CONTENTS

SERVICE TIRES SAFELY

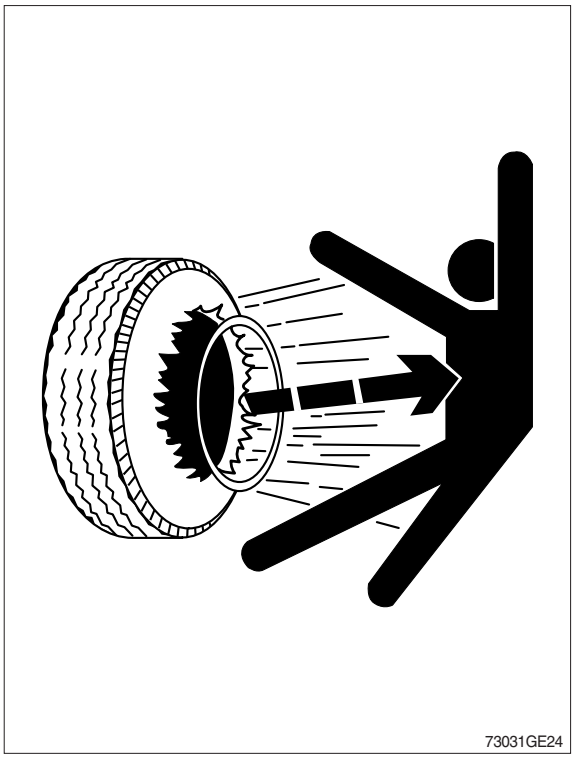
Explosive separation of a tire and rim parts can cause serious injury or death.

Do not attempt to mount a tire unless you have the proper equipment and experience to perform the job.

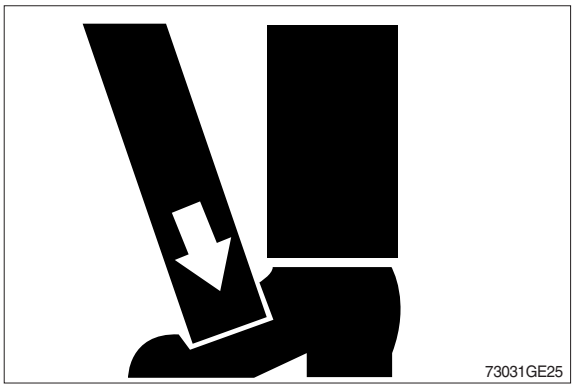
Always maintain the correct tire pressure. Do not inflate the tires above the recommended pressure. Never weld or heat a wheel and tire assembly. The heat can cause an increase in air pressure resulting in a tire explosion.
Welding can structurally weaken or deform the wheel.

When inflating tires, use a clip-on chuck and extension hose long enough to allow you to stand to one side and not in front of or over the tire assembly. Use a safety cage if available.

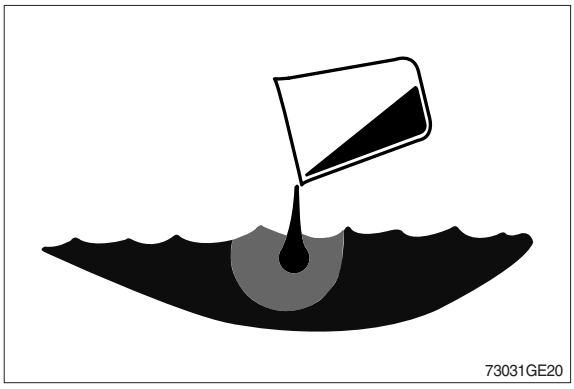
Check wheels for low pressure, cuts, bubbles, damaged rims or missing lug bolts and nuts.



USE PROPER LIFTING EQUIPMENT



DISPOSE OF FLUIDS PROPERLY



6. TORQUE CHART

Use following table for unspecified torque.

1) BOLT AND NUT

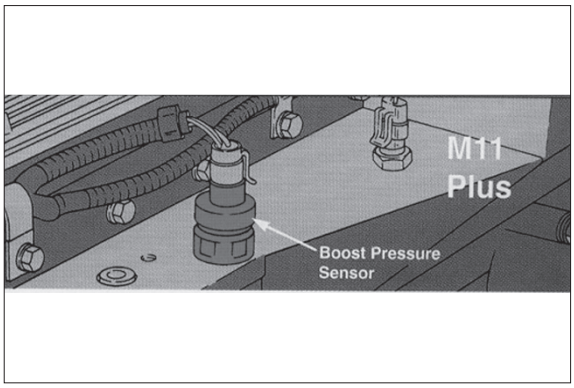
(1) Coarse thread

Bolt size	8T		10T	
	kg · m	lb · ft	kg · m	lb · ft
M 6 × 1.0	0.85 ~ 1.25	6.15 ~ 9.04	1.14 ~ 1.74	8.2 ~ 12.6
M 8 × 1.25	2.0 ~ 3.0	14.5 ~ 21.7	2.73 ~ 4.12	19.5 ~ 29.8
M10 × 1.5	4.0 ~ 6.0	28.9 ~ 43.4	5.5 ~ 8.3	39.8 ~ 60
M12 × 1.75	7.4 ~ 11.2	53.5 ~ 79.5	9.8 ~ 15.8	71 ~ 114
M14 × 2.0	12.2 ~ 16.6	88.2 ~ 120	16.7 ~ 22.5	121 ~ 167
M16 × 2.0	18.6 ~ 25.2	135 ~ 182	25.2 ~ 34.2	182 ~ 247
M18 × 2.5	25.8 ~ 35.0	187 ~ 253	35.1 ~ 47.5	254 ~ 343
M20 × 2.5	36.2 ~ 49.0	262 ~ 354	49.2 ~ 66.6	356 ~ 482
M22 × 2.5	48.3 ~ 63.3	350 ~ 457	65.8 ~ 98.0	476 ~ 709
M24 × 3.0	62.5 ~ 84.5	452 ~ 611	85.0 ~ 115	615 ~ 832
M30 × 3.0	124 ~ 168	898 ~ 1214	169 ~ 229	1223 ~ 1655
M36 × 4.0	174 ~ 236	1261 ~ 1703	250 ~ 310	1808 ~ 2242

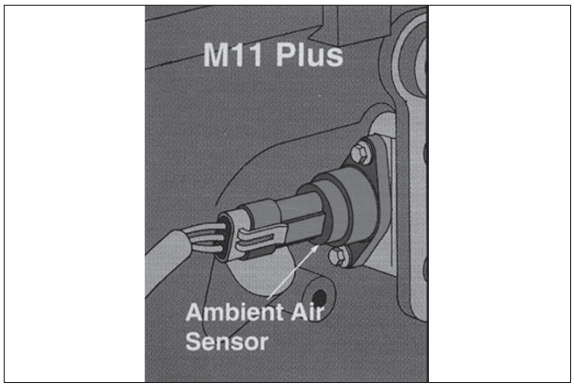
(2) Fine thread

Bolt size	8T		10T	
	kg · m	lb · ft	kg · m	lb · ft
M 8 × 1.0	2.17 ~ 3.37	15.7 ~ 24.3	3.04 ~ 4.44	22.0 ~ 32.0
M10 × 1.25	4.46 ~ 6.66	32.3 ~ 48.2	5.93 ~ 8.93	42.9 ~ 64.6
M12 × 1.25	7.78 ~ 11.58	76.3 ~ 83.7	10.6 ~ 16.0	76.6 ~ 115
M14 × 1.5	13.3 ~ 18.1	96.2 ~ 130	17.9 ~ 24.1	130 ~ 174
M16 × 1.5	19.9 ~ 26.9	144 ~ 194	26.6 ~ 36.0	193 ~ 260
M18 × 1.5	28.6 ~ 43.6	207 ~ 315	38.4 ~ 52.0	278 ~ 376
M20 × 1.5	40.0 ~ 54.0	289 ~ 390	53.4 ~ 72.2	386 ~ 522
M22 × 1.5	52.7 ~ 71.3	381 ~ 515	70.7 ~ 95.7	512 ~ 692
M24 × 2.0	67.9 ~ 91.9	491 ~ 664	90.9 ~ 123	658 ~ 890
M30 × 2.0	137 ~ 185	990 ~ 1338	182 ~ 248	1314 ~ 1795
M36 × 3.0	192 ~ 260	1389 ~ 1879	262 ~ 354	1893 ~ 2561

9) The Boost Pressure Sensor is mounted next to the intake manifold temperature sensor. Its input is crucial to the precise electronic control of fuel metering.

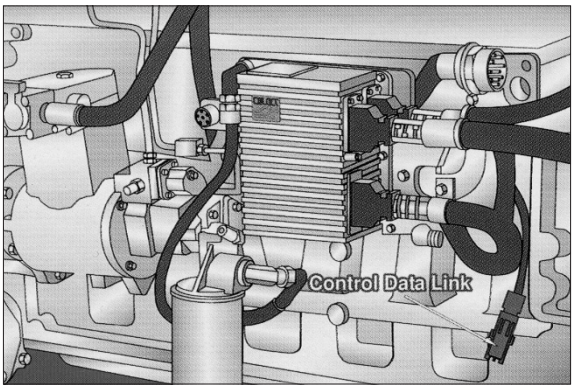


10) An Ambient Air Pressure sensor provides altitude input information to the ECM for altitude derate purposes.



11) The vehicle Control Data Link Connector provides a means of connecting the QSM system with other onboard microprocessor-based systems, such as an anti-skid braking system.

This connector, however, is not designed to be used with a diagnostic tool such as INSITE. INSITE and other diagnostic tools should only be connected to the Service Data Links located on the OEM Harness or the Service Data Link mounted on the engine next to the ECM.



GROUP 2 ENGINE SPEED & STALL RPM

1. TEST CONDITION

1) Normal temperature of the whole system
   - Coolant : Approx 80˚C (176˚F)
   - Hydraulic oil : 45 ± 5˚C (113 ± 10˚F)
   - Transmission oil : 75 ± 5˚C (167 ± 10˚F)

2) Normal operating pressure : See page 6-47.

2. SPECIFICATION

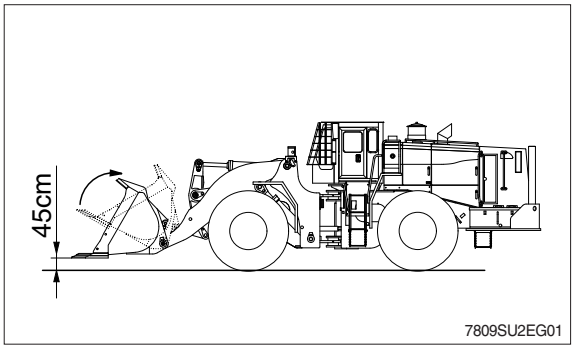
Engine speed, rpm (P mode)						Remark
Low idle	High idle	Pump stall	Converter stall	Full stall	Fan motor	
800±25	2130±50	2040±70	2010±70	1530±100	1150±50	

3. ENGINE RPM CHECK

Remark : If the checked data is not normal, it indicates that the related system is not working properly. Therefore, it is required to check the related system pressure : See page 6-47.

1) Pump stall rpm

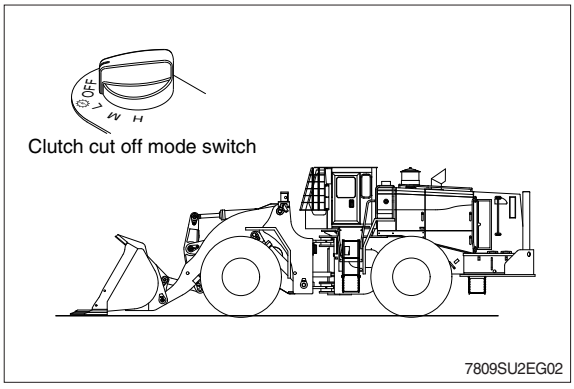
- Start the engine and raise the bucket approx 45 cm (1.5 ft) as the figure.
- Press the accelerator pedal fully and operate the bucket control lever to the retract position fully.
- Check the engine rpm at the above condition.



7809SU2EG01

2) Convertor stall rpm

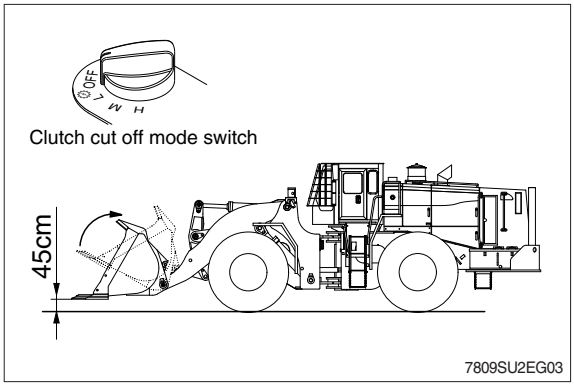
- Start the engine and lower the bucket on the ground as the figure.
- Set the clutch cut off mode switch at the OFF position.
- Press the brake pedal and accelerator pedal fully.
- Shift the transmission lever to the 4th forward position.
- Check the engine rpm at the above condition.



7809SU2EG02

3) Full stall rpm

- Start the engine and raise the bucket approx 45 cm (1.5 ft) as the figure.
- Set the clutch cut off mode switch at the OFF position.
- Press the brake pedal and accelerator pedal fully .
- Shift the transmission lever to the 4th forward position and operate the bucket lever to the retract position fully.
- Check the engine rpm at the above condition.

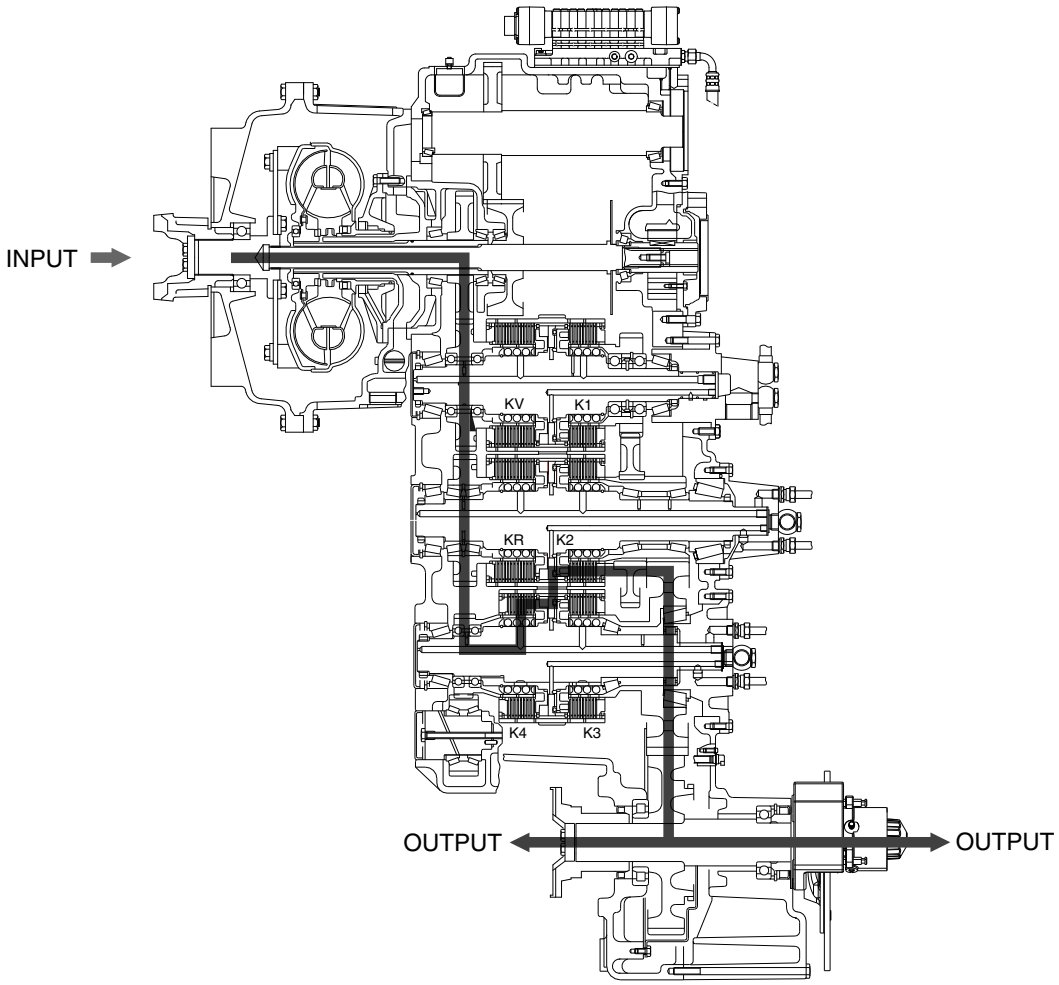


7809SU2EG03

③ Forward 3rd

In 3rd forward, 4th clutch and 2nd clutch are engaged.

4th clutch and 2nd clutch are actuated by the hydraulic pressure applied to the clutch piston.



78093PT09-1

4. FAULT CODE

1) MACHINE FAULT CODE

HCESPN	FMI	Description
101	3	Hydraulic oil temperature sensor circuit - Voltage above normal, or shorted to high source (or open circuit)
	4	Hydraulic oil temperature sensor circuit - Voltage below normal, or shorted to low source
145	5	Engine cooling fan EPPR valve circuit - Current below normal, or open circuit
	6	Engine cooling fan EPPR valve bircuit - Current above normal
172	4	Boom up lever detent solenoid circuit - Voltage below normal, or shorted to low source (or open circuit)
	6	Boom up lever detent solenoid circuit - Current above normal
173	4	Boom down lever detent solenoid circuit - Voltage below normal, or shorted to low source (or open circuit)
	6	Boom down lever detent solenoid circuit - Current above normal
174	4	Bucket lever detent solenoid circuit - Voltage below normal, or shorted to low source (or open circuit)
	6	Bucket lever detent solenoid circuit - Current above normal
181	4	Engine cooling fan reverse solenoid circuit - Voltage below normal, or shorted to low source (or open circuit)
	6	Engine cooling fan reverse solenoid circuit - Current above normal
183	4	Engine cooling fan reverse driving status signal circuit - Voltage below normal, or shorted to low source (or open circuit)
	6	Engine cooling fan reverse driving status signal circuit - Current above normal
187	4	Emergency steering pump relay circuit - Voltage below normal, or shorted to low source (or open circuit)
	6	Emergency steering pump relay circuit – Current above normal
202	0	Steering main pump pressure sensor data above normal range (or open circuit)
	1	Steering main pump pressure sensor data below normal range
	2	Steering main pump pressure sensor data error
	4	Steering main pump pressure sensor circuit - Voltage below normal, or shorted to low source
203	0	Emergency steering pump pressure sensor data above normal range (or open circuit)
	1	Emergency steering pump pressure sensor data below normal range
	2	Emergency steering pump pressure sensor data error
	4	Emergency steering pump pressure sensor circuit - Voltage below normal, or shorted to low source
204	0	Boom cylinder pressure sensor data above normal range (or open circuit)
	1	Boom cylinder pressure sensor data below normal range
	2	Boom cylinder pressure sensor data error
	4	Boom cylinder pressure sensor circuit - Voltage below normal, or shorted to low source
205	0	Bucket cylinder pressure sensor data above normal range (or open circuit)
	1	Bucket cylinder pressure sensor data below normal tange
	2	Bucket cylinder pressure sensor data error
	4	Bucket cylinder pressure sensor circuit - Voltage below normal, or shorted to low source

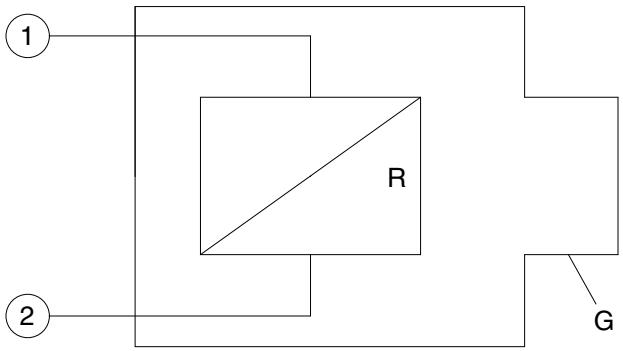
Fault code J1939 SPN J1939 FMI	Reason	Effect (only when fault code is active)
1117 627 2	Power supply lost with ignition on - Data erratic, intermittent, or incorrect. Supply voltage to the ECM fell below 6.2 volts momentarily, or the ECM was not allowed to power down correctly (retain battery voltage for 30 seconds after key OFF).	Engine will shut down.
1633 625 2	OEM datalink cannot transmit - Data erratic, intermittent, or incorrect. Communications within the OEM datalink network is intermittent.	Engine will only idle.
2185 520197 3	Sensor supply 4 circuit - Voltage above normal, or shorted to high source. High voltage detected at +5 volt sensor supply circuit to the accelerator pedal position sensor.	Engine will only idle.
2186 520197 4	Sensor supply 4 circuit - Voltage below normal, or shorted to low source. Low voltage detected at +5 volt sensor supply circuit to the accelerator pedal position sensor.	Possibly hard to start, low power, or engine smoke.
2249 157 1	Injector metering rail 1 pressure - Data valid but below normal operational range - Most severe level. The ECM has detected that fuel pressure is lower than commanded pressure.	Engine may be difficult to start.
2265 1075 3	Electric lift pump for engine fuel supply circuit - Voltage above normal, or shorted to high source. High voltage or open detected at the fuel lift pump signal circuit.	Engine may be difficult to start.
2266 1075 4	Electric lift pump for engine fuel supply circuit - Voltage below normal, or shorted to low source. Low signal voltage detected at the fuel lift pump circuit.	Possible low power.
2311 633 31	Electronic fuel injection control valve circuit - Condition exists. Fuel pump actuator circuit resistance too high or too low.	Engine may exhibit misfire as control switches from the primary to the backup speed sensor. Engine power is reduced while the engine operates on the backup speed sensor.
2321 190 2	Engine crankshaft speed/position - Data erratic, intermittent, or incorrect. crankshaft engine speed sensor intermittent synchronization.	Possible low power.
2322 723 2	Engine camshaft speed / position sensor - Data erratic, intermittent, or incorrect. Camshaft engine speed sensor intermittent synchronization.	Engine power derate.
2345 103 10	Turbocharger 1 Speed - Abnormal rate of change. The turbocharger speed sensor has detected an erroneous speed value.	Engine power derate.
2346 2789 15	Turbocharger turbine inlet temperature (Calculated) - Data valid but above normal operational range - Least severe level. Turbocharger turbine inlet temperature has exceeded the engine protection limit.	Engine power derate.
2347 2790 15	Turbocharger compressor outlet temperature (Calculated) - Data valid but above normal operational range - Least severe level.	Engine brake on cylinders 1, 2, and 3 can not be activated or exhaust brake will not operate.
2377 647 3	Fan control circuit - Voltage above normal, or shorted to high source. Open circuit or high voltage detected at the fan control circuit.	Variable geometry turbocharger will go to the open position.

Fault code (Hex)	Meaning of the fault code possible reason for fault detection	Reaction of the TCU	Possible steps to repair
76	O.C. at clutch K2 The measured resistance value of the valve is out of limit · Cable/connector is defective and has no contact to TCU · Regulator has an internal defect	TCU shifts to neutral OP mode : Limp home If failure at another clutch is pending TCU shifts to neutral OP mode : TCU shutdown	· Check the cable from TCU to the gearbox · Check the connectors from gearbox to TCU · Check the regulator resistance* · Check internal wire harness of the gearbox * See page 3-49
77	S.C. to battery voltage at clutch K3 The measured resistance value of the valve is out of limit, the voltage at K3 valve is too high · Cable/connector is defective and has contact to battery voltage · Cable/connector is defective and has contact to another regulator output of the TCU · Regulator has an internal defect	TCU shifts to neutral OP mode : Limp home If failure at another clutch is pending TCU shifts to neutral OP mode : TCU shutdown	· Check the cable from TCU to the gearbox · Check the connectors from gearbox to TCU · Check the regulator resistance* · Check internal wire harness of the gearbox * See page 3-49
78	S.C. to ground at clutch K3 The measured resistance value of the valve is out of limit, the voltage at K3 valve is too low · Cable/connector is defective and has contact to vehicle ground · Regulator has an internal defect	TCU shifts to neutral OP mode : Limp home If failure at another clutch is pending TCU shifts to neutral OP mode : TCU shutdown	· Check the cable from TCU to the gearbox · Check the connectors from gearbox to TCU · Check the regulator resistance* · Check internal wire harness of the gearbox * See page 3-49
79	O.C. at clutch K3 The measured resistance value of the valve is out of limit · Cable/connector is defective and has no contact to TCU · Regulator has an internal defect	TCU shifts to neutral OP mode : Limp home If failure at another clutch is pending TCU shifts to neutral OP mode : TCU shutdown	· Check the cable from TCU to the gearbox · Check the connectors from gearbox to TCU · Check the regulator resistance* · Check internal wire harness of the gearbox * See page 3-49
7D	S.C. ground at engine derating device · Cable is defective and is contacted to vehicle ground · Engine derating device has an internal defect · Connector pin is contacted to vehicle ground	Engine derating will be on until TCU power down even if fault vanishes (Loose connection) OP mode : Normal	· Check the cable from TCU to the engine derating device · Check the connectors from engine derating device to TCU · Check the resistance* of engine derating device ※ Not used * See page 3-49
7E	S.C. battery voltage at engine derating device · Cable/connector is defective and is contacted to battery voltage · Engine derating device has an internal defect	No reaction OP mode : Normal	· Check the cable from TCU to the engine derating device · Check the connectors from backup alarm device to TCU · Check the resistance* of backup alarm device * See page 3-49

※ Some fault codes are not applied to this machine.

5) MEASURING OF RESISTANCE AT ACTUATOR/SENSOR AND CABLE

(1) Actuator



76043PT19

Open circuit $R_{12} = R_{1G} = R_{2G} = \infty$

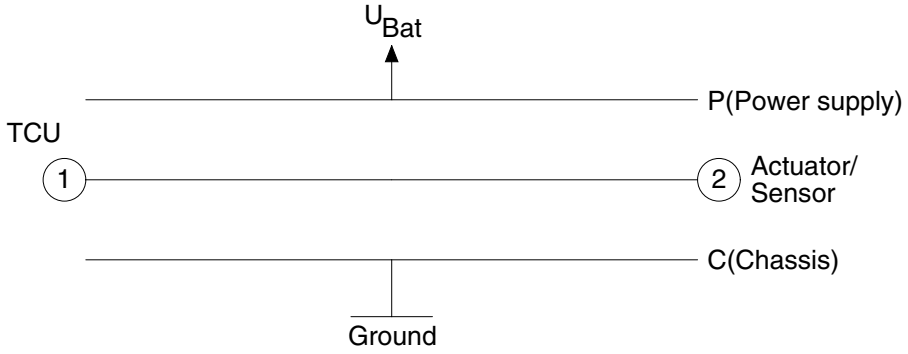
Short cut to ground $R_{12} = R$; $R_{1G} = 0$, $R_{2G} = R$ or $R_{1G} = R$, $R_{2G} = 0$

(For S.C. to ground, G is connected to vehicle ground)

Short cut to battery $R_{12} = R$; $R_{1G} = 0$, $R_{2G} = R$ or $R_{1G} = R$, $R_{2G} = 0$

(For S.C. to battery, G is connected to battery voltage)

(2) Cable



76043PT20

Open circuit $R_{12} = R_{1P} = R_{1C} = R_{2P} = R_{2C} = \infty$

Short cut to ground $R_{12} = 0$; $R_{1C} = R_{2C} = 0$, $R_{1P} = R_{2P} = \infty$

Short cut to battery $R_{12} = 0$; $R_{1C} = R_{2C} = 0$, $R_{1P} = R_{2P} = 0$

Problem	Cause	Remedy
Transmission pressure is low (all gears)	Low oil level.	Check transmission oil level and refill if necessary.
	Failed transmission pressure switch.	Verify transmission system pressure. Do transmission system pressure test.
	Plugged suction strainer.	Transmission pump may be noisy if transmission suction screen is clogged. Drain transmission. Remove and clean suction screen. Also, check condition of transmission filter.
	Stuck transmission pressure regulating valve or broken spring.	Remove transmission pressure regulating valve. Inspect for damage (See transmission control valve).
	Failed control valve gasket.	Inspect transmission control valve for external leakage. Remove control valve. Inspect or replace gasket.
	Stuck PPC valve.	Remove end cover to inspect modulation spool and check torque on cap screws retaining control valve to transmission.
Transmission system pressure is low (one or two gears)	Failed transmission pump.	Do pump flow test.
	Failed transmission control valve gasket.	Inspect transmission control valve for external leakage. Remove control valve. Inspect or replace gasket.
	Leakage in clutch piston or seal ring.	Disassemble and repair.
Transmission shifts too low	Low oil level (aeration of oil).	Add oil.
	Low transmission pressure.	Do transmission system pressure test.
	Restricted transmission pump suction screen.	Remove and clean screen.
	Low transmission pump flow.	Do transmission pump flow test.
	Excessive transmission element leakage.	Do transmission element leakage test using system pressure.
	Stuck PPC valve.	Remove end cover to inspect modulation spool. Replace if necessary.
	Restricted PPC valve orifice.	Remove orifice and inspect for contamination and /or plugging.
	Restricted oil passages between control valve and transmission elements.	Remove control valve and inspect oil passage.
	Incorrect transmission oil.	Change oil (SAE 10W-30/15W-40)

2) ASSEMBLY

※ All single components are to be checked for damage and replaced, if required.
Prior to installation check the mobile parts in the housing for functionality.
Pistons can be replaced individually.
Oil the single components prior to installation.
Place the orifices, with the concave side showing upwards, until contact.

※ Installation position, see arrows.

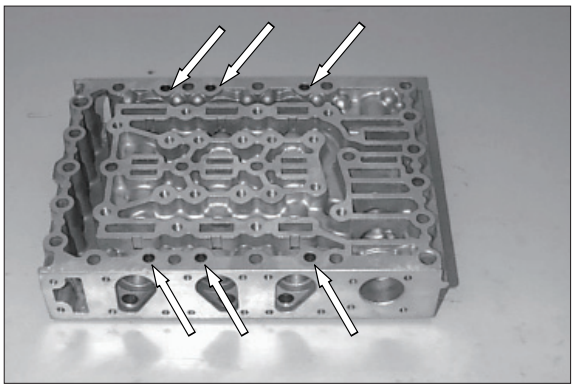


Figure 1013

(1) Opposite figure shows the following single components.
1 Vibration damper
(3EA, piston & comp spring)
2 Follow-on slide
(3EA, piston & comp spring)
3 Pressure reducing valve
(1EA, piston & comp spring)

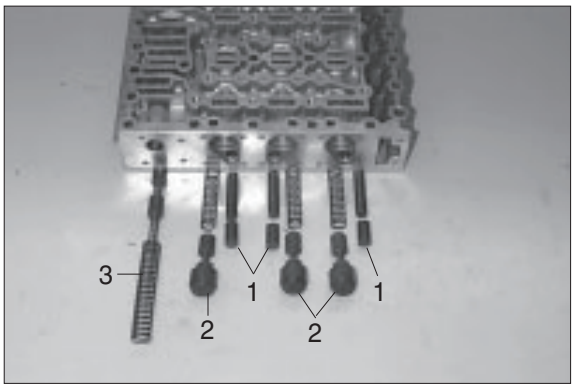


Figure 1014

(2) Install the single components according to figure 1014.

※ Preload the compression springs of the follow-on slides and fasten the pistons preliminarily by means of cylindrical pins ø 5.0 mm (assembly aid), see arrows/ figure 1015.

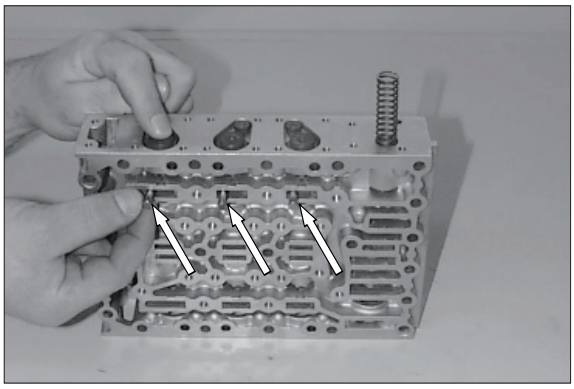


Figure 1015

(3) Install two adjusting screws.
Assemble gasket (arrow) and housing cover (figure 1016).
Then place the housing cover by means of adjusting screws equally until contact (figure 1017).

※ Special tool
Adjusting screws 5870 204 036

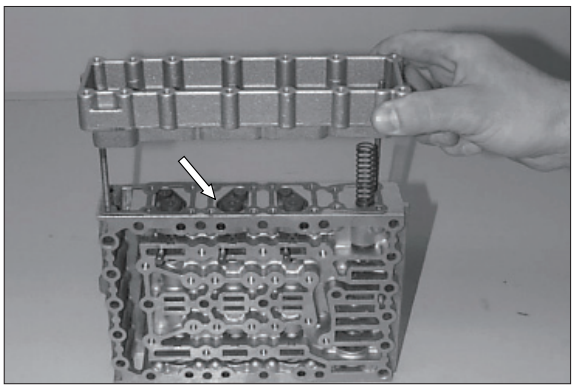


Figure 1016

(10) Remove the inductive transmitter.
9 = n - Engine

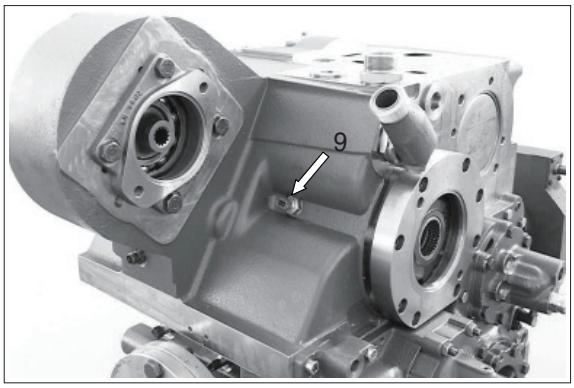


Figure 13

Input shaft-pump/power take-off (the 1st power take-off)

(1) Loosen the cap screw.

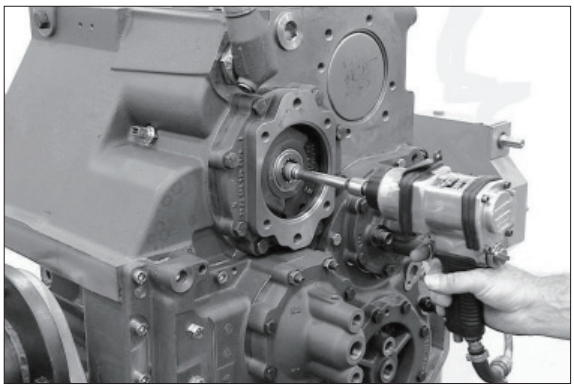


Figure 21

(2) Remove the cap screw and clamping plate.

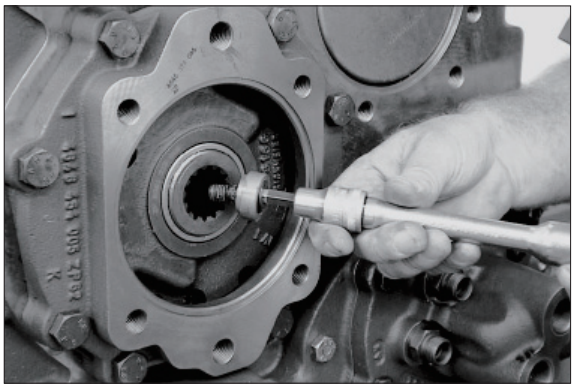


Figure 22

(3) Press the input shaft out of the bearing.

※ Pay attention to released input shaft as well as shims.

※ Special tool
Extractor 5870 000 065

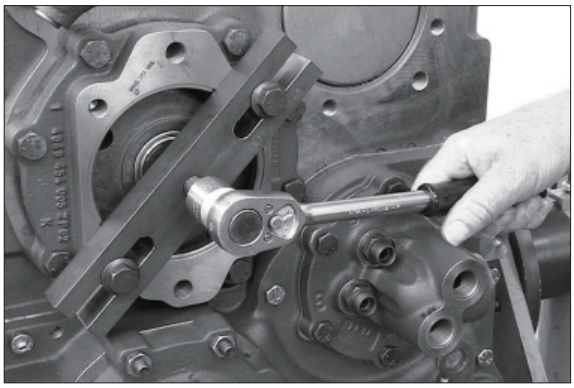


Figure 23

Dismantling of the Multi-Disc Clutch K3/K4

(1) By means of clamping ring (S) fasten the clutch to the assembly truck.

※ Special tool

Clamping ring	5870 654 033

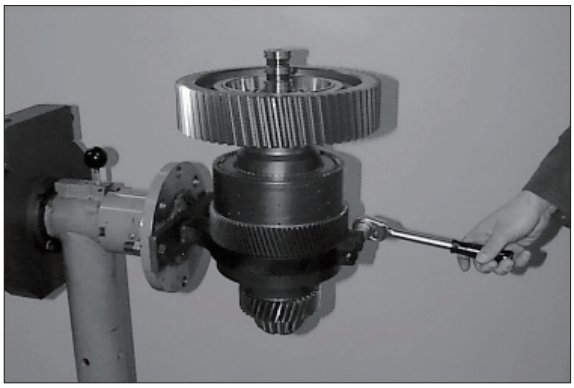


Figure 62

(2) Pull off the roller bearing from the disc carrier.

※ Special tool

Three-armed puller	5870 971 002

Figure 63

(3) Separate spur gear K3 from the disc carrier.

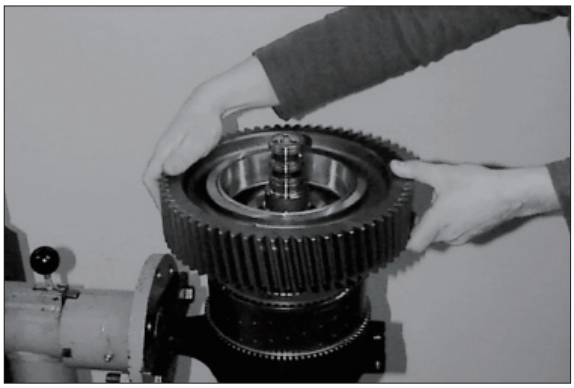


Figure 64

(4) Pull off the bearing inner ring from the disc carrier.

※ Special tool

Rapid grip	5873 012 012
Basic tool	5873 002 001

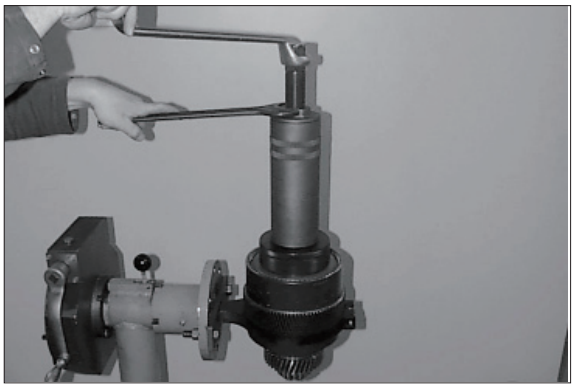


Figure 65

2) ASSEMBLY

3rd/4th power take-off

1 = Ball bearing
2 = Spur gear
3 = Driver
4 = Ball bearing
5 = Pump flange
6 = Cover
7 = Intermediate gear
8 = Shim
9 = Pin
10 = Sealing cover
11 = Orifice

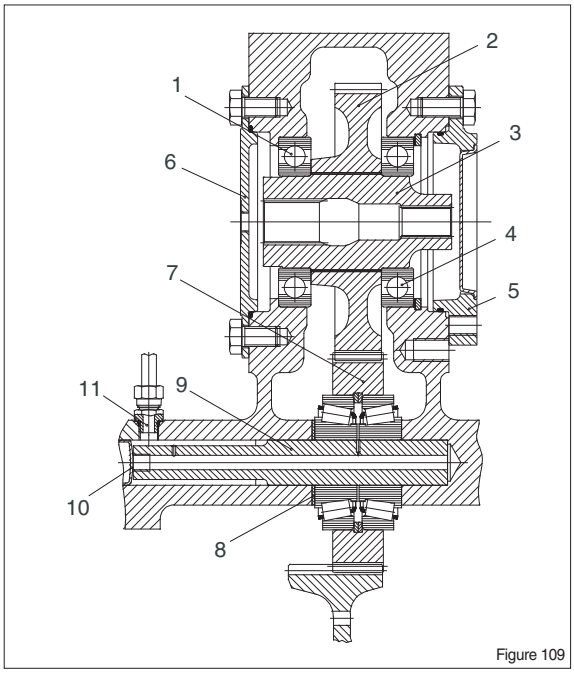


Figure 109

(1) Insert the ball bearing (1) into the housing bore until contact.

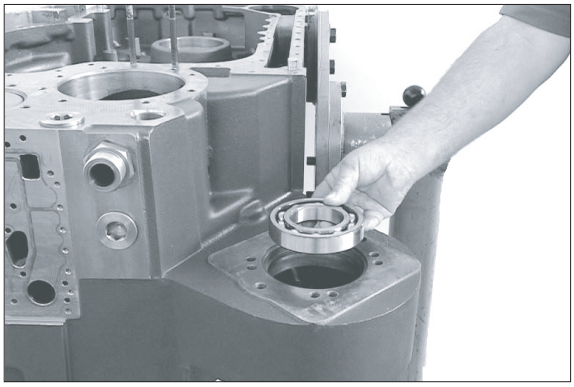


Figure 110

(2) Position spur gear (2).

※ Pay attention to the installation position, see sketch (figure 109).

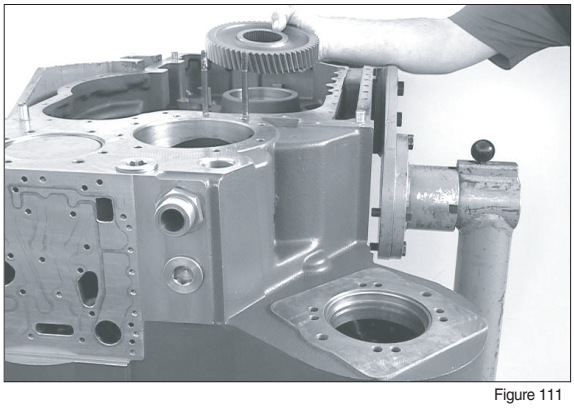


Figure 111

Preassemble and install spur gear K4 (figure 140~144) :

(1) Opposite figure shows the single components of spur gear K4.
   1 Bearing inner ring
   2 Bearing outer ring
   3 Ring
   4 Spur gear

   Locate both bearing outer rings (2) until contact.

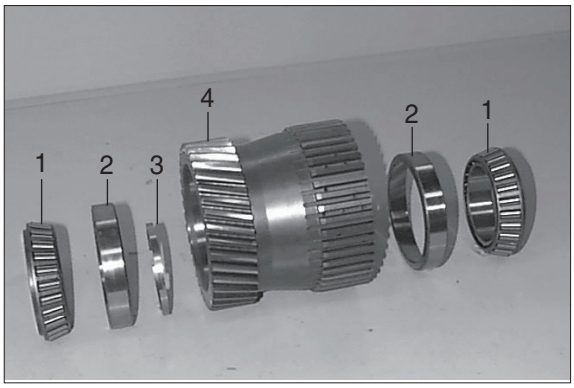


Figure140

(2) Heat the bearing inner ring and install it until contact.


Figure141

(3) Install the ring (3).

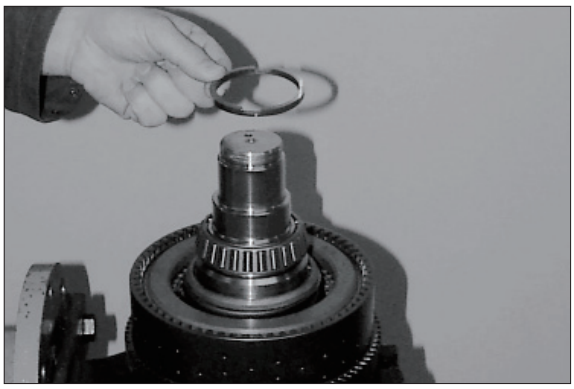


Figure142

(4) Assemble the spur gear until all inner clutch discs are located.

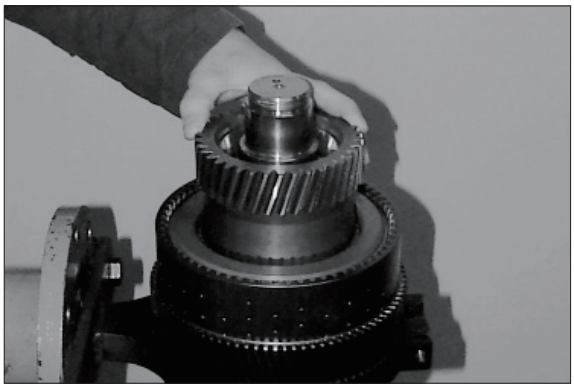


Figure143

Disc Components KR

※ Below sketch or table shows the standard version as to the installation position of the single components. Obligatory is the respective spare parts list.

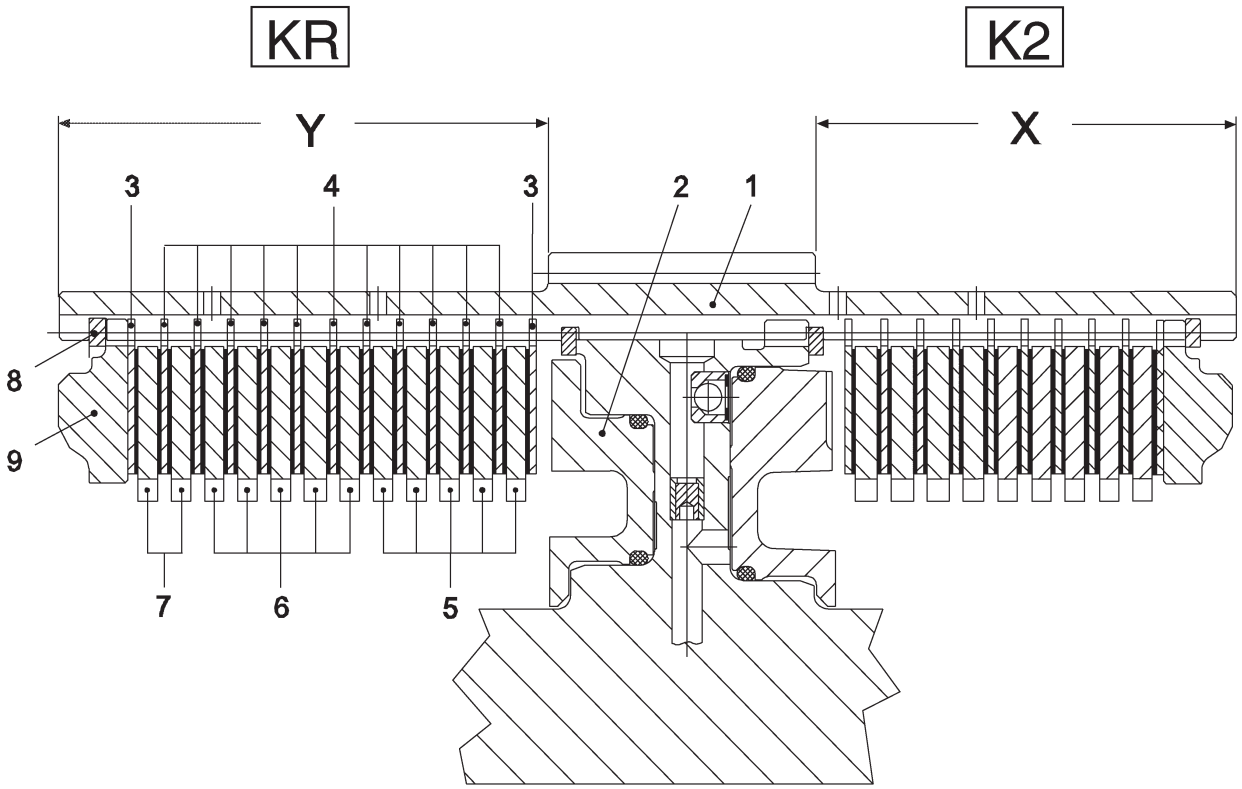


Figure 168

Position	Description	Quantity	s (mm)	Remarks
1	Disc carrier	1		
2	Piston	1		
3	Outer clutch disc	2	1.85	Coated on one side
4	Outer clutch disc	11	3.35	Coated on both sides
5	Inner clutch disc	5	2.5	
6	Inner clutch disc	5	3.0	
7	Inner clutch disc	2	2.5~4.0	Optional
8	Snap ring	1	2.10~3.10	Optional
9	End shim	1		
Number of friction surfaces : 24				
Disc clearance : 2.8 ~ 3.0 mm				

※ Install the outer clutch discs position 3 with uncoated side showing to the piston and end shim respectively. The respective clutch side can be seen on the length of the disc carrier, see sketch.

KR Dimension X (long disc carrier side)

K2 Dimension Y (short disc carrier side)

(1) Lift the disc carrier with the KV-side showing downwards into the clamping ring(S) and fasten it.
Then rotate disc carrier by 180˚.

⚠ **To install new disc carriers the finished bores have to be sealed with plugs.**
Installation position, see arrow, figure193~194.

※ Special tool

Hand mounting tool	5870 320 014
Ratchet spanner	5870 320 018

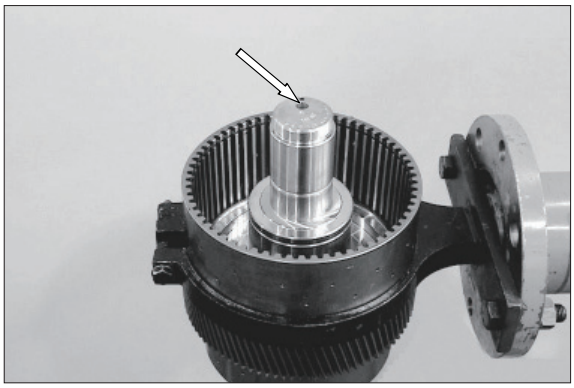


Figure 193

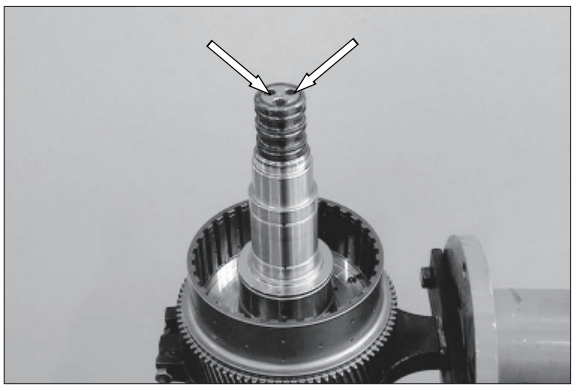


Figure 194

(2) Flush-mount the drain valve (arrow) with the chamfer showing downwards.

※ Special tool

Inserting tool	5870 320 019

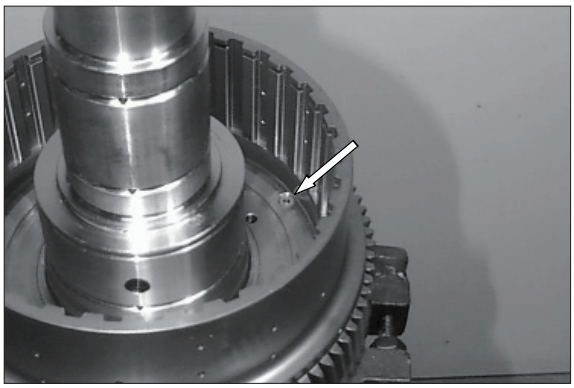


Figure 195

(3) Put both O-rings scroll-free into the annular grooves of the piston, see arrows.

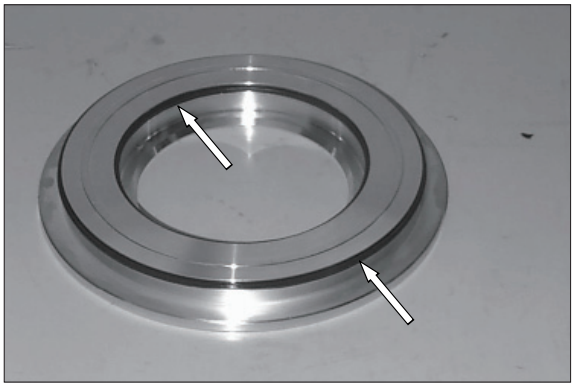


Figure 196

(8) Install shim s = 1.20 mm

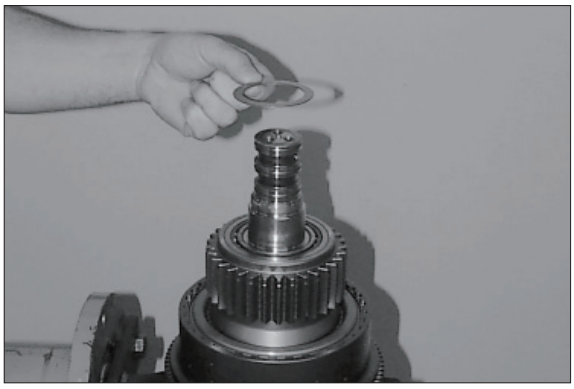


Figure 223

(9) Heat the bearing inner ring and install it until contact.

⚠ **Use safety gloves.**

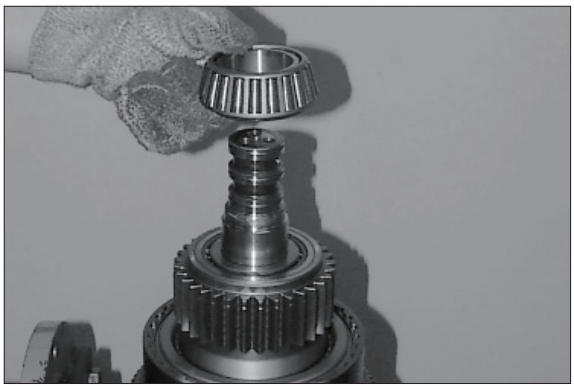


Figure 224

(10) Lift the disc carrier out of the clamping ring (S). To ensure the exact locating of the single components, preload the bearing with 100KN (10 t) (figure 225).

⚠ **Support on the lower as well as upper bearing inner ring.**
Use pressure pieces (S).

※ Special tool
Pressure pieces 5870 506 096

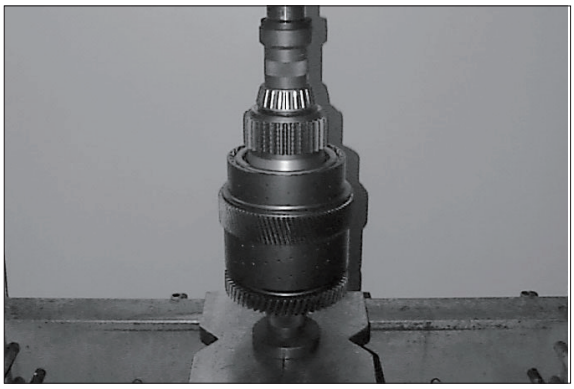


Figure 225

Housing dimension :

(3) Determine Dimension I, from the bearing outer ring to the mounting face.
Dimension I e.g ····· 16.13 mm

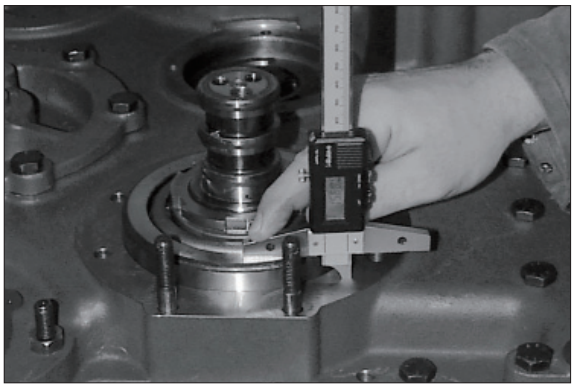


Figure 260

Cover dimension :

(4) Determine Dimension II, from the contact/ bearing outer ring to the mounting face.
Dimension II e.g ····· 17.75 mm

※ Special tool
Digital depth gauge 5870 200 072

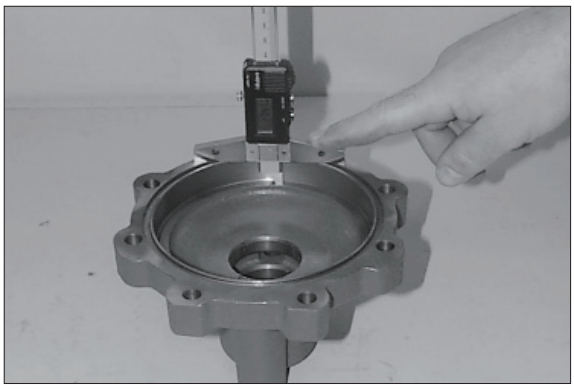


Figure 261

Example :

Dimension II ·····		17.75 mm
Dimension I ·····		- 16.13 mm
Difference ·····		= 1.62 mm
Bearing preload ·····	e.g.	+ 0.03 mm
Resulting shim (s) ·····	s	= 1.65 mm

(5) Fix the shim with assembly grease into the cover. Install the O-ring (arrow).

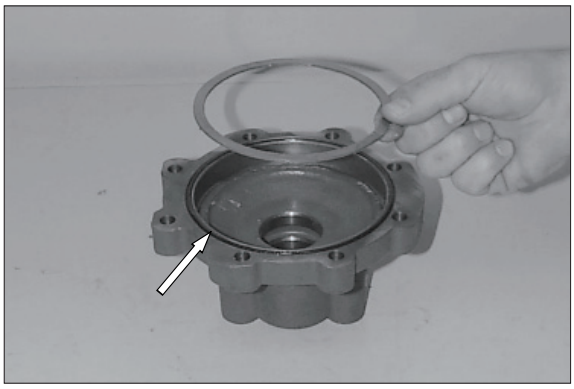


Figure 262

(6) Grease the rectangular rings (arrows) and centrally align them.

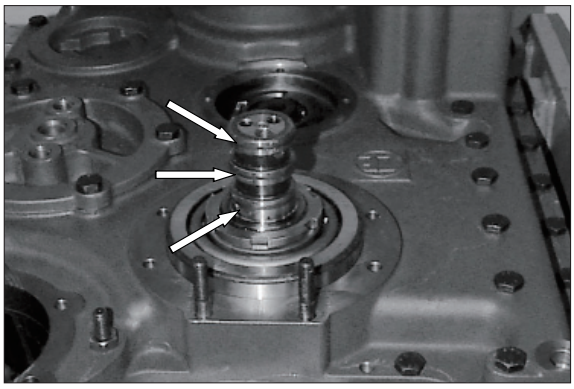


Figure 263

Output flange - parking brake

(1) Press on the screen sheet (arrow) until contact.

※ The installation position of the screen sheet is identical with the output flange.

Pressing bush 5870 506 138

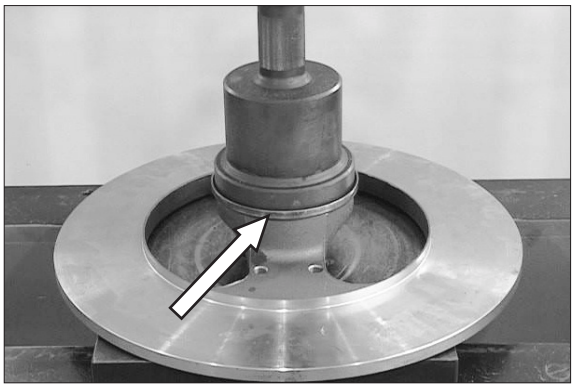


Figure 295

(2) Install the output flange-brake disk until contact.

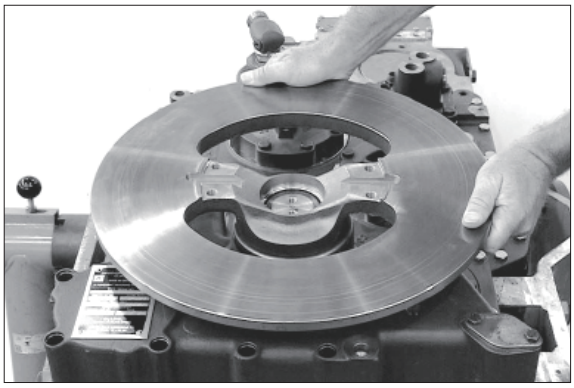


Figure 296

Mount the brake (figure 297~301)

⚠ **For working on the brake system, the instructions and specifications of the brake manufacturer are mandatory.**

(3) Remove the screw cap and loosen the locking nut (wrench size 30).
Unscrew the adjusting screw in counterclockwise direction until a demension > 13.0 mm (brake disc shim) results (figure 297).

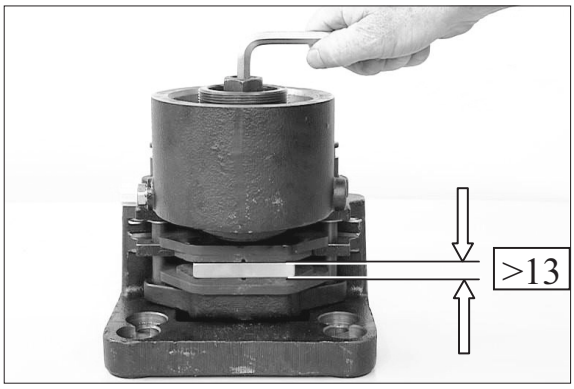


Figure 297

(4) Position the brake and fasten it with cap screws.

Tightening torque M14/8.8) : 12.7 kgf · m
(92.2 lbf · ft)

Socket spanner 5870 656 047

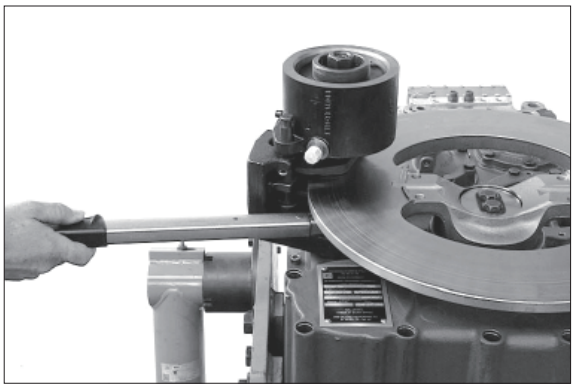


Figure 298

(5) Fasten the ball bearing by means of retaining ring.

※ Special tool

Set of internal pliers	5870 900 013

Figure 333

(6) Install the O-ring (arrow) and grease it.

Figure 334

(7) Heat the housing bore.

※ Special tool

Preheating bush	5870 801 006
Hot-air blower 230V	5870 221 500
Hot-air blower 115V	5870 221 501

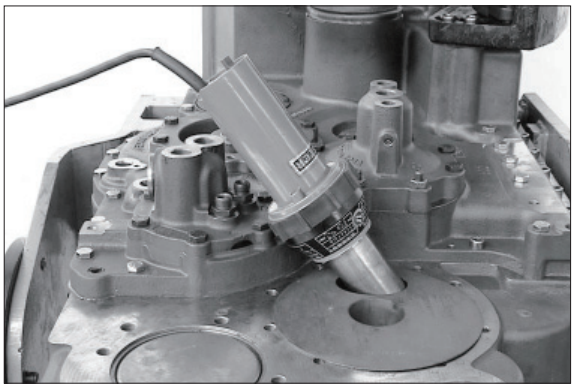


Figure 335

(8) Install two adjusting screws and assemble the pump until contact.

※ Observe the radial installation position.

※ Special tool

Adjusting screws	5870 204 021

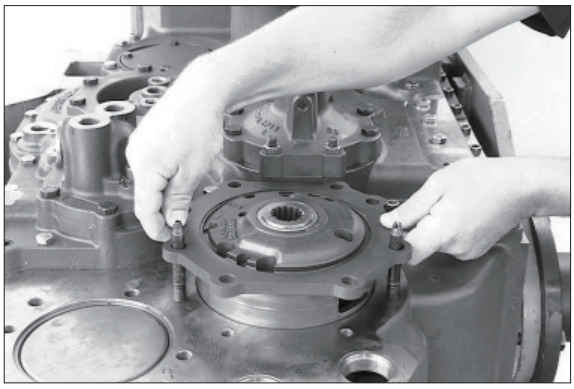


Figure 336

Coarse Filter

(1) Install filter (assy) into the housing bore.

※ Oil the sealing (arrow).

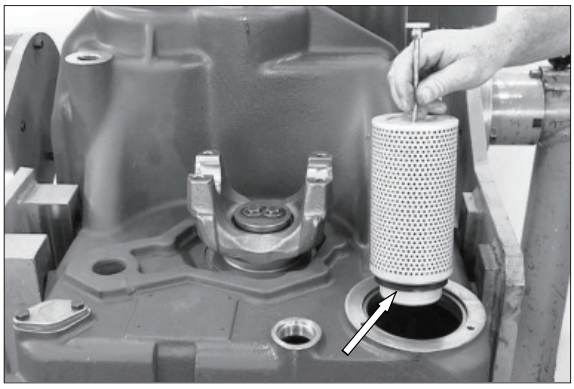


Figure 371

(2) Fasten the cover by means of hexagon screws (install the washers).

※ Install the new O-ring (arrow).

· Torque limit (M8/8.8) :
2.35 kgf · m (17.0 lbf · ft)

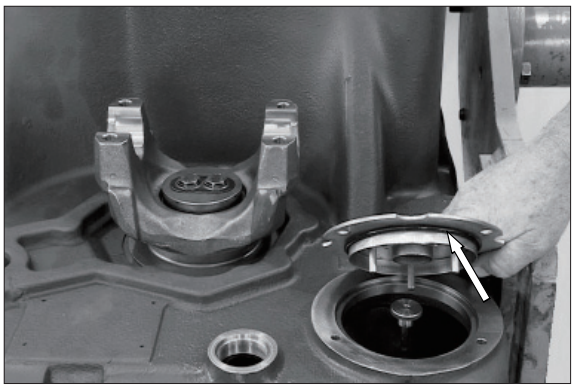


Figure 372

Inductive and speed transmitters

(1) Following sketches show the installation position of the single inductive and speed transmitters.

14	Inductive transmitter	n-Turbine
9	Inductive transmitter	n-Engine
5	Inductive transmitter	n-Intenal
13	Speed transmitter	speed input n-Output

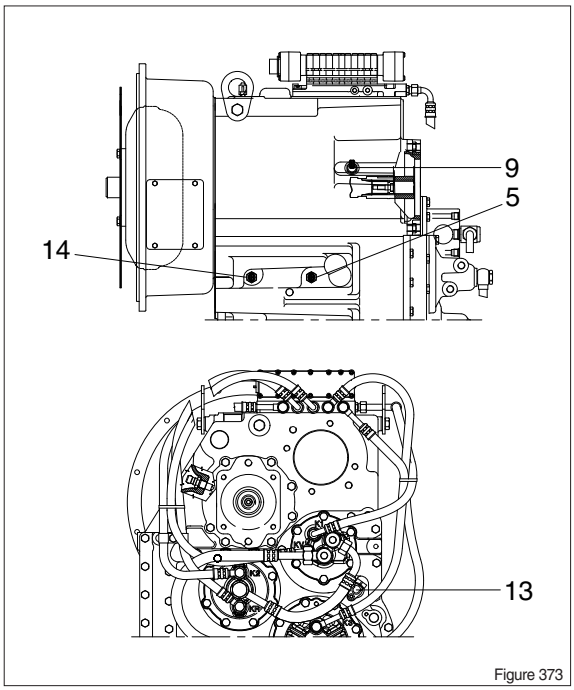
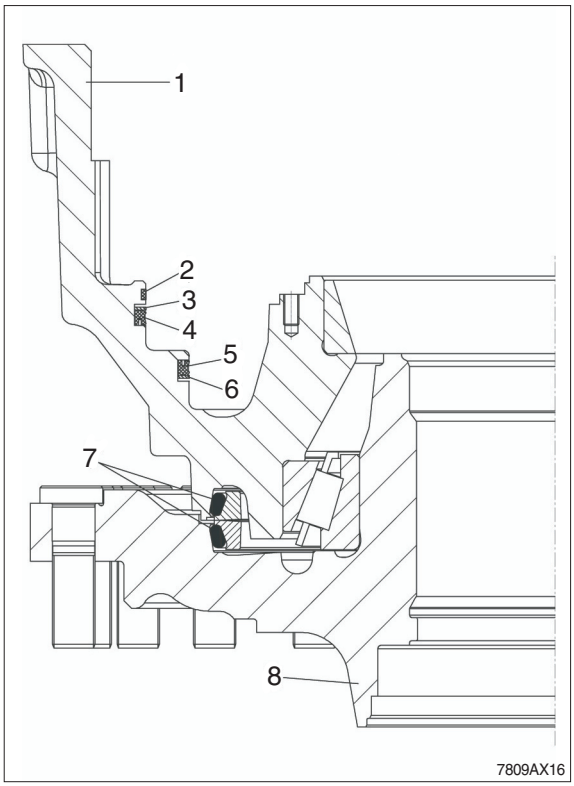


Figure 373

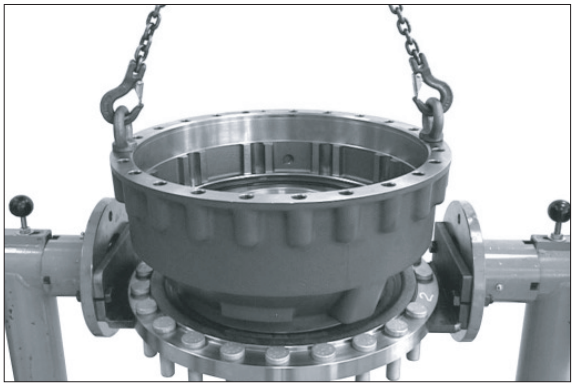
Legend to sketch :

1 = Brake housing
2 = Guide ring
3 = Back-up ring
4 = Grooved ring
5 = Grooved ring
6 = Back-up ring
7 = Slide ring seal
8 = Output shaft



7809AX16

⑱ Lift the brake housing from the output shaft by means of the lifting device.


7809AX17

⑲ Use a lever to remove the slide ring seal from the brake housing.

If necessary, force out both bearing outer rings.

Resetting device 5870 400 001


7809AX18

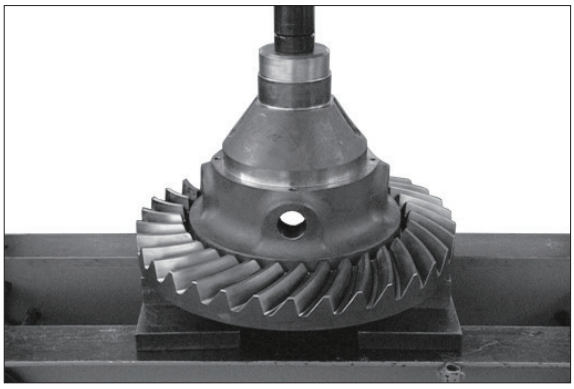
2) ASSEHBY

(1) Assembly differentials

Assembly multi-disk differential lock

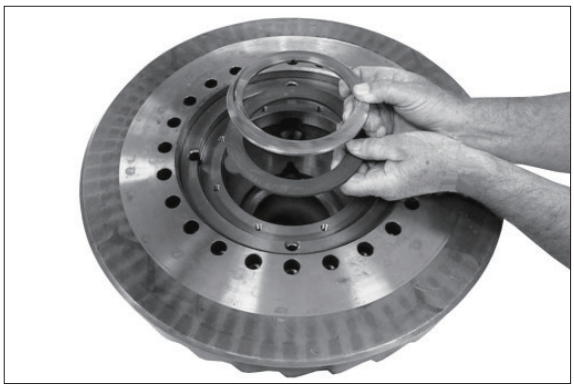
① Mount two adjusting screws and press the heated crown wheel onto the differential housing until contact is obtained.

Adjusting screws 5871 204 040



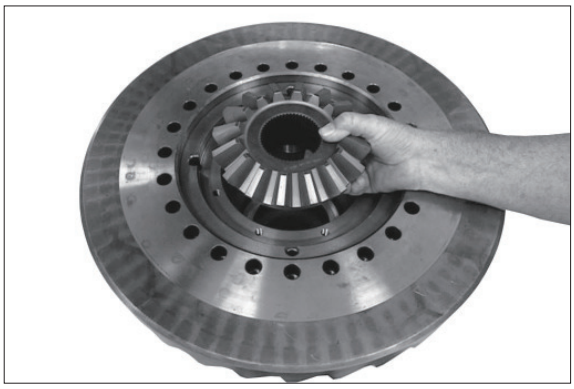
7809AX102

② Insert disk and thrust washer into the differential housing



7809AX103

③ Insert axle bevel gear.

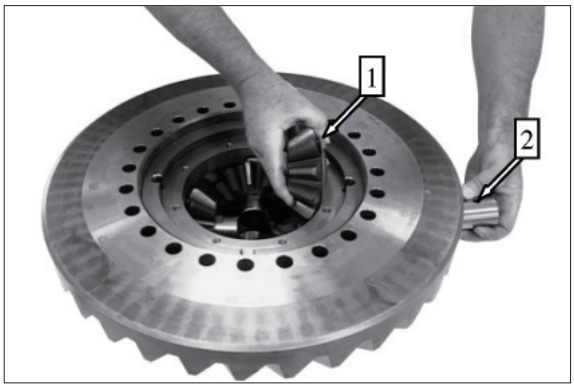


7809AX104

④ Insert spider gears with thrust washers into the differential housing and fix them with the spider shaft.

※ Thrust washers must be positioned with the tabs (see arrow 1) in the recesses of the differential housing.

Pay attention to radial installation position of the spider shafts (fixing holes, arrow 2).



7809AX105

⑪ Mount oil tube.

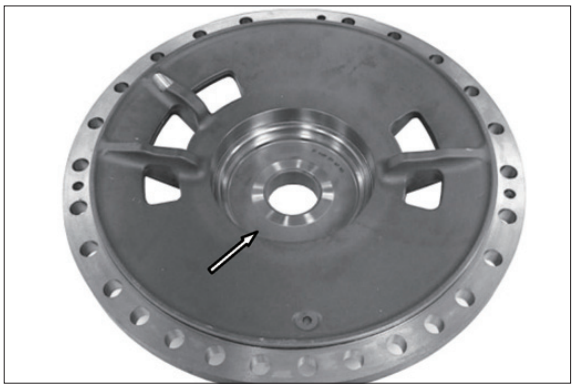
・Tightening torque :
10.2 kgf · m (73.8 lbf · ft)

7809AX138

⑫ Grease O-rings (see arrows) and insert them into the annular grooves of the piston.

7809AX139

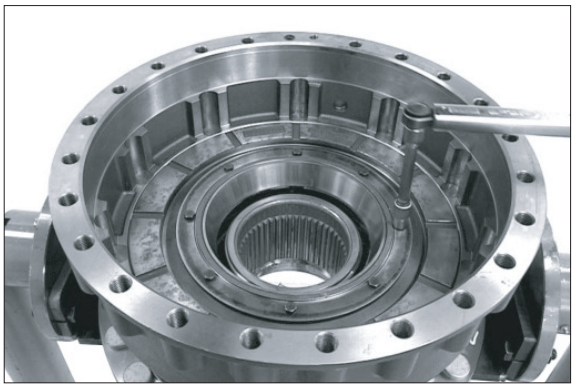
⑬ Insert piston (see arrow) into the bearing housing until contact is obtained.



7809AX140

⑧ Insert disk and fix it by means of hexagon screws.

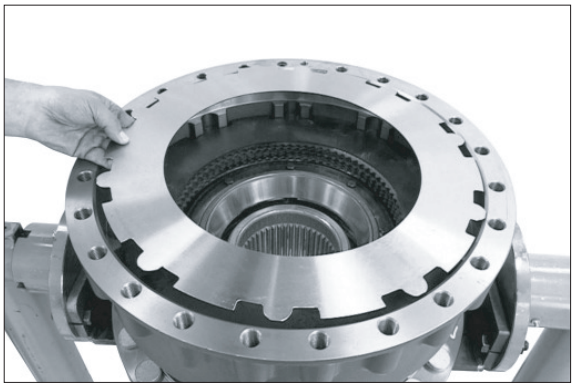
· Tightening torque (M8/10.9) :
3.47 kgf · m (25.1 lbf · ft)



7809AX37

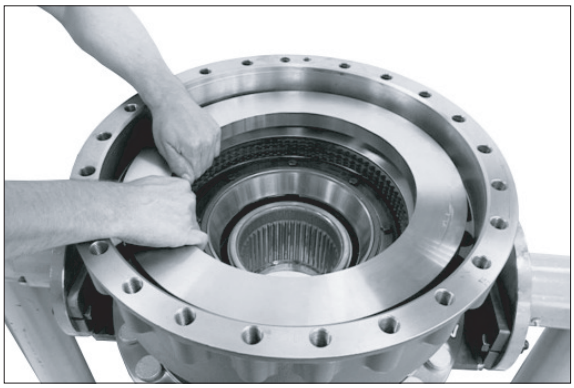
⑨ Mount outer and inner disks.

※ For the number of disks and the disk arrangement please refer to the relating spare parts list.



7809AX38

⑩ Insert end plate.



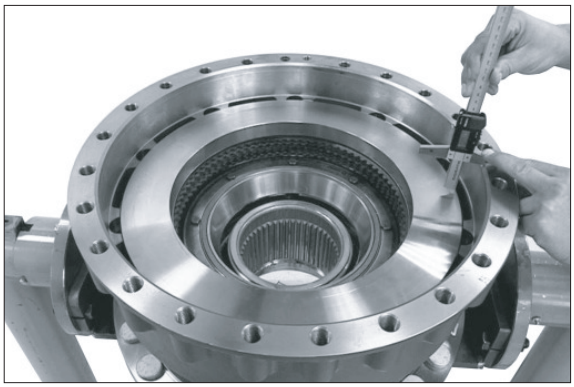
7809AX39

Setting of installation dimension 57.25~ 57.79 mm

⑪ Measure installation dimension from the mounting face of the brake housing to the front face of the end plate.

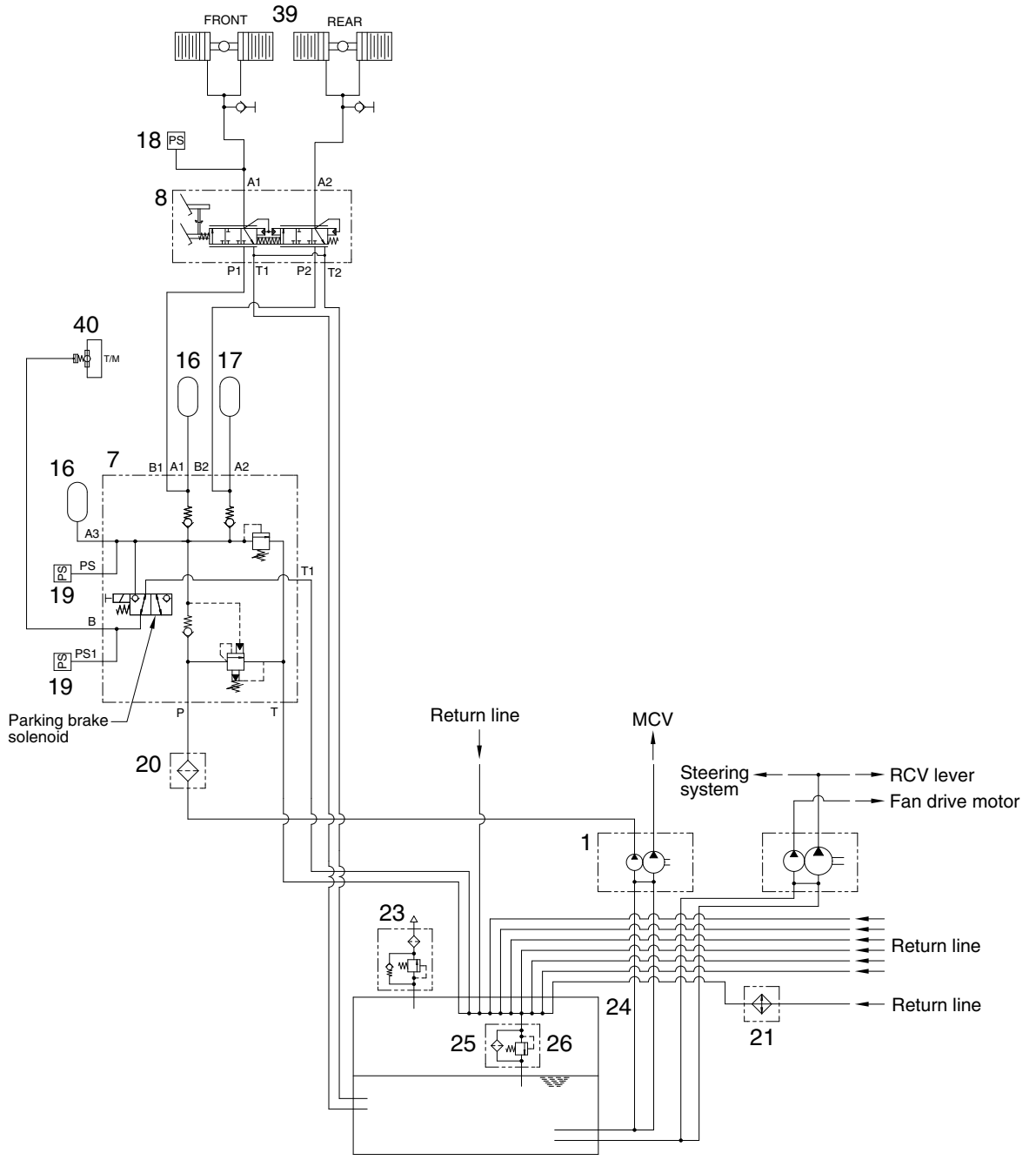
Installation dimension e.g . . . . . 57.50 mm

※ Any deviation from the necessary installation dimension must be corrected with an appropriate outer disk (see spare parts manual).



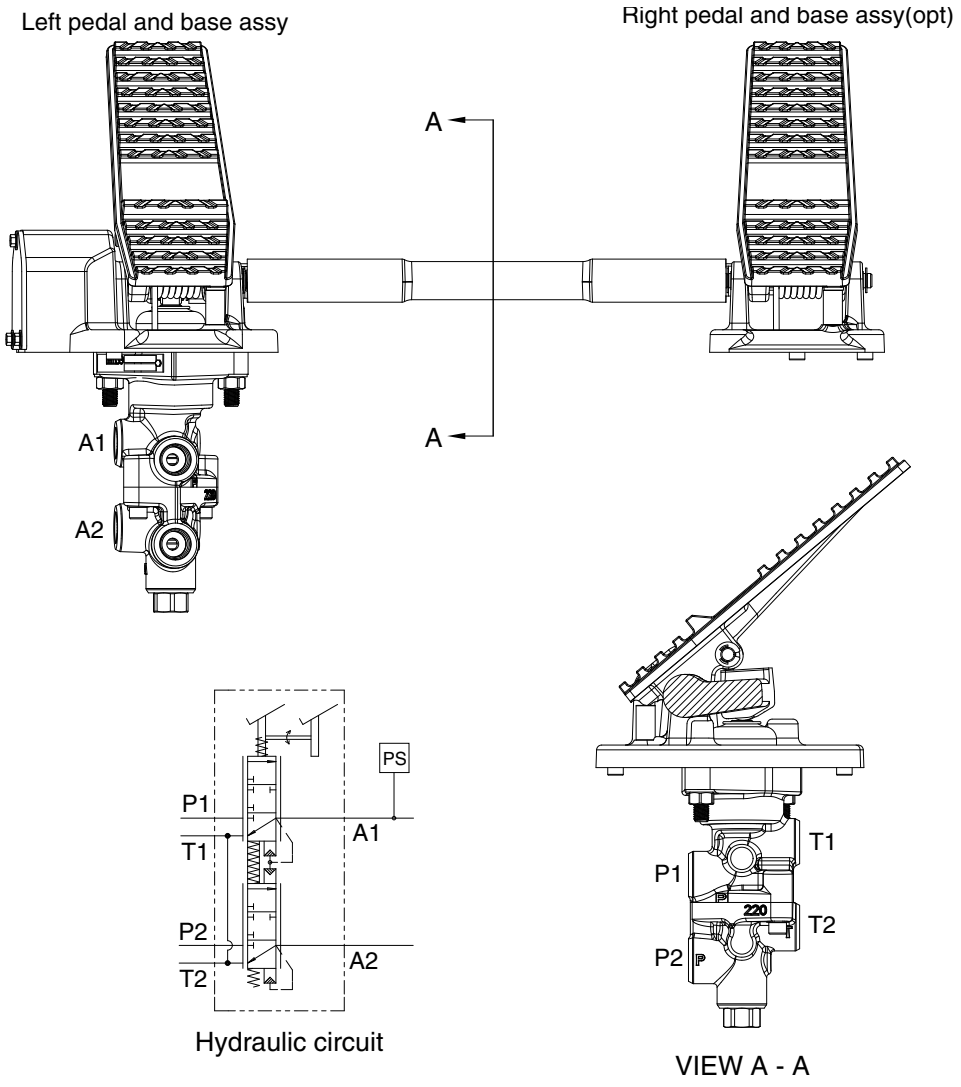
7809AX40

2. HYDRAULIC CIRCUIT



1	Main pump (loader + brake)	18	Pressure sensor	24	Hydraulic tank
7	Cut-off valve	19	Pressure sensor	25	Return filter
8	Brake valve	20	Line filter	26	Bypass valve
16	Accumulator	21	Oil cooler	39	Axle
17	Accumulator	23	Air breather	40	Parking brake at T/M

2) OPERATION



Hydraulic circuit

VIEW A - A

Port	Port name	Port size
P1, P2	Pressure port	3/4-16UNF
T1, T2	Return port	3/4-16UNF
A1, A2	Brake cylinder port	3/4-16UNF

75794BS08

· Brake pressure specification : 80±5 bar (1160±70 psi)

(2) Basic setting regulation

① Turn the adjusting screw manually clockwise until both brake pads make contact with the brake disk. Then it is not longer possible to turn the adjusting screw without exerting a major amount of force.

② Turn the adjusting screw anticlockwise in order to set the following rated clearances.

Adjusting screw	Clearance (㎜)		Turns
M20 (SW 10)	Min.	1.0	1/4
	Clearance	2.0	1/2
	Max.	3.0	3/4

③ Hold the adjusting screw in position with a hexagonal socket wrench and lock with lock nut.

④ Mount the screw cap and tighten as far as possible manually.

⑤ Mount the pressure connection in accordance with the instructions of the axle.

※ For bleeding the piston chamber use the socket spanner size 13 for the bleeding valve.

(3) Adjusting regulations

During this adjusting process, the parking brake must be released, i.e. the bank of cup springs must be completely pre-tensioned.

① Stand the vehicle on an even surface and secure against rolling away.

② Release the parking brake by using the required release pressure.

③ Release the screw cap and unscrew.

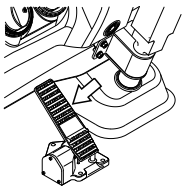
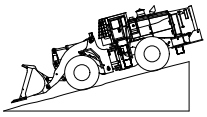
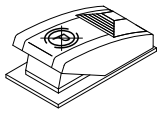
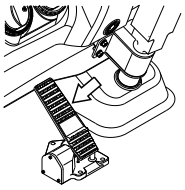
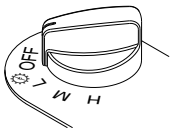
④ Release the lock nut (size 24 or 30) and turn the adjusting screw with socket wrench size 8 or 10 manually clockwise until the two brake pads make contact with the brake disk.

⑤ Turn the adjusting screw anti-clockwise and set the clearance specified in the above table.

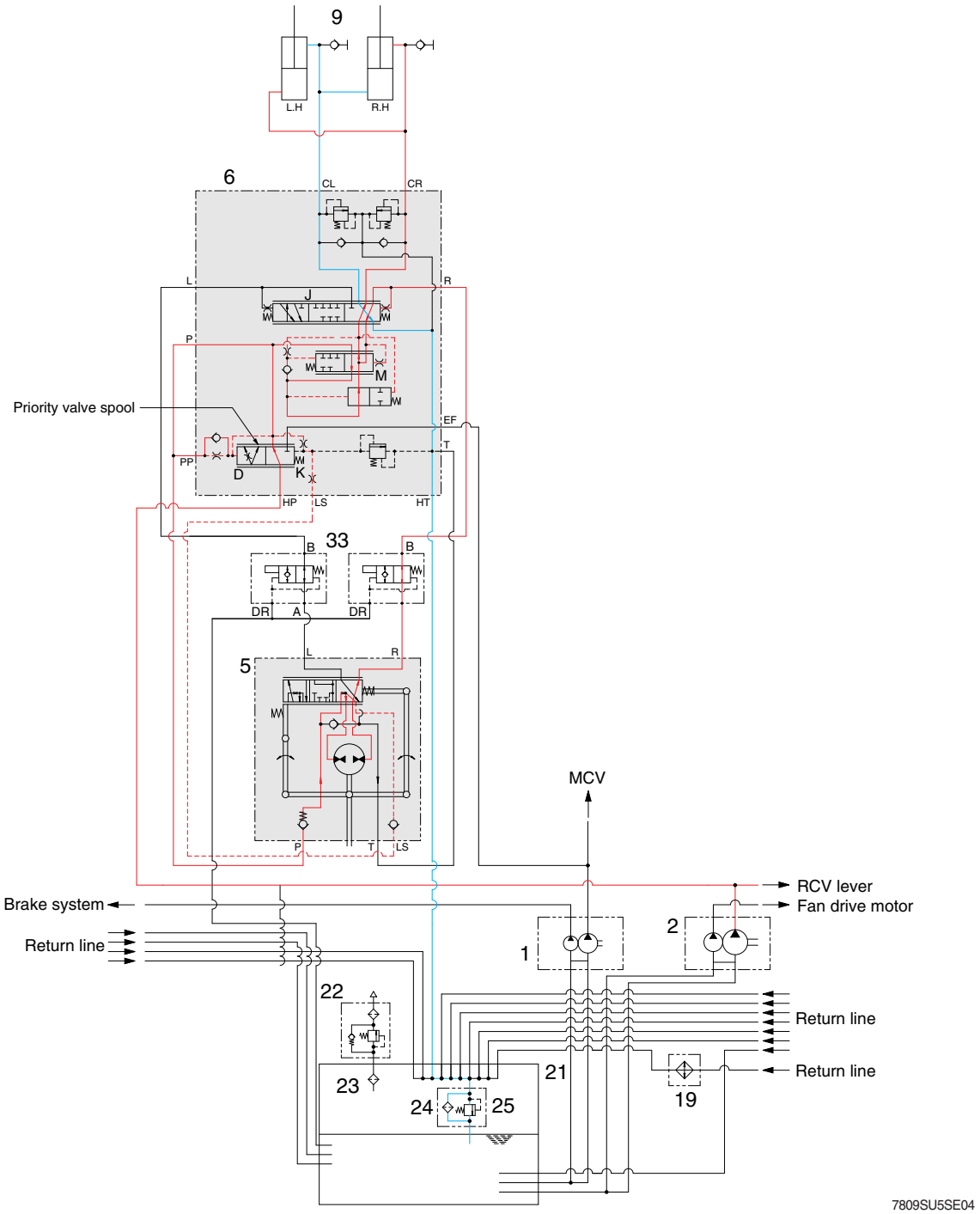
⑥ Hold the adjusting screw in position with the hexagonal socket wrench and lock with the lock nut.

⑦ Mount the screw cap and tighten as far as possible manually.

※ Actuate the brake valve several times and check the braking efficiency of the parking brake on a slope.

Item	Description	Service action
Service brake pedal check	 Slowly depress brake pedal. Listen for a hissing noise that indicates oil is flowing to brake pistons. **LISTEN/FEEL** : A hissing noise must be heard when pedal is depressed.	**OK** Check completed. **NOT OK** Inspect for debris under brake pedal.
Service and parking brake system drag checks Engine running	 Position machine on gradual slope. Lower bucket approximately 50 mm (2 in) from ground. Release parking and service brakes.  **LOOK** : Machine must move or coast. **NOTE** : If machine does not move, check brake pedals to be sure they fully release when feet are removed from pedals. Drive machine at high speed for about 5 minutes. Brake drag is indicated if brake areas in differential case are hot. **NOTE** : Observe parking brake. If disk is hot, parking brake drag is indicated.	**OK** Check completed. **NOT OK** Adjust park brake. **NOT OK** Check floor mat interference to pedal or debris build-up. **IF OK** Check for brake pressure when brake is released. Go to brake pressure test.
Clutch cut-off check	 Place clutch cut-off mode switch in L position. Release parking brake. Run engine at half speed in 1st forward. Firmly depress brake pedal.  **FEEL** : Transmission must disengage when brake pedal is depressed at 30% of pedal stroke. **NOTE** : Clutch cut-off mode switch can be selected to operator preference to match your loading needs.	**OK** Check completed. **NOT OK** Adjust clutch cut-off switch.

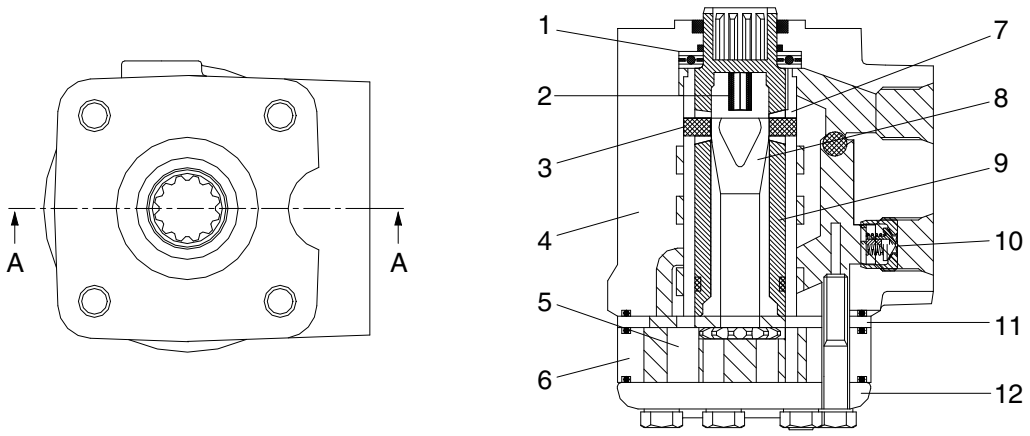
3) RIGHT TURN



- When the steering wheel is turned to the right, the spool (G) within steering unit (5) connected with steering column shaft is pushed to the right direction.
- The oil discharged from the pump flows into HP port of flow amplifier (6).
- The delivered oil passes through the main orifice of steering unit (5), through the priority valve spool (D) of flow amplifier (6). The position of priority spool (D) is determined when the pressure difference between front and rear of main orifice is balanced with control spring (K) force.
- The oil supplied through the directional spool (J) from the steering unit (5) is combined with the direct oil from the priority valve spool (D) in the amplifier spool (M). The amplified oil flows into the small chamber of the right steering cylinder and large chamber of the left steering cylinder respectively.
- Oil returned from left and right cylinder returns to hydraulic tank through directional spool (J) of flow amplifier (6).
- When the above operation is completed, the machine turns to the right.

5. STEERING UNIT

1) STRUCTURE



SECTION A - A

7607SE17

1	Bearing	5	Gear wheel	9	Spool
2	Neutral position spring	6	Gear rim	10	Check valve
3	Cross pin	7	Sleeve	11	Distributor plate
4	Housing	8	Cardan shaft	12	End cover

2) OPERATION

The steering unit consists of a rotary valve and a rotary meter.

Via a steering column the steering unit is connected to the steering wheel of the machine.

When the steering wheel is turned, oil is directed from the steering system pump via the rotary valve (spool and sleeve) and rotary meter (gear wheel set) to the cylinder ports L or R, depending on the direction of turn. The rotary meter meters the oil flow to the steering cylinder in proportion to the angular rotation of the steering wheel.

Spool (9) is connected directly to the drive shaft of steering wheel. It is connected to sleeve (7) by cross pin (3) (not in contact with the spool when the steering wheel is at neutral) and neutral position spring (2).

Cardan shaft(8) is meshed at the top with cross pin (3) and forms one unit with sleeve (7).

At the same time, it is meshed with gear rim (5) of the gerotor set by spline.

There are four ports in valve body. They are connected to the pump circuit, tank circuit, and the head, and left and right steering cylinder. In addition, the pump port and tank port are connected inside the body by the check valve. Therefore, if there is any failure in the pump of engine, oil can be sucked in directly from the tank through the check valve.

GROUP 3 TESTS AND ADJUSTMENTS

1. HYDRAULIC OIL CLEAN UP PROCEDURE USING PORTABLE FILTER CADDY

※ Service equipment and tool.
- Portable filter caddy
- Two 3658 mm (12 ft) × 1" I.D. 100R1 hoses with 3/4 M NPT ends
- Quick disconnect fittings
- Discharge wand
- Various size fittings and hoses

※ Brake system uses oil from hydraulic oil tank. Flush all lines in the steering system.
Disassemble and clean major components for steering system.
Steering components may fail if steering system is not cleaned after hydraulic oil tank contamination.

1) If hydraulic system is contaminated due to a major component failure, remove and disassemble steering cylinders to clean debris from cylinders.

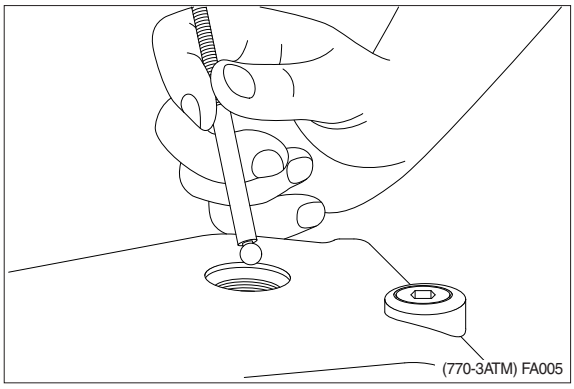
2) Install a new return filter element. Clean filter housing before installing new element.

※ For a failure that creates a lot of debris, remove access cover from hydraulic oil tank. Drain and clean hydraulic oil tank of fill the specified oil to hydraulic oil tank through upper cover.

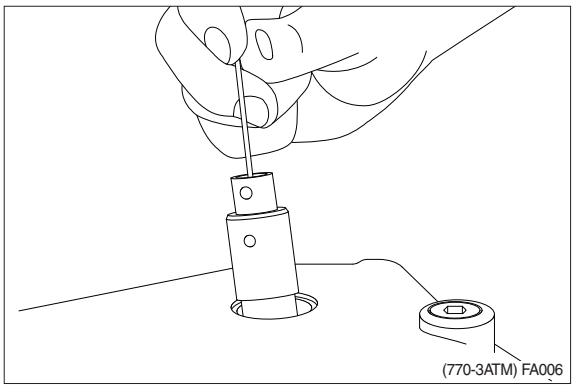
3) To minimize oil loss, pull a vacuum in hydraulic oil tank using a vacuum pump. Connect filter caddy suction line to drain port at bottom of hydraulic oil tank using connector. Check to be sure debris has not closed drain port.

4) Put filter caddy discharge line into hydraulic oil tank filter hole so end is as far away from drain port as possible to obtain a through cleaning of oil.

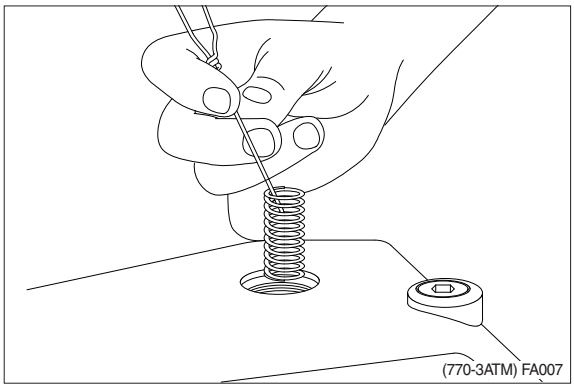
③ Take out ball (magnetic rod).



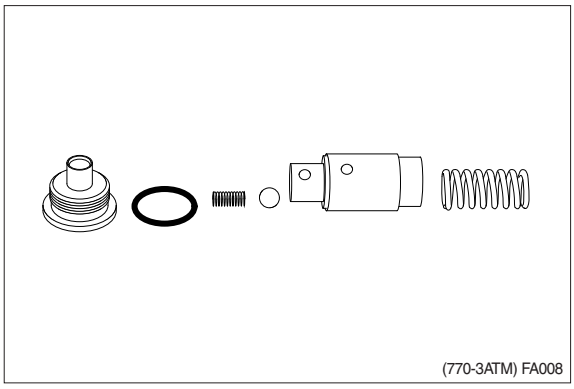
④ Take out piston.



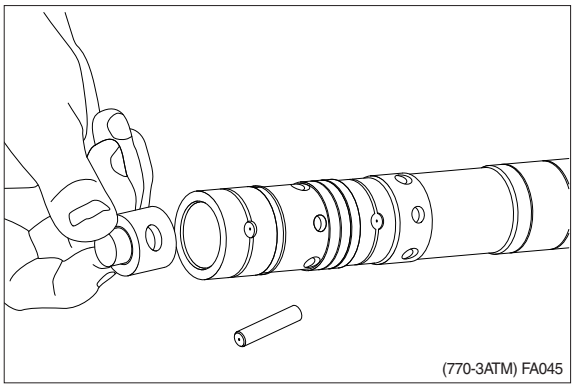
⑤ Take out spring.



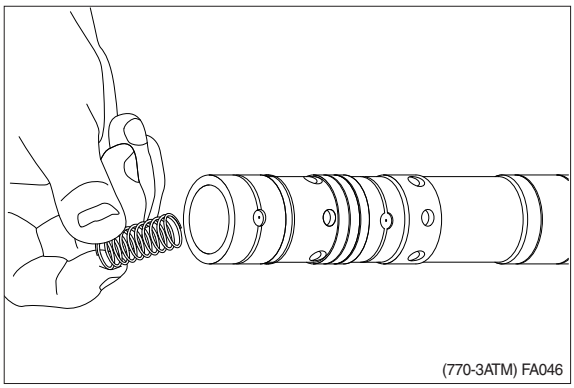
⑥ Counter pressure valve shown disassembled.



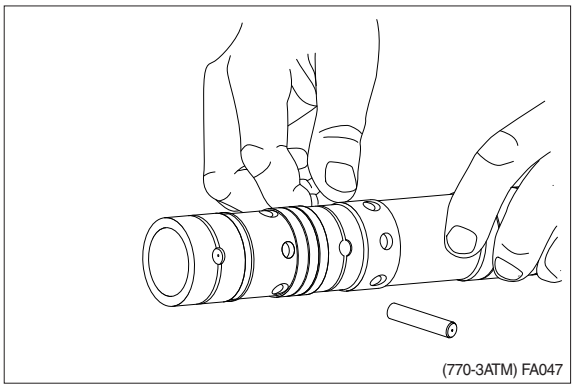
⑤ Take out plug.


(770-3ATM) FA045

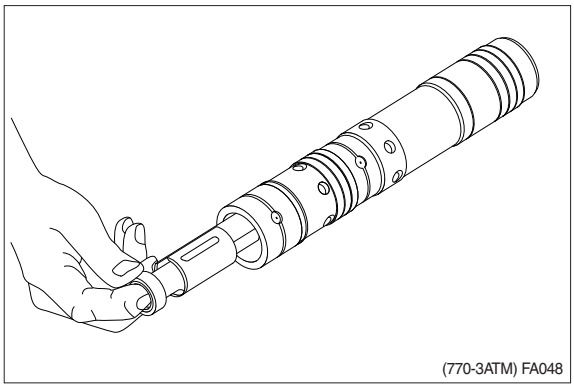
⑥ Take out spring.


(770-3ATM) FA046

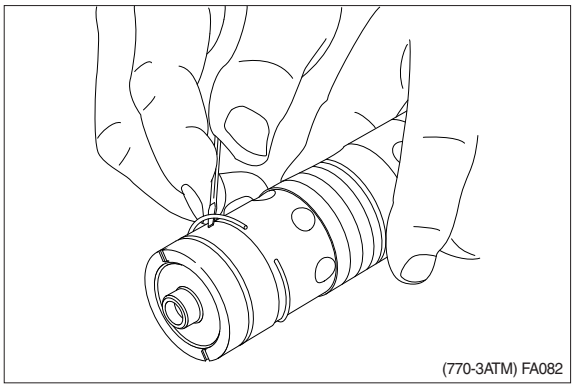
⑦ Take out pin 3㎜ screwdriver.


(770-3ATM) FA047

⑧ Take out inner spool.

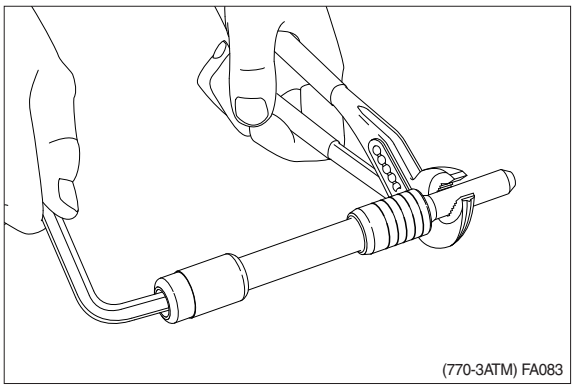

(770-3ATM) FA048

⑩ Push spring ring into position. Place spring ring into the recess with ends facing away from pin holes.


(770-3ATM) FA082

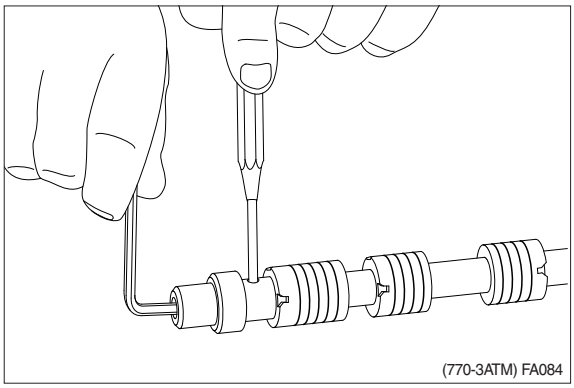
(4) Assembly of priority valve spool

① Fit plug or throttle check valve.
External PP : Plug.
Internal PP : Throttle check valve.
· Tightening torque : 1±0.3 kgf · m
(7.2±2.2 lbf · ft)


(770-3ATM) FA083

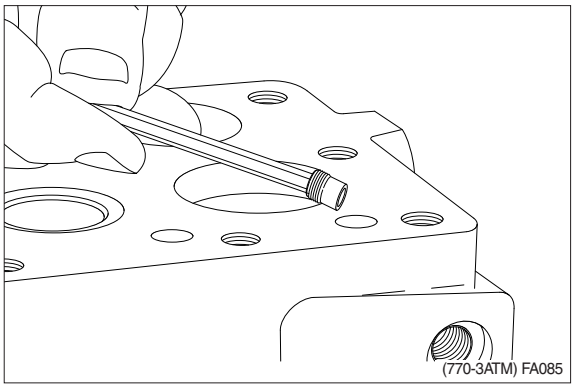
(5) Assembly of directional spool

① Screw in orifice.
· Tightening torque : 0.5±0.1 kgf · m
(3.6±0.7 lbf · ft)


(770-3ATM) FA084

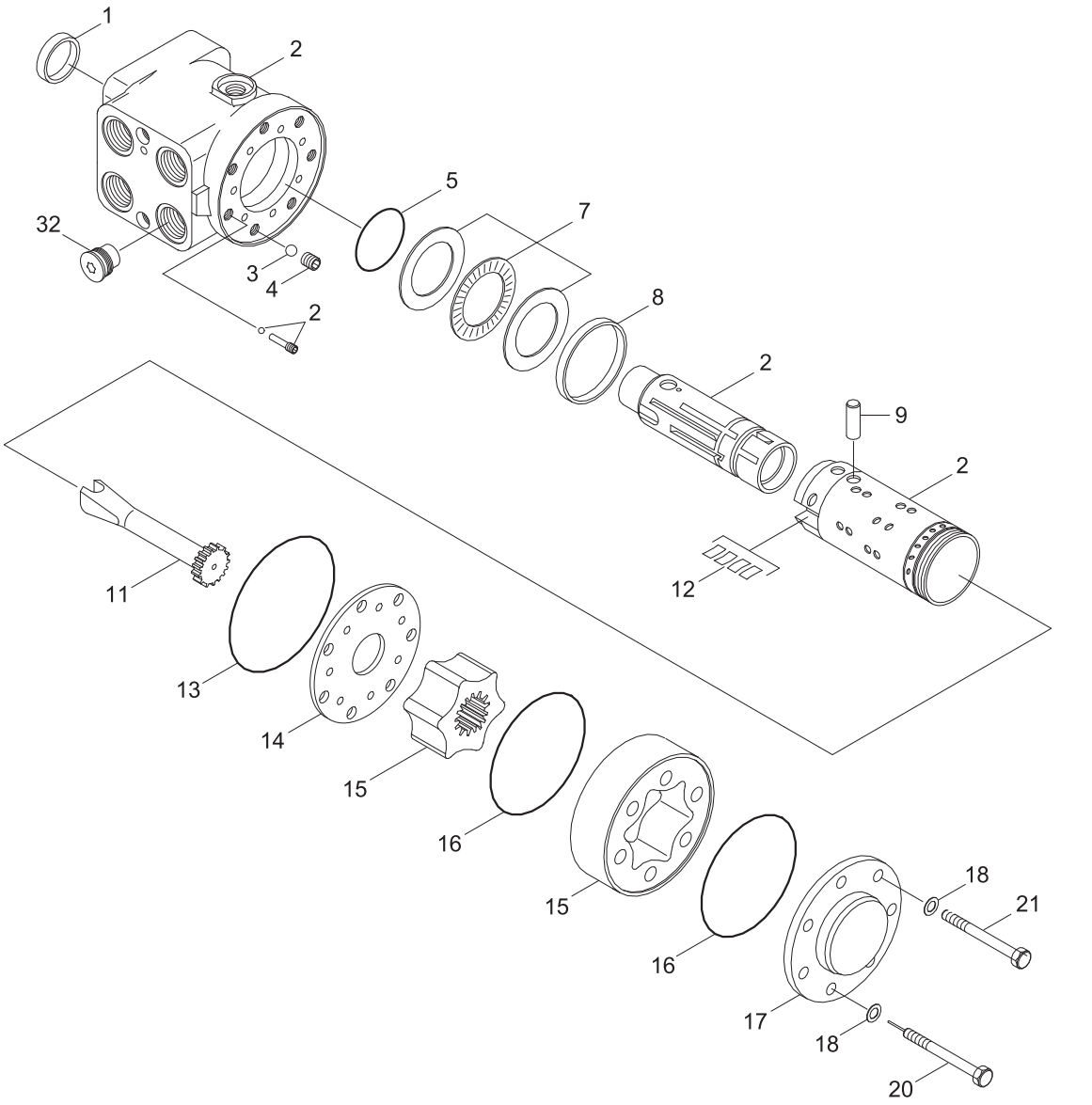
(6) Installation of orifice and throttle check valve

① Fit orifice in housing.
· Tightening torque : 0.5±0.1 kgf · m
(3.6±0.7 lbf · ft)


(770-3ATM) FA085

2. STEERING UNIT

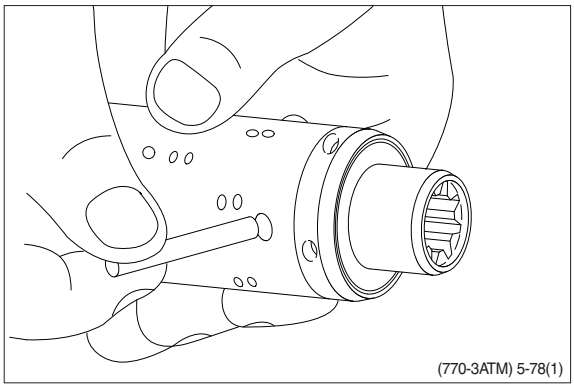
1) STRUCTURE



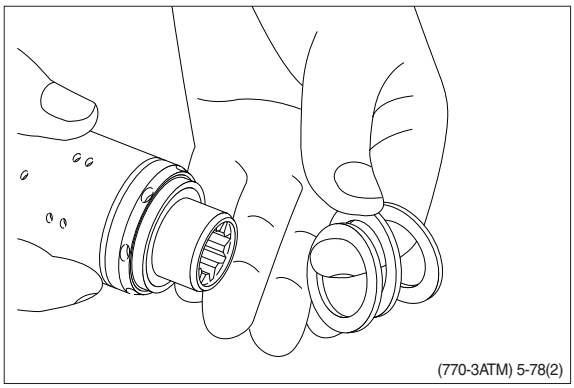
7707SE21

1	Dust seal ring	9	Cross pin	17	End cover
2	Housing, Spool, sleeve	11	Shaft	18	Washer
3	Ball	12	Spring set	20	Pin screw
4	Bushing	13	O-ring	21	Screw
5	Lip seal	14	Distributor plate	32	Check valve
7	Bearing assy	15	Gearwheel set		
8	Ring	16	O-ring		

(8) Fit the cross pin into the spool / sleeve.

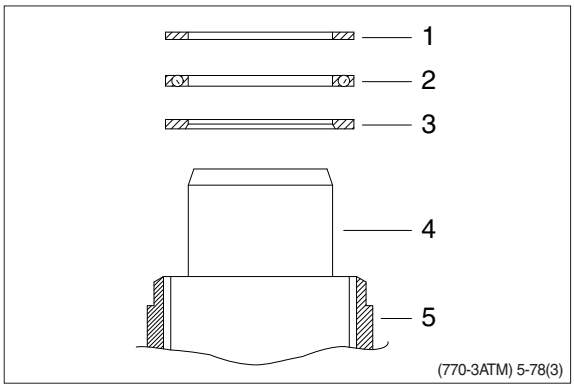

(770-3ATM) 5-78(1)

(9) Fit bearing races and needle bearing as shown on below drawing.


(770-3ATM) 5-78(2)

※ Assembly pattern for standard bearings

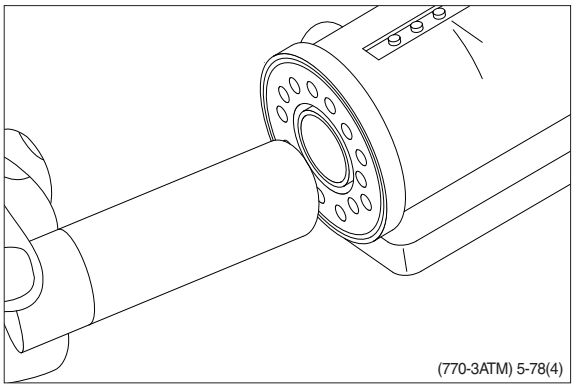
1 Outer bearing race
2 Needle bearing
3 Inner bearing race
4 Spool
5 Sleeve



(770-3ATM) 5-78(3)

Installation instruction for O-ring

(10) Turn the steering unit until the bore is horizontal. Guide the outer part of the assembly tool into the bore for the spool / sleeve.


(770-3ATM) 5-78(4)

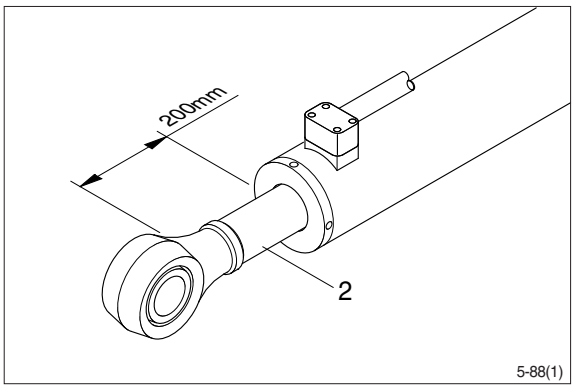
3) DISASSEMBLY

(1) Remove cylinder head and piston rod

① Hold the clevis section of the tube in a vise.

※ Use mouth pieces so as not to damage the machined surface of the cylinder tube. Do not make use of the outside piping as a locking means.

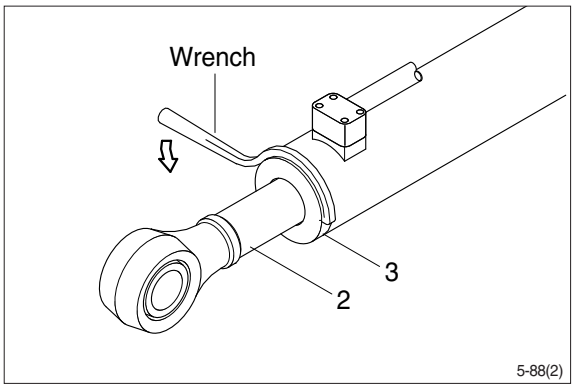
② Pull out piston rod (2) about 200 mm (7.8 in). Because the piston rod is rather heavy, finish extending it with air pressure after the oil draining operation.



5-88(1)

③ Loosen and remove the gland (3).

※ Cover the extracted piston rod (2) with rag to prevent it from being accidentally damaged during operation.

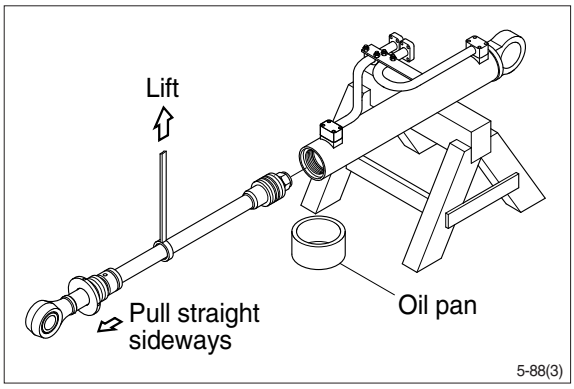


5-88(2)

④ Draw out gland (3) and piston rod (2) assembly together from cylinder tube (1).

※ Since the piston rod assembly is heavy in this case, lift the tip of the piston rod (2) with a crane or some means and draw it out.

However, when piston rod (2) has been drawn out to approximately two thirds of its length, lift it in its center to draw it completely.



5-88(3)

(5) Apply grease to lower collar (8) and insert it to the lower of roller bearing.

(6) After setting the bearing so that its upper surface is horizontal, tighten the all the bolt (19, 25). After tightening, confirm that tapered roller bearing moves lightly ; if does not move smoothly, add shims (4, 5).
- Tightening Torque : 35~43 kgf · m (253~311 lbf · ft)
- Apply loctite #243.

(7) Move the front frame and join it to the rear frame so that match the pin hole at the center.

(8) Apply grease to pin (11), bushing (22) and insert it into tapered roller bearing (1).

(9) Apply grease to lower collar (9) and insert it to the lower of roller bearing through rear frame (32).

(10) Apply grease to pin (7) and insert it into tapered roller bearing (1).

(11) Before tightening bolt (6), adjust shims (13, 14, 15) in order to control the clearance between the plate (21) and rear frame (32).

· **Adjustment method of clearance B**

① Install pin (7) and plate (10) without shim (13, 14, 15).
Install four of bolt (6) so that each bolt is separated by 90 degrees.
· Tightening torque : 1.5~1.7 kgf · m (10.8~12.3 lbf · ft)

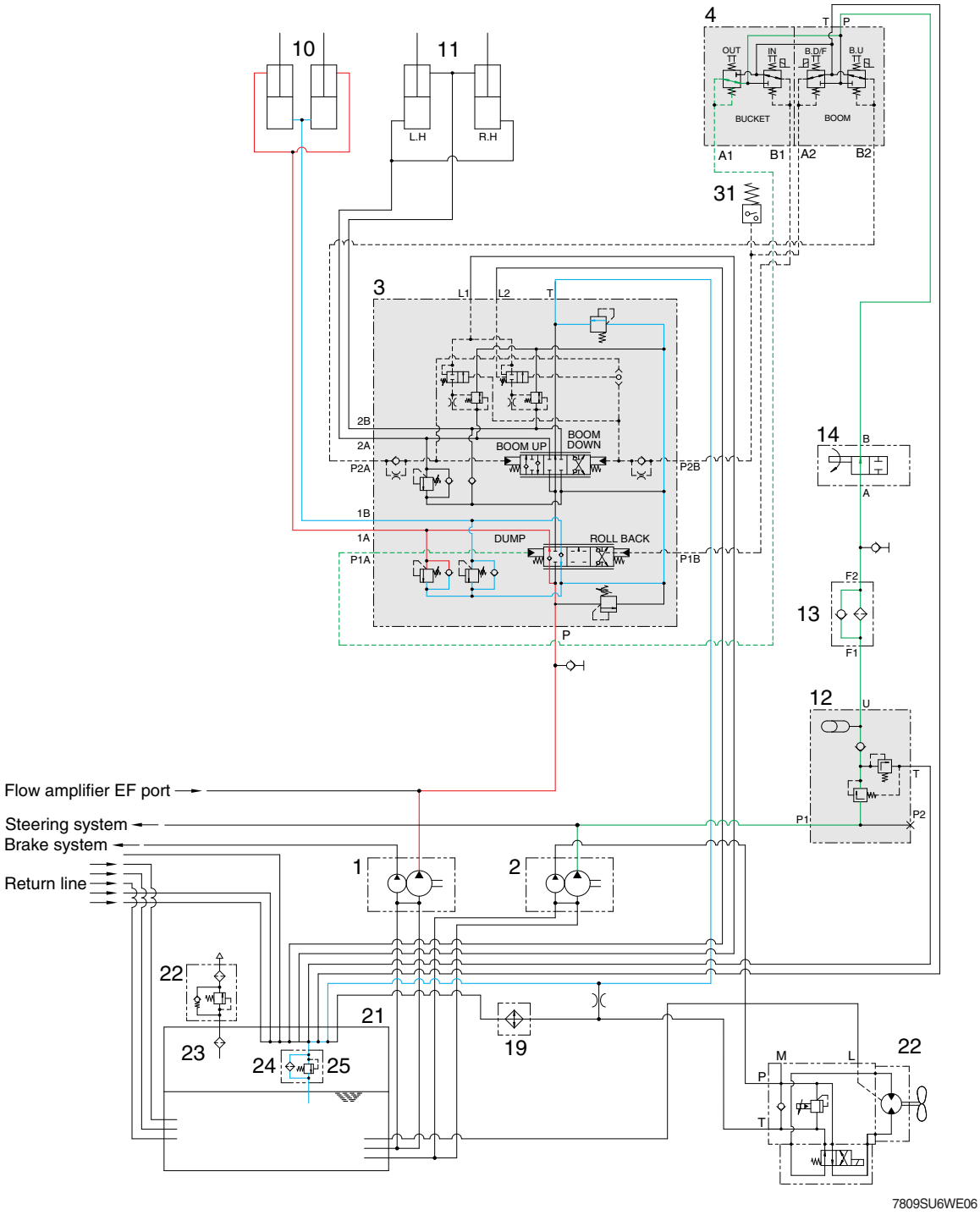
② Adjust shims in order to control the clearance B.
· Clearance B : 0.1~0.2 mm
· Shim thickness : 0.1 mm, 0.5 mm, 2.0 mm

(12) Tighten the all the bolts (6).
· Tightening Torque : 35~43 kgf · m (253~311 lbf · ft)
· Apply loctite #243.

5) TROUBLESHOOTING

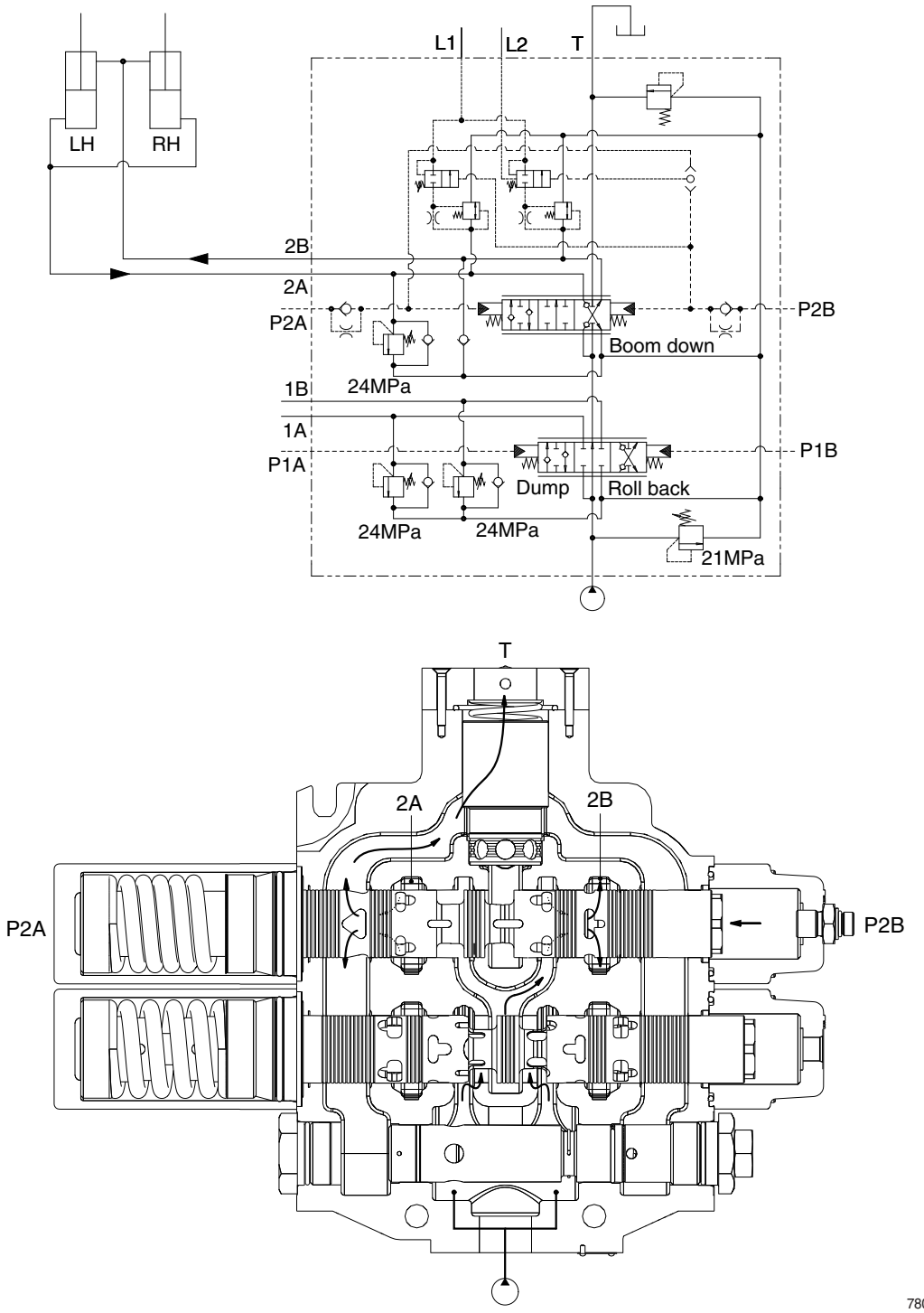
Trouble	Probable cause	Remedy
Shock is felt when steering	Capscrew for fixing steering valve is loose	Retighten
	Faulty center pivot pin mounting bolts	Retighten
	Center pivot pins have worn out	Readjust or replace
	Faulty hydraulic system	See hydraulic system
Shock is felt when moving backward or forward	Fault fixing of connecting capscrews	Retighten
	Center pins have worn out	Readjust or replace
	Bearings of support unit have worn out	Retighten
	Drive shaft damaged	See drive system
	Faulty transmission	See transmission system

4) WHEN THE RCV LEVER IS IN THE DUMP POSITION



- If the bucket RCV lever (4) is pushed forward, the bucket spool is moved to dump position by pilot oil pressure from port A1 of RCV.
- The oil from main pump (1) flows into main control valve (3) and then goes to the small chamber of bucket cylinder (10) by pushing the load check valve of the bucket spool.
- The oil at the large chamber of bucket cylinder (10) returns to hydraulic tank (21) through the bucket spool.
- When this happens, the bucket is dumped.
- When the dumping speed of bucket is faster, the oil returned from the large chamber of bucket cylinder combines with the oil from the pump, and flows into the small chamber of the cylinder.
  This prevents cylinder cavitation by the negative pressure when the pump flow cannot match the bucket dump speed.

(3) Boom lower position



When the pilot pressure from remote control valve is supplied to the pilot port (P3B), the spool moves to the left and the neutral passage is closed.

The oil supplied from the pump flow into boom cylinder port (3B).

The pump pressure reaches proportionally the load of cylinder and fine control finished by shut off of the neutral passage.

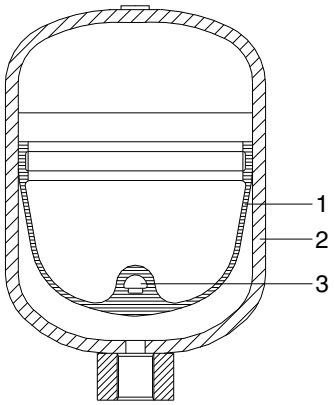
The return oil from cylinder port (3A) flows into the tank via the low pressure passage.

※ **Boom float position : Refer to page 6-6.**

9. ACCUMULATOR

The accumulator is installed at the safety valve. When the boom is left the raised position, and the control levers are operated with the engine stopped the pressure of the compressed nitrogen gas inside the accumulator sends pilot pressure to the control valve to actuate it and allow the boom and bucket to come down under their own weight.

Type of gas	Nitrogen gas (N_2)
Volume of gas	0.75 ℓ (0.2 U.S.gal)
Charging pressure of gas	16 kg/cm^2 (228 psi)
Max actuating pressure	128 kg/m^2 (1820 psi)



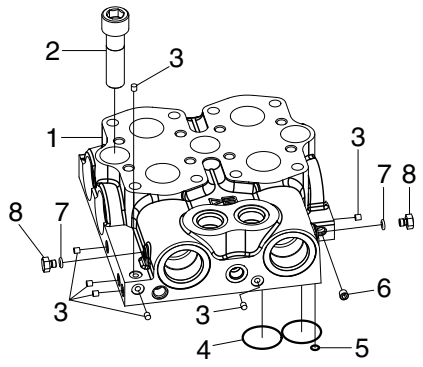
1 Diaphragm
2 Steel pressure vessel
3 Closure button

7803AWE56

Problem	Cause	Remedy
No steering or hydraulic function	Low oil level.	Add recommended oil.
	Failed hydraulic pump.	Remove and inspect return filter for metal pump particles.
No hydraulic functions steering normal	Failed hydraulic pump.	Remove and inspect return filter for metal pump particles, or replace the pump.
	Failed line filter.	Remove and inspect line filter for RCV.
	Faulty safety valve.	Safety valve leakage test or ON, OFF function test.
	Stuck open port relief valve.	Replace relief valve.
Boom float function does not work	Low pilot control pressure.	Do pressure reducing valve pressure test in group 3.
	Faulty pilot control valve (RCV).	Replace relief valve.
	Loader control valve (MCV) spool binding in bore.	Do pressure reducing valve pressure test in group 3.
One hydraulic function does not work.	Faulty pilot control valve (RCV).	Do pilot control valve pressure test. Inspect and repair valve.
	Stuck open port relief valve.	Replace relief valve.
	Oil leaking past cylinder packings.	Do boom and bucket cylinder leakage test in group 3.
	Blockage in oil lines or valve.	Inspect lines for damage. Disconnect and inspect lines for internal blockage.
	Loader control valve (MCV) spool stuck in bore.	Inspect and repair valve.
Low hydraulic power	Leakage within work circuit.	Do cylinder drift check in group 2.
	Low system relief valve (main relief valve) setting.	Do loader system and port relief valve pressure test in group 3.
	Low port relief valve setting.	Do loader system and port relief valve pressure test in group 3.
	Leaking system relief valve.	Remove and inspect valve.
	Worn hydraulic pump.	Do hydraulic pump performance check in group 2.
	Faulty pilot control valve (RCV).	Do pilot control valve pressure test in group 3.

(9) PILOT OPERATED FLOAT CHECK BLOCK ASSEMBLY (Item 11)

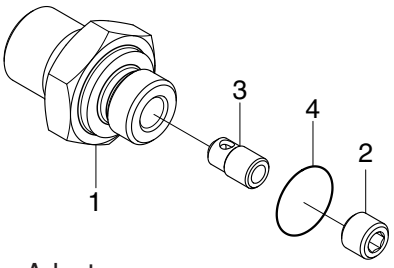
Remove the three retaining screws (2) and lift the block from the main housing.
Do not slide the block accross the face as this may damage the sealing face and seals.



1	Float check block	5	O-ring
2	Cap head screw	6	Plug
3	Plug	7	O-ring
4	O-ring	8	Plug

7707WE59

(10) ADAPTER+ORIFICE SCREW+CHECK VALVE (Item 12)

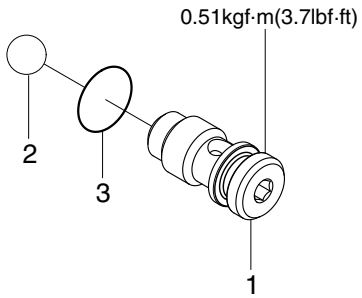


1 Adapter
2 Socket set screw
3 Check valve
4 O-ring

7707WE60

(11) SHUTTLE VALVE ASSEMBLY (Item 13)

This is non servicable item and a replacement unit should be fitted.
Inspect seat in float check block for damage before refitting.



1 Seat
2 Metric ball
3 O-ring

7707WE61

2. HEAD LIGHT CIRCUIT

1) OPERATING FLOW

Fuse box [CN-36 (19)] → Head light switch [CS-21 (6)] → Light switch ON, 2nd step [CS-21 (4)]
→ Multi function switch [CS-11(8)]
→ Multi function switch MIDDLE [CS-11(7)] → I/conn [CN-6 (28)] → I/conn [CN-10 (6)]
→ LH Head light low beam ON [CL-3 (3)]
→ RH Head light low beam ON [CL-4 (3)]
→ Multi function switch DOWN [CS-11(6)] → I/conn [CN-6 (27)] → I/conn [CN-10 (5)]
→ LH Head light high beam ON [CL-3 (2)]
→ RH Head light high beam ON [CL-4 (2)]
→ Cluster high beam pilot lamp ON [CN-56 (5)]

2) CHECK POINT

Engine	Key switch	Check point	Voltage
OFF	ON	① - GND (switch input) ② - GND (switch output) ③ - GND (multi function input) ④ - GND (multi function output) ⑤ - GND (multi function output) ⑥ - GND (low beam) ⑦ - GND (high beam) ⑧ - GND (passing B^+)	20~25V

※ GND : Ground

7. WIPER AND WASHER CIRCUIT

1) OPERATING FLOW

Fuse box [CN-36 (28)] → Wiper relay Hi [CR-4 (3)→(4)] → Front wiper motor [CN-21 (1)]
Wiper relay Hi [CR-4 (3)→(4)] → Wiper relay Lo [CR-26 (5), (2)]
Fuse box [CN-36 (28)] → Multi function switch [CS-12 (6)]
Fuse box [CN-36 (28)] → I/conn [CN-9 (3)] → Rear wiper & washer switch [CS-35 (3)]
Fuse box [CN-36 (28)] → Rear wiper motor [CN-102 (1)]

(1) Front washer switch ON

① Washer switch ON [CS-12(6)→(2)] → Front washer [CN-22 (1)] → Washer operating
Washer switch ON [CS-12(6)→(2)] → MCU [CN-58A (A31)→(B02)] → Front wiper relay Lo [CR-26 (5)→(3)] → Front wiper motor [CN-21 (5)] → Wiper motor operating (low)

(2) Front wiper switch ON

① INT position
Wiper switch ON [CS-12 (6)→(1)] → MCU [CN-58A (A23)→(B02)] → Wiper relay Lo [CR-26 (5)→(3)] → Front wiper motor [CN-21(5)] → Front wiper motor intermittently operating

② Lo position
Wiper switch ON [CS-12 (6)→(4)] → Wiper relay Lo [CR-26 (4)→(3)] → Front wiper motor [CN-21 (5)] → Front wiper motor operating (low)

③ Hi position
Wiper switch ON [CS-12 (6)→(3)] → Wiper relay Hi [CR-4(3)→(5)] → Front wiper motor [CN-21(4)] → Front wiper motor operating (high)

(3) Auto-parking (when switch OFF)

Switch OFF → Fuse box [CN-36 (28)] → Wiper relay Hi [CR-4 (3)→(4)] → Front wiper motor [CN-21 (1)→(2)] → Multi function switch [CS-12 (5)→(4)] → Wiper relay Lo [CR-26 (4)→(3)] → Front wiper motor [CN-21 (5)] → Wiper motor stop

(4) Rear wiper and washer switch

① Wiper switch ON (1st step)
Wiper switch ON [CS-35 (3)→(8)] → I/conn [CN-9 (5)] → Rear wiper motor [CN-102(5)] → Rear wiper motor operating

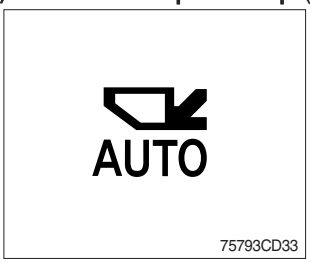
② Washer switch ON (2nd step)
Washer switch ON [CS-35 (3)→(5)] → I/conn [CN-9 (4)] → Rear washer tank [CN-103(1)] → Washer operating

2) CHECK POINT

Condition	Check point	
Engine : Stop Key switch : ON Voltage : 20~25V	① - GND (front wiper switch power input)	⑥ - GND (wiper relay power input)
	② - GND (rear wiper switch power input)	⑦ - GND (front washer power output)
	③ - GND (wiper relay power input)	⑧ - GND (rear washer power output)
	④ - GND (front wiper motor Lo power input)	⑨ - GND (front wiper motor power output)
	⑤ - GND (front wiper motor High power input)	⑩ - GND (rear wiper motor power output)

※ GND : Ground

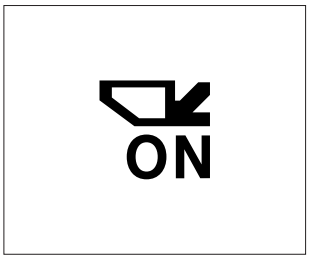
(8) Ride control pilot lamp (option)



① Auto ride control

This lamp lights ON when push in the bottom of the ride control switch (auto position).

※ Refer to page 7-46.

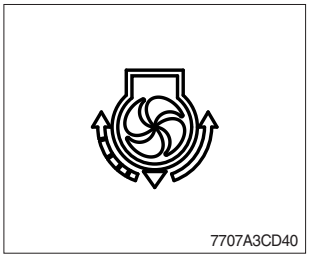


② Manual ride control

Refer to page 7-46.

(13)

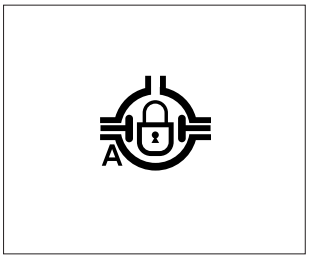
(9) Fan reverse pilot lamp



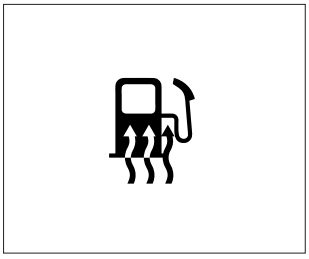
① This lamp lights ON when the fan control switch is pressed.

※ Refer to page 7-46.

(10) Differential lock pilot lamp



(11) Fuel warmer pilot lamp



· **Change password**

- Input 5 to 10 digits and press *.

75793CD26G

75793CD26H

Enter the current password.

75793CD26L

Enter the new password.

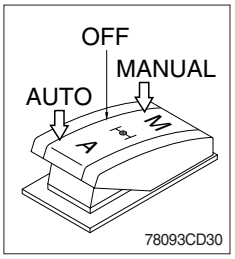
75793CD26M

Enter the new password again.

75793CD26N

The new password is stored in the MCU.

12) DIFFERENTIAL LOCK SWITCH (option)



(1) This switch is used to apply differential lock.
The differential lock gives equal power to both front wheels and is used in conditions when traction is poor.

(2) Manual mode

Press the top of the switch for the manual mode of the differential lock function. You press the switch, the differential lock will engage immediately and differential lock pilot lamp lights ON.
Manual mode is temporarily engaged as long as the operator pushes the switch. When the switch is released, differential lock function is disengaged and switch returns to OFF position.

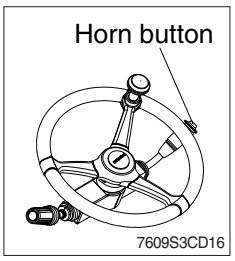
(3) Auto mode

Press the bottom of the switch for auto mode of the differential lock function.
If you press the switch, the axle differential lock will automatically engage when the differential function is used.

※ **While the axle differential lock function is operating, the differential lock pilot lamp lights ON.**

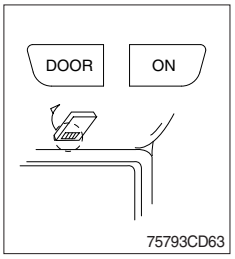
※ **Refer to page 7-28.**

13) HORN BUTTON



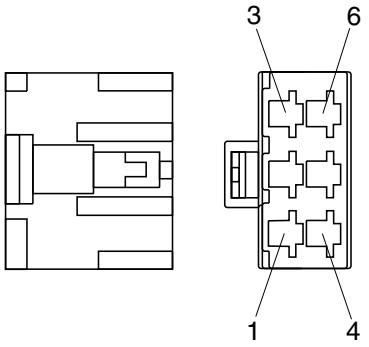
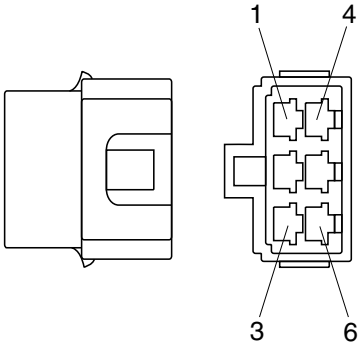
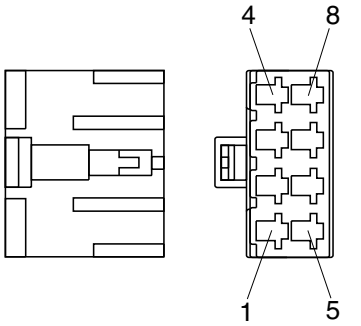
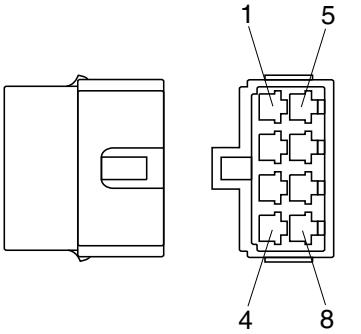
(1) If you press the button on the top of the multifunction switch, the horn will sound.

14) CAB LAMP SWITCH



(1) This switch turns ON the cab room lamp.
① This switch is used to turn the lamp ON or OFF.

Connector number	Type	No. of pin	Destination	Connector part No.	
				Female	Male
CN-83	NMWP	2	Aircon fan	PB625-02027	-
CN-93	DEUTSCH	50	ECM	DRC26-50S-01	-
CN-94	DEUTSCH	31	ECM power	HD34-24-23PE	-
CN-95	MTA	2	Fusible link (80A)	07.00960	03.210000
CN-96	-	2	Fuel heater	1530-0027	-
CN-99	DEUTSCH	2	Resister	DT04-3P-EP10	-
CN-100	Econoseal J	3	Boom kick out	S816-003002	S816-103002
CN-101A	DEUTSCH	3	Bucket leveler	-	S816-103002
CN-102	AMP	6	Rear wiper motor	936257-1	-
CN-103	KET	2	Rear washer tank	MG640605	-
CN-112	KOSTAL	16	Gear box	09-4300-10	-
CN-114	DEUTSCH	8	Finger tip joy stick	DT06-8S	-
CN-126	DEUTSCH	9	Data link	HD10-9-96P	-
CN-134	AMP	6	TCU diagnostic	-	1-480705-0
CN-136	AMP	2	Ride control solenoid	85202-1	-
CN-138	AMP	3	DC/DC Converter	174200-1	-
CN-139	250	2	12V socket	S810-002202	-
CN-141	Econoseal J	6	I/conn (Ride control harness-Front harness)	S816-006002	S816-106002
CN-154	AMP	2	Fan speed solenoid	85202-5	-
CN-155	AMP	2	Fan reverse solenoid	85202-1	-
CN-157	AMP	60	T/M control unit	962175	-
CN-158	PACKARD	4	Gear shift lever	-	1201-0974
CN-159	PACKARD	4	Gear shift lever	1201-5797	-
CN-162	AMP	6	Electric pedal	174262-2	-
CN-249	DEUTSCH	4	Camera	DT06-4S	DT04-4P
CN-250	AMP	4	Rear view camera	-	174259-2
CN-252	Econoseal J	6	I/conn (Diff lock harness-Front harness)	S816-006002	S816-106002
Relay					
CR-1	Ring term	-	Battery relay	ST710263-2	14-10
CR-2	AMP	5	Horn relay	VCFM-1002	-
CR-3	AMP	5	Front work lamp relay	VCFM-1002	-
CR-4	AMP	5	Wiper relay (Hi)	VCFM-1002	-
CR-5	HELLA	5	Safety relay	8JA003526-001	-
CR-7	AMP	5	Aircon relay	VCFM-1002	-
CR-11	HES	3	Flasher unit	S810-0037002	-
CR-23	Ring term	-	Start relay	S820-105000	-
CR-24	Shur	1	Preheater relay	S822-014000	R5-10

No. of pin	Receptacle connector (female)	Plug connector (male)
6	 S810-006202	 S810-106202
8	 S810-008202	 S810-108202