Mégane

N.T. 2805B

XA0 F

Basic Manual: M.R. 312

LPG (Liquefied Petroleum Gas)

77 11 205 803 **AUGUST 1997** **Edition Anglaise**

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

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

Contents

This document covers the XA0 F equipped with the K7M 702 engine which has been converted for use with both petrol and LPG . (These engines have also been equipped with cylinder heads fitted with sintered valve seats.)

This document only covers standard vehicles fitted with LPG and not vehicles fitted with LPG as an aftermarket option.

Vehicles equipped with the LPG option as standard can be identified as they have a special plate. Consult the section on the "vehicle identification plates".

The "bi-fuel" vehicles with petrol injection and a 3-way catalytic converter can be used either with unleaded petrol or LPG.

The liquefied petroleum gas is stored in the tank in liquid form.

The driver changes from one type of fuel to the other by operating a selector switch on the dashboard (red illuminated when running on petrol, green illuminated when running on LPG).

LPG is a mixture of butane and propane.

IMPORTANT: The fuel pump is always operating, even when the vehicle is being driven in LPG mode. This means the vehicle should never be driven when the petrol tank is empty (low fuel level warning light illuminated).

Personnel and workshops authorised to repair LPG vehicles

IMPORTANT: Only those persons who have been specifically trained to work with LPG vehicles are allowed to work on the gas connections through which the liquid gas circulates and which are routed from the filler neck via the tank to the pressure-reducing valves .

Also, only these persons are allowed to service and repair LPG vehicles.

Workshops are only allowed to work on the tank if they have a burner which allows them to perform degassing operations.

If the tank cannot be degassed, it is very important not to touch it and to contact the Renault Technical Department responsible for your country.

DANGER

SAFETY INSTRUCTIONS WHICH MUST ALWAYS BE FOLLOWED WHEN CARRYING OUT ANY WORK ON THE VEHICLE

The operator must not wear either a quartz watch or any clothes containing acrylic which are likely to generate static electricity .

All work must be carried out in a well-ventilated area. The LPG in gas form is heavier than air. Do not work on the system in a location that is below ground level.

Ensure that there are no flames, sparks or lighted cigarettes near where the work is being performed.

The battery must be disconnected when any dismantling work is taking place.

Never attempt to dismantle the fuel tank or any component attached to this without first having purged the tank (risk of explosion).

In the event of a serious gas leak, it is important to isolate the vehicle in an open space away from any buildings.

Help from the safety authorities may be required if the situation cannot be brought under control.

Never attempt to open the pressure-reducing valve to repair it. It cannot be adjusted. If any problems occur, change it.

Do not wash the engine compartment using a pressure-operated system and using detergents. There is a risk that these detergents may cause the pressure-reducing valve diaphragms to deteriorate.

If the vehicle is to pass through a paint booth, it is essential that

- the tank is only filled to three-quarters of its useful volume,
- that the temperature is less than 60°C in the paint booth during drying,
- that the time the vehicle is in the paint booth is less than 20 minutes.

The following units must be purged:

- The fuel tank when the following items are removed:
  - the fuel tank,
  - any component screwed on to the tank.

  (However, it is first necessary to purge the gas contained in the gas circuit.)

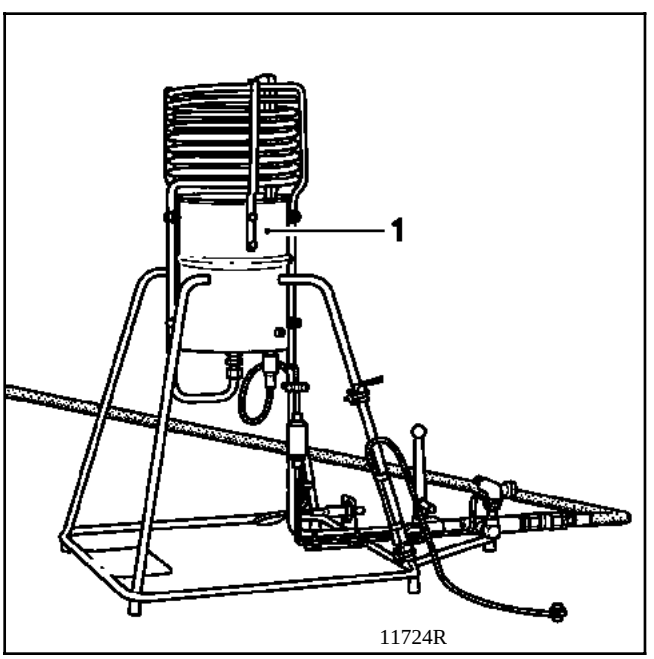
- The gas contained in the gas circuit but not the gas contained in the tank if the following components are removed:
  - the fuel filler neck,
  - the pipes,
  - the filter,
  - the pressure-reducing valve,
  - the stepping motor,
  - the diffuser.

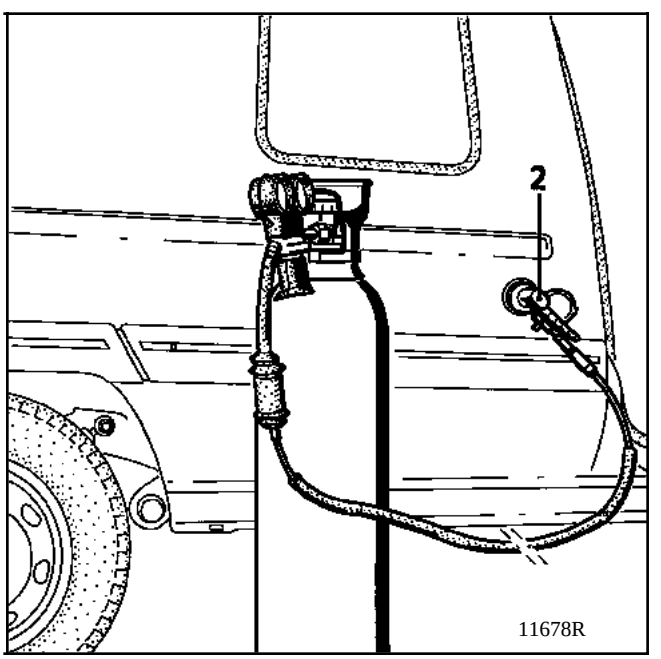
Purging the tank

There are two ways of purging the tank:

- **The engine can be run in LPG mode.**
  If this method is selected, run the engine is LPG mode until it runs out of fuel completely (runs dry). Drive the vehicle on the road to accelerate this procedure.

- **If the engine cannot be operated in LPG mode:**
  In this case, use a burner (1) and a nitrogen filler nozzle (2) (see tooling catalogue for a description of the tool). See the purging method in the section on the fuel tank. If you are unable to purge the tank, it is vital not to touch it. Contact the Renault Technical Department responsible for your country.





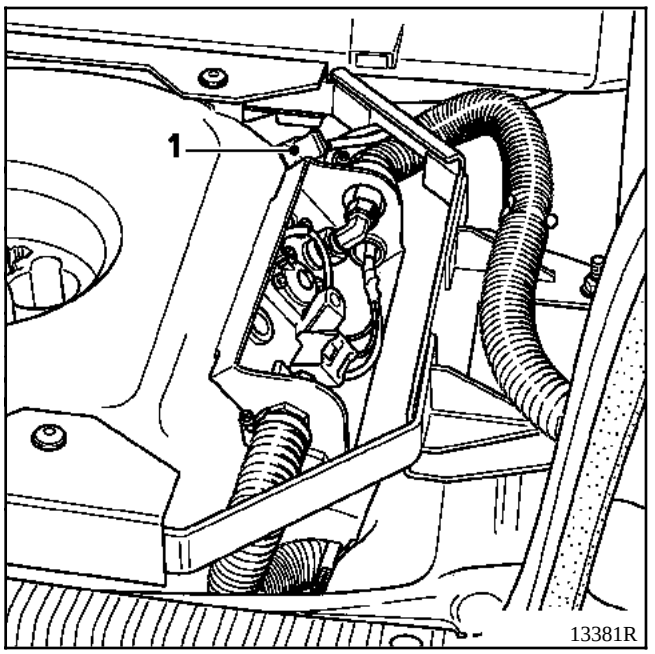
Burner:
For more information, please contact the Renault Technical Department responsible for your country.

Fuel filler nozzle:
For more information, please contact the Renault Technical Department responsible for your country.

Purging the gas contained in the gas circuit, excluding the gas in the tank:

There are two ways of doing this:

- If the vehicle starts up, disconnect the safety solenoid valve connector (1) on the tank. Run the engine in LPG mode until it stalls,

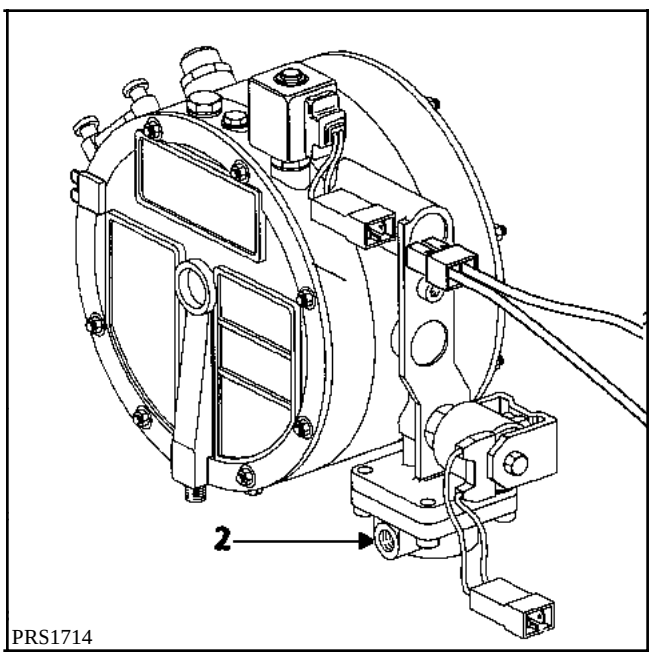


- If the vehicle will not start in LPG mode, move it to a location outside the building. Use a cable to connect it to an earthing point and remove the battery.
  Apply some soapy water or the product distributed by SODICAM, Part
  No. 77 11 143 071 (leak detector) to the high-pressure connection of the pressure-reducing valve (2) to trace any leaks.
  Open the gas connection slightly. When the **circuit is empty**, open the connection completely. (You can then move the vehicle back into the building and carry out work on it.)

(**IMPORTANT:** This operation does not purge the LPG contained in:

- the pipe between the engine and the pressure-reducing valve,
- the pressure-reducing valve,
- the pipe between the fuel filler neck and the tank.

To purge the LPG contained in the pipe between the fuel filler neck and the tank, refer to the section entitled "Pipes").



SAFETY INSTRUCTIONS WHICH MUST BE OBSERVED AFTER CARRYING OUT ANY WORK ON THE VEHICLE

After carrying out any work on the tank pipe connection, once it has been refitted check that it does not leak.

Apply soapy water or the product distributed by SODICAM under Part No. 77 11 143 071 (leak detector) to the open pipe connection(s).

If the tank has been purged, fill it with a few litres of LPG (operation to be carried out with the ignition switched off).

Check that the LPG connections do not leak.

Start up the engine, operate it in LPG mode and check again that there are no leaks.

If you detect a leak, retighten the connection which is the source of the problem. If the fault persists, remake the connection

Fill the fuel tank (80% of the total volume). Start up the engine, operate it in LPG mode and check that there are no leaks.

If the battery has been disconnected or if the stepping motor, pressure-reducing valve, diffuser or computer have been changed, the computer must be recalibrated. See the section on "recalibrating the computer".

Check that all the electrical connections in the LPG kit on which you were working are correctly connected.

After reassembly, check that all the rubber and steel LPG pipes with sleeves do not make contact with any unit which is likely to cause wear and, as a result, cause a gas leak. (Use the pins to separate the pipes from each other.)

ROAD TEST (in "petrol" mode then in LPG mode)

Check that the engine speed increases normally.

When braking suddenly and until the vehicle comes to a halt, check that the engine will not stall and that it maintains a stable idling speed.

Travelling at a steady speed of 35 mph (60 km / h), select 4th gear. When accelerating fully, check that the speed of the vehicle increases steadily.

IMPORTANT: Operating in LPG mode disrupts the operation of the injection computer because it detects an oxygen sensor fault. However, this does not mean it is faulty. To check that it is operating correctly, clear the computer memories, carry out a"petrol" road test and then check if the computer has detected a fault.

This vehicle has a cylinder head with sintered valve seats as this will give a better service life with LPG operation .

If you have to change the cylinder head, make sure that it is suitable for operation with LPG.

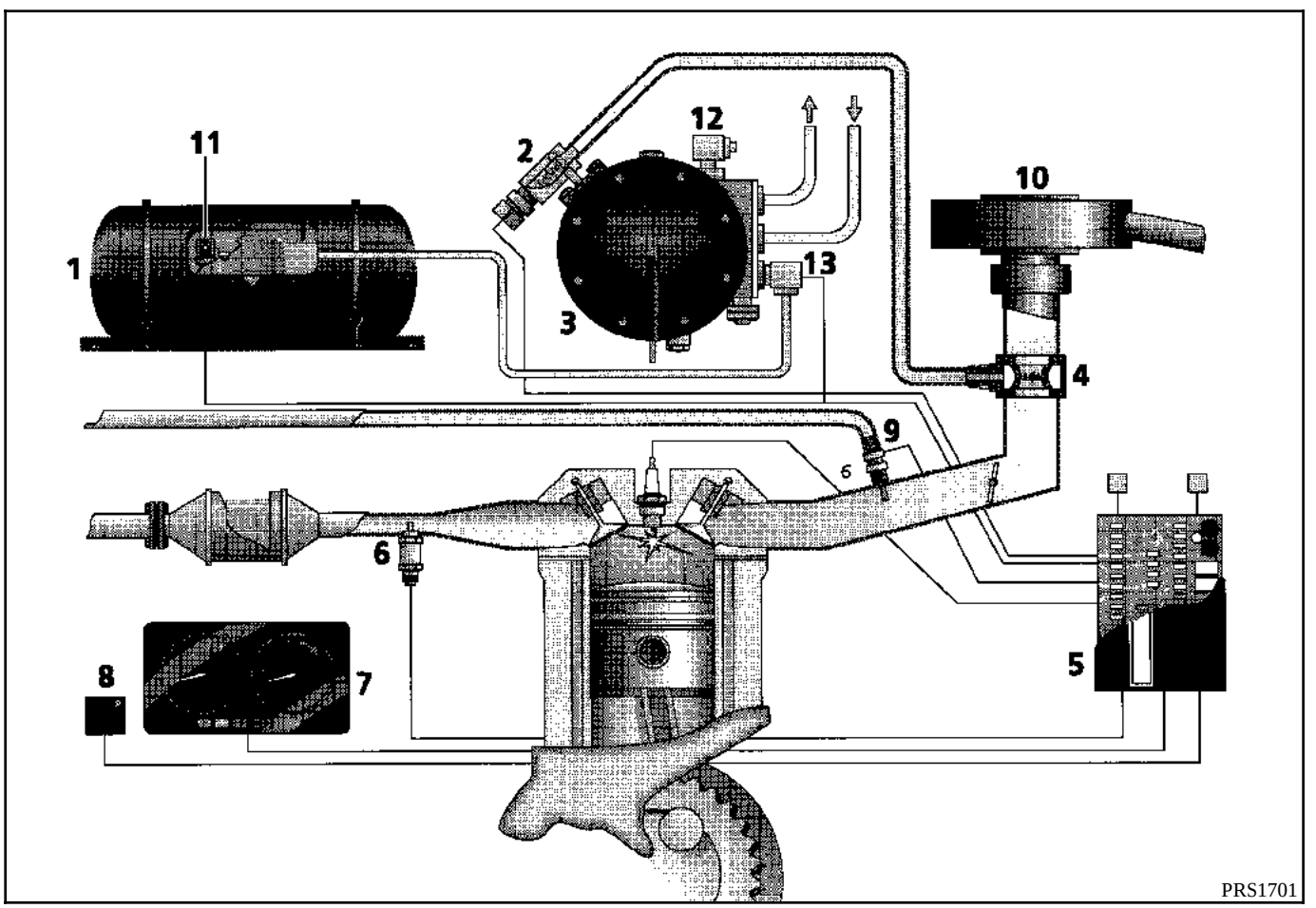
Cylinder heads that are suitable for operation with LPG are marked with a stripe painted in green on the side.

The LPG fuel system is regulated by the oxygen sensor and adapts the ratio of LPG to air in order to provide the optimum mix for the catalytic converter. The mixture is defined in terms of richness. The best possible richness ratio is 1. This is the level which gives the best possible conversion of CO, HC and NOx and at which the engine operates efficiently in terms of the relationship between performance and fuel consumption.

The aim is to obtain the ideal mix for as much of the time as possible. This is achieved via a regulation circuit consisting of an oxygen sensor, an LPG computer and a stepping motor. The regulation circuit corrects the imperfections in the pressure-reducing valve / diffuser system.

When the control circuit is operating, this is called a **closed loop** system.

When the control circuit is not operating, this is called an **open loop** system.



1 Tank
2 Stepping motor
3 Pressure-reducing valve
4 Diffuser
5 Computer
6 Oxygen sensor
7 Instrument panel
8 Selector switch
9 Fuel injector
10 Air filter
11 Safety solenoid valve
12 Idle solenoid valve
13 Main running solenoid valve

OPERATING PRINCIPLE OF THE SYSTEM

After the liquefied petroleum gas from the tank has vaporised in the pressure-reducing valve, it is injected into the engine via a diffuser upstream of the throttle valve

The amount of LPG drawn in depends on the pressure at the diffuser: the lower the pressure, the greater the amount of gas that is injected. Combustion is controlled by measuring the composition of the exhaust gas (oxygen sensor). A stepping motor adjusts the metering.

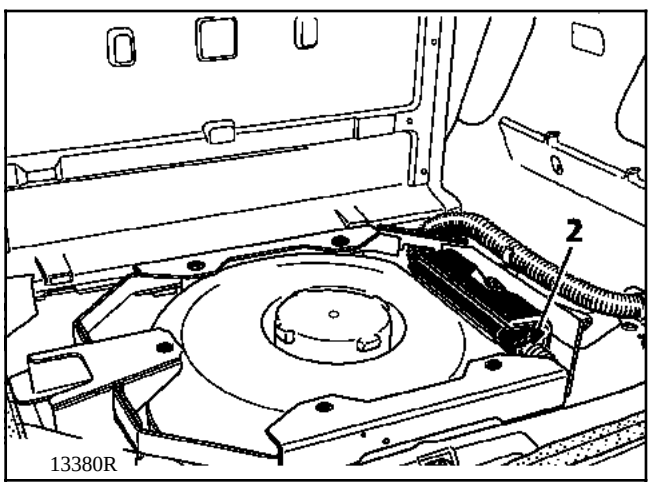
PLEASE READ THE "SAFETY INSTRUCTIONS" BEFORE STARTING ANY WORK

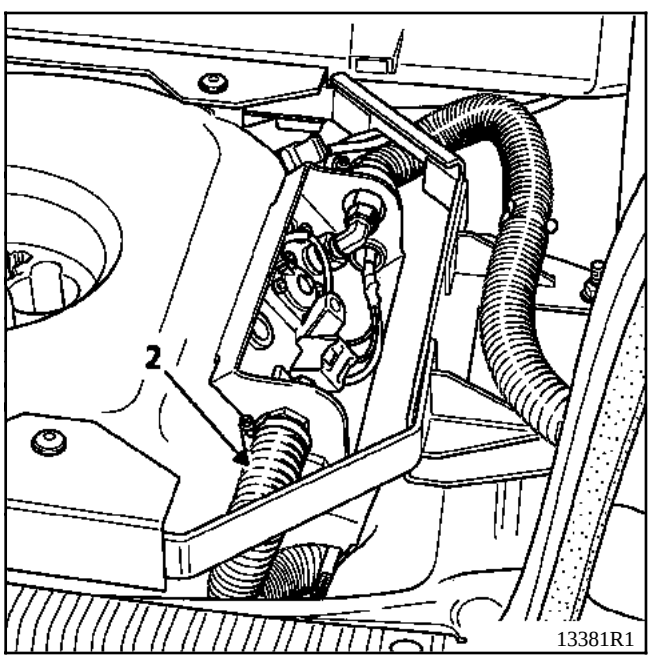
Pipes for fuel tank/pressure-reducing valve

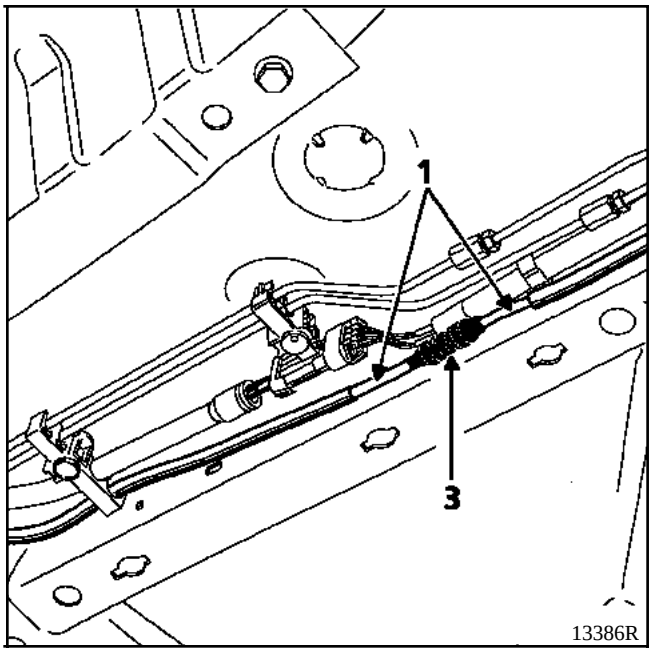
The pipe (1) is copper and sheathed in plastic. It is fitted with sealed hose nozzle connections on the tank side and sealed flanged connections on the side of the pressure-reducing valve. If you have to work on these connections, there is no need to purge the tank. However, the circuit does have to be purged.

There is no need to apply a sealing product (teflon) to the threads of the nuts when refitting these pipes.

The section of pipe that passes through the passenger compartment is encased in a sealed plastic sleeve (2) which comes out under the vehicle







If you have established that there is a leak and retightening the connection has not rectified the problem, you will have to remake it. The sheathed copper pipe is sold by the meter.

To tighten these connections, pretighten the connection (until contact is made) and then turn it a quarter of a turn.

To remake these connections, use a tool with a flange (This type of tool is supplied by automotive tool distributors.)

AFTER CARRYING OUT ANY WORK ON THE SYSTEM, CHECK TO MAKE SURE THERE ARE NO LEAKS, FOLLOWING THE INSTRUCTIONS GIVEN IN THE "SAFETY INSTRUCTIONS".

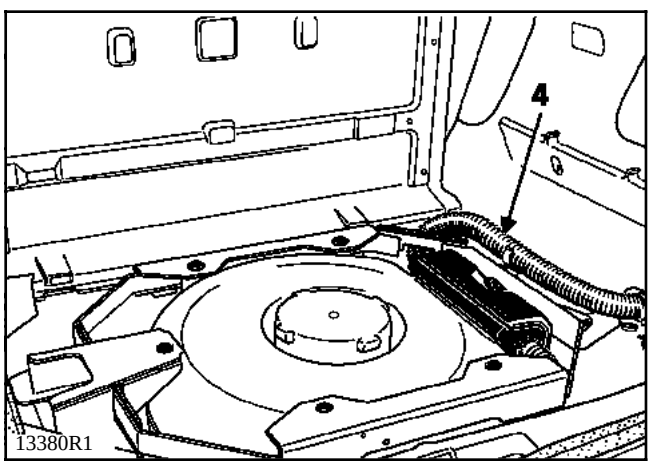
NOTE :
There are two connections underneath the vehicle (3) (one at the front and one at the rear). These make it easier to dismantle the pipe supplying LPG to the pressure-reducing valve.

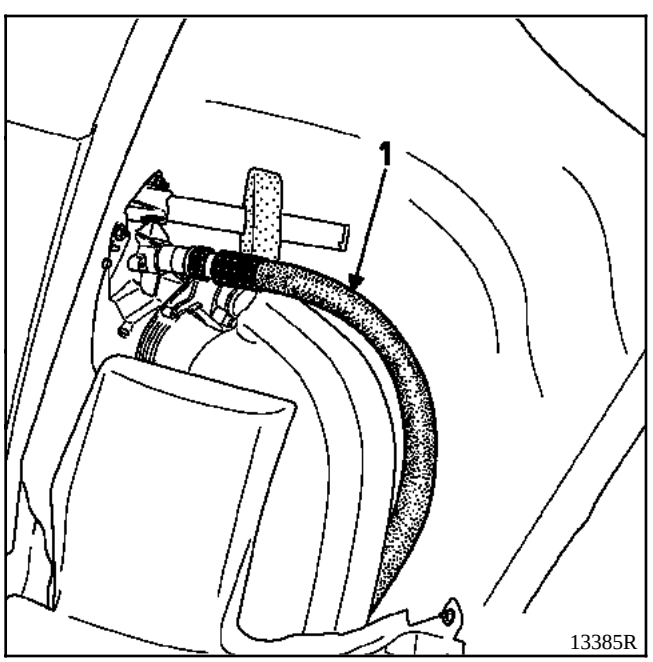
After undertaking any dismantling work, check to make sure that there are no leaks at the connections.

Pipes (1) at fuel filler neck/fuel tank

This flexible pipe is made of braided steel and is covered with a sleeve of microporous rubber. **It has to be changed every 5 years**. The date of manufacture is written on the steel part of the pipe behind the nut. When fitting, ensure that the date can be read without having to dismantle this.

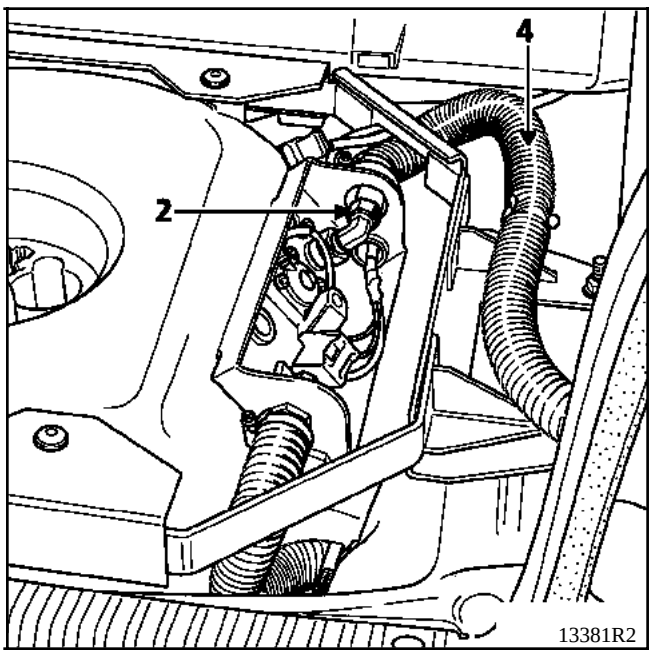
The section of pipe that passes through the passenger compartment is encased in a sealed plastic sleeve (4) which comes out under the vehicle

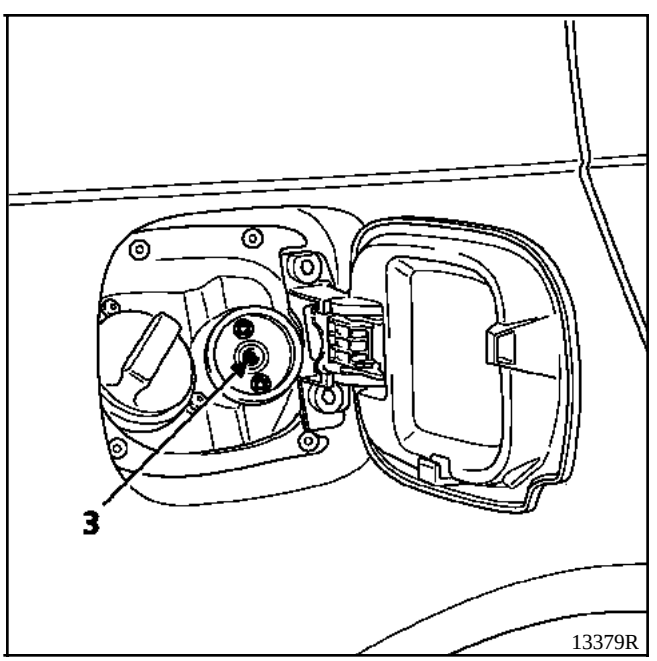




Before working on this pipe, the gas inside has to be purged. To do this, create a slight leak by opening the connection (2) at the tank inlet or use a screwdriver to apply pressure to the ball bearing (3) in the non-return valve on the filler neck.

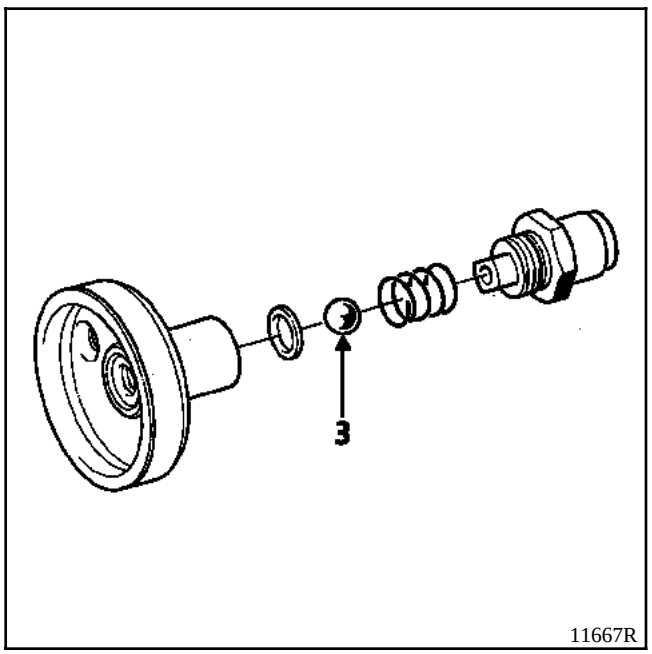
This ball bearing can be accessed from the vehicle exterior. (Use gloves and protective goggles.) The tank does not need to be purged.





Before refitting the pipe, blow through it with compressed air to remove any impurities.

AFTER CARRYING OUT ANY WORK ON THE SYSTEM, CHECK TO MAKE SURE THERE ARE NO LEAKS, FOLLOWING THE INSTRUCTIONS GIVEN IN THE "SAFETY INSTRUCTIONS".



This is fitted behind the fuel filler flap next to the opening used to fill the vehicle with petrol.

PLEASE READ THE "SAFETY INSTRUCTIONS" BEFORE STARTING ANY WORK.

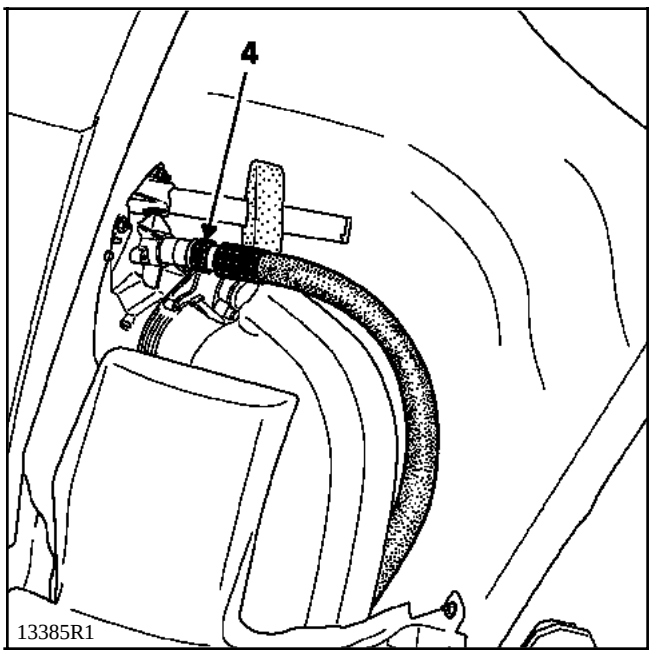
REMOVING

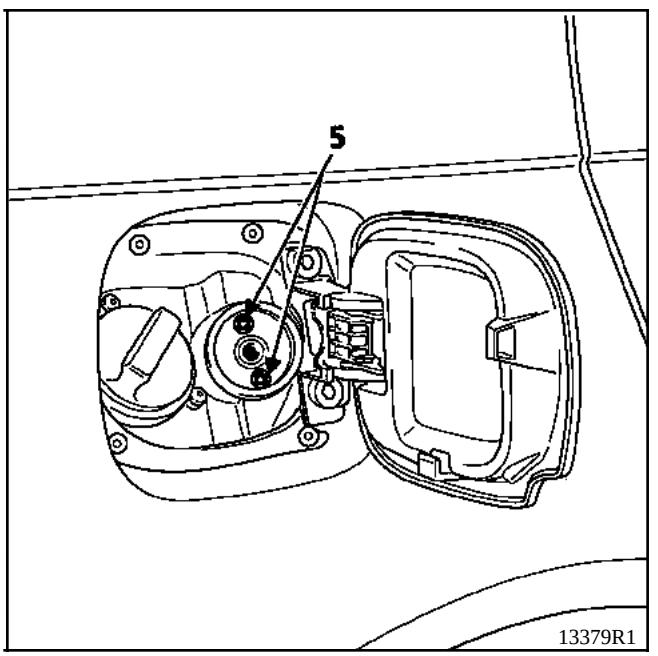
Disconnect the battery.

Unscrew:
- the connection (4) behind the fuel filler neck in the wheel arch,

- the two mounting bolts (5) for the fuel filler neck.

Take out the fuel filler neck.



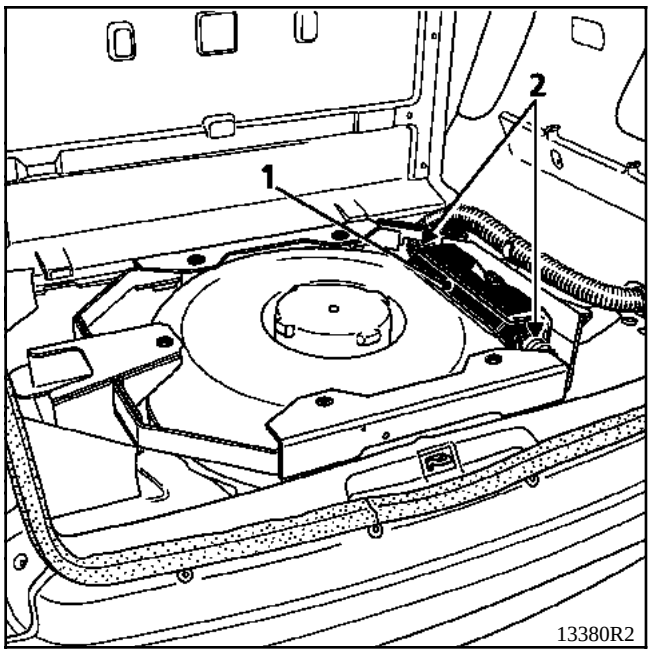


REFITTING

Fit in reverse order to removal.

AFTER CARRYING OUT ANY WORK ON THE SYSTEM, CHECK TO MAKE SURE THERE ARE NO LEAKS, FOLLOWING THE INSTRUCTIONS GIVEN IN THE "SAFETY INSTRUCTIONS".

The tank is at the rear of the vehicle in the compartment for the emergency spare wheel.



This tank is used to store LPG in liquefied form. (LPG is a mixture of butane and propane.) Its maximum permissible pressure during storage is "**20 bar**". (On average, the pressure in summer is "**8 bar**"and the pressure in winter is **3 bars**.)

It has capacity for 52 litres but only 42 litres of this capacity can be used.

It must:
- not be filled in excess of 80% of its total capacity,
- be securely fastened to the floor.

The accessories assembly (1) must be sealed and connected to the exterior via the pipes (2).

The tank must be tested every eight years by the appropriate authorities to make sure it is able to withstand the required pressure. If the tank is more than five years old at the time of resale, the tank must be retested.

The date of the test is engraved on the tank between the two punches which look like mirrored Ws.

The filler pipe between the fuel filler neck and the tank must be changed every five years. The date of manufacture is indicated on the steel part of the pipe

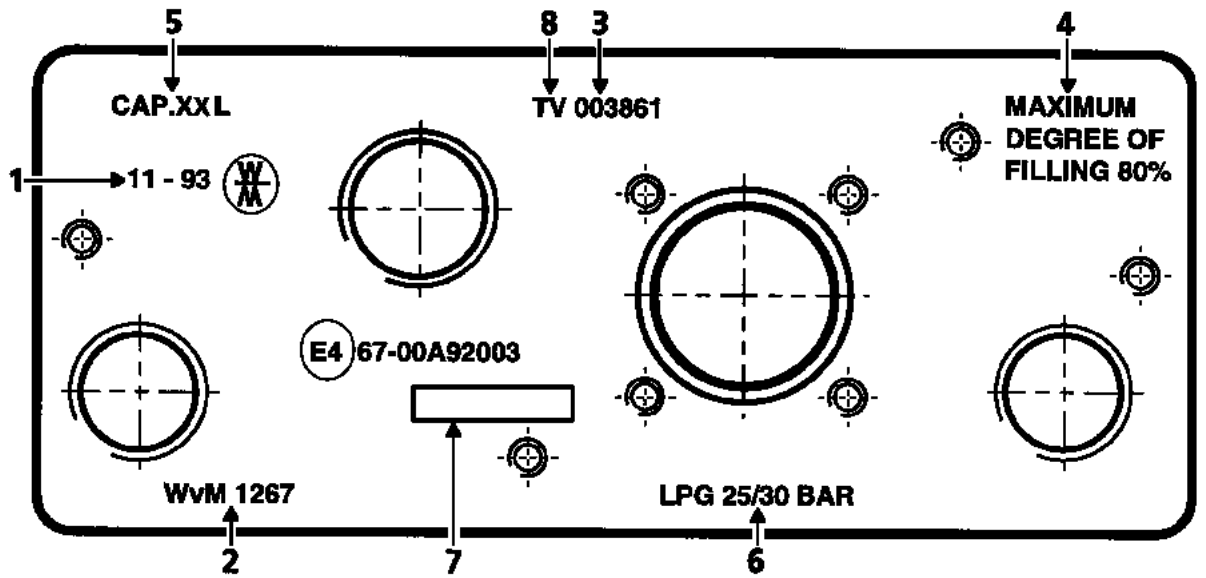
The tank must be purged before any work is carried out on it.

The accessories on the tank must be fitted in their correct positions.

Great care must be taken to ensure that the accessories are fitted in the correct order: always start by fitting the sender unit and then, as desired, the filler valve, the overpressure safety valve (if the tank is fitted with one) and the tank outlet connection with restrictor.

The filler valve can only be removed when the accessories group is positioned horizontally at the top of the tank.

A few special points must be taken into account when using teflon. The threads must be clean and the tape must be wound in the direction of tightening. (Wind teflon round four times.) It is impossible to slacken off a connection, even partially, without causing a leak. If a connection has to be slackened off slightly to position a component correctly, remove the component and commence the procedure right from the start.



PRS1702

1 Date of tests engraved between the "mirrored Ws" symbol.

2 Supplier code

3 Serial number

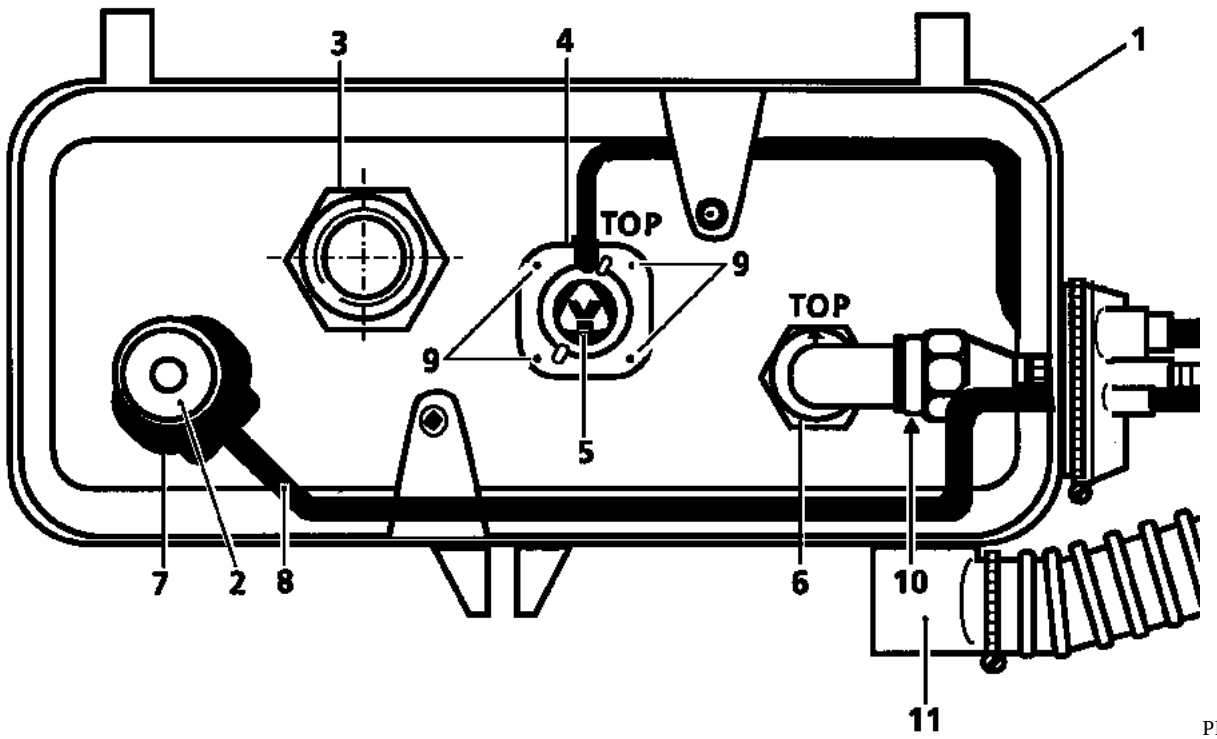
4 Only fill up to 80% of total capacity

5 Total capacity of the tank in litres

6 Calculated pressure and test pressure

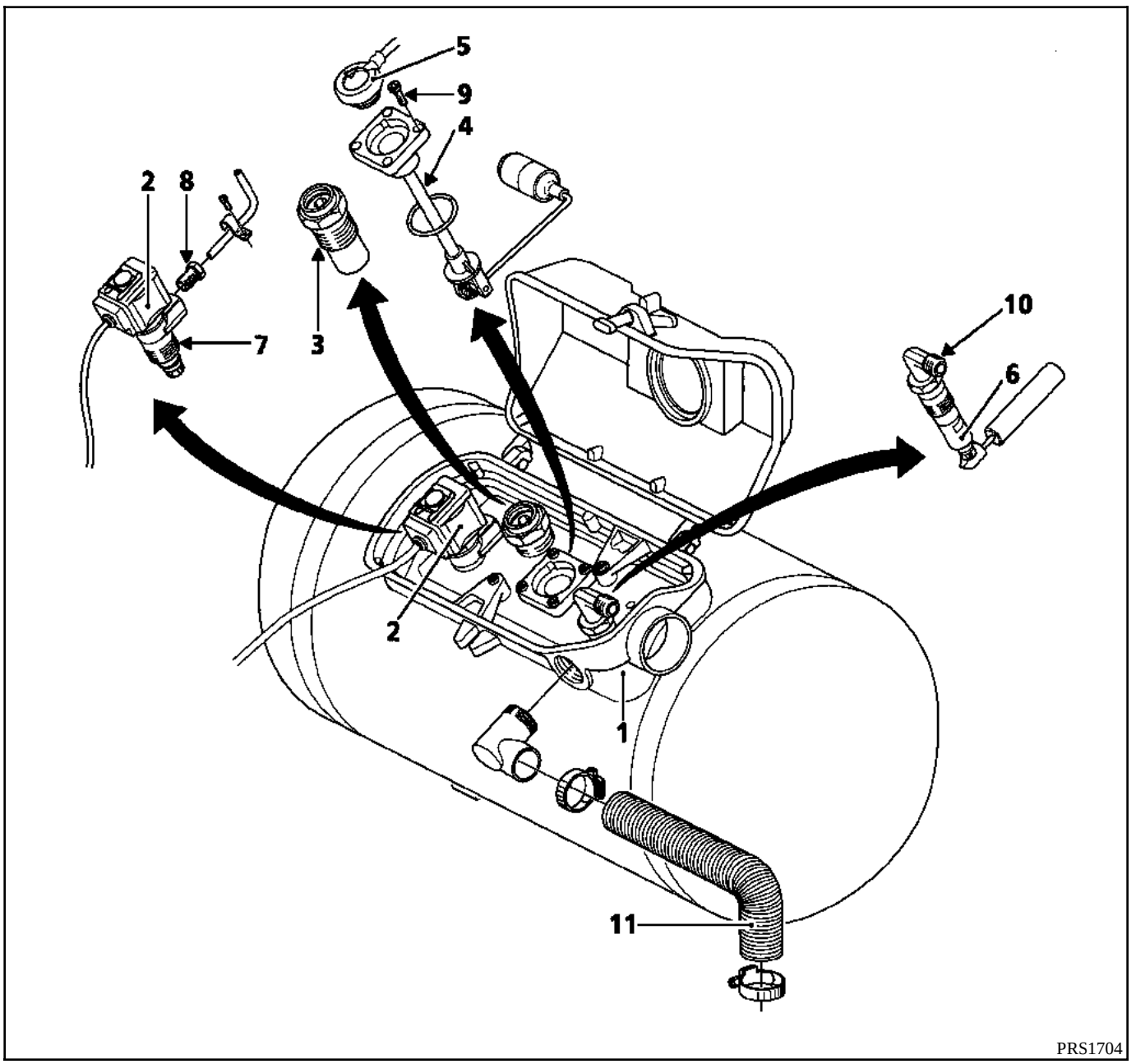
7 French homologation mark "VL TP GPL 6008"

8 Code letter (this indicates the capacity and diameter for the manufacturer)



PRS1703

1 Accessories assembly
2 Safety valve
3 Overpressure valve
4 Sender unit
5 Sender unit potentiometer
6 Filler valve
7 Tank outlet connection with restrictor
8 Tank outlet pipe
9 Securing bolts for fuel sender unit
10 Tank filling pipe
11 Vent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PRS1704

PURGING THE TANK

PLEASE READ THE "SAFETY INSTRUCTIONS" BEFORE STARTING ANY WORK.

The tank must be purged before working on a component mounted on the tank or before removing it.

This task can be performed in one of two ways:

- If the engine can still run on LPG, run the engine until it stalls (until it runs out of fuel. (This will take less time if the vehicle is driven.)

- If the engine will not operate in LPG mode, use a burner and a fuel filler nozzle. (This tool is described in the equipment catalogue.) (The burner is manufactured by MUGNIER 73410 ALBENS.)

To purge the tank using a burner :

Disconnect the battery.

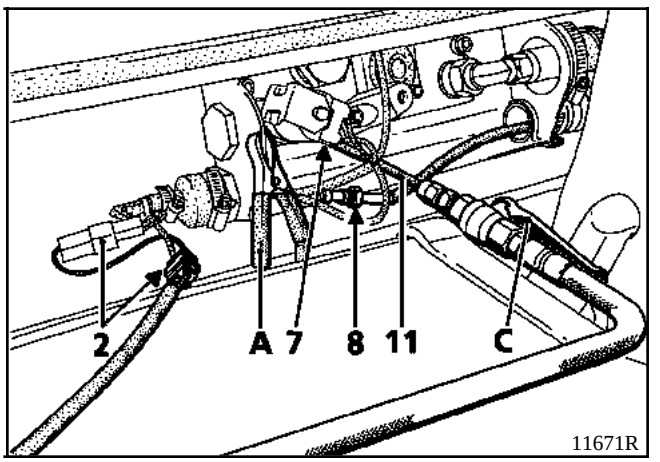
Park the vehicle in the open air.

Ensure that there is a connection between the vehicle and a ground (example shown in A).

With the vehicle outside and the ignition off, open the connection (8) connected to the tank outlet connection with the restrictor on the vehicle (thus purging gas contained in the pipes), switch on the burner ensuring that it is at least 20 metres away from any object which could catch fire (buildings, fuel, combustible materials, etc.).

Ensure that there is a connection between the burner and a ground (10).

Connect the LPG pipe (11) to the burner (supplied with 10 metres of piping) and the tank outlet connection with restrictor (7), having first checked that the sealing connections are compatible (hose nozzle connections).



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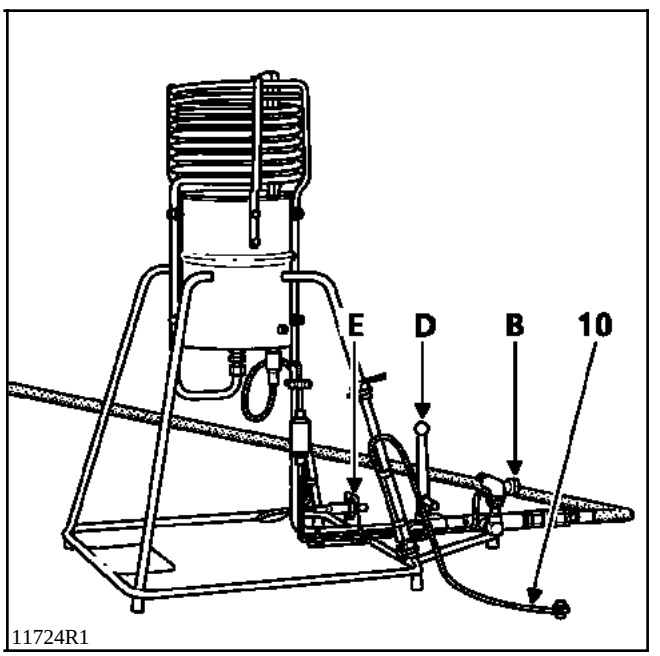

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Check that the gas valves on the burner are closed (at B, C and D).

Disconnect the solenoid valve (2) and then connect the red wire from its connector to +12 volts and the black wire to earth. (Make a tool locally with a 3-way connector and four metres of wire.)

Check that the gas connections between the tank and the burner do not leak.

Purge the air contained in the burner by opening valves (D) and (C). (This also helps to freeze the coiled part of the burner slightly.)

Close the valve (D).

Light the pilot light on the burner by using the piezo igniter (E) and first opening the gas pipe (B) specifically for the pilot light. This cannot light up at once. Enough time must be allowed for the gas to flow through the pipe.

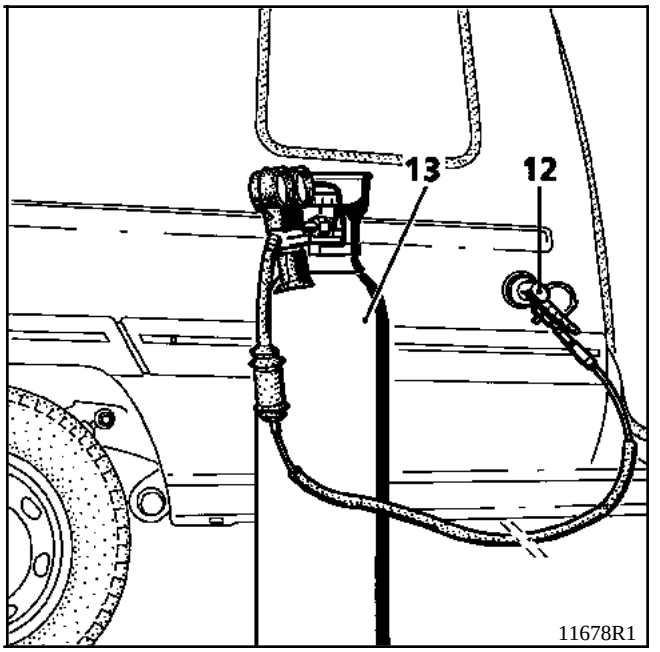
Open the main gas pipe on the burner (C and D). The flame may reach 3 to 4 metres over a period of 30 minutes.

If the flow is excessive, the tank outlet connection with the restrictor will be used. To avoid the need for this and to ensure the tank is purged correctly, adjust the flow of gas by adjusting the lever (D) (if, for example, you do not manage to obtain an adequate main flame).

When the flame dies down, the filler nozzle which connects to the filler neck has to be used. (Described in the equipment catalogue.)

The nozzle (12) is connected to a bottle of nitrogen (13) which has a regulator set to between 5 to 8 bars.

Connect the pistol to the filler neck.



After a few seconds, the flame should burn more vigorously again.

When the flame extinguishes, try to light the burner again using the piezo igniter (E).

From the time when it becomes impossible to light the burner again, allow the nitrogen to flow from the bottle into the tank for another 5 minutes. The main gas pipe on the burner should always remain open.

After 5 minutes, close the nitrogen bottle and disconnect the nozzle from the filler neck.

Allow the mixture of LPG and nitrogen in the tank to escape via the burner.

A whistling noise should be heard as the gas escapes from the burner.

When no more gas escapes, disconnect the earth and the the 12 volts connected to the safety valve (2).

On the tank disconnect the gas connection attached to the burner.

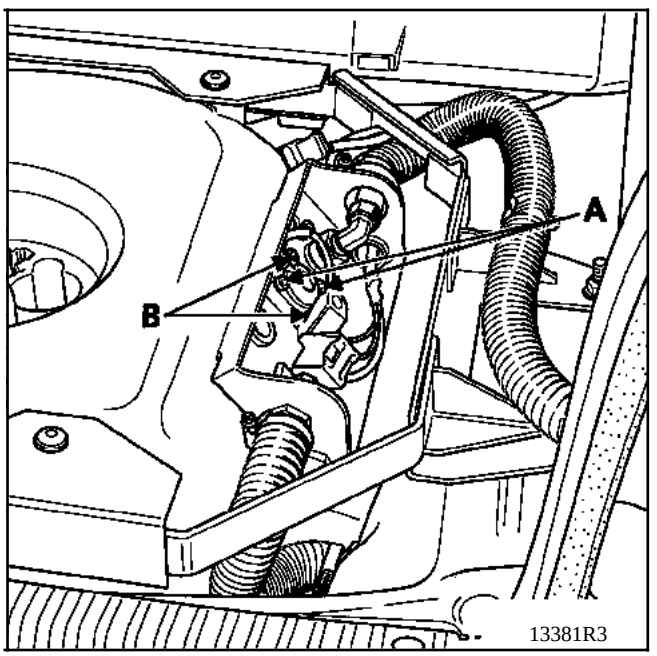
If the LPG gauge or the filler valve is removed:

- Remove the potentiometer (C) from the fuel gauge.

- Release the residual pressure in the tank. Remove the two screws (A) holding the sender unit plunger in position. Replace them by two longer screws. Once they have been fitted, remove the other two screws (B),

- Lift out the sender unit carefully.

When the pressure has been released, remove the two long screws and then the sender unit plunger. Leave the vehicle outside for a few minutes with the door open before taking it back into the workshop.



IMPORTANT : If you are unable to purge the tank, you MUST NOT remove the accessories fitted to it. You must contact the Renault Technical Department responsible for your country.

TIGHTENING TORQUES (in daN.m)	
Frame/ tank bolt	**4.4**
Frame/vehicle nut	**4.4**

REMOVING

PLEASE READ THE "SAFETY INSTRUCTIONS" BEFORE STARTING ANY WORK.

Purge the fuel tank (see the section on "**Purging the tank**") and the fuel tank filler neck pipe. (See section on "**Pipes**".)

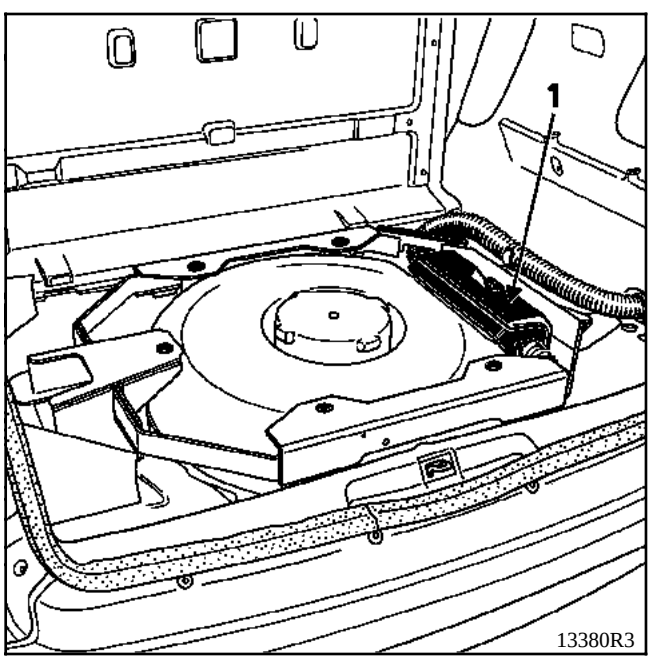
Disconnect the battery.

Move the rear seats as far forward as they will go.

Lift the false floor in the luggage compartment.

Remove the cover (1) from the accessories assembly.

Disconnect:
- the 3-way connector (2),

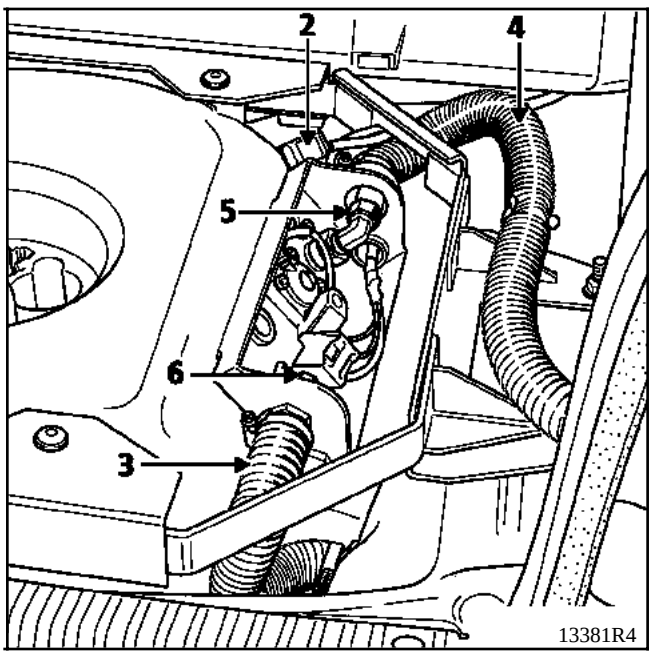


- the two venting pipes (3 and 4),
- the filler connection (5),
- the tank gas outlet connection (6).

Extract these two connections from the accessories assembly.

Take off the four nuts securing the tank to the vehicle.

Remove the tank .



REFITTING

Carry out the refitting operations in reverse order to removal.

Make sure the plastic and metal clamps are in the correct position.

AFTER CARRYING OUT ANY WORK ON THE SYSTEM, CHECK TO MAKE SURE THERE ARE NO LEAKS, FOLLOWING THE INSTRUCTIONS GIVEN IN THE "SAFETY INSTRUCTIONS".

PLEASE READ THE "SAFETY INSTRUCTIONS" BEFORE STARTING ANY WORK.

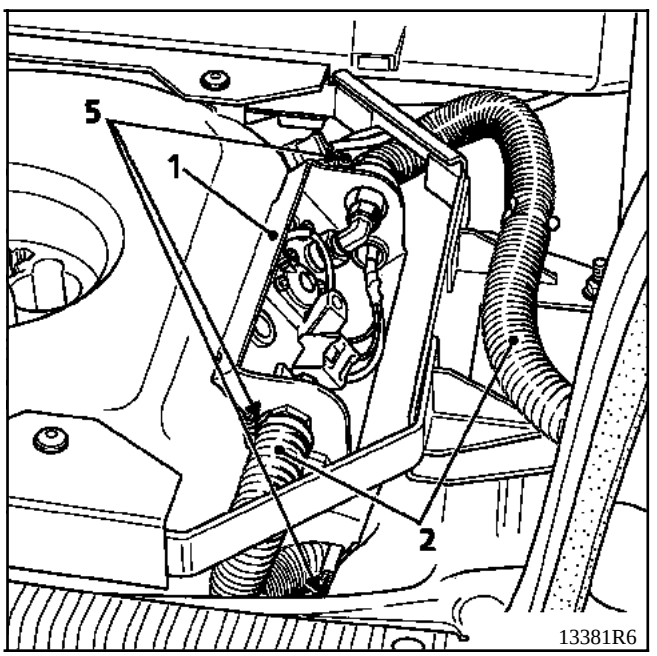
The accessories assembly (1) consists of an aluminium bracket and a cover. This unit must be sealed. It isolates the vehicle from any gas leak which may occur in the components screwed to the tank.

If a leak occurs, the gas escapes under the vehicle via the plastic pipes (2) through which the gas pipe linking the tank to the pressure-reducing valve passes.

The four bolts securing the accessories assembly to the tank have a tightening torque of **1 daN.m**.

When replacing the cover, check that:

- the rubber seal is not marked,
- the bellows and clamps (5) are fitted in position properly.



AFTER CARRYING OUT ANY WORK ON THE SYSTEM, CHECK TO MAKE SURE THERE ARE NO LEAKS, FOLLOWING THE INSTRUCTIONS GIVEN IN THE "SAFETY INSTRUCTIONS".

PURPOSE

This tells the driver how much LPG is left in the tank and the reading is displayed on the gauge on the instrument panel.

When the vehicle is operating in petrol mode, the gauge shows the level for the petrol tank.

When the vehicle is operating in LPG mode, the gauge shows the level for the LPG tank.

The wire running from the petrol sender unit to the instrument panel has been diverted and runs into the LPG computer.

The wire running from the LPG sender unit is also routed to the LPG computer. This acts in the same way as a relay:

- in petrol mode, it transmits information from the petrol sender unit to the instrument panel,

- in LPG mode, it transmits information from the LPG sender unit.

DESCRIPTION

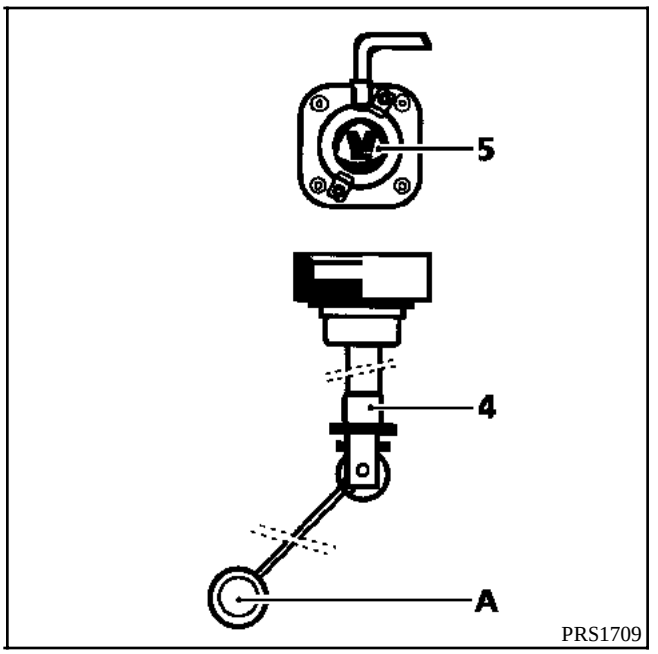
This consists of:

- a plunger (4) connected to a float (A). This part is submerged in the tank. (Its position is marked by the word "Top".)

- A potentiometer (5) attached to the plunger. Its resistance ranges from 0 to 700 Ω. (Simply unscrew the two mounting screws to remove the potentiometer.)

OPERATION

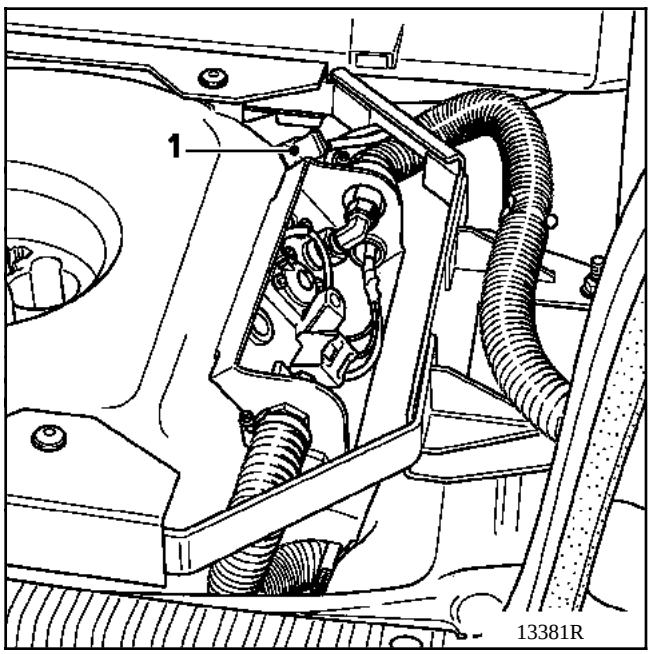
A rotating shaft is in the centre of the plunger. It is linked, on the one side, to a link which transforms the transverse movement of the float into an axial movement and, on the other, a magnet mounted in an eccentric position in relation to the shaft. The movement of the float turns the shaft, which makes the magnet move in a circle on the upper part of the external sender unit on the tank. The potentiometer, the magnet of which causes the sliding contact to move, is mounted on this part.



REMOVING (the potentiometer)

Disconnect the battery.

Disconnect the 3-way connector (1).



Using the 1.20 mm setting pin, (see NT8074) remove the connector terminals (1). (Mark the position of each.)

Cut the earth wires of the potentiometer and the solenoid in line with their common terminal.

Extract the wires from the bellows, using soap to make them easier to pull out. (Secure a guide to the wires that have to be extracted to make the refitting operation easier.)

Remove the two potentiometer mountings and then take them out.

REFITTING

Fit the potentiometer.

Guide the wires back into the bellows using the guide fitted earlier.

Crimp the terminals and then insert them in the connector. (Make sure they are in the right position.)

Reconnect the connector.

Fit the clamps.

Reconnect the battery.

REMOVING (the plunger (4))

PLEASE READ THE "SAFETY INSTRUCTIONS" BEFORE STARTING ANY WORK.

The tank must be purged (see section on the tank).

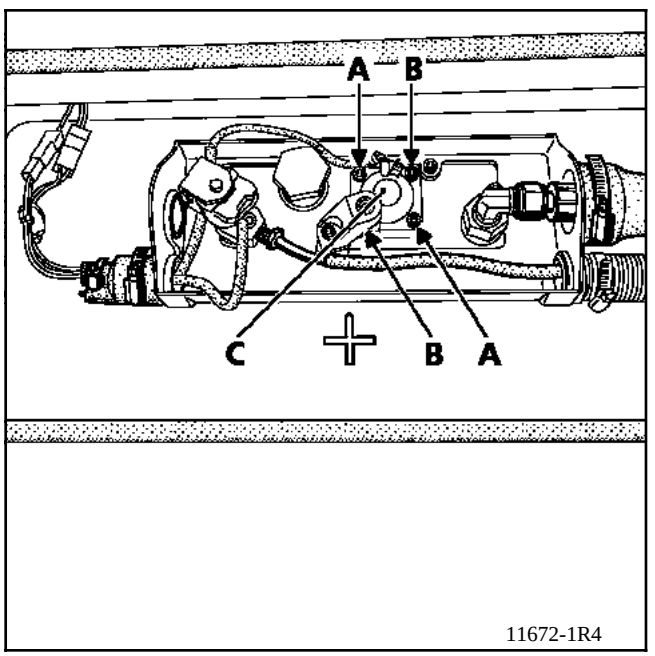
Unscrew:
- the two screws securing the potentiometer (C),
- the two screws (B) securing the plunger.

Fit two longer screws (safety screws) in place of the two screws removed and then tighten them.

Remove the two screws (A) securing the plunger.

Lift up the sender unit carefully.

Once the residual pressure in the tank has been released, remove the two safety screws and extract the plunger and float.



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REFITTING

Change the rubber seal.

Refit the plunger so that the inscription "Top" is on the top. (See diagram in the section on the tank.)

Tighten the bolt to a torque of **1 daN.m**.

Fit the potentiometer in position. (It is fitted with a location notch.) Then reconnect it.

When connecting the connector, check that the colour of the wires on each side match. There is a risk that the connector may be interchanged.

AFTER CARRYING OUT ANY WORK ON THE SYSTEM, READ THE "SAFETY INSTRUCTIONS" TO MAKE SURE THAT THERE IS NO LEAK.

FILLING VALVE (6)

PLEASE READ THE "SAFETY INSTRUCTIONS" BEFORE STARTING ANY WORK.

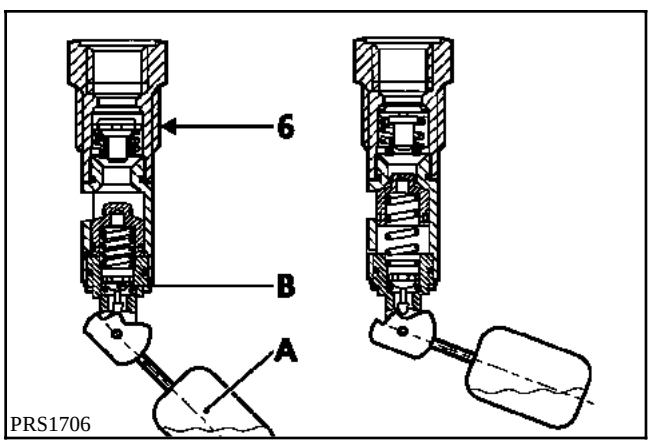
PURPOSE

This is the valve through which the LPG passes to enter the tank. At the end there is a float (A) connected to a valve (B).

When the tank is filled to 80% of its capacity, the float acts on the valve to prevent the tank being filled further.

The amount of liquid LPG must not exceed 80% of the capacity of the tank for safety reasons. If the temperature increases, the liquid LPG can then expand, compressing the vapour in the rest of the tank. To ensure that the tank is not filled to a level greater than 80%, two criteria must be satisfied:

- the position of the tank,
- the position of the safety valve. It is in the correct position when the word "top" is on the top of the valve.



PRS1706

REMOVING

The following operations must be carried out before removing the filling valve:
- Purge the tank. (See the section on the tank.)
- Remove the sender unit. (See the section on the sender unit.)
- Separate the tank from its support. Rotate it on itself so that the so that the accessories assembly is positioned horizontally on the tank.

These operations must be carried out in the order stated to prevent any damage being caused.

Remove:
- The fuel filling pipe on the tank.
- The filling valve. (The elbow fitting on the valve can be separated.)

REFITTING

Teflon must be applied to the screw threads (4 turns in the direction of tightening).

IMPORTANT: It is impossible to unscrew a connection or a component without creating a leak. Once the unscrewing operation has started, it cannot be reversed. If this is the case, the connection or component must be unscrewed completely and fresh teflon applied.

Tighten the elbow fitting on the valve to **5 daN.m** and then continue to tighten it so that it is at an angle of 90 degrees in relation to "top".

Tighten the filling valve to a torque of **10 daN.m** and then continue so that the position of "top" is pointing upwards.

Refit the filling pipe, making sure that the date engraved on the steel section of the pipe is visible without having to dismantle it.

AFTER CARRYING OUT ANY WORK ON THE SYSTEM, CHECK TO MAKE SURE THERE ARE NO LEAKS, FOLLOWING THE INSTRUCTIONS GIVEN IN THE "SAFETY INSTRUCTIONS".

SAFETY SOLENOID (2)

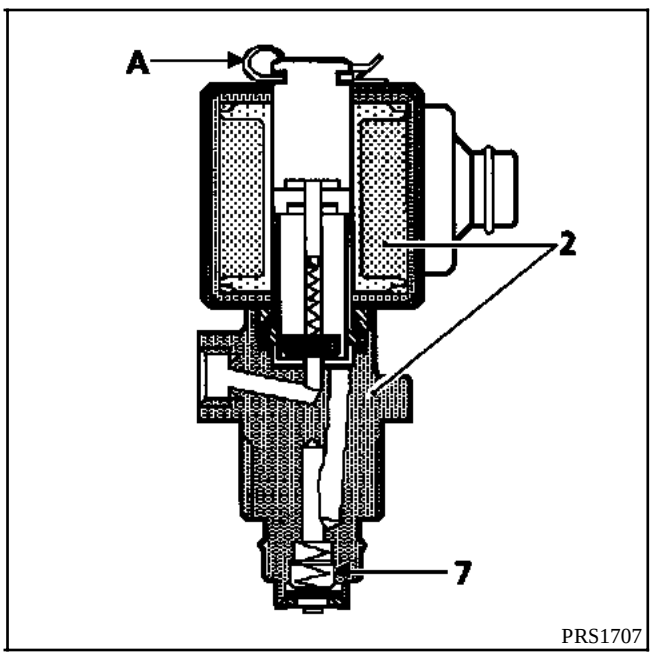
This is mounted on the tank outlet connection with the restrictor (7) and is controlled by the LPG computer at a voltage of 12 volts.

The resistance is 12.5 Ω.

When the solenoid is not controlled, the LPG is isolated in the tank.

The solenoid is controlled when the starter is activated and when the engine is operating in LPG mode.

The solenoid coil may be removed (without having to drain the tank) by taking off the upper screw or clip (A) that holds it in position.

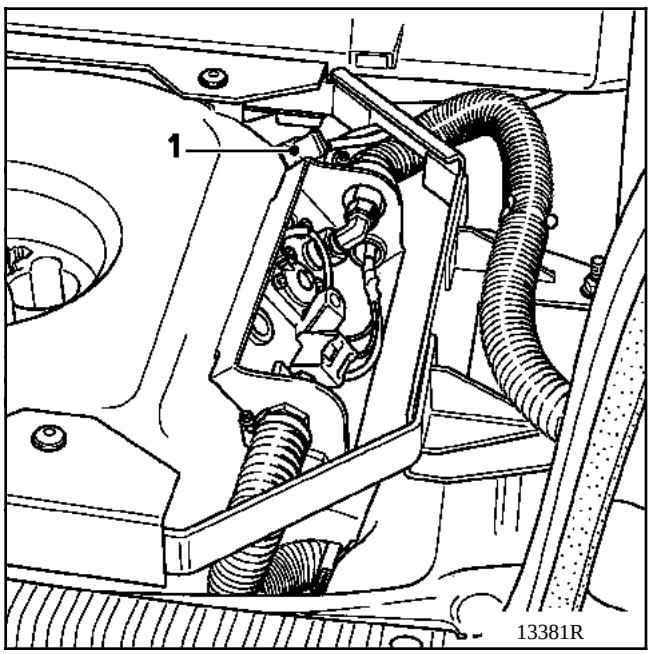


When reconnecting the connector, check that the colours of the wires on each side match. It is possible to interchange the connector.

REMOVING (the coil)

Disconnect:
- the battery,

- the 3-way connector (1).



Using the 1.20 mm setting pin, (see NT8074) remove the connector terminals (1). (Mark the position of each.)

Cut the earth wires of the potentiometer and the solenoid in line with their common terminal.

Extract the wires from the bellows, using soap to make them easier to pull out. (Secure a guide to the wires that have to be extracted to make the refitting operation easier.)

Remove the coil on the safety solenoid.

REFITTING

Fit the coil for the safety solenoid.

Guide the wires back into the bellows using the guide fitted earlier.

Crimp the terminals and then insert them in the connector. (Make sure they are in the right position.)

Reconnect the connector.

Fit the clamps.

Reconnect the battery.

TANK OUTLET CONNECTION WITH RESTRICTOR (7)

PURPOSE

Its purpose is to limit the flow of gas. If a pipe breaks, the LPG will only escape from the tank very slowly, thus limiting the risk of it being ignited or an explosion occurring.

REMOVING

PLEASE READ THE "SAFETY INSTRUCTIONS" BEFORE STARTING ANY WORK.

The tank must be purged. (See the section on the **tank**.)

If the tank is being purged by driving the vehicle, it is essential to remove the LPG sender unit in accordance with the instructions given in the section on the fuel sender unit. This is so that any residual pressure in the tank is released.

Note: There is no need to remove the LPG sender unit if the tank is purged using the burner.

As soon as the tank has been purged (in a well-ventilated place), remove the following components to release any residual pressure:

- The LPG pipe on the tank outlet connection with a restrictor.
- The tank outlet connection with restrictor.

REFITTING

After cleaning the threads, apply teflon to the screw threads (wind the teflon round the threads four times in the direction of tightening).

Tighten the outlet connection to a torque of **10 daN.m** and then continue to tighten it so that the tank outlet pipe is correctly positioned.

AFTER CARRYING OUT ANY WORK ON THE SYSTEM, CHECK TO MAKE SURE THERE ARE NO LEAKS, FOLLOWING THE INSTRUCTIONS GIVEN IN THE "SAFETY INSTRUCTIONS".

OVERPRESSURE VALVE (3)

This is only fitted on some vehicles. If it is not fitted, a blank is fitted in its place.

PURPOSE

The purpose of this component is to prevent excessive pressure from building up and acting on the internal walls of the tank. It is calibrated to **25 bars**. When the pressure reaches the calibrated pressure, the gas escapes into the sealed accessories assembly and is vented outside the vehicle.

Note:

This part contains a plastic cap (4) which acts as an indicator. If this cap is pushed out, it may indicate that degassing has taken place as a result of the tank being overfilled.

IMPORTANT: If degassing occurs, the filling valve must be checked.

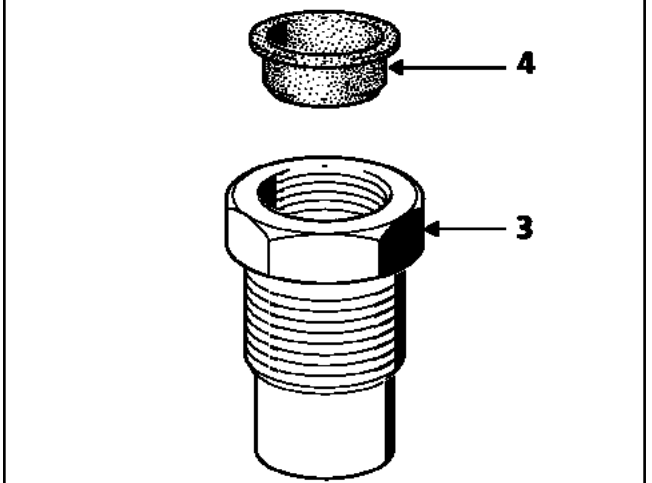
Checking the filling valve:

Check:
- that the tank is in the correct position (see the section on the **tank**),

- that the filling valve is in the correct position (see the section on the **filling valve**).

If the LPG tank is empty, fill it up completely:
- Check that, when the tank is full, its maximum filling capacity is 80% of total capacity. (This total capacity is written inside the accessories assembly.)

IMPORTANT: The filling capacity of the tank = 80% of total capacity.



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REMOVING

PLEASE READ THE "SAFETY INSTRUCTIONS" BEFORE STARTING ANY WORK.

The tank must be purged. (See the section on the **tank**.)

If the tank is being purged by driving the vehicle, it is essential to remove the LPG sender unit in accordance with the instructions given in the section on the fuel sender unit. This is so that any residual pressure in the tank is released.

Note: There is no need to remove the LPG sender unit if the tank is purged using the burner.

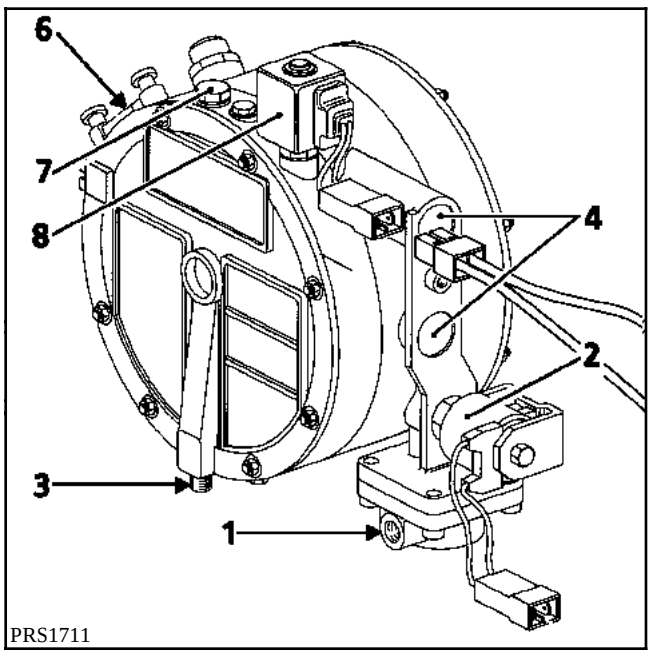
As soon as the tank has been purged (in a well-ventilated place), unscrew the valve to remove it, thus releasing any residual pressure.

REFITTING

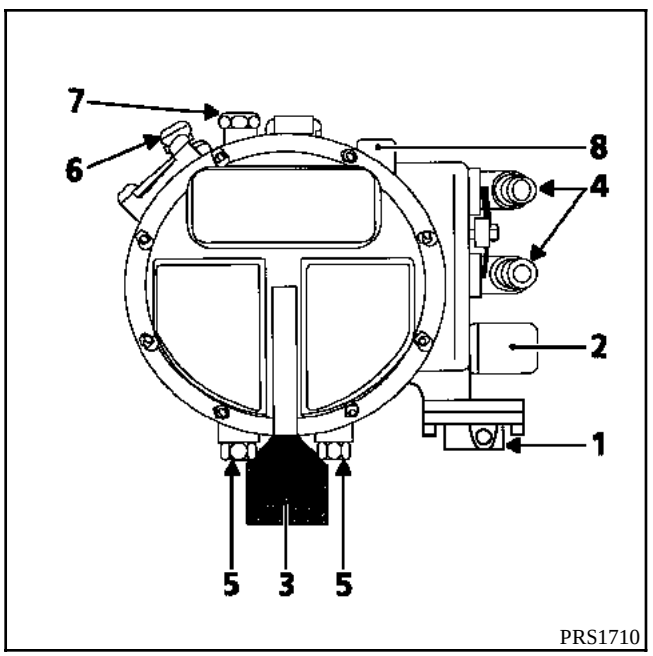
After cleaning the threads, apply teflon to the screw threads (wind the teflon round the threads four times in the direction of tightening).

Tighten the valve to a torque of **10 daN.m**.

AFTER CARRYING OUT ANY WORK ON THE SYSTEM, READ THE "SAFETY INSTRUCTIONS" TO MAKE SURE THAT THERE IS NO LEAK.



PRS1711



PRS1710

1 LPG filling pipe and filter to be changed every 42,000 miles (60,000 km)

2 Main running solenoid

3 Connection to atmosphere

4 Engine coolant filling and outlet pipe for heating the pressure-reducing valve

5 Screw for draining condensation in the LPG part of the pressure-reducing valve (to be purged if a problem occurs)

6 LPG tank outlet pipe, stepping motor support

7 Balancing screw

8 Idle solenoid

LOCATION

It is behind the bumper shield on the front left-hand side.

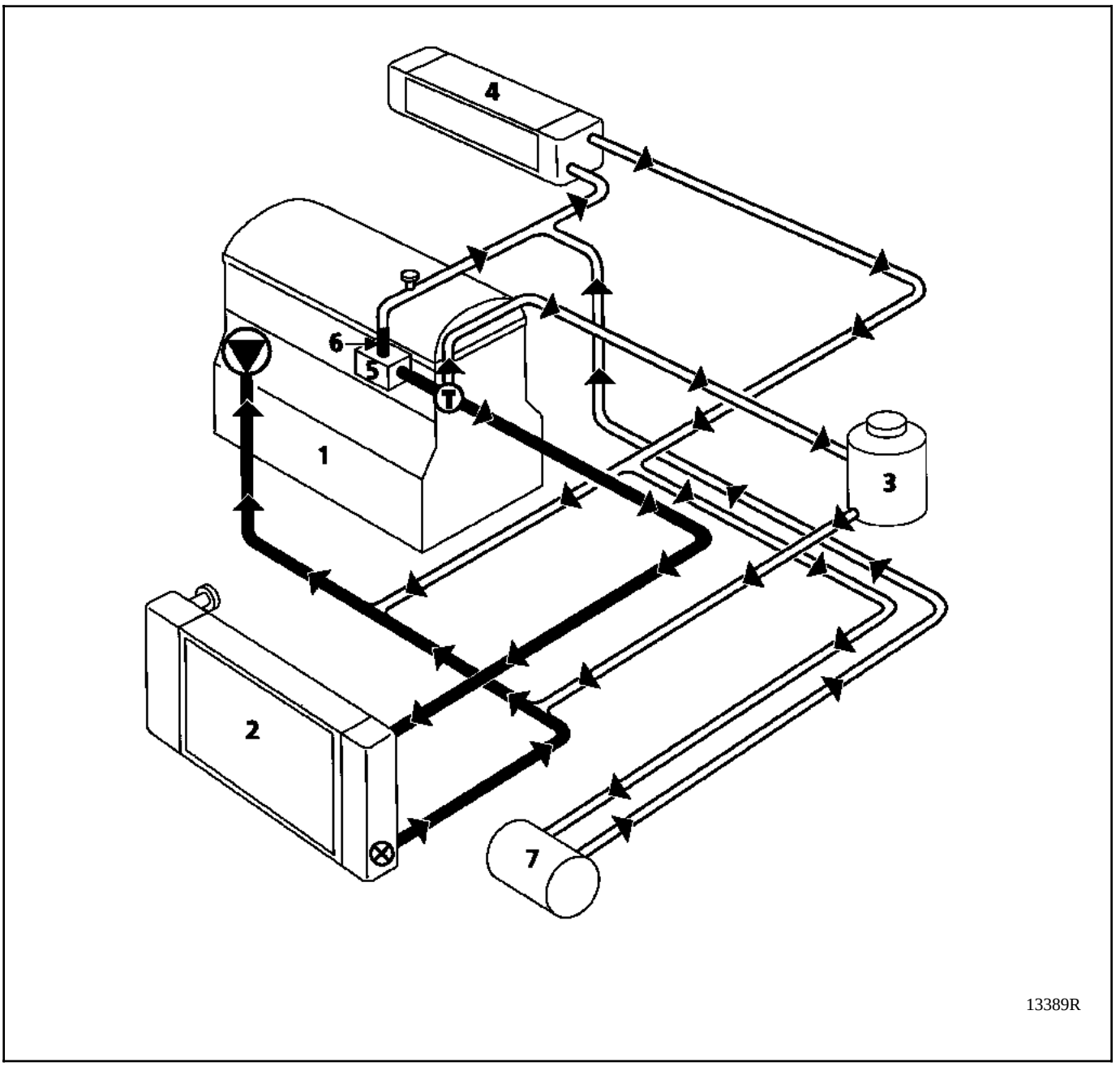
It is connected:

- **to the tank** by a copper pipe encased in plastic sheathing,
- **to the diffuser,** routed via the stepping motor and a rubber pipe,
- **to the cooling circuit** for the engine via two rubber pipes. The purpose of this detour is to heat up the pressure-reducing valve.

PURPOSE

The pressure-reducing valve is used to change liquid LPG into low-pressure gas vapour.

COOLANT CIRCUIT



1 Engine

2 Radiator

3 "Hot" degassing bottle after thermostat

4 Heater matrix

5 Thermostat support

6 3 mm dia. restrictor

7 Pressure-reducing valve

Coolant pump

Thermostat

Bleed valve

Thermoswitch

The expansion bottle valve rating is 1.6 bar (blue).

PLEASE READ THE "SAFETY INSTRUCTIONS" BEFORE STARTING ANY WORK.

The LPG pipes must be purged.

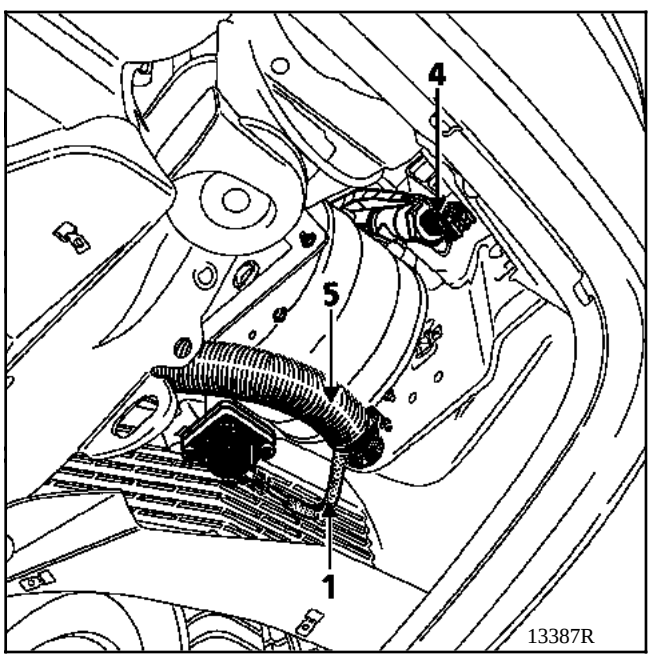
REMOVING

Disconnect the battery.

Raise the vehicle.

Remove the front left-hand wheel arch inner liner.

On the pressure-reducing valve, disconnect the LPG pipe (1) from the tank.



Lower the vehicle.

Disconnect:

- the idle solenoid connector (2),
- the main running solenoid connector (3),
- the connector and hose for the stepping motor (4).

Remove the two mounting screws from the pressure-reducing valve on the vehicle.

Fit the hose clamps **Mot. 453-01** on the two coolant pipes connected to the pressure-reducing valve.

Remove:

- the two hoses,
- the atmospheric balancing pipe (5) under the pressure-reducing valve,
- the pressure-reducing valve.

Separate the support for the pressure-reducing valve from the valve itself.

If you have to change the pressure-reducing valve, remove the solenoids and the stepping motor.

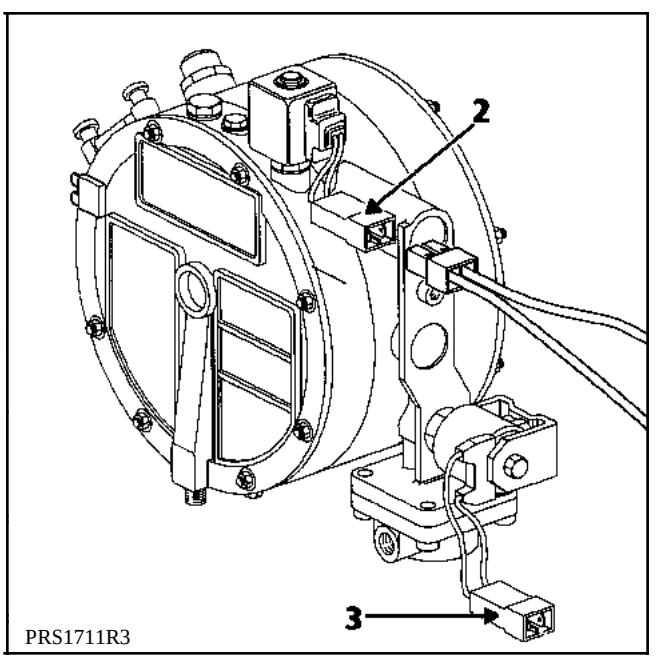
REFITTING

If you change the pressure-reducing valve, see the method for changing the atmospheric balancing connector, described in the section on the balancing system.

To refit the valve, proceed in reverse order to removal.

Recalibrate the computer. (See the section on **computer recalibration**)

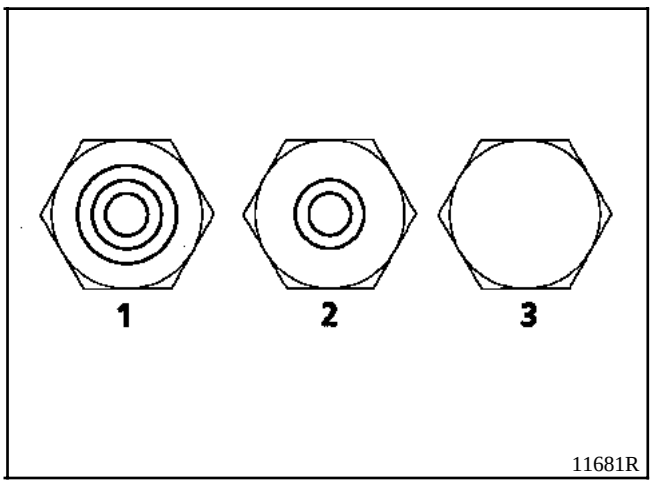
AFTER CARRYING OUT ANY WORK ON THE SYSTEM, READ THE "SAFETY INSTRUCTIONS" TO MAKE SURE THAT THERE IS NO LEAK.



This allows the engine speed to change from idling speed to an accelerated engine speed without hesitation (progressiveness).

Depending on the length of the screw, the mixture will be richer or leaner, and the stepping motor will be open to a greater or lesser extent in the idle position.

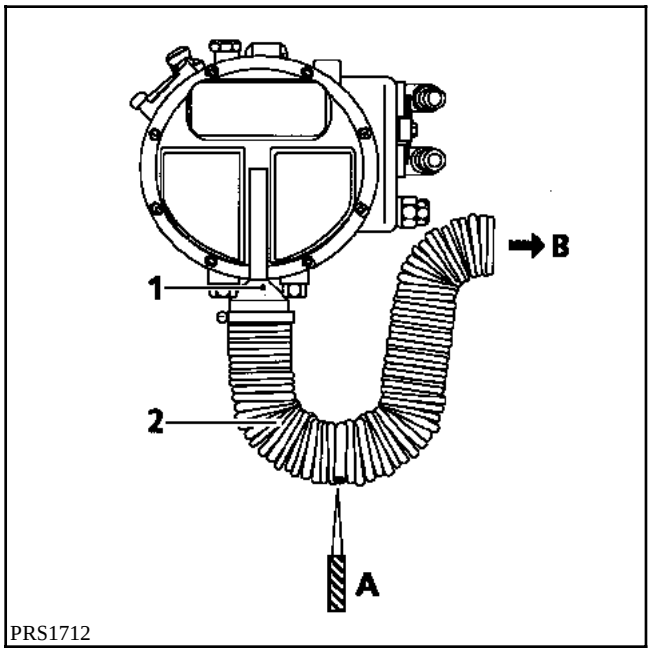
A long screw will make the mixture leaner and the stepping motor will open. A short screw will make the mixture richer and the stepping motor will close. The best position for the stepping motor at idling speed is the one that is as close as possible to initialisation.



There are three types of screw:

- long (1),
- medium (2),
- short (3).

This vehicle uses a short screw.



PRS1712

1 Connection for atmospheric balancing pipe

2 Atmospheric balancing pipe

A A hole has been drilled in the pipe at the lowest point to drain any condensation

B The pipe outlet is on the front left-hand headlamp unit

As an after-sales part, the balancing pipe connector is supplied without a drilled hole and with no threads. To modify this part, mark the direction of fitting of the old connector on the pressure-reducing valve, drill a hole of the same size as the inside diameter, remove all the chippings and burrs, as required. Then screw the connector onto the pressure-reducing valve. The thread will be cut as it is screwed onto the pressure-reducing valve.

OPERATION

The pressure-reducing valve adjusts the flow of LPG supplied to the engine, taking account of the atmospheric pressure. The place where the reference atmospheric pressure is measured is on the side of the headlight (area with minimal exposure to pressure distortions).

The pressure-reducing valve is connected to this point by a threaded connector and a hose.

The atmospheric pressure cannot be measured in the vicinity of the pressure-reducing valve because this valve is in a part of the engine compartment exposed to considerable variations in pressure. These are caused by the aerodynamic flow (driving) and when the cooling fan starts up.

CHECKING THAT THE SYSTEM WORKS

Drive at a speed of 55 mph (90 km/h) on a main road.

Disengage the clutch.

Wait until the engine speed is at idling speed.

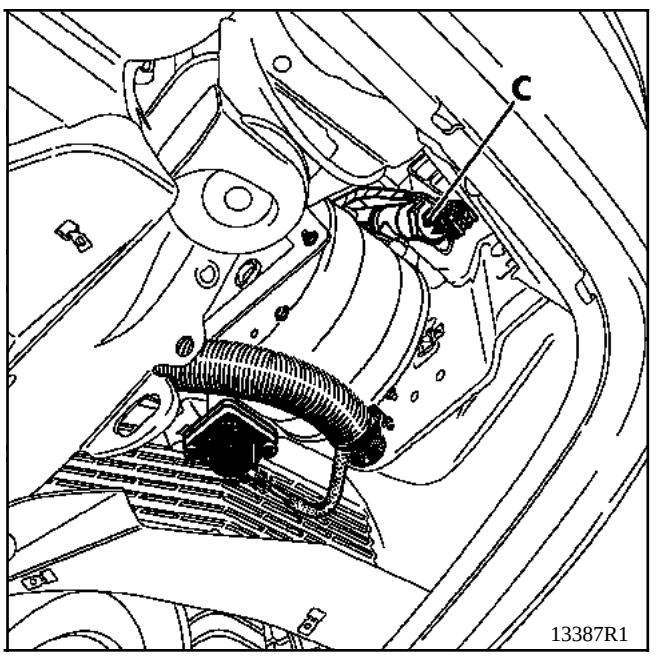
The system is operating correctly if the engine does not stall.

The stepping motor is linked to the oxygen sensor. It allows the LPG flow to be adjusted accurately so that it is as close as possible to a richness ratio of 1.

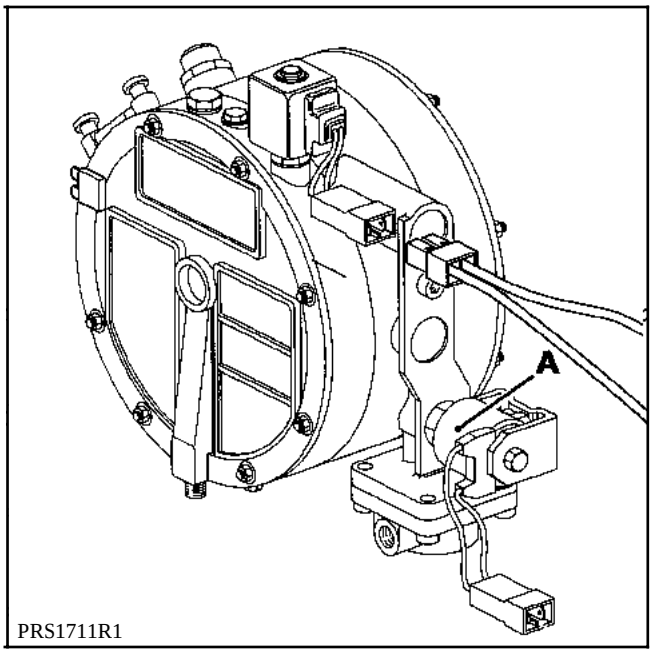
If the stepping motor has to be removed, take off the rubber pipe and then unscrew the stepping motor. Its resistance between tracks A and B, and then between D and C is approx. **55 Ω**. Control operations take place at **12 Volts**.

If a stepping motor has to be replaced, the computer has to be recalibrated. See the section on recalibrating the computer.

It is fitted on the pressure-reducing valve at (C).



LOCATION



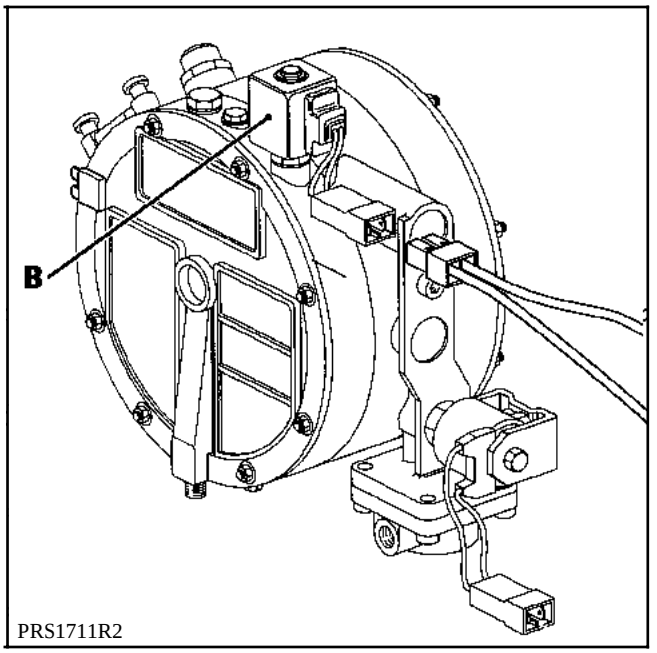
This valve is fitted to the pressure-reducing valve at (A). It has a resistance of **12.5** Ω and is supplied with **12 volts**.

OPERATION

It is controlled by the LPG computer. This computer authorises the supply of fuel to the pressure-reducing valve when LPG operation is selected on the vehicle and the engine speed information is present.

Important: Ensure the polarity of the solenoid is correct when it is connected.

LOCATION



This valve is fitted to the pressure-reducing valve at (B). It has a resistance of **12.5** Ω and is supplied with **12 volts**.

OPERATION

It is controlled by the LPG computer. This computer authorises the supply of fuel to the idling circuit of the pressure-reducing valve when LPG operation is selected on the vehicle and the engine speed information is present.

Important: Ensure the polarity of the solenoid is correct when it is connected.

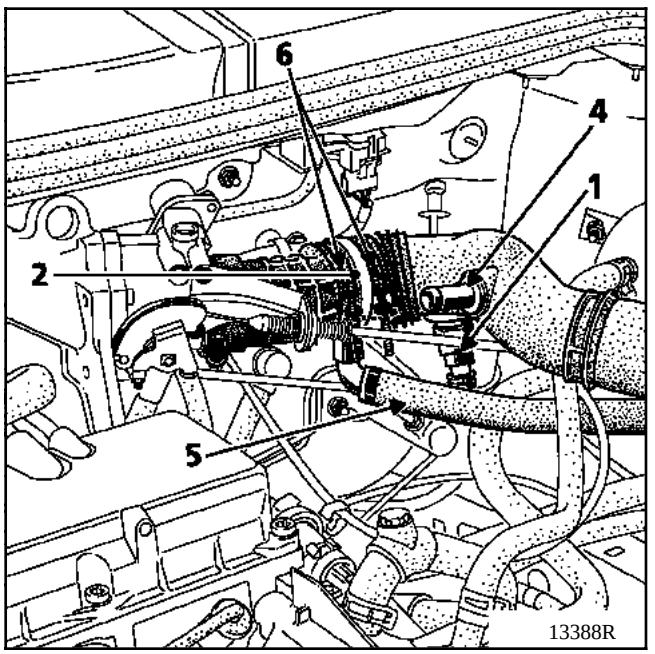
PURPOSE

This is used to mix gas in the intake manifold. Its shape allows fuel to mix easily (air / gas).

LOCATION

It is fitted on the air filter sleeve, in front of the throttle body.

PLEASE READ AND FOLLOW THE "SAFETY INSTRUCTIONS" BEFORE STARTING ANY WORK.



REMOVING

Disconnect the air temperature sensor (1).

Remove:

- the oil vapour rebreathing hose,
- the hose supplying gas (5) to the diffuser (2),
- the clamp for mounting the air filter sleeve (4) on the throttle body.

Take the sleeve (4) off the air filter.

Remove the two clamps (6) securing the diffuser to the air filter sleeve.

Take out the diffuser, marking the direction in which it should be installed.

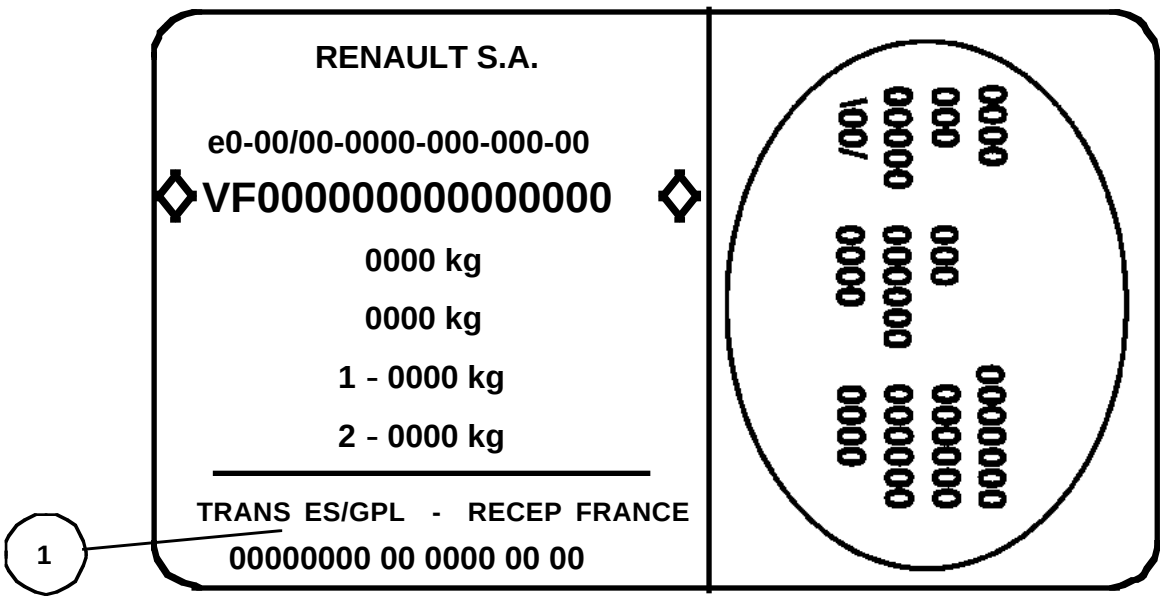
REFITTING

When refitting, proceed in reverse order to removal, ensuring that the diffuser is fitted in the correct direction.

PLEASE READ AND FOLLOW THE "SAFETY INSTRUCTIONS" BEFORE STARTING ANY WORK.

The fact that the vehicle operates on LPG (1) is shown on the vehicle identification plate on the right-hand B-pillar of the vehicle.

Please list the data on this plate in all letters and orders.



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If this plate has to be changed, place an order for a "duplicate vehicle identification plate", stating all the information shown on this plate.

Note: All orders must be placed with a Renault Dealer or subsidiary.

PURPOSE

The computer (1) manages the flow of gas supplied to the engine when the driver has selected LPG mode. The computer analyses the following information:

- the oxygen sensor signal,
- the engine speed data,
- the throttle position potentiometer data.

The computer controls the stepping motor to manage the flow.

It also manages the main, idle and safety solenoid valves.

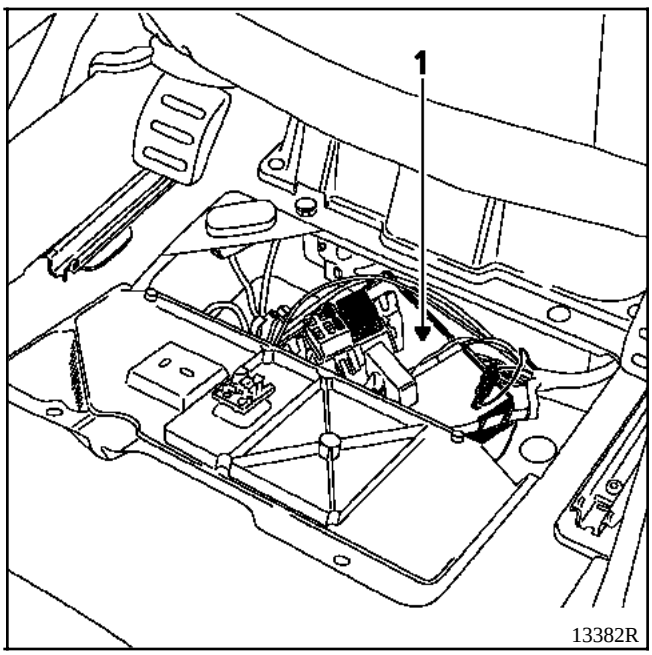
In LPG mode, the LPG computer interrupts:
- the petrol injection computer / fault warning light connection on the instrument panel,
- the petrol injection computer / oxygen sensor. (This creates an oxygen sensor fault in the memory of the injection computer.)
- the injection computer / petrol injector connection.

The petrol injection computer still controls the illumination of lights.

LOCATION

The computer is under the front seat on the passenger side:

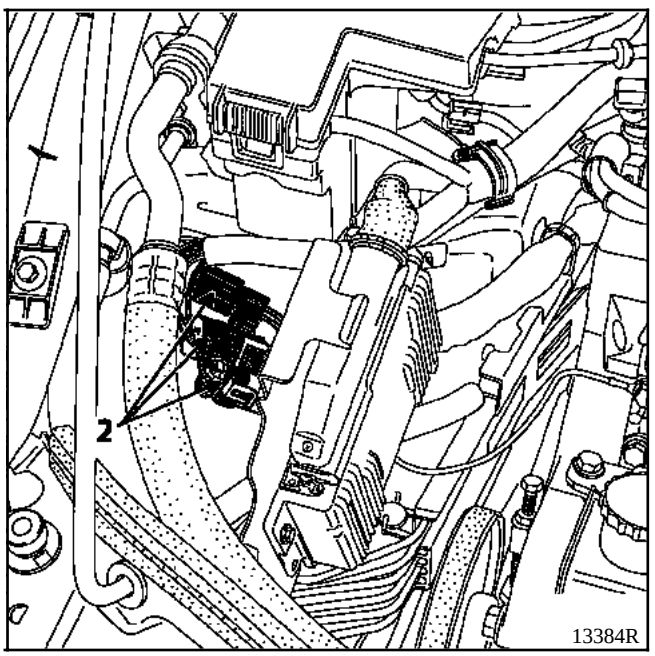
- (Scénic version: under the flap)
- (Other versions: under the carpet)



LPG COMPUTER/PETROL INJECTION COMPUTER CONNECTION

In order to operate, the LPG computer uses information from the petrol injection computer.

The standard wiring has been modified so that this information can be collected. Three connectors (2) are routed to the the front right-hand wing inner panel and are connected to the LPG wiring.



COMPUTER RECALIBRATION

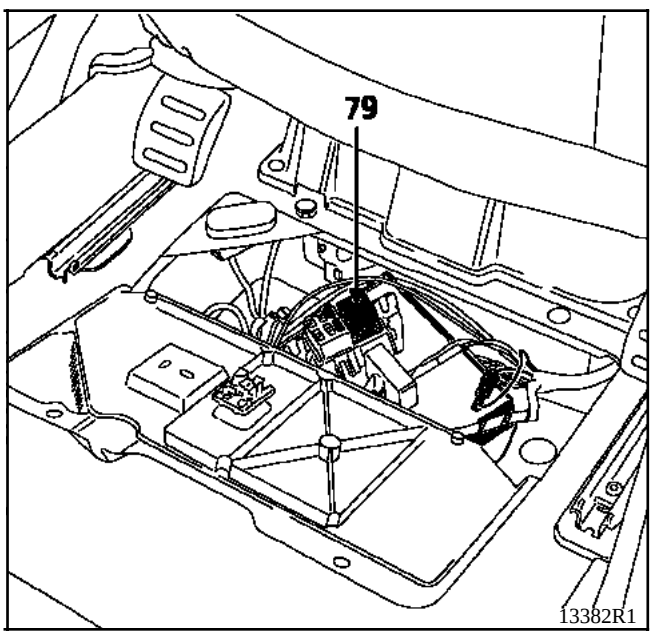
Each time the computer is removed or changed, or a connector plugged into the LPG computer has been disconnected, the computer must be recalibrated. (See the section on computer calibration for more information.)

The LPG computer is continuously supplied with oxygen sensor information. However, this information must not be supplied to the injection computer when the engine is operating in LPG mode.

If this situation arose, the petrol computer would be able to reprogram itself to operate in gas mode, varying its richness adaptation (#30 - #31). However, the engine would malfunction when the engine returned to petrol mode.

As this would be inconvenient, the relay (79) prevents the injection computer from receiving oxygen sensor information in LPG mode.

However, in LPG mode the petrol injection computer will indicate an oxygen sensor fault. To ascertain whether this fault is genuine, clear the computer memory and carry out a road test in petrol mode. The fault should not reappear.

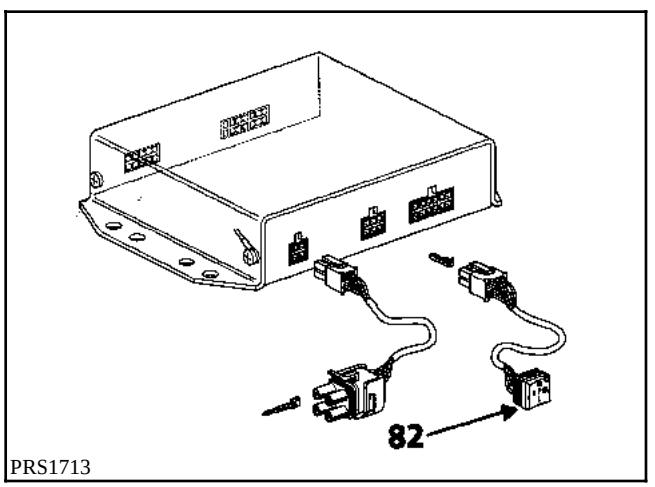


The petrol/LPG selector switch (82) allows the driver to change from petrol to LPG mode and vice versa. There is a push button with a small printed circuit board fitted behind it.

A tell-tale light with two colours - green and red - is mounted on the switch. When the green light is illuminated, the engine is running on LPG. When the red light is illuminated, the engine is operating in petrol mode.

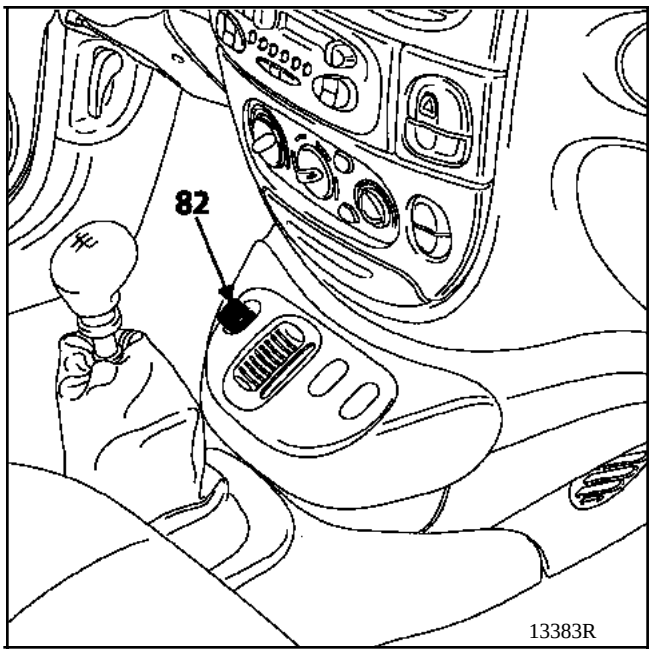
The tell-tale light on the switch is also used for:

- reconfiguring the computer,
- when the LPG computer detects a fault in the memory. In this case, the tell-tale light flashes red and green in sequence.



PRS1713

LOCATION

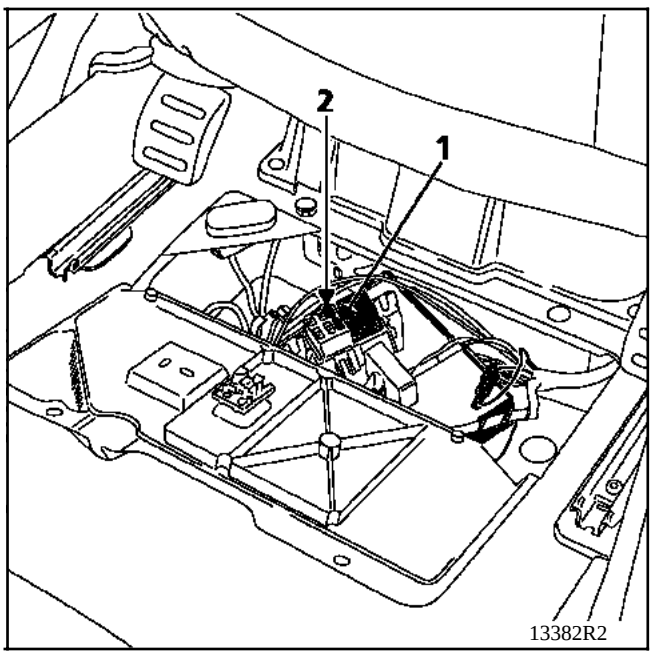


13383R

There are two fuses in the system.

A 3 amp fuse (1) protects the+ before ignition.

A 7.5 amp fuse (2) protects the + after ignition.



COMPUTER RECALIBRATION

The computer must be recalibrated every 10,000 miles (15,000 km) or each time the battery is disconnected. (See the method in the section on recalibrating the computer.)

TANK

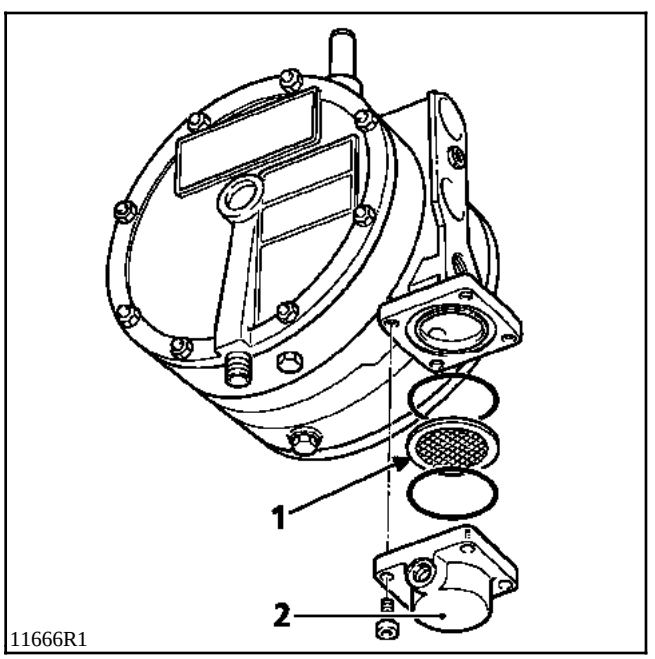
Legislation governing the use of pressurised systems requires the LPG tank to be checked by the authorities every 8 years (5 years if the vehicle is resold).

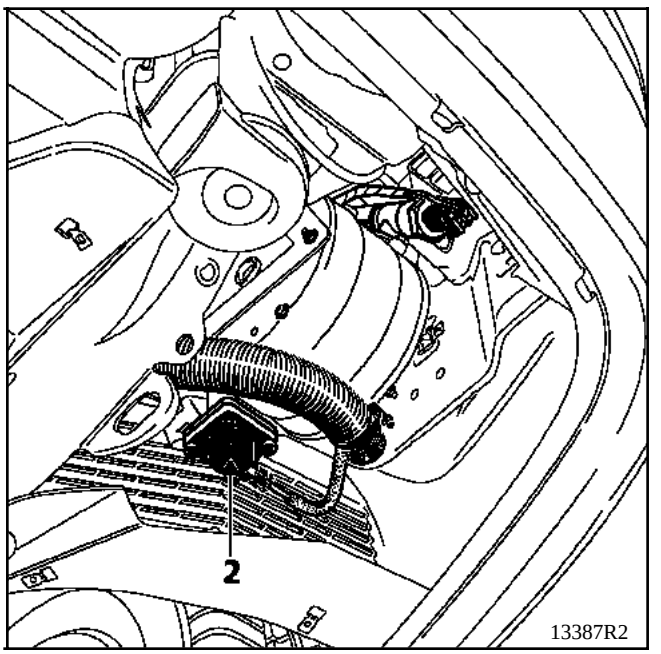
PIPE BETWEEN THE FILLER NECK AND THE TANK

This pipe must be changed every 5 years.

GAS FILTER (1)

The filter must be changed every 42,000 miles (60,000 km). The steel filter screen must be on the pressure-reducing valve side. The fabric filter screen must be on the gas inlet side (2).





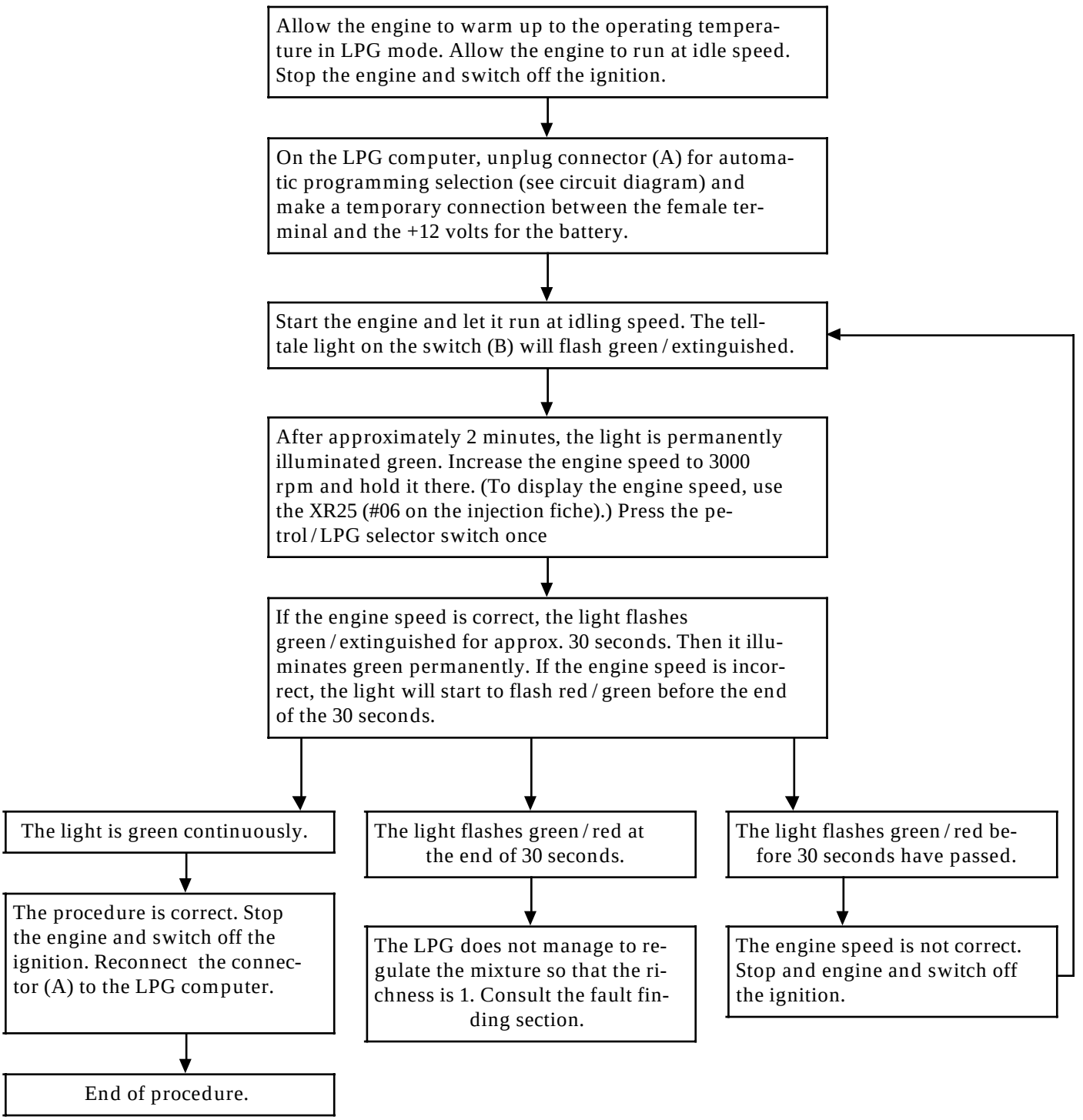
CHECKING THAT THE SAFETY VALVE IS OPERATING CORRECTLY

(Fitted on the tank)

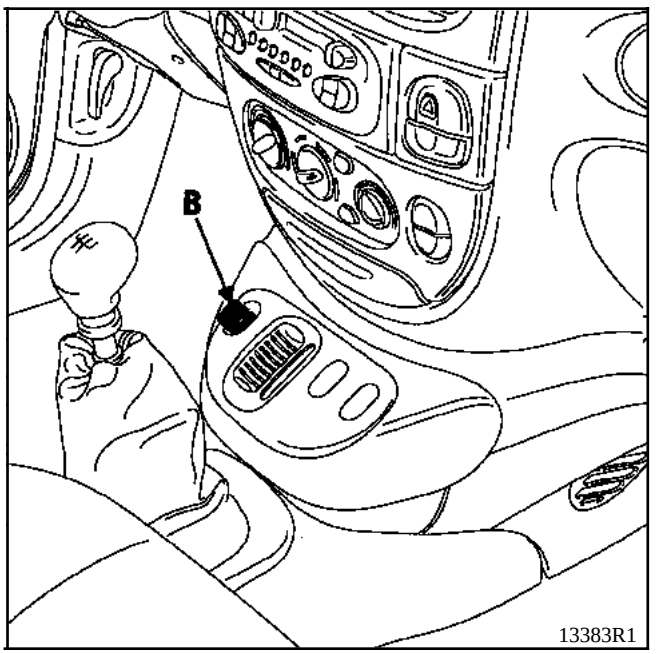
This must be inspected every 10,00 miles (15,000 km).

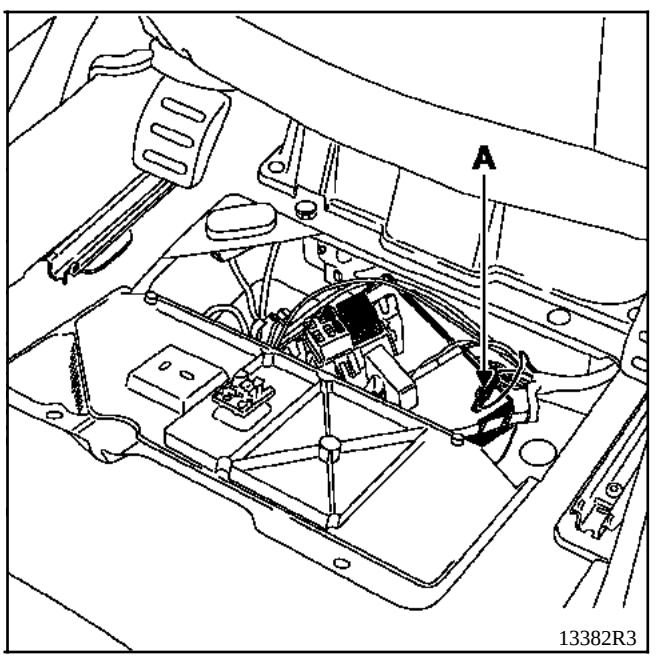
Operate the engine at idling speed in LPG mode. Disconnect the solenoid. The engine ought to stall.

This procedure must be carried out every 10,000 miles (15,000 km) and after the battery, pressure-reducing valve, stepping motor, computer, diffuser or air filter has been changed or removed.



NOTE: If you do not manage to carry out the operation, consult the fault finding section.

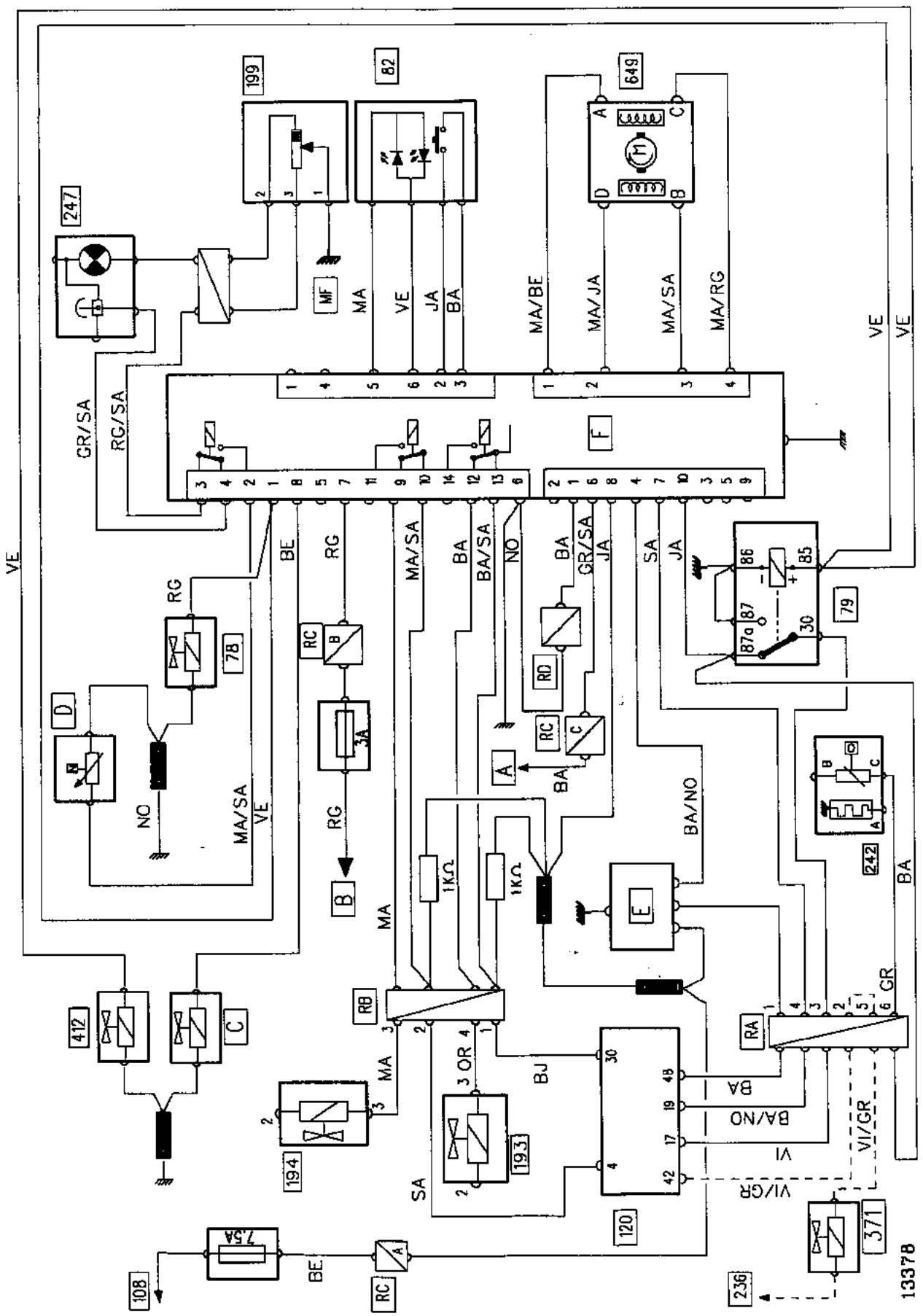

B
13383R1


A
13382R3

COMPONENTS

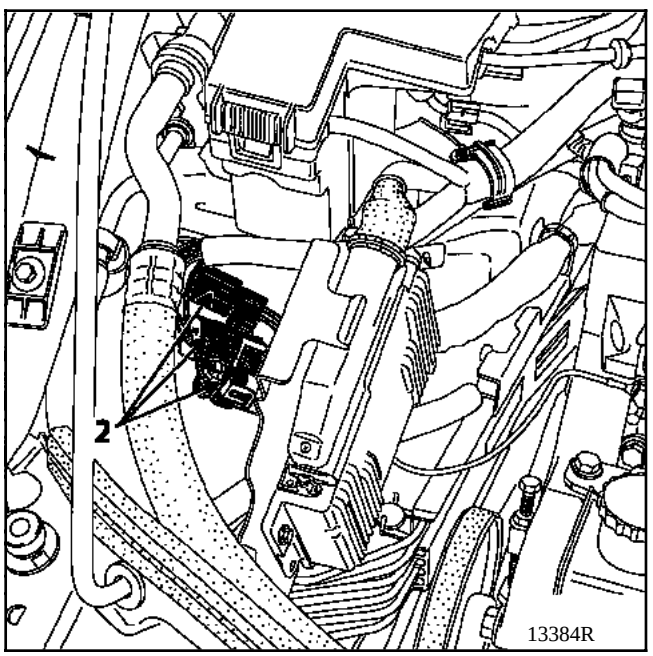
No. of component or connection	Description
78	High pressure solenoid valve
79	Oxygen sensor balance relay
82	Petrol / LPG switch
108	Ignition coil
120	Petrol injection computer
193	Injectors **No. 1** and **No. 4**
194	Injectors **No. 2** and **No. 3**
199	Fuel tank sender unit
236	Fuel pump relay
242	Oxygen sensor
247	Fuel gauge and injection fault tell-tale light on instrument panel
371	Canister bleed solenoid
412	Idle solenoid valve
649	Stepping motor for managing gas flow
A	Starter information
B	+Before ignition
C	Main running solenoid valve
D	LPG fuel sender unit potentiometer
E	"Engine speed" signal amplifier
F	LPG computer
RA	6-track connection (LPG engine / wiring connection)
RB	4-track connection (LPG engine / wiring connection)
RC	3-track connection (LPG engine / wiring connection)
RD	Connector for LPG computer recalibration
MF	RH rear electrical earth

OPERATING WIRING DIAGRAM

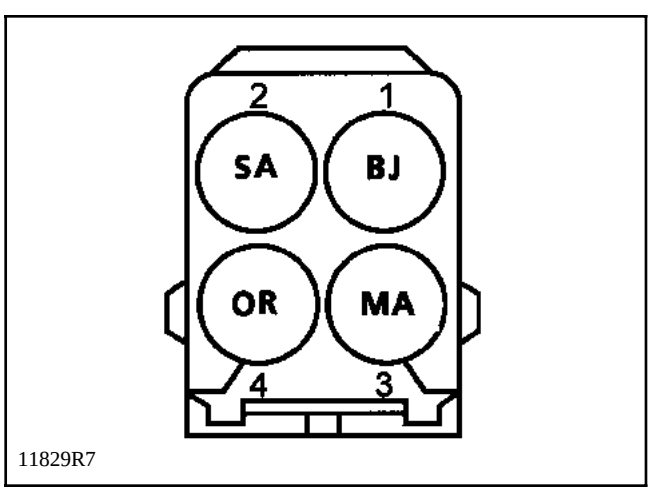


PRN1202

The original wiring has been modified to facilitate the connection of the LPG wiring harness. Three connectors (2) have been fitted specifically for this purpose. They are behind the injection computer on the front right-hand wing inner panel.



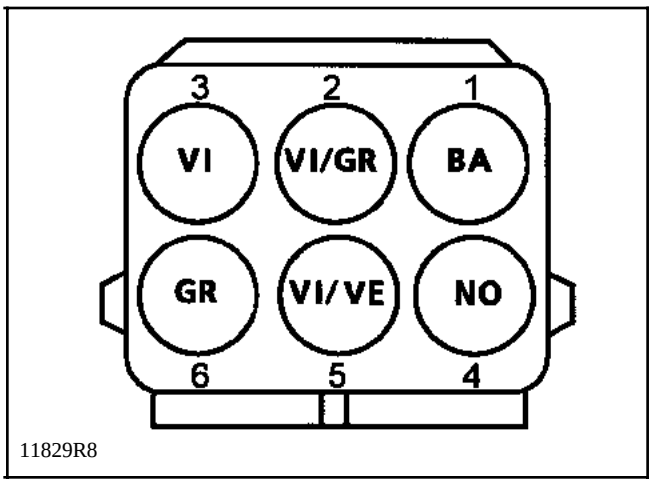
4-track LPG connection - RB



3-track connector

Track	Description
A	+after ignition (track 8 of LPG computer, +ignition coils).
B	+12 volts battery (track 7 LPG computer, battery).
C	Starter motor information (track 6 LPG computer, starter motor).

6-track LPG - RA connection



4-track connector

Track	Description
1	Control for injectors 2 and 3 (tracks 8 and 13 LPG computer, track 30 injection computer).
2	Control for injectors 1 and 4 (tracks 8 and 10 LPG computer, track 4 injection computer).
3	Control for injectors 1 and 4 (track 9 LPG computer, injectors 1 and 4).
4	Control for injectors 2 and 3 (track 12 LPG computer, injectors 2 and 3).

6-track connector

Track	Description
1	Engine speed information (track 4 LPG computer, track 48 injection computer).
2	Canister purge shunt (depending on type) (track 5 of 6-track LPG connector, canister purge solenoid).
3	Oxygen sensor information (track 17 injection computer, oxygen sensor relay).
4	Throttle valve position information (track 7 LPG computer, track 19 injection computer).
5	Canister purge shunt (depending on type) (track 2 of 6-track LPG connector, track 42 of injection computer).
6	Oxygen sensor information (oxygen sensor, oxygen sensor relay).

ASSIGNMENT OF LPG COMPUTER TRACKS

14-track connector

Track	Description
1	Feed + 12 volts safety solenoid, idle solenoid and oxygen sensor relay
2	LPG fuel level information
3	Petrol tank fuel level information
4	Fuel level information (petrol or LPG) displayed on the instrument panel
5	Not used
6	Engine earth
7	+12 volts before ignition
8	Feed+12 volts main running solenoid
9	Control - injectors 1 and 4 (via the LPG computer).
10	Controls - injectors 1 and 4 (via the injection computer).
11	Not used
12	Control - injectors 2 and 3 (via the LPG computer).
13	Control - injectors 2 and 3 (via the injection computer).
14	Not used

NOTE: Tracks 3 and 4, 9 and 10, 12 and 13, respectively are managed by three relays under the LPG computer.

10-track connector

Track	Designation
1	Computer recalibration wire
2	Not used
3	Not used
4	Engine speed information
5	Not used
6	Starter information
7	Full load information
8	+12 volts after ignition
9	Not used
10	Oxygen sensor information

6-track connector

Track	Designation
1	Not used
2	Connection to petrol/LPG switch
3	Connection to petrol/LPG switch
4	Not used
5	Connection to petrol/LPG switch
6	Connection to petrol/LPG switch

4-track connector

Track	Designation
1	Connection to stepping motor
2	Connection to stepping motor
3	Connection to stepping motor
4	Connection to stepping motor

STARTING THE ENGINE

The vehicle will run either in LPG mode or petrol mode, depending on the position of the switch.

1) If the vehicle was running in LPG mode before the ignition was switched off, the vehicle will still be selected for LPG operation when it is started up again. When the ignition is switched on, the green tell-tale light on the switch is illuminated. As soon as the LPG computer receives information from the starter motor, the red tell-tale light on the switch illuminates and the engine starts in petrol mode. Then, if the LPG computer does not receive any further information from the starter motor, it reverts to operation in LPG mode.

2) If the engine was operating in LPG mode and if the driver pressed the petrol/LPG switch after the ignition had been switched off, the engine will start in LPG mode. (Important: This procedure is only to be used in exceptional circumstances. It may result in backfiring. This procedure must not be divulged to customers.)

3) If the engine was operating in petrol mode, the vehicle will continue to operate in petrol mode.

If the ignition is switched on, the driver may select the mode he wants before starting the engine. The vehicle will start as described in cases 1 and 3.

CHANGE FROM PETROL TO LPG MODE AND VICE VERSA

A few precautions must be taken when changing from one fuel to another. Preferably, the changeover should take place at a moderate speed and without pressing the accelerator at the moment when the switch (petrol/LPG) is pressed to select the fuel required.

The vehicle will take a few seconds to operate correctly.

SPECIAL POINTS

If the LPG computer is not provided with the following information, operation in LPG mode will be deactivated and the engine will continue operating in petrol mode irrespective of the position of the switch:
- + 12 volts after ignition,
- earth connection,
- engine speed (the tell-tale light will remain illuminated on green but the vehicle will run on petrol),
- +12 volts before ignition, 3A fuse removed.

At the start of the fault finding procedure, check that there is still some LPG in the tank.

Check that there is still some petrol in the vehicle. (Note: Even if the selector is set for LPG when the vehicle is started, the engine will always start in petrol mode before switching automatically to LPG mode.)

The vehicle must not register any faults in petrol mode if a fault finding procedure is to be carried out for LPG mode.

To do that, check that the vehicle operates properly in petrol mode:

- Disconnect the LPG system.
- Make a bridge:
  . on the 6-track RA connector between tracks 3 and 6 on the injection computer side,
  . on the 14-track connector on the LPG computer, between tracks 9 and 10 and between tracks 12 and 13.
- Disconnect the 3-track LPG connector and remove the 7.5 A fuse.
- Carry out the fault finding procedure on the petrol injection computer and rectify the problems relating to petrol injection.
- Clear the injection computer memory.
- Road test the vehicle.
- If there are no further problems in petrol injection mode, carry out the fault finding procedure for LPG.
- Reconnect the LPG system first.

IMPORTANT: The LPG computer must be recalibrated each time the battery is disconnected. See the section on computer recalibration.

The vehicle's battery must be disconnected and removed when dismantling components under the bonnet which are in direct contact with LPG.

Consult the section on "Safety instructions" before carrying out the fault finding procedure.

NOTES	It is essential to follow the general instructions before starting the fault finding procedure.

STARTING PROBLEMS

- Impossible to start vehicle in LPG mode — **CHART 1**
- Impossible to start vehicle — **CHART 2**

IDLING PROBLEMS

- Vehicle does not maintain idling speed in LPG mode — **CHART 3**

DRIVING PERFORMANCE

- Serious loss of power in LPG mode without any engine hesitation — **CHART 4**
- When accelerating fully in LPG mode, the engine stalls or the engine speed does not increase — **CHART 5**
- The engine starts normally in petrol mode but it stalls the moment it switches to LPG mode — **CHART 6**

FUEL GAUGE READING

- Fuel gauge reading not consistent in LPG mode — **CHART 7**

ODOUR OF LPG

- Smell of LPG in the vehicle or under the bonnet — **CHART 8**

LPG LEAK

- LPG leak when filling up the tank — **CHART 9**

OTHER SYMPTOMS

Red and green tell-tale lights flash alternately on the fuel selector	**CHART 10**
Impossible to fill LPG tank (LPG fuel gauge indicates low fuel level)	**CHART 11**
Impossible to change from petrol mode to LPG mode (the fuel selector will not operate)	**CHART 12**
The fuel selector tell-tale light is always extinguished	**CHART 13**

CHART 1	STARTING PROBLEMS **Impossible to start vehicle in LPG mode (starts normally in petrol mode ≈ 2 seconds, then stalls when it is switched to LPG mode)**
NOTES	It is essential to follow all the general instructions before starting the fault finding procedure. Check that there is enough petrol in the tank because, even the engine is set to start in LPG mode, the vehicle will always start in petrol mode before switching automatically to LPG mode.

Check the condition of the air filter.
Is the air filter in good condition?

no → Change the air filter.

yes

Connect tracks 1 and 8 of the 14-track connector for the LPG computer to + 12 volts. A click should be heard from each of the solenoids (safety, main and idling).
Can the three solenoids be heard?

no → D

yes

Check the condition of the balancing system.
Make sure that the balancing connector has been drilled correctly.
Check the state of the balancing pipe and the pipe from the pressure-reducing valve.
Make sure that a hole has been drilled at the lowest point of the balancing pipe to allow water to be drained.
Make sure that no pipes are blocked.

Are all these points correct?

no → Repair the faulty component.

yes

A

AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

GPL1006.0

CHART 1
CONTINUED 1

A

When working on the system, ensure that the safety instructions are followed (vehicle outside in a well ventilated place, away from sources of heat, etc.). Check that LPG is flowing from the pressure-reducing valve. Disconnect the pipe connecting the pressure-reducing valve to the stepping motor at the pressure-reducing valve outlet side. Connect tracks 1 and 8 of the 14-track LPG computer connector to + 12 volts, then check that a flow of LPG equivalent to the flow at idling speed can be heard coming from the pressure-reducing valve (flow sounds similar to a slight leak of compressed air).
Is the flow of LPG from the pressure-reducing valve equivalent to the flow at idling speed?

no → C

yes

Check condition of stepping motor. Disconnect 4-track connector from stepping motor. Measure resistance at terminals of stepping motor. It should be:
- between A and B, R = 55 ohms.
- between C and D, R = 55 ohms.

Are these the resistance readings?

no → Change the stepping motor.

yes

B

AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

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CHART 1
CONTINUED 2

B

Check the continuity and insulation to earth or to 12 volts of the electric wiring between :

stepping motor connector

A	1	4-track connector for LPG computer
B	3	
C	4	
D	2	

Is the wiring in good condition?

no → Repair the faulty wiring.

yes

Check the condition of the stepping motor. Carry out the test procedure for the stepping motor using the method described in the section on "Fault finding - Aid".

Is the stepping motor operating correctly?

no → Change the stepping motor.

yes

Change the LPG computer.

AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

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CHART 1
CONTINUED 3

C

How much LPG flows from the pressure-reducing valve?

Excessive flow of LPG → Change the pressure-reducing valve.

No flow of LPG or very little flow

Reconnect the pipe coming from the pressure-reducing valve. When working on the system, ensure that the safety instructions are followed (vehicle outside in a well ventilated place, away from sources of heat, etc.).
Check the main running solenoid liquid LPG feed pipe.
Disconnect the main running solenoid inlet pipe. (Caution: LPG may escape from the pipe.) During this operation, take great care to ensure that this pipe is not directed towards a source of heat.
Connect track 1 of the 14-track connector of the LPG computer to+ 12 volts.
Then check that LPG is coming out of the pipe in the form of dense white fog .
Is there a dense white fog of LPG?

no → Change the pressure-reducing valve.

yes

Check and change the fuel filter on the pressure-reducing valve. The fuel filter must be changed every 42,000 miles (60,000 km).

AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

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CHART 1
CONTINUED 4

D

Does the safety solenoid make a clicking noise?

no → Check the condition of the safety solenoid. Disconnect the solenoid connector and then measure the resistance at the terminals. The reading should be R = 12.5 ohms.
Does R = 12.5 ohms?

yes → Repair the wiring between the safety solenoid and:
- the vehicle earth,
- track 1 of the 14-track connector of the LPG computer.

no → Change the safety solenoid.

yes

Does the main running solenoid make a clicking noise?

no → Check the condition of the main running solenoid. Disconnect the solenoid connector and then measure the resistance at the terminals. It should measure R = 12.5 ohms.
Does R = 12.5 ohms?

yes → Repair the wiring between the main running solenoid and:
- the vehicle earth
- track 8 of the 14-track connector for the LPG computer.

no → Change the main running solenoid.

yes

E

AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

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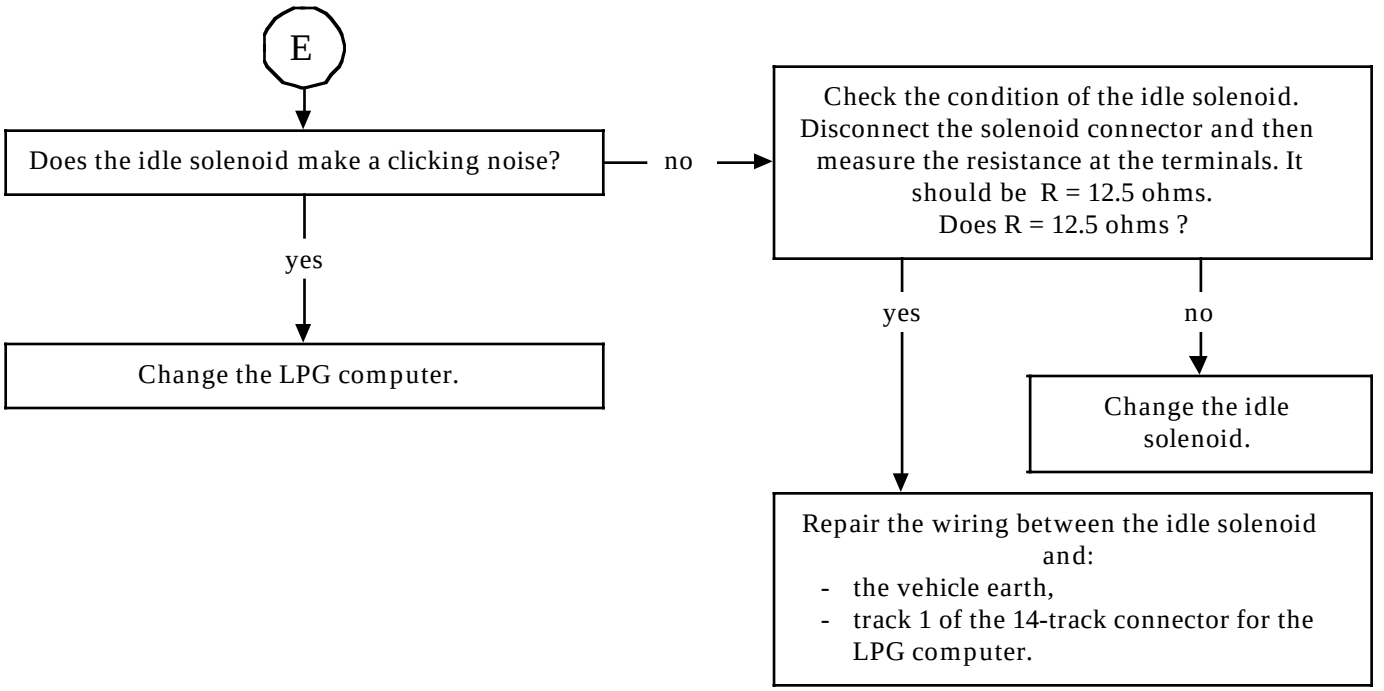
CHART 1
CONTINUED 5



AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

GPL1006.0

CHART 2	STARTING PROBLEM Impossible to start engine

NOTES	Follow the general instructions before starting the fault finding procedure. Check that there is petrol in the tank because, even if LPG mode is selected when the engine is started, the vehicle always starts in petrol mode before changing automatically to LPG mode.

Check the condition of the 3 A and 7.5 A fuses. Are the fuses in good condition?

no → Replace the defective fuse(s).

yes

Check that the 4-track LPG connector is inserted properly.
Is the connector properly inserted?

no → Ensure the connector is inserted correctly.

yes

Check the connector between:

4-track LPG connector { 1 → 4, 2 → 30 } LPG connector

Is the connector in good condition?

no → Repair the faulty wiring.

yes

Change the LPG connector.

AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

GPL1006.0

CHART 3	IDLING PROBLEM The vehicle does not maintain idling speed in LPG mode (irregular idling and then stalling)

NOTES	It is essential to follow the general instructions before starting the fault finding procedure.

Check the condition of the air filter.
Is the air filter in good condition ?

no → Change the air filter.

yes

Check the insulation between the resistors and the LPG computer in relation to earth.
Is it insulated?

no → Repair the faulty wiring.

yes

Connect tracks 1 and 8 of the 14-track connector for the LPG computer to + 12 volts. A click should be heard from each of the solenoids (safety, main running and idling).
Can you hear the three solenoids click ?

no → D

yes

Check the condition of the balancing system.
Make sure that the balancing connector has been drilled correctly.
Check the state of the balancing pipe and the pipe from the pressure-reducing valve.
Make sure that a hole has been drilled at the lowest point of the balancing pipe to allow water to be drained.
Make sure that no pipes are blocked.

Are all these points correct?

no → Repair the faulty component.

yes

A

AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

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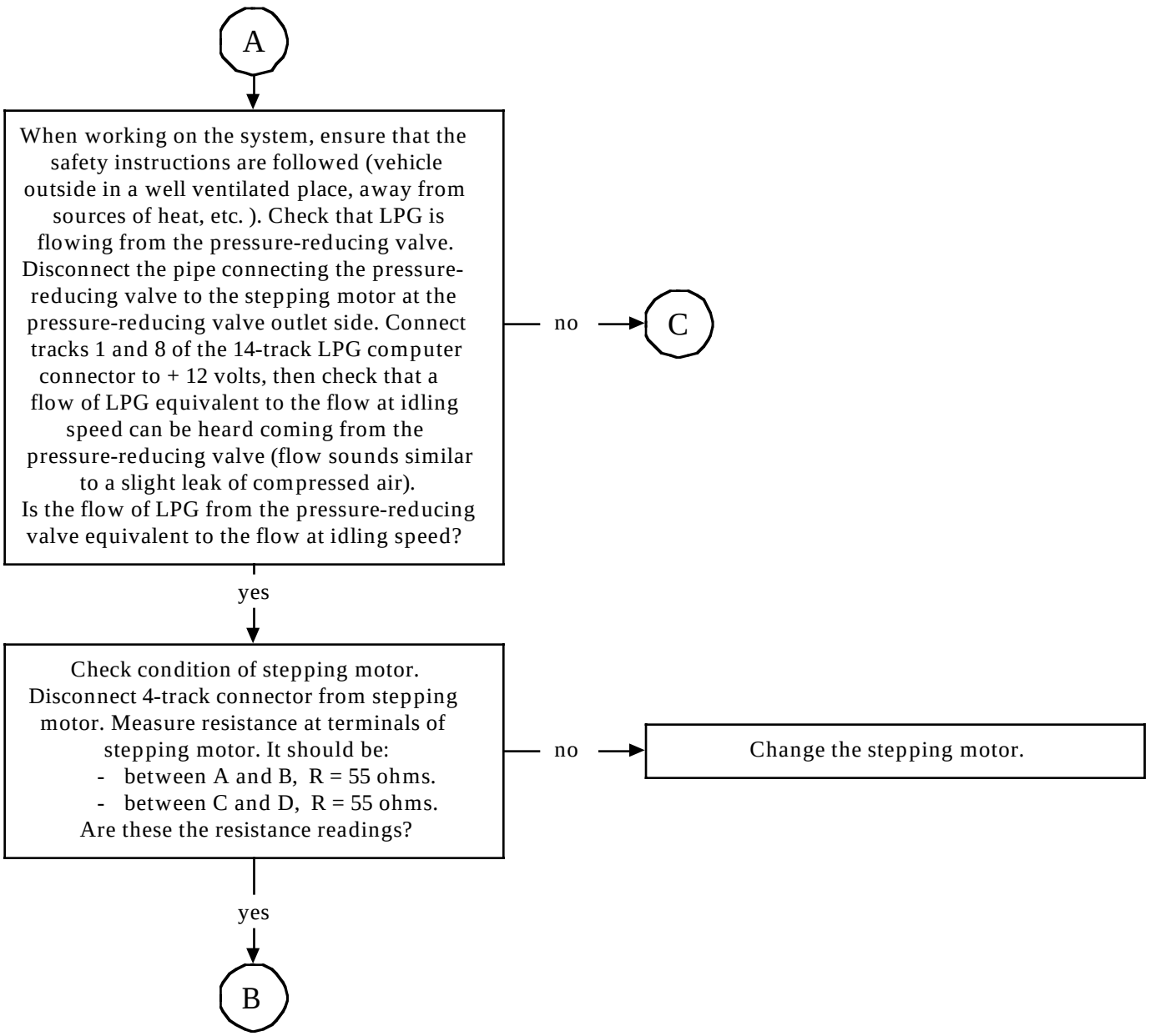
CHART 3
CONTINUED 1



AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

GPL1006.0

CHART 3
CONTINUED 2

B

Check the continuity and insulation to earth or to 12 volts of the electric wiring between :

stepping motor connector
- A → 1
- B → 3
- C → 4
- D → 2

4-track connector for LPG computer

Is the wiring in good condition?

no → Repair the faulty wiring.

yes

Check the condition of the stepping motor. Carry out the test procedure for the stepping motor using the method described in the section on "Fault finding - Aid".

Is the stepping motor operating correctly?

no → Change the stepping motor.

yes

Change the LPG computer.

AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

GPL1006.0

CHART 3
CONTINUED 3

C

How much LPG flows from the pressure-reducing valve?

Excessive flow of LPG → Change the pressure-reducing valve.

No flow of LPG or very little flow

Reconnect the pipe coming from the pressure-reducing valve. When working on the system, ensure that the safety instructions are followed (vehicle outside in a well ventilated place, away from sources of heat, etc.).
Check the main running solenoid liquid LPG feed pipe.
Disconnect the main running solenoid inlet pipe. (Caution: LPG may escape from the pipe.) During this operation, take great care to ensure that this pipe is not directed towards a source of heat.
Connect track 1 of the 14-track connector of the LPG computer to+ 12 volts.
Then check that LPG is coming out of the pipe in the form of dense white fog .
Is there a dense white fog of LPG?

no → Change the pressure-reducing valve.

yes

Check and change the fuel filter on the pressure-reducing valve. The fuel filter must be changed every 42,000 miles (60,000 km).

AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

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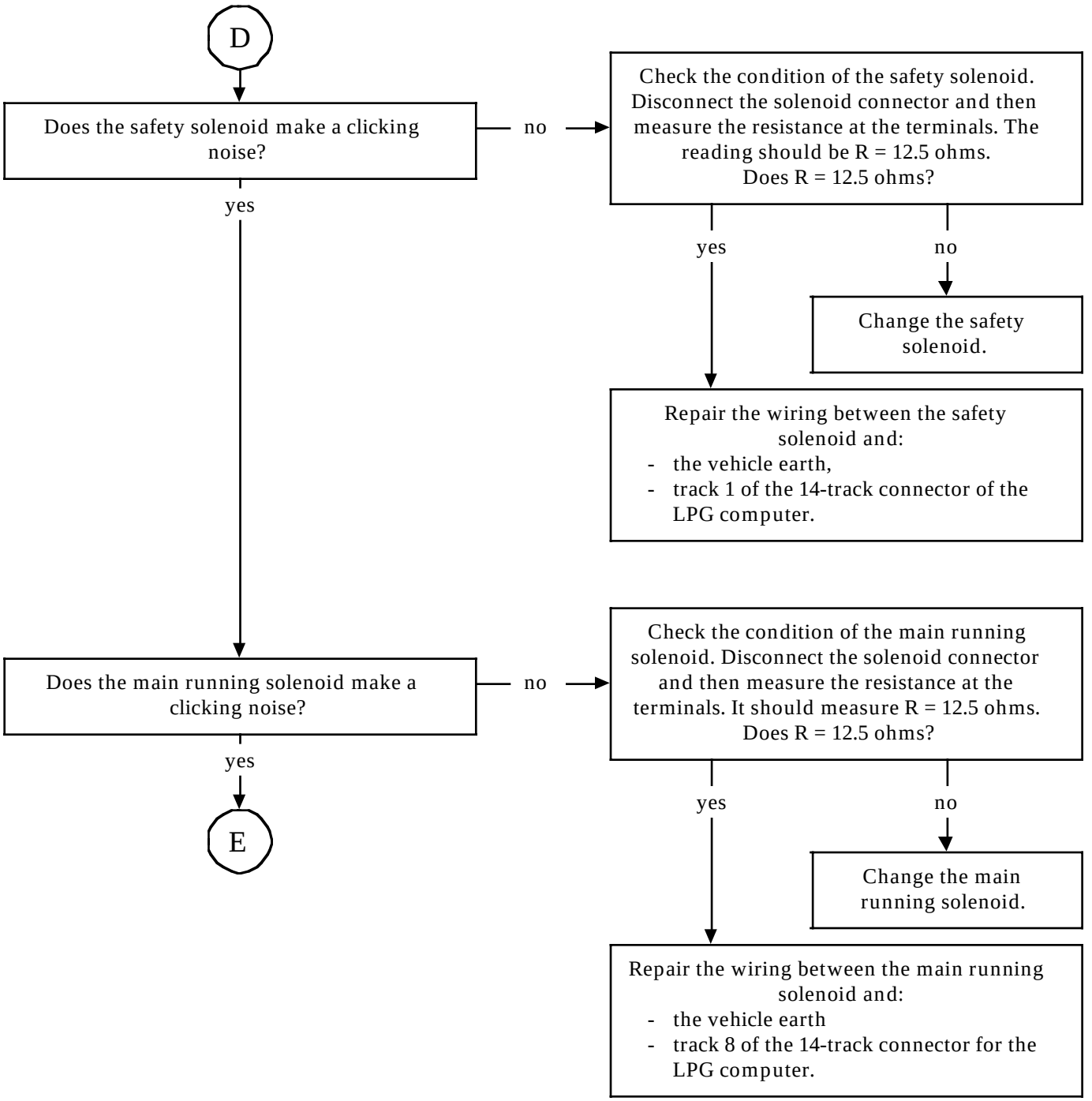
CHART 3
CONTINUED 4



AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

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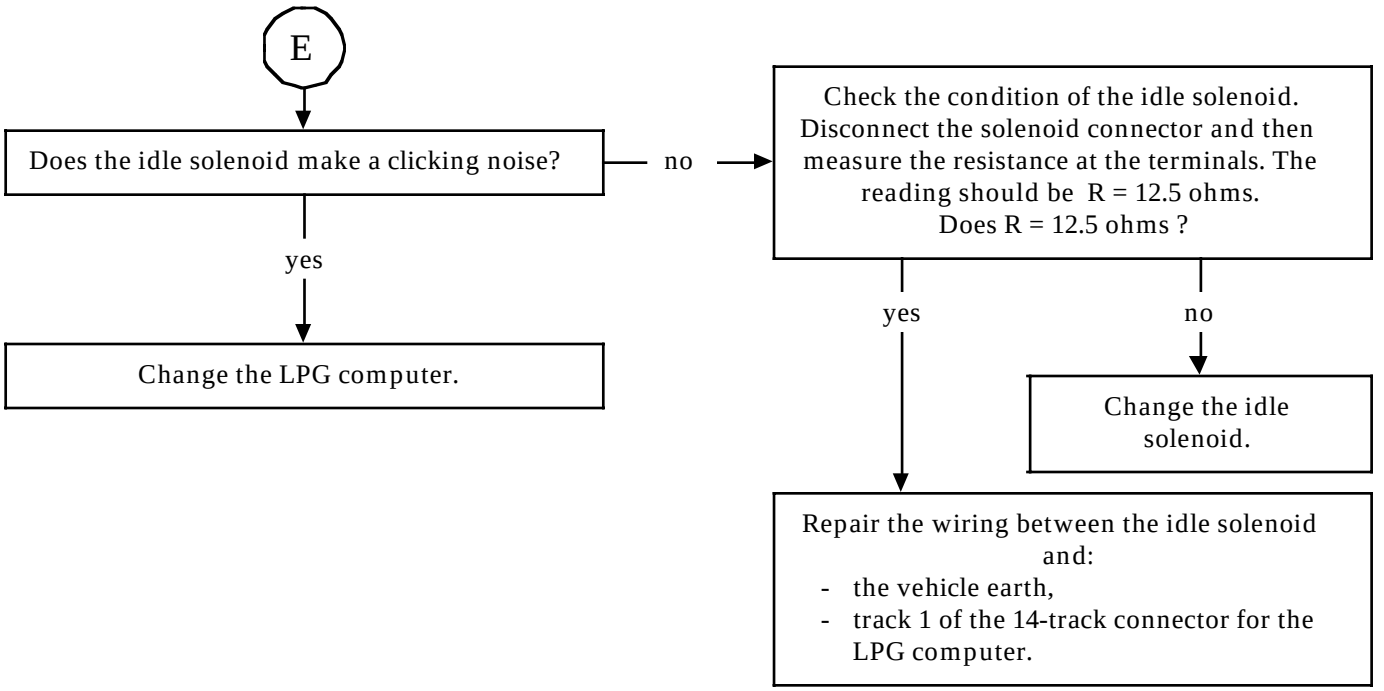
CHART 3
CONTINUED 5



AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

GPL1006.0

CHART 4	DRIVING PERFORMANCE Serious loss of power in LPG mode without any engine hesitation

NOTES	It is essential to follow the general instructions before starting the fault finding procedure.

Check that the two wires of track 6 of the 14-track connector and track 1 of the 10-track connector for the LPG computer are properly connected to each other. Are the two wires properly connected?

no → Reconnect or repair the two wires.

yes

Check the condition of the air filter.
Is the air filter in good condition?

no → Change the air filter.

yes

Connect tracks 1 and 8 of the 14-track connector for the LPG computer to + 12 volts. A click should be heard from each of the solenoids (safety, main and idling).
Can the three solenoids be heard?

no → D

yes

Check the condition of the balancing system.
Make sure that the balancing connector has been drilled correctly.
Check the state of the balancing pipe and the pipe from the pressure-reducing valve.
Make sure that a hole has been drilled at the lowest point of the balancing pipe to allow water to be drained.
Make sure that no pipes are blocked.

Are all these points correct?

no → Repair the faulty component.

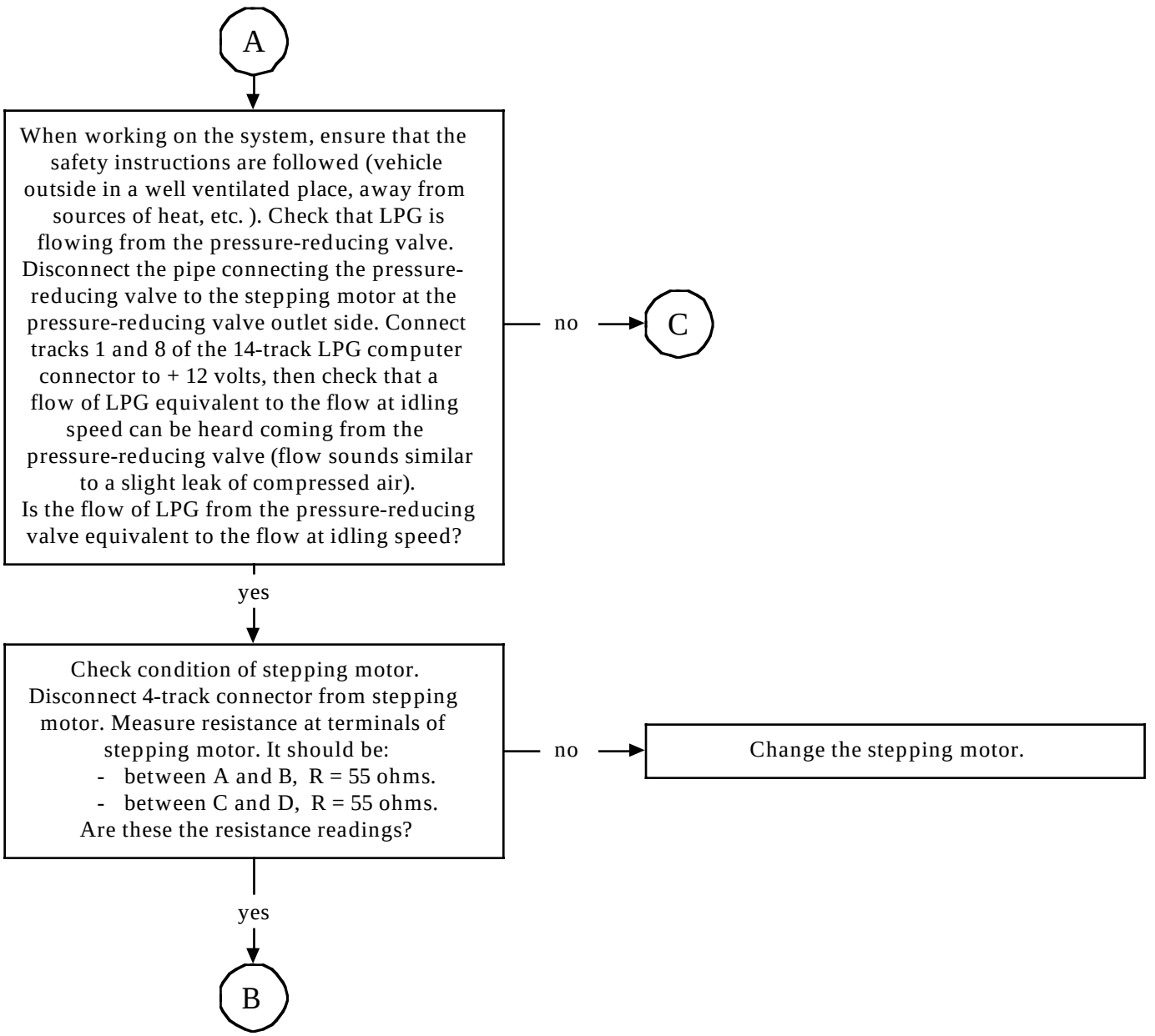
yes

A

AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

GPL1006.0

CHART 4
CONTINUED 1



AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

GPL1006.0

CHART 4
CONTINUED 2

B

Check the continuity and insulation to earth or to 12 volts of the electric wiring between:

stepping motor connector: A → 1, B → 3, C → 4, D → 2 (4-track connector for LPG computer)

Is the wiring in good condition?

no → Repair the faulty wiring.

yes

Check the condition of the stepping motor. Carry out the test procedure for the stepping motor using the method described in the section on "Fault finding - Aid".

Is the stepping motor operating correctly?

no → Change the stepping motor.

yes

Check that the relay for the oxygen sensor is fitted correctly. Check the condition of the electric wiring between track 10 of the 10-track connector for the LPG computer and the oxygen sensor via the relay.
Is the wiring in good condition?

no → Repair the faulty wiring.

yes

Change the LPG computer.

AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

GPL1006.0

CHART 4
CONTINUED 3

C

How much LPG flows from the pressure-reducing valve?

Excessive flow of LPG → Change the pressure-reducing valve.

No flow of LPG or very little flow

Reconnect the pipe coming from the pressure-reducing valve. When working on the system, ensure that the safety instructions are followed (vehicle outside in a well ventilated place, away from sources of heat, etc.).
Check the main running solenoid liquid LPG feed pipe.
Disconnect the main running solenoid inlet pipe. (Caution: LPG may escape from the pipe.) During this operation, take great care to ensure that this pipe is not directed towards a source of heat.
Connect track 1 of the 14-track connector of the LPG computer to+ 12 volts.
Then check that LPG is coming out of the pipe in the form of dense white fog .
Is there a dense white fog of LPG?

no → Change the pressure-reducing valve.

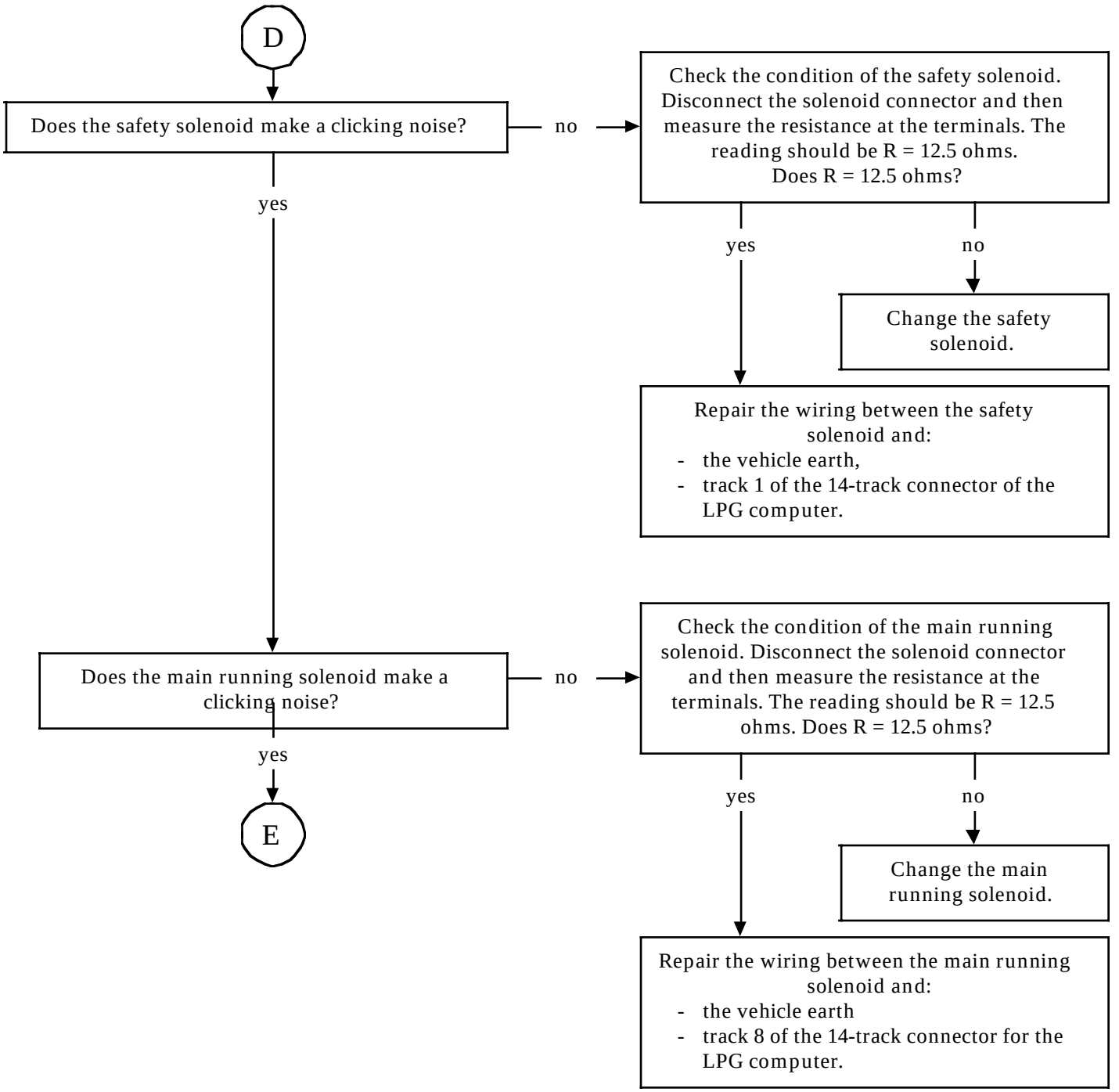
yes

Check and change the fuel filter on the pressure-reducing valve. The fuel filter must be changed every 42,000 miles (60,000 km).

AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

GPL1006.0

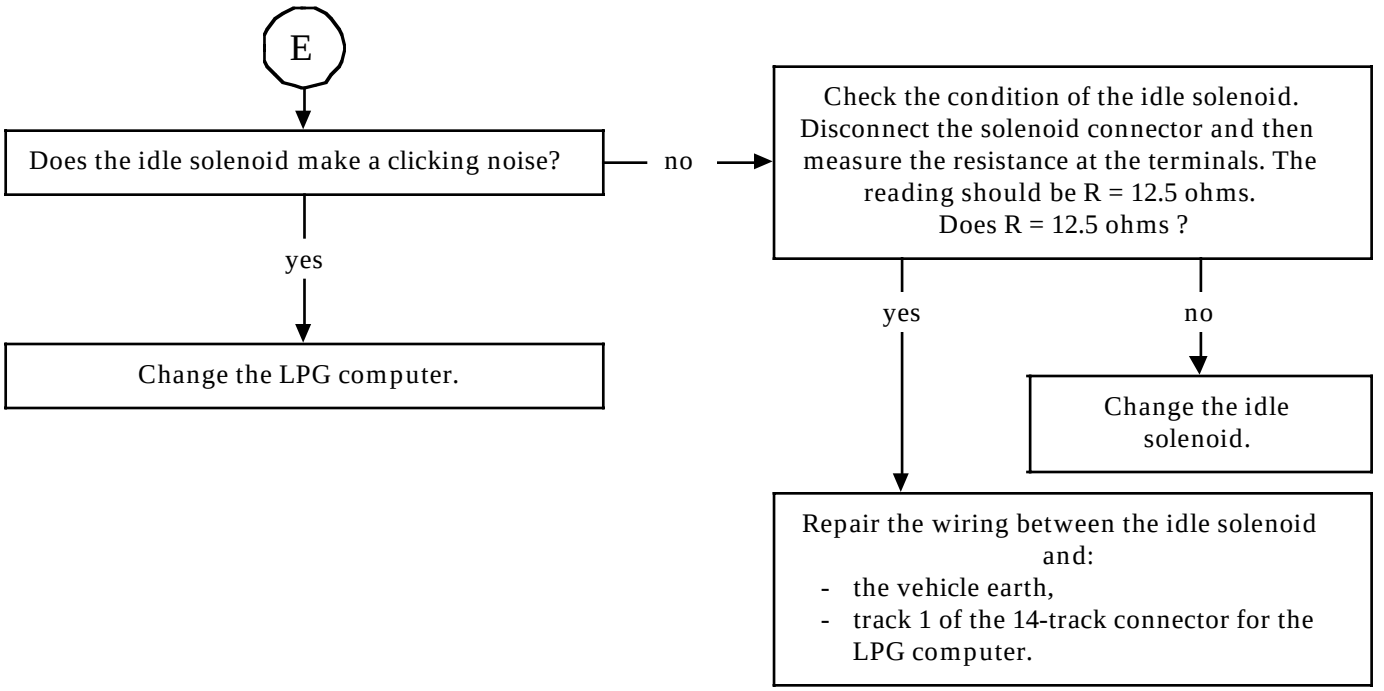
CHART 4
CONTINUED 4



AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

GPL1006.0

CHART 4
CONTINUED 5



AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

GPL1006.0

CHART 5	DRIVING PERFORMANCE When accelerating fully in LPG mode, the engine stalls or the engine speed does not increase

NOTES	It is essential to follow the general instructions before starting the fault finding procedure.

Check that the two wires of track 6 of the 14-track connector and track 1 of the 10-track connector for the LPG computer are properly connected to each other. Are the two wires properly connected?

no → Reconnect or repair the two wires.

yes ↓

Check the condition of the air filter.
Is the air filter in good condition?

no → Change the air filter.

yes ↓

Connect tracks 1 and 8 of the 14-track connector for the LPG computer to + 12 volts. A click should be heard from each of the solenoids (safety, main running and idling).
Can you hear the three solenoids click?

no → D

yes ↓

Check the condition of the balancing system.
Make sure that the balancing connector has been drilled correctly.
Check the state of the balancing pipe and the pipe from the pressure-reducing valve.
Make sure that a hole has been drilled at the lowest point of the balancing pipe to allow water to be drained.
Make sure that no pipes are blocked.

Are all these points correct?

no → Repair the faulty component.

yes ↓

A

AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

GPL1006.0

CHART 5
CONTINUED 1

A

When working on the system, ensure that the safety instructions are followed (vehicle outside in a well ventilated place, away from sources of heat, etc.). Check that LPG is flowing from the pressure-reducing valve. Disconnect the pipe connecting the pressure-reducing valve to the stepping motor at the pressure-reducing valve outlet side. Connect tracks 1 and 8 of the 14-track LPG computer connector to + 12 volts, then check that a flow of LPG equivalent to the flow at idling speed can be heard coming from the pressure-reducing valve (flow sounds similar to a slight leak of compressed air).
Is the flow of LPG from the pressure-reducing valve equivalent to the flow at idling speed?

no → C

yes

Check condition of stepping motor. Disconnect 4-track connector from stepping motor. Measure resistance at terminals of stepping motor. It should be:
- between A and B, R = 55 ohms.
- between C and D, R = 55 ohms.

Are these the resistance readings?

no → Change the stepping motor.

yes

B

AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

GPL1006.0

CHART 5
CONTINUED 2

B

Check the continuity and insulation to earth or to 12 volts of the electric wiring between:

Stepping motor connector: A → 1, B → 3, C → 4, D → 2 (4-track connector for LPG computer)

Is the wiring in good condition?

no → Repair the electric wiring.

yes

Check the condition of the stepping motor. Carry out the test procedure for the stepping motor using the method described in the section on "Fault finding - Aid".

Is the stepping motor operating correctly?

no → Change the stepping motor.

yes

Check that the relay for the oxygen sensor is fitted correctly. Check the condition of the electric wiring between track 10 of the 10-track connector for the LPG computer and the oxygen sensor via the relay.
Is the wiring in good condition?

no → Repair the electric wiring.

yes

Change the LPG computer.

AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

GPL1006.0

CHART 5
CONTINUED 3

C

How much LPG flows from the pressure-reducing valve?

Excessive flow of LPG → Change the pressure-reducing valve.

No flow of LPG or very little flow

Reconnect the pipe coming from the pressure-reducing valve. When working on the system, ensure that the safety instructions are followed (vehicle outside in a well ventilated place, away from sources of heat, etc.).
Check the main running solenoid liquid LPG feed pipe.
Disconnect the main running solenoid inlet pipe. (Caution: LPG may escape from the pipe.) During this operation, take great care to ensure that this pipe is not directed towards a source of heat.
Connect track 1 of the 14-track connector of the LPG computer to+ 12 volts.
Then check that LPG is coming out of the pipe in the form of dense white fog .
Is there a dense white fog of LPG?

no → Change the pressure-reducing valve.

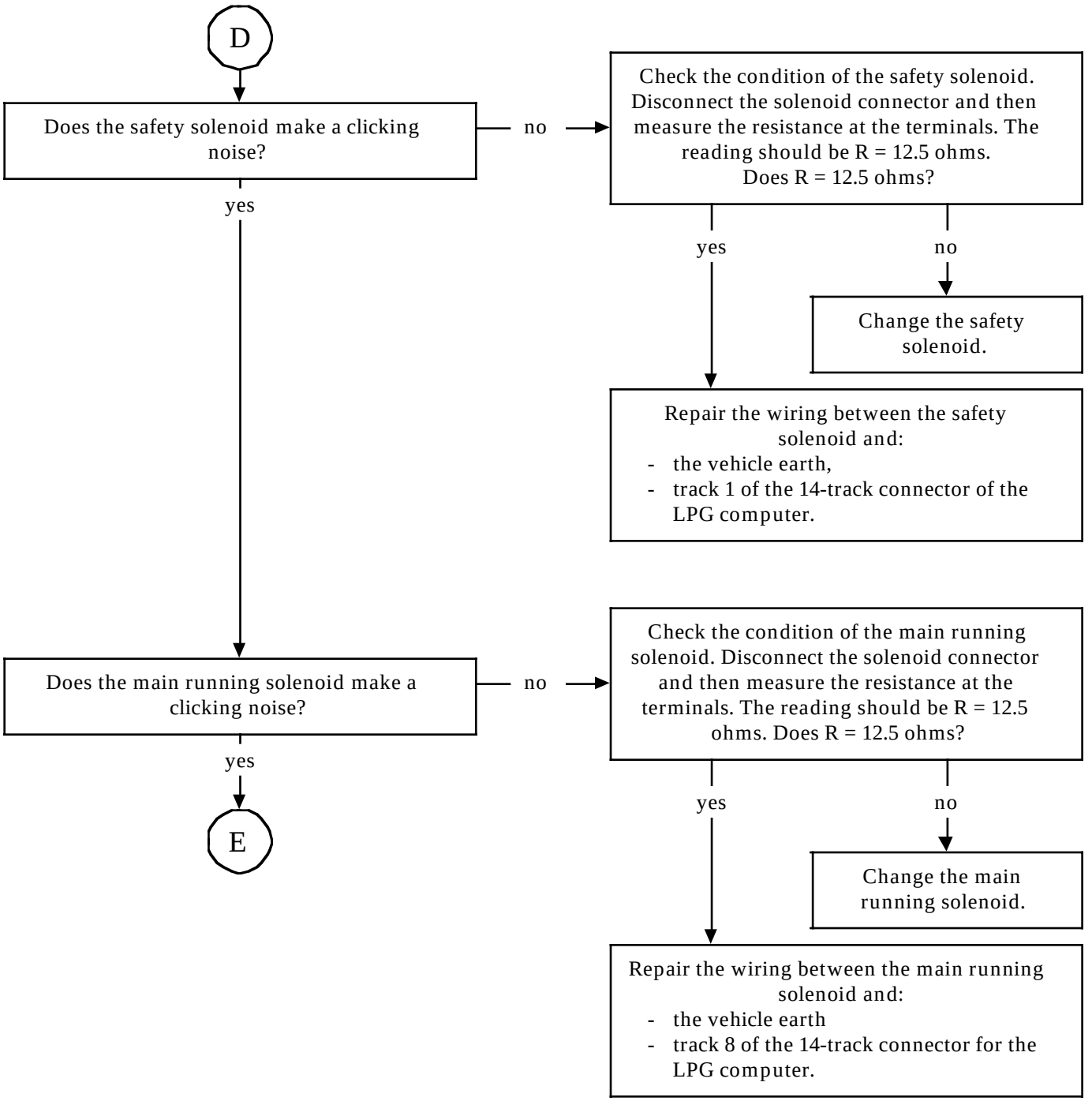
yes

Check and change the fuel filter on the pressure-reducing valve. The fuel filter must be changed every 42,000 miles (60,000 km).

AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

GPL1006.0

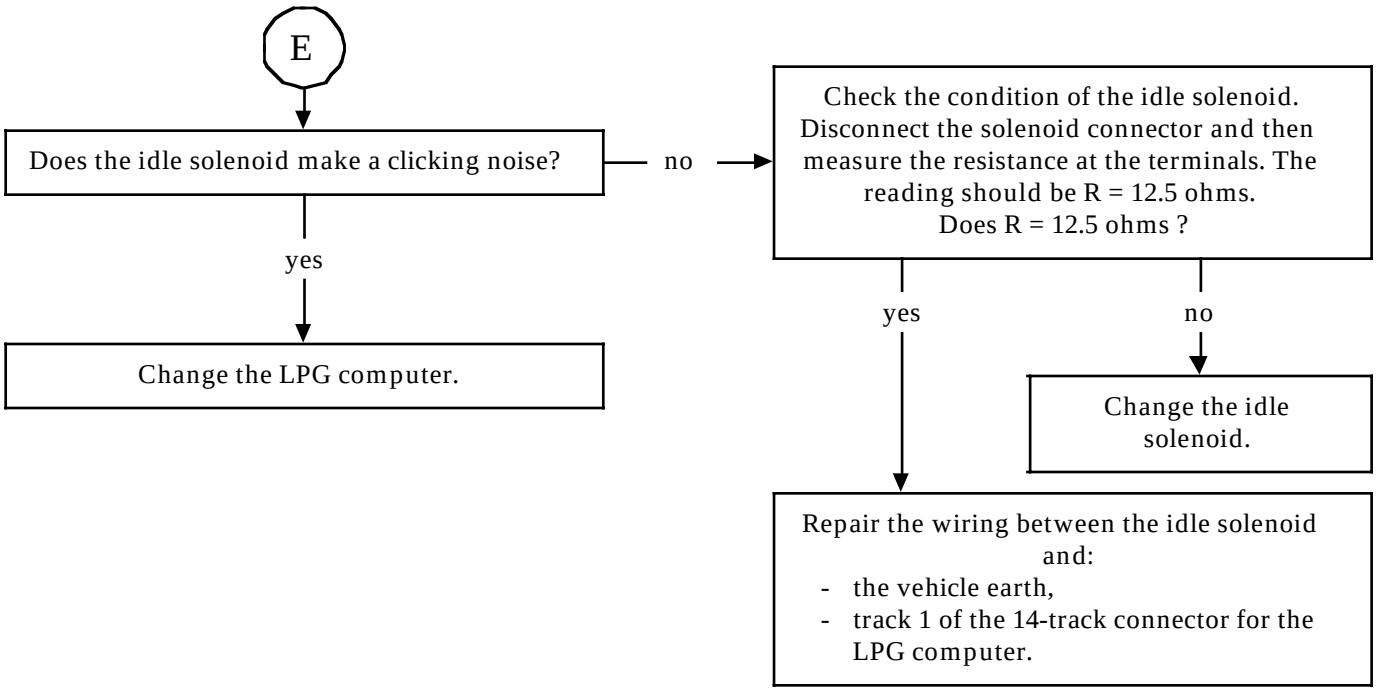
CHART 5
CONTINUED 4



AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

GPL1006.0

CHART 5
CONTINUED 5



AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

GPL1006.0

CHART 6	DRIVING PERFORMANCE The engine starts normally in petrol mode but it stalls the moment it switches to LPG mode

NOTES	It is essential to follow all the general instructions before starting the fault finding procedure. Check that there is some LPG in the tank.

Check the condition of the air filter.
Is the air filter in good condition?

no → Change the air filter.

yes ↓

Check the connections between track 4 of the 6-track LPG connector and track 2 of the throttle valve potentiometer.
Are the connections in good condition?

no → Rectify, if necessary.

yes ↓

Connect tracks 1 and 8 of the 14-track connector on the LPG computer to + 12 volts.
A click should be heard from each of the solenoids (safety, main and idling).
Can the three solenoids be heard?

no → D

yes ↓

Check the condition of the balancing system.
Make sure that the balancing connector has been drilled correctly.
Check the state of the balancing pipe and the pipe from the pressure-reducing valve.
Make sure that a hole has been drilled at the lowest point of the balancing pipe to allow water to be drained.
Make sure that no pipes are blocked.

Are all these points correct?

no → Repair the faulty component.

yes ↓

A

AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

GPL1006.0

CHART 6
CONTINUED 1

A

When working on the system, ensure that the safety instructions are followed (vehicle outside in a well ventilated place, away from sources of heat, etc.). Check that LPG is flowing from the pressure-reducing valve. Disconnect the pipe connecting the pressure-reducing valve to the stepping motor at the pressure-reducing valve outlet side. Connect tracks 1 and 8 of the 14-track LPG computer connector to + 12 volts, then check that a flow of LPG equivalent to the flow at idling speed can be heard coming from the pressure-reducing valve (flow sounds similar to a slight leak of compressed air).
Is the flow of LPG from the pressure-reducing valve equivalent to the flow at idling speed?

no → C

yes

Check condition of stepping motor. Disconnect 4-track connector from stepping motor. Measure resistance at terminals of stepping motor. It should be:
- between A and B, R = 55 ohms.
- between C and D, R = 55 ohms.

Are these the resistance readings?

no → Change the stepping motor.

yes

B

AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

GPL1006.0

CHART 6
CONTINUED 2

B

Check the continuity and insulation to earth or to 12 volts of the electric wiring between:

stepping motor connector

A	→ 1	4-track connector for LPG computer
B	→ 3	
C	→ 4	
D	→ 2	

Is the wiring in good condition?

no → Repair the faulty wiring.

yes

Check the condition of the stepping motor. Carry out the test procedure for the stepping motor using the method described in the section on "Fault finding - Aid".

Is the stepping motor operating correctly?

no → Change the stepping motor.

yes

Change the LPG computer.

AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

GPL1006.0

CHART 6
CONTINUED 3

C

How much LPG flows from the pressure-reducing valve?

Excessive flow of LPG → Change the pressure-reducing valve.

No flow of LPG or very little flow

Reconnect the pipe coming from the pressure-reducing valve. When working on the system, ensure that the safety instructions are followed (vehicle outside in a well ventilated place, away from sources of heat, etc.).
Check the main running solenoid liquid LPG feed pipe.
Disconnect the main running solenoid inlet pipe. (Caution: LPG may escape from the pipe.) During this operation, take great care to ensure that this pipe is not directed towards a source of heat.
Connect track 1 of the 14-track connector of the LPG computer to+ 12 volts.
Then check that LPG is coming out of the pipe in the form of dense white fog .
Is there a dense white fog of LPG?

no → Change the pressure-reducing valve.

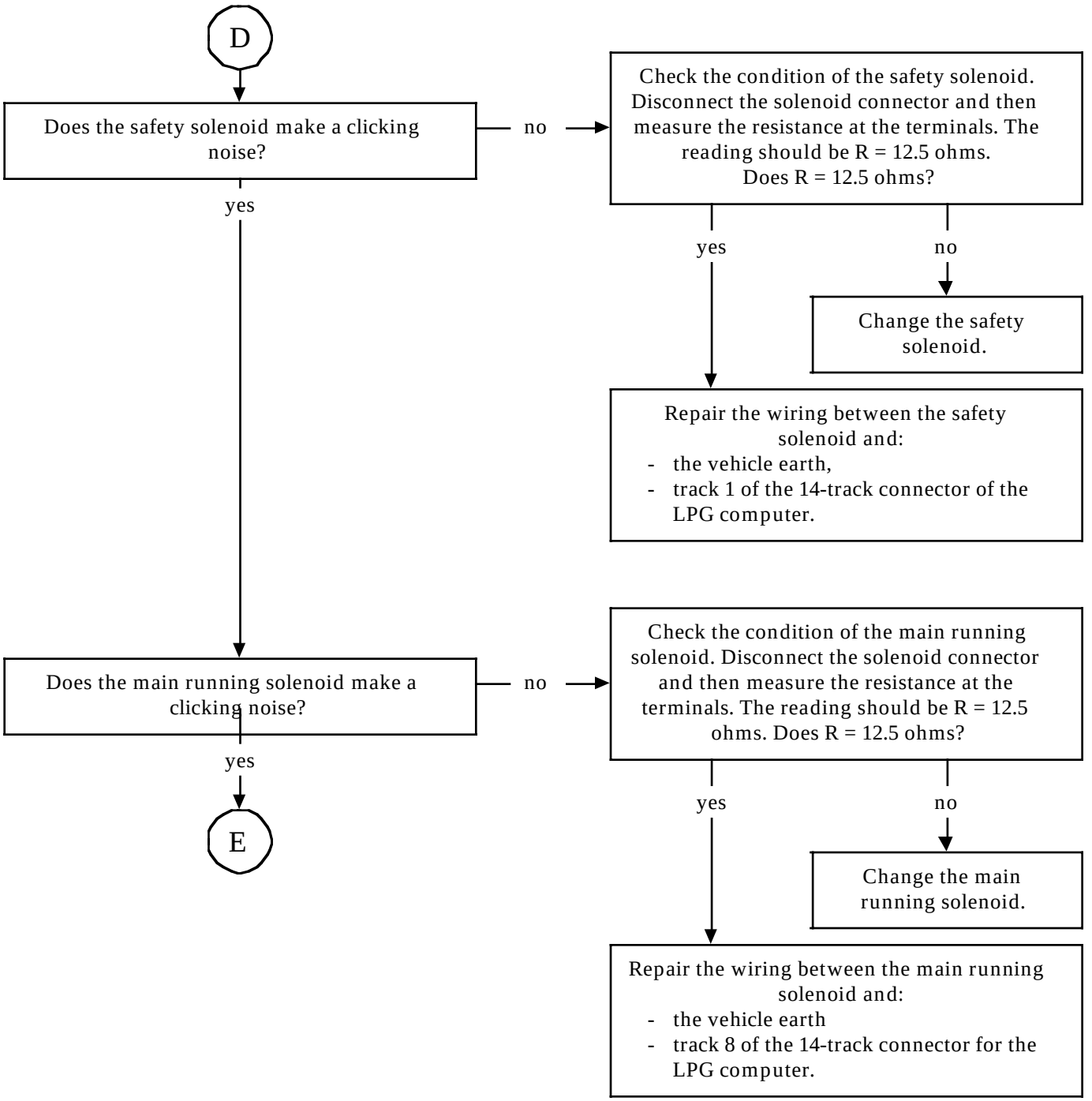
yes

Check and change the fuel filter on the pressure-reducing valve. The fuel filter must be changed every 42,000 miles (60,000 km).

AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

GPL1006.0

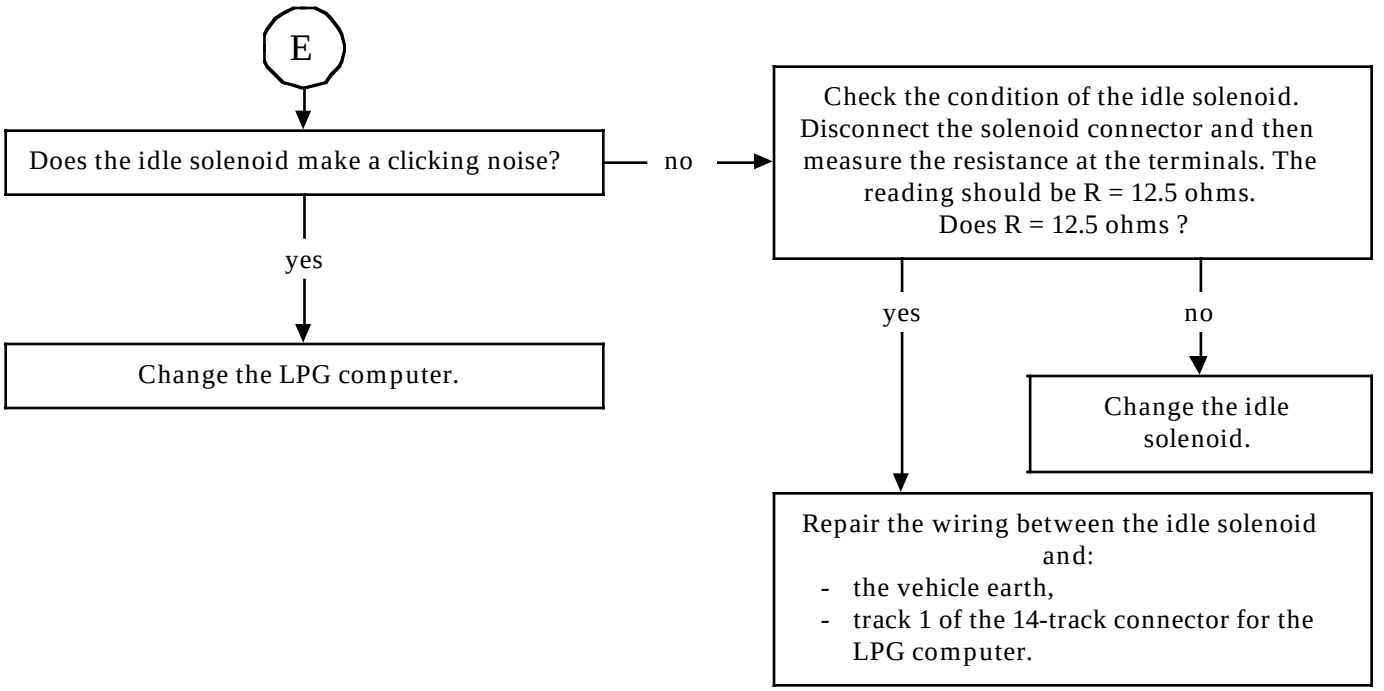
CHART 6
CONTINUED 4



AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

GPL1006.0

CHART 6
CONTINUED 5



AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

GPL1006.0

CHART 7	FUEL GAUGE READING Fuel gauge reading not consistent in LPG mode

NOTES	It is essential to follow the general instructions before starting the fault finding procedure.

With the ignition on, press the fuel selector several times and check that, each time the selector is pressed, the selector tell-tale light changes from red to green (or vice versa).
Does the fuel selector tell-tale light change from red to green (or vice versa)?

no → B

yes ↓

Using a multimeter, measure the resistance at the 14-track connector for the LPG computer (connector plugged in) :

- Measure the following resistances in petrol mode:
  - . Between tracks 3 and 4, the reading should be R ≈ 0 ohm,
  - . Between tracks 2 and 4, the reading should be R = infinity.
- Measure the following resistances in LPG mode:
  - . Between tracks 3 and 4, the reading should be R = infinity,
  - . Between tracks 2 and 4, the reading should be R ≈ 0 ohm.

Are these the resistance measurements?

no → Change the LPG computer.

yes ↓

Check that the potentiometer for the sender unit in the LPG tank has been fitted correctly and aligned correctly in the tank.
Has the potentiometer for the sender unit in the LPG tank been fitted correctly?

no → Refit the sender unit potentiometer correctly in the LPG tank.

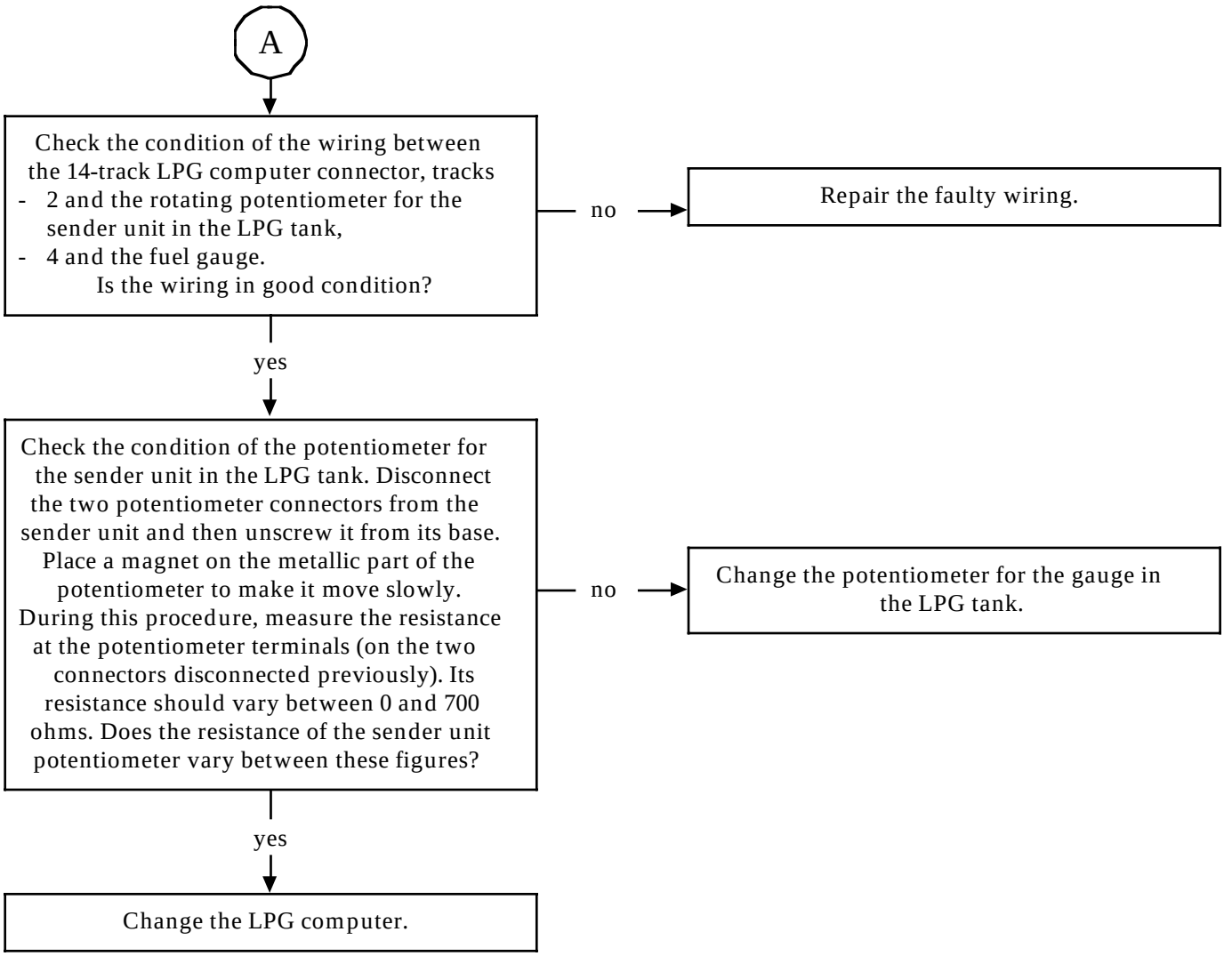
yes ↓

A

AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

LPG 1006.0

CHART 7
CONTINUED 1



AFTER REPAIR	If the potentiometer for the sender unit in the LPG tank has been removed, refit it correctly, ensuring that it is in the correct position in relation to the notch on its base. It is essential to follow the specified procedure when completing the work.

GPL1006.0

CHART 7
CONTINUED 2

B

Disconnect the 6-track connector for the LPG computer. Then measure the resistance between tracks 2 and 3 of the connector on the wiring side. The reading should be:
- Fuel selector pushed in: R ≈ 0 ohm.
- Fuel selector released: R = infinite.

Are these the resistances?

no → Change the fuel selector.

yes

Leave the 6-track connector for the LPG computer disconnected. Switch on the ignition and then measure the voltage between tracks 5 and 6 of the connector on the LPG computer side. The voltage measured should be greater than 9 volts. Is the voltage greater than 9 volts?

no → Change the LPG computer.

yes

Change the fuel selector.

AFTER REPAIR	If the potentiometer for the sender unit in the LPG tank has been removed, refit it correctly, ensuring that it is in the correct position in relation to the notch on its base. It is essential to follow the specified procedure when completing the work.

GPL1006.0

CHART 8	ODOUR OF LPG Odour of LPG in the vehicle or under the bonnet

NOTES	It is essential to follow the general instructions before starting the fault finding procedure.

Make sure the customer has filled up with LPG.
Check if there are any LPG leaks, as follows:

- Check that all connections are free of leaks (from the filler neck to the LPG tank and from the tank to the inlet of the pressure-reducing valve).
- Retighten the connections, if necessary, or replace them. Fit in position the ventilation sleeves and tighten the mounting clamps, if necessary.
- Check the condition of the tanks (welding, etc.).

If the odour persists, retighten the eight screws on each side of the pressure-reducing valve.

AFTER REPAIR	It is essential to follow the specified procedure when completing the work.

GPL1006.0

CHART 9	LPG LEAK LPG leak when filling up the tank

NOTES	It is essential to follow the general instructions before starting the fault finding procedure.

Open the plastic cover on the filler neck.
Make sure the filler neck is in good condition.
Change the filler neck, if necessary.
Check that there are no leaks on the pipe between the filler neck and the LPG tank. (To carry out this operation, the LPG tank must be filled up to its true full level.)
Repair the pipe, if necessary.

AFTER REPAIR	It is essential to follow the specified procedure when completing the work.

CHART 10	OTHER SYMPTOMS Red and green tell-tale lights flash alternately on the fuel selector

NOTES	It is essential to follow the general instructions before starting the fault finding procedure.

Disconnect and then reconnect the battery.
If the fault persists, change the LPG computer.

AFTER REPAIR	It is essential to follow the specified procedure when completing the work.

CHART 11	OTHER SYMPTOMS Impossible to fill LPG tank (LPG fuel gauge indicates low fuel level)

NOTES	This fault finding operation only applies to tanks that are not fitted with an overpressure valve. It is essential to follow the general instructions before starting the fault finding procedure.

There may be excess pressure in the LPG tank and this may damage the sender unit float.

IMPORTANT: If you are not able to purge the tank, it is important not to remove the accessories mounted on the tank. It will be necessary to contact the Renault Technical Department responsible for your country.

AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

GPL1006.0

CHART 12	OTHER SYMPTOMS Impossible to change from petrol mode to LPG mode (the fuel selector will not operate)

NOTES	It is essential to follow the general instructions before starting the fault finding procedure.

With the ignition on, check if the fuel selector tell-tale light is illuminated (green or red).

Is the fuel selector tell-tale light illuminated?

yes → B

no ↓

Check the condition of the 3 A and 7.5 A fuses. Are the fuses in good condition?

no → Change the faulty fuse.

yes ↓

Check that the LPG computer connectors are fitted together correctly.
Are the connectors fitted together correctly?

no → Ensure the connectors are fitted together correctly.

yes ↓

Check that the earth cable is properly screwed on to the side of the LPG computer casing and on the chassis.
Is the earth cable screwed on correctly?

no → Screw the cable back on the LPG computer casing correctly.

yes ↓

With the ignition on, check that ≈ 12 volts are present between track 7 on the 14-track LPG computer connector and the vehicle earth. Is the reading ≈ 12 volts ?

no → Check and repair the wiring for track 7 of the 14-track LPG computer connector.

yes ↓

A

AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

GPL1006.0

CHART 12
CONTINUED 1

A

Check that the 6-track LPG connector from the oxygen sensor relay is fitted together correctly.
Is the connector fitted together correctly?

no → Fit together the 6-track connector correctly.

yes

Check the wiring between:
6-track LPG connector { 1 → 4 } 10-track connector for LPG computer
Is the wiring is in good condition?

no → Repair the wiring.

yes

With the ignition on, check that there are ≈ 12 volts between track 8 of the 10-track connector for the LPG computer and the vehicle earth. Is the reading ≈ 12 volts?

no → Check and repair the electric wiring between track 8 of the 10-track connector for the LPG computer.

yes

Check for the presence of an earth on track 6 of the 14-track LPG computer connector.
Is there an earth?

no → Check and repair the wiring from track 6 of the 14-track connector for the LPG computer.

yes

Disconnect the 6-track connector for the LPG computer. Switch on the ignition and then measure the voltage between tracks 5 and 6 of the connector on the LPG computer side. The voltage measured should be greater than 9 volts. Is the voltage greater than 9 volts?

no → Change the LPG computer.

yes

Change the fuel selector.

AFTER REPAIR

Check that all connectors disconnected during the tests have been properly reconnected.
It is essential to follow the specified procedure when completing the work.

GPL1006.0

CHART 12
CHART 2

B

Check that the 3-track LPG connector is fitted together correctly.
Is the connector fitted together properly?

no → Fit together the 3-track connector correctly.

yes

Check the connector between:

3-track LPG computer { A → 8 conn. 10 tracks; B → 7 conn. 14 tracks; C → 6 conn. 10 tracks } LPG computer

Is the wiring in good condition?

no → Repair the faulty wiring.

yes

Disconnect the 6-track connector for the LPG computer. Then measure the resistance between tracks 2 and 3 of the connector on the wiring side. The reading should be:
- Fuel selector pushed in:
  R ≈ 0 ohm.
- Fuel selector released: R = infinite.

Are these the resistances?

no → Change the fuel selector.

yes

Leave the 6-track connector for the LPG computer disconnected. Switch on the ignition and then measure the voltage between tracks 5 and 6 of the connector on the LPG computer side. The voltage measured should be greater than 9 volts. Is the voltage greater than 9 volts?

no → Change the LPG computer.

yes

Change the fuel selector.

AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

GPL1006.0

CHART 13	OTHER SYMPTOMS The fuel selector tell-tale light is always extinguished

NOTE	It is essential to follow the general instructions before starting the fault finding procedure.

Check the condition of the 3 A and 7.5 A fuses. Are the fuses in good condition?

- no → Change the faulty fuse.
- yes ↓

Check that the 3-track LPG connector is fitted together correctly.
Is the connector fitted together correctly?

- no → Ensure the connector is fitted together correctly.
- yes ↓

Check that the LPG computer connectors are fitted together correctly.
Are the connectors fitted together correctly?

- no → Ensure the connectors are fitted together correctly.
- yes ↓

Check that the earth cable is properly screwed on to the side of the LPG computer casing and on the chassis.
Is the earth cable screwed on correctly?

- no → Screw the cable back on the LPG computer casing correctly.
- yes ↓

With the ignition on, check that ≈ 12 volts are present between track 7 on the 14-track LPG computer connector and the vehicle earth. Is the reading ≈ 12 volts ?

- no → Check and repair the wiring for track 7 of the 14-track LPG computer connector.
- yes ↓

(A)

AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

GPL1006.0

CHART 13
CONTINUED

A

With the ignition on, check that there are ≈ 12 volts between track 8 of the 10-track connector for the LPG computer and the vehicle earth. Is the reading ≈ 12 volts?

no → Check and repair the electric wiring between track 8 of the 10-track connector for the LPG computer.

yes

Check for the presence of an earth on track 6 of the 14-track LPG computer connector. Is there an earth?

no → Check and repair the wiring from track 6 of the 14-track connector for the LPG computer.

yes

Disconnect the 6-track connector for the LPG computer. Switch on the ignition and then measure the voltage between tracks 5 and 6 of the connector on the LPG computer side. The voltage measured should be greater than 9 volts. Is the voltage greater than 9 volts?

no → Change the LPG computer.

yes

Disconnect the 6-track connector for the LPG computer.
Using a multimeter, measure the resistance between tracks 2 and 3 of the 6-trackconnector on the selector side. It should measure:
- selector pressed in, R ≈ 0 ohm,
- selector released, R infinite.

Are these the resistance readings?

no → Change the fuel selector.

yes

Change the LPG computer.

AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

GPL1006.0

METHOD FOR CHECKING THAT THE STEPPING MOTOR IS OPERATING CORRECTLY

- With the ignition on, set the fuel selector for petrol mode (selector tell-tale light illuminated red).
- Switch off the ignition. Remove the stepping motor on the side of the pressure-reducing valve connection.
- Disconnect and then reconnect the battery.
- Switch on the ignition. Move the fuel selector to LPG mode (selector tell-tale light illuminated green). When the fuel selector changes to LPG mode, check that the cone inside the stepping motor moves from stop to stop.

CHECKS AND ADJUSTMENTS AFTER REPAIR

After repair, check that the LPG system is operating correctly.

- Reconnect the battery, if appropriate.
- Switch on the ignition.
- Activate the fuel selector.
- Check that the fuel selector tell-tale light changes colour (red - petrol, green - LPG) each time the selector is pressed. When the switch is moved from petrol to LPG mode or vice versa, check that the fuel display (LPG / petrol) on the instrument panel changes.
- Set switch to petrol position.
- Start the engine and check at idling speed that all the functions operate correctly.
- Switch the ignition off and on. Connect the XR 25 on the diagnostic socket.
  Use the relevant injection fiche for the engine.
  Make sure that the petrol injection is not faulty.
- Fill up with LPG, if necessary.
- Run the engine at idling speed and select LPG mode.
- Make sure there is no LPG leak.
- Check that the fuel display on the instrument panel indicates the correct level for the LPG tank.
- Switch off the ignition. Start the engine in LPG mode.
  Check that the fuel selector tell-tale light is red when the engine is started and that it then switches automatically to green.
- Switch off the ignition. Then carry out an LPG computer calibration procedure. See the section on recalibrating the computer.
- Test for correct regulation in LPG mode, using a tester connected to the oxygen sensor or a digital voltmeter.
- Then test the vehicle on the road.

AFTER REPAIR	Check that all connectors disconnected during the tests have been properly reconnected. It is essential to follow the specified procedure when completing the work.

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