Shop Manual
Part I

VEBM210100

WA400-5H

WHEEL LOADER

MODEL	SERIAL NUMBER
WA400-5H	WA400H50051 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.
- WA400-5 mount the SAA6D114E-2 engine.
  For details of the engine, see the 114-2 Series Engine Shop Manual

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KOMATSU

STANDARD TIGHTENING TORQUE

STANDARD TIGHTENING TORQUE TABLE (WHEN USING TORQUE WRENCH)

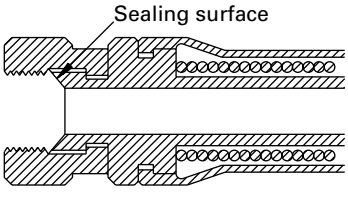
★ In the case of metric nuts and bolts for which there is no special instruction, tighten to the torque given in the table below.

Thread diameter of bolt	Width across flats	 CDL00372	
mm	mm	Nm	kgm
6	10	13.2 ± 1.4	1.35 ± 0.15
8	13	31 ± 3	3.2 ± 0.3
10	17	66 ± 7	6.7 ± 0.7
12	19	113 ± 10	11.5 ± 1
14	22	177 ± 19	18 ± 2
16	24	279 ± 30	28.5 ± 3
18	27	382 ± 39	39 ± 4
20	30	549 ± 59	56 ± 6
22	32	745 ± 83	76 ± 8.5
24	36	927 ± 103	94.5 ± 10.5
27	41	1320 ± 140	135 ± 15
30	46	1720 ± 190	175 ± 20
33	50	2210 ± 240	225 ± 25
36	55	2750 ± 290	280 ± 30
39	60	3290 ± 340	335 ± 35

Thread diameter of bolt	Width across flats	 CDL00373	
mm	mm	Nm	kgm
6	10	7.85 ± 1.95	0.8 ± 0.2
8	13	18.6 ± 4.9	1.9 ± 0.5
10	14	40.2 ± 5.9	4.1 ± 0.6
12	27	82.35 ± 7.85	8.4 ± 0.8

TABLE OF TIGHTENING TORQUES FOR FLARED NUTS

★ In the case of flared nuts for which there is no special instruction, tighten to the torque given in the table below.

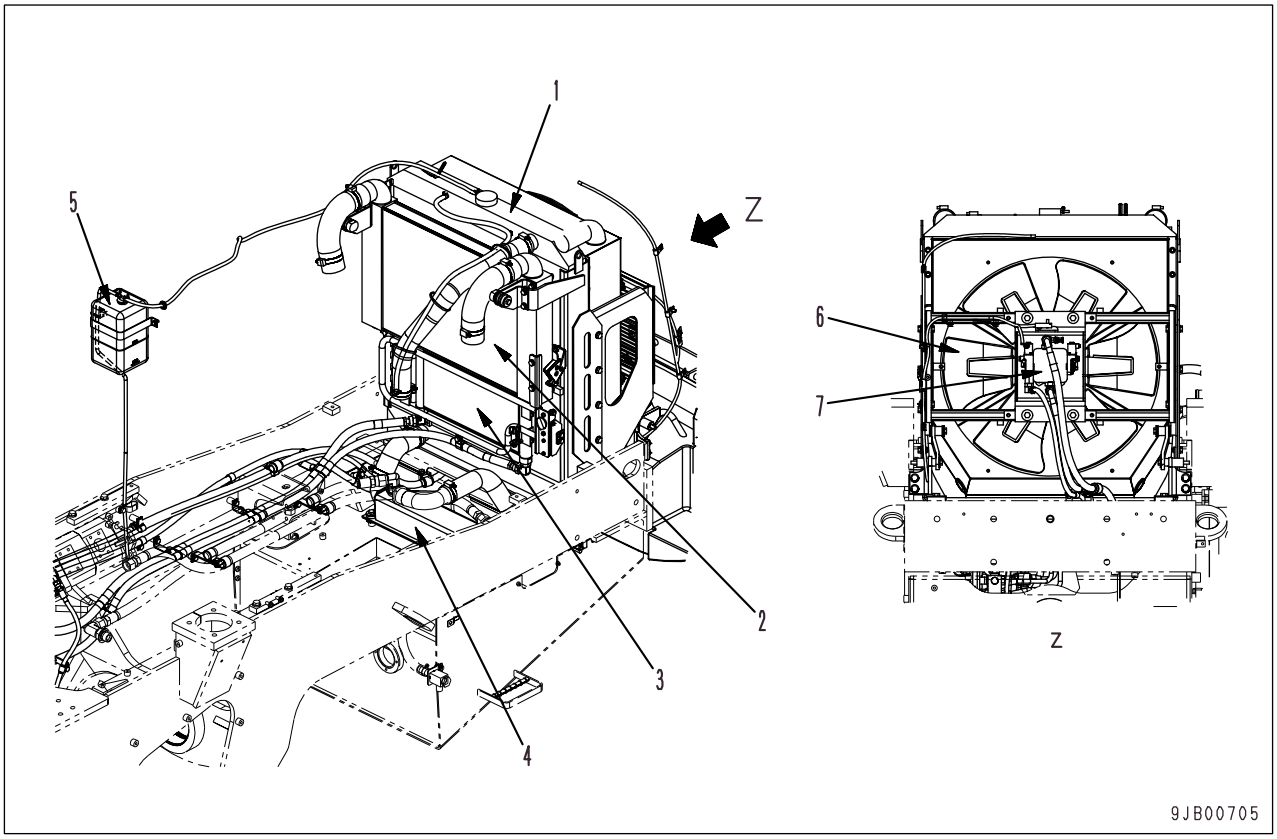


SAD00483

Thread diameter	Width across flat	Tightening torque	
mm	mm	Nm	kgm
14	19	24.5 ± 4.9	2.5 ± 0.5
18	24	49 ± 19.6	5 ± 2
22	27	78.5 ± 19.6	8 ± 2
24	32	137.3 ± 29.4	14 ± 3
30	36	176.5 ± 29.4	18 ± 3
33	41	196.1 ± 49	20 ± 5
36	46	245.2 ± 49	25 ± 5
42	55	294.2 ± 49	30 ± 5

01 GENERAL

COOLING SYSTEM



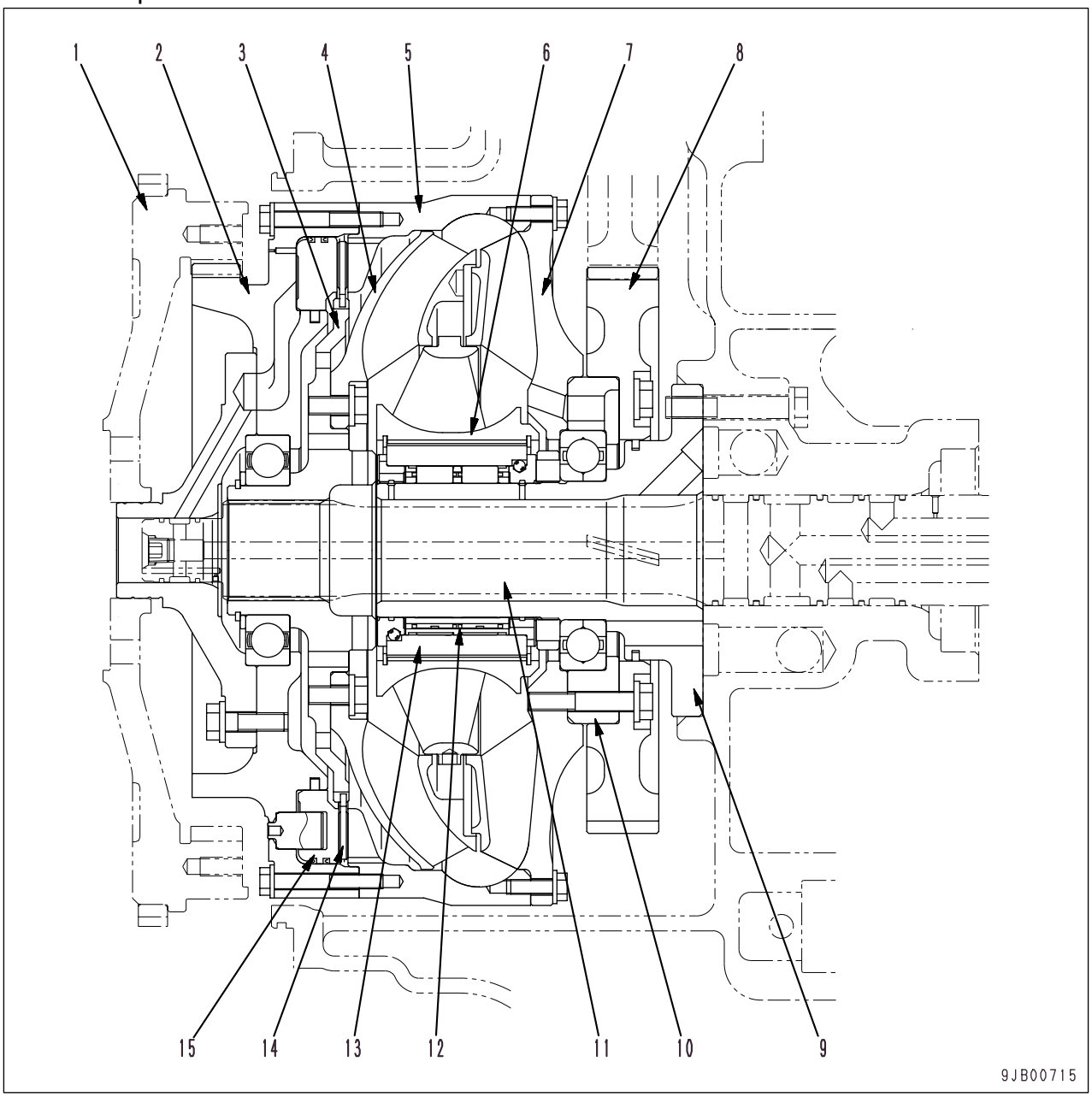
1. Radiator
2. After cooler
3. Oil cooler
4. Torque converter oil cooler
5. Reservoir tank
6. Cooling fan
7. Cooling fan motor

Specifications

	Radiator	Oil cooler	After cooler	Torque converter oil cooler
Core type	CF19-4	CF40-1	AL-CFT	PTO-OL
Fin pitch (mm)	4.0/2	4.5/2	4.0/2	※ 1 100 X 558 X 12 Step
Total heat radiating area (m^2)	60.08	2.90	17.55	1.291
Pressure valve opening pressure (kPa {kg/cm^2})	68.6 {0.7}	—	—	—
Vacuum valve opening pressure (kPa {kg/cm^2})	0 ~ 4.9 {0 ~ 0.05}	—	—	—

※ 1: Shows the element size.

With lock-up clutch

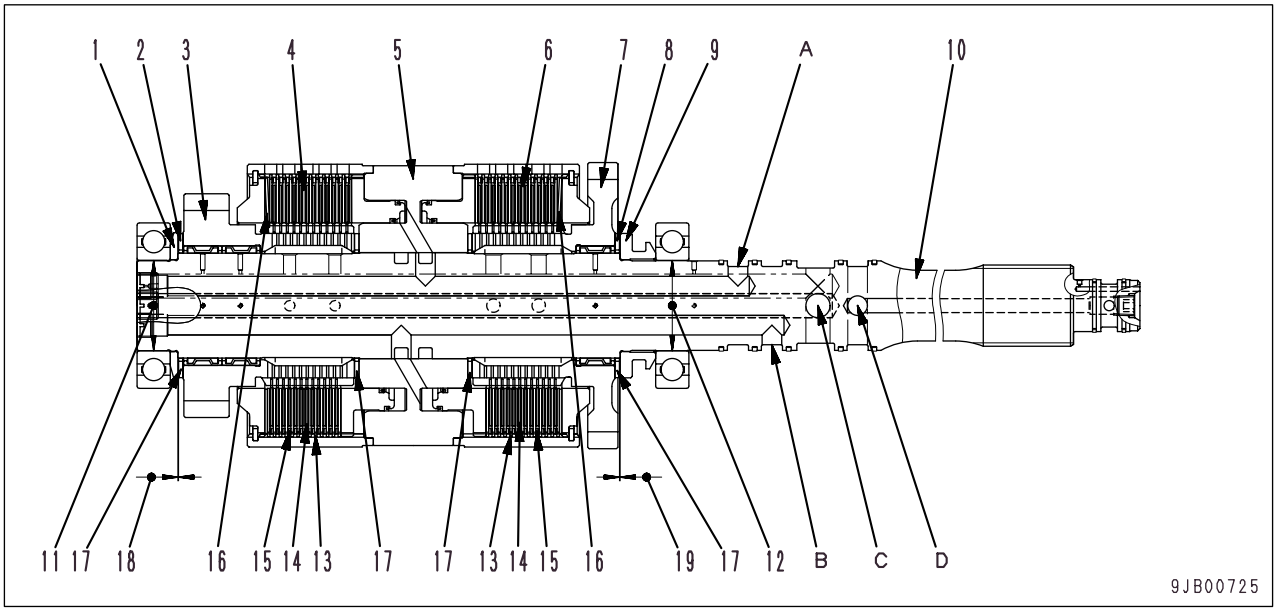


1. Flywheel
2. Clutch housing (Number of teeth: 72)
3. Boss (Number of teeth: 90)
4. Turbine
5. Drive case
6. Stator
7. Pump
8. PTO drive gear (Number of teeth: 97)
9. Stator shaft
10. Guide
11. Transmission input shaft
12. One way clutch
13. Race
14. Disc
15. Piston

Specifications

Type	3-element, 1-stage, 2-phase
Stall torque ratio	2.98

F and R clutches (With a lock-up clutch)



A: R clutch oil port
B: F clutch oil port
C: Lubricating oil port
D: Lock-up clutch oil port

1. Spacer
2. Thrust washer
3. R gear (Number of teeth: 31)
4. R clutch
5. F • R cylinder
6. F clutch
7. F gear (Number of teeth: 40)
8. Thrust washer
9. Spacer
10. Transmission input shaft

Unit: mm

No.	Check item		Criteria				Remedy
11	Clearance at bearing press fit part of shaft (F)		Standard size	Tolerance		Standard clearance	Clearance limit	Replace
				Shaft	Hole		
			ø 60	+0.039 +0.020	0 -0.015	-0.054 ~ -0.020	—
12	Clearance at bearing press fit part of shaft (R)		ø 60	+0.030 +0.011	0 -0.015	-0.045 ~ -0.011	—
13	Separator plate		Standard size	Tolerance		Clearance limit	
		Thickness	1.7	±0.05		1.5	
		Distortion	—	0.1		0.15	
14	Friction plate	Thickness	2.2	±0.08		1.6	
		Distortion	—	0.1		0.25	
15	Load of wave spring (Height: 2.2 mm)		1,010 N {103 kg}	±101 N {±10.3 kg}		859 N {87.6 kg}	
16	Warp of spring plate		1.4	±0.2		1.2	
17	Thickness of thrust washer of F and R clutches		3	±0.1		2.7	
18	End play of R gear		0.30 ~ 0.70				
19	End play of F gear		0.24 ~ 0.76				

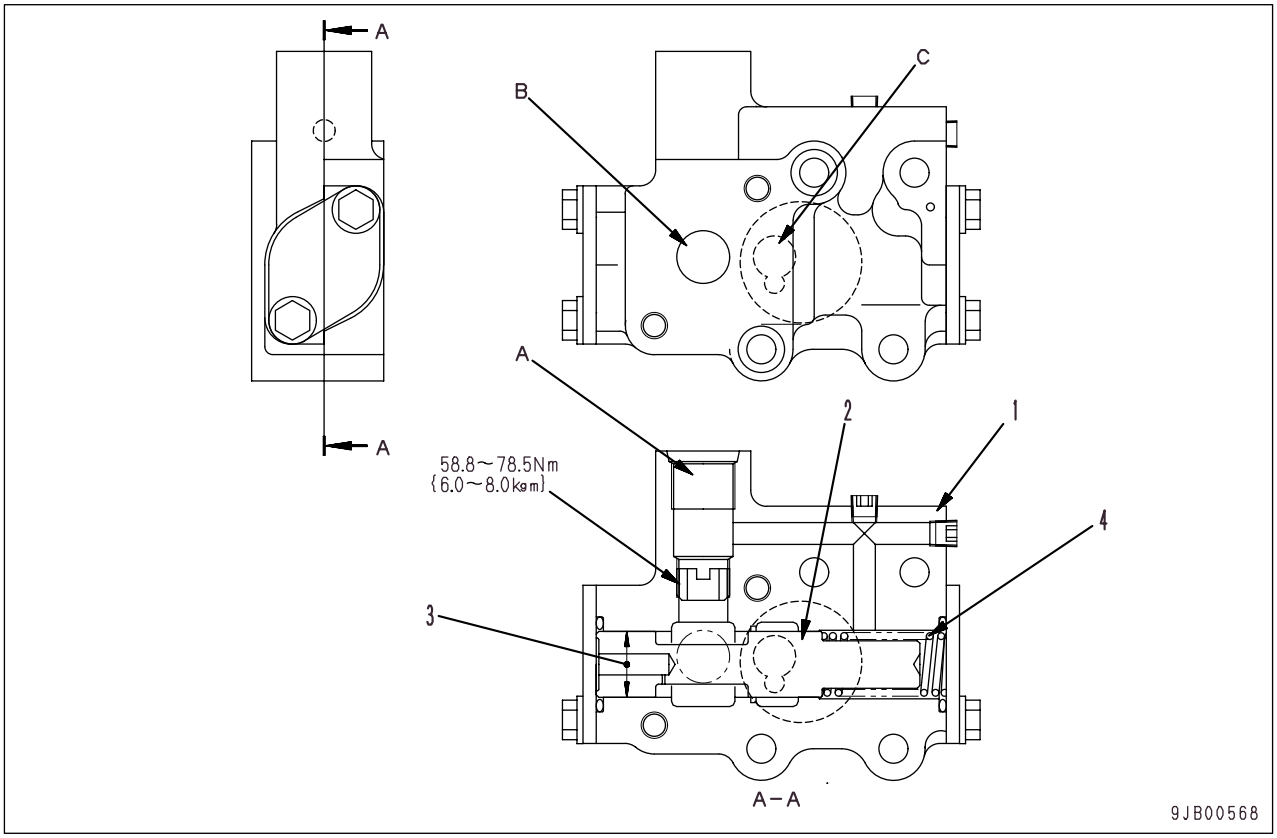
ECMV actuation table

ECMV / Gear speed range	F	R	1st	2nd	3rd	4th
F1	○		○			
F2	○			○		
F3	○				○	
F4	○					○
R1		○	○			
R2		○		○		
R3		○			○	
R4		○				○

Outline

- The oil from the pump passes through the flow valve, is filtered by the oil filter, enters the transmission control valve, and is separated into the main relief circuit and clutch actuation circuit.
- The oil pressure adjusted by the main relief valve and flowing to the clutch actuation circuit passes through the last-chance filter and actuates the clutch and parking brake. The oil relieved by the main relief valve is supplied to the torque converter.
- When the transmission shifts gear, the ECMV uses the command current from the transmission controller to raise the clutch oil pressure smoothly in order to reduce the transmission shock. In addition, it keeps the clutch pressure constant when the machine is traveling.
- By switching the F, R, and 1st-4th ECMVs, the adjusted oil pressure is supplied to the selected clutch to provide the necessary speed range.

FLOW VALVE



a. To transmission valve circuit
b. From pump
c. To transmission lubrication circuit

1. Valve body
2. Valve spool

Unit: mm

No.	Check item	Criteria					Remedy
3	Clearance between flow control valve and body	Standard size	Tolerance		Standard clearance	Clearance limit	Replace
			Shaft	Hole			
		25	-0.020 -0.030	+0.013 0	0.020 ~ 0.043	0.06	
4	Flow control valve spring	Standard size			Repair limit		
		Free length	Installed length	Installed load	Free length	Installed load	
		63.8	47	79.5 N {8.11 kg}	61.9	75.5 N {7.7 kg}	

Operation

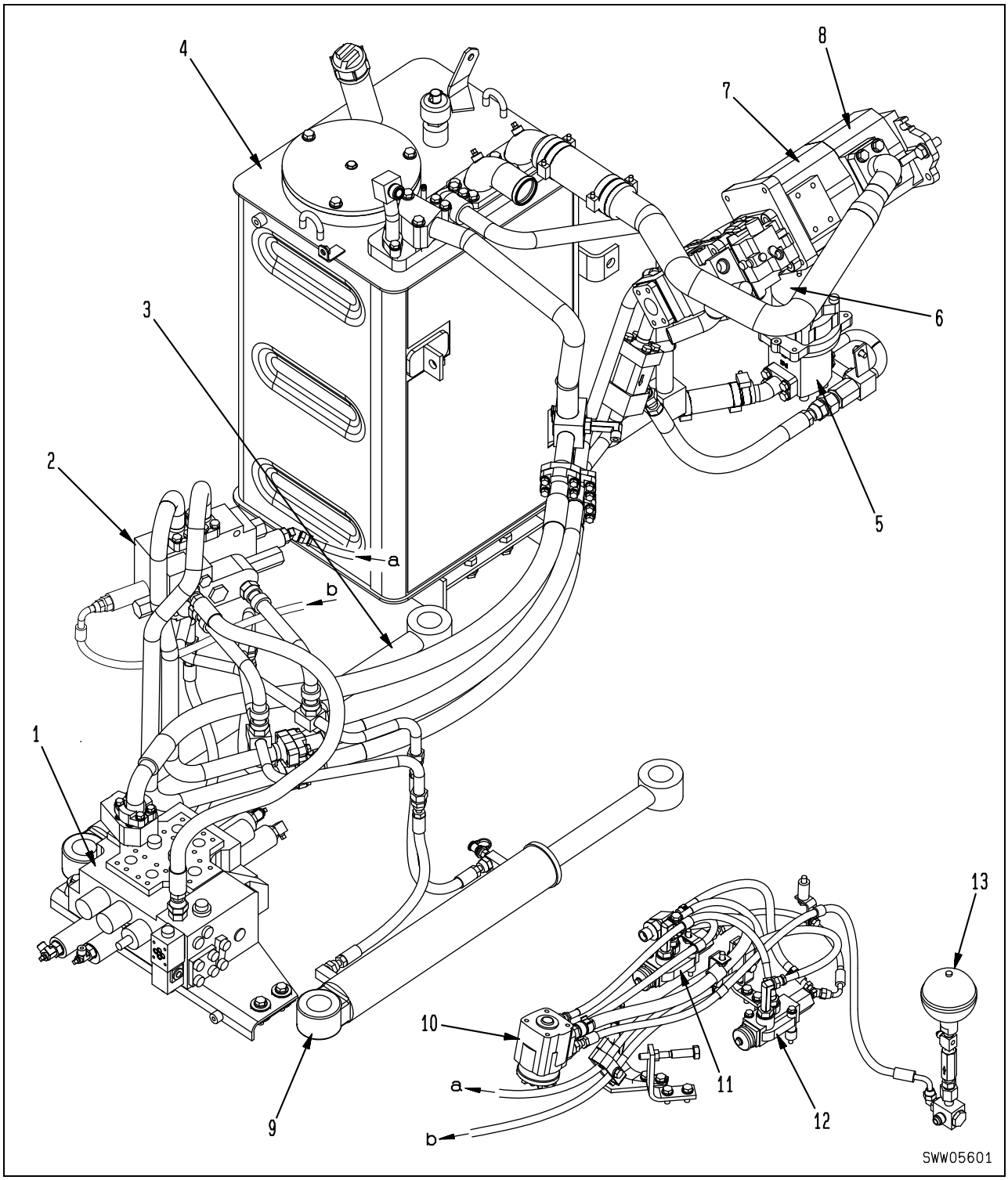
- The oil from the pump flows to the transmission valve circuit, but if it goes above the specified amount, the flow valve acts to send it to the transmission lubrication circuit.
- If the flow of oil from the pump goes above the specified amount, valve spool (2) moves and sends part of the oil from the pump to the transmission lubrication circuit.

REAR DIFFERENTIAL

Unit: mm

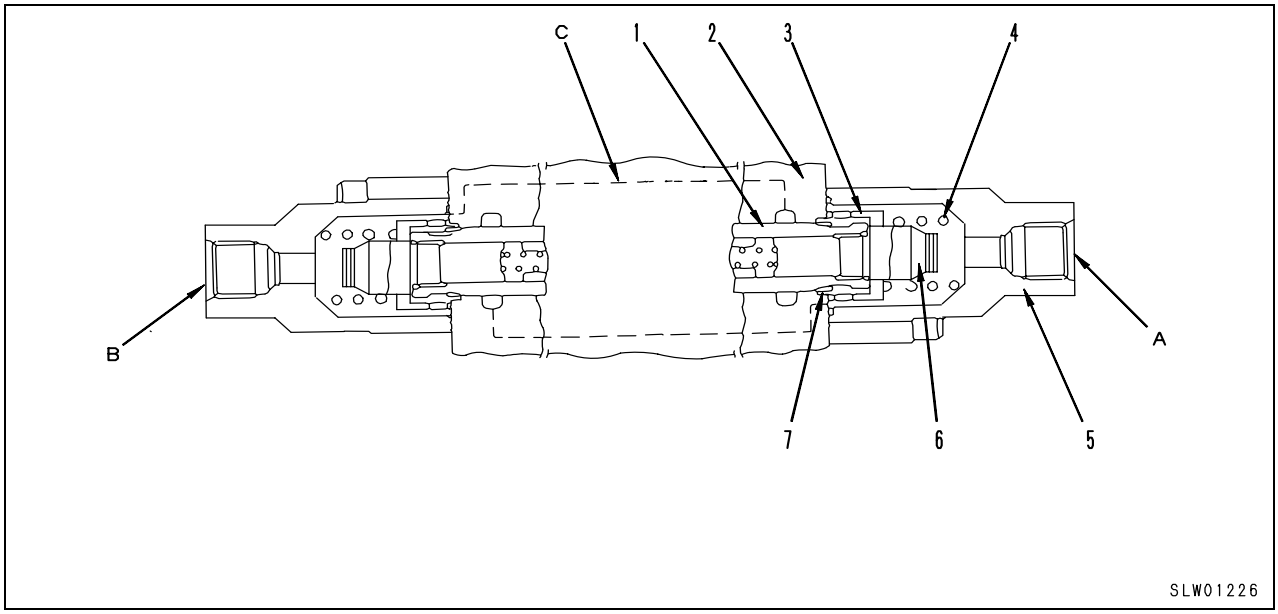
No.	Check item		Criteria					Remedy
1	Washer thickness		Standard size		Tolerance	Repair limit		Replace
			2		±0.03	1.8		
			2.1					
2	Plate thickness		3		±0.02	2.9		
			3.1					
3	Disc thickness		3		+0.04 -0.03	2.95		
4	Clearance between spider and differential pinion gear		Standard size	Shaft	Hole	Standard Clearance	Clearance limit	
			30	-0.110 -0.160	+0.050 0	0.110 ~ 0.210	0.3	
5	Piston assembly portion of differential housing (housing, piston)		290.5	-0.110 -0.191	+0.079 0	0.110 ~ 0.270	—	
6	Piston assembly portion of bearing carrier (piston, carrier)		311	-0.111 -0.190	+0.081 0	0.111 ~ 0.271	—	
7	Clearance at differential side bearing	Outer race	150	0 -0.016	-0.045 -0.085	-0.085 ~ -0.029	—	
		Inner race	100	+0.059 +0.037	0 -0.020	-0.079 ~ -0.037	—	
8	Clearance of bearing at pinion shaft gear end	Outer race	150	0 -0.020	-0.054 -0.071	-0.071 ~ -0.034	—	
		Inner race	70	+0.039 +0.020	0 -0.015	-0.054 ~ -0.020	—	
9	Clearance of bearing at pinion shaft coupling end	Outer race	140	0 -0.018	-0.054 -0.082	-0.082 ~ -0.036	—	
		Inner race	65	+0.039 +0.020	0 -0.015	-0.054 ~ -0.020	—	
10	Backlash between case and plate		0 ~ 0.4					
11	Clearance between disc and plate		0.2 ~ 0.6					
12	Backlash between side gear and disc		0.13 ~ 0.36					
13	End play (one end) of side gear in axial direction		0.15 ~ 0.35					

STEERING PIPING



1. Work equipment valve
2. Steering valve
3. Steering cylinder (right)
4. Hydraulic oil tank
5. Emergency steering pump
6. Emergency steering motor
7. Switch pump
8. Steering pump
9. Steering cylinder (left)
10. Orbit-roll
11. Stop valve (right)
12. Stop valve (left)
13. PPC accumulator

FLOW AMP

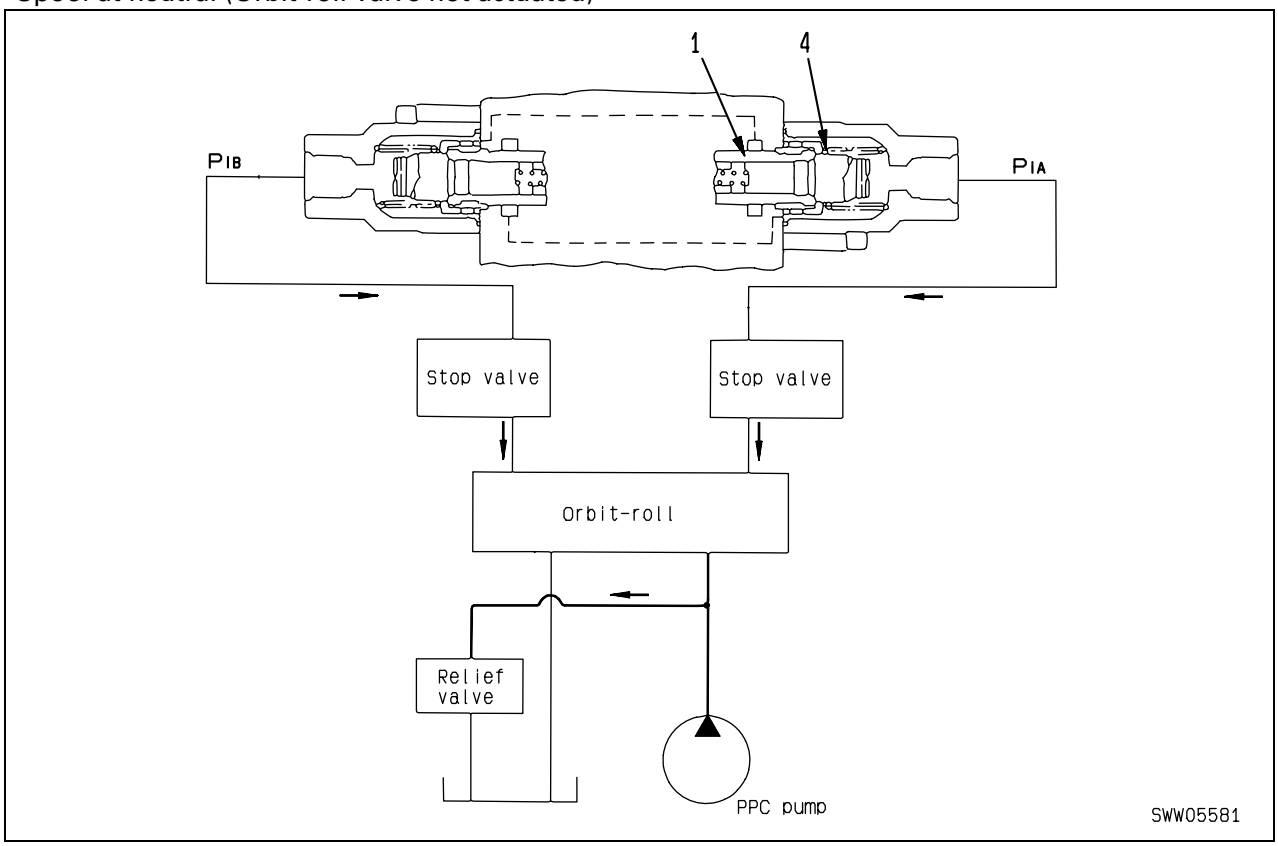


1. Steering spool
2. Valve housing (body)
3. Spring seat
4. Return spring
5. Cap
6. Capscrew
7. Orifice

A. From Orbit-roll valve
B. From Orbit-roll valve
C. Passage (inside housing)

- Operation of flow amp

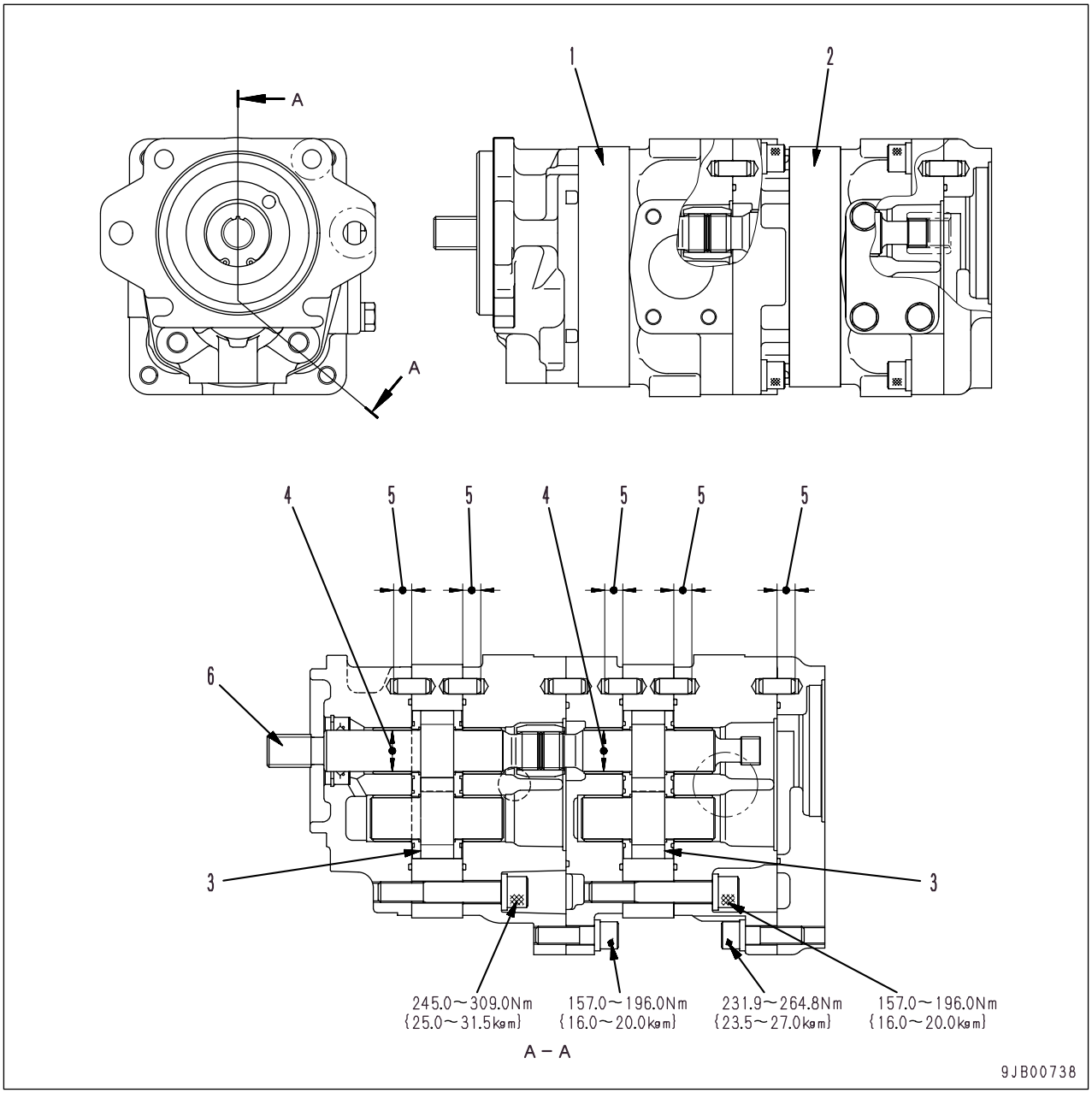
1. Spool at neutral (Orbit-roll valve not actuated)



- When the Orbit-roll valve is not actuated, both pilot port PiA and pilot port PiB are connected through the Orbit-roll to the drain (return) circuit, so steering spool (1) is kept at neutral by return spring (4).

STEERING PUMP, SWITCH PUMP

SAL (3) 40+45



1. Steering pump
2. Switch pump

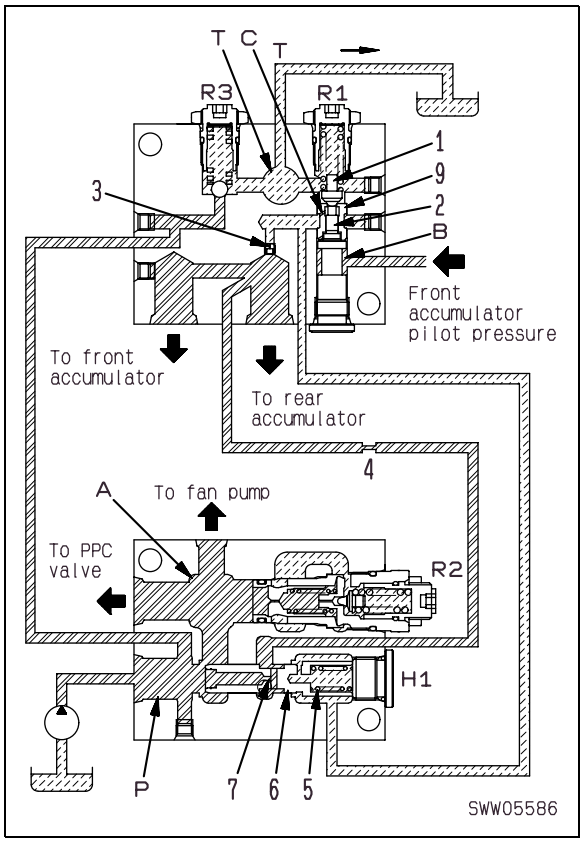
Outline

- The steering pump and switch pump are installed to the PTO shaft of the torque converter. When the shaft rotates, the pumps are driven and supply pressure oil to the steering circuit.
- The pressure of the oil supplied from the switch pump is adjusted by the steering valve, and when the pressure in the steering circuit is sufficient to meet the demand, the oil from the switch pump is diverted to the work equipment hydraulic circuit.

1. Brake valve (LH)
2. Brake valve (RH)
3. Hydraulic oil tank
4. Accumulator (for the front side)
5. Accumulator (for the rear side)
6. Accumulator (for the rear side)
7. Accumulator (for the front side)
8. Charge valve
9. Parking brake emergency release valve
10. Pilot control pump
11. Rear brake
12. Transmission control valve
13. Parking brake solenoid valve
14. Parking brake
15. Front brake

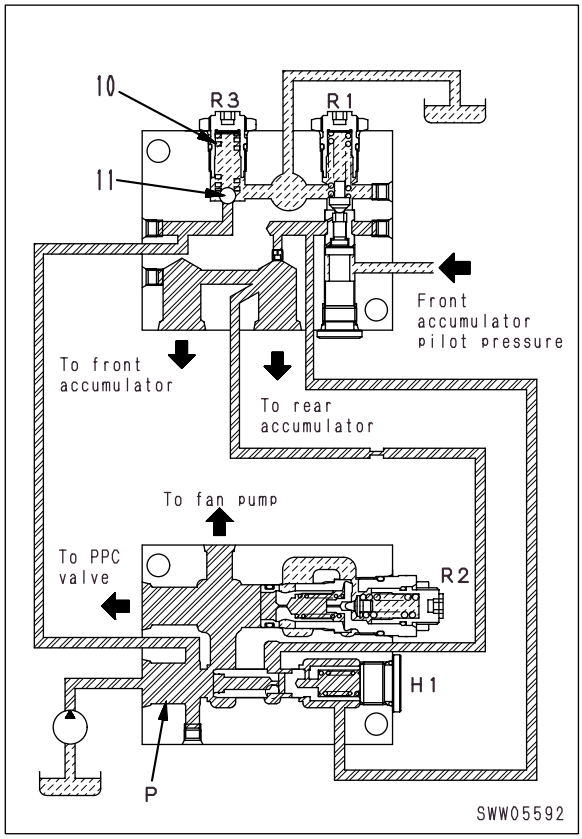
2) When cut-out pressure is reached

- When the pressure at port B (accumulator pressure) reaches the set pressure of relief valve R1, poppet (1) separates from valve seat (9), the oil flows, and the relief is actuated.
- A difference in pressure at the top and bottom of piston (2) is created by the relief action, so piston (2) moves up or down, forcibly opens poppet (1), and port C and port T are connected.
- The spring chamber at the right end of spool (6) is connected to port C of relief valve R1, so it is the tank pressure.
- The pressure at port P goes down in the same way to a pressure equivalent to the load of spring (5), and the supply of oil to port B is also stopped.

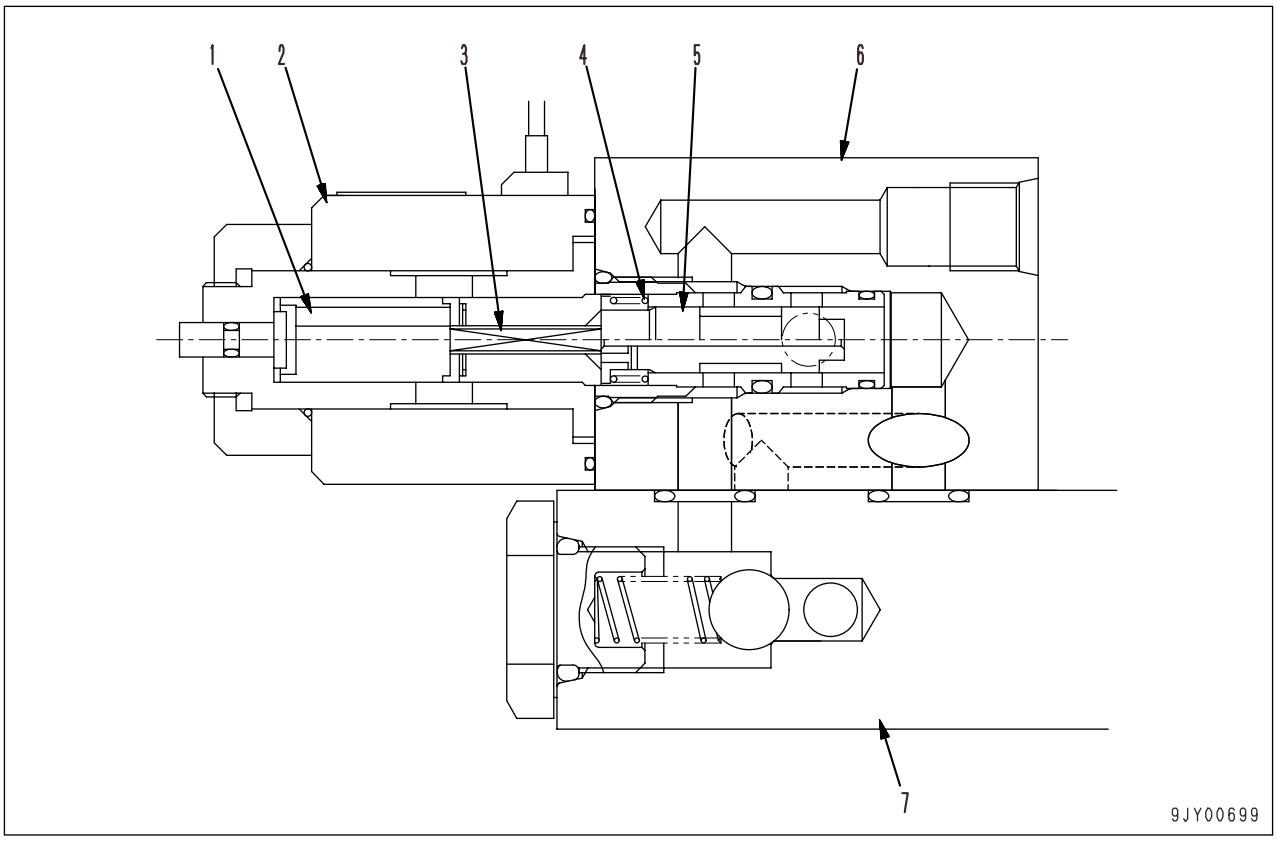


3. Safety relief valve (R3)

- When the pressure at port P (pump pressure) goes above the set pressure of relief valve R3, the oil from the pump pushes against spring (10), pushes up ball (11), and sends the oil to the tank circuit to set the maximum pressure in the brake circuit and protect the circuit.



PARKING BRAKE SOLENOID VALVE

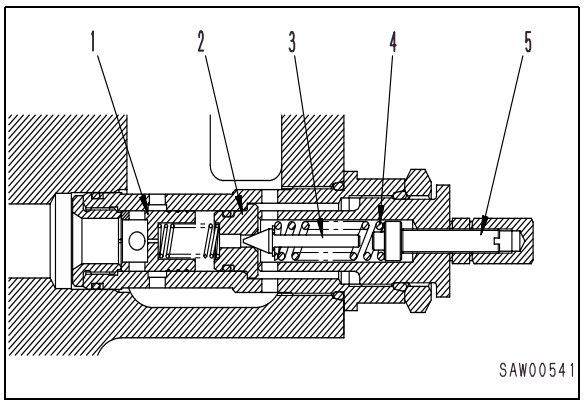


1. Movable iron core
2. Coil
3. Bushing pin
4. Spring
5. Spool
6. Valve seat
7. Check valve

Unit: mm

<table>
<tr><th>No.</th><th>Check item</th><th colspan="5">Criteria</th><th>Remedy</th></tr>
<tr><td rowspan="4">4</td><td rowspan="4">Side clearance</td><td>Model</td><td colspan="2">Standard clearance</td><td colspan="2">Clearance limit</td><td rowspan="11">Replace</td></tr>
<tr><td>SAL(3)80</td><td colspan="2" rowspan="2">0.10 ~ 0.15</td><td colspan="2" rowspan="3">0.19</td></tr>
<tr><td>SAL(3)90</td></tr>
<tr><td>SAL(1)20</td><td colspan="2">0.08 ~ 0.13</td></tr>
<tr><td rowspan="4">5</td><td rowspan="4">Clearance between inside diameter of plain bearing and outside diameter of gear shaft</td><td>SAL(3)80</td><td colspan="2" rowspan="2">0.069 ~ 0.149</td><td colspan="2" rowspan="3">0.20</td></tr>
<tr><td>SAL(3)90</td></tr>
<tr><td>SAL(1)20</td><td colspan="2">0.06 ~ 0.119</td></tr>
<tr><td rowspan="4">6</td><td rowspan="4">Driving depth of pin</td><td>Model</td><td>Standard size</td><td colspan="2">Tolerance</td><td>Repair limit</td></tr>
<tr><td>SAL(3)80</td><td rowspan="2">14</td><td colspan="2" rowspan="3">0
-0.5</td><td rowspan="3">—</td></tr>
<tr><td>SAL(3)90</td></tr>
<tr><td>SAL(1)20</td><td>10</td></tr>
<tr><td>7</td><td>Spline rotating torque</td><td colspan="6">17.7 ~ 33.3 Nm {1.8 ~3.4 kgm}</td><td rowspan="4">—</td></tr>
<tr><td>—</td><td>Discharge amount
Oil: SAE10WCD
Oil temperature: 45 - 55°C</td><td>Model</td><td>Speed (rpm)</td><td>Discharge pressure (MPa {kg/cm²})</td><td>Standard discharge amount (ℓ/min)</td><td>Discharge amount limit (ℓ/min)</td></tr>
<tr><td>SAL(3)80</td><td rowspan="3">2,500</td><td>20.6 {210}</td><td>184</td><td>170</td></tr>
<tr><td>SAL(3)90</td><td>20.6 {210}</td><td>208</td><td>192</td></tr>
<tr><td>SAL(1)20</td><td>2.9 {30}</td><td>47</td><td>42</td></tr>
</table>

3. Relief valve



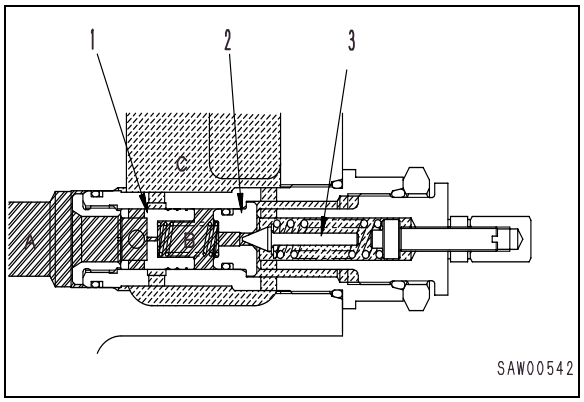
1. Main valve
2. Valve seat
3. Pilot poppet
4. Spring
5. Adjusting screw

Function

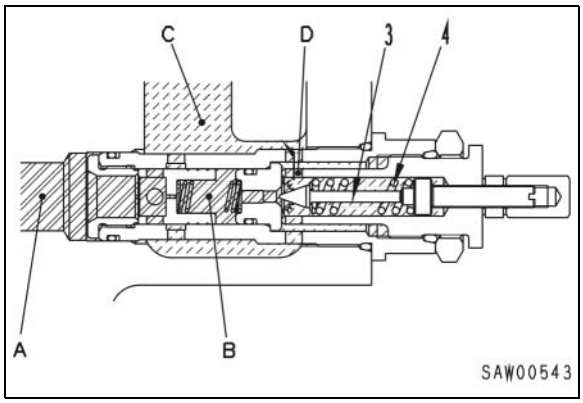
- The relief valve is installed to the inlet of the work equipment valve. When the oil pressure rises above the specified level, this valve drains the oil into the hydraulic tank to limit the maximum pressure of the work equipment circuit and protect the circuit.

Operation

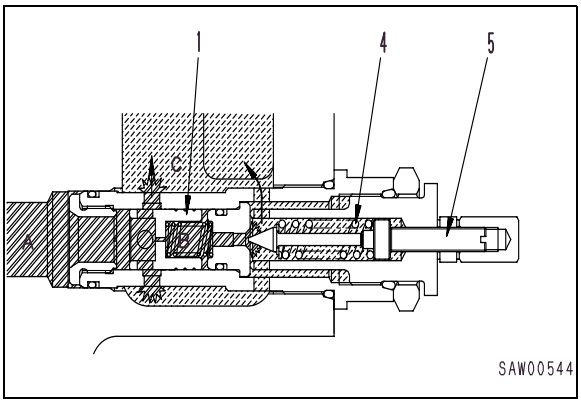
- The port A is connected to the pump circuit and the port C is connected to the drain circuit. The oil passes through the orifice of the main valve (1) to fill the port B. The pilot poppet (3) is contacting (seated) to the valve seat (2).



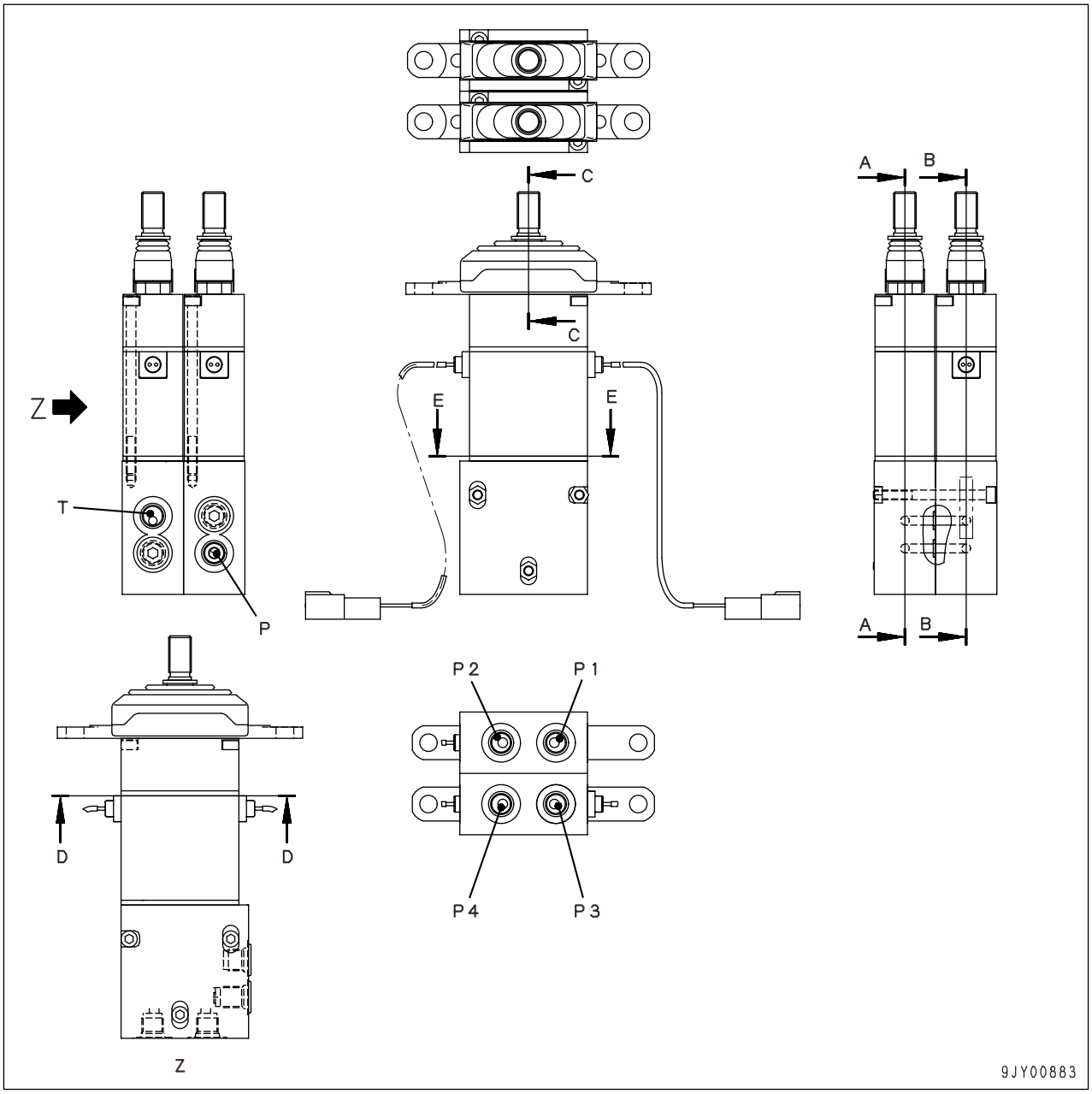
- When the hydraulic pressure inside the port A and the port B reaches the set pressure of the pilot poppet spring (4), the pilot poppet (3) opens to let the hydraulic pressure of the port B flow from the port D to the port C and the pressure of the port B drops.



- When the pressure at the port B drops, pressure difference occurs between the port A and the port B by the orifice of the main valve (1) and the main valve shall be pushed open to let the oil of the port A to pass through the port C to flow into the drain circuit, to release the abnormal pressure.
- The preset pressure can be changed by increasing or decreasing the tension of the pilot poppet spring (4).
- To change the preset pressure, remove the cap nut to loosen the lock nut. After that, screw-in the adjust screw (5) to raise the preset pressure and loosen the adjust screw to lower the preset pressure.



WORK EQUIPMENT PPC VALVE



P : From HST charging pump
T : To hydraulic tank
P1 : To bucket TILT valve
P2 : To bucket DUMP valve
P3 : To lift arm RAISE valve
P4 : To lift arm LOWER (FLOAT) valve

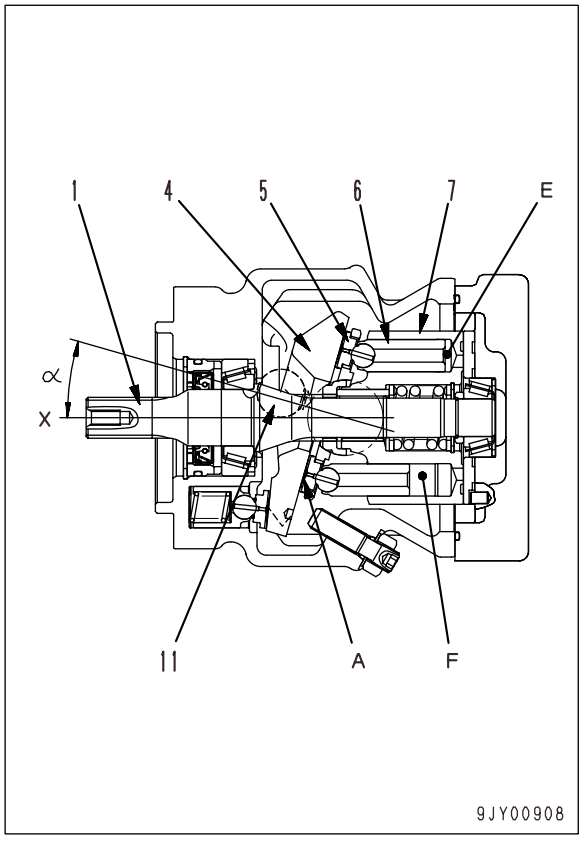
Unit: mm

No.	Check item	Criteria					Remedy
		Standard size			Repair limit		
10	Center ring spring	Free length x Outside diameter	Installed length	Installed load	Free length	Installed load	If spring is damaged or deformed, replace it
		41.1 X 15.5	28.4	38.0 N {3.88 kg}	—	30.4 N {3.1 kg}	
11	Metering spring	22.7 X 8.10	22.0	16.7 N {1.70 kg}	—	13.3 N {1.36 kg}	

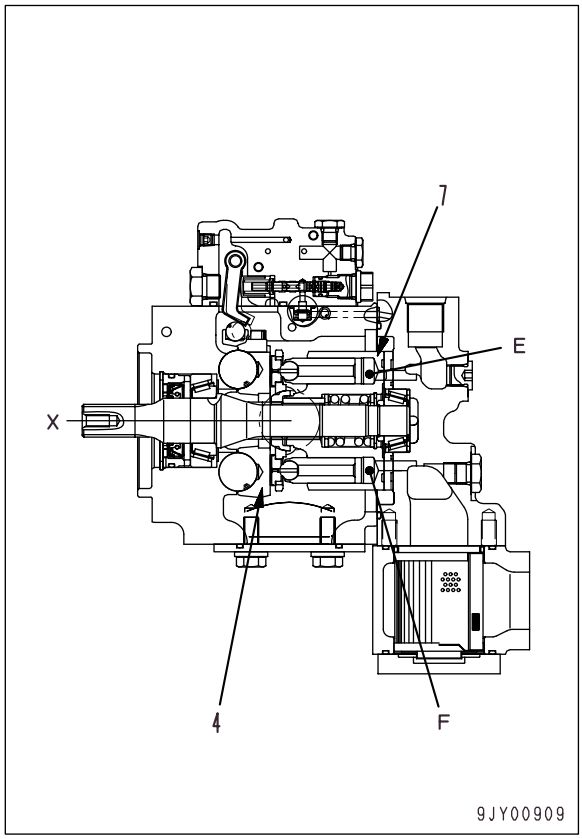
Operation

1. Operation of pump

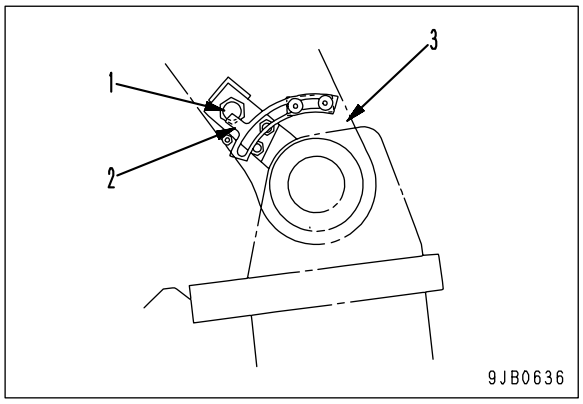
- Shaft (1) and cylinder block (7) revolve together and shoe (5) slides on plane A. As rocker cam (4) slants around ball (11) at this time, angle α between the center line X of rocker cam (4) and axis of cylinder block (7) changes. Angle α is called the swash plate angle.
- If the angle between the center line X of rocker cam (4) and the axis of cylinder block (7) is α, plane A works as a cam for shoe (5).
- Accordingly, each piston (6) slides inside cylinder block (7) and makes difference between volumes E and F in cylinder block (7) and the oil is drawn and discharged by the difference.
- In short, if cylinder block (7) revolves and volume of chamber E is reduced, the oil is discharged. On the other hand, the volume of chamber F is increased and the oil is sucked. (The figure shows the end of suction process of chamber F and the end of discharge process of chamber E.)

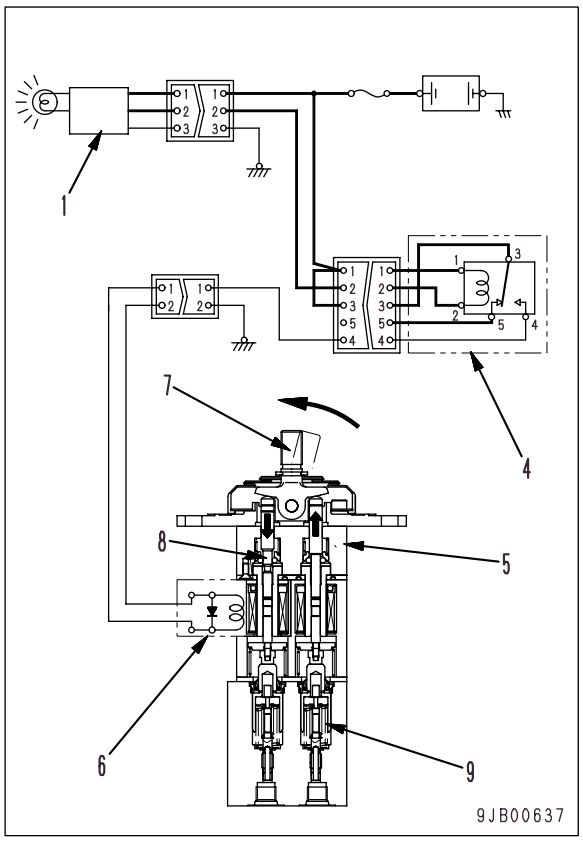


- If center line X of rocker cam (4) is in the direction of the axis of cylinder block (7) (Swash plate angle = 0), the difference between volumes E and F in cylinder block (7) is 0 and oil is not sucked or discharged (The swash plate angle is not reduced to 0 actually, however).
- In short, swash plate angle α is in proportion to the discharge of the pump.



- If lift arm (3) is raised to the set position of the kick-out, or if plate (2) reaches the detection plane of proximity switch (1), proximity switch (1) lights up and lift arm kick-out relay (4) is turned on. As a result, the circuit of detent solenoid (6) of PPC valve (5) is turned off and the coil is turned off. Accordingly, held lift arm spool (8) receives the reaction force of spring (9) and returns lift arm control lever (7) to the neutral position.





Operation of proximity switch

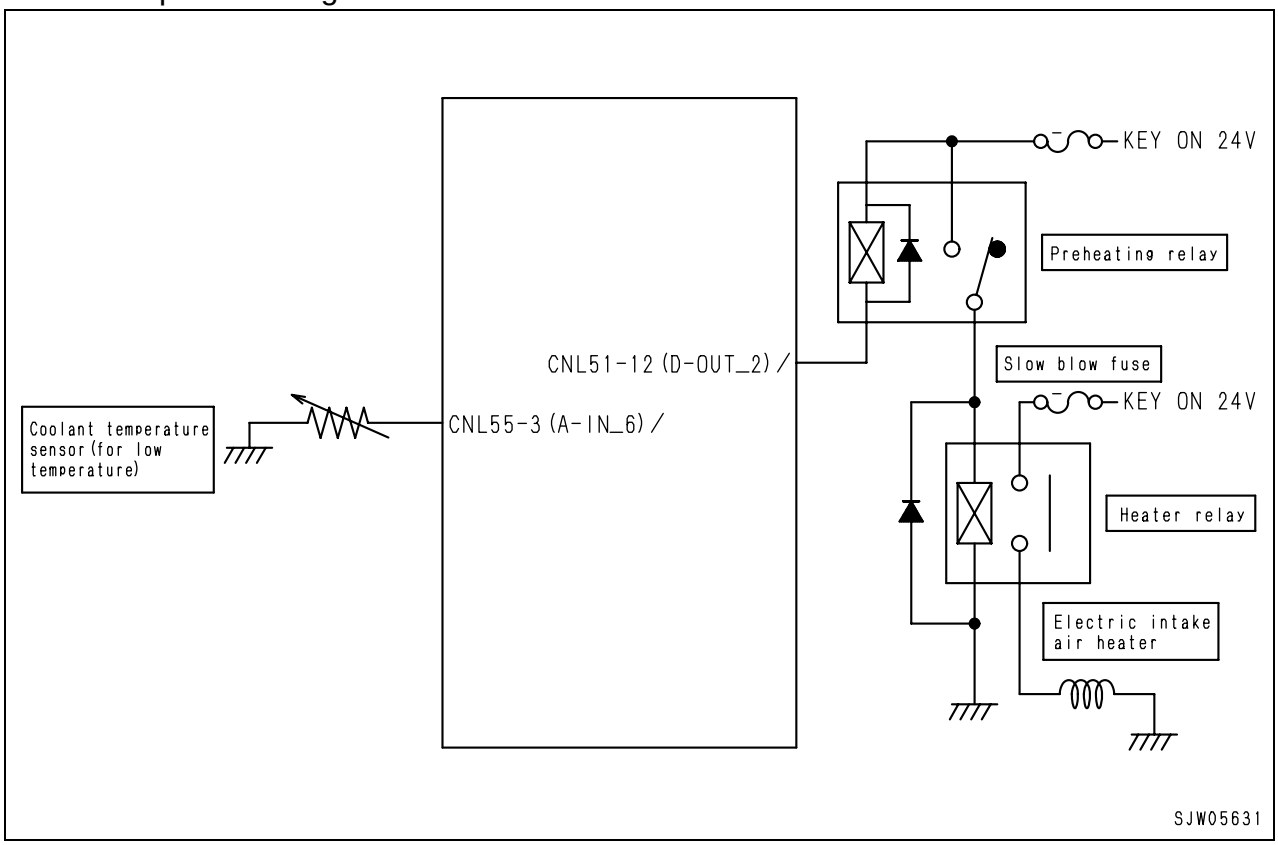
When part to be detected is apart from detection plane of proximity switch

Pilot lamp of proximity switch	OFF
Lift arm kick-out relay switch circuit	OFF
PPC valve detent solenoid circuit	ON
PPC valve detent solenoid	ON

When part to be detected is on detection plane of proximity switch

Pilot lamp of proximity switch	ON
Lift arm kick-out relay switch circuit	ON
PPC valve detent solenoid circuit	OFF
PPC valve detent solenoid	OFF

Automatic preheating function



4. When making the speedometer/tachometer indication changeover setting and tire size selection setting (Setting of the rotary switch [SW3])
   Since the machine monitor is being set to the tire size of standard tires for speed calculations, when the tire size has been changed, it becomes necessary to adjust to the new tire size by the rotary switch [SW3] for compensation of the speed indications.

   Adjustment procedures
   Make the setting according to the following Table to fit to the new tire size.

km/h indication	3	STD	
MPH indication	4	STD	Usable in non-SI-unit employing countries only
rpm indication	5	STD	

Tire size	WA470-5
23.5-25 small	STD

Making the speedometer/tachometer indication changeover setting means to change the indication content of the speed meter located in the central section of the monitor.
Changeover from the speedometer to (engine) tachometer can also be made using the "option setting".
After the above setting is made, the indication unit of the travel distance integrating meter (odometer) will become according to the setting made as above.
Since the MPH indication is only for the countries employing the non-SI-unit only, do not make the MPH indication setting for machines being used in countries employing the SI-unit.
In case other tires than the above or when the speed indications deviate from the actual speed by wears of the tires, it is possible to make tire compensations using the "option setting".

5. When making necessary setting when the engine controller is installed (Setting of the dip switch [SW5-1])
   Make the setting as follows and do not change it.
   Setting position of the SW5-1 in case of machines equipped with the KOMATSU Common Rail engine (WA470-5 and WA400-5H): "ON"

6. When making necessary setting for the work equipment/joy-stick controller (Setting of the dip switch [SW5-2])
   When the work equipment/joy-stick controller is newly installed or removed, make the setting as follows.
   Setting position of the SW5-2 in case the controller has been removed: "OFF"
   Setting position of the SW5-2 in case the controller has been newly installed: "ON"

7. When making the setting of the dip switch [SW5-3]
   Make the setting as follows and do not change it.
   Setting position of the SW5-3: "OFF"

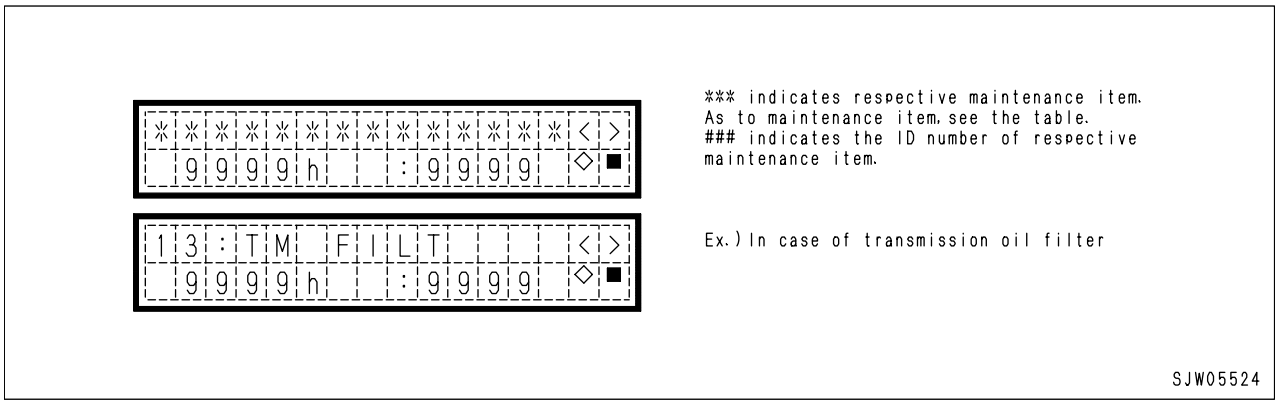
8. When making the setting of the dip switch [SW5-4]
   Make the setting as follows and do not change it.
   Setting position of the SW5-4: "OFF"

9. When making the setting of the dip switch [SW6-1]
   Make the setting as follows and do not change it.
   Setting position of the SW6-1: "OFF"

10. When making the setting of the dip switch [SW6-2]
    Make the setting as follows and do not change it.
    Setting position of the SW6-2: "OFF"

11. When making the setting of the dip switch [SW6-3]
    Make the setting as follows and do not change it.
    Setting position of the SW6-3: "OFF"

3) Selection of the maintenance items (second layer)
The display is the same as that on the maintenance monitor which is included in the functions open to operators, except that the maintenance caution lamp is turned off.
Pressing the ■SW changes the screen to the [Select the maintenance monitor functions] screen.
Pressing the ◇SW changes the screen to the [Change the maintenance monitor interval time] screen.



4) Changing the maintenance interval time (third layer)
The change of the maintenance interval time can be set to any value within a range 0-9999h.
Pressing the ■SW causes the change of the time skipped, and changes the screen to the [Select the maintenance items] screen. In this case, a peep sounds for one second to notify that the operation is cancelled.

How to Enter Interval Time

① Enter a number from 0-9 in the cursor position.

② The cursor is at the highest digit first. Each time the < or > SW was pressed, the number changes by 1 within a range 0-9.

③ If the desired number was entered, press the ◇SW to apply it.

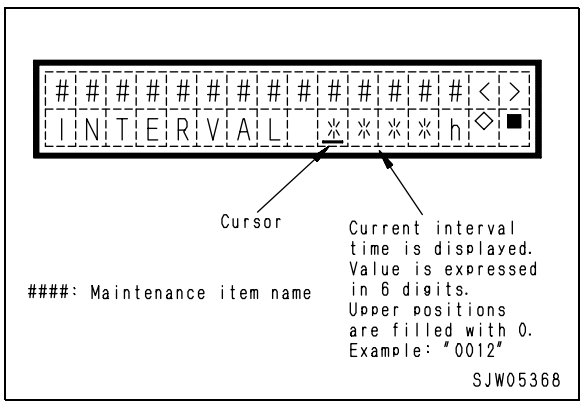
④ The cursor moves to the second highest digit. Repeat the procedures mentioned in ② and ③ until the last number is filled in the lowest digit.

⑤ After the lowest digit was entered, press the ◇SW.

⑥ -1 If the entered value represents the time which can be set, the screen changes to the confirmation screen.

⑥ -2 Otherwise, the screen does not change to the confirmation screen but to the [Select the maintenance items] screen. In this case, a peep sounds for one second to notify that the operation is cancelled.

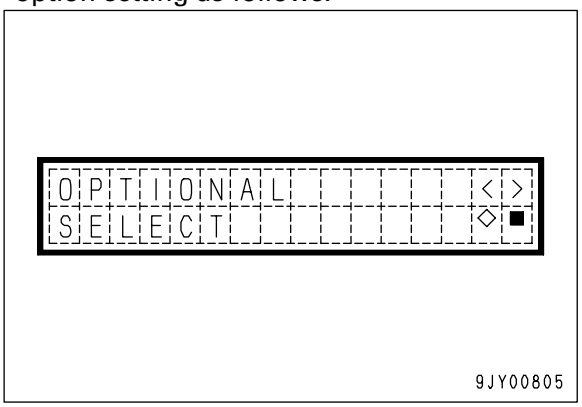
⑦ If a wrong number was entered, return to the [Maintenance items] screen with the ■SW, and do the procedure from the beginning again.



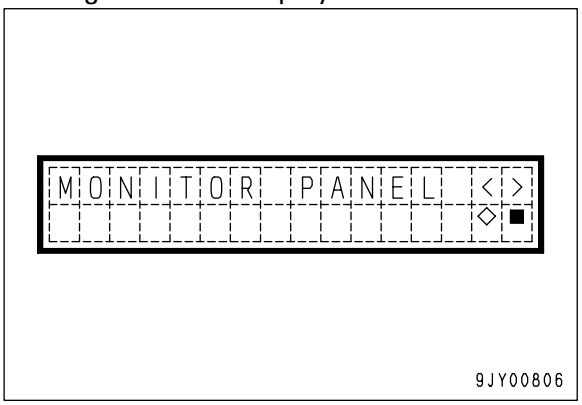
I/O signal	Displayed item	Connector No.	Pin No.	ON/OFF logic
Machine Monitor				
D-IN-0	Head lamp	L52	1	Head lamp turned ON=(24V)/OFF (OPEN)
D-IN-1	No item	L52	10	ON (24V)/OFF (OPEN)
D-IN-2	IGN_C	L52	2	Starter activated=(24V)/OFF (OPEN)
D-IN-3	No item	L52	11	ON (24V)/OFF (OPEN)
D-IN-4	Auto-grease A (OP)	L52	3	Tank empty or abnormal=(24V)/OFF (OPEN)
D-IN-5	Auto-grease B (OP)	L52	12	Operating or abnormal=(24V)/OFF (OPEN)
D-IN-6	No item	L52	4	ON (24V)/OFF (OPEN)
D-IN-7	No item	L52	13	ON (24V)/OFF (OPEN)
D-IN-8	No item	L52	5	ON (24V)/OFF (OPEN)
D-IN-9	No item	L52	14	ON (24V)/OFF (OPEN)
D-IN-10	No item	L52	6	ON (24V)/OFF (OPEN)
D-IN-11	No item	L52	15	ON (24V)/OFF (OPEN)
D-IN-12	Blinker R	L52	7	Right blinker=ON (24V)/OFF (OPEN)
D-IN-13	Blinker L	L52	16	Left blinker=ON (24V)/OFF (OPEN)
D-IN-14	Input from the ◇SW	L52	8	Switch pressed=ON (24V)/OFF (OPEN)
D-IN-15	Input from the ■SW	L52	17	Switch pressed=ON (24V)/OFF (OPEN)
D-IN-16	Brake fluid pressure (front)	L53	1	Pressure normal=ON (GND)/OFF (OPEN)
D-IN-17	Brake fluid pressure (rear)	L53	7	Pressure normal=ON (GND)/OFF (OPEN)
D-IN-18	No item	L53	2	ON (GND)/OFF (OPEN)
D-IN-19	No item	L53	8	ON (GND)/OFF (OPEN)
D-IN-20	Clogged air cleaner	L53	3	No clogging=ON (GND)/OFF (OPEN)
D-IN-21	No item	L53	9	ON (GND)/OFF (OPEN)
D-IN-22	No item	L53	4	ON (GND)/OFF (OPEN)
D-IN-23	No item	L53	10	ON (GND)/OFF (OPEN)
D-IN-24	No item	L53	5	ON (GND)/OFF (OPEN)
D-IN-25	No item	L53	11	ON (GND)/OFF (OPEN)
D-IN-26	Parking brake	L54	1	P/B in operation=ON (GND)/OFF (OPEN)
D-IN-27	Coolant level	L54	10	Coolant level normal=ON (GND)/OFF (OPEN)
D-IN-28	Engine oil pressure	L54	2	Dropped pressure=ON (GND)/OFF (OPEN)
D-IN-29	Engine oil level	L54	11	Oil level normal=ON (GND)/OFF (OPEN)
D-IN-30	(Emergency steering) motor normal (OP)	L54	3	(Emergency steering) motor activated=ON (GND)/OFF (OPEN)
D-IN-31	No item	---	---	---
D-IN-32	Load meter subtotal switch (OP)	L54	4	Switch pressed=ON (GND)/OFF (OPEN)
D-IN-33	Load meter cancel switch (OP)	L54	13	Switch pressed=ON (GND)/OFF (OPEN)
D-IN-34	High-beam switch	L54	5	High-beam=ON (GND)/OFF (OPEN)
D-IN-35	No item	L54	14	ON (GND)/OFF (OPEN)
D-IN-36	Service function 2	L54	6	ON (GND)/OFF (OPEN)
D-IN-37	Input from the > SW	L54	15	Switch pressed=ON (GND)/OFF (OPEN)
D-IN-38	Input from the < SW	L54	7	Switch pressed=ON (GND)/OFF (OPEN)
D-IN-39	Dropped steering pressure	L54	6	Oil pressure normal=ON (GND)/OFF (OPEN)

Operation method

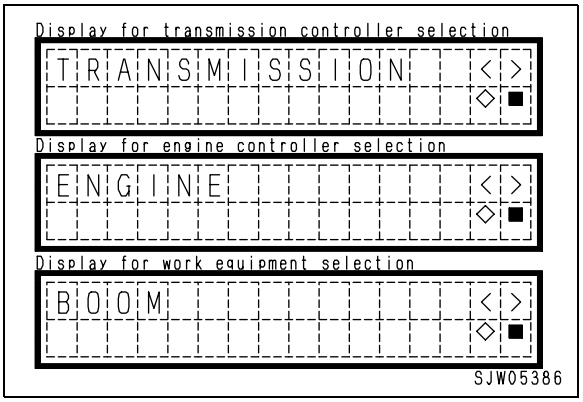
1. Operate the monitor mode switch to select a service mode option.
   Pressing the monitor mode switch changes the option setting as follows.



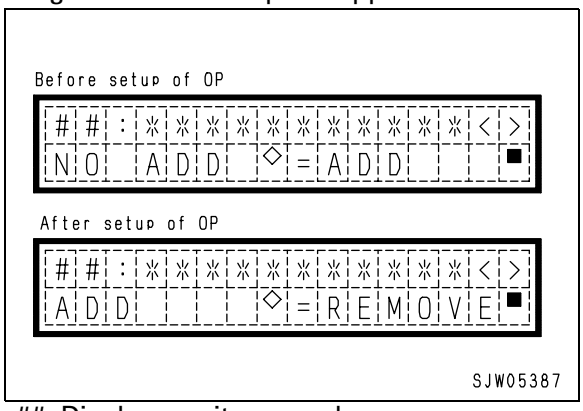
2. Press and release the monitor panel mode switch (◇).
   The screen changes to the monitor panel option setting selectable display.



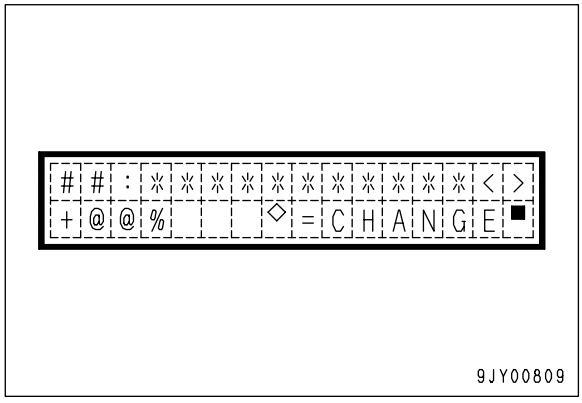
3. When the option setting controller is not the monitor, use the monitor panel mode switch (< or >) to switch to each controller.



4. After a target controller is selected, press and release the monitor mode switch (◇). The setting state for each option appears as follows.



##: Displays an item number.
***: Displays an item name.
Upper row: Displayed when no OPT is set currently.
Lower row: Displayed when OPT is set currently.
Pressing the ◇SW changes ADD (set) or NO ADD (not set), and the display is switched.
If the setting is changed, the operation acceptance completion sound (two short tones (0.1 sec. ON → 0.1 sec. OFF → 0.1 sec. ON)) is output.
To adjust the tire size, the operation and display sizes are as follows:
Using the ◇SW switches the 00% and @@%.
@@: Can be switched every 2% up to deflection -12 to +12% for the setting of the DIP switches on the rear.
+00→+02→+04→+06→+08→+10→+12→-02→-04 →-06→-08→-10→-12→+00⋯ .
When the value is changed, the operation acceptance completion sound (two short tones (0.1 sec. ON → 0.1 sec. OFF → 0.1 sec. ON)) is output.
Adjust the tire size only when an unspecified tire is mounted.

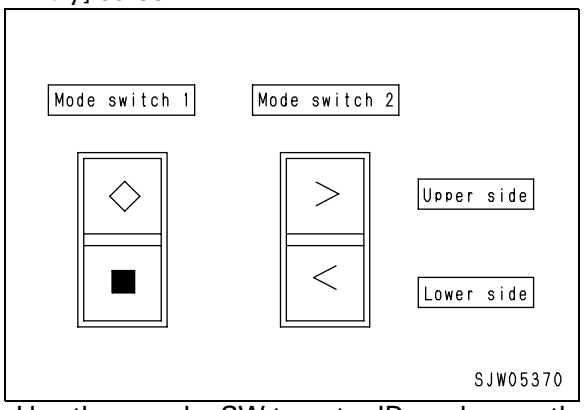


5. Press and release the monitor panel mode switch (■); the menu returns to the preceding screen.

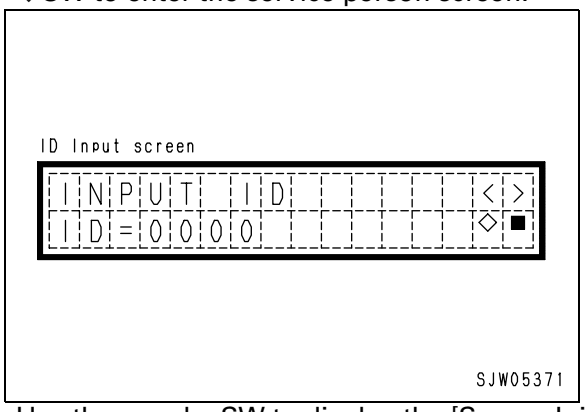
Adjustment of lift arm angle for load meter (OP)

Adjustment of lift arm angle (upper position)

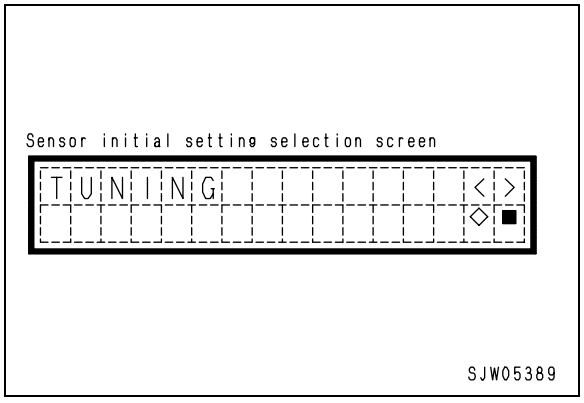
1. Hold down the ■SW < SW for 5 seconds or more at the same time, and change to the [ID Entry] screen.



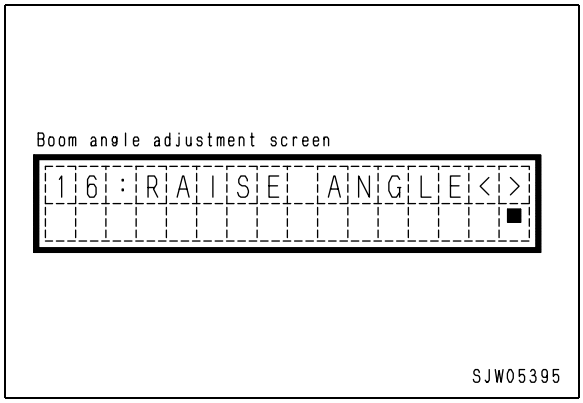
2. Use the < and > SW to enter ID, and press the ◇SW to enter the service person screen.



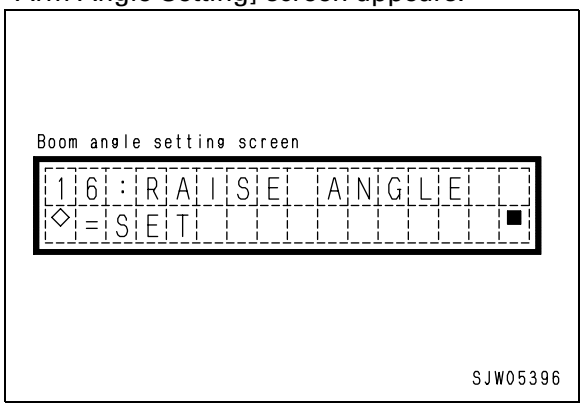
3. Use the < and > SW to display the [Sensor Initialization Setting] screen, and press the ◇SW to decide the value.



4. Press the < and > SW to display the [Work Equipment Lift Arm Angle Adjustment] screen on set item 16.



5. Press the ◇SW here; the [Work Equipment Lift Arm Angle Setting] screen appears.



6. Adjust the lift arm to the highest position without load.
7. Press the ◇SW here; the lift arm angle sensor value is read, and a difference between the read result and reference value is stored as an offset value.
8. The buzzer sounds twice (two short tones), and the menu returns to the [Lift Arm Angle Adjustment] screen. The setting is then completed.
9. Press the ■SW; the lift arm angle correction is ended even if it is in progress of processing.

1-6. Travel Speed Alarm Function

Alarm buzzer is sounded for travel speeds beyond 38km/h as over speeds. The alarm is turned off as the travel speed is reduced to 36km/h or below.

Auto-Shift Point List

	Shift lever position	Solenoid signal	Forward (F)	Reverse (R)	Gear speed change disabling time after the preceding change (sec)
			Speed (km/h)	Speed (km/h)	
Engine speed (1,000 rpm or above)	2, 3 or 4	1T/C→2T/C(L&M)	4.7	4.7	2
		1T/C→2T/C(H)	5.3	5.3	2
	3 or 4	2T/C→3T/C(H)	10.2	10.2	2
		2T/C→3T/C(M)	9.0	9.0	2
		2T/C→3T/C(L)	7.0	7.0	2
	3	3T/C→3L/U(M&H)	13.9	16.0	0
		3T/C→3L/U(L)	11.0	16.0	0
	4	3T/C→4T/C(H)	18.0	18.0	1
		3T/C→4T/C(M)	16.5	16.5	1
		3T/C→4T/C(L)	15.0	15.0	1
		4T/C→4L/U(H)	23.7	25.2	0
		4T/C→4L/U(M)	22.2	23.6	0
		4T/C→4L/U(L)	20.7	22.0	0
	4	4L/U→4T/C(L&M&H)	40.0	40.0	5
		4L/U→4T/C(L&M&H)	19.1	20.3	1
		4T/C→3T/C(H)	16.0	16.0	1
		4T/C→3T/C(M)	14.5	14.5	1
		4T/C→3T/C(L)	13.0	13.0	1
	3 or 4	3T/C→2T/C(H)	10.7	10.7	2
		3T/C→2T/C(M)	9.5	9.5	2
		3T/C→2T/C(L)	6.5	6.5	2
Engine speed (less than 1,000 rpm)	4	4T/C→2T/C(L&M&H)	1.0	1.0	0
	3 or 4	3T/C→2T/C(L&M&H)	1.0	1.0	0
Engine speed (Less than 1,000 rpm → Above 1,000 rpm)		4T/C→2T/C(L&M&H)	5.0	5.0	2
		3T/C→2T/C(L&M&H)	5.0	5.0	2
Kick-down mode (When kick-down switch OFF → ON)		2T/C→1T/C(L&M&H)	Through all speed ranges	Through all speed ranges	5
		3T/C→1T/C(L&M&H)	Less than 12.5	Less than 12.5	5
		3L/U→3T/C(L&M&H)	Through all speed ranges	Through all speed ranges	0
		4T/C→1T/C(L&M&H)	Less than 12.5	Less than 12.5	5
		4L/U→4T/C(L&M&H)	Through all speed ranges	Through all speed ranges	0
		4T/C→3T/C(L&M&H)	12.5~35.0	12.5~35.0	4
		3T/C→2T/C(L&M&H)	12.5~35.0	12.5~35.0	4

2) Self-check operation of emergency steering
3 seconds after the starting switch is turned on (after the monitor check is completed), the transmission controller implements the self-check in which the controller checks operation of the emergency steering automatically.
In the following cases, however, the self-check is not implemented.

① When the engine starter is turned on from the starting switch.

② When the engine is already started (when engine speed of 500 rpm or above is detected).

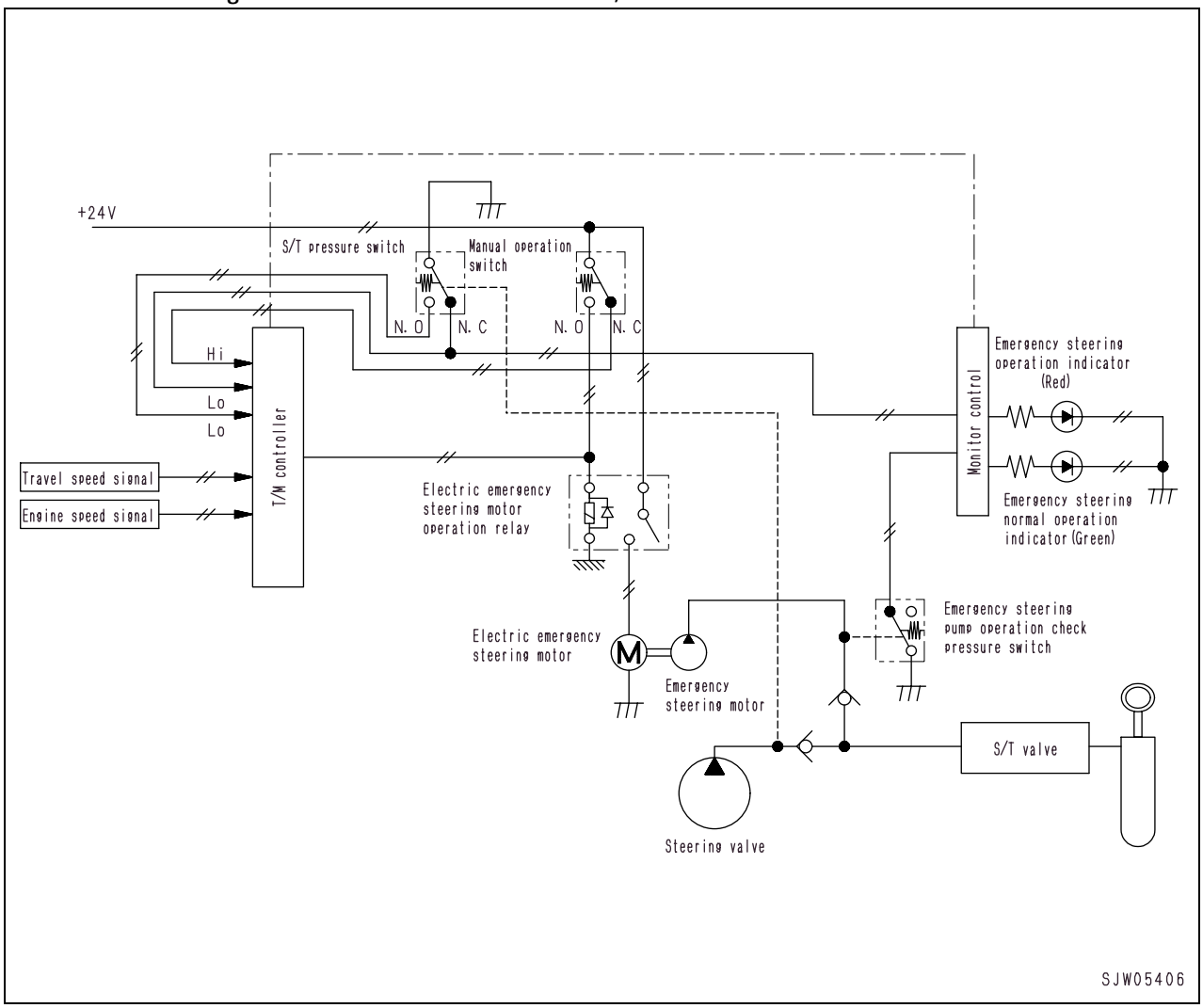
③ When the steering pressure is already present.

④ When the automatic engine pre-heating function is turned on.

⑤ When a emergency steering-related error is detected in the monitor check.

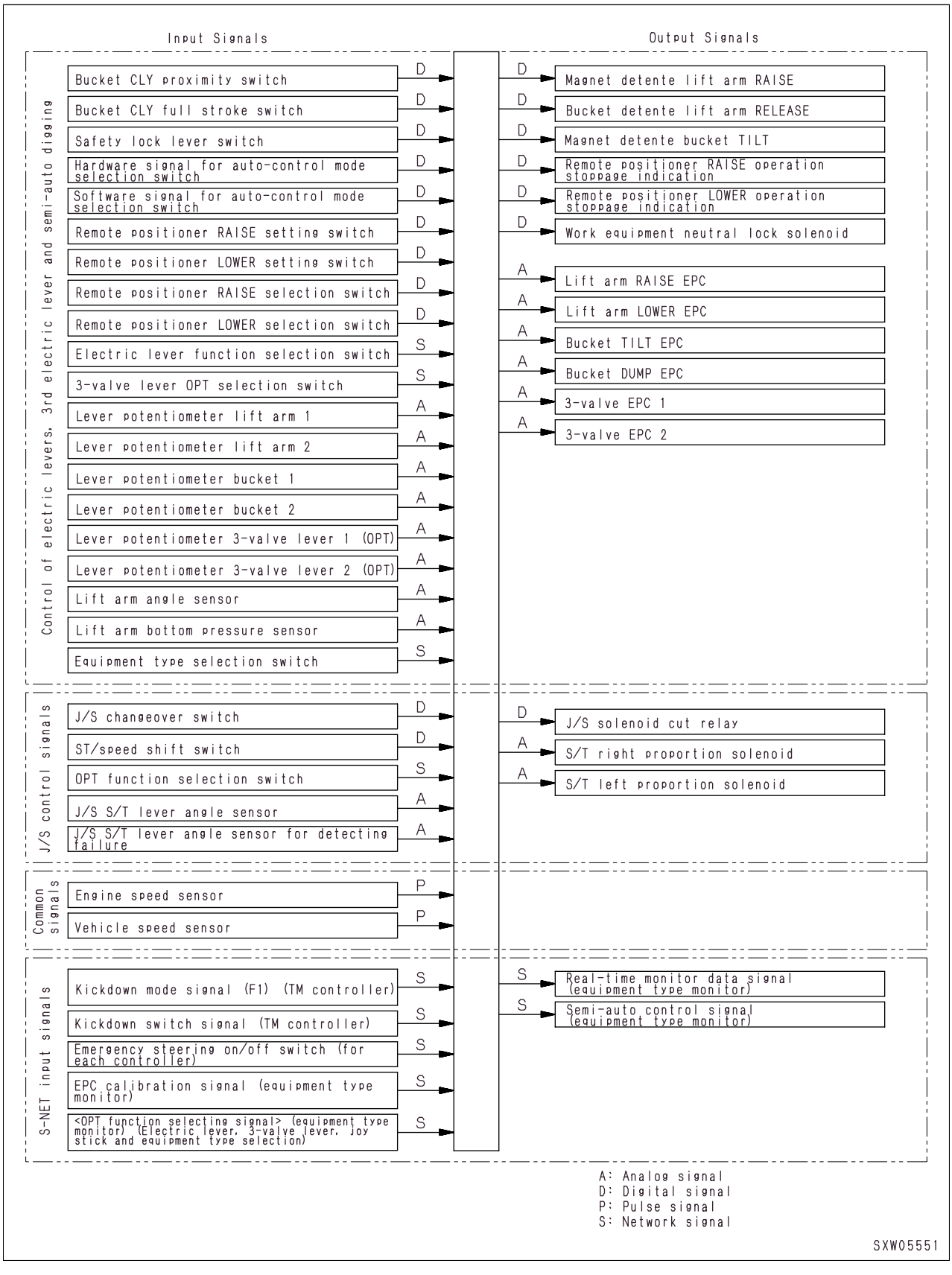
⑥ When the engine has not been operated more than 10 seconds from the last self-check (when the engine has not been operated at 500 rpm for 10 seconds or more).

The emergency steering ON signal at the self-check is output for 3 seconds maximum. If the monitor detects presence of the emergency steering operating pressure within 3 seconds, the monitor sends the emergency steering operation detection signal to the network. Upon output of this signal, the transmission controller ends the self-check of the emergency steering.
If the above signal is not sent within 3 seconds, the controller warns an error.

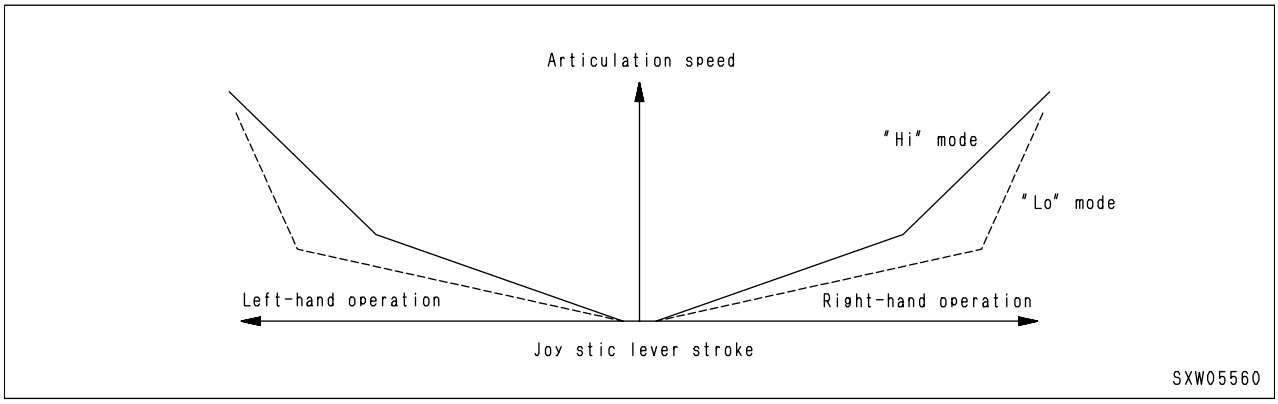


WORK EQUIPMENT CONTROL SYSTEM (OP)

SYSTEM DIAGRAM

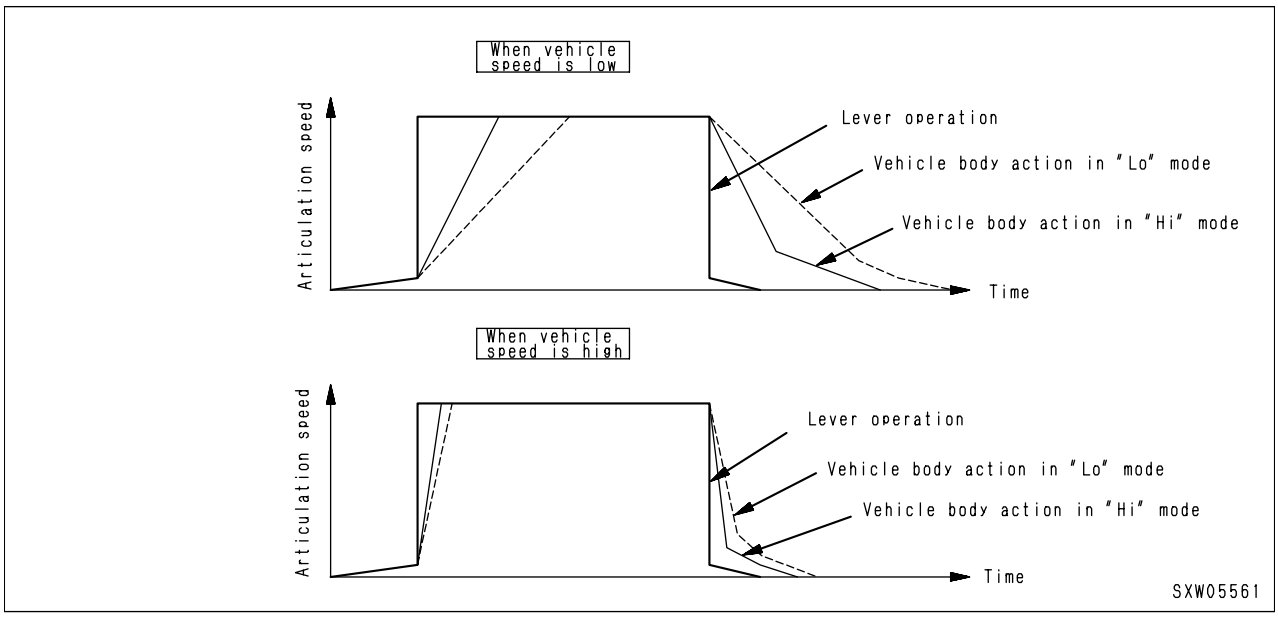


1) Steering control
Steering control with the joystick provides an articulation speed according to how the joystick lever is moved.

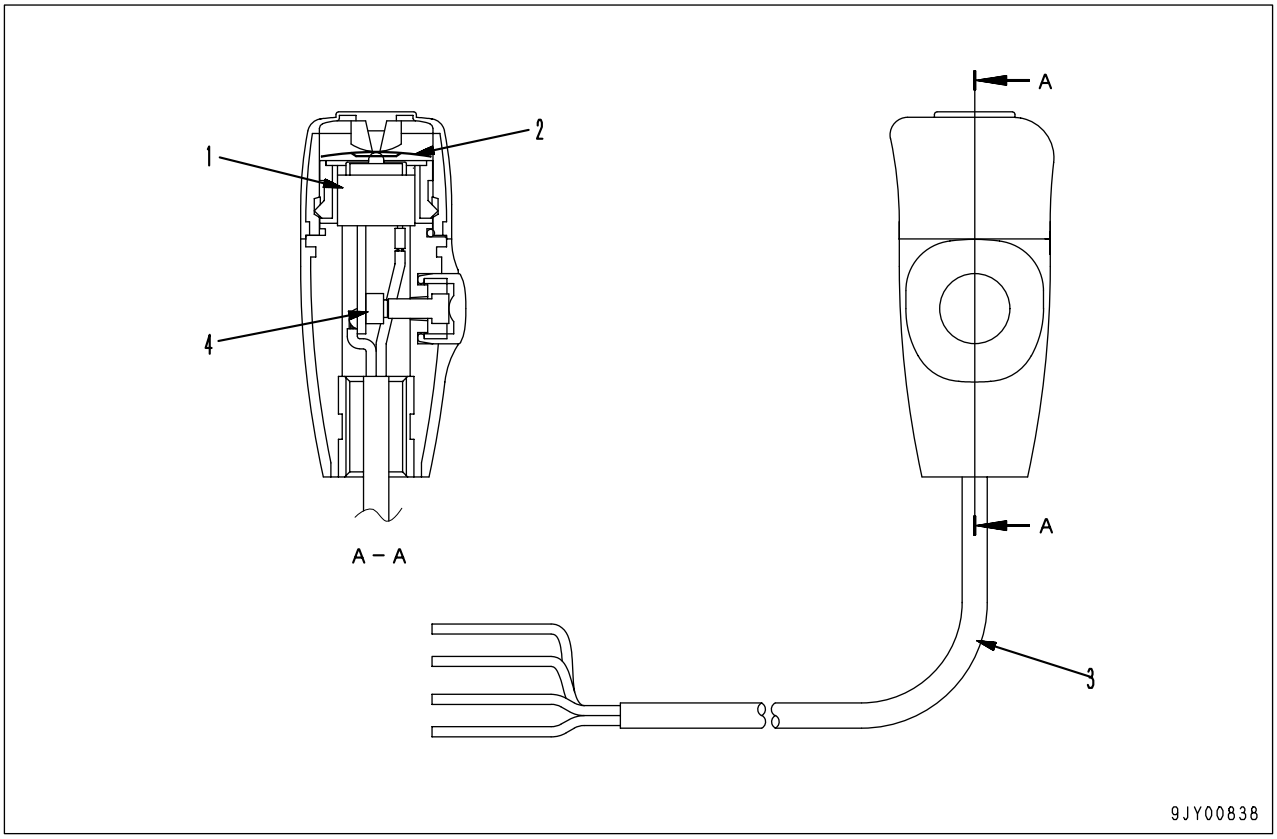


A more fine steering range is provided for the "Lo" mode then the "Hi" mode for the joystick.

2) Modulation control
Steering with the joystick applies modulation control in order to reduce impact that may be experienced when operation is started or finished.
A greater degree of modulation control is provided for the "Lo" for more impact reduction.
This modulation control enables steering of the machine even during traveling at a high speed, as it improves response of the machine toward lever operation according to the machine speed.



KICK DOWN, HOLD SWITCH

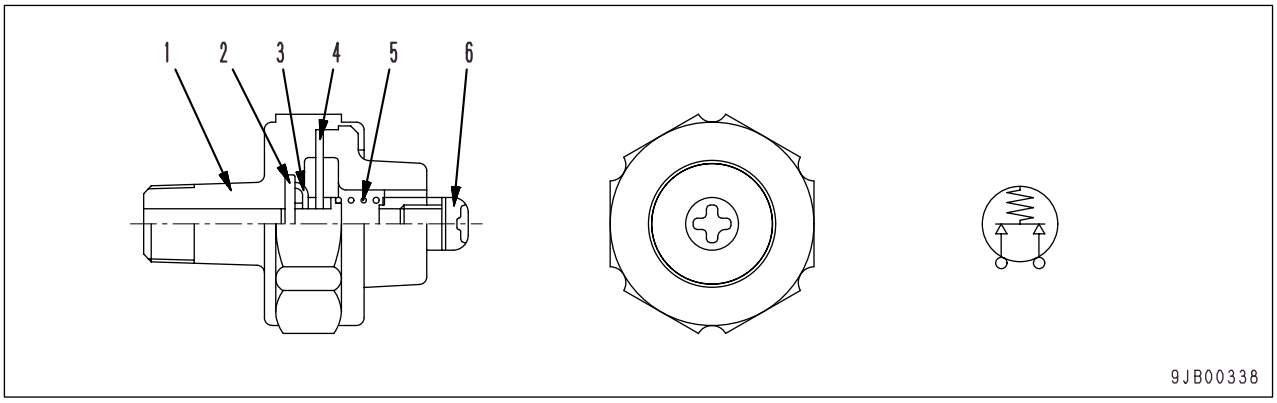


1. Switch A (white harness)
2. Spring
3. Harness
4. Switch B (yellow harness)

Functions

- Being installed on the lift arm-operating lever, switch A (1) and switch B (4) function as the kick down switch and hold switch, respectively.
- When the load meter (optional) is provided, switch A and switch B are installed on the bucket-operating lever. In this case, switch A and B function as the cancel switch and sub-total switch, respectively.
- Contact of both switches A and B resets automatically, namely it is closed only when the switches are depressed.

ENGINE OIL PRESSURE SENSOR

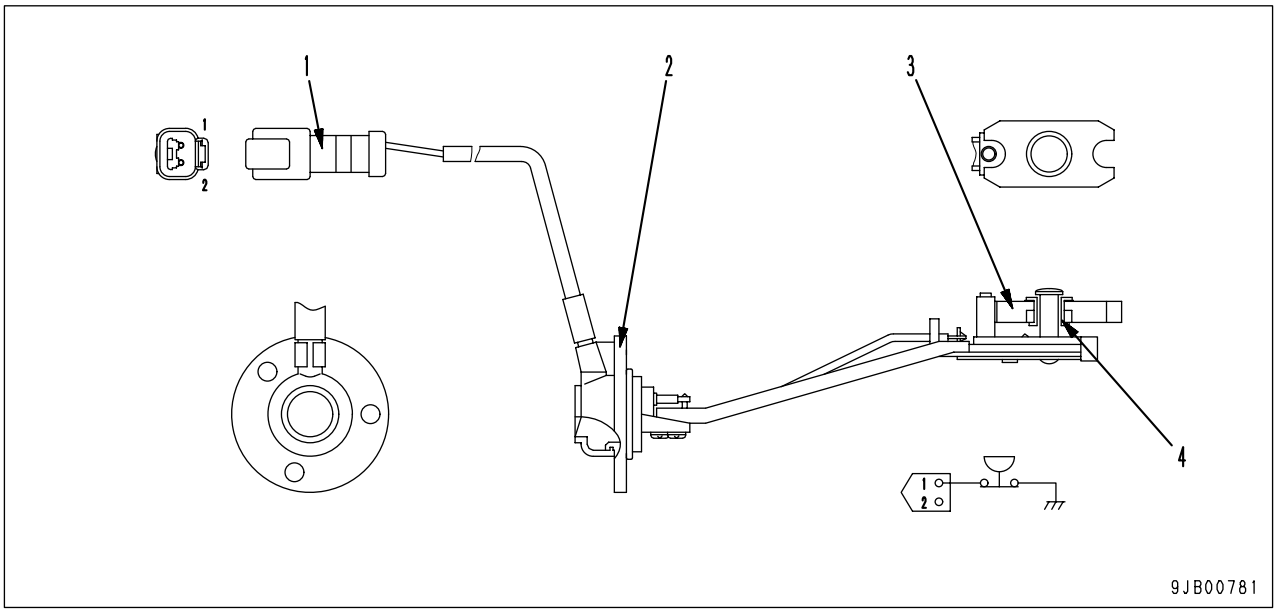


1. Plug
2. Contact ring
3. Contact
4. Diaphragm
5. Spring
6. Terminal

Function

- This sensor is mounted to the engine block. The diaphragm detects oil pressure, and when it reaches below the specified value, the switch is turned ON.

ENGINE OIL LEVEL SENSOR



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

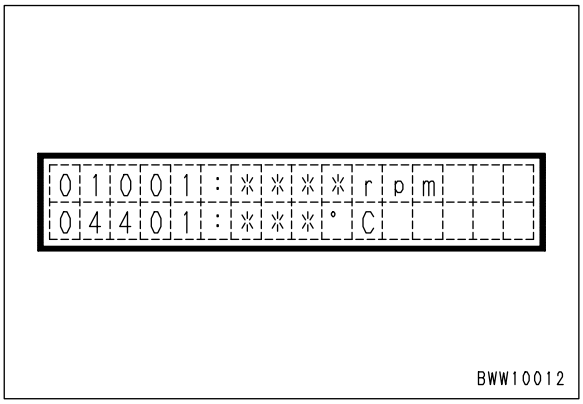
Function

- This sensor is mounted to the side surface of the oil pan. The float lowers when the oil level reaches below the specified level, turning OFF the switch.

STANDARD VALUE TABLE FOR ENGINE

Machine Model				WA400-5H	
Engine				SAA6D114E-3	
Item	Measurement Conditions		Unit	Standard Value For New Machine	Service Limit Value
Revolving speed	High idling		rpm	2,230 ± 50	2,230 ± 50
	Low idling			900 $^{+50}_{0}$	900 $^{+50}_{0}$
	Rated revolving speed			2,000	2,000
Exhaust temperature (Turbocharger outlet temperature)	All revolution ranges (Atmospheric temperature: 20 °C)		°C	Max. 550	Max. 600
Intake air pressure (Boost pressure)	At rated output		kPa {mmHg}	113.1 ~ 126.4 {850 ~ 950}	Max. 106.4 {Max. 800} Min. 133.3 {Min. 1,000}
Exhaust gas color	At sudden acceleration At high idling		Bosch index	Max. 4.5 Max. 1.0	Min. 6.5 Max. 1.5
Valve clearance	Air intake valve Exhaust valve (Normal temperature)		mm	0.33 ± 0.05 0.56 ± 0.05	0.33 ± 0.05 0.56 ± 0.05
Compression pressure	Oil temperature: 40 ~ 60 °C (SAE30 oil) (Engine speed)		MPa {kg/cm^2} (rpm)	Min. 2.4 {24.6} (250 rpm)	Min. 2.0 {20.5} Difference between cylinders: Max. 0.7 {6.9} (250 rpm)
Blow-by pressure	At rated output (Operating range of water temperature) (SAE30 oil)		kPa {mmH$_2$O}	Max. 0.98 {Max. 100}	Max. 1.96 {Max. 200}
Oil pressure	(Operating range of water temperature) At high idling (15W-40) At low idling (15W-40) At high idling (SAE10W) At low idling (SAE10W)		MPa {kg/cm^2}	 0.36 ~ 0.61 {3.5 ~ 6.0} Min. 0.15 {1.5} 0.30 - 0.56 {3.0 - 5.5} Min. 0.10 {1.0}	 0.21 {2.1} 0.07 {0.7} 0.18 {1.8} 0.07 {0.7}
Oil temperature	All revolution ranges (Inside oil pan)		°C	90 ~ 120	Min. 120
Fuel injection timing	Before compression top dead center		°(deg.)	8.5 ± 1	8.5 ± 1
Belt tension	Deflection made by finger pressure of about 58.8 N {about 6 kg}	Idler pulley - Crank pulley	mm	8	Above 10 or below 6
	Deflection made by finger pressure of about 98 N {about 10 kg}	Air conditioner compressor - Crank pulley		16 ~ 20	16 ~ 20

3. Measuring hydraulic stall speed:
1) Switch to the monitoring function of Service Mode 1 and use the 2-item simultaneous monitoring function to display the following 2 items. For details, see SPECIAL FUNCTIONS OF MACHINE MONITOR in the TROUBLESHOOTING section.
★ Monitoring items
① Code No. 01001: Engine speed
② Code No. 04401: Hydraulic oil temperature



2) Start the engine and run at high idling.
3) Measure the engine speed when the boom cylinder or bucket cylinder is extended and the circuit is relieved.

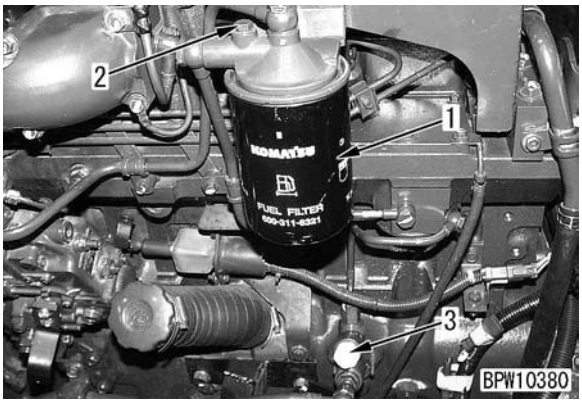
4. Measuring torque converter stall + hydraulic stall (full stall) speed:
1) The setting of the machine monitor is the same as 2-1) Measuring torque converter stall speed.
2) Start the engine.
3) Turn the transmission cut-off selector switch (2) OFF and depress the left brake securely.
4) Place the directional lever at F4 or R4.
5) Release the parking brake.
6) Run the engine at high idling, stall the torque converter, extend the boom cylinder or bucket cylinder at the same time to relieve the circuit, and measure the engine speed.

★ Do not keep the stall condition for more than 20 seconds. Make sure that the torque converter oil temperature does not exceed 120 °C.

BLEEDING AIR FROM FUEL CIRCUIT

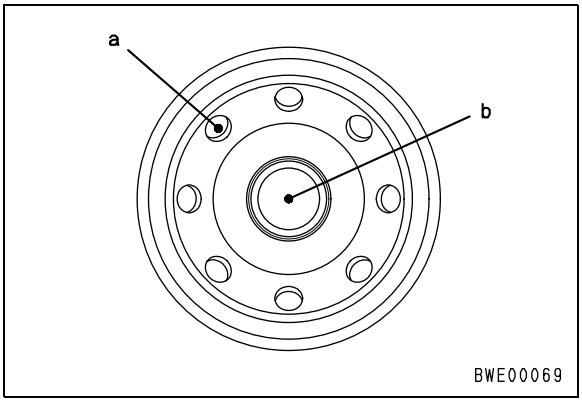
★ If the fuel runs out or if any fuel circuit device is removed and installed, bleed air according to the following procedure.

1. Remove fuel filter (1) and fill it with fuel and install it again.



★ When filling, use clean fuel and be careful not to let dirt get in.

★ Add fuel through inlet port portion **a** (8 places) of the filter. Portion **b** is the outlet port (clean side) after the fuel has been filtered, so never add fuel from here.



★ If clean fuel is not available, do not remove the filter. Operate the priming pump to fill the filter with fuel.

2. Remove air bleed plug (2) of the fuel filter and operate priming pump (3).

★ Continue operating the priming pump until flow out from the plug hole. When fuel comes out, install the plug.

N·m Air bleed plug:
7.8 ~ 9.8 Nm {0.8 ~ 1.0 kgm}

3. Crank the engine (for 15 - 20 seconds) with the starting motor 2 - 3 times.

PROCEDURE FOR FLUSHING TORQUE CONVERTER, TRANSMISSION HYDRAULIC CIRCUIT

★ Metal particles and other dirt in the torque converter and transmission hydraulic circuit will reduce the life of the torque converter and transmission, and will cause internal damage. To prevent this, carry out flushing to remove the dirt in the hydraulic circuit.

1. Flush the circuit if the following conditions apply.
   1) If there has been any breakage of the torque converter, transmission, or hydraulic equipment, and metal particles are circulating in the hydraulic circuit.
   2) When the torque converter and transmission have been overhauled or repaired.

2. Install a new filter cartridge.
   1) Drain the oil from the filter piping.
   2) remove the transmission oil filter cartridge, then install the cartridge (714-07-28711).

3. Fill the transmission case with oil.
   • Add fresh oil through the oil filter port to the specified level, and run the engine to circulate the oil through the system. Then check the level again.

Transmission case: 54 **l**

4. Carry out flushing as follows.
   1) After starting the engine, run the engine for approx. 20 minutes at low idling without operating the speed lever or directional lever.
      ★ From time to time, raise the engine speed to approx. 1500 rpm.
      ★ If the ambient temperature is low and the engine water temperature gauge does not enter the white range, continue the warming-up operation longer.
   2) Travel or carry out actual operations for 20 minutes.
      ★ Use all the speed ranges (FORWARD, REVERSE, and 1st - 4th).
   3) Repeat the procedure in step 4-1) and run the engine at low idling for approx. 20 minutes.

5. Replace the filter cartridge.
   1) Using the procedure in Step, 2 replace the cartridge used for flushing with the new cartridge (714-07-28711).

WARNING! If the cartridge used for flushing is used for a long time, there will be premature clogging, so always replace the flushing element with the standard element.

   2) Add oil and check the level again.

TESTING WEAR OF PARKING BRAKE DISC

Special tool required

Sym-bol	Part No.	Part Name	Qty	Remarks
M	Commercially available	Calipers	1	(Mitsutoyo N10 or equiv-alent)

★ If the parking brake does not work sufficiently, check the parking brake disc for wear according to the following procedure.

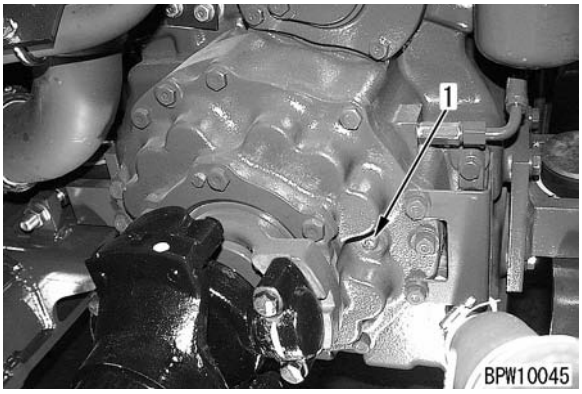
WARNING! To prevent the machine from moving, lower the bucket to the ground and put blocks under the tires.

WARNING! Always stop the engine before carrying out this procedure.

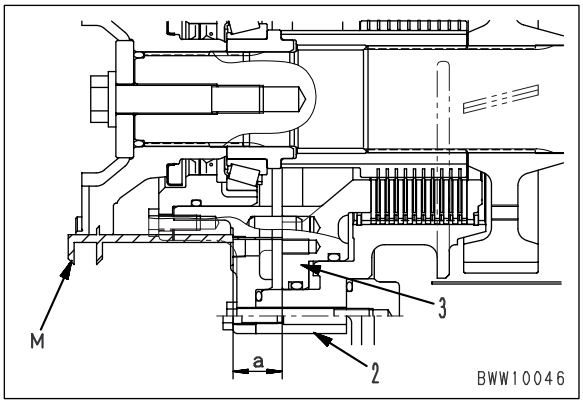
1. Drain the oil from the transmission case.

Transmission case: **. . . . . 54 l**

2. Remove 1 plug (1) (remove 1 of the 2 plugs).

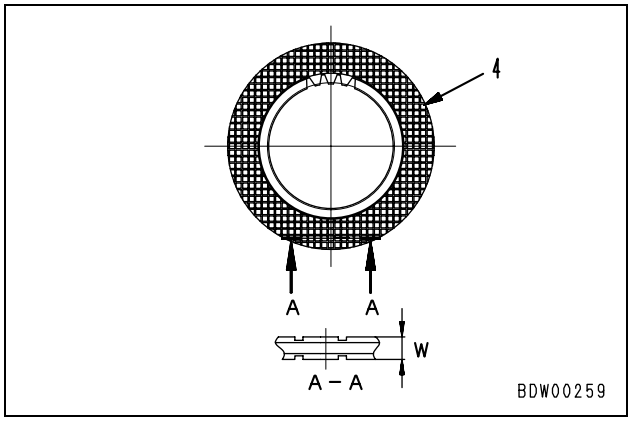


3. Measure depth **a** with calipers **M** from the end face of cage (2) to piston (3).
- Standard depth **a**: Max. 42.3 mm



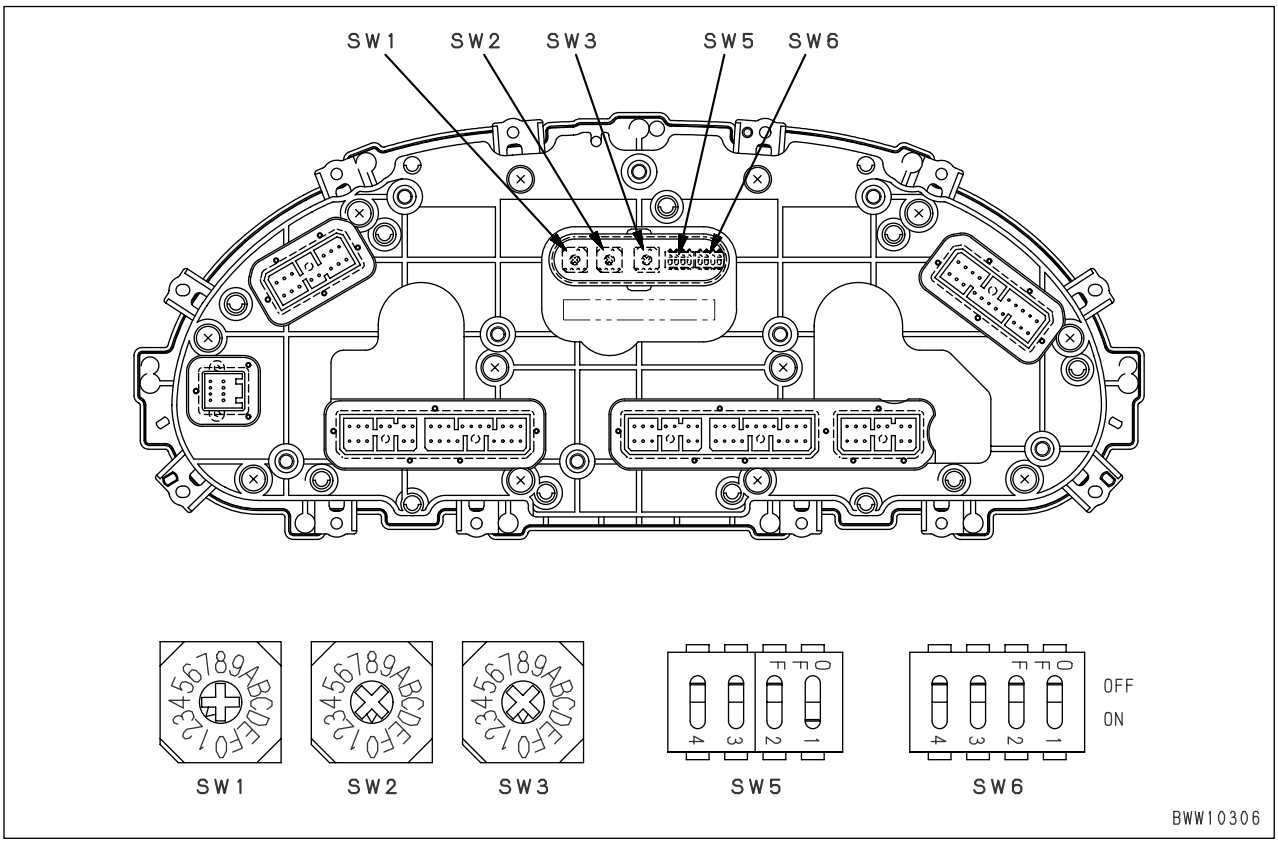
4. When the depth **a** is more than the standard value, remove parking brake disc (4), and measure disc width **W**. For details, see DISASSEMBLY AND ASSEMBLY, Removal of parking brake disc.
- Judgement standard width **W**: 2.97 mm

★ When the depth of the parking brake disc is less than the standard value replace the disc.



ADJUSTING MACHINE MONITOR

Machine monitor rotary switches (SW1, SW2, SW3) and dipswitches (SW5, SW6)



- In the following cases, check the settings of the rotary switches and dipswitches at the rear face of the machine monitor, and change the settings as necessary.
  - When the machine monitor has been removed and installed again.
  - When the tire size has been changed (travel speed compensation setting).
  - When an optional device has been installed or removed.
  - When the parts of the machine monitor have been replaced with new parts (service meter, odometer).
    - ★ When carrying out these settings, it is necessary to use the special operation of the character display and mode switch. For details, see STRUCTURE AND FUNCTION, SPECIAL FUNCTIONS OF MACHINE MONITOR.
  - The status of each switch can be checked with the special function of the machine monitor (monitoring function).
  - ★ All setting operations are carried out with the starting switch OFF and the monitor panel removed.
  - ★ Always set each switch as instructed.
  - ★ Be careful not to touch anything inside the grommet except for the switch.
  - ★ When turning the rotary switch, use a precision cross-head screwdriver and turn slowly.
  - ★ The protruding triangular part of the rotary switch is the setting arrow.
  - ★ When changing the dipswitch, use a precision flat-headed screwdriver and turn slowly.

2) Removing, installing, and drying connectors and wiring harnesses

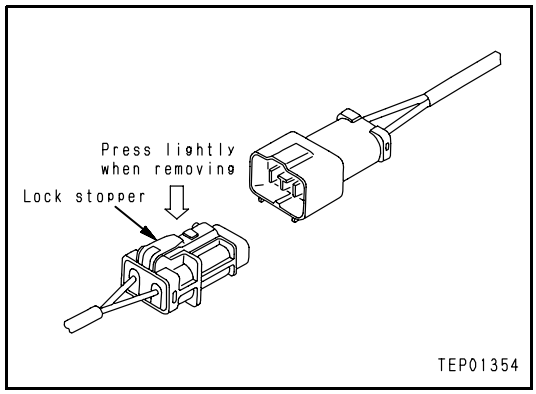
- Disconnecting connectors

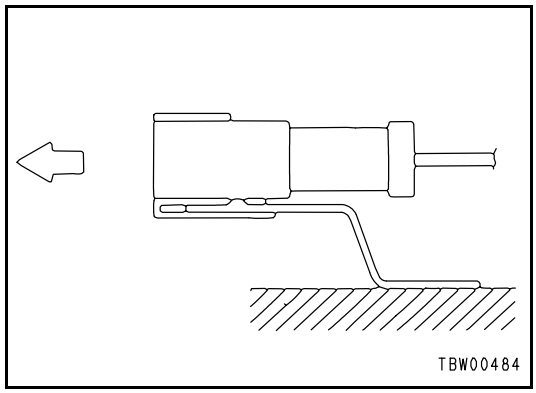
① Hold the connectors when disconnecting. When disconnecting the connectors, hold the connectors and not the wires. For connectors held by a screw, loosen the screw fully, then hold the male and female connectors in each hand and pull apart. For connectors which have a lock stopper, press down the stopper with your thumb and pull the connectors apart.

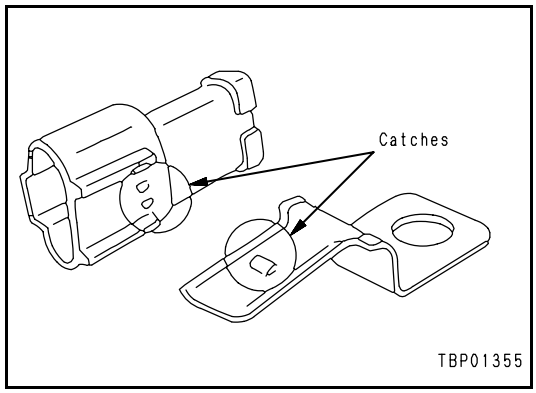
★ Never try to pull apart with one hand.

② When removing the connectors from the clips, pull the connector in a parallel direction to the clip.

★ If the connector is twisted to the left and right or up and down, the housing may break.



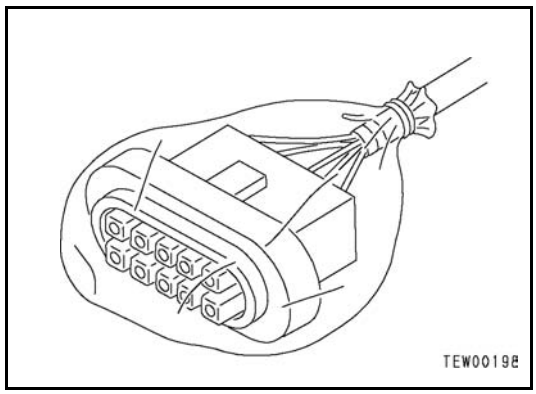


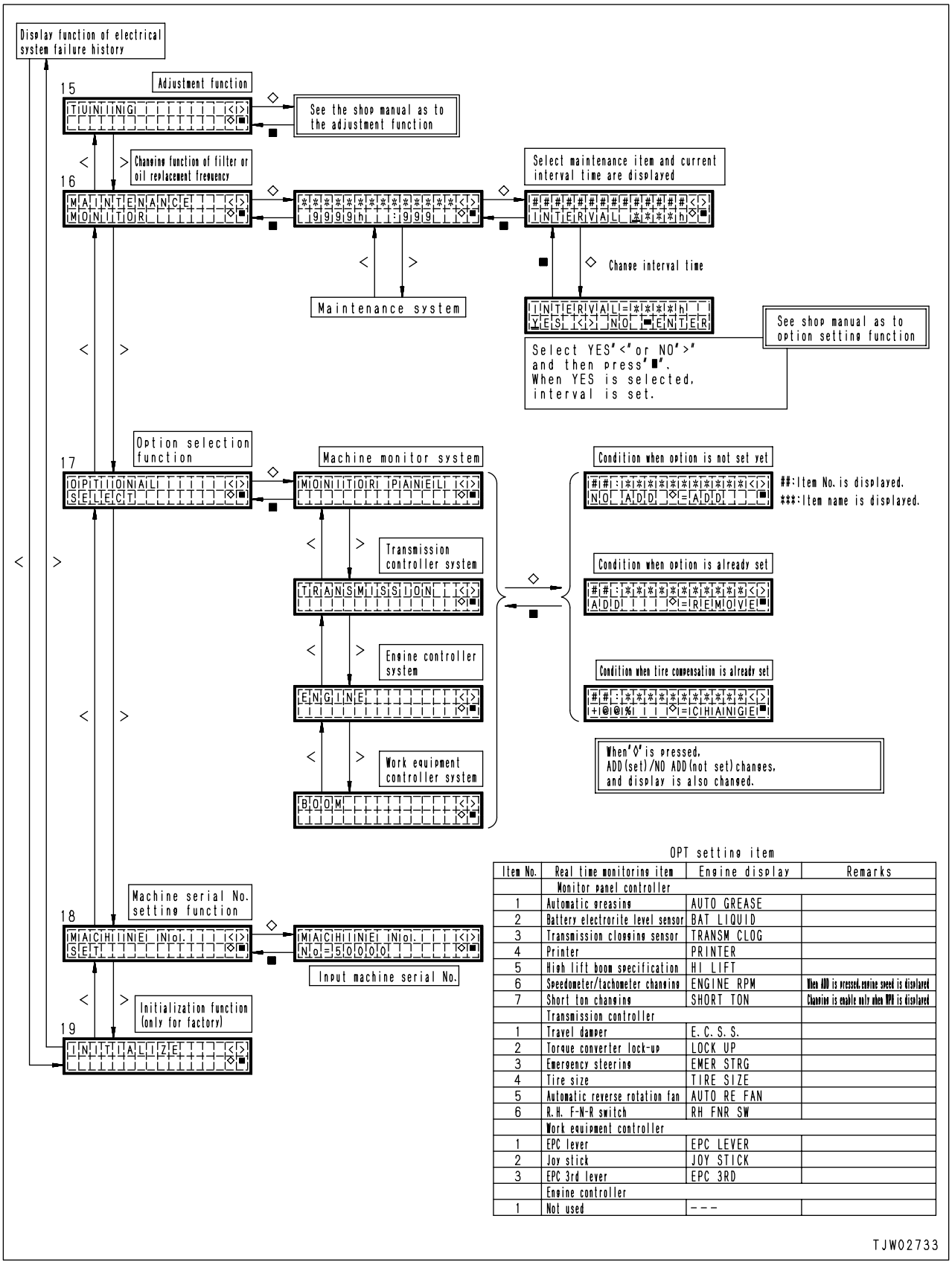


③ Action to take after removing connectors.

After removing any connector, cover it with a vinyl bag to prevent any dust, dirt, oil, or water from getting in the connector portion.

★ If the machine is left for a long time, it is particularly easy for improper contact to occur, so always cover the connector.





OPT setting item

Item No.	Real time monitoring item	Engine display	Remarks
	Monitor panel controller		
1	Automatic greasing	AUTO GREASE	
2	Battery electrorite level sensor	BAT LIQUID	
3	Transmission clogging sensor	TRANSM CLOG	
4	Printer	PRINTER	
5	High lift boom specification	HI LIFT	
6	Speedometer/tachometer changing	ENGINE RPM	When ADD is pressed, engine speed is displayed
7	Short ton changing	SHORT TON	Changing is enable only when RPM is displayed
	Transmission controller		
1	Travel damper	E.C.S.S.	
2	Torque converter lock-up	LOCK UP	
3	Emergency steering	EMER STRG	
4	Tire size	TIRE SIZE	
5	Automatic reverse rotation fan	AUTO RE FAN	
6	R.H. F-N-R switch	RH FNR SW	
	Work equipment controller		
1	EPC lever	EPC LEVER	
2	Joy stick	JOY STICK	
3	EPC 3rd lever	EPC 3RD	
	Engine controller		
1	Not used	---	

TJW02733

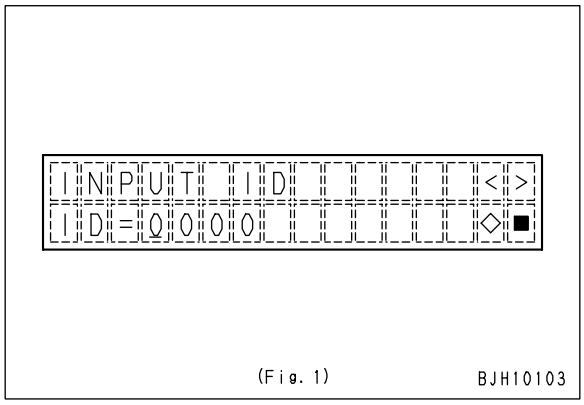
Procedure for switching to Service Mode 1 and screen display

★ When using Service Mode 1, carry out the following special operation to switch the screen display.

1) Checking screen display
With the machine monitor in the operator mode, check that the screen is one of the following displays: Service meter, action code, or failure code.

2) Initial screen display for ID input
Press the following 2 buttons at the same time for at least 5 seconds to display the initial screen display for the ID input.
- [■] button and [<] button

★ If the buttons are held pressed for at least 5 seconds, the whole screen will give no display, so check that the screen gives no display, then release the buttons.



(Fig. 1) BJH10103

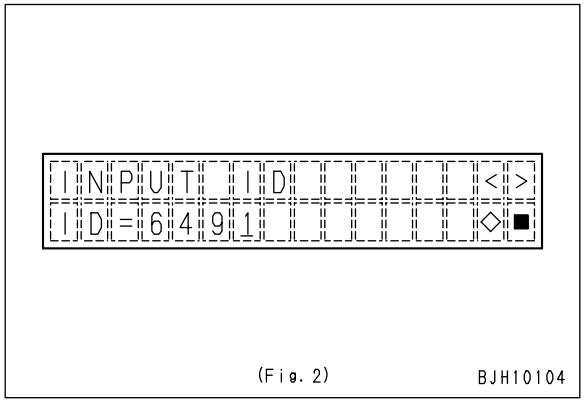
3) Inputting, confirming ID
Operate the buttons to input the ID.

★ ID: 6491

- [>] button: Number at cursor goes up.
- [<] button: Number at cursor goes down.
- [◊] button: Number at cursor is confirmed.
- [■] button: Returns to initial screen (see Note).

Note: When the cursor is at the left edge, the screen returns to the normal screen (operator mode). If the cursor is not at the left edge, the cursor returns to the left edge.

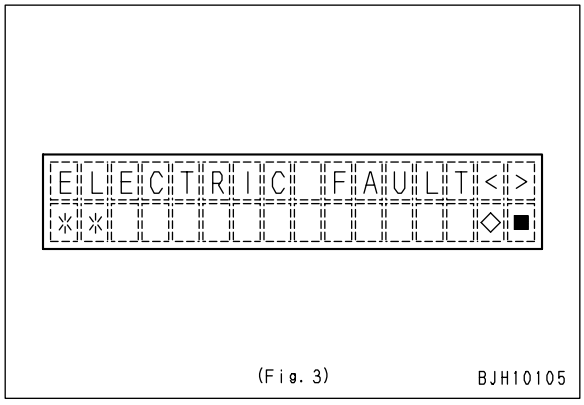
★ If more than 60 seconds passes before the switch on the ID input screen is operated, the screen returns automatically to the normal screen.



(Fig. 2) BJH10104

4) Displaying menu initial screen
After all four digits of the ID are confirmed, the menu initial screen of Service Mode 1 is displayed.

★ Once the ID has been input and confirmed, it remains effective until the starting switch is turned OFF.



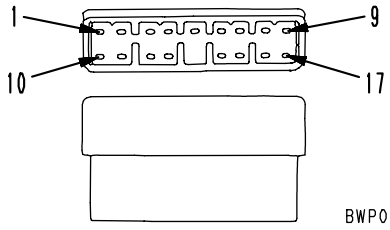
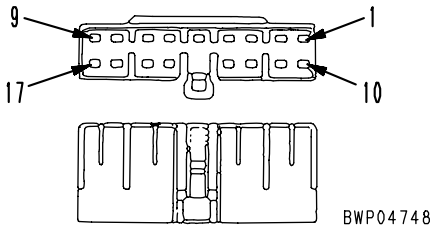
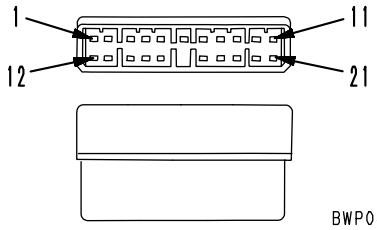
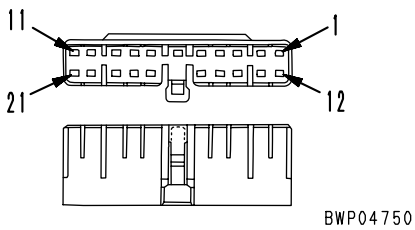
(Fig. 3) BJH10105

WORK [Work equipment controller system]					
No.	Monitoring Item	Item Display	Monitoring Code	Data Display Range	Unit
1	Work equipment controller ROM part No.	BOOM ROM	20202	—	—
2	Joystick steering right solenoid valve current	RH J/S EPC	41904	0 ~ 1000	mA
3	Joystick steering left solenoid current	LH J/S EPC	41905	0 ~ 1000	mA
4	Lever potentiometer voltage lift arm 1	BOOM POT1	42000	0.00 ~ 5.00	V
5	Lever potentiometer voltage lift arm 2	BOOM POT2	42001	0.00 ~ 5.00	V
6	Lever potentiometer voltage bucket 1	BUCKET POT1	42002	0.00 ~ 5.00	V
7	Lever potentiometer voltage bucket 2	BUCKET POT2	42003	0.00 ~ 5.00	V
8	Lever potentiometer voltage joystick steering 1	J/S POT1	42004	0.00 ~ 5.00	V
9	Lever potentiometer voltage joystick steering 2	J/S POT2	42005	0.00 ~ 5.00	V
10	Lever potentiometer voltage 3-tandem valve 1	3RD POT1	42006	0.00 ~ 5.00	V
11	Lever potentiometer voltage 3-tandem valve 1	3RD POT2	42007	0.00 ~ 5.00	V
12	Lift arm angle	BOOM ANG	06002	-41 ~ 46	deg.
13	Lift arm bottom pressure	BTM PRESS	40401	0.00 ~ 50.00	MPa
14	No. of times of lift arm lever operation	BOOM LVR	42100	0 ~ 25600	x 1000
15	No. of times of bucket lever operation	BUCKET LEVER	42101	0 ~ 25600	x 1000
16	No. of times of 3rd lever operation	3RD LVR	42102	0 ~ 25600	x 1000
17	Engine speed	ENG SPEED	01003	0 ~ 3000	rpm
18	Travel speed	SPEED	40001	0 ~ 50	km/h
19	Input signal D_IN_0-7	D-IN--0------7	40910	See separate table	Status display
20	Input signal D_IN_8-15	D-IN--8------15	40911	See separate table	Status display
21	Input signal D_IN_16-23	D-IN--16------23	40912	See separate table	Status display
22	Input signal D_IN_24-31	D-IN--24------31	40913	See separate table	Status display
23	Output signal D_OUT_0-6	D-OUT-0------6	40917	See separate table	Status display
24	Output signal SOL/0_0-5	SOL/O-0------5	40916	See separate table	Status display

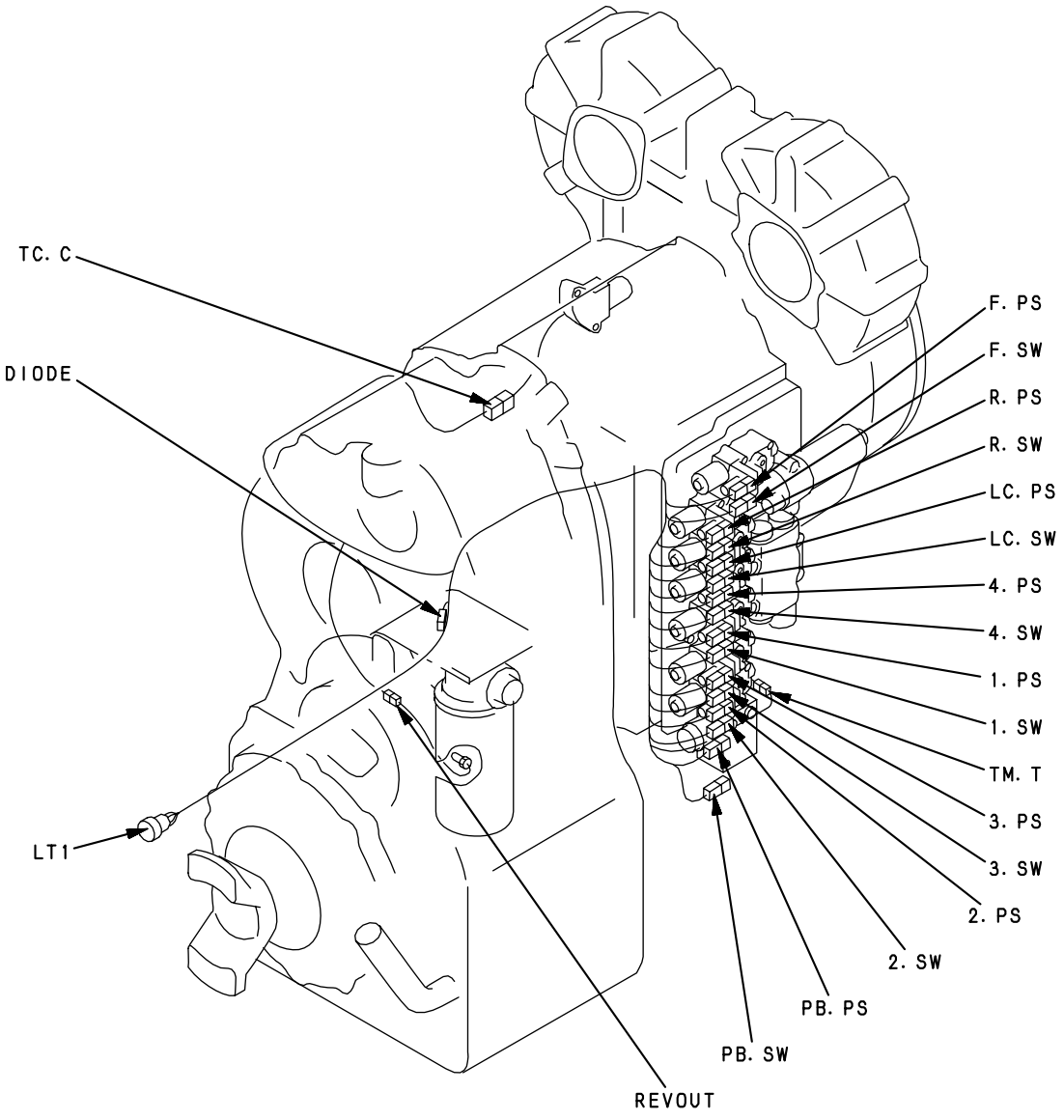
3. Method of using troubleshooting table (TM mode, WRK mode, MON mode, E mode)

Action Code	Error Code	Controller Code	Trouble	Trouble displayed in trouble data
Panel display	Panel display	Panel display		
Description of Trouble	• Condition when monitor panel or controller detected trouble.			
Controller Reaction	• Action to take to protect system or equipment when monitor or controller detected trouble.			
Effect on Machine	• Condition that appeared as problem on machine when action (given above) was taken by monitor panel or controller.			
Related Information	• Information related to troubleshooting or error that occurred.			

	Causes		Standard Value in Normal State and Remarks on Troubleshooting
Possible Causes and Standard Values	1	Probable cause when trouble occurred (the numbers are index numbers and do not indicate the order of priority)	<Data to fill in> • Normal standard values used to judge probable cause • Remarks regarding decision-making <Condition when wiring harness is defective> • Disconnection There is defective connection of connector or disconnection in wiring harness • Short circuit with ground Wiring harness not wired to ground (GND) circuit is in contact with ground (GND) circuit • Short circuit with power source Wiring harness not wired to power supply (24 V) circuit is in contact with power supply (24 V) circuit <Points to remember when troubleshooting> ① Method of displaying connector No. and handling T-adapter Unless there is special instruction, insert or connect the T-adapter as follows •If there is no indication for the male or female terminal of the connector No., disconnect the connector and insert the T-adapter in both the male and female terminals •If there is indication for the male or female terminal of the connector No., disconnect the connector and connect the T-adapter to only the terminal indicated (either the male terminal or female terminal) <Points to remember when troubleshooting> ② Given order for pin numbers and handling tester lead Unless there is a special instruction, connect tester (+) lead and (-) lead as follows to carry out troubleshooting •Connect the (+) lead to the wiring harness for the pin No. given first •Connect the (-) lead to the wiring harness for the pin No. given last
	2		
	3		
	4		
	5		

Number of Pins	MIC Type Connector		
	Male (Female housing)	Female (Male housing)	T-adapter Part Number
17			799-601-2730
	Body part number: 79A-222-2730 (Quantity: 2 pieces)	Body part number: 79A-222-2720 (Quantity: 2 pieces)	
21			799-601-2740
	Body part number: 79A-222-2750 (Quantity: 2 pieces)	Body part number: 79A-222-2740 (Quantity: 2 pieces)	
—	Body part number: 79A-222-2770 (Quantity: 50 pieces)	Body part number: 79A-222-2760 (Quantity: 50 pieces)	—

Connector No.	Connector Type	Number of Pins	Installation Name	Address	
				Layout Drawing	System Drawing
F30	Terminal	1	Ground (Front frame)	C-1	U-1
FF1	S	10	Intermediate connector (Front lamp)	E-1	N-3
FF2	DT-T (Gr)	8	Intermediate connector (Work equipment sensor)	D-1	E
FL1	S	12	Intermediate connector (Front lamp)	—	K-3
FL2	DT-T (Gr)	8	Intermediate connector (Work equipment sensor)	—	E
FL3	DT-T	6	Intermediate connector (Load meter)	—	K-5
FL7	DT-T (Br)	12	Intermediate connector (Work equipment solenoid)	F-1	WRK
FL8	DT-T (G)	8	Intermediate connector (Work equipment solenoid)	F-2	WRK
FL9	DT-T	6	Intermediate connector (3rd lever solenoid)	F-2	WRK
FS1	L	2	Intermediate connector (Fuse box)	W-7	E
FS2	L	2	Intermediate connector (Fuse box)	V-7	E
FS3	S (W)	16	Intermediate connector (Fuse box)	V-8	E
FS4	S (W)	12	Intermediate connector (Fuse box)	V-8	E
FS5	M	6	Intermediate connector (Fuse box)	V-7	E
FS6	Plug	1	Intermediate connector (Fuse box)	V-8	—
FS7	Plug	1	Intermediate connector (Fuse box)	W-7	—
F.PS	DT-T	2	Transmission F clutch solenoid	j-6	TM
F.SW	DT	2	Transmission F clutch fill switch	j-6	TM
G01	Terminal	1	Backup buzzer	J-9	TM
G02	Terminal	1	Backup buzzer	J-9	TM
G04	M	2	Rear working lamp (Left)	K-9	V-8
G05	M	2	Rear working lamp (Right)	J-9	U-8
GR1	DT-T	4	Intermediate connector (Fan reverse solenoid, rear working lamp)	L-7	U-6
GR2	DT-T	2	Fan reverse solenoid	L-8	TM
HEAD	M	3	Head lamp (Right)	A-6	W-3
HEAD	M	3	Head lamp (Left)	—	W-2
JT1	DT-T (B)	8	Centralized connector (Ground)	e-5	Q-8
JT2	DT-T (B)	8	Centralized connector (Shield)	e-4	TM
JT3	DT-T	6	Centralized connector	e-4	TM
L01	SWP	6	Parking brake switch	M-6	TM
L02	SWP	6	Dimmer switch, light switch	M-5	B-1
L03	SWP	6	Turn signal and hazard switch	M-6	B-1
L04	SWP	14	Shift switch	M-3	TM
L05	DT-T	2	Horn switch	M-5	E-8
L07	DT-T	6	Machine monitor switch (Mode/Cancel selector switch)	Q-1	B-8
L08	DT-T	6	Machine monitor switch (Screen selector switch)	Q-1	A-8
L09	DT-T	2	Stop lamp switch	Q-1	D-8
L10	DT-T	3	Left brake pressure sensor	R-1	TM
L11	DT-T	2	Air suspension seat	S-1	—
L12	DT-T	4	R direction switch	O-7	—
L13	DT-T	2	Lift arm N lock switch	O-7	—
L14	DT-T	4	Kickdown and hold switch	P-7	—
L15	DT-T	4	Load meter cancel and sub-total switch	O-7	D-8
L16	M	2	Intermediate connector (DC converter)	V-2	—
L17	M	4	DC24V/DC12V converter	W-5	—
L18	Yazaki	2	DC12V socket	W-3	—


TC. C
DIODE
LT1
REVOUT
F. PS
F. SW
R. PS
R. SW
LC. PS
LC. SW
4. PS
4. SW
1. PS
1. SW
TM. T
3. PS
3. SW
2. PS
2. SW
PB. PS
PB. SW

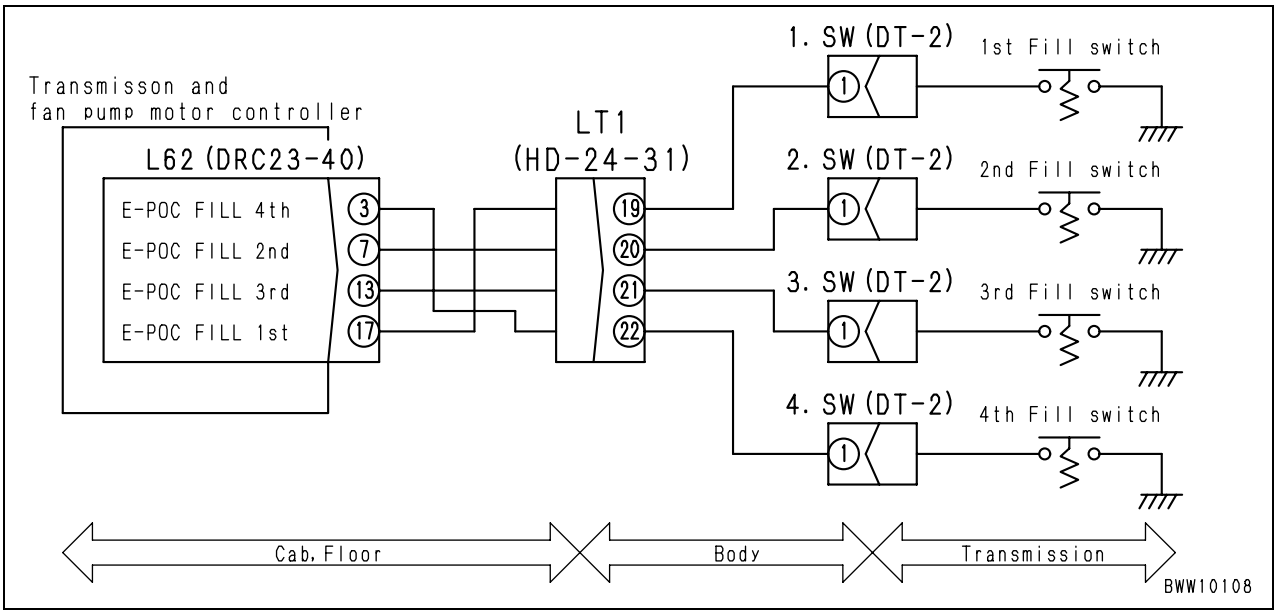
BWW10156

ERROR CODE [15SFL1]

Action Code	Error Code	Controller Code	Trouble	2nd_ECMV fill switch system short-circuited
E03	15SFL1	TM		
Description of Trouble	• A 2nd_ECMV fill switch signal is input when 2nd_ECMV is OFF.			
Controller Reaction	• Assumes that the 2nd_ECMV fill switch signal is on and turns speed clutch output OFF.			
Effect on Machine	• No travel.			
Related Information	• Can be checked with the monitoring function (Code: 40908, D-IN-27).			

	Causes		Standard Values in Normal State and Remarks on Troubleshooting			
Possible Causes and Standard Values	1	Defective 2nd_ECMV fill switch	1) Turn starting switch OFF. 2) Disconnect connector 2.SW. 3) Connect T-adapter. 4) Start engine. 5) Turn transmission cut-off switch OFF. 6) Turn parking brake switch OFF. 7) Do not apply parking brake while traveling.			
			Between 2.SW (Male) 1 ~ body	Gear shift lever = 2nd speed	Resistance	1 Ω and below
				Other than above	Resistance	1 MΩ and above
	2	Wiring harness ground fault	1) Turn starting switch OFF. 2) Disconnect connectors L62 and 2.SW. 3) Connect T-adapter.			
			Between L62 (Female) 7/2.SW (Female) 1 ~ body		Resistance	1 MΩ and above
	3	Defective transmission and fan pump motor controller	1) Turn starting switch OFF. 2) Disconnect connector L62. 3) Insert T-adapter. 4) Start engine. 5) Turn transmission cut-off switch OFF. 6) Turn parking brake switch OFF. 7) Do not apply parking brake while traveling. 8) Turn manual/auto shift selector switch to “Manual”. 9) Turn forward-reverse lever (Or switch) to “F” or “R”.			
			Between L62 7 ~ body	Gear shift lever = 2nd speed	Voltage	1 V and below
				Other than above	Voltage	20 ~ 30 V

Related circuit diagram

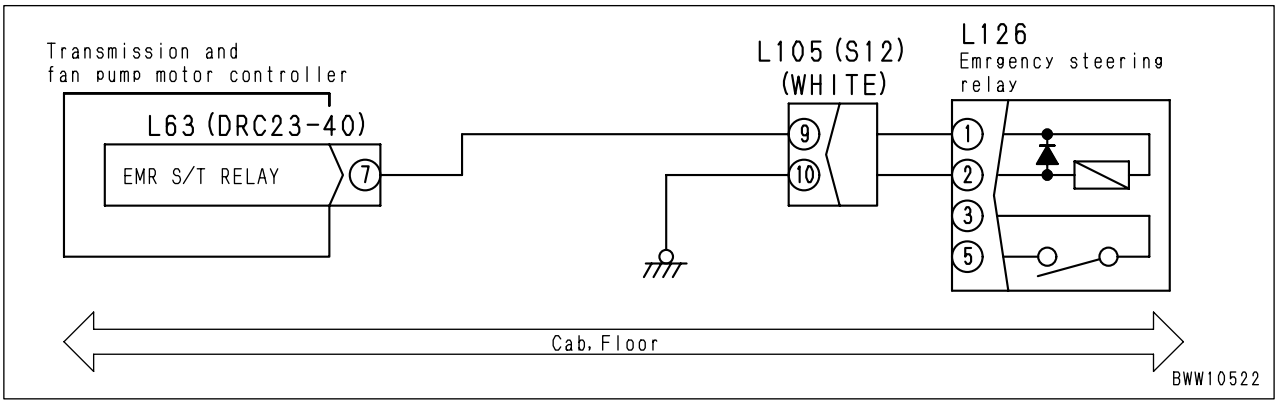


ERROR CODE [D150KA]

Action Code	Error Code	Controller Code	Trouble	Emergency steering relay output system disconnected
E03	D150KA	TM		
Description of Trouble	• No signal is output to the emergency steering relay due to disconnection.			
Controller Reaction	• No reaction.			
Effect on Machine	• The electric emergency steering motor does not rotate.			
Related Information	—			

	Causes		Standard Values in Normal State and Remarks on Troubleshooting		
Possible Causes and Standard Values	1	Defective emergency steering realy (L126)	1) Turn starting switch OFF 10 or more seconds after starting engine. 2) Replace relay. 3) Turn starting switch ON (at self-check).		
			This Error code (D150KA) issued	Relay L126 is not defective	
			This Error code (D150KA) not issued	Relay L126 is defective	
			1) Turn starting switch OFF. 2) Disconnect connector L105. 3) Connect T-adapter.		
			Between L105 (Male) 9 ~ 0	Resistance	200 ~ 400 Ω
	2	Wiring harness discontinuity (Disconnection or defective contact)	1) Turn starting switch OFF. 2) Disconnect connectors L63 and L105. 3) Connect T-adapter.		
			Wiring harness between L63 (Female) 7 ~ L105 (Female) 9	Resistance	1 Ω and below
			Wiring harness between L105 (Female) 0 ~ body	Resistance	1 Ω and below
	3	Defective transmission and fan pump motor controller	1) Turn starting switch OFF. 2) Disconnect connector L63. 3) Connect T-adapter.		
			Between L63 (Female) 7 ~ body	Resistance	200 ~ 400 Ω

Related circuit diagram

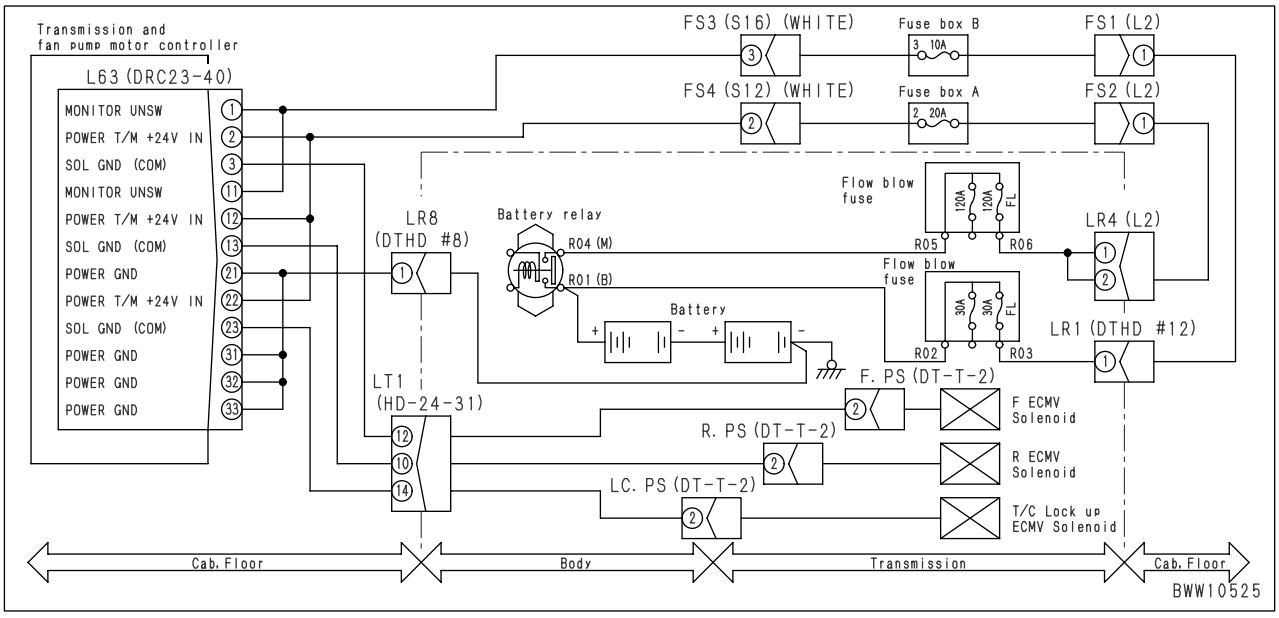


ERROR CODE [DAQ0KK]

Action Code	Error Code	Controller Code	Trouble	Controller power supply voltage lowered
—	DAQ0KK	TM		
Description of Trouble	• The controller power supply voltage is lowered.			
Controller Reaction	• Cannot detect input signals properly.			
Effect on Machine	• Normal operation is disabled.			
Related Information	—			

	Causes		Standard Values in Normal State and Remarks on Troubleshooting			
Possible Causes and Standard Values	1	Wiring harness discontinuity (Disconnection or defective contact)	Turn starting switch OFF. 2) Disconnect connectors L63 and FS3. 3) Connect T-adapter.			
			Wiring harness between L63 (Female) 1/A ~ FS3 (Female) 3		Resistance	1 Ω and below
			Between L63 (Female) K/U/V/W/ ~ body.		Resistance	1 Ω and below
	2	Wiring harness ground fault	1) Turn starting switch OFF. 2) Disconnect connector L63 and FS3. 3) Connect T-adapter.			
			Between L63 (Female) 1/A/FS3 (Female) 3 ~ body		Resistance	1 MΩ and above
	3	Defective transmission and fan pump motor controller	1) Turn starting switch OFF. 2) Disconnect connector L63. 3) Connect T-adapter. 4) Turn starting switch ON.			
			Between L63 1/A ~ body	Constant (NSW) power supply	Voltage	20 ~ 30 V

Related circuit diagram

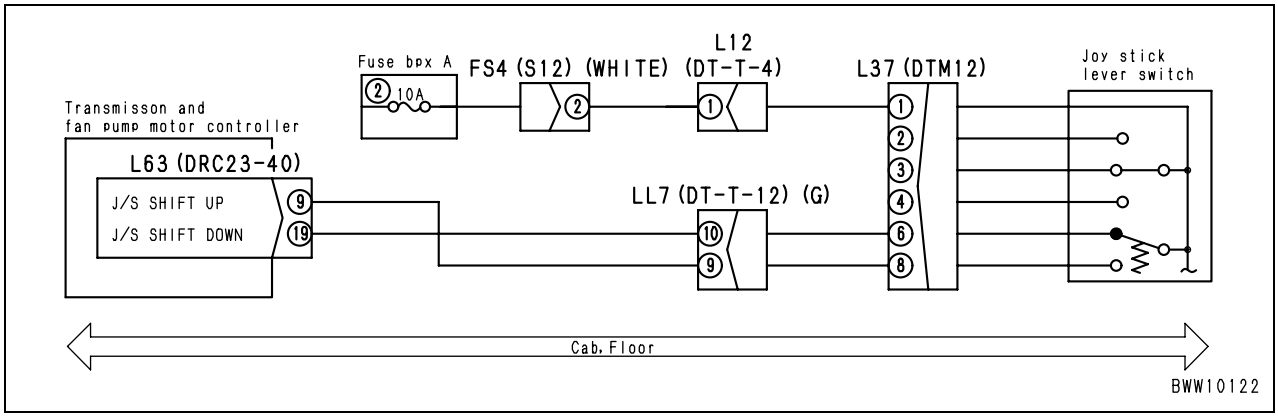


ERROR CODE [DDK5LD]

Action Code	Error Code	Controller Code	Trouble	Short circuit with power source in joystick SHIFT_UP/ SHIFT_DOWN switch
E03	DDK5LD	TM		
Description of Trouble	• Joystick SHIFT_UP/SHIFT_DOWN switch signal is input for 30 seconds continuously.			
Controller Reaction	• Ignores input signal.			
Effect on Machine	• Gear is shifted up or down once, then it cannot be shifted up or down with the joystick SHIFT_UP or SHIFT_DOWN switch. • Operate can shift gear in auto shift mode or steering wheel mode.			
Related Information	• This failure can be checked with monitoring function (Code: 40906, D-IN-12, DIN-13).			

	Causes		Standard Values in Normal State and Remarks on Troubleshooting			
Possible Causes and Standard Values	1	Short circuit with power source in wiring harness (Contact with 24-V wiring harness)	1) Turn starting switch OFF. 2) Disconnect L63 and L37. 3) Connect T-adapter. 4) Turn starting switch ON.			
			Between L63 (female) 9, L37 (female) 8 - chassis ground		Voltage	1 V and below
			Between L63 (female) I, L37 (female) 6 - chassis ground		Voltage	1 V and below
	2	Defective joystick SHIFT_UP/ SHIFT_DOWN switch	1) Turn starting switch OFF. 2) Disconnect connector L37. 3) Connect T-adapter.			
			Between L37 (Male) 8 - 1	When switch is at SHIFT_UP	Resistance	1 Ω and below
				When switch is not at above position	Resistance	1 MΩ and above
			Between L37 (Male) 6 - 1	When switch is at SHIFT_DOWN	Resistance	1 Ω and below
				When switch is not at above position	Resistance	1 MΩ and above
	3	Defective transmission and fan pump motor controller	1) Turn starting switch OFF. 2) Disconnect connector L63. 3) Insert T-adapter. 4) Turn starting switch ON.			
			Between L63 9 - chassis ground	When switch is at SHIFT_UP	Voltage	20 ~ 30 V
				When switch is not at above position	Voltage	1 V and below
			Between N63 I - chassis ground	When switch is at SHIFT_DOWN	Voltage	20 ~ 30 V
				When switch is not at above position	Voltage	1 V and below

Related circuit diagram

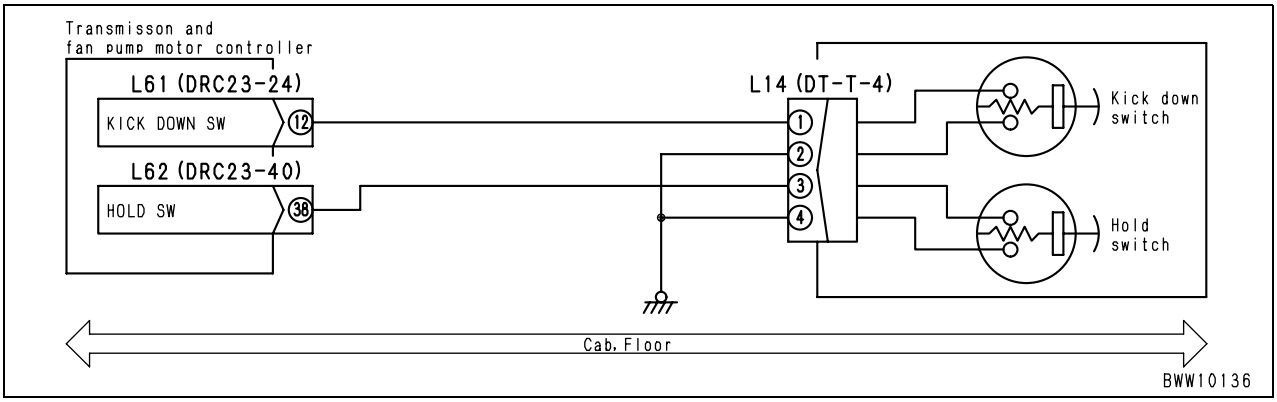


ERROR CODE [DDWLLD]

Action Code	Error Code	Controller Code	Trouble	Ground fault of hold switch system
E01	DDWLLD	TM		
Description of Trouble	• Due to ground fault of the hold switch system, the hold switch cannot be changed over.			
Controller Reaction	• Cannot perform hold control after performing it once at ground fault.			
Effect on Machine	• Cannot perform hold control after performing it once at ground fault.			
Related Information	• Can be checked with the monitoring function (Code: 40908, D-IN-31).			

	Causes		Standard Values in Normal State and Remarks on Troubleshooting			
Possible Causes and Standard Values	1	Defective hold switch	1) Turn starting switch OFF. 2) Disconnect connector L14. 3) Connect T-adapter.			
			Between L14 (Male) 3 ~ 4	Hold switch = ON	Resistance	1 Ω and below
				Hold switch = OFF	Resistance	1 MΩ and above
	2	Wiring harness ground fault	1) Turn starting switch OFF. 2) Disconnect connector L14. 3) Connect T-adapter.			
			Between L62 (Female) \/L14 (Female) 3 ~ body		Resistance	1 MΩ and above
	3	Defective transmission and fan pump motor controller	1) Turn starting switch OFF. 2) Disconnect connectors L61 and L14. 3) Connect T-adapter. 4) Turn starting switch ON.			
			Between L62 \ ~ body	Hold switch = ON	Voltage	1 V and below
				Hold switch = OFF	Voltage	20 - 30 V

Related circuit diagram

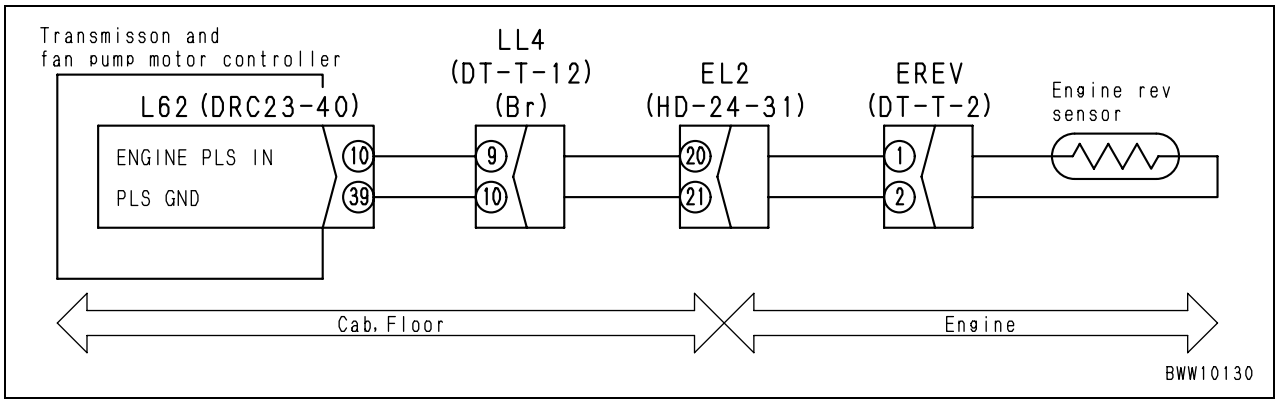


ERROR CODE [DLE2LC]

Action Code	Error Code	Controller Code	Trouble	Engine revolution sensor failure
E03	DLE2LC	TM		
Description of Trouble	• Due to ground fault of the engine revolution sensor system, no engine speed signal can be input.			
Controller Reaction	• Cannot detect engine speed. (Assumes that engine speed is 2,100 rpm.)			
Effect on Machine	• Gear shift shock may occur.			
Related Information	—			

Possible Causes and Standard Values	Causes		Standard Values in Normal State and Remarks on Troubleshooting		
	1	Wiring harness ground fault or short-circuiting	1) Turn starting switch OFF. 2) Disconnect connectors L62 and EREV. 3) Connect T-adapter.		
			Between L62 (Female) 0/E27 (Female) 1 ~ body	Resistance	1 MΩ or above
	2	Defective engine revolution sensor	1) Turn starting switch OFF. 2) Disconnect connector EREV. 3) Connect T-adapter.		
			Between EREV (Male) 1 ~ 2	Resistance	500 ~ 1,000 Ω
	3	Defective transmission and fan pump motor controller	1) Turn starting switch OFF. 2) Disconnect connector L62. 3) Connect T-adapter. 4) Turn starting switch ON.		
			Between L62 0 ~]	Voltage (Measured in AS range)	0.5 V or above

Related circuit diagram

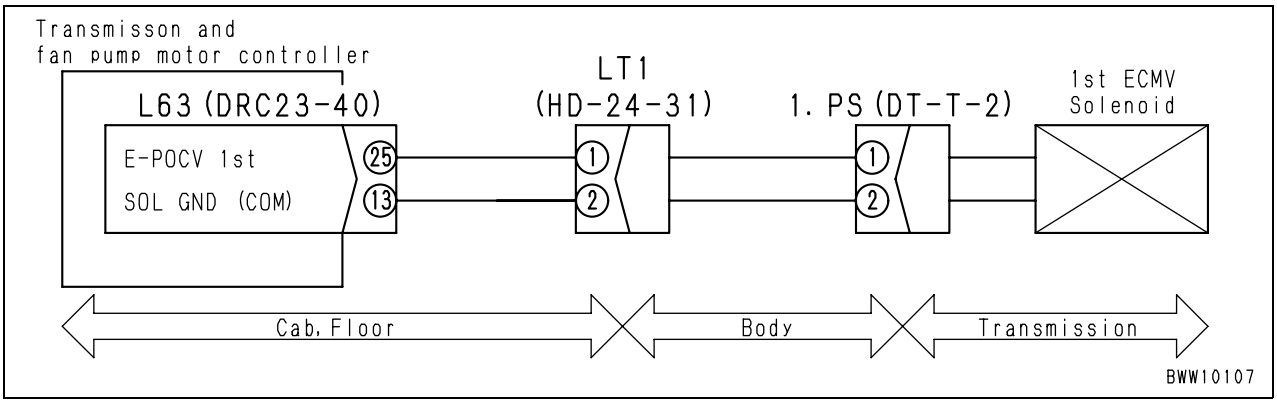


ERROR CODE [DXH4KA]

Action Code	Error code	Controller code	Trouble	1st_ECMV solenoid system discontinuity
E03	DXH4KA	TM		
Description of Trouble	• Due to discontinuity of the 1st_ECMV solenoid system, no output goes to the 1st_ECMV.			
Controller Reaction	• No action.			
Effect on Machine	• The first pass cannot be engaged. (Traveling in other passes is possible.)			
Related Information	—			

Possible Causes and Standard Values	Causes		Standard Values in Normal State and Remarks on Troubleshooting		
	1	Defective 1st_ECMV	1) Turn starting switch OFF. 2) Disconnect connector 1.PS. 3) Connect T-adapter.		
			Between 1.PS (Male) 1 ~ 2	Resistance	15 ~ 25 Ω
	2	Wiring harness discontinuity (Disconnection or defective contact)	1) Turn starting switch OFF. 2) Disconnect connectors L63 and 1.PS. 3) Connect T-adapter.		
			Wiring harness between L63 (Female) O ~ 1.PS (Female) 1	Resistance	1 Ω or below
			Wiring harness between L63 (Female) C ~ 1.PS (Female) 2	Resistance	1 Ω or below
	3	Defective transmission and fan pump motor controller	1) Turn starting switch OFF. 2) Disconnect connector L63. 3) Connect T-adapter.		
			Between L63 (Female) O ~ C	Resistance	15 ~ 25 Ω

Related circuit diagram

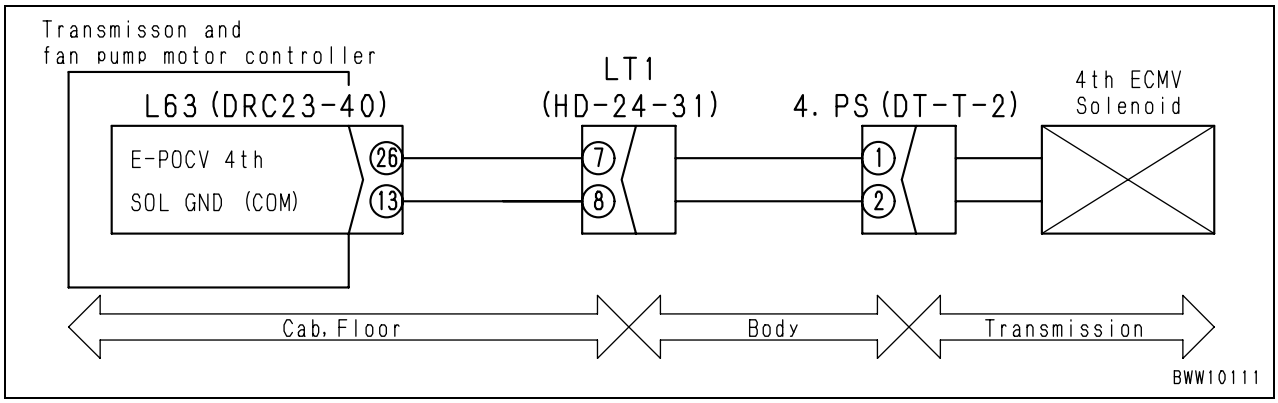


ERROR CODE [DXHHKB]

Action Code	Error Code	Controller Code	Trouble	4th ECMV solenoid system short-circuiting
E03	DXHHKB	TM		
Description of Trouble	• Due to ground fault of the 4th_ECMV solenoid system, no output goes to the 4th_ECMV			
Controller Reaction	• Turns output to the 4th_ECMV solenoid OFF.			
Effect on Machine	• The fourth pass cannot be engaged. (Traveling in other passes is possible.)			
Related Information	—			

	Causes		Standard Values in Normal State and Remarks on Troubleshooting		
Possible Causes and Standard Values	1	Defective F_ECMV	1) Turn starting switch OFF. 2) Disconnect connector 4.PS. 3) Connect T-adapter.		
			Between 4.PS (Male) 1 ~ 2	Resistance	15 ~ 25 Ω
	2	Wiring harness ground fault	1) Turn starting switch OFF. 2) Disconnect connectors L63 and 4th.PS. 3) Connect T-adapter.		
			Wiring harness between L63 (Female) P/4.PS (Female) 1 ~ body	Resistance	1 MΩ or above
	3	Defective transmission and fan pump motor controller	1) Turn starting switch OFF. 2) Disconnect connector L63. 3) Connect T-adapter.		
			Between L63 (Female) P ~ C	Resistance	15 ~ 25 Ω

Related circuit diagram



ACTION CODE [TM-5]

Action Code	Error Code	Controller Code	Trouble	Emergency steering switch (motor-driven emergency steering operation switch) signal system failure
TM-5	—	(TM)		
Description of Trouble	• Due to failure of the emergency steering switch (motor-driven emergency steering operation switch) signal system, emergency steering does not function. Or, emergency steering always functions.			
Controller Reaction	• No reaction.			
Effect on Machine	• Emergency steering does not function. Or, emergency steering always functions.			
Related Information	• Emergency steering switch input signal can be checked with the monitoring function (Code: 40906, DN-IN-14).			

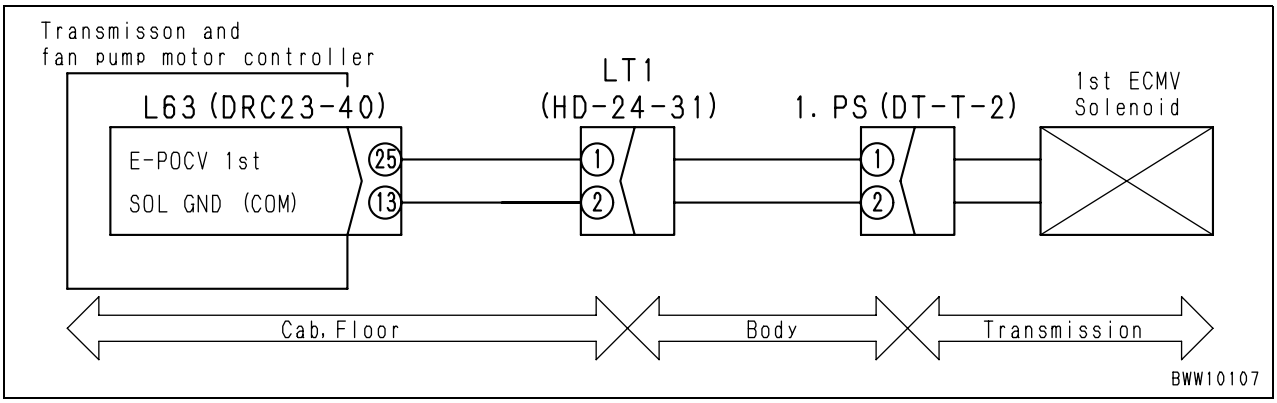
	Causes		Standard Values in Normal State and Remarks on Troubleshooting			
Possible Causes and Standard Values	1	Defective emergency steering manual switch	1) Turn starting switch OFF. 2) Disconnect connector S19. 3) Connect T-adapter.			
			Between S19 (Male) 4 ~ 3	Emergency steering switch = ON	Resistance	1 Ω or below
				Emergency steering switch = OFF	Resistance	1 MΩ or above
	2	Defective emergency steering relay (L126)	1) Turn starting switch OFF. 2) Disconnect connector L126. 3) Connect T-adapter.			
			Between L126 (Female) 3/L126 (Female) 5 ~ body		Resistance	1 MΩ or above
	3	Defective emergency steering operation relay	1) Turn starting switch OFF. 2) Disconnect connectors R15, R16 and both power lines (100sq).			
			Between relay contacts.		Resistance	1 MΩ or above
	4	Wiring harness discontinuity (Disconnection or defective contact)	1) Turn starting switch OFF. 2) Disconnect connectors L63 and S19. 3) Connect T-adapter.			
			Wiring harness between L63 (Female) S ~ S19 (Female) 1		Resistance	1 Ω or below
	5	Hot short-circuiting between harnesses (Contacting 24-V harness)	1) Turn starting switch OFF. 2) Disconnect connectors L63 and S19. 3) Connect T-adapter. 4) Turn starting switch ON.			
			Between L63 (Female) (S/S19 (Female) 1 ~ body		Voltage	1 V or below
	6	Wiring harness ground fault	1) Turn starting switch OFF. 2) Disconnect connectors L63, L105, L126 and S19. 3) Connect T-adapter.			
			Between L63 (Female) S/S19 (Female) 1 ~ body		Resistance	1 MΩ or above
	7	Wiring harness short-circuiting	1) Turn starting switch OFF. 2) Disconnect connectors L63, L126 and S19. 3) Connect T-adapter. 4) Turn starting switch ON.			
			Between L63 (Female) S/L126 (Female) 1/S19 (Female) 4 ~ body		Resistance	1 MΩ or above
			1) Turn starting switch OFF. 2) Disconnect connectors L126 and R15. 3) Connect T-adapter. 4) Turn starting switch ON.			
			Between L126 5/R15 ~ body		Resistance	1 MΩ or above
	8	Defective transmission and fan pump motor controller	1) Turn starting switch OFF. 2) Disconnect connector L63. 3) Connect T-adapter. 4) Turn starting switch ON.			
			Between L63 S ~ body	Emergency steering switch = ON	Voltage	20 - 30 V
				Other than above	Voltage	1 V or below

ACTION CODE [TM-22]

Action Code	Error Code	Controller Code	Trouble	1st ECMV solenoid system hot short-circuiting
TM-22	—	—		
Description of Trouble	• Due to hot short-circuiting of the 1st ECMV solenoid system, 1st ECMV is turned ON without shifting the gear to "1st."			
Controller Reaction	• No reaction.			
Effect on Machine	• The transmission may be damaged. • Traveling may be disabled.			
Related Information	—			

Possible Causes and Standard Values	Causes		Standard Values in Normal State and Remarks on Troubleshooting		
	1	Wiring harness hot short-circuiting	1) Turn starting switch OFF. 2) Disconnect connectors L63 and 1.PS. 3) Connect T-adapter. 4) Turn starting switch ON.		
			Between L63 (Female) O/1.PS (Female) 1 ~ body	Voltage	1 V or below
	2	Defective transmission and fan pump motor controller	1) Turn starting switch OFF. 2) Disconnect connector L63. 3) Connect T-adapter.		
			Between L63 (Female) O ~ C	Resistance	15 ~ 25 Ω

Related circuit diagram



CONNECTOR TYPES AND MOUNTING LOCATIONS

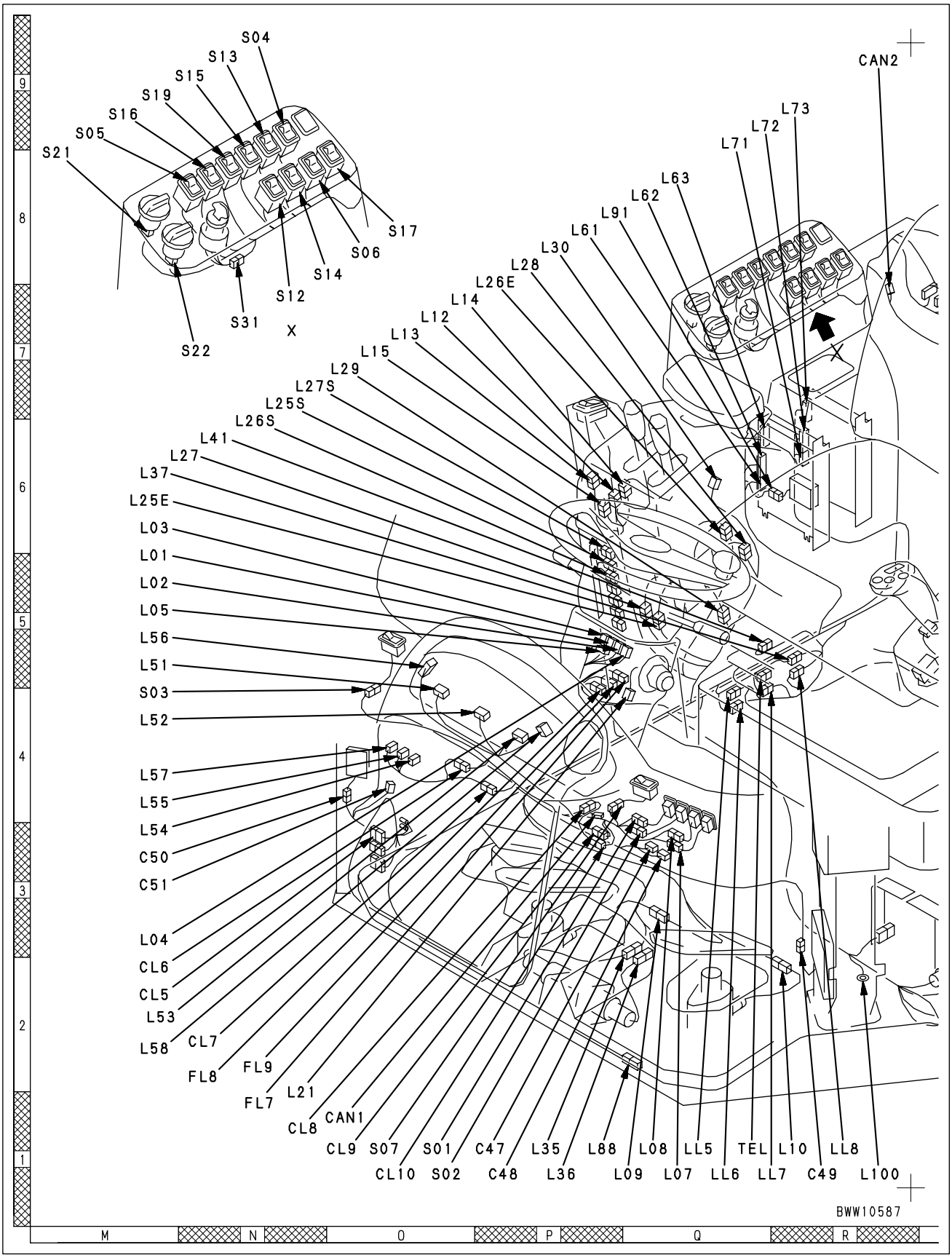
★ The address column of the table indicates each address of a connector placement diagram (diagram in three dimensions) and an electrical circuit system diagram.

★ Symbols of the circuit diagram address column of the table:

TM: Transmission control system,WRK: Work equipment control system, MON: Monitoring system, E: Electrical system.

★ The item enclosed by parentheses in the connector type column indicates the color of the connector body. (B: Black, Br: Brown, G: Green, Gr: Gray, L: Blue, W: White.

Connector No.	Connector Type	Number of Pins	Installation Name	Address	
				Layout Drawing	System Drawing
1.PS	DT-T	2	Transmission 1st clutch solenoid	j-4	TM
1.SW	DT	2	Transmission 1st clutch fill switch	j-4	TM
2.PS	DT-T	2	Transmission 2nd clutch solenoid	j-3	TM
2.SW	DT	2	Transmission 2nd clutch fill switch	j-3	TM
3.PS	DT-T	2	Transmission 3rd clutch solenoid	j-4	TM
3.SW	DT	2	Transmission 3rd clutch fill switch	j-4	TM
4.PS	DT-T	2	Transmission 4th clutch solenoid	j-5	TM
4.SW	DT	2	Transmission 4th clutch fill switch	j-5	TM
A1	M	6	Air conditioner blower motor and resistor	U-2	—
A2	SWP	6	Air conditioner air mixing servomotor	U-2	—
A3	M	2	Air conditioner thermistor	U-2	—
A4	X	2	Air conditioner air servomotor	T-9	—
A5	X	2	Air conditioner condenser switch	T-1	—
A6	Yazaki	2	Air conditioner Hi-Lo switch	T-1	—
A7	Yazaki	4	Air conditioner blower relay (Main)	W-6	—
A8	Yazaki	4	Air conditioner blower relay (Hi)	W-6	—
A9	Yazaki	4	Air conditioner blower relay (M2)	W-6	—
A10	Yazaki	4	Air conditioner blower relay (M1)	W-5	—
A11	Yazaki	4	Air conditioner condenser relay	W-5	—
A12	Yazaki	4	Air conditioner condenser Hi (1) relay	W-5	—
A13	Yazaki	4	Air conditioner condenser Hi (2) relay	W-4	—
A14	Yazaki	4	Air conditioner MAG clutch relay	W-4	—
A20	Terminal	1	Ground (Floor)	T-2	—
A21	Yazaki	2	Water temperature sensor (Vehicle with automatic air conditioner)	W-3	—
A22	Yazaki	2	Inside temperature sensor (Vehicle with automatic air conditioner)	U-2	—
A23	Yazaki	2	Outside temperature sensor (Vehicle with automatic air conditioner)	W-4	—
A24	DT-T	2	Diode (Vehicle with automatic air conditioner)	W-3	—
A25	DT-T	2	Diode (Vehicle with automatic air conditioner)	V-3	—
A26	DT-T	2	Intermediate connector (Vehicle with automatic air conditioner)	W-3	—
AL1	M	6	Intermediate connector (Air conditioner relay)	U-2	—
AL2	S (W)	12	Intermediate connector (Air conditioner relay)	V-3	—
B01	DT-T	3	Air conditioner condenser motor	A-7	—
B02	DT-T	3	Air conditioner condenser motor	B-7	—
BR1	DT-T	2	Intermediate connector (Air conditioner condenser motor)	J-2	W-6
C01	Yazaki	2	AM/FM radio	C-9	—
C02	KES0	2	Speaker (Right)	F-9	—
C03	KES0	2	Speaker (Left)	G-9	—

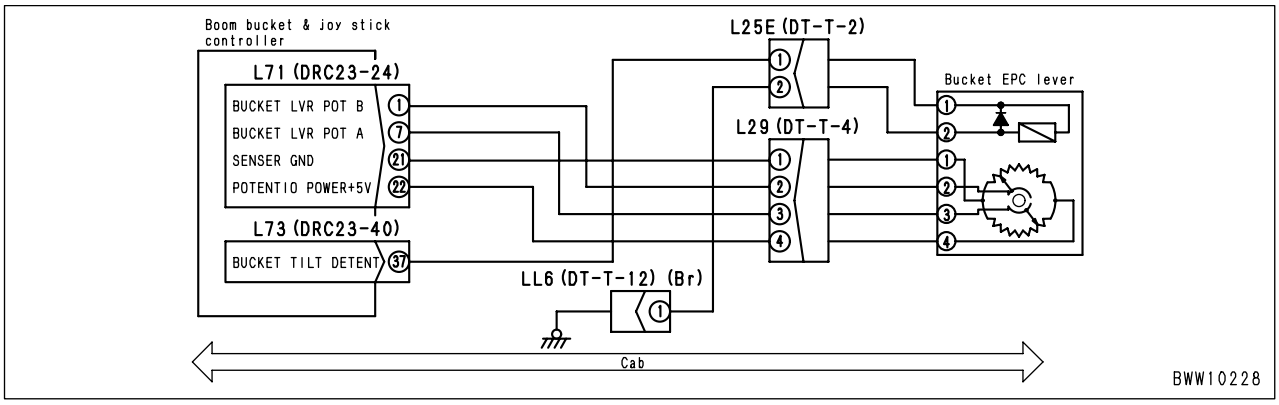

S04
S13
S15
S19
S16
S05
S21
S17
S06
S14
S12
S31
S22
X
CAN2
L73
L72
L71
L63
L62
L91
L61
L30
L28
L26E
L14
L12
L13
L15
L29
L27S
L25S
L26S
L41
L27
L37
L25E
L03
L01
L02
L05
L56
L51
S03
L52
L57
L55
L54
C50
C51
L04
CL6
CL5
L53
L58
CL7
FL8
FL9
FL7
L21
CL8
CAN1
CL9
S07
S01
C47
L35
L88
L08
LL5
TEL
L10
LL8
CL10
S02
C48
L36
L09
L07
LL6
LL7
C49
L100
BWW10587
M
N
O
P
Q
R

ERROR CODE [DK5BKA]

Action Code	Error Code	Controller Code	Trouble	Defective bucket EPC lever potentiometer system (Main circuit discontinuity or ground fault)
E03	DK5BKA	WRK		
Description Of Trouble	• The bucket EPC lever potentiometer signal system is disconnected (Main circuit discontinuity or ground fault).			
Controller Reaction	• Turns off the bucket EPC solenoid output and the bucket magnet detent output.			
Effect on Machine	• The bucket cannot be operated.			
Related Information	• Can be checked with the monitoring function (Code: 42002).			

	Causes		Standard Value in Normal State and Remarks on Troubleshooting		
Possible Causes and Standard Values	1	Wiring harness discontinuity (Disconnection or defective contact)	1) Turn starting switch OFF. 2) Disconnect connectors L71 and L29. 3) Connect T-adapter.		
			Wiring harness between L71 (Female) ⑦ ~ L29 (Female) ③	Resistance	1 Ω and below
	2	Wiring harness ground fault	1) Turn starting switch OFF. 2) Disconnect connectors L71 and L29. 3) Connect T-adapter.		
			Between L71 (Female) ⑦ ~ body	Resistance	1 MΩ and above
	3	Defective potentiometer	1) Turn starting switch OFF. 2) Disconnect connector L29. 3) Connect T-adapter. 4) Turn starting switch ON. 5) Set lever to neutral position.		
			Between L29 ③ ~ ①	Voltage	2.4 ~ 2.6 V
	4	Defective work equipment controller	1) Turn starting switch OFF. 2) Disconnect connectors L71. 3) Connect T-adapter. 4) Turn starting switch ON. 5) Set lever to neutral position.		
			Between L71 ⑦ ~ ㉑	Voltage	2.4 ~ 2.6 V

Related circuit diagram

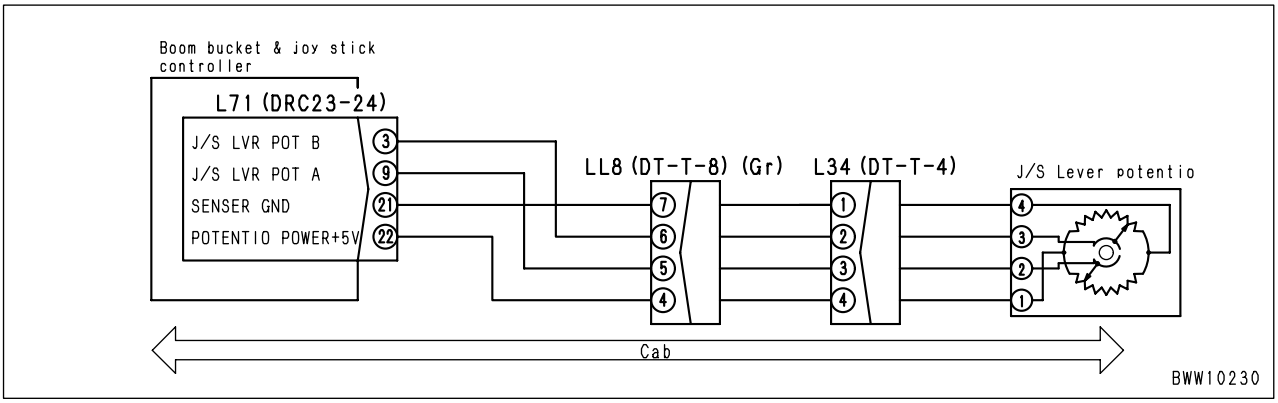


ERROR CODE [DK5FKY]

Action Code	Error Code	Controller Code	Trouble	Defective joystick steering EPC lever potentiometer system (Main circuit shorted)
E03	DK5FKY	WRK		
Description Of Trouble	• The electric power supply harness is contacted to the joystick steering EPC lever magnet detent output.			
Controller Reaction	• Turns off the joystick steering EPC solenoid output and the joystick steering EPC lever magnet detent output.			
Effect on Machine	• The steering cannot be operated by the joystick lever.			
Related Information	• Can be checked with the monitor system function (Codes: 42004).			

	Causes		Standard Value in Normal State and Remarks on Troubleshooting		
Possible Causes and Standard Values	1	Wiring harness discontinuity (Disconnection or defective contact)	1) Turn starting switch OFF. 2) Disconnect connectors L71 and L34. 3) Connect T-adapter.		
			Wiring harness between L71 (Female) ⑨ ~ L34 (Female) ③	Resistance	1 Ω and below
	2	Wiring harness hot short circuit (Electric power supply harness is contacted)	1) Turn starting switch OFF. 2) Disconnect connectors L71 and L34. 3) Connect T-adapter. 4) Turn starting switch ON.		
			Wiring harness between L71 (Female) ⑨/ L34 (Female) ③ ~ body	Voltage	1 V and below
	3	Defective work equipment controller	1) Turn starting switch OFF. 2) Disconnect connector L71. 3) Connect T-adapter. 4) Turn starting switch ON. 5) Set lever to neutral position.		
			Between L71 ⑨ ~ ㉑	Voltage	2.4 ~ 2.6 V

Related circuit diagram

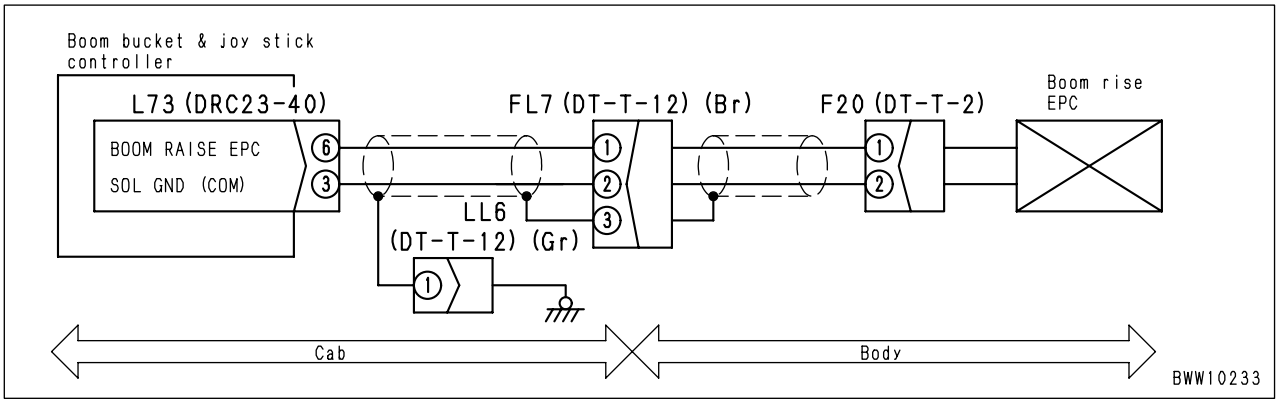


ERROR CODE [DW4PKA]

Action Code	Error Code	Controller Code	Trouble	Disconnected lift arm RAISE EPC solenoid system
E03	DW4PKA	WRK		
Description Of Trouble	• The lift arm RAISE EPC solenoid system disconnection prevents output to the lift arm RAISE EPC solenoid.			
Controller Reaction	• Stops the output to the lift arm RAISE EPC solenoid. • Stops the output to the lift arm RAISE detent.			
Effect on Machine	• The lift arm cannot raise.			
Related Information	• Can be checked with the monitoring function (Code: 41900).			

	Causes		Standard Value in Normal State and Remarks on Troubleshooting		
Possible Causes and Standard Values	1	Defective lift arm RAISE EPC solenoid	1) Turn starting switch OFF. 2) Disconnect connector F20. 3) Connect T-adapter.		
			Between F20 (Male) ① ~ ②	Resistance	9 ~ 10.2 Ω
			Between F20 (Male) ① ~ body	Resistance	1 MΩ and above
	2	Wiring harness discontinuity (Disconnection or defective contact)	1) Turn starting switch OFF. 2) Disconnect connectors L73 and F20. 3) Connect T-adapter.		
			Wiring harness between L73 (Female) ⑥ ~ F20 (Female) ①	Resistance	1 Ω and below
			Wiring harness between L73 (Female) ③ ~ F20 (Female) ②	Resistance	1 Ω and below
	3	Defective work equipment controller	1) Turn starting switch OFF. 2) Disconnect connector L73. 3) Connect T-adapter. 4) Turn starting switch ON.		
			Between L73 ⑥ ~ ③	Resistance	9 ~ 10.2 Ω

Related circuit diagram

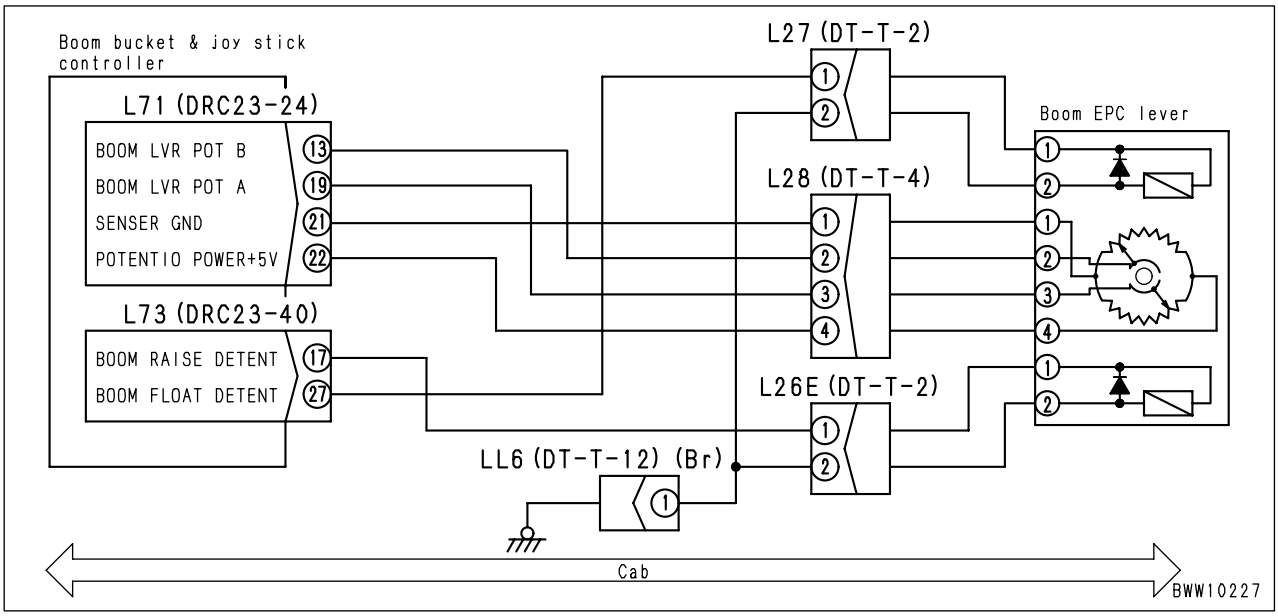


ERROR CODE [DWN6KB]

Action Code	Error Code	Controller Code	Trouble	Lift arm RAISE magnet detent system ground fault
E01	DWN6KB	WRK		
Description Of Trouble	• The detent cannot be controlled due to the lift arm RAISE magnet detent system ground fault.			
Controller Reaction	• Stops output to the magnet detent solenoid. • Stops the remote RAISE function. • Stops the output of the remote positioner RAISE lamp.			
Effect on Machine	• The detent does not work but normal operation is possible.			
Related Information	• Can be checked with the monitoring function (Code: 40916).			

Possible Causes and Standard Values	Causes		Standard Value in Normal State and Remarks on Troubleshooting		
	1	Defective lift arm RAISE magnet detent	1) Turn starting switch OFF. 2) Disconnect connector L26E. 3) Connect T-adapter.		
			Between L26E (Male) ① ~ ②	Resistance	35 ~ 45 Ω
			Wiring harness between L26E (Male) ① ~ body	Resistance	1 MΩ and above
	2	Wiring harness ground fault (Disconnection or defective contact)	1) Turn starting switch OFF. 2) Disconnect connectors L73 and L26E. 3) Connect T-adapter.		
			Wiring harness between L73 (Female) ⑰,L26E (Female) ① ~ body	Resistance	1 MΩ and above
	3	Defective work equipment controller	1) Turn starting switch OFF. 2) Disconnect connector L73. 3) Connect T-adapter.		
			Between L73 (Female) ⑰ ~ body	Resistance	35 ~ 45 Ω

Related circuit diagram

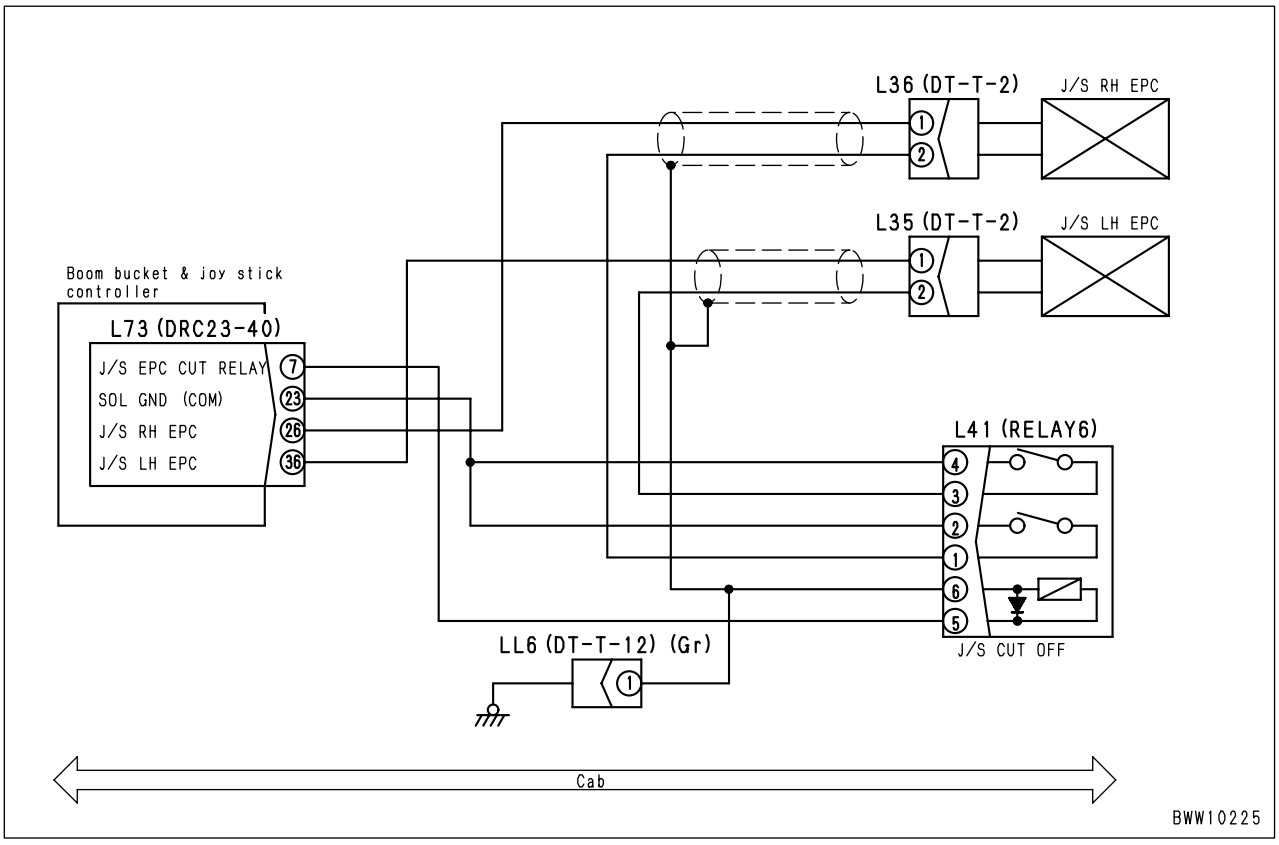


ERROR CODE: [DXHMKA]

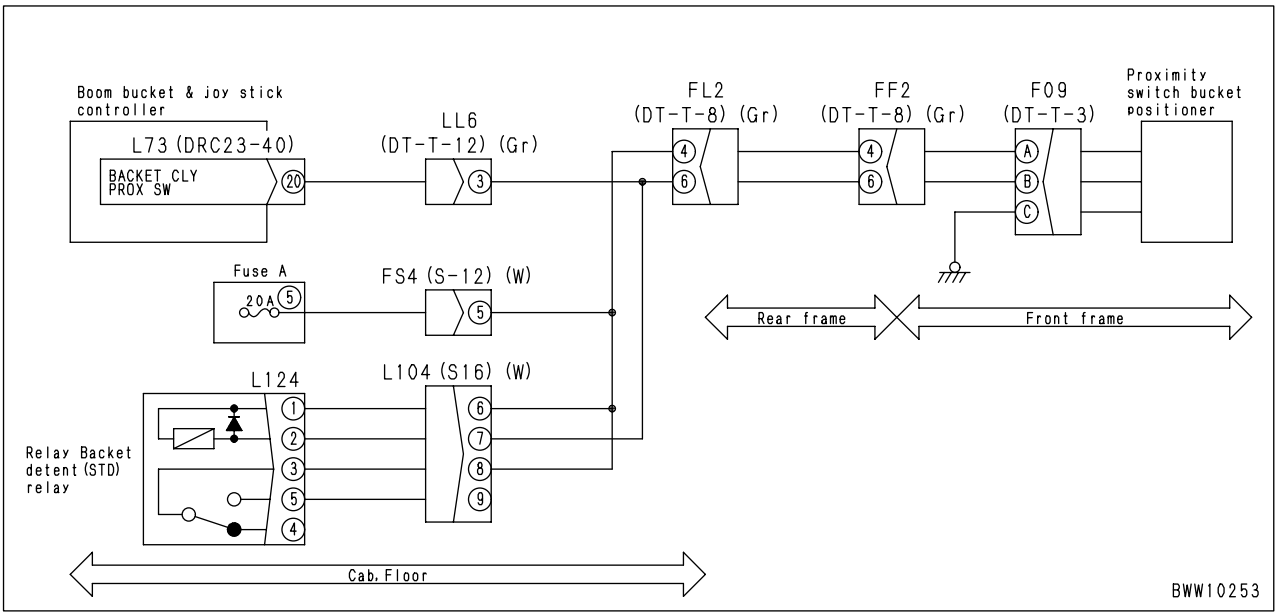
Action Code	Error Code	Controller Code	Trouble	Joystick steering left-hand EPC solenoid system disconnection
E03	DXHMKA	WRK		
Description of Trouble	• Joystick steering left-hand EPC solenoid system disconnection prevents output to the joystick steering left-hand EPC solenoid.			
Controller Reaction	• Stops output to the joystick steering left-hand EPC solenoid (Both sides).			
Effect on Machine	• Stops output to the joystick steering left-hand EPC solenoid (Both sides). • Stops output to the joystick solenoid cutoff relay.			
Related Information	—			

	Causes		Standard Value in Normal State and Remarks on Troubleshooting		
Possible Causes and Standard Values	1	Defective joystick steering left-hand EPC solenoid	1) Turn starting switch OFF. 2) Disconnect connector L35. 3) Connect T-adapter.		
			Between L35 (Male) ① ~ ②	Resistance	10 ~ 15 Ω
			Between L35 (Male) ① ~ body	Resistance	1 MΩ or more
	2	Wiring harness discontinuity (Disconnection or defective contact)	1) Turn starting switch OFF. 2) Disconnect connectors L73 and L35. 3) Connect T-adapter.		
			Wiring harness between L73 (Female) ㊱ ~ L35 (Female) ①	Resistance	1 Ω or below
			Wiring harness between L35 (Female) ② ~ L41 (Female) ③	Resistance	1 Ω or below
			Wiring harness between L35 (Female) ② ~ body	Resistance	1 Ω or below
			Wiring harness between L73 (Female) ㉓ ~ L41 (Female) ④	Resistance	1 Ω or below
	3	Defective work equipment controller	1) Turn starting switch OFF. 2) Disconnect connector L73. 3) Connect T-adapter.		
			Between L73 (Female) ㊱ ~ L41 (Female) ③	Resistance	10 ~ 15 Ω

Related circuit diagram



Related circuit diagram

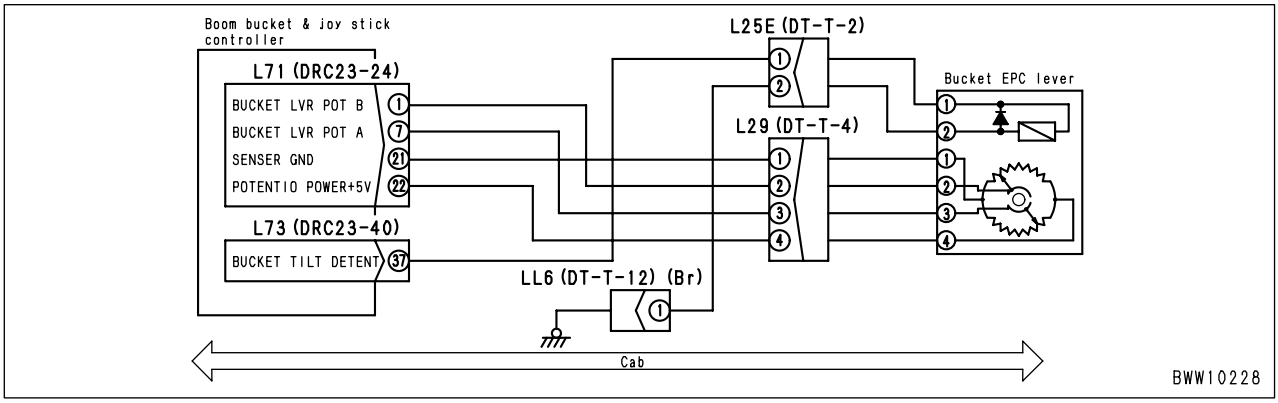


ACTION CODE: [WRK-15]

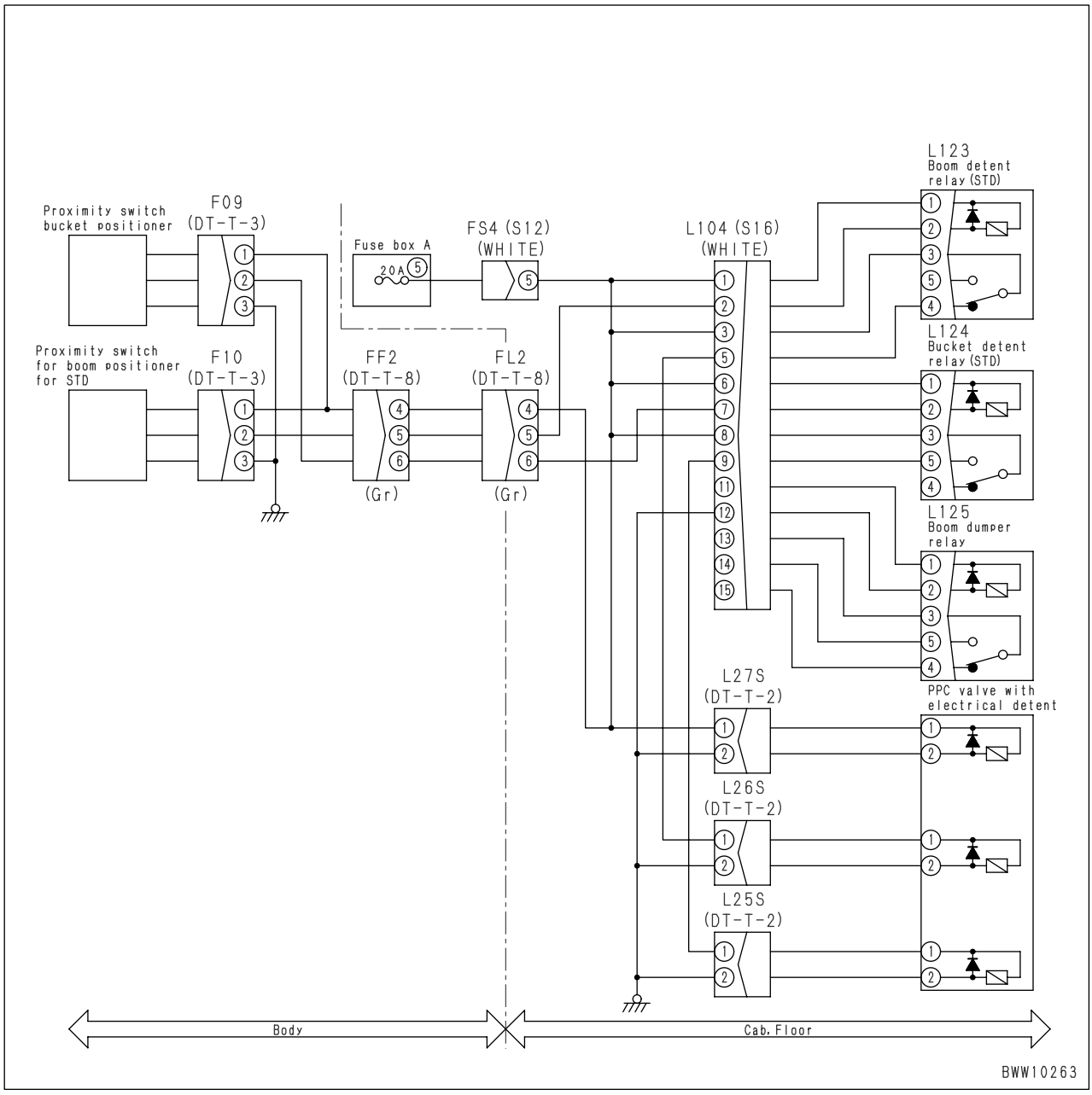
Action Code	Error Code	Controller Code	Trouble	Hot short-circuited bucket TILT magnet detent output system
WRK-15	—	(WRK)		
Description of Trouble	• TILT detent cannot be cancelled due to hot short-circuited bucket TILT magnet detent output system.			
Controller Reaction	• No reaction.			
Effect on Machine	• TILT detent left turned ON. • Normal operation is possible excluding automatic cancel of detent.			
Related Information	—			

Possible Causes and Standard Values	Causes		Standard Value in Normal State and Remarks on Troubleshooting		
	1	Short-circuited wiring harness	1) Turn starting switch OFF. 2) Disconnect connectors L73 and L25. 3) Connect T-adapter. 4) Turn starting switch ON.		
			Between L73 (Female) ㊲, L25 (Female) ① ~ body	Voltage	1 V and below
	2	Defective work equipment controller	1) Turn starting switch OFF. 2) Disconnect connector L73. 3) Connect T-adapter.		
			Between L73 (Female) ㊲ ~ body	Resistance	35 ~ 45 Ω

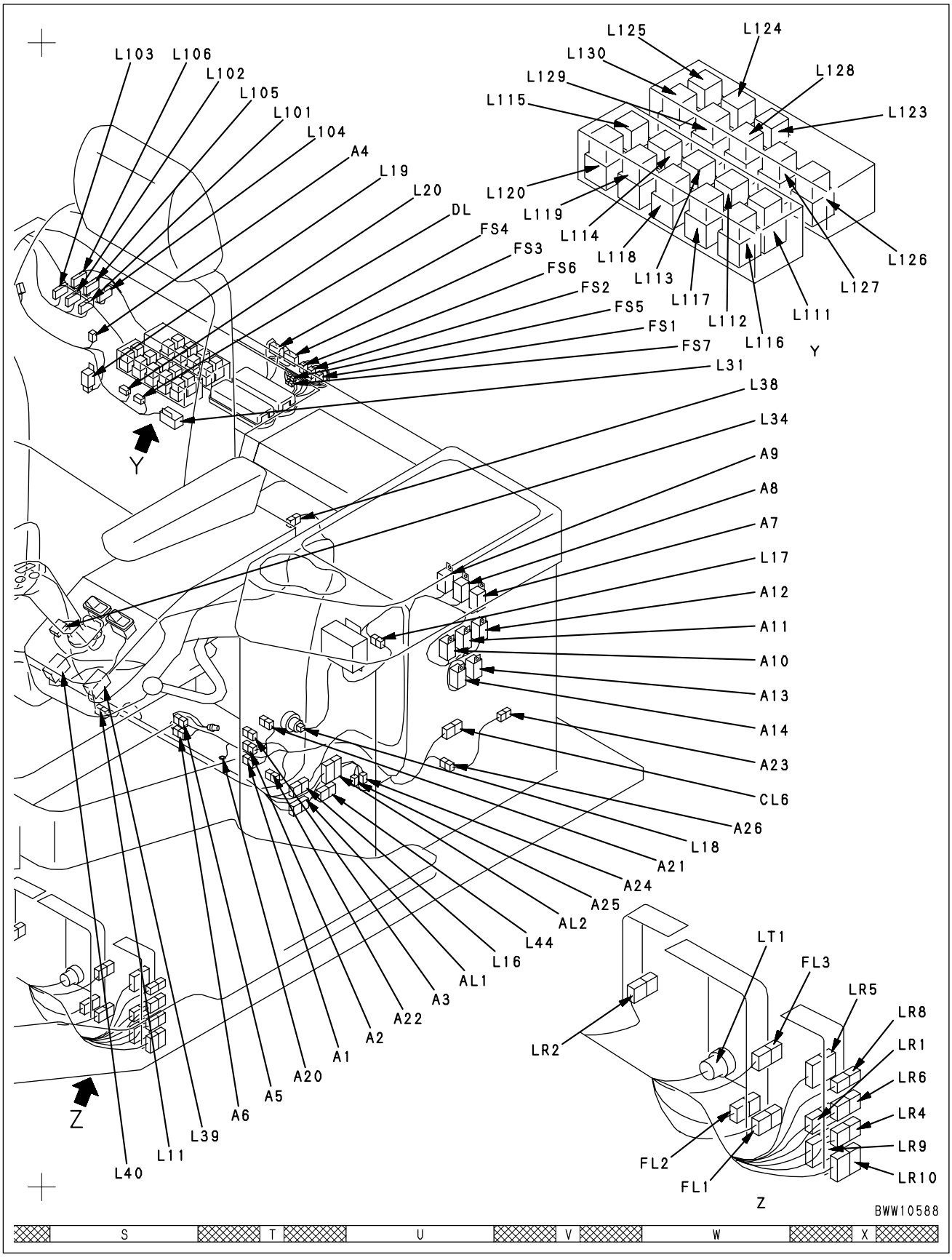
Related circuit diagram



Related circuit diagram



Connector No.	Connector Type	Number of Pins	Installation Name	Address	
				Layout Drawing	System Drawing
C04	M	2	Front working lamp (Right)	C-8	E-8
C05	M	2	Front working lamp (Left)	B-8	E-8
C07	KES1	2	Room lamp	C-8	—
C08	M	1	Door switch (Right) (Room Lamp)	C-8	—
C09	M	1	Door switch (Left) (Room lamp)	B-8	—
C10	—	2	Cigarette lighter	A-7	—
C12	M	6	Front wiper motor	A-7	—
C15	M	4	Rear wiper motor	F-9	—
C17	Kyoritsu ES	4	Warning lamp switch	D-9	—
C18	Plug	1	Warning lamp (Beacon)	C-8	—
C19	DT-T	6	Glass heater switch	D-9	—
C29	M	1	Glass heater ON	E-9	—
C33	H	1	Rear glass heater	E-9	—
C35	H	1	Rear glass heater	G-9	—
C38	M	1	Connector (Electric power take-off)	—	—
C39	Terminal	1	Ground (Radio)	C-9	E-7
C40	Terminal	1	Ground (Cab)	C-8	—
C41	M	1	Warning lamp	F-9	—
C43	Yazaki	6	Side wiper switch	E-9	—
C44	M	4	Right side wiper motor	A-7	—
C45	M	4	Left side wiper motor	A-7	—
C46	M	1	Intermediate connector (Power source)	D-9	—
C47	Terminal	1	Ground (Cab)	F-9	—
C47	AMP172021-2	16	A/C control AMP	P-1	—
C47	AMP040	20	A/C control AMP (Vehicle with automatic air conditioner)	D-9	—
C48	AMP172245-2	12	A/C control AMP	P-1	—
C48	AMP040	16	A/C control AMP (Vehicle with automatic air conditioner)	D-9	—
C49	SWP	8	Left Servomotor	R-1	—
C50	SWP	8	Right Servomotor	M-3	—
C51	Yazaki	2	Diode (Vehicle with automatic air conditioner)	M-3	—
CAN1	DT-T	3	Resistor	O-1	B-2
CAN2	DT-T	3	Resistor	R-9	B-2
CL1	S	8	Intermediate connector	A-4	E-7
CL2	S (L)	12	Intermediate connector (Wiper motor)	A-4	—
CL5	S (W)	16	Intermediate connector (Vehicle with automatic air conditioner)	M-2	—
CL6	M	6	Intermediate connector (Vehicle with automatic air conditioner)	M-2	—
CL6	DT-T (G)	12	Intermediate connector (Monitor panel controller)	W-6	C-4
CL7	DT-T (Gr)	12	Intermediate connector (Monitor panel controller)	N-2	C-5
CL8	DT-T (Gr)	12	Intermediate connector (Monitor panel controller)	N-1	C-5
CL9	DT-T (Gr)	8	Intermediate connector (Monitor panel controller)	O-1	C-6
CL10	DT-T (Gr)	8	Intermediate connector (Monitor panel controller)	O-1	C-3
CN55	DT-T	2	Intermediate connector (Backup buzzer)	K-9	V-8
COMBI	M	3	Front combination lamp (Right)	A-6	W-3
COMBI	M	3	Front combination lamp (Left)	E-1	W-2
DIODE	DT-T	2	Diode (Parking brake solenoid)	e-6	TM
DL	DT-T (Gr)	12	Connector (S-NET)	U-8	K-5

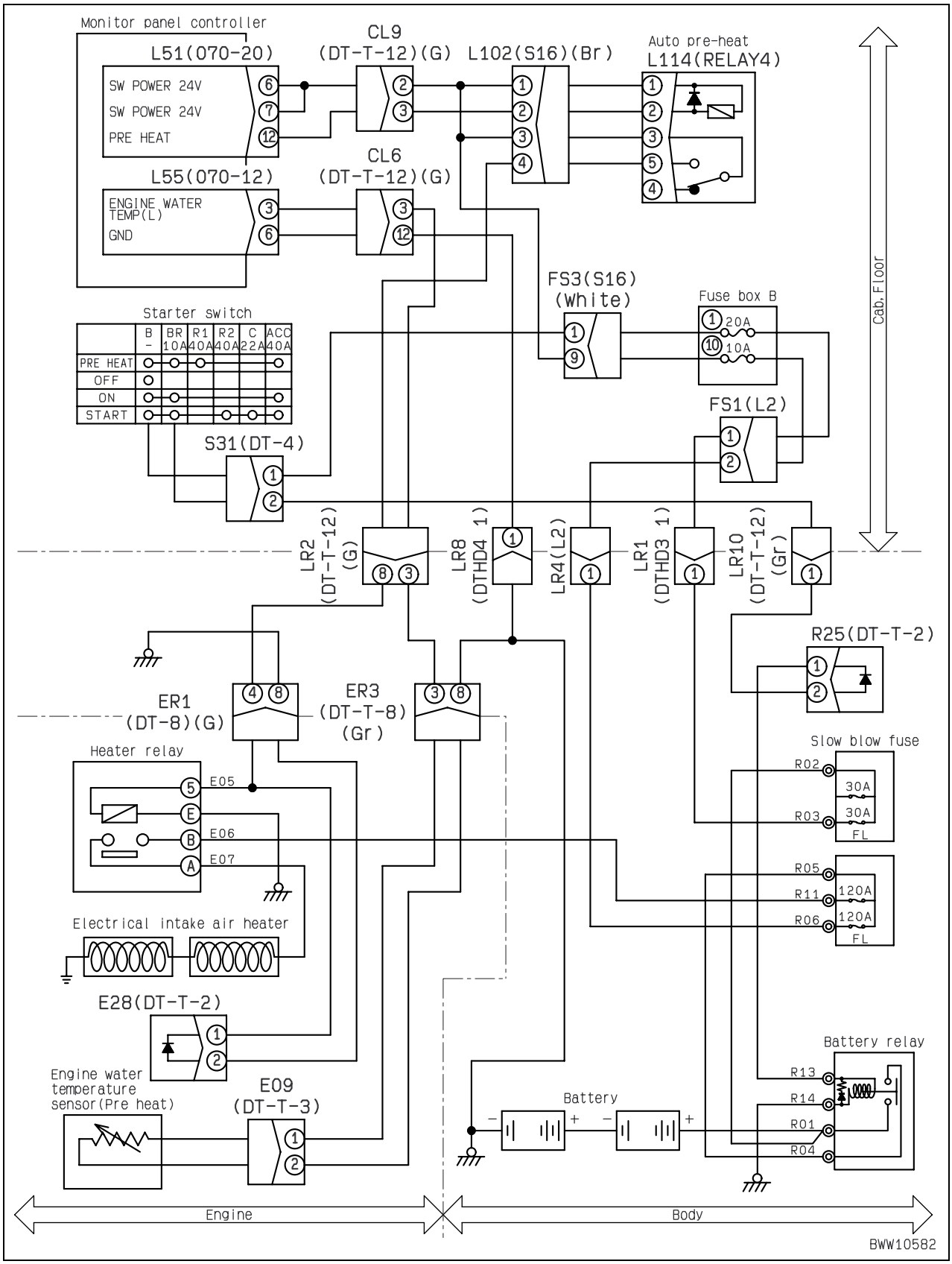

L103
L106
L102
L105
L101
L104
A4
L19
L20
DL
FS4
FS3
FS6
FS2
FS5
FS1
FS7
L31
L38
L34
A9
A8
A7
L17
A12
A11
A10
A13
A14
A23
CL6
A26
L18
A21
A24
A25
AL2
L44
L16
AL1
A3
A22
A2
A1
A20
A5
A6
L39
L11
L40
Y
Z
L125
L124
L130
L128
L129
L123
L115
L120
L119
L114
L118
L113
L117
L112
L116
L111
L127
L126
Y
LT1
FL3
LR5
LR8
LR2
LR1
LR6
LR4
LR9
LR10
FL2
FL1
Z
BWW10588
S
T
U
V
W
X

ERROR CODE [AA1ANX]

Action Code	Error Code	Controller Code	Trouble	Air cleaner 1 clogged
E01	AA1ANX	MON		
Description of Trouble	• The clogging sensor circuit for air cleaner is opened.			
Controller Reaction	• Triggers an alarm.			
Effect on Machine	• Air cleaner 1 is clogged (The engine may be damaged).			
Related Information	• Can be checked with the monitoring function (Code: 40902, D-IN-20).			

	Causes		Standard Value in Normal State and Remarks on Troubleshooting			
Possible Causes and Standard Values	1	Clogged air cleaner	—			
	2	Defective dust indicator 1	1) Turn starting switch OFF. 2) Disconnect connector E33.			
			Short-circuit between E33 (Female) ① ~ ②	This failure code (AA1ANX) issued	Dust indicator is not defective.	
				This failure code (AA1ANX) not issued	Dust indicator is defective (Air cleaner clogged).	
	3	Defective dust indicator relay	1) Turn starting switch OFF. 2) Disconnect connector E33. 3) Connect t-adapter.			
			Between L112 (Male) ① ~ ②		Resistance	200 - 400 Ω
			1) Turn starting switch OFF. 2) Replace relay. 3) Start engine.			
			This failure code (AA1ANX) issued	Dust indicator relay 1 is not defective.		
			This failure code (AA1ANX) not issued	Dust indicator relay 1 is defective.		
	4	Wiring harness discontinuity (Disconnection or defective contact)	1) Turn starting switch OFF. 2) Disconnect connectors L53 and L112. 3) Connect t-adapter.			
			Wiring harness between L112 (Female) ③ ~ body		Resistance	1 Ω and below
			Wiring harness between L53 (Female) ③ ~ L112 (Female) ④		Resistance	1 Ω and below
	5	Wiring harness ground fault	1) Turn starting switch OFF. 2) Disconnect connectors L112 and E33. 3) Connect t-adapter.			
			Between L112 (Female) (2)/E33 (Female) ① ~ body		Resistance	1 MΩ and above
	6	Wiring harness hot-shorted incorrectly	1) Turn starting switch OFF. 2) Disconnect connectors L51 and L112. 3) Connect t-adapter. 4) Turn starting switch ON.			
			Between L51 (Female) ⑥/L112 (Female) ① ~ body		Voltage	1 V or below
	7	Defective monitor panel	1) Turn starting switch OFF. 2) Disconnect connectors L51 and L53. 3) Insert t-adapter. 4) Start engine.			
			Between L53 (Female) ③ ~ body	Dust indicator is not defective (Air cleaner not clogged)	Voltage	20 ~ 30 V
				Dust indicator is defective (Air cleaner clogged)	Voltage	1 V or below

Related circuit diagram

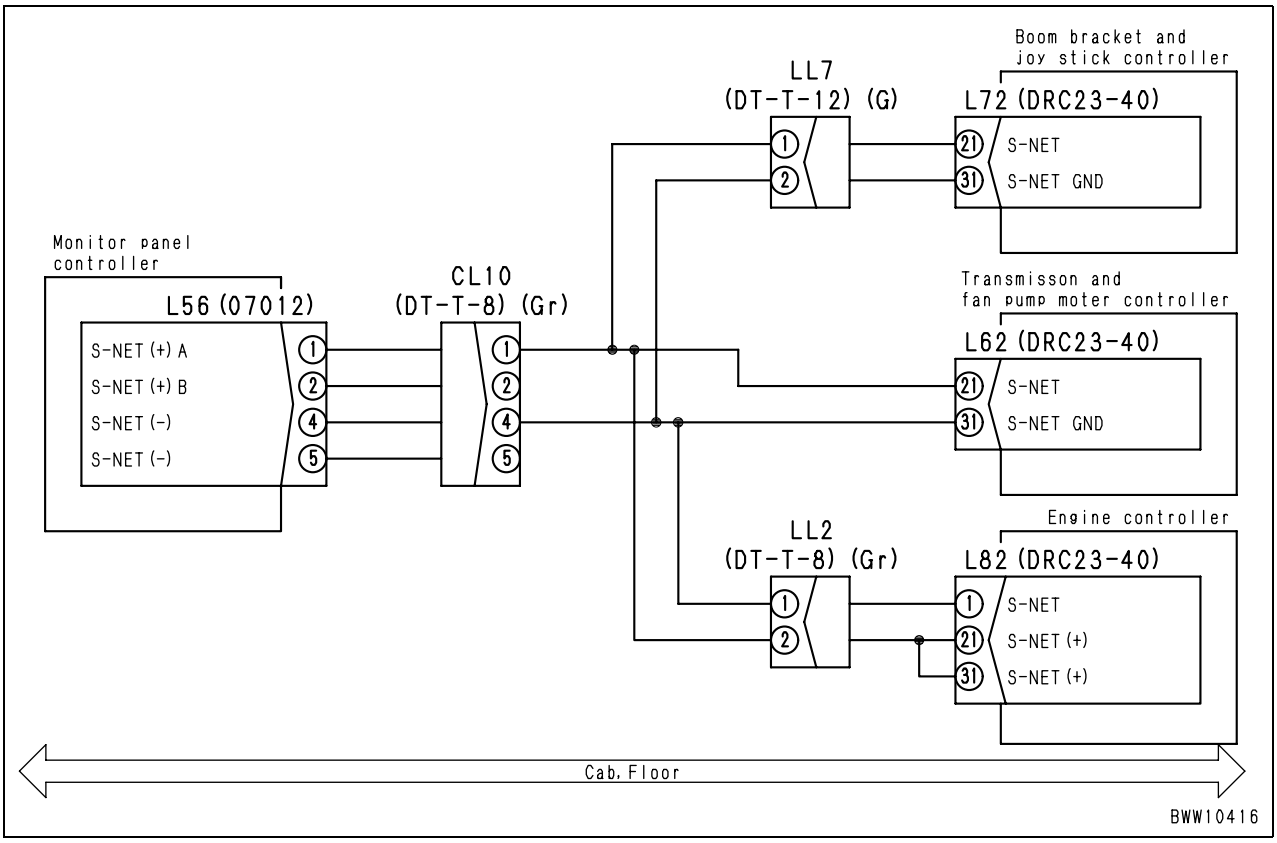


ERROR CODE [DAQSKR]

Action Code	Error Code	Controller Code	Trouble	Abnormal S-NET Communication (between monitor panel and transmission controller).
E03	DAQSKR	MON		
Description of Trouble	• The S-NET (+) signal line between the monitor panel and the transmission controller is disconnected, short-circuited with the ground or hot short-circuited.			
Controller Reaction	• Alarm sounds.			
Effect on Machine	• The monitor does not display normally. (The shift indicator, machine speed/engine speed are not displayed.)			
Related Information	—			

Possible Causes and Standard Values		Causes	Standard Value in Normal State and Remarks on Troubleshooting		
	1	Disconnection of harness (disconnection, defective contact)	1) Starting switch OFF 2) Disconnect the connectors L56 and L62. 3) Connect a T-adaptor.		
			Harness betweenL56 (female) ① ~ L62 (female) ㉑.	Resistance	1 Ω and below
	2	Ground fault of harness	1) Starting switch OFF. 2) Disconnect L56 and L62. 3) Insert a T-adaptor.		
			Among L56 (female) ①, L62 (female) ㉑ ~ body.	Resistance	1 MΩ and above
	3	Hot short-circuit of harness	1) Starting switch OFF. 2) Disconnect L56, L62 (L72), L80 and L07. 3) Connect a T-adaptor. 4) Starting switch ON.		
			Among L56 (female) ①, L62 (female) ㉑ ~ body.	Voltage	1 V and below
	4	Defective monitor panel	1) Starting switch OFF. 2) Disconnect the connector L56 and L62. 3) Insert a T-adaptor. 4) Starting switch ON.		
			Among L56 ①, ② ~ body.	Voltage	4 ~ 8 V
			Among L56 ①, ② ~ ④, ⑤	Voltage	4 ~ 8 V

Related circuit diagram

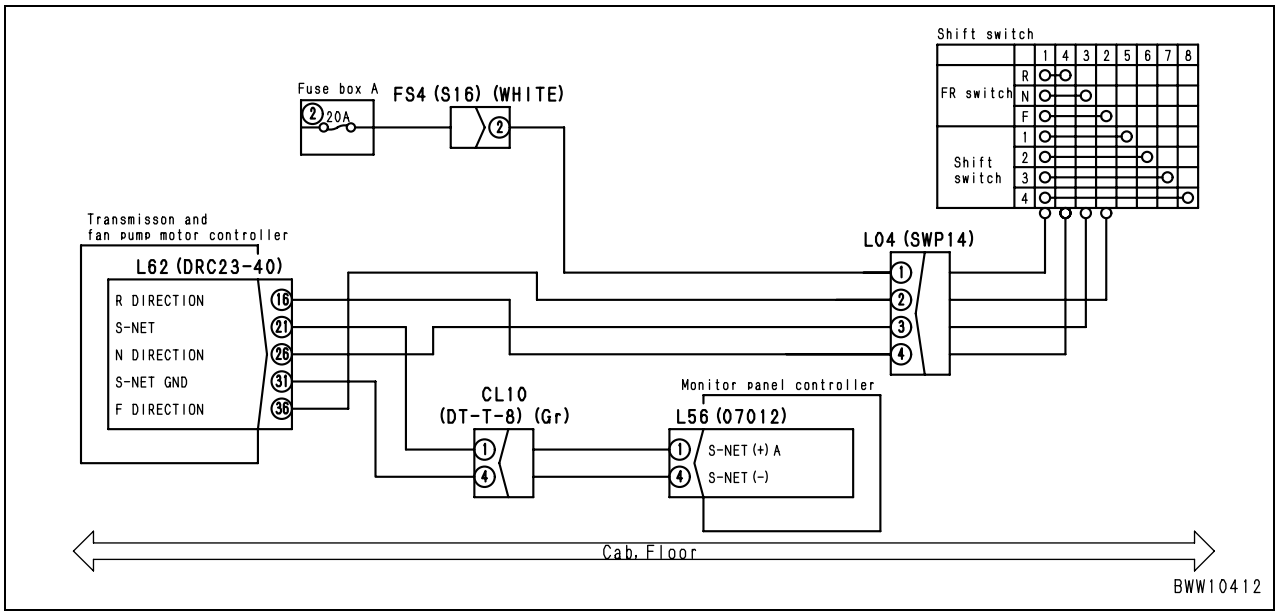


ERROR CODE [DDK6KM]

Action Code	Error Code	Controller Code	Trouble	Caution: FNR (Forward-reverse) lever switch is in N (Neutral)
E00	DDK6KM	MON		
Description of Trouble	• The FNR (Forward-reverse) lever is set to F or R when the lever is selected and during engine stop.			
Controller Reaction	• Activates an alarm.			
Effect on Machine	• The FNR (Forward-reverse) lever is held in the neutral position (N) until it is returned to that position.			
Related Information	• Can be verified with the monitoring function (Code: 40907, D-IN-20, 21, 22).			

Possible Causes and Standard Values		Causes	Standard Value in Normal State and Remarks on Troubleshooting
	1	Faulty forward-reverse lever position (Other than N)	Return forward-reverse lever to the neutral position (N).
	2	See DAQSKR or DB9QSKR (S-NET failure) or DDK6KA (N signal failure).	

Related circuit diagram

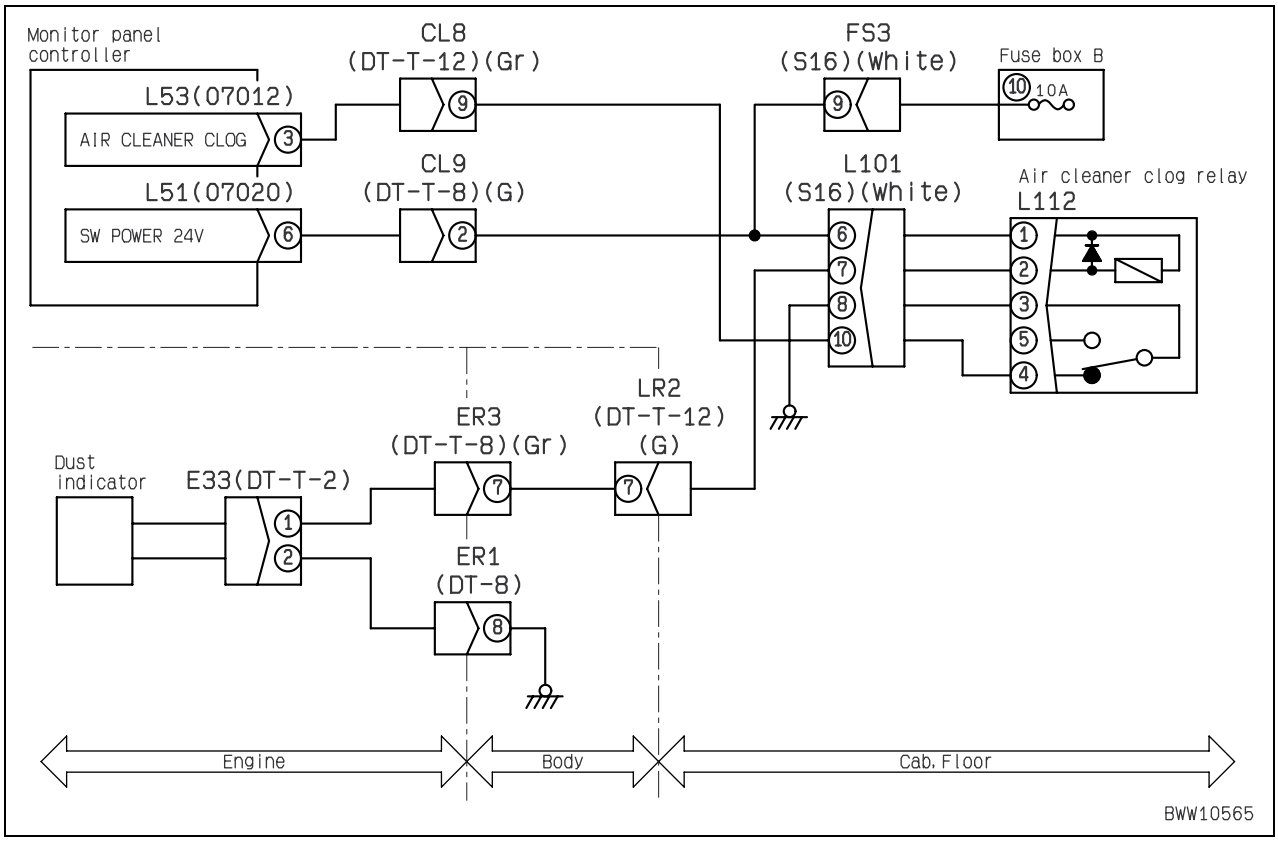


ERROR CODE [DHPDKX]

Action Code	Error Code	Controller Code	Trouble	Head pressure sensor failure
E01	DHPDKX	MON		
Description of Trouble	• The head pressure sensor input voltage is less than 0.5 V.			
Controller Reaction	• Activates an alarm and disables load display.			
Effect on Machine	• Activates an alarm and disables load display.			
Related Information	• The head pressure signal (0.01 Mpa) can be verified with the monitoring function (Code: 40500).			

	Causes		Standard Value in Normal State and Remarks on Troubleshooting			
Possible Causes and Standard Values	1	Faulty head pressure sensor (Head side)	1) Turn starting switch OFF. 2) Disconnect connector F16. 3) Insert T-adapter. 4) Turn starting switch ON.			
			Between F17 ② ~ ①		Voltage	20 ~ 30 V
			Between F17 ② ~ ①	When machine is in operation	Voltage	0.7 ~ 5.3 V
				When pressure is released to air	Voltage	0.5 ~ 1.5 V
	2	Wiring harness discontinuity (Broken wires or loose connections)	1) Turn starting switch OFF. 2) Disconnect connectors L51, L55, F16 and F17. 3) Connect T-adapter.			
			Between L55 (Female) ④ ~ F17 (Female) ③		Resistance	1 Ω and below
			Between L51 (Female) ⑮ ~ F17 (Female) ②		Resistance	1 Ω and below
	3	Wiring harness ground fault	1) Turn starting switch OFF. 2) Disconnect connectors L55, F16, F17. 3) Connect T-adapter.			
			Between L55 (Female) ④, F17 (Female) ③ ~ body		Resistance	1 MΩ and above
	4	Defective monitor panel	1) Turn starting switch OFF. 2) Disconnect connectors L51 and F17. 3) Insert T-adapter. 4) Turn starting switch ON.			
			Between L51 ⑮ ~ body		Voltage	20 ~ 30 V
			Between L55 ④ ~ body	When machine is in operation	Voltage	0.7 ~ 5.3 V
				When pressure is released to air	Voltage	0.5 ~ 1.5 V

Related circuit diagram

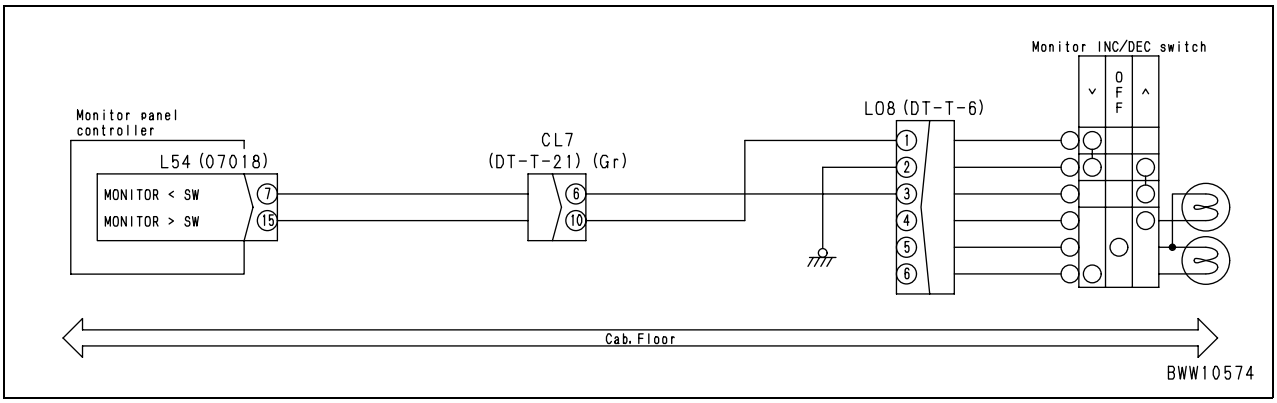


ACTION CODE [MON-15]

Action Code	Error Code	Controller Code	Trouble	Input fault in monitor panel mode switch 2 [>] (Panel SW4)
MON-15	—	(MON)		
Description of Trouble	• The input circuit of the monitor panel mode switch 2 [>] (Panel SW4)is in the CLOSE state continuously for 1 minute or more.			
Controller Reaction	• No reaction.			
Effect on Machine	• The monitor operation is impossible.			
Related Information	• The input signal (0/1) of the monitor panel mode switch 2 [>] (Panel SW4) can be checked with the monitoring function (Code: 40904, D-IN-37). • Since the [>] switch is abnormal, the monitoring function may not be implemented.			

	Causes		Standard Value in Normal State and Remarks on Troubleshooting			
Possible Causes and Standard Values	1	Defective monitor panel mode switch 2 [>]	1) Turn starting switch OFF. 2) Disconnect connector L08. 3) Connect T-adapter.			
			Between L08 (Female) ① ~ ②	When the monitor panel mode switch 2 [>] is ON	Resistance	1 Ω and below
				Others	Resistance	1 MΩ and above
	2	Harness disconnection (Disconnection or defective contact)	1) Turn starting switch OFF. 2) Disconnect connectors L54 and L08. 3) Connect T-adapter.			
			Between L54 (Female) ⑮ ~ L08 (Female) ①		Resistance	1 Ω and below
	3	Harness hot short fault	1) Turn starting switch OFF. 2) Disconnect connectors L54 and L08. 3) Connect T-adapter. 4.) Turn starting switch ON.			
			Between L54 (Female) ⑮, L08 (Female) ① ~ body		Voltage	1 V and below
	4	Defective monitor panel	1) Turn starting switch OFF. 2) Disconnect connector L54. 3) Connect T-adapter. 4.) Turn starting switch ON.			
			Between L54 (Female) ⑮ ~ body	When the monitor panel mode switch 2 [>] is ON	Voltage	1 V and below
				Others	Voltage	20 ~ 30 V

Related circuit diagram



H-3 a. The travel speed is slow, the thrusting force is weak, the uphill traveling power is weak, and the gear is not shifted

Ask the operator about the following:

- Has an abnormality occurred suddenly?
  → Breakage of related equipment
  Did any abnormal noise occur at the time and where?
- Have any abnormal signs come to occur gradually?
  → Wear of related equipment, defective seal

Check of abnormality

- Execute digging and measure traveling speeds on a level ground and on a slope to check whether the abnormality actually occurs or is a matter of operator's sense

Inspection before diagnosis

- Is any failure code of the electrical system displayed on the machine monitor?
- Are the transmission oil level and the oil type appropriate?
- Haven't the transmission filter and strainer been clogged?
- Is any external oil leak found on the mating faces of pipes and valves around the torque converter and the transmission?
- Isn't the wheel brake or the parking brake being dragged?
- Are the tire air pressure and the tread shape appropriate?
- Is the operating method correct?

Note: When the inspection result was "Engine Degradation," proceed to Engine System Troubleshooting (S Mode).

No.	Diagnosis \ Remedy		Cause: Torque Converter Charging Pump a Clogging of strainer	b Air intake on pump suction side	c The charging pump is defective	Torque Converter Oil Cooler d Clogging of oil cooler and pipe (After torque converter outlet)	e Breakage of oil cooler and pipe (After torque converter outlet)	Torque Converter f Oil leak inside torque converter	g Internal breakage of torque converter	Main Relief Valve h Defective operation of torque converter relief valve	i Drop of main relief valve set pressure	j Clogging of last change filter	ECMV k Defective operation of relevant ECMV	Transmission l Internal breakage of transmission	m Defective seal of relevant clutch piston	n Defective seal of relevant clutch shaft	o Clogging of breather	Parking Brake p Defective seal of parking brake piston	Others q Defective seal of work equipment and steering system hydraulic pump shaft (Mixing of hydraulic oil in transmission case)	r Engine degradation
			C X	Δ X	X	Δ X	X	Δ X	Δ X	Δ X	Δ X	X	※	Δ X	※	X	C X	X	Δ X	Note
1	Any abnormality occurs at all gear speeds		○	○	○	○	○	○	○	○	○	○		○			○	○	○	○
2	Any abnormality occurs at specific gear speeds												○	○	○	○				
3	When the transmission oil temperature is low, the charging pump or the transmission filter causes any abnormal noise		○	○																
4	The torque converter oil temperature rises abnormally high		○	○	○	○	○	○	○	○				○			○		○	
5	The transmission oil level rises or falls					○	○										○		○	○
6	Metal (Aluminum, copper, iron, etc.) powers are adhered to the transmission filter or the strainer				○				○					○						
7	The engine low idling and high idling speeds are measured to be abnormal								○					○						○
8	When the stall speed of the torque converter is measured	The speed is high	○	○	○		○	○	○	○		○		○			○			
9		The speed is low																		○
10	When the ECMV output (Clutch) oil pressure is measured	The oil pressure drops as the temperature rises			○										○	○		○		
11		The oil pressure is low at all gear speeds	○	○	○						○	○		○			○	○		○
12		The oil pressure is low at specific gear speeds											○	○	○	○				
13		The oil pressure does not become stable as the gauge touches the oil	○	○																
14	When the torque converter relief (Inlet) oil pressure is measured, the oil pressure is low. (Nos. 11~13 are normal.)							○	○	○										
15	When the oil pressure at the torque converter outlet is measured, the oil pressure is low. (No. 14 is normal.)						○													

※ Proceed to the paragraph of "Defective clutch and ECMV Specifying Method (Check by Failure Code)."

H-10 Steering is heavy

Checking for abnormalities

- Is the steering difficult to turn?
  Yes = Go to H-8 or H-9
- Measure the operating effort and turning speed, and check the STANDARD
- VALUE TABLE to see if they are abnormal.

Ask the operator the following questions.

- Did the problem suddenly start?
  Yes = Related equipment broken
- Was there there previously any symptom, such as heavy steering?
  Yes = Wear of related equipment, defective seal

Checks before troubleshooting

- Is the oil level in the hydraulic tank correct?
  Is the type of oil correct?
- Is the tire inflation pressure correct?

No.	Problems \ Remedy		Cause: Orbit-roll (a) Δ / X	Stop valve (b) Δ / X	S/V (c) Δ / X	Others (d) Δ / X
			Defective Orbit-roll	Defective actuation of stop valve	Defective actuation of steering spool	Interference of steering wheel or steering shaft
1	Steering is heavy when turned in both directions (left and right)		○		○	○
2	Steering is heavy when turned in one directions (left or right)			○		
3	Steering is heavy even when joint between steering shaft and Orbit-roll is disconnected					○
4	When steering relief pressure is measured	Oil pressure is low in both directions (left and right)	○		○	
5		Oil pressure is low in one directions (left and right)		○		
6	When Orbit-roll output pressure is measured, pressure is found to be low		○			○

H-24 The bucket comes to operate slowly in he midst of tilting-back

Inspection before diagnosis

- Deformation of bucket cylinder in appearance

Cause

- Expansion of bucket cylinder tube or damage inside
  For other abnormal phenomena during bucket operation, see "H-23. The bucket moves slowly or the tilting-back force is insufficient."

H-25 The bucket cylinder cannot hold down the bucket

See "H-23. The bucket moves slowly or the tilting-back force is insufficient."

Inspection before diagnosis

- Is the stroke of the bucket control lever appropriate?

Cause

- Defective seat of suction valve on the bucket cylinder rod side of work equipment valve
- Oil leak from bucket cylinder piston seal

H-26 Hydraulic drifts of the bucket occur often

Ask the operator about the following:

- Have hydraulic drifts come to occur often suddenly? → Wastes pinched in valve or damage of parts
- Have hydraulic drifts come to occur often gradually? → Wear of parts

Inspection before diagnosis

- Is the bucket spool at the neutral position? → Seizure of link bushing or the spool detent is defective

Check of Abnormality

- Refer to the criterion value table and check if the hydraulic drift of the bucket occurs often practically

Cause

- Oil leak in bucket cylinder
- Improper adhesion of safety valve (With suction valve) on the bottom side
- Improper oil tight of bucket spool

Connector No.	Connector Type	Number of Pins	Installation Name	Address	
				Layout Drawing	System Drawing
L105	S (W)	12	Intermediate connector (Relay sub-unit)	T-9	—
L106	S (W)	16	Intermediate connector (Relay sub-unit)	T-9	K-7
L111	—	5	Turn signal lamp and hazard relay	X-7	I-9
L112	—	5	Air cleaner clogging relay	W-7	I-9
L113	—	5	Steering selector relay	W-8	J-9
L114	—	5	Automatic preheater relay	V-8	J-9
L115	—	5	Engine controller power supply relay	V-9	—
L116	—	4	Neutral safety relay	W-7	J-9
L117	—	4	Backup lamp relay	W-7	K-9
L118	—	4	Stop lamp relay	V-8	K-9
L119	—	4	Horn relay	V-8	K-9
L120	—	4	Parking brake relay	V-8	—
L123	—	5	Lift arm detent relay (STD)	X-9	—
L124	—	5	Bucket detent relay (STD)	X-9	—
L125	—	5	Lift arm damper relay	V-9	—
L126	—	4	Emergency steering relay	X-8	—
L127	—	4	Front working lamp relay	X-7	K-9
L128	—	4	Rear working lamp relay	X-9	K-9
L129	—	4	Rear glass heater relay	V-9	—
L130	—	4	Transmission pump cut-off relay	V-9	—
LC.PS	DT-T	2	Torque converter lockup solenoid (OPT)	j-5	TM
LC.SW	DT	2	Torque converter lockup fill switch (OPT)	j-5	TM
LL5	DT	3	Intermediate connector (Vehicle with joystick)	Q-1	WRK
LL6	DT-T (Gr)	12	Intermediate connector (Vehicle with joystick)	Q-1	WRK
LL7	DT-T (G)	12	Intermediate connector (Vehicle with joystick)	Q-1	K-5
LL8	DT-T (Gr)	8	Intermediate connector (Joystick switch)	R-1	WRK
LR1	DTHD#12	1	Intermediate connector (Slow-blow fuse)	—	E
LR2	DT-T (G)	12	Intermediate connector (Engine)	—	K-4
LR4	L	2	Intermediate connector (Slow-blow fuse)	—	TM
LR5	DT-T	6	Intermediate connector (Auto grease controller)	—	K-1
LR6	L	2	Intermediate connector (Ground)	—	K-1
LR8	DTHD#8	1	Intermediate connector (Ground)	—	K-2
LR9	DT-T (G)	12	Intermediate connector (Steering and brake oil pressure switch)	—	K-2
LR10	DT-T (Gr)	12	Intermediate connector	—	K-3
LT1	HD-24	31	Intermediate connector (Transmission)	e-3	K-4
PB.PS	DT-T	2	Parking brake solenoid	i-2	TM
PB.SW	DT-T	2	Parking brake indicate switch	i-2	P-8
R.PS	DT-T	2	Transmission R clutch solenoid	j-6	TM
R.SW	DT	2	Transmission R clutch fill switch	j-6	TM
R01	Terminal	1	Battery relay	J-2	X-6
R02	Terminal	1	Slow-blow fuse	L-2	E
R03	Terminal	1	Slow-blow fuse	L-2	E
R04	Terminal	1	Battery relay	L-1	X-6
R05	Terminal	1	Slow-blow fuse	K-2	X-7
R06	Terminal	1	Slow-blow fuse	K-2	E
R09	Terminal	1	Slow-blow fuse	K-2	E

ACTION CODE: [E-4]

Action Code	Error Code	Controller Code	Trouble	The engine power modes cannot be selected.
E-4	—	—		
Description of Trouble	The engine power mode system is out of order, and the power modes cannot be selected.			
Controller Reaction	—			
Effect on Machine	The engine power modes cannot be selected.			
Related Information	—			

	Causes		Standard Value in Normal State and Remarks on Troubleshooting			
Possible Causes and Standard Values	1	Defective power mode selector switch	1) Starting switch OFF. 2) Disconnect the connector S21. 3) Connect a T-adapter. ★ Solid part check			
			Between S01 (male) ① and ④	In the economy mode	Resistance	1 MΩ and above
				In the power mode	Resistance	1 Ω and below
	2	Defective power mode selector relay	1) Starting switch OFF. 2) Replace L115 with any other relay. 3) Starting switch "ON."			
			It returned to normal.			The power mode selector relay is out of order.
			It does not return to normal.			The power mode selector relay is normal.
	3	Disconnection of harness	1) Starting switch OFF. 2) Disconnect the connectors S21, L102, L88, L61 and FS33. 3) Connect a T-adapter.			
			Harness between S21 (female) ④, L61 (female) ⑥ and L102 (female) ⑦		Resistance	1 Ω and below
			Harness between S21 (female) ① and machine body		Resistance	1 Ω and below
			Harness between L102 (female) ⑨ and L88 (female) ⑤		Resistance	1 Ω and below
			★ In the above three cases, the power mode cannot be selected.			
			Harness between FS3 (female) ⑤ and L88 (female) ④, L102 (female) ⑥		Resistance	1 Ω and below
			Harness between L88 (female) ③ and L102 (female) ⑩		Resistance	1 Ω and below
			★ In the above two cases, the economy mode cannot be selected.			
			Harness between L88 (female) ⑧ and machine body		Resistance	1 Ω and below
			Harness between L88 (female) ⑦ and L102 (female) ⑧		Resistance	1 Ω and below
			★ In the above two cases, the economy mode cannot be changed to the power mode, and the power mode cannot be changed to the economy mode.			
	4	Ground fault of harness	1) Starting switch OFF. 2) Disconnect the connectors S21, L102 and L61. 3) Connect a T-adapter.			
			Among S21 (female) ④, L61 (female) ⑥, L102 (female) ⑦ and machine body		Resistance	1 MΩ and above
			Among L88 (female) ③, L102 (female) ⑩ and machine body		Resistance	1 MΩ and above
			★ In the above two cases, the economy mode cannot be selected.			
			Among FS3 (female) ⑤, L88 (female) ④, L102 (female) ⑥ and machine body		Resistance	1 MΩ and above
			★ In the above case, the fuse B-⑥ will be blown.			
			Among L88 (female) ⑦, L102 (female) ⑧ and machine body		Resistance	1 MΩ and above
			★ In the above two cases, the economy mode cannot be changed to the power mode, and the power mode cannot be changed to the economy mode.			

Action Code	Error Code	Controller Code	Trouble	The front wiper does not function
E-9	—	—		

Possible Causes and Standard Values	Causes		Standard Value in Normal State and Remarks on Troubleshooting		
	4	Harness disconnection or ground fault ★ Fuse A-H blows in ground fault case.	1) Turn starting switch OFF. 2) Disconnect connectors L21, L31, and C12. 3) Connect T-adapter.		
			Harness between L21 (Female) ② ~ L31 (Female) ④	Resistance	1 Ω and below
			Between L21 (Female) ②, L31 (Female) ④ ~ body	Resistance	1 MΩ and above
			Harness between L21 (Female) ③ ~ L31 (Female) ⑤	Resistance	1 Ω and below
			Between L21 (Female) ③, L31 (Female) ⑤ ~ body	Resistance	1 MΩ and above
			Harness between L21 (Female) ⑤ ~ C12 (Female) ②	Resistance	1 Ω and below
			Between L21 (Female) ⑤, C12 (Female) ② ~ body	Resistance	1 MΩ and above
			Harness between L21 (Female) ④ ~ C12 (Female) ①	Resistance	1 Ω and below
			Between L21 (Female) ④, C12 (Female) ① ~ body	Resistance	1 MΩ and above
			Harness between L31 (Female) ⑥ ~ C12 (Female) ⑤	Resistance	1 Ω and below
			Between L31 (Female) ⑥, C12 (Female) ⑤~ body	Resistance	1 MΩ and above
	5	Harness disconnection or ground fault ★ Fuse A-⑦ blows in ground fault case.	1) Turn starting switch OFF. 2) Disconnect connectors FS4, L21, C12, C15, C43, C44, and C45. 3) Connect T-adapter		
			Harness between L21 (Female) ⑦ ~ FS4 (Female) ⑦	Resistance	1 Ω and below
			Between L21 (Female) ⑦, FS4 (Female) ⑦ ~ body	Resistance	1 MΩ and above

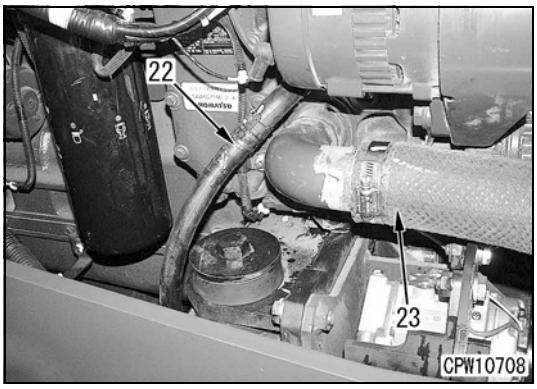
Action Code	Error Code	Controller Code	Trouble	The headlamp (Hi beam) does not light on
E-14	—	—		

Possible Causes and Standard Values	Causes		Standard Value in Normal State and Remarks on Troubleshooting		
	3	Harness disconnection or ground fault ★ Fuses A-1, A-12, and A-13 blow at occurrence of a ground fault.	Harness between L02 (Female) ③ ~ right HEAD (Female)	Resistance	1 Ω and below
			Between L02 (Female) ③ ~ right HEAD (Female) harness ~ body	Resistance	1 MΩ and above
			Harness between L02 (Female) ③ ~ left HEAD (Female)	Resistance	1 Ω and below
			Between L02 (Female) ③ ~ left HEAD (Female) harness ~ body	Resistance	1 MΩ and above
			Harness between FS5 (Male) ④ ~ ⑤ (Including fuse A-13)	Resistance	1 Ω and below
			Between FS5 (Male) ④ ~ ⑤ harness ~ body	Resistance	1 MΩ and above
			Harness between FS5 (Male) ④ ~ ⑤ (Including fuse A-12)	Resistance	1 Ω and below
			Between FS5 (Male) ④ ~ ⑤ harness ~ body	Resistance	1 MΩ and above
			Between L02 (Female) ⑥ ~ body	Resistance	1 Ω and below

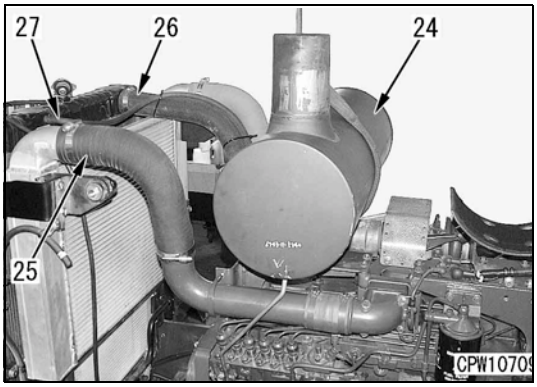
Related circuit diagram (See item E-13.)

CONTENTS

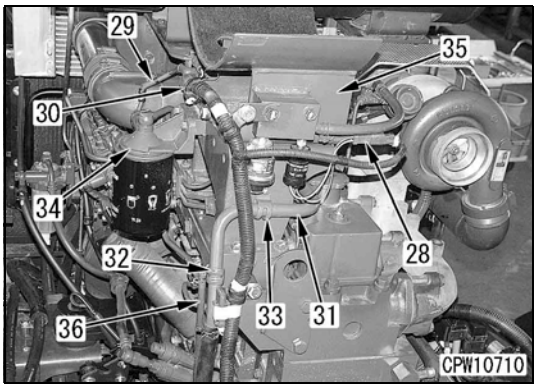
7. Disconnect the car heater hose (22) and remove the clamp.
8. Disconnect the radiator outlet hose (23).

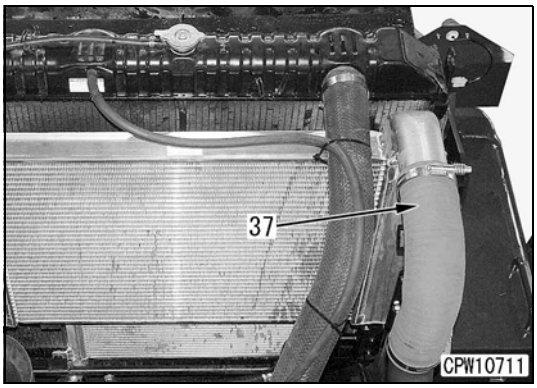


9. Lift and remove the muffler assembly (24).
   kg Muffler assembly: **36 kg**
10. Disconnect the aftercooler outlet hose (25).
11. Disconnect the radiator inlet hose (26).
12. Disconnect the aeration hose (27).



13. Air cleaner bracket
    1) Remove the dust indicator connector (28).
    2) Disconnect the ground wiring harness (29) and also remove the heater replay (30).
    3) Disconnect the breather hose (31) from the head cover, remove the clamps (32) and (33) and bring it to the left side of the engine.
    4) Remove the fuel filter (34) from the bracket.
    5) Remove the air cleaner bracket (35).
14. Disconnect the spill hose (36).
15. Disconnect the turbo outlet hose (37).



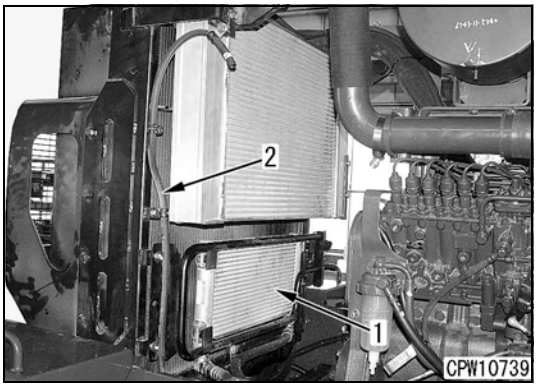


Radiator and fan motor assembly

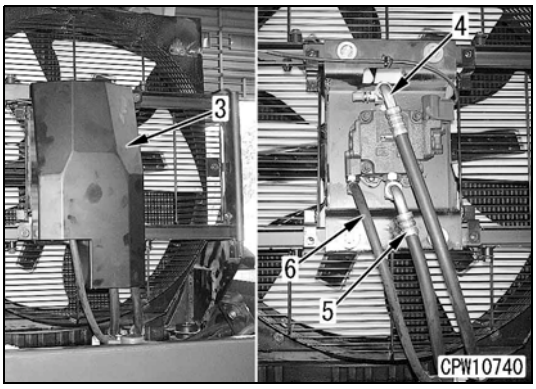
Removal

1. Drain engine coolant.
2. Engine hood assembly

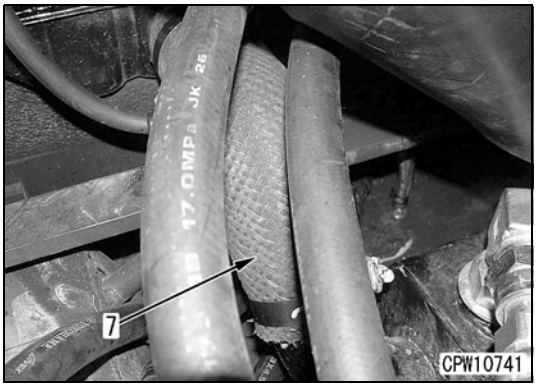
   See Paragraph 2 of "Removal of Cylinder Head Assembly" and remove the engine hood assembly.
3. Remove the lock and the hinge mounting bolt, remove the hydraulic oil cooler assembly (1) and bring it to the engine side.
4. Disconnect the fuel tank air bleeding hose (2).

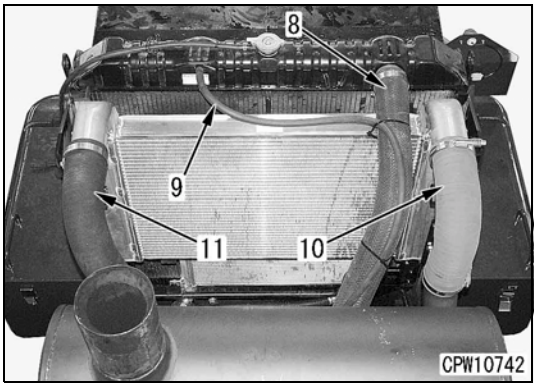


5. Remove the cover (3).
6. Disconnect the hydraulic hoses (4), (5), and (6) from the motor. ※1



7. Disconnect the radiator outlet hose (7) on the torque converter cooler side.
8. Disconnect the radiator inlet hose (8) and the aeration hose (9).
9. Disconnect the aftercooler inlet hose (10) and the outlet hose (11).





Fan and fan motor assembly

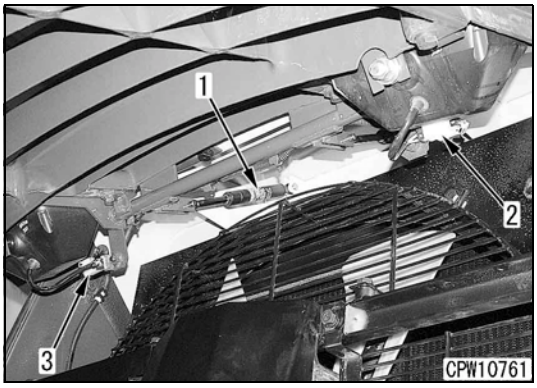
Removal

Disconnect the battery (-) terminal in advance.

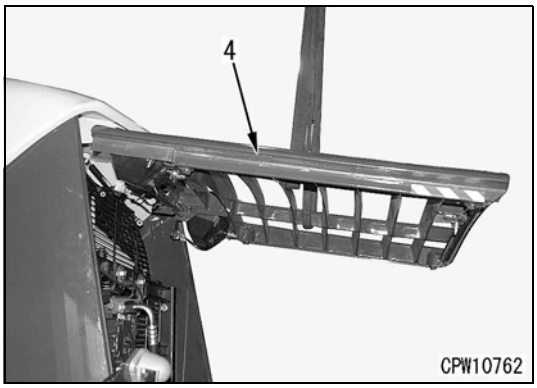
1. Grille

   1) Open the grille and sling it. Then, remove the right and left dampers (1).

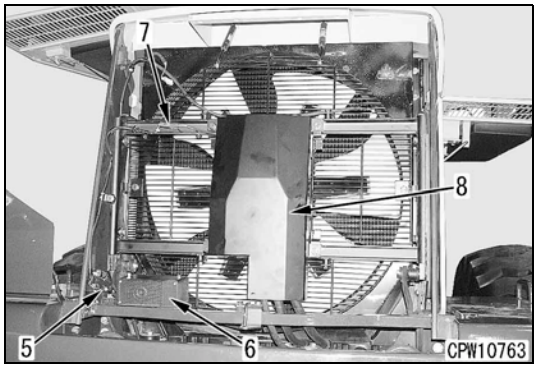
   2) Remove the connectors (2) and (3) of the working lamp and then remove the wiring harness clamp.



   3) Remove 4 pieces of the mounting bolt and then remove the grille (4).



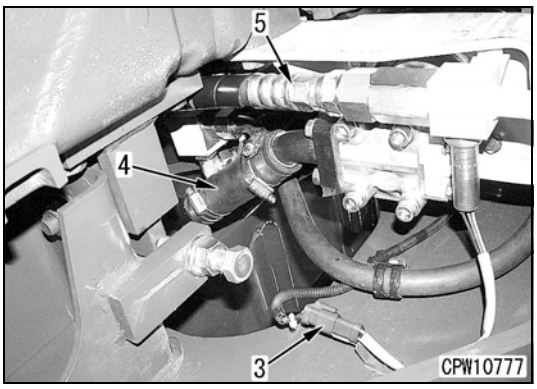
2. Remove the connector (5) and then remove the backup buzzer (6).
3. Remove the connector (7) of the fan motor solenoid.
4. Remove the motor cover (8).



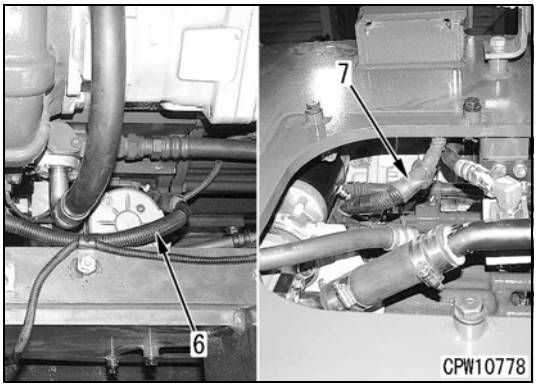
8. Wiring and piping of emergency steering pump

   1) Disconnect the connector (3).

   2) Disconnect the pump inlet hose (4) and the outlet hose (5).



   3) Disconnect the motor wiring harness (6) and the ground wiring harness (7).

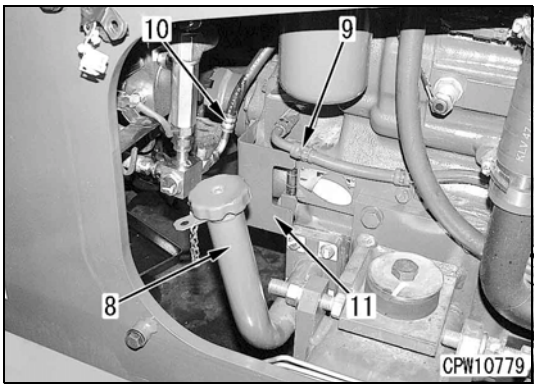


9. Remove the oil filler port (8).

10. Disconnect the hoses (9) and (10).

    ★ Disconnect the hose (9) because it touches the transmission assembly when the assembly is lifted.

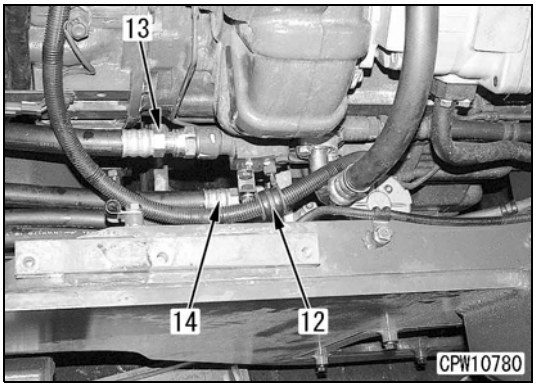
11. Remove the cover (11).



12. Piping of torque converter and transmission

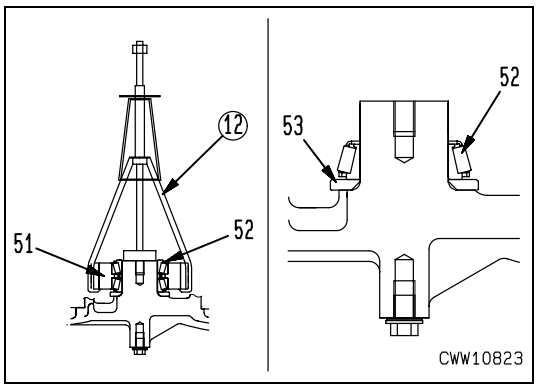
    1) Remove the clamp (12) of the wiring harness.

    2) Disconnect the outlet hose (13) to the oil cooler and the return hose (14) from the cooler.



2) Use the puller ⑫ to remove the gear (51) and the bearing (52).

3) Remove the bearing (52) and the plate (53).

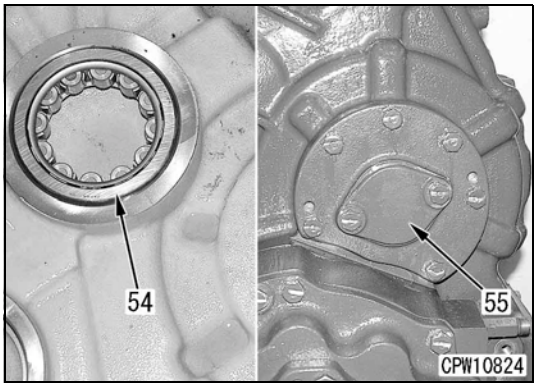


15. Bearing (on the 1st speed clutch side)

Remove the bearing (54).

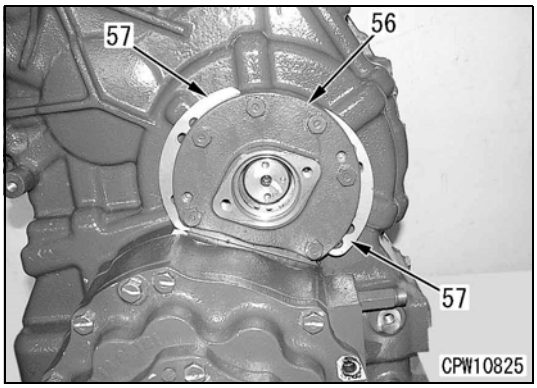
16. Cover (on the 2nd speed clutch side)

1) Remove the cover (55).

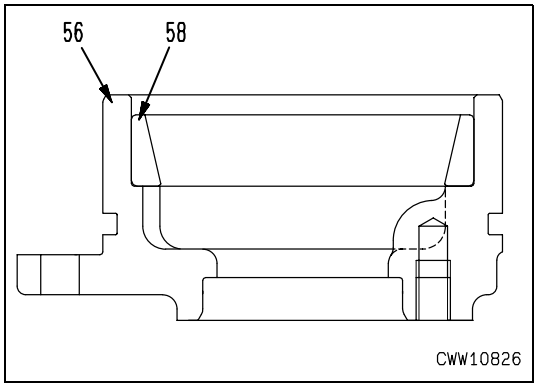


2) Use a forcing screw to remove the cover (56).

★ Check the thickness and the quantity of the shims (57) in advance.



3) Remove the outer race (58) from the cover (56).



Transmission clutch pack assembly

Special tools

Symbol		Part Number	Part Name	Necessity	Quantity	New/Revised	Simplified Drawing
C2	1	790-201-2170	Plate	■	1		
	2	790-201-2730	Spacer	■	1		
	3	796-465-1120	Push tool	■	1		O
	4	790-201-2740	Spacer	■	1		
C3	1	793-607-1110	Seal holder	■	1	N	
	2	793-607-1120	Seal holder	■	1	N	
C12		799-301-1500	Oil leak tester kit	■	1		

Disassembly

When loading the clutch pack on the block, take care so that the clutch pack may not slip from your hands with oil and so that your finger may not get caught between the block and clutch pack.

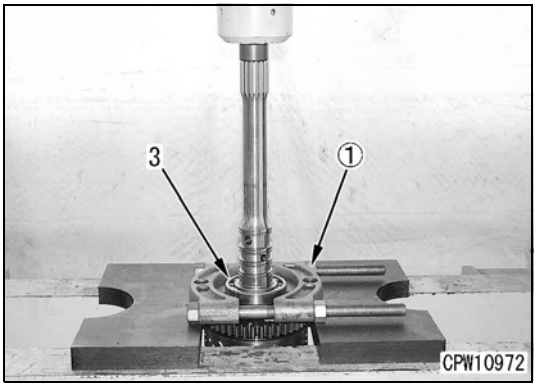
Disassembly of forward and reverse clutch packs

[Forward clutch side]

1. Bearing

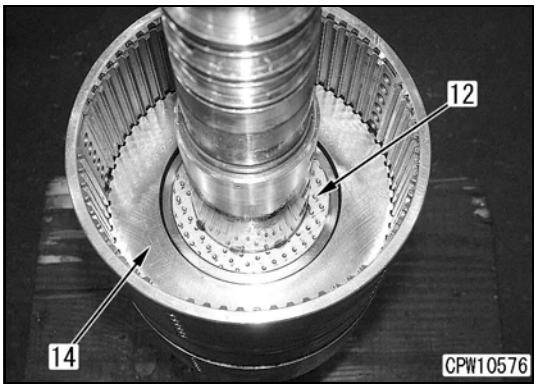
   Mount bearing race puller ① on bearing (3) and push the shaft with a press, then dismount bearing (3).

   ★ When the bearing is dismounted, the clutch assembly drops. So catch the clutch assembly by a cushion seat.



[Forward clutch side]

6. Forward side piston



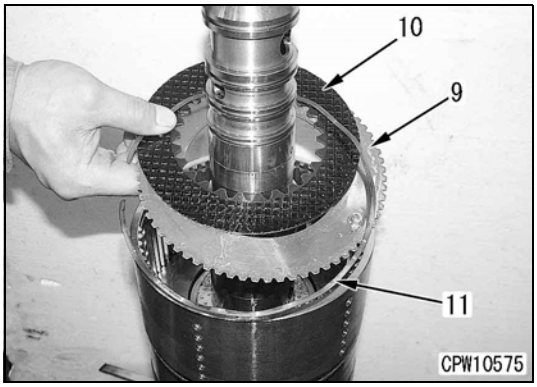
1) Make the piston seal run in the same manner as the reverse clutch side and assemble it in piston (14).

2) Assemble piston (14) in the same manner as the reverse side piston.

   Piston sliding surface: **Transmission oil**

3) Mount thrust washer (12).

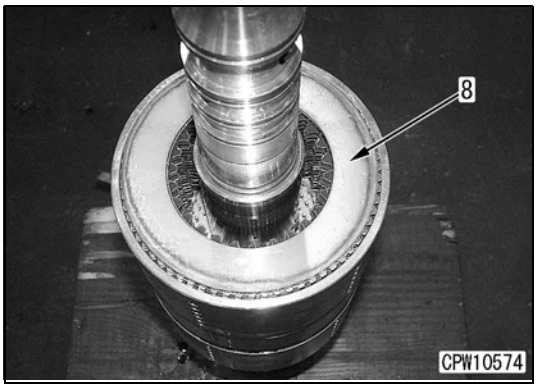
7. Clutch plate



1) Alternately assemble plate (9), disk (10) and spring (11) in this order.

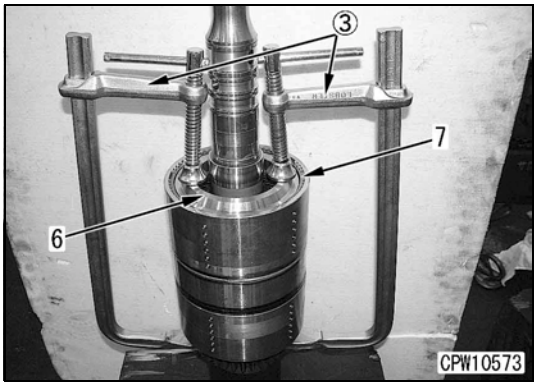
   ★ Assemble them in the same manner as the reverse clutch side.

2) Mount spring plate (8)



   ★ Mount it facing identification mark **U** sideways.

8. End plate



1) Mount end plate (6).

2) Use C clamp ③ or the like to press needle plate (6) and mount snap ring (7).

Parking brake assembly

Special tools

Symbol		Part Number	Part Name	Necessity	Quantity	New/Revised	Simplified Drawing
H	1	793T-607-1190	Bracket	●	1		O
		722-14-13130	Plate	●	1		
		01011-62020	Bolt	●	1		
	2	793T-607-1130	Push tool	●	1		O
		790-101-5421	Grip	●	1		
		01010-51240	Bolt	●	1		
	3	793T-607-1130	Push tool	●	1		O
		01010-51240	Grip	●	1		
		790-101-5421	Bolt	●	1		
	4	793T-607-1140	Spacer	●	1		O
	5	792T-446-1150	Push tool	●	1		O
	6	797T-423-1141	Push tool	●	1		O
	7	793T-512-1110	Push tool	●	1	N	O
		790-101-5421	Grip	●	1		
		01010-51240	Bolt	●	1		
	8	793T-512-1110	Push tool	●	1	N	O
		01010-51240	Grip	●	1		
		790-101-5421	Bolt	●	1		
	9	793T-607-1160	Spacer	●	1		O
	10	793T-607-1180	Push tool	●	1		O

Disassembly

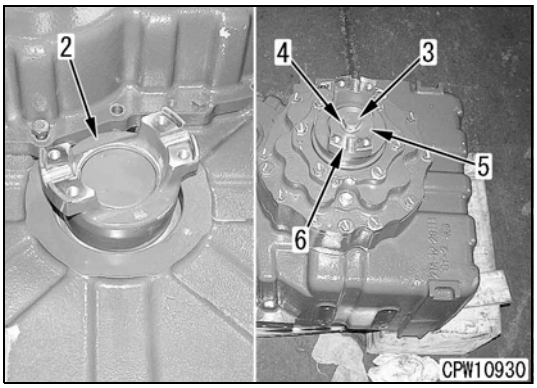
1. Coupling (rear drive)

   Dismount coupling (2).

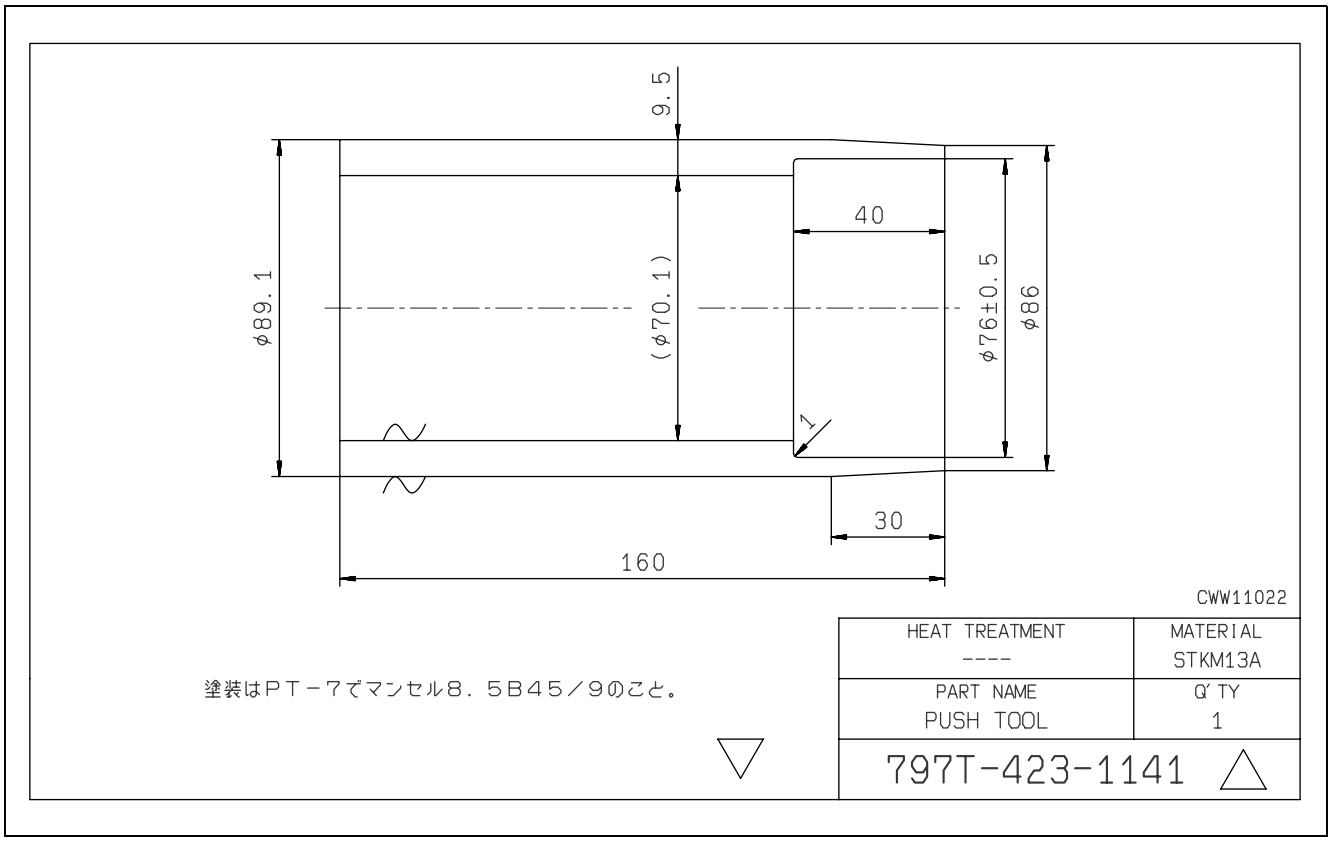
2. Coupling (front drive)

   1) Dismount bolt (3) and dismount washer (4) and holder (5).

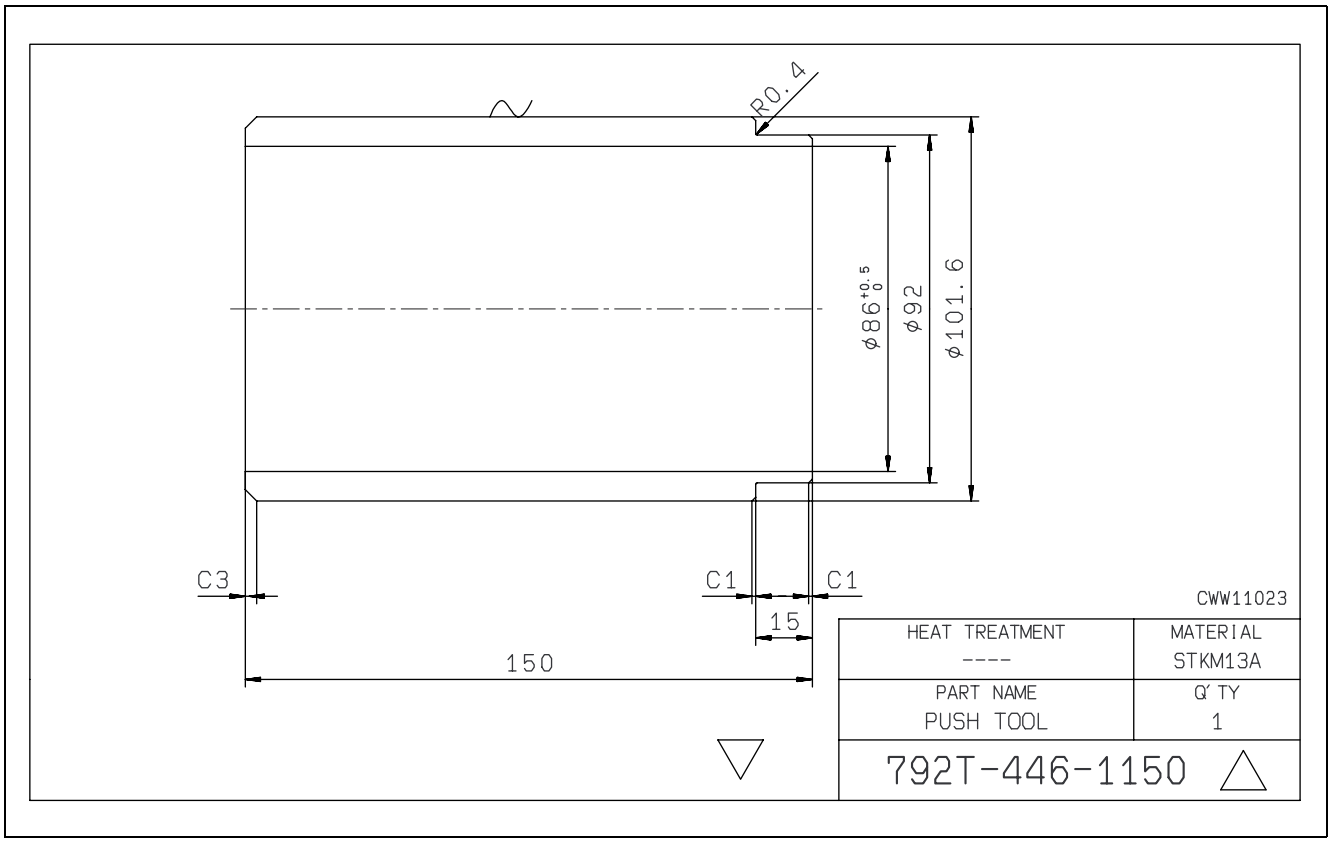
   2) Dismount coupling (6)



H6 Push tool



H5 Push tool

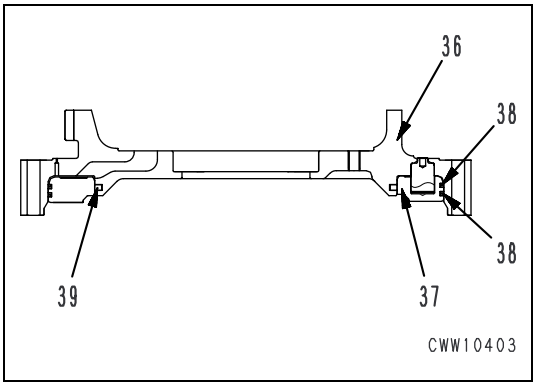


7) Fine disassembly of complete housing assembly

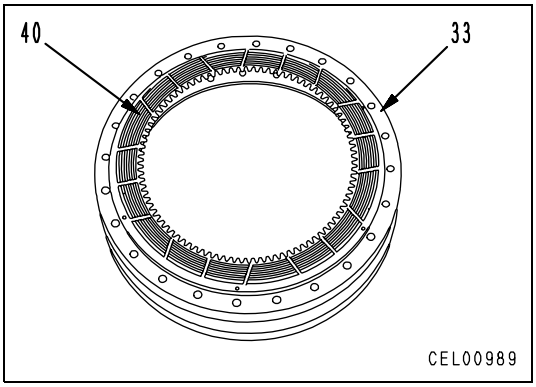
I. Dismount piston (37) from complete housing (36).

II. Dismount seal ring (38) from piston (37).

III. Dismount seal ring (39) from complete housing (36).



8) Dismount disc (40) from drive case (33).



Axle housing assembly

Special tools

For rear axle housing

Symbol	Part Number	Part Name	Necessity	Quantity	New/Revised	Simplified Drawing
J1	793T-522-1140	Push tool	■	1	N	O
	793T-522-1150	Spacer	■	1	N	O
J2	797T-423-1290	Push tool	■	1		O
J3	793T-522-1160	Push tool	■	2	N	O

For front axle housing

Symbol		Part Number	Part Name	Necessity	Quantity	New/Revised	Simplified Drawing
J4	1	793T-622-1330	Push tool	■	1	N	O
	2	793T-622-1340	Spacer	■	1	N	O
J5	1	790-201-2320	Plate	■	1		
	2	790-201-2760	Spacer	■	1		
J6	1	793T-622-1370	Support	■	2	N	O
	2	01016-30860	Bult	■	6		

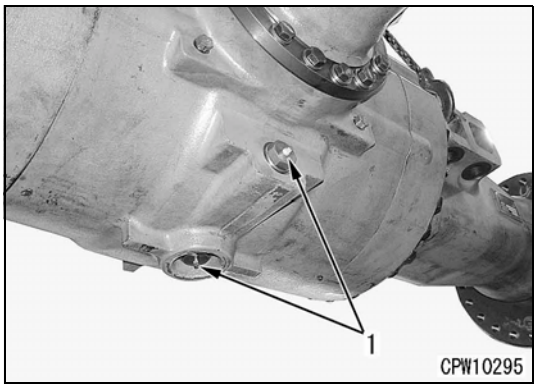
Disassembly

★ The subsequent photographs and illustrations are shown using the front axle assembly as an example.

★ The front axle housing and the rear axle housing have the same internal structure except their external appearance shape.

1. Oil drain

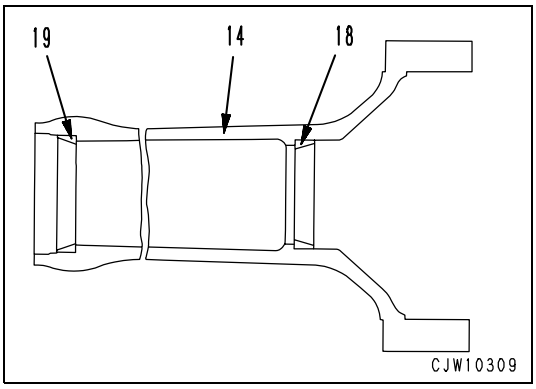
   Dismount plug (1) and extract oil. (Front, rear)



Assembly of front axle housing

1. Axle housing

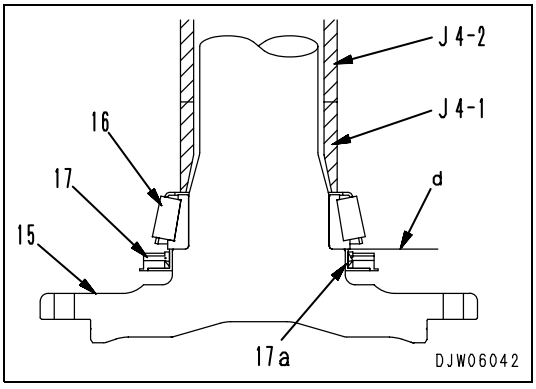
   Press in bearing outer races (18) and (19) into the axle housing (14).



2. Axle shaft

   Press in the oil seal (17) and bearing (16) into the axle shaft (15) at the same time using tools **J4-1** and **J4-2**.

   ★ Press in the oil seal sleeve (17a) until it is flush with the **d** surface of the axle shaft and make sure that it leaves no space between the bearing (16).



3. Axle housing, shaft

   1) Mount tool **J6-1** under oil seal (17).

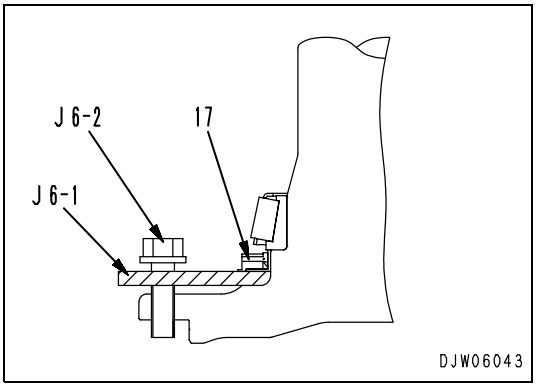
      ★ Adjust with tool **J6-2** so that the upper face of the tool **J6-1** and the oil seal (17) touches each other lightly and its clearance is even.

   2) Suspend the axle housing (14) horizontally and slowly lower by aligning its position to the oil seal (17).

      ★ Insert the axle housing using its weight.

      Insertion part of the oil seal, bearing: **Axle oil**

   ★ Keep tool **J6** mounted until step 3). Do not dismount after mounting the housing.



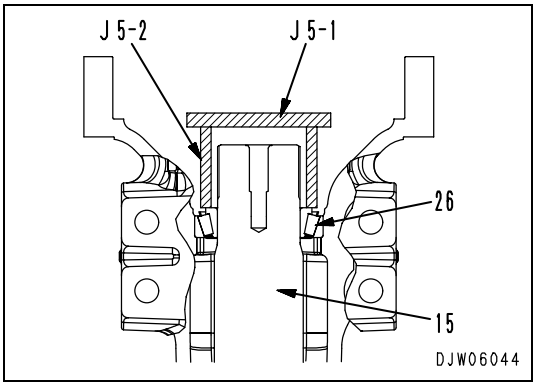
   3) Insert the axle shaft (15) to the bearing (26) using tool **J5-1** and **J5-2**.

      ★ Insert until the end-play reaches 0.1 mm by turning the axle housing with hand.

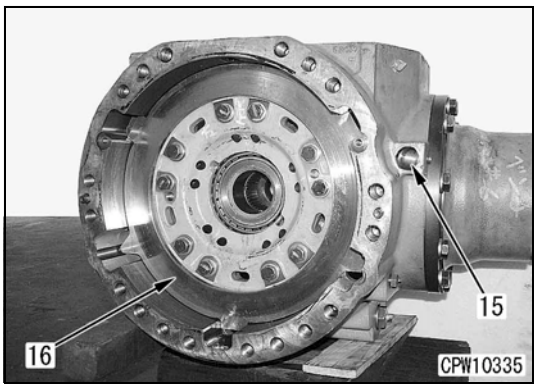
      Bearing periphery: **Axle oil**

   4) Pull out tool **J6** horizontally.

      ★ Check to see if oil seal (17) is not tilting.



4) Blow air into the brake tube joint unit (15) and remove the piston (16).

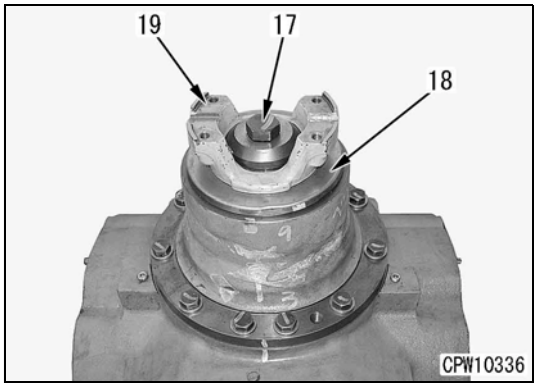


7. Cage assembly

1) Lift the differential case and turn up the cage assembly.

2) Remove the bolt (17) and also remove the coupling (19) with the protector (18).

★ Do not remove the protector from the coupling unless required.



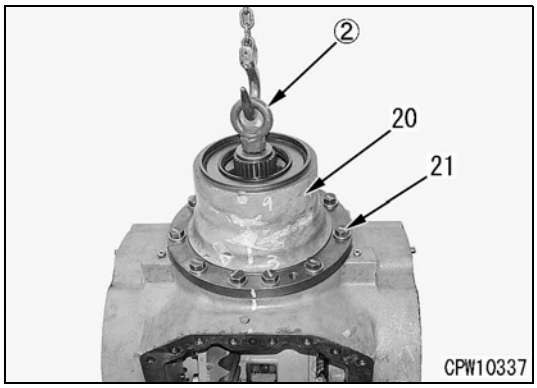
3) Attach the lift bolt ② and temporarily lift the cage assembly (20).

★ Mark index symbols on the cage and differential case so that they smoothly match at assembly.

4) Remove the bolt (21).

5) Screw the pull-up bolt and pull up the case assembly until the o-ring appears.

6) Lift the cage assembly and remove it.



7) Remove the shim (22).

★ Record the number of shims to refer to at assembly.