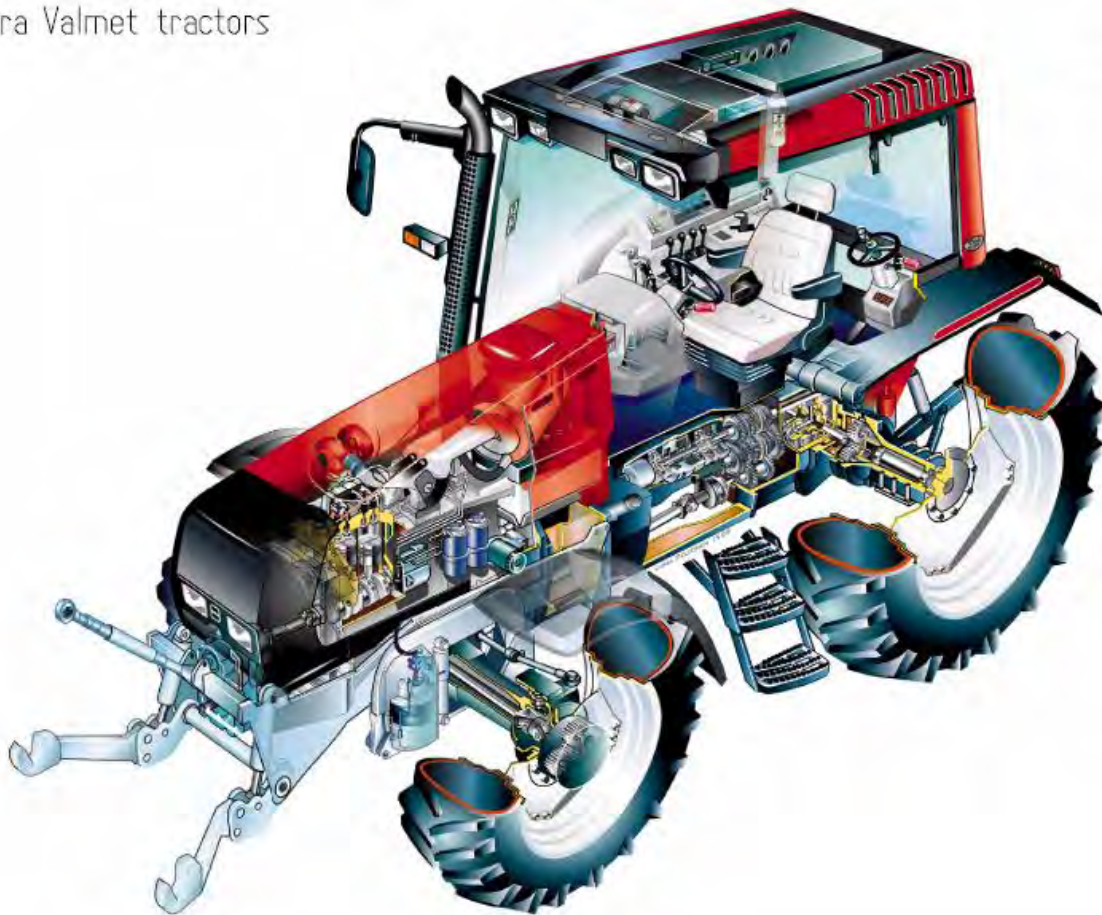


# VALTRA – VALMET MEGA MEZZO HI-TEC

Valtra Valmet tractors



## WORKSHOP MANUAL

# VALTRA

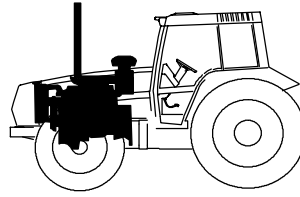
## Service Manual Tractors

Groups 10–100

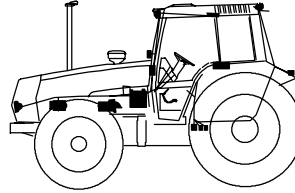
Valtra Inc.  
44200 Suolahti, Finland

Virtakäyttöön Käyttöohje  
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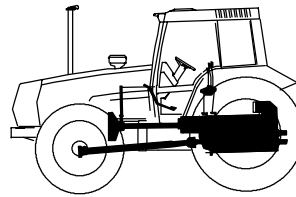
**10** General



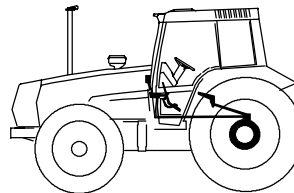
**20** Engine



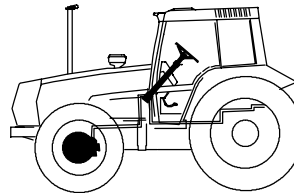
**30** Electrical system



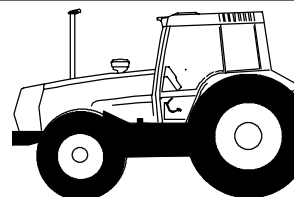
**40** Power transmission



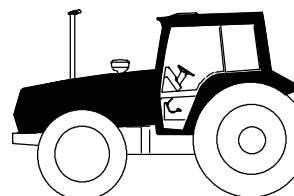
**50** Brake system



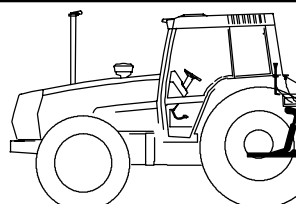
**60** Steering system and Front axle



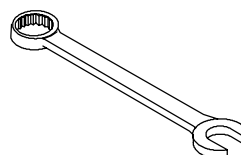
**70** Frame and Wheels



**80** Cab and Shields



**90** Hydraulics



**100** Tools

## **60. Steering system and front axle**

**61. Steering system**

**64. Powered front axle**

**65. Industrial front axle**

**66. Air suspension**

**67. Carracro 20.29 front axle**

<b>61. Steering system</b>	<del>15. 5. 1993</del>	Model	Code	Page
	15. 5. 1996	6000–8750	610	1

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### Reconditioning steering system

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## Technical data

Hydrostatic steering system. Oil is supplied to the steering system from the high – pressure pump via the priority valve. Adjustable telescopic steering wheel column. One double – action steering cylinder in the middle of the front axle.

Steering valve .....	Orbitrol OSPC 125 LS
Pump capacity per revolution .....	0,125 l
Working pressure (at pressure – test point, 1500 r/min / 50–65° C) .....	14–15,5 MPa
Pressure – limiting valve opening pressure .....	14 MPa
Shock valve opening pressure .....	19,5–21,5 MPa
Priority valve:	
– 6000–8400 .....	OLS 80
– 8050–8750 .....	OLS 120
Steering speed .....	over 2 rounds/sec. at idling speed
Steering wheel rotates .....	5,2 turn
Steering capacity $\pm 30^\circ$ with front axle load of 5000 kg on dry asphalt	

Turning radius (m) with standard track width:

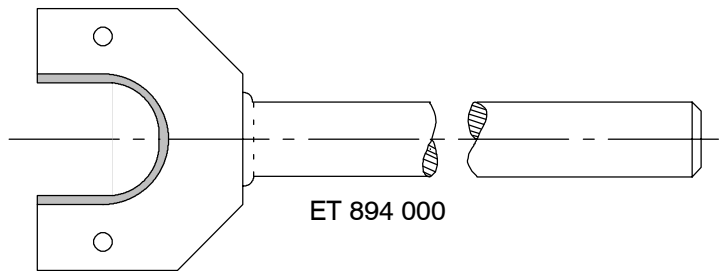
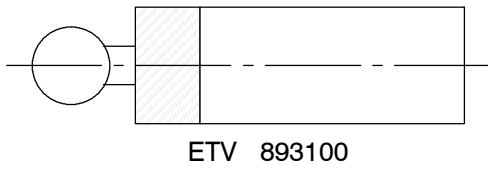
Tractor	6100	6300–6400	6600	8000	8100	8400
Tyres	12.4–24	13.6–24	14.9R24	14.9R24	13.6R28	16.9R28
Turning circle	4,0 m	4,2 m	4,7 m	5,1 m	5,1 m	5,5 m

Toe-in .....	0–5 mm
Suction strainer filtering properties .....	125 $\mu$ m
Pressure filter, degree of separation .....	$\beta_{10}=75$

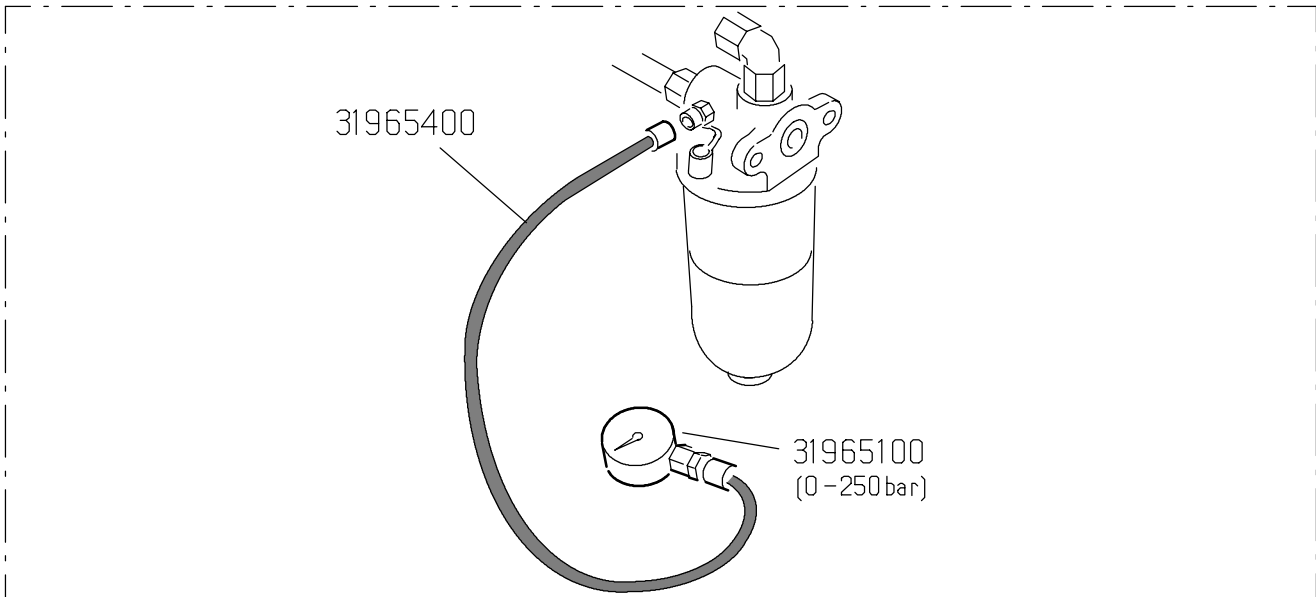
<b>61. Steering system</b>		Model	Code	Page
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## Special tools

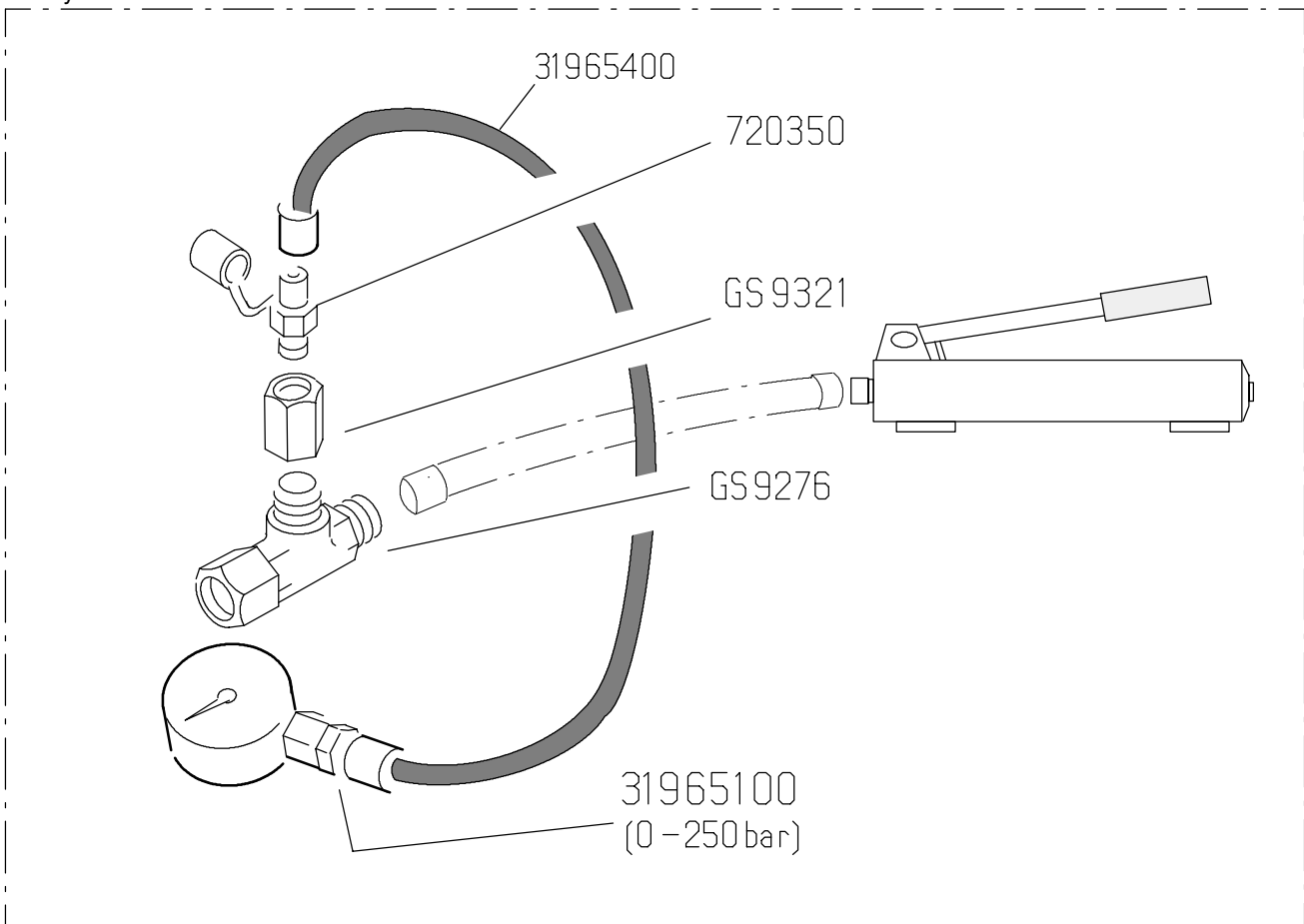
- ETV 893 100      Fitting tool for steering valve seal (Steering valve 505–905)  
ET 894 000      Tool for rotating steering cylinder head up to axle no **129/92** (Front axle Sige 505–905)



## Special tools

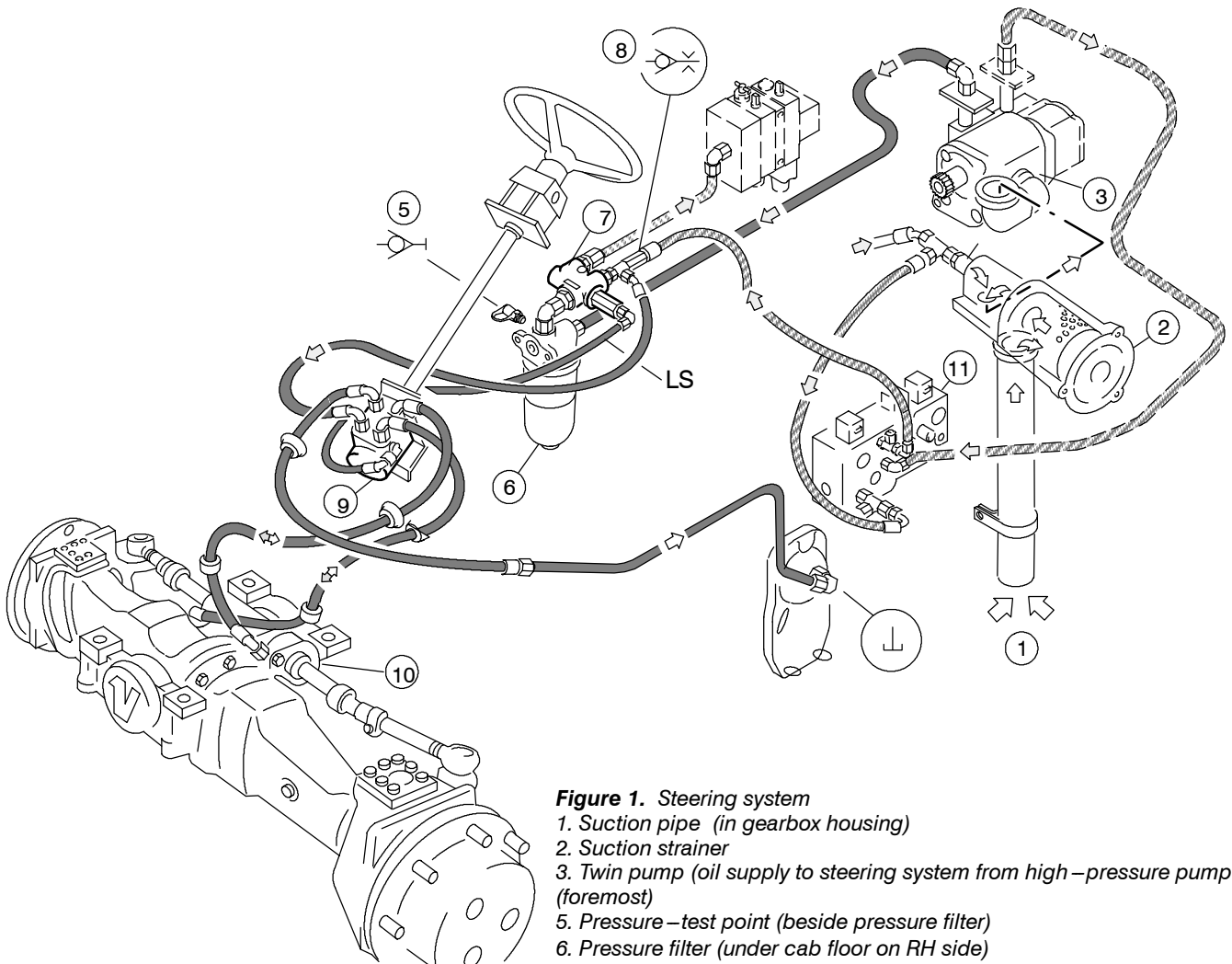


1. Equipment for measuring steering system working pressure (**pressure at test point 14,0–15,5 MPa**)  
 Pressure measuring kit 31965000 includes the above shown hose and pressure gauge. These parts can also be ordered separately.



2. Equipment for measuring shock valve opening pressure (**opening pressure 19,0–21,5 MPa**).  
**Note!** T–connector GS9276 has thread 3/4–16 for connecting hand pump hose. The pressure measuring kit 31965000 does not include the hand pump

## Steering system, description



**Figure 1. Steering system**

1. Suction pipe (in gearbox housing)
2. Suction strainer
3. Twin pump (oil supply to steering system from high-pressure pump (foremost))
5. Pressure-test point (beside pressure filter)
6. Pressure filter (under cab floor on RH side)
7. Priority valve
8. Non-return valve
9. Steering valve
10. Steering cylinder
11. Servo valve block, -660070 (low-pressure circuit)

Pressurized oil to the steering system (and to the working hydraulics) is supplied by the high-pressure pump. The system has a priority valve, which ensures that there is always enough hydraulic oil for steering.

Pressure-limiting valve (14 MPa) and shock valves (19,5 MPa) are fitted in the steering cylinder.

The steering valve on the 6100–8100 tractors is a load sensing type of valve. Compared with the conventional unit, the LS steering valve has a 5th additional LS port. One port on the steering valve is for pressure oil feed, one for return oil, two to/from the steering cylinder and one for the load sensing. The load sensing pipe is fitted between the priority valve and the steering valve.

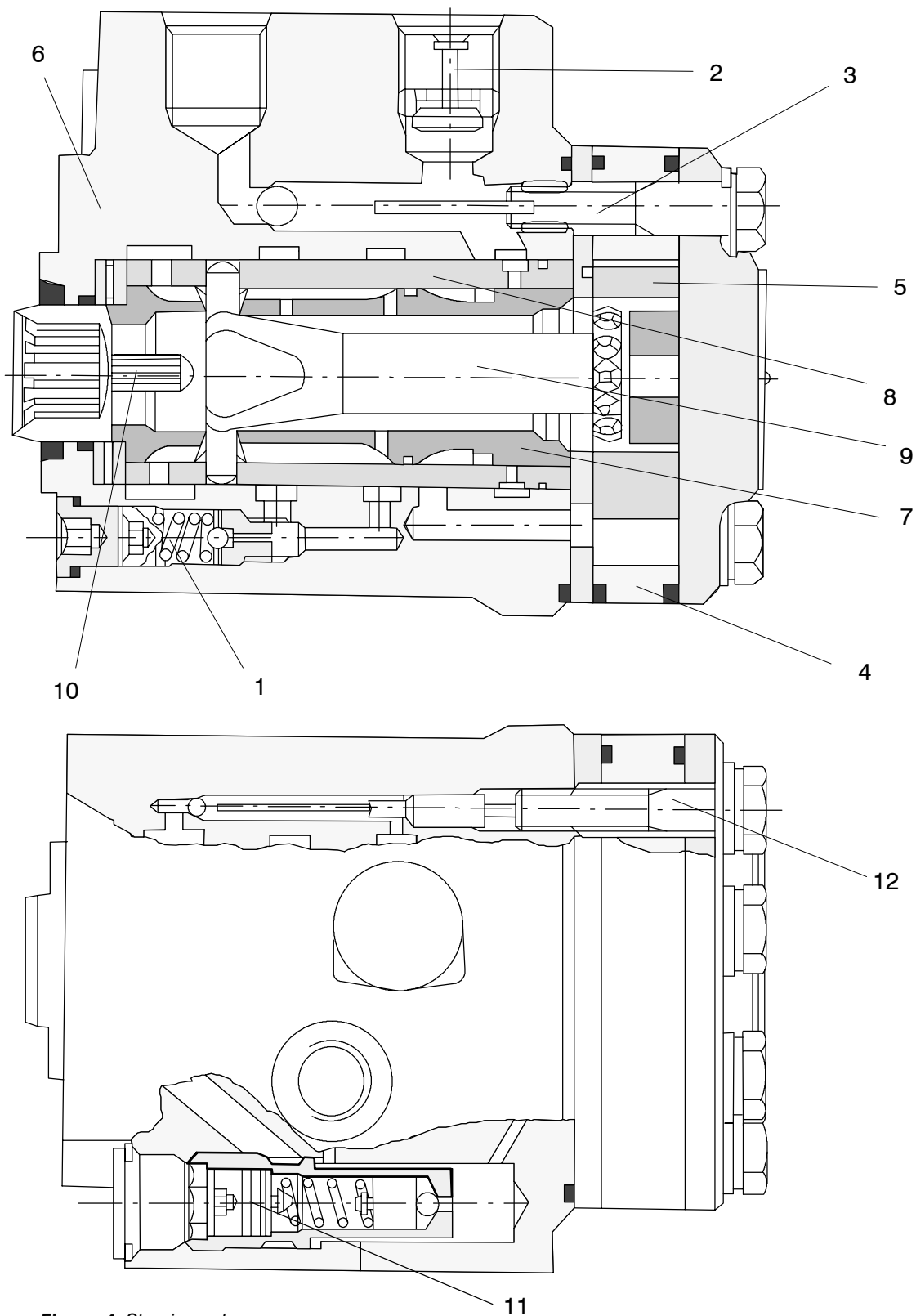
The LS port is either open to the return line when the steering is in neutral, or open to the pressure feed line as soon as the steering wheel is turned.

**Important!** With effect from tractor serial number **660071**, 6100–8400 tractors have a new servo valve block. In picture above is shown an earlier valve block. There is not an oil hose between the new valve block and the priority valve





## Steering valve



**Figure 4.** Steering valve

- 1. Shock valve (2 pcs, 19,5 MPa)
- 2. Non-return valve
- 3. Non-return valve for emergency steering
- 4. Rotor ring
- 5. Rotor
- 6. Valve housing

- 7. Inner valve spool
- 8. Outer valve spool
- 9. Rotor shaft
- 10. Centring springs
- 11. Pressure-limiting valve (14 MPa)
- 12. Anti-cavitation valves (2 pcs)

## Steering valve, description

See figure 4 on previous page.

The steering valve consists of a metering unit (rotor set) and a valve unit. The rotor set consists of a rotor ring (4) with seven internal teeth and a rotor (5) with six external teeth. The valve unit consists of a valve housing (6), outer valve slide (8) and inner valve slide (7).

The inner slide (7) is directly actuated by the steering wheel. The outer valve slide (8) is mechanically connected to the rotor (5) by a cross pin and rotor shaft (9). The cross pin which runs through both valve slides permits the inner valve slide to move  $8^\circ$  in both directions independent of the outer valve slide.

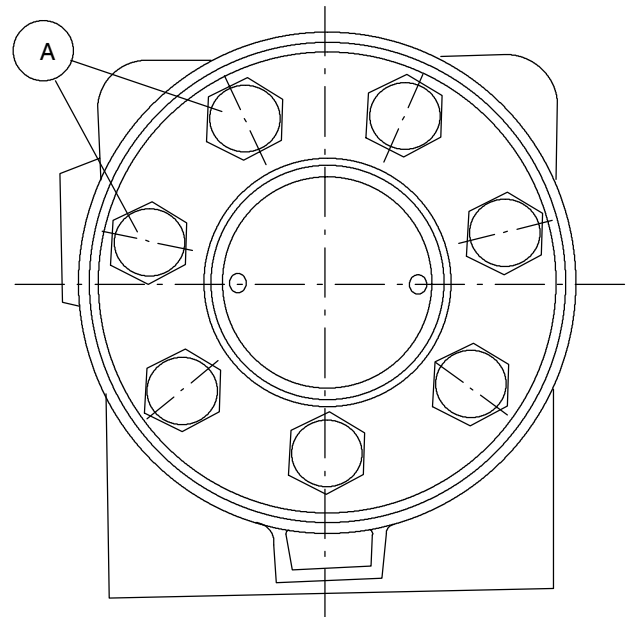
When the steering wheel is in the rest position, centring springs keep the inner and the outer valve slides in neutral (in relation to each other) and the oil flows freely through the steering valve. The passages to the steering cylinder are kept closed and the steering cylinder cannot move.

When the steering wheel is turned, the inner valve slide is turned in relation to the outer valve slide. The neutral-position passages become restricted at the same time the passages down to the measuring unit and on to the steering cylinder gradually open. Simultaneously the return oil from the other side of the steering cylinder flows back via the steering valve. The oil flow from the pump through the valve makes the rotor and the outer valve slide turn in the same direction as the steering wheel and the inner valve slide.

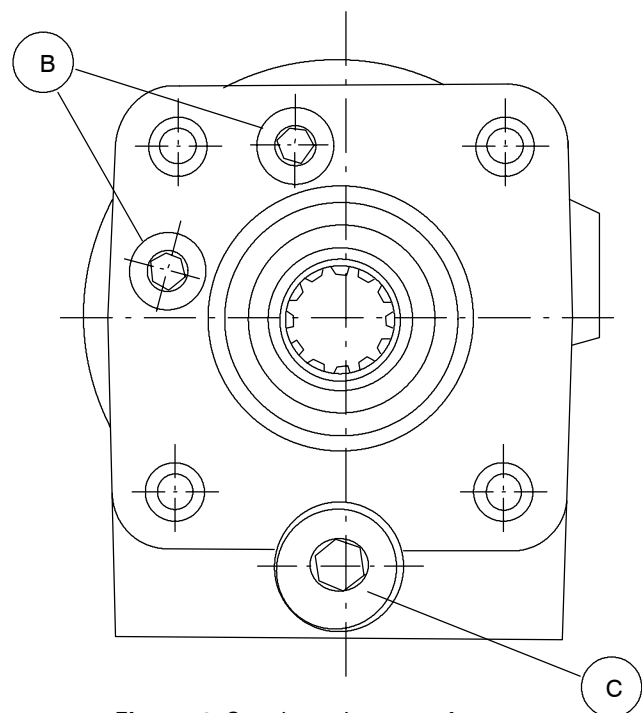
When the steering wheel is not turned any further and kept still, the centring springs bring the outer and the inner valve slide back into the neutral position. The passages to the steering cylinder close and the oil flows freely again through the steering valve.

When the hydraulic pump does not supply any oil, the metering unit of the steering valve acts as a manually powered pump. The oil which is drawn from the steering cylinder and the return line via the non-return valve (3) is delivered to the other side of the steering cylinder when the steering wheel (and inner valve slide 7) is turned  $8^\circ$ . The cross pin then also makes the following parts turn: the outer valve slide (8), rotor shaft (9) and rotor (5). Shocks and knocks against the steering wheel are dampened by the two shock valves (1) which are fitted in the steering valve.

The shock valves are combined with anti-cavitation valves (point A in figure 5) in order to keep the cylinder fully supplied with oil at all times.



**Figure 5.** Steering valve lower face  
A. Anti-cavitation valves



**Figure 6.** Steering valve upper face  
B. Shock valves  
C. Pressure-limiting valve

Priority valve

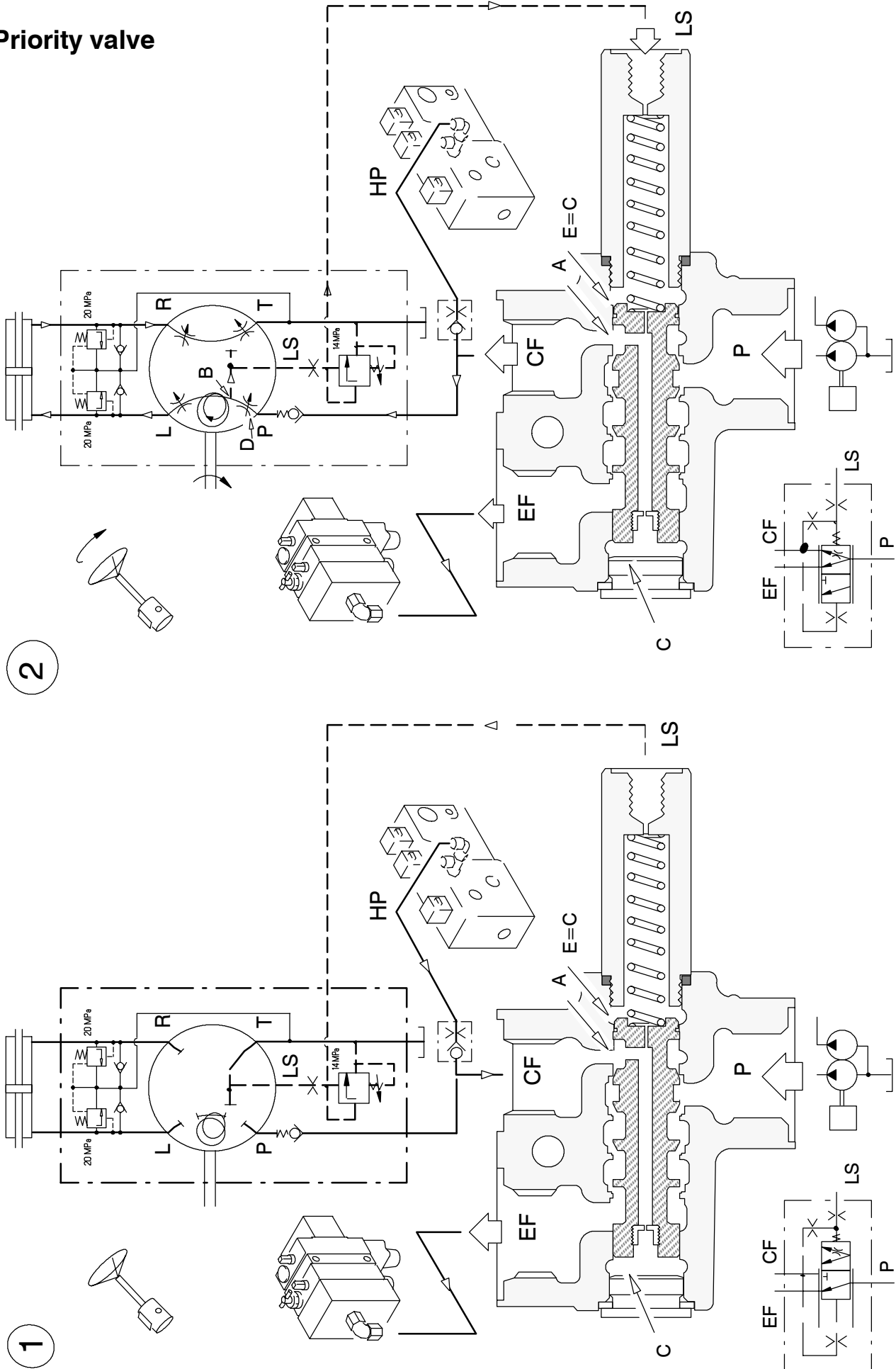


Figure 7. Priority valve

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