twingo

N.T. 2682 A

X066 - X067

Basic manual : **M.R. 305**

SPECIAL FEATURES OF THE TWINGO FITTED WITH THE D7F ENGINE WITH AIR CONDITIONING

77 11 192 018 **DECEMBER 1996** Edition Anglaise

Contents

EQUIPMENT REQUIRED	
Mot. 1273	**Tool for checking belt tension**

INSTRUCTIONS FOR TENSIONING

With the engine cold (ambient temperature), fit the new belt.

Fit tool **Mot. 1273** sensor as shown (→).

Turn the sensor wheel until it clicks.

Tension the belt until the recommended fitting value shown below is displayed on tool **Mot. 1273**.

Lock the tensioner, carry out a check and adjust the value.

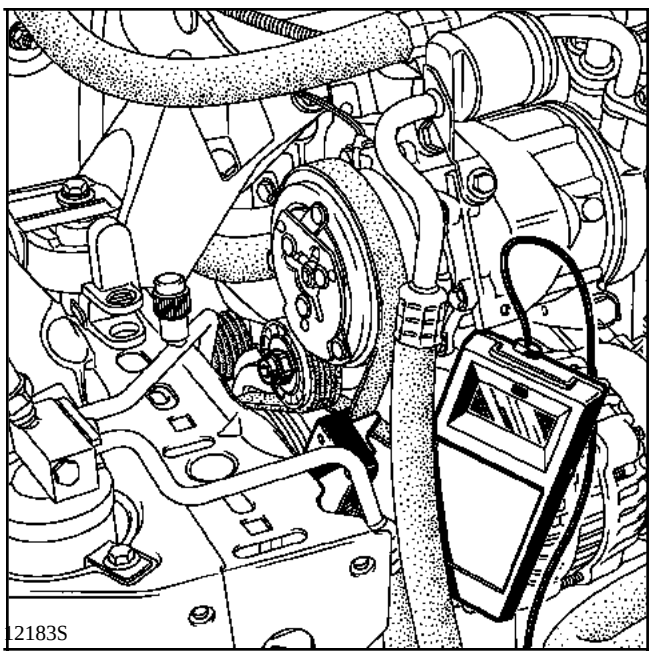
Rotate the crankshaft three times.

Carry out a check and adjust the value to the recommended fitting tension, if necessary.

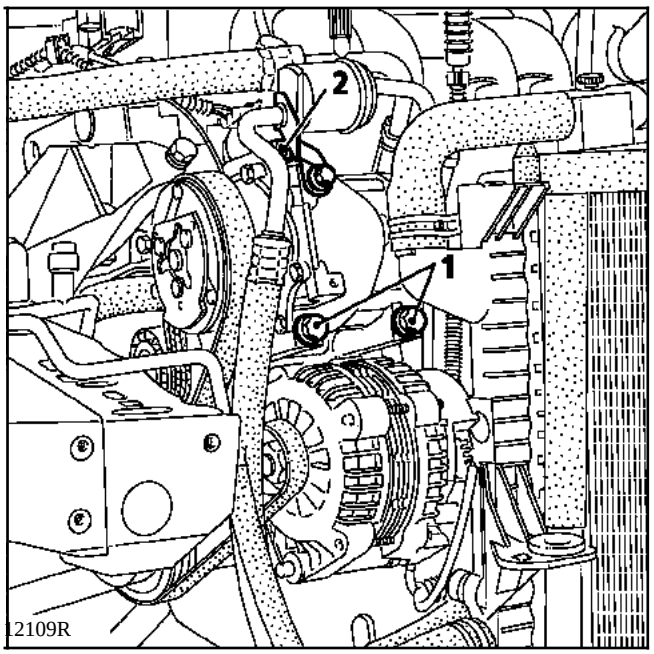
Never refit a belt that has been removed, always fit a new belt.

Tension (US=SEEM unit)	Multi-tooth air conditioning compressor belt
Fitting	107±7
Minimum operating tension	56

Air conditioning compressor belt



Remove and refit the cylinder head gasket by following the method given in **section 11**, **Cylinder head gasket**, of Technical Note **2621A**, but noting also that the compressor fasteners (1) and then (2) must be removed in order to remove the inlet manifold, throttle housing and injection rail assembly.



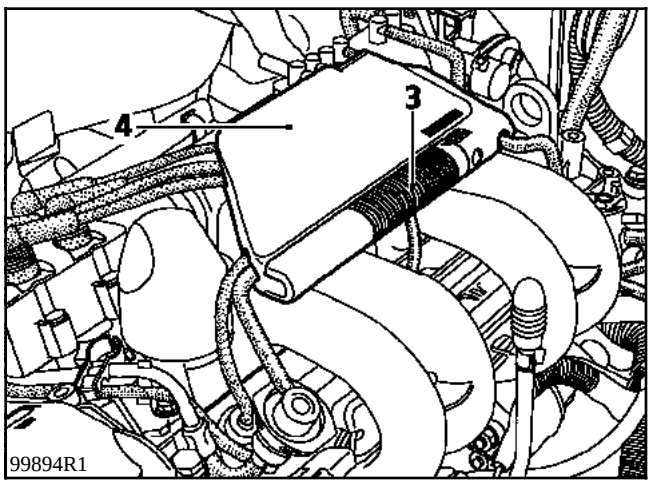
TIGHTENING TORQUES (in daN.m)	
Bolt securing the injection rail to manifold	**1**
Manifold to cylinder head mounting nut	**1.7**
Manifold to cylinder head mounting stud	**1**
Compressor mounting bolt	**3**

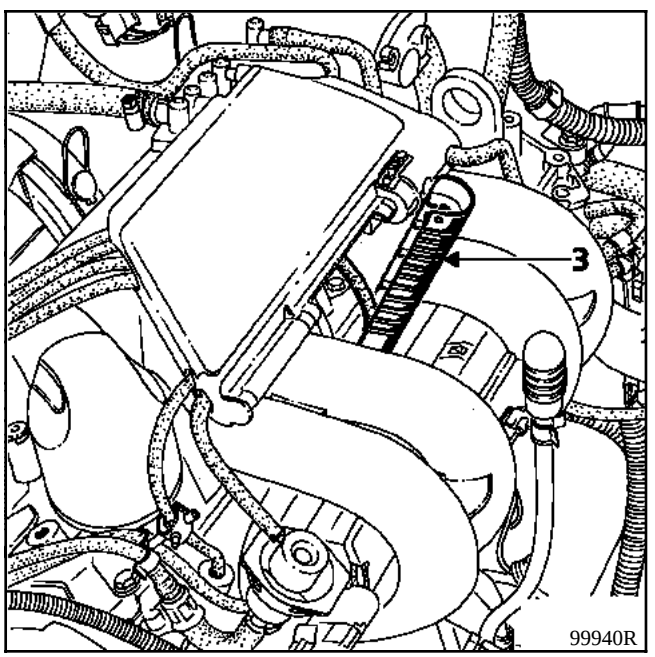
REMOVAL

Disconnect the battery.

Remove the two air pipes on the air filter.

Disconnect the spark plug wires using the tool (3) integral with the plastic protector (4).



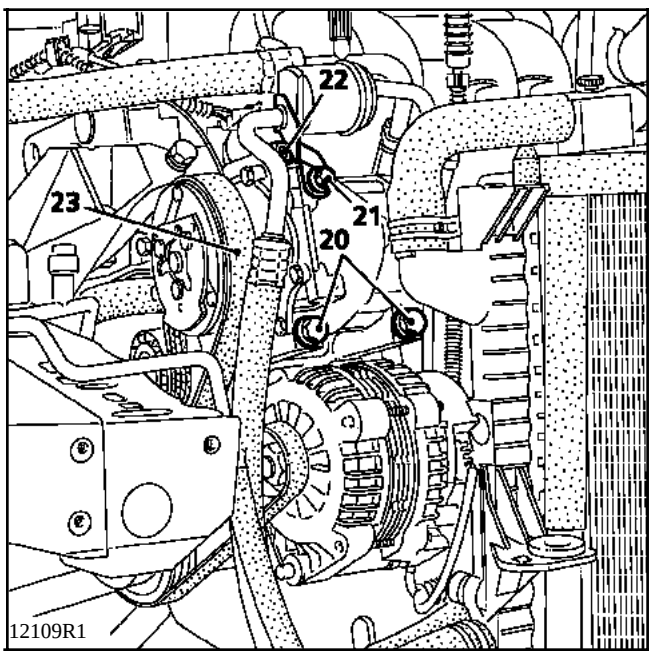


Remove the accessories drive belt (23).

Slacken the two bolts (20) without removing them.

Do not slacken bolt (21).

Unscrew bolt (22) without removing it. Eliminate the clearance between the bolt and the compressor as it is unscrewed. Do this by pulling the compressor towards the cooling assembly.



Move the compressor as far away from the engine as possible.

Remove the upper section of the plastic protector.

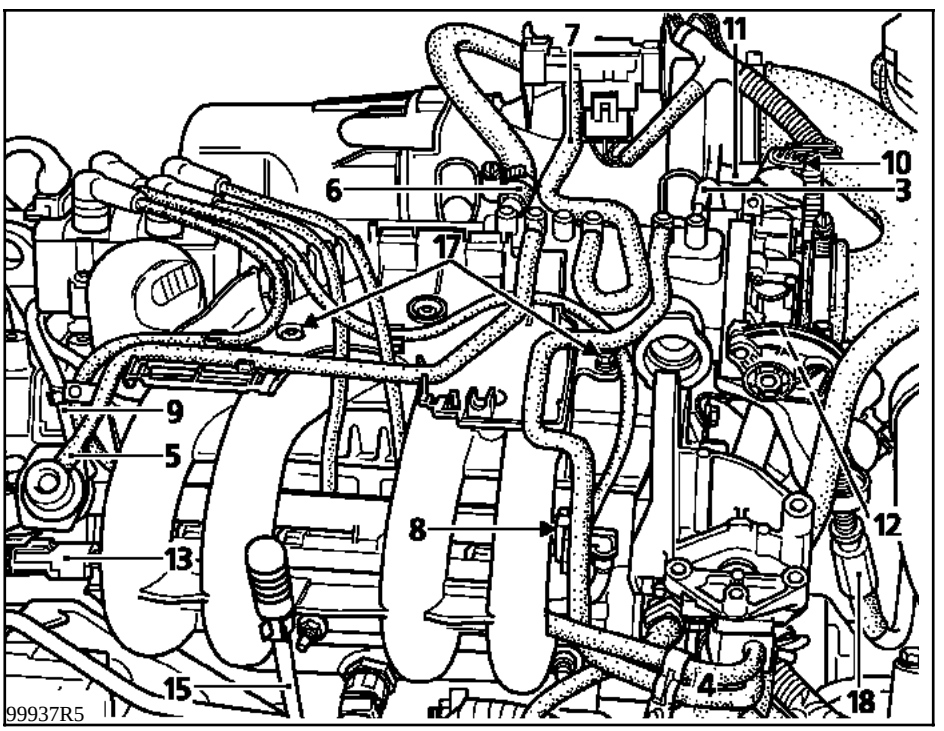
Move the spark plug wires to the right hand side of the vehicle.

Disconnect:
- the oil vapour breather pipe (3) on the manifold,
- the fuel vapour breather pipes (4) on the solenoid valve,
- the pressure connection pipe (5) on the pressure regulator,
- the vacuum connection pipe (6) on the brake servo,
- the pressure sensor vacuum connection pipe (7),
- the fuel supply (8) and return (9) pipes,
- the idle regulation stepping motor connector (10),
- the throttle position potentiometer connector (11),
- the air temperature sensor connector (12),
- the injectors connector (13),
- the accelerator cable (18).

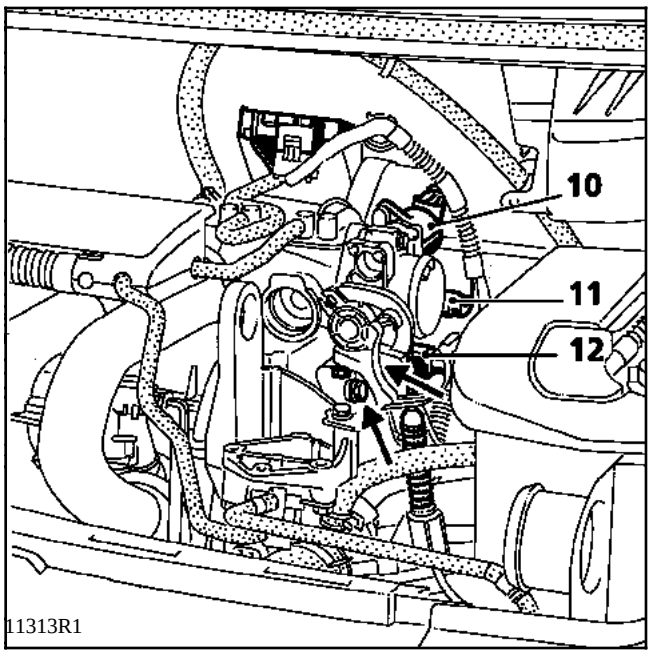
Remove the dipstick (15).

Remove the 6 nuts which secure the manifold to the cylinder head .

Remove the 2 bolts (17) which secure the manifold to the top of the cylinder head.

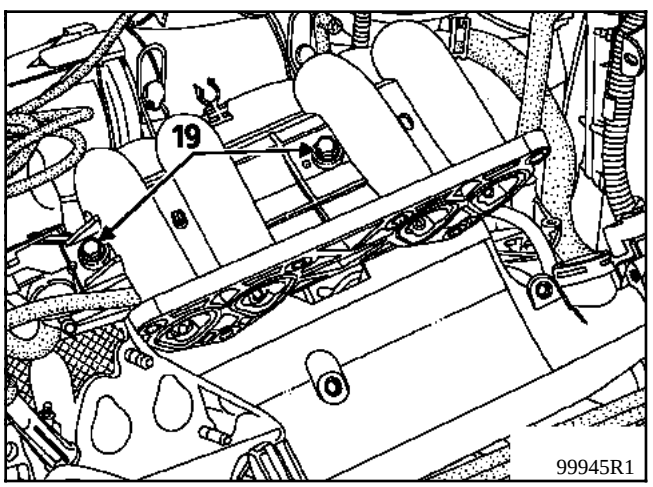


Remove
- the two bolts which secure the throttle housing to the cylinder head stiffening plate,
- the three bolts which secure the throttle housing to the manifold.



Detach the manifold from the cylinder head, rotate it one half turn.

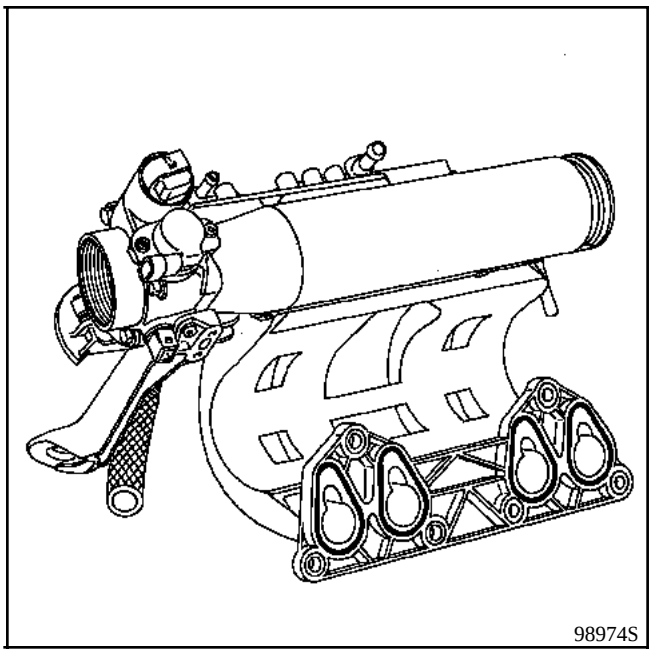
Remove the 2 bolts (19) which secure the injection rail to the manifold.



Remove the injection rail.

Move the fuel supply pipe.

Remove the manifold.



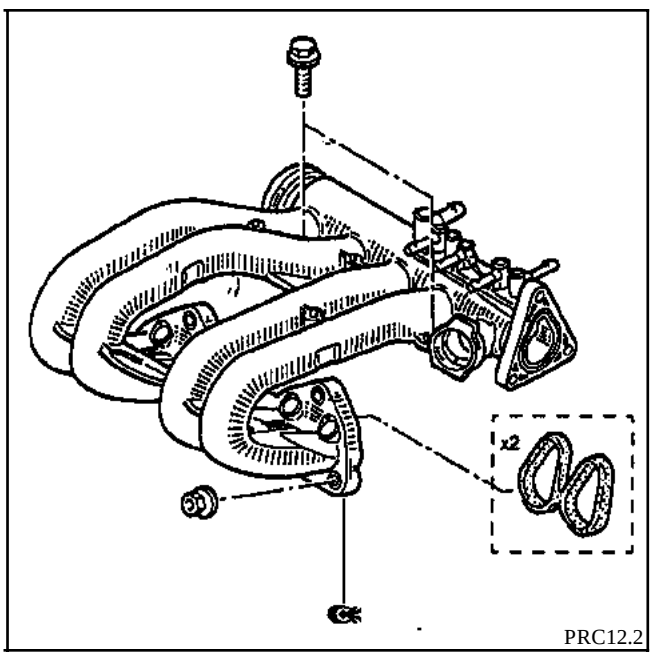
REFITTING

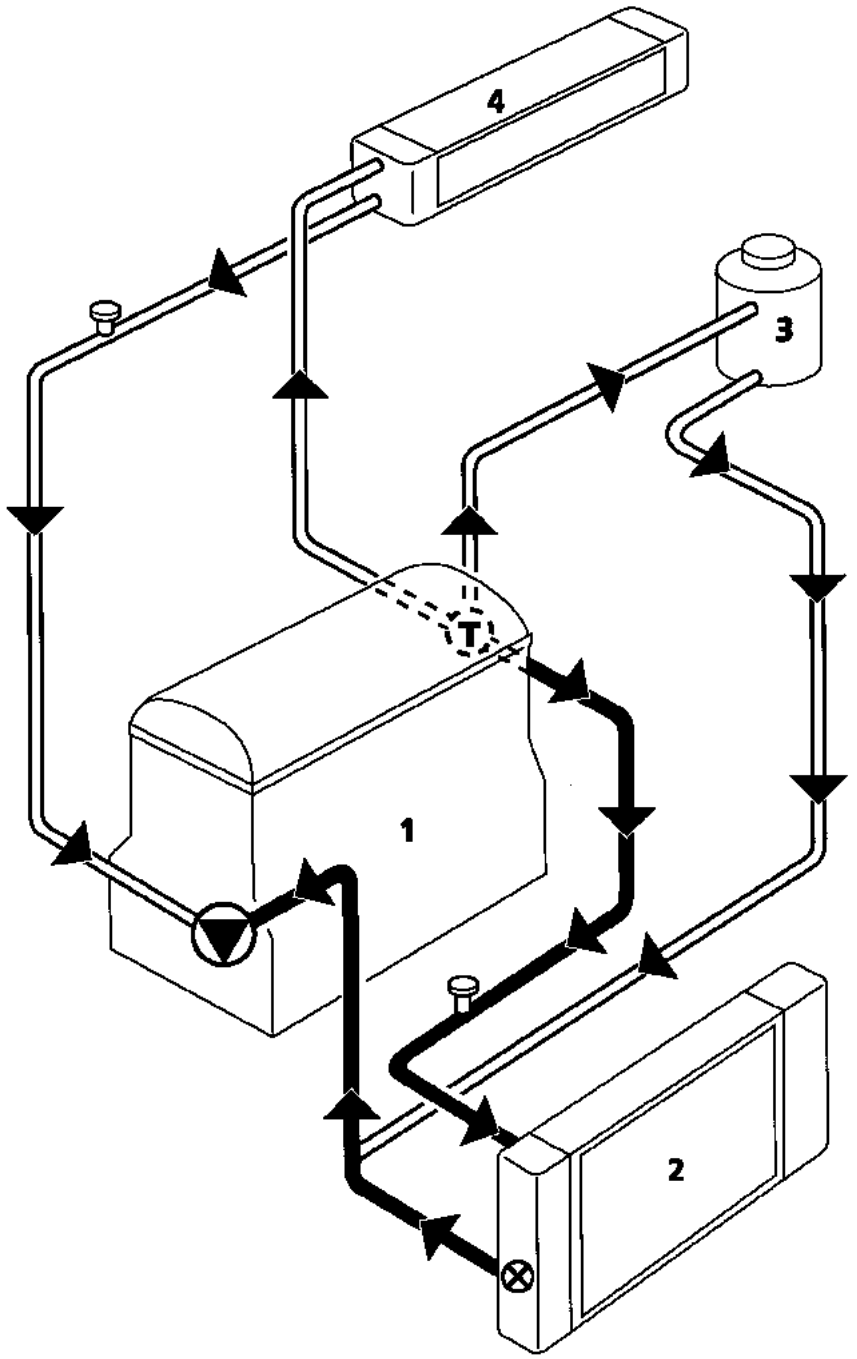
Change the manifold seals and the throttle housing seal.

Fit the fuel return pipe and the fuel vapour breather pipe back into place before refitting the injection rail.

Change the accessories drive belt (for fitting and tensioning, see section 07 "**Accessories belt tensioning**").

For the other operations, proceed in reverse order to removal.





11635-2R

1 Engine
2 Radiator
3 Expansion bottle with permanent degassing
4 Heater matrix

Water pump

Thermostat

Bleed screw

Temperature switch

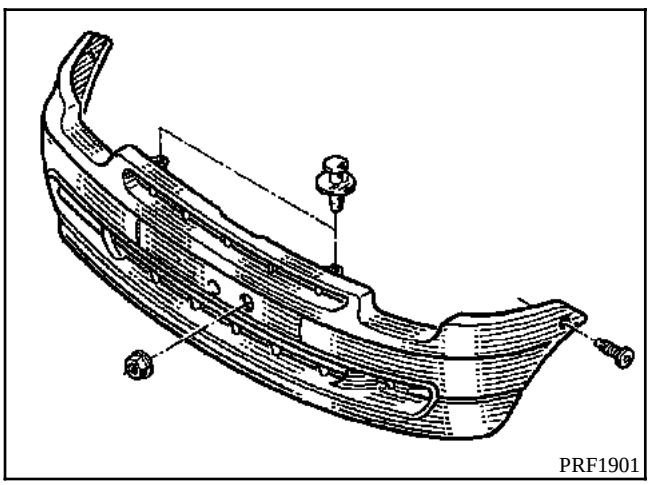
The expansion bottle cap is brown; the rating value is **1.2 bar**.

SPECIAL TOOLING REQUIRED	
Mot. 1265	**Pliers for the removal of fuel pipe quick release couplings**

REMOVAL

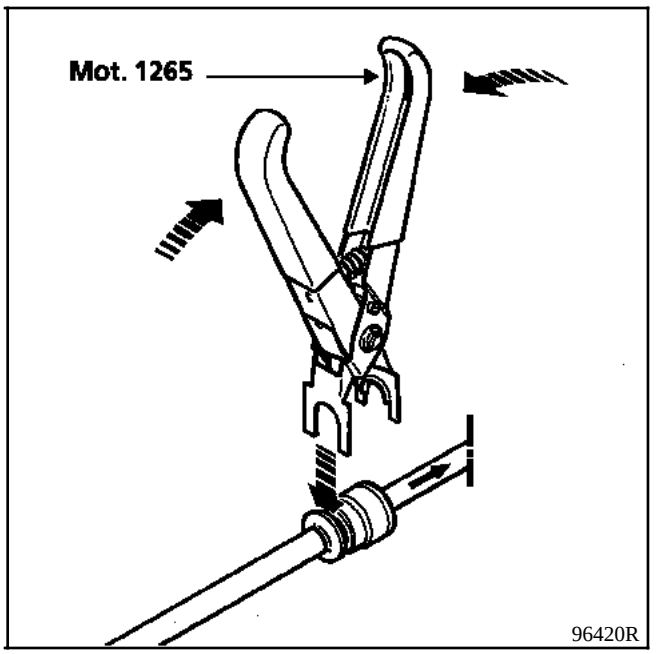
Put the vehicle on a 2-post lift.

Remove:
- the battery,
- the engine undertray
- the bumper.


PRF1901

Drain the cooling circuit (lower radiator hose).

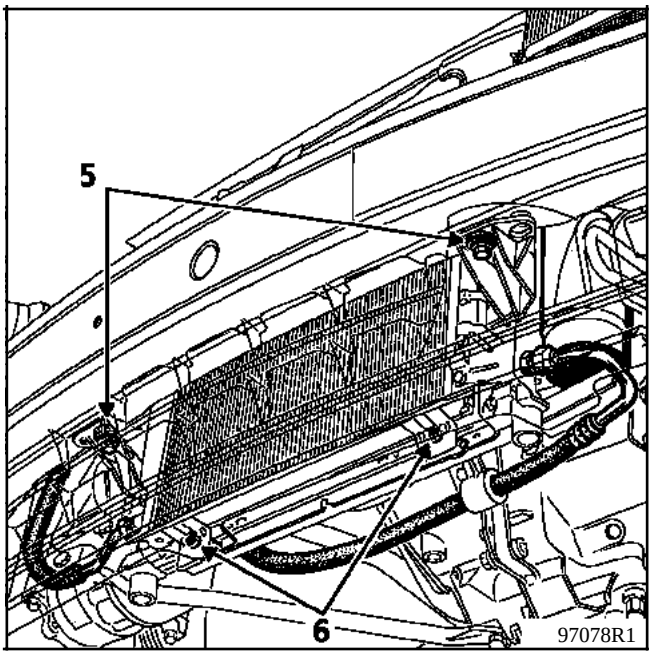
Remove:
- the injection computer cover
- the two pipes on the canister using pliers **Mot. 1265** for the pipe from the fuel tank.



96420R

- the upper radiator hose,
- the fan thermistor and the resistor connectors,
- the mountings which secure the air conditioning pipe to the radiator,
- the fan assembly mounting bolts and remove it from above,

- the mounting bolts (5) and the four bolts (6) which secure the condenser to the radiator.



- the radiator.

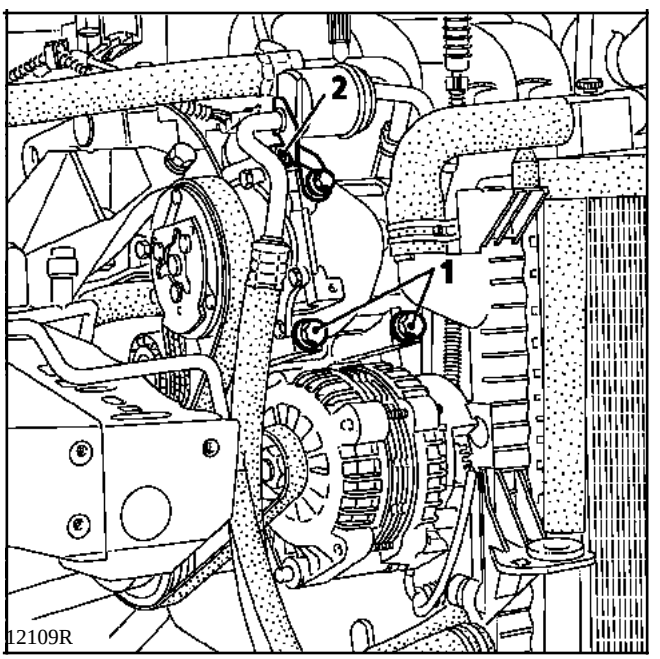
REFITTING

Refitting is the reverse of removal.

Fill and bleed the cooling circuit (see **section 19**, **Filling - Bleeding** in Technical Note **2621A**).

Remove and refit the water pump by following the method given in **section 19, Water pump** inTechnical Note **2621A**, including the following operations to gain access to the water pump inlet neck mounting bolt.

Remove:
- the mountings which secure the air conditioning pipe to the radiator,
- the alternator (from above),
- the compressor mounting bolts (1) and then (2) (attach the compressor to the inlet manifold),



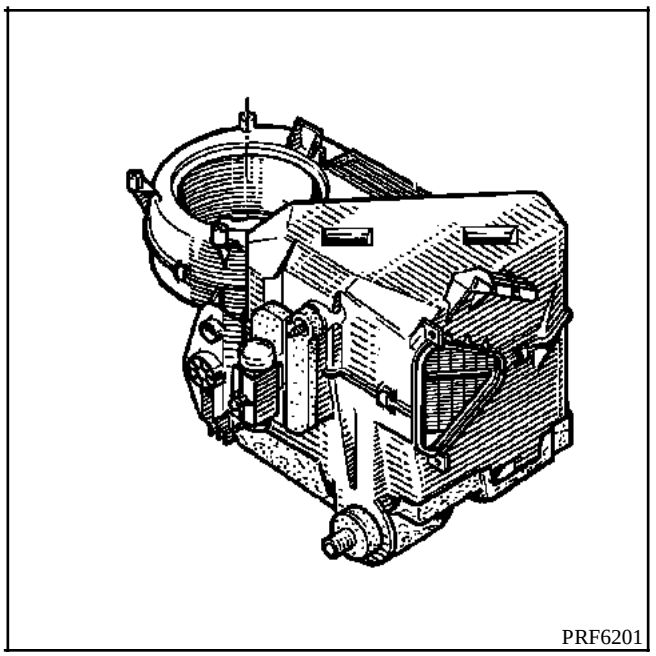
- the alternator bracket mounting bolts then move it aside,
- the compressor bracket.

CONSUMABLES

	Oil for variable capacity compressor	Refrigerant
Type	SANDEN SP 10 (PAG)	R 134a
Quantity	135 cm^3	740 g ± 35

Special points

An evaporator with plates is fitted in the passenger compartment.


PRF6201

The removal-refitting method is the same as that given in Technical Note 2048.

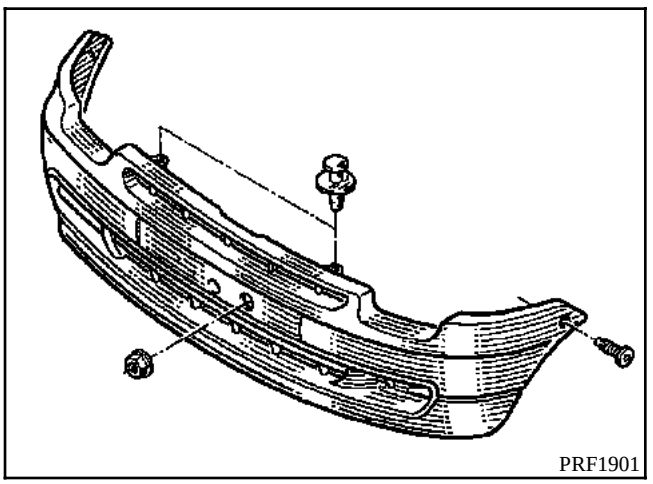
NOTE: do not remove the bulkhead heatshield. There is no mounting connecting the fan assembly to the bulkhead.

REMOVAL

Place the vehicle on a lift.

Disconnect the battery.

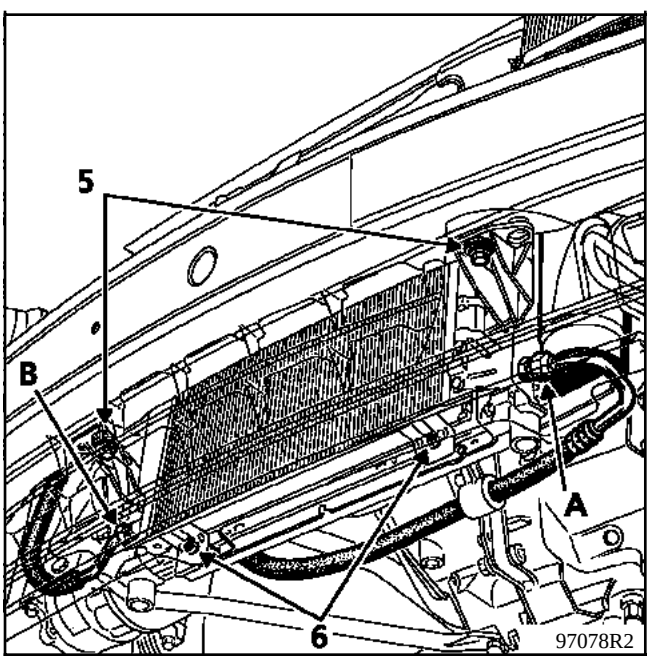
Remove:
- the plastic engine undertray,
- the bumper.


PRF1901

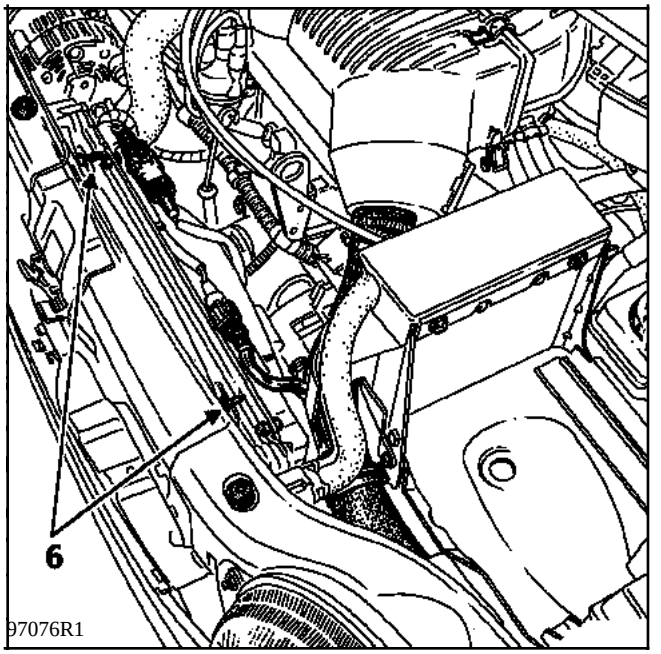
Drain the R134a refrigerant circuit using the filling station.

Remove:
- the refrigerant pipes on the condenser and quickly blank off the four openings.
- the two main radiator mounting bolts (5).

Detach the radiator from its upper guide holes and lower it.



97078R2



97076R1

In this position, remove the four bolts (6) which secure the condenser to the radiator.

Remove the condenser from below.

REFITTING

Refit in reverse order to removal.

Tighten the pipe connections on the condenser to a torque of:
- **2 daN.m :** inlet(A).
- **1,3 daN.m :** outlet(B).

Change the seals and smear them with SP 10 oil (approximately 2 g).

IMPORTANT: Follow the fluid charge recommendations exactly when working on the components of the air conditioning circuit.
Add 30 ml of oil plus the quantity recovered on draining in the case of replacement or 100 ml in the case of a fast leak (rupture of a unit). Change the dehydration bottle.

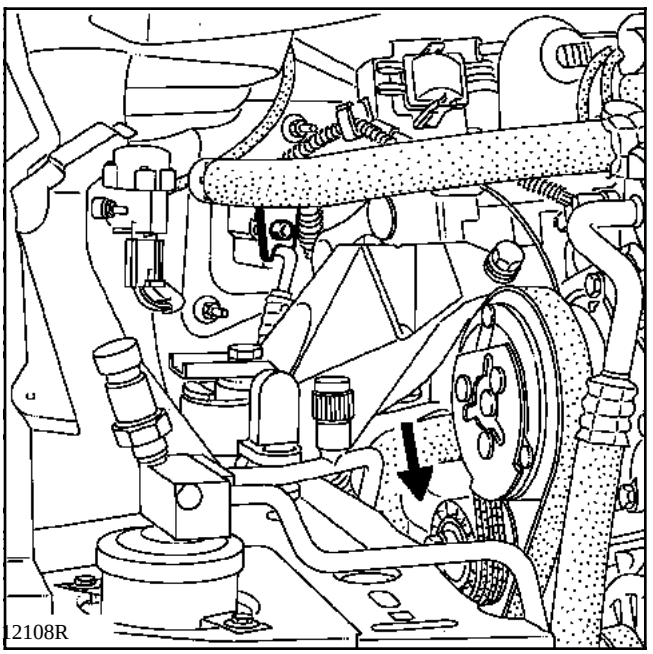
Fill the refrigerant circuit using the filling station.

REMOVAL

This operation can only be carried out after draining the refrigerant circuit.

Disconnect the battery.

Slacken the tensioner roller and remove the belt.

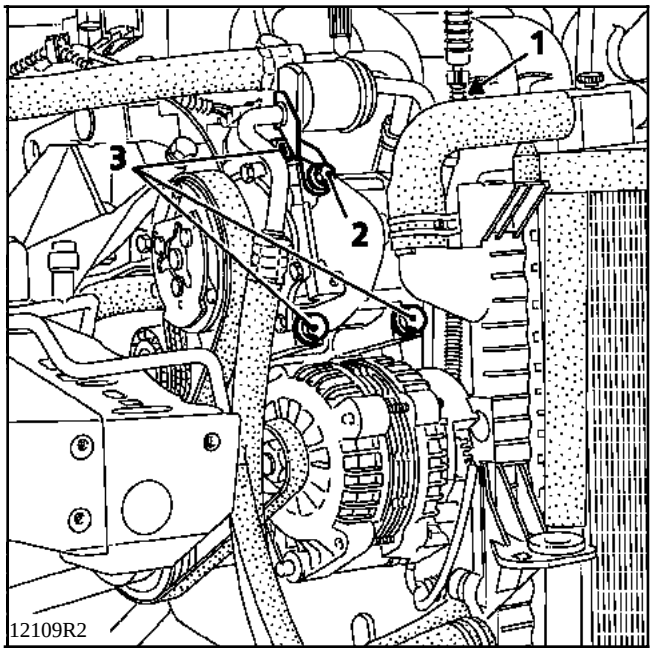

12108R

Remove:
- the high pressure pipe mounting bolt,
- the low pressure pipe mounting bolt.

Fit the caps on the openings.

Disconnect the compressor clutch supply.

Remove:
- the compressor clamp bolt (1),
- the high pressure pipe securing bolt (2),
- the compressor securing bolt (3).



12109R2

Remove the compressor from above.

REFITTING

Refitting is the reverse of removal.

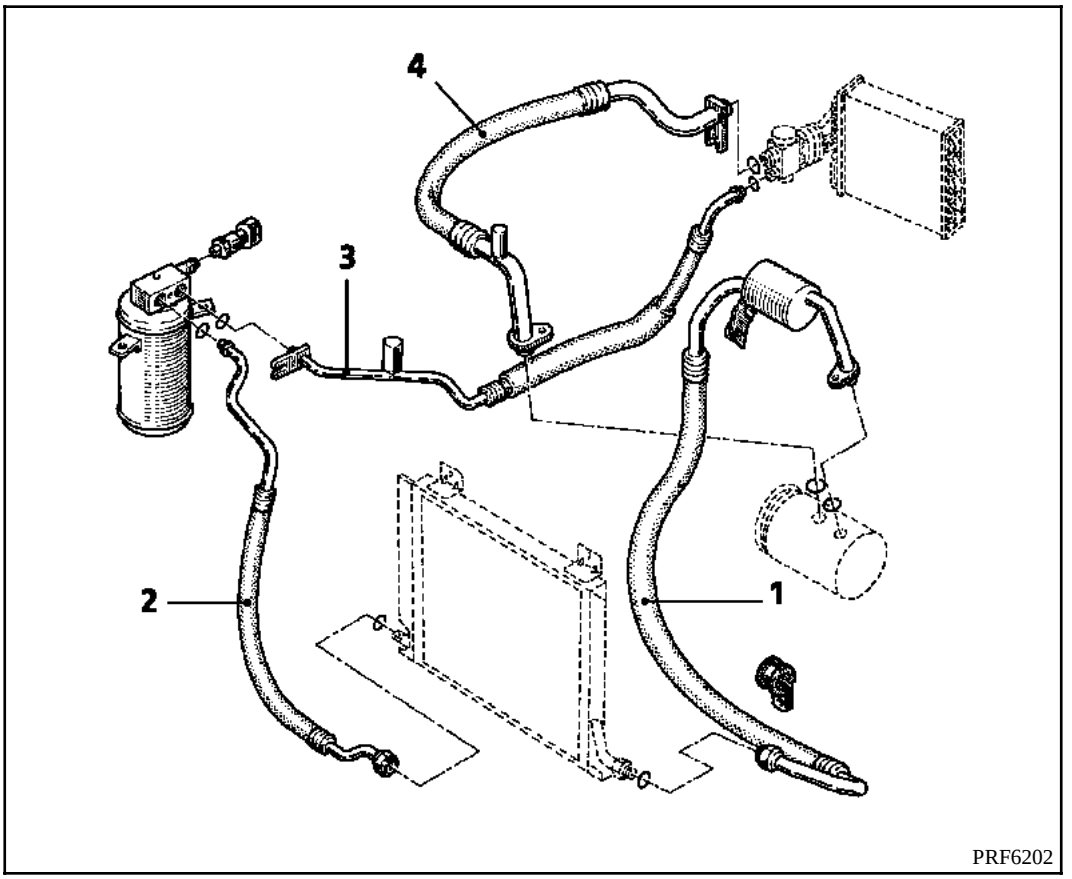
Torque tighten the mounting bolts :
Pipes on the compressor: **2.1 daNm.**
Compressor on the bracket: **3 daNm.**

When fitting pipes to the various units, the seals must be smeared with SP 10 oil.

Fill the circuit with refrigerant using the filling station.

Refit the belt, see belt tensioning value and method in **section 07, Accessories drive belt tensioning.**

IMPORTANT: Follow the fluid charge recommendations exactly when working on the components of the air conditioning circuit.



REMOVAL

Disconnect the battery.

Drain the R134a refrigerant circuit using the filling station.

PIPE (1) BETWEEN THE COMPRESSOR AND THE CONDENSER

Place the vehicle on a lift.

Disconnect the battery.

Remove:
- the plastic engine undertray,
- the bolt which secures the pipe on the compressor,
- the pipe bracket plate bolt.

Fit the caps on the openings.

From underneath the vehicle :
Remove:
- the two nuts which secure the pipe on the condenser,
- the nut which connects the pipe to the condenser.

Fit the caps on the openings.

Remove the high pressure pipe.

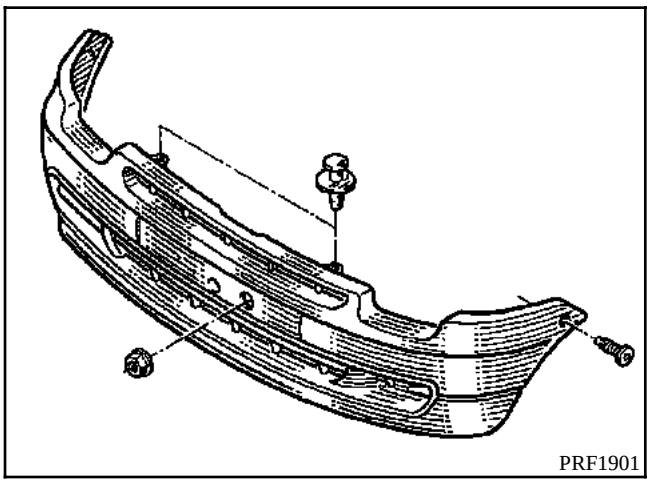
Torque tighten the bolts :
- **on the compressor : 2.1 daNm**
- **on the condenser : 2 daNm**

PIPE (2) BETWEEN THE CONDENSER AND THE DEHYDRATION BOTTLE

Place the vehicle on a lift.

Disconnect the battery.

Remove:
- the plastic engine undertray,
- the bumper,


PRF1901

- the nut which connects the pipe to the condenser,
- the dehydration canister mounting bolt.

Fit caps on the openings.

Remove the high pressure pipe.

Tightening of the mounting bolt on the dehydration bottle : 0.75 daN.m.

PIPE (3) BETWEEN THE DEHYDRATION BOTTLE AND THE PRESSURE RELIEF VALVE

Remove:
- the mounting bolt on the dehydration bottle,
- the bolt which secures the pipe to the pressure relief valve.

Fit caps on the openings.

Remove the high pressure pipe.

LOW PRESSURE PIPE (4)

Remove:
- the mounting bolt on the pressure relief valve,
- the mounting bolt on the compressor.

Fit caps on the openings.

Remove the high pressure pipe.

REFITTING

Refitting is the reverse of removal.

Change the seals and smear them with SP 10 oil (approximately 2 g).

Torque tighten the mounting bolt on the pressure relief valve : 0.85 daN.m.

When changing a pipe, add 10 ml of SP 10 oil or if a pipe splits (rapid leak) add 100 ml and change the dehydration bottle.

AIR CONDITIONING
Fault-finding

CUSTOMER COMPLAINTS

- Air distribution fault — **CHART 1**
- Heating efficiency fault — **CHART 2**
- Air flow fault
  - Air distribution rotator in the "footwells" position — **CHART 3**
  - Air distribution rotator in the demisting position — **CHART 4**
  - Air distribution rotator in the ventilation position (mixing flap in the maximum heat position) — **CHART 5**
  - Air distribution rotator in the ventilation position (mixing flap in the maximum cooling position) — **CHART 6**

- Stiffness of the controls — **CHART 7**
- Projection of foreign bodies by the ventilation circuit (vehicle without air conditioning) — **CHART 8**
- Passenger compartment odours — **CHART 9**
- Heating fault  (Air mixing flap set to maximum hot air)
  - No heat — **CHART 10**
  - Too much heat — **CHART 11**

- Demisting / de-icing efficiency fault (Air mixing flap set to maximum hot air)  — **CHART 12**
- Air conditioning fault  (Air mixing flap set to maximum cold air)
  - No cold air — **CHART 13**
  - Lack of efficiency — **CHART 14**
  - Too much cold air — **CHART 15**

- The recycled air flap does not operate — **CHART 16**
- The passenger compartment fan does not operate (Vehicle with air conditioning) — **CHART 17**
- The cooling fan does not operate — **CHART 18**

e06061.1

Fault Chart 1: Air distribution fault

Set the fan assembly to full power, temperature control set to maximum cooling. Move the air distribution control and check the consistency between the selection and the output of air. Is the distribution of air correct?

yes → If necessary, explain to the customer how to operate the system including more precise instructions (for example: close the vents to obtain a greater flow of air on demisting, heating...).

no

Visually check that moving the controls moves the flaps (black sprocket to the right of the assembly). Do the flaps move?

yes → Readjust the cable on the right hand side of the assembly.

no

(*)

Check the connection of the cable to the assembly and to the control panel. Repair if necessary. Is the fault still present?

no → End of fault-finding

yes

Check the adjustment on the assembly and the control panel (sprockets, levers). Is this correct?

no → Rectify if possible, otherwise change the assembly.

yes

Remove the assembly and check the air distribution flaps, change the assembly if necessary.

* From this asterisk onwards, the text also applies to fault charts 2, 9, 10, 12 and 14.

e06061.1

Fault Chart 2: Heating efficiency fault

Before carrying out any work, check that the customer is operating the heating system correctly.
(see the specific Workshop manual and the vehicle driver's handbook).

Carry out a road test to confirm the customer complaint.
Is the customer complaint confirmed?

- no → Advise the customer how to operate the heating system to maximum advantage for example: do not set the fan assembly to full power on starting the engine from cold but increase the power gradually.
- yes ↓

Visually check that operating the control moves the mixing flap (blue cable and lever).
Does the flap move?

- no → See fault chart 1. "Air distribution fault" from (*)
- yes ↓

Visually check on the assembly that the flap travel is complete.
Is it complete?

- no → Readjust the cable.
- yes ↓

Check that the cooling circuit is correctly filled and bled.
Also check the condition of the circuit, pipes, correct connection of the pipes, conformity of the coolant circuit.
Rectify if necessary.
Is the fault still present?

- no → End of fault-finding
- yes ↓

Remove the engine coolant thermostat and check that it is not stuck in the open position.
Change the thermostat if necessary.
Is the fault still present?

- no → End of fault-finding
- yes ↓

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NOTE : if during a test it is noticed that the heating efficiency is very poor at high speeds, the engine coolant thermostat must be changed as it opens under pressure.

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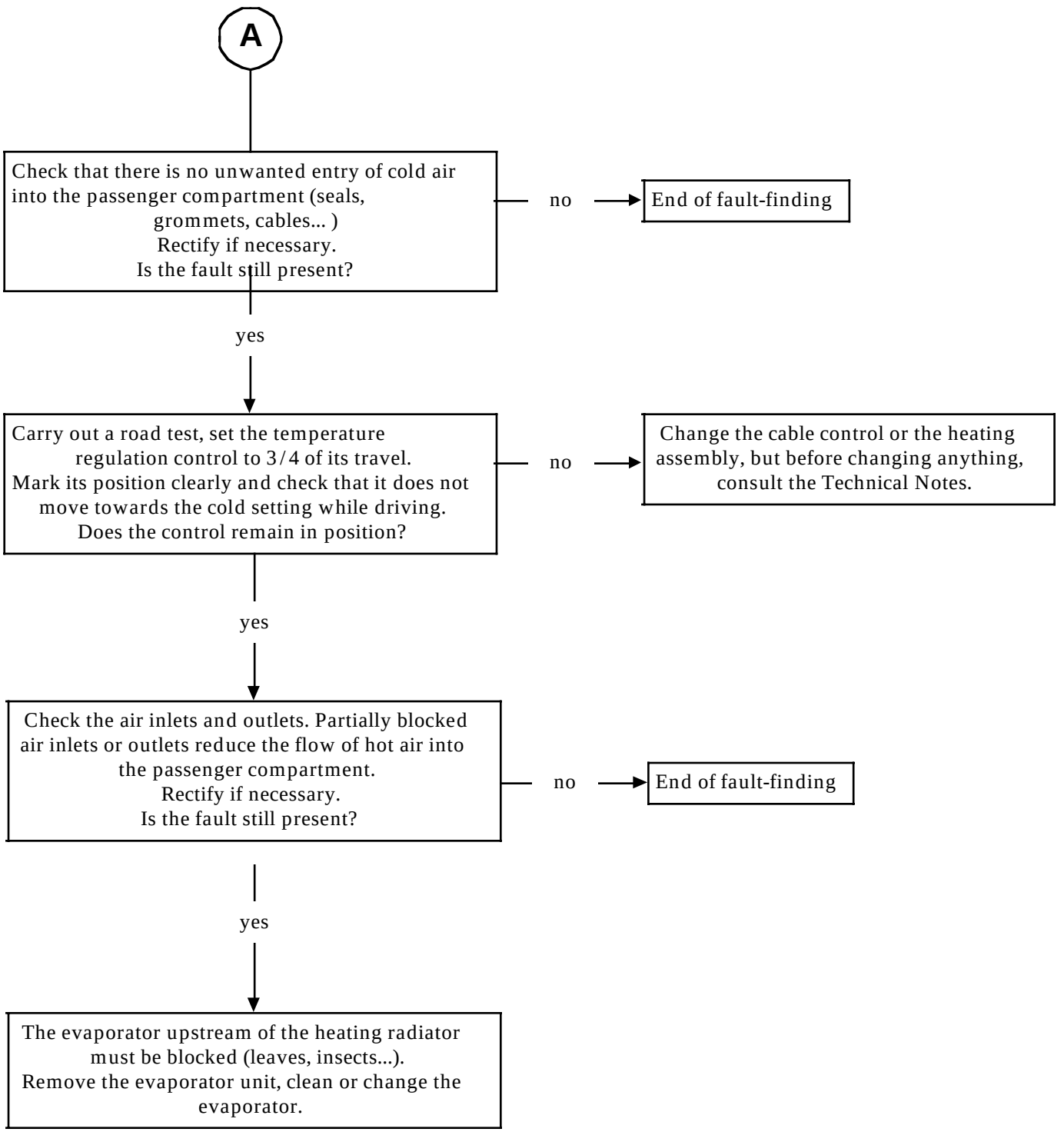
Fault Chart 2: Heating efficiency fault



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Fault Chart 3: Air flow fault (when the air distribution rotator is in position )

Check the air inlet circuit, the scuttle grille, the passenger compartment fan assembly, the ventilation unit (plenum chamber...). Rectify if necessary. Is the fault still present?

no → End of fault-finding

yes

Check the air extraction circuit. Repair if necessary. Is the fault still present?

no → End of fault-finding

yes

The evaporator upstream of the heater radiator must be blocked (leaves, insects...). Remove the evaporator unit, clean or change the evaporator.

Fault Chart 4: Air flow fault (when the air distribution rotator is in position )

Check the air inlet circuit, the scuttle grille, the passenger compartment fan assembly, ventilation unit (plenum chamber...). Rectify if necessary. Is the fault still present?

no → End of fault-finding

yes

Check the air extraction circuit. Rectify if necessary. Is the fault still present?

no → End of fault-finding

yes

Check whether the upper section of the dashboard where the air vents are located is correctly positioned opposite the ventilation unit outlets. Rectify if necessary. Is the fault still present?

no → End of fault-finding

yes

The evaporator upstream of the heating radiator must be blocked (leaves, insects...). Remove the evaporator unit, clean or change the evaporator.

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Fault Chart 5: Air flow fault
**(when the air distribution rotator is in position  **
and the air mixing rotator is in the maximum heat position)

Check the air inlet circuit, the scuttle grille, the passenger compartment fan assembly, the ventilation unit (plenum chamber...). Rectify if necessary. Is the fault still present?

no → End of fault-finding

yes ↓

Check the air extraction circuit. Rectify if necessary. Is the fault still present?

no → End of fault-finding

yes ↓

Check the presence and connection of the ventilation ducts. Rectify if necessary. Is the fault still present?

no → End of fault-finding

yes ↓

The evaporator upstream of the heating radiator must be blocked (leaves, insects...). Remove the evaporator unit, clean or change the evaporator.

Fault Chart 6: Air flow fault
**(when the air distribution rotator is in position  **
and the air mixing rotator is in the maximum heat position)

Check the air inlet circuit, the scuttle grille, the passenger compartment fan assembly, the ventilation unit (plenum chamber...). Rectify if necessary. Is the fault still present?

no → End of fault-finding

yes ↓

Check the air extraction circuit. Rectify if necessary. Is the fault still present?

no → End of fault-finding

yes ↓

Check the presence and connection of the ventilation ducts. Rectify.

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Fault Chart 7: Stiffness of the controls

Check the cable routing. Correct any restrictions, bending, clamping of the cable by plastic clips etc...
Change the cable if necessary.
Is the fault still present?

no → End of fault-finding

yes ↓

Unclip the cable on the assembly and check the operation of the control button and the flap (mixing or distribution).
Is the control button or the flap unusually stiff?

yes → Change the control panel.

no ↓

Change the heating / ventilation assembly.

Fault Chart 8: Projection of foreign bodies by the ventilation circuit

Check that the air intake grille is clean and in good condition. Clean or change the grille.
Is the fault still present?

no → End of fault-finding

yes ↓

Grille mesh not fine enough :
Ensure that the grille conforms to the latest specification.

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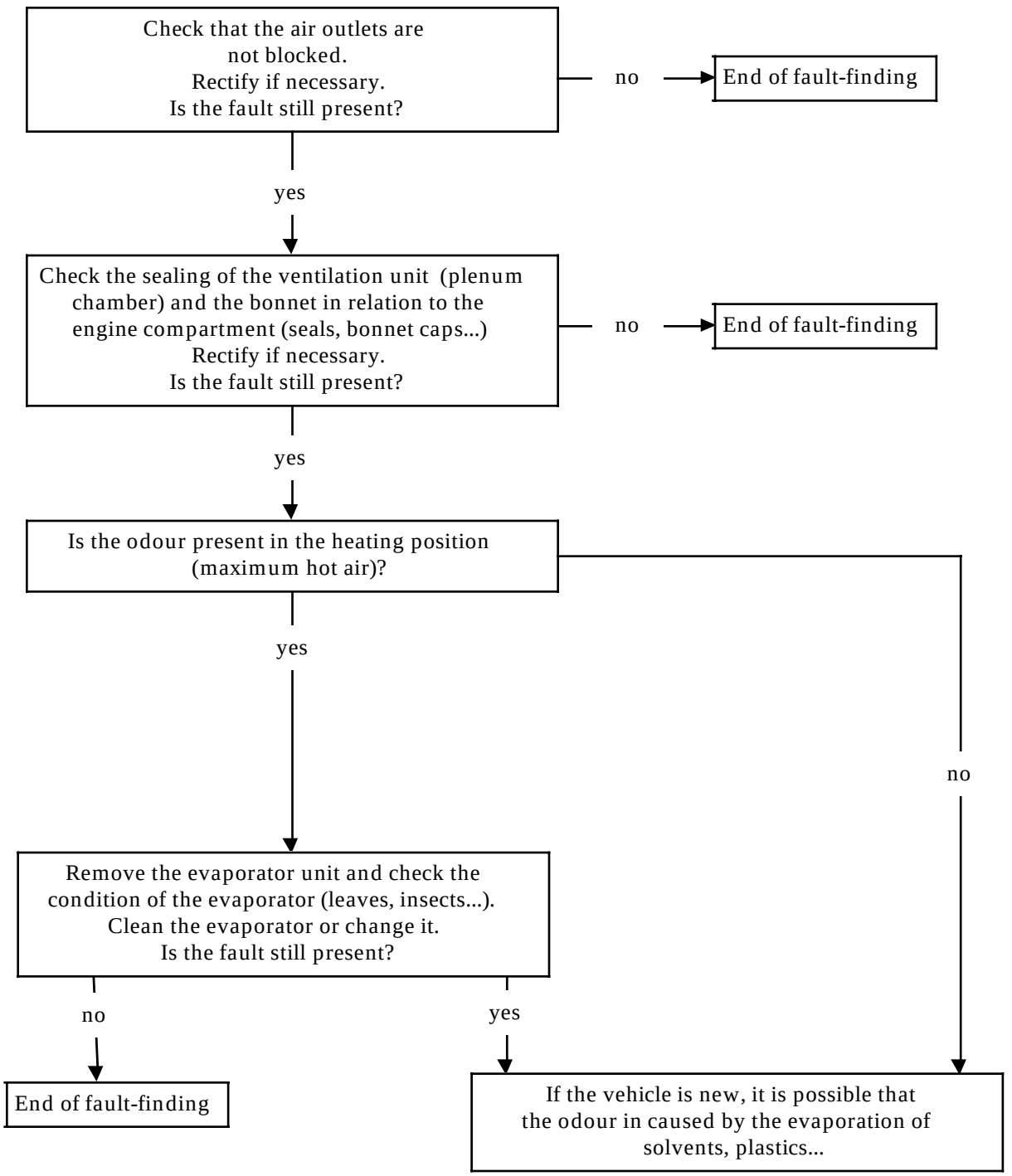
Fault Chart 9: Passenger compartment odours



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Fault Chart 10: No heating

Is it an air flow fault? — yes → See the corresponding fault chart

no

Check the level of coolant in the cooling circuit. Rectify if necessary. Is the fault still present? — no → End of fault-finding

yes

Visually check the condition of the coolant pipes and check the tightness of the clips. Rectify if necessary. Is the fault still present? — no → End of fault-finding

yes

Visually check that moving the control moves the mixing flap. Does the flap move? — no → See Fault Chart 1 "Air distribution fault" from (*)

yes

Remove the evaporator unit, it must be blocked by leaves, insects..., clean or change the evaporator.

Fault Chart 11: Too much heat

Visually check that moving the control moves the mixing flap. Does the flap move? — no → See Fault Chart 1 "Air distribution fault" from (*)

yes

Check that the flap travel is complete. Readjust the cable (right hand side of the assembly) Is the fault still present? — no → End of fault-finding

yes

Check the operation of the engine coolant thermostat. Change the thermostat if necessary.

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Fault Chart 12 : Demisting/de-icing efficiency fault

Before carrying out any work, check that the customer is operating the system correctly. Remind the customer that the vents must be closed for greater demisting efficiency. Also check that the windows are clean on the inside. (greasy windows decrease the demisting efficiency).

Check that the air outlet is not blocked. Rectify if necessary. Is the fault still present?

- no → End of fault-finding
- yes ↓

Ensure that there are no water leaks in the passenger compartment as this will significantly increase the humidity factor and decrease the demisting efficiency.
NOTE : if there is a water leak, after driving and stopping the vehicle for several hours, a water deposit forms on the inside of the windows. Rectify if necessary.
Is the fault still present?

- no → End of fault-finding
- yes ↓

Is it an air distribution fault?

- yes → See Fault Chart 1
- no ↓

Is it an air flow fault?

- yes → See the corresponding fault chart
  - Fault Chart 3 footwells position
  - Fault Chart 4 demisting / de-icing position
  - Fault Chart 5 ventilation hot position
  - Fault Chart 6 ventilation cold position
- no ↓

Is it a heating efficiency fault?

- yes → See Fault Chart 2 up to "remove the thermostat..."
- no ↓

INCORRECT DIAGNOSIS

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Fault chart 13 : No cold air

Does the compressor clutch operate?
- no → See Fault Chart 13 cont.
- yes ↓

Check that operating the heating control moves the mixing flap.
Does the flap move?
- no → See fault Chart 1 from (*).
- yes ↓

Visually check on the assembly whether the mixing flap travel is complete.
Reset if necessary.
Is the fault still present?
- no → End of fault-finding
- yes ↓

Connect the pressure gauges (high and low) and check the pressures at idle with the air conditioning set to maximum and the fan assembly in position 4.
If low pressure = high pressure pressure relief valve is fully open
or low pressure ≤ 0 pressure relief valve is closed
if one of these two configurations is obtained, change the pressure relief valve and top up with refrigerant
Is the fault still present?
- no → End of fault-finding
- yes ↓

Top up with refrigerant.
Note : Do not take any notice of the indicator on the reservoir as with refrigerant there are always bubbles, in particular at a temperature > 30 °C.
After rectification,
is the fault still present?
- no → End of fault-finding
- yes ↓

Change the compressor.

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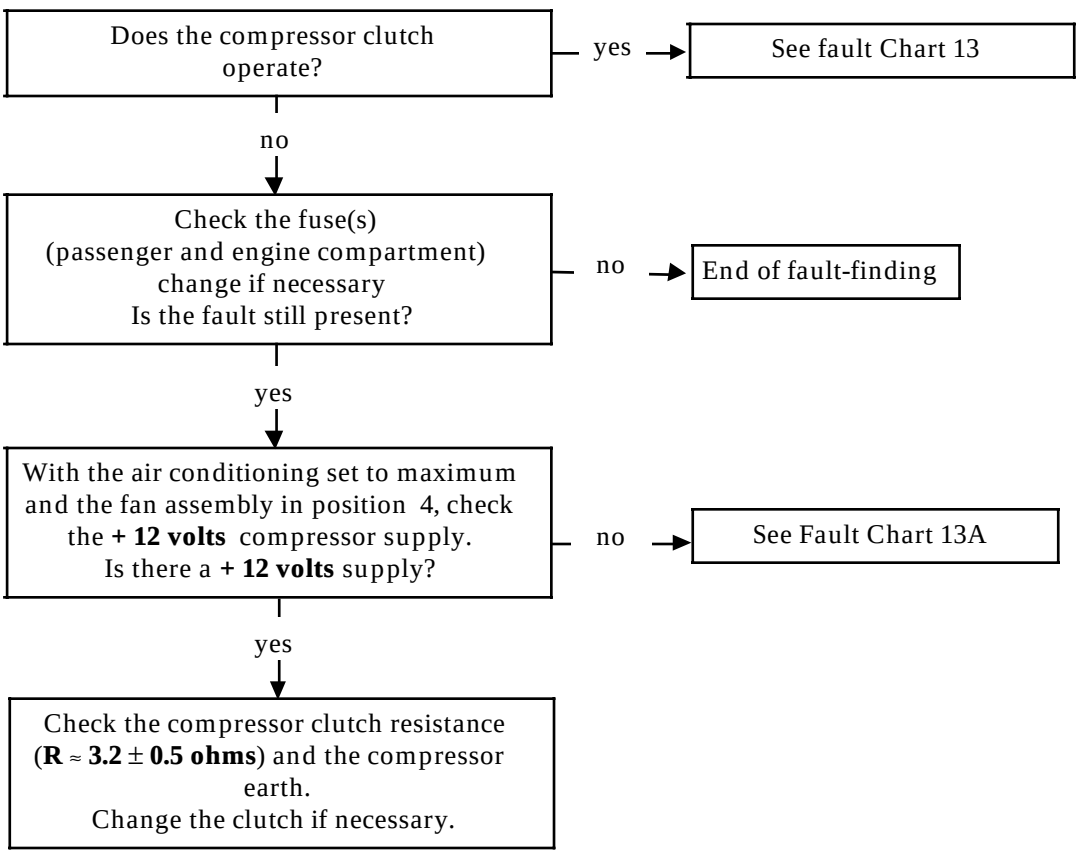
Fault Chart 13: No cold air (cont.)



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Fault Chart 13A: No cold air

Engine running at idle speed.
Connect the XR25 (injection fiche n° 27 side 2/2).
Enter code D13 with the selector at S8.
Switch on the air conditioning
(passenger compartment fan assembly and
and air conditioning set to maximum).
Are left hand bargraph 9 and left bargraph 10 illuminated?

no → See Fault Chart 13B

yes

Is right hand bargraph 10 illuminated?

no → The injection computer is prohibiting operation of the air conditioning, find the reason for this.
On fiche 27 side 1/2, if left hand bargraph 15 is permanently illuminated, there is a short circuit to + 12 volts on the line between track 51 of the injection computer and track A5 of the control panel.

yes

Engine running at idle speed.
Air conditioning set to maximum and passenger compartment fan in position 4.
Check that there is no voltage on track A5 of the connected control panel connector.
Is the voltage **0 volt** ?

no → Repair the electrical wiring between track A5 of the control panel and track 51 of the injection computer.

yes

Engine running at idle speed.
Air conditioning set to maximum and passenger compartment fan in position 4.
Check that the voltage on track A6 of the connected control panel connector is **+12 volts**
Is the voltage **+12 volts** ?

no → Fault Chart 13C

yes

A

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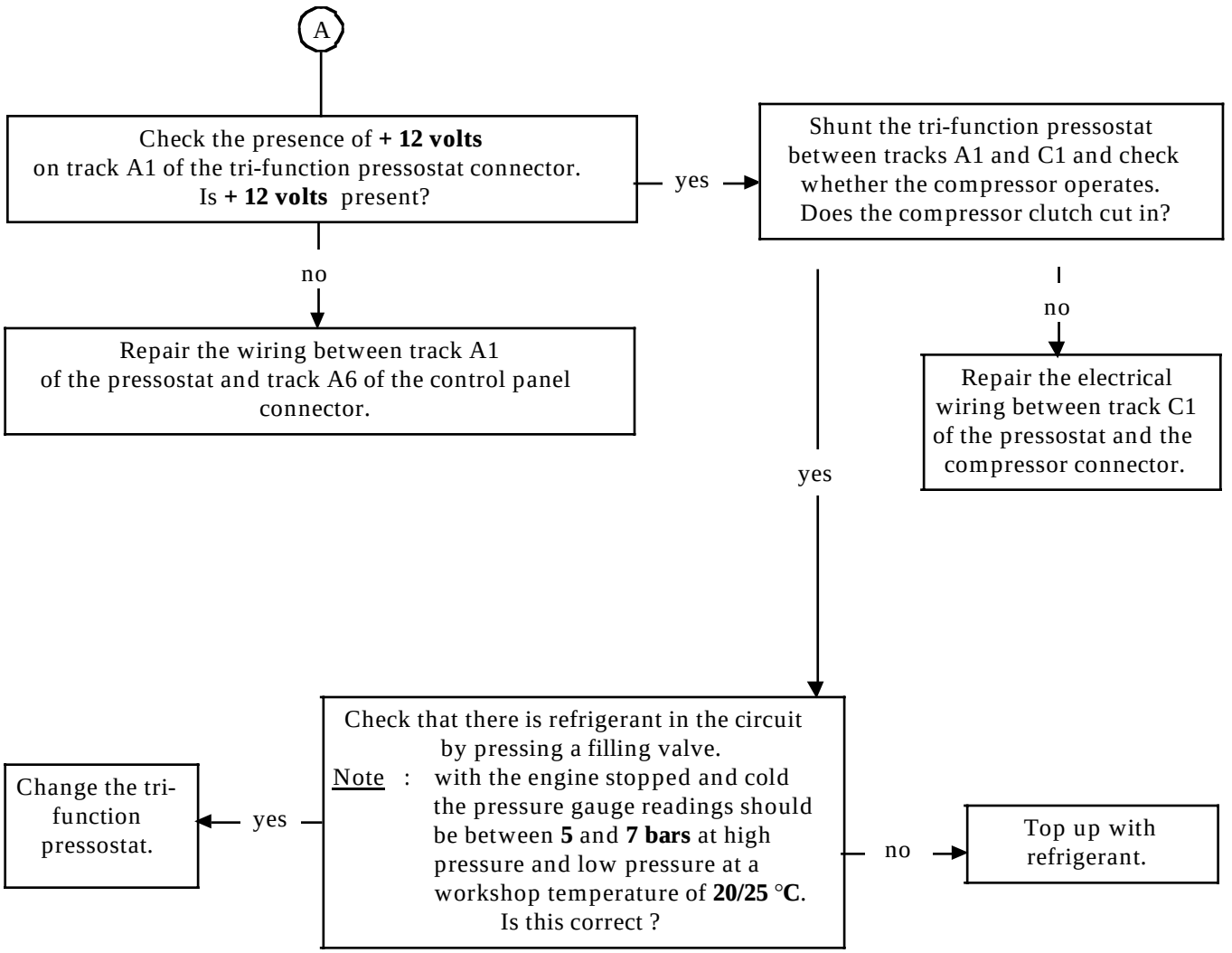
Fault Chart 13 A: No cold air (cont.)



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Fault Chart 13B: No cold air

With the air conditioning on (fan assembly and air conditioning set to maximum).
Using a voltmeter, check that there are **12 volts** on track C2 of the R212 connector connector next to the battery.
Is **+ 12 volts** present?

no → Under the same test conditions, check that there are **12 volts** on track A2 of the control panel connector.
Is **+ 12 volts** present?

no → Under the same test conditions, shunt the evaporator sensor.
Does the compressor cut in ?

yes → Change the evaporator sensor

yes → Change the control panel

yes → Repair the electrical wiring between track A2 of the control panel connector and track C2 of the R212 connector connector.

yes → Switch off the ignition.
Connect the Sus.1228 bornier in place of the injection computer.
Earth track 51 of the bornier.
Switch the ignition on again, air conditioning on (fan assembly and air conditioning set to maximum)
and check whether the voltage on track 5 of the bornier is **12 volts** .
Is the voltage **+ 12 volts** ?

no → Repair the electrical wiring between track C2 of the R212 connector connector and track 5 on the injection computer connector.

yes → Injection computer fault.
Consult the injection fault-finding information for the vehicle.

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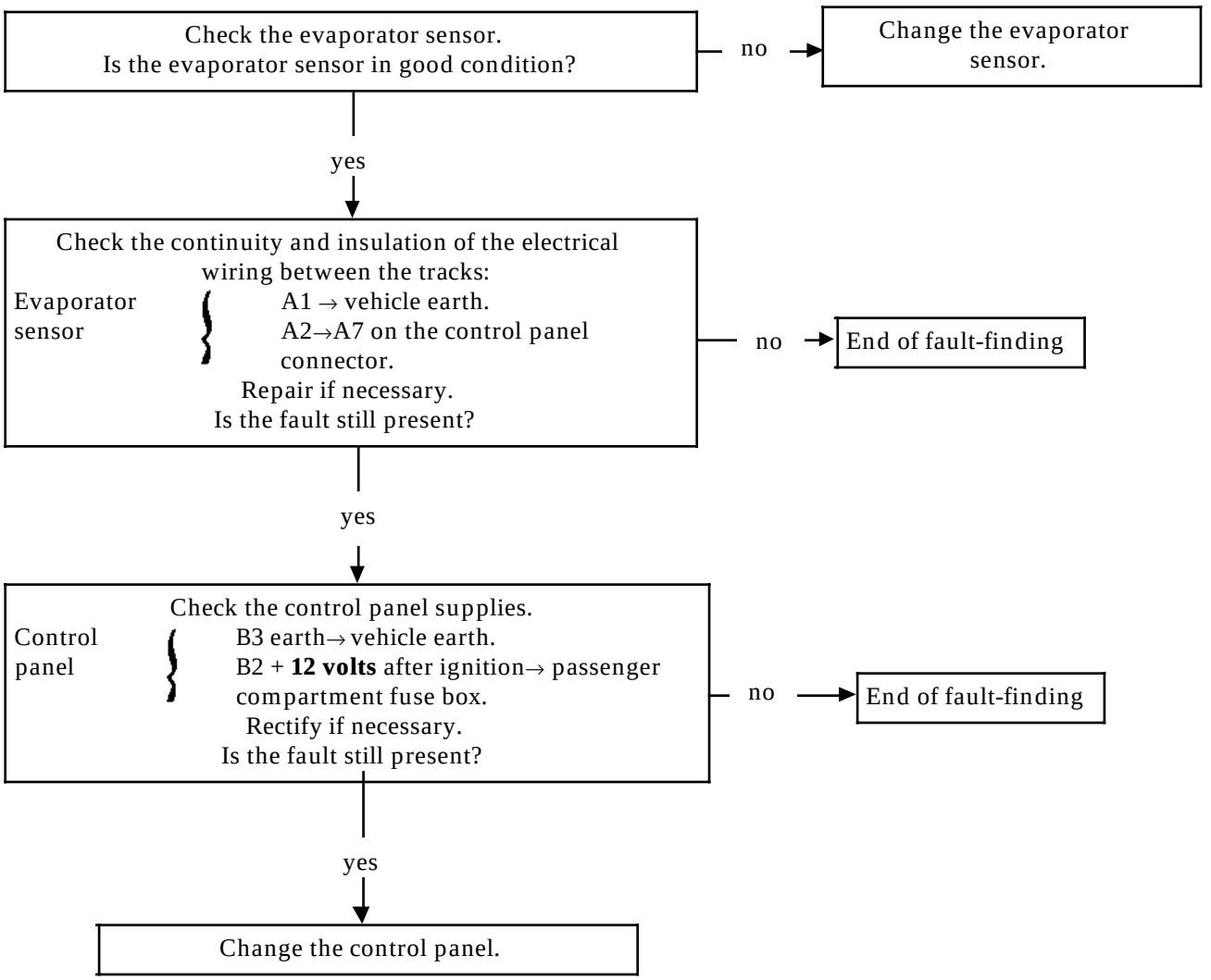
Fault Chart 13C: No cold air



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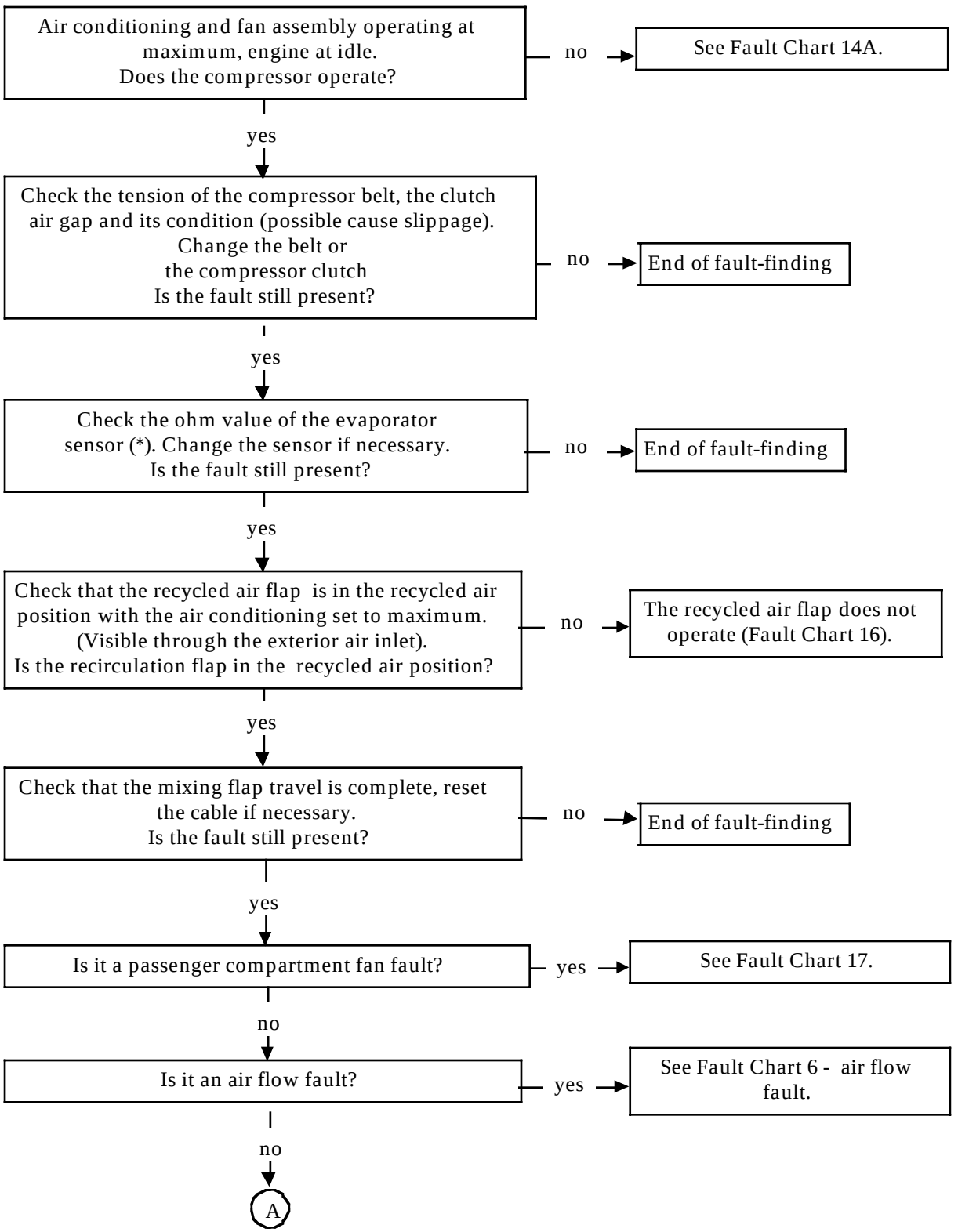
Fault chart 13C: Lack of efficiency



(*) If the ohm value of the sensor is incorrect:

1) Outside of the maximum tolerance : The compressor operates sooner and its efficiency is reduced.
2) Outside of the minimum tolerance : The compressor operates later and the evaporator freezes resulting in a reduction in its efficiency and a reduction in the air flow.

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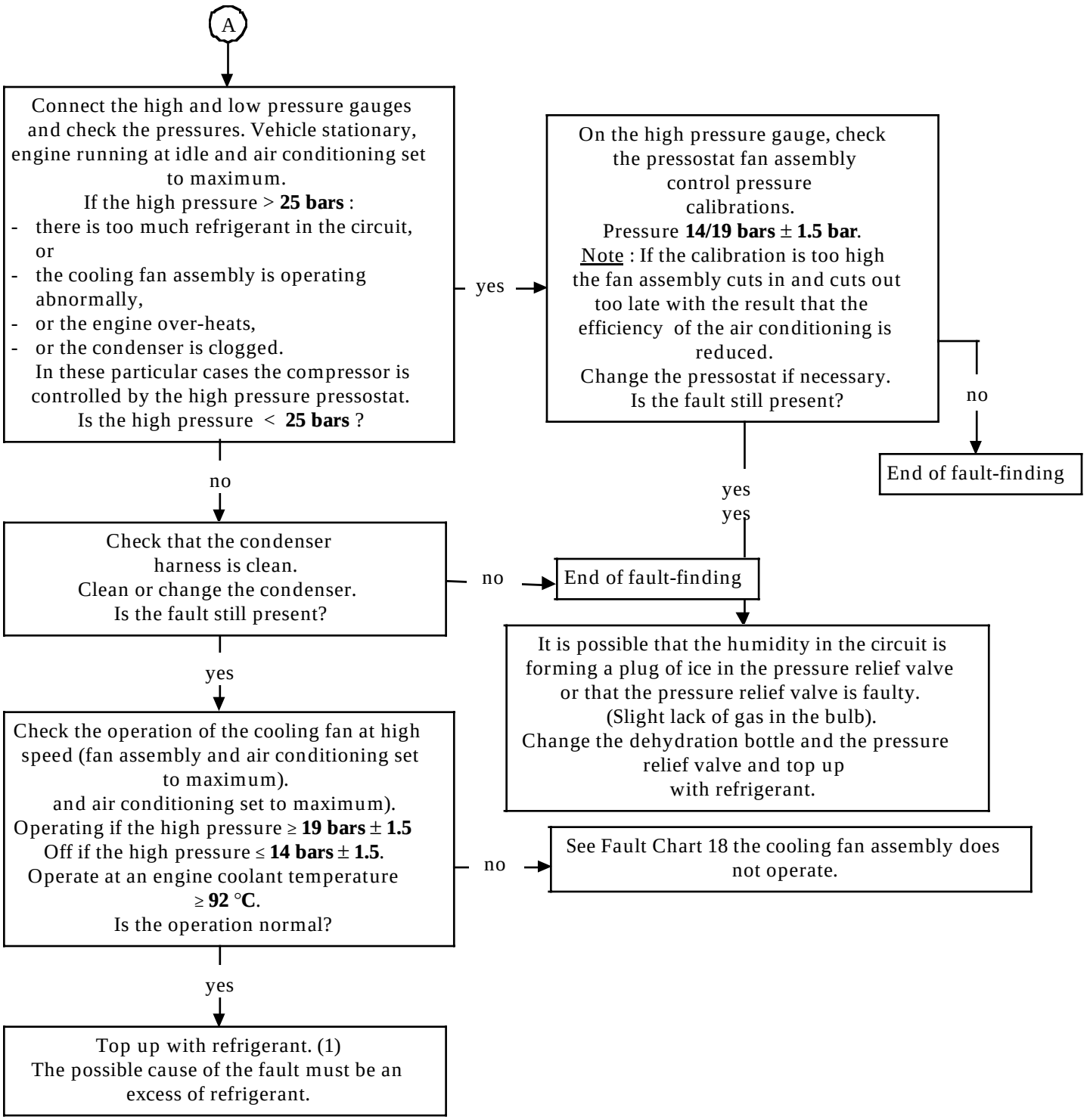
Fault Chart 14: Lack of efficiency (cont.)



(1) Note : Excess refrigerant causes incorrect operation of the compressor and reduces the efficiency of the air conditioning..

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Fault Chart 14: Lack of efficiency

Air conditioning and passenger compartment fan assembly operating at maximum power engine at idle.
Does the compressor operate?

yes → See Fault Chart 14.

no

Connect the high and low pressure gauges.
Check that the cooling fan assembly operates correctly (air conditioning set to maximum).
Operating if the high pressure ≥ **19 bars** ± **1.5**
Off if the high pressure ≤ **14 bars** ± **1.5**.
Also operating at an engine coolant temperature ≥ **92 °C**.
Is the operation normal?

no → If the calibration of the pressostat cooling fan assembly control pressures is too high the cooling fan assembly cuts in and cuts out too late with the result that the air conditioning efficiency is reduced.
In this case change the pressostat.

yes

Doors and windows closed, vehicle not in direct sunlight, temperature ≤ **25 °C**, engine at idle, passenger compartment fan assembly and air conditioning set to maximum. Check the air temperature in the central vent.
Is the temperature less than **10°C?**

yes → Check whether the customer is operating the system correctly. Explain how to operate it again if necessary.

no

Check the ohm value of the evaporator sensor.
Is the evaporator sensor in good condition?

no → Change the evaporator sensor.

yes

A

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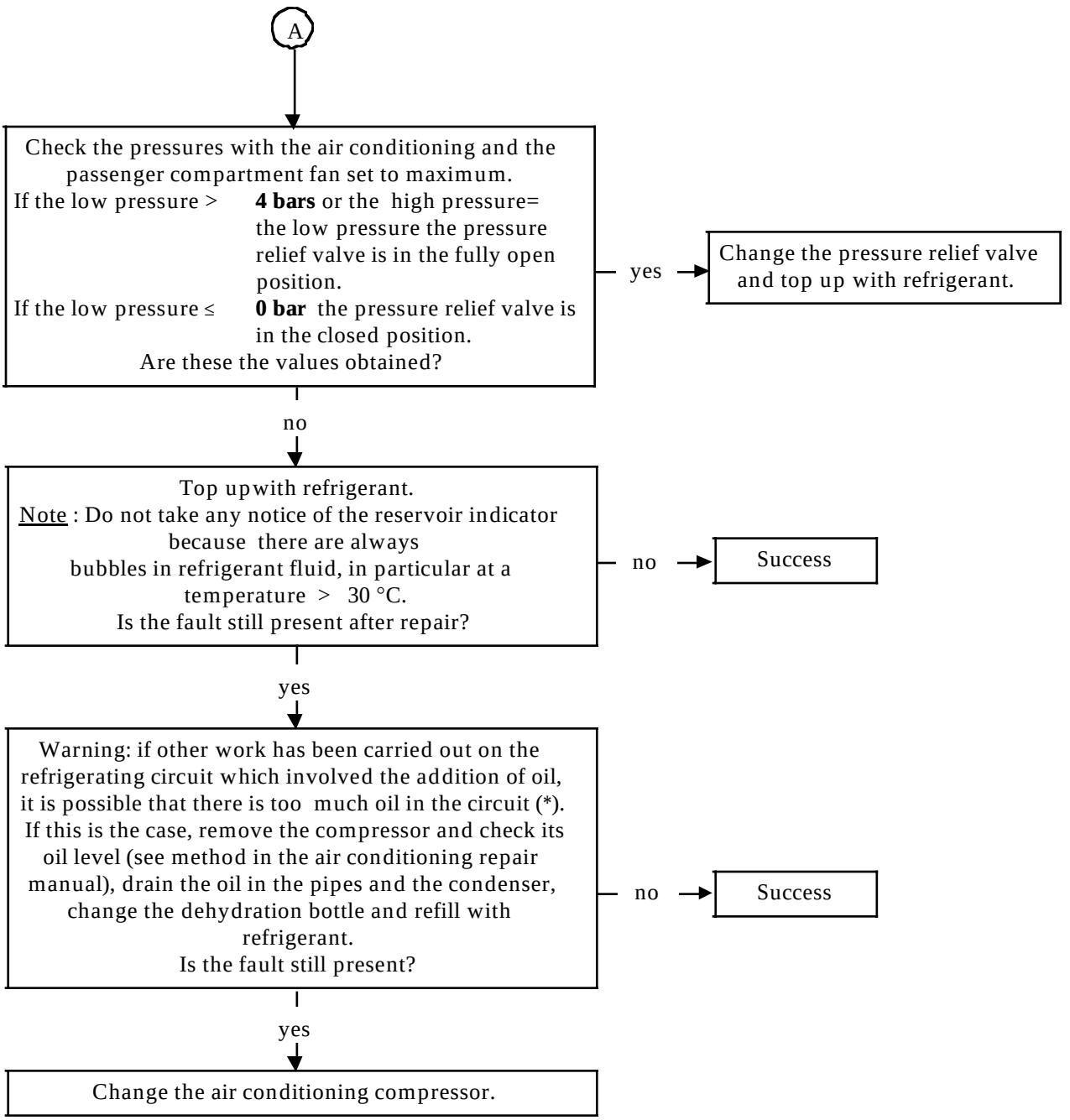
Fault Chart 14A: Lack of efficiency (cont.)



(*) Warning: type 709 compressors allow more oil to circulate in the circuit than 508 and 510 type compressors.

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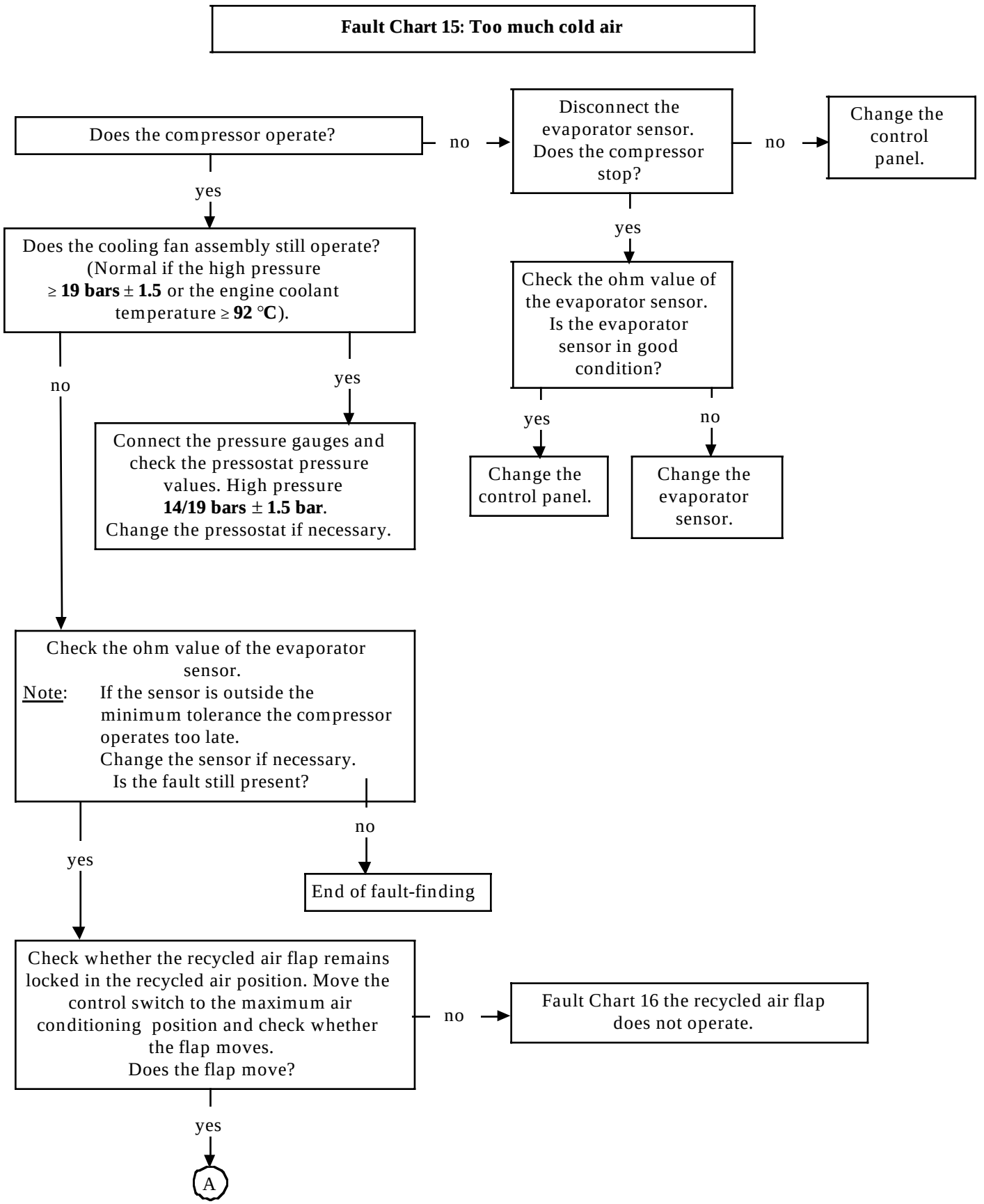
Fault Chart 15: Too much cold air
Does the compressor operate?
no
Disconnect the evaporator sensor. Does the compressor stop?
no
Change the control panel.
yes
yes
Check the ohm value of the evaporator sensor. Is the evaporator sensor in good condition?
yes
Change the control panel.
no
Change the evaporator sensor.
Does the cooling fan assembly still operate? (Normal if the high pressure ≥ 19 bars ± 1.5 or the engine coolant temperature ≥ 92 °C).
no
yes
Connect the pressure gauges and check the pressostat pressure values. High pressure 14/19 bars ± 1.5 bar. Change the pressostat if necessary.
Check the ohm value of the evaporator sensor.
Note: If the sensor is outside the minimum tolerance the compressor operates too late. Change the sensor if necessary.
Is the fault still present?
yes
no
End of fault-finding
Check whether the recycled air flap remains locked in the recycled air position. Move the control switch to the maximum air conditioning position and check whether the flap moves.
Does the flap move?
no
Fault Chart 16 the recycled air flap does not operate.
yes
A

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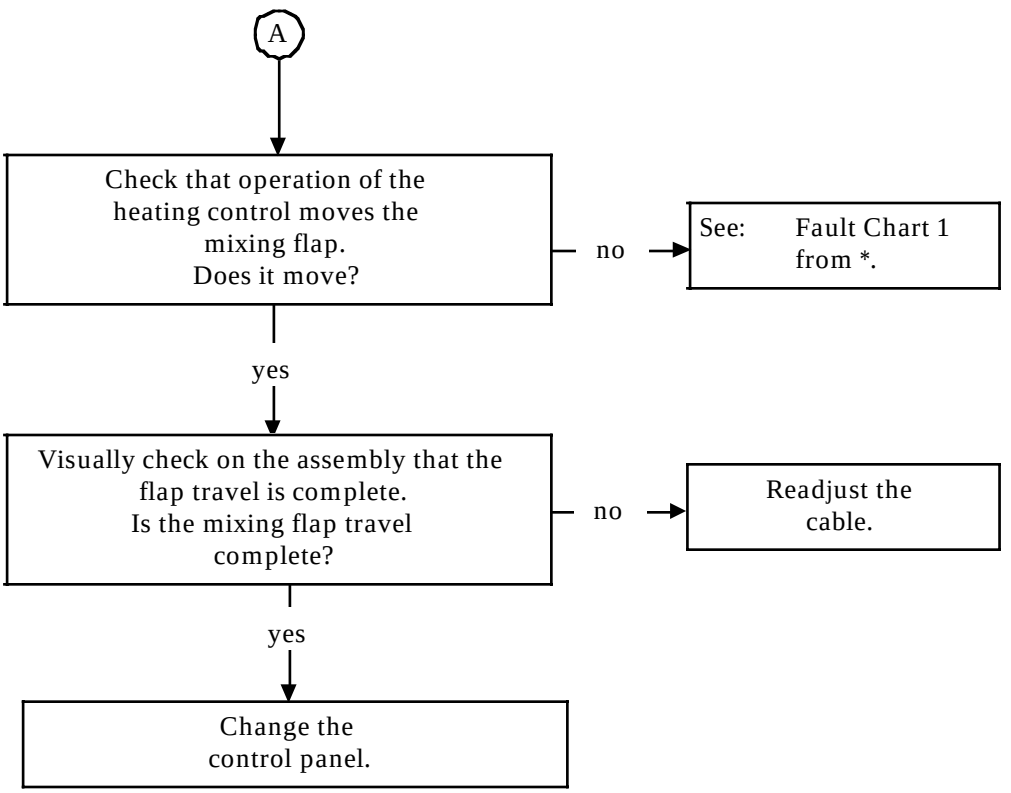
Fault Chart 15: Too much cold air (cont.)



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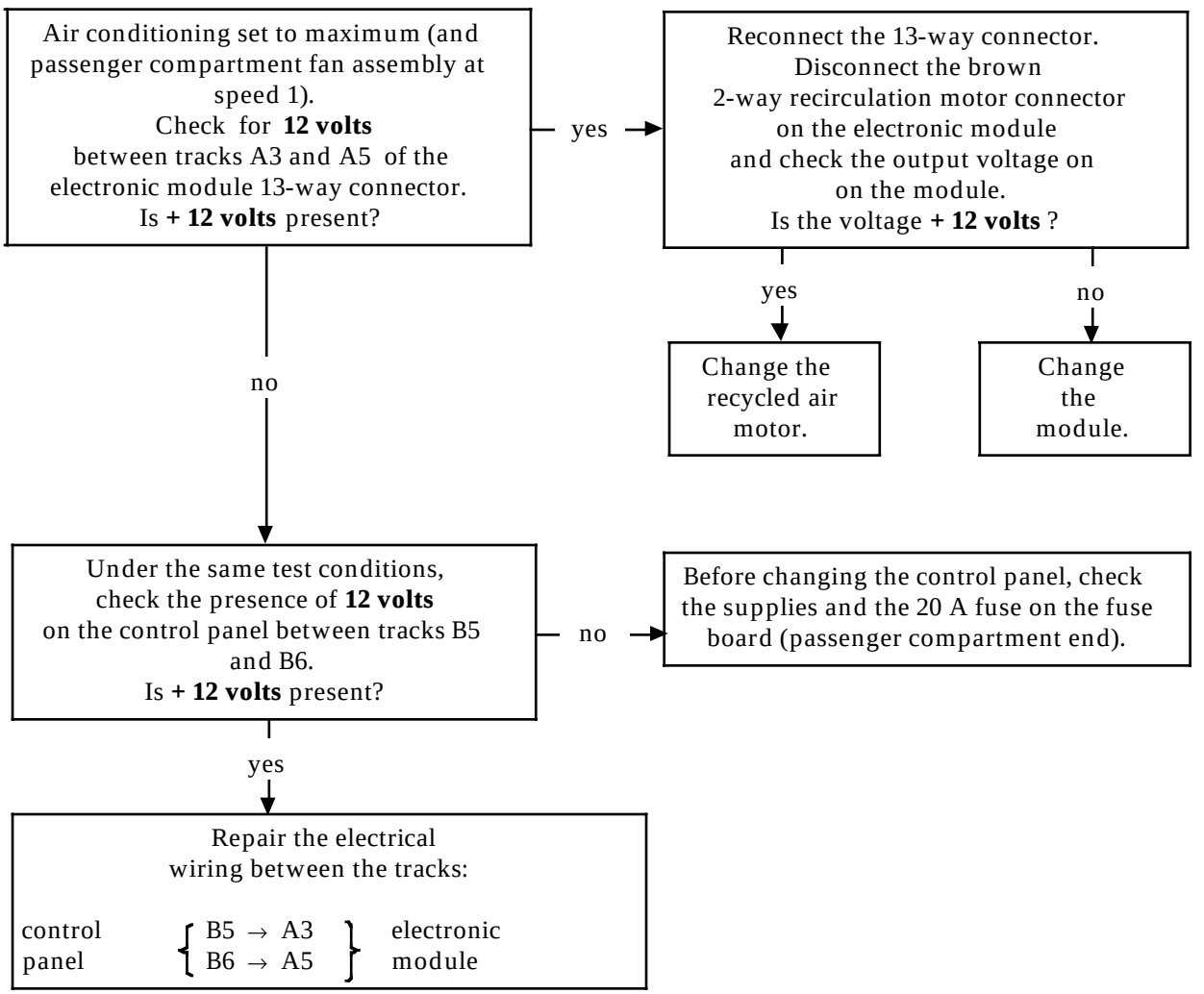
Fault Chart 16: The recycled air flap does not operate



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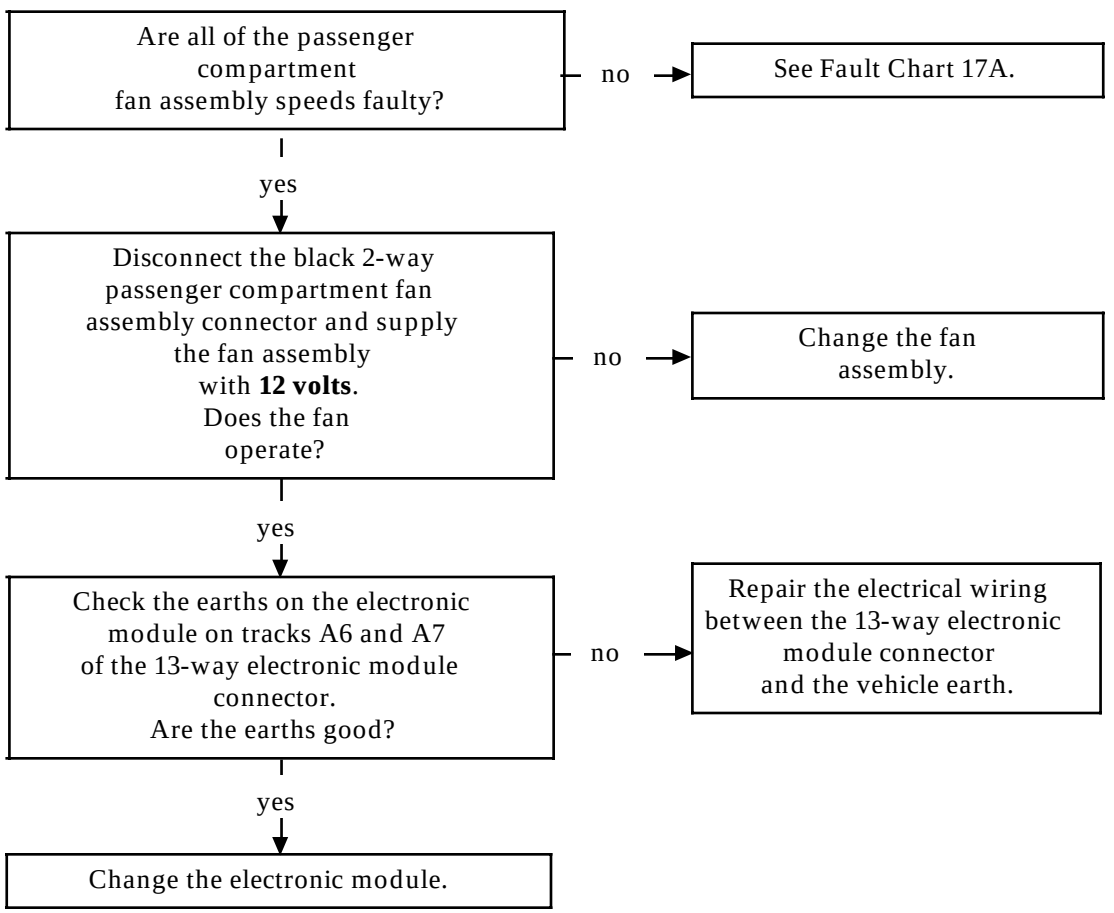
Fault Chart 17: **The passenger compartment fan does not operate**

(at 1 or more speeds)



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Fault Chart 17A : The passenger compartment fan does not operate
(at 1 or more speeds)

Check the **20 A**.
Is the fuse in good condition?
— no → See Fault Chart 17B.

yes ↓

Does the 4th speed of the passenger compartment fan assembly operate?
— no → Rectify.

yes ↓

Check the control panel supplies on the panel connector:
Tracks { B2 **+ 12 volts** after ignition; B3 earth }
Are the supplies correct?
— no → Repair the electrical wiring between the tracks:
Control panel { B2 → fuse board; B3 → vehicle earth }

yes ↓

Ignition on.
On the resistor module connector, check the presence of
+ 12 volts between the tracks:
Fan assembly rotator in position
1st speed between B2 and A6 or A7
2nd speed between B1 and A6 or A7
3rd speed between B3 and A6 or A7
Is + 12 volts present?
— yes → Change the electronic module.

no ↓

Ignition on.
On the control panel connector, check the presence of
+ 12 volts between the tracks:
Fan assembly rotator in position
1st speed between A3 and B3
2nd speed between B1 and B3
3rd speed between A1 and B3
Is + 12 volts present?
— no → Change the control panel.

yes ↓

Repair the electrical wiring between the tracks:
Control panel { A3 → B2; B1 → B1; A1 → B3 } electronic module

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Fault Chart 17B : The passenger compartment fan does not operate
(at 1 or more speeds)

Check the **40 A** (engine compartment fuse board) Is the fuse in good condition?

no → Change the fuse.

yes

With the ignition on, the passenger compartment fan assembly rotator at 4th speed, check the presence of **+ 12 volts** on the electronic module connector between tracks: B7 and A6 or A7. Is 12 volts present?

no → With the ignition on, the passenger compartment fan assembly rotator at 4th speed, check the presence of **+ 12 volts** on the control, panel connector between tracks: B4 and B3. Is 12 volts present?

no → Change the control panel.

yes → Repair the electrical wiring between track B4 of the control panel and track B7 of the electronic module.

yes

With the ignition on, check the presence of **+ 12 volts** on the 13-way electronic module connector between tracks:
B4 and A6 or A7
B5 and A6 or A7
Is 12 volts present?

no → Repair the electrical wiring between tracks:

Electronic module:
- A6 → vehicle earth
- A7 → vehicle earth
- B4 → Engine compartment fuse box
- B5 → Engine compartment fuse box

yes

Change the electronic module.

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Fault Chart 18: The cooling fan does not operate

The compressor operates

Check the fuses:
- **20 A** on the passenger compartment fuse board.
- **40 A** on the engine compartment fuse / relay board.

Is the fuse in good condition?

no → Repair..

yes ↓

Supply the cooling fan assembly with **12 volts**.
Does it operate?

no → Change the cooling fan assembly.

yes ↓

Switch on the air conditioning.
Does the cooling fan operate at low speed?

no → See Fault Chart 18A (fan does not operate at 1st speed).

yes ↓

Shunt tracks B1 and B2 of the pressostat connector (vehicle wiring end).
Does the fan operate at high speed?

yes → Connect the high and low pressure gauges to the air conditioning circuit.
With the air conditioning and the air conditioning fan assembly set to maximum,
Check the calibration of the fan assembly control pressostat.

High pressure ≥ **19 ± 1.5 bars** fan assembly operating at high speed.

High pressure ≤ **14 ± 1.5 bars** fan assembly operating at low speed.

Note : The fan assembly also operates at an engine coolant temperature ≥ **92 °C**.
Run the engine at **2000 rpm**.
Is the pressure > **19 ± 1.5 bars** ?

yes ↓ → Change the pressostat.

no ↓ → If the high pressure is low and does not reach the pressostat calibration value, recharge the refrigerant circuit.

no ↓

Ignition on. Shunt between B1 and B2.
Air conditioning and air conditioning fan assembly set to maximum.
On the engine compartment fuse.relay board, shunt tracks 3 and 5 on the 234 connector.
Does the fan assembly operate at high speed?

no → B

yes ↓

A

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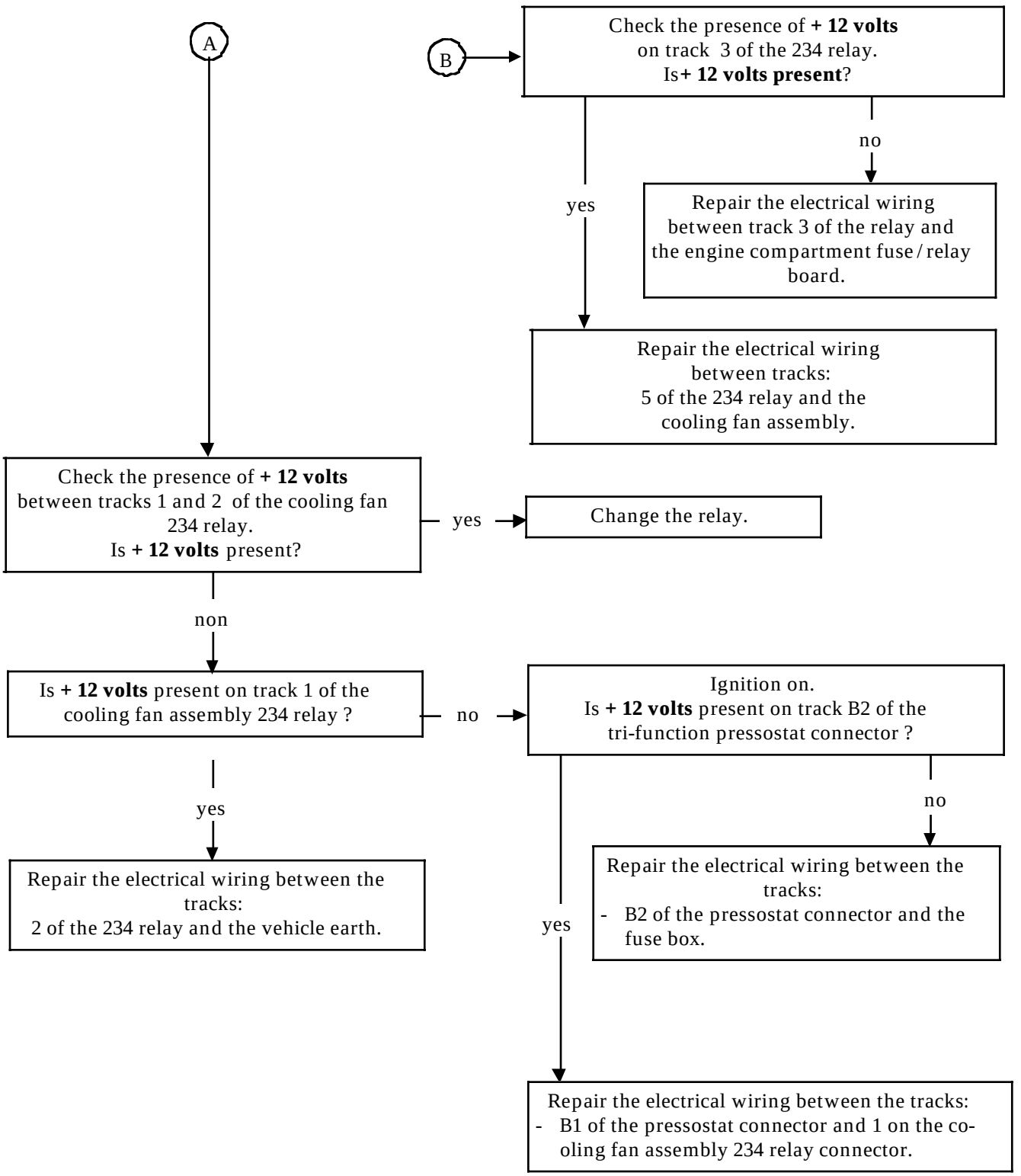
Fault Chart 18: The cooling fan does not operate (cont.)



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Fault Chart 18A: The cooling fan does not operate

(at 1st speed)

Ignition on. Air conditioning and air conditioning fan assembly set to maximum. On the engine compartment fuse / relay board, shunt tracks 3 and 5 of the 233 relay connector. Does the fan assembly operate at 1st speed?

no → Check the presence of **+ 12 volts** on track 3 of the 233 relay. Is **+ 12 volts** present?

no → Repair the electrical wiring between track 3 of the 233 relay and the engine compartment fuse / relay board.

yes → Repair the electrical wiring between the tracks:
- 5 of the 233 relay and 1 of the fan assembly resistor (321).
- 2 of the fan assembly resistor (321) and the cooling fan assembly or change the resistor R = **0.28** Ω.

yes → Check the presence of **+ 12 volts** between tracks 1 and 2 of the cooling fan assembly 233 relay. Is **+ 12 volts** present?

yes → Change the relay.

no → Is **+ 12 volts** present on track 1of the cooling relay 233 ?

no → Repair the electrical wiring:
- between track 1 of the 233 relay and the diode (659),
- between the diode (659) and track C4 of the R212 connector connector.
- change the diode if necessary.

yes → Repair the electrical wiring between the tracks:
- 2 of the 233 relay and track 2 of the 234 relay.
- 2 of the 234 relay and and the vehicle earth.

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