Output Diagnostic Test Mode (DTM)

Notes:

- *Component location of activated components ⇒ Page 87-61 and ⇒ Page 87-85 .*
- *The Output Diagnostic Test Mode (DTM) can be carried out more than once if necessary.*
- *If components marked with an * malfunction, DTCs for these components can be stored in DTC memory.*
- *Checking the "Idle Air Control" (IAC) regulation function ⇒ Page 01-90 .*
- *During output DTM, the vehicle must not be moved and the engine speed must be lower than 3000 RPM.*

- *During output DTM, the air conditioning control functions are switched off. Depending on A/C Control Head -E87- version, all segments, control lights in buttons as well as the button illumination of -E87- are displayed or dark.*

- *The output DTM sequence for A/C Control Heads -E87- are different for vehicles up to model year 2001 and from model year 2002.*

- *For Audi allroad, the change-over of the A/C system is not performed with the model year change 2001 to 2002, instead it is a running change (implementation open, for vehicles with 4.2 Liter engine with start of production).*

⇒ *Parts Catalog*

Initiating output DTM

- Star engine (vehicles up to model year 2001).

- Switch ignition on or start engine (vehicles from model year 2002).

Notes:

- *The engine should not be running, if the actuation of "A/C Compressor Regulator Valve -N280-" or "A/C clutch -N25-" is being checked on vehicles from model year 2002. With engine running the A/C Control Head -E87- does not actuate these actuators, but starts the output DTM with Fresh Air Blower -V2-.*

- *The engine must be running, if the activation of Coolant FC (Fan Control) Control Module -J293- on vehicles from model year 2002 is to be checked. Depending on engine type, the A/C Control Head - E87- sends the request to switch on the coolant fan directly to the Engine Control Module (ECM), the Coolant FC (Fan Control) Control Module -J293 or to one of the respective coolant fan relays. Depending on the version e.g. the Engine Control Module switches the coolant fan on, but only with the engine running.*

⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations*

- Press AUTO button to switch compressor on.

- Open instrument panel vents.

- Set air distribution to instrument panel vents.

- Connect VAG 1551 Scan Tool (ST),Press buttons -0- and -8- to insert "AC/Heating Electronics" address word 08 and advance program until "Select function XX" appears on display ⇒ Page 01-11 .

- Switch printer on via the PRINT button (indicator lamp in button lights up).

- Check DTC memory ⇒ Page 01-18 .

Rapid data transfer HELP **Select function XX**	Indicated on display (function selection): - Press buttons -0- and -3- to select "output Diagnostic Test Mode" function 03.
Rapid data transfer Q **03 - Output Diagnostic Test Mode (DTM)**	Indicated on display: - Press -Q- button to confirm input.
Output Diagnostic Test Mode (DTM) **A/C clutch -N25-**	Indicated on display: - The → button is used to advance through the program sequence. ***Notes:*** ♦ *Pressing the C-button can terminate output DTM.* ♦ *When output DTM is completed, check DTC memory ⇒ Page 01-18 .*

- *If at the beginning of output DTM the message "Function is unknown or cannot be carried out at the moment" appears on the display (e.g. if the engine is not running), press the advance button and select function 03 (output Diagnostic Test Mode) again. The control element "A/C clutch - N25-" will longer be activated during this test).*
- *If the message "Function unknown or cannot be carried out at the moment" appears on the display* ⇒ *Page 01-134* *Read measuring value block (display group 001).*

Function is unknown or → cannot be performed at the moment!

Indicated on display:

- If this display appears, DTM is concluded.
- Press → button.

Output Diagnostic Test Mode (DTM) procedure (vehicles up to model year 2001)

Indicated on display	Specified function	Corrective action
A/C clutch -N25-	- A/C clutch -N25- clicks every 2 seconds, compressor is engaged. - Input of A/C Control Head -E87- is closed every 2 seconds (switched to Ground).	- Check voltage supply for A/C clutch -N25- (via clutch relay -J44-) according to wiring diagram. - Service A/C clutch -N25-.(⇒ Page 87-35 . - Check wiring between -E87-, -J44- and -N25- according to wiring diagram. - Replace A/C control head -E87-.

Notes:

- *When the air conditioning is operating, the A/C compressor cut in output (connector -C-, terminal 15 of A/C control head -E87- is activated (switched from 0 - 12 volt) when A/C clutch -N25- is switched on. This output can be tested by switching the compressor on and off using the ECON button while reading the measuring value block for the Engine Control Module (ECM).*

⇒ *Repair Manual, Fuel Injection & Ignition, Repair Group 01*

- *The ECM uses the A/C compressor cut in signal to compensate for the temporarily higher load placed on the engine when the compressor is switched on.*

⇒ *Repair Manual, Fuel Injection & Ignition, Repair Group 01*

- *The ECM can switch off the A/C compressor via the A/C compressor cut-in output/input (⇒ Read measuring value block ⇒ Page 01-134 display group 001).*

- *To test read the measuring value block for the injection and ignition system control unit with the engine running and switch the compressor on and off (by pressing ECON button), or connect the VAG 1598 test box.*

- *If voltage is present at the A/C compressor cut-in output/input when the compressor is switched off, this is indicated as a malfunction.*

Indicated on display	Specified function	Corrective action
Fresh Air Blower -V2-	- Fresh Air Blower -V2 is activated for 2 sec. with 0V, 3V, 6V, 9V, 12V, 15V, 0V etc.	- Make sure fresh air blower moves freely. - Check Ground connection to Control module for fresh air blower -J126- according to wiring diagram. - Check control module for fresh air blower -J126- (⇒ electrical testing ⇒ Page 01-253). - Replace A/C control head -E87-.

Indicated on display	Specified function	Corrective action
WARNING! Coolant fan switched on	- Info - Display WARNING! The next time the → -button is pressed the Coolant fan -V7- will be switched on. Keep well clear of the fan. Do not reach in fan area.	
Coolant fan -V7 [1].	- The coolant fan -V7- (1st step) is switched on and off every 2 seconds.	- Check for open or short circuit in wiring between A/C Control Head -E87-, Coolant Fan control (FC) Relay and Coolant FC (Fan Control) Control Module -J293- according to wiring diagram. - Check activation of Coolant Fan -V7- from Check Coolant Fan control (FC) Relay -J26-/ Coolant FC (Fan Control) Control Module -J293-[1]. ⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations*

		- Check function of Coolant Fan control (FC) Relay -J26-/Coolant FC (Fan Control) Control Module -J293- (⇒ electrical test ⇒ Page 01-253).

1) The coolant fan is switched to second speed by the Second Speed Coolant Fan Control (FC) Relay -J101-/ Coolant FC (Fan Control) Control Module -J293-:

- when Coolant Fan Control (FC) Thermal Switch -F18- is closed.
- when A/C pressure switch -F129- is closed (switch between terminal 3 and 4).

Indicated on display	Specified function	Corrective action
Actuator for temperature flap left -V158-	- Actuator for temperature flap left -V158- moves from stop to stop (fresh air blower is running and air is coming from instrument panel vents) 1). - Air temperatures from left vents changes.	- Check wiring between Actuator for temperature flap left -V158- and A/C control head -E87- for open circuit or reversed wiring according to wiring diagram. - Make sure both left temperature flaps move freely. - Check Actuator for temperature flap left -V158- (⇒ electrical testing ⇒ Page 01-253). - Replace A/C control head -E87-.

1) The central flap is set to the "instrument panel vents" position, the fresh air/recirculated air flap to the "fresh air mode" position, and the defroster flap is closed.

Indicated on display	Specified function	Corrective action
Actuator for temperature flap right -V159-	- Actuator for temperature flap right -V159- moves from stop to stop (fresh air blower is running and air is coming from instrument panel vents) 1). - Air temperatures from right vents changes.	- Check wiring between Actuator for temperature flap right -V159- and A/C control head -E87- for open circuit or reversed wiring according to wiring diagram. - Make sure both right temperature flaps move freely. - Check Actuator for temperature flap right -V159- (⇒ electrical testing ⇒ Page 01-253). - Replace A/C control head -E87-.
Actuator motor for central flap Central Air Flap Motor -V70-	- Central air flap motor -V70- moves from stop to stop (fresh air blower is running)2). - Air distribution switches between footwell and instrument panel vents.	- Check wiring between Central air flap motor -V70- and A/C control head -E87- for open circuit or reversed wiring according to wiring diagram. - Make sure central flap and footwell flap can move freely.

		- Check Central Air Flap Motor - V70- (⇒ electrical testing ⇒ Page 01-253). - Replace A/C control head - E87-.

1) The central flap is set to the "instrument panel vents" position, the fresh air/recirculated air flap to the "fresh air mode" position, and the defroster flap is closed.

2) The fresh air/recirculated flap is set to the "fresh air mode" position and defroster flap is closed.

Indicated on display	Specified function	Corrective action
Defroster Flap Motor -V107-	- Defroster flap motor -V107- moves from stop to stop (fresh air blower is running)[1]. - Air flow from windshield vents changes.	- Check wiring between Defroster Flap Motor -V107- and A/C control head -E87- for open circuit or reversed wiring according to wiring diagram. - Make sure defrost flap moves freely. - Check Defroster Flap Motor -V107- (⇒ electrical testing ⇒ Page 01-253). - Replace A/C control head -E87-.

Air Flow Flap Motor -V71-.[2]	- Air Flow Flap Motor -V71- moves from stop to stop (fresh air blower is running)[3]. - Air flow from windshield vents changes (air flow flap); air conditioning changes between fresh air and recirculated air mode (fresh air/ recirculated air flap).	- Check wiring between Air Flow Flap Motor -V71- and A/C control head -E87- for open circuit or reversed wiring according to wiring diagram. - Make sure air flow flap and fresh air/ recirculated air flap can move freely. - Check Air Flow Flap Motor -V71- (⇒ electrical testing ⇒ Page 01-253). - Replace A/C control head -E87-.

[1] ,The fresh air/recirculated flap is set to the "fresh air mode" position and central flap and footwell flap are closed.

[2] .This positioning motor also moves the fresh air/recirculated air flap is addition to the air flow flap.

[3] The central flap and footwell flap are closed, and the defroster flap is open. The operation of the positioning motor can be observed if the dust and pollen filter is removed.

Indicated on display	Specified function	Corrective action
Segment test	- All display segments of A/C control head -E87- are switched on and off every 3 seconds.	- Replace A/C control head -E87-.
Outside Air Temperature Display -G106- (in driver information display)[2)]	- Outside air temperature display (in drivers information display) counts at -45 ° c or ° F upward (approx. 3 sec. per step).	- Check wiring between driver information display and A/C control head -E87- for open circuit or short circuit according to wiring diagram. - Check for open circuit in B+ and Ground (GND) connection to Outside Air Temperature Display -G106- (in driver information display) according to wiring diagram. - Check driver information display. ⇒ *Repair Manual, Electrical Equipment On Board Diagnostic (OBD), Repair Group 01.* - Replace A/C control head -E87-.

Idle control[1)]	- Output of A/C Control Head - E87- is switched from 0 to 12 volt every 5 seconds (testing ⇒ Page 01-90).	

1) Depending on the vehicles equipment, a positive signal is applied to this output when the rear window heater is switching on (switch off rear window heater before testing).

⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations*

2) The outside temperature is only displayed by the instrument cluster, if e.g. the doors are closed and no display with a higher value is stored in instrument cluster.

Idle Air Control (IAC) regulation, initiating Output Diagnostic Test Mode (DTM)

- Switch off ignition.

- Remove Engine Control Module (ECM) and connect adapter cable of VAG 1598 test box to ECM connector. Do not connect ECM to test box..

⇒ *Repair Manual, Fuel Injection & Ignition, Repair Group 01*

Notes:

- *Terminal assignment of harness connectors to Engine Control Module (ECM).*

⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations*

⇒ *Repair Manual, Fuel Injection & Ignition, Repair Group 01*

- Switch on ignition.

- Switch rear window heater off.

- Connect VAG 1551 Scan Tool (ST), Press buttons -0- and -8- to insert "AC/Heating Electronics" address word 08 and advance program until "Select function XX" appears on display ⇒ Page 01-11 .

- Switch printer on via the PRINT button (indicator lamp in button lights up).

Rapid data transfer HELP

Select function XX

Indicated on display (function selection):

- Press buttons -0- and -3- to select "output Diagnostic Test Mode" function 03.

Rapid data transfer Q

03 - Output Diagnostic Test Mode (DTM)

Indicated on display:

- Press -Q- button to confirm input.

Function is unknown or

cannot be carried out at the moment

Indicated on display:

- Press → button.

- Once again press buttons -0- and -3-.

Rapid data transfer Q

03 - Output Diagnostic Test Mode (DTM)

Indicated on display:

- Press -Q- button to confirm input.

Note:

If the function "Output Diagnostic Test Mode" is once again entered, the A/C Clutch -N25- is no longer actuated ⇒ Page 01-134 Read Measuring Value Block (display group 001).

- To check the "Idle Air Control" (IAC) regulation function: Connect VAG 1527 voltage tester between Ground (GND) and appropriate input (for ECM) on test box.

Indicated on display	Specified function	Corrective action
Fresh Air Blower -V2-	- Fresh Air Blower -V2 is activated for 2 sec. with 0V, 3V, 6V, 9V, 12V, 15V, 0V etc.	- ⇒ Page 01-83 .
→Keep pressing advance button until display reads "Idle Air Control Regulation".		
Idle control[2)]	- Output of A/C Control Head -E87- (connector -A- terminal -7-) is switched every 5 seconds (LED in VAG 1527 flashes).	- Check wiring between A/C control head -E87- and Engine Control Module (ECM) according to wiring diagram [1)]. - Replace A/C control head -E87-.

1) Checking with Engine Control Module (ECM) installed.

⇒ *Repair Manual, Fuel Injection & Ignition, Repair Group 01*

2) Causes an increase in idling speed or a change to the pre-programmed control value in the Engine Control Module (ECM).

⇒ *Repair Manual, Fuel Injection & Ignition, Repair Group 01*

Note:

The "idle air control increase" output is not activated if the compressor has been switched off manually (during normal regulation).

Output Diagnostic Test Mode (DTM) procedure (vehicles from model year 2002)

Indicated on display	Specified function	Corrective action
♦ Display for vehicles with A/C control head -E87- coded for compressor with A/C Compressor Regulator Valve -N280-. - The ignition is switched on, the engine should not be running.		
A/C Compressor Regulator Valve -N280- See note	♦ The A/C Compressor Regulator Valve is switched on and off every 5 seconds. - Therefore the compressor is switched on and off. - The control valve is activated with a current of 0.65 A.	- Eliminate compressor cut-off conditions ⇒ Read Measuring value block on vehicles from model year 2002 ⇒ Page 01-166 (display group 001). - Check coding of -E87- ⇒ Page 01-123 and Equipment / Activation table from model year 2002 ⇒ Page 01-132 - Check A/C Compressor Regulator Valve -N280- ⇒ electrical testing, ⇒ Page 01-288 .

Continuation (next page)		

Indicated on display	Specified function	Corrective action
♦ Display for vehicles with A/C control head -E87- coded for compressor with A/C clutch -N25-. - The ignition is switched on, the engine should not run.		
A/C clutch -N25- See note	- A/C clutch -N25- clicks every 2 seconds, (compressor is engaged). - Input of A/C Control Head -E87- is closed every 2 seconds (switched to Ground).	- Check voltage supply for A/C clutch -N25- (via clutch relay -J44-) according to wiring diagram. - Check coding of -E87- ⇒ Page 01-123 and Equipment / Activation table from model year 2002 ⇒ Page 01-132 - Service A/C clutch -N25-.(⇒ Page 87-35 . - Check wiring between -E87-, -J44- and -N25- according to wiring diagram. - Replace A/C control head -E87-.

Notes:

- *The compressor type (with A/C clutch -N25- or A/C Compressor Regulator Valve-N280-) depends on the engine ⇒ Page 87-36 or ⇒ Page 87-44 and Equipment -/Activation table for vehicles from model year 2002 ⇒ Page 01-132*

⇒ *Parts Catalog*

- *On vehicles with A/C Compressor Regulator Valve -N280- there also an Evaporator Vent Temperature Sensor -G263 installed ⇒ Page 87-85 . The A/C Control Head -E87- uses the measuring value of the Evaporator Vent Temperature Sensor -G263- to control the temperature of the evaporator via the A/C Compressor Regulator Valve -N280-.*

- *The actuator "A/C Compressor Regulator Valve -N280" or "A/C clutch -N25" is only actuated with engine switched off. These actuators will not be displayed on the VAS 5051 display and not activated by the A/C control head -E87- with the engine running.*

- *The A/C Compressor Regulator Valve is installed in the compressor (the compressor can only replaced by a work shop that is authorized for air conditioning work).*

⇒ *Climate control with refrigerant R134a*

- *The current that flows through the "switched on" control valve can be measured using the current pick-up clamp ⇒ electrical testing, ⇒ Page 01-288 .*

- *If another compressor cut-off condition exists besides "5 = engine speed less than 300 RPM", the "A/C Compressor Regulator Valve -N280-" or "A/C clutch -N25-" is not activated.*

Indicated on display	Specified function	Corrective action
Fresh Air Blower -V2-	♦ Fresh Air Blower -V2- runs - The fresh air blower speed changes every 5 seconds continuously between 0% and 100% of maximum speed.	- Make sure fresh air blower moves freely. - Check B+ and Ground connection for Control module for fresh air blower -J126-, according to wiring diagram. - Check Control module for fresh air blower -J126- ⇒ Page 01-299 - Check wiring between Control module for fresh air blower -J126- and A/C control head -E87- according to wiring diagram. - Replace A/C control head -E87-.
WARNING! Coolant fan switched on	Info - Display WARNING!	

	The next time the → button is pressed the Coolant fan -V7- will be switched on. Keep well clear of the fan. Do not reach in fan area.	

Indicated on display	Specified function	Corrective action
♦ Display for vehicles with A/C Control Head -E87- coded with compressor for A/C Compressor Regulator Valve -N280-. - The engine must be running		
Coolant fan -V7- See note	♦ The A/C Control Head -E87- sends the request for coolant fan activation (via CAN-bus system) to the respective Engine Control Module (ECM), the request changes approximately within 20 seconds continuously between 0% and 100% of the maximum speed. - With the engine running, the respective ECM switches via the Coolant FC (Fan Control) Control Module -J293- the coolant fan from 0% to 100% of the coolant fan speed (depending on ECM). - The coolant fan changes speed depending on the activation (from off to maximum speed).	- Check DTC memory of A/C Control Head -E87-, no malfunction should be stored ⇒ Page 01-18 . - Check DTC memory of respective Engine Control Module (ECM), and Coolant fan -V7- activation from ECM via Coolant FC (Fan Control) Control Module -J293-. ⇒ *Repair Manual, Fuel Injection & Ignition, Repair Group 01* - Check voltage supply and Ground connection to Coolant FC (Fan Control) Control Module -J293- and Coolant fan -V7-. ⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations*

Continuation (next page)		

Indicated on display	Specified function	Corrective action
♦ Display for vehicles with A/C Control Head -E87- coded with compressor for A/C clutch -N25- (⇒ Equipment / Activation table for vehicles from model year 2002 ⇒ Page 01-132). - The engine must be running		
Coolant FC (Fan Control) Control Module -J293- (steps 1+2) See note	- The coolant fan -V7- (1st step) is switched on and off every 5 seconds.	- Check wiring between A/C Control Head -E87- and Coolant Fan control (FC) Relay -J26- or Coolant FC (Fan Control) Control Module -J293- for an open or short circuit to B+ according to wiring diagram. - Check activation of Coolant Fan -V7- from Coolant Fan control (FC) Relay -J26-/ Coolant FC (Fan Control) Control Module -J293-. ⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations* - Check function of Coolant Fan control (FC) Relay -J26-/Coolant FC (Fan Control) Control Module -J293- (⇒ electrical test ⇒ Page 01-253).
Continuation (next page)		

Indicated on display	Specified function	Corrective action
♦ Display for vehicles with A/C Control Head -E87- coded with compressor for A/C clutch -N25- (⇒ Equipment / Activation table for vehicles from model year 2002 ⇒ Page 01-132 . - The engine must be running		
Coolant FC (Fan Control) Control Module -J293- (steps 1+2) See note	- The coolant fan -V7- (2nd step) is switched on and off every 5 seconds.	- Check wiring between A/C Control Head -E87- and Second Speed Coolant Fan Control (FC) Relay -J101- or Coolant FC (Fan Control) Control Module -J293- for an open or short circuit to B+ according to wiring diagram. - Check activation of Coolant Fan -V7- from Second Speed Coolant Fan Control (FC) Relay -J101-/ Coolant FC (Fan Control) Control Module -J293-. ⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations* - Check function of Second Speed Coolant Fan Control (FC) Relay -J101-/Coolant FC (Fan Control) Control Module -J293- (⇒ electrical test ⇒ Page 01-253).

Notes:

- *The activation of Coolant fan -V7- varies. Depending on engine type, the Coolant fan -V7- is activated directly by the A/C Control Head -E87- or the activation occurs via the respective Engine Control Module (ECM) (⇒ Equipment / Activation table for vehicles as model year 2002 ⇒ Page 01-132)*

- *Start engine when checking coolant fan activation. The respective Engine Control Module (ECM) and the Coolant FC (Fan Control) Control Module -J293-switches the coolant fan on only with the engine running (depending on the version the Coolant FC (Fan Control) Control Module -J293- e.g. checks the voltage at terminal 61).*

- *On vehicles where the Engine Control Module activates the coolant fan, the request to activate the Coolant fan -V7- occurs via the CAN-bus system from the A/C Control Head -E87- to the respective Engine Control Module, the ECM activates (controls) the Coolant FC (Fan Control) Control Module -J293- using a rectangle signal, the -J293 switches the coolant fan on.*

- *On vehicles where the Coolant fan -V7- is directly activated by the A/C Control Head -E87-, the activation occurs via a separate wire connection (for 1st and 2nd coolant fan step) to Coolant Fan control (FC) Relay -J26- and Second Speed Coolant Fan Control (FC) Relay -J101- or to Coolant FC (Fan Control) Control Module -J293- (depending on engine). The cooling fans are switched on by Coolant Fan control (FC) Relay -J26- and Second Speed Coolant Fan Control (FC) Relay -J101- or Coolant FC (Fan Control) Control Module -J293-*

Indicated on display	Specified function	Corrective action
Interior temperature sensor fan - V42- malfunctioning	♦ Interior Temperature Sensor Fan - V42- in instrument cluster is switched on and off every 5 seconds. - Smoke is sucked in by fan	- Checking intake frame for throughput - Replace A/C control head - E87-.

Notes:

- *Check function of Interior Temperature Sensor Fan -V42- with smoke (hold smoke before intake frame of A/C Control Head -E87-)*
- *The Interior Temperature Sensor Fan -V42- is part of A/C Control Head -E87- and cannot be replaced separately.*

Indicated on display	Specified function	Corrective action
Actuator for temperature flap left -V158- - Open all dash panel vents	♦ Actuator for temperature flap left -V158- moves from stop to stop ♦ The fresh air fan runs with approximately 50% of maximum speed - Air temperature of left vents changes (with warm engine)	- Make sure left temperature flap moves freely. - Check wiring connection between Actuator for temperature flap left -V158- and A/C Control Head -E87- for an open circuit or reversed wiring according to wiring diagram. - Check Actuator for temperature flap left -V158- (⇒ electrical testing ⇒ Page 01-288). - Replace A/C control head -E87-.

Indicated on display	Specified function	Corrective action
Actuator for temperature flap right -V159-	♦ Actuator for temperature flap right -V159- moves from stop to stop	- Make sure right temperature flap moves freely.
- Open all dash panel vents	♦ The fresh air fan runs with approximately 50% of maximum speed - Air temperature of right vents changes (with warm engine)	- Check wiring connection between Actuator for temperature flap right -V159- and A/C Control Head -E87- for an open circuit or reversed wiring according to wiring diagram. - Check Actuator for temperature flap right -V159- (⇒ electrical testing ⇒ Page 01-288). - Replace A/C control head -E87-.

Indicated on display	Specified function	Corrective action
Central Air Flap Motor -V70- - Open all dash panel vents	♦ Central Air Flap Motor -V70- moves from stop to stop ♦ The fresh air fan runs with approximately 50% of maximum speed ♦ The defroster flap is closed - Air distribution changes from footwell to instrument panel vents	- Make sure central flap moves freely. - Check wiring between Defroster Flap Motor -V107- and A/C Control Head -E87- for open circuit or reversed wiring according to wiring diagram - Check Central Air Flap Motor -V70- (⇒ electrical testing ⇒ Page 01-288). - Replace A/C control head -E87-.
Defroster Flap Motor -V107-	♦ Defroster Flap Motor -V107- moves from stop to stop	- Make sure defrost flap moves freely.

	◆ The fresh air fan runs with approximately 50% of maximum speed ◆ The central air flap and footwell flap are closed ("Air to defroster flap") - Air flow from windshield vents changes.	- Check wiring between Defroster Flap Motor -V107- and A/C Control Head -E87- for open circuit or reversed wiring according to wiring diagram - Check Defroster Flap Motor -V107- (⇒ electrical testing ⇒ Page 01-288). - Replace A/C control head -E87-.

Indicated on display	Specified function	Corrective action
Recirculation Flap Motor -V113-	♦ Recirculation Flap Motor -V113- moves from stop to stop	- Make sure fresh air / recirculating flap can move freely.
- Open all dash panel vents	♦ The fresh air fan runs with approximately 50% of maximum speed ♦ Air Flow Flap is closed. - The fresh air/recirculation flap opens and closes. - The air flow in vents changes.	- Check wiring connection between Recirculation Flap Motor -V113- and A/C Control Head -E87- for open circuit or reversed wiring according to wiring diagram. - Check Recirculation Flap Motor -V113- ⇒ electrical testing, ⇒ Page 01-288 - Replace A/C control head -E87-.

Notes:

- *The Recirculation Flap Motor -V113- moves the fresh air/air recirculation flaps.*

- *Vehicles with left hand steering have Back Pressure Flaps installed; this flap is moved by Air Flow Flap Motor - V71-. The back pressure flap must be close in order to prevent the fresh air/recirculation flap (in end position "Recirculation mode") touching the back pressure flap.*

- *The back pressure flap is closed on vehicles with left hand steering, therefore in fresh air mode less air flows out of vents as in recirculation mode. In recirculation mode the air is sucked in through the passenger footwell area.*

Indicated on display	Specified function	Corrective action
♦ Display on vehicles with left hand steering (⇒ coding table for vehicles as model year 2002 ⇒ Page 01-123).		
Air Flow Flap Motor -V71-. - Open all dash panel vents	♦ Air Flow Flap Motor -V71- moves from stop to stop ♦ The fresh air fan runs with approximately 50% of maximum speed ♦ The recirculation flap in in fresh air mode position. - The back pressure flaps open and close. - The air flow in vents changes.	- Make sure back pressure flaps move freely. - Check wiring connection between Air Flow Flap Motor -V71- and A/C Control Head -E87- for open circuit or reversed wiring according to wiring diagram. - Check Air Flow Flap Motor -V71- (⇒ electrical testing ⇒ Page 01-288). - Replace A/C control head -E87-.

Notes:

♦ *This actuator motor is installed on vehicles with left hand steering only, it moves the back pressure flaps.*

Indicated on display	Specified function	Corrective action
Segment test	♦ All segment of the display, return message lights in the buttons and illumination light in A/C Control Head - E87- are switched on.	- Replace A/C control head - E87-.
Outside Air Temperature Display - G106- - In driver information display	♦ Display of outside temperature changes in 5 ° Steps (in ° c or ° F) up or down (approx. every 3 sec.).	- Check wiring between A/C Control Head -E87- and instrument cluster for an open circuit according to wiring diagram. - Check control module in instrument cluster: ⇒ *Repair Manual, Electrical Equipment On Board Diagnostic (OBD), Repair Group 01.* - Replace A/C control head - E87-.

Notes:

- *The outside temperature is only displayed by the instrument cluster, if e.g. the doors are closed and no display with a higher value is stored in instrument cluster.*

- *The outside temperature is transferred with the CAN-bus system.*

Indicated on display	Specified function	Corrective action
Heated rear window -Z1- faulty.	◆ The heated rear window is switched on once for 10 seconds. - The rear window warms up in the heating wire range.	- Check activation and current pick up of Heated rear window -Z1- ⇒ Page 01-336 - Replace A/C control head -E87-.
DONE	Info - Display - End of output DTM on vehicles without heated front windshield.	

Notes:

- *The switch on function of A/C Control Head -E87- for heated rear window, e.g. can be checked during the DTM using VAG1715 multimeter. Place current-pick up clamp across B+ wire from A/C Control Head -E87- and Heated rear window -Z1- and select multimeter function "Current measurement with current pick up clamp". The display will change from approx. 0 amps to greater than 7 amps.*

- *If actuator "Heated front windshield" is displayed after actuator "Heated rear window", check coding of A/C Control Head -E87- ⇒ Page 01-123 . A heated front windshield is currently not available, however, the A/C Control Head -E87- already has the ability to activate this output via a possible coding.*

Indicated on display	Specified function	Corrective action
♦ Display on vehicles with heated front windshield (⇒ coding table for vehicles as model year 2002 ⇒ Page 01-123).		
Heated front window -Z2-	♦ The Heated Windshield Control Module -J505- is activated for approx. 10 seconds. - The Heated Windshield Control Module -J505- switches the Heated front window -Z2-, if the vehicle voltage is greater than 12.7 volt.	- Read measuring value block ⇒ Page 01-166 (Read measuring value block on vehicles from model year 2002, display group 016) - Check voltage supply and Ground connection to Heated Windshield Control Module -J505- according to wiring diagram. - Check wiring between A/C Control Head -E87- and Heated Windshield Control Module -J505- according to wiring diagram. - Check activation and current pick up of Heated Windshield Control Module -Z2- (see notes) - Replace A/C control head -E87-

DONE	Info - Display - End of output Diagnostic Test Mode (DTM)	

Notes:

- *If this actuator is activated on vehicles without heated front windshields, check coding of A/C Control Head - E87 ⇒ Page 01-121 .*

- *If actuator "Heated front windshield" is displayed after actuator "Heated rear window", check coding of A/C Control Head -E87- ⇒ Page 01-121 . A heated front windshield is currently not available, however, the A/C Control Head -E87- already has the ability to activate this output via a possible coding.*

- *The output DTM only activates the heated front windshield if the passenger compartment temperature is less than 40 ° c. If the temperature is higher, the text "Function unknown or cannot be carried out" is displayed on scan tool.*

- *The switch on function of Heated Windshield Control Module -J505- can be checked using VAG 1715 multimeter. Place current pick up clamp across B+ wire from Heated Windshield Control Module -J505- and heated front windshield and select multimeter function to "Current measurement with current pick up clamp". The display will change from approx. 0 amps to greater than 7 amps.*

- *Function of heated front windshield ⇒ Page 01-166 (Read measuring value block on vehicles from model year 2002, display group 016)*

- *The function and checking procedure is not described in this Repair Manual, since the Heated front window - Z2- application remains as an open option. Information on function and checking procedures can be identified under:*

⇒ *Audi A8 1997 > Climate control system*

⇒ *Audi A4 2002 > Climate control system*