

RENAULT

Technical Note 3726A

<i>Vehicle</i>	<i>Engine</i>
CLIO	K4J 710 - 711 - 712 - 713 - 714 K4M 708 - 744 - 745 - 748 F4R 732 - 736 - 738
KANGOO	K4M 708 - 730 - 750 - 752 - 753 - 754
MEGANE - SCENIC	K4J 714 - 750 K4M 700 - 701 - 708 - 709 - 712 F4P 720 - 722 F4R 744 - 746 - 747

PETROL INJECTION FAULT FINDING

TYPE OF COMPUTER: SIRIUS 34
PROGRAM No.: E5
VDIAG No.: 04 - 08 - 09

COMPUTER TYPE: EMS 31 - 34
PROGRAM No.: E5
VDIAG No.: 09

This note cancels and replaces Technical Notes 3475A - 3514A - 3554A - 3571A and pages 17-207 to 17-288 of Workshop Repair Manual 346 - Section 1

77 11 320 942

Edition 3 - JULY 2006

EDITION ANGLAISE

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

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

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1. SCOPE OF THIS DOCUMENT

This document presents the fault finding method applicable to all computers with the following characteristics:

Vehicle(s): **All types**

Engines:

K4J 710-711-714-715

K4M 708-709-712-730-744-745-750-752-779

F4R 736-742-743-746-747

F4P 720

Name of computer: **SIRIUS 34**

Program no.: **E5**

VDIAG No.: **04 - 08 - 09**

Name of computer: **EMS 31-34**

Program no.: **E5**

VDIAG No.: **09**

2. PREREQUISITES FOR FAULT FINDING

Documentation type

Fault-finding procedure (this document and the Technical Note on injection installed in the vehicle:

- Assisted fault finding (incorporated into the diagnostic tool), paper version (Workshop Repair Manual or Technical Note) and Dialogys.

Wiring Diagrams:

- Visu-Diagram (CD-ROM), paper.

Type of diagnostic tools:

- **CLIP**

Special tooling required:

Special tooling required	
Multimeter.	
Elé. 1497	Terminal
Elé. 1681	Universal terminal

If the information obtained by the fault-finding tool requires checking electrical continuity, connect terminal **Elé. 1497** or universal terminal **Elé. 1681**.

IMPORTANT

- All tests with terminal **Elé. 1497** or **Elé. 1681** must be conducted with the battery disconnected.
- The terminal is only designed to be used with a multimeter. Never apply **12 V** to the checkpoints.

3. REMINDERS

Faults:

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

The **present** or **stored** state of faults should be taken into consideration when the diagnostic tool is used after the + after ignition feed (without acting on the system components).

Apply the procedure shown in the **Interpreting faults** section for a **present fault**.

For a **stored fault**, note the faults displayed and apply the **instructions** 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 for these lines (for oxidation, bent pins, etc.),
- the resistance of the faulty component,
- the condition of the wires (melted or cut insulation, wear).

Conformity check

The conformity check is designed to check the states and parameters which do not display any faults on the diagnostic tool when inconsistent. This phase therefore allows:

- diagnosis of faults that do not have a fault display, and which may correspond to a customer complaint.
- checks that the system is operating correctly and that there is no risk of a fault reappearing after repairs.

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

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

Customer complaints - Fault finding chart

If the diagnostic tool check is correct, but the customer complaint persists, it should be dealt with according to **the customer complaint**.

A synopsis of the general procedure to follow is provided on the following page in the form of a logic flow chart.

5. FAULT FINDING LOG



WARNING

All problems involving a complex system call for thorough diagnostics with the appropriate tools. The FAULT FINDING LOG, which should be completed during the fault finding procedure, ensures a record is kept of the procedure carried out. It is an essential item when discussing the fault with the constructor.

IT IS THEREFORE MANDATORY TO FILL OUT A FAULT FINDING SHEET EACH TIME FAULT FINDING IS DONE.

You will always be asked for this report:

- When requesting technical assistance from the Techline.
- For certification requests when replacing parts that must be certified.
- Which must be attached to monitored parts for which reimbursement is requested. It is therefore used to decide whether a reimbursement will be made under warranty and leads to improved analysis of the removed parts.

6. SAFETY INSTRUCTIONS

All work on components requires obeying safety rules to prevent physical damage or human injury:

- Make sure the battery is properly charged to avoid damaging the computers with a low charge.
- Use the proper tools.

WIRING CHECK

Diagnostic problems

Disconnecting the connectors and/or handling the wiring can delete the incident.
Electrical measurements of the voltage, resistance and insulation are generally correct, especially if the fault is not present (stored) when doing the testing.

Inspection

Look for damage under the bonnet and in the passenger compartment.
Meticulously inspect the protective devices, insulation and path of the wiring.

Tactile inspection

While handling the wiring, use the fault-finding tool to detect any change in the status of stored or present faults during the inspection:

- make sure the connectors are firmly locked,
- apply light pressure to the connectors,
- twist the bundle.

If a change of status occurs, try to visualize the incident.

Inspection of each component

Disconnect the connectors and inspect the appearance of clips and tabs.

Make sure the clips and tabs are properly connected in the cells.

Check the contact pressure of the clips.

Resistance test

Look for a short circuit to earth at **+ 12 V** or with another wire.

Measure continuity on the full line, then section by section.

If a fault is detected, repair or replace the wiring.

REPROGRAMMING THE COMPUTERS:

Reprogramming conditions:

- Ignition on.
- Engine stopped.
- Computer not protected.

Important recommendation following reprogramming:

The computer does not transmit any information on the multiplex network during reprogramming operations (it is "mute"). Therefore all the computers connected to the multiplex network receiving information from the injection computer will detect faults.

It is therefore essential, after reprogramming the injection computer, to clear the faults on all the computers in communication with the injection computer.

Program the throttle stops

Switch on the ignition for at least **5 seconds** without starting the engine: the throttle stops will be automatically programmed.

If the programming is not carried out, it is possible to start the engine, but driving the vehicle is forbidden as there is a high risk of stalling and/or unstable engine speeds.

Conduct a road test so that the computer reprograms the adaptive variables (torquemeter and richness); this prevents any possible driving discomfort when the customer leaves with the vehicle.

Programming conditions for engine adaptive variables:

- steady speed between **2500** and **3000 rpm** for at least **30 seconds**, then acceleration in 2nd gear to **4000 rpm** followed by deceleration to idle.

STARTING THE VEHICLE AFTER AN IMPACT:

Upon receiving a signal through the multiplex network that the airbag computer has detected an impact, the injection computer (maximum 10 milliseconds):

Cuts off power to the fuel pump, ignition and petrol or LPG injection.

Status ET264 "computer locked following impact" changes to STATUS1.

The only way to restarting is to switch off the ignition for at least 10 seconds.

The only way of clearing status ET264 is to clear the stored faults.

DEFECT MODES

If the motorised throttle system fails, various defect modes take effect and are displayed by status ET118 Motorised throttle in defect mode:

NO: NORMAL MODE

STATUS 1: MOTORISED THROTTLE IN LIMP-HOME MODE:

This defect mode maintains the engine at a constant speed irrespective of gear changes or the accelerator pedal position.

It is generally associated with: DF002 Throttle potentiometer circuit, DF226 Throttle stop programming, DF254 Motorised throttle body control or DF255 Security of throttle/pedal operation.

If no fault is present, check diagnostic PR275 Oscillation detection counter.

STATUS 2: INJECTION CUT-OFF:

This defect mode is not used on the SIRIUS 34 injection computer.

STATUS 3: PEDAL FAULT (loss of driver control):

When this defect mode is in use, there is a loss of pedal power, fast idle speed and the engine slows to idle speed if the brake pedal is depressed.

It is generally associated with: "DF125" Pedal potentiometer circuit track 1+ "DF129" Pedal potentiometer circuit or "DF125" Pedal potentiometer circuit track 1 + "DF126" Pedal potentiometer circuit track 2.

If no fault is present, check diagnostic PR275 Oscillation detection counter.

STATUS 4: REDUCTION OF ENGINE PERFORMANCE (limited performance):

This defect mode is indicated by: Limitation of the vehicle speed, limitation of the command section of the throttle, limitation of the vehicle acceleration (slow increase in the command section of the throttle).

It is generally associated with: DF002 Throttle potentiometer circuit, DF125 Pedal potentiometer circuit track 1, DF126 Pedal potentiometer circuit track 2, DF129 Pedal potentiometer circuit or DF258 First sensor reference voltage.

If no fault is present, check diagnostic PR275 Oscillation detection counter.

FAULT FINDING LOG

System: Injection

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List of monitored parts: **Computer**

● Administrative identification

Date:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	2	0	<input type="text"/>	<input type="text"/>
Sheet completed by:	<input type="text"/>							
VIN:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Engine	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Diagnostic tool	<input type="text"/>	CLIP						
Version	<input type="text"/>	<input type="text"/>	<input type="text"/>					

● Customer complaint

<input type="text"/>	579	Does not start - fault	<input type="text"/>	570	Stalls - difficult to start when cold	<input type="text"/>	571	Stalls - difficult to start when warm
<input type="text"/>	586	Difficult to start	<input type="text"/>	572	Idle - engine speed unsteady	<input type="text"/>	574	Jerking - flat spots
<input type="text"/>	573	Lack of power	<input type="text"/>	520	Abnormal noise, vibrations	<input type="text"/>	576	Smoke - exhaust odours
<input type="text"/>	569	Difficult to start						

Other

Your comments

● Conditions under which the customer complaint occurs

<input type="text"/>	001	When cold	<input type="text"/>	005	While driving	<input type="text"/>	008	When decelerating
<input type="text"/>	002	When warm	<input type="text"/>	006	When changing gear	<input type="text"/>	009	Sudden breakdown
<input type="text"/>	003	When stationary	<input type="text"/>	007	When accelerating	<input type="text"/>	010	Gradual deterioration
<input type="text"/>	004	Intermittently						

Other

Your comments

● Documentation used in fault finding

Fault finding procedure	
Type of fault finding manual:	Workshop Repair Manual: <input type="checkbox"/> Technical Note <input type="checkbox"/> Assisted fault finding <input type="checkbox"/>
Fault Finding Manual No.:	<input type="text"/>
Wiring diagram used	
Wiring Diagram Technical Note No.:	<input type="text"/>
Other documentation	
Title and/or part no.:	<input type="text"/>



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FD 01
Fault finding log

FAULT FINDING LOG

System: Injection

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- **Identification of computer and system parts exchanged**

Part 1 part no.	
Part 2 part no.	
Part 3 part no.	
Part 4 part no.	
Part 5 part no.	

To be read with the diagnostic tool (Identification screen):

Computer part no.	
Supplier no.	
Program no.	
Software version	
Calibration no.:	
VDIAG	

- **Faults found with the diagnostic tool**

Fault no.	Present	Stored	Fault title	Specification

- **Conditions when fault occurs**

State or parameter no.	Name of parameter	Value	Unit

- **System-specific information**

Description:

- **Additional information**

What factors led you to replace the computer?

What other parts were replaced?

Other faulty functions?

Your comments



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FD 01
Fault finding log

PETROL INJECTION




Fault finding - Interpretation of faults

17A

DF002 PRESENT OR STORED	<u>THROTTLE POTENTIOMETER CIRCUIT</u> 1.DEF : throttle potentiometer circuit track 1 2.DEF : throttle potentiometer circuit track 2 3.DEF: inconsistency between throttle track 1 and track 2
--	---

NOTES	Processing priority in the event of a number of faults: Second sensor reference voltage fault DF152 should be dealt with first.
	Conditions for applying the fault finding procedure to stored faults: Apply the fault finding strategy whether the fault is present or stored.

1.DEF	Check the connection and condition of the throttle potentiometer connector. Replace the connector if necessary.
--------------	---

Connect the terminal in place of the computer and check the insulation, continuity and absence of interference resistance on the connections between: Computer Track 7  Track 5 Throttle potentiometer Computer Track 82  Track 1 Throttle potentiometer Computer Track 17  Track 2 Throttle potentiometer If this fault appears, meticulously inspect the protective devices, insulation and path of the engine wiring (see Preliminaries, Wiring test). Repair if necessary.
--

Measure the resistance of throttle potentiometer track 1 (the resistance is zero or equal to infinity in the event of a straight failure). Change the throttle potentiometer if the resistance is not approximately 1 kΩ .
--

AFTER REPAIR	Vary the engine speed to confirm repair. Deal with any other possible faults. Clear the fault memory.
---------------------	---

PETROL INJECTION

Fault finding - Interpretation of faults

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DF002
CONTINUED

2.DEF

Check the **connection and condition** of the throttle potentiometer connector.
Replace the connector if necessary.

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

Computer **track 7** —————> **Track 5** Throttle potentiometer
computer **track 82** —————> **Track 1** Throttle potentiometer
computer **track 13** —————> **Track 6** Throttle potentiometer

If this fault appears, meticulously inspect the protective devices, insulation and path of the engine wiring (see Preliminaries, Wiring test).

Repair if necessary.

Measure the **resistance of throttle potentiometer** track 2 (the resistance is **zero or equal to infinity** in the event of a straight failure).

Change the throttle potentiometer if the resistance is not approximately **1 kΩ**.

3.DEF

Check the **connection and condition** of the throttle potentiometer connector.
Replace the connector if necessary.

Connect the terminal in place of the computer and measure the **resistance of throttle potentiometer** tracks 1 and 2. Operate the throttle, moving from no load to full load, to ensure that the potentiometer resistance is developing in a linear fashion.

Track 1 tracks: Computer **track 17** —————> **Track 7** Computer
computer **track 17** —————> **Track 82** Computer
and

Track 2 tracks: Computer **track 13** —————> **Track 7** Computer
computer **track 13** —————> **Track 82** Computer

If this fault appears, meticulously inspect the protective devices, insulation and path of the engine wiring (see Preliminaries, Wiring test).

Replace the throttle potentiometer if necessary.

If the fault persists, **replace** the throttle potentiometer.

AFTER REPAIR

Vary the engine speed to confirm repair.
Deal with any other possible faults.
Clear the fault memory.

**DF003
PRESENT
OR
STORED**

AIR TEMPERATURE SENSOR CIRCUIT

NOTES

Special notes:

Parameter **PR003 "air temperature"** indicates the value read by the injection computer.

Check the **connection and condition** of the air temperature sensor connector.
Replace the connector if necessary.

Connect the terminal in place of the ECU and check the **insulation, the continuity and absence of spurious resistance** on the connections between:

computer **track 84** —————> **Track 1** Air temperature sensor
computer **track 18** —————> **Track 2** Air temperature sensor

Repair if necessary.

Make sure the air temperature **sensor resistance** is **not zero or infinity**
(Straight failure of the sensor).
Check the **sensor resistance at various temperatures**.
Replace the air temperature sensor, if necessary.

Temperature	Resistance +/- 20%
-10°C	9.5 kΩ
25°C	2 kΩ
50°C	810 Ω
80°C	309 Ω

AFTER REPAIR

Deal with any other possible faults.
Clear the fault memory.

DF004
PRESENT
OR
STORED

COOLANT TEMPERATURE SENSOR CIRCUIT

NOTES

Special notes:

Parameter **PR002 "coolant temperature"** gives the value read by the injection computer.

Check **connection and condition** of the coolant temperature sensor connector.
Replace the connector if necessary.

Connect the terminal in place of the ECU and check the **insulation, the continuity and absence of spurious resistance** on the connections between:

computer **track 73** ➡ **Track B1** Coolant temperature sensor
computer **track 46** ➡ **Track B2** Coolant temperature sensor

Repair if necessary.

Check that the **resistance of the** coolant temperature sensor is not **zero or infinity** (straight failure of the sensor).

Check the **sensor resistance at various temperatures**.

Replace the coolant temperature sensor, if necessary.

Temperature	Resistance +/- 20%
-10°C	9.5 kΩ
25°C	2 kΩ
50°C	810 Ω
80°C	309 Ω
100°C	114 Ω
120°C	87 Ω

AFTER REPAIR

Deal with any other possible faults.
Clear the fault memory.

DF006 PRESENT OR STORED	<u>PINKING SENSOR CIRCUIT</u>
--	-------------------------------

NOTES	Conditions for applying the fault finding procedure to stored faults: The fault is declared present with a sufficiently warm engine, engine above idling speed and a sufficiently high manifold pressure.
	Special notes: Parameter PR013 "pinking sensor signal" indicates the value read by the injection computer.

Check the **connection and condition** of the pinking sensor connector.
Replace the connector if necessary.

Check **clamping of the pinking sensor** on the engine block.
Retighten if necessary.

Connect the terminal in place of the ECU and check the **insulation, the continuity and absence of spurious resistance** on the connections between:

Computer **track 12** —————> **Track 1** Pinking sensor
Computer **track 72** —————> **Track 2** Pinking sensor
Computer **track 19** —————> **Pinking sensor screening**

Repair if necessary.

If the fault persists, **replace** the pinking sensor.

AFTER REPAIR	Follow the instructions to confirm the repair: Deal with any other possible faults. Clear the fault memory.
---------------------	---

DF008 PRESENT OR STORED	<u>FUEL PUMP RELAY CONTROL CIRCUIT</u> CO : open circuit CC.0 : short circuit to earth CC.1 : short circuit to +12 V
--	---

NOTES	Conditions for applying the fault finding procedure to stored faults: The fault is declared present after running command AC010 "fuel pump relay" .
	Special notes: Status ET020 fuel pump control relay) can help with the treatment of this fault.

Check the **connection and condition of the fuel pump relay connector**.
Replace the connector if necessary.

Disconnect the relay.
With the ignition on, check for a **+ 12v feed on track 1 of the petrol pump relay**.
Repair if necessary.

Check the insulation and continuity of the connection between:
Injection computer **track 9** —————> **Track 2** Fuel pump relay
Repair if necessary.

Measure the resistance of the fuel pump relay coil.
Replace the fuel pump relay if necessary.

AFTER REPAIR	Deal with any other possible faults. Clear the fault memory.
---------------------	---

**DF009
PRESENT
OR
STORED**

ACTUATOR RELAY CONTROL CIRCUIT

CO : open circuit
CC.1 : short circuit to +12 V
CC.0 : short circuit to earth

NOTES

Special notes:
Status **ET025 "actuator control relay"** can help with the treatment of this fault.

Check **the connection and condition of the actuator relay connector**.
Replace the connector if necessary.

Disconnect the relay.
With the ignition on, check for the presence of **+ 12 V on track 1 of the actuator relay**.
Repair if necessary.

Check the insulation and continuity of the connection between:
Injection computer **Track 10** —————→ **Track 2** Actuator relay
Repair if necessary.

Measure the resistance of the actuator relay coil.
Replace the actuator relay, if necessary.

AFTER REPAIR

Deal with any other possible faults.
Clear the fault memory.

DF010 PRESENT OR STORED	<u>LOW-SPEED FAN ASSEMBLY CIRCUIT</u> CO : open circuit CC.1 : short circuit to +12 V CC.0 : short circuit to earth
--	---

NOTES	Processing priority in the event of a number of faults: Faults DF004 "coolant temperature sensor circuit" and DF009 "actuator relay circuit" should be dealt with first.
	Conditions for applying the fault finding procedure to stored faults: The fault is declared present after running command AC626 "low-speed fan assembly" .
	Special notes: Status ET035 low speed fan assembly can help with the treatment of this fault.

Check the **connection and the condition of the connector to the low-speed fan relay**.
Replace the connector if necessary.

Disconnect the relay.
With the ignition on, check for the presence of **+ 12 volts on track 1 of the low-speed fan assembly relay**.
Repair if necessary.

Check the insulation and continuity of the connection between:
Injection computer **Track 11** —————> **Track 2** Low speed fan assembly relay
Repair if necessary.

Measure the resistance of the low-speed fan relay coil:
Replace the low-speed fan relay if necessary.

AFTER REPAIR	Deal with any other possible faults. Clear the fault memory.
---------------------	---

DF011 PRESENT OR STORED	<u>FAULT WARNING LIGHT CIRCUIT</u> CO : open circuit CC.0 : short circuit to earth CC.1 : short circuit to +12 V
--	--

NOTES	Conditions for detecting the fault: This fault cannot be diagnosed on SIRIUS 34 VDIAG 08, 09 or EMS 3134 VDIAG 09 computers and therefore may not be present or stored because the "fault warning light" circuit is a connection via the multiplex network.
	Conditions for applying the fault finding procedure to stored faults: The fault is declared present after running command AC211 "warning-light fault" .
	Special notes: Status ET006 "warning-light fault" can help with the treatment of this fault.

VDIAG 04	With the ignition on, check that 12 V is reaching the warning light. Repair the line if necessary.
	Connect the terminal in place of the computer and check the insulation, continuity and absence of interference resistance on the connection between: Computer track 70 —————> Warning-light fault on instrument panel Repair if necessary.
	Check the condition of the warning light (if it is not lit). Replace it if necessary.

VDIAG 08 and 09	<u>Switch on the ignition.</u> Test the multiplex network.
------------------------	---

AFTER REPAIR	Deal with any other possible faults. Clear the fault memory.
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PETROL INJECTION

Fault finding - Interpretation of faults

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DF012 PRESENT OR STORED	<u>INJECTION CONNECTION → AC</u>
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NOTES	Special notes: Status ET016 "injection-AC connection" can help with the treatment of this fault.
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<p>Connect the terminal in place of the computer and check the insulation, continuity and absence of interference resistance on the connection between:</p> <p>Computer track 81 → climate control unit</p> <p>Repair if necessary.</p>	
--	--

AFTER REPAIR	Deal with any other possible faults. Clear the fault memory.
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PETROL INJECTION

Fault finding - Interpretation of faults

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DF014 PRESENT OR STORED	<u>CANISTER BLEED SOLENOID VALVE CIRCUIT</u> CO : open circuit CC.0 : short circuit to earth CC.1 : short circuit to +12 V
--	---

NOTES	Processing priority in the event of a number of faults: Fault DF009 "actuator relay circuit" should be dealt with first.
	Conditions for applying the fault finding procedure to stored faults: The fault is declared present after running command AC016 "canister bleed solenoid valve" .
	Special notes: Status ET032 "canister bleed solenoid valve" can help with the treatment of this fault.

Check the **connection and condition of the fuel vapour absorber solenoid valve connector**.
Replace the connector if necessary.

With the ignition on, check for the presence of **12 V on the fuel vapour absorber solenoid valve**.
Repair if necessary.

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

Injection computer **Track 8** —————> **Fuel vapour absorber solenoid valve**

Repair if necessary.

Measure the **resistance of the fuel vapour absorber solenoid valve**.
Replace the solenoid valve if the resistance is not approximately: **26 Ω \pm 4 at 23°C**.

AFTER REPAIR	Deal with any other possible faults. Clear the fault memory.
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DF018 PRESENT OR STORED	<u>UPSTREAM OXYGEN SENSOR HEATER CIRCUIT</u> CO : open circuit CC.0 : short circuit to earth CC.1 : short circuit to +12 V
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NOTES	Processing priority in the event of a number of faults: Fault DF009 "actuator relay circuit" should be dealt with first.
	Conditions for applying the fault finding procedure to stored faults: The fault is declared present with the engine running after using command AC261 "upstream sensor heating" .
	Special notes: Status ET030 "upstream sensor heating" can help with the treatment of this fault.

Check the **connection and condition** of the oxygen sensor connector.
Replace the connector if necessary.

With the ignition on, check for the presence of **12 V on the oxygen sensor**.
Rectify the electrical line to the actuator relay.

Connect the breakout connector in place of the ECU and **check the insulation, the continuity, and absence of spurious resistance** on the connection between:

Computer **track 65** —————> **Oxygen sensor**

Repair if necessary.

Measure the **resistance** of the oxygen sensor heating circuit.
Change the oxygen sensor if the resistance is not approximately **3.4 Ω at 20°C**.

AFTER REPAIR	Follow the instructions to confirm repair. Deal with any other possible faults. Clear the fault memory.
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**DF022
PRESENT**

COMPUTER

1.DEF : Computer defective or not to specification

NOTES

None.

Check that **the computer is the correct one for the vehicle.**

Reprogram the computer.

REPROGRAMMING THE COMPUTERS:

Reprogramming conditions:

- Ignition on
- Engine stopped
- Computer not protected

Important recommendation following reprogramming:

The computer does not transmit any information on the multiplex network during reprogramming operations (it is "mute"). Therefore all the computers connected to the multiplex network receiving information from the injection computer will detect faults.

It is therefore essential, after reprogramming the injection computer, to clear the faults on all the computers in communication with the injection computer.

Program the throttle stops:

Switch on the ignition for at least **5 seconds** without starting the engine: the throttle stops will be automatically programmed.

If the programming is not carried out, it is possible to start the engine, but driving the vehicle is forbidden as there is a high risk of stalling and/or unstable engine speeds.

Then conduct a road test so that the computer reprograms the adaptive variables (torquemeter and richness); this prevents any possible driving discomfort when the customer leaves with the vehicle.

The programming conditions for engine adaptive variables are:

- steady speed between **2500** and **3000 rpm** for at least **30 seconds**, then acceleration in 2nd gear to **4000 rpm** followed by deceleration to idle.

If the fault is still present, **contact your Techline.**

AFTER REPAIR

Clear the computer memory.
Perform a road test and then recheck with the diagnostic tool.

PETROL INJECTION

Fault finding - Interpretation of faults

17A

DF024 PRESENT	<u>VEHICLE SPEED SENSOR CIRCUIT</u>
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NOTES	Conditions for applying the fault finding procedure to stored faults: The fault is reported present after: speed > 9 mph (15 km/h) for more than 30 seconds .
	Special notes: Two types of connection are used: wire-frame and multiplex. Check what type is used by reading configuration LC038 "vehicle speed connection by CAN" . Status ET069 "speed sensor connection" and parameter PR018 "vehicle speed" can help with the treatment of this fault.

Wire connection	Connect the terminal in place of the computer and check the insulation, continuity and absence of interference resistance on the connection between: Computer track 53 —————> ABS computer Repair if necessary.
CAN connection	<u>Switch on the ignition.</u> Test the multiplex network.

AFTER REPAIR	Follow the instructions to confirm the repair: Deal with any other possible faults. Clear the fault memory.
---------------------	---

DF025 PRESENT OR STORED	<u>FLYWHEEL SIGNAL SENSOR CIRCUIT</u>
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NOTES	Conditions for applying the fault finding procedure to stored faults: The fault is declared present after the engine has been started or running for at least 10 seconds .
	Special notes: Parameter PR006 "engine speed" can help with the treatment of this fault.

Check the **connection and condition** of the engine speed sensor connector.
Replace the connector, if necessary

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

Computer **track 54** —————→ **Track A** engine speed sensor
Computer **track 24** —————→ **Track B** engine speed sensor

Repair if necessary.

Measure the **resistance** of the engine speed sensor.
Replace the engine speed sensor if the resistance is not between **200 and 270 Ω**.

AFTER REPAIR	Follow the instructions to confirm the repair: Deal with any other possible faults. Clear the fault memory.
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DF030 PRESENT OR STORED	<u>HIGH-SPEED FAN CIRCUIT</u> CO : open circuit CC.1 : short circuit to +12 V CC.0 : short circuit to earth
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NOTES	Special notes: Overlook this fault if the vehicle is not equipped with the "High speed fan assembly" function (i.e. vehicle not fitted with air conditioning).
	Processing priority in the event of a number of faults: Fault DF 009 "actuator relay circuit" should be dealt with first.
	Conditions for applying the fault finding procedure to stored faults: The fault is declared present after running command AC625 "high-speed fan assembly" .

Check the **connection and condition of the high-speed fan assembly relay connector**.
Replace the connector if necessary.

Disconnect the relay.
With the ignition on, check for the presence of **+ 12 V on track 1 of the high-speed fan assembly relay**.
Repair if necessary.

Check the insulation and continuity of the connection between:
Injection computer **track 69** —————> **track 2** high-speed fan assembly relay
Repair if necessary.

Measure the resistance of the high-speed fan relay coil.
Replace the high-speed fan relay if necessary.

AFTER REPAIR	Deal with any other possible faults. Clear the fault memory.
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PETROL INJECTION

Fault finding - Interpretation of faults

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DF031 PRESENT OR STORED	<u>FAULT WARNING LIGHT CIRCUIT</u> CO : open circuit CC.0 : short circuit to earth CC.1 : short circuit to +12 V
NOTES	Conditions for detecting the fault: This fault cannot be diagnosed on SIRIUS 34 VDIAG 08, 09 or EMS 3134 VDIAG 09 computers and therefore may not be present or stored because the "fault warning light" circuit is a connection via the multiplex network.
	Conditions for applying the fault finding procedure to stored faults: The fault is declared present after running command AC213 "OBD (On Board Diagnostic) warning light (MIL)" .
VDIAG 04	With the ignition on, check that 12 V is reaching the warning light. Repair the line if necessary.
	Connect the terminal in place of the computer and check the insulation, continuity and absence of interference resistance on the connection between: <div>Computer track 40 —————> OBD warning light on instrument panel</div> Repair if necessary.
	Check the condition of the warning light (if it is not lit). Replace it if necessary.
VDIAG 08 and 09	<u>Switch on the ignition.</u> Test the multiplex network.
AFTER REPAIR	Deal with any other possible faults. Clear the fault memory.

PETROL INJECTION

Fault finding - Interpretation of faults

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DF032 PRESENT OR STORED	<u>COOLANT TEMPERATURE OVERHEATING WARNING LIGHT CIRCUIT</u> CO : open circuit CC.0 : short circuit to earth CC.1 : short circuit to +12 V
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NOTES	Conditions for detecting the fault: This fault cannot be diagnosed on SIRIUS 34 VDIAG 08, 09 or EMS 3134 VDIAG 09 computers and therefore may not be present or stored because the "fault warning light" circuit is a connection via the multiplex network.
	Conditions for applying the fault finding procedure to stored faults: The fault is declared present after the engine has been running at a speed of > 3000 rpm.

VDIAG 04	With the ignition on, check that 12 V is reaching the warning light. Repair the line if necessary.
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Connect the terminal in place of the computer and check the insulation, continuity and absence of interference resistance on the connection between: <div>Computer track 38 —————> Coolant temperature overheat warning light on instrument panel</div> Repair if necessary.	
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Check the condition of the warning light (if it is not lit). Replace it if necessary.

VDIAG 08 and 09	<u>Switch on the ignition.</u> Test the multiplex network.
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AFTER REPAIR	Deal with any other possible faults. Clear the fault memory.
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DF038 PRESENT OR STORED	<u>DOWNSTREAM OXYGEN SENSOR HEATER CIRCUIT</u> CO : open circuit CC.0 : short circuit to +12 V CC.1 : short circuit to earth
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NOTES	Processing priority in the event of a number of faults: Fault DF009 "actuator relay circuit" should be dealt with first.
	Conditions for applying the fault finding procedure to stored faults: The fault is reported present with the engine running, hot, and not idling, or after using command AC262 "downstream oxygen sensor heating" .
	Special notes: Status ET031 "downstream sensor heating" can help with the treatment of this fault.

Check the **connection and condition** of the oxygen sensor connector.
Replace the connector if necessary.

With the ignition on, check for the presence of **12 V on the oxygen sensor**.
Repair the electrical line to the actuator relay.

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

Computer **track 68** —————> **Oxygen sensor**

Repair if necessary.

Measure the **resistance** of the oxygen sensor heating circuit.
Change the oxygen sensor if the resistance is not approximately **3.4 Ω at 20°C**.

AFTER REPAIR	Follow the instructions to confirm repair. Deal with any other possible faults. Clear the fault memory.
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PETROL INJECTION

Fault finding - Interpretation of faults

17A

DF044 PRESENT OR STORED	<u>IMMOBILISER CIRCUIT</u>
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NOTES	Processing priority in the event of a number of faults: Fault DF009 "actuator relay circuit" should be dealt with first.
	Conditions for applying the fault finding procedure to stored faults: The fault is declared present following: absence or delay of the encoded signal > 2 seconds ,
	Special notes: Two types of connection are used: wire-frame and multiplex. Status ET002 "engine immobiliser" and ET099 "immobiliser code programmed" can help with the treatment of this fault.

Wire connection	Connect the terminal in place of the computer and check the insulation, continuity and absence of interference resistance on the connection between: Computer track 58 —————> engine immobiliser Repair if necessary.
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CAN connection	<u>Switch on the ignition.</u> Test the multiplex network.
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AFTER REPAIR	Deal with any other possible faults. Clear the fault memory.
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DF045 PRESENT OR STORED	<u>MANIFOLD PRESSURE SENSOR CIRCUIT</u> DEF : pressure sensor fault 1.DEF: inconsistency between the calculated pressure and the true pressure.
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NOTES	Processing priority in the event of a number of faults: Fault DF258 "sensor first reference voltage" should be dealt with first.
	Conditions for applying the fault finding procedure to stored faults: The fault is declared present after the engine is started.
	Special notes: Parameter PR016 "atmospheric pressure" can help with the treatment of this fault.

Check the **connection and condition** of the pressure sensor connector.
Replace the connector if necessary.

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

Computer **track 15** —————> **Pressure sensor**
Computer **track 78** —————> **Pressure sensor**
Computer **track 16** —————> **Pressure sensor**

Repair if necessary.

With the engine running, the computer runs a **test to check the consistency between the measured manifold pressure and the pressure calculated** from the throttle position and the engine speed.

If the fault persists, **replace** the manifold pressure sensor.

AFTER REPAIR	Deal with any other possible faults. Clear the fault memory.
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PETROL INJECTION

Fault finding - Interpretation of faults

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**DF052
PRESENT
OR
STORED**

CYLINDER 1 INJECTOR CIRCUIT

CO : open circuit
CC.0 : short circuit to earth
CC.1 : short circuit to +12 V

NOTES

Processing priority in the event of a number of faults:
Fault **DF009 "actuator relay circuit"** should be dealt with first.

Conditions for applying the fault finding procedure to stored faults:
The fault is declared present with the engine running.
If the fault becomes present with CO, CC.0 or CC.1, carry out this fault finding strategy.

Check the **connection and condition of the connector** of injector 1.
Replace the connector, if necessary

Check, **with the ignition on, for + 12 V on track 1 of the injector 1 connector.**

Check the **insulation, the continuity and absence of unwanted resistance** on the connection between:
Injection computer **track 59** —————> **Track 2** injector 1
Repair if necessary.

Measure the **resistance of injector 1**.
Replace the injector if the resistance is not approximately **14.5 Ω at 20°C**.

AFTER REPAIR

Deal with any other possible faults.
Clear the fault memory.

PETROL INJECTION

Fault finding - Interpretation of faults

17A

**DF053
PRESENT
OR
STORED**

CYLINDER 2 INJECTOR CIRCUIT

CO : open circuit
CC.0 : short circuit to earth
CC.1 : short circuit to +12 V

NOTES

Processing priority in the event of a number of faults:
Fault **DF009 "actuator relay circuit"** should be dealt with first.

Conditions for applying the fault finding procedure to stored faults:
The fault is declared present with the engine running.
If the fault becomes present with CO, CC.0 or CC.1, carry out this fault finding strategy.

Check the **connection and condition of the connector** of injector 2.
Replace the connector if necessary.

Check, **with the ignition on, for + 12 V on track 1 of the injector 2 connector.**

Check the **insulation, the continuity and absence of unwanted resistance** on the connection between:
Injection computer **track 90** —————▶ **Track 2** injector 2
Repair if necessary.

Measure the **resistance of injector 2**.
Replace the injector if the resistance is not approximately **14.5 Ω at 20°C**.

AFTER REPAIR

Deal with any other possible faults.
Clear the fault memory.

DF054 PRESENT OR STORED	<u>CYLINDER 3 INJECTOR CIRCUIT</u> CO : open circuit CC.0 : short circuit to earth CC.1 : short circuit to +12 V
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NOTES	Processing priority in the event of a number of faults: Fault DF009 "actuator relay circuit" should be dealt with first.
	Conditions for applying the fault finding procedure to stored faults: The fault is declared present with the engine running. If the fault becomes present with CO, CC.0 or CC.1, carry out this fault finding strategy.

Check the **connection and condition of the connector** of injector 3.
Replace the connector, if necessary

Check, **with the ignition on, for + 12 V on track 1 of the injector 3 connector.**

Check the **insulation, the continuity and absence of spurious resistance** on the connection between:
Injection computer **track 60** —————> **Track 2** injector 3
Repair if necessary.

Measure the **resistance of injector 3**.
Replace the injector if the resistance is not approximately **14.5 Ω at 20°C**.

AFTER REPAIR	Deal with any other possible faults. Clear the fault memory.
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PETROL INJECTION

Fault finding - Interpretation of faults

17A

**DF055
PRESENT
OR
STORED**

CYLINDER 4 INJECTOR CIRCUIT

CO : open circuit
CC.0 : short circuit to earth
CC.1 : short circuit to +12 V

NOTES

Processing priority in the event of a number of faults:
Fault **DF009 "actuator relay circuit"** should be dealt with first.

Conditions for applying the fault finding procedure to stored faults:
The fault is declared present with the engine running.
If the fault becomes present with CO, CC.0 or CC.1, carry out this fault finding strategy.

Check the **connection and condition** of the injector 4 connector.
Replace the connector, if necessary

Check, **with the ignition on, for + 12 V on track 1 of the injector 4 connector.**

Check the **insulation, the continuity and absence of spurious resistance** on the connection between:
Injection computer **track 89** —————> **Track 2** injector 4
Repair if necessary.

Measure the **resistance of injector 4**.
Replace the injector if the resistance is not approximately **14.5 Ω at 20°C**.

AFTER REPAIR

Deal with any other possible faults.
Clear the fault memory.

<p>DF057 PRESENT OR STORED</p>	<p><u>UPSTREAM OXYGEN SENSOR CIRCUIT</u></p>
<p>NOTES</p>	<p>Conditions for applying the fault finding procedure to stored faults: The fault is declared present after the engine has been running for at least 5 minutes (ET037 "richness regulation": ACTIVE).</p>
	<p>Note: The fault is only stored if the computer took into account the richness correction default value during this fault: PR035 "richness correction value" set at 128.</p>
	<p>Special notes: Two assemblies are possible: 3-wire or 1-wire sensor.</p>
<p>3-wire sensor</p>	<p>Check the connection and condition of the oxygen sensor connector. Replace the connector if necessary.</p> <p>Connect the breakout connector in place of the ECU and check the insulation, the continuity, and absence of spurious resistance on the connection between:</p> <p>Computer track 80 —————> Oxygen sensor Computer track 45 —————> Oxygen sensor</p> <p>Repair if necessary.</p> <p>If the fault persists, replace the oxygen sensor.</p>
<p>1-wire sensor</p>	<p>Check the connection and condition of the oxygen sensor connector. Replace the connector if necessary.</p> <p>Connect the terminal in place of the computer; check the insulation, continuity and absence of interference resistance on the connection between:</p> <p>Computer track 45 —————> Oxygen sensor</p> <p>Repair if necessary.</p> <p>If the fault persists, replace the oxygen sensor.</p>
<p>AFTER REPAIR</p>	<p>Follow the instructions to confirm repair. Deal with any other possible faults. Clear the fault memory.</p>

**DF058
PRESENT
OR
STORED**

DOWNSTREAM OXYGEN SENSOR CIRCUIT

NOTES

Conditions for applying the fault finding procedure to stored faults:
If the fault is declared as present after the engine has been running for at least 5 minutes.

Check the **connection and condition** of the oxygen sensor connector.
Replace the connector, if necessary

Connect the terminal in the place of the computer; **check the insulation, continuity and the absence of interference resistance** on the connections between:

Computer **track 76** —————> Oxygen sensor
Computer **track 44** —————> Oxygen sensor

Repair if necessary.

If the fault persists, **replace** the oxygen sensor.

AFTER REPAIR

Follow the instructions to confirm repair.
Deal with any other possible faults.
Clear the fault memory.

PETROL INJECTION

Fault finding - Interpretation of faults

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**DF061
PRESENT
OR
STORED**

IGNITION COIL 1 - 4 CIRCUIT

CO : open circuit
CC.0 : short circuit to earth
CC.1 : short circuit to +12 V

NOTES

Processing priority in the event of a number of faults:
Fault **DF008 "fuel pump relay control circuit"** should be dealt with first.

Conditions for applying the fault finding procedure to stored faults:
The fault is declared present with the engine running.
If the fault becomes present with CO, CC.0 or CC.1, carry out this fault finding strategy.

Check the **connection and condition** of the coil 1 and 4 connectors.
Replace the connector(s) if necessary.

Check, **with the ignition on, for + 12 V on track 1 of the coil 1 connector.**

Check the **insulation, the continuity and absence of spurious resistance** on the connections between:

coil 1 **track 2** —————> **Track 1** coil 4

Repair if necessary.

Check the **insulation, the continuity and absence of spurious resistance** on the connections between:

injection computer **track 32** —————> **Track 2** coil 4

fuel pump relay **track 5** —————> **Track 1** coil 1

Repair if necessary.

Check the **resistance of coils 1 and 4.**

Change the coil(s) if their primary circuit resistance is not approximately **0.5 Ω** and their secondary circuit resistance is not approximately **10.7 KΩ**.

AFTER REPAIR

Deal with any other possible faults.
Clear the fault memory.

DF062 PRESENT OR STORED	<u>IGNITION COIL 2-3 CIRCUIT</u> CO : open circuit CC.0 : short circuit to earth CC.1 : short circuit to +12 V
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NOTES	Processing priority in the event of a number of faults: Fault DF008 "fuel pump relay control circuit" should be dealt with first.
	Conditions for applying the fault finding procedure to stored faults: The fault is declared present with the engine running. If the fault becomes present with CO, CC.0 or CC.1, carry out this fault finding strategy.

Check **the connection and condition** of the coil 2 and 3 connectors.
Replace the connector(s) if necessary.

Check, **with the ignition on, for + 12 V on track 1 of the coil 2 connector.**

Check the **insulation, the continuity and absence of spurious resistance** on the connection between:

coil 2 track 2 —————> **Track 1** coil 3

Repair if necessary.

Check the **insulation, the continuity and absence of spurious resistance** on the connections between:

injection computer **track 1** —————> **Track 2** coil 3
fuel pump relay **track 5** —————> **Track 1** coil 2

Repair if necessary.

Measure the **resistance of coils 2 and 3.**
Change the coil(s) if their primary circuit resistance is not approximately **0.5 Ω** and their secondary circuit resistance is not approximately **10.7 KΩ**.

AFTER REPAIR	Deal with any other possible faults. Clear the fault memory.
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DF063 PRESENT OR STORED	<u>CAMSHAFT SHIFTER</u> CO : open circuit CC.0 : short circuit to earth CC.1 : short circuit to +12 V
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NOTES	Processing priority in the event of a number of faults: Fault DF009 "actuator relay circuit" should be dealt with first.
	Conditions for applying the fault finding procedure to stored faults: The fault is declared present with the engine running because of certain special conditions (coolant temperature, pressure, speed) or when actuator command AC491 "camshaft dephaser" is entered. If the fault becomes present with CO, CC.0 or CC.1, carry out this fault finding strategy.
	Special notes: Status ET026 camshaft dephaser can help with the treatment of this fault.

Check the **connection and condition of the camshaft shifter solenoid valve connector**.
Replace the connector if necessary.

With the ignition on, check for the presence of **12 V on the camshaft-dephaser solenoid valve**
Repair if necessary.

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

computer **track 37** —————> **camshaft dephaser solenoid valve**

Repair if necessary.

Measure the **resistance of the camshaft-dephaser solenoid valve**.
Replace the solenoid valve if the resistance is not approximately **7.2 Ω at 20°C**.

AFTER REPAIR	Follow the instructions to confirm repair. Deal with any other possible faults. Clear the fault memory.
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PETROL INJECTION

Fault finding - Interpretation of faults

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DF082 PRESENT OR STORED	<u>CONNECTION BETWEEN PETROL ↔ PETROL CONNECTION</u>
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NOTES	Conditions for applying the fault finding procedure to stored faults: The fault is declared present after it has been detected for longer than 2 seconds with the engine running.
	Special notes: Status ET200 "injection-LPG connection" can help with the treatment of this fault. When this fault is present the vehicle functions in forced petrol mode .

<u>Switch on the ignition.</u> Test the multiplex network.

AFTER REPAIR	None.
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**DF102
PRESENT
OR
STORED**

OXYGEN SENSOR OPERATING FAULT

OBD : OBD fault (On Board Diagnostic)
1.OBD : OBD fault present
2.OBD : OBD fault detected while driving

NOTES

Conditions for applying the fault finding procedure to stored faults:

The fault is declared present after a test to detect a malfunction causing the HC emissions **to exceed the EOBD threshold**.

This test can only be performed once during a road test under the following conditions: vehicle speed between **40 (63) and 80 mph (130 km/h)** and engine speed between **1800 and 4000 rpm**.

Check for **absence of air leakage on the exhaust system**.

If the vehicle is mainly used for urban driving, **clean the exhaust system**.

Check the **connection and condition** of the upstream oxygen sensor connector.
Replace the connector if necessary.

With the ignition on, check for the presence of **+ 12 V on track A of the upstream oxygen sensor**.
Repair if necessary.

Connect the terminal in place of the ECU and check the **insulation, the continuity and absence of spurious resistance** on the connections between:

computer track 65	————→	Oxygen sensor
computer track 45	————→	Oxygen sensor
computer track 80	————→	Oxygen sensor

Repair if necessary.

Measure the **heating resistance** of the upstream oxygen sensor.
Replace the oxygen sensor if necessary.

AFTER REPAIR

Check that all faults have been dealt with.
Clear the stored faults. It is not necessary to clear the programming.
To check that the system has been repaired correctly:

- There must be no remaining electrical faults.
- A road test should be performed, but the conditions required for the test may be difficult to recreate in an After-Sales environment.

<p>DF106 PRESENT OR STORED</p>	<p><u>CATALYTIC CONVERTER OPERATING FAULT</u></p> <p>OBD : OBD (On Board Diagnostic) fault</p> <p>1.OBD : OBD fault present</p> <p>2.OBD : OBD fault detected while driving</p>
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<p>NOTES</p>	<p>Conditions for applying the fault finding procedure to stored faults:</p> <p>The fault is declared present after a test to detect a malfunction causing the HC emissions to exceed the EOBD threshold. Conduct this test at a vehicle speed between 40 (63) and 80 mph (130 km/h) and engine speed between 1800 and 4000 rpm.</p>
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<p>Check for air leaks on the exhaust system. Repair if necessary.</p>

<p>Visually check the condition of the catalytic converter. A deformity may be causing it to malfunction.</p>
<p>Check for visual signs of thermal shock. A splash of cold water on the hot catalytic converter or driving through water can damage it.</p>
<p>Ensure absence of excessive oil or coolant consumption. Ask the customer if he has used an additive or other products of this kind. Such products can contaminate the catalytic converter and damage its performance sooner or later.</p>
<p>Check if the engine has been misfiring. This could damage the catalytic converter.</p>
<p>If the cause of the damage has been determined, replace the catalytic converter. If the cause of the damage has not been determined, the new catalytic converter could quickly become damaged.</p>

<p>AFTER REPAIR</p>	<p>Check that all faults have been dealt with. Clear the stored faults. It is not necessary to clear the programming. To check that the system has been repaired correctly:</p> <ul style="list-style-type: none"> – There must be no remaining electrical faults. – A road test should be performed, but the conditions required for the test may be difficult to recreate in an After-Sales environment.
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PETROL INJECTION

Fault finding - Interpretation of faults

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<p>DF109 PRESENT OR STORED</p>	<p><u>POLLUTANT MISFIRES</u></p> <p>OBD : OBD fault (On Board Diagnostic)</p> <p>1.OBD : OBD fault present</p> <p>2.OBD : OBD fault detected while driving</p>
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<p>NOTES</p>	<p>Conditions for applying the fault finding procedure to stored faults:</p> <p>The fault is declared present with the engine running and coolant temperature above 75°C.</p>
	<p>Note:</p> <p>ET093 "Misfire on cylinder 1"</p> <p>ET094 "Misfire on cylinder 2"</p> <p>ET095 "Misfire on cylinder 3"</p> <p>ET096 "Misfire on cylinder 4"</p> <p>Give information on the nature and location of the fault.</p>

<p>One cylinder is declared faulty - ET093 or ET094 or ET095 or ET096</p>	<p>For this reason, the problem is probably due to an item associated with this cylinder only:</p> <ul style="list-style-type: none"> - injector problem, - spark plug problem and/or damage, - problem with the coil, - oil seeping in through the valve stem joints, - Engine compression problem.
<p>Cylinders 1 and 4 or cylinders 2 and 3 declared faulty ET093 and ET096 or ET094 and ET095</p>	<p>The problem is probably due to a factor that can only affect this pair of cylinders:</p> <ul style="list-style-type: none"> - problem with the high-voltage-side coil, - problem on the control side of the coil. - engine compression problem, - oil seeping in through the valve stem joints,
<p>Four cylinders declared faulty - ET093 and ET094 and ET095 and ET096</p>	<p>The problem is probably due to a factor that can only affect all the cylinders.</p> <ul style="list-style-type: none"> - fuel filter problem, - fuel pump problem, - problem with type of petrol, - engine compression problem, - oil seeping in through the valve stem joints.

<p>AFTER REPAIR</p>	<p>Check that all faults have been dealt with.</p> <p>Clear the stored faults. It is not necessary to clear the programming.</p> <p>To check that the system has been repaired correctly:</p> <ul style="list-style-type: none"> - there should be no further electrical faults, - the engine should be warm, - run at idling speed with all electrical consumers drawing power for 15 minutes. <p>If the fault reappears, continue the fault finding procedure.</p>
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PETROL INJECTION

Fault finding - Interpretation of faults

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<p>DF110 PRESENT OR STORED</p>	<p><u>DESTRUCTIVE MISFIRE</u></p> <p>OBD : OBD fault (On Board Diagnostic) 1.OBD : OBD fault present 2.OBD : OBD fault detected while driving</p>
<p>NOTES</p>	<p>Conditions for applying the fault finding procedure to stored faults: The fault is declared present with the engine running and coolant temperature above 75°C.</p>
	<p>Note: ET093 "Misfire on cylinder 1" ET094 "Misfire on cylinder 2" ET095 "Misfire on cylinder 3" ET096 "Misfire on cylinder 4" Give information on the nature and location of the fault.</p>
<p>One cylinder is declared faulty - ET093 or ET094 or ET095 or ET096</p>	<p>The problem is probably due to a factor that can only affect this cylinder.</p> <ul style="list-style-type: none"> – injector problem, – spark plug problem and/or damage, – problem with the coil, – oil seeping in through the valve stem joints.
<p>Cylinders 1 and 4 or cylinders 2 and 3 declared faulty ET093 and ET096 or ET094 and ET095</p>	<p>The problem is probably due to a factor that can only affect this pair of cylinders:</p> <ul style="list-style-type: none"> – problem with the high-voltage-side coil, – problem on the control side of the coil, – oil seeping in through the valve stem joints.
<p>Four cylinders declared faulty - ET093 and ET094 and ET095 and ET096</p>	<p>The problem is probably due to a factor that can only affect all the cylinders.</p> <ul style="list-style-type: none"> – fuel filter problem, – fuel pump problem, – problem with type of fuel or pollution (presence of water, gasoil...), – oil seeping in through the valve stem joints.
<p>AFTER REPAIR</p>	<p>Check that all faults have been dealt with. Clear the stored faults. It is not necessary to clear the programming. To check that the system has been repaired correctly:</p> <ul style="list-style-type: none"> – there should be no further electrical faults, – the engine should be warm, – run at idling speed with all electrical consumers drawing power for 15 minutes. <p>If the fault reappears, continue the fault finding procedure.</p>

**DF118
PRESENT
OR
STORED**

REFRIGERANT PRESSURE SENSOR CIRCUIT

NOTES

Processing priority in the event of a number of faults:
Fault **DF258 "sensor first reference voltage"** should be dealt with first.

Special notes:
Parameter **PR027 "coolant pressure"** can help with the treatment of this fault.

Check the **connection and condition of the air conditioning sensor connector**.
Replace the connector if necessary.

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

Injection computer track 79	—————>	Refrigerant pressure sensor.
Injection computer track 83	—————>	Refrigerant pressure sensor.
Injection computer track 47	—————>	Refrigerant pressure sensor.

If this fault appears, meticulously inspect the protective devices, insulation and path of the engine wiring (see Preliminaries, Wiring test).

Repair if necessary.

Measure the **resistance of the refrigerant pressure sensor**.
If necessary replace the sensor.

AFTER REPAIR

Deal with any other possible faults.
Clear the fault memory.

PETROL INJECTION

Fault finding - Interpretation of faults

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**DF125
PRESENT
OR
STORED**

PEDAL POTENTIOMETER CIRCUIT TRACK 1

NOTES

Processing priority in the event of a number of faults:
Fault **DF152 "sensor second reference voltage"** should be dealt with first.

Check the **connection and condition** of the pedal potentiometer connector.
Replace the connector if necessary.

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

computer track 14 ➡ Pedal potentiometer track 1
computer track 6 ➡ Pedal potentiometer track 1
computer track 75 ➡ Pedal potentiometer track 1

If this fault appears, meticulously inspect the protective devices, insulation and path of the engine wiring (see Preliminaries, Wiring test).

Repair if necessary.

Measure the **resistance of pedal potentiometer track 1** (the resistance is **zero or equal to infinity** in the event of a straight failure).

Measure the **resistance of the potentiometer in various positions.**

Replace the pedal potentiometer if necessary.

AFTER REPAIR

Deal with any other possible faults.
Clear the fault memory.

**DF126
PRESENT
OR
STORED**

PEDAL POTENTIOMETER CIRCUIT TRACK 2

NOTES

Processing priority in the event of a number of faults:
Fault **DF258 "sensor first reference voltage"** should be dealt with first.

Check the **connection and condition** of the pedal potentiometer connector.
Replace the connector if necessary.

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

computer track 43 ➡ **Pedal potentiometer track 2**
computer track 71 ➡ **Pedal potentiometer track 2**
computer track 87 ➡ **Pedal potentiometer track 2**

If this fault appears, meticulously inspect the protective devices, insulation and path of the engine wiring (see Preliminaries, Wiring test).

Repair if necessary.

Measure the **resistance of throttle potentiometer track 2** (the resistance is **zero or equal to infinity** in the event of a straight failure).

Measure the **resistance of the potentiometer in various positions.**

Replace the pedal potentiometer if necessary.

AFTER REPAIR

Deal with any other possible faults.
Clear the fault memory.

DF129 PRESENT OR STORED	<u>PEDAL POTENTIOMETER CIRCUIT</u> 1.DEF : Inconsistency between pedal tracks 1 and 2 2.DEF : pedal potentiometer fault
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NOTES	Processing priority in the event of a number of faults: Faults DF152 "sensor second reference voltage" and DF258 "sensor first reference voltage" should be dealt with first.
	Conditions for applying the fault finding procedure to stored faults: The fault is declared present during smooth transition of the pedal potentiometer from no load to full load.

Check the **connection and condition** of the pedal potentiometer connector.
Replace the connector if necessary.

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

computer track 14	————→	Pedal potentiometer
Computer track 6	————→	Pedal potentiometer
computer track 75	————→	Pedal potentiometer
computer track 43	————→	Pedal potentiometer
computer track 71	————→	Pedal potentiometer
computer track 87	————→	Pedal potentiometer

If this fault appears, meticulously inspect the protective devices, insulation and path of the engine wiring (see Preliminaries, Wiring test).

Repair if necessary.

Measure the **resistance of the pedal potentiometer** (the resistance is **zero or equal to infinity** in the event of a straight failure).

Check that the potentiometer resistance follows the proper curve, by pressing the pedal from no load to full load.

Check parameter **PR202; the voltage difference between tracks 1 and 2 must be less than 0.52 V.**

Check that the pedal is operating the potentiometers correctly.

Replace the accelerator pedal potentiometer if necessary.

AFTER REPAIR	For a present fault, press the accelerator pedal from no load to full load to confirm repair. Deal with any other possible faults. Clear the fault memory.
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PETROL INJECTION

Fault finding - Interpretation of faults

17A

DF135 PRESENT OR STORED	<u>BRAKE PEDAL SENSOR CIRCUIT</u>
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NOTES	Conditions for applying the fault finding procedure to stored faults: The fault is declared present after the ignition has been switched on for > 20 seconds.
	Special notes: Status ET132 " brake pedal depressed " can help with the treatment of this fault.

Check **the connection and condition** of the brake pedal sensor connector.
Replace the connector if necessary.

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

computer track 53 —————> **Brake-pedal contact**
computer track 52 —————> **Brake-pedal contact**

Repair if necessary.

If the fault persists, **replace** the brake pedal switch.

AFTER REPAIR	Deal with any other possible faults. Clear the fault memory.
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PETROL INJECTION

Fault finding - Interpretation of faults

17A

**DF138
PRESENT
OR
STORED**

HEATING ELEMENT 1 RELAY CONTROL

CO : open circuit
CC.0 : short circuit to earth
CC.1 : short circuit to +12 V

NOTES

Processing priority in the event of a number of faults:

Faults **DF009 "fuel pump relay control circuit"**, **DF003 "air temperature sensor circuit"**, **DF004 "coolant temperature sensor circuit"** should be dealt with first.

Conditions for applying the fault finding procedure to stored faults:

The fault is reported present after running command **AC002 "heating-element 1 relay"**.

Check the **connection and condition of the relay connector** of heating element 1.
Replace the connector if necessary.

Check for the presence of **+ 12 V after ignition on track 1** of the heating element 1 relay.
Repair the wiring up to the fuse if necessary.

Check the insulation and continuity of the connection between:

Injection computer track 34 —————> **Heating element 1 relay**

Check **the relay coil** of heating element 1.
Replace the relay if necessary.

AFTER REPAIR

Deal with any other possible faults.
Clear the fault memory.

PETROL INJECTION

Fault finding - Interpretation of faults

17A

DF139 PRESENT OR STORED	<u>HEATING ELEMENT 2 RELAY CONTROL</u> CO : open circuit CC.0 : short circuit to earth CC.1 : short circuit to +12 V
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NOTES	Processing priority in the event of a number of faults: Faults DF009 "fuel pump relay control circuit" , DF003 "air temperature sensor circuit" , DF004 "coolant temperature sensor circuit" should be dealt with first.
	Conditions for applying the fault finding procedure to stored faults: The fault is reported present after running command AC620 "heating-element 2 relay" .

Check **the connection and condition of the relay connector** of heating element 2.
Replace the relay if necessary.

Check for the presence of **+ 12 V after ignition on track 1** of the heating element 2 relay.
Repair the wiring up to the fuse if necessary.

Check the insulation and continuity of the connection between:

Injection computer track 4  **Heating element 2 relay**

Check **the connection and condition of the relay connector** of heating element 2.
Replace the connector if necessary.

AFTER REPAIR	Deal with any other possible faults. Clear the fault memory.
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DF152 PRESENT OR STORED	<u>SECOND SENSOR REFERENCE VOLTAGE</u> 1.DEF : supply fault to tracks 1 and 2 on the throttle potentiometer and to track 1 on the pedal potentiometer
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NOTES	Processing priority in the event of a number of faults: If faults DF152 "sensor second reference voltage" , DF002 "throttle potentiometer circuit" and DF125 "pedal potentiometer circuit track 1" are present or stored, first do the following diagnostics.
	Conditions for applying the fault finding procedure to stored faults: Apply the fault finding strategy whether the fault is present or stored.

Check the **connection and condition of the connectors** on the pedal potentiometer and throttle potentiometer.
Replace the connectors if necessary.

With the ignition switched on, check for the presence of + 5 volts on the following tracks:

- **Track 6** Pedal potentiometer track 1
- **Track 5** Throttle potentiometer

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

computer **track 6** ➡ **Track 6** Pedal potentiometer track 1
computer **track 7** ➡ **Track 5** Throttle potentiometer

If faults DF152, DF002 and DF125 are all reported, meticulously inspect the protective devices, insulation and path of the engine wiring: see the "Wire testing" segment of the "Preliminaries" section.

Repair if necessary.

If the fault is still present, contact your Techline.

AFTER REPAIR	Deal with any other possible faults. Clear the fault memory.
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PETROL INJECTION

Fault finding - Interpretation of faults

17A

DF170 PRESENT OR STORED	<u>CONNECTION BETWEEN AUTOMATIC TRANSMISSION AND</u> <u>↔ INJECTION</u>
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NOTES	Processing priority in the event of a number of faults: Fault DF003 "air temperature sensor circuit" should be dealt with first.
	Conditions for applying the fault finding procedure to stored faults: the fault is declared present after the engine has been running for > 3 seconds.

<u>Switch on the ignition.</u> Test the multiplex network.

AFTER REPAIR	Follow the instructions to confirm repair. Deal with any other possible faults. Clear the fault memory.
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DF189 PRESENT OR STORED	<u>FLYWHEEL TARGET</u>
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NOTES	Conditions for applying the fault finding procedure to stored faults: The fault is declared present when the engine is running at a speed > 600 rpm for at least 10 seconds .
	Special notes: Parameter PR006 "engine speed" and status ET148 "tooth signal in progress" can help with the treatment of this fault.

This fault indicates that the computer is not receiving the tooth signal.

This fault finding strategy is based on **checking the consistency** between the successive engine strokes, allowing you to detect whether or not the engine has actually stopped. To do this, **watch the manifold pressure develop**.
If the engine has actually stopped, the manifold pressure is stable; if not, fault **DF189 "flywheel target"** is detected.

Check **the connection and condition of** the speed sensor connector.
Replace the connector if necessary.

Measure the **resistance** of the engine speed sensor.
Replace the engine speed sensor if the resistance is not between **200 and 270 Ω**.

If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

AFTER REPAIR	Follow the instructions to confirm repair. Deal with any other possible faults. Clear the fault memory.
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DF226 PRESENT	<u>THROTTLE END STOP PROGRAMMING</u>
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NOTES	Processing priority in the event of a number of faults: Faults DF003 "coolant temperature sensor circuit" and DF004 "air temperature sensor circuit" should be dealt with first.
	Special notes: It is possible to start the engine when this fault is present, but driving the vehicle is forbidden as there is a high risk of stalling and/or unstable engine speeds.

This fault indicates that the computer has not stored **the minimum and maximum throttle stop programming values** in its memory.
This fault appears after **replacement of the motorised throttle valve, computer reprogramming or replacement, or an open circuit in one of the two throttle motor power wires.**

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

computer **track 62** —————> Throttle position potentiometer
computer **track 61** —————> Throttle position potentiometer

Check the condition and snugness of the clips and of the motorised throttle valve and injection computer connectors.

Repair if necessary.

Switch on the ignition for at least **5 seconds** without starting the engine: **the throttle stops will be programmed automatically.**

If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

AFTER REPAIR	Deal with any other possible faults. Clear the fault memory.
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PETROL INJECTION

Fault finding - Interpretation of faults

17A

DF228 PRESENT OR STORED	<u>AIR CONDITIONING COMPRESSOR CONTROL</u> CO : open circuit CC.0 : short circuit to earth CC.1 : short circuit to +12 V
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NOTES	Conditions for applying the fault finding procedure to stored faults: The fault is declared present: after running command AC003 "air-conditioning compressor" .
	Special notes: Status ET070 "climate control compressor" can help with the treatment of this fault.

Check the connection and condition of the climate control compressor connector . Replace the connector if necessary.
--

Connect the terminal in place of the computer and check the insulation, continuity and absence of interference resistance on the connections between: Injection computer track 39 —————> Air-conditioning compressor Repair if necessary.
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If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

AFTER REPAIR	Deal with any other possible faults. Clear the fault memory.
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PETROL INJECTION

Fault finding - Interpretation of faults

17A

DF235 PRESENT OR STORED	<u>CRUISE CONTROL/SPEED LIMITER</u> 1.DEF: Fault on one brake pedal contact 2.DEF: Fault on both brake pedal contacts 3.DEF: Controls at the steering wheel 4.DEF: on/off switch 5.DEF: electronic stability program						
NOTES	Conditions for applying the fault finding procedure to stored faults: The fault is declared present following a road test using the cruise control and the speed limiter functions.						
1.DEF 2.DEF	<p>Check the connection and condition of the brake pedal switch connector. Replace the connector if necessary.</p> <p>Connect the terminal in place of the computer and check the insulation, continuity and absence of interference resistance on the connections between:</p> <table><tr><td>computer track 53</td><td>—————▶</td><td>Brake-pedal contact</td></tr><tr><td>computer track 52</td><td>—————▶</td><td>Brake-pedal contact</td></tr></table> <p>Repair if necessary.</p> <p>If the fault persists, replace the brake pedal switch.</p>	computer track 53	—————▶	Brake-pedal contact	computer track 52	—————▶	Brake-pedal contact
computer track 53	—————▶	Brake-pedal contact					
computer track 52	—————▶	Brake-pedal contact					
3.DEF	<p>Check the connection and condition of the cruise control/speed limiter switches on the steering wheel controls. Replace the connector if necessary.</p> <p>Connect the terminal in place of the computer and check the insulation, continuity and absence of interference resistance on the connections between:</p> <table><tr><td>Injection computer track 58</td><td>—————▶</td><td>Steering wheel control</td></tr><tr><td>Injection computer track 77</td><td>—————▶</td><td>Steering wheel control</td></tr></table> <p>Repair if necessary.</p> <p>Check the reliability of the steering wheel controls. Replace the switch(es) if necessary.</p>	Injection computer track 58	—————▶	Steering wheel control	Injection computer track 77	—————▶	Steering wheel control
Injection computer track 58	—————▶	Steering wheel control					
Injection computer track 77	—————▶	Steering wheel control					
AFTER REPAIR	Deal with any other possible faults. Clear the fault memory.						

DF235
CONTINUED

4.DEF

Check **the connection and condition** of the cruise control/speed limiter switches on the steering wheel controls.
Replace the connector if necessary.

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

Injection computer track 23	————→	Cruise-control/speed limiter ON/OFF switch
Injection computer track 49	————→	Cruise-control/speed limiter ON/OFF switch

Repair if necessary.

5.DEF

Check the correct operation of the cruise control/speed limiter ON/OFF switch.
Replace the switch if necessary.

With the engine running and engine speed > at 800 rpm:

Test the multiplex network if the vehicle is fitted with this option.

AFTER REPAIR

Deal with any other possible faults.
Clear the fault memory.

PETROL INJECTION

Fault finding - Interpretation of faults

17A

**DF236
STORED**

+ AFTER RELAY FEED

NOTES

Processing priority in the event of a number of faults:
Fault **DF009 "actuator relay circuit"** should be dealt with first.

Check **the condition of the battery and the vehicle earths**.
Repair if necessary.

Check **the connection and condition of the actuator relay connector**.
Replace the connector if necessary.

Disconnect the relay and check for presence of the **12 V on track 3** of the relay support
Repair if necessary.

Check the **insulation, the continuity and absence of interference resistance** on the connection between:

Injection computer track 66 —————> **Actuator relay track 5**

Repair the line if necessary.

Connect the relay and, with the ignition on, check for **the presence of 12 volts on track 5** of the actuator relay holder.
Replace the relay if necessary.

AFTER REPAIR

Deal with any other possible faults.
Clear the fault memory.

PETROL INJECTION

Fault finding - Interpretation of faults

17A

**DF251
STORED**

+ AFTER IGNITION SUPPLY

NOTES

Conditions for applying the fault finding procedure to stored faults:

This fault can only be declared stored, because communication is lost with the fault finding tool if it is present.

Check **the condition of the battery and the vehicle earths**.
Repair if necessary.

Check the insulation to earth on track 29 of the injection computer connector.
Repair the line if necessary.

With the ignition on:

Check for the presence of **12 V** on **track 29 of the injection computer**.
Repair the line if necessary.

AFTER REPAIR

Deal with any other possible faults.
Clear the fault memory.

PETROL INJECTION

Fault finding - Interpretation of faults

17A

DF253 PRESENT OR STORED	<u>ENGINE EARTH</u>
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NOTES	None.
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In the event of **the 1-wire upstream sensor** being "without earth return", track 44 is used to receive the engine earth signal. If this occurs, **the computer cannot control the downstream sensor**.

Connect the terminal in the place of the computer; **check the insulation, continuity and the absence of interference resistance** on the connection between:

computer **track 44** —————> Vehicle earth

Repair if necessary.

AFTER REPAIR	Deal with any other possible faults. Clear the fault memory.
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PETROL INJECTION

Fault finding - Interpretation of faults

17A

DF254 PRESENT OR STORED	<u>MOTORISED THROTTLE VALVE CONTROL</u> 1.DEF : internal fault on the throttle valve unit or the computer: faulty microprocessor: 2.DEF : Motorised throttle control fault
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NOTES	Processing priority in the event of a number of faults: Faults DF009 "actuator relay circuit" and DF236 "power + after relay" should be dealt with first.
	Conditions for applying the fault finding procedure to stored faults: Apply the fault finding strategy whether the fault is present or stored.
	Special notes: It is possible to start the engine when this fault is present, but driving the vehicle is forbidden as engine speed is constant irrespective of the accelerator pedal position.

1.DEF	If this fault appears and is characterized 1 DEF , contact your Techline.						
2.DEF	<p>Check the connection and condition of the throttle valve unit connector. Replace the connector if necessary.</p> <p>Connect the terminal in place of the computer and check the insulation, continuity and absence of interference resistance on the connections between:</p> <table><tr><td>computer track 62</td><td>————→</td><td>Throttle position potentiometer</td></tr><tr><td>computer track 61</td><td>————→</td><td>Throttle position potentiometer</td></tr></table> <p>If this fault occurs, meticulously inspect the protective devices, insulation and path of the engine wiring; if possible, move it manually while the engine is running to make sure the wiring is not being damaged: see "Wire testing" in the Preliminaries section.</p> <p>Repair if necessary.</p> <p>If the fault persists, replace the motorised throttle valve unit.</p> <p>Then program the throttle stops: switch on the ignition and wait at least 5 seconds without starting the engine: the throttle valve will be programmed automatically. If the programming is not carried out, it is possible to start the engine, but driving the vehicle is forbidden as there is a high risk of stalling and/or unstable engine speeds.</p>	computer track 62	————→	Throttle position potentiometer	computer track 61	————→	Throttle position potentiometer
computer track 62	————→	Throttle position potentiometer					
computer track 61	————→	Throttle position potentiometer					

AFTER REPAIR	Deal with any other possible faults. Clear the fault memory.
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DF255 PRESENT OR STORED	<u>SECURITY OF THROTTLE/PEDAL OPERATION</u> 1.DEF : Coherence between the position of the pedal and the position of the throttle
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NOTES	Processing priority in the event of a number of faults: Fault DF152 "sensor second reference voltage" should be dealt with first.
	Conditions for applying the fault finding procedure to stored faults: This fault only becomes present when the longest gear is selected and two acceleration/deceleration sequences have been carried out. But this test is not carried out when: <ul style="list-style-type: none">– There is a coupling request originating from the automatic transmission or the ESP (electronic stability program).– The power limitation strategy is active.– A fault is detected on the motorised throttle valve system (DF002, DF226, DF254).– The cruise control or speed limiter is active.
	Special notes: The only way of clearing the stored is to use service RZ008 "programming reinitialisation".

Check the **connection and condition** of the pedal potentiometer connector.
Replace the connector if necessary.

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

computer track 14	————→	Pedal potentiometer
Computer track 6	————→	Pedal potentiometer
computer track 75	————→	Pedal potentiometer
computer track 43	————→	Pedal potentiometer
computer track 71	————→	Pedal potentiometer
computer track 87	————→	Pedal potentiometer

Repair if necessary.

Check the **resistance of pedal potentiometer** tracks 1 and 2 (the resistance is **zero or equal to infinity** in the event of a straight failure).
Measure the **resistance of the potentiometer in various positions**.
Replace the pedal potentiometer if necessary.

AFTER REPAIR	Apply the procedures to confirm that the repair is successful. Deal with any other possible faults. Clear the fault memory.
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DF255
CONTINUED

Check the **connection and condition** of the throttle potentiometer connector.
Replace the connector if necessary.

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

Computer track 7	————→	Track 5 Throttle potentiometer
computer track 82	————→	Track 1 Throttle potentiometer
computer track 13	————→	Track 6 Throttle potentiometer
computer track 17	————→	Track 2 Throttle potentiometer

Repair if necessary.

Measure the **resistance of throttle potentiometer track 2** (the resistance is **zero or equal to infinity** in the event of a straight failure).
Replace the throttle potentiometer if the resistance is not **1 k Ω \pm 25 %**.

If the problem is still not resolved, the computer needs to be reprogrammed.

REPROGRAMMING THE COMPUTERS:

Reprogramming conditions:

- Ignition on.
- Engine stopped.
- Computer not protected.

Important recommendation following reprogramming:

The computer does not transmit any information on the multiplex network during reprogramming operations (it is "mute"). Therefore all the computers connected to the multiplex network receiving information from the injection computer will detect faults.

It is therefore essential, after reprogramming the injection computer, to clear the faults on all the computers in communication with the injection computer.

Then program the throttle stops:

Switch on the ignition and wait at least 5 seconds without starting the engine; the throttle stops will be programmed automatically.

If the programming is not carried out, it is possible to start the engine, but driving the vehicle is forbidden as there is a high risk of stalling and/or unstable engine speeds.

Conduct a road test so that the computer reprograms the adaptive variables (torquemeter and richness); this prevents any possible driving discomfort when the customer leaves with the vehicle.

The programming conditions for engine adaptive variables are:

- steady speed between **2500 and 3000 rpm** for at least **30 seconds**, then acceleration in 2nd gear to **4000 rpm** followed by deceleration to idle.

AFTER REPAIR

Apply the procedures to confirm that the repair is successful.
Deal with any other possible faults.
Clear the fault memory.

PETROL INJECTION

Fault finding - Interpretation of faults

17A

DF258 PRESENT OR STORED	FIRST SENSOR REFERENCE VOLTAGE 1.DEF : supply fault to the manifold pressure, pedal track 2 or refrigerant pressure sensors
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NOTES	Processing priority in the event of a number of faults: If faults DF258 "sensor first reference voltage" , DF126 "pedal potentiometer track 2 circuit" , DF045 "manifold pressure sensor circuit" and DF118 "refrigerant pressure sensor circuit" (if the vehicle is equipped with refrigerant sensor) are present or stored, first perform the following diagnostics.
	Conditions for applying the fault finding procedure to stored faults: Apply the fault finding strategy whether the fault is present or stored.

Check the **connection and condition of the connectors** on the pedal potentiometer, manifold pressure sensor and coolant pressure sensor (if fitted).

Replace the connectors if necessary.

With the ignition switched on, check for the presence of +5 volts on the following tracks:

- **Track 3** Pedal potentiometer track 2
- **Track C** Manifold pressure sensor
- **Track B** Refrigerant pressure sensor

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

- computer **track 71** —————> **Track 3** Pedal potentiometer track 2
- computer **track 78** —————> **Track C** Manifold pressure sensor
- computer **track 83** —————> **Track B** Refrigerant pressure sensor

If faults **DF258**, **DF126**, **DF118** and **DF045** (if the vehicle has a refrigerant sensor) all occur, meticulously inspect the protective devices, insulation and path of the engine wiring: see the "Wiring test" segment in the "Preliminaries" section.

Repair if necessary.

If the fault is still present, contact your Techline.

AFTER REPAIR	Deal with any other possible faults. Clear the fault memory.
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PETROL INJECTION

Fault finding - Interpretation of faults

17A

<p>DF308 PRESENT OR STORED</p>	<p><u>DUAL-MODE INTAKE SOLENOID VALVE</u></p> <p>CO : open circuit CC.0 : short circuit to earth CC.1 : short circuit to +12 V</p>
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<p>NOTES</p>	<p>Processing priority in the event of a number of faults: Fault DF009 "actuator relay circuit" should be dealt with first.</p>
	<p>Conditions for applying the fault finding procedure to stored faults: The fault is declared present when the ignition is switched on and the battery voltage exceeds 10 V. If the fault becomes present with CO, CC.0 or CC.1, carry out this fault finding strategy.</p>
	<p>Special notes: This fault applies only to the F4R 736 engine (Renault Sport). The command is active if the vehicle is in 2nd gear at a speed < 4800 rpm or in the 3rd gear at a speed < 3260 rpm, if the vehicle speed is less than 75 mph (120 km/h), and if no fault in the vehicle speed is detected. If the fault is present with CC.1 (short circuit to 12 V, it is not detected unless the dual-mode stop valve is activated (valve closed). If the fault is present with CC.0 and C.0 (short circuit to earth and open circuit) it is detected even if the dual-mode stop valve is not activated (valve open).</p>

<p>Check the connection and condition of the dual-mode stop valve connector. Replace the connector if necessary.</p>

<p>Check, with the ignition on, for the presence of 12 V on track 2 of the dual-mode stop valve connector.</p>
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<p>Check the insulation, the continuity and absence of spurious resistance on the connections between: Injection computer track 63 —————> Track 1 dual-mode stop valve Repair if necessary.</p>

<p>Check the electrical resistance of the dual-mode stop valve. Replace the dual-mode stop valve if its resistance is not approximately 45 Ω.</p>

<p>AFTER REPAIR</p>	<p>Apply the procedures to confirm that the repair is successful. Deal with any other possible faults. Clear the fault memory.</p>
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INJECTION

Fault finding - Conformity check

17A

NOTES

The values indicated in this conformity check are given for reference purposes only. It is therefore vital to consult the Technical Note which deals with your vehicle.
Test conditions: engine stopped, ignition on.

Order	Function	Parameter or State Check or Action	Display and notes	Fault finding
1	+ after ignition	ET001: + computer after ignition	ACTIVE	In the event of a problem: check the charge circuit.
		PR004: computer supply voltage	$11 < X < 14 \text{ V}$	
2	Immobiliser	ET002: engine immobiliser	INACTIVE	In the event of a problem: Test the multiplex network
		ET099: immobiliser code programmed	ACTIVE	
3	Computer	ET264: computer locked following an impact - NO	NO	If there is a problem: Check diagnostic ET264 "computer locked following an impact"
4	Pressure sensor	PR016: atmospheric pressure	$X = \text{atmospheric pressure} \pm 10\%$	In the event of a problem: Use fault-finding procedure DF045 "manifold sensor circuit"
		PR001: manifold pressure	$X = \text{atmospheric pressure} \pm 10\%$	
5	Accelerator pedal (released)	ET129: accelerator pedal no load	ACTIVE	In the event of a problem: Use fault-finding procedures : DF125 , DF126 and DF129 "pedal potentiometer track 1 circuit", "potentiometer track 2 circuit" and "pedal potentiometer circuit".
		ET128: accelerator pedal at full load	INACTIVE	
		PR203: pedal travel	$X < 20\%$	
		PR206: pedal position track 1	$X < 20\%$	
		PR207: pedal position track 2	$X < 20\%$	
6	Throttle valve (accelerator pedal released)	ET118: motorised throttle valve in defect mode	NO	In the event of a problem: See diagnostic ET118 "motorised throttle in defect mode"

INJECTION

Fault finding - Conformity check

17A

NOTES

The values indicated in this conformity check are given for reference purposes only.
It is therefore vital to consult the Technical Note which deals with your vehicle.
Test conditions: engine stopped, ignition on.

Order	Function	Parameter or State Check or Action	Display and notes	Fault finding
6 con- tinued	Throttle valve (accelerator pedal released)	ET003: throttle position no load	ACTIVE	In the event of a problem: Use fault-finding procedures DF002 and DF226 "throttle potentiometer circuit" et "throttle stop programming".
		ET005: fully open throttle position.	INACTIVE	
		PR017: measured throttle position	X = throttle valve position specification ± 10 %	
		PR113: motorised throttle valve position specifications	X < 20%	
		PR110: Measured throttle position track 1	X < 20%	
		PR197: difference between throttle valve tracks 1 and 2	X < 3%	
		PR111: Measured throttle position track 2	X < 20%	
		PR198: minimum stop position programmed track 1	X = position in % of minimum stop programmed track 1 for an MGI throttle valve or X = value of the limp- home position for a VDO throttle valve	
		PR199: maximum stop position programmed track 1	X = position in % of maximum stop programmed track 1 for an MGI throttle valve or X = value of the limp- home position for a VDO throttle valve	

INJECTION

Fault finding - Conformity check

17A

NOTES

The values indicated in this conformity check are given for reference purposes only. It is therefore vital to consult the Technical Note which deals with your vehicle.
Test conditions: engine stopped, ignition on.

Order	Function	Parameter or State Check or Action	Display and notes	Fault finding
6 con- tinued	Throttle valve (accelerator pedal released)	PR200: minimum stop position programmed track 2	X = position in % of minimum stop programmed track 2 for an MGI throttle valve or X = value of the limp- home position for a VDO throttle valve	In the event of a problem: Use fault-finding procedures DF002 and DF226 "throttle potentiometer circuit" et "throttle stop programming".
		PR201: maximum stop position programmed track 2	X = position in % of maximum stop programmed track 2 for an MGI throttle valve or X = value of the limp- home position for a VDO throttle valve	
7	Upstream oxygen sensor	ET030: upstream sensor heating	INACTIVE	In the event of a problem: Use fault-finding procedures DF018 and DF057 "upstream oxygen sensor heating circuit" and "upstream oxygen sensor circuit".
		ET037: mixture control	INACTIVE	
		PR009: upstream oxygen sensor voltage	Set value of approximately 400 mV	
		PR035: richness correction value	Approximately 128	
8	Downstream oxygen sensor	ET031: downstream sensor heating	INACTIVE	In the event of a problem: Use fault-finding procedures DF038 and DF058 "downstream sensor heating circuit" et "downstream oxygen sensor circuit".
		PR010: downstream oxygen sensor voltage	Set value of approximately 400 mV	
9	Brake pedal (released)	ET132: brake pedal pressed	INACTIVE	In the event of a problem: Use fault-finding procedure DF135 "brake pedal circuit" .
		ET143: redundant brake pedal	INACTIVE	

INJECTION

Fault finding - Conformity check

17A

NOTES

The values indicated in this conformity check are given for reference purposes only. It is therefore vital to consult the Technical Note which deals with your vehicle.
Test conditions: engine stopped, ignition on.

Order	Function	Parameter or State Check or Action	Display and notes	Fault finding
10	Cruise control/ speed limiter	cruise control START/ STOP button pressed ET192: Cruise control/ speed limiter function	STATUS 1: Cruise control on/off switch pressed	In the event of a problem: apply the fault finding procedure for the cruise control / speed limiter (DF235) fault and consult the wiring diagram of the vehicle concerned.
		cruise control START/ STOP button pressed ET192: Cruise control/ speed limiter function	STATUS 2: Speed limiter ON/OFF button pressed	
		Speed limiter on/off switch pressed and Suspend switch on steering-wheel control pressed ET192: Cruise control/ speed limiter function	STATUS 3: Suspend switch pressed	
		Speed limiter on/off switch pressed and Resume switch on steering-wheel control pressed ET192: Cruise control/ speed limiter function	STATUS 4: Restart switch pressed	
		Speed limiter on/off switch pressed and + switch on steering-wheel control pressed ET192: Cruise control/ speed limiter function	STATUS 5: Incrementation switch pressed	

INJECTION

Fault finding - Conformity check

17A

NOTES

The values indicated in this conformity check are given for reference purposes only.
It is therefore vital to consult the Technical Note which deals with your vehicle.
Test conditions: engine stopped, ignition on.

Order	Function	Parameter or State Check or Action	Display and notes	Fault finding
10 con- tinued	Cruise control/ speed limiter	Speed limiter on/off switch pressed and + switch on steering- wheel control pressed ET192: Cruise control/ speed limiter function	STATUS 6: Decrementation switch pressed	In the event of a problem: Use fault-finding procedure DF235 "cruise control/speed limiter" and check the wiring diagram for the vehicle model
11	Clutch pedal	Clutch pedal released ET182: Clutch pedal switch ----- Clutch pedal depressed ET182: Clutch pedal switch	INACTIVE: Only on vehicles equipped with cruise control / speed limiter ----- ACTIVE: On vehicles not equipped with cruise control/speed limiter this status does not change	In the event of a problem consult the wiring diagram for the vehicle concerned

INJECTION

Fault finding - Conformity check

17A

NOTES

The values indicated in this conformity check are given for reference purposes only. It is therefore vital to consult the Technical Note which deals with your vehicle.
Test conditions: engine stopped, ignition on.

Order	Function	Parameter or State Check or Action	Display and notes	Fault finding
Command Window				
8	Fuel pump relay	AC010: fuel pump relay	The fuel pump should be heard operating	In the event of a problem, check diagnostic AC010 "fuel pump relay control".
9	Air conditioning compressor	AC003: air conditioning compressor	You should hear the air conditioning clutch compressor engage	In the event of a problem, use fault-finding procedure DF228 "air-conditioning compressor control".
10	Fuel vapour absorber solenoid valve	AC016: canister bleed solenoid valve	The fuel vapour absorber solenoid valve should be heard operating	In the event of a problem, use fault-finding procedure DF014 "canister bleed solenoid valve circuit".
11	Camshaft dephaser	AC491: camshaft shifter	The camshaft dephaser should operate	In the event of a problem, use fault-finding procedure DF063 "camshaft dephaser".
12	Motorised throttle unit	AC621: motorised throttle valve	The motorised throttle valve should operate	In the event of a problem, use fault-finding procedure DF254 "motorised throttle control".
13	Low speed fan assembly	AC626: Low speed fan assembly	It should be possible to hear the fan running at low speed.	In the event of a problem, check diagnostic AC626 "low-speed fan assembly".
14	High speed fan assembly	AC625: High speed fan assembly	It should be possible to hear the fan running at high speed.	In the event of a problem, check diagnostic AC625 "high-speed fan assembly".
15	Heating element 1 relay	AC002: Heating element 1 relay	You should hear the heating element 1 relay engage	In the event of a problem, check diagnostic AC002 "heating element 1 relay".
16	Heating element 2 relay	AC620: Heating element 2 relay	You should hear the heating element 2 and 3 relays engage	In the event of a problem, check diagnostic AC620 "heating element 2 relay".
17	Dual-mode intake solenoid valve	AC024: dual-mode intake solenoid valve	The dual-mode intake solenoid valve should work	In the event of a problem, use fault-finding procedure DF308 "dual-mode inlet solenoid valve".

INJECTION

Fault finding - Conformity check

17A

NOTES

The values indicated in this conformity check are given for reference purposes only. It is therefore vital to consult the Technical Note which deals with your vehicle.
Test conditions: engine stopped, ignition on.

Order	Function	Parameter or State Check or Action	Display and notes	Fault finding
1	Pressure sensor	PR016: atmospheric pressure	X = atmospheric pressure $\pm 10\%$	In the event of a problem: Use fault-finding procedure DF045 "manifold sensor circuit".
		PR001: manifold pressure	X < 500 mbar	
2	Idle speed	PR006: idle speed	X = Idle speed specifications + 50 rpm	None
		PR041: engine idling speed reference.	730 < X < 780 rpm	
		ET039: idle speed regulation	ACTIVE	
		PR275: "oscillation detection counter"	X = 0	In the event of a problem: Check the diagnostic of parameter PR275 "oscillation detection counter"
3	Power assisted steering pressure switch	ET067: power assisted steering pressostat connection	ACTIVE	None
		ET034: power assisted steering pressostat	ACTIVE if steering wheel is moved	
4	Richness regulation	ET037: mixture control	ACTIVE	In the event of a problem: Use fault-finding procedures DF057 and DF058 "upstream oxygen sensor circuit" and "downstream et oxygen sensor circuit".
		PR009: upstream oxygen sensor voltage	50 < X < 800 mV	
		PR010: downstream oxygen sensor voltage	The value should be as stable as possible	
		PR035: richness correction value	The value should be around 128	

INJECTION

Fault finding - Conformity check

17A

NOTES

The values indicated in this conformity check are given for reference purposes only.
It is therefore vital to consult the Technical Note which deals with your vehicle.
Test conditions: engine stopped, ignition on.

Order	Function	Parameter or State Check or Action	Display and notes	Fault finding
5	Air conditioning	Air conditioning requested by the driver		In the event of a problem: use fault-finding procedures DF012 "AC- injection connection", DF118 "refrigerant sensor circuit" and DF228 "air- conditioning compressor control".
		ET016: connection between injection ↔ CA	ACTIVE	
		ET009: air conditioning request	ACTIVE	
		ET070: air conditioning compressor	ACTIVE	
		PR027: refrigerant fluid pressure	$0 < X < 32$ bars	
		PR044: power used by the AC compressor	$X > 300$ W	
		ET038: fast idle speed ACTIVE	ACTIVE	
6	Coolant temperature sensor	PR002: Coolant temperature	$X = \text{Engine temperature} \pm 5^{\circ}\text{C}$ $-40 < X < +120^{\circ}\text{C}$	In the event of a problem, use fault-finding procedure DF004 "coolant temperature sensor circuit".
7	Air temperature sensor	PR003: Air temperature	$X = \text{Temperature under bonnet} \pm 5^{\circ}\text{C}$ $-40 < X < +120^{\circ}\text{C}$	In the event of a problem, use fault-finding procedure DF003 "air temperature sensor circuit".
8	Pinking sensor	PR013: average pinking signal	The value should not be constant	In the event of a problem, use fault-finding procedure DF006 "pinking sensor circuit".
		PR015: pinking signal correction	$X < 5$	

INJECTION

Fault finding - Conformity check

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NOTES

The values indicated in this conformity check are given for reference purposes only.
It is therefore vital to consult the Technical Note which deals with your vehicle.
Test conditions: engine stopped, ignition on.

Order	Function	Parameter or State Check or Action	Display and notes	Fault finding
Status window				
1	LPG	LPG requested by the driver		
		ET200: "petrol/LPG connection"	ACTIVE	In the event of a problem, consult diagnostic ET200
		ET236: "LPG mode request"	ACTIVE	In the event of a problem, consult diagnostic ET236
		ET257: "LPG ready"	YES	In the event of a problem, consult diagnostic ET257
		ET234: "Balance conditions in LPG mode"	OK	In the event of a problem, consult diagnostic ET234
		ET237: "LPG tank empty"	NO	In the event of a problem, consult diagnostic ET237
		ET258: "LPG fault"	NO	In the event of a problem, consult diagnostic ET258
		ET134: "Transition from petrol to LPG mode"	ACTIVE	In the event of a problem, consult diagnostic ET134
		ET133: "Transition from LPG to petrol mode"	INACTIVE	In the event of a problem, consult diagnostic ET133
		ET114: "Operating in petrol mode"	INACTIVE	In the event of a problem, consult diagnostic ET114
		ET113: "Operating in LPG mode"	ACTIVE	In the event of a problem, consult diagnostic ET113

AC002

HEATING ELEMENT 1 RELAY

NOTES

No faults should be present or stored in the fault finding tool.

Check the **connection and condition of the heating element 1 relay connector**.
Replace the connector if necessary.

Disconnect the relay.

Check for the presence of **+ 12 volts** on **track 3 of the heating element 1 relay connector**.

Repair if necessary using the relevant **wiring diagram**.

Check the **insulation and continuity** of the connection between:

Heating element 1 track 5 —————> Heating element 1
Heating element 1 —————> Vehicle earth

Repair if necessary.

Reconnect the relay.

Check for the presence of **+ 12 V** on **track 5 of the heating element 1 relay connector by using command AC002 "heating element 1 relay"**.

Replace the relay if necessary.

Check the resistance of heating element 1.

Replace heating element 1 if necessary.

AC010

FUEL PUMP CONTROL RELAY

NOTES

No faults should be present or stored in the fault finding tool.

Check the **connection and condition of the fuel pump relay connector**.

Replace the connector if necessary.

Disconnect the relay.

Check for the **presence of 12 V** on **track 3 of the fuel pump relay connector**.

Repair if necessary using the relevant **wiring diagram**.

Check the **insulation and continuity** of the connection between:

fuel pump relay **track 5** —————> **Track 1** of the inertia impact sensor

Repair if necessary.

Check the absence of resistance between

Inertia impact sensor **track 1** —————> **Track 3** of the inertia impact sensor

Replace the inertia impact sensor if necessary.

Check the **insulation and continuity** of the connection between:

Inertia impact sensor **track 3** —————> **Track C1** of the fuel pump

Fuel pump **track C2** —————> **Vehicle earth**

Repair if necessary.

Reconnect the relay.

Check for the presence of **+ 12 V** on **track 5 of the fuel pump relay connector by using command AC010 "fuel pump relay control"**.

Replace the relay if necessary.

If the fault persists, change the petrol pump.

AC620

HEATING ELEMENT 2 RELAY

NOTES

No faults should be present or stored in the fault finding tool.

Check **the connection and condition of the heating element 2 relay connector**.

Replace the connector if necessary.

Disconnect the relay.

Check for the presence of **+ 12 volts** on **track 3 of the heating element 2 relay connector**.

Repair if necessary using the relevant **wiring diagram**.

Check the **insulation and continuity** of the connection between:

Heating element 2 track 5 —————> Heating elements 2 and 3
Heating elements 2 and 3 —————> Vehicle earth

Repair if necessary.

Reconnect the relay.

Check for the presence of **+ 12 V** on **track 5 of the heating element 2 relay connector by using command AC620 "heating element 2 relay"**.

Replace the relay if necessary.

Check the resistance of heating elements 2 and 3.

Replace heating element 2 and/or 3 if necessary.

AC625	<u>HIGH-SPEED FAN ASSEMBLY</u>
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NOTES	No faults should be present or stored in the fault finding tool.
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Check the **connection and condition of the high speed fan assembly relay connector**.

Replace the connector if necessary.

Disconnect the relay.

Check for the presence of **+ 12 V** on **track 3 of the high-speed fan assembly relay connector**.

Repair if necessary using the relevant **wiring diagram**.

Check the **insulation and continuity** of the connection between:

High-speed fan assembly relay track 5 —————> **Engine cooling fan 2**
Engine cooling fan 2 —————> **Vehicle earth**

Repair if necessary.

Reconnect the relay.

Check for the presence of **+ 12 V** on **track 5 of the high-speed fan assembly relay connector by using command AC625 "high-speed fan assembly"**.

Replace the relay if necessary.

Check that engine cooling fan 2 is not seized and that the helix turns easily.

Replace engine cooling fan 2 if necessary.

CONDITIONS	FAN 2 ACTIVE
Air-conditioning pressure > 24 bar	YES
Air-conditioning pressure > 18 bar + vehicle speed > 12 mph (20 km/h)	YES
Coolant temperature with engine running > 102°C	YES
Coolant temperature with engine running < 95°C	NO

AC626

LOW-SPEED FAN ASSEMBLY

NOTES

No faults should be present or stored in the fault finding tool.

Check the **connection and condition of the low speed fan assembly relay connector**.

Replace the connector if necessary.

Disconnect the relay.

Check for the presence of **+ 12 V** on **track 3 of the low-speed fan assembly relay connector**.

Repair if necessary using the relevant **wiring diagram**.

Check the **insulation and continuity** of the connection between:

Low-speed fan assembly relay track 5 —————> Engine cooling fan 1
Engine cooling fan 1 —————> Vehicle earth

Repair if necessary.

Reconnect the relay.

Check for the presence of **+ 12 V** on **track 5 of the low-speed fan assembly relay connector by using command AC626 "low-speed fan assembly"**.

Replace the relay if necessary.

Check that engine cooling fan 1 is not seized and that the helix turns easily.

Replace engine cooling 1 if necessary.

CONDITIONS	FAN 1 ACTIVE
Coolant temperature with engine off < 95°C	NO
Coolant temperature with engine off > 100°C	YES
Air conditioning requested and authorised	YES
Coolant temperature with engine running > 99°C	YES
Coolant temperature with engine running < 96°C	NO

ET113	<u>OPERATION IN LPG MODE</u>
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NOTES	<p>There must be no faults present or stored. This condition applies only to vehicle XA0B engine K4M 712 (LPG). Status ET237 "tank empty" should be NO. Status ET258 "LPG fault" should be NO. Status ET257 "LPG ready" should be YES. Status ET234 "balance conditions in LPG mode" should be GOOD</p>
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When all the balance conditions are united, the system moves to: **ET134 transition from petrol mode to LPG mode active**.

On decelerating, or after a delay, when both fuels have been recovered, the system moves to: **ET113 operation in LPG mode Active**.

Consult the LPG fault finding strategy if the fault persists.

ET114	<u>OPERATION IN PETROL MODE</u>
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NOTES	<p>There must be no faults present or stored. This condition applies only to vehicle XA0B engine K4M 712 (LPG). Status ET237 "tank empty" should be NO. Status ET258 "LPG fault" should be NO. Status ET257 "LPG ready" should be YES. Status ET234 "balance conditions in LPG mode" should be GOOD</p>
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Starting the engine is always done in petrol mode, ET114 ACTIVE.

The status will be ET114 "forced petrol mode operation" still ACTIVE if:

- status **ET237 "tank empty"** is YES
- status **ET258 "LPG fault"** is YES
- status **ET234 "balance conditions in LPG mode"** is NOT OK

When all the balance conditions are united, the system moves to **ET134 "transition from petrol to LPG mode" ACTIVE**, then to **ET113 "operation in LPG mode" ACTIVE**, and then to **ET114 "operation in petrol mode" INACTIVE**.

Consult the LPG fault finding strategy if the fault persists.

ET118	<u>MOTORISED THROTTLE BODY IN DEFECT MODE</u>
NOTES	If any of the defect modes "status 1", "status 3" or "status 4" occur, meticulously check the protective devices, insulation and path of the engine wiring; if possible, see the "Wire testing" segment in the "Preliminaries" section.
NO	NORMAL MODE
STATUS 1	<p>MOTORISED THROTTLE IN LIMP-HOME MODE: This defect mode maintains the engine at a constant speed irrespective of gear changes or accelerator pedal position. It is usually associated with DF002 "throttle potentiometer circuit", DF226 "throttle stop programming", DF254 "motorised throttle control" or DF255 "throttle/pedal operation safety". If no fault is present, check diagnostic PR275 Oscillation detection counter. If this defect mode occurs, meticulously inspect the protective devices, insulation and path of the engine wiring; if possible, move it manually while the engine is running to make sure the wiring is not being damaged.</p>
STATUS 2	<p>INJECTION CUT-OFF: This defect mode is not used on the SIRIUS 34 injection computers.</p>
STATUS 3	<p>PEDAL FAULT (loss of driver control): When this defect mode is in use, there is a loss of pedal power, fast idle speed and the engine slows to idle speed if the brake pedal is depressed. It is usually associated with DF125 "pedal potentiometer circuit track 1" + DF129 "pedal potentiometer circuit" or DF125 "pedal potentiometer circuit track 1" + DF126 "pedal potentiometer circuit track 2". If no fault is present, check diagnostic PR275 Oscillation detection counter. If this defect mode occurs, meticulously inspect the protective devices, insulation and path of the engine wiring; if possible, move it manually while the engine is running to make sure the wiring is not being damaged.</p>
STATUS 4	<p>REDUCTION OF ENGINE PERFORMANCE (limitation of performance): This defect mode is indicated by: Limitation of the vehicle speed, limitation of the control section of the throttle, limitation of the vehicle acceleration (slow increase in the control section of the throttle). It is usually associated with DF002 "throttle potentiometer circuit", DF125 "pedal potentiometer circuit track 1", DF126 "pedal potentiometer circuit track 2", DF129 "pedal potentiometer circuit" or DF258 "sensor first reference voltage". If no fault is present, check diagnostic PR275 Oscillation detection counter. If this defect mode occurs, meticulously inspect the protective devices, insulation and path of the engine wiring; if possible, move it manually while the engine is running to make sure the wiring is not being damaged.</p>

ET133	<u>TRANSITION FROM LPG MODE TO PETROL MODE</u>
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NOTES	There must be no faults present or stored. This condition applies only to vehicle XA0B engine K4M 712 (LPG).
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**After operating in LPG mode ET113 ACTIVE, if ET236 "LPG mode operation request" becomes INACTIVE, status ET133 "transition from LPG to petrol mode" changes to ACTIVE.
Then status ET114 "operation in petrol mode" becomes ACTIVE.**

Consult the LPG fault finding strategy if the fault persists.

ET134	<u>TRANSITION FROM PETROL MODE TO LPG MODE</u>
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NOTES	<p>There must be no faults present or stored. This condition applies only to vehicle XA0B engine K4M 712 (LPG). Status ET237 "tank empty" should be NO. Status ET258 "LPG fault" should be NO. Status ET257 "LPG ready" should be YES. Status ET234 "balance conditions in LPG mode" should be GOOD</p>
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<p>After ET236 "request for LPG mode operation" ACTIVE, if all the balance conditions are met, the status changes to ET134 "transition from petrol to LPG mode" ACTIVE. Then to ET113 "operation in LPG mode" ACTIVE.</p>
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<p>Consult the LPG fault finding strategy if the fault persists.</p>

ET182	<u>CLUTCH PEDAL SWITCH</u>
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NOTES	There must be no faults present or stored.
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Vehicle not equipped with the cruise control/speed limiter function	There is no clutch pedal switch on vehicles not equipped with the cruise control/speed limiter function. Status ET182, clutch pedal switch, still displays ACTIVE.
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Vehicle equipped with the cruise control/speed limiter function	<p>There is a clutch pedal switch on vehicles equipped with the cruise control/speed limiter function.</p> <p>Status ET182 "clutch pedal switch" shows ACTIVE if the clutch pedal is pressed.</p> <p>Status ET182 "clutch pedal switch" shows INACTIVE if the clutch pedal is released.</p> <p>Even though there is no fault finding procedure on this signal, there is a strategy to detect racing of the engine speed in the case of a problem with the clutch pedal switch. If it is used, the cruise control is automatically disconnected.</p>
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Check the connection and condition of the clutch pedal switch connector . Replace the connector if necessary.

Check for the presence of + 12 V on track A1 of the clutch pedal switch connector . Repair if necessary using the relevant wiring diagram .

Check the insulation and continuity of the connection between: Injection computer track 48 —————> track A2 clutch pedal switch Repair if necessary.
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ET200	<u>INJECTION/LPG CONNECTION</u>
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NOTES	There must be no faults present or stored.
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The computer recognises that it is connected to an LPG computer when the ignition is switched on, and stores this information for life.

The information is transmitted by the multiplex network.

Switch on the ignition.

Test the multiplex network.

ET234	<u>BALANCE CONDITIONS IN LPG MODE</u>
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NOTES	There must be no faults present or stored. This condition applies only to vehicle XA0B engine K4M 712 (LPG).
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The **ET234 "balance conditions in LPG mode"** signal is sent by the fuel injection computer to indicate whether or not it will allow operation in LPG mode.

The injection computer authorises operation in LPG mode if the following conditions are met:

- **If it has received signal ET257 "LPG ready": YES** (this signal comes from the LPG computer and is sent to the fuel injection computer through the multiplex network).
- **Sufficiently high air temperature** (to prevent any risks of the LPG injectors icing up).
- **Following a delay according to the coolant temperature when starting the engine.**

Switch on the ignition.

Test the multiplex network.

Consult the LPG fault finding strategy if the fault persists.

ET236	<u>LPG MODE REQUEST</u>
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NOTES	There must be no faults present or stored. This condition applies only to vehicle XA0B engine K4M 712 (LPG).
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Status **ET236 "LPG mode request"** indicates attainment of the petrol/LPG switch position requested by the driver.

This signal comes from the LPG computer and is sent to the fuel injection computer through the multiplex network.

Switch on the ignition.

Test the multiplex network.

Consult the LPG fault finding strategy if the fault persists.

ET237	<u>LPG TANK EMPTY</u>
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NOTES	There must be no faults present or stored. This condition applies only to vehicle XA0B engine K4M 712 (LPG).
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The fuel injection computer calculates that the LPG tank is empty on the basis of these criteria:

- **the signal from the upstream sensor and richness regulation** (indicating abnormally poor operation).
- **detection of successive engine stalls when switching into LPG mode.**
- **it takes an LPG pressure reading downstream from the pressure relief valve** (this information is issued by the LPG computer and transmitted to the fuel injection computer via the multiplex network).

This diagnostic is done in the fuel injection computer to enable automatic return to petrol operation mode when the LPG tank is reported empty:

Status ET237 "tank empty" is YES.

Switch on the ignition.

Test the multiplex network.

Consult the LPG fault finding strategy if the fault persists.

ET257	<u>LPG READY</u>
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NOTES	There must be no faults present or stored. This condition applies only to vehicle XA0B engine K4M 712 (LPG).
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The **ET257 "LPG ready"** signal is sent by the LPG computer to indicate that the LPG system is ready to operate.

The signal travels through the multiplex network.

Switch on the ignition.

Test the multiplex network.

Consult the LPG fault finding strategy if the fault persists.

ET258	<u>LPG FAULT</u>
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NOTES	There must be no faults present or stored. This condition applies only to vehicle XA0B engine K4M 712 (LPG).
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The **ET258 "LPG fault"** signal is sent by the LPG computer to indicate that the LPG system has detected an electrical or operational fault in one of these components and can no long ensure proper engine operation.
The information is transmitted by the multiplex network.

Switch on the ignition.

Test the multiplex network.

Consult the LPG fault finding strategy if the fault persists.

FUEL INJECTION

Fault finding - Interpretation of states

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ET264	<u>COMPUTER LOCKED FOLLOWING AN IMPACT</u>
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NOTES	There must be no faults present or stored.
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On receiving an impact detection signal emitted by the air bag computer on the multiplex network, the injection computer will do the following, having received the signal (after a maximum of 10 milliseconds): Stop the fuel pump supply, the ignition and the petrol or LPG injection.

Status ET264 "computer locked following impact" changes to STATUS 1.

The only way of restarting is to switch off the ignition for at least 10 seconds.

The only way to erase status ET264 is with command RZ007 "erase stored fault".

PR275	<u>OSCILLATION DETECTION COUNTER</u>
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NOTES	None.
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Parameter **PR275 "oscillation detection counter"** makes it possible to count abnormal throttle vibrations caused either by engine vibrations, or by micro-breaks in the power supply to the motorised throttle valve.
The counter climbs from 0 to 255.

A micro-break in the motorised throttle valve's power supply is sufficient to trigger defect-mode engine operation. Status ET118 "throttle in defect mode" then indicates **STATUS 1, 3 or 4**.
The injection fault warning light does not always come on and the fault-finding tool finds none.
After turning the ignition off and on, the defect mode disappears.

When this counter indicates a value higher than 0:
Check the condition and snugness of the clips and of the motorised throttle valve and injection computer connectors.
Repair.

To reset the counter to 0: Erase the computer's memory with command RZ 007 "erase stored fault".

If the problem persists, **contact your Techline**.

NOTES

Customer Complaints should only be investigated after a complete check has been run using the diagnostic tool.

NO DIALOGUE WITH THE COMPUTER

CHART 1

STARTING PROBLEMS

CHART 2

IDLE SPEED PROBLEMS

CHART 3

PROBLEMS WHEN DRIVING

CHART 4

NO AIR CONDITIONING

CHART 5

NO OPERATION IN LPG MODE

CHART 6

FUEL INJECTION

Fault finding - Fault finding chart

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CHART 1

No dialogue with the computer

NOTES

None.

Try the diagnostic tool on another vehicle.

Check:

- the connection between the diagnostic tool and the diagnostic socket (lead in good condition),
- the injection, engine and passenger compartment fuses.
- Try to communicate with another computer on the same vehicle.

Repair if necessary.

Check that + 12 volts is present on track 16 of the diagnostic socket.

Repair if necessary.

Connect the terminal in place of the ECU and check the **insulation, the continuity and absence of spurious resistance** on the connections between:

Diagnostic socket track 5 —————> **vehicle earth**
Diagnostic socket track 4 —————> **vehicle earth**

Repair if necessary.

Ensure the **presence of + 12 V** on:

- **Injection computer track 30**
- **Injection computer track 29 (ignition on)**

Repair if necessary.

Connect the terminal in place of the ECU and check the **insulation, the continuity and absence of spurious resistance** on the connections between:

Injection computer track 3 —————> **vehicle earth**
Injection computer track 28 —————> **vehicle earth**
Injection computer track 33 —————> **vehicle earth**
Injection computer track 67 —————> **vehicle earth**
Injection computer track 56 —————> **diagnostic socket track 7**

Repair if necessary.

AFTER REPAIR

Test using the diagnostic tool.

FUEL INJECTION

Fault finding - Fault finding chart

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CHART 2

Starting faults

NOTES

This customer complaint should only be investigated after a complete check has been run using the diagnostic tool.

- Check the condition of the battery.
- Check the tightness and oxydisation of the terminals.
- Check that the wiring on the battery/starter motor and battery/vehicle earth is in good condition.
- Check that the starter motor rotates properly.



- Check that there is fuel present (fuel gauge faulty).
- Check that the fuel is of the proper type.
- Check that no hoses are pinched (especially after one has been removed).
- Check the condition of the petrol filter.
- Check that the tank vent is not blocked.
- Make sure that the fuel pump is running correctly and that petrol is reaching the injector rail.
- Make sure that the petrol pressure regulator is in good condition by checking the pressure.



- Make sure that the air filter is in good condition; replace it if necessary.
- Check the condition of the intake ducts (no air leaks, pinching of the air intake pipe etc.).
- Disconnect the hose connecting the fuel vapour canister solenoid valve to the inlet manifold and block the hose to prevent air intake: if there is no more disturbance, the fuel vapour canister solenoid valve is the problem.



- Check that the spark plugs are in good condition and that they correspond to the engine type; change them if necessary.
- Remove the engine speed sensor and make sure it has not been rubbing on its target (increase in the air gap). If it has, check the condition of the engine flywheel.
- Make sure that the ignition coils are in good condition.



- Check that the exhaust system is not blocked nor the catalytic converter clogged.



- Make sure that the engine can turn freely.
- Check the engine compression
- Check the timing.

AFTER REPAIR

Test using the diagnostic tool.

FUEL INJECTION

Fault finding - Fault finding chart

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CHART 3

Idle speed faults

NOTES

This customer complaint should only be investigated after a complete check has been run using the diagnostic tool.

- Check that there is petrol present (the petrol gauge may be faulty).
- Check that the petrol is of the proper type.
- Check that no hoses are pinched (especially after a removal operation).
- Check the condition of the petrol filter.
- Check that the tank vent is not blocked.
- Make sure the breather canister is not blocked and that the fuel vapour absorber is not clogged.
- Make sure that the petrol pressure regulator is in good condition by checking the pressure.



- Make sure that the air filter is in good condition; replace it if necessary.
- Check the condition of the intake ducts (no air leaks, pinching of the air intake pipe etc.).
- Disconnect the hose connecting the fuel vapour canister solenoid valve to the inlet manifold and block the hose to prevent air intake: if there is no more disturbance, the fuel vapour canister solenoid valve is the problem.



- Check that the spark plugs are in good condition and that they correspond to the engine type; change them if necessary.
- Make sure the spark plugs have resistance by checking for the letter R in the supplier's part number. If in doubt, check their resistance, which must be between **3000** and **8000 Ω**.
- Make sure that the ignition coils are in good condition.



- Check that the exhaust system is not blocked nor the catalytic converter clogged.



- Check with the dipstick that the oil level is not too high.
- Check the engine compression
- Check the timing.

AFTER REPAIR

Test using the diagnostic tool.

FUEL INJECTION

Fault finding - Fault finding chart

17A

CHART 4

Starting faults

NOTES

This customer complaint should only be investigated after a complete check has been run using the diagnostic tool.

- Check that there is petrol present (the petrol gauge may be faulty).
- Check that the petrol is of the proper type.
- Check that no hoses are pinched (especially after a removal operation).
- Check the condition of the petrol filter.
- Check that the tank vent is not blocked.
- Make sure the breather canister is not blocked and that the fuel vapour absorber is not clogged.
- Make sure that the petrol pressure regulator is in good condition by checking the pressure.



- Make sure that the air filter is in good condition; replace it if necessary.
- Check the condition of the intake ducts (no air leaks, pinching of the air intake pipe etc.).
- Disconnect the hose connecting the fuel vapour canister solenoid valve to the inlet manifold and block the hose to prevent air intake: if there is no more disturbance, the fuel vapour canister is the problem.



- Check that the spark plugs are in good condition and that they correspond to the engine type; change them if necessary.
- Make sure the spark plugs have resistance by checking for the letter R in the supplier's part number. If in doubt, check their resistance, which must be between **3000** and **8000 Ω**.
- Make sure that the ignition coils are in good condition.



- Check that the exhaust system is not blocked nor the catalytic converter clogged.



- Check that the engine cooling system is working correctly.
- Check with the dipstick that the oil level is not too high.
- Check the engine compression
- Check the timing.



- Check that the wheels turn freely (calipers, drums and bearings not seized).
- Check the condition of the tyre pressures.

AFTER REPAIR

Test using the diagnostic tool.

FUEL INJECTION

Fault finding - Fault finding chart

17A

CHART 5

NO AIR CONDITIONING

NOTES

This customer complaint should only be investigated after a complete check has been run using the diagnostic tool.

Does parameter PR027 "coolant pressure" have a value of zero?

YES

Test the air conditioning charge.
Repair if necessary.

Check the **connection and condition of the air-conditioning sensor connector.**
Replace the connector if necessary.

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

Injection computer track 79	—————▶	Coolant pressure sensor
Injection computer track 83	—————▶	Coolant pressure sensor
Injection computer track 47	—————▶	Coolant pressure sensor

Repair if necessary

Measure **the resistance of the air-conditioning pressure sensor.**
If necessary replace the sensor.

NO

Check the **connection and condition of the air conditioning compressor connector.**
Replace the connector if necessary.

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

Injection computer track 39	—————▶	Climate control compressor
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Repair if necessary.

Check **that the air conditioning compressor clutch is engaging properly** with fault-finding tool command **AC003 "air-conditioning compressor"**.
Repair if necessary.

Consult the fault finding strategy for the heating and ventilation if the incident persists.

AFTER REPAIR

Test using the diagnostic tool.

FUEL INJECTION

Fault finding - Fault finding chart

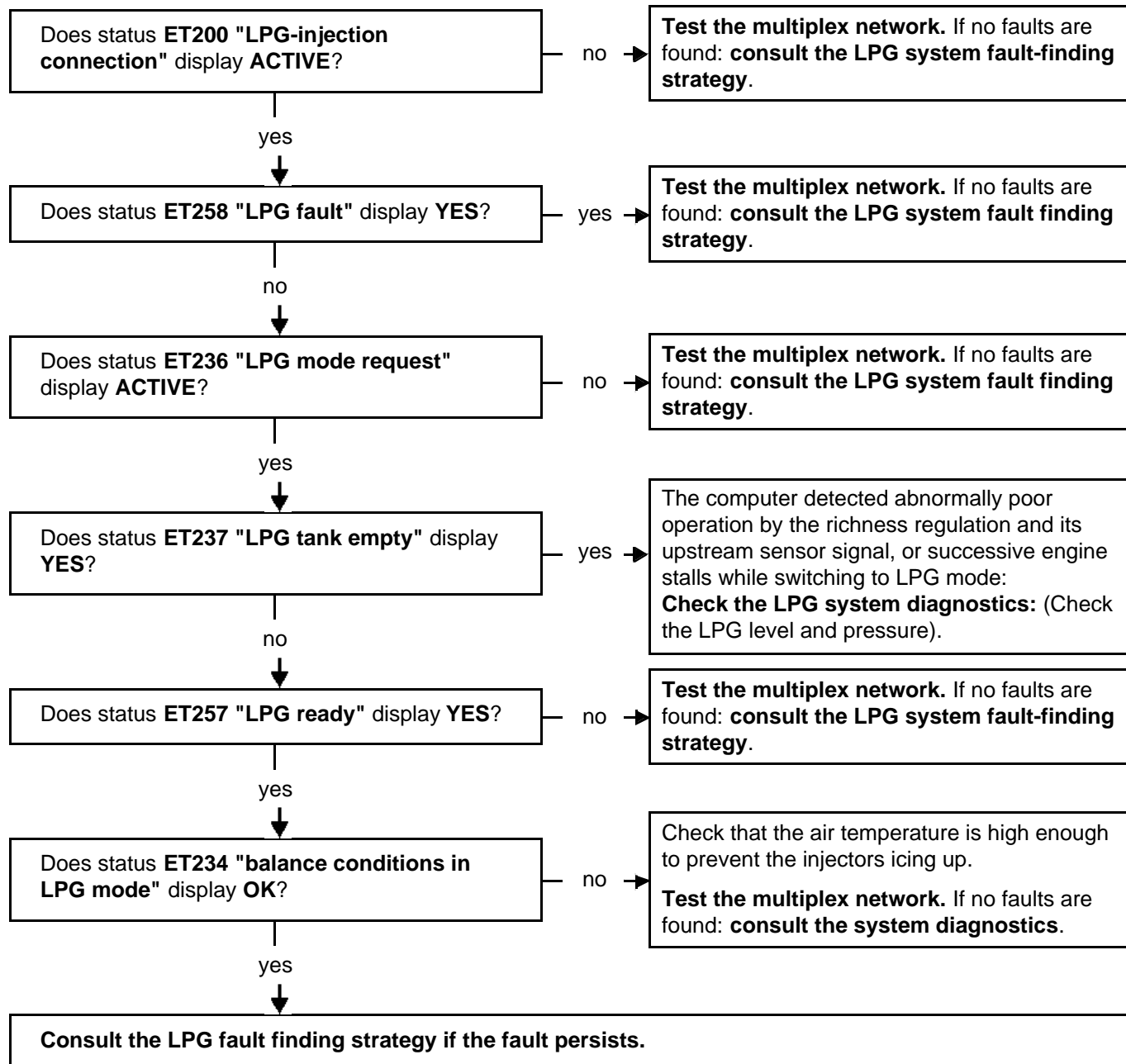
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CHART 6

NO OPERATION IN LPG MODE

NOTES

This customer complaint should only be investigated after a complete check has been run using the diagnostic tool.
There must be no faults present or stored in the LPG system.



AFTER REPAIR

Test using the diagnostic tool.