Diagnosis – Diagnostic Trouble Code (DTC) Memory

Testing via temperature window display

This test is divided into the following test modes:

A. Continuous display, instantaneous display of actual temperature sensor readings, temperature selector wheel setting, vehicle speed, system voltage and soft top position.

B. Display of permanent and intermittent diagnostic trouble codes (DTC) stored in memory.

C. Testing the temperature sensors, potentiometer and feedback potentiometer.

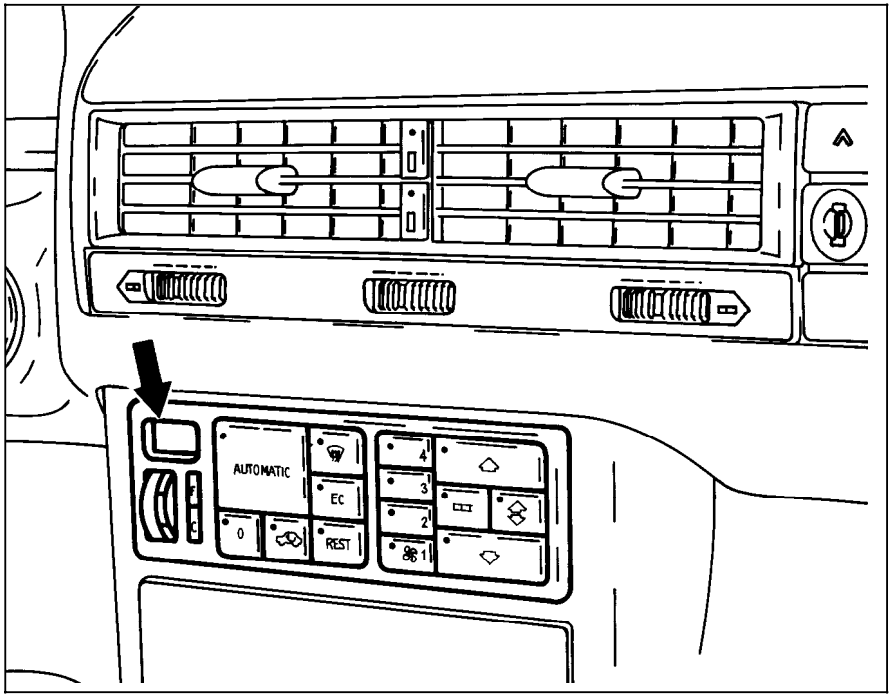

Figure 1

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Note:
If no DTC can be found when testing via the temperature window display and with the socket box, for example the footwell vacuum flap does not open, it is possible there is a leak in the vacuum system. Check vacuum system, see SMS job no. 83-520.

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Test mode A.

Note: To select this test mode

Ignition **ON**. Press REST, and within 1 second press blower speed button 4.
The temperature window (arrow) will alternately display the test step number "02" with the in-car temperature (in °C) or "OP E" if there is an open circuit or "CL 0" if there is a short circuit.
Press F to go to next higher test step, and
Press C to go to previous test step.
To exit this test mode, turn ignition **OFF** and wait 5 seconds

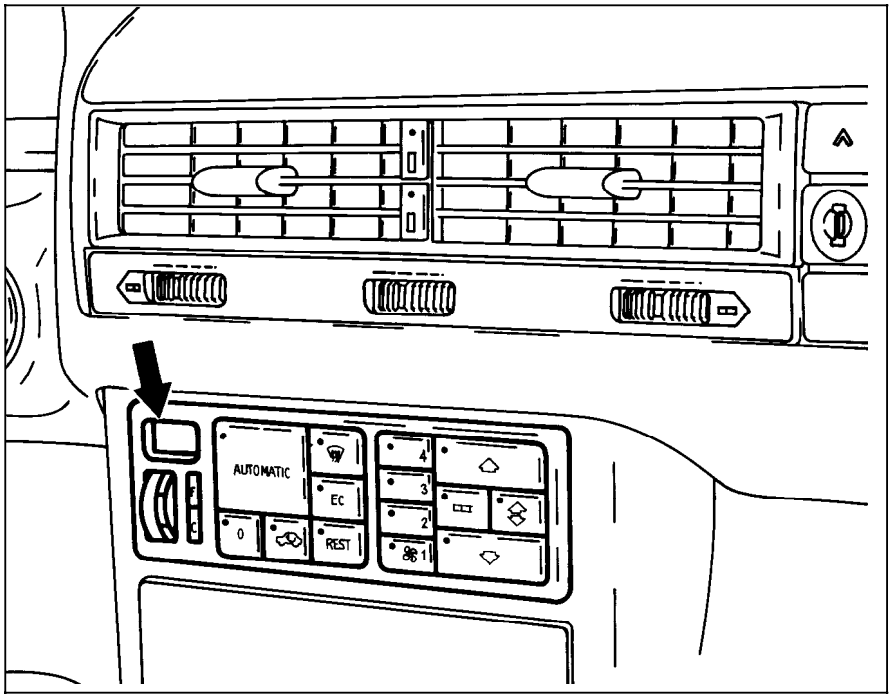

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Figure 2

Diagnosis – Diagnostic Trouble Code (DTC) Memory

Test step display	Possible Cause	Test Step/Remedy [1]
02	In – car temperature sensor	23 ⇒ 1.0
04	Outside temperature sensor	23 ⇒ 2.0
06	Evaporator temperature sensor	23 ⇒ 3.0
08	Heater core temperature sensor	23 ⇒ 4.0
12	ECT sensor	23 ⇒ 5.0
14	Temperature selector wheel setting (°C)	A/C pushbutton control module
18	Vehicle speed (km/h)	DM, Body and Accessories, Vol. 2 – 11.2
20	Soft top open U, soft top closed O	23 ⇒ 14.0
22	System voltage	23 ⇒ 16.0 – 17.0
83	OFF/ON (not used)	–
84 [2]	Blower voltage 050 (0.5 V) – 600 (6.0 V)	23 ⇒ 22.0

1) Observe Preparation for Test, see 22.
2) Starting approximately 11/91.

Diagnosis – Diagnostic Trouble Code (DTC) Memory

Test modes

B. Display of permanent and intermittent DTC's stored in memory.
C. Testing the temperature sensors, potentiometer and feedback potentiometer

Notes for Diagnosis

- The A/C pushbutton control module (N22) has DTC memory and the capability to display the codes via the temperature display window (arrow) on the A/C pushbutton control panel. The stored DTC's will remain in memory even with the vehicle battery disconnected.

- The DTC readout displays permanent as well as intermittent fault codes. The number "01" indicates that there are no stored fault codes in the systems memory. All other numbers refer to a specific fault code source.

- The display window will show in sequence the actual temperatures of the individual sensors and the voltages at the potentiometers and feedback potentiometers. Thereby allowing the tolerance range of the temperature sensors and the adjustment of the feedback potentiometers to be checked.

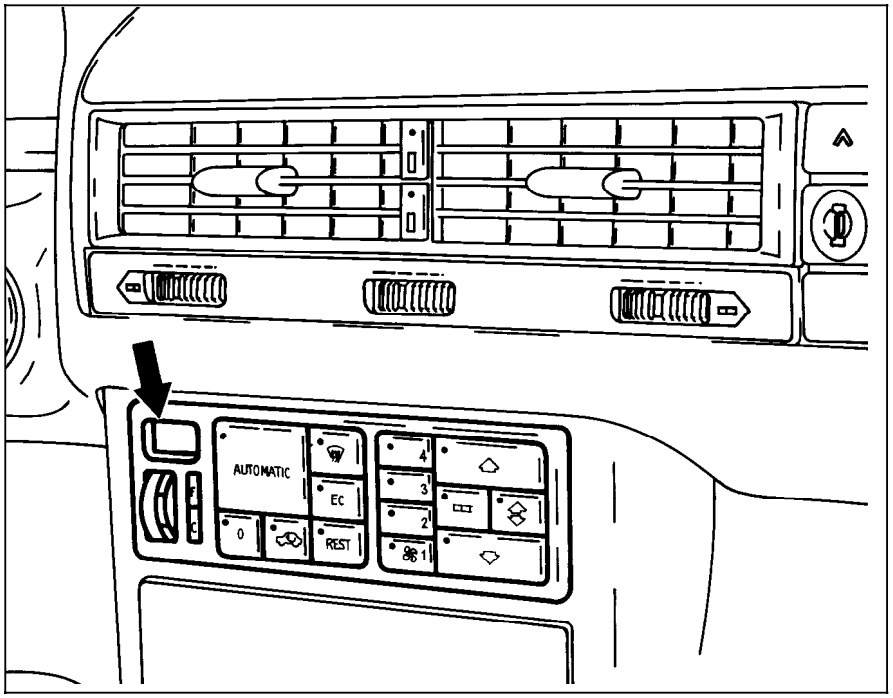

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Figure 3

Diagnosis – Diagnostic Trouble Code (DTC) Memory

Test preparations for test modes B. and C.

- Turn temperature selector wheel to white field.
- Turn ignition "**ON**" and within 10 seconds press F, and REST **simultaneously** for 2 to 4 seconds.
- The display will show permanent DTC's stored in memory. After each DTC is displayed and recorded, press again until the display reads "End".
- Press once again. Now the stored intermittent DTC's will be displayed. The symbol will appear after each DTC to indicate an intermittent fault. After each DTC is displayed and recorded, press again unttil the dissplay reads "End".
- Press once again. The display will alternately blink the number "02" and the in – car temperature in °C. Press until all temperature sensor display numbers from 02 – 12 are shown (see section C).
  Press once again and the display will alternately blink the number "16" and the voltage of the potentiometer for the center air outlet flap dependent upon the setting (open or closed). The voltage, for example, for 3.5 V is displayed as "35u". Press until all potentiometer and feedback potentiometer display numbers from 16 – 26 are shown. Press until the display reads "End" and the symbol blinks.
- Turn ignition OFF and repair recorded DTC's.

Note:
The DTC's can be redisplayed as often as desired. To do so, turn ignition OFF and ON and within 10 seconds press F, and REST **simultaneously** for 2 to 4 seconds and then press only . The light diode inside will blink once per second during the impulse readout.

Erasing DTC's

- Turn ignition ON and within 10 seconds press , REST and **simultaneously** for 2 to 4 seconds until "– – –" appears on the display.

Verification

- Repeat readout of DTC's. The number "01" (no fault) must appear in the display window.

Electrical Wiring Diagrams:
See "Electrical Troubleshooting Manual", Model 129

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B. DTC readout with permanent and intermittent faults

Diagnostic Trouble Code (DTC)	Possible Cause	Test Step/Remedy [1]
01	No stored DTC's in system memory	–
02	In – car temperature sensor (B10/4), short circuit	23 ⇒ 1.0
03	In – car temperature sensor (B10/4), open circuit	23 ⇒ 1.0
04	Outside temperature sensor (B10/5), short circuit	23 ⇒ 2.0
05	Outside temperature sensor (B10/5), open circuit	23 ⇒ 2.0
06	Evaporator temperature sensor (B10/6), short circuit	23 ⇒ 3.0
07	Evaporator temperature sensor (B10/6), open circuit	23 ⇒ 3.0
08	Heater core temperature sensor (B10/1), short circuit	23 ⇒ 4.0
09	Heater core temperature sensor (B10/1), open circuit	23 ⇒ 4.0
12	ECT sensor (B10/8), short circuit	23 ⇒ 5.0
13	ECT sensor (B10/8), open circuit	23 ⇒ 5.0
16	Center air outlet adjuster (N18/2r2), short circuit	23 ⇒ 7.0

[1] Observe Preparation for Test, see 22.

Diagnosis – Diagnostic Trouble Code (DTC) Memory

Diagnostic Trouble Code (DTC)	Possible Cause	Test Step/Remedy [1]
17	Center air outlet adjuster (N18/2r2), open circuit	23 ⇒ 7.0
18	Center air outlet feedback potentiometer (R23/3), short circuit	23 ⇒ 12.0
19	Center air outlet feedback potentiometer (R23/3), open circuit	23 ⇒ 12.0
20	Left air outlet adjuster (N18/2r1), short circuit	23 ⇒ 6.0
21	Left air outlet adjuster (N18/2r1), open circuit	23 ⇒ 6.0
22	Left air outlet feedback potentiometer (R23/1), short circuit	23 ⇒ 11.0
23	Left air outlet feedback potentiometer (R23/1), open circuit	23 ⇒ 11.0
24	Right air outlet adjuster (N18/2r3), short circuit	23 ⇒ 8.0
25	Right air outlet adjuster (N18/2r3), open circuit	23 ⇒ 8.0
26	Right air outlet feedback potentiometer (R23/2), short circuit	23 ⇒ 13.0
27	Right air outlet feedback potentiometer (R23/2), open circuit	23 ⇒ 13.0
30	Auxiliary coolant pump (M13), short circuit	23 ⇒ 20.0

[1] Observe Preparation for Test, see 22.

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Diagnostic Trouble Code (DTC)	Possible Cause	Test Step/Remedy [1]
31	Automatic A/C monovalve (Y19), short circuit	23 ⇒ 19.0
33	A/C compressor signal, short circuit	23 ⇒ 25.0
34	Auxiliary fan signal, 2nd stage, short circuit	23 ⇒ 24.0
35	Auxiliary fan signal, 1st stage, short circuit	23 ⇒ 23.0
36	Not used	–
50	Switchover valve block (Y11), short circuit	23 ⇒ 21.0
70	Auxiliary coolant pump (M13), open circuit	23 ⇒ 20.0
71	Automatic A/C monovalve (Y19), open circuit	23 ⇒ 15.0
73	A/C compressor signal, open circuit	23 ⇒ 25.0
74	Auxiliary fan signal, 2nd stage, open circuit	23 ⇒ 24.0
75	Auxiliary fan signal, 1st stage, open circuit	23 ⇒ 23.0

1) Observe Preparation for Test, see 22.

Diagnosis – Diagnostic Trouble Code (DTC) Memory

C. Readout of momentary sensor temperatures as well as potentiometer and feedback potentiometer voltages.

Test step	Test scope	Test connection	Nominal value	Test step/Remedy
02	In – car temperature sensor	Press	Indicated value may deviate by no more than ± 1 °C	23 ⇒ 1.0
04	Outside temperature sensor	Press	Indicated value may deviate by no more than ± 3 °C	23 ⇒ 2.0
06	Evaporator temperature sensor	Press	Indicated value may deviate by no more than ± 3 °C	23 ⇒ 3.0
08	Heater core temperature sensor	Press	Indicated value may deviate by no more than ± 3 °C	23 ⇒ 4.0
12	ECT sensor	Press	Indicated value may deviate by no more than ± 3 °C	23 ⇒ 6.0

Diagnosis – Diagnostic Trouble Code (DTC) Memory

Test step	Test scope	Test connection	Display	Nominal value	Test step/Remedy
16	Center air outlet adjuster	Move center air outlet adjuster completely to the right (outlet closed)	06 – 09 U	0.6 – 0.9 V	23 ⇒ 8.0
		Move center air outlet adjuster completely to the left (outlet open)	39 – 45 U	3.9 – 4.5 V	
18	Center air outlet feedback potentiometer	Move center air outlet adjuster completely to the right (outlet closed)	07 – 11 U	0.7 – 1.1 V	23 ⇒ 13.0
		Move center air outlet adjuster completely to the left (outlet open)	35 – 48 U	3.5 – 4.8 V	
20	Left air outlet adjuster	Move left air outlet adjuster completely to the right (outlet closed)	06 – 09 U	0.6 – 0.9 V	23 ⇒ 7.0
		Move left air outlet adjuster completely to the left (outlet open)	39 – 45 U	3.9 – 4.5 V	

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Test step	Test scope	Test connection	Nominal value	Possible cause/Remedy
22	Left air outlet feedback potentiometer	Move left air outlet adjuster completely to the right (outlet closed) Move left air outlet adjuster completely to the left (outlet open)	07 – 11 U 0.7 – 1.1 V 35 – 48 U 3.5 – 4.8 V	23 ⇒ 12.0
24	Right air outlet adjuster	Move right air outlet adjuster completely to the right (outlet closed) Move right air outlet adjuster completely to the left (outlet open)	06 – 09 U 0.6 – 0.9 V 39 – 45 U 3.9 – 4.5 V	23 ⇒ 9.0
26	Right air outlet feedback potentiometer	Move right air outlet adjuster completely to the right (outlet closed) Move right air outlet adjuster completely to the left (outlet open)	07 – 11 U 0.7 – 1.1 V 35 – 48 U 3.5 – 4.8 V	23 ⇒ 14.0