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HOISTING INSTRUCTIONS

HOISTING

> Heavy parts (25 kg or more) must be lifted with a hoist, etc. In the **DISASSEMBLY AND ASSEMBLY** section, every part weighing 25 kg or more is indicated clearly with the symbol kg

- If a part cannot be smoothly removed from the machine by hoisting, the following checks should be made:
  1) Check for removal of all bolts fastening the part to the relative parts.
  2) Check for existence of another part causing interference with the part to be removed.

WIRE ROPES

1) Use adequate ropes depending on the weight of parts to be hoisted, referring to the table below:

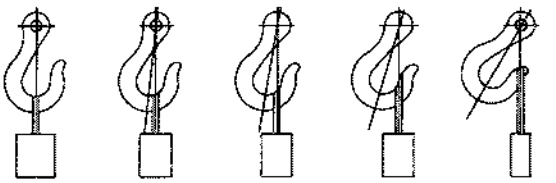
Wire ropes
(Standard "Z" or "S" twist ropes without galvanizing)

Rope diameter	Allowable load	
mm	kN	tons
10	9.8	1.0
11.2	13.7	1.4
12.5	15.7	1.6
14	21.6	2.2
16	27.5	2.8
18	35.3	3.6
20	43.1	4.4
22.4	54.9	5.6
30	98.1	10.0
40	176.5	18.0
50	274.6	28.0
60	392.2	40.0

★ The allowable load value is estimated to be one-sixth or one-seventh of the breaking strength of the rope used.

2) Sling wire ropes from the middle portion of the hook.

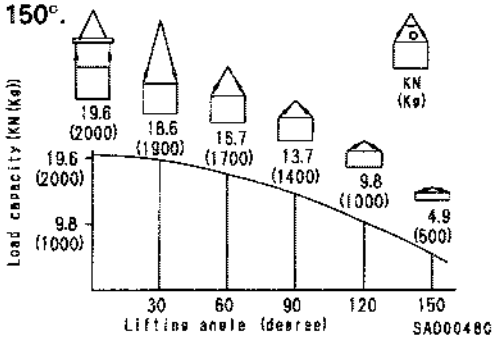
Slinging near the edge of the hook may cause the rope to slip off the hook during hoisting, and a serious accident can result. Hooks have maximum strength at the middle portion.



SAD00479

3) Do not sling a heavy load with one rope alone, but sling with two or more ropes symmetrically wound onto the load.
   ⚠ Slinging with one rope may cause turning of the load during hoisting, untwisting of the rope, or slipping of the rope from its original winding position on the load, which can result in a dangerous accident.

4) Do not sling a heavy load with ropes forming a wide hanging angle from the hook. When hoisting a load with two or more ropes, the force subjected to each rope will increase with the hanging angles. The table below shows the variation of allowable load kN {kg} when hoisting is made with two ropes, each of which is allowed to sling up to 9.8 kN {1000 kg} vertically, at various hanging angles.
   When two ropes sling a load vertically, up to 19.6 kN {2000 kg} of total weight can be suspended. This weight becomes 9.8 kN {1000 kg} when two ropes make a 120° hanging angle. On the other hand, two ropes are subjected to an excessive force as large as 39.2 kN {4000 kg} if they sling a 19.6 kN {2000 kg} load at a lifting angle of 150°.



SA000480

WEIGHT TABLE

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

Serial No. : 8001 – 12771

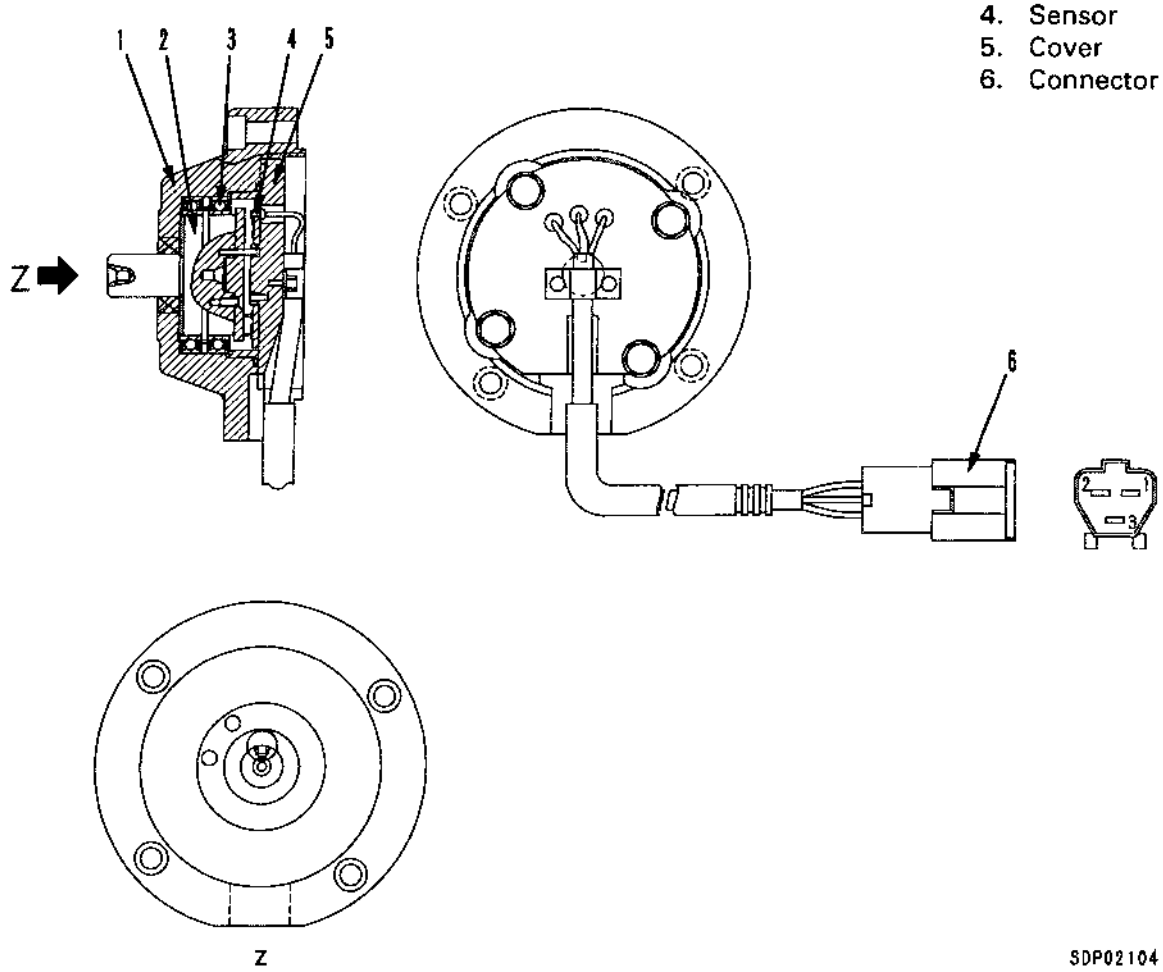
Unit : kg

Machine model	PC50UU-2
Serial Number	8001 – 12771
Engine, hydraulic pump assembly	250
• Engine (with mount)	230
• PTO	10
• Piston pump + gear pump	9
Radiator, oil cooler assembly	24
Fuel tank (without fuel)	8.2
Hydraulic tank (without oil)	50
Canopy	59
Operator's cab	172
Revolving frame (without counterweight)	1,480
Counterweight	800
Swing circle	66
Swing machinery	24
Track frame assembly (with piping, cover)	890(866)
• Track frame	535
• Idler	20 x 2
• Recoil spring assembly	8 x 2 (7 x 2)
• Track roller	10 x 10 (7 x 10)
• Carrier roller	6 x 2 (4 x 2)
• Sprocket	11 x 2 (13 x 2)
Track shoe assembly	
• Road liner (400 mm)	236 x 2
• Rubber shoe (400 mm)	(296 x 2)
• Steel shoe (480 mm)	(335 x 2)
5-spool control valve	19
6-spool control valve	21
4-spool control valve	11

Figures in ( ) : Steel shoe specification

Serial No.: 12772

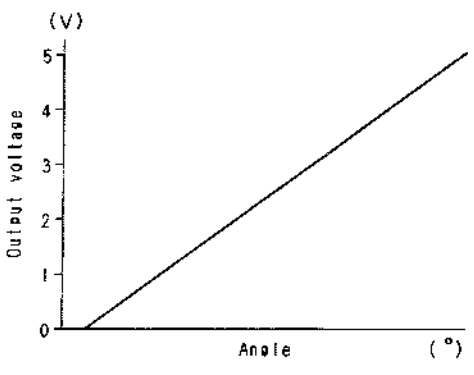
1. Body
2. Rotor
3. Bearing
4. Sensor
5. Cover
6. Connector



SDP02104

Function

- The potentiometers are mounted at the boom foot, the arm foot and the second boom top. Each potentiometer detects the angle of each work equipment, i.e. boom, arm and offset.
- Based on the angles of these work equipment, the power supply voltage of 5V is converted to the signal voltage using the resistance value of the variable resistor. The converted signal voltage is sent to the controller.

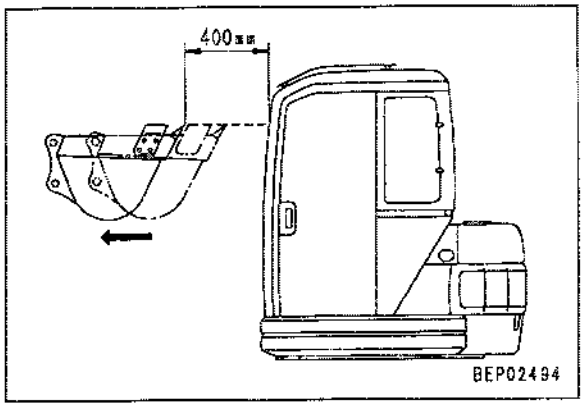


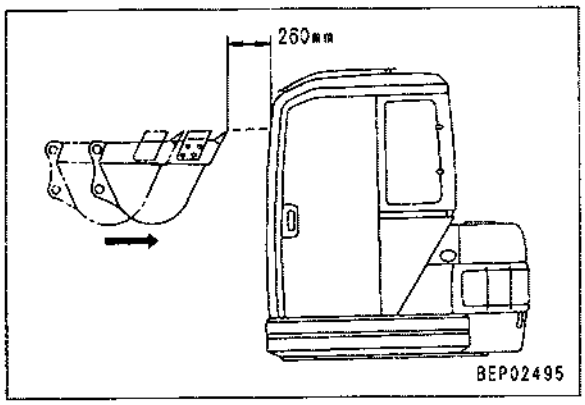
SDP02520

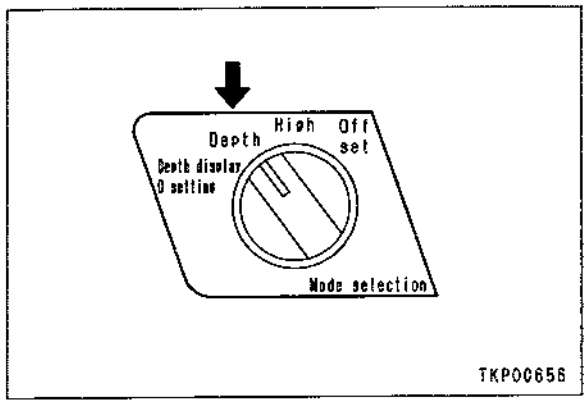
System	Name of component	Connector No.	Inspection method	Judgment table	Measurement conditions
4 systm	PPC lock solenoid valve	K18(male) V1(female)	Measure resistance	If the condition is as shown in the table below, it is normal Between K18 – V1: 5 – 25Ω Between K18, V1 – chasses: Min. 1MΩ	1) Turn starting switch OFF. 2) Disconnect connector.
Travel boost	Travel speed boost solenoid valve	V3(male) V4(female)	Measure resistance	If the condition is as shown in the table below, it is normal Between V3 – V4: 5 – 25Ω Between V3, V4 – chasses: Min. 1MΩ	1) Turn starting switch OFF. 2) Disconnect connector.
Fuel system	Fuel control dial	M26(male)	Measure resistance	If the condition is as shown in the table below, it is normal Tester direction (2) → (1): 1.35 – 1.4Ω Tester direction (1) → (2): Min. 1MΩ ★ Terminal (1): Negative Terminal (2): Positive	1) Turn starting switch OFF. 2) Disconnect connector. 3) Connect Tadapter.
Fuel controller system	Fuel controller	K5(male)	Measure resistance	If the condition is as shown in the table below, it is normal Between K5(2) – (4): 2.2 kΩ Between K5(1) – (2): Min.1MΩ Between K5(1) – K6(2): Min.1MΩ Between K5(2) – K35(2): Min.1MΩ	1) Turn starting switch OFF. 2) Disconnect connector. 3) Connect Tadapter.
		K6(female)	Measure resistance	If the condition is as shown in the table below, it is normal Between (1) – (4): Max.1Ω Between (5) – (6): 0.7 kΩ	1) Turn starting switch OFF. 2) Disconnect connector. 3) Connect Tadapter.

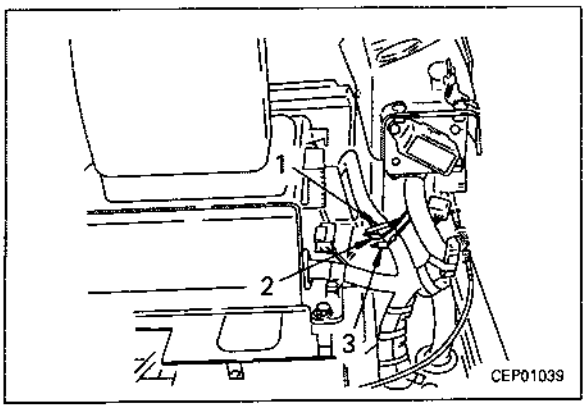
6. **Automatic stop position is further away than specified value**
   - ★ Even if the value is slightly outside the specified value, there is no problem in actual operations, so except in special cases (for example, a request from the user), do not carry out the resetting operation unnecessarily.
   - Carry out the resetting operation as follows.

   1) Operate the arm in the OUT direction and move the bucket 400 mm away from the cab (canopy).
   2) Set cancel switch (1) to the ON position, operate the arm slowly in the IN direction, and set distance **L** between the tip of the bucket teeth and the cab (canopy) to 260 mm.
      - ★ Because of inertia when stopping, the work equipment will move about 50 mm closer than the set position, so allow a margin when setting.
   3) Turn the starting switch OFF, stop the engine, then turn the starting switch ON again.
   4) Set the mode selection switch to DEPTH, then connect reset power source terminal (1) and reset terminal (2).
      - ★ Reset power source terminal (1) is a female 1-pin connector (red wiring harness); reset terminal (2) is a male 1-pin connector (red wiring harness, no taping).
   5) Check that electrical system caution lamp (6) on the monitor panel starts to flash 2 seconds later in 1-second cycles.
   6) Disconnect terminals (1) and (2), then turn the starting switch OFF.
   7) When the starting switch is turned ON again, the resetting operation is completed.
      - ★ Run the engine at full throttle, carry out the automatic stop and check stopping distance **L**.
   8) After finishing the operation, tape the reset terminals to their original position.

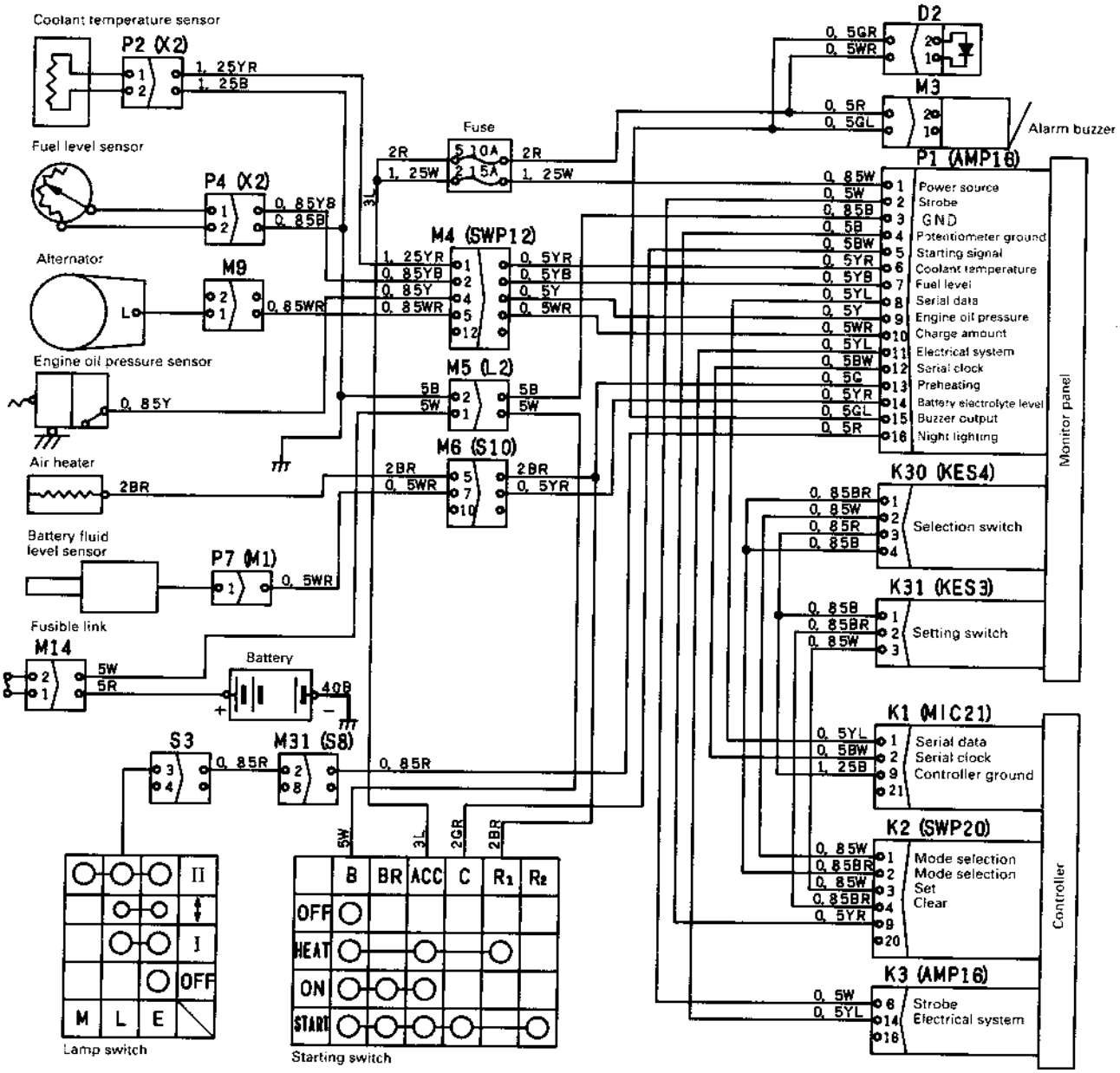








MACHINE MONITOR SYSTEM



020U02

20UF02221-K

E-16 Cancel switch is not turned ON, but alarm buzzer sounds for 7 seconds and electric system caution lamp flashes

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

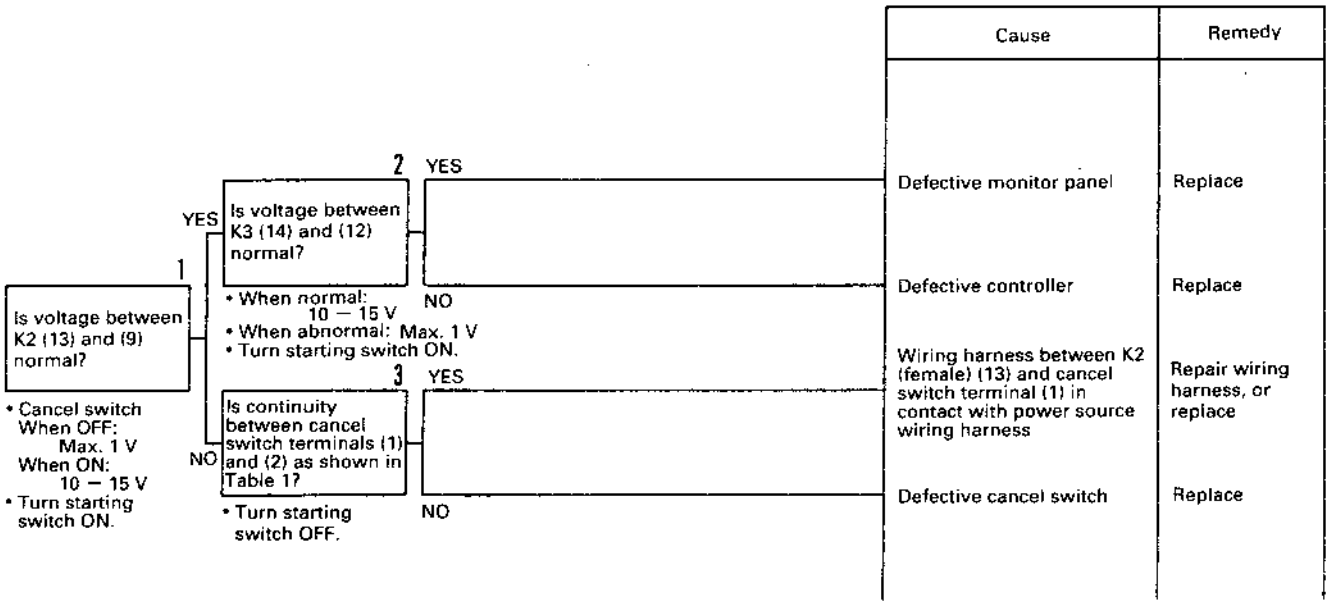
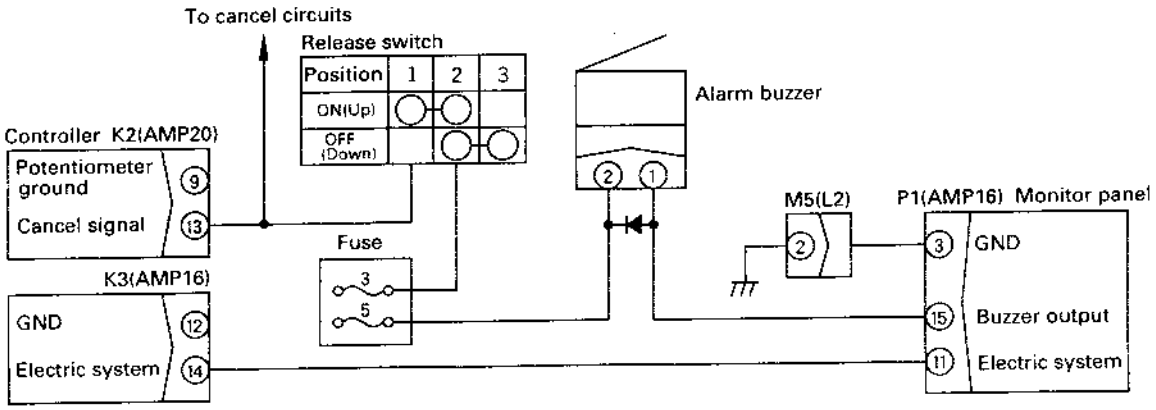


Table 1

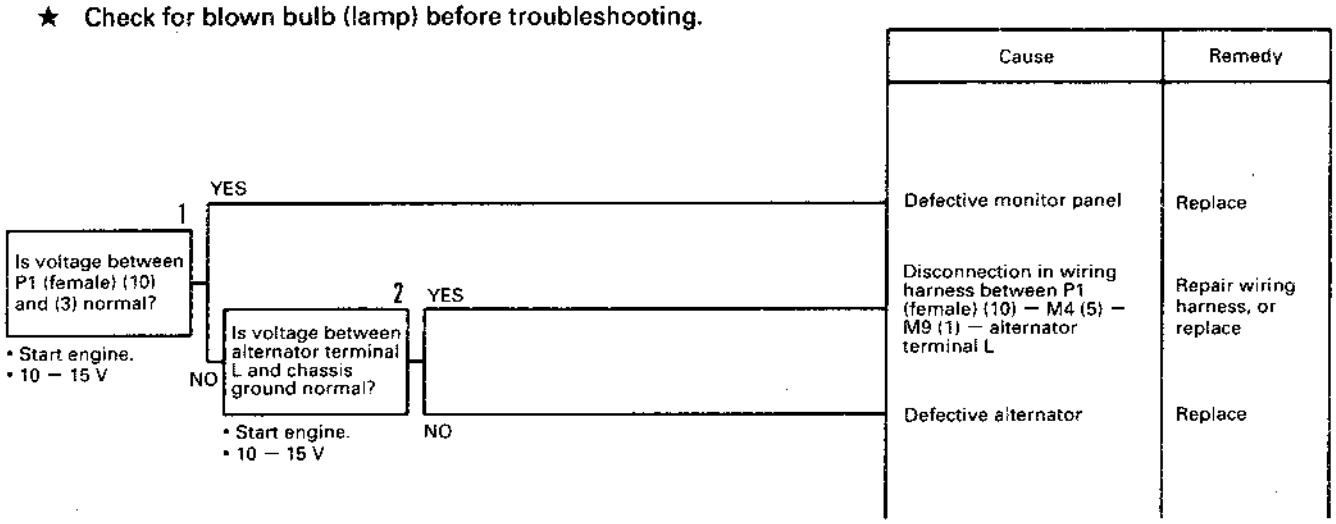
Switch	1	2	3
ON (Up)	○	○	
OFF (Down)		○	○

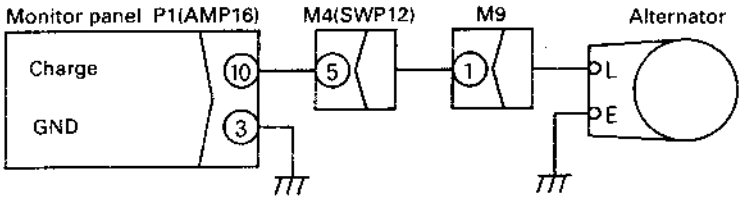


20UF02255

M-4 When starting switch is ON (engine stopped), charge caution lamp does not light up

★ Before carrying out troubleshooting, check that all the related connectors are properly inserted.
★ Always connect any disconnected connectors before going on the next step.
★ Check for blown bulb (lamp) before troubleshooting.

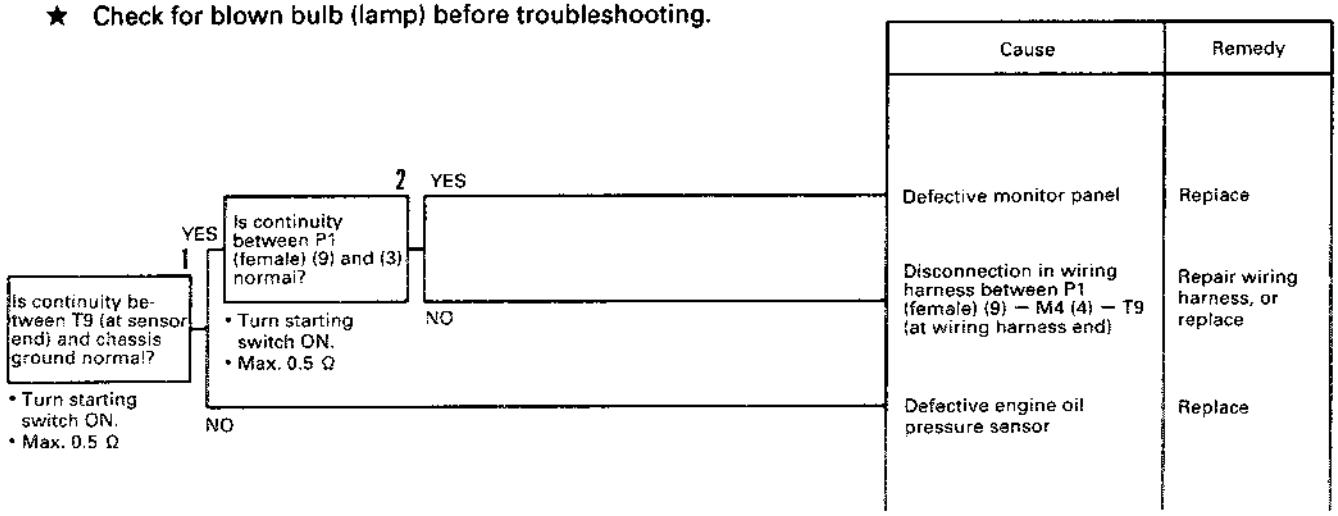


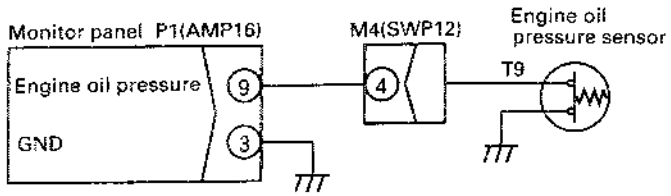


20UF02263

M-5 When starting switch is ON (engine stopped), engine oil pressure caution lamp does not light up

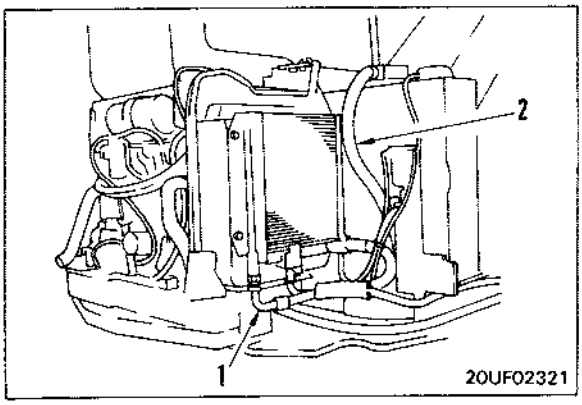
★ Before carrying out troubleshooting, check that all the related connectors are properly inserted.
★ Always connect any disconnected connectors before going on the next step.
★ Check for blown bulb (lamp) before troubleshooting.

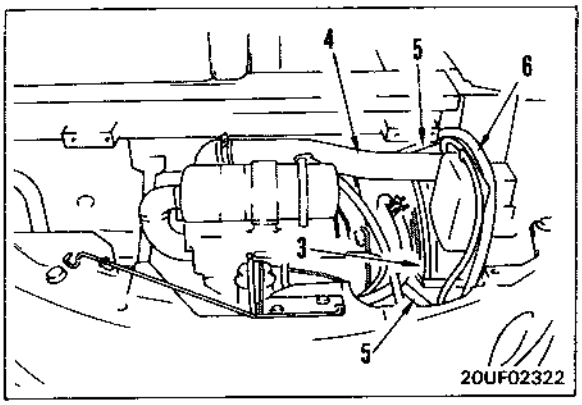




20UF02264A

REMOVAL OF RADIATOR AND HYDRAULIC OIL COOLER ASSEMBLY





⚠ Lower the work equipment to the ground and release the residual pressure from the circuit. For details, see TESTING AND ADJUSTING, Releasing residual pressure from hydraulic circuit.

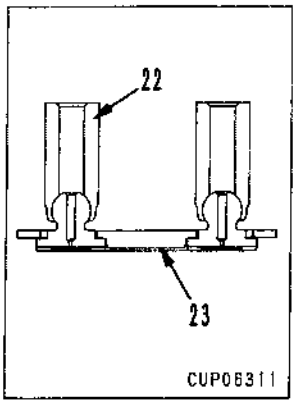
1. Remove counterweight assembly. For details, see REMOVAL OF COUNTERWEIGHT.
2. Drain coolant.
3. Remove hood, right side cover of machine body, and rear decorative panel of machine body.
4. Disconnect hydraulic oil cooler hoses (1) and (2).
5. Remove fan guard (3).
6. Remove air intake connector (4) and radiator outlet and inlet hoses (5), then remove radiator and hydraulic oil cooler assembly (6).

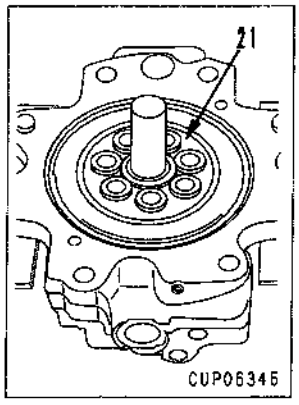
INSTALLATION OF RADIATOR AND HYDRAULIC OIL COOLER ASSEMBLY

- Carry out installation in the reverse order to removal.
- **Refilling with oil**
  Add oil through the oil filler to the specified level. Run the engine to circulate the oil through the system. Then, check the oil level again.
- **Refilling with water**
  Add water through the water filler to the specified level. Run the engine to circulate the water through the system. Then, check the water level again.

9. Shoe retainer and piston assembly

1) Install piston (22) to shoe retainer (23).
2) Install shoe retainer and piston assembly (21) to the cylinder block.





10. Spacer and thrust plate

Install spacer (11) and thrust plate (12) to the swash plate.

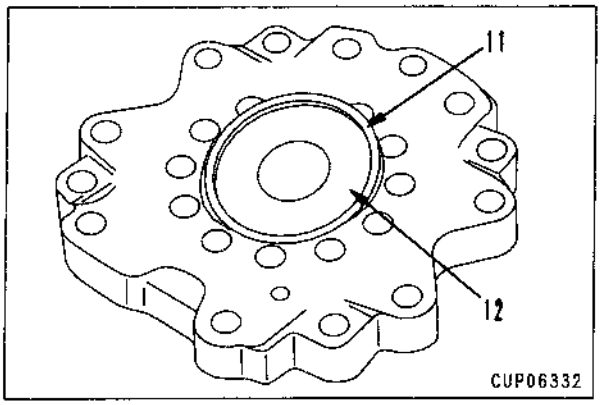
★ The installation method of the spacer depends on its material.
Steel spacer: Press fit
Copper alloy spacer: Clearance fit

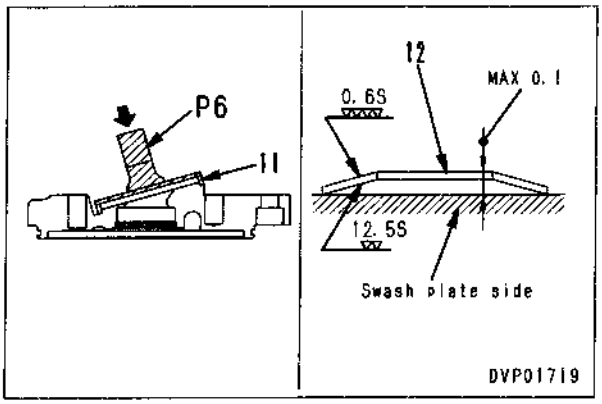
★ Press fit steel spacer with tool **P6** until it is fitted to the swash plate.

★ Press fitting load: Max. 980 N {100 kg}

Press fitting surface:
Engine oil (EO10-CD)

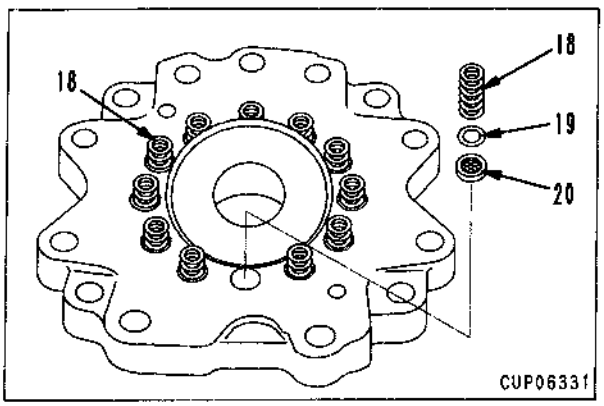
★ Judge the direction of the thrust plate by the difference of the surface machining accuracy and the sectional shape and install it as shown in the figure.





11. Filter and brake spring

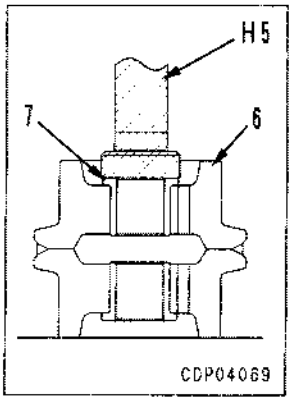
1) Install filter (20) and washer (19) to the swash plate.
   ★ Turn over the swash plate and find out the through spring hole and install the filter to that hole.
2) Install 12 brake springs (18) to the swash plate.



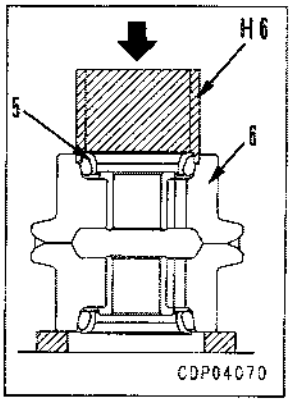
ASSEMBLY OF TRACK ROLLER ASSEMBLY

Serial No.: 14993 and up

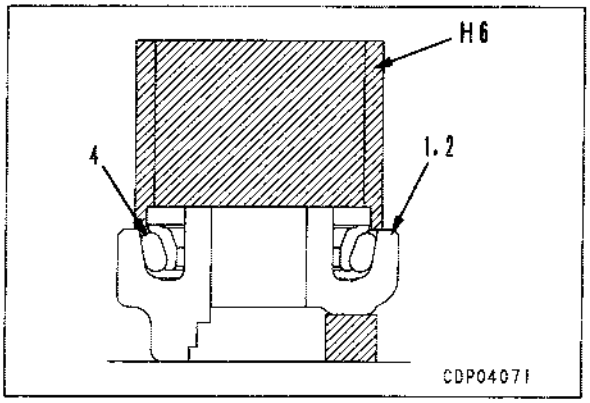
1. Using tool **H5**, press fit 2 bushings (7) to roller (6).



2. Using tool **H6**, install 2 floating seals (5) to roller (6).
   - ★ Clean, degrease, and dry the O-ring and O-ring fitting surfaces.
   - ★ Apply engine oil (EO30-CD) to the sliding surfaces of the floating seal and take care not to stick dust to them.



3. Using tool **H6**, install floating seal (4) to collars (1) and (2).
   - ★ Clean, degrease, and dry the O-ring and O-ring fitting surfaces.
   - ★ Apply engine oil (EO30-CD) to the sliding surfaces of the floating seal and take care not to stick dust to them.



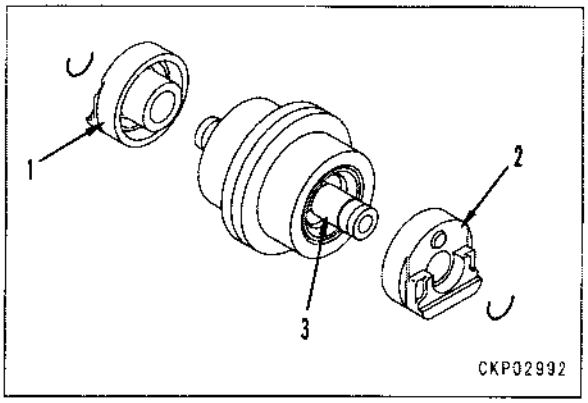
4. Fit O-ring, then install shaft (3) to roller.

5. Install collar (2) and secure it with snap ring.

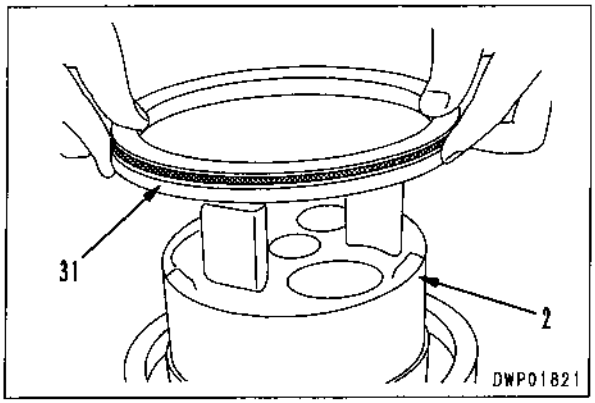
6. Fill roller with engine oil.

   Inside of roller: **Approx. 70 cc (EO30-CD)**

7. Install collar (1) and secure it with snap ring.

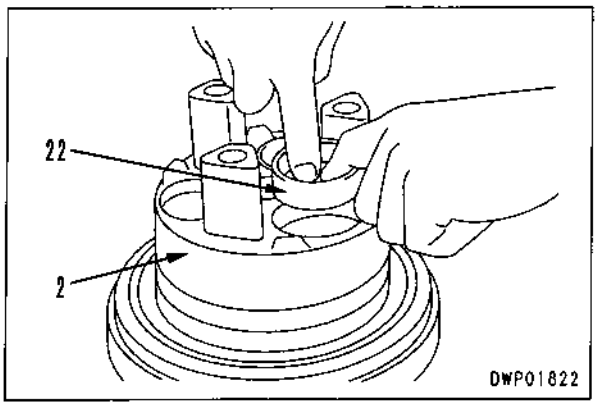


2) Take floating seal (31) out of spindle (2).



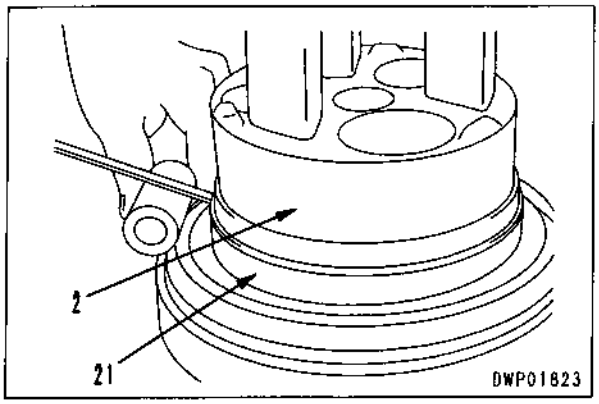
3) Take outer races (3 pieces) of tapered roller bearings (22).

⚠ The outer races of tapered roller bearings (22) may stick to the spindle and may not be taken out easily because of the gear oil films. In this case, hit the center of the mounting hole of the spindle (2) lightly with an aluminum bar, and the oil films are broken and the outer races can be taken out easily.



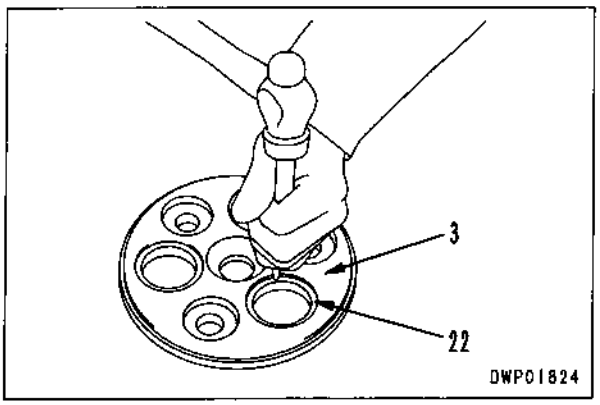
4) Remove the inner race of bearing (21) from spindle (2) with a spatula and a steel pipe.

⚠ Remove the inner race of bearing (21) from the spindle only when it needs to be replaced.



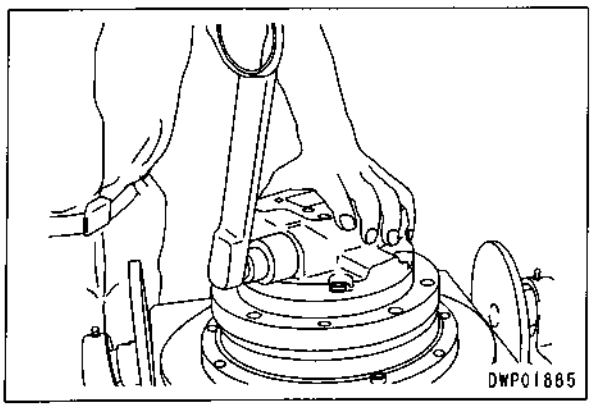
26. Removal of hold flange parts

1) Take the outer races of tapered roller bearings (22) out of hold flange (3) by hitting it with a hammer.



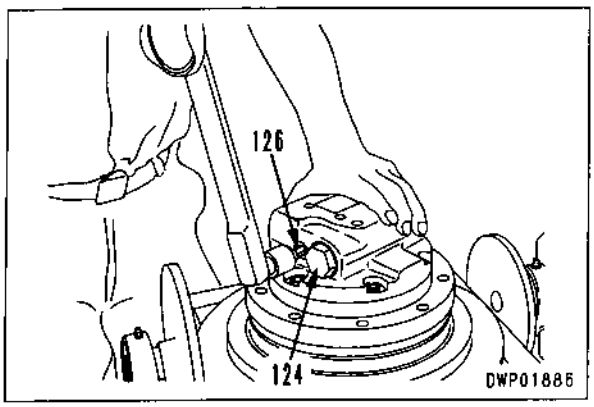
7) Tighten plugs (124) to the specified torque.

kgm Plugs (124):
107.9 ± 24.5 Nm {11 ± 2.5 kgm}



8) Tighten plugs (126) to the specified torque.

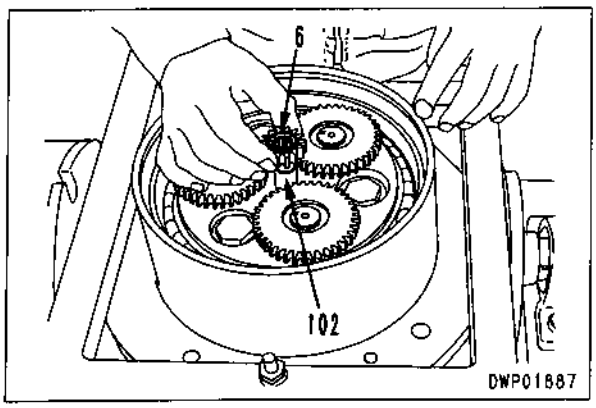
kgm Plugs (126):
49.0 ± 7.8 Nm {5 ± 0.8 kgm}



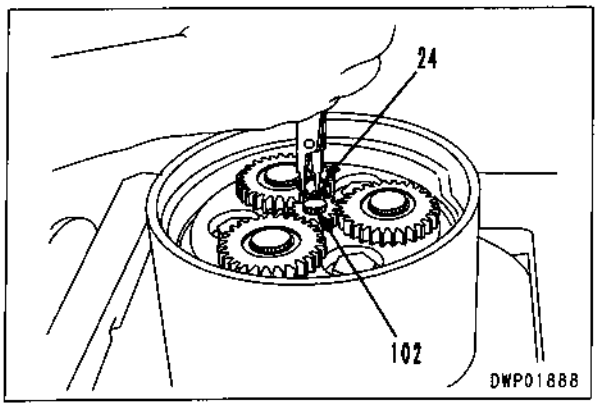
20. Reassembly of input gear

1) Turn over the travel motor.
2) Install input gear (6) to shaft (102).

⚠ Fit input gear (6) to shaft (102), meshing it with 3 spur gears (7). If it does not mesh, inspect.



3) Install C-type shaft snap rings (24) to the snap ring grooves of shaft (102).



REMOVAL OF BLADE ASSEMBLY

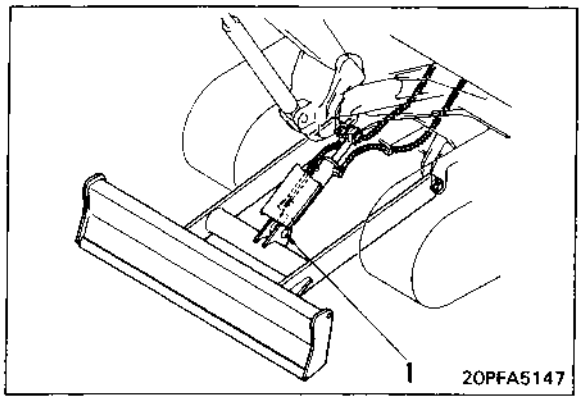
⚠ Lower the blade to the ground and stop the engine. Operate the blade control lever 2 – 3 times, then loosen the oil filler cap of the hydraulic tank slowly to release the internal pressure of the hydraulic tank. Lower the work equipment to the ground, then set the safety lock lever to the LOCK position.

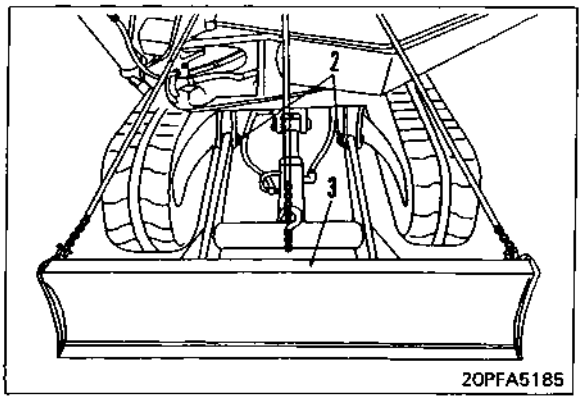
1. Remove the blade cylinder protection cover.

2. Sling blade cylinder assembly temporarily and remove head pin (1). ※ 1
   - ★ Start the engine and retract the blade cylinder rod, then lower the blade cylinder on a block.
   - ★ Check the quantity and positions of the inserted shims.

3. Sling blade assembly temporarily and remove pin (2). ※ 2
   - ★ Check the quantity and positions of the inserted shims.

4. Remove blade assembly (3).
   kg Blade assembly: **200 kg**





INSTALLATION OF BLADE ASSEMBLY

- Carry out installation in the reverse order to removal.

※ 1

⚠ When aligning the pin holes, never insert your fingers in them.

★ Insert the shims securely.

※ 2

⚠ When aligning the pin holes, never insert your fingers in them.

★ Insert the shims securely.