

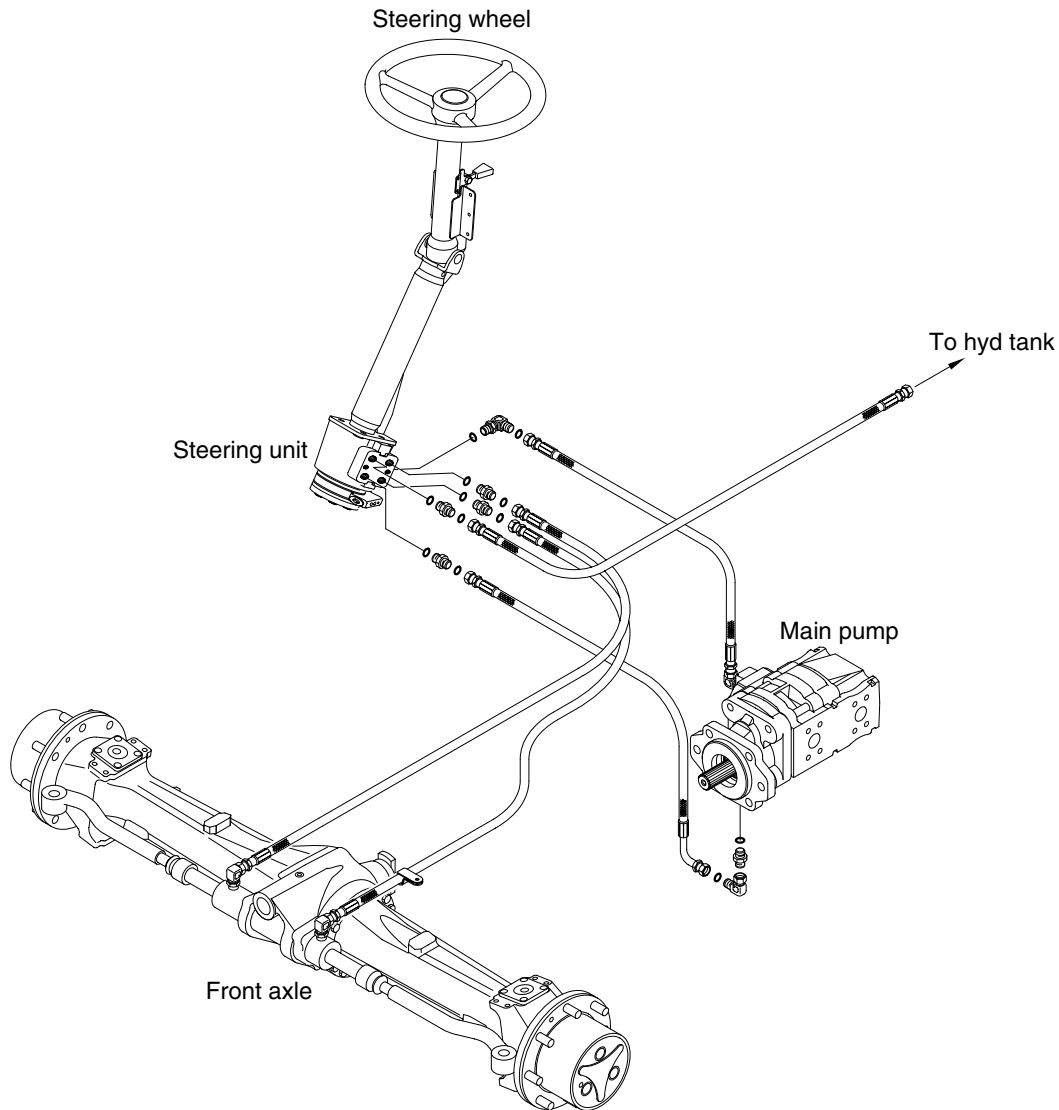
SECTION 5 STEERING SYSTEM

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SECTION 5 STEERING SYSTEM

GROUP 1 STRUCTURE AND FUNCTION

1. OUTLINE



HB100SE01

The main components of the steering system are the priority valve in main pump, load sensing steer unit, hydraulic tank and front power track rod ram.

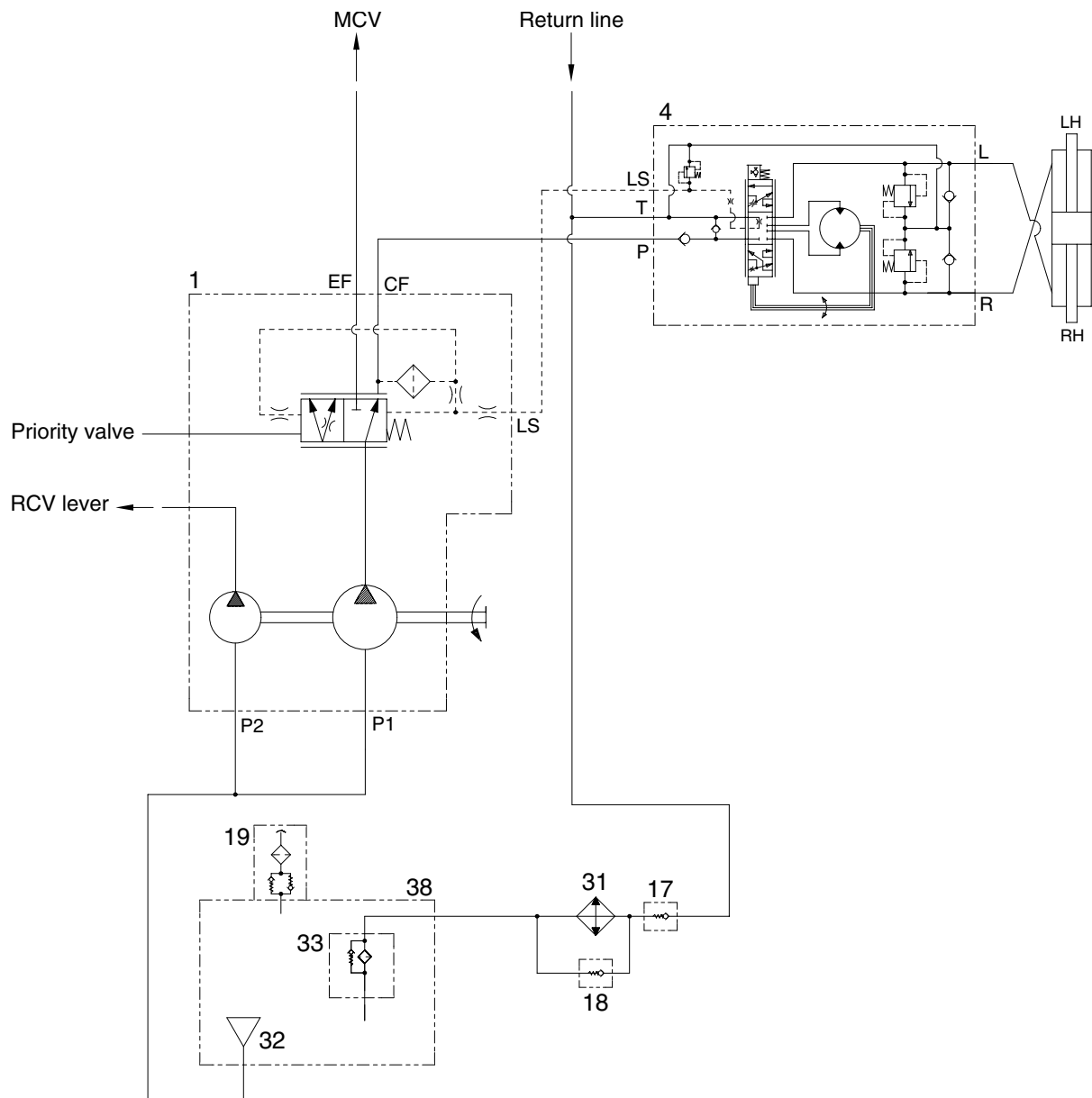
When the steering wheel is turned, a pressure demand is sensed at the priority valve in main pump via load sensing line LS.

Oil from the main pump is then distributed via the priority valve to the steer unit, which then directs the oil to the front power track rod ram until the required steering lock is achieved.

When the steering lock is held, the pressure signal LS ceases, flow from the main pump is now distributed to the main hydraulic circuit via the priority valve in main pump.

Maximum steering system pressure is controlled by a relief valve located in the steering unit.

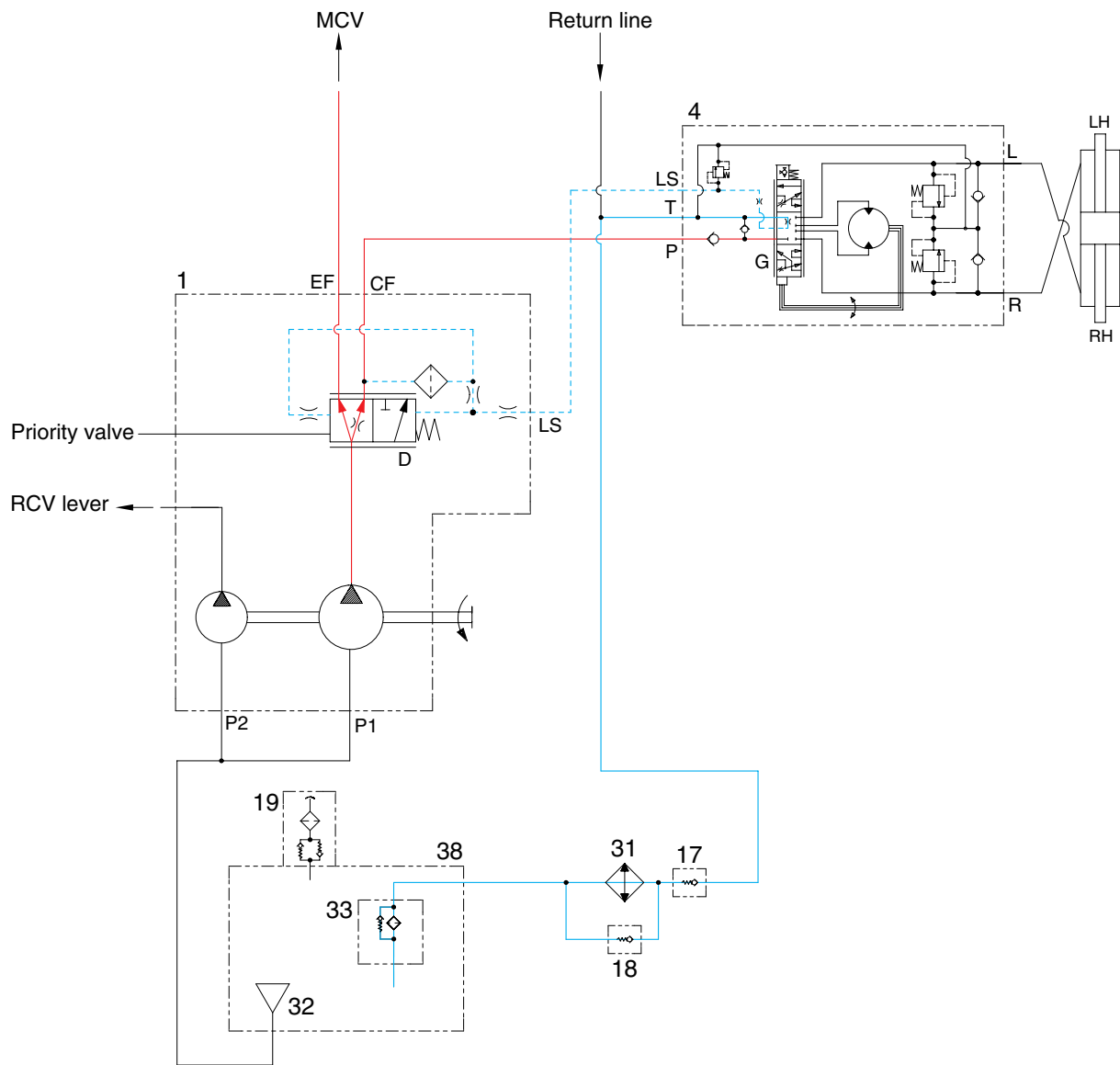
2. HYDRAULIC CIRCUIT



HB100SE02

- | | | | | | |
|----|--------------------|----|---------------------|----|------------------|
| 1 | Main pump | 18 | By-pass check valve | 32 | Suction strainer |
| 4 | Steering unit | 19 | Air breather | 33 | Return filter |
| 17 | Return check valve | 31 | Oil cooler | 38 | Hydraulic tank |

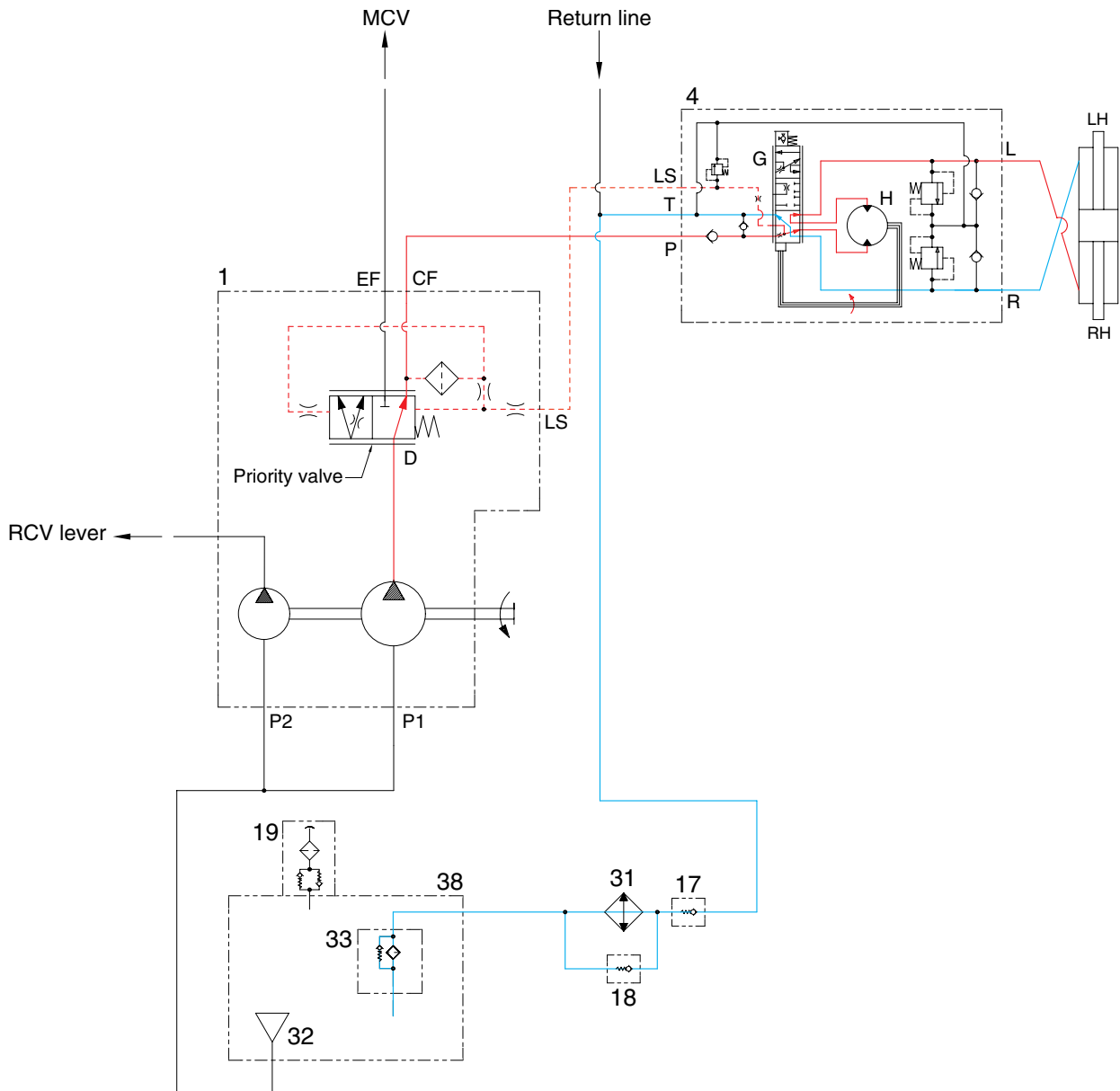
1) NEUTRAL



HB100SE03

- The steering wheel is not being operated so control spool (G) does not move.
- The oil from the main pump (1) enters port P of steering unit (4) and the inlet pressure oil moves the priority valve spool (D).
- Almost all of pump flow goes to the main control valve through the EF port and partly flows into the hydraulic tank (38) through the spool (G).

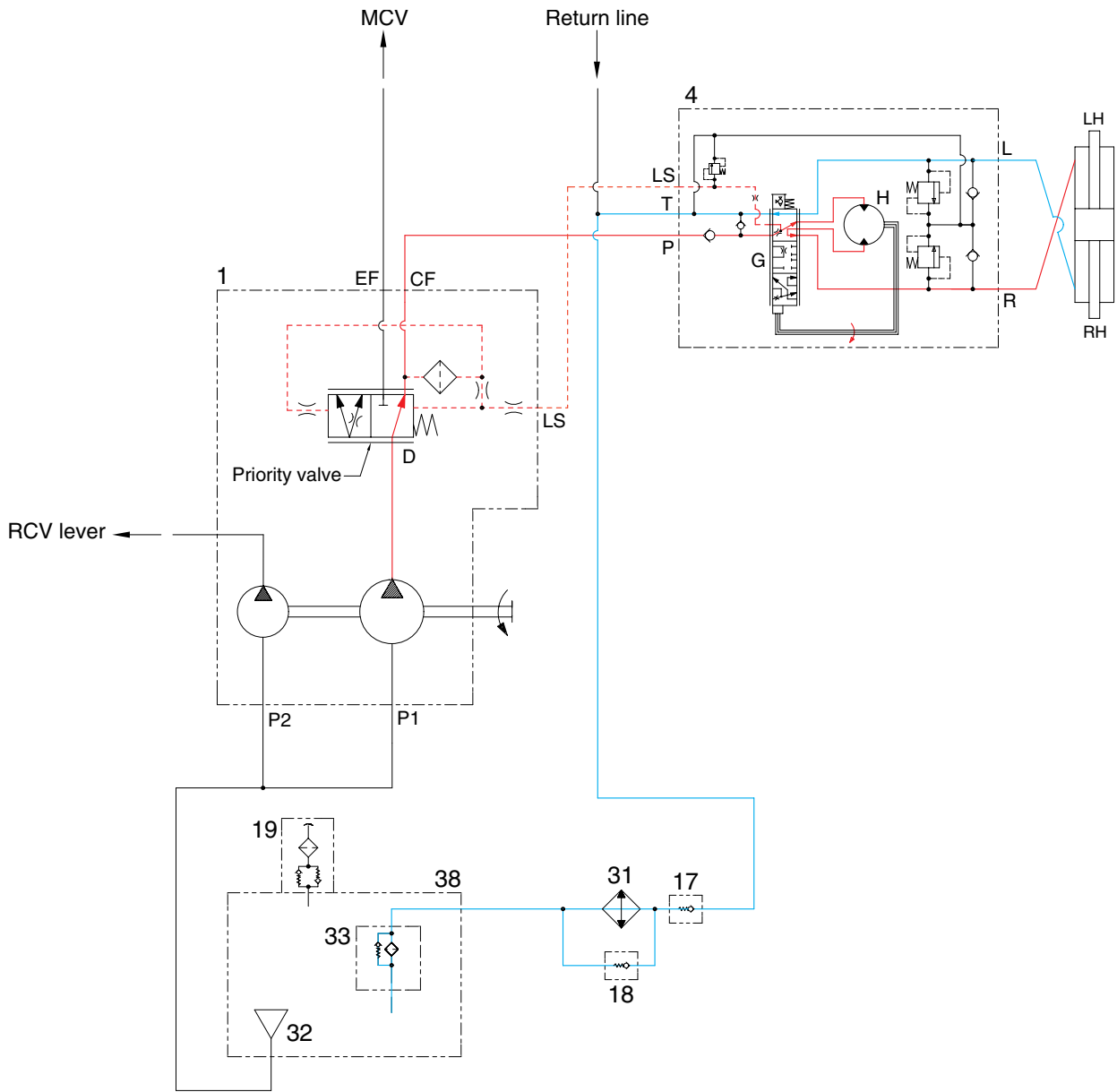
2) LEFT TURN



HB100SE04

- When the steering wheel is turned to the left, the spool (G) within the steering unit (4) connected with steering column turns in left hand direction.
- At this time, the oil discharged from the main pump (1) flows into the spool (G) of the steering unit through the spool (D) of priority valve built in main pump (1) and flows the gerotor (H).
- Oil flow from the gerotor (H) flows back into the spool (G) where it is directed out the left work port (L).
- Oil returned from cylinder returns to hydraulic tank (38).
- When the above operation is completed, the machine turns to the left.

3) RIGHT TURN

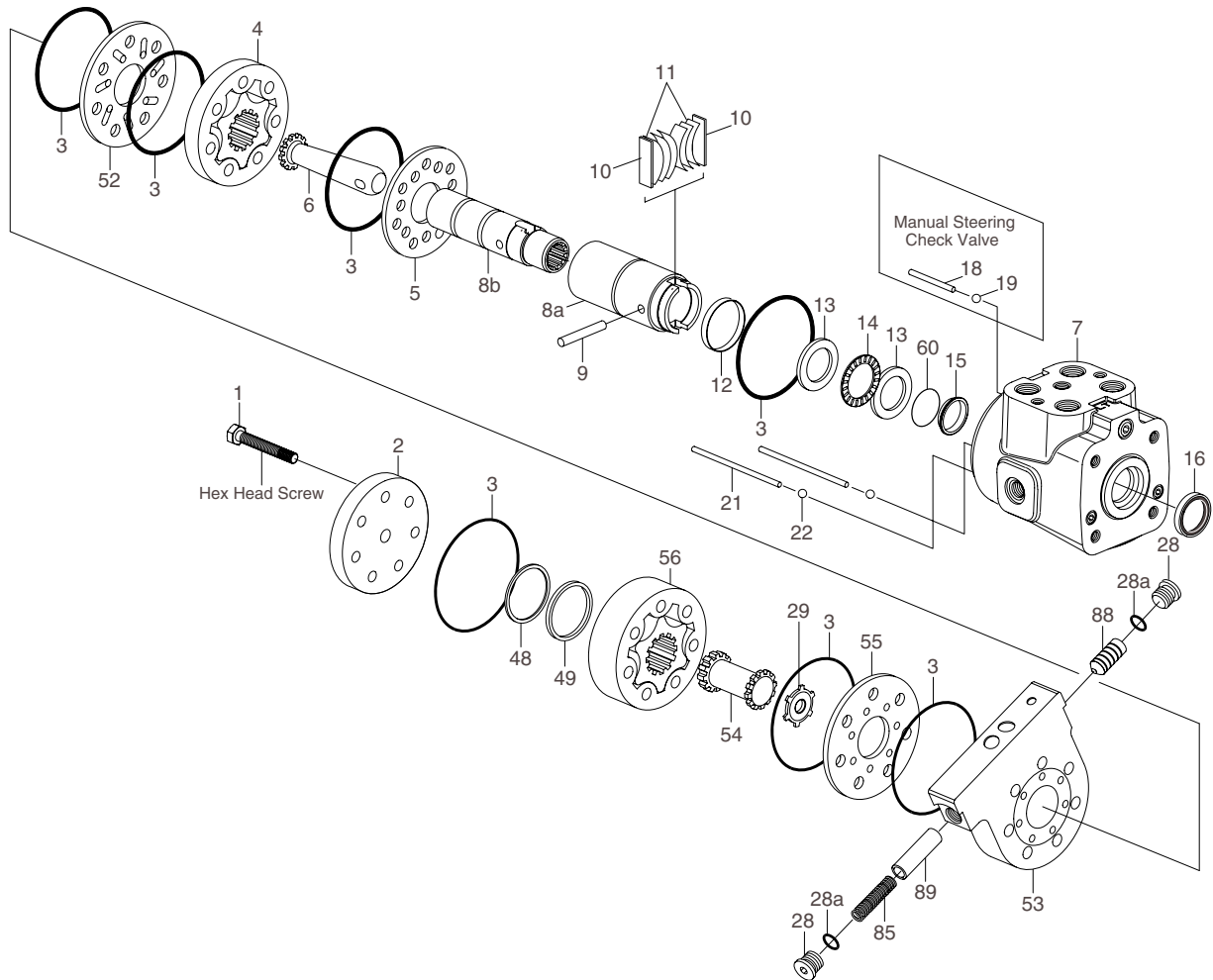


HB100SE05

- When the steering wheel is turned to the right, the spool (G) within the steering unit (4) connected with steering column turns in right hand direction.
- At this time, the oil discharged from the main pump (1) flows into the spool (G) of the steering unit through the spool (D) of priority valve built in main pump (1) and flows the gerotor (H).
- Oil flow from the gerotor (H) flows back into the spool (G) where it is directed out the right work port (R).
- Oil returned from cylinder returns to hydraulic tank (38).
- When the above operation is completed, the machine turns to the right.

3. STEERING UNIT

1) STRUCTURE



HB100SE06

- | | | | | | |
|----|------------------|----|-----------------------|-----|---------------------|
| 1 | Cap screw | 12 | Retainer spring | 52 | Valve plate |
| 2 | End cap | 13 | Race bearing | 53 | Valve sub assy |
| 3 | Seal | 14 | Needle thrust bearing | 54 | Drive |
| 4 | Gerotor sub assy | 15 | Seal | 55 | Valve plate |
| 5 | Spacer plate | 16 | Dust seal | 56 | Gerotor sub assy |
| 6 | Drive | 18 | Roll pin | 60 | O-ring |
| 7 | Valve housing | 19 | Ball | 85 | Compression spring |
| 8a | Control sleeve | 21 | Roll pin | 86a | Plug |
| 8b | Control spool | 22 | Check ball | 86b | O-ring |
| 9 | Centering pin | 29 | Spacer | 88 | Piston |
| 10 | Spacer spring | 48 | Seal ring | 89 | Guide spring piston |
| 11 | Centering spring | 49 | Back-up ring | | |

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.