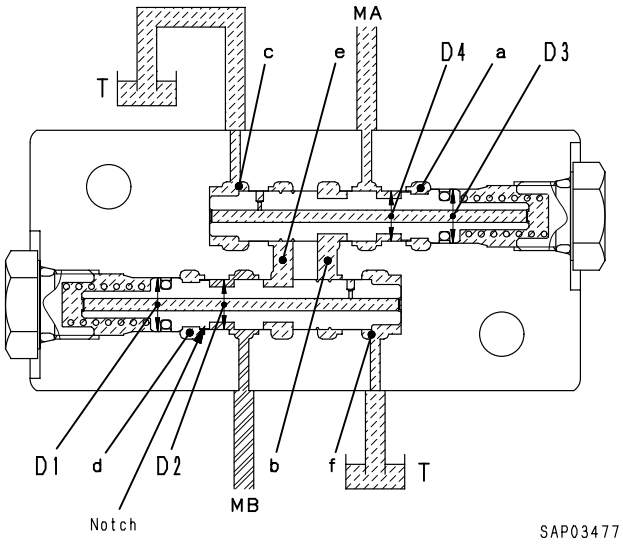
CONTENTS

Outline

This valve reduces the swing back generation in the swing body by the inertia of the swing body, the backlash and rigidity of the machinery system, and the compression of the hydraulic oil when the swing is stopped. This is effective in preventing spillage of the load and reducing the cycle time when stopping the swing (the positioning ability is good and it is possible to move swiftly to the next job.

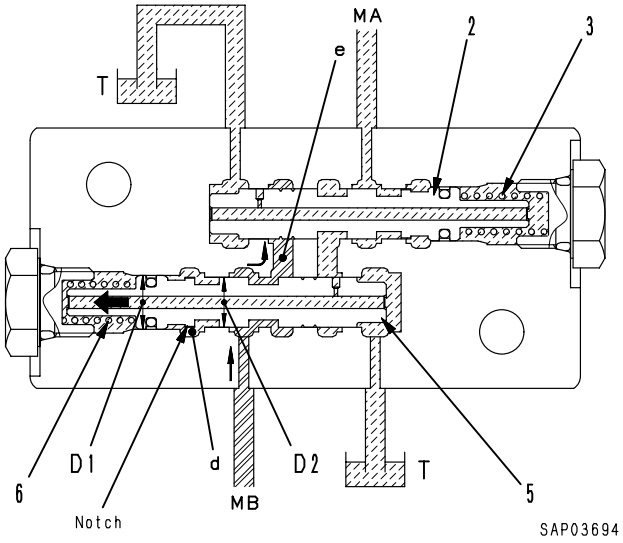


Operation

1) When brake pressure is being generated at port MB

- Pressure **MB** passes through the notch and goes to chamber **d**, spool (5) pushes spring (6) according to the difference in area **D1** > **D2**, moves to the left, and **MB** is connected to **e**.

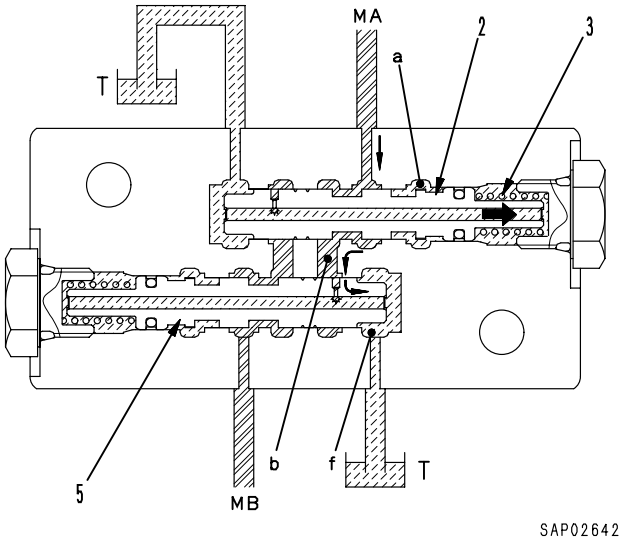
  When this happens, pressure **MA** is below the set pressure of spring (3), so spool (2) does not move. For this reason, the pressure oil is closed by spool (2), and the braking force is ensured.

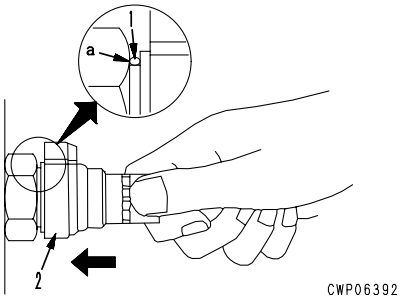


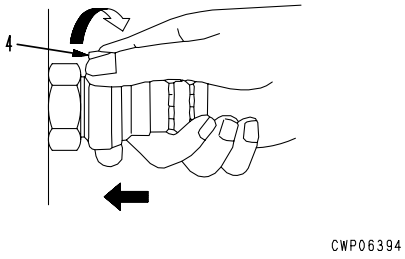
2) After motor stops

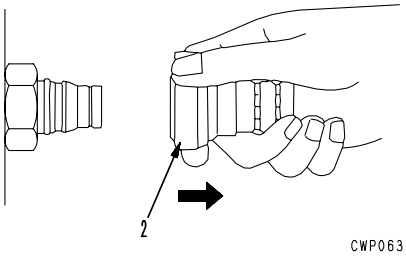
- The motor is reversed by the closing pressure generated at port **MB**. (1st reversal)

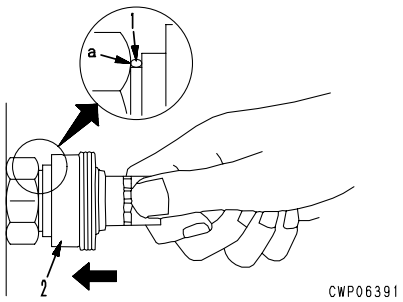
  When this happens, reversal pressure is generated at port **MA**. Pressure **MA** goes to chamber **a**, so spool (2) pushes spring (3) and moves to the right, and **MA** is connected to **B**. At the same time, **b** is connected to **f** through the drill hole in spool (5), so the reversal pressure at port **MA** is bypassed to port **T** to prevent the 2nd reversal.

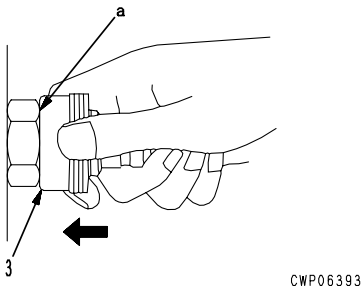


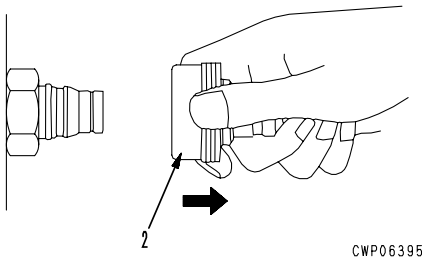
<table>
<tr><th></th><th>Type 2</th><th>Type 3</th></tr>
<tr><td>Disassembly</td><td>
1) Hold the mouthpiece of the tightening portion and push body (2) in straight until sliding prevention ring (1) contacts contact surface a of the hexagonal portion at the male end.


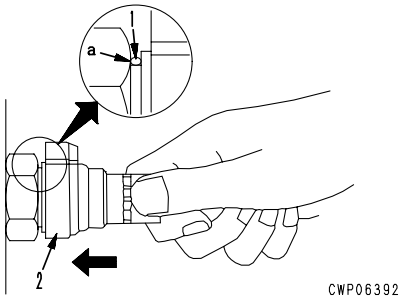
2) Hold in the condition in Step 1), and turn lever (4) to the right (clockwise).


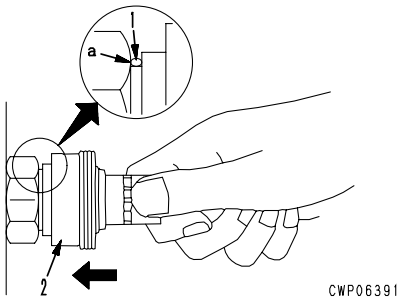
3) Hold in the condition in Steps 1) and 2), and pull out whole body (2) to disconnect it.


</td><td>
1) Hold the mouthpiece of the tightening portion and push body (2) in straight until sliding prevention ring (1) contacts contact surface a of the hexagonal portion at the male end.


2) Hold in the condition in Step 1), and push until cover (3) contacts contact surface a of the hexagonal portion at the male end.


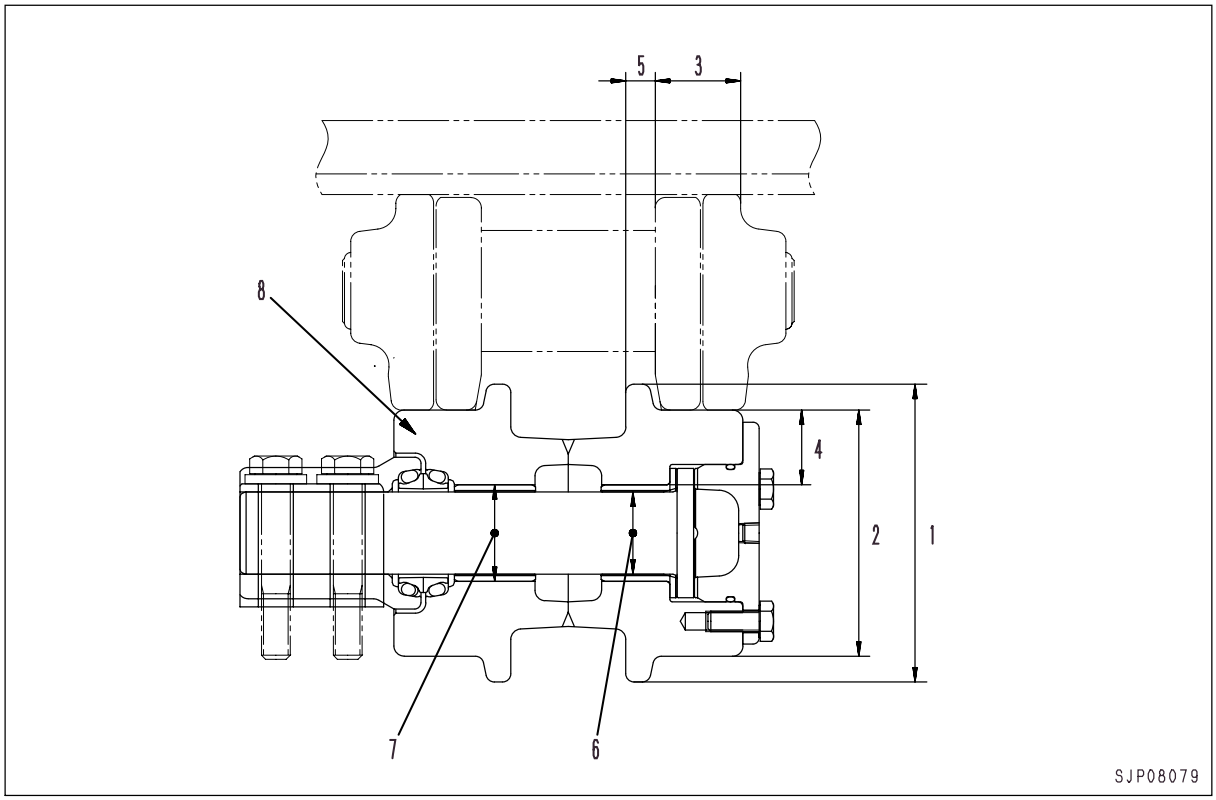
3) Hold in the condition in Steps 1) and 2), and pull out whole body (2) to disconnect it.


</td></tr>
<tr><td>Connection</td><td>
• Hold the mouthpiece of the tightening portion and push body (2) in straight until sliding prevention ring (1) contacts contact surface a of the hexagonal portion at the male end to connect it.


</td><td>
• Hold the mouthpiece of the tightening portion and push body (2) in straight until sliding prevention ring (1) contacts contact surface a of the hexagonal portion at the male end to connect it.


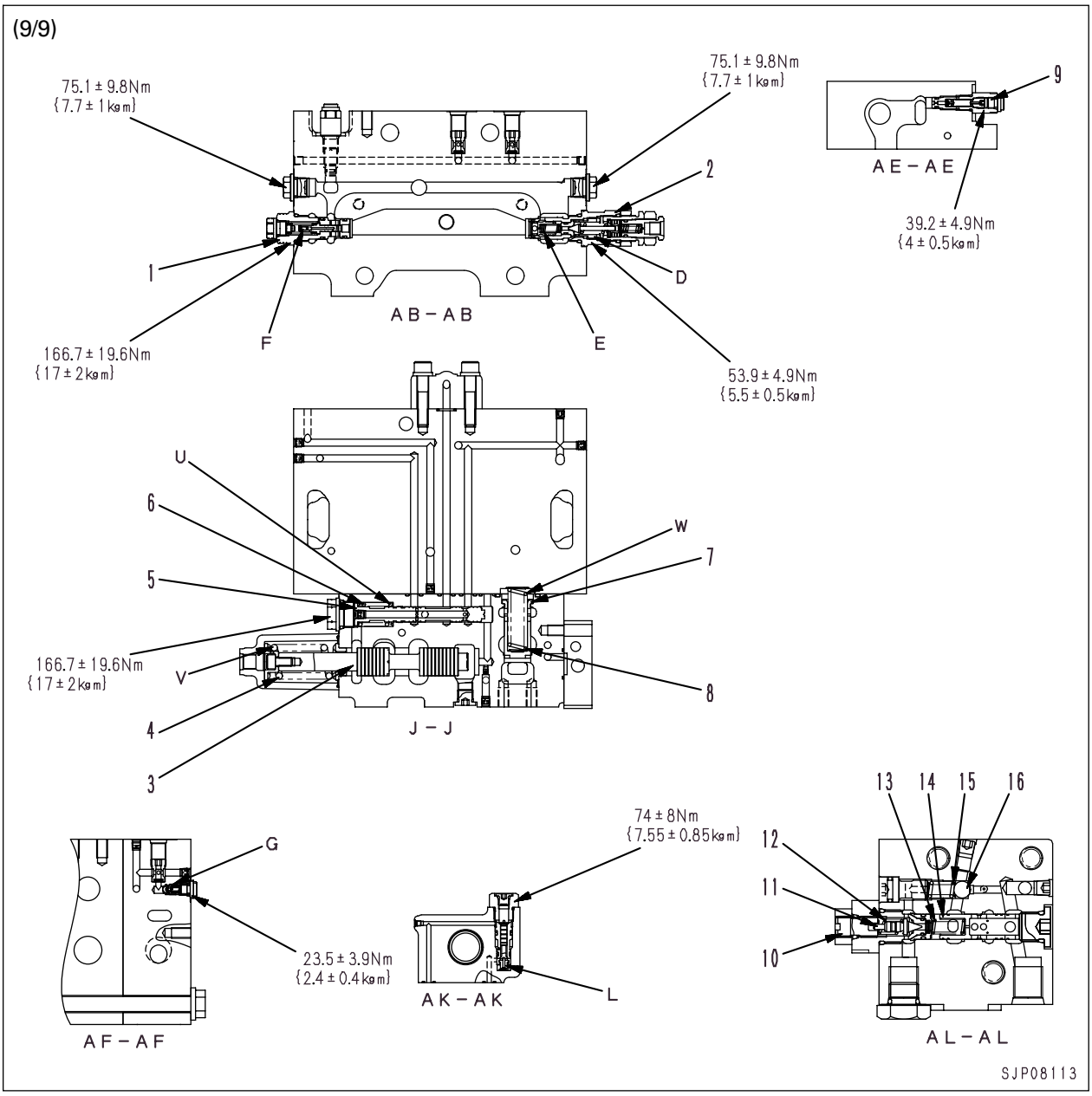
</td></tr>
</table>

CARRIER ROLLER

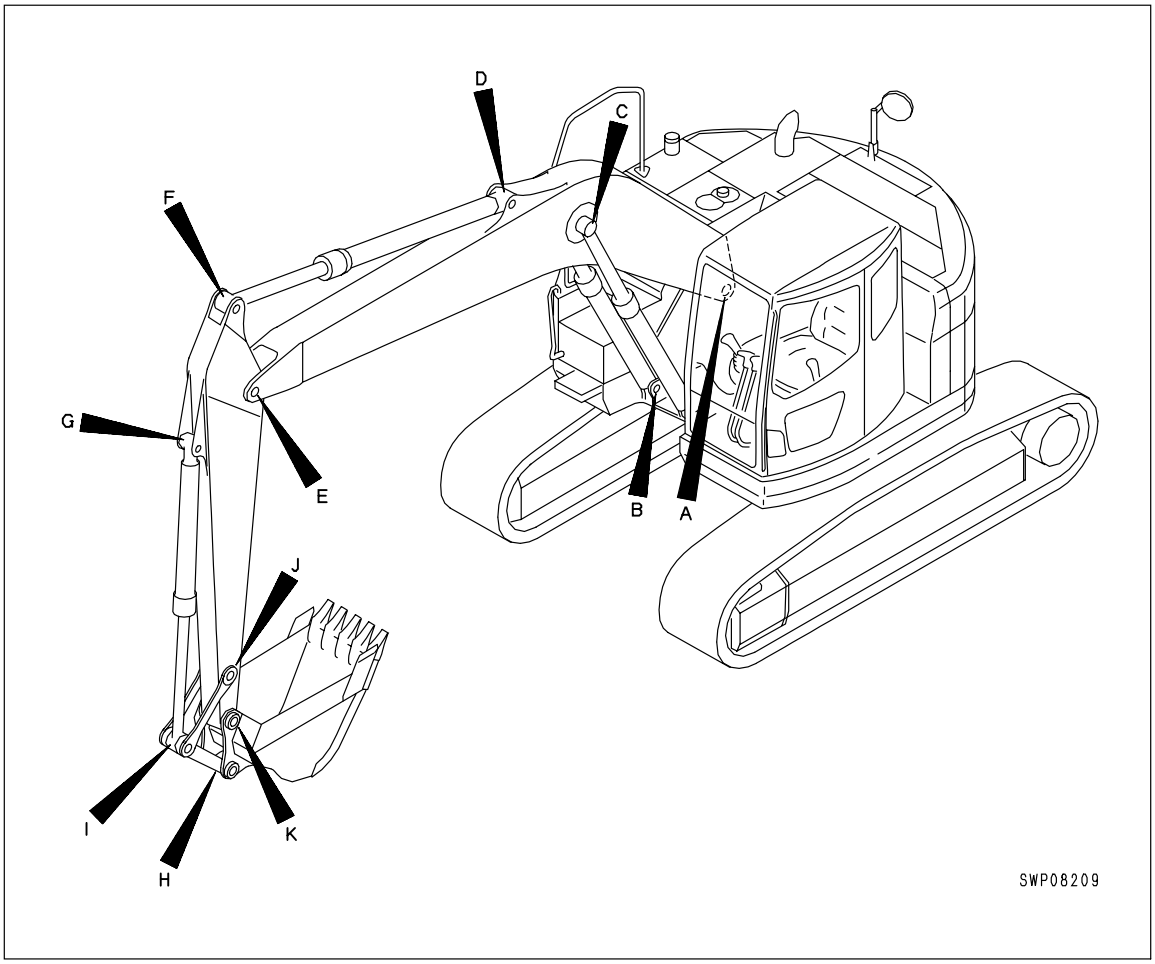


Unit: mm

No.	Check item	Criteria					Remedy
1	Outside diameter of flange	Standard size			Repair limit		Replace
		145			—		
2	Outside diameter of tread	120			—		
3	Width of tread	43			—		
4	Thickness of tread	36.5			—		
5	Width of flange	14			—		
6	Interference between shaft and bushing	Standard size	Tolerance		Standard interference	Interference limit	
			Shaft	Hole			
		40	-0.179 -0.190	+0.284 +0.169	0.339 - 0.474	—	
7	Interference between idler and bushing	47	-0.061 -0.036	0 -0.040	0.036 - 0.101	—	
8	Axial clearance of roller	Standard clearance			Clearance limit		
		—			—		



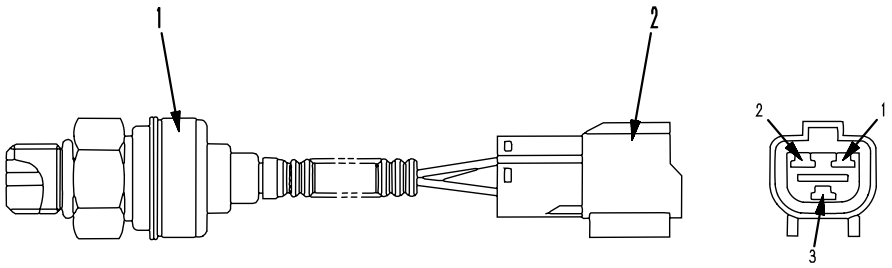
1. Unload valve
2. Main relief valve
3. Pump merge-divider valve (Main)
4. Return spring
5. Pump merge-divider valve (For LS)
6. Return spring
7. Valve (Sequence valve)
8. Spring (Sequence valve)
9. LS bypass plug
10. Screw
11. Puppet
12. Spring (Pressure reducing valve pilot)
13. Spring (Pressure reducing valve main)
14. Valve (Pressure reducing valve)
15. Spring (Safety valve)
16. Ball

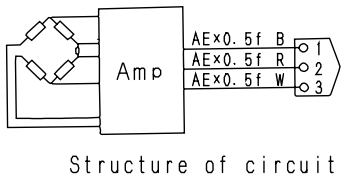


Unit: mm

No.	Check item	Criteria					Remedy
		Standard size	Tolerance		Standard clearance	Clearance limit	
			Shaft	Hole			
1	Clearance between connecting pin and bushing of revolving frame and boom	90	-0.036 -0.071	+0.140 +0.074	0.110 ~ 0.211	1.0	Replace
2	Clearance between connecting pin and bushing of boom and arm	90	-0.036 -0.071	+0.139 +0.074	0.110 ~ 0.210	1.0	
3	Clearance between connecting pin and bushing of arm and link	70	-0.030 -0.076	+0.160 +0.074	0.104 ~ 0.236	1.0	
4	Clearance between connecting pin and bushing of arm and bucket	80	-0.030 -0.076	+0.337 +0.273	0.303 ~ 0.413	1.0	
5	Clearance between connecting pin and bushing of link and bucket	80	-0.030 -0.076	+0.169 +0.084	0.114 ~ 0.245	1.0	
6	Clearance between connecting pin and bushing of link and link	80	-0.030 -0.076	+0.160 +0.074	0.104 ~ 0.236	1.0	

3) Pump pressure sensor

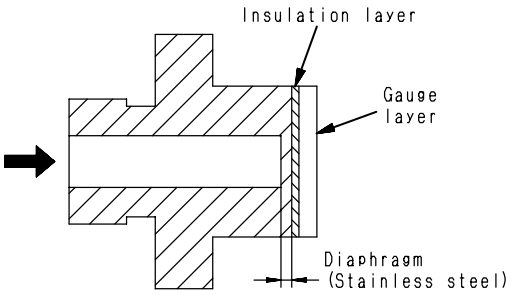




Structure of circuit

SEP02584

1. Sensor
2. Connector



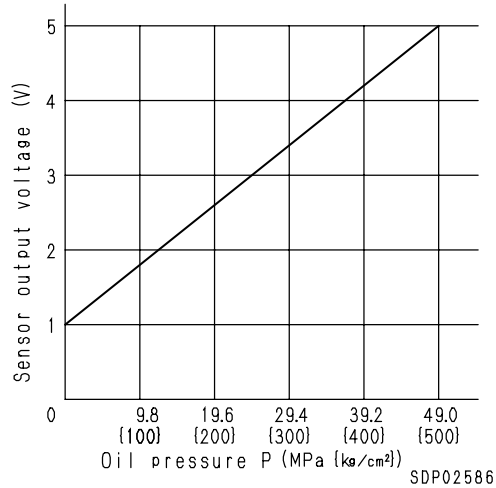
SDP02585

Function

- The pump pressure sensor is installed to the inlet circuit of the control valve. It converts the pump discharge pressure into a voltage and transmits it to the governor/pump controller.

Operation

- The oil pressure applied from the pressure intake part presses the diaphragm of the oil pressure sensor, the diaphragm is deformed.
- The gauge layer facing the diaphragm measures the deformation of the diaphragm by the change of its resistance, then converts the change of the resistance into a voltage and transmits it to the amplifier (voltage amplifier).
- The amplifier amplifies the received voltage and transmits it to the governor/pump controller.
- Relationship between pressure P (MPa {kg/cm²}) and output voltage (V) is as follows.
  V = 0.008 x P + 1.0



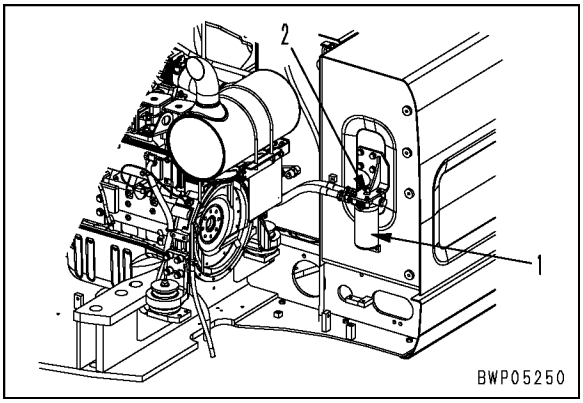
SDP02586

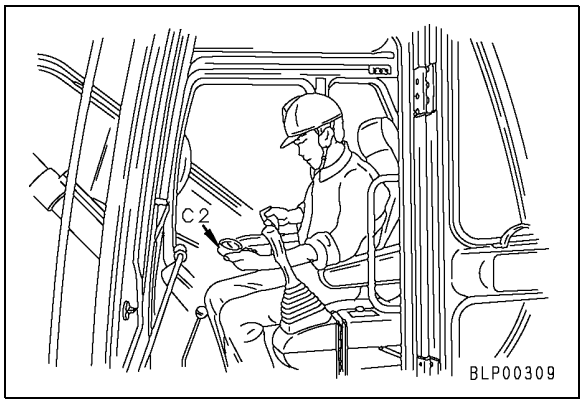
MEASURING ENGINE OIL PRESSURE

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

1. Remove oil pressure pick-up plug (2) from the top of engine oil filter (1), then install the adapter of oil pressure gauge kit C1 and oil pressure gauge C2 (1.0 MPa {10 kg/cm^2}) (see TOOLS FOR TROUBLESHOOTING.)

2. Start the engine, and measure the oil pressure with the engine at low idling and at high idling.





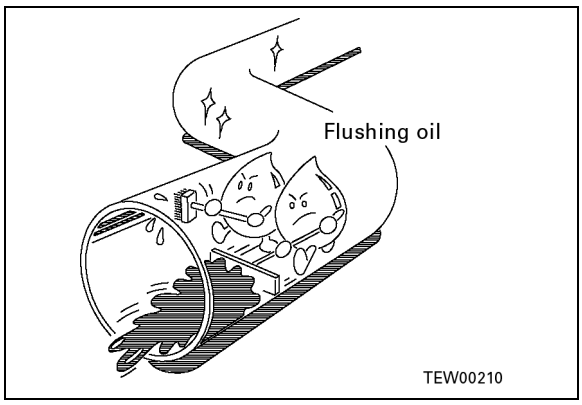
5) Change hydraulic oil when the temperature is high.

When the hydraulic oil or other oil is warm, it flows easily. In addition, the sludge can also be drained out easily from the circuit together with the oil, so it is best to change the oil when it is still warm. When changing the oil, as much as possible of the old hydraulic oil must be drained out. (Do not drain the oil from the hydraulic tank. Drain the oil from the filter and from the drain plug in the circuit). If any old oil is left, the contaminants and sludge in it will mix with the new oil and will shorten the life of the hydraulic oil.

6) Flushing operations

After disassembling and assembling the equipment, or changing the oil, use flushing oil to remove the contaminants, sludge, and old oil from the hydraulic circuit.

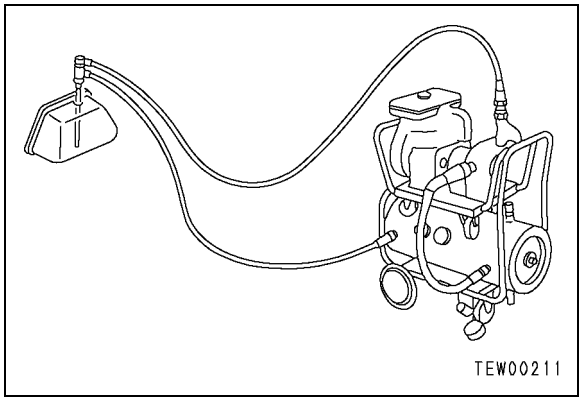
Normally, flushing is carried out twice: primary flushing is carried out with flushing oil, and secondary flushing is carried out with the specified hydraulic oil.



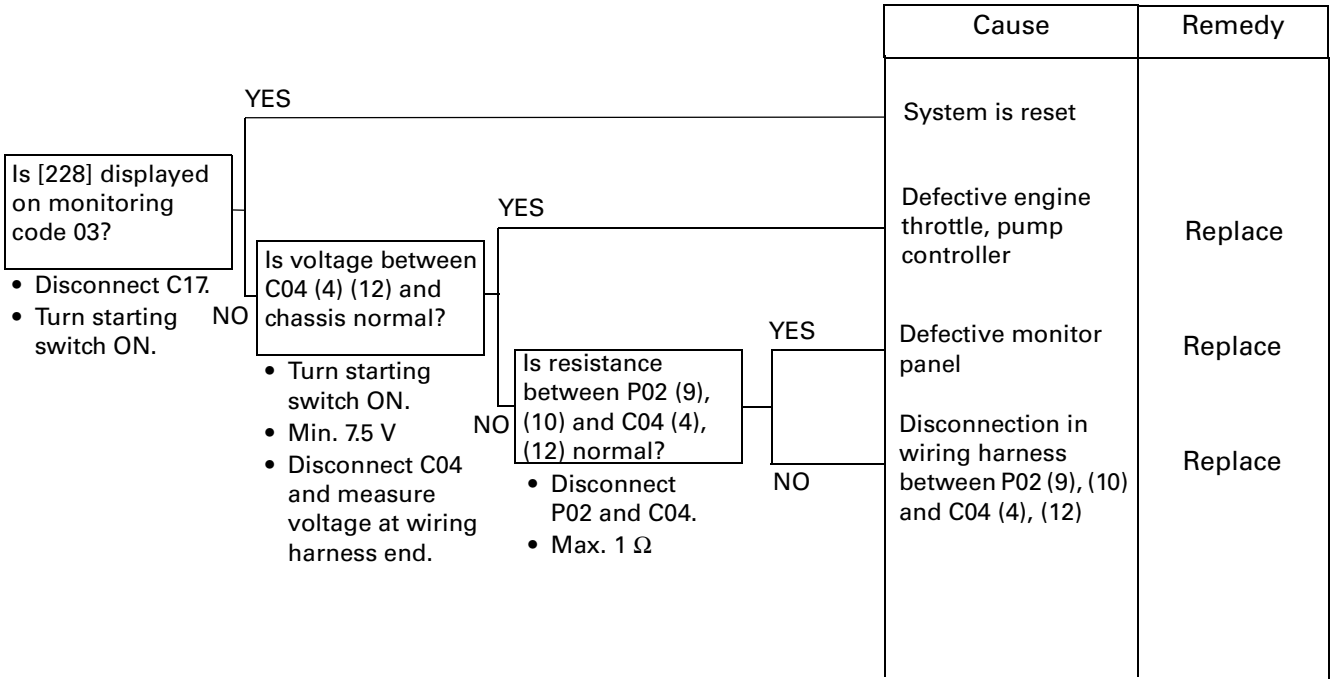
7) Cleaning operations

After repairing the hydraulic equipment (pump, control valve, etc.) or when running the machine, carry out oil cleaning to remove the sludge or contaminants in the hydraulic oil circuit.

The oil cleaning equipment is used to remove the ultra-fine (about 3 μ) particles that the filter built into hydraulic equipment cannot remove, so it is an extremely effective device.

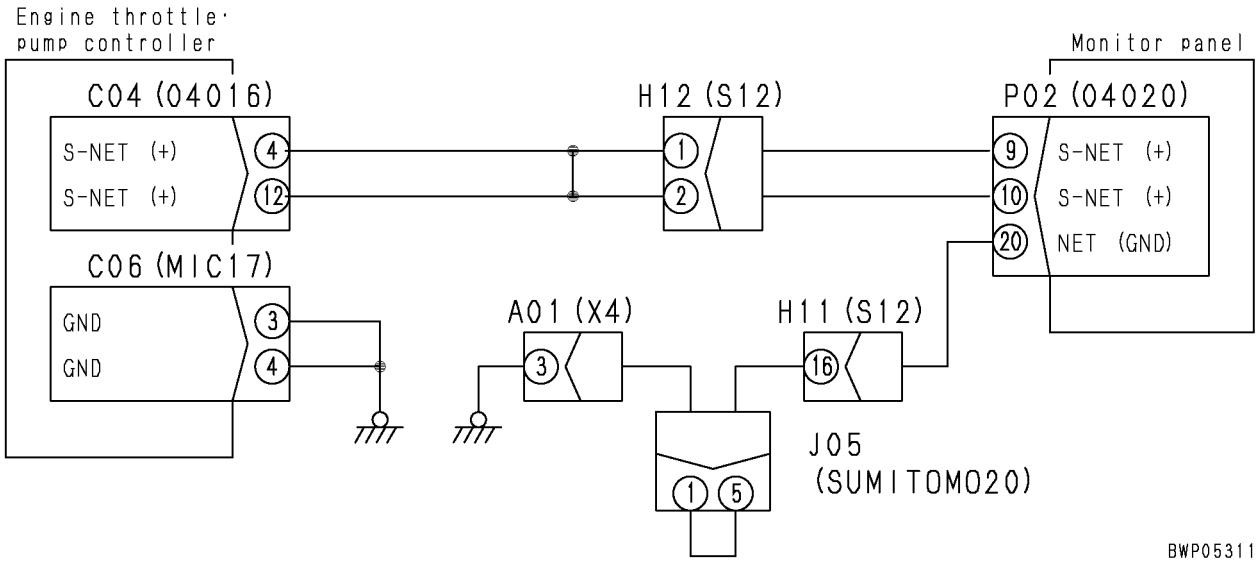


N-1 [E218] Communications abnormality



- When the controllers are not connected to the network, "- --" is displayed. If the correct letter or number is not displayed (another model is displayed), there is an abnormality in the controller model selection

N-1 Related electrical circuit diagram



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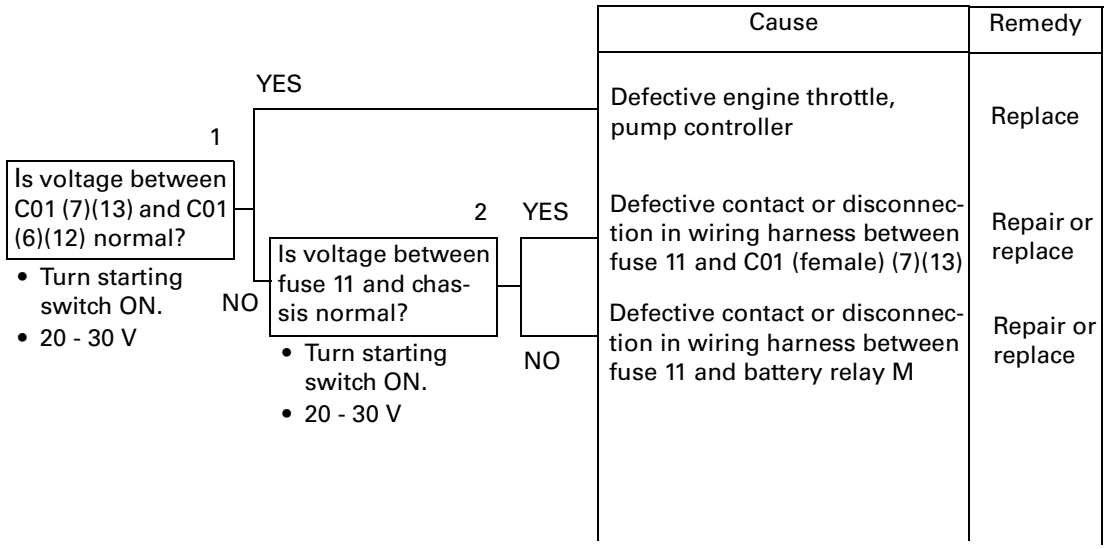
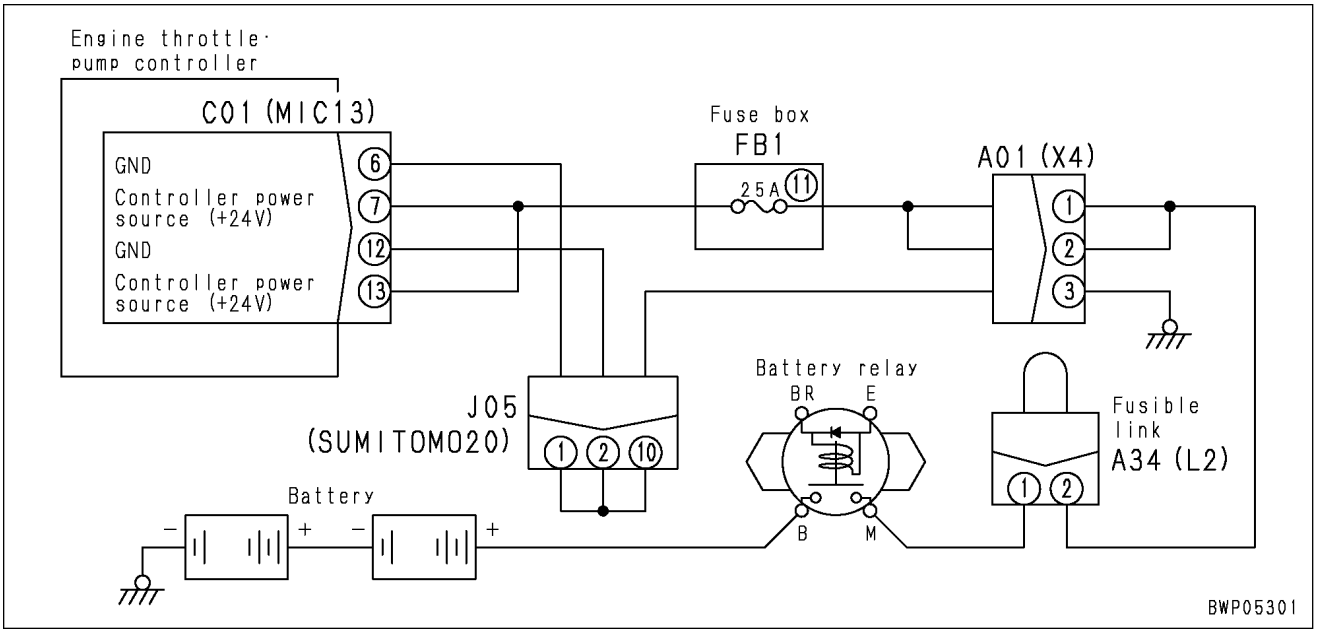
User code	Service code	Abnormal system	Nature of abnormality
—	E225	Abnormality in rear pump pressure sensor system	1. Disconnection, defective contact inside, short circuit, short circuit with ground inside rear pump pressure sensor 2. Disconnection, defective contact, short circuit in wiring harness between controller C03 (6) and pressure sensor A52 (B) ((+) side) and between C03 (16) and A52 (A) ((-) side) 3. Disconnection , defective contact, short circuit with power source, short circuit with ground in wiring harness between controller C03 (13) and pressure sensor A52 (C) (SIG side) 4. Defective engine throttle pump and controller
—	E226	Abnormality in pressure sensor power source system	1. Short circuit, short circuit with ground inside front pressure sensor or rear pump pressure sensor 2. Short circuit, short circuit with ground in wiring harness between controller C03 (6) and front pressure sensor A51 (B) or rear pressure sensor A52 (B) ((+) side) 3. Defective engine throttle and pump controller
—	E227	Abnormality in engine speed sensor system	1. Disconnection, defective contact, short circuit, short circuit inside engine speed sensor 2. Disconnection, defective contact, short circuit with ground in wiring harness between controller C06 (1) and speed sensor E04 (2) ((-) side) and between C06 (2) and E04 (1) (SIG side) 3. Defective engine throttle and pump controller
—	E241	Short circuit in LS-EPC solenoid system	1. Short circuit in wiring harness between C03 (7) - (14), (7) - (17), (14) - (17) 2. Short circuit in wiring harness between A53 (1) - (2), (1) - (3), (2) - (3) 3. Short circuit in wiring harness between E10 (A) - (B), (A) - (C), (B) - (C) 4. Short circuit in wiring harness between E06 (1) - (2), (1) - (3), (2) - (3) 5. Short circuit in wiring harness between C03 (7) - (1), (1) - (17) 6. Disconnection in wiring harness between C03 (7) - A53 (1) 7. Disconnection in wiring harness between C03 (4) - A53 (2) 8. Disconnection in wiring harness between C03 (17) - A53 (3) 9. Defective boom angle potentiometer 10. Defective contact of connector C03, A07, E53
—	E255	Disconnection in LS-EPC solenoid system	1. Defective controller
—	E256	Abnormality in front pump pressure sensor system	1. Defective controller
—	E313	Abnormality in automatic greasing	1. Defective automatic greasing controller (option)

C1 Abnormality in controller power source system (controller LED is off)

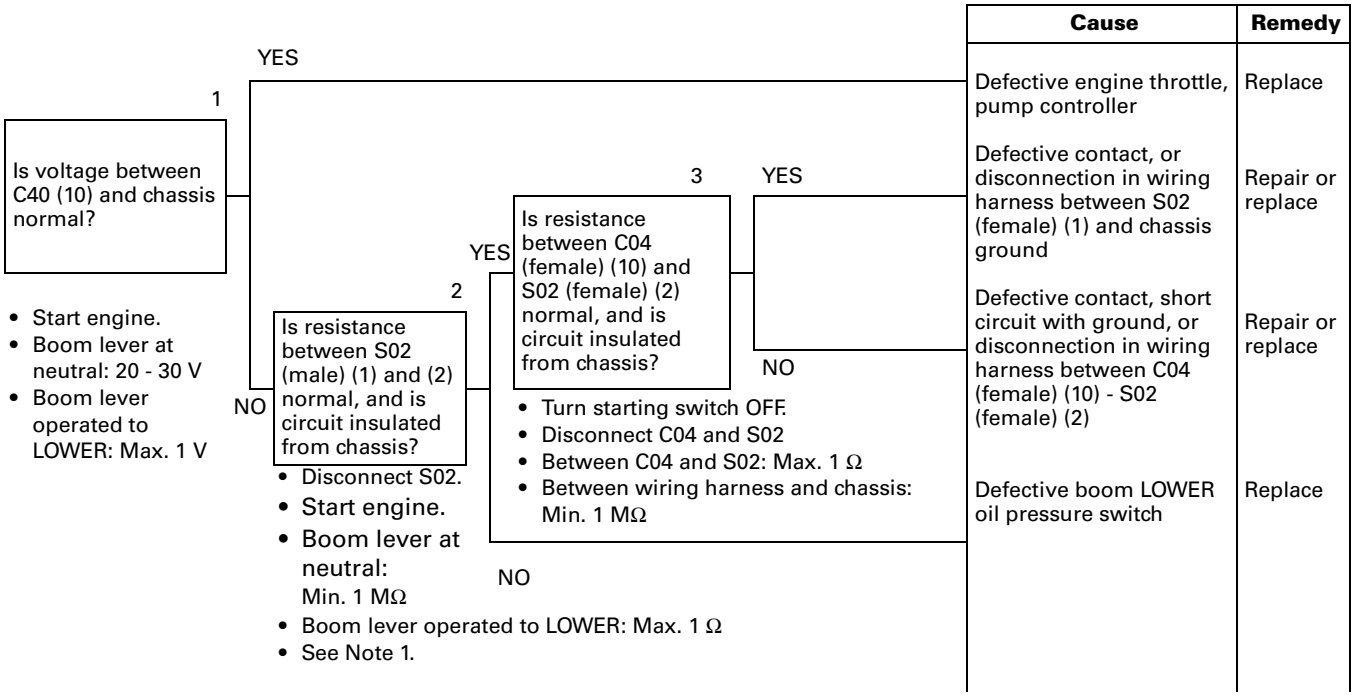
★ Check that fuse 11 is not blown.
★ When the starting motor rotates normally. (If the starting motor also does not rotate, go to E-8.)



C-1 Related electrical circuit diagram



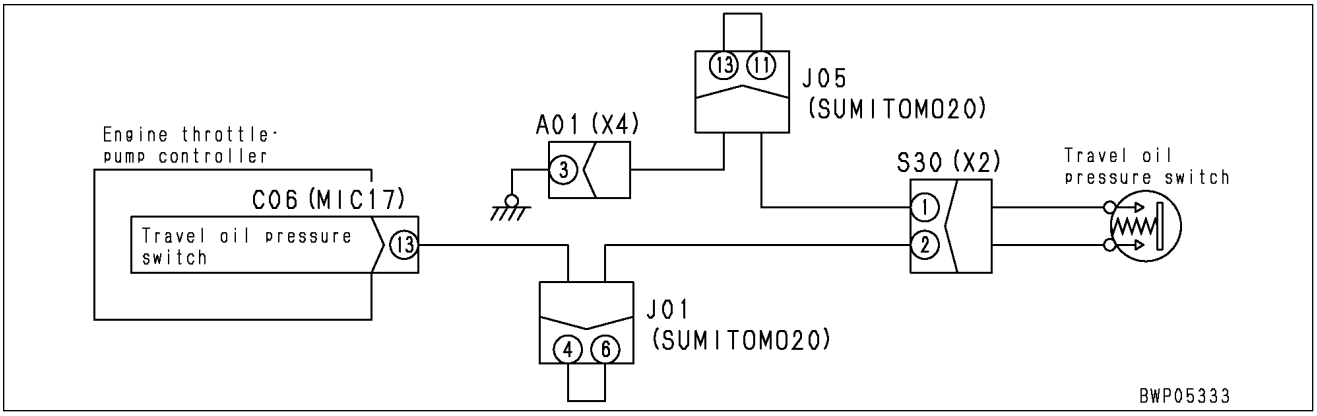
F-3 Bit pattern 20-(3) Boom LOWER oil pressure switch ON display does not light up



Cause	Remedy
Defective engine throttle, pump controller	Replace
Defective contact, or disconnection in wiring harness between S02 (female) (1) and chassis ground	Repair or replace
Defective contact, short circuit with ground, or disconnection in wiring harness between C04 (female) (10) - S02 (female) (2)	Repair or replace
Defective boom LOWER oil pressure switch	Replace

Note 1: It is also possible to fit a short connector and judge the condition. In this case, check the voltage between C04 (10) and the chassis.
- If it is 20 - 30 V: Go to YES
- If it is less than 1 V: Go to NO

F-3 Related electrical circuit diagram

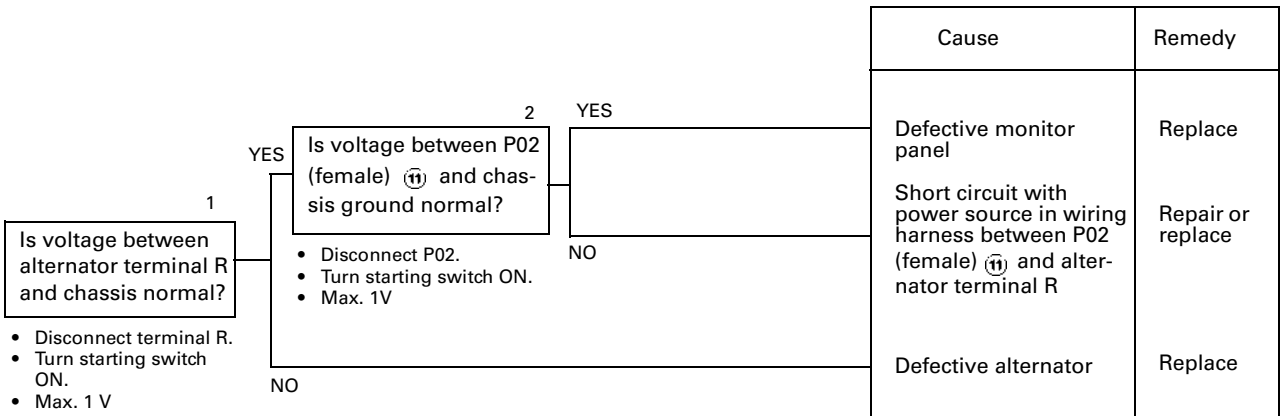


M-14 When starting switch is turned ON (engine stopped), caution items, emergency items flash, engine oil pressure lamps do not light up

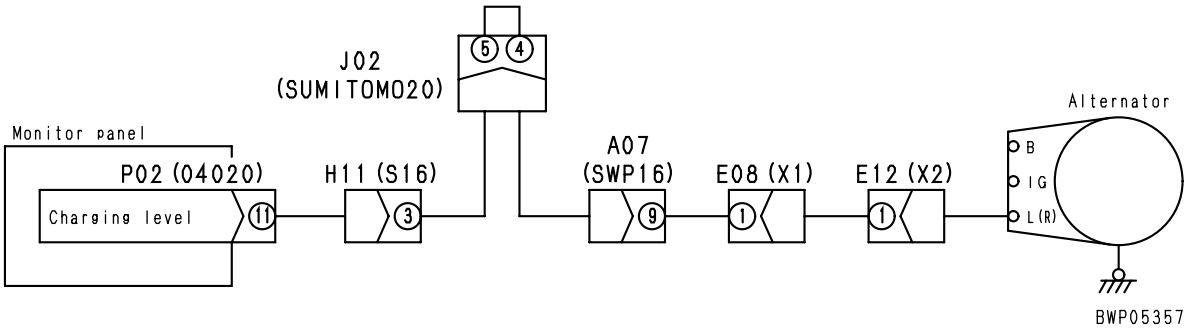
★ Check both the alternator system and the engine oil pressure system.

A. Alternator system

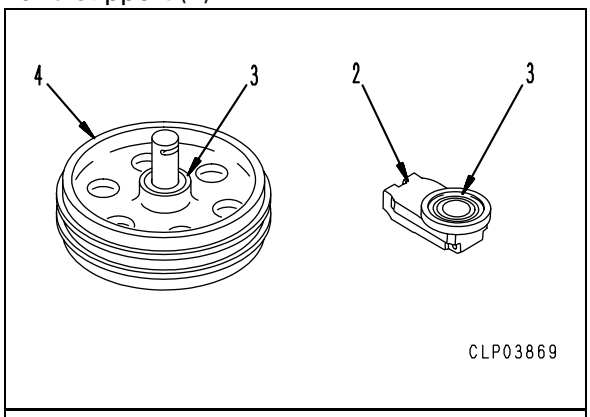
★ Check monitoring code [43]. If 100 or more is displayed with the engine at a mid-range speed or above, the monitor panel is defective.

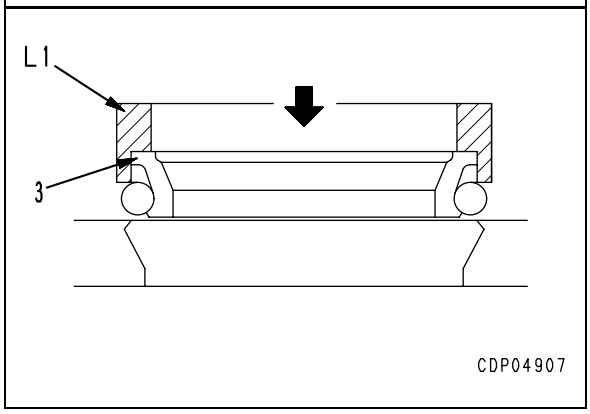


M-14 a) Related electrical circuit diagram



5. Using tool L1, install floating seal (3) to idler (4) and support (2).

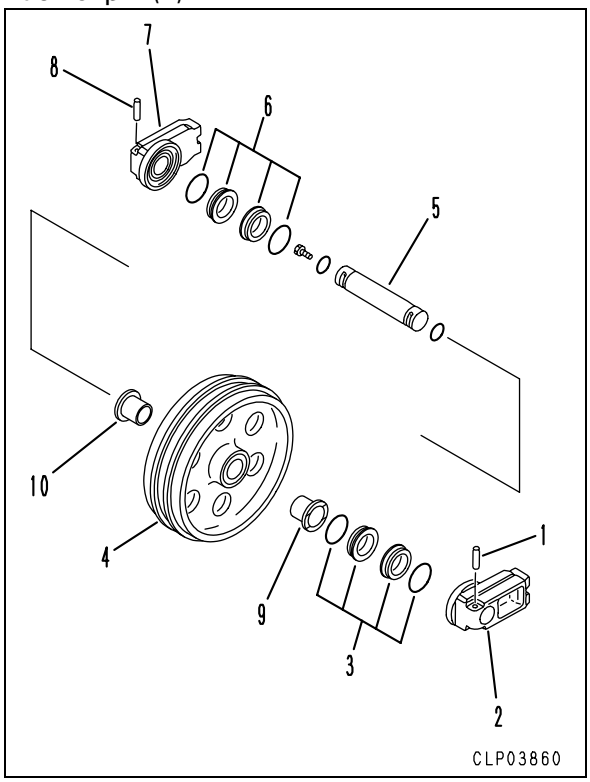




★ Coat the sliding surface of the floating seal with oil, and be careful not to let any dirt or dust get stuck to it.

★ Remove all grease and oil from the contact surface of the O-ring and the floating seal.

6. Install O-ring, then install support (2) with dowel pin (1).



7. Add oil using tool L7, then tighten plug.

Oil: Approx. 80 cc (EO 30-CD)

Plug: 207.9 ± 49.5 N·m {21.0 ± 5.0 kgm}