A/C system, On Board Diagnostic (OBD)

Function

The A/C control head -E87- receives input information from various electrical and electronic components (sensors).

This information is processed by the control head in accordance with specified values and then provides corresponding output signals that control electrical components (actuators).

The control head is controlled by an internal microprocessor with On Board Diagnostic (OBD) capability. If faults or open circuits occur on applicable components, Diagnostic Trouble Codes (DTC) are stored in DTC memory. Stored faults are identified using either VAG1551 Scan Tool (ST) or VAG1552 Scan Tool (ST). Tables containing all DTCs and corresponding repair information guide technicians through the OBD process.

01-2

Notes:

- *This Repair Manual describes On Board Diagnostic (OBD) with VAG1551 Scan Tool (ST). OBD procedures can also be performed with VAG1552 Scan Tool (ST) (VAG1552 Scan Tool is not equipped with a printer).*
- *Scan Tool VAG1551 or 1552 must be used in in operating mode -1- (Rapid data transfer).*
- *Operating mode -2- (Flash code output) is not provided for A/C and Heating OBD.*
- *Always check DTC memory and perform necessary repairs before erasing DTC memory.*
- *DTC output is possible only if ignition is on or engine is running and engine speed is less than 3000 rpm (if engine speed is higher, output is possible only for a limited time or is terminated).*
- *If a fault exists for a certain time it is stored as a static fault.*
- *If a static fault is no longer present after a certain time, it is stored as a sporadic fault and the reference "SP" appears on the upper right of the VAG1551 display/print-out.*

- *Before replacing a suspected malfunctioning component, check all related wiring, connections, harness connectors and Ground (GND) connections according to the appropriate wiring diagram.*

- *Output Diagnostic Test Mode (DTM), Basic Setting, A/C control head identification and coding functions are also possible.*

01-3

Notes:

- *A/C system component locations: engine compartment ⇒ page 87-96 .*
- *A/C system component locations: passenger compartment ⇒ page 87-106 .*
- *If a the display of a newly installed A/C control head -E87- flashes after switching the ignition on (for approximately 2 minutes), code the control head ⇒ page 01-57 and execute basic setting ⇒ page 01-52 .*
- *If a replacement control head is not coded after installation or if an unrecognized code was entered, code "00042" (4-cyl. gasoline engine USA) is stored.*
- *Control of A/C compressor, flap motors and fan motors etc. is not possible when executing Output Diagnostic Test Mode (DTM), function 03 and basic setting, function 04. A/C control is possible in all other functions.*

01-4

Heating and A/C system changes, 1997

On Board Diagnostic changes

- New A/C control head -E87- with specific coding for m.y. 1997, 4-cyl. and 6-cyl. engines.

Notes:

- *Before performing On Board Diagnostic of A/C system, ensure A/C control head -E87- is coded correctly (according to engine application).*
- *A/C control heads beginning with Part No. 8L0 820 043 should only be installed in m.y. 1997 vehicles.*
- *A/C control heads beginning with Part No. 8D0 820 043 must only be installed in vehicles through m.y. 1996.*

CAUTION!

- ***Part numbers are for reference only.***
- ***Always check with your Parts Dept. for the latest information.***

01-5

Notes:

- *For m.y. 1997, changes that affect monitoring of the A/C system by A/C control head -E87- were made.*
- *Monitored components, locations ⇒ pages 87-101 and ⇒ Page 87-113 .*
- *Additional technical data and notes ⇒ page 01-1 .*
- *If a replacement A/C control head is not coded after installation or if an unrecognized code was entered, code "04142" (Audi A4 -4cyl. -USA) is stored.*
- *The A/C control head is no longer connected to terminal 30 (vehicle electronics). The last input setting (into the A/C control head) is stored when the ignition is switched off and retained when the ignition is switched on.*
- *The duration of time when ignition is off is calculated by the A/C control head. When ignition is switched on, the previous "standing time" is calculated by monitoring a time signal from the instrument cluster. If more than 4 hours pass since ignition was switched off, the actual measured values of the outside*

temperature sensor are used as instantaneous outside and engine temperature inputs for A/C system control. If "standing time" is shorter than 4 hours, the actual measured values of the outside temperature sensor are suppressed and system output temperature control is calculated by the A/C control head. The "standing time" period is monitored and used for this calculation. (Heat radiating from the engine and radiator leads affects the measured value of the temperature sensor).

01-6

The following components previously monitored by OBD and triggered by A/C control head -E87- are deleted:

- Refrigerant low pressure switch -F73-.
- Refrigerant high pressure switch -F118- (low and high pressure switch functions integrated into A/C pressure switch, -F29-).
- Fresh air/recirculating flap two-way valve -N63-.

The following new components are monitored by OBD and provide input signals to -E87-:

- A/C pressure switch -F129-.
- Sender for outlet temperature, center -G191-.
- Sender for outlet temperature, floor outlet -G192-.

The following components monitored by OBD or triggered by -E87- are revised:

- The heater/air conditioner assembly with all servo motors.

- The fresh air blower and control module.

Following components that provide input signals to the A/C control head -E87- are revised:

- Instrument cluster

01-7

A/C system changes

- Revised heating/air conditioner assembly with flap motors ⇒ page 87-174 .
- The air flow flap motor now activates the fresh air/recirculating air flap as well.
- The two way valve for the circulating/fresh air door, the vacuum unit and the vacuum reservoir are deleted.

A/C refrigerant circuit changes

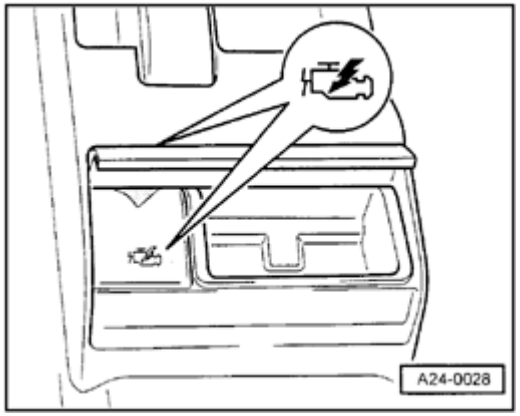
- New service valve connection on low pressure side.
- Service valve connection for high pressure side installed in high pressure line in plenum panel (deleted at condenser).
- A/C pressure switch -F129- replaces pressure switches -F73- and -F118-.
- New version "Zexel" compressor and high pressure line (4-cyl. engines only).

01-8

VAG1551 Scan Tool (ST), connecting; A/C control head -E87-, checking version

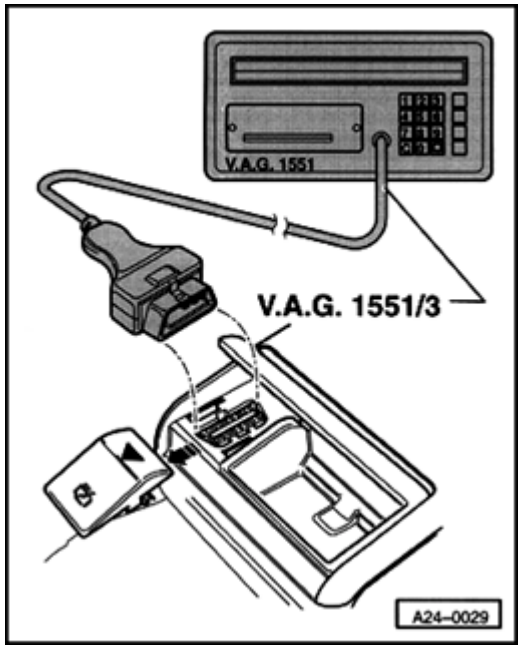
- Battery Voltage OK
- Fuse 22 (S22) OK
- Ground (GND) connection on engine and transmission OK

1996 vehicles



- Open rear passenger ashtray in center console and remove cover for Data Link Connector (DLC).

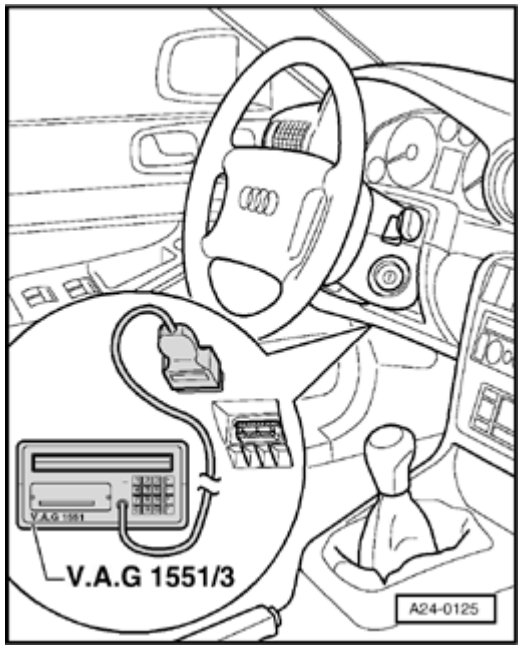
01-9



- With ignition switched off, connect VAG1551 Scan Tool (ST) to Data Link Connector (DLC) with cable VAG1551/3.

01-10

1997 ➢ vehicles



- With ignition switched off, connect VAG1551 (VAG1552) scan tool to 16-pin Data Link Connector (DLC) under dash to left of steering column, using adapter cable VAG1551/3.

All vehicles

V.A.G - ON BOARD DIAGNOSTIC HELP

1 - Rapid data transfer

2 - Blink code output

Indicated on display 1)

1) Operating modes 1 and 2 are displayed alternately

- Switch on printer with -PRINT- button (indicator lamp in switch will light up).
- Switch on ignition or start engine.
- Switch A/C compressor on (press "AUTO" button).

01-11

- Press button -1- for operating mode "Rapid data transfer."

Rapid data transfer HELP **Enter address word XX**	Indicated on display

Notes:

If display is blank, check wiring to VAG1551/power supply using Troubleshooting Procedure No. 1 in "Electrical Wiring Diagrams, Troubleshooting and Component Locations" Manual.

- *Additional operating instructions can be obtained by pressing the HELP button on VAG1551 Scan Tool (ST)*
- *During testing procedures, the→ button advances the program to the next step*
- *An incorrect entry can be cancelled with the -C- button*

Address word for A/C Heating Electronics: 08

- Press buttons -0- and -8-.

Rapid data transfer Q **08 - A/C Heating Electronics**	Indicated on display

- Press -Q- button to confirm input.

01-12

If one of the following messages is displayed:

Rapid data transfer HELP
Control module does not answer

Indicated on display

or

Rapid data transfer HELP
K wire not switching to B+

Indicated on display

- Press HELP button to print out list of possible causes.

Rapid data transfer →
No signal from control module

- Check wiring to Data Link Connector (DLC) according to wiring diagram ⇒ Electrical Wiring Diagrams, Troubleshooting & Component Locations binder.

Rapid data transfer →
Error in communication link

If this display appears at the beginning of or during the OBD program, malfunctions have occurred and data transfer is no longer possible between the VAG1551 Scan Tool (ST) and the A/C control head -E87-.

- Check wiring to DLC.

⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations binder*

Rapid data transfer Q
08 - A/C Heating Electronics

- After repairing possible causes of the malfunction, press buttons -0- and -8- to insert "AC/Heating Electronics" address word 08.
- Press -Q- button to confirm input.

Rapid data transfer
Scan Tool sends address word 08

Indicated on display

01-13

8D0820043D A4-Klimavollautomat DXX

→ Coding 00062 WSC ZZZZZ

Indicated on display after approx. 5 seconds

- 8D0 820 043 D: Part Number of A/C control head -E87-
- A4: A/C Heating Electronics component designation
- DXX: Software version of A/C control head -E87-
- Coding: 00062
- WSC 06812: Dealership code

Readout example shows US/CDN version, Zexel A/C compressor, 6 cylinder gasoline engine

Coding -E87- and code tables ⇒ **page 01-57** **.**

8L0 820 043B A4-A/C fully automatic DXX

Coding XXXXX WSC ZZZZZ

For m.y. 1997 vehicles install only A/C control head -E87- with Part No. 8L0 820 043 up to and including Part No. index letter "C."

8L0 820 043D A4-A/C fully automatic DXX

Coding XXXXX WSC ZZZZZ

For vehicles beginning m.y. 1998 install only A/C control head -E87- with Part No. 8L0 820 043 from Part No. index letter "D."

CAUTION!

Part numbers are listed here for reference only. Always check with your Parts department for the latest information.

01-14

Part number	Comments
8D0 820 043 D - G	♦ Regulation is only switched off in On Board Diagnostic (OBD) during output diagnostic test mode and basic setting. ♦ For vehicles with 6 cylinder engines, must only be combined with Zexel compressor.
8D0 820 043 after H	For all vehicles up to m.y. 96.
8L0 820 043 A - C	For all vehicles up to m.y. 97 (lighting via terminal 58 and 58d)
8L0 820 043 after D	For all vehicles up to m.y. 98 without radio navigation system up to VIN 199999 of m.y. 1999 (lighting indirectly activated via terminal 58s).
8D0 820 043 K or L	Version with only one display (for vehicles with radio navigation system up to VIN 199999 of m.y. 1999)
8D0 820 043 after M	Version with only one display (for vehicles as of VIN 200000 of m.y. 1999)

01-15

Notes:

- *Zexel A/C compressors were installed from start of production. During m.y. 1996, Nippondenso type compressors are installed as a running change. These compressors are not equipped with A/C speed sensor G111.*
- *The A/C control head is coded to reflect the compressor type installed (Zexel or Nippondenso).*
- *Vehicles equipped with Nippondenso (Denso) compressors must have A/C control head with Part No. index "H" or higher installed to allow for correct coding.*
- *Follow coding exactly when replacing an A/C control head -E87-.*

⇒ *Parts catalog microfiche*

- *A/C control head varies after VIN 200000 of m.y. 1999 for vehicles with and without radio navigation system (or a radio with a large control panel), with and without switch for heated seats (e.g. index "M", "N", "P" or "Q").*

⇒ *Parts catalog microfiche*

- *Depending on VAG1551 Scan Tool (ST) program card version, 1st and 2nd digit may not be displayed (readout: e.g. 040 instead of 00040).*

- *Software version of control head is of no significance for service department.*

- *If a replacement control head is not coded after installation or if an unrecognized code was entered, code "00042" (4-cyl. gasoline engine USA) is stored.*

Safety precautions

If special testing equipment is required during road test, note the following:

WARNING!

- ***Special testing equipment must always be secured on the back seat and must be operated from there by a 2nd person.***

- ***If special testing equipment were to be operated from the passenger seat, there could be injuries to the person seated there in the event of an accident and air bag deployment.***

01-17

On Board Diagnostic (OBD) functions

A list of On Board Diagnostic functions can be printed out by pressing the HELP button.

The following functions are available:

List of functions	Page
01 - Check Control Module Versions	⇒ Page 01-8
02 - Check DTC Memory	⇒ Page 01-18
03 - Output Diagnostic Test Mode	⇒ Page 01-42
04 - Basic Setting	⇒ Page 01-52
05 - Erase DTC Memory	⇒ Page 01-55
06 - End Output	⇒ Page 01-56
07 - Code Control Module	⇒ Page 01-57
08 - Read Measuring Value Block	⇒ Page 01-63

Only the functions listed above can be used for the "AC/Heating Electronics" OBD program.

- Press → button.

Rapid data transfer **HELP**	
Select function XX	

Indicated on display

01-18

Check DTC Memory (function 02)

- Press buttons -0- and -8- to insert "AC/Heating Electronics" address word 08 and advance program until "Select function XX" appears on display ⇒ page01-17 .

- Switch printer on by pressing PRINT button (indicator lamp in button comes on).

Rapid data transfer HELP **Select function XX**	➢ Indicated on display (function selection)

- Press buttons -0- and -2- to select "Check DTC Memory" function 02.

Rapid data transfer Q **02 - Check DTC Memory**	➢ Indicated on display

- Press -Q- button to confirm input.

Rapid data transfer Q **X DTC recognized**	➢ Number of stored DTCs is displayed

- Press→ button.

Rapid data transfer Q **No DTC recognized**	➢ If "No DTC recognized" is displayed, the program returns to the starting position after→ button is pressed ⇒ page 01-20 .

- Press→ button.

Notes:

- *If the printer is switched on, stored DTCs are displayed and printed*

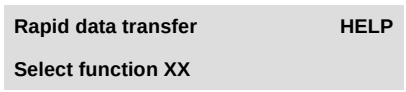
out in sequence.

- *If the printer is switched off, the → button must be pressed in order to display the next DTC.*

01-19

If DTC are displayed:

- Refer to DTC table and check and repair as instructed ⇒ page 01-22 .
- Operate A/C system and check DTC memory (function 02) to confirm repair.
- Erase DTC memory (function 05).
- Confirm A/C control head -E87- coding (function 01), and if necessary code -E87- (function 07).
- Perform basic setting (function 04).
- Check DTC memory (function 02), if malfunctions are stored, erase DTC memory (function 05).
- VAG1551 Scan Tool (ST) can be returned to the function mode by pressing the → button.



Indicated on display (function selection)

- End output (function 06) ⇒ page 01-56 .
- Switch ignition off and disconnect VAG1551 Scan Tool (ST) from Data Link Connector (DLC).

01-20

If no DTC are displayed and A/C system complaints exist (e.g. compressor does not run or only occasionally, system control unsatisfactory, speed of fresh air blower cannot be regulated etc.):

- Read measuring value block (function 08).
- Perform Output Diagnostic Test Mode (DTM) (function 03).
- Check A/C system cooling performance ⇒ page 87-213 .
- VAG1551 Scan Tool (ST) can be returned to the function mode by pressing the → button.

Rapid data transfer **HELP**	
Select function XX	

Indicated on display (function selection)

- End output (function 06) ⇒ page 01-56 .
- Switch ignition off and disconnect VAG1551 Scan Tool (ST) from Data Link Connector (DLC).

01-21

Notes:

- *1997 ➢ If A/C control head -E87- is unable to determine the duration of time when ignition is off ("standing time"), DTC 01206 "signal for time span ignition off" is loaded into memory. The A/C control head will then default to a standing time greater than 4 hours. The actual measured values of the outside temperature sensor are then used as instantaneous outside and engine temperature inputs for A/C system control. When the "heating" mode is selected under these conditions, fresh air blower -V2- has a delayed start (even when the actual standing time is less than 4 hours and the engine is warm) ⇒ page 01-86 , Read Measuring Value Block. The outside air temperature display -G106- may also indicate incorrect outside temperature values.*

- *If both display fields of the A/C control head do not light with ignition switched on check control head coding ⇒ Page 01-57 .*

01-22

Diagnostic Trouble Code (DTC) table

Notes:

- *DTC changes affecting m.y. 1997 ➢ vehicles ⇒ page 01-38 .*
- *Diagnostic Trouble Codes (DTC) recognized by A/C control head -E87- and displayed on VAG1551 Scan Tool (ST) ⇒ starting on page 01-24 .*
- *If malfunctions occur only occasionally or if the DTC memory was not erased after repairs, such DTC are displayed as "sporadic faults." (The contents of DTC memory is retained until erased, "permanent memory").*
- *DTCs and flash codes (only for specific components) appear only in the printout in operating mode -1-, (Rapid data transfer).*
- *In addition to displayed DTC and affected component descriptions, malfunction cause information is listed in the table below the DTC code.*
- *After performing repairs and operating the A/C system, DTC memory must always be checked again to confirm the repair.*
- *Before replacing a suspected malfunctioning component, check all appropriate wiring, connections, harness connectors and Ground (GND) connections.*
- *When checking for the cause of sporadic faults, check all plug connections and wiring between A/C control head -E87- and any component recognized as being inoperative using wiring diagram.*
- *After replacing AC/heating system components, always perform basic setting (function 04), check DTC memory (function*

02). After repair, erase DTC memory and end output (functions 05 and 06).

- *Use VAG1598 Test Box with cables VAG1598/11 and VAG1598/12 when testing DTC related wiring/connections to A/C control head -E87- and always refer to current wiring diagram.*

- *If A/C control head -E87- continues to operate after ignition is switched off, check wiring to -E87- terminal -D1- for short circuit to positive using wiring diagram.*

01-23

Notes

- *If 22 ° C (72 ° F) is always displayed after switching ignition off and on, regardless of last setting, check power supply (terminal 30) to A/C control head -E87- using wiring diagram.*
- *If a malfunction is recognized at an air/temperature distribution flap motor potentiometer, air distribution can be altered by pressing buttons on A/C control head -E87-.*
- *To switch display from ° C (Celsius) to ° F (Fahrenheit)(and vice versa), press "Temperature +" button while holding "recirculating air" button.*
- *If no DTC are displayed and air conditioning system complaints exist (e.g. compressor does not run or only occasionally, system control unsatisfactory, speed of fresh air blower cannot be regulated etc.), perform function 03 "Output Diagnostic Test Mode (DTM)" and 08 "Read Measuring Value block."*

01-24

VAG1551 scan tool display	Possible cause	Corrective action
00000 No DTC recognized	If "no DTC recognized appears after performing repairs, OBD is ended.	
00529 2122 Speed information missing /SP1)	- Open circuit in wiring between Engine Control Module (ECM), instrument cluster and A/C control head -E87- - ECM and instrument cluster supply an unusable engine speed signal	- Diagnose and repair open circuit in wiring using wiring diagram - Read measuring value block ⇒ page 01-63 - Test engine speed signal ⇒ Repair Manual, Fuel Injection & Ignition, Repair Group 24
00532 2234 Supply voltage Signal too low /SP	- Voltage drops in electrical system to levels of less than 9.5 V2) - Contact resistance in cable connection to A/C Refrigerant Low Pressure Switch -F73-	- Test Generator (GEN) and Voltage Regulator (VR) ⇒ Repair Manual, Engine Mechanical, Repair Group 27 - Diagnose and repair contact resistance using wiring diagram

1)This fault may be generated during Output Diagnostic Test Mode (DTM) (no engine speed signal recognized although A/C compressor speed detected).

2) If voltage at -E87-connector -C3- drops below 9.5 V, compressor switches off for a minimum of 25 seconds. Compressor switches on again when voltage exceeds 10.8 V.

01-25

VAG1551 scan tool display	Possible cause	Corrective action
00600 Temperature Regulator Flap Motor Position Sensor -G92- for Temperature Regulator Flap Motor V681) Short circuit to ground /SP Open circuit/short circuit to positive /SP Adaptation limit exceeded Mechanical malfunction.	- Short circuit, open circuit in wiring or incorrect terminal assignment (wires interchanged) of connectors between -G92- and -E87- - Temperature flap not operating freely - -G92- in -V68- inoperative	- Diagnose and repair short circuit, open circuit in wiring or confirm terminal assignment using wiring diagram - Check for free operation of temperature flap - Replace -V68-
00601 Central Flap Motor Position Sensor G112 in Central Air Flap Motor V70 Short circuit to ground /SP Open circuit/short circuit to positive /SP Adaptation limit exceeded2) Mechanical malfunction	- Short circuit, open circuit in wiring or incorrect terminal assignment (wires interchanged) of connectors between -G112- and -E87- - Central flap not operating freely - -G112- in V70 inoperative	- Diagnose and repair short circuit, open circuit in wiring or confirm terminal assignment using wiring diagram - Check for free operation of central flap3) - Replace -V70-

1)If a fault exists at potentiometer -G92-, flap motor V68 can be set manually by operating "+" or "-" button for temperature selection (display range between 0 ° C and 50 ° C).

2)This fault only recognized during the basic setting.

3)Both end stops must be reached.

01-26

VAG1551 scan tool display	Possible cause	Corrective action
00602 Footwell/Defrost Flap Motor Position Sensor G114 in Footwell/Defroster Flap Motor V85 Short circuit to ground /SP Open circuit/short circuit to positive /SP Adaptation limit exceeded1) Inoperative	- Short circuit, open circuit in wiring or incorrect terminal assignment (wires interchanged) of connectors between -G114- and -E87- - Footwell/defroster flap not operating freely - -G114- in -V85- inoperative	- Diagnose and repair short circuit, open circuit in wiring or confirm terminal assignment using wiring diagram - Check for free operation of footwell/defroster flap2) - Replace -V85-
00603 Footwell/Defroster Flap Motor V85 Blocks or de-energized /SP	- Short circuit, open circuit in wiring or incorrect terminal assignment (wires interchanged) of connectors between V85 and -E87- - Footwell/defroster flap flap not operating freely - -V85- inoperative	- Diagnose and repair short circuit, open circuit in wiring or confirm terminal assignment using wiring diagram - Check for free operation of footwell/defroster flap - Check -V85- using function 03 (Output DTM) ⇒ page 01-42

1)This fault only recognized during basic setting.

2) Both end stops must be reached.

01-27

VAG1551 scan tool display	Possible cause	Corrective action
00604 Back Pressure Flap Motor Position Sensor G113 in Air Flow Flap Motor V71 Short circuit to ground /SP Open circuit/short circuit to positive /SP Adaptation limit exceeded1) Inoperative	- Short circuit, open circuit in wiring or incorrect terminal assignment (wires interchanged) of connectors between -G113- and -E87- - Air flow flap not operating freely - -G113- in -V71- inoperative	- Diagnose and repair short circuit, open circuit in wiring or confirm terminal assignment using wiring diagram - Check for free operation of air flow flap2) - Replace -V71-
00625 Road speed signal Implausible signal /SP	- Loose terminal in wiring/connections between Speedometer Vehicle Speed Sensor (VSS) G22, the instrument cluster or in another component also connected to this signal (e.g. radio or control module for cruise control) and -E87- - Speedometer -G21- or instrument cluster supplying unusable signal or a component disrupts signal	- Diagnose and repair loose terminal using wiring diagram.

		- Test road speed signal from Speedometer G21 or from instrument cluster (check all components connected to this circuit using wiring diagram)

1)This DTC only recognized during basic setting.

2)Both end stops must be reached.

01-28

VAG1551 scan tool display	Possible cause	Corrective action
00779 3133 Outside Air Temperature Sensor G17 Short circuit to ground /SP Open circuit/short circuit to positive /SP	- Short circuit or open circuit between -G17- and -E87- - -G17- malfunction	- Diagnose and repair short circuit or open circuit in wiring using wiring diagram - -G17- electrical test ⇒ page 01-115
00785 3211 Instrument Panel Interior Temperature Sensor G56 Short circuit to ground /SP Open circuit/short circuit to positive /SP	- Short circuit or open circuit between -G56- and -E87- - -G56- malfunction	- Diagnose and repair short circuit or open circuit using wiring diagram - -G56- electrical test ⇒ page 01-115
00787 3213 Fresh Air Intake Duct Temperature Sensor G89 Short circuit to ground /SP	- Short circuit or open circuit between -G89- and -E87- - -G89- malfunction	- Diagnose and repair short circuit or open circuit in wiring using wiring diagram - -G89- electrical test ⇒ page 01-115

Open circuit/short circuit to positive /SP		

01-29

VAG1551 scan tool display	Possible cause	Corrective action
00797 3241 Sunlight Photo Sensor G107 Open circuit/short circuit to positive /SP Short circuit to ground /SP	- Short circuit or open circuit between -G107- and -E87- - Connections to -G107- interchanged - -G107- malfunction	- Diagnose and repair short circuit or open circuit in wiring using wiring diagram - Confirm connection using wiring diagram - Test G107 using function 08 (Read measuring value block) ⇒ page 01-63 - Replace -G107-
00799 3243 A/C Engine Coolant Temperature (ECT) Sensor G1101) Open circuit/short circuit to positive /SP Short circuit to ground /SP	- Short circuit or open circuit between -G110-1) and -E87- - -G110-1) malfunction	- Diagnose and repair short circuit or open circuit in wiring using wiring diagram - Test -G110-1) using function 08 (Read measuring value block) ⇒ page 01-63

1) Not on USA/CDN models.

01-30

VAG1551 Scan Tool display		Possible cause	Corrective action
00785 Instrument panel interior temperature sensor -G56-	3211	♦ Short circuit or open circuit between instrument panel interior temperature sensor -G56- and A/C control head -E87-	- Locate short circuit or open circuit using wiring diagram and repair
	Short circuit to Ground /SP Open/Short circuit to B+ /SP	♦ Instrument panel interior temperature sensor -G56- malfunctioning	- Check instrument panel interior temperature sensor -G56- ⇒ electrical testing, page 01-115

Note for DTC 00785:

For the A/C control head -E87-, the instrument panel interior temperature sensor -G56- is installed with only one display in the A/C control head -E87-. instrument panel interior temperature sensor-G56- cannot be checked or replaced individually, if malfunctioning replace A/C control head -E87- completely.

VAG1551 Scan Tool display		Possible cause	Corrective action
00796 6) Interior temperature sensor fan-V42	3234	♦ Open circuit in power supply to -V42- or in wiring connection between -V42- and -E87-	- Locate and repair open circuit using wiring diagram
	Blocked or no voltage /SP	♦ Interior temperature sensor fan -V42- malfunctioning	- Replace A/C control head -E87-

6) For an A/C control head -E87- with only one display, the interior temperature sensor fan -V42- is installed in the A/C control head -E87-; if malfunctioning replace complete unit.

01-31

VAG1551 scan tool display	Possible cause	Corrective action
00801 3311 A/C Refrigerant High Pressure Switch F118 Open circuit/short circuit to positive /SP	- Open circuit in wiring/connections between -F118- and -E87- - Malfunction in operation of coolant fan V7 (stage 1) - Condenser or radiator dirty - Malfunction of Coolant Fan V7 (stage 2) by A/C Refrigerant High Pressure Switch F23 - -F23-/-F118-1) malfunction - Refrigerant circuit malfunction	- Diagnose and repair open circuit in wiring using wiring diagram - Test fan operation V7 (stage 1) using function 03 (Output DTM) ⇒ page 01-42 - -V7- electrical test ⇒ page 01-115 - Clean condenser and radiator - Test V7 (stage 2) from -F23- ⇒ page 87-64 - Test F23/F118 ⇒ page 87-64 (switching pressures) - Check refrigerant system pressures ⇒ page 87-192 .

1)F118 and F23 are integrated into the same housing.

Note:

If an open A/C Refrigerant High Pressure Switch -F118- was recognized 30 times during a driving period (e.g. because of a loose contact), the compressor is switched off. Compressor can be switched on again by pressing "compressor on" button or by switching ignition off and on. If this fault occurs over several driving periods, compressor cannot be switched on again until DTC memory is erased.

01-32

VAG1551 Scan Tool Display	Possible cause	Corrective action
01044 Control module incorrectly coded	- Coding of A/C control head -E87- not performed according to specifications. - Wrong code entered.	- Code A/C control head -E87- according to specifications ⇒ page 01-61
01087 Basic setting not performed	- A malfunction occurred during the basic setting function or ignition was switched off and the A/C control head -E87- could not complete the function. - Basic setting was not performed after replacement of the A/C control head -E87-. - Basic setting was performed on a non-coded or incorrectly coded A/C control head -E87-.	- Check coding of A/C control head -E87- ⇒ page 01-61 - Perform basic setting of A/C control head -E87- ⇒ page 01-52 .

Note:

The DTCs "Incorrectly coded control module" and "Basic setting not performed" are only stored by A/C control heads -E87- with one display.

01-33

VAG1551 scan tool display	Possible cause	Corrective action
01270 4121 A/C Clutch N251) Open circuit /SP Continued on next page	- Short circuit or open circuit in wiring between A/C compressor speed sensor -G111-2/3) and -E87- - Open circuit in wiring between A/C Clutch Relay J44 and N25 - Open circuit in voltage supply or in wiring/connections between A/C clutch relay J44 and -E87- - J44 malfunction - N25 malfunction - Malfunction in refrigerant circuit (A/C Compressor Speed Sensor G111 not producing signals or compressor siezed2/3)	- Diagnose and repair short or open circuit in wiring using wiring diagram - -G111- electrical test ⇒ page 01-115 - Diagnose and repair open circuit using wiring diagram - Diagnose and repair open circuit using wiring diagram - Replace -J44- - Repair or replace -N25- ⇒ page 87-85 - Replace -G111- ⇒ page 87-63 - Replace compressor ⇒ page 87-38

1)During m.y. 1996, Nippondenso type A/C compressors were installed as a running change. These compressors are not equipped with A/C speed sensor G111. DTC at A/C Clutch -N25- are only detected only on compressors equipped with A/C Compressor speed sensor G111.

2)Sender G111 produces 4 pulses for each compressor revolution.

3)A/C Clutch is switched on for a few seconds after engine starts.

01-34

♦ *DTC 01270 continued*

VAG1551 scan tool display	Possible cause	Corrective action
01270 4121 A/C Clutch N251) Speed difference too great /SP3) Continued on next page.	- Ribbed belt loose, slipping - A/C control head -E87- not coded correctly - Loose terminal or contact resistance in circuit between -N25- and A/C clutch relay -J44- or in wiring/connections between -G111-2)4) and -E87- - N25 slipping - Incorrect crankshaft vibration damper (diameter) - Malfunction in refrigerant circuit (compressor not operating freely).	- Check belt tension ⇒ Repair Manual, Engine Mechanical, Repair Group 13 Compare speeds of engine and compressor using function 08 (Read measuring value block) ⇒ page 01-63 - Code A/C control head -E87- according to compressor type installed4) "Zexel" or "Nippondenso" ⇒ page 01-57 - Diagnose and repair circuit using wiring diagram and perform electrical tests ⇒ page 01-115 - -G111-, -J44- electrical test ⇒ page 01-115 - Repair or replace -N25- ⇒ page 87-85 - Check for proper vibration damper part number - Check compressor for free operation and replace if necessary ⇒ page 87-38

1/2) Continued from ⇒ page 01-33

3) If speed difference is 30 % to 60 %, A/C Clutch is switched on again by -E87- for not more than 9 times during a driving period (ignition off). If speed difference is greater than 60 %, A/C Clutch remains off until engine is started again.

4) A/C compressor speed sensor G111 is not installed on Nippondenso compressors. If A/C control head -E87- is not coded correctly according to compressor type, A/C Clutch -N25- will only engage briefly and shut off due to no speed signal input.

01-35

♦ *DTC 01270 continued*

VAG1551 scan tool display	Possible cause	Corrective action
01270 4121 A/C Clutch N251) Mechanical malfunction /SP2)	- Belt and coupling pulley of -N25- are stuck together - Short circuit to positive in wiring/connections between -N25- and for A/C Clutch relay -J44- - -J44- malfunction - Short circuit to ground in wiring/connections between -E87- and -J44-	- Repair or replace -N25- ⇒ page 87-85 - Diagnose and repair short circuit using wiring diagram - Replace -J44- - Diagnose and repair short circuit using wiring diagram.
01271 4122 Temperature Regulator Flap Motor V68 Blocks or de-energized /SP	- Short circuit, open circuit or incorrect terminal assignment (wires interchanged) of connectors between -V68- and -E87- - Temperature flap sticking - -V68- malfunction	- Diagnose and repair short circuit, open circuit or confirm terminal assignment using wiring diagram - Check for free operation of temperature flap - Test -V68- using function 03 (Output DTM) ⇒ page 01-42

1) Continued from ⇒ page 01-34 .

2) Compressor cannot be switched off (this fault is recognized only during Output Diagnosis Test Mode (DTM)).

01-36

VAG1551 scan tool display	Possible cause	Corrective action
01272 4123 Central Air Flap Motor -V70- Blocks or de-energized /SP	- Short circuit, open circuit in wiring or incorrect terminal assignment (wires interchanged) of connectors between -V70- and -E87- - Central flap sticking - -V70- malfunction	- Diagnose and repair short circuit, open circuit or confirm terminal assignment using wiring diagram - Check for free operation of central flap - Test -V70- using function 03 (Output DTM) ⇒ page 01-42
01273 4124 Fresh air blower V2 Control difference /SP	- Short circuit or open circuit in wiring between V2, control module for fresh air blower J126 and/or -E87- - Open circuit in voltage supply or ground connection to -J126- - -J126- malfunction - -V2- mechanical malfunction.	- Diagnose and repair short circuit or open circuit in wiring using wiring diagram - Diagnose and repair open circuit using wiring diagram - -J126- electrical test ⇒ page 01-115 - Replace -V2-
01274 4131 Air flow flap motor V71	- Short circuit, open circuit in wiring or incorrect terminal assignment (wires interchanged) of connectors between V71 and -E87- - Air flow flap sticking	- Diagnose and repair short circuit, open circuit or confirm terminal assignment using wiring diagram

Blocks or de-energized /SP	- -V71- malfunction.	- Check for free operation of air flow flap - Test -V71- using function 03 (Output DTM) ⇒ page 01-42

01-37

VAG1551 Scan Tool display	Possible cause	Corrective action
01582 Coolant Temperature Signal Short circuit to Ground /SP Open/Short circuit to B+ /SP Incorrect Signal /SP	♦ Short circuit or open circuit between instrument cluster and A/C control head -E87-	- Locate short circuit or open circuit according to wiring diagram and repair
	♦ Instrument cluster malfunctioning	- Check signal from instrument cluster.

Note:

The DTC "Coolant Temperature Signal" is only recognized by A/C control heads -E87- with one display.

01-38

Diagnostic Trouble Code (DTC) table, changes specific to vehicles 1997

Notes:

The following DTCs are no longer recognized beginning m.y. 1997:

- *00529 Speed info missing (sensor -G111- deleted).*
- *00799 A/C engine coolant temperature (ECT) sensor -G110- (sensor deleted).*
- *00801 A/C refrigerant high pressure switch -F118- (switch deleted).*
- *01270 A/C clutch -N25- (Sensor -G111- deleted).*

The following DTCs are new for 1997, or are current DTCs with additional references to 1997 changes. DTCs and component references include various malfuction causes in the display below the DTC, etc.

VAG1551 scan tool display	Possible cause	Corrective action
00604 Back Pressure Flap Motor Position Sensor -G113- in Air Flow Flap Motor -V71-1) Short circuit to ground /SP Open circuit/short circuit to positive /SP	- Short circuit, open circuit in wiring or incorrect terminal assignment (wires interchanged) of connectors between -G113- and -E87- - Air flow flap not operating freely - -G113- in -V71- inoperative	- Diagnose and repair short circuit, open circuit in wiring or confirm terminal assignment using wiring diagram - Check for free operation of air flow flap3) - Replace -V71-

Adaptation limit exceeded2) Inoperative		

1) For m.y. 1997, -V71- operates the air flow flap as well as the fresh/recirculated air flap.

2) This DTC only recognized during basic setting.

3) Both end stops must be reached.

01-39

VAG1551 scan tool display	Possible cause	Corrective action
00792 3224 A/C Pressure Switch -F129- Short circuit to ground /SP	- Open circuit in wiring/connections between -F129- and -E87- - Malfunction in operation of coolant fan -V7- (stage 1) - Condenser or radiator dirty. - Malfunction in operation of coolant fan -V7- (stage 2) by A/C pressure switch -F129- - -F129- malfunction - Excess or low refrigerant system pressure	- Diagnose and repair short or open circuit in wiring using wiring diagram. - Test fan operation -V7- (stage 1) using function 03 (Output DTM) ⇒ page 01-42 - -V7- electrical test ⇒ page 01-115 . - Clean condenser and radiator. - Test -V7- (stage 2) via A/C pressure switch -F129- ⇒ page 87-67). - Test -F129- ⇒ page 87-67 . - Check refrigerant system pressures ⇒ page 87-192 .

Notes:

- *A/C pressure switch -F129- contains 2 switching elements. Via terminals 1 & 2, the compressor is shut off due to low or excess refrigerant system pressure (switch open). Via terminals 3 & 4, the second speed coolant fan is switched on (switch closed).*

- *When -F129- terminals 1 & 2 open, excess refrigerant pressure is initially recognized by A/C control head -E87- and a DTC is stored. If the measured outside temperature is between 0° C & 50° C (32° F & 122° F) and -F129- terminals 1 & 2 remain open for longer than 30 seconds, -E87- switches over from excess pressure to low pressure (Low pressure switch function) ⇒ page 01-86 , Read measuring value block (Display group 01 compressor shut-off conditions).*

- *When -F129- is recognized to open 30 times during a driving period (Eg.: intermittent contact), the compressor is switched off. The compressor can be switched on again by pressing the "compressor on" button or by switching ignition off (and on). If this malfunction occurs frequently, the compressor can only be switched on after erasing the DTC memory.*

01-40

VAG1551 scan tool display	Possible cause	Corrective action
01206 Signal for time span ignition off1) implausible signal /SP	- Short or open circuit in wiring/connections between instrument cluster and -E87- - Instrument cluster malfunctioning.	- Diagnose and repair short or open circuit in wiring using wiring diagram. - Check signal from instrument cluster using function 08, Read measuring value block ⇒ page 01-86 .
01274 4131 Air Flow Flap Motor -V71- 2) blocked or no current /SP	- Short or open circuit in wiring/connections between -V71- and -E87-. - Air flap or fresh/recirculated air flap binding/sticking - -V71- malfunctioning.	- Diagnose and repair short or open circuit in wiring using wiring diagram. - Check air flap or fresh/recirculated air flap for ease of movement. - Check -V71- using function 03, Output Diagnostic Test Mode (DTM) ⇒ page 01-42 .

1) If A/C control head -E87- is unable to determine the duration of time when ignition is off ("standing time"), DTC 01206 "signal for time span ignition off" is loaded into memory. The A/C control head will then default to a standing time greater than 4 hours. The actual measured values of the outside temperature sensor are then used as instantaneous outside and engine temperature inputs for A/C system control. When the "heating" mode is selected under these conditions, the fresh air blower -V2- has a delayed start (even when the actual standing time is less than 4 hours and the engine is warm) ⇒ page 01-86 , Read measuring value block. The outside air temperature display -G106- may also indicate incorrect outside temperature values.

2) -V71- operates the air flow flap as well as the fresh/recirculated air flap.

01-41

VAG1551 scan tool display	Possible cause	Corrective action
01296 Sender for Outlet Temperature, Center -G191- Short circuit to ground /SP Open circuit/short circuit to positive /SP	- Short or open circuit in wiring/connections between -G191- and -E87- - Sensor -G191- malfunctioning	- Diagnose and repair short or open circuit in wiring using wiring diagram - -G191- electrical check ⇒ page 01-115
01297 Sender for Outlet Temperature, Floor Outlet -G192- Short circuit to ground /SP Open circuit/short circuit to positive /SP	- Short or open circuit in wiring/connections between -G192- and -E87-. - -G192- malfunctioning	- Diagnose and repair short or open circuit in wiring using wiring diagram. - -G192- electrical check ⇒ page 01-115
65535 A/C control head -E87- Malfunction	- Short or open circuit in wiring/connections between terminal -15- or -31- to -E87-, contact resistance or loose connection - -E87- malfunctioning	- Diagnose and repair short or open circuit in wiring to -E87- using wiring diagram - Replace A/C control head -E87-

Output Diagnostic Test Mode (DTM) (function 03)

Function

Output DTM allows functional checking of A/C control head actuated components (DTM components). Actuators receive output signals generated by the control head via VAG1551 Scan Tool (ST) in sequence. Function is confirmed in accordance with specified responses.

The following components are tested in sequence using Output DTM:

1 - A/C Clutch -N25-

2 - Fresh Air Blower -V2-

3 - Coolant Fan -V7-

4 - Fresh Air/Recirculating Flap Two-Way Valve -N63-1)

5 - Temperature Regulator Flap Motor -V68-

6 - Central Air Flap Motor -V70-

7 - Footwell/Defroster Flap Motor -V85-

8 - Air Flow Flap Motor -V71-

9 - Interior Temperature Sensor Fan -V42-

10 - A/C control head display segment test

11 - Outside Air Temperature Display -G106- test

1) Not installed on m.y. 1997 vehicles.

01-43

Notes:

- *During Output DTM on vehicles with Control Head (E87) Part Number 8D0 820 043 D, A/C Compressor Clutch (N25) DTC "01270, mechanical malfunction SP" may be stored even though no malfunction is present. Corrective action: When output DTM is complete, check DTC memory. If above DTC is present, erase DTC memory.*
- *When starting Output DTM, temperature and air distribution flap flap motors move to pre-determined positions in preparation for individual tests: Temperature Regulator Flap Motor V68: moves to "heat" position. Central Air Flap Motor - V70- moves to "floor & defroster outlet" position. Footwell Defroster Flap Motor V85 moves to "defrost" position.*
- *Output DTM can be repeated several times, if necessary.*
- *During Output DTM, vehicle must not be moved and engine speed must be less than 3000 rpm.*
- *During Output DTM, A/C system control is switched off and all segments in both A/C control head displays are actuated.*
- *Interior temperature sensor fan -V42- is activated via an A/C control head:*

with one display after activation of the coolant fan.

with two displays after activation of air flow flap motor.

- *Outside air temperature display -G106- is activated via an A/C control head*

with one display after activation of air flow flap motor.

with two displays after activation of idle regulation.

- *For the A/C control head -E87-, the instrument panel interior temperature sensor -G56- is installed with only one display in the -E87-. -V42- and -G56- are not individually replaceable. If -E87- is malfunctioning, they must be replaced together.*

- *A/C control heads with one display indicate that output diagnostic test mode is completed after activation of the last component ("END" is indicated on the Scan Tool display).*

01-44

Starting output Diagnostic Test Mode (DTM)

- Start engine, switch on compressor (press "Auto" button), adjust air flow to center instrument panel outlets only.

- Connect Scan Tool VAG1551 or 1552 in operating mode -1-, enter address word 08 "A/C Heating Electronics" and move forward in program until "select function XX" appears in the display.

- Switch on printer by pressing the PRINT button (indicator lamp in button comes on).

- Check DTC memory ⇒ page 01-18 .

- Note any stored DTCs for reference and move forward in program until "select function XX" appears in the display.

Rapid data transfer **HELP**	
Select function XX	

Indicated on display (function selection)

- Press buttons -0- and -3-.

Rapid data transfer **Q**	
03 - Output Diagnostic Test Mode	

Indicated on display

- Press -Q- button to confirm input.

Output Diagnostic Test Mode

A/C Clutch - N25

➢ Indicated on display

- Advance through all DTM component checks using → button.
- Refer to output DTM table ⇒ page 01-46 to confirm function of DTM components and test results.

01-45

Notes:

- *If a DTM component fails to respond as specified, perform all corrective actions, checks and tests recommended in output DTM table ⇒ page 01-46 .*
- *A/C system component locations: engine compartment ⇒ page 87-96 (note specific model year information).*
- *A/C system component locations: passenger compartment ⇒ page 87-106 (note specific model year information).*
- *Output DTM can be ended by pressing the -C- button.*
- *After ending output DTM, check DTC memory ⇒ page 01-18 .*
- *If the readout "function unknown or cannot be carried out at the moment" appears in the display at the start of output DTM, e.g. when engine not running, press → button and once again select "function 03 Output Diagnosis Test Mode (DTM)" (DTM component "A/C Clutch N25" is no longer actuated for this test).*

- *If the readout "function unknown or cannot be carried out at the moment" appears in the display ⇒ page 01-63 , Read measuring value block (display group 1).*

Function is unknown or cannot be carried out at the moment!

Indicated on display

- If this readout appears in the display, output Diagnostic Test Mode (DTM) is ended.
- VAG1551 Scan Tool (ST) can be returned to the function mode by pressing the → button.

01-46

Output Diagnostic Test Mode (DTM) table

VAG1551 scan tool display	Specified function	Corrective action
A/C Clutch N25 Notes:	- N25 clicks every 2-seconds - Output of A/C control head -E87- is switched from 0 V to 12 V every 2-seconds2)	- Test voltage supply for -N25- (via A/C Clutch Relay J44) using wiring diagram - Repair or replace -N25- ⇒ page 87-90 - Test circuit and connectors between A/C control head -E87-, J44 and -N25- using wiring diagram - Replace -E87-
♦ "A/C compressor on" output to Engine Control Module (ECM) and -E87- terminal -C12- is also actuated at the same time1)	♦ Output of -E87- switched from 0 V to 12 V every 2 seconds can be confirmed by switching compressor on and off using the "ECON" button while reading the measured value block of engine control module ⇒ Repair Manual, Fuel Injection and Ignition System, Repair Group 01)	

1)Test this "A/C compressor on" signal only if complaints exist. ECM uses signal to compensate for engine load when compressor engages ⇒ Repair Manual, "Fuel Injection & Ignition," Repair Group 24 .

ECM is capable of switching off the A/C compressor from this signal. Confirm via function 08, Read measuring value block, page ⇒ Page 01-63 , display group 01 and Fuel Injection and Ignition System Repair Manual, Repair group 01: Read measured value block of ECM with engine running and at same time switch compressor on and off.

2)A/C Clutch -N25- cannot be actuated during Output DTM when certain compressor cut-off conditions exist, ⇒ page 01-63 , Read measuring value block.

01-47

VAG1551 scan tool display	Specified function	Corrective action
Fresh Air Blower V2 **Caution:** **Coolant Fan coming on !**	- V2 runs for 2 seconds with 0V, 3V, 6V, 9V, 12V, 15V, 0V applied. **Warning:** **The next forwarding of program with the → button will cause Coolant Fan V7 to come on. Keep clear of Coolant Fan!**	- Check that fresh air blower operates freely - Test ground connection to Control Module for Fresh Air Blower J126 using wiring diagram - J126 electrical test ⇒ page 01-115 - Replace -E87-
Coolant Fan V7	- V7 (1st stage) switched on and off every 5 seconds	- Test wiring/connections between -E87- and J26 for open circuit or short circuit to positive using wiring diagram - Coolant Fan Control (FC) Relay J261) electrical test ⇒ page 01-115 - Replace -E87-
Fresh Air/Recirculating Flap Two-Way Valve N63 2)	- N63 switches from fresh air to recirculating air every 5 seconds	- Check vacuum supply to -N63- ⇒ page 87-187 - Test voltage supply to N63 and circuit to -E87- for open circuit or short circuit to ground using wiring diagram

		- Check vacuum unit for -N63- - Replace N63

1)Coolant fan 2nd stage is controlled by Second Speed Coolant Fan Control (FC) Relay J101:

When Coolant Fan Control (FC) Thermal Switch F54 closes and when A/C Refrigerant High Pressure Switch F23 closes

2)-N63- deleted for m.y. 1997

01-48

VAG1551 scan tool display	Specified function	Corrective action
Temperature Regulator Flap Motor V68 Note: ♦ Wait until temperature flap is in "heat" position before pressing → button	- V68 moves from stop to stop (fresh air blower running, temperature of air at outlets changes)	- Test wiring/connections between V68 and -E87- for open circuit or wrong connection using wiring diagram - Check for free operation of temperature flap - V68 electrical test ⇒ page 01-115 - Replace -E87-
Central Air Flap Motor V70 Notes: ♦ Wait until central flap is at "air distribution to footwell/ defroster flap" position before pressing → button ♦ Close all instrument panel air outlets.	- -V70- moves from stop to stop (fresh air blower running, air flow switches from footwell/defrost to instrument panel air outlets)	- Test wiring/connections between -V70- and -E87- for open circuit or wrong connection using wiring diagram - Check for free operation of central flap - -V70- electrical test ⇒ page 01-115 - Replace -E87-

01-49

VAG1551 scan tool display	Specified function	Corrective action
Footwell/Defroster Flap Motor V85 Note: ♦ Wait until footwell/defroster flap is at "defrost" stop before pressing → button.	- V85 moves from stop to stop (fresh air blower running, air flow switches from footwell to defrost)	- Test wiring/connections between V85 and -E87- for open circuit or wrong connection using wiring diagram - Check for free operation of footwell/defroster flap - V85 electrical test ⇒ page 01-115 - Replace -E87-
Air Flow Flap Motor V71 1)	- V71 moves from stop to stop (fresh air blower running, air flow changes)	- Test wiring/connections between V71 and -E87- for open circuit or wrong connection using wiring diagram - Check for free operation of air flow flap - V71 electrical test ⇒ page 01-115 - Replace -E87-

1) For m.y. 1997, -V71- operates the air flow flap as well as the fresh/recirculated air flap.

01-50

VAG1551 scan tool display	Specified function	Corrective action
Interior Temperature Sensor Fan V42	- V42 (for temperature sensor in instrument panel) is switched on and off every 5 seconds1)	- Test wiring/connections between V42 and -E87- for open circuit or short circuit to ground using wiring diagram - Test voltage supply for V42 using wiring diagram - Check intake slot and intake hose for restriction ⇒ page 87-145 - Replace -E87-

1)Confirm operation by blowing smoke over intake slot on center of instrument panel.

01-51

VAG1551 scan tool display	Specified function	Corrective action
Segment test	- All segments of A/C control head -E87- are switched on and off every 3 seconds	- Replace bulbs ⇒ page 87-126 - Replace -E87-
Outside Air Temperature Display G106 in Auto Check System1)	- Temperature display in Auto Check System1) begins counting up at 3 second intervals	- Test wiring/connections between -E87- and G106 for open circuit or short circuit using wiring diagram - Test positive and ground connections to G106 for open circuit using wiring diagram - Test Auto Check System1) - Replace -E87-

1) If equipped.

01-52

Basic setting (function 04)

- Connect Scan Tool VAG1551 or 1552, enter address word 08 "A/C Heating Electronics" and move forward in program until "select function XX" appears in the display.

- Switch on printer by pressing the PRINT button (indicator lamp in the button comes on).

- Check DTC memory (⇒ page 01-18) and repair all malfunctions which are displayed.

- Erase DTC memory ⇒ page 01-55 .

- Check coding (⇒ page 01-57) and re-code if necessary.

Rapid data transfer HELP **Select function XX**	Indicated on display (function selection)

- Press buttons -0- and -4-.

Rapid data transfer Q **04 - Basic Setting**	Indicated on display

- Press -Q- button to confirm input.

Start basic setting HELP **Input display number XXX**	Indicated on display

- Press buttons -0- and -1-.

- Press -Q- button to confirm input.

01-53

Note:

The following flap motors are actuated in sequence and end positions are stored in A/C control head -E87-:

- *Temperature Regulator Flap Motor -V68-*
- *Central Flap Motor -V70-*
- *Footwell/Defroster Flap Motor -V85-*
- *Air Flow Flap Motor -V71-*

End positions are determined from resistance values of potentiometers installed in the air/temperature flap flap motors.

Basic setting 1 **XXX XXX XXX XXX**	⮜	Indicated on display
Basic setting 1 **0 0 0 0**	⮜	Indicated on display

When all display fields indicate "0", basic setting is ended.

- Press → button.

01-54

Notes:

- *For m.y. 1996, because A/C engine coolant temperature sensor G110 is not installed on USA/CDN models, during basic setting, DTC "00799 engine coolant temperature sensor G110" is stored and must be erased.*

- *For m.y. 1997 A/C engine coolant temperature (ECT) sensor -G110- is deleted, and will no longer load a DTC when checking DTC memory after ending basic setting.*

- Check DTC memory ⇒ page 01-18 .

- Erase DTC memory (function 05) and end output (function 06) ⇒ page 01-55 .

01-55

Erase DTC Memory (function 05)

Requirements

- DTC Memory checked

Erasing DTC memory

- Press → button.

Rapid data transfer HELP **Select function XX**	⮜ Indicated on display

- Press buttons -0- and -5-.

Rapid data transfer Q **05 - Erase DTC Memory**	⮜ Indicated on display

- Press -Q- button to confirm input.

Rapid data transfer Q **DTC Memory is erased!**	⮜ Indicated on display

- Press → button.

Attention! **DTC Memory is not interrogated**	⮜ Indicated on display

Notes:

- *If display appears as shown, check DTC memory and follow test procedures carefully ⇒ page 01-18 .*
- *If ignition was switched off between "Check DTC Memory" and "Erase DTC memory," the memory is not erased. Check DTC memory once*

again.

01-56

End output (function 06)

Requirements:

- DTC Memory checked
- Malfunctions repaired
- Basic setting performed
- DTC memory erased
- A/C control head coding confirmed

Ending output

- Press → button.

Rapid data transfer HELP **Select function XX**	⮜	Indicated on display
		- Press buttons -0- and -6-.
Rapid data transfer Q **06 - End Output**	⮜	Indicated on display
		- Press -Q- button to confirm input.
Rapid data transfer HELP	⮜	Indicated on display

Enter address word XX

- Switch ignition off and disconnect VAG1551 Scan Tool (ST) from Data Link Connector (DLC).

01-57

Code Control Module (function 07)

A/C control head -E87- coding, vehicles 1996

Notes:

- *A/C control head coding 1997 ⇒ page 01-59 .*
- *A/C control head coding 1998 ⇒ page 01-61 .*

A/C control head -E87- coding shows market application, compressor type and engine type.

Notes:

- *Zexel A/C compressors are installed from start of production. During m.y. 1996, Nippondenso type compressors are installed as a running change. These compressors are not equipped with A/C speed sensor G111.*
- *Each time A/C control head -E87- is coded, basic setting must be performed ⇒ page 01-52 .*
- *If a the display of a newly installed A/C control head -E87- flashes after switching ignition on (for approximately 2 minutes), code the control*

head and execute basic setting.

- Connect Scan Tool VAG1551 or 1552 in operating mode -1-, enter address word 08 "A/C Heating Electronics" and move forward in program until "select function XX" appears in the display.

- Switch on printer by pressing the PRINT button (indicator lamp in button comes on).

01-58

Rapid data transfer	**HELP**
Select function XX	

Indicated on display

- Press buttons -0- and -7-.

Rapid data transfer	**Q**
07 - Code Control Module	

Indicated on display

- Press -Q- button to confirm input.

Code Control Module
Enter code number XXXXX

Indicated on display

- Press → button.

Coding m.y. 1996:

Code	Market	Compressor	Engine
00062	**USA/CDN**	**Zexel**	**6-cylinder gasoline**
00162	**USA/CDN**	**Nippondenso**	**6-cylinder gasoline**

Note:

Coding example, m.y. 1996: 0 0 1 6 2

0 = open

0 = open

1 = compressor w/o Compressor Speed Sensor -G111-

(0 = compressor with -G111-)

6 = 6-cyl. engine

2 = gasoline engine USA/CDN

01-59

A/C control head -E87- coding, vehicles 1997

Note:

A/C control head coding 1996 ⇒ page 01-57 .

Code	Market	Compressor	Engine
04142	USA/CDN	Zexel	4-cylinder gasoline
04162	USA/CDN	Nippondenso	6-cylinder gasoline

Note:

Coding example, m.y. 1997: 0 4 1 4 2

0 = open

4 = Audi A4

1 = compressor w/o compressor speed sensor - G111-

4 = 4-cyl. engine

(6 = 6-cyl. engine)

2 = gasoline engine USA/CDN

Notes:

- *A/C control heads beginning with Part No. 8L0 820 043 should only be installed in m.y. 1997 vehicles.*

- *If a replacement A/C control head -E87- is not coded after installation or if an unrecognized code was entered, code "04142" (Audi A4 4-cyl. - USA) is stored.*

01-60

CAUTION!

- ***Part numbers are for reference only.***
- ***Always check with your Parts Dept. for the latest information.***

Coding example:

- Enter code "00062" by pressing applicable buttons on key pad of VAG1551.

Code Control Module

Enter code number 00062

⇖ Indicated on display

- Press -Q- button to confirm input.
- Perform basic setting ⇒ page 01-52 .

Notes:

- *Nippondenso A/C compressors must have A/C control head Part No. index "H" installed to allow coding "00162."*
- *If an unrecognized code is entered in a control head, it is suppressed and coding "00042" (4-cyl. gasoline engine USA) is then stored.*
- *When replacing an A/C control head, always refer to the most recent parts information.*

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Part number	Comments
8L0 820 043 after D	For all vehicles up to m.y. 98 without radio navigation system up to VIN 199999 of m.y. 1999 (lighting indirectly activated via terminal 58s).
8D0 820 043 K or L	Version with only one display (for vehicles with radio navigation system up to VIN 199999 of m.y. 1999)
8D0 820 043 after M	Version with only one display (for vehicles as of VIN 200000 of m.y. 1999)

A/C control head -E87- (with one display), coding table vehicles 1998

Notes:

- *A/C control head coding 1996 ⇒ page 01-57 .*
- *The following coding table is only valid for A/C control heads with part number 8D0 820 043 after index "K." Additional coding tables and coding A/C control head -E87- ⇒ page 01-57 .*

A/C control heads -E87- with the part number 8D0 820 043 after index "K" have only one

display, they are installed in the following vehicles:

- *in vehicles with radio navigation system (implemented gradually in m.y. 1998)*
- *in vehicles with radio navigation system after VIN 200000 of m.y. 1999*

Code	Meaning
00	Place holder, unallocated
1	USA
4	4 cylinder engine
6	6 cylinder engine
0	Left Hand Drive gas engine

Coding example

00140	USA 4 cyl. Left Hand Drive gas engine
00160	USA 6 cyl. Left Hand Drive gas engine

01-63

Read Measuring Value Block (function 08)

Notes:

- *10 measuring value blocks each containing 4 measured values are available.*

When performing read measuring value block, function 08:

- *Control of A/C system is possible (compressor runs, air distribution control is possible etc.)*