

Kangoo

Clio

Technical Note 3431A

XB0X - XC0X

SAGEM

PETROL INJECTION FAULT FINDING

COMPUTER TYPE: SAFIR 2
PROGRAM No.: AF
55 TRACK

77 11 297 742

DECEMBER 2000

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 describes the generic fault finding strategy applicable to all SAFIR 2, program no. AF, 55 track computers.

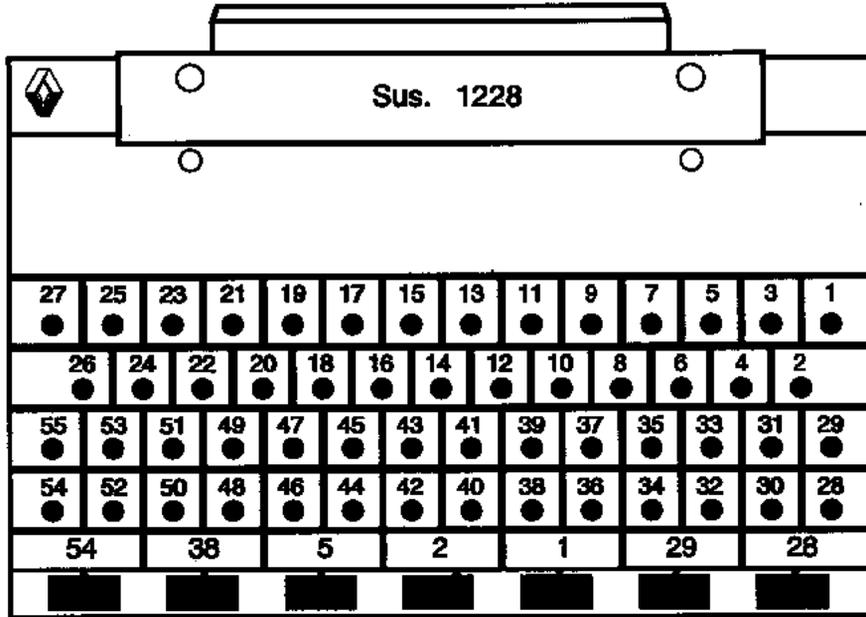
The following are thus required to carry out fault finding on this system:

- the Fault finding Technical Note,
- the wiring diagram of the function for the vehicle concerned,
- the tools listed under the special tooling required.

GENERAL APPROACH TO FAULT FINDING:

- Use of one of the fault finding tools to identify the system equipping the vehicle (to read the computer family, SAFIR 2, program no. AF, 55 track computers (command LC046)).
- Finding the Fault finding documents corresponding to the system identified.
- Taking note of information contained in the introductory sections.
- Reading the faults stored in the computer memory and using the Interpretation of faults section of the documents.
Reminder: Each fault is interpreted for a particular type of storage (fault present, fault stored, fault present or stored). The checks defined for handling each fault are therefore only to be performed if the fault shown by the fault finding tool is interpreted in the document for its type of storage. The storage type should be considered when using the fault finding tool following ignition switch-off and switch-on.
If a fault is interpreted when it is stated to be "stored", the conditions for application of the fault finding procedure appear in the "NOTES" box. When these conditions are not satisfied, use the fault finding procedure to check the circuit of the faulty part since the fault is no longer present on the vehicle. Follow the same procedure when a fault is shown as "stored" by the fault finding tool but is only interpreted in the documentation for a "present" fault.
- Perform the conformity check (appearance of possible incorrect operations not yet stated by the system's self diagnosis procedure) and apply the associated fault finding strategy according to results.
- Validation of the repair (disappearance of the phenomenon reported by the customer).
- Use of the fault finding strategy for each "Customer complaint " if the problem persists.

If the information obtained by the fault finding tool requires electrical continuities to be checked, connect bornier **SUS. 1228**.



Bornier **Sus. 1228** is a 55 track base with a printed circuit on which there are 55 copper-coated areas, numbered from 1 to 55.

Using the wiring diagrams, it is easy to identify the cables connecting the component(s) to be checked.

IMPORTANT:

- All the checks using bornier **Sus. 1228** are carried out with the battery disconnected.
- The bornier is only designed to operate with an ohmmeter. Under no circumstances should 12 volts be applied to the test points.

**DF003
PRESENT
OR
STORED**

Air temperature sensor circuit
DEF : Unidentified electrical fault

NOTES

Conditions for applying the diagnostic to stored faults:
The fault is declared present following tripping of the fan with the engine running.

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

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

Computer track 20 —————> **Air temperature sensor**
Computer track 46 —————> **Air temperature sensor**

Repair if necessary.

Check the resistance of the sensor. Replace it if necessary.

AFTER REPAIR

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

**DF004
PRESENT
OR
STORED**

Coolant temperature sensor circuit

DEF : Unidentified electrical fault

NOTES

Conditions for applying the diagnostic to stored faults:

The fault is declared present following tripping of the fan with the engine running.

Check connection and status of the coolant temperature sensor connector.
Change the connector if necessary.

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

Computer track 44 —————> **Coolant temperature sensor**

Computer track 15 —————> **Coolant temperature sensor**

Repair if necessary.

Check the sensor resistance at different temperatures (see the Help section).
Replace the sensor if necessary.

AFTER REPAIR

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

**DF006
PRESENT
OR
STORED**

Pinking sensor circuit

DEF : Unidentified electrical fault

NOTES

Conditions for applying the diagnostic to stored faults:

The fault is declared present during a road test when the engine is warm and with a high engine speed.

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

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

Computer track 54 —————> **Pinking sensor**
Computer track 44 —————> **Pinking sensor**
Computer track 2 —————> **Pinking sensor screening**

Repair if necessary.

Change the pinking sensor if the fault persists.

AFTER REPAIR

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

DF008 PRESENT	<p><u>Fuel pump control relay circuit</u> CC.1 : Short circuit to + 12 volts</p>
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NOTES	None
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<p>Check the connection and condition of the fuel pump relay connector. Change the connector if necessary.</p>
<p>Disconnect the relay. Check, with the ignition on, for +12 V on track 1 of the fuel pump relay. Repair if necessary.</p>
<p>Check the fuel pump relay coil. Change the fuel pump relay if necessary.</p>
<p>Check the insulation against 12 V of the connection between: Computer track 48 —————> Fuel pump relay Repair if necessary.</p>
<p>If the problem has still not been solved, deal with the other faults and then proceed to the conformity check.</p>

AFTER REPAIR	<p>Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.</p>
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DF011 PRESENT	<u>Fault warning light circuit</u> CO.0 : Open circuit or short circuit to earth CC.1 : Short circuit to + 12 volts
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NOTES	None
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Check the status of the indicator light (if it is not lit). Change if necessary.
Check that there is an input of 12 V into the indicator (if it is not lit). Rectify the line to the fuse.
Check the insulation and the continuity of the connection between: Computer track 43 —————> track 6 Instrument panel Repair.

AFTER REPAIR	Clear the fault memory. Deal with any other possible faults.
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DF014 PRESENT	<u>Canister bleed solenoid valve circuit</u> DEF : Unidentified electrical fault
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NOTES	None
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Check the connection and condition of the canister bleed solenoid valve connector. Change the connector if necessary.	
With the ignition switched on, check for the presence of 12 volts on track A of the canister bleed solenoid valve. Repair if necessary.	
Check the condition of the connectors and the insulation and continuity of the connection between: Computer track 42 —————> Canister bleed valve Repair if necessary.	
Check the resistance of the canister bleed valve. Replace the valve if necessary.	

AFTER REPAIR	Clear the fault memory. Deal with any other possible faults.
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DF016 PRESENT OR STORED	<p><u>Injector circuits</u></p> <p>DEF : Fault stored</p> <p>2.3.CO : Injector 2 or 3 in open circuit or short circuit to earth</p> <p>2.3.CC : Injector 2 or 3 in short circuit to + 12 volts</p> <p>1.4.CO : Injector 1 or 4 in open circuit or short circuit to earth</p> <p>1.4.CC : Injector 1 or 4 in short circuit to +12 volts</p>
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NOTES	<p>Conditions for application of the diagnostic to the stored fault:</p> <p>The fault is declared present after the engine has been running for 5 minutes at idling speed.</p>
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<p>Check the connection and condition of the injector connectors. Change the connector if necessary.</p>
<p>Check the resistance of the value for the two faulty injectors. Replace the injector/s if necessary.</p>
<p>When the ignition is switched on and during the period specified, check for 12 V on track 1 of the faulty injector. Repair if necessary.</p>
<p>Check the insulation, the continuity and absence of interference resistance on the connections between:</p> <p style="text-align: center;"> Computer track 30 \longrightarrow Injectors 1 and 4 Computer track 4 \longrightarrow Injectors 2 and 3 </p> <p>Repair if necessary.</p>

AFTER REPAIR	<p>Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.</p>
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DF021 PRESENT	<u>Immobiliser circuit</u> DEF : Stored fault 1.DEF : Coded line fault 2.DEF : Immobiliser code not programmed
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NOTES	None
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1.DEF	NOTES	None
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Connect the bornier in place of the computer and check the insulation, continuity and that there is no interference resistance on the wiring on **track 37** of the computer.
Repair if necessary.

Refer to the immobiliser fault finding if the fault persists.

2.DEF	NOTES	None
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Refer to the immobiliser fault finding.

AFTER REPAIR	Clear the fault memory. Deal with any other possible faults.
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<p>DF022 PRESENT</p>	<p><u>Computer</u> DEF : Unidentified electrical fault</p>
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<p>NOTES</p>	<p>None</p>
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Computer defective or not correct.
Replace the computer.

<p>AFTER REPAIR</p>	<p>Clear the fault memory. Perform a road test then check with the fault finding tool.</p>
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**DF023
PRESENT
OR
STORED**

Oxygen sensor circuit

DEF : Unidentified electrical fault

NOTES

Conditions for applying the diagnostic to stored faults:

The fault is declared present after the engine has been running at 2500 rpm for 5 minutes.

Check the connection and condition of the oxygen probe connector.
Change the connector if necessary.

Check, with the ignition on during the period specified, for:
– **earth on track B** of the oxygen sensor,
– **+12 V after the fuel pump relay on track A** of the oxygen sensor.
Repair if necessary.

Check for the presence of earth on **track 18** of the injection computer.
Repair if necessary.

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

Computer track 17 —————> **Oxygen sensor**

Repair if necessary.

Change the oxygen sensor if the fault persists.

AFTER REPAIR

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

**DF024
PRESENT
OR
STORED**

Vehicle speed sensor circuit
DEF : Unidentified electrical fault

NOTES

Conditions for applying the diagnostic to stored faults:

The fault is declared present during a test under variable conditions
OR a road test at a steady speed
OR a road test driving down-hill in no load position.

Check the connection and condition of the vehicle speed sensor connector.
Change the connector if necessary.

Check that the sensor is correctly positioned.

Check on the vehicle speed sensor for:
– **earth on track B2,**
– **+12 V after ignition on track A.**
Repair if necessary.

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

Computer track 12 —————> **Vehicle speed sensor**

Repair if necessary.

Replace the sensor if the fault persists.

AFTER REPAIR

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

DF025 PRESENT OR STORED	<p><u>Flywheel signal sensor circuit</u></p> <p>DEF : Stored fault CC.0 : Short circuit to earth of flywheel signal sensor CO.0 : Absence of tooth signal open circuit or short circuit to earth IN : Inverted target sensor</p>
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NOTES	<p>Conditions for applying the diagnostic to stored faults: The fault is declared present following starter-motor activation for 10 seconds. OR after the engine has been running for two minutes.</p>
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CO.0 - CC.0	NOTES	None.
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<p>Check the flywheel signal sensor resistance. Replace the sensor if necessary.</p>
<p>Check the condition of the flywheel, especially if it has been removed.</p>
<p>Check the condition of the connectors and the insulation, the continuity and absence of interference resistance on the connections between:</p> <p style="text-align: center;"> Computer track 33 \longrightarrow Flywheel signal sensor Computer track 34 \longrightarrow Flywheel signal sensor </p> <p>Repair if necessary.</p>

In	NOTES	None.
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<p>Check that the flywheel signal sensor has been correctly connected (the sensor connector must not be inverted). Repair if necessary.</p>
<p>Replace the sensor if the fault persists.</p>

AFTER REPAIR	<p>Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.</p>
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DF026 PRESENT OR STORED	<u>Throttle potentiometer circuit</u> DEF : Unidentified electrical fault
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NOTES	<p>Conditions for applying the diagnostic to stored faults:</p> <p>The fault is declared present after the ignition has been switched on and the accelerator pedal not depressed for the first 10 seconds.</p> <p>OR</p> <p>The fault is declared present when there is a slight variation of the throttle position potentiometer from no load towards full load.</p> <p>OR</p> <p>The fault is declared present when there is a full load request for 10 seconds.</p>
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Check the connection and general condition of the connector on the throttle position potentiometer.
Change the connector if necessary.

Check the resistance of the throttle potentiometer.
Replace the throttle potentiometer if necessary.

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

Computer track 19	—————▶	Throttle position potentiometer
Computer track 45	—————▶	Throttle position potentiometer
Computer track 46	—————▶	Throttle position potentiometer

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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DF036 PRESENT OR STORED	<u>Ignition coil circuit</u> 1DEF : Fault stored 2.3.CO : Coils 2 and 3 open circuit 2.3.CC : Coils 2 and 3 short circuit 1.4.CO : Coils 1 and 4 open circuit 1.4.CC : Coils 1 and 4 short circuit
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NOTES	Conditions for applying the diagnostic to stored faults: The fault is declared present after the engine has been running for 10 seconds or at starter speed.
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Check the 15 A fuse on the power supply fuseboard which protects the ignition coil module. Change the fuse if necessary.									
Check the connection and condition of the ignition coil connector. Change the connector if necessary.									
Check the condition of the connectors and the insulation and continuity of the connections between: <table style="margin-left: 40px; border: none;"> <tr> <td>Computer track 29</td> <td>————→</td> <td>Ignition coil</td> </tr> <tr> <td>Computer track 28</td> <td>————→</td> <td>Ignition coil</td> </tr> <tr> <td>Coil track 3</td> <td>————→</td> <td>Fuse</td> </tr> </table> Repair if necessary.	Computer track 29	————→	Ignition coil	Computer track 28	————→	Ignition coil	Coil track 3	————→	Fuse
Computer track 29	————→	Ignition coil							
Computer track 28	————→	Ignition coil							
Coil track 3	————→	Fuse							
Change the ignition coil if the fault persists.									

AFTER REPAIR	Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.
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**DF041
PRESENT
OR
STORED**

Oxygen sensor heating relay control circuit

DEF : Stored fault
CO.0 : Open circuit or short circuit to earth
CC.1 : Short circuit to +12 volts

NOTES

Conditions for applying the diagnostic to stored faults:

The fault is declared present after the engine has been running for 10 seconds at idling speed.

Check the connection and status of the connector on the heating relay of the oxygen sensor.
Change the connector if necessary.

Check, with the ignition on, **the presence of 12 volts on track 1** of the heating relay for the oxygen sensor.
Disconnect the relay.
Repair if necessary.

Check the heating relay coil.
Change the heating relay if necessary.

Check the insulation and the continuity of the connection between:

Computer track 10 —————> **Oxygen sensor heating relay**

Repair if necessary.

If the problem has still not been solved, deal with the other faults and then proceed to the conformity check.

AFTER REPAIR

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

DF045 PRESENT OR STORED	<p><u>Manifold pressure sensor circuit</u></p> <p>DEF : Pressure sensor fault</p> <p>1.DEF : Ignore this fault</p> <p>2.DEF : Ignore this fault</p> <p>3.DEF : Ignore this fault</p>
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NOTES	<p>Conditions for applying the diagnostic to stored faults:</p> <p>The fault is declared present after the engine has been switched off and dialogue lost AND the engine is switched back on and dialogue established AND 10 seconds with the engine running at a minimum of 608 rpm.</p>
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DEF	NOTES	None
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<p>Check for the presence of earth on the fuel pressure regulator.</p>
<p>Check that the pressure sensor is correctly connected both electrically and pneumatically. Check the conformity of the pressure sensor pipe (it must not be holed or blocked...).</p>
<p>Check the insulation, the continuity and absence of interference resistance on the connections between:</p> <p style="text-align: center;"> Computer track 45 \longrightarrow Pressure sensor Computer track 44 \longrightarrow Pressure sensor Computer track 16 \longrightarrow Pressure sensor </p> <p>Repair if necessary.</p>
<p>Replace the sensor if the fault persists.</p>

1.DEF - 2.DEF - 3.DEF	NOTES	None
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<p>Ignore these faults.</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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DF140 PRESENT OR STORED	<p><u>Fan assembly relay output</u></p> <p>DEF : Unidentified electrical fault CO.0 : Open circuit or short circuit to earth CC.1 : Short circuit to +12 volts</p>
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NOTES	<p>Deal with the coolant sensor circuit fault DF004 as a priority.</p> <p>Conditions for applying diagnostic on stored faults: Apply the fault finding strategy whether the fault is present or stored.</p>
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<p>Check the connection and the state of the connector to the low-speed fan relay. Change the connector if necessary.</p>										
<p>Check for the presence of 12 volts on track 30 of the low-speed fan assembly relay. Check for the presence of 12 volts on track 85 of the low-speed fan assembly relay when the ignition is switched on. Repair if necessary.</p>										
<p>Disconnect the relay. Check the coil in the low-speed fan assembly relay. Replace the low-speed fan relay if necessary.</p>										
<p>Check the insulation and continuity of the connections between:</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: right;">Computer track 51</td> <td style="text-align: center;">—————▶</td> <td>Low-speed fan relay</td> </tr> <tr> <td style="text-align: right;">Low-speed fan relay</td> <td style="text-align: center;">—————▶</td> <td>Fan assembly (not forgetting the fan assembly resistance)</td> </tr> <tr> <td style="text-align: right;">Fan</td> <td style="text-align: center;">—————▶</td> <td>earth</td> </tr> </table> <p>Repair if necessary.</p>		Computer track 51	—————▶	Low-speed fan relay	Low-speed fan relay	—————▶	Fan assembly (not forgetting the fan assembly resistance)	Fan	—————▶	earth
Computer track 51	—————▶	Low-speed fan relay								
Low-speed fan relay	—————▶	Fan assembly (not forgetting the fan assembly resistance)								
Fan	—————▶	earth								
<p>Disconnect the fan assembly. Run the engine at idle speed (for the measuring period). Switch on the air conditioning. Check for the presence of 12 volts at the fan assembly connector. If 12 volts is not present, change the low-speed fan assembly relay.</p>										
<p>Change the fan assembly if the fault persists.</p>										

AFTER REPAIR	<p>Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.</p>
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<p>DF140</p> <p>CONTINUED</p>	
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<p>NOTES</p>	<p>Deal with the coolant sensor circuit fault DF004 as a priority.</p> <p>Conditions for applying diagnostic on stored faults: Apply the fault finding strategy whether the fault is present or stored.</p>
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<p>Check the high-speed fan relay connector for condition and proper connection. Change the connector if necessary.</p>										
<p>Check the presence of 12 volts on track 3 of the high-speed fan assembly relay. Check the presence of 12 volts on track 1 of the high-speed fan assembly relay when the ignition is switched on. Repair if necessary.</p>										
<p>Disconnect the relay. Check the coil in the high-speed fan assembly relay. Change the high-speed fan relay if necessary.</p>										
<p>Check the insulation and continuity of the connections between:</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">Computer track 10</td> <td style="text-align: center;">—————▶</td> <td style="text-align: center;">High-speed fan assembly relay</td> </tr> <tr> <td style="text-align: center;">High speed fan assembly relay</td> <td style="text-align: center;">—————▶</td> <td style="text-align: center;">Fan</td> </tr> <tr> <td style="text-align: center;">Fan</td> <td style="text-align: center;">—————▶</td> <td style="text-align: center;">earth</td> </tr> </table> <p>Repair if necessary.</p>		Computer track 10	—————▶	High-speed fan assembly relay	High speed fan assembly relay	—————▶	Fan	Fan	—————▶	earth
Computer track 10	—————▶	High-speed fan assembly relay								
High speed fan assembly relay	—————▶	Fan								
Fan	—————▶	earth								
<p>Disconnect the fan assembly. Connect track 2 of the high-speed fan assembly relay to earth. Switch on the ignition. Check for the presence of 12 volts on the fan assembly connector. Warning: this operation may cause the reappearance of the DF140 fan assembly relay output fault. If 12 volts is not present, change the low-speed fan assembly relay.</p>										
<p>Change the fan assembly if the fault persists.</p>										

<p>AFTER REPAIR</p>	<p>Clear the fault memory. Follow the instructions to confirm repair. Deal with any other possible faults.</p>
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DF143 PRESENT	<u>Idle speed regulation solenoid valve circuit</u> DEF : Unidentified electrical fault
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NOTES	None
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<p>Check the connection and status of the idle speed regulation solenoid valve connector. Change the connector if necessary.</p>												
<p>Check the resistance of the idle speed regulation stepper motor. Replace the idle speed regulation valve if necessary.</p>												
<p>Check the insulation, the continuity and absence of spurious resistance on the connections between:</p> <table><tr><td>Computer track 8</td><td>————▶</td><td>Idle speed regulation solenoid valve stepper motor</td></tr><tr><td>Computer track 35</td><td>————▶</td><td>Idle speed regulation solenoid valve stepper motor</td></tr><tr><td>Computer track 9</td><td>————▶</td><td>Idle speed regulation solenoid valve stepper motor</td></tr><tr><td>Computer track 36</td><td>————▶</td><td>Idle speed regulation solenoid valve stepper motor</td></tr></table> <p>Repair if necessary.</p>	Computer track 8	————▶	Idle speed regulation solenoid valve stepper motor	Computer track 35	————▶	Idle speed regulation solenoid valve stepper motor	Computer track 9	————▶	Idle speed regulation solenoid valve stepper motor	Computer track 36	————▶	Idle speed regulation solenoid valve stepper motor
Computer track 8	————▶	Idle speed regulation solenoid valve stepper motor										
Computer track 35	————▶	Idle speed regulation solenoid valve stepper motor										
Computer track 9	————▶	Idle speed regulation solenoid valve stepper motor										
Computer track 36	————▶	Idle speed regulation solenoid valve stepper motor										

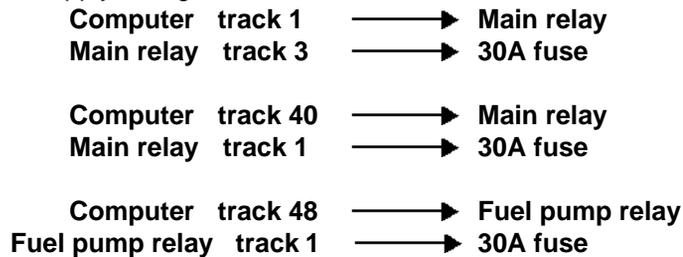
AFTER REPAIR	Clear the fault memory. Deal with any other possible faults.
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DF147 PRESENT	<p><u>Memory circuit</u> DEF : Unidentified electrical fault</p>
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NOTES	None
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This fault only appears when the computer supply has been cut (disconnection of the battery, the computer, ...).

Check that the computer supply voltage is correct:



Repair if necessary.

Turn the engine over.

Switch off the ignition and wait for the dialogue between the diagnostic tool and the computer to be lost.

Switch on the ignition.

Enter dialogue with the computer.

Clear the computer memory.

NOTE: stored faults are erased. It would therefore be useful to carry out a road test to check that there are no faults on the injection system.

AFTER REPAIR	<p>Clear the fault memory. Deal with any other possible faults.</p>
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**DF148
PRESENT
OR
STORED**

Air conditioning authorisation
DEF : Unidentified electrical fault

NOTES

Conditions for applying the diagnostic to stored faults:

The fault is declared present after the air conditioning has been switched on with the engine running.

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

Computer track 51 —————> **Air conditioning control unit**

Repair if necessary.

Consult the diagnostic for the heating/ventilation if the incident persists.

AFTER REPAIR

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

NOTES

The values shown in this conformity check are only given as an indication. It is therefore vital to consult the Technical Note which deals with your vehicle.
Conditions for performance: Engine stopped, ignition on.

Order	Function	Configuration / status checked or action	Display and notes	FAULT FINDING
1	Battery voltage	ET001 + After ignition PR004 Computer supply voltage	Status CONFIRMED 11.8 < X < 13.2 V	In the event of a problem, consult the fault finding strategy PR004
2	Immobiliser (if option)	ET002 Immobiliser	Status NOT CONFIRMED	In the event of a problem, consult the diagnostic DF021
3	Computer configuration	ET044 Computer configuration with manual gearbox ET082 Automatic transmission configuration	Status CONFIRMED If the vehicle is fitted with a manual gearbox Status CONFIRMED If the car is fitted with an automatic gearbox	None
4	Throttle position potentiometer	Accelerator pedal released ET003 Throttle position: no load PR017 Measured throttle position ET005 Throttle position: full load	Status CONFIRMED 10 < X < 50 Status NOT CONFIRMED	In the event of a problem, consult the diagnostic PR017
		Accelerator pedal lightly depressed: ET003 Throttle position: no load ET005 Throttle position: full load	Status NOT CONFIRMED Status NOT CONFIRMED	

NOTES

The values shown in this conformity check are only given as an indication. It is therefore vital to consult the Technical Note which deals with your vehicle.
Conditions for performance: Engine stopped, ignition on.

Order	Function	Configuration / status checked or action	Display and notes	FAULT FINDING
4	Throttle position potentiometer (continued)	<p>Accelerator pedal pressed</p> <p>ET003 Throttle position: no load</p> <p>PR017 Measured throttle position</p> <p>ET005 Throttle position: full load</p>	<p>Status NOT CONFIRMED</p> <p>185 < X < 245</p> <p>Status CONFIRMED</p>	In the event of a problem, consult the diagnostic PR017
5	Pressure sensor	<p>PR001 Manifold pressure</p> <p>PR016 Atmospheric pressure</p>	<p>X: atmospheric pressure</p> <p>X: atmospheric pressure</p>	In the event of a problem, consult the diagnostic DF045
6	Coolant temperature sensor	<p>PR002 Coolant temperature</p>	X = engine temperature ± 5 °C	In the event of a problem, consult the diagnostic DF004
7	Air temperature sensor	<p>PR003 Air temperature</p>	X = temperature under bonnet ± 5 °C	In the event of a problem, consult the diagnostic DF003
8	Canister bleed solenoid valve	<p>AC016 Canister bleed solenoid valve</p>	The canister bleed valve must be heard to activate	In the event of a problem, consult the diagnostic DF014

PETROL INJECTION

Fault finding - Conformity check

NOTES

The values shown in this conformity check are only given as an indication. It is therefore vital to consult the Technical Note which deals with your vehicle.
Conditions for performance: Engine stopped, ignition on.

Order	Function	Configuration / status checked or action	Display and notes	FAULT FINDING
9	Fault warning light	AC211 Fault warning light	Fault warning light must light up then go out	In the event of a problem, consult the diagnostic DF011
10	Fuel pump	AC010 Fuel pump relay	Fuel pump should be heard to operate	In the event of a problem, consult the fault finding strategy AC010

NOTES

The values shown in this conformity check are only given as an indication. It is therefore vital to consult the Technical Note which deals with your vehicle.
Conditions for performance : Engine warm at idle speed, no electrical consumers.

Order	Function	Configuration / status checked or action	Display and notes	FAULT FINDING
1	Flywheel signal sensor	ET060 Flywheel signal with engine running	Status CONFIRMED	In the event of a problem, consult diagnostic DF025
2	Charging circuit	ET001 + After ignition PR004 Computer supply voltage	Status CONFIRMED 13 < X < 14.5 V	In the event of a problem, consult diagnostic procedure PR004
3	Throttle potentiometer	ET003 Throttle position no load	Status CONFIRMED	In the event of a problem, consult diagnostic DF002
4	Idle speed regulation	ET039 Idle speed regulation PR006 Engine speed PR022 Idling opening cyclic ratio PR021 Adaptive idling opening cyclic ratio	Status CONFIRMED 690 < X < 790 rpm 4 % < X < 14% -4.3 % < X < 3.9 %	In the event of a problem, consult diagnostic ET039
5	Anti-pinking circuit	PR013 Average pinking signal	X: variable and not zero	In the event of a problem, consult diagnostic DF006
5	Pressure circuit	PR001 Manifold pressure PR016 Atmospheric pressure	270 < X < 500 mb X = atmospheric pressure	In the event of a problem, consult the diagnostic DF045

NOTES

The values shown in this conformity check are only given as an indication. It is therefore vital to consult the Technical Note which deals with your vehicle.
Conditions for performance: Engine warm at idle speed, no electrical consumers.

Order	Function	Configuration / status checked or action	Display and notes	FAULT FINDING
7	Richness ratio regulation	ET037 Richness ratio regulation PR005 Oxygen sensor voltage PR035 Richness correction value	Status CONFIRMED $50 < X < 900 \text{ mV}$ $0 < X < 255$	In the event of a problem, consult diagnostic ET037
7	Heating/ventilation (air conditioning selected)	ET061 Selection of air conditioning ET009 Heating/ventilation request PR006 Engine speed PR044 Power consumed by the air conditioning compressor	Status CONFIRMED If the air conditioning requests compressor operation Status CONFIRMED If the injection system authorises compressor operation $690 < X < 790 \text{ rpm}$ $250 < X < 4000 \text{ W}$	In the event of a problem, consult diagnostic DF148
9	Power assisted steering pressostat	ET034 Power assisted steering pressostat	Status CONFIRMED	In the event of a problem, consult diagnostic DF034
10	Low speed fan assembly	Select air conditioning	The fan should run at low speed	In the event of a problem, consult diagnostic DF140
11	High speed fan assembly	Warm up the engine PR002 Coolant temperature	$X \geq 99^\circ\text{C}$ The fan should run at high speed	In the event of a problem, consult diagnostic DF140

NOTES

The values shown in this conformity check are only given as an indication. It is therefore vital to consult the Technical Note which deals with your vehicle.
Conditions for performance: Road test.

Order	Function	Configuration / status checked or action	Display and notes	FAULT FINDING
1	Vehicle speed signal	PR018 Vehicle speed	X = speed read on speedometer in km/h	In the event of a problem, consult diagnostic DF024
2	Adaptive richness	After programming PR030 Operating adaptive richness PR031 Idle adaptive richness	106 < X < 150 106 < X < 150	In the event of a problem, consult diagnostic PR030
3	Pollutant emissions	2500 rpm after driving At idle speed, wait for stabilisation	CO < 0.3 % CO ₂ > 13.5 % O ₂ < 0.8 % HC < 100 ppm 0.97 < λ < 1.03 CO < 0.5 % HC < 100 ppm 0.97 < λ < 1.03	In the event of a problem, consult the Technical Note on antipollution

ET034	<u>Power assisted steering pressure switch</u>
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NOTES	There must be no faults present or stored.
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<p>Check the correct operation of the power assisted steering (oil level, ...). Check for proper connection of the power assisted steering pressure switch. Check the insulation, continuity and interference resistance of the electrical line:</p> <p style="text-align: center;">Computer track 13 \longrightarrow Power steering pressure switch. Power assisted steering pressure switch \longrightarrow earth</p>	
If these points are correct, replace the power assisted steering pressure switch.	

AFTER REPAIR	Restart the conformity check from the beginning.
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ET037	<u>Mixture control</u>
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NOTES	There must be no faults present or stored.
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<p>Check the connection and condition of the downstream oxygen probe connector. Repair if necessary.</p>
<p>Check for 12 V on the upstream oxygen sensor. Check the insulation and continuity of the connections between:</p> <p style="text-align: center;"> Computer track 17 —————▶ Oxygen sensor Oxygen sensor —————▶ earth </p> <p>Repair if necessary.</p>
<p>Check ignition. Check the sealing of the canister bleed valve (a leak can disrupt the richness considerably). Check the exhaust system tightness. Check the sealing of the inlet manifold. If the vehicle has only been driven in town, the sensor is contaminated (try driving under load). Check the fuel pressure. If the idling is unstable, check the valve clearances and the timing. If necessary, replace the oxygen sensor.</p>

AFTER REPAIR	Restart the conformity check from the beginning.
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Diagnostics - Interpretation of statuses

ET039	<u>Idle speed regulation</u>
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NOTES	There must be no faults present or stored.
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Check the resistance of the idle speed regulation stepper motor.
Change the idle regulation valve if necessary.

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

Computer track 8 \longrightarrow **Idle speed regulation motor**
Computer track 35 \longrightarrow **Idle speed regulation motor**
Computer track 9 \longrightarrow **Idle speed regulation motor**
Computer track 36 \longrightarrow **Idle speed regulation motor**

Repair if necessary and continue fault finding.

Idle speed variance < min. stop	NOTES	The idle speed is too low
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Idle speed regulation is not maintaining the idle speed.

- Clean the air supply circuit (throttle body, idle speed regulation stepper motor), since it is probably dirty.
- Check the engine oil level (too high ---> splashing).
- Check and ensure correct fuel pressure.
- Check the engine compression
- - Check the valve clearances and the timing.

If all these points are correct, replace the idle regulation motor.

Idle speed variance > min. stop	NOTES	Idling speed is too high
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An air leak may be affecting the idle speed regulation programming.

- Check the connections on the manifold.
- Check the cleanness of the pipes on the manifold.
- Check the pneumatically controlled solenoid valves.
- Check the manifold gaskets.
- Check the throttle body gaskets.
- Check the brake servo tightness.
- Check that the restrictions are present in the oil vapour rebreathing circuit.
- Check the fuel pressure.

If all these points are correct, replace the idle regulation motor.

AFTER REPAIR	Restart the conformity check from the beginning.
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Diagnostic - Interpretation of parameters

PR004	<u>Computer supply voltage</u>
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NOTES	There must be no faults present or stored. No electrical consumers.
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Ignition on

If voltage < minimum, the battery is discharged:
Check the charging circuit to determine the cause of this fault.

If voltage > maximum, the battery may be over-charged:
Check that the charging voltage is correct with and without electrical consumers.

At idle speed

If # < minimum, the charging voltage is too low:
Check the charging circuit to determine the cause of this fault.

If voltage > maximum, the charging voltage is too high:
The alternator regulator is faulty. Repair this fault and check the electrolyte level in the battery.

AFTER REPAIR	Restart the conformity check from the beginning.
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Diagnostic - Interpretation of parameters

PR017	<u>Measured throttle position</u>
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NOTES	There must be no faults present or stored. No electrical consumers.
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<p>Check the insulation, continuity and absence of interference resistance on the connections between:</p> <table><tr><td>Computer track 19</td><td>————></td><td>Throttle position potentiometer</td></tr><tr><td>Computer track 45</td><td>————></td><td>Throttle position potentiometer</td></tr><tr><td>Computer track 46</td><td>————></td><td>Throttle position potentiometer</td></tr><tr><td>Computer track 18</td><td>————></td><td>Earth</td></tr><tr><td>Computer track 28</td><td>————></td><td>Coil</td></tr><tr><td>Computer track 29</td><td>————></td><td>Coil</td></tr></table> <p>Repair if necessary.</p>	Computer track 19	————>	Throttle position potentiometer	Computer track 45	————>	Throttle position potentiometer	Computer track 46	————>	Throttle position potentiometer	Computer track 18	————>	Earth	Computer track 28	————>	Coil	Computer track 29	————>	Coil
Computer track 19	————>	Throttle position potentiometer																
Computer track 45	————>	Throttle position potentiometer																
Computer track 46	————>	Throttle position potentiometer																
Computer track 18	————>	Earth																
Computer track 28	————>	Coil																
Computer track 29	————>	Coil																
<p>Check the resistance of the throttle potentiometer. Replace the throttle potentiometer if necessary.</p>																		
<p>Check the resistance of the coil. If the coil is not in good condition, replace it before continuing with the fault finding.</p>																		

AFTER REPAIR	Restart the conformity check from the beginning.
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Diagnostic - Interpretation of parameters

PR030	<u>Operating adaptive richness</u>
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NOTES	There must be no faults present or stored. No electrical consumers.
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Ensure the canister bleed valve is sealed.
Clear the computer memory. With the engine hot and running at regulated idle speed, observe the operating richness adaptive and the idle richness adaptive. – If the operating richness adaptive and the idle richness adaptive go to the MAXI stop, there is insufficient fuel. – If the operating richness adaptive and the idle richness adaptive go to the MINI stop, there is excess fuel.
Ensure the correctness, cleanness and proper operation: – of the filter, – of the fuel pump, – of the fuel circuit, – of the tank.

AFTER REPAIR	Restart the conformity check from the beginning.
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Diagnostic - Interpretation of controls

AC010	<u>Fuel pump relay</u>
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NOTES	There must be no faults present or stored.
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<p>Check that the impact sensor is switched on. Switch on the impact sensor if necessary.</p>
<p>Check the continuity between tracks 1 and 3 of the impact sensor. If there is no continuity, change the impact sensor.</p>
<p>With the starter motor on, check for +12 V on track 3 of the impact sensor connector. If +12 V is not present, correct the track 3 line of the impact sensor to track L5 of the fuel pump relay.</p>
<p>Check the condition and presence of the fuel pump earth.</p>
<p>Check the insulation and continuity of wiring: Impact sensor track 1 —————▶ Fuel pump Repair if necessary.</p>
<p>If the fault persists, replace the fuel pump if necessary.</p>

AFTER REPAIR	Restart the conformity check from the beginning.
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Refer to section 12

of the Technical Note which deals with your vehicle to obtain the exact values

Injector resistance		= 14.5 Ω	
Idle regulation stepper motor resistance		A-D = 100 Ω B-C = 100 Ω	
Canister bleed valve resistance		= 35 Ω	
Ignition coil resistance	Primary	= 1-4; 1-3; 2-3; 2-4 3-4	= 1.5 Ω = 0.6 Ω
	Secondary	= 8 k Ω	
Oxygen sensor heater resistance		= 3 to 15 Ω	
Throttle potentiometer resistance		PL A-B = 1300 Ω A-C = 1360 Ω B-C = 2300 Ω	PF A-B = 1300 Ω A-C = 2350 Ω B-C = 1260 Ω
Flywheel signal resistance		= 220 Ω	
Fuel pressure regulator		= 3 bar ignition on / 2.5 bar at idle speed	
Parameter for	CO	= 0.3 % max	
	HC	= 100 ppm max	
	CO ₂	= 14.5 % min	
	Lambda	= 0.97 < λ < 1.03	

Temperature in °C	0	20	40	80	90
Air temperature sensor Resistance in ohms	5000 to 7000	1700 to 3300	500 to 1550	-	-
Coolant temperature sensor Resistance in ohms	6700 to 8000	2600 to 3000	1100 to 1300	270 to 300	200 to 215

NOTES	Only consult the customer complaints after a complete check using the fault finding tool.
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NO COMMUNICATION WITH THE DIAGNOSTIC TOOL

CHART 1

STARTING PROBLEMS

CHART 2

IDLE SPEED FAULTS

CHART 3

PROBLEMS WHEN DRIVING

CHART 4

CHART 1	NO COMMUNICATION WITH THE DIAGNOSTIC TOOL
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NOTES	Only consult the customer complaints after a complete check using the diagnostic tool
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Try the diagnostic tool on another vehicle.

Check:
– the injection, engine and passenger compartment fuses.
Repair if necessary.

Check for + 12 V on track 16 and for earth 16 on track 5 of the diagnostic socket.
Repair if necessary.

Check, with the ignition on, for 12 V on track:
– 1 of the main relay,
– 3 of the main relay,
– 1 of the fuel pump relay.

Connect the bornier in place of the computer and check the insulation and continuity of the connections between:

Computer track 18	→	Earth
Computer track 2	→	Earth
Computer track 3	→	Earth
Computer track 11	→	Track 7 Diagnostic socket
Computer track 38	→	Track 15 Diagnostic socket
Computer track 1	→	Track 5 Main relay
Computer track 40	→	Track 2 Main relay
Computer track 48	→	Track 2 Fuel pump relay

Repair if necessary.

With the ignition on, check for +12 V on track 5 of the main relay:
– If +12 V is not present on track of the main relay: replace the fuel pump relay.
– If +12 V is not present on track 5 of the main relay: replace the main relay.

AFTER REPAIR	Test using the diagnostic tool.
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CHART 2**STARTING PROBLEMS****NOTES**

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

Check for the presence of earth on the fuel pressure regulator.
Check that there is fuel present (fuel gauge faulty).
Check that the fuel is of the proper type.
Check that no hoses are pinched (especially after a removal operation).
Check the condition of the tank.

Check the fuel pump supply.
Check that the impact sensor is operating correctly.

Check the idle speed regulation valve.
Tap gently to release the valve.

Disconnect the pipe connecting the canister-bleed solenoid valve to the inlet manifold.
Plug the pipe to prevent an air leak.
If there is no other effect, the canister bleed is faulty.

Check the condition of the plugs and coils.
Check that these parts are correct for the vehicle.

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

Check the engine compression.

Check the condition of the flywheel.

AFTER REPAIR

Clear the computer memory using the diagnostic tool and carry out a road test.

CHART 3**IDLE SPEED FAULTS****NOTES**

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

Check for the presence of earth on the fuel pressure regulator.
Check that there is fuel present (fuel gauge faulty).
Check that the fuel is of the proper type.
Check that no hoses are pinched (especially after a removal operation).
Check the condition of the tank.

Check the idle speed regulation valve
Tap gently to release the valve.

Disconnect the pipe connecting the canister-bleed solenoid valve to the inlet manifold.
Plug the pipe to prevent an air leak.
If there is no other effect, the canister bleed is faulty.

Check the condition of the plugs and coils.
Check that these parts are correct for the vehicle.

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

Check on the dipstick that the oil level is not too high.

Check the condition of the inlet manifold gaskets.

Check that the throttle valve unit is not clogged.

Check that the brake servo is not leaking (noise).

Check the condition of the flywheel.

AFTER REPAIR

Clear the computer memory using the diagnostic tool and carry out a road test.

CHART 4**PROBLEMS WHEN DRIVING****NOTES**

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

Check for the presence of earth on the fuel pressure regulator.
Check that the air filter is not deformed.
Check that there is fuel present (fuel gauge faulty).
Check that the fuel is of the proper type.
Check that no hoses are pinched (especially after a removal operation).
Check the condition of the tank.

Disconnect the pipe connecting the canister-bleed solenoid valve to the inlet manifold.
Plug the pipe to prevent an air leak.
If there is no other effect, the canister bleed is faulty.

Check the condition of the plugs and coils.
Check that these parts are correct for the vehicle.

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

Check on the dipstick that the oil level is not too high.

Check the condition of the inlet manifold gaskets.

Check that the throttle valve unit is not clogged.

Check, after removal, that the injectors do not drip.

Check that the brake servo is not leaking (noise).

Check that the calipers, drums and bearings are not seized.
Check that the tyres are not under-inflated.

Ensure that the cooling function is satisfactory.

AFTER REPAIR

Clear the computer memory using the diagnostic tool and carry out a road test.