



TECHNICAL NOTE 3467A

CBAA

FAULT FINDING PETROL INJECTION

COMPUTER TYPE: MOTRONIC ME 7.4.6
PROGRAMME No.: 12
No. of tracks: 08

77 11 299 222

MARCH 2001

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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Fault finding - Introduction

This document describes Special Features fault finding applicable to all computers of the **BOSCH MOTRONIC ME 7.4.6** type fitted in the **CLIO V6** with a **L7X760** engine.

The following are thus required to carry out fault finding on this system:

- this "Fault Finding" Technical Note,
- the wiring diagram of the function on the vehicle concerned,
- the CLIP or NXR diagnostic tool, a multimeter and test bornier No. 1613 Elé.

GENERAL APPROACH TO FAULT FINDING

- Using one of the fault finding tools for the identification of the system fitted to the vehicle (reading of the computer series, the program no., the Vdiag, etc.).

The identification is obtained by reading the following in the command window:

COMPUTER PART NUMBER

ME 7.4.6

VDIAG NUMBER

08

PROGRAM NUMBER (starting from)

12

- Finding the Fault Finding documents corresponding to the system identified.
- Considering the information provided in the "Introduction" sections.

DESCRIPTION OF THE FAULT FINDING PHASES**1 FAULT CHECKING:**

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

Order of priority:

It is essential to deal with electrical faults before OBD (On Board Diagnostic) faults (**DF111, DF112, DF113, DF114, DF185, DF186** misfiring of cylinders 1 to 6; **DF183, DF184** catalytic converters no. 1 and no. 2; **DF202, DF203** fuel supply bank A and bank B; **DF204 and DF205** ageing of upstream sensor bank A and bank B).

Note that there must be no electrical faults -either present or stored - before processing OBD operational faults.

Other priorities are dealt with in the diagnostic of the relevant fault in the section "Notes" section.

DESCRIPTION OF THE FAULT FINDING STAGES (contd.)

Reminder: Each fault is interpreted by a specific storage type (fault present, fault stored, fault present and stored). The checks defined for the treatment of each fault should therefore only be applied to the vehicle if the fault shown by the diagnostic tool is interpreted in the document as that storage type. The storage type should be considered when using the fault finding tool following ignition switch-off and switch-on.

If a fault is interpreted when it is declared stored, the conditions for application of the fault finding procedure appear in the NOTES box. When these conditions are not satisfied, use the fault finding procedure to check the circuit of the faulty part since the fault is no longer present on the vehicle.

Perform the same procedure if a fault is declared "stored" by the diagnostic tool and it is only interpreted in the document as a "present" fault.

2 CHECKING CONFORMITY

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

- To diagnose faults that are not displayed which may correspond to a customer complaint.
- To checks that the injection is in correct working order and ensures that a fault will not reappear after repair.

This section therefore features a diagnostic of the statuses and parameters, within the conditions for checking them. If a status is not operating normally or a parameter is outside permitted tolerance values, you should consult the corresponding diagnostic page.

3 DIAGNOSTIC TOOL CHECK IS CORRECT

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

Dealing with the customer complaint:

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

- No fault observed on diagnostic tool .
- No anomaly detected during conformity check.
- The vehicle is not operating correctly

SPECIAL FEATURES OF THE ME 7.4.6 INJECTION SYSTEM

IMPORTANT: A computer is matched to the engine and to the vehicle in which it is fitted. Therefore do not try a computer on another vehicle then return it to the original vehicle.

1 MOTORISED THROTTLE BODY

1.1 General

Because the motorised throttle body system does not contain a means of adjustment between the real value obtained using the potentiometers and the mechanical position of the throttle valve, an adaptation has to be made in the ME 7.4.6 computer.

During the adaptation, the lower mechanical stop and the emergency position of the throttle valve are learned and an equalisation of the potentiometer amplifier is carried out. The programmed values are stored in the computer memory. The **stop programming + storage of the programmed values** sequence equates to **initialisation** of the motorised throttle. The springs in the motorised throttle are also tested.

This initialisation process runs automatically and autonomously when the ignition is switched on, but only under certain input conditions. It may run several times when the ignition is on.

1.2 Throttle programming procedure

This programming should properly be carried out at least once during the life of the vehicle, when the ignition is first switched on (original initialisation) and at **every change of computer or motorised throttle**.

After changing the throttle body and before reprogramming, it is necessary to **cancel the programming**.

1. Switch on the ignition and wait at least 5 seconds without starting up the engine: the throttle adaptation initialises automatically.
2. Switch off the ignition.
3. Wait before switching the ignition back on to allow the computer to store the values learned:
 - at least 10 seconds if the engine is cold (coolant temperature lower than 85°C),
 - at least 130 seconds if the engine is warm (coolant temperature greater than or equal to 90°C).
4. Switch on the ignition, start up the engine and let it run at idling speed for 1 minute to ensure that the output of the air escaping from the motorised throttle is correctly adjusted.

NOTE: A fault occurs and the emergency position is commanded:

- if the automatic programming procedure (stage 1 above) is interrupted before 5 seconds has elapsed, and if stage 3 is not observed.

1.3 Programming of the emergency position of the motorised throttle

The emergency position is necessary for the throttle position regulator and for the recognition of the need for adjustment if the motorised throttle is changed.

If the contact is locked, and insofar as the throttle is no longer being supplied, the emergency position is read on the two potentiometers and a plausibility calculation is carried out using the values stored in the computer memory. If the values are different, it is therefore recognised that an adjustment is required, and the emergency position needs to be programmed.

1.4 Testing the springs of the motorised throttle (automatic)

1.4.1 Testing the return springs

By opening the throttle from the emergency position in the open direction, then shutting off the power stage of the motorised throttle, the return forced by the return springs may be tested. In the case of a fault, the emergency position of the throttle is actuated.

The test is only carried out if all of the following conditions are met:

- no irreversible fuel cut-off,
- motorised throttle is supplied,
- no reaction to a Fail-safe Function type fault,
- throttle position control is active,
- battery voltage is sufficient (between 11 and 15 V),
- vehicle is stationary,
- engine speed is less than or equal to 250 rpm,
- engine coolant temperature is greater than 6°C,
- air temperature is greater than 6°C.

1.4.2 Testing spring opening

By closing the throttle from the emergency position in the close direction, then shutting off the power stage of the motorised throttle, the forced return in the emergency position as a result of opening the spring may be checked. In the case of a fault, the emergency position of the throttle is actuated.

The test is only performed if all the conditions in paragraph 1.4.1 are met.

2 CONTROL OF THE ILLUMINATION OF THE INDICATORS

- The injection-fault warning light (amber indicator light, severity 1) indicates a fault on the motorised throttle or the accelerator pedal sensor, requiring repairs.
- The "severe injection fault" warning light (red lamp, severity 2) indicates that the injection system has detected a serious problem that will require repairs. Illumination of this indicator is preceded by a resetting of the computer (in the customer complaint this is indicated by flat spots due to micro-breaks in the injection, indicating the imminent resetting of the computer).
- The coolant overheating indicator lights above 118°C.

- The OBD (On Board Diagnostic) warning light (orange warning light representing an engine) indicates that the pollution threshold has been exceeded.

Every time the ignition is switched on again, the OBD warning light comes on to give a visual check. The light goes out three seconds after the engine is started.

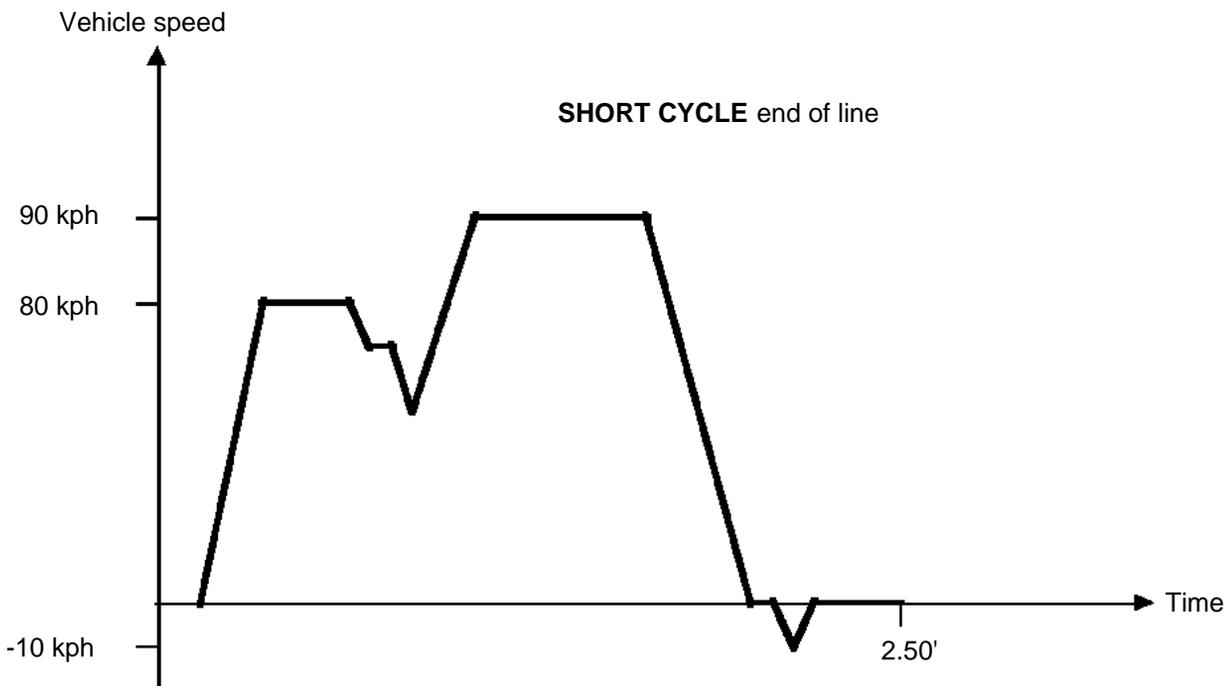
In normal operation, the indicator light coming on signifies that the pollution threshold has been exceeded due to an OBD fault (misfiring, ageing of the oxygen sensors or a fault in the fuel supply), or to an electrical fault causing an OBD fault (injector, coil etc.). If this light flashes, it is indicating a risk of catalytic converter damage.

3 DRIVING CONDITIONS OBD TEST

There are two ways of activating the OBD tests:

- **Short cycle type running** carried out on a roller table at the end of the assembly line (see diagram below) requiring strict load, engine speed, torque etc. conditions. This test requires a specific control of the assembly-line end test tool and **therefore may not be triggered by the after-sales tool.**

The OBD running diagram below is therefore only given for indication purposes, but may give an indication of the speed ranges to implement.



- **A customer road test** using the load and engine speed ranges frequently encountered during the life of the vehicle. This road test is intended to show up the presence of, or validate the repair of, the following faults: **DF204** and **DF205** ageing of the A and B upstream sensors, **DF183** and **DF184** catalytic converters No.1 and No. 2 and **DF202** and **DF203** fuel supply A and B.

The six misfiring faults (**DF111** to **114**, **DF185** and **DF186**) are also OBD faults, but the test is activated after the engine is started. It is therefore not necessary to undertake a road test to validate the repair of these faults.

If the OBD (On Board Diagnostic) faults specified above appear to have been stored in the diagnostic tool, it is recommended that the fault finding procedure is started without trying to make them show up as present then validating the repair by a road test.

3.1 Procedure to be followed for the validation of the repair of an OBD fault

- Carry out a full check using the diagnostic tool.
- Note the OBD fault.
- **DO NOT UNDER ANY CIRCUMSTANCES DELETE THE FAULT.**
- Click on the description of the fault in order to show up the environmental contexts associated with when the fault occurs, **NOTE THEM DOWN OR PRINT THE SCREEN** (they will disappear if the fault is deleted).
- Note the specifications detailed in the instructions section for the fault concerned (repair of electrical faults prior to OBD faults).
- Apply the fault finding process associated with the OBD fault and carry out the necessary repairs.
- Delete the faults using the diagnostic tool.
- If a part has been replaced, ensure that the configurations and the programming of the computer have been effected.
- Carry out a test drive reproducing the stored contexts noted above.
- **DO NOT SWITCH OFF THE IGNITION AT THE END OF THE TEST DRIVE** (to allow the results to be noted) and carry out a diagnostic using the tool.

THE VALIDATION OF THE REPAIR WILL BE CONFIRMED BY THE ABSENCE OF THE FAULT.

3.2 Additional directions on the driving conditions for the OBD test

The principal driving condition necessary for the validation of the repair of an OBD fault are the stored contexts associated with the appearance of the fault (see section above). However, the **catalytic converter** and the **oxygen** sensor tests require certain special conditions:

- **It is necessary to carry out one stage of 90 km/h for a minimum of 60 seconds with 25 to 60 % engine load (see short-cycle OBD test diagram).**

Diagnostics - Fault interpretation

DF003 PRESENT	<p><u>Air temperature sensor circuit</u></p> <p>CO.1 : Open circuit or short circuit to +12 volts</p> <p>CC.0 : Short circuit to earth</p>
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NOTES	None
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Check the **connection and condition of the** air temperature sensor connector.
Change the connector if necessary.

Ensure that the sensor is **correctly inserted** in the inlet manifold.
Reposition it if necessary.

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

computer (connector A)	track C4	→	track 1	of the air temperature sensor
computer (connector A)	track D4	→	track 2	of the air temperature sensor

Repair if necessary.

Check the **resistance** of the sensor by measuring across **track 1** and **track 2** of the air temperature sensor.
Replace the sensor if the resistance is not approximately: **2051 Ω ± 125 Ω** at 25°C.
(For more details, consult the electrical properties of the sensor as a function of temperature in the repair method).

With ignition on, verify the presence of a **5 volt feed** on **track 2** of the sensor.
If there is no feed, **change** the injection computer (reprogram and reconfigure: see introduction).

If the fault persists, **change** the air temperature sensor.

AFTER REPAIR	<p>Clear the fault memory. Deal with any other possible faults.</p>
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Diagnostics - Fault interpretation

DF004 PRESENT OR STORED	<p><u>Coolant temperature sensor circuit</u></p> <p>CO : Open circuit CC.0 : Short circuit to earth CO.1 : Open circuit or short circuit to +12 volts 1.DEF : Inconsistency of the signal</p>
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NOTES	<p>Special notes:</p> <p>A short circuit of the sensor or a short circuit of the two tracks of the sensor will not necessarily be detected by the diagnostic tool (the computer gives priority to defect mode rather than displaying the fault) but it will result in the overheating warning light coming on, the engine cooling fan starting in their second speed and a coolant temperature set at 120°C on the diagnostic tool (substitution value). If the case arises, it is recommended that the diagnostic procedure below is run.</p>
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CO - CC.0 - CO.1	NOTES	<p>Only apply this fault finding procedure if a fault is present designated CO, CC.0 and CO.1.</p>
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<p>Check connection and status of the coolant temperature sensor connector. Change the connector if necessary.</p>										
<p>Connect the borrier in place of the computer and check the insulation, continuity and absence of interference resistance of the connections:</p> <table style="width: 100%; border: none;"> <tr> <td style="padding-left: 20px;">computer (connector A)</td> <td style="padding-left: 20px;">track D3</td> <td style="padding-left: 20px;">→</td> <td style="padding-left: 20px;">track 1</td> <td style="padding-left: 20px;">of the coolant temperature sensor</td> </tr> <tr> <td style="padding-left: 20px;">computer (connector A)</td> <td style="padding-left: 20px;">track D2</td> <td style="padding-left: 20px;">→</td> <td style="padding-left: 20px;">track 2</td> <td style="padding-left: 20px;">of the coolant temperature sensor</td> </tr> </table> <p>Repair if necessary.</p>	computer (connector A)	track D3	→	track 1	of the coolant temperature sensor	computer (connector A)	track D2	→	track 2	of the coolant temperature sensor
computer (connector A)	track D3	→	track 1	of the coolant temperature sensor						
computer (connector A)	track D2	→	track 2	of the coolant temperature sensor						
<p>Check the resistance of the sensor by measuring across track 1 and track 2 of the coolant temperature sensor. Replace the sensor if the resistance is not approximately: 5000 Ω ± 150 Ω at 25°C. (For more details, consult the electrical properties of the sensor as a function of temperature in the repair method.).</p>										
<p>With ignition on, verify the presence of a 5 volt feed on track 2 of the sensor. If there is no feed, change the injection computer (reprogram and reconfigure: see introduction).</p>										
<p>If the fault persists, change the coolant temperature sensor.</p>										

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

DF004 (continued)	
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1.DEF	NOTES	Conditions of application of the diagnostic procedure on a stored fault: the fault is notified as present following: starting the engine (cold engine) then warming the engine up to 60°C.
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Verify the correctness of the engine cooling system : radiator in good condition, unobstructed flow of cooling air (radiator not obstructed by leaves, etc.), coolant correctly bled, etc.
Using the diagnostic tool, monitor the temperature of the engine coolant (PR002). After starting (cold engine), at idle speed the temperature should rise uniformly without wavering. If the temperature rise is not linear (temperature curve rises or falls sharply), change the coolant temperature sensor.
If the fault persists, change the coolant temperature sensor.

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

DF008 PRESENT OR STORED	<p><u>Fuel pump relay control circuit</u></p> <p>CO : Open circuit CC.0 : Short circuit to earth CC.1 : Short circuit to +12 volts</p>
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NOTES	<p>Priority for dealing with a combination of faults: First, deal with the DF157 battery voltage fault if it is present or stored.</p>
	<p>Conditions for applying the fault finding procedure to the fault stored: The fault is declared present when the engine is started or the following command is issued: AC010 fuel pump relay.</p>
	<p>Special note: On the after-sales diagram, the fuel pump relay is referred to as the "injection relay".</p>

Check the condition of the clips on the injection relay (in the engine fuse/relay box). Replace the clips if necessary.
Ensure the presence of a +12 V accessories signal on track 1 and on track 3 of the injection relay. Repair if necessary.
Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connection: computer (connector C) track H4 \longrightarrow track 2 of the injection relay. Repair if necessary.
Check the resistance of the relay by measuring across track 1 and track 2 of the relay. Replace the sensor if the resistance is not approximately: 65 Ω \pm 5 Ω at 25°C.
If the fault persists, change the injection relay.

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

DF010 PRESENT OR STORED	<p><u>Low-speed fan circuit (fan 1)</u></p> <p>CO : Open circuit CC.0 : Short circuit to earth CC.1 : Short circuit to +12 volts</p>
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NOTES	<p>Conditions for applying the fault finding procedure to the fault stored: The fault is declared present once the engine is started or the AC271 low-speed fan relay command is issued.</p>
	<p>Special notes: This fault only appears on the diagnostic tool if the computer has detected a problem in the control circuit of the relays; it is therefore essential to consult the vehicle wiring diagram in order to confirm the power circuit of the fan assembly relays.</p>

	<p>Check the condition of the clips of the fan 1 relays (in the engine fuse/relay box). Replace the clips if necessary.</p>
	<p>Ensure presence of a +12 volt accessories signal on track 1 of the fan 1 relays (large 50A violet relay and small 25A black or grey relay: see diagrams). Repair if necessary.</p>
	<p>Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connection: computer (connector B) track J4 \longrightarrow track 2 of the fan 1 relay Repair if necessary.</p>
	<p>Check the resistance of the relays by measuring across track 1 and track 2 of the relays. Replace the relays if their resistance is not approximately</p> <ul style="list-style-type: none"> - 85 Ω \pm 5 Ω at 25°C for the 25A black or grey relay. - 65 Ω \pm 5 Ω at 25°C for the 50A violet relay.
	<p>If the fault persists, change the fan 1 relay.</p>

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

DF011 PRESENT	<u>Fault warning light circuit</u> CO : Open circuit CC.0 : Short circuit to earth CC.1 : Short circuit to +12 volts
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NOTES	None
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Ensure **the presence of a +12 V accessories signal** on the instrument panel connector (see instrument panel diagrams).
Repair if necessary.

Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** of the connection:
 computer (connector B) **track J3**  instrument panel connector
 (see instrument panel diagrams)

Repair if necessary.

Check that the bulb is in good condition.
Change if necessary.

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

DF014 PRESENT OR STORED	<p><u>Canister bleed solenoid valve circuit</u></p> <p>CO : Open circuit CC.0 : Short circuit to earth CC.1 : Short circuit to +12 volts</p>
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NOTES	<p>Conditions for applying the fault finding procedure to the fault stored: The fault is declared present when the engine is started or the following command is issued: AC016 canister bleed solenoid valve.</p>
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	<p>Check the connection and condition of the canister bleed solenoid valve connector. Change the connector if necessary.</p>
	<p>With the ignition switched on, check the presence of +12 V on track 1 of the canister bleed solenoid valve.</p>
	<p>If there is no feed, check the insulation, continuity and absence of interference resistance of the connection: injection relay track 5 \longrightarrow track 1 of the canister bleed solenoid valve Repair if necessary.</p>
	<p>Connect the borrier in place of the computer and check the insulation, continuity and absence of interference resistance of the connection: computer (connector C) track F4 \longrightarrow track 2 of the canister bleed solenoid valve. Repair if necessary.</p>
	<p>Check the resistance of the solenoid valve by measuring across track 1 and track 2 of the canister bleed solenoid valve. Replace the solenoid valve if the resistance is not around 26 Ω \pm 4 Ω at 23°C.</p>
	<p>If the fault persists, change the canister bleed solenoid valve.</p>

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

DF022 PRESENT	<u>Computer</u>
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NOTES	Special note: Engine does not start.
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Make sure that **the battery is correctly charged**. If it is not, carry out fault finding on the charging circuit.

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

- | | | | | |
|------------------------|-----------------|---|-----------------------|--|
| computer (connector C) | track L3 | → | track 5 | of the injection locking relay |
| computer (connector C) | track E1 | → | track 2 | of the injection locking relay |
| computer (connector B) | track B4 | → | injection fuse | + after ignition feed (see vehicle diagrams) |
| computer (connector A) | track H1 | → | earth | |
| computer (connector B) | track L4 | → | earth | |
| computer (connector B) | track M4 | → | earth | |
| computer (connector C) | track M4 | → | earth | |

Repair if necessary.

If the fault persists, **change** the injection computer (reprogram and reconfigure where necessary).

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

DF030 PRESENT OR STORED	<p><u>Low-speed fan circuit (fan 2)</u></p> <p>CO : Open circuit CC.0 : Short circuit to earth CC.1 : Short circuit to +12 volts</p>
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NOTES	<p>Conditions for applying the fault finding procedure to the fault stored: The fault is declared present when the engine is started or the following command is issued: AC272 fan relay - high speed.</p>
	<p>Special note: This fault only appears on the diagnostic tool if the computer has detected a problem in the control circuit of the relays; it is therefore essential to consult the vehicle wiring diagram in order to confirm the power circuit of the fan assembly relays.</p>

	<p>Check the condition of the clips of the fan 2 relays (in the engine fuse/relay box). Replace the clips if necessary.</p>
	<p>Ensure presence of a +12 volt accessories signal on tracks 1 and 3 of the fan 2 relays (large 50A violet relay) and on track 1 of the second relay of fan 2 (small 25A black or grey relay). Repair if necessary.</p>
	<p>Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connections:</p> <p style="margin-left: 20px;"> computer (connector B) track K4 \longrightarrow track 2 of the violet fan 2 relay computer (connector B) track K4 \longrightarrow track 2 of the black or grey fan 2 relay </p> <p>Repair if necessary.</p>
	<p>Check the resistance of the relays by measuring across track 1 and track 2 of the relays. Replace the relays if their resistance is not approximately</p> <ul style="list-style-type: none"> - 85 Ω \pm 5 Ω at 25°C for the 25A black or grey relay. - 65 Ω \pm 5 Ω at 25°C for the 50A violet relay.
	<p>If the fault persists, change the fan 2 relays.</p>

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

DF032 PRESENT OR STORED	<p><u>Coolant temperature overheat warning light circuit</u></p> <p>CO : Open circuit CC.0 : Short circuit to earth CC.1 : Short circuit to +12 volts</p>
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NOTES	<p>None</p>
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Ensure **the presence of a +12 V accessories signal** on the instrument panel connector (see instrument panel diagrams).
 Repair if necessary.

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

computer (connector B) **track K3** instrument panel connector
 (see instrument panel diagrams)

Repair if necessary.

Check that the bulb is in good condition.
 Change if necessary.

AFTER REPAIR	<p>Clear the fault memory. Deal with any other possible faults.</p>
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Diagnostics - Fault interpretation

DF045 PRESENT OR STORED	<p><u>Manifold pressure sensor circuit</u></p> <p>CO : Open circuit CC.0 : Short circuit to earth CO.1 : Open circuit or short circuit to +12 volts 1.DEF : Inconsistency of the signal</p>
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NOTES	<p>Priority for dealing with a combination of faults: As a priority, process fault DF137 motorised throttle if it is present or stored.</p>
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CO - CC.0 - CO.1	NOTES	<p>Only apply this fault finding procedure if a fault is present with CO, CC.0 and CO.1.</p>
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<p>Check the connector on the pressure sensor for proper mating and its general condition. Change the connector if necessary.</p>															
<p>Check that the pressure sensor is correctly inserted in the inlet manifold.</p>															
<p>Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connections: 675 674</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">computer (connector A)</td> <td style="width: 10%;">track B3</td> <td style="width: 10%; text-align: center;">→</td> <td style="width: 10%;">track 1</td> <td style="width: 30%;">of the pressure sensor</td> </tr> <tr> <td>computer (connector A)</td> <td>track C3</td> <td style="text-align: center;">→</td> <td>track 2</td> <td>of the pressure sensor</td> </tr> <tr> <td>computer (connector A)</td> <td>track A3</td> <td style="text-align: center;">→</td> <td>track 3</td> <td>of the pressure sensor</td> </tr> </table> <p>Repair if necessary.</p>	computer (connector A)	track B3	→	track 1	of the pressure sensor	computer (connector A)	track C3	→	track 2	of the pressure sensor	computer (connector A)	track A3	→	track 3	of the pressure sensor
computer (connector A)	track B3	→	track 1	of the pressure sensor											
computer (connector A)	track C3	→	track 2	of the pressure sensor											
computer (connector A)	track A3	→	track 3	of the pressure sensor											
<p>Ensure the presence of a 5 volt feed on track 3 of the sensor. If there is no feed, change the injection computer (reprogram and reconfigure: see introduction).</p>															
<p>If the fault persists, change the pressure sensor.</p>															

1.DEF	NOTES	<p>Condition for the application of the fault finding strategy to the fault stored.: The fault is declared present after the engine has been started.</p>
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<p>Ensure absence of air leaks on the inlet manifold, particularly at the manifold pressure sensor (behind the manifold).</p>
<p>Check on the diagnostic tool that parameter PR001 manifold pressure - is indicating a consistent value (if necessary perform a conformity check). If the pressure measurement is not consistent, change the manifold pressure sensor.</p>
<p>If the fault persists, change the manifold pressure sensor.</p>

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

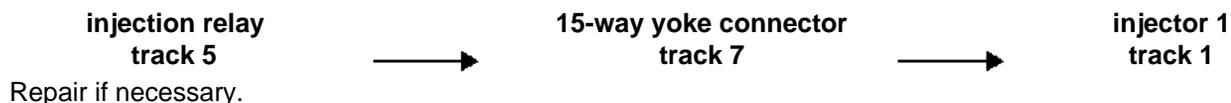
DF084 PRESENT OR STORED	<u>Cylinder 1 injector command</u> CO : Open circuit CC.0 : Short circuit to earth CC.1 : Short circuit to +12 volts
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NOTES	Conditions for applying the fault finding procedure to the fault stored: The fault is declared present when the engine is started or the following command is issued: AC040 - injector, cylinder 1.
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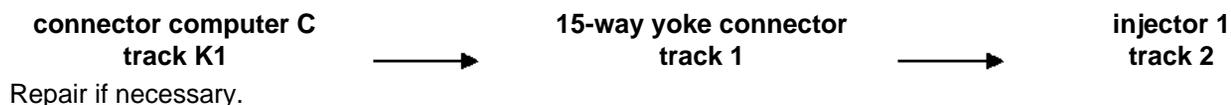
Check the injector connector for **proper mating and general** condition.
Change the connector if necessary.

With the ignition on, check **the presence of +12 V** on **track 1** of the injector.

If there is no feed, check the **insulation, continuity and absence of interference resistance** of the connection:



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



Check the **resistance** of the injector, measuring across **track 1** and **track 2** of the injector.
Replace the injector if the resistance is not approximately: **14.5 Ω ± 0.7 Ω** at 20°C.

If the fault persists, **change** injector No.1.

AFTER REPAIR	Clear the fault memory. Follow the instructions to confirm repair. Carry out an OBD (On Board Diagnostic) running test (see introduction) to ensure that the injector fault has not caused a deterioration in the catalytic converter. Deal with any other possible faults.
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Diagnostics - Fault interpretation

DF085 PRESENT OR STORED	<p><u>Cylinder 2 injector command</u></p> <p>CO : Open circuit CC.0 : Short circuit to earth CC.1 : Short circuit to +12 volts</p>
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NOTES	<p>Conditions for applying the fault finding procedure to the fault stored: The fault is declared present when the engine is started or the following command is issued: AC041 - injector, cylinder 2.</p>
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<p>Check the injector connector for proper mating and general condition. Change the connector if necessary.</p>
<p>With ignition on, check the presence of +12 V on track 1 of the injector.</p>
<p>If there is no feed, check the insulation, continuity and absence of interference resistance of the connection:</p> <div style="display: flex; justify-content: space-around; align-items: center; text-align: center;"> <div style="width: 30%;"> <p>injection relay track 5</p> <p>Repair if necessary.</p> </div> <div style="width: 10%; text-align: center;"> <p>→</p> </div> <div style="width: 30%;"> <p>black 15-way yoke connector track 7</p> </div> <div style="width: 10%; text-align: center;"> <p>→</p> </div> <div style="width: 15%;"> <p>injector 2 track 1</p> </div> </div>
<p>Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connection:</p> <div style="display: flex; justify-content: space-around; align-items: center; text-align: center;"> <div style="width: 30%;"> <p>connector computer C track J3</p> <p>Repair if necessary.</p> </div> <div style="width: 10%; text-align: center;"> <p>→</p> </div> <div style="width: 30%;"> <p>15-way yoke connector track 2</p> </div> <div style="width: 10%; text-align: center;"> <p>→</p> </div> <div style="width: 15%;"> <p>injector 2 track 2</p> </div> </div>
<p>Check the resistance of the injector, measuring across track 1 and track 2 of the injector. Replace the injector if the resistance is not approximately: 14.5 Ω ± 0.7 Ω at 20°C.</p>
<p>If the fault persists, change injector No.2.</p>

AFTER REPAIR	<p>Clear the fault memory. Follow the instructions to confirm repair. Carry out an OBD (On Board Diagnostic) running test (see introduction) to ensure that the injector fault has not caused a deterioration in the catalytic converter. Deal with any other possible faults.</p>
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Diagnostics - Fault interpretation

DF086 PRESENT OR STORED	<p><u>Cylinder 3 injector command</u></p> <p>CO : Open circuit CC.0 : Short circuit to earth CC.1 : Short circuit to +12 volts</p>
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NOTES	<p>Conditions for applying the fault finding procedure to the fault stored: The fault is declared present when the engine is started or the following command is issued: AC042 - injector, cylinder 3.</p>
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<p>Check the injector connector for proper mating and general condition. Change the connector if necessary.</p>
<p>With ignition on, check for the presence of +12 V on track 1 of the injector.</p>
<p>If there is no feed, check the insulation, continuity and absence of interference resistance of the connection:</p> <div style="display: flex; justify-content: space-around; align-items: center; margin: 10px 0;"> <div style="text-align: center;"> <p>injection relay track 5</p> <p>Repair if necessary.</p> </div> <div style="text-align: center;"> <p>—————▶</p> </div> <div style="text-align: center;"> <p>15-way yoke connector track 7</p> </div> <div style="text-align: center;"> <p>—————▶</p> </div> <div style="text-align: center;"> <p>injector 3 track 1</p> </div> </div>
<p>Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connection:</p> <div style="display: flex; justify-content: space-around; align-items: center; margin: 10px 0;"> <div style="text-align: center;"> <p>connector computer C track K3</p> <p>Repair if necessary.</p> </div> <div style="text-align: center;"> <p>—————▶</p> </div> <div style="text-align: center;"> <p>15-way yoke connector track 3</p> </div> <div style="text-align: center;"> <p>—————▶</p> </div> <div style="text-align: center;"> <p>injector 3 track 2</p> </div> </div>
<p>Check the resistance of the injector, measuring across track 1 and track 2 of the injector. Replace the injector if the resistance is not approximately: 14.5 Ω ± 0.7 Ω at 20°C.</p>
<p>If the fault persists, change injector No.3.</p>

AFTER REPAIR	<p>Clear the fault memory. Follow the instructions to confirm repair. Carry out an OBD (On Board Diagnostic) running test (see introduction) to ensure that the injector fault has not caused a deterioration in the catalytic converter. Deal with any other possible faults.</p>
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Diagnostics - Fault interpretation

DF087 PRESENT OR STORED	<p><u>Cylinder 4 injector command</u></p> <p>CO : Open circuit CC.0 : Short circuit to earth CC.1 : Short circuit to +12 volts</p>
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NOTES	<p>Conditions for applying the fault finding procedure to the fault stored: The fault is declared present when the engine is started or the following command is issued: AC043 - injector, cylinder 4.</p>
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<p>Check the injector connector for proper mating and general condition. Change the connector if necessary.</p>
<p>With ignition on, check for the presence of +12 V on track 1 of the injector.</p>
<p>If there is no feed, check the insulation, continuity and absence of interference resistance of the connection:</p> <div style="display: flex; justify-content: space-around; align-items: center; text-align: center;"> <div style="width: 30%;"> <p>injection relay track 5</p> <p>Repair if necessary.</p> </div> <div style="width: 10%; text-align: center;"> <p>→</p> </div> <div style="width: 30%;"> <p>black 15-way yoke connector track 7</p> </div> <div style="width: 10%; text-align: center;"> <p>→</p> </div> <div style="width: 15%;"> <p>injector 4 track 1</p> </div> </div>
<p>Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connection:</p> <div style="display: flex; justify-content: space-around; align-items: center; text-align: center;"> <div style="width: 30%;"> <p>connector computer C track J4</p> <p>Repair if necessary.</p> </div> <div style="width: 10%; text-align: center;"> <p>→</p> </div> <div style="width: 30%;"> <p>15-way yoke connector track 4</p> </div> <div style="width: 10%; text-align: center;"> <p>→</p> </div> <div style="width: 15%;"> <p>injector 4 track 2</p> </div> </div>
<p>Check the resistance of the injector, measuring across track 1 and track 2 of the injector. Replace the injector if the resistance is not approximately: 14.5 Ω ± 0.7 Ω at 20°C.</p>
<p>If the fault persists, change injector No.4.</p>

AFTER REPAIR	<p>Clear the fault memory. Follow the instructions to confirm repair. Carry out an OBD (On Board Diagnostic) running test (see introduction) to ensure that the injector fault has not caused a deterioration in the catalytic converter. Deal with any other possible faults.</p>
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Diagnostics - Fault interpretation

DF111 PRESENT OR STORED	<u>Misfiring in cylinder 1</u>
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NOTES	<p>Priority for dealing with a combination of faults: Give priority to processing the DF084, DF085, DF086, DF087, DF160, DF161, Injectors 1 to 6 control; DF192, DF193, DF194, DF195, DF196, DF197, Cylinders 1 to 6 coil control; DF238, Engine speed sensor; DF180, DF181, Downstream oxygen sensors 1 and 2; DF178, DF179, Upstream oxygen sensors 1 and 2; DF202, DF203, Fuel supply banks A and B and DF198, DF201 Heating the upstream and downstream oxygen sensors on banks A and B faults if they are present or stored.</p>
	<p>Conditions for applying the fault finding procedure to the fault stored: The fault is declared present after the engine has been started.</p>
	<p>Special notes: The OBD (on-board diagnostics) warning light will come on to show that the engine is misfiring, which means that the vehicle does not comply with emission control standards. Flashing of the OBD warning light indicates the risk of destruction of the catalytic converter.</p>

<p>Check the ignition system, confirming the condition of the spark plug and the low and high tension contacts of the coil of cylinder 1. Replace any faulty parts where necessary.</p>
<p>Check the compression ratio of cylinder 1. Repair if necessary.</p>
<p>Check the flywheel target (deformation or cracks). Change the flywheel if necessary.</p>
<p>Make sure that there is no leakage at the inlet manifold. Repair if necessary.</p>
<p>If no anomaly is found, then there must be a problem with the fuel system. Therefore check:</p> <ul style="list-style-type: none"> – condition of the fuel filter – the petrol flow and pressure (the pressure should to be equal to 3.5 bar), – cleanness of the tank, – condition of the injector of cylinder 1, – conformity of the fuel. <p>Replace the defective component.</p>

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

DF112 PRESENT OR STORED	<u>Misfiring in cylinder 2</u>
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NOTES	<p>Priority for dealing with a combination of faults: Give priority to processing the DF084, DF085, DF086, DF087, DF160, DF161, Injectors 1 to 6 control; DF192, DF193, DF194, DF195, DF196, DF197, Cylinders 1 to 6 coil control; DF238, Engine speed sensor; DF180, DF181, Downstream oxygen sensors 1 and 2; DF178, DF179, Upstream oxygen sensors 1 and 2; DF202, DF203, Fuel supply banks A and B and DF198, DF201 Heating the upstream and downstream oxygen sensors on banks A and B faults if they are present or stored.</p>
	<p>Conditions for applying the fault finding procedure to the fault stored: The fault is declared present after the engine has been started.</p>
	<p>Special notes: The OBD (on-board diagnostics) warning light will come on to show that the engine is misfiring, which means that the vehicle does not comply with emission control standards. Flashing of the OBD warning light indicates the risk of destruction of the catalytic converter.</p>

<p>Check the ignition system, confirming the condition of the spark plug and the low and high tension contacts of the coil of cylinder 2. Replace any faulty parts where necessary.</p>
<p>Check the compression ratio of cylinder 2. Repair if necessary.</p>
<p>Check the flywheel target (deformation or cracks). Change the flywheel if necessary.</p>
<p>Make sure that there is no leakage at the inlet manifold. Repair if necessary.</p>
<p>If no anomaly is found, then there must be a problem with the fuel system. Therefore check:</p> <ul style="list-style-type: none"> – condition of the fuel filter – the petrol flow and pressure (the pressure should to be equal to 3.5 bar), – cleanness of the tank, – condition of the injector of cylinder 2, – conformity of the fuel. <p>Replace the defective component.</p>

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

DF113 PRESENT OR STORED	<u>Misfiring in cylinder 3</u>
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NOTES	<p>Priority for dealing with a combination of faults: Give priority to processing the DF084, DF085, DF086, DF087, DF160, DF161, Injectors 1 to 6 control; DF192, DF193, DF194, DF195, DF196, DF197, Cylinders 1 to 6 coil control; DF238, Engine speed sensor; DF180, DF181, Downstream oxygen sensors 1 and 2; DF178, DF179, Upstream oxygen sensors 1 and 2; DF202, DF203, Fuel supply banks A and B and DF198, DF201 Heating the upstream and downstream oxygen sensors on banks A and B faults if they are present or stored.</p>
	<p>Conditions for applying the fault finding procedure to the fault stored: The fault is declared present after the engine has been started.</p>
	<p>Special notes: The OBD (on-board diagnostics) warning light will come on to show that the engine is misfiring, which means that the vehicle does not comply with emission control standards. Flashing of the OBD warning light indicates the risk of destruction of the catalytic converter.</p>

<p>Check the ignition system, confirming the condition of the spark plug and the low and high tension contacts of the coil of cylinder 3. Replace any faulty parts where necessary.</p>
<p>Check the compression ratio of cylinder 3. Repair if necessary.</p>
<p>Check the flywheel target (deformation or cracks). Change the flywheel if necessary.</p>
<p>Make sure that there is no leakage at the inlet manifold. Repair if necessary.</p>
<p>If no anomaly is found, then there must be a problem with the fuel system. Therefore check:</p> <ul style="list-style-type: none"> – condition of the fuel filter – the petrol flow and pressure (the pressure should to be equal to 3.5 bar), – cleanness of the tank, – condition of the injector of cylinder 3, – conformity of the fuel. <p>Replace the defective component.</p>

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

DF114 PRESENT OR STORED	<u>Misfiring in cylinder 4</u>
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NOTES	<p>Priority for dealing with a combination of faults: Give priority to processing the DF084, DF085, DF086, DF087, DF160, DF161, Injectors 1 to 6 control; DF192, DF193, DF194, DF195, DF196, DF197, Cylinders 1 to 6 coil control; DF238, Engine speed sensor; DF180, DF181, Downstream oxygen sensors 1 and 2; DF178, DF179, Upstream oxygen sensors 1 and 2; DF202, DF203, Fuel supply banks A and B and DF198, DF201 Heating the upstream and downstream oxygen sensors on banks A and B faults if they are present or stored.</p>
	<p>Conditions for applying the fault finding procedure to the fault stored: The fault is declared present after the engine has been started.</p>
	<p>Special notes: The OBD (on-board diagnostics) warning light will come on to show that the engine is misfiring, which means that the vehicle does not comply with emission control standards. Flashing of the OBD warning light indicates the risk of destruction of the catalytic converter.</p>

<p>Check the ignition system, confirming the condition of the spark plug and the low and high tension contacts of the coil of cylinder 4. Replace any faulty parts where necessary.</p>
<p>Check the compression ratio of cylinder 4. Repair if necessary.</p>
<p>Check the flywheel target (deformation or cracks). Change the flywheel if necessary.</p>
<p>Make sure that there is no leakage at the inlet manifold. Repair if necessary.</p>
<p>If no anomaly is found, then there must be a problem with the fuel system. Therefore check:</p> <ul style="list-style-type: none"> – condition of the fuel filter – the petrol flow and pressure (the pressure should to be equal to 3.5 bar), – cleanness of the tank, – condition of the injector of cylinder 4, – conformity of the fuel. <p>Replace the defective component.</p>

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

DF118 PRESENT OR STORED	<p><u>Coolant pressure sensor circuit</u></p> <p>CO : Open circuit CC.0 : Short circuit to earth CC.1 : Short circuit to +12 volts</p>
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NOTES	<p>Priority for dealing with a combination of faults: Give priority to the processing of DF010 low-speed fan circuit and DF126 - pedal potentiometer track 2, if they are present or stored.</p>
	<p>Conditions for applying the fault finding procedure to the fault stored: The fault is declared present once the air conditioning has been switched on and the passenger compartment blower unit is operating.</p>

<p>Check the connection and condition of the coolant pressure sensor connector. Change the connector if necessary.</p>																				
<p>Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connections:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">computer (connector B)</td> <td style="width: 10%;">track D4</td> <td style="width: 10%; text-align: center;">→</td> <td style="width: 10%;">track 1</td> <td style="width: 30%;">of the coolant pressure sensor</td> </tr> <tr> <td>computer (connector B)</td> <td>track E4</td> <td style="text-align: center;">→</td> <td>track 2</td> <td>of the coolant pressure sensor</td> </tr> <tr> <td>computer (connector B)</td> <td>track A3</td> <td style="text-align: center;">→</td> <td>track 3</td> <td>of the coolant pressure sensor</td> </tr> <tr> <td></td> <td></td> <td style="text-align: center;">→</td> <td>track 1</td> <td>of the pedal potentiometer (track 2)</td> </tr> </table> <p>Repair if necessary.</p>	computer (connector B)	track D4	→	track 1	of the coolant pressure sensor	computer (connector B)	track E4	→	track 2	of the coolant pressure sensor	computer (connector B)	track A3	→	track 3	of the coolant pressure sensor			→	track 1	of the pedal potentiometer (track 2)
computer (connector B)	track D4	→	track 1	of the coolant pressure sensor																
computer (connector B)	track E4	→	track 2	of the coolant pressure sensor																
computer (connector B)	track A3	→	track 3	of the coolant pressure sensor																
		→	track 1	of the pedal potentiometer (track 2)																
<p>With ignition on, verify the presence of a 5 volt feed on track 2 of the sensor. If there is no feed, change the injection computer.</p>																				
<p>If the fault persists, change the coolant pressure sensor.</p>																				

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

DF125 PRESENT	<p><u>Pedal potentiometer track 1 circuit</u></p> <p>CO.1 : Open circuit ouvert or short circuit to +12 volts CO.0 : Open circuit or short circuit to earth 1.DEF : Inconsistency of the signal</p>
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NOTES	<p>Priority for dealing with a combination of faults: give priority to the processing of the DF126 pedal potentiometer 2 circuit fault if it is present or stored.</p>
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	<p>Check the connection and condition of the pedal potentiometer connector. Change the connector if necessary.</p>															
	<p>Check that the accelerator pedal is properly actuating the sensor.</p>															
	<p>Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connections:</p> <table style="margin-left: 20px;"> <tr> <td>computer (connector B)</td> <td>track A1</td> <td>————→</td> <td>track 3</td> <td>of the accelerator pedal sensor</td> </tr> <tr> <td>computer (connector B)</td> <td>track K1</td> <td>————→</td> <td>track 2</td> <td>of the accelerator pedal sensor</td> </tr> <tr> <td>computer (connector B)</td> <td>track B1</td> <td>————→</td> <td>track 4</td> <td>of the accelerator pedal sensor</td> </tr> </table> <p>Repair if necessary.</p>	computer (connector B)	track A1	————→	track 3	of the accelerator pedal sensor	computer (connector B)	track K1	————→	track 2	of the accelerator pedal sensor	computer (connector B)	track B1	————→	track 4	of the accelerator pedal sensor
computer (connector B)	track A1	————→	track 3	of the accelerator pedal sensor												
computer (connector B)	track K1	————→	track 2	of the accelerator pedal sensor												
computer (connector B)	track B1	————→	track 4	of the accelerator pedal sensor												
	<p>Check the resistance of the pedal potentiometer no. 1 by measuring across track 2 and track 4 of the potentiometer. Replace the potentiometer if the resistance is not approximately: 1.2 Ω ± 480 Ω at 20°C.</p>															
	<p>With ignition on, verify the presence of a 5 volt feed on track 4 of the potentiometer. If there is no feed, change the injection computer (reprogram and reconfigure: see introduction).</p>															
	<p>If the fault persists, change the pedal potentiometer.</p>															

AFTER REPAIR	<p>Clear the fault memory. Deal with any other possible faults.</p>
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Diagnostics - Fault interpretation

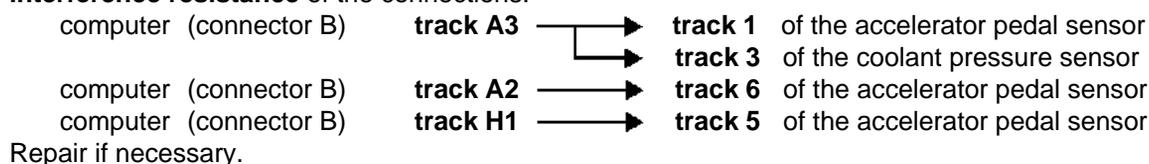
DF126 PRESENT	<p><u>Pedal potentiometer track 2 circuit</u></p> <p>CO.1 : Open circuit ouvert or short circuit to +12 volts CO.0 : Open circuit or short circuit to earth 1.DEF : Inconsistency of the signal</p>
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NOTES	None
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Check the **connection and condition** of the pedal potentiometer connector.
Change the connector if necessary.

Check that the accelerator pedal is properly actuating the sensor.

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



Check the **resistance** of the pedal potentiometer no. 2 by measuring across **track 5** and **track 1** of the potentiometer. Replace the potentiometer if the resistance is not approximately: **1.7 Ω ± 680 Ω** at 20°C.

With ignition on, verify the presence of a **5 volt feed** on **track 5** of the potentiometer. If there is no feed, **change** the injection computer (reprogram and reconfigure: see introduction).

If the fault persists, **change** the pedal potentiometer.

AFTER REPAIR	<p>Clear the fault memory. Deal with any other possible faults.</p>
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Diagnostics - Fault interpretation

DF135 PRESENT OR STORED	<p><u>Brake-pedal sensor circuit</u></p> <p>1.DEF : Failure of one of the two contacts of the brake pedal 2.DEF : Failure of both contacts of the brake pedal</p>
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NOTES	<p>Conditions for applying the fault finding procedure to the fault stored: The fault is declared present following application of 2-second pressure on the brake pedal ten times.</p>
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Check the connector on the brake-pedal switch for **proper mating** and its general condition.
 Change the connector if necessary.

Ensure **correct adjustment** of the brake-pedal switch (refer to repair methods).

With the ignition on, check for **presence of +12 V** on **track A1** and on **track B1** of the stop light switch.

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

computer (connector B) **track B2** \longrightarrow **track B3** of the stop light switch.
 computer (connector B) **track M1** \longrightarrow **track A3** of the stop light switch.

Repair if necessary.

Disconnect the pedal-sensor connector and check condition of contacts using an ohmmeter.
Change the pedal sensor if it does not operate as specified below:

Pedal in rest position

continuity between tracks B1 and A3
 isolation of tracks A1 and B3

Pedal pressed

isolation of tracks B1 and A3
 continuity between tracks A1 and B3

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

DF137 PRESENT OR STORED	<p><u>Motorised throttle</u></p> <p>1.DEF : Signal above maximum 2.DEF : Signal below minimum 3.DEF : General control fault of motorised throttle</p>
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NOTES	<p>Priority for dealing with a combination of faults: As a priority, process the DF045 manifold pressure-sensor circuit fault if it is present or stored.</p>
	<p>Special note: If the two potentiometers are faulty or the throttle motor is faulty, the motorised throttle will move to the emergency position which may be recognised by an engine speed fixed at around 1500 rpm. These two faults cause the fault in fuel injection warning light to come on (orange warning light in the matrix: injection fault severity 1).</p>

1.DEF - 2.DEF	NOTES	<p>Condition for the application of the fault finding strategy to the fault stored.: The fault is declared present when the engine is started and the accelerator pedal is depressed.</p>
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Check the connection and condition of the motorised throttle connector. Change the connector if necessary.																				
Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connections: <table style="width: 100%; margin-top: 5px;"> <tr> <td style="width: 25%;">computer (connector C)</td> <td style="width: 15%;">track C3</td> <td style="width: 10%; text-align: center;">—————▶</td> <td style="width: 15%;">track 3</td> <td style="width: 35%;">of the motorised throttle</td> </tr> <tr> <td>computer (connector C)</td> <td>track B4</td> <td style="text-align: center;">—————▶</td> <td>track 4</td> <td>of the motorised throttle</td> </tr> <tr> <td>computer (connector C)</td> <td>track C4</td> <td style="text-align: center;">—————▶</td> <td>track 5</td> <td>of the motorised throttle</td> </tr> <tr> <td>computer (connector C)</td> <td>track B3</td> <td style="text-align: center;">—————▶</td> <td>track 6</td> <td>of the motorised throttle</td> </tr> </table> Repair if necessary.	computer (connector C)	track C3	—————▶	track 3	of the motorised throttle	computer (connector C)	track B4	—————▶	track 4	of the motorised throttle	computer (connector C)	track C4	—————▶	track 5	of the motorised throttle	computer (connector C)	track B3	—————▶	track 6	of the motorised throttle
computer (connector C)	track C3	—————▶	track 3	of the motorised throttle																
computer (connector C)	track B4	—————▶	track 4	of the motorised throttle																
computer (connector C)	track C4	—————▶	track 5	of the motorised throttle																
computer (connector C)	track B3	—————▶	track 6	of the motorised throttle																
Ensure the presence of a 5-volt supply by measuring across track 5 (+) and track 3 (earth) of the motorised throttle connector. If there is no feed, change the injection computer.																				
Check the resistance of the throttle potentiometers measuring across track 3 and track 5 of the motorised throttle (connector disconnected). Replace the motorised throttle if the resistance is not approximately: 1.2 Ω ± 240 Ω at 20°C.																				
If the fault persists, change the motorised throttle.																				

AFTER REPAIR	<p>If the computer or throttle body is replaced, reprogram the throttle stops (see fault finding introduction). Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.</p>
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Diagnostics - Fault interpretation

DF137 (continued)	
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3.DEF	NOTES	<p>Condition for the application of the fault finding strategy to the fault stored.: The fault is declared present after the engine has been started and the accelerator pedal is depressed.</p>
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Check the connection and condition of the motorised throttle connector. Change the connector if necessary.
Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connections: computer (connector C) track L4 \longrightarrow track 1 of the motorised throttle computer (connector C) track M3 \longrightarrow track 2 of the motorised throttle Repair if necessary.
A short circuit in both signals of the potentiometer simultaneously may give rise to designation 3.DEF: Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connections: computer (connector C) track B4 \longrightarrow track 4 of the motorised throttle (signal No.1) computer (connector C) track B3 \longrightarrow track 6 of the motorised throttle (signal No.2) Repair if necessary.
Check the resistance of the throttle motor measuring across track 1 and track 2 of the motorised throttle (connector disconnected). Replace the motorised throttle if the resistance is not approximately: $2 \Omega \pm 1 \Omega$ at 20°C.
If the fault persists, change the motorised throttle.

AFTER REPAIR	If the computer or throttle body is replaced, reprogram the throttle stops (see fault finding introduction). Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.
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Diagnostics - Fault interpretation

DF157 PRESENT OR STORED	<u>Battery voltage</u>
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NOTES	Conditions for applying the fault finding procedure to the fault stored: The fault is declared present after engine has been running more than 3 minutes and vehicle speed > 0 kph.
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Make sure that the cable connecting the battery to the starter motor, the battery earth cable to the chassis and the chassis earth cable to the engine and transmission assembly (GMP) **are in good condition.**
 Repair if necessary.

Make sure that the **battery is in a good state of charge** and, if necessary, check the charging circuit.

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

computer (connector B) **track B4** \longrightarrow **injection fuse** + after ignition feed (see vehicle diagrams)

computer (connector C) **track L3** \longrightarrow **track 5** of the injection locking relay

Repair if necessary.

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

DF160 PRESENT OR STORED	<p><u>Cylinder 5 injector command</u></p> <p>CO : Open circuit CC.0 : Short circuit to earth CC.1 : Short circuit to +12 volts</p>
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NOTES	<p>Conditions for applying the fault finding procedure to the fault stored: The fault is declared present when the engine is started or the following command is issued: AC044 - injector, cylinder 5.</p>
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<p>Check the injector connector for proper mating and general condition. Change the connector if necessary.</p>
<p>With ignition on, check the presence of +12 V on track 1 of the injector.</p>
<p>If there is no feed, check the insulation, continuity and absence of interference resistance of the connection:</p> <div style="display: flex; justify-content: space-around; align-items: center; text-align: center;"> <div style="width: 30%;"> <p>injection relay track 5</p> <p>Repair if necessary.</p> </div> <div style="width: 10%; text-align: center;"> <p>→</p> </div> <div style="width: 30%;"> <p>15-way yoke connector track 7</p> </div> <div style="width: 10%; text-align: center;"> <p>→</p> </div> <div style="width: 30%;"> <p>injector 5 track 1</p> </div> </div>
<p>Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connection:</p> <div style="display: flex; justify-content: space-around; align-items: center; text-align: center;"> <div style="width: 30%;"> <p>connector computer C track K4</p> <p>Repair if necessary.</p> </div> <div style="width: 10%; text-align: center;"> <p>→</p> </div> <div style="width: 30%;"> <p>15-way yoke connector track 5</p> </div> <div style="width: 10%; text-align: center;"> <p>→</p> </div> <div style="width: 30%;"> <p>injector 5 track 2</p> </div> </div>
<p>Check the resistance of injector no. 5, measuring across track 1 and track 2 of the injector. Replace the injector if the resistance is not approximately: 14.5 Ω ± 0.7 Ω at 20°C.</p>
<p>If the fault persists, change injector No.5.</p>

AFTER REPAIR	<p>Clear the fault memory. Follow the instructions to confirm repair. Carry out an OBD (On Board Diagnostic) running test (see introduction) to ensure that the injector fault has not caused a deterioration in the catalytic converter. Deal with any other possible faults.</p>
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Diagnostics - Fault interpretation

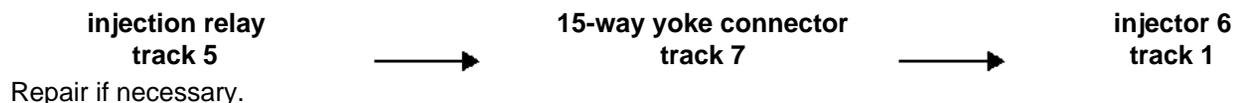
DF161 PRESENT OR STORED	<p><u>Cylinder 6 injector command</u></p> <p>CO : Open circuit CC.0 : Short circuit to earth CC.1 : Short circuit to +12 volts</p>
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NOTES	<p>Conditions for applying the fault finding procedure to the fault stored: The fault is declared present when the engine is started or the following command is issued: AC600 - injector, cylinder 6.</p>
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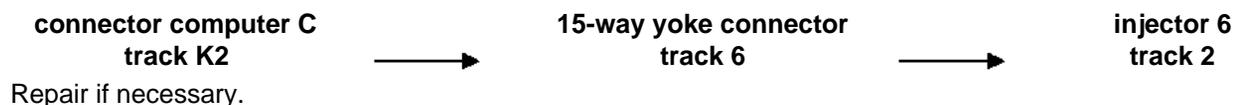
Check the injector connector for **proper mating and general** condition.
 Change the connector if necessary.

With ignition on, check **the presence of +12 V** on **track 1** of the injector.

If there is no feed, check the **insulation, continuity and absence of interference resistance** of the connection:



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



Check the **resistance** of injector no. 6, measuring across **track 1** and **track 2** of the injector.
 Replace the injector if the resistance is not approximately: **14.5 Ω ± 0.7 Ω** at 20°C.

If the fault persists, **change** injector No.6.

AFTER REPAIR	<p>Clear the fault memory. Follow the instructions to confirm repair. Carry out an OBD (On Board Diagnostic) running test (see introduction) to ensure that the injector fault has not caused a deterioration in the catalytic converter. Deal with any other possible faults.</p>
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Diagnostics - Fault interpretation

DF174 PRESENT OR STORED	<p><u>No.1 camshaft circuit</u></p> <p>CO : Open circuit CC.0 : Short circuit to earth CO.1 : Open circuit or short circuit to +12 volts 1.DEF : Inconsistency of the signal</p>
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NOTES	<p>Conditions for applying the fault finding procedure to the fault stored: The fault is declared present after the engine has been started.</p>
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Check the connector on the camshaft sensor for **proper mating** and its general condition.
 Change the connector if necessary.

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

computer (connector C)	track B1	→	track 1	of No.1 camshaft sensor
computer (connector C)	track C1	→	track 2	of camshaft sensor No. 1
computer (connector C)	track B2	→	track 3	of No.1 camshaft sensor

Repair if necessary.

With ignition on, ensure the presence of a **5-volt supply** by measuring across **track 3 (+)** and **track 1 (earth)** of the No.1 camshaft sensor connector.
 If there is no feed, **change** the injection computer (reprogram and reconfigure: see introduction).

If the fault persists, **change** the No.1 camshaft sensor

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

DF175 PRESENT OR STORED	<p><u>No.2 camshaft sensor</u></p> <p>CO : Open circuit CC.0 : Short circuit to earth CO.1 : Open circuit or short circuit to +12 volts 1.DEF : Inconsistency of the signal</p>
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NOTES	<p>Conditions for applying the fault finding procedure to the fault stored: The fault is declared present after the engine has been started.</p>
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Check the connector on the camshaft sensor for **proper mating** and its general condition.
 Change the connector if necessary.

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

computer connector C track B1 track C2 track B2	→ → →	15-way yoke connector track 9 track 10 track 8	→ → →	camshaft sensor No. 2 track 1 track 2 track 3
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Repair if necessary.

With ignition on, ensure the presence of a **5-volt supply** by measuring across **track 3 (+)** and **track 1 (earth)** of the No.2 camshaft sensor connector.
 If there is no feed, **change** the injection computer (reprogram and reconfigure: see introduction).

If the fault persists, **change** the No.2 camshaft sensor

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

DF176 PRESENT OR STORED	<u>No.1 pinking sensor</u> CO : Open circuit CC : Short circuit
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NOTES	Priority for dealing with a combination of faults: As a priority, process the DF174 and DF175 - No.1 and No.2 camshaft sensors faults if they are present or stored.
	Condition for the application of the fault finding strategy to the fault stored. The fault is declared present following a road test during which pinking starts (engine speed in excess of 2520 rpm for 3 seconds with 35 % charge).

Check the connection and condition of the pinking sensor connector. Change the connector if necessary.
Check the tightness of the pinking sensor with a torque wrench (see repair methods for manufacturer's value).
Ensure that the engine does not make an abnormal noise . If there is an abnormal noise, the cause of the noise must be eliminated before the sensor is checked.
Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connections: computer (connector C) track A1 \longrightarrow track 1 of the No.1 pinking sensor computer (connector C) track A2 \longrightarrow track 2 of the No.1 pinking sensor Repair if necessary.
If the fault persists, change the No.1 pinking sensor.

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

DF177 PRESENT OR STORED	<u>No.2 pinking sensor</u> CO : Open circuit CC : Short circuit
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NOTES	Priority for dealing with a combination of faults: As a priority, process the DF174 and DF175 - No.1 and No.2 camshaft sensors faults if they are present or stored.
	Condition for the application of the fault finding strategy to the fault stored. The fault is declared present following a road test during which pinking starts (engine speed in excess of 2520 rpm for 3 seconds with 35 % charge).

Check the connection and condition of the pinking sensor connector. Change the connector if necessary.
Check the tightness of the pinking sensor with a torque wrench (see repair methods for manufacturer's value).
Ensure that the engine does not make an abnormal noise . If there is an abnormal noise, the cause of the noise must be eliminated before the sensor is checked.
Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connections: computer (connector C) track A3 \longrightarrow track 1 of the No.2 pinking sensor computer (connector C) track A4 \longrightarrow track 2 of pinking sensor No.2 Repair if necessary.
If the fault persists, change the No.2 pinking sensor.

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

DF178 PRESENT OR STORED	<p><u>No.1 upstream oxygen sensor</u></p> <p>CO : Open circuit CC : Short circuit 1.DEF : Inconsistency of the signal</p>
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NOTES	<p>Priority for dealing with a combination of faults: As a priority, process the DF180 and DF181 No.1 and No.2 downstream oxygen sensors faults if they are present or stored.</p>
	<p>Condition for the application of the fault finding strategy to the fault stored: The fault is declared present once the engine has been running at idling speed for two minutes.</p>
	<p>Special note: A fault with the upstream sensor No. 1 causes an increase in pollution and the OBD (On Board Diagnostic) warning light to come on.</p>

Check the connection and condition of the oxygen sensor connector . Change the connector if necessary.
Check for absence of air leakage on the exhaust system .
If the vehicle is used frequently in urban conditions, decoke the engine .
Connect the borrier in place of the computer and check the insulation, continuity and absence of interference resistance of the connections: computer (connector A) track E4 —————> track 4 of the oxygen sensor computer (connector A) track F4 —————> track 3 of the oxygen sensor Repair if necessary.
If the fault persists, change the oxygen sensor .

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

DF179 PRESENT OR STORED	<p><u>No.2 upstream oxygen sensor</u></p> <p>CO : Open circuit CC : Short circuit 1.DEF : Inconsistency of the signal</p>
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NOTES	<p>Priority for dealing with a combination of faults: As a priority, process the DF180 and DF181 No.1 and No.2 downstream oxygen sensors faults if they are present or stored.</p>
	<p>Condition for the application of the fault finding strategy to the fault stored: The fault is declared present after the engine has been running at idling speed for two minutes.</p>
	<p>Special note: A fault with the upstream sensor No. 2 causes an increase in pollution and the illumination of the OBD (On Board Diagnostic) warning light.</p>

Check the connection and condition of the oxygen sensor connector . Change the connector if necessary.
Check for absence of air leakage on the exhaust system .
If the vehicle is used frequently in urban conditions decoke the engine .
Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connections: computer (connector A) track E2 \longrightarrow track 4 of the oxygen sensor computer (connector A) track F2 \longrightarrow track 3 of the oxygen sensor Repair if necessary.
If the fault persists, change the oxygen sensor .

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

DF180 PRESENT OR STORED	<u>No.1 downstream oxygen sensor</u> CO : Open circuit CC : Short circuit 1.DEF : Inconsistency of the signal
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NOTES	Condition for the application of the fault finding strategy to the fault stored: The fault is declared present after the engine has been running at idling speed for four minutes.
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Check the connection and condition of the oxygen sensor connector . Change the connector if necessary.
Check for absence of air leakage on the exhaust system .
If the vehicle is used frequently in towns, decoke the engine .
Connect the borrier in place of the computer and check the insulation, continuity and absence of interference resistance of the connections: computer (connector A) track E3 —————> track 4 of the oxygen sensor computer (connector A) track F3 —————> track 3 of the oxygen sensor Repair if necessary.
If the fault persists, change the oxygen sensor .

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

DF181 PRESENT OR STORED	<p><u>No.2 downstream oxygen sensor</u></p> <p>CO : Open circuit CC : Short circuit 1.DEF : Inconsistency of the signal</p>
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NOTES	<p>Condition for the application of the fault finding strategy to the fault stored: The fault is declared present after the engine has been running at idling speed for four minutes.</p>
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Check the **connection and condition of the oxygen sensor connector**.
 Change the connector if necessary.

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

If the vehicle is used frequently in urban conditions, **decoke the engine**.

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

computer (connector A)	track E1	→	track 4	of the oxygen sensor
computer (connector A)	track F1	→	track 3	of the oxygen sensor

Repair if necessary.

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

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

DF182 PRESENT OR STORED	<p><u>Pinking correction</u></p> <p>1.DEF : Faulty sensors 2.DEF : Detection exceeds permitted maximum or minimum</p>
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NOTES	<p>Priority for dealing with a combination of faults: Give priority to the processing of the DF176 and DF177 - No.1 and No.2 pinking sensor faults if they are present or stored.</p>
	<p>Condition for the application of the fault finding strategy to the fault stored. The fault is declared present following a road test during which pinking starts (engine speed in excess of 2520 rpm for 5 seconds with 35 % charge).</p>

2.DEF	NOTES	Run this diagnostic only in the case of a fault present with 2.DEF .
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Check the connection and condition of the pinking sensor connector. Change the connector if necessary.
Check the tightening of the pinking sensors (for factory setting, see Repair Methods).
Ensure that the engine does not make an abnormal noise . in the event of abnormal noise, the cause of the noise must be eliminated before running the sensor diagnostics.
If the fault persists, change the pinking sensor.

1.DEF	NOTES	Run this diagnostic only in the case of a fault present with 1.DEF .
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Ensure that the engine is not generating an abnormal noise (engine damage) and ensure that sensors are torqued to correct value.
Change the pinking sensors (even if no fault present), to ensure that the fault does not stem from the sensors. If there the fault persists, change the injection computer (reprogram and reconfigure: see introduction).

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

DF183 PRESENT OR STORED	<u>No.1 catalytic converter</u>
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NOTES	<p>Priority for dealing with a combination of faults: Give priority to processing the DF180 and DF181, Downstream oxygen sensors No. 1 and No. 2; DF178, DF179, Upstream oxygen sensors 1 and 2; DF111, DF112, DF113, DF114, DF185 and DF186, Misfires cylinders 1 to 6; DF202, DF203, Fuel supply banks A and B faults if they are present or stored.</p>
	<p>Conditions for applying the fault finding procedure to the fault stored: The fault is declared present following: warm engine (double richness regulation loop closed), during road test with a section at 90 km/h. ON NO ACCOUNT DELETE THE FAULT without noting the contexts stored on appearance of the fault (see introduction for the OBD road test procedure).</p>
	<p>Special note: A fault with the catalytic converter No. 1 causes an increase in pollution and the OBD (On Board Diagnostic) warning light to come on.</p>

Check the tightness of the oxygen sensors.
Ensure absence of air leaks on the exhaust system. Repair if necessary.
Remove the catalytic converter No. 1 and check the internal condition of the filter element (clogging). If the filter element seems correct, shake the catalytic converter to check that there are no components broken inside (metallic noises). Replace the catalytic converter if necessary.
If the fault persists, change the No.1 catalytic converter.

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

DF184 PRESENT OR STORED	<u>No.2 Catalytic converter</u>
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NOTES	<p>Priority for dealing with a combination of faults: Give priority to processing the DF180 and DF181, Downstream oxygen sensors No. 1 and No. 2; DF178, DF179, Upstream oxygen sensors 1 and 2; DF111, DF112, DF113, DF114, DF185 and DF186, Misfires cylinders 1 to 6; DF202, DF203, Fuel supply banks A and B faults if they are present or stored.</p>
	<p>Conditions for applying the fault finding procedure to the fault stored: The fault is declared present following: warm engine (double richness regulation loop closed), during road test with a section at 90 km/h. ON NO ACCOUNT DELETE THE FAULT without noting the contexts stored on appearance of the fault (see introduction for the OBD road test procedure)..</p>
	<p>Special note: A fault with the catalytic converter No. 2 causes an increase in pollution and the OBD (On Board Diagnostic) warning light to light up.</p>

Check the tightness of the oxygen sensors.
Ensure absence of air leaks on the exhaust system. Repair if necessary.
Remove the catalytic converter No. 2 and check the condition of the filter element inside (clogging). If the filter element seems correct, shake the catalytic converter to check that there are no components broken inside (metallic noises). Replace the catalytic converter if necessary.
If the fault persists, change the No.2 catalytic converter.

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

DF185 PRESENT OR STORED	<p><u>Misfiring on cylinder 5.</u></p>
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NOTES	<p>Priority for dealing with a combination of faults: Give priority to processing the DF084, DF085, DF086, DF087, DF160, DF161, Injectors 1 to 6 control; DF192, DF193, DF194, DF195, DF196, DF197, Cylinders 1 to 6 coil control; DF238, Engine speed sensor; DF180, DF181, Downstream oxygen sensors 1 and 2; DF178, DF179, Upstream oxygen sensors 1 and 2; DF202, DF203, Fuel supply banks A and B and DF198, DF201 Heating the upstream and downstream oxygen sensors on banks A and B faults if they are present or stored.</p>
	<p>Conditions for applying the fault finding procedure to the fault stored: The fault is declared present after the engine has been started.</p>
	<p>Special notes: The OBD (on-board diagnostics) warning light will come on to show that the engine is misfiring, which means that the vehicle does not comply with emission control standards. Flashing of the OBD warning light indicates the risk of destruction of the catalytic converter.</p>

<p>Check the ignition system, confirming the condition of the spark plug and the low and high tension contacts of the coil of cylinder 5. Replace any faulty parts where necessary.</p>
<p>Check the compression ratio of cylinder 5. Repair if necessary.</p>
<p>Check the flywheel target (deformation or cracks). Change the flywheel if necessary.</p>
<p>Make sure that there is no leakage at the inlet manifold. Repair if necessary.</p>
<p>If no anomaly is found, then there must be a problem with the fuel system. Therefore check:</p> <ul style="list-style-type: none"> – the condition of the fuel filter – the petrol flow and pressure (the pressure should to be equal to 3.5 bar). – the cleanliness of the tank. – the condition of the cylinder 5 injector, – the correctness of the fuel. <p>Replace the defective component.</p>

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

DF186 PRESENT OR STORED	<p><u>Misfiring on cylinder 6.</u></p>
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NOTES	<p>Priority for dealing with a combination of faults: Give priority to processing the DF084, DF085, DF086, DF087, DF160, DF161, Injectors 1 to 6 control; DF192, DF193, DF194, DF195, DF196, DF197, Cylinders 1 to 6 coil control; DF238, Engine speed sensor; DF180, DF181, Downstream oxygen sensors 1 and 2; DF178, DF179, Upstream oxygen sensors 1 and 2; DF202, DF203, Fuel supply to banks A and B and DF198, DF201 Heating of the upstream and downstream oxygen sensors on banks A and B faults if they are present or stored.</p>
	<p>Conditions for applying the fault finding procedure to the fault stored: The fault is declared present after the engine has been started.</p>
	<p>Special notes: The OBD (on-board diagnostics) warning light will come on to show that the engine is misfiring, which means that the vehicle does not comply with emission control standards. Flashing of the OBD warning light indicates the risk of destruction of the catalytic converter.</p>

	<p>Check the ignition system, confirming the condition of the spark plug and the low and high tension contacts of the coil of cylinder 6. Replace any faulty parts where necessary.</p>
	<p>Check the compression ratio of cylinder 6. Repair if necessary.</p>
	<p>Check the flywheel target (deformation or cracks). Change the flywheel if necessary.</p>
	<p>Make sure that there is no leakage at the inlet manifold. Repair if necessary.</p>
	<p>If no anomaly is found, then there must be a problem with the fuel system. Therefore check:</p> <ul style="list-style-type: none"> – the condition of the fuel filter – the petrol flow and pressure (the pressure should to be equal to 3.5 bar), – the cleanliness of the tank, – the condition of the injector in cylinder 6, – the correctness of the fuel. <p>Replace the defective component.</p>

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

DF189 PRESENT OR STORED	<p><u>Engine flywheel target</u></p> <p>1.DEF : Inconsistency of the signal</p>
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NOTES	<p>Condition for the application of the fault finding strategy to the fault stored: The fault is declared present after the engine has been started (or an attempt to start the engine).</p>
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	<p>Check the connection and condition of the flywheel signal sensor. Change the connector if necessary.</p>
	<p>Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connections:</p> <p style="margin-left: 40px;"> computer (connector C) track E2 \longrightarrow track 1 of the engine speed sensor computer (connector C) track E3 \longrightarrow track 2 of the engine speed sensor </p> <p>Repair if necessary.</p>
	<p>Check the resistance of the engine speed sensor by measuring across track 1 and track 2 of the sensor. Replace the sensor if the resistance is not approximately: 375 Ω \pm 30 Ω.</p>
	<p>Remove the sensor and ensure it has not been rubbing on the flywheel target (flywheel runt-out) Replace the sensor if necessary.</p>
	<p>Check the condition of the engine flywheel and the condition of the target of the sensor (in particular in the case of removal). Change the flywheel if necessary.</p>
	<p>If the fault persists, change the flywheel signal sensor.</p>

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

DF191 PRESENT OR STORED	<p style="text-align: center;"><u>Camshaft dephaser solenoid valve bank B</u></p> <p>CO.0 : Open circuit or short circuit to earth CO.1 : Short circuit to +12 volts 1.DEF : Fault on solenoid valve B</p>
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NOTES	<p>Priority for dealing with a combination of faults: Give priority to processing of the DF004 coolant-temperature sensor circuit; DF188 engine oil temperature sensor; DF174 and DF175 No.1 and No.2 camshaft sensors; DF238 engine speed sensor engine; DF137 motorised throttle faults if present or stored.</p> <p>Conditions for applying the fault finding procedure to the fault stored: The fault is declared present with engine running at speed of between 700 and 4520 rpm for 10 seconds and engine temperature > 50°C.</p>
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<p>Ensure that the oil and coolant temperature sensors indicate consistent values on the basis of parameters PR002 (coolant temperature) and PR183 (oil temperature).</p>
<p>Check the connection and condition of the solenoid valve connector. Change the connector if necessary.</p>
<p>With the ignition on, check for presence of +12 V on track 1 of the solenoid valve.</p>
<p>If there is no feed, check the insulation, continuity and absence of interference resistance of the connection:</p> <div style="text-align: center; margin: 10px 0;"> <p> injection relay track 5 15-way yoke connector track 7 bank A solenoid valve track 1 —————> —————> </p> </div> <p>Repair if necessary.</p>
<p>Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connection:</p> <div style="text-align: center; margin: 10px 0;"> <p> connector computer C track F1 15-way yoke connector track 15 bank B solenoid valve track 2 —————> —————> </p> </div> <p>Repair if necessary.</p>
<p>Check the resistance of the solenoid valve by measuring across track 1 and track 2 of the solenoid valve. Replace the solenoid valve if the resistance is not around 12 Ω ± 1 Ω.</p>
<p>If the fault persists, change the bank B camshaft dephaser solenoid valve.</p>

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

DF192 PRESENT OR STORED	<p><u>Cylinder No.1 coil command</u></p> <p>CO.1 : Open circuit or short circuit to +12 volts</p> <p>CC.0 : Short circuit to earth</p>
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NOTES	<p>Condition for the application of the fault finding strategy to the fault stored: The fault is declared present after the engine has been started.</p>
	<p>Special notes: It is not possible to measure the resistance of the secondary winding because of an internal diode. The weak resistance of the primary winding will not necessarily give a very precise measurement (resistance of the multimeter leads). Measuring the inductance of the winding is more precise: (0.55 mH ± 5%).</p>

	<p>Check the connection and condition of the connector of the coil. Change the connector if necessary.</p>
	<p>With the ignition on, check for presence of +12 V on track 2 of the coil.</p>
	<p>If there is no feed, check the insulation, continuity and absence of interference resistance of the connection: injection relay track 5 \longrightarrow track 2 of the No.1 ignition coil Repair if necessary.</p>
	<p>Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connection: computer (connector A) track H2 \longrightarrow track 1 No.1 ignition coil Repair if necessary.</p>
	<p>Check the resistance of the coil measuring across track 1 and track 2 of the coil for the resistance of the primary winding. Replace the coil if the resistance is not approximately: 0.5 Ω ± 0.2 Ω.</p>
	<p>If the fault persists, change the No.1 coil.</p>

AFTER REPAIR	<p>Clear the fault memory. Follow the instructions to confirm repair. Carry out an OBD (On Board Diagnostic) running test (see introduction) to ensure that the coil has not caused a deterioration in the catalytic converter. Deal with any other possible faults.</p>
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Diagnostics - Fault interpretation

DF193 PRESENT OR STORED	<p><u>Cylinder No.2 coil command</u></p> <p>CO.1 : Open circuit or short circuit to +12 volts</p> <p>CC.0 : Short circuit to earth</p>
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NOTES	<p>Condition for the application of the fault finding strategy to the fault stored: The fault is declared present after the engine has been started.</p>
	<p>Special notes: It is not possible to measure the resistance of the secondary winding because of an internal diode. The weak resistance of the primary winding will not necessarily give a very precise measurement (resistance of the multimeter leads). Measuring the inductance of the winding is more precise: (0.55 mH ± 5%).</p>

<p>Check the connection and condition of the connector of the coil. Change the connector if necessary.</p>
<p>With the ignition on, check for presence of +12 V on track 2 of the coil.</p>
<p>If there is no feed, check the insulation, continuity and absence of interference resistance of the connection: injection relay track 5 —————> track 2 of the No.2 ignition coil Repair if necessary.</p>
<p>Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connection: computer (connector A) track H4 —————> track 1 of ignition coil No. 2 Repair if necessary.</p>
<p>Check the resistance of the coil measuring across track 1 and track 2 of the coil for the resistance of the primary winding. Replace the coil if the resistance is not approximately: 0.5 Ω ± 0.2 Ω.</p>
<p>If the fault persists, change the No.2 coil.</p>

AFTER REPAIR	<p>Clear the fault memory. Follow the instructions to confirm repair. Carry out an OBD (On Board Diagnostic) running test (see introduction) to ensure that the coil has not caused a deterioration in the catalytic converter. Deal with any other possible faults.</p>
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Diagnostics - Fault interpretation

DF194 PRESENT OR STORED	<p><u>Cylinder No.3 coil command</u></p> <p>CO.1 : Open circuit or short circuit to +12 volts</p> <p>CC.0 : Short circuit to earth</p>
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NOTES	<p>Condition for the application of the fault finding strategy to the fault stored: The fault is declared present after the engine has been started.</p>
	<p>Special notes: It is not possible to measure the resistance of the secondary winding because of an internal diode. The weak resistance of the primary winding will not necessarily give a very precise measurement (resistance of the multimeter leads). Measuring the inductance of the winding is more precise: (0.55 mH ± 5%).</p>

<p>Check the connection and condition of the connector of the coil. Change the connector if necessary.</p>
<p>With the ignition on, check for presence of +12 V on track 2 of the coil.</p>
<p>If there is no feed, check the insulation, continuity and absence of interference resistance of the connection: injection relay track 5 —————> track 2 of ignition coil No. 3 Repair if necessary.</p>
<p>Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connection: computer (connector A) track H3 —————> track 1 of the N° 3 ignition coil Repair if necessary.</p>
<p>Check the resistance of the coil measuring across track 1 and track 2 of the coil for the resistance of the primary winding. Replace the coil if the resistance is not approximately: 0.5 Ω ± 0.2 Ω.</p>
<p>If the fault persists, change the No.3 coil.</p>

AFTER REPAIR	<p>Clear the fault memory. Follow the instructions to confirm repair. Carry out an OBD (On Board Diagnostic) running test (see introduction) to ensure that the coil has not caused a deterioration in the catalytic converter. Deal with any other possible faults.</p>
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Diagnostics - Fault interpretation

DF196 PRESENT OR STORED	<p><u>Cylinder No.5 coil command</u></p> <p>CO.1 : Open circuit or short circuit to +12 volts</p> <p>CC.0 : Short circuit to earth</p>
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NOTES	<p>Condition for the application of the fault finding strategy to the fault stored: The fault is declared present after the engine has been started.</p>
	<p>Special notes: It is not possible to measure the resistance of the secondary winding because of an internal diode. The weak resistance of the primary winding will not necessarily give a very precise measurement (resistance of the multimeter leads). Measuring the inductance of the winding is more precise: (0.55 mH ± 5%).</p>

<p>Check the connection and condition of the connector of the coil. Change the connector if necessary.</p>
<p>With the ignition on, check for presence of +12 V on track 1 of the coil.</p>
<p>If there is no feed, check the insulation, continuity and absence of interference resistance of the connection:</p> <div style="text-align: center; margin: 10px 0;"> <p>injection relay 15-way yoke connector ignition coil No. 5</p> <p>track 5 track 7 track 1</p> <p>→ →</p> </div> <p>Repair if necessary.</p>
<p>Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connection:</p> <div style="text-align: center; margin: 10px 0;"> <p>connector computer A 15-way yoke connector ignition coil No. 5</p> <p>track G3 track 13 track 2</p> <p>→ →</p> </div> <p>Repair if necessary.</p>
<p>Check the resistance of the coil measuring across track 1 and track 2 of the coil for the resistance of the primary winding. Replace the coil if the resistance is not approximately: 0.5 Ω ± 0.2 Ω.</p>
<p>If the fault persists, change the No.5 coil.</p>

AFTER REPAIR	<p>Clear the fault memory. Follow the instructions to confirm repair. Carry out an OBD (On Board Diagnostic) running test (see introduction) to ensure that the coil has not caused a deterioration in the catalytic converter. Deal with any other possible faults.</p>
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Diagnostics - Fault interpretation

DF197 PRESENT OR STORED	<p><u>Cylinder No.6 coil command</u></p> <p>CO.1 : Open circuit or short circuit to +12 volts</p> <p>CC.0 : Short circuit to earth</p>
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NOTES	<p>Condition for the application of the fault finding strategy to the fault stored: The fault is declared present after the engine has been started.</p>
	<p>Special notes: It is not possible to measure the resistance of the secondary winding because of an internal diode. The weak resistance of the primary winding will not necessarily give a very precise measurement (resistance of the multimeter leads). Measuring the inductance of the winding is more precise: (0.55 mH ± 5%).</p>

Check **the connection and condition of the connector** of the coil.
Change the connector if necessary.

With the ignition on, check for **presence of +12 V** on **track 1** of the coil.

If there is no feed, check the **insulation, continuity and absence of interference resistance** of the connection:

injection relay **15-way yoke connector** **ignition coil No. 6**

track 5 **track 7** **track 1**

→ →

Repair if necessary.

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

connector computer A **15-way yoke connector** **ignition coil No. 6**

track G2 **track 14** **track 2**

→ →

Repair if necessary.

Check the **resistance** of the coil measuring across **track 1** and **track 2** of the coil for the resistance of the primary winding. Replace the coil if the resistance is not approximately: **0.5 Ω ± 0.2 Ω**.

If the fault persists, **change** the No.6 coil.

AFTER REPAIR	<p>Clear the fault memory. Follow the instructions to confirm repair. Carry out an OBD (On Board Diagnostic) running test (see introduction) to ensure that the coil has not caused a deterioration in the catalytic converter. Deal with any other possible faults.</p>
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Diagnostics - Fault interpretation

DF198 PRESENT OR STORED	<p><u>No.1 upstream oxygen sensor heating</u></p> <p>CO : Open circuit CC.0 : Short circuit to earth CC.1 : Short circuit to +12 volts 1.DEF : Inconsistency of the signal</p>
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NOTES	<p>Condition for the application of the fault finding strategy to the fault stored: The fault is declared present after the engine has been started.</p>
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	<p>Check the connection and condition of the oxygen sensor connector. Change the connector if necessary.</p>
	<p>With the ignition on, check for presence of +12 V on track 1 of the oxygen sensor.</p>
	<p>If there is no feed, check the insulation, continuity and absence of interference resistance of the connection: injection relay track 5 —————> track 1 of the No.1 upstream oxygen sensor Repair if necessary.</p>
	<p>Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connection: computer (connector C) track L1 —————> track 2 of the No.1 upstream oxygen sensor Repair if necessary.</p>
	<p>Check the resistance of the sensor heating measuring across track 1 and track 2 of the sensor, replacing it if the resistance is not approximately $9 \Omega \pm 1 \Omega$ at 25°C.</p>
	<p>If the fault persists, change the No. 1 upstream oxygen sensor.</p>

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

DF199 PRESENT OR STORED	<p><u>No.2 upstream oxygen sensor heating</u></p> <p>CO:Open circuit</p> <p>CC.0 : Short circuit to earth</p> <p style="padding-left: 20px;">CC.1 : Short circuit to +12 volts</p> <p>1.DEF : Inconsistency of the signal</p>
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NOTES	<p>Condition for the application of the fault finding strategy to the fault stored: The fault is declared present after the engine has been started.</p>
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	<p>Check the connection and condition of the oxygen sensor connector. Change the connector if necessary.</p>
	<p>With the ignition on, check for presence of +12 V on track 1 of the oxygen sensor.</p>
	<p>If there is no feed, check the insulation, continuity and absence of interference resistance of the connection: injection relay track 5 —————> track 1 of the No.2 upstream oxygen sensor Repair if necessary.</p>
	<p>Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connection: computer (connector C) track M1 —————> track 2 of the No. 2 upstream oxygen sensor Repair if necessary.</p>
	<p>Check the resistance of the sensor heating measuring across track 1 and track 2 of the sensor, replacing it if the resistance is not approximately $9 \Omega \pm 1 \Omega$ at 25°C.</p>
	<p>If the fault persists, change the No. 2 upstream oxygen sensor.</p>

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

DF200 PRESENT OR STORED	<p><u>No.1 downstream oxygen sensor heating</u></p> <p>CO : Open circuit CC.0 : Short circuit to earth CC.1 : Short circuit to +12 volts 1.DEF : Inconsistency of the signal</p>
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NOTES	<p>Condition for the application of the fault finding strategy to the fault stored: The fault is declared present after the engine has been started.</p>
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	<p>Check the connection and condition of the oxygen sensor connector. Change the connector if necessary.</p>
	<p>With the ignition on, check for presence of +12 V on track 1 of the oxygen sensor.</p>
	<p>If there is no feed, check the insulation, continuity and absence of interference resistance of the connection: injection relay track 5 —————> track 1 of the No.1 downstream oxygen sensor Repair if necessary.</p>
	<p>Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connection: computer (connector C) track L2 —————> track 2 of the No.1 downstream oxygen sensor Repair if necessary.</p>
	<p>Check the resistance of the sensor heating measuring across track 1 and track 2 of the sensor, replacing it if the resistance is not approximately $9 \Omega \pm 1 \Omega$ at 25°C.</p>
	<p>If the fault persists, change the No. 1 downstream oxygen sensor.</p>

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

DF201 PRESENT OR STORED	<p><u>No.2 downstream oxygen sensor heating</u></p> <p>CO : Open circuit CC.0 : Short circuit to earth CC.1 : Short circuit to +12 volts 1.DEF : Inconsistency of the signal</p>
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NOTES	<p>Condition for the application of the fault finding strategy to the fault stored: The fault is declared present after the engine has been started.</p>
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Check the **connection and condition of the oxygen sensor connector**.
 Change the connector if necessary.

With the ignition on, check for **presence of +12 V** on **track 1** of the oxygen sensor.

If there is no feed, check the **insulation, continuity and absence of interference resistance** of the connection:
 injection relay **track 5** \longrightarrow **track 1** of the No.2 downstream oxygen sensor
 Repair if necessary.

Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** of the connection:
 computer (connector C) **track M2** \longrightarrow **track 2** of the No.2 downstream oxygen sensor
 Repair if necessary.

Check the **resistance** of the sensor heating measuring across **track 1** and **track 2** of the sensor, replacing it if the resistance is not approximately $9 \Omega \pm 1 \Omega$ at 25°C.

If the fault persists, **change** the No. 2 upstream oxygen sensor.

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

DF202 PRESENT OR STORED	<p><u>Bank A fuel feed</u></p> <p>1.DEF : Pressure too low 2.DEF : Pressure too high 3.DEF : Lack of control of fuel pressure</p>
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NOTES	<p>Priority for dealing with a combination of faults: Give priority to the processing of the DF084, DF085, DF086, DF087, DF160, DF161, injector commands 1 to 6; DF180, DF181, No.1 and No.2 downstream oxygen sensors; DF178, DF179, No.1 and No.2 upstream oxygen sensors and DF198, DF199, DF200 and DF201, upstream and downstream oxygen sensor heating faults for banks A and B.</p>
	<p>Conditions for applying the fault finding procedure to the fault stored: The fault is declared present following: warm engine (double richness regulation loop closed). It is recommended that the fault-finding sequence for this fault is performed even if it is not stored, and that the fault is confirmed by a road test. ON NO ACCOUNT DELETE THE FAULT without noting the contexts stored on appearance of the fault (see introduction for the OBD (On Board Diagnostic) road test procedure).</p>
	<p>Special notes: A fuel-supply fault impedes correct engine running (jolting, flat spots etc.) and triggers lighting of the OBD warning light (on three consecutive journeys), which indicates that the vehicle is running outside the pollution standards.</p>

<p>Carry out a full inspection of the fuel supply and injection system, by checking:</p> <ul style="list-style-type: none"> - the condition of the fuel filter, - the petrol flow and pressure (3.5 bar), - the cleanliness of the tank, - the state and reliability of the injectors (no leaking injector), - the conformity of the fuel, - any air leakage or fuel leakage on the fuel feed system. <p>Replace any faulty components.</p>
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AFTER REPAIR	<p>Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.</p>
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Diagnostics - Fault interpretation

DF203 PRESENT OR STORED	<p><u>Bank B fuel supply</u></p> <p>1.DEF : Pressure too low 2.DEF : Pressure too high 3.DEF : Lack of control of fuel pressure</p>
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NOTES	<p>Priority for dealing with a combination of faults: Give priority to the processing of the DF084, DF085, DF086, DF087, DF160, DF161, injector commands 1 to 6; DF180, DF181, No.1 and No.2 downstream oxygen sensors; DF178, DF179, No.1 and No.2 upstream oxygen sensors and DF198, DF199, DF200 and DF201, upstream and downstream oxygen sensor heating faults for banks A and B.</p>
	<p>Conditions for applying the fault finding procedure to the fault stored: The fault is declared present following: warm engine (double richness regulation loop closed). It is recommended that the fault-finding sequence for this fault is performed even if it is not stored, and that the fault is confirmed by a road test. ON NO ACCOUNT DELETE THE FAULT without noting the contexts stored on appearance of the fault (see introduction for the OBD (On Board Diagnostic) road test procedure).</p>
	<p>Special notes: A fuel-supply fault impedes correct engine running (jolting, flat spots etc.) and triggers lighting of the OBD warning light (on three consecutive journeys), which indicates that the vehicle is running outside the pollution standards.</p>

<p>Carry out a full inspection of the fuel supply and injection system, by checking:</p> <ul style="list-style-type: none"> - the condition of the fuel filter, - the petrol flow and pressure (3.5 bar), - the cleanliness of the tank, - the state and reliability of the injectors (no leaking injector), - the conformity of the fuel, - any air leakage or fuel leakage on the fuel feed system. <p>Replace any faulty components.</p>
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AFTER REPAIR	<p>Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.</p>
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Diagnostics - Fault interpretation

DF204 PRESENT OR STORED	<p><u>Ageing of upstream sensor - bank A</u></p> <p>1.DEF : Inconsistency of the signal</p>
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NOTES	<p>Priority for dealing with a combination of faults: Give priority to processing of the DF084, DF085, DF086, DF087, DF160, DF161 - injector commands 1 to 6; DF180, DF181 - downstream oxygen sensors 1 and 2; DF178, DF179 - upstream oxygen sensors 1 and 2; DF198, DF199, DF200 and DF201 heating of the upstream and downstream oxygen sensors, banks A and B; DF202 and DF203 fuel supply, bank A and bank B faults if present or stored.</p>
	<p>Conditions for applying the fault finding procedure to the fault stored: The fault is declared present following: warm engine (double richness regulation loop closed), during road test. It is recommended that the fault-finding sequence for this fault is performed even if it is not stored, and that the fault is confirmed by a road test. ON NO ACCOUNT DELETE THE FAULT without noting the contexts stored on appearance of the fault (see introduction for the OBD (On Board Diagnostic) road test procedure).</p>
	<p>Special notes: A problem related to ageing of the sensor causes lighting of the OBD warning light, which indicates that the vehicle is running outside the pollution standards.</p>

<p>Check the connection and condition of the oxygen sensor connector. Change the connector if necessary.</p>
<p>Ensure the wiring has not been confused between the upstream sensor and the downstream sensor.</p>
<p>Check for absence of air leakage on the exhaust system.</p>
<p>If the vehicle is used frequently in urban situations, decoke the engine.</p>
<p>If the fault persists, change the upstream oxygen sensor, bank A.</p>

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

DF205 PRESENT OR STORED	<p><u>Ageing of upstream sensor - bank B</u></p> <p>1.DEF : Inconsistency of the signal</p>
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NOTES	<p>Priority for dealing with a combination of faults: Give priority to processing of the DF084, DF085, DF086, DF087, DF160, DF161 - injector commands 1 to 6; DF180, DF181 - downstream oxygen sensors 1 and 2; DF178, DF179 - upstream oxygen sensors 1 and 2; DF198, DF199, DF200 and DF201 heating of the upstream and downstream oxygen sensors, banks A and B; DF202 and DF203 - fuel supply, bank A and bank B faults if present or stored.</p>
	<p>Conditions for applying the fault finding procedure to the fault stored: The fault is declared present following: warm engine (double richness regulation loop closed), during road test. It is recommended that the fault-finding sequence for this fault is performed even if it is not stored, and that the fault is confirmed by a road test. ON NO ACCOUNT DELETE THE FAULT without noting the contexts stored on appearance of the fault (see introduction for the OBD (On Board Diagnostic) road test procedure).</p>
	<p>Special notes: A problem related to ageing of the sensor causes lighting of the OBD warning light, which indicates that the vehicle is running outside the pollution standards.</p>

<p>Check the connection and condition of the oxygen sensor connector. Change the connector if necessary.</p>
<p>Ensure the wiring has not been confused between the upstream sensor and the downstream sensor.</p>
<p>Check for absence of air leakage on the exhaust system.</p>
<p>If the vehicle is used frequently in urban conditions, decoke the engine.</p>
<p>If the fault persists, change the upstream oxygen sensor, bank B.</p>

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

DF206 PRESENT OR STORED	<p><u>Compressor control</u></p> <p>CO : Open circuit CC.0 : Short circuit to earth CC.1 : Short circuit to +12 volts</p>
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NOTES	<p>Conditions for applying the fault finding procedure to the fault stored: The fault is declared present after the engine has been switched on and the air conditioning is operating.</p>
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	<p>Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connection: computer (connector B) track C3 —————▶ track 2 of the compressor relay Repair if necessary.</p>
	<p>With the ignition switched on, check the a on track 1 and on track 3 of the compressor relay. Repair if necessary.</p>
	<p>Check the insulation, continuity and absence of interference resistance of the connection: compressor relay track 5 —————▶ track 2 of the compressor clutch Repair if necessary.</p>
	<p>Verify the presence of an earth on track 1 of the compressor clutch connector. Repair if necessary.</p>
	<p>Check the resistance of the compressor clutch between track 1 and track 2 of the connector. Replace the compressor if the resistance is not approximately: 3 Ω ± 0.6 Ω at 25°C.</p>
	<p>If the fault persists, change the air conditioning compressor relay.</p>

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

DF238 PRESENT OR STORED	<p><u>Engine speed sensor</u></p> <p>1.DEF : Absence of signal</p> <p>2.DEF : The flywheel sensor indicates a cycle irregularity, i.e:</p> <ul style="list-style-type: none"> - a target fault (more apparent in the case of automatic transmission) - a flywheel air gap sensor fault - micro-breaks in the flywheel sensor circuit <p>3.DEF : Inconsistency of the signal</p>
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NOTES	<p>Conditions for applying the fault finding procedure to the fault stored: The fault is declared present after the engine has been started.</p>
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	<p>Check the connection and condition of the flywheel signal sensor connector and replace the connector if necessary.</p>
	<p>Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connections:</p> <p style="margin-left: 40px;"> computer (connector C) track E2 \longrightarrow track 1 of the engine speed sensor computer (connector C) track E3 \longrightarrow track 2 of the engine speed sensor </p> <p>Repair if necessary.</p>
	<p>Check the resistance of the engine speed sensor by measuring across track 1 and track 2 of the sensor. Replace the sensor if the resistance is not approximately: 375 Ω \pm 30 Ω.</p>
	<p>Remove the sensor and ensure it has not been rubbing on the flywheel target (flywheel run-out) Replace the sensor if necessary.</p>
	<p>Check the condition of the engine flywheel and the condition of the target of the sensor (in particular in the case of removal). Change the flywheel if necessary.</p>
	<p>If the fault persists, change the flywheel signal sensor.</p>

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

NOTES

Only proceed to a conformity check after a complete check with the fault finding tool.
Test conditions: engine stopped, ignition on at 20°C.

Order	Function	Parameter or status Check or action	Display and notes	Fault finding
1	+ after ignition	ET001 + after ignition computer	ACTIVE	In the event of problems, run the diagnostics for the charging circuit.
		PR004 computer supply voltage	11 < X < 14 V	
2	Immobiliser	ET002 engine immobiliser	INACTIVE	None
3	Multiplexing	ET016 injection connection > air conditioning	ACTIVE	In the event of problems, run the diagnostics for the multiplex network.
4	Throttle position-valve potentiometer (without pressing the accelerator pedal)	ET003 throttle position valve - no-load position.	ACTIVE	In the event of problems, reprogram the motorised throttle. If the problem persists, run the diagnostic procedure for the DF137 "motorised throttle" fault.
		ET005 throttle position valve - full load position.	INACTIVE	
		PR017 measured throttle position	2 < X < 10%	
5	Accelerator pedal position- valve potentiometer (without pressing the accelerator pedal)	PR112 measured pedal position.	0%	In the event of problems, run the diagnostic procedure for the Pedal potentiometer track 1 and 2 circuits faults (DF125 and DF126).
		ET128 accelerator pedal position: full load.	INACTIVE	
		ET129 accelerator pedal position: no load.	ACTIVE	
6	Air conditioning	ET141 air-conditioning authorisation.	INACTIVE	None

Fault finding - Conformity check

NOTES

Only proceed to a conformity check after a complete check with the fault finding tool.
Test conditions: engine stopped, ignition on at 20°C.
NOTE: Reading off the temperature parameters when the engine is cold (in the morning) is sufficient to confirm their correctness (without thermometer).
 The coolant temperature should be equal to the oil temperature and the air temperature.

Order	Function	Parameter or status Check or action	Display and notes	Fault finding
7	Air temperature sensor	PR003 air temperature	X = temperature under bonnet $\pm 5^{\circ}\text{C}$ ($-40 < X < 128^{\circ}\text{C}$)	In the event of problems, run the diagnostic procedure for the Air temperature sensor fault (DF003).
8	Oil temperature sensor.	PR183 oil temperature.	X = temperature under bonnet $\pm 5^{\circ}\text{C}$ ($-40 < X < 154^{\circ}\text{C}$)	In the event of problems, run the diagnostic procedure for the Oil temperature sensor fault (DF188).
9	Coolant temperature sensor	PR002 coolant temperature	X = temperature under bonnet $\pm 5^{\circ}\text{C}$ ($-40 < X < 140^{\circ}\text{C}$)	In the event of problems, run the diagnostic procedure for the Coolant temperature sensor fault (DF004).
10	exhaust temperature	PR007 exhaust temperature	$0 < X < 1200^{\circ}\text{C}$	This temperature is an estimated temperature of the catalytic converter. There is no possible procedure to alter this parameter
11	Manifold pressure sensor	PR001 inlet manifold pressure ----- PR016 atmospheric pressure	atmospheric pressure $\pm 10\%$	In the event of problems, run the diagnostic procedure for the Manifold pressure sensor fault (DF045).

Fault finding - Conformity check

NOTES

Only proceed to a conformity check after a complete check with the fault finding tool.
Test conditions: engine stopped, ignition on at 20°C.

Order	Function	Parameter or status Check or action	Display and notes	Fault finding
12	Downstream oxygen sensor	ET031 downstream O ₂ sensor heating.	INACTIVE	In the event of problems, run the diagnostic procedure for the "No.1 and No.2 downstream oxygen sensors" faults (DF180 and DF181).
		PR221 No.1 downstream oxygen sensor	350 < X < 550 mV	
		PR223 No.2 downstream oxygen sensor	350 < X < 550 mV	
13	Upstream oxygen sensor	ET030 upstream O ₂ sensor heating.	INACTIVE	In the event of problems, run the diagnostic procedure for the No.1 and No.2 upstream oxygen sensors faults (DF178 and DF179).
		PR220 No.1 upstream oxygen sensor	350 < X < 550 mV	
		PR222 No.2 upstream oxygen sensor	350 < X < 550 mV	
Command window				
14	Erasing the fault memory.	RZ007 erasing the fault memory.	Used for erasing stored faults.	None
15	Reinitialising the programming.	EF005 reinitialising the programming.	Used for reinitialising the programming.	None
16	Canister bleed	AC016 canister bleed solenoid valve	The canister-bleed solenoid valve should operate	In the event of problems, run the diagnostic procedure for the Canister-bleed solenoid valve circuit fault (DF014).

Fault finding - Conformity check

NOTES	<p>Only proceed to a conformity check after a complete check with the fault finding tool. Running the actuator commands is a way of retrieving faults when stored, or of checking the correct operation of the actuators.</p> <p>Test conditions: engine stopped, ignition on at 20°C.</p>
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Order	Function	Parameter or status Check or action	Display and notes	Fault finding
Command window				
17	Relays	AC010 fuel pump relay	Fuel pump should be heard to operate	In the event of a problem , consult fault finding procedure AC010
		AC271 low speed fan assembly relay	The fan should be heard running at low speed.	In the event of a problem , consult fault finding procedure AC271
		AC272 high speed fan assembly relay	The fan should be heard running at high speed.	In the event of a problem , consult fault finding procedure AC272
18	Camshaft dephaser solenoid valves.	AC648 No. 1 camshaft dephaser solenoid valve	The solenoid valve should be heard running.	In the event of problems , run the diagnostic procedure for the "bank A camshaft dephaser solenoid valve (DF190) fault".
		AC649 No. 2 camshaft dephaser solenoid valve	The solenoid valve should be heard running.	In the event of problems , run the diagnostic procedure for the Bank B camshaft dephaser solenoid valve (DF191) fault.

Fault finding - Conformity check

NOTES	<p>Only proceed to a conformity check after a complete check with the fault finding tool. Running the actuator commands is a way of retrieving faults when stored, or of checking the correct operation of the actuators.</p> <p>Test conditions: engine stopped, ignition on at 20°C.</p>
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Order	Function	Parameter or status Check or action	Display and notes	Fault finding
Command window				
19	Oxygen sensors	AC261 upstream O ₂ sensor heating.	Although its action cannot be heard or seen, this command is used for checking the reliability of the sensor heating function	In the event of problems, run the diagnostic procedure for the Heating No.1 and No.2 upstream oxygen sensors faults (DF198 and DF199).
		AC262 downstream O ₂ sensor heating.	Although its action cannot be seen or heard, this command is used for checking the reliability of the sensor heating function.	
20	Locking and unlocking the injectors.	AC591 injector command locking ----- AC592 injector command unlocking	Used for turning the engine over without starting it (e.g. for measuring the compression).	None

Fault finding - Conformity check

NOTES

Only proceed to a conformity check after a complete check with the fault finding tool. Running the actuator commands is a way of **retrieving faults** when stored, or of checking the **correct operation of the actuators**.
Test conditions: engine stopped, ignition on at 20°C.

Order	Function	Parameter or status Check or action	Display and notes	Fault finding
Command window				
21	Ignition	AC601 ignition, cylinder 1.	The action of these commands cannot be seen or heard; the commands are therefore used for checking the reliability of the injection system and where necessary identifying stored faults.	In the event of problems, run the diagnostic procedure for the "cylinder 1 to 6 coil command, depending on the coil affected (DF192 for cylinder 1, DF193 for cylinder 2, DF194 for cylinder 3, DF195 for cylinder 4, DF196 for cylinder 5, DF197 for cylinder 6)" faults
		----- AC602 ignition, cylinder 2.		
		----- AC603 ignition, cylinder 3.		
		----- AC604 ignition, cylinder 4.		
		----- AC605 ignition, cylinder 5.		
		----- AC606 ignition, cylinder 6.		
22	Petrol injection	AC040 Injector, cylinder 1.	The action of these commands cannot be seen or heard; the commands are therefore used for checking the reliability of the injection system and where necessary identifying stored faults.	In the event of problems, run the diagnostic procedure for the Cylinder 1 to 6 injector command faults, depending on the injector affected (DF084 for cylinder 1, DF085 for cylinder 2, DF086 for cylinder 3, DF087 for cylinder 4, DF160 for cylinder 5, DF161 for cylinder 6)
		----- AC041 injector, cylinder 2		
		----- AC042 injector, cylinder 3		
		----- AC043 injector, cylinder 4		
		----- AC044 injector, cylinder 5		
		----- AC600 injector, cylinder 6		

Fault finding - Conformity check

NOTES	<p>Only proceed to a conformity check after a complete check with the fault finding tool. Running the actuator commands is a way of retrieving faults when stored, or of checking the correct operation of the actuators.</p> <p>Test conditions: engine stopped, ignition on at 20°C.</p>
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Order	Function	Parameter or status Check or action	Display and notes	Fault finding
Command window				
23	Warning lights	AC211 fault warning light	The warning light should come on	In the event of problems, run the diagnostic procedure for the "Fault warning light" fault (DF011).
		AC212 coolant temperature warning light	The warning light should come on	In the event of problems, run the diagnostic procedure for the Coolant temperature overheat warning light circuit (DF032) fault.
		AC627 MIL warning light	The warning light should come on	In the event of a problem, consult fault finding procedure AC627

Fault finding - Conformity check

NOTES

Only proceed to a conformity check after a complete check with the fault finding tool.
Test conditions: Engine warm at idle speed, no electrical consumers.

Order	Function	Parameter or status Check or action	Display and notes	Fault finding
1	+ after ignition	ET001 + after ignition computer	ACTIVE	In the event of problems, run the diagnostics for the charging circuit.
		PR004 computer supply voltage	12 < X < 14.5 V	
2	engine immobiliser	ET002 engine immobiliser	INACTIVE	If active run the diagnostics for the immobiliser system.
3	Multiplexing	ET016 injection connection > air conditioning	ACTIVE	In the event of problems, run the diagnostics for the multiplex network.
4	Throttle position-valve potentiometer (without pressing the accelerator pedal)	ET003 throttle position valve - no load position.	ACTIVE	In the event of problems, run the diagnostic procedure for the DF137 motorised throttle fault
		ET005 throttle position valve - full load position.	INACTIVE	
		PR017 measured throttle position	1.5 < X < 3 %	
5	Accelerator pedal position- valve potentiometer (without pressing the accelerator pedal)	PR112 measured pedal position.	0 < X < 5%	In the event of problems, run the diagnostic procedure for the pedal potentiometer track 1 and 2 circuits faults (DF125 and DF126)".
		ET128 Accelerator pedal position: full load.	INACTIVE	
		ET129 Accelerator pedal position: no load.	ACTIVE	

Fault finding - Conformity check

NOTES

Only proceed to a conformity check after a complete check with the fault finding tool.
Test conditions: Engine warm at idle speed, no electrical consumers.

Order	Function	Parameter or status Check or action	Display and notes	Fault finding
6	Air temperature sensor	PR003 air temperature	X = engine temperature $\pm 5^{\circ}\text{C}$ (-40 < X < 128°C)	In the event of problems, run the diagnostic procedure for the Air temperature sensor fault (DF003).
7	Oil temperature sensor	PR183 oil temperature.	X = engine temperature $\pm 5^{\circ}\text{C}$ (-40 < X < 154°C)	In the event of problems, run the diagnostic procedure for the Oil temperature sensor fault (DF188).
8	Coolant temperature sensor	PR002 coolant temperature	X = engine temperature $\pm 5^{\circ}\text{C}$ (-40 < X < 140°C overheating warning light comes on at 118°C)	In the event of problems, run the diagnostic procedure for the Coolant temperature sensor fault (DF004).
9	Exhaust temperature	PR007 exhaust temperature	0 < X < 1200°C	This temperature is an estimated temperature of the catalytic converter. There is no possible procedure to alter this parameter
10	Manifold pressure sensor	PR001 inlet manifold pressure ----- PR016 atmospheric pressure	250 < X < 450 mb ----- = atmospheric pressure	In the event of problems, run the diagnostic procedure for the Manifold pressure sensor fault (DF045).

Fault finding - Conformity check

NOTES

Only proceed to a conformity check after a complete check with the fault finding tool.
Test conditions: Engine warm at idle speed, no electrical consumers.

Order	Function	Parameter or status Check or action	Display and notes	Fault finding
11	Engine speed	PR006 engine speed	= engine idling-speed reference ± 50 rpm	None
		PR041 engine idling speed reference.	750 rpm\pm 50 rpm if not fast idle speed	
		ET038 fast idle speed	INACTIVE (ACTIVE if air conditioning is on and refrigerant fluid pressure > 13 bar	
		ET039 idle speed regulation	ACTIVE	
12	Engine	PR182 engine load.	10 < X < 25%	None
		PR108 engine torque	-15 < X < 10 N.m	
		PR113 average pinking signal	0.5 < X < 2 V	
		ET026 camshaft dephaser command	INACTIVE (at idling speed)	
13	Injection	ET072 injection cut-off.	INACTIVE (ACTIVE in case of no load or excessive engine speed)	None
		PR050 injection duration.	2 < X < 5 μs	

Fault finding - Conformity check

NOTES

Only proceed to a conformity check after a complete check with the fault finding tool.
Test conditions: Engine warm at idle speed, no electrical consumers.

Order	Function	Parameter or status Check or action	Display and notes	Fault finding
14	Richness	ET037 richness-ratio regulation	ACTIVE	In the event of problems, run the diagnostic procedure for the Fuel supply, bank A and bank B faults (DF202 and DF203)
		PR035 richness correction value	$0.75 < X < 1.25$	
		PR185 average richness factor, bank 1	$0.75 < X < 1.25$	
		PR186 average richness factor, bank 2	$0.75 < X < 1.25$	
		PR031 idle speed richness adaptive	$0 < X < 100\%$	
15	Ignition	PR051 advance ignition	$0 < X < 20^\circ\text{V}$	In the event of problems, run the diagnostic procedure for the Coil command cylinder 1 to 6 faults (DF192 to DF197) depending on the cylinder in question.
		PR036 coil charging time.	$1700 < X < 2000 \mu\text{s}$	
16	Canister bleed	PR023 canister bleed solenoid valve opening cyclic ratio	$0 < X < 25\%$	In the event of problems, run the diagnostic procedure for the Canister-bleed solenoid valve circuit fault (DF014).
		ET117 canister bleed command.	INACTIVE (ACTIVE in case of bleeding)	

Fault finding - Conformity check

NOTES

Only proceed to a conformity check after a complete check with the fault finding tool.
Test conditions: Engine warm at idle speed, no electrical consumers.

Order	Function	Parameter or status Check or action	Display and notes	Fault finding
17	Downstream oxygen sensor	ET031 downstream O2 sensor heating.	ACTIVE or INACTIVE depending on command	In the event of problems, run the diagnostic procedure for the No.1 and No.2 downstream oxygen sensors faults (DF180 and DF181).
		PR221 No.1 downstream oxygen sensor	300 < X < 900 mV	
		PR223 No.2 downstream oxygen sensor	300 < X < 900 mV	
18	Upstream oxygen sensor	ET030 upstream O2 sensor heating.	ACTIVE or INACTIVE depending on command	In the event of problems, run the diagnostic procedure for the No.1 and No.2 upstream oxygen sensors faults (DF178 and DF179).
		PR220 No.1 upstream oxygen sensor	0 < X < 900 mV	
		PR222 No.2 upstream oxygen sensor	0 < X < 900 mV	
19	Air conditioning	ET141 air-conditioning authorisation.	ACTIVE in the absence of an injection fault causing a reduction in the performance of the engine and in the absence of a fault in the fan assembly	None
		ET024 compressor control	INACTIVE	

Fault finding - Command interpretation

AC010	<u>Fuel pump relay</u>
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NOTES	There must be no faults present.
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Ensure the **correct condition of the fuel pump connector**.
Repair if necessary.

Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** of the connection:
computer (connector C) **track H4** \longrightarrow **track 2** of the fuel pump relay.
Repair if necessary.

Check the following, using the electrical diagram for the injection system:

- the relay supply,
 - the soundness of the fuel pump earth connections,
 - the state of the fuel pump relay (resistance of winding and condition of power circuit),
 - the fuel pump resistor,
 - The connection with **track 5** of the relay \longrightarrow fuel pump connector (see vehicle diagrams)
- Repair if necessary.

AFTER REPAIR	Restart the conformity check from the beginning.
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Fault finding - Command interpretation

AC271	<u>Low-speed fan relay</u>
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NOTES	There must be no faults present.
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Ensure the **correct condition of the fan** connectors.
Repair if necessary.

Check the **condition of the clips** of the fan 1 relay (see vehicle diagrams).
Repair if necessary.

Ensure **presence of a +12 volt accessories signal before ignition** on track 1 of the fan 1 relays (large 50A violet relay and small 25A black or grey relay: see diagrams).
Repair if necessary.

Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** of the connection:
computer (connector B) **track J4**  **track 2** of the fan 1 relay
Repair if necessary.

If the fault persists, check the following, using the electrical diagram for the engine cooling system:

- the relay supply,
- the soundness of the fan earth connections,
- the condition of the fan relay (resistance of windings and condition of power circuits),
- the fan resistance values.

Repair if necessary.

AFTER REPAIR	Restart the conformity check from the beginning.
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Fault finding - Command interpretation

AC272	<u>High-speed fan relay</u>
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NOTES	There must be no faults present.
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Ensure the **correct condition of the fan** connectors.
Repair if necessary.

Check the **condition of the clips** of the fan 2 relay (see vehicle diagrams).
Repair if necessary.

Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** of the connection:
computer (connector B) **track K4** —————> **track 2** of the relay fan 2 assembly
Repair if necessary.

Check the following, using the electrical diagram for the engine cooling system:

- the relay supply,
- the soundness of the fan earth connections,
- the condition of the fan relay (resistance of windings and condition of power circuits),
- the fan resistance values.

Repair if necessary.

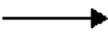
AFTER REPAIR	Restart the conformity check from the beginning.
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Fault finding - Command interpretation

AC627	<u>MIL warning light</u>
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NOTES	There must be no faults present.
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Ensure **the presence of + 12 V before ignition** on **track...** of the instrument panel connector (see instrument panel diagrams).
Repair if necessary.

Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** of the connection:
computer (connector B) **track C4**  instrument panel connector (see instrument panel diagrams)

Repair if necessary.

Check that the bulb is in good condition.
Change if necessary.

AFTER REPAIR	Restart the conformity check from the beginning.
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PINOUT OF 15-WAY BLACK YOKE CONNECTOR ON INJECTION SUB-HARNESS (above cylinder bank "A").

No. of the computer track	No. of the 15V yoke connector track	Allocation
K1 connector C	1	No.1 injector command (track 2)
J3 connector C	2	No.2 injector command (track 2)
K3 connector C	3	No.3 injector command (track 2)
J4 connector C	4	No.4 injector command (track 2)
K4 connector C	5	No.5 injector command (track 2)
K2 connector C	6	No.6 injector command (track 2)
	7	+ after ignition feed from track 5 of the injection relay
B2 connector C	8	+ +5 volts track 3 of the bank "B" camshaft sensor
B1 connector C	9	earth track 1 of the bank "B" camshaft sensor
C2 connector C	10	signal track 2 of the bank "B" camshaft sensor
	11	
G4 connector A	12	No.4 ignition coil command (track 2)
G3 connector A	13	No.5 ignition coil command (track 2)
G2 connector A	14	No.6 ignition coil command (track 2)
F1 connector C	15	camshaft shifter bank B command (track 2)

CORRESPONDENCE OF THE DESIGNATIONS OF THE SENSORS AND THE ACTUATORS

- **Cylinder bank B:** No. 2 sensors and actuator (the cylinder bank located beneath the inlet manifold).
- **Cylinder bank A:** No. 1 sensors and actuators.

Fault finding - Customer complaints

NOTES

Only consult this customer complaint after a complete check using the fault finding tool.

NO COMMUNICATION WITH THE COMPUTER

..... CHART 1

STARTING PROBLEMS

..... CHART 2

IDLE SPEED FAULTS

..... CHART 3

BEHAVIOUR WHILE DRIVING

..... CHART 4

Fault finding - Fault charts

CHART 1	NO COMMUNICATION WITH THE COMPUTER
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NOTES	None
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Try the fault finding tool on another vehicle.

Check:
 – the connection between the diagnostic tool and the diagnostic socket (lead in good condition),
 – injection, engine and passenger compartment fuses.
 Repair if necessary.

Verify the presence of **+12 volts from the battery on track 16** and **earth on track 5** and **track 4** of the diagnostic socket.
 Repair if necessary.

Connect the bournier in place of the computer and check the insulation, continuity and absence of interference resistance of the connections:

computer connector A	track H1	→	earth	
computer connector B	track L4	→	earth	
computer connector B	track M4	→	earth	
computer connector B	track B4	→	+ after ignition	
computer connector B	track H2	→	track 7	diagnostic socket
computer connector C	track L3	→	track 5	injection locking relay
computer connector C	track M4	→	earth	

AFTER REPAIR	Check with the diagnostic tool.
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Fault finding - Fault charts

CHART 2	STARTING PROBLEMS
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NOTES	Only refer to this customer complaint after a check using the diagnostic tool
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Ensure that the engine immobiliser is not active (the red warning light should be extinguished); if it is active, carry out the fault-finding procedure for the engine immobiliser system.

↓

Make sure that the starter motor turns correctly (approximately 250 rpm).
If this is not the case:

- Check the condition of the battery, corrosion and tightness of the terminals.
- Make sure the engine earth strap is in good condition.
- Make sure that the battery lead to the starter motor is in good condition.
- Check the condition of the battery.
- Check that the starter motor is operating correctly.

↓

Fuel supply check:

- Check that there is fuel present (fuel gauge faulty).
- Check that the fuel is of the proper type.
- Check no hoses are pinched (especially after a removal operation).
- Check the condition of the fuel filter; change it if necessary.
- Make sure that the fuel tank breather is not blocked.
- Make sure that the fuel pump is running correctly and that petrol is in fact reaching the injector rail.
- Ensure correct condition of the fuel pressure regulator by checking the pressure (3.5 bar).

↓

Air supply check:

- Check the condition of the intake ducts (no air leaks, pinching of the air intake pipe etc.).
- Make sure that the air filter is in good condition; change it if necessary.
- Disconnect the pipe which connects the canister drain solenoid valve to the inlet manifold and block the canister inlet from the manifold so that no air can enter. If there is no longer any fault, change the canister bleed solenoid valve.

↓



AFTER REPAIR	Check with the diagnostic tool.
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Fault finding - Fault charts

CHART 2
(continued)



Ignition check:

- Check the condition of the spark plugs; change them if necessary.
- Make sure that the spark plugs are correct for the engine type.
- 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.



Exhaust system check:

- Make sure that the exhaust system is in good condition.
- Remove the catalytic converters and look at the condition of the filter element inside (clogging).
- Shake the catalytic converter to see whether the filter element is broken (metallic noises)



Engine condition check:

- Make sure that the engine turns freely.
- Check the cylinder compressions.
- Check the timing.

AFTER REPAIR

Check with the diagnostic tool.

Fault finding - Fault charts

CHART 3

IDLE SPEED FAULTS

NOTES

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

Fuel supply check:

- Check that there is fuel present (fuel gauge faulty).
- Check that the fuel is of the proper type.
- Check no hoses are pinched (especially after a removal operation).
- Check the condition of the fuel filter; change it if necessary.
- Make sure that the fuel tank breather is not blocked.
- Ensure correct condition of the fuel pressure regulator by checking the pressure (3.5 bar).



Air supply check:

- Check the condition of the intake ducts (no air leaks, pinching of the air intake pipe etc.).
- Make sure that the air filter is in good condition; change it if necessary.
- Disconnect the pipe which connects the canister drain solenoid valve to the inlet manifold and block the canister inlet from the manifold so that no air can enter. If there is no longer any disturbance, change the canister bleed solenoid valve.
- Check that the brake servo is not leaking (air entering).



Ignition check:

- Check the condition of the spark plugs; change them if necessary.
- Make sure that the spark plugs are correct for the engine type.
- Make sure that the ignition coils are in good condition.



Engine condition check:

- Check on dipstick that oil level is not too high
- Check the cylinder compressions.
- Check the timing.

AFTER REPAIR

Check with the diagnostic tool.

Fault finding - Fault charts

CHART 4

PROBLEMS WHEN DRIVING

NOTES

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

Fuel supply check:

- 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 a removal operation).
- Check the condition of the fuel filter; change it if necessary.
- Make sure that the fuel tank breather is not blocked.
- Ensure correct condition of the fuel pressure regulator by checking the pressure (3.5 bar).



Air supply check:

- Check the condition of the intake ducts (no air leaks, pinching of the air intake pipe etc.).
- Make sure that the air filter is in good condition and not deformed; change it if necessary.
- Disconnect the pipe which connects the canister drain solenoid valve to the inlet manifold and block the canister inlet from the manifold so that no air can enter. If there is no longer any fault, change the canister bleed solenoid valve.
- Check that the brake servo is not leaking (air entering).
- Remove the air feed line of the motorised throttle and check that the valve is not clogged.



Ignition check:

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



AFTER REPAIR

Check with the diagnostic tool.

CHART 4
(continued)



Engine condition check:

- Check on dipstick that oil level is not too high
- Check the cylinder compressions.
- Check the timing.
- Check the condition of the engine speed sensor target (engine flywheel).
- Make sure that the engine cooling system is operating correctly (so that the engine is operating under optimum conditions, neither too cold nor too hot).



Exhaust system check:

- Make sure that the exhaust system is in good condition.
- Remove the catalytic converters and look at the condition of the filter element inside (clogging).
- Shake the catalytic converter to see whether the filter element is broken (metallic noises)



Running gear check:

- Check that the wheels turn freely (calipers, drums or bearings not binding).
- Check the tyre pressures and tread condition (bulges).

AFTER REPAIR

Check with the diagnostic tool.