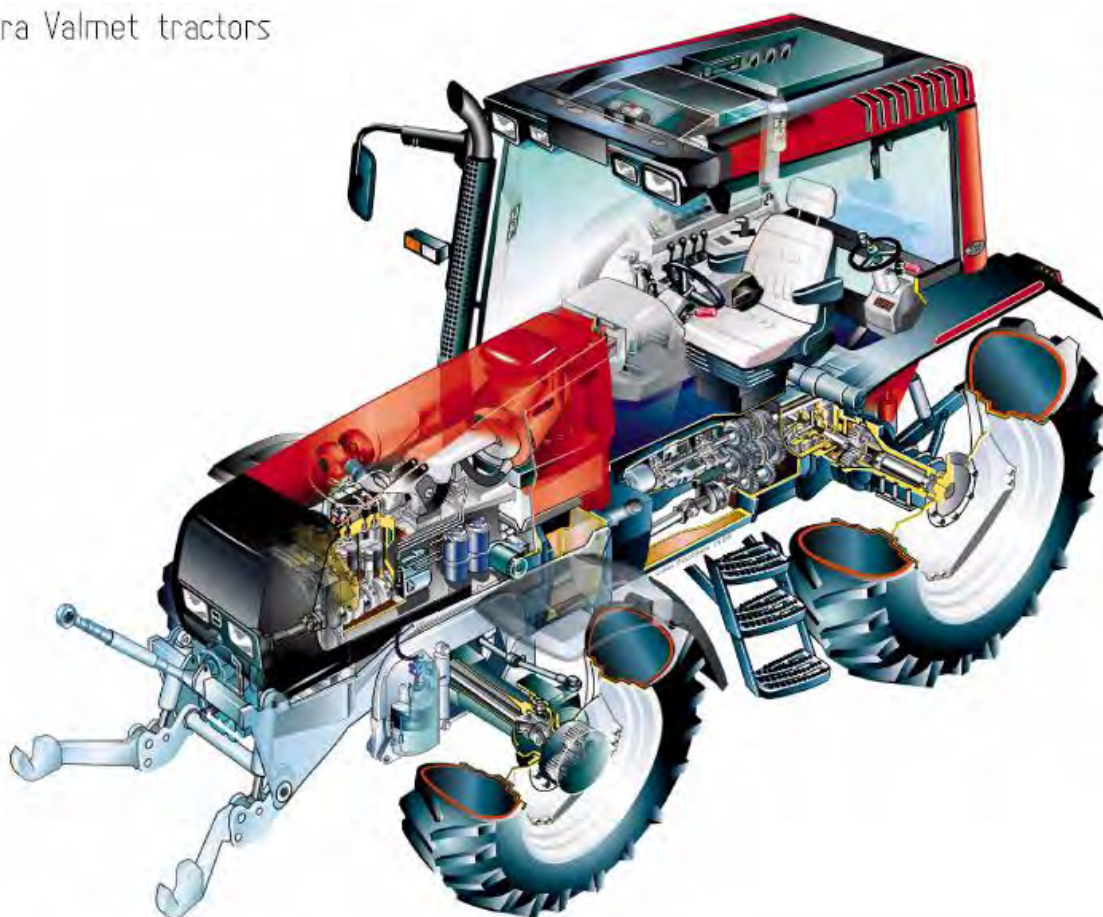


# VALTRA – VALMET MEGA MEZZO HI-TEC

Valtra Valmet tractors



## WORKSHOP MANUAL

# VALTRA

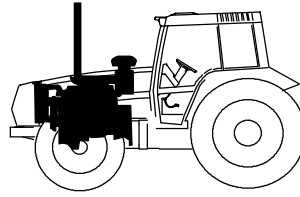
## Service Manual Tractors

Groups 10–100

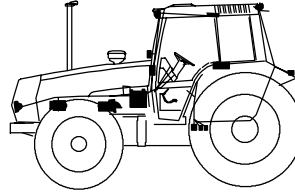
Valtra Inc.  
44200 Suolahti, Finland

Virtakäyttöön Käyttöohje  
Stromläsraie Air 1000 fram  
relä  
K3 20122000 K4

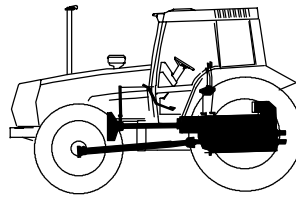
**10** General



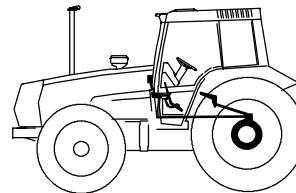
**20** Engine



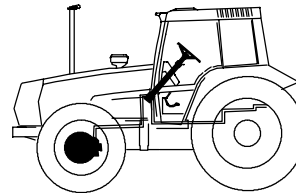
**30** Electrical system



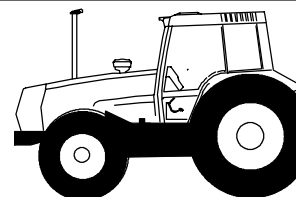
**40** Power transmission



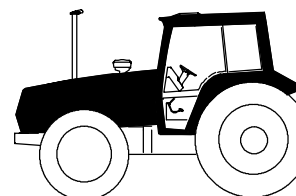
**50** Brake system



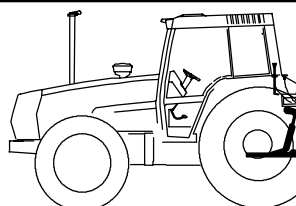
**60** Steering system and Front axle



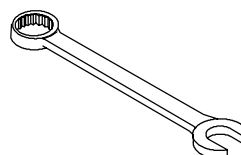
**70** Frame and Wheels



**80** Cab and Shields



**90** Hydraulics



**100** Tools

<b>35. Autocontrol IV</b>	<del>1. 1. 1994</del>	Model <b>6600E</b> <b>8100E–8750E</b>	Code <b>350</b>	Page <b>1</b>
	1. 1. 1995			

Valmet Autocontrol IV Tractor Control System is standard equipment on tractors 6600E – 8750E from the beginning of the year 1994 (662343–). Autocontrol IV replaces Autocontrol III which is shown in section 34. Autocontrol IV is in many points the same as Autocontrol III. The main difference is that Autocontrol IV controls the 3–step Delta Powershift gear (Autocontrol III controlled the 2–step quick–shift gear).

**4WD control AC IV**

Manual or automatic control with aid of the 3–position rocking switch.  
 Rear edge depressed: 4WD disengaged except when latched together brake pedals are depressed.  
 Middle position: 4WD is engaged manually  
 Front edge depressed: AC IV controls automatically the 4WD as follows:

4WD engages	4WD disengages
<ul style="list-style-type: none"> <li>– when the rotation speed difference of the front and rear axle exceeds 9%</li> <li>– when braking with latched together brake pedals (also in manual position).</li> <li>– when the engine is stopped</li> </ul>	<ul style="list-style-type: none"> <li>– when the engine is started (in automatic (A) position)</li> <li>– when the wheel slip is less than 2% for more than 6 seconds.</li> </ul>

**Differential lock control AC IV**

Manual or automatic control with aid of the 3–position rocking switch.  
 Rear edge depressed: differential lock is disengaged.  
 Middle position: lock is engaged manually but disengages when brake pedal/pedals are depressed  
 Front edge depressed: AC IV controls automatically the lock as follows:

Diff. lock engages	Diff. lock disengages
<ul style="list-style-type: none"> <li>– when one rear wheel rotates 20% faster than the other and the driving speed is less than 12 km/h</li> </ul>	<ul style="list-style-type: none"> <li>– when the rear wheel slip is less than 10 % during a period of one second (speed &lt; 12 km/h).</li> <li>– when the brake pedal/pedals are depressed (also in the manual position)</li> <li>– when the clutch pedal is depressed</li> <li>– when the steering angle is more than <math>\pm 15^\circ</math></li> <li>– when the tractor driving speed is over 12 km/h</li> <li>– when the tractor is stopped</li> </ul>

**Delta Powershift control AC IV**

Manual or automatic control with aid of the 2–position rocking switch.  
 Rear edge depressed: the gear is controlled with the push buttons in the gear lever knob  
 Front edge depressed: AC IV controls the gear automatically as follows:

Change down	Change up
<ul style="list-style-type: none"> <li>– changes automatically down when the loading increases</li> <li>– changes to the lowest ratio when the tractor speed is below 1,5 km/h and the clutch pedal is depressed.</li> </ul>	<p>AC IV selects automatically the best possible higher ratio</p> <ul style="list-style-type: none"> <li>– highest ratio reduces noise and fuel consumption.</li> </ul>

**Note!** In the automatic position the gear ratio can temporarily be changed with the push buttons. There is a buzzer in the instrument panel which alarms when the engine is stopped and the parking brake is not applied.

**PTO control AC IV**  
(Always automatic functions on)

PTO engages	PTO disengages
<p>1. PTO is engaged manually with the control lever</p> <ul style="list-style-type: none"> <li>– electric engagement with the switch in the lever knob</li> </ul>	<ul style="list-style-type: none"> <li>– if the PTO has been engaged before starting the engine, the PTO shaft does not start to rotate. Warning light flashes. PTO engages after the control lever is moved to neutral and back to the engaged position.</li> <li>– If the PTO clutch slips more than 4 %. Warning light flashes. PTO is engaged again, when current is switched off and on.</li> <li>– when the safety switch is opened over 3 seconds. Warning light flashes. PTO engages when the engine is stopped and current is switched off and on and the control lever is moved to the neutral position and back to the engaged position. <b>Note!</b> If the safety plug is replaced into the socket within 2 seconds the PTO begins to rotate. This must be observed when using a remote emergency switch connected to the plug.</li> </ul>

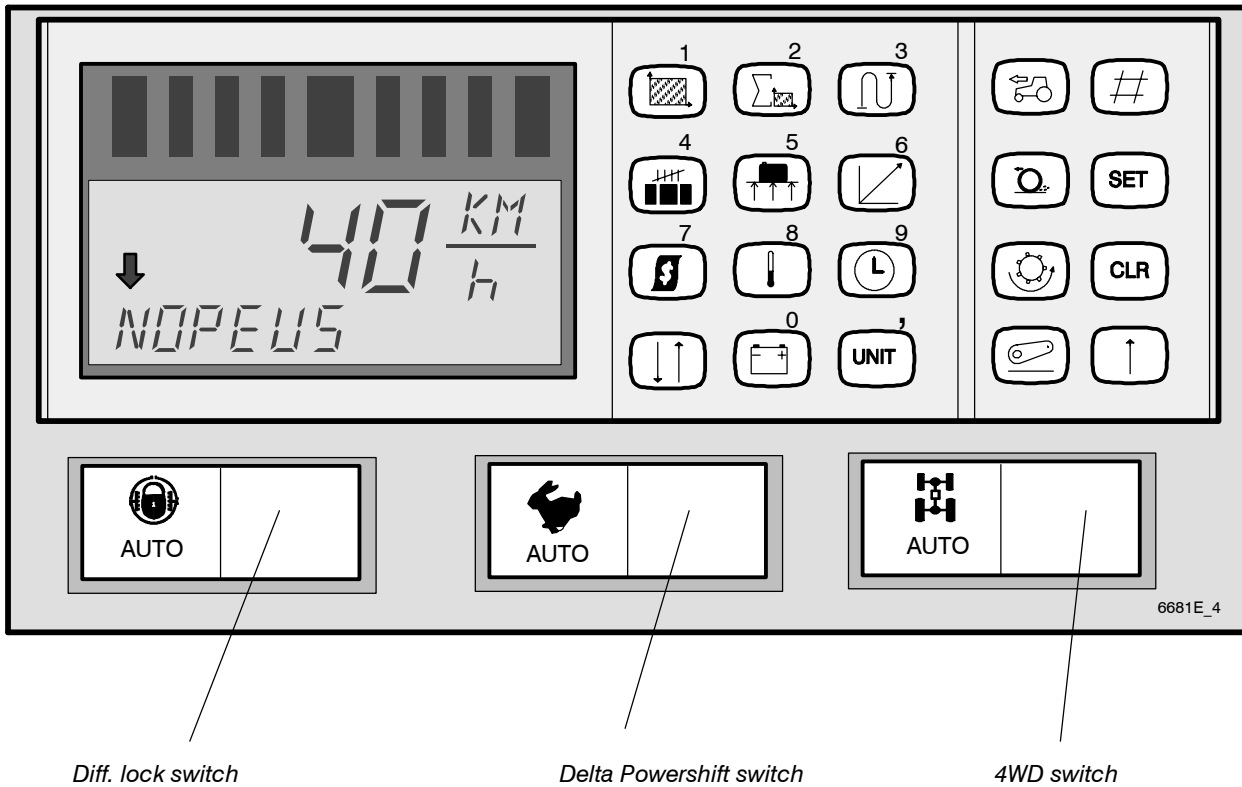
**Slip control AC IV**

<p><b>Slip control is switched on with a switch that has 6 different positions</b>  <b>0 = switched off</b>  <b>1 – 5 = switched on</b></p>	<p><b>Slip percent is adjustable</b></p>	
<p>Draft control selector in position P.</p>	<p>Draft control selector in position 1–5</p>	<ul style="list-style-type: none"> <li>– desired slip limit can be programmed</li> </ul>
<ul style="list-style-type: none"> <li>– buzzer signal is heard when the set slip percent is exceeded.</li> </ul>	<ul style="list-style-type: none"> <li>– if the set slip percent is exceeded, the lift order is sent to the power lift.</li> <li>– lift movement is determined by the position of the slip switch: 1-small lift 5–big lift</li> </ul>	

**Cold starting AC IV**  
(Ignition switch has also a normal glowing position)

Notify readiness for start	Automatic afterglowing if needed
<ul style="list-style-type: none"> <li>– indicator lamp is lit=glowing</li> <li>– indicator lamp flashes=ready for starting</li> </ul> <p>Programmed according to the engine coolant temperature.</p>	<ul style="list-style-type: none"> <li>– indicator lamp is lit continuously=afterglowing</li> <li>– glowing time has been programmed according to the engine coolant temperature.</li> </ul>

### Autocontrol IV display unit and function keys



Diff. lock switch

Delta Powershift switch

4WD switch

**Picture 1.** Display unit and function keys

**Diff. lock switch:**

Rear edge depressed: differential lock is engaged.

Middle position: lock is engaged manually but disengages when brake pedal/pedals are depressed

Front edge depressed: AC IV automatically controls the lock

**Delta Powershift switch:**

Rear edge depressed: the gear is controlled with the push buttons in the gear lever knob.

Front edge depressed: AC IV controls the gear automatically.

**4WD switch:**

Rear edge depressed: 4WD disengaged except when latched together brake pedals are depressed

Middle position: 4WD is engaged manually

Front edge depressed: AC IV automatically controls the 4WD

The display unit and keys are the same as on Autocontrol III, see pages 340/6 and 7. The key functions differ a little when calibrating the flow meter.

The switches below the display unit differ from the switches on Autocontrol III, see page 340/6 (AC III) and page 350/1 (AC IV).

**Calibrating mode for the hidden functions**, see AC III on page 340/6.

# 35. Autocontrol IV

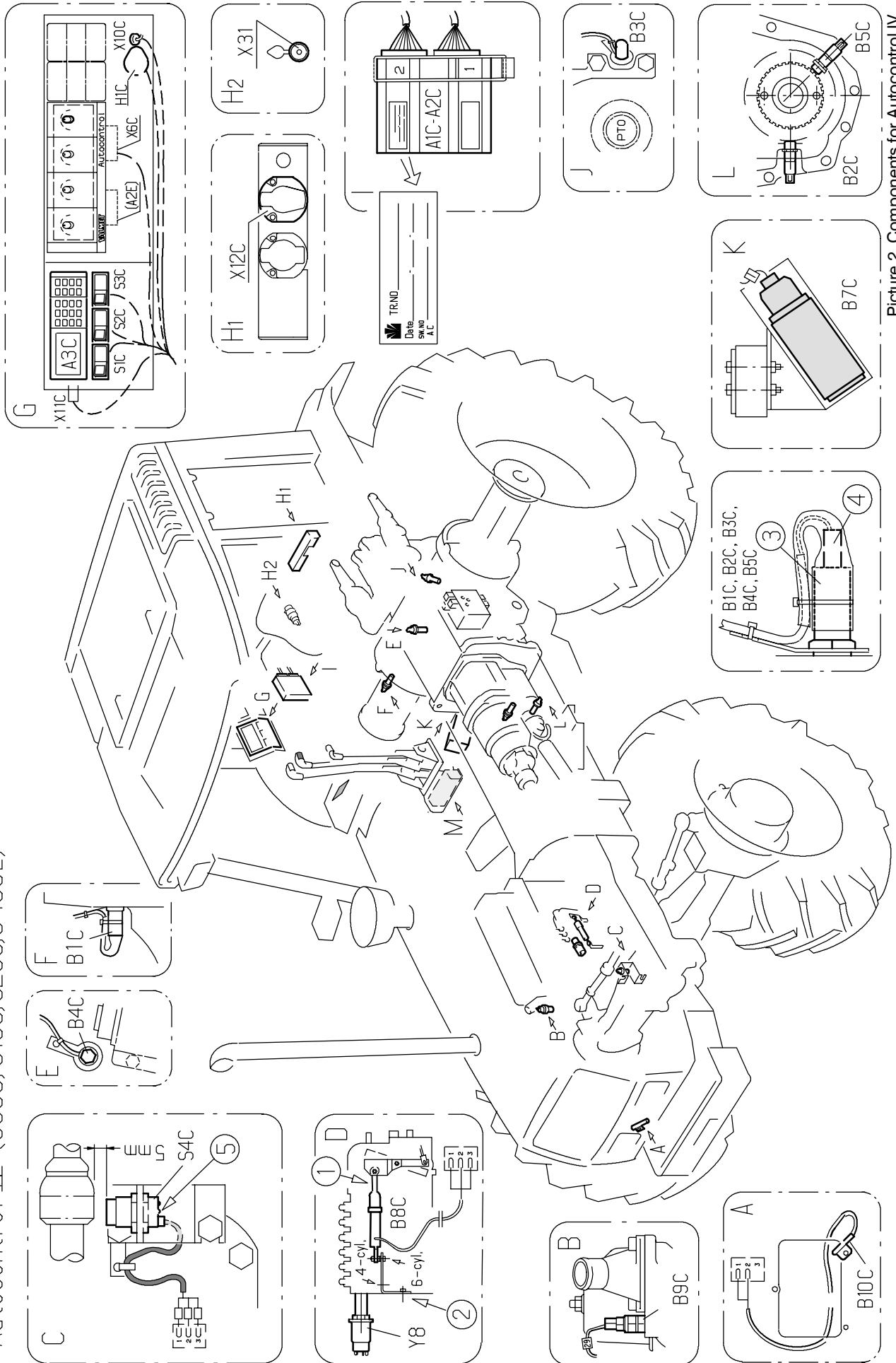
1. 1. 1994

Model  
**6600E**  
**8100E-8750E**

Code  
**350**

Page  
**4**

Autocontrol IV (6600, 8100, 8200, 8400E)



Picture 2. Components for Autocontrol IV

<b>35. Autocontrol IV</b>	<del>1. 1. 1994</del>	Model	Code	Page
	15. 5. 1996	6600E 8100E–8750E	350	5

## Components for AC IV system

See picture 2 on previous page.

### A. Outdoor temperature sensor

Sensor B10C is fitted under the fixing screw for the headlight. AC IV display shows the outdoor temperature.

### B. Sensor for engine coolant temperature

Sensor (B9C) controls the cold starting automatics. An indicator light on the instrument panel shows when the engine can be started. The system controls automatically the afterglowing in cold conditions. AC IV display shows also the engine coolant temperature.

### C. Sensor for front wheel steering angle

Sensor (S4C) notifies the AC IV system when the front wheel steering angle is over  $\pm 15^\circ$ . Then the automatics disengage the differential lock. The lock is re-engaged automatically when the front wheels are turned less than  $\pm 15^\circ$ .

5. Sensor signal lights.

### D. Potentiometer on fuel injection pump

Potentiometer (B8C) notifies the system the position of the governor control lever on the fuel injection pump. AC IV compares the governor control lever position and the engine revs. Eg. the system changes automatically to the lower gear when the engine revs drop during a hard load (and vice versa)

1. Universal grease.
2. Loctite 242.

E–models have a starting solenoid Y8 in the front face of the fuel injection pump, see page 350/7.

### E. Sensor for engine revs

Sensor (B4C) is fitted on the gearbox under the cab. The sensor measures the engine rotation speed from the gear for the hydraulic pump drive mechanism. The display shows also the engine revs. The sensor controls the engagement of the Delta Powershift and indicates if the PTO clutch is slipping.

### F. Sensor for rear axle rotation speed

Sensor (B1C) measures the rotation speed of the RH side rear axle from the impulse disc fitted on the final drive planetary gear. Engages the differential lock when the rotation speed difference between the rear axles exceeds 20 %.

## G. Display unit

Display unit A3C and the function keys are the same as on AC III. Below the display unit there are switches for selecting between the manual or automatic control of the tractor transmission.

### H<sub>1</sub> and H<sub>2</sub>. Sockets at the rear of the tractor

Socket X12C for connecting implement sensors to the AC IV system.  
PTO emergency stop socket X31 (terminator)

### I. Central processing unit ECS (Electrical Control System)

The central unit ECS (connectors A1C, A2C) is fitted in the lever console in the cab. On the ECS is fitted a sticker with the tractor manufacturing number etc.

### J. Sensor for PTO revs

Sensor (B3C) measures the rotation speed of the PTO shaft from the impulse disc fitted on the shaft. Display shows the PTO rotation speed.

**Note!** With effect from ser. no. F17107 the PTO control system has been modified. In this new system the PTO has a relay control (compare AC II and AC 2.1).

### K. Radar

Radar (B7C) notifies the ECS the actual tractor travelling speed. The radar is used e.g. for detecting the wheel slip. The radar has been connected to the hydraulic power lift so that when the set slip percent is exceeded the lift order is sent to the power lift. The radar controls also the engagement of the front wheel drive and the differential lock.

**Radar** – You are not allowed to go under the tractor which has radar (slip control models) before the current switch has been turned off. – **dangerous for eyes.**

### L. Gearbox rotation speed sensor B2C and front axle speed sensor B5C

The reverse shuttle housing has been changed. That is why the above mentioned sensors are fitted in different positions as on Autocontrol III.

### M. Delta Powershift control unit A10

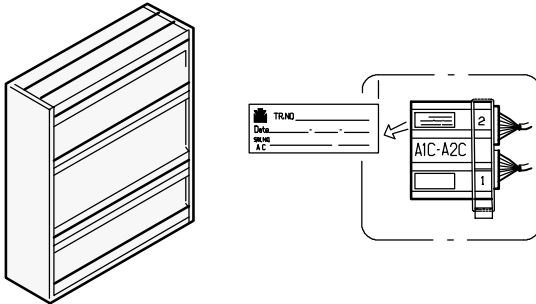
The control unit is the same on all Mezzo–tractors which have the Delta Powershift control with two push buttons in the gear lever knob (not rocking switch). Control unit A10, ind. light panel A9 and the buzzer B1 are shown on pages 311/3–6 (Autocontrol II).

**Important!** IN AC.2.1 system there are changes for DPS control, see code 312.

## Differences between Autocontrol III and IV

- The front wheel steering angle sensor is different to Autocontrol III.
- The gearbox speed sensor is fitted on the RH side of the reverse shuttle and it measures gearbox rotation speed from the gearwheel of the 4WD clutch drum (not an impulse disc as on AC III).
- The front axle speed sensor measures the rotation speed of the 4WD output shaft. There is an impulse plate fitted between the two output shaft nuts. On the side of the impulse plate there are holes for possible running recorder (tachograph) which must be ordered separately.

## Central processing unit ECS



The ECS is fitted in the same place as on AC III. The central unit of the AC IV is different as on AC III but its appearance and size is the same. The AC IV ECS has a sticker with marking "Autocontrol 4 Control Unit", order no 32884200. Other markings, see page 353/2.

### Parameter files:

Autocontrol IV parameter files are different compared with AC III, see page 343/2 (AC III) and 353/2 (AC IV). AC III parameter files must not be used. The parameter file is input into the ECS in the same way as on AC III (see under code 353) but the Service Program is different.

## Delta Powershift control

The greatest difference is the automatic control of the Delta powershift. AC IV has a 2-position rocker switch with which can be selected either manual or automatic control of the gear. In the manual mode the gear ratio is changed with the push buttons in the speed gear lever knob.

On AC IV the Delta Powershift control unit A10, indicator light panel A9 and buzzer B1 are the same as on Autocontrol II, see pages 311/3–6.

In the automatic mode, AC IV engages the best possible gear ratio according to the loading conditions. When changing the gear, ECS sends a current signal to the control unit A10 to the same pins as the push buttons in the manual mode. The control unit A10 then sends output signals to the gear solenoids and indicator lights for gear changing.

On AC III, the automatic gear change happened according to the max output or max torque. On AC IV there is only one automatic position and the gear change happens between these two possibilities and the rocking switch has only one automatic position.

## Slip control and the power lift

The slip control is the same as on AC III. The hydraulic power lift is the same as on AC III but the lift/lower switch has three positions from the beginning of the year 1994. The middle position stops the movement of the lower links.

## Display unit and switches

The function keys are the same as on AC III but the possible flow meter calibration has been changed a little. The functions of the switches below the display unit are different. The 4WD and diff. lock switches have been removed from the gear lever knobs.

## Counting functions (same as on AC II)

The counting functions are checked in the same way as on AC III, see page 341/7.

## Implement functions (same as on AC III)

The implement functions and the rear socket are the same as on AC III. Possible functional checking is carried out in the same way as on AC III, see page 352/9 (AC IV).

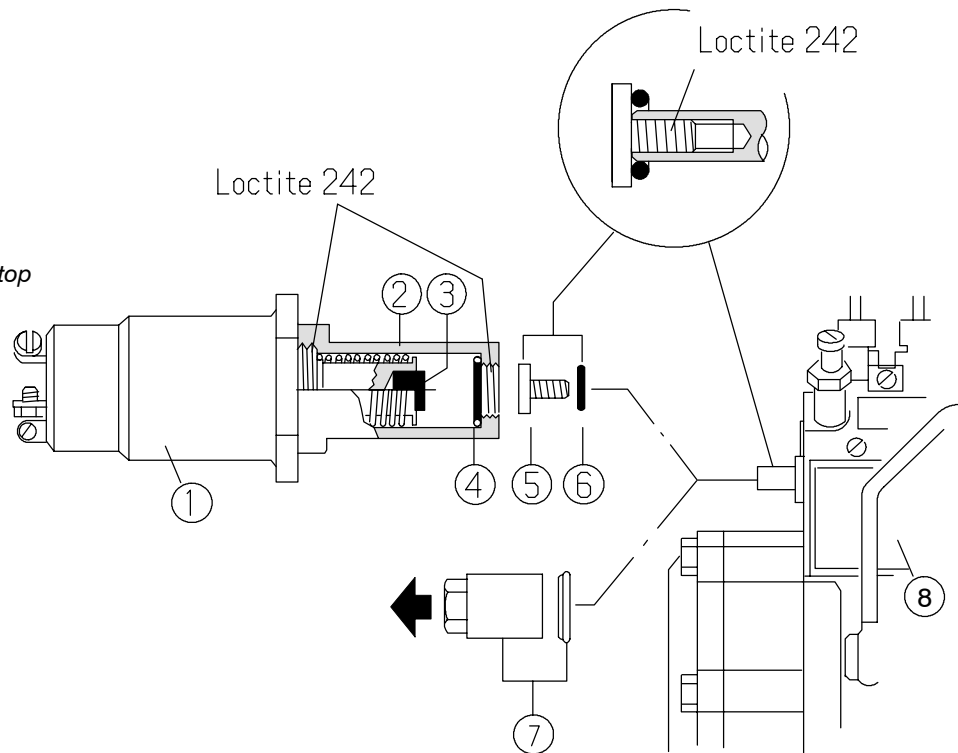


## Electric stop of the engine

E-models have not a stop control knob but the engine stops when the ignition switch is turned to the 0-position. The fuel injection pump is moved to the stop position by a solenoid spring when the current to the solenoid is cut-off.

**Picture 3.** Fitting of electrical stop

1. Solenoid
2. Threaded sleeve
3. Rubber
4. O-ring
5. Screw
6. O-ring
7. Removed standard parts
8. Fuel injection pump



When the ignition switch is in the ON-position, the solenoid is energised and the magnet keeps the pump in the running position.

The solenoid earth wire (white) has been fastened under the bolt of the injection pump potentiometer fixing plate. The solenoid supply wire (171/Black) has connector X32 and the wire goes via the socket X19 on the front wall of the cab. The electric stop requires a different ignition switch compared with the normal stop system. From date 9403 all Mezzo-tractors have an ignition switch no 325 53200 which can control the electric stop.

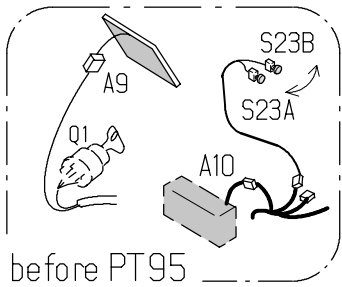
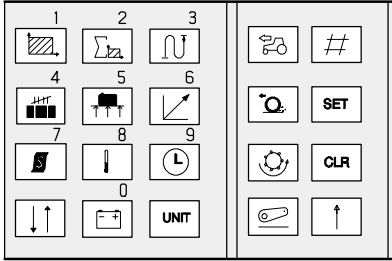
If the engine stops during driving, the solenoid magnet can be damaged or there can be poor wire contacts. When current is switched on to the solenoid, a click sound can be heard.

**Note!** On later E-Models, the automatic stop control is a standard equipment, see pages 312/1 and 312/4 and wiring diagrams on pages 350/12-17.

Connectors and wiring

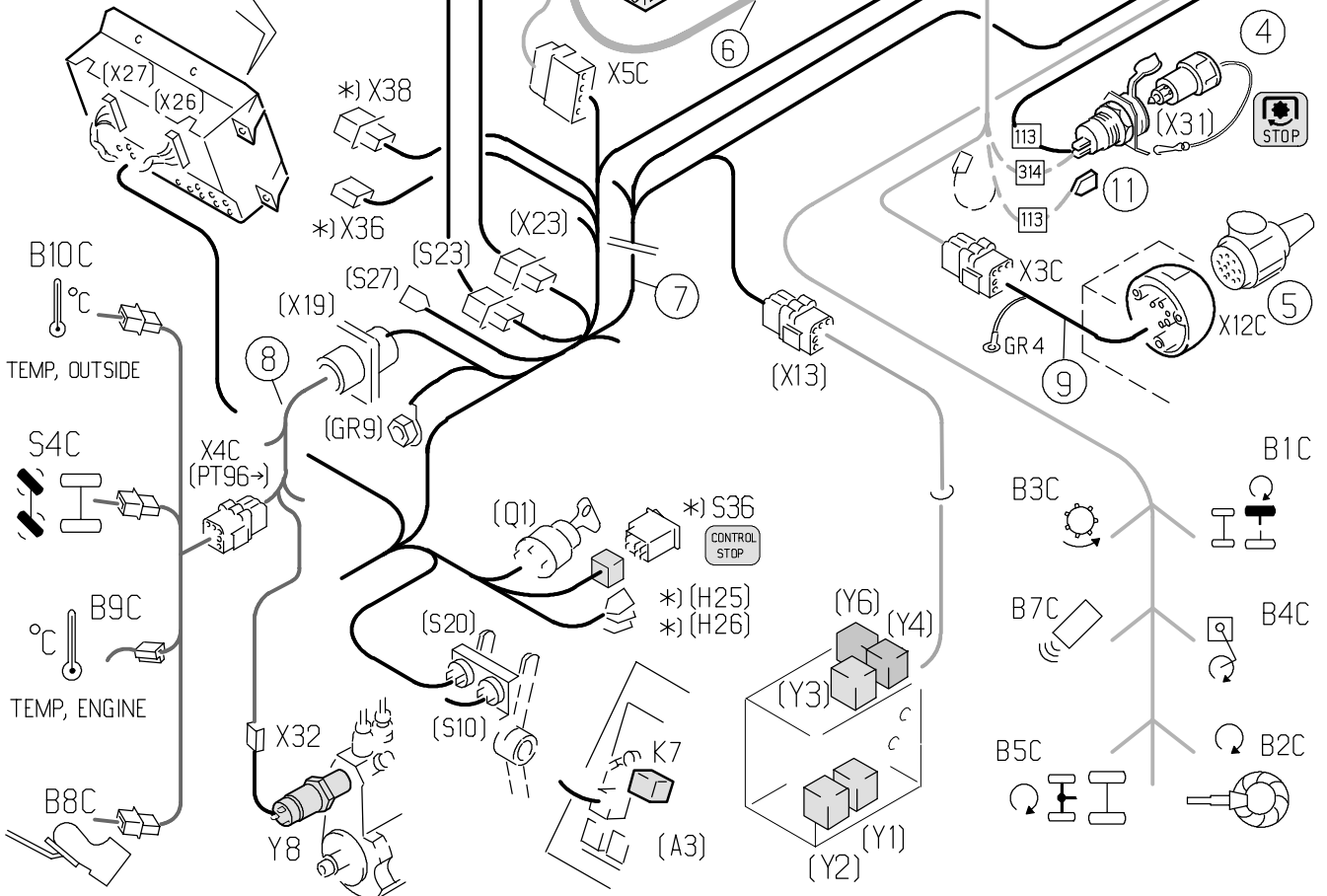
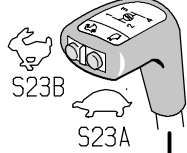
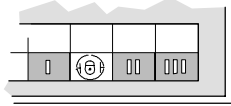
Autocontrol IV

(6600E, 8100E  
8200E, 8400E)



OPTIONAL EQUIPMENT

\*) PT95



Picture 4. Autocontrol IV, wiring and components

<del>1. 1. 1995</del>	Model <b>6600E</b>	Code <b>350</b>	Page <b>9</b>
15. 5. 1996	<b>8100E-8750E</b>		

## Wiring and connectors

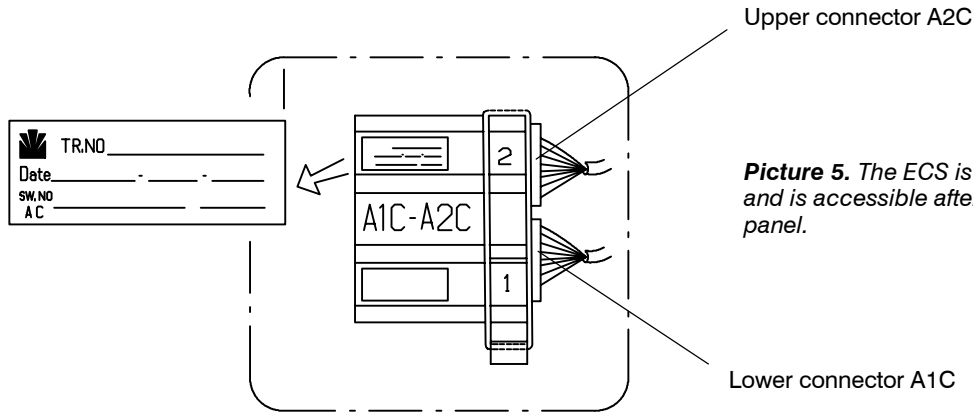
See picture 4 on previous page.

1. Display unit with connector X11C.
2. Central unit (ECS, in the lever console).
3. Slip control (+ buzzer)
4. PTO emergency stop socket
5. Implement socket
6. ECS wiring loom
7. Cab wiring loom
8. Engine wiring loom
9. Rear socket wiring loom
10. Power lift wiring loom

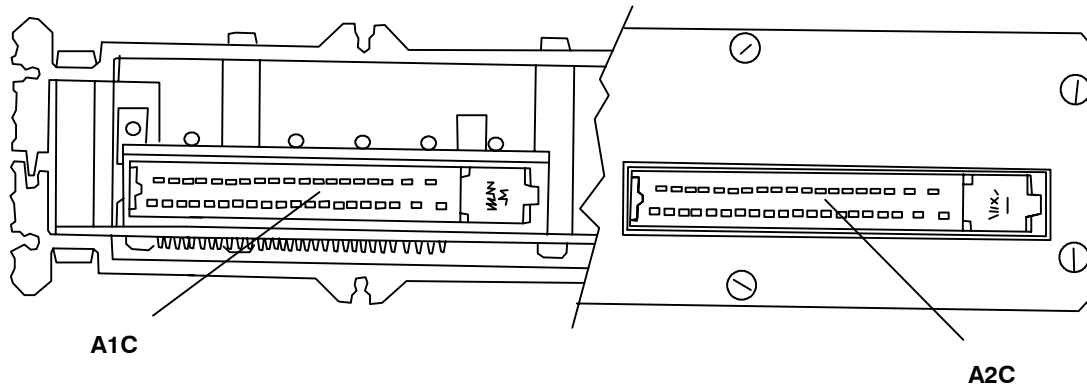
11. If the ECS is damaged, the PTO automatics can be overridden by disconnecting wire nr 314 (lilac) from the emergency stop socket (in the lever console) and then by connecting free wire nr 113 (yellow) in place of the lilac wire. The PTO can now be controlled manually with the switch S25 in the PTO lever knob. The emergency stop functions also with this connection but not the slip control.

**Note!** With effect from spring -96 a new connector X4C has been fitted for the sensors in the front part of the tractor. This connector is in the engine compartment on the RH side.

**Note!** With effect from ser. no. F17107 the PTO control system has been modified. In this new system the PTO has a relay control (compare AC II and AC 2.1).



**Picture 5.** The ECS is placed in the lever console and is accessible after removing the console side panel.



**Picture 6.** Rear side of the ECS

Voltage and resistance measurements can be done from the pins of connectors A1C and A2C. The pins have been numbered.

Supply voltage can be measured from connector A2C: Earth A2C/1. Supply voltage A2C/2, A2C/21 and A2C/25 (current must be switched on)

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