Service Training

Linde IC Engined Truck
S30, S30W, S40 ,S40W
S50, S50W, S60, S60W
Series 316



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LINDE AG Werksgruppe Flurförderzeuge und Hydraulik

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2.3 HYDRAULIC CIRCUIT DIAGRAM, AUTOMOTIVE HYDROSTATIC DRIVE

A Variable displacement hydrostatic pump BPV 70S AU comprising:

1	Variable displacement hydraulic pump	
2	Charge pump	18 cm^3
3	Pressure relief valve	32 bar
4	Oil filter	10 µ
5	By pass valve	
6	Boost pressure valve	16 bar
7	Combination boost and pressure relief valve	420 bar
8	Oil cooler	
9	Directional solenoid valves	
10	Restrictor	D2
11	Restrictor	D1 (Inch valve)
12	Pressure valve	Pv1
13	Pressure valve	Pv2
14	Oil screen	
15	Pilot piston	
16	4/3 way valve - pilot	
17	servo pistons - swashplate	

B Variable hydrostatic motor with brake pressure shut off comprising:

18	Variable speed hydraulic motor	
19	Control piston	
20	Pressure regulator	240 bar
21	3/2 way valve, to 04/91	
21a	3/2 way valve, from 05/91	
22	3/3 way valve, directional valve	
23	3/2 way valve, electromagnetic switching valve	
24	Purge valve	10 bar

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2.8 HYDROSTATIC DRIVE FROM 09/02

Key to hydrostatic transmission diagram.

A	Perkins engine	
B	Hydraulic tank147 litre	
C	Transmission pump	HPV 55-02 (S30-S40) HPV 75-02 (S50-S60)
D	Oil cooler	
E	Thermostatic wax valve,	Starts opening 40°c, fully open 68°c
F	Transmission motor	HMV 105-02 (S30-S40) HMV 135-02 (S50-S60)
G	Solenoid controlled dump valve.	
1	Suction filters	20µm with bypass 0.2 barΔp
2	Spring loaded checkvalve	1 bar
3	Cannister filter	10µm
4	bypass valve	2 barΔp
5	Combination charge relief valve	423 bar
6	Priming pressure valve (Boost)	19 bar
7	Priming pump	
8	Priming pressure relief valve	32 bar
9	Servo control valve	
10	Servo back off control	
11	Direction control valve	
12	Direction solenoid valve	(12 volt)
13	Direction solenoid valve	(12 volt)
14		
15		
16		
17	Case venting valve	
18	Case venting directional valve	
19	Motor	
20	Servo control piston	
21	Servo control valve	
22	Speed selection valve	M1 (12 volt) See table below
23	Directional control valve	M2 (12 volt)

ORIFICE SIZES		
	S30-S40	S50-S60
D1	0.9MM	0.9MM
D2	0.9MM	0.9MM
D3	6.4MM	7.2MM
D4	1.0MM	1.0MM
D5	0.7MM	0.7MM
D7	0.7MM	0.7MM
D10	0.9MM	0.8MM
D11	0.9MM	0.8MM
D12	0.7MM	0.7MM

SPEED MODES				
	STANDARD MODE		TORTOISE MODE	
	FORWARD	REVERSE	FORWARD	REVERSE
M1	OFF	OFF	ON	ON
M2	ON	OFF	ON	OFF

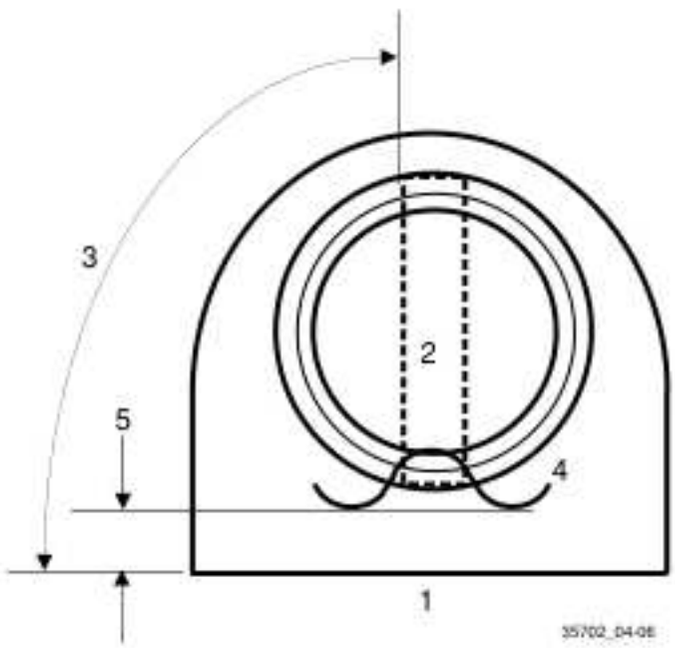
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4.2.3.5 DANFOSS STEER HAND PUMP, ASSEMBLY TIMING.

CAUTION
The steer hand pump must be timed on assembly, failure to do so could lead to serious damage to the unit or possible injury to the user. If in doubt do not attempt disassembly.

During assembly the alignment of the driving pin, it's relationship with the gear set gyrotor and the port face are critical. The illustration below indicates this relationship.
The spool must be assembled and fitted with the pin (2) at 90 degrees to the port face of the pump(1) as illustrated by the arrow (3).
The gyrotor of the gear set must then be fitted so that two of the lobes (4) are parallel with the port face (1) as illustrated by the lines (5).



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4.2.3.6 DANFOSS STEER HAND PUMP,TROUBLESHOOTING.

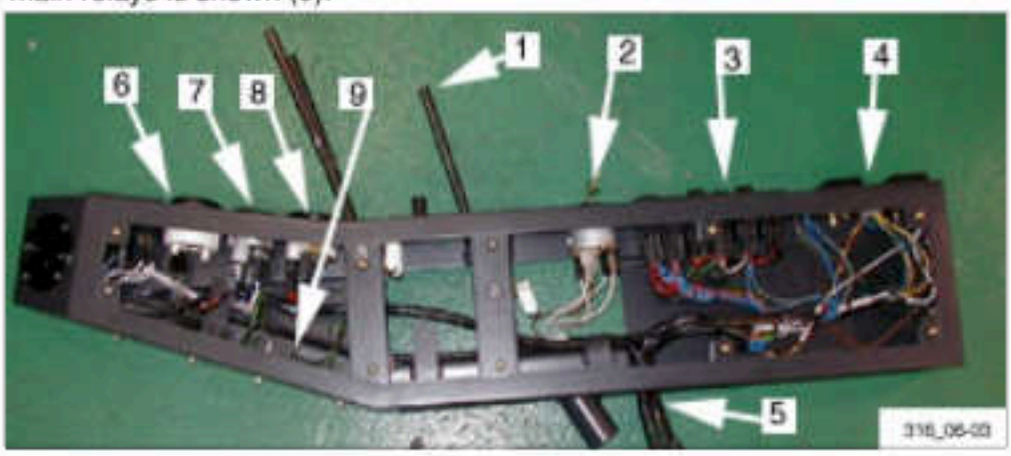
The following chat can be utilised to aid fault analysis.

ERROR	CAUSE	REMEDY
No steering function	Oil flows directly back to tank within the steering unit	Manual steering ball is missing.

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6.3 COMPONENTRY

The majority of components are mounted within the instrument pod located in the drivers cabin, a panel on the side of the pod will allow access to the underside of the instrumentation and componentry. Shown are the hydraulic control levers (1), the ignition switch (2) the switch panel (3) and the two fuse boxes (4). The harness exit point is shown (5) as are the three instruments from top to bottom (6) (7) (8) the positon of the three main relays is shown (9).



THE SWITCH PANEL



1 Light switch
2 Dip/main beam switch
3 Screen washer switch
4 Heater blower
5 Mast floodlights, option
6 Cabin floodlights, option

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WARNING LIGHTS



1 Battery charge indicator
2 Main beam repeater
3 Low fuel warning
4 Low oil pressure warning
5 Turn indicator repeater

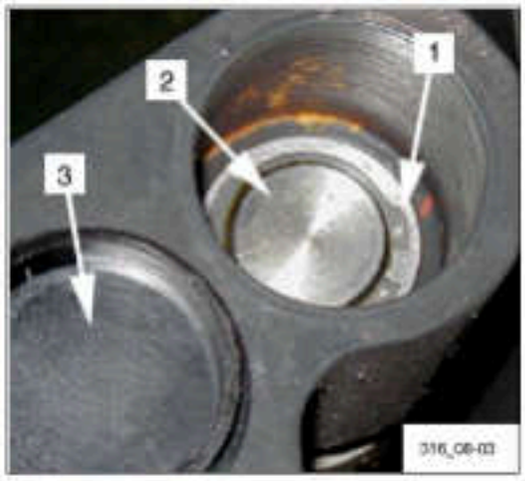
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8.4 REMOVING THE LIFT CYLINDERS.



It is possible to remove the lift cylinders from the mast with the mast in situ in the chassis.

Remove the forks from the carriage.
Using the truck hydraulics operate the lift to raise the inner mast.
Place a piece of wood about 600mm long inside the outer channel and lower the mast until the inner channel touches the wood.
Place another piece of wood under the carriage.



Remove the dust cap (3) covers on the top if the inner mast to gain access to thecirclip (1) securing the lift cylinder (2) to the inner mast. Remove the circlip and the washer beneath.

Operate the hydraulics to lower the cylinders, the shaft (2) will lower away from the inner mast.

Ensure that all hydraulic pressure in the cylinders is relieved.



Working through the hole in the front of the carriage, remove the hydraulic connection to the cylinder (1).

Attach a sling to the cylinder and aupport it's weight with a crane or other appropriate lifting equipment.

Remove the bracket securing the cylinder to the mast and lift the cylinder out.
Retain the two steel and one rubber washer from beneath the cylinder.

Replacing the cylinder is the reverse of the removal procedure.

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