

Document Title: Description	Function Group: 400	Information Type: Service Information	Date: 2014/5/29
Profile:			

Description

Loader L90C is provided with transmission HT131. Loader L120C is provided with transmission HT205. Both the HT131 and HT205 are hydro-mechanical four-speed transmissions, with torque converter, cylindrical spur gearings and hydraulically controlled disc clutches.

The power from the engine to the wheels is transmitted hydraulically and mechanically through the transmission, via a torque converter which adapts its output torque to the torque requirements.

The clutch drums for the different gears turn freely on the clutch shafts. When a gear is engaged, the clutch drum, which transfers the force mechanically, is connected to the respective clutch shaft by the disc clutches which are applied hydraulically. The mechanical transfer of power within the transmission takes place via gear wheels which are in constant mesh.

L90C is provided with AWB30 drive axles. L120C is provided with an AWB31 drive axle at the front and an AWB30 drive axle at the rear.

The front axle can be equipped with a differential lock.

Document Title: APS II (Automatic Power Shift with Mode Selector)	Function Group: 420	Information Type: Service Information	Date: 2014/5/29
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APS II (Automatic Power Shift with Mode Selector)

Description

L90C and L120C are, as standard, provided with APS II (Automatic Power Shift with shift Mode Selector [1] ⓘ, which is included in the Contronic System control unit.

The following positions are available:

LIGHT: (first position)

The machine shifts at low engine speed, suitable for transport operations without load.

LIGHT: (second position)

The machine shifts at a slightly higher speed than the first position, suitable for transport operations and lighter loading / carrying work.

NORMAL: Is used for "normal handling" and operation.

HEAVY: The machine shifts at higher engine speeds, suitable for heavier work.

MAN: Gear shifting is operated manually by the operator using the gear selector.

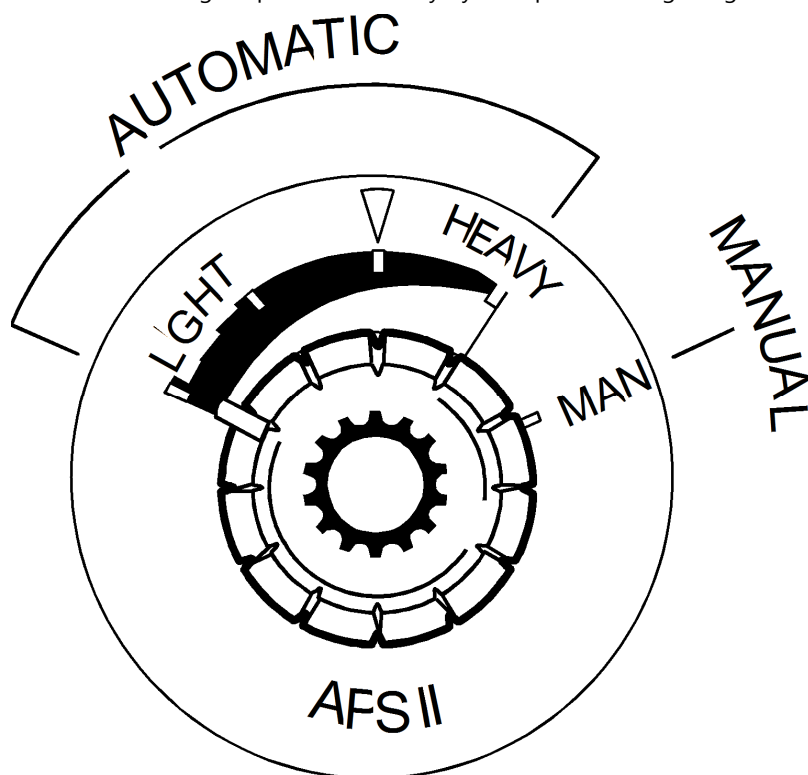


Figure 1
Shift Mode Selector SW143 positioned on the front panel

Description of function during manual gear shifting

Mode Selector SW143 placed in position "MAN"

Gears are selected manually by turning the gear selector to the required gear position.

Changing travelling direction

After changing travelling direction, the machine starts off in the previously selected gear.

NOTE!

As a safety precaution, upshifting to a higher gear takes place if a certain critical travelling speed and/or engine speed is exceeded.

Description of function during automatic gear shifting

Mode selector SW143 placed within the "AUTOMATIC" range

The gear selector placed in the 3rd or 4th gear position.

When starting from stationary this takes place in 2nd gear and, if the machine is rolling, it will start off in 3rd gear.

The gear shifting is automatic. Conditions required to cause gear shifting is a combination of the setting of the Mode Selector, travelling speed and engine speed.

Gear shifting between gears, Forward: 2nd - 3rd - 4th, Reverse: 2nd - 3rd

For gear shifting down to 1st gear, see "Kick-down function".

Changing travelling direction

Changing travelling direction at low speed takes place in 2nd gear. If the speed is too high, 3rd gear will first be engaged and then, when the speed has dropped, 2nd gear will be engaged.

Engine braking / downshifting

2nd gear is the basic gear and the gear which the machine always starts off in when operating with the selector set in 3rd or 4th gear position. During engine retarding, the accelerator control should be let up fully and the engine braking / down-shift button SW105, should be pressed in. Downshifting then takes place in stages, with one gear for each time the button is pressed, from 4th to 3rd and from 3rd to 2nd, if the travelling speed is then below 22 km/h (13.7 mph).

For a further downshifting to 1st gear, see "Kick-down function".

If engine braking / down-shift button, SW105, is kept pressed in while the accelerator is actuated, upshifting is prevented.

Over-speeding protection

When downshifting, the control programme always first checks that the travelling speed is not too high for the selected gear. If it is too high, the engaged gear will be retained until the travelling speed has dropped to a permissible level.

Kick-down function

Kick-down means shifting down to 1st gear by activating the kick-down function with SW90 on the selector control, or SW105 on the control lever carrier. The timing of the downshift to 1st gear depends on the setting of the shift Mode Selector, the engine speed and the travelling speed. 1st gear will be engaged if the travelling speed of the machine is sufficiently low or if the travelling speed, within 8 seconds from that kick-down has been activated, becomes sufficiently low. When 1st gear is engaged, this is indicated by a pip from the buzzer.

In order to shift up to 2nd gear, the kick-down button must again be actuated.

NOTE!

As a safety precaution, upshifting to a higher gear takes place if a certain critical travelling speed and/or engine speed is exceeded.

[1]*) APS II with Mode Selector SW143 on the front panel is a gear-shifting programme which is adjustable for different operating and working conditions.

Document Title: Gear selector valve	Function Group: 420	Information Type: Service Information	Date: 2014/5/29
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Gear selector valve

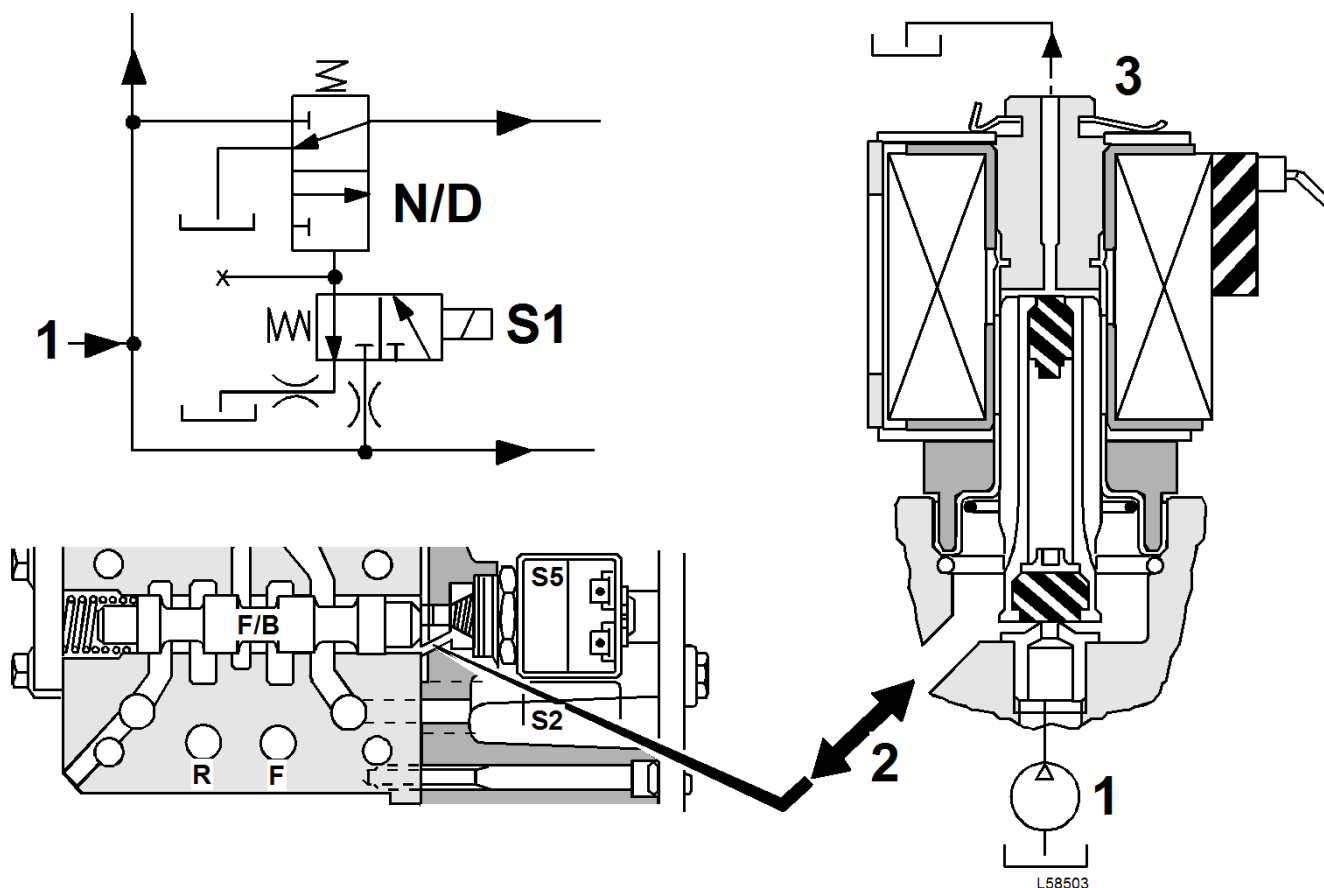


Figure 1

1. Pressure connection from transmission pump
2. Connection to valve spool
3. Return to tank

When the solenoid is not activated, the valve spool control side is connected to tank via the solenoid (connection 2 - 3). The return spring, which is positioned on the opposite side, presses the valve spool toward the solenoid, see fig. [Invalid linktarget] . When the solenoid is activated, the solenoid core closes connection 3 to tank, the connection from the pump to the valve spool is opened (connection 1 - 2), the valve spool is pressed over to the opposite side, see fig. 4.

Document Title: Operating with the ecu disconnected	Function Group: 420	Information Type: Service Information	Date: 2014/5/29
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Operating with the ecu disconnected

Op nbr

Nipple, part no. 957030, 2 pcs for operating forward, 4 pcs for operating rearward

Hose, part no. 13932807, 1 pcs for operating forward, 2 pcs for operating rearward



when operating with the ecu disconnected, the gear will be applied immediately the engine is started, therefore keep the service brakes applied when starting the engine.

Operating forward with the ecu disconnected

1. Remove the pressure checking point for the main pressure, fig. [Invalid linktarget] for I90c and fig. [Invalid linktarget] for I120c respectively and plug n/d on the gear selector valve fig. [Invalid linktarget] . Fit nipples part no. 957030.
2. Connect a hose part no. 13932807 between the nipples.
3. Keep the selector control in neutral position and start the engine. 3rd gear forward will now be applied.
4. When operating with the ecu disconnected is no longer required, restore the check point and plugs.

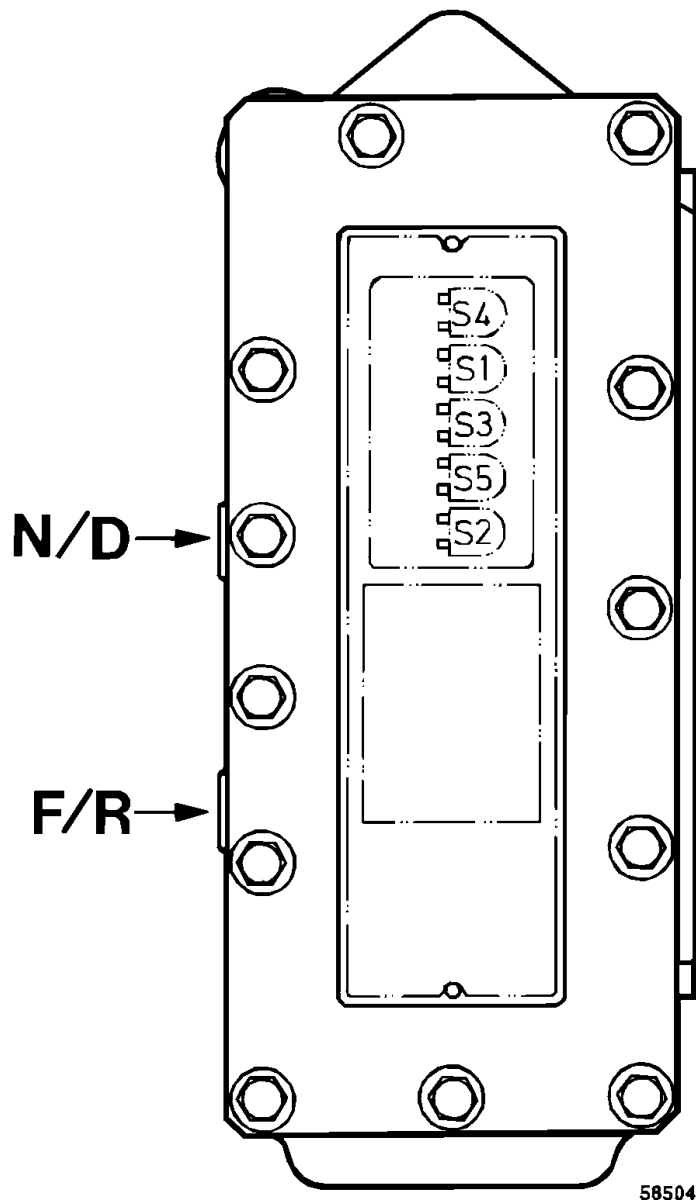


Figure 1

Gear selector valve

N/d valve spool, neutral - drive

F/r valve spool, forward - reverse

Operating rearward with the ecu disconnected

5. Remove the pressure checking points for the main pressure and the 3rd clutch pressure on the checking panel, fig. [Invalid linktarget] and fig. [Invalid linktarget] for I90c and fig [Invalid linktarget] for I120c respectively as well as plugs n/d and f/r on the gear selector valve fig. [Invalid linktarget] . Fit nipples part no. 957030.
6. Connect a hose part no. 13932807 between the outlet for the main pressure on the checking panel and the outlet n/d on the gear selector valve. Connect the other hose between the pressure outlet for the 3rd clutch on the checking panel and outlet f/r on the gear selector valve.
7. Keep the selector control in neutral position and start the engine.3rd gear reverse will now be applied.
8. When operating with the ecu disconnected is no longer required, restore the check points and the plugs.

Document Title: Symbol diagram HT131	Function Group: 420	Information Type: Service Information	Date: 2014/5/29
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Symbol diagram HT131

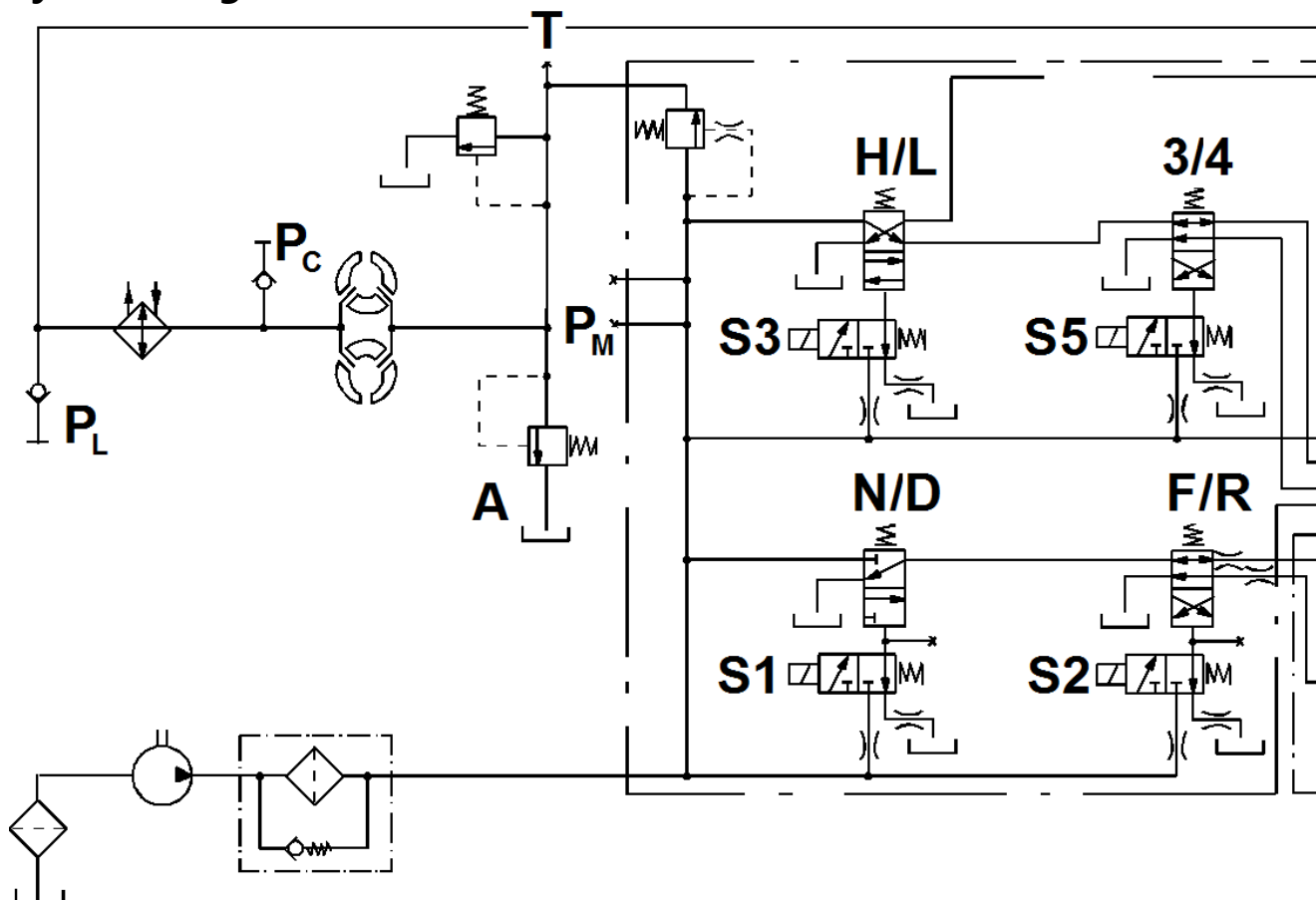
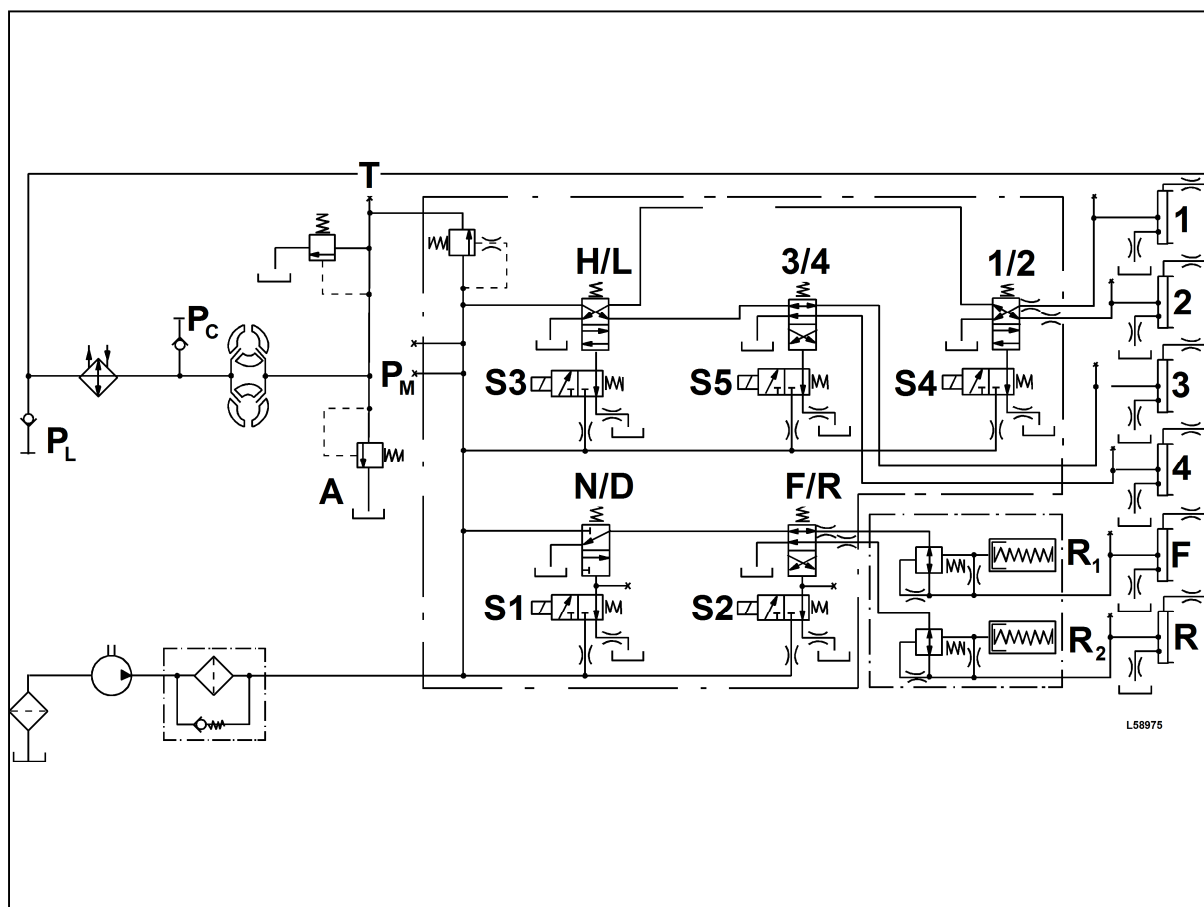


Figure 1
Symbol diagram HT131

A	Pressure-reducing valve, input torque converter pressure
PM	Check point, main pressure
PC	Check point, torque converter pressure
PL	Check point, lubricating oil pressure
N/D	Selector spool, neutral - drive
F/R	Selector spool, forward - reverse
H/L	Selector spool, high - low
1/2	Selector spool, 1st - 2nd
3/4	Selector spool, 3rd - 4th
R1	Damping valve, forward gear
R2	Damping valve, reverse gear
S1	Solenoid, neutral - drive
S2	Solenoid, forward - reverse



S3	Solenoid, high - low gear
S4	Solenoid, 1st - 2nd gear
S5	Solenoid, 3rd - 4th gear
1	1st disc clutch
2	2nd disc clutch
3	3rd disc clutch
4	4th disc clutch
F	Forward gear disc clutch
R	Reverse gear disc clutch

The gear-shifting diagram shows the solenoids which are activated for the respective gears. For instance, for 1F, solenoids S1, S3 and S4 are activated.

Document Title: Symbol diagram HT205	Function Group: 420	Information Type: Service Information	Date: 2014/5/29
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Symbol diagram HT205

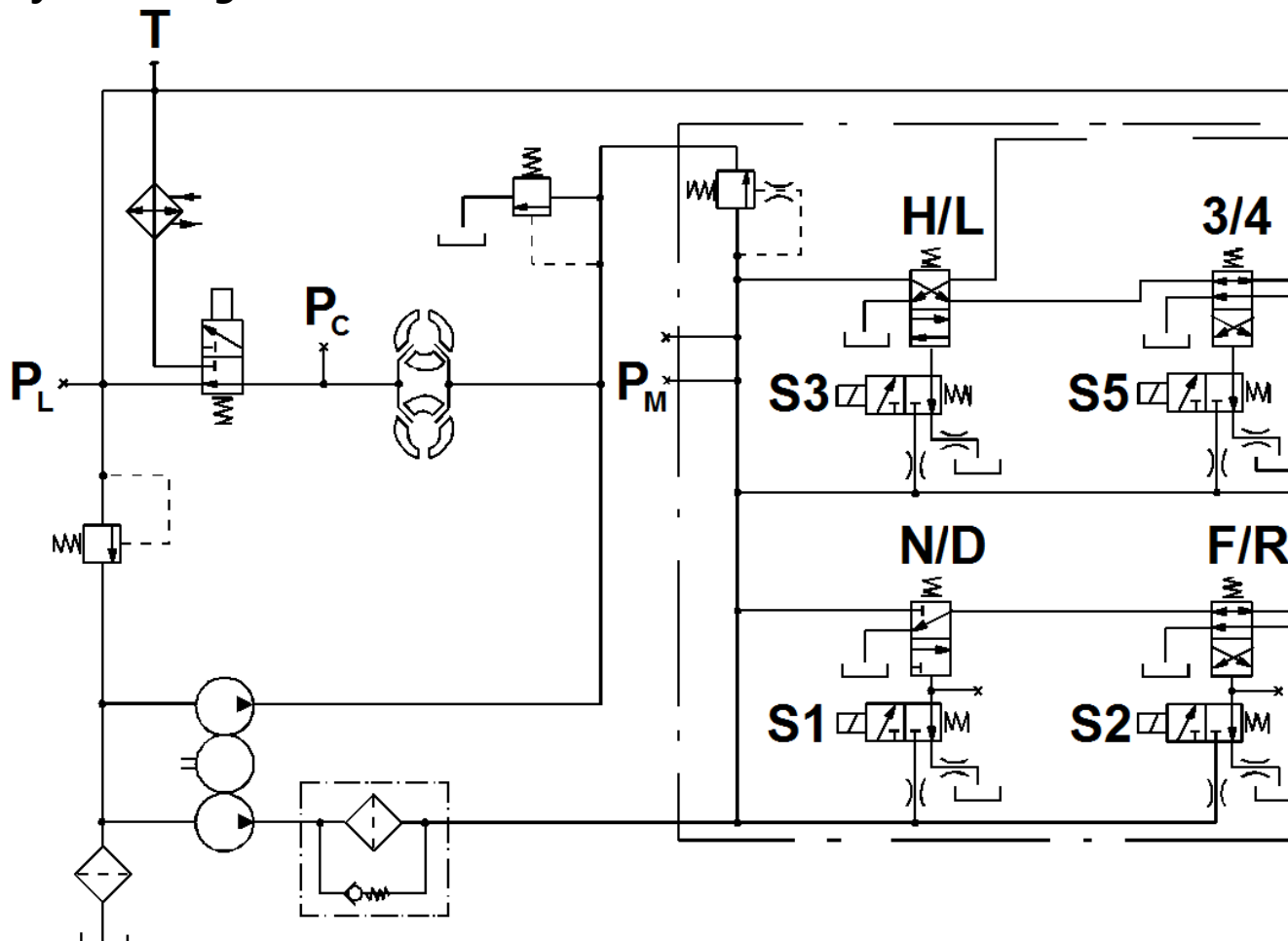
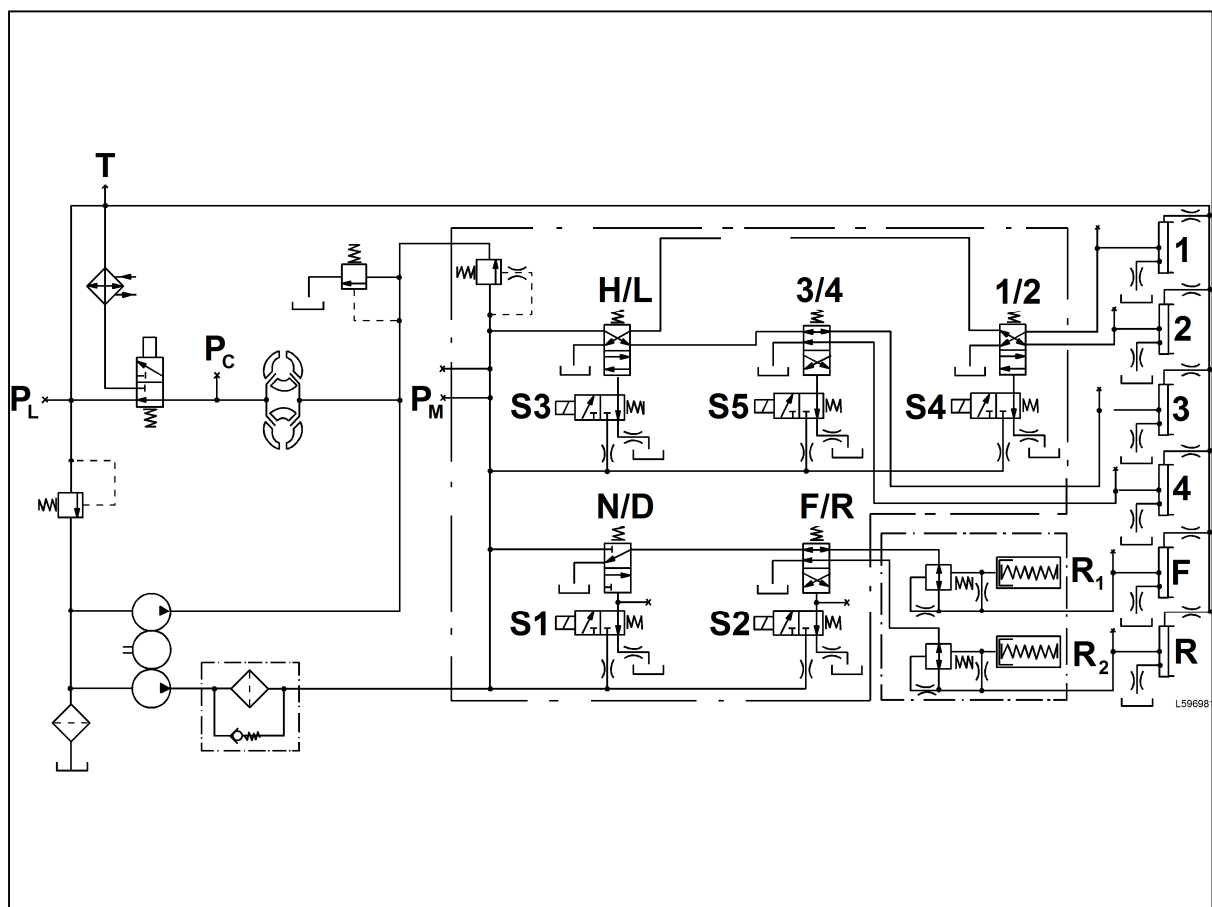


Figure 1
Symbol diagram HT205

PM	Check point, main pressure
PC	Check point, torque converter pressure
PL	Check point, lubricating oil pressure
N/D	Selector spool, neutral - drive
F/R	Selector spool, forward - reverse
H/L	Selector spool, high - low
1/2	Selector spool, 1st - 2nd
3/4	Selector spool, 3rd - 4th
R1	Damping valve, forward gear
R2	Damping valve, reverse gear
S1	Solenoid, neutral - drive
S2	Solenoid, forward - reverse gear



S3	Solenoid, high - low gear
S4	Solenoid, 1st - 2nd gear
S5	Solenoid, 3rd - 4th gear
1	1st disc clutch
2	2nd disc clutch
3	3rd disc clutch
4	4th disc clutch
F	Forward gear disc clutch
R	Reverse gear disc clutch

The gear-shifting diagram shows the solenoids which are activated for the respective gears. For instance, for 1F, solenoids S1, S3 and S4 are activated.

Document Title: Checking oil pressures, transmission	Function Group: 421	Information Type: Service Information	Date: 2014/5/29
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Checking oil pressures, transmission

Op nbr 42102

[11 666 017 Pressure gauge, range 0 - 0.6 MPa \(0 - 87 psi\)](#)

[11 666 018 Pressure gauge, range 0 - 2.5 MPa \(0 - 363 psi\)](#)

[11 666 035 Hose](#)

[999 3721 Service display unit](#)

[930032 Measuring nipple](#)

L90C

Main pressure (neutral): 1.45 - 1.68 MPa (210 - 244 psi)

Clutch pressure, 1st - 4th 1.35 - 1.58 MPa (196 - 229 psi)

Clutch pressure, Forward - Reverse: 1.35 - 1.58 MPa (196 - 229 psi)

Torque converter pressure, (out, neutral): 0.57 - 0.69 MPa (83 - 100 psi)

Lubricating oil pressure, (neutral): 0.35 - 0.45 MPa (51 - 65 psi)

L120C

Main pressure (neutral): 1.37 - 1.58 MPa (199 - 229 psi)

Clutch pressure, 1st - 4th 1.37 - 1.58 MPa (199 - 229 psi)

Clutch pressure, Forward - Reverse: 1.37 - 1.58 MPa (199 - 229 psi)

Torque converter pressure, (out, neutral): 0.20 - 0.50 MPa (29 - 73 psi)

Lubricating oil pressure, (neutral): 0.16 - 0.22 MPa (23 - 32 psi)

The following applies when checking:

Temperature: Normal operating temperature

Speed: High idling speed

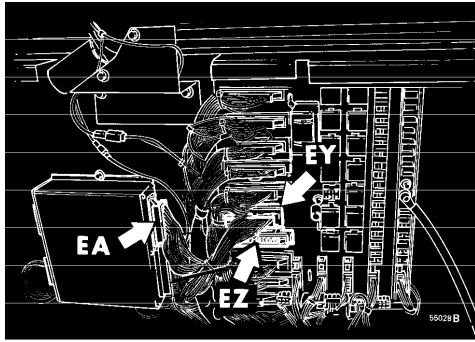
Use measuring nipple 930032 where it is not already mounted.

NOTE!

When checking the pressures, apply service brakes and parking brake. Also make sure that the transmission disengagement function is not activated.

NOTE!

To be able to check the clutch pressure for the 4th gear, without activating the automatic shifting, the ECU must be disconnected, see Fig. [Invalid linktarget] .



1.

Figure 1
Disconnecting ECU

1. Connector EY should be disconnected from the circuit board
 2. Connector EA should be disconnected from ECU and connected on the circuit board, to connector EZ
2. Remove the lining from the rear cab wall so that the electrical distribution box is accessible.
 3. Disconnect the ECU by removing connector EY (blue leads) from the circuit board.
 4. Disconnect connector EA (yellow) from the control unit and connect it to connector EZ (yellow) on the circuit board.

L90C

Main pressure (alternative 1)

5. The main pressure can be read off with the aid of the service display unit.
6. Connect service display unit 3721 to connector IA on the steering wheel column.
7. The gear selector should be in neutral position, and the engine running at high idling speed.

Main pressure (alternative 2)



Our support email:

ebooklibonline@outlook.com