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SECTION 1 GENERAL

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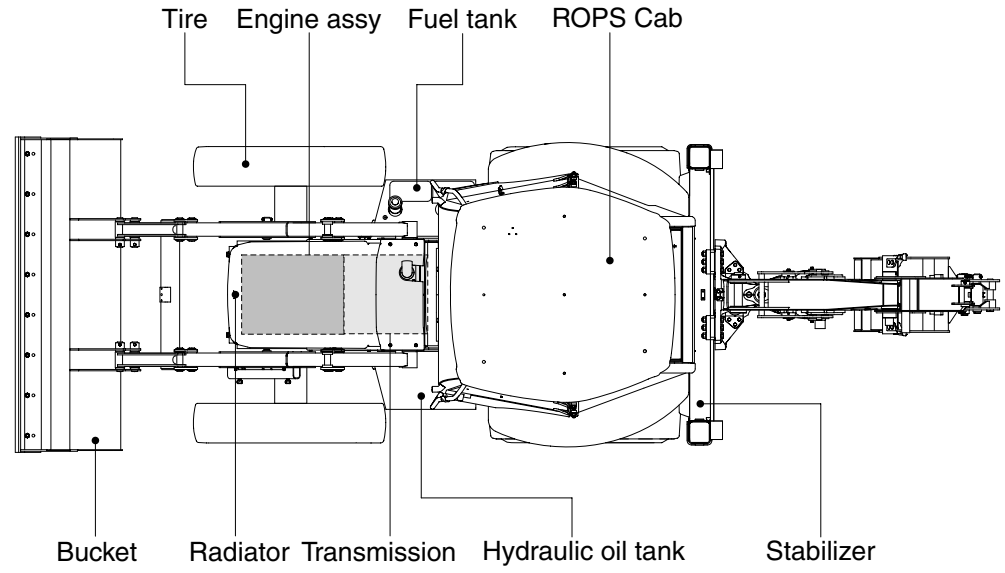
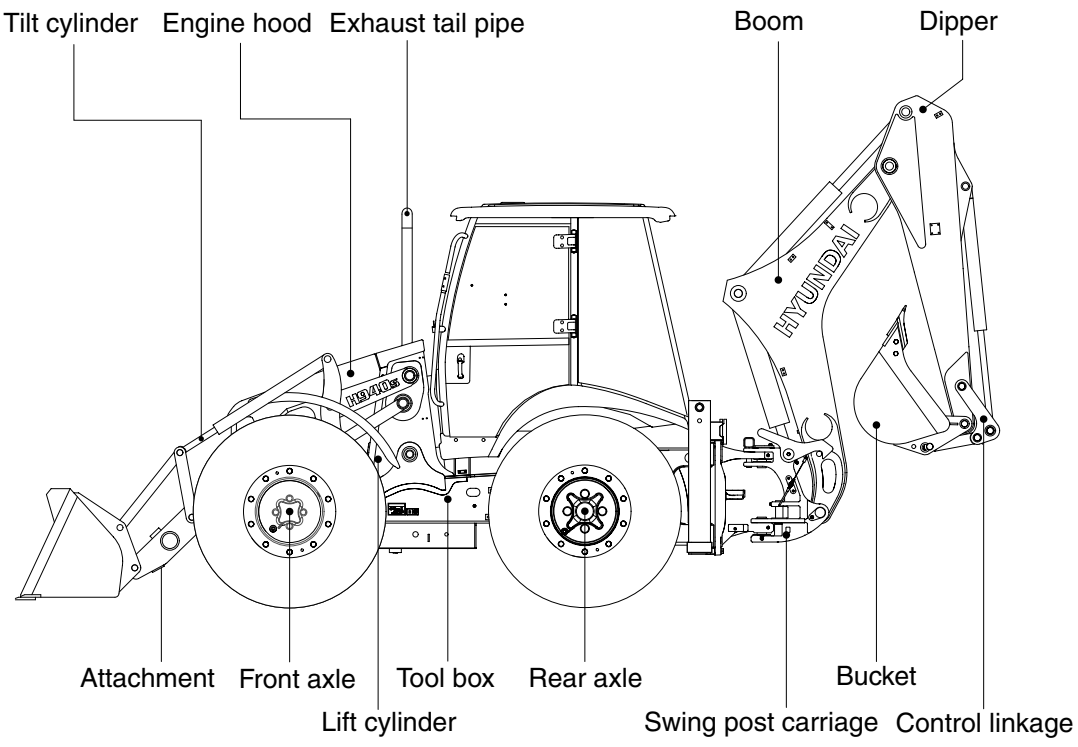
GROUP 2 SPECIFICATION

1. MAJOR COMPONENT





H940S4WS2SP01

SECTION 2 ENGINE

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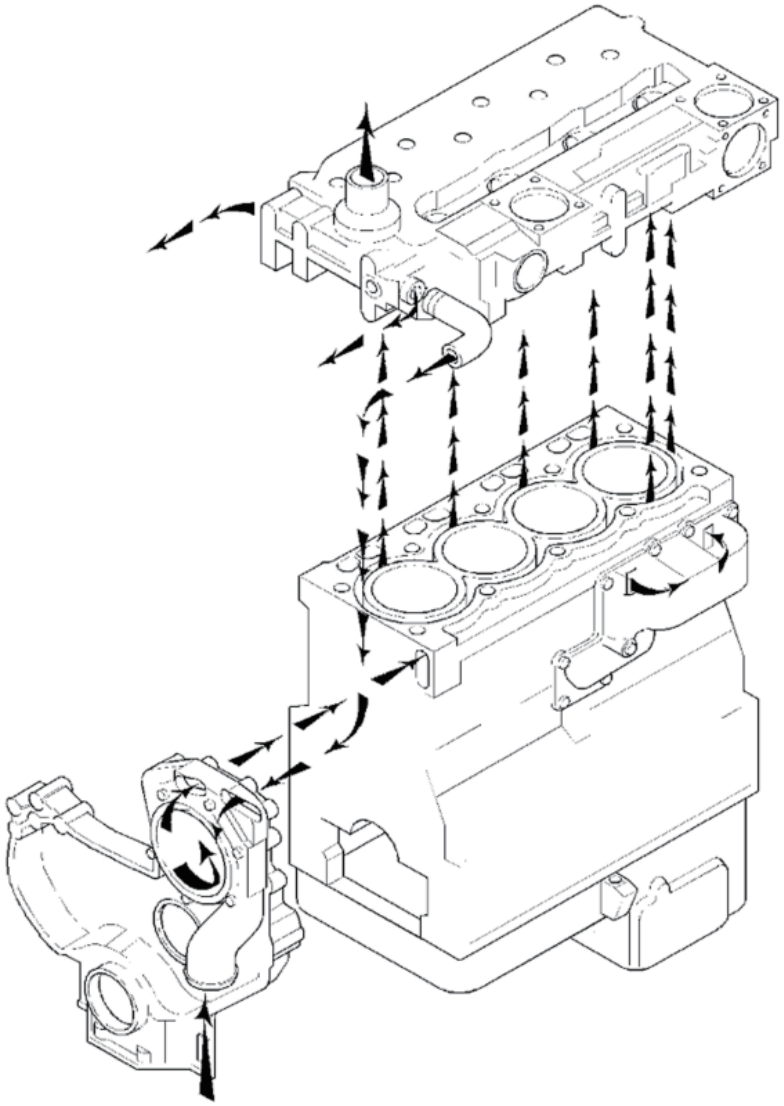
7. COOLING SYSTEM



H940S2EG05

The coolant flows from the bottom of the radiator to the centrifugal water pump. The water pump assists in the flow of the coolant through the system. The water pump is installed on the front of the timing case. The water pump is gear-driven by the fuel injection pump gear.

The water pump forces the coolant through a passage in the front of the timing case to the water jacket in the top left side of the cylinder block. The coolant continues to the rear of the cylinder block.

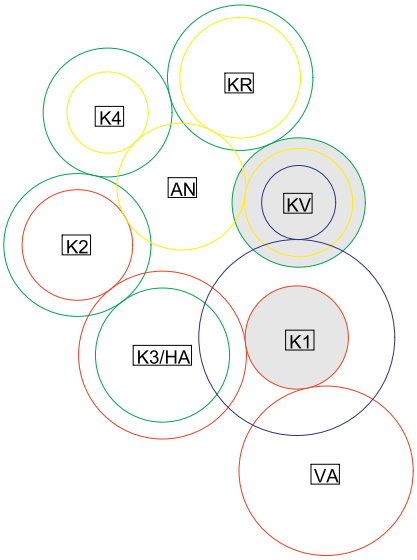
The main flow of the coolant passes from the rear of the cylinder block into the rear of the cylinder head. The coolant flows forward through the cylinder head and into the water temperature regulator housing. If the water temperature regulator is closed, the coolant goes directly through a bypass to the inlet side of the water pump. If the water temperature regulator is open, the bypass is closed and the coolant flows to the top of the radiator.

From the rear of the cylinder block, some of the coolant passes into the modine oil cooler (if equipped). The modine oil cooler is located on the left side of the cylinder block. The coolant passes through the oil cooler before being returned through an external line to the inlet side of the water pump.

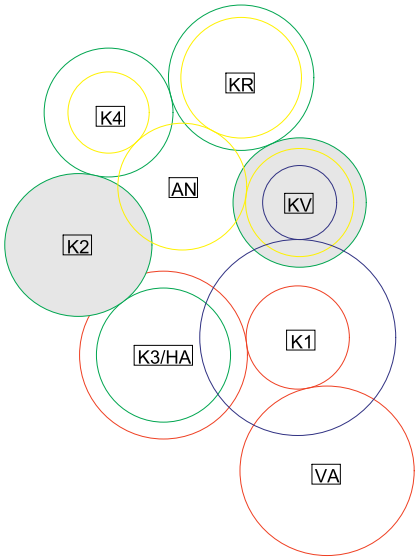
From the rear of the cylinder block, some of the coolant passes into the oil cooler. The oil cooler is located on the left side of the cylinder block with no external lines. The coolant flows around the element of the oil cooler before being returned to the rear of the cylinder block.

② Forward

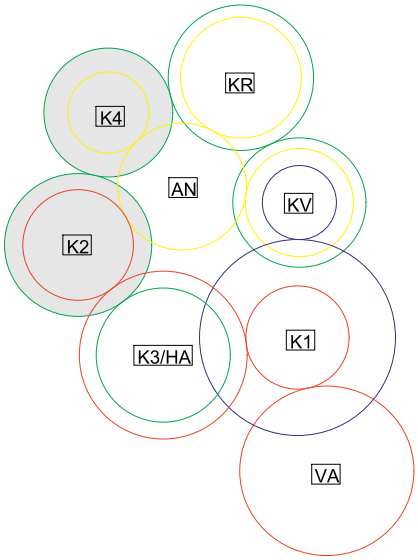
In forward, forward clutch and K1, K2, K3, K4 clutch are engaged.
Forward clutch and K1, K2, K3, K4 clutch are actuated by the hydraulic pressure applied to the clutch piston.



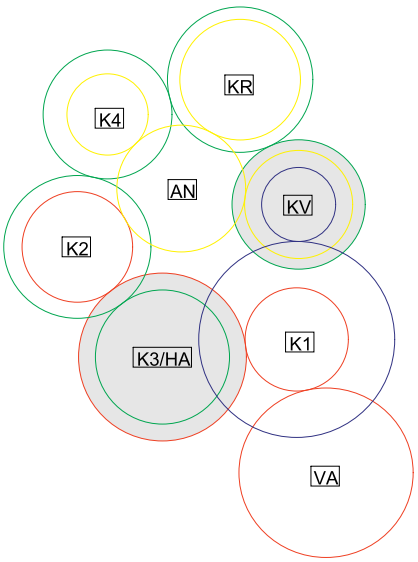
1st gear forward



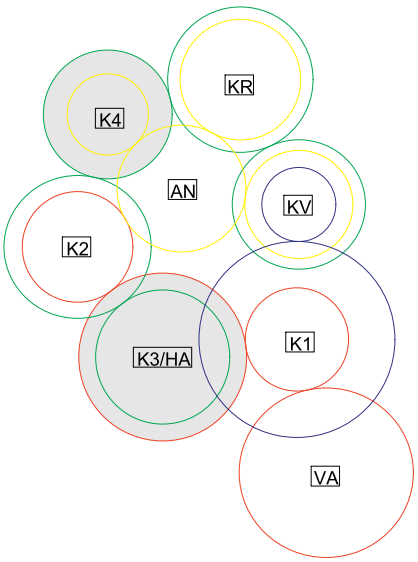
2nd gear forward



3rd gear forward



4th gear forward



5th gear forward

H940S4WSPT12

KR = Clutch reverse
KV = Clutch forward
K1 = Clutch 1st speed
K2 = Clutch 3rd speed
K3/HA = Clutch 4th speed/output
K4 = Clutch 5th speed
VA = Front wheel drive

(10) Solenoid valve selection in position neutral

Especially at Wheel loaders and lift trucks, determined, transmission-specific solenoid valve combinations are issued in the positions 1 and 2 in the neutral position of the controller lever for the pre-filling of the speed clutches. These will be cancelled if the vehicle is exceeding a determined maximum speed (wheel loaders : the maximum speed of the 2nd Speed).

(11) Inductive transmitter - failure recognition

The driving speed is acquired through an output-side inductive transmitter.
Its failure during the drive will be acquired and recognized by the electronic unit. The maximally permitted speed is then the highest speed, in which a direct reversing, independently from the driving speed is permitted, i.e. the 2nd speed.

A failure will be also supposed if the vehicle has already at least one time reversed, and is standing in a speed higher than the 2nd for more than 10 seconds.
If the electronic unit has recognized a sensor failure, upshiftings beyond the limit "2nd speed" can no more be realized, and from the speeds 3 and 4 only reverse shiftings are still possible. Besides, reverse shiftings from the speeds 3 and 4 are only still possible into the 2nd speed of the other driving direction.
At the speed engagement from neutral, the highest disposable speed will be generally engaged and then downgraded in the preselected (lower) speed.

The status "sensor failure" will be cancelled, as soon as the inductive transmitter signal is recognized again. Then however, follows an automatic upshifting in a possibly preselected speed (see also (12)).

(12) System behavior at faults

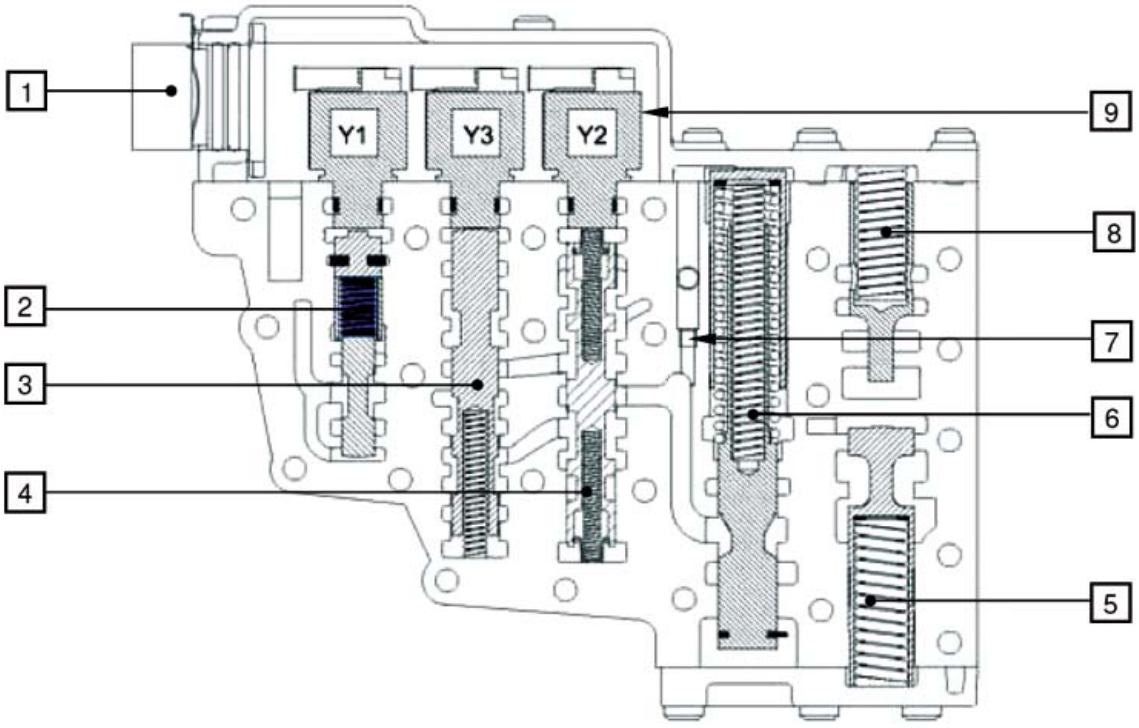
The control unit is constantly monitoring all inputs from the controller and outputs to the solenoid valves as well as the speed sensors. In case of illegal combinations (e.g. by a cable break, external supply), the electronic unit is going immediately in the neutral condition and switches off all outputs. The same happens if the voltage supply is exceeding determined limit values or a short circuit is existing. The cut-off can be cancelled again by shifting the controller lever beyond the position "NEUTRAL". The cancelation of the upshifting lock after (terminated) sensor failure, is realized by shifting to neutral or automatically as soon as preselected and the actual speed are coinciding.
It will be distinguished between unrecoverable failures (emergency properties plus display, see appendix A). At a repeated fault, it is absolutely necessary to check the supply system electrics; defective components must be immediately replaced.

Problem	Cause	Remedy
Machine lacks power and acceleration	Engine high idle speed set too low.	Check high idle adjustment.
	Incorrect transmission oil.	Change oil.
	Aerated oil.	Add oil.
	Low transmission pressure.	Do transmission system pressure test.
	Warped transmission clutch.	Do transmission clutch drag checks.
	Torn transmission control valve gasket.	Inspect gasket.
	Brake drag.	Do brake drag check.
	Failed torque converter.	Do torque converter stall speed test.
	Low engine power.	Do engine power test.
Torque converter stall RPM too high	Aerated oil.	Run machine to check for bubbles in oil.
	Stuck open converter relief valve.	Do converter-out pressure test.
	Leakage in torque converter seal.	Do converter-out pressure test.
	Torque converter not transferring power (Bent fins, broken stator).	Replace torque converter.
Torque converter stall RPM too low	Low engine power.	Do engine power test.
	Mechanical malfunction.	Remove and inspect torque converter.

2) ASSEMBLY

※ Check all components for damage, respective wear, and renew if necessary.
※ Prior to the installation, check the free travel of the movable parts in the housing.
※ Oil the components prior to the assembly.

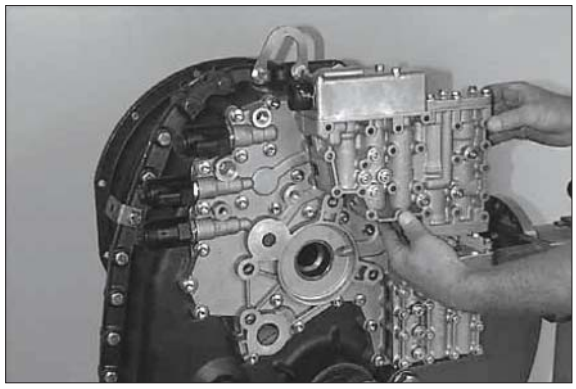
(1) Shift control component - control circuit "I"



H940S4WSTM301

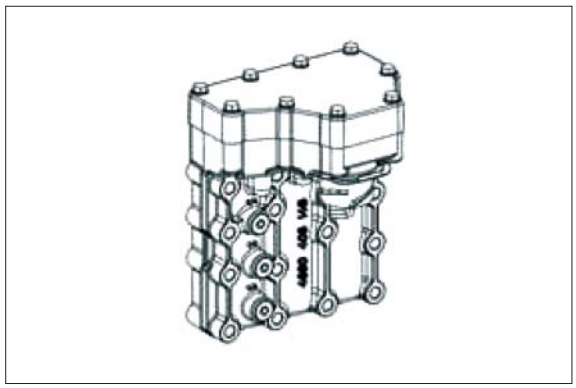
1 = Cable harness		
2 = Reducing valve	RDV	10 bar
3 = Shift valve	S-N/K4 (neutral/K4)	
4 = Shift valve	S-V/R (forward/reverse)	
5 = Control pressure valve	SDV	16+3 bar
6 = Modulation valve	DMV	3-12 bar
7 = Orifice	C2 (for DMV)	
8 = Converter safety valve	WSV	8+2 bar
9 = Solenoid valves	Y1, Y2, Y3	

② Remove complete shift control component - control circuit "I" with intermediate plate.



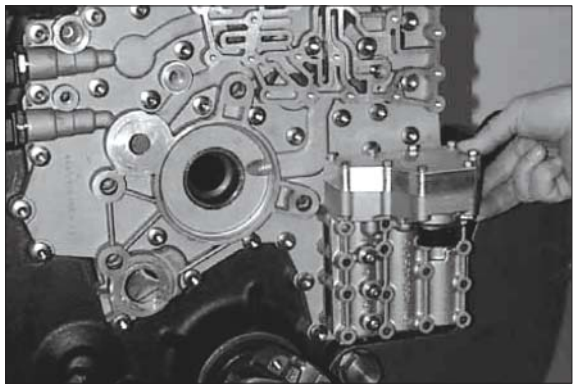
H940S4WSTM209

③ Shift control (control circuit "I")



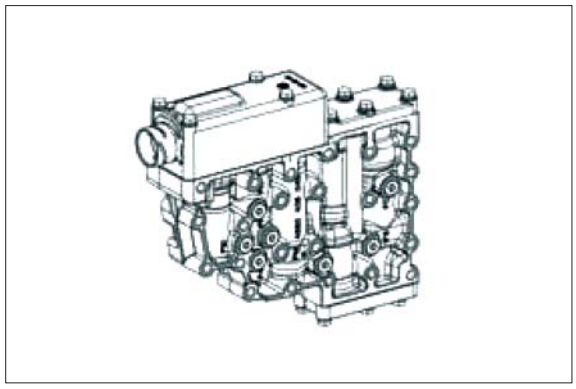
H940S4WSTM210

④ Loosen screw connection of the shift control components - control circuit "I". Remove complete shift control component along with intermediate plate.



H940S4WSTM211

⑤ Shift control (control circuit "I")

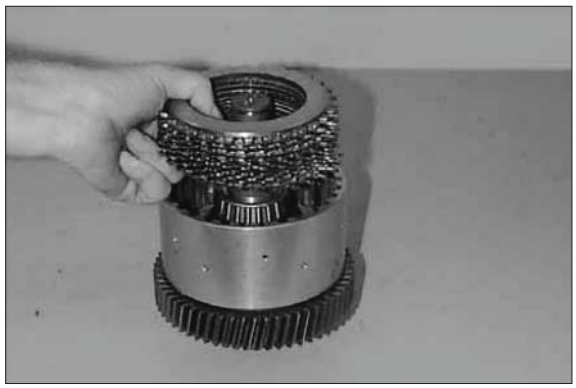


H940S4WSTM212

⑱ Squeeze snap ring out.

H940S4WSTM248

⑲ Take end shim and plate pack out of the plate carrier.



H940S4WSTM249

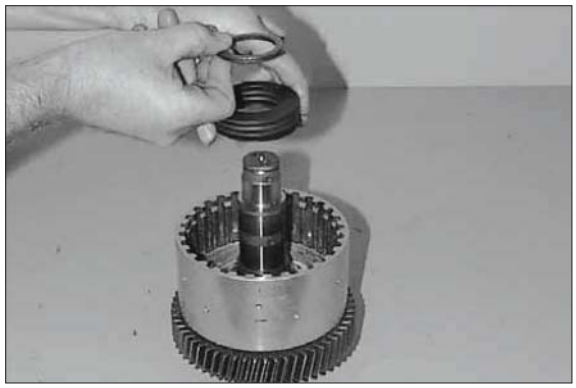
⑳ Pull off bearing inner race.

⚠ **For roller bearings which will not be replaced, pay attention to the following. Record (mark) installation position (shaft) as well as the single bearing coordination (bearing outer race to bearing inner race).**

(S) Grab sleeve "Super"	5873 001 036
(S) Basic tool	5873 001 000

H940S4WSTM250

㉑ Remove shim and cup spring pack.

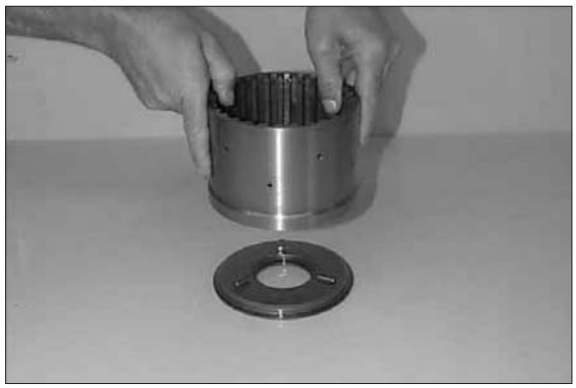


H940S4WSTM251

㊺ Remove spacer ring and cup spring pack.

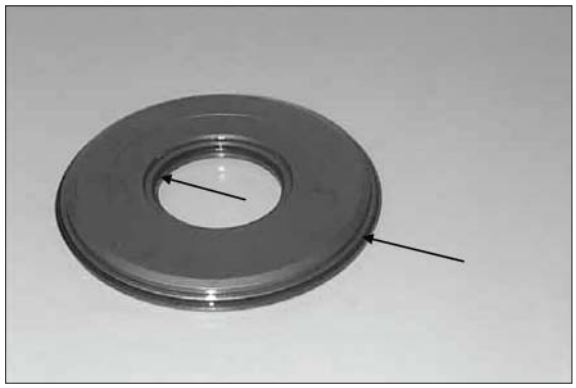
H940S4WSTM288

※ Pry piston out of the plate carrier - use suitable support - and pay atention to the released rollers (3EA).



H940S4WSTM289

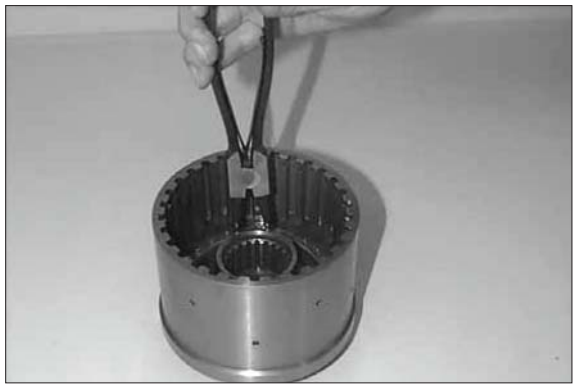
㊻ Remove both O-Rings (arrows)



H940S4WSTM290

㊼ Squeeze circlip out.

(S) Set of external pliers 5870 900 015



H940S4WSTM291

○ Demount cup spring pack (18) again.
Preload cup spring pack only until the circlip (20) will be released and can be squeezed out.

(S) Pressure piece 5870 506 128

⚠ Danger of damage - if the cup spring pack will be loaded until contact is obtained, this will cause a damage of the sealing seat on the outer plate carrier.

H940S4WSTM026

㉒ Remove cup spring pack (18) and spacer ring (19).
Hold piston (15) in position.

H940S4WSTM027

○

H940S4WSTM028

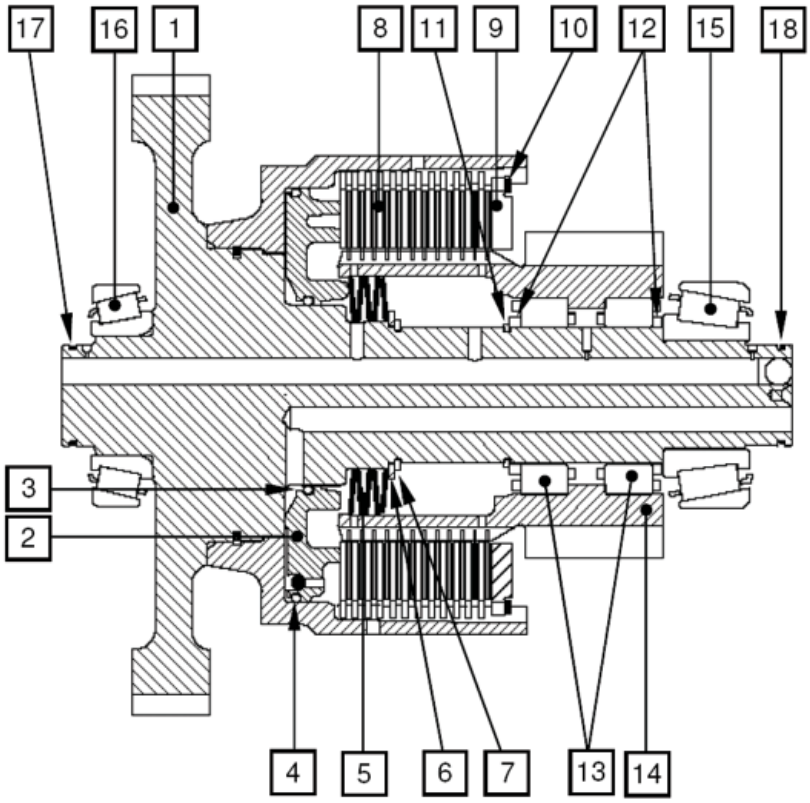
○ Hold outer plate carrier in lined-up position.
Line up cup spring pack (18) and mount spacer ring (19).

⚠ Pay attention to the installation position and stacking of the cup spring pack - see figure TM006.

Pay attention to the installation position of the spacer ring - the chamfered end face of the spacer ring must be facing the cup springs (figure/downward).

H940S4WSTM029

(4) Clutch "K1"



H940S4WSTM059

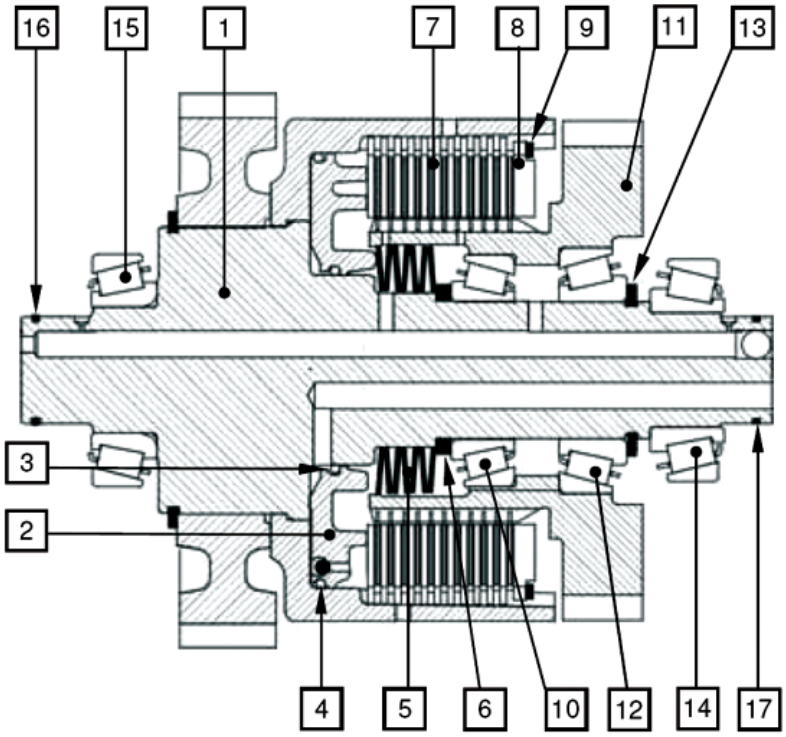
Legend refer draft figure TM059~078

1 = Shaft complete (with spur gear, plate carrier and circlip)
2 = Spool
3 = O-ring 40 × 3
4 = O-ring 115 × 3
5 = Cup spring pack
6 = Support plate
7 = Circlip 40 × 1.75
8 = Plate pack
9 = End shim
10 = Snap ring (S = optional)
11 = Circlip 40 × 175
12 = Collar washer
13 = Roller ring
14 = Plate carrier (inner)
15 = Roller bearing
16 = Roller bearing
17 = Rectangular ring 30 × 2
18 = Rectangular ring 30 × 2

① Check passage of pressure oil supply bores and lube oil supply bores (by means of compressed air).

H940S4WSTM060

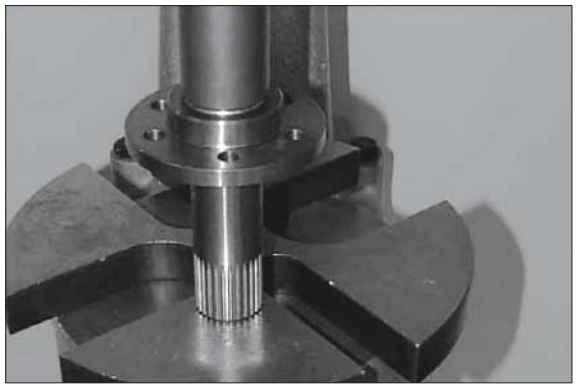
(8) Clutch "KR"



H940S4WSTM093

1 = Shaft complete (with plate carrier, helical gear and circlip)
2 = Spool complete (with ball)
3 = O-ring 52 × 3
4 = O-ring 115 × 3
5 = Cup spring pack
6 = Support plate
7 = Plate pack
8 = End shim
9 = Snap ring (S = optional)
10 = Roller bearing
11 = Plate carrier (inner)
12 = Roller bearing
13 = Circlip (S = optional)
14 = Roller bearing
15 = Roller bearing
16 = Rectangular ring 30 × 2
17 = Rectangular ring 30 × 2

⑤ Mount bearing bush - with sealing compound loctite (Type-No. 574) - into the stator shaft.
Now, oil bearing bush.



H940S4WSTM126

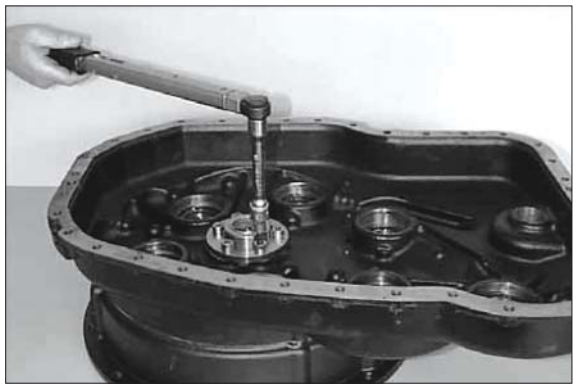
⑥ Screw in 2 adjusting screws (M10).
Insert pre-assembled stator shaft.

(S) Adjusting screws (M10) 5870 204 007

H940S4WSTM127

⑦ Fasten stator shaft by means of socket head screws.

· Torque limit (M10/8.8 × 50)
M_A = 4.7 kgf·m (33.9 lbf·ft)



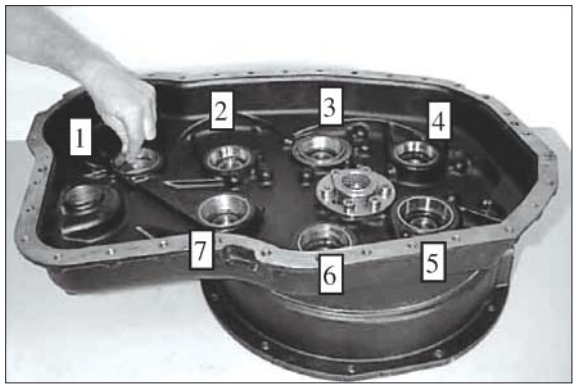
H940S4WSTM128

⑧ Insert all bearing outer races into the gearbox housing/part I (make adhere with grease - assembly aid).

Clutch arrangement:

1 = VA	2 = K1
3 = KV	4 = KR
5 = K4	6 = K2
7 = K3	

※ Pay attention to the installation position and the bearing coordi-nation - see disassembly note - figure TM228.



H940S4WSTM129

⑤ Line up axial washer (3) and axial needle cage (4).

H940S4WSTM166

⑥ Mount angle disk (6)

※ Pay attention to the installation position - see figure TM165.

H940S4WSTM167

⑦ Insert O-ring 36×2.5(2).
Grease O-ring (assembly aid).

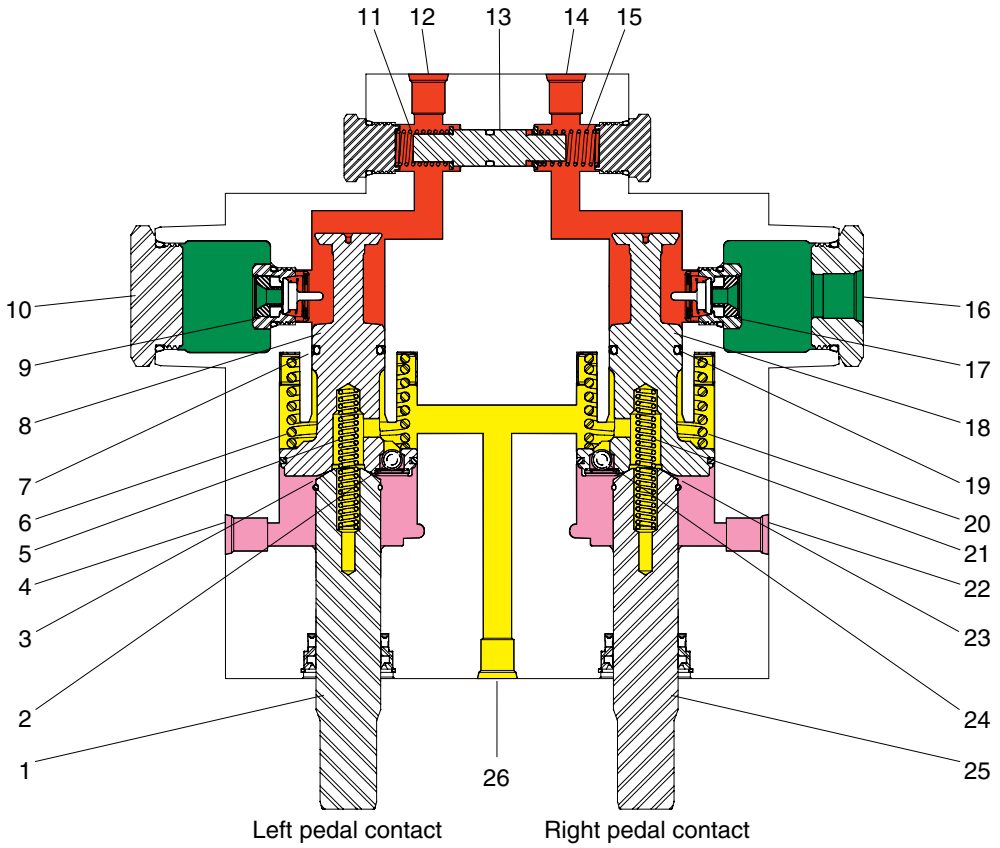
H940S4WSTM168

⑧ Line up stop sleeve (6).

⚠ The spacing sleeve has to be mounted on the pump (as illustrated) and not asasembled on the central shaft – ensures the operational funktion.

H940S4WSTM169

(2) Both pedals applied



Oil from the hydraulic system enters ports (4 & 22) separately and drains to hydraulic system reservoir port (26). Both pedals are depressed forcing springs (5 & 21) to compress. Oil flowing through land areas (3 & 23) becomes restricted. Oil flow moves to close check balls (2 & 24).
Restricted oil flow at lands (3 & 23) causes pressure to act against the large diameter of pistons (8 & 18). Pistons (8 & 18) move to compress springs (6 & 20). As more push rod displacement occurs, valve assemblies (9 & 17) close, stopping brake system oil from moving to reservoir or atmosphere pressure. Additional movement of the push rods and pistons (8 & 18) forces brake system oil to the brakes causing brakes to fill through ports (12 & 14). If the brakes consume slightly different amounts of oil, spool (13) moves against either spring (11 or 15) to satisfy the original amount of brake oil of which ever side has the most required.
After the brakes are filled, higher brake pressure is developed by the inlet oil pressure being modulated at lands (3 & 23), causing piston (8 & 18) to generate a higher pressure at the brake ports. Brake pedal mod- ulated feel is determined by the hydraulic areas of push rods (1 & 25) and modulated pressure at lands (3 & 23).
Maximum boosted brake pressure is limited by the inlet oil pressure at ports (4 & 22).
Additional pedal effort can cause higher brake pressure and is dependent only by the amount of pedal force applied.

2) DISASSEMBLY

(1) Remove valve assembly from machine by disconnecting necessary fluid lines. Remove mounting bolts and drain fluid from assembly.

(2) Remove reservoir plugs (27) from housing (20).
Remove o-rings (28) from reservoir plugs (27).

(3) Remove tip valve assemblies (29) from housing (20).
Tip valve assemblies (29) are not field serviceable.
Service by replacement only.

(4) Housings (7 & 20) are under spring tension. To separate housing halves, position mounting flange on housing (7) face down and clamp in a vise. Apply downward pressure on housing (20) while evenly loosening four cap screws (5). It may be necessary to twist on housing (20) to break the two sections apart.

(5) Remove four cap screws (5) and four washers (6) while carefully separating housing halves.

(6) Remove springs (9), piston (14) assemblies, springs (17), o-rings (18) and retainers (19).

(7) Remove retaining ring (11), washer (12) and ball (13) from pistons (14).

(8) Remove piston ring (10), seal (16) and o-ring (15) from pistons (14).

(9) Remove push rods (8) from housing (7). Do not remove retaining rings from push rods (8).
Retainer (3) need not be removed to service seals (2 & 4). Carefully remove wiper seal (2) by inserting a small screw driver along the outer perimeter of wiper seal (2) and prying out. Remove seal (4) using a dull pointed pick tool. See Figure 2.

※ Be careful not to scratch or mar insert (2) or housing bore.
If retainers (3) require replacement, remove retaining rings (1) and seals (2 & 4) as indicated. With housing (7) flange face down in a vise, use a plastic or wooden dowel through housing (7) bore to evenly tap on retainers (3) to remove. An inside bearing puller can also be used to remove retainers (3).

(10) Remove plugs (21), springs (23) and washers (24) from housing (20). Remove o-rings (22) from plugs (21).

(11) Use a plastic or wooden dowel to carefully remove spool (26) from housing (20). Remove o-ring (25) from spool (26).

※ Be careful not to scratch or mar spool (26) or housing bore.

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

Cardan shaft is meshed at the top with cross pin and forms one unit with sleeve.

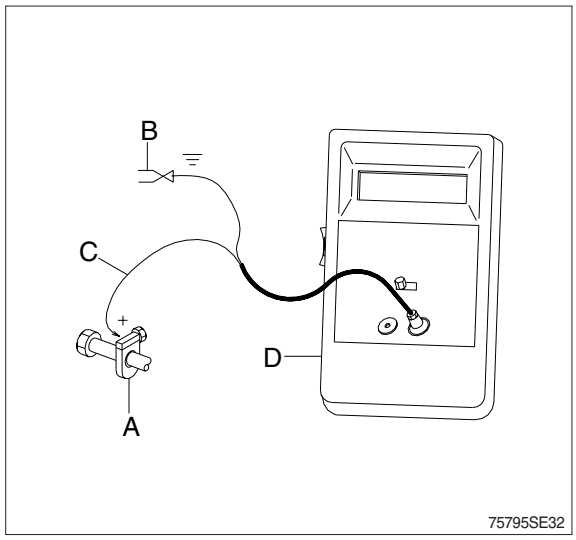
At the same time, it is meshed with gear rim of the gerotor set by spline.

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.

2. TEST TOOLS

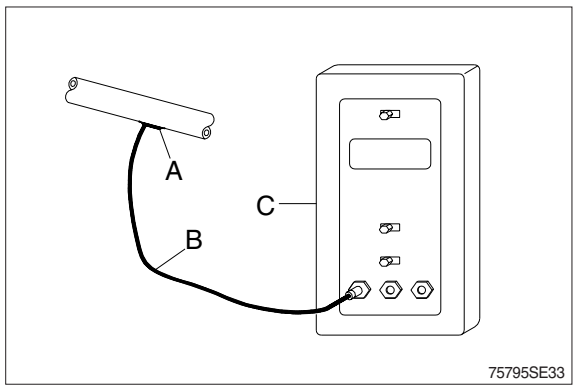
1) CLAMP-ON ELECTRONIC TACHOMETER INSTALLATION

- Service equipment and tools
  Tachometer
  A : Clamp on tachometer.
  Remove paint using emery cloth and connect to a straight section of injection line within 100 mm (4in) of pump. Finger tighten only-do not over tighten.
  B : Black clip (-). Connect to main frame.
  C : Red clip (+). Connect to transducer.
  D : Tachometer readout. Install cable.



2) DIGITAL THERMOMETER INSTALLATION

- Service equipment and tools
  Digital thermometer
  A : Temperature probe.
  Fasten to a bare metal line using a tie band. Wrap with shop towel.
  B : Cable.
  C : Digital thermometer.



3) DISPLAY MONITOR TACHOMETER

The display monitor tachometer is accurate enough for test work.

HB103CD44

(2) Assembly

① Assemble spool and sleeve.

Insert spool carefully in sleeve to the spring end. Rotate spool while parts are sliding together. Test for free rotation. Spool should rotate smoothly in sleeve with fingertip force at splined end. Align spring slots.

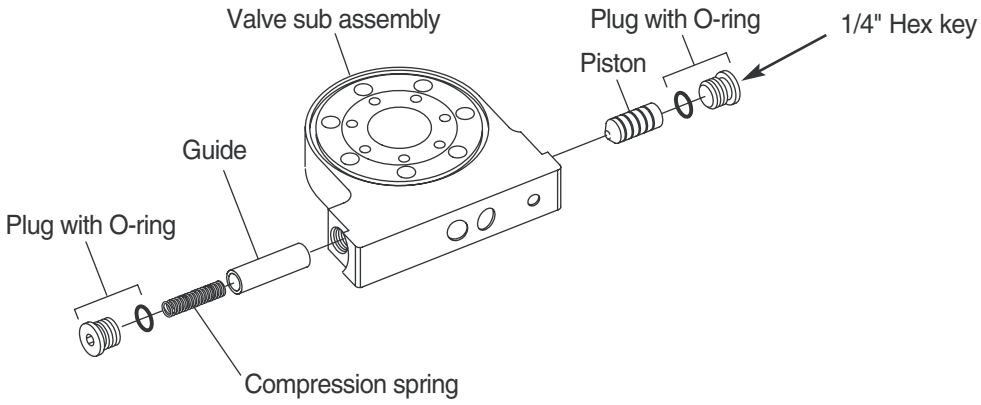
② Install the centering spring.

Stand all springs with the notched side pointed down. Arrange the springs that the arched side of each set (2 or 3 leaves) contacts on each other.
Put the two plate springs between them if the unit is low input torque type.
Standard input torque units use six centering (arched) springs, while low input torque units use four centering (arched) springs with two plate (straight) springs in the center.

First Insert spring installation tool through the openings in the spool and sleeve.
See the figure. Insert one end of the entire centering spring set with notched side toward the spool and sleeve into the spring installation tool.
Compress and push springs into the spool and sleeve assembly while the installation tool only prevents the spring from falling apart.
Keep pressure on spring ends while withdrawing installation tool and pushing forward until the springs are engaged with sleeve.
Push them down to the spool until the tip and the side are flush with the sleeve.

The centering springs can also be installed by hand. Install two outside springs first and add the others one at a time in between them.

(27) Disassemble valve sub-assembly as shown in figure.



HB100SE37

GROUP 1 STRUCTURE AND FUNCTION

1. HYDRAULIC SYSTEM OUTLINE

The loader and backhoe hydraulic system is a open center system which is supplied with flow from the fixed displacement double gear pump.
The backhoe hydraulic system is a pilot operated and the loader hydraulic system is operated by linkage.

Oil is drawn from the hydraulic tank by the hydraulic pump. The pump has two sections, P1 and P2.

The hydraulic pump is mounted on the rear of the transmission and is driven by the engine via a driveshaft.

Oil from pump section P1 flows direct to the loader control valve. Oil from the small section P2, flows to steering unit, and in neutral circuit flows through the priority valve in pump to the loader control valve and then to join the flow from P1 at the loader control valve.

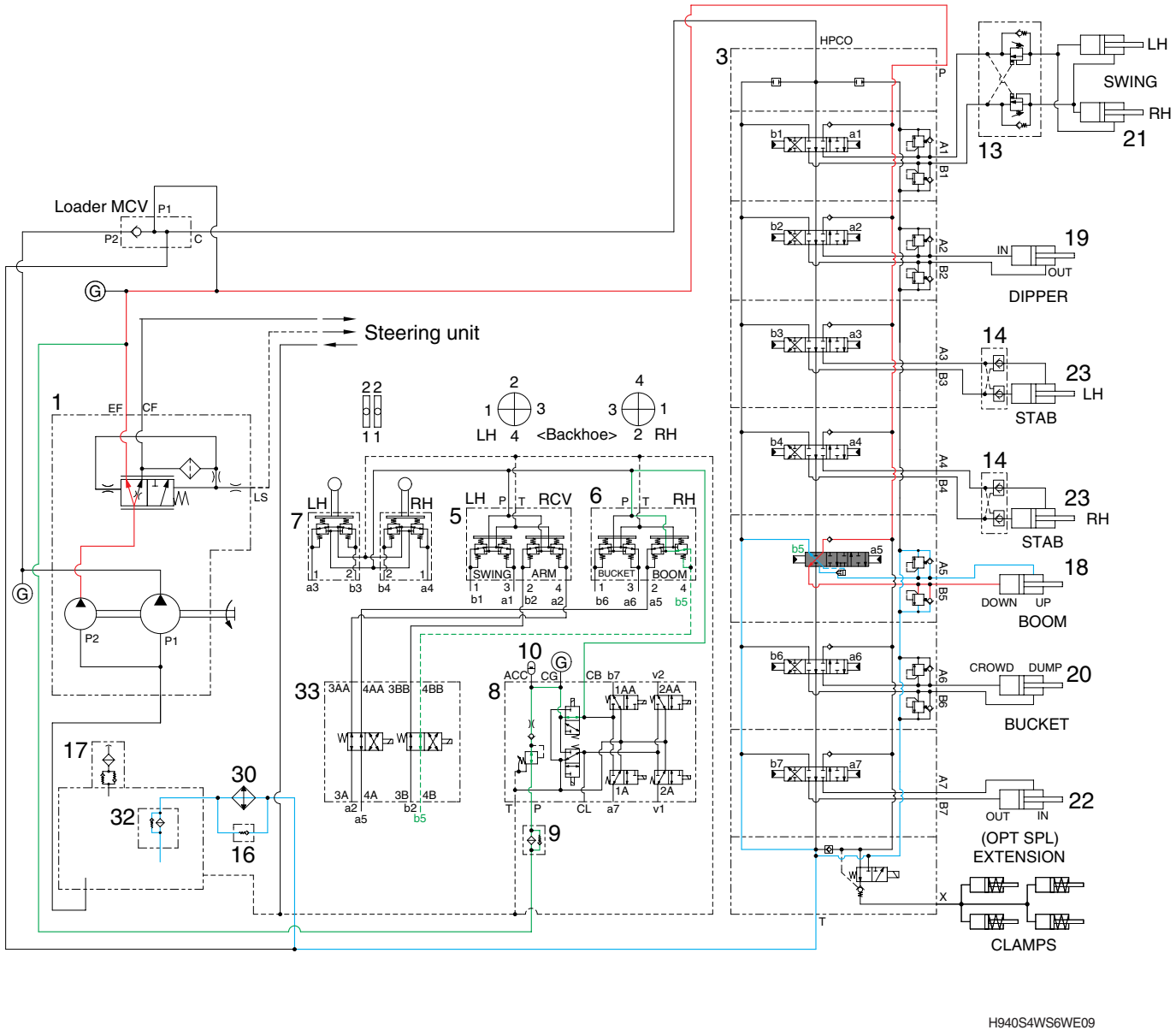
From the loader control valve neutral gallery, oil flows via a high pressure carry-over line to the backhoe valve.

Some of the exhaust oil flows directly back to the tank through a filter and some of the exhaust oil returns to tank via the hydraulic oil cooler.

To help prevent backhoe dipper cylinder and loader lift cylinder cavitation, there is a check valve fitted to the return line. The check valve raises approximately 5 bar (75 lbf/in^2) of pressure in the line, which improves the operation of the respective anti-cavitation valves.

The hydraclamp exhaust hose is fitted. The hose connects the hydraclamp spool directly into the exhaust circuit. This prevents the clamp from **locking-up** when the sideshifting operation is required.

1) BOOM UP OPERATION



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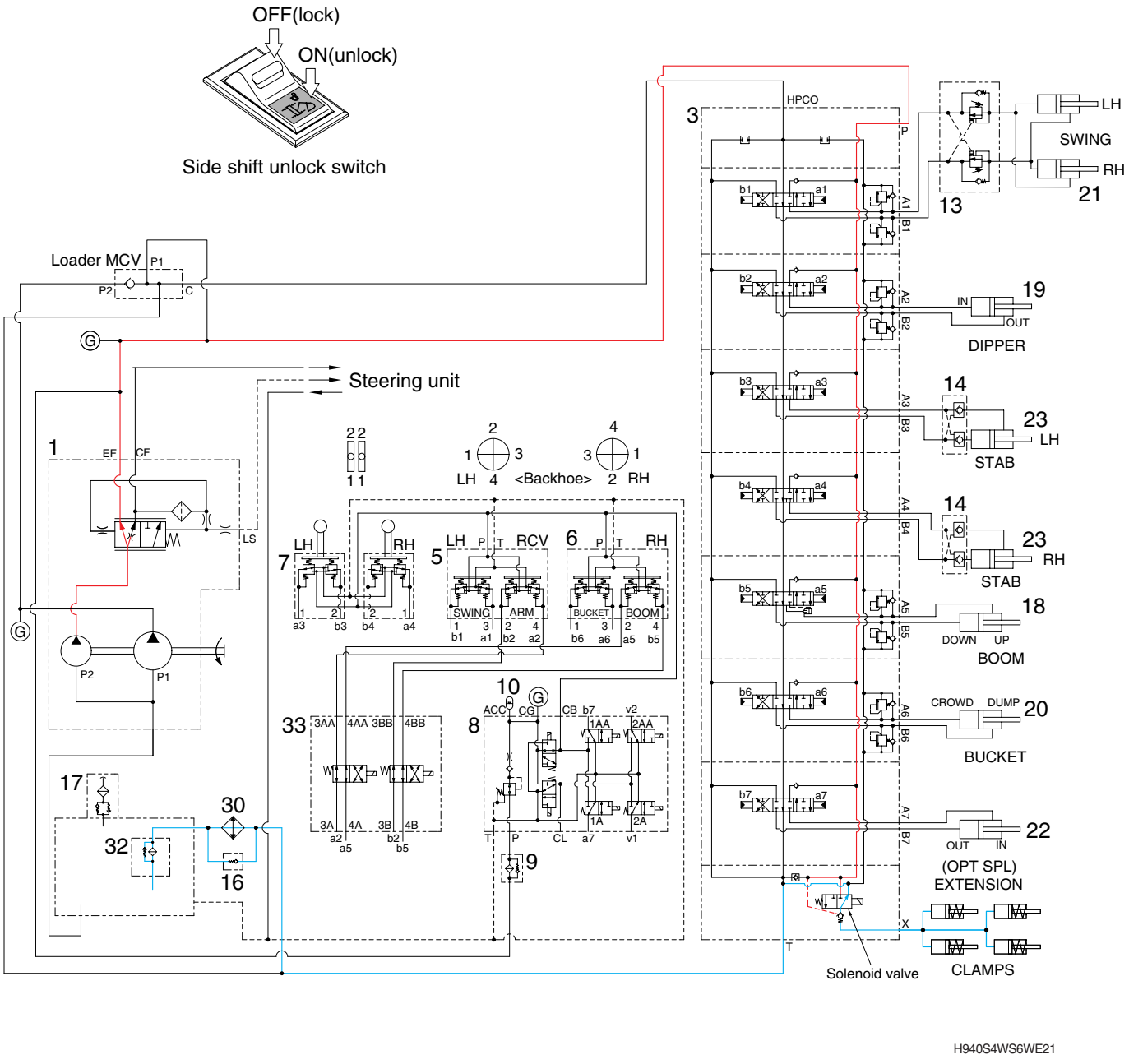
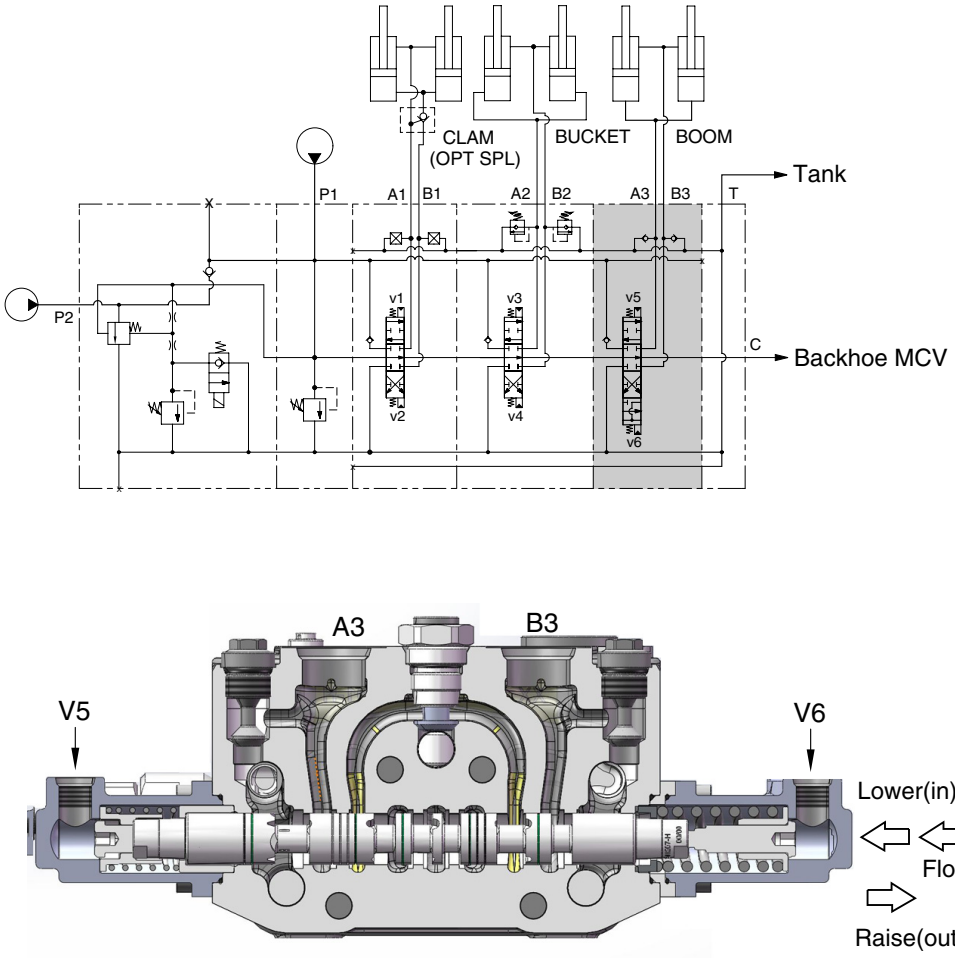
When the backhoe right control lever is pulled back, the boom spool in the main control valve (3) is moved to the up position by the pilot oil pressure from the remote control valve (6).
The oil from the pump (P1, P2) flows into the main control valve and then goes to the small chamber of boom cylinders. At the same time, the oil from the large chamber of boom cylinders returns to the hydraulic oil tank through the boom spool in the main control valve. When this happens, the boom goes up. The excessive pressure in the boom cylinder rod end circuit is prevented by relief valve.

11) CLAMP RELEASE OPERATION



When the side shift unlock switch is in the ON position (pressed down), the solenoid valve is energized. The solenoid valve opens the clamp cylinder to the drain port (tank).
Oil from the clamp cylinder is drained to the tank. Then, the clamp is unlocked.

2) BOOM SECTION OPERATION



H930ST6WE42

(1) Spool in neutral

If the control lever is not operated, the oil supplied from the pump ports (P1 & P2) passes through the neutral passage of loader MCV to the backhoe MCV and then returns to the tank.

(2) Boom raise position (when the boom lever is pulled back)

When the boom spool out, the pressured oil supplied from the pumps (P1 & P2) flow through the port (A3) into boom cylinder.

The return oil from cylinder port (B3) flows into the tank via the low pressure passage.

(3) Boom lower position (when the boom lever is pushed)

When the boom spool in, the pressured oil supplied from the pumps (P1 & P2) flow through the port (B3) into boom cylinder.

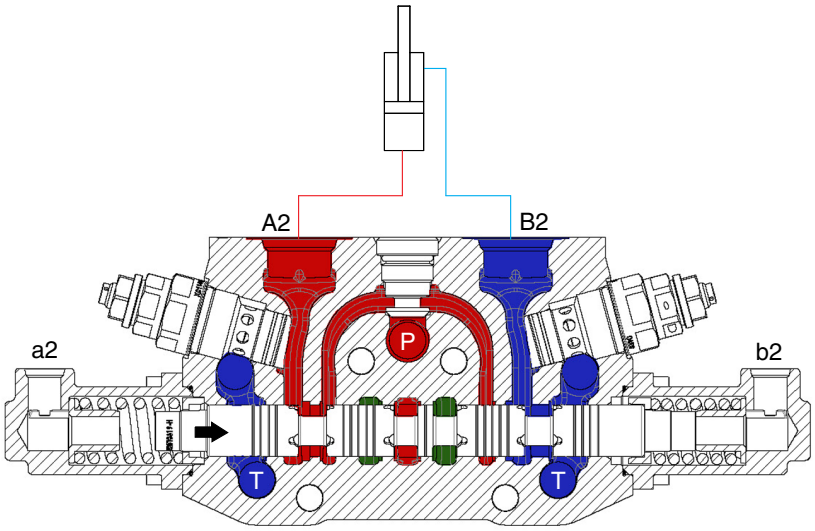
The return oil from cylinder port (A3) flows into the tank via the low pressure passage.

(4) Boom float position (when the boom lever is in the float position)

When the boom spool in 4th position, the pressured oil supplied from the pumps (P1 & P2) flow through the neutral passage of loader MCV to the backhoe MCV and then returns to the tank.

The return oil from cylinder port (A3 & B3) flows into the tank via the low pressure passage.

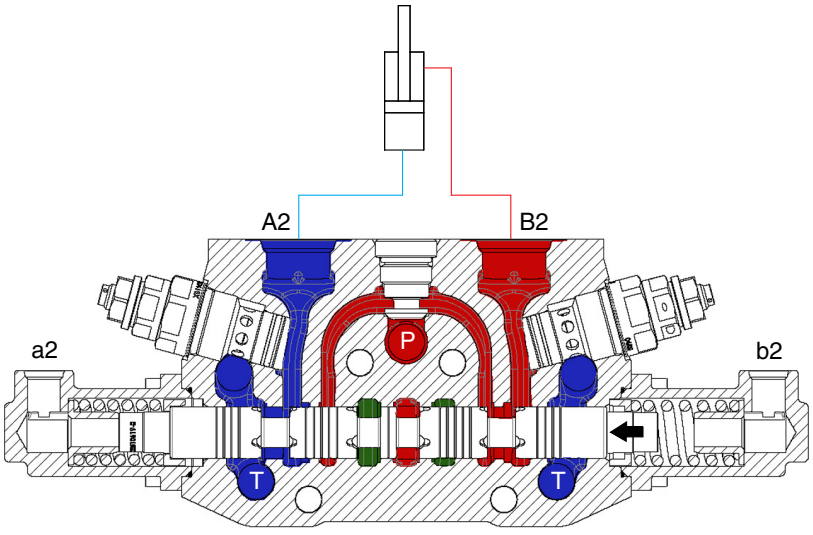
(2) Dipper in position (when dipper lever is pulled back)



H940C6WE54

When the dipper spool moves to the right, the pressure oil supplied from the pump flow through cylinder port (A2) into dipper cylinder.
The return oil from cylinder port (B2) flows into the tank via the low pressure passage.

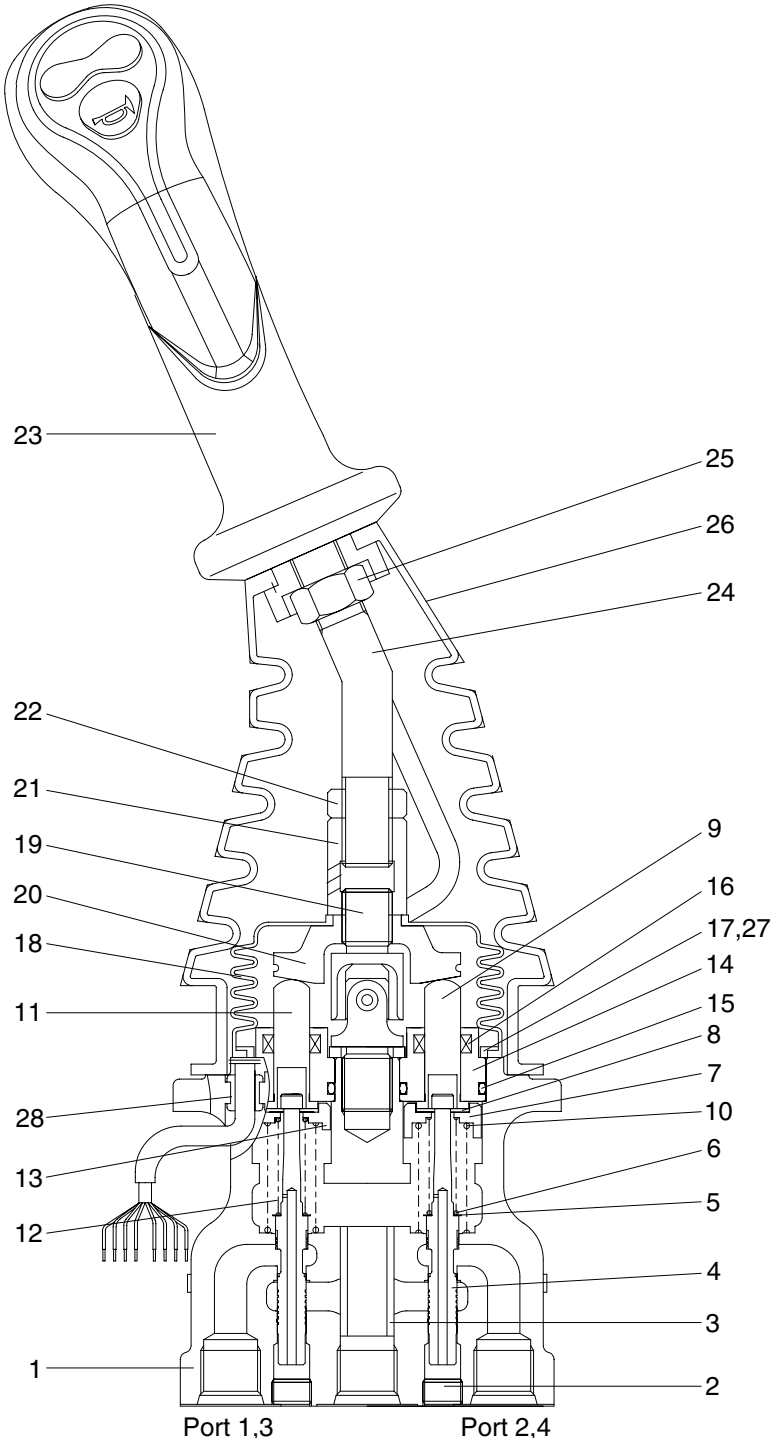
(3) Dipper out position (when dipper lever is pushed)



H940C6WE55

When the dipper spool moves to the left, the pressure oil supplied from the pump flow through cylinder port (B2) into dipper cylinder.
The return oil from cylinder port (A2) flows into the tank via the low pressure passage.

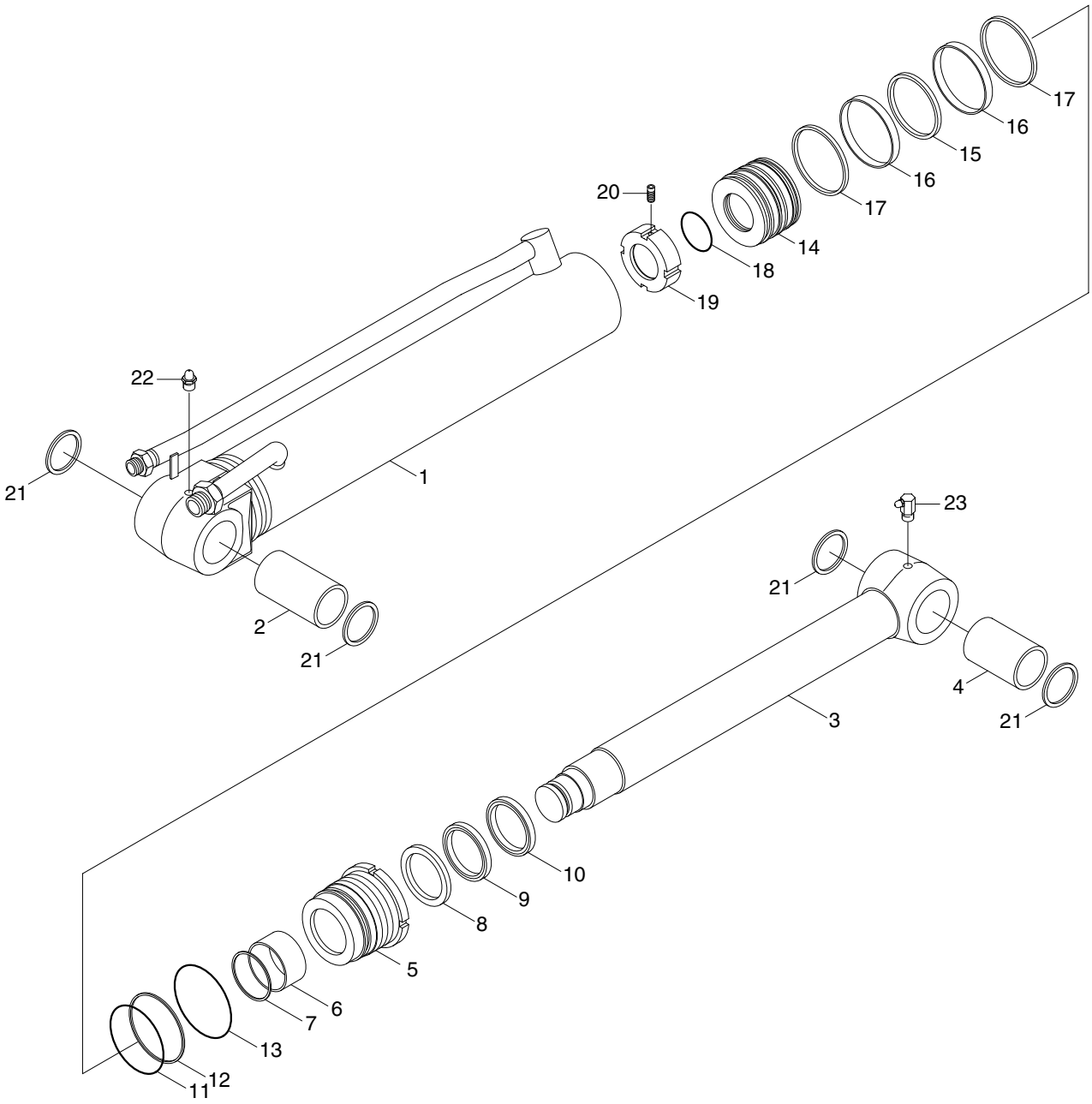
CROSS SECTION



H940C6WE71

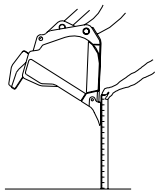
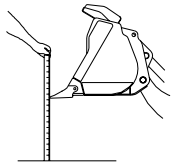
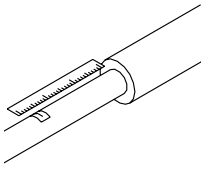
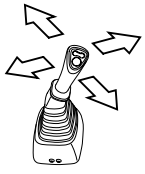
1	Case	8	Stopper	15	O-ring	22	Lock nut
2	Plug	9	Push rod	16	Rod seal	23	Handle assembly
3	Bushing	10	Spring	17	Plate	24	Handle bar
4	Spool	11	Push rod	18	Boot	25	Nut
5	Shim	12	Spring	19	Joint assembly	26	Boot
6	Spring	13	Spring seat	20	Swash plate	27	Spring pin
7	Spring seat	14	Plug	21	Adjusting nut	28	Bushing

3) BUCKET CYLINDER



H940C6WE132

1	Tube assembly	9	U-packing	17	Dust ring
2	Pin bushing	10	Dust wiper	18	O-ring
3	Rod assembly	11	O-ring	19	Piston nut
4	Pin bushing	12	Back up ring	20	Set screw
5	Rod cover	13	O-ring	21	Pin wiper
6	Rod bushing	14	Piston	22	Grease nipple
7	Retaining ring	15	Piston seal	23	Grease nipple
8	Buffer seal	16	Wear ring		

Item	Description	Service action
Boom cylinder leakage check Heat hydraulic oil to operating temperature.	 Dump bucket until teeth or cutting edge is perpendicular to the ground. Raise boom until cutting edge is about 1 m (3 ft) above ground. Stop engine. Measure drift from tooth or cutting edge to ground for 1 minute. Wait 10 minutes. Measure drift from tooth or cutting edge to ground for 1 minute. **LOOK** : Compare the drift rate between the first measurement and the second measurement.	**OK** Drift is approximately the same between first and second measurement. Repair loader control valve or circuit relief valve. **NOT OK** If drift is considerably less on second measurement, repair cylinder.
Bucket cylinder leakage check Heat hydraulic oil to operating temperature.	 Raise bucket about 1 m (3 ft) off ground with bucket level. Stop engine. Place a support under boom. Measure drift from tooth or cutting edge to ground for 1 minute. Wait 10 minutes. Measure drift from tooth or cutting edge to ground for 1 minute. **LOOK** : Compare the drift rates between the first measurement and the second measurement.	**OK** Drift is approximately the same between first and second measurement. Repair loader control valve or circuit relief valve at page 6-92. **NOT OK** Drift is considerably less on second measurement. Repair cylinder.
Check valve of safety valve leakage check Heat hydraulic oil to operating temperature.	 Put bucket level and position about 1.2 m (4 ft) above ground. Place a piece of tape on cylinder rod at least 51 mm (2 in) from rod guide. Run engine at low idle in safety-release position. **LOOK** : Bucket must not drift up.	**OK** Check complete. **NOT OK** Check or replace safety valve.
Pilot control valve (RCV lever) check	 Stop engine. Turn key switch to OFF position. Move control lever to all positions and then release. **LOOK** : Lever must return to neutral when released from all positions.	**OK** Check completed. **NOT OK** Repair pilot control valve.

1. HYDRAULIC OIL CLEAN UP PROCEDURE USING PORTABLE FILTER CADDY

※ Service equipment and tool
- Portable filter caddy
- Two 4000 mm × 1in 100R1 Hoses
- Quick disconnect fittings.
- Discharge wand
- Various size fittings.

※ Loader system uses oil from hydraulic oil tank. Flush all lines in the loader, pilot system. Disassemble and clean major components for hydraulic system.

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. Inspect 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 filler hole so end is as far away from drain port as possible to obtain a thorough cleaning of oil.

11. PILOT OIL SUPPLY UNIT PRESSURE TEST

· **SPECIFICATION**

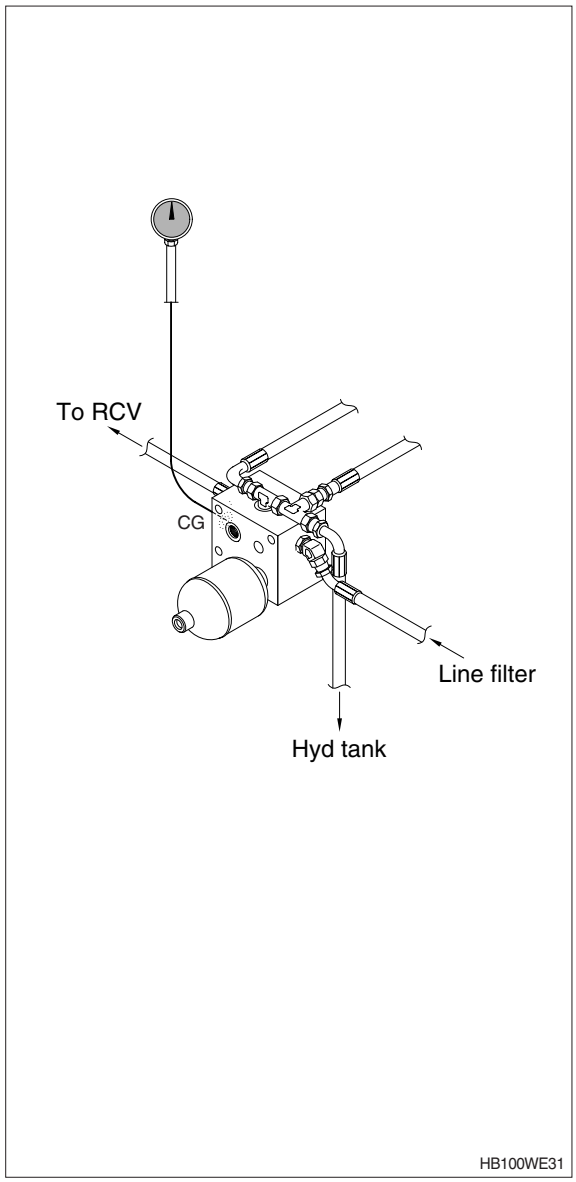
Oil temperature 45±5°C (113±9°F)
Engine speed Low idle and stop
Pilot pressure setting (backhoe)
30 kgf/cm² (430psi)
Pilot pressure setting (stabilizer)
30 kgf/cm² (430psi)
Reducing & relief valve setting pressure
30 kgf/cm² (430psi)
Accumulator precharging pressure
15 kgf/cm² (215psi)

· **GAUGE AND TOOL**

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

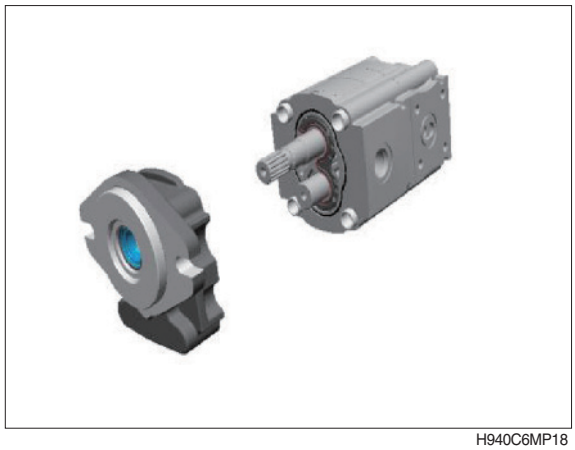
The pilot supply unit consist of the pressure reducing & relief valve, solenoid valve and an accumulator. This regulates pressure to the pilot control circuit.

1) Connect gauge to test port on the block.
2) Install temperature reader.
(See temperature reader installation procedure in this group.)
3) Heat hydraulic oil to specification.(See hydraulic oil warm up procedure in this group.)
4) Run engine at low idle for 1 minute and stop engine, wait for 5 minutes. Then start measuring.
5) If pressure in not within specifications, replace valve. The valve is staked and should not be adjusted.



⑨ Assemble mounting flange to the body, taking care not to give any damage on the shaft seals by sharp edge of shaft.

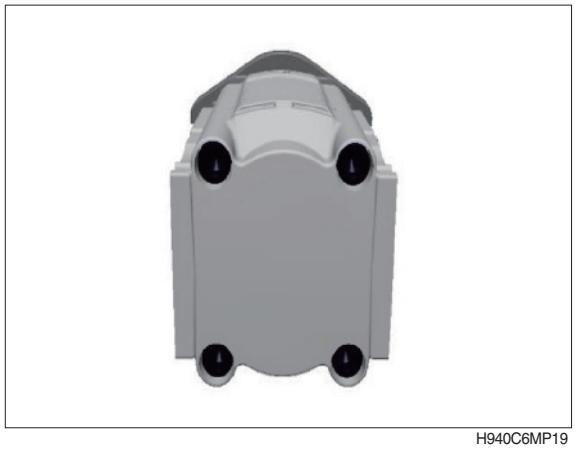
※ Smear clean grease on the lips of shaft seals before assembling.



H940C6MP18

⑩ Assemble the bolts and tighten the bolts with in a crisscross pattern to a torque value of 14.3 kgf · m (103 lbf · ft).

⑪ Check that the pump rotates freely when the drive shaft is turned by hand, if not a possible, plate seal may be pinched.



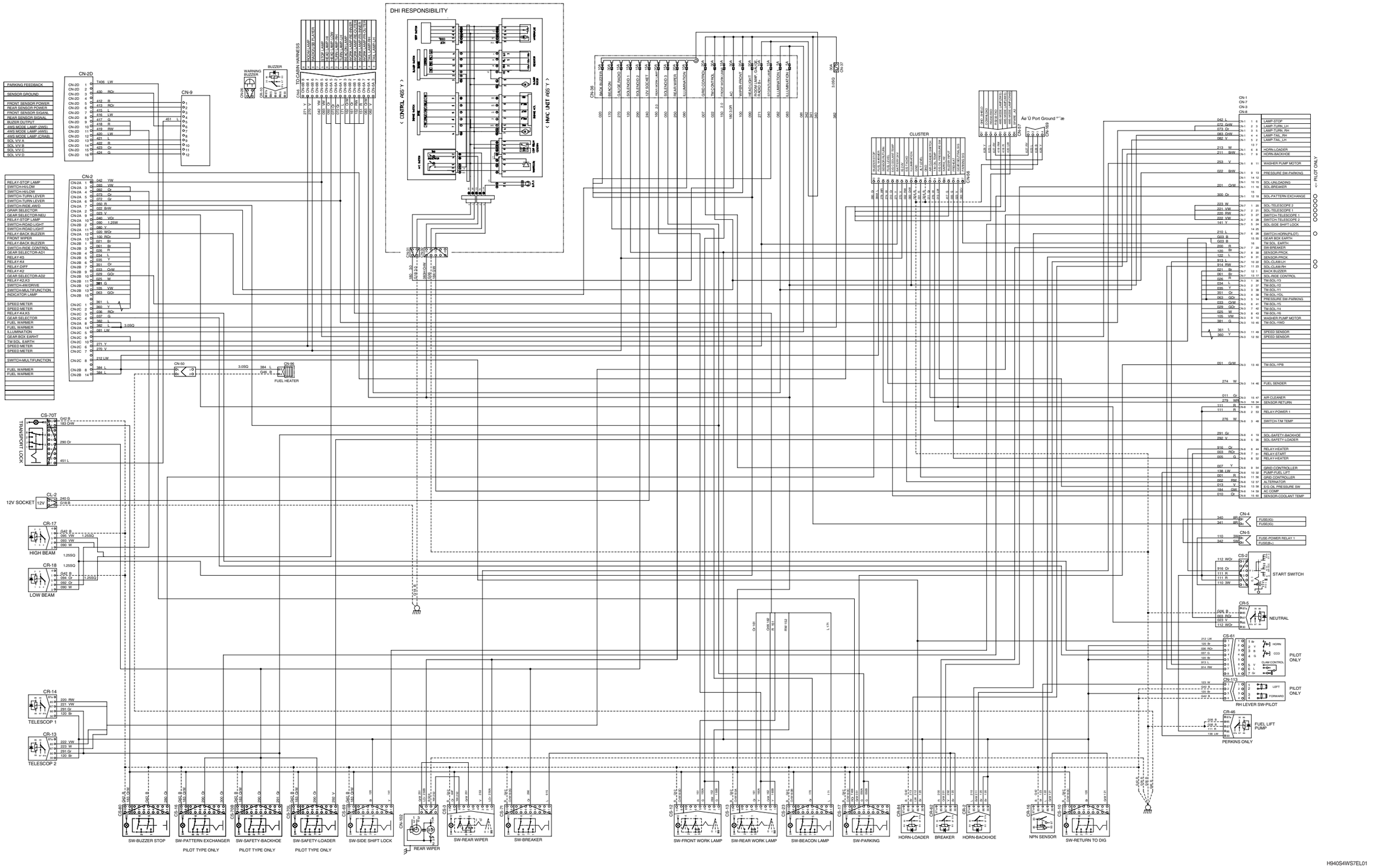
H940C6MP19

⑫ Locate an O-ring into the groove on the body.

⑬ Locate preassembled LS - priority valve on the 1st working section and tighten the bolts with in a crisscross pattern to a torque value of 7.14 kgf · m (51.6 lbf · ft).

H940C6MP20

1. ELECTRICAL CIRCUIT (1/3)



H940S4WS7EL01

4. STARTING CIRCUIT

1) OPERATING FLOW

Battery(+) terminal → Master switch [(CS-74)]
→ Power relay 1 [CR-1P] → I/conn [CN-5 (1)] → Start switch [CS-2 (1)]
→ Power relay 2 [CR-35P] → I/conn [CN-5 (2)] → Fuse box [CN-37]

※ The gear selector lever is neutral position. It is necessary condition before the starting.
The gear selector has an output signal which is activated whenever the shift lever is in the neutral position. This signal can be used to control a relay and prevent engine from starting whenever the shift lever is not in the neutral position.

(1) When start key switch is in ON position

Start switch ON → Start switch [CS-2 (2, 3)] → I/conn [CN-8 (1, 2)]
→ Power relay 1 [CR-1S(1) → CR-1P(2)] → I/conn [CN-4 (1)]
→ Fuse box [CN-36]
→ Power relay 2 [CR-35S(1) → CR-35P(2)] → I/conn [CN-4 (2)]
→ Fuse box [CN-36]

(2) When start key switch is in START position

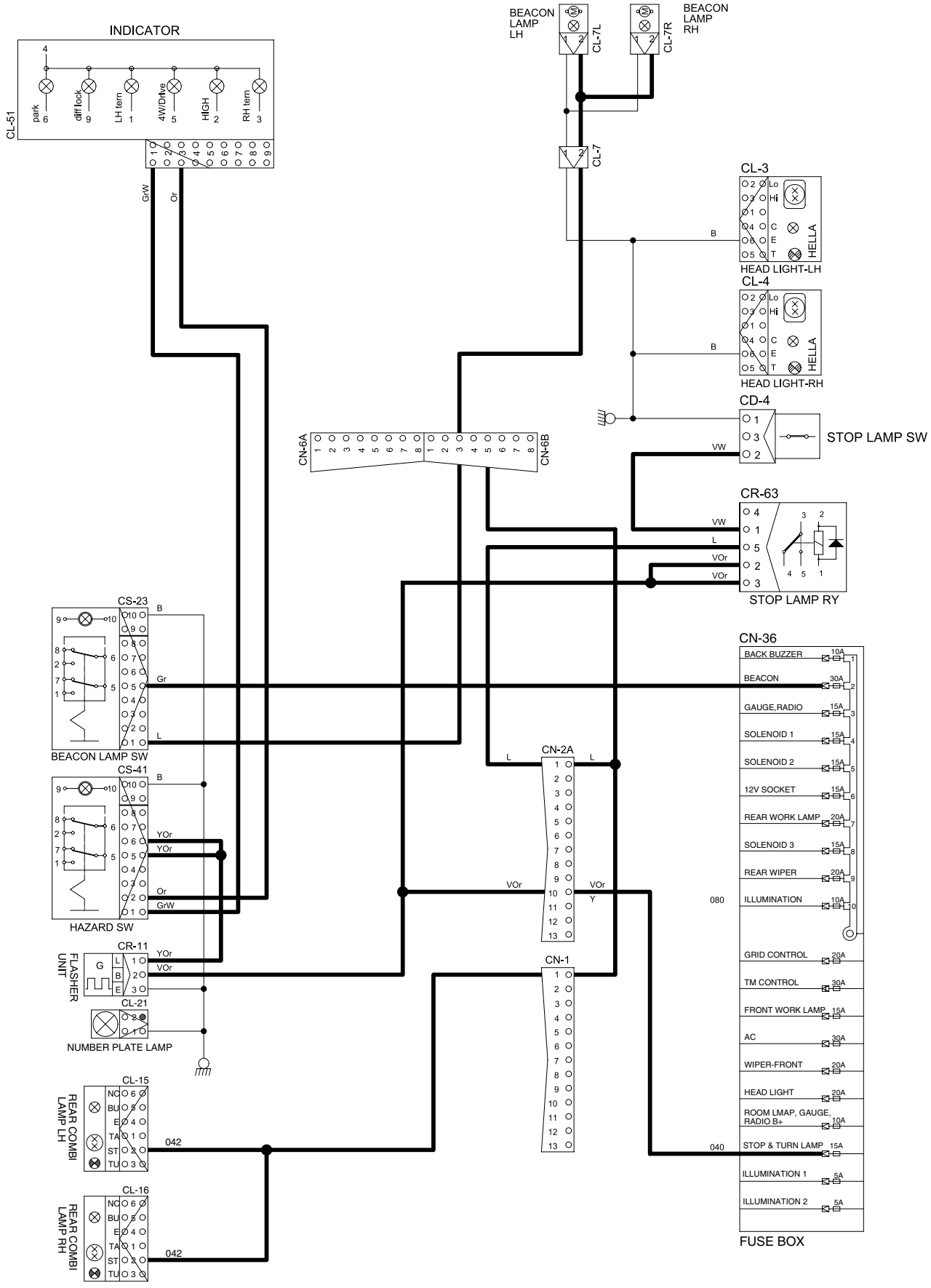
Start switch START [CS-2 (6)] → Start safety relay [CR-5 (87a)→(87)] → I/conn [CN-8 (7)] → I/conn [CN-13 (10)] → Start relay [CR-23] →
Starter (terminal B^+ and M connector of start motor)

2) CHECK POINT

Engine	Key switch	Check point	Voltage
Running	ON	① - GND (battery B^+) ② - GND (Power relay) ③ - GND (start key B terminal) ④ - GND (start key BR, ACC terminal) ⑤ - GND (start key C terminal) ⑥ - GND (start safety relay output)	12 V

※ GND : Ground

HAZARD, TURN AND ROTARY CIRCUIT



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