

Shop Manual

DUMP TRUCK

HD325-7R

HD405-7R

SERIAL NUMBERS

HD325-11001

HD405-11001

and up

KOMATSU

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2. Standard clearance and standard value

- The clearance made when new parts are assembled is called the “standard clearance”, which is indicated by the range from the minimum clearance to the maximum clearance.
- When some parts are repaired, the clearance is generally adjusted to the standard clearance.
- A value of performance and function of new products or equivalent is called the “standard value”, which is indicated by a range or a target value.
- When some parts are repaired, the value of performance/function is set to the standard value.

3. Standard interference

- When the diameter of a hole of a part shown in the given standard size and tolerance table is smaller than that of the mating shaft, the difference between those diameters is called the “interference”.
- The range (A – B) from the difference (A) between the minimum size of the shaft and the maximum size of the hole to the difference (B) between the maximum size of the shaft and the minimum size of the hole is the “standard interference”.
- After repairing or replacing some parts, measure the size of their hole and shaft and check that the interference is in the standard range.

4. Repair limit and allowable value or allowable dimension

- The size of a part changes because of wear and deformation while it is used. The limit of changed size is called the “repair limit”.
- If a part is worn to the repair limit, it must be replaced or repaired.
- The performance and function of a product lowers while it is used. A value which the product can be used without causing a problem is called the “allowable value” or “allowable dimension”.
- If a product is worn to the allowable value, it must be checked or repaired. Since the permissible value is estimated from various tests or experiences in most cases, however, it must be judged after considering the operating condition and customer's requirement.

5. Clearance limit

- Parts can be used until the clearance between them is increased to a certain limit. The limit at which those parts cannot be used is called the “clearance limit”.
- If the clearance between the parts exceeds the clearance limit, they must be replaced or repaired.

6. Interference limit

- The allowable maximum interference between the hole of a part and the shaft of another part to be assembled is called the “interference limit”.
- The interference limit shows the repair limit of the part of smaller tolerance.
- If the interference between the parts exceeds the interference limit, they must be replaced or repaired.

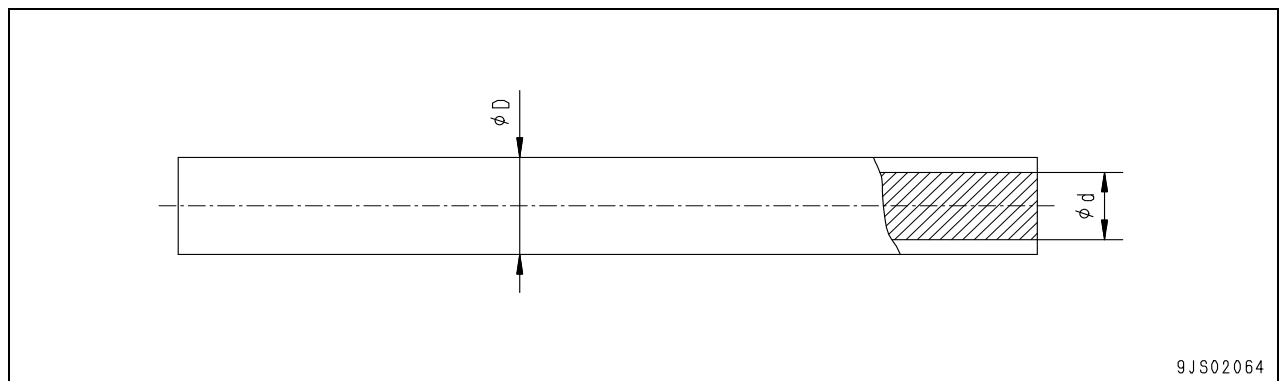
2. Dimensions

(Table 2)

Nominal No.		0.5f	(0.5)	0.75f	(0.85)	1.25f	(1.25)	2f	2	3f	3	5
Conductor	Number of strands/Diameter of strand	20/0.18	7/0.32	30/0.18	11/0.32	50/0.18	16/0.32	37/0.26	26/0.32	58/0.26	41/0.32	65/0.32
	Sectional area (mm ²)	0.51	0.56	0.76	0.88	1.27	1.29	1.96	2.09	3.08	3.30	5.23
	d (approx.)	1.0		1.2		1.5		1.9	1.9	2.3	2.4	3.0
Cover D	AVS Standard	2.0		2.2		2.5		2.9	2.9	3.5	3.6	–
	AV Standard	–		–		–		–	–	–	–	4.6
	AEX Standard	2.0		2.2		2.7		3.0	3.1	–	3.8	4.6

Nominal No.		8	15	20	30	40	50	60	85	100
Conductor	Number of strands/Diameter of strand	50/0.45	84/0.45	41/0.80	70/0.80	85/0.80	108/0.80	127/0.80	169/0.80	217/0.80
	Sectional area (mm ²)	7.95	13.36	20.61	35.19	42.73	54.29	63.84	84.96	109.1
	d (approx.)	3.7	4.8	6.0	8.0	8.6	9.8	10.4	12.0	13.6
Cover D	AVS Standard	–	–	–	–	–	–	–	–	–
	AV Standard	5.5	7.0	8.2	10.8	11.4	13.0	13.6	16.0	17.6
	AEX Standard	5.3	7.0	8.2	10.8	11.4	13.0	13.6	16.0	17.6

“f” of nominal No. denotes flexible”.



Liters to U.K. Gallons

1 ℓ = 0.21997 U.K.Gal

	0	1	2	3	4	5	6	7	8	9
0	0	0.220	0.440	0.660	0.880	1.100	1.320	1.540	1.760	1.980
10	2.200	2.420	2.640	2.860	3.080	3.300	3.520	3.740	3.950	4.179
20	4.399	4.619	4.839	5.059	5.279	5.499	5.719	5.939	6.159	6.379
30	6.599	6.819	7.039	7.259	7.479	7.699	7.919	8.139	8.359	8.579
40	8.799	9.019	9.239	9.459	9.679	9.899	10.119	10.339	10.559	10.778
50	10.998	11.281	11.438	11.658	11.878	12.098	12.318	12.528	12.758	12.978
60	13.198	13.418	13.638	13.858	14.078	14.298	14.518	14.738	14.958	15.178
70	15.398	15.618	15.838	16.058	16.278	16.498	16.718	16.938	17.158	17.378
80	17.598	17.818	18.037	18.257	18.477	18.697	18.917	19.137	19.357	19.577
90	19.797	20.017	20.237	20.457	20.677	20.897	21.117	21.337	21.557	21.777

kgm to ft.lb

1 kgm = 7.233 ft.lb

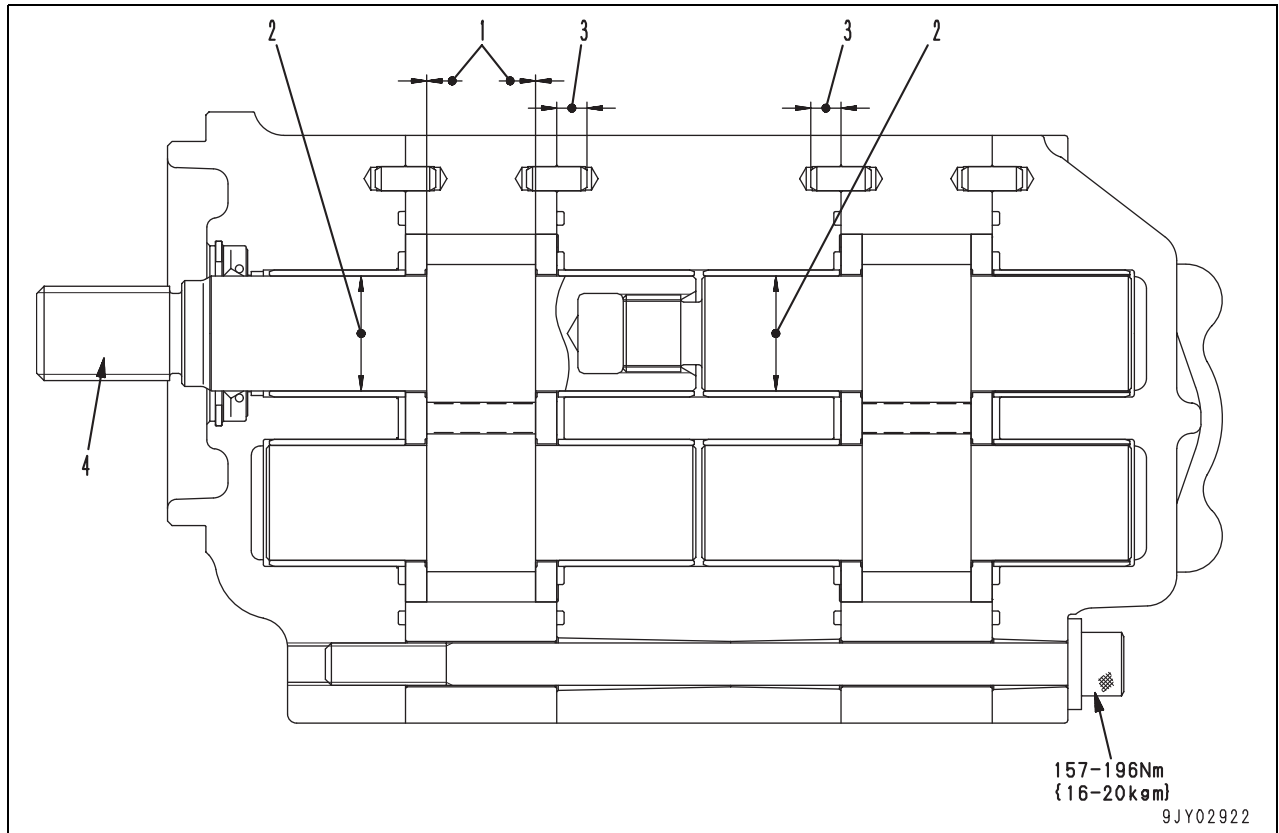
	0	1	2	3	4	5	6	7	8	9
0	0	7.2	14.5	21.7	28.9	36.2	43.4	50.6	57.9	65.1
10	72.3	79.6	86.8	94.0	101.3	108.5	115.7	123.0	130.2	137.4
20	144.7	151.9	159.1	166.4	173.6	180.8	188.1	195.3	202.5	209.8
30	217.0	224.2	231.5	238.7	245.9	253.2	260.4	267.6	274.9	282.1
40	289.3	296.6	303.8	311.0	318.3	325.5	332.7	340.0	347.2	354.4
50	361.7	368.9	376.1	383.4	390.6	397.8	405.1	412.3	419.5	426.8
60	434.0	441.2	448.5	455.7	462.9	470.2	477.4	484.6	491.8	499.1
70	506.3	513.5	520.8	528.0	535.2	542.5	549.7	556.9	564.2	571.4
80	578.6	585.9	593.1	600.3	607.6	614.8	622.0	629.3	636.5	643.7
90	651.0	658.2	665.4	672.7	679.9	687.1	694.4	701.6	708.8	716.1
100	723.3	730.5	737.8	745.0	752.2	759.5	766.7	773.9	781.2	788.4
110	795.6	802.9	810.1	817.3	824.6	831.8	839.0	846.3	853.5	860.7
120	868.0	875.2	882.4	889.7	896.9	904.1	911.4	918.6	925.8	933.1
130	940.3	947.5	954.8	962.0	969.2	976.5	983.7	990.9	998.2	1005.4
140	1012.6	1019.9	1027.1	1034.3	1041.5	1048.8	1056.0	1063.2	1070.5	1077.7
150	1084.9	1092.2	1099.4	1106.6	1113.9	1121.1	1128.3	1135.6	1142.8	1150.0
160	1157.3	1164.5	1171.7	1179.0	1186.2	1193.4	1200.7	1207.9	1215.1	1222.4
170	1129.6	1236.8	1244.1	1251.3	1258.5	1265.8	1273.0	1280.1	1287.5	1294.7
180	1301.9	1309.2	1316.4	1323.6	1330.9	1338.1	1345.3	1352.6	1359.8	1367.0
190	1374.3	1381.5	1388.7	1396.0	1403.2	1410.4	1417.7	1424.9	1432.1	1439.4

Reservoir		Engine oil pan	Transmission case (Including brake sub tank)	Hydraulic tank	Front suspension (each)	Rear suspension (each)
Capacity						
Specified	Liters	58	211	165	13.8	8.3
	US gal	15.32	55.78	43.56	3.64	2.19
Refill	Liters	50	165	129	–	–
	US gal	13.21	43.62	34.06	–	–

Reservoir		Differential case	Final drive case (each)	Fuel tank	Cooling system
Capacity					
Specified	Liters	50	15	500	138
	US gal	13.2	3.96	132.1	36.46
Refill	Liters	45	15	–	134
	US gal	11.88	3.96	–	35.40

Retarder cooling pump

SDR (30) 63 + 63



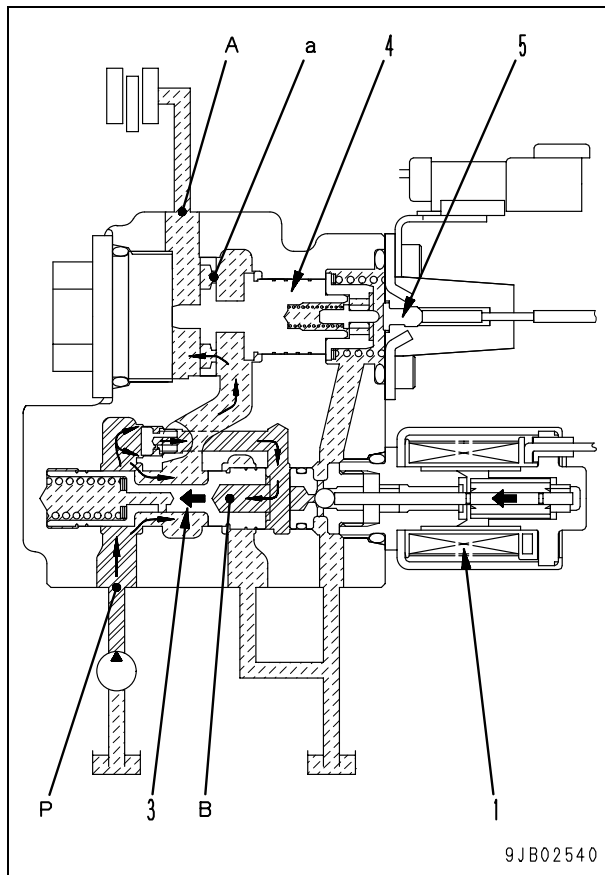
Unit: mm

No.	Check item	Criteria				Remedy	
		Model	Standard clearance	Clearance limit			
1	Side clearance	SDR(30)-63	0.16 – 0.20	0.24	Replace		
		SDR(30)-63					
2	Clearance between inside diameter of plain bearing and outside of diameter of gear shaft	SDR(30)-63	0.06 – 0.131	0.20			
		SDR(30)-63					
3	Depth for knocking in pin	Model	Standard size	Tolerance		Repair limit	
		SDR(30)-63	10	0		-	
		SDR(30)-63		-0.5			
4	Rotating torque of spline shaft	13.8 – 23.6 Nm {1.4 – 2.4 kgm}					
-	Discharge amount Oil: EO10-CD Oil temperature: 45 – 55 °C	Model	Rotating speed (rpm)	Delivery pressure {MPa (kg/cm ²)}		Standard delivery amount (ℓ/min)	Delivery amount limit (ℓ/min)
		SDR(30)-63	2,500	20.6 {210}		145.8	134.7
		SDR(30)-63					

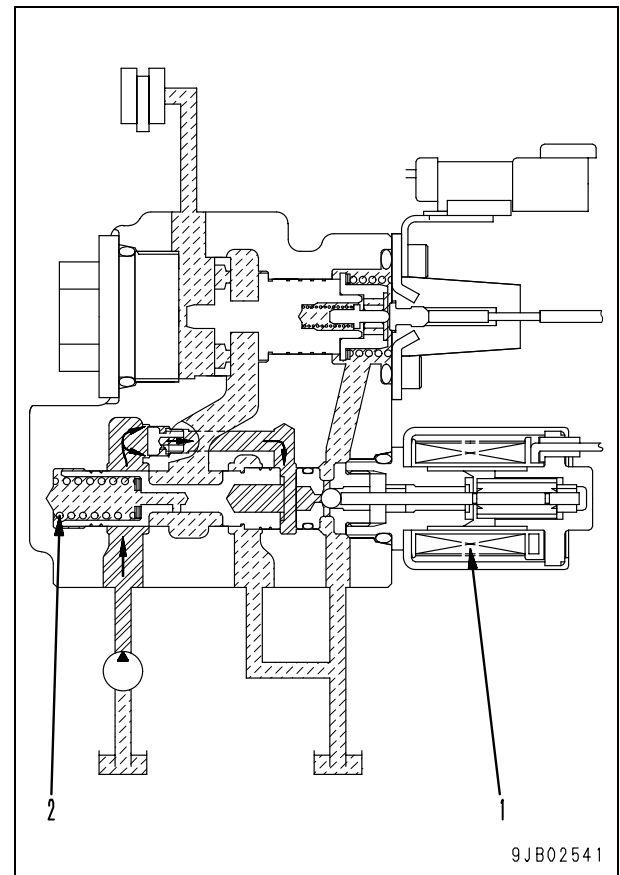
Unit: mm

No.	Check item	Criteria				Remedy	
37	Side clearance of planetary pinion	Location	Standard clearance	Clearance limit		Replacement of thrust washer or carrier	
		H gear train	0.30 – 0.80	1.5			
		3rd gear train	0.30 – 0.80	1.5			
		R gear train	0.30 – 0.80	1.5			
		2nd gear train	0.30 – 0.80	1.5			
		1st gear train	0.30 – 0.80	1.5			
38	Stepped-type wear of seal ring mating surface	Standard size		Amount of wear		Replace	
		—		Max 0.05			
39	Contact surface of output shaft oil seal	Standard size		Amount of wear			
		120		119.8			
40	Clearance between cylinder and piston	Clutch No.	Standard size	Tolerance		Standard clearance	Clearance limit
				Shaft	Hole		
		H (outside)	395	-0.5 -0.7	+0.089 0	0.5 – 0.789	0.87
		H (inside)	375	-0.125 -0.214	+0.089 0	0.125 – 0.303	0.33
		L and 4th (outside)	275	-0.5 -0.7	+0.081 0	0.5 – 0.781	0.86
		L and 4th (Middle)	250	-0.5 -0.7	+0.072 0	0.5 – 0.772	0.85
		L and 4th (inside)	170	-0.085 -0.148	+0.063 0	0.085 – 0.211	0.23
		3rd, R, 2nd and 1st (outside)	375	-0.5 -0.7	+0.089 0	0.5 – 0.789	0.87
3rd, R, 2nd and 1st (inside)	325	-0.125 -0.214	+0.089 0	0.125 – 0.303	0.33		

During filling (Range B in chart)

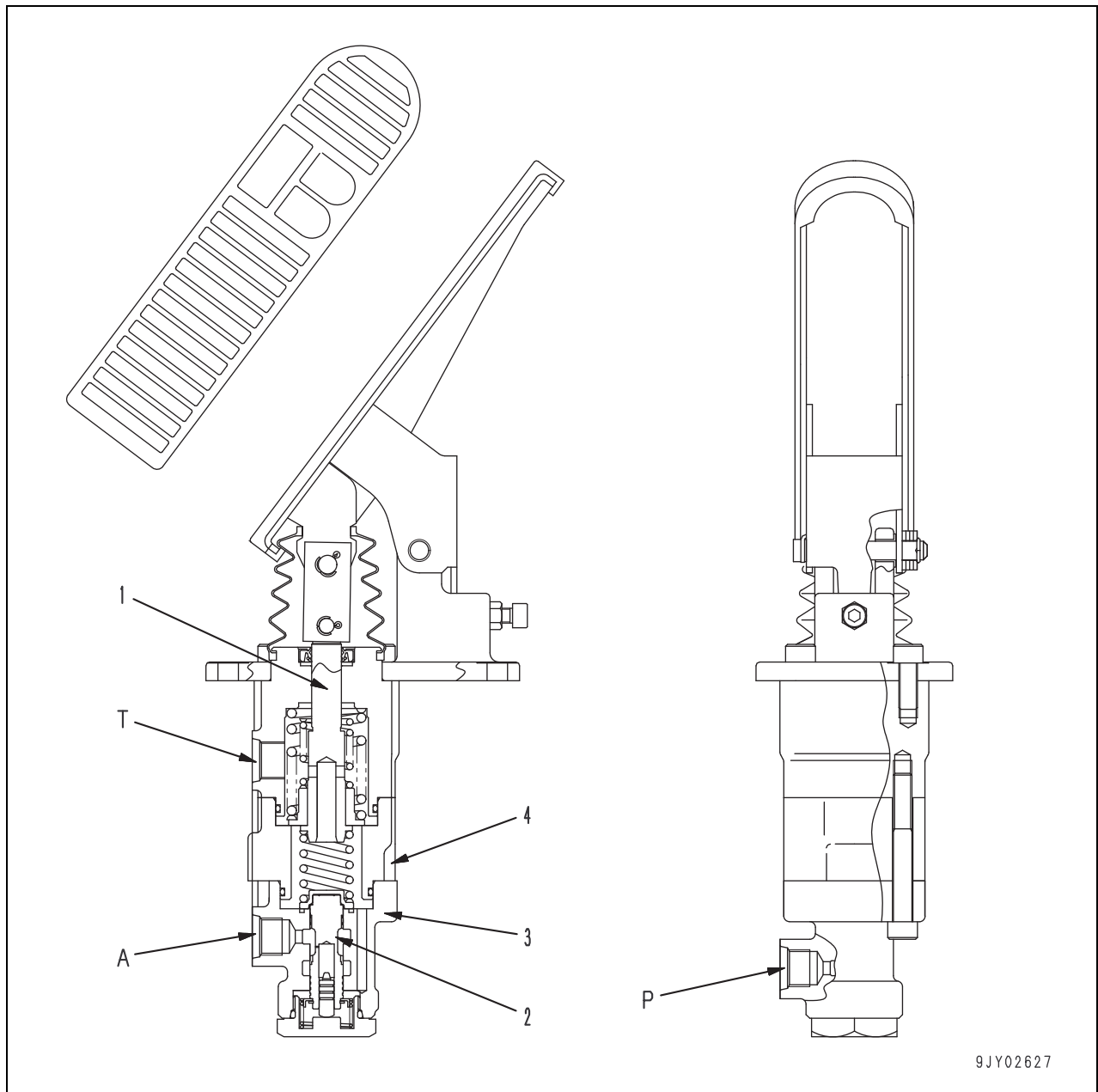


Pressure regulation (Range C in chart)



- If a current is given to proportional solenoid (1) while there is no oil in the clutch, a hydraulic force balanced with the solenoid force is applied to chamber (B) and it pushes pressure control valve (3) to the left. This conducts oil through pump port (P) and orifice (a) of flow rate pickup valve (4) to start filling the oil to the clutch chamber. At this time, differential pressure is generated between the upper stream and down stream of orifice (a) of flow rate pickup valve (4). This differential pressure pushes flow rate pickup valve (4) leftward. As the clutch chamber is filled up with oil and oil flow from pump port (P) to clutch port (A) is stopped, differential pressure before and after orifice (a) of flow rate pickup valve (4) disappears. As the result, flow rate pickup valve (4) is pushed rightward, turning "ON" fill switch (5).
- If current flows in proportional solenoid (1), the solenoid generates thrust in proportion to the current. This thrust of the solenoid is balanced with the sum of the thrust generated by the oil pressure in clutch port and the tension of pressure control valve spring (2), and then the pressure is settled.

Secondary brake valve



1. Rod
2. Spool
3. Lower cylinder
4. Upper cylinder

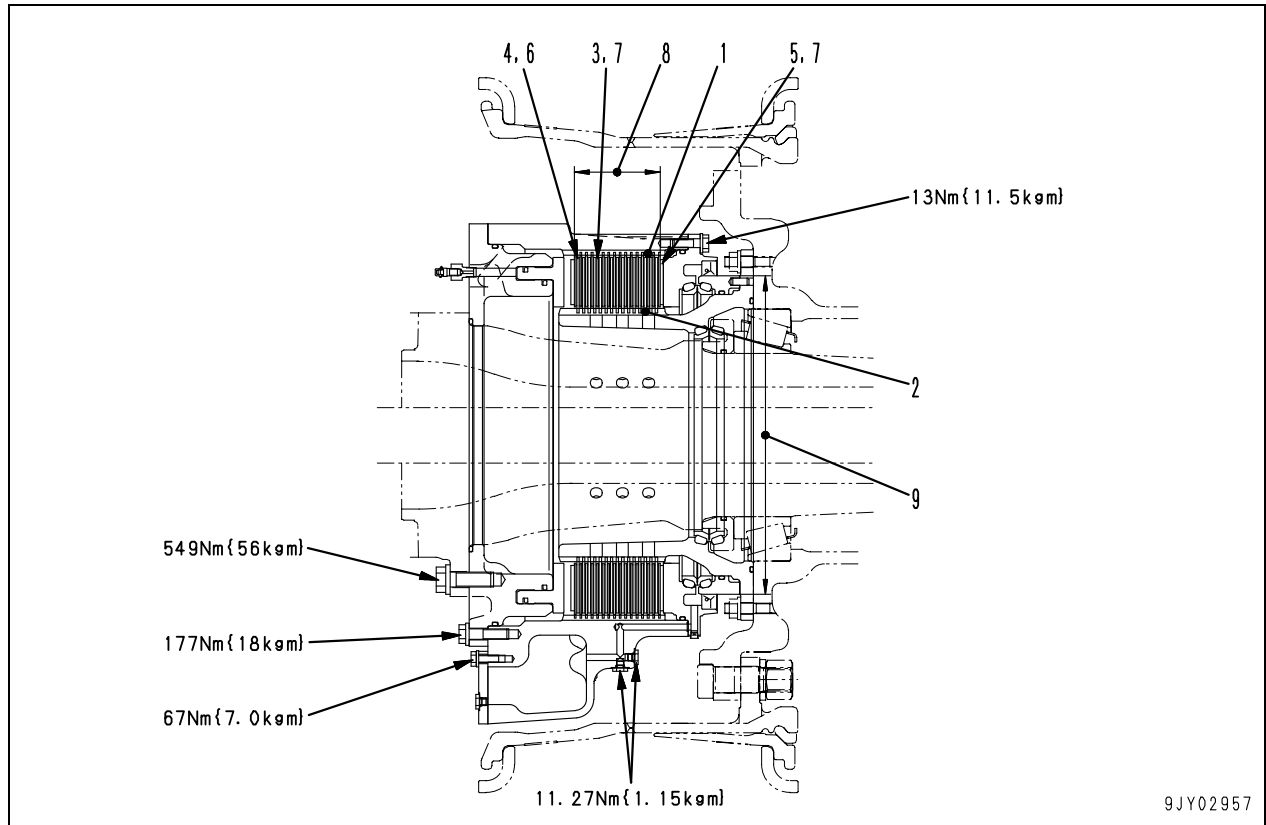
A: To parking brake valve and tandem relay valve

P: From accumulator

T: To brake sub tank

Function

- If the pedal is pressed, the parking brake release pressure and tandem relay valve actuating pressure lower to operate the parking brake and tandem relay valve according to the pedal pressing ratio.



Unit: mm

No.	Check item	Criteria		Remedy
1	Backlash between outer gear and plate	Standard backlash	Repair limit	Replace
		0.52 – 0.90	1.5	
2	Backlash between inner gear and plate	0.52 – 0.90	1.5	
3	Thickness of plate	Standard size	Repair limit	
		2.4	2.15	
4	Thickness of disc	5.1	4.6	
5	Thickness of damper	6.9	5.1	
6	Distortion of disc friction surface	Standard distortion	Repair limit	
		Max. 0.45	0.7	
7	Distortion of plate and damper friction surface	Max. 0.50	0.7	
8	Assemble thickness of plate and disc	Standard size	Repair limit	
		123.9	114.4	
9	Wear of oil seal contact surface	430	0 – -0.155	Repair or replace

Unit: mm

No.	Check item	Criteria				Remedy	
		Standard size	Tolerance		Standard clearance		Clearance limit
Shaft	Hole						
11	Clearance between piston rod and bushing	160	-0.043 -0.106	+0.240 +0.060	+0.103 +0.346	0.4	Replace bushing
12	Clearance between piston rod and bushing	160	-0.043 -0.106	+0.540 +0.360	+0.403 +0.646	0.7	Replace bushing
13	Clearance between cylinder and wear ring	200	-0.050 -0.260	+0.115 0	+0.050 +0.375	0.8	Replace wear ring
14	Elasticity of leaf spring	Measuring method: • Place the spring on a flat bench and measure the amount that the spring curves.			Repair limit		Replace
					Max. 0.3 mm		
15	Deformation of stopper	Measuring method: • Measure protrusion and elongation of stopper.			Elongation : Max. 5 mm Protrusion : Min. 2 mm No cracks		

Fig. 1

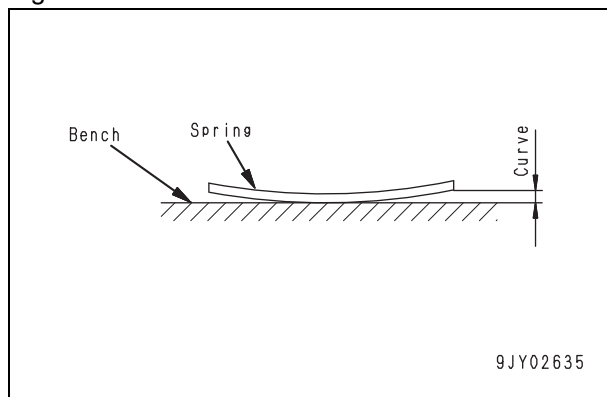
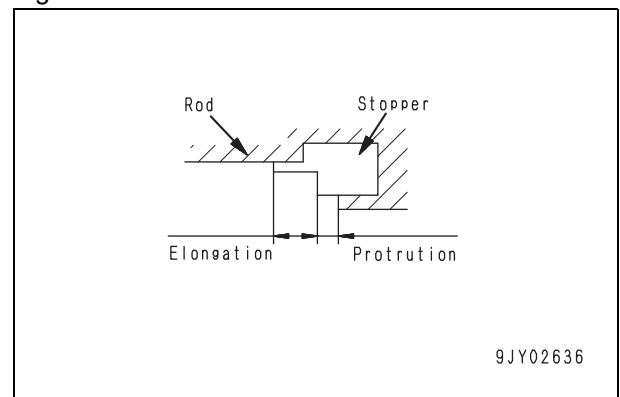
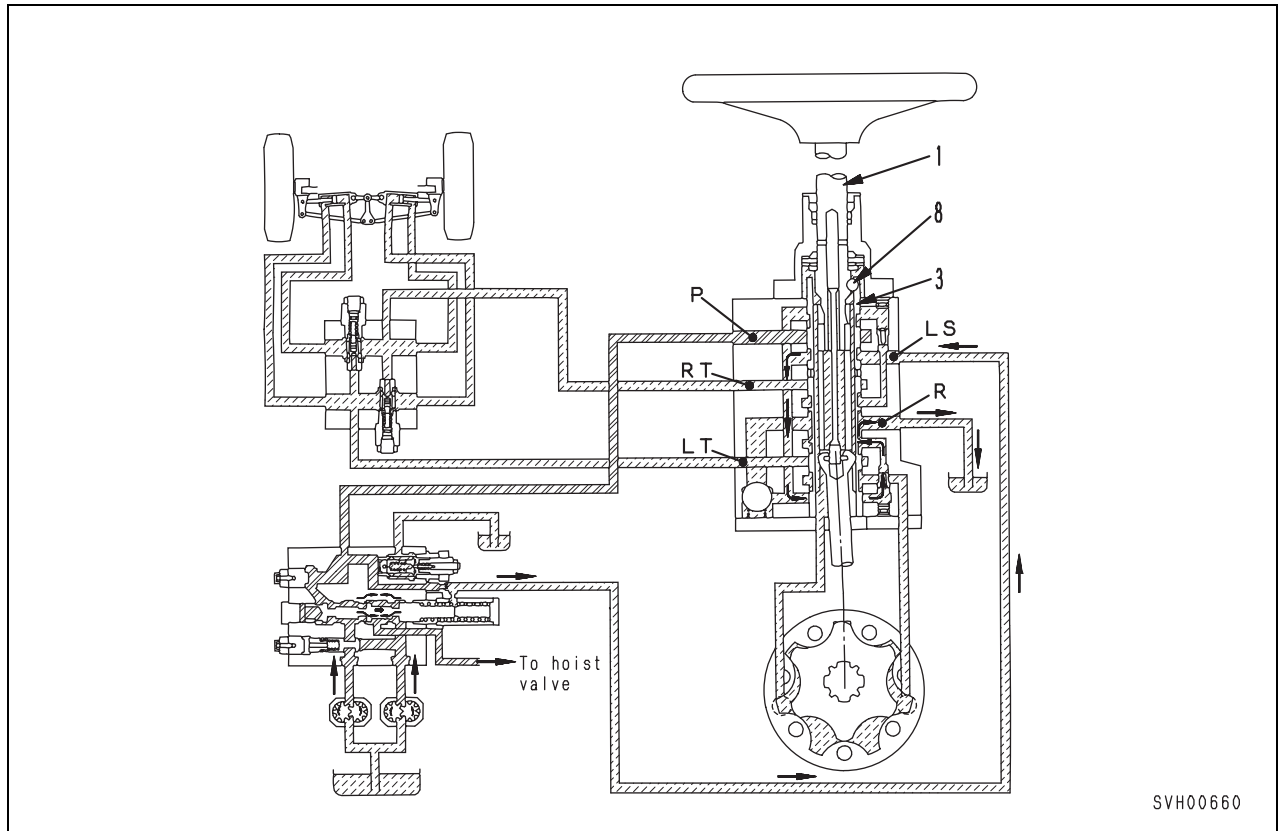


Fig. 2



Operation

1. When at neutral



- The oil from the pump passes through the steering control valve and enters port (P) to the steering valve.
- Valve spool (3) is at the neutral position, so port (P) and the ports ((RT) and (LT)) to the cylinder are closed. No oil flows to the cylinder, so the cylinder does not move.
- At the same time, port (LS) is connected through port (R) to the tank. As a result there is no oil pressure at port (LS), so all the oil from the pump at the steering control valve flows to the hoist valve.

- A1: To hoist cylinder bottom
- B1: To hoist cylinder head
- P: From steering control valve
- PA: From EPC valve (LOWER, FLOAT)
- PB: From EPC valve (RAISE)
- T: To tank

1. Retainer
2. Spool
3. Body
4. Retainer
5. Retainer
6. Retainer
7. Relief valve
8. Check valve

Unit: mm

No.	Check item	Criteria					Remedy
		Standard size			Repair limit		
		Free length x Outside diameter	Installed length	Installed load	Free length	Installed load	
9	Spool return spring (FLOAT)	74.0 x 36.0	55.5	927 N {94.5 kg}	—	741 N {75.6 kg}	If damaged or deformed, replace spring
10	Spool return spring (LOWER)	34.2 x 28.7	32	1,254 N {12.7 kg}	—	100 N {10.2 kg}	
11	Spool return spring (RAISE)	51.3 x 34.5	47	525 N {53.5 kg}	—	420 N {42.8 kg}	
12	Check valve spring	32.6 x 10.9	24.5	44.1 N {4.5 kg}	—	35.31 N {3.6 kg}	

DUMP TRUCK

HD325-7R

HD405-7R

Machine model Serial number

HD325-7R 11001 and up
HD405-7R 11001 and up

10 Structure, function and maintenance standard

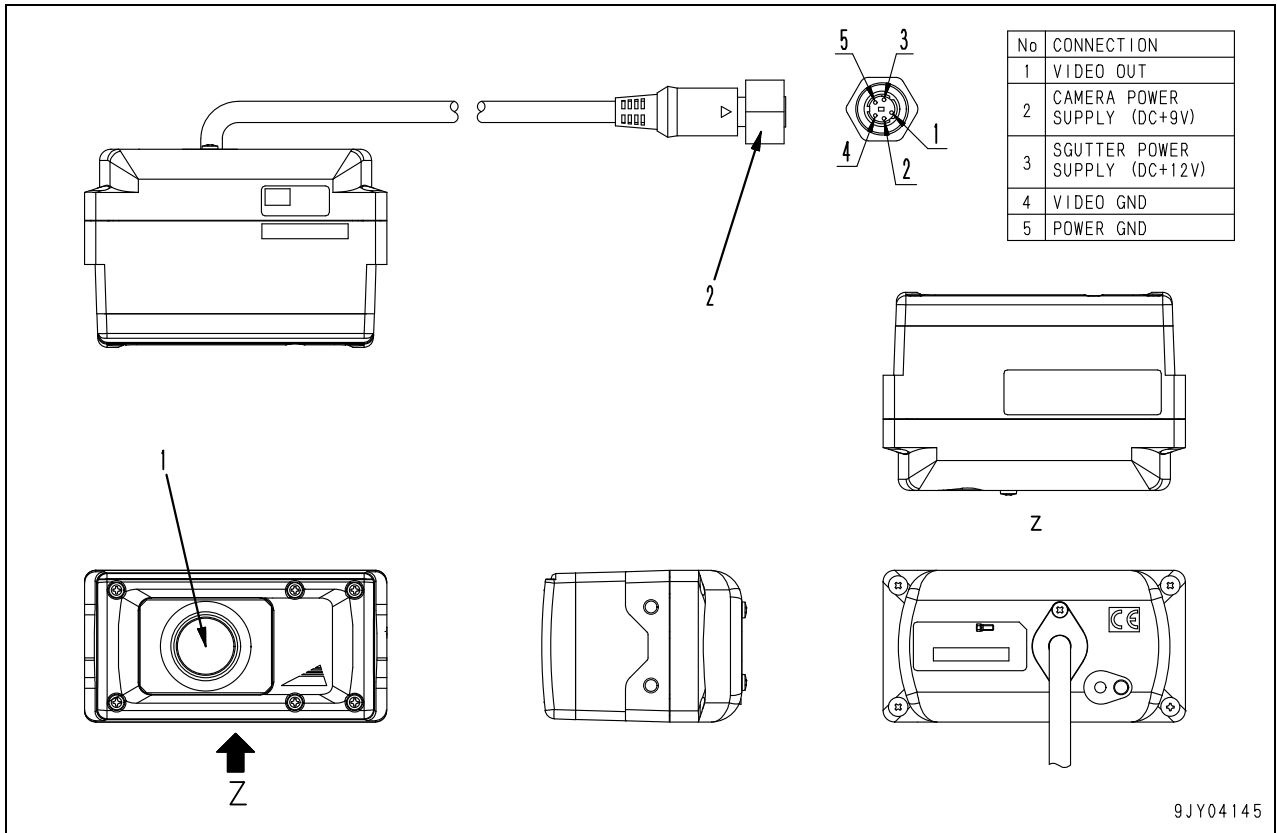
Cab and its attachments

ROPS cab	2
Air conditioner	3
Rear view monitor	9

Serial number

HD325/405-7R: 11001 - 11187

Camera



- 1. Camera
- 2. Connector

Specifications

TV signal method:

As per Japanese standard TV method

Scanning method: 2:1 Interlace method

Image sensor:

1/4 inch color CCD with 250,000 pixels

Lens: 1.7 mm, 1:2.8

Angle of view: Horizontal; Approx. 118 deg.,

Vertical; Approx. 97.6 deg.

Electronic zoom: Approx. 1.4 power

Using luminance range:

Min. luminance of object; 3 lux

Power supply voltage:

DC 5.5 V – 99.5 V for main unit
(supplied by monitor)

Power consumption: Max. 120 mA

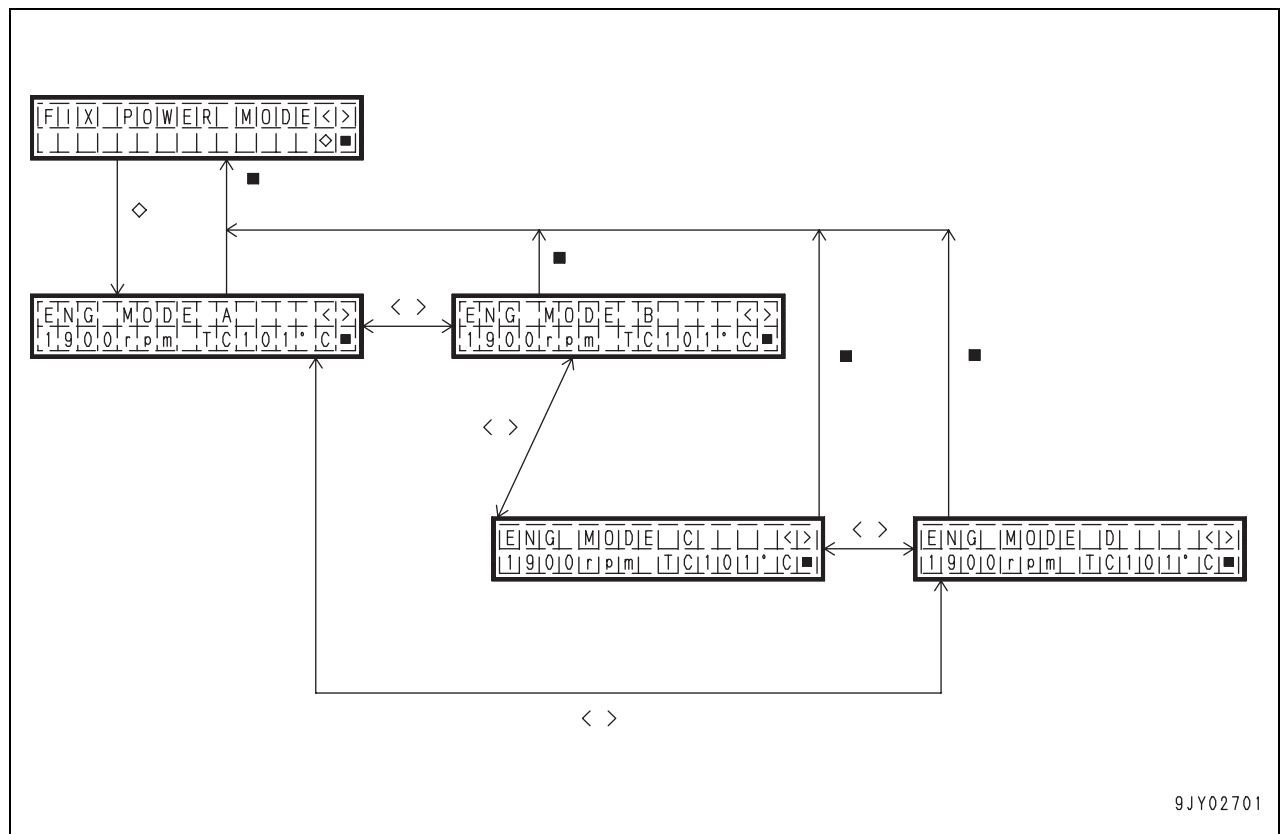
No.	Display item	Display category	Device	Color	Display range/ conditions	Display method	Related operation		When machine monitor check switch is operated.	Immediately after turning key ON.	Remarks
							Central warning lamp	Warning buzzer			
37	Suspension mode (medium) (if equipped)	Pilot	LED	Green	In suspension "medium" mode	Lit up in "medium" mode	—	—	○	○	
38	Suspension mode (soft) (if equipped)		LED	Green	In suspension "soft" mode	Lit up in "soft" mode	—	—	○	○	
39	ABS (if equipped)		LED	Orange	When ABS is operated.	During operation: lit up During non-operation: turned OFF	—	—	○	○	
40	ASR (if equipped)		LED	Orange	When ASR is operated.	During operation: lit up During non-operation: turned OFF					
41	Preheating		LED	Red	When electric intake air heater for preheating engine is operated.	During operation: lit up During non-operation: turned OFF	—	—	○	○	
42	Automatic retarder being ready (if equipped)		LED	Green	When automatic retarder is ready to be operated.	When ready to be operated: lit up	—	—	○	○	
43	Automatic retarder set speed (if equipped)		LCD	Background color: gray	When automatic retarder switch is turned ON.	Display of set speed (*)	—	—	○	○	* Zero is displayed when the set speed is cancelled.
44	Automatic retarder unit display (km/h) (if equipped)		LED	Green	When automatic retarder switch is turned ON and the unit km/h is selected.	During operation: lit up During non-operation: turned OFF	—	—	○	○	
45	Automatic retarder unit display (MPH) (if equipped)	LED	Green	When automatic retarder switch is turned on and the unit MPH is selected.	During operation: lit up During non-operation: turned OFF	—	—	○	○		

Contents of display in normal state	Remarks
As per software No.	
As per application version No.	
As per data version No.	
0 – 30 V	
–	Unused
SW5-1: For 7831-46-7000*, normally OFF For 7831-46-8000*, normally ON SW5-2: Unused	
–	Unused
–	Unused
–	Unused
1 0000000 (Headlight = ON) 0 1 000000 (Switch = ON) 00 1 00000 (AISS switch = ON) 00000 1 00 (Switch = ON) 000000 1 0 (Switch = ON) 0000000 1 (Switch = Economy)	D-IN-0: High beam D-IN-1: Machine monitor check switch D-IN-2: AISS switch D-IN-5: ABS system switch (if equipped) If not equipped: 0 D-IN-6: Passing switch D-IN-7: Engine mode switch
1 0000000 (Normally 1) 0 0 000000 (Monitor mode switch (■) = ON) 00 1 00000 (Monitor mode switch (>) = ON) 000 1 0000 (Monitor mode switch (<) = ON) 0000 1 000 (Winker (Right) = ON) 00000 1 00 (Winker (Left) = ON) 000000 1 0 (Monitor mode switch (◇) = ON) 0000000 0 (Unused)	D-IN-8: Connector check D-IN-9: Machine monitor mode switch (■) D-IN-10: Machine monitor mode switch (>) D-IN-11: Machine monitor mode switch (<) D-IN-12: Winker (Right) D-IN-13: Winker (Left) D-IN-14: Machine monitor mode switch (◇) D-IN-15: Unused

Engine mode fixing function

Outline

- This function is used to check the engine performance. (High idle speed and torque converter stall speed)
- There are 4 engine modes (A, B, C, and D). If a mode is selected by the following operation, it is transmitted to the transmission controller. Then, transmission controller orders the engine controller to operate in that mode.
- While this screen is displayed, run the engine at high idle or stall the torque converter and check the engine speed in each case.
- If this screen changes to another, the engine mode fixing function is reset.
- For the Standard values of the engine in A, B, C, and D, see the Standard value table.
- ★ Before using this function, check the following.
 - The parking brake is turned ON.
 - No errors are made.



Data range	Remarks
Depending upon software part number	
Depending upon software version No.	
Depending upon software version No.	
x1 [min-1] (0 – 32767 [min-1]) ---- [Other than above]	
x1 [min-1] (0 – 32767 [min-1]) ---- [Other than above]	
x1 [min-1] (0 – 32767 [min-1]) ---- [Other than above]	
x1 [Ω] (0 – 250 [Ω]) ---- [Other than above]	
x.001 [V] (0 – 5 [V]) ---- [Other than above]	
x1 [min-1] (0 – 32767 [min-1]) ---- [Other than above]	
0:OFF 1:ON	
x1 [°C] (0 – 150 [°C]) ---- [Other than above]	
x1 [mV] (0.00 – 5.00 [V]) ---- [Other than above]	
4.72 V = 0 °C 4.33 V = 30 °C 3.55 V = 60 °C 2.20V = 100 °C 1.61 V = 120 °C	
x1 [°C] (0 – 150 [°C]) ---- [Other than above]	
x1 [mV] (0.00 – 5.00 [V]) ---- [Other than above]	
4.72 V = 0 °C 4.33 V = 30 °C 3.55 V = 60 °C 2.20 V = 100 °C 1.61 V = 120 °C	
x1 [°C] (0 – 150 [°C]) ---- [Other than above]	
x1 [mV] (0.00 – 5.00 [V]) ---- [Other than above]	
4.72 V = 0°C 4.33 V = 30°C 3.55 V = 60°C 2.20 V = 100°C 1.61 V = 120°C	
x1 [MPa] (0.00 – 5.00 [MPa]) ---- [Other than above]	
x1 [mV] (0.00 – 5.00 [V]) ---- [Other than above]	
x1 [MPa] (0.00 – 5.00 [MPa]) ---- [Other than above]	
x1 [MPa] (0.00 – 5.00 [MPa]) ---- [Other than above]	
x1 [mV] (0.00 – 5.00 [V]) ---- [Other than above]	
x1 [mV] (0.00 – 5.00 [V]) ---- [Other than above]	
x1 [mA] (0 – 1000 [mA]) ---- [Other than above]	
x1 [mA] (0 – 1000 [mA]) ---- [Other than above]	
x1 [mA] (0 – 1000 [mA]) ---- [Other than above]	

Data range	Remarks
Depending upon software part number	
Depending upon software version No.	
Depending upon software version No.	
0.00 – 5.00 [V] ---- [ARSC setting OFF or other than above]	
0 – 32767 [rpm] ---- [ARSC option setting OFF or other than above]	
0 – 32767 [rpm] ---- [Other than above]	
0 – 32767 [rpm] ---- [Other than above]	
0 – 160 [°C] ---- [Other than above]	
0.00 – 5.00 [V] ---- [Other than above]	
0 – 1000 [mA] [command value] ---- [Other than above]	
0 – 1000 [mA] [command value] ---- [Other than above]	
0.00 – 5.00 [V] ---- [Other than above]	
0.00 – 5.00 [V] ---- [Other than above]	
0.00 – 5.00 [V] ---- [Other than above]	
0.00 – 5.00 [V] ---- [Other than above]	
0 – 1000 [mA] [command value] ---- [Other than above]	
0 – 1000 [mA] [command value] ---- [Other than above]	
0 – 1000 [mA] [command value] ---- [Other than above]	
0.00 – 5.00 [V] ---- [Other than above]	
0.00 – 5.00 [V] ---- [Other than above]	
0.0 – 10.00 [s] ---- [Other than above]	Down to 2 decimal places are displayed.
0.0 – 10.00 [s] ---- [Other than above]	Down to 2 decimal places are displayed.
ON [1] OFF [0]	Unit is not displayed.
-180.0 – +180.0 [°] ---- [Other than above]	
0.00 – 5.00 [V] ---- [Other than above]	
0.0 – 99.99 [rad/s] ---- [Other than above]	Down to 2 decimal places are displayed.
0.00 – 20.10 [MPa] ---- [Automatic suspension option setting OFF and ARSC option setting OFF, or other than above]	
0.00 – 5.00 [V] ---- [Automatic suspension option setting OFF and ARSC option setting OFF, or other than above]	
0.00 – 20.10 [MPa] ---- [Automatic suspension option setting OFF and ARSC option setting OFF, or other than above]	

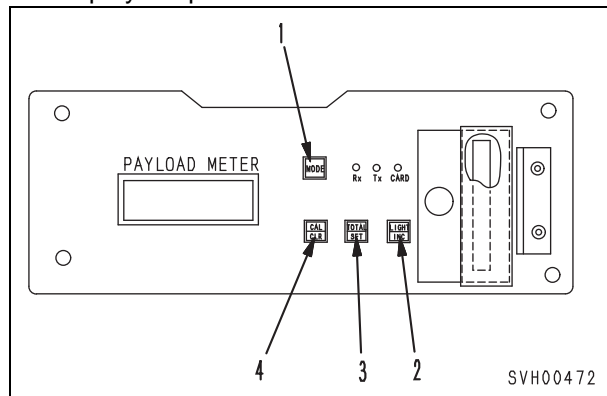
- 4) Data of intergrated load weight and total number of cycles
 - ★ The integrated load weight and total number of cycles after a time are calculated and saved again each time the dumping condition is fulfilled.
 - ★ Integration of the load weight and total number of cycles are started after they are cleared. (See the volume of Operation.)
 - ★ The saving limit of the integrated load weight and total number of cycles is 999900.0 t (metric ton) or US ton (short ton) and 9999 cycles.

Item	Unit	Range	
Intergrated load weight	t (Metric ton) or US ton (Short ton)	0-999900.0	Shows integrated value after time when data were cleared
Total number of cycles	Times	0-9999	
Year (right 2 digits)	Year	0-99	Shows date and time when data were cleared
Month	Month	1-12	
Day	Day	1-31	
Time Hour	Hour	Displayed as 0-23	
Time Minute	Minute	0-59	

5) Other data

Contents	Item	Unit	Range	
Operator check mode set data	Machine ID	Integer	0-200	Operator check mode set by input operation
	Open ID	Integer	0-200	
	Limit speed	km/h	0-99	
	Option code	Integer	0-11	
Calibration performance data	Year (right 2 digits)	Year	0-99	Date and time when calibration was performed
	Month	Month	1-12	
	Day	Day	1-31	
	Time Hour	Hour	Displayed as 0-23	
	Time Minute	Minute	0-59	
User write data	Data 1		20 Characters	Comments that can be written freely into payload meter. Note: Input and settings are possible only from PC through cable communications. (For details, see software manual.)
	Data 2		20 Characters	
	Data 3		20 Characters	
	Data 4		20 Characters	

(I) Operation for setting display range of external display lamps



1. Set to H.SEL display, then press CAL/CLR switch (4)

Display: E.SEL

2. Press TOTAL/SFT switch (3).

Display: A."XXX"

(present value of lamp 1)

If it is necessary to correct the display range for lamp 1, press LIGHT/INC switch (2) and correct.

3. Press CAL/CLR switch (4).

Display: b."XXX"

(present value of lamp 2)

If it is necessary to correct the display range for lamp 2, press LIGHT/INC switch (2) and correct.

4. Press CAL/CLR switch (4) again.

Display: C."XXX"

(present value of lamp 3)

If it is necessary to correct the display range for lamp 3, press LIGHT/INC switch (2) and correct.

5. Press CAL/CLR switch (4) again.

Display: d."XXX"

(present value of lamp 4)

If it is necessary to correct the display range for lamp 4, press LIGHT/INC switch (2) and correct.

6. Press CAL/CLR switch (4) again.

Display: E."XXX"

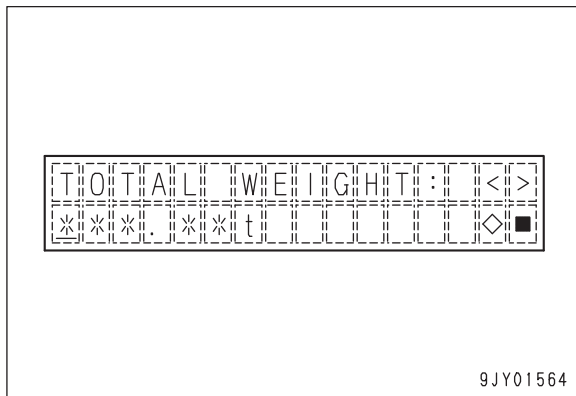
(present value of lamp 5)

If it is necessary to correct the display range for lamp 5, press LIGHT/INC switch (2) and correct.

7. When the correction operation from Step1. is completed, press MODE switch (1) at any time to return to the "CHEC" display. (End)

If it is impossible to set the input values even when MODE switch (1) is pressed, it displays d.FAL and returns to Step2.

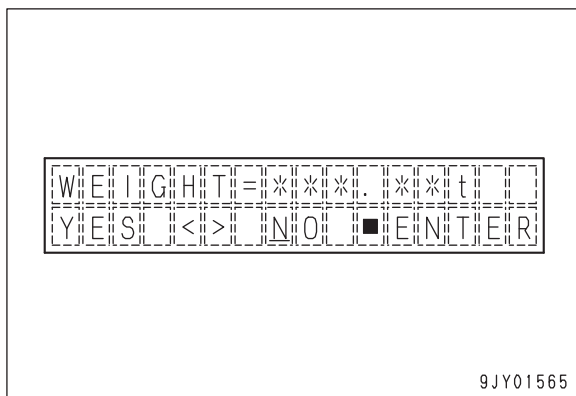
- iii) Input the measured weight of the fully loaded dump truck.



- [>] switch: Number at cursor moves forward.
- [<] switch: Number at cursor moves backward.
- [◇] switch: Enter number at cursor.
- [■] switch: Return to the largest position of the number to input the value again. If this switch is pressed again, inputting of the value is stopped and the previous screen appears.

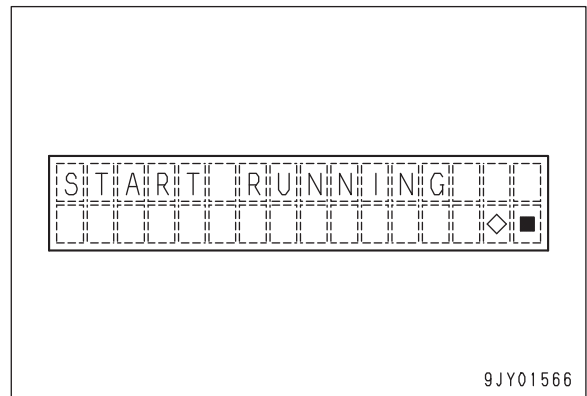
- ★ Inputtable range
 HD325-7: $A1 \pm (A1 \times 0.25)$ (metric ton)
 However,
 $A1 = \{32.7 \text{ [t] (Operating weight) + 46 \text{ [t] (Load capacity)}\}$
 HD405-7:
 $A2 \pm (A2 \times 0.25)$ (metric ton)
 However,
 $A2 = \{35 \text{ [t] (Operating weight) + 40 \text{ [t] (Load capacity)}\}$

- iv) Check the input value.



- [<] switch: Select "YES".
- [>] switch: Select "NO".
- [■] switch: Enter.

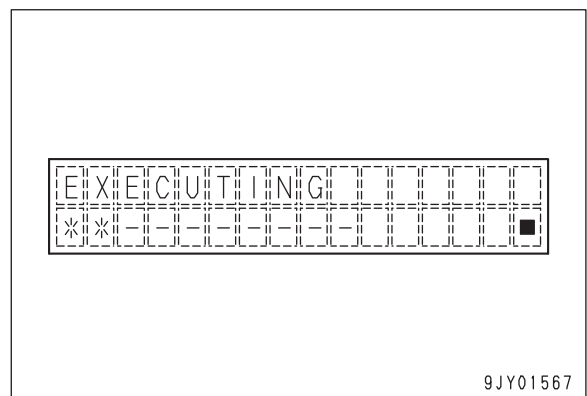
- v) Move the dump truck to a place where you can drive it for about 3 minutes.



- [◇] switch: After getting ready for drive, press this switch and start driving the dump truck.
- [■] switch: Return to the screen for inputting values.

Drive the dump truck for about 3 minutes (at a speed higher than 8 km/h) to enter the relationship between the weight of the dump truck and the suspension pressure under that weight.

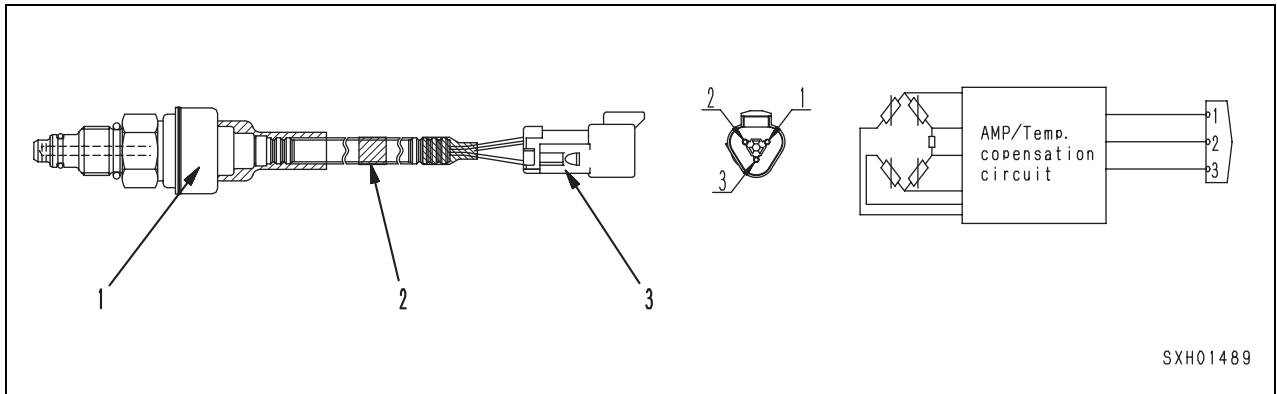
- vi) Display the progress of measurement.



- [■] switch: Stop measurement and return to the previous screen.

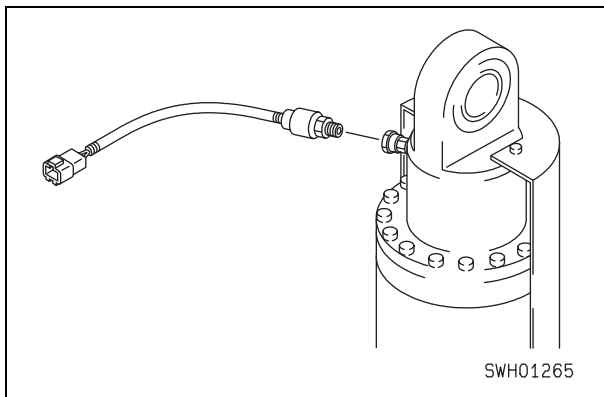
As measurement is executed, the number of [*] increases. When measurement is finished, the next screen appears automatically.

Pressure sensor (for payload meter II)



- 1. Sensor
- 2. Tube
- 3. Connector

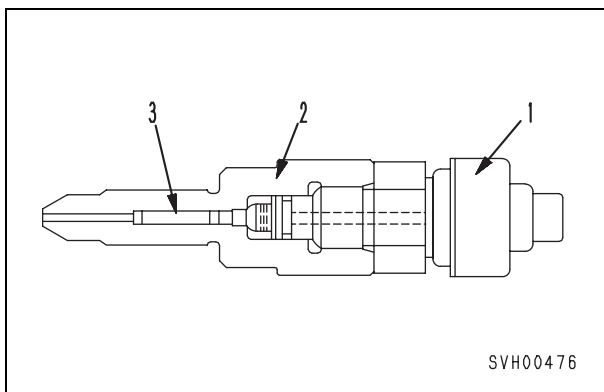
The pressure sensor is installed at the bottom end of the suspension cylinder and acts to measure the pressure at the cylinder bottom.



When replacing pressure sensor (1), leave the valve (2) installed to the suspension and remove only pressure sensor (1).

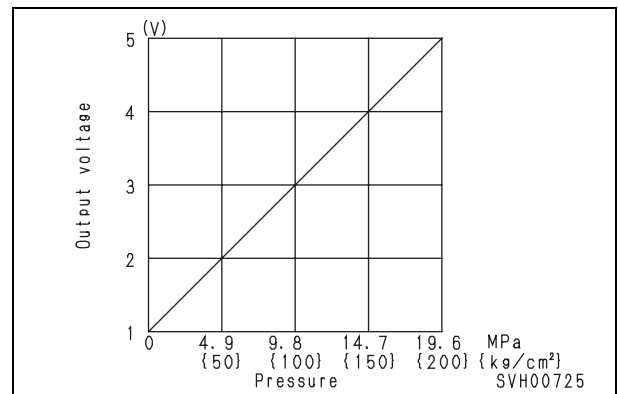
When removing or installing pressure sensor (1), be careful not to let valve (2) rotate.

When removing pressure sensor (1), the action of valve core (3) prevents the suspension pressure from going down.



The output characteristics of the sensor are as shown in the diagram.

Voltage between pin (1) (GND) and pin (3) (output) of each pressure sensor connector or voltage of output (pins (4), (5), (6), (7)) of each sensor when pin (3) of payload meter II controller connector (PM6) is grounded.



DUMP TRUCK

HD325-7R

HD405-7R

Machine model Serial number

HD325-7R	11001 and up
HD405-7R	11001 and up

30 Testing and adjusting

Testing and adjusting, Part 1

Precautions before work	3
Tools for testing, adjusting, and troubleshooting	4
Sketches of special tools	10
Testing engine speed	11
Testing intake air pressure (boost pressure)	12
Testing exhaust temperature	13
Testing exhaust gas color	15
Adjusting valve clearance	17
Testing compression pressure	18
Testing blow-by pressure	20
Testing engine oil pressure	21
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Releasing residual pressure from fuel system	22
Testing fuel pressure	23
Reduced cylinder mode operation	24
No-injection cranking	24

Testing exhaust gas color

- ★ Testing instrument for exhaust gas color

Symbol	Part No.	Part name
C	1	799-201-9001 Handy smoke checker
	2	Commercially available Smoke meter

⚠ When installing and removing the measuring instrument, take care not to touch a hot part.

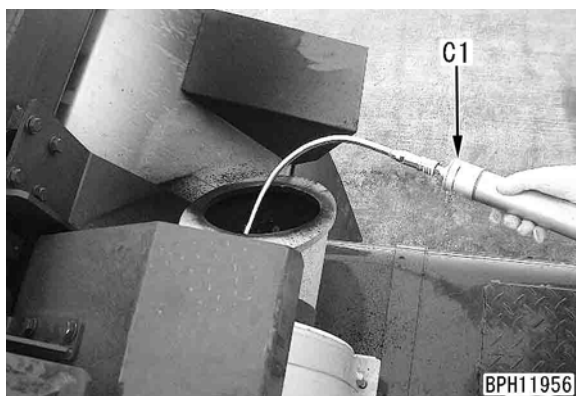
⚠ When testing, set the gear shift lever in the "N" or "D" to prevent internal breakage of the transmission.

When stalling, check that the gear shift lever position pilot lamp indicates "2" and be sure to apply the parking brake and check that the parking brake switch is lighting.

- ★ If an air source and a electric power source are not available in the field, use handy smoke checker **C1**. When recording official data, etc., use smoke meter **C2**.
- ★ Raise the body and lock it by inserting the pin.

1. Testing with handy smoke checker C1

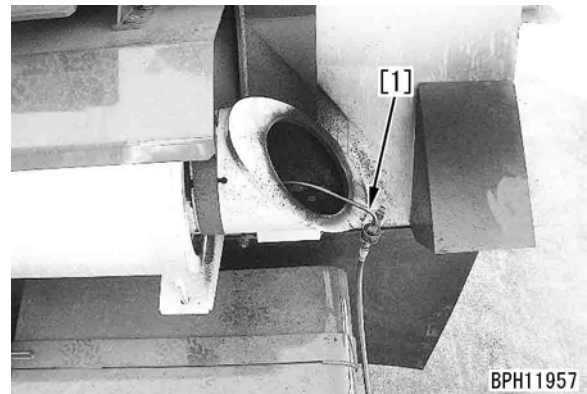
- 1) Stock a sheet of filter paper to smoke checker **C1**.
- 2) Insert the exhaust gas intake pipe in the exhaust pipe.
- 3) Start the engine and raise the temperature of the coolant to the operating range.
- 4) Let the exhaust gas stay on the filtering paper by operating a handle of Handy Smoke Checker **C1**, when the engine speed is suddenly accelerated or kept at high idle.



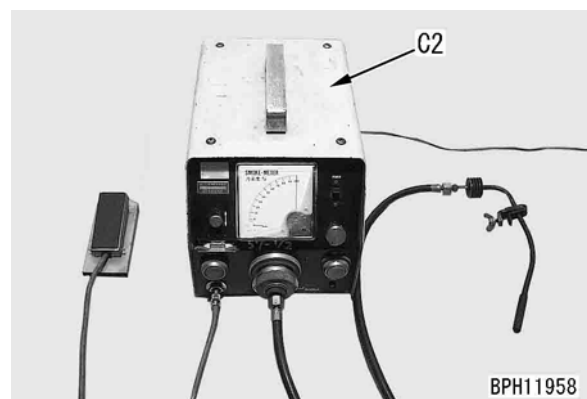
- 5) Remove the filter paper and compare it with the attached scale to make a judgement.

2. Testing with smoke meter C2

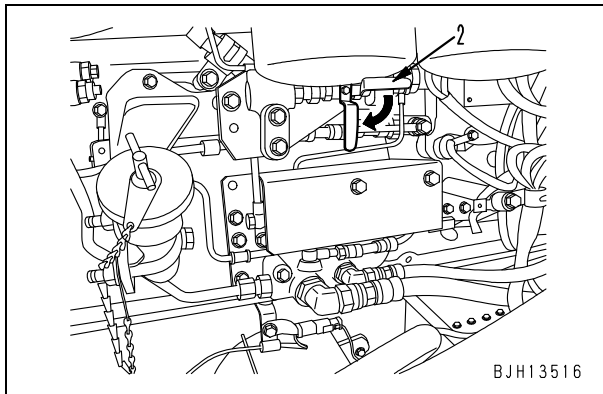
- 1) Insert probe [1] of the Smoke Meter **C2** into the exhaust gas pipe outlet, and fasten it to the outlet with a clip.



- 2) Connect the probe hose, accelerator switch outlet and air hose to the Smoke Meter **C2**.
 - ★ Restrict the supplied air pressure below 1.5 MPa {15 kg/cm²}.
- 3) Connect the power cable to an outlet of power.
 - ★ Before connecting the cable, check that the power switch of the smoke meter is turned OFF.
- 4) Fit a filtering paper by loosening the suction pump cap nut.
 - ★ Fit the filtering paper securely so that air may not leak.
- 5) Turn ON the power switch of smoke meter **C2**.



5. After the specified time (approx. 7 minutes), lamp (4) goes off and the electric priming pump stops automatically.
 - ★ If only the fuel filter was replaced, the air bleeding work is completed now.
6. If the fuel was used up or the fuel piping or supply pump was replaced and there is not fuel in the fuel circuit, turn switch (3) to the "ON" position after the electric priming pump stops automatically.
7. When lamp (4) goes off, the air bleeding work is completed.
8. Close air bleeding valve.
 - ★ Set the valve lever (2) in the close position.



9. Start the engine with the starting motor.
 - ★ The air in the high-pressure circuit is bled automatically if the engine is cranked.
 - ★ If the engine does not start, there may be still air in the low-pressure circuit. In this case, start the engine according to the following procedure.
 - 1) Turn the electric priming pump switch to the "ON" position.
 - ★ The switch returns to the "N" position automatically.
 - 2) While the electric priming pump is operating, start the engine.
 - ★ If the engine still does not start, repeat the above operation.
 - 3) After the engine starts, keep it running for at least 5 minutes to bleed all air from the fuel circuit.

Transmission related

★ Table of gearshift lever positions, speed ranges, and clutches actuated

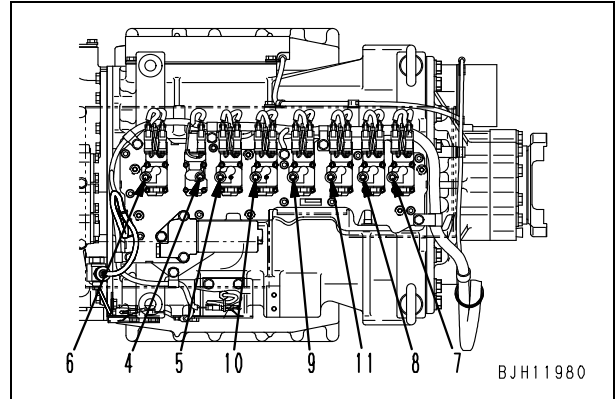
Gearshift lever									Speed engine	Clutches							
R	N	D	6	5	4	3	2	L		Lo	Hi	1st	2nd	3rd	4th	R	
			○	○	○	○	○	○	F1	◎		●					
			○	○	○	○	○		F2	●			●				
			○	○	○	○			F3		●		◎				
			○	○	○				F4	◎				●			
			○	○					F5		◎			◎			
			○						F6	◎						●	
		○							F7		◎					◎	
	○								N								
○									R	◎							●

- ★ The ○ mark indicates the speed ranges that are actuated for each position of the gearshift lever.
- ★ The ◎ mark and ● mark indicate the clutches that are actuated for each travel speed.
- ★ The ● mark indicates the speed range when measuring the oil pressure for each clutch.

5. Testing transmission Lo clutch pressure

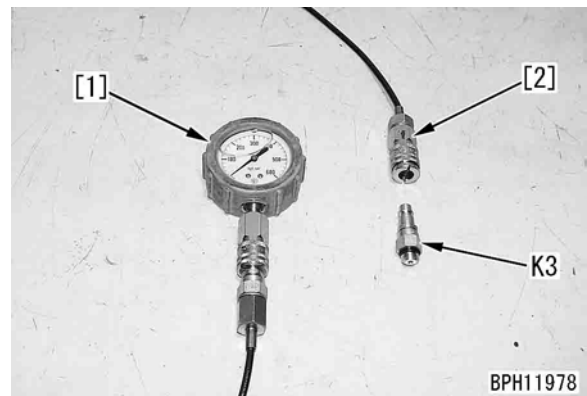
▲ Raise the dump body, then lock with pin.

- 1) Remove oil pressure pickup plug (5), install nipple K3, and connect hose [2] of hydraulic tester K1.



- 2) Lower the dump body and set to the original condition.
- 3) Connect oil pressure gauge [1] (6 MPa {60 kg/cm²}) to hose [2].
- 4) Start the engine and raise the temperature of the torque converter oil to the operating range.
- 5) Turn the parking brake switch TRAVEL, depress the parking brake pedal, then set the gearshift lever to position "2".
- 6) Release the brake and measure the oil pressure when traveling at high idle.

▲ In F2, a maximum travel speed of approx. 16.0 km/h is reached, so check carefully that the surrounding area is safe.



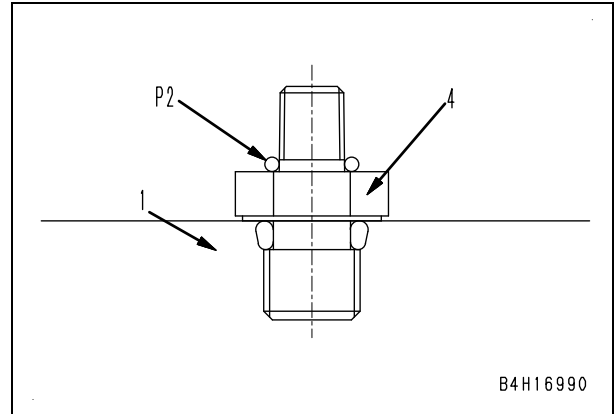
- 7) After completing the measurement, remove the measuring equipment and set to the original condition.

- When number of presses is 4 or less:
The accumulator gas pressure may be low
- When number of presses is 5 or more:
The accumulator gas pressure is normal

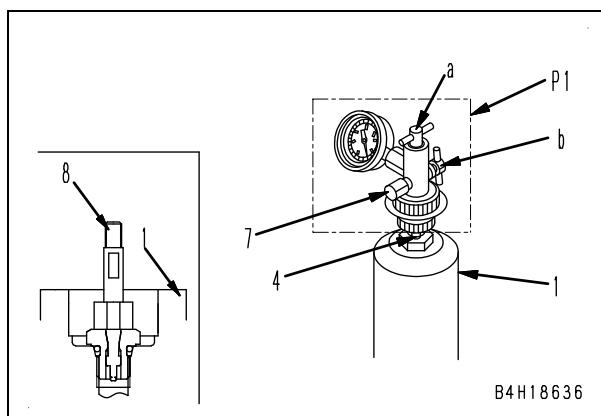
Reference: How to discharge nitrogen gas when discarding accumulator

★ When discarding an uninstalled accumulator, you need to discharge the nitrogen gas.

1. Connect gas charging tool **P1** to gas valve (4) of accumulator (1) or extension (8). For details, see "Testing of accumulator nitrogen gas pressure", 1 to 4.
2. Slowly turn handle (a) clockwise, and stop when you feel a light reaction force.
 - ★ Do not turn handle (a) excessively, otherwise it damages the accumulator valve core and gas may leak. Operate handle (a) carefully.
3. Gradually turn handle (b) counterclockwise. When nitrogen gas starts leaking through the threaded portion of handle (b), leave the handle as it is, and discharge the nitrogen gas.
4. When nitrogen gas stops leaking, leave handle (a) as it is, and remove gas charging tool **P1** from accumulator (1).
5. Remove extension (8).
(New type accumulator)
6. Remove O-ring **P2** from gas valve (4).
(Old type accumulator)
7. Discard the accumulator.
 - ★ According to step 4, gas valve (4) of accumulator (1) remains open.



B4H16990



B4H18636

Testing and adjusting inverted type rear suspension cylinder

★ Testing and adjusting instruments of rear suspension cylinder

Symbol	Part No.	Part name
N	-	792-610-1000 Suspension tool assembly
	-	792-610-1100 ●Pump Ass'y
	1	792-610-1130 ●●Pump
	2	792-610-1110 ●●Hose
	3	792-610-2200 ●●Joint
	-	792-610-1200 ●Charging tool assembly
	4	07020-21732 ●●Fitting
	5	792-610-1140 ●●Joint
	6	792-610-1250 ●●Valve Ass'y
	7	792-610-1260 ●●Nipple
	8	792-610-1270 ●●Hose
	9	792-610-1280 ●●Valve
	10	792-610-1400 ●●Regulator

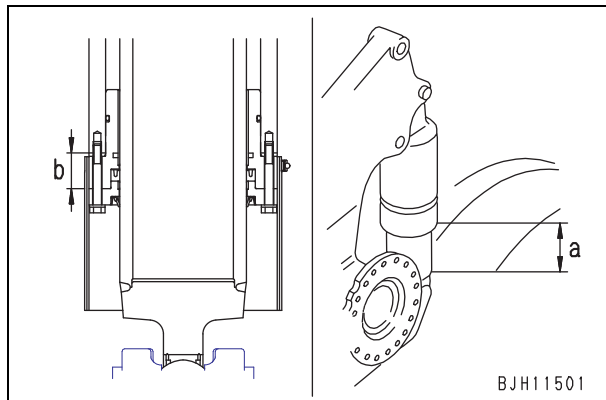
"-" : Kit tool Nos.

★ Stop the machine empty on level ground.

1. Testing length of cylinder

Check that dimension (a) of the rear suspension cylinder is within the specified value.
Specified value for dimension (a) :

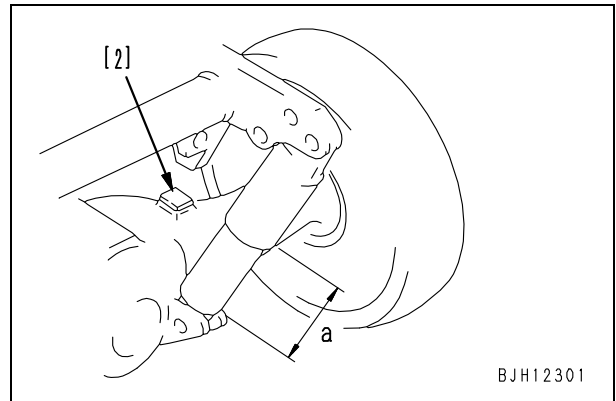
176 ± 10 mm



2. Releasing nitrogen gas

1) Set block [2] between the stopper and axle housing.

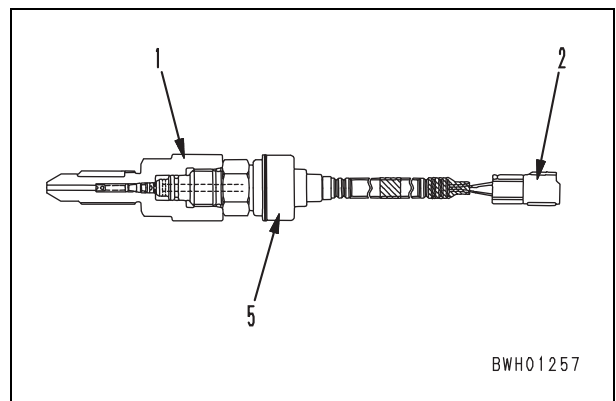
- ★ Thickness of block: 26 mm
- Dimension (a) : 97 ± 3 mm



2) Disconnect pressure sensor connector (2) of valve (1), then loosen the valve 2 – 3 turns.

- ★ The pressure sensor is installed to only the machine with the payload meter. The standard machine is equipped with only the oil level valve.
- ★ When releasing the nitrogen gas, there is danger that releasing the gas from the valve core of feed valve (3) will damage the valve core, so remove the gas at the valve (1).
- ★ When loosening the valve (1), loosen only the valve itself. Do not loosen the pressure sensor.
- ⚠ **When loosening the valve (1), gradually loosen only valve (1) itself, and do not remove the valve until all the nitrogen gas has been released from the slit.**
- ⚠ **If the nitrogen gas has not all been released, pressure sensor (5) are still under high pressure, so do not loosen them under any circumstances.**
- ★ When the valve (1) is loosened, and oil and gas spurt out together, tighten the valve slightly, and allow time for the gas to escape slowly.

● Pressure sensor (With payload meter)



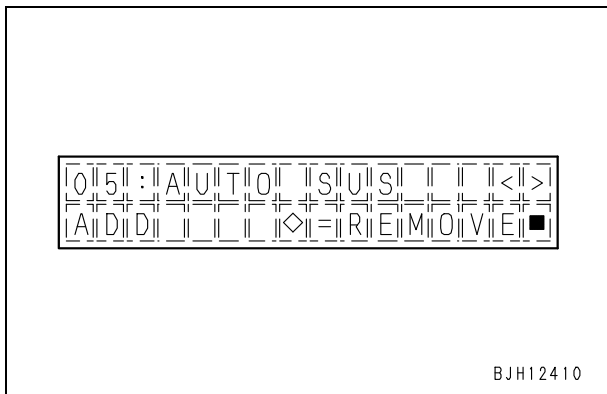
Handling of high voltage circuit of engine controller

1. Disconnecting or connecting operation of the connector between the engine controller and the engine shall be performed only when the starting switch is in the OFF position.
2. Do not start the engine while the T adapter is inserted or connected to the connector between the engine controller and the engine for diagnosis.
 - ★ You may turn the starting switch to the OFF or ON position but must not turn it to the START position.

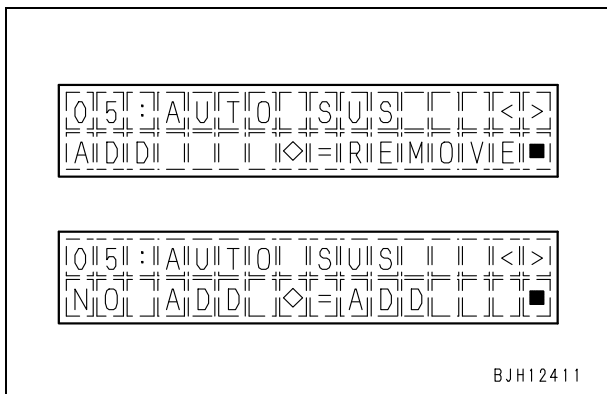
Adjusting transmission controller

- ★ After any of the following operations, adjust the transmission in order to tune the feeling of transmission and its controller.
 - The transmission has been overhauled or replaced.
 - The transmission control valve has been repaired or replaced.
 - The transmission controller has been replaced.
 - Power train speed sensor has been repaired or replaced.
 - The transmission oil temperature sensor has been repaired or replaced.
 - The transmission oil filter has been clogged abnormally and repaired.
- ★ For the adjusting operation of the transmission, use the service function of the machine monitor.
- ★ For the details of the operation method, see "Special functions of machine monitor (EMMS)".

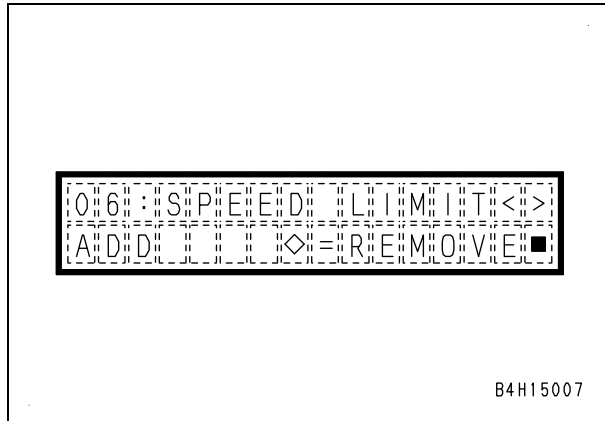
6. Setting of auto-suspension (05: AUTO SUS)
 - 1) While the optional item selection screen is displayed, select the auto-suspension (05: AUTO SUS).
 - ★ The current setting condition is displayed on the left side of the lower line.
 - ADD: Auto-suspension is set.
 - NO ADD: Auto-suspension is not set.



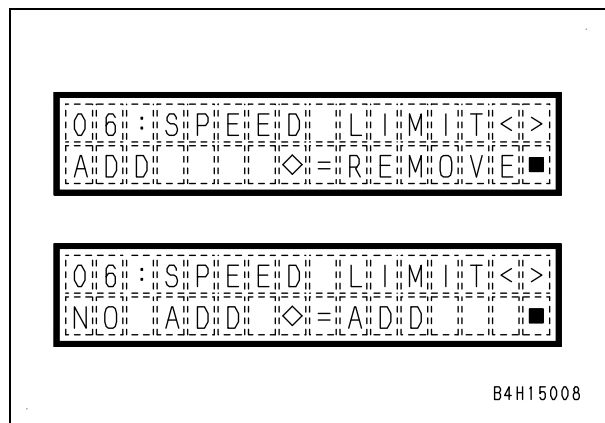
- 2) Check the installation condition of the auto-suspension and setting condition on the screen and press the [◇] switch to settle the setting.
 - [◇]: Change setting (Display changes).
 - [■]: Return to optional item selection screen.
 - ADD: Set option.
 - NO ADD: Set no option.
 - ★ If the setting is settled with the [◇] switch, it is effective even after this screen is turned OFF.



7. Setting of maximum speed restriction function (06: SPEED LIMIT)
 - 1) Select maximum speed restriction function (06: SPEED LIMIT) on the optional item selection screen.
 - ★ The current set condition is displayed on the left part of the lower line.
 - ADD: Setting is made.
 - NO ADD: No setting is made.

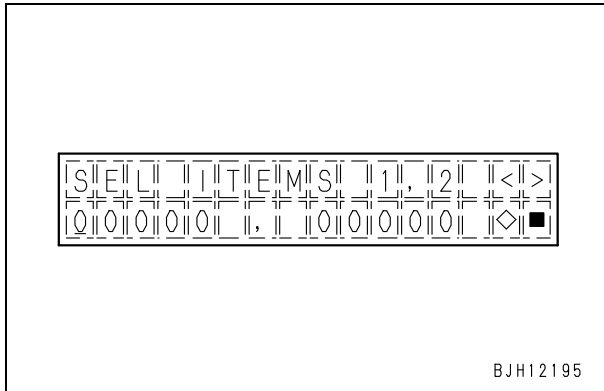


- 2) Check the installation of the maximum speed restriction function and the set condition on the screen, and then fix the setting by pressing the [◇] switch.
 - [◇]: Fixes setting
 - [■]: Returns to optional item selection screen
 - ADD: Sets option
 - NO ADD: Sets no option
 - ★ If the setting is fixed with the [◇] switch, it is still available even if this screen is closed.

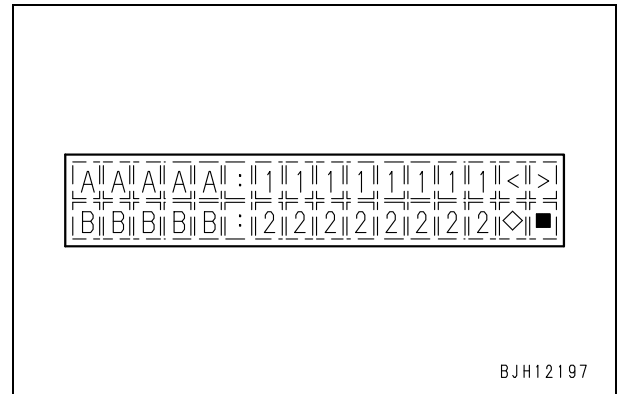


Failure code	Trouble part	Trouble	Controller	Action code	Category of record
15SJMA	Lockup clutch solenoid	Malfunction	TM	E03	Electrical system
(989A00)	Engine over run prevention command signal	Operating	MON	E02	—
(989D00)	Rear section tipping over alarm	Alarm is activated	MON	—	—
2F00KM	Parking brake	Mistake in operation or setting	TM	E03	Mechanical system
2G42ZG	Front accumulator	Lowering of oil pressure	TM	E03	Mechanical system
2G43ZG	Rear accumulator	Lowering of oil pressure	TM	E03	Mechanical system
A570NX	Engine oil filter	Clogging	BK	E01	Mechanical system
AA10NX	Air cleaner element	Clogging	MON	E01	Mechanical system
AB00MA	Alternator	Malfunction	MON	E03	Electrical system
B@BAZG	Abnormal lowering of engine oil pressure	Lowering of oil pressure	ENG	E02	Mechanical system
B@BAZK	Engine oil	Level too low	BK	E01	Mechanical system
B@BCZK	Lowering of radiator coolant	Lowering of level	TM	E01	Mechanical system
B@BCNS	Engine	Overheat	ENG	E02	Mechanical system
B@C7NS	Rear brake oil	Overheat	MON	E02	Mechanical system
B@CENS	Torque converter oil	Overheat	MON	E02	Mechanical system
B@GAZK	Battery electrolyte level	Lowering of level	BK	E01	Mechanical system
B@JANS	Steering oil	Overheat	TM	E02	Mechanical system
CA111	Engine controller	Abnormal	ENG	E03	Electrical system
CA115	Abnormal engine Ne and Bkup sensors	Both sensors have trouble simultaneously	ENG	E03	Electrical system
CA122	Charge (boost) pressure sensor	Too high	ENG	E03	Electrical system
CA123	Charge (boost) pressure sensor	Too low	ENG	E03	Electrical system
CA131	Throttle sensor	Too high	ENG	E03	Electrical system
CA132	Throttle sensor	Too low	ENG	E03	Electrical system
CA135	Oil pressure sensor	Too high	ENG	E01	Electrical system
CA141	Oil pressure sensor	Too low	ENG	E01	Electrical system
CA144	Coolant temperature sensor	Too high	ENG	E01	Electrical system
CA145	Coolant temperature sensor	Too low	ENG	E01	Electrical system
CA153	Charge (boost) temperature sensor	Too high	ENG	E01	Electrical system

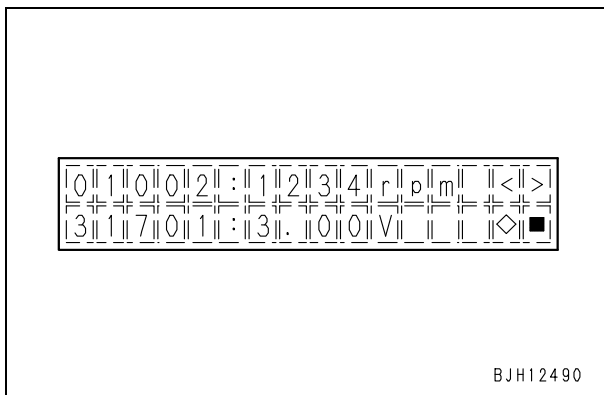
- 3) In the monitoring code input screen, operate each of the switches [>], [<], [◊] and [■], and directly input two monitoring codes directly.
 - [>]: Number at the cursor increases.
 - [<]: Number at the cursor decreases
 - [◊]: Number at the cursor is determined
 - [■]: Cursor moves to the left end / To return to the monitoring system and function selection screen.



6. Display data for 2 items simultaneous monitoring
 On the 2 item simultaneous monitoring display screen, the following data are displayed.
 - A** : Monitoring code 1
 - 1** : Monitoring data 1 (including unit)
 - B** : Monitoring code 2
 - 2** : Monitoring data 2 (including unit)
 - ★ For details, see "Monitoring code table".



- 4) When both of the monitoring codes have been confirmed, the screen switches to the 2 items simultaneous monitoring display screen.



- 5) To hold or cancel monitoring data display:
 - If the [◊] switch is pressed during monitoring, the monitoring data display is held and the [◊] mark flashes.
 - If the [◊] switch is pressed again, hold is canceled and it becomes active again.
 - [◊]: Hold and release of data display

Detailed information of 40937 (D-IN--0-----7)

[0] : ABS cut pressure switch (Front)
 [1] : ABS cut pressure switch (Rear)
 [2] : (Unused)
 [3] : (Unused)
 [4] : (Unused)
 [5] : (Unused)
 [6] : (Unused)
 [7] : (Unused)

Detailed information of 40959 (D-OUT--8-----15)

[8] : (Unused)
 [9] : (Unused)
 [10] : (Unused)
 [11] : (Unused)
 [12] : (Unused)
 [13] : (Unused)
 [14] : (Unused)
 [15] : (Unused)

Detailed information of 40938 (D-IN--8-----15)

[8] : (Unused)
 [9] : (Unused)
 [10] : (Unused)
 [11] : (Unused)
 [12] : (Unused)
 [13] : (Unused)
 [14] : (Unused)
 [15] : (Unused)

Detailed information of 40960 (D-OUT--16-----23)

[16] : (Unused)
 [17] : (Unused)
 [18] : ABS cut valve (Front) (* Through relay)
 [19] : ABS control valve (Rear) (* Through relay)
 [20] : (Unused)
 [21] : (Unused)
 [22] : (Unused)
 [23] : (Unused)

Detailed information of 40939 (D-IN--16-----23)

[16] : Starting switch C terminal signal
 [17] : (Unused)
 [18] : (Unused)
 [19] : (Unused)
 [20] : (Unused)
 [21] : (Unused)
 [22] : (Unused)
 [23] : (Unused)

Detailed information of 40940 (D-IN--24-----31)

[24] : (Unused)
 [25] : (Unused)
 [26] : (Unused)
 [27] : (Unused)
 [28] : (Unused)
 [29] : (Unused)
 [30] : (Unused)
 [31] : (Unused)

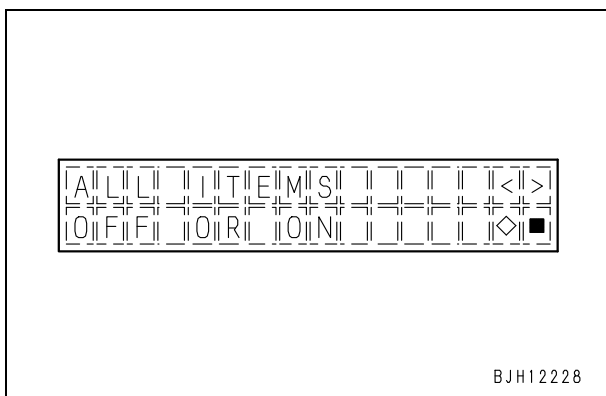
Detailed information of 40958 (D-OUT--0-----7)

[0] : (Unused)
 [1] : (Unused)
 [2] : (Unused)
 [3] : (Unused)
 [4] : (Unused)
 [5] : (Unused)
 [6] : (Unused)
 [7] : (Unused)

- ★ The number of resetting times is kept at the value before the default was set.
- ★ Each item is set turned ON.

7. Setting the function activation or deactivation for all the items (function No.15)

- 1) With the activation or deactivation setting for all items selected (ALL ITEMS) on the maintenance item and function selection screen, press the [◇] switch to display the all items activation or deactivation setting screen.
 - [◇]: Implement the function to set activation or deactivation of all the items.



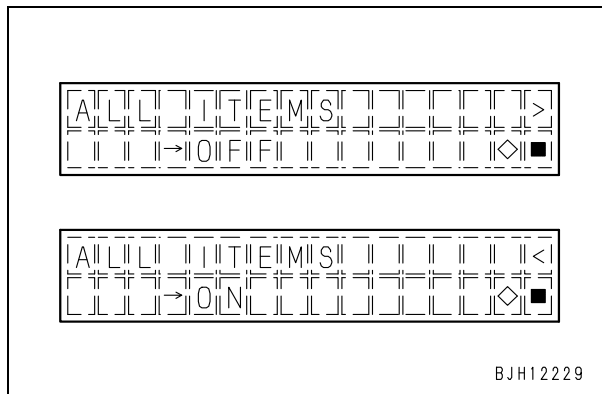
- 2) After the all items activation or deactivation setting screen is displayed, press the [>] switch or the [<] switch to display the activation setting or deactivation setting screen.

- [>]: Switch the setting screen.
- [<]: Switch the setting screen
- ★ To deactivate all the items, display the upper line setting screen (OFF), and to activate all the items, display the lower line setting screen (ON).

- 3) Confirm the setting screen, press the [◇] switch or the [■] switch to display the change confirmation screen.

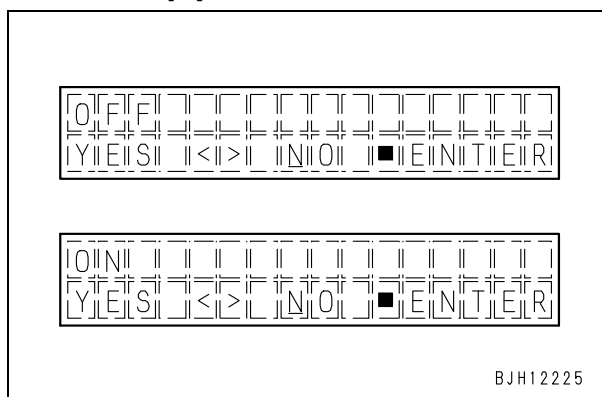
- [◇]: To switch to the change confirmation screen.
- [■]: To return to the maintenance item and function selection screen.
- ★ If deactivation of all the items (OFF) is set, it will stop the maintenance function of all the items, regardless of the setting of each maintenance item.

- ★ If activation of all the items (ON) is set, the maintenance function of all the items starts to work regardless of the setting of each maintenance item and the interval is set to the previous time before the interval has been deactivated.
- ★ The timer is reset simultaneously and it restarts to count from 0 h. The number of resetting times is set to the value before it was turned OFF.

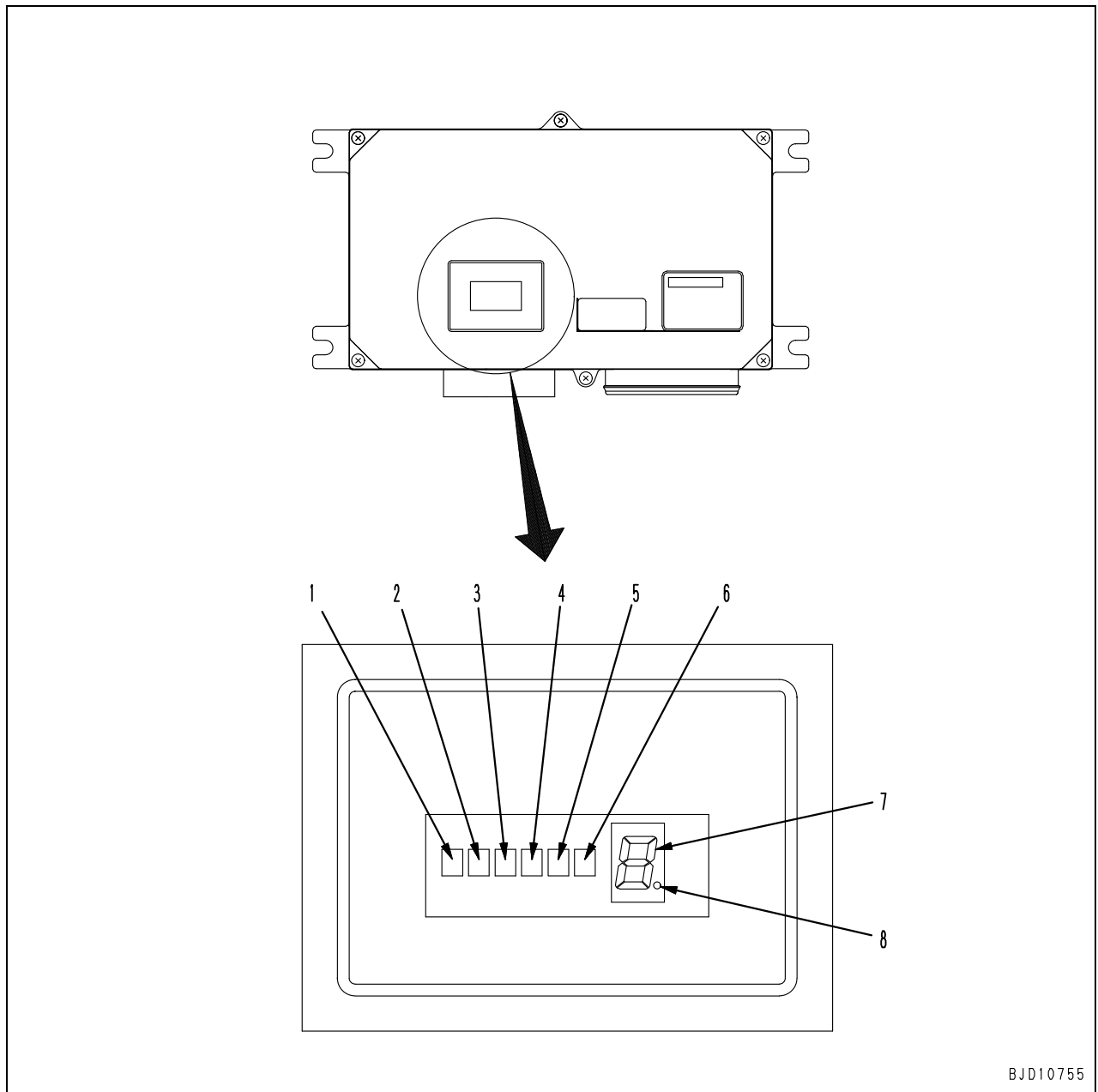


- 4) When the change confirmation screen is displayed, operate each [<], [>] and [■] switches.

- [<]: Select YES (move cursor)
- [>]: Select NO (move cursor)
- [■]: Execute YES or NO



Lamp display of KOMTRAX terminal



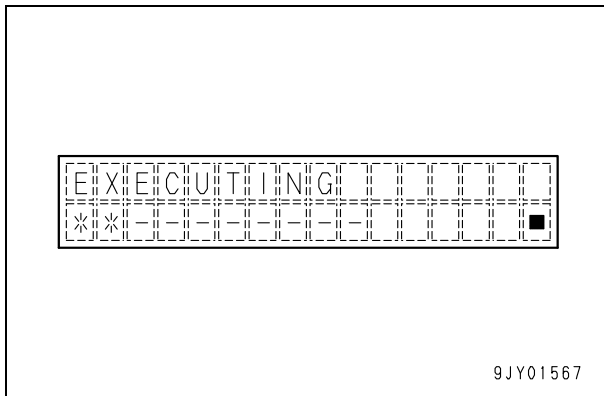
CPU LED

1. LED-C1 (R signal, ACC signal)
2. LED-C2 (Starting output status)
3. LED-C3 (S-NET, C signal status)
4. LED-C4 (Condition of CAN communication)
5. LED-C5 (downloading and writing status)
6. LED-C6 (downloading and writing status)

7 segments and dot for CPU

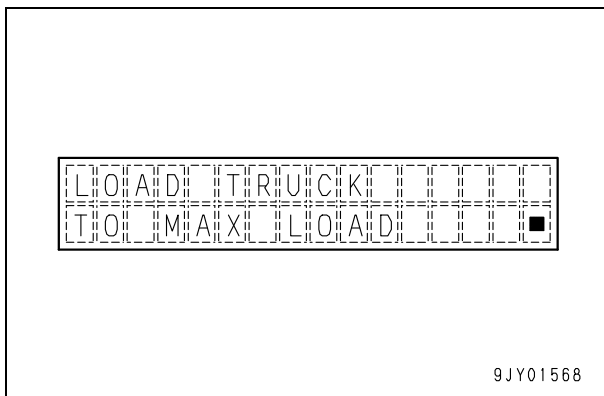
7. 7 segments (number of mails not yet sent)
8. Dot (GPS positioning status)

- 6] Display the progress of measurement.



- [■] button: Stop measurement and return to the previous screen. As measurement is executed, the number of "*" increases. When measurement is finished, the next screen appears automatically.

- 3) Load the machine to measure its fully loaded weight.



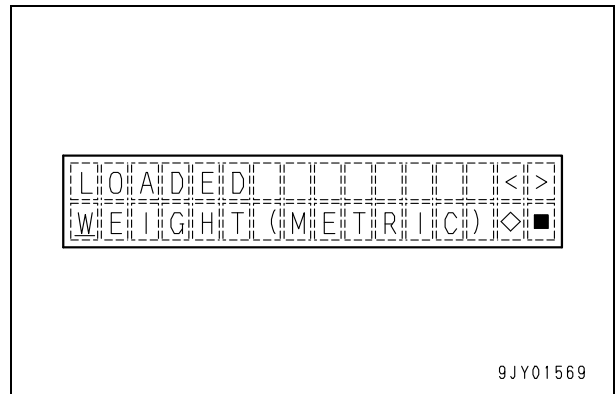
- [■] button: Return to the menu screen. When loading is started, the menu screen appears automatically. When indicating the current load for reference while the machine is being loaded, go out of "Service mode 1" temporarily and return to "Display of load weight/integrated odometer". On this screen, you can check the current load.

- 4) Measure the weight of the fully loaded machine with the load meter and record it (Write it on a sheet of paper, etc.)

- 5) Input the measured weight of the fully loaded machine and drive the machine for about 3 minutes.

- 1] Select "LOADED WEIGHT".

For the method of displaying the following screen, see the steps up to the above step.



- [>], [<] buttons: Select "EMPTY WEIGHT" or "LOADED WEIGHT"
- [◇] button: Enter the selection
- [■] button: Return to the previous screen

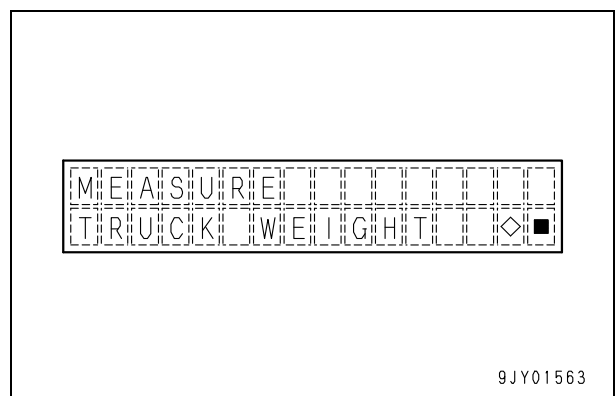
If the weight of the empty machine has been input and the machine has been driven for about 3 minutes, "LOADED WEIGHT" is displayed when the menu is selected.

Check the unit of the input value. The unit is indicated in the () on the right side of WEIGHT.

(METRIC): metric ton

(SHORT): short ton

- 2] Check that measurement of the weight of the fully loaded machine has been completed.

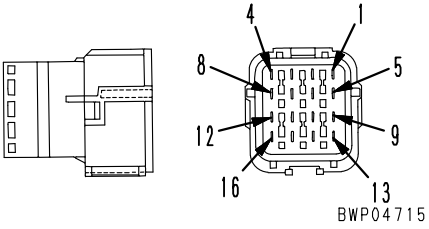
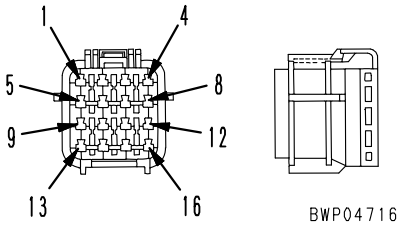


- [◇] button: Check that measurement has been completed and go to the next step
- [■] button: Return to the previous screen

Failure code	Trouble part	Trouble	Controller	Action code	Category of record	Reference manual
DX11K4	Rear brake proportional pressure reducing solenoid valve	Out of control	BK	E03	Electrical system	Troubleshooting by failure code, Part 4 SEN03715-**
DX11KA	Rear brake proportional pressure reducing solenoid valve output circuit	Disconnection	BK	E03	Electrical system	
DX11KB	Rear brake proportional pressure reducing solenoid valve	Short circuit	BK	E03	Electrical system	
DX11KY	Rear brake proportional pressure reducing solenoid valve	Short circuit to power source line	BK	E03	Electrical system	
DX11MA	Rear brake proportional pressure reducing solenoid valve	Malfunction	BK	E03	Mechanical system	
DX13KA	Output circuit of hoist EPC valve	Disconnection	TM	E03	Electrical system	
DX13KB	Output circuit of hoist EPC valve	Short circuit	TM	E03	Electrical system	
DX13KY	Output circuit of hoist EPC valve	Short circuit with power source line	TM	E03	Electrical system	
DX17K4	ASR proportional pressure reducing solenoid valve (right)	Valve keeps operating	BK	E01	Electrical system	Troubleshooting by failure code, Part 5 SEN03716-**
DX17KA	ASR proportional pressure reducing solenoid valve (right) output circuit	Disconnection output circuit	BK	E01	Electrical system	
DX17KB	ASR proportional pressure reducing solenoid valve (right) output circuit	Ground fault	BK	E01	Electrical system	
DX17KY	ASR proportional pressure reducing solenoid valve (right) output circuit	Short circuit	BK	E01	Electrical system	
DX17MA	ASR proportional pressure reducing solenoid valve (right)	Valve does not operate	BK	E01	Electrical system	
DX18K4	ASR proportional pressure reducing solenoid valve (left)	Valve keeps operating	BK	E01	Electrical system	
DX18KA	ASR proportional pressure reducing solenoid valve (left) output circuit	Disconnect output circuit	BK	E01	Electrical system	
DX18KB	ASR proportional pressure reducing solenoid valve (left) output circuit	Ground fault	BK	E01	Electrical system	
DX18KY	ASR proportional pressure reducing solenoid valve (left) output circuit	Short circuit	BK	E01	Electrical system	
DX18MA	ASR proportional pressure reducing solenoid valve (left)	Valve does not operate	BK	E01	Electrical system	
DXH1KA	Lockup clutch solenoid output circuit	Disconnection	TM	E03	Electrical system	
DXH1KB	Lock-up clutch solenoid output circuit	Short circuit	TM	E03	Electrical system	
DXH1KY	Lockup clutch solenoid output circuit	Short circuit to power source line	TM	E03	Electrical system	

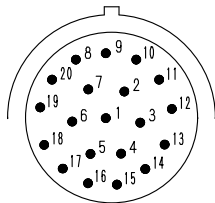
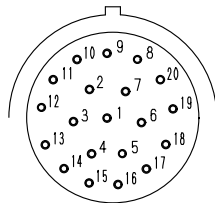
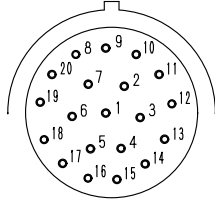
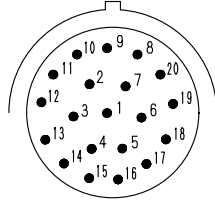
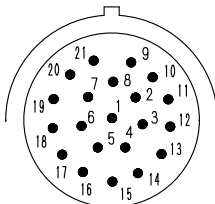
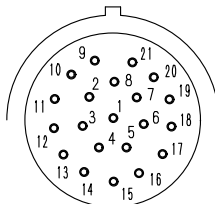
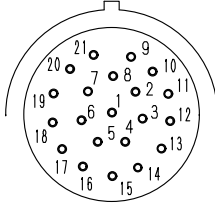
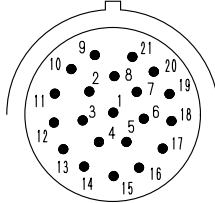
Checks before troubleshooting

	Check item	Judgement value	Remedy
Lubricating oil, coolant	1. Check fuel level and type	—	Add oil
	2. Check for impurities in fuel	—	Clean, drain
	3. Check water separator	—	Clean
	4. Check fuel filter	—	Replace
	5. Check hydraulic oil level	—	Add oil
	6. Check hydraulic oil strainer	—	Clean, drain
	7. Check power train oil level	—	Add oil
	8. Check engine oil level (engine oil pan level) and type	—	Add oil
	9. Check coolant level	—	Add coolant
	10. Check dust indicator for clogging	—	Clean or replace
	11. Check power train oil filter	—	Replace
	12. Check hydraulic oil filter	—	Replace
	13. Check final drive oil level	—	Add oil
Electrical equipment	1. Check for looseness and corrosion of battery cable terminals	—	Retighten or replace
	2. Check for looseness and corrosion of alternator harness terminals	—	Retighten or replace
	3. Check for looseness and corrosion of starting motor harness terminals	—	Retighten or replace
	4. Check operation of instruments	—	Repair or replace
Hydraulic and mechanical equipment	1. Check for abnormal noise and smell	—	Repair
	2. Check for oil leakage	—	Repair
	3. Carry out air bleeding	—	Bleed air
Electrical equipment	1. Check battery voltage (engine stopped)	20 – 26 V	Replace
	2. Check battery electrolyte level	—	Refill or replace
	3. Check for discoloration, burnout of wiring, and peeling of harness coating	—	Replace
	4. Check for missing wiring clamps and a slack of wire	—	Repair
	5. Check for water leaking on wiring (pay particularly careful attention to water leaking on connectors or terminals)	—	Disconnect connector and dry
	6. Check for blown or corroded fuse	—	Replace
	7. Check alternator voltage (engine running at half throttle or above)	After running for several minutes: 27.5 – 29.5 V	Replace
	8. Check operating noise of battery relay (when turning the starting switch ON or OFF)	—	Replace

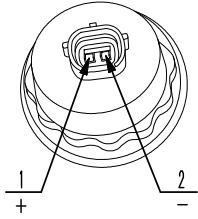
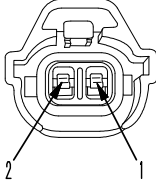
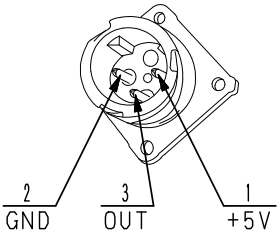
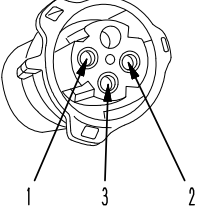
No. of pins	SWP type connector		
	Male (female housing)	Female (male housing)	Testing connection use special tool Part No.
16	 <p style="text-align: center;">BWP04715</p>	 <p style="text-align: center;">BWP04716</p>	799-601-7320 (T-adapter)
	Part No. : 08055-11681	Part No. : 08055-11691	
—	Terminal part No. : ·Electric wire size: 0.85 ·Grommet:Black ·Q'ty: 20	Terminal part No. : ·Electric wire size: 0.85 ·Grommet:Black ·Q'ty: 20	—
—	Terminal part No. : ·Electric wire size: 1.25 ·Grommet:Red ·Q'ty: 20	Terminal part No. : ·Electric wire size: 1.25 ·Grommet:Red ·Q'ty: 20	—

B4D18192

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

Type (shell size code)	HD30 Series connector		
	Body (plug)	Body (receptacle)	Testing connection use special tool Part No.
18-20 (3)	Pin (male terminal)  BWP05009	Socket (female terminal)  BWP05010	799-601-9230 (T-adapter)
	Part No. :08191-31201, 08191-31202	Part No. :08191-34101, 08191-34102	
	Socket (female terminal)  BWP05011	Pin (male terminal)  BWP05012	799-601-9230 (T-adapter)
	Part No. :08191-32201, 08191-32202	Part No. :08191-33101, 08191-33102	
18-21 (4)	Pin (male terminal)  BWP05013	Socket (female terminal)  BWP05014	799-601-9240 (T-adapter)
	Part No. :08191-41201, 08191-42202	Part No. :08191-44101, 08191-44102	
	Socket (female terminal)  BWP05015	Pin (male terminal)  BWP05016	799-601-9240 (T-adapter)
	Part No. :08191-42201, 08191-42202	Part No. :08191-43101, 08191-43102	

B4D18406

SUMITOMO connector for engine			
No. of pins	PCV (125, 140, 170, 12V140 engine)		
	Valve side (plug)	Harness side (receptacle)	Testing connection use special tool Part No.
2			799-601-9430 (Socket) (Kit: 799-601-4101) (Kit: 799-601-4201)
	-	-	
CANNON connector for engine			
No. of pins	Boost (air intake) pressure sensor (140 engine)		
	Sensor side (plug)	Harness side (receptacle)	Testing connection use special tool Part No.
4			799-601-4110 (T-adapter) (Kit: 799-601-4101) (Kit: 799-601-4201)
	☆ Without pin (4)	☆ Without pin (4)	

B4D18420

Circuit diagram related

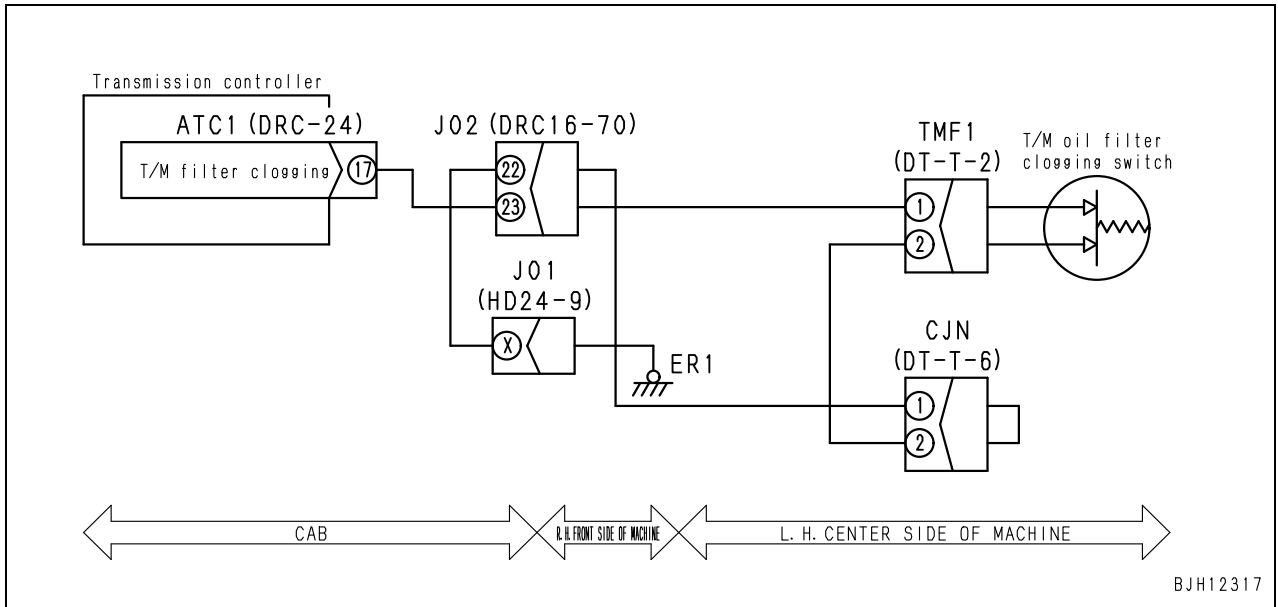
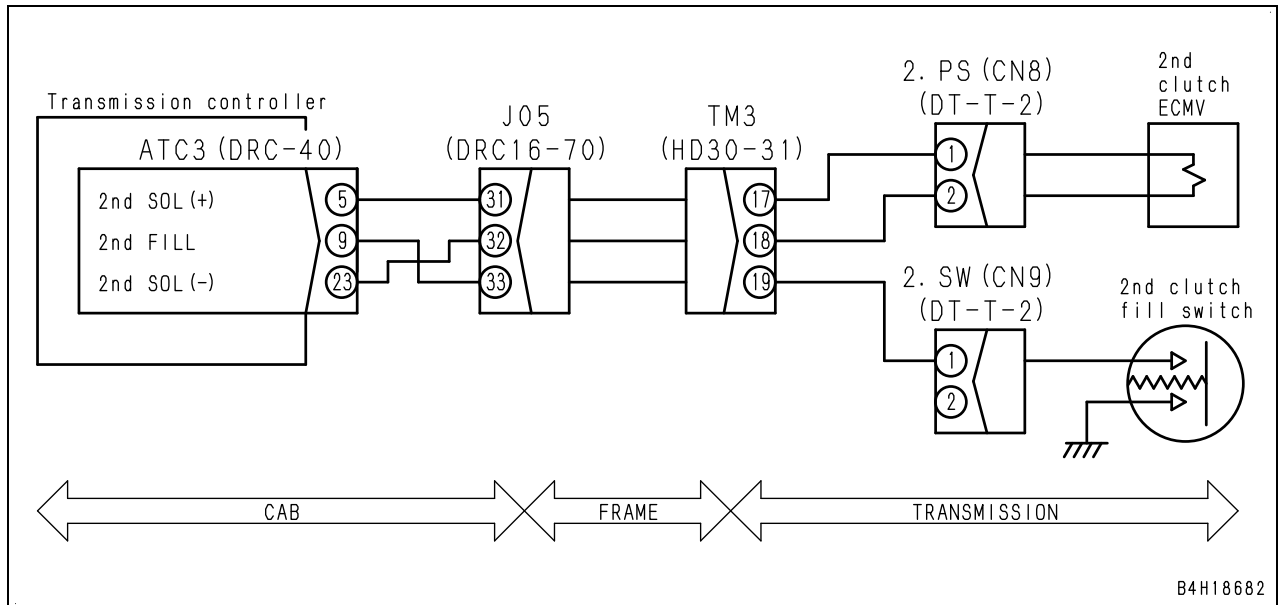


Table 1

Speed when trouble was detected		Failed clutch	Remedy against trouble		
			Action of controller (Selected clutch, gear speed)		ON/OFF state of lockup clutch
F7	4th High	4th	OFF	NEUTRAL	OFF
		High	OFF	NEUTRAL	OFF
F6	4th Low	4th	OFF	NEUTRAL	OFF
		Low	4H	F7	OFF
F5	3rd High	3rd	4L	F6	OFF
		High	4L	F6	OFF
F4	3rd Low	3rd	4L	F6	OFF
		Low	3H	F5	OFF
F3	2nd High	2nd	3L	F4	OFF
		High	3L	F4	OFF
F2	2nd Low	2nd	3L	F4	OFF
		Low	2H	F3	OFF
F1	1st Low	1st	2L	F2	OFF
		Low	2H	F3	OFF
R1	Reverse Low	Reverse	OFF	NEUTRAL	OFF
		Low	RH	R2	OFF

Circuit diagram related



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Table 2

Speed when trouble was detected		Failed clutch (Fill switch ON)	Remedy against trouble		
			Action of controller (Selected clutch, gear speed)		ON/OFF state of lockup clutch
F7	4th High	3rd	OFF	NEUTRAL	OFF
		2nd	OFF	NEUTRAL	OFF
		1st	OFF	NEUTRAL	OFF
		Reverse	OFF	NEUTRAL	OFF
		Low	OFF	NEUTRAL	OFF
F6	4th Low	3rd	OFF	NEUTRAL	OFF
		2nd	OFF	NEUTRAL	OFF
		1st	OFF	NEUTRAL	OFF
		Reverse	OFF	NEUTRAL	OFF
		High	4H	F7	OFF
F5	3rd High	4th	4L	F6	OFF
		2nd	OFF	NEUTRAL	OFF
		1st	OFF	NEUTRAL	OFF
		Reverse	OFF	NEUTRAL	OFF
		Low	4L	F6	OFF
F4	3rd Low	4th	4L	F6	OFF
		2nd	OFF	NEUTRAL	OFF
		1st	OFF	NEUTRAL	OFF
		Reverse	OFF	NEUTRAL	OFF
		High	3H	F5	OFF
F3	2nd High	4th	4L	F6	OFF
		3rd	3L	F4	OFF
		1st	OFF	NEUTRAL	OFF
		Reverse	OFF	NEUTRAL	OFF
		Low	3L	F4	OFF
F2	2nd Low	4th	4L	F6	OFF
		3rd	3L	F4	OFF
		1st	OFF	NEUTRAL	OFF
		Reverse	OFF	NEUTRAL	OFF
		High	2H	F3	OFF
F1	1st Low	4th	4L	F6	OFF
		3rd	3L	F4	OFF
		2nd	2L	F2	OFF
		Reverse	OFF	NEUTRAL	OFF
		High	2H	F3	OFF
R1	Reverse Low	4th	OFF	NEUTRAL	OFF
		3rd	OFF	NEUTRAL	OFF
		2nd	OFF	NEUTRAL	OFF
		1st	OFF	NEUTRAL	OFF
		High	RH	R2	OFF
N		ANY	NONE	No reaction	—

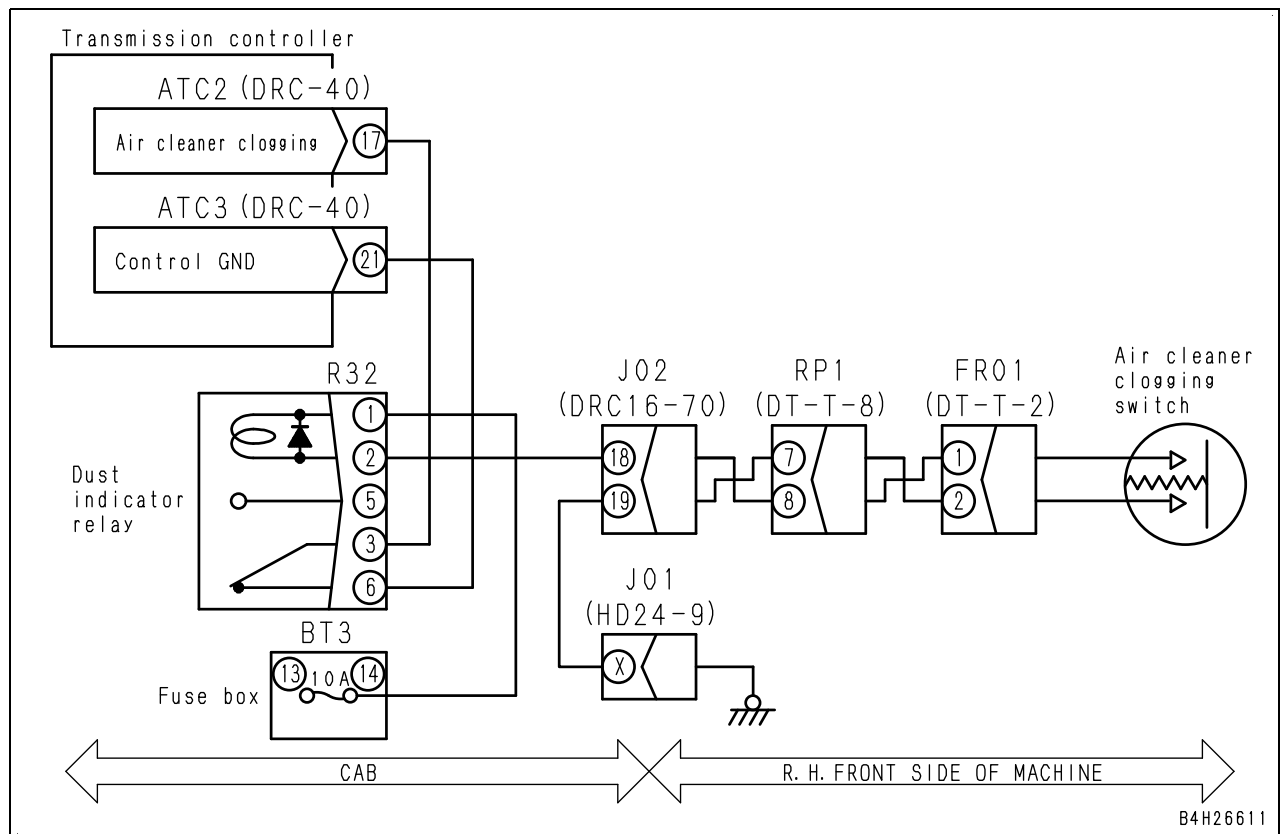
Failure code [15SHL1] 4th clutch solenoid: Command current is OFF and fill signal is ON

Action code	Failure code	Trouble	4th clutch solenoid: Command current is OFF and fill signal is ON.
E03	15SHL1		
Contents of trouble	<ul style="list-style-type: none"> When output to 4th clutch ECMV is turned OFF, signal from fill switch is kept ON and clutch is not disengaged. 		
Action of controller	<ul style="list-style-type: none"> Shifts up and keeps gear according to gear speed before trouble and Table 2. Turns lockup system OFF. 		
Problem that appears on machine	<ul style="list-style-type: none"> Gear is set in neutral suddenly during travel. Machine travels at gear speeds which use 4th clutch. 		
Related information	<ul style="list-style-type: none"> If electrical system is normal, check hydraulic and mechanical systems of 4th clutch or pressure control valve for defect. Current output to ECMV can be checked with monitoring function (Code: 31605). Fill switch input signal can be checked with code: 38919. 		

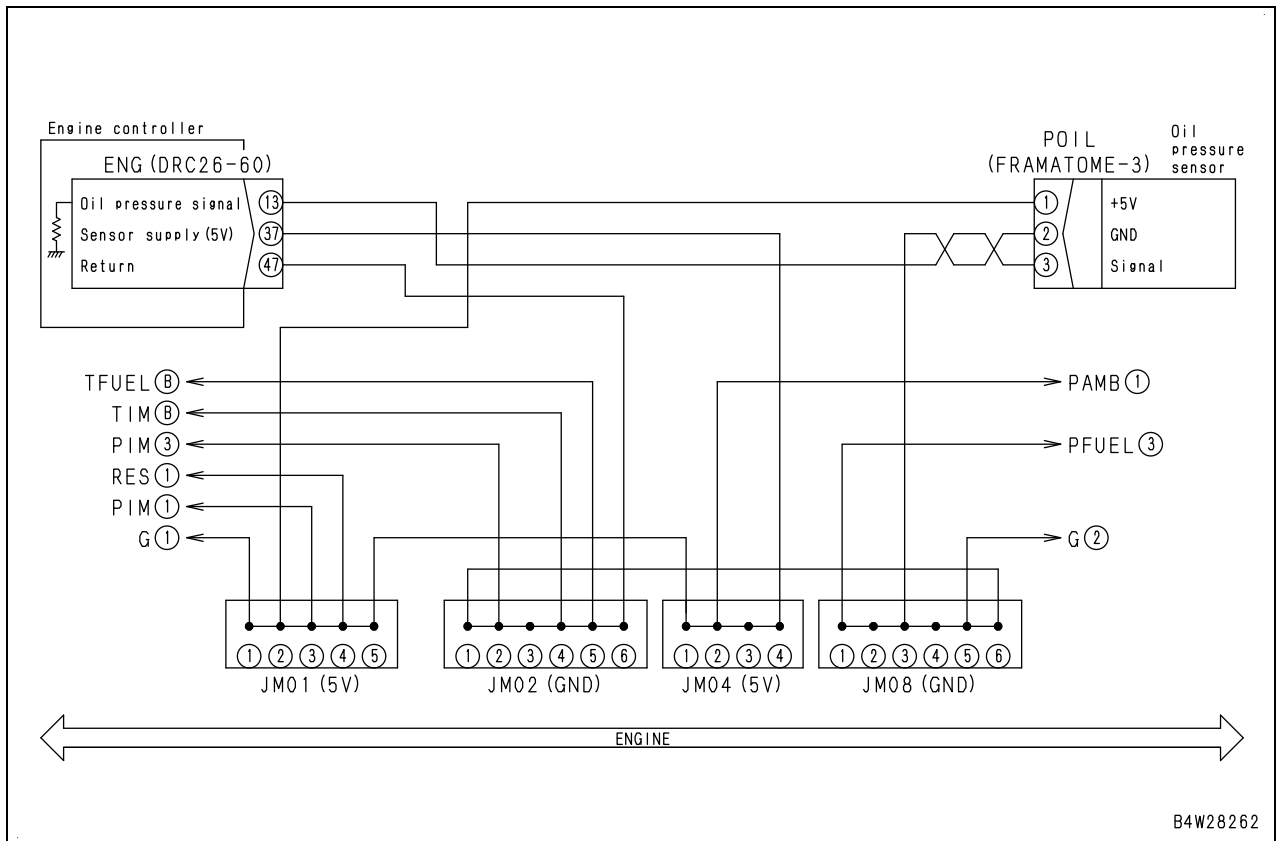
Possible causes and standard value in normal state	Cause		Standard value in normal state/Remarks on troubleshooting			
	Possible causes and standard value in normal state	1	Defective 4th clutch fill switch	1) Turn starting switch OFF. 2) Disconnect connector 4.SW (CN15). 3) Connect T-adapter.		
Between 4.SW (CN15) (male) (1) and ground				Resistance	Min. 1 MΩ	
2		Ground fault in wiring harness	1) Turn starting switch OFF. 2) Disconnect connectors ATC3 and 4.SW (CN15). 3) Connect T-adapter to ATC3 (female) or 4.SW (CN15) (female).			
			Between ground and ATC3 (female) (20) or 4.SW (CN15) (female) (1)	Resistance	Min. 1 MΩ	
3		Short circuit in wiring harness	1) Turn the starting switch OFF. 2) Disconnect connector ATC3, and connect T-adapter to female side.			
	Between ATC3 (female) (20) and each pin other than pin (20)		Continuity	No continuity		
4	Defective 4th clutch ECMV	1) Check that transmission 4th clutch operation pressure is normal, referring to Testing and adjusting, "Testing power train oil pressure". 2) While the testing tools are as they are, shift the gear shift lever to "L" position. If clutch oil pressure exceeds the following standard value, 4th clutch ECMV is defective.				
		4th clutch	Gear shift lever: "L"	Oil pressure	Max. 0.2 MPa {Max. 2 kg/cm ² }	
5	Defective transmission controller	1) Turn starting switch OFF. 2) Insert T-adapter into connector ATC3. 3) Turn starting switch to ON position.				
		Between ATC3 (20) and ground	Voltage	7 – 11 V		
If causes are not found by above checks, transmission controller is defective. (Since this is an internal failure, troubleshooting can not be performed.)						

Possible causes and standard value in normal state	Cause		Standard value in normal state/Remarks on troubleshooting			
		5	Air cleaner clogging sensor defective	★ Inside of air cleaner clogging sensor consists of electrical circuit, so it is impossible to judge with resistance. 1) Turn the starting switch OFF. 2) Insert T-adapter in connector FR01. 3) Start engine.		
Between FR01 (male) (1) and (2)				Air cleaner is normal	Voltage	20 – 30 V
			Air cleaner is clogged	Voltage	Max. 10 V	
6		Transmission controller defective	1) Turn starting switch OFF. 2) Insert T-adapter in connectors ATC3 and ATC2. 3) Start engine.			
	Between ATC2 (17) and ATC3 (21)		Air cleaner is normal	Voltage	Max. 1 V	
			Air cleaner is clogged	Voltage	Min. 7 V	

Circuit diagram related



Circuit diagram related to engine oil pressure sensor

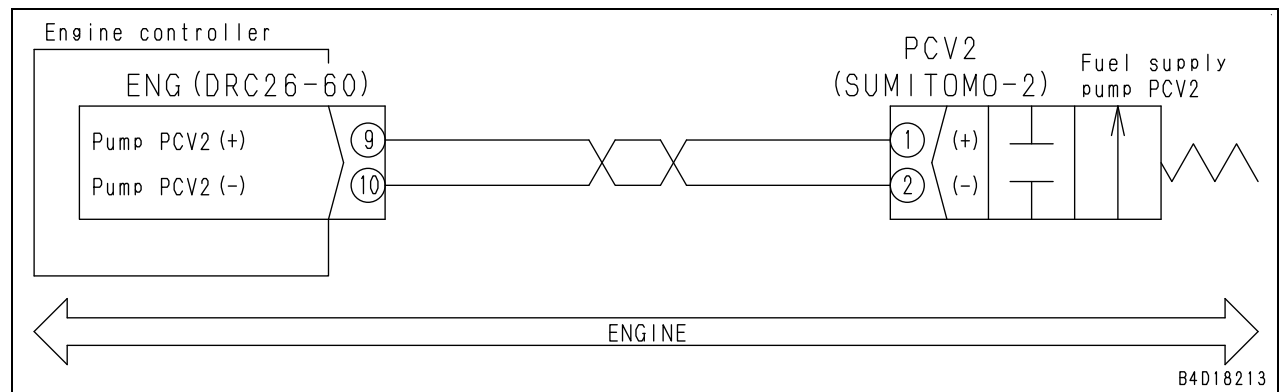


Failure code [CA274] PCV2 Disconnection

Action code	Failure code	Failure	PCV2 disconnection (Engine controller system)
E03	CA274		
Detail of failure	<ul style="list-style-type: none"> Disconnection was detected in supply pump PCV2 circuit. 		
Action of controller	<ul style="list-style-type: none"> Turns the centralized warning lamp and alarm buzzer ON. 		
Problem on machine	<ul style="list-style-type: none"> Engine output drops. 		
Related information	<ul style="list-style-type: none"> Method of reproducing failure code: Turn starting switch to ON position. While engine is running normally, approximately 24 V of pulse voltage is applied to PCV2 (1). But it is pulse voltage and cannot be measured by using multimeter. 		

Cause		Procedure, measuring location, criteria and remarks		
1	Defective wiring harness connector	See descriptions of wiring harness and connectors in "Electrical equipment" in "Checks before troubleshooting" of "General information on troubleshooting", and check them.		
2	Defective supply pump PCV2 (internal open circuit)	1. Turn starting switch to OFF position. 2. Disconnect connector PCV2 and connect socket to male side.		
		Between PCV2 (male) (1) and (2)	Resistance	2.3 – 5.3 Ω
3	Open or short circuit in wiring harness	1. Turn starting switch to OFF position. 2. Disconnect connector ENG and connect T-adapter to female side.		
		Between ENG (female) (9) and (10) (PCV2 resistance)	Resistance	2.3 – 5.3 Ω
4	Ground fault in wiring harness (Contact with ground circuit)	1. Turn starting switch to OFF position. 2. Disconnect connector ENG and PCV2. 3. Connect T-adapter to female side of connector ENG.		
		Between ENG (female) (9) and ground	Resistance	Min. 1 MΩ
		Between ENG (female) (10) and ground	Resistance	Min. 1 MΩ
5	Defective engine controller	If no abnormality is found by above checks, engine controller is defective. (Since the failure is in it, troubleshooting cannot be performed.)		

Circuit diagram related to PCV2

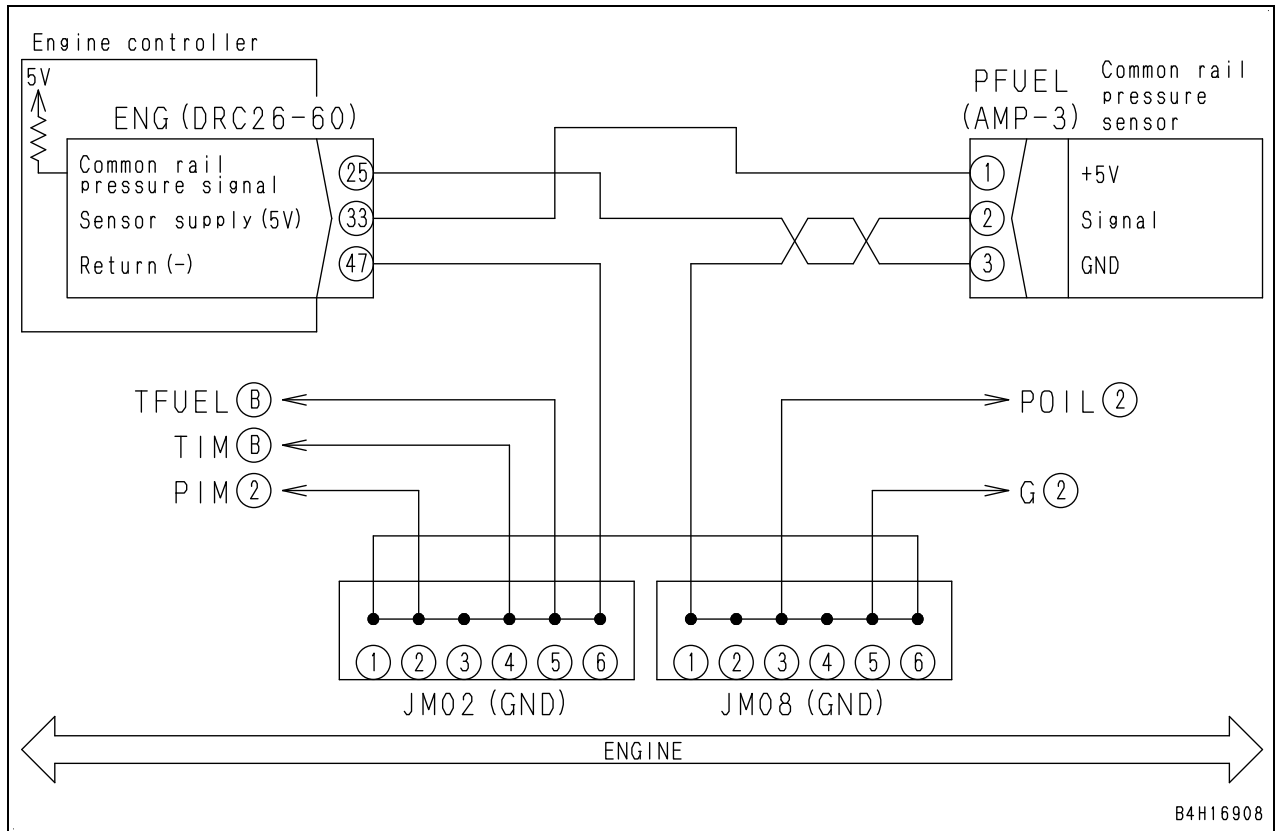


Failure code [CA351] Injectors drive circuit error

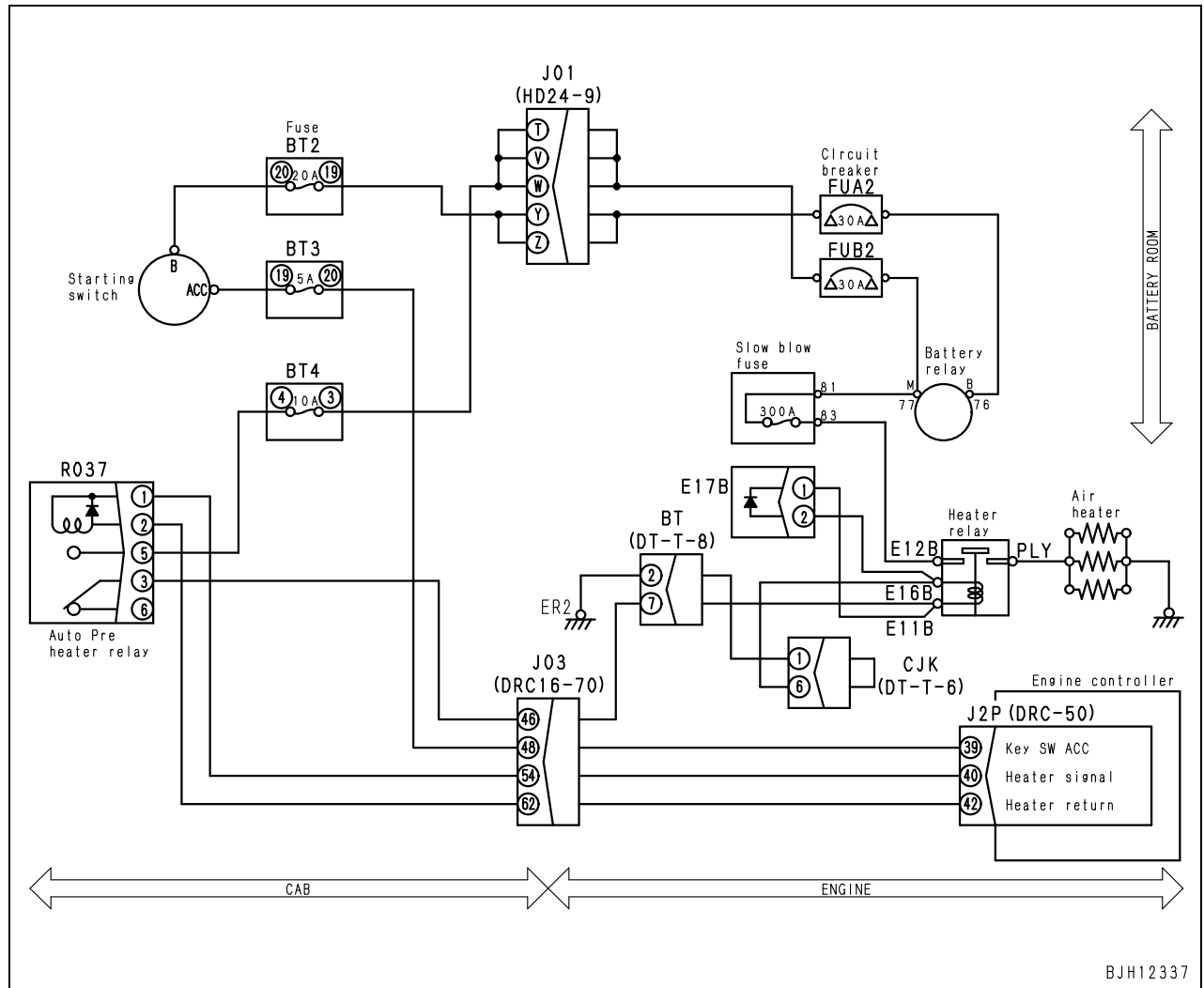
Action code	Failure code	Failure	Injectors drive circuit error (Engine controller system)
E03	CA351		
Detail of failure	<ul style="list-style-type: none"> Abnormality has occurred in injector drive circuit. 		
Action of controller	<ul style="list-style-type: none"> Limits engine output for travel (Limits common rail pressure) and allows engine to run Turns the centralized warning lamp and alarm buzzer ON. 		
Problem on machine	<ul style="list-style-type: none"> Engine output drops. 		
Related information	<ul style="list-style-type: none"> Method of reproducing failure code: Start engine. 		

Cause		Procedure, measuring location, criteria and remarks
1	Defect in related system	Check whether other failure code (failure code related to injector system) are displayed together. If another code is displayed, perform troubleshooting for it.
Perform troubleshooting for failure code [CA111]		

Circuit diagram related to common rail pressure

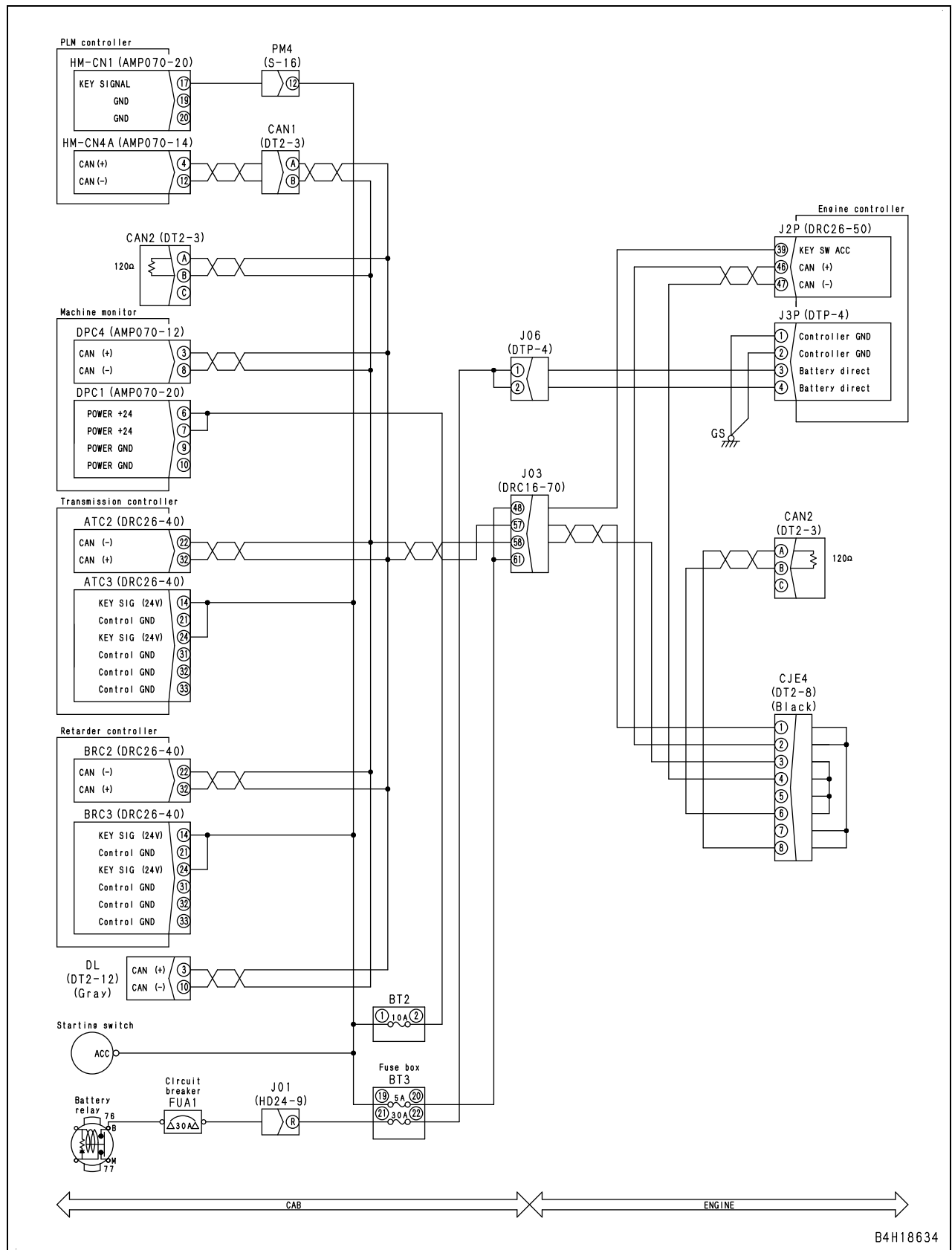


Circuit diagram related to intake air heater relay



	Cause		Standard value in normal state/Remarks on troubleshooting				
	Possible causes and standard value in normal state	5	Disconnection in wiring harness (Wire breakage or defective contact of connector)	Between ATC2 (female) (32) and BRC2 (female) (32)	Resistance	Max. 1 Ω	
Between ATC2 (female) (22) and BRC2 (female) (22)				Resistance	Max. 1 Ω		
Between ATC2 (female) (32) and DPC4 (female) (3)				Resistance	Max. 1 Ω		
Between ATC2 (female) (22) and DPC4 (female) (8)				Resistance	Max. 1 Ω		
Between ATC2 (female) (32) and J2P (female) (46)				Resistance	Max. 1 Ω		
Between ATC2 (female) (22) and J2P (female) (47)				Resistance	Max. 1 Ω		
Between ATC2 (female) (32) and DL (male) (3)				Resistance	Max. 1 Ω		
Between ATC2 (female) (22) and DL (male) (10)				Resistance	Max. 1 Ω		
Between ATC2 (female) (32) and CAN2 (female) (A)				Resistance	Max. 1 Ω		
Between ATC2 (female) (22) and CAN2 (female) (B)				Resistance	Max. 1 Ω		
Between ATC2 (female) (32) and HM-CN4A (female) (4) *				Resistance	Max. 1 Ω		
Between ATC2 (female) (22) and HM-CN4A (female) (12) *				Resistance	Max. 1 Ω		
★ If no failure is found by check on cause 4, this check is not required. 1) Turn the starting switch to OFF position and disconnect the battery ground cable. 2) Disconnect connectors ATC3, J2P, DPC1, BRC3, HM-CN1 and ABS3, and connect the T-adaptor to their female side.							
Between starting switch (ACC) and ATC3 (female) (14), (24)				Resistance	Max. 1 Ω		
Between starting switch (ACC) and DPC1 (female) (6), (7)				Resistance	Max. 1 Ω		
Between starting switch (ACC) and J2P (female) (39)				Resistance	Max. 1 Ω		
Between starting switch (ACC) and BRC3 (female) (14), (24)				Resistance	Max. 1 Ω		
Between starting switch (ACC) and HM-CN1 (female) (17)				Resistance	Max. 1 Ω		
Between starting switch (ACC) and ABS3 (female) (14), (24)				Resistance	Max. 1 Ω		

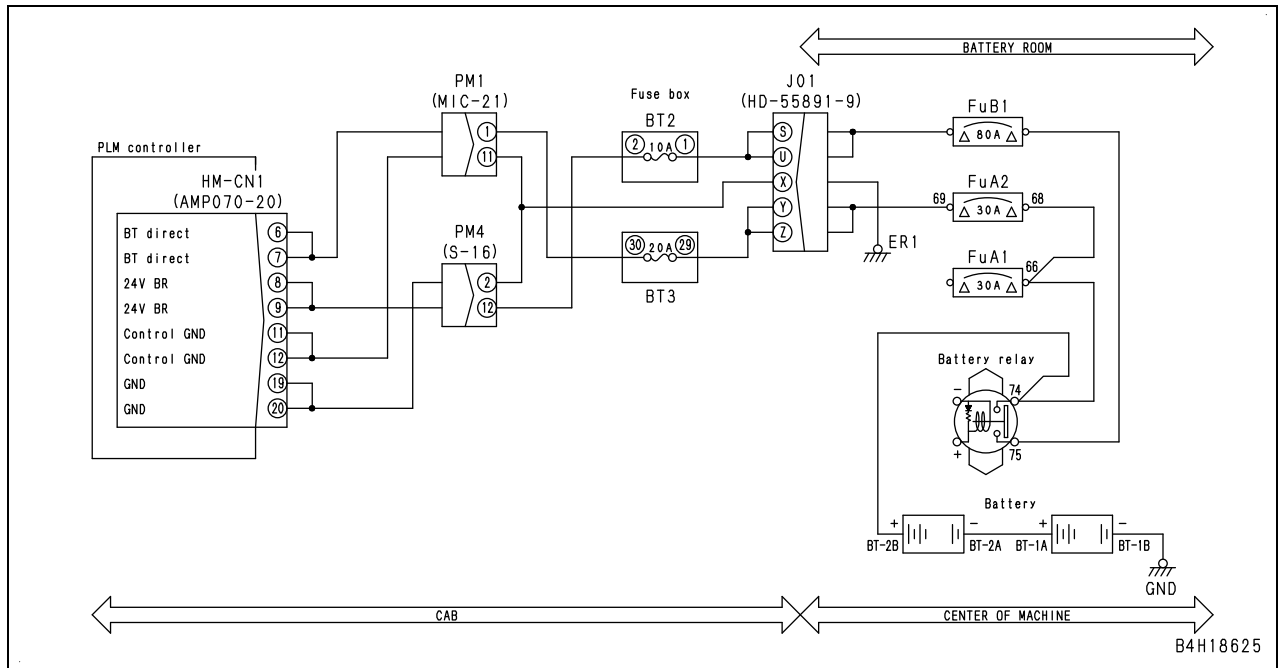
Circuit diagram related



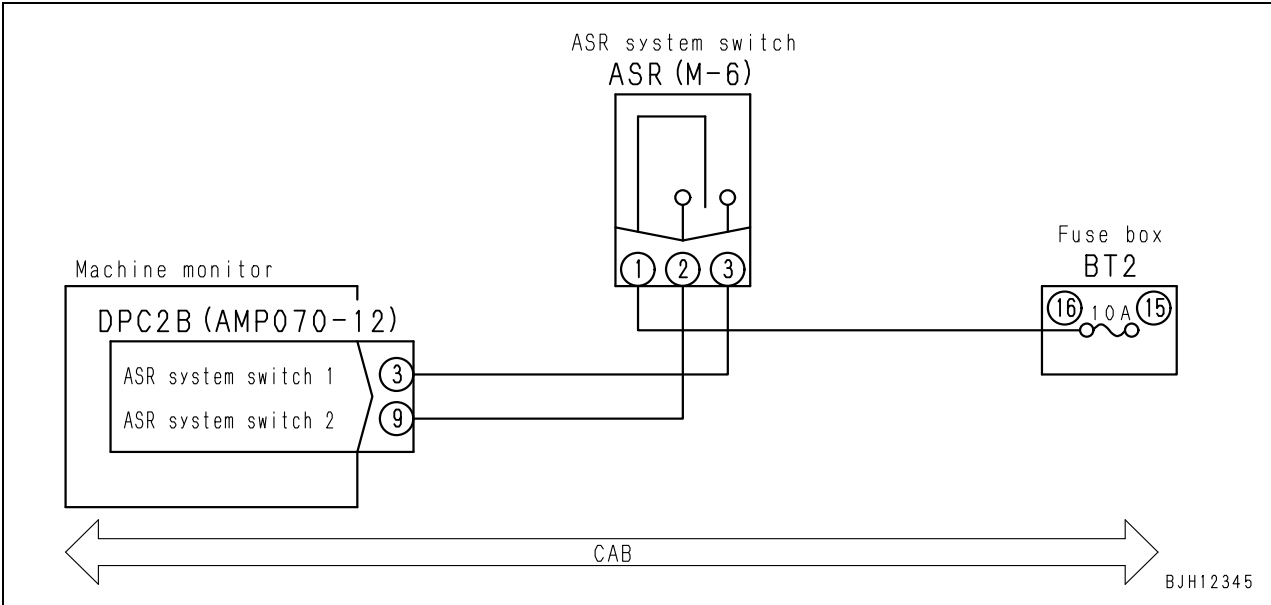
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*: If PLM controller is equipped.

Circuit diagram related to PLM controller power supply



Circuit diagram related



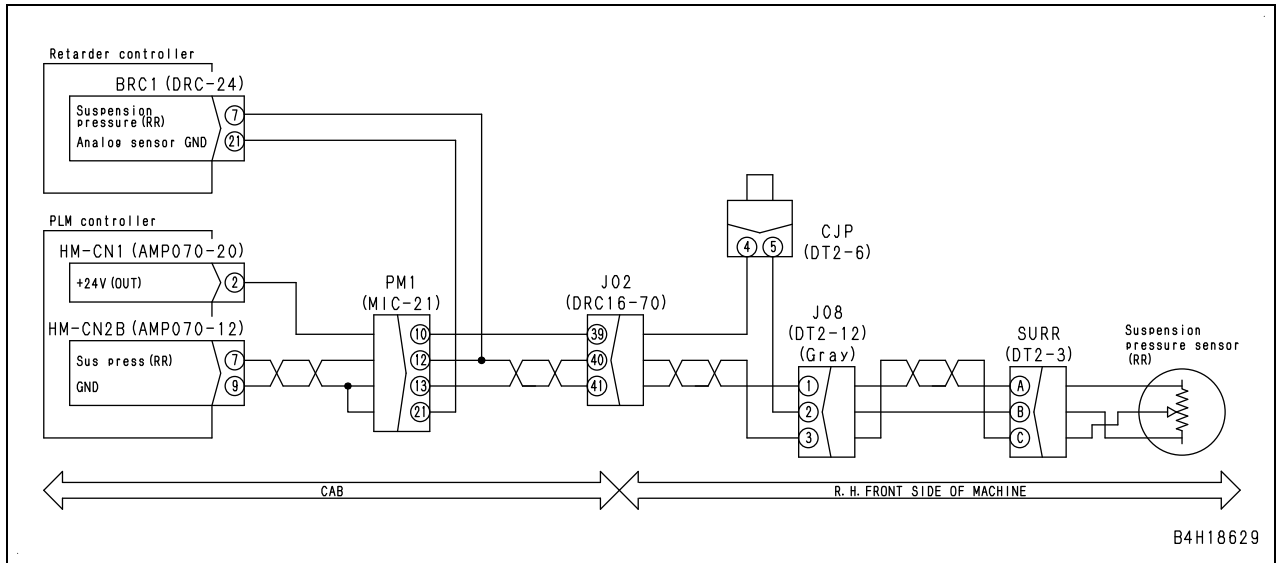
Failure code [DF10KB] Gear shift lever: Short circuit

Action code	Failure code	Trouble	Gear shift lever: Short circuit (Input of multiple lever signach) (Transmission controller system)
E03	DF10KB		
Contents of trouble	<ul style="list-style-type: none"> • Gear shift lever signals have been inputted at the same time from 2 or more systems. 		
Action of controller	<ul style="list-style-type: none"> • Controls according to high priority signal. (1): N > D > 6 > 5 > 4 > 3 > 2 > 1 (2): N > R1 • Shifts gear speed to neutral when signals have been inputted from system (1) and system (2) at the same time. 		
Problem that appears on machine	<ul style="list-style-type: none"> • There are cases where the gear speed is shifted to a higher gear speed than that which has been set by the gear shift lever. • Gear speed is still in neutral and cannot start vehicle. • Gear shift lever position lamp does not indicate actual gear shift lever position. 		
Related information	<ul style="list-style-type: none"> • Nothing particular. 		

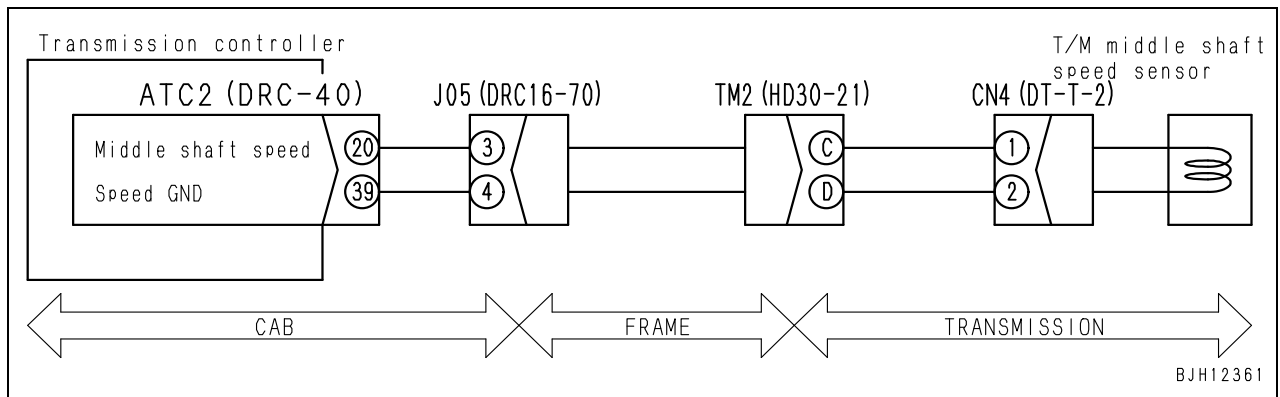
Possible causes and standard value in normal state	Cause		Standard value in normal state/Remarks on troubleshooting			
	Possible causes and standard value in normal state	1	Hot short in wiring harness (a contact with 24 V circuit)	1) Turn starting switch OFF. 2) Disconnect connector SF1, and connect T-adapter to male side. 3) Turn starting switch ON.		
Between ground and SF1 (male) (3)				Voltage	Max. 1 V	
Between ground and SF1 (male) (5)				Voltage	Max. 1 V	
Between ground and SF1 (male) (4)				Voltage	Max. 1 V	
Between ground and SF1 (male) (6)				Voltage	Max. 1 V	
Between ground and SF1 (male) (7)				Voltage	Max. 1 V	
Between ground and SF1 (male) (8)				Voltage	Max. 1 V	
Between ground and SF1 (male) (9)				Voltage	Max. 1 V	
Between ground and SF1 (male) (10)				Voltage	Max. 1 V	
Between ground and SF1 (male) (11)				Voltage	Max. 1 V	
2		Defective gear shift lever	1) Turn starting switch OFF. 2) Disconnect connectors ATC1, ATC2 and ATC3. 3) Insert T-adapter in connector SF1. 4) Turn starting switch ON.			
			Between SF1 (3) and ground	In shift range "R"	Voltage	20 – 30 V
				In shift range other than "R"	Voltage	Max. 1 V
			Between SF1 (4) and ground	In shift range "N"	Voltage	20 – 30 V
				In shift range other than "N"	Voltage	Max. 1 V
			Between SF1 (5) and ground	In shift range "D"	Voltage	20 – 30 V
				In shift range other than "D"	Voltage	Max. 1 V
			Between SF1 (6) and ground	In shift range "6"	Voltage	20 – 30 V
				In shift range other than "6"	Voltage	Max. 1 V
Between SF1 (7) and ground	In shift range "5"	Voltage	20 – 30 V			
	In shift range other than "5"	Voltage	Max. 1 V			
Between SF1 (8) and ground	In shift range "4"	Voltage	20 – 30 V			
	In shift range other than "4"	Voltage	Max. 1 V			

Failure code [DX11KY] (Rear brake proportional pressure reducing solenoid valve:
Short circuit to power source line) 98
Failure code [DX11MA] (Rear brake proportional pressure reducing solenoid valve: Malfunction) 100
Failure code [DX13KA] (Output circuit of hoist EPC valve: Disconnection) 102
Failure code [DX13KB] (Output circuit of hoist EPC valve: Short circuit) 104
Failure code [DX13KY] (Output circuit of hoist EPC valve: Short circuit with power source line) 106

Circuit diagram related

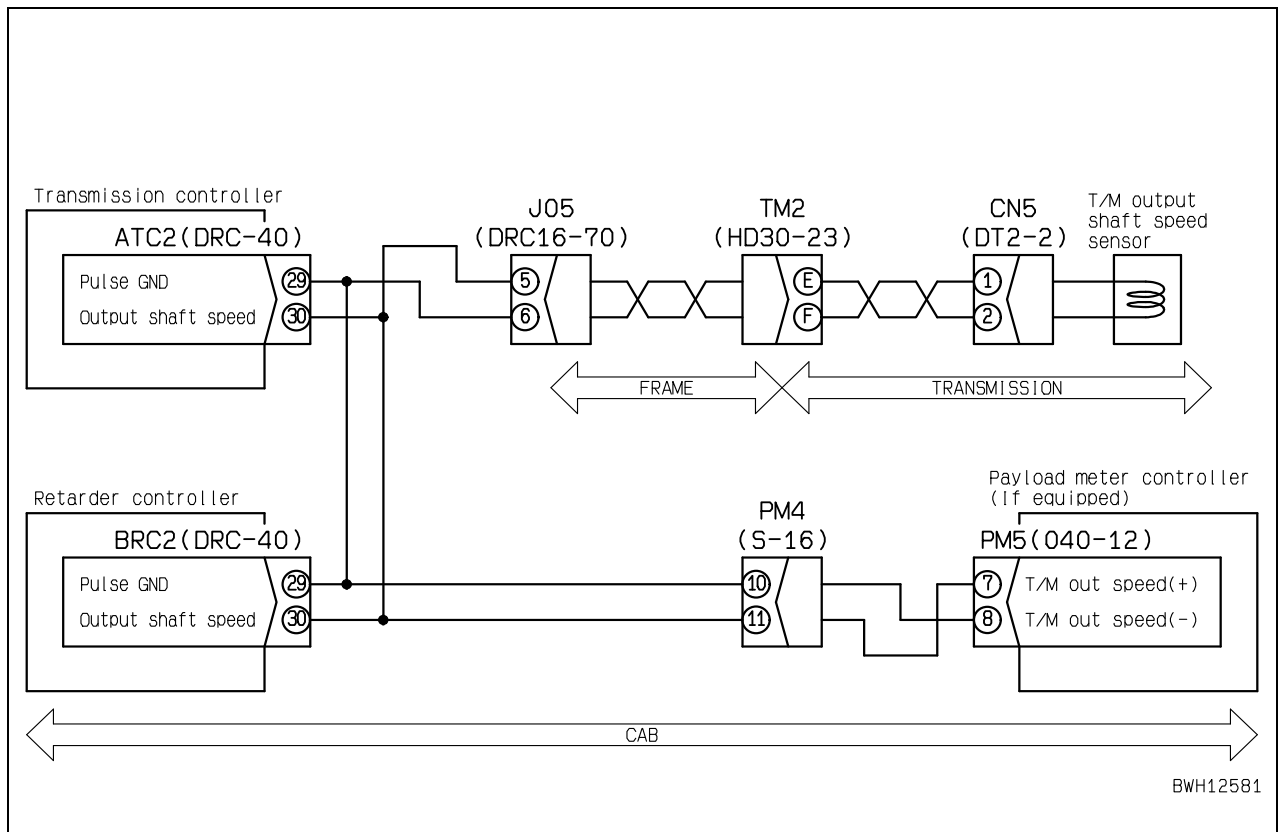


Circuit diagram related

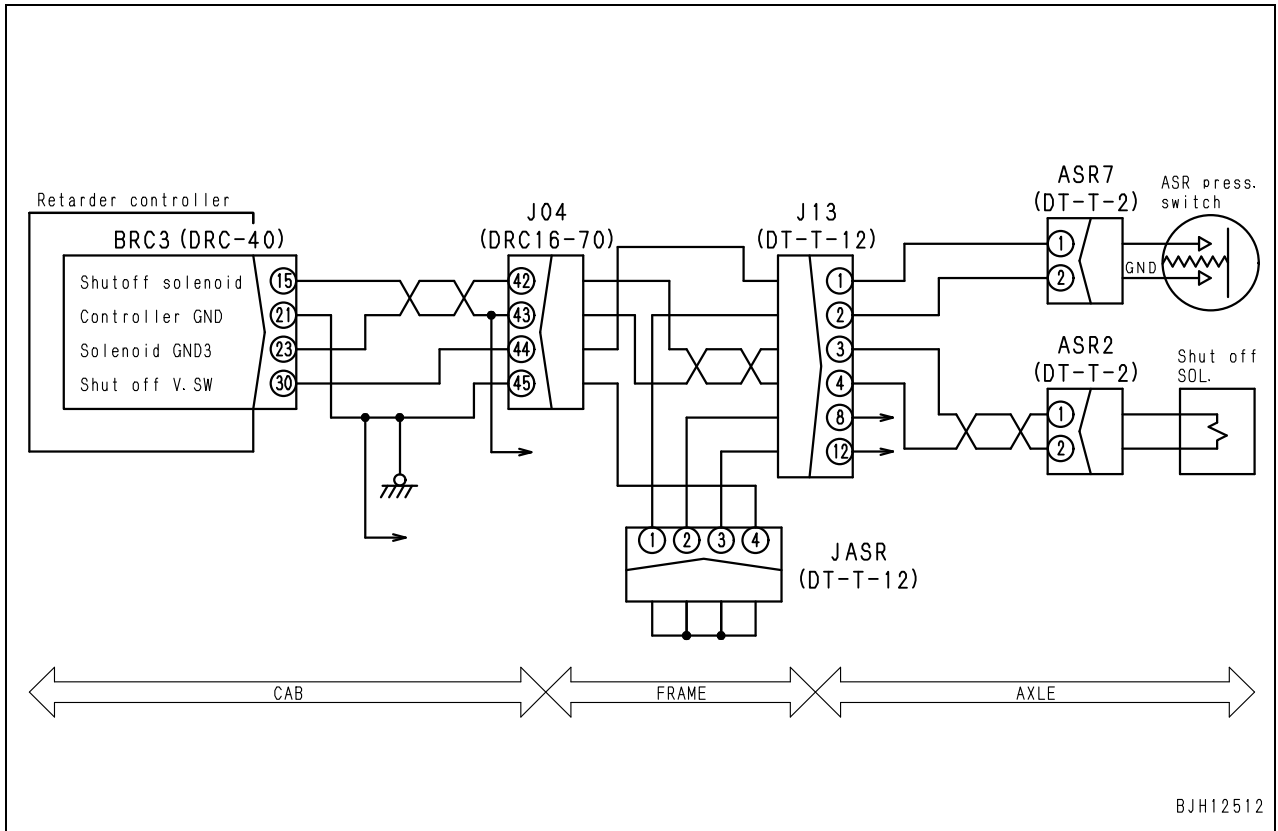


Possible causes and standard value in normal state	Cause		Standard value in normal state/Remarks on troubleshooting		
	6	Defective reterder controller	1) Turn the starting switch OFF. 2) Disconnect connector BRC2 and ATC2. 3) Connect T-adapter.	Between BRC2 (female) (30) – (29)	Resistance

Circuit diagram related

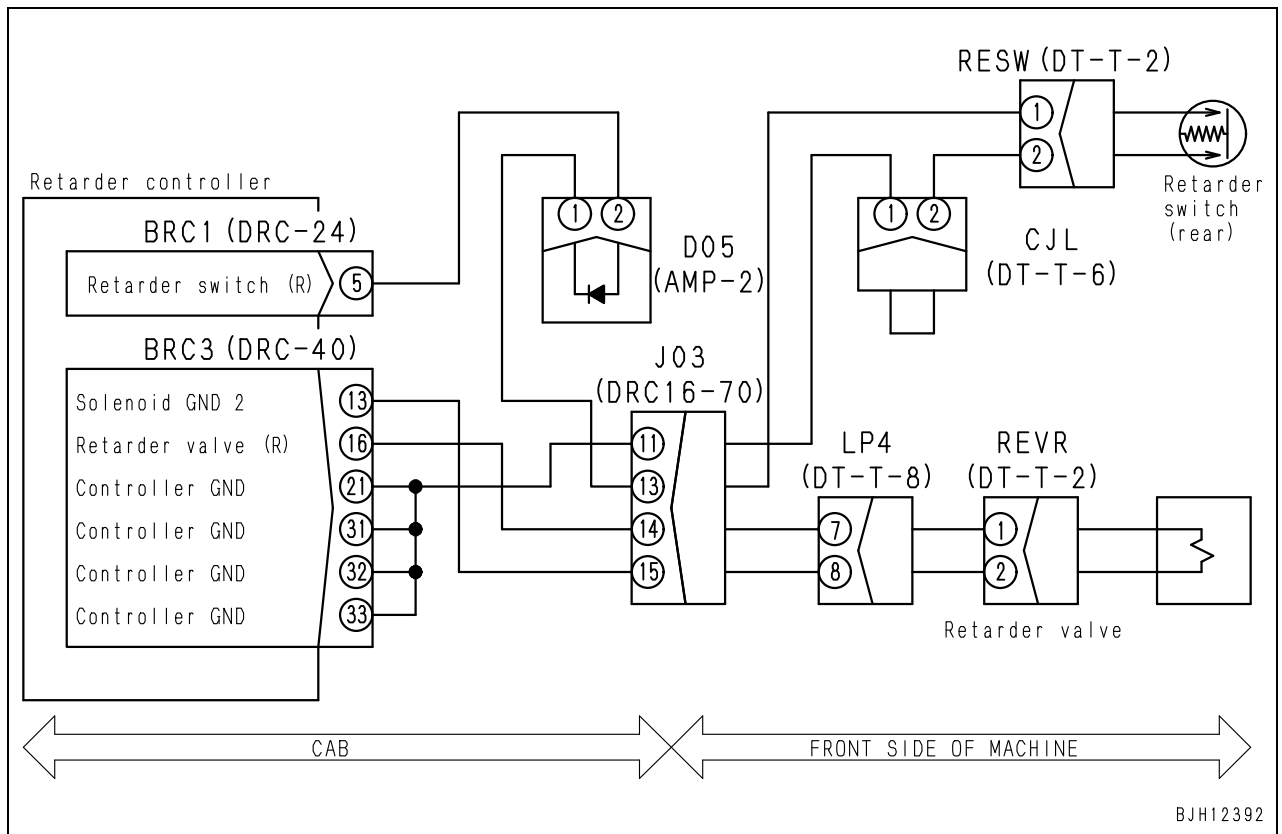


Circuit diagram related



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Circuit diagram related



Circuit diagram related

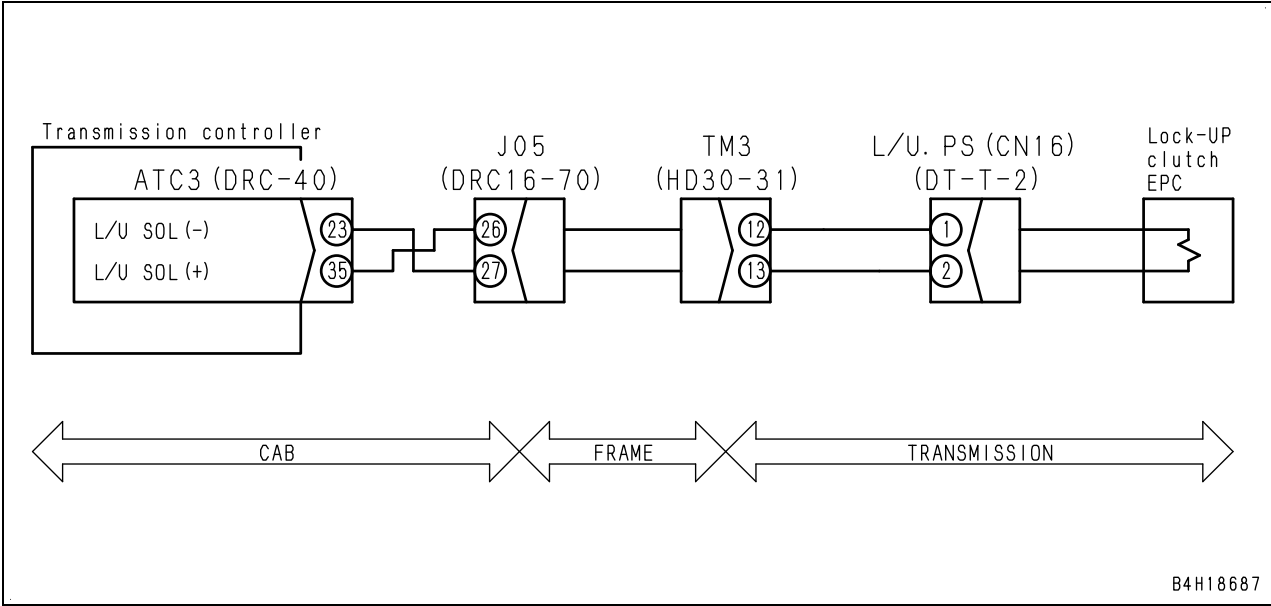


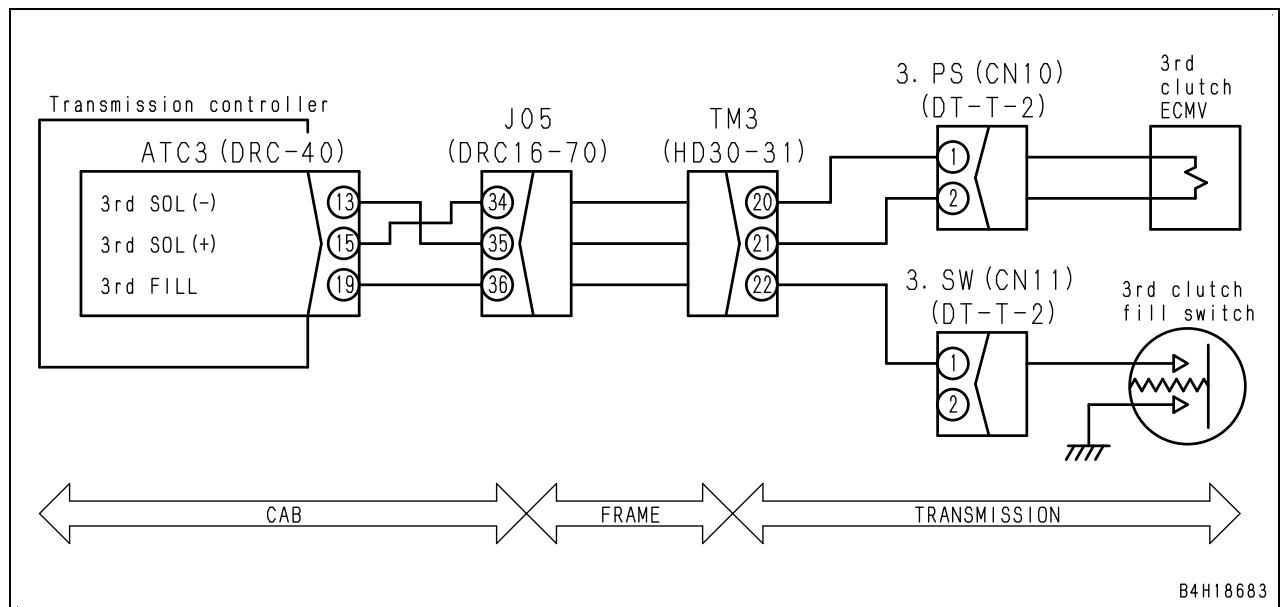
Table 2

Speed when trouble was detected		Failed clutch (Fill switch ON)	Remedy against trouble		
			Action of controller (Selected clutch, gear speed)		ON/OFF state of lockup clutch
F7	4th High	3rd	OFF	NEUTRAL	OFF
		2nd	OFF	NEUTRAL	OFF
		1st	OFF	NEUTRAL	OFF
		Reverse	OFF	NEUTRAL	OFF
		Low	OFF	NEUTRAL	OFF
F6	4th Low	3rd	OFF	NEUTRAL	OFF
		2nd	OFF	NEUTRAL	OFF
		1st	OFF	NEUTRAL	OFF
		Reverse	OFF	NEUTRAL	OFF
		High	4H	F7	OFF
F5	3rd High	4th	4L	F6	OFF
		2nd	OFF	NEUTRAL	OFF
		1st	OFF	NEUTRAL	OFF
		Reverse	OFF	NEUTRAL	OFF
		Low	4L	F6	OFF
F4	3rd Low	4th	4L	F6	OFF
		2nd	OFF	NEUTRAL	OFF
		1st	OFF	NEUTRAL	OFF
		Reverse	OFF	NEUTRAL	OFF
		High	3H	F5	OFF
F3	2nd High	4th	4L	F6	OFF
		3rd	3L	F4	OFF
		1st	OFF	NEUTRAL	OFF
		Reverse	OFF	NEUTRAL	OFF
		Low	3L	F4	OFF
F2	2nd Low	4th	4L	F6	OFF
		3rd	3L	F4	OFF
		1st	OFF	NEUTRAL	OFF
		Reverse	OFF	NEUTRAL	OFF
		High	2H	F3	OFF
F1	1st Low	4th	4L	F6	OFF
		3rd	3L	F4	OFF
		2nd	2L	F2	OFF
		Reverse	OFF	NEUTRAL	OFF
		High	2H	F3	OFF
R1	Reverse Low	4th	OFF	NEUTRAL	OFF
		3rd	OFF	NEUTRAL	OFF
		2nd	OFF	NEUTRAL	OFF
		1st	OFF	NEUTRAL	OFF
		High	RH	R2	OFF
N		ANY	NONE	No reaction	—

Table 1

Speed when trouble was detected		Failed clutch	Remedy against trouble		
			Action of controller (Selected clutch, gear speed)		ON/OFF state of lockup clutch
F7	4th High	4th	OFF	NEUTRAL	OFF
		High	OFF	NEUTRAL	OFF
F6	4th Low	4th	OFF	NEUTRAL	OFF
		Low	4H	F7	OFF
F5	3rd High	3rd	4L	F6	OFF
		High	4L	F6	OFF
F4	3rd Low	3rd	4L	F6	OFF
		Low	3H	F5	OFF
F3	2nd High	2nd	3L	F4	OFF
		High	3L	F4	OFF
F2	2nd Low	2nd	3L	F4	OFF
		Low	2H	F3	OFF
F1	1st Low	1st	2L	F2	OFF
		Low	2H	F3	OFF
R1	Reverse Low	Reverse	OFF	NEUTRAL	OFF
		Low	RH	R2	OFF

Circuit diagram related



B4H18683

Table 2

Speed when trouble was detected		Failed clutch (Fill switch ON)	Remedy against trouble		
			Action of controller (Selected clutch, gear speed)		ON/OFF state of lockup clutch
F7	4th High	3rd	OFF	NEUTRAL	OFF
		2nd	OFF	NEUTRAL	OFF
		1st	OFF	NEUTRAL	OFF
		Reverse	OFF	NEUTRAL	OFF
		Low	OFF	NEUTRAL	OFF
F6	4th Low	3rd	OFF	NEUTRAL	OFF
		2nd	OFF	NEUTRAL	OFF
		1st	OFF	NEUTRAL	OFF
		Reverse	OFF	NEUTRAL	OFF
		High	4H	F7	OFF
F5	3rd High	4th	4L	F6	OFF
		2nd	OFF	NEUTRAL	OFF
		1st	OFF	NEUTRAL	OFF
		Reverse	OFF	NEUTRAL	OFF
		Low	4L	F6	OFF
F4	3rd Low	4th	4L	F6	OFF
		2nd	OFF	NEUTRAL	OFF
		1st	OFF	NEUTRAL	OFF
		Reverse	OFF	NEUTRAL	OFF
		High	3H	F5	OFF
F3	2nd High	4th	4L	F6	OFF
		3rd	3L	F4	OFF
		1st	OFF	NEUTRAL	OFF
		Reverse	OFF	NEUTRAL	OFF
		Low	3L	F4	OFF
F2	2nd Low	4th	4L	F6	OFF
		3rd	3L	F4	OFF
		1st	OFF	NEUTRAL	OFF
		Reverse	OFF	NEUTRAL	OFF
		High	2H	F3	OFF
F1	1st Low	4th	4L	F6	OFF
		3rd	3L	F4	OFF
		2nd	2L	F2	OFF
		Reverse	OFF	NEUTRAL	OFF
		High	2H	F3	OFF
R1	Reverse Low	4th	OFF	NEUTRAL	OFF
		3rd	OFF	NEUTRAL	OFF
		2nd	OFF	NEUTRAL	OFF
		1st	OFF	NEUTRAL	OFF
		High	RH	R2	OFF
N		ANY	NONE	No reaction	—

E-11 Turn signal lamp or turning lamp (hazard lamp) do not work properly

Trouble	Turn signal lamp or turning lamp (hazard lamp) do not flash.
Related information	

	Cause		Standard value in normal state/Remarks on troubleshooting		
	Possible causes and standard value in normal state	1	Defective fuse BT1 (4) or BT2 (24)	When the fuse BT1 (4) or BT2 (24) is blown, it is highly possible that a defective grounding has occurred in the circuit (troubleshooting cause 7).	
2		Defective lamp	Since the lamp can be suspected to be defective, visually check it or replace it with known good lamp to make a judgement.		
3		Defective turn signal lamp	1) Turn starting switch OFF. 2) Insert T-adapter in connector FLS. 3) Turn starting switch ON and carry out troubleshooting.		
			FLS	Turn switch	Voltage
			Between (3) – GND	At any positions	20 – 30 V
			Between (4) – GND	Turned to the left or right	20 – 30 V – 0 V repeatedly
4		Defective turn switch	1) Turn starting switch OFF. 2) Connect T-adapter to connector (male). 3) Check switch unit.		
			CM (male)	Turn switch (lever)	Resistance
			Between (6) – (7)	Turned to the left	Max. 1 Ω
				Turned to the right	Min. 1 MΩ
Between (6) – (8)		Turned to the right	Max. 1 Ω		
		Turned to the left	Min. 1 MΩ		
5		Defective relay	When the relay can be suspected to be defective, replace it with another relay to make a judgement. <ul style="list-style-type: none"> As for the relay R16 (6 terminals): Replace with the relay R21, R40 or R05, etc. As for the relay R17 (5 terminals): Replace with the relay R11, R32 or R27, etc. 		
6	Disconnection in wiring harness (Disconnection or defective contact)	1) Turn starting switch OFF. 2) Disconnect connectors HAZ, R17, R16, FLS, CM, DPC2A, PR03, PL03, CJR, B02, and B03. 3) Connect T-adapter to connector of circuit to be checked.			
		Wiring harness between BT1 (4) – R17 (female) (6)	Resistance	Max. 1 Ω	
		Wiring harness between BT2 (24) – R17 (female) (5) – HAZ (female) (1)	Resistance	Max. 1 Ω	
		Wiring harness between HAZ (female) (3) – R17 (female) (1) – R16 (female) (5)	Resistance	Max. 1 Ω	
		Wiring harness between R17 (female) (3) – FLS (female) (3)	Resistance	Max. 1 Ω	
		Wiring harness between R16 (female) (4) – CM (female) (7) – DPC2A (female) (7)	Resistance	Max. 1 Ω	
		Wiring harness between R16 (female) (2) – CM (female) (8) – DPC2A (female) (16)	Resistance	Max. 1 Ω	
		Wiring harness between R16 (female) (1), (3) – FLS (female) (4) – CM (female) (6)	Resistance	Max. 1 Ω	
		Wiring harness between CM (female) (7) – PR03 (female) (3) (right front)	Resistance	Max. 1 Ω	
		Wiring harness between CM (female) (7) – B03 (female) (1) (left front)	Resistance	Max. 1 Ω	
		Wiring harness between CM (female) (8) – PL03 (female) (3)	Resistance	Max. 1 Ω	
		Wiring harness between CM (female) (8) – B02 (female) (1) (left rear)	Resistance	Max. 1 Ω	

Trouble (2)	When the steering pump stops operating, it does not operate with manual.
Related information	<ul style="list-style-type: none"> When it operates with auto (troubleshooting the symptom of failure (1) first, if it does not operate with auto), check that the parking brake is released.

	Cause		Standard value in normal state/Remarks on troubleshooting			
	Possible causes and standard value in normal state	1	Defective fuse BT2 (26)	If fuse BT2 (26) is blown, it is highly possible that a defective harness grounding has occurred in the circuit.		
2		Defective manual switch (internal defective contact)	1) Turn starting switch OFF. 2) Disconnect switch terminal and check switch unit.			
			Manual switch terminal	Manual switch operation	Resistance	
			Between ST1 – ST2 (Switch unit)	Switch (pressed)	Max. 1 Ω	
				Switch (not pressed)	Min. 1 MΩ	
3		Disconnection in wiring harness (Disconnection or defective contact)	1) Turn starting switch OFF. 2) Disconnect BT2 (26) and J02. 3) Connect T-adaptor to J02 (female)			
			Wiring harness between BT2 (26) – manual switch terminal ST1		Resistance	Max. 1 Ω
			Wiring harness between manual switch terminal ST2 – J02 (female) (13) (to branched point)		Resistance	Max. 1 Ω
4		Short circuit (ground fault) of harness (Contact with ground circuit)	1) Turn starting switch OFF. 2) Disconnect BT2 (26) and J02. 3) Connect T-adaptor to J02 (female)			
			Between ground and wiring harness between BT2 (26) – manual switch terminal ST1		Resistance	Min. 1 MΩ
			Between ground and wiring harness between manual switch terminal ST2 – J02 (female) (13) (to branched point)		Resistance	Min. 1 MΩ

H-4 Excessive shock when starting or shifting

Trouble	Shock when starting or shifting is excessive.
Related information	<ul style="list-style-type: none"> If a failure code related to the machine is displayed, firstly troubleshooting the displayed code.

Possible causes and standard value in normal state	Cause		Standard value in normal state/Remarks on troubleshooting
	1	Defective gear speed clutch ECMV	<ul style="list-style-type: none"> * There is some shock, but it is difficult to judge if the shock is excessive or not, so judge that it is excessive in the following cases. • When it is apparent that the shock suddenly became severer than before. • The shock is severer compared with other machines of the same class.
			Since the operation of the gear speed clutch ECMV can be suspected to be defective, check it directly.

H-17 Excessive hydraulic drift of dump body

Trouble	Hydraulic drift of dump body is excessive.
Related information	<ul style="list-style-type: none"> If a failure code related to the machine is displayed, firstly troubleshooting the displayed code.

Possible causes and standard value in normal state	Cause		Standard value in normal state/Remarks on troubleshooting
	1	Defective oil tightness of hoist valve main spool	★ Raise the dump body and troubleshooting with the engine stopped. Raise the dump body and disconnect the hydraulic hose in the dump cylinder head side. If the oil flows out from the cylinder side, the oil tightness of the spool is defective.
2	Defective dump cylinder	Raise the dump body and disconnect the hydraulic hose in the dump cylinder head side. If the oil does not flow out from the cylinder side, the cylinder piston ring is defective.	

S-6 Engine lacks output (or lacks power)

General causes why engine lacks output

- Insufficient intake of air
- Insufficient supply of fuel
- Defective condition of fuel spray
- Improper selection of fuel
- There is overheating
→ See "S-14 Coolant temperature becomes too high (Overheating)"
- Controller is controlling in derate mode (limiting injection rate (output) because of a trouble in electrical system)

		Causes															
		Clogged air cleaner element	Air leakage from air intake piping, air linkage from aftercooler	Seized turbocharger, interference of turbocharger	Defective contact of valve and valve seat	Improper valve clearance	Worn piston ring, cylinder liner	Clogged air breather hole of fuel tank cap	Leaking, clogged fuel piping	Clogged fuel filter	Clogged feed pump gauze filter	Stuck, seized supply pump plunger	Clogged injector, defective spray (dirt in injector)	Defective drive of injector (signal, solenoid)	Defective installation of charge pressure sensor (air leakage)	Defective charge pressure sensor, wiring harness	Defective fuel temperature sensor, wiring harness
Questions	Confirm recent repair history																
	Degree of use of machine	Operated for long period	△			△					△	△					
	Power was lost	Suddenly	○											○	○	○	
		Gradually	○		○	○				○	○		○	○	○		
	Non-specified fuel is being used									○	○						
	Replacement of filters has not been carried out according to Operation and Maintenance Manual		○														
	Engine oil must be added more frequently					○	○	○									
	Dust indicator is red		○														
	Air breather hole of fuel tank cap is clogged							○									
	Fuel is leaking from fuel piping								○								
	Output becomes insufficient after short stop of operation																○
	Check items	Color of exhaust gas	Black	○	○	○											
			Blue under light load						○								
		When exhaust manifold is touched immediately after starting engine, temperature of some cylinders is low												○			
		When engine is cranked, interference sound is generated around turbocharger				○											
When engine is cranked, abnormal sound is generated around cylinder head					○												
High idle speed is too low													○				
High idle speed under no load is normal, but speed suddenly drops when load is applied									○	○	○						
Engine does not pick up smoothly and combustion is irregular		○					○	○				○					
There is hunting from engine (rotation is irregular)							○	○	○	○							
Blow-by gas is excessive				○		○											
Troubleshooting		Inspect air cleaner directly	●														
		Inspect air intake piping directly		●													
		When boost pressure is measured, it is found to be low	●	●	●												
		When compression pressure is measured, it is found to be low				●	●										
		Inspect valve clearance directly					●										
	Inspect fuel filter directly									●							
	Inspect feed pump gauze filter directly										●						
	Carry out troubleshooting according to "No-pressure feed by supply pump (*1)"											●					
	When a cylinder is cut out for reduced cylinder mode operation, engine speed does not change												●	●			
	Inspect charge (boost) pressure sensor mount directly														●		
	Carry out troubleshooting according to "Abnormality in charge pressure sensor (*2)"															●	
	Carry out troubleshooting according to "Abnormality in fuel temperature sensor (*3)"															●	
	Remedy	Clean	Correct	Replace	Replace	Adjust	Replace	Clean	Correct	Replace	Clean	Replace	Replace	Replace	Correct	Replace	Replace

*1: Code [CA559] and code [CA2249]

*2: Code [CA122] and code [CA123]

*3: Code [CA263] and code [CA265]

DUMP TRUCK

HD325-7R

HD405-7R

Machine model	Serial number
---------------	---------------

HD325-7R	11001 and up
HD405-7R	11001 and up

50 Disassembly and assembly

General information on disassembly and assembly

Precautions before work	2
How to read this manual	3
Coating materials list.....	5
Special tool list	8
Sketches of special tools	11

DUMP TRUCK

HD325-7R

HD405-7R

Machine model Serial number


HD325-7R	11001 and up
HD405-7R	11001 and up

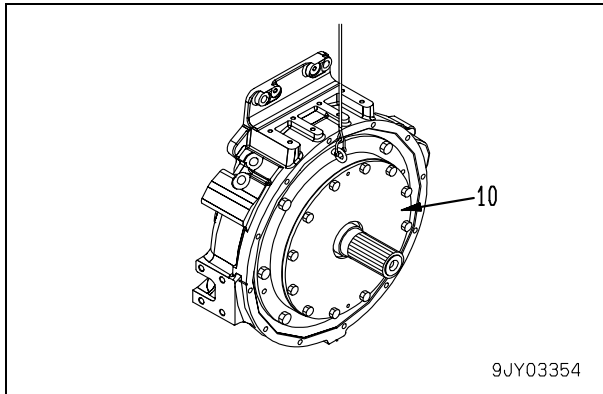
50 Disassembly and assembly

Engine and cooling system

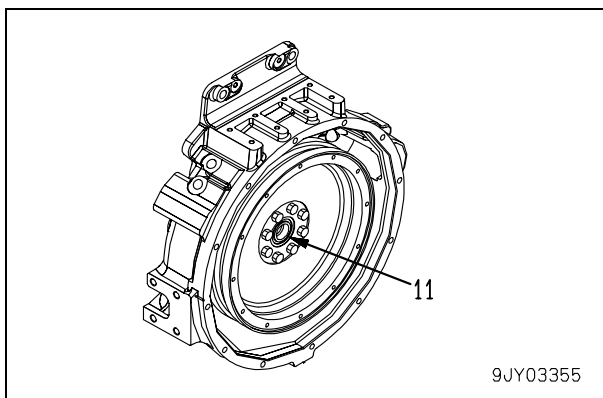
Removal and installation of engine assembly	2
Removal and installation of radiator assembly	8
Removal and installation of output shaft assembly	14
Disassembly and assembly of output shaft assembly	16
Removal and installation of fuel supply pump assembly	19
Removal and installation of fuel injector assembly	24
Removal and installation of cylinder head assembly	29
Removal and installation of engine front seal	37
Removal and installation of engine rear seal	41

11. Lift off output shaft assembly (10). [*5]

 Output shaft assembly: **60 kg**





12. Remove bearing (11). [*6]




Installation

- Carry out installation in the reverse order to removal.
- For the procedure for supplying ENS grease, see "Disassembly and assembly of output shaft assembly".




[*1]

-  Drive shaft mounting bolt: **Adhesive (LT-2)**
-  Drive shaft mounting bolt:
98 – 123 Nm {10 – 12.5 kgm}

[*2]

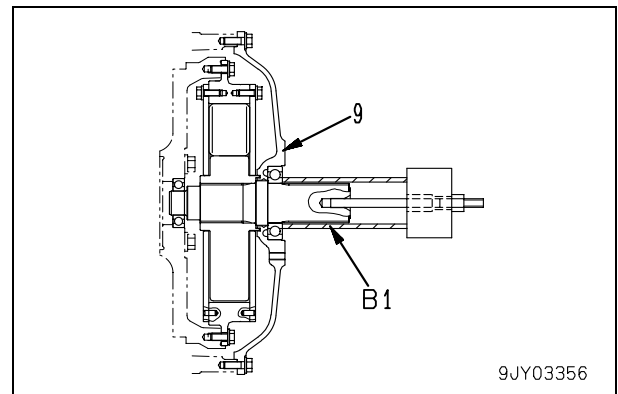
-  Spline: **ENS grease**
- ★ Before supplying ENS grease, remove all of the other grease to prevent it from mixing in ENS grease. (Use a special grease gun for ENS grease.)
- ★ ENG grease:
Use **427-12-11871 (GREASE)** (2kg can).

[*3]



-  Mating face of flange:
Gasket sealant (LG-4)
-  Oil seal cage cover mounting bolt:
Adhesive (LT-2)
-  Oil seal cage cover mounting bolt:
98 – 123 Nm {10 – 12.5 kgm}

[*4]


Sling cover (9) and set it to the output shaft. Using tool **B1**, press fit the inner part of the bearing and install cover (9).



[*5]

-  Output shaft mounting bolt: **Adhesive (LT-2)**
-  Output shaft mounting bolt:
98.0 – 123.0 Nm {10 – 12.5 kgm}

[*6]

-  Bearing: **Apply ENS grease all around inside of bearing and outside of shaft.**

Removal and installation of cylinder head assembly

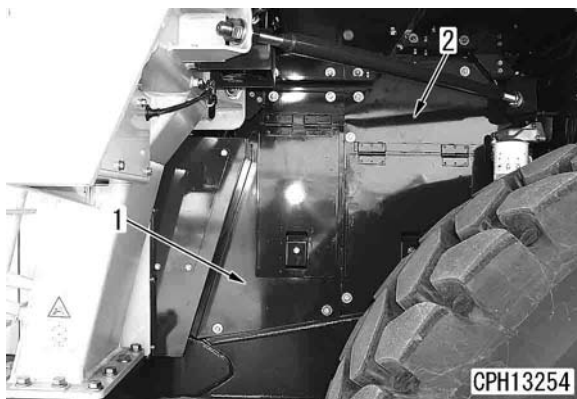
Special tools

Symbol	Part No.	Part name	Necessity	Q'ty	New/Remodel	Sketch
A 2	790-331-1120	Wrench	●	1		

Removal

- ⚠ Stop the machine on a level ground and lock the tires with chocks.
- ⚠ Disconnect the cable from the negative (-) terminal of the battery.

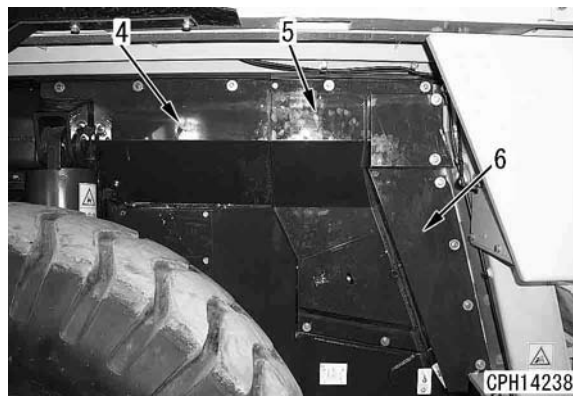
- Remove engine left side covers (1) and (2).



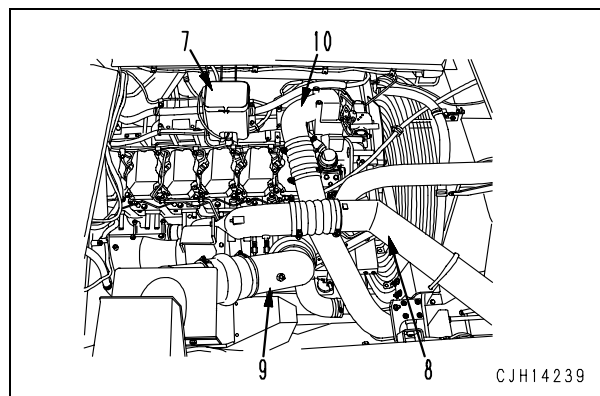
- Remove cover (3).



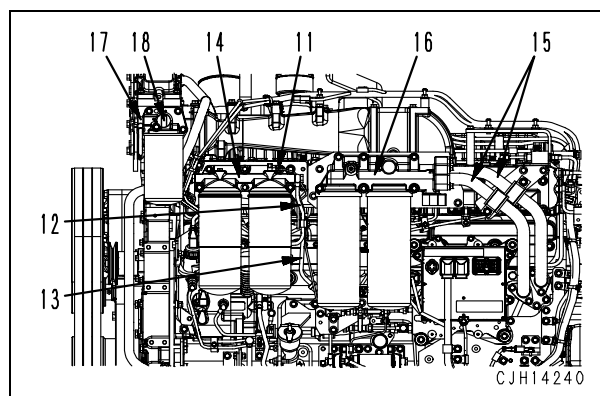
- Remove engine right side covers (4) – (6).



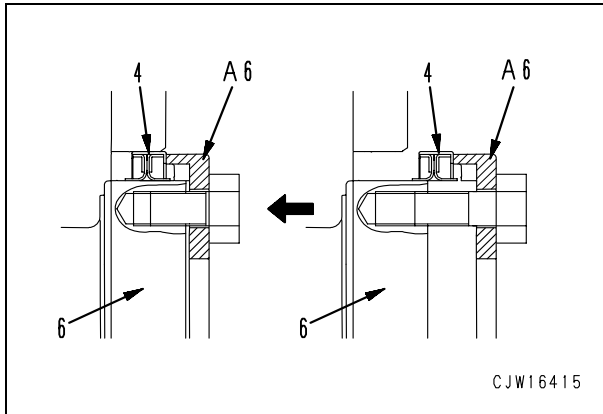
- Open engine hood.
- Remove washer tank (7).
- Remove tube (8) – (10). [*1]



- Remove fuel tubes (11) – (13). [*2]
- Remove fuel filter head assembly (14).
- Remove oil tube (15).
 - ★ To avoid installation error, mark the top, bottom, inlet and outlet side of this tube.
- Remove oil filter head assembly (16).
- Remove 2 water tubes (17) and remove corrosion resistor head assembly (18). [*3]




- 4) Tighten the 4 bolts evenly to press fit rear seal (4) until the end of tool **A6** reaches the end of crankshaft (6).
 - ★ First, tighten the bolts of tool **A6** without setting any washer until they stop. Then, tighten the bolts with 2 washers on each of them.
 - ★ When press fitting the seal, take care not to damage the lip on the PTO side with the tool set, etc.
 - ★ After press fitting the seal, remove the red sealant layer from its periphery.

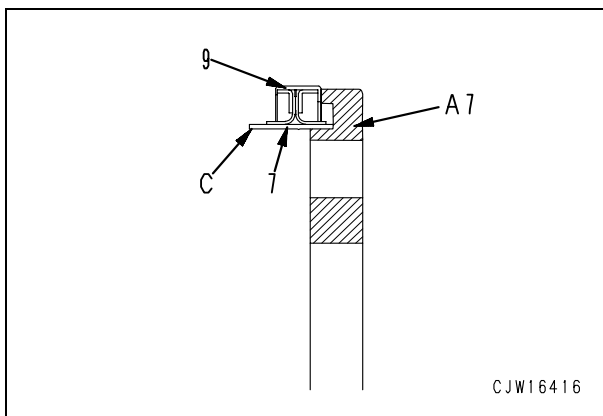


2. Procedure for installing sleeved seal

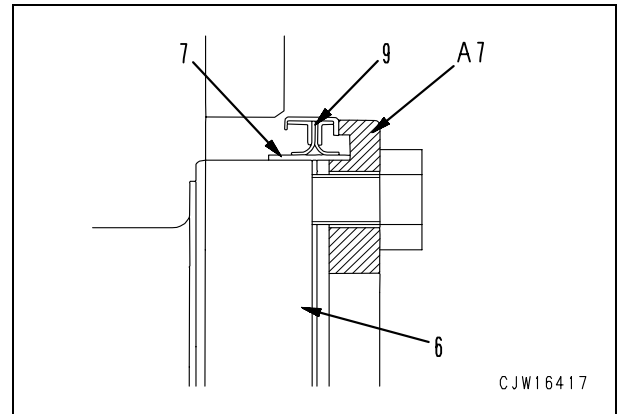
- ★ When installing the rear seal, do not apply oil or grease to the crankshaft, inside cylinder surface (C) of the sleeve (7) and seal lip.

- 1) Set sleeve and rear seal assembly (9) to tool **A7** (for fitting the sleeved seal).

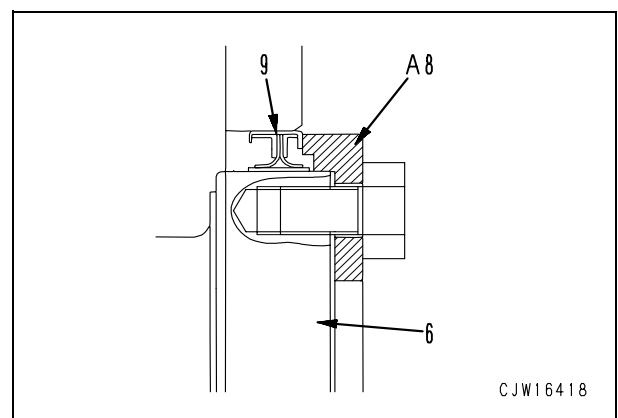
 Sleeve inside cylinder surface (C):
Gasket sealant (LG-7)



- 2) Set the sleeve (7) of the rear seal to the end of crankshaft (6) and tighten the 4 bolts evenly to press fit sleeve and rear seal assembly (9) of tool **A7**.
 - ★ Tighten the bolts of tool **A7** with 1 washer on each of them until it stops.



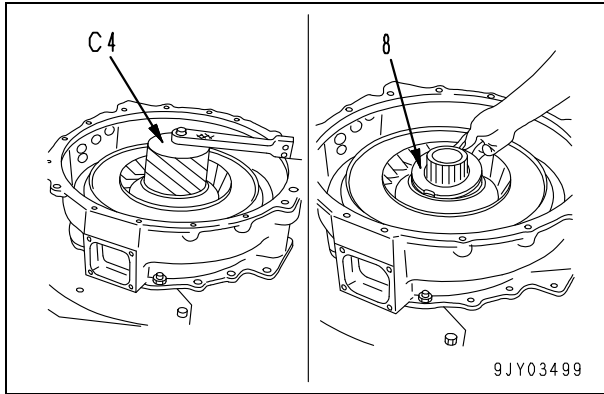
- 3) Remove tool **A7** and install tool **A8**.
- 4) Tighten the 4 bolts evenly to press fit sleeve and rear seal assembly (9) until the end of tool **A8** reaches the end of crankshaft (6).
 - ★ First, tighten the bolts of tool **A8** without setting any washer until they stop. Then, tighten the bolts with 2 washers on each of them.
 - ★ After press fitting the seal, remove the red sealant layer from its periphery.
 - ★ Rear seal driving depth:
13.2 ± 0.2 mm from end of crankshaft



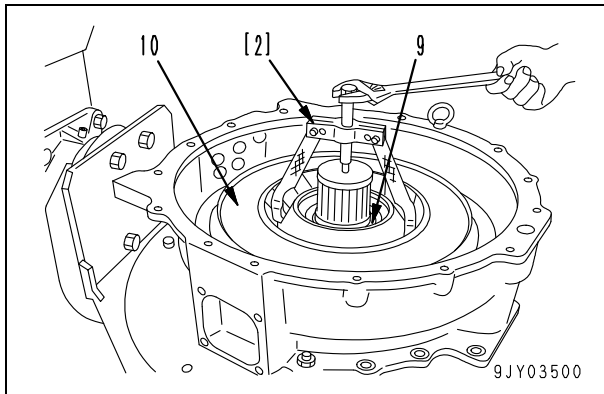
- ★ When installing, set the dowel pin of the crankshaft to the dowel hole of the flywheel.

5. Pump assembly

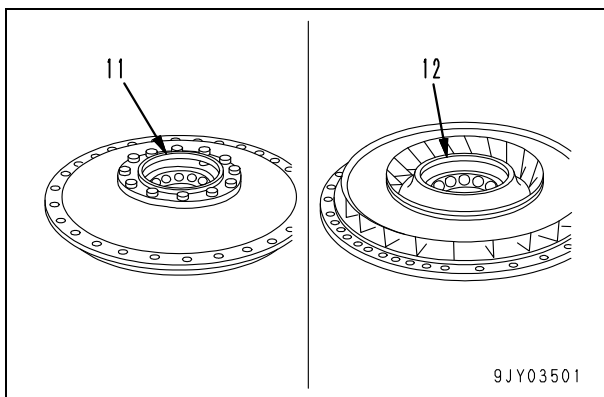
- 1) Using tool **C4**, remove nut (8).



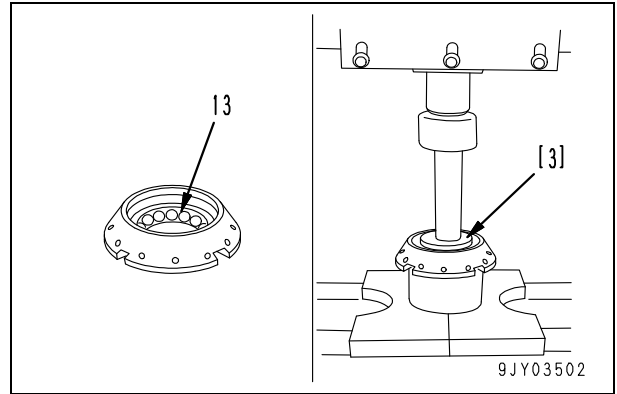
- 2) Using puller [2], remove inner race (9) and pump assembly (10).



- 3) Remove mounting bolt, then remove retainer (11) and guide (12).

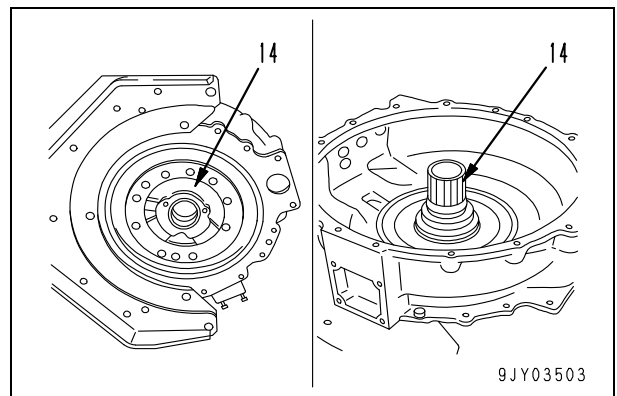


- 4) Using push tool [3], remove bearing (13) from guide.



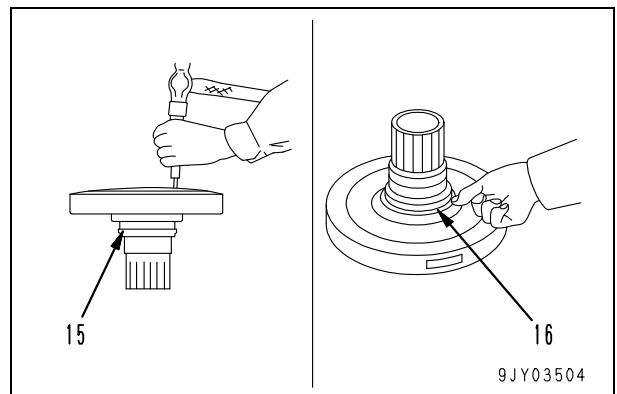
6. Stator shaft

- 1) Remove mounting bolts, then remove stator shaft (14).

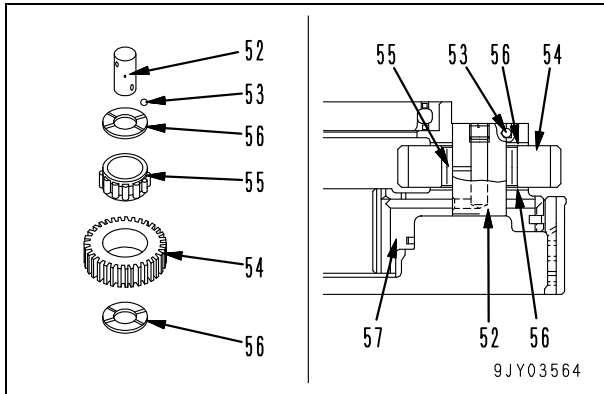


- 2) Remove plug, then remove inner race (15) with bar.

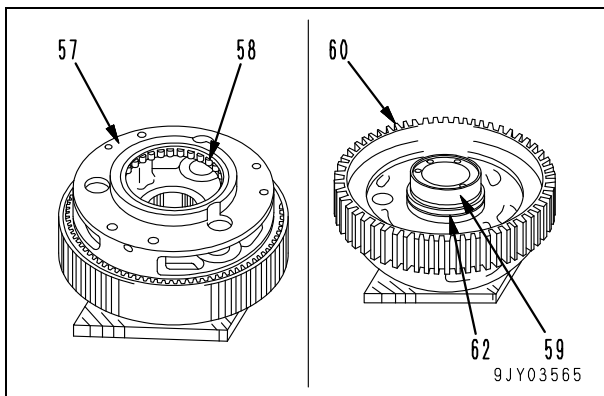
- 3) Remove seal ring (16).



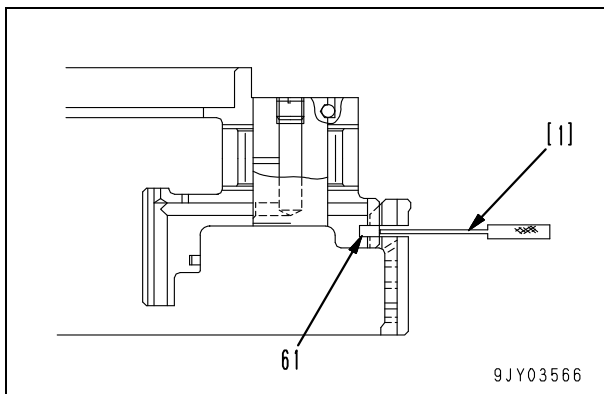
- 5) Planetary gear
 - 1) Remove shafts (52)
 - ★ Be careful not to lose balls (53).
 - 2) Remove gear (54), bearing (55), and thrust washer (56) from carrier (57).



- 3) Remove bearing (58), seal ring (62), and inner race (59) from carrier (57), then remove ring gear (60).

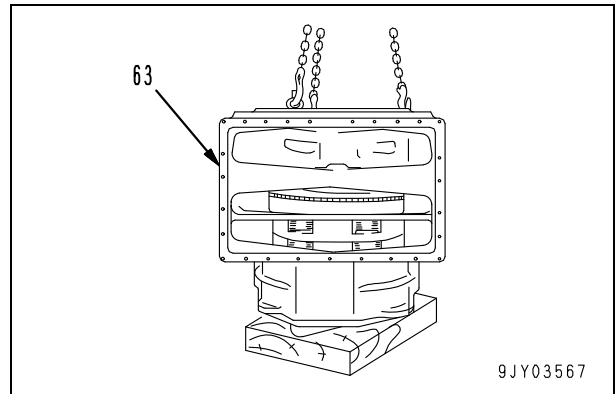


- ★ When removing ring gear (60) from carrier (57), use two of the four holes in the ring gear on opposite sides, insert round bar [1] (max. diameter: $\varnothing 8$ mm), compress snap ring (61), and pull out the ring gear.



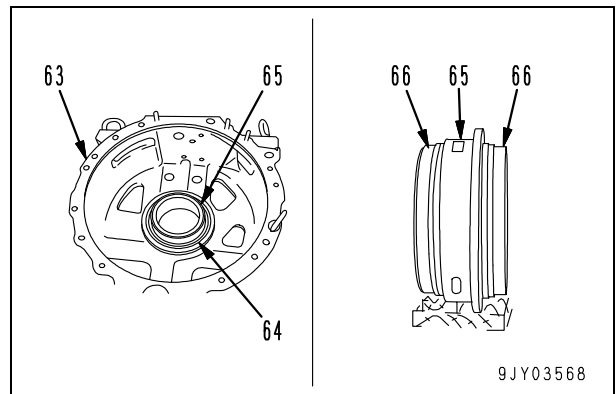
9. Transmission case assembly

Lift off transmission case assembly (63).



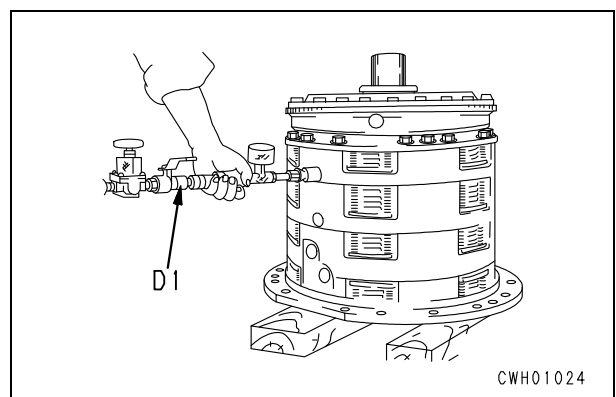
10. Transmission case

- 1) Remove snap ring (64).
- 2) Remove collar (65).
- 3) Remove inner race (66) from collar.




11. Checking piston operation

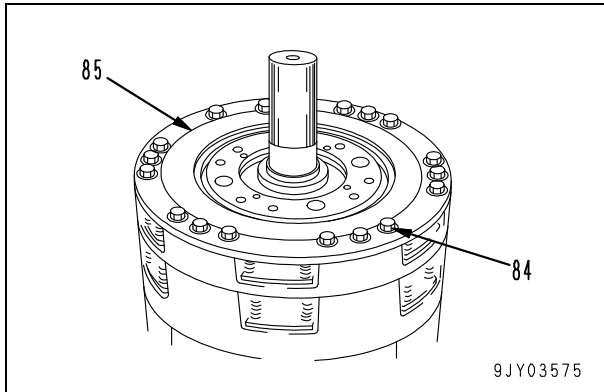
Using tool D1, check piston operation of No. 4, 5, 6, and 7 cutch.



18. Tie bolts

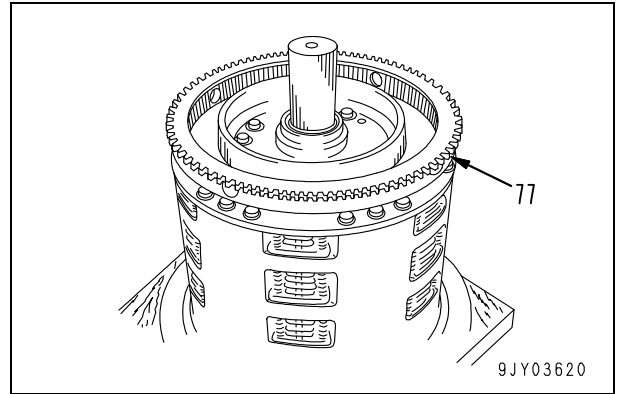
Install tie bolts (84).

 Tie bolt: $166.7 \pm 9.8 \text{ Nm}$ ($17 \pm 1 \text{ kgm}$)

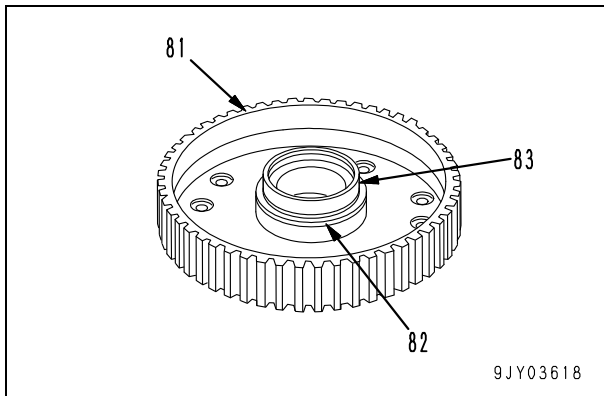


21. No. 3 clutch drum

Install drum (77).



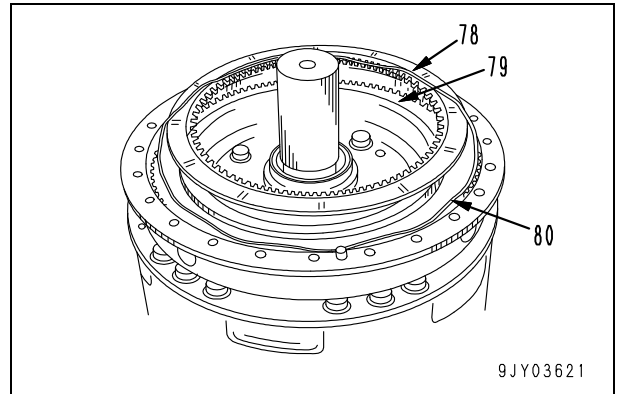
19. Install inner race (83) and seal ring (82) to ring gear (81).



22. No. 3 clutch discs • plates • springs

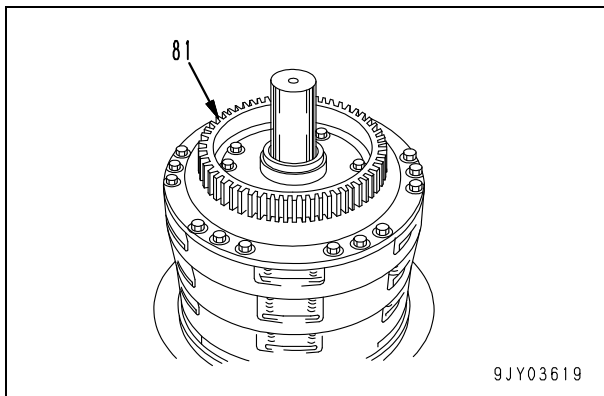
Install discs (78), plates (79) and springs (80).

★ There are three discs, two plates and three springs.



20. No. 3 clutch ring gear

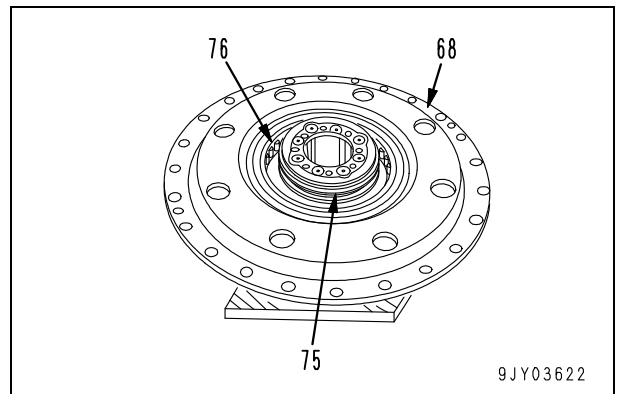
Install ring gear (81).



23. Housing assembly

1) Assemble housing assembly as follows.

- 1] Install bearing (76) in housing (68).
- 2] Install seal ring (75).



DUMP TRUCK

HD325-7R

HD405-7R

Machine model	Serial number
---------------	---------------

HD325-7R	11001 and up
HD405-7R	11001 and up

50 Disassembly and assembly

Power train, Part 2

Removal and installation of differential assembly	2
Disassembly and assembly of differential assembly	4
Removal and installation of rear final drive carrier assembly	17
Disassembly and assembly of rear final drive carrier assembly	19
Disassembly and assembly of rear final drive assembly	21
Disassembly and assembly of front wheel hub assembly	25

4) Tooth contact of bevel gear and bevel pinion

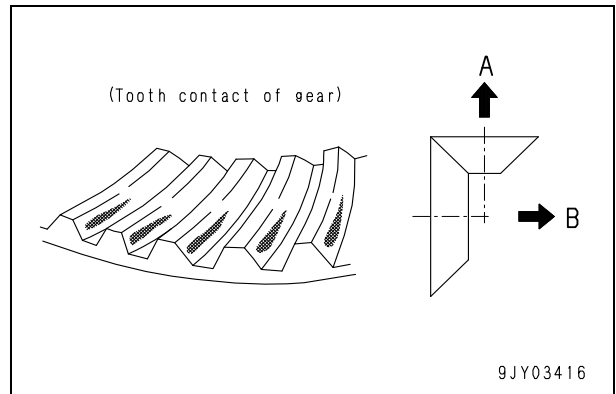
Adjustment

If the result of the inspection shows that the correct tooth contact is not being obtained, adjust again as follows.

1] If bevel pinion is too far from center line of bevel gear. Contact is at the small end of the convex tooth face of the bevel gear and at the big end of the concave tooth face.

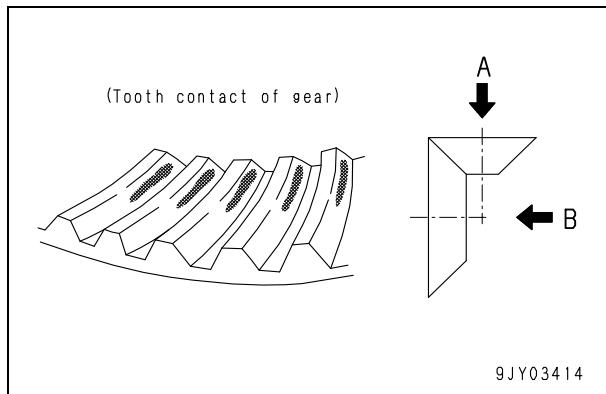
- Procedure for adjustment
Adjust the thickness of the shims to move the bevel pinion in direction (A), nearer to the bevel gear.

Using shims or the adjustment nut of the bevel gear bearing cage, move the bevel gear in direction (B) by the same amount that the bevel pinion has moved in direction (A). Check the tooth contact pattern and backlash.



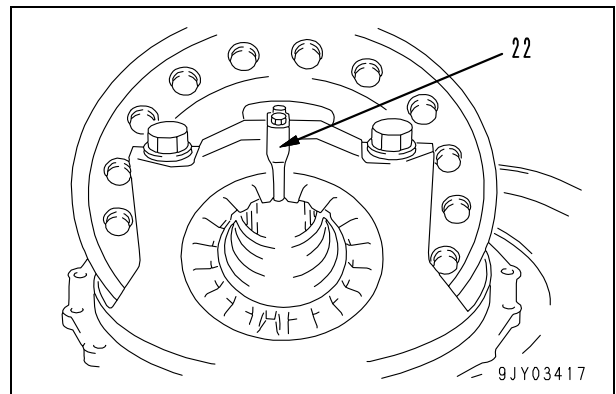
- ★ When adjusting the bevel gear to the right or left, do not change the pre-load of the bearing. Always turn the adjustment nuts at both ends the same amount in the same direction.

5) After adjusting tooth contact and backlash, install lock plate (22).



2] If bevel pinion is too close to center line of bevel gear. Contact is at the small end of the concave tooth face of the bevel gear and the big end of the convex tooth face.

- Procedure for adjustment
Adjust the thickness of the shims at the bevel pinion to move the bevel pinion in direction (A), away from the bevel gear. Using shims or the adjustment nut of the bevel gear bearing cage, move the bevel gear in direction (B) by the same amount that the bevel pinion has moved in direction (A). Check the tooth contact pattern and backlash.



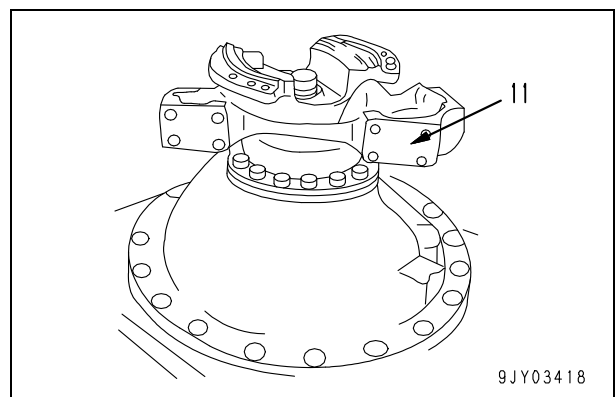
13. Case

After completing adjustment of the tooth contact and backlash, coat case (11) mounting bolts with thread tightener and tighten fully.

☞ Mounting bolt:

245 – 310 Nm {25 – 31.5 kgm}

- ★ After tightening, rotate the bearing 20 – 30 turns again, and check again that the bearing rotates smoothly.



Disassembly and assembly of rear brake assembly

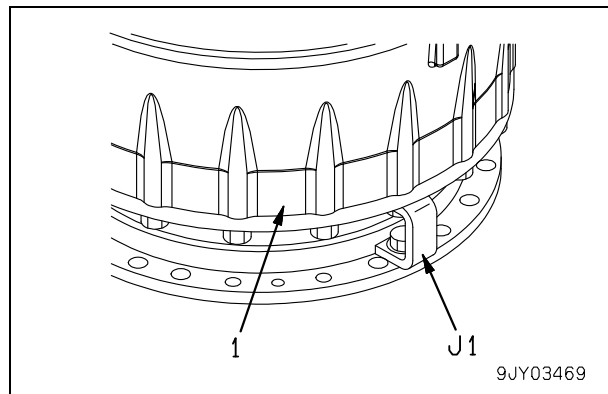
Special tools

Symbol	Part No.	Part name	Necessity	Q'ty	New/Remodel	Sketch
J 4	1	792-103-1201	Fixture	■	3	
		792-520-2121	Installer	■	1	
		791-580-1600	Push tool	■	1	
		792-520-2110	Installer	■	1	
		792-530-1600	Push tool	■	1	

Disassembly

1. Outer gear assembly

- 1) Remove tool **J1**.
- 2) Using eyebolts, lift off outer gear (1) together with disc and plate.
 - ★ Be careful not to damage the floating seal when removing.

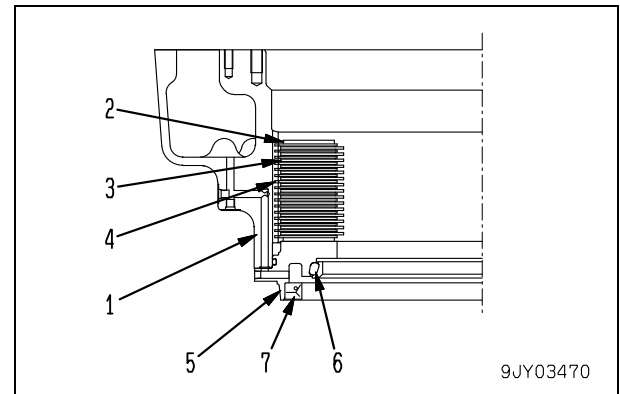


2. Damper, disc, plate

- Remove damper (2), disc (3), and plate (4) from outer gear (1).

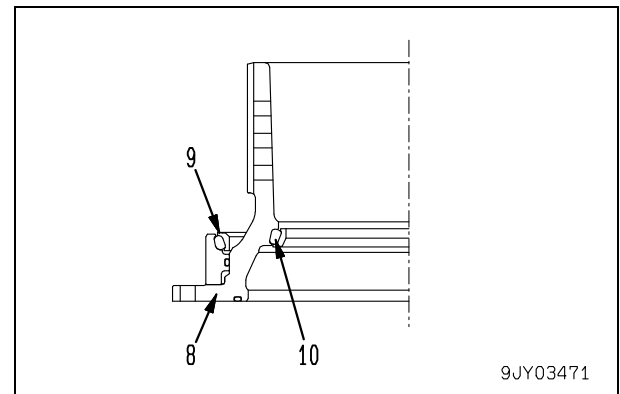
3. Hub

- 1) Remove mounting bolts, then remove hub (5) from outer gear (1).
- 2) Remove floating seal (6) and dust seal (7) from hub (5).



4. Floating seals

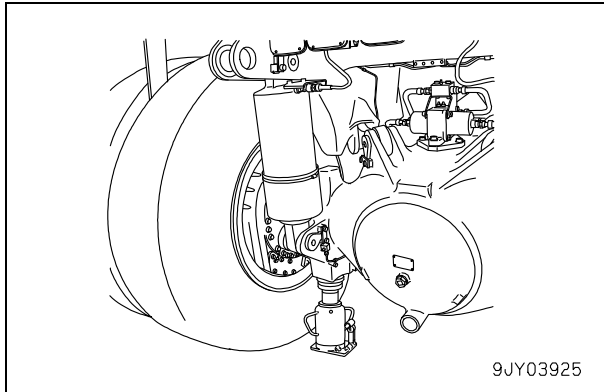
- Remove floating seals (9) and (10) from inner gear (8).




Removal and installation of rear wheel assembly

Removal

- ⚠ Stop the machine on a level ground and put chocks at the front and rear of the front tires.
 - ⚠ Raise the body and lock it with the safety pin.
1. Set a hydraulic jack (30 ton) under either rear axle and raise the rear wheel assembly.




2. Loosen the locknut of the air valve and remove lock plate (1).
3. Remove outer hub nuts (2). [*1]
4. Remove wheel assembly.
 - ★ When removing the wheel, take care not to break its air valve.

 Wheel assembly: 750 kg

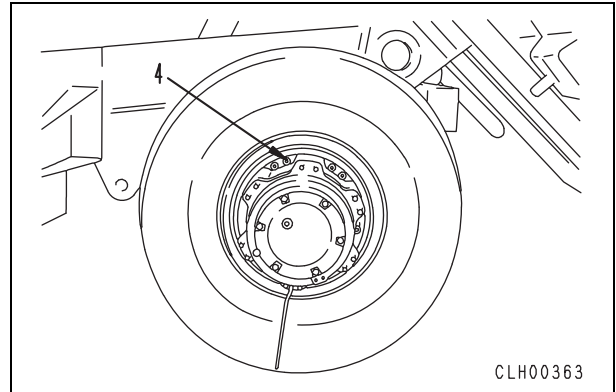
- ⚠ Rest the removed wheel assembly against a safe place and put blocks under it to prevent it from falling down.



5. Remove inner hub nuts (4). [*2]
6. Remove wheel assembly.

 Wheel assembly: 750 kg

- ⚠ Rest the removed wheel assembly against a safe place and put blocks under it to prevent it from falling down.




Installation

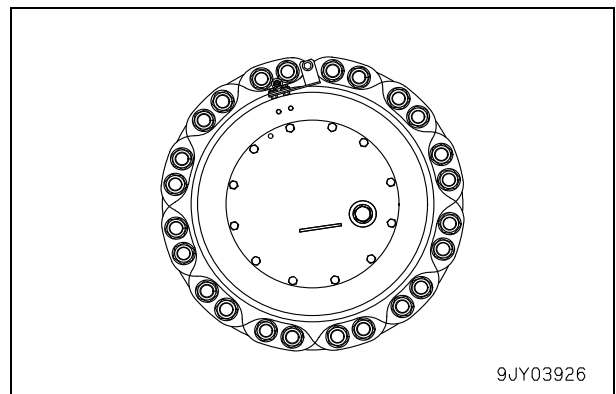
- Carry out installation in the reverse order to removal.

[*1] [*2]

- ★ Tighten the hub nuts evenly in the diagonal order.
- ★ Tighten the hub nuts permanently after lowering the machine.

 Hub nut:

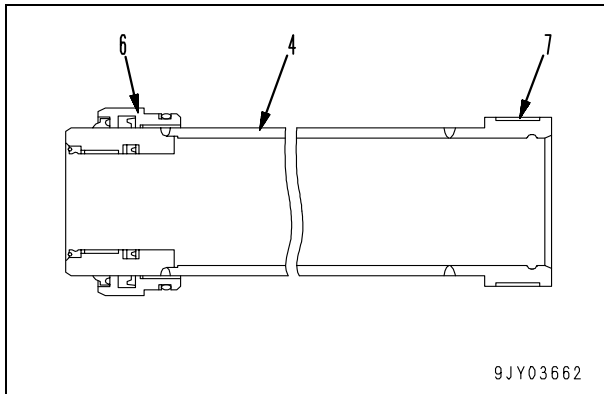
1,519 – 1,852 Nm {154.9 – 189.1 kgm}



- ★ When installing, be careful not to damage the air valve.

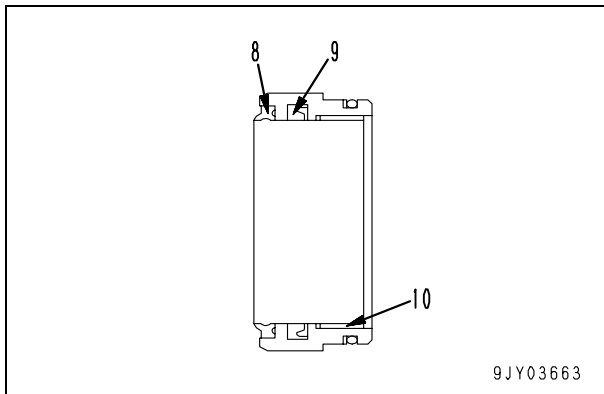
- Rotate the wheel and check that the runout is within 5 mm.
- After installing the wheel assembly, drive the machine about 5 – 6 km and then check that the bolts are tightened to the specified torque.

5. Remove cylinder head assembly (6) from cylinder II (4).
6. Remove wear ring (7).

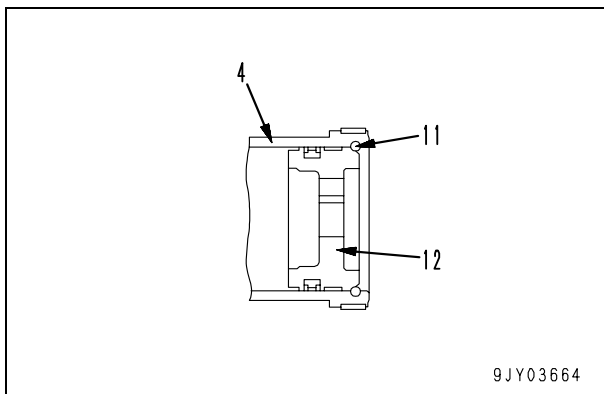


● **Disassembly of cylinder head assembly**

- 1) Remove O-ring, then remove dust seal (8) and rod packing (9).
- 2) Remove bushing (10).

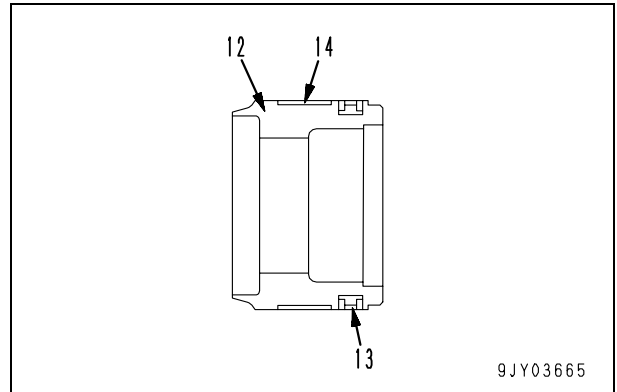


7. Remove snap ring (11) from cylinder II (4), then remove piston assembly (12).

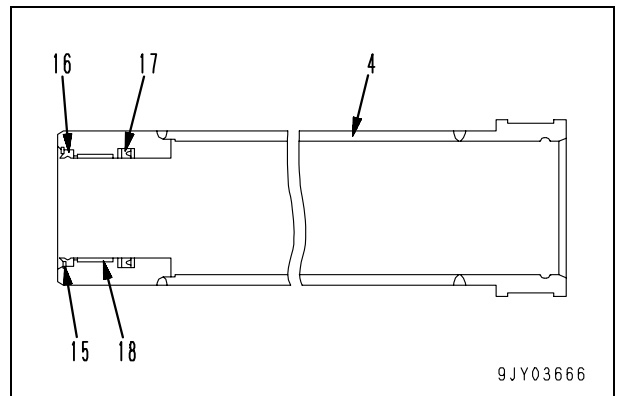


● **Disassembly of piston assembly**

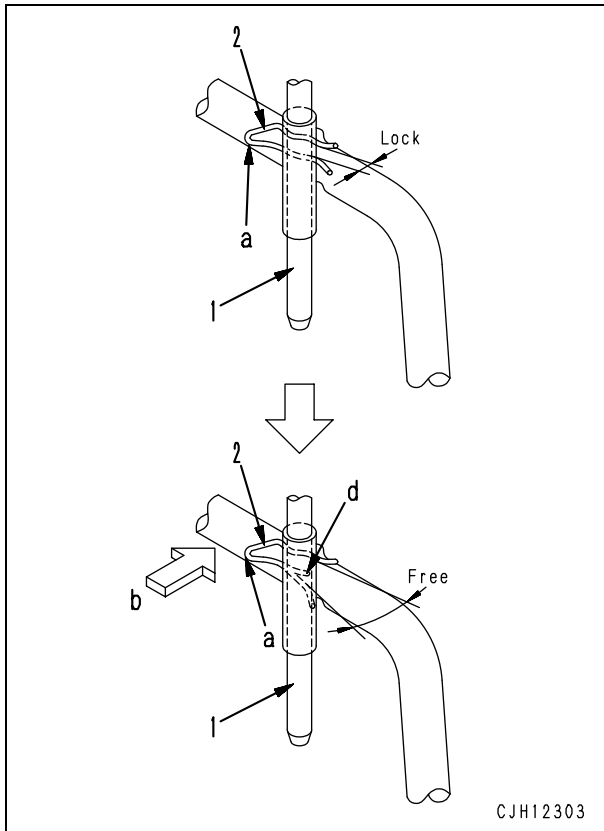
- Remove piston ring (13) and wear ring (14) from piston assembly (12).



8. Remove snap ring (15) from cylinder II (4), then remove dust seal (16), rod packing (17), and bushing (18).

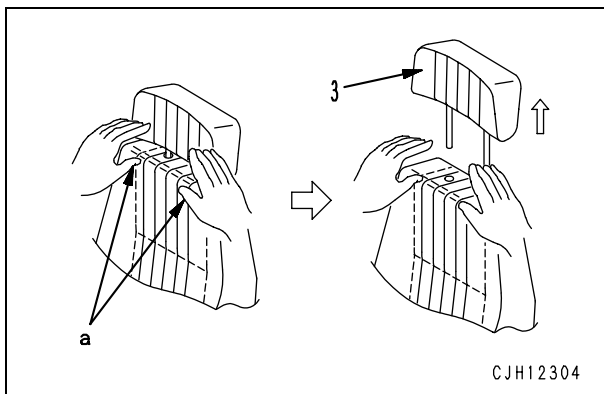


- 2) Apply force b to part a of each clip (2) in the direction of the arrow to turn the clip. Release headrest stay (1) from part d of the clip and pull out up headrest (3).



CJH12303

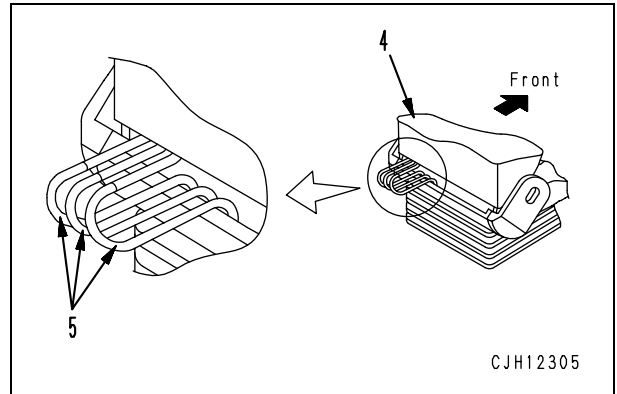
- ★ Pushing in both clips (2) simultaneously, remove headrest (3).



CJH12304

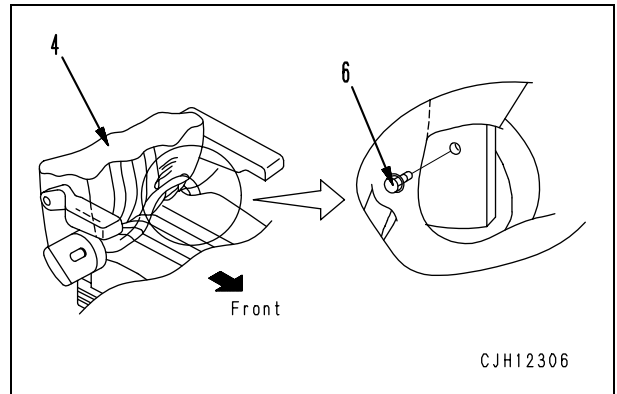
2. Seatback

- 1) Disconnect 3 air hoses (5) from the rear left of seatback (4).
 ★ Before disconnecting the air hoses, check their types.



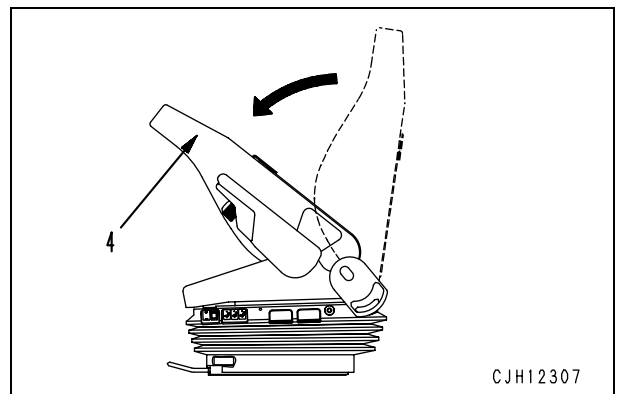
CJH12305

- 2) Remove seatback hinge mounting bolt (6) (M8 bolt).



CJH12306

- 3) Bring seatback (4) down forward.



CJH12307

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