



**11.02**

**Edition 16.01.03**

## **Heating and air conditioning in Transporter 2004**

Trainer information (GB)

## Contents

	Subject	Page
<b>1</b>	<b>Air conditioning system</b>	<b>3</b>
1.1	General information on manual air conditioning system	3
1.2	Functional description	3
1.3	Manual air conditioning for vehicles with R5 TDI engine	4
1.4	CAN bus network	4
1.5	Other variants of air conditioning system	4
<b>2</b>	<b>Front control unit</b>	<b>5</b>
2.1	CLIMATronic C-3 for Multivan with LHD	5
2.2	Functional description in general	6
2.3	CAN networked actuators and sensors	8
2.4	CLIMATronic (slave) – Rear control unit	9
<b>3</b>	<b>Auxiliary water heating/auxiliary heating</b>	<b>10</b>
3.1	Auxiliary heating	11
3.2	Auxiliary ventilation	12
3.3	Auxiliary air heating	13

## 1 Air conditioning system

All air conditioning systems have 25% more power than in the T4 and also feature a glove compartment cooling system. (T4 had 400 kg/h and the new T5 has 650 kg/h.)

### 1.1 General information on manual air conditioning system

There are different types of manual air conditioning systems for vehicles with and without R5 TDI engine.

On vehicles without R5 TDI there is a standard compressor with magnetic coupling.

On vehicles with R5 TDI engine there is a compressor with external regulation, which also features an air conditioning control unit. This control unit is also linked in a network, and temperature and pressure sensors permit control of the evaporator temperature.

### 1.2 Functional description

All recirculation, temperature and footwell/defroster flaps are cable operated. The operating units are rotary switches, which include one with 0, 1, 2, 3, 4 stages for the fan via series resistors.

When the magnetic coupling is switched on, a PWM signal is sent from the magnetic coupling control unit to the engine control unit to increase the idling speed.

## Trainer information, Heating and air conditioning in Transporter 2004, 11.02 (GB)

### 1.3 Manual air conditioning for vehicles with R5 TDI engine

The manual air conditioning system on vehicles with R5 TDI engines is based on a networked air conditioning control unit that is actuated by an externally controlled A/C compressor. This control unit is integrated in the operating unit.

The input signals are provided by a refrigerant pressure sensor, a refrigerant temperature sensor and an evaporator temperature sensor.

### 1.4 CAN bus network

- With onboard power supply control unit
- With combi/Gateway
- With engine control unit

### 1.5 Other variants of air conditioning system

For commercial vehicles, the following equipment is fitted:

Kombi: Basic version of manual air conditioning system for front and rear

Shuttle: Manual air conditioning system for front and rear, cooled recirculated air via headliner

Others: Manual air conditioning system, front and rear ventilated only

## 2 Front control unit



### 2.1 CLIMATronic C-3 for Multivan with LHD

The Multivan has, what is known as, a three zone air conditioning system. This means that for three zones, i.e. front left, front right and the rear, there is fully automatic climatic control. This is controlled by an operator unit in the dash panel for front regulation and an operator unit in the headliner for rear regulation.

## 2.2 Functional description in general

<b>Air recirculation, automatic air recirculation</b>	When the button for air recirculation is operated, the air recirculation flap is closed by a motor. If air recirculation is switched off, automatic air recirculation mode is active. When the wash/wipe system is activated, the air recirculation flap is closed. A pollution sensor (Multivan only) can be found in the plenum chamber. This automatically controls closing of the air recirculation flap (e. g. at traffic lights, when driving through tunnels).
<b>REST (residual heat)</b>	When the REST button is operated and with "terminal 15 OFF", the residual heat from the engine is utilised to heat the vehicle interior. In support of this, the water pump and the blower (stage 2) are activated. This function is limited to 30 minutes.
<b>REAR</b>	When the REAR button is operated, operation for the rear is made possible via the front operator unit.
<b>Fan</b>	The fan output can be adjusted via fan (+) and fan (-).
<b>Temperature setting</b>	The temperature flap is controlled via buttons + and -. This guides the air intake via the heat exchanger. The temperature setting is separate for the left and right-hand sides.

## Trainer information, Heating and air conditioning in Transporter 2004, 11.02 (GB)

<b>Air distribution</b>	The distribution of air drawn in is set via the air distribution buttons up/side/footwell. In addition there is also a booster fan in the doors to improve air distribution to the side windows and to the rear.
<b>AUTO</b>	The air conditioning control unit processes information from up to 11 temperature sensors.
<b>ECON</b>	In ECON mode, the compressor is deactivated so that, if required, the temperature can only be cooled down to the ambient temperature. However, it is no longer possible to dry the fresh air intake.
<b>Defrost</b>	If Defrost is activated, all of the air drawn in is guided to the windscreen and the air recirculation flap is set to fresh air mode. The air that has already been dried removes any condensation from the windscreen. To support this, the highest fan output level is selected.

## 2.3 CAN networked actuators and sensors

### Actuators

- Radiator fan
- Rear window heating
- Booster heater
- Auxiliary heating

### Sensors

- Ambient temperature sensor (combi-instrument/Gateway)
- Engine speed sensor (engine control unit)
- Road speed (engine control unit)
- Steering angle (ESP control unit - steering angle sensor)



## 2.4 CLIMATronic (slave) – Rear control unit



This control unit is connected to the front air conditioning control unit (master) via the CAN bus. It has the sole function of regulating control of the air conditioning system for the rear (3rd zone).

## 3 Auxiliary water heating/auxiliary heating

The auxiliary water heater can be operated in both auxiliary heating mode and auxiliary ventilation mode independent of the ambient temperature or of the ON/OFF state of terminal 15. Operating mode selection is described in the chapter about the roof display module in the operating instructions.

On diesel vehicles, the auxiliary water heater works in the same way as a heater booster without any user input.

The system can be activated via the roof display module or via radio remote control.

If a crash signal is received with a predefined minimum force, the auxiliary water heater will be switched off. The system will not be switched off if the fuel tank warning lamp is activated (fuel drops below predefined level) as is the case with the heater booster. There are no plans to introduce this function because, other than adaption of the auxiliary water heater control unit, additional changes would be necessary. For classic auxiliary heating operation, the combi-instrument would also have to be modified so that the fuel level warning message can also be sent to the CAN when terminal 15 is OFF.

If the onboard power supply is too weak, the load management system switches the auxiliary water heater off or prevents it from being switched on.

## Trainer information, Heating and air conditioning in Transporter 2004, 11.02 (GB)

### 3.1 Auxiliary heating

When the auxiliary water heater is used as an auxiliary heater, the water is heated by a fuel burner. This is done for a predetermined period in the circuit that is fed through the heat exchanger into the vehicle interior, but not through the engine block.

In this way, the warm up period for the interior is minimised.

When the coolant temperature reaches 75 °C, the burner will switch off.

The auxiliary heater operates independently of the engine until the predetermined period has elapsed.

If the engine is running, the solenoid valve will remain closed to separate the coolant circuits for the vehicle interior and engine block for a set temperature difference in both circuits, in order that no cold air can enter the interior.

If a diesel engine is fitted and the engine is running, the system switches automatically from auxiliary heater mode to booster heater mode once the predetermined period has elapsed.

In this way, coolant is heated automatically up to a temperature of 75 °C without user input when the ambient temperature is below 10 °C. The solenoid valve remains closed here too for the period determined within the parameters.

The point at which heating begins and the duration of heating are set via the roof display module. The maximum heating period is 35 minutes.

The interior temperature of the vehicle cannot be predetermined. Instead of this, the heater works at maximum output during the period selected until the coolant temperature reaches 75 °C. Because the heat exchanger is included in the defroster circuit for interior ventilation, quick defrosting of the windows is guaranteed during icy periods.

## Trainer information, Heating and air conditioning in Transporter 2004, 11.02 (GB)

### 3.2 Auxiliary ventilation

When the auxiliary water heater is in auxiliary ventilation mode, air from the outside is blown into the interior for the selected period.

The point at which ventilation begins and the duration of ventilation are set via the roof display module.

The maximum ventilation period is 35 minutes.

The fan is actuated in auxiliary heating and auxiliary ventilation modes.

When terminal 15 is switched OFF, the fan will continue to operate until the predetermined period for stage 2 has elapsed. When terminal 15 is switched ON, the user can only influence the fan output if CLIMATronic is installed.

If CLIMATronic is installed, the fan is actuated by the air conditioning control unit according to the user's input at the front operator/display unit. The fan can also be switched off. In addition, CLIMATronic guarantees that the fan does not start in auxiliary heater mode until a predefined period after the heating process has started so that no cold air is blown into the interior.

Without CLIMATronic, the auxiliary water heater controls the fan directly, immediately and for the entire predefined period of operation. The user can only set the fan to stage 2 or higher i.e. if stage 0 (OFF) or 1 is selected on the fan switch, stage 2 is activated.

In auxiliary heating mode, a water pump pumps coolant through the heat exchanger.

If CLIMATronic is installed, the air conditioner control unit with front operator/display unit controls the water pump during the periods determined by the air conditioning control unit.

Without CLIMATronic, the auxiliary water heater controls the water pump directly and for the entire predefined period of operation. In auxiliary mode and during auxiliary ventilation, the water pump is deactivated.

## Trainer information, Heating and air conditioning in Transporter 2004, 11.02 (GB)

### 3.3 Auxiliary air heating

The auxiliary air heater heats the interior with the aid of a fuel burner depending on the ambient temperature and whether terminal 15 is ON or OFF. It has its own fan to distribute air into the interior.

The point at which heating begins and the period of heating (unlimited) are set via the module in the headliner. The temperature cannot be selected.



In the event of an accident, the heating is isolated via a CAN signal in the roof module.



For internal use only

© Volkswagen AG, Service Training, VK-36, Brieffach 1995

All rights reserved. Technical specifications subject to change without notice.

Technical status 02.2003