Kangoo
Clio

TECHNICAL NOTE 3432A

XB0X - XC0X

FAULT FINDING
SAGEM PETROL INJECTION

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

Contents

This document describes the generic fault finding strategy applicable to all SAFIR 2, program no. AF, 35 track computers.
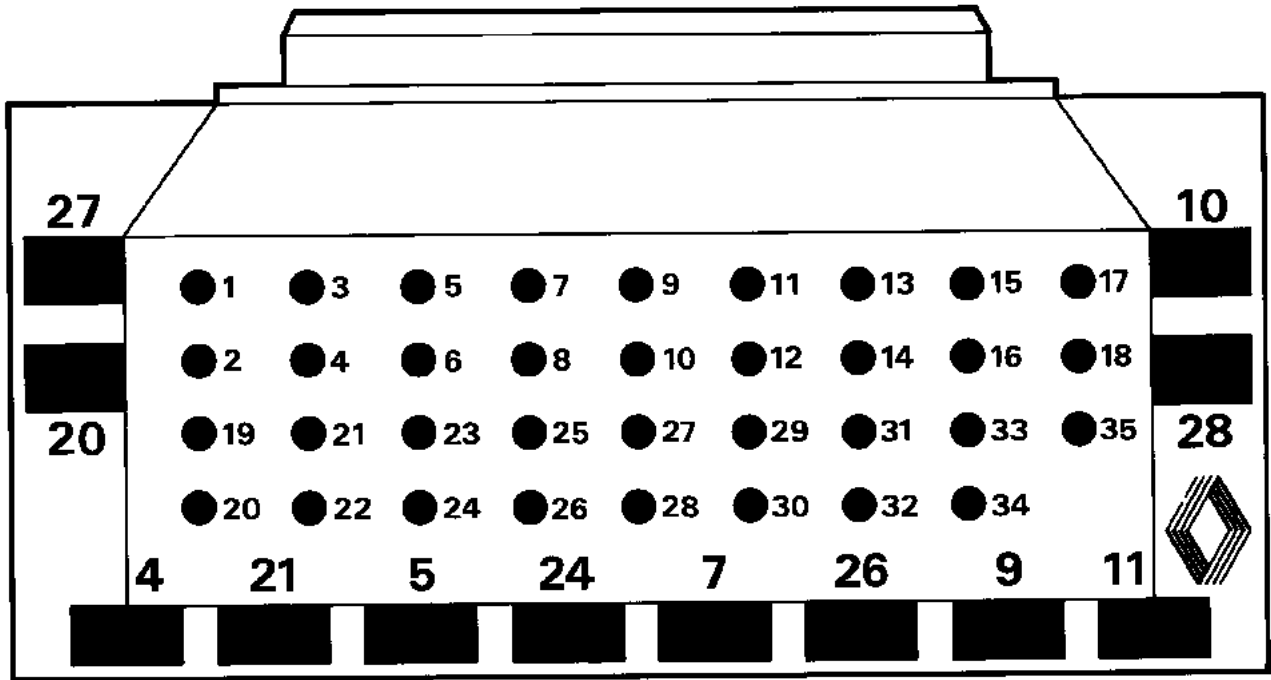
The following are thus required to carry out fault finding on this system:

  – the "Fault finding" Technical Note,
  – the wiring diagram of the function on the vehicle concerned,
  – the tools listed under 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, 35 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 "Fault interpretation" 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.

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If the information obtained by the fault finding tool requires checking of electrical continuity, connect bornier **MS1048.**

Bornier **MS 1048** is a 35 track base with a printed circuit on which there are 35 copper-coated areas, numbered from 1 to 35.

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

IMPORTANT:

– All checks using bornier **MS 1048** can only be 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 fault finding procedure to the fault stored:** The fault is declared present following fan activation with the engine running.

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

Check the condition of the connectors and the insulation and continuity of the connections between:

        Computer   track 2 ⟶ Air temperature sensor
        Computer   track 15 ⟶ 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.

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DF004 PRESENT OR STORED	<u>Coolant temperature sensor circuit</u> DEF : Unidentified electrical fault

NOTES	**Conditions for applying the fault finding procedure to the fault stored:** The fault is declared present following fan activation with the engine running.

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

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

Computer   track 15   ⟶   Coolant temperature sensor
Computer   track 6   ⟶   Coolant temperature sensor

Repair if necessary.

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

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

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DF006 **PRESENT** **OR** **STORED**	<u>Pinking sensor circuit</u> DEF : Unidentified electrical fault

NOTES	**Conditions for applying the fault finding procedure to the fault stored:** The fault is declared present during a road test when the engine is warm and at a high engine speed.

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

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

Computer	**track 1** ⟶	**Pinking sensor**
Computer	**track 15** ⟶	**Pinking sensor**
Computer	**track 16** ⟶	**Pinking sensor screening**

Repair if necessary.

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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DF008 PRESENT	Fuel pump relay control circuit CC.1 : Short-circuit to 12 volts

NOTES	None

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

Disconnect the relay.
Check, with the ignition on, for **+12 volts on track 1 of the fuel pump relay.**
Repair if necessary.

Check the fuel pump relay coil.
Change the fuel pump relay if necessary.

Check the insulation against +12 volts of the connection between:
         Computer   track 20 ⟶ Fuel pump 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. Deal with any other possible faults.

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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 | |

| *NOTES* | None |

Check the condition of the warning light (if it is not lit).
Change if necessary.

Check that +12 volts is supplying the fault light (if it is not lit).
Rectify the line to the fuse.

Check the insulation and continuity of the connection between:

    Computer track 19 ⟶ 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 circuit</u> DEF : Unidentified electrical fault

NOTES	None

Check the connection and condition of the canister bleed 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 valve**.
Repair if necessary.

Check the insulation and continuity of the connection between:

                Computer track 24   ⟶   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.

	Injector circuit
DF016 **PRESENT** **OR** **STORED**	.DEF : Fault stored 2.3.CO : Injector 2 or 3 in open circuit or short circuit to earth 2.3.CC : Injector 2 or 3 in short circuit to + 12 volts 1.4.CO : Injector 1 or 4 in open circuit or short circuit to earth 1.4.CC : Injector 1 or 4 in short circuit to +12 volts

NOTES	**Conditions for applying the fault finding procedure to the fault stored:** The fault is declared present after the engine has been running at idle speed for 5 minutes.

Check the connection and condition of the injector connectors.
Change the connector if necessary.

Check the resistance of the value for the two faulty injectors.
Replace the injector/s if necessary.

After the ignition has been switched on and during the **period specified above**, check for **12 volts** on **track 1** of the faulty injector.
Repair if necessary.

Check the insulation and absence of interference resistance on the connections between:
Computer   track 33 ────▶ Injectors 1 and 4
Computer   track 32 ────▶ Injectors 2 and 3
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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DF021 **PRESENT**	<u>Immobiliser circuit</u> DEF : Stored fault 1.DEF : Coded line fault 2.DEF : Immobiliser code not programmed

NOTES	None

1.DEF	**NOTES**	None

Connect the bornier in place of the computer and check the insulation, continuity and absence of interference resistance on the wiring on **track 30** of the computer.
Repair if necessary.

Refer to the immobiliser fault finding if the fault persists.

2.DEF	**NOTES**	None

Consult the immobiliser fault finding procedure.

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

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DF022 PRESENT	<u>Computer</u> DEF : Unidentified electrical fault

NOTES	None

Computer defective or incorrect.
Replace the computer.

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

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DF023 PRESENT OR STORED	<u>Oxygen sensor circuit</u> DEF : Unidentified electrical fault

NOTES	**Conditions for applying the fault finding procedure to the fault stored:** The fault is declared present after the engine has been running at 2 500 rpm for 5 minutes.

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

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

Check for **the presence of earth on track 4** of the injection computer.
Repair if necessary.

Check the insulation, continuity and absence of interference resistance on the connection between:
        Computer track 22 ⟶ 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.

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DF024 PRESENT OR STORED	<u>Vehicle speed sensor circuit</u> DEF : Unidentified electrical fault

NOTES	**Conditions for applying the fault finding procedure to the fault stored:** The fault is declared present during a varied road test OR a road test driving uphill at constant speed OR a road test driving downhill with the accelerator in the 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:
– an **earth on track B2,**
– **+12 volts after ignition on track A**.
Repair if necessary.

Check the insulation, continuity and absence of interference resistance on the connection between:
Computer   track 8 ⟶ 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.

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DF025 **PRESENT** **OR** **STORED**	<u>Flywheel signal sensor circuit</u> DEF : Fault stored CC.0 : Short circuit to earth from engine target sensor CO.0 : No tooth signal: open circuit or short circuit to earth IN : Target sensor reversed

NOTES	**Conditions for applying the fault finding procedure to the fault stored:** The fault is declared present following starter activation for 10 seconds. OR after the engine has been running for 2 minutes.

CO.0 - CC.0	***NOTES***	None.

Check the flywheel signal sensor resistance.
Replace the sensor if necessary.

Check the condition of the flywheel, especially if it has been removed.

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

Computer	**track 13**	⟶	**Flywheel signal sensor**
Computer	**track 31**	⟶	**Flywheel signal sensor**

Repair if necessary.

IN	***NOTES***	None.

Check that the flywheel signal sensor has been correctly connected (the sensor connector must not be reversed).
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.

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DF026 PRESENT OR STORED	Throttle potentiometer circuit DEF : Unidentified electrical fault

NOTES	**Conditions for applying the fault finding procedure to the fault stored:** The fault is declared present after the ignition on is switched on without the accelerator pedal being depressed for the first 10 seconds. OR The fault is declared present when there is a slight variation of the throttle position potentiometer from no load to full load. OR The fault is declared present when there is a full load signal for 10 seconds.

Check the connection and 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.

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

Computer track 3 ⟶ Throttle position potentiometer
Computer track 5 ⟶ Throttle position potentiometer
Computer track 15 ⟶ 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> 1.DEF : 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

NOTES	**Conditions for applying the fault finding procedure to the fault stored:** The fault is declared present after the engine has been running for 10 seconds or at starter speed.

Check the 15A 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:

Computer	**track 17**	⟶	**Ignition coil**
Computer	**track 35**	⟶	**Ignition coil**
Coil	**track 3**	⟶	**Fuse**

Repair if necessary.

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 : Fault stored
CO.0 : Open circuit or short circuit to earth
CC.1 : Short circuit to +12 volts |

| *NOTES* | **Conditions for applying the fault finding procedure to the fault stored:**
The fault is declared present after the engine has been running at idle speed for 10 seconds. |

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

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

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

Check the insulation and continuity of the connection between:
                    Computer   track 22 ⟶ 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. |

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| **DF045**
PRESENT
OR
STORED | <u>Manifold pressure sensor circuit</u>
DEF : Unidentified electrical fault
1.DEF : Ignore this fault
2.DEF : Ignore this fault
3.DEF : Ignore this fault |

| *NOTES* | **Conditions for applying the fault finding procedure to the fault stored:**
The fault is declared present after the ignition is switched off and dialogue lost
AND the ignition is switched back on and dialogue reestablished
AND after the engine has been running at a minimum speed of 608 rpm for 10 seconds. |

| *DEF* | *NOTES* | None |

Check for the presence of earth on the fuel pressure regulator.

Check that the pressure sensor is correctly **connected both electrically and pneumatically.**
Check the conformity of the pressure sensor pipe (it must not be pierced or blocked...).

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

Computer   track 5 ⟶   Pressure sensor
Computer   track 15 ⟶   Pressure sensor
Computer   track 23 ⟶   Pressure sensor

Repair if necessary.

Replace the sensor if the fault persists.

| *1.DEF - 2.DEF - 3.DEF* | *NOTES* | None |

Ignore these faults.

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

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DF140 **PRESENT** **OR** **STORED**	<u>Fan assembly relay output</u> DEF : Fault stored CO.0 : Open circuit or short circuit to earth CC.1 : Short circuit to +12 volts

NOTES	Deal with the coolant sensor circuit fault DF004 as a priority. **Conditions for applying the fault finding procedure to the fault stored:** Apply the fault finding procedure whether the fault is present or stored.

Check the connection and condition of the fan assembly relay connector.
Change the connector if necessary.

Check for the **presence of +12 volts on track 3 of the fan assembly relay**.
Check, with the ignition on, for the presence of 12 volts on track 1 of the fan assembly relay.
Repair if necessary.

Disconnect the relay.
Check the coil in the fan assembly relay.
Replace the fan assembly relay if necessary.

Check the insulation and continuity of the connections between:

Computer   track 27 ——▶ Fan assembly relay
Fan assembly relay ——▶ Fan assembly
Fan assembly ——▶ Earth

Repair if necessary.

Disconnect the fan assembly.
Connect track 2 of the 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 fan assembly relay.

Change the fan assembly 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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DF143 PRESENT	<u>Idle speed regulation solenoid valve circuit</u> DEF : Unidentified electrical fault

NOTES	None

Check the connection and status of the idle speed regulation solenoid valve connector.
Change the connector if necessary.

Check the resistance of the idle speed regulation stepper motor.
Change the idle regulation valve if necessary.

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

Computer	**track 11**	⟶	**Idle speed regulation solenoid valve stepper motor**
Computer	**track 12**	⟶	**Idle speed regulation solenoid valve stepper motor**
Computer	**track 28**	⟶	**Idle speed regulation solenoid valve stepper motor**
Computer	**track 29**	⟶	**Idle speed regulation solenoid valve stepper motor**

Repair if necessary.

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

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| **DF147 PRESENT** | Memory circuit
DEF : Unidentified electrical fault |

| *NOTES* | None |

This fault only appears when the computer supply has been cut (disconnection of the battery from the computer, ...).

Check the correctness of the computer supply voltage:

Computer **track 18** ⟶ **Main relay.**
Main relay **track 3** ⟶ **30A fuse**

Computer **track 26** ⟶ **Main relay.**
Main relay **track 1** ⟶ **30A fuse**

Computer **track 20** ⟶ **Petrol pump relay**
Petrol pump relay **track 1** ⟶ **30A fuse**

Repair if necessary.

Run the engine.
Switch off the ignition and wait for the dialogue between the fault finding tool and the computer to be lost.
Switch on the ignition.
Establish 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* | Clear the fault memory.
Deal with any other possible faults. |

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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. **Test conditions**: Engine stopped, ignition on.

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

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	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. **Test conditions**: Engine stopped, ignition on.

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

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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. **Test conditions**: 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 fault finding procedure **DF011**
10	Petrol pump	**AC010** Petrol pump relay	Petrol pump should be heard to operate	In the event of a problem, consult fault finding procedure **AC010**

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	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. **Test conditions**: 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 fault finding procedure **DF025**
2	Charging circuit	**ET001**	+ After ignition	**Status CONFIRMED**	In the event of a problem, consult fault finding procedure **PR004**
		PR004	Computer supply voltage	13 < X < 14.5 V	
3	Throttle potentiometer	**ET003**	Throttle position: no load	**Status CONFIRMED**	In the event of a problem, consult fault finding procedure **PR017**
4	Idle speed regulation	**ET039**	Idle speed regulation	**Status CONFIRMED**	In the event of a problem, consult fault finding procedure **ET039**
		PR006	Engine speed	690 < X < 790 rpm	
		PR022	Idling opening cyclic ratio	4 % < X < 14%	
		PR021	Idling opening cyclic ratio adaptive	-4.3 % < X < 3.9 %	
5	Anti-pinking circuit	**PR013**	Average pinking signal	X: variable and not zero	In the event of a problem, consult fault finding procedure **DF006**
6	Pressure circuit	**PR001**	Manifold pressure	270 < X < 500 mb	In the event of a problem, consult fault finding procedure **DF045**
		PR016	Atmospheric pressure	X = atmospheric pressure	

| | 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.
Test conditions: 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** $50 < X < 900$ mV $0 < X < 255$	In the event of a problem, consult fault finding procedure **ET037**
8	Power assisted steering pressostat	**ET034** Power assisted steering pressostat	**Status CONFIRMED**	In the event of a problem, consult fault finding procedure **ET034**
9	Cooling fan assembly	Warm up the engine	$X \geq 99°C$ The fan should run	In the event of a problem, consult fault finding procedure **DF140**

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	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. **Test conditions**: 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 fault finding procedure **DF024**
2	Adaptive richness	Programming **PR030** Operating adaptive richness **PR031** Idle adaptive richness	 106 < X < 150 106 < X < 150	In the event of a problem, consult fault finding procedure **PR030**
3	Pollutant emissions	2 500 rpm after having driven At idle speed, wait for stabilisation	$CO < 0.3\ \%$ $CO_2 > 13.5\ \%$ $O_2 < 0.8\ \%$ $HC < 100\ ppm$ $0.97 < \lambda < 1.03$ $CO < 0.5\ \%$ $HC < 100\ ppm$ $0.97 < \lambda < 1.03$	In the event of a problem, consult the Technical Note on Antipollution

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	Power assisted steering pressure switch
ET034	

NOTES	There must be no faults present or stored.

Check the correct operation of the power assisted steering (fluid level, ...).
Check for reliable connection of the power assisted steering pressure switch.
Check the insulation, continuity and interference resistance of the electrical line:

<div align="center">

Computer   track 27   ⟶   Power steering pressure switch.

Power assisted steering pressure switch   ⟶   Earth

</div>

If these points are correct, replace the power assisted steering pressure switch.

AFTER REPAIR	Restart the conformity check from the beginning.

ET037	<u>Richness regulation</u>

NOTES	There must be no faults present or stored.

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

Check for +12 volts on the upstream oxygen sensor.
Check the insulation and continuity of the connections between:

Computer   track 22 ──────▶ Oxygen sensor
Oxygen sensor ──────▶ Earth

Repair if necessary.

Check ignition.
Check the sealing of the canister bleed valve (a leak can disrupt the richness considerably).
Check the exhaust system tightness
Check the tightness of the inlet manifold.
If the vehicle has only been driven in town, the sensor will be dirty (try driving under load).
Check the fuel pressure.
If idling is unstable, check the valve clearances and timing.
If necessary, replace the oxygen sensor.

AFTER REPAIR	Restart the conformity check from the beginning.

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ET039	Idle speed regulation

NOTES	There must be no faults present or stored.

Check the resistance of the idle speed regulation stepper motor.
Change the idle speed regulation valve if necessary.

Check the insulation and continuity of the connections between:

Computer	track 11	⟶	**Idle speed regulation motor**
Computer	track 28	⟶	**Idle speed regulation motor**
Computer	track 12	⟶	**Idle speed regulation motor**
Computer	track 29	⟶	**Idle speed regulation motor**

Repair if necessary and continue fault finding.

Idle speed variance < minimum stop	*NOTES*	Idle speed is too slow.

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 for and ensure correct fuel pressure.
– Check the engine compression
– Check the valve clearances and timing.
If all these points are correct, replace the idle speed regulation motor.

Idle speed variance > minimum stop	*NOTES*	Idle speed is too high.

An air leak may be affecting the idle speed regulation strategy.
– - Check the connections on the manifold.
– - Check the correctness 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 sealing.
– - 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 speed regulation motor.

AFTER REPAIR	Restart the conformity check from the beginning.

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| **PR004** | <u>Computer supply voltage</u> |

| *NOTES* | There must be no faults present or stored. No consumers |

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 consumers.

At idle speed

If voltage < 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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PR017	<u>Measured throttle position</u> 17-32

NOTES	There must be no faults present or stored. No consumers

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

Computer	**track 3**	⟶	**Throttle position potentiometer**
Computer	**track 5**	⟶	**Throttle position potentiometer**
Computer	**track 15**	⟶	**Throttle position potentiometer**
Computer	**track 4**	⟶	**Earth**
Computer	**track 35**	⟶	**Ignition coil**
Computer	**track 17**	⟶	**Ignition coil**

Repair if necessary.

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

Check the resistance of the coil.
If the coil is faulty, replace it before continuing with the fault finding procedure.

AFTER REPAIR	Restart the conformity check from the beginning.

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PR030	<u>Operating adaptive richness</u> 17-33

NOTES	There must be no faults present or stored. No consumers

Ensure the canister bleed valve is tight.

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, cleanliness 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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AC010	<u>Fuel pump relay</u>

NOTES	There must be no faults present or stored.

Check that the **impact sensor is switched on.**
Switch on the impact sensor if necessary.

Check the **continuity between tracks 1 and 3 of the impact sensor.**
If there is no continuity, change the impact sensor.

With the starter motor on, check for **+ 12 volts on track 3 of the impact sensor connector.**
If +12 volts is not present, correct the line from track 3 of the impact sensor to track L5 of the fuel pump relay.

Check the correctness and presence of earth **on the fuel pump.**

Check the **insulation and continuity** of the connection between:
    Impact sensor   track 1   ⟶   Fuel pump (see wiring diagram)
Repair if necessary.

If the fault persists, change the fuel pump.

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 = 1.5 Ω
                3-4   = 0.6 Ω

               Secondary = 8 k Ω

Oxygen sensor heater resistance	= 3 à 15 Ω

Throttle potentiometer resistance   PL A-B = 1300 Ω PF A-B = 1300 Ω
                   A-C = 1360 Ω A-C = 2350 Ω
                   B-C = 2300 Ω B-C = 1260 Ω

Flywheel signal resistance	= 220 Ω
Fuel pressure regulator	= 3 bar with the ignition on / 2.5 bar at idle speed

Value 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

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NOTES	Only consult the customer complaints after a complete check using the fault finding tool.

NO COMMUNICATION WITH THE FAULT FINDING TOOL   **CHART 1**

STARTING PROBLEMS   **CHART 2**

IDLE SPEED FAULTS   **CHART 3**

PROBLEMS WHEN DRIVING   **CHART 4**

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CHART 1	**NO COMMUNICATION WITH THE FAULT FINDING TOOL**

NOTES	Only consult the customer complaints after a complete check using the fault finding tool.

Try the fault finding tool on another vehicle.

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

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

Check, with the ignition on, for +12 volts 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 4**	⟶	**Earth**
Computer	**track 16**	⟶	**Earth**
Computer	**track 34**	⟶	**Earth**
Computer	**track 9**	⟶	**Track 7 Diagnostic socket**
Computer	**track 10**	⟶	**Track 15 Diagnostic socket**
Computer	**track 18**	⟶	**Track 5 Main relay**
Computer	**track 26**	⟶	**Track 2 Main relay**
Computer	**track 20**	⟶	**Track 2 Fuel pump relay**

Repair if necessary.

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

AFTER REPAIR	Test using the fault finding 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 fault finding 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 further fault, the canister bleed is faulty.

Check the condition of the plugs and coils.
Check that these elements 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 fault finding tool and carry out a road test. |

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CHART 3	**IDLE SPEED FAULTS**

NOTES	This Customer Complaint should only be investigated after a complete check has been run using the fault finding 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 further fault, the canister bleed is faulty.

Check the condition of the plugs and coils.
Check that these elements 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 fault finding tool and carry out a road test.

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CHART 4	**PROBLEMS WHEN DRIVING**

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

Check for the presence of earth on the fuel pressure regulator.
Check that the air filter is not distorted.
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 further fault, the canister bleed is faulty.

Check the condition of the plugs and coils.
Check that these elements 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 injectors do not drip after removal.

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 fault finding tool and carry out a road test.

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