# 1710 Forwarder SN 17100195-01JUN99 Operator's manual

## Operator's manual
## 1710 SN 17100195-

**F057893 English**

CALIFORNIA
Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

If this product contains a gasoline engine:

**⚠ WARNING**

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

The State of California requires the above two warnings.

**Worldwide Construction And Forestry Division**

# 2. Warranty

The machine is covered by Timberjack's guarantee in compliance with the standard warranty clauses accepted by the Timberjack group.

The manufacturer will not assume responsibility for the machines delivered should the following conditions be violated:

- The forwarder is exclusively operated and maintained by experienced personnel who have been trained by Timberjack or by a dealer authorized by Timberjack.
- The forwarder must be operated and maintained in accordance with the instructions provided in this manual.
- Use fuels and lubricants specified in this manual only.
- Only genuine Timberjack spare parts are used.

## 2.1 After-Sales Service

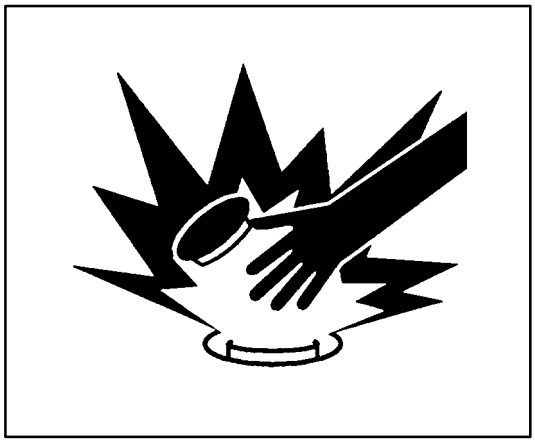
The forwarder was checked and test driven before delivery, and it can be put to use immediately. However, to ensure good reliability it is very important to thoroughly service the machine once it has been put to use.

The warranty given by Timberjack will be valid provided that the machine is handed over for after sales maintenance after appr. 250 running hours, the service shop being one authorized by Timberjack.

Open the expansion tank cap slowly if the cooling system is hot. This allows the pressure to even out.

Ensure that tires and rims are correctly assembled and undamaged before inflating tires.

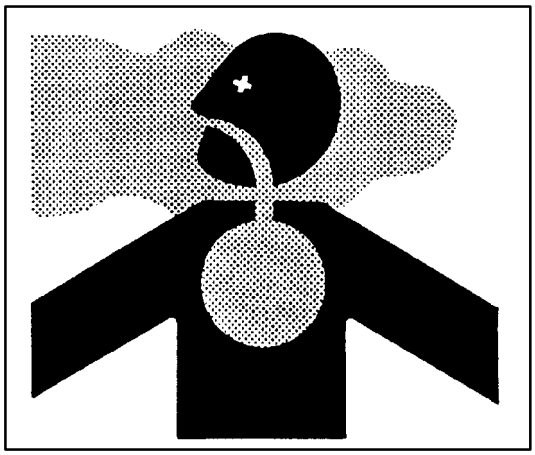
Use an inflation cage when inflating tires. Do not exceed the tire manufacturer's recommended maximum pressure.



Work in a ventilated area. If it is necessary to run an engine in an enclosed area, use an exhaust pipe extension to remove exhaust fumes.

Run the engine only when it is necessary for testing or adjustments.

If you don't have an exhaust pipe extension, either work outside, or open the shop doors.



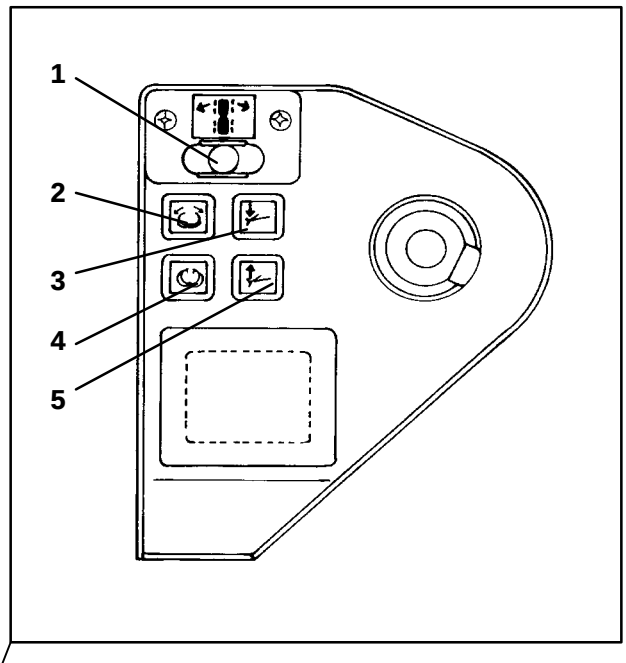
Dispose of fluids properly. Do not pour fluids onto the ground, or into streams, ponds or lakes.

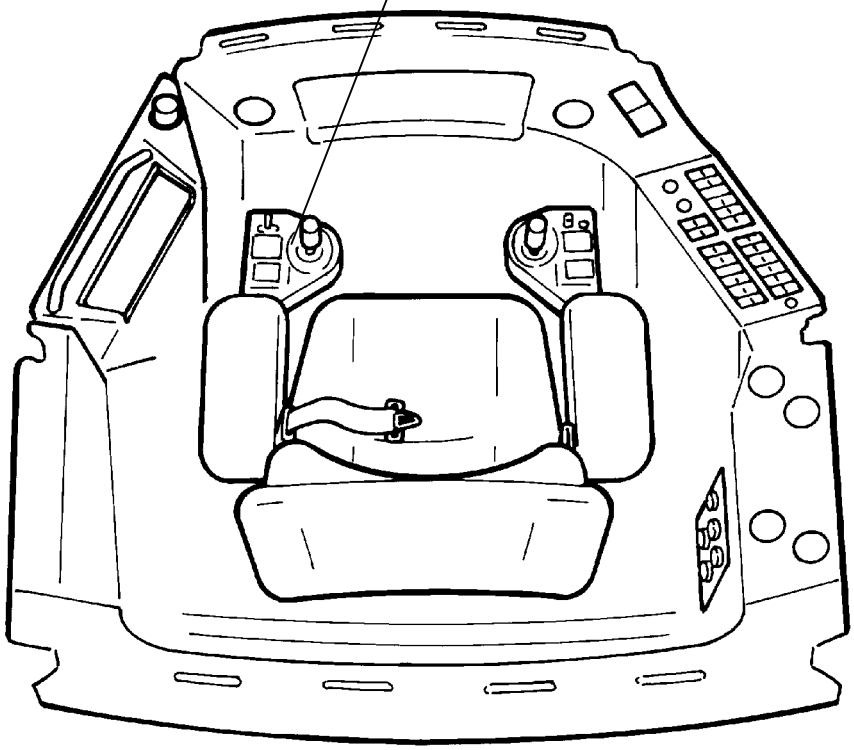
Observe local environmental protection regulations when disposing of filters, batteries, fuel, coolant, oil, brake fluid, and other harmful waste.

## 4.7 Left Control Panel

1. Steering
2. Clambunk open; optional equipment
3. Blade down; optional equipment
4. Clambunk closed; optional equipment
5. Blade up; optional equipment

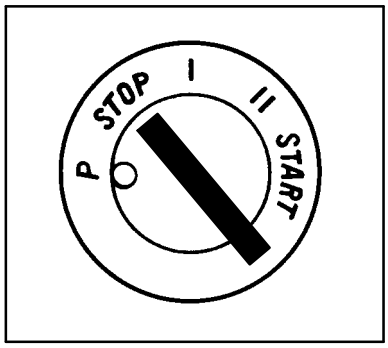
For the operation of the decking blade see also Paragraphs 4.11 and 5.1.9.



## 5.2.2 How to Start the Engine

- Make sure that there are no people within the danger zone around the forwarder.
- Engage the parking brake (the forwarder will start only if the parking brake is on).
- Check that the switch for driving direction is in the middle position and the emergency stopper in the upper position.
- Do not start the engine when the preheater is on.
- Make sure that working RPMs is disengaged.
- Turn the start key to the 'I' position. Check that the warning lights function properly.
- Wait until you hear the TMC signal and the basic menu appears in the display module.
- Start to press the drive pedal smoothly.
- Turn the ignition key to start (position START) and release the ignition key immediately when the engine fires.
- If the engine is cold and the ambient temperature is below 15 degrees centigrade, press the accelerator to full throttle for starting, and release the throttle when the engine fires to prevent the engine speed from exceeding 1000 rpm.
- Ensure that the oil pressure warning light goes off within ten seconds.




If the engine fails to fire within 15 seconds, discontinue starting. Allow the starter motor to cool down for appr. one minute. After that, try again. Should the engine still refuse to start after three tries, find out what is wrong.

**WARNING**

**Once the above steps have been taken, the machine cannot be properly controlled anymore. Therefore, it is of utmost importance to ensure that nobody is placed in jeopardy during the towing process or during installation work. Make sure that no outsider enters the risk zone around the machine.**

*Attention ! We strongly recommend you use a rigid towing linkage for towing. Make sure that the machine is adequately supported before anybody embarks on repairing the machine.*

### 6.3.2 Fuel

The fuel specification recommended by the manufacturer for Perkins engines is the following:

| | |
|---|---|
| Cetane number | 50 minimum |
| Viscosity | 2.0/4.5 CST/40 ˚C |
| Density | 0.835 ... 0.855 kg/dm$^3$ |
| Sulphur | 0.2 % of mass, maximum |
| Distillation | 85 % / 350 ˚C. |

Special winter fuels available in some countries often contain less than 0.2 percent of sulphur. However, if you use high sulphur fuels, it is necessary to renew the lubricating oil more frequently.

You can minimize the formation of condensation water by ensuring that the fuel level is always as high as possible. Do not add methylated spirit to the diesel fuel, because even a small amount may damage the fuel system. Use clean fuel only.

**8. Check the tires for air pressure and overall shape.**

Check tire pressures visually every day. If in doubt, use a pressure gauge to check the pressure.

**8-wheel**

| FRONT | PRESSURE (kPa) | REAR | PRESSURE (kPa) |
|---|---|---|---|
| 650/55-26.5/20 Nokian | 300... 350 | 650/55-26.5/20 Nokian | 500... 550 |
| 750/55-26.5/20 Nokian | 300... 350 | 750/55-26.5/20 Nokian | 500... 550 |

**6-wheel**

| | | | |
|---|---|---|---|
| 23.1-34/16 Nokian | 230... 250 | 650/55-26.5/20 Nokian | 500... 550 |
| 700/70-34/16 Nokian | 220... 250 | 750/55-26.5/20 Nokian | 500... 550 |

*Attention ! When operating with heavy loads in harsh, rugged terrain, it is good to use maximum tire pressures. Running a tire with too low pressure can lead to immediate tire failure.*

*Attention ! Too low pressure can lead to sidewall damage and rim chafing, possible even to rim slippage.*

*Attention ! Min.pressures must be found in wheels even in cold winter days (cold weather reduces the tire pressures about 10 kPa / 10˚*C).

## 6.5.5 Every 500 Running Hours

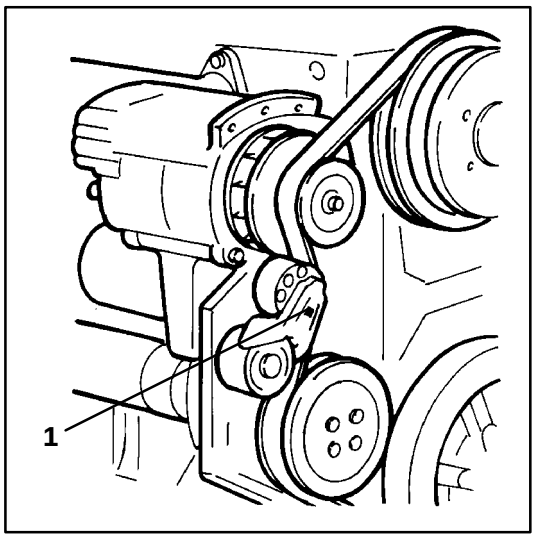
**1. Check the batteries for charge.**

Measure the specific gravity of the battery electrolyte. The density (specific gravity) of the electrolyte must be 1,28 g/cm$^3$. If the density has dropped down to 1,23 g/cm$^3$, the batteries must be recharged. It is worth bearing in mind that the electrolyte of a discharged battery freezes as early as at – 10 ˚C, which is enough to destroy the battery.

Make sure that the batteries are correctly connected. See the wiring diagram for comparison.

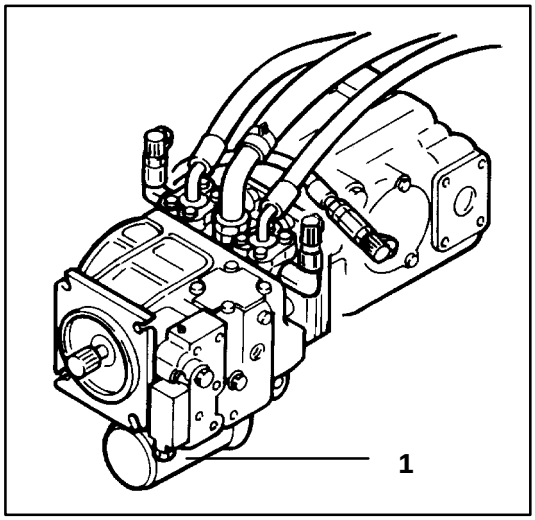
**2. Check the drive belt condition.**

The engine is supplied with an automatic belt tensioner. For belt change the belt can be loosened by turning the tensioner outwards with a socket wrench. A 1/2” driver can be fitted into the opening (1) of the tensioner.




**3. Renew the pressure filter of the drive hydraulic system.**

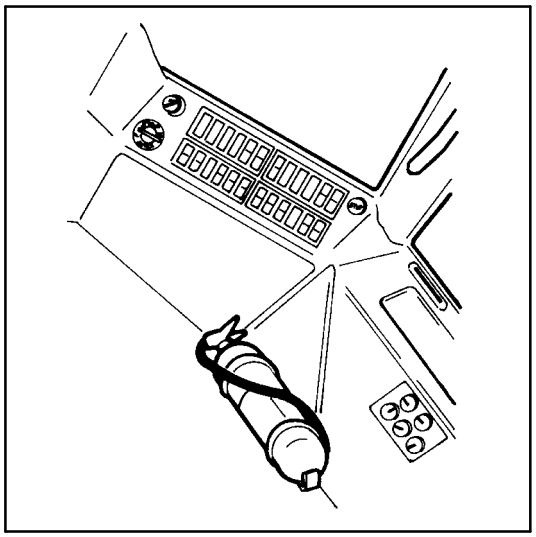
The pressure filter (1) of the drive hydraulics is located under the drive pump. Remove the old filter and fit a new one.



## 6.5.8 Maintenance after Every Six Months

**1. Service the fire extinguisher.**

The fire extinguishers must be checked, serviced and stamped by an authorized dealer. On certain markets fire insurance terms stipulate that fire extinguishers must be checked after every six months. Contact your insurance company for all the details.



### 3. Checking and adjusting the PCOR setting
(Pressure Compensation Over Ride)

- Disconnect the parking brake solenoid (1) from the valve block (fig. 4). After this, the parking brake will stay engaged.
- Connect pressure gauges (60 MPa) to measuring points MH4 and MH6 (Figure 6) and to measuring point MH2 drive pressure (forward) (fig. 5).
- Start the engine and set the engine speed to 1600 rpm.
- Turn the manual steering lever of the hydraulic motor to the position that the charge pressure can be seen at measuring point MH6. Lock the manual steering lever (1) to that position (fig. 6).
- Engage high gear and rear wheel drive.
- Select the driving direction forward.
- Set the adjustable speed range (snail) to 10 %.
- Press smoothly the drive pedal, the pressure will first start to rise at measuring point MH6 and then start to rise at measuring point MH4.
- When the pressure difference between MH4 and MH6 reaches zero, simultaneously record the pressure at measuring point MH2. This pressure value is the setting value for the PCOR valve. The pressure should be **37...37.2 MPa**. If the pressure at measuring point MH2 is too low, tighten the adjusting screw (2) and if it is too high loosen the adjusting screw.
- Unlock the manual steering lever (1) (fig. 6).
- After making the adjustment, fit the solenoid into the valve and tighten the lockscrew (2) hand tight (fig. 4).

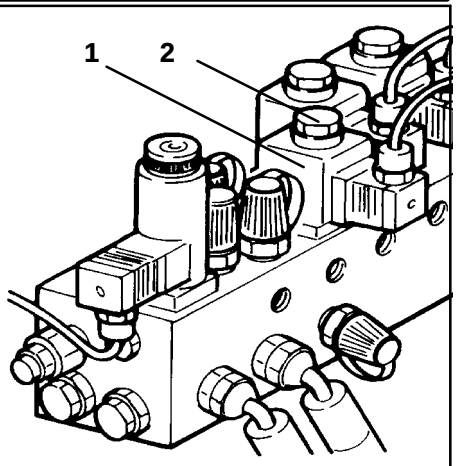


**fig. 4**

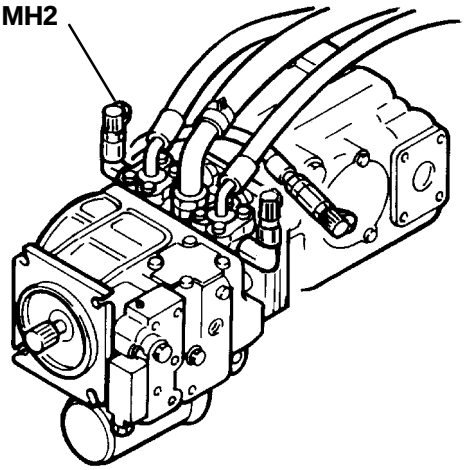


**fig. 5**

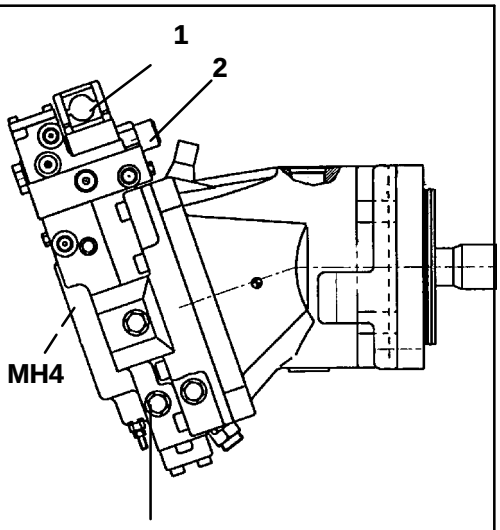


**fig. 6**

2. Measuring the pressures for each movement

- Clambunk function pressures can be measured through measuring point MS1 (7). The pressure is adjusted from adjusting screws CS1...CS6.
- Connect a (0...30 MPa) pressure gauge to measuring point MS1 (7).
- Engage working rpms and open left arm fully, the pressure at the measuring point MS1 (7) should be 17.5 ± 0.5 MPa. If necessary, adjust from adjusting screw CS3 (3).
- Close left arm fully, the pressure at the measuring point MS1 (7) should be 17.5 ± 0.5 MPa. If necessary, adjust from adjusting screw CS4 (4).
- Open right arm fully, the pressure at the measuring point MS1 (7) should be 17.5 ± 0.5 MPa. If necessary, adjust from adjusting screw CS1 (1).
- Close right arm fully, the pressure at the measuring point MS1 (7) should be 17.5 ± 0.5 MPa. If necessary, adjust from adjusting screw CS2 (2).
- Close left and right arm.
- Operate cable tensioning movement, the pressure at the measuring point MS1 (7) should be 16.0 ± 1.5 MPa. If necessary, adjust the pressure from adjusting screw CS6 (6).

Cable release cannot be controlled separately, it releases when operating arm open movements. CS5 (5) is adjusted to maximum.

## 6.9.6 Service Brake

- Connect a pressure gauge (0 ... 30 MPa) to measuring points MB4 and MB5 (fig. 1).
- Start the engine.
- Disengage the parking brake. Symbol 'P' on the TMC display will be replaced by 'S'.
- Make sure that the maximum pressure reading from the pressure measuring points MB4 and MB5 are 9,5 ... 10.0 MPa.
- The pressures cannot be adjusted.

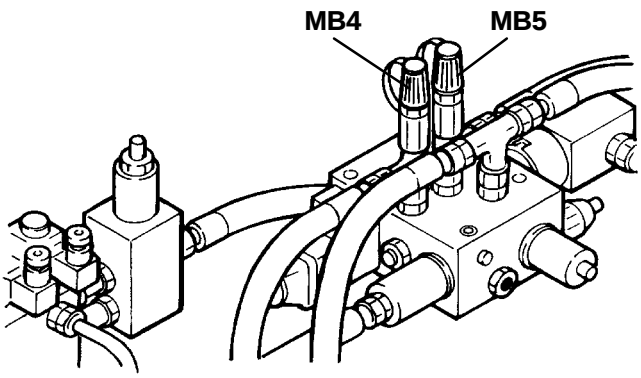



**fig. 1**

- If necessary, eliminate air from the service brake cylinders. This is done by means of vent screws RB6, RB7, RB8 and RB9 (fig. 2).

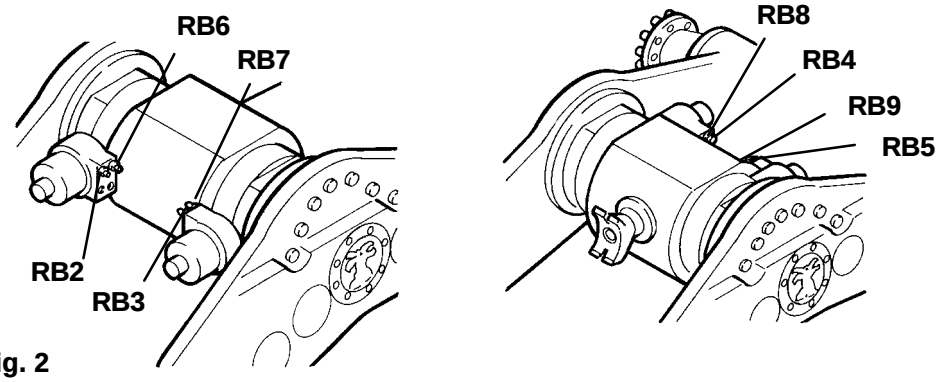
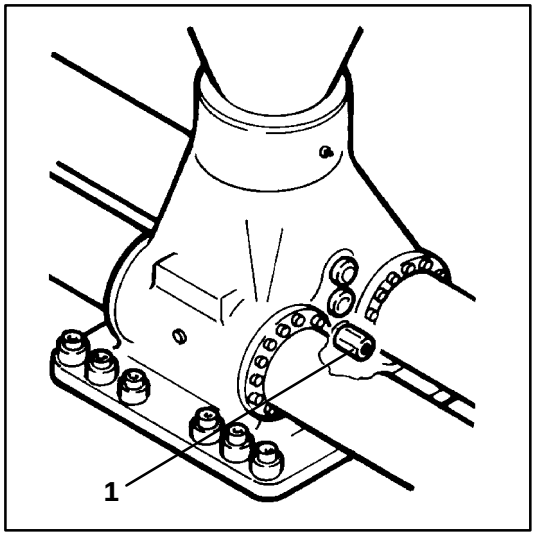



**fig. 2**

## 6.11.5 Every 1000 Running Hours

**1. Change the loader slewing system oil.**

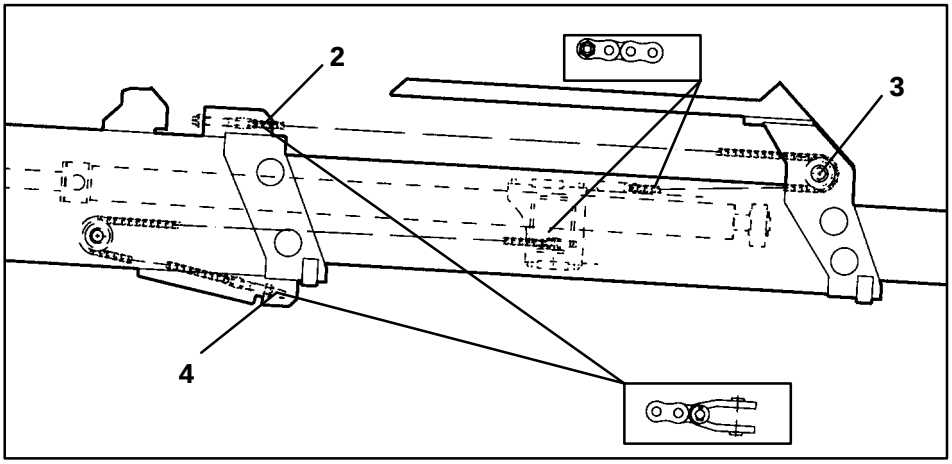
The drain plug (1) is located at the base of the loader. The oil must be changed after every 1000 running hours or once a year. Drain the water deposited in the base by opening the drain plug.

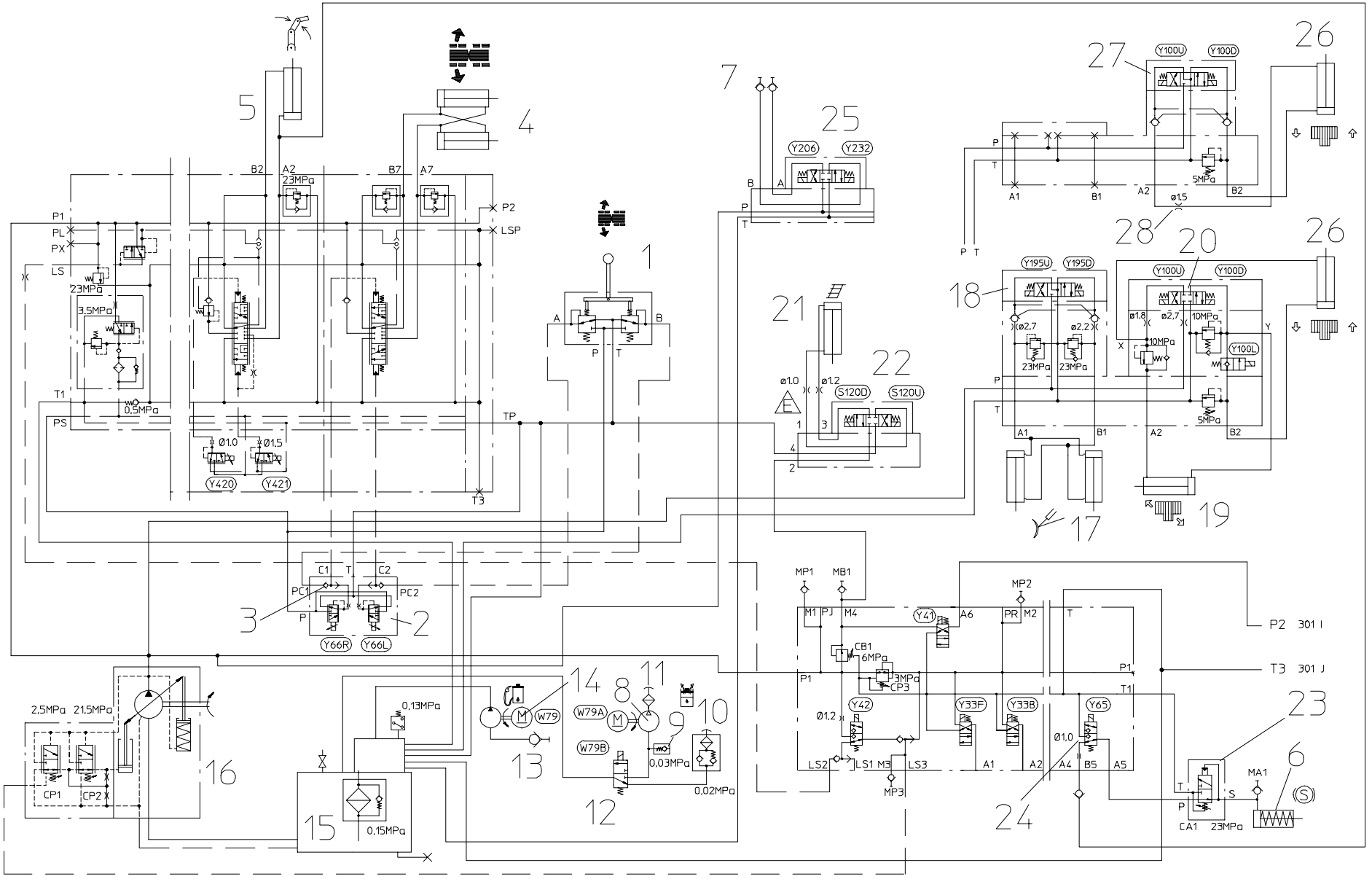



**2. Clean the loader extension boom chains.**

The chains and extensions can be removed by first disconnecting the upper chain from its clamp (2). Next, remove the sheave (3) and bearing housing. Pull the chain through its opening and straighten it on top of the second extension.
After this, disconnect the lower chain from its clamp (4) and tie a rope to its end. Pull the second extension out.

*Attention ! The extension booms and grapple must be properly supported at every stage.*



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| Huom. Note | | Piirtänyt Drawn | PAh | 06.03.96 | Nimitys 1710 HYDRAULIIKKAKAAVIO HYDRAULIC SCHEME Title | Timberjack TAMPERE FINLAND | Piirustus no Drawing No F042365 | Rev. E | Lehti Sheet 4/5 |

## 8.6 Instrument Box Relays

K1 Ignition

K2 Intermittent wiper action

K4 Blinker relay

K6 Seat compressor

K9 Hourmeter

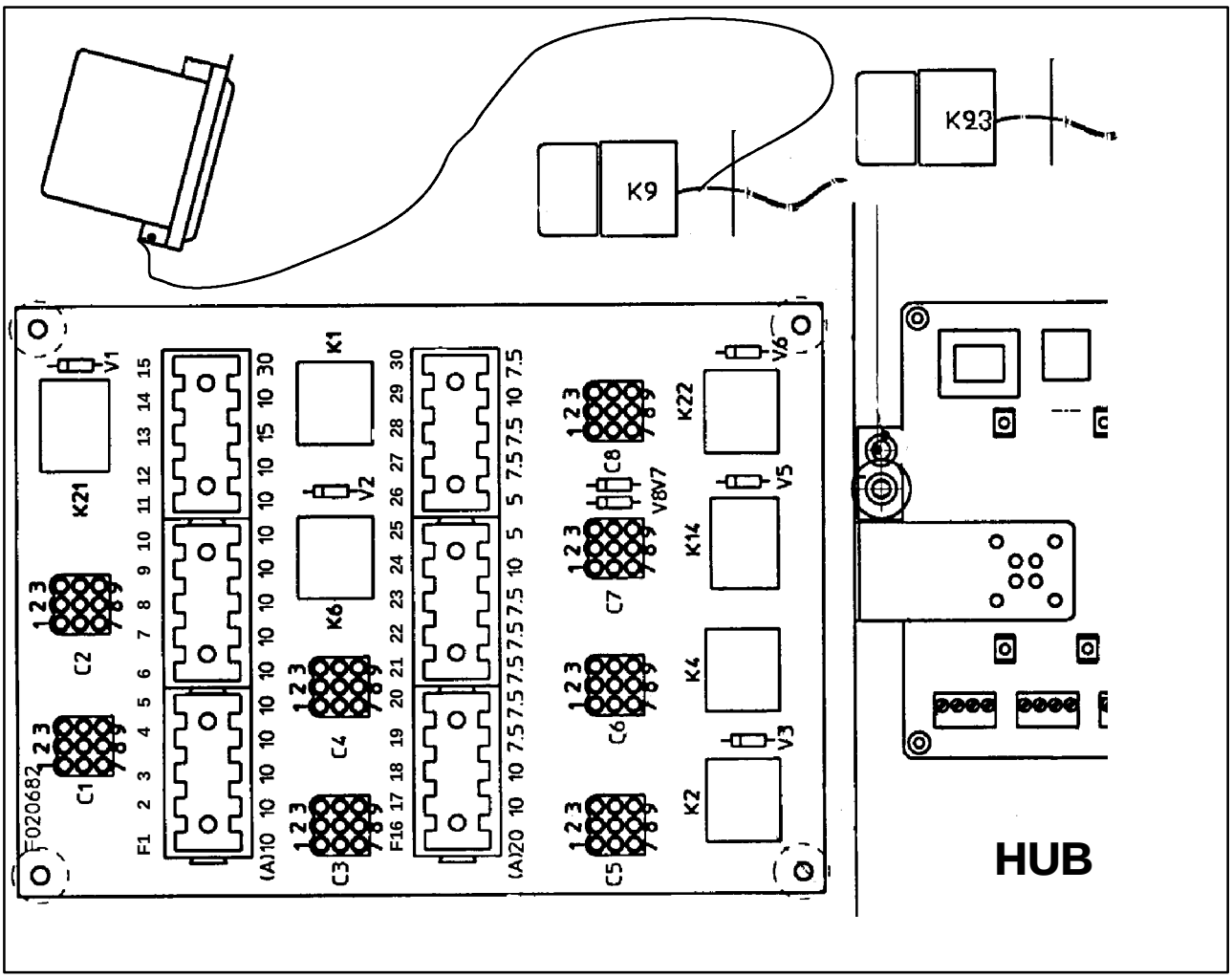
K14 Engine starting prevent

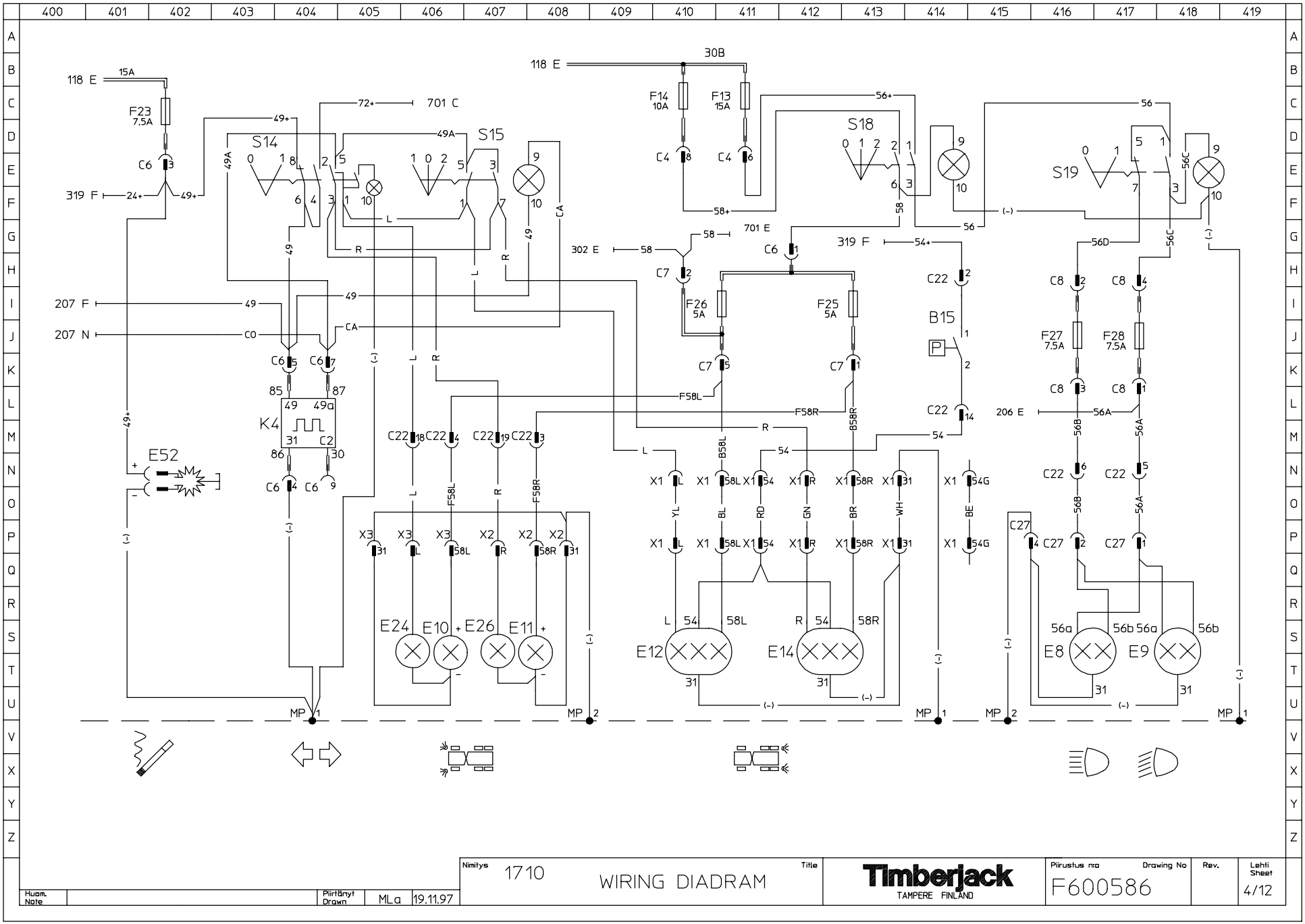
K21 Pressure switch, Air conditioner, compressor (opt. eq.)

K22 Air conditioner, (opt. eq.)

K23 Seat compressor

Relay K3, Starting motor, see Paragraph 8.4.






| Nimitys | 1710 | Title | WIRING DIADRAM | Piirustus nro | Drawing No | Rev. | Lehti Sheet |
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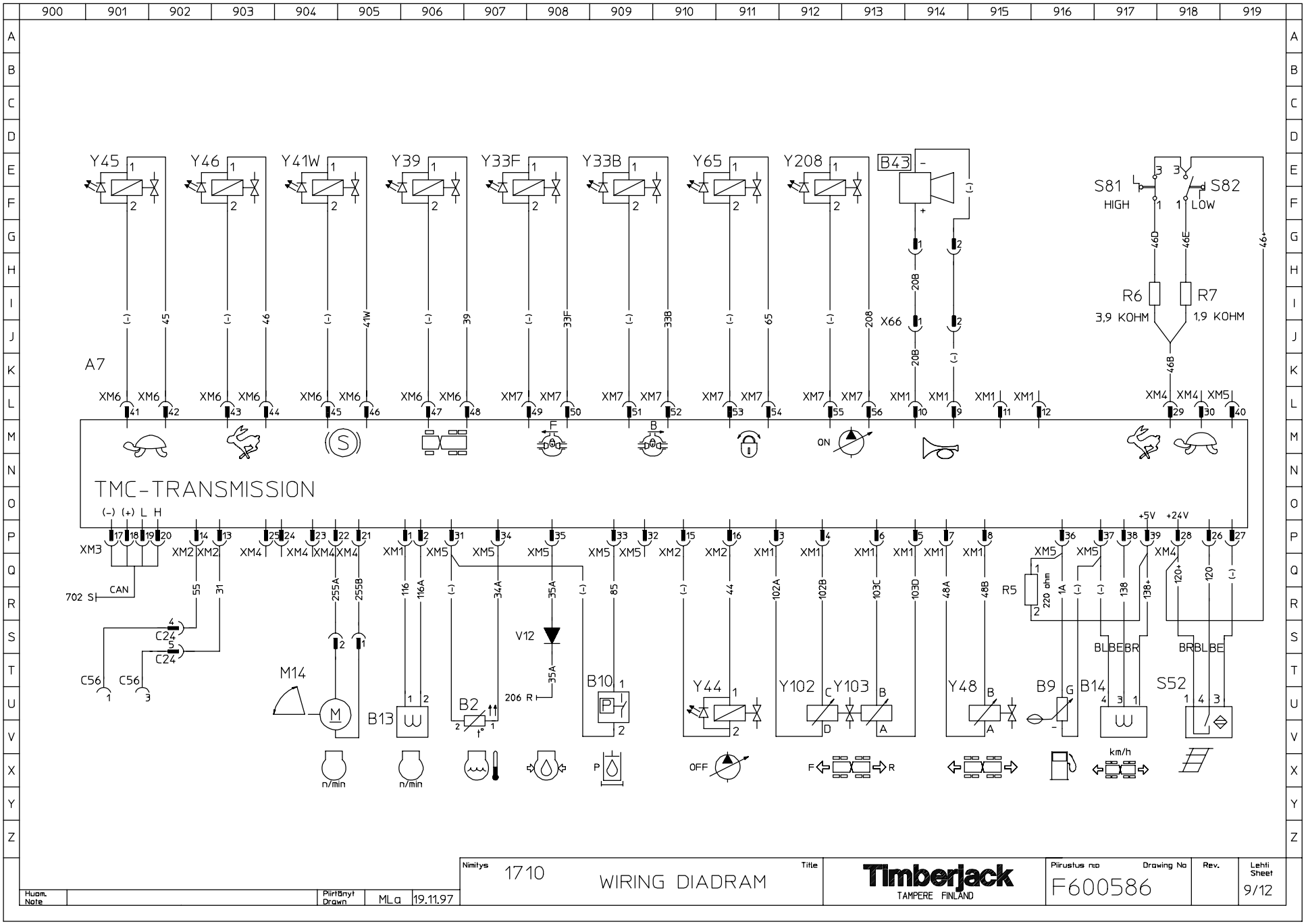


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Timberjack TAMPERE FINLAND

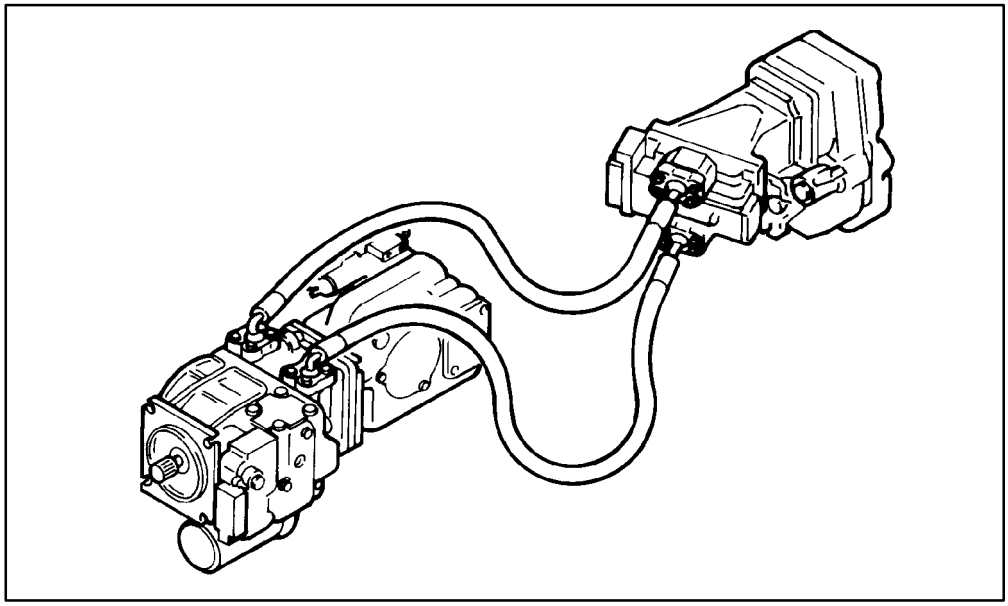
Piirustus nro Drawing No F600586 | Rev. | Lehti Sheet 9/12

## 9.1 High/Low Gear

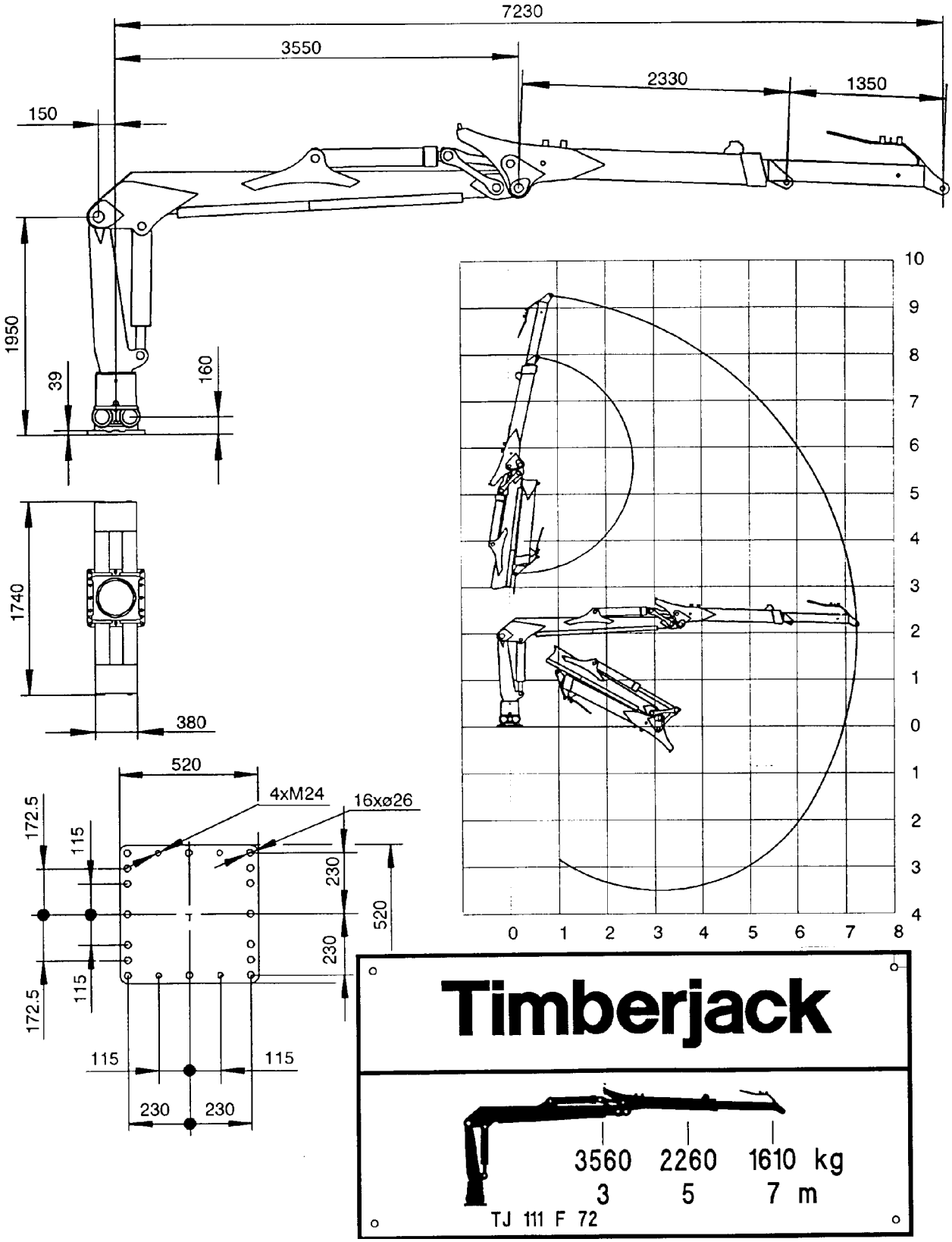
The high/low transfer case is located at the back of the front frame. The power generated by the hydraulic motor is distributed by the high/low transfer case (through the drive shafts) to the front differential and rear differential.

The gear is shifted with the switch on the right–hand–side control panel (see Paragraph 4.8). The switch controls a hydraulic cylinder via an electrical valve.

## 9.2 Hydrostatic System



The main components of the system are a hydraulic pump and a hydraulic motor. These components make up a closed loop circuit in which the oil flowing from the pump to the motor will return to the pump from the motor. Both the pump and the motor are of the variable displacement piston type.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