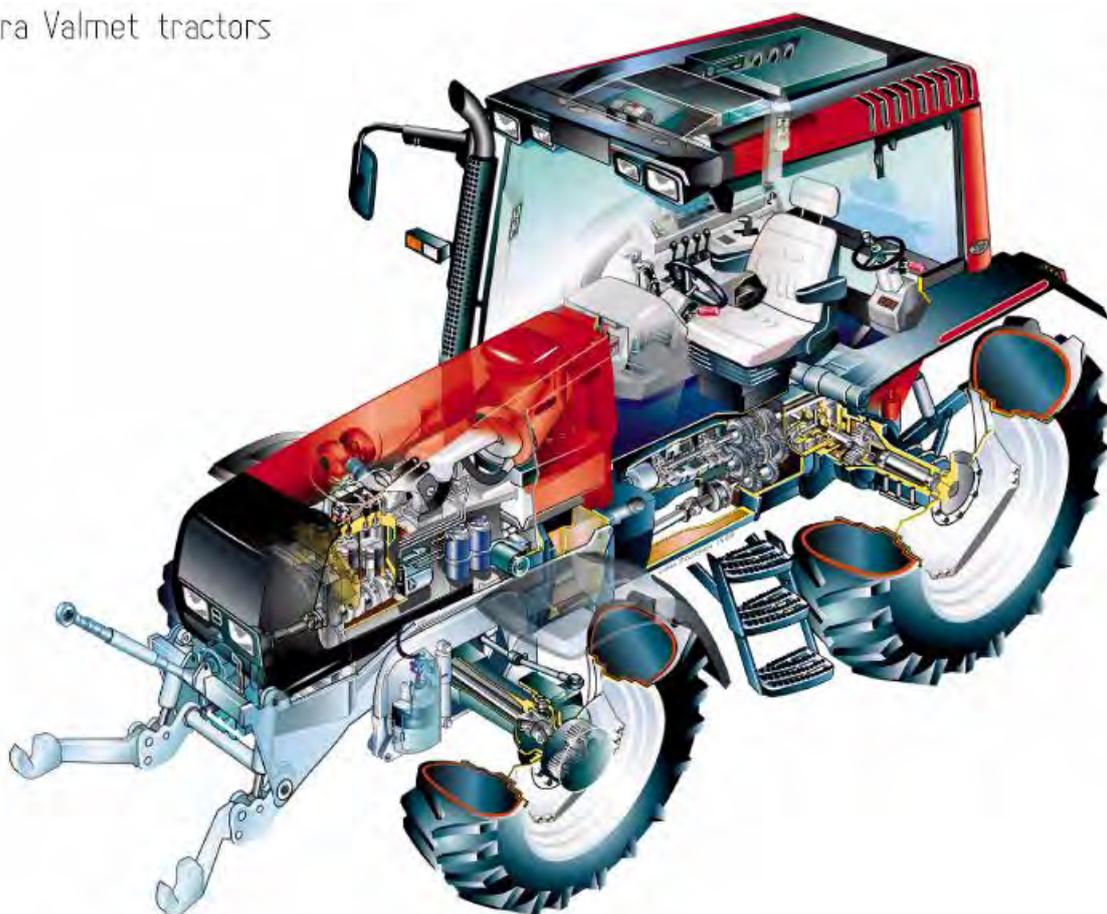


VALTRA – VALMET MEGA MEZZO HI-TEC

Valtra Valmet tractors



WORKSHOP MANUAL

VALTRA

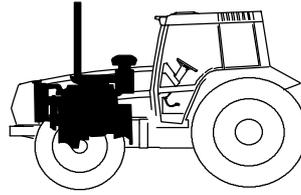
Service Manual Tractors

Groups 10–100

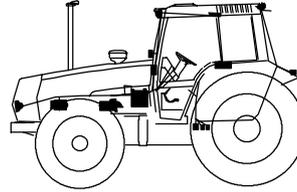
Valtra Inc.
44200 Suolahti, Finland

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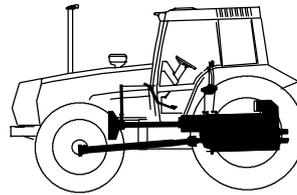
10 General



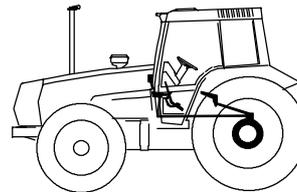
20 Engine



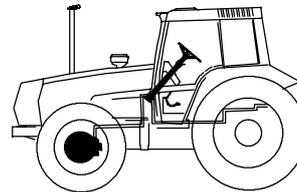
30 Electrical system



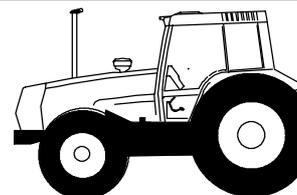
40 Power transmission



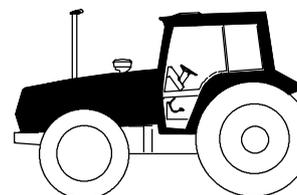
50 Brake system



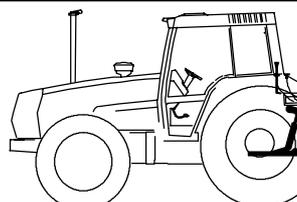
60 Steering system and Front axle



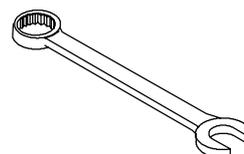
70 Frame and Wheels



80 Cab and Shields



90 Hydraulics



100 Tools

33. Valmet Agrodata	X	Model	Code	Page
	8. 11. 1990	6000–8400	330	1

Valmet Agrodata performance monitor

N.B. ! These instructions deal with trouble shooting on the Agrodata unit. For detailed instructions concerning the use of the Agrodata system, please see the Operator's Manual.

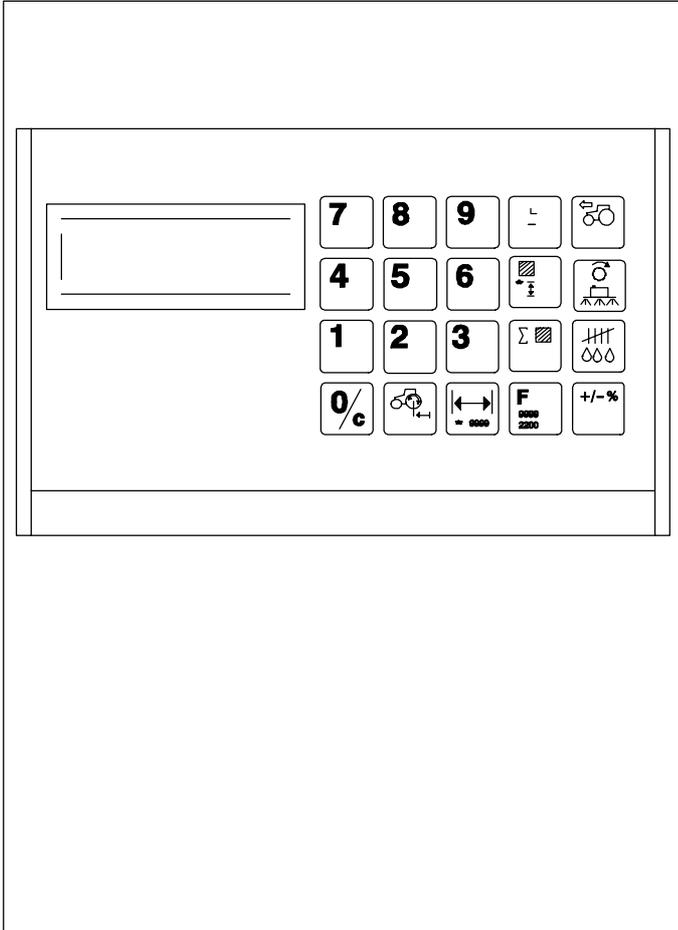


Figure 1. Agrodata function keys

-  Number keys (1–9)
-  Zeroing key for time, area, total area and litres. Also used to input the figure 0.
-  Wheel circumference input key
-  Working width input key
-  Function code
-  Flow meter calibration
-  Time (hours and minutes)
-  Speed
-  Area meter and distance travelled
-  Total area meter
-  Engine RPM and application rate (litres per hectare)
-  Piece counter and total litres consumed

Note! Additionally one rocker switch selects between tractor and implement wheel sensor for measurement of speed and area. The other switch selects between of engine revs or implement functions (Eg. piece counter or flow rate).

General

Agrodata can be fitted on Valmet tractors as an optional accessory. Agrodata is meant to be used in agricultural and contract work for measuring tractor and implement functions and work performance.

Agrodata can monitor:

- Time (h, min)
- Rotation speed (RPM)
- Area (trip and total, ha)
- Distance (current meters)
- Speed (km/h)
- Flow rate (l/ha, l)
- Numbers of items (piece counter)

The different keys are pressed to call up a display of a particular function (see Operator's Manual)

Before the Agrodata unit can be used the following three values must be input:

- the circumference of the wheel (cm) on which the magnetic sensor is mounted (LH rear wheel of tractor) divided by the number of magnets used.
- the effective working width (cm) of the implement
- the function code (9999 except when measuring flow rate and total consumption)

Important! Before measuring flow rate and total consumption, the Agrodata unit and flow meter must be calibrated in order to obtain the correct function code.

The data listed above is retained in the Agrodata unit's memory even if the battery cables are disconnected from the battery terminals.

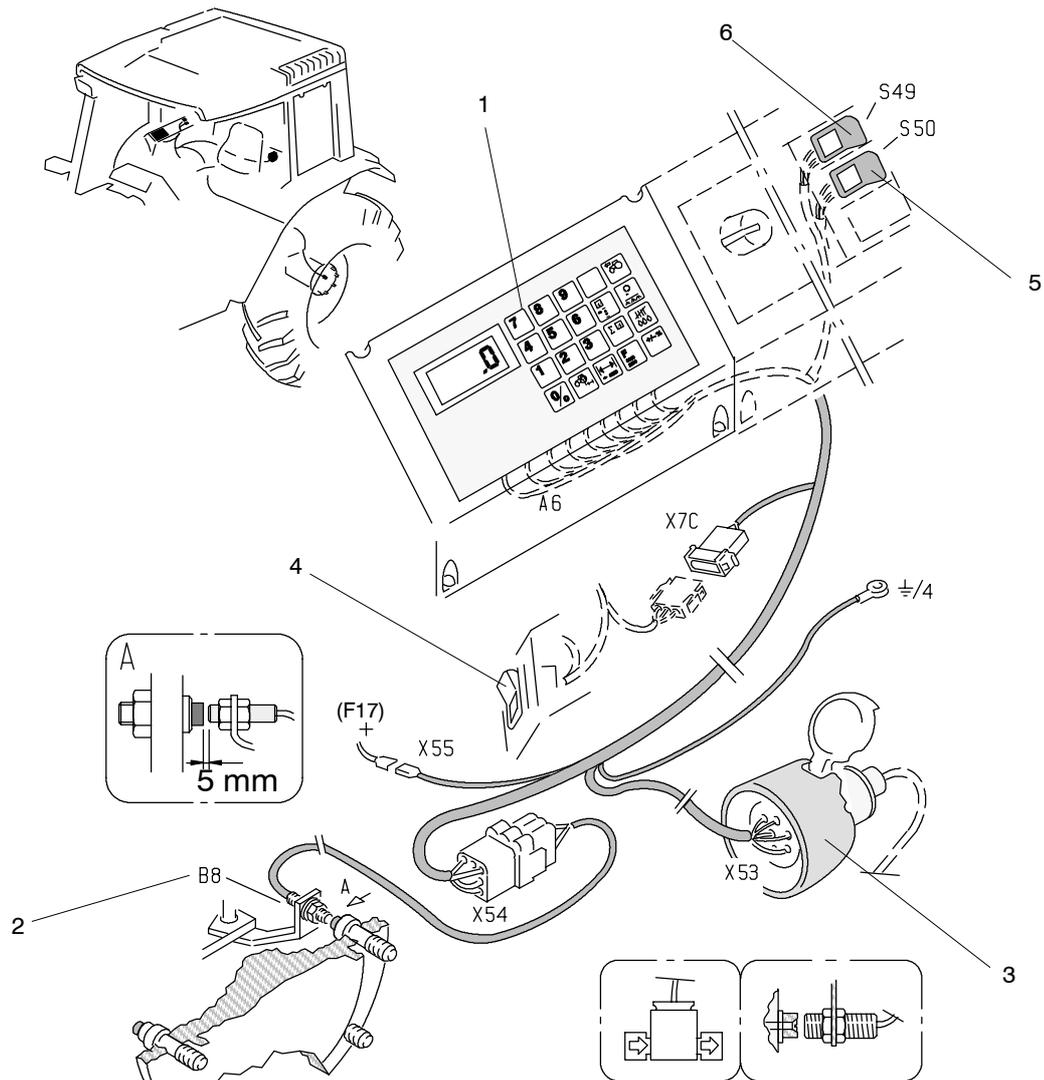


Fig. 2. Agrodata monitor and sensors

1. Agrodata unit
2. Magnetic sensor for detecting wheel rotation speed
3. Socket for connecting sensors on implement
4. Lift/lower switch for power lift (stops the area meter when the implement is raised)
5. Selector switch; selects between tractor and implement wheel sensor for measurement of speed and area
6. Selector switch; selects between measurement of engine revs and measurement of implement functions (Eg. piece counter or flow rate)

Equipment

The Agrodata unit consists of a monitor in the cab, wheel sensor (engine RPM sensor not fitted), socket for connecting sensors on implement, leads connecting monitor and sensors and supply voltage leads.

The Agrodata unit fuse (F17, 10 A) is placed in the fuse box. The connectors are placed in the lever console in the cab. The connectors are accessible by removing the side panel of the console.

On the rear cover of the Agrodata unit there are terminals for sensor leads and supply voltage leads. The terminals are numbered from one to nine. The leads have corresponding numbers (to terminal 9 is connected lead no 19)

- X55=supply voltage connector
 X54=connector for sensors and implement socket
 B8=wheel sensor
 X7C=connector to lift/lower switch of power lift
 X53=socket for sensors on implement
 S49=selector switch
 S50=selector switch
 A6=Agrodata unit

The Agrodata system uses magnetic sensors. When the magnet and the sensor are in close proximity the sensor is activated and an electrical signal is transmitted to the monitor display.

The wheel sensor is fitted on the LH rear wheel mounting flange. Several magnets can be fitted on the wheel, evenly spaced for more accurate measurement of driving speed. Correct speed measurement is not possible if too few magnets are used with a big wheel.

Agrodata is connected to the hydraulic power lift. When implement is raised with the lift/lower switch, the area meter is stopped.

Sensors on implement (Eg. flow meter, piece counter etc) can be connected to the Agrodata via the socket at the rear of the tractor (implement sensors must be ordered separately from the factory).

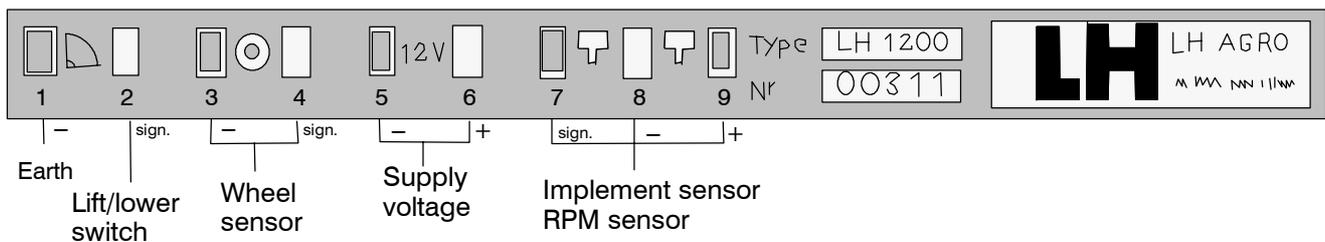
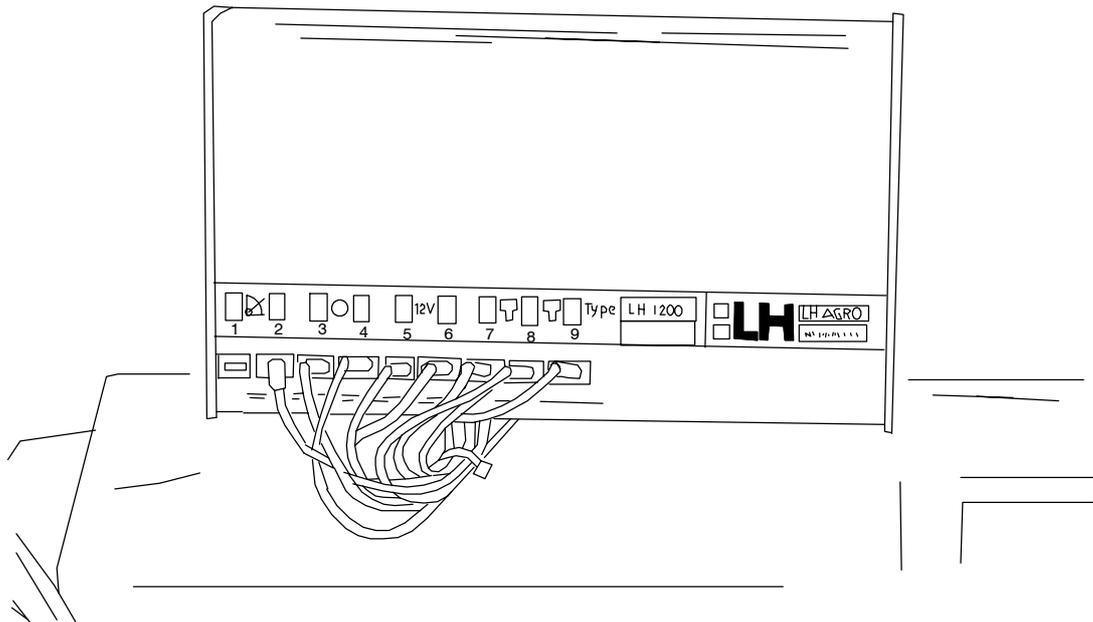


Figure 3. Cable terminal panel (monitor unit rear panel)

Terminal 1; earth (no lead)
 Terminal 2; Signal from lift/lower switch of power lift
 Terminal 3 and 4; Wheel sensor leads
 Terminal 5 and 6; Supply leads (battery voltage)
 Terminals 7, 8 and 9; Leads for sensors on implement (or engine RPM sensor leads)

Note! Sensors on implement can be e.g. flow meter, piece counter, RPM sensor etc.

1. Trouble shooting

A. Checking display operation

The Agrodata unit receives its power supply from connector X55 (in the lever console).

- Turn on the ignition. Check that:
 - the monitor display is lit
 - the display flashes the word "AGRO".
- If this does not happen:
 - check fuse F17 (10 A) in the fuse box
 - disconnect the monitor (not the leads) and make sure that the unit is receiving power (measure voltage between terminals 5 and 6).

3. If the power supply is in order, but the monitor fails to operate, the defect is in the unit itself. In this case the monitor must be replaced (the condition of the other leads and sensors is irrelevant if the monitor is defective).

4. If the monitor responds to commands (e.g. working width, wheel circumference), it is in working order.

5. If the monitor displays or flashes the word "FEJL", this indicates that the supply voltage to the unit is not adequate (12 V). Check the condition of the battery and the battery connections.

B. Checking the sensors and signal from lift/lower switch

1. Turn on the ignition and:

– input the working width by pressing the  and followed by 8888.

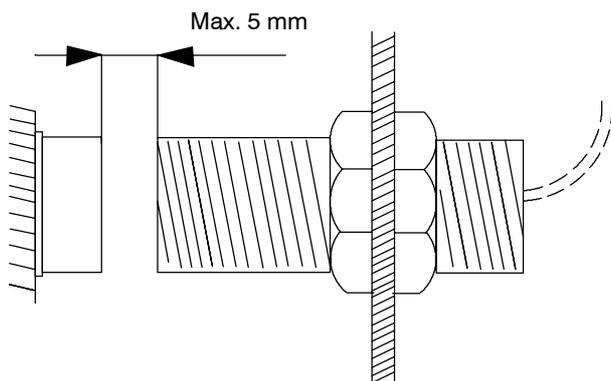
– press the time function key . Following this the display should be clear (this indicates that the unit is in order).

– set switches 5 and 6 for the unit to measure tractor operations (front side pressed)

2. Now the unit will display the following letters:

– "h" (only flashes), when the wheel sensor is activated
 – "r" (is lit), when the lift/lower switch is in the lifting position
 – "F" (is lit), when the flow meter blade wheel is revolving (rocker switches in the implement position) or if the RPM sensor is activated.

3. If the letter "h" does not flash, check that the wheel sensor and magnets are properly located.



4. The distance between the magnet and sensor is max. 5 mm (magnet must be fitted so that yellow dot points towards the sensor)

5. If the sensors and magnets are correctly fitted then:

– disconnect the monitor (not the leads)
 – switch on the ignition
 – measure the voltage between terminal 1 (–) and the following:
 – terminal 9 (+), supply voltage (about battery voltage)
 – terminal 4 (+), wheel sensor (voltage **0 V** when sensor is activated, otherwise the voltage should be **11–13,5 V**)

6. Wheel sensor resistance (is measured between cable shoes 3 and 4) must be about **33 ohms** when the sensor is activated, otherwise **10 kilo-ohms** or greater.

7. Check the earth connection by measuring the voltage between terminals 8 (–) and 6 (+); this should equal battery voltage.

8. Set the lift/lower switch to the lifting position and measure the voltage between terminals 1 (–) and 2 (+); this voltage should be close to zero.

9. Press the lift/lower switch to the lowering position. Now the voltage should be **11–13,5 V**.

10. The defects may be either in the sensors or in the leads. or the connectors have poor contacts

11. The sensors on the implement are checked in the same manner. When this is being done, the rocker switches (5 and 6) must be in implement position (the rear side pressed)

C. Connecting the leads from the implement sensor to the plug poles

Flow meter leads

Blue	to pole 5	(–)
Black	to pole 6	(+)
Brown	to pole 2	(signal)

Piece counter leads

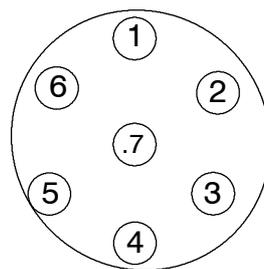
Brown	to pole 5	(–)
Blue	to pole 6	(+)
Black	to pole 2	(signal)

Wheel sensor leads

Blue	to pole 3	(signal)
Brown	to pole 1	(–)

Sensor for detecting movement of part of implement

Blue	to pole 7	(signal)
Brown	to pole 5	(–)



The numbering of poles can be found in the plug by the corresponding pole

Note! Figure shows the plug from the lead side.

Note! The line from the Agrodata unit to the socket can be checked as follows:

– input working depth of 8888 and press the time key
 – shunt between the socket terminals no 5 (–) and 2 (signal) and the display should show "F" (flow meter, piece counter)
 – shunt between terminals no 1 (–) and 3 (signal). The display should show letter "h" (only flashes) (wheel sensor).
 – then shunt between terminals no 5 (–) and 7 (signal). The display should show letter "r".

Spare part numbers for sensors and plug

Wheel sensor/sensor for detecting movement of part of implement: 31703200 (2–pole sensor)

Piece counter/flow meter: 31703000 (3–pole sensor)

Plug: 31702900

C. Further information on Agrodata operation

– Any short–circuit device may be use as a sensor (Eg. mechanical relays)

– Only original magnets should be used. If the magnet is not strong enough malfunctions will occur.

– The full supply voltage should not be connected to the sensor, because this may cause damage to the sensors.

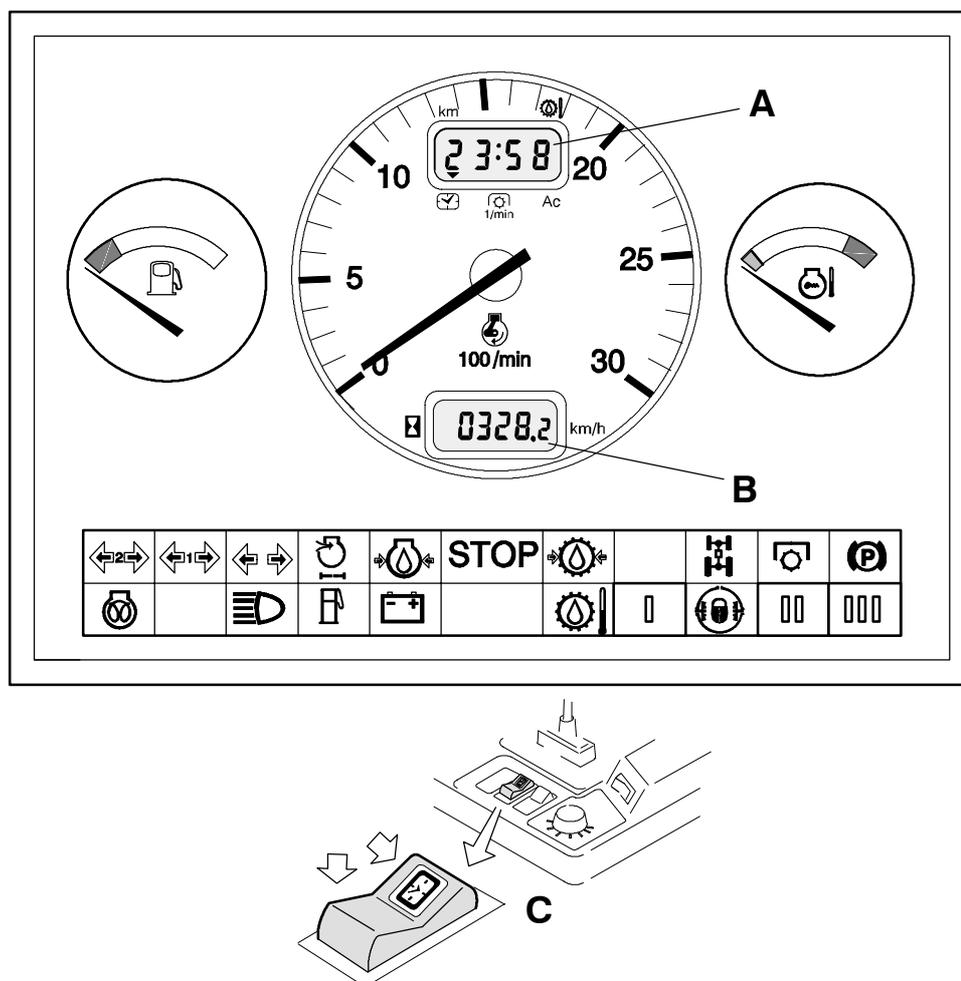
–The unit will not be damaged if the power supply wires are connected in reverse.

– The monitor bulbs cannot be changed in the present models. They are 10000 hour bulbs, and they not only illuminate the display but also dry out internal moisture.

33. Agrodata – instrument	15. 4. 1995	Model	Code	Page
	1. 8. 2000	6000–8950	331	1

Agrodata – instrument

Note! This is a different device as Agrodata performance monitor shown under code 330. Agrodata is a **factory-mounted** option. Standard equipment in HiTech tractors.



Agrodata has two digital number displays, which is fitted in place of the standard instrument.

Agrodata has a rev. counter, a temperature gauge and a fuel gauge as the standard instrument.

In addition, the lower digital display **B** shows:

1. Running hours, when the tractor is stationary (also when the current is switched off).
2. Driving speed, when the tractor is moving (from 0,3 km/h. There is letter L in front of the value, when the driving speed is slower than 7 km/h).

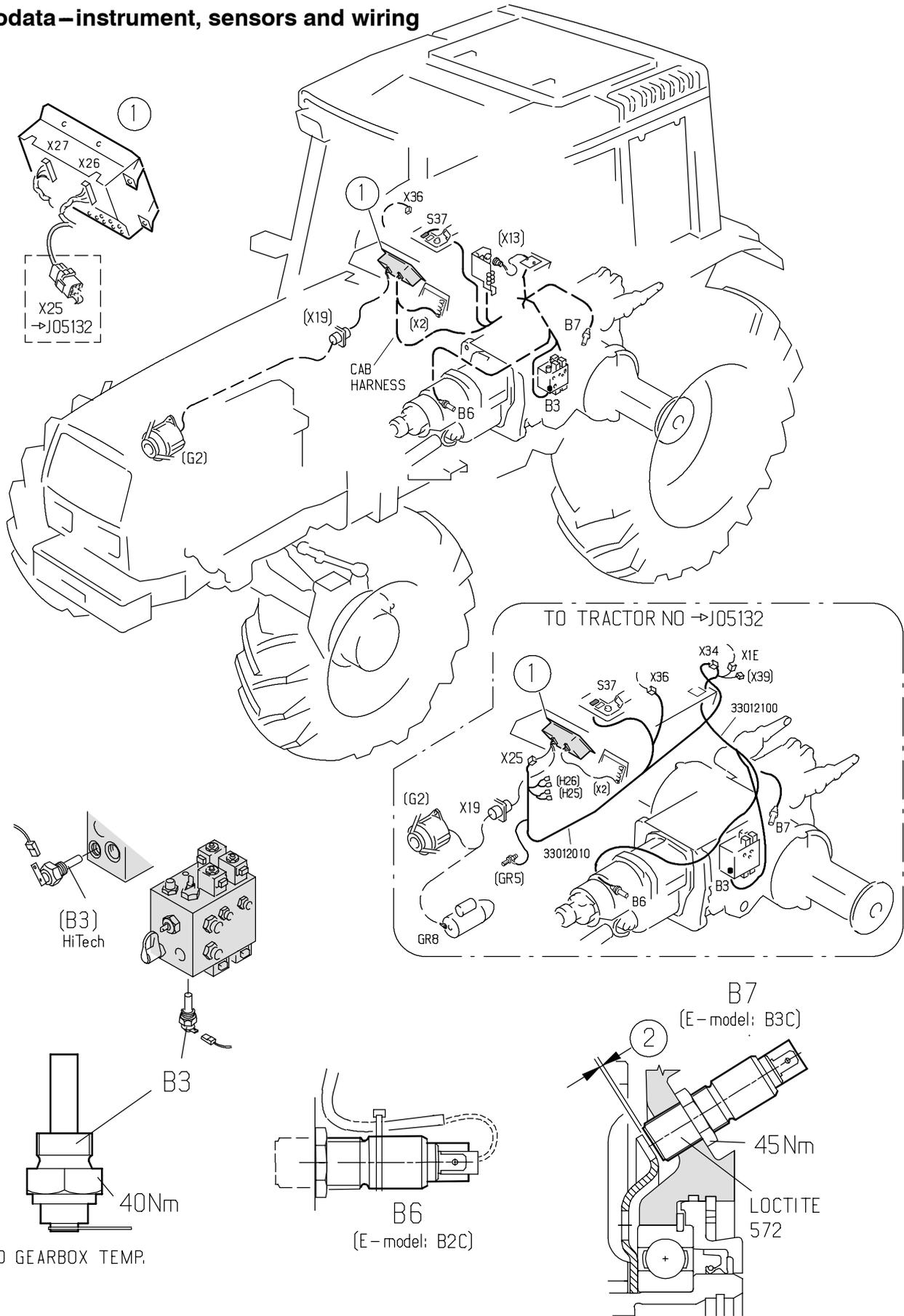
The upper digital display **A** shows:

1. Time (always when ignition is switched off)
2. PTO shaft rotation speed (r/min)
3. Position of lower links (0–99)
4. Distance travelled (up to 1000 km, after which is zeroed)
5. Gearbox temperature (from +40°C. LO is shown at lower temperatures).

The different functions of the upper display can be changed by pressing the rear edge (spring returned) of the switch **C** on the LH side of the position control potentiometer. The black arrow indicates which function is selected.

Tractors, which have Agrodata, have two rotation speed sensors. One on the RH side of the reverse shuttle housing (driving speed, distance travelled) and another at the rear of the tractor for measuring the PTO shaft rotation speed. The sensors are the same as on AC IV system or in HiTech tractors.

Agrodata – instrument, sensors and wiring



33. Agrodata – instrument	15. 4. 1995	Model	Code	Page
	1. 8. 2000	6000 – 8950	331	3

Agrodata – instrument, sensors and wiring

(See picture on previous page)

1. Agrodata – instrument P5 (upper display)
 1. Agrodata – instrument P4 (lower display)
 2. Clearance 1/4 of a turn
- B3: Gearbox temperature sensor
 B6: Gearbox speed sensor
 B7: PTO shaft speed sensor
 S37: Selector switch for Agrodata upper display
 G2: Alternator (engine speed and running hours)

Position of connectors:

- X2: In fuse box (not illustrated)
 X3: In fuse box (not illustrated)
 X13: on fastening plate in lever console (J05133–)
 X19: Plug on the cab front wall on the RH side
 X25: Connector for Agrodata under the instrument panel (–J05132)
 X26: Connector on the rear side of the instrument (white)
 X27: Connector on the rear side of the instrument (blue)
 X34: Sensor connector in the rear part of the lever console (–J05132)
 X1E: ACD power lift sensors (e.g. radar) on fastening plate in lever console (J05133–).
 GR1: Earth point in the lever console rear part
 GR5: Earth point on the cab front wall.
 GR8: Earth point on the starter motor

Current from the ignition switch (12 V) comes to the Agrodata – unit as on the standard instrument via fuse F18. Agrodata – unit is supplied with permanent current (12 V) for the clock via fuse F2. If the unit does not work at all, check the fuses. The supply voltage wire to the clock is via plug X19/18 and via connector X2/5. The voltage can be measured between pins 23 (earth) and 24 (supply) of connector X26. Voltage via ignition switch can be measured on pin 26 of connector X27.

If the Agrodata – unit has an internal fault (e.g. in electronics), it cannot be repaired separately, but the damaged instrument section must be replaced as a complete unit.

The rev counter and fuel and temperature gauges can be replaced separately and also the smaller circuit card (or bigger basis circuit card) which includes the digital displays. Warning light bulbs and instrument light bulbs can be changed separately without opening the instrument unit.

Switch S37 earths pin X26/12, when the rear edge is depressed. When depressing the front edge, pin X26/13 gets earthed.

Zeroing the travelling distance

- select travelling distance into the display by pressing the switch rear edge.
- press the switch front edge until the display is zeroed.

Time setting

- select time into the display by pressing the switch rear edge.
- press the switch front edge, until the hours are flashing.
- set the hours by pressing the switch rear edge
- press the switch front edge, until the minutes are flashing.
- set the minutes by pressing the switch rear edge
- when the time has been set, press the front edge, until the correct time appears into the display (flashing stops).

Calibrating the instrument for different tyres, see page 331/5.

1. Sensors

A. Gearbox speed sensor B6

Note! The sensor resistance should be **1,0–1,10 kΩ**. The resistance can be measured on the pins shown below. If the resistance is infinite, it should be measured on the sensor pins in order to clear up possible breaks:

Pins:

Sensor pins

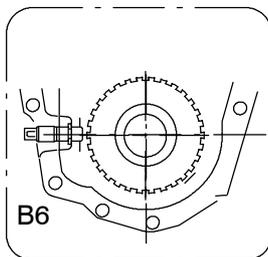
X34: pins 1 and 2 (–J05132)

X25: pins 1 and 2 (–J05132)

X26: pins 9 and 10 (white connector)

X13: pins 6 and 15 (J05133–)

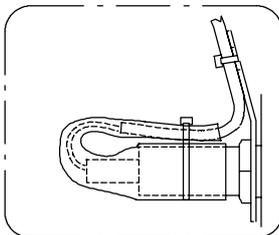
X1E: pins 1 and 2 (if in use)



Changing the sensor:

Note! Before the gearbox speed sensor can be removed, the tractor frame must be split between gearbox–fuel tank.

- Remove the faulty sensor and clean the threads where the sensor fits.
- Apply Loctite 572 onto the sensor threads and turn it against the gear wheel and then unscrew it $\frac{1}{4}$ of a turn.
- Lock the sensor with the nut and connect wires
- Carry out a test drive and ensure that Agrodata–unit functions.
- Fit the plastic tube onto the sensor wire. Connect the wires to the sensor and protect with grease UC1913 (vaseline spray HHS 2000 (Wyrth)). Move the tube onto the sensor and warm it until it is pressed tightly round the sensor.

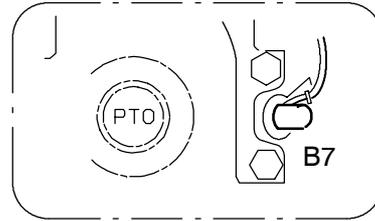


- Fold the wire on the sensor and fasten it with a plastic cable tie.

N.B.: In 50 km/h transmission the sensor locking nut must be removed and the sensor is locked with Loctite 572. This must be done since in this transmission, the measuring gear wheel is smaller and the sensor thread length is insufficient to fit the lock nut.

Note! If the driving speed display or travelling distance is clearly faulty, the fault can lie also in the wrong calibration of the instrument, see page 331/5.

B. PTO speed sensor B7



Engage the PTO and measure the PTO shaft rotation speed with a separate RPM meter and compare the reading with the display on the Agrodata–unit. Rudely said the display can be checked so that you adjust the engine speed until the rev. counter indicator is at 540 mark, at which time the display should show the same value (± 100 rpm).

If there is no PTO speed display or it is incorrect, check the sensor and its wiring (ensure that the emergency plug is placed in the rear socket):

Note! The sensor resistance should be **1,0–1,10 kΩ**. The resistance can be measured on the pins shown below. If the resistance is infinite, it should be measured on the sensor pins in order to clear up possible breaks in the loom:

Pins:

Sensor pins

X34: pins 5 and 6 (–J05132)

X25: pins 5 and 6 (–J05132)

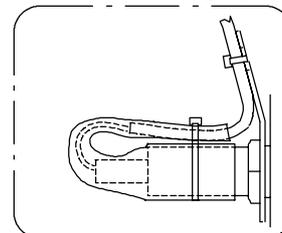
X26: pins 21 and 22 (white connector)

X13: pins 19 and 27 (J05133–)

X1E: pins 5 and 6 (if in use)

Changing the sensor:

- Remove the faulty sensor and clean the threads where the sensor fits.
- Find with a dial gauge the shortest distance between the sensor and the impulse disc through the sensor hole.
- Apply Loctite 572 onto the threads and screw the sensor by hand until the sensor touches the impulse disc (do not screw too hard because the disc can spring). Unscrew the sensor then $\frac{1}{4}$ of a turn.
- Lock the sensor with a locking nut and connect wires
- Ensure that the display shows the PTO speed.
- Fit a plastic tube onto the sensor leads. Connect the wires to the sensor and protect with grease UC1913 (vaseline spray HHS 2000 (Wyrth)). Move the tube onto the sensor and warm it until it is pressed tightly round the sensor.



- Fold the wire on the sensor and fasten it with a plastic cable tie.

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