SERVICE MANUAL

T4.75V / T4.85V / T4.95V / T4.105V

Tractor

Part number 47888374

English

July 2016

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Hydraulic control components - General specification

Data

Hydrostatic steering	
Type	Hydrostatic control
Hydraulic circuit	Independent, fed by services hydraulic pump
Oil filter	Paper cartridge on pump intake side
Control valve, manufacturer	OGNIBENE or DANFOSS
Type	With the rotating valve controlled directly by the steering column; the steering continues to function even if the pump is damaged
Outfit code	
Two and four wheel drive models (OGNIBENE)	STH ON 80 G170 LNV
Two and four wheel drive models (DANFOSS)	OSPC 80 ON − 150 N 1058
Pressure relief valve calibration **(24)**, **Hydraulic steering line - Plumbing schema (41.200) Figure 1**	**165.0 - 170.0 bar (2392 - 2465 psi)**
Cylinder safety valve calibration **(33)**, **Hydraulic steering line - Plumbing schema (41.200) Figure 1**	**230 - 240 bar (3335 - 3480 psi)**

Hydraulic control components - Torque

Parts to be tightened	Thread	Tightening torque
Bolt securing cover to power steering housing	M8 x 1	**24 - 36 N·m (212.42 - 318.63 lb in)**
Steering column flange retaining nut **(1)**	M8 x 1	**23 N·m (203.57 lb in)**
Bolt **(2)** securing hydrostatic steering to tractor	M10 x 1.5	**44 N·m (389.43 lb in)**
Hydrostatic steering control pump retaining bolt	**M6 x 1**	**8 N·m (70.81 lb in)**
Nut for pump housing cover retaining bolt	**M10 x 1.25**	**39 N·m (345.18 lb in)**
Nut for securing thrust sleeve to pump drive shaft	**7/16 in** − 20UNF − 2B	**28 N·m (247.82 lb in)**

Hydraulic control components - Special tools

NOTICE: *The operations described in this section can only be carried out with ESSENTIAL tools indicated by an (X). To work safely and efficiently and obtain the best results, it is also necessary to use the recommended specific tools listed below and certain other tools, which are to be made according to the drawings included in this manual.*

List of specific tools required for the various operations described in this section.

X	**380000223**	Steering wheel extractor
X	**380000307**	Power steering rotor retaining lever
X	**380000240**	Universal pressure testing kit
	380000306	Plug for fitting the power steering rotating valve return springs
X	**380000281**	Tool for fitting power steering. Rotoglyd seal
X	**380000836**	Tool for fitting power steering. Varisel seal

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4724-X-Axis selection switch: Both lines active

T4.105V With cab [ZDJE17896 -]	LA
T4.65V With cab [ZDJE10473 -]	
T4.75V With cab [ZDJE10095 -]	LA
T4.85V With cab [ZDJE11669 -]	LA
T4.95V With cab [ZDJE11682 -]	LA

Control Module : Mid mount control unit

NOTE: *When the cause of the error code has been rectified, clear the error code and test the system for normal operation.*

Cause:
The mid mount control unit has detected a voltage at both pins 8 and 18 on connector **MOD-4007** when voltage should only be detected on either pin 8, pin 18 or no voltage detected at all.

Possible failure modes:

1. Faulty connector
2. Faulty X-Axis selection switch
3. Faulty wiring harness
4. Faulty mid mount control unit

Solution:

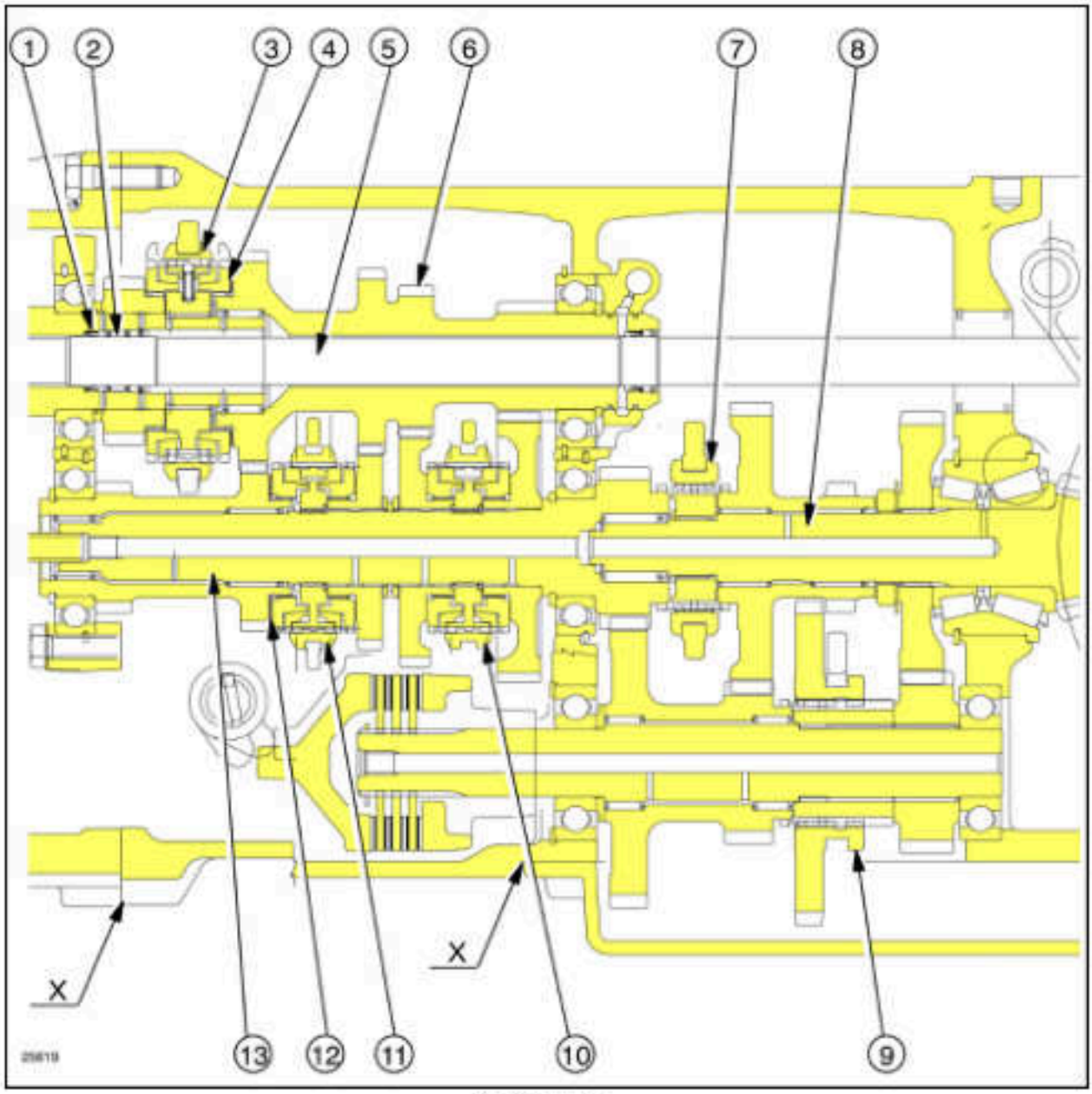
1. Check the X-Axis selection switch **SW-4004-A** and the mid mount control unit connector **MOD-4007**.
   A. Ensure the connectors are connected, not damaged, the pins are in the correct position and that the fit is tight. Repair or replace as required.
   B. If the connectors are okay, continue to step **2**
2. Check the Axis selection switch for a short circuit.
   A. Turn the ignition key switch to OFF. Remove the X-Axis selection switch and disconnect connector **SW-4004-A**. Check between the component side of the X-Axis selection switch:
   SW-4004-A pins 4 and 1 and operate the switch. If a short circuit is indicated with the switch in any position, replace the X-Axis selection switch.
   B. If the switch is okay, continue to step **3**
3. Check for a short circuit.
   A. Disconnect connector **MOD-4007**. Check between connector **MOD-4007** pin 8 (BR) and pin 18 (V). If a short circuit is indicated, repair or replace the harness as required.
   B. If a short circuit is not indicated, continue to step **4**
4. Check for a short to positive voltage.
   A. Turn the ignition key switch ON. Check for a voltage between connector:
   MOD-4007 pin 8 (BR) and ground
   MOD-4007 pin 18 (V) and ground
   If a voltage is indicated, repair or replace the harness as required.
   B. If no wiring harness problems are indicated, download the correct version of software. If the error code occurs again, remove and replace the mid mount control unit.

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Rear mechanical lift, 2WD - 4x2, mechanical differential lock, with cab
Wiring harnesses - Electrical schematic sheet 22 - Mid mount control valves circuit (55.100.DP-C.20.E.22)

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Gears, shaft, and bearings - Sectional view Gearbox and gear range



WLSPVN521C1-08G 1

Longitudinal cross-sectional view of gearbox and gear range

1. Seal.
2. Power take-off shaft support roller bearings.
3. Reverser control synchroniser.
4. Gearbox driving gear clearance adjusting thickness.
5. Power take-off shaft.
6. Gearbox driving gear.
7. Selector sleeve for high or medium-low speeds.
8. Bevel pinion shaft.
9. Selector sleeve for low or medium-high speeds.
10. Synchroniser for 1st and 2nd speed.
11. Synchroniser for 3rd and 4th speed.
12. Gearbox driven shaft gear clearance adjusting thickness.
13. Gearbox driven shaft.

NOTE: *On assembly apply a bead of sealing compound to the surfaces "X" as indicated in* ***Transmission housing - Reseal (21.114)****.*

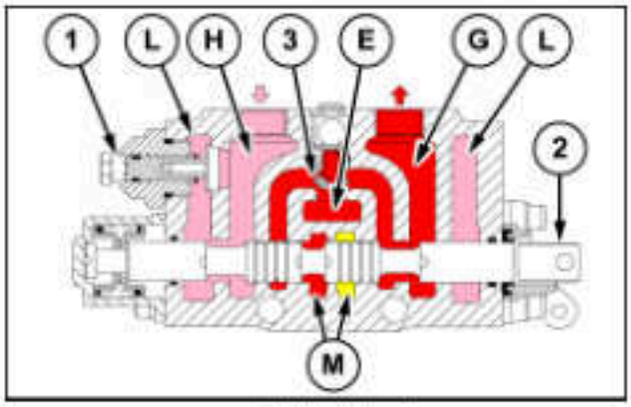
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Remote control valve Open center mechanical remote valve - Dynamic description

Operating stages of auxiliary control valve for operation of a double-acting cylinder (Figs. 1 and 2) and single-acting cylinder (Figs. 3 and 4)

Lifting

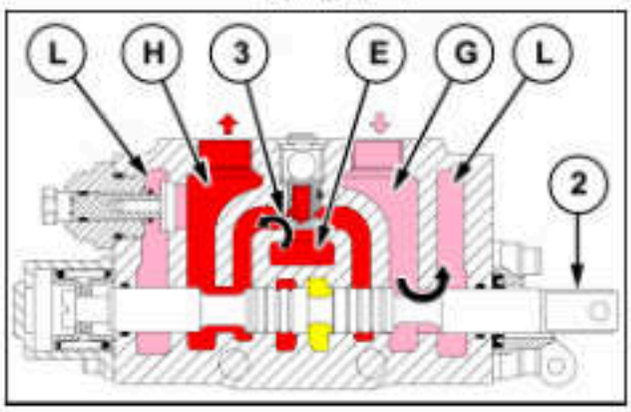
On pulling back the control lever, (located in the cab) the control valve stem **(2)**, (Fig. **1**) shifts to connect the bottom chamber of the cylinder with the delivery line **(E)** by way of the check valve **(3)** and line **(G)** and also to connect the top chamber of the cylinder with the exhaust line **(L)** by way of line **(H)**, intercepting the supply of oil to the lift control valve. Keep the lever pulled back, to extend the cylinder to its full stroke. On releasing the lever it will automatically return to the neutral position under the action of the return spring, and the entire flow from the pump will be conveyed to the lift control valve by way of lines **(M)**.



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Lowering

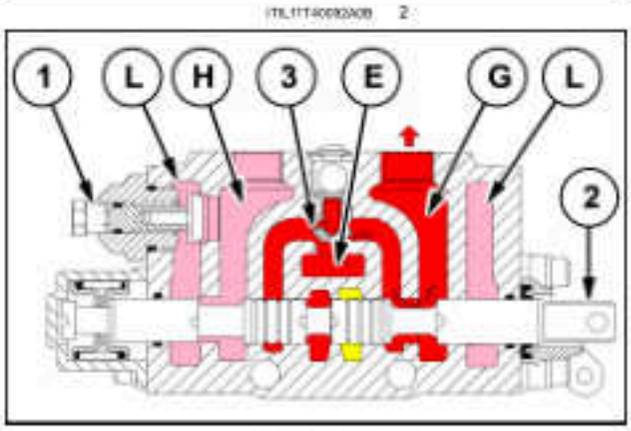
To lower the implement, push the control lever (located in the cab). The control valve spool **(2)** will shift to the position indicated in Fig. **2** thus allowing the oil in the lower cylinder chamber to flow to the exhaust **(L)** through the line **(G)**, while the upper chamber is connected to the delivery line **(E)** through line **(H)** and check valve **(3)**.



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Lifting

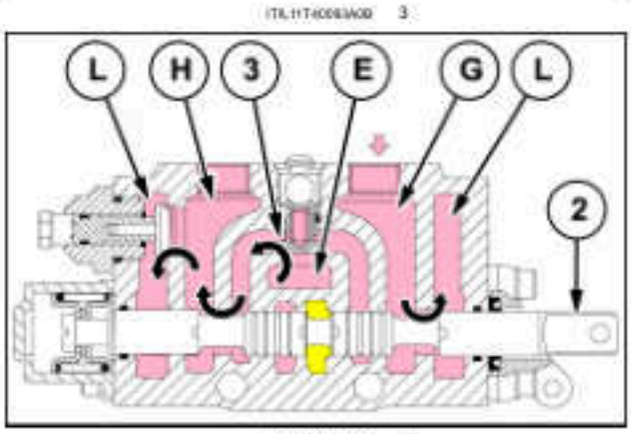
On pulling back the control lever (located in the cab) the control valve stem **(2)**, (Fig. **3**) shifts to connect the cylinder with the delivery line **(E)** by way of the check valve **(3)** and line **(G)**. Line **(H)**, for the control of double-acting cylinders, is not used at this stage as it is permanently connected to the exhaust **(L)** by the open position of the switching valve **(1)**.



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Lowering

On pushing back the control lever (located in the cab) the stem **(2)** will shift to the position indicated in Fig. **4**. The oil contained in the cylinder, pressurized by the weight of the lifted implement, will flow to the exhaust **(L)** by way of line **(G)**, while the entire flow from the pump is also conveyed to the exhaust **(L)** through the check valve **(3)** and line **(H)**.



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Pressurized oil

Oil in suction, delivery or exhaust

Static oil

NOTE: *For operation of a double-acting cylinder, tighten the screw **(1)**. For operation of a single-acting cylinder, loosen the screw.*

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Wiring harnesses - Electrical schematic sheet 32 - Electronic control unit input/output wiring diagram Power-Shuttle/dual command (2 speed Powershift) 32+16 / 44+16 (SB)

T4.105V With cab [ZDJE17896 -]	LA Four-Wheel Drive (4WD) - Automatic engagement — LA Rear lifter - Electronic control
T4.65V With cab [ZDJE10473 -]	Four-Wheel Drive (4WD) - Automatic engagement — Rear lifter - Electronic control
T4.75V With cab [ZDJE10095 -]	LA Four-Wheel Drive (4WD) - Automatic engagement — LA Rear lifter - Electronic control
T4.85V With cab [ZDJE11669 -]	LA Four-Wheel Drive (4WD) - Automatic engagement — LA Rear lifter - Electronic control
T4.95V With cab [ZDJE11682 -]	LA Four-Wheel Drive (4WD) - Automatic engagement — LA Rear lifter - Electronic control

Position	Description
(1)	Battery (**BAT−83−A**, **BAT−83−B** and **BAT−83−E**).
(2)	Ignition switch (**SW−19**).
(3)	Starter relay (RLY−13).
(4)	Starter motor (**M−85**).
(5)	Clutch pedal potentiometer (**SEN−153**).
(6)	Shuttle lever (**SW−152**), composed of three switches:
(A)	Common switch-neutral position (starting), forward/reverse position 12VD supply to the two clutches A and B.
(B)	Switch with forward gear diagnostics.
(C)	Switch with reverse gear diagnostics.
(7)	Clutch pedal switch (**SW−151**), view in starting position (pedal pressed and shuttle level on neutral), with pedal released and shuttle lever engaged (not on neutral) it supplies current to the control unit (12VD) that will supply the forward and reverse clutches.
(8)	Supply line to the sensors and potentiometers of **5 V** that the control unit provides directly.
(9)	Control unit supply: 12VD-from clutch pedal switch. 12VF and 12VP-directly from the fuses.
(10)	Forward gear clutch A solenoid (**SOL−146**).
(11)	Reverse gear clutch B solenoid (**SOL−147**).
(12)	Synchronizer movement solenoid in dual command (2 speed power shift) mode (**SOL−138**).
(13)	Synchronizer movement solenoid in shuttle mode (**SOL−139**).
(14)	Discharge solenoid (**SOL−140**).
(15)	Gear lever (**SW−183**) with buttons:
(A)	HI used to select fast speed.
(B)	LO used to select slow speed.
(C)	DUMP used to change gears, within the same range, without pressing the clutch pedal.
(16)	Control unit ground type
(17)	Ground that the control unit supplies to the various sensors (observe the triangular end, on all the sensors where at a pin and marked with this symbol they receive ground straight from the control unit).
(18)	CAN BUS line wires input, inside the control unit there is the terminator (resistance **120 Ω**).
(19)	Parking lock switch (SW–1200).
(20)	Transmission temperature sensor (**SEN−148**).
(21)	Shuttle synchronizer position potentiometer/dual command (2 speed power shift) (**SEN−203**). In the starting phase the control unit moves the synchro (dual command (2-speed power shift)/Power-Shuttle) to the opposite side from where it is at starting. From the movement of the synchronizer, controlled by the potentiometer. This sends a signal to the control unit that understands the power steering pump that supplies the clutch pack oil works properly.
(22)	Range lever position switch (**SW−141**).
(23)	Gear lever position switch (**SW−142**).
(24)	Creeper unit position switch (**SW−143**).

NOTE: *A) The numbers in brackets are the correspondence with the sensors, switches, of the diagram.*
*B) On the control unit the connectors are identified with CN1b and corresponds to connector (**MOD−150**).*

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