TWINGO

6 Heating and air conditioning system

62B CLIMATE CONTROL

Vdiag No.: 44

V1 **Edition Anglaise**

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

The procedures 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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1. SCOPE OF THIS DOCUMENT

This document presents the fault finding procedure applicable to all computers with the following specifications:

Vehicle(s): **New Twingo**	*Computer name:* **CAREG**
Function concerned: **Climate control**	*Vdiag No.:* **44**

2. PREREQUISITES FOR FAULT FINDING

Documentation type

Fault finding procedures (this document and the Technical Notes concerning the injection system fitted to the vehicle, and the UCH):

– Assisted fault finding (integrated into the **diagnostic tool**), Dialogys.

Wiring Diagrams:

– Visu-Schéma (CD-ROM), paper.

Type of diagnostic tools

– CLIP + multiplex line sensor

Special tooling required

Special tooling required	
	Multimeter
Elé. 1681	Universal bornier

3. REMINDERS

Procedure

To run fault finding on the vehicle computers, proceed as follows:
– turn the ignition key to APC,
– connect the **diagnostic tool** and perform the required operations.

To cut off the + after ignition feed, proceed as follows:
– disconnect the **diagnostic tool**,
– turn the ignition key to OFF,
– switch off the ignition.

Faults

Faults are declared as either present or stored (depending on whether they appeared in a certain context and have disappeared since, or whether they remain present but have not been diagnosed within the current context).

The **present** or **stored** status of faults should be taken into consideration when the **diagnostic tool** is switched on after the + after ignition feed (without any system components being active).

For a **present fault**, apply the procedure described in the **Interpretation of faults** section.

For a **stored fault**, note the faults displayed and apply the **Notes** section.

If the fault is **confirmed** when the instructions in the Notes section are applied, the fault is present. Deal with the fault.

If the fault is **not confirmed**, check:
- the electrical lines which correspond to the fault,
- the connectors on these lines (corrosion, bent pins, etc.),
- the resistance of the component detected as faulty,
- the condition of the wires (melted or split insulation, wear).

Conformity check

The aim of the conformity check is to check data that does not produce a fault on the **diagnostic tool** because the data is inconsistent. Therefore, this stage is used to:

- carry out fault finding on faults that do not have a fault display, and which may correspond to a customer complaint.
- check that the system is operating correctly and that there is no risk of a fault recurring after repairs.

This section gives the fault finding procedures for statuses and parameters and the conditions for checking them.

If a status is not behaving normally or a parameter is outside the permitted tolerance values, consult the corresponding fault finding page.

Special notes on the conformity check for the air conditioning function:

All variables (statuses and parameters) and commands required for the air conditioning function are divided into **three sub-functions**:

- The **COLD LOOP** sub-function groups together all the information required for producing cold air.
- The **HEATING** sub-function groups together all the information required for producing warm air.
- The **PASSENGER COMPARTMENT VENTILATION** sub-function groups together all the information relating to ventilation and the mixing and distribution of air within the passenger compartment.

The conformity check for the **air conditioning function** is split into two parts:

For all signals relating to the sensors and actuators **controlled by the climate control panel** (distribution motor, mixing motor, recirculation motor, passenger compartment ventilation, interior temperature, etc.), (see **62B, Climate control, Conformity check**).

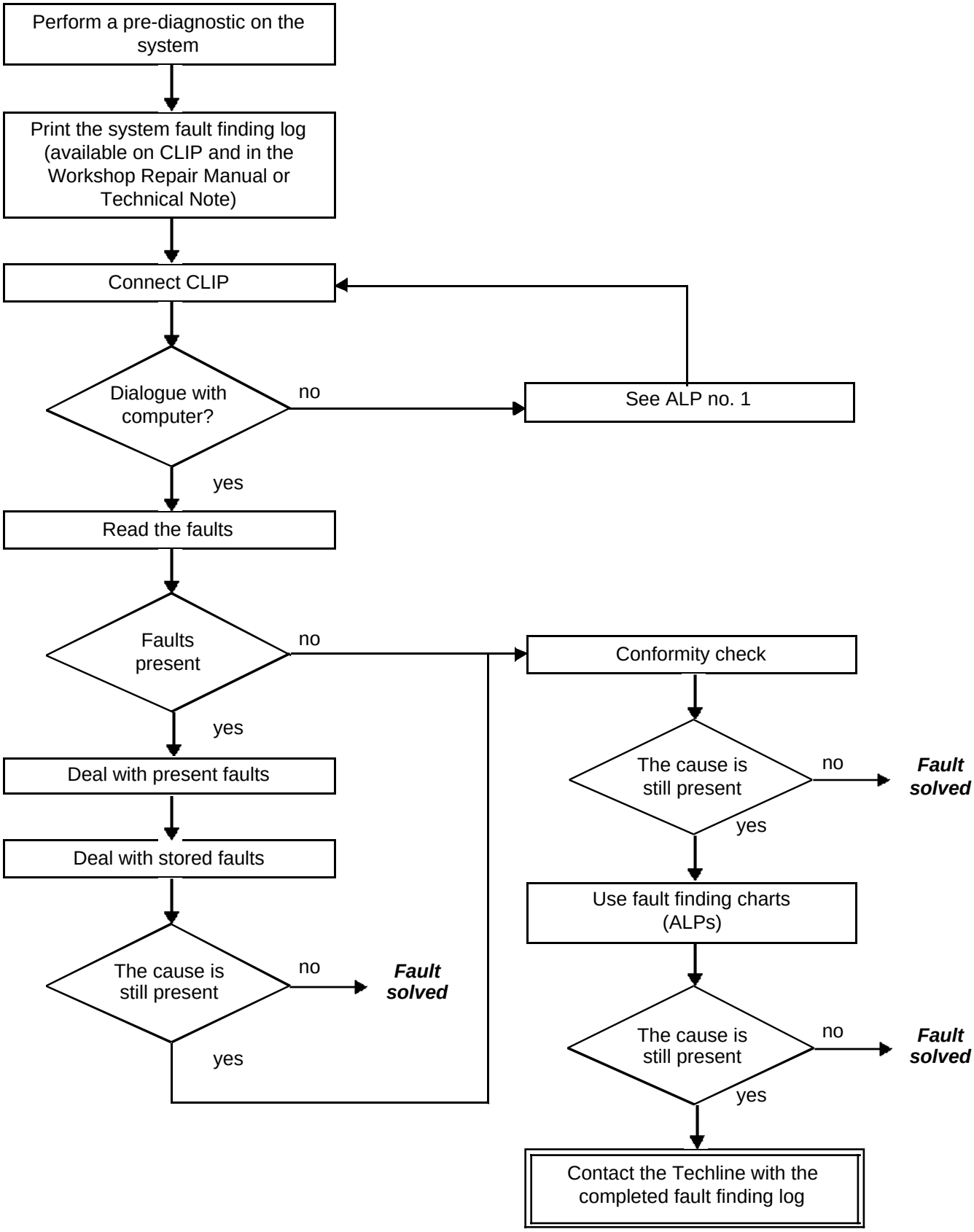
Note:
The interpretation of statuses, parameters and commands is also split into several sections. Everything which is controlled by the control panel of the climate control function is dealt with in this section. However, signals from other computers are interpreted in the **Fault finding Workshop Repair Manuals for the computers** which produce these signals.

Customer complaints - Fault finding chart

If the test with the **diagnostic tool** is OK but the customer complaint is still present, the fault should be processed by **customer complaints**.

A summary of the overall procedure to follow is provided on the following page in the form of a flow chart.

4. FAULT FINDING PROCEDURE



4. FAULT FINDING PROCEDURE (CONTINUED)

Wiring check

Note:
Carry out each requested check visually. Do not remove a connector if it is not required.

Note:
Repeated connections and disconnections alter the functionality of the connectors and increase the risk of poor electrical contact. Limit the number of connections/disconnections as much as possible.

Note:
The check is carried out on the 2 parts of the connection. There may be two types of connections:
- Connector / Connector
- Connector / Device

Fault finding problems
Disconnecting the connectors and/or manipulating the wiring harness may temporarily remove the cause of a fault. Electrical measurements of voltage, resistance and insulation are generally correct, especially if the fault is not present when the analysis is made (stored fault).

Visual inspection of the connection:
- Check that the connector is connected correctly and that the male and female parts of the connection are correctly coupled.

Visual inspection of the area around the connection:
- Check the condition of the mounting (pin, strap, adhesive tape, etc.) if the connectors are attached to the vehicle.
- Check that there is no damage to the wiring trim (sheath, foam, adhesive tape, etc.) near the wiring.
- Check that there is no damage to the electrical wires at the connector outlets, in particular on the insulating material (wear, cuts, burns, etc.).

Disconnect the connector to continue the checks.

Visual inspection of the plastic casing:
- Check that there is no mechanical damage (casing crushed, cracked, broken, etc.), in particular to the fragile components (lever, lock, openings, etc.).
- Check that there is no heat damage (casing melted, darker, deformed, etc.).
- Check that there are no stains (grease, mud, liquid, etc.).

Visual inspection of the metal contacts:
(The female contact is called CLIP. The male contact is called TAB.)
- Check that there are no bent contacts (the contact is not inserted correctly and can come out of the back of the connector). The spring contact of the connector when the wire is gently pulled.
- Check that there is no damage (folded tabs, clips open too wide, blackened or melted contact, etc.).
- Check that there is no oxidation on the metal contacts.

Visual inspection of the sealing:
(Only for watertight connectors)

- Check for the seal on the connection (between the 2 parts of the connection).
- Check the seal at the back of the connectors:
  - For *unit* joints (1 for each wire), check that the unit joints are present on each electrical wire and that they are correctly positioned in the opening (level with the housing). Check that plugs are present on openings which are not used.
  - For a *grommet* seal (one seal which covers the entire internal surface of the connector), check that the seal is present.
  - For *gel* seals, check for gel in all of the openings without removing the excess or any protruding sections (it does not matter if there is gel on the contacts).
  - For *hotmelt* sealing (heat-shrink sheath with glue), check that the sheath has contracted correctly on the rear of the connectors and electrical wires, and that the hardened glue comes out of the side of the wire.
- Check that there is no damage to any of the seals (cuts, burns, significant deformation, etc.).

If a fault is detected, repair or replace the wiring (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**)

5. FAULT FINDING LOG

IMPORTANT

IMPORTANT
Any fault on a complex system requires thorough fault finding with the appropriate tools. The FAULT FINDING LOG, which should be completed during the procedure, enables you to keep track of the procedure which is carried out. It is an essential document when consulting the manufacturer.

IT IS THEREFORE MANDATORY TO FILL OUT A FAULT FINDING LOG EACH TIME FAULT FINDING IS CARRIED OUT

You will always be asked for this log:

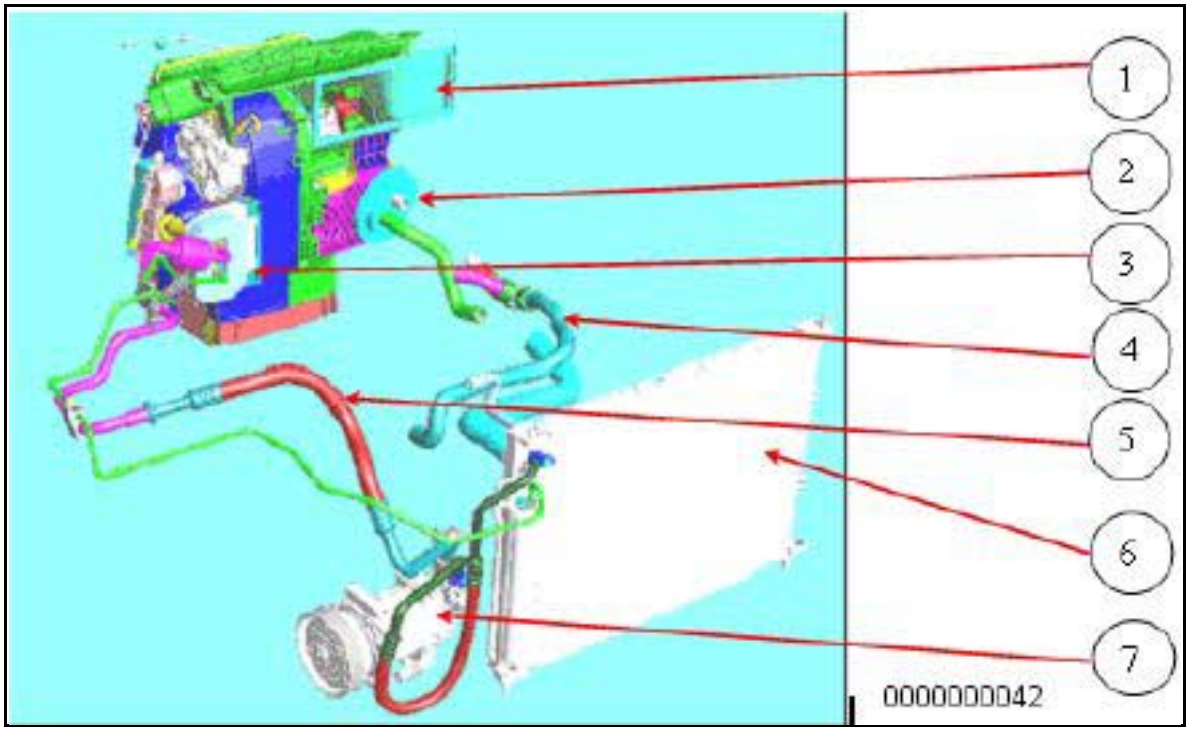
- when requesting technical assistance from Techline,
- for approval requests when replacing parts for which approval is mandatory,
- to be attached to monitored parts for which reimbursement is requested. The log is needed for warranty reimbursement, and enables better analysis of the parts removed.

6. SAFETY INSTRUCTIONS

Safety rules must be observed during any work on a component to prevent any damage or injury:

- check the battery voltage to avoid incorrect operation of computer functions,
- do not smoke,
- use the proper tools.

List and location of components



System (cold loop, hot loop and components)

1 Heating and air conditioning unit
2 Heater matrix
3 Expansion valve and evaporator
4 Coolant circuit
5 Cold loop
6 Condenser and radiator
7 Compressor

- **COLD LOOP COMPONENTS**

  – **Compressor**: This is located at the bottom on the left-hand side, next to the radiator in the engine compartment.

  – **Condenser**: This is located between the radiator and the cooling fan assembly.

  – **Dehydrator reservoir**: This is located on the left-hand side of the condenser outlet.

  – **Heating and air conditioning unit**: This is located under the dashboard.

  – **Thermostatic expansion valve**: This is located to the left of the heating and air conditioning unit on the bulkhead.

  – **Evaporator**: This is located to the right of the **thermostatic expansion valve** in the heating and air conditioning unit.

  – **High pressure pipe:** This pipe connects the compressor, condenser, dehydrator reservoir, and expansion valve inlet in series (it is located in the engine compartment on the left-hand side).

  – **Low pressure pipe:** This pipe connects the expansion valve, buffering capacity, evaporator, and compressor inlet in series (it is located in the engine compartment on the left-hand side).

● **HEATING COMPONENTS**

– **Heater matrix:** This is located at the bottom of the heating and air conditioning unit.

– **Passenger compartment heating resistors:** These are located at the bottom of the heater matrix on the driver's side (depending on the equipment).

● **SENSOR**

– **Interior temperature sensor:** This is located on the interior rear-view mirror.

● **ACTUATORS**

– **Air distribution flap:** This is located in the heating and air conditioning unit.

– **Air mixing flap:** This is located in the heating and air conditioning unit.

– **Recirculation flap:** This is located behind the dashboard.

– **Flap motors:** These are located close to the flaps.

● **OTHERS**

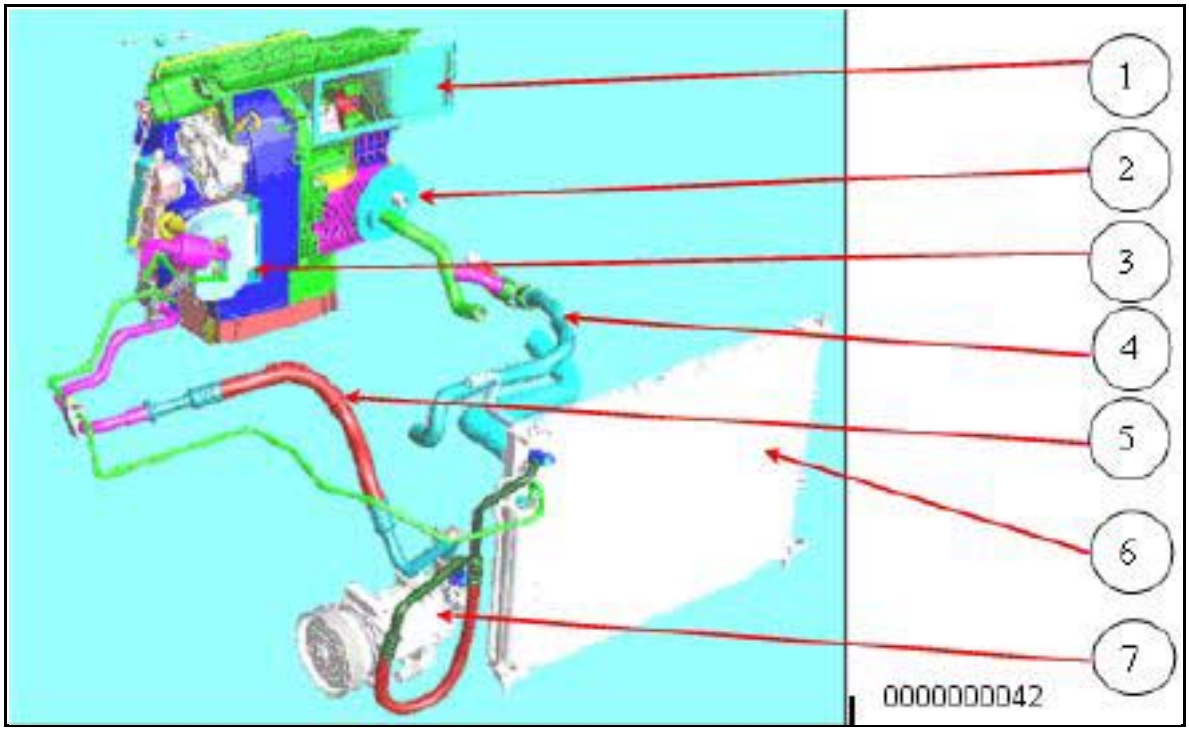
– **Passenger compartment blower unit:** This is located in the heating and air conditioning unit.

– **Cooling fan assembly:** This is located in the front panel of the vehicle, in front of the condenser.

– **Climate control computer:** This is located in the control panel.

– **Air pipes:** Theses are located under the dashboard.

● **COLD LOOP COMPONENTS**



System assembly

1 Heating and air conditioning unit
2 Heater matrix
3 Expansion valve and evaporator
4 Coolant circuit
5 Cold loop
6 Condenser and radiator
7 Compressor

– Compressor:

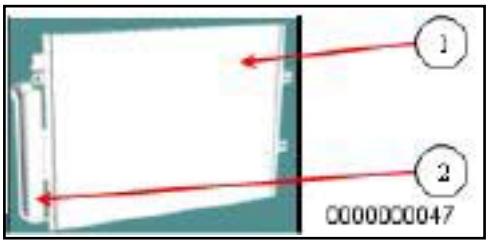
The compressor is not activated when the exterior temperature is less than 0°; it is used to compress the refrigerant fluid into gas. The pressure can reach up to **28 bar.**

Air conditioning compressor

– Condenser:

The condenser is composed of flat horizontal aluminium tubes. The pipes are divided by the vanes in order to increase the air heat exchange and therefore cool the refrigerant fluid to produce condensation.

Condenser + Dehydrator reservoir



1 Condenser
2 Dehydration canister

– Dehydrator reservoir: (see figure above)

The dehydrator reservoir is used to:
- Check the condition of the refrigerant.
- Absorb the variations in volume (expansion bottle principle).
- Filter impurities.
- Absorb moisture (water in the circuit).

– Heating and air conditioning unit: (see figure above)

This unit acts as an air mixing box. It is equipped with a system of flaps which allow the air to be directed in accordance with the requirements of the occupants whilst simultaneously allowing the temperature of the air entering the passenger compartment to be modified by mixing hot and cold air.

– Thermostatic expansion valve: (see figure below)

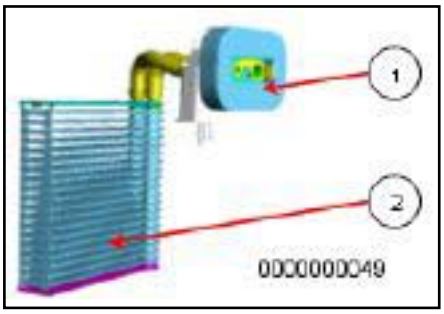
This thermostatic-type expansion valve is used to check refrigerant expansion. It is located at the evaporator inlet.

– Evaporator: (see figure below)

- The evaporator is a heat exchanger which enables the air entering the passenger compartment to be cooled.

Note: Condensation of the air may occur thereby causing normal drops of water to form under the body.

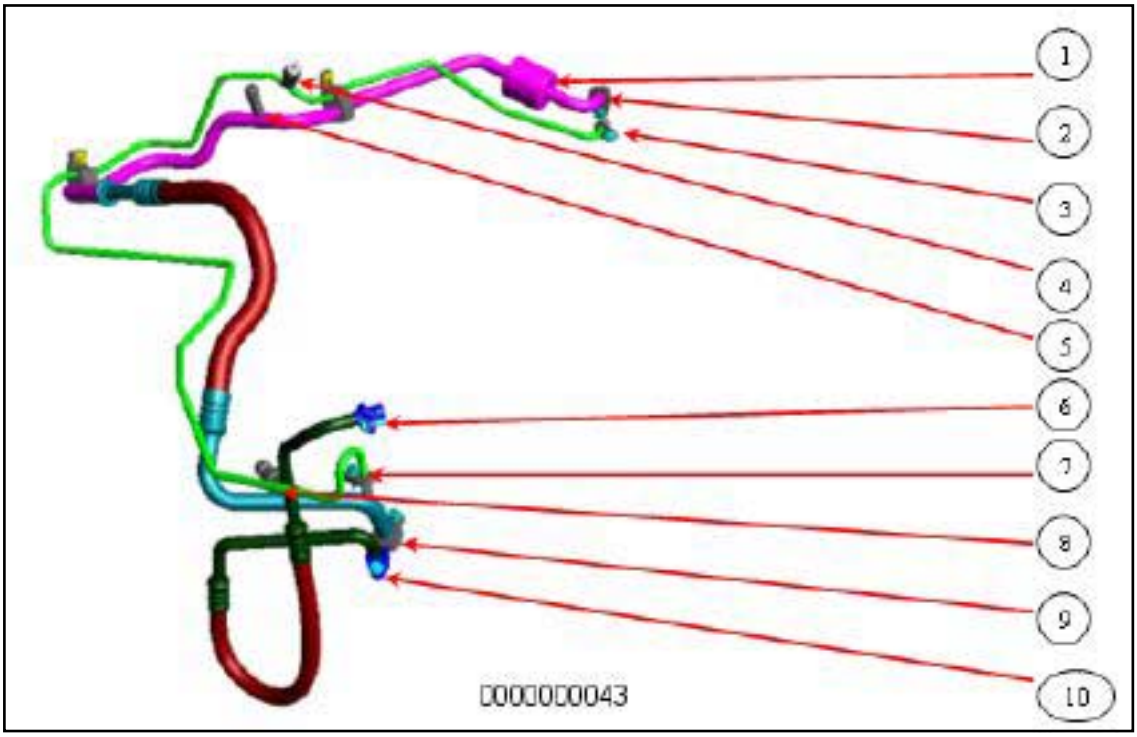
Evaporator + expansion valve



1 Expansion valve
2 Evaporator

– **High and low pressure pipes: (see figure below)**

- The **High Pressure** and **Low Pressure** pipes are composed of rigid aluminium pipes and flexible pipes that enable engine-related movements to be absorbed.
- Two filler valves (**High Pressure** and **Low Pressure**) can be accessed in order to fill (or drain) the refrigerant loop.
- The connections must be checked in the event of a refrigerant fluid leak.



Cold loop pipes

1 Buffering capacity
2 Expansion valve outlet
3 Expansion valve inlet
4 High pressure filler valve
5 Low pressure filler valve
6 Condenser inlet
7 Condenser outlet
8 Pressure sensor
9 Compressor inlet
10 Compressor outlet

- **HEATING COMPONENTS**

– **Heater matrix**:
The external air entering the heating and air conditioning device (**HVAC**) is heated by the **heater matrix**.

– **Passenger Compartment Heating Resistors** (depending on the equipment): (**see figure below**)
The passenger compartment heating resistors (RCH) are electrical heating devices in the air conditioning unit. This system is an additional heating system which operates when the engine is cold (when starting).

Passenger Compartment Heating Resistors (RCH)

- **SENSOR**

  – **Interior temperature sensor:**

This sensor is used to measure the air temperature of the passenger compartment.

- **ACTUATORS**

  – **Air distribution flap:**

This flap enables the air flowing into the passenger compartment to be directed.

  – **Air mixing flap:**

This flap enables the temperature requirements of the occupants to be met.

  – **Recirculation flap:**

This flap prevents the entry of exterior air. In this case, the passenger compartment is isolated from the exterior and air is blown in the passenger compartment in a closed circuit.

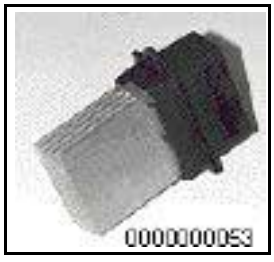
  – **Flap motors:** these motors enable the flaps to be moved electrically. There are 3 motors: One motor for the air mixing flap (stepper-motor), one motor for the distribution flap (stepper-motor) and one motor for the recirculation flap (direct current motor).

- **OTHERS**

  – **Passenger compartment blower unit:**

The passenger compartment blower unit is controlled by the Electronic Blower Dimmer Module (MVPE).

Electronic Blower Dimmer Module (MVPE)



The passenger compartment blower unit is used to vary the rate at which air is blown into the passenger compartment, depending on the requirements of the customer.

– **Cooling fan assembly:**

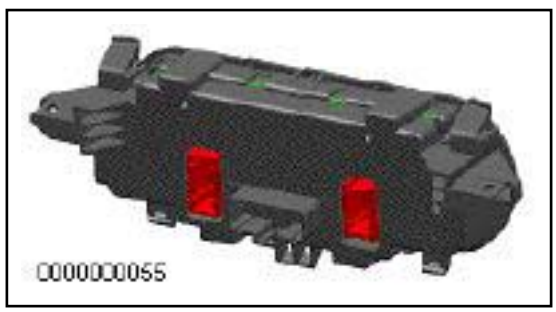
The cooling fan assembly motor is normally used in order to promote heat exchange in the condenser and therefore improve the performance of the air conditioning system. Activation of the air conditioning fan unit depends, among other things, on the vehicle speed and high pressure in the loop.

– **Climate control computer:**

The climate control computer is in permanent communication with the UCH and injection computers. It controls a number of parameters:
- Meteorological (temperature, etc.)
- Vehicle (speed, engine speed, circuit temperature and pressure)
- Comfort (interior temperature).

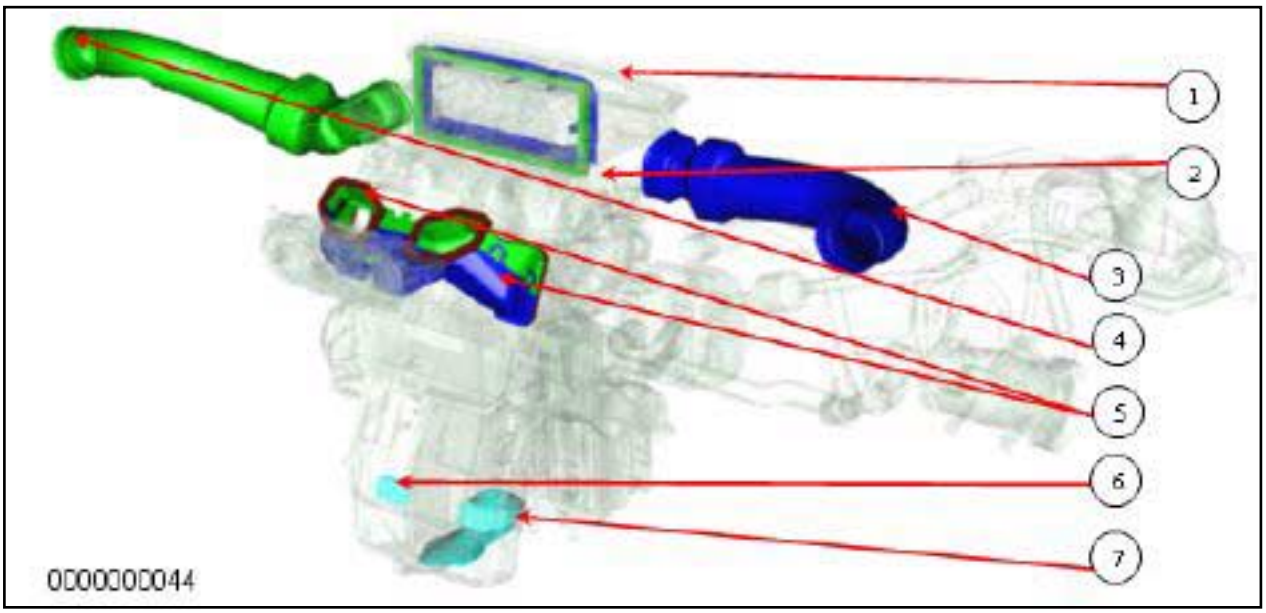
Climate control panel: front panel

Climate control panel: rear panel



– Air pipes:

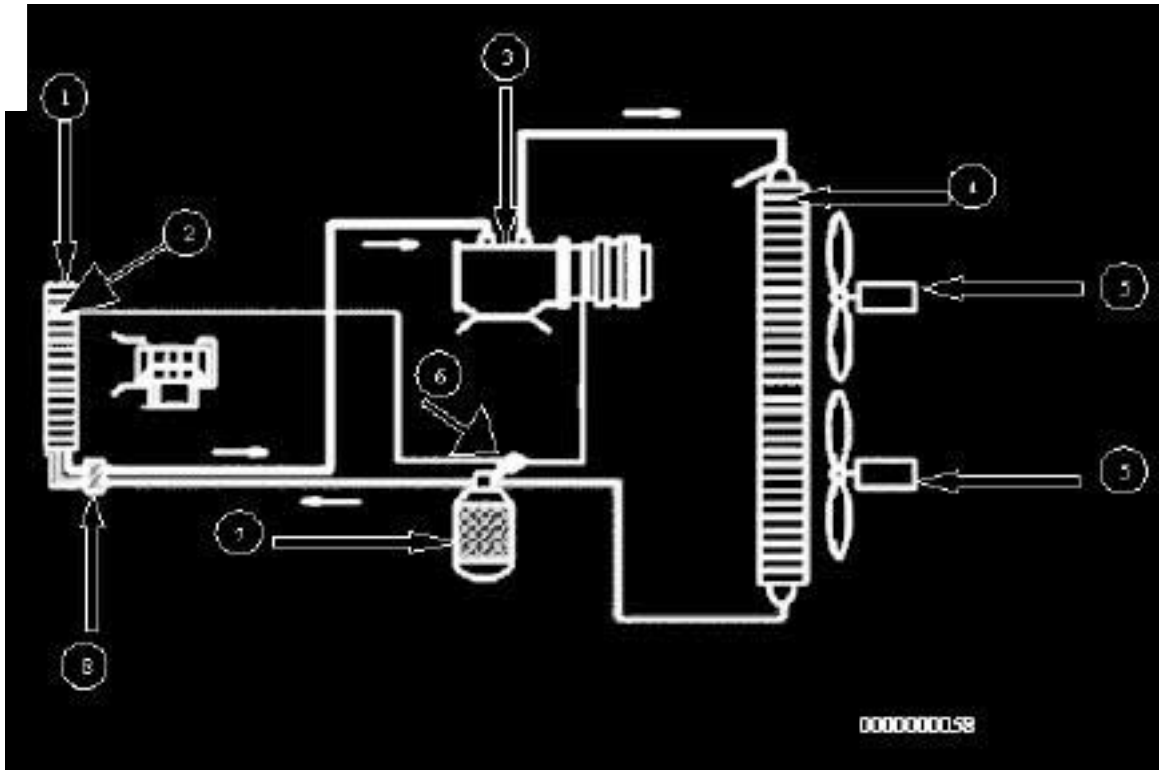
The air flows into an open air inlet scoop towards the exterior. Therefore there must be enough air flow for it to be channelled into the passenger compartment. This flow can be created by the vehicle speed (in non-recirculation mode) or by activating the blower. The air flowing into the passenger compartment is protected by a grille and a rain shield in order to prevent foreign bodies and water from entering. The air is then distributed inside the passenger compartment.



Passenger compartment air pipes

1 Air inlet
2 De-icing
3 Right-hand air vent
4 Left-hand air vent
5 Centre air vents
6 Left-hand footwell vent
7 Right-hand footwell vent

Summary diagram of all the components of the air conditioning system



1 Evaporator
2 Temperature sensor
3 Compressor
4 Condenser
5 Fan assembly
6 Pressure switch
7 Dehydration canister
8 Expansion valve

GENERAL INFORMATION:

The climate control function which is fitted to the new Twingo depends on the three computers: injection, UCH and climate control (**DISTRIBUTED FUNCTION**).
Fault finding on the air conditioning is performed in two different ways using the **diagnostic tool**.
The first procedure consists of performing **fault finding on each computer** which allows dialogue to be established with just one computer (select the climate control computer).
The second procedure consists of performing **fault finding on each function** which allows communication with all three computers belonging to the **CLIMATE CONTROL** function.

DESCRIPTION OF THE OPERATION OF THE CLIMATE CONTROL COMPUTER:

The climate control computer controls the passenger compartment ventilation, the distribution motor, the mixing motor and the recirculation motor.

The climate control computer also controls the interior temperature sensor.

The sensor and the three motors are connected to the climate control computer by wire connections. The climate control computer controls the passenger compartment ventilation using a modulated control signal (square pulse signal) sent to a power module (MVPE) by a wire connection.

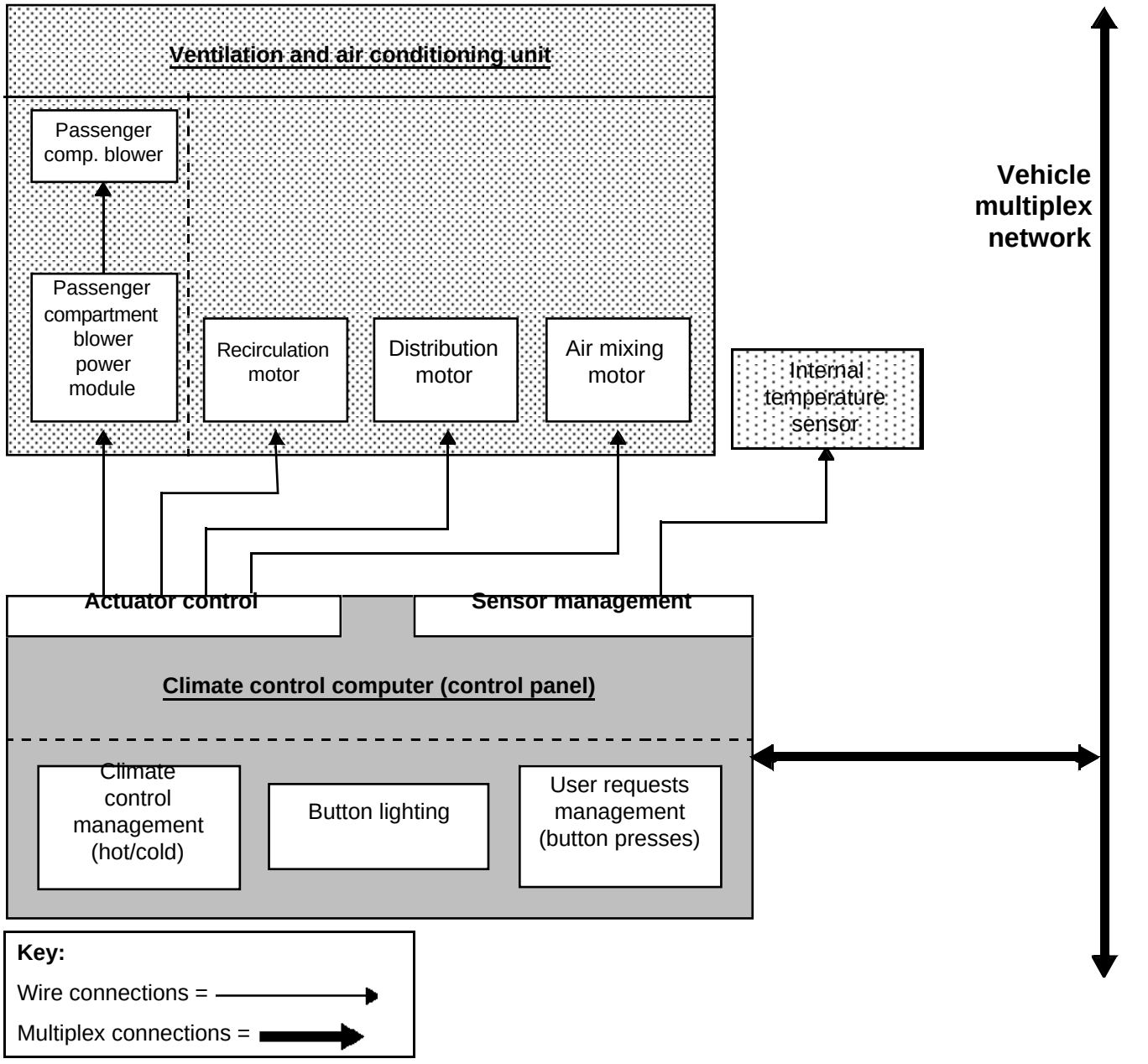
All other signals used by the climate control computer or transmitted by this computer to other computers are sent on the multiplex network.

The production of cold air (cold loop) and hot air (heating) is controlled by the other two computers involved in the **CLIMATE CONTROL** function (UCH and engine injection computer).

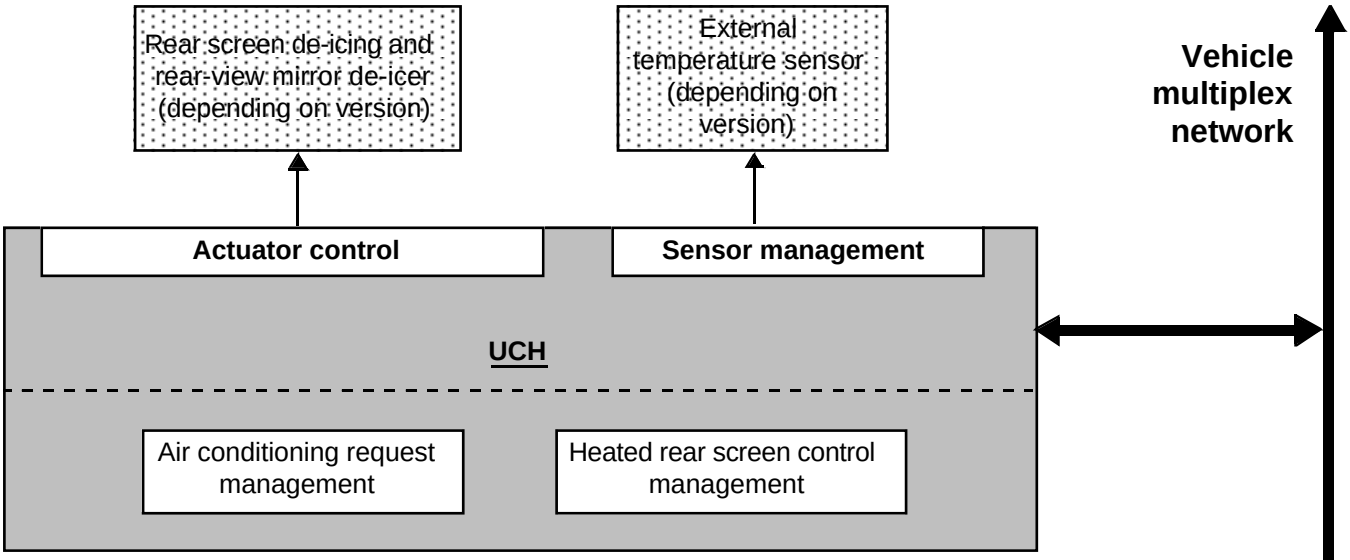
Special notes on operation:

– When the engine is stopped, the passenger compartment fan rotates more slowly than when the engine is running.
– If any of the actuators are faulty, the air conditioning can no longer control them, but the setting requests are still displayed on the control panel: warning lights light up, display of symbols on the control panel (distribution motor position, passenger compartment blower speed, AC symbol, etc.).

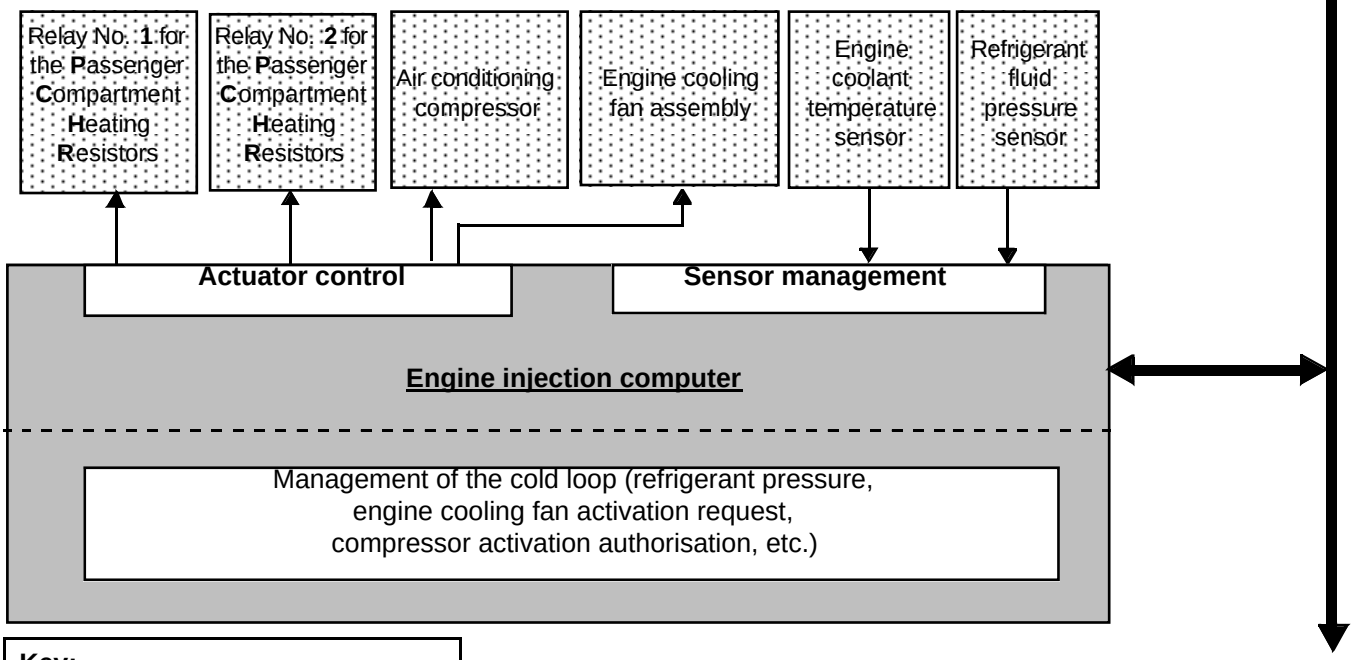
SUMMARY OF ELEMENTS CONTROLLED OR MANAGED BY THE CLIMATE CONTROL COMPUTER:



Summary diagram of components controlled or managed by the UCH:



Summary diagram of components controlled or managed by the injection computer

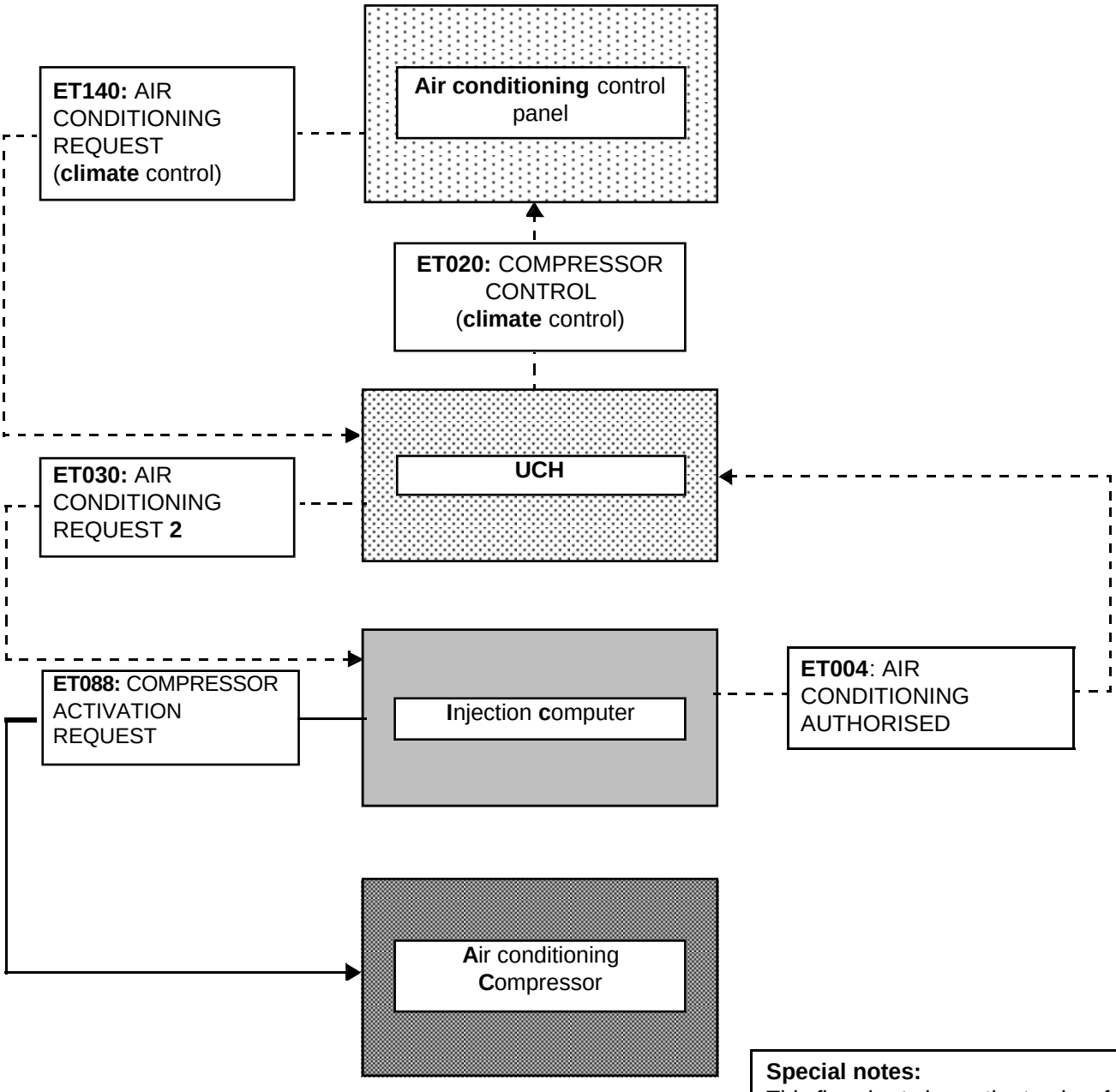


Key:

Wire connections = ——→

Multiplex connections = ➡

Compressor control flowchart:



Key:

- - - - - - - - **: Multiplex signals**

———— **: Wire connections**

Special notes:
This flowchart shows the tracks of the compressor engagement request. Components which may block this request are not listed (passenger compartment blower operation signal for the UCH on manual version with AC, correct refrigerant pressure for the injection, etc.).
If the compressor does not engage (one of the requests is not transmitted): carry out a conformity check.

REPLACING THE CLIMATE CONTROL COMPUTER

WARNING
Before replacing the climate control computer, check that it is faulty (read faults, conformity of variables, read customer complaints). Replacement of the computer must be authorised by the Techline after a fault finding log has been completed and submitted.

– Note the computer configuration according to the optional equipment fitted on the vehicle **(see climate control computer configuration)** or using the **Shared World Information (ICM)**.
– Ensure that the ignition is switched off.
– After approval from the Techline, replace the computer.
– Switch on the ignition and carry out a check using the diagnostic tool.
– Configure the computer according to the vehicle specifications.
– Switch off the ignition and then back on for the configurations to register.
– Check in the Read configuration menu that the configurations have been recognised correctly.
– Check for faults and apply the corresponding fault finding procedure for any faults shown on the **diagnostic tool**.
– Clear any stored faults.
– Run command **VP001 Enter VIN**.
– Start the engine, switch on the air conditioning and ensure that it is operating correctly.

CLIMATE CONTROL COMPUTER CONFIGURATION

The climate control computer has three configuration functions. These configurations need to be set after replacing the computer.

These three configurations are important as they ensure that climate control is optimised within the vehicle (better control compared to automatic air conditioning). If these configurations are not entered correctly, cold air and warm air production will be severely affected.

These configurations can be accessed in repair mode by the diagnostic tool and can only be entered using the fault finding by computer menu as opposed to the fault finding by function menu.

These configurations can also be read using the **diagnostic tool** in **repair mode** to ensure they have been correctly set. Configurations can be read in **fault finding by computer mode** and **fault finding by function** mode.

Configuration		Option	Configuration reading	
CF044	Vehicle type	– New Twingo	**LC013**	Vehicle type
CF024	Geographical zone	– Zone 1 – Zone 2	**LC046**	Geographical zone
CF117	Type of heating resistors	– None – 900 W	**LC044**	Type of heating resistors

WARNING
– The **"ZONE 1"** configuration must be selected for **HOT AND HUMID COUNTRIES** which correspond to the technical and legislative criteria available on the **Shared World Information.**
– The **"ZONE 2"** configuration must be selected for **TEMPERATE COUNTRIES** which correspond to the technical and legislative criteria available on the **Shared World Information.**

Note:
In hot and humid climates, when the heating and air conditioning system is in operation, condensation may form on the outside of the windscreen.
The **"ZONE 1"** configuration corrects this customer complaint.

Note:
In **fault finding by function mode, the diagnostic tool** can also display the configuration readings of the other computers involved in the air conditioning function. All of the air conditioning function configurations (of the injection computer and UCH computer) are listed (See **62C, Air conditioning**).

MIXING AND DISTRIBUTION MOTOR PROGRAMMING PROCEDURE:

There is no **specific** programming operation for the air mixing motor or the distribution motor.

However, the minimum and maximum limits of these motors have to be programmed. This operation is automatic and is performed in the following cases:
– after communication using the **diagnostic tool**, the next time ignition is switched on,
– if a fault, declared as present when the ignition was switched off, disappears the next time the ignition is switched on.

WARNING
It is imperative that communication is established with the diagnostic tool (to initiate programming the next time the ignition is switched on) after any operation on the distribution and mixing motors or on the control panel.

SUMMARY OF SENSORS AND ACTUATORS ON WHICH FAULT FINDING CAN BE PERFORMED BY THE CLIMATE CONTROL COMPUTER (with corresponding design office codes)

Tool fault	Associated DTC	Diagnostic tool title
DF001	9105	Computer
DF007	9101	Interior temperature sensor circuit
DF010	9107	Mixing motor circuit
DF012	9108	Distribution motor circuit
DF021	9106	Air recirculation motor circuit

DF001 PRESENT OR STORED	COMPUTER 1. DEF: Internal electronic fault

NOTES	**Conditions for running fault finding on a present or stored fault:** Apply this fault finding procedure if the fault reappears as present or stored after the ignition is switched off and on again.

Switch off the ignition and wait for the immobiliser warning light (Power-latch) to come one,
– Switch on the ignition again.
– Start the engine and switch on the air conditioning.
If the fault recurs, contact the Techline.
If the fault does not reappear: leave the climate control switched on and select various ventilation and air distribution settings to check that the system is operating correctly.
– Check that no fault is displayed.

If the fault is still present, contact the Techline.

AFTER REPAIR	Follow the instructions to confirm repair. If the computer was replaced (at the request of the Techline), reconfigure the computer (see **Configurations and programming**). Deal with any other faults.

DF007 PRESENT OR STORED	INTERIOR TEMPERATURE SENSOR CIRCUIT CC.0 : Short circuit to earth CO.1 : Short circuit or open circuit to + 12 V

NOTES	**Conditions for running fault finding on a present or stored fault:** Apply this fault finding procedure if the fault reappears as present or stored after the ignition is switched on and air conditioning activation is requested with the engine running.
	Special notes: The interior temperature sensor is located at the top of the roof in the unit under the rear view mirror.
	Use the Wiring Diagram Technical Note for the New Twingo.

Check the connection and condition (possible wiring damage) of the connector of **component 1872.**
If the connector is faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for the repair**), repair the connector, otherwise replace the wiring.

With connector A of component **419** and connector of union **R301** disconnected, check the **insulation and continuity** of the following connections between components **R301** (dashboard/interior lights intermediate union) and **419**.

- connection **38JN**
- connection **38GZ**

If the connection or connections are faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the wiring, otherwise replace it.
With the connector of component **1872** disconnected, check the **insulation and continuity** of the following connections between components **R301** (dashboard/interior lights intermediate union) and **1872**.

- connection **38JN**
- connection **38GZ**

If the connection or connections are faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the wiring, otherwise replace it.
Check the insulation of connections **38JN** and **38GZ** of component **1872**.
If the connection or connections are faulty and there is a repair procedure (see **Technical Note 6015A, Electrical wiring repair, Wiring: Precautions for repair**), repair the wiring, otherwise replace it.

Check the resistance of component **1872** between connections **38JN** and **38GZ**.
Replace the sensor if the resistance is not **10 kΩ ± 500 Ω at 25 °C**. For more details, consult the electrical specifications of the sensor according to the temperature (see **Help**).

If the fault is still present, contact the Techline.

AFTER REPAIR	Clear the stored faults. Follow the instructions to confirm repair. Deal with any other faults.

DF010 PRESENT OR STORED	MIXING MOTOR CIRCUIT CO.0 : Open circuit or short circuit to earth CC.1 : Short circuit to + 12 V

NOTES	**Conditions for running fault finding on a present or stored fault:** The fault is declared present when the temperature control is activated (minimum or maximum temperature request and air conditioning control panel on).
	Special notes: Wait **1 minute** after repairing the fault so that the climate control computer can control the mixer motor. To avoid having to wait for 1 minute, switch the ignition o**f** and then back on again. There is no specific programming operation for the mixing motor, however, after it has been replaced, the motor needs to program its limits (minimum and maximum).
	Use the Wiring Diagram Technical Note for the New Twingo.

Check the **connection and condition** of the connector of **component 420**.
If the connector is faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for the repair**), repair the connector, otherwise replace the wiring.

With connector B of component **419** disconnected, check the **insulation and continuity** of the following connections between components **419** and **420**:

- connection **38LC**
- connection **38LD**
- connection **38LG**
- connection **38LH**

If the connection or connections are faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the wiring, otherwise replace it.

Connector of component **1115** disconnected,
Check the **insulation and continuity** of connection **S** between components **419** and **420**.

If the connection or connections are faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the wiring, otherwise replace it.

Connector of **component 419** connected and ignition on,

- Check for 12 V supply on connection S of component 420 in relation to earth NAM.

If the connection is faulty (see Technical Note 6015A, **Repairing electrical wiring, Wiring: Precautions for the repair**), repair the wiring, otherwise replace the wiring.

If the supply is not present and if no faulty connections are detected during the continuity checks, contact your Techline.

AFTER REPAIR	Clear the stored faults. Follow the instructions to confirm repair. If the motor has been replaced (see **Configuration and programming**). Deal with any other faults.

DF010 CONTINUED	

With the connector disconnected, measure the resistance value of the mixing motor:

Check the resistance of component **420** between the following connections:

- connections **S and 38LG,**
- connections **S and 38LC,**
- connections **S and 38LH,**
- connections **S and 38LD.**

If the connection or connections are faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the wiring, otherwise replace it.

The results of the four checks should be **100 Ω ± 5 Ω at 20 °C**, replace the mixing motor if this is not the case.

If the fault is still present, remove the mixing motor but leave it electrically connected and send a motor command from the temperature buttons on the control panel: switch the temperature setting to maximum **27 °C** (a value of **100 %**), then switch the temperature setting to minimum **15 °C** (a value of **0 %**), the motor must change from one direction to the other. If the connections are correct but the motor does not switch during the commands: replace the mixing motor.

AFTER REPAIR	Clear the stored faults. Follow the instructions to confirm repair. If the motor has been replaced (see **Configuration and programming**). Deal with any other faults.

DF012 PRESENT OR STORED	DISTRIBUTION MOTOR CIRCUIT CO.0 : Open circuit or short circuit to earth CC.1 : Short circuit to + 12 V

NOTES	**Conditions for running fault finding on a present or stored fault:** The fault is declared present with the air conditioning control panel on and the distribution control activated (de-icing, ventilation, footwells, etc.).
	Special notes: Wait **1 minute** after repairing the fault so that the climate control computer can control the distribution motor. To avoid having to wait for 1 minute, switch the ignition off and then back on again. 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).
	Use the Wiring Diagram Technical Note for the New Twingo.

Check the **connection and condition** of the connector of **component 1115**.
If the connector is faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for the repair**), repair the connector, otherwise replace the wiring.

With connector of **component 419** disconnected, check **the insulation and continuity** of the following connections between components **419** and **1115**:

- connection **38KY**
- connection **38KZ**
- connection **38LA**
- connection **38LB**

If the connection or connections are faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the wiring, otherwise replace it.

With the connector of component **420** disconnected, check the **insulation and continuity** of connection **S** between components **419 and 1115**.

If the connection or connections are faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the wiring, otherwise replace it.

Connector of component **419** connected and ignition on (**air conditioning control panel on**).
Check for **12 V** supply on connection **S** of component **1115** in relation to earth **NAM**.

If the connection is faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for the repair**), repair the wiring, otherwise replace the wiring.

If the supply is not present and if no faulty connections are detected during the continuity checks, contact your Techline.

AFTER REPAIR	Clear the stored faults. Follow the instructions to confirm repair. If the motor has been replaced (see **Configuration and programming**). Deal with any other faults.

DF012 CONTINUED	

With the connector disconnected, measure the resistance value of component **1115** between the following connections:

- connections **S and 38KY**,
- connections **S and 38LA**,
- connections **S and 38LB**,
- connections **S and 38KZ**.

If the connection or connections are faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the wiring, otherwise replace it.

The results of the four checks should be **100 Ω ± 5 Ω at 20 °C**, replace the distribution motor if this is not the case.

If the fault is still present, remove the distribution motor but leave it electrically connected, send a motor command from the distribution buttons on the control panel: switch the distribution setting to demisting (a **value of 100 %**), then switch the distribution setting to air vent (a **value of 0 %**), the motor must change 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, contact the Techline.

AFTER REPAIR	Clear the stored faults. Follow the instructions to confirm repair. If the motor has been replaced (see **Configuration and programming**). Deal with any other faults.

DF021 PRESENT OR STORED	RECIRCULATION MOTOR CIRCUIT CO : Open circuit CC.0 : Short circuit to earth CC.1 : Short circuit to + 12 V

NOTES	**Conditions for running fault finding on a present or stored fault:** The fault is declared present with the air conditioning panel on and the recirculation control activated (recirculation selected for flap closed or exterior air selected for flap open).
	Special notes: After repairing the fault (when the fault switches from present to stored), wait for **1 minute** before the climate control computer is able to control the distribution motor. To avoid having to wait for 1 minute, switch the ignition off and then back on again. In extreme temperatures (above **35 °C**) and when the climate control is switched on, the recirculation flap sets itself to the recirculation position in order to correct the passenger compartment temperature more quickly.
	Use the Wiring Diagram Technical Note for the New Twingo.

Check the **condition and connection** of the connector of **component 475**.
If the connector is faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for the repair**), repair the connector, otherwise replace the wiring.

With connector B of component 419 disconnected, check the **insulation and continuity** of the following connections between components **419** and **475**:

- connection **38JA**
- connection **38JB**

If the connection or connections are faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the wiring, otherwise replace it.

Check the resistance of component **475** between connections **38JA** and **38JB**.

If the connection or connections are faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the wiring, otherwise replace it.

Replace the motor if the resistance is not: **35 Ω ± 5 Ω at 20 °C**.

If the fault is still present, contact the Techline.

AFTER REPAIR	Clear the stored faults. Follow the instructions to confirm repair. If the motor has been replaced (see **Configuration and programming**). Deal with any other faults.

NOTES	Only carry out this conformity check after a **complete check** with the **diagnostic tool** (fault reading and configuration checks). **Application conditions**: engine stopped with ignition on (**12 V APC), AIR CONDITIONING OFF** (air conditioning compressor not activated). Note: – Read the parameters when the vehicle is cold (in the morning) to check the conformity of the temperature parameters (without thermometer). The two temperatures should be practically the same (as should the coolant temperature given by the injection system). – The invalid values given in this check correspond to the value sent by the diagnostic tool (substitute value) when the sensor in question is faulty. A sensor fault can be detected when these invalid values are displayed (this is an important point for sensors on which fault finding cannot be performed, e.g. exterior temperature sensor). Delayed illumination of the exterior temperature sensor LCD indicates that an invalid value has been received concerning the exterior temperature sensor.

SUB-FUNCTION: PASSENGER COMPARTMENT VENTILATION

Function	Parameter or Status checked or Action		Display and Notes	Fault finding
Passenger compartment blower	**ET141:**	Passenger compartment blower	**RUNNING** or **STOPPED** After a user request	In the event of a fault, refer to the **interpretation of this status**.
	PR019:	Passenger compartment fan PWM setting	Speed 0 = **0 %** Speed 8 = **100 %** Note: The **PWM** signal is a modulated control voltage used to control the air conditioning blower power module.	If there is a fault or for more information (to find the intermediate speed percentages), refer to the **interpretation of this parameter**. Note: If the parameter varies correctly, but the passenger compartment blower unit does not operate: consult **ALP 5 "Air flow fault"**
Air flaps	**PR012:**	Mixing flap position	**From 0 %** (“Maximum cold” position: **15 °C**) to **100 %** (“Maximum hot” position: **27 °C**).	In the event of a fault, see **the interpretation of this parameter**.
	ET062:	Recirculation flap position	**OPEN** if the flap is in the external air position. **CLOSED** if the flap is in the recirculation position.	In the event of a fault, refer to **the interpretation of this status**.
	PR011:	Distribution flap position	**From 0 %** (Air vent position) to **100 %** (De-icing position)	In the event of a fault, see **the interpretation of this parameter**.

NOTES	Only carry out this conformity check after a **complete check** with the **diagnostic tool** (fault reading and configuration checks). **Application conditions:** engine stopped with ignition on (**12 V APC**), **CLIMATE CONTROL OFF** (air conditioning compressor not engaged).

SUB-FUNCTION: PASSENGER COMPARTMENT VENTILATION (CONTINUED)

Function	Parameter or Status checked or Action		Display and Notes	Fault finding
Temperatures	**PR001:**	Interior temperature	**X** = interior temperature ± **5 °C** (invalid value: **87.5 °C**)	In the event of a fault, see **the interpretation of this parameter**.
	PR002:	External temperature	**X** = exterior temperature ± **5 °C** (invalid value: **215 °C**)	In the event of a fault, see **the interpretation of this parameter** Note: This parameter is displayed via the climate control computer but is generated by the UCH.
Motor activation	**AC001:**	Passenger compartment blower	When this command is run the passenger compartment blower comes on.	In the event of a fault, refer to the **interpretation of this command**.
	AC002:	Recirculation motor: exterior air	This command is used to actuate the air recirculation motor to check that it is working.	In the event of a fault, refer to the **interpretation of this command**.
	AC003:	Recirculation motor: recirculation	This command is used to actuate the air recirculation motor to check that it is working.	In the event of a fault, refer to the **interpretation of this command**.
	AC007:	Distribution motor: de-icing	This command is used to activate the ventilation/ de-icing distribution flap to check that it is working.	In the event of a fault, refer to the **interpretation of this command**.
	AC006:	Distribution motor: air vent	This command is used to activate the ventilation/ de-icing distribution flap to check that it is working.	In the event of a fault, refer to the **interpretation of this command**.
	AC004:	Mixer motor: maximum cold	This command is used to activate the mixing flap to check that it is working.	In the event of a fault, refer to the **interpretation of this command**.
	AC005:	Mixer motor: maximum hot		In the event of a fault, refer to the **interpretation of this command**.

NOTES	Only carry out this conformity check after a **complete check** with the **diagnostic tool** (fault reading and configuration checks). **Application conditions:** engine stopped with ignition on (**12 V APC**), **CLIMATE CONTROL OFF** (air conditioning compressor not engaged).

COLD LOOP SUB-FUNCTION

Function	Parameter or Status checked or Action		Display and Notes	Fault finding
Request to engage the compressor	**ET140:**	Air conditioning request	**INACTIVE**	In the event of a fault, refer to **the interpretation of this status**.
Passenger compartment blower	**ET141:**	Passenger compartment blower	**RUNNING** or **STOPPED** After a user request	In the event of a fault, refer to **the interpretation of this status**.
Compressor	**ET020:**	Compressor control	**INACTIVE**	In the event of a fault, refer to **the interpretation of this status**.
Temperatures	**PR001:**	Interior temperature	**X** = interior temperature ± **5 °C** (invalid value: **87.5 °C**)	In the event of a fault, see **the interpretation of this parameter**.
	PR002:	External temperature	**X** = exterior temperature ± **5 °C** (invalid value: **215 °C)**	In the event of a fault, see **the interpretation of this parameter** Note: This parameter is displayed via the climate control computer but is generated by the UCH.
Air flaps	**PR012:**	Mixing flap position	**From 0 %** (“Maximum cold” position: **15 °C**) to **100 %** (“Maximum hot” position: **27 °C**).	In the event of a fault, see **the interpretation of this parameter**.

NOTES	Only carry out this conformity check after a **complete check** with the **diagnostic tool** (fault reading and configuration checks). **Application conditions:** engine stopped with ignition on (**12 V APC**), **CLIMATE CONTROL OFF** (air conditioning compressor not engaged).

HEATING SUB-FUNCTION

Function	Parameter or Status checked or Action		Display and Notes	Fault finding
Heated rear screen	**ET086:**	Heated rear screen: manual mode	**INACTIVE**	In the event of a fault, refer to **the interpretation of this status**.
	ET085:	Heated rear screen: automatic mode	**INACTIVE**	In the event of a fault, refer to **the interpretation of this status**.
Passenger compartment ventilator	**ET141:**	Passenger compartment ventilator	**RUNNING** or **STOPPED** After a user request	In the event of a fault, refer to **the interpretation of this status**.
Air mixing motor	**PR012:**	Mixing flap position	**From 0 %** ("Maximum cold" position: **15 °C**) to **100 %** ("Maximum hot" position: **27 °C**).	In the event of a fault, see **the interpretation of this parameter**.
Heating	**PR045:**	Current heating resistor power	**0 W**	In the event of a fault, see **the interpretation of this parameter**.
Temperature	**PR001:**	Interior temperature	**X** = interior temperature ± **5 °C** (invalid value: **87.5 °C**)	In the event of a fault, see **the interpretation of this parameter**.
	PR002:	External temperature	**X** = exterior temperature ± **5 °C** (invalid value: **215 °C**)	In the event of a fault, consult the **interpretation of this parameter**. Note: This parameter is displayed via the climate control computer but is generated by the UCH.
	PR004:	Coolant temperature	**X** = engine coolant temperature in **°C**	In the event of a fault, see **the interpretation of this parameter**.

NOTES	Only carry out this conformity check after a **full check** using the **diagnostic tool** (fault reading and configuration checks). **Application conditions**: engine stopped with ignition on (**12 V APC**), **AIR CONDITIONING OFF** (air conditioning compressor not activated). Note: This page lists the statuses and parameters provided by the climate control computer but which are not associated with the three sub-functions given in the conformity check (**PASSENGER COMPARTMENT VENTILATION, COLD LOOP and HEATING** sub-functions).

MAIN SCREEN

Function	Parameter or Status checked or Action		Display and Notes	Fault finding
Electrical supplies	**PR092:**	Battery voltage	**10.5 V < X <14.4 V**	In the event of a fault, see **the interpretation of this parameter**.
	ET083:	+ 12 V after ignition present	**ABSENT**: Ignition off. **PRESENT**: Ignition on.	In the event of a fault, refer to **the interpretation of this status**.
	ET002:	+ 12 V side lights	**ABSENT**: Side lights off. **PRESENT**: Side lights on.	In the event of a fault, refer to the **interpretation of this status**.
	PR122:	Night lighting level	**15 %** = minimum lighting level **99 %** = maximum lighting level (side lights off: **102 %**)	In the event of a fault, refer to the **interpretation of this status**. Note: This parameter is displayed via the climate control computer but is generated by the instrument panel.

NOTES	Only carry out this conformity check after a **full check** using the **diagnostic tool** (fault reading and configuration checks). **Application conditions**: engine running, **AIR CONDITIONING ON** (air conditioning compressor activated). Note: – Read the parameters when the vehicle is cold (in the morning) to check the conformity of the temperature parameters (without thermometer). The two temperatures should be practically the same (as should the coolant temperature given by the injection system). – The invalid values given in this check correspond to the value sent by the diagnostic tool (substitute value) when the sensor in question is faulty. A sensor fault can be detected when these invalid values are displayed (this is an important point for sensors on which fault finding cannot be performed, e.g. exterior temperature sensor).

SUB-FUNCTION: PASSENGER COMPARTMENT VENTILATION

Function	Parameter or Status checked or Action		Display and Notes	Fault finding
Passenger compartment blower	**PR019:**	Passenger compartment fan PWM setting	Speed 0 = **0 %** Speed 8 = **100 %** Note: The **PWM** signal is a modulated control voltage used to control the air conditioning blower power module.	If there is a fault or for more information (to find the intermediate speed percentages), refer to the **interpretation of this parameter**. Note: If the parameter varies correctly, but the passenger compartment blower unit is not working: refer to **fault finding chart no. 5**.
	ET141:	Passenger compartment blower	**RUNNING** or **STOPPED** After a user request.	In the event of a fault, refer to **the interpretation of this status**.
Air flaps	**PR012:**	Mixing flap position	**From 0 %** (“Maximum cold” position: **15 °C)** to **100 %** (“Maximum hot” position: **27 °C)**.	In the event of a fault, see **the interpretation of this parameter**.
	ET062:	Recirculation flap position	**OPEN** if the flap is in the external air position. **CLOSED** if the flap is in the recirculation position.	In the event of a fault, refer to **the interpretation of this status**.
	PR011:	Distribution flap position	From **0 %** (Air vent position) to **100 %** (De-icing position).	In the event of a fault, refer to **the interpretation of this status**.

NOTES	Only carry out this conformity check after a **full check** using the **diagnostic tool** (fault reading and configuration checks). **Application conditions**: engine running, (**12 V APC**) **AIR CONDITIONING ON** (air conditioning compressor activated).

SUB-FUNCTION: PASSENGER COMPARTMENT VENTILATION (CONTINUED)

Function	Parameter or Status checked or Action	Display and Notes	Fault finding
Temperatures	**PR001:** Interior temperature	**X** = interior temperature ± **5 °C** (invalid value: **87.5 °C**)	In the event of a fault, see **the interpretation of this parameter**.
	PR002: External temperature	**X** = exterior temperature ± **5 °C** (invalid value: **215 °C**)	In the event of a fault, see **the interpretation of this parameter**. Note: This parameter is displayed via the climate control computer but is generated by the UCH.

NOTES	Only carry out this conformity check after a **full check** using the **diagnostic tool** (fault reading and configuration checks). **Application conditions**: engine running, **AIR CONDITIONING ON** (air conditioning compressor activated).

COLD LOOP SUB-FUNCTION

Function	Parameter or Status checked or Action		Display and Notes	Fault finding
Request to activate the compressor	**ET140:**	Air conditioning request	**ACTIVE**	In the event of a fault, refer to **the interpretation of this status**.
Passenger compartment blower	**ET141:**	Passenger compartment blower	**RUNNING**	In the event of a fault, refer to **the interpretation of this status**.
Compressor	**ET020:**	Compressor control	**ACTIVE**	In the event of a fault, refer to **the interpretation of this status**.
Temperature	**PR001:**	Interior temperature	**X** = interior temperature ± **5 °C** (invalid value: **87.5 °C**)	In the event of a fault, see **the interpretation of this parameter**.
	PR002:	External temperature	**X =** exterior temperature ± **5 °C** (invalid value: **215 °C)**	In the event of a fault, see **the interpretation of this parameter** Note: This parameter is displayed via the climate control computer but is generated by the UCH.
Air flaps	**PR012:**	Mixing flap position	**From 0 %** (“Maximum cold” position: **15 °C)** to **100 % (**“Maximum hot” position: **27 °C**).	In the event of a fault, see **the interpretation of this parameter**.

NOTES	Only carry out this conformity check after a **full check** using the **diagnostic tool** (fault reading and configuration checks). **Application conditions**: engine running, **AIR CONDITIONING ON** (air conditioning compressor activated).

HEATING SUB-FUNCTION

Order	Function	Parameter or Status checked or Action		Display and Notes	Fault finding
1	Heated rear screen	**ET086:**	Heated rear screen: manual mode	**ACTIVE:** De-icing request using the control button. **INACTIVE** otherwise.	In the event of a fault, refer to **the interpretation of this status**.
		ET085:	Heated rear screen: automatic mode	**ACTIVE**: De-icing request using the control button. (“see clear” function) **INACTIVE** otherwise.	In the event of a fault, refer to **the interpretation of this status**.
2	Passenger compartment blower	**ET141:**	Passenger compartment blower	**RUNNING**	In the event of a fault, refer to **the interpretation of this status**.
3	Air mixing motor	**PR012:**	Mixing flap position	**From 0 %** (“Maximum cold” position: **15 ˚C** to **100 %** = “Maximum hot” position: **27 ˚C**).	In the event of a fault, see **the interpretation of this parameter**.
4	Heating	**PR045:**	Current heating resistor power	**0 < X < 900 W**	In the event of a fault, see **the interpretation of this parameter**.
5	Temperature	**PR001:**	Interior temperature	**X** = interior temperature ± **5 ˚C** (invalid value: **87.5 ˚C**)	In the event of a fault, see **the interpretation of this parameter**.
		PR002:	External temperature	**X** = exterior temperature ± **5 ˚C** (invalid value: **215 ˚C**)	In the event of a fault, see **the interpretation of this parameter** Note: This parameter is displayed via the climate control computer but is generated by the UCH.
		PR004:	Coolant temperature	**X** = engine coolant temperature in ˚C.	In the event of a fault, see **the interpretation of this parameter**.

NOTES	Only carry out this conformity check after a **full check** using the **diagnostic tool** (fault reading and configuration checks). **Application conditions**: engine running, **AIR CONDITIONING ON** (air conditioning compressor activated). This page lists the statuses and parameters provided by the climate control computer but which are not associated with the three sub-functions given in the conformity check (**PASSENGER COMPARTMENT VENTILATION, COLD LOOP and HEATING** sub-functions).

MAIN SCREEN

Order	Function	Parameter or Status checked or Action	Display and Notes	Fault finding
1	Electrical supplies	**PR092:** Battery voltage	**10.5 V < X <14.4 V**	In the event of a fault, see **the interpretation of this parameter**.
		ET083: + 12 V after ignition present	**PRESENT**: Ignition on.	In the event of a fault, refer to **the interpretation of this status**.
		ET002: + 12 V side lights	**ABSENT**: Side lights off. **PRESENT**: Side lights on.	In the event of a fault, refer to **the interpretation of this status**.
		PR122: Night lighting level	Between **15 %** (minimum lighting level) and **99 %** (maximum lighting level) (side lights off: **102 %**)	In the event of a fault, consult the **interpretation of this parameter** Note: This parameter is displayed by the climate control computer but is generated by the instrument panel.

Tool status	Diagnostic tool title
ET002	+ 12 V side lights
ET020	Compressor control
ET062	Recirculation flap position
ET083	+ 12 V after ignition present
ET085	Heated rear screen: automatic mode
ET086	Heated rear screen: manual mode
ET140	Air conditioning request
ET141	Passenger compartment blower

AFTER REPAIR	Repeat the conformity check from the start.

ET002	+ 12 V SIDE LIGHTS FEED

NOTES	None

This status indicates the presence of **+ 12 V** side lights feed on connection **LPD** of component **419**.
If **ET002** displays **ABSENT** when the side light are lit, check for **+ 12 V** between connection **LPD** and the earth connection **NAM** of component **419**. If **+ 12 V** is present on connection LPD and **ET002** displays **ABSENT**. If the status does not operate, carry out fault finding on the UCH (see **87B, UCH**).
If **+ 12 V** is not present on connection **LPD**, consult **ALP No. 13**.

AFTER REPAIR	Repeat the conformity check from the start.

ET020	COMPRESSOR CONTROL

NOTES	None

This indicates the status of the compressor actuated by the injection computer.
If **ET020** displays **ACTIVE**, the compressor activation request is authorised.
If **ET020** displays **INACTIVE**, the compressor activation request is not authorised.

If the "**AC**" indicator light is lit and if **ET020** displays **INACTIVE**, run fault finding on the **injection computer** (see **13B, Diesel injection or 17B, Petrol injection**) and **UCH** (see **87B, UCH**).

AFTER REPAIR	Repeat the conformity check from the start.

ET062	RECIRCULATION FLAP POSITION

NOTES	**Special notes** In extreme temperatures (above **35 °C**) and when the climate control is switched on, the recirculation flap sets itself to the recirculation position in order to correct the passenger compartment temperature more quickly.

This status specifies the position of the recirculation flap.
If the flap is in the exterior air position, the status displays **OPEN**.
If the flap is in the recirculation position, the status displays **CLOSED**.

If the status does not operate as indicated, apply the interpretation of fault **DF021 Recirculation motor circuit**.

AFTER REPAIR	Repeat the conformity check from the start.

ET083	+ 12 V AFTER IGNITION PRESENT

NOTES	**Use the Wiring Diagram Technical Note for the New Twingo.**

This status indicates activation of **+ 12 V APC** by the UCH via the multiplex line.
When the ignition is off, the status displays **ABSENT**.
When the ignition is on, the status displays **PRESENT**.

If the status does not operate, carry out fault finding on the UCH (see **87B, UCH**).

AFTER REPAIR	Repeat the conformity check from the start.

ET085	HEATED REAR SCREEN: AUTO MODE

NOTES	None

This status specifies whether the heated rear screen is operated in automatic mode or not. This mode corresponds to the **SEE CLEAR** function. This function switches on the heated rear screen, the heated door mirrors, the air conditioning and the windscreen ventilation. The heating and air conditioning system requires a short amount of time between the request and blower activation in order for dry air to be blown. The heated rear screen will operate for as long as the **SEE CLEAR** function is requested (permanently controlled). This automatic mode is obtained by pressing the de-icing button at the top of the air conditioning control panel.
If the **SEE CLEAR** function is requested, the status should display **ACTIVE**.
If the **SEE CLEAR** function is not requested, the status should display **INACTIVE**.

If the status does not operate as indicated (see **ALP10 Poor de-icing efficiency - rear screen demisting**).

AFTER REPAIR	Repeat the conformity check from the start.

ET086	HEATED REAR SCREEN: MANUAL MODE

NOTES	None

This status specifies whether the request for the heated rear screen is being operated in manual mode. This mode corresponds to a timed operating period for the heated rear screen, controlled by the UCH. This time delay depends on the exterior temperature (between **10** and **15 minutes**).
Operation in manual mode is obtained by pressing the de-icing button at the bottom of the air conditioning control panel. This function is used to switch on the heated rear screen and the heated door mirrors.
If activation of the heated rear screen is requested in manual mode, the status should display **ACTIVE**.
If activation of the heated rear screen is not requested, the status should display: **INACTIVE**.

If the status does not operate as indicated (see **ALP10 Poor de-icing efficiency - rear screen demisting**).

AFTER REPAIR	Repeat the conformity check from the start.

ET140	AIR CONDITIONING REQUEST

NOTES	Note: For more information, refer to the flowchart for the request to switch on the compressor (see **Air conditioning, General operating mode**).

This status specifies whether the request to switch on the compressor has been sent by the climate control computer to the UCH or not.
When activation of the air conditioning is requested, the status should display **ACTIVE**.
When activation of the air conditioning is not requested, the status should display **INACTIVE**.

If the status does not operate as indicated, contact your Techline.

AFTER REPAIR	Repeat the conformity check from the start.

ET141	PASSENGER COMPARTMENT FAN

NOTES	**Special note**: This status is used by the UCH to authorise the request for air conditioning which is sent to the injection. The UCH sends this signal to the injection to authorise the request to activate the passenger compartment heating resistors (only on diesel version): operating safety.

This status shows the operation of the passenger compartment blower.
When the passenger compartment blower is operating (from speed 1 to speed 8), the status displays: **RUNNING**.
When the passenger compartment blower is not operating (speed 0), the status displays **STOPPED**.

If the status does not operate as displayed, check that the passenger compartment blower is operating correctly.
If the passenger compartment blower does not work, apply the fault finding procedure in **Fault finding chart (ALP) 5 No passenger compartment ventilation**.

If the passenger compartment blower operates correctly but the status displays the message **OFF**, check that the passenger compartment blower visual feedback (spiral symbol) on the control panel works correctly (increase in spiral bargraphs according to the eight speeds).
If the passenger compartment visual feedback (blade symbol) on the instrument panel does not work, contact your Techline.

If the fault is still present, perform fault finding on the multiplex network (see **88B, Multiplexing**).

AFTER REPAIR	Repeat the conformity check from the start.

Tool parameter	Diagnostic tool title
PR001	Interior temperature
PR002	External temperature
PR004	Coolant temperature
PR011	Distribution flap position
PR012	Mixing flap position
PR019	Passenger compartment PWM* setting
PR045	Current heating* resistor power
PR092	Battery voltage
PR122	Night lighting level

PR001	INTERIOR TEMPERATURE

NOTES	None

The climate control computer receives the interior temperature signal through a wire connection.
Read the temperature signal when the vehicle is cold (in the morning) to check the conformity of this parameter (without a thermometer). The interior temperature, the exterior temperature and the engine coolant temperature should be practically the same. Another way of checking whether this sensor is correct is to check the resistance value of the sensor according to temperature: refer to the electrical specifications of the sensor in the **Help** section (at the end of the document).
If the temperature displayed by this parameter is implausible, apply the fault finding procedure for fault: **DF007 Interior temperature sensor circuit**.

AFTER REPAIR	Repeat the conformity check from the start.

PR002	EXTERNAL TEMPERATURE

NOTES	None

The climate control computer receives the exterior temperature signal through the multiplex line via the UCH.
Read the temperature signal when the vehicle is cold (in the morning) to check the conformity of this parameter (without a thermometer). The interior temperature, the exterior temperature and the engine coolant temperature should be practically the same.
If the temperature displayed by this parameter appears inconsistent: carry out fault finding on the UCH (see **87B, UCH**).

AFTER REPAIR	Repeat the conformity check from the start.

PR004	COOLANT TEMPERATURE

NOTES	**Special note:** The climate control computer receives the engine coolant temperature signal through the multiplex line via the injection system.

Read the temperature signal when the vehicle is cold (in the morning) to check the conformity of this parameter (without a thermometer). The interior temperature, the exterior temperature and the engine coolant temperature should be practically the same.

If the temperature displayed by this parameter appears inconsistent, carry out fault finding on the injection system (see **13B, Diesel injection or 17B, Petrol injection**).

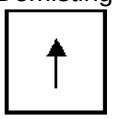
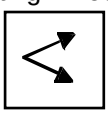
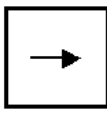
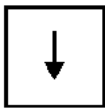
AFTER REPAIR	Repeat the conformity check from the start.

PR011	DISTRIBUTION FLAP POSITION

NOTES	The values listed below are only given as a guide (they depend on which way the flap is being moved).

The following table gives the percentages by which the air distribution motor is controlled as well as the opening status of the lower flaps (footwell flap and under seat duct flap). To view the lower flaps, remove the right-hand and left-hand lower air ducts.

Values should be checked with the engine off and the climate control in manual mode (tolerance **± 5 %**).

Air distribution request	**PR011 Distribution flap position**	**Air flow distribution information**			**Lower flap opening status**
		Demisting flow	Vent flow	Footwell flow	
Demisting 	100 %	High	Low	None	Completely closed
Demisting + Footwells 	77 %	High	Low	High	Completely open
Air vents 	0 %	Low	High	None	Completely closed
Air vent + Footwells 	32 %	Low	High	High	Approximately 20 % open
Footwell Ventilation 	54 %	Medium	Medium	High	Completely open

If the request and position read by the computer for **PR011** is inconsistent, contact Techline.

AFTER REPAIR	Repeat the conformity check from the start.

PR012	MIXER FLAP POSITION

NOTES	None

The mixer flap moves according to the temperature requested or automatically if the climate control is in automatic mode. The mixing motor does not have a position copy potentiometer. This parameter is therefore an indication of the flap position according to how the motor is being controlled by the climate control computer. As specified in the conformity check, in the “maximum cold” position (**15 °C**) the parameter indicates **0 %** and in the “maximum hot” position (**27 °C**) the parameter indicates **100 %**.

If the value displayed by this parameter appears inconsistent or if the parameter is consistent but the temperature of the blown air does not change in accordance with the user's request: apply the fault finding procedure for fault **DF010 "Mixing motor circuit"** or consult the fault finding charts **ALP 6 No heating** or **ALP 8 No cold air** depending on the customer complaint.

AFTER REPAIR	Repeat the conformity check from the start.

PR019	PASSENGER COMPARTMENT PWM* SETTING

NOTES	The values listed below are examples only.

Controlled values with the engine stationary and engine running with heating and ventilation in manual mode (tolerance **± 5 %**).

Passenger compartment blower speed setting	SPEED 0	SPEED 1	SPEED 2	SPEED 3	SPEED 0	SPEED 5	SPEED 6	SPEED 7	SPEED 8
PR019 Passenger compartment blower unit PWM setpoint.	0 %	20 %	25 %	33 %	43 %	50 %	60 %	77 %	100 %

If the values given above are correct but the passenger compartment blower does not work, see **ALP 5 No passenger compartment ventilation**.

AFTER REPAIR	Repeat the conformity check from the start.

PR045	CURRENT HEATING RESISTOR POWER

NOTES	None

The climate control computer receives the exterior temperature signal coming from the injection computer via the UCH computer through the multiplex line.
This parameter indicates the heating power developed by the passenger compartment heating resistors. The passenger compartment heating resistors are equipped with three power ratings, each having increments of 300 W. The parameter values are therefore 0 W, 300 W, 600 W and 900 W.
If this parameter appears inconsistent, run fault finding on the injection computer (see **13B, Diesel injection or 17B, Petrol injection**).

AFTER REPAIR	Repeat the conformity check from the start.

PR092	BATTERY VOLTAGE

NOTES	**Use the Wiring Diagram Technical Note for the New Twingo.**

This parameter specifies the supply voltage of the climate control computer.
This parameter must display a voltage equal to: **10.5 V < X < 14.4 V** with the engine running.

Using a multimeter, check the consistency of the parameter by measuring the voltage across the battery terminals.
If the parameter corresponds with the voltage measured on the battery terminals, run fault finding on the **electric charging circuit.**

If the parameter does not correspond with the battery voltage, check the condition and position of fuse **F29 (15A)** in the **passenger compartment fuse unit**.
Consult section 81C Fuses.

Disconnect the connectors of the following components of **connection SP2**:

- Component connector **615**
- Component connector **419**
- Component connector **645**
- Component connector **319**
- Component connector **261**
- Component connector **653**
- Component connector **1428**

With connector A of component **419** disconnected, check the **insulation and continuity** of connection **SP2** between components **419 and 1016**.

If the connection or connections are faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the wiring, otherwise replace it.

Check the vehicle earth connection **NAM** of the connector of component **419**.

If the connection is faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for the repair**), repair the wiring, otherwise replace the wiring.

If these checks do not reveal any faults, carry out a test on each of the components involved in connection SP2 (short circuit).

AFTER REPAIR	Repeat the conformity check from the start.

PR122	NIGHT LIGHTING LEVEL

NOTES	The climate control computer receives the dimmer lighting level via the instrument panel through the multiplex line.

This parameter indicates the dimmer lighting level as a percentage.
If this parameter appears inconsistent with the air conditioning control panel lighting, contact Techline.

AFTER REPAIR	Repeat the conformity check from the start.

Tool command	Diagnostic tool title
AC001	Passenger compartment blower unit
AC002	Recirculation motor: exterior air
AC003	Recirculation motor: recirculation
AC004	Mixer motor: maximum cold
AC005	Mixer motor: maximum hot
AC006	Distribution motor: air vent
AC007	Distribution motor: de-icing

AC001	PASSENGER COMPARTMENT BLOWER UNIT

NOTES	None

This command is used to ensure that the passenger compartment blower is working. When this command is run the passenger compartment blower comes on.

If the command does not operate as indicated, consult **Fault finding chart 5 No passenger compartment ventilation**.

AFTER REPAIR	Check that the air conditioning function operates correctly.

AC002 **AC003**	RECIRCULATION MOTOR: EXTERIOR AIR RECIRCULATION MOTOR: RECIRCULATION

NOTES	**WARNING** Do not touch the flap when running the command.
	NOTE The flap is located behind the cabin filter.

This command is used to actuate the air recirculation motor to check that it is working.
When running command **AC003**, the flap closes. When running command **AC002**, the flap opens.
If the command does not work as shown, check the mechanical condition of the flap. If the fault is still present, apply the interpretation of fault **DF021 Recirculation motor circuit**.

AFTER REPAIR	Check that the air conditioning function operates correctly.

AC004 **AC005**	MIXER MOTOR: MAXIMUM COLD MIXER MOTOR: MAXIMUM HOT

NOTES	**NOTES:** The flap is located in the air conditioning mechanism. In order to confirm this command, the engine must be warm in order to be able to check for the presence of a warm air flow during command **AC005**.

This command is used to activate the mixing flap to check that it is working. Switch on the ignition, and issue a passenger compartment ventilation request (via the driver's control panel).
Run command **AC004** and check that the air coming out of the air vents is cold (ambient temperature).
Run command **AC005** and check that the air coming out of the air vents is warm.

If the command does not operate as indicated, consult the customer complaints:
– Production of cold air, see: **ALP 8 No cold air and ALP 9 Too much cold air**.
– Production of warm air, see: **ALP 6 No heating or loss of heating**.

AFTER REPAIR	Check that the air conditioning function operates correctly.

AC006 **AC007**	DISTRIBUTION MOTOR: AIR VENTS DISTRIBUTION MOTOR: DE-ICING

NOTES	**NOTE** The flap is located under the dashboard.

This command is used to activate the ventilation/de-icing distribution flap to check that it is working.
Switch on the ignition, and issue a passenger compartment ventilation request (via the driver's control panel).
Run command **AC007** and check that the air comes out by the windscreen.
Run command **AC006** and check that the air comes out of the front air vents.

If the command does not operate as indicated, check the air distribution conformity (see **ALP 2 Air distribution fault**).

AFTER REPAIR	Check that the air conditioning function operates correctly.

NOTES	**Special notes:** General summary of all of the fault finding charts for each function.

DIALOGUE FAULT

- **NO DIALOGUE WITH THE COMPUTER** — **ALP 1**

AIR DISTRIBUTION PROBLEM

- **AIR DISTRIBUTION PROBLEM** — **ALP 2**
- **AIR FLOW FAULT** — **ALP 3**
- **INEFFICIENT WINDSCREEN DEMISTING** — **ALP 4**
- **NO PASSENGER COMPARTMENT VENTILATION** — **ALP 5**

HEATING FAULT

- **NO HEATING OR LOSS OF HEATING (section 61A)** — **ALP 6**
- **TOO MUCH HEATING (section 61A)** — **ALP 7**

AIR CONDITIONING FAULT

- **NO COLD AIR** — **ALP 8**
- **TOO MUCH COLD AIR** — **ALP 9**
- **INEFFICIENT REAR SCREEN DE-ICING/DEMISTING** — **ALP 10**

PASSENGER COMPARTMENT ODOURS

- UNPLEASANT ODOURS IN PASSENGER COMPARTMENT — ALP 11

WATER IN PASSENGER COMPARTMENT

- WATER IS PRESENT IN PASSENGER COMPARTMENT — ALP 12

CONTROL PANEL FAULT

- NO CONTROL PANEL LIGHTING — ALP 13

COMPRESSOR NOISES

- COMPRESSOR NOISES — ALP 14

ALP 1	No dialogue with the computer

NOTES	**Special notes:** To run fault finding on the vehicle computers, use the key to switch on the ignition.
	Use the Wiring Diagram Technical Note for the New Twingo.

Check that the vehicle is equipped with **climate control**.

Try to establish dialogue with a computer on another vehicle to make sure that the **diagnostic tool** is not faulty.
If the tool is not at fault, and dialogue cannot be established with any other computer on the same vehicle, the cause could be a faulty computer interfering on the multiplex network.
Check the battery voltage and perform the necessary operations to obtain a correct voltage (**9.5 V < Battery voltage < 17.5 V, see section 16A Starting-charging**).

Check:
– the connection between the **diagnostic tool** and the diagnostic probe (lead in good condition),
– the connection between the **diagnostic sensor** and the diagnostic socket (lead in good condition).

Carry out fault finding on the multiplex network using the diagnostic tool (see **88B, Multiplex**).

Check the condition and position of fuse **F29 (15 A)** in the **passenger compartment fuse box**.
Consult **section 81C Fuses**.
Disconnect the connectors of the following components of **connection SP2**:

- Component connector **615**
- Component connector **419**
- Component connector **645**
- Component connector **319**
- Component connector **261**
- Component connector **653**
- Component connector **1428**

Check the **insulation and continuity** of connection **SP2** between components **419** and **1016**.

Check the vehicle earth connection **NAM** of the connector of component **419**.

If the connection is faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for the repair**), repair the wiring, otherwise replace the wiring.

If these checks do not reveal any faults, carry out a test on each of the components involved in connection SP2 (short circuit).

Check the condition and position of fuse **F18 (10 A)** in the **passenger compartment fuse box**.

Consult section 81C Fuses.

Disconnect the connectors of the following components of **connection BP6**:

- Component connector **995**
- Component connector **419**

AFTER REPAIR	Carry out a complete check with the **diagnostic tool**.

ALP 1 CONTINUED	

- Component connector **645**

Check the **insulation and continuity** of connection **BP6** between components **419 and 1016**.

Check the vehicle earth connection **NAM** of the connector of component **419**.

If the connection is faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for the repair**), repair the wiring, otherwise replace the wiring.

If these checks do not reveal any faults, carry out a test on each of the components involved in connection BP6 (short circuit).

Ensure that the supply to the diagnostic socket is correct:

Check the condition and position of fuse **F12 (5 A)** in the **passenger compartment fuse box**.

Consult section 81C Fuses.

Connector of **component 645** of connection BP19 disconnected:

– Check for **+ after ignition feed on connection BP19** of component **225**.

If the + after ignition feed on **connection BP 19** is not guaranteed, check **component 1016**.

– Check **connections NAM** and **MAM** of **component 225**.

If the connection is faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for the repair**), repair the wiring, otherwise replace the wiring.

If these checks do not reveal any faults, carry out a test on each of the components involved in connection BP19 (short circuit).

If dialogue has still not been established after these checks, contact the Techline.

AFTER REPAIR	Carry out a complete check with the **diagnostic tool**.

ALP 2	Air distribution fault

NOTES	None

Check that **the air circuit** (**cabin filter**, scuttle panel grille, air ducts and grilles etc.) is not blocked. Repair, clean or change the cabin filter if necessary.
Also check that there is no air flow fault: (see **ALP 3 Air flow fault**).

Check that the blower unit is correctly **sealed**. Also check that the air distribution ducts (right-hand and left-hand, upper and lower) are correctly connected to the housing as well as the refrigeration pipe in the glove box (if the customer complains about a feeling of cold air on the passenger's side).
Repair if necessary.

↓

Set the passenger compartment blower to maximum speed with maximum hot or maximum cold and move the air distribution control. Check that the air outlet is the one selected.
Note:
For information about the air flows according to user selection, refer to the air distribution table given in the interpretation of parameter **PR011 Distribution flap position**.

Has the customer complaint been confirmed?

NO → The air distribution is operating correctly. Explain to the customer how the system operates.

YES

↓

Remove the centre console and glovebox (see **MR 412 Bodywork, 57A, Interior equipment, Removal - refitting procedures).**
Remove the distribution motor and check the condition of the flap control.

Is the flap control damaged?

YES → Replace the distribution - ventilation unit.

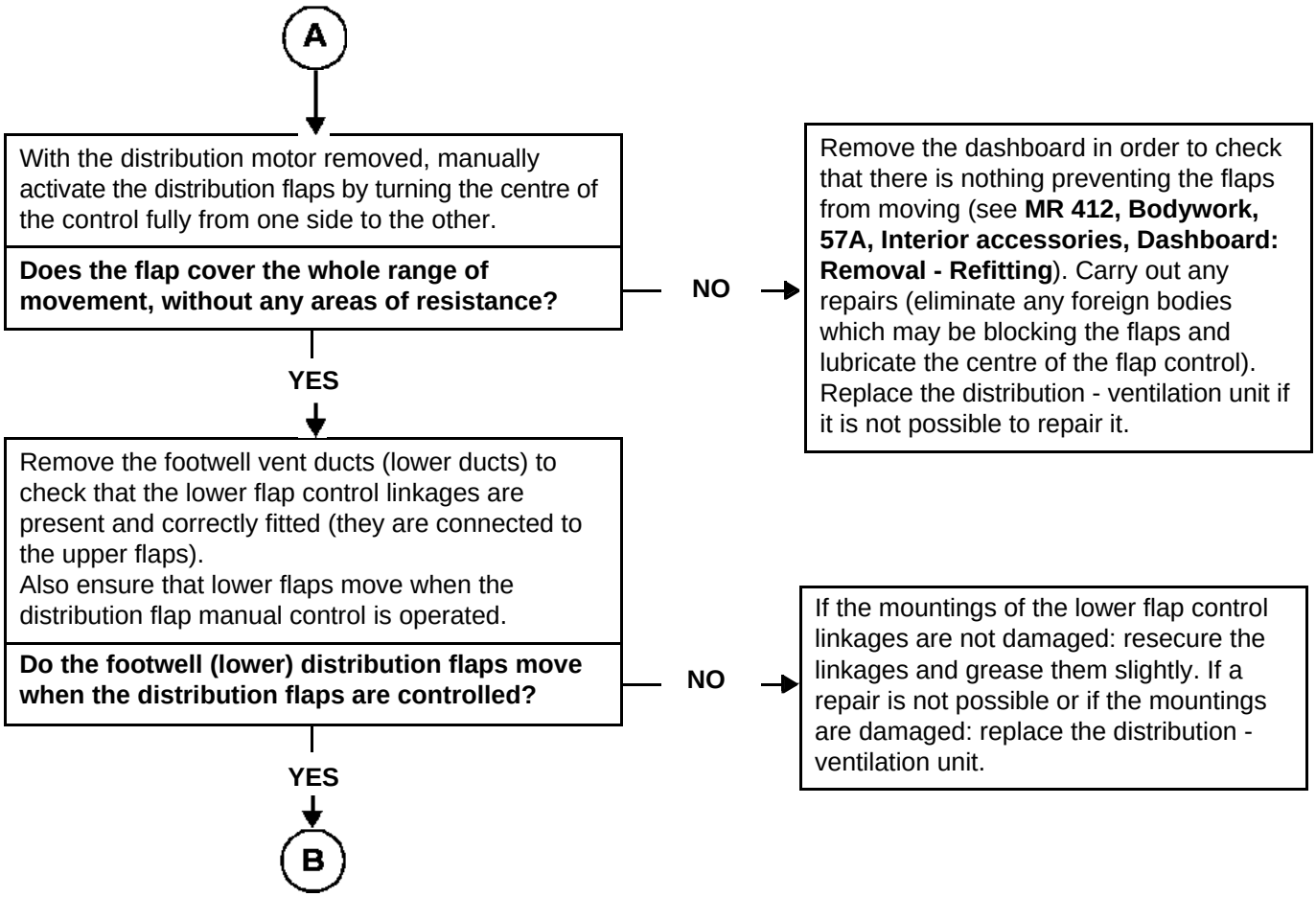
NO

↓

(A)

AFTER REPAIR	Carry out a complete check with the **diagnostic tool**.

ALP 2 CONTINUED 1	



AFTER REPAIR	Carry out a complete check with the **diagnostic tool**.

ALP 2 CONTINUED 2	

B

Remove the distribution motor but leave it electrically connected, send a motor command from the distribution buttons on the control panel: switch the distribution flap to the demisting position (a value of **100 %**), then switch the distribution setting to vent (a value of **0 %**).

Is the distribution motor operating?

NO → Apply fault finding procedure for fault **DF012 Distribution motor circuit**.

YES

Visually check that when the distribution flaps are moved manually (by turning the centre of the control), moving the control does in fact move the distribution flaps.

Is movement possible?

NO → Replace the distribution - ventilation unit (see **MR411, 62B, Climate control, Distribution motor, Removal - Refitting).**

YES

End of fault finding.

AFTER REPAIR	Carry out a complete check with the **diagnostic tool**.

ALP 3	Air flow fault

NOTES	Only consult this customer complaint after a **complete check with the diagnostic tool**. Check that the customer knows how to work the air conditioning system properly.

Is the passenger compartment blower unit **working**?

NO → Repair, see **ALP 5**.

YES

Check that **the air circuit** (cabin filter, scuttle panel grille, air vents and extractors etc.) is not blocked.
If necessary, repair, clean or replace the cabin filter (**see MR 411 Mechanical, 61A, Heating, Cabin filter: Removal - Refitting**).
Check that the blower blades are in good condition (**see MR 412 Bodywork, 57A Interior equipment, Passenger compartment blower: Removal - refitting**).

Check that the blower unit is correctly **sealed**. Also check that the air distribution ducts (right-hand and left-hand, upper and lower) are correctly connected to the housing as well as the refrigeration pipe in the glove box (if the customer complains about a feeling of cold air on the passenger's side).
Repair if necessary.

Check that the air recirculation flap does not remain closed when in the recirculation position. On the **diagnostic tool**, status **ET062 Recirculation flap position** should display **OPEN** (the flap can be seen by removing the windscreen frame). Repair if necessary (apply the fault finding procedure for fault **DF021 Recirculation motor circuit**).

With the passenger compartment filter removed, put your hand into the housing to ensure that the evaporator is not obstructed and that there is no ice.

Is the evaporator obstructed?

YES → Remove the evaporator and clean if it is obstructed.
If there is ice on the evaporator, carry out a **conformity check** on the temperature sensors (interior, exterior and coolant temperatures).
Replace any faulty components.

NO

(A)

AFTER REPAIR	Carry out a complete check with the **diagnostic tool**.

ALP 3 CONTINUED	

(A)

Using the **diagnostic tool**, check that the air conditioning control panel is correctly controlling the passenger compartment blower unit by checking parameter **PR019 Passenger compartment blower unit PWM setting** (control setpoint).
Note:
The control values are given in the interpretation of this parameter (see the **HELP** sub-section).

If the passenger compartment fan setting values are correct, check that the air flow varies in line with the 8 control speeds.

Does the air flow vary?

NO → Check that the passenger compartment blower unit control is correct by referring to the fault finding procedure (see **HELP**).

YES

End of fault finding.

AFTER REPAIR	Carry out a complete check with the **diagnostic tool**.

ALP 4	Inefficient windscreen demisting

NOTES	Only consult this customer complaint after a **complete check with the diagnostic tool**.
	Special notes: Check that the inside of the windows are not greasy, as this lowers the efficiency of the demister.

Use the **diagnostic tool** to check that the **computer is correctly configured** by reading the **LC046 GEOGRAPHICAL ZONE** configuration. If necessary, reconfigure the computer (**CF024 GEOGRAPHICAL ZONE**) and check that the windscreen demisting operates correctly.

Check that the air extraction vents are not blocked. Repair if necessary.

Is the fault still present?

NO → **End of fault finding procedure.**

YES

↓

Check that there is no **water leakage** in the passenger compartment which would significantly increase the humidity and reduce the efficiency of the demisting. Repair if necessary (see **ALP12 Water in the passenger compartment**).

Is the fault still present?

NO → **End of fault finding procedure.**

YES

↓

Check that the compressor **operates correctly** by switching on the air conditioning (press the “AC” button). Repair if necessary (see **ALP8 NO COLD AIR**).

↓

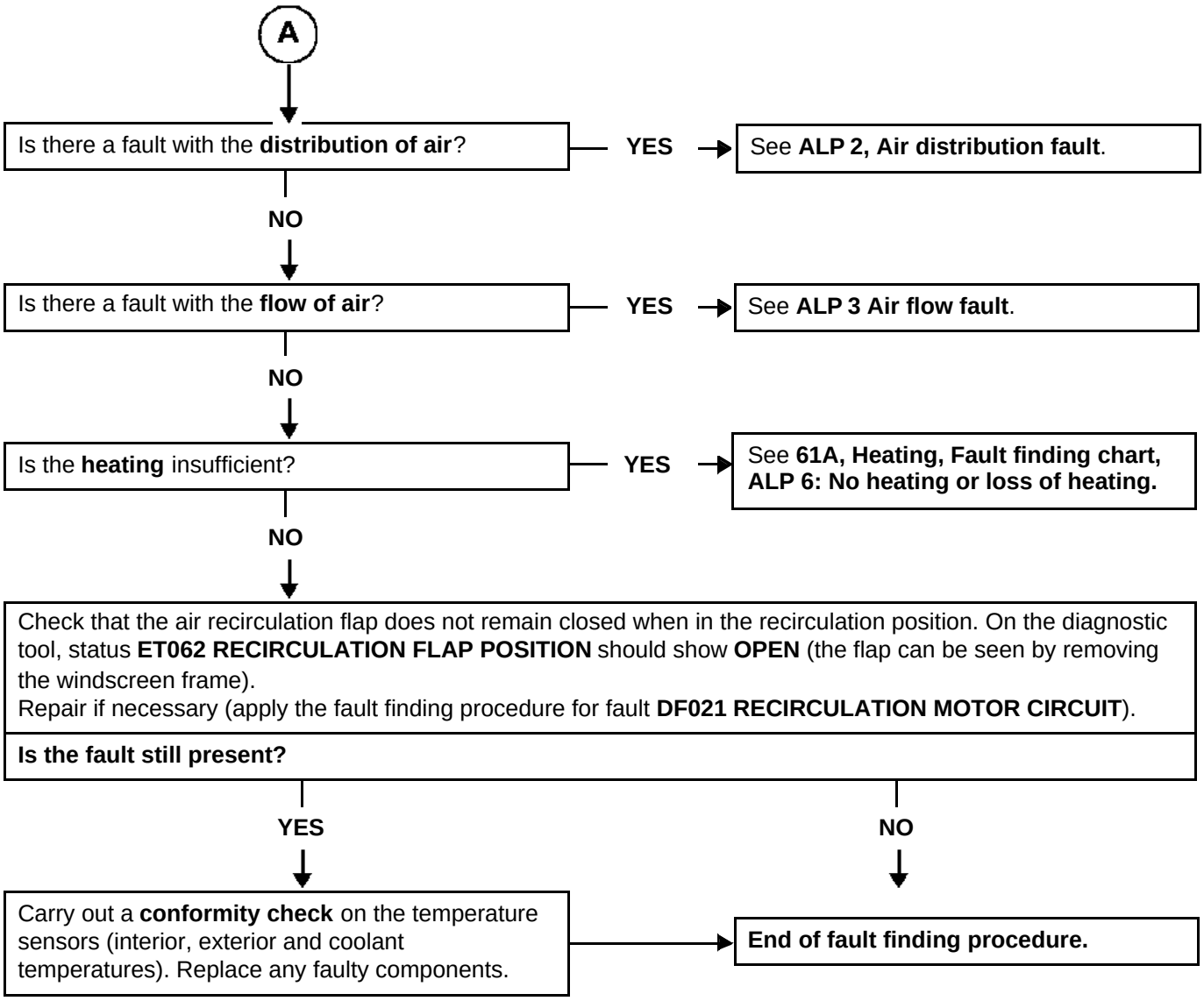
Check that the condensation (water from the evaporator) **evacuation ring** is not obstructed (under the vehicle). Repair if necessary.

↓

(A)

AFTER REPAIR	Carry out a complete check with the **diagnostic tool**.

ALP 4 CONTINUED	



AFTER REPAIR	Carry out a complete check with the **diagnostic tool**.

ALP 5	No passenger compartment ventilation

NOTES	Only consult this customer complaint after a **complete check with the diagnostic tool**.
	Special notes: The intermediate connector is located on the distribution-ventilation unit and the passenger compartment blower unit control module is located slightly higher up, below the heater matrix pipes.
	Use the Wiring Diagram Technical Note for the New Twingo.

Using the **diagnostic tool**, check that the passenger compartment blower control setting given by the computer varies from 0 to 100 % by checking parameter **PR019 PASSENGER COMPARTMENT BLOWER PWM SETTING** (refer to the interpretation of this parameter).

Does the value vary?

NO → **Contact the Techline.**

Check that the control voltage (PWM) from the passenger compartment blower power **module** varies between **0 and 12 V** (from 0 to 100 %) by measuring this voltage between connection **38LR** of component **1023** and earth **MAN** (connector disconnected).

Does the voltage vary correctly?

NO

Check the insulation and **continuity** of connection **38LR** between components **419 and 1023**.

If the connection is faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for the repair**), repair the wiring, otherwise replace the wiring.

Before ignition feed, check for **+ 12 V accessories feed** on connection **SP3** of component **1023** in relation to the **chassis earth.**

- Check the continuity of connection **MAN** between the intermediate connector and component **1023.**
- Check the continuity of connection **MAN** between the intermediate connector and the chassis earth.

If the connection is faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for the repair**), repair the wiring, otherwise replace the wiring.

If there is no **+12 V** accessories feed, check the condition and position of fuse **F28** (**30A**) in the **passenger compartment fuse box**. **Consult section 81C Fuses.**

If the checks do not reveal any faults, carry out conformity check on **component 1016** and **component 1428** if the **vehicle is fitted with electric windows.**

YES → (A)

AFTER REPAIR	Carry out a complete check with the **diagnostic tool**.

ALP 5 CONTINUED	

A

Check the **insulation and continuity** of the following connections between component **1023 and the intermediate connector:**
- connection **SP3**
- connection **MAN**

If the connection or connections are faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the wiring, otherwise replace it.

Check the **insulation and continuity** of the following connections between component **1023 and 1156:**
- connection **38DB**
- connection **38DA**

If the connection or connections are faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the wiring, otherwise replace it.
– Check the **insulation and continuity** of connection **SP3** between component **1428 and the intermediate connector if the vehicle is fitted with front electric windows.**
– Check the **insulation and continuity** of connection **SP3** between component **1016 and the intermediate connector if the vehicle is fitted with front manual windows.**

If the connection or connections are faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the wiring, otherwise replace it.

If the checks do not reveal any faults, carry out conformity check on **component 1016** and **component 1428** if the **vehicle is fitted with electric windows**.

Check that the passenger compartment blower blade is not **broken or separated** from its shaft (**see MR 412 Bodywork, 57A Interior equipment, Passenger compartment blower: Removal - refitting**).
Replace the passenger compartment blower if necessary.

With the connector disconnected, measure the resistance value of the passenger compartment blower motor:
Check the resistance (approximately 0.180 Ω of component **1156** between connections **38DB and 38DA**.
If the connection or connections are faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the wiring, otherwise replace the passenger compartment blower.
Replace the passenger compartment blower if the resistance is zero or equal to infinity.

If the fault is still present, replace the power module.

AFTER REPAIR	Carry out a complete check with the **diagnostic tool**.

ALP 8	No cold air

NOTES	Only deal with this customer complaint after a **full check** with the **diagnostic tool** (fault reading and configuration checks). Check that the engine speed is greater than **750 rpm** and that the exterior temperature is above 3 °C. Check that the fuses are sound. Use a multimeter and a 21 W test light. Use the **Wiring Diagram Technical Note, NEW TWINGO**.

Preliminary cold loop efficiency test

Engine running, air conditioning in maximum cold position and maximum ventilation speed. After **10 minutes**, is the high pressure pipe at the compressor outlet hot, and the low pressure pipe at the evaporator outlet cold and iced up?

YES → **2**

NO

Check the cleanliness of the condenser. Touch the pipes: are they warmer at the inlet than the outlet?

NO → Replace the condenser (see **MR 411 Mechanical, 62A, Air conditioning, Condenser: Removal - Refitting).**

YES

Is the dehydrator reservoir pipe hot at the inlet and outlet?

NO → Replace the dehydrator reservoir (see **MR 411 Mechanical, 62A, Air conditioning, Dehydrator reservoir: Removal - Refitting).**

YES

Is the expansion valve pipe hot at the inlet and outlet?

YES → Replace the expansion valve (see **MR 411 Mechanical, 62A, Air conditioning, Expansion valve: Removal - Refitting).**

NO

Is the evaporator pipe hot at the inlet and outlet?

YES → Replace the evaporator (see **MR 411 Mechanical, 62A, Air conditioning, Evaporator: Removal - Refitting).**

NO

1

AFTER REPAIR	Carry out a complete check with the **diagnostic tool**.

ALP 8 CONTINUED 1

1

Using the **diagnostic tool** statuses and parameters screen (cold loop sub-function), check that the temperature signals are consistent (no sensor deviation resulting in incorrect measurement).

– Using parameters **PR002 "exterior temperature", PR064 "coolant temperature"** and **PR001 "interior temperature".**

Are the temperature signals consistent?

NO →

Carry out a **conformity check:**

– For the coolant temperature sensor, see **13B, Diesel injection, Fault summary table** or **17B Petrol injection, Fault summary table.**

– For the exterior temperature sensor, see **87B, Passenger compartment connection unit, Fault summary table.**

– For the interior temperature sensor, see **62B, Climate control, Fault summary table.**

Replace any faulty components.

YES

Start the engine and switch on the air conditioning by pressing the AC button (with a request for maximum cold temperature and the passenger compartment blower running).
Display the following status in the “User selection” sub-function screen:
ET140 "air conditioning request" should be ACTIVE and the “AC” symbol should be displayed on the air conditioning control panel screen.

Is status **ET140 ACTIVE**?

NO →

Air conditioning request interpretation fault on the climate control computer. Carry out fault finding on the climate control computer (see **interpretation of statuses).**

YES

A

AFTER REPAIR	Carry out a complete check with the **diagnostic tool**.

ALP 8 CONTINUED 2

(A)

With the engine running at idle speed, use the **diagnostic tool** to check that the passenger compartment central unit sends the start air conditioning request to the injection computer. Status **ET030 Air conditioning request 2** should display **ACTIVE**.

Is status ET030 "ACTIVE"?

NO

Check that the UCH is correctly configured by viewing the configuration reading **LC013 Type of air conditioning**.
Should be “Climate control”
Reconfigure the UCH if necessary.

Check that the UCH is receiving the engine operating status and passenger compartment blower signals correctly (for manual air conditioning). In the Cold Loop sub-function screen, status **ET142 "Engine operating phase"** should display “**RUNNING**” and status **ET015 "Passenger compartment blower"** should display “**ACTIVE**” and parameter **PR024** “Exterior temperature” is > 3°C.

If the parameter and statuses are not correct, carry out fault finding on the multiplex network and UCH (interpretation of status **ET015, ET142 and parameter PR024)**.

YES

Using the **diagnostic tool**, display (injection cold loop sub-function screen), the following statuses:
– **ET004 Air conditioning authorised,**
– **ET088 Compressor activation request,**

Is status ET004 "YES" and status ET088 "ACTIVE"

YES

(C)

NO

Check that the injection computer is correctly configured. Status **ET079 CLIMATE CONTROL PRESENT** should display **YES** (cold loop sub-function screen).

Is status ET079 YES?

YES

(B)

NO

Interpretation fault for status **ET079,** see conformity check, cold loop sub-function:
– **13B, Diesel injection,**
– **17B, Petrol injection.**

AFTER REPAIR	Carry out a complete check with the **diagnostic tool**.

ALP 8 CONTINUED 3

B

Carry out **fault finding on the injection system** to ensure that no fault is present (if faults are displayed by the injection computer, engagement of the air conditioning may be inhibited). If there are present or stored faults, **carry out the necessary repairs (see 13B, Diesel injection or 17B, Petrol injection)**.

Check that the **refrigerant fluid pressure** is correct (neither too low nor too high) using the **PR037 Refrigerant fluid pressure** parameter (see **Conformity check, Cold loop sub-function**).

Check that the engine cooling fan assembly is at speed 1 by viewing the following status on the cold loop sub-function screen:
- Status **ET022 Low-speed fan assembly request** should display ACTIVE.

Note:
These statuses are not displayed by all types of injection (see Conformity check, Cold loop sub-function).

Does the engine cooling fan operate at low speed?

NO

Using the **diagnostic tool**, run command **AC154 Low speed fan assembly relay.**

Does the engine cooling fan operate at low speed?

YES

C

NO

Connector of component **321** disconnected. Connect a test light between connection **49L** of component **321** and the chassis **earth** and run command **AC154 Low speed fan assembly relay.**

Does the test light illuminate?

YES

Measure the resistance of component **321**, between connections **49L** and **49B** of component **321**. If the resistance measured is infinite, replace the fan assembly resistor (component **321**).

NO

D

YES

Carry out fault finding on the injection system (sub-function: cold loop and engine cooling for low speed fan assembly activation).

AFTER REPAIR	Carry out a complete check with the **diagnostic tool**.

ALP 8 CONTINUED 4	

D

Check the continuity of connection **49L** between components **321** and **700**.

Is the continuity correct?

NO

Continuity fault on connection **49L**. If there is a repair procedure (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the wiring, otherwise replace it.

YES

Check that the low speed fan assembly relay operates correctly (component **700**). Replace it if it is faulty (see **MR 411 Mechanical, 81C, Fuses, Fuses: List and location of components)**.

AFTER REPAIR	Carry out a complete check with the **diagnostic tool**.

ALP 8 CONTINUED 5

C

Check the air conditioning compressor **belt tension** (see **Technical Note 3786A, Engine and peripherals, 10A, Belt tension setting tool Hz measurement: tension values)**.

Is the tension correct?

NO → **Replace** the belt (see **MR 411 Mechanical, 11A, Top and front of engine, Accessories belt: Removal - Refitting)**.

YES

With the engine stopped, use the diagnostic tool to run command **AC180 Air conditioning compressor relay** (injection command mode menu).

Does the compressor clutch jam?

NO → Connect a test light between connections **38R** and **MAS** of component **171** and run command **AC180 Air conditioning compressor relay**.

Does the test light illuminate?

YES

YES → E

YES → Check the condition of the diode (component **322**). Replace the diode if it is faulty.

Replace the air conditioning clutch (component 171) if possible, otherwise replace the compressor (see **MR 411 Mechanical, 62A, Air conditioning, Compressor: Removal - Refitting)**.

NO → Connect a test light between connection **38R** of component **171** and the chassis **earth**, then run command **AC180 Air conditioning compressor relay**.

Does the test light illuminate?

NO → F

YES → Earth fault on component **171**. If there is a repair procedure (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the wiring, otherwise replace it.

AFTER REPAIR	Carry out a complete check with the **diagnostic tool**.

ALP 8 CONTINUED 6	

F

Check the continuity and insulation to earth of connection **38R** between components **171** and **584**.

Is the connection OK?

YES

Apply the fault finding procedure for command **AC180 Air conditioning compressor relay** (see **13B Diesel injection or 17B Petrol injection)**.

NO

If there is a repair procedure (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the wiring, otherwise replace it.

AFTER REPAIR	Carry out a complete check with the **diagnostic tool**.

ALP 8 CONTINUED 7	

E

2

With the engine warm and passenger compartment ventilation operating, vary the position of the **mixing flap** from the maximum hot position to the maximum cold position and check subjectively that there is a difference in temperature.

Is a difference in temperature noted?

NO →

Carry out a **conformity check** on the mixing motor (**PR012 Mixing flap position**). If the conformity check does not reveal any faults, look for a mechanical fault on the mixing flap (condition of the motor's notched sector, flap jammed inside the unit, etc.).

Is the fault still present?

YES

NO

End of fault finding procedure.

YES

Check the cold loop by checking the condition of the pipes and ensuring that the air conditioning system does not have any **refrigerant leaks** (see **Technical Note 6001A, Air conditioning, 62A, Air conditioning, Air conditioning: Check**). Repair the faulty pipes or components.

Top up the refrigerant (see **MR 411 Mechanical, 62A, Air conditioning, Refrigerant circuit: Draining - Filling).**

Is the fault still present?

NO

End of fault finding procedure.

YES

Replace the air conditioning compressor.

AFTER REPAIR	Carry out a complete check with the **diagnostic tool**.

ALP 9	Too much cold air

NOTES	Only deal with this customer complaint after a **full check** with the **diagnostic tool** (fault reading and configuration checks). Check that the fuses are sound. Use a multimeter and a 21 W test light. Use the **Wiring Diagram Technical Note, NEW TWINGO**.

With the engine running at idle speed and air conditioning switched off (**AC** button not pressed and no **AUTO** mode), check that the air conditioning compressor clutch is not engaged.

Is the air conditioning compressor clutch engaged?

NO → (A)

YES

With the engine stopped, check that the compressor clutch electric control operates correctly, using the **diagnostic tool** to run command **AC180 Air conditioning compressor relay** (injection command mode menu).
– During the command, connection **38R** of component **171** must be supplied with + 12 V.
– After the command, connection **38R** of component **171** must no longer be supplied with + 12 V.

Is the connection still supplied with + 12 V after the command?

YES

Check the continuity and insulation from **+ 12 V** of connection **38R** between components **171** and **584**.

Is the connection OK?

NO

If there is a repair procedure (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the wiring, otherwise replace it.

YES

With the vehicle ignition off, check that the compressor clutch relay is not “jammed”, by checking the continuity between connection **38R** and connection **AP3** of component **584**.

Is the continuity present?

YES → **Replace the air conditioning compressor clutch relay.**

NO

Apply the fault finding procedure for command **AC180 Air conditioning compressor relay** (see **13B Diesel injection or 17B Petrol injection**).

Is the fault still present?

(A)

NO

Check that the air conditioning compressor clutch is not jammed (mechanical fault).

Is the clutch still engaged?

YES

Replace the air conditioning compressor (see **MR 411, Mechanical, 62A, Air conditioning, Compressor: Removal - Refitting**).

AFTER REPAIR	Carry out a complete check with the **diagnostic tool**.

ALP 9 CONTINUED	

(A)

With the engine warm and passenger compartment ventilation operating, vary the position of the **mixing flap** from the maximum cold position to the maximum hot position and check subjectively that there is a difference in temperature.

Is a difference in temperature noted?

NO →

Carry out a **conformity check** on the mixing motor (**PR012 Mixing flap position**). If the conformity check does not reveal any faults, look for a mechanical fault on the mixing flap (condition of the motor's notched sector, flap jammed inside the unit, etc.).

YES ↓

Using the **diagnostic tool** statuses and parameters screen (cold loop sub-function), check that the temperature signals are consistent (no sensor deviation resulting in incorrect measurement).

– Using parameters **PR002 Exterior temperature, PR064 Coolant temperature and PR001 Interior temperature**.

Are the temperature signals consistent?

NO →

Carry out a **conformity check**:

– For the coolant temperature sensor, see **13B, Diesel injection, Fault summary table** or **17B Petrol injection, Fault summary table.**

– For the exterior temperature sensor, see **87B, Passenger compartment connection unit, Fault summary table.**

– For the interior temperature sensor, see **62B, Climate control, Fault summary table.**

Replace any faulty components.

YES ↓

Check the refrigerant fluid **(see Technical Note 6001A, Air conditioning, 62A, Air conditioning, Air conditioning: Check).**

AFTER REPAIR	Carry out a complete check with the **diagnostic tool**.

ALP 10	Inefficient rear screen de-icing/demisting

NOTES	
	Carry out this conformity check after a **full check** using the **diagnostic tool** (fault reading, especially UCH and injection faults and configuration checks). Check that the fuses are sound. Use a multimeter and a 21 W test light. Use the **Wiring Diagram Technical Note, NEW TWINGO**.
	Special notes: Check that the inside of the windows are not **greasy** as this reduces the efficiency of the de-icing.
	Note: The de-icing control is only authorised when the engine is running to save power. The rear screen de-icer control is activated by pressing the de-icing button at the bottom of the climate control panel in manual mode (with time delay and rear-view mirror de-icer).

Ensure that there are no water leaks in the passenger compartment which would significantly increase the moisture and reduce the effectiveness of the demisting function (see **ALP 12** if the fault is noted).

Is the fault still present?

NO → **End of fault finding procedure.**

YES

Check that the UCH is correctly configured by viewing the configuration reading **LC013 Type of air conditioning**. Reconfigure the UCH if necessary.

Check that the UCH receives the signal about the status and operation of the engine. In the Cold Loop screen, status **ET142 "engine operating phase"** should display **RUNNING**.

Is status ET142 RUNNING?

NO → Carry out fault finding on the UCH (interpretation of status **ET142**) and on the multiplex network.

YES

(A)

AFTER REPAIR	Carry out a complete check with the **diagnostic tool**.

ALP 10 CONTINUED

(A)

Press the de-icing button on the control panel and check status:
– **ET086 heated rear screen** for climate control.

Is status **ET086** "**ACTIVE**"?

NO → Rear de-icing request interpretation fault on the climate control computer. Carry out fault finding on the climate control computer (see **Interpretation of statuses**).

YES

Connect a test light between connections **15LP** and **MYH** of component **200** and, using the **diagnostic tool**, run command **AC060 Rear screen de-icer** (UCH command mode menu).

Does the test light illuminate?

NO → Check the resistance of the rear screen de-icer lines. The line resistance must not be **zero** or **infinite**. If the resistance is not correct, replace the rear screen (see **MR 412, Bodywork, 54A, Windows, Rear screen window: Removal - Refitting)**.

YES

Connect a test light between connection **15LP** and the chassis **earth** and use the **diagnostic tool** to run command **AC060 Rear screen de-icer** (UCH command mode menu).

Does the test light illuminate?

YES → Continuity fault on connection **MYH** of component **200**. If there is a repair method (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair),** repair the wiring, otherwise replace the wiring.

NO

Check the continuity of connection **15LP** between components **200** and **645**.

Is the continuity correct?

NO → Continuity fault on connection **15LP** between components **200** and **645**.
If there is a repair method (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the wiring, if not replace the wiring.

YES

See **87B, UCH, Interpretation of commands,** for command **AC060 Rear screen de-icer**.

AFTER REPAIR	Carry out a complete check with the **diagnostic tool**.

ALP 11	Unpleasant odours in the passenger compartment

NOTES	Only consult this customer complaint after a **complete check with the diagnostic tool**.

Check that the cabin filter is not blocked or damaged **(see MR 411 Mechanical, 61A, Heating, Cabin filter: Removal - refitting)**.
Replace it if necessary.

Is the fault still present?

- **NO** → **End of fault finding procedure.**
- **YES** ↓

Check that the condensate (water from the evaporator) **drain ring** is not obstructed (beneath the body).
Repair if necessary.

Is the fault still present?

- **NO** → **End of fault finding procedure.**
- **YES** ↓

Check the **sealing of the heating unit** in relation to the engine compartment:
- Foam seal on the heater matrix coolant pipes fitted and in good condition.
- Rubber seal on the radiator tank fitted and in good condition (seal under the bonnet separating the engine compartment from the windscreen aperture).
- Drain valve on the radiator tank fitted and in good condition.

Repair if necessary.

Is the fault still present?

- **NO** → **End of fault finding procedure.**
- **YES** ↓

Remove the passenger compartment filter to apply air conditioning system cleaner using an extension piece on the evaporator. Spray the entire contents of the aerosol.
Leave the product to work for **15 minutes**.

AFTER REPAIR	Carry out a complete check with the **diagnostic tool**.

ALP 12	Water is present in the passenger compartment

NOTES	Only consult this customer complaint after a **complete check with the diagnostic tool**.

Pressurise the cooling circuit.

Is there any coolant leaking into the vehicle? — **YES** → **Repair.**

NO

Check that the evaporator **evacuation ring** is not blocked (under the body).
Repair if necessary.

Is the fault still present? — **NO** → **End of fault finding procedure.**

YES

Make sure that the **scuttle panel** (under the windscreen aperture) is not filled with water. If it is, check that the drain valve is fitted to the scuttle panel and is in good condition.
Replace the valve if necessary.

Has the customer just washed the vehicle? — **NO** → **End of fault finding procedure.**

YES

Explain to the customer that when washing the car using a hose pipe, the water jet must not be left for too long on the air inlet in the scuttle panel (on the bonnet).

AFTER REPAIR	Carry out a complete check with the **diagnostic tool**.

ALP 13	Lighting fault on the control panel in night mode

NOTES	
	Only consult this customer complaint after a **complete check of the multiplex network and the air conditioning with the diagnostic tool.**
	Special notes: With the ignition on, the control panel screen is permanently on but the panel buttons only light up when the side lights are switched on.
	Note: **If the exterior temperature sensor is faulty, the climate control computer is activated 5 seconds after the ignition is switched on** (the UCH performs fault finding on the exterior temperature sensor).
	Use the Wiring Diagram Technical Note for the New Twingo.

Is the fault shared with other components (first row cigarette lighter, radio, multifunction display, cruise control/ speed limiter on off switch, etc.)

YES

Switch on the ignition and the side lights.
Using the **diagnostic tool** and the conformity check, check that the lighting dimmer is operating correctly using parameter **PR122 NIGHT TIME LIGHTING LEVEL**.

Does the parameter vary?

NO →

Carry out a fault finding procedure of the instrument panel.
Run a multiplex network test (see **88B, Multiplex**).

YES

NO

Check the **connection and condition** of the connector of **component 419.**
If there is a repair method (see **Technical Note 6015A, Electrical wiring repair, Wiring: Repair precautions**), repair the wiring, otherwise replace it.

If the fault is still present, contact the Techline.

AFTER REPAIR	Carry out a complete check with the **diagnostic tool**.

ALP 13 CONTINUED	

(A)

Switch off the ignition and turn off the side lights.
Disconnect the connectors of components **101, 1081, 1222, 1391, 319, 184, 1390, 261, 653, 1016 and 419** of connection **LPD (see Wiring Diagrams Technical Note, Twingo 2 passenger compartment fuse board, component code 1016, connection code LPD).**

Check the **insulation, continuity and the absence of interference resistance** of connection **LPD** between components **419 and 1016.**
If the connection is faulty (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for the repair**), repair the wiring, otherwise replace the wiring.

YES

If the check does not reveal any electrical faults, check the conformity of the components on **connection LPD** (component in short circuit, etc.)
Check the condition and position of fuse **F42 (10 A)** in the **passenger compartment fuse box**.
Consult section 81C Fuses.
Repair if necessary.

Is the fault still present? — **NO** → **End of fault finding procedure.**

YES

Contact the Techline.

AFTER REPAIR	Carry out a complete check with the **diagnostic tool**.

ALP 14	Noisy compressor

NOTES	Only deal with this customer complaint after a **full check** with the **diagnostic tool** (fault reading and configuration checks).
	WARNING Check that the computers active in the AIR CONDITIONING function (Injection, UCH and climate control) are correctly configured.
	Note: Before starting any work, check that the noise is indeed coming from the compressor.

Check that the compressor **belt is in good condition** and **check its tension** (for engines without automatic tensioning) (see **MR 411, Mechanical, 11A, Top and front of engine,Accessories belt: Removal - Refitting)**.

↓

Check that the compressor is **correctly fixed** (see **MR 411 Heating and air conditioning system, 62A, Air conditioning, Compressor: Removal - Refitting**).

↓

Check the refrigerant fluid and look for any leaks. Significant loss of fluid causes the compressor to make noises. (see **Technical Note 6001A, Air conditioning, 62A,Air conditioning, Air conditioning: Check)**.

↓

If the fault is still present, **replace** the air conditioning compressor (see **MR 411, Mechanical, 62A, Air conditioning, Compressor: Removal - Refitting**).

AFTER REPAIR	Carry out a complete check with the **diagnostic tool**.

MEASURING THE CONTROL VOLTAGE OF THE PASSENGER COMPARTMENT FAN UNIT POWER MODULE

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

1 / MEASURING USING A MULTIMETER (in the voltmeter position, direct current measurement):
This voltage measurement only gives an indication (average of non-representative voltages) and is not a rigourous method. However, this method can be used if no oscilloscope is available or simply as a guide value.
With the power module connector disconnected, measure between **connection 38LR** of **component 1023** and the earth **MAN**.
At **speed 0** the voltage measured is equal to the **battery voltage (± 1 V)** and at **speed 8** the voltage is **0 V (± 0.5 V)**.
For the seven intermediate speeds, the voltage varies between **0** and **the battery voltage**.
Examples of measurements taken with the voltmeter with the engine at idle speed (values given as a guide):

Passenger compartment blower speed	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Voltage measurement in V at the PWM* terminals	**11.73 V**	**9.5 V**	**9 V**	**8.3 V**	**7.2 V**	**6.6 V**	**5.4 V**	**3.6 V**	**0.4 V**
Voltage measurement in V at the fan assembly terminals	**0**	**2.5**	**3.2**	**4.3**	**5.6**	**6.6**	**8**	**10**	**12**
PR019 Passenger compartment blower PWM* setting	**0 %**	**20 %**	**25 %**	**33 %**	**43 %**	**50 %**	**60 %**	**77 %**	**100 %**

Note:
These values are given for a battery voltage of **+ 12 V**.

2 / MEASURING USING AN OSCILLOSCOPE (Optima 5800, CLIP technique):

The fan assembly power module is controlled by pulse width modulated control voltage (PWM*). This control voltage is always **12 V**, it is the control signal (square signal) that varies:
The amplitude and frequency do not vary but instead the **high status (12 V)** varies in relation to the **low status (0 V)**.
To make this measurement, connect the oscilloscope earth lead to the battery earth and the oscilloscope measuring lead to connection **38LR** of component **1023** (power module connector connected).

Adjust the oscilloscope's time base to **500 µs** per division with a range of 5 V per division and set the oscilloscope to the Auto position by selecting the Trigger mode.
The signals obtained must be:

- a **straight line** at **12 V (±1)** for **speed 0**,
- a **straight line** at **0 V (± 0.5 V)** for **speed 8**.

Examples of measurements taken using the oscilloscope with the engine at idle speed (given as a guide):

Passenger compartment blower speed	0	1	2	3	4	5	6	7	8
Duration of high status		450 µs	400 µs	350 µs	300 µs	250 µs	200 µs	150 µs	
Duration of low status		50 µs	100 µs	150 µs	200 µs	250 µs	300 µs	350 µs	
PR019 Passenger compartment blower PWM* setting	0 %	20 %	25 %	33 %	43 %	50 %	60 %	77 %	100 %

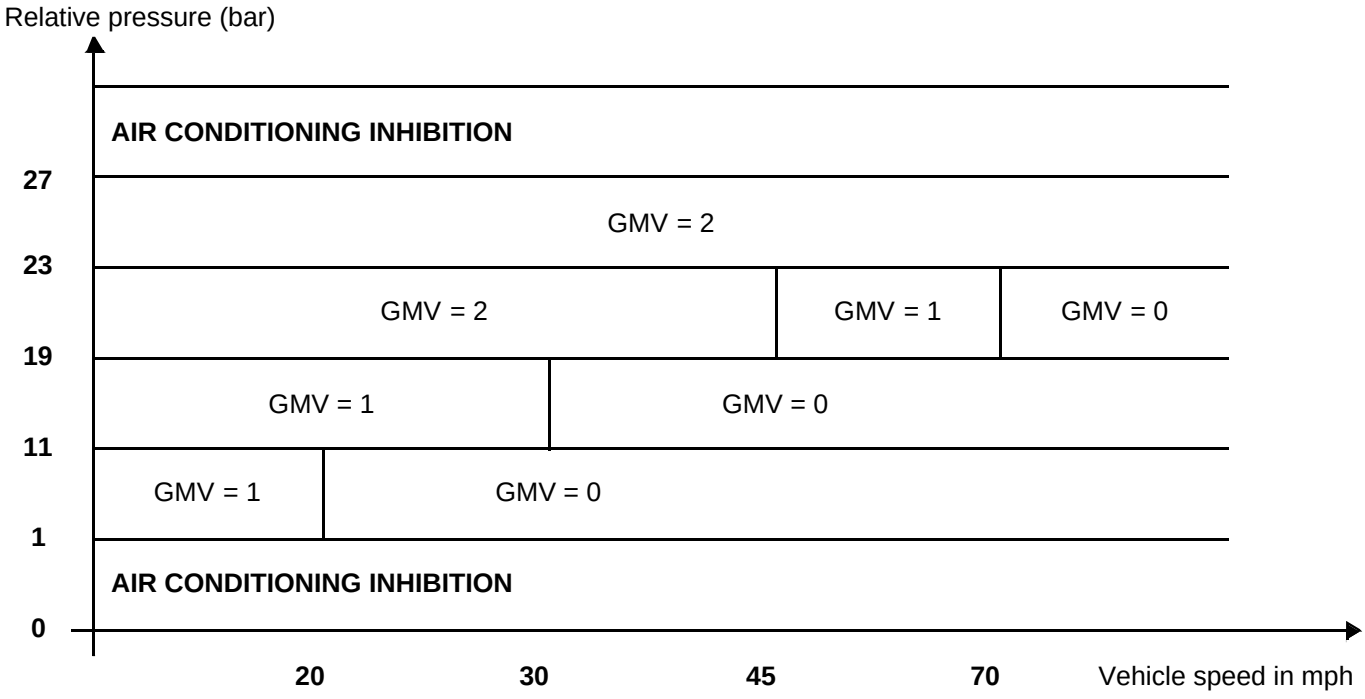
*** Passenger compartment blower unit PWM** voltage of the modulated control for the passenger compartment blower unit.

ELECTRICAL SPECIFICATIONS OF THE INTERIOR TEMPERATURE SENSOR ACCORDING TO TEMPERATURE (TOLERANCE: ± 5 %)

INTERIOR 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
16 °C	14991 Ω
17 °C	14318 Ω
18 °C	13679 Ω
19 °C	13074 Ω
20 °C	12490 Ω
21 °C	11942 Ω
22 °C	11422 Ω
23 °C	10928 Ω
24 °C	10458 Ω
25 °C	10000 Ω
26 °C	9574 Ω
27 °C	9168 Ω
28 °C	8783 Ω
29 °C	8416 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

OPERATION OF THE ENGINE COOLING FAN ASSEMBLY AS A FUNCTION OF THE REFRIGERANT FLUID PRESSURE AND VEHICLE SPEED



GMV = 1 Low-speed engine cooling fan
GMV = 2 High-speed engine cooling fan
GMV = 0 Engine cooling fan stopped

The engine cooling fan assembly is not used for vehicle speeds in excess of **70 km/h**, except in rare cases where the refrigerant fluid pressure is greater than **23 bar** despite the high speed (e.g. driving behind a lorry).
When the vehicle is stationary, the engine cooling fan is always used at low speed if the refrigerant fluid relative pressure is below **19 bar**, otherwise it is used at high speed.
While the vehicle is being driven, the engine cooling fan may either not operate, or operate at low or high speed depending on the refrigerant fluid pressure at the condenser outlet and the vehicle speed.