

twingo

Kangoo

Clio

TECHNICAL NOTE 3544A

X06X - XB0X - KC0X

PETROL INJECTION FAULT FINDING

COMPUTER TYPE: 5 NR
PROGRAM No.: 002
VDIAG No.: 04

This note cancels and replaces Technical Note No. 3387A

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EDITION ANGLAISE

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

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

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This document presents the generic fault finding applicable to all 5 NR, VDIAG 04 computers fitted to Twingos, Clios and Kangoos with D4D or D4F engines.

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

- The fault finding technical note.
- the wiring diagrams for the function on the vehicle concerned.
- the test bornier Elé. 1618 and a multimeter.

GENERAL APPROACH TO FAULT FINDING

- Use one of the diagnostic tools to identify the system fitted to the vehicle (to read the computer group, the program number, the Vdiag, etc.).

Identification is made by reading the following information:

COMPUTER PART NUMBER	5 NR
VDIAG NUMBER	04
PROGRAM NUMBER (from:)	024

- Locate the Fault finding documents corresponding to the system identified.
- Include information contained in the introductory sections.

DESCRIPTION OF THE FAULT FINDING PHASES

1 - CHECKING THE FAULTS

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

Order of priority

Electrical faults must be dealt with before OBD (on-board diagnostics) faults (**DF111**, **DF112**, **DF113**, **DF114**, misfires in cylinders 1 to 4; **DF165** detection of misfires; **DF102** oxygen sensor operating fault; **DF106** catalytic converter operating fault; **DF116** fuel system operating fault).

Note that there must be no electrical faults either present or stored before dealing with OBD operational faults. Other priorities are dealt with in the NOTES section of the fault finding procedure for the fault in question.

REMINDER: each fault is interpreted for a given type of storage (fault present, fault stored, fault present or stored). The specified checks for dealing with each fault are therefore only to be performed if the fault declared by the diagnostic tool can be identified in the document by its type. The storage type should be considered when using the diagnostic tool after the ignition has been switched off and switched back on. If a fault is interpreted when it is declared as stored, the conditions for applying fault finding 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 when a fault is declared stored by the diagnostic tool but is only interpreted in the documentation as a present fault.

2 - CONFORMITY CHECK

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

- allows problems to be diagnosed without a fault being displayed (e.g. as a result of a customer complaint).
- checks that the injection is functioning correctly and ensures that the states and parameters are correct after the repair.

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

NOTE: the substitution values shown in the conformity check are the default values that the computer uses when the sensor concerned sends an inconsistent signal or no signal at all.

3 - CHECK THAT REPAIR IS CORRECT WITH THE DIAGNOSTIC TOOL

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 faults appear on the diagnostic tool.
- No faults are detected during the conformity check.
- The vehicle is not operating correctly.

GENERAL OBSERVATIONS

1 - FAULT WARNING LIGHT MANAGEMENT

The instrument panel warning lights (configuration with 3 active bulbs) light up according to the faults detected.

Level 1 safety warning light (orange injection warning light):	Level 2 safety warning light (red coolant temperature warning light):	EOBD warning light (orange pollution warning light):
<ul style="list-style-type: none">– throttle control– throttle programming– automatic throttle control– pedal sensor– throttle potentiometer– manifold pressure sensor– air component– inlet manifold– computer– sensor reference voltage– battery voltage– + after relay supply	<ul style="list-style-type: none">– coolant temperature warning (permanent lighting of the coolant temperature warning light):– computer (coolant temperature warning light flashing):	<ul style="list-style-type: none">– engine misfiring– catalytic converter– oxygen sensors– upstream oxygen sensor heater– fuel system– canister– fuel richness autoadaptives– injectors– coils

N.B.: if the level 2 warning light comes on **the computer must be replaced**, unless there are fault codes relating to engine cooling.

2 - PROGRAMMING OPERATIONS:

The programming operations below will be necessary every time one of the following items is replaced in After Sales operation: **computer, throttle valve** and every time the auto-adaptive mappings are adjusted.

2.1 Operation for programming the throttle valve limit:

This operation is carried out the first time the ignition is switched on after the computer or the throttle valve has been replaced.

This operation is automatic (it only requires the ignition to be switched on) and lasts 5 seconds.

This programming operation involves the computer learning the value of the minimum throttle position; this operation is also performed as the system ages if the stored limit positions change.

The programmed position is stored when the ignition is switched off.

Correct programming is shown by the absence of faults in this function and is required for satisfactory driving behaviour.

GENERAL OBSERVATIONS**2.2 Minimum throttle air inlet programming operation:**

This operation consists of allowing the engine to run at idle speed until the coolant temperature reaches 60°C, in order to enable the computer to carry out the torque sequence calculation (estimated time starting from a coolant temperature of 20°C: approximately 3 minutes).

This operation will be stored in the computer memory when the ignition is switched off.

2.3 Operation to program the phonic wheel (toothed ring) for detecting engine misfires:

There are two levels of programming:

- Programming limited in scope to EOBD tests.

This programming operation is carried out at the start of the tests by accelerating under no load until the engine speed cut-off point is reached and then returning to idle speed for injection cut-off and subsequent acceleration.

- Full programming, used for fault finding which explores all levels of operation. This programming operation involves driving the vehicle in 2nd or 3rd gear, reaching the maximum engine speed at 70 mph (120 km/h) and then returning to idle speed by a long deceleration to take up the power again and the idle speed.

2.4 Operation to program the presence of the power assisted steering sensor:

This operation consists of turning the steering to full lock twice, with the engine running at idle speed.

2.5 Operation to prime the fuel system after replacement of the computer:

This operation is performed the first time the ignition is switched on and consists of operating the fuel pump for 20 seconds. This operation is started, with the ignition switched on, by pressing the accelerator pedal to 3/4 of its full travel for one second. It will be performed if this operation did not take place the first time. It will not be performed again unless data is downloaded or a new computer is fitted.

2.6 No load/full load detection operation:

This operation is not necessary with 5NR injection.

2.7 Auto-adaptive resetting operation:

This operation consists of leaving the engine running at idle speed for fifteen minutes (throttle programming carried out).

– DEFINITION OF THE COMPUTER SELF-SUPPLY (power latch):

This supply is timed (approximately 10 seconds) and its purpose is:

- to improve engine starting from warm
- to operate the fans for post-ventilation
- to control the computer locking function
- to store the auto-adaptives and fault codes.

CORRELATION BETWEEN COMPUTER CONNECTOR DESIGNATIONS AND COLOURS:

- **Black** 48-way computer connector: **Connector A.**
- **Brown** 48-way computer connector: **Connector B.**

OBD (on-board diagnostics) TEST ACTIVATION PROCEDURE:

These tests are available in the **SPECIFIC COMMANDS** tab.

NOTE: at the end of the misfiring and fuel system tests, the ignition must be switched off for sufficient time to allow the power latch phase to end before other tests are started. All test instructions described below are shown on the screen of the diagnostic tool.

For the upstream sensor and catalytic converter test:

- Repair all faults beforehand.
- Clear the fault memory.
- Warm up the engine (check that the engine cooling fans perform at least two on/off cycles) until the second richness closed loop is reached
- Begin the test by pressing the blue button on the diagnostic tool (wait for instructions)
- Set the engine speed to 4500 rpm with no load (**for the catalytic converter test only**) in order to reach a catalytic converter temperature above 350°C for 60 seconds.
- Set the engine speed to 3000 rpm with no load for 60 seconds.
- Start the test from the tool.
- Read the results obtained.
- Return to idle speed.
- Deal with any faults detected (in the read faults menu).

For the fuel system test:

- Repair all faults beforehand.
- Clear the fault memory.
- Warm up the engine (check that the engine cooling fans perform at least two on/off cycles) until the second richness closed loop is reached
- Return to idle speed.
- Begin the test by pressing the blue button on the diagnostic tool (wait for instructions)
- Read the results obtained.
- Deal with any faults found.

For the misfire test:

- Repair all faults beforehand.
- Clear the fault memory.
- Warm up the engine (check that the engine cooling fans perform at least two on/off cycles) until the second richness closed loop is reached
- Two possibilities arise:
 - a) the phonic wheel programming has not been erased: the test is activated as soon as the engine is started (no need to start the test from the tool)
 - b) the phonic wheel programming has been erased (delete programming function)
- Begin the engine misfiring test with the diagnostic tool
- Program the phonic wheel (accelerate with no load up to the engine speed cut-off point, then return to idle speed).
- Read the results obtained.
- Deal with any faults detected (in the read faults menu).

CORRELATION BETWEEN COMPUTER CONNECTOR DESIGNATIONS AND COLOURS:

- **Black** 48-way computer connector: **Connector A**.
- **Brown** 48-way computer connector: **Connector B**.

DF003 PRESENT	<u>AIR TEMPERATURE SENSOR CIRCUIT</u> CC.0 : Short circuit to earth CO.1 : Open circuit or short circuit to +12 V
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NOTES	Special notes: The air temperature sensor is located in the inlet manifold.
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Connect the bornier in place of the computer and check the resistance value of the sensor by measuring between track D3 and track E4 of computer connector B. The sensor should have a resistance of approximately 2050 Ω at 25°C (refer to the repair method for the electrical specifications of the sensor according to temperature). Ensure the two connections are insulated against earth and +12 V .	
If the measurement gives an incorrect value or if the fault persists (bad contacts): remove the inlet manifold to gain access to the air temperature sensor.	
Check the connection and condition of the air temperature sensor connector. Replace the connector if necessary.	
Ensure that the sensor is correctly mounted on the throttle body. Repair 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 B track D3 —————▶ Track 1 of the air temperature sensor Computer connector B track E4 —————▶ Track 2 of the air temperature sensor Repair if necessary.	
Check for the presence of a 5 V supply on track 1 of the sensor. If there is no supply, change the injection computer.	
If the fault persists, change the air temperature sensor.	

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

DF004 PRESENT OR STORED	<u>COOLANT TEMPERATURE SENSOR CIRCUIT</u> CC.0 : Short circuit to earth CO.1 : Short circuit or open circuit to + 12 V 1.DEF : Inconsistent signal
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NOTES	Priority in the event of a combination of faults: – Deal first with faults DF219 Throttle potentiometer reference voltage and DF220 Pressure sensor reference voltage, if they are present or stored.
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CC.0 CO.1	NOTES	Only apply this fault finding procedure if a fault is present with CC.0 or CO.1
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Check the **connection and condition** of the coolant temperature sensor connector.
 Replace 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 B **track F1** —————▶ **Track B1** of the coolant temperature sensor

Computer connector B **track D4** —————▶ **Track B2** of the coolant temperature sensor

Repair if necessary.

Check the **resistance value** of the sensor by measuring between:
tracks B1 and B2 of the coolant temperature sensor. Replace the sensor if the resistance is not around:
2360 Ω at 25°C.

(For more details, consult the electrical properties of the sensor as a function of temperature in the Repair method).

Check for the presence of a **5 V supply** on **track B1** of the sensor.
 If there is no supply, **change** the injection computer.

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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Fault finding - Interpretation of faults

DF004 CONTINUED	
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1.DEF	NOTES	Conditions for applying the fault finding strategy to the fault stored: The fault is declared present after: – starting the engine (engine cold) then letting it warm up to 60°C.
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Check **that the engine cooling circuit is correct**: 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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DF006 PRESENT	<p>PINKING SENSOR CIRCUIT</p> <p>CO : Open circuit</p> <p>CC.0 : Short circuit to earth</p> <p>CC.1 : Short circuit to +12 V</p>
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NOTES	None.
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<p>Check the connection and condition of the pinking sensor connector.</p> <p>Replace the connector if necessary.</p>						
<p>Check that the pinking sensor is tightened to torque (see repair methods for manufacturer's value).</p>						
<p>Ensure that the engine does not make an abnormal noise.</p> <p>If there is an abnormal noise, the cause of the noise must be eliminated before the sensor is checked.</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><tr><td>Computer connector B track C2</td><td>—————▶ Track 1 of the pinking sensor</td></tr><tr><td>Computer connector B track C3</td><td>—————▶ Track 2 of the pinking sensor</td></tr><tr><td>Computer connector B track D2</td><td>—————▶ Shielding of the sensor</td></tr></table> <p>Repair if necessary.</p>	Computer connector B track C2	—————▶ Track 1 of the pinking sensor	Computer connector B track C3	—————▶ Track 2 of the pinking sensor	Computer connector B track D2	—————▶ Shielding of the sensor
Computer connector B track C2	—————▶ Track 1 of the pinking sensor					
Computer connector B track C3	—————▶ Track 2 of the pinking sensor					
Computer connector B track D2	—————▶ Shielding of the sensor					
<p>If the fault persists, change the pinking sensor.</p>						

AFTER REPAIR	<p>Clear the fault memory.</p> <p>Deal with any other possible faults.</p>
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DF008 PRESENT	<u>FUEL PUMP RELAY CONTROL CIRCUIT</u> CO : Open circuit CC.0 : Short circuit to earth CC.1 : Short circuit to +12 V
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NOTES	None.
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<p>Check the condition of the clips of the fuel pump relay on the engine fuse and relay plate (see diagrams for the vehicle and model year concerned). Replace the clips if necessary.</p>
<p>With the ignition on, check for the presence of +12 V on track 3 and on track 1 of the fuel pump 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 connection: Computer connector A track G1 —————> Track 2 of the fuel pump relay. Repair if necessary.</p>
<p>Check the resistance value of the relay by measuring between: track 1 and track 2 of the fuel pump relay. Replace the relay if its resistance is zero or equal to infinity (it should be equal to 84 Ω on average).</p>

AFTER REPAIR	Run command AC010 fuel pump relay to check that the pump is operating correctly. Clear the fault memory. Deal with any other possible faults.
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Fault finding - Interpretation of faults

DF010 PRESENT OR STORED	<u>LOW-SPEED FAN ASSEMBLY CIRCUIT</u> CO : Open circuit CC.0 : Short circuit to earth CC.1 : Short circuit to +12 V
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NOTES	Priority in the event of a combination of faults: – Deal first with faults DF004 coolant temperature sensor circuit and DF032 coolant temperature overheating warning light circuit, if these are present or stored.
	Conditions for applying the fault finding strategy to the fault stored: The fault is declared present after: – starting the engine or running command AC626 low speed fan relay using the diagnostic tool.

Check **the condition of the clips** of the low speed fan relay (on the engine fuse and relay plate).
Replace the clips if necessary.

With the ignition switched on, check the **presence of +12 volts** on **track 3** and **track 1** of the low speed fan 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 A **track C2** —————> **Track 2** of the low speed fan relay
Repair if necessary.

Check the **resistance value** of the relay by measuring between:
track 1 and **track 2** of the low speed fan relay. Replace the relay if its resistance is zero or equal to infinity (it should be equal to 64 Ω on average).

AFTER REPAIR	Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.
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DF011 PRESENT OR STORED	<u>FAULT WARNING LIGHT CIRCUIT</u> CC.0 : Short circuit to earth CC.1 : Short circuit to +12 V
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NOTES	Conditions for applying the fault finding strategy to the fault stored: The fault is declared present after: – switching on the ignition or running command AC211 Fault warning light.
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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 A1 —————> Instrument panel (see diagrams for the vehicle and model year concerned). Repair if necessary.	
If the warning light does not come on, check that it is connected to +12 volts . Check that the bulb is in good condition. Repair if necessary.	
If the insulation of the line is correct and the warning light comes on, refer to fault warning light management in fault finding introduction to find out how serious the fault is.	
Carry out repairs according to the type of fault stored. If the fault persists, carry out the fault finding procedure for the instrument panel .	

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

DF014 PRESENT OR STORED	<u>CANISTER BLEED SOLENOID VALVE CIRCUIT</u> CO : Open circuit CC.0 : Short circuit to earth CC.1 : Short circuit to +12 V
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NOTES	Priority in the event of a combination of faults: – Deal first with faults DF076 main relay, DF157 battery voltage and DF236 + after relay supply if they are present or stored.
	Condition for applying the fault finding procedure to the stored fault: The fault is declared present after: – running the engine, whilst warm, at 1500 rpm or starting command AC016 Canister bleed solenoid valve.
	Special notes: The valve is normally closed when the engine is not running. Bleeding takes place with the engine running (but not at idle speed). A canister valve which is mechanically jammed will not be detected by the electrical fault finding system, but if there is an input signal fault on the upstream sensor (DF207), perform mechanical fault finding on the valve (if the valve is jammed open).

Check the **connection and condition of the** canister bleed solenoid valve connector.
Replace the connector if necessary.

With the ignition switched on, check the **presence of +12 V** on track 1 of the canister bleed solenoid valve.

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

Injection relay **track 5** —————> **Track 1** of the canister bleed solenoid valve

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 A **track M3** —————> **Track 2** of the canister bleed solenoid valve

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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<div>DF014</div> <div>CONTINUED</div>	
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<p>Check the resistance value of the solenoid valve by measuring between: tracks 1 and 2 of the canister bleed solenoid valve. Replace the solenoid valve if the resistance is not approximately: 26 Ω ± 4 Ω at 23°C.</p>
<p>If the fault persists, change the canister bleed solenoid valve.</p>

<div>AFTER REPAIR</div>	<p>Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.</p>
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DF018 PRESENT OR STORED	<u>UPSTREAM OXYGEN SENSOR HEATER CIRCUIT</u> CC.0 : Short circuit to earth CC.1 : Short circuit to +12 V
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NOTES	Priority in the event of a combination of faults: – Deal first with faults DF076 main relay and DF157 battery voltage if they are present or stored.
	Conditions for applying the fault finding strategy to the fault stored: The fault is declared present after: – the engine is started.

Check the connection and condition of the oxygen sensor connector and replace the connector if necessary.
With the ignition on, check for the presence of +12 V on track A of the oxygen sensor.
If there is no supply, check the insulation, continuity and absence of interference resistance of the connection: Injection locking relay track 5 —————▶ Track A of the upstream oxygen sensor
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 M4 —————▶ Track B of the upstream oxygen sensor Repair if necessary.
Check the resistance value of the oxygen sensor heating resistor by measuring between: track A and track B of the sensor. Replace the sensor if the resistance is not approximately: 3.3 Ω ± 0.5 Ω at 23°C.
If the incident 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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DF022 PRESENT	<u>COMPUTER</u> 1.DEF : Electronic fault inside computer
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NOTES	Priority in the event of a combination of faults: – Deal first with fault: DF236 + after relay supply if it is present or stored.
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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 A track L3 —————> Track 5 of the main relay Computer connector A track L4 —————> Injection fuse: + battery (see vehicle diagram) Computer connector A track M4 —————> Injection fuse: + after ignition (see vehicle diagram) Computer connector B track L2 —————> Earth Computer connector B track L3 —————> Earth Computer connector B track L4 —————> Earth Repair if necessary.	
If the fault persists, change the injection computer.	

AFTER REPAIR	Program the throttle limits and the throttle air cross section (see introduction). Clear the fault memory. Deal with any other possible faults.
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DF025 PRESENT OR STORED	<u>FLYWHEEL SIGNAL SENSOR CIRCUIT</u> 1.DEF : No tooth signal
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NOTES	Priority in the event of a combination of faults: – Deal first with fault: DF157 Battery voltage if it is present or stored.
	Conditions for applying the fault finding strategy to the fault stored: The fault is declared present after: – running the starter motor for 5 seconds in the no load position.

Check the connection and condition of the flywheel signal sensor connector and replace the connector if necessary.
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 A2 —————> Track A of the engine speed sensor Computer connector B track A1 —————> Track B of the engine speed sensor Repair if necessary.
Check the resistance value of the speed sensor by measuring between: track A and track B of the sensor. Replace the sensor if the resistance is not approximately: 200 Ω ± 270 Ω at 25°C.
Remove the sensor and check whether it has been rubbing on the engine flywheel target (flywheel warped). Replace the sensor if necessary.
Check the condition of the engine flywheel especially if it is removed (condition of teeth). Change the flywheel if necessary.
If the fault persists, change the flywheel signal sensor.

AFTER REPAIR	Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.
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DF032 PRESENT OR STORED	<u>COOLANT TEMPERATURE OVERHEATING WARNING LIGHT CIRCUIT</u> CO : Open circuit CC.0 : Short circuit to earth CC.1 : Short circuit to +12 V
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NOTES	Priority in the event of a combination of faults: – Deal first with faults: DF157 Battery voltage and DF010 low speed fan assembly if they are present or stored.
	Conditions for applying the fault finding strategy to the fault stored: The fault is declared present after: – switching the ignition on or running command AC212 Coolant temperature warning light.

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 E3 —————> Instrument panel (see diagrams for the vehicle and model year concerned) Repair if necessary.	
If the warning light does not come on, check that it is connected to +12 volts . Check that the bulb is in good condition. Repair if necessary.	
If the connection, the bulb and its supply are correct, look in the context stored in the memory (relating to the appearance of the fault) to see whether there has been genuine overheating, by displaying the coolant temperature parameter (PR002).	

AFTER REPAIR	Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.
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DF038 PRESENT OR STORED	<u>DOWNSTREAM OXYGEN SENSOR HEATER CIRCUIT</u> CC.0 : Short circuit to earth CC.1 : Short circuit to +12 V
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NOTES	Priority in the event of a combination of faults: – Deal first with faults: DF076 Main relay, DF157 Battery voltage and DF236 + after relay supply if they are present or stored.
	Condition for applying the fault finding procedure to the stored fault: The fault is declared present following: – the engine is started.
	Special notes: This fault only affects the D4F engine.

Check the connection and condition of the oxygen sensor connector and replace the connector if necessary.
With the ignition on, check for the presence of +12 V on track A of the oxygen sensor.
If there is no supply, check the insulation, continuity and absence of interference resistance of the connection: Injection locking relay track 5 —————> Track A of the downstream oxygen sensor
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 M1 —————> Track B of the downstream oxygen sensor Repair if necessary.
Check the resistance value of the oxygen sensor heating resistor by measuring between: track A and track B of the sensor. Replace the sensor if the resistance is not approximately: 3.3 Ω ± 0.5 Ω at 23°C.
If the incident 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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DF039 PRESENT OR STORED	<u>POWER ASSISTED STEERING PRESSOSTAT</u> 1.DEF : Inconsistent signal
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NOTES	Conditions for applying the fault finding procedure to the stored fault: The fault is declared present after: – starting the engine and holding the steering wheel on full lock for 2 minutes.
	Special notes: This fault only affects vehicles fitted with hydraulic power assisted steering.

Make sure that the pressostat does indeed detect that the steering is on full lock by looking at state ET034 . It should become active on full lock.
If state ET034 does not become active with the steering on full lock, verify that track 2 of the pressostat is connected to earth. Repair if necessary.
Check the connection and condition of the power assisted steering pressure switch connector and replace the connector if necessary.
Verify that track 2 of the power assisted steering pressostat is connected to earth. Repair if necessary.
Connect the bornier in place of the computer and check the insulation (absence of +12 volts), continuity and absence of interference resistance on the connection: Computer connector A track E2 —————▶ Track 1 of the power assisted steering pressostat Repair if necessary.
If the fault persists, change the power assisted steering pressostat.

AFTER REPAIR	Carry out an adjustment of the programming of the power assisted steering pressostat (see fault finding introduction). Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.
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DF044 PRESENT	<u>IMMOBILISER CIRCUIT</u> 1.DEF : Inconsistent signal
NOTES	Special notes: Engine does not start. This fault only appears when the injection computer is unlocked.
Using the diagnostic tool, check the decoder unit (or the multi-timer unit, depending on the equipment of the vehicle concerned) and make sure that its immobiliser code has been programmed correctly . Reconfigure the decoder unit or multi-timer unit 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 A track D3  Decoder ECU (see diagrams for the vehicle and model year concerned) Repair if necessary.	
Carry out a starting test. If the vehicle does not start, switch off the ignition and wait 15 seconds (computer power latch phase) then try to start the engine again. If the problem persists, repeat the operation three times.	
If the vehicle still will not start, replace the injection computer to check that the fault is not due to unlocking of the computer.	
If the problem persists, replace the decoder ECU .	

AFTER REPAIR	Clear the fault memory. Deal with any other possible faults.
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DF045 PRESENT OR STORED	<u>MANIFOLD PRESSURE SENSOR</u> 1.DEF : Below minimum threshold 2.DEF : Above maximum threshold 3.DEF : Inconsistency between the calculated pressure and the actual pressure
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NOTES	Priority in the event of a combination of faults: – Deal first with faults: DF157 Battery voltage, DF226 Throttle limit programming and DF220 Pressure sensor reference voltage if they are present or stored.
	Conditions for applying the fault finding strategy to the fault stored: The fault is declared present after the engine has been started.

Check the connection and condition of the manifold pressure sensor connector. Change the connector if necessary.
Ensure that the sensor is correctly installed in the manifold and that there is no air leak (check the condition of the seal of the sensor).
Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connections: Computer connector B track F2 —————> Track A of the pressure sensor Computer connector B track F3 —————> Track B of the pressure sensor Computer connector B track B2 —————> Track C of the pressure sensor Repair if necessary.
Check for the presence of a 5 V supply on track C of the sensor. If there is no supply, change the injection computer.
If the fault persists, change the pressure sensor.

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

DF061 PRESENT OR STORED	<u>IGNITION COIL 1 - 4 CIRCUIT</u> CC.0 : Short circuit to earth CC.1 : Short circuit to +12 V
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NOTES	Priority in the event of a combination of faults: – Deal first with faults: DF076 Main relay, DF157 Battery voltage and DF236 + after relay supply if they are present or stored.
	Conditions for applying the fault finding strategy to the fault stored: The fault is declared present after: – the engine is started.
	Special notes: The ignition coils are supplied by the fuel pump relay. This relay is timed from the point when the ignition is switched on (without starting the engine), so the supply to the coils must be measured during this period or by running command AC010 fuel pump relay using the diagnostic tool.

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

When the ignition is switched on, check the **presence of +12 V** on **track B** of the coil unit.

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

Fuel pump relay **track 5** —————> **Track B** of the coil unit

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 M3** —————> **Track D** of the coil connector.

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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DF061 CONTINUED	
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Check the resistance value of the coil by measuring between: track A and track D of the coil. Replace the coil unit if the resistance is not approximately: 0.4 Ω ± 0.02 Ω at 25°C.
If the fault persists, change the coil unit.

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

DF062 PRESENT OR STORED	<u>IGNITION COIL 2-3 CIRCUIT</u> CC.0 : Short circuit to earth CC.1 : Short circuit to + 12 V
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NOTES	Priority in the event of a combination of faults: – Deal first with faults: DF076 Main relay, DF157 Battery voltage and DF236 + after relay supply if they are present or stored.
	Conditions for applying the fault finding strategy to the fault stored: The fault is declared present after: – the engine is started.
	Special notes: The ignition coils are supplied by the fuel pump relay. This relay is timed from the point when the ignition is switched on (without starting the engine), so the supply to the coils must be measured during this period or by running command AC010 fuel pump relay using the diagnostic tool.

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

When the ignition is switched on, check the **presence of +12 V** on **track B** of the coil unit.

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

Fuel pump relay **track 5** —————> **Track B** of the coil unit.
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 M2** —————> **Track A** of the coil connector.
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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DF062 CONTINUED	
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Check the resistance value of the coil by measuring between: track B and track A of the coil. Replace the coil unit if the resistance is not approximately: 0.4 Ω ± 0.02 Ω at 25°C.
If the fault persists, change the coil unit.

AFTER REPAIR	Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.
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DF064 PRESENT OR STORED	<u>VEHICLE SPEED SIGNAL</u> 1.DEF : Vehicle speed sensor signal erratic
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NOTES	Conditions for applying the fault finding procedure to the stored fault: – Drive the vehicle at more than 3 mph (5 km/h) . Once the coolant temperature is equal to or greater than 30°C, go into cut-off mode (no load deceleration) for 4 seconds while maintaining the engine speed in the range between 2000 and 5000 rpm.
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Check the connection and condition of the vehicle speed sensor connector. Repair if necessary.
With the ignition switched on, verify the presence of +12 volts on track A of the sensor and earth on track B2 of the vehicle speed 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 A track F4 —————> Track B1 of the vehicle speed sensor Repair if necessary.
Ensure sure that the vehicle speed appears consistent by using the parameter window of the diagnostic tool: PR018 (vehicle speed). If the signal is not consistent, change the vehicle speed sensor.
If the fault persists, change the vehicle speed sensor.

AFTER REPAIR	Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.
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DF076 PRESENT OR STORED	<u>MAIN RELAY</u> CO : Open circuit CC.0 : Short circuit to earth CC.1 : Short circuit to + 12 V
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NOTES	Conditions for applying the fault finding strategy to the fault stored: The fault is declared present after: – the engine is started.
	Note: The main relay may be called the injection locking relay on the injection wiring diagrams.

Check the condition of the clips of the main relay on the engine fuse and relay plate (see relay plate diagrams for the vehicle and model year concerned). Replace the clips if necessary.
Check the presence of +12 volts before ignition on track 3 and track 1 of the main 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 A track M2 —————▶ Track 2 of the main relay Repair if necessary.
Check the resistance value of the relay by measuring between: track 1 and track 2 of the main relay. Replace the relay if its resistance is zero or equal to infinity (it should be equal to 84 Ω on average).
If the fault persists, change the main relay.

AFTER REPAIR	Clear the fault memory. Deal with any other possible faults.
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DF084 PRESENT OR STORED	<u>CYLINDER 1 INJECTOR CONTROL</u> CO : Open circuit CC.0 : Short circuit to earth CC.1 : Short circuit to +12 V
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NOTES	Priority in the event of a combination of faults: – Deal first with faults: DF076 Main relay, DF157 Battery voltage and DF236 + after relay supply if they are present or stored.
	Conditions for applying the fault finding strategy to the fault stored: The fault is declared present after: – the engine is started.

<p>Connect the bornier in place of the computer and check the resistance value of the injector by measuring between: track J1 of computer connector B and track 5 of the main relay (or track C of the 3-way grey connector above the computer).</p> <p>The resistance of the injector should be approximately 14.5 Ω ± 0.7 Ω at 23°C (this value does not take into account any interference resistance in the line).</p> <p>Ensure insulation against earth and against +12 V of track J1 of computer connector B and that track 5 of the main relay is insulated against earth.</p>
<p>If the measurement gives an incorrect value: remove the inlet manifold to gain access to the injectors.</p>
<p>Check the connection and condition of the no. 1 cylinder injector connector. Replace the connector if necessary.</p>
<p>With the ignition switched on, check the presence of +12 volts on track 1 of the injector.</p>
<p>If there is no supply, check the insulation, continuity and absence of interference resistance of the connection:</p> <p>Main relay track 5 —————> Track 1 of injector no. 1</p> <p>Repair if necessary.</p>

AFTER REPAIR	Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.
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<div>DF084</div> <div>CONTINUED</div>	
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<div>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 J1 —————▶ Track 2 of injector no. 1 Repair if necessary.</div>
<div>If the fault persists, change injector no. 1.</div>

<div>AFTER REPAIR</div>	<div>Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.</div>
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DF085 PRESENT OR STORED	<u>CYLINDER 2 INJECTOR CONTROL</u> CO : Open circuit CC.0 : Short circuit to earth CC.1 : Short circuit to +12 V
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NOTES	Priority in the event of a combination of faults: – Deal first with faults: DF076 Main relay, DF157 Battery voltage and DF236 + after relay supply if they are present or stored.
	Conditions for applying the fault finding strategy to the fault stored: The fault is declared present after: – the engine is started.

<p>Connect the bornier in place of the computer and check the resistance value of the injector by measuring between: track K1 of computer connector B and track 5 of the main relay (or track C of the 3-way grey connector above the computer).</p> <p>The resistance of the injector should be approximately 14.5 Ω ± 0.7 Ω at 23°C (this value does not take into account any interference resistance in the line).</p> <p>S'assurer de l'isolement par rapport à la masse et au + 12 V de la voie K1 du calculateur connecteur B et de l'isolement par rapport à la masse de la voie 5 du relais principal.</p>
<p>If the measurement gives an incorrect value: remove the inlet manifold to gain access to the injectors.</p>
<p>Check the connection and condition of the no. 2 cylinder injector connector. Replace the connector if necessary.</p>
<p>With the ignition switched on, check the presence of +12 volts on track 1 of the injector.</p>
<p>If there is no supply, check the insulation, continuity and absence of interference resistance of the connection:</p> <p> Main relay track 5 —————> Track 1 of injector no. 2</p> <p>Repair if necessary.</p>

AFTER REPAIR	Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.
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<div>DF085</div> <div>CONTINUED</div>	
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<div>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 K1 —————▶ Track 2 of injector no. 2 Repair if necessary.</div>
<div>If the incident persists, change injector no. 2.</div>

<div>AFTER REPAIR</div>	<div>Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.</div>
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DF086 PRESENT OR STORED	<u>CYLINDER 3 INJECTOR CONTROL</u> CO : Open circuit CC.0 : Short circuit to earth CC.1 : Short circuit to +12 V
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NOTES	Priority in the event of a combination of faults: – Deal first with faults: DF076 Main relay, DF157 Battery voltage and DF236 + after relay supply if they are present or stored.
	Condition for applying the fault finding procedure to the stored fault: The fault is declared present following: – the engine is started.

<p>Connect the bornier in place of the computer and check the resistance value of the injector by measuring between: track K3 of computer connector B and track 5 of the main relay (or track C of the 3-way grey connector above the computer).</p> <p>The resistance of the injector should be approximately 14.5 Ω ± 0.7 Ω at 23°C (this value does not take into account any interference resistance in the line).</p> <p>S'assurer de l'isolement par rapport à la masse et au + 12 V de la voie K3 du calculateur connecteur B et de l'isolement par rapport à la masse de la voie 5 du relais principal.</p>
<p>If the measurement gives an incorrect value: remove the inlet manifold to gain access to the injectors.</p>
<p>Check the connection and condition of the no. 3 cylinder injector connector. Replace the connector if necessary.</p>
<p>With the ignition switched on, check the presence of +12 volts on track 1 of the injector.</p>
<p>If there is no supply, check the insulation, continuity and absence of interference resistance of the connection:</p> <p> Main relay track 5 —————> Track 1 of injector no. 3</p> <p>Repair if necessary.</p>

AFTER REPAIR	Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.
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<div>DF086</div> <div>CONTINUED</div>	
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<div>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 —————▶ Track 2 of injector no. 3 Repair if necessary.</div>
<div>If the fault persists, change injector no. 3.</div>

<div>AFTER REPAIR</div>	<div>Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.</div>
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DF087 PRESENT OR STORED	<u>CYLINDER 4 INJECTOR CONTROL</u> CO : Open circuit CC.0 : Short circuit to earth CC.1 : Short circuit to +12 V
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NOTES	Priority in the event of a combination of faults: – Deal first with faults: DF076 Main relay, DF157 Battery voltage and DF236 + after relay supply if they are present or stored.
	Conditions for applying the fault finding strategy to the fault stored: The fault is declared present after: – the engine is started.

<p>Connect the bornier in place of the computer and check the resistance value of the injector by measuring between: track K4 of computer connector B and track 5 of the main relay (or track C of the 3-way grey connector above the computer).</p> <p>The resistance of the injector should be approximately 14.5 Ω ± 0.7 Ω at 23°C (this value does not take into account any interference resistance in the line).</p> <p>S'assurer de l'isolement par rapport à la masse et au + 12 V de la voie K4 du calculateur connecteur B et de l'isolement par rapport à la masse de la voie 5 du relais principal.</p>
<p>If the measurement gives an incorrect value: remove the inlet manifold to gain access to the injectors.</p>
<p>Check the connection and condition of the no. 4 cylinder injector connector. Replace the connector if necessary.</p>
<p>With the ignition switched on, check the presence of +12 volts on track 1 of the injector.</p>
<p>If there is no supply, check the insulation, continuity and absence of interference resistance of the connection:</p> <p> Main relay track 5 —————> Track 1 of injector no. 4</p> <p>Repair if necessary.</p>

AFTER REPAIR	Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.
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<div>DF087</div> <div>CONTINUED</div>	
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<div>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 injector no. 4 Repair if necessary.</div>
<div>If the fault persists, change injector no. 4.</div>

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

DF102 PRESENT OR STORED	<u>OXYGEN SENSOR OPERATING FAULT</u> 1.DEF : Reduced frequency
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NOTES	Priority in the event of a combination of faults: – Deal first with faults: DF084, DF085, DF086, DF087 , Injector control, cylinders 1 - 4; DF018, DF038, DF207, DF208 , Heating circuit and signal input for the two oxygen sensors, DF111, DF112, DF113, DF114, DF165 , Detection of misfires and DF106 Catalytic converter functional fault if they are present or stored.
	Condition for applying the fault finding procedure to stored faults: The fault is declared present after the vehicle has been driven or when the engine is warm at idling speed, allowing richness regulation of the two sensors to start: – The state ET159 upstream richness regulation should show STATE 1 : closed loop. – The state ET160 downstream richness regulation should show STATE 1 : closed loop. Make sure that the engine cooling fan cuts in at least twice. Set the engine speed to 3000 rpm, then start an OBD (on-board diagnostics) test of the oxygen sensors (see introduction).
	Note: This fault finding procedure only relates to the upstream oxygen sensor. If the presence of this fault is confirmed (three journeys with this fault), the OBD (on-board diagnostics) warning light comes on.

Carry out a check on the **fuel pressure** (check the regulator and the fuel pump).

If there is no fault on the upstream sensor input signal, **replace the upstream oxygen sensor**. Otherwise, carry out the **DF207** fault finding procedure.

AFTER REPAIR	Clear the fault memory. Reset programmed values (erase programming command). Carry out the instruction to confirm repair (run the OBD oxygen sensor test). Deal with any other possible faults.
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Fault finding - Interpretation of faults

DF106 PRESENT OR STORED	CATALYTIC CONVERTER OPERATING FAULT 1.DEF : Catalytic converter operating fault
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NOTES	Priority in the event of a combination of faults: – Deal first with faults: DF084, DF085, DF086, DF087 , Injector control, cylinders 1 - 4, DF018, DF038, DF102, DF207, DF208 , heating circuit and signal input of the two oxygen sensors and DF111, DF112, DF113, DF114, DF165 , Misfire detection if they are present or stored.
	Condition for applying the fault finding procedure to stored faults: The fault is declared present after the vehicle has been driven or when the engine is warm at idling speed, allowing richness regulation of the two sensors to start: – The state ET159 upstream richness regulation should show STATE 1 : closed loop. – The state ET160 downstream richness regulation should show STATE 1 : closed loop. Make sure that the engine cooling fan cuts in at least twice. Set the engine speed to 3 000 rpm, then start an OBD (on-board diagnostics) test of the catalytic converter (see fault finding introduction).
	Special notes: If the presence of this fault is confirmed (three journeys with this fault), the OBD (on-board diagnostics) warning light comes on.

Check the **tightness** of the oxygen sensors.

Make sure there are **no air leaks** into the exhaust system.
Repair if necessary.

AFTER REPAIR	Clear the fault memory. Reset programmed values (erase programming command). Carry out the instruction to confirm repair (run the catalytic converter OBD test). Deal with any other possible faults.
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<div>DF106</div> <div>CONTINUED</div>	
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<div>Remove the catalytic converter 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</div>
<div>If the fault persists, change the catalytic converter.</div>

<div>AFTER REPAIR</div>	<div>Repeat programming (clear programming command). Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.</div>
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Fault finding - Interpretation of faults

DF111 PRESENT OR STORED	<u>MISFIRING ON CYLINDER 1</u> 1.DEF : Non compliance with emission control standards 2.DEF : Risk of catalytic converter damage
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NOTES	Priority in the event of a combination of faults: – Deal first with faults: DF061 Ignition coils 1 & 4 circuit, DF084 - DF087 Injector control, cylinders 1 - 4, DF025 Flywheel sensor circuit and DF018, DF038, DF102, DF207, DF208 , Heating circuit and signal input of the two oxygen sensors if they are present or stored.
	Conditions for applying the fault finding strategy to the fault stored: The fault is declared present after an OBD (on-board diagnostics) misfiring test: – If the phonic wheel programming has not been erased, the OBD (on board diagnostics) misfiring test is run automatically with the engine running at idle speed for one and a half minutes if the engine is cold or for 30 seconds if the engine is warm. – Before the OBD (on-board diagnostics) misfiring test can be run from the diagnostic tool, programming must be erased and then the test run (see fault finding introduction).
	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. If the OBD (on-board diagnostics) warning light flashes, it means the catalytic converter is in danger of destruction.

Check the ignition system by checking the **condition of the plug** and the radio interference suppressor.
Repair if necessary.

Check the **compression ratio** of cylinder 1.
Repair if necessary.

AFTER REPAIR	Repeat programming (clear programming command). Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.
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DF111 CONTINUED	
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Check the engine flywheel target (disc warped or cracked). Repair if necessary.
Make sure that there is no leakage at the inlet manifold. Repair if necessary.
If no fault is found, then there must be a problem with the fuel system . Therefore check: <ul style="list-style-type: none">– condition of the fuel filter,– the fuel flow rate and pressure.– the cleanness of the tank,– the condition of injector cylinder 1,– the conformity of the fuel. Replace the defective component.

AFTER REPAIR	Repeat programming (clear programming command). Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.
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Fault finding - Interpretation of faults

DF112 PRESENT OR STORED	<u>MISFIRING ON CYLINDER 2</u> 1.DEF : Non compliance with emission control standards 2.DEF : Risk of catalytic converter damage
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NOTES	Priority in the event of a combination of faults: – Deal first with faults: DF062 Ignition coils 2 & 3 circuit, DF084 - DF087 Injector control, cylinders 1 - 4, DF025 Flywheel signal sensor circuit and DF018, DF038, DF102, DF207, DF208 , Heating circuit and signal input of the two oxygen sensors if they are present or stored.
	Conditions for applying the fault finding strategy to the fault stored: The fault is declared present after an OBD (on-board diagnostics) misfires test: – If the phonic wheel programming has not been erased, the OBD (on board diagnostics) misfires test is run automatically with the engine running at idle speed for one and a half minutes if the engine is cold or for 30 seconds if the engine is warm. – Before the OBD (on-board diagnostics) misfires test can be run from the diagnostic tool, programming must be erased and then the test run (see preliminary fault finding).
	Special features: The OBD (On Board Diagnostic) warning light will come on to show that the engine is misfiring, which means that the vehicle does not comply with emission control standards. If the OBD (on-board diagnostics) warning light flashes, it means the catalytic converter is in danger of destruction.

Check the ignition system by checking the **condition of the plug** and the radio interference suppressor.
Repair if necessary.

Check the **compression ratio** of cylinder 2.
Repair if necessary.

AFTER REPAIR	Repeat programming (clear programming command). Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.
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Fault finding - Interpretation of faults

DF112
CONTINUED

Check the **engine flywheel target** (disc warped or cracked).
Repair if necessary.

Make sure that there is **no leakage** at the inlet manifold.
Repair if necessary.

If no fault is found, then there must be **a problem with the fuel system**. Therefore check:

- condition of the fuel filter,
- the fuel flow rate and pressure.
- the cleanness of the tank,
- the condition of the injector of cylinder 2,
- the conformity of the fuel.

Replace the defective component.

**AFTER
REPAIR**

Repeat programming (clear programming command).
Clear the fault memory.
Follow the instructions to confirm repair.
Deal with any other possible faults.

Fault finding - Interpretation of faults

DF113 PRESENT OR STORED	<u>MISFIRING ON CYLINDER 3</u> 1.DEF : Non compliance with emission control standards 2.DEF : Risk of catalytic converter damage
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NOTES	Priority in the event of a combination of faults: – Deal first with faults: DF062 Ignition coils 2 & 3 circuit, DF084 - DF087 Injector control, cylinders 1 - 4, DF025 Flywheel signal sensor circuit and DF018, DF038, DF102, DF207, DF208 , Heating circuit and signal input of the two oxygen sensors if they are present or stored.
	Conditions for applying the fault finding procedure to the stored fault: The fault is declared present after a misfire OBD test: – If the phonic wheel programming has not been erased, the OBD (on board diagnostics) misfires test is run automatically with the engine running at idle speed for one and a half minutes if the engine is cold or for 30 seconds if the engine is warm. – Before the OBD (on-board diagnostics) misfires test can be run from the diagnostic tool, programming must be erased and then the test run (see preliminary fault finding).
	Special features: The OBD (On Board Diagnostic) warning light will come on to show that the engine is misfiring, which means that the vehicle does not comply with emission control standards. If the OBD (on-board diagnostics) warning light flashes, it means the catalytic converter is in danger of destruction.

Check the ignition system by checking the **condition of the plug** and the radio interference suppressor.
Repair if necessary.

Check the **compression ratio** of cylinder 3.
Repair if necessary.

AFTER REPAIR	Repeat programming (clear programming command). Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.
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DF113 CONTINUED	
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Check the engine flywheel target (disc warped or cracked). Repair if necessary.
Make sure that there is no leakage at the inlet manifold. Repair if necessary.
If no fault is found, then there must be a problem with the fuel system . Therefore check: <ul style="list-style-type: none">– condition of the fuel filter,– the fuel flow rate and pressure.– the cleanness of the tank,– the condition of the injector of cylinder 3,– the conformity of the fuel. Replace the defective component.

AFTER REPAIR	Repeat programming (clear programming command). Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.
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Fault finding - Interpretation of faults

DF114 PRESENT OR STORED	<u>MISFIRING ON CYLINDER 4</u> 1.DEF : Non compliance with emission control standards 2.DEF : Risk of catalytic converter damage
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NOTES	Priority in the event of a combination of faults: – Deal first with faults: DF061 Ignition coils 1 & 4 circuit, DF084 - DF087 Injector control, cylinders 1 - 4, DF025 Flywheel signal sensor circuit and DF018, DF038, DF102, DF207, DF208 , Heating circuit and signal input of the two oxygen sensors if they are present or stored.
	Conditions for applying the fault finding strategy to the fault stored: The fault is declared present after an OBD (on-board diagnostics) misfires test: – If the phonic wheel programming has not been erased, the OBD (on board diagnostics) misfires test is run automatically with the engine running at idle speed for one and a half minutes if the engine is cold or for 30 seconds if the engine is warm. – Before the OBD (on-board diagnostics) misfires test can be run from the diagnostic tool, programming must be erased and then the test run (see preliminary fault finding).
	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. If the OBD (on-board diagnostics) warning light flashes, it means the catalytic converter is in danger of destruction.

Check the ignition system by checking the **condition of the plug** and the radio interference suppressor.
Repair if necessary.

Check the **compression ratio** of cylinder 4.
Repair if necessary.

AFTER REPAIR	Repeat programming (clear programming command). Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.
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DF114 CONTINUED	
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Check the engine flywheel target (disc warped or cracked). Repair if necessary.
Make sure that there is no leakage at the inlet manifold. Repair if necessary.
If no fault is found, then there must be a problem with the fuel system . Therefore check: <ul style="list-style-type: none">– condition of the fuel filter,– the fuel flow rate and pressure.– the cleanness of the tank,– the condition of the injector of cylinder 4,– the conformity of the fuel. Replace the defective component.

AFTER REPAIR	Repeat programming (clear programming command). Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.
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Fault finding - Interpretation of faults

DF116 PRESENT OR STORED	FUEL SYSTEM OPERATING FAULT 1.DEF : O ₂ sensor error 2.DEF : O ₂ sensor error: rich 3.DEF : Lean mixture drift 4.DEF : Rich mixture drift 5.DEF : Lean gain 6.DEF : Rich gain
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NOTES	Priority in the event of a combination of faults: – Deal first with faults: DF084 - DF087 Injector control, cylinders 1 - 4 if they are present or stored.
	Conditions for applying the fault finding strategy to the fault stored: The fault is declared present after a test drive cycle or engine warm-up at idle speed which enables the mixture control phase of the two sensors to start: – The state ET159 upstream richness regulation should be identified as STATE 1 : closed loop. – The state ET160 downstream richness regulation should be identified as STATE 1 : closed loop. Make sure that the engine cooling fan cuts in at least twice. Run the OBD (On-Board Diagnostic) fuel supply test.

Carry out a check on the **fuel pressure** (check the regulator and fuel pump).

Carry out a check on the **canister drain solenoid valve** (pipes and valve).

Make sure that there are **no leaks in the fuel system**.
Repair if necessary.

AFTER REPAIR	Clear the fault memory. Reset programmed values (erase programming command). Carry out the instruction to confirm repair (run the fuel system OBD test). Deal with any other possible faults.
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Fault finding - Interpretation of faults

DF118 PRESENT OR STORED	<u>REFRIGERANT PRESSURE SENSOR CIRCUIT</u> CC.0 : Short circuit to earth CC.1 : Short circuit to + 12 V
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NOTES	Priority in the event of a combination of faults: – Deal first with faults: DF220 pressure sensor reference voltage and DF010 fan low speed circuit if they are present or stored.
	Conditions for applying the fault finding strategy to the fault stored: The fault is declared present after: – after the air conditioning has been switched on and the passenger compartment fan is operating.

Check the connection and condition of the Freon pressure sensor connector. Replace 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 A track K2 —————▶ Track A of the Freon pressure sensor Computer connector A track C1 —————▶ Track B of the Freon pressure sensor Computer connector A track J1 —————▶ Track C of the Freon pressure sensor Repair if necessary.
Check for the presence of a 5 V supply on track B of the sensor. If there is no supply, change the injection computer.
If the fault persists, change the refrigerant pressure sensor.

AFTER REPAIR	Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.
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DF120 PRESENT OR STORED	<u>OBD WARNING LIGHT CIRCUIT</u> CO : Open circuit CC.0 : Short circuit to earth CC.1 : Short circuit to + 12 V
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NOTES	Conditions for applying the fault finding strategy to the fault stored: The fault is declared present after: – switching the ignition on or running command AC213 OBD warning light.
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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 A3 —————> instrument panel (see diagrams for the vehicle and model year concerned) Repair if necessary.	
If the warning light does not come on, check that it is connected to +12 volts . Check that the bulb is in good condition. Repair if necessary.	
If the insulation of the line is correct and the warning light illuminates, refer to fault warning light management in preliminary fault finding to find out which components are concerned when the warning light comes on.	
If other faults have appeared, carry out repairs according to the type of fault stored. If the fault persists, carry out the fault finding procedure for the instrument panel .	

AFTER REPAIR	Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.
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DF125 PRESENT OR STORED	<p><u>PEDAL POTENTIOMETER TRACK 1 CIRCUIT</u></p> <p>CC.0 : Short circuit to earth CC.1 : Short circuit to +12 V 1.DEF : Detection of signal outside upper or lower limit</p>
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NOTES	<p>Priority in the event of a combination of faults:</p> <p>– Deal first with faults DF219 Throttle potentiometer reference voltage and DF220 Pressure sensor reference voltage if they are present or stored.</p>
	<p>Conditions for applying the fault finding strategy to the fault stored:</p> <p>The fault is declared present after:</p> <p>– switching on the ignition and pressing the accelerator pedal.</p>
	<p>Special notes:</p> <p>The accelerator pedal position sensor is located on the bulkhead below the brake servo.</p> <p>There is no need to program no load and full load position recognition.</p>

<p>Check the connection and condition of the pedal potentiometer connector.</p> <p>Change the connector if necessary.</p>									
<p>Make sure that the accelerator pedal moves the potentiometer correctly (from the minimum end stop to the maximum end stop).</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><tr><td>Computer connector A track H1</td><td>————></td><td>Track 2 of the pedal potentiometer track 1</td></tr><tr><td>Computer connector A track C4</td><td>————></td><td>Track 4 of the pedal potentiometer track 1</td></tr><tr><td>Computer connector A track B1</td><td>————></td><td>Track 6 of the pedal potentiometer track 1</td></tr></table> <p>Repair if necessary.</p>	Computer connector A track H1	————>	Track 2 of the pedal potentiometer track 1	Computer connector A track C4	————>	Track 4 of the pedal potentiometer track 1	Computer connector A track B1	————>	Track 6 of the pedal potentiometer track 1
Computer connector A track H1	————>	Track 2 of the pedal potentiometer track 1							
Computer connector A track C4	————>	Track 4 of the pedal potentiometer track 1							
Computer connector A track B1	————>	Track 6 of the pedal potentiometer track 1							
<p>Check for the presence of a 5 V supply on track 6 of the potentiometer.</p> <p>If there is no supply, change the injection computer.</p>									

AFTER REPAIR	<p>Clear the fault memory.</p> <p>Follow the instructions to confirm repair.</p> <p>Deal with any other possible faults.</p>
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DF125 CONTINUED	
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Check the resistance value of pedal potentiometer track 1 by measuring between: track 6 and track 4 of the potentiometer. Replace the pedal sensor if the resistance is not approximately: 1700 Ω ± 900 Ω at 25°C.
If the fault persists, change the pedal sensor.

AFTER REPAIR	Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.
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DF126 PRESENT OR STORED	<u>PEDAL POTENTIOMETER TRACK 2 CIRCUIT</u> CC.0 : Short circuit to earth CC.1 : Short circuit to +12 V
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NOTES	Priority in the event of a combination of faults: – Deal first with faults DF219 Throttle potentiometer reference voltage and DF220 Pressure sensor reference voltage if they are present or stored.
	Conditions for applying the fault finding strategy to the fault stored: The fault is declared present after: – switching on the ignition and pressing the accelerator pedal.
	Special notes: The accelerator pedal position sensor is located on the bulkhead below the brake servo. There is no need to program no load and full load position recognition.

Check the connection and condition of the pedal potentiometer connector. Change the connector if necessary.
Make sure that the accelerator pedal moves the potentiometer correctly (from the minimum end stop to the maximum end stop).
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 K1 —————> Track 1 of the pedal potentiometer track 2 Computer connector A track F1 —————> Track 3 of the pedal potentiometer track 2 Computer connector A track B4 —————> Track 5 of the pedal potentiometer track 2 Repair if necessary.
Check for the presence of a 5 V supply on track 3 of the potentiometer. If there is no supply, change the injection computer.

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

DF126 CONTINUED	
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Check the resistance value of pedal potentiometer track 2 by measuring between: track 3 and track 5 of the potentiometer. Replace the pedal sensor if the resistance is not approximately: 3000 Ω ± 2200 Ω at 25°C.
If the fault persists, change the pedal sensor.

AFTER REPAIR	Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.
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DF135 PRESENT OR STORED	<u>BRAKE PEDAL SENSOR CIRCUIT</u> 1.DEF : Inconsistent signal
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NOTES	Condition for applying the fault finding procedure to the stored fault: The fault is declared present after: – the brake pedal has been pressed for 2 seconds ten times.
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Check the connection and condition of the brake pedal switch connector. Replace 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 volts on track A1 and on track B1 of the brake switch.	
Connect the bornier in place of the computer and check: the insulation , continuity and absence of interference resistance of the connection: <div>Computer connector A track B3 —————> Track A3 of the brake switch Computer connector A track C3 —————> Track B3 of the brake switch</div> Repair if necessary.	
Disconnect the pedal sensor connector and check the condition of the contacts using an ohmmeter. Change the pedal sensor if it does not operate as specified below: <div><div><u>Pedal not pressed</u> continuity between tracks B1 and A3 insulation between tracks A1 and B3</div><div><u>Pedal pressed</u> insulation between tracks B1 and A3 continuity between tracks A1 and B3</div></div>	

AFTER REPAIR	Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.
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DF137 PRESENT	<u>MOTORISED THROTTLE</u> CC.0 : Short circuit to earth CC.1 : Short circuit to +12 V 1.DEF : Above maximum threshold
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NOTES	Special notes: The motorised throttle is located in the inlet manifold.
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Connect the bornier in place of the computer and check the resistance value of the throttle motor by measuring between: track L1 and track M1 of computer connector B. The motor resistance must not be zero or equal to infinity. Replace the motorised throttle if necessary.	
If the measurement gives an incorrect value: remove the inlet manifold to gain access to the motorised throttle.	
Check the connection and condition of the motorised throttle connector. Replace 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 B track L1 ➡ Track 3 of the motorised throttle Computer connector B track M1 ➡ Track 4 of the motorised throttle Repair if necessary.	
If the fault persists, change the motorised throttle.	

AFTER REPAIR	Repeat programming (clear programming command). Clear the fault memory. Deal with any other possible faults.
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DF145 PRESENT	<u>MULTIPLEX NETWORK</u>
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NOTES	Special notes: This fault is only active on vehicles with sequential gearbox. This fault indicates a connection problem between the engine and the gearbox and not a signal fault.
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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 J4 —————> Track 45 of the sequential gearbox Computer connector A track H3 —————> Track 33 of the sequential gearbox Repair if necessary.	
If the connections are correct, perform fault finding on the sequential gearbox.	

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

DF146 PRESENT OR STORED	<u>MIXTURE CONTROL</u> 1.DEF : Parameter at min limit 2.DEF : Parameter at max limit 3.DEF : Richness adjustment at upper limit 4.DEF : Richness adjustment at lower limit
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NOTES	Priority in the event of a combination of faults: – Deal first with faults: DF084, DF085, DF086 and DF087 Injector control, cylinders 1 - 4 and DF018, DF102, DF207 , Upstream oxygen sensor heating circuit and signal input if they are present or stored.
	Conditions for applying the fault finding strategy to the fault stored: The fault is declared present after a test drive cycle or engine warm-up at idle speed which enables the mixture control phase of the two sensors to start: – The state ET159 upstream richness regulation should be identified as STATE 1 : closed loop. – The state ET160 downstream richness regulation should be identified as STATE 1 : closed loop. Make sure that the engine cooling fan cuts in at least twice.
	Special notes: This fault only affects the D4D engine.

Carry out a **full inspection of the fuel supply and injection system**, by checking:

- The condition of the fuel filter.
- Fuel flow rate and pressure.
- The cleanliness of the tank.
- Condition and correct operation of the injectors.
- The conformity of the fuel.
- Whether any air is entering the fuel supply system.

Replace any faulty components.

AFTER REPAIR	Reset the self-adapting systems (see introduction). Program the throttle stop and the air valve (see introduction). Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.
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DF157 PRESENT OR STORED	<u>BATTERY VOLTAGE</u> CC.0 : Short circuit to earth CC.1 : Short circuit to +12 V
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NOTES	Condition for applying the fault finding procedure to the stored fault: The fault is declared present after: – keeping the engine speed above 900 rpm for 50 seconds.
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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 are in good condition .	
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 A track L4 —————> Injection fuse: + battery (refer to diagrams for vehicle and model year concerned) 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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Fault finding - Interpretation of faults

DF165 PRESENT OR STORED	<u>DETECTION OF ENGINE MISFIRING</u> 1.DEF : Non compliance with emission control standards 2.DEF : Risk of catalytic converter damage
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NOTES	Priority in the event of a combination of faults: – Deal first with faults: DF061 Ignition coils 1 & 4 circuit, DF084 - DF087 Injector control, cylinders 1 - 4, DF025 Flywheel signal sensor circuit and DF018, DF038, DF102, DF207, DF208 , Heating circuit and signal input of the two oxygen sensors if they are present or stored.
	Conditions for applying the fault finding strategy to the fault stored: The fault is declared present after an OBD (on-board diagnostics) misfires test: – If the phonic wheel programming has not been erased, the OBD (on board diagnostics) misfires test is run automatically with the engine running at idle speed for one and a half minutes if the engine is cold or for 30 seconds if the engine is warm. – Before the OBD (on-board diagnostics) misfires test can be run from the diagnostic tool, programming must be erased and then the test run (see preliminary fault finding).
	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. If the OBD (on-board diagnostics) warning light flashes, it means the catalytic converter is in danger of destruction.

Check the ignition system by checking the **condition of the plugs** and the interference suppressor.
Change the radio interference suppressor and spark plugs if necessary.

Check the **compression ratio** of the engine.
Repair if necessary.

AFTER REPAIR	Repeat programming (clear programming command). Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.
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DF165 CONTINUED	
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Check the engine flywheel target (disc warped or cracked). Repair if necessary.
Make sure there is no leakage at the inlet manifold and that the air filter is in good condition. Repair if necessary.
If no fault is found, then there must be a problem with the fuel system . Therefore check: <ul style="list-style-type: none">– condition of the fuel filter,– the fuel flow rate and pressure.– the cleanness of the tank,– condition of the injectors.– the conformity of the fuel. Replace any faulty components.

AFTER REPAIR	Repeat programming (clear programming command). Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.
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Fault finding - Interpretation of faults

DF167 PRESENT OR STORED	THROTTLE ANGLE SENSOR CC.0 : Short circuit to earth CC.1 : Short circuit to +12 V 1.DEF : Voltage outside tolerances
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NOTES	Priority in the event of a combination of faults: – Deal first with faults DF219 Throttle potentiometer reference voltage and DF220 Pressure sensor reference voltage if they are present or stored.
	Conditions for applying the fault finding strategy to the fault stored: The fault is declared present after: – switching on the ignition and pressing the accelerator pedal.
	Special notes: The motorised throttle is located in the inlet manifold.

<p>On the parameter screen, display the two voltages: PR166 Voltage measured on throttle track 1 and PR165 Voltage measured on throttle track 2. The measured values of these two parameters should be within the range of values given above.</p> <p>NOTE: to check these two parameters are correct (as well as being within the correct range), the values measured (PR166 + PR165) should be added together. The sum of the two voltages should be equal to 5 V ± 0.05 V</p> <p>With the vehicle stationary, 10 seconds after switching off the ignition (motorised throttle no longer energised), the two voltages should be equal to:</p> <p>PR166 —————▶ 0.60 < X < 1.43 V PR165 —————▶ 3.54 < X < 4.35 V</p> <p>With the engine warm and at idle speed with no consumers switched on, the two voltages should be equal to:</p> <p>PR166 —————▶ 0.13 < X < 0.75 V PR165 —————▶ 4.28 < X < 4.90 V</p>	
<p>If the voltages displayed are outside the permitted range, remove the inlet manifold to gain access to the motorised throttle.</p>	
<p>Check the connection and condition of the motorised throttle connector. Replace the connector if necessary.</p>	

AFTER REPAIR	Repeat programming (clear programming command). Program the throttle limits and the throttle air cross section (see introduction). Clear the fault memory. Deal with any other possible faults.
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DF167 CONTINUED	
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If the voltages displayed are outside the permitted range, remove the inlet manifold to gain access to the motorised throttle.	
Check the connection and condition of the motorised throttle connector. Replace 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 B track G1 —————> Track 1 of the motorised throttle Computer connector B track G3 —————> Track 2 of the motorised throttle Computer connector B track C1 —————> Track 5 of the motorised throttle Computer connector B track F4 —————> Track 6 of the motorised throttle Repair if necessary.	
Check for the presence of a 5 V supply on track 5 of the motorised throttle. If there is no supply, change the injection computer.	
If the fault persists, change the motorised throttle.	

AFTER REPAIR	Repeat programming (clear programming command). Program the throttle limits and the throttle air cross section (see introduction). Clear the fault memory. Deal with any other possible faults.
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DF168 PRESENT OR STORED	<u>AIR INTAKE CIRCUIT</u> 1.DEF : Inconsistent signal
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NOTES	Priority in the event of a combination of faults: Deal first with faults: DF045 Manifold pressure sensor and DF137 Motorised throttle if they are present or stored.
	Conditions for applying the fault finding procedure to the stored fault: The fault is declared present after: – the engine has been idling for 10 seconds .
	Special notes: An open circuit on track A (earth) of the manifold pressure sensor will not necessarily create fault DF045 Manifold pressure sensor but instead fault DF168 .

Check the condition of the air filter (clogging or deformation). Replace the air filter if necessary.
Check the air inlet circuit is correct : air filter inlet pipe not clogged and no air leaks on the inlet circuit (especially on the injection computer seal). Repair if necessary.
Check the connection and condition of the manifold pressure sensor connector. Change the connector if necessary .
Ensure that the sensor is correctly installed in the manifold and that there is no air leak (check the condition of the seal of the sensor).
Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance on the connections (especially sensor track A): Computer connector B track F2 —————→ Track A of the pressure sensor Computer connector B track F3 —————→ Track B of the pressure sensor Computer connector B track B2 —————→ Track C of the pressure sensor Repair if necessary.
Check for the presence of a 5 V supply on track C of the sensor. If there is no supply: contact your Techline .
Make sure that there is no point of resistance in the movement of the motorised throttle. Repair if necessary.

AFTER REPAIR	Repeat programming (clear programming command). Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.
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DF182 PRESENT OR STORED	<u>PINKING CORRECTION</u> 1.DEF : Detection of signal outside upper or lower limit
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NOTES	Priority in the event of a combination of faults: – Deal first with faults: DF061 Ignition coils 1 & 4 circuit, DF084 - DF087 Injector control, cylinders 1 - 4, DF146 Richness regulation and DF018, DF038, DF102, DF207, DF208 , Heating circuit and signal input of the two oxygen sensors if they are present or stored.
	Conditions for applying the fault finding strategy to the fault stored: The fault is declared present after: – the engine has been running at more than 2100 rpm and the coolant temperature is above 10°C.

Check the connection and condition of the pinking sensor connector. Replace the connector if necessary.
Check the tightness of the pinking sensor (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 B track C2 —————> Track 1 of the pinking sensor Computer connector B track C3 —————> Track 2 of the pinking sensor Computer connector B track D2 —————> Shielding of the sensor Repair if necessary.
Verify the conformity of the fuel and the spark plugs. 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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Fault finding - Interpretation of faults

DF182 CONTINUED	
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Carry out a conformity check to verify that the mixture adjustment is operating correctly.
If the fault persists, change the pinking sensor.

AFTER REPAIR	Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.
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DF207 PRESENT OR STORED	<u>UPSTREAM SENSOR INPUT SIGNAL</u> CC.1 : Short circuit to +12 V 1.DEF : Below minimum threshold 2.DEF : Above maximum threshold 3.DEF : Consistency of upstream/downstream sensors
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NOTES	Priority in the event of a combination of faults: – Deal first deal with faults: DF076 main relay, DF157 battery voltage, DF236 + after relay feed, DF111 , DF112 , DF113 , DF114 , DF165 detection of engine misfires and DF146 mixture control if they are present or stored.
	Conditions for applying the fault finding procedure to the stored fault: – Carry out a test drive. When the engine is warm, go into cut-off mode (no-load deceleration) for about 5 seconds. If necessary, repeat the operation three times successively.
	Special notes: Make sure that the canister valve is not mechanically jammed (even if the diagnostic tool detects no canister valve fault).

Check the connection and condition of the upstream oxygen sensor connector. Replace the connector if necessary.
Make sure there are no air leaks .
If the vehicle is driven frequently in town, decoke the engine .
With the ignition on, check the presence of +12 volts on track A of the upstream oxygen sensor.
If there is no supply, check the insulation, continuity and absence of interference resistance of the connection: Injection locking relay track 5 —————> Track A of the upstream oxygen sensor 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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DF207 CONTINUED	
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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 connections:</p> <p>Computer connector B track E3 —————▶ Track C of the upstream oxygen sensor</p> <p>Computer connector B track D1 —————▶ Track D of the upstream oxygen sensor</p> <p>Repair if necessary.</p>
<p>If the fault persists, change the oxygen sensor (tighten to the correct torque).</p>
<p>If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.</p>

AFTER REPAIR	<p>Clear the fault memory.</p> <p>Follow the instructions to confirm repair.</p> <p>Deal with any other possible faults.</p>
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DF208 PRESENT OR STORED	<u>DOWNSTREAM SENSOR INPUT SIGNAL</u> CC.1 : Short circuit to +12 V 1.DEF : Below minimum threshold 2.DEF : Above maximum threshold
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NOTES	Priority in the event of a combination of faults: – Deal first deal with faults: DF076 main relay, DF157 battery voltage, DF236 + after relay feed, DF111 , DF112 , DF113 , DF114 , DF165 detection of engine misfires and DF146 mixture control if they are present or stored.
	Conditions for applying the fault finding procedure to the stored fault: – Carry out a test drive. When the engine is warm, go into cut-off mode (no-load deceleration) for about ten seconds. If necessary, repeat the operation three times successively.
	Special notes: This fault only affects the D4F engine.

Check the connection and condition of the downstream oxygen sensor connector. Replace the connector if necessary.
Make sure there are no air leaks .
If the vehicle is driven frequently in town, decoke the engine .
With the ignition on, check the presence of +12 volts on track A of the downstream oxygen sensor.
If there is no supply, check the insulation, continuity and absence of interference resistance of the connection: Injection locking relay track 5 —————> Track A of the downstream oxygen sensor. 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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DF208 CONTINUED	
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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 connections:</p> <p>Computer connector A track H2 —————▶ Track C of the downstream oxygen sensor</p> <p>Computer connector A track E1 —————▶ Track D of the downstream oxygen sensor</p> <p>Repair if necessary.</p>
<p>If the fault persists, change the oxygen sensor (tighten to the correct torque).</p>
<p>If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.</p>

AFTER REPAIR	<p>Clear the fault memory.</p> <p>Follow the instructions to confirm repair.</p> <p>Deal with any other possible faults.</p>
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DF216 PRESENT	THROTTLE BODY MOTOR CONTROL 1.DEF : Inconsistency between throttle valve position and control
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NOTES	Priority in the event of a combination of faults: – Deal first with faults DF045 manifold pressure sensor, DF226 throttle stop programming and DF137 motorised throttle valve if they are present or stored.
	Special notes: The motorised throttle is located in the inlet manifold.

Connect the bornier in place of the computer and check the resistance value of the throttle motor by measuring between: track L1 and track M1 of computer connector B. The motor resistance must not be zero or equal to infinity. Replace the motorised throttle if necessary.
If the measurement gives an incorrect value: remove the inlet manifold to gain access to the motorised throttle.
Check the connection and condition of the motorised throttle connector. Replace 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 B track L1 ➡ Track 3 of the motorised throttle valve Computer connector B track M1 ➡ Track 4 of the motorised throttle valve Repair if necessary.
If the fault persists, change the motorised throttle.
If replacement of the motorised throttle does not solve the problem, change the injection computer .

AFTER REPAIR	Repeat programming (clear programming command). Clear the fault memory. Deal with any other possible faults.
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DF218 PRESENT OR STORED	<u>AIR COMPONENT</u> 1.DEF : Inconsistency between the calculated pressure and the actual pressure
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NOTES	Priority in the event of a combination of faults: – Deal first with faults: DF045 Manifold pressure sensor and DF137 Motorised throttle if they are present or stored.
	Conditions for applying the fault finding strategy to the fault stored: The fault is declared present after: – the engine is started.

Check the plausibility of parameter PR001 Manifold pressure in the parameters window relating to the fault, then in the actual parameters window (to detect any discrepancy in the pressure sensor signal). If necessary, replace the pressure sensor and compare the two signals.
If the signal is correct, remove the inlet manifold and verify the correct operation and condition of the throttle body (contamination of the throttle valve, point of resistance, etc.).
Check the conformity of the air intake circuit (clogging, air leaks, etc.). Repair if necessary.
If the fault persists, change the manifold pressure sensor.
If after replacing the pressure sensor the fault persists, change the motorised throttle.

AFTER REPAIR	Repeat programming (clear programming command). Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.
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DF219 PRESENT	<div>THROTTLE POTENTIOMETER REFERENCE VOLTAGE</div> <div>CC.0 : Short circuit to earth CC.1 : Short circuit to +12 V</div>
NOTES	None.
<div>Check the connection and condition of the sensor connectors: pedal potentiometer and manifold pressure sensor. Change the connectors if necessary.</div>	
<div>With the ignition on, check that the 5 volt supply is reaching the sensors on tracks:<ul style="list-style-type: none">– track 3 of the pedal potentiometer (potentiometer no.2)– track C of the manifold pressure sensor.</div>	
<div>If the 5 volt supply is not reaching the sensors: Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connections:<div>Computer connector A track F1 —————> Track 3 of the pedal potentiometer Computer connector B track B2 —————> Track C of the manifold pressure sensor.</div>Repair if necessary.</div>	
<div>If the connections are correct, change the injection computer.</div>	

AFTER REPAIR	<div>Program the throttle limits and the throttle air cross section (see introduction). Clear the fault memory. Deal with any other possible faults.</div>
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DF220 PRESENT	<p>PRESSURE SENSOR REFERENCE VOLTAGE</p> <p>CC.0 : Short circuit to earth</p> <p>CC.1 : Short circuit to + 12 V</p>
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NOTES	None.
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<p>Check the connection and condition of the connectors of the following sensors: pedal potentiometer, throttle potentiometer, freon pressure sensor, air temperature sensor and coolant temperature sensor.</p> <p>Change the connectors if necessary.</p>															
<p>With the ignition on, check that the 5 volt supply is reaching the sensors on tracks:</p> <ul style="list-style-type: none">– track 6 of the pedal potentiometer (potentiometer no.1)– track 5 of the motorised throttle (supply to both potentiometers)– track B of the freon pressure sensor– track 1 of the air temperature sensor– track B1 of the coolant temperature sensor															
<p>If the 5 volt supply is not reaching the sensors:</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><tr><td>Computer connector A track B1</td><td>—————></td><td>Track 6 of the pedal potentiometer (potentiometer no.1)</td></tr><tr><td>Computer connector B track C1</td><td>—————></td><td>Track 5 of the motorised throttle valve</td></tr><tr><td>Computer connector A track C1</td><td>—————></td><td>Track B of the Freon pressure sensor</td></tr><tr><td>Computer connector B track D3</td><td>—————></td><td>Track 1 of the air temperature sensor</td></tr><tr><td>Computer connector B track F1</td><td>—————></td><td>Track B1 of the coolant temperature sensor</td></tr></table> <p>Repair if necessary.</p>	Computer connector A track B1	—————>	Track 6 of the pedal potentiometer (potentiometer no.1)	Computer connector B track C1	—————>	Track 5 of the motorised throttle valve	Computer connector A track C1	—————>	Track B of the Freon pressure sensor	Computer connector B track D3	—————>	Track 1 of the air temperature sensor	Computer connector B track F1	—————>	Track B1 of the coolant temperature sensor
Computer connector A track B1	—————>	Track 6 of the pedal potentiometer (potentiometer no.1)													
Computer connector B track C1	—————>	Track 5 of the motorised throttle valve													
Computer connector A track C1	—————>	Track B of the Freon pressure sensor													
Computer connector B track D3	—————>	Track 1 of the air temperature sensor													
Computer connector B track F1	—————>	Track B1 of the coolant temperature sensor													
<p>If the connections are correct, change the injection computer.</p>															

AFTER REPAIR	<p>Program the throttle limits and the throttle air cross section (see introduction).</p> <p>Clear the fault memory.</p> <p>Deal with any other possible faults.</p>
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Fault finding - Interpretation of faults

DF226 PRESENT OR STORED	<p><u>THROTTLE LIMIT PROGRAMMING</u></p> <p>CC.0 : Short circuit to earth</p> <p>1.DEF : Inconsistent signal</p> <p>2.DEF : Detection of signal outside upper or lower limit</p>
NOTES	<p>Priority in the event of a combination of faults:</p> <p>– Deal first with faults: DF125, DF126 Pedal potentiometers, track 1 and track 2, DF137 Motorised throttle and DF167 Throttle angle sensor if they are present or stored.</p>
	<p>Special notes:</p> <p>The motorised throttle can only be programmed above 6°C.</p>
<p>Make sure that the battery is correctly charged. If it is not, carry out fault finding on the charging circuit.</p>	
<p>Connect the bornier in place of the computer and check the resistance value of the throttle valve motor by measuring between track L1 and track M1 of computer connector B: The engine resistance should not be zero or infinity.</p> <p>Replace the motorised throttle if necessary.</p>	
<p>On the parameters screen, display the two voltages PR166 measured throttle voltage, track 1 and PR165 measured throttle voltage, track 2. The measured values of these two parameters must be within the range of values given below.</p> <p>NOTE: to check these two parameters are correct (as well as being within the correct range), the values measured (PR166 + PR165) should be added together. The sum of the two voltages should be equal to 5 V ± 0.05 V</p> <p>With the vehicle stationary, 10 seconds after switching off the ignition (motorised throttle no longer energised), the two voltages should be equal to:</p> <p>PR166 —————> 0.60 < X < 1.43 V</p> <p>PR165 —————> 3.54 < X < 4.35 V</p> <p>With the engine warm and at idle speed with no consumers switched on, the two voltages should be equal to:</p> <p>PR166 —————> 0.13 < X < 0.75 V</p> <p>PR165 —————> 4.28 < X < 4.90 V</p>	
AFTER REPAIR	<p>Repeat programming (clear programming command).</p> <p>Program the throttle limits and the throttle air cross section (see introduction).</p> <p>Clear the fault memory.</p> <p>Deal with any other possible faults.</p>

<div>DF226</div> <div>CONTINUED</div>	
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<p>If the fault persists, check the bornier is place of the computer and check the resistance value of the throttle motor measuring between track L1 and track M1 of computer connector B: the resistance of the motor should not be equal to zero nor infinity.</p>																		
<p>If the resistance of the throttle valve is zero or infinite, or if the voltages displayed by the parameters PR165 and PR166 are outside the permitted range, remove the inlet manifold to access the motorised throttle valve.</p>																		
<p>Check the connection and condition of the motorised throttle connector. Replace the connector if necessary.</p>																		
<p>Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance of the connections:</p> <table><tr><td>Computer connector B track L1</td><td>—————▶</td><td>Track 3 of the motorised throttle valve</td></tr><tr><td>Computer connector B track M1</td><td>—————▶</td><td>Track 4 of the motorised throttle valve</td></tr><tr><td>Computer connector B track G1</td><td>—————▶</td><td>Track 1 of the motorised throttle valve</td></tr><tr><td>Computer connector B track G3</td><td>—————▶</td><td>Track 2 of the motorised throttle valve</td></tr><tr><td>Computer connector B track C1</td><td>—————▶</td><td>Track 5 of the motorised throttle valve</td></tr><tr><td>Computer connector B track F4</td><td>—————▶</td><td>Track 6 of the motorised throttle valve</td></tr></table> <p>Repair if necessary.</p>	Computer connector B track L1	—————▶	Track 3 of the motorised throttle valve	Computer connector B track M1	—————▶	Track 4 of the motorised throttle valve	Computer connector B track G1	—————▶	Track 1 of the motorised throttle valve	Computer connector B track G3	—————▶	Track 2 of the motorised throttle valve	Computer connector B track C1	—————▶	Track 5 of the motorised throttle valve	Computer connector B track F4	—————▶	Track 6 of the motorised throttle valve
Computer connector B track L1	—————▶	Track 3 of the motorised throttle valve																
Computer connector B track M1	—————▶	Track 4 of the motorised throttle valve																
Computer connector B track G1	—————▶	Track 1 of the motorised throttle valve																
Computer connector B track G3	—————▶	Track 2 of the motorised throttle valve																
Computer connector B track C1	—————▶	Track 5 of the motorised throttle valve																
Computer connector B track F4	—————▶	Track 6 of the motorised throttle valve																
<p>If the fault persists, change the motorised throttle.</p>																		

<div>AFTER REPAIR</div>	<p>Repeat programming (clear programming command). Program the throttle limits and the throttle air cross section (see introduction). Clear the fault memory. Deal with any other possible faults.</p>
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DF228 PRESENT OR STORED	<u>AIR CONDITIONING COMPRESSOR CONTROL</u> CC.0 : Short circuit to earth CC.1 : Short circuit to +12 V
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NOTES	Conditions for applying the fault finding strategy to the fault stored: The fault is declared present after: – starting the engine and requesting that the compressor is switched on.
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Check the connection and condition of the compressor relay clips. Replace the clips if necessary.
With the ignition on, check for the presence of a 12 V supply on tracks 86 and 30 of the compressor 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 A trackA4 —————▶ Track 85 of the compressor relay Repair if necessary.
Check the resistance value of the relay by measuring between: track 85 and track 86 of the compressor relay. Replace the relay if its resistance is zero or equal to infinity (it should be equal to 84 Ω on average).
If the connections are correct, change the compressor relay.

AFTER REPAIR	Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.
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DF230 PRESENT	<u>COMPUTER</u> 1.DEF : Data inconsistency 2.DEF : No signal 3.DEF : Electronic fault inside computer
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NOTES	Priority in the event of a combination of faults: – Deal first with fault: DF236 + after relay supply if it is present or stored.
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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 A track L3 —————> Track 5 of the main relay Computer connector A track L4 —————> Injection fuse: + battery (refer to diagrams for vehicle and model year concerned) Computer connector A track M4 —————> Injection fuse: + after ignition (refer to diagrams for the vehicle and model year concerned). Computer connector B track L2 —————> Earth Computer connector B track L3 —————> Earth Computer connector B track L4 —————> Earth Repair if necessary.	
If the fault persists, change the injection computer.	

AFTER REPAIR	Program the throttle limits and the throttle air cross section (see introduction). Clear the fault memory. Deal with any other possible faults.
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DF231 PRESENT	<u>COMPUTER</u> 1.DEF : Electronic fault inside computer
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NOTES	Priority in the event of a combination of faults: – Deal first with fault: DF236 + after relay supply if it is present or stored.
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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 A track L3 —————> Track 5 of the main relay Computer connector A track L4 —————> Injection fuse: + battery (refer to diagrams for vehicle and model year concerned) Computer connector A track M4 —————> Injection fuse: + after ignition (refer to diagrams for the vehicle and model year concerned). Computer connector B track L2 —————> Earth Computer connector B track L3 —————> Earth Computer connector B track L4 —————> Earth Repair if necessary.	
If the fault persists, change the injection computer.	

AFTER REPAIR	Program the throttle limits and the throttle air cross section (see introduction). Clear the fault memory. Deal with any other possible faults.
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DF232 PRESENT OR STORED	<u>COMPUTER</u> 1.DEF : Electronic fault inside computer
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NOTES	Priority in the event of a combination of faults: – Deal first with fault DF236 + after relay supply if it is present or stored.
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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 A track L3 —————> Track 5 of the main relay Computer connector A track L4 —————> Injection fuse: + battery (refer to diagrams for vehicle and model year concerned) Computer connector A track M4 —————> Injection fuse: + after ignition (refer to diagrams for the vehicle and model year concerned). Computer connector B track L2 —————> Earth Computer connector B track L3 —————> Earth Computer connector B track L4 —————> Earth Repair if necessary.	
If the fault persists, change the injection computer.	

AFTER REPAIR	Program the throttle limits and the throttle air cross section (see introduction). Clear the fault memory. Deal with any other possible faults.
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DF236 PRESENT	<div><div>+ AFTER RELAY FEED</div><div>CC.0 : Short circuit to earth</div><div>CC.1 : Short circuit to +12 V</div></div>
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NOTES	None.
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<p>Check the condition of the clips of the injection locking relay (main relay) on the engine fuse and relay board. Replace the clips if necessary.</p>
<p>Check for the presence of +12 V before ignition on track 3 and on track 1 of the main 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 connection: Computer connector A track L3 —————> Track 5 of the actuator relay Repair if necessary.</p>
<p>Check the resistance value of the relay by measuring between: track 1 and track 2 of the injection locking relay. Replace the relay if its resistance is zero or equal to infinity (it should be equal to 84 Ω on average).</p>

AFTER REPAIR	<div>Clear the fault memory.</div> <div>Deal with any other possible faults.</div>
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Fault finding - Conformity check

NOTES

Only carry out this conformity check after a **full check** with the diagnostic tool (the values shown in this conformity check are only given as a guide).
Conditions for applying this check: engine off, ignition on.

Order	Function	Parameter or state Check or action	Display and notes	Fault finding procedure
1	Computer supply	ET001: + after ignition computer ----- PR004: computer supply voltage	ACTIVE ----- $11 < X < 14 \text{ V}$	In the event of a fault: perform the charge circuit fault finding procedure.
2	Immobiliser	ET002: engine immobiliser	INACTIVE	If the state is active, apply the fault finding procedure for the immobiliser system.
3	Coolant temperature sensor	PR002: coolant temperature ----- PR143: coolant temperature sensor voltage.	X = engine temperature $\pm 5 \text{ }^{\circ}\text{C}$ ----- $0 < X < 5 \text{ V}$	If there is a problem, perform the fault finding procedure for the coolant temperature sensor (DF004).
4	Air temperature sensor	PR003: air temperature ----- PR144: air temperature sensor voltage.	X = temperature under bonnet $\pm 5 \text{ }^{\circ}\text{C}$ ----- $0 < X < 5 \text{ V}$	If there is a problem: perform the fault finding procedure for the air temperature sensor (DF003).
5	Manifold pressure sensor	PR001: manifold pressure ----- PR016: atmospheric pressure	= atmospheric pressure	If there is a problem: perform the fault finding procedure for the manifold pressure sensor (DF045).
6	Engine operation.	ET142: engine	STATE 1: ignition on and engine off	For more information consult the fault finding procedure for state ET142.

NOTES	Only carry out this conformity check after a full check with the diagnostic tool (the values shown in this conformity check are only given as a guide). Conditions for applying this check: engine off, ignition on.
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Order	Function	Parameter or state Check or action	Display and notes	Fault finding procedure
7	Throttle position potentiometer (in no load position).	ET003: throttle position no load	ACTIVE	If there is a problem: perform the fault finding procedure for the throttle angle sensor (DF167).
		ET005: throttle position wide open.	INACTIVE	
		PR017: measured throttle position	$0 < X < 20 \text{ d}^\circ$	
		PR166: measured throttle voltage, track 1.	$0.60 < X < 1.43 \text{ V}$ (10 seconds after the ignition is switched on)	
		PR165: measured throttle voltage, track 2.	$3.54 < X < 4.35 \text{ V}$ (10 seconds after the ignition is switched on)	
8	Motorised throttle	ET111: programming throttle valve limits	YES	If the state displays NO , reprogram the motorised throttle (see fault finding introduction).
		ET109: motorised throttle.	STATE 1: opening movement STATE 2: closing movement	If there is a problem: perform the fault finding procedure for the motorised throttle (DF137).
		PR118: motorised throttle valve upper limit	$0.78 \text{ V} \pm 0.16 \text{ V}$	If there is a problem: perform the fault finding procedure for the throttle angle sensor (DF167).
		PR119: motorised throttle valve lower limit	$0.39 \text{ V} \pm 0.1 \text{ V}$	

NOTES	Only carry out this conformity check after a full check with the diagnostic tool (the values shown in this conformity check are only given as a guide). Conditions for applying this check: engine off, ignition on.
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Order	Function	Parameter or state Check or action	Display and notes	Fault finding procedure
9	Accelerator pedal position potentiometer	<div>PR112: pedal position measured.</div> <div>PR150: pedal angle measured position 1.</div> <div>PR151: pedal angle measured position 2</div>	<div>15 < X < 110°</div> <div>0.5 < X < 4.5 V</div> <div>0.2 < X < 2.5 V</div>	In the event of a problem: perform the fault finding procedure for the pedal potentiometer track 1 and track 2 circuits (DF125 and DF126).

NOTES	<p>Only carry out this conformity check after a full check with the diagnostic tool (the values shown in this conformity check are only given as a guide).</p> <p>Conditions for applying this check: engine warm at idle speed, no electrical consumers.</p>
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Order	Function	Parameter or state Check or action	Display and notes	Fault finding procedure
1	Computer supply	<div>ET001: + after ignition computer</div> <div>PR004: computer supply voltage</div>	<div>ACTIVE</div> <div>11 < x < 14.5 V</div>	In the event of a fault : perform the charge circuit fault finding procedure.
2	Immobiliser	ET002: engine immobiliser	INACTIVE	If active apply the fault finding procedure for the immobiliser system.
3	Coolant temperature sensor	<div>PR002: coolant temperature</div> <div>PR143: coolant temperature sensor voltage.</div>	<div>X = engine temperature ± 5°C (substitute value: 84°C).</div> <div>0 < X < 5 V</div>	If there is a problem , perform the fault finding procedure for the coolant temperature sensor (DF004).
4	Air temperature sensor	<div>PR003: air temperature</div> <div>PR144: air temperature sensor voltage.</div>	<div>X = temperature under bonnet ± 5°C (substitute value: 30°C).</div> <div>0 < X < 5 V</div>	If there is a problem :perform the fault finding procedure for the air temperature sensor (DF003).
5	Accelerator pedal position potentiometer (no load).	<div>PR112: measured pedal position</div> <div>PR150:</div> <div>PR151: measured pedal angle voltage 2</div>	<div>5 < X < 30°</div> <div>0.298 < X < 0.800 V</div> <div>0.298 < X < 0.425 V</div>	In the event of a problem : apply the fault finding procedure for the accelerator pedal potentiometer track 1 and track 2 circuits (DF125 and DF126).

NOTES	Only carry out this conformity check after a full check with the diagnostic tool (the values shown in this conformity check are only given as a guide). Conditions for applying this check: engine warm, idling, no electrical consumers.
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Order	Function	Parameter or state Check or action	Display and notes	Fault finding procedure
6	Throttle position potentiometer	ET003: throttle position no load	ACTIVE	If there is a problem: perform the fault finding procedure for the throttle angle sensor (DF167).
		ET005: fully open throttle position.	INACTIVE	
		PR017: measured throttle position	$0 < X < 20^{\circ}$	
		PR166: measured throttle voltage, track 1.	$0.13 < X < 0.75 \text{ V}$	
		PR165: measured throttle voltage, track 2.	$4.28 < X < 4.90 \text{ V}$	
7	Motorised throttle	ET111: programming throttle valve limits	YES	If the state displays NO , reprogram the motorised throttle (see fault finding introduction).
		ET109: motorised throttle body	STATE 1: opening movement	If there is a problem: perform the fault finding procedure for the motorised throttle (DF137).
			STATE 2: closing movement	
		PR132: motorised throttle OCR.	$30 < X < 50\%$	None.
		PR118: motorised throttle valve upper limit.	$0.78 \text{ V} \pm 20 \%$	If there is a problem: perform the fault finding procedure for the throttle angle sensor (DF167).
		PR119: motorised throttle valve lower limit	$0.39 \text{ V} \pm 20 \%$	

INJECTION

Fault finding - Conformity check

NOTES

Only carry out this conformity check after a **full check** with the diagnostic tool (the values shown in this conformity check are only given as a guide).
Conditions for applying this check: engine warm at idle speed, no electrical consumers.

Order	Function	Parameter or state Check or action	Display and notes	Fault finding procedure
8	Manifold pressure sensor	PR001: manifold pressure PR016: atmospheric pressure	$216 < X < 504 \text{ mb}$ = local atmospheric pressure	If there is a problem: perform the fault finding procedure for the manifold pressure sensor (DF045).
9	Air conditioning	ET009: air conditioning request ET076: air conditioning authorisation PR027: refrigerant fluid pressure	ACTIVE if requested YES $1 < X < 10 \text{ B}$	None. If there is a problem: perform the fault finding procedure for the refrigerant pressure sensor (DF118).
10	Adaptive richness adjustment	PR030: operating richness adaptive PR031: idle richness adaptive PR140: rapid mixture correction. PR142: average mixture correction.	$- 25.5 < X < 22\%$ $- 50.5 < X < 43\%$ $- 33 < X < 50\%$ $- 33 < X < 50\%$	Since these parameters are directly managed by the injection computer, it is difficult for the After Sales network to interpret them.

NOTES	<p>Only carry out this conformity check after a full check with the diagnostic tool (the values shown in this conformity check are only given as a guide).</p> <p>Conditions for applying this check: engine warm at idle speed, no electrical consumers.</p>
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Order	Function	Parameter or state Check or action	Display and notes	Fault finding procedure
11	Engine operation.	ET142: engine	STATE 3: engine at idle speed.	For more information consult the fault finding procedure for state ET142.
		PR006: engine speed	750 ± 50 rpm	If there is a problem: consult the fault finding chart: idle speed problem (CHART 3).
		PR041: engine idling speed reference.	750 ± 50 rpm	
		ET038: fast idle speed	INACTIVE	None.
		ET039: idle speed regulation	ACTIVE	
		PR051: ignition advance.	- 5 < X < 15 V	Since these parameters are directly managed by the injection computer, it is difficult for the After Sales network to interpret them.
		PR050: injection duration.	2.16 < X < 5.88 ms.	
		PR147: intake efficiency	0.094 < X < 0.218	
12	Upstream oxygen sensor	ET157: upstream sensor state	ACTIVE	If there is a problem: apply the fault finding procedure for the following faults: upstream sensor input signal and upstream oxygen sensor heater circuit (DF207 and DF018).
		ET159: upstream mixture control state.	STATE 2: open loop STATE 1: closed loop	
		PR009: upstream oxygen sensor voltage	10 < X < 1201 mV	

NOTES	Only carry out this conformity check after a full check with the diagnostic tool (the values shown in this conformity check are only given as a guide). Conditions for applying this check: engine warm at idle speed, no electrical consumers.
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Order	Function	Parameter or state Check or action	Display and notes	Fault finding procedure
13	Downstream oxygen sensor	ET158: downstream sensor state	ACTIVE	If there is a problem: apply the fault finding procedure for the following faults: downstream sensor input signal and downstream oxygen sensor heater circuit (DF208 and DF038).
		ET160: downstream mixture control state.	STATE 2: open loop	
		PR010: downstream oxygen sensor voltage	STATE 1: closed loop	
		PR154: downstream sensor rapid correction.	10 < X < 1201 mV - 1.2 < X < 1.2%	
14	Pinking correction function	PR015: anti-pinking correction	0 < X < - 3°	If there is a problem: perform the fault finding procedure for the pinking sensor circuit (DF006).
		PR086: cylinder 1 pinking value	10 < X < 1000 mV	
		PR088: cylinder 2 pinking value	10 < X < 1000 mV	
		PR090: cylinder 3 pinking value	10 < X < 1000 mV	
		PR092: cylinder 4 pinking value	10 < X < 1000 mV	

ET142	<u>ENGINE</u>
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NOTES	These states give an indication of engine operation and can be used for detecting faults when the conditions required for detection (whether stored or present) are specific; e.g.: engine deceleration for a given timed period.
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List of conditions associated with state ET142 :	
	STATE 1: ignition on and engine off
	STATE 2: engine cranking.
	STATE 3: engine at idle speed.
	STATE 4: steady engine speed.
	STATE 5: engine acceleration.
	STATE 6: engine deceleration.
	STATE 7: petrol injection cut-out request.
	STATE 8: injection cut-out return.

AFTER REPAIR	Begin the conformity check again at the state concerned.
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NOTES	Only consult the customer complaints after a complete check using the diagnostic tool.
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NO DIALOGUE WITH THE COMPUTER

CHART 1

STARTING FAULTS

CHART 2

IDLE SPEED FAULTS

CHART 3

FAULTS WHEN DRIVING

CHART 4

CHART 1	No dialogue with the computer
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NOTES	None.
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Try the diagnostic tool on another vehicle.
Check: – the connection between the diagnostic tool and the diagnostic socket (lead in good condition), – the injection, engine and passenger compartment fuses.
Ensure the presence of a +12 volts battery supply on track 16 and earth on track 5 and track 4 of the diagnostic socket. Repair 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 L3 —————> Track 5 of the injection locking relay Computer connector A track L4 —————> + Battery (engine fuse box) Computer connector A track M4 —————> + After ignition (passenger compartment fuse box) Computer connector A track M2 —————> Track 2 of the injection locking relay Computer connector B track L2 —————> Earth Computer connector B track L3 —————> Earth Computer connector B track L4 —————> Earth Computer connector A track H3 —————> Track 14 of the diagnostic socket Computer connector A track J4 —————> Track 6 of the diagnostic socket Computer connector A track K4 —————> Track 7 of the diagnostic socket Repair if necessary.

AFTER REPAIR	Check with the diagnostic tool.
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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 starter motor is turning correctly (approximately 250 rpm).
If this is not the case:

- Check the condition of the battery for corrosion and the 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 the fuel is of the correct type.
- Check that no hoses are pinched (especially after one has been removed).
- 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 impact sensor is operating correctly.
- Make sure that the fuel pump is running correctly and that petrol is reaching the injector rail.
- Make sure that the fuel pressure regulator is in good condition by checking the pressure.



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; replace it if necessary.
- Disconnect the pipe which connects the canister bleed solenoid valve to the inlet manifold and block the canister inlet from the manifold so that no air can enter. If the problem is no longer present, change the canister bleed solenoid valve.



AFTER REPAIR	Check with the diagnostic tool.
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<div>FAULT FINDING CHART 2</div> <div>Cont'd</div>	
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<div>NOTES</div>	Only refer to this customer complaint after a check using the diagnostic tool.
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<div>Ignition check:</div> <div><ul style="list-style-type: none">– Check the condition of the spark plugs; change them if necessary.– Make sure that the spark plugs are correct for the engine type.– Check the condition of the ignition wiring (wires hardened or cracked).– 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.</div>

<div>Exhaust system check:</div> <div><ul style="list-style-type: none">– Make sure that the exhaust system is in good condition.– Remove the catalytic converter 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)</div>

<div>Engine condition check:</div> <div><ul style="list-style-type: none">– Make sure that the engine turns freely.– Check the cylinder compressions.– Check the timing.</div>
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<div>AFTER REPAIR</div>	Check with the diagnostic tool.
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CHART 3	Idle speed faults
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NOTES	Only refer to this customer complaint after a check using the diagnostic tool.
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Fuel supply check:

- Check that there is fuel present (fuel gauge faulty).
- Check the fuel is of the correct type.
- Check that no hoses are pinched (especially after one has been removed).
- 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 pressure regulator is in good condition by checking the pressure.



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; replace it if necessary.
- Disconnect the pipe which connects the canister bleed solenoid valve to the inlet manifold and block the canister inlet from the manifold so that no air can enter. If the problem is no longer present, change the canister bleed solenoid valve.
- Check that the brake servo is not leaking (air leak).



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.
- Check the condition of the ignition wiring (wires hardened or cracked).
- Make sure that the ignition coils are in good condition.



Engine condition check:

- Check for correct oil level on the oil dipstick (not overfilled).
- Check the cylinder compressions.
- Check the timing.

AFTER REPAIR	Check with the diagnostic tool.
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CHART 4	Faults when driving
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NOTES	Only refer to this customer complaint after a check using the diagnostic tool.
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Fuel supply check:

- Check that there is fuel present (fuel gauge faulty).
- Check the fuel is of the correct type.
- Check that no hoses are pinched (especially after one has been removed).
- 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 pressure regulator is in good condition by checking the pressure.



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 connecting the canister bleed solenoid valve to the inlet manifold.
- Block the canister inlet from the manifold so that no air can enter. If the problem is no longer present, change the canister bleed solenoid valve.
- Check that the brake servo is not leaking (air leak).
- Remove the inlet manifold and check that the throttle is not fouled.



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.
- Check the condition of the ignition wiring (wires hardened or cracked).
- 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 in the air gap). If it has, check the condition of the engine flywheel.



AFTER REPAIR	Check with the diagnostic tool.
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<div>FAULT FINDING CHART 4</div> <div>CONTINUED</div>	
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<div>NOTES</div>	<div>Only refer to this customer complaint after a check using the diagnostic tool.</div>
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Engine condition check:

- Check for correct oil level on the oil dipstick (not overfilled).
- 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 converter 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)



Axle check:

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