



6 Air conditioning

62B AUTOMATIC AIR CONDITIONING

CB1U - CB1H

77 11 319 942

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EDITION ANGLAISE

*The repair methods given by the manufacturer in this document are based on the technical specifications current when it was prepared.

The methods may be modified as a result of changes introduced by the manufacturer in the production of the various component units and accessories from which his vehicles are constructed.

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Air conditioning

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This document contains the special fault finding procedures applicable to all automatic climate control computers fitted on CLIO II V6 phase II.

In order to implement fault finding on this system, it is essential to have the following items available:

- This section of the Workshop Repair Manual,
- The wiring diagram of the function for the vehicle concerned,
- The CLIP or NXR diagnostic tool,
- A control bornier.

GENERAL APPROACH TO FAULT FINDING

- Use one of the diagnostic tools to identify the heating and ventilation system equipping the vehicle (to read the computer family, the program number, the Vdiag, etc.).
- Find the Fault finding documents corresponding to the system identified.
- Take note of information contained in the introductory sections.

DESCRIPTION OF THE FAULT FINDING PHASES

1 - CHECKING THE FAULTS

It is essential to start with this stage before any work is done on the vehicle.

- Read the faults stored in the computer memory and use the Interpretation of Faults section of the documents.
Reminder: Each fault is interpreted for a particular type of storage (fault present, fault stored in memory, fault present or stored). The checks defined for dealing with each fault are therefore only to be performed if the fault declared by the diagnostic tool is interpreted in the document for its type of storage. The type of storage should be considered when using a diagnostic tool after switching the ignition off then on again.
If a fault is interpreted when it is declared as stored, the conditions for applying fault finding appear in the NOTES box. If the conditions are not satisfied, use the fault finding strategy to check the circuit of the faulty part since the fault is no longer present on the vehicle. Perform the same operation when a fault is declared as stored by the diagnostic tool but is only interpreted in the documentation as a present fault.

2 - CONFORMITY CHECK

The conformity check is designed to check the states and parameters which do not display any faults on the diagnostic tool when they are outside the permitted tolerance values. This phase therefore allows:

- Fault finding on faults which are not displayed but which may correspond to a customer complaint.
- Checks the reliability of the heating and ventilation system and ensures that a fault will not reappear after repair.

This section gives the fault finding procedures for states and parameters and the conditions for checking them. If a state is not operating normally or a parameter is outside permitted tolerance values, you should consult the corresponding fault finding page.

3 - RECTIFYING THE CUSTOMER COMPLAINT

If the diagnostic tool check is correct, but the customer complaint is still present, the fault should be dealt with according to the customer complaint.

This section has fault finding charts, which suggest a series of possible causes of the fault. These lines of investigation must only be used in the following cases:

- No fault observed on diagnostic tool.
- No fault detected during conformity check.
- The heating and ventilation system is not working correctly.

4 - SPECIAL FEATURES

The heating and ventilation system cold loop is controlled by the injection computer (compressor control, control of the coolant pressure sensor and the engine cooling fan).

The climate control computer controls the compressor by means of a wire connection between the two computers.

If a fault is detected during the heating and ventilation diagnostic procedure but the compressor is not engaged, a diagnostic procedure should be performed on the injection (refer to customer complaints).

- **NO SPECIAL PROGRAMMING IS REQUIRED** (mixing and distribution motors program their stops automatically on ignition, after they are replaced or the battery has been disconnected).

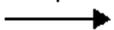
NOTE: when the distribution and mixer motors are at the minimum or maximum limit, they undergo dynamic adjustment (programming travel). This programming operation causes **a slight noise** that may lead customers to complain.

If the customer complains about the noise, explain that it is normal and necessary for automatic air conditioning control **in order to maintain optimum levels of performance**.

- **THE CLIMATE CONTROL COMPUTER HAS NO CONFIGURATION SERVICE.**

5 - COMPUTER CONNECTOR DESIGNATIONS

The automatic climate control computer has two connectors:

- a grey 30-track connector  connector A
- a red 15-track connector  connector B

Fault finding - Interpretation of faults

DF001 PRESENT OR STORED	<u>COMPUTER</u>
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NOTES	None.
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The computer fault indicates an internal memory fault.
Try to **clear the fault** and run the heating and ventilation system.

If the fault reappears, check **the connection and condition** of the heating and ventilation system control panel connectors.
Repair if necessary.

Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connections:

Computer connector B track 15	—————▶	earth
computer connector A track 7	—————▶	earth
computer connector A track 3	—————▶	+ accessories
computer connector A track 29	—————▶	+ after ignition

Repair if necessary (see vehicle wiring diagrams).

If the fault is still present, **replace the climate control computer** (control panel).

AFTER REPAIR	Clear the fault memory. Deal with any other possible faults.
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Fault finding - Interpretation of faults

DF007 PRESENT OR STORED	<u>INTERIOR TEMPERATURE SENSOR CIRCUIT</u> CO : Open circuit CC : Short circuit
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NOTES	Special features: The interior temperature sensor (linked to a small ventilation fan) is located above the roof in the interior lighting unit.
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Check the connection and condition of the interior temperature sensor connector. Replace the connector if necessary.
With the ignition on, check that the temperature sensor fan is operating correctly . If not, check for the presence of +12 volts on track 1 of the temperature sensor connector and an earth on track 3 . If the blower supply is correct and the blower is not working, replace the sensors/blower assembly (the blower is not available separately).
Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connections: <p style="text-align: center;"> computer connector A track 4 \longrightarrow track 4 of the temperature sensor computer connector A track 21 \longrightarrow track 6 of the temperature sensor </p> Repair if necessary.
Check the resistance value of the sensor: Track 4 and track 5 of the interior temperature sensor connector, replace the sensor if the resistance is not approximately: 10 kΩ \pm 500 Ω at 25°C (for greater precision, refer to the HELP section on sensor electrical specifications according to temperature).
If the fault is still present, replace the interior temperature sensor.

AFTER REPAIR	Clear the fault memory. Deal with any other possible faults.
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Fault finding - Interpretation of faults

DF010 PRESENT OR STORED	<u>MIXER MOTOR CIRCUIT</u>
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NOTES	<p>Conditions for applying the fault finding procedure to stored faults: The fault is declared present when the air conditioning control panel is lit and the temperature control activated (minimum or maximum temperature request).</p>
	<p>Special features: There is no specific programming operation for the mixer motor; however, after it has been replaced, the motor needs to program its limits (minimum and maximum). This operation only occurs when the battery has been turned off. Therefore the battery must be disconnected then reconnected before restarting the ignition and starting up the air conditioning.</p>

<p>Check the connection and condition of the mixer motor connector. Replace the connector if necessary.</p>
<p>Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connections:</p> <p style="padding-left: 40px;"> computer connector B track 5 \longrightarrow track 4 of the mixer motor computer connector B track 6 \longrightarrow track 1 of the mixer motor computer connector B track 7 \longrightarrow track 6 of the mixer motor computer connector B track 8 \longrightarrow track 3 of the mixer motor </p> <p>Repair if necessary.</p>
<p>With the ignition on, check for the presence of a 12 volt supply on track 2 of the mixer motor connector. Repair if necessary.</p>

AFTER REPAIR	<p>Follow the instructions to confirm repair. Clear the fault memory. Deal with any other possible faults.</p>
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Fault finding - Interpretation of faults

DF010
CONTINUED

With the connector disconnected, check the resistance value of the mixer motor by measuring between:

track 2 and **track 1** of the mixer motor connector,

track 2 and **track 3** of the mixer motor connector,

track 2 and **track 4** of the mixer motor connector,

track 2 and **track 6** of the mixer motor connector.

The results on the four controls should be $84 \Omega \pm 4 \Omega$ at 20°C, if this is not the case, replace the mixer motor.

Take the mixer motor apart, connect its connector and, using the diagnostic tool, activate the controls: **AC004** then **AC005**. The motor should switch from one direction to the other.

If the connections matched when tested but the motor does not switch during the commands: replace the mixer motor.

If the commands were executed correctly, check that the mixer motor flap is not **blocked** by trying to move the gears.

Repair if necessary.

If the fault is still present, **replace** the mixer motor.

AFTER REPAIR

Follow the instructions to confirm repair.

Clear the fault memory.

Deal with any other possible faults.

Fault finding - Interpretation of faults

DF012 PRESENT OR STORED	<u>DISTRIBUTION MOTOR CIRCUIT</u>
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NOTES	<p>Conditions for carrying out a fault finding test on the fault stored: The fault is declared present: when the air conditioning control panel is lit and the air distribution control is operated (air vent, footwell, de-icing).</p>
	<p>Special features: There is no specific programming operation for the distribution motor, however, after it has been replaced the motor needs to program its limits (minimum and maximum). This operation only occurs when the battery has been turned off. Therefore the battery must be disconnected then reconnected before restarting the ignition and starting up the air conditioning.</p>

<p>Check the connection and condition of the distribution motor connector. Replace the connector if necessary.</p>
<p>Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connections:</p> <p style="margin-left: 40px;"> computer connector B track 1 \longrightarrow track 4 of the distribution motor computer connector B track 2 \longrightarrow track 3 of the distribution motor computer connector B track 3 \longrightarrow track 6 of the distribution motor computer connector B track 4 \longrightarrow track 1 of the distribution motor </p> <p>Repair if necessary.</p>
<p>With the ignition on, check for the presence of 12 volts supply on track 2 of the distribution motor connector. Repair if necessary.</p>

AFTER REPAIR	<p>Follow the instructions to confirm repair. Clear the fault memory. Deal with any other possible faults.</p>
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Fault finding - Interpretation of faults

DF012
CONTINUED

With the connector disconnected, check the resistance value of the distribution motor by measuring between:

track 2 and **track 1** of the distribution motor connector,

track 2 and **track 3** of the distribution motor connector,

track 2 and **track 4** of the distribution motor connector,

track 2 and **track 6** of the distribution motor connector.

The results on the four controls should be $84 \Omega \pm 4 \Omega$ at 20°C, if this is not the case, replace the distribution motor.

Take the mixer motor apart, connect its connector and, using the diagnostic tool, activate the controls: **AC006** then **AC007**. The motor should switch from one direction to the other.

If the connections tested earlier match but the motor does not switch during the commands: replace the distribution motor.

If the commands have been executed correctly, check that the distribution motor flap is not **blocked** by trying to move the gears.

Repair if necessary.

If the fault is still present, **replace** the distribution motor.

AFTER REPAIR

Follow the instructions to confirm repair.

Clear the fault memory.

Deal with any other possible faults.

Fault finding - Interpretation of faults

DF021 PRESENT OR STORED	<u>AIR RECIRCULATION MOTOR CIRCUIT</u>
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NOTES	<p>Conditions for applying the fault finding procedure to stored faults: The fault is declared present when the air conditioning control panel is lit and the air recirculation control activated.</p>
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<p>Take apart the right-hand scuttle panel grille and check the connection and condition of the black 15-track connector and the connection and condition of the 3-track recirculation motor connector (next to the black 15-track connector). Replace the connector(s) if necessary.</p>									
<p>Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connections:</p> <table style="margin-left: auto; margin-right: auto; border: none;"> <thead> <tr> <th style="text-align: center; padding: 5px;"><u>computer connector A</u></th> <th style="text-align: center; padding: 5px;"><u>black 15-track clip connector</u></th> <th style="text-align: center; padding: 5px;"><u>3-track connector of the recirculation motor</u></th> </tr> </thead> <tbody> <tr> <td style="text-align: center; padding: 5px;">track 25</td> <td style="text-align: center; padding: 5px;">→ track 1</td> <td style="text-align: center; padding: 5px;">→ track C of the air recirculation motor</td> </tr> <tr> <td style="text-align: center; padding: 5px;">track 26</td> <td style="text-align: center; padding: 5px;">→ track 2</td> <td style="text-align: center; padding: 5px;">→ track B of the air recirculation motor</td> </tr> </tbody> </table> <p>Repair if necessary.</p>	<u>computer connector A</u>	<u>black 15-track clip connector</u>	<u>3-track connector of the recirculation motor</u>	track 25	→ track 1	→ track C of the air recirculation motor	track 26	→ track 2	→ track B of the air recirculation motor
<u>computer connector A</u>	<u>black 15-track clip connector</u>	<u>3-track connector of the recirculation motor</u>							
track 25	→ track 1	→ track C of the air recirculation motor							
track 26	→ track 2	→ track B of the air recirculation motor							
<p>Check the resistance of the air recirculation motor across: track C and track B of the air recirculation motor connector and replace the motor if the resistance is not approximately: 40 Ω ± 10 Ω at 20°C.</p>									
<p>Take apart the right-hand scuttle panel and using the diagnostic tool, activate the command: AC003. It is possible to see the flap close by looking above the heating unit (it moves towards the front of the vehicle). During the command, check that the recirculation motor flap is closed without point of resistance or blockage. Repair if necessary.</p>									
<p>If the fault is still present, replace the air recirculation motor.</p>									

AFTER REPAIR	<p>Follow the instructions to confirm repair. Clear the fault memory. Deal with any other possible faults.</p>
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Fault finding - Interpretation of faults

DF096 PRESENT OR STORED	<u>AIR BLOWER TEMPERATURE SENSOR CIRCUIT</u> CO : Open circuit CC : Short circuit
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NOTES	None.
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<p>Check the connection and condition of the delivery air temperature sensor connector. Replace the connector if necessary.</p>
<p>Check that the air blower temperature sensor has not slipped from its housing (mounted by quarter turns). Replace the sensor in its housing if necessary.</p>
<p>Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connections:</p> <p style="margin-left: 40px;">computer connector B track 13 \longrightarrow track 1 of the temperature sensor</p> <p style="margin-left: 40px;">computer connector B track 10 \longrightarrow track 2 of the temperature sensor</p> <p>Repair if necessary.</p>
<p>Check the resistance value of the delivery air temperature sensor by measuring across: Track 1 and track 2 of the temperature sensor connector, replace the sensor if the resistance is not approximately: 10 kΩ \pm 500 Ω at 25°C (for greater precision, refer to the HELP section on sensor electrical specifications according to temperature).</p>
<p>If the fault is still present, replace the delivery air temperature sensor.</p>

AFTER REPAIR	<p>Clear the fault memory. Deal with any other possible faults.</p>
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NOTES

Only check the conformity after a **complete check** with the diagnostic tool.

Test conditions: engine off, ignition on, **air conditioning off**.

NOTE: read the parameters when the vehicle is cold (in the morning) to check the conformity of the temperature parameters (without thermometer). The three temperatures should be about equal.

Order	Function	Parameter or state Check or action	Display and notes	Fault finding
1	Computer voltage supply	ET001: + 12V accessories	ACTIVE	In the event of a problem occurring with the states and the parameter, check the insulation, continuity and absence of resistance interference of the computer earths and supplies (see electronic diagrams). If the problem is still present, carry out a fault finding test on the charging circuit .
		ET002: + 12V lights	INACTIVE (ACTIVE when the side lights are activated)	
		PR014: computer supply voltage	10 V < x < 12.5 V.	
2	Interior temperature.	PR001: interior temperature	X = interior temperature ± 5°C (substitution value: 128°)	In the event of a problem occurring carry out a fault finding test on fault: DF007 interior temperature sensor circuit.
3	External temperature.	PR002: external temperature	X = external temperature ± 5°C (substitution value: 128°)	In the event of a problem, consult the fault finding procedure for parameter PR002
4	Delivery air temperature.	PR115: delivery air temperature	X = delivery air temperature ± 5°C (the temperature varies depending on whether the mixer motor is open) (substitution value: 128°)	In the event of a problem perform the fault finding procedure : DF096 delivery air temperature sensor circuit.

NOTES

Only check the conformity after a **complete check** with the diagnostic tool.
Test conditions: engine off, ignition on, **air conditioning off.**

Order	Function	Parameter or state Check or action	Display and notes	Fault finding
5	Passenger compartment blower assembly	PR116: passenger compartment blower assembly speed	0% at minimum speed. 100% at maximum speed.	For greater precision, refer to fault finding parameter PR116 .
6	Position of distribution and mixing flaps.	PR011: position of distribution flap	0% air vents at 100%: de-icing	For greater precision, refer to fault finding parameter PR011 . In the event of a problem occurring carry out a fault finding test on fault: DF012 distribution motor circuit.
		PR012: Position of mixing flap	0% maximum cold to 100% maximum heat	In the event of a problem occurring carry out a fault finding test on fault: DF010 mixer motor circuit.
7	Air recirculation.	ET021: air recirculation motor command	STATE 1 recirculation motor: recirculation STATE 2 recirculation motor: external air	In the event of a problem occurring carry out a fault finding test on fault: DF021 air recirculation motor circuit.
		ET079: recirculation request	YES or NO according to the request	
8	Air conditioning request	ET078: air conditioning request	NO	None.

NOTES

Only check the conformity after a complete check with the diagnostic tool.
Running the "actuator" command is a way of **reporting faults** when stored, or of checking the **reliability of the actuators**.
Test conditions: engine off, ignition on, **heating and ventilation off**.

Order	Function	Parameter or state Check or action	Display and notes	Fault finding
Command window				
9	Recirculation	AC002: Recirculation motor: exterior air	The recirculation flap should be in the external air position.	In the event of a problem occurring carry out a fault finding test on fault: DF021 air recirculation motor circuit.
		AC003: Recirculation motor: recirculation	The recirculation flap should be in the recirculation position.	
10	Mixing.	AC004: Mixer motor: maximum cold	The recirculation flap should be in the maximum cold position.	In the event of a problem occurring carry out a fault finding test on fault: DF010 mixer motor circuit.
		AC005: Mixer motor: maximum hot	The recirculation flap should be in the hot position.	
11	Air distribution.	AC006: Distribution motor: air vents	The distribution flap should be in air vent mode.	In the event of a problem occurring carry out a fault finding test on fault: DF012 distribution motor circuit.
		AC007: Distribution motor: de-icing	The distribution flap should be in de-icing mode.	

NOTES

Only check the conformity after a complete check with the diagnostic tool.
Running the "actuator" command is a way of **reporting faults** when stored, or of checking the **reliability of the actuators**.
Test conditions: engine off, ignition on, **heating and ventilation off**.

Order	Function	Parameter or state Check or action	Display and notes	Fault finding
Command window				
12	Compressor control.	AC021: Compressor clutch	The compressor clutch should cut in. Special features: since the compressor clutch command is controlled by the injection computer, it is necessary to start the engine before starting the command (injection can only be authorised when the engine is running).	If there is a problem, refer to the chart No. 8 , or perform an injection fault finding procedure.
13	Indicators.	AC026: Control panel indicators	The control panel indicators should light up.	If there is a problem, refer to chart No. 12 .
14	Passenger compartment ventilation.	AC001: Passenger compartment fan	It should be possible to hear the passenger compartment blower running.	If there is a problem, refer to chart No. 5 .

NOTES

Only check the conformity after a **complete check** with the diagnostic tool.
Test conditions: engine at idle speed, **heating and ventilation on.**

Order	Function	Parameter or state Check or action	Display and notes	Fault finding
1	Computer voltage supply	ET001: + 12V accessories	ACTIVE	In the event of a problem occurring with the states and the parameter, check the insulation, continuity and absence of resistance interference of the computer earths and supplies (see electronic diagrams). If the problem is still present, carry out a fault finding test on the charging circuit.
		ET002: + 12V lights	ACTIVE	
		PR014: computer supply voltage	$12.5\text{ V} < x < 14.4\text{ V.}$	
2	Air conditioning request	ET078: air conditioning request	YES	None.
3	Passenger compartment blower assembly	PR116: passenger compartment blower assembly speed	0% at minimum speed. 100% at maximum speed.	For greater precision, refer to fault finding parameter PR116.
4	Position of distribution and mixing flaps.	PR011: position of distribution flap	0%: air vents to 100%: de-icing	In the event of a problem occurring carry out a fault finding test on fault: DF012 distribution motor circuit.
		PR012: Position of mixing flap	0% maximum cold to 100 % maximum heat	In the event of a problem occurring carry out a fault finding test on fault: DF010 mixer motor circuit.

Fault finding - Conformity check

NOTES

Only check the conformity after a **complete check** with the diagnostic tool.
Test conditions: engine at idle speed, **air conditioning on**.
NOTE: it is difficult to test the validity of temperature information when the heating and ventilation is operating (particularly the delivery air temperature which varies more rapidly than the other two). It is preferable to check the validity of temperature information when the heating and ventilation is off (refer to the NOTE on checking conformity, when the heating and ventilation is off).

Order	Function	Parameter or state Check or action	Display and notes	Fault finding
5	Air recirculation.	ET021: air recirculation motor command	STATE 1 recirculation motor: recirculation STATE 2 recirculation motor: external air	In the event of a problem occurring carry out a fault finding test on fault: DF021 air recirculation motor circuit.
		ET079: recirculation request	YES or NO according to the request	
6	Temperatures.	PR001: interior temperature	X = exterior temperature ± 5 °C (substitution value: 128°C)	In the event of a problem, perform the fault finding procedure : DF007 interior temperature sensor circuit.
		PR002: external temperature	X = exterior temperature ± 5 °C (substitution value: 128°C)	In the event of a problem, refer to the fault finding procedure for parameter PR002 .
		PR115: delivery air temperature.	X = delivery air temperature ± 5°C (the temperature varies depending on whether the mixer motor is open) (substitution value: 128°C)	In the event of a problem, perform the fault finding procedure : DF096 delivery air temperature sensor unit.

PR002

EXTERNAL TEMPERATURE**NOTES****Special note:**

The external temperature sensor is located in the right-hand side rear-view mirror.

Vehicles fitted with a central communication unit:Look at the temperature shown on the multifunction display. **Is it consistent?**

If the temperature shown on the multifunction display is consistent: connect the bonnier in place of the climate control computer and check the **insulation, continuity and resistance interference** of the connection:

climate control computer **central communication unit**
connector A **track 28** **—————▶** **track 21** of connector C

Repair if necessary.

If the connection matched when tested but the fault is still present, **measure the voltage of the temperature signal** between track 28 (connector A) of the climate control computer and the earth:

- Between 5 and 7 volts should be measured with the **voltmeter** set to AC voltage measuring.
- A square wave signal should appear on the **oscilloscope** (high state at 12 volts).

If the central communication unit **emits no voltage** and the display shows a consistent temperature: replace the central communication unit.

If the central communication unit **emits voltage** and the display shows a consistent temperature: replace the climate control computer.

If the temperature shown on the multifunction display is not consistent: ensure that the display is not faulty by running its fault finding procedure (refer to the multifunction display technical note).

AFTER REPAIR

Repeat the conformity check from the start.

PR002
CONTINUED 1

Using the diagnostic tool, test the multiplex network to check the conformity of the connection between the central communication unit and the display. If the connection is faulty, connect the bornier in place of the central communication unit computer and check the **insulation, continuity and resistance interference** of the connections:

multifunction display

central communication unit

connector B track 15	————→	track 4 of connector C
connector B track 14	————→	track 3 of connector C
connector B track 12	————→	track 7 of connector C

Repair if necessary.

If the connections are correct, **perform a fault finding procedure on the central communication unit** to check that the external temperature sensor is in correct working order (refer to the central communication unit fault finding note).

Replace the external temperature sensor if necessary.

If the external temperature sensor is not faulty, connect the bornier in place of the central communication unit computer and check the **insulation, continuity and resistance interference** of the connections:

central communication unit C track 16	————→	track 4 of the external temperature sensor.
central communication unit C track 17	————→	track 3 of the external temperature sensor.

Repair if necessary.

If the above tests have not solved the problem, connect the bornier in place of the climate control computer and check the insulation, continuity and resistance interference of the connections:

climate control computer

central communication unit

connector A track 28	————→	track 21 of connector C
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Repair if necessary.

AFTER REPAIR

Repeat the conformity check from the start.

PR002
CONTINUED 3

If the connections matched when tested but the fault is still present, **measure the voltage of the temperature signal** between track 28 (connector A) of the climate control computer and the earth:

- Between **5 and 7 volts** should be measured with the **voltmeter** set to AC voltage measuring.
- A square wave signal should appear on the **oscilloscope** (high state at 12 volts).

If the multifunction display **emits no voltage** but it shows a consistent temperature: replace the multifunction display.

If the multifunction display **emits voltage** and it shows a consistent temperature: replace the climate control computer.

If the temperature shown on the multifunction display is consistent: connect the bornier in place of the climate control computer and check the **I insulation, continuity and resistance interference** of the connection:

climate control computer

multifunction display

connector A **track 28** —————▶ **track 10** of connector B

Repair if necessary.

If the connection matched when tested, **measure the voltage of the temperature signal** between track 28 (connector A) of the climate control computer and the earth:

- Between **5 and 7 volts** should be measured with the **voltmeter** set to AC voltage measuring.
- A square wave signal should appear on the **oscilloscope** (high state at 12 volts).

If the multifunction display **emits no voltage** but it shows a consistent temperature: replace the multifunction display.

If the multifunction display **emits voltage** and it shows a consistent temperature: replace the climate control computer.

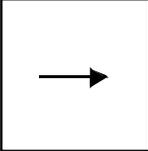
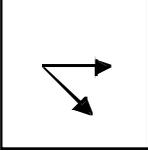
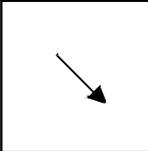
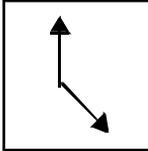
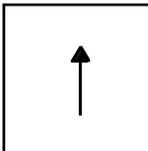
AFTER REPAIR

Repeat the conformity check from the start.

PR011	<u>DISTRIBUTION FLAP POSITION</u>
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NOTES	The values listed below are examples only (they depend on which way the flap is being moved).
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Controlled values for engine halted and engine running with heating and ventilation in manual mode (tolerance $\pm 5\%$).

Air distribution request	Position of distribution flap
Air vents 	0%
Air vent + footwells 	14 %
Footwell ventilation 	50%
Footwells + demisting 	82%
Demisting 	100%

AFTER REPAIR	Repeat the conformity check from the start.
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PR116	<u>PASSENGER COMPARTMENT BLOWER ASSEMBLY SPEED</u>
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NOTES	The values listed below are examples only.
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Controlled values for engine halted and engine running (tolerance $\pm 5\%$).

Passenger compartment fan speed setting	SPEED 0	SPEED 1	SPEED 2	SPEED 3	SPEED 4	SPEED 5	SPEED 6	SPEED 7	SPEED 8
Passenger compartment blower assembly speed display.	0 %	20%	30 %	40 %	50 %	62 %	74 %	85 %	92 %

AFTER REPAIR	Repeat the conformity check from the start.
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MEASURING THE CONTROL VOLTAGE OF THE PASSENGER COMPARTMENT BLOWER ASSEMBLY POWER MODULE

There are two ways to measure the control voltage of the passenger compartment fan power module:

1 / Measuring on a multimeter (in Voltmeter position):

With the power module connector connected, measure across **track 2** of the module and the earth.

At speed 0 the voltage measured should be equal to the battery voltage.

At maximum speed (8) the voltage should be negligible (± 0.5 volts).

For the 7 speeds in between the voltage varies between 0 and 12 volts.

Examples of measurements taken with the Voltmeter with the engine at idling speed (for information only):

speed 0	13.94 Volts
speed 1	11.36 Volts
speed 2	10.17 Volts
speed 3	8.93 Volts
speed 4	7.69 Volts

speed 5	6.34 Volts
speed 6	5.13 Volts
speed 7	3.80 Volts
speed 8	0.14 Volts

2 / Measuring using an oscilloscope (Optima 5800, Clip technique or NXR):

The fan power module is controlled by a power width modulation (PWM).

This control voltage is always 12 volts, the control signal (square wave signal) varies: the range and frequency do not move, the **high state (12 Volts)** varies in relation to the **low state (0 Volts)**.

To measure, connect the oscilloscope earth lead to the battery earth and the oscilloscope measuring lead to **track 2** of the power module (connected module connector). Adjust the time base on the oscilloscope to **500 μ s** divisions with a gauge of **5-Volt** divisions.

The signals obtained should be: a straight line at 14 Volts for speed 0, a straight line at 0 Volts for speed 8.

Example of measurements for the seven speeds in between (for information only):

Blower assembly speed	duration of high state	duration of low state
speed 1	450 μ s	50 μ s
speed 2	400 μ s	100 μ s
speed 3	350 μ s	150 μ s
speed 4	300 μ s	200 μ s

Blower assembly speed	duration of high state	duration of low state
speed 5	250 μ s	250 μ s
speed 6	200 μ s	300 μ s
speed 7	150 μ s	350 μ s

Electrical specifications of the temperature sensors according to temperature (tolerance: $\pm 5\%$).

Inside temperature sensor

Temperature	Sensor resistance
- 30°C	175200 Ω
- 25°C	129300 Ω
- 20°C	96360 Ω
- 15°C	72500 Ω
- 10°C	55050 Ω
- 5°C	42160 Ω
0°C	32560 Ω
5°C	25340 Ω
10°C	19870 Ω
15°C	15700 Ω
20°C	12490 Ω
25°C	10000 Ω
30°C	8059 Ω
35°C	6535 Ω
40°C	5330 Ω
45°C	4372 Ω
50°C	3606 Ω
55°C	2989 Ω
60°C	2490 Ω

Delivery air temperature sensor

Temperature	Sensor resistance
- 20°C	96358 Ω
- 15°C	72500 Ω
- 10°C	55046 Ω
- 5°C	42157 Ω
0°C	32554 Ω
5°C	25339 Ω
10°C	19872 Ω
15°C	15698 Ω
20°C	12487 Ω
25°C	10000 Ω
30°C	8059 Ω
35°C	6534 Ω
40°C	5329 Ω
45°C	4371 Ω
50°C	3605 Ω
55°C	2988 Ω
60°C	2490 Ω

NOTES

Only refer to this customer complaint after a complete check using the diagnostic tool.

FAULTY AIR DISTRIBUTION

FAULTY AIR DISTRIBUTION _____ CHART 1

AIR FLOW PROBLEM _____ CHART 2

INEFFICIENT WINDSCREEN DEMISTING _____ CHART 3

POOR VENTILATION PERFORMANCE _____ CHART 4

NO PASSENGER COMPARTMENT VENTILATION _____ CHART 5

FAULTY HEATING

NO HEATING OR INADEQUATE HEATING _____ CHART 6

TOO HOT _____ CHART 7

NO COLD AIR _____ CHART 8

AIR TOO COLD _____ CHART 9

ODOUR PROBLEM IN PASSENGER COMPARTMENT

UNPLEASANT ODOURS IN PASSENGER COMPARTMENT _____ CHART 10

WATER IN PASSENGER COMPARTMENT

WATER IS PRESENT IN PASSENGER COMPARTMENT _____ CHART 11

FAULTY CONTROL PANEL

CONTROL PANEL LIGHTING FAILURE _____ CHART 12

COMPRESSOR NOISES

NOISY COMPRESSOR _____ CHART 13

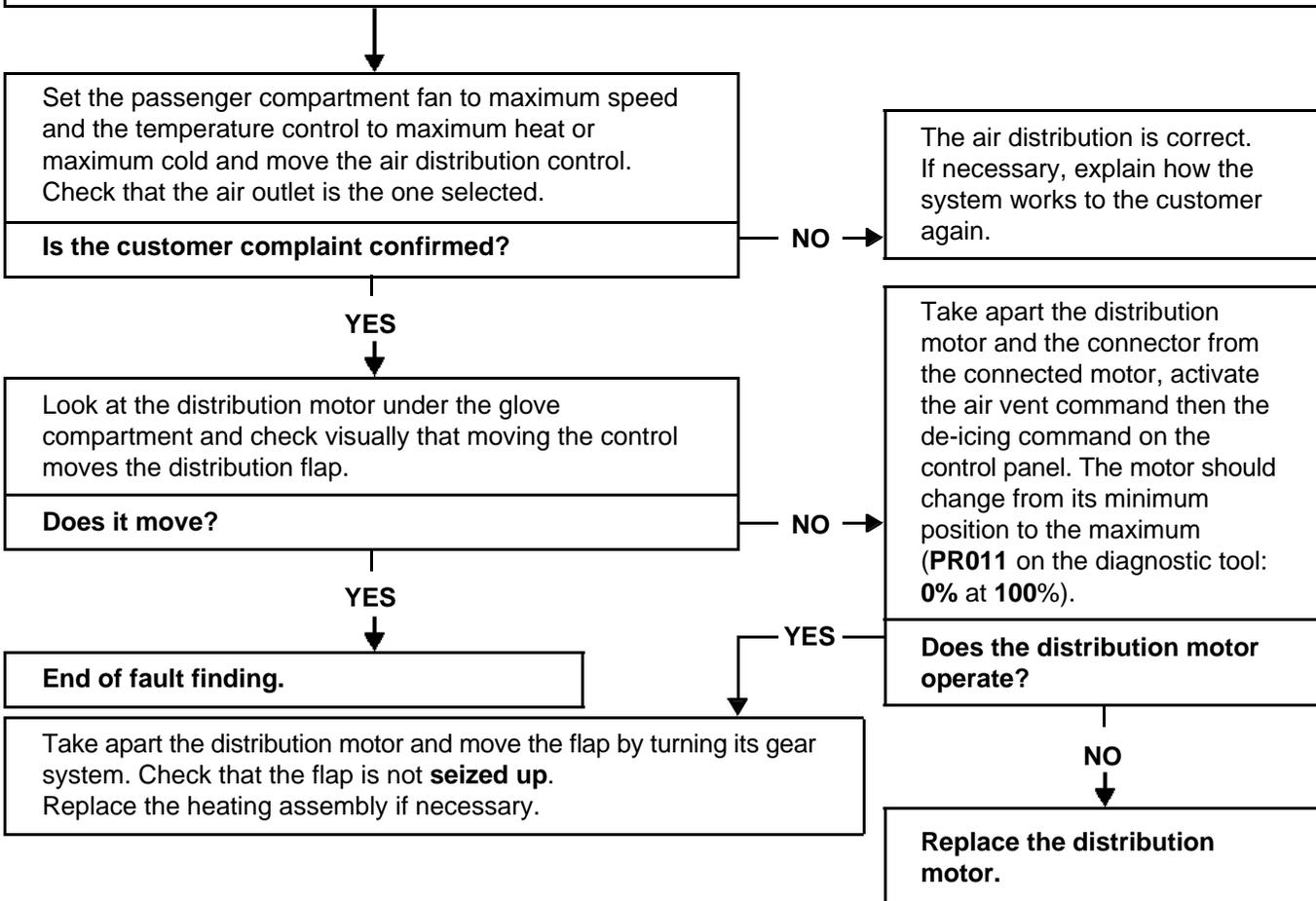
CAREG
Vdiag no.: 06

CHART 1	Air distribution fault
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NOTES	Only refer to this customer complaint after a complete check using the diagnostic tool
	Special notes: Adjusting the air distribution or ventilation controls switches off automatic climate control mode.

Check that **the air circuit (particle filter, scuttle panel grille, air vents etc.)** is not blocked.
Repair, clean or replace the particle filter if necessary.

Ensure that the fan housing **has no leaks**.
Repair if necessary.

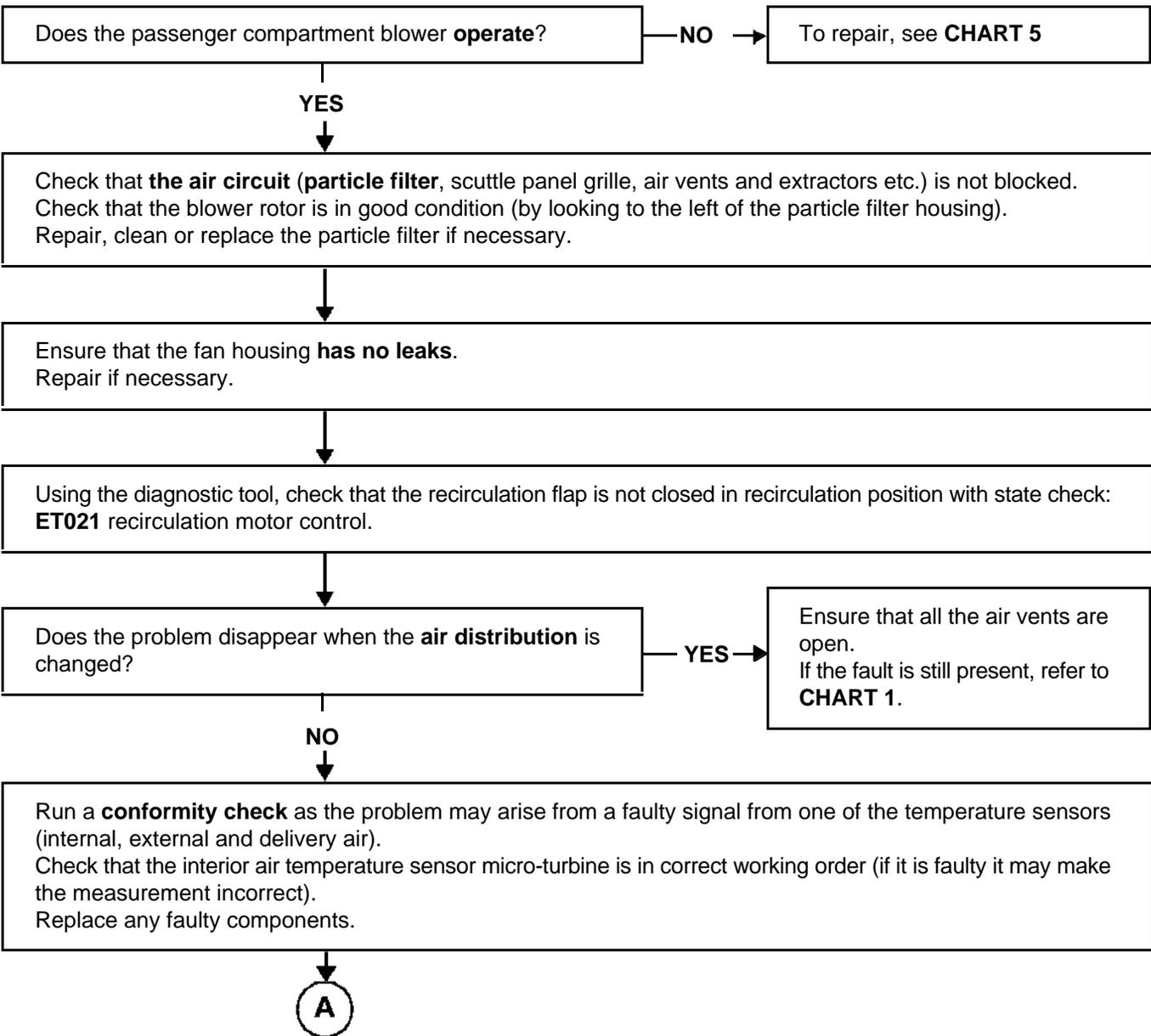


AFTER REPAIR	Check that the system is operating correctly.
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CAREG
Vdiag no.: 06

Chart 2	Air flow fault
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NOTES	<p>Only refer to this customer complaint after a complete check using the diagnostic tool. Check that the customer knows how to operate the climate control system properly.</p>
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AFTER REPAIR	Check that the system is operating correctly.
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CAREG
Vdiag no.: 06

**CHART 2
CONTINUED**

A

Check that the **PWM** (modulated control specifications) for the passenger compartment blower assembly power unit vary between **track A2** of the unit and the earth (**see HELP for the measurement**).

Does the voltage vary correctly?

YES →

Replace the power module.

NO

Check the **continuity and absence of unwanted resistance** on the following connection:

computer connector B **track 11** → **track A2** of the unit

Repair if necessary.

Is the fault still present?

NO

YES

Replace the control panel.

End of fault finding.

AFTER REPAIR

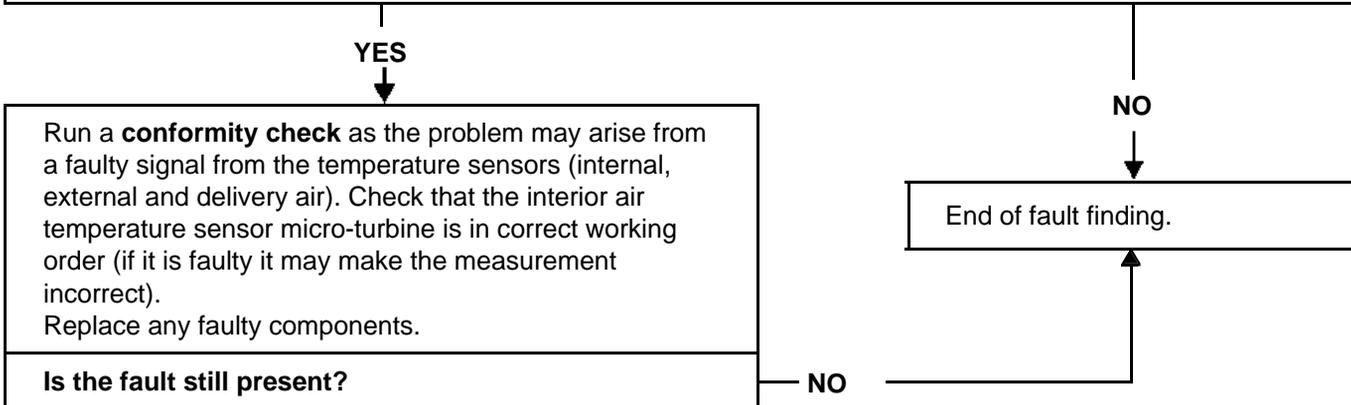
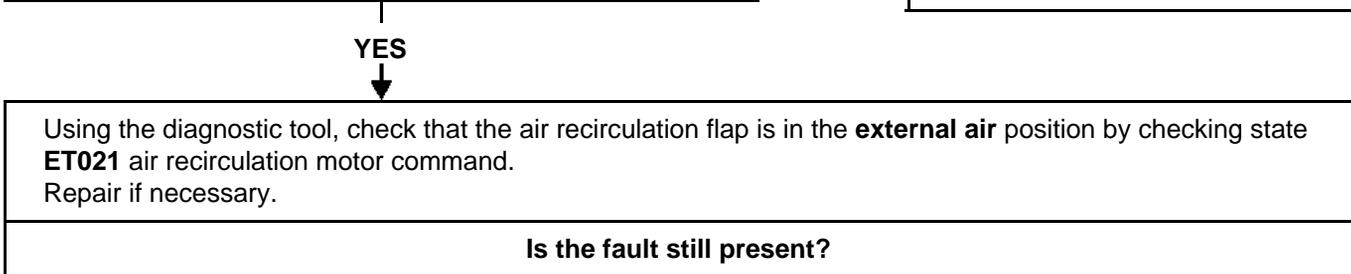
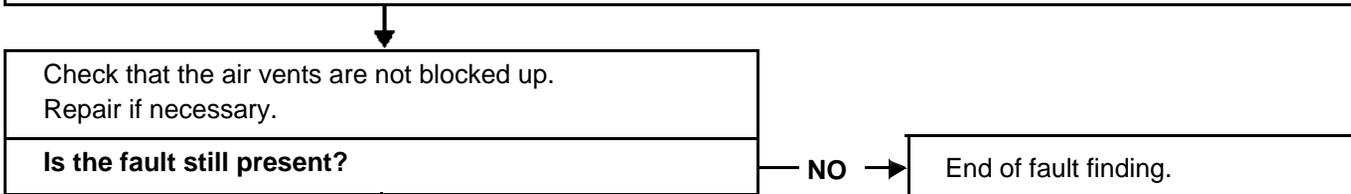
Check that the system is operating correctly.

CAREG
Vdiag no.: 06

Chart 3	inefficient windscreen demisting
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NOTES	Only refer to this customer complaint after a complete check using the diagnostic tool
	Special notes: Check that the inside of the windows are not dirty, as this lowers the efficiency of the demister.

Check that the distribution motor is in de-icing position by viewing the **PR011** parameter using the diagnostic tool in distribution flap position, it should be at **100%**.



AFTER REPAIR	Check that the system is operating correctly.
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CHART 3 CONTINUED

A

Check that there are no **water leaks** into the passenger compartment which would significantly increase the humidity and reduce the effectiveness of the demisting. Repair if necessary (see **CHART 11**).

Is the fault still present?

NO

End of fault finding.

YES

Check that the compressor is in **correct working order** by using command: **AC021 compressor clutch** or by switching on the heating and ventilation. Repair if necessary.

Check that the water evaporator outlet is not blocked. Repair if necessary.

Is it an **air distribution** fault?

YES

See **CHART 1**

NO

Is it an **air flow** fault?

YES

See **CHART 2**

NO

Is it a **heater performance** fault?

YES

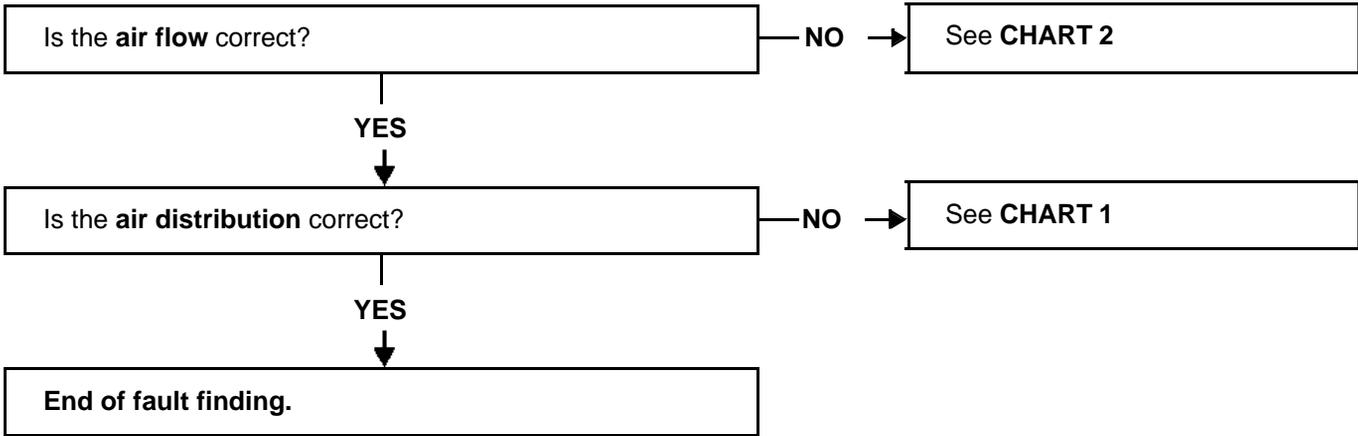
See **CHART 6**

AFTER REPAIR

Check that the system is operating correctly.

CHART 4	Poor ventilation performance
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NOTES	Only refer to this customer complaint after a complete check using the diagnostic tool
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AFTER REPAIR	Check that the system is operating correctly.
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CAREG
Vdiag no.: 06

**CHART 5
CONTINUED**

A

Check for the presence of an **earth** on **track 5** of the passenger compartment blower power module.
Repair if necessary.

Check the **insulation, continuity and absence of interference resistance** of the connection:
power module **track 1** —————> **track 2** of the passenger compartment blower motor
Repair if necessary.

Take apart the particle filter (under the right-hand scuttle panel grille) and check that the passenger compartment blower rotor has not **broken or slipped** out of position
Replace the passenger compartment blower if necessary.

Disconnect the connector from the power module (under the right-hand scuttle panel grille) and, with the ignition on, shunt **tracks 1 and 5**. The blower should run at maximum speed.
If the blower is not running: Replace the passenger compartment blower.

Check that **the PWM** (modulated control specifications) for the passenger compartment blower power vary by measuring between **unit control track A2** of the unit and the earth
(see HELP for the measurement).

Does the voltage vary correctly?

NO

Replace the climate control computer.

YES

Replace the power module.

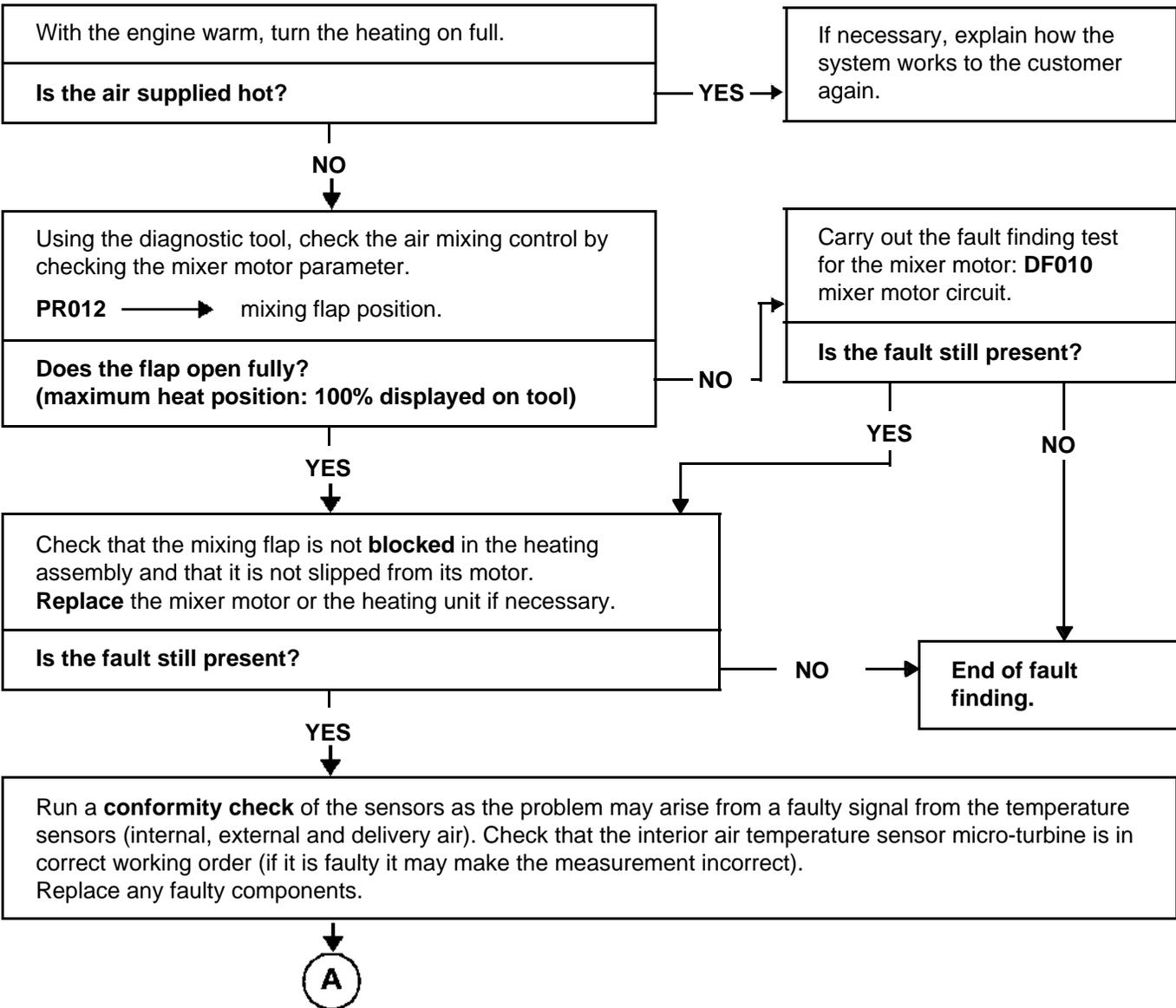
AFTER REPAIR

Check that the system is operating correctly.

CAREG
Vdiag no.: 06

CHART 6	No heating or inadequate heating
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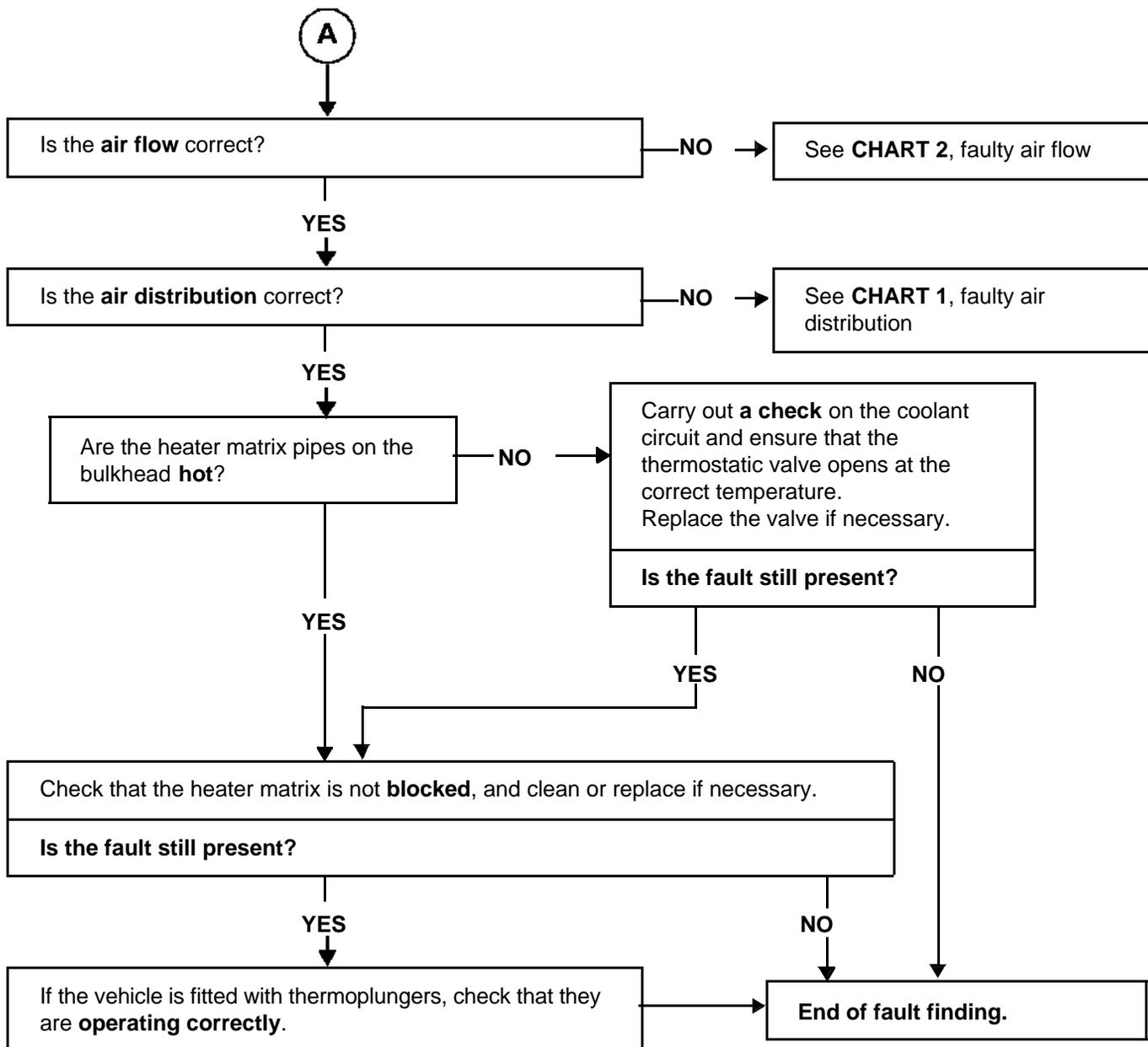
NOTES	Only refer to this customer complaint after a complete check using the diagnostic tool
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AFTER REPAIR	Check that the system is operating correctly.
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CAREG
Vdiag no.: 06

Chart 6
CONTINUED

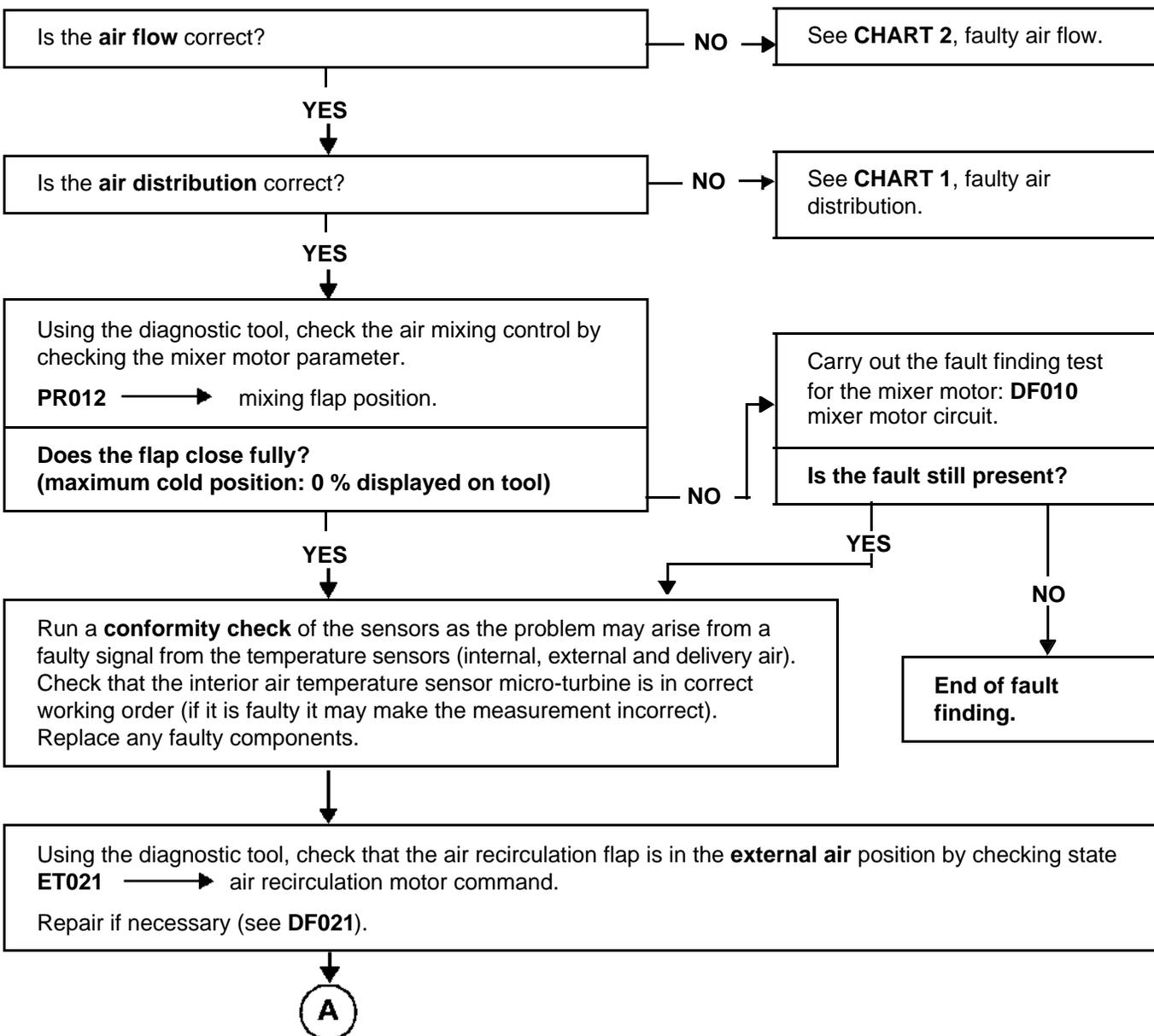


AFTER REPAIR Check that the system is operating correctly.

CAREG
Vdiag no.: 06

CHART 7	Too much hot air
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NOTES	Only refer to this customer complaint after a complete check using the diagnostic tool
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AFTER REPAIR	Check that the system is operating correctly.
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CAREG
Vdiag no.: 06

**CHART 7
CONTINUED**

A

Carry out a **check** on the coolant circuit and ensure that the thermostatic valve opens at the correct temperature. Replace the valve if necessary.

Is the fault still present?

NO

YES

Run a **conformity check** on the engine coolant temperature sensor (in the injection fault finding procedure) and check that the engine cooling fan engages at the right temperature. Replace the coolant temperature sensor if necessary.

End of fault finding.

AFTER REPAIR

Check that the system is operating correctly.

Fault finding - Fault finding charts

CHART 8

No cool air

NOTES

Only refer to this customer complaint after a **complete check using the diagnostic tool**

Special notes:

The compressor control, coolant pressure sensor and engine cooling fan are controlled by the injection computer.

Check that **the air circuit (particle filter, scuttle panel grille, air vents and extractors etc.)** is not blocked. Check that **the evaporator** is not blocked. Repair, clean or replace the particle filter and the evaporator if necessary.

With the engine at idling speed, activate the clutch compressor command using **AC021** diagnostic tool

Does the compressor clutch jam?

YES

NO

Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** of the connection:

computer connector A **track 24** → **injection computer** (refer to the injection diagrams concerned).

Repair if necessary.

Carry out a **fault finding test on the injection** (faulty injection leading to a sub-standard performance may prevent the heating and ventilation from functioning). Check that the engine cooling fan assembly is working by activating the appropriate command (if the fan is faulty, climate control is not authorised). If the injection reports a compressor control fault: carry out the relevant fault finding procedure (in the injection Technical Note). Repair if necessary.

A

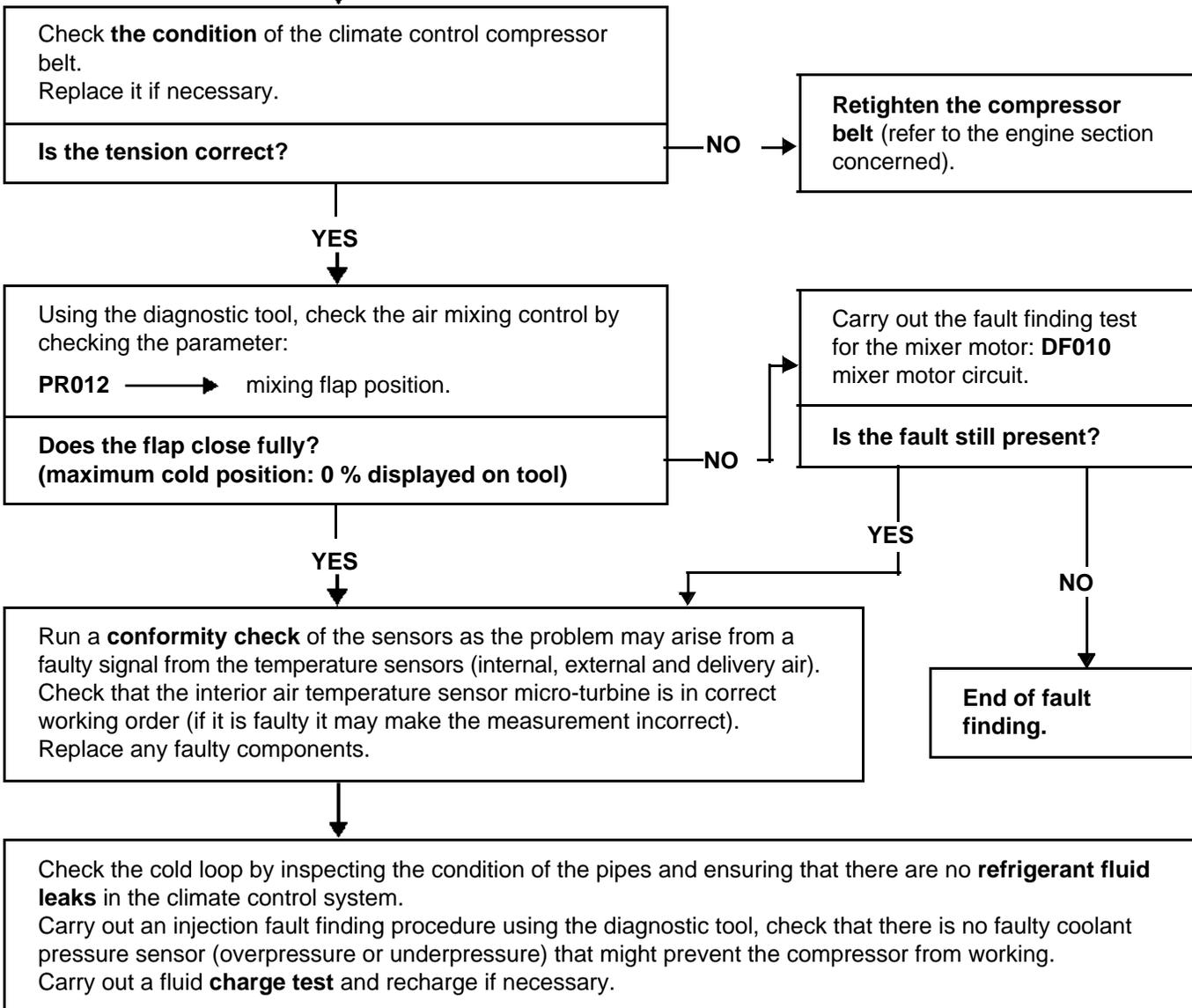
AFTER REPAIR

Check that the system is operating correctly.

CAREG
Vdiag no.: 06

CHART 8
CONTINUED

A



AFTER REPAIR Check that the system is operating correctly.

CAREG
Vdiag no.: 06

CHART 9

Air too cold

NOTES

Only refer to this customer complaint after a **complete check using the diagnostic tool**

Start the engine and switch on the climate control:
Does the compressor operate?

YES

NO

Run a **conformity check** of the sensors as the problem may arise from a faulty signal from the temperature sensors (internal, external and delivery air).
Check that the interior air temperature sensor micro-turbine is in correct working order (if it is faulty it may make the measurement incorrect).
Replace any faulty components.

Check that **the delivery air temperature sensor** is in place (it is located under the glove compartment next to the mixer motor).

Using the diagnostic tool, check the air mixing control by checking the parameter:

PR012: → mixing flap position.

Does the flap open fully?
(maximum hot position: 100 % displayed on tool).

NO

Carry out the fault finding test for the mixer motor:
DF010 mixer motor.

Is the fault still present?

YES

YES

NO

Check the refrigerant fluid level.

End of fault finding.

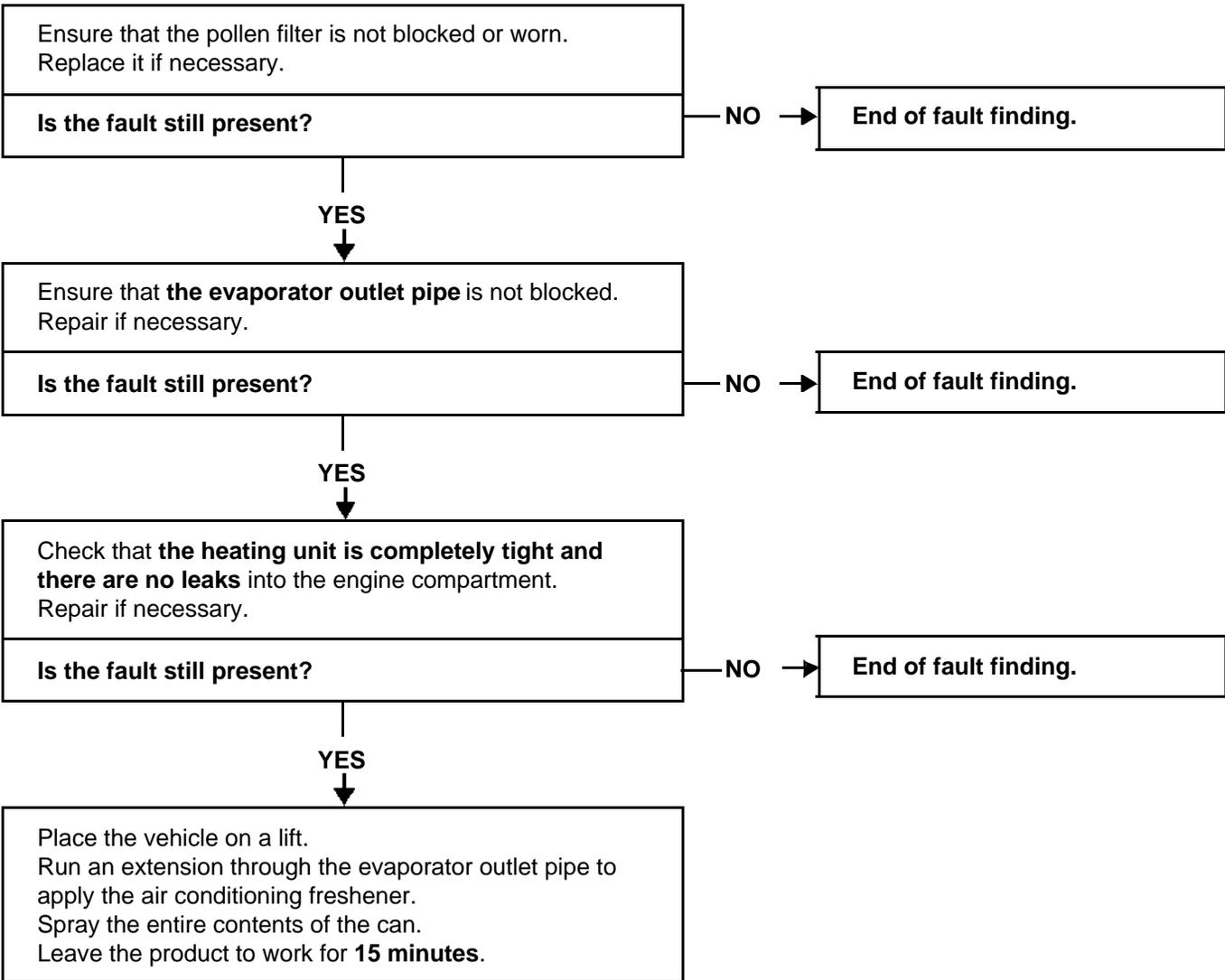
AFTER REPAIR

Check that the system is operating correctly.

CAREG
Vdiag no.: 06

CHART 10	Unpleasant odours in the passenger compartment
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NOTES	Only refer to this customer complaint after a complete check using the diagnostic tool
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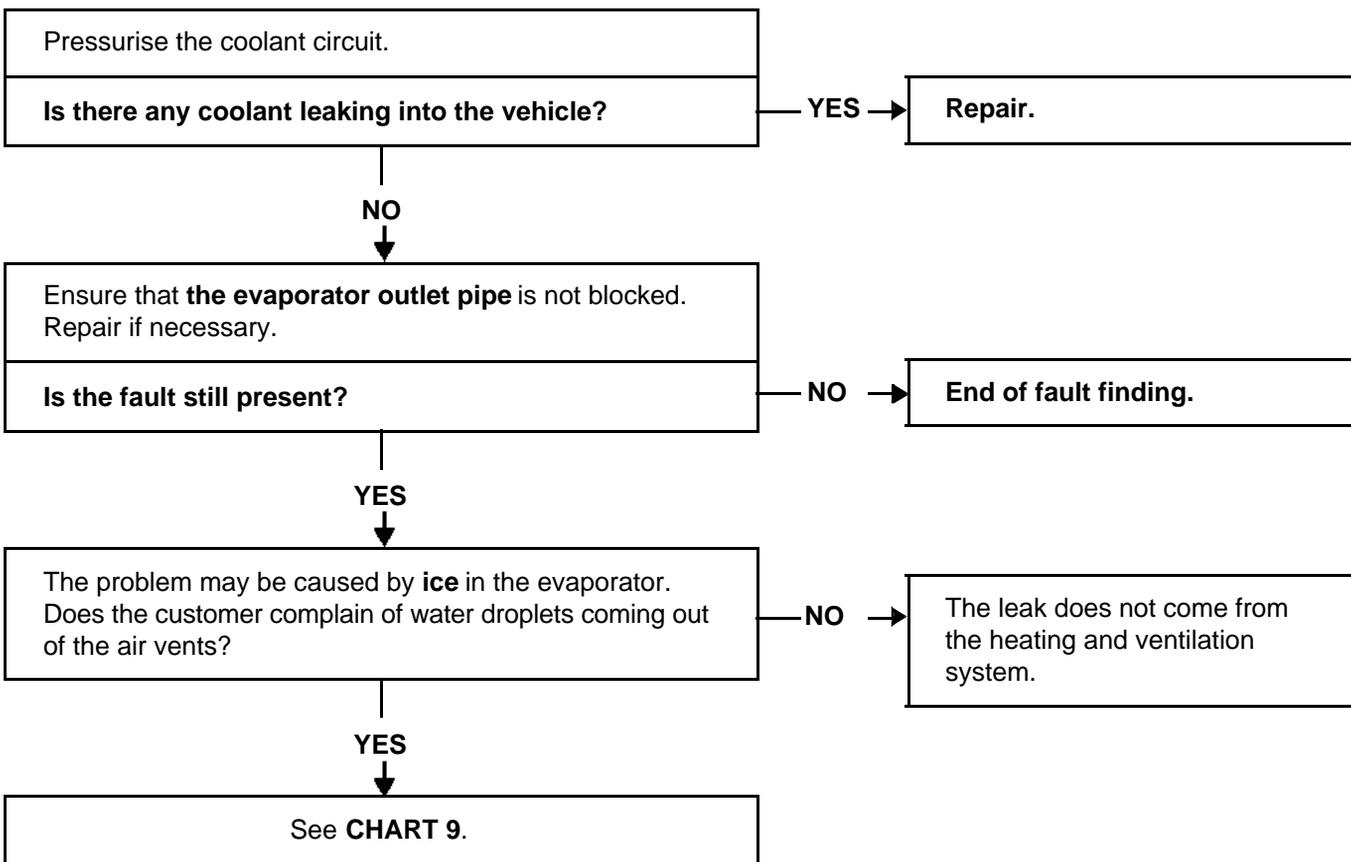


AFTER REPAIR	Check that the system is operating correctly.
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CAREG
Vdiag no.: 06

CHART 11	Water is present in the passenger compartment
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NOTES	Only refer to this customer complaint after a complete check using the diagnostic tool
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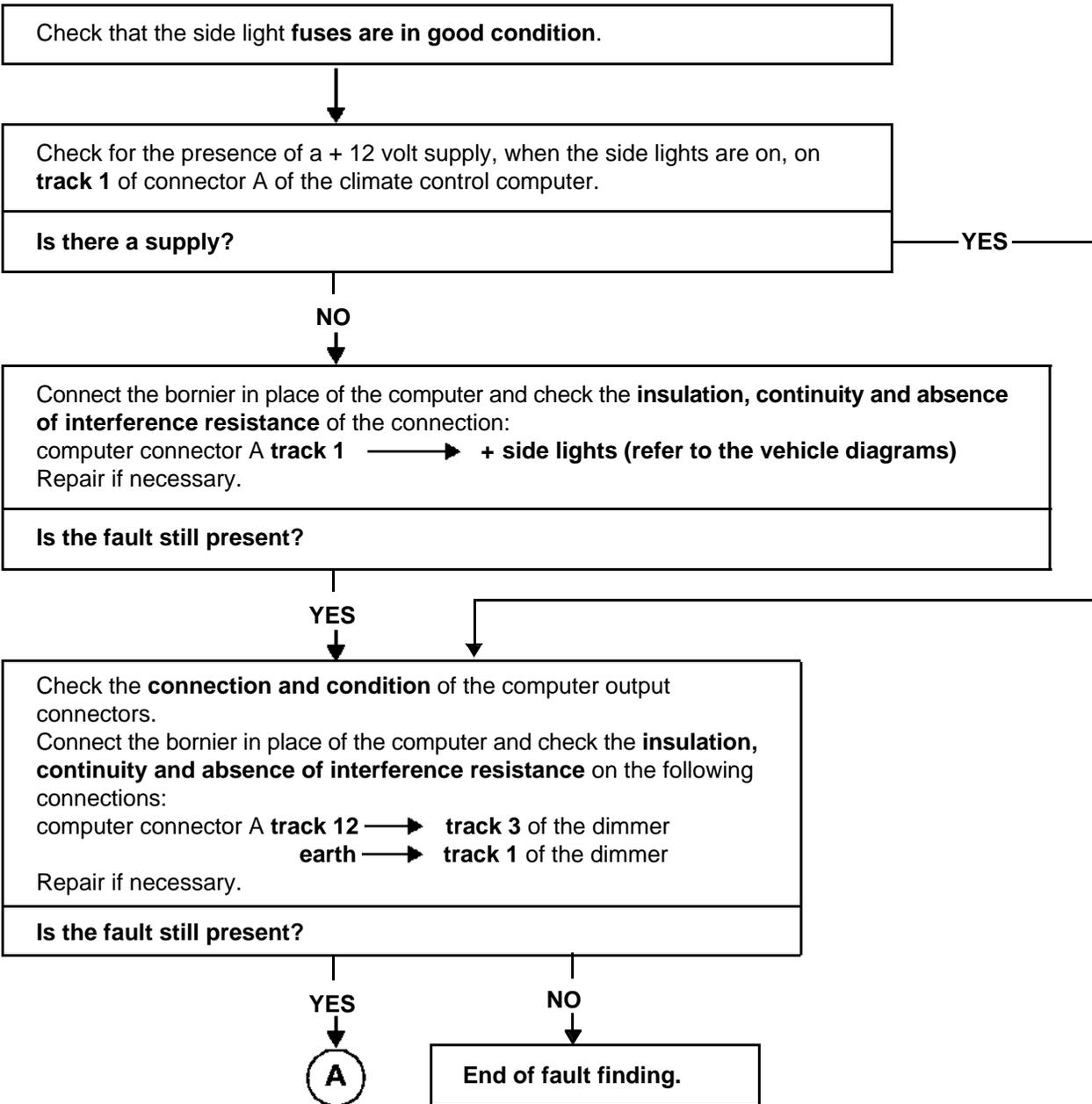


AFTER REPAIR	Check that the system is operating correctly.
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CAREG
Vdiag no.: 06

CHART 12	No control panel lighting
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NOTES	Only refer to this customer complaint after a complete check using the diagnostic tool
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AFTER REPAIR	Check that the system is operating correctly.
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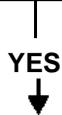
CHART 12
CONTINUED



Check the **resistance** value of the dimmer by measuring across:
track 1 and **track 3** of the dimmer connector.
When the dimmer is operated, its resistance should vary between **0 and 140 $\Omega \pm 10 \Omega$** .
Replace the dimmer if this is not the case.

Is the fault still present?

NO → End of fault finding.



Replace the computer (control panel).

AFTER REPAIR

Check that the system is operating correctly.

CHART 13

Noisy compressor

NOTES

Only refer to this customer complaint after a **complete check using the diagnostic tool**

Check that the compressor **belt is in good condition** and **check its tension** (for engines without automatic tensioner).
Replace the belt if necessary.

Check that the compressor is **correctly positioned**.
Repair if necessary.

Check **the refrigerant fluid** and look for leaks as the compressor may become noisy if it loses a significant volume of fluid.
Refill if necessary.

If the fault is still present, **replace** the climate control compressor.

AFTER REPAIR

Check that the system is operating correctly.