twingo

Kangoo

Clio

TECHNICAL NOTE 3475E

Basic manual: Technical Note 2802B and 3132B

Twingo	**C068 - S068**
Kangoo	**FC0F - KC0F**
Clio II	**BB0F - CB0F**

MULTIPOINT LPG INJECTION

D7F 704 - D7F 744 - D7F 764 - D7F 766 engines

77 11 296 838 **Edition 2 - JUNE 2006** **Edition Anglaise**

Contents

This document deals with **KANGOO XC0F, CLIO XB0F and TWINGO X068** vehicles fitted with **D7F 744, D7F 764, D7F 704 and D7F 766** engines respectively, operating with a dual-fuel system (**LPG** petrol).

This document only deals with vehicles which are fitted with **LPG** as standard.

Vehicles fitted with **LPG** as standard can be recognised using a special means of identification.
Refer to section on **Vehicle plating**.

Duel-fuel vehicles with petrol injection and a **3-track** catalytic converter can be supplied either with unleaded petrol or with **LPG**.

Liquefied petroleum gas is stored in the tank in liquid form.

Changing from one type of fuel to another is achieved using a selector located on the dashboard (off: petrol mode, green light (Kangoo Clio) red light (Twingo): gas mode). A few seconds may pass after the selector has been engaged before the engine switches to **LPG** mode.

LPG is a mixture of butane and propane.

IMPORTANT: in **LPG** mode, the fuel pump is still in action. Consequently, the engine must never be made to operate when the fuel tank is empty (minimum petrol warning light is lit).

Personnel and workshops authorised to repair an LPG vehicle

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

In the same way, only such people may work on **LPG** vehicles for maintenance and repair operations.

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

If the tank cannot be degassed, do not touch it and contact the **French Butane and Propane Commission** by fax at **01 41 97 02 89** or the equivalent body for your country.

DANGER

INSTRUCTIONS WHICH MUST BE FOLLOWED BEFORE STARTING ANY WORK ON THE VEHICLE

The operator must not wear acrylic clothes likely to generate static electricity nor a quartz watch.

All work must be carried out in a well ventilated space. **LPG** is heavier than air in its gaseous form; do not work on the system in a basement garage.

There must not be any flames, sparks or burning cigarettes near the area where work is being carried out.

The battery must be disconnected before removal operations are carried out.

Do not attempt to remove the fuel tank or any of its fixed components, without first having bled it (risk of explosion).

If a major gas leak occurs, the vehicle must be isolated in the open air, away from buildings.

The emergency services may be required to intervene if the situation cannot be controlled.

Do not attempt to open the expansion valve in order to repair it. It is not adjustable.

Do not wash the engine compartment with a vacuum system or using detergent.
These can cause the expansion valve membranes to deteriorate.

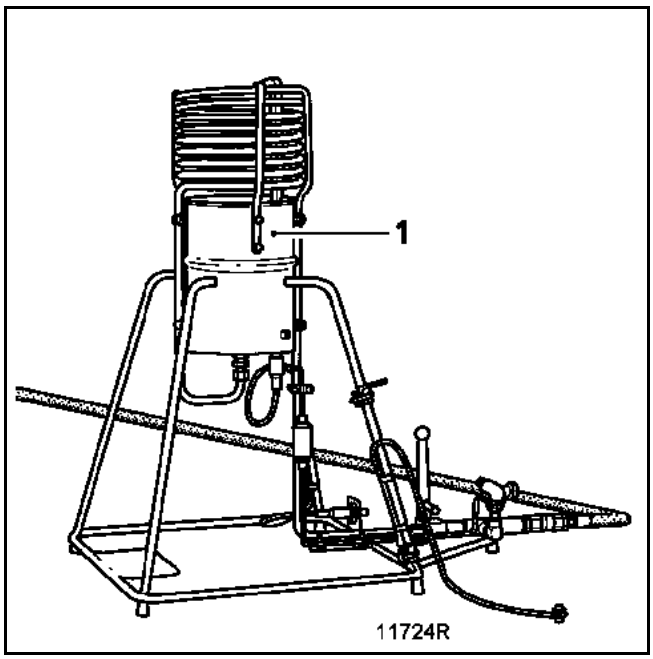
Drain:

– the tank before removing:
  ● the fuel tank,
  ● a component screwed onto the tank.
  (The gas contained in the gas circuit must be bled first).

– the gas contained in the circuit (except for the gas in the tank) before removing:
  ● the filler neck,
  ● the pipes,
  ● the filter,
  ● the expansion valve,
  ● the rail,
  ● the injectors.

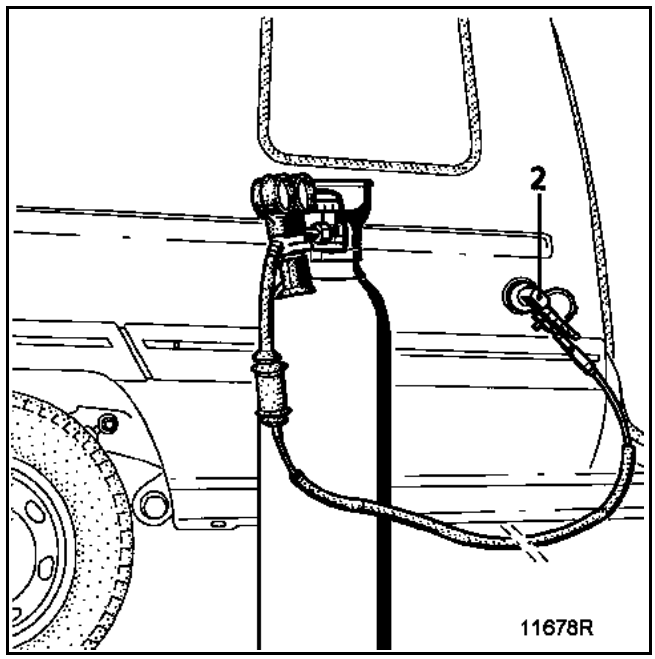
Bleeding the tank

It is essential to use a burner (1) and a nitrogen filler nozzle (2) (tooling described in the equipment catalogue), see bleeding procedure in the **Tank** section. If you cannot degas the tank, do not touch it and contact the **French Butane and Propane Commission** by fax at **01 41 97 02 89** or the equivalent body for your country.



Burner:

Société MUGNIER
Braille
73410 ALBENS
or
Société ALSIA
17-19, route de Bischwiller
67300 SCHILTIGHEIM



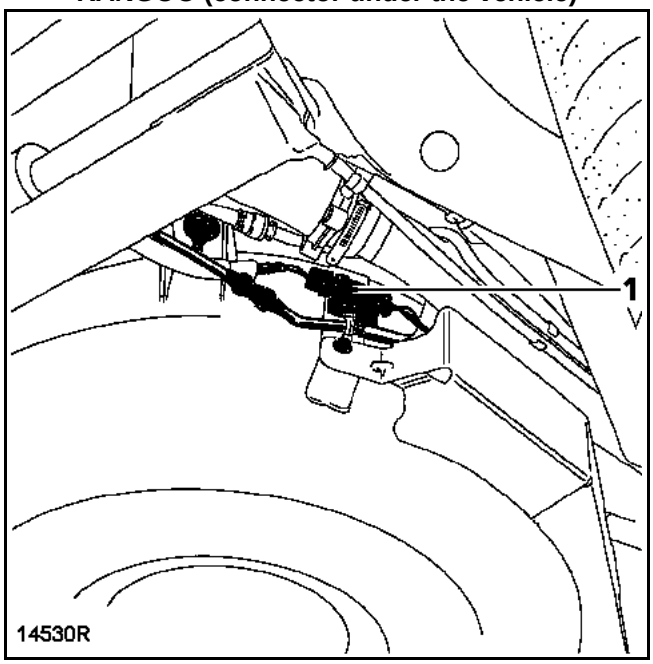
Nozzle:

AUTO TECHNIGAZ
Zone Artisanale
53440 ARON

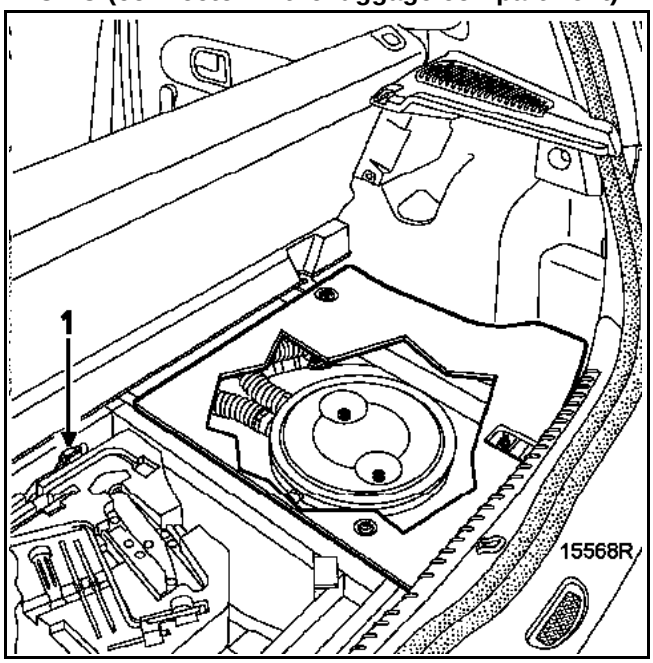
Bleeding the gas contained in the gas circuit (except for the gas in the tank).

To do this, disconnect:
– the battery,
– the safety solenoid valve connector (1) on the tank.

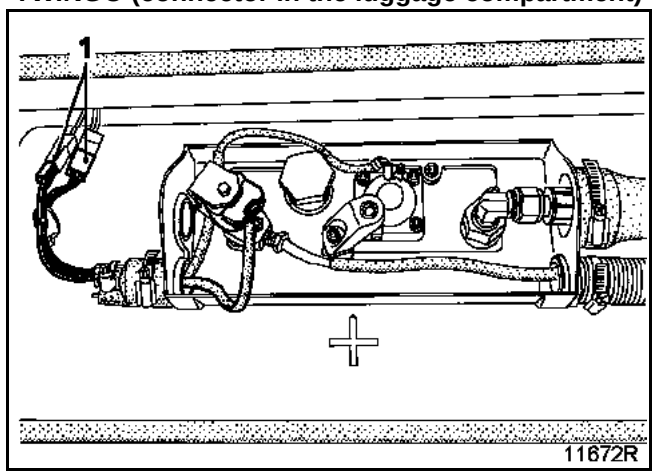
KANGOO (connector under the vehicle)



CLIO (connector in the luggage compartment)

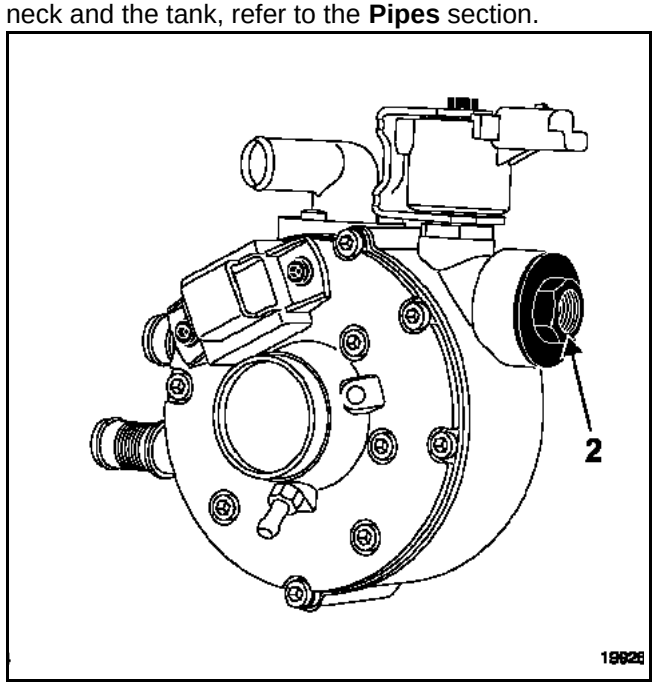


TWINGO (connector in the luggage compartment)



- Put the vehicle outside, connect it to earth with a cable. Remove the battery.
  Apply soapy water or product, part number **77 11 143 071** (leak detector) to the expansion valve high pressure union (2) to identify any gas leaks. Open the gas union slightly. When the **circuit is empty**, open the union completely (put the vehicle inside and operate on it here).

IMPORTANT: this operation does not bleed the **LPG** contained:
– in the pipe between the engine and expansion valve,
– in the expansion valve,
– in the pipe between the filler neck and the tank.
To bleed the **LPG** contained in the pipe between the neck and the tank, refer to the **Pipes** section.



INSTRUCTIONS WHICH MUST BE FOLLOWED AFTER ANY WORK ON THE VEHICLE

After working on a gas union, check that it is not leaking after refitting.

Apply soapy water or the product distributed by **SODICAM**, part number **77 11 143 071** (leak detector) to the open union(s).

Fill the tank with a few litres of **LPG** if the tank has been bled (operation to be carried out with the ignition off).

Check that the gas unions are not leaking.

Start the engine, put it in **gas** mode and check again that there is no leak.

If you detect a leak, retighten the relevant union. If the leak persists, refit the union.

Fill the fuel tank (80 % of total volume). Start the engine, put it in **gas** mode and check that there is no leak.

Check that all the electric connections on the **LPG** kit where you have been working are properly connected.

After refitting, check that all the rubber and encased steel gas pipes are not in contact with any parts that can be accessed by the user and hence are likely to create a gas leak. (Use brackets to keep the pipes apart from one another).

ROAD TESTS (in petrol then gas mode)

Check that the ignition stabilisation time is normal.

Check that the engine does not stall and maintains a stable idling speed until the vehicle comes to a stop under sudden braking.

Put the vehicle in **4th** gear, at a stable speed of **35 mph (60 km/h)**. Check that the vehicle accelerates progressively under full load acceleration.

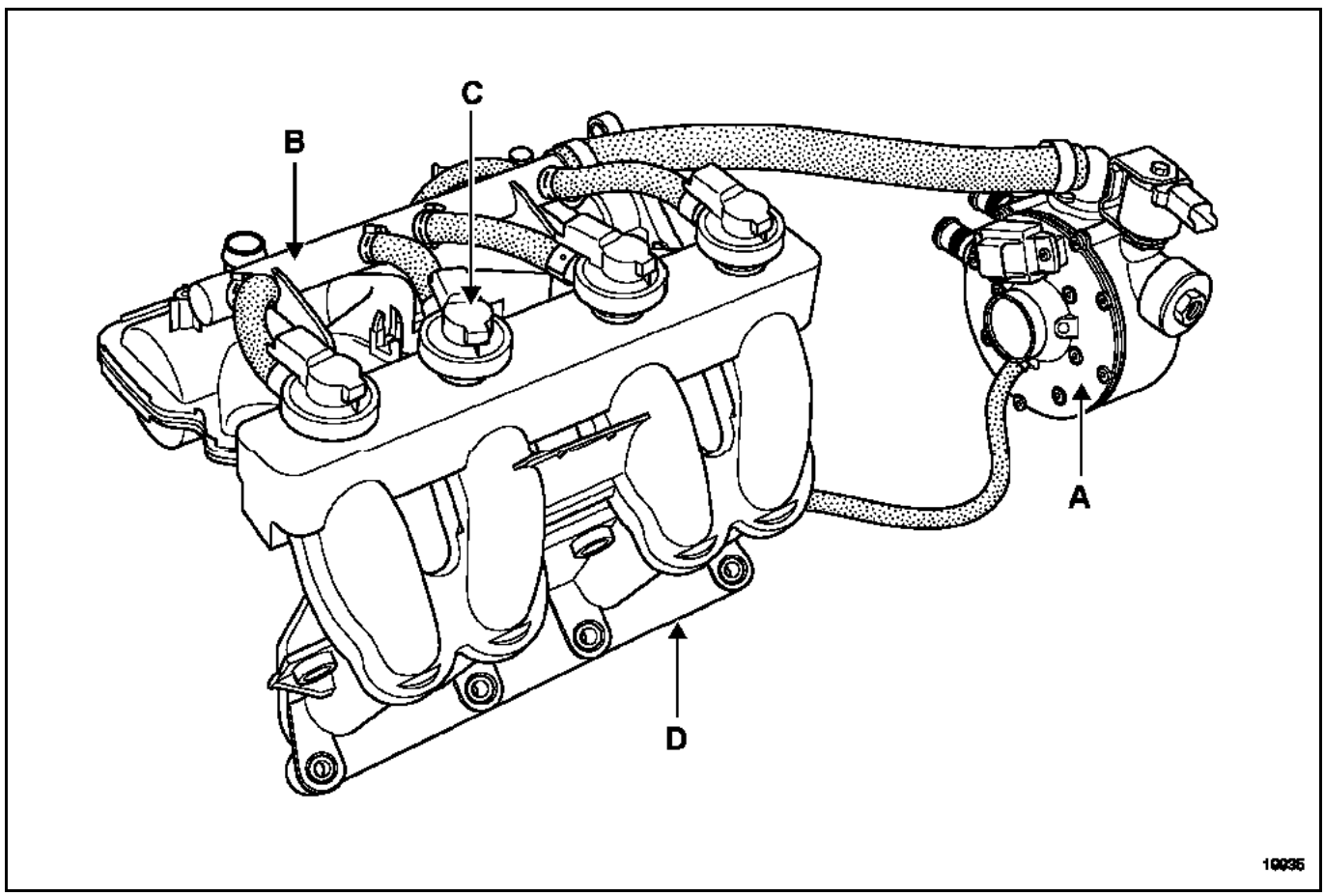
Replace the clips on the gas pipes with new ones after any operation.

The multipoint **LPG** injection system regulated by the oxygen sensor adjusts the proportions of the gas-air mixture so that it is optimal for the catalytic converter. The mixture is called "richness". The optimal ratio is indicated by a richness of **1**. This is the level at which the conversion of **carbon monoxide, hydrocarbon** and **nitrogen oxide** is optimal and the level at which the engine has a good performance/fuel consumption ratio.

The aim is to obtain this ideal mixture as often as possible. This is ensured by a regulation circuit composed of an oxygen sensor (shared with the petrol injection), an **LPG** computer, an expansion valve and four **LPG** injectors (one per cylinder). This regulation circuit corrects any mixture imperfections throughout all of the engine operating phases.

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

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



A Expansion valve
B Rail
C Injectors
D Inlet manifold

SYSTEM OPERATING PRINCIPLE

The liquid gas from the tank passes through the filter and is vaporised in the expansion valve. It is then directed towards the **LPG** injector rail which supplies the four gas injectors. The injectors are individually controlled by the **LPG** computer and they inject gas into the inlet manifold which is just upstream of the petrol injectors.

The amount of gas injected (once per engine cycle and injector), depends on the manifold pressure, the gas pressure measured by the gas pressure sensor, the pedal position (motorised throttle valve potentiometer) and the oxygen sensor signal.

The mixture produced by the injectors is permanently controlled by the oxygen sensor.

OPERATING CONDITIONS

When a request is made for the **LPG** function, the indicator light positioned on the **LPG** control button lights up. The **LPG** indicator light on the instrument panel lights up as soon as the injectors start injecting, during the overlap phase and when the engine operates correctly in LPG mode.

During the starting phase, the engine still starts in petrol mode even if **LPG** mode is requested by the driver.

Switching to **LPG** operating mode is achieved after a delay which depends on the coolant temperature (if the coolant temperature is greater than **20 °C**, **LPG** mode operates almost immediately) or after deceleration.

When the switch is activated, the time delay begins. If the button is pressed again, the time delay starts again from the beginning.

When the **LPG** fuel tank is empty, the engine automatically changes to **Petrol** mode.

Information about the temperature of the gas is assessed from the coolant temperature, air temperature and **LPG** flow.

These vehicles are fitted with a special cylinder head which can operate with **LPG** on a long-term basis.

If the cylinder head has to be changed, ensure that the new one will be able to operate with **LPG** fuel.

Twingo

This vehicle has two distinct fuel level indicators:
– one for **LPG** located under the indicator light bar,
– one for petrol.

On the **Petrol** model, the display depends on the information from the petrol gauge and the distance travelled.

The **LPG** model has an additional earth on the **15-track** display connector which is used to freeze the illumination of the petrol gauge diodes.

In **Petrol** mode, the system returns to normal operation.

BLEEDING THE TANK

BEFORE ATTEMPTING ANY OPERATIONS, READ THE SECTION ON SAFETY ADVICE

Before operating on a component attached to the tank, or before it is removed, bleed the tank.

It is essential to bleed the gas contained in the tank using a bleed screw.

To bleed the tank using a burner (refer to the instruction manual for the equipment).

Disconnect the battery.

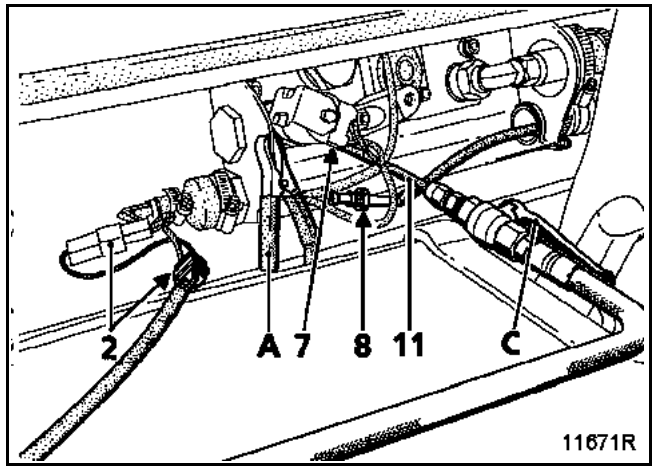
Put the vehicle outside.

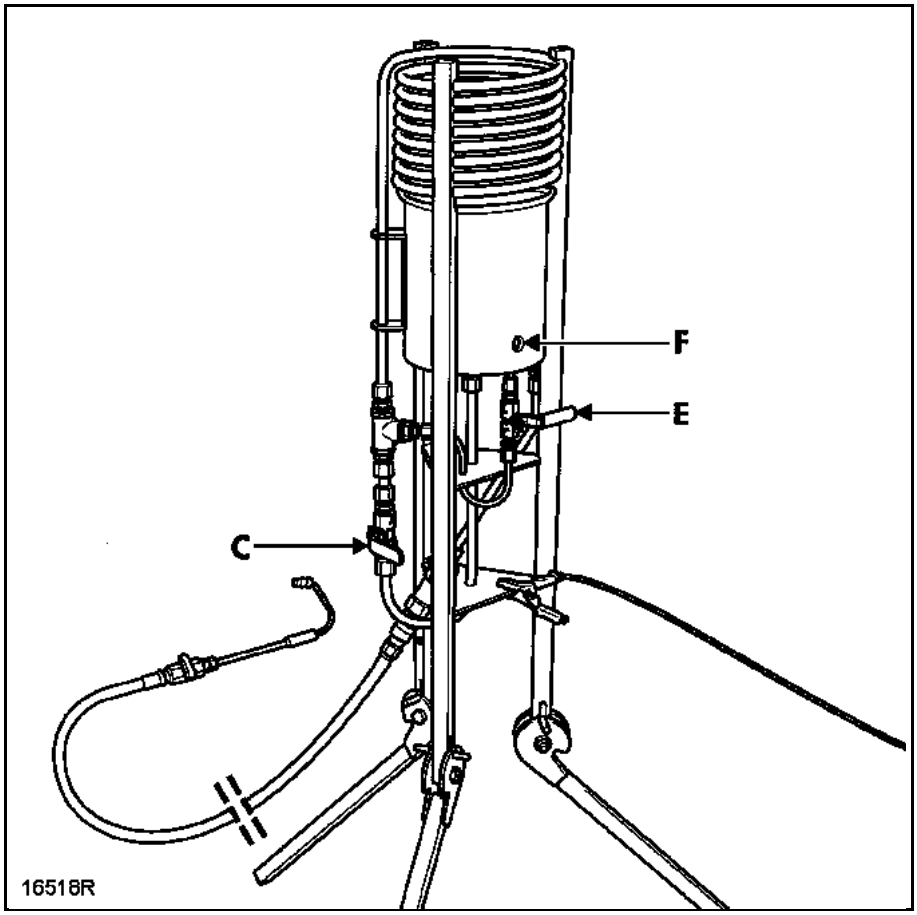
Connect the tank to earth (example A).

With the vehicle in a well-ventilated area and the ignition off, open the union (8) connected to the vehicle flow limiter (bleed the gas in the pipe), put the burner **20 metres** away from any flammable objects (houses, fuel and combustible material, etc.).

Connect the burner to earth.

Connect the gas pipe (11) to the burner (supplied with **10 metres**) and to the flow limiter (7), having checked beforehand that the sealing unions are compatible (olive system).





C Main valve
E Pilot light valve
F Burner pilot light

MUGNIER BURNER

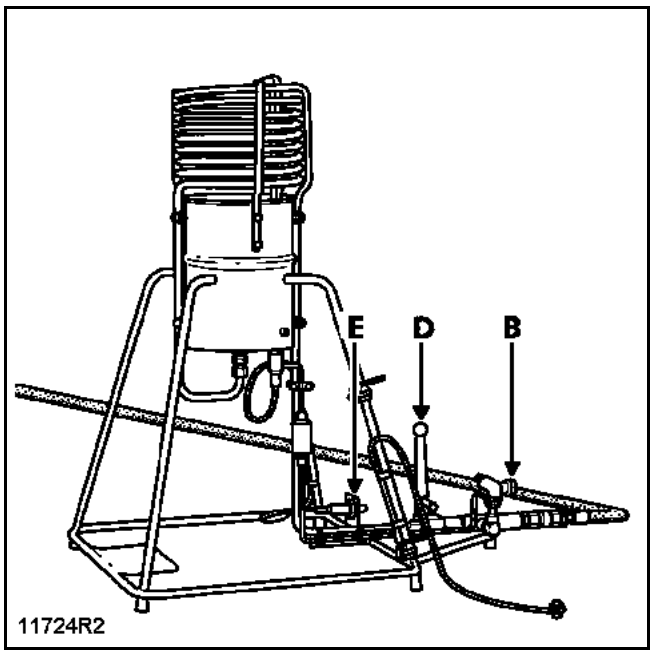
Check that the gas valves on the burner are closed (B), (C) and (D).

Disconnect the solenoid valve then connect the red wire from its connector (2) to **+ 12 Volts** and the black wire to earth (make a local tool with a **3-track** connector and **4 metres** of wire).

Check that there are no leaks from the gas unions between the tank and the burner.

Bleed the air contained in the burner by opening valves (D) and (C) (allow the burner coil to freeze slightly).

Close the valve (D).



Ignite the burner pilot light using the electric ignition system (E), having opened the gas pipe (B) leading to the pilot light beforehand. This cannot be ignited instantly; time must be allowed for the gas to travel through the pipe.

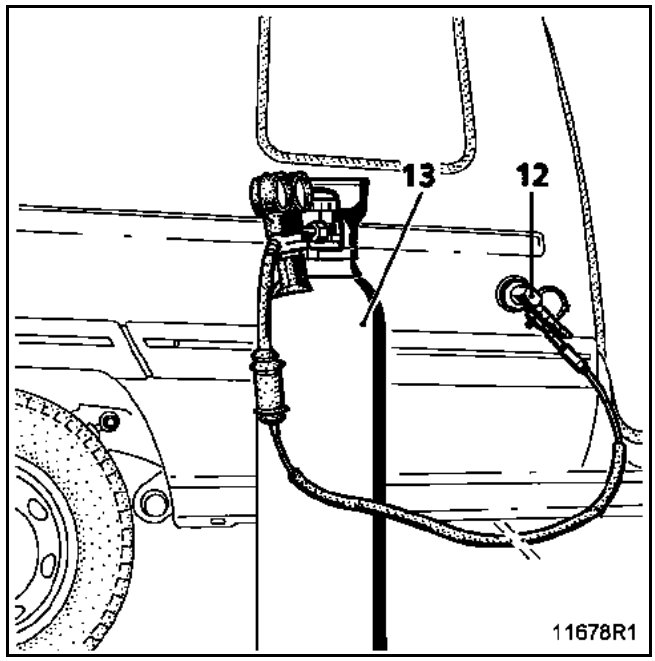
Open the main gas pipe on the burner (C) and (D). The flame can reach **3** to **4 metres** for **30 minutes**.

Too much flow will activate the flow limiter. To prevent this and to bleed the tank correctly, adjust the gas flow by moving the lever (D) (for example, when the main flame is not large enough).

When the flame weakens, use the filler nozzle which connects to the neck (described in the equipment catalogue).

The nozzle (12) is connected to a nitrogen canister (13) which must be adjusted so that it has a pressure output of between **5** and **8 bars**.

Connect the nozzle to the neck.



After a few seconds, the flame should become more powerful.

When the flame goes out, try to relight the burner using the electric system (E).

When the burner cannot be lit again, allow the nitrogen to flow out of the bottle into the tank for **5 minutes**, the main gas pipe on the burner should still be open.

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

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

It should be possible to hear the whistling noise of the gas leaving the burner.

When all the gas has escaped, disconnect the earth and the **12 Volts** connected to the safety solenoid valve connector (2).

Disconnect the gas union connected to the burner on the tank.

ALSIA BURNER

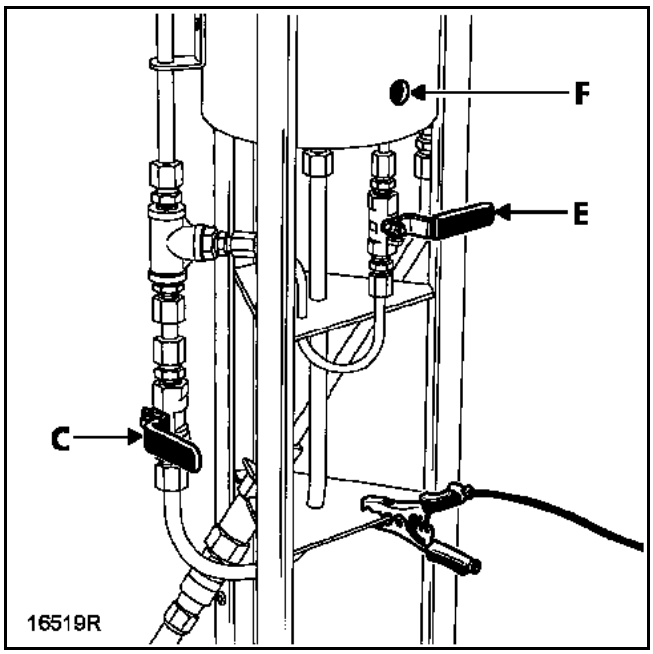
Check that gas valves (C) and (E) are closed.

Disconnect the solenoid valve then connect the red wire from its connector (2) to **+12 Volts** and the black wire to earth (make a local tool with a **3-track** connector and **4 metres** of wire).

Check that there are no leaks from the gas unions between the tank and the burner.

Open the pilot light valve (E) on the burner and ignite it, inserting a flame into the valve (F).

Check that the burner is far enough away from the vehicle and from any red hot objects.



Gradually open the main valve on the burner (C). The flame can reach **3** to **4 metres** for **30 minutes**.

When the burner draws in the gas contained in the tank, the flame gradually changes colour.

When the main flame goes out, allow the pilot light to burn until it goes out so that there is no further pressure in the tank.

Close the main valve (C) in order to complete the bleeding operation with the pilot light.

Try to ignite the pilot light again to check that the tank has been fully bled.

Then close the pilot light valve (E).

If necessary, flush the tank using a nozzle (12) and a nitrogen canister (13).

Connect the nozzle to the neck and adjust the flow to a pressure of between **5** and **8 bars**.

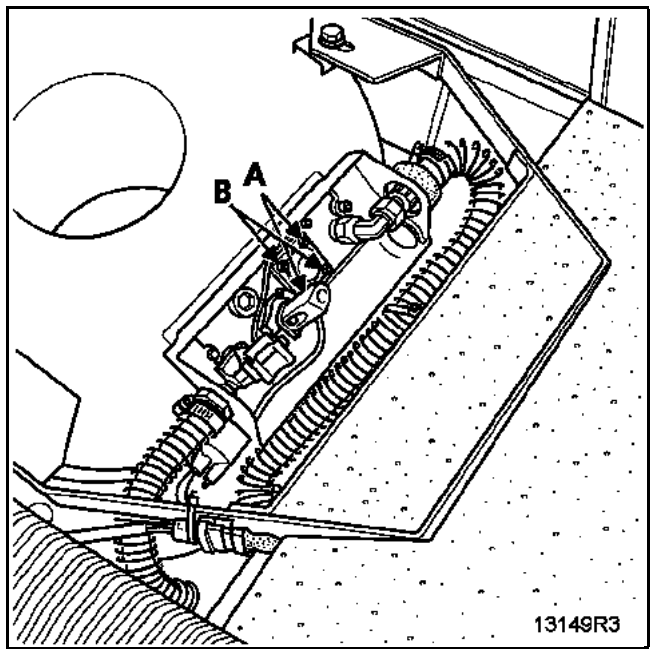
Open the main valve (C).

Allow nitrogen to flow from the bottle for **5 minutes**. Shut off the flow from the nitrogen canister and disconnect the solenoid valve on the tank.

Eliminate the residual pressure left in the tank; remove the two bolts (A) securing the gauge plunger. Replace them with two longer bolts. When they are secure, remove the other two bolts (B).

Lift the gauge carefully.

When the pressure has been released, remove the two long bolts then the plunger from the gauge. Leave the vehicle outside for a few minutes with the door open before moving it back into the workshop.



WARNING: if you cannot bleed the tank, do not remove the accessories attached to it. Contact the **French Butane and Propane Commission** by fax at **01 41 97 02 89**, or the equivalent body for your country, who will send out a specialist.

REMOVAL

BEFORE ATTEMPTING ANY OPERATIONS, READ THE SECTION ON SAFETY ADVICE

Bleed the **LPG** contained in the gas circuit. It is not necessary to bleed the tank.

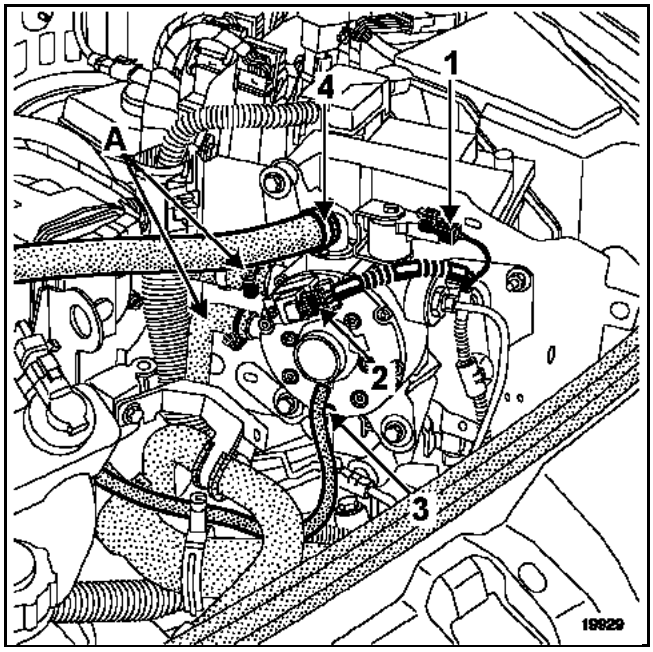
See section **Safety advice**.

Disconnect the battery.

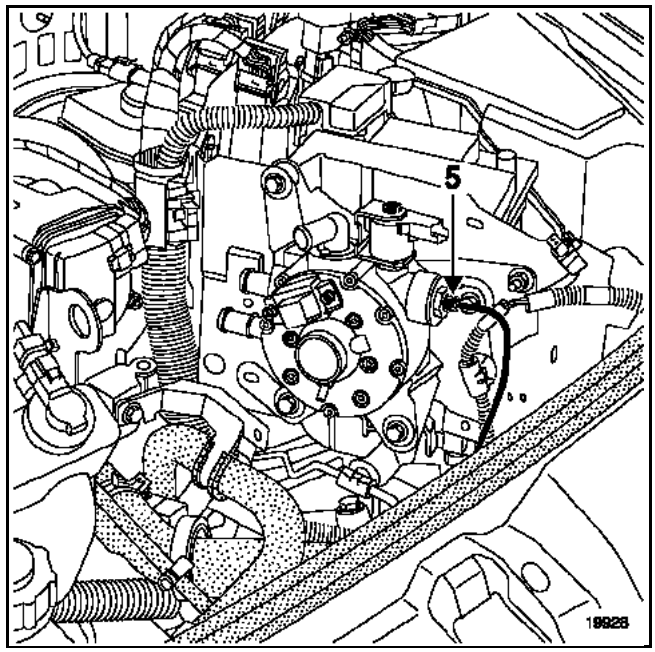
Fit a set of hose clamps onto the pipes coming from the engine cooling system.

Undo the two clips and take out the two hoses (A).

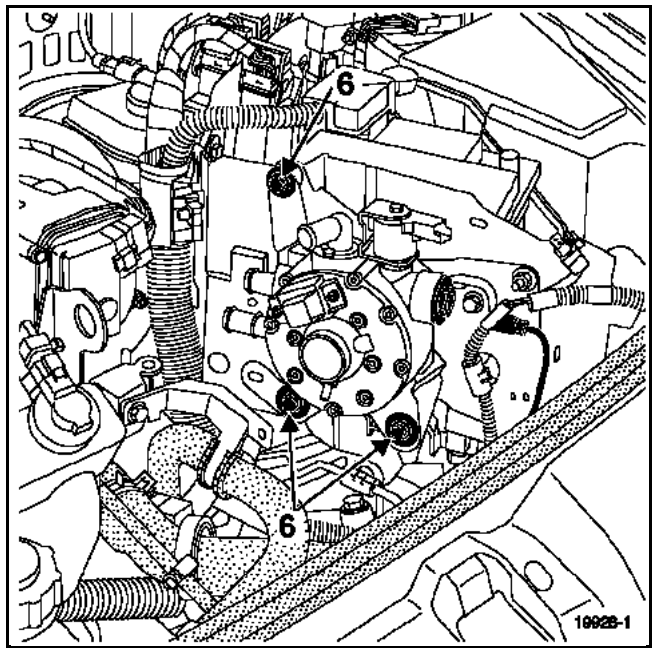
Disconnect:
– the main solenoid valve (1),
– the gas pressure sensor (2),
– the inlet manifold pressure signal pipe (3).



Remove:
– the rail/expansion valve gas pipe (4),
– the rigid pipe (5) supplying gas to the expansion valve,



– the expansion valve/support assembly mounting bolts (6), m
– the expansion valve with its support, then its support.



REFITTING

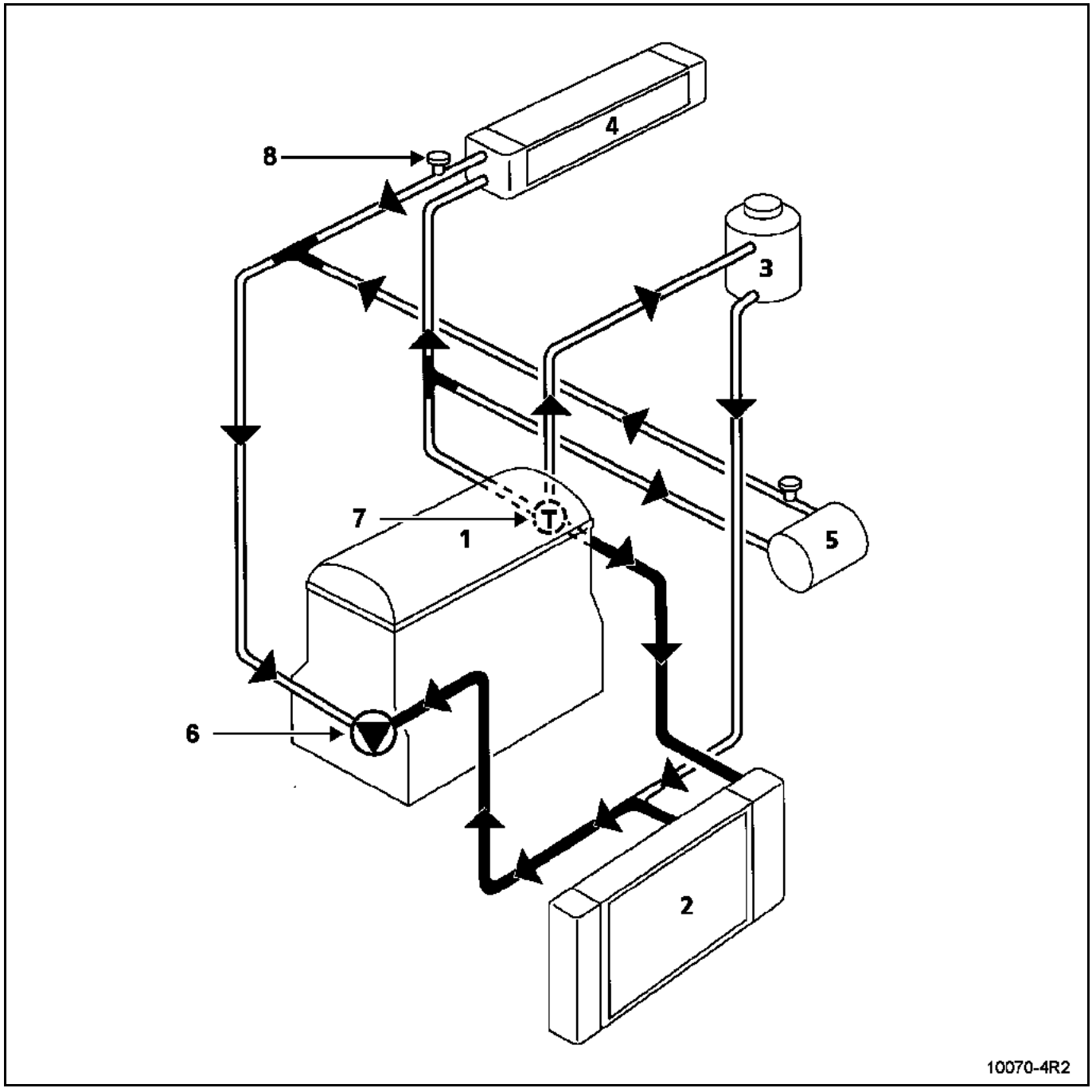
Refit in the reverse order to removal.

Replace the clips on the rail/expansion valve gas pipe.

Clean the threads of the expansion valve rigid gas supply pipe then wrap them with teflon three or four times in the direction of tightening.

AFTER ANY OPERATION ON THE GAS CIRCUIT, CHECK THAT THERE ARE NO LEAKS BY FOLLOWING THE PROCEDURE DESCRIBED IN THE SAFETY ADVICE SECTION.

COOLANT CIRCUIT



1 Engine
2 Radiator
3 **"Hot"** bottle with permanent degassing
4 Heater matrix
5 Expansion valve
6 Water pump
7 Double action thermostat
8 Bleed screws

The expansion bottle valve is dark brown in colour.

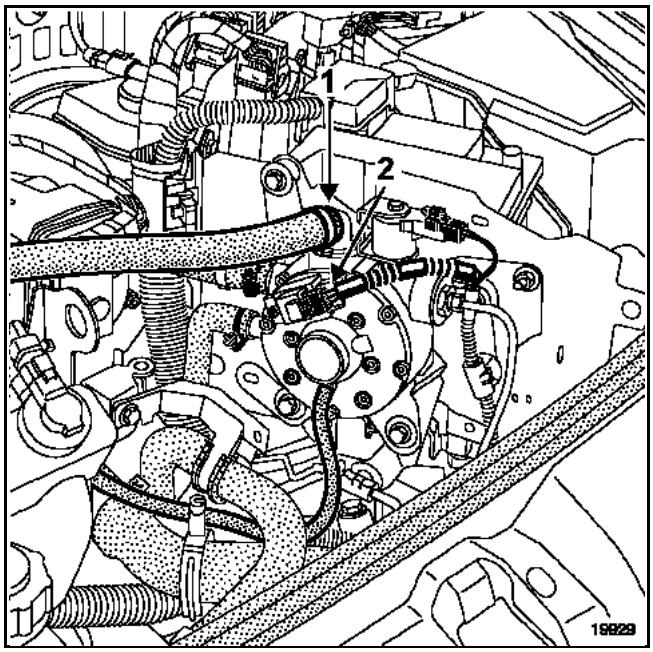
REMOVAL

BEFORE ATTEMPTING ANY OPERATIONS, READ THE SECTION ON SAFETY ADVICE

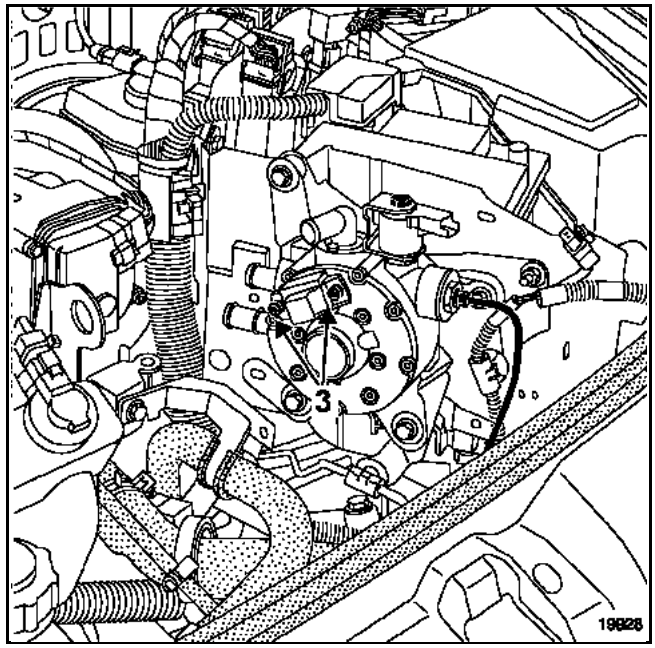
Bleed the **LPG** contained in the expansion valve.

To do this:
– put the vehicle outside,
– disconnect and remove the battery,
– remove the clip (1) from the rail/expansion valve gas pipe,
– disconnect the rail/expansion valve gas pipe and allow the gas to escape.

Disconnect the pressure sensor (2).



Remove:
– the two pressure sensor mounting bolts (3),
– the pressure sensor.



REFITTING

To enable the sensor to be refitted, the seal must be lubricated with engine oil.

Proceed with refitting in the reverse order to removal. Replace the rail/expansion valve pipe clip with a new clip.

AFTER ANY OPERATION ON THE GAS CIRCUIT, CHECK THAT THERE ARE NO LEAKS BY FOLLOWING THE PROCEDURE DESCRIBED IN THE SAFETY ADVICE SECTION.

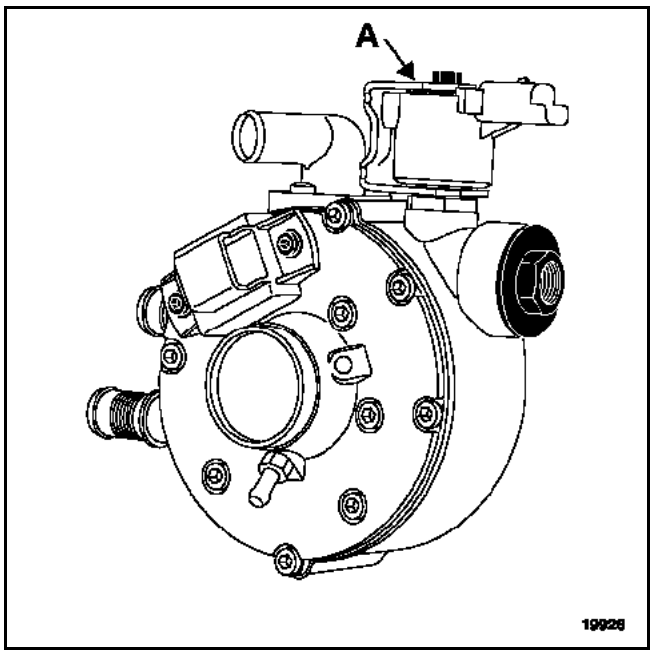
CONNECTION

Track	Description
1	Sensor supply (+ 5 V)
2	Signal
3	Earth

LOCATION

The main solenoid valve (A) is located on the expansion valve. It has a resistance of **12.6 ± 0.7 Ohms**.

It is supplied with **12 Volts**.



OPERATION

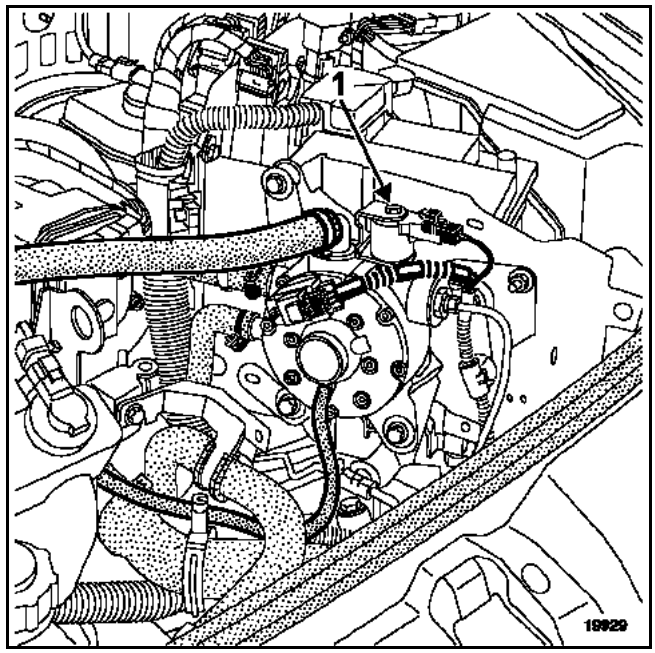
It is controlled by the **LPG** computer. This computer authorises the supply of fuel to the expansion valve when a request is made for the vehicle to operate in **LPG** mode and when an engine speed signal is present.

REMOVAL

The circuit does not need to be drained when the main solenoid valve coil is removed.

Disconnect:
– the battery,
– the main solenoid valve connector.

Remove:
– the solenoid valve coil mounting bolt (1),
– the solenoid valve coil.



REFITTING

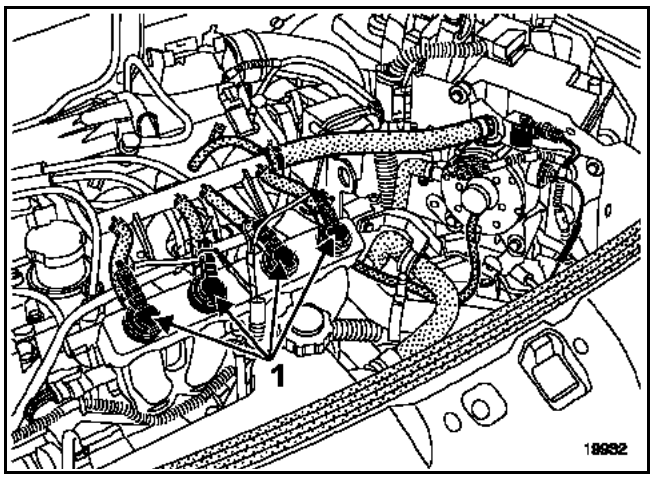
Refit in the reverse order to removal.

PURPOSE AND OPERATION

The gas injectors (1) are controlled individually by the **LPG** computer. They receive **LPG** in gas form from the rail and inject the gas just upstream of the inlet valve (near the petrol injectors).

As for petrol injectors, the amount of gas injected depends on the opening time of the injector.

In contrast to the previous **LPG** dual-fuel systems, the gas is injected and regulated by the richness regulation loop (oxygen sensor) in all engine operating ranges.



The injectors are supplied by track 1 and are controlled by the earth of track 2.

Resistance of injector: **22** ± **1 Ohms** at **20 °C**.

IMPORTANT: all injectors removed must be replaced.

REMOVAL

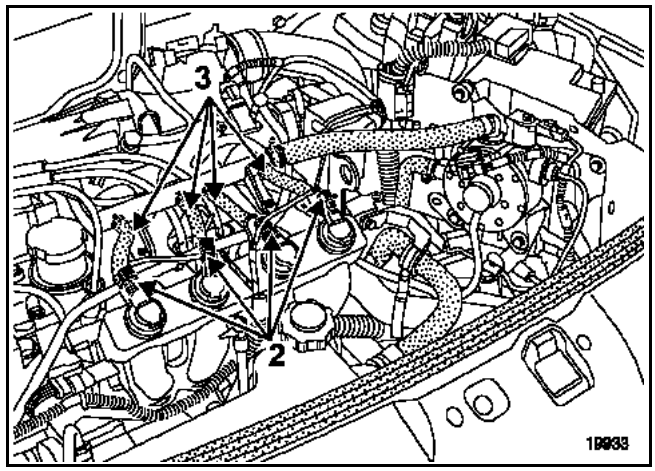
BEFORE ATTEMPTING ANY OPERATIONS, READ THE SECTION ON SAFETY ADVICE.

Bleed the **LPG** contained in the expansion valve.

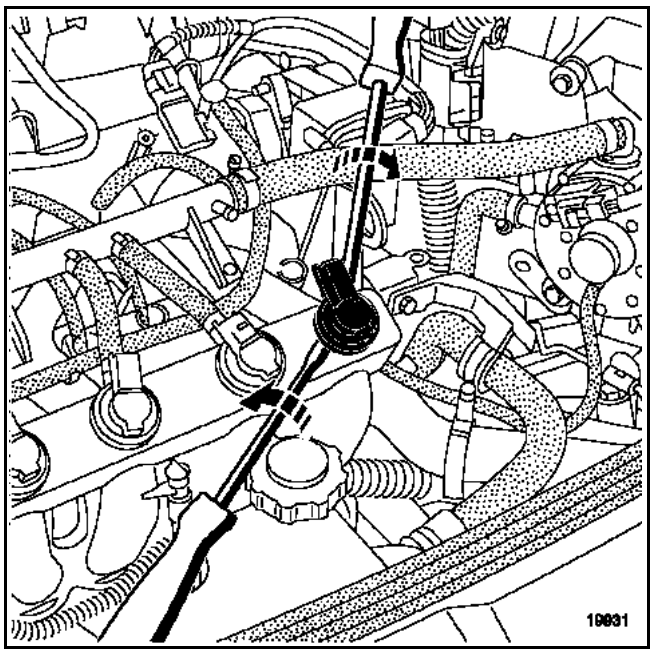
To do this:
– put the vehicle outside,
– disconnect and remove the battery,
– remove the clip from the rail/expansion valve gas pipe,
– disconnect the rail/expansion valve gas pipe and allow the gas to escape.

Disconnect:
– the injector connectors (2).

Remove:
– the injector/rail gas pipe clips
– the gas pipes (3).



Remove the injector using two flat-blade screwdrivers, inserting them between the injector and the manifold and then rotating the screwdrivers.

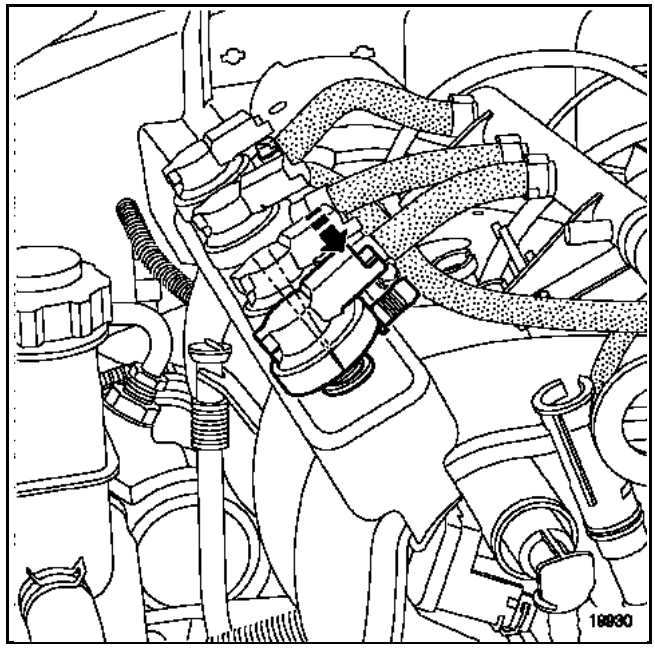


REFITTING

All injectors that have been removed must be replaced by new injectors as well as all LPG hose clips.

To enable the injectors to be refitted easily, it is recommended that the seals and injector retaining ring are lubricated with engine oil.

Refitting:
– position the cut section of the retaining ring towards the injector's **LPG** supply end piece,
– position the injector in its support, pivoting it backwards to engage the ring,
– press on the injector, pivoting it forwards (see drawing) in order to engage it completely.



Proceed in the reverse order to removal for the other refitting operations.

AFTER ANY OPERATION ON THE GAS CIRCUIT, CHECK THAT THERE ARE NO LEAKS BY FOLLOWING THE PROCEDURE DESCRIBED IN THE SAFETY ADVICE SECTION.

REMOVAL

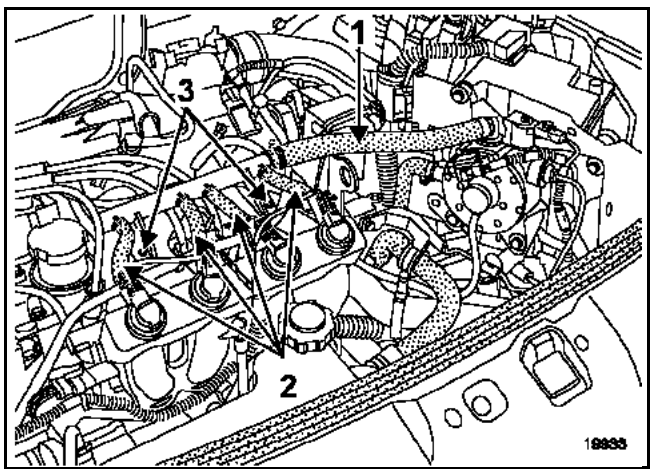
BEFORE ATTEMPTING ANY OPERATIONS, READ THE SECTION ON SAFETY ADVICE.

Bleed the **LPG** contained in the gas circuit. It is not necessary to bleed the tank.

See section **Safety advice**.

Disconnect the battery.

Remove:
– the rail/expansion valve gas pipe (1),
– the injector/rail gas pipes (2),
– the two injector rail mounting bolts (3),
– the injector rail.



REFITTING

Replace the clips on the **LPG** hoses.

Refit in the reverse order to removal.

AFTER ANY OPERATION ON THE GAS CIRCUIT, CHECK THAT THERE ARE NO LEAKS BY FOLLOWING THE PROCEDURE DESCRIBED IN THE SAFETY ADVICE SECTION.

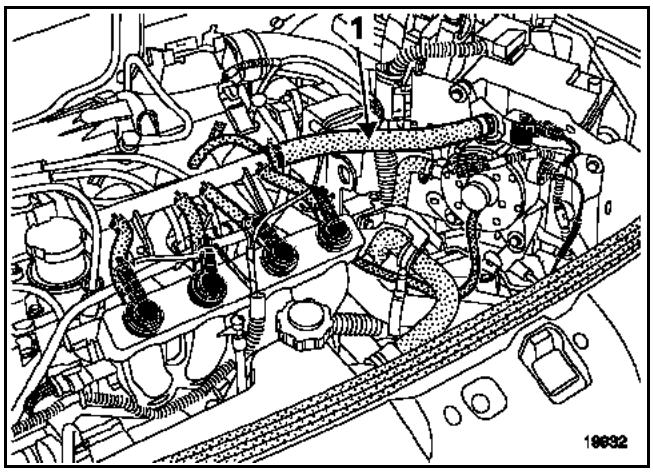
REMOVAL

BEFORE ATTEMPTING ANY OPERATIONS, READ THE SECTION ON SAFETY ADVICE.

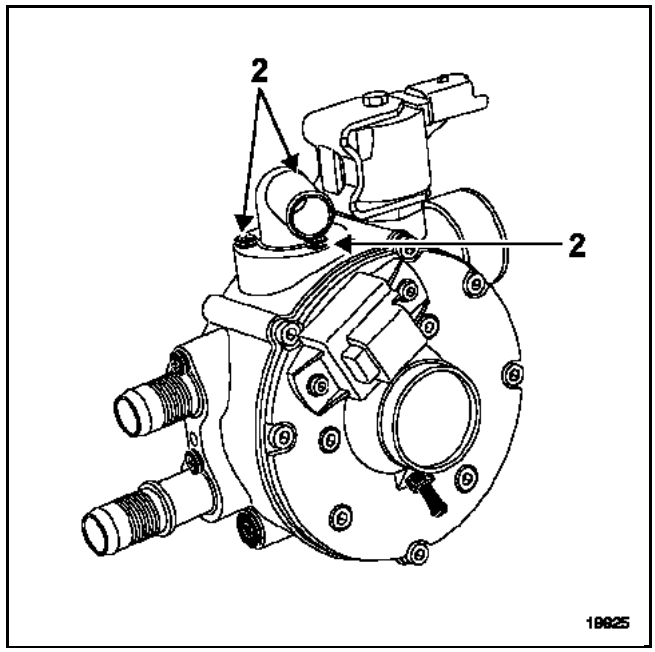
Bleed the **LPG** contained in the expansion valve.

To do this:
– put the vehicle outside,
– disconnect and remove the battery,
– remove the clip from the rail/expansion valve gas pipe,
– disconnect the rail/expansion valve gas pipe and allow the gas to escape.

Remove:
– the rail/expansion valve gas pipe (1),



– the three gas outlet mounting bolts (2),
– the gas outlet.



REFITTING

Replace the gas outlet filter, the gas outlet, the seal and the outlet mounting bolts.

Replace the rail/expansion valve hose clips.

AFTER ANY OPERATION ON THE GAS CIRCUIT, CHECK THAT THERE ARE NO LEAKS BY FOLLOWING THE PROCEDURE DESCRIBED IN THE SAFETY ADVICE SECTION.

REMOVAL

BEFORE ATTEMPTING ANY OPERATIONS, READ THE SECTION ON SAFETY ADVICE.

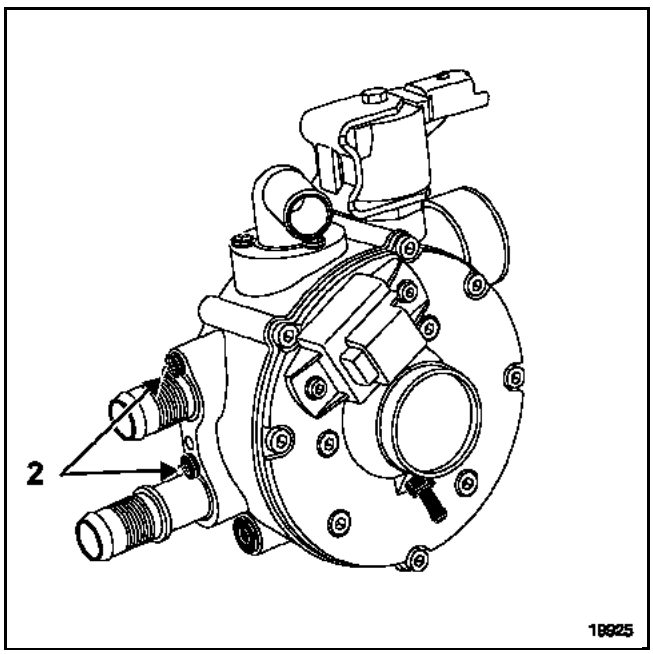
Bleed the **LPG** contained in the gas circuit. It is not necessary to bleed the tank.

See the **Safety advice** section.

Disconnect the battery.

Removing the cooling system unions does not require the expansion valve to be removed (see section **12 LPG fuel Expansion valve**).

Remove:
– the coolant union mounting bolts (2),
– the coolant unions.



REFITTING

Replace the coolant outlet unions, the seals and the union mounting bolts.

Refitting is in the reverse order to removal.

Replace the rail/expansion valve hose clips.

AFTER ANY OPERATION ON THE GAS CIRCUIT, CHECK THAT THERE ARE NO LEAKS BY FOLLOWING THE PROCEDURE DESCRIBED IN THE SAFETY ADVICE SECTION.

FUEL TANK

As the legislation regulating the use of pressurised systems stipulates, the **LPG** tank must be tested by the vehicle testing service every **8 years** (**5 years** if the vehicle has been resold).

GAS FILTERS

The filters must be changed at every major service.

To replace them, bleed the gas contained in the gas circuit (see the **Safety advice** section).

GAS INLET FILTER

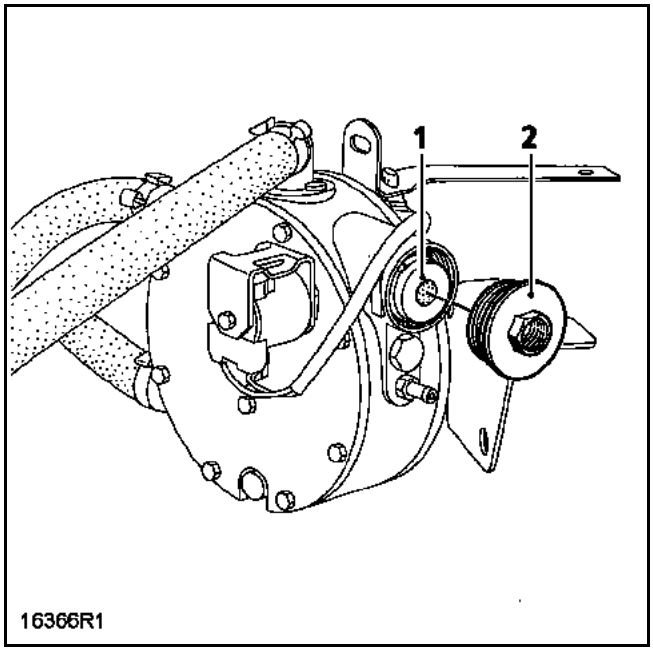
Remove:
– the rigid supply pipe, holding the filter cover (2) with a spanner,
– the filter (1).

Replace the filter and the cap seal.

GAS OUTLET FILTER

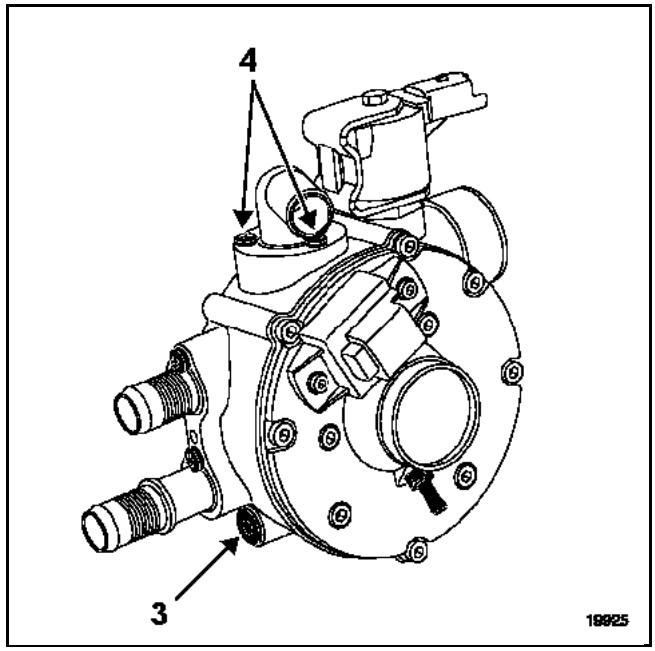
Remove:
– the three gas outlet mounting bolts (4),
– the gas outlet and the outlet filter.

Replace the gas outlet filter.



AFTER ANY OPERATION ON THE GAS CIRCUIT, CHECK THAT THERE ARE NO LEAKS BY FOLLOWING THE PROCEDURE DESCRIBED IN THE SAFETY ADVICE SECTION.

BLEEDING THE EXPANSION VALVE



3 Bleed screw

The operation is carried out when the **engine is very warm**.
– Stop the engine and place a container under the **LPG** expansion valve,
– undo the bleed screw (3) and allow the liquid residue to flow out for approximately one minute,
– clean the bleed screw and the bleed hole, then retighten.

NOTE: this operation must be carried out at every service, together with a test to check the cleanliness of the air filter cartridge.

CHECKING THE CORRECT OPERATION OF THE SAFETY SOLENOID VALVE (on the tank)

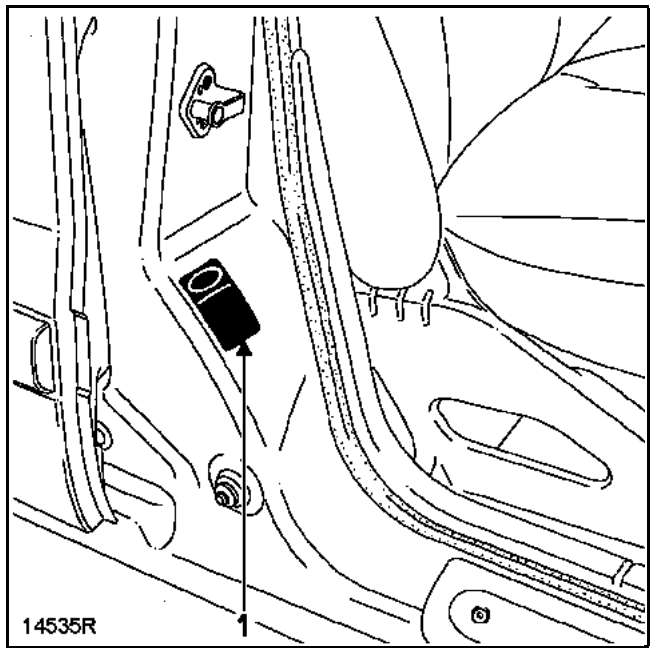
To be carried out at every service.

Put the LPG switch in the position requesting LPG operation.

Switch on the ignition; it should be possible to hear the tank solenoid valve "click".

IMPORTANT: consult the Maintenance Booklet to find out the exhaustive list of operations to carry out on **LPG** vehicles.

LPG identification (1) is integrated into the manufacturer's plate located on the vehicle's right hand side B-pillar.



The information on this plate must be used in all communication or orders.

If this plate has to be changed, place a request for a **duplicate manufacturer's plate**, stating all the information on this plate.

NOTE: all requests must be made through the primary network.

PURPOSE

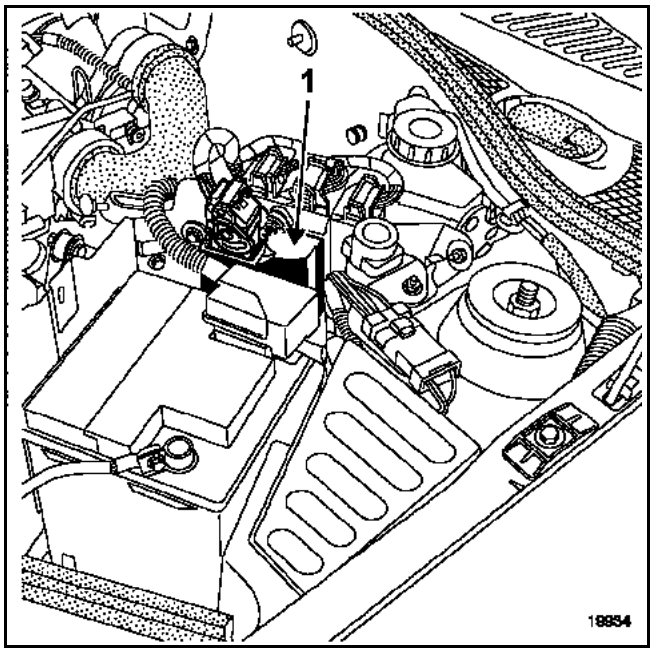
The **LPG** computer (1) manages gas flow by controlling the injectors when the driver has selected **LPG** mode, analysing various information relating to the petrol injection system:
– oxygen sensor signal,
– engine speed signal,
– throttle potentiometer signal,
– coolant temperature,
– Inlet manifold pressure.

It also uses information specific to the **LPG** system operation:
– gas pressure measurement at the expansion valve outlet,
– **LPG** temperature using coolant temperature information.

LOCATION

It is located in the engine compartment, attached:
– to the battery tray in **Clio** and **Kangoo**,
– to the expansion valve support in **Twingo**.

Clio and Kangoo

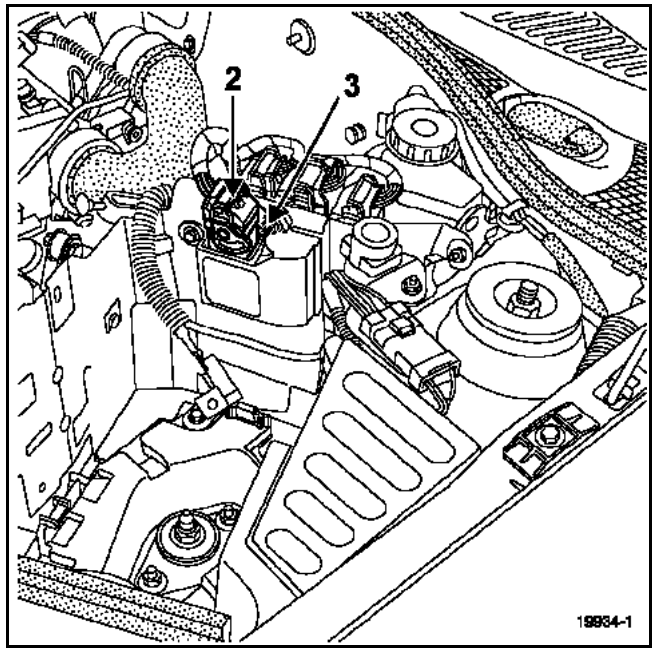


REMOVAL

Disconnect the battery and remove it.

Disconnect the connector (2) from the **LPG** computer.

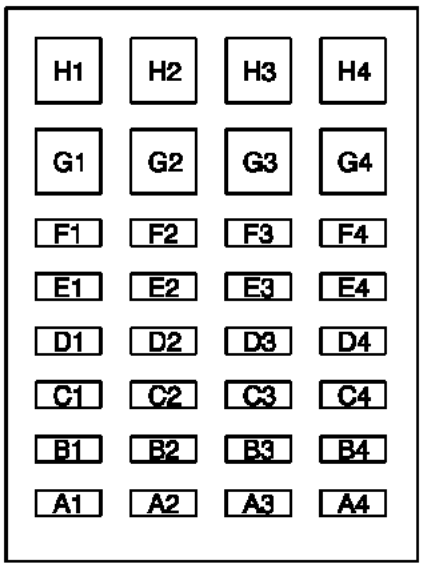
Remove the mounting nut (3) from the **LPG** computer then remove the computer.



REFITTING

Refit in the reverse order to removal.

ALLOCATION OF LPG INJECTION COMPUTER INPUTS AND OUTPUTS



A1	→←	Multiplex line L multiplex connection (injection computer)
A2	→←	Multiplex line H multiplex connection (injection computer)
A3	---	**LPG** pressure sensor supply
B3	---	**LPG** pressure sensor earth
B4	→←	Fault finding
C1	←	**LPG** control button signal
C2	---	+ After ignition feed
C4	←	**LPG** pressure sensor signal
D1	→	**LPG (Twingo and Kangoo)** control button warning light command
D2	←	**LPG (Clio)** gauge signal
D3	---	**LPG (Clio)** gauge earth
E1	→	**LPG** instrument panel warning light control
E4	→	**LPG** tank solenoid valve relay control
F1	←	TDC signal
F2	→	**LPG level signal (Twingo)**
F2	→	**LPG (Twingo Kangoo)** gauge switching command
F3	→	Fuel pump cut-out relay control
G1	---	Power earth
G2	→	Main solenoid valve command (expansion valve)
G3	→	Injector 1 command
G4	→	Injector 2 command
H1	---	Power earth
H2	→	Injector 3 command
H3	→	Injector 4 command
H4	---	+ before ignition feed

Connection between injection computer and **LPG**

Injection (tracks)	**LPG** (tracks)
B K3	A1
B K4	A2
B A4	C2
C B3	F1