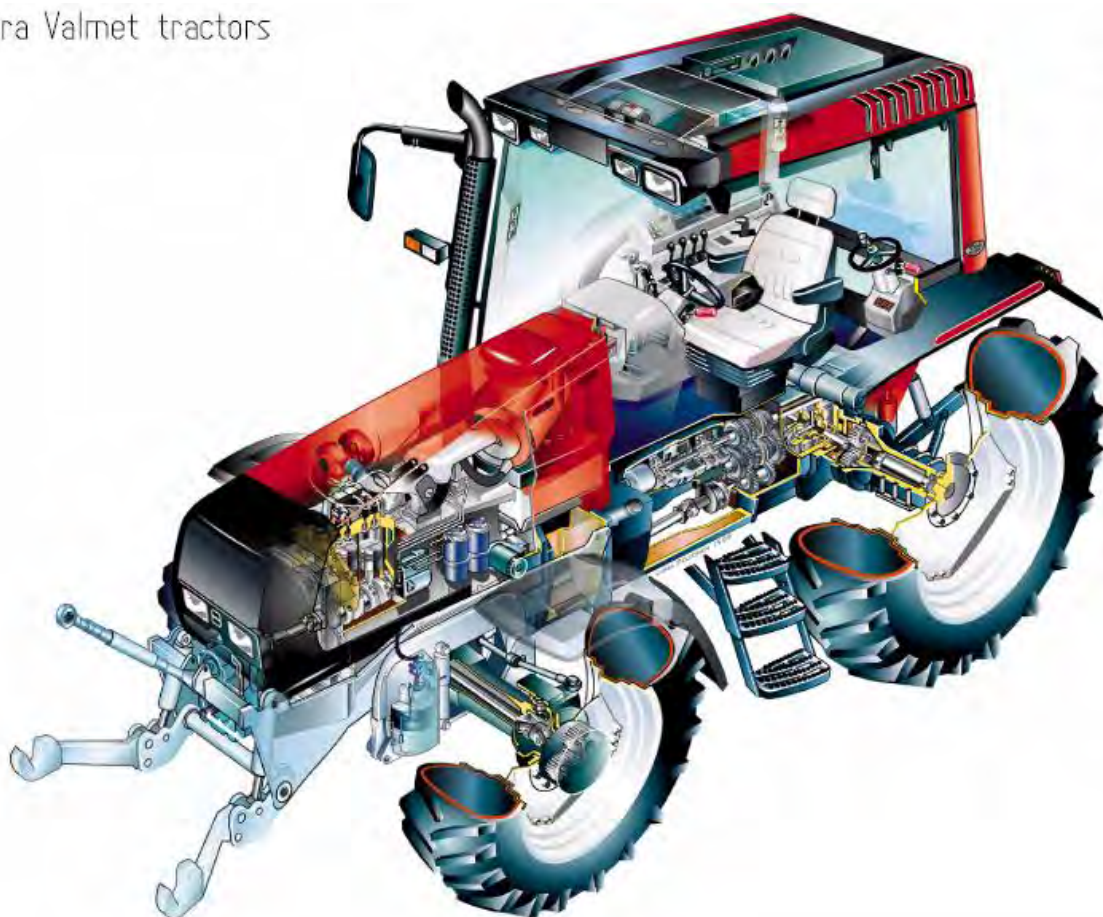


# VALTRA – VALMET MEGA MEZZO HI-TEC

Valtra Valmet tractors



## WORKSHOP MANUAL

# VALTRA

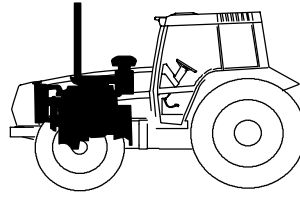
## Service Manual Tractors

Groups 10–100

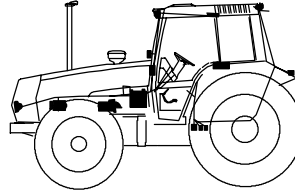
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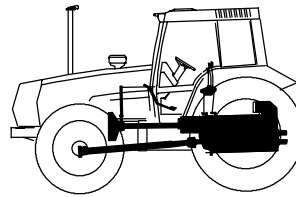
**10** General



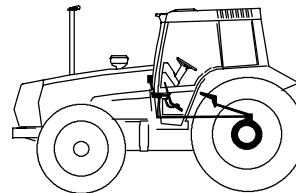
**20** Engine



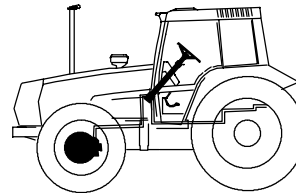
**30** Electrical system



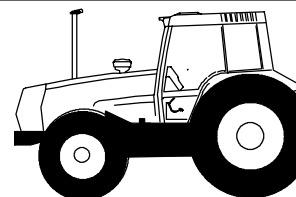
**40** Power transmission



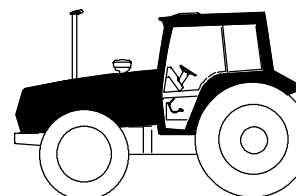
**50** Brake system



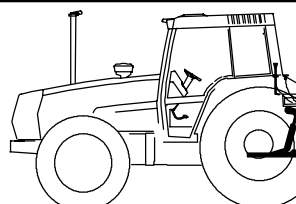
**60** Steering system and Front axle



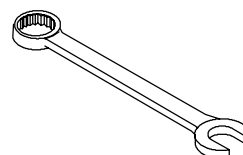
**70** Frame and Wheels



**80** Cab and Shields



**90** Hydraulics



**100** Tools

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## Technical data, 6000–8150

**NOTE! Front PTO on models 6250Hi–6850Hi, see page 463/13A.**

PTO shaft	6–splines, $\varnothing$ 1 3/8" (35 mm)
Nominal revs 1000 r/min are achieved at an engine speed of	1860 r/min.
Direction of rotation of the PTO shaft (seen from the front)	anti-clockwise
Max. permissible continuous loading on the crankshaft	400 Nm
Corresponding max. front PTO output at 1000 RPM	78 kW (106 hp)
Control:	
– electro–hydraulically with aid of a rocker switch in the cab.	
– wet multi–disc clutch inside the PTO housing.	
– friction discs 9 pcs, intermediate discs 10 pcs	$\varnothing$ 135 mm.
– clutch pressure (separate hydraulic circuit with a pump and filter)	1,8 MPa
– pump output	4,5 l/min
Oil cooler fitted in the hydraulic circuit.	
Lubricating oil:	
– oil volume	4,0 litres
– oil quality (same oil as in the tractor transmission)	10W30 GL4

### Tightening torques

Front PTO attaching bolts (4 pcs)	240 Nm
Fixing bolts of the elastic joint (3+3 pcs (4–cyl.), 4+4 pcs (6–cyl.))	140 Nm
Flange joint bolts on the drive shaft (m12.9)	85 Nm
Belt pulley fixing bolts at the crankshaft front end (m12.9)	45 Nm
Front power lift attaching bolts, see page 910/26.	

## Technical data, 8350–8950

PTO shaft	6–splines, $\varnothing$ 1 3/8" (35 mm)
Nominal revs 1000 RPM are achieved at an engine speed of	2040 r/min (8350Hi: 1767 r/min).
Direction of rotation of the PTO shaft (seen from the front)	anti-clockwise *)
Max. permissible continuous loading on the crankshaft	400 Nm
Corresponding max. front PTO output at 1000 RPM	85 kW (116 hp)
Control:	
– electro–hydraulically with an aid of a rocker switch in the cab.	
– dry cone clutch on the rear face of the PTO housing	$\varnothing$ 168 mm.
– friction pieces	6 pcs
Hydraulics:	
– clutch pressure from the tractor low hydraulic circuit	1,8 MPa
– pressure from the solenoid valve into the cone clutch	1,1 MPa
– the system has a separate hydraulic pump for the cooling circuit	
– system is equipped with an oil cooler	
Lubricating oil:	
– oil amount	2,5 litres
– oil quality, Shell Tivela WB.	SAE90

### Tightening torques

Attaching bolts (4 pcs) of the front PTO bracket on the front face of the engine oil sump	400 Nm
Front PTO attaching bolts (4 pcs) to the bracket front face	140 Nm
Fixing bolts of the elastic joint (4+4 pcs)	140 Nm
Flange joint bolts at the rear end of the drive shaft (m12.9)	40 Nm
Front power lift attaching bolts, see page 910/26.	

\*) Change of rotation direction is possible (8450–8950) by removing one intermediate gear and by fitting another gear "in the middle" between the upper and lower shaft.

# 1. Description

## A. Front PTO on 6000–8150 tractors

The front PTO is an alternative equipment. The front power lift linkage is also fitted together with the front PTO.

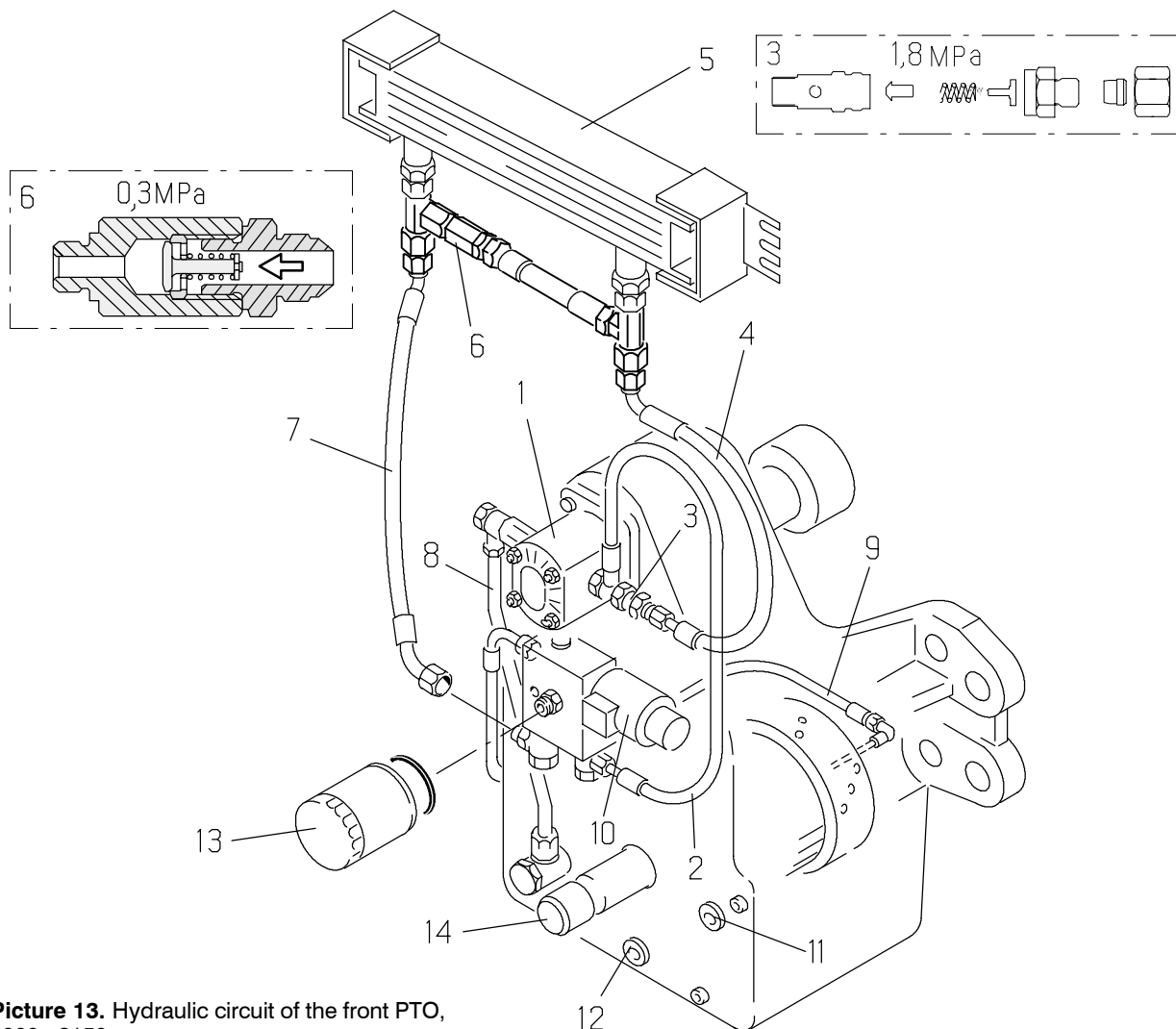
The front PTO unit is attached in place of the tractor front piece. The front PTO unit is powered via a drive shaft in the front end of the engine crank shaft. The PTO unit has its own hydraulic circuit with a pump, and is not connected to the tractor hydraulic system.

On tractors with the front PTO, the engine radiator with its cowl and the fan have been modified as well as, the fan belt

pulleys of the crankshaft (the fan ratio has been changed on 8150 tractor, and also the belt pulleys and v-belts).

The front PTO is engaged and disengaged with the aid of a rocker switch in the cab. In the cab lever console, on the PTO wire loom, there is an electric box, which creates a progressive engagement of the front PTO.

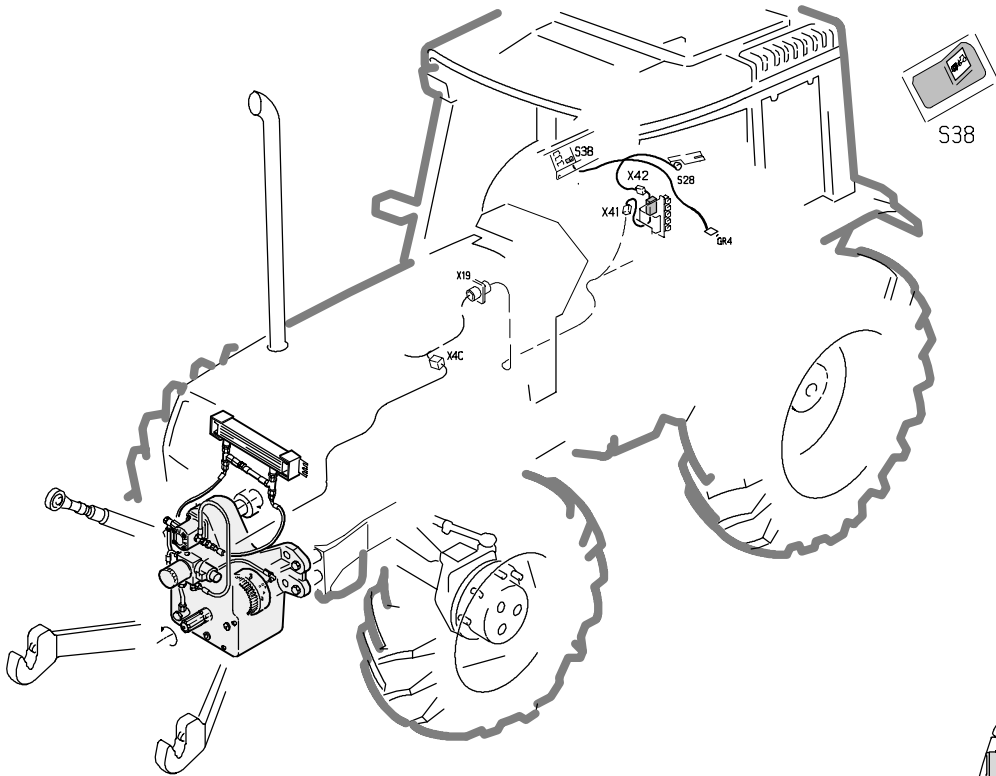
In the PTO housing, there is a hydraulic multi-disc clutch, into which pressure oil is conducted via a solenoid valve (proportional valve) on the front side of the PTO unit.



**Picture 13.** Hydraulic circuit of the front PTO, 6000–8150.

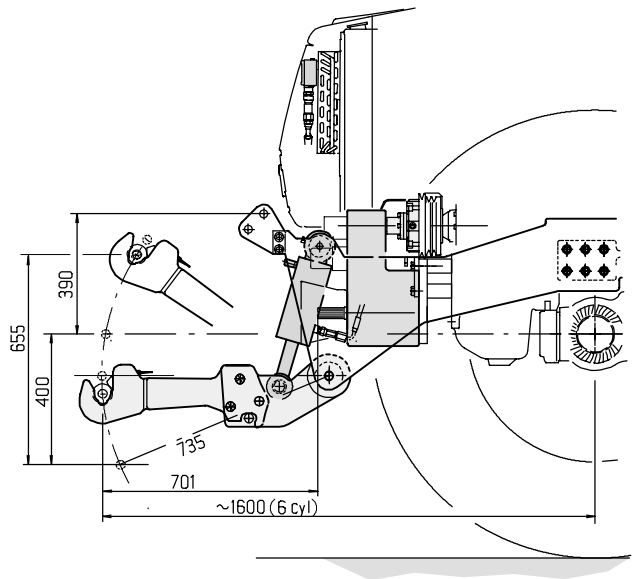
1. Gear wheel pump (output 4,5 l/min)
2. Pressure oil (1,8 MPa) to the solenoid valve
3. Pressure valve, 1,8 MPa.
4. Oil into cooler
5. Oil cooler
6. Cooler by-pass valve, 0,3 MPa
7. Oil from cooler
8. Suction pipe
9. Oil pressure into multi-disc clutch (1,8 MPa)
10. Solenoid valve
11. Oil filling plug/oil level (oil amount 4 l)
12. Oil draining plug
13. Replaceable oil filter
14. PTO shaft

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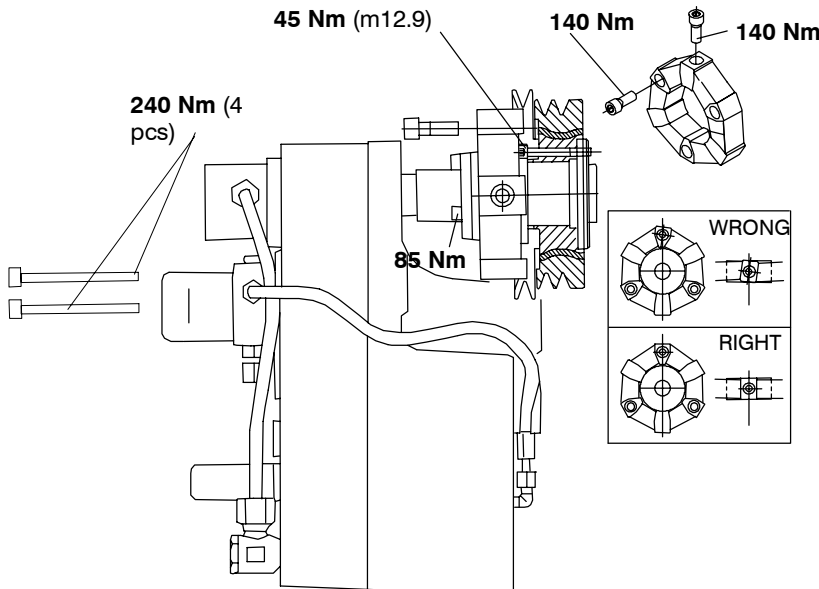


**Picture 14.** Front PTO on 6000–8150

**Note!** The max allowed (continuous) loading in the engine crankshaft is 400 Nm, which corresponds to an output of 78 kW (106 hp) in the PTO shaft at an engine speed of 1860 r/min. This must be observed, when large implements are attached to the front PTO. Use a torque limiting clutch, if necessary. With the torque limiting clutch the max. torque can reach up to 750 Nm.



**Picture 15.** Front PTO and front lift, dimensional drawing



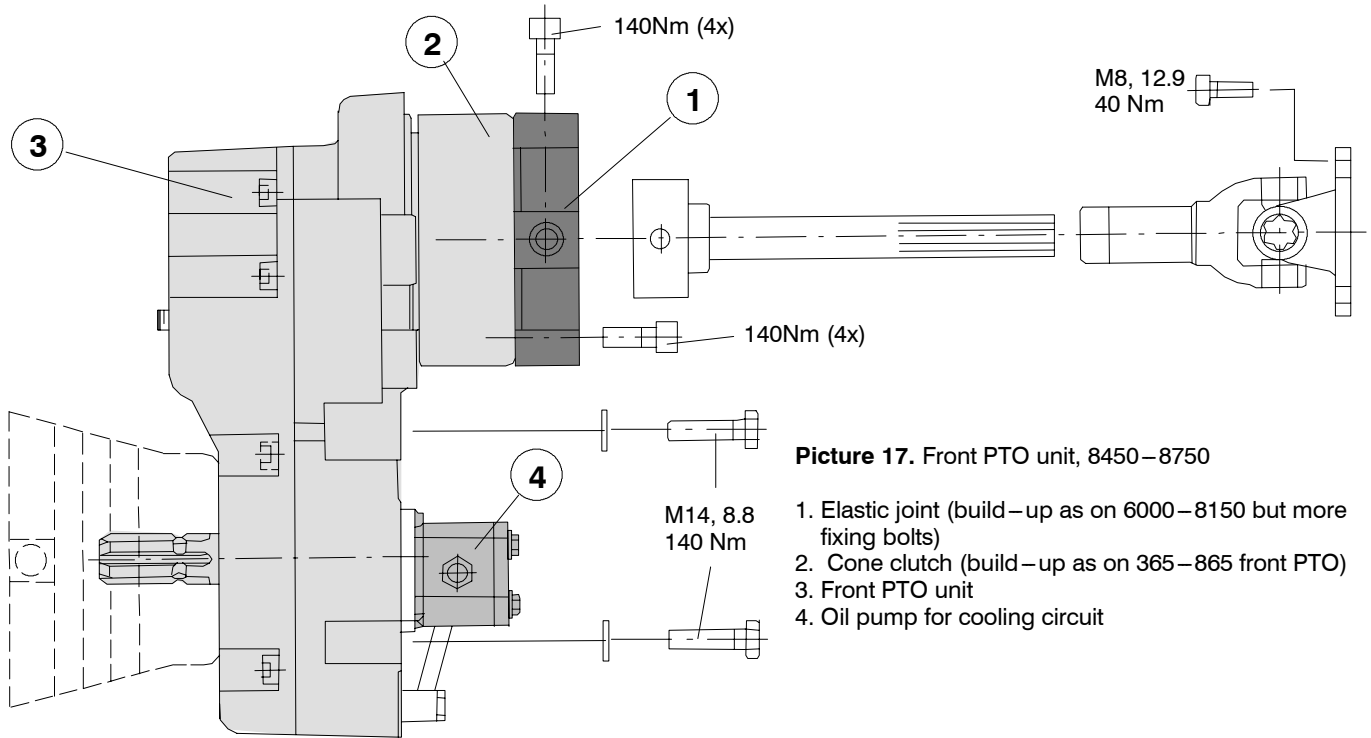
The PTO unit has been fastened to the engine oil sump front surface with four bolts. There are spacer sleeves of 80 mm (6-cyl. engines) between the oil sump and the PTO unit.

There is an elastic rubber joint between the crankshaft front end and the front PTO. On the 4-cylinder engines (6000–6800), the elastic joint is placed inside the belt pulley.

**Note!** Before removing the front PTO unit, the engine coolant should be drained and the engine radiator and its cowl must be removed.

**Kuva 16.** Etukoneisto 6000–8150

B. Front PTO on 8450–8750 tractors

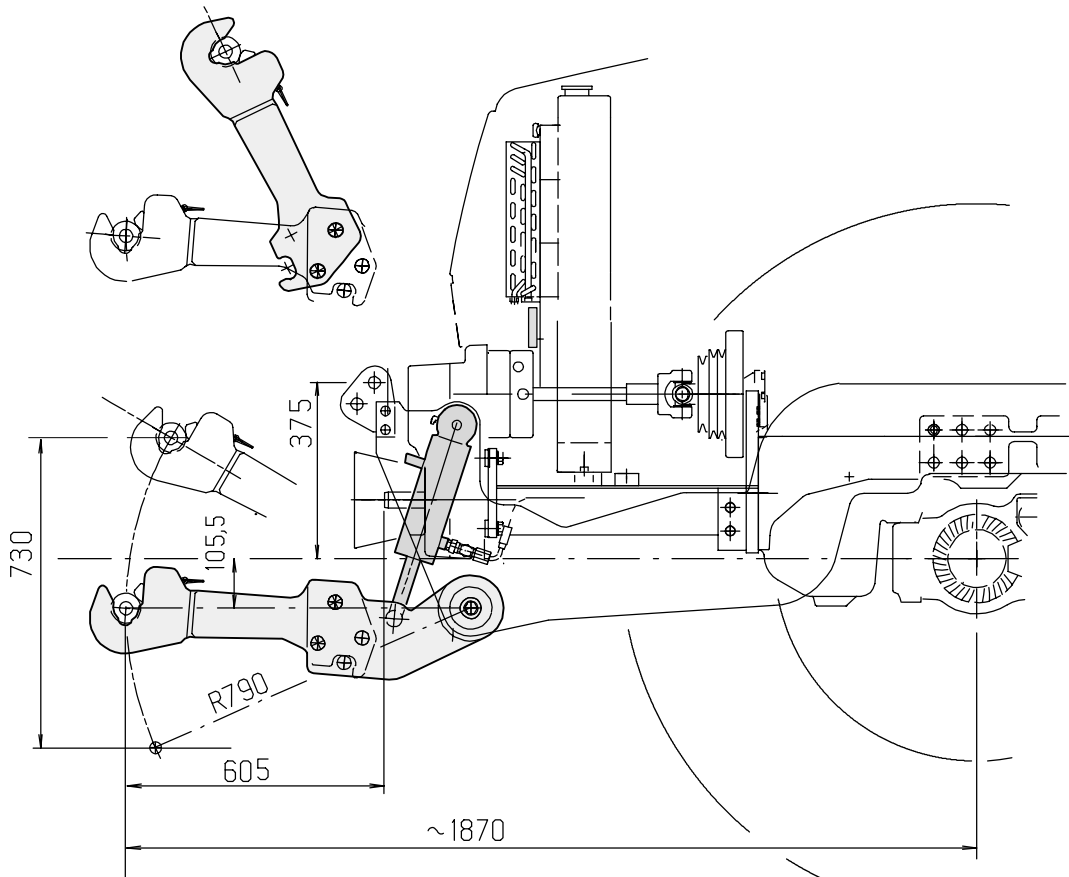


Picture 17. Front PTO unit, 8450–8750

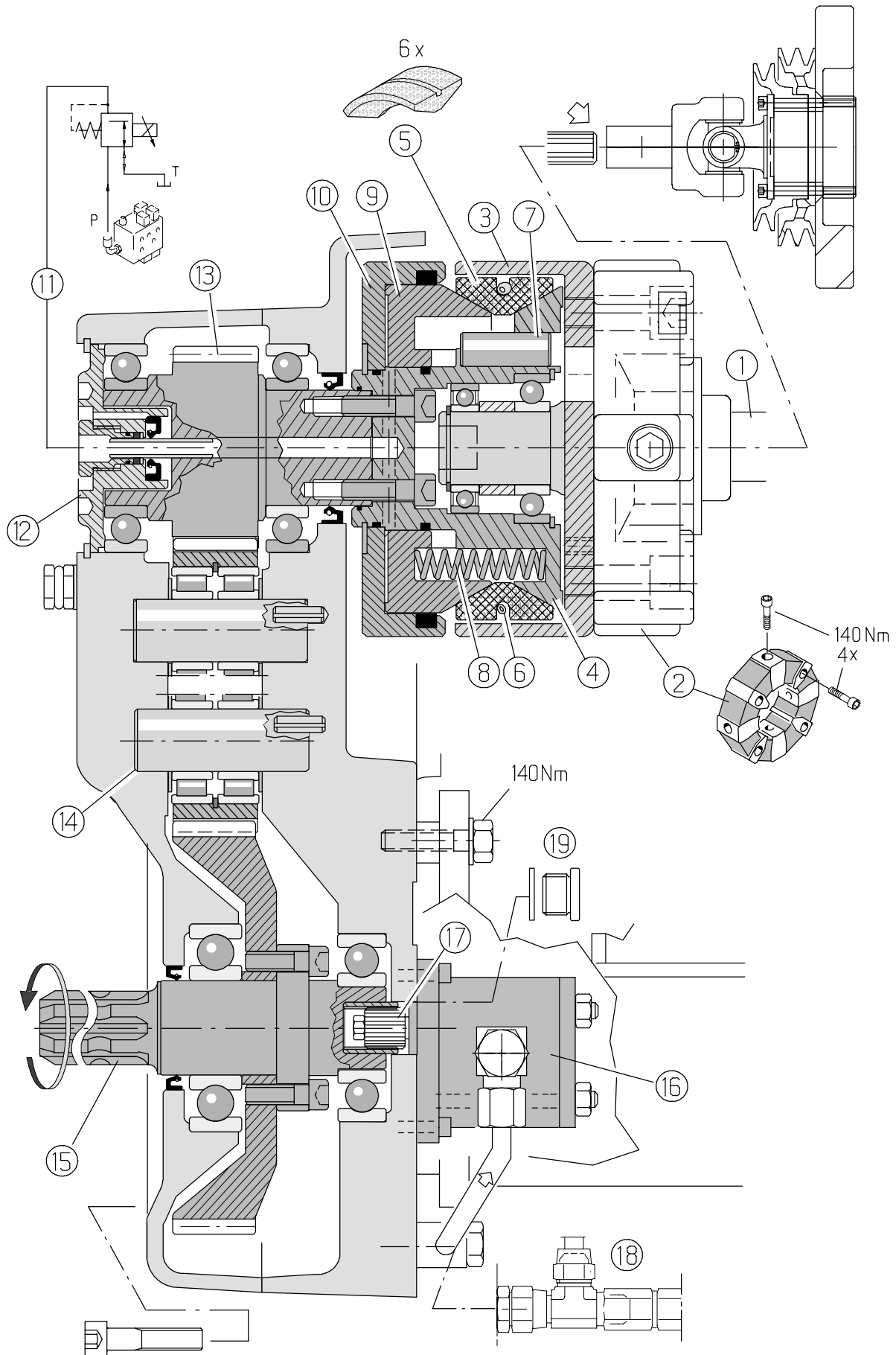
- 1. Elastic joint (build-up as on 6000–8150 but more fixing bolts)
- 2. Cone clutch (build-up as on 365–865 front PTO)
- 3. Front PTO unit
- 4. Oil pump for cooling circuit

The attaching bracket of the front PTO has been fastened to the oil sump front face in place of the standard front piece. The front PTO is attached to the front part of the bracket with aid of four bolts.

**Note!** The max allowed (continuous) loading in the engine crankshaft is 400 Nm, which corresponds to an output of 85 kW (116 hp) in the PTO shaft at an engine speed of 2040 r/min. This must be observed, when large implements are attached to the front PTO. Use a torque limiting clutch, if necessary. With the torque limiting clutch the max. torque can reach up to 820 Nm on 8450–8750 tractors.



Picture 18. Front PTO, front power lift 8450–8750, dimensional drawing

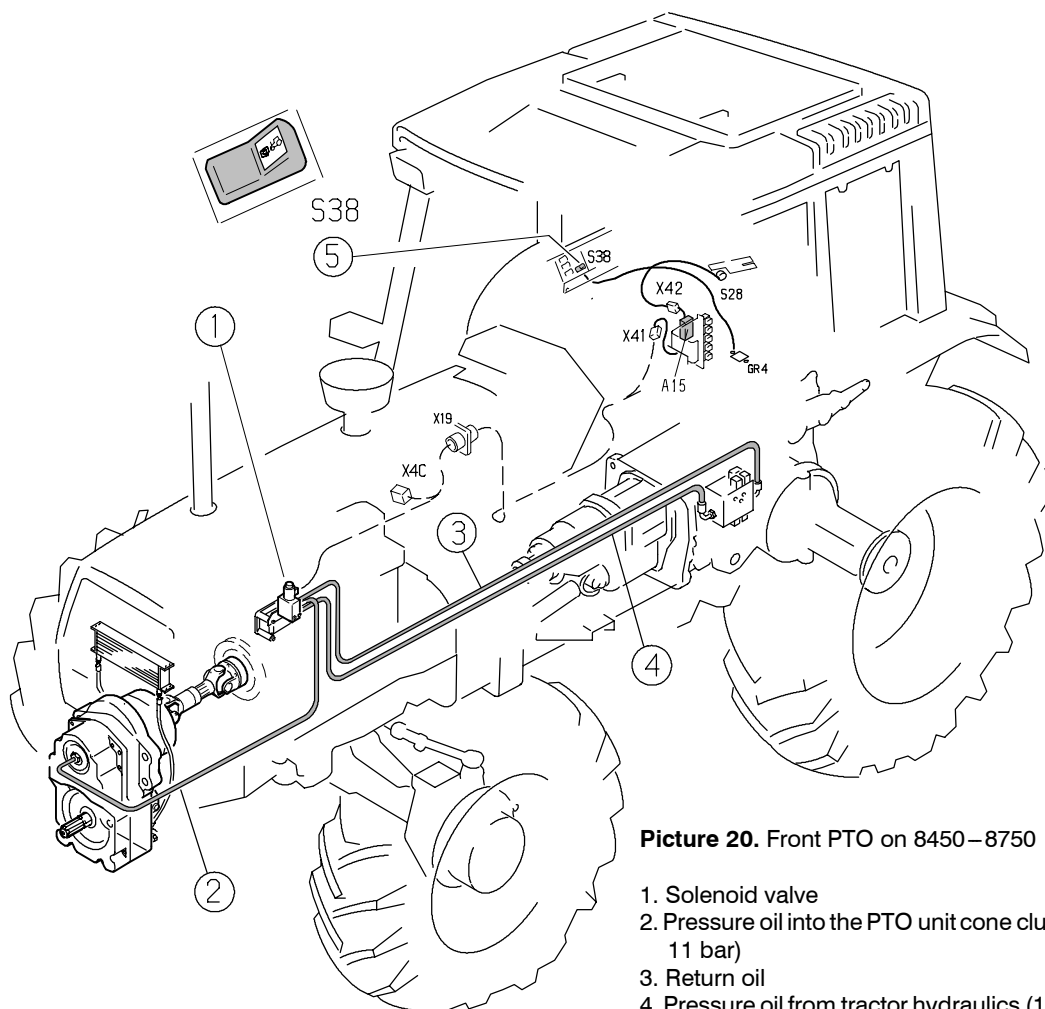


Picture 19. Front PTO unit cross section, 8450-8750



Picture 19. Cross section

1. Drive shaft
2. Elastic joint
3. Clutch drum
4. Hub
5. Friction piece (6 pcs)
6. Spring
7. Clutch guide pin (3 pcs)
8. Return spring (6 pcs)
9. Piston
10. Clutch cylinder
11. Pressure oil into clutch (from tractor low pressure circuit)
12. Oil inlet cover
13. Shaft
14. Intermediate gear wheel
15. PTO shaft
16. Pump (for cooling circuit)
17. Pump drive sleeve
18. Oil draining
19. Oil level



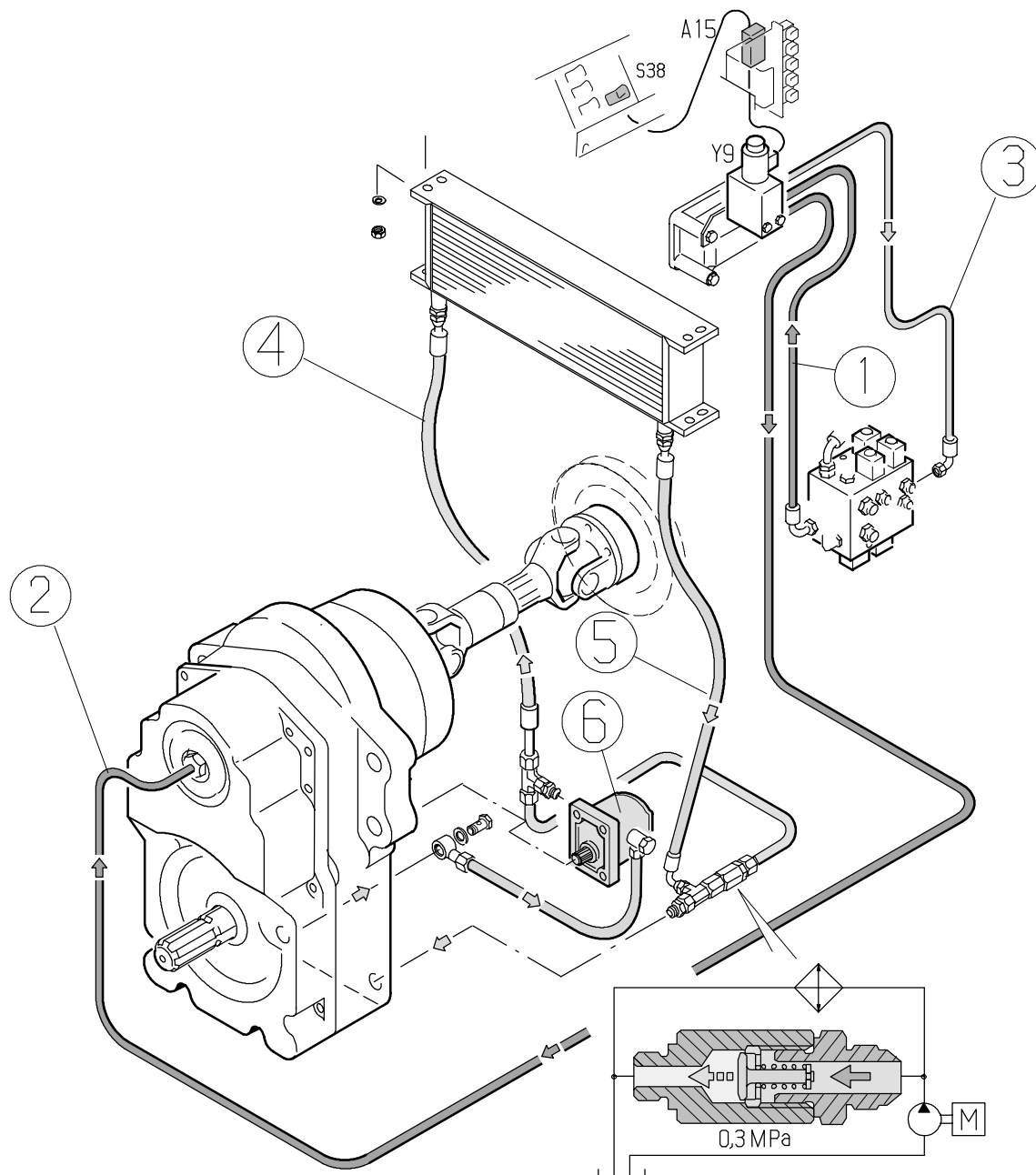
Picture 20. Front PTO on 8450–8750

1. Solenoid valve
2. Pressure oil into the PTO unit cone clutch (about 11 bar)
3. Return oil
4. Pressure oil from tractor hydraulics (18–19 bar)
5. Rocker switch of front PTO

On 8450–8750 tractors the front PTO clutch pressure is maintained by the low pressure circuit of the tractor hydraulic system.

Solenoid valve (1), which is located in the engine compartment, directs the oil pressure to the front PTO clutch when the switch (5) is turned. The electronic box (A15) is the same and in the same place as on 6000–8150 tractors.

**Note!** The electric systems of the front PTO on 6000–8750 tractors are similar, but the wire lengths are different, since the solenoid valves are fitted in the different places on 6000–8150 and 8450–8750 tractors.



**Picture 21.** Hydraulic system of the front PTO, 8450–8750.

1. Pressure oil from the tractor hydraulics (1,8–1,9 MPa)
2. Clutch pressure into the PTO unit cone clutch (about 1,1 MPa)
3. Return oil into the tractor hydraulic system
4. Lubricating oil into the oil cooler
5. Return oil from the oil cooler
6. Oil pump for the cooling circuit (pump is different as on 6000–8150 tractors)

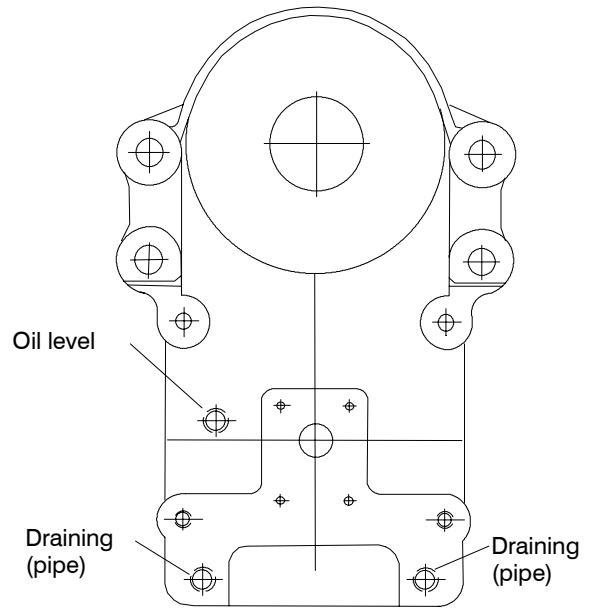
**Note!** The oil cooler by-pass valve, 0,3 MPa, is the same as on front PTO 6000–8150. The oil cooler is different as on 6000–8150 tractors.

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## 2. Repair instructions, front PTO on 6000–8150

### A. Maintenance (also 8350–8950)

- All front PTO fixing bolts should be retightened after the first 100 running hours.
- Check occasionally for leaks, change leaking parts.
- 8350–8950: grease the drive shaft universal joints nipples at intervals of 500 running hours.
- 6000–8150: Change oil and filter at intervals of 500 running hours (clean the filter on 6250–6850, Kxxxxx–).  
8350–8950: Check oil level at intervals of 500 running hours, top up if needed.  
Oil amount and oil quality:
  - 6000–8150: 4 litres SAE 10W/30 GL4 oil.
  - 6250Hi–6850Hi: 2,6 litres, Shell Donax TX.
  - 8350–8950: 2,5 litres SAE90 oil, Shell Tivela WB.
 Draining/level plugs:
  - 6000–8150, see picture 13 on page 463/3
  - 8350–8950, see the next picture
  - 6250Hi–6850Hi, see page 463/13B.
- When necessary, clean the oil cooler to prevent overheating of the front PTO.
- At every 500 running hours, check the rubber coupling for breakage or tears and replace if necessary.



**B. Fault tracing, 6000-8150** (also 8450-8750)

If the PTO shaft does not start to rotate, although the switch S38 is turned to the starting position, the fault can lie in:

- fuse F22 in the fuse box. Check/change.
- solenoid valve (resistance should be **5,5-7,5 ohms**) or in its wires at which time the solenoid valve does not get voltage in the running position (check, if voltage (12 V) comes to the valve connector pins. If not, check the switch S38 and its wiring).
- pump. Remove the pump and check the splined drive sleeve. 6000-8150: Open the pressure valve and clean it and check the spring and the valve spindle sealing surface). 8450-8750: assure that the pressure of 1,8 MPa is fed into the solenoid valve and that a pressure of 1,1 MPa is fed into the cone clutch.
- worn clutch discs or in leaking piston or solenoid valve seals (the clutch can slip).
- too little oil in the PTO housing. Check/add.

**Note!** If the front PTO does not start progressively, the fault can lie in the electric box A15 in the cab lever console.

**Note!** If the front PTO overheats, check the cleanliness of the oil cooler, condition of the pump, oil amount and condition of the by-pass valve and the pressure maintaining valve on 6000-8150

**F22** = fuse in the fuse box

**S38** = rocker switch on the lever console front part (FRONT PTO)

**A15** = electric box (fastened on the relay bracket) in the lever console

**Y9** = solenoid valve on the PTO unit front surface (6000-8150) or in the engine compartment (8450-8750)

**Connectors:**

X1/1 in the fuse box

X42/1, 2, 3 in the cab lever console

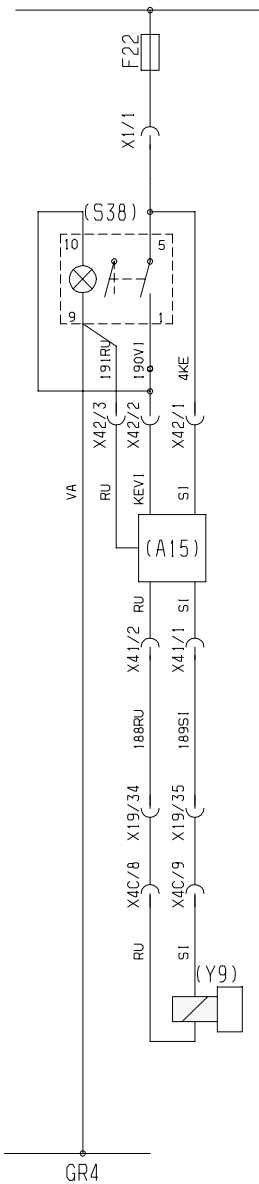
X41/1, 2 in the lever console

X19/34, 35 socket in the cab front wall on the RH side

X4C/8,9 in the engine compartment front part

GR 4 earthing point in the lever console rear part

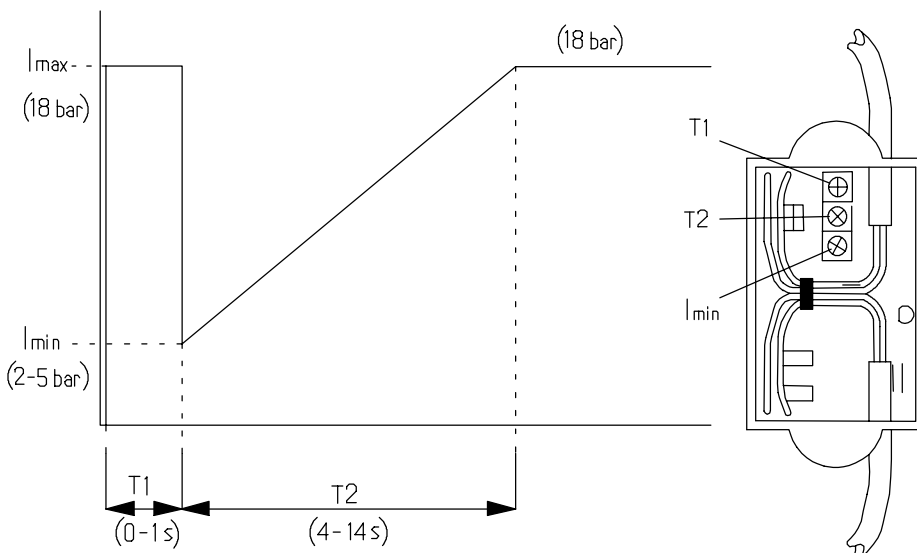
Solenoid valve Y9 pins have connector.



**Wire colours**  
Ru=brown  
Si=blue  
Va=white  
Ke=yellow  
Kevi=Yellowgreen

**C. Adjusting engagement, 6000-8150**

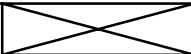
(also 8450-8750)



**T1** = Clutch filling time  
**T2** = Engaging time  
**I min** = Start pressure

The values above can be adjusted by turning the adjusting screws in the electric box A15.

**Note!** The adjustment has been done in the factory and readjustment is normally unnecessary. Long engaging time causes excessive clutch wear.

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## D. Removing the front PTO/changing v–belts/changing elastic joint, 6000–8150

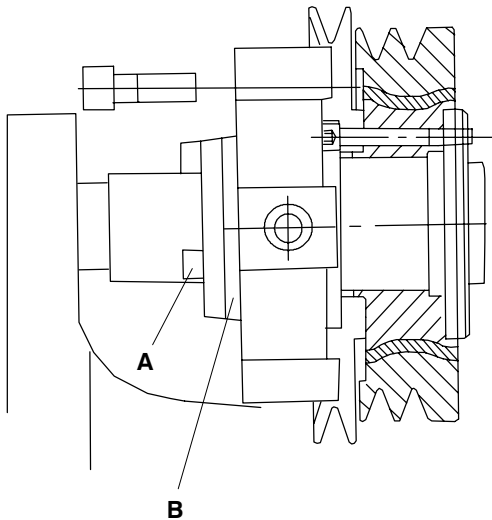
### Removing the front PTO unit:

1. Before removing the front PTO unit, the engine coolant should be drained and the engine radiator and its cowl must be removed. At the same time must be released the oil cooler and the air conditioner condenser and the drier reservoir, if fitted (do not disconnect the hoses).

2. Unscrew the bolts of the drive shaft flange joint in front of the elastic joint (bolts A in the picture below). Unscrew the PTO unit four fixing bolts, after which the unit can be removed.

**Note!** If necessary, remove the front lift top link bracket. It is possible to remove the front housing half while the rest of the unit is attached to the tractor.

### Changing v–belts:



If the engine V–belts have to be changed on 6000–8150 tractors, which are equipped with the front PTO, unscrew the flange joint (A) in front of the elastic joint and then remove the intermediate ring (B), after which there is enough space to remove/fit the belts.

**Note!** On 6000–6800 tractors (4–cyl.) the front PTO unit must be inclined a little, if the tractors have three belt pulleys.

### Changing elastic joint:

Before work the front PTO unit must be removed. When fitting the elastic joint (140 Nm, 3+3 pcs (4–cyl), 4+4 pcs (6–cyl.)) apply a little grease onto the lower surfaces of the bolt heads (see also picture 16 on page 463/4).

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