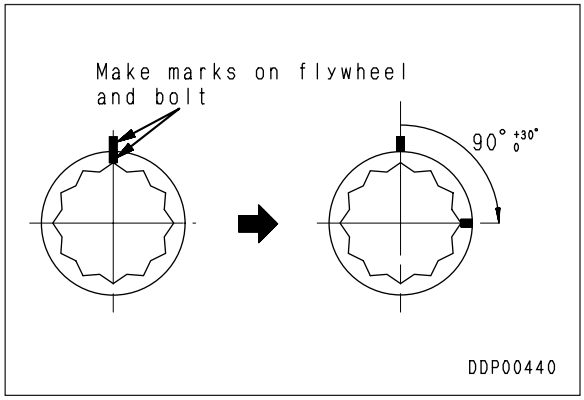
★ After tightening, make one punch mark on the bolt head to indicate the number of times it has been tightened.

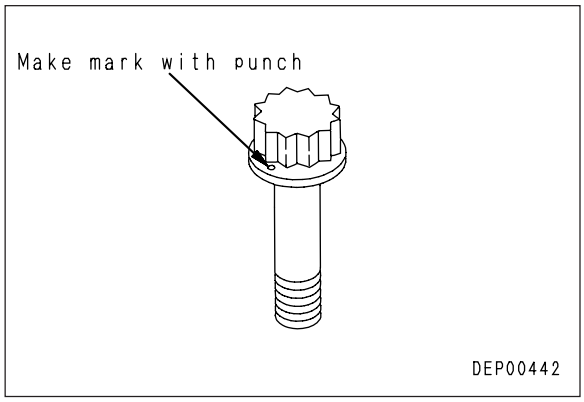
★ If any bolt already has five punch marks, do not reuse it. Replace it with a new bolt.

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Diagram A

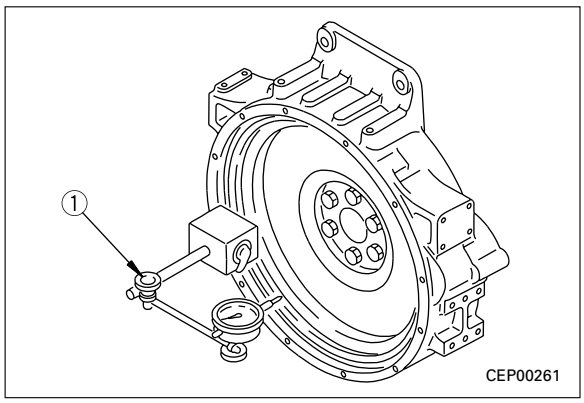






- Using dial gauge ①, measure radial and face runout of flywheel.

★ Face runout: **0.2 mm**
Radial runout: **0.15 mm**



※ 9
kgm Mounting bolt:
66.2 ± 7.4 Nm {6.75 ± 0.75 kgm}

※ 10
kgm Connection:
36.8 ± 2.5 Nm {3.75 ± 0.25 kgm}
kgm Locknut: **31.9 ± 2.5 Nm {3.25 ± 0.25 kgm}**

※ 11
★ Check that there is no dirt or dust inside the nozzle holder sleeve.
★ Check that the copper gasket is fitted to the tip of the nozzle holder.

※ 12
★ Check that the push rod is fitted securely in the cam follower.

※ 13
kgm Mounting bolt:
98 ± 4.9 Nm {10 ± 0.5 kgm}

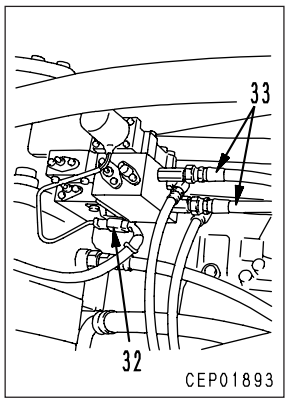
※ 14
★ Adjust the crosshead as follows.
1) Loosen the locknut and turn the adjustment screw back.
2) Hold down the top of the crosshead lightly with a finger and screw in the adjustment screw.
3) When the adjustment screw contacts the valve stem, tighten a further 20°.
4) Tighten the locknut to hold in position.
kgm Locknut:
59 ± 5.9 Nm {6.0 ± 0.6 kgm}

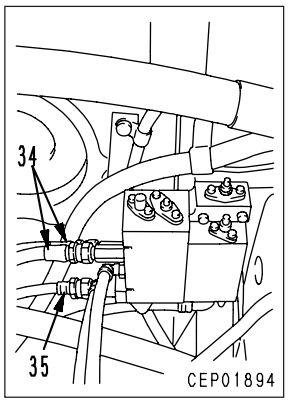
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18. Disconnect TVC solenoid connector (32), remove clamp, then disconnect wiring harness from pump.

19. Disconnect jet sensor hoses (33) and (34) of No. 1 pump.

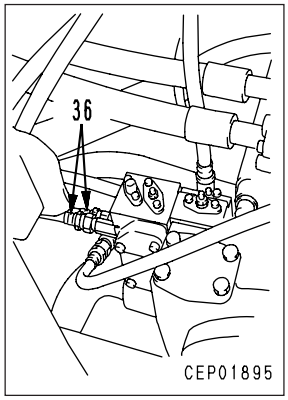
20. Disconnect CO cancel hose (35).

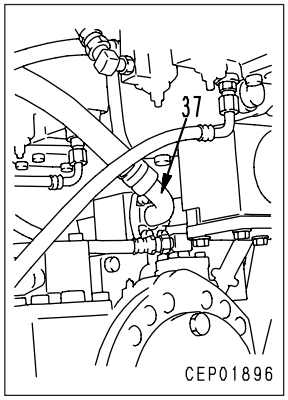




21. Disconnect NC valve control hoses (36) of No. 2 rear pump.

22. Disconnect control pump outlet hose (37).

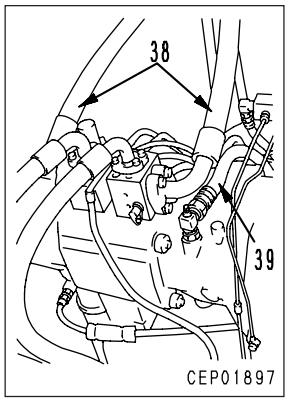


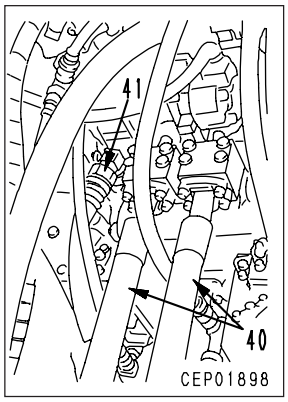


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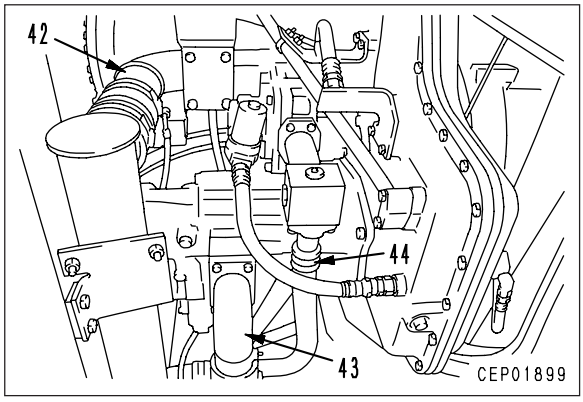
23. Disconnect outlet hoses (38) and drain hose (39) of No. 1 pump.

24. Disconnect outlet hoses (40) and drain hose (41) of No. 2 pump.





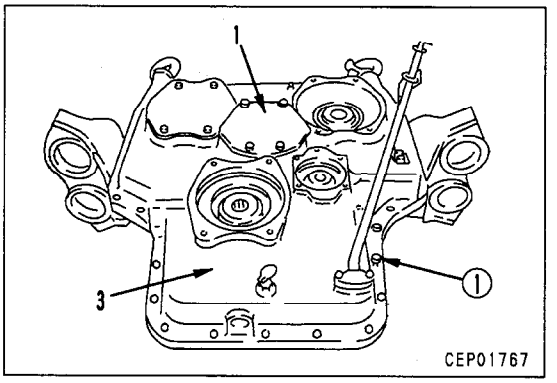
25. Disconnect suction tubes (42) and (43), and hose (44).



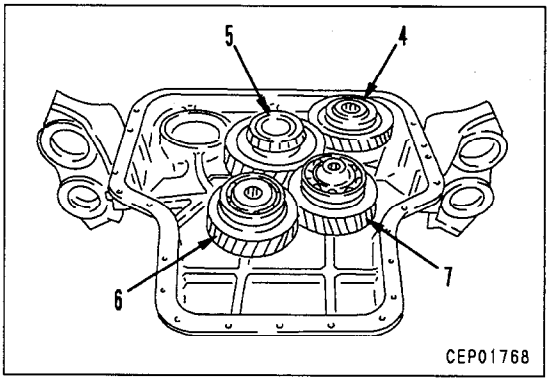
DISASSEMBLY OF PTO ASSEMBLY

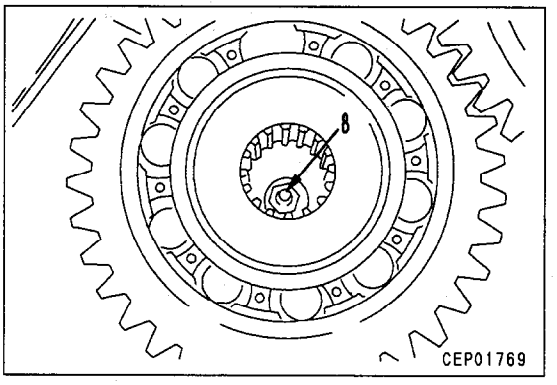
PC750-6 Serial No.: 10001 – 10238
PC800-6 Serial No.: 30001 – 30174

1. **Cover**
   Remove cover (1), remove mounting bolts, then using bolt ①, remove case (3).
   ★ Check the number and thickness of the shims, and keep in a safe place.

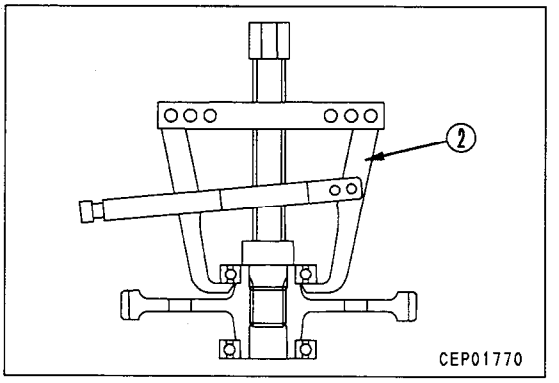


2. **Gear assembly**
   Remove gear assemblies (4), (5), (6), and (7).
   ★ If the gear assembly will not come out, remove nipple (8), then use a puller to remove the gear assembly from the case.



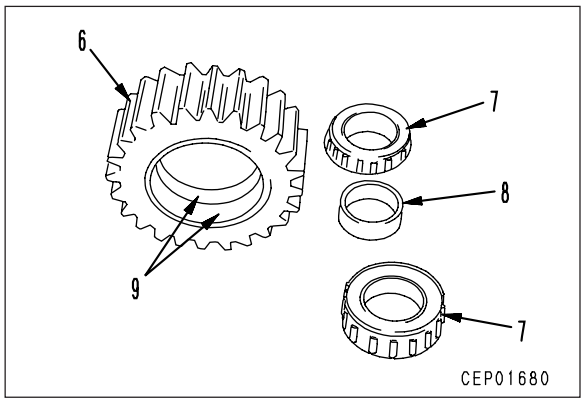


3. **Removal of bearing**
   Using puller ②, remove bearing from each gear.

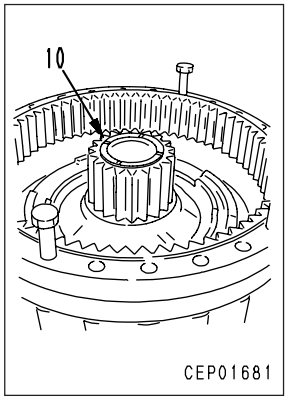


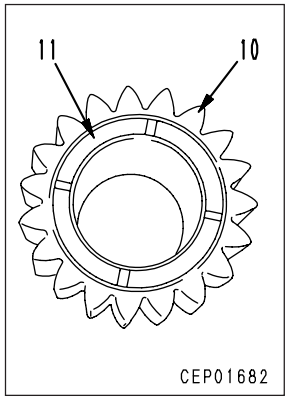
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iv) Remove bearing (7) and spacer (8) from gear (6).
★ If the parts are to be used again, make match marks to prevent any change in the combination with the outer race.
v) Remove outer race (9) from gear (6).

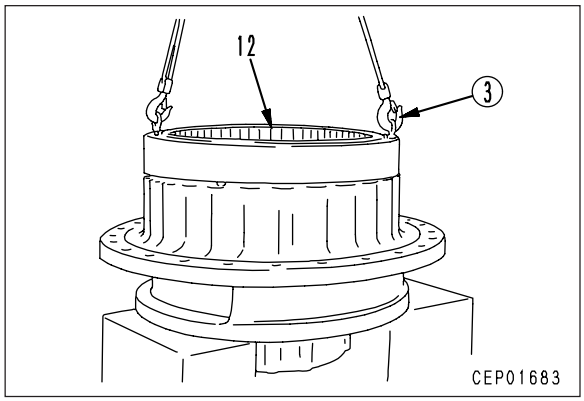


5. No. 3 sun gear
1) Remove thrust washer (11) from No. 3 sun gear (10).
2) Remove No. 3 sun gear (10).

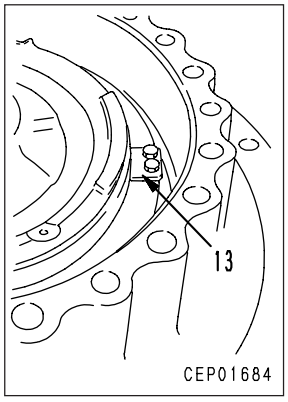


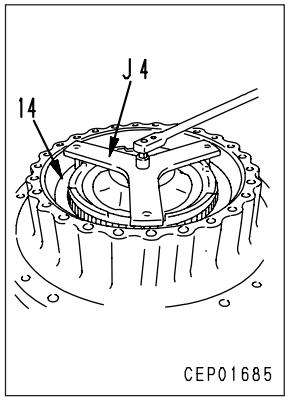


6. No. 3 ring gear
Using eyebolts ③, remove No. 3 ring gear (12).



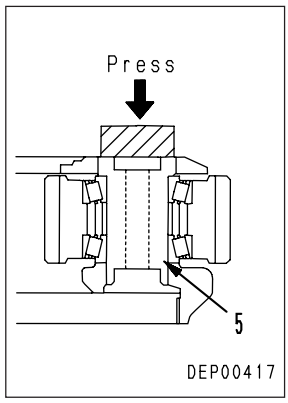
7. Hub assembly
1) Remove lock plate (13).
2) Using tool **J4**, remove nut (14).

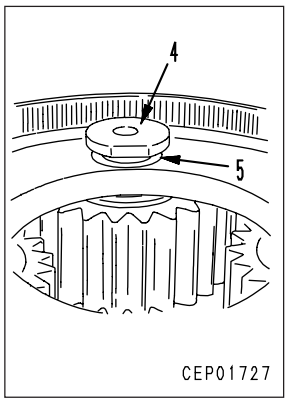




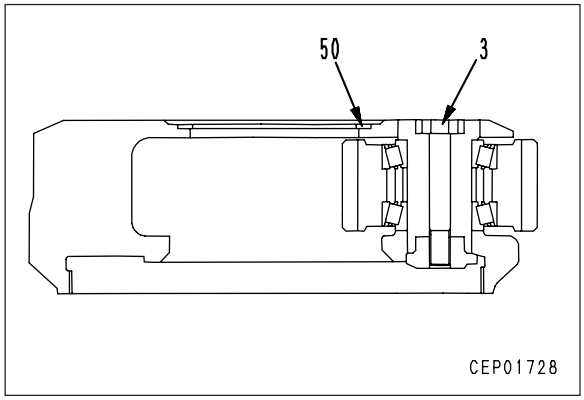
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iii) Expand fit shaft (5) or press fit with a press.
★ Do not move the gear until the tip of shaft (5) enters the carrier. Be particularly careful with the spacer.
★ After press fitting the pin, check that the gear rotates smoothly.
★ When press fitting the shaft, be careful of the angle of the shaft.
iv) Assemble holder (4) to shaft (5).



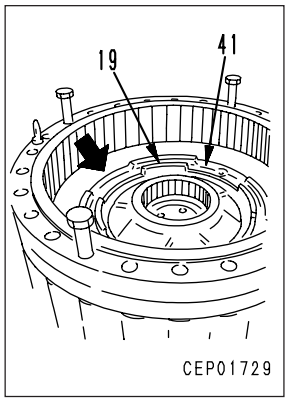


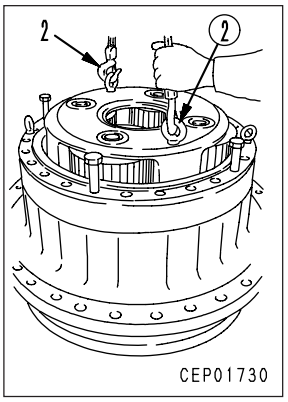
v) Tighten bolt (3).
Bolt: **Thread tightener (LT-2)**
kgm Bolt:
927 ± 103 Nm {94.5 ± 10.5 kgm}
vi) Install thrust washer (50).



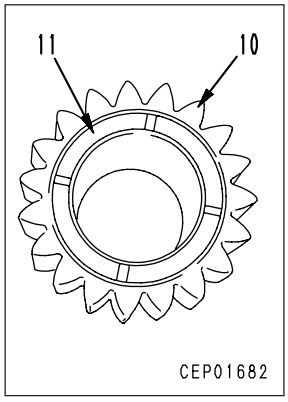
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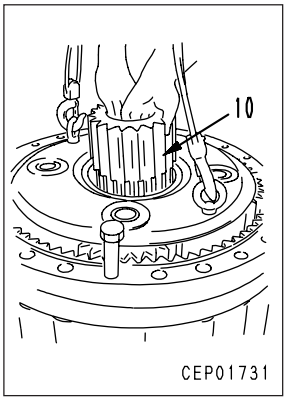
2) Using eyebolts ②, install No. 3 carrier assembly (2).
★ Align the low portion (4 places) of spacer (19) and shaft (14) with the carrier assembly holder.
★ Align the bolt holes also.





13. No. 3 sun gear
1) Install thrust washer (11) to No. 3 sun gear (10).
2) Install No. 3 sun gear (10).
★ Be careful not to get your fingers caught.



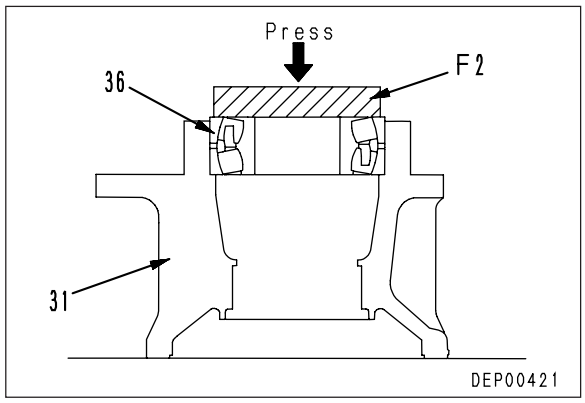


ASSEMBLY OF SWING MACHINERY ASSEMBLY

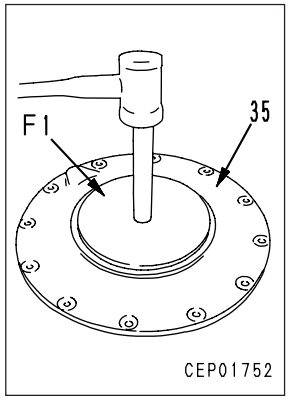
★ Clean all parts, and check for dirt or damage. Coat the sliding surfaces of all parts with engine oil before installing.

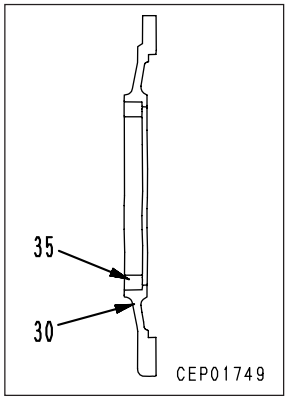
1. Bearing

1) Expand fit bearing (36) to case (31), or use a press to install.

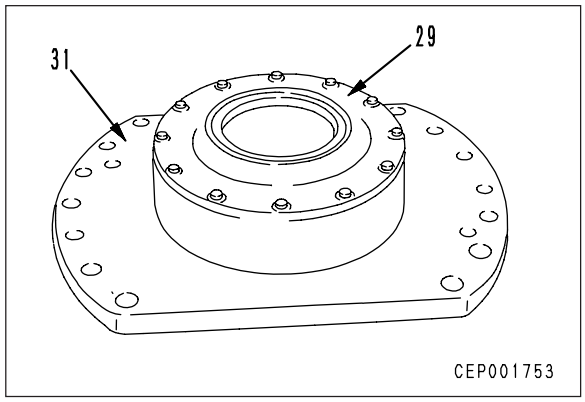


2) Using tool **F1**, press fit oil seal (30) to cover (35).
   - Outside circumference of oil seal: **Gasket sealant (LG-6)**
   - Lip of oil seal: **Grease (G2-LI)**



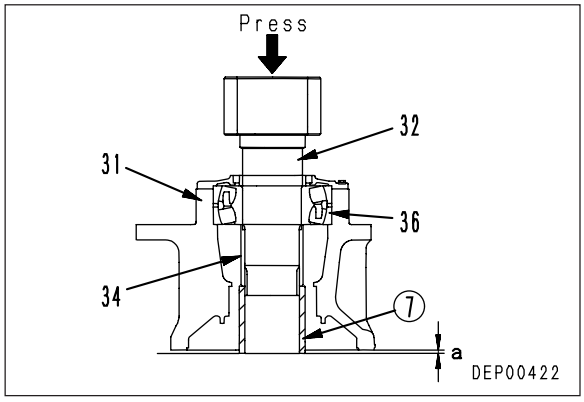


3) Align oil groove of cover assembly (29) with drill hole (drain port) of case (31), then install cover assembly (29).
   - Cover mounting surface: **Gasket sealant (LG-6)**
   - kgm Bolt: **66.5 ± 7.5 Nm {6.75 ± 0.75 kgm}**



2. Pinion shaft assembly

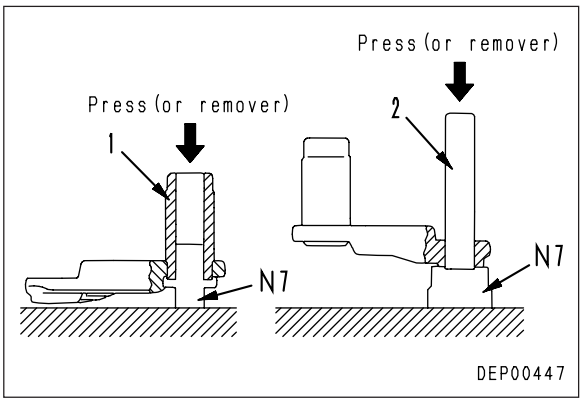
1) Set spacer (34) on push tool ⑦, and set case (31) in position.
   ★ Clearance **a** between the case and the press stand is 1 – 2 mm.
2) Check that spacer (4) is in correct position, then push pinion shaft (32) and press fit to bearing (36).
   ★ When setting case assembly (31) and shaft (32) in position, be careful not to damage the oil seal.



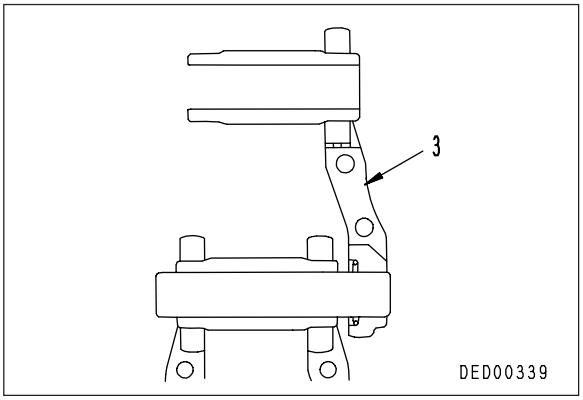
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FIELD ASSEMBLY OF ONE LINK

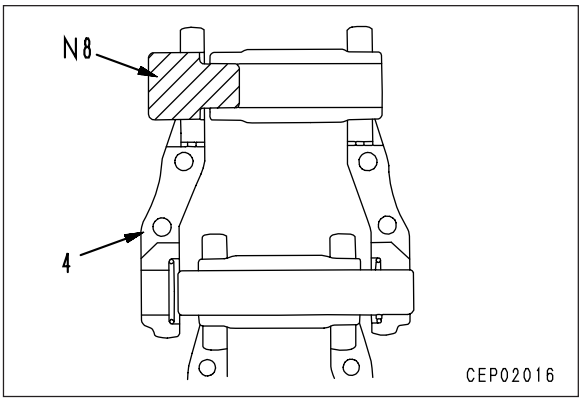
1. Assemble link sub-assembly.
1) Set tool **N7** to end face of link, then press fit bushing (1).
2) Set tool **N7** to end face of link (pin end), and press fit pin (2).



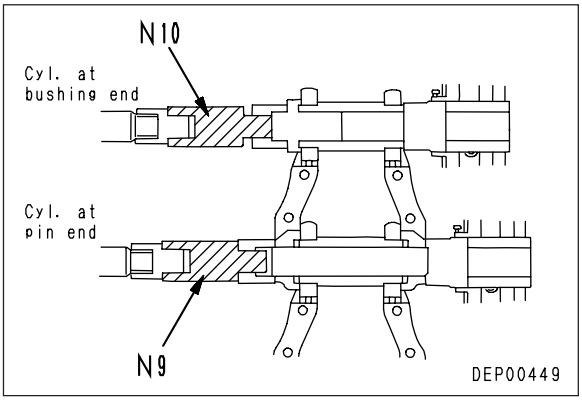
2. Set link sub-assembly (3) on link to be connected.



3. Set link (4) on opposite side, and support with tool **N8** (guide).

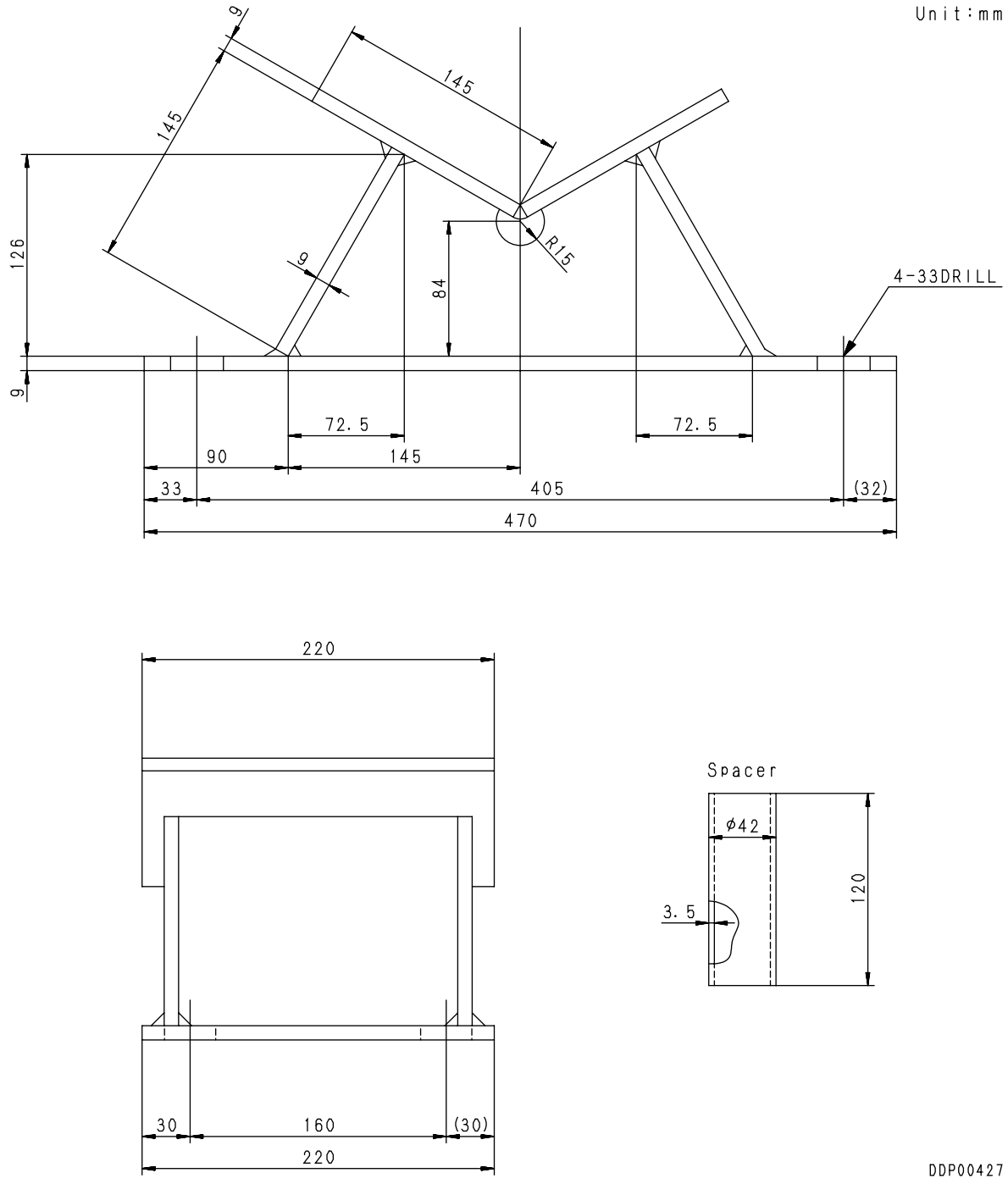


4. Set tools **N9** and **N10** in same way as for operation to remove pin, then use tool **N9** (adapter, extension, guide, adapter, bolt) for press fitting pin, and tool **N10** (extension, guide, adapter, bolt) for press fitting bushing, and press fit in turn.



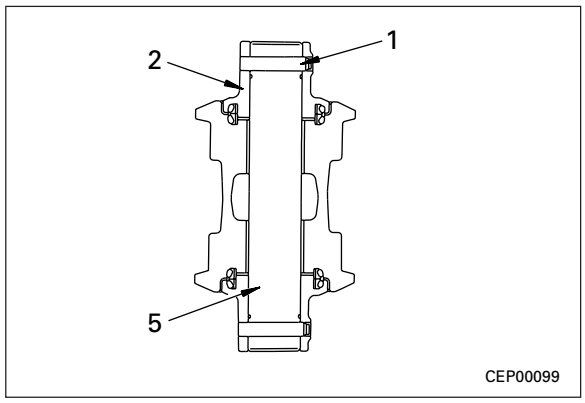
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Fig. 1 (for tool ①)

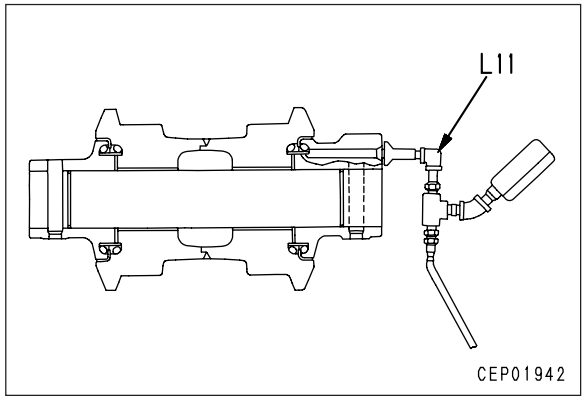


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8. Assemble collar (2) to shaft (5), and install pin (1).



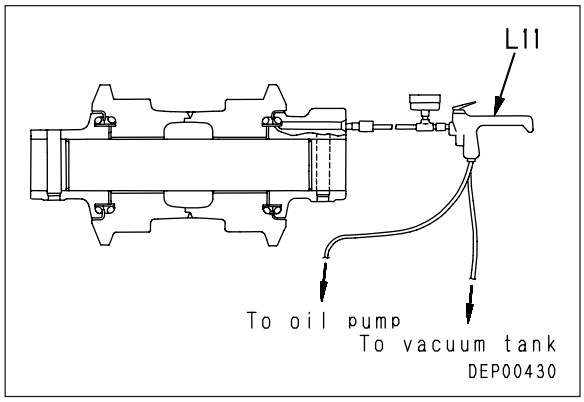
9. Using tool **L11**, apply standard pressure to roller oil filler port, and check for leakage of air from seal.
- ★ Standard pressure: **1 MPa {1 kg/cm²}**
- ★ Method of checking
  The standard pressure shall be maintained for 10 seconds and the indicator of the gauge shall not go down.

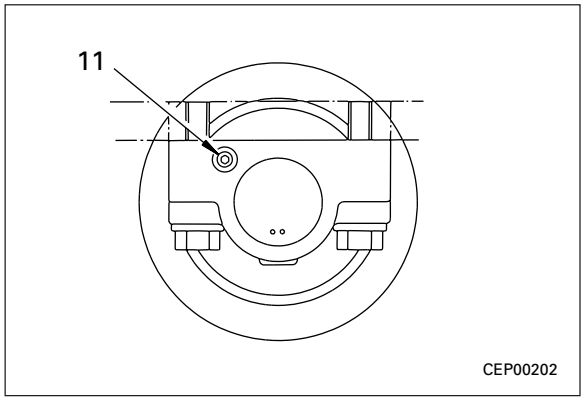


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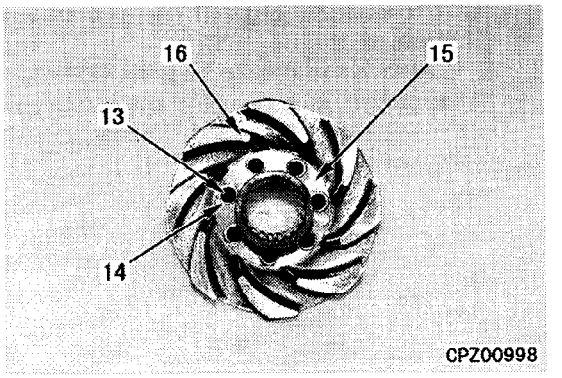
10. Using tool **L11**, fill track roller assembly with oil, then tighten plug (11).

Track roller oil: **280 – 310 cc (EO30-CD)**
kgm Plug: **14.7 ± 4.9 Nm {1.5 ± 0.5 kgm}**

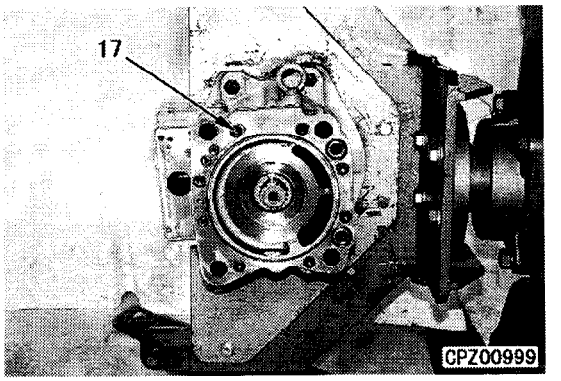




- **Sub-disassembly of impeller assembly**
  Take off the screw (13) and the washer (14) by using the tool **B9**, and divide the assembly to the coupling (15) and the impeller (16).

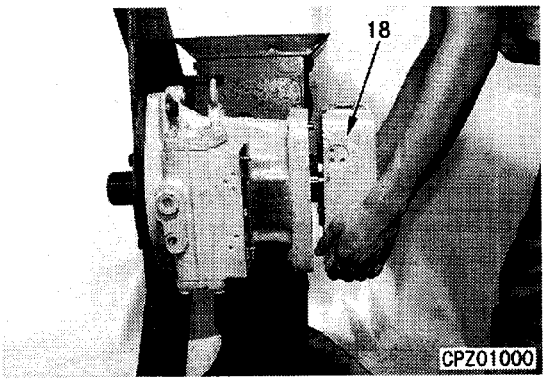


5. **Front end cap assembly**
   1) Take off seven pieces of the mounting bolt (17).
      ★ When taking them off, leave two bolts as guide.

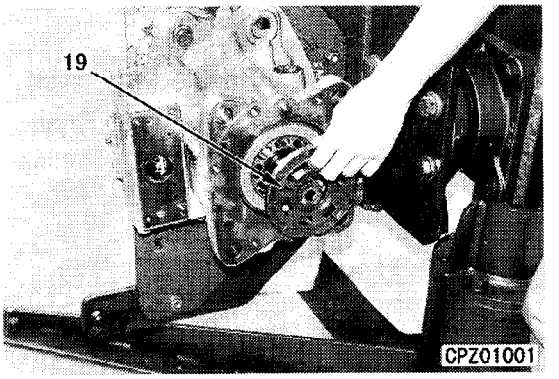


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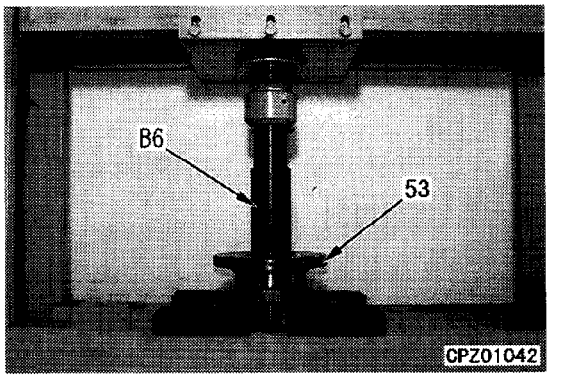
   2) Remove the end cap assembly (18).
      ★ The valve plate may be adhered to the end cap. So, be careful not to drop it.



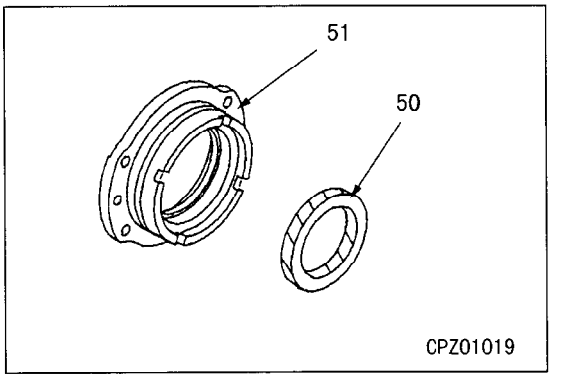
   3) Take off the valve plate (19).



3) Press fit the cradle (53) in the shaft assembly (52) by using the tool **B6** to make the shaft and cradle assembly (35).
   Press-fitting surface of bearing : **Grease (G2-LI)**
   ★ When press fitting the bearing, push the end face of the bearing outer ring with the tool **B6**.



4) Set the oil seal (50) in the housing (51) by using the tool **B4**.
   Oil seal lip surface : **Grease (G2-LI)**

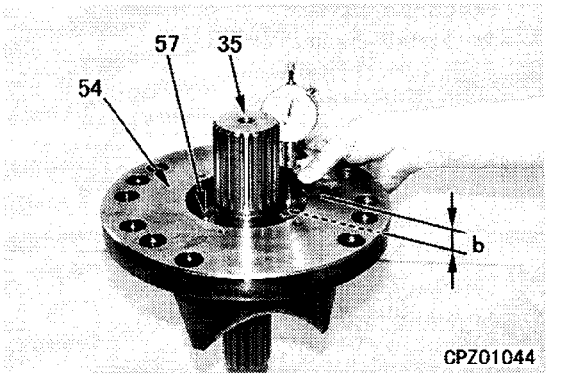


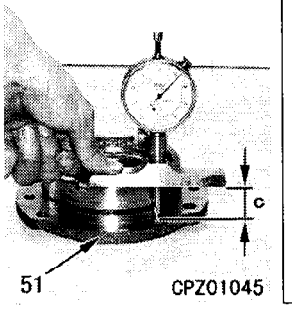
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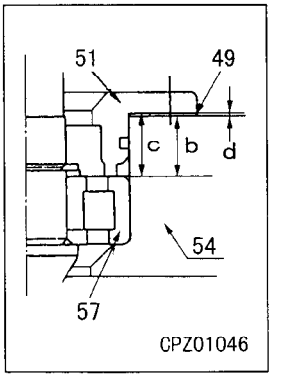
2. **Shaft and housing assembly**
   - **Selecting method of bearing fixing shim (49)**

   i) Measure the size "**b**" between the bearing (57) outer race end face and the cradle (54) housing (51) mounting surface of the shaft and cradle assembly (35).
   ii) Measure the size "**c**" of the housing (51).
   iii) Select a shim (49) as thick as the clearance size "**d**" between the measured sizes "**c**" and "**b**" from the table below. Then, place it in the cradle.

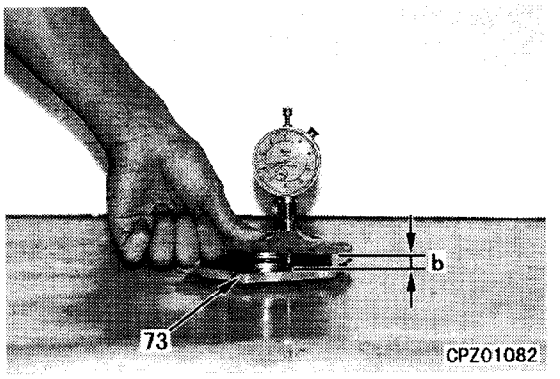
Shim Part No.	708-27-12830	708-27-12840	708-27-12850
Shim thickness (mm)	0.15	0.1	0.05





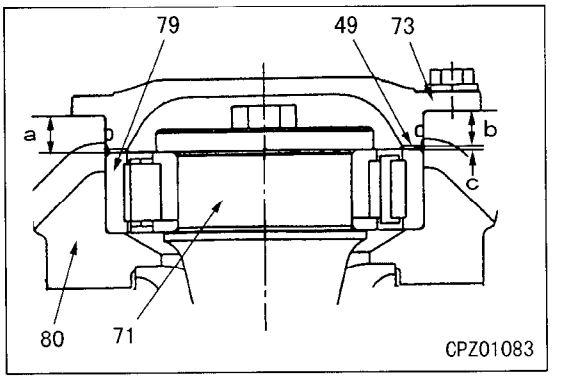


ii) Measure the size "**b**" of the housing (73).



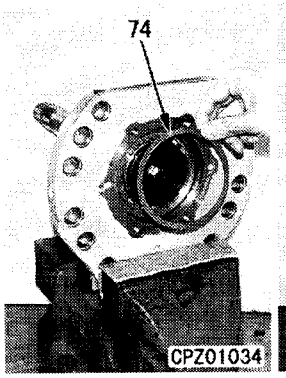
iii) Select a shim (49) as thick as the clearance size "**c**" between the measured sizes "**a**" and "**b**" from the table below. Then, place it in the cradle.

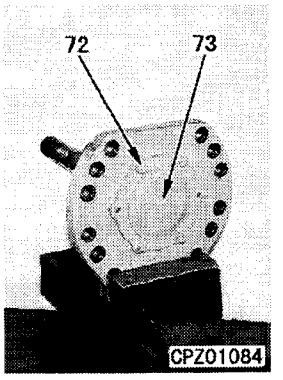
Shim Part No.	708-27-12830	708-27-12840	708-27-12850
Shim thickness (mm)	0.15	0.1	0.05



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1) Incorporate the selected shim (74).
2) Set the O-ring to the housing (73) and tighten the bolt (72) to make the shaft and housing assembly.
   ★ Tighten the bolts equally and be careful not to damage the O-ring.
   Mounting bolt :
   31.4 ± 2.94 Nm {3.2 ± 0.3 kgm}



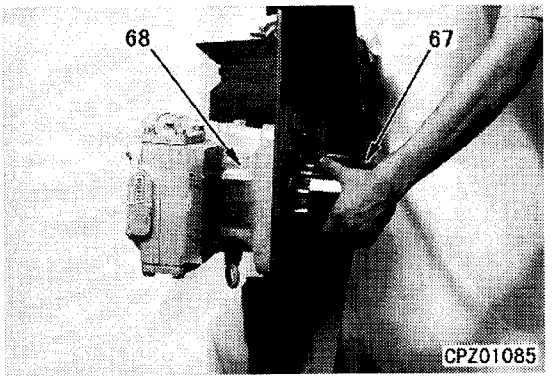


13. Servo piston
Assemble the servo piston in the same way as the procedures mentioned in Paragraph 3.

14. Rocker cam assembly
Assemble the rocker cam assembly in the same way as the procedures mentioned in Paragraph 4.

15. Shaft and housing assembly
Assemble the shaft and housing assembly in the same way as the procedures mentioned in Paragraph 5.

16. Cylinder block and piston assembly
- **Sub-assembly of cylinder assembly and piston assembly**
  1) Assemble them in the same way as the procedures mentioned in Paragraph 6.
  2) Install the cylinder block and piston assembly to the rear pump case (68).



INSTALLATION OF MAIN PUMP (NO. 2 PUMP) ASSEMBLY

PC750-6 Serial No.: 10239 and up
PC800-6 Serial No.: 30175 and up

- Carry out installation in the reverse order to removal.

- Refilling with oil (hydraulic tank)
  ★ Add oil through oil filler 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.
  For details, see TESTING AND ADJUSTING.

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ASSEMBLY OF NO. 2 MAIN PUMP ASSEMBLY (HPV95 + 95)

★ Clean all parts, remove all burrs, and check for dirt or damage.
★ Coat the rotating and sliding surfaces of all parts with engine oil (EO10-CD) before installing.

- Always check the following parts before assembling.
  i) Check contact of cradle and rocker cam (for details, see procedure for checking contact).
  ii) Check contact between cylinder block and valve plate (for details, see procedure for checking contact).
  iii) Check contact between valve plate and end cap (for details, see procedure for checking contact).

- **Assembly of front pump assembly**

1. Shaft, cradle assembly

- **Assembly of shaft and cradle assembly**

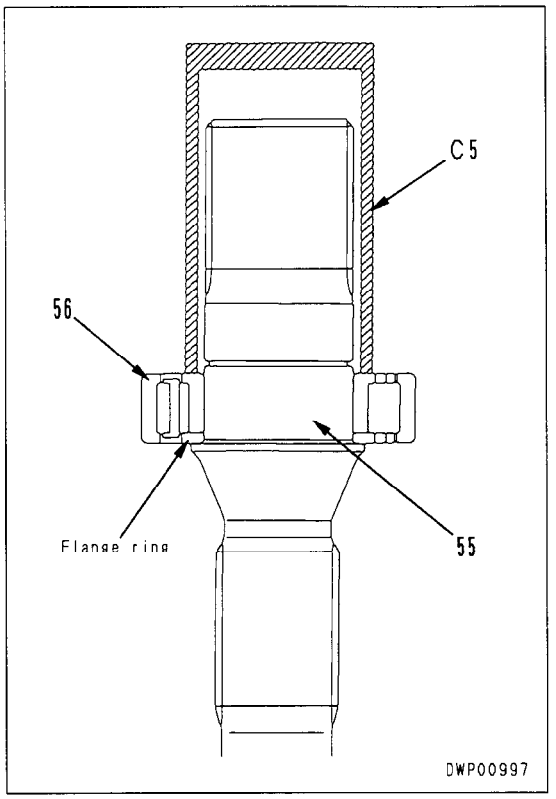
1) Assemble flange ring to shaft (55), then use tool **C5** to press fit bearing (56).
Press-fitting surface of bearing: **Grease (G2-LI)**
★ When press fitting the bearing, push the end face of the bearing inner race with tool **C5**.

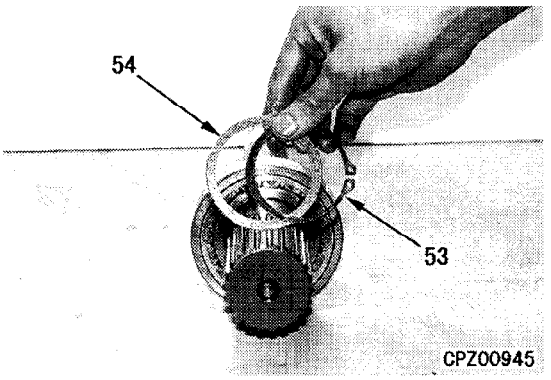
2) Assemble washer (54), and install snap ring (53).

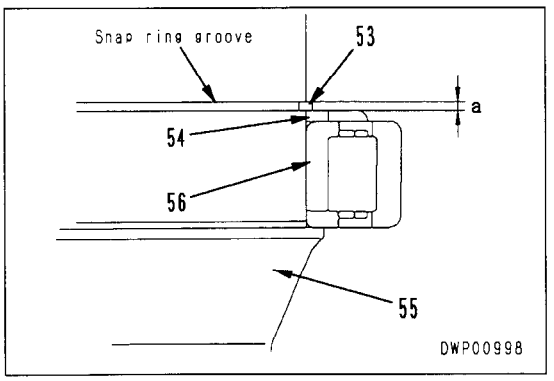
- **Method of selecting lock washer (54)**

i) After press fitting bearing (56) to shaft (55), assemble washer (54) (removed during disassembly).
ii) Measure clearance dimension **a** between end face of assembled washer (54) and snap ring groove.
★ Clearance dimension **a**: 1.45 – 1.60 mm
iii) If clearance **a** is not within above standard value, select washer from table below and assemble.

Washer Part No.	708-2E-12160	708-2E-12170	708-2E-12180	708-2E-12190
Washer thickness (mm)	3.1	3.0	2.9	2.8





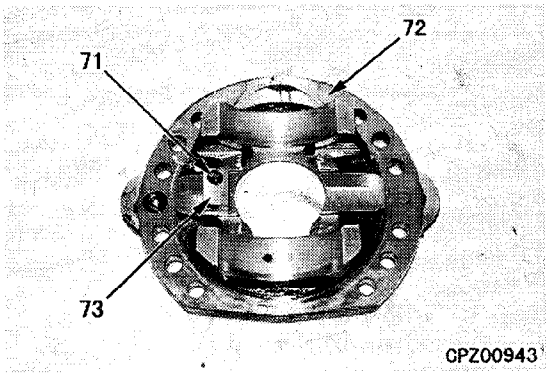


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- **Assembly of rear pump assembly**

12. Cradle assembly

1) Set the dowel pin on the cradle (72) and install the stopper (73).
2) Tighten the screw (71) using the tool **C9**.
   kgm Screw :
   13.23 ± 1.5 Nm {1.35 ± 0.15 kgm}
   Mounting bolt :
   Adhesive (Loctite 648)



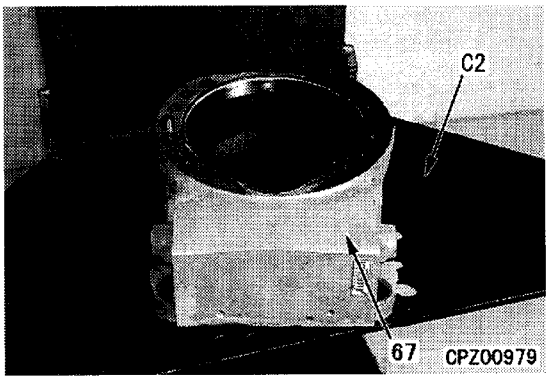
- **Sub-assembly of shaft and cradle assembly**
  Assemble the shaft and cradle assembly in the same way as the procedures mentioned in Paragraph 1.

13. Shaft and housing assembly

Assemble the shaft and housing assembly in the same way as the procedures mentioned in Paragraph 2.

14. Servo piston

1) Install the pump case (67) by using the tool **C2**.
2) Then, follow the procedures mentioned in Paragraph 3.



15. Rocker cam assembly

Assemble the rocker cam assembly in the same way as the procedures mentioned in Paragraph 4.

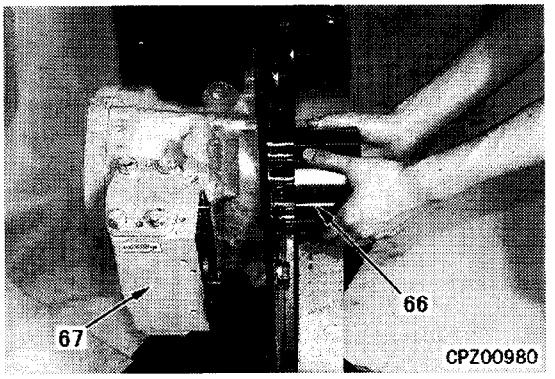
16. Shaft and cradle assembly

Assemble the shaft and cradle assembly in the same way as the procedures mentioned in Paragraph 5.

17. Cylinder block and piston assembly

- **Sub-assembly of cylinder assembly and piston assembly**

1) Assemble them in the same way as the procedures mentioned in Paragraph 6.
2) Install the cylinder block and piston assembly (66) to the rear pump case (67).



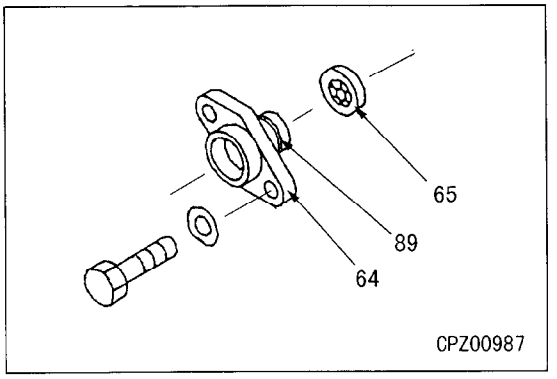
18. Rear pump

Remove the pump case (67) from the tool **C2**.

★ Remove it so that the cylinder block and piston assembly does not come off.

19. Rear end cap assembly

1) Incorporate the filter (65), set the O-ring (89) to the flange (64) and install the assembly.
   kgm Mounting bolt :
   27.4 – 34.3 Nm {2.8 – 3.5 kgm}



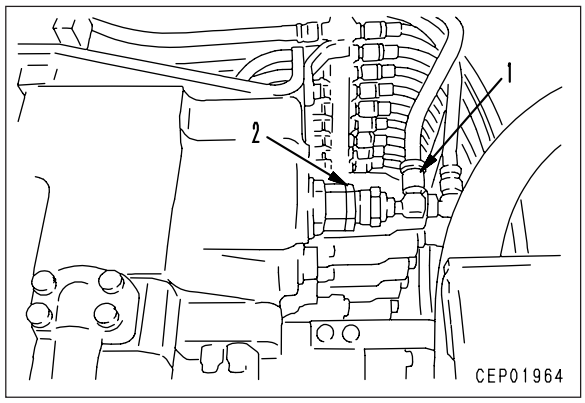
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REMOVAL OF MAIN RELIEF VALVE ASSEMBLY

⚠ Lower the work equipment completely to the ground and stop the engine. Then loosen the oil filler cap slowly to release the pressure inside the hydraulic tank.

1. Disconnect 2-stage relief hose (1).

2. Remove main relief valve assembly (2).
※ 1 ※ 2

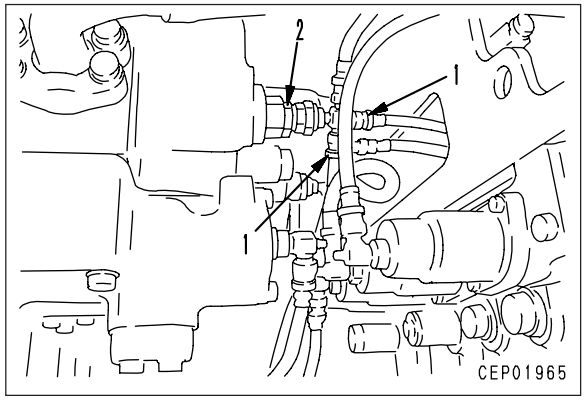


INSTALLATION OF MAIN RELIEF VALVE ASSEMBLY

- Carry out installation in the reverse order to removal.

※ 1
kgm Main relief valve:
320.95 ± 46.55 Nm {32.75 ± 4.75 kgm}

※ 2
★ Check the relief pressure.
For details, see TESTING AND ADJUSTING, Testing and adjusting hydraulic pressure in work equipment, swing, and travel circuits.



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ASSEMBLY OF CONTROL VALVE ASSEMBLY (WORK EQUIPMENT)

★ The operation described below is for the right 4-spool control valve (with straight-travel valve), but the procedure is basically the same for the left 5-spool control valve also.
★ Coat the sliding surface with engine oil when assembling.

1. Fit O-ring and install main relief valve (37).
kgm Main relief valve:
320.95 ± 46.55 Nm {32.75 ± 4.75 kgm}

2. Fit O-ring and install 2-stage safety valve (36).
kgm 2-stage safety valve :
225.4 ± 9.8 Nm {23 ± 1 kgm}

3. Fit O-ring and install suction valve (35).
kgm Suction valve:
225.4 ± 9.8 Nm {23 ± 1 kgm}

4. Fit O-ring and install suction-safety valves (34) and (33).
kgm Suction-safety valve:
225.4 ± 9.8 Nm {23 ± 1 kgm}

5. Fit O-ring and install jet sensor relief valve (32) and orifice (31).
kgm Jet sensor relief valve :
186.2 ± 9.8 Nm {19 ± 1 kgm}
kgm Orifice:
151.9 ± 24.5 Nm {15.5 ± 2.5 kgm}

6. Install spool to valve body as follows.
1) Assemble spools (30), (29), and (28) to valve body.
2) Assemble retainer (23), and springs (26) and (27), then fit O-ring and install case (25).

7. Install spool to valve body as follows.
1) Assemble spool (24) to valve body.
2) Assemble retainer (23), and springs (22) and (21), then fit O-ring and install case (20).

8. Assemble check valve (19), spring (18), and seat (17) to valve body.

9. Install check valve (16) and spring (15).

10. Assemble straight-travel valve as follows.
1) Fit O-ring and backup ring (38), then install sleeve (14), and tighten nut (13).
2) Assemble check valve (12) and spring (11), then fit O-ring and backup ring (39) and install plug (10).
3) Assemble spring (9), spool (8), and piston (7) to valve body, then fit O-ring and install sleeve (6).
4) Fit backup ring (5) and install plug (4).
5) Install cover (3).

11. Fit O-ring, then fit straight-travel valve assembly (2), and tighten mounting bolts (1).

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8. Piston, shaft

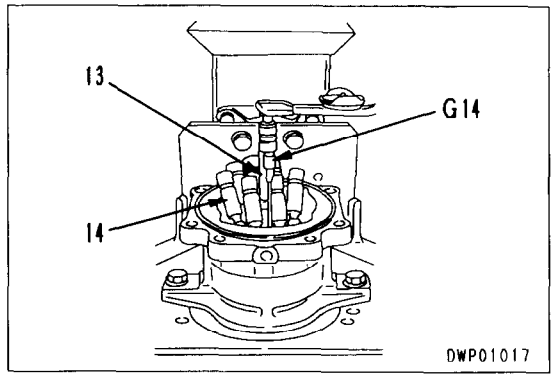
1) Set 7 pistons (14) and center shaft (13) in position.

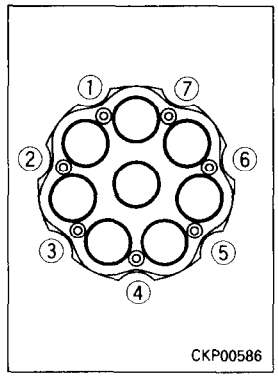
2) Using tool **G14**, tighten 7 retainer mounting screws.
   - ★ Replace the retainer mounting screws with new parts.

   Screw: **Thread tightener (LT-2)**

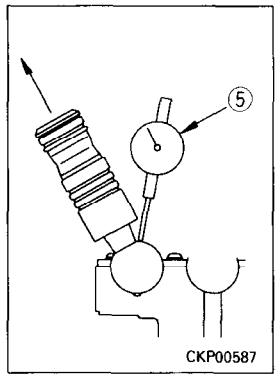
   Screw:
   1st step (tighten temporarily):
   Max. 0.98 Nm {0.1 kgm}
   2nd step: **3.9 – 5.9 Nm {0.4 – 0.6 kgm}**
   3rd step: **13.2 ± 1.5 Nm {1.35 ± 0.15 kgm}**

   - ★ Remove all oil and grease from the thread (male and female), and dry completely.
   - ★ Order for tightening: ①-④-⑦-③-⑥-②-⑤ Tighten either clockwise or counterclockwise.
   - ★ After tightening, wipe off any adhesive that has been squeezed out.
   - ★ Check that the large ball of piston (14) and center shaft (13) move smoothly.





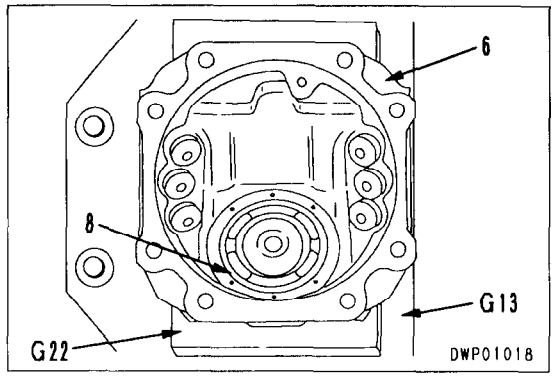
3) Using dial gauge ⑤, measure play of piston (14) in axial direction.
   - ★ Play of piston in axial direction:
     Max. 0.25 mm



9. Spring

1) Set housing (6) to tool **G13** together with tool **G22**, then adjust angle so that valve plate mounting surface is horizontal.

2) Install valve plate (8).



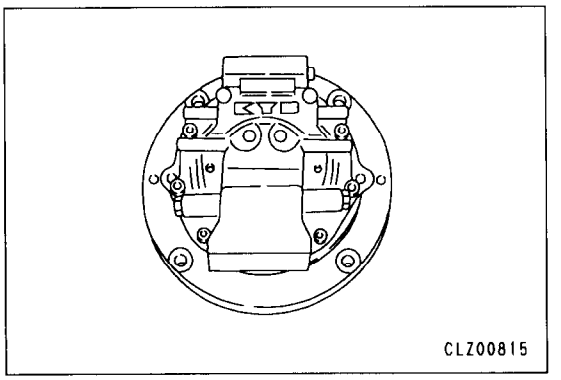
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DISASSEMBLY PROCEDURE

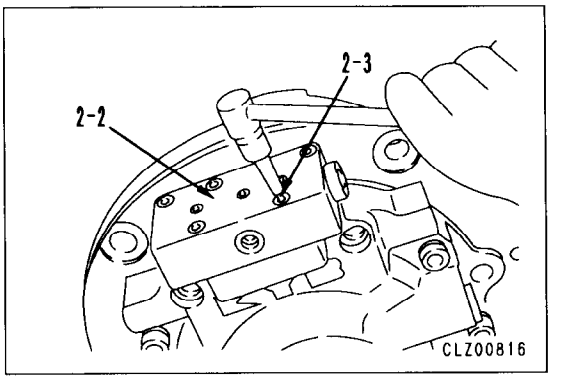
★ Precautions before disassembly
1) Remove all mud and dirt stuck to the outside surface.
2) Drain all the hydraulic oil from inside the piston motor case and the port circuit.
3) Select a work place that is free of dirt or dust, and be extremely careful not to let mud or dirt stick to any part.
4) Do not disassemble more than is necessary.

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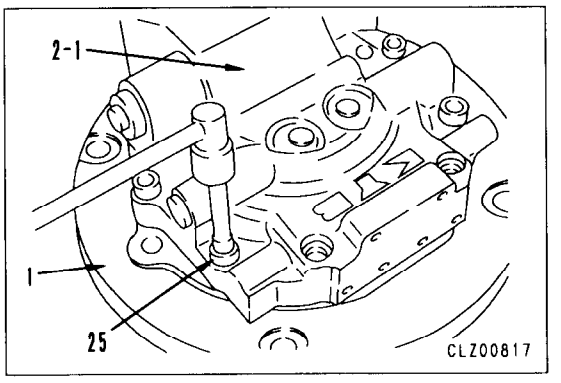
1. Fixing motor
Set motor on work stand with output shaft at bottom.



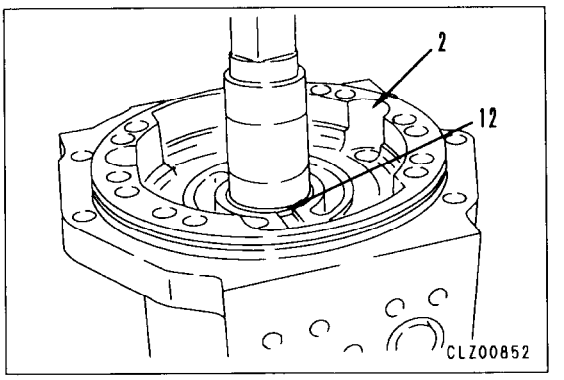
2. Removal of supplied valve
Before starting disassembly of motor, remove supplied valve.
Loosen socket bolt (2-3) and remove valve assembly (2-2).
※ Tools: Torque wrench ②, hexagonal bit ⑨, hexagonal wrench ⑯



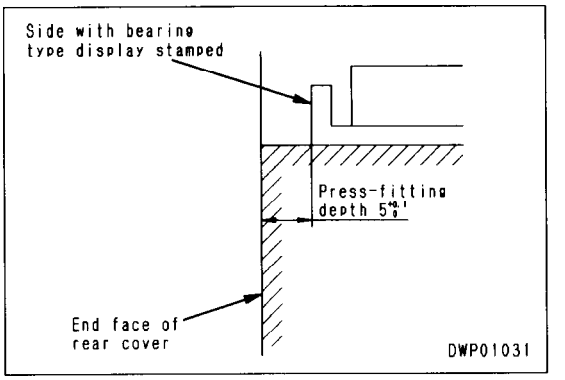
3. Removal of rear cover
1) Loosen socket bolt (25), then put screwdriver between rear cover (2-1) and case (1), and remove rear cover (2-1).
★ Do not use the screwdriver to twist with force.
※ Tools: Torque wrench ⑥, hexagonal bit ⑫, hexagonal wrench ⑲, screwdriver ㉒



5. **Assembly of rear cover assembly**
   1) Press fit needle bearing (12) to rear cover (2).
      ★ Press fit slowly and be careful not to apply any impact to the surface with the stamped mark.
      ※ Tools: Press, jig **F** for assembling needle bearing

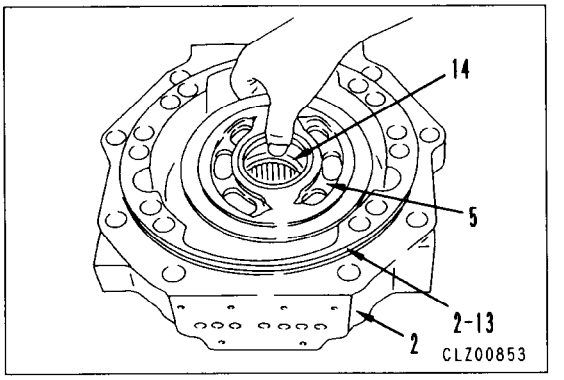


   • Installation dimension

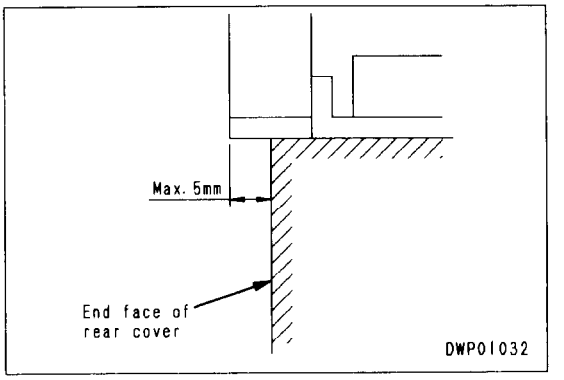


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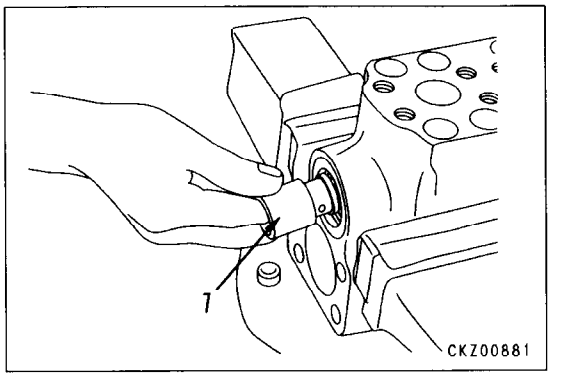
   2) Assemble collar (14), pin (17), O-ring (2-13), and valve plate (5) to rear cover (2).
      ★ Coat the valve plate with grease to prevent it from falling off the rear cover.



   • Installation dimension of collar

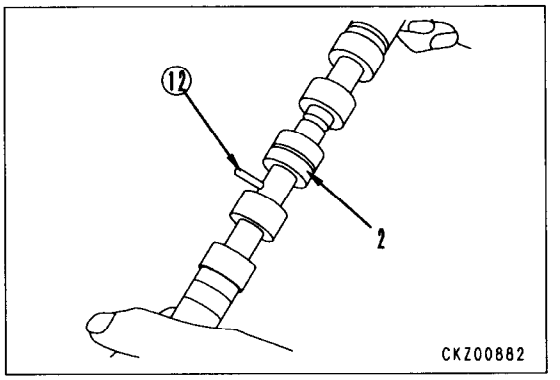


3) Pull out check valve (7).
   ★ Insert your finger fully into the body of the check valve and hold down the inside with your finger while pulling out the check valve.



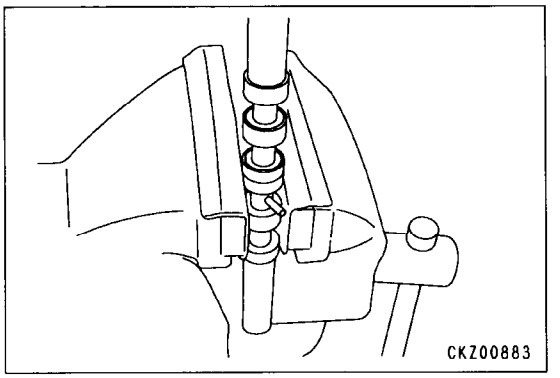
4. Disassembly of plunger assembly

1) Insert round bar (pin) into ø3 hole in stepped groove portion of plunger assembly (2).
   ※ Tools: Round bar (pin) ⑫

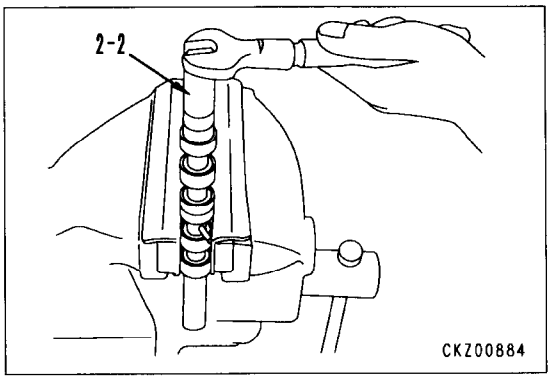


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2) Put round bar (pin) in contact with jaw of vice and use it as a lever to prevent plunger assembly from rotating.
   ★ Use a copper plate in the jaws of the vice to prevent damage to the outside diameter portion of the plunger.
   ※ Tool: Vice ⑪



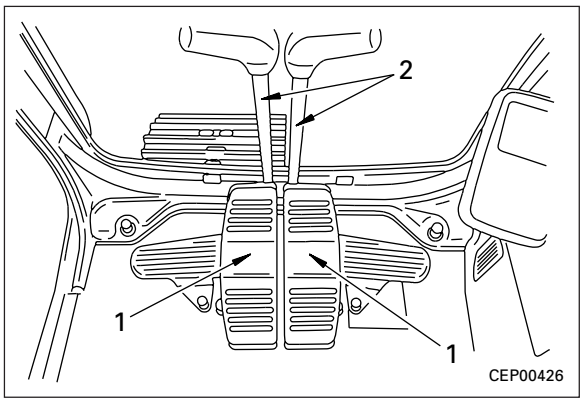
3) Remove plug (2-2).
   ※ Tools: Torque wrench ②, socket ⑧

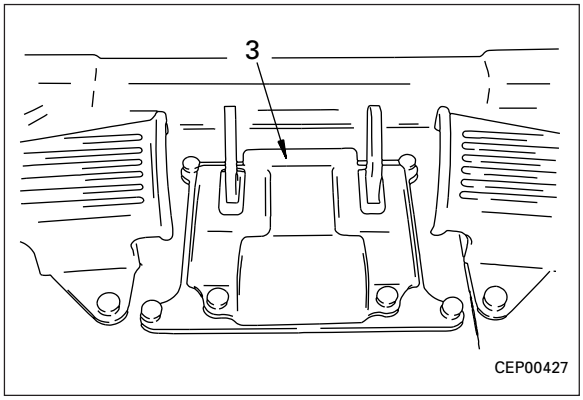


REMOVAL OF TRAVEL PPC VALVE ASSEMBLY

⚠ Lower the work equipment completely to the ground and stop the engine. Then loosen the oil filler cap slowly to release the pressure inside the hydraulic tank.

1. Remove travel PPC valve undercover.
2. Remove floor mat.
3. Remove pedal (1) and lever (2).
4. Remove cover (3). ※ 1
5. Remove covers (4), then remove springs (5).
6. Disconnect 6 PPC hoses (7), then remove travel PPC valve assembly (8). ※ 2



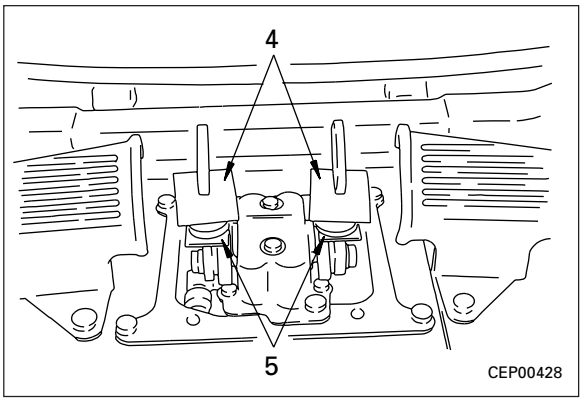


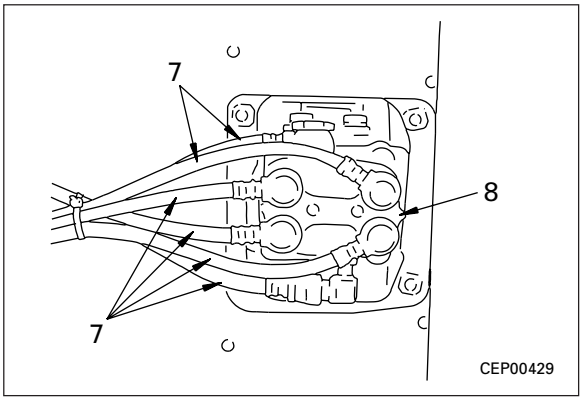
INSTALLATION OF TRAVEL PPC VALVE ASSEMBLY

- Carry out installation in the reverse order to removal.

※ 1
kgm Cover mounting bolt:
19.6 ± 1.9 Nm {2.0 ± 0.2 kgm}

※ 2
kgm Hose mounting joint bolt (width across flats: 30 mm):
32.9 ± 4.9 Nm {4.9 ± 0.5 kgm}
kgm Hose mounting joint bolt (width across flats: 22 mm):
29.4 ± 4.9 Nm {3.0 ± 0.5 kgm}





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REMOVAL OF ARM CYLINDER ASSEMBLY

LOADING SHOVEL

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

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

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

1. Disconnect grease tube (1) at piston rod end.

2. Sling arm cylinder assembly, and remove plate, then using forcing screws (Thread dia. = 16 mm, Pitch = 2.0 mm), pull out pin (2). ※ 1
★ Pull out the pin to a position where the piston rob can be disconnected.
kg Pin: **56 kg**

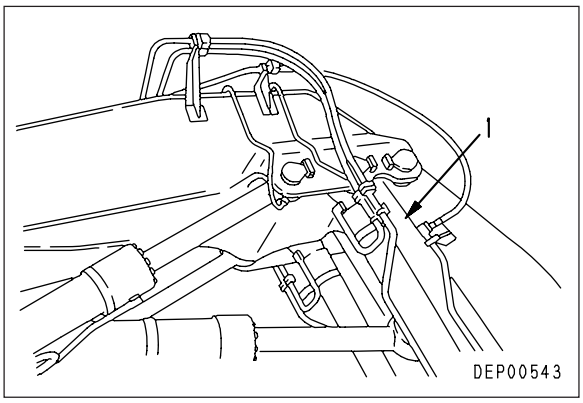
3. Start engine and retract piston rod fully.
⚠ Tie the rod with wire to prevent it from coming out.
⚠ After stopping the engine, release the pressure inside the piping.
For details, see TESTING AND ADJUSTING, Releasing pressure in PPC circuit.

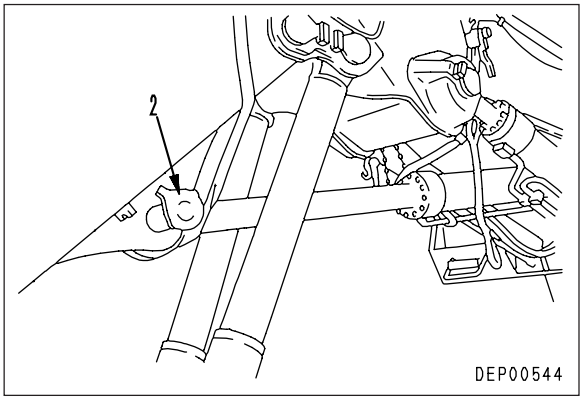
4. Disconnect hose (3).

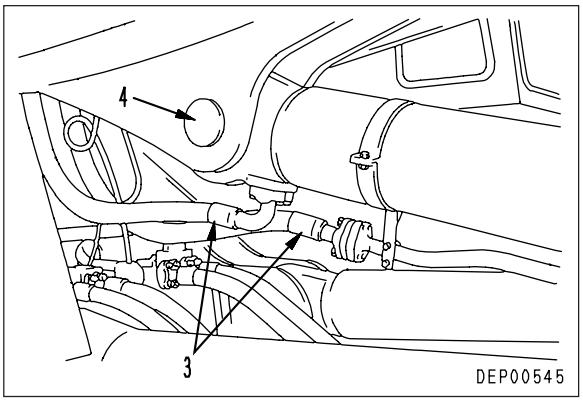
5. Sling piston rod end and bottom end, and remove plate, then using forcing screws (Thread dia. = 16 mm, Pitch = 2.0 mm), pull out pin (4). ※ 2
★ Pull out the pin to a position where the cylinder bottom can be disconnected.
kg Pin: **56 kg**

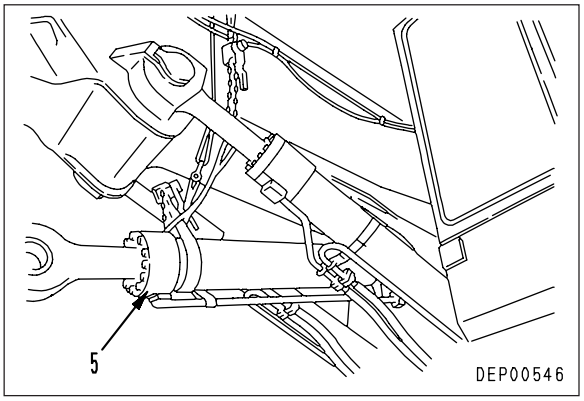
6. Lift off arm cylinder assembly (5) carefully.

kg Arm cylinder assembly: **845 kg**



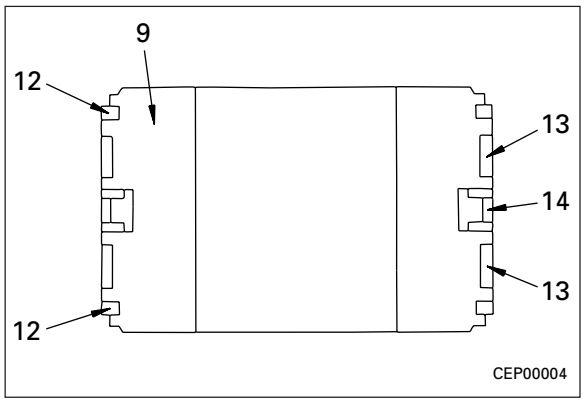




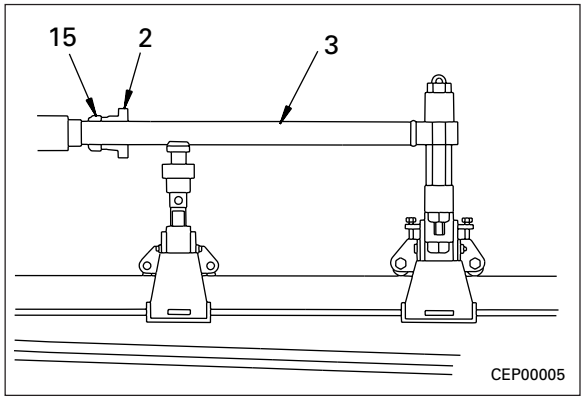


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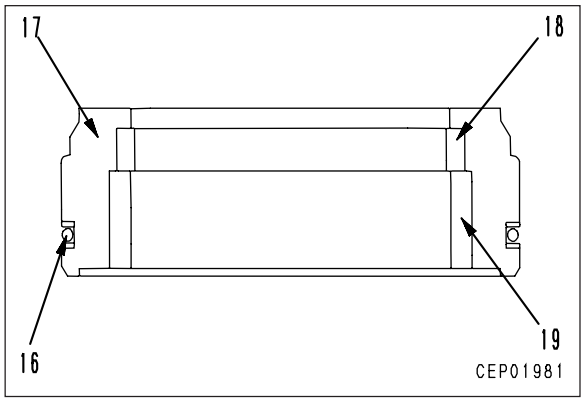
6) Disassembly of piston assembly
   i) Remove ring (12).
   ii) Remove wear ring (13).
   iii) Remove piston ring (14).



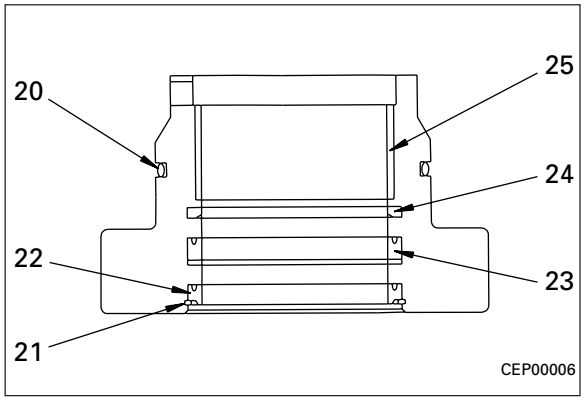
7) Remove collar assembly (15) and head assembly (2) from piston rod (3).



8) Disassembly of collar
   i) Remove O-ring and backup ring (16).
   ii) Remove rings (18) and (19) from collar (17).



9) Disassembly of head assembly
   i) Remove O-ring and backup ring (20).
   ii) Remove snap ring (21), then remove dust seal (22).
   iii) Remove rod packing (23).
   iv) Remove buffer ring (24).
   v) Remove bushing (25).



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REMOVAL OF ARM ASSEMBLY

LOADING SHOVEL

1. Remove bucket assembly.
For details, see REMOVAL OF BUCKET ASSEMBLY.

2. Start engine, and set work equipment so that bucket cylinder is perpendicular.

3. Remove 3 mounting bolts, then using forcing screws (Thread dia. = 16 mm, Pitch = 2.0 mm), pull out pin (1). ※ 1
★ Remove the pin on the other side in the same way, then secure the link to the arm with wire so that it cannot move.

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

5. Remove cover (3), and disconnect wiring (4) of potentiometer.

6. Remove 3 mounting bolts (5), then remove potentiometer (6) together with bracket (7).

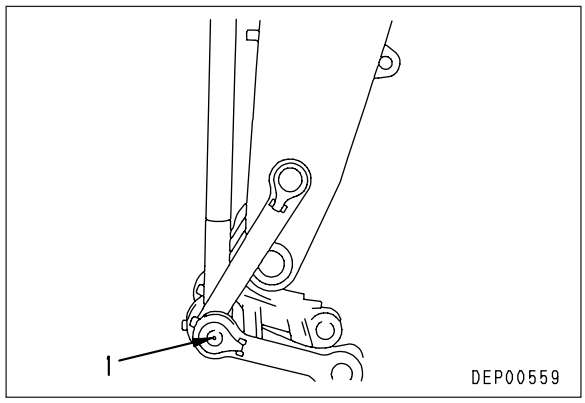
7. Remove arm cylinder from arm.
For details, see REMOVAL OF ARM CYLINDER ASSEMBLY.
★ Secure the arm cylinder assembly to the boom with lever block ①.

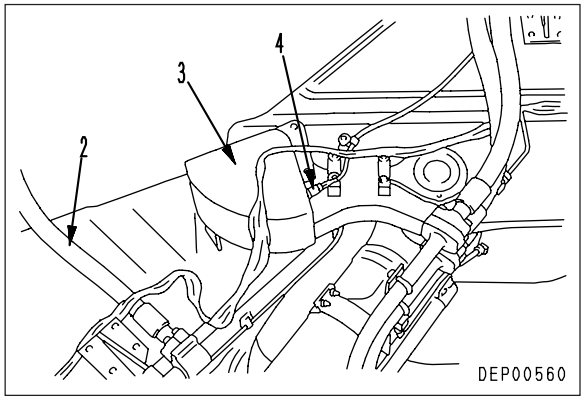
8. Sling arm assembly, and remove 3 mounting bolts, then using forcing screws (Thread dia. = 16 mm, Pitch = 2.0 mm), pull out pin (8). ※ 2
★ Pull out the pin on the other side in the same way to a position where the arm can be disconnected from the boom.

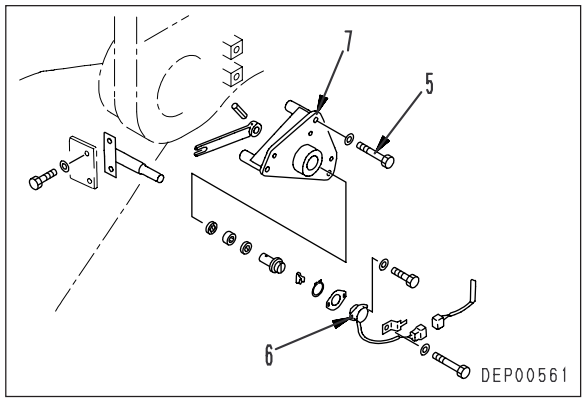
kg Pin: **45 kg**

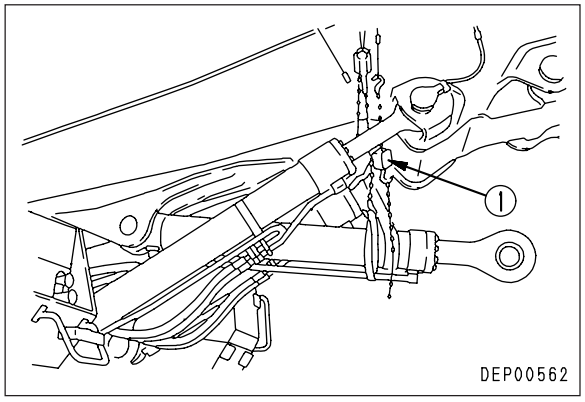
9. Lift off arm assembly (9).

kg Arm assembly: **3,070 kg**









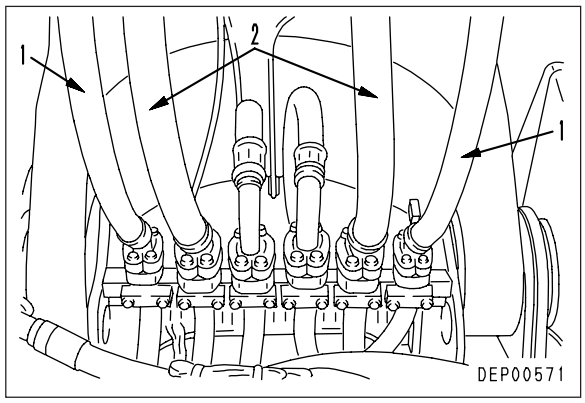
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REMOVAL OF WORK EQUIPMENT ASSEMBLY

LOADING SHOVEL

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

★ Release the remaining pressure in the circuit. For details, see TESTING AND ADJUSTING, Releasing pressure in hydraulic circuit.

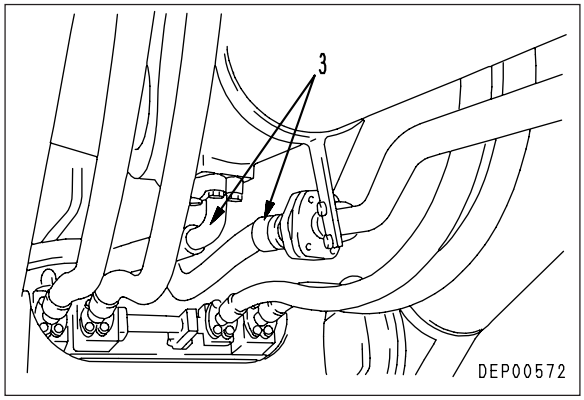


1. Disconnect boom cylinder from boom.
For details, see REMOVAL OF BOOM CYLINDER ASSEMBLY.

2. Disconnect bottom dump cylinder hose (1), bucket cylinder hose (2), and arm cylinder hose (3).

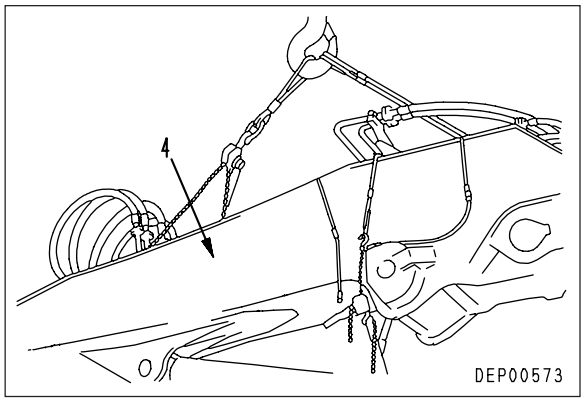
★ When the hoses are disconnected, oil may spurt out, so loosen the hose flanges slowly before disconnecting.

⚠ To prevent oil from spurting out when the engine is started, fit blind plugs securely in the piping at the chassis end.



3. Disconnect head lamp wiring.

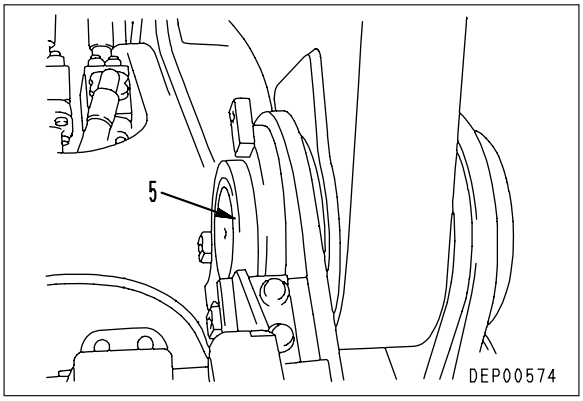
4. Remove potentiometer assembly.
For details, see REMOVAL OF BOOM ASSEMBLY.



5. Set bottom of bucket horizontal, lower work equipmemt completely to ground, then sling boom assembly (4).

6. Using forcing screws (Thread dia. = 16 mm, Pitch = 2.0 mm), pull out left and right boom foot pins (5), then disconnect work equipment assembly (4).

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



7. Start engine, drive machine slowly in reverse, and operate crane to lower boom foot to ground.

⚠ Before driving the machine in reverse, check that the boom foot is completely separated from the machine body.

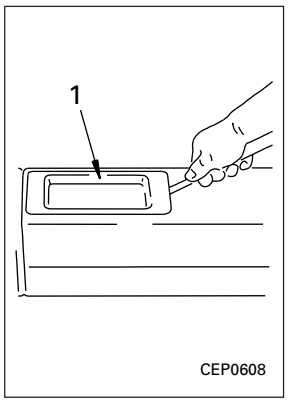
kg Work equipment assembly: **16,200 kg**

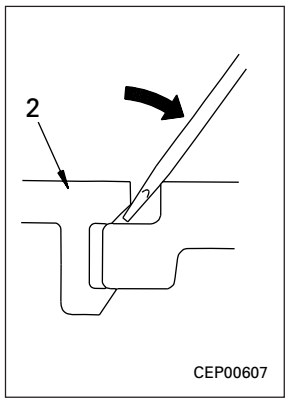
020906

REMOVAL OF CONTROL STAND CASE

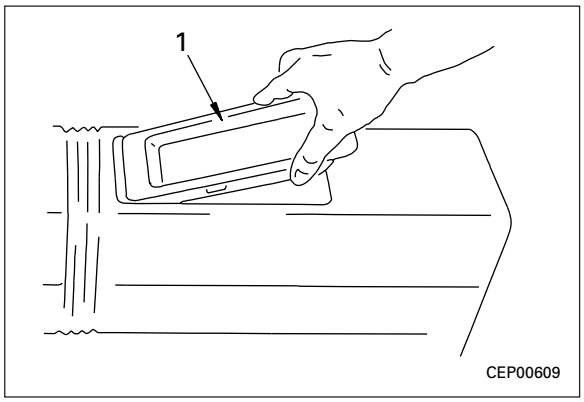
1. Tray

1) Insert a thin flat-headed screwdriver into notch at rear of tray (1) and lever up lightly to release rear claw (2).
   ★ The claw can only be released from the rear.





2) Pull tray (1) to rear to remove. ※ 2



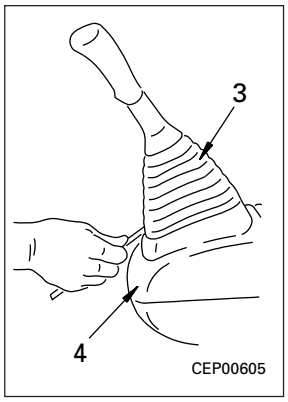
2. Boot

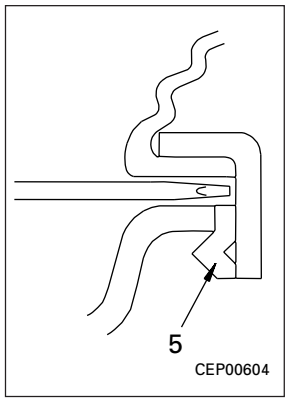
1) Insert a thin flat-headed screwdriver between boot (3) and upper case (4), remove claw (5) at front of boot from upper case, then raise front.

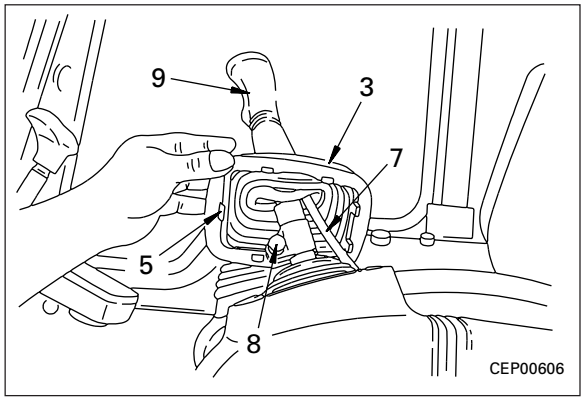
2) Pull boot (3) to front to remove claw at rear of boot. ※ 1

3) Disconnect wiring connector (7) from hole for removed tray.

4) Push boot up, remove bolt (8), then remove lever (9) and boot (3).
   ★ Check the direction of the lever.







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Unit: mm

No.	Check item	Criteria		Remedy
1	Backlash between swing motor shaft and No. 1 sun gear	Standard clearance	Clearance limit	Replace
		0.07 – 0.18	—	
2	Backlash between No. 1 sun gear and No. 1 planet gear	0.15 – 0.38	—	
3	Backlash between No. 1 planet gear and ring gear	0.21 – 0.58	—	
4	Backlash between No. 2 planet gear and coupling	0.06 – 0.24	—	
5	Backlash between No. 1 planet carrier and No. 2 sun gear	0.47 – 0.72	—	
6	Backlash between No. 2 sun gear and No. 2 planet gear	0.15 – 0.38	—	
7	Backlash between No. 2 planet gear and ring gear	0.23 – 0.67	—	
8	Backlash between coupling and swing pinion	0.09 – 0.25	—	
9	Backlash between swing pinion and swing circle	0.41 – 2.02	—	
10	Clearance between plate and coupling	0.5 – 1.0	—	
11	Wear of swing pinion oil seal contact surface	Standard size	Repair limit	Repair hard chrome plating or replace
		185	—	

Unit: mm

No.	Check item		Criteria			Remedy
1	Link pitch		Standard size	Repair limit		Reverse or replace
			260.6	263.6 (Heavy-duty areas) 265.6 (Standard areas)		
2	Bushing outside diameter		Standard size	When turned		
				Normal load	Impact load	
			87.5	82.5	—	
3	Link height		Standard size	Repair limit		Repair or replace
			156	143		
4	Thickness of link metal (bushing press-fitting portion)		39.3			Replace
5	Shoe bolt pitch		234.95			
6			184.15			
7			76.2			
8	Link	Inside width	133.55			Repair or replace
9		Overall width	73			
10		Tread width	65			
11	Protrusion of pin		4.5			Adjust or replace
12	Protrusion of regular bushing		10.8			
13	Overall length of pin		320.4			
14	Overall length of bushing		225.8			
15	Thickness of bushing metal		15.75			
16	Thickness of spacer		12.45			
17	Press-fitting force	Bushing	130 – 217 kN {13.3 – 22.1 ton}			—
18		Regular pin	312 – 350 kN {31.8 – 35.7 ton}			
※ 19		Master pim	249 – 294 kN {25.9 – 30 ton}			

※ : Dry type track link

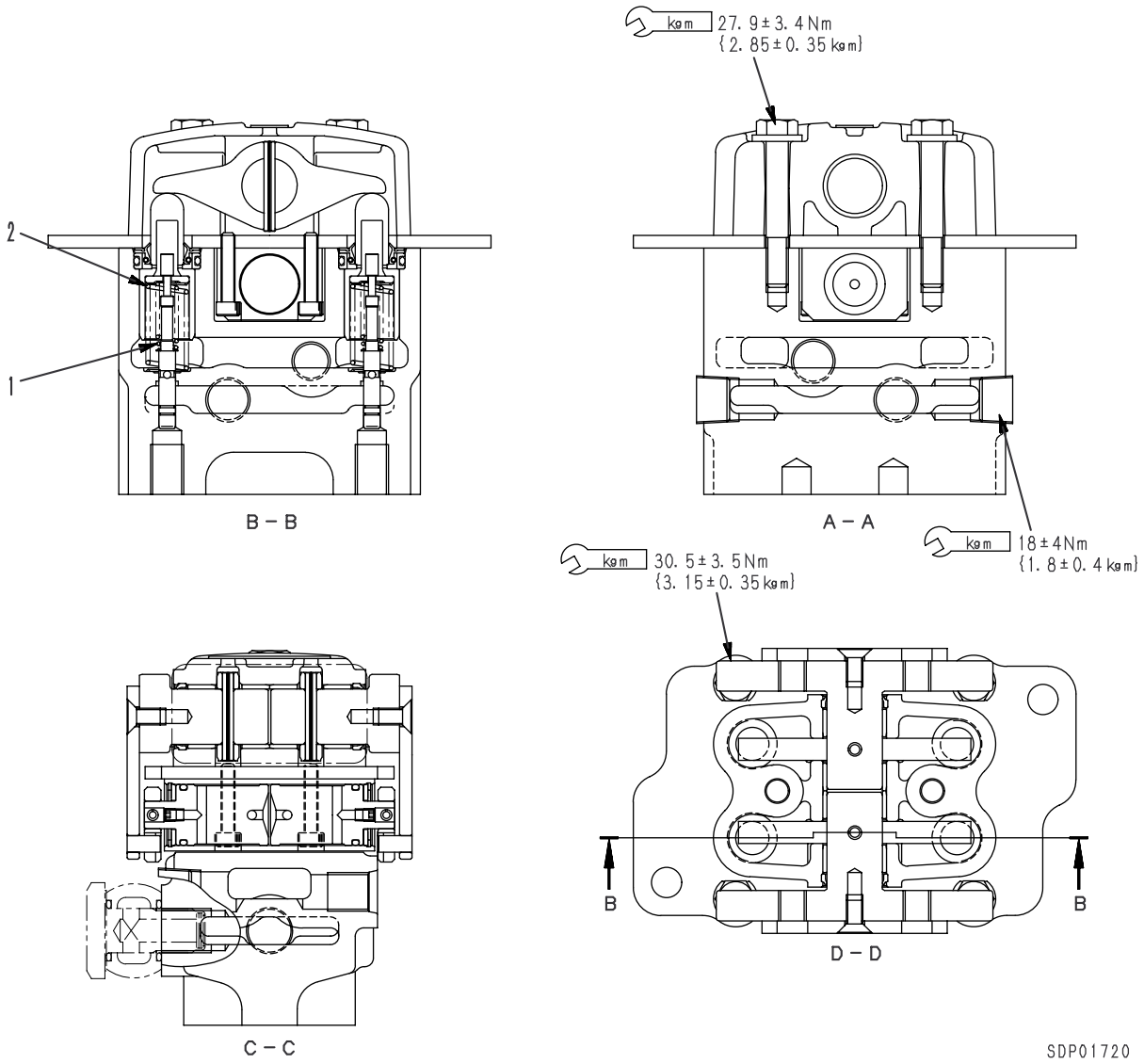
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Unit: mm

No.	Check item	Criteria					Remedy
		Standard size			Repair limit		
1	Main relief valve, main valve spring	Free length × OD	Installation length	Installation load	Free length	Installation load	
		34.7 × 10.1	32.5	394.2 N {40.2 kg}	—	315.2 N {32.2 kg}	
2	Jet sensor relief valve, pilot poppet spring	34.5 × 8.8	29.4	30 N {3.1 kg}	—	24.3 N {2.5 kg}	
3	Jet sensor relief valve, main valve spring	37.4 × 11.4	33	49 N {5.0 kg}	—	39.2 N {4.0 kg}	Replace spring if damaged or deformed
4	Spool return spring	69.9 × 57	63	431 N {44 kg}	—	345 N {35.2 kg}	
5	Spool return spring	75 × 37	74.3	0 N {0 kg}	—	0 N {0 kg}	
6	Throttle valve spring	31.8 × 7.6	26.5	1 N {0.1 kg}	—	0.78 N {0.08 kg}	
7	Check valve spring	78.2 × 26.6	52	18.8 N {1.92 kg}	—	15.1 N {1.54 kg}	
8	Check valve spring (throttle valve)	65.3 × 14	46	18.8 N {1.92 kg}	—	15.1 N {1.54 kg}	

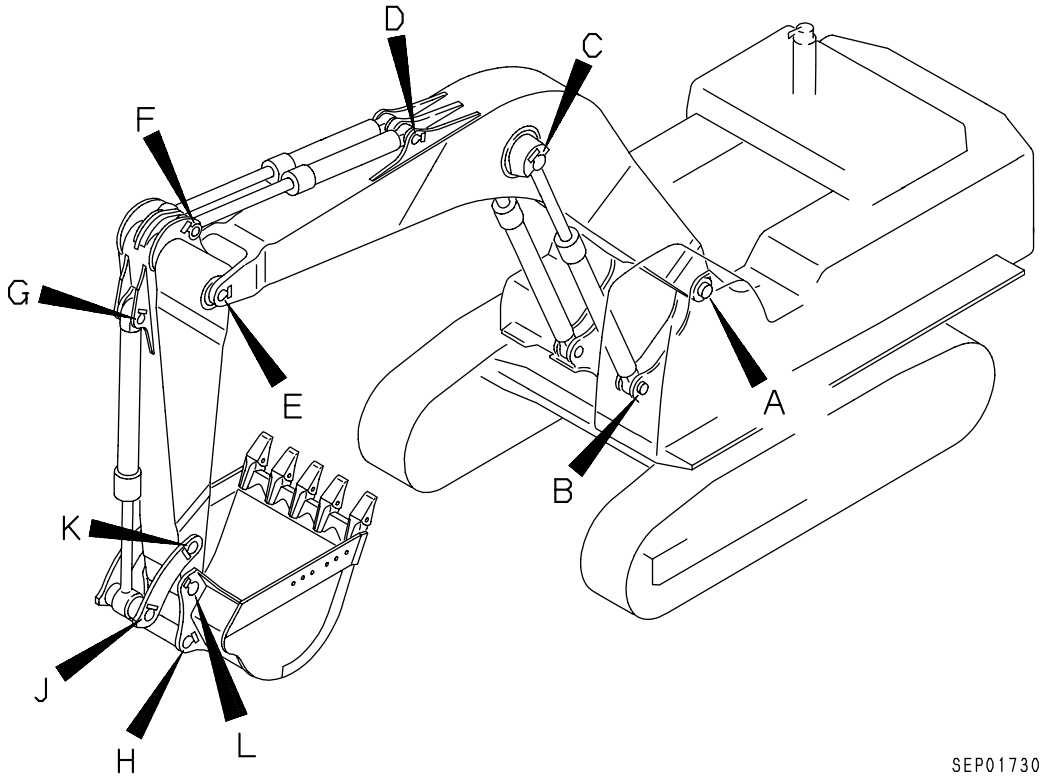
For travel



020906

Unit: mm

No.	Check item	Criteria					Remedy
		Standard size			Repair limit		
1	Metering spring	Free length × OD	Installation length	Installation load	Free length	Installation load	Replace spring if damaged or deformed
		26.7 × 8.14	24.9	16.6 N {1.69 kg}	—	13.2 N {1.35 kg}	
2	Centering spring	48.1 × 15.5	32.5	108 N {11 kg}	—	86.2 N {8.8 kg}	



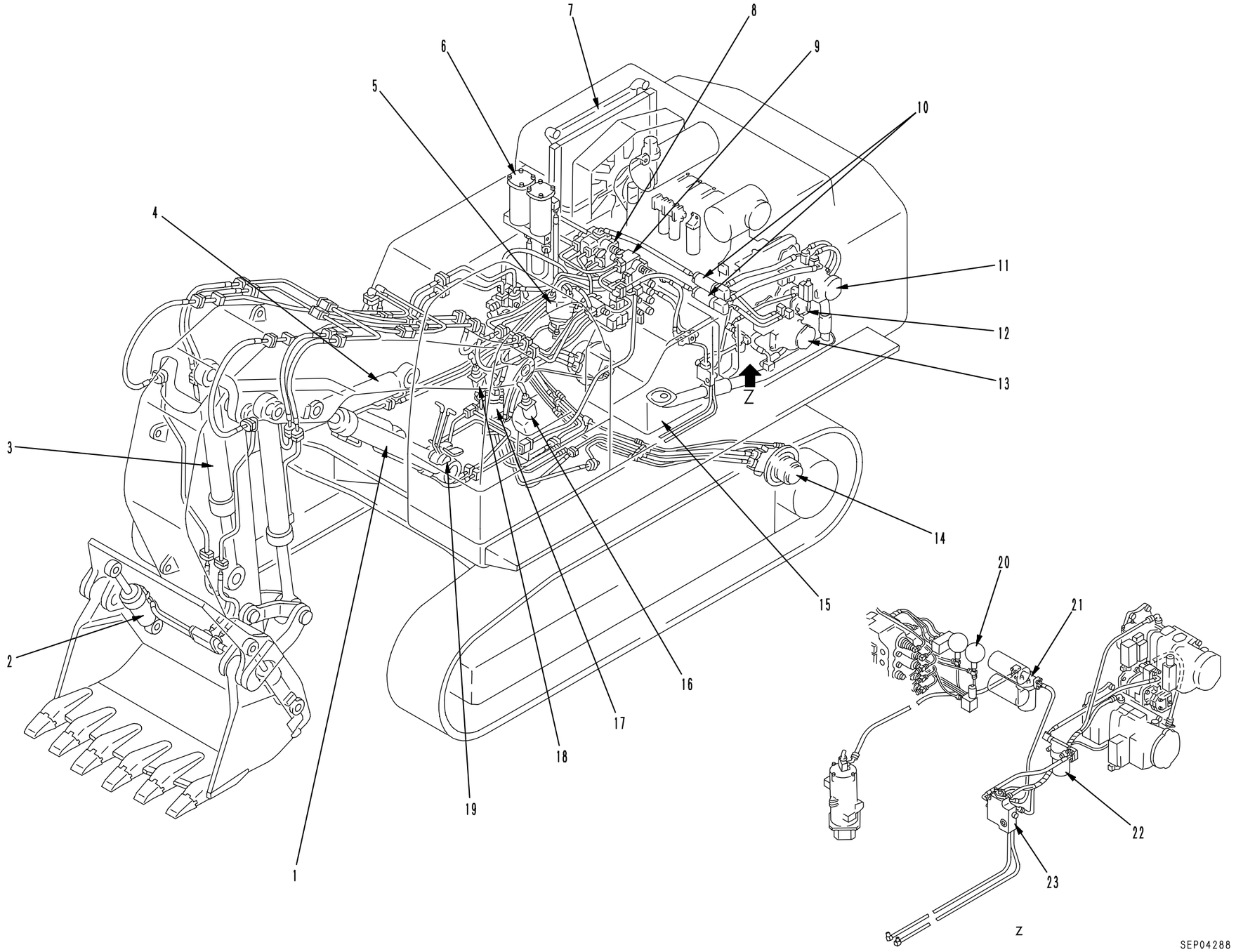
020906

Unit: mm

No.	Check item		Criteria					Remedy
			Standard size	Tolerance		Standard clearance	Clearance limit	
				Shaft	Hole			
1	Clearance between bushing and mounting pin of boom and revolving frame		140	–0.043 –0.106	+0.542 +0.442	0.485 – 0.648	1.5	Replace
2	Clearance between bushing and mounting pin of boom and arm		140	–0.043 –0.106	+0.542 +0.442	0.485 – 0.648	1.5	
3	Clearance between bushing and mounting pin of arm and link		115	–0.036 –0.090	+0.351 +0.271	0.307 – 0.441	1.5	
4	Clearance between bushing and mounting pin of arm and bucket		130	–0.043 –0.106	+0.482 +0.392	0.435 – 0.588	1.5	
5	Clearance between bushing and mounting pin of link and link	PC800	110	–0.036 –0.090	+0.351 +0.271	0.307 – 0.441	1.5	
		PC750SE PC800SE	140	–0.043 –0.106	+0.361 +0.270	0.313 – 0.467	1.5	
6	Clearance between bushing and mounting pin of link and bucket		115	–0.036 –0.090	+0.351 +0.271	0.037 – 0.441	1.5	
7	Bucket clearance		0.5 – 1.0					Adjust shims

HYDRAULIC PIPING DRAWING

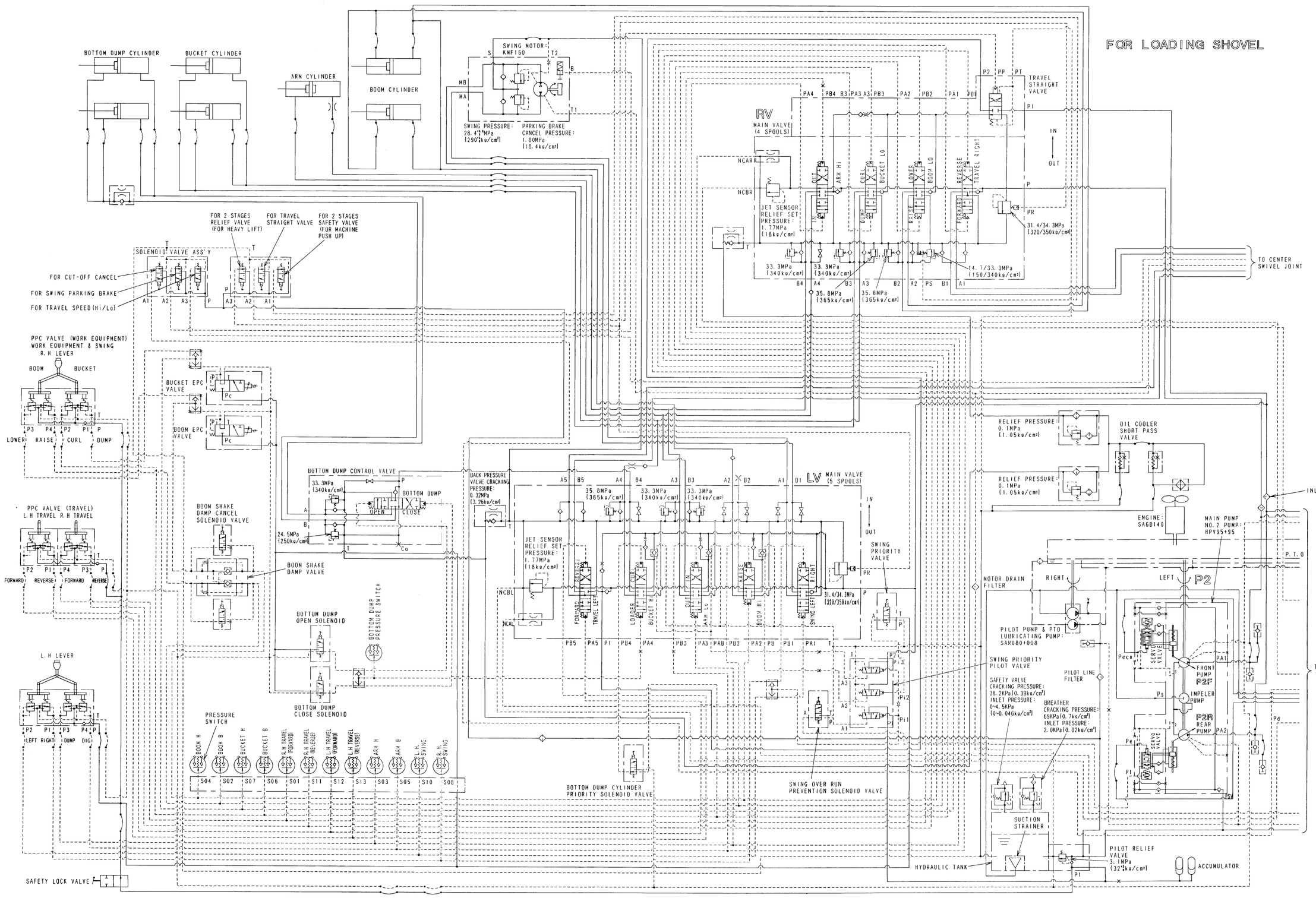
LOADING SHOVEL



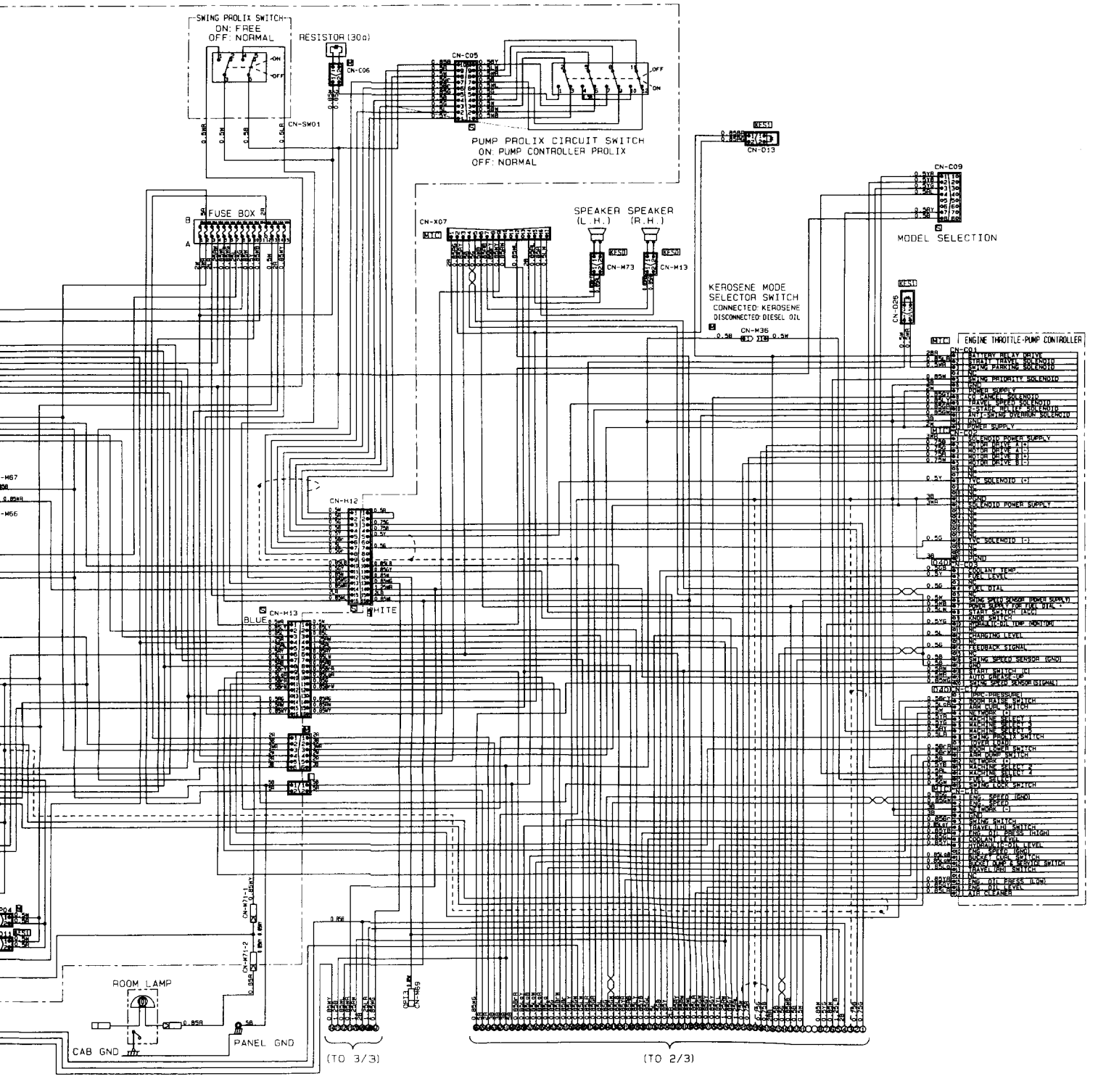
1. Boom cylinder
2. Bottom dump cylinder
3. Bucket cylinder
4. Arm cylinder
5. Swing motor
6. Return oil filter
7. Oil cooler
8. R.H. 4-spool control valve
9. L.H. 5-spool control valve
10. Line oil filter
11. No. 1 pump
12. Control pump
13. No. 2 pump
14. L.H. travel motor
15. Hydraulic tank
16. L.H. PPC valve
17. Center swivel joint
18. R.H. PPC valve
19. Travel PPC valve
20. Accumulator
21. Drain oil filter
22. Pilot oil filter
23. PPC control relief valve

020906

HYDRAULIC CIRCUIT DRAWING
LOADING SHOVEL
PC750 Serial No.: 10239 and up

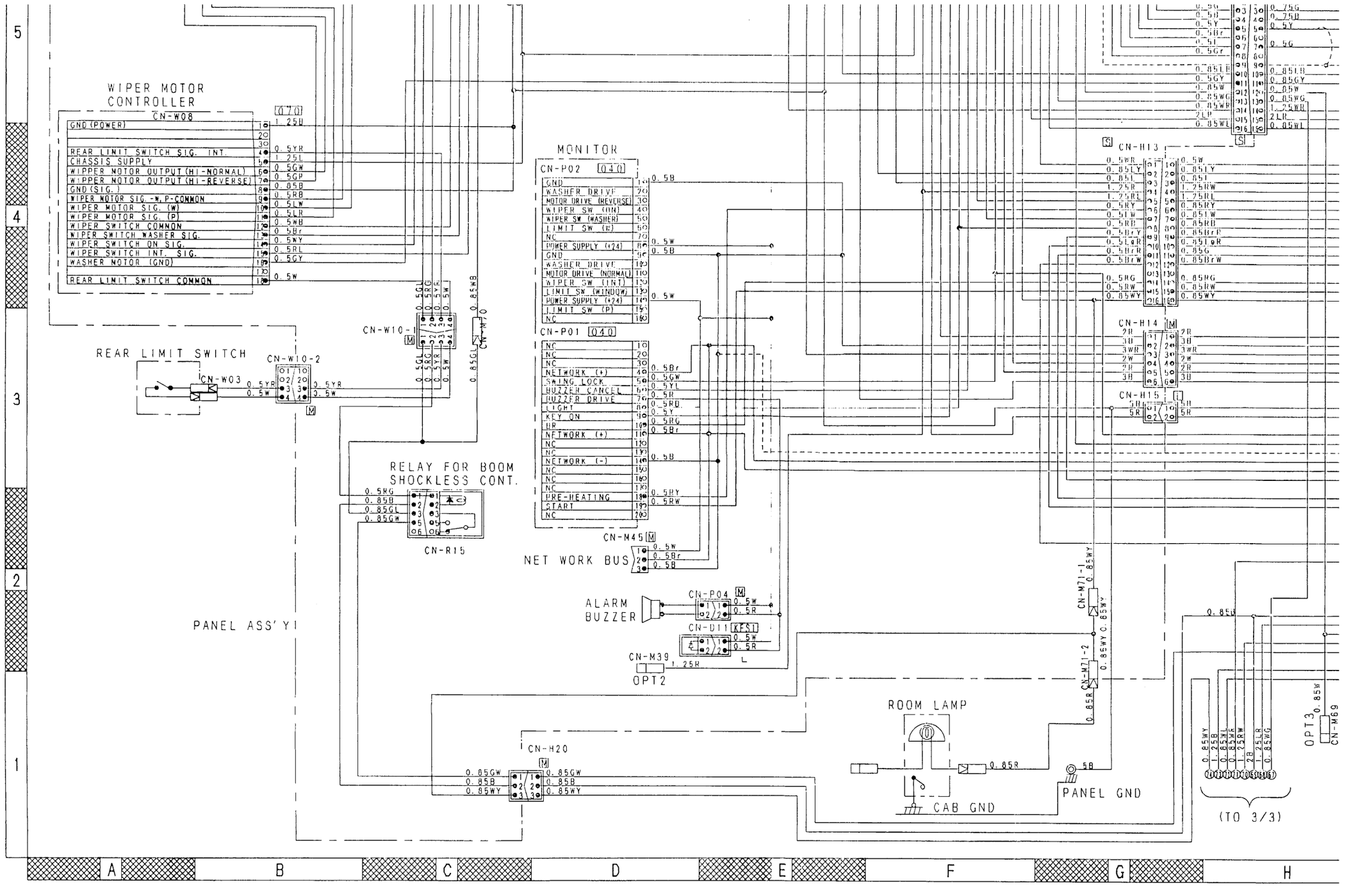


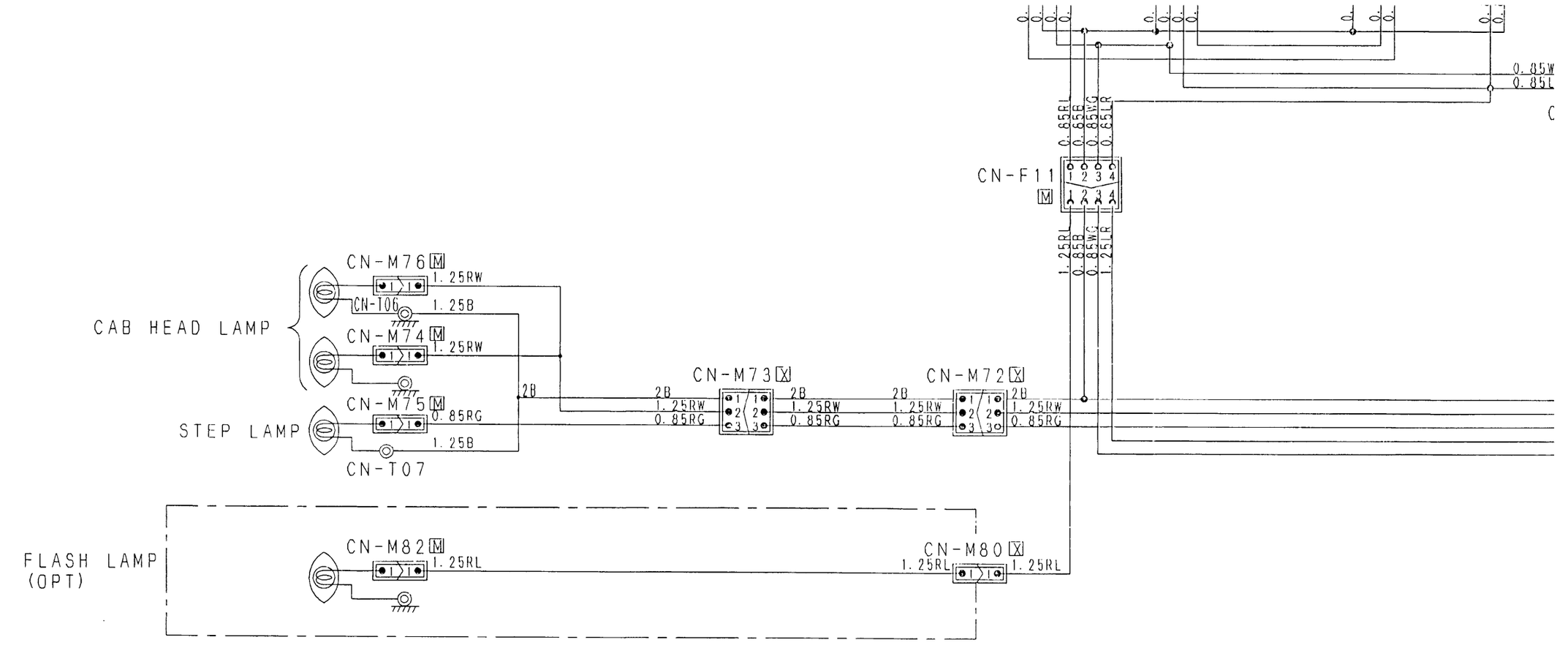
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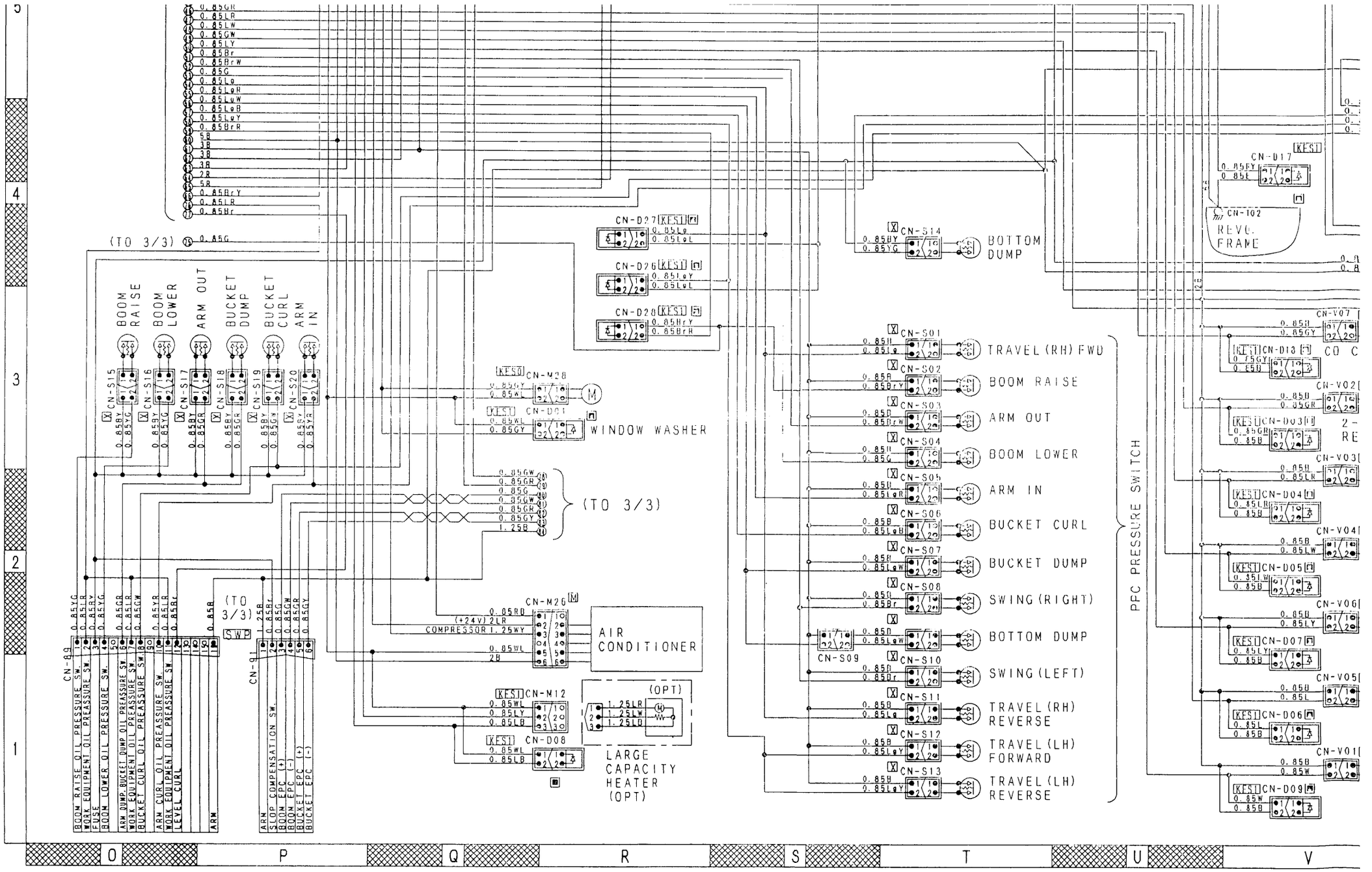


SDP01656

E F G H I J K L M N


WIPER MOTOR CONTROLLER
CN-W08
GND (POWER)
REAR LIMIT SWITCH SIG. INT.
CHASSIS SUPPLY
WIPPER MOTOR OUTPUT (HI-NORMAL)
WIPPER MOTOR OUTPUT (HI-REVERSE)
GND (SIG.)
WIPER MOTOR SIG. -W, P-COMMON
WIPER MOTOR SIG. (W)
WIPER MOTOR SIG. (P)
WIPER SWITCH COMMON
WIPER SWITCH WASHER SIG.
WIPER SWITCH ON SIG.
WIPER SWITCH INT. SIG.
WASHER MOTOR (GND)
REAR LIMIT SWITCH COMMON
REAR LIMIT SWITCH
CN-W03
CN-W10-1
CN-W10-2
CN-W70
MONITOR
CN-P02
CN-P01
RELAY FOR BOOM SHOCKLESS CONT.
CN-R15
CN-M45
NET WORK BUS
ALARM BUZZER
CN-P04
CN-D11
CN-M39
OPT2
PANEL ASS'Y
CN-H20
ROOM LAMP
CAB GND
PANEL GND
CN-M71-1
CN-M71-2
CN-H13
CN-H14
CN-H15
OPT3
CN-M69
(TO 3/3)
A
B
C
D
E
F
G
H
1
2
3
4
5


CN-F11
M
0.85RL
0.85B
0.85WG
0.85LR
1.25RL
0.85B
0.85WG
1.25LR
0.85W
0.85L
CAB HEAD LAMP
CN-M76 M
1.25RW
CN-T06
1.25B
CN-M74 M
1.25RW
STEP LAMP
CN-M75 M
0.85RG
1.25B
CN-T07
2B
CN-M73 X
2B
1.25RW
0.85RG
2B
1.25RW
0.85RG
CN-M72 X
2B
1.25RW
0.85RG
2B
1.25RW
0.85RG
FLASH LAMP
(OPT)
CN-M82 M
1.25RL
CN-M80 X
1.25RL
1.25RL


(TO 3/3)
BOOM RAISE
BOOM LOWER
ARM OUT
BUCKET DUMP
BUCKET CURL
ARM IN
CN-S15
CN-S16
CN-S17
CN-S18
CN-S19
CN-S20
CN-M28
WINDOW WASHER
CN-D01
(TO 3/3)
CN-M26
(+24V) 2LR
COMPRESSOR 1.25WY
AIR CONDITIONER
CN-M12
CN-D08
(OPT)
LARGE CAPACITY HEATER (OPT)
CN-89
CN-91
BOOM RAISE OIL PRESSURE SW.
WORK EQUIPMENT OIL PRESSURE SW.
FUSE
BOOM LOWER OIL PRESSURE SW.
ARM DUMP, BUCKET DUMP OIL PRESSURE SW.
WORK EQUIPMENT OIL PRESSURE SW.
BUCKET CURL OIL PRESSURE SW.
ARM CURL OIL PREASSURE SW.
WORK EQUIPMENT OIL PRESSURE SW.
LEVEL CURL
ARM
SLOP COMPENSATION SW.
BOOM EPC (+)
BOOM EPC (-)
BUCKET EPC (+)
BUCKET EPC (-)
CN-D27
CN-D26
CN-D28
CN-S14
BOTTOM DUMP
CN-S01
TRAVEL (RH) FWD
CN-S02
BOOM RAISE
CN-S03
ARM OUT
CN-S04
BOOM LOWER
CN-S05
ARM IN
CN-S06
BUCKET CURL
CN-S07
BUCKET DUMP
CN-S08
SWING (RIGHT)
CN-S09
BOTTOM DUMP
CN-S10
SWING (LEFT)
CN-S11
TRAVEL (RH) REVERSE
CN-S12
TRAVEL (LH) FORWARD
CN-S13
TRAVEL (LH) REVERSE
PFC PRESSURE SWITCH
CN-D17
CN-T02
REVO. FRAME
CN-V07
CN-D18
CN-V02
CN-D03
CN-V03
CN-D04
CN-V04
CN-D05
CN-V06
CN-D07
CN-V05
CN-D06
CN-V01
CN-D09

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