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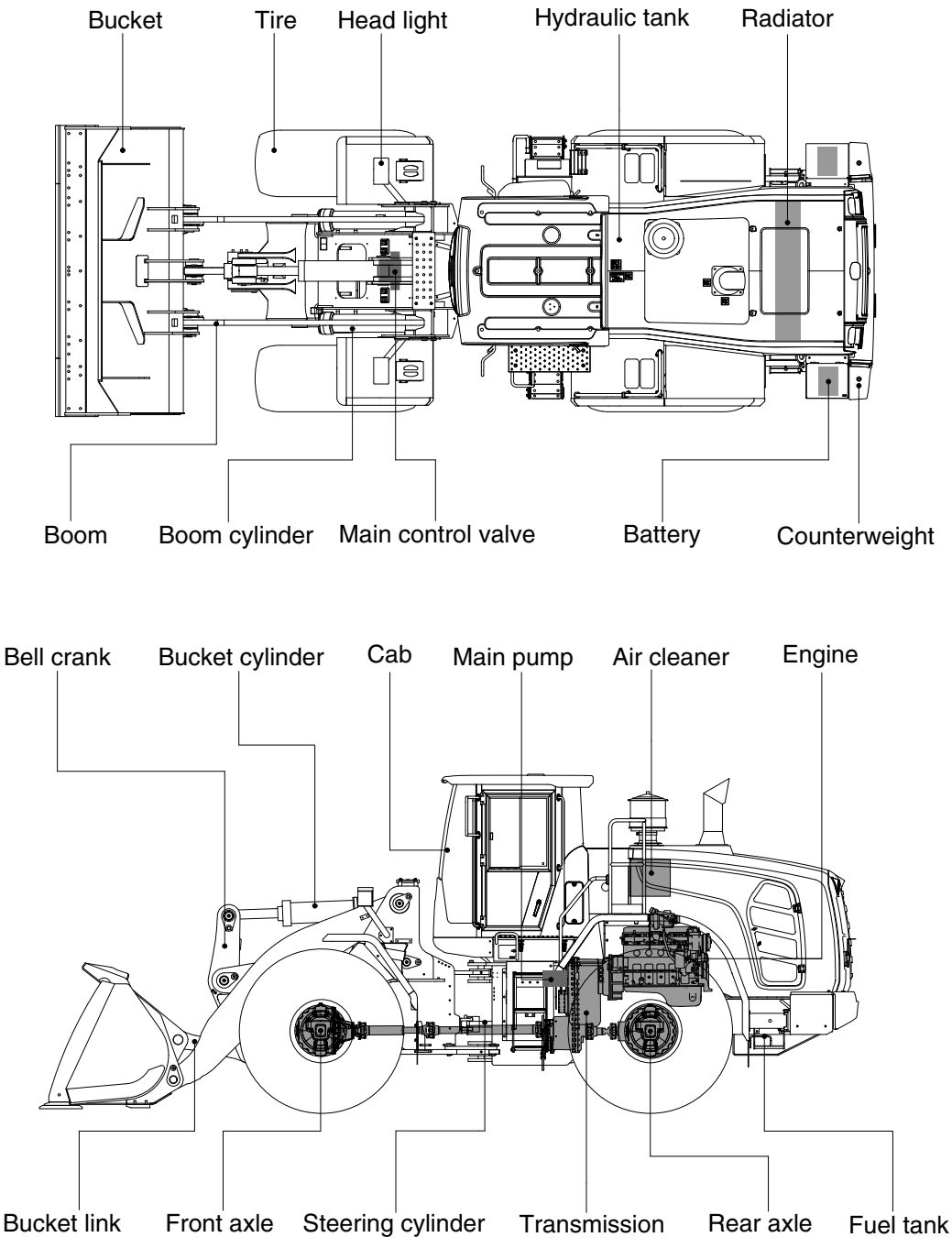
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SECTION 1 GENERAL

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GROUP 2 SPECIFICATIONS

1. MAJOR COMPONENT



770F2SE01

2) PIPE AND HOSE (FLARE type)

Thread size	Width across flat (mm)	kgf · m	lbf · ft
1/4"	19	4	28.9
3/8"	22	5	36.2
1/2"	27	9.5	68.7
3/4"	36	18	130
1"	41	21	152
1-1/4"	50	35	253

3) PIPE AND HOSE (ORFS type)

Thread size	Width across flat (mm)	kgf · m	lbf · ft
9/16-18	19	4	28.9
11/16-16	22	5	36.2
13/16-16	27	9.5	68.7
1-3/16-12	36	18	130
1-7/16-12	41	21	152
1-11/16-12	50	35	253

4) FITTING

Thread size	Width across flat (mm)	kgf · m	lbf · ft
1/4"	19	4	28.9
3/8"	22	5	36.2
1/2"	27	9.5	68.7
3/4"	36	18	130
1"	41	21	152
1-1/4"	50	35	253

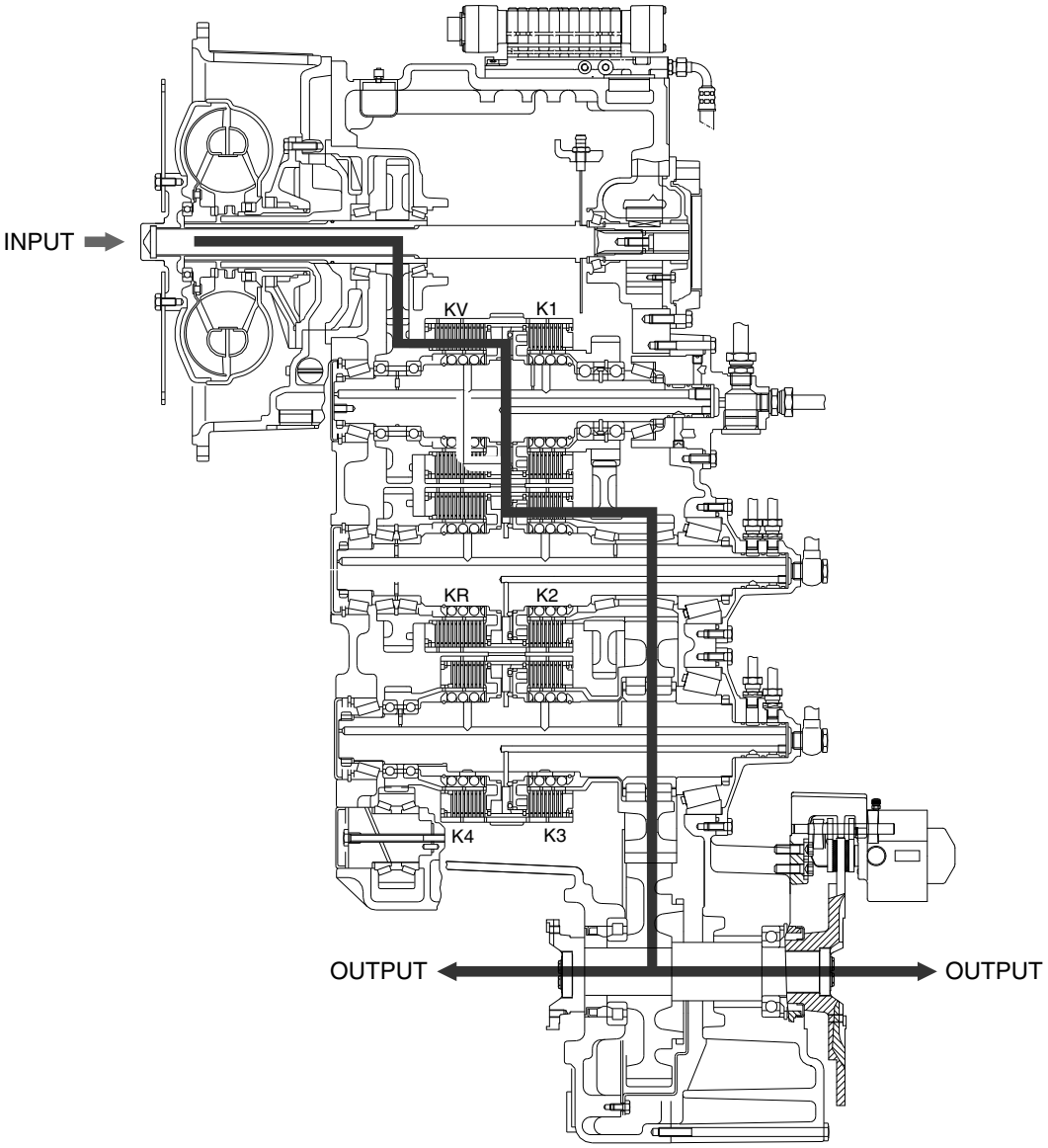
SECTION 3 POWER TRAIN SYSTEM

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② Forward 2nd

In 2nd forward, forward clutch (KV) and 2nd clutch (K2) are engaged.

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



77093PT08

· Protection against operating errors, as far as possible and practical.
· Protection against overspeeds (on the basis of engine and turbine speed).
· Reversing-automatic system (driving speed-dependent).
· Pressure cut off (disconnecting of the drive train for maximum power on the power take-off).
· Switch for manual or automatic operation.
· Reversing function button, respectively kickdown function.

(3) Gearshifts

The control unit (EST-37A) is shifts the required speeds fully-automatically under consideration of the following criteria.

· Gear selector position
· Driving speed
· Load level

At the same time, the following speeds are picked up by the control unit (EST-37A).

· n Engine
· n Turbine
· n Central gear train
· n Output

- Neutral position

Neutral position is selected through the gear selector.
After the ignition is turned on, the electronics remains in the waiting state; By the position neutral of the gear selector, respectively by pressing on the key neutral, the control unit (EST-37A) becomes ready for operation.
Now, a speed can be engaged.

- Speed engagement

In principle, the speed, adapted to the driving speed (at standing, or rolling machine), will be engaged. The engagement is realized in dependence on load and rotational speed.

- Upshifting under load

Upshifting under load will be then realized if the machine can still accelerate by it.

- Downshifting under load

Downshifting under load will be realized if more traction force is needed.

- Upshifting in coasting condition

In the coasting condition, the upshifting will be suppressed if the speed of the machine on a slope shall not be further increased.

- Downshifting in coasting condition

Downshiftings in the coasting condition will be realized if the machine shall be retarded.

- Reversing

At speeds below the reversing limit, direct reversing can be carried out at any time in the speeds 1F 1R and 2F 2R (as a rule, this is the maximum driving speed of the 2nd speed).

2) ENGINE FAULT CODE

Fault code J1939 SPN J1939 FMI	Name	Description
12D1 46 1	Pnuematic supply pressure	Low air pressure signal from APS
12D4 46 19	Pnuematic supply pressure	CAN message timeout from APS
2123 51 3	Engine throttle valve position	Throttle Position Sensor 1, short circuit to +24
2122 51 4	Engine throttle valve position	Throttle Position Sensor 1, short circuit to ground
2121 51 7	Engine throttle valve position	Throttle Position Sensor, not plausible
1091 51 8	Engine throttle valve position	Endpoints of throttle position sensor are out of range
2138 51 9	Engine throttle valve position	Throttle Position Sensor, correlation error
16C9 91 2	Accelerator pedal position	Auxiliary accelerator pedal is used due to other fault
16C8 91 9	Accelerator pedal position	Accelerator pedal faulty or error via can
D415 91 10	Accelerator pedal position	Accelerator pedal not plausible, faulty
D414 91 19	Accelerator pedal position	Accelerator pedal value out of range via CAN
1100 94 0	Engine fuel deliver pressure	Accumulator pressure is too high
250A 98 2	Engine oil level	Oil level sensor, faulty
250D 98 3	Engine oil level	Oil level sensor, short circuit to +24V
250C 98 4	Engine oil level	Oil level sensor, short circuit to ground
1715 98 10	Engine oil level	Oil level sensor stuck

※ Some fault codes are not applied to this machine.

Fault code J1939 SPN J1939 FMI	Name	Description
1214 636 1	Engine position sensor	Camshaft position sensor, faulty
0344 636 2	Engine position sensor	Camshaft position sensor, intermittent fault
0343 636 3	Engine position sensor	Camshaft position sensor, short circuit to +24V
0342 636 4	Engine position sensor	Camshaft position sensor, short circuit to ground
0340 636 5	Engine position sensor	Camshaft position sensor, open circuit
0016 636 7	Engine position sensor	Engine speed detected by flywheel sensor, but no signal from camshaft sensor
0341 636 8	Engine position sensor	Camshaft Pulse Pattern, Gap or Sync Error or other fault
16E7 641 2	Engine turbocharger actuator	VGT internal temperature sensor stuck
1686 641 4	Engine turbocharger actuator	VGT voltage supply open load
16B5 641 5	Engine turbocharger actuator	VGT internal temperature sensor open circuit
168B 641 7	Engine turbocharger actuator	VGT motion limited or restricted
168E 641 8	Engine turbocharger actuator	VGT reference or position not found
1134 641 9	Engine turbocharger actuator	VGT temperature sensor value not plausible
168C 641 10	Engine turbocharger actuator	VGT motion error, span too large
1689 641 11	Engine turbocharger actuator	VGT actuator faulty
1693 641 12	Engine turbocharger actuator	VGT internal fault

※ Some fault codes are not applied to this machine.

Fault code J1939 SPN J1939 FMI	Name	Description
1606 1483 2	Source address of engine control device	EMS Memory Error
1610 1483 2	Source address of engine control device	EMS Memory Error
1607 1483 8	Source address of engine control device	EMS Memory or TPU Error
160F 1483 8	Source address of engine control device	EMS memory or TPU error
16D7 1483 9	Source address of engine control device	Camshaft TPU Supervision Error
160A 1483 11	Source address of engine control device	Software Watchdog Reset
1604 1483 12	Source address of engine control device	Hardware watchdog error
D100 1484 9	Other control are reporting faults affecting the engine	CAN message DLN1 from coordinator timeout
D102 1484 10	Other control are reporting faults affecting the engine	CAN message CRUISE CONTROL/ VEHICLE SPEED from coordinator timeout
D113 1484 16	Other control are reporting faults affecting the engine	CAN message from EMSX, invalid data
D112 1484 18	Other control are reporting faults affecting the engine	CAN message from EMSX, invalid data
D103 1484 19	Other control are reporting faults affecting the engine	CAN message DLN6 from coordinator timeout
D111 1484 20	Other control are reporting faults affecting the engine	CAN message timout from EMSX
D110 1484 21	Other control are reporting faults affecting the engine	CAN message timout from EMSX
20EA 1485 16	ECM main relay	SCR main unit, power switched off too early
20EB 1485 18	ECM main relay	SCR main unit, power switched off too late

※ Some fault codes are not applied to this machine.

Fault code J1939 SPN J1939 FMI	Name	Description
0069 3563 17	Engine intake manifold pressure	Boost pressure sensor and ambient pressure sensor do not correlate
F001 3607 2	Engine emergency shutdown	Incorrect EMS shutdown
2128 3673 3	Engine throttle valve position	Throttle Position Sensor 2, short circuit to +24V
2127 3673 4	Engine throttle valve position	Throttle Position Sensor 2, short circuit to ground
0406 3822 3	Engine EGR valve position	EGR position sensor, short circuit to +24V
0405 3822 4	Engine EGR valve position	EGR position sensor, short circuit to ground
1405 3822 7	Engine EGR valve position	EGR SRA reports a warning during Learn Stops.
049D 3822 8	Engine EGR valve position	EGR position sensor, outside the permitted range
1404 3822 12	Engine EGR valve position	EGR SRA reports it has a continuous fault.
1705 3822 13	Engine EGR valve position	EGR position sensor, not plausible
1406 3822 16	Engine EGR valve position	EGR SRA reports a running conditions warning for high temp or low voltage.
1402 3822 19	Engine EGR valve position	EGR CAN timeout
1813 3822 20	Engine EGR valve position	EGR position sensor, voltage shows large variation in open position
1814 3822 21	Engine EGR valve position	EGR position sensor, voltage shows large variation in closed position
244B 3936 2	After treatment - DPF filter	Particulate filter, clogged
242F 3936 6	After treatment - DPF filter	Particulate filter, ash level too high

※ Some fault codes are not applied to this machine.

Fault code (Hex)	Meaning of the fault code possible reason for fault detection	Reaction of the TCU	Possible steps to repair
34	S.C. to battery voltage or O.C. at turbine speed input TCU measures a voltage higher than 7.00V at speed input pin · Cable is defective and is contacted to vehicle battery voltage · Cable has no connection to TCU · Speed sensor has an internal defect · Connector pin is contacted to battery voltage or has no contact	OP mode : Substitute clutch control If a failure is existing at output speed, TCU shifts to neutral OP mode : Limp home	· Check the cable from TCU to the sensor · Check the connectors · Check the speed sensor
35	S.C. to ground at turbine speed input TCU measures a voltage less than 0.45V at speed input pin · Cable/connector is defective and is contacted to vehicle ground · Speed sensor has an internal defect	OP mode : Substitute clutch control If a failure is existing at output speed, TCU shifts to neutral OP mode : Limp home	· Check the cable from TCU to the sensor · Check the connectors · Check the speed sensor ※ This fault is reset after power up of TCU
36	Logical error at turbine speed input TCU measures a turbine speed over a threshold and at the next moment the measured speed is zero · Cable/connector is defective and has bad contact · Speed sensor has an internal defect · Sensor gap has the wrong size	OP mode : Substitute clutch control If a failure is existing at output speed, TCU shifts to neutral OP mode : Limp home	· Check the cable from TCU to the sensor · Check the connectors · Check the speed sensor · Check the sensor gap
37	S.C. to battery voltage or O.C. at internal speed input TCU measures a voltage higher than 7.00V at speed input pin · Cable is defective and is contacted to vehicle battery voltage · Cable has no connection to TCU · Speed sensor has an internal defect · Connector pin is contacted to battery voltage or has no contact	OP mode : Substitute clutch control	· Check the cable from TCU to the sensor · Check the connectors · Check the speed sensor
38	S.C. to ground at turbine speed input TCU measures a voltage less than 0.45V at speed input pin · Cable/connector is defective and is contacted to vehicle ground · Speed sensor has an internal defect	OP mode : Substitute clutch control	· Check the cable from TCU to the sensor · Check the connectors · Check the speed sensor
39	Logical error at internal speed input TCU measures a internal speed over a threshold and at the next moment the measured speed is zero · Cable/connector is defective and has bad contact · Speed sensor has an internal defect · Sensor gap has the wrong size	OP mode : Substitute clutch control	· Check the cable from TCU to the sensor · Check the connectors · Check the speed sensor · Check the sensor gap ※ This fault is reset after power up of TCU
3A	S.C. to battery voltage or O.C. at output speed input TCU measures a voltage higher than 12.5V at speed input pin · Cable is defective and is contacted to battery voltage · Cable has no connection to TCU · Speed sensor has an internal defect · Connector pin is contacted to battery voltage or has no contact	Special mode for gear selection OP mode : Substitute clutch control If a failure is existing at turbine speed, TCU shifts to neutral OP mode : Limp home	· Check the cable from TCU to the sensor · Check the connectors · Check the speed sensor

※ Some fault codes are not applied to this machine.

Fault code (Hex)	Meaning of the fault code possible reason for fault detection	Reaction of the TCU	Possible steps to repair
B3	Slippage at clutch K3 TCU calculates a differential speed at closed clutch K3. If this calculated value is out of range, TCU interprets this as slipping clutch · Low pressure at clutch K3 · Low main pressure · Wrong signal at internal speed sensor · Wrong signal at output speed sensor · Wrong size of the sensor gap · Clutch is defective	TCU shifts to neutral OP mode : Limp home If failure at another clutch is pending TCU shifts to neutral OP mode : TCU shutdown	· Check pressure at clutch K3 · Check main pressure in the system · Check sensor gap at internal speed sensor · Check sensor gap at output speed sensor · Check signal at internal speed sensor · Check signal at output speed sensor Replace clutch
B4	Slippage at clutch K4 TCU calculates a differential speed at closed clutch K4. If this calculated value is out of range, TCU interprets this as slipping clutch · Low pressure at clutch K4 · Low main pressure · Wrong signal at internal speed sensor · Wrong signal at turbine speed sensor · Wrong size of the sensor gap · Clutch is defective	TCU shifts to neutral OP mode : Limp home If failure at another clutch is pending TCU shifts to neutral OP mode : TCU shutdown	· Check pressure at clutch K4 Check main pressure in the system · Check sensor gap at internal speed sensor · Check sensor gap at turbine speed sensor · Check signal at internal speed sensor · Check signal at turbine speed sensor Replace clutch
B5	Slippage at clutch KV TCU calculates a differential speed at closed clutch KV. If this calculated value is out of range, TCU interprets this as slipping clutch · Low pressure at clutch KV · Low main pressure · Wrong signal at internal speed sensor · Wrong signal at turbine speed sensor · Wrong size of the sensor gap · Clutch is defective	TCU shifts to neutral OP mode : Limp home If failure at another clutch is pending TCU shifts to neutral OP mode : TCU shutdown	· Check pressure at clutch KV · Check main pressure in the system · Check sensor gap at internal speed sensor · Check sensor gap at turbine speed sensor · Check signal at internal speed sensor · Check signal at turbine speed sensor · Replace clutch
B6	Slippage at clutch KR TCU calculates a differential speed at closed clutch KR. If this calculated value is out of range, TCU interprets this as slipping clutch · Low pressure at clutch KR · Low main pressure · Wrong signal at internal speed sensor · Wrong signal at turbine speed sensor · Wrong size of the sensor gap · Clutch is defective	TCU shifts to neutral OP mode : Limp home If failure at another clutch is pending TCU shifts to neutral OP mode : TCU shutdown	· Check pressure at clutch KR Check main pressure in the system · Check sensor gap at internal speed sensor · Check sensor gap at turbine speed sensor · Check signal at internal speed sensor · Check signal at turbine speed sensor · Replace clutch
B7	Overtemp sump TCU measured a temperature in the oil sump that is over the allowed threshold.	No reaction OP mode : Normal	· Cool down machine · Check oil level · Check temperature sensor
B9	Overspend engine	Retarder applies OP mode : Normal	-
BA	Differential pressure oil filter TCU measured a voltage at differential pressure switch out of the allowed range · Oil filter is polluted · Cable/connector is broken or cable/connector is contacted to battery voltage or vehicle ground · Differential pressure switch is defective	No reaction OP mode : Normal	· Check oil filter · Check wiring from TCU to differential pressure switch · Check differential pressure switch(Measure resistance)

※ Some fault codes are not applied to this machine.

GROUP 2 OPERATIONAL CHECKS AND TROUBLESHOOTING

1. POWER TRAIN OPERATIONAL CHECKS

This procedure is designed so that the mechanic can make a quick check of the system using a minimum amount of diagnostic equipment. If you need additional information, read Structure and function, Group 1.

A location will be required which is level and has adequate space to complete the checks.

The engine and all other major components must be at operating temperature for some checks.

Locate system check in the left column and read completely, following the sequence from left to right. Read each check completely before performing.

At the end of each check, if no problem is found(OK), that check is complete or an additional check is needed. If problem is indicated(NOT OK), you will be given repair required and group location.
If verification is needed, you will be given next best source of information :

Chapter 2 : Troubleshooting
Group 3 : Tests and adjustments

2) DIFFERENTIAL / AXLE

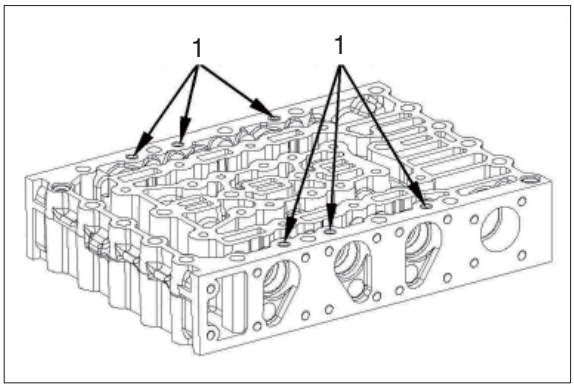
Problem	Cause	Remedy
Differential low on oil	External leakage.	Inspect axle and differential for leaks.
Excessive differential and/or axle noise	Low oil level in differential.	Check oil. Remove drain plug and inspect for metal particles in differential case. Disassemble and determine cause.
	Incorrect type of oil.	Change oil
	Dragging brakes.	Do brake check.
	Failed pinion bearing.	Remove and inspect pinion. Check to ensure pinion housing was indexed.
	Incorrect gear mesh pattern between ring and pinion gear.	Remove pinion gear housing and inspect ring and pinion gear.
	Failed differential pinion gears and/or cross shafts.	Remove differential housing drain plug and inspect for metal particles. Disassemble and inspect.
	Failed axle bearing.	Do axle bearing adjustment check.
	Mechanical failure in axle planetary.	Remove differential. Inspect, repair.
Oil seeping from outer axle seal	Excessive end play in axle.	Do axle bearing adjustment check.
	Worn outer bearing and/or cup.	Disassemble and inspect outer axle bearing, cup, spacer, and seal. Replace, if necessary.
	Overfilled differential.	Check differential oil return system for excessive internal restriction.
Axle overheats	Low differential oil.	Add oil.
	Overfilled differential.	See differential overfills with oil in this group.
	Brake drag.	See brakes drag in this group.

(1) **Fitting of electric control**

※ All single parts are to be checked for damage and replaced, if required.
Ensure free travel of the moving parts in the valve block prior to installation. Pistons can be exchanged individually.
Prior to the installation, oil single part.

① With the concave side showing upwards, insert orifice (1) until contact is obtained.

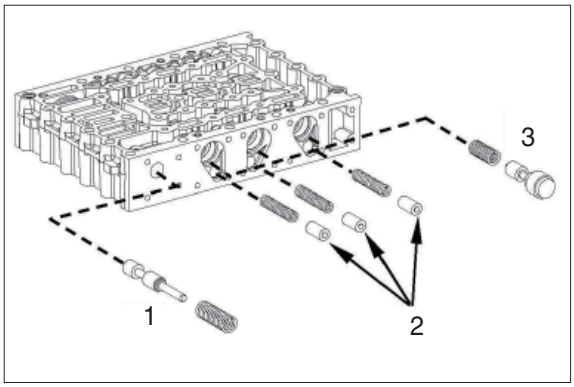
※ See arrows for installation position.



7709ACV20

② The opposite figure shows the following single parts :

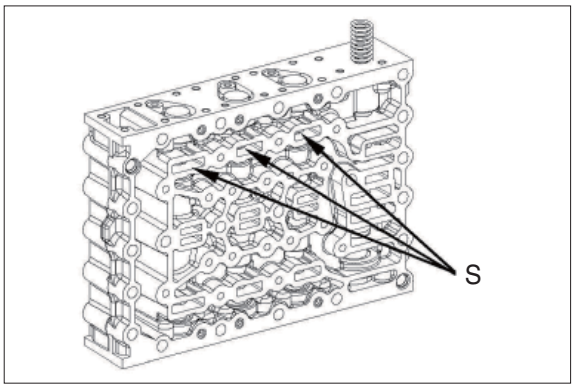
1 Pressure reducing valve
(1EA, piston and compression spring)
2 Vibration damper
(3EA, piston and compression spring)
3 Follow-on slide
(3EA, piston and compression spring)



7709ACV21

③ Install the single parts according to figure CV21.

※ Preload compression springs of the follow-on slides and preliminarily fix pistons by means of cylindrical pins Ø5.0 mm (assembly aid), see arrows (S).

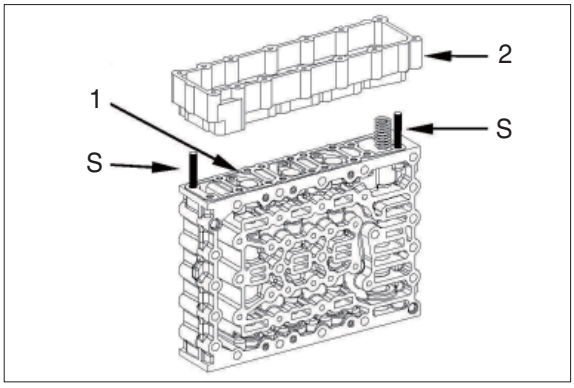


7709ACV22

④ Fit two adjusting screws.

Mount seal (1) and housing (2).
Then position housing equally by means of adjusting screws until contact is obtained.

Adjusting screws (S) 5870 204 036



7709ACV23

(6) Remove the rectangular ring (arrow).



Figure 9

(7) Press the input shaft out of the spur gear bearing. Remove the released bearing inner ring and the spur gear.

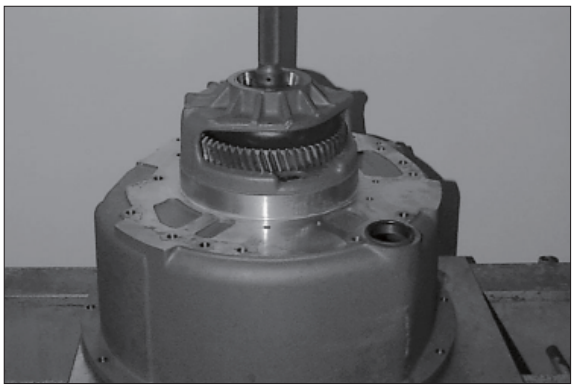


Figure10

(8) Press off the bearing inner ring from the spur gear.

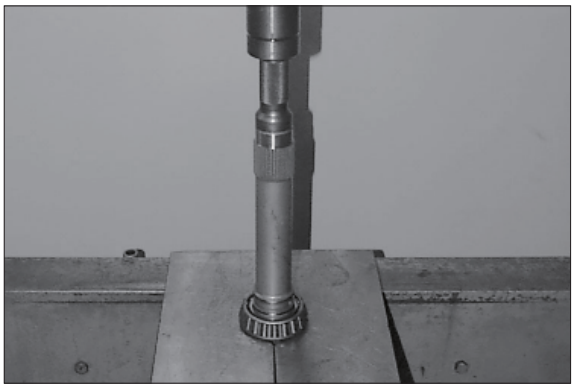


Figure11

(9) Remove the converter pressure back-up valve.



Figure 12

(9) Remove the ring.



Figure 70

(10) Pull off the taper roller bearing.

※ Special tool
Three-armed puller 5870 971 002

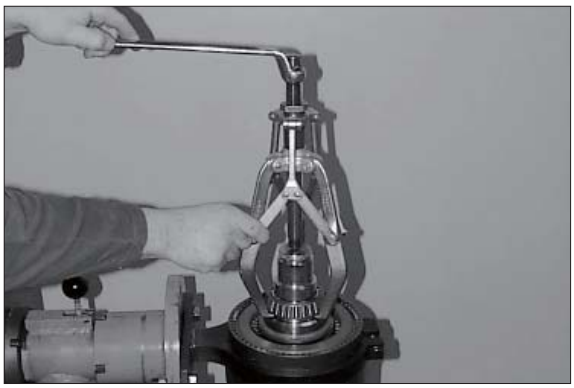


Figure 71

(11) Squeeze out the snap ring.
Remove the end shim and the disc set K4.



Figure 72

(12) Preload the compression spring by means of fixture.
Squeeze out the snap ring and the released single components.
Remove the opposite single components (K3 side) analogously.

※ Special tool
Pressure piece 5870 345 072



Figure 73

(4) Oil the O-rings and the piston contact surface.
Install K3 piston equally until contact.

※ Observe the installation position of the piston, see figure.



Figure 132

(5) Install spacer and compression spring.



Figure 133

(6) Place guide ring, with the chamfer (arrow) showing upwards, over the compression spring and install the snap ring.

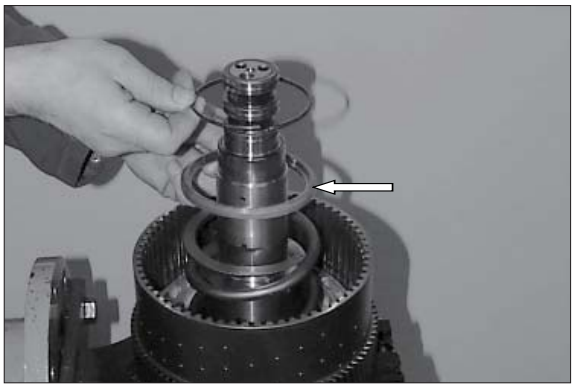


Figure 134

(7) Lift the disc carrier out of the clamping ring. Preload the compression spring by means of fixture and engage the snap ring into the annular groove of the disc carrier (arrow), see figure 135.

※ Special tool

Fixture	5870 345 072
Clamping fixture	5870 654 036

Install the drain valve, piston and compression spring on the opposite side (clutch K4) analogously (figure 130~135).
Then lift the disc carrier with the K4-side showing downwards into the clamping ring and fasten it. Rotate disc carrier by 180˚.



Figure 135

Assembly of the multi-disc clutch KR/K2

The following sketch shows the clutch sectioning.

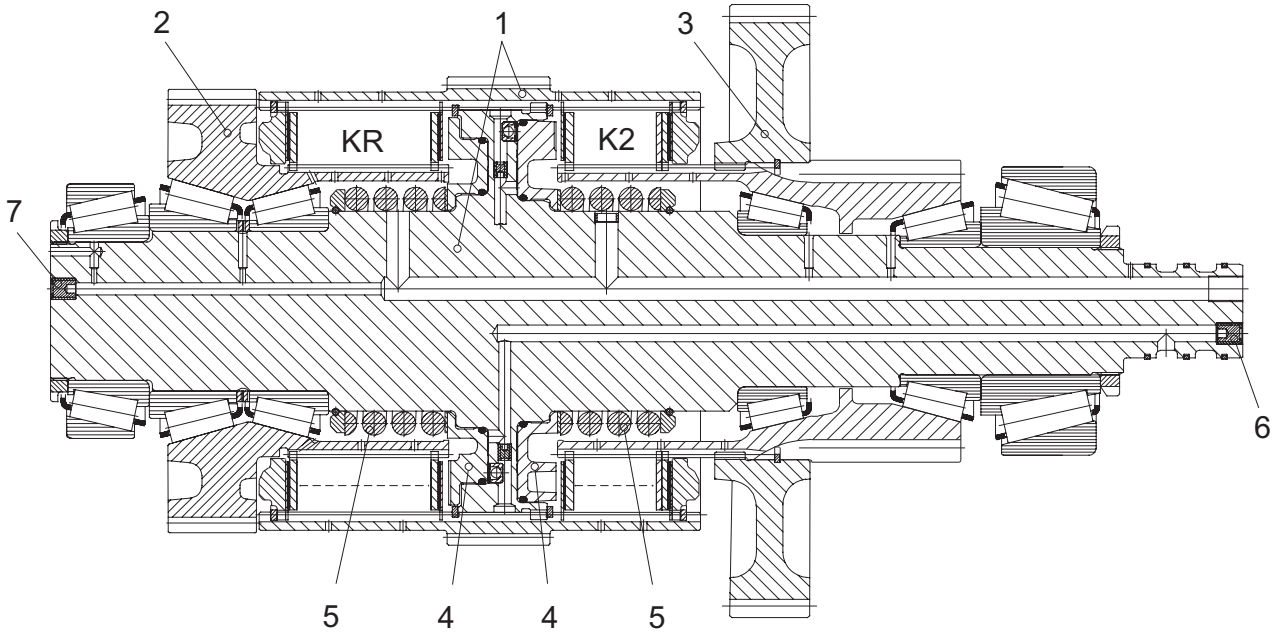


Figure159

1	Disc carrier	K4	Multi-disc clutch KR	5	Compression spring
2	Spur gear KR	K3	Multi-disc clutch K2	6	Plug 2EA
3	Spur gear K2	4	Piston	7	Plug 1EA

※ Observe the installation position of the single components for the following assembly.

(5) Heat the bearing inner ring (spur gear bearing) and install it until contact.

⚠ **Use safety gloves.**



Figure 186

(6) Heat the bearing inner ring (clutch bearing) and locate it until contact.

⚠ **Use safety gloves.**



Figure 187

(7) Lift the disc carrier out of the clamping ring.
To ensure the exact locating of the single components, preload the bearing with 100 KN (10t) (figure 188)

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

※ Special tool
Pressure piece 5870 506 096



Figure 188

Check disc clearance K1=2.2~2.4 mm
(figure 212~214)

※ In order to ensure a perfect measuring result, the disc set is first of all to be installed without oil.

(1) Install disc set according to sketch or table (page 3-164).



Figure 212

(2) Install the end shim and fasten it by means of the snap ring.

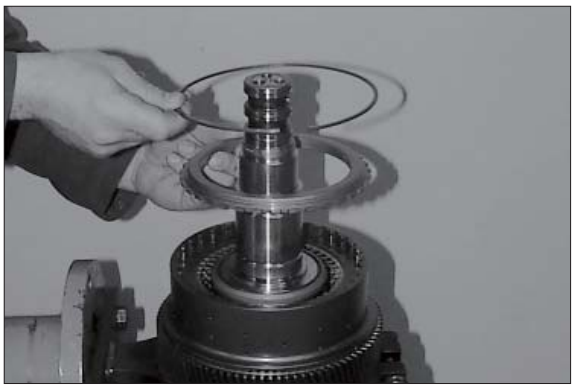


Figure 213

(3) Press on end shim with approximately 100N (10 kg) and set dial indicator to "Zero".
Then press end shim against snap ring (upwards) and read disc clearance on the dial indicator.

※ If the required disc clearance differs, it has to be corrected with the adequate inner clutch disc or/and snap ring, see table/ position 7 and position 8.

Upon setting of disc clearance, remove the disc set, oil the clutch discs and reinstall them.

※ Special tool

Magnetic stand	5870 200 055
Dial indicator	5870 200 057

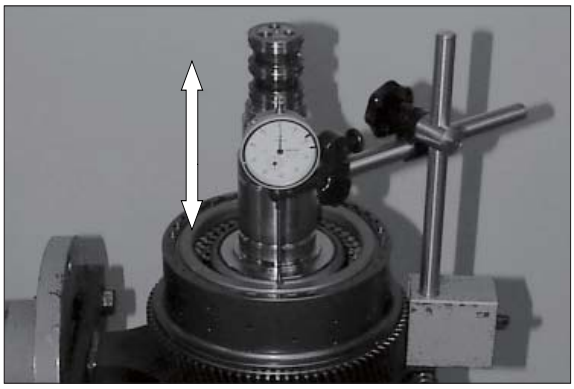


Figure 214

Housing dimension :

(1) Press on equally the bearing inner ring and detemine Dimension I, from the mounting face to the bearing inner ring.
Dimension I e.g ····· 43.65 mm

※ Take several measuring points and determine the mean value.

Then remove the bearing inner ring again.

※ Special tool

Measuring shaft	5870 200 022
Digital depth gauge	5870 200 072

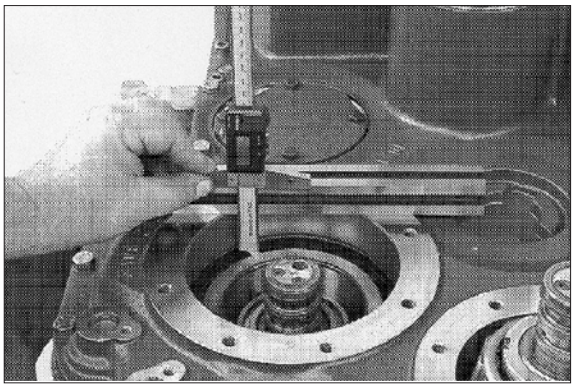


Figure 248

Cover dimension :

(2) Determine Dimension II, from the mounting face until contact/bearing inner ring.
Dimension II e.g ····· 42.12 mm

※ Special tool

Straightedge	5870 200 022
Gauge blocks	5870 200 067
Digital depth gauge	5870 200 072

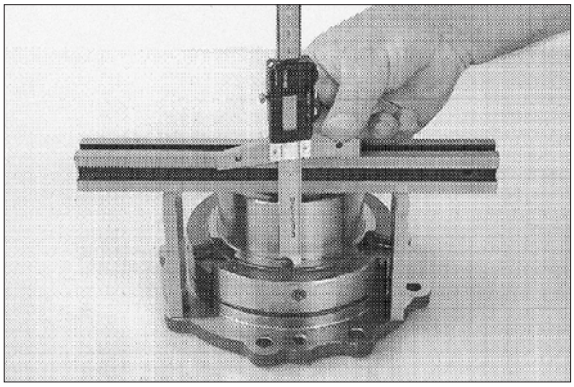


Figure 249

Example :

Dimension I ·····		43.65 mm
Dimension II ·····		- 42.12 mm
Difference ·····		= 1.53 mm
Bearing preload ·····	e.g.	+ 0.02 mm
Resulting shim(s) ·····	s	= 1.55 mm

(3) Put on the shim.



Figure 250

(4) Heat the bearing inner ring and place it until contact.

⚠ **Use safety gloves.**

※ Install the bearing inner ring after cooling down subsequently (press).



Figure 251



Figure 284

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

※ Clamping pliers 5870 900 021

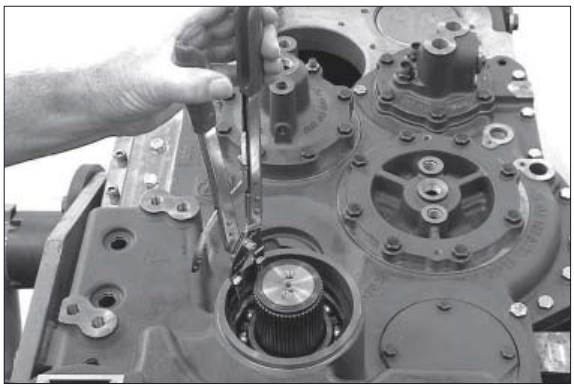


Figure 285

(9) Remove the converter-side mounting tool again.
Install the shaft seal, (arrow) with the sealing lip showing to the oil sump.

※ Using of the specified mounting tool, results in the exact installation position (without retaining ring = 20 mm).
Grease the sealing lip.

※ Special tool
Mounting tool 5870 048 265

※ Depending on the version different shaft seals can be used :
Outer diameter rubber-coated-wet it with spirit. Outer diameter metallic-wet it with sealing compound (loctite, type No. 574).

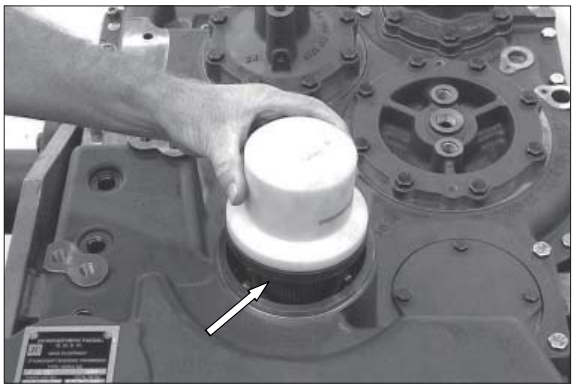


Figure 286

(13) Heat the bevel bearing inner ring.

※ Special tool

Hot-air blower 230V	5870 221 500
Hot-air blower 115V	5870 221 501

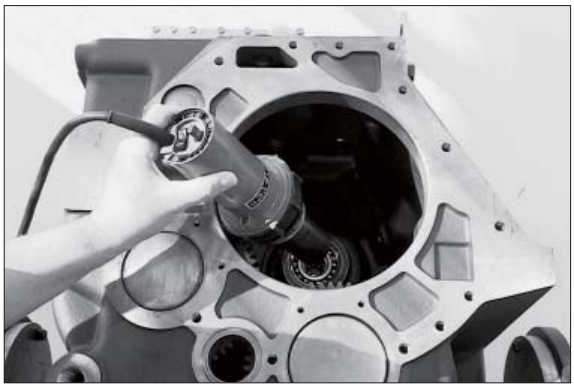


Figure 341

(14) Install the input shaft until contact.

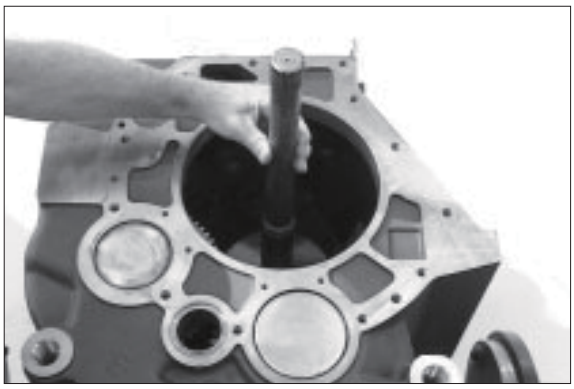


Figure 342

(15) Fasten the input shaft by means of clamping plate and cap screw (arrow).

· Torque limit (M10/8.8) :
3.26 kgf · m (23.6 lbf · ft)

※ Wet thread of the cap screw with loctite (type No. 243).



Figure 343

(3) Turn out the plug gauge and determine Dimension II (also see figure 378).

Dimension II e.g ····· 30.10 mm



Figure 379

Example "A_1" :

Dimension II	30.10 mm
Dimension X ($0.5^{+0.3}$ mm)	- 0.60 mm
Results in installation dimension A	= 29.50 mm

Example "A_2" :

Dimension I	30.00 mm
Installation dimension A	- 29.50 mm
Results in shim ring (s)	s = 0.50 mm

(4) Install the adequate shim ring (s) and wet the thread (arrow) with loctite (type No. 574).

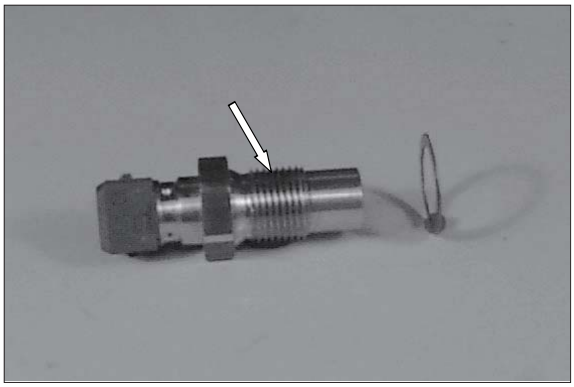


Figure 380

(5) Install the inductive transmitter n-Engine (9), see arrow.

· Torque limit : 3.06 kgf · m (22.1 lbf · ft)

Set and install the inductive transmitter n-Turbine (14) and n-internal speed input (5) analogously.

※ Observe the different setting dimensions. Installation position of the single inductive transmitters, also see page 3-203.



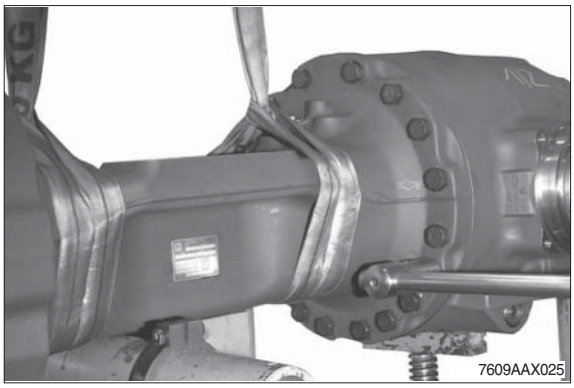
Figure 381

(2) Disassembly axle housing

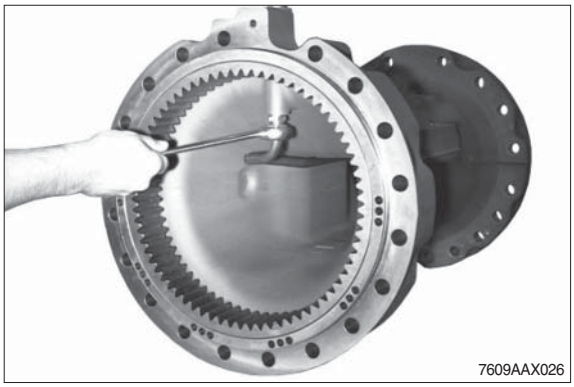
① Secure axle housing with the lifting device and loosen the hexagon screws.

Then separate the axle housing from the axle drive housing.

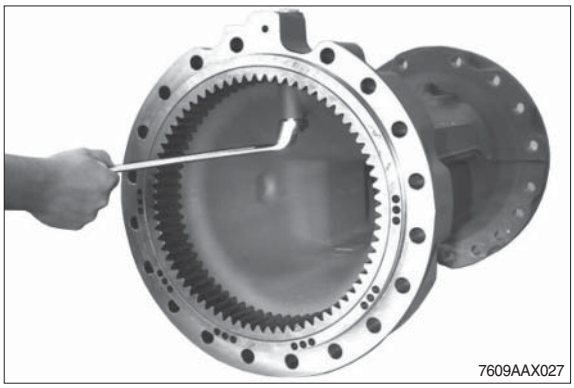
※ Pay attention to releasing differential.



② Loosen the threaded connections and remove the releasing brake tube.

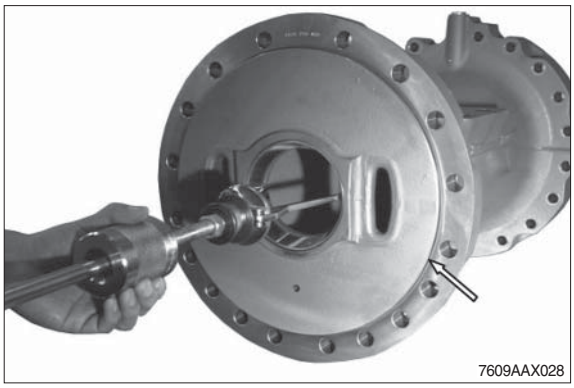


③ Loosen screw neck.



④ Pull the bearing outer ring out of the bearing hole and remove the shim behind.

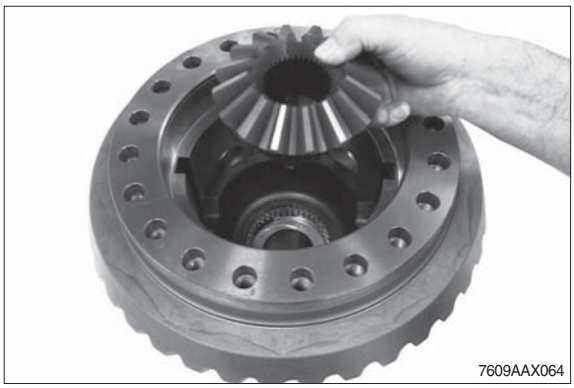
Then remove the O-ring (see arrow).



④ Remove spider shafts and axle bevel gears (see figure) out of the differential housing.



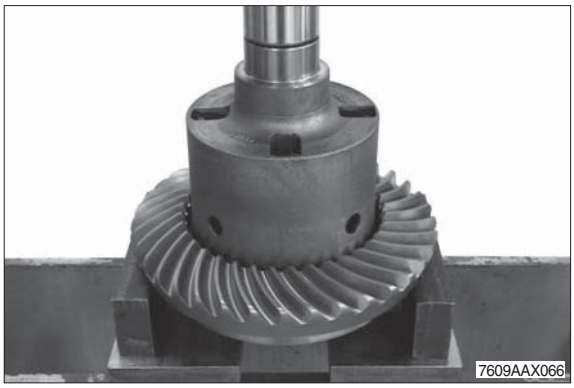
⑤ Remove the second axle bevel gear.



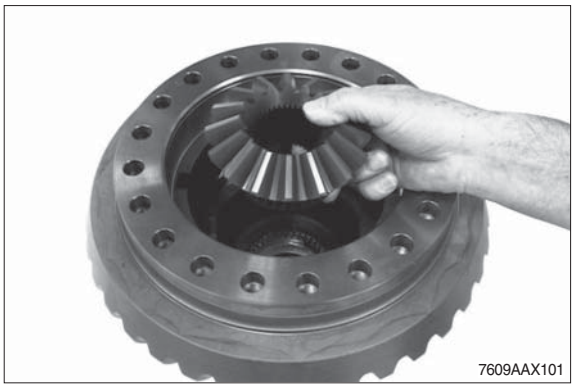
⑥ Lift the pressure ring out of the differential housing and remove the disk package and thrust washers behind.



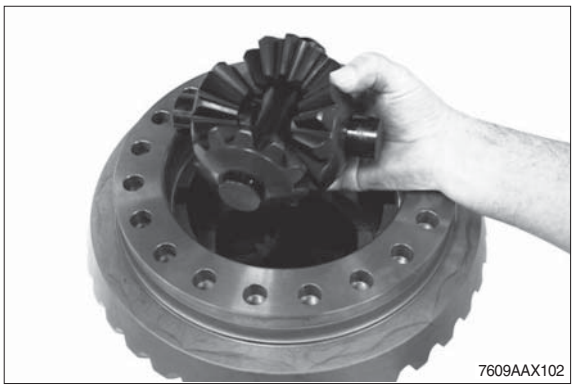
⑦ Press crown wheel from the differential carrier.



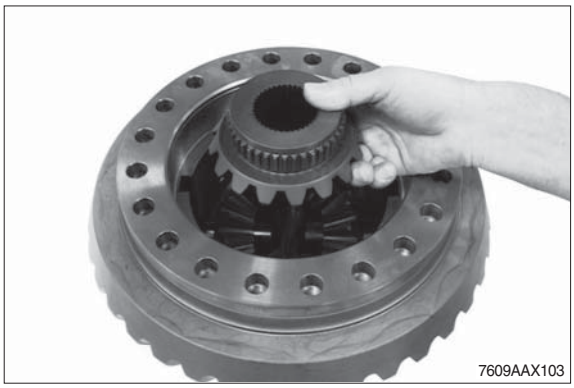
⑤ Insert the axle bevel gear until contact is obtained and install the inner disks with the teeth.



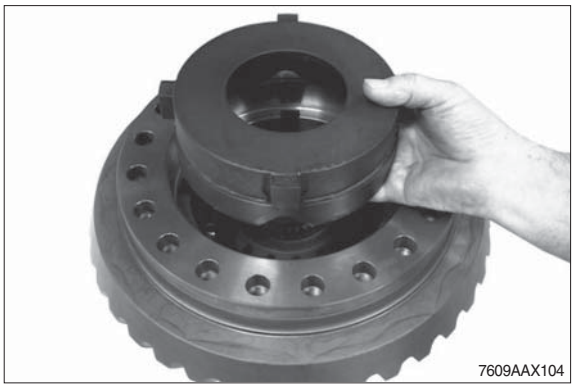
⑥ Preassemble the differential spider and insert it into the differential housing/into the pressure ring.



⑦ Mount second axle bevel gear.



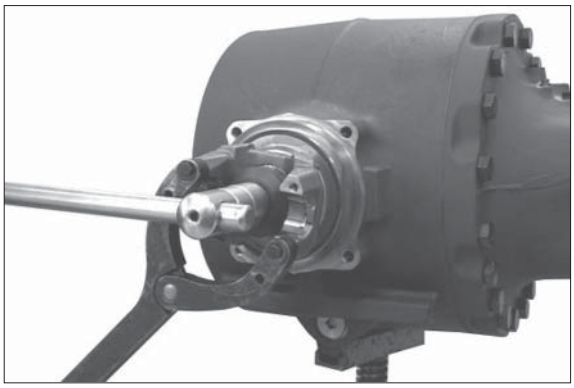
⑧ Insert the second pressure ring into the differential housing.



Reassembly of shaft seal (figure AX134~136)

㉓ Loosen the slotted nut and pull the input flange from the input pinion.

Slotted nut wrench	5870 401 139
Clamping device	5870 240 002



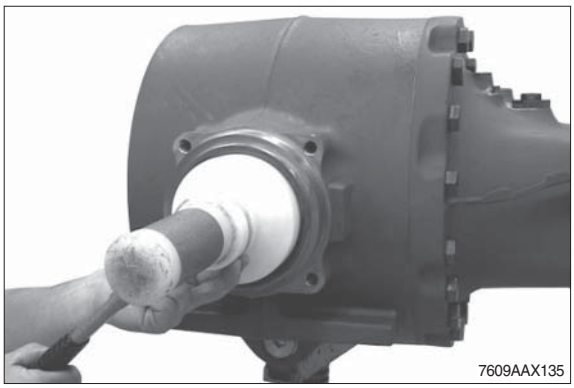
7609AAX134

㉔ Mount the shaft seal with the seal lip showing to the oil chamber.

Driver tool	5870 048 233

※ The exact installation position of the shaft seal is obtained when using the specified driver tool.

※ Wet the outer diameter of the shaft seal with spirit directly before installation and fill the space between seal and dust lip with grease.



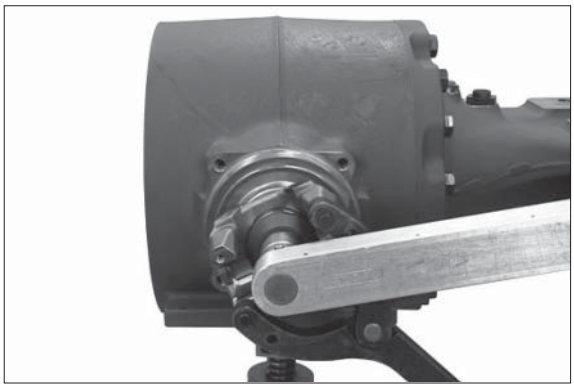
7609AAX135

㉕ Insert input flange and finally tighten by means of disk and slotted nut.

· Tightening torque :
122 kgf · m (885 lbf · ft)

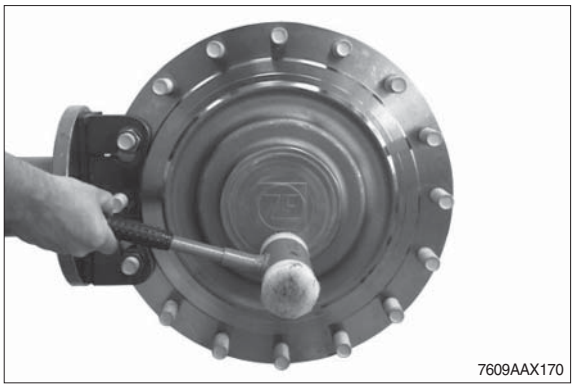
Slotted nut wrench	5870 401 139
Clamping device	5870 240 002

※ Cover the thread of the slotted nut with loctite (type no. : 262).



7609AAX136

㉕ Insert the cover into the output shaft until contact is obtained.

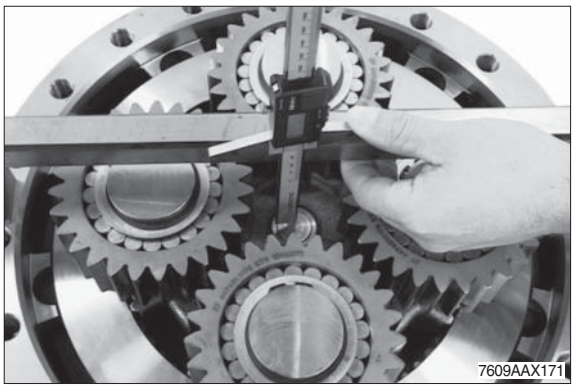


Set the axial play of the sun gear shaft 0.5~2.0 mm

㉖ Determine dimension I, from the mounting face of the brake housing to the front face of the stop bolt.

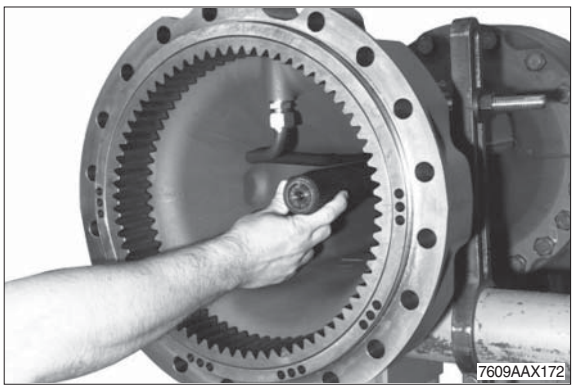
Dimension I e.g.
Front axle ..... 40.80 mm
Rear axle ..... 19.75 mm

Gauge blocks	5870 200 066
Straightedge	5870 200 022

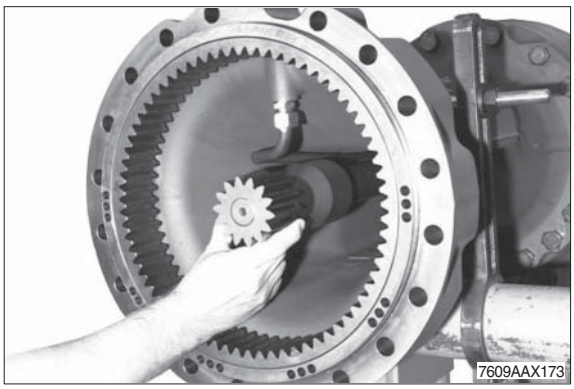


㉗ Insert stub shaft into the teeth of the axle bevel gear until contact is obtained.

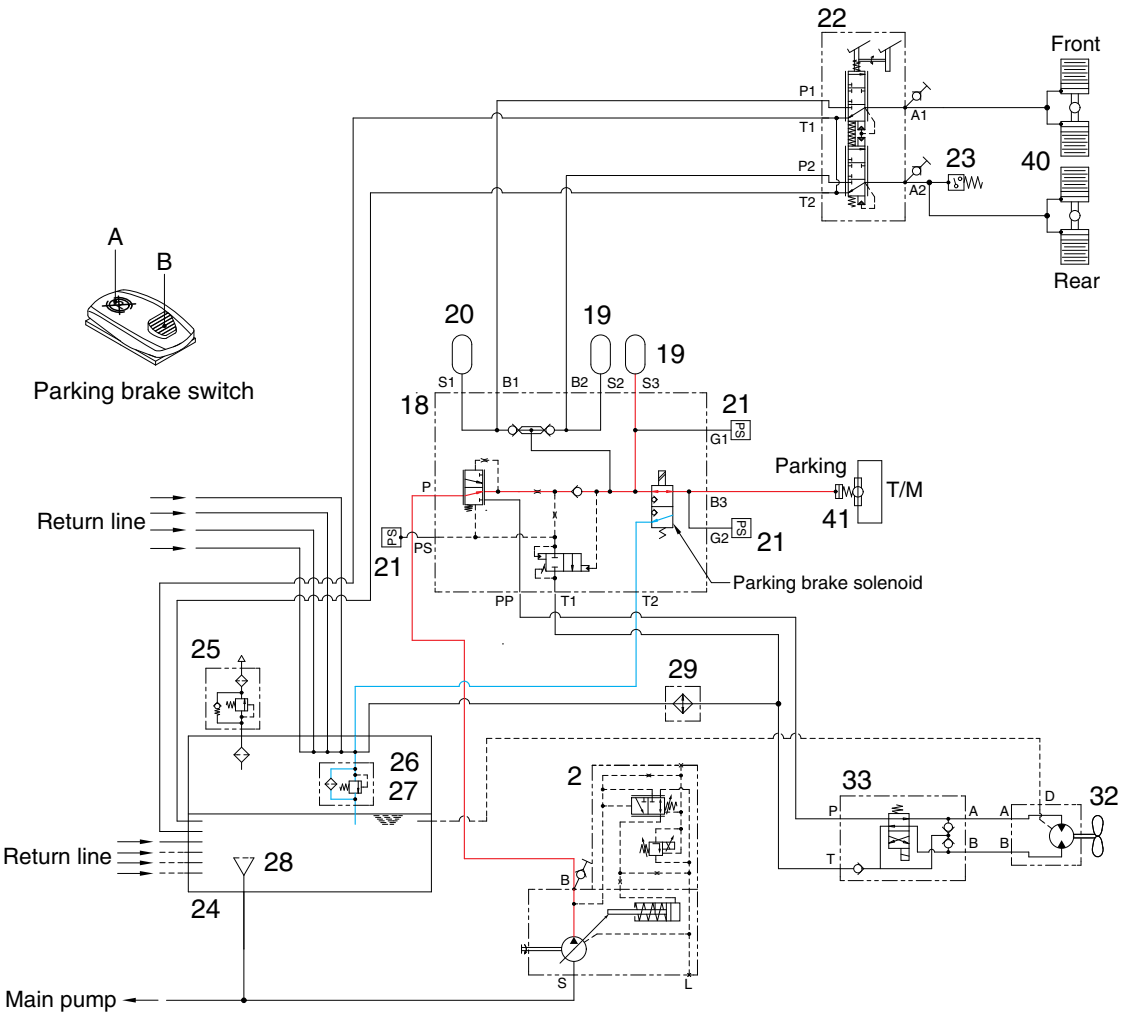
※ Pay attention to the installation position ; mount the stub shaft with the long teeth showing to the differential.



㉘ Insert the sun gear shaft until contact is obtained.



3) PARKING BRAKE RELEASED



7709A4BS04

When the parking brake switch is pressed A position, the solenoid valve is energized and the hydraulic oil controlled the pressure level by the cut-off valve enters the parking brake. It overcomes the force of the spring and pushes the piston rod. This releases the brake.

Therefore, the hydraulic oil pressure is applied to the parking brake piston through the solenoid valve and the parking brake is kept released.

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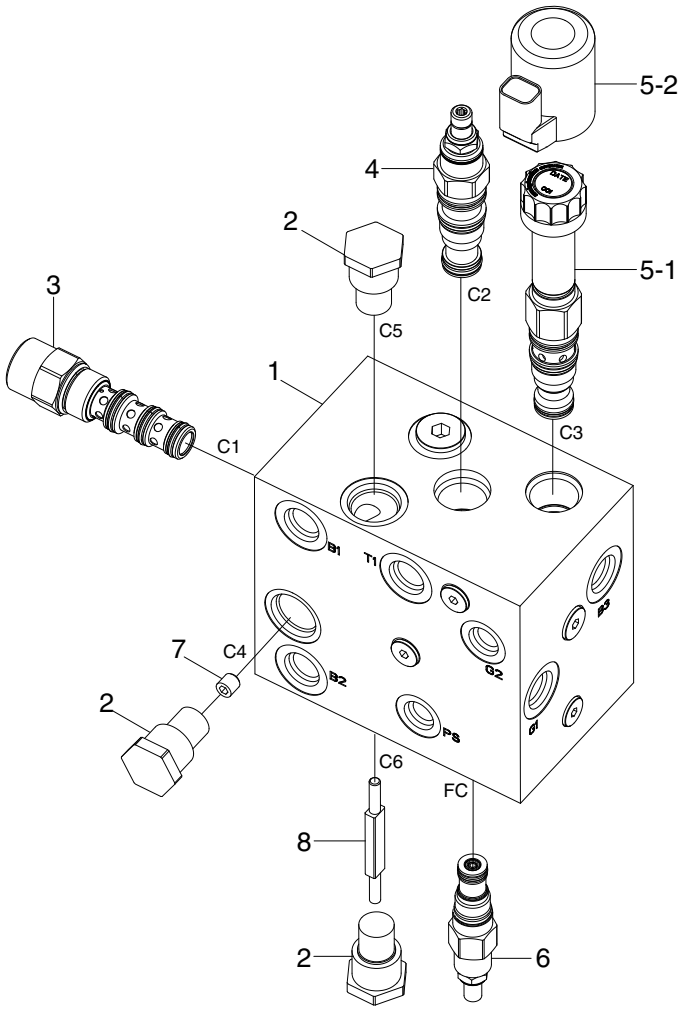


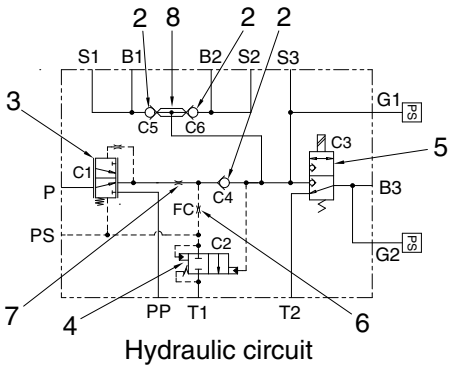
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5. CUT-OFF VALVE

1) STRUCTURE





Hydraulic circuit

7609A4BS32

Part name	Port size
P, PP	SAE 3/4"
T2	PF 1/2
T1, S1, S2, S3, B1, B2, B3, G1	PF 3/8
PS, G2	PF 1/4

1	Block	4	Unload valve	6	Fixed orifice with compensated
2	Check valve	5-1	Solenoid valve	7	Orifice
3	Priority valve	5-2	Coil	8	Bar

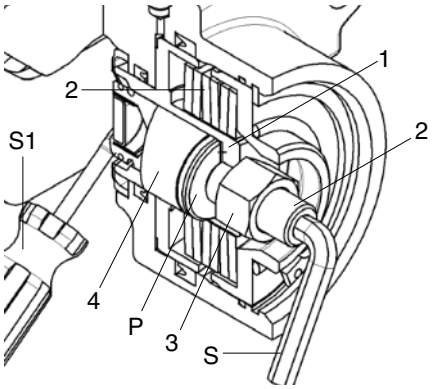
5) MAINTENANCE AND REPAIR WORK

(1) Maintenance and exchange of brake pads

The brake pads themselves are maintenance free. All that is required here is a check for damaged parts, as well as inspection to ensure that the brake disk remains easy running.

The thickness of the brake lining must be subjected to a visual inspection at regular intervals, which depend on vehicle usage, but every six months at the latest. In the event of a minimal residual lining thickness, these intervals must be reduced accordingly in order to avoid major damage to the brake or disk.

Min. residual thickness 2.0 ㎜ per lining pad (8 ㎜ carrier plate thickness).

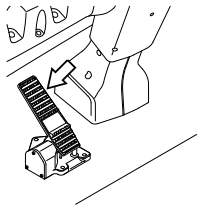
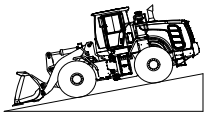
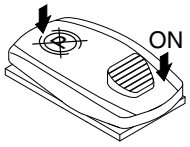
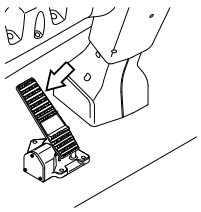


100D7BS113

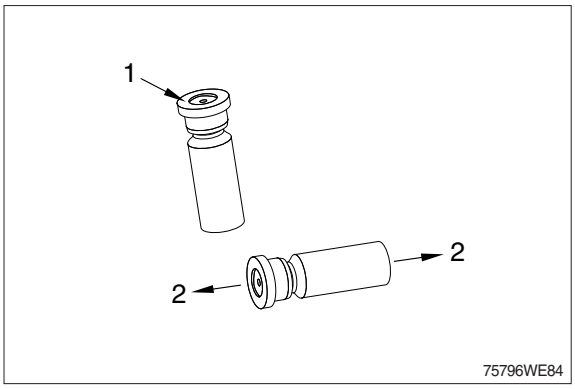
1	Piston	S	Socket wrench
2	Adjusting screw	S1	Screwdriver
3	Lock nut	P	Inside of the piston
4	Thrust bolt		

※ Only original spare lining plates may be used. If any other spare parts are used, no warranty claims will be accepted either for the brakes or their functional characteristics.

① Stand the vehicle on an even surface and secure against rolling away.
② Release the parking brake by applying 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 it lies flush with the inside of the piston.
⑤ Press back the thrust bolt using a suitable screwdriver until it has contact with the piston.

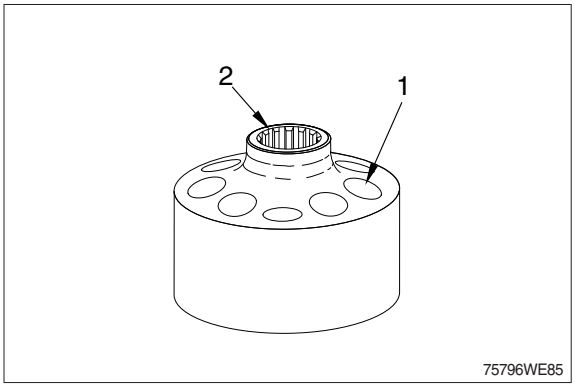
Item	Description	Service action
Service brake pedal check	 Slowly depress brake pedal. Listen for a hissing noise that indicates oil is flowing to brake pistons. **LISTEN/FEEL** : A hissing noise must be heard when pedal is depressed.	**OK** Check completed. **NOT OK** Inspect for debris under brake 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	  Select clutch cut-off mode to L mode. 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 can be selected to operator preference to match your loading needs.	**OK** Check completed. **NOT OK** Adjust clutch cut-off mode.

(6) Check :
Check to see that there are no scratches or metal deposits on the sliding surface (1) and that there is no axial play (2) (Pistons must only be replaced as a set).

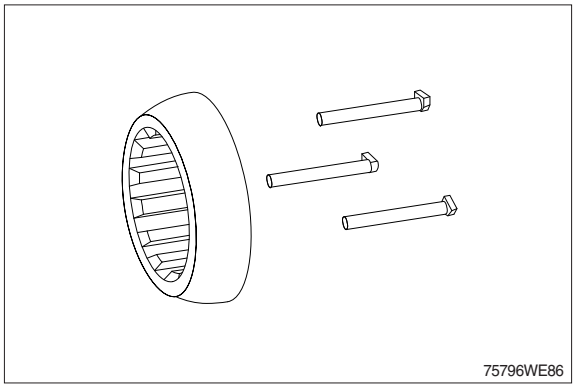


(7) Check :

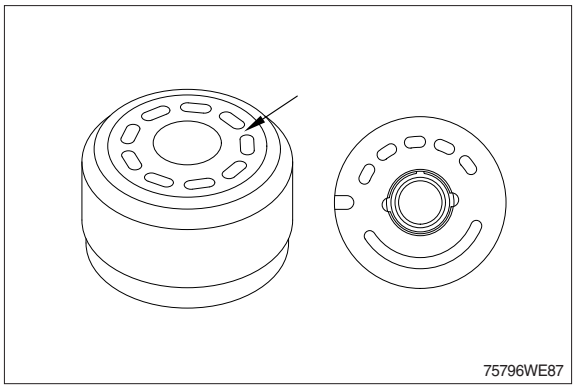
1 Cylinder bores
2 Splines



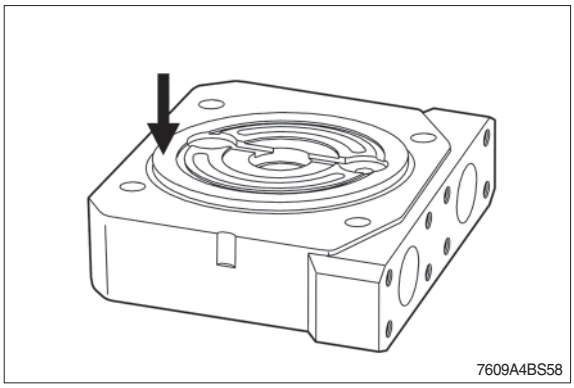
(8) Free of grooves, no signs of wear.



(9) Check :
Cylinder sliding surface free of grooves, no wear, no embedded foreign particles. That there are no scratches on the control plate. (Only replace them as a set).

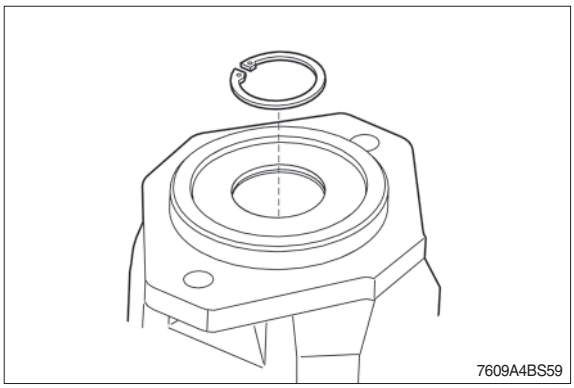


(5) Mounting surface - control plate undamaged.

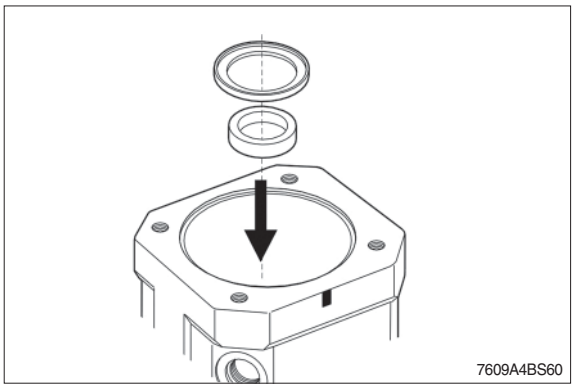


5) MOTOR ASSEMBLY

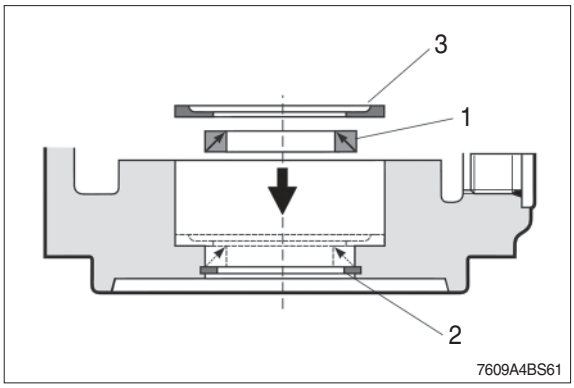
(1) Fit the circlip into the housing.



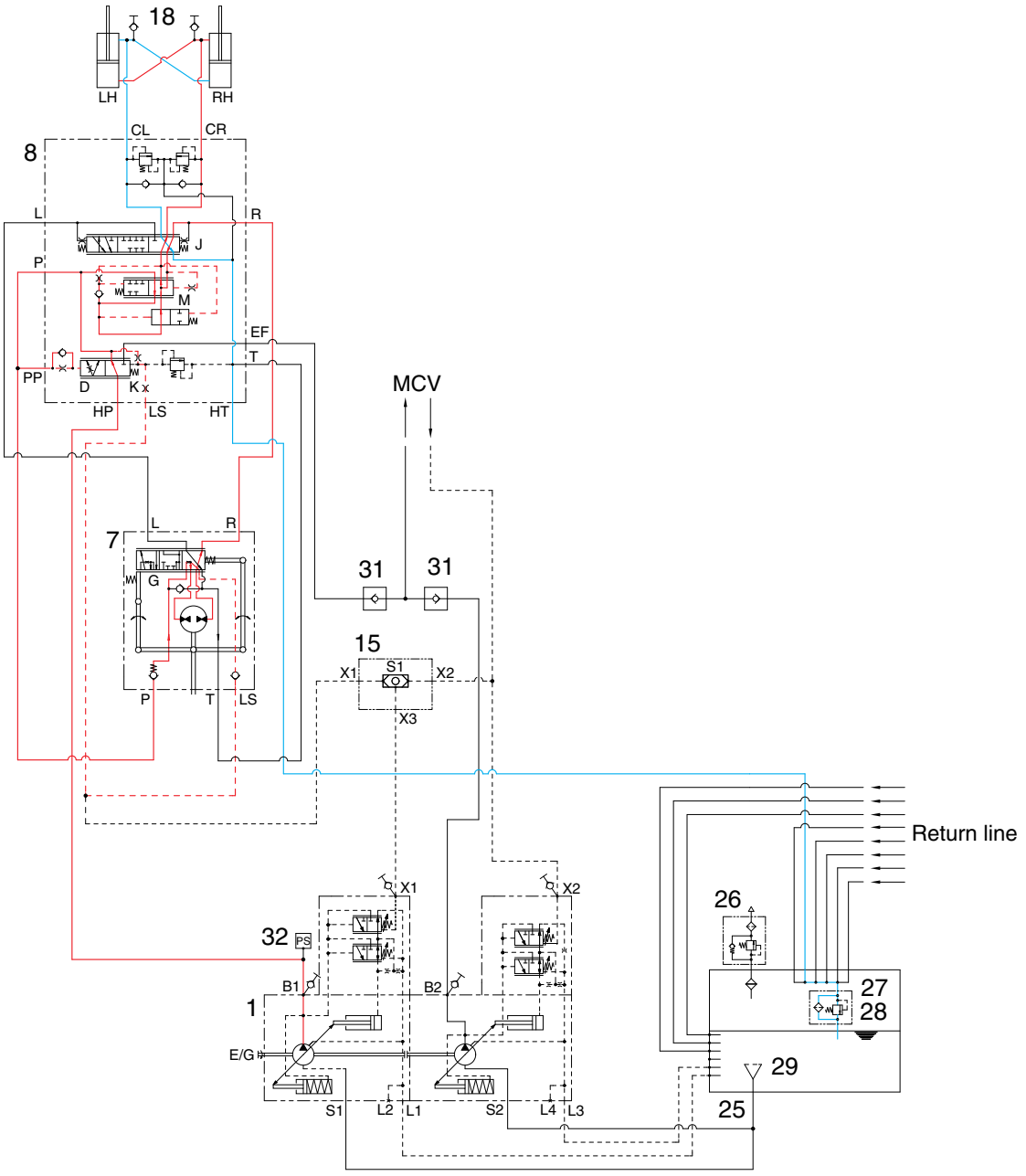
(2) Assemble shaft seal and shim against circlip.



(3) Assembly of the shaft seal (1) against the safety ring (2) back up the shim (3) down to the seal ring.



3) RIGHT TURN

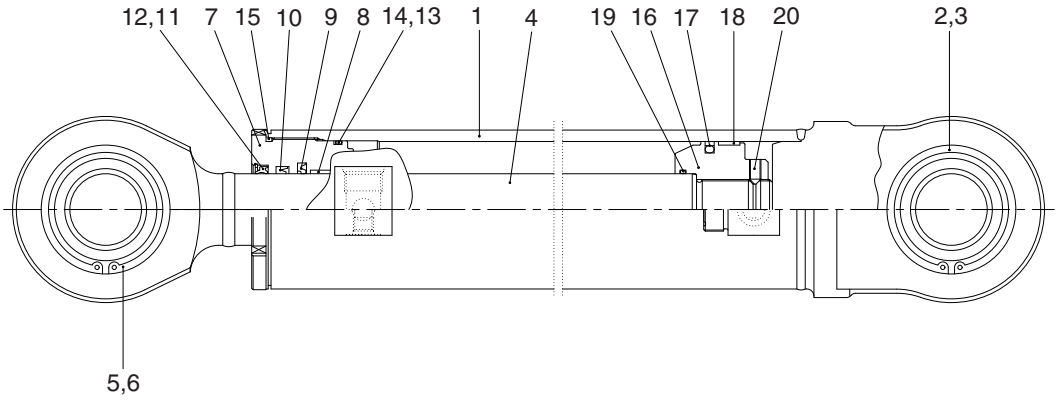


770F5SE04

- When the steering wheel is turned to the right, the spool (G) within steering unit (7) connected with steering column shaft is pushed to the right direction.
- The oil discharged from the pump flows into HP port of flow amplifier (8).
- The delivered oil passes through the main orifice of steering unit (7), through the priority valve spool (D) of flow amplifier (8). 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 (7) 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 (8).
- When the above operation is completed, the machine turns to the right.

5. STEERING CYLINDER

1) STRUCTURE



77095SE17

1	Tube assembly	8	Rod bushing	15	O-ring
2	Spherical bearing	9	Buffer seal	16	Piston
3	Retaining ring	10	U-packing	17	Piston seal
4	Rod assy	11	Dust wiper	18	Wear ring
5	Spherical bearing	12	Retaining ring	19	O-ring
6	Retaining ring	13	O-ring	20	Set screw
7	Gland	14	Back up ring		

2) OPERATION

This machine use to cross connected cylinder for steering operation.

The steering cylinder use a gland (7) to remove piston and sealed seals. Dust wiper (11) located on the in side of the glands (7) protects cylinder inner parts from dust. The piston (16) is fastened to the rod (4).

The piston uses a single wear ring (18) with a piston seal (17) to seal between the piston and tube. The gland seals against the tube with two O-rings. The rod is sealed against the gland with a U-packing (10).

5) Start the filter caddy. Check to be sure oil is flowing through the filters.
   Operate filter caddy approximately 10 minutes so oil in hydraulic oil tank is circulated through filter a minimum of four times.

※ Hydraulic oil tank capacity 152 ℓ (40.2 U.S. gal).
   Leave filter caddy operating for the next steps.

6) Start the engine and run it at high idle.

※ For the most effective results, cleaning procedure must start with the smallest capacity circuit then proceed to the next largest capacity circuit.

7) Operate all functions, one at a time, through a complete cycle in the following order: clam, steering, bucket, and boom. Also include all auxiliary hydraulic functions.

   Repeat procedure until the total system capacity has circulated through filter caddy seven times, approximately 30 minutes.
   Each function must go through a minimum of three complete cycles for a through cleaning for oil.

※ Filtering time for machines with auxiliary hydraulic functions must be increased because system capacity is larger.

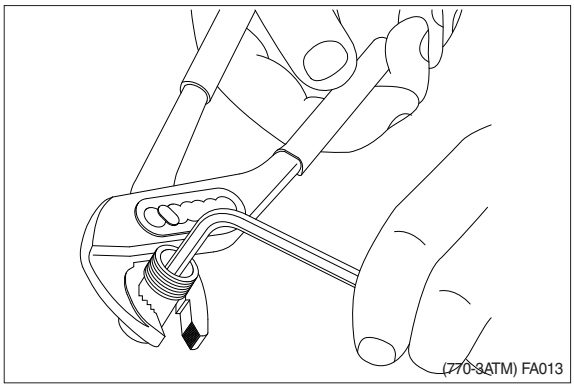
8) Stop the engine. Remove the filter caddy.

9) Install a new return filter element.

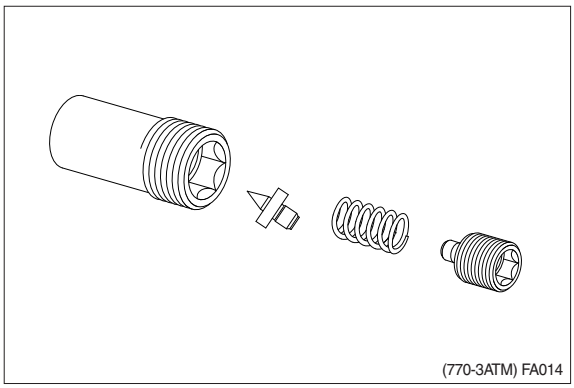
10) Check oil level in hydraulic oil tank ; Add oil if necessary.

(3) Disassembly pressure relief valve

① Hold cartridge (multigrip pliers) and screw the adjustment screw out (5 mm hexagon key).

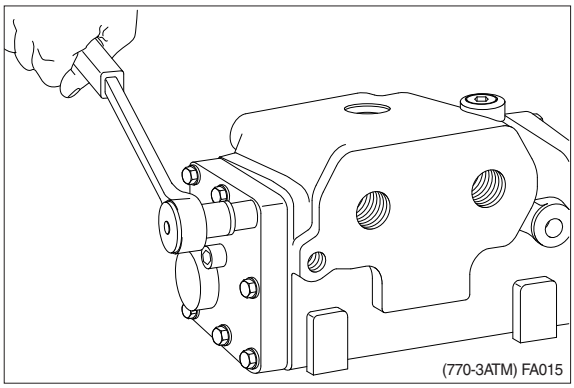


② Pressure relief valve shown disassembled.

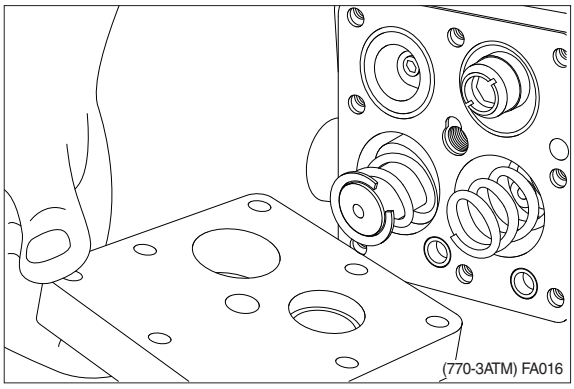


(4) Removing end cover at PP-connection

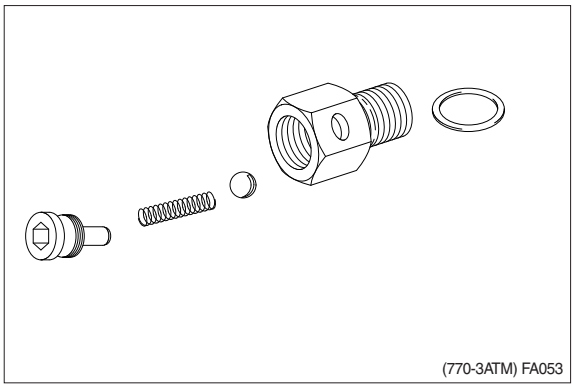
① Unscrew screws with spring washer using hexagon socket for 13 mm external hexagon and 10 mm internal hexagon.



② Remove end cover.



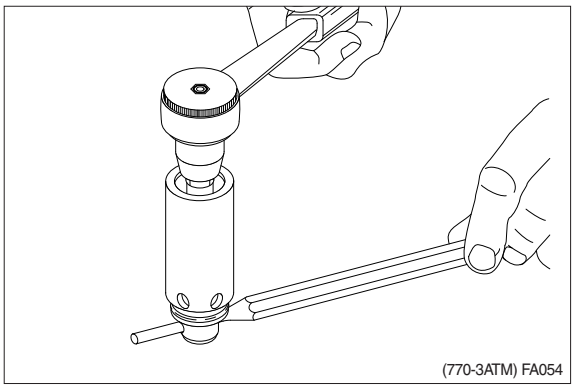
② Check valve shown disassembled.


(770-3ATM) FA053

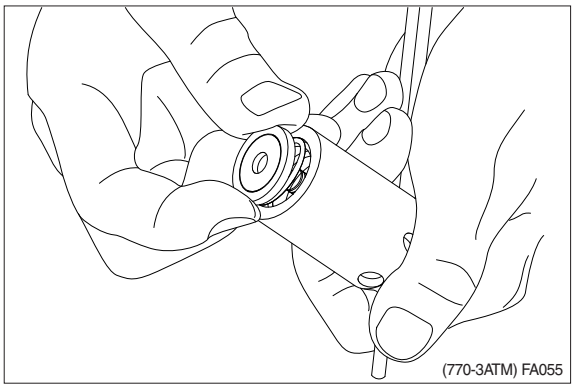
(14) Disassembly of shock valve / suction valve

① Unscrew locknut with hexagon socket for 13 mm external hexagon. Use a mandrel.

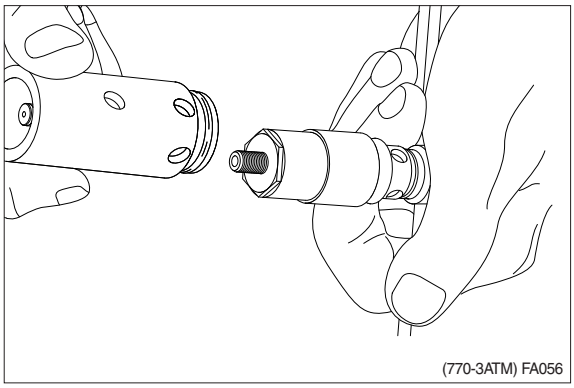
※ When readjusting shock valve hold locknut with 13 mm ring spanner.


(770-3ATM) FA054

② Take out disc and spring.

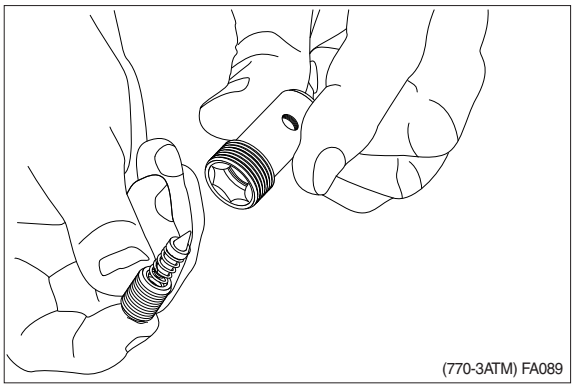

(770-3ATM) FA055

③ Take off housing.

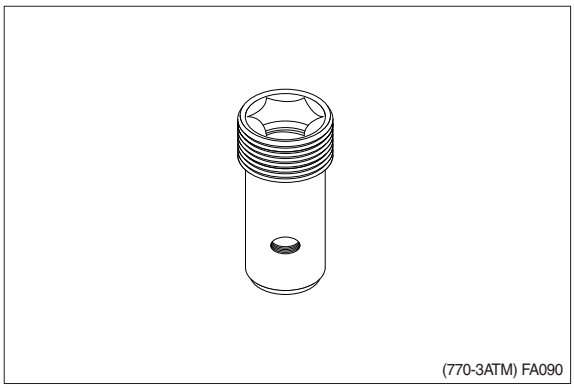

(770-3ATM) FA056

(8) Assembly of pressure relief valve

① Guide adjustment screw, spring and cone up into the cartridge.

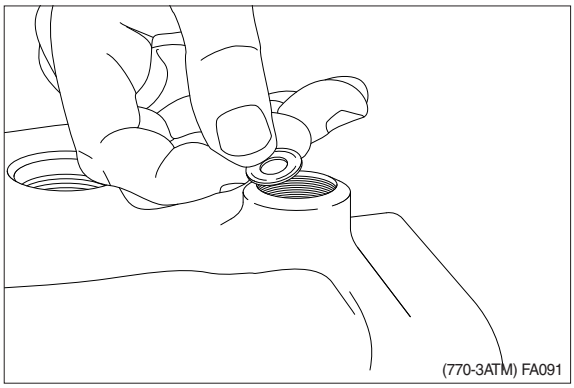

(770-3ATM) FA089

② Screw the adjustment screw so far in that the 10 ㎜ hexagon key fully engages.


(770-3ATM) FA090

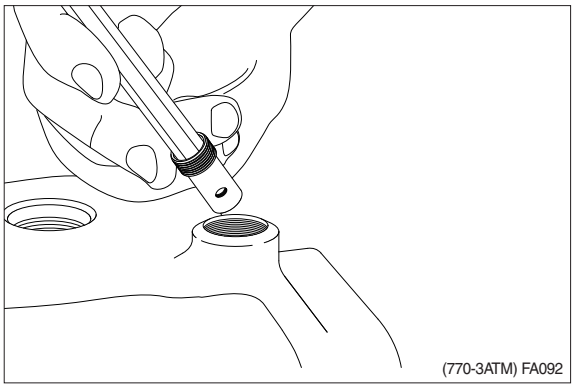
(9) Installation of pressure relief valve

① Let the washer drop into the hole.

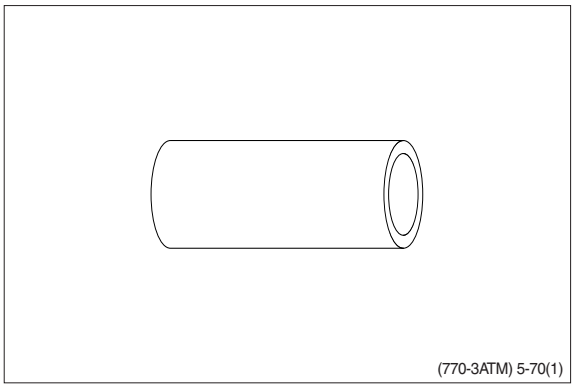

(770-3ATM) FA091

② Fit pressure relief valve.

· Tightening torque : 3.1±0.3 kgf · m
(22.4±2.2 lbf · ft)

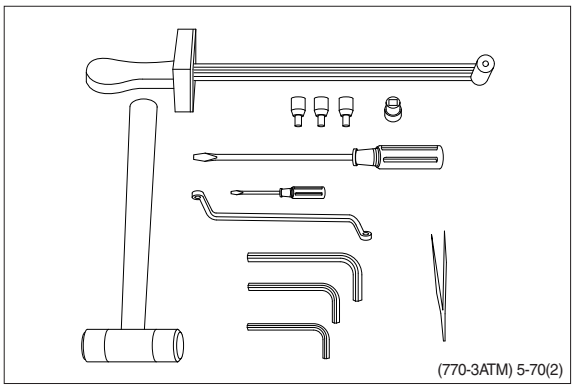

(770-3ATM) FA092

(5) Assembly tool for dust seal.



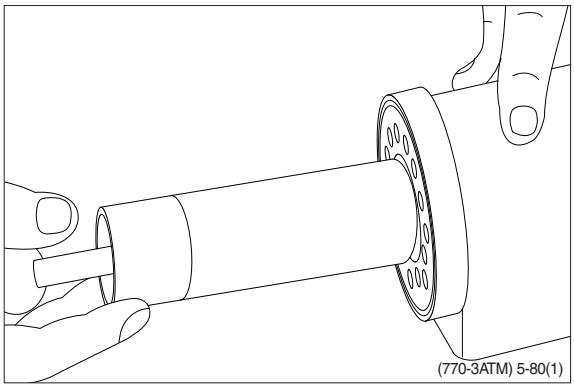
(770-3ATM) 5-70(1)

(6) Torque wrench 0~7.1 kgf · m
(0~54.4 lbf · ft)
13 mm socket spanner
6, 8 mm and 12 mm hexagon sockets
12 mm screwdriver
2 mm screwdriver
13 mm ring spanner
6, 8 and 12 mm hexagon socket spanners
Plastic hammer
Tweezers



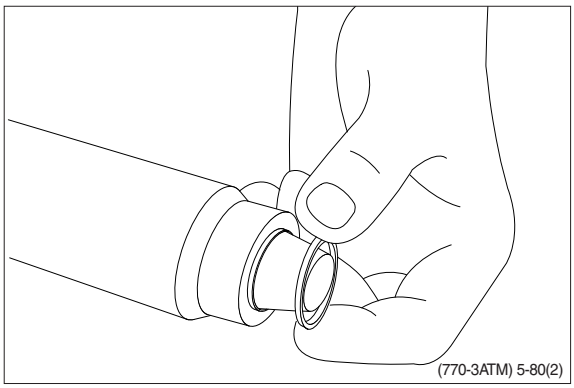
(770-3ATM) 5-70(2)

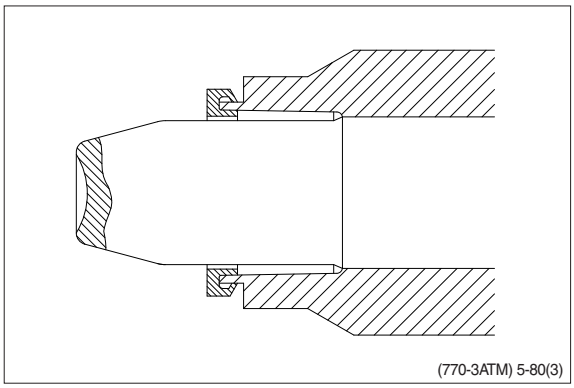
(14) Draw the inner and outer parts of the assembly tool out of the steering unit bore, leaving the guide from the inner part in the bore.


(770-3ATM) 5-80(1)

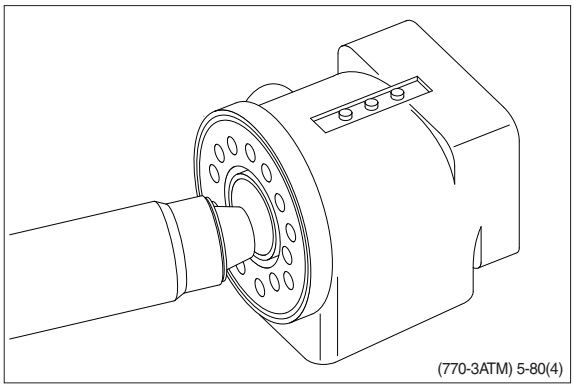
Installation instructions for lip seal

(15) Lubricate the lip seal with hydraulic oil and place it on the assembly tool.


(770-3ATM) 5-80(2)


(770-3ATM) 5-80(3)

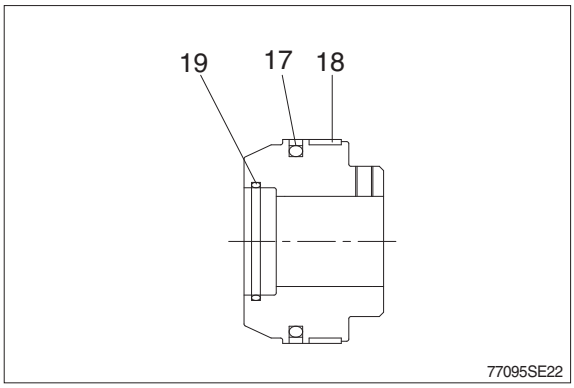
(16) Guide the assembly tool right to the bottom.


(770-3ATM) 5-80(4)

(3) Disassemble the piston assembly

① Remove wear ring (18) and piston seal (17).
Remove O-ring (19).

※ Exercise care in this operation not to damage the grooves.

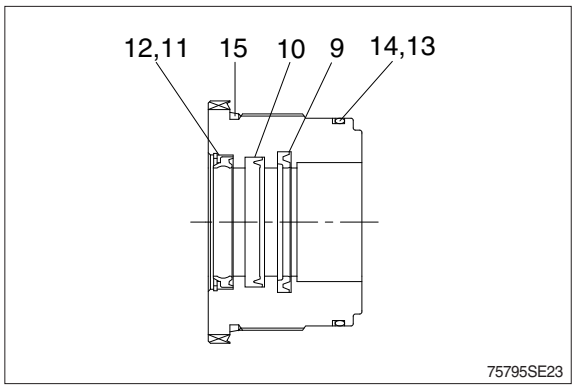


(4) Disassemble gland assembly

① Remove back up ring (14), and O-ring (13).
② Remove O-ring (15).
③ Remove retaining ring (12) and dust wiper (11).
④ Remove U-packing (10) and buffer seal (9).

※ Exercise care in this operation not to damage the grooves.

※ Do not remove seal and ring, if does not damaged.



GROUP 1 STRUCTURE AND FUNCTION

1. HYDRAULIC SYSTEM OUTLINE

The loader hydraulic system is a pilot operated, closed center system which is supplied with flow from the variable displacement piston main hydraulic pump.

The loader system components are :

- Main pump
- Main control valve
- Bucket cylinder
- Boom cylinders
- Remote control valve (Pilot control valve, EH type)
- Safety valve

Flow from the main hydraulic pump not used by the steering system leaves the flow amplifier EF port. It flows to the inlet port plate of two section or three section block type main control valve.

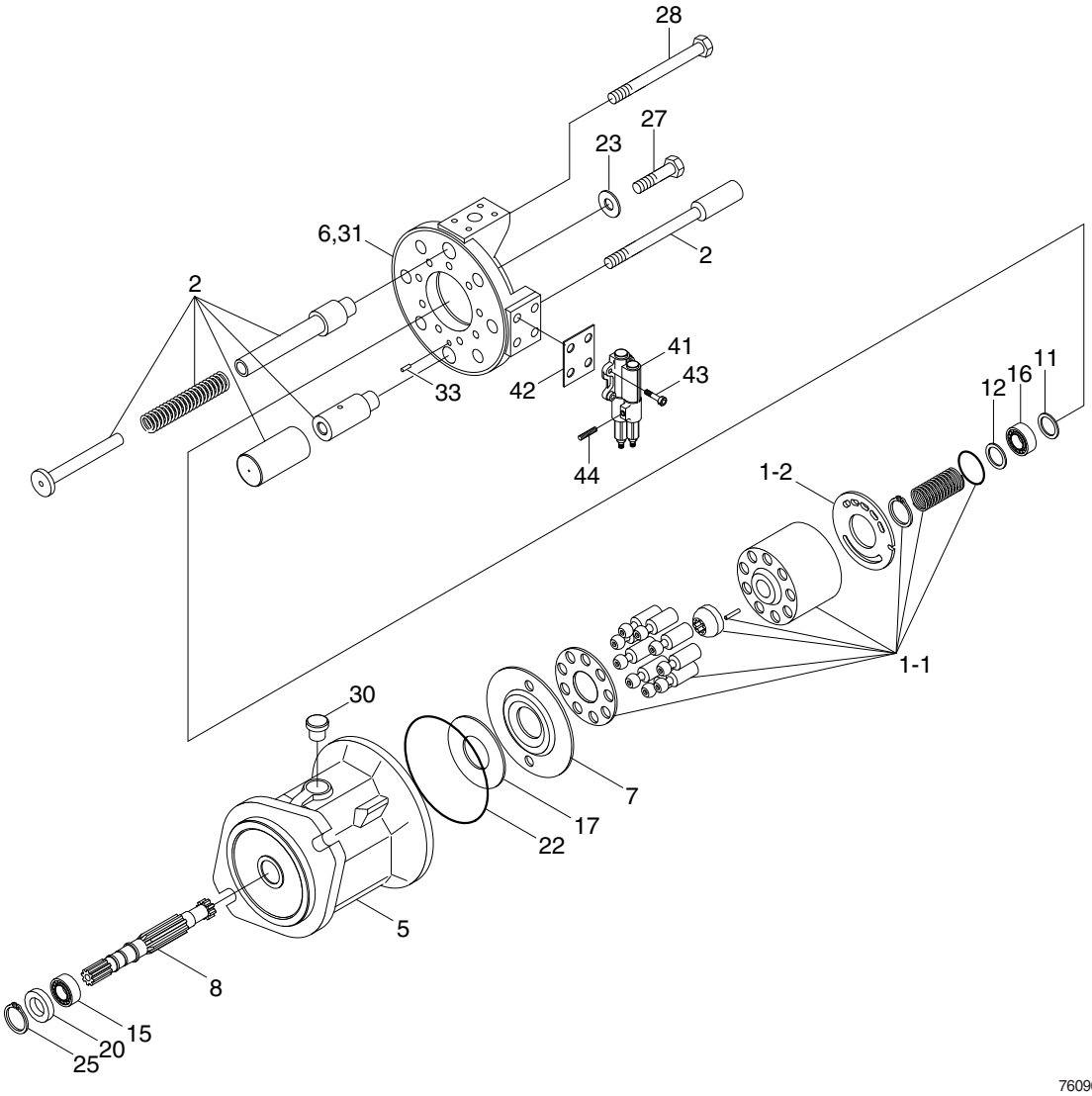
The main control valve is load pressure independent flow distribution system which routes flow to the boom, bucket or auxiliary cylinders (not shown) when the respective spools are shifted.

Flow from the main pump is routed to the main control valve where pump outlet pressure is reduced to pilot circuit pressure. The main control valve flow to the remote control valve.
The remote control valve routed flow to either end of each spool valve section in the main control valve to control spool stroke.

A accumulator mounted on safety valve supplies a secondary pressure source to operated remote control valve so the boom can be lowered if the engine is off.

The return circuit for the main hydraulic system have return filter inside the hydraulic tank. The return filter uses a filter element and a bypass valve. The bypass valve is located in the upside of filter.

· **MAIN PUMP** (2/2, LOADER)



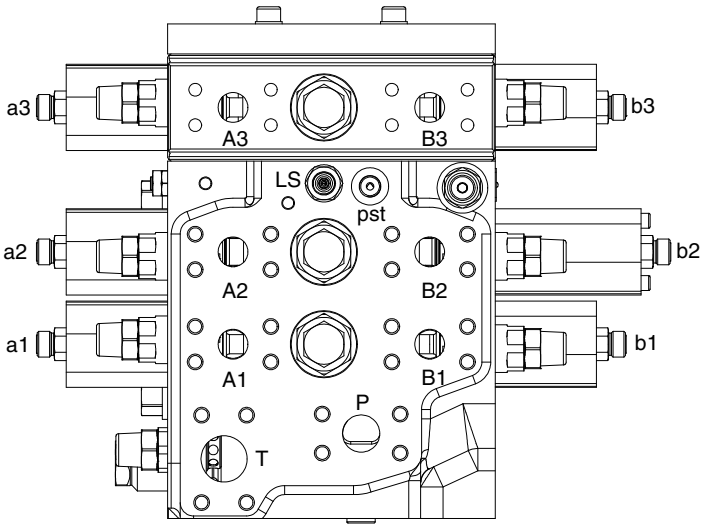
76096WE12

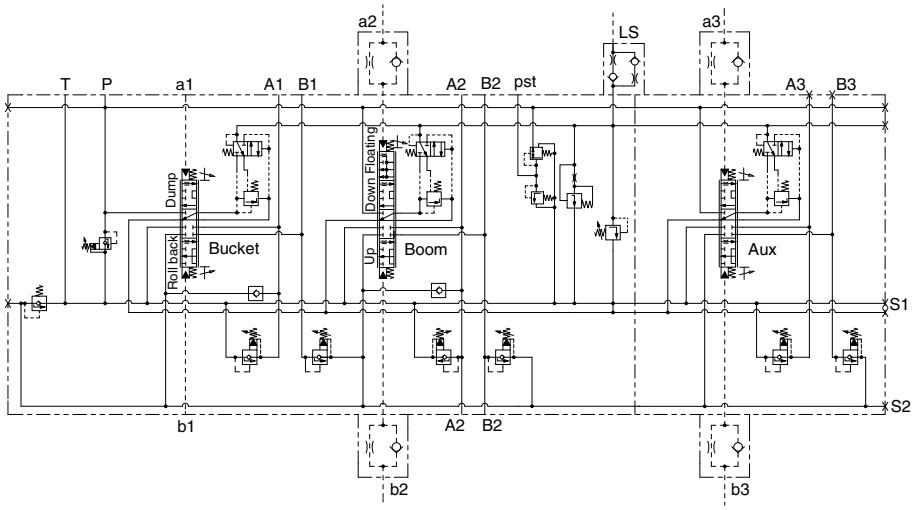
1	Rotary group	12	Adjustment shim	28	Locking screw
1-1	High speed rotary group	15	Taper roller bearing	30	Locking screw
1-2	Control plate	16	Taper roller bearing	31	Double break-off pin
2	Adjusting piece	17	Bearing liner	33	Cylinder pin
5	Pump housing	20	Shaft seal ring	41	Control valve
6	Port plate	22	O-ring	42	Gasket
7	Swash plate	23	O-ring	43	Socket screw
8	Drive shaft	25	Retaining ring	44	Locking screw
11	Adjustment shim	27	Socket screw		

6. MAIN CONTROL VALVE

1) STRUCTURE (1/3)

· Type : Closed center, Load pressure - Independent - Flow - Distribution



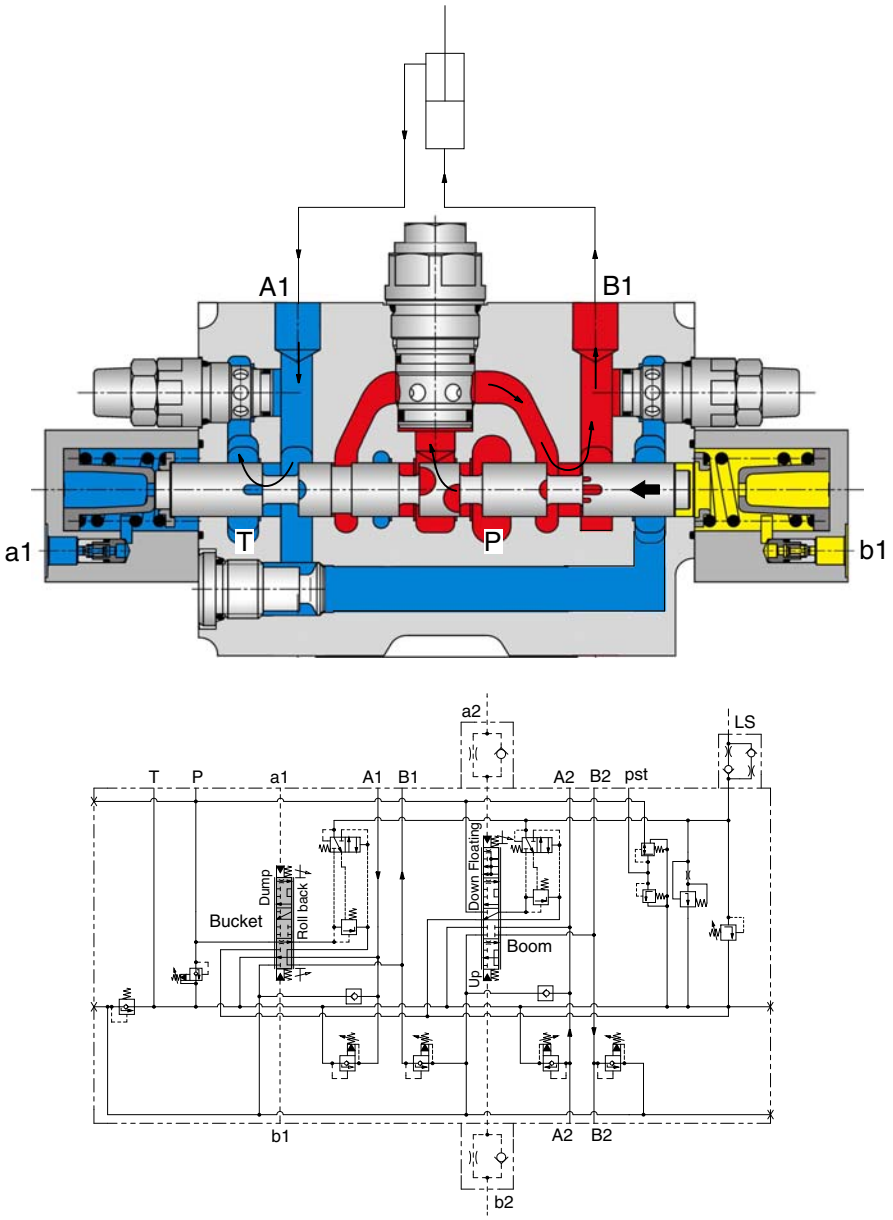


Hydraulic circuit

76096WE10

Port	Port name	Port size
P	From main pump	SAE 1"
T	To hydraulic tank	SAE 1 1/4"
A1, B1	To bucket cylinder port	SAE 3/4"
A2, B2	To boom cylinder port	SAE 3/4"
a1, b1	Bucket pilot port	11/16-16UN
a2, b2	Boom pilot port	11/16-16UN
a3, b3	Auxiliary pilot port	11/16-16UN
LS	Load sensing port	9/16-18UNF
Pst	To RCV P port	9/16-18UNF

(2) Bucket rollback position



Hydraulic circuit

76096WE56

When the pilot pressure is led to the port b1, the bucket spool moved to rollback position.
Oil from the pump flows to the cylinder port B1 and oil from the cylinder flows into the tank passage through the cylinder port A1.

GROUP 2 OPERATIONAL CHECKS AND TROUBLESHOOTING

1. OPERATIONAL CHECKS

This procedure is designed so the mechanic can make a quick check of the system using a minimum amount of diagnostic equipment. If you need additional information, read structure and function, Group 1.
A location will be required which is level and has adequate space to complete the checks.

The engine and all other major components must be at operating temperature for some checks.

Locate system check in the left column and read completely, following the sequence from left to right. Read each check completely before performing.

At the end of each check, if no problem is found (OK), that check is complete or an additional check is needed. If problem is indicated (NOT OK), you will be given repair required and group location.
If verification is needed, you will be given next best source of information:

- Chapter 2 : Troubleshooting
- Group 3 : Tests and adjustments

9) Disassemble and/or assemble the hydraulic equipment only in a clean place free of dust. When disassembling, be careful about the interchangeability of parts, and clean the disassembled parts with pure and clean mineral cleansing oil. Clean the internal passages as well. After the parts have dried, wipe them off with a clean lint-free cloth.

10) When overhauling the hydraulic equipment replace all O-rings, backup rings, etc. with new ones. Assemble O-rings with grease or vaseline applied.

11) After installing the equipment, add more hydraulic oil to make up for that lost during disassembly.

12) Tighten joints correctly. Loose joints will cause the hydraulic oil to leak. If the oil leaks, the tank oil level drops and air gets sucked in, so the pump will break down. Also loose joints in suction lines will take air in and might cause abnormal noise, malfunction or damage to pumps.

9. PILOT CONTROL VALVE (EH CONTROL BLOCK) PRESSURE TEST

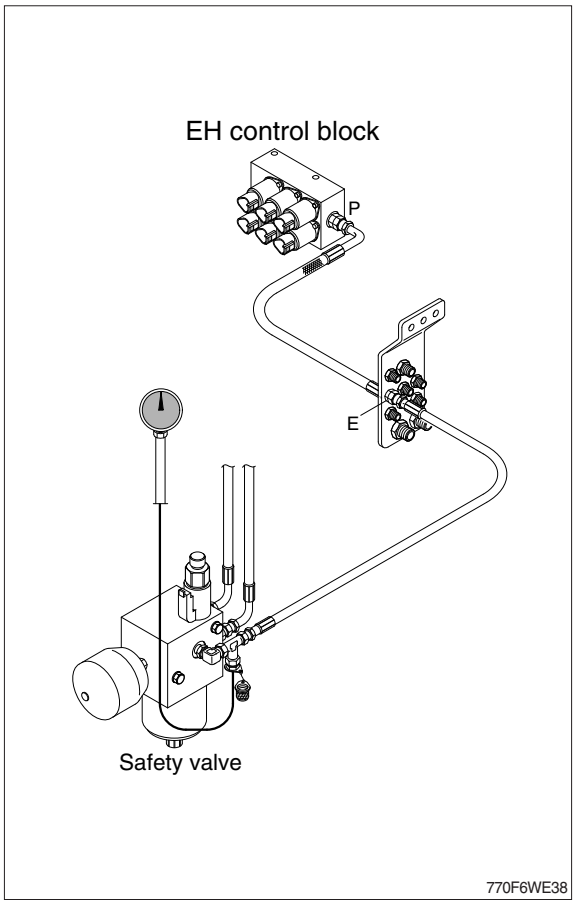
· **SPECIFICATION**

Oil temperature	45±5˚C(113±9˚F)
Engine speed	High idle
Minimum pressure	30 bar
Pressure range	35~50 bar

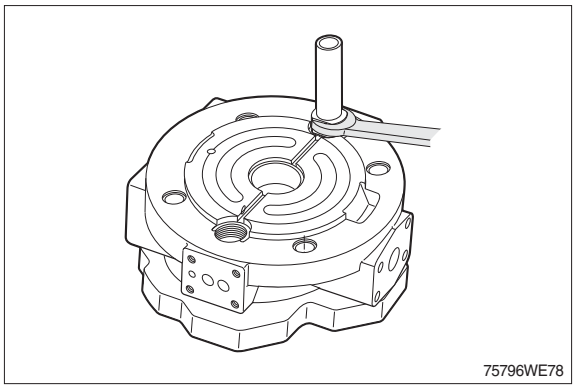
· **GAUGE AND TOOL**

Gauge 0~7 MPa (0~70 bar, 0~1000 psi)

1) Lower boom to ground.
2) Connect gauge to the pilot pressure port of function to be checked.
3) Install temperature reader (see temperature reader installation procedure in this group).
4) Heat hydraulic oil to specification (see hydraulic oil warm up procedure in this group).

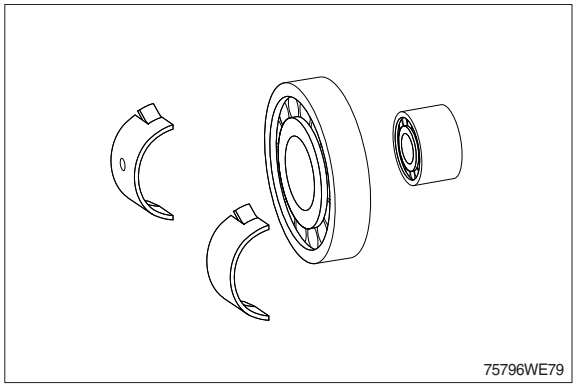


(14) Disassemble the guide of the opposite piston.

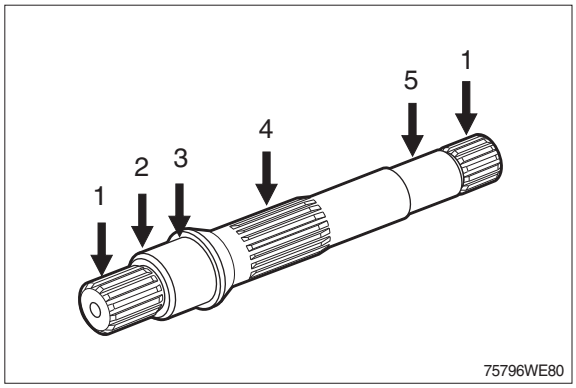


6) INSPECT HINTS

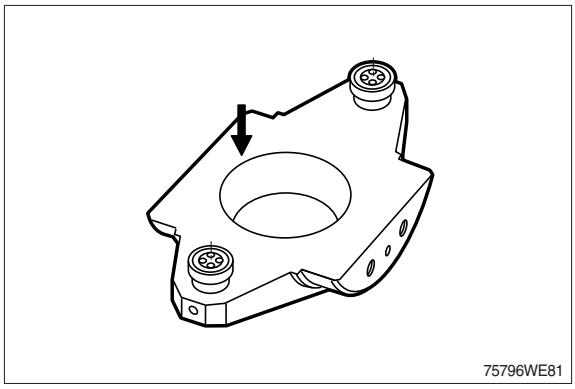
(1) Renew all bearings.



(2) Check :
1 Wear on splines, rust
2 Drive shaft seal wear grooves
3 Bearing seat
4 Splines for cylinder drive
5 Bearing seat



(3) Check :
Sliding surface free of grooves.



5) DISASSEMBLY AND ASSEMBLY

(1) Spool

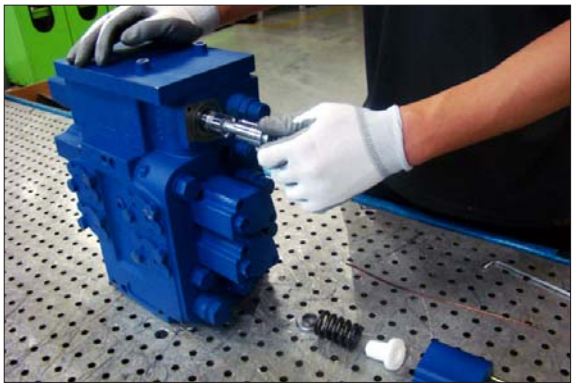
① Loosen the bolt (2EA).

- Tool : Wrench 5 mm
- Tightening torque : 0.85 kgf · m (6.1 lbf · ft)



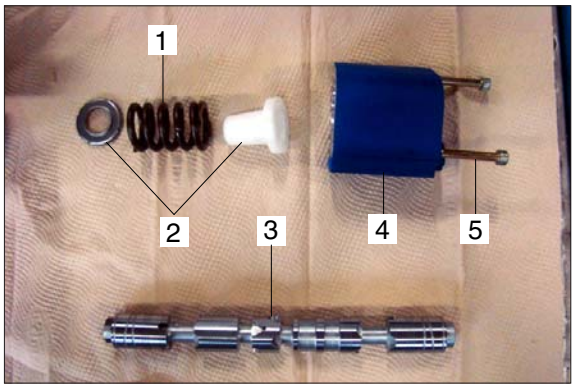
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② Remove the cover, spring retainer, spring and spool.



76096WE41

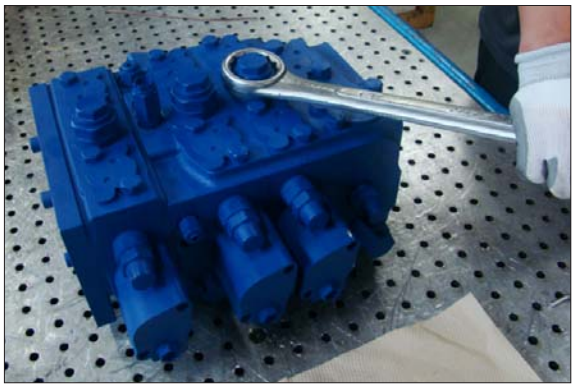
1 Spring
2 Spring ratainer
3 Spool
4 Cover
5 Bolt



76096WE42

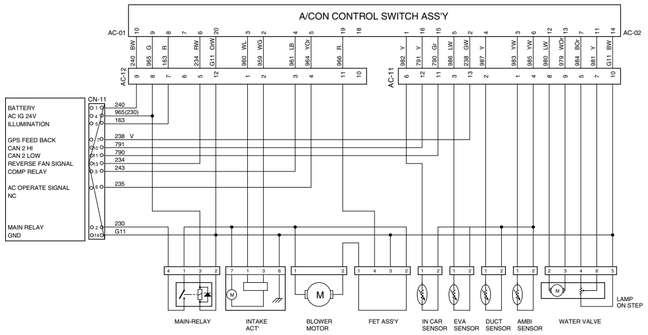
(2) Compensator valve

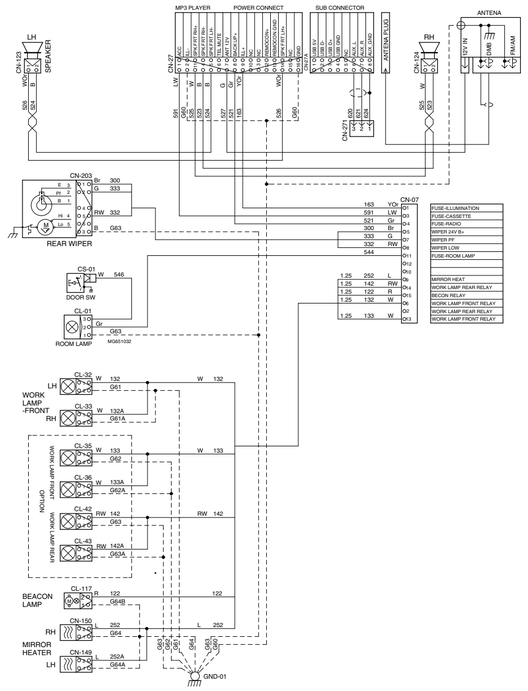
- Tool : Spanner 42 mm

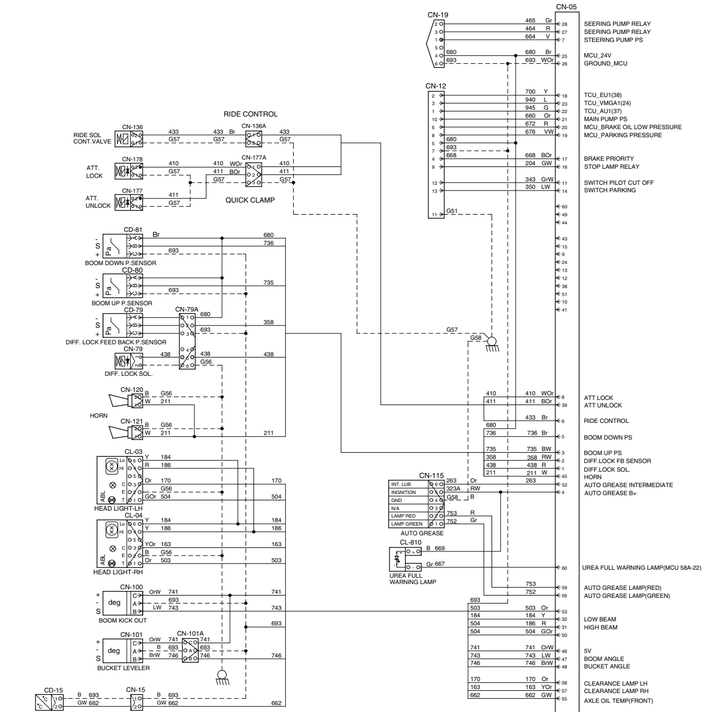


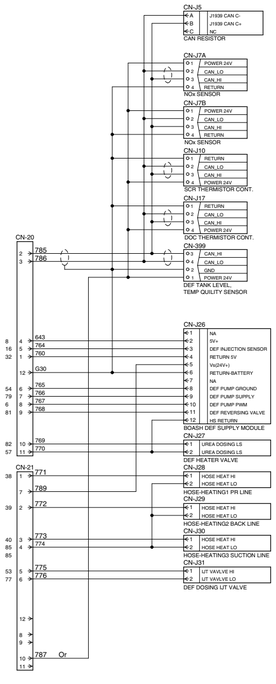
76096WE43

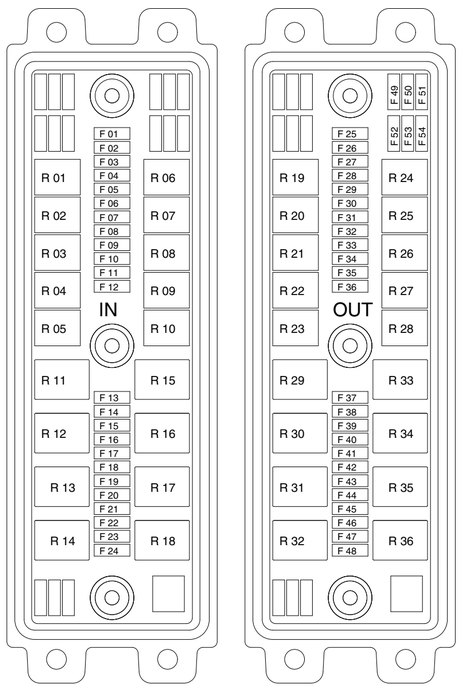
· ELECTRICAL CIRCUIT (3/3, machine serial number : ~#0247)

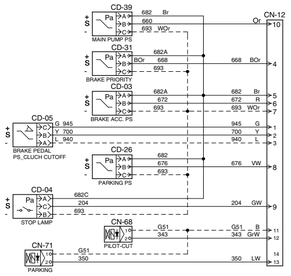


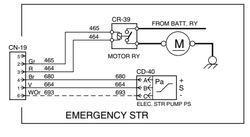




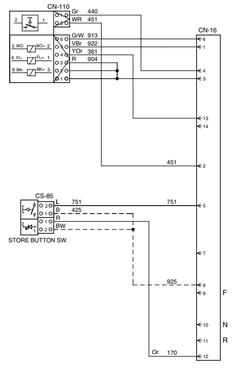




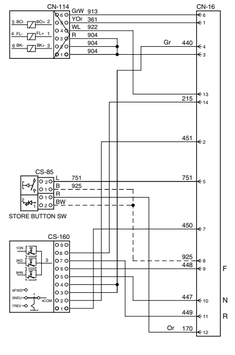




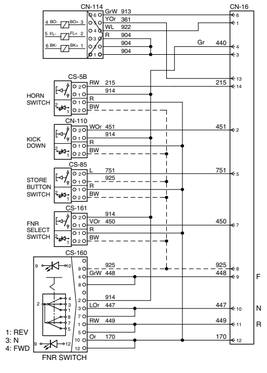
RH-STD RCV (21WB-11150)



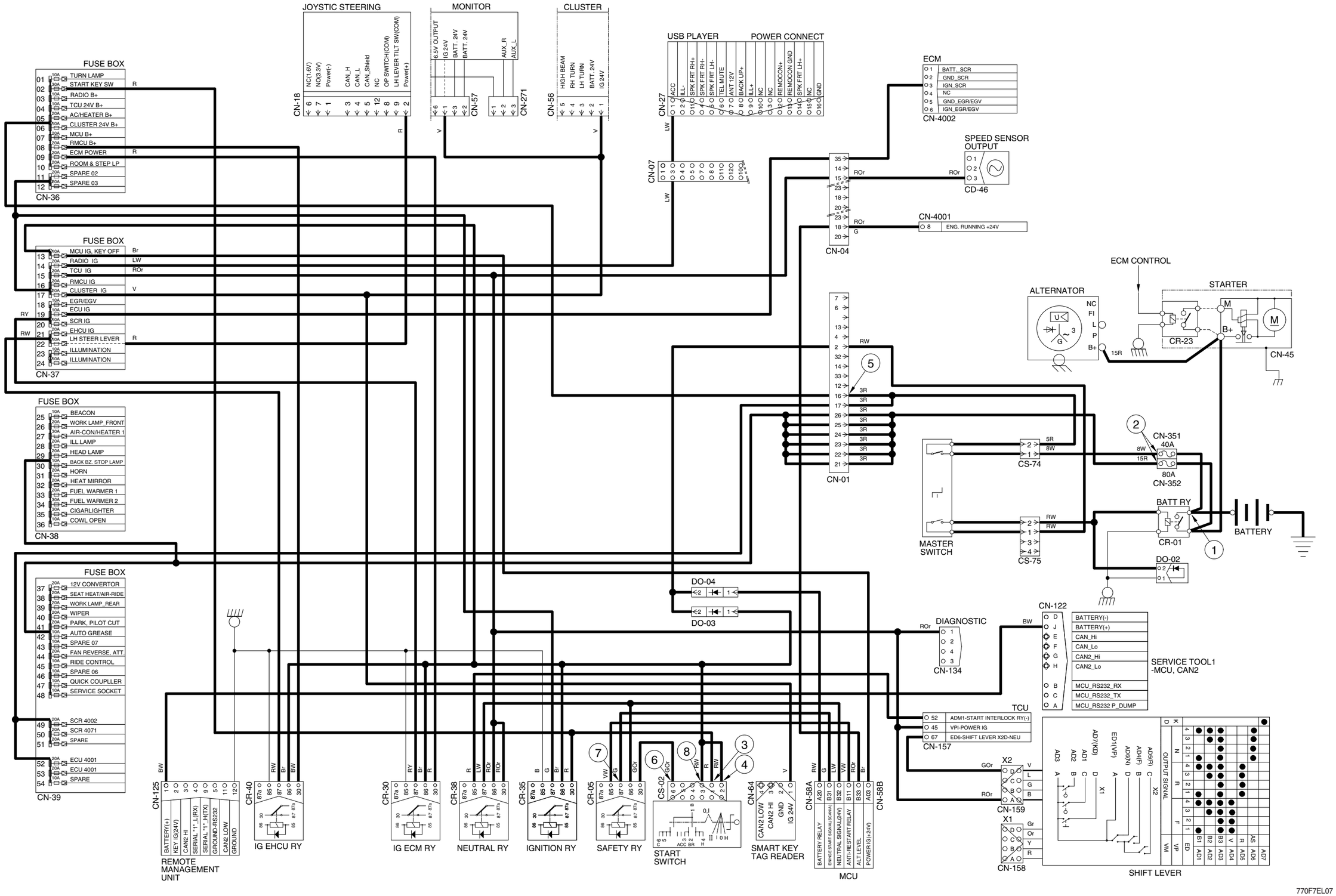
RH-JOYSTICK TYPE RCV (21WB-11141)



RH-FINGER TIP TYPE RCV (21WB-11131)

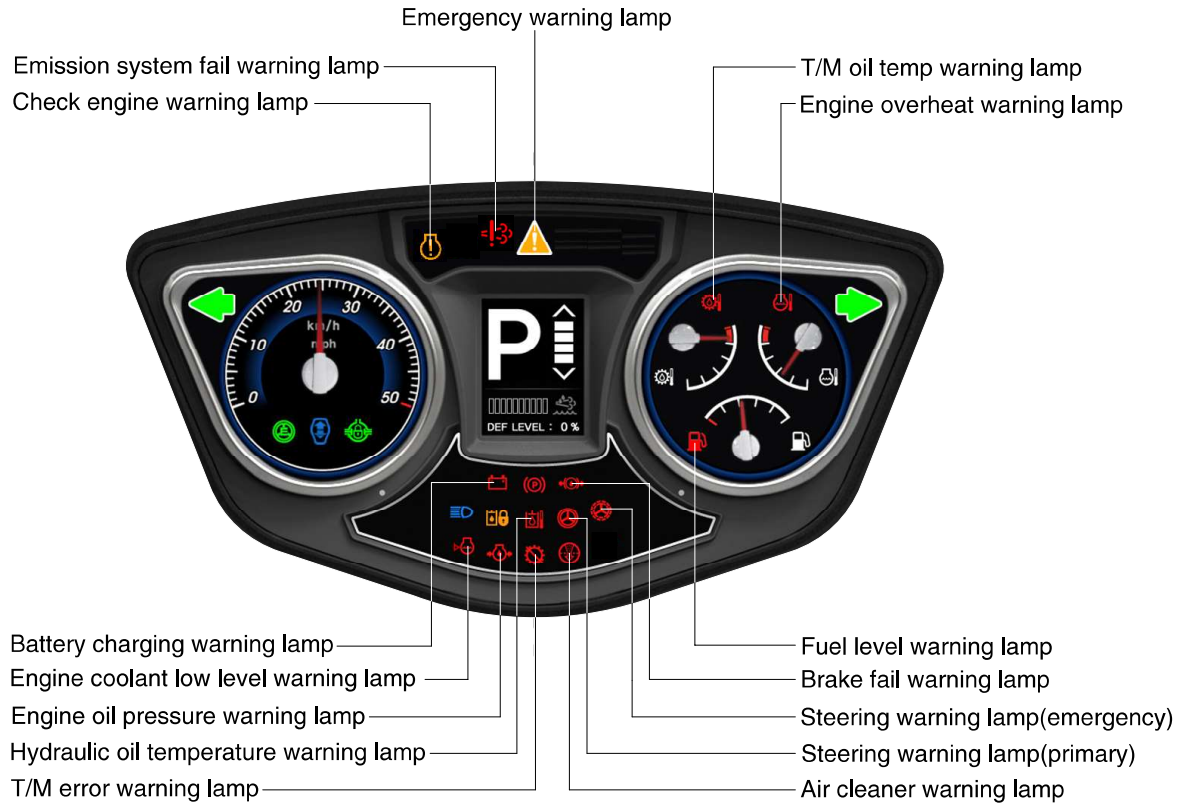


STARTING CIRCUIT



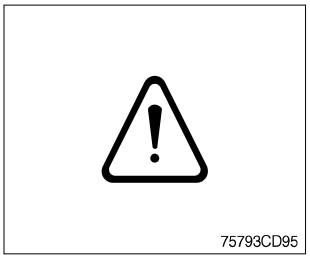
770F7EL07

3) WARNING LAMPS



770F3CD09

(1) Emergency warning lamp

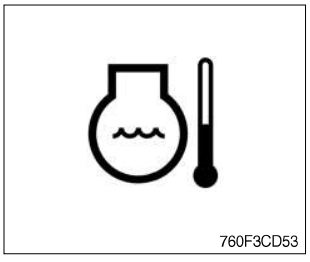


75793CD95

① This lamp blinks when each of the below warnings is happened.
- Warning lamps light ON
- MCU input voltage abnormal
- Monitor communication data error
- Engine ECM and TCU communication data error

② When this warning lamp blinks, machine must be checked and service immediately.

(2) Engine overheat warning lamp



760F3CD53

① This lamp is turned ON when the temperature of coolant is over the normal temperature (113˚C, 235˚F).

② Check the cooling system when the lamp is ON.

⑤ Quick menu



760F3CD08F-1

※ Move the quick menu screen by touching  .

ⓐ User switching

· When multiple users share a machine, it allows users to switch user settings of machine.

· User can apply or save the setting of monitor easily.

ⓑ Active fault

· Display the fault code of MCU/ECU/TCU/EHCU.

· Refer to page 7-46.

ⓒ Maintenance

· Elapsed time, change or replace cycle can be changed.

· Refer to page 7-49.

ⓓ Help

· Read the monitor manual as a PDF file on the monitor.

※ Smart terminal

· The menu features a smartphone and operates the miracast.

ⓐ User switching



760F3CD08H-1

ⓑ Active fault



760F3CD16-1

ⓒ Maintenance



760F3CD08J-1

ⓓ Help



760F3CD08K

ⓔ Virtual keypad

To display the virtual keypad, drag the button () to top of the screen.

※ Refer to the page 7-57 for details.



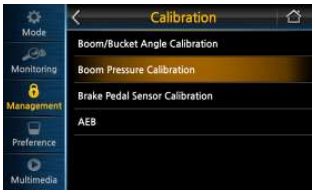
760F3CD68A-1

Virtual keypad



760F3CD68B-1

· **Boom pressure calibration**



760F3CD70A


760F3CD70B-1

Display A

- Press START button after following the instruction.
- After a few minutes, "Calibration fail" or "Calibration success" message will be shown. Press complete button then process be ended.

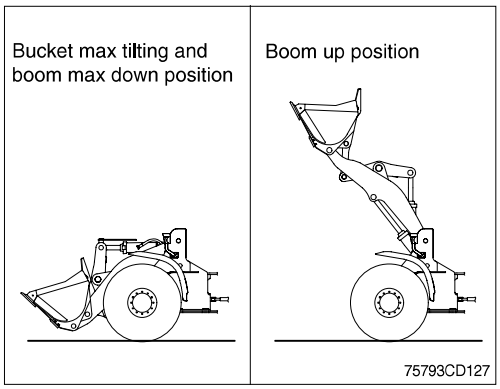
※ **Using button**

- Using ↵ instead of NEXT, complete button.

· **Boom pressure calibration**

- It is used when bucket weight is changed or measured weight is inaccurate.
- The calibration must be carried out as follows :

① Increase hydraulic temperature (about 40~60˚C).
② Select "Boom-pressure".
③ Roll-in the bucket at maximum range and lower the boom at minimum height.
④ Press START button.
⑤ Raise boom to maximum position. Boom up must be finished before stepping advance in "display A".
⑥ If it show "Calibration success" message in a moment, press complete button (or ↵).

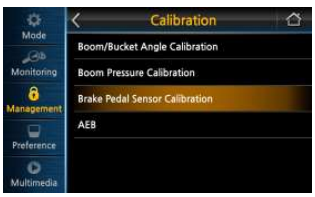


※ **Raise hydraulic temperature enough when checking work load / boom pressure sensor calibration (recommendation : about 40 ~ 60˚C).**

※ **Check if pressure sensor or angle sensor is in normal condition for accurate work load algorism or pressure sensor calibration [pressure sensors at boom cylinder head area and rod area, boom angle sensor (CD-80), bell crank angle sensor (CD-81)].**

※ **Sensor error message during pressure sensor calibration : sensor need to be checked.**

· **Brake pedal sensor calibration**



760F3CD71A

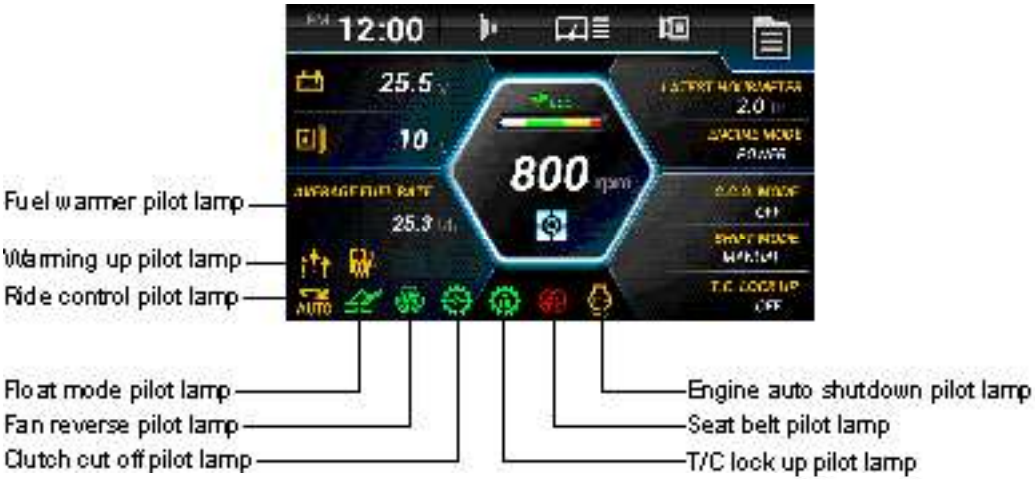


760F3CD71B-1

- Turn the engine OFF and turn the starting switch ON position.
- Press OK button, then calibration will be started.
- When display " IP ⇧ " on main display, press slowly the brake pedal completely.
- Release the brake pedal when display " IP ⇩ " on main display.
- For cancel, press MENU/HOME switch.

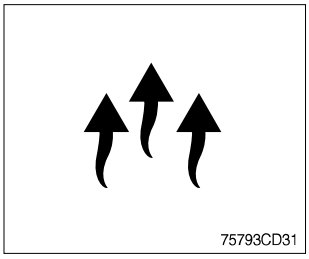
※ When the brake pedal or sensor is replaced, **brake pedal sensor calibration must be performed.**

3) PILOT LAMPS



9703CD90

(1) Warming up pilot lamp

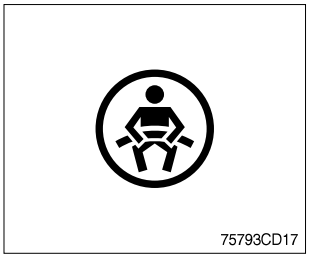


75793CD31

① This lamp lights ON when the coolant temperature is below 30˚C (86˚F).

② The automatic warming up is cancelled when the engine coolant temperature is above 30˚C, or when 10 minutes have passed since starting the engine.

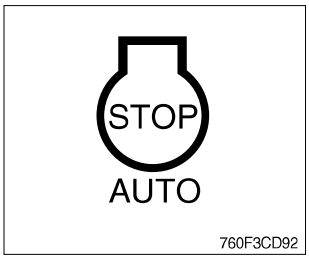
(2) Seat belt pilot lamp



75793CD17

① This lamp lights ON for the first five seconds after starting the engine.

(3) Engine auto shutdown pilot lamp

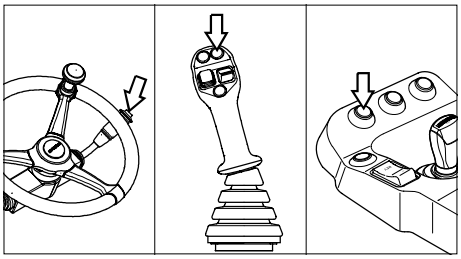


760F3CD92

① This lamp lights ON when the engine auto shutdown function is activated.

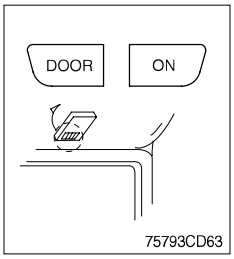
※ **Refer to page 7-45.**

6) HORN BUTTON



(1) If you press the button, the horn will sound.

7) CAB LAMP SWITCH



(1) This switch turns ON the cab room lamp.

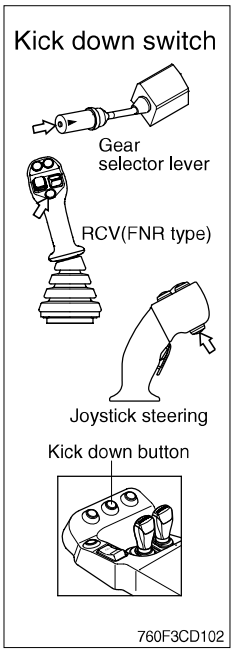
① **DOOR**

The lamp comes ON when the door is opened.
When the door is closed the lamp is OFF.

② **ON**

This switch is used to turn the lamp ON or OFF.

8) KICK DOWN SWITCH



(1) Manual mode

It is effective 2nd speed to 1st speed only and recover to 2nd speed quickly when push the switch one more time.

(2) Automatic mode

① **Mode 1** (down/up)

It shifts down quickly from current gear to one step lower speed by pushing the switch and recover to current speed quickly when push the switch one more time.

② **Mode 2** (down)

It shifts down from current gear to one step lower speed when push the switch every time.
The kick down function is released in only 1st speed.

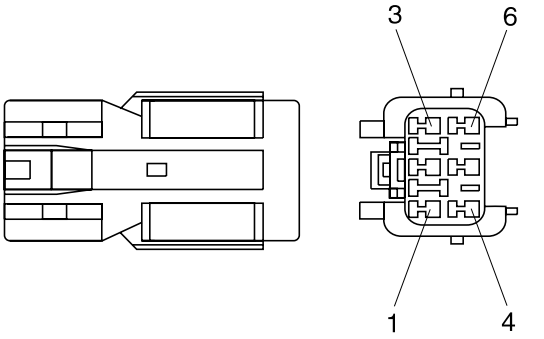
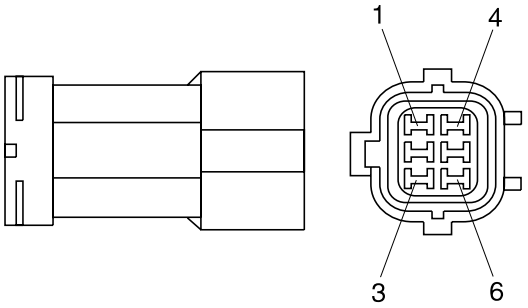
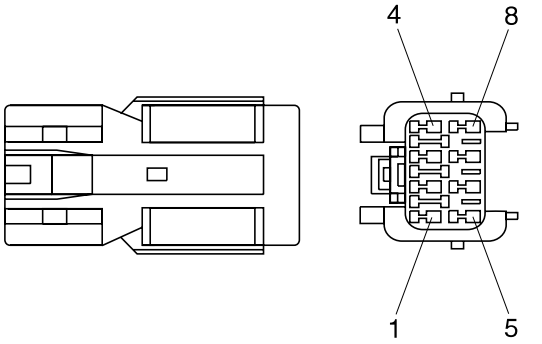
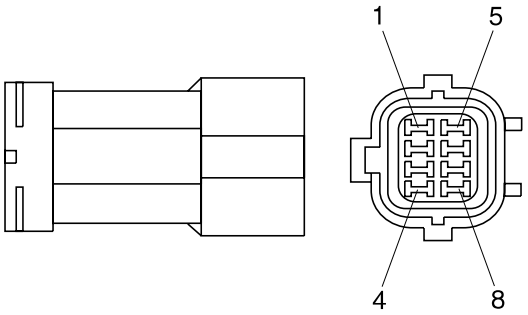
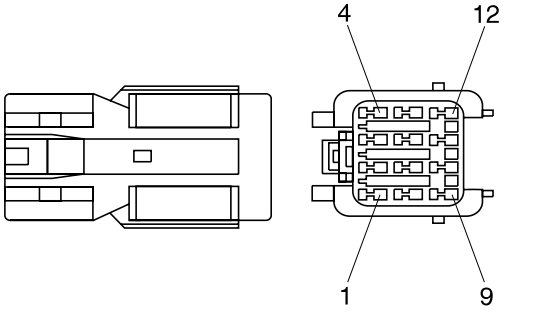
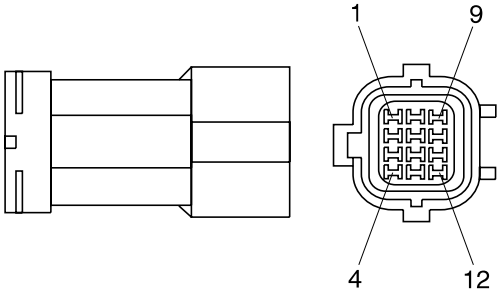
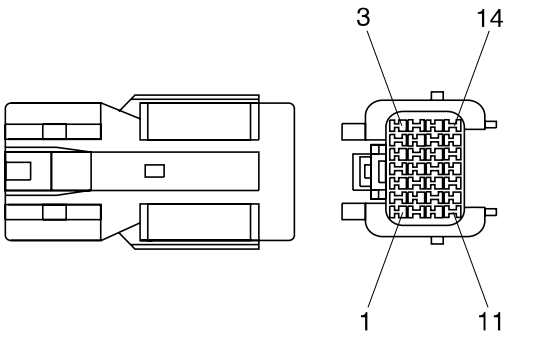
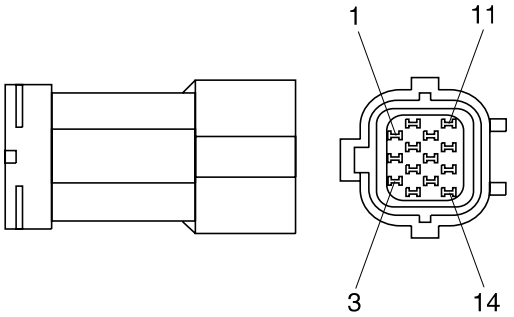
※ **Refer to page 7-38 for the kick down mode.**

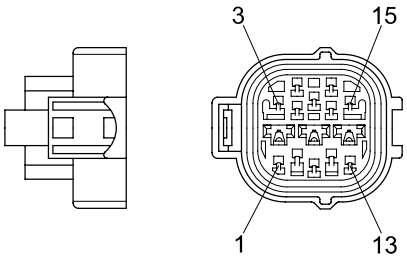
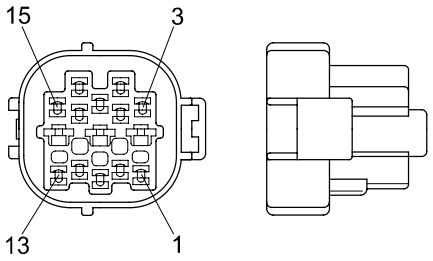
※ **The normal autoshift function continues after the kick down switch is released.**

GROUP 5 CONNECTORS

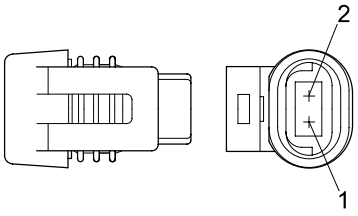
1. CONNECTOR DESTINATION

Connector number	Type	No. of pin	Destination	Connector part No.	
				Female	Male
CN-1	DEUTSCH	48	I/conn (Frame harness-Main harness)	DRB16-48SAE-L018	DRB12-48PAE-L018
CN-4	DEUTSCH	60	I/conn (Engine harness-Main harness)	DRB16-60SAE-L018	DRB12-60PAE-L018
CN-5	DEUTSCH	60	I/conn (Front harness-Main harness)	DRB16-60SAE-L018	DRB12-60PAE-L018
CN-7	AMP	15	I/conn (Main harness-Cab harness)	2-85262-1	368301-1
CN-9	DEUTSCH	4	Cab camera	DT06-4S	DT04-4P
CN-11	AMP	15	I/conn (Main harness-Aircon harness)	2-85262-1	368301-1
CN-12	AMP	15	I/conn (Front harness-Bottom harness)	2-85262-1	368301-1
CN-14	DEUTSCH	12	I/conn (Frame harness-Grill harness)	DT06-12S	DT04-12P
CN-15	KET	11	I/conn (RH console harness-Main harness)	MG651350	MG641353
CN-16	KET	14	I/conn (RH console harness-Main harness)	MG651110	MG641113
CN-18	DEUTSCH	12	LH seat console	DT06-12S	DT04-12P
CN-19	Econoseal J	6	I/conn (Emer steer harness-Front harness)	S816-006002	S816-106602
CN-21	AMP	6	Front wiper motor	936257-1	-
CN-24	DEUTSCH	12	Grill harness	DT06-12S	-
CN-26	250	2	Warning buzzer	S810-002202	-
CN-26A	TYCO	10	Joystick steering	174661-2	368537-1
CN-27	MK II	16	Radio and USB player	PK145-16017	-
CN-27A	MK II	8	USB connector	174984-2	-
CN-31	DEUTSCH	3	Brake priority	DT06-3S	-
CN-36~39	-	-	Fuse box	21WF-11213	-
CN-43	AMP	2	Lock-up	282028	-
CN-45	Ring term	-	Starter	R14-12	ST 710246-2
CN-48	AMP	1	Hour meter	2-520193-2	-
CN-56	KUM	16	Cluster	KPK145-16017	-
CN-57	AMP	20	Monitor	174047-2	-
CN-58A	DEUTSCH	40	MCU	DRC26-40-SA	-
CN-58B	DEUTSCH	40	MCU	DRC26-40-SB	-
CN-64	MOLEX	4	Smart key	39012040	-
CN-65	DEUTSCH	2	Back up buzzer	DT06-2S	-
CN-68	DEUTSCH	2	Pilot cut off	DT06-2S	-
CN-71	DEUTSCH	2	Parking solenoid	DT06-2S	-
CN-72	DEUTSCH	2	Cowl open activator	DT06-2S	-

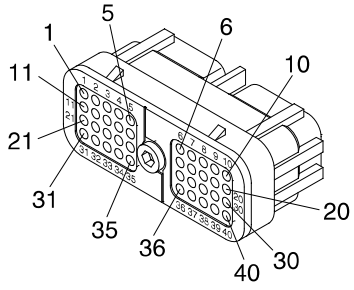
No. of pin	Receptacle connector (female)	Plug connector (male)
6	 S814-006000	 S814-106000
8	 S814-008000	 S814-108000
12	 S814-012000	 S814-112000
14	 S814-014000	 S814-114000

No. of pin	Receptacle connector (female)	Plug connector (male)
15	 368301-1	 2-85262-1

17) METRI-PACK TYPE CONNECTOR

No. of pin	Receptacle connector (female)	Plug connector (male)
2	 12040753	

18) DEUTSCH MCU CONNECTOR

No. of pin	Receptacle connector (Female)	Plug connector (Male)
40	 DRC26-40SA/B/C	

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