

RENAULT

N.T. 6522A

Vehicle	Engine
LOGAN, SANDERO, CLIO II, TWINGO II, THALIA 2, SYMBOL 2	D4F 734, 726, 736, 776

Sub-section concerned: 17 C

FAULT FINDING - System LPG Landi Renzo OMEGAS PLUS EURO 5

Edition n° 2 - NOVEMBER 2012

Edition Anglaise

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

The procedures 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."

All rights reserved by Renault s.a.s.

Copying or translating, in part or in full, of this document or use of the service part reference numbering system is forbidden without the prior written authority of Renault s.a.s.

CONTENTS

	Pages
17C GAS INJECTION	
Fault Finding – Introduction	17C-1
Fault Finding – System Description	17C-2
Fault Finding – Wiring Diagrams	17C-9
Fault Finding – Fault Summary Table	17C-13
Fault Finding – Faults Interpretation	17C-15
Fault Finding – Symptoms Summary	17C-29
Fault Finding – Symptoms Interpretation	17C-30

1- SCOPE OF THIS DOCUMENT

This document presents the fault finding procedure applicable to all computers with the following specifications:

Vehicle(s): **THALIA 2, SYMBOL 2**
For Engines: **D4F 734-726-736-776**
Function concerned: **LANDI RENZO OMEGAS PLUS**

Computer Name: **OMEGAS PLUS**
N° de programme: ...

2. PRE-REQUISITES FOR FAULT FINDING

Documentation Type:

Fault Finding Procedure (this document):

- Assisted fault finding (integrated into the diagnostic tool), Dialogys.

Wiring Diagrams:

- Visu-Schéma (CD-ROM) + Landi Renzo wiring diagram within this documented

Diagnostic tools type:

- **PLUS + probe**

Special tooling required:

Special tooling required

Multimeter

Universal bornier

3. REMINDERS

Procedure

To run fault finding on the vehicle computers, switch on the ignition, plug the PLUS tool
Depending on the type of vehicle equipment, proceed as follow:

For vehicles with radio frequency remote control/key,
Switch on the ignition with the key.

To cut off + after ignition feed, proceed as follow:

For vehicles with radio frequency remote control/key,
Switch off the ignition with the key.

4. SAFETY INSTRUCTIONS

All work on components requires you to obey safety rules to prevent any physical damage or human injury.

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

Safety instructions that must be followed before any operation is performed on the vehicle

- If a major gas leak occurs, the vehicle must be isolated, away from buildings and any fire risks.
- The emergency services may be required to intervene if the situation cannot be controlled.
- All work on the gas circuit must be performed by qualified and authorized personnel.
- Do not try to open the tank. Don't ever try to remove the multi-valve located at the end of the tank.
- Do not clean the engine compartment with detergent when the system is pressurized.
- Always refer to the RENAULT Workshop Repair Manual before performing any work.

Safety instructions that must be followed when any operation is performed on the vehicle

- All work must be carried out in a well ventilated space.
- There must not be any flames, sparks, burning cigarettes or telephones near the area where work is being carried out.
- The operator must not wear acrylic clothes likely to generate static electricity.
- Disconnect the battery and leave the vehicle on the ground.
- If working on the tank, drain it by running the engine in gas mode.
- Once it has been drained and removed, the tank can be sent to the GIAT Company, with the stop valve in closed position and fitted with its mounting.
- If work is to be done in the painting station, remove the tank (with its mounting).
- The tank must not be subjected to temperatures greater than 50°C.

Safety instructions that must be followed when any operation is performed on the vehicle

- After working on a gas union, check that it is not leaking after refitting.
 - Apply soapy water or the product distributed by SODICAM, part number 77 11 143 071 (leak detector) to the open union(s).
 - Fill the fuel tank with a few liters of LPG if it has been bled (the ignition must be switched off first).
 - Start the engine, put it in gas mode and check again that there is no leak.
 - If a leak is detected, retighten the relevant union. If the leak persists, remake the union.
 - Fill the fuel tank (80 % of total volume). Start the engine, put it in gas mode and check that there is no leak.
- After refitting, check that all the rubber and encased steel gas pipes are not in contact with any parts that can be accessed by the user and may create a gas leak.

Fault Finding – System Description

5. ROAD TEST (in Petrol mode, then in LPG mode)

- Check that the ignition stabilization time is normal.
- Check that the engine does not stall and maintains a stable idling speed until the vehicle comes to a stop under heavy braking.
- Put the vehicle in **4th gear**, at a steady speed of **36 mph (60 km/h)**. Check that the vehicle accelerates progressively under full load acceleration.

WARNING

Before performing any work on the vehicle, drain the gas circuit.

Only personnel who have undergone specific LPG training can work with gas unions where liquid gas is circulating and moving through the fuel tank from the filler neck to the expansion valve.

In addition, only personnel who have undergone specific LPG training can perform maintenance and repairs on LPG vehicles.

Workshops can only carry out work on the fuel tank if they have a degassing burner.

If the tank cannot be degassed, do not touch it and contact the **Comité Français du Butane et du Propane (French Butane and Propane Commission)** by fax on **01.41.97.02.89**.

Maintenance operations

- No adjustment.
- Removal of internal components is not permitted.
- If LPG clips are removed, they must be replaced.
- If LPG unions are removed, they must be replaced.

The tank must be empty before removing:

- the fuel tank,
- a component bolted onto the tank, before bleeding the gas contained in the gas circuit.

To remove the following, bleed all gas contained in the gas circuit (except the gas in the tank):

- the filler neck,
- the pipes,
- the filter,
- The pressure reducer
- The gas injector

Changeover from petrol to gas

The vehicle can be switched to gas if:

- *) The temperature of the engine coolant is above 40°C
- *) The speed is above 1,600 rpm
- *) An interval of time ranging from 35" to 5" has elapsed from when the coolant temperature threshold has been exceeded after the engine has been started, depending on the engine temperature

- It is not possible to switch the vehicle from petrol to gas, even if the above conditions are met, if the petrol injection time is above 10 ms.

Before proceeding with the reparation, verify that there are no other faults by running the vehicle on petrol and/or check that there are no faults stored in the petrol ECU. Connect the diagnostic PLUS Tool to the corresponding connector on the vehicle.

The **operating pressure** of the second stage of the regulator displayed on the PLUS, when the vehicle is running on gas, at minimum speed and when the temperature of the radiator liquid is below 70°C, may range between: **1.23 & 1.35 bar**.

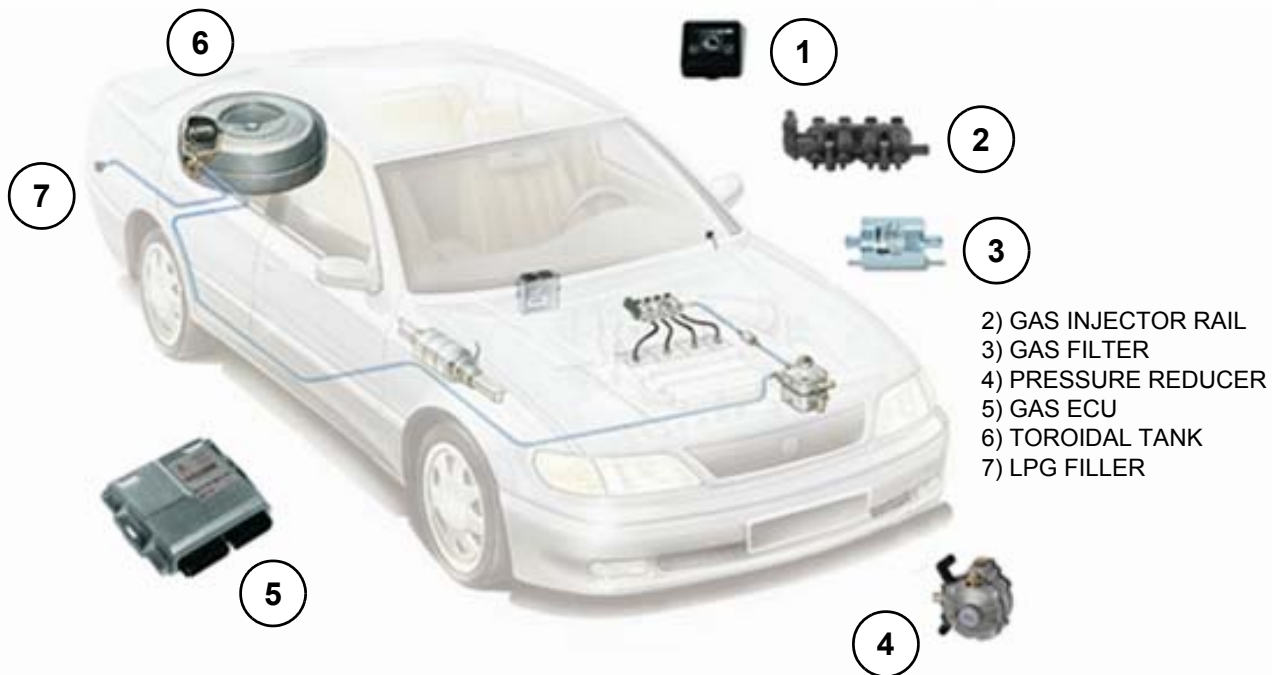
The **system automatically switches** the vehicle **back to petrol** when pressure falls **more than 0.5 bar** as compared to the **operating value**.

The **“supply voltage of gas injectors”** influences the correct operation of the gas system. The recommended voltage range for a correct operation is between: **8 & 16 Volts**.

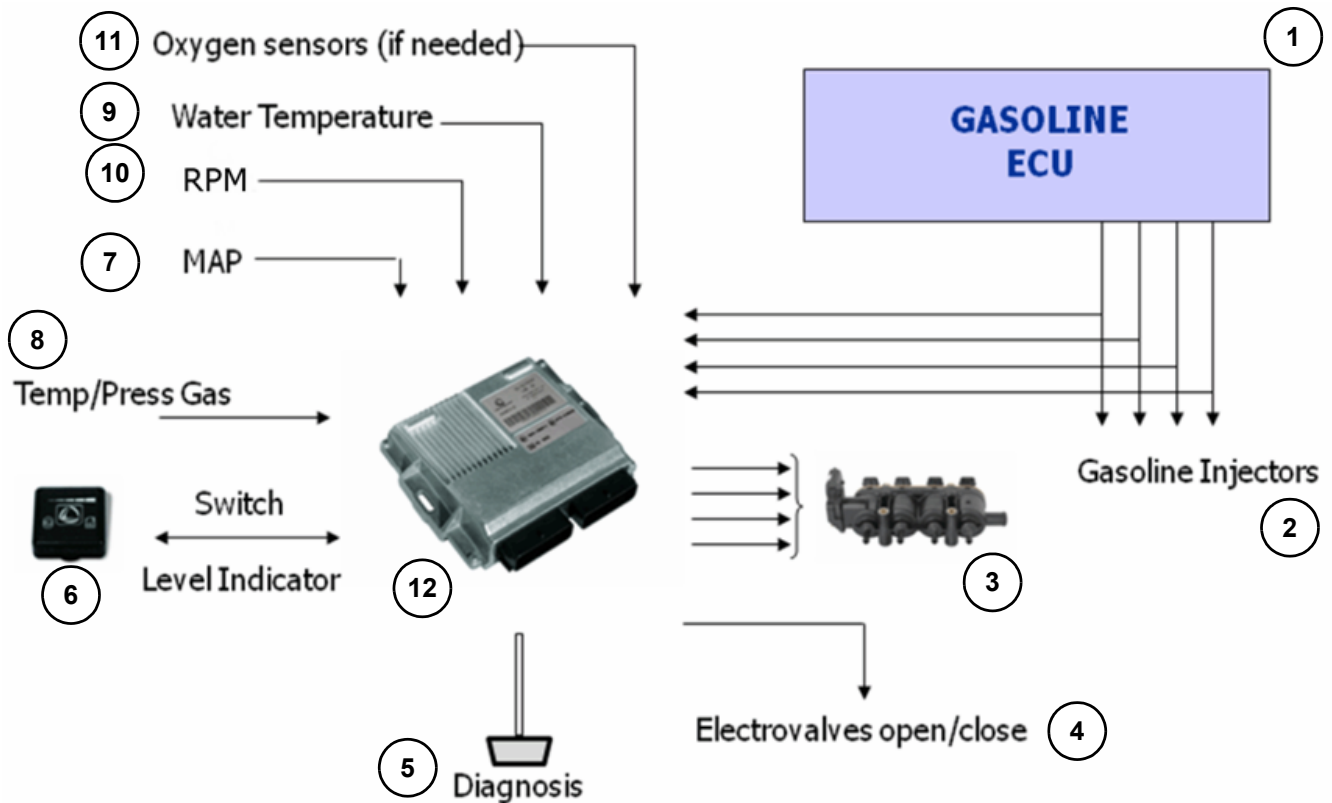
The vehicle is switched back to petrol due to the unavailability of gas if the switch indicates a low gas condition and pressure falls under the preset threshold. In all other cases, an error code is stored in the memory of the diagnostic system.

Repairs must be performed using a PLUS connecting to the dedicated connector on the vehicle.

GAS SYSTEM COMPONENT OVERVIEW



GAS OPERATING PRINCIPLE



1) PETROL ECU

2) PETROL INJECTOR

3) GAS INJECTOR

4) OPENING CLOSING SOLENOID

5) DIAGNOSIS SOCKET

6) SWITCH – LEVEL INDICATOR

7) MAP

8) GAS TEMPERATURE/PRESSURE SENSOR

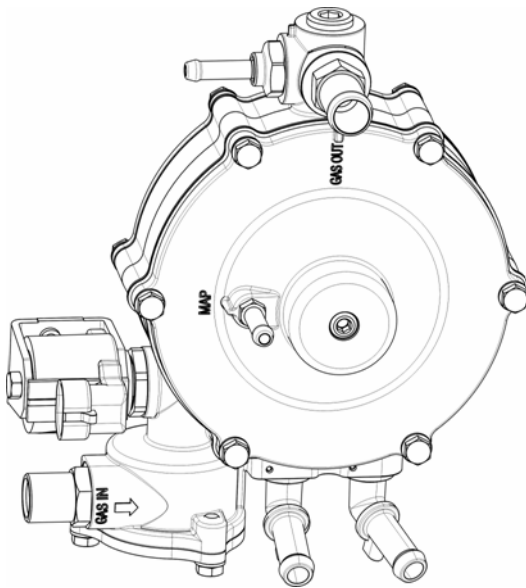
9) WATER TEMPERATURE

10) RPM

11) OXYGEN SENSOR

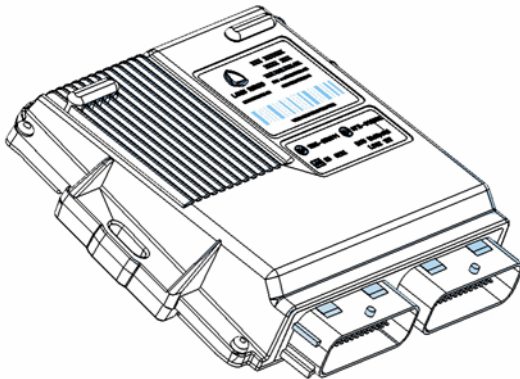
12) GAS ECU

COMPONENT DESCRIPTION



LI 10 PRESSURE REGULATOR

Aluminium body
ON-OFF solenoid safety valve
Filter incorporated in solenoid
Supply pressure: 2.5 to 30 bar
Calibration pressure: 0,95 bar
Temperature range: -20° to 120°C
Solenoid power supply: 6 to 16 Volts
Maximum flow rate: 30 Kg/h
Weight: 1450 g.
Homologation: ECE/ONU R67/01



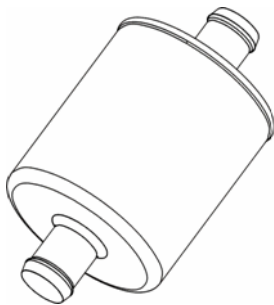
OMEGAS PLUS ECU

Automotive 16 bit 40 Mhz microprocessor
Manages up to 4 injectors
Internal self-diagnosis for sensors and actuators
Temperature range - 40° to 105°C



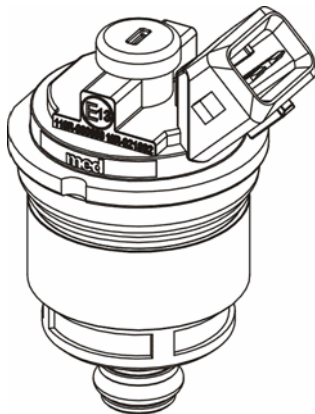
SWITCH

The switch shows the level of gas and offers the driver a choice of fuels (gas/petrol). The switch has an internal "buzzer" that works when the system switches back to petrol in case of any fault on the gas system or when the gas tank is empty.



COALESCENCE GAS FILTER

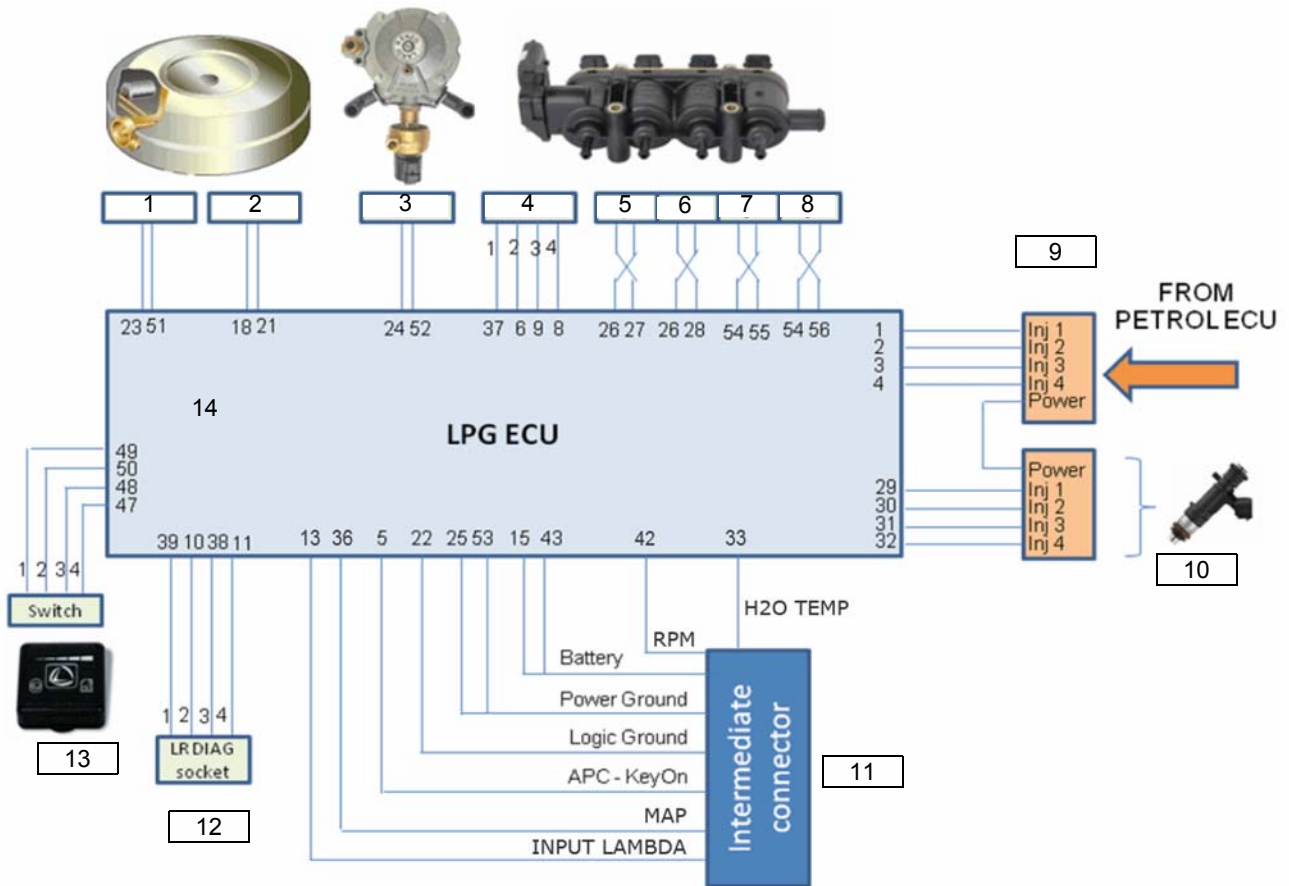
Type of gas:	LPG or Methane
Pipe diameter IN:	14 mm
Pipe diameter OUT:	14 mm
Maximum pressure:	2.2 bar (absolute)
Filtering grade:	10 micron
Weight:	75 g
Homologation:	ECE R110 - ECE R67/01



GAS INJECTOR

Current management:	4/1A "Peak and hold"
Supply voltage:	6 to 16 Volts
Temperature range:	- 40 °C to +120 °C
Nominal pressure:	0.8 to 3 bar
Opening time @12V:	1.5 ms
Dimensions:	Ø 32 x h 73 mm
Weight:	120 g
Homologation:	ECE R 110 - ECE R 67/01

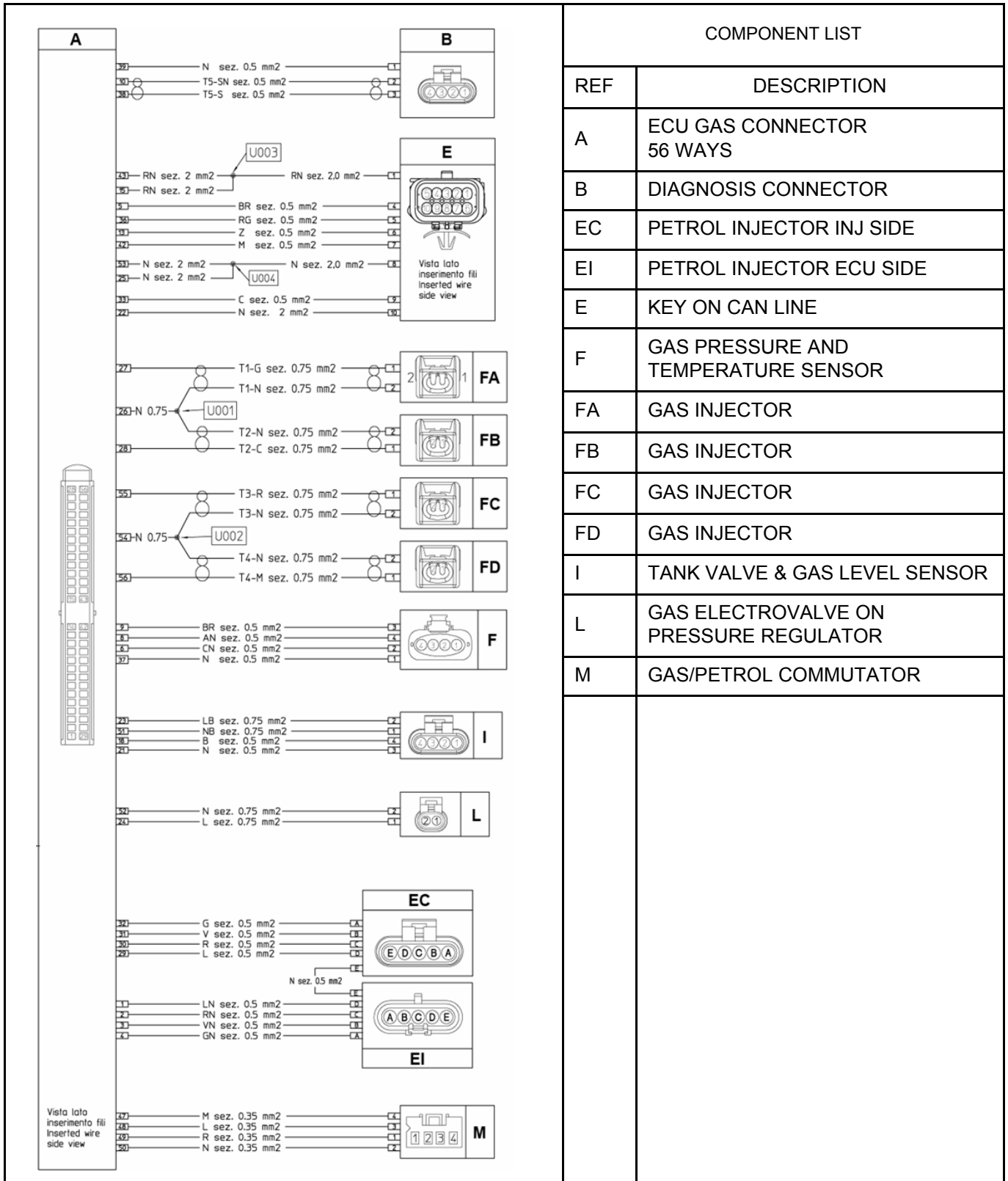
LOGAN, SANDERO, CLIO II, TWINGO II's WIRING DIAGRAM, COMPONENTS GENERAL OVERVIEW



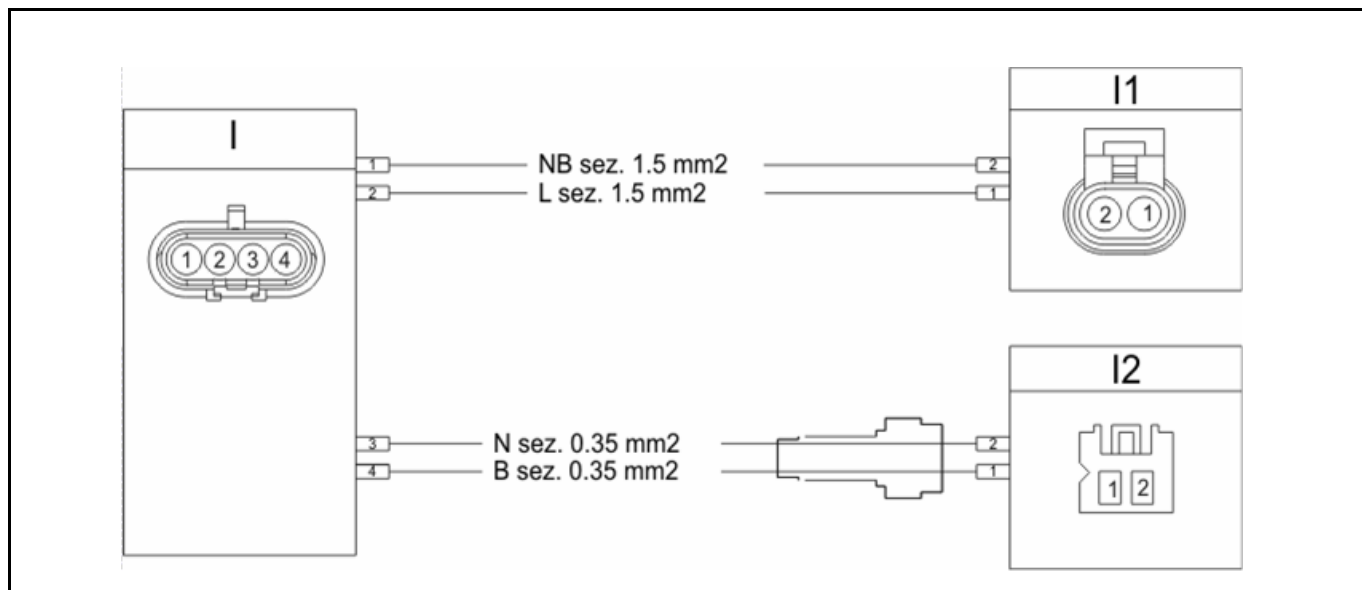
1. TANK SHUT-OFF VALVE
2. LPG LEVEL INDICATOR
3. PRESSURE REDUCER SHUT-OFF VALVE
4. GAS PRESSURE/
TEMPERATURE SENSOR
5. GAS INJ 1
6. GAS INJ 2
7. GAS INJ 3
8. GAS INJ 4
9. INJECTION TIME SIGNAL
FROM PETROL ECU
10. INJECTION TIME TO PETROL
INJECTORS
11. INTERMEDIATE CONNECTOR
12. LANDI RENZO DIAGNOSYS
SOCKET
13. SWITCH-LEVEL SENSOR

LANDIRENZO GAS ECU PIN-OUT 56 WAYS « A »			
PIN	FUNCTION DESCRIPTION	PIN	FUNCTION DESCRIPTION
1	INJECTOR 1 EMULATOR ECU SIDE	29	INJECTOR 1 EMULATOR INJ SIDE
2	INJECTOR 2 EMULATOR ECU SIDE	30	INJECTOR 2 EMULATOR INJ SIDE
3	INJECTOR 3 EMULATOR ECU SIDE	31	INJECTOR 3 EMULATOR INJ SIDE
4	INJECTOR 4 EMULATOR ECU SIDE	32	INJECTOR 4 EMULATOR INJ SIDE
5	KEY ON (+APC) +12 V	33	H2O TEMPERATURE
6	GAS TEMPERATURE	34	
7		35	
8	GAS PRESSURE	36	MAP
9	SENSOR VOLTAGE REFERENCE +5 V	37	PRESSURE SENSOR GND
10	SERIAL RX	38	CAN H/ SERIAL TX
11		39	
12		40	
13	INPUT LAMPIDA	41	
14		42	RPM
15	BATTERY POWER SUPPLY +12 V	43	BATTERY POWER SUPPLY + 12V
16		44	
17		45	
18	LEVEL SENSOR	46	
19		47	HMI SERIAL LINE
20		48	HMI SWITCH
21	LEVEL SENSOR GND	49	HMI SUPPLY (5V)
22	LOGICAL GROUND	50	HMI GND
23	TANK SOLENOID VALVE COMMAND	51	GND TANK SOLENOID VALVE
24	REGULATOR SOLENOID VALVE COMMAND	52	GND REGULATOR SOLENOID VALVE
25	POWER GND	53	POWER GND
26	POSITIVE GAS INJECTOR	54	POSITIVE GAS INJECTOR
27	GAS INJECTOR 1	55	GAS INJECTOR 3
28	GAS INJECTOR 2	56	GAS INJECTOR 4

FUNCTIONAL SCHEMATICS FOR LOGAN, SANDERO, CLIO II, TWINGO II



MULTIVALVE HARNESS



CONNECTOR

REF	DESCRIPTION
I	JUNCTION CONNECTOR
I1	TANK VALVE CONNECTOR
I2	GAS LEVEL SENSOR CONNECTOR

Fault Finding – Faults Summary Table

SUMMARY OF FAULT THAT CAN BE READ WITH THE DIAGNOSTIC TOOL

Landi Renzo Faults	Messages Faults
SOLENOID VALVES	V1 short circuit to battery/open circuit V1 short circuit to ground V2 short circuit to battery/open circuit V2 short circuit to ground
GAS PRESSURE SENSOR	Too low pressure Too high pressure Open circuit Short circuit to battery Inconsistent Pgas/Thank level
MAP SENSOR	Open circuit Short circuit to ground Short circuit to battery Too high pressure Too low diff. Pressure
GAS TEMPERATURE SENSOR	Too high pressure Too high temperature Open circuit Short circuit to ground Short circuit to battery
WATER TEMPERATURE SENSOR	Too low temperature Too high temperature Short circuit to ground Open circuit Short circuit to plus
TANK LEVEL SENSOR	Reserve Short circuit to battery

Fault Finding – Faults Summary Table

Landi Renzo Faults	Messages Faults
GAS INJECTORS	1 Short circuit to ground/open circuit 1 Short circuit to battery 1 Open circuit/short circuit (x10) 2 Short circuit to ground/open circuit 2 Short circuit to battery 2 Open circuit/short circuit (x10) 3 Short circuit to ground/open circuit 3 Short circuit to battery 3 Open circuit/short circuit (x10) 4 Short circuit to ground/open circuit 4 Short circuit to battery 4 Open circuit/short circuit (x10)
PETROL INJECTORS	Petrol injector 1 Petrol injector 1 (Crank) Petrol injector 2 Petrol injector 2 (Crank) Petrol injector 3 Petrol injector 3 (Crank) Petrol injector 4 Petrol injector 4 (Crank)
SAFETY RELAY	Open relay Close relay
O2 PROBE	Short circuit to ground Short circuit to battery
INJECTORS DRIVERS TEMPERATURE	Too high temperature

<p>V1 short circuit to battery/open circuit V1 short circuit to ground V2 short circuit to battery/open circuit V2 short circuit to ground</p>	<p>SOLENOID VALVES</p>
--	-------------------------------

FAULT FINDING PROCEDURE

ITEMS TO CHECK	CORRECTIVE ACTIONS
<p>Open circuits Check if the pressure regulator connector has been correctly connected Check if the multivalve connector has been correctly connected Check if the junction connector has been correctly connected</p>	<p>To connect the connector correctly</p>
<p>Detach connector "A" from the gas ECU. Use an OHM multimeter to check the continuity of the harness and solenoid valves of the tank and regulator, between the following pins: - A51 - A23 Multivalve solenoid valve and A52 - A24 Regulator solenoid valve. The correct value that should display for both pairs of contacts is 12.4 Ω (± 6%).</p>	
<p>If the value indicates a potential short-circuit or open circuit between the pairs of pins: detach the connector of the solenoid valve being tested (multivalve, connector "I2"); (regulator, connector "L") and check the resistance of the coil (12.4 Ω ± 6%).</p>	<p>If the value displayed differs from the one specified, replace the faulty coil.</p>

<p>V1 short circuit to battery/open circuit V1 short circuit to ground V2 short circuit to battery/open circuit V2 short circuit to ground</p>	<p>SOLENOID VALVES (CONTINUED)</p>
--	---

FAULT FINDING PROCEDURE

<p>If the value measured for the coil being examined is correct, disconnect all the connectors and verify there are no open circuits/ short-circuits between the following pins: – A51- I12 and A23-I11 (multivalve harness) or – A52- L2 and A24-L1 (Regulator harness)</p>	<p>If possible, re-establish the connection. – If required, replace the faulty harness</p>
<p>If there is a short-circuit/open circuit on the multivalve harness, detach intermediate connector "I" and determine if the fault originates from the main harness by examining the following pins: "A51-I1 and A23-I2"; or from the tank harness by examining the following pins: "I1- I12" and "I2- I11"</p>	
<p>Measure the voltage on the ends of the gas ECU connector between the following pins: "A15 (positive) - A53 (negative). If no voltage is present, replace the supply fuse</p>	<p>Replace the fuse with a new one with an equivalent capacity</p>

Too low pressure Too high pressure Open circuit Short circuit to battery Inconsistent Pgas/Thank level	GAS PRESSURE SENSOR
--	----------------------------

FAULT FINDING PROCEDURE

ITEMS TO CHECK	CORRECTIVE ACTIONS
Open circuits Check if the sensor has been correctly connected	Connect the sensor correctly
Short-circuits or open circuits Connect the Diagnosis Tool to the diagnostic socket. Measure the operating gas pressure when the engine is running, at MINIMUM speed, at the operating temperature, when the vehicle is running on gas and when all the services or accessories are off. Check that Pgas is between 1.23 & 1.35 bar . If the Pgas is 0 bar or significantly differs from the values specified above , inspect the gas pressure/temperature sensor and its connections.	
Measure with an OHM multimeter the value between the following pins of connector "A" on the ECU: A-8- A-9 (~ 5.5KΩ); A8 - A37 (~ 4.7KΩ); A9 - A37 (~ 5.8KΩ). In the event of short-circuit or open circuit, detach connector "F" from the gas pressure/temperature sensor. Use the OHM multimeter to verify if the short-circuit continues to be present between pins A8 - A9 and A8 - A37 of connector on the ECU.	If the harness is shorted: - Re-establish the connection, if possible - Replace the whole harness, if required If the harness is interrupted: - Replace the whole harness, if required If the harness is working: replace the gas pressure/temperature sensor
Measure the continuity between connector "A" of the ECU and connector "F" of the pressure sensor on the gas injector rail, between the following pins: A37-F1; A9-F3; A8-F4	If the fault persists after the replacement of the sensor, replace the gas ECU.

<p>Too low pressure Too high pressure Open circuit Short circuit to battery Inconsistent Pgas/Thank level</p>	<p>GAS PRESSURE SENSOR (CONTINUED)</p>
---	---

FAULT FINDING PROCEDURE

ITEMS TO CHECK	CORRECTIVE ACTIONS
<p>Low pressure, high pressure Connect the PLUS to the diagnostic socket of the ECU. Measure the gas operating pressure when the engine is running, when the vehicle is running on gas and at minimum speed. Check that Pgas is between 1.23 & 1.35 bar. Turn the adjustment screw on the pressure regulator counterclockwise (to increase the pressure) or clockwise (to reduce it) to maintain the pressure reading within the specified value. It is generally advisable to turn the screw by one quarter revolution at a time and record the number of ATTENTION! Do not rotate the adjustment screw by more than 6 full revolutions.</p>	<p>If the specified pressure cannot be reached, move the adjustment screw back to its original position and replace the gas pressure/temperature sensor.</p> <hr/> <p>If the fault persists after the replacement of the sensor, replace the gas ECU.</p>

<p>Open circuit Short circuit to ground Short circuit to battery Too high pressure Too low diff. Pressure</p>	<p>MAP SENSOR</p>
---	--------------------------

FAULT FINDING PROCEDURE

ITEMS TO CHECK	CORRECTIVE ACTIONS
<p>Open circuit Short circuit to ground Short circuit to battery</p> <p>Use an OHM multimeter to check the continuity of the harness between the ECU connector and MAP sensor. To check the continuity between the following pins: A36- E5</p>	<p>If the harness is interrupted or shorted:</p> <ul style="list-style-type: none"> – Re-establish the connection, if possible – Replace the whole harness, if required – If the harness is working, check any malfunction of the original MAP sensor.
<p>Too low diff. Pressure Too high pressure</p>	<ul style="list-style-type: none"> – check the LPG level – check the Pgas value (see page. 14)

<p>Too high pressure Too high temperature Open circuit Short circuit to ground Short circuit to battery</p>	<p>GAS TEMPERATURE SENSOR</p>
---	--------------------------------------

FAULT FINDING PROCEDURE

ITEMS TO CHECK	CORRECTIVE ACTIONS
<p>Open circuits Check if the sensor has been correctly connected</p>	<p>To connect the sensor correctly</p>
<p>Short-circuits or open circuits Use an OHM multimeter to check the continuity of the harness between the ECU connector and temperature sensor on the gas injectors rail. Measure the continuity between the following pins: A6-A9 (~ 8.2KΩ); A6- A37 (~ 2.3KΩ); A9- A37 (~ 5.8KΩ); with the sensor at ambient temperature. In the event of short-circuit or open circuit, detach connector "F" from the gas pressure/temperature sensor. Use an OHM multimeter to check the continuity of the harness between connector "A" on the ECU and the connector of sensor "F". Measure the continuity between the following pins: A37-F1; A6-F2; A9-F3.</p>	<p>If the harness is interrupted or shorted: – Re-establish the connection, if possible – Replace the whole harness, if required If the harness is working, replace the gas temperature/pressure sensor If the fault persists after the replacement of the sensor, replace the gas ECU</p>
<p>Low temperature, high temperature (correct temperature range: 0°C 130°C)</p>	<p>Replace the gas temperature/pressure sensor. If the fault persists after the replacement of the sensor, replace the gas ECU</p>

<p>Too low temperature Too high temperature Short circuit to ground Open circuit Short circuit to plus</p>	<p>WATER TEMPERATURE SENSOR</p>
--	--

FAULT FINDING PROCEDURE

ITEMS TO CHECK	CORRECTIVE ACTIONS
<p>The problem may originate from:</p> <ul style="list-style-type: none"> – The original vehicle wiring harness. – The gas wiring harness. <p>Open circuit Use an OHM multimeter to check the continuity of the wiring harness between the pin “9” of the E connector from the petrol wiring harness side and from the LPG wiring harness side. system (as specified in Toyota's manuals) and pin “A33” on the connector of the gas ECU.</p> <p>Short-circuit Use a Volt multimeter to measure the voltage on the connector of the gas ECU between pin “A33” and the “positive battery terminal”.</p>	<p>The value is correct if it is slightly below the battery voltage. If the cable is damaged:</p> <ul style="list-style-type: none"> – Re-establish the connection, if possible – Replace the whole wiring harness, if applicable

Reserve Short circuit to battery	TANK LEVEL SENSOR
-------------------------------------	--------------------------

FAULT FINDING PROCEDURE

ITEMS TO CHECK	CORRECTIVE ACTIONS
<p>Open circuits Check if the sensor has been correctly connected Check if the junction connector has been correctly connected</p>	<p>To connect the sensor correctly To connect the junction connector correctly</p>
<p>Determine the actual amount of gas present in the tank. Detach the connector from the level sensor. Use an OHM multimeter to determine the actual short-circuit between the two sensor contacts (range: empty tank ~100 Ω; full tank ~21.7 KΩ)</p>	<p>If the sensor value is out of range: – Replace the petrol level sensor</p>
<p>If the value is within the specified range, connect the connector on the gas level sensor and use an OHM multimeter to check the harness continuity between the following pins: A18 -A21. The resulting value should correspond to the value previously obtained for the sensor. If a short-circuit or open circuit is present, detach the intermediate connector from the tank harness "I" and check the continuity between the following pins: A21 - I3 and A18 - I4. If the main harness is in good working order, the fault originates from the secondary harness connected to the tank. To exclude all possible doubts, check the continuity between the following pins: I3 - I22 and I4 - I21</p>	<p>After determining the faulty harness: – Re-establish the connection, if possible – Replace the whole harness, if required</p>

Fault Finding – Faults Interpretation

<ul style="list-style-type: none"> 1 Short circuit to ground/open circuit 1 Short circuit to battery 1 Open circuit/short circuit (x10) 2 Short circuit to ground/open circuit 2 Short circuit to battery 2 Open circuit/short circuit (x10) 3 Short circuit to ground/open circuit 3 Short circuit to battery 3 Open circuit/short circuit (x10) 4 Short circuit to ground/open circuit 4 Short circuit to battery 4 Open circuit/short circuit (x10) 	<p>GAS INJECTOR</p>
--	----------------------------

FAULT FINDING PROCEDURE

ITEMS TO CHECK	CORRECTIVE ACTIONS
<p>Use an OHM multimeter to check the continuity of the harness and injectors on the terminations of the gas ECU connectors. Measure the continuity between the following pins:</p> <ul style="list-style-type: none"> – A26-A27 (for an injector fault on cylinder 1) – A26-A28 (for an injector fault on cylinder 2) – A54-A55 (for injector faults on cylinder 3) – A54-A56 (for injector faults on cylinder 4) <p>The correct value is $1.1 \Omega \pm 10\%$ if the injector is at ambient temperature.</p> <p>If the resulting value is different, detach the connector from the faulty gas injector ("FA-FB-FC- FD") and use an OHM multimeter to measure the resistance of the gas injector. The correct value is $1.1 \Omega \pm 10\%$ if the injector is at ambient temperature</p>	<p>If the resulting resistance differs from this value, replace the gas injector that corresponds to the letter printed on the rail housing:</p> <p>A=First cylinder B=Second cylinder C=Third cylinder D=Fourth cylinder</p>

Fault Finding – Faults Interpretation

<ul style="list-style-type: none"> 1 Short circuit to ground/open circuit 1 Short circuit to battery 1 Open circuit/short circuit (x10) 2 Short circuit to ground/open circuit 2 Short circuit to battery 2 Open circuit/short circuit (x10) 3 Short circuit to ground/open circuit 3 Short circuit to battery 3 Open circuit/short circuit (x10) 4 Short circuit to ground/open circuit 4 Short circuit to battery 4 Open circuit/short circuit (x10) 	<p>GAS INJECTOR (CONTINUED)</p>
--	--

FAULT FINDING PROCEDURE

ITEMS TO CHECK	CORRECTIVE ACTIONS
<p>If the gas injector is in good working order, use an OHM multimeter to check the continuity of the supply cables of the gas injector being tested, between the ECU connector and injector connector.</p> <p>Measure the continuity between the following pins:</p> <ul style="list-style-type: none"> – A26-FA2 (for injector faults on cylinder 1 or 2) – A26-FB2 (for injector faults on cylinder 1 or 2) – A27-FA1 (for injector faults on cylinder 1) – A27-FB1 (for injector faults on cylinder 2) – A54-FC2 (for injector faults on cylinder 3 or 4) – A54-FD2 (for injector faults on cylinder 3 or 4) – A55-FC1 (for injector faults on cylinder 3) – A56-FD1 (for injector faults on cylinder 4) 	<p>If the harness is interrupted:</p> <ul style="list-style-type: none"> – Re-establish the connection, if possible – Replace the whole harness, if required
<p>If the injectors and harness are in good working order:</p>	<p>Replace the gas ECU</p>
	<p>If the problem persists, contact Renault Techline</p>

<p>Petrol injector 1 Petrol injector 1 (Crank) Petrol injector 2 Petrol injector 2 (Crank) Petrol injector 3 Petrol injector 3 (Crank) Petrol injector 4 Petrol injector 4 (Crank)</p>	<p>PETROL INJECTORS</p>
--	--------------------------------

FAULT FINDING PROCEDURE

ITEMS TO CHECK	CORRECTIVE ACTIONS
<p>Fault with LED "MIL" on: – Detach the connectors of the injectors exclusion harness and re-establish a direct connection between the connectors on the corresponding petrol injectors If the fault disappears, check the gas harness continuity between the connector of the ECU and the interface connectors of the petrol injectors. Measure the continuity between the following pins: – A1- EC12; A2- EC22; A3- EC32; A4- EC42; – A29- EI12; A30- EI22; A31- EI32; A32- EI42; And on the interface connectors of the petrol injectors, measuring the continuity between the following pins: EC11 – EI11;- EC21 - EI21; EC31 - EI31; EC41 – EI41;</p>	<p>If the harness is damaged: – Re-establish the connection, if possible. – Replace the whole harness, if required</p>
<p>Fault with LED "MIL" off:</p>	<p>Replace the gas injection ECU</p>
<p>Fault with LED "MIL" on: – Verify if the fault disappears when a "temporary connection" to a new gas injection ECU is made.</p>	<p>If the fault disappears when a new gas ECU is used, replace the gas ECU</p>

Open relay Close relay	SAFETY RELAY
---------------------------	---------------------

FAULT FINDING PROCEDURE

ITEMS TO CHECK	CORRECTIVE ACTIONS
Detach the connector from the ECU. Use a Volt multimeter to measure the voltage between pins "A43" and "A15" of the ECU connector and compare the results with those with the "Battery negative cable"	If no voltage is present: Inspect the supply fuse and the connection between the harness and battery positive cable. If the fuse is damaged: replace the fuse with a new one with an equivalent capacity If the harness is disconnected: connect the power supply to the positive cable of the battery.
	If voltage is present: Replace the gas injection ECU

<p>Short circuit to ground Short circuit to battery</p>	<p>02 PROBE</p>
---	------------------------

FAULT FINDING PROCEDURE

ITEMS TO CHECK	CORRECTIVE ACTIONS
<p>Short circuit to ground Short circuit to battery</p> <p>Use an OHM multimeter to check the continuity of the harness between the ECU connector and lambda sensor. To check the continuity between the following pins: A13- E6</p>	<p>If the harness is interrupted or shorted:</p> <ul style="list-style-type: none"> – Re-establish the connection, if possible – Replace the whole harness, if required

Too high temperature	INJECTORS DRIVERS TEMPERATURE
----------------------	--------------------------------------

FAULT FINDING PROCEDURE

ITEMS TO CHECK	CORRECTIVE ACTIONS
<p>Use an OHM multimeter to check the continuity of the harness and injectors on the terminations of the gas ECU connectors. Measure the continuity between the following pins:</p> <ul style="list-style-type: none"> – A26-A27 (for an injector fault on cylinder 1) – A26-A28 (for an injector fault on cylinder 2) – A54-A55 (for an injector fault on cylinder 3) – A54-A56 (for an injector fault on cylinder 4) <p>The correct value is $1.1 \Omega \pm 10\%$ if the injector is at ambient temperature.</p> <p>If the resulting value is different, detach the connector from the faulty gas injector ("FA-FB-FC-FD") and use an OHM multimeter to measure the resistance of the gas injector. The correct value is $1.1 \Omega \pm 10\%$ if the injector is at ambient temperature</p>	<p>If the resulting resistance differs from this value, replace the gas injector that corresponds to the letter printed on the rail housing:</p> <p>A=First cylinder B=Second cylinder C=Third cylinder D=Fourth cylinder</p> <p>If the harness is shorted:</p> <ul style="list-style-type: none"> – Re-establish the connection, if possible. – Replace the whole harness, if required
If the injectors and harness are in good working order:	Replace the gas ECU

GAS INJECTION

Fault Finding – Symptoms Summary

G001_003_001	STARTING THE ENGINE: IMPOSSIBLE
G001_003_002	STARTING THE ENGINE: STALLS WHEN COLD
G002_007_001	SWITCH BETWEEN PETROL/FUEL GAS: IMPOSSIBLE
G002_004_001 G002_009_009	INJECTION WARNING LIGHT: ON DRIVING EXPERIENCE: JOLTS WHEN SWITCHING BETWEEN FUEL/GAS FUEL
G002_009_005	DRIVING EXPERIENCE: ERRATIC ACCELERATION
G002_008_001	PERFORMANCE: INSUFFICIENT POWER OR TORQUE THE VEHICLE'S SHOW
	MODE SWITCHING: UNEXPECTED
G002_004_001	INJECTION WARNING LIGHT: ON
G001_009_001 G002_009_002 G002_009_003 G002_009_004	DRIVING EXPERIENCE: UNSTABLE IDLING SPEED DRIVING EXPERIENCE: IDLING SPEED TOO HIGH OR TOO LOW DRIVING EXPERIENCE: JOLTS DRIVING EXPERIENCE: ENGINE STALLS
G002_004_001 G002_009_003	INJECTION WARNING LIGHT: ON DRIVING EXPERIENCE: JOLTS
I001_007_006	GAS LEVEL INDICATOR: INCOHERENT
R003_003_004	WATER LEAKS UNDER THE VEHICLE
	GAS ECU GLOBAL CHECK

G001_003_001

STARTING THE ENGINE: IMPOSSIBLE

FAULT FINDING PROCEDURE

ITEMS TO CHECK	CORRECTIVE ACTIONS
Gas mixes with petrol. Re-establish the connections on the petrol injectors, excluding the petrol injectors harness interfaces	– If start-up does not occur correctly, replace the gas ECU. – If the problem persists, determine if there are other causes.

G001_003_002

STARTING THE ENGINE: STALLS WHEN COLD

FAULT FINDING PROCEDURE

The ECU switches the vehicle to gas but the engine switches off immediately.

ATTENTION: this condition is common, because if several gas hose have been disconnected during reparation, the gas may not be able to reach the injectors in right time and thus maintain the engine running when the "first" flow of fuel is conveyed to the injectors.

ITEMS TO CHECK	CORRECTIVE ACTIONS
<p>Switch the car to gas mode and check that Pgas is between 1.23 & 1.35 bar at idle. The pressure falls very quickly. Inspect the pressure regulator, check the efficiency of the gas filter and verify that there are no bends in the high/low pressure circuit.</p>	<ul style="list-style-type: none"> – Remove the oil residuals from the regulator – Replace the filter – Remove the bend from the gas tubes.
<p>The solenoid valve on the tank does not open (no error code is stored in the memory of the diagnostic system). Verify that the gasket on the mobile core of the solenoid valve is not damaged. Close the manual faucet on the multivalve. Disassemble the mobile core of the solenoid valve Reassemble the sleeve without the mobile core and coil. Open the manual faucet and verify if the problem persists. ATTENTION: this check is temporary and must be performed for this type of fault only. Do not drive the vehicle without the mobile core of the solenoid valve.</p>	<p>If the fault has been repaired, replace the mobile core of the multivalve</p>

G001_003_002	STARTING THE ENGINE: STALLS WHEN COLD (CONTINUED)
--------------	--

ITEMS TO CHECK	CORRECTIVE ACTIONS
<p>The ECU does not read the engine speed. The wiring harness is faulty, the connection is damaged or the gas injection system is faulty.</p>	<p>Use an OHM multimeter to check the wiring harness continuity between the following pins:</p> <ul style="list-style-type: none"> - A42-E7; - E7 (LPG side)- E7 (petrol side) - If there are open circuits: - Re-establish the connection, if possible - Replace the whole wiring harness, if required

Fault Finding – Symptoms Interpretation

G002_007_001	SWITCH BETWEEN PETROL/FUEL GAS: IMPOSSIBLE
--------------	---

FAULT FINDING PROCEDURE

<p>There is no gas because the tank has been emptied before the reparation. Check the gas level on the floating stick.</p>	Refuel.
<p>If the fault reoccurs after reparation: Check the conditions of the manual faucet on the tank.</p>	Open the manual faucet on the tank
Check the connections between the low pressure tubes.	Reconnect the detached tube.
<p>Connect the PLUS and measure the gas operating pressure. The pressure measured (P_{gas}) must range between 1.23 and 1.35 bar when the vehicle is running on gas and at idle speed. Turn the adjustment screw on the pressure regulator counterclockwise (to increase the pressure) or clockwise (to reduce it) to maintain the pressure reading within the specified value. It is generally advisable to turn the screw by one quarter revolution at a time and record the number of ATTENTION! Do not rotate the adjustment screw by more than 6 full revolutions. If the pressure continues to be low, the gas filter may be clogged (in this case the customer has probably reported a gradual loss of power).</p>	<p>Replace the gas filter The regulator may be faulty. Replace the regulator The pressure sensor on the injectors rail is faulty (see GAS PRESSURE SENSOR Diagnosis).</p>
<p>The pressure in the tank is too low because of a low ambient temperature. This fault originates from atmospheric conditions.</p>	----

Fault Finding – Symptoms Interpretation

G002_007_001	SWITCH BETWEEN PETROL/FUEL GAS: IMPOSSIBLE (CONTINUED)
--------------	---

The switch remains always off

ITEMS TO CHECK	CORRECTIVE ACTIONS
<p>The power fuse is damaged or one of the ECU supply cables is interrupted or disconnected. Inspect the supply fuse and the connection between the power harness and battery If no positive voltage is supplied to the battery, a "Safety relay" error is stored in the memory of the diagnostic system.</p>	<p>If the fuse is damaged: replace the fuse with a new one with an equivalent capacity (20A). If the harness is disconnected: connect the supply harness to the positive terminal of the battery.</p>
<p>There is no connection for the "key on" signal. In "key on" mode check the voltage on the pin A5 of gas ECU with a multimeter: +15V is expected.</p>	<p>If the voltage is absent: to check the fuse which provide voltage to the white-red wire of the "E" connector.</p>
<p>Use a OHM multimeter to check the continuity of the WHITE-RED wire. Measure the continuity between the following pins: – A5-E4</p>	<p>If the harness is damaged: – Re-establish the connection, if possible. – Replace the whole harness, if required.</p>
<p>Defective harness. Use an OHM multimeter to check the continuity of the wires connected to the switch and between the switch and ECU connectors. Measure the continuity between the following pins: – A47-M4; A48-M3; A49-M1; A50-M2</p>	<p>If the harness is interrupted: – Re-establish the connection, if possible. – Replace the faulty harness, if required</p>
<p>The switch may be damaged.</p>	<p>Replace the switch</p>
<p>The ECU may be damaged.</p>	<p>Check the ECU</p>

G002_004_001 G002_009_009	INJECTION WARNING LIGHT: ON DRIVING EXPERIENCE: JOLTS WHEN SWITCHING BETWEEN FUEL/GAS FUEL
------------------------------	---

FAULT FINDINGS PROCEDURES

The vehicle switches to gas and turns off

ITEMS TO CHECK	CORRECTIVE ACTIONS
There is no gas because the tank has been emptied before the reparation. Verify that the "Red" LED of the switch turns on or check the petrol level on the dipstick.	Refuel.
If the fault persists after the reparation, check the conditions of the manual faucet on the tank. Inspect the manual faucet on the tank.	Open the manual faucet on the tank.
The solenoid valves on the tank and/or regulator do not open (an error code is stored in the memory of the DIAGNOSTIC system). Connect the PLUS and perform the diagnostic procedures for PLUS Fault GAS PRESSURE SENSOR .	Perform the reparation following the instructions given under paragraph PLUS Fault GAS PRESSURE SENSOR

Fault Finding – Symptoms Interpretation

<p>G002_004_001 G002_009_009</p>	<p>INJECTION WARNING LIGHT: ON</p> <p>DRIVING EXPERIENCE: JOLTS WHEN SWITCHING BETWEEN FUEL/GAS FUEL (CONTINUED)</p>
--------------------------------------	--

ITEMS TO CHECK	CORRECTIVE ACTIONS
<p>The pressure falls very quickly: check that Pgas is between 1,23 & 1,35 bar. Inspect the pressure regulator, check the efficiency of the gas filter and verify that there are no bends in the high/low pressure circuit.</p>	<ul style="list-style-type: none"> – Remove the oil residuals from the regulator. – Replace the filter. – Remove the bend from the gas tubes.
<p>The solenoid valve on the tank does not open (no error code is stored in the memory of the diagnostic system). Verify that the gasket on the mobile core of the solenoid valve is not damaged. Close the manual faucet on the multivalve. Disassemble the mobile core of the solenoid valve Reassemble the sleeve without the mobile core and coil. Open the manual faucet and verify if the problem persists. <u><i>ATTENTION: this check is temporary and must be performed for this type of fault only. Do not drive the vehicle without the mobile core of the solenoid valve.</i></u></p>	<p>If the fault has been repaired, replace the mobile core of the multivalve.</p>

Fault Finding – Symptoms Interpretation

G002_009_005	DRIVING EXPERIENCE: ERRATIC ACCELERATION
--------------	---

FAULT FINDING PROCEDURE

During acceleration, the vehicle jerks and then resumes normal operation

ITEMS TO CHECK	CORRECTIVE ACTIONS
If the fault reoccurs after reparation: Check the connection of the petrol injectors exclusion harness.	Check the pairing of the injectors exclusion harness
If the fault reoccurs after reparation: Check the connection of the gas injectors harness.	Check the pairing of the gas injectors exclusion harness
One of the injectors is not working correctly. Locate the damaged injector. Close one gas discharge hose at a time for a few seconds using the pliers. Verify which hose is crushed when the engine appears to be running normally. Replace the gas injector that corresponds to the crushed hose using the pliers. Be careful not to damage the tubes with the pliers.	Replace the faulty injector

Fault Finding – Symptoms Interpretation

G002_008_001	PERFORMANCE: INSUFFICIENT POWER OR TORQUE THE VEHICLE'S SHOW
--------------	---

FAULT FINDING PROCEDURE

ITEMS TO CHECK	CORRECTIVE ACTIONS
<p>The gas filter is clogged. Connect the PLUS and check that P_{gas} is between 1.23 & 1.35 bar at idle speed).</p>	Replace the gas filter.
<p>The pressure regulator is damaged. Connect the PLUS and measure the gas operating pressure by using P_{gas}. The pressure measured must range between 1.23 and 1.35 bar when the vehicle is running on gas and at idle speed. Turn the adjustment screw on the pressure regulator counterclockwise (to increase the pressure) or clockwise (to reduce it) to maintain the pressure reading within the specified value. It is generally advisable to turn the screw by one quarter revolution at a time and record the number of ATTENTION! Do not rotate the adjustment screw by more than 6 full revolutions. If the pressure continues to be low, the gas filter may be clogged (in this case the customer has probably reported a gradual loss of power).</p>	<p>Replace the regulator</p> <p>Replace the gas filter.</p>

Fault Finding – Symptoms Interpretation

	MODE SWITCHING: UNEXPECTED
--	-----------------------------------

FAULT FINDING PROCEDURE

The gas system switches back to petrol after high speed running

ITEMS TO CHECK	CORRECTIVE ACTIONS
The pressure has fallen below the limit set on the ECU. Inspect the gas filter (in this case, the customer should have reported a gradual loss of power).	Replace the gas filter. Remove the oil residuals for the regulator.
The pressure has fallen below the limit set on the ECU. Check the gas level. If the level corresponds to the minimum, the vehicle probably needs refueling and the amount of gas is sufficient only to run the vehicle at medium and low speeds.	Refuel.

The gas ECU switches the vehicle back to petrol (a "Gas pressure sensor" error is stored in the memory of the DIAGNOSTIC system)

Note: this fault occurs only if the switch detects an amount of petrol above the "minimum level".
If the switch detects a "minimum" level of petrol, the ECU switches the vehicle back to petrol because there is no more gas and no error is stored in the memory of the DIAGNOSTIC system.

Fault Finding – Symptoms Interpretation

	MODE SWITCHING: UNEXPECTED (CONTINUED 1)
--	---

ITEMS TO CHECK	CORRECTIVE ACTIONS
There is no gas because the tank has been emptied before the reparation. Check the gas level on the floating stick.	Refuel.
If the fault reoccurs after reparation: Check the conditions of the manual faucet on the tank.	Open the manual faucet on the tank
If the fault reoccurs after reparation: Verify that the supply connectors of the solenoid on the multivalve and regulator have been correctly connected.	Reconnect the detached connector.
Check the connections between the low pressure tubes.	Reconnect the detached tube.
Connect the PLUS and measure the gas operating pressure by using P_{gas} . The pressure measured must range between 1.23 and 1.35 bar when the vehicle is running on gas and at idle speed. Turn the adjustment screw on the pressure regulator counterclockwise (to increase the pressure) or clockwise (to reduce it) to maintain the pressure reading within the specified value. It is generally advisable to turn the screw by one quarter revolution at a time and record the number of ATTENTION! Do not rotate the adjustment screw by more than 6 full revolutions.	If the specified pressure cannot be reached, move the adjustment screw back to its original position and verify is the gas filter is clogged.

	MODE SWITCHING: UNEXPECTED (CONTINUED 2)
--	---

ITEMS TO CHECK	CORRECTIVE ACTIONS
The gas filter is clogged.	Replace it.
When ambient temperature is below 0°C, the quality of the gas does not match the one required for rigid climates. This may occur in presence of rapid temperature excursions during mild seasons.	Refuel the vehicle with gas suitable for the ambient temperature.
One of the gas injectors may be damaged or several gas injectors may be dirty (no error code is stored in the memory of the diagnostic system). Locate the damaged injector Close one gas discharge hose at a time for a few seconds using the pliers. Verify which hose is crushed when the engine appears to be running normally. Replace the gas injector that corresponds to the crushed hose using the pliers. Be careful not to damage the tubes with the pliers.	Replace the faulty injector.

MODE SWITCHING: UNEXPECTED (CONTINUED 3)

ITEMS TO CHECK	CORRECTIVE ACTIONS
The gas filter is clogged. In this case the customer has probably reported also a gradual loss of power.	Replace the filter and remove the traces of oil from the pressure regulator
If the fault persists after the reparation, check the connection of the injectors exclusion harness. Check the pairing of the petrol injectors interface harness	Reconnect the petrol injectors interface harness.
If the fault persists after the reparation, check the connection of the gas injectors harness. Check the pairing of the gas injectors harness	Reconnect the gas injectors harness.

Fault Finding – Symptoms Interpretation

G002_004_001	INJECTION WARNING LIGHT: ON
--------------	------------------------------------

ITEMS TO CHECK	CORRECTIVE ACTIONS
If the issue persists after maintenance: Verify that there are no "bends" between the tubes on the gas rail and nozzles.	Straighten the bent tubes.
LED MIL is ON when the vehicle is running on gas, but not when it is running on petrol. No errors are stored in the memory of the gas ECU diagnostic system.	
The problem may originate from a inadequate gas carburetion. Use the diagnostic tester to check the stored error.	Perform the corrective action required to correct the fault.

The MIL lamp is ON when the vehicle is running on gas, but not when it is running on petrol.

ITEMS TO CHECK	CORRECTIVE ACTIONS
The problem may originate from a inadequate gas carburetion. Use the diagnostic tester to check the stored error.	Perform the corrective action required to correct the fault.
The gas ECU is probably faulty.	Replace the gas ECU.

Fault Finding – Symptoms Interpretation

<p>G001_009_001 G002_009_002 G002_009_003 G002_009_004</p>	<p>DRIVING EXPERIENCE: UNSTABLE IDLING SPEED DRIVING EXPERIENCE: IDLING SPEED TOO HIGH OR TOO LOW DRIVING EXPERIENCE: JOLTS DRIVING EXPERIENCE: ENGINE STALLS</p>
--	---

FAULT FINDINGS PROCEDURES

The engine tends to switch off at idle speed (this problem generally occurs when the engine is “cold”).

ITEMS TO CHECK	CORRECTIVE ACTIONS
<p>One or more injectors are dirty or are so worn that they do not open correctly. Locate the damaged injector. Close one gas discharge hose at a time for a few seconds using the pliers. Verify which hose is crushed when the engine appears to be running normally. Replace the gas injector that corresponds to the crushed hose using the pliers. Be careful not to damage the hoses with the pliers.</p>	<p>Replace the faulty injector</p>

The engine speed is irregular.

ITEMS TO CHECK	CORRECTIVE ACTIONS
<p>One of the injectors is not working correctly. Locate the damaged injector by performing the procedure described. Close one gas discharge hose at a time for a few seconds using the pliers. Verify which hose is crushed when the engine appears to be running normally. Replace the gas injector that corresponds to the crushed hose using the pliers. Be careful not to damage the tubes with the pliers.</p>	<p>Replace the faulty injector</p>

Fault Finding – Symptoms Interpretation

<p>G001_009_001 G002_009_002 G002_009_003 G002_009_004</p>	<p>DRIVING EXPERIENCE: UNSTABLE IDLING SPEED DRIVING EXPERIENCE: IDLING SPEED TOO HIGH OR TOO LOW DRIVING EXPERIENCE: JOLTS DRIVING EXPERIENCE: ENGINE STALLS (CONTINUED 1)</p>
--	---

The change-over from idle speed is irregular.

ITEMS TO CHECK	CORRECTIVE ACTIONS
<p>One of the injectors is not working correctly. Locate the damaged injector by performing the procedure described. Close one gas discharge hose at a time for a few seconds using the pliers. Verify which hose is crushed when the engine appears to be running normally. Replace the gas injector that corresponds to the crushed hose using the pliers. Be careful not to damage the tubes with the pliers.</p>	<p>Replace the faulty injector</p>

When the engine is accelerated to a high speed, a “Low pressure: ERROR” is stored in the memory of the diagnostic system and the ECU switches the vehicle back to petrol.

ITEMS TO CHECK	CORRECTIVE ACTIONS
<p>The gas filter is clogged.</p>	<p>Replace the gas filter</p>
<p>The regulator is clogged.</p>	<p>Clean the regulator</p>
<p>The gas in the tank is not sufficient to maintain a high speed, but only allows the vehicle to run at medium-low speeds. Check the level of gas in the tank.</p>	<p>Perform a gas refueling operation.</p>

Fault Finding – Symptoms Interpretation

<p>G001_009_001 G002_009_002 G002_009_003 G002_009_004</p>	<p>DRIVING EXPERIENCE: UNSTABLE IDLING SPEED DRIVING EXPERIENCE: IDLING SPEED TOO HIGH OR TOO LOW DRIVING EXPERIENCE: JOLTS DRIVING EXPERIENCE: ENGINE STALLS (CONTINUED 2)</p>
--	---

The engine stalls and then resumes operation when it is accelerated to a high speed.

<p>If the fault reoccurs after reparation: Check the connection of the injectors exclusion harness.</p>	<p>Check the pairing of the injectors exclusion harness.</p>
<p>If the fault reoccurs after reparation: Check the connection of the gas injectors harness.</p>	<p>Check the pairing of the gas injectors harness.</p>

The operation of the vehicle is unstable, particularly at idle speed, and there is a smell of gas.

ITEMS TO CHECK	CORRECTIVE ACTIONS
<p>There is a gas leak in some part of the system and carburetion does not therefore occur correctly. Check the operating pressure of the regulator by using Pgas. If the pressure is stable at 1.92 bar at idle speed but falls when the vehicle accelerates.</p>	<p>Replace the pressure regulator.</p>

Fault Finding – Symptoms Interpretation

<p>G001_009_001 G002_009_002 G002_009_003 G002_009_004</p>	<p>DRIVING EXPERIENCE: UNSTABLE IDLING SPEED DRIVING EXPERIENCE: IDLING SPEED TOO HIGH OR TOO LOW DRIVING EXPERIENCE: JOLTS DRIVING EXPERIENCE: ENGINE STALLS (CONTINUED 3)</p>
--	--

The vehicle barely stays on, it occasionally turns off and its drivability is bad in all conditions.

ITEMS TO CHECK	CORRECTIVE ACTIONS
<p>One of the gas injectors is not working correctly. Locate the damaged injector: close one gas discharge hose at a time for a few seconds using the pliers. Verify which hose is crushed when the engine appears to be running normally. Replace the gas injector that corresponds to the crushed hose using the pliers. Be careful not to damage the hose with the pliers.</p>	<p>Replace the faulty injector</p>

G002_004_001
G002_009_003

INJECTION WARNING LIGHT: ON
DRIVING EXPERIENCE: JOLTS

FAULT FINDINGS PROCEDURES

The engine jerks at high speeds

One of the injectors is not working correctly.
Close one gas discharge hose at a time for a few seconds using the pliers.
Verify which hose is crushed when the engine appears to be running normally.
Replace the gas injector that corresponds to the crushed hose using the pliers.
Be careful not to damage the tubes with the pliers.

Replace the faulty injector

1001_007_006	GAS LEVEL INDICATOR: INCOHERENT
--------------	--

FAULT FINDING PROCEDURE

The switch always indicates that the tank is full after the replacement of the fuel level indicator.

ITEMS TO CHECK	CORRECTIVE ACTIONS
The petrol level indicator has been installed upside down. Check the position of the petrol level indicator. If it has been correctly installed, the connector should be situated next to the solenoid valve	Install the petrol level indicator in the correct location.
One of the connectors has not been connected (an error is stored in the memory of the diagnostic system). Check that the connector has been correctly inserted in the level indicator or the connection of the connector between the multivalve harness and main harness	Reconnect the detached connector.

The switch in the cockpit "always" indicates a minimum petrol level.

ITEMS TO CHECK	CORRECTIVE ACTIONS
The harness is defective. Perform the procedure described by PLUS fault TANK LEVEL SENSOR .	Perform the corrective actions required to correct the fault.
The switch is defective.	Replace the switch

I001_007_006

GAS LEVEL INDICATOR: INCOHERENT (CONTINUED 1)

The petrol level indicator of the multivalve does not indicate the correct level of petrol.

ITEMS TO CHECK	CORRECTIVE ACTIONS
The floating stick is blocked or its mechanism damaged.	Replace the multivalve.

During refueling, gas leaks from the multivalve gasket.

ITEMS TO CHECK	CORRECTIVE ACTIONS
The fixing screws of the multivalve have not been firmly tightened.	Tighten the fixing screws of the multivalve with a 5 mm Allen wrench calibrated at 5 Nm.

Gas leaks from the gas inlet fitting (lower tube Ø 8 mm) during refueling.

ITEMS TO CHECK	CORRECTIVE ACTIONS
The fitting has not been firmly tightened.	Tighten the inlet fitting using a 17 mm dynamometric wrench calibrated at 14 Nm.

Fault Finding – Symptoms Interpretation

I001_007_006

GAS LEVEL INDICATOR: INCOHERENT (CONTINUED 2)

During the first refueling, the multivalve has not stopped the operation when the level of petrol reached 80% of the total capacity of the tank.

ITEMS TO CHECK	CORRECTIVE ACTIONS
The multivalve has been incorrectly installed. Check the orientation of the multivalve on the tank.	Disassemble the multivalve and install it in the correct location

After the first refueling, the fuel level indicator of the multivalve indicates that the tank is empty.

ITEMS TO CHECK	CORRECTIVE ACTIONS
The floating stick is interwoven with the suction pipe. The tank has been filled up to 100% of its capacity.	Disassemble the multivalve and install it in the correct location

When the gas first enters the system, gas leaks out of the gas discharge fitting (Ø 6 mm tube).

ITEMS TO CHECK	CORRECTIVE ACTIONS
The fitting has not been firmly tightened.	Tighten the gas discharge fitting using a 13 mm dynamometric wrench calibrated at 11 Nm

When gas first enters the system, the multivalve does not dispense gas.

ITEMS TO CHECK	CORRECTIVE ACTIONS
The manual faucet has not been opened. Check the conditions of the manual faucet on the multivalve.	Open the manual faucet

1001_007_006

GAS LEVEL INDICATOR: INCOHERENT (CONTINUED 3)

The LED of the switch inside the cockpit does not indicate the "maximum amount of fuel" or switches the vehicle back to petrol after the RED LED has been on for less than "usual".

ITEMS TO CHECK	CORRECTIVE ACTIONS
The fuel level indicator has not been fitted correctly on the multivalve.	Remove the fuel level indicator from the multivalve and insert it in one of the 2 additional holes

The tank has filled up to 100% of its capacity.

ITEMS TO CHECK	CORRECTIVE ACTIONS
Gas impurities have deposited in the device that controls the filling of the tank. Determine if the fault occurs systematically or occasionally.	Disassemble the multivalve and clean the device that controls the filling

I001_007_006

GAS LEVEL INDICATOR: INCOHERENT (CONTINUED 4)

The multivalve does not supply gas.

ITEMS TO CHECK	CORRECTIVE ACTIONS
The manual faucet has not been opened after completing a maintenance operation.	Open the manual faucet
Verify with PLUS Tool that neither GAS PRESSURE SENSOR nor SOLENOID VALVES is present. The solenoid valve of the multivalve does not open the gas path. Perform the checks described for GAS PRESSURE SENSOR .	Perform the corrective action required to correct the fault.
The sealing disc on the mobile core of the solenoid valve is locked.	Disassemble the solenoid valve and replace the sealing disc of the mobile core

The switch inside the cockpit always indicates that the tank is full.

ITEMS TO CHECK	CORRECTIVE ACTIONS
The harness connected to the multivalve is interrupted. Verify that the intermediate connector of the multivalve harness and connector on the level indicator sensor have been correctly inserted.	Install the detached connector on the opposite side.
Perform the checks described for PLUS Fault TANK LEVEL SENSOR .	Perform the corrective action required to correct the fault.

R003_003_004

WATER LEAKS UNDER THE VEHICLE

FAULT FINDING PROCEDURE

Water leaks from the hydraulic circuit

ITEMS TO CHECK	CORRECTIVE ACTIONS
The clamps have not been correctly fitted in place. Visually inspect the damaged component.	Reinstall the clamps.
The regulator heating hoses are damaged. Visually inspect the damaged tube.	Replace the regulator heating hose.

Fault Finding – Symptoms Interpretation

	GAS ECU GLOBAL CHECK
--	-----------------------------

FAULT FINDING PROCEDURE

CAUSE AND ITEMS TO CHECK	CORRECTIVE ACTIONS
The ECU is in "standby" mode. Check the position of the ignition key.	Turn the ignition key to position "ON".
One of the supply cable terminals on the "positive" and "negative" terminals of the battery is disconnected or the fuse on the positive supply cable is damaged. Use a Volt multimeter to measure the supply voltage on the ECU connectors. Measure the voltage between the following pins: A15-A22 Inspect the supply fuse and verify that the cable terminals are correctly connected on the battery terminals.	<ul style="list-style-type: none"> – Reconnect the disconnected terminal – Replace the fuse with a new one with an equivalent value
There is no connection for the "key on" signal. In "key on" mode check the voltage on the pin A5 of gas ECU with a multimeter: +15V expected.	If the voltage is absent: to check the fuse which provide voltage to the white-red wire of the "E" connector.
Use a OHM multimeter to check the continuity of the WHITE-RED wire. Measure the continuity between the following pins: – A5-E4	If the harness is damaged: <ul style="list-style-type: none"> – Re-establish the connection, if possible. – Replace the whole harness, if required

Fault Finding – Symptoms Interpretation

	GAS ECU GLOBAL CHECK (CONTINUED)
--	---

The engine is unable to stabilize the rotation speed and tends to switch off.

ITEMS TO CHECK	CORRECTIVE ACTIONS
If the fault reoccurs after reparation: Check the connection of the gas injectors harness.	Check the pairing of the gas injectors harness

When the engine is running at idle speed, the gas pressure is stable and equivalent to 1.92 bar (the correct gas pressure value should range from 1.23 to 1.35 bar).

ITEMS TO CHECK	CORRECTIVE ACTIONS
The engine loses power because carburetion is too lean. When the engine is running at idle speed, the gas pressure is stable and equivalent to 1.92 bar (the correct gas pressure value should range from 1.23 to 1.35 bar). The regulator compensation hose is disconnected or damaged. Check the connection and integrity of the compensation hose on the regulator and on the suction manifold fitting	– Re-establish the connection and replace the hose, if required