Document Title: **General description**	Function Group: **600**	Information Type: **Service Information**	Date: **2014/3/26**
Profile: **WLO, L330E [GB]**			

General description

The machine is equipped with hydrostatic load-sensing (LS) articulated frame steering consisting of a steering valve (ORBITROL), pump and two steering cylinders.
Pump 1 (P1) is a variable axial piston pump located on the torque converter upper left power take-off. P1 delivers oil to the flow amplifier. The flow amplifier has priority, and surplus oil is directed to the working hydraulics.
The flow amplifier receives a signal from the steering valve and increases flow from the steering valve in order to then deliver the oil to the steering cylinders.

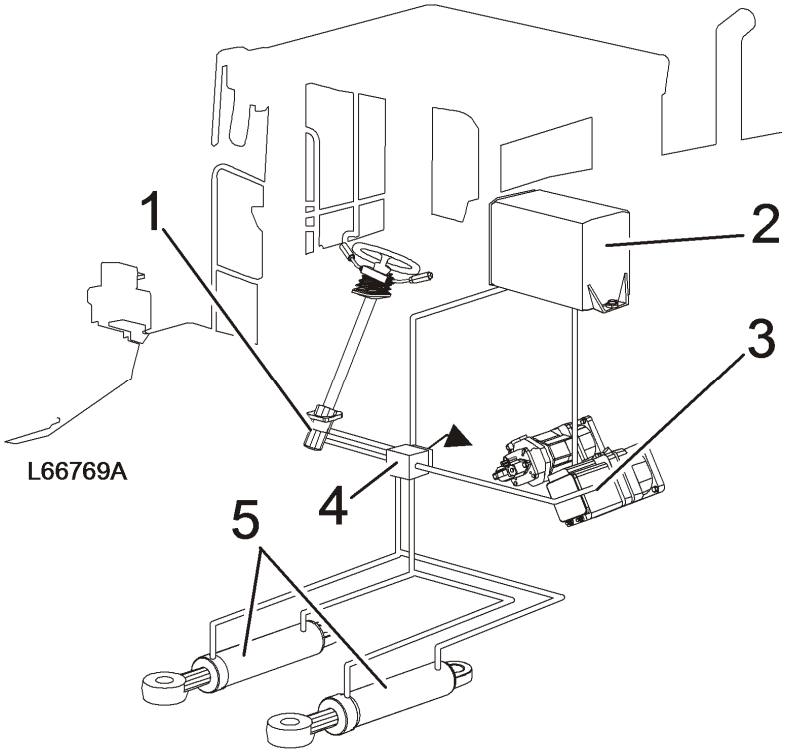

Figure 1
Steering, component positions (explanatory illustration)

1. Steering valve (ORBITROL)
2. Hydraulic tank
3. Pump 1
4. Flow amplifier
5. Steering cylinders

Document Title:	Function Group:	Information Type:	Date:
Steering valve, description	**645**	**Service Information**	**2014/3/26**
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Steering valve, description

Steering valve (ORBITROL)

The steering valve is a so-called non-reaction type with closed centre.
It has a load-sensing outlet (LSD) from which a steering pressure is obtained to the LSS connection on the central block. From the LSS connection on the central block, the steering pressure goes to the flow compensator on P1/P2.

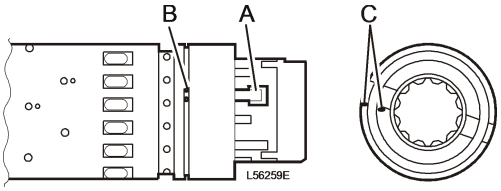

Figure 1

Steering valve, inner and outer spool assembled

A. T-shaped groove (inner spool)
B. Holes (outer spool)
C. Punch marks, must line up when installing

Function

The steering valve is in the neutral position when the steering wheel is stationary and only hold (stand-by) pressure is obtained from pump P1. P1 is angled down and does not deliver any oil..
Turning the wheel in one direction or another leads to internal rotation of inner spool 8 and outer spool 9. Once this rotation reaches 1.5°, the channels to the metering unit (rotor 19 and rotor ring 20) and the load-sensing port (LS) begin to open.
At 6° rotation, the channels to the metering unit and the load-sensing port are fully open. Internal rotation of the inner spool and outer spool is limited to 8 - 9°.

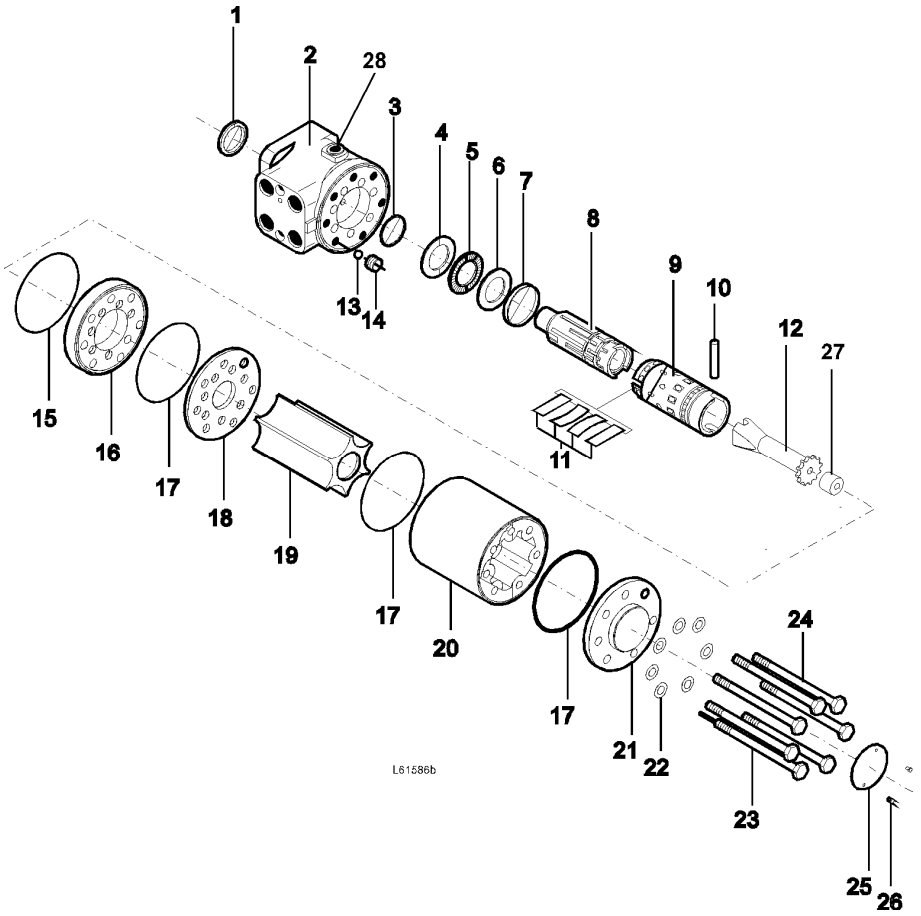

Figure 2
Steering valve, ORBITROL, OSPL (Principle illustration)

Steering valve

1	Seal	15	O-ring
2	Valve housing	16	Distribution plate
3	O-ring/back-up ring	17	O-ring
4	Axial disc	18	Distribution plate
5	Needle bearing	19	Rotor*
6	Bearing race	20	Rotor ring*
7	Ring (retainer)	21	Cover
8	Inner valve spool	22	Washer
9	Outer valve spool	23	Screw with guide pin
10	Cross-pin	24	Screw (6 pcs.)
11	Leaf springs (4 pcs.)	25	Type plate
12	Rotor shaft	26	Blind rivet
13	Ball (non-return valve)	27	Spacer (not fitted on every size of steering valve)
14	Bushing	28	LS-connection (load-sensing outlet)

* 19 Rotor and 20 Rotor ring make up the metering unit

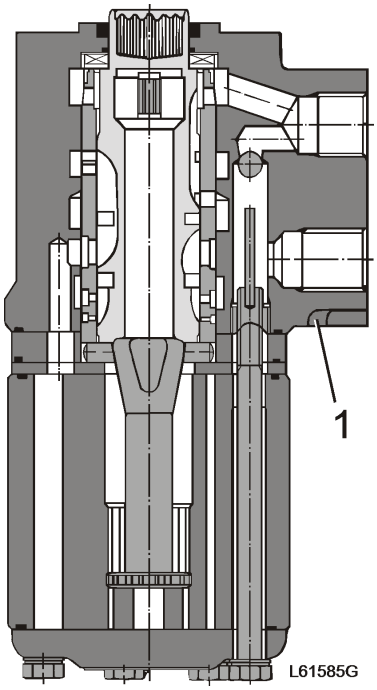

Figure 3
Steering valve, ORBITROL, OSPL

1. Stamped-in marking, week/year, i.e. 419 (week 41 year 1999)

Document Title: **Steering cylinder, description**	Function Group: **645**	Information Type: **Service Information**	Date: **2014/3/26**
Profile: **WLO, L330E [GB]**			

Steering cylinder, description

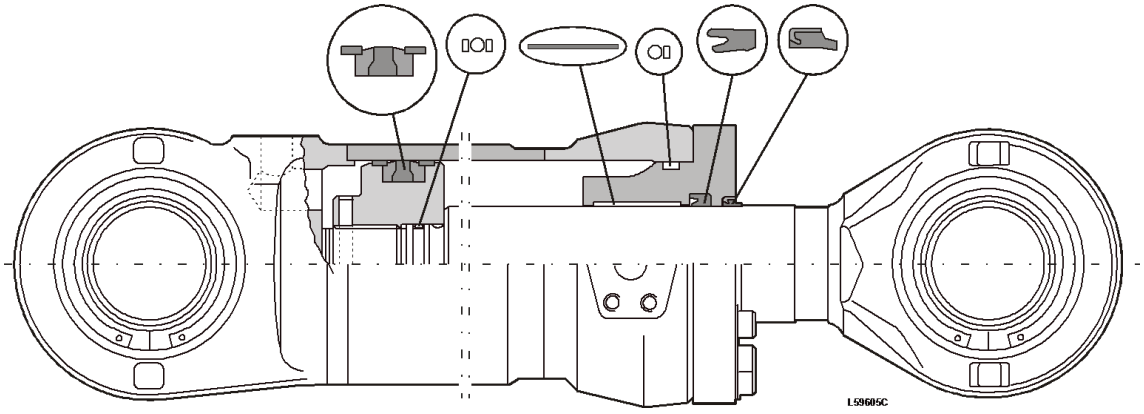

Figure 1
Steering cylinder

VOLVO

Construction Equipment

Service Information

Document Title:	Function Group:	Information Type:	Date:
Flow amplifier, description	**645**	**Service Information**	**2014/3/26**
Profile: **WLO, L330E [GB]**			

Flow amplifier, description

The flow amplifier is located on the rear frame under the cab.
It contains a priority valve, amplifier element, directional valve, pressure limiting valve as well as shock and anti-cavitation valves.

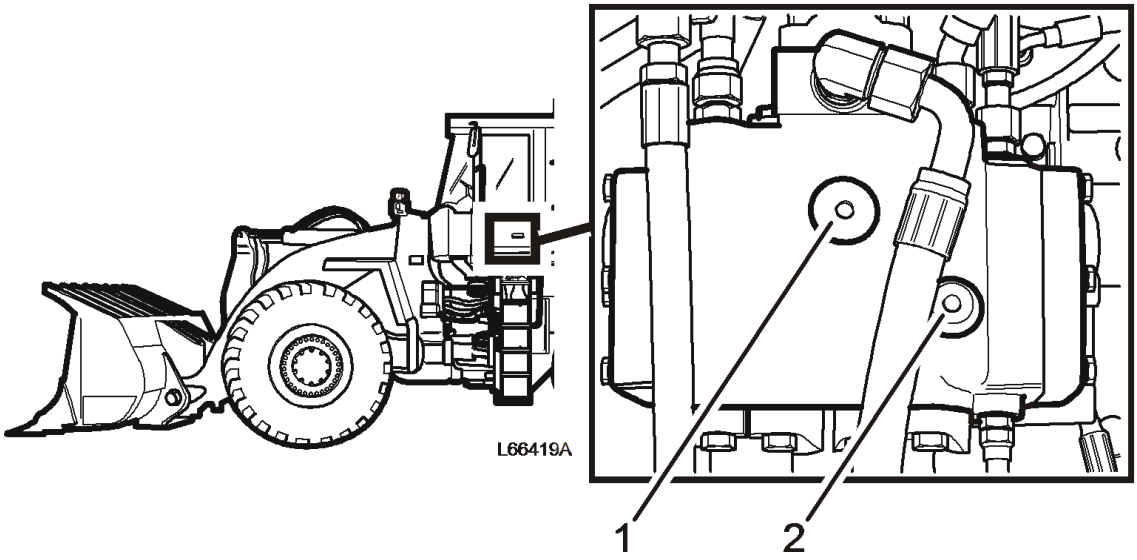

Figure 1
Flow amplifier

1. Return pressure valve, anti-cavitation valve
2. Max. steering pressure limiter (blocked)

- The priority valve gives priority to the oil flow for the steering system, and surplus oil flow goes to the working hydraulic system.
- The amplifier element is controlled by the steering wheel angle via the steering valve (ORBITROL) and complements the oil flow from the steering valve with oil directly from the hydraulic oil pumps via the priority valve.
- The directional valve is controlled by the steering wheel angle via the steering valve and allows total oil flow out to the steering cylinders in proportion to the steering wheel angle.
- The role of the pressure-limiting valve is to control the function of the priority valve at high pressure. The pressure limiter is screwed in all the way. The pressure level becomes high when pressure limitation occurs through the pressure limiter in the central block.
- The shock and anti-cavitation valves are built as one unit for each steering direction.
  The shock valves limit the pressure in the steering system during shock loads.
  The anti-cavitation valves ensure adequate refilling in the cylinders during the steering movement.

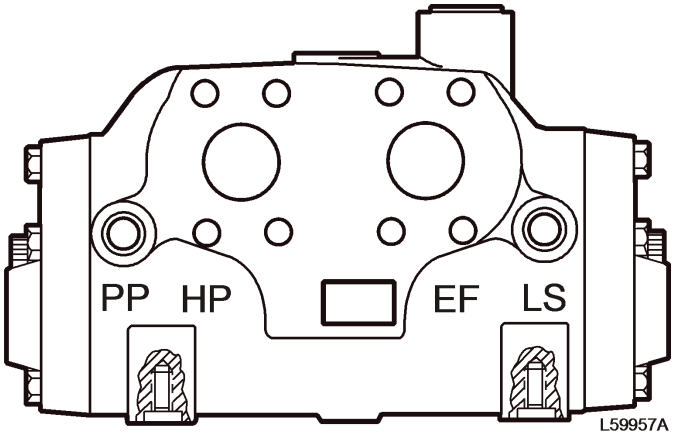

Figure 2
Flow amplifier

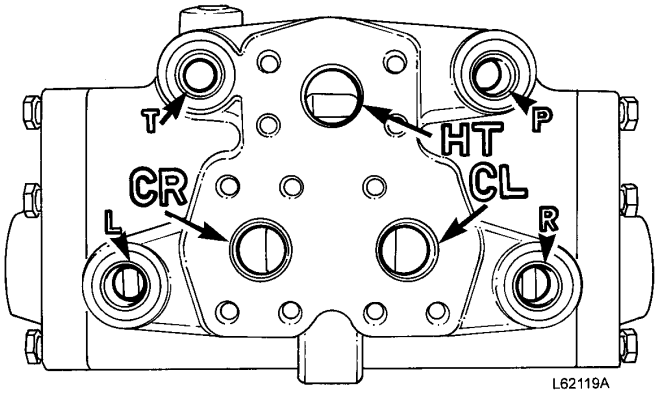

Figure 3

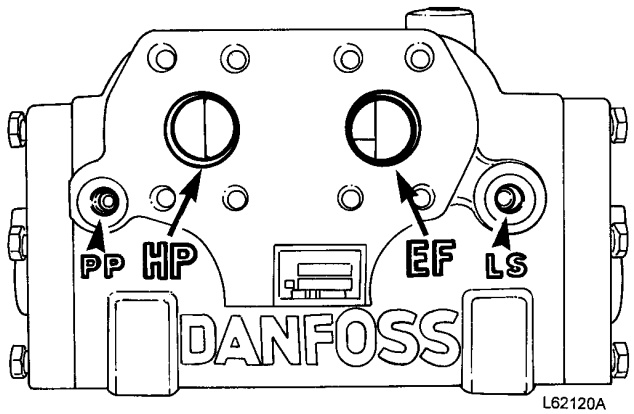

Figure 4
Connections, flow amplifier

PP Connected to P on steering valve (ORBITROL)

HT Connected to hydraulic oil tank (return)

CR Right steering Connected to steering cylinders, right in (minus), left out (plus)

CL Left steering Connected to steering cylinders, right out (plus), left in (minus)

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