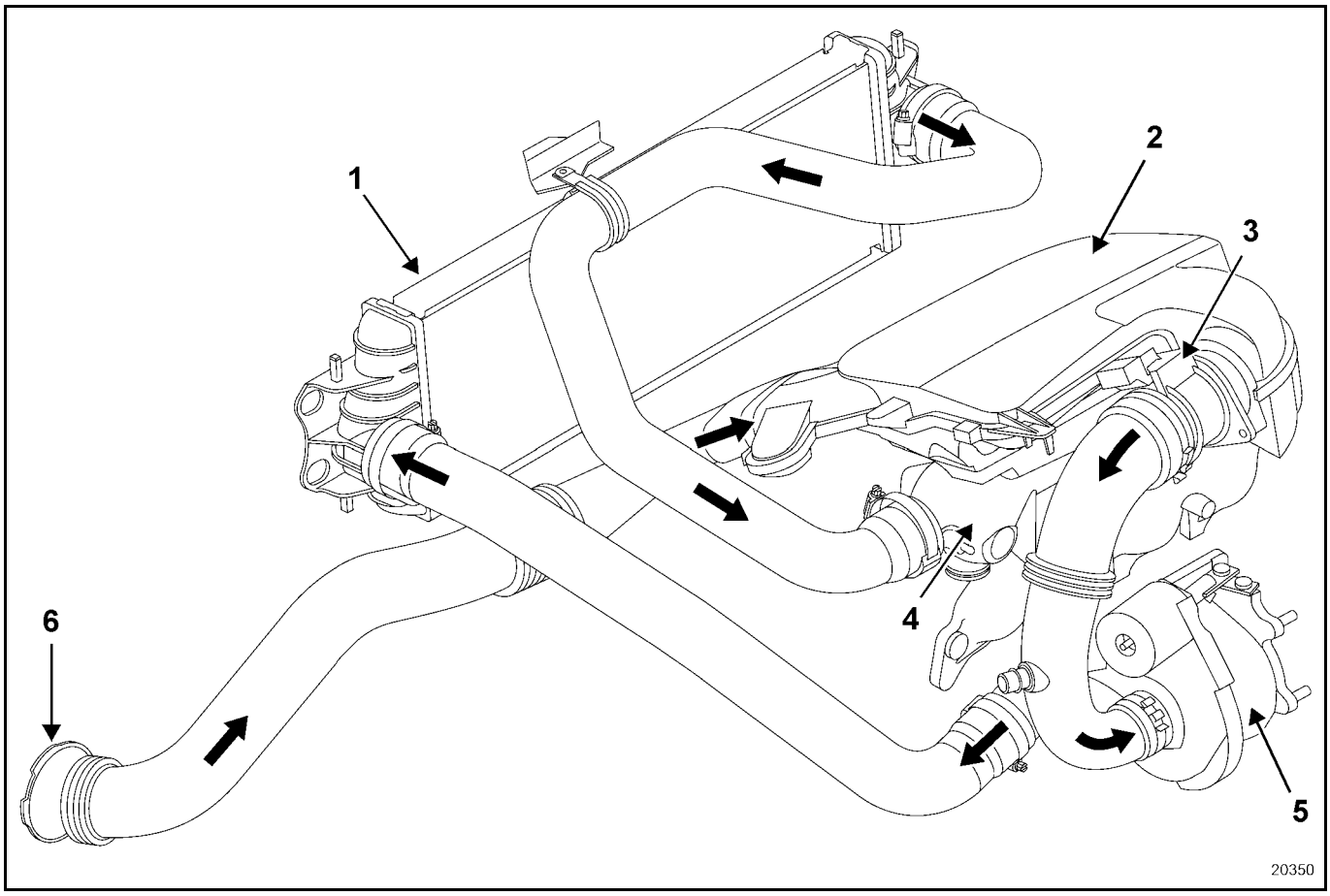
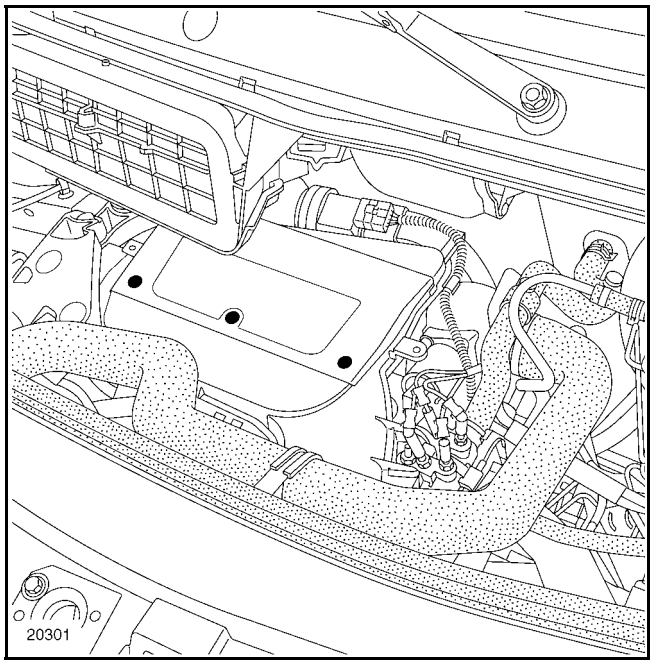
AIR INTAKE CIRCUIT DIAGRAM



1 Air-to-air intercooler
2 Air filter
3 Flowmeter
4 Inlet manifold
5 Turbocharger
6 Air inlet

FILTER ELEMENT REPLACEMENT



Remove the three screws on the air filter cover to gain access to the filter element.

TIGHTENING TORQUES (in daNm)	
Manifold mounting stud	**0.8**
Manifold mounting nut	**2.8**
Exhaust gas recirculation valve mounting bolt	**0.8**

REMOVAL

NOTE:
To remove the manifolds it is necessary to remove the turbochargers (see **Section 12 Turbocharging turbocharger**). The two manifolds cannot be removed separately.

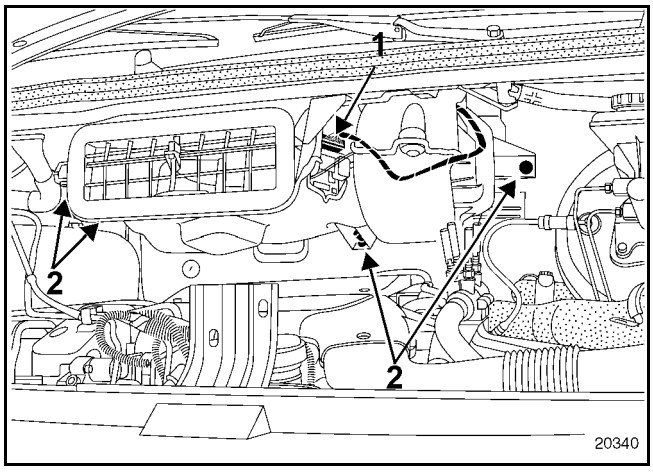
Put the vehicle on a two-post lift.

Disconnect the battery.

Remove the engine undertray.

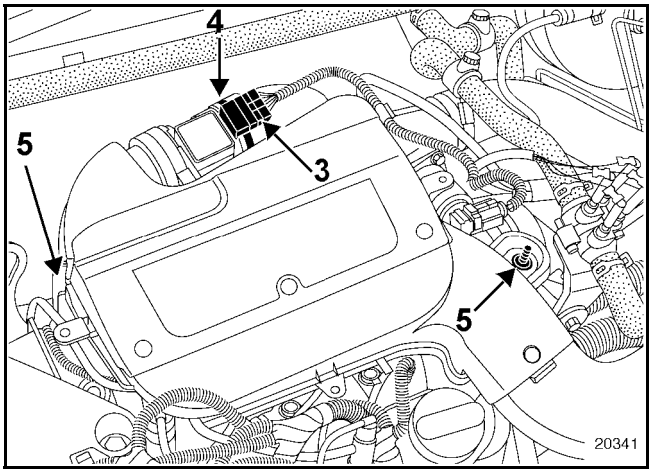
Disconnect the heater unit connector (1).

Remove the heater unit mounting bolt and three nuts (2), then remove the unit.



Disconnect:
– airflow sensor connector (3),
– turbocharger air intake pipe (4).

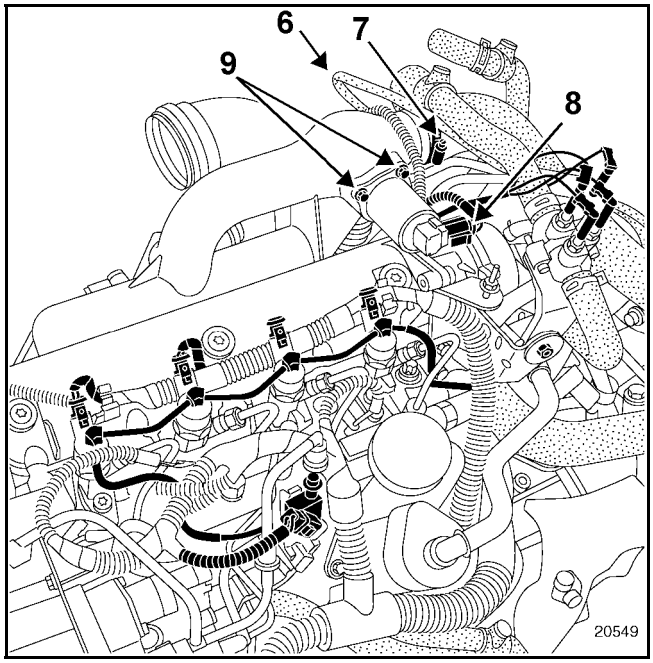
Remove:
– air filter unit mounting nuts (5), then remove it,



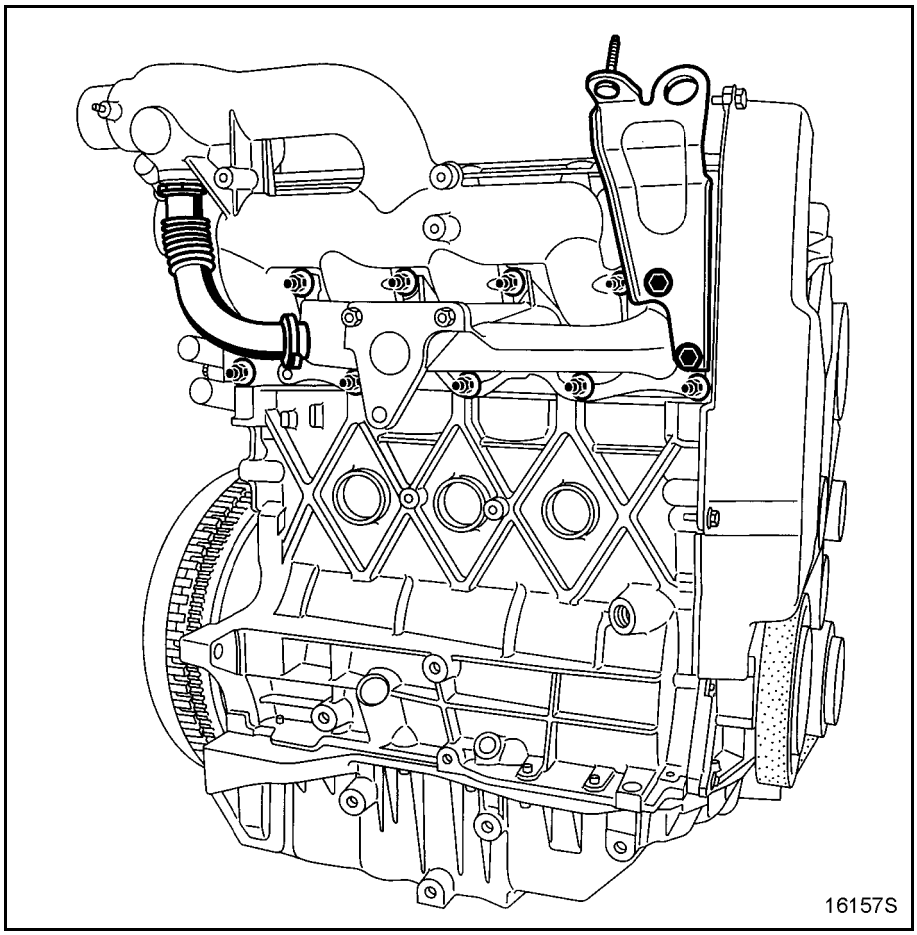
– the turbocharger (see **Section 12 Turbocharging: turbocharger**).

Disconnect:
– manifold pressure signal pipe (6),
– manifold air intake pipe (7),
– the electrical **exhaust gas recirculation** valve (8).

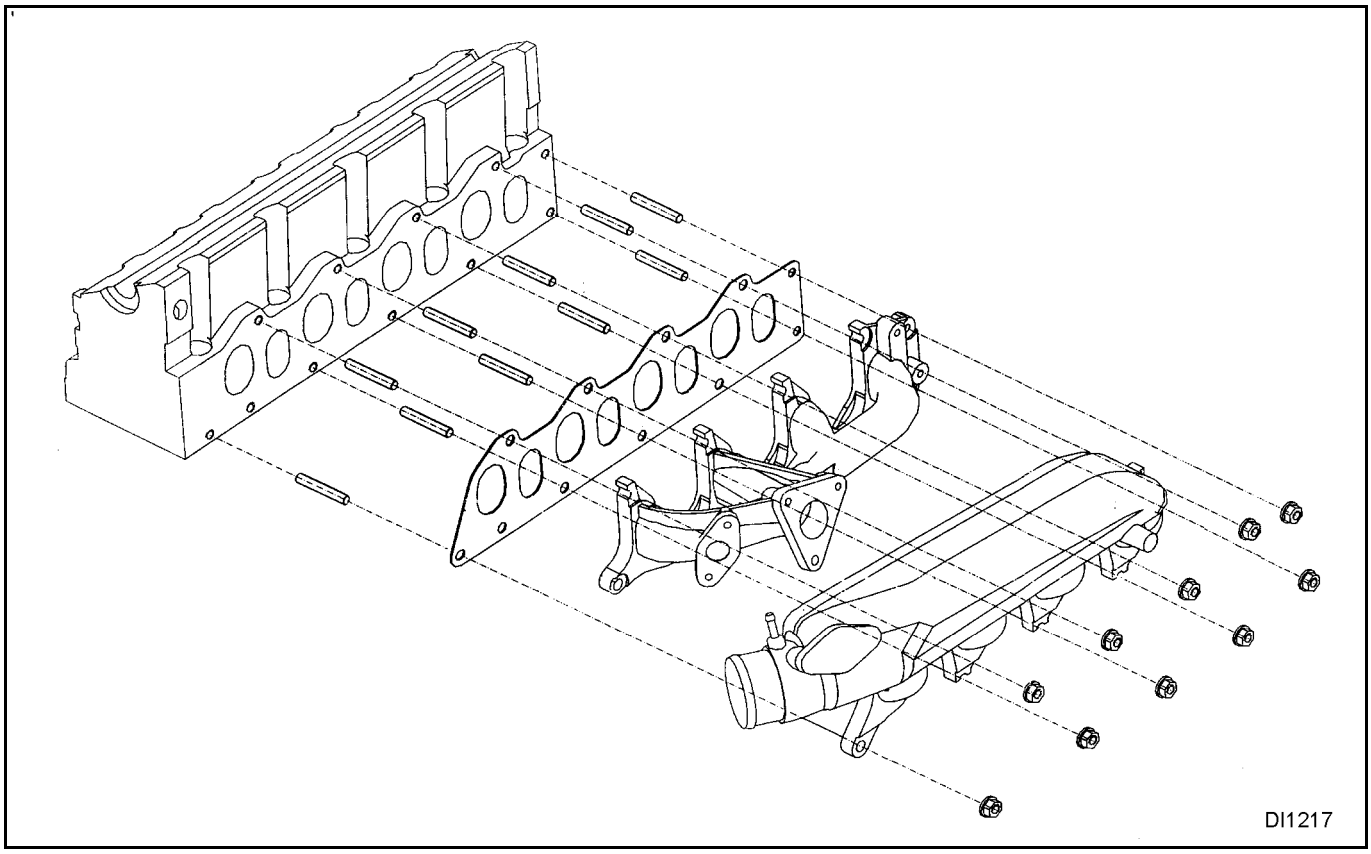
Remove the electrical **exhaust gas recirculation** valve mounting bolt (9) and remove the valve.



Remove the **exhaust gas recirculation** pipe and the lifting lug.



Remove:
– nuts securing the manifolds,
– the manifolds.



REFITTING

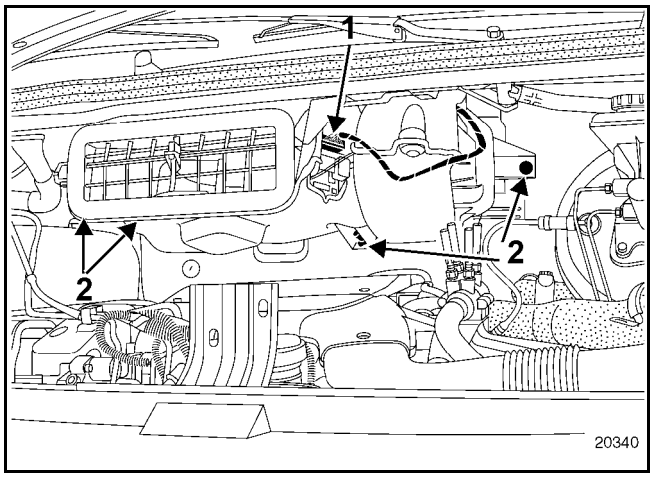
Proceed in the reverse order to removal.

Replace the manifold, taking care to replace it correctly, and the **exhaust gas recirculation** valve seal.

REMOVAL

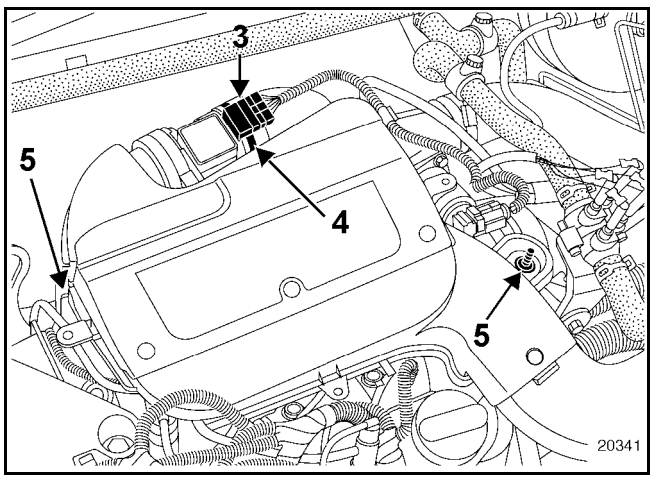
Disconnect:
– the battery,
– heater unit connector (1).

Remove the heater unit mounting bolt and three nuts (2), then remove the unit.

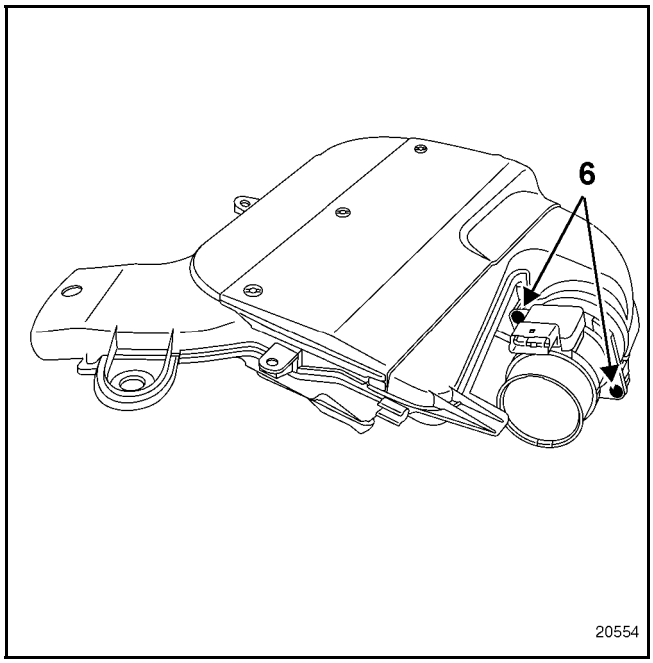


Disconnect:
– airflow sensor connector (3),
– turbocharger air intake pipe (4).

Remove:
– air filter unit mounting screws (5), then remove it,



– both airflow sensor mounting screws (6) on the air filter unit,
– the airflow sensor.



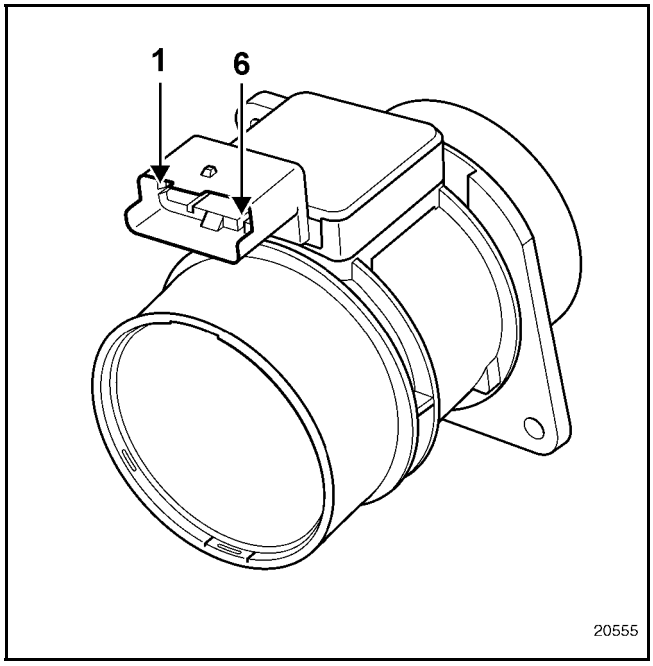
REFITTING

Proceed with refitting in the reverse order to removal

TRACK ALLOCATION

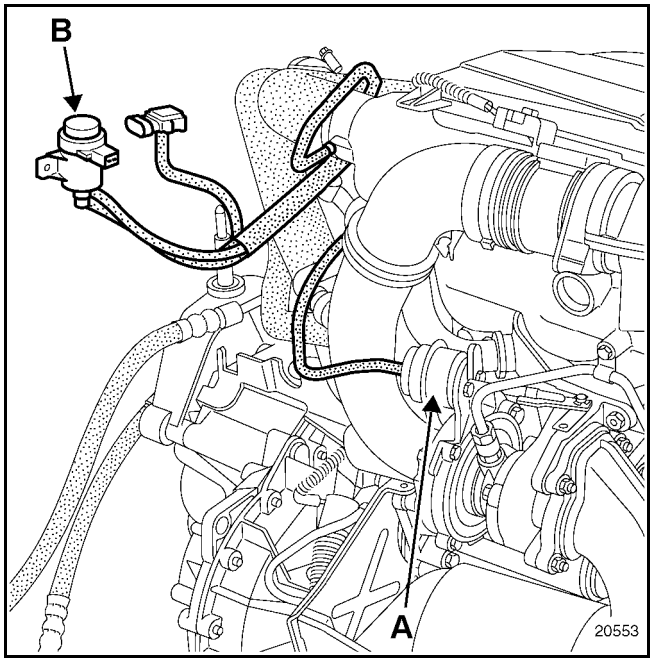
Connector for air flowmeter with integrated air temperature sensor.

Track	Description
1	Air temperature
2	Earth
3	5 V reference
4	+ battery
5	Air flowmeter signal
6	Earth



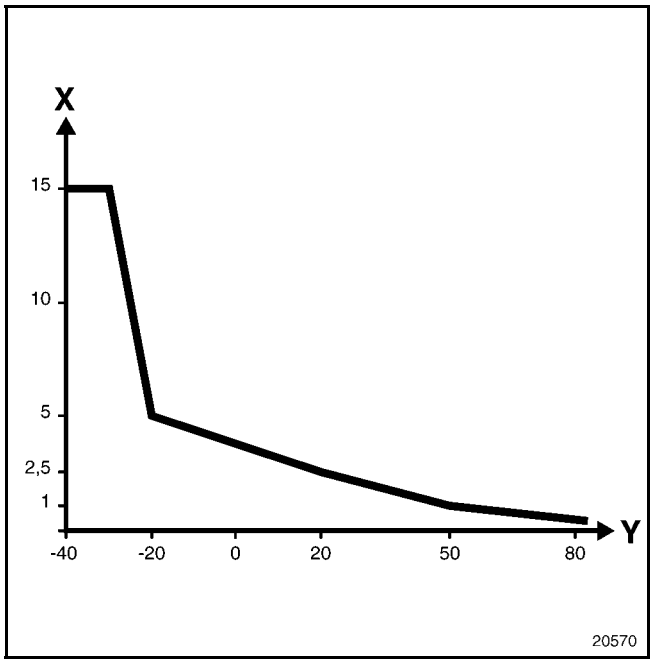
Air temperature sensor resistance (between **tracks 1** and **2**): ≈ approximately **2170** Ω at **20** °**C**.

The diaphragm (A) of the pressure regulation valve is controlled by a solenoid valve (B) which is managed by the injection computer. This solenoid valve varies the vacuum according to the engine operating range, which enables the turbocharging pressure to be regulated.



The pressure regulation valve is open in rest position. The engine operates as normally aspirated.

The solenoid valve, closed in the rest position, is supplied after the engine is started following a delay according to the coolant temperature.



X Timed period (**seconds**)
Y Temperature (°**C**)

TURBOCHARGER PRESSURE CONTROL VALVE (WASTEGATE)

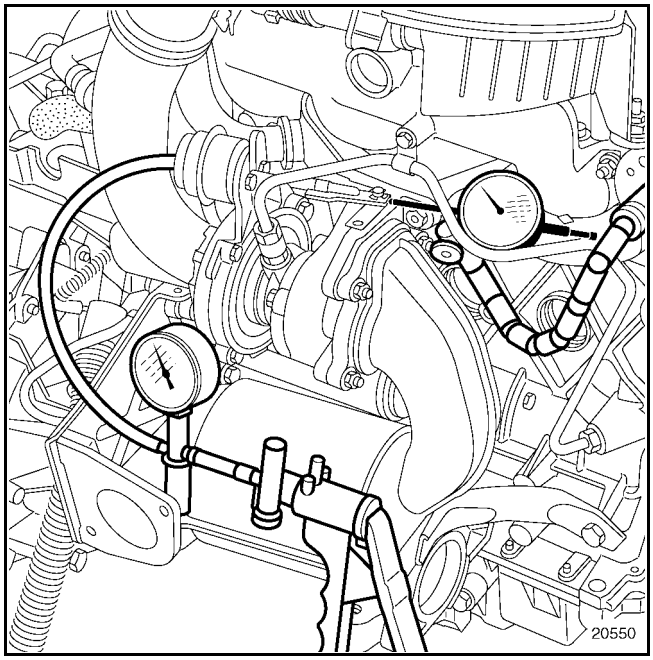
NOTE:
The limiter valve functions in the opposite way to conventional assemblies.

The absence of control pressure limits the turbocharging pressure.

Check that there are no leaks between the vacuum pump and the control valve.

Calibration pressure check

Operation on the vehicle.



Use a magnetic base fitted with a gauge which should be positioned at the end of the **wastegate** rod (inserted as close as possible to the centre line of the **wastegate**).

A vacuum is applied gradually to the **wastegate** using pressure gauge **Mot. 1014**.

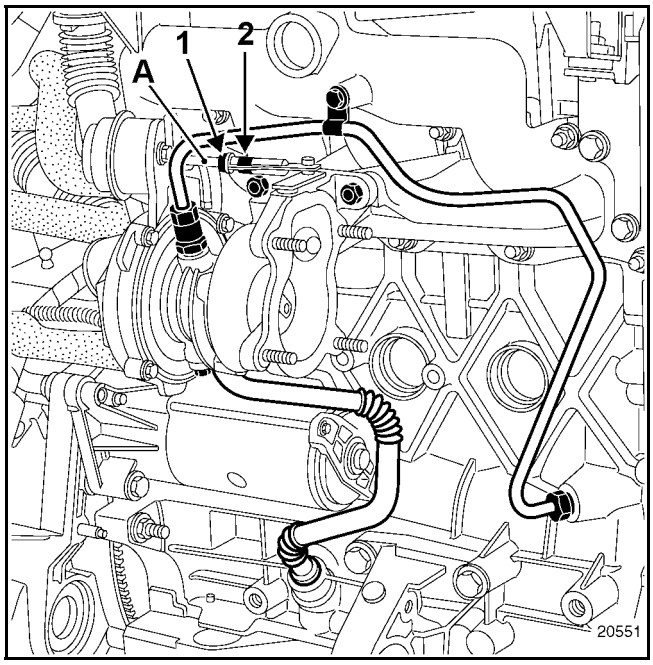
Calibration value

Vacuum value (mbar)	Rod movement (mm)
120	between 1 and 4
400	between 10 and 12
> 450	Rod at stop

On the vehicle itself

It may be necessary to adjust the wastegate rod length (A) (if the pressure is not within tolerance) when checking the calibration pressure.

Loosen the lock nut (1).



Carry out the adjustment by tightening or loosening the adjusting wheel (2) half a turn at a time until the correct calibration pressure is obtained.

NOTE:
Check the calibrating pressure after retightening the locknut (1).

Confirm the repair with a road test, checking parameters **Wastegate opening cyclic ratio** and **Turbocharging pressure** on the diagnostic tools.

TIGHTENING TORQUES (in daNm)	
Turbocharger mounting nut	2.4 ± 1
Oil inlet union on the turbocharger	2.4 ± 4
Engine oil supply connection	2.6 ± 0.2
Oil return union bolt	1.2 ± 0.1
Catalytic converter mounting nuts on the turbocharger	2.6 ± 0.2

REMOVAL

NOTE:
To loosen the turbocharger mounting nuts on the exhaust manifold, it helps to spray some unlocking fluid onto the nuts while they are still warm, just before removal.

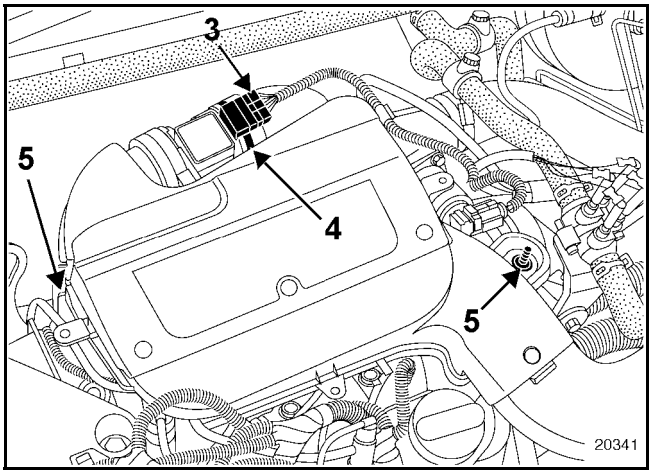
Put the vehicle on a two-post lift.

Disconnect the battery.

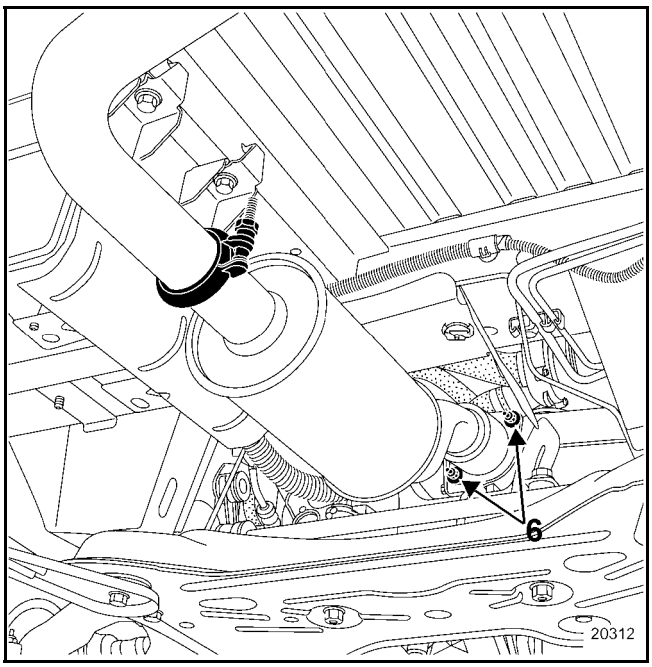
Remove the engine undertray.

Disconnect:
– airflow meter connector (3),
– turbocharger air intake pipe (4).

Remove:
– air filter unit mounting screws (5), then remove it,

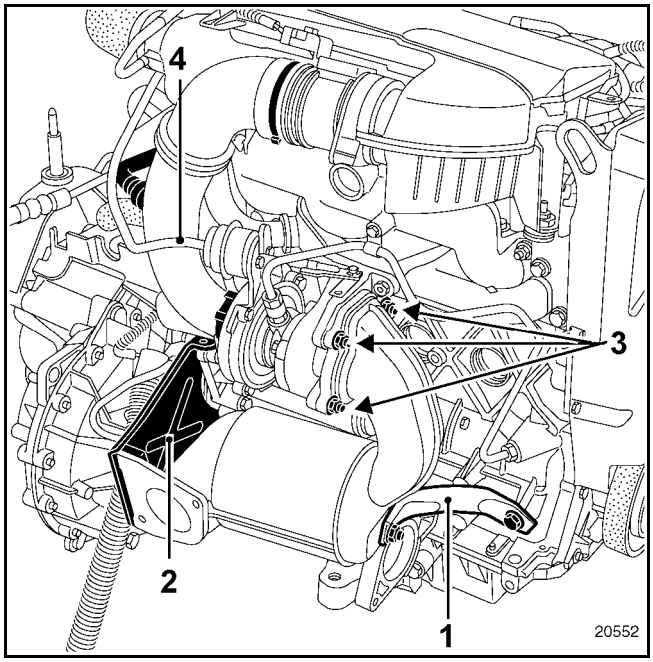


– both exhaust system mounting nuts (6) and allow it to rest on the engine sub-frame.

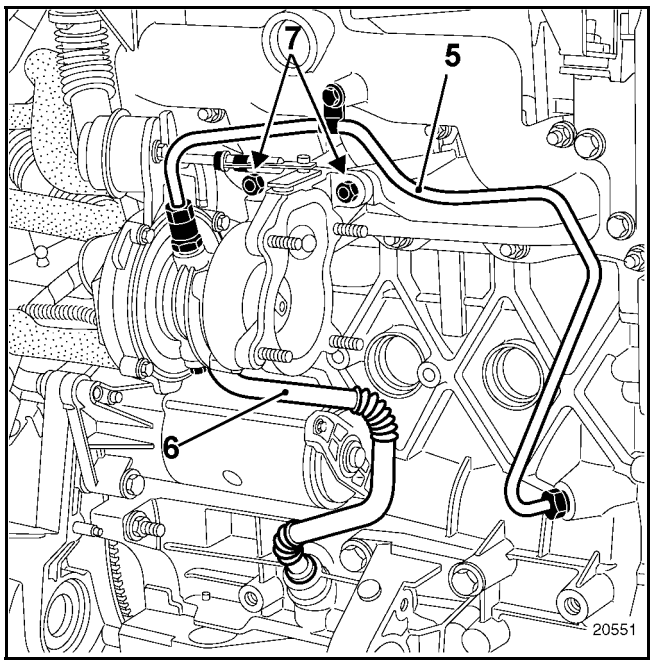


Remove:
– the catalytic converter mounting stays (1) and (2),
– the nuts (3) securing the catalytic converter to the turbocharger,
– the catalytic converter.

Disconnect:
– **wastegate** diaphragm control pipe (4),
– the turbocharger air intake and outlet pipes.



Remove:
– turbocharger oil supply pipe (5),
– turbocharger oil return pipe (6),
– three turbocharger mounting nuts (7),
– the turbocharger.



REFITTING

For refitting operations, use the reverse procedure to removal.

IMPORTANT:
It is essential to replace the leather seal on the turbocharger oil inlet union and the oil return pipe seal.

IMPORTANT:
Before starting the engine, leave the pressure regulator connector on the high pressure pump disconnected.
Then run the starter motor until the oil pressure warning light goes out (do this for a few seconds).
Reconnect the regulator, preheat and start the engine.
Run the engine at idle speed and check that there are no leaks at the oil connections.
Clear the fault and check the turbocharging pressure solenoid valve sensor.

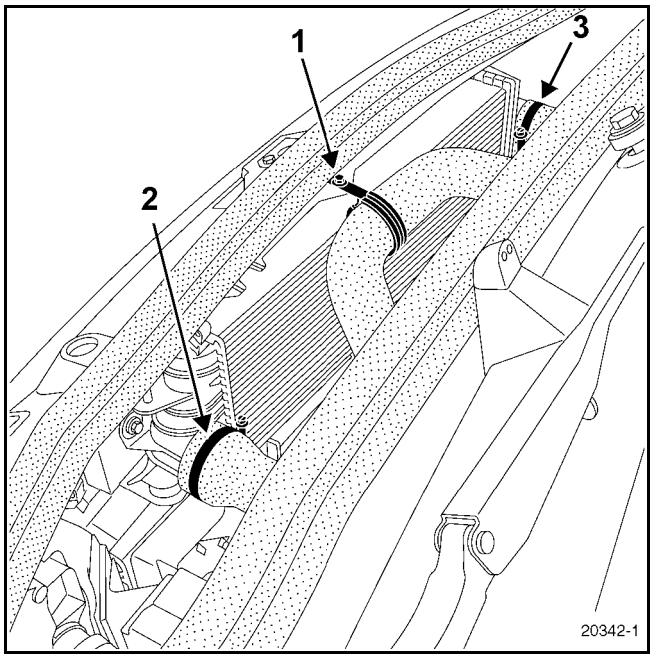
Special precautions

- Before refitting, check that the turbocharger bearings are correctly greased. To do this, activate the starter motor having first disconnected the high pressure regulator connector (to prevent the engine from starting) (clear the computer memory). Sufficient oil should arrive via the oil pressure pipes (place a container underneath). If this is not the case, change the lubrication pipe.
- Ensure that no foreign bodies enter the turbine or compressor during the refitting operation.
- If there has been a fault in the turbocharger, check that the air-to-air intercooler is not full of oil. If the air-to-air intercooler is full of oil, it must be removed, flushed with a cleaning agent and then left to drain properly.
- Check that the turbocharger oil return pipe is not partially or completely blocked by scale. Also check that it is perfectly sealed. If not, replace it.

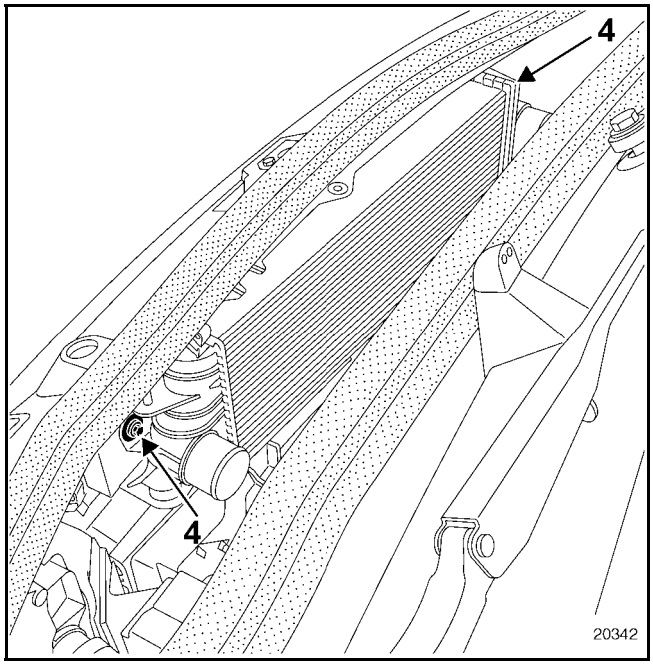
REMOVAL

Remove the retaining clip screw (1).

Disconnect:
– air-to-air intercooler air intake pipe (2),
– air-to-air intercooler air outlet pipe (3),



Remove:
– air-to-air intercooler mounting bolts (4),
– air-to-air intercooler.



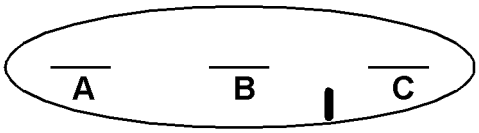
REFITTING

Refitting is the reverse of removal.

Vehicle	Gearbox	Engine						
		Type	Suffix	Bore (mm)	Stroke (mm)	Cubic capacity (cm^3)	Compression ratio	Emission control standard
XLOC XLOB	PK5 and PK6	F9Q	760	80	93	1870	19 / 1	EU 00

ENGINE SPEED (rpm)			FUME OPACITY	
Idle speed	Maximum - no load	Maximum - full load	Homologation value	Maximum - maximum
800 ± 50 rpm	4160 ± 150 rpm	3700 ± 100 rpm	1.7 m^{-1} (50%)	3 m^{-1} (70%)

Description	Make/Type	Special notes
High-pressure pump	**BOSCH CR / CP3**	Pressure from **250** to **1350 bar**
Booster pump (low-pressure)	**BOSCH EKP3**	Pressure **2.5 bar maximum** Flow: **80** to **100 l/h minimum**
Diesel pressure sensor	**BOSCH**	Screwed to the injection rail Resistance: **tracks 1,2 and 1,3 = 4,3 MΩ** **tracks 2, 3 = 1050 Ω**
Injectors	**BOSCH**	Solenoid injector Resistance: < **2 Ω** Maximum pressure **1600 bar**
Pressure regulator	-	Incorporated in the high-pressure pump (**not removable**) Resistance: approximately **5 Ω** at **20 °C**
Injection computer	**BOSCH EDC 15**	**128-track** computer
Accelerator pedal sensor	**HELLA**	Dual track potentiometer Track 1 resistance: **1200 ± 480 Ω** Track 2 resistance: **1700 ± 680 Ω**
Pre/postheating unit	**NAGARES BED/7**	With pre/post-heating function controlled by the injection computer
Engine speed sensor	**MGI**	Resistance: **800 ± 80 Ω** at **20 °C**

Description	Make/Type	Special notes
Preheater plugs	**BERU** or **CHAMPION**	Resistance: **0.6** Ω connector disconnected
Air intake temperature sensor	**SIEMENS**	Incorporated in the air flowmeter Resistance = approximately **2170** Ω at **20** °**C**
Diesel temperature sensor	**MAGNETTI MARELLI** and **ELTH**	Resistance = approximately **2050** Ω at **25** °**C**
Atmospheric pressure sensor	-	Incorporated into the computer
Camshaft sensor	**ELECTRICIFIL**	Hall effect sensor
Turbocharging pressure sensor	**DELCO**	Resistance: **4 k**Ω across tracks A and C Resistance: **5 k**Ω across tracks B and C Resistance: **9 k**Ω across tracks A and B  DI 1330
Turbocharger control solenoid valve	**BITRON**	Resistance: **16.5** ± **1** Ω at **25** °**C**
Air flowmeter	**SIEMENS**	Air flowmeter with integrated air temperature sensor **Track 1**: air temperature **Track 2**: earth **Track 3**: **5 V** reference voltage **Track 4**: + battery **Track 5**: airflow signal **Track 6**: earth
Exhaust gas recirculation system solenoid valve	**PIERBURG/SIEBE**	Track resistance: **8** ± **0.5** Ω at **20** °**C** (tracks 1 and 5) Sensor resistance: **4** ± **1.6 k**Ω at **20** °**C** (tracks 2 and 4)

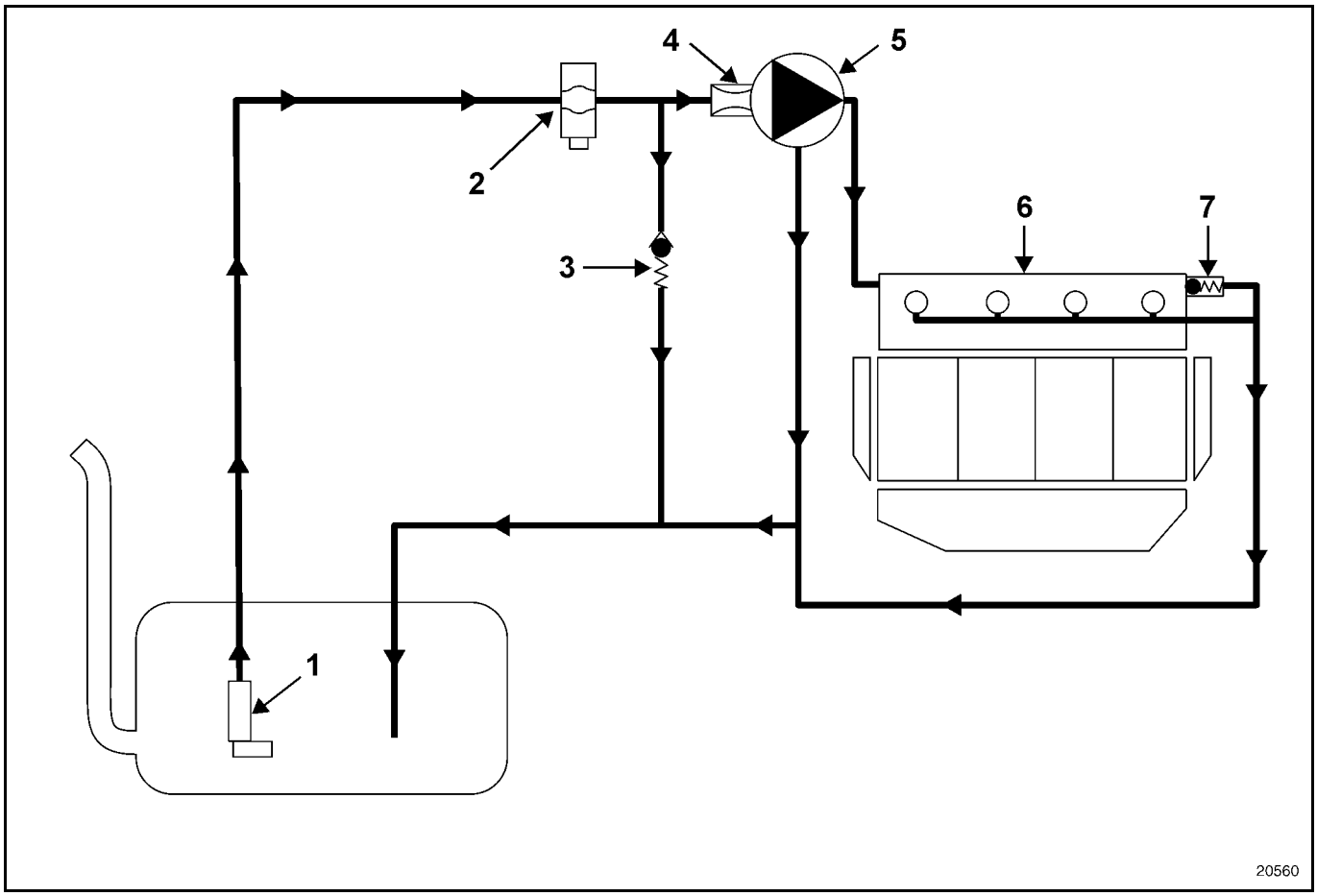
Description	Make/Type	Special notes
Turbocharger	**ALLIED SIGNAL**	Wastegate setting: (fixed geometry turbo) **120 mbar** for rod travel between **1** and **4 mm** **400 mbar** for rod travel between **10** and **12 mm** **> 450 mbar** with rod at end of travel
Thermoplungers	-	Resistance: **0.45** ± **0.05** Ω at **20** °**C**
Engine coolant temperature sensor	**ELTH**	Resistance: **2252** ± **112** Ω at **25** °**C**

The **Common Rail** high-pressure injection system is designed to deliver a certain quantity of diesel fuel to the engine at a precisely determined moment.

DESCRIPTION

The system consists of:
– a low-pressure pump (1) (located in the fuel tank),
– a fuel filter (2),
– a priming valve (3),
– a high-pressure regulator (4) mounted on the pump (it is forbidden to separate the regulator from the pump. If there is a fault in one component, both must be replaced),
– a high-pressure pump (5),
– an injection rail (6) fitted with a diesel fuel pressure sensor and a pressure limiter (7),
– four solenoid injectors,
– various sensors,
– an injection computer.

Dismantling the interior of the high-pressure pump and the injectors is prohibited.



OPERATION

The **Common Rail** high-pressure direct injection system is a sequential diesel injection system (based on the multipoint injection system for petrol engines).

This new injection system reduces operating noise, reduces the volume of pollutant gases and particles and produces high engine torque at low engine speeds thanks to a pre-injection procedure.

The low-pressure pump (also known as the booster pump) feeds the high-pressure pump via the fuel filter **during the starting phase only**.

The high-pressure pump generates the high pressure sent to the injector rail. The high-pressure regulator located on the pump modulates the value of the high pressure via the computer. The rail supplies each injector through a steel pipe.

The computer:
– determines the value of injection pressure necessary for the engine to operate correctly and then controls the pressure regulator. It checks that the pressure value is correct by analysing the value transmitted by the pressure sensor located on the rail,
– determines the injection time necessary to deliver the right quantity of diesel and the moment when injection should start,
– controls each injector electrically and individually after determining these two values.

The injected flow to the engine is determined by:
– the duration of injector control,
– the injector opening and closing speed,
– the needle travel (determined by the type of injector),
– the normal hydraulic flow of the injector (determined by the type of injector),
– the high-pressure rail pressure controlled by the computer.

THE CLEANLINESS AND SAFETY ADVICE SPECIFIED IN THIS DOCUMENT MUST BE FOLLOWED DURING ANY WORK CARRIED OUT ON THE HIGH-PRESSURE INJECTION SYSTEM.

POST-REPAIR CHECK

Re-prime the circuit. To do this, turn the low-pressure pump over by switching on the ignition several times, or turn the low-pressure pump over with the diagnostic tool using the **Actuator Commands** menu.

After any operation, check that there are no diesel fuel leaks. Run the engine at idle speed until the engine cooling fan starts up, then accelerate several times with no load.

IMPORTANT: the engine must not be run with diesel fuel containing more than **10%** diester.

The system injects the diesel fuel into the engine at a pressure of up to 1350 bar. Before carrying out any work, check that the injector rail is depressurized.

It is absolutely vital that you observe the tightening torque:
– of the high-pressure pipes,
– of the cylinder head injector,
– of the pressure sensor.

When the high-pressure pump, injectors and high pressure supply, output and return unions are removed or repaired, all openings should be fitted with new blanking plugs of the correct size to prevent contamination entering.

When replacing the high-pressure pipe, follow the method below:
– remove the high-pressure pipe,
– fit anti-contamination plugs,
– loosen the high-pressure rail,
– fit the high-pressure pipe,
– torque-tighten the union at the injector side,
– torque-tighten the union at the high-pressure rail side,
– torque-tighten the high-pressure rail mountings,
– torque-tighten the pump/rail pipe (pump side first).

Dismantling the interior components of the pump is prohibited.

The fuel return pipe fitted to the injectors must be replaced when it is removed.

The diesel temperature sensor cannot be removed. It is part of the fuel return rail.

Loosening a High-pressure pipe connection when the engine is running is prohibited.

It is forbidden to remove the pressure regulator from the pump (type CP3).

CLEANLINESS INSTRUCTIONS WHICH MUST BE FOLLOWED WHEN WORKING ON THE HIGH-PRESSURE DIRECT INJECTION SYSTEM

Risks relating to contamination

The system is very sensitive to contamination. The risks caused by the introduction of contamination are:
– damage to or destruction of the high-pressure injection system,
– a component seizing or leaking.

All After-Sales operations must be performed under very clean conditions. This means that no impurities (particles a few microns in size) should get into the system during dismantling or into the circuits via the fuel unions.

The cleanliness principle must be applied from the filter through to the injectors.

WHAT ARE THE SOURCES OF CONTAMINATION?

Contamination is caused by:
– metal or plastic chips,
– paint,
– fibres:
  - boxes,
  - brushes,
  - paper,
  - clothing,
  - cloths,
– foreign bodies such as hairs,
– ambient air,
– etc.

IMPORTANT: it is not possible to clean the engine using a high-pressure washer because of the risk of damaging connections. Furthermore, moisture may collect in the connectors and cause electrical connection problems.

INSTRUCTIONS TO BE FOLLOWED <u>BEFORE ANY WORK IS CARRIED OUT</u> ON THE INJECTION SYSTEM

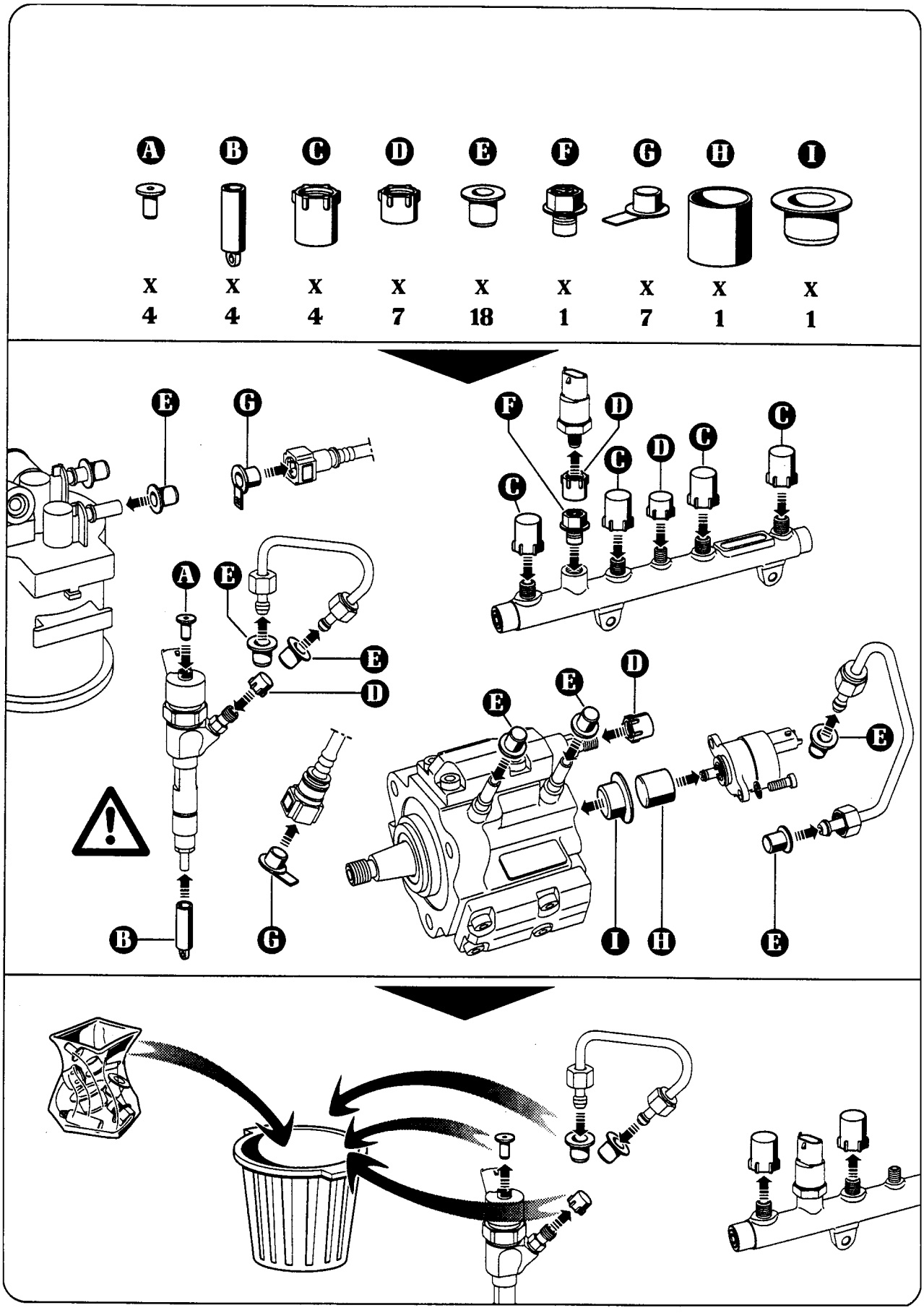
- Ensure that you have the plugs for the unions to be opened (bag of plugs available from the Parts Stores). Plugs are to be used once only. After use, they must be thrown away (once used they are soiled and cleaning is not sufficient to make them reusable). Unused plugs must be thrown away.
- Ensure that you have the resealable plastic bags for storing removed parts. There is less risk of parts stored in this way being exposed to contamination. The bags must be used only once, and after use they must be thrown away.
- Make sure that lint-free towelettes are to hand. Towelette part number: **77 11 211 707**. The use of conventional cloth or paper wipes is prohibited. They are not lint-free and may contaminate the fuel circuit of the system. Each lint-free cloth should only be used once.

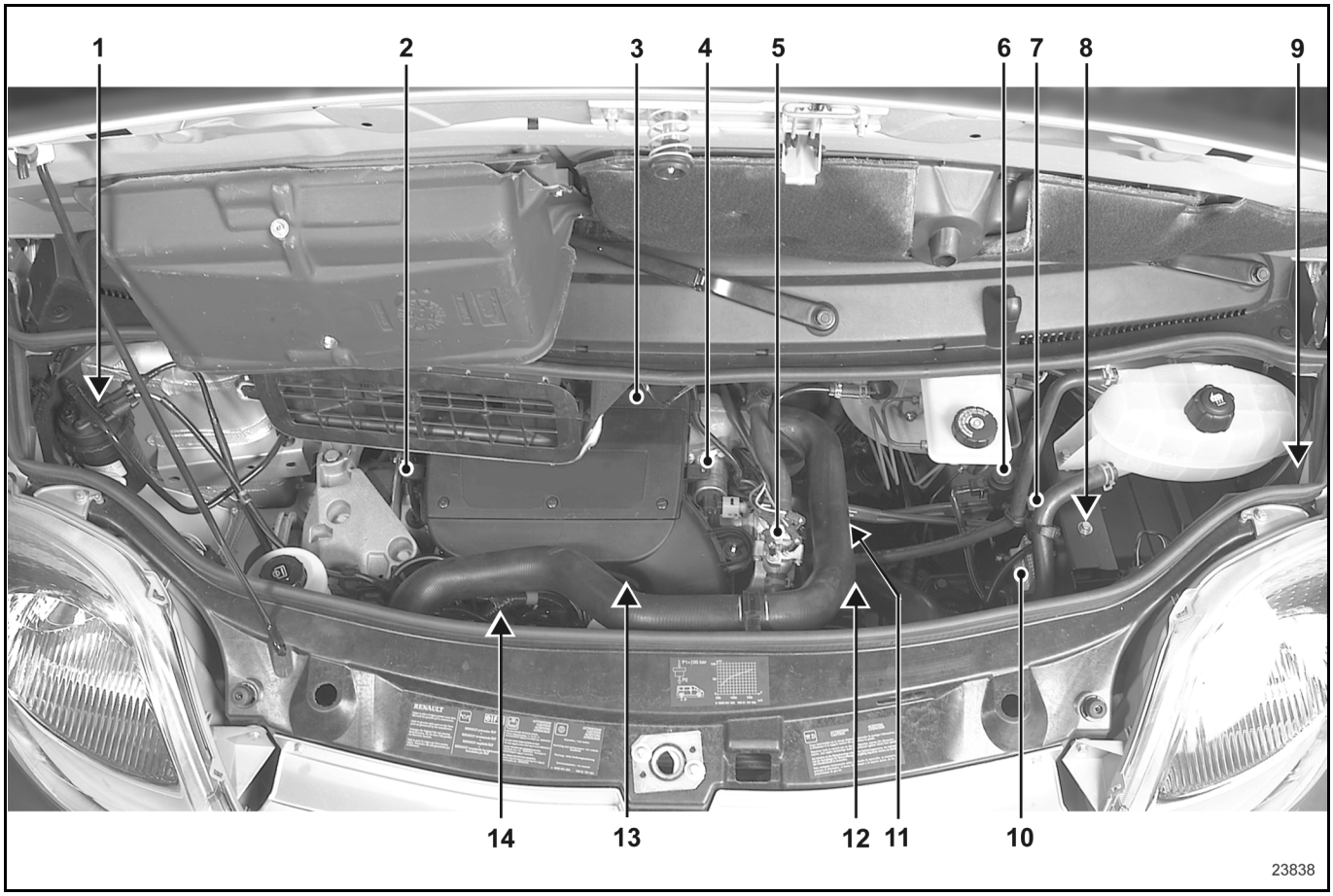
INSTRUCTIONS TO BE FOLLOWED BEFORE OPENING THE FUEL CIRCUIT

- Use new thinner for each operation, (used thinner contains impurities). Pour it into a clean receptacle.
- For each operation, use a clean brush in good condition (the brush must not shed its bristles).
- Use a brush and thinners to clean the connections to be opened.
- Blow compressed air over the cleaned parts (tools, cleaned the same way as the parts, connections and injection system zone). Check that no bristles remain adhered.
- Wash your hands before and during the operation if necessary.
- When wearing leather protective gloves, cover them with latex gloves.

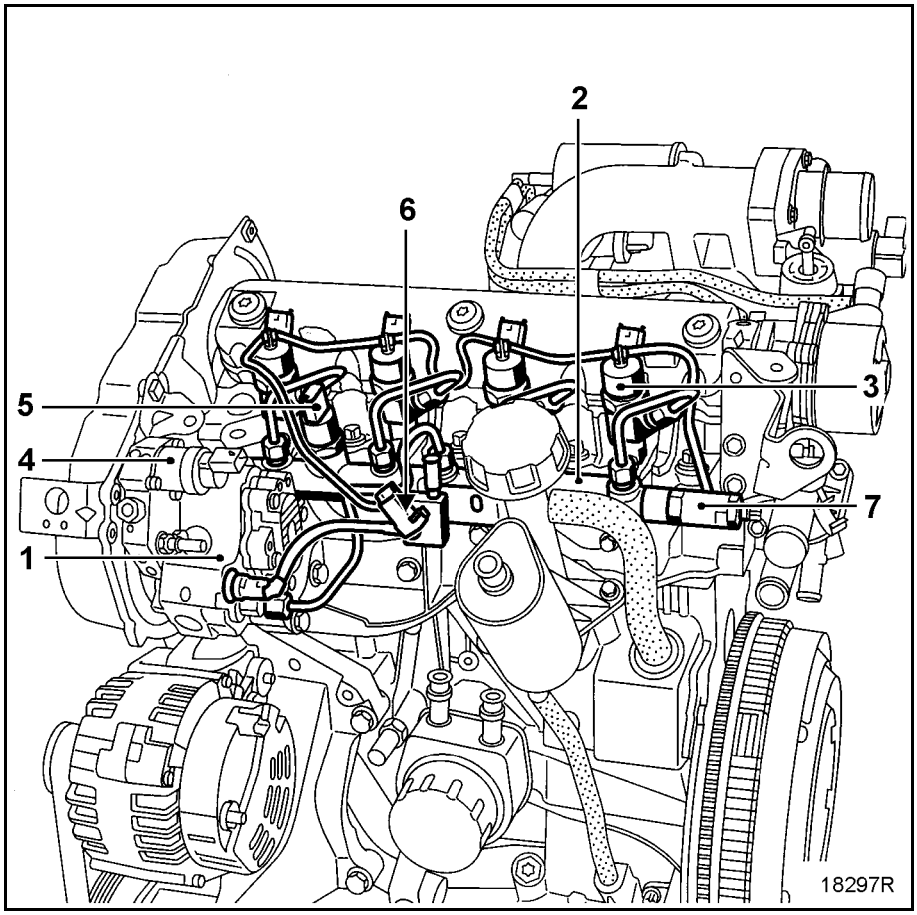
INSTRUCTIONS TO BE FOLLOWED DURING THE OPERATION

- As soon as the circuit is open, all openings must be plugged to prevent impurities from entering the system. The plugs to be used are available from the Parts Stores. They must not, under any circumstances, be reused.
- Close the resealable bag, even if it has to be reopened shortly afterwards. Ambient air carries impurities.
- All components removed from the injection system must be stored in a hermetically sealed plastic bag once the plugs have been inserted.
- The use of a brush, thinner, bellows, sponge or normal cloth is strictly forbidden once the circuit has been opened. In fact, these elements are liable to cause the entry of impurities into the system.
- A new component replacing an old one must not be removed from its packaging until it is to be fitted to the vehicle.

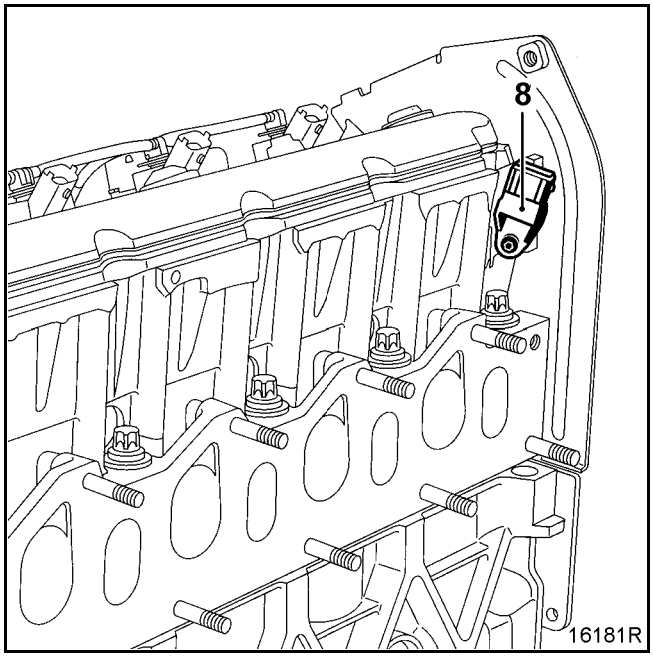

A B C D E F G H I
X 4
X 4
X 4
X 7
X 18
X 1
X 7
X 1
X 1
23866



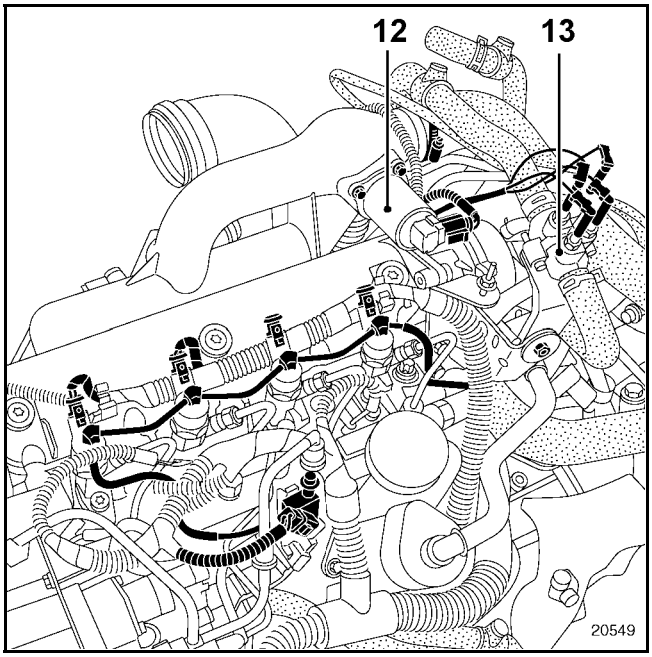
1 Diesel fuel filter with heater
2 Camshaft sensor
3 Air flowmeter with air temperature sensor
4 Exhaust gas recirculation valve
5 Thermoplunger unit
6 Turbocharger regulation solenoid valve
7 Turbocharging pressure sensor
8 Injection computer
9 Impact sensor
10 Preheating unit
11 Coolant temperature sensor
12 Engine speed sensor
13 Solenoid injector
14 High-pressure pump



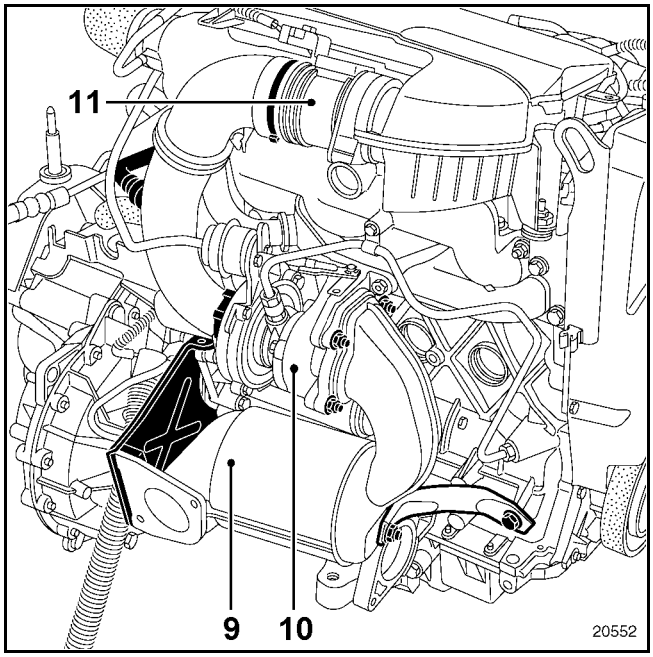
1 High-pressure pump
2 Common injection rail
3 Injector
4 Pressure regulator
5 Pressure sensor
6 Fuel temperature sensor
7 Pressure limiter



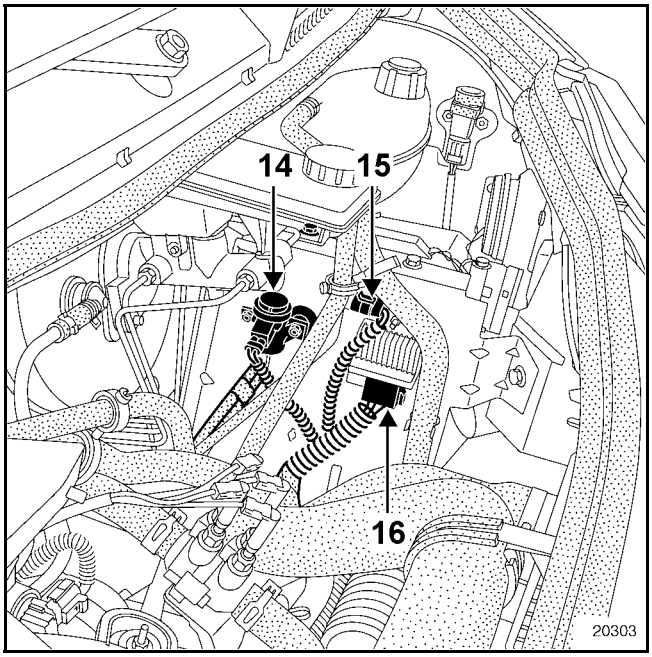
8 Cylinder marking sensor



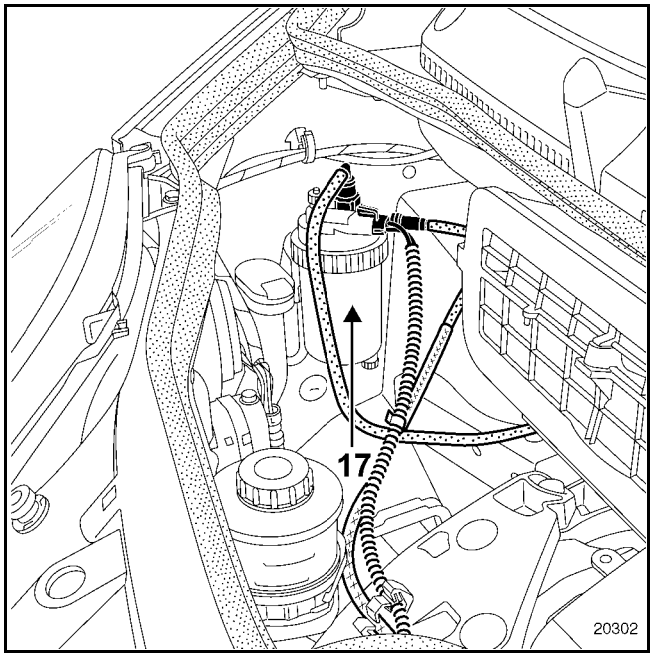
12 Exhaust gas recirculation system valve
13 Thermoplunger unit



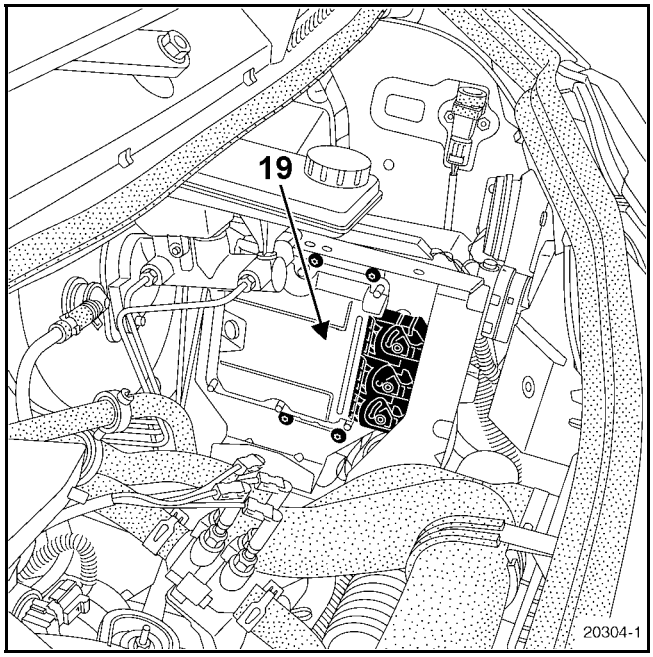
9 Priming catalytic converter
10 Turbocharger
11 Airflow sensor with integrated temperature sensor



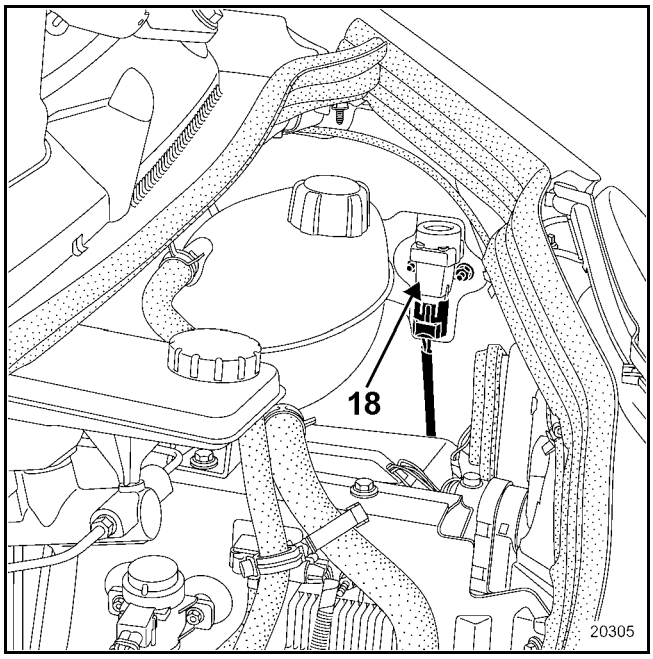
14 Turbocharger regulation solenoid valve
15 Turbocharger pressure sensor
16 Preheating unit



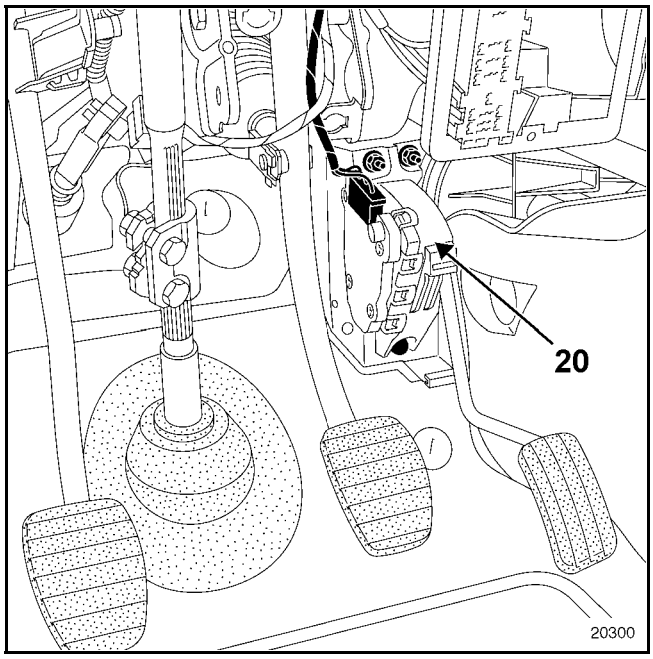
17 Fuel filter



19 Injection computer



18 Impact sensor



20 Accelerator potentiometer

Vehicles using the high-pressure diesel fuel system are fitted with two injection warning lights. These warning lights are used during the preheating phase and when there is an injection fault.

PRINCIPLE FOR WARNING LIGHTS COMING ON

- The preheating warning light comes on when the ignition is switched on, remains lit during the preheating phase and then goes out (see **section 13 Pre/post-heating control**).

- When there is an injection fault (severity level 1), the fault warning light which is also the preheating warning light comes on permanently, indicating the need to consult a Renault Dealer. These faults are:
  – internal computer fault,
  – engine immobiliser fault,
  – engine speed fault (vehicle does not start),
  – accelerator potentiometer fault,
  – air flowmeter fault,
  – vehicle speed sensor fault,
  – exhaust gas recirculation valve fault,
  – turbocharger regulation solenoid valve fault,
  – turbocharging pressure sensor fault,
  – Top Dead Centre sensor and camshaft sensor synchronisation fault.

- When there is a serious injection fault (level 2), the warning light with the symbol of an engine and the word STOP flashes to indicate that the vehicle must be stopped immediately. These faults are:
  – internal computer fault,
  – injector fault,
  – computer supply voltage fault,
  – rail pressure sensor fault,
  – rail pressure regulator fault,
  – Top Dead Centre sensor and camshaft sensor synchronisation fault.

- If the engine overheats, the warning light with the engine symbol and the word STOP remains lit.

This vehicle is fitted with an engine immobiliser system which is controlled by a key recognition system.

REPLACING AN INJECTION COMPUTER

Injection computers are supplied without a code, but they can all be programmed with one.

If a computer is replaced, it must be programmed with the code of the vehicle and the correct operation of the engine immobiliser function must be ensured.

To do this, switch on the ignition for a few seconds without starting the engine, then switch it off. With the ignition off, the engine immobiliser function comes into operation after approximately **10 seconds** (the red engine immobiliser warning light flashes).

SPECIAL NOTES ON TESTING THE INJECTION COMPUTER

WARNING:

These vehicles have a special injection computer which does not operate unless it is coded.

Consequently, it is strongly recommended not to carry out tests using computers borrowed from the stores or from another vehicle, to prevent coding and uncoding problems which could render the computers useless.

THIS VEHICLE IS FITTED WITH A VARIABLE DISPLACEMENT COMPRESSOR

There is no air conditioning computer on this type of engine. The injection computer controls the compressor clutch according to the request for the compressor to operate (**Air conditioning** function requested by the driver), which can be interrupted at any moment by the coolant pressure sensor.

The tracks used for the air conditioning function are:
– one wire on track **A F4** of the computer which controls the air conditioning compressor clutch,
– one wire on track **A G4** of the injection computer. This wire carries the request for the compressor to start operating.

When the air conditioning function is selected, the idle speed does not change; it is **800 rpm**.

COMPRESSOR OPERATION PROGRAMMING

During certain stages of operation, the injection computer prevents the compressor from operating.

Engine starting program

The compressor is prevented from operating for **2 seconds** after the engine has started.

Recovery of output when the vehicle starts moving

If the potentiometer position is greater than **45%**, and the vehicle speed is below **15 mph (25 km/h)**, the compressor is cut off.

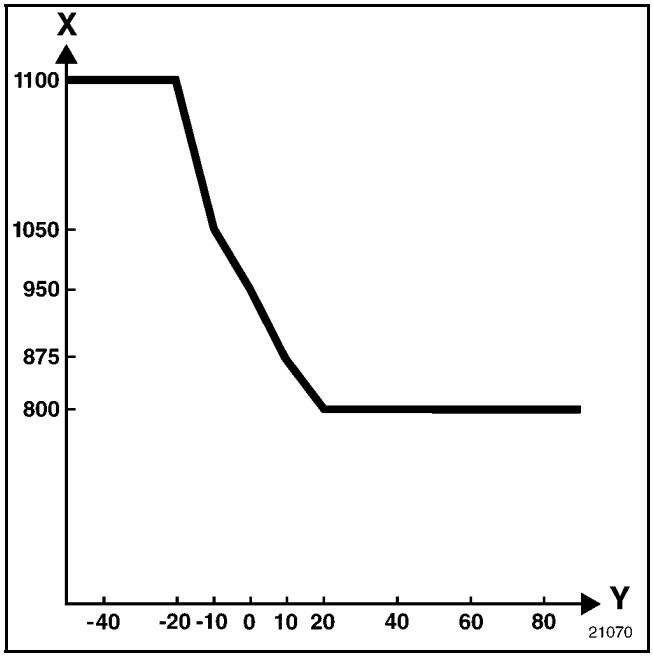
Anti-stall protection

During vthrottle-off, if the engine speed is below **675 rpm**, the compressor clutch is disengaged. It is re-engaged when the engine speed exceeds this figure.

Thermal protection program

The compressor does not come into operation when the coolant temperature is greater than **+ 102 °C**.

IDLE SPEED CORRECTION ACCORDING TO COOLANT TEMPERATURE



X: Engine speed in **rpm**.
Y: Coolant temperature in °**C**

CORRECTION ACCORDING TO ELECTRICAL LOAD

The purpose of this adjustment is to compensate for the drop in voltage due to a power consumer being switched on when the battery is not charged sufficiently. To achieve this, the idle speed is increased, which increases the speed of rotation of the alternator, and this increases the battery voltage.

The lower the voltage, the more significant the correction. Correction of the engine speed is therefore variable. It begins when the voltage drops to below approximately **12 V**. Idle speed may reach a maximum speed of **900 rpm**.

IDLE SPEED CORRECTION WHEN THE POTENTIOMETER IS FAULTY

If the idle speed is held at **1250 rpm**. if the accelerator pedal potentiometer is faulty.

If the signal from the accelerator pedal position potentiometer and the brake switch signal are inconsistent, the speed is changed to **1250 rpm**.

IDLE SPEED CORRECTION WHEN DRIVING

The travelling idle speed is modified according to the gear engaged in the gearbox:
– in 1st and 2nd gear, the idle speed is **825 rpm**,
– for other gears the speed is **870 rpm**.

IDLE SPEED LIMITATION WHEN STATIONARY

If the vehicle is stationary with a gear engaged (clutch pedal depressed), then the maximum engine speed is limited to **3000 rpm**.

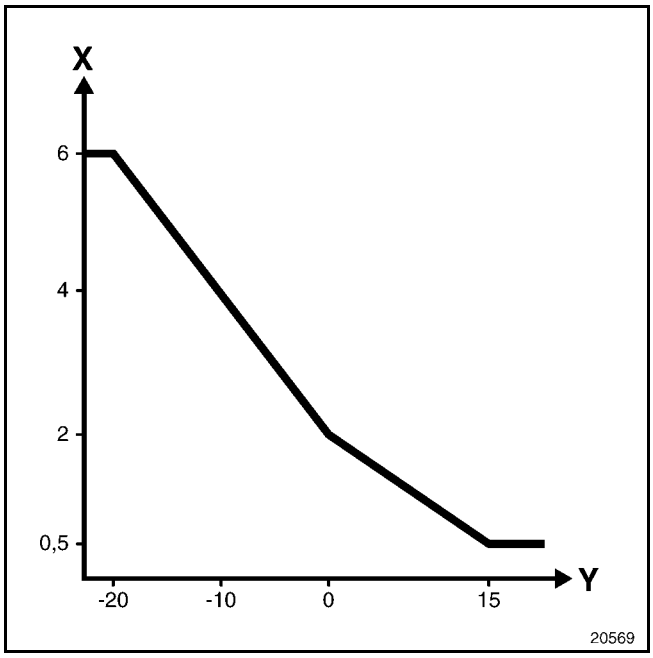
The pre/postheating function is controlled by the preheating unit.

PRE/POSTHEATING OPERATING PRINCIPLE

1) Switching on the preheating

a) Variable preheating

The length of time that the warning lights are on and the heater plugs supply depends on the coolant temperature and the battery voltage.



X Time in **seconds**
Y Coolant temperature in °**C**

In all cases the preheating warning light cannot light up for more than **10 seconds**.

b) Fixed preheating

After the warning light goes out the plugs remain supplied for a fixed period of **10 seconds**.

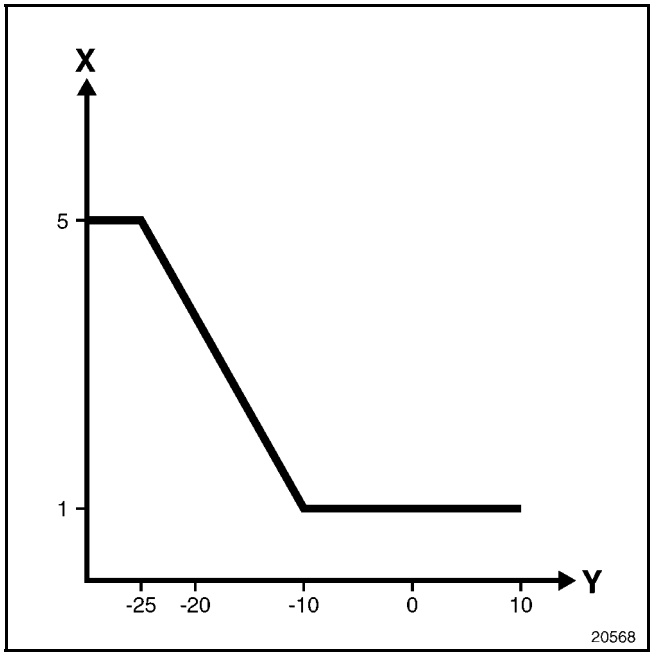
2) Starting the engine

The plugs remain supplied while the starter is being activated.

3) Engine running, postheating

During this phase, the plugs are supplied continuously according to the coolant temperature.

For idle speed without pressing the accelerator pedal.



X Time in **seconds**
Y Coolant temperature in °**C**

The preheating plug resistance is **0.6** Ω (connector disconnected).

TIGHTENING TORQUE (in daNm)	▽
Pre-heater plugs	**1.5**

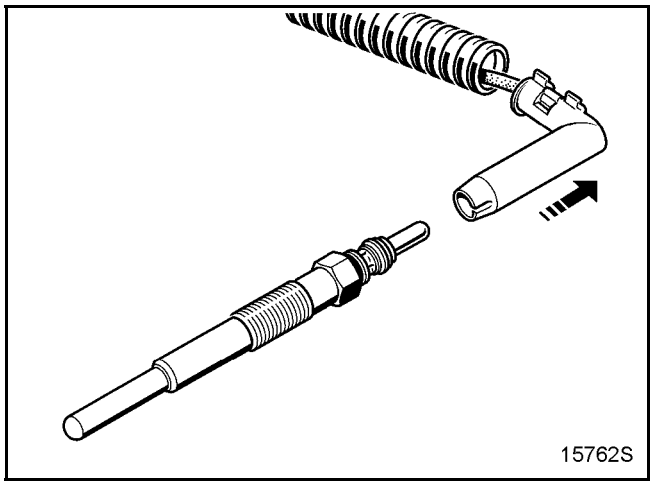
Plugs may be removed without having to open the high-pressure circuit.

REMOVAL

Unclip the plug connector.

Clean the outside of the plug to avoid any impurities entering the cylinder.

Loosen and remove the plugs.



REFITTING

Proceed in the reverse order to removal.

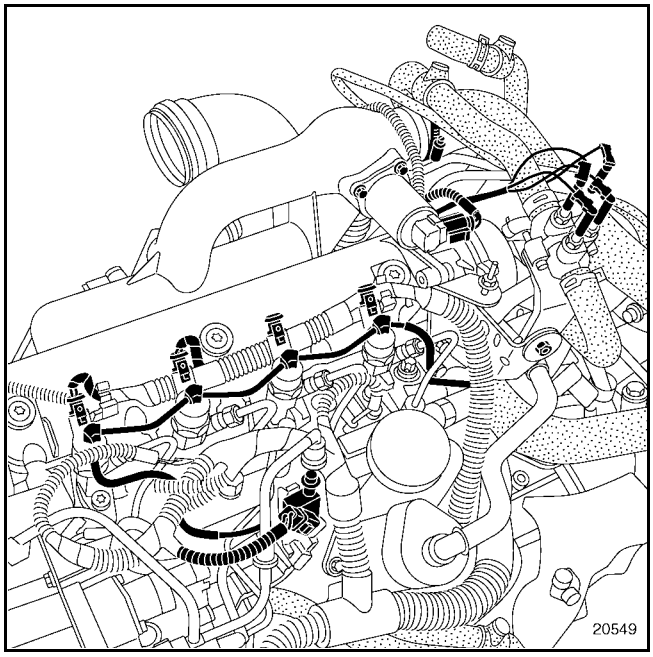
Ensure that no contamination enters the cylinder during this operation.

The four thermoplungers are located on a water unit mounted on the engine lifting bracket.

The purpose of the system is to reheat the coolant.

The thermoplungers are supplied with **12 V** by three relays. One relay controls two thermoplungers, the two other relays control one thermoplunger each. This enables control of one, two, three or four thermoplungers as required.

The resistance of the thermoplungers is:
0.45 ± **0.05** Ω at **20** °**C**.

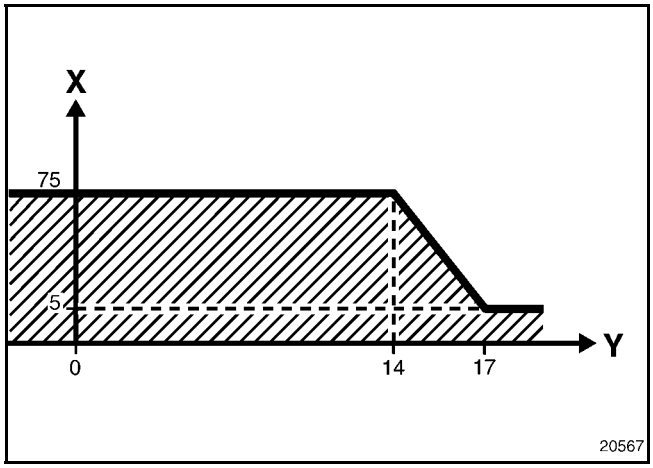


Control strategy

When the thermoplungers are operating the idle speed is brought to **825 rpm**.

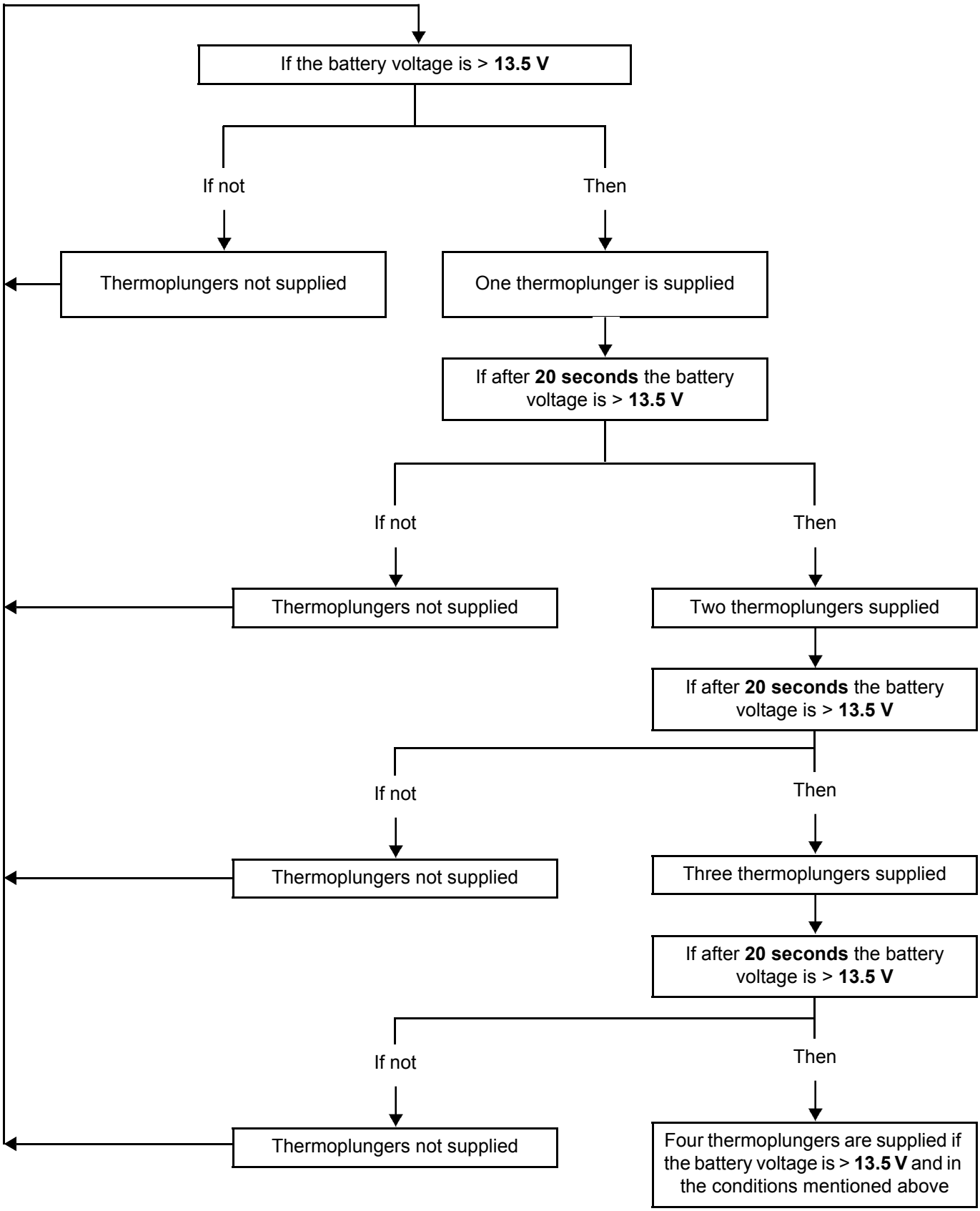
Thermoplungers cannot operate:
– preheating,
– post-heating,
– if the engine speed is below **700 rpm**,
– heated windscreen on.

If the conditions mentioned above apply, the thermoplungers are controlled according to a mapping related to the air and coolant temperature.



X Coolant temperature in °**C**
Y Air temperature in °**C**

Non-shaded area: thermoplunger not supplied
Shaded area: thermoplunger supplied


If the battery voltage is > **13.5 V**
If not
Then
Thermoplungers not supplied
One thermoplunger is supplied
If after **20 seconds** the battery voltage is > **13.5 V**
If not
Then
Thermoplungers not supplied
Two thermoplungers supplied
If after **20 seconds** the battery voltage is > **13.5 V**
If not
Then
Thermoplungers not supplied
Three thermoplungers supplied
If after **20 seconds** the battery voltage is > **13.5 V**
If not
Then
Thermoplungers not supplied
Four thermoplungers are supplied if the battery voltage is > **13.5 V** and in the conditions mentioned above

SPECIAL TOOLING REQUIRED	
Mot. 1397	Fuel pump securing nut

IMPORTANT:
During all operations on the fuel tank or fuel supply circuit, it is vital to:
– refrain from smoking or bringing incandescent objects close to the work area,
– protect yourself against diesel fuel splashes when the pipes are removed (due to residual pressure).

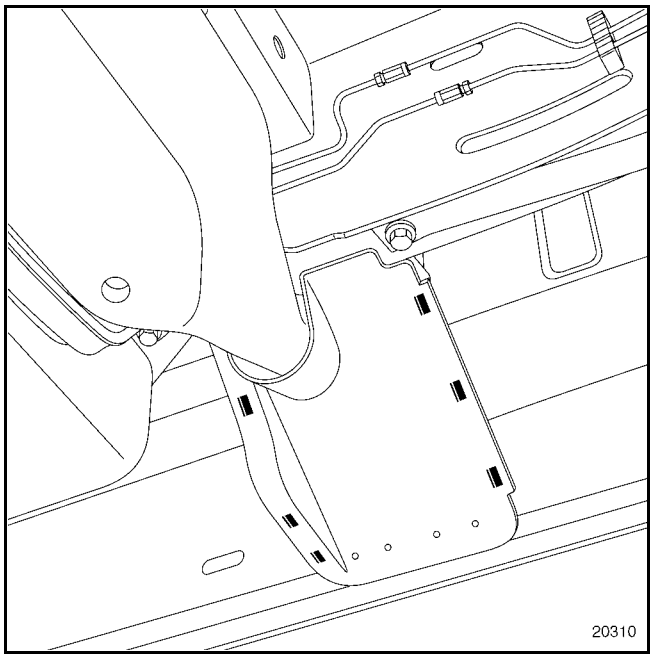
REMOVAL

WARNING: before removing any components, take precautions to trap fuel running out of the pipes (do not clamp pipes, this could damage them).

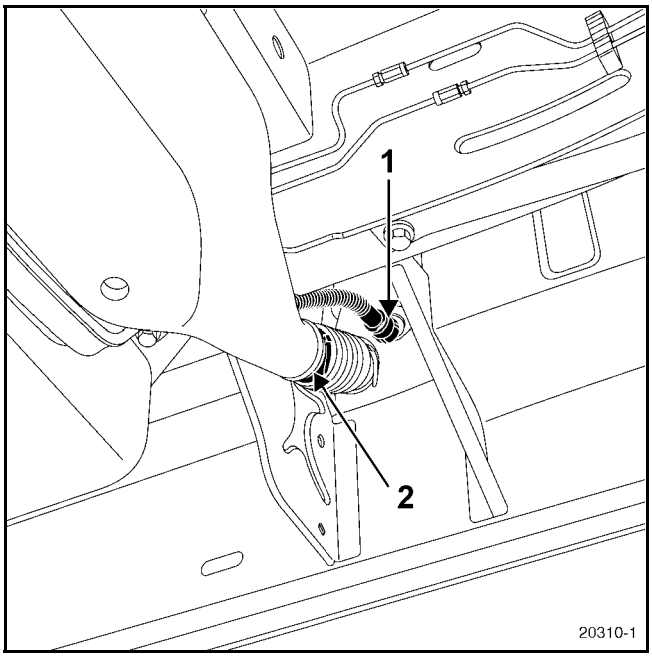
Put the vehicle on a two-post lift.

Disconnect the battery.

Remove the fuel tank filler pipe access flap.

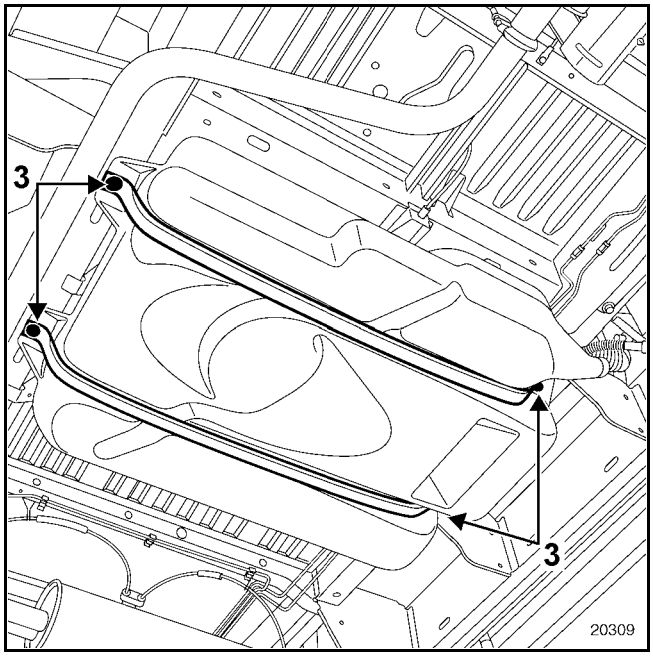


Disconnect:
– anti-splashback pipe (1),
– fuel tank filler neck (2).



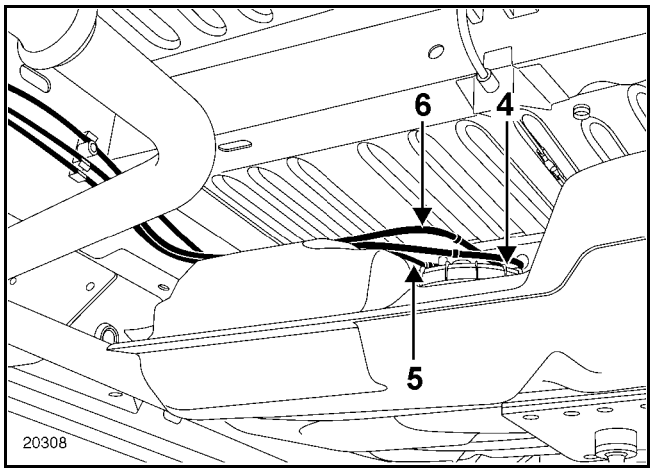
Place a component jack under the tank to hold it.

Remove the fuel tank mounting bolts (3).

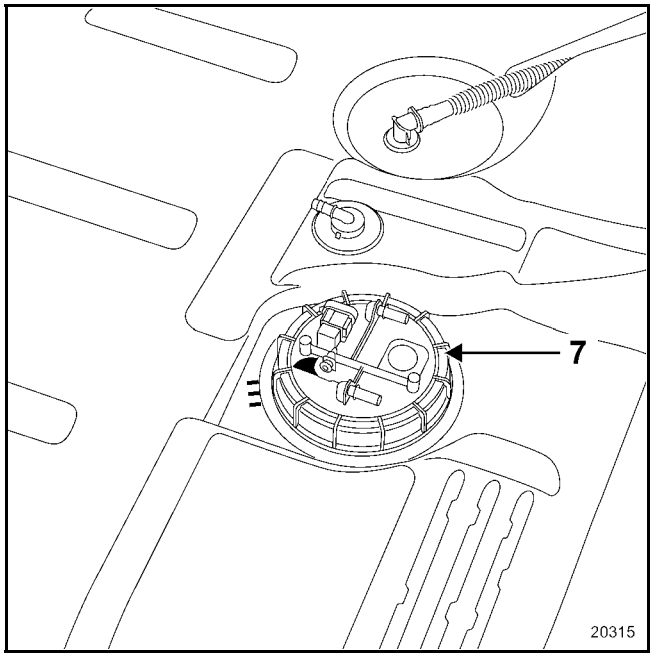


Lower the tank slightly to be able to gain access to the fuel pipes and the electrical wiring.

Disconnect:
– pump electrical connector (4),
– fuel return pipe (5),
– fuel outlet pipe (6).



Remove the fuel tank and drain it if necessary.



Remove the pump mounting nut (7) using tool **Mot.1397**.

Allow any fuel in the sender unit to drain, then remove the pump-sender assembly, taking care not to damage the float.

NOTE: if it is anticipated that several hours will elapse between removal and refitting of the pump-sender assembly, screw the nut back on the fuel tank to prevent any distortion.

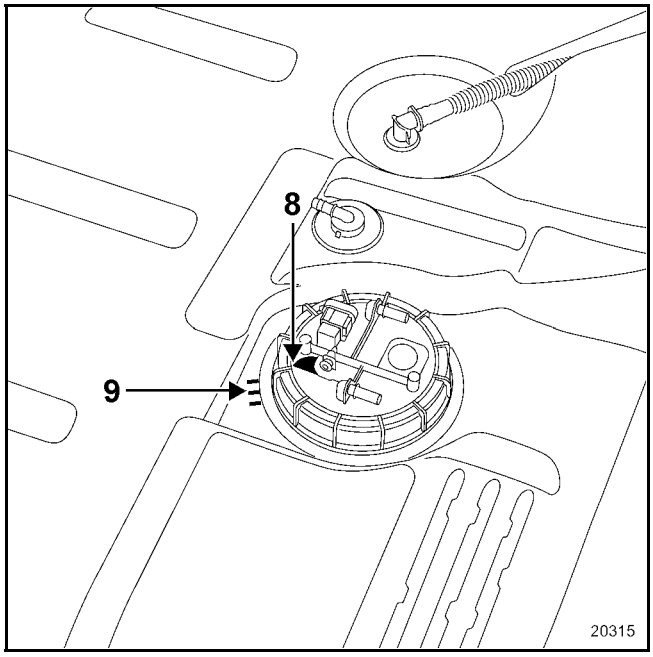
REFITTING

Replace the sealing gasket.

Refit the pump/sender assembly, positioning the mark on the sender unit (8) opposite the three raised lines (9) on the tank.

Refit the nut and tighten to a torque of **6 daNm**.

After tightening, check that the mark (8) on the pump/sender assembly does in fact line up with the marks (9) on the tank.



For the other refitting operations, proceed in the reverse order to removal.

Re-prime the circuit. To do that, turn the low-pressure pump over by switching on the ignition several times, or turn the low-pressure pump over with the diagnostic tool using the **Actuator Commands menu**.

The fuel filter is located in the engine compartment. It is contained in a removable cartridge. This cartridge contains a diesel fuel heater.

To replace the filter it is therefore necessary to remove the whole unit.

REMOVAL

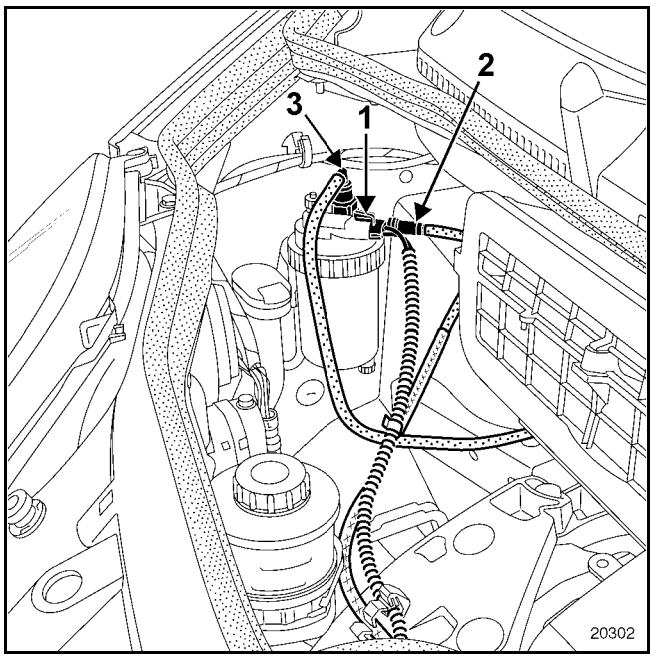
FOLLOW THE CLEANLINESS INSTRUCTIONS CLOSELY

WARNING: watch out for the residual pressure and the quantity of diesel fuel remaining in the pipes.

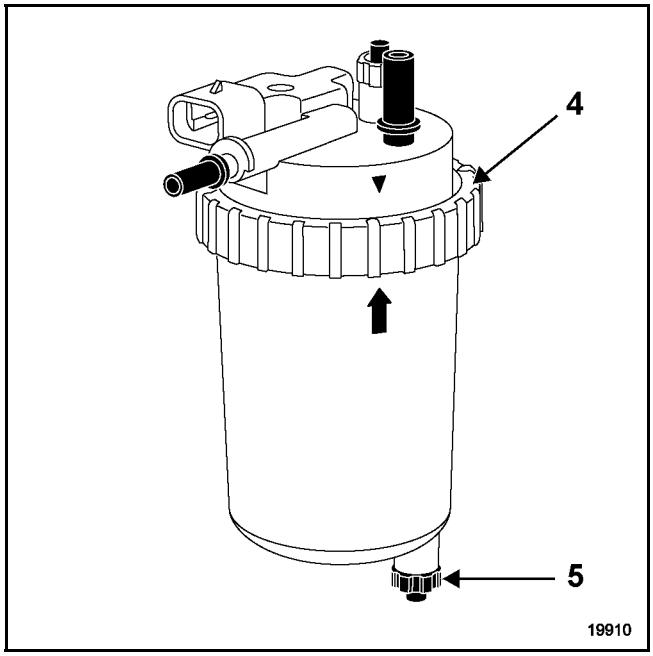
Disconnect the battery.

Disconnect from the filter:
– the diesel fuel heater connector (1),
– the fuel supply pipe to the engine (2),
– the pipes (3) coming from the tank,

Remove the filter by unclipping it from its support.



Unscrew the filter cover (4) and remove the filter cartridge.



REFITTING

Take care to line up the mark on the cover and the mark on the bowl correctly.

It is vital to respect the position of the connections to the filter.

Be careful not to squeeze or damage the pipes.

IMPORTANT: re-prime the system by switching on the ignition several times, or turn the low-pressure pump over with the diagnostic tool using the **Actuator Commands** menu.

From time to time it is necessary to bleed the water trapped in the diesel fuel filter via the bleed plug (5).

It is possible to check the pressure and flow in the low-pressure fuel circuit.

The low pressure is provided by the booster pump (electric pump fitted in the fuel tank which feeds the high-pressure pump during starting phases).

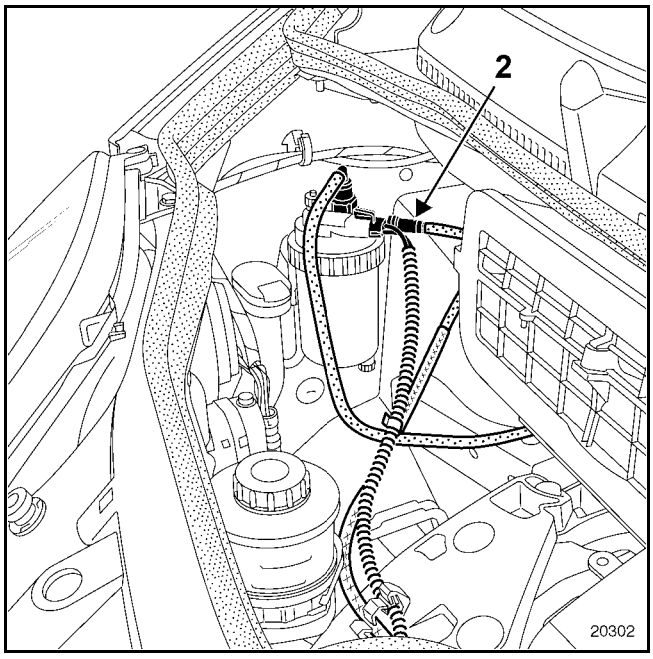
SPECIAL TOOLING REQUIRED	
Mot. 1311-01 or Mot. 1328	**Fuel pressure test kit**
Mot. 1311-03	**I adapter for fuel pressure test kit**
EQUIPMENT REQUIRED	
2000 ml graduated cylinder	

LOW PRESSURE CHECK (BOOSTER PUMP)

Fit an **I adapter**, **Mot. 1311-03**, to be able to connect the fuel pressure test kit **Mot. 1311-01** to the outlet (2) of the fuel filter.

Turn over the fuel pump with the diagnostic tool or by direct feed to the pump or by switching on the ignition.

Read the pressure, which should be **2.5 bar** maximum.



FLOW TEST (BOOSTER PUMP)

Make the pump flow into a **2000 ml** graduated cylinder. Turn on the ignition to run the pump. The pump is supplied for **10 seconds** if the engine is not started.

The flow read should be **80** to **100 l/h** minimum.

WARNING: it is forbidden to measure the pressure and flow of the high-pressure pump.

DISMANTLING THE PUMP INTERNALS IS PROHIBITED

SPECIAL TOOLING REQUIRED	
Mot. 1054	TDC setting pin
Mot. 1383	Tool for removing and refitting the high-pressure pipes
Mot. 1200-02	Pump pulley retaining tool
Mot. 1525	Pulley extractor
Mot. 1525-01	Extractor claws for F9Q
Mot. 1367	Engine support bar
Mot. 1367-02	Engine support tool
EQUIPMENT REQUIRED	
Low torque wrench	

TIGHTENING TORQUE (in daNm and/or °)	
High-pressure pipe	2.5 ± 0.2
High-pressure pump mounting	3 ± 0.3
Rear pump support mounting	3 ± 0.3
High-pressure pump pulley nut	1.5 then 60 ± 10°
Injection rail mounting bolt	2.2 ± 0.2

WARNING: before carrying out any work, connect the diagnostic tool to the injection computer and check that the injection rail is not pressurized.

Make a note of the fuel temperature.

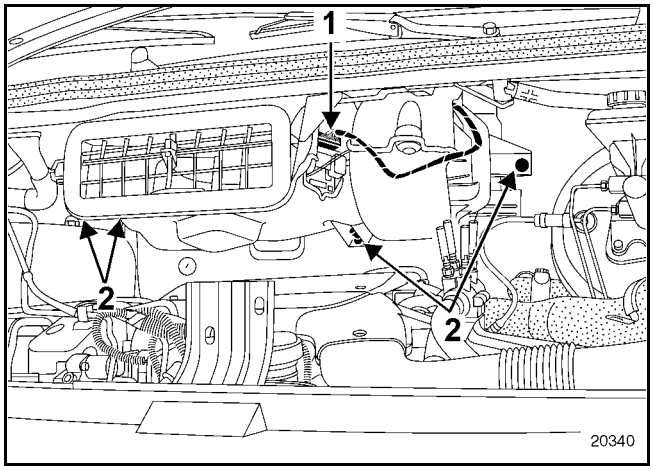
FOLLOW THE CLEANLINESS INSTRUCTIONS CLOSELY

REMOVAL

Put the vehicle on a two-post lift.

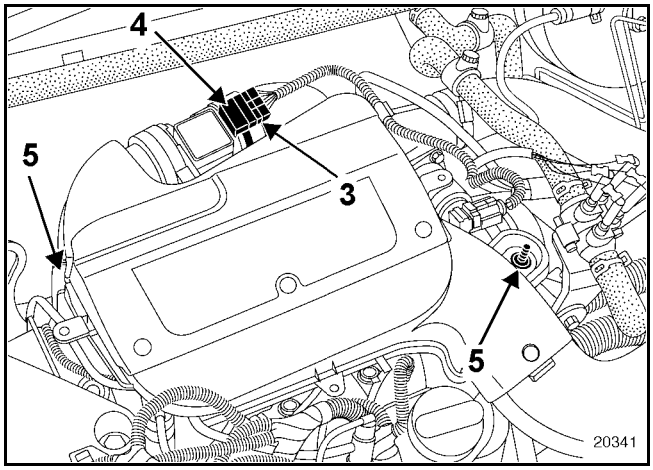
Disconnect:
– the battery,
– heater unit connector (1).

Remove:
– heater unit bolt and three nuts (2),
– heater unit.

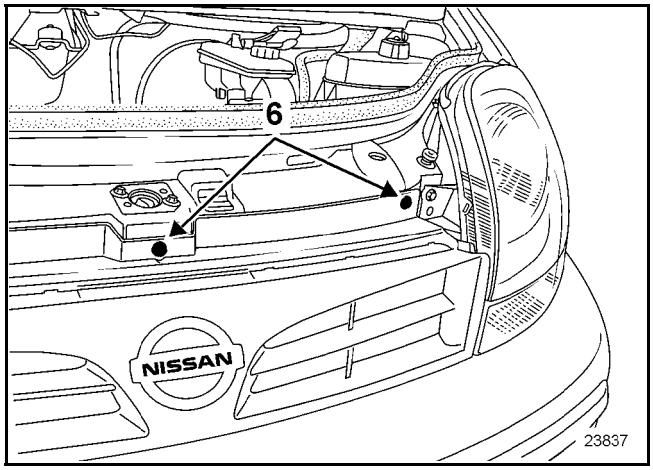


Disconnect:
– airflow sensor connector (3),
– turbocharger air intake pipe (4).

Remove:
– air filter unit mounting bolts (5),
– the air filter unit,

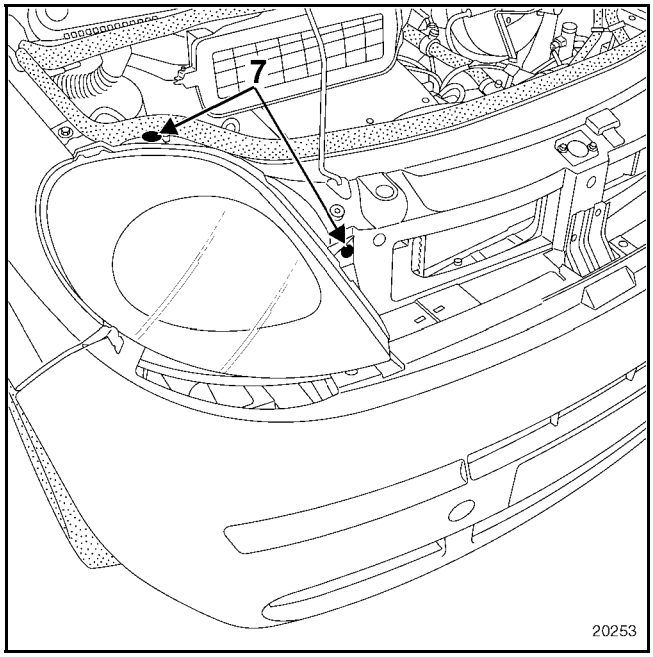


– radiator grille mounting screws (6),
– radiator grille.

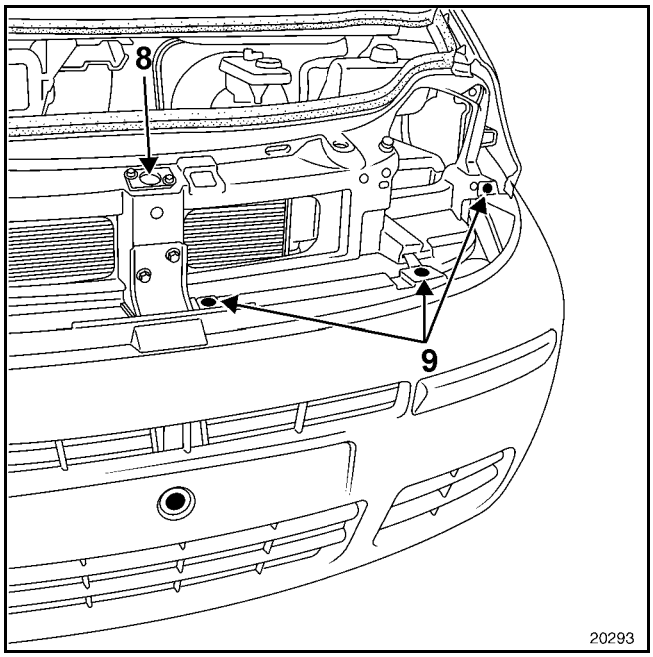


Disconnect the headlight units.

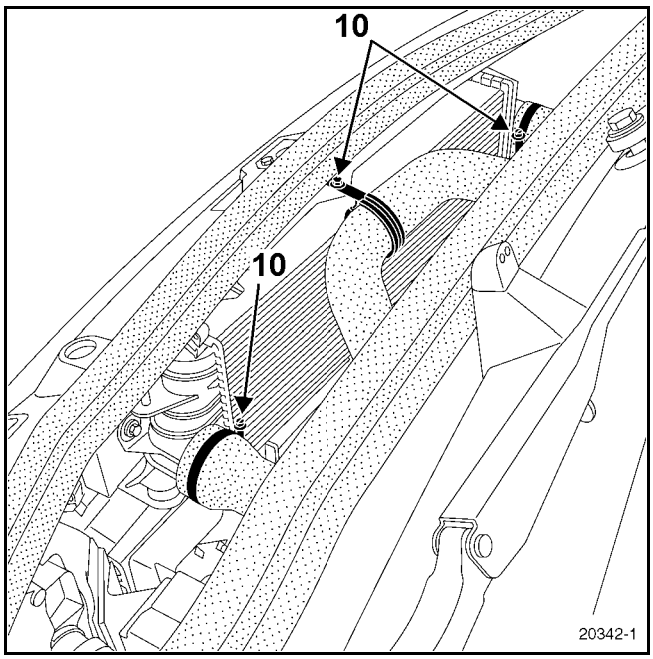
Remove:
– both headlight unit mounting bolts (7),
– the headlight units.



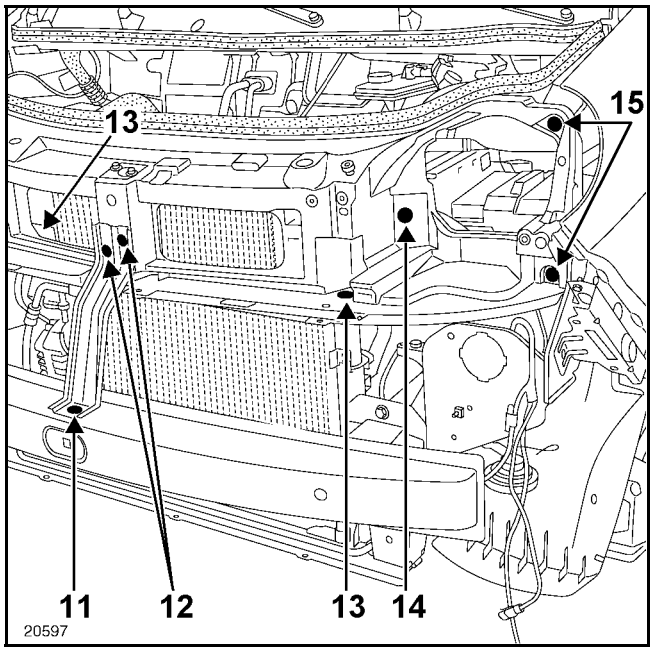
Remove:
– bonnet catch (8),
– upper bumper mounting bolts (9),
– air/air heat exchanger air inlet and outlet pipes,



– air/air heat exchanger air inlet and outlet pipes (10),

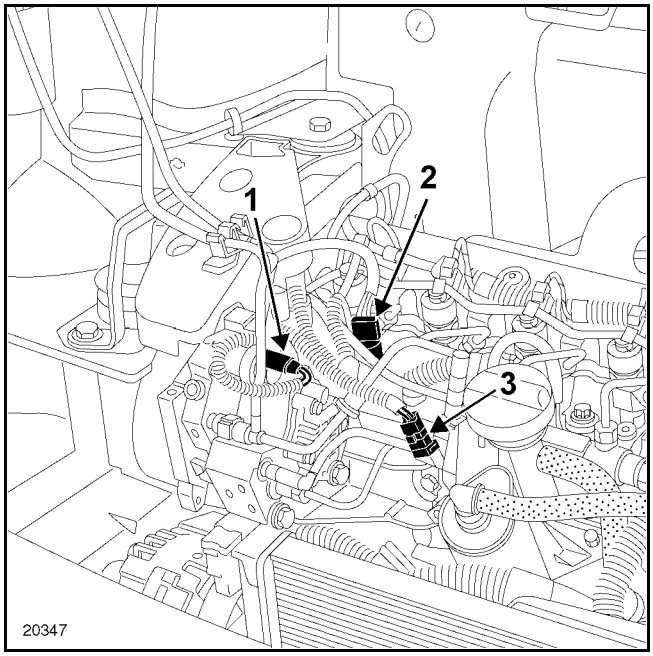


– bolt through the bumper (11),
– front upper cross member central mounting bolts (12), then the reinforcing strut,
– cooling radiator mounting bolts (13),
– computer shield mounting bolt (14),
– front upper cross member mounting bolts (15),
– upper cross member by pivoting it round the bumper.

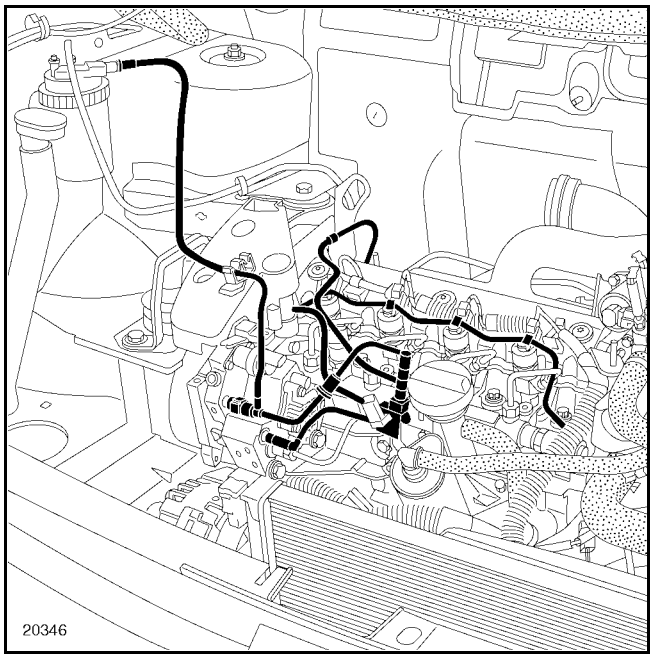


Disconnect:
– pressure regulator (1),
– pressure sensor (2),
– fuel temperature sensor (3).

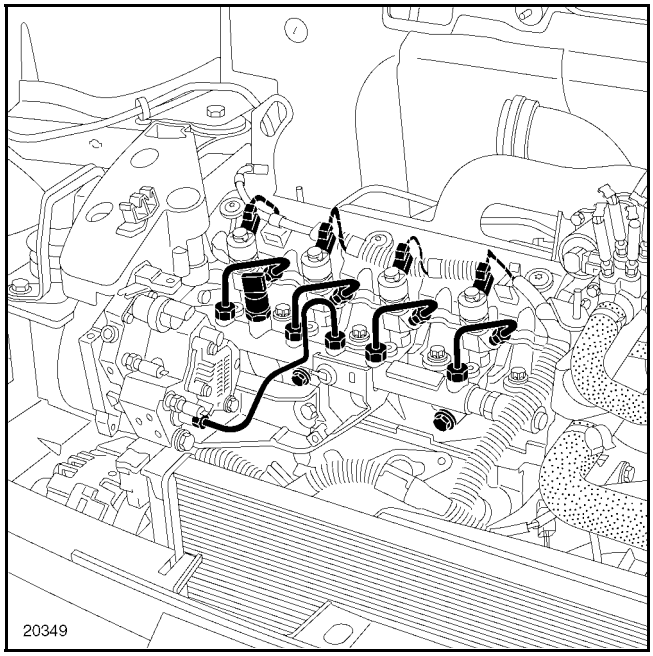
Move the electrical wiring loom aside.



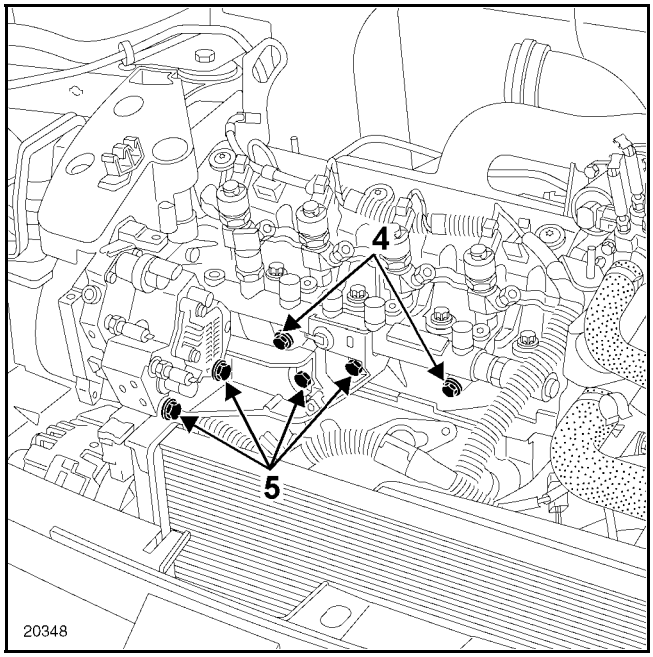
Remove:
– diesel fuel supply and return pipes, then fit plugs,



– High-pressure pipes using tool **Mot. 1383**, then fit plugs,



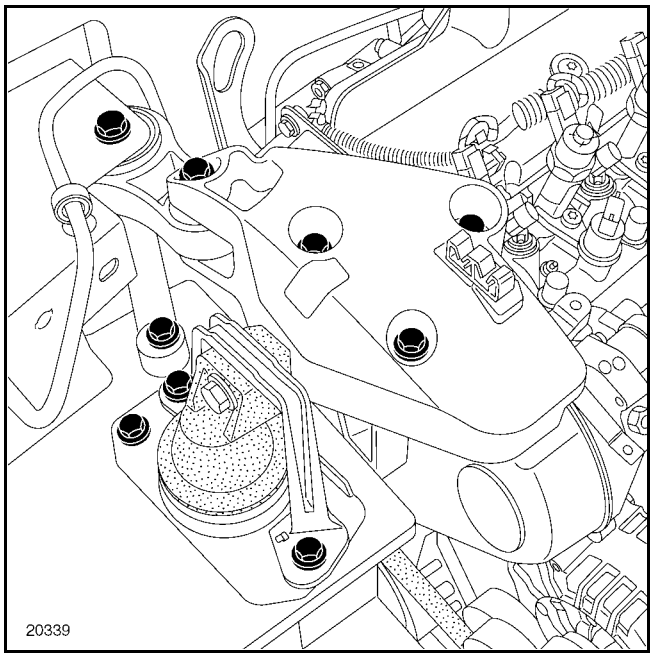
– rail mounting bolts (4),
– the rail,
– rear pump support mounting bolts (5),
– the rear pump support.



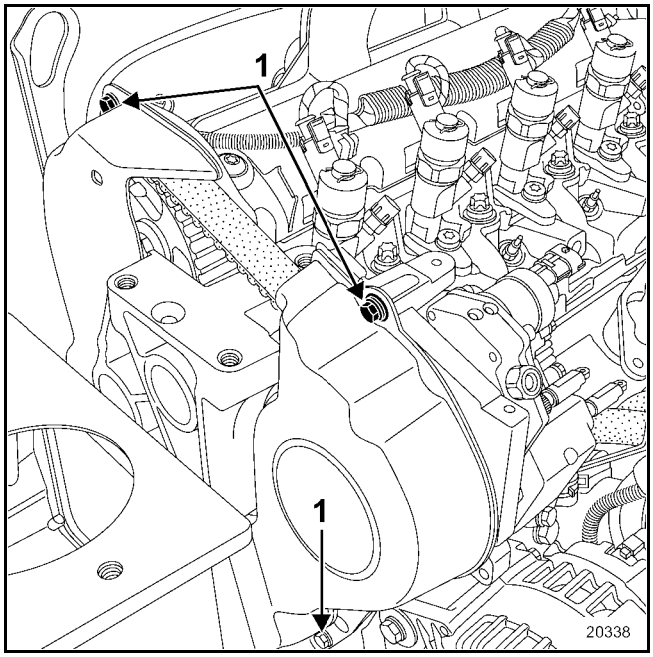
Set the engine to Top Dead Centre using pin **Mot. 1054**.

Put the engine support tools **Mot. 1367** and **Mot. 1367-02** in position.

Remove the suspended engine mounting.

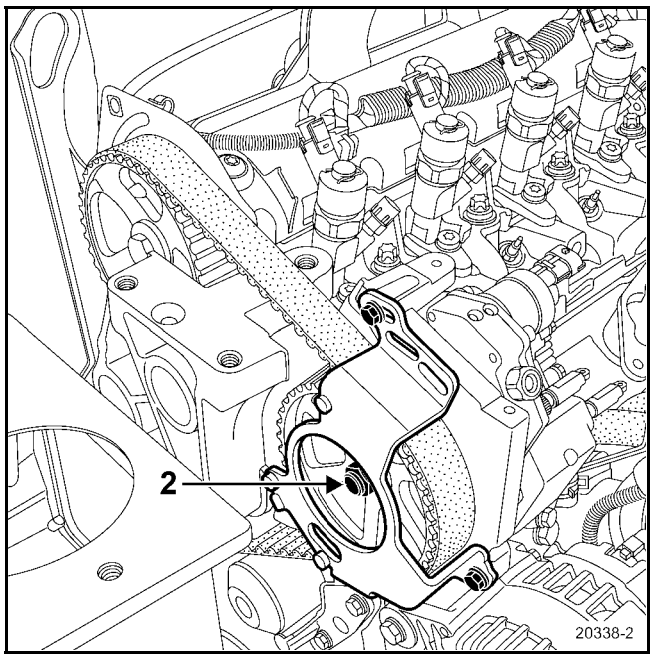


Remove:
– timing cover screws (1),
– the timing cover.

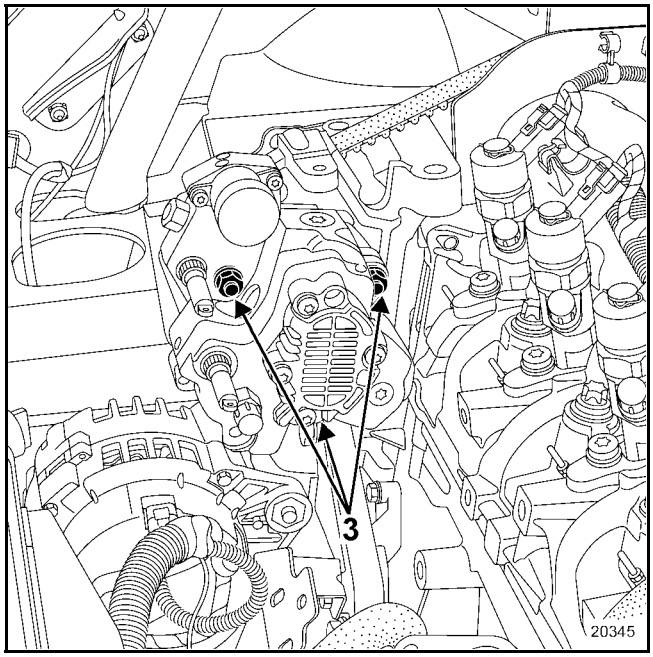


Place the pulley retaining tool **Mot. 1200-02** in position on the pulley.

Remove:
– High-pressure pump gear nut (2).

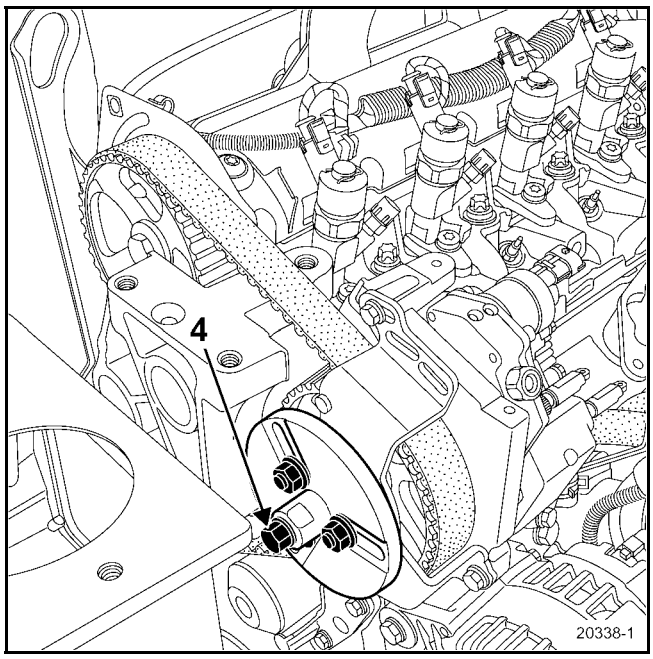


– High-pressure pump mounting nuts (3).



Position the **F9Q** extractor claws for **Mot. 1525-01**, then the pulley extractor **Mot. 1525**.

Extract the pump by tightening the thrust bolt (4) of the pulley extractor.



REFITTING

Leave removal of the protection plugs from any component until last.

For refitting operations, proceed in the reverse order to removal.

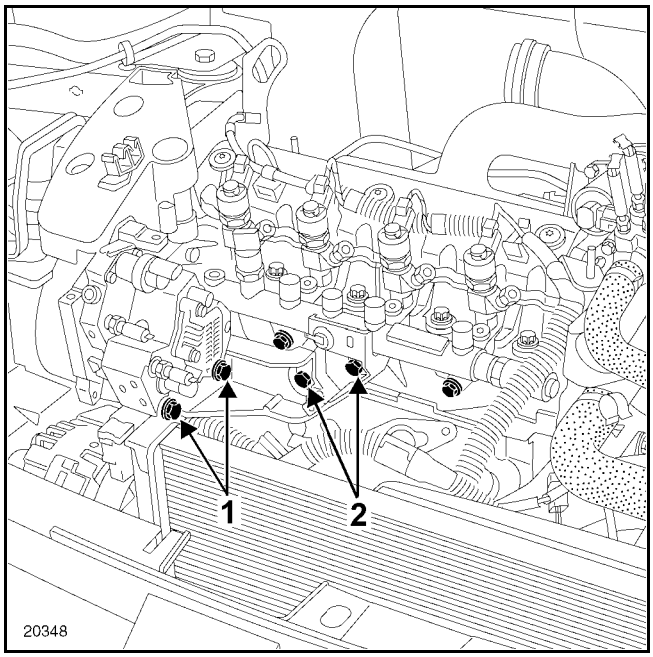
NOTE: be careful not to put the High-pressure pipes or the rear pump support under any strain.

To do this:

Refitting the rear pump support

Refit the rear pump mounting and hand-tighten the mounting bolts so as to bring the mounting into contact with the cylinder head and the pump.

Torque-tighten the rear pump support mounting bolts to **3 daNm**, tightening bolt (1) on the pump first, then bolts (2) on the cylinder head.



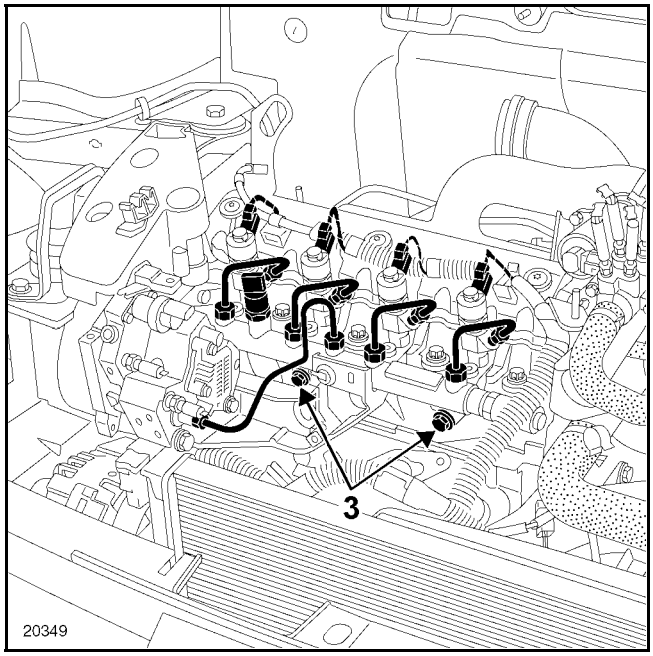
Refitting the rail and the High-pressure pipes

Refit the rail and hand-tighten the mounting bolts without tightening them (the rail must be loose).

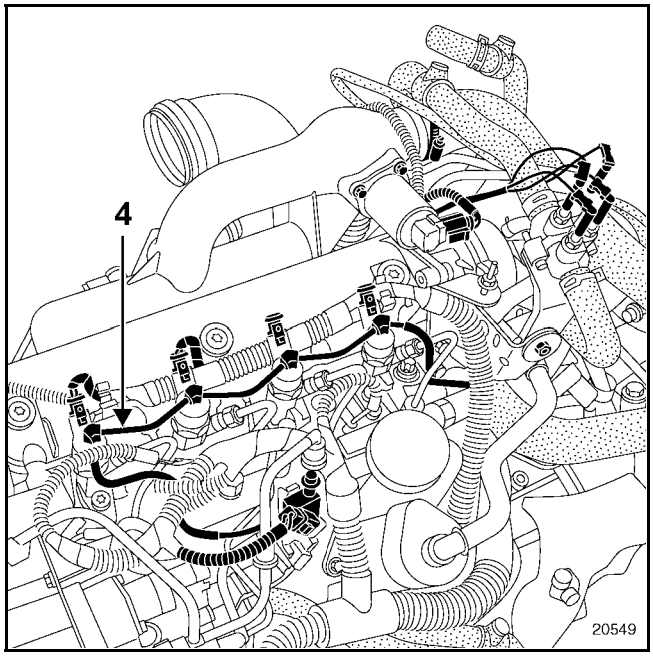
Refit the High-pressure pipes by hand-tightening the nuts at the pump and injectors end, then the rail end.

Tighten the rail mounting bolts (3) to a torque of **2.2 daNm**.

Torque-tighten the High-pressure pipes to **2.5 daNm**, tightening the nuts at the pump and injectors end first, then the rail end.



The diesel fuel return pipe (4) must be replaced every time it is removed.



Refit the suspended engine mounting (refer to the procedure in **Section 19**).

The remaining refitting operations are performed in the reverse order to removal.

IMPORTANT: re-prime the system by switching on the ignition several times, or turn the low-pressure pump over with the diagnostic tool using the **Actuator Commands** menu.

SPECIAL TOOLING REQUIRED	
Mot. 1383	Tool for removing and refitting the high-pressure pipes
EQUIPMENT REQUIRED	
Low torque wrench	

TIGHTENING TORQUE (in daNm) ▽	
High-pressure pipe	2.5 ± 0.2
Injection rail mounting bolt	2.2 ± 0.2
Pressure sensor	3.5 ± 0.2

IMPORTANT: before carrying out any work, connect the diagnostic tool, establish dialogue with the injection computer and check that the injection rail is no longer pressurized.

Make a note of the fuel temperature.

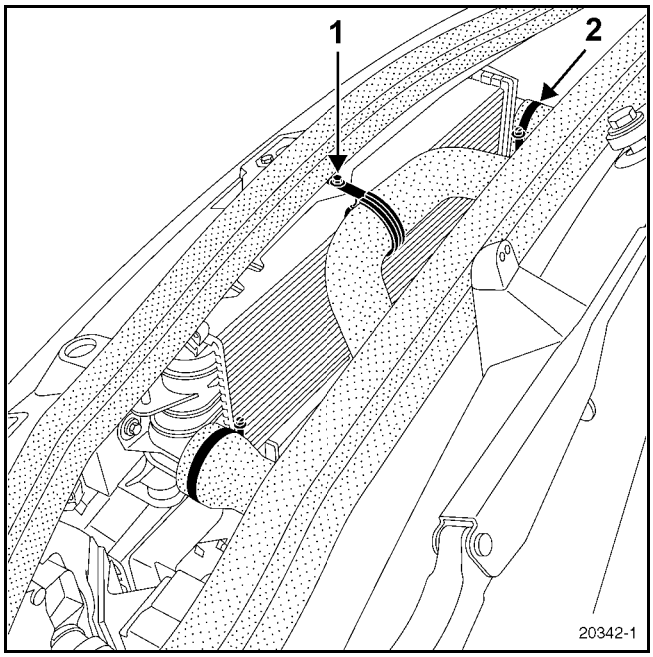
FOLLOW THE CLEANLINESS INSTRUCTIONS CLOSELY

REMOVAL

Disconnect the battery.

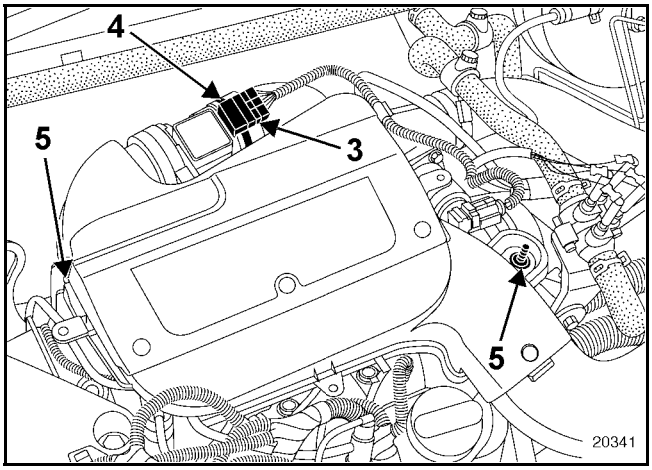
Remove the retaining clip screw (1).

Disconnect:
– heat exchanger air intake pipe (2),



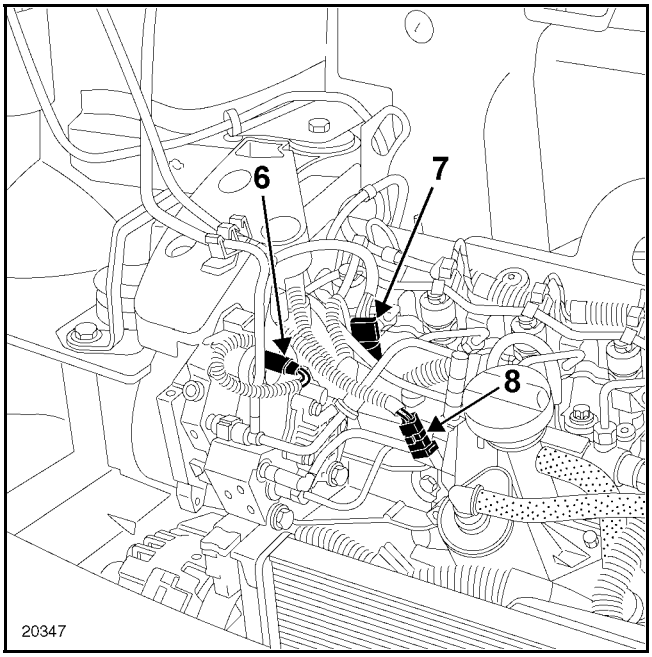
– airflow sensor connector (3),
– turbocharger air intake pipe (4).

Remove:
– air filter unit mounting bolts (5),
– the air filter unit.

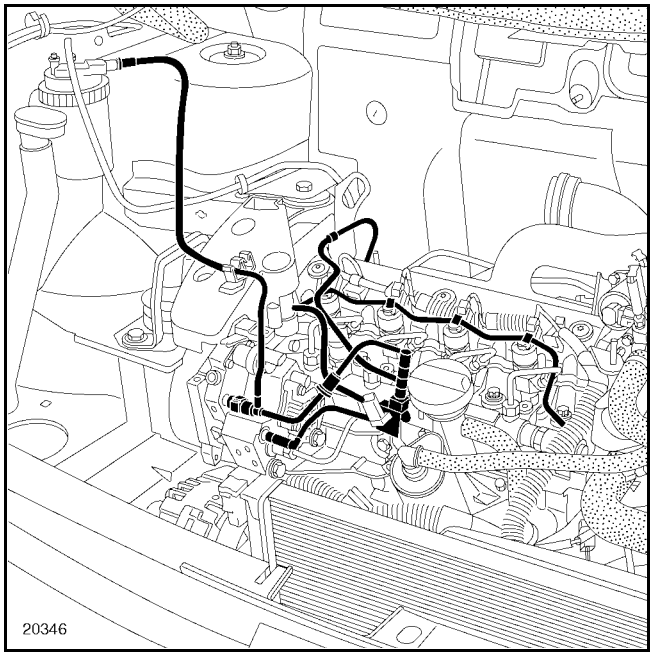


Disconnect:
– pressure regulator (6),
– pressure sensor (7),
– fuel temperature sensor (8).

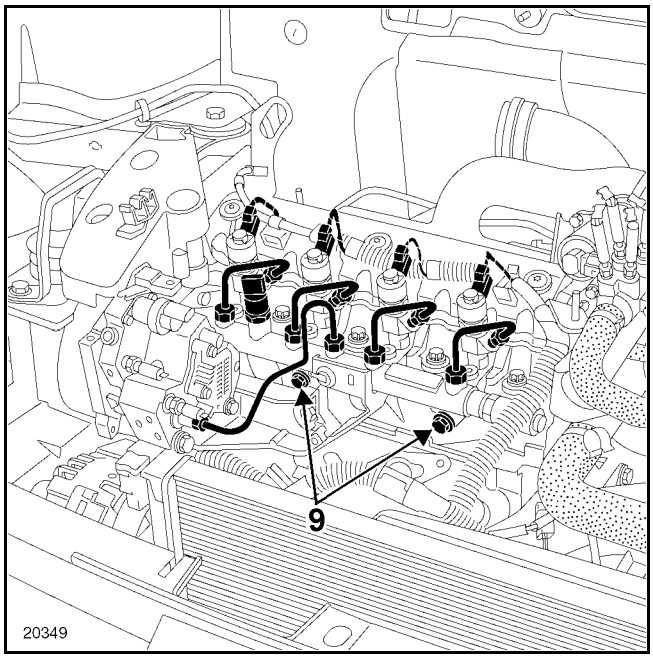
Move the electrical wiring loom aside.



Remove:
– diesel fuel supply and return pipes, then fit plugs,



– High-pressure pipes using tool **Mot. 1383**, then fit plugs,



– rail mounting bolts (9),
– the rail.

REFITTING

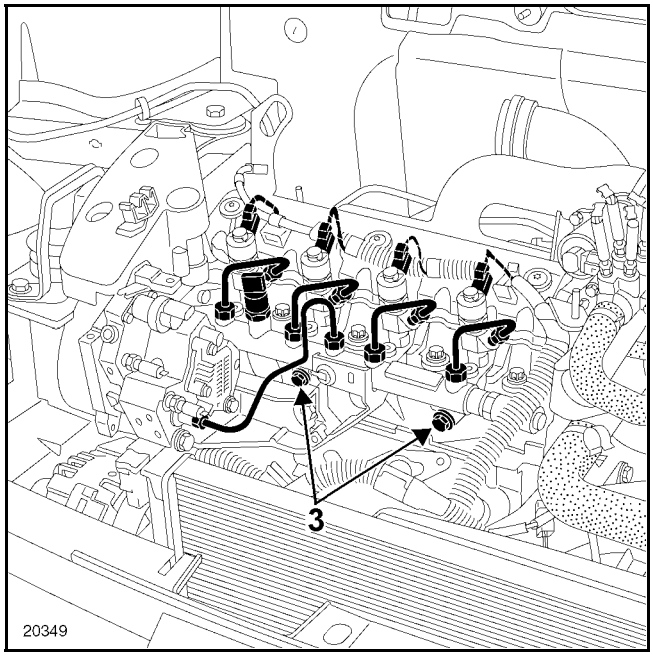
Leave removal of the protection plugs from any component until last.

Refit the rail and hand-tighten the mounting bolts without tightening them (the rail must be loose).

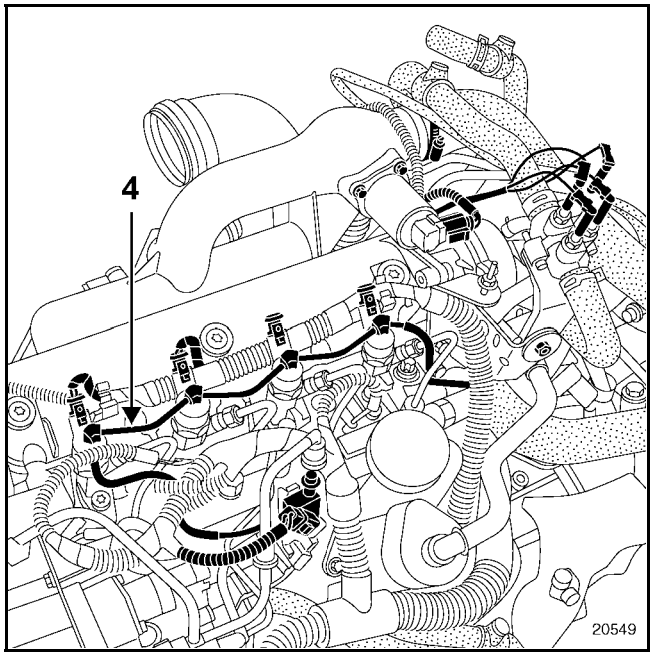
Refit the High-pressure pipes by hand-tightening the nuts at the pump and injectors end, then the rail end.

Tighten the rail mounting bolts (3) to a torque of **2.2 daNm**.

Torque-tighten the High-pressure pipes to **2.5 daNm**, tightening the nuts at the pump and injectors end first, then the rail end.



The diesel fuel return pipe (4) must be replaced every time it is removed.



The remaining refitting operations are performed in the reverse order to removal.

IMPORTANT: re-prime the system by switching on the ignition several times, or turn the low-pressure pump over with the diagnostic tool using the **Actuator Commands** menu.

IT IS FORBIDDEN TO DISMANTLE THE INSIDE OF AN INJECTOR OR TO SEPARATE THE INJECTOR HOLDER FROM THE NOZZLE.

SPECIAL TOOLING REQUIRED	
Mot. 1383	Tool for removing and refitting the high-pressure pipes
EQUIPMENT REQUIRED	
Low torque wrench	

TIGHTENING TORQUES (in daNm)	▽
High-pressure pipe	2.5 ± 0.2
Injection rail mounting bolt	2.2 ± 0.2
Injector clamp mounting bolt	2.5 ± 0.5

IMPORTANT: before carrying out any work, connect the diagnostic tool, establish dialogue with the injection computer and check that the injection rail is not pressurized.

Make a note of the fuel temperature.

FOLLOW THE CLEANLINESS INSTRUCTIONS CLOSELY

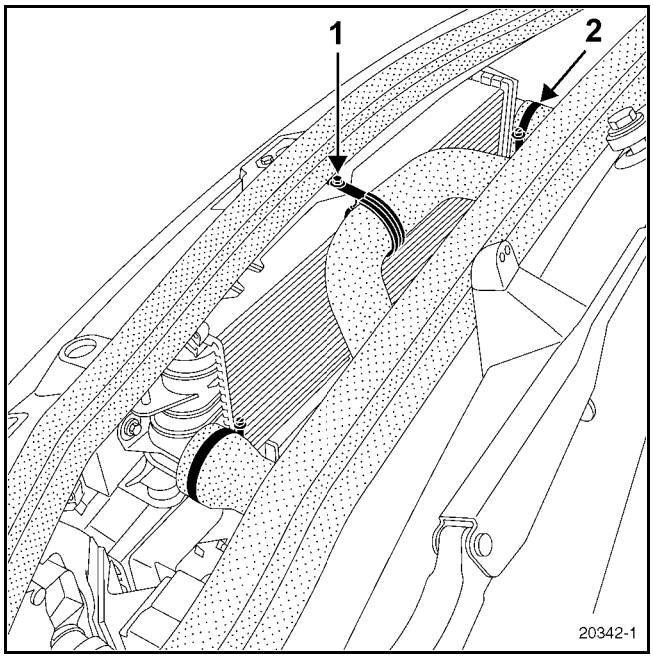
NOTE: injectors may be replaced individually.

REMOVAL

Disconnect the battery.

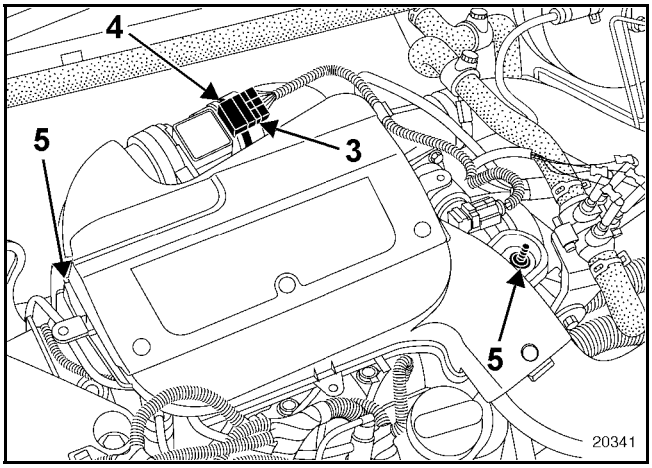
Remove the retaining clip screw (1).

Disconnect:
– heat exchanger air intake pipe (2),

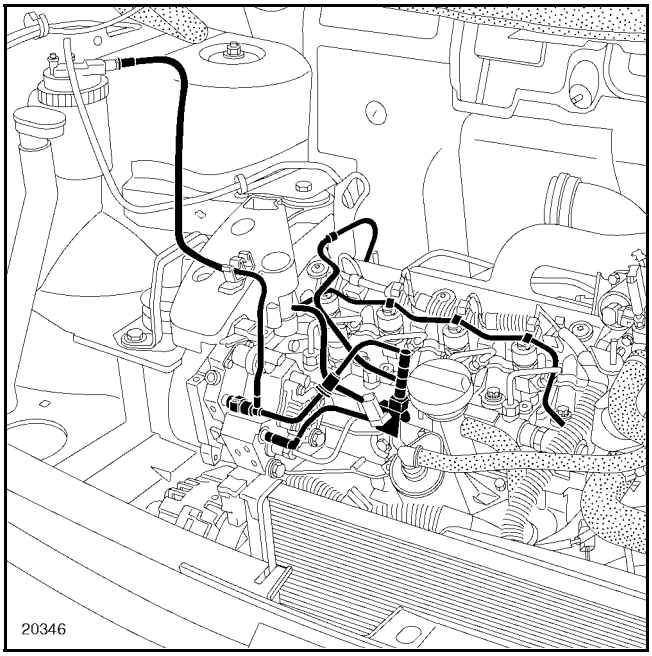


– airflow sensor connector (3),
– turbocharger air intake pipe (4).

Remove:
– air filter unit mounting bolts (5),
– the air filter unit,



– diesel fuel return pipe, then fit plugs,

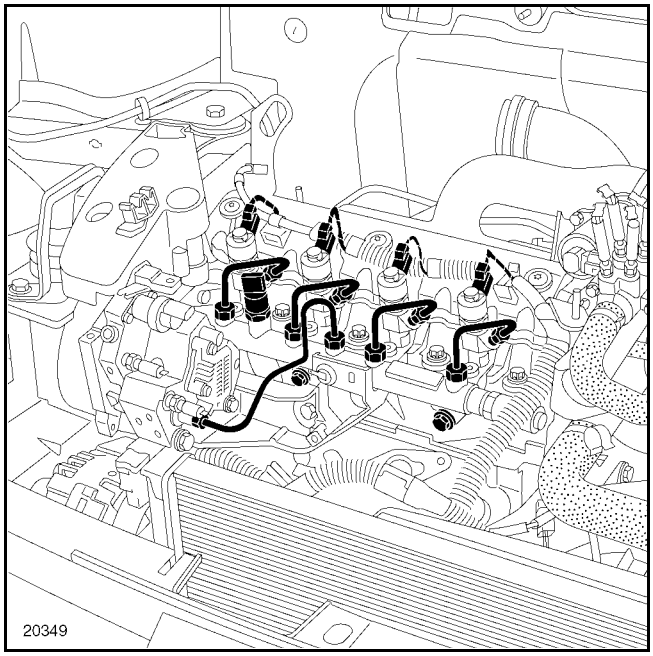


Remove the high-pressure pipe using tool **Mot. 1383**.

Fit anti-pollution plugs.

Disconnect the injector connector.

Remove:
– the injector mounting clamp,
– the injector,
– the flame shield washer.



CLEANING

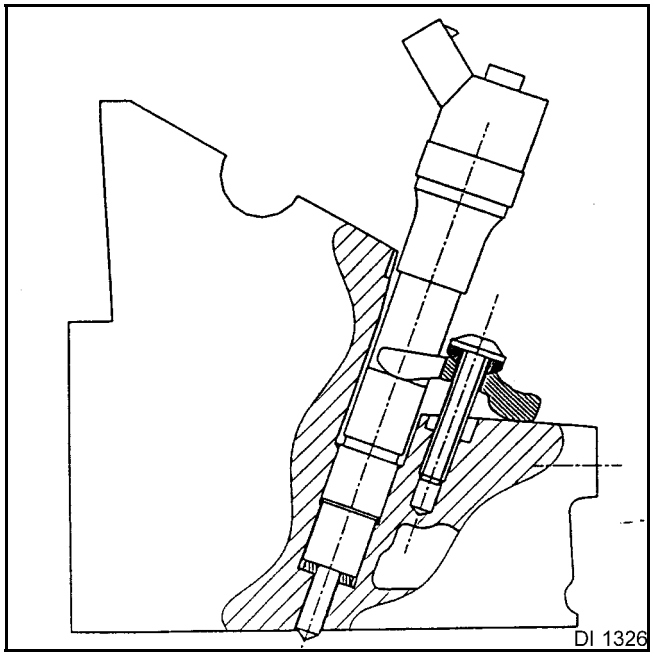
It is absolutely forbidden to use the following when cleaning the injector:
– a wire brush,
– an emery cloth,
– an ultrasonic cleaner.

To clean the nose of the injector, let it soak in degreaser, then wipe it with a lint-free cloth.

REFITTING

Leave removal of the protection plugs from any component until last.

Change the washer beneath the injector.



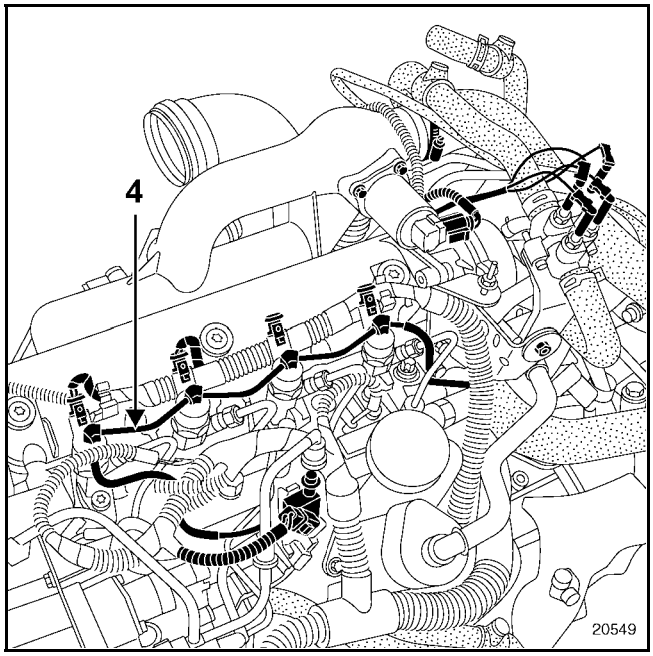
Refit the injector.

Torque-tighten the injector flange bolts to **2.5 daNm**.

NOTE: be careful not to place the High-pressure pipes under any strain.

To do this:
– undo the injection rail (the rail should be loose),
– refit the High-pressure pipes by hand-tightening the nuts at the injectors end first,
– tighten the rail mounting bolts to a torque setting of **2.2 daNm**,
– torque-tighten the High-pressure pipes to **2.5 daNm**, tightening the nuts at the injectors end first.

The diesel fuel return pipe (4) must be replaced every time it is removed.



The remaining refitting operations are performed in the reverse order to removal.

IMPORTANT: re-prime the system by switching on the ignition several times, or turn the low-pressure pump over with the diagnostic tool using the **Actuator Commands** menu.

TIGHTENING TORQUE (in daNm)	
Pressure sensor	3.5 ± 0.2

IMPORTANT: before carrying out any work, connect the diagnostic tool, establish dialogue with the injection computer and check that the injection rail is not under pressure.

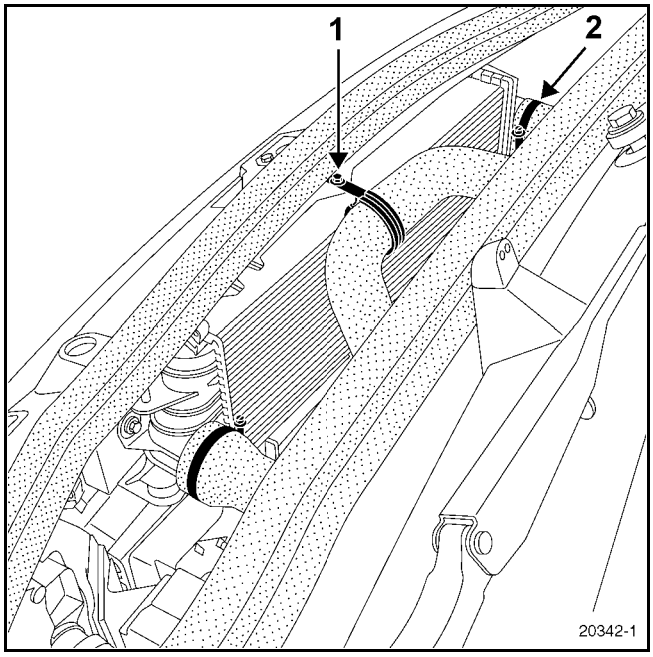
Make a note of the fuel temperature.

REMOVAL

Disconnect the battery.

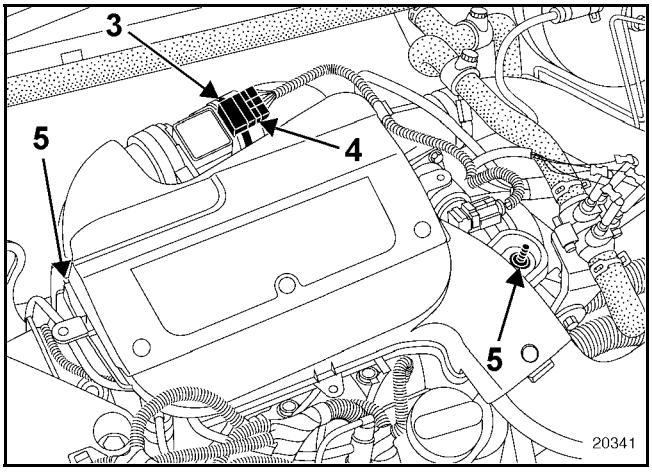
Remove the retaining clip screw (1).

Disconnect:
– heat exchanger air intake pipe (2),

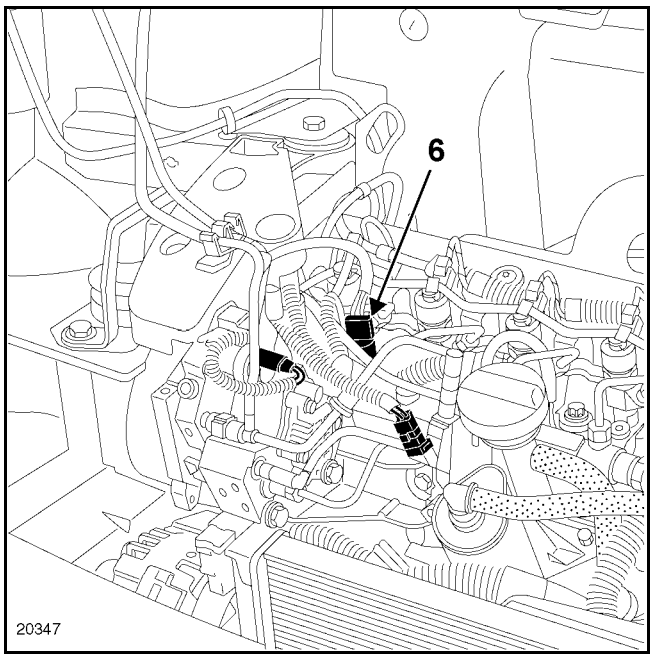


– airflow sensor connector (3),
– turbocharger air intake pipe (4).

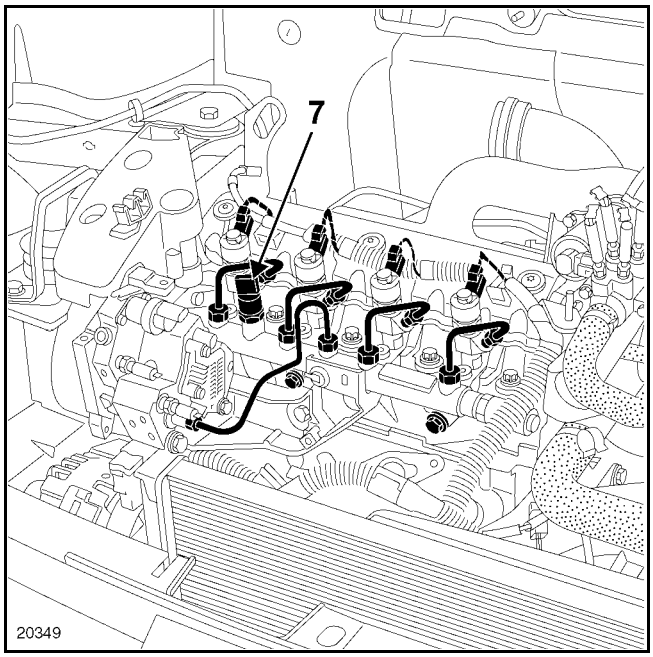
Remove:
– air filter unit mounting bolts (5),
– the air filter unit,



Disconnect the pressure sensor (6).



Remove the pressure sensor (7).



REFITTING

Replace the seal.

Screw in the sensor and torque-tighten it to **3.5 daNm**.

Connect the sensor.

The remaining refitting operations are performed in the reverse order to removal.

IMPORTANT: re-prime the system by switching on the ignition several times, or turn the low-pressure pump over with the diagnostic tool using the **Actuator Commands** menu.

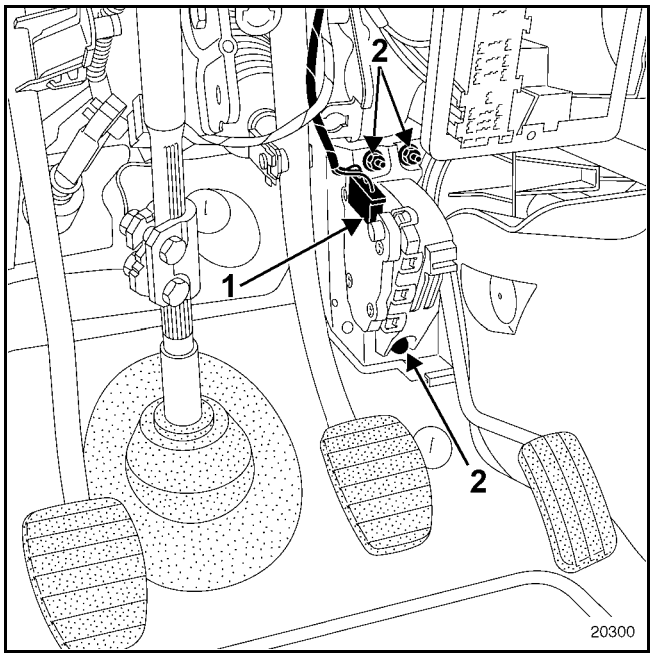
GENERAL INFORMATION

The accelerator pedal potentiometer is incorporated in the accelerator pedal. Its replacement therefore requires replacement of the accelerator pedal.

REMOVAL

Disconnect:
– the battery,
– the accelerator pedal connector (1).

Remove:
– the three pedal mounting bolts (2),
– the pedal.

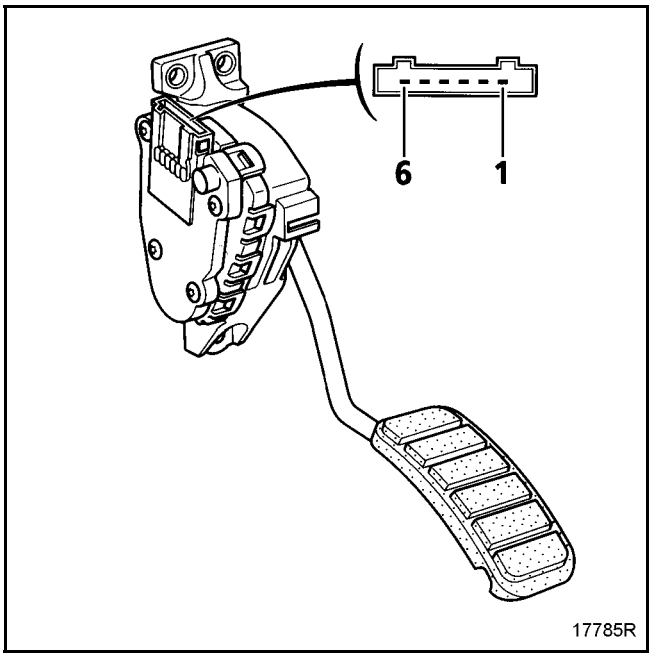


REFITTING

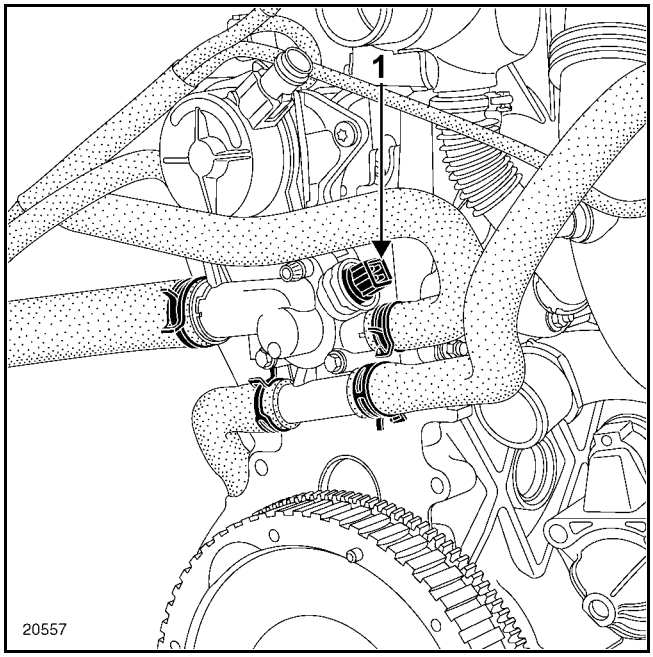
Refitting is the reverse of removal.

Track allocation:

Track	Description
1	Track 2 earth
2	Track 1 earth
3	Track 1 signal
4	Track 1 feed
5	Track 2 feed
6	Track 2 signal



NOTE: a fault on the accelerator position potentiometer causes variations in the idle speed or engine operation (see **Section 13 Idle speed correction**).



The coolant temperature sensor (1) (injection and coolant temperature indicator on the instrument panel) is a three-track sensor.

Two tracks for the coolant temperature signal to the computer (tracks **B E1** and **B K3**).

This system allows the engine cooling fan to be controlled by the injection computer. It consists of a single temperature sensor used for the injection, the engine cooling fan, the temperature indicator and the temperature warning light on the instrument panel.

OPERATION

The injection computer uses the coolant temperature to control:
– the injection system,
– the fan relay:
- the cooling fan is activated at low speed then at high speed if the coolant temperature exceeds **90** °**C** and stops when the temperature falls below **95** °**C**,
- the fan unit can be controlled by the air conditioning.

COOLANT TEMPERATURE WARNING LIGHT

The warning light is controlled by the computer via the multiplex network.

It lights up when the coolant temperature exceeds **115** °**C** and goes out when the temperature falls below **110** °**C**.

GENERAL INFORMATION

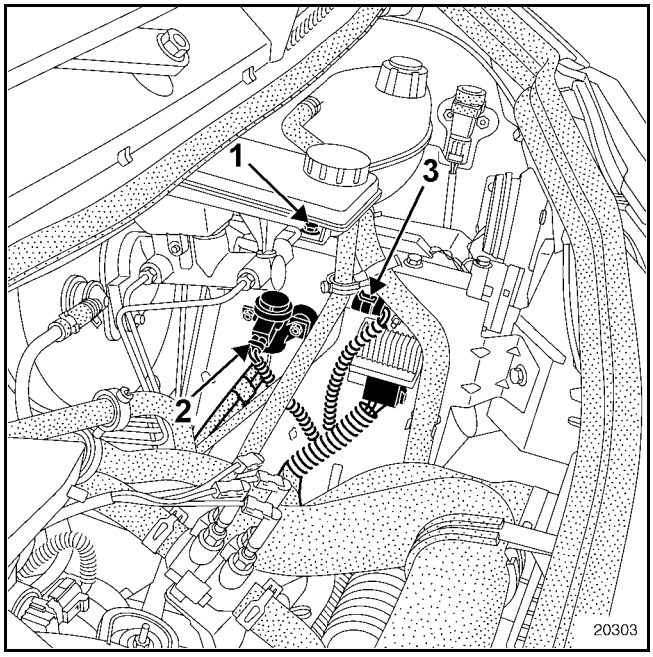
The injection computer is located behind a sheet metal shield under the expansion bottle.

REMOVAL

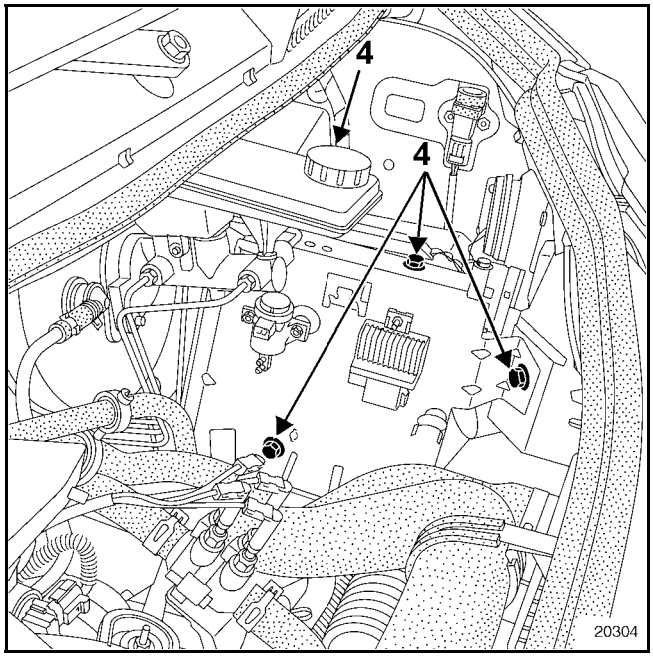
Disconnect the battery.

Remove the expansion bottle mounting screw (1) and move it out of the way.

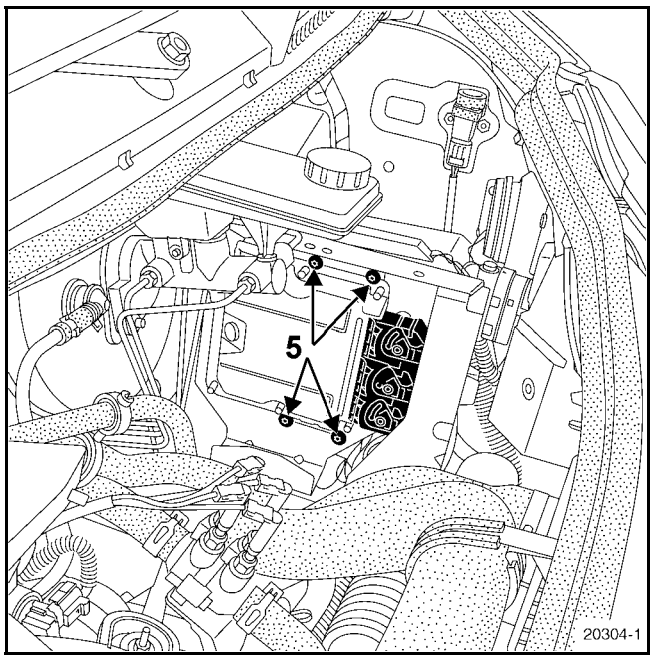
Disconnect:
– the turbocharger regulation solenoid valve (2),
– the turbocharging pressure sensor (3) and unclip it,
– the preheating unit.



Remove:
– metal shield mounting bolts (4) and remove it from above,



– computer mounting bolts (5) and remove it, having disconnected it beforehand.

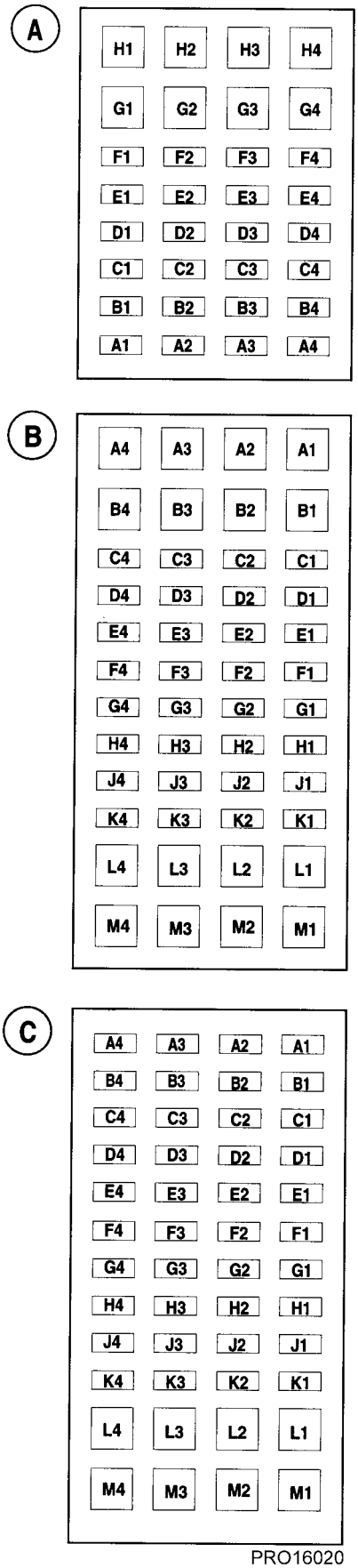


REFITTING

Proceed with refitting in the reverse order to removal.

If the computer has been replaced, carry out programming of the immobiliser code by following the procedure described in the Section **Immobiliser**.

TRACK ALLOCATION

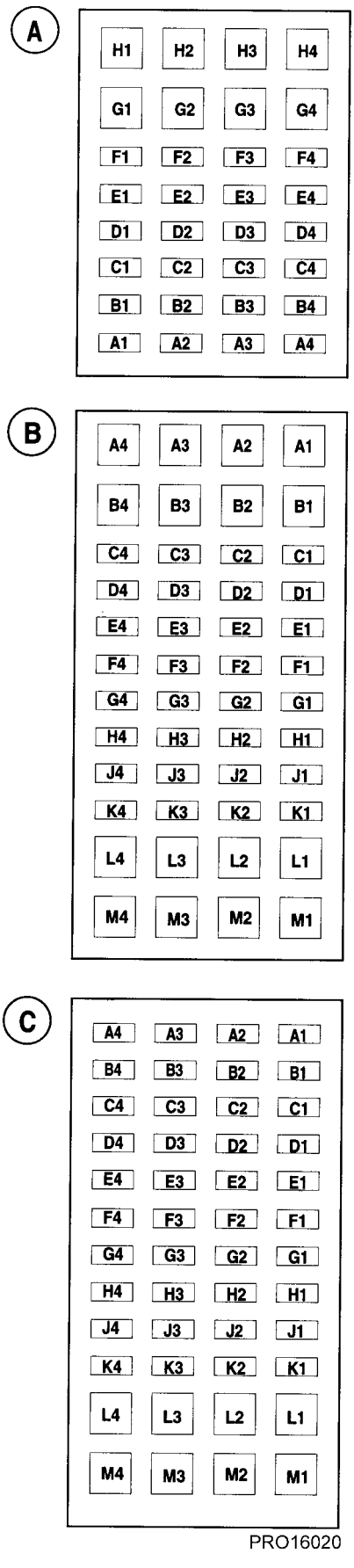


CONNECTOR A

A3	---	Load potentiometer earth (track 2)
A4	→←	CAN L MULTIPLEX LINK (Passenger compartment)
B1	←	Heated windscreen input
B3	---	Load potentiometer earth (track 1)
B4	→←	CAN H MULTIPLEX LINK (Passenger compartment)
C1	←	Load potentiometer signal input (track 1)
C3	→←	Fault finding
E1	---	Load potentiometer feed (track 1)
E2	←	Clutch switch input
E4	←	Vehicle speed input
F1	←	Load potentiometer signal input (track 2)
F3	←	Brake switch input
F4	→	Air conditioning compressor control output
G4	←	Air conditioning request input
H2	---	Load potentiometer feed (track 2)

CONNECTOR B

B2	---	Exhaust gas recirculation system position potentiometer earth
B3	←	Plugs fault-finding input
C1	←	Turbocharger pressure sensor signal input
C2	←	Exhaust gas recirculation system position potentiometer signal output
C3	→	Preheating control relay
D1	←	Diesel fuel pressure sensor input
D3	←	Air temperature sensor input
D4	→	Feed control relay output
E1	---	Coolant temperature sensor earth
E3	---	+ After ignition
F2	---	Exhaust gas recirculation system position potentiometer supply
F3	→	Thermoplunger control relay 2 output (2 thermoplungers)
G1	---	Fuel temperature sensor earth
G2	---	Air flowmeter feed
G3	←	Engine speed sensor signal
H2	---	Diesel pressure sensor supply
H3	←	Engine speed sensor signal
H4	←	Air flowmeter sensor signal input
J2	---	Turbocharging pressure sensor feed
J3	←	Fuel temperature input
K3	←	Coolant temperature sensor input
L1	→	High-pressure regulation valve output
L2	→	Turbo regulation solenoid valve output
L3	---	Power earth
L4	---	Power earth
M1	→	Exhaust gas recirculation system solenoid valve control output
M2	---	+ After relay
M3	---	+ After relay
M4	---	Power earth



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CONNECTOR C

A1	→	Booster pump control output
A2	→	Low speed fan assembly relay control outlet
A3	---	Air flowmeter earth
A4	---	Turbocharger pressure sensor earth
B3	---	Diesel pressure sensor earth
B4	→	High speed fan assembly relay control outlet
C1	---	Camshaft sensor earth
E4	→	Thermoplunger control relay 3 output (1 thermoplunger)
J4	→	Thermoplunger control relay 1 output (1 thermoplunger)
K4	←	Camshaft position sensor signal
L1	→	Injector 4 control
L2	---	Injector 3 feed
L3	---	Injector 2 feed
L4	→	Injector 2 control
M1	→	Injector 1 control
M2	→	Injector 3 control
M3	---	Injector 1 feed
M4	---	Injector 4 feed

This document presents the fault finding procedure applicable to computers with part number 82 00 051 603 for F9Q 762 engines, and part number 82 00 051 600 for F9Q 760 engines.

EDC15C3C, Program No. **CB,** Vdiag No. **0C** equipping: **Primastar** vehicle

To run diagnostics on this system, it is essential to have the following items:

- the wiring diagram of the function for the vehicle concerned,
- The Workshop Repair Manual for the vehicle in question,
- the tools listed under the Special Tooling Required section.

DIAGNOSTIC PROCEDURE:

- Use one of the diagnostic tools for identifying the system fitted on the vehicle (reading the computer type, program number, Vdiag number, etc.).
- Locate the Fault finding documents corresponding to the system identified.
- Read the information provided in the Introductory section.
- Read the faults in the computer memory and use the Interpretation of faults section of the documentation.

REMINDER: each fault is interpreted for a given type of storage (fault present, fault stored, fault present or stored). The checks defined for handling each fault are therefore only to be performed if the fault stated by the diagnostic tool is described for its type of storage. The type should be considered when the diagnostic tool is switched on after the ignition has been turned off then back on.

If a fault is interpreted when it is declared stored, the conditions for applying fault finding procedures are shown in the NOTES box. When these conditions are not satisfied, use the fault finding procedure to check the circuit of the faulty part, since the fault is no longer present on the vehicle. Follow the same procedure when a fault is declared as stored by the diagnostic tool but is only interpreted in the documentation for a present fault.

Carry out the conformity check (appearance of possible faults not yet identified by the system's self-diagnostic procedure) and implement the associated fault finding procedure according to the results.

- Confirm the repair (customer complaint disappears).
- Implement the diagnostic procedure for each "Customer complaint" according to the "fault finding charts", if the problem persists.

TOOLING REQUIRED:

Diagnostic tool: Consult II

Bornier part number: **Elé. 1613** (necessary to avoid damaging the injection computer connector terminals).

IMPORTANT:

Any fault finding which requires an operation on the direct high pressure injection system requires a comprehensive knowledge of the cleanliness and safety instructions as set out in this Workshop Repair Manual, section 13.

DF001 PRESENT OR STORED	COMPUTER 1.DEF : Internal electronic fault.

1.DEF	***NOTES***	None.

If the fault is **stored**, clear the fault from the computer memory.
Switch off the ignition, then switch it on again to initialise the computer.
If the fault reappears, replace the engine management computer.
If necessary, modify the configuration of the new computer to match the equipment options present on the vehicle.

If the fault is **present**, replace the engine management computer.
If necessary, modify the configuration of the new computer to match the equipment options present on the vehicle.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch the ignition off and carry out a road test followed by a check with the diagnostic tool.

DF002 PRESENT OR STORED	COOLANT TEMPERATURE SENSOR CIRCUIT CC.0 : Short circuit to earth CO.1 : Short circuit or open circuit to + 12 V 1.DEF : Coolant operating temperature not attained

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault is declared present after: – the fault has been cleared – and the engine has been running for **1 minute**.
	Special notes Use bornier **Elé. 1613** for all operations on the engine management computer connectors. Use a workshop temperature sensor to compare the temperatures.

CC.0	***NOTES***	None.

Check the coolant temperature sensor connectors.
Check the connectors on the engine management computer.
Repair if necessary.

Measure the resistance of the coolant temperature sensor between **terminals 2 and 3** of its connector.
Replace the sensor if the **N**egative **T**emperature **C**oefficient is not approximately:

2252 Ω ± 112 at 25°C.
811 Ω ± 39 at 50°C.
283 Ω ± 8 at 80°C.

Ensure **insulation** against **earth** of the connection between:
Engine management computer, **connector B track2** ⟶ **K3 track 3** coolant-temperature-sensor connector.

Ensure **continuity of the connection** between:
Engine management computer, **connector B track3** ⟶ **E1 track 2** coolant-temperature-sensor connector,

CO.1	***NOTES***	None.

Check the coolant temperature sensor connectors.
Check the connectors on the engine management computer.
Repair if necessary.

Measure the resistance of the coolant temperature sensor between **terminals 2 and 3** of the connector.
Replace the sensor if the **N**egative **T**emperature **C**oefficient is not approximately:

2252 Ω ± 112 at 25°C.
811 Ω ± 39 at 50°C.
283 Ω ± 8 at 80°C.

Check **the continuity and insulation** relative to **+ 12 V** on the connections between:
Engine computer, **connector B track E1** ⟶ **Track 2** coolant temperature sensor connector
Engine management computer, **connector B track K3** ⟶ **Track 3** coolant temperature sensor connector

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF002 **CONTINUED**	

1.DEF	***NOTES***	**Conditions for applying the fault finding procedure to stored faults:** The fault is declared present after: – a delay of **3.3 minutes** with the engine running.
		Special notes: Use a workshop temperature sensor to compare the values.

Check the coolant temperature sensor connectors.
Check the connectors on the engine management computer.
Repair if necessary.

Compare the engine temperatures indicated on the instrument panel and by the diagnostic tool "parameter" screen with those indicated by the "workshop" temperature sensor.

–If there is a significant difference, replace the engine temperature sensor.

or

Measure the resistance of the coolant temperature sensor between **terminals 2 and 3** of its connector.
Replace the sensor if the **N**egative **T**emperature **C**oefficient is not approximately:

2252 Ω ± 112 at 25°C.
811 Ω ± 39 at 50°C.
283 Ω ± 8 at 80°C.

Check **the continuity and insulation** against **earth** of the connection between: (connectors disconnected)

Engine management computer, **connector B track K3** ⟶ **Track 3** coolant temperature sensor connector

Check **the continuity and insulation** relative to **+ 12 V** on the connection between (connectors disconnected):

Engine management computer, **connector B track E1** ⟶ **Track 2** coolant temperature sensor connector

Measure the line resistance of the following connections:

Track E1, connector B computer ⟶ **Track 2** coolant temperature sensor connector
Track K3, connector B computer ⟶ **Track 3** coolant temperature sensor connector

Carry out the necessary operations if the resistance is abnormally high.

With the engine cold, check the closed position of the thermostat. ⟶ Start of opening: **83°C.**
Check the level and leaktightness of the coolant circuit, see section **19** of the Workshop Repair Manual.
Carry out the necessary repairs.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF012 PRESENT OR STORED	BATTERY VOLTAGE 1.DEF : Voltage too low 2.DEF : Voltage too high

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault is declared present after: – starting and a delay of **30 seconds** with the engine running.
	Special notes: If necessary, perform a complete check of the charge circuit using the Consult II diagnostic tool.

1.DEF	***NOTES***	None.

Carry out the operations necessary to obtain the correct computer supply:
9 V < operating voltage < 14.5 V.
– Using a multimeter, check the battery voltage directly at the terminals, then compare with the value displayed by the diagnostic tool in Parameters menu **PR004**.
If there is no difference:
– Recharge and test the battery and replace it if it is faulty.
– Next check the charge circuit.
If there is a difference:
– Check the condition of engine fuse **F2** (corrosion, poor contact at terminals, etc.).
– Check the tightness and the condition of the battery terminals.
– Make sure there is no interference resistance on the power supply to the engine management computer:
Engine fuseholder (**F2**) ⟶ tracks **M2** and **M3** of connector **A** of the engine management computer
Earths ⟶ tracks **L3, L4, M4** of connector **A** of the engine management computer
Carry out the necessary repairs.

2.DEF	***NOTES***	None.

Carry out the operations necessary to obtain the correct computer supply:
9 V < operating voltage < 14.5 V.
– Check the charging circuit.
Carry out the necessary repairs.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF015 PRESENT OR STORED	IMMOBILISER 1.DEF : Internal electronic fault.

NOTES	**Conditions for applying the fault finding procedure to stored faults:** Apply the fault finding strategy if the fault is either present or stored.

1.DEF	***NOTES***	None.

If the fault is **stored**, clear the fault from the computer memory.
Switch off the ignition, then switch it on again to initialise the computer.
If the fault reappears, replace the engine management computer.
If necessary, modify the configuration of the new computer to match the equipment options present on the vehicle.

If the fault is **present**, replace the engine management computer.
If necessary, modify the configuration of the new computer to match the equipment options present on the vehicle.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF019 PRESENT OR STORED	AIR FLOW SENSOR CIRCUIT CO.0 : Open circuit or short circuit to earth, engine running CC.1 : Short circuit to + 12 V, engine running 1.DEF : Sensor supply fault 2.DEF : Signal inconsistency

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault reappears as stored after: – the engine has been running at varying speeds for **5 minutes**.
	Special notes: Use bornier **Elé. 1613** for all operations on the engine management computer connectors.

CO.0	***NOTES***	**Priority in the event of a combination of faults:** In the event of the simultaneous presence of fault **DF022: Air temperature sensor circuit CO.1**, check the connection of the air flowmeter connector.

Check the air flowmeter connectors.
Check the connectors on the engine management computer. Repair if necessary.

Ensure **continuity and insulation** against **earth** of the connection between:
Engine management computer, **connector B track H4** → **Track 5** of the air flowmeter connector.

Check the presence of **+ 5 V** on **track 3** of the air flowmeter connector.

Ensure **insulation** as follows:
– between **tracks 5 and 6** of the air flowmeter connector,
– between **tracks 2 and 5** of the air flowmeter connector.

If the fault persists after these checks, replace the air flowmeter.

CC.1	***NOTES***	None.

Check the air flowmeter connectors.
Check the connectors on the engine management computer. Repair if necessary.

Check **insulation** against **+ 12 V** on the connection between:
Engine management computer, **connector B track H4** → **Track 5** air flowmeter connector

Check **the continuity** of the following connections:
Engine management computer, **connector B track L3** → **Track 6** of the air flowmeter connector
Engine management computer, **connector B tracks L3, L4 and M4** → **Battery** earth
Engine management computer, **connector C track A3** → **Track 2** of the air flowmeter connector
Engine management computer, **connector B tracks M2 and M3** → **Track 4** of the air flowmeter connector

If the fault persists after these checks, replace the air flowmeter.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF019 **CONTINUED 1**	

1.DEF	***NOTES***	**Priority in the event of a combination of faults:** Deal with the **DF091: Sensor feed voltage no. 1** fault as a priority if it is present or stored.

Check the air flowmeter connectors.
Check the connectors on the engine management computer.
Repair if necessary.

Check **the continuity and insulation** relative to **+ 12 V** on the connection between:
Engine management computer, **connector B track G2** ⟶ **Track 3** air flowmeter connector

Check the insulation between **tracks 3 and 4** of the air flowmeter connector.

Ensure **continuity and insulation** against **earth** of the connection between:
Engine management computer, **connector B track G2** ⟶ **Track 3** air flowmeter connector

Check the following insulations:
- between **tracks 3 and 6** of the air flowmeter connector,
- between **tracks 3 and 2** of the air flowmeter connector.

Check the presence of **+ 12 V after relay** on **track 4** of the air flowmeter connector.
Check for the presence of **earth** on **tracks 2 and 6** of the air flowmeter connector.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF019 **CONTINUED 2**	

2.DEF	***NOTES***	**Conditions for applying the fault finding procedure to stored faults:** If the fault is declared present after: – starting and a rise in temperature at idle speed exceeding **60°C** followed by a delay of **40 seconds** or – if it reappears as stored after the fault has been cleared, the engine started, the ignition switched off, followed by the completion of power-latch and the ignition being switched off.
		Priority in the event of a combination of faults: Deal with the **DF077 EGR valve 1.DEF or 2.DEF** fault as a prioriaty if it is declared present.

Check the air flowmeter connectors.
Check the connectors on the engine management computer.
Repair if necessary.

Check **the continuity and insulation** relative to **+ 12 V** and **earth** on the connection between:
Engine management computer, **connector B track G2** ⟶ **Track 3** air flowmeter connector

Ensure **continuity and insulation** against **earth** of the connection between:
Engine management computer, **connector B track H4** ⟶ **Track 5** air flowmeter connector

Ensure the **continuity and insulation** relative to **+ 12 volts** of the connection between:
Engine management computer, **connector C track A3** ⟶ **Track 2** air flowmeter connector

Check the presence of **+ 12 V after relay** on **track 4** of the air flowmeter connector.
Check continuity of the connection between earth and **track 6** of the air-flowmeter connector.

Make sure there are no foreign bodies on the flowmeter grille.
Ensure that the air inlet circuit is tight.
Check the oil-vapour recycling circuit (excess oil).
Carry out the required operations.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF022 PRESENT OR STORED	AIR TEMPERATURE SENSOR CIRCUIT CC.0 : Short circuit to earth CO.1 : Open circuit or short circuit to + 12 V

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault is declared present after: – the engine has been running for **2 minutes**.
	Special notes: Use bornier **Elé. 1613** for all operations on the engine management computer connectors.

CC.0	***NOTES***	None.

Check the air temperature sensor connections (flowmeter).
Check the connectors on the engine management computer. Repair if necessary.

Ensure **insulation** against **earth** of the connection between:
Engine management computer, connector **B track D3** → **Track 1** of air temperature sensor connector, (flowmeter)

Check the presence of: **+ 5 V** on **track 3** of the air flowmeter connector.

Measure the **N**egative **T**emperature **C**oefficient air temperature sensor resistance between **tracks 1** and **2** of the air flowmeter:
Replace the air flowmeter if the **N**egative **T**emperature **C**oefficient is not approximately:

3714 Ω ± 161 at 10°C.
2448 Ω ± 90 at 20°C.
1671 Ω ± 59 at 30°C.

CO.1	***NOTES***	**Priorité dans le traitement en cas de cumul de défaut:** In the event of simultaneous presence of fault **"DF019: air flowmeter 2.DEF", check that the flowmeter connector is properly mated.**

Check the air temperature sensor connections (flowmeter).
Check the connectors on the engine management computer. Repair if necessary.

Check **the continuity and insulation** relative to **+ 12 V** on the following connections:
Engine management computer, **connector B tracks D3** → **Track 1** air temperature sensor connector
Engine management computer, **connector C tracks A3** → **Track 2** air temperature sensor connector

Measure the **N**egative **T**emperature **C**oefficient between **tracks 1** and **2** of the air flowmeter:
Replace the air flowmeter if the **N**egative **T**emperature **C**oefficient is not approximately:

3714 Ω ± 161 at 10°C.
2448 Ω ± 90 at 20°C.
1671 Ω ± 59 at 30°C.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF040 PRESENT OR STORED	AFTER IGNITION FEED 1.DEF : Inconsistency after initialisation

1.DEF	***NOTES***	None.

Check after ignition power supply to the engine management computer on **connector B** in track **E3**.
If necessary, check:
- the condition of the engine fuseholders **F2 and F4** (oxidation, crimping of wires at the terminals and condition of terminals on the fuse side),
- the integrity of the ignition switch,
- the engine management computer connectors.

Repair if necessary.

If the fault persists:
- Clear the fault from the computer memory.
- Switch off the ignition, then switch it on again to initialise the computer.
- If the fault reappears, replace the engine management computer.

If necessary, modify the configuration of the new computer to match the equipment options present on the vehicle.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF048 PRESENT OR STORED	LOW SPEED FAN ASSEMBLY CIRCUIT CC.1 : Short circuit to + 12 V CO.0 : Open circuit or short circuit to earth

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault reappears as stored after: – the fault memory has been cleared and – actuator command **AC011: Low speed fan assembly relay**
	Special notes: Use bornier **Elé. 1613** for all operations on the engine management computer connectors.

CC.1	***NOTES***	None.

Perform a check on the connectors of low speed fan relay socket "**R10**" in the engine fuse and relay box.
Check the connectors on the engine management computer.
Repair if necessary.

Measure the resistance of the low-speed fan relay coil:
Replace the relay if the resistance is not approximately **65** $\Omega \pm$ **5 at + 20°C**

Remove the low speed relay and check the insulation relative to **+ 12 V** on the connection between:
Engine management computer, **connector C track A2** ⟶ **Track 2** low speed fan relay socket

CO.0	***NOTES***	None.

Perform a check on the connectors of low speed fan relay socket "**R10**" in the engine fuse and relay box.
Check the connectors on the engine management computer.
Repair if necessary.

Measure the resistance of the low-speed fan relay coil:
Replace the relay if the resistance is not approximately **65** $\Omega \pm$ **5 at + 20°C**

Ensure the continuity and insulation against **earth** of the connection between:
Engine management computer, **connector C track A2** ⟶ **Track 2** of the low speed fan assembly relay socket

Check the presence of **12 V after relay** on **track 1** of the low speed fan assembly relay socket.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF049 PRESENT OR STORED	HIGH SPEED FAN ASSEMBLY CIRCUIT CC.1 : Short circuit to + 12 V CO.0 : Open circuit or short circuit to earth

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault reappears as stored after: – the fault memory has been cleared and – actuator command "**AC012: High speed fan assembly relay**".
	Special notes Use bornier **Elé. 1613** for all operations on the engine management computer connectors.

CC.1	***NOTES***	None.

Perform a check on the connectors of high-speed fan relay socket **R9** in the engine fuse and relay box.
Check the connectors on the engine management computer.
Repair if necessary.

Measure the resistance of the high-speed fan relay coil:
Replace the relay if the resistance is not approximately **60 Ω ± 5 at + 20°C**.

Remove the high speed relay and check the insulation relative to **+ 12 V** on the connection between:
Engine management computer, connector **C track B4** ⟶ **Track 2** of the high speed fan assembly relay socket

CO.0	***NOTES***	None.

Perform a check on the connectors of high-speed fan relay socket **R9** in the engine fuse and relay box.
Check the connectors on the engine management computer.
Repair if necessary.

Measure the resistance of the high-speed fan relay coil:
Replace the relay if the resistance is not approximately **60 Ω ± 5 at +20°C**.

Ensure the continuity and insulation against **earth** of the connection between:
Engine management computer, connector **C track B4** ⟶ **Track 2** of the high speed fan assembly relay socket

Check the presence of **12 V after relay** on **track 1** of the high speed fan assembly relay socket.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF061 PRESENT OR STORED	HEATER PLUG CIRCUIT 1.DEF : Heater plug(s) faulty or in open circuit

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault reappears as stored after: – the fault memory has been cleared and – actuator command **AC010: Preheating relay**.
	Special notes: Use bornier **Elé. 1613** for all operations on the engine management computer connectors.

1.DEF	***NOTES***	None.

Check the preheating unit connectors.
Check the connections on all the heater plugs.
Check the connectors on the engine management computer.
Repair if necessary.

Ensure that the engine is earthed.

Check the resistance of heater plugs: replace any plug in which the resistance is not **0.6 ± 0.1 at 20°C**.

Ensure the **continuity** of the following connections:
- Preheating unit **track 1** ⟶ **Cylinder 3** heater plug,
- Preheating unit **track 2** ⟶ **Cylinder 4** heater plug,
- Preheating unit **track 6** ⟶ **Cylinder 1** heater plug,
- Preheating unit **track 7** ⟶ **Cylinder 2** heater plug.

Check that **fuse no. 1** (70A) on the engine fuse and relay box is intact.
Check the presence of **+ 12 V battery** on **track 3** of the heater plug relay.

Check the **continuity of the connection** between:
Engine management computer, **connector B track B3** ⟶ **Track 9** preheating unit connector.

If the fault persists, replace the preheating unit.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF067 **PRESENT** **OR** **STORED**	FUEL PRESSURE SENSOR CIRCUIT CC.0 : Short circuit to earth CO.1 : Open circuit or short circuit to + 12 V 1.DEF : Sensor supply fault

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault is declared present after: – the engine has been running for **5 minutes**.
	Special notes: Use bornier **Elé. 1613** for all operations on the engine management computer connectors.
	IMPORTANT: It is forbidden to carry out an ohmmeter check on the pressure sensor.

CC.0	***NOTES***	None.

Check the fuel pressure sensor connectors.
Check the connectors on the engine management computer.
Repair if necessary.

Check the **insulation** against **earth** on the connection between:
Engine management computer, **connector B track D1** → **Track 2** fuel pressure sensor connector
Check **continuity** of the connection between:
Engine management computer, **connector B track H2** → **Track 3** fuel pressure sensor connector

If the problem persists, replace the rail pressure sensor.

CO.1	***NOTES***	None.

Check the connectors on the engine management computer. Repair if necessary.
Check the fuel pressure sensor connectors. Repair if necessary.

Check **the continuity and insulation** relative to **+ 12 V** on the connection between:
Engine management computer, **connector B track D1** → **Track 2** fuel pressure sensor connector
Check the **continuity of the connection** between:
Engine management computer, **connector B track B3** → **Track 1** fuel pressure sensor connector

If the problem persists, replace the rail pressure sensor.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF067 **CONTINUED**	

1.DEF	***NOTES***	**Priority in the event of a combination of faults:** Deal with the **DF091: Sensor feed voltage no. 1** fault as a priority if it is present.

Check the fuel pressure sensor connectors.
Check the connectors on the engine management computer.
Repair if necessary.

Check the **continuity and the absence of interference resistance** on the following connections:

- Engine management computer, **connector B track D1** ⟶ **Track 2** fuel pressure sensor connector
- Engine management computer, **connector B track H2** ⟶ **Track 3** fuel pressure sensor connector
- Engine management computer, **connector C track B3** ⟶ **Track 1** fuel pressure sensor connector

Carry out the necessary repairs.

If all these connections are correct, check presence of a power supply to the fuel pressure sensor:

- **+ 5 V** ⟶ **Track 3** of rail pressure sensor connector
- **Earth** ⟶ **Track 1** of rail pressure sensor connector

If the feeds are correct, replace the fuel pressure sensor.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF070 PRESENT OR STORED	CAMSHAFT SENSOR / ENGINE SPEED CONSISTENCY 1.DEF : Frequency of camshaft sensor signal too high 2.DEF : Engine speed inconsistency 3.DEF : Tooth-to-tooth dynamic consistency of engine speed sensor 4.DEF : Inconsistent camshaft signal

NOTES	**Conditions for applying the fault finding strategy to the stored fault.** The fault is declared present after: – starter action for **10 seconds**, or – the engine has been running for one minute.
	Special notes: Use bornier **Elé. 1613** for all operations on the engine management computer connectors.

1.DEF	***NOTES***	**Priority in the event of a combination of faults:** Deal with fault **DF012: Battery voltage** as a priority if it is declared present.

Check presence of power supply between **tracks 1 and 3** of camshaft sensor connector:
12 V after relay ⟶ **Track 3**
Earth ⟶ **Track 1**
Repair if necessary.
Ensure earthing of the engine block.
Check the state of the sensor (temperature rise). Replace it if necessary.

2.DEF	***NOTES***	None.

Check the engine speed sensor connectors.
Check the connectors on the engine management computer.
Repair if necessary.

Check the resistance of the engine speed sensor between sensor **tracks A and B**.
Replace the sensor if the resistance is not approximately: **800** Ω ± **80** Ω.

Check the **continuity** of the following connections:
Engine management computer, connector **B track G3** ⟶ **Track A** of the engine management computer
Engine management computer, connector **B track H3** ⟶ **Track B** of the engine speed sensor

Check fastening, air gap and condition (overheating) of the sensor. Replace if necessary.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF070 **CONTINUED**	

3.DEF	***NOTES***	**Conditions for applying the fault finding strategy to the stored fault.** The fault reappears after: – it is cleared and the engine is started followed by the engine running for one minute.

Check the engine speed sensor connectors.
Check the connectors on the engine management computer.
Repair if necessary.

Ensure that the engine block is **earthed**.
Check the **continuity** of the following connections:

Engine management computer, connector **B track G3** → **track A** of the engine management computer

Engine management computer, connector **B track H3** → **track B** of the engine speed sensor

Check the resistance of the engine speed sensor between sensor **tracks A and B**.
Replace the sensor if the resistance is not approximately: **800 Ω ± 80 Ω at 20°C**.

Carry out a conformance check on the flywheel (where applicable check the form of the engine speed signal using an oscilloscope, broken tooth, etc.). Carry out the necessary repairs.

4.DEF	***NOTES***	None.

Check the camshaft sensor connections.
Check the connectors on the engine management computer.
Repair if necessary.

Check the **continuity** of the following connections:

Engine management computer, connector **C track K4** → **Track 2** of the camshaft sensor connector

Engine management computer, connector **C track C1** → **Track 1** of the camshaft sensor connector

Check the presence of **12 V after relay** on **track 3** of the camshaft sensor connector.

If the fault persists:
Check the tension of the timing belt.
Check pinion/key assembly on the camshaft.
Check the timing adjustment.
Carry out the necessary repairs.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF071 PRESENT OR STORED	PEDAL SENSOR CIRCUIT TRACK 1 CO.0 : Open circuit or short circuit to earth CC.1 : Short circuit to + 12 V 1.DEF : Sensor supply fault

NOTES	**Special notes:** Use bornier **Elé. 1613** for all operations on the engine management computer connectors.

CO.0	***NOTES***	**Priority in the event of a combination of faults:** In the event of the simultaneous presence of the **DF073: Pedal sensor circuit track 2 CO.0** fault, check that the pedal sensor connector is fully plugged in.

Check the pedal sensor connections.
Check the connectors on the engine management computer.
Repair if necessary.

Check the **continuity and insulation** against **earth** on the connection between:
Engine management computer, connector **A track C1** → **Track 3** pedal sensor connector
Also ensure the **insulation** of this connection against the following connections:
Engine management computer, connector **A track B3** → **Track 2** pedal sensor connector
Engine management computer, connector **A track A3** → **Track 1** pedal sensor connector

Check the **continuity** of the connection between:
Engine management computer, connector **A track E1** → **Track 4** pedal sensor connector

Measure the resistance of the pedal sensor track 1 between tracks **2 and 4**.
Replace the sensor if the resistance is not approximately: **1.2 ± 0.48 kΩ at + 20°C**.

CC.1	***NOTES***	None.

Check the pedal sensor connections.
Check the connectors on the engine management computer.
Repair if necessary.

Check **insulation** relative to **+ 12 V** on the connection between:
Engine management computer, **connector A track C1** → **Track 3** pedal sensor connector
Check the **continuity** of the connection between:
Engine management computer, **connector A track B3** → **Track 2** pedal sensor connector.

Measure the resistance of the pedal sensor track 1 between tracks **2 and 4.**
Replace the sensor if the resistance is not approximately: **1.2 ± 0.48 kΩ at + 20°C**.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF071 **CONTINUED**	

1.DEF	***NOTES***	**Priority in the event of a combination of faults**: As a priority, deal with fault **DF091: Sensor supply voltage No. 1** if the fault is present or stored.

Check the pedal sensor connections.
Check the connectors on the engine management computer.
Repair if necessary.

Check the **continuity and absence of interference resistance** on the following connections:

- Engine management computer, **connector A track E1** → **Track 4** pedal sensor connector
- Engine management computer, **connector A track C1** → **Track 3** pedal sensor connector
- Engine management computer, **connector A track B3** → **Track 2** pedal sensor connector

Check the **insulation** between the following two connections:

- Engine management computer, **connector A track E1** → **Track 4** pedal sensor connector
- Engine management computer, **connector A track B3** → **Track 2** pedal sensor connector

Also check the insulation against **+ 12 V**.

If the fault persists, go to the accelerator pedal sensor conformity check.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF072 PRESENT OR STORED	FUEL PRESSURE SIGNAL 1.DEF : Measured pressure too high 2.DEF : Measured pressure too low 3.DEF : OCR of rail pressure regulating solenoid valve too high 4.DEF : Regulating solenoid valve jammed closed 5.DEF : Regulating solenoid valve jammed open

NOTES	**Conditions for applying the fault finding procedure to the stored fault.** The fault is declared present after: – the engine has been running at idle speed for **2 minutes**.
	Special notes: Use bornier **Elé. 1613** for all operations on the engine management computer connectors.
	IMPORTANT: It is forbidden to carry out an ohmmeter check on the pressure sensor.

1.DEF ***5.DEF***	***NOTES***	**Priority in the event of a combination of faults**: As a priority, deal in priority with the **DF091: Sensor power supply No. 1** or **DF012: Battery voltage** faults if one of these two faults is present or stored.

Check the fuel pressure sensor connectors.
Check the fuel pressure solenoid valve connectors.
Check the connectors on the engine management computer.
Repair if necessary.

Check the **insulation** against earth of the connection between:
Engine management computer, **connector B track L1** ⟶ **Track 2** fuel pressure solenoid valve connector

With the connector disconnected, check the **insulation** against **5 V** on the connection between:
Engine management computer, **connector B track D1** ⟶ **Track 2** rail pressure sensor connector

Perform an **AC006: Fuel pressure solenoid valve** actuator command. A light whistling sound should be heard from the fuel pressure regulator. If it cannot be heard, check the presence of **+ 12 V after relay** on **track 1** of the fuel pressure sensor solenoid valve connector.

If the problem persists, go to the fault finding procedure for the interpretation of parameter: **PR083**.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF072 **CONTINUED**	

2.DEF ***3.DEF*** ***4.DEF***	***NOTES***	None.

Check the fuel pressure sensor connectors.
Check the fuel pressure solenoid valve connectors.
Check the connectors on the engine management computer.
Repair if necessary.

Check the presence of **12 V after relay** on **track 1** of the rail pressure regulating solenoid valve.

Check the **continuity and absence of interference resistance** on the following connections:

- Engine management computer, **connector B track L1** ⟶ **Track 2** fuel pressure solenoid valve connector
- Engine management computer, **connector B track D1** ⟶ **Track 2** fuel pressure sensor connector

At idling speed, warm engine (coolant temperature > **75**°**C**), view parameter **PR083: Pressure in rail**.
If the value displayed is not **275** ± **30 bar**, go on to perform the fault finding procedure for the interpretation of parameters **"PR083"**.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF073 PRESENT OR STORED	PEDAL SENSOR CIRCUIT TRACK 2 CO.0 : Open circuit or short circuit to earth CC.1 : Short circuit or + 12 V 1.DEF : Sensor supply fault 2.DEF : Consistency between track 1 and track 2

NOTES	**Conditions for applying the fault finding strategy to the stored fault.** The fault is declared present after: – successive cycles of full load and no load on the accelerator pedal.
	Special notes: Use bornier **Elé. 1613** for all operations on the engine management computer connectors.

CO.0	***NOTES***	**Priority in the event of a combination of faults:** In the event of the simultaneous presence of the **DF071: Pedal sensor circuit track 1 CO.0** fault, check that the pedal sensor connector is fully plugged in

Check the connectors on the pedal sensor.
Check the connectors on the engine management computer.
Repair if necessary.

Check the **continuity** of the connection between:
Engine management computer, connector **A track F1** ⟶ **Track 6** pedal sensor connector
Also check the **insulation** of this connection against **earth** and against the following connections:
Engine management computer, connector **A track B3** ⟶ **Track 2** pedal sensor connector
Engine management computer, connector **A track A3** ⟶ **Track 1** pedal sensor connector

Measure the resistance of the pedal sensor - track 2, between tracks:
1 and 5 ⟶ 1.7 ± 0.68 kΩ at + 20°C

Replace the sensor if the resistance is outside permitted tolerance values.

CC.1	***NOTES***	None.

Check the pedal sensor connections.
Check the connectors on the engine management computer.
Repair if necessary.

Check **insulation** relative to **+ 12 V** on the connection between:
Engine management computer, **connector A track F1** ⟶ **track 6** pedal sensor connector
Ensure the presence of **earth** on **track 1** of the pedal sensor connector.

If the fault persists, replace the pedal sensor.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF073 **CONTINUED**	

1.DEF	***NOTES***	**Priority in the event of a combination of faults:** As a priority, deal with the **DF092: Sensor supply voltage No.2** fault if it is present or stored.

Check the pedal sensor connections.
Check the connectors on the engine management computer.
Repair if necessary.

Check the **continuity and insulation** against **+ 12 V** on the connections between:
- Engine management computer, connector **A track H2** → **Track 5** pedal sensor connector
- Engine management computer, connector **A track E1** → **Track 4** pedal sensor connector
- Engine management computer, connector **A track A3** → **Track 1** pedal sensor connector
- Engine management computer, connector **A track B3** → **Track 2** pedal sensor connector

Ensure **the insulation** against earth of the connections between:
- Engine management computer, connector **A track H2** → **Track 5** pedal sensor connector
- Engine management computer, connector **A track E1** → **Track 4** pedal sensor connector

If the fault persists, replace the pedal sensor.

2.DEF	***NOTES***	None.

Check the pedal sensor connections.
Check the connectors on the engine management computer.
Repair if necessary.

Measure the resistance of pedal sensor track 1, across **tracks 2 and 4** of the pedal sensor connector.
Replace the sensor if the resistance is not approximately: **1.2 ± 0.48 KΩ**.
Measure the resistance of pedal sensor track 2, between **tracks 1 and 5** of the pedal sensor connector.
Replace the sensor if the resistance is not approximately: **1.7 ± 0.68 KΩ**.

Measure the line resistance of the following connections:
- Engine management computer, **connector A track F1** → **Track 6** pedal sensor connector
- Engine management computer, **connector A track C1** → **Track 3** pedal sensor connector
- Engine management computer, **connector A track H2** → **Track 5** pedal sensor connector
- Engine management computer, **connector A track B3** → **Track 2** pedal sensor connector
- Engine management computer, **connector A track A3** → **Track 1** pedal sensor connector
- Engine management computer, **connector A track E1** → **Track 4** pedal sensor connector

Carry out the necessary operations if the resistance is abnormally high.

If the fault persists, go on to perform the accelerator-pedal sensor correctness check.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF074 PRESENT OR STORED	TURBOCHARGER PRESSURE SENSOR OC.0 : Open circuit or short circuit to earth CC.1 : Short circuit to + 12 V 1.DEF : Sensor supply fault 2.DEF : Inconsistency with atmospheric pressure

NOTES	**Special notes:** Use bornier **Elé. 1613** for all operations on the engine management computer connectors.
	Conditions for applying the fault finding procedure to stored faults: The fault is declared present after: – the engine has been started or after a road test.

CO.0	***NOTES***	None.

Check the turbocharger pressure sensor connectors.
Check the connectors on the engine management computer.
Repair if necessary.

Check the **continuity and insulation** against **earth** of the connection between:
Engine management computer, connector **B track C1** ⟶ **Track B** turbocharger pressure sensor connector.

Also check the **continuity** of the connection between:
Engine management computer, connector **B track J2** ⟶ **Track C** turbocharger pressure sensor connector

If the fault remains present, replace the turbocharger pressure sensor.

CC.1	***NOTES***	None.

Check the turbocharger pressure sensor connectors.
Check the connectors on the engine management computer.
Repair if necessary.

Check the **continuity and insulation** against **+ 12 V** on the connection between:
Engine management computer, connector **B track C1** ⟶ **Track B** turbocharger pressure sensor connector.

Also check the **continuity** of the connection between:
Engine management computer, connector **B track A4** ⟶ **Track A** turbocharger pressure sensor connector

If the fault remains present, replace the turbocharger pressure sensor.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF074 CONTINUED	

1.DEF	*NOTES*	**Priority in the event of a combination of faults:** Deal with the **DF091: Sensor feed voltage no. 1** fault as a priority if it is present or stored.

Check the turbocharger pressure sensor connectors.
Check the connectors on the engine management computer.
Repair if necessary.

Check the **continuity** of the connection between:
Engine management computer, connector **B track J2** ⟶ **Track C** turbocharger pressure sensor connector
Also check the **insulation** on this connection against the **earth** and **+ 12 V** and against the following connections:
Engine management computer, connector **B track C1** ⟶ **Track B** turbocharger pressure sensor connector
Engine management computer, connector **C track A4** ⟶ **Track A** turbocharger pressure sensor connector
Check the **continuity** of the connection between:
Engine management computer, connector **C track A4** ⟶ **Track A** turbocharger pressure sensor connector
Also check the **insulation** of this connection against **+ 12 V** and against the connection between:
Engine management computer, connector **B track C1** ⟶ **Track B** turbocharger pressure sensor connector

2.DEF	*NOTES*	None.

Check the turbocharger pressure sensor connectors.
Check the connectors on the engine management computer.
Repair if necessary.

Check the **continuity** and absence of interference resistance on the connections between:
Engine management computer, **connector B track C1** ⟶ **Track B** turbocharger pressure sensor connector
Carry out the necessary operations if the resistance is abnormally high.
If the fault persists:
Check fitting of the sensor and the condition of its seal.
Check that there are no leaks in the induction circuit: unions, hoses, sleeves, exchanger, turbocharger.
Ensure there is no oil in the air inlet circuit.
Check the efficiency of the turbocharger.
If the problem persists, carry out the interpretation of commands diagnostic procedure **AC004**. If the wastegate is not faulty, replace the turbocharger pressure sensor.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF075 **PRESENT** **OR** **STORED**	ATMOSPHERIC PRESSURE SENSOR 1.DEF : Supply voltage too low 2.DEF : Supply voltage too high

NOTES	**Priority in the event of a combination of faults:** Deal with the **DF091: Sensor feed voltage no. 1** fault as a priority if it is present or stored.

1.DEF ***2.DEF***	***NOTES***	**Priority in the event of a combination of faults:** Deal with the **DF091: Sensor feed voltage no. 1** fault as a priority if it is present or stored.

If the fault is **stored**, clear the fault from the engine management computer memory.
Switch off the ignition, then switch it on again to initialise the computer.
If the fault reappears, replace the engine management computer.
If necessary, modify the configuration of the new computer to match the equipment options present on the vehicle.

If the fault is **present**, replace the engine management computer.
If necessary, modify the configuration of the new computer to match the equipment options present on the vehicle.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF077 PRESENT OR STORED	EGR VALVE CC.1 : Short circuit to + 12 V OC.0 : Open circuit or short circuit to earth 1.DEF : Negative loop deviation 2.DEF : Positive loop deviation

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault reappears as stored after: – the fault has been cleared from the memory and – actuator command **AC007: EGR valve**.
	Special notes: Use bornier **Elé. 1613** for all operations on the engine management computer connectors.

CC.1	***NOTES***	None.

Check the connections of the exhaust gas recirculation valve.
Check the connectors on the engine management computer.
Repair if necessary.

Measure the resistance of the exhaust gas recirculation valve between **tracks 1 and 5**.
If the resistance is not approximately **8 Ω ± 0.5 at + 20°C**, replace the exhaust gas recirculation valve.

Check **insulation** relative to **+ 12 V** on the connection between:
Engine management computer, connector **B track M1** ⟶ **Track 5** exhaust gas recirculation valve connector

CO.0	***NOTES***	None.

Check the connections of the exhaust gas recirculation valve.
Check the connectors on the engine management computer.
Repair if necessary.

Measure the resistance of the exhaust gas recirculation valve between **tracks 1 and 5**.
If the resistance is not approximately **8 Ω ± 0.5 at + 20°C**, replace the exhaust gas recirculation valve.

Check the **continuity and insulation** against **earth** of the connection between:
Engine management computer, connector **B track M1** ⟶ **Track 5** of the exhaust gas recirculation valve connector

Check the presence of **+ 12 V after relay** on **track 1** of the exhaust gas recirculation valve connector.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF077 **CONTINUED**	

1.DEF ***2.DEF***	***NOTES***	None.

Check the connections of the exhaust gas recirculation valve. Check the connectors on the engine management computer. Repair if necessary.
Measure the resistance of the exhaust gas recirculation valve between **tracks 1 and 5**. If the resistance is not approximately **8 Ω ± 0.5 at + 20°C**, replace the exhaust gas recirculation valve.
Check leaktightness of the air intake circuit and the exhaust gas recirculation circuit.
If the problem persists, carry out the interpretation of commands diagnostic procedure: **AC007**.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF078 PRESENT OR STORED	WASTEGATE CC.1 : Short circuit to + 12 V OC.0 : Open circuit or short circuit to earth 1.DEF : Positive deviation in turbocharging regulation 2.DEF : Negative deviation in turbocharging regulation

NOTES	**Conditions for applying the fault finding procedure to stored faults:** The fault reappears as stored after: – the fault memory has been cleared and actuator command **AC004: Wastegate**, or – if the fault becomes present during a road test.
	Special notes: Use bornier **Elé. 1613** for all operations on the engine management computer connectors.

CC.1	***NOTES***	None.

Check the wastegate connectors.
Check the connectors on the engine management computer.
Repair if necessary.

Check **insulation** relative to **+ 12 V** on the connection between:
Engine management computer, connector **B track L2** ⟶ **Track 1** wastegate connector.

Check the resistance of the wastegate (turbocharger pressure limitation valve) between **tracks 1 and 2**.
Replace the wastegate if the resistance is not approximately: **16.5** Ω ± **1.6** at **+ 25°C** / (**22.1** Ω ± **2.2 at + 110°C**).

CO.0	***NOTES***	None.

Check the wastegate connectors.
Check the connectors on the engine management computer.
Repair if necessary.

Check the **insulation** against **earth** of the connection between:
Engine management computer, connector **B track L2** ⟶ **Track 1** wastegate connector

Check the presence of **+ 12 V after relay** on **track 2** of the wastegate connector.

Check the resistance of the wastegate (turbocharger pressure limitation valve) between **tracks 1 and 2**.
Replace the wastegate if the resistance is not approximately: **16.5** Ω ± **1.6** at **+ 25°C** / (**22.1** Ω ± **2.2 at + 110°C**).

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF078 **CONTINUED 1**	

1.DEF	***NOTES***	**Priority in the event of a combination of faults**: Deal with the **DF074: turbocharger pressure sensor** fault as a priority if it is declared present.

Check the wastegate connectors.
Check the connectors on the engine management computer.
Repair if necessary.

Check the **continuity** and absence of interference resistance on the connections between:
Engine management computer, connector **B track L2** ⟶ **Track 1** wastegate connector.
Check the presence of **12 V** after relay on **track 2** of the wastegate connector.
Check the resistance of the wastegate (turbocharger pressure limitation valve) between **tracks 1 and 2**.
Replace the wastegate if the resistance is not approximately: **16.5** Ω ± **1.6** at **+ 25°C** / **22.1** Ω ± **2.2 at + 110°C**

If the fault persists, this indicates that the pressure measured by the computer exceeds that set by the wastegate management system.

Check integrity of the wastegate (jamming/seizing: open).
Check wastegate movement (jamming/seizing: closed).
Check the setting of the wastegate control rod (Workshop Repair Manual section **12**: **Pressure regulator valve**).

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF078 **CONTINUED 2**	

2.DEF	***NOTES***	**Priority in the event of a combination of faults**: Deal with the **DF074: turbocharger pressure sensor** fault as a priority if it is declared present.

Check the wastegate connectors.
Check the connectors on the engine management computer.
Repair if necessary.

Check the **continuity** and absence of interference resistance on the connections between:
Engine management computer, connector **B track L2** ⟶ **Track 1** wastegate connector.

Check the resistance of the wastegate (turbocharger pressure limitation valve) between **tracks 1 and 2**.
Replace the wastegate if the resistance is not approximately: **16.5** Ω ± **1.6** at **+ 25**°**C** / **22.1** Ω ± **2.2 at + 110**°**C**.

If the fault persists, this indicates that the pressure measured by the computer is lower than that set by the wastegate management system.:

- Check integrity of wastegate valve (jamming/seizing: closed)
- Check the condition and sealing of the air inlet circuit.
- Check the leaktightness of the vacuum system, from the vacuum pump up to the *wastegate* control LDA via the solenoid valve (or flap valve).
- Check the efficiency of the vacuum pump.
- Check the setting of the wastegate control rod (Workshop Repair Manual section **12**: **Pressure regulator valve**).
- Check wastegate movement (jamming/seizing: open).
- Check the turbocharger.

Carry out the necessary repairs.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF079 PRESENT OR STORED	THERMOPLUNGER RELAY No. 3 CC.1 : Short circuit to + 12 V OC.0 : Open circuit or short circuit to earth

NOTES	**Special notes:** Use bornier **Elé. 1613** for all operations on the engine management computer connectors.
	Conditions for applying the fault finding procedure to stored faults: If the fault is declared present after: – the engine has been started, after the engine has been running for **30 seconds** at idle speed, with heated windscreen not selected and the engine temperature at starting less than **70°C**, or – if it reappears after being cleared followed by actuator command: **AC002**.

CC.1	***NOTES***	None.

Check the connectors on the additional heater **3** relay socket in the engine fuse and relay box.
Check the connectors on the engine management computer.
Repair if necessary.

Check the integrity of the additional heater **3** relay socket in the engine fuse and relay box:
– Insulation between **tracks 3 and 5** of the relay.
– Measure the resistance of the relay coil, between **tracks 1 and 2**.
  – replace the relay if the resistance is not approximately **65 ± 5 Ω at + 20°C**.

Check **insulation** relative to **+ 12 V** on the connection between:
Engine management computer, connector **C track E4** ⟶ **Track 2** of the additional heater **no. 3** relay socket in the engine fuse and relay box

Also check the **insulation** of this connection against the following connections:
Additional heater **no. 3** in the engine fuse and relay box **track 1** ⟶ **+ 12 V after relay**
Additional heater **no. 3** in the engine fuse and relay box **track 3** ⟶ **+ 12 V battery**

CO.0	***NOTES***	None.

Check the connectors on the "additional heater **3**" relay socket in the engine fuse and relay box.
Check the connectors on the engine management computer.
Repair if necessary.

Measure the resistance of the "additional heater **3**" relay coil, between its **tracks 1 and 2**:
  –replace the relay if the resistance is not approximately **65 ± 5 Ω at + 20°C**.

Ensure **continuity and insulation** against **earth** of the connection between:
Engine management computer, connector **C track E4** ⟶ **Track 2** of the additional heater **no. 3** relay socket in the engine fuse and relay box

Check the presence of **+ 12 V after igntion** on **track 1** of the additional heater **no. 3** relay socket.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF081 PRESENT OR STORED	PREHEATING RELAY CIRCUIT CC.1 : Short circuit to +12 V CO.0 : Open circuit or short circuit to earth

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault reappears as stored after: – the fault has been cleared from the memory and – actuator command **AC010: Preheating relay**.
	Special notes Use bornier **Elé. 1613** for all operations on the engine management computer connectors.

CC.1	***NOTES***	None.

Check the preheating unit connectors.
Check the connectors on the engine management computer.
Repair if necessary.

Check **insulation** relative to **+ 12 V** on the connection between:
Engine management computer, connector B **track C3** ⟶ **Track 8** preheating unit connector

If the fault persists, replace the preheating unit.

CO.0	***NOTES***	None.

Check the preheating unit connectors.
Check the connectors on the engine management computer.
Repair if necessary.

Ensure the continuity and insulation against **earth** of the connection between:
Engine management computer, connector B **track C3** ⟶ **Track 8** preheating unit connector

Check the presence of **12 V battery** on **track 3** of the preheating unit connector (via F01; 70A)

If the fault persists, replace the preheating unit.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF082 PRESENT OR STORED	LOW PRESSURE PUMP RELAY CIRCUIT CC.1 : Short circuit to + 12 V CO.0 : Open circuit or short circuit to earth

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault reappears as stored after: – the fault memory has been cleared and – actuator command **AC005: Low pressure pump relay control**.
	Special notes: Use bornier **Elé. 1613** for all operations on the engine management computer connectors.

CC.1	***NOTES***	None.

Check the low pressure pump relay socket connections **R3** in the engine fuse and relay box.
Check the connectors on the engine management computer.
Repair if necessary.

Remove the low pressure pump relay and check the insulation against **+ 12 V** on the connection between:
Engine management computer, connector **C track A1** ⟶ **Track 2** low pressure pump relay socket
Also check the **insulation** of this connection against the following connections:
High pressure pump relay socket in the engine fuse and relay box **track 1** ⟶ **+12 V after ignition**
Low pressure pump relay socket on the engine fuse and relay box **track 3** ⟶ **+12 V battery**

Check the integrity of the "low-pressure pump" relay in the engine fuse and relay box:
– Insulation between **tracks 3 and 5** of the relay.
Measure the resistance of the relay coil, between **tracks 1 and 2**.
Replace the relay if the resistance is not approximately **85 ± 5 Ω at + 20°C**.

CO.0	***NOTES***	None.

Perform a check on the connectors of low-pressure pump relay socket **R3** in the engine fuse and relay box.
Check the connectors on the engine management computer.
Repair if necessary.

Check the **continuity and insulation** against **earth** of the connection between:
Engine management computer, connector **C track A1** ⟶ **Track 2** low pressure pump relay socket

Check the presence of **+ 12 V after relay** on **track 1** of the low pressure pump relay.

Measure the resistance of the low pressure pump relay coil between its **tracks 1 and 2**.
Replace the relay if the resistance is not approximately **85 ± 5 Ω at + 20°C**.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF083 PRESENT OR STORED	FUEL PRESSURE SOLENOID VALVE CIRCUIT CC.1 : Short circuit to +12 V CO.0 : Open circuit or short circuit to earth 1.DEF : Consistency after switching off the ignition

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault reappears as stored after: – the fault has been cleared from the memory and – actuator command **AC006: Fuel pressure solenoid valve control**.
	Special notes: Use bornier **Elé. 1613** for all operations on the computer connector.

CC.1	***NOTES***	None.

Check the fuel pressure solenoid valve connections.
Check the connectors on the engine management computer.
Repair if necessary.

With the fuel pressure solenoid valve connector disconnected, check the **insulation** against **+ 12 V** on the connection between:

Engine management computer **B track L1** ⟶ **Track 2** fuel pressure solenoid valve connector

Measure the resistance of the fuel-pressure solenoid valve across **tracks 1 and 2**:
Replace the solenoid valve if the value is not approximately: **5** Ω ± **05** Ω at **20**°**C**.

CO.0	***NOTES***	None.

Check the fuel pressure solenoid valve connections.
Check the connectors on the engine management computer.
Repair if necessary.

Measure the resistance of the fuel-pressure solenoid valve across **tracks 1 and 2**:
Replace the solenoid valve if the value is not approximately: **5** Ω ± **0.5** Ω at **20**°**C**.

Ensure **continuity and insulation** against **earth** of the connection between:

Engine management computer, connector **B track L1** ⟶ **Track 2** fuel pressure solenoid valve connector

Check the presence of **+ 12 V after relay** on **track 1** of the fuel pressure solenoid valve.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF083 **CONTINUED**	

1.DEF	***NOTES***	**Priority in the event of a combination of faults**: Deal with the **DF088 Consistency of flywheel signal** fault as a priority if it is declared present.

Check the fuel pressure solenoid valve connections.
Check the connectors on the engine management computer.
Repair if necessary.

Measure the line resistance of the following connections:
Engine management computer, connector **B track H3** ⟶ **Track B** engine speed sensor
Engine management computer, connector **B track G3** ⟶ **Track A** engine speed sensor
Carry out the necessary operations if the resistance is abnormally high.

Ensure earthing of the engine block.

Measure the line resistance of the connection between:
Engine management computer, connector **B track L1** ⟶ **Track 2** of the fuel pressure solenoid valve
Carry out the necessary operations if the resistance is abnormally high.

Measure the resistance of the fuel pressure solenoid valve between **tracks 1** and **2**:
Replace the solenoid valve if the value is not approximately: **5** Ω ± **0.5** Ω at **20**°**C**.

If the problem persists, carry out the interpretation of commands correctness check: **AC006**.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF088 PRESENT OR STORED	FLYWHEEL SIGNAL INCONSISTENCY 1.DEF : Overspeed detected

NOTES	**Conditions for applying the fault finding procedure to stored faults:** The fault is declared present after: – the fault has been cleared, – the engine has been started followed by acceleration to over **2500 rpm.**
	Special notes: Use bornier **Elé. 1613** for all operations on the engine management computer connectors.

1.DEF	***NOTES***	This fault appears following an engine overspeed of > **5000 rpm**

Check the engine speed sensor connectors. Check the connectors on the engine management computer. Repair if necessary.
Check the **insulation** against **+ 12 V** and the **earth** on the following connections: Engine management computer, connector **B track H3** ⟶ **Track B** engine speed sensor Engine management computer, connector **B track G3** ⟶ **Track A** engine speed sensor Ensure earthing of the engine block.
Measure the resistance of the engine speed sensor between **tracks A and B** of the sensor. Replace the sensor if the resistance value is not approximately **800 Ω ± 80 at 20°C**.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF089 **PRESENT** **OR** **STORED**	INJECTION CONTROL CAPACITOR VOLTAGE 1.DEF : Voltage too high 2.DEF : Voltage too low

1.DEF ***2.DEF***	***NOTES***	**Conditions for applying the fault finding procedure to stored faults:** The fault is declared present after: – the fault memory has been cleared and – the engine has been running for one minute.

If the fault is **stored**, clear the fault from the engine management computer memory.
Switch off the ignition, then switch it on again to initialise the computer.
If the fault reappears, replace the engine management computer.
If necessary, modify the configuration of the new computer to match the equipment options present on the vehicle.

If the fault is **present**, replace the engine management computer.
If necessary, modify the configuration of the new computer to match the equipment options present on the vehicle.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF090 **PRESENT** **OR** **STORED**	ANALOGUE TO DIGITAL CONVERTER 1.DEF : Internal electronic fault.

1.DEF	***NOTES***	None.

If the fault is **stored**, clear the fault from the engine management computer memory.
Switch off the ignition, then switch it on again to initialise the computer.
If the fault reappears, replace the engine management computer.
If necessary, modify the configuration of the new computer to match the equipment options present on the vehicle.

If the fault is **present**, replace the engine management computer.
If necessary, modify the configuration of the new computer to match the equipment options present on the vehicle.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF091 PRESENT OR STORED	SENSOR SUPPLY VOLTAGE No. 1 1.DEF : Voltage too low 2.DEF : Voltage too high

NOTES	**Conditions for applying the fault finding procedure to stored faults:** The fault reappears as stored after: – The fault has been cleared and – the engine has been running for **1 minute**.
	Special notes: Use bornier **Elé. 1613** for all operations on the engine management computer connectors.

1.DEF	***NOTES***	None.

Check the connectors of the following sensors:
– pedal sensor,
– fuel pressure sensor,
– air flowmeter,
– exhaust gas recirculation valve position sensor,
– turbocharger pressure sensor.

Check the connectors on the engine management computer.
Repair if necessary.

Display parameter **PR090: Sensors no.1 supply voltage**. If this voltage is below **4.9 V**, disconnect the connectors on all the sensors referred to above one by one.
– If the voltage returns to normal (wait a few seconds between each disconnection so that the computer can take the measurement), replace the faulty sensor (or repair the faulty connection).

Clear the faults created by the multiple disconnections.

– If the voltage is still below **4.9 V** when all these sensors are disconnected, check that there is no short circuit in these sensor supply lines:
  – Disconnect all the sensors referred to above and the computer-side connectors and check the insulation between:
    tracks **2 and 4** of the pedal sensor connector;
    tracks **1 and 3** of the fuel pressure sensor connector;
    tracks **2 and 3** of the air-flowmeter connector.
    tracks **2 and 4** of the exhaust gas recirculation valve position sensor connector,
    tracks **A and C** of the turbocharger pressure sensor connector.

If all the insulation is correct, replace the engine management computer.
If necessary, modify the configuration of the new computer to match the equipment options present on the vehicle.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF091 **CONTINUED**	

2.DEF	***NOTES***	None.

Check the connectors of the following sensors:
– pedal sensor,
– fuel pressure sensor,
– air flowmeter,
– exhaust gas recirculation valve position sensor,
– turbocharger pressure sensor.

Check the connectors on the engine management computer.
Repair if necessary.

Display parameter **PR090: Sensors no.1 supply voltage**. If this voltage is above **5.1 V**, disconnect all the sensor connectors referred to above one by one:

– If the voltage returns to normal, replace the faulty sensor (or repair the faulty connection) (wait a few seconds between each disconnection so that the computer can take the measurement).

Clear the faults created by the multiple disconnections.

– If the voltage is still above **5.1 V** with all these sensors disconnected, check that there is no short circuit to **+ 12 V** on these sensor supply lines (**+ 5 V**):
  – Disconnect all the sensors referred to above and the connectors on the computer side and check the insulation against **+ 12 V** on tracks:
    – **4** of the pedal sensor connector;
    – **3** of the fuel pressure sensor connector;
    – **3** of the air flowmeter connector;
    – **2** of the exhaust gas recirculation valve position sensor connector,
    – **C** of the turbocharger pressure sensor connector.

If all these tracks are insulated against **+ 12 V**, replace the engine management computer. If necessary, modify the configuration of the new computer to match the equipment options present on the vehicle.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF092 PRESENT OR STORED	SENSOR SUPPLY VOLTAGE No. 2 1.DEF : Voltage too low 2.DEF : Voltage too high

NOTES	**Conditions for applying the fault finding procedure to stored faults:** The fault reappears after: – The fault has been cleared and – the engine has been running for **2 minutes**.
	Special notes: Use bornier **Elé. 1613** for all operations on the engine management computer connectors.

1.DEF	***NOTES***	None.

Check the connectors of the following sensors:
– pedal sensor,
– Refrigerant pressure sensor.
Check the connectors on the engine management computer.
Repair if necessary.

Display parameter **PR091: Sensor no.2 supply voltage**. If the value of this voltage is below **4.9 V**, disconnect the sensor connectors referred to above one by one and display **PR091** again.
– If the voltage returns to normal (wait a few seconds after each disconnection so the computer can take the measurement), replace the faulty sensor (or repair the faulty connection).
– If the voltage is still below **4.9 V**, with all these sensors disconnected, check that there is no short circuit on these sensor supply lines.
  – Disconnect all the sensors referred to above and the computer-side connectors and check the insulation between:
    tracks **1 and 5** of the pedal sensor connector;
    tracks **A and B** of the refrigerant pressure sensor connector.

If these checks reveal a short circuit, perform the necessary repairs.
If these checks do not reveal a short circuit, replace the engine management computer.
If necessary, modify the configuration of the new computer to match the equipment options present on the vehicle.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF092 **CONTINUED**	

2.DEF	***NOTES***	None.

Check the connectors of the following sensors:
– pedal sensor,
– refrigerant pressure sensor.
Check the connectors on the engine management computer.
Repair if necessary.

Display parameter **PR091: Sensor no.2 supply voltage**. If the value of this voltage is above **5.1 V**, disconnect the sensor connectors referred to above one by one and display **PR091** again;
– If the voltage returns to normal (wait a few seconds after each disconnection so the computer can take the measurement), replace the faulty sensor (or repair the faulty connection).
– If the voltage is still above **5.1 V** with all these sensors disconnected, check that there is no short circuit to **+ 12 V** on these sensor supply lines (**+ 5 V**):
  – Disconnect all the sensors referred to above and the connectors on the computer side and check the insulation against **+ 12 V** on tracks:
    – **5** of the pedal sensor connector.
    – **B** of the refrigerant pressure sensor connector.

If these checks reveal a short circuit to **+ 12 V**, perform the necessary repairs.
If these checks do not reveal a short circuit, replace the engine management computer.
If necessary, modify the configuration of the new computer to match the equipment options present on the vehicle.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF093 **PRESENT** **OR** **STORED**	MICROCONTROLLER 1.DEF : Internal electronic fault. 2.DEF : Inconsistency

1.DEF ***2.DEF***	***NOTES***	None.

If the fault is **present** or **stored**, clear the fault from the engine management computer memory.
Switch off the ignition, then switch it on again to initialise the computer. Carry out a road test.
If the fault reappears, replace the engine management computer.
If necessary, modify the configuration of the new computer to match the equipment options present on the vehicle.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF094 PRESENT OR STORED	THERMOPLUNGER RELAY No. 1 CC.1 : Short circuit to +12 V CO.0 : Open circuit or short circuit to earth

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault is declared present after: – the engine has been started, after the engine has been running at idle speed for **30 seconds**, with heated windscreen not selected and the engine temperature at starting less than **70°C**, or – if it reappears after being cleared followed by actuator command: **AC301**.
	Special notes: Use bornier **Elé. 1613** for all operations on the engine management computer connectors.

CC.1	***NOTES***	None.

Check the connectors on the "additional heater 1" relay in the engine fuse and relay box.
Check the connectors on the engine management computer.
Repair if necessary.

Check the integrity of the "additional heater 1" relay in the engine fuse and relay box:
– Insulation between **tracks 3 and 5** of the relay (at rest position).
– Measure the resistance of the relay coil, between **tracks 1 and 2:**
–replace the relay if its resistance is not approximately: **64 Ω ± 5 at +20°C**.

Check **insulation** relative to **+ 12 V** on the connection between:
Engine management computer, connector **C track J4** ⟶ **Track 2** additional heater 1 relay socket in the engine fuse and relay box.

Also check the **insulation** of this connection against following connections:
Additional heater no. 1 relay socket in the engine fuse and relay box, **track 1** ⟶ **+ 12 V after relay**
Additional heater no. 1 relay socket in the engine fuse and relay box, **track 3** ⟶ **+ 12 V battery**

CO.0	***NOTES***	None.

Check the connectors on the "additional heater 1" relay in the engine fuse and relay box.
Check the connectors on the engine management computer.
Repair if necessary.

Check the presence of **+ 12 V after ignition** on **track 1** of additional heater 1 relay socket. Measure the resistance of the relay coil, between **tracks 1 and 2:**
–replace the relay if its resistance is not approximately: **64 Ω ± 5 at + 20°C**.

Check the **continuity and insulation** against **earth** of the connection between:
Engine management computer, connector **C track J4** ⟶ **Track 2** additional heater 1 relay socket in the engine fuse and relay box.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF095 **PRESENT** **OR** **STORED**	SENSOR SUPPLY VOLTAGE No. 2 1.DEF : Vehicle speed too high 2.DEF : Vehicle speed signal frequency too high 3.DEF : Inconsistency between engine speed and air flow

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault becomes present: – during a road test at a speed above **2000 rpm**.
	Special notes: Use bornier **Elé. 1613** for all operations on the engine management computer connectors.

1.DEF	***NOTES***	Condition for appearance of fault 1.DEF: if speed is > **200 km/h** for **10 seconds** .

Check the condition of the sensor, if the body shows any deformation due to overheating, replace the sensor.
Perform a road test and compare the speed indicated by the diagnostic tool (Parameters menu) with that shown on the instrument panel:

– ***If these two values do not coincide,***

Ensure earthing of the engine block.
Check the following continuity (obtain the appropriate wiring diagram):
Engine management computer connector A track **E4** / speed sensor track **B1** / track **13** black connector on instrument panel.
If continuity is ensured between these three points, replace the engine management computer.
If necessary, modify the configuration of the new computer to match the equipment options present on the vehicle.

– ***If these two values coincide, perform the following checks:***

Ensure earthing of the engine block.
Check the **insulation** against the earth and against **+ 12 V** on the following connection:
Engine management computer, connector **A track E4** ⟶ **Track B1** vehicle speed sensor connector
Ensure the presence of **earth** on **track B2** of the vehicle speed sensor.
Check the presence of **+ 12 V** on **track A** of the vehicle speed sensor.
If the fault persists, remove the speed sensor and check the condition of the sensor drive pinion. If necessary replace the sensor.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF095 **CONTINUED**	

2.DEF ***3.DEF***	***NOTES***	**Condition for appearance of 3.DEF:** If the computer detects a speed signal lower than **10 km/h** but the fuel flow and engine speed show a higher speed.
		Special notes: If the road test highlights a clutch problem (slipping), consult Workshop Repair Manual **Section 2** and correct the problem. After the repair, follow the general notes for **DF095** before applying the fault-finding procedure.

Check the vehicle speed sensor connectors.
Check the connectors on the engine management computer.
Repair if necessary.

Check the condition of the sensor, if the body shows any deformation due to overheating, replace the sensor.
Ensure earthing of the engine block.
Check the integrity of fuse **F4** in the engine fuse and relay box.
Check the presence of **12 V** after ignition on **track A** of the vehicle speed sensor.
Ensure the presence of **earth** on **track B2** of the vehicle speed sensor.
Check the **continuity** of the following connection:

Engine management computer, **connector A** track E4 ⟶ **Track B1** vehicle speed sensor connector

Also check the insulation against the earth and against **+ 12 V** on the same connection.
If the fault persists:
The speed sensor supplies a signal which is shared by four control units: The injection control unit, the radio, the video display and the instrument panel.

To eliminate a possible fault caused by one of these elements, disconnect them one by one (except the injection control unit) and perform a road test between each disconnection.

– If the fault is not present during the road test after one of the disconnections, this means that the control unit in question was causing an electrical fault.
  If this is the case, clear the fault, carry out a final road test to confirm the source of the fault and if the fault does not reappear, replace the unit found to be faulty
– If the fault persists, remove the vehicle speed sensor and check condition of the pinion, its rod and the connection to the sensor itself.
  Replace the pinion or sensor if necessary.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF097 PRESENT OR STORED	CLUTCH CONTACT INFORMATION 1.DEF: Inconsistent vehicle speed

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault becomes present: – during a road test exceeding **60 mph (100 km/h)**.
	Priority in the event of a combination of faults: Deal with the **DF095: Vehicle speed signal** fault as a priority if it is declared present or stored.
	Special notes: Use bornier **Elé. 1613** for all operations on the engine management computer connector.

1 - Perform a check on the connectors of the clutch switch.
Check the connectors on the engine management computer.
Repair if necessary.

Display state **ET012: Clutch switch signal**. Press the clutch pedal and note whether this state becomes active:

If it becomes active,
– Reset the engine management computer. Switch the ignition back on, road test the vehicle and then take a fault reading. If the fault reappears, go to step 2.

If it does not become active,
– Ensure that the switch is correctly adjusted.
– Check the **continuity and insulation** against **earth** of the connection between:

Engine management computer, **connector A track E2** ⟶ **Track A1** clutch switch

– Ensure the presence of **earth** on **track B3** of the clutch switch.
Repair if necessary.

– Check the operation of the clutch switch:
– Closing of the contact between **tracks A1 and B3** when the clutch pedal is depressed.
– Opening of the contact between **tracks A1 and B3** when the clutch pedal is released.
– Replace the switch if necessary.

2 - If the fault persists:
– Clear the fault from the computer memory.
– Switch off the ignition, then switch it on again to initialise the computer.
– Carry out a road test.
– If the fault reappears, replace the engine management computer.
If necessary, modify the configuration of the new computer to match the equipment options present on the vehicle.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF098 **STORED**	MAIN RELAY 1.DEF : Relay cut-out too soon 2.DEF : Relay cut-off too late

NOTES	**Conditions for applying the fault finding procedure:** If the fault reappears as stored after: – the fault has been cleared and – the ignition is switched off with loss of dialogue and – the ignition is switched on again and dialogue is re-established.

1.DEF	***NOTES***	None.

Check the connectors on **R2** main relay socket in the engine fuse and relay box.
Check the connectors on the engine management computer.
Repair if necessary.

Check that the battery terminals (+ and -) are tight and in good condition.

Check the **continuity** of the following connections:
Main relay R2 **track 5** ⟶ **tracks M2** and **M3,** connector **B** of the engine management computer
Main relay R2 **track 2** ⟶ **Track D4,** connector **B** of the engine management computer

Check the condition of the **F2** fuse connections on the engine fuse and relay box (crimping of the wires on the terminals and condition of the terminals).

Check the condition of the engine management computer earth connections: tracks **L3**, **L4**, **M4**, connector **B** of the engine management computer.
Check the conformity of the impact sensor.

If the fault persists after these checks, replace main relay **R2**.

2.DEF	***NOTES***	None.

Check the connectors on main relay **R2** in the engine fuse and relay box.
Check the connectors on the engine management computer.
Repair if necessary.

Check the **insulation** against earth for the following connection:
Main relay **R2 track 2** ⟶ **Track D4**, computer connector **B**

Check the conformity of the main relay (relay removed).
– Insulation of contacts across **tracks 3** and **5**.
– Measure the resistance of the coil across **tracks 1** and **2**:
– Replace the relay if the resistance is not approximately **60** $\Omega \pm$ **5 at + 20**°**C**.
Check the integrity of the impact sensor.

If the fault persists after these checks, replace the main relay **R2**.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF099 PRESENT OR STORED	CYLINDER INJECTOR CIRCUIT 1 1.DEF : Overcurrent on injector energising current 2.DEF : Undercurrent on the injector energising current

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault reappears as present following: – starting the engine.
	Special notes: Use bornier **Elé. 1613** for all operations on the engine management computer connectors.

1.DEF	***NOTES***	None.

Check the connections for injector no. 1.
Check the connectors on the engine management computer.
Repair if necessary.

Measure the resistance of injector no. 1:
Replace the injector if the resistance between **tracks 1 and 2** is not: **0.33 Ω at + 20°C / 2 Ω max**.
Check the **insulation** between the following two connections:
Engine management computer, connector **C track M1** → **Track 2** injector no. 1 connector
Engine management computer, connector **C track M3** → **Track 1** injector no. 1 connector

Check **insulation** against **earth** on the following connection:
Engine management computer, connector **C track M3** → **Track 1** of the connector to the no. 1 injector

If the fault persists, replace the injector.

2.DEF	***NOTES***	None.

Check the connections for injector no. 1.
Check the connectors on the engine management computer.
Repair if necessary.

Check the **continuity** of the following connections:
Engine management computer, connector **C track M1** → **Track 2** injector no. 1 connector
Engine management computer, connector **C track M3** → **Track 1** injector no. 1 connector

Measure the resistance of injector no. 1:
Replace the injector if the resistance between **tracks 1 and 2** is not: **0.33 Ω at + 20°C / 2 Ω max**.

If the fault persists, replace the injector.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF100 PRESENT OR STORED	CYLINDER INJECTOR CIRCUIT 2 1.DEF : Overcurrent on injector energising current 2.DEF : Undercurrent on the injector energising current

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault reappears as present following: – starting the engine.
	Special notes: Use bornier **Elé. 1613** for all operations on the engine management computer connectors.

1.DEF	***NOTES***	None.

Check the connections for injector no. 2.
Check the connectors on the engine management computer.
Repair if necessary.

Measure the resistance of injector no. 2.
Replace the injector if the resistance between **tracks 1 and 2** is not: **0.33 Ω at + 20°C / 2 Ω max**.
Check the **insulation** between the following two connections:
Engine management, computer **C track L4** ⟶ **Track 2** injector no. 2 connector
Engine management, computer **C track L3** ⟶ **Track 1** injector no. 2 connector
Check **insulation** against **earth** on the following connection:
Engine management computer, connector **C track L3** ⟶ **Track 1** of injector no. 2 connector

If the fault persists, replace the injector.

2.DEF	***NOTES***	None.

Check the connections for injector no. 2.
Check the connectors on the engine management computer.
Repair if necessary.

Check the **continuity of the following connections:**
Engine management computer, connector **C track L4** ⟶ **Track 2** injector no. 2 connector
Engine management computer, connector **C track L3** ⟶ **Track 1** injector no. 2 connector

Measure the resistance of injector no. 2.
Replace the injector if the resistance between **tracks 1 and 2** is not: **0.33 Ω at + 20°C / 2 Ω max**.

If the fault persists, replace the injector.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF101 PRESENT OR STORED	CYLINDER INJECTOR CIRCUIT 3 1.DEF :Overcurrent on injector energising current 2.DEF :Undercurrent on the injector energising current

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault becomes present after: – the engine is started.
	Special notes: Use bornier **Elé. 1613** for all operations on the engine management computer connectors.

1.DEF	***NOTES***	None.

Check the connections for injector no. 3.
Check the connectors on the engine management computer.
Repair if necessary.

Measure the resistance of injector no. 3.
Replace the injector if the resistance between **tracks 1 and 2** is not: **0.33 Ω at + 20°C / 2 Ω max**.
Check the **insulation** between the following two connections:
Engine management computer, connector **C track M2** → **Track 2** injector no. 3 connector
Engine management computer, connector **C track L2** → **Track 1** injector no. 3 connector
Check the **insulation** against **earth** on the following connection:
Engine management computer, connector **C track L2** → **Track 1** of injector no. 3 connector

If the fault persists, replace the injector.

2.DEF	***NOTES***	None.

Check the connections for injector no. 3.
Check the connectors on the engine management computer.
Repair if necessary.

Check the **continuity** of the following connections:
Engine management computer, connector **C track M2** → **Track 2** injector no. 3 connector
Engine management computer, connector **C track L2** → **Track 1** injector no. 3 connector

Measure the resistance of injector no. 3.
Replace the injector if the resistance between **tracks 1 and 2** is not: **0.33 Ω at + 20°C / 2 Ω max**.

If the fault persists, replace the injector.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF102 PRESENT OR STORED	CYLINDER INJECTOR CIRCUIT 4 1.DEF : Overcurrent on injector energising current 2.DEF : Undercurrent on the injector energising current

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault reappears as present after: – the engine is started.
	Special notes: Use bornier **Elé. 1613** for all operations on the engine management computer connectors.

1.DEF	***NOTES***	None.

Check the connections for injector no. 4.
Check the connectors on the engine management computer.
Repair if necessary.

Measure the resistance of injector no. 4.
Replace the injector if the resistance between **tracks 1 and 2** is not: **0.33 Ω at + 20°C / 2 Ω max**.
Check the **insulation** between the following two connections:
Engine management computer, connector **C track L1** → **Track 2** injector no. 4 connector
Engine management computer, connector **C track M4** → **Track 1** injector no. 4 connector

Ensure **insulation** against **earth** for the following connection:
Engine management computer, connector **C track M4** → **Track 1** of the injector no. 4 connector

If the fault persists, replace the injector.

2.DEF	***NOTES***	None.

Check the connections for injector no. 4.
Check the connectors on the engine management computer.
Repair if necessary.

Check the **continuity** of the following connections:
Engine management computer, connector **C track L1** → **Track 2** injector no. 4 connector
Engine management computer, connector **C track M4** → **Track 1** injector no. 4 connector

Measure the resistance of injector no. 4.
Replace the injector if the resistance between **tracks 1 and 2** is not: **0.33 Ω at + 20°C / 2 Ω max**.

If the fault persists, replace the injector.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF104 PRESENT OR STORED	THERMOPLUNGER No. 2 RELAY CC.1 : Short circuit to +12 V CO.0 : Open circuit or short circuit to earth

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault is declared present after: – the engine has been started, after the engine has been running at idle speed for **30 seconds**, with heated windscreen not selected and the engine temperature at starting less than **70°C**, or – if it reappears after being cleared followed by actuator command: **AC302**
	Special notes: Use bornier **Elé. 1613** for all operations on the engine management computer connectors. The no. 2 thermoplunger relay powers thermoplungers 2 and 3 in parallel.

CC.1	***NOTES***	None.

Check the connectors on additional heater2 relay in the engine fuse and relay box.
Check the connectors on the engine management computer.
Repair if necessary.

Check **insulation** relative to **+ 12 V** on the connection between:
Engine management computer, connector **B track F3** ⟶ **track 2** additional heater 2 relay socket
Also check the **insulation** of this connection against the following connections:
Additional heater 2 relay socket, **track 1** ⟶ **+ 12 V after relay**
Additional heater 2 relay socket, **track 3** ⟶ **+ 12 V battery**

Check the integrity of the additional heater 2 relay:
– Insulation between **tracks 3 and 5** of the relay.
– Measure the resistance of the relay coil, between **tracks 1 and 2:**
– Replace the relay if the resistance is not approximately: **82 Ω ± 5 at + 20°C**.

CO.0	***NOTES***	None.

Check the connectors on the additional heater 2 relay in the engine fuse and relay box.
Check the connectors on the engine management computer.
Repair if necessary.

Check **continuity and insulation** against **earth** of the connection between:
Engine management computer, connector **B track F3** ⟶ **Track 2** additional heater 2 relay socket

Check the presence of **+ 12 V after relay** on **track 1** on additional heater 2 relay socket

– Measure the resistance of the additional heater 2 relay coil, between its **tracks 1 and 2**:
– Replace the relay if the resistance is not approximately: **82 Ω ± 5 at + 20°C**.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF105 PRESENT OR STORED	STABILISED VOLTAGE REGULATOR 1.DEF : Voltage too low 2.DEF : Voltage too high

If the fault is **stored**, clear the fault from the engine management computer memory. Switch off the ignition, then switch it on again to initialise the computer. If the fault reappears, replace the engine management computer. If necessary, modify the configuration of the new computer to match the equipment options present on the vehicle.
If the fault is **present**, replace the engine management computer. If necessary, modify the configuration of the new computer to match the equipment options present on the vehicle.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF111 PRESENT OR STORED	A.C. RELAY CONTROL CIRCUIT, COLD LOOP 1.CC.1 : Short circuit to + 12 V on the compressor relay control line 1.CO.0 : Open circuit or short circuit to earth of the compressor relay control line. 1.DEF : Refrigerant pressure sensor voltage too low 2.DEF : Refrigerant pressure sensor voltage too high 3.DEF : Refrigerant pressure sensor supply fault

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault reappears as stored after: – the fault has been cleared and actuator command **AC003: Air conditioning suppression command** is issued or – the engine is started followed by a request for air conditioning.
	Special notes: Use bornier **Elé. 1613** for all operations on the engine management computer connectors.

CC.1	***NOTES***	None.

Check the connections on the compressor control relay socket.
Check the connectors on the engine management computer.
Repair if necessary.

Remove the compressor relay and check the **insulation** against **+ 12 V** on the connection between:
Engine management computer, connector **A track F4** ⟶ **Track A2** compressor control relay socket

Check the resistance of the air conditioning compressor control relay coil:
Replace the relay if the resistance is not **88** Ω ± **10** Ω.

CO.0	***NOTES***	None.

Check the connections on the compressor control relay socket.
Check the connectors on the engine management computer.
Repair if necessary.

Ensure the continuity and insulation against **earth** of the connection between:
Engine management computer, connector **A track F4** ⟶ **Track A2** compressor control relay socket
Check the presence of **12 V after relay** on **track 1** of the compressor control relay socket.
Check the resistance of the air conditioning compressor control relay coil:
Replace the relay if the resistance is not **88** Ω ± **10** Ω.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF111 **CONTINUED**	

1.DEF ***2.DEF***	***NOTES***	None.

Check the refrigerant pressure sensor connections.
Check the connectors on the engine management computer.
Repair if necessary.

Check the **continuity** (and absence of interference resistance) on the following connections:

- Engine management computer, connector **B track F1** → **Track A** refrigerant pressure sensor connector
- Engine management computer, connector **B track A3** → **Track B** refrigerant pressure sensor connector
- Engine management computer, connector **B track G4** → **Track C** refrigerant pressure sensor connector

If the fault persists, check conformance of the air conditioning circuit.
1.DEF: Underpressure in the refrigerant fluid circuit;
2.DEF: Overpressure in the refrigerant fluid circuit.

3.DEF	***NOTES***	**Priority in the event of a combination of faults:** Deal with the **DF091: Sensor feed voltage no. 1** fault as a priority if it is present.

Check the refrigerant pressure sensor connections.
Check the connectors on the engine management computer.
Repair if necessary.

Check the **continuity** (and absence of interference resistance) on the following connections:

- Engine management computer, connector **B track F1** → **Track A** refrigerant pressure sensor connector
- Engine management computer, connector **B track A3** → **Track B** refrigerant pressure sensor connector
- Engine management computer, connector **B track G4** → **Track C** refrigerant pressure sensor connector

With the connectors disconnected, check insulation values between these same connections.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

DF141 **STORED**	FLOW AT SELF-TEST AFTER IGNITION SWITCHED OFF 1.DEF : Inconsistency with engine speed

1.DEF	***NOTES***	**Priority in the event of a combination of faults:** Deal with any other fault that is present or stored as a priority.
		Conditions for application of the fault finding procedure: If the fault reappears as stored after: – the fault has been cleared, – followed by several power latch* phase ends, each preceded by an engine start and acceleration to **> 2000 rpm** cycle. *** Information regarding the notes:** This fault is detected when the ignition is switched off, during the power latch phase. Moreover, this detection is based on a "counting" strategy and is therefore not performed at each ignition switch-off. If it is detected during a power latch, it will not necessarily be detected during the next. After a fault is cleared, then, several power latches should be performed, each preceded by one cycle with the engine running (see above), to attempt to make the fault reappear.

Conditions for appearance of the fault: this fault appears if the engine speed does not drop below a certain value (˜ 300 rpm) in a very short time (t < 1.5 seconds) after the ignition is switched off. It is therefore necessary to eliminate all mechanical, hydraulic or other causes which keep the engine running after it has been switched off.

It is therefore necessary to eliminate all causes which could keep the engine running after the ignition is switched off.

Check that there is not an excess of engine oil, and correct the oil level if required.

Check that there are no leaks in the injector pipes (see injector fault finding in the **Help** section).

Perform the necessary operations, clear the fault and then carry out the instructions again.

If the fault persists, replace the engine management computer. If necessary, modify the configuration of the new computer to match the equipment options present on the vehicle.

AFTER REPAIR	Deal with any other possible faults. Clear the faults from the computer memory. Switch off the ignition and carry out a road test followed by a check with the diagnostic tool.

NOTES	Do not refer to this conformity check until you have checked that there is no fault with the diagnostic tool. **Test conditions: engine stopped, ignition on.**

Order	Function	Parameter or state Check or action	Symbol on display and notes	Fault finding
1	Battery voltage	**ET001:** Computer +after ignition **PR004:** Computer supply voltage	state: **ACTIVE** 12.4 < X < 12.8 V	In the event of a problem, refer to fault finding procedure **PR004**
2	Immobiliser	**ET003:** Engine immobiliser **ET133:** Code programmed	status: **INACTIVE** The computer is locked! state: **YES** The computer has a code stored in memory!	In the event of problems, refer to the engine immobiliser diagnostic
3	Synchronisation *(between camshaft sensor and engine speed sensor)*	**ET157:** synchronisation	state: **STANDBY**, *then becomes "Complete" once the engine is started*.	Any phase difference between the camshaft sensor and the TDC sensor causes clearing of **DF070**. If starting is impossible: the status becomes "UNDERWAY" while the starter motor is running, and will only become "performed" if the engine starts.
4	Pre/postheating	**E027T:** Pre/postheating relay command **ET011:** pre-postheating signal	status: **ACTIVE** as soon as the ignition is switched on and until the end of pre-postheating status: **ACTIVE** as soon as pre-postheating is completed	If **ET011** is "ACTIVE" at the same time as **ET027**, a plug has failed or the diagnostic connection of the pre-postheating unit is in open circuit. + appearance of **DF061**.
5	Boosting pump	**ET105:** Low-pressure pump relay control	status: **ACTIVE**, as soon as the ignition is switched on. Becomes: **INACTIVE**, as soon as the engine is running, or after 10 seconds if the engine does not start.	This function ensures priming of the low-pressure circuit

NOTES	Do not refer to this conformity check until you have checked that there is no fault with the diagnostic tool. **Test conditions:engine stopped, ignition on.**

Order	Function	Parameter or state Check or action	Symbol on display and notes	Fault finding
6	Switches	**ET012:** Clutch switch signal **ET154:** Brake pedal	state: **DEPRESSED** or **RELEASED**, *depending on actions on the pedals*	None
7	Instrument panel warning lights	– Engine overheating warning light: – Preheating + electronic failure warning light	Indicator lights controlled by the engine computer via the multiplexed network: as soon as the ignition is switched on and for a few seconds	The coolant temperature warning is lit when the coolant temperature is > 110°C, and turns off when the temperature drops below 105°C again. In the event of problems, perform the fault finding procedure for the instrument panel
8	Supply voltage	**PR090:** Sensor supply voltage No. 1 **PR091:** Sensor supply voltage No. 2	4.9 V < X < 5.1 V 4.9 V < X < 5.1 V	None
9	Temperature sensors	**PR002:** Coolant temperature **PR003:** Air temperature **PR001:** Fuel temperature	X = Engine temperature ± 5 °C X = vehicle external temperature ± 5 °C X = Engine temperature ± 10 °C	In the event of a problem, refer to fault finding strategy **PR002** In the event of a problem, refer to fault finding strategy **PR003** In the event of a problem, refer to fault finding strategy **PR001**
10	Inlet pressures	**PR016:** Atmospheric pressure **PR082:** Turbocharger pressure	X = Atmospheric pressure X ≅ Atmospheric pressure	In the event of a problem, refer to diagnostic **PR016** In the event of a problem, refer to diagnostic **PR082**

NOTES	Do not refer to this conformity check until you have checked that there is no fault with the diagnostic tool. **Test conditions:engine stopped, ignition on.**

Order	Function	Parameter or state Check or action	Symbol on display and notes	Fault finding
11	RCO signal: – Exhaust gas recirculation valve	**PR095:** Exhaust gas recirculation valve opening cyclic ratio **PR088:** Copy exhaust gas recirculation valve position	X = 5% X ≅ 1 V	In the event of a problem, go to fault finding procedure **AC007**.
	– Wastegate	**PR094:** Turbocharger wastegate opening cyclic ratio	X = 5%	In the event of a problem, go to fault finding procedure **AC004**.
12	Diesel pressure Fuel flow	**PR083:** Manifold pressure **PR202:** Regulated fuel flow rate **PR033:** Fuel flow	0 < X < 4 bars X ≅ 25000 mm^3/s 10 < X < 80 mm^3/ stroke	If the engine has just been stopped, wait a few seconds to obtain this value. In the event of a problem, consult the fault finding procedure for **PR083**
13	Accelerator pedal sensor	**ACCELERATOR PEDAL NO LOAD** **PR008:** Pedal potentiometer voltage track 1 **PR005:** Pedal load **PR092:** Pedal load (circuit No. 1) **PR093:** Pedal load (circuit No. 2) **PR009:** Pedal potentiometer voltage track 2 **ACCELERATOR PEDAL FULL LOAD** **PR008:** Pedal potentiometer voltage track 1 **PR005:** Pedal load **PR092:** Pedal load (circuit No. 1) **PR093:** Pedal load (circuit No. 2) **PR009:** Pedal potentiometer voltage track 2	 X = 0.71 V X = 0% X = 0% X = 0% X = 0.35 V X = 4.1 V X = 100% X = 100% X = 100% X = 2.1 V	**Important:** approximately every 5 seconds the computer performs a test to set **PR009** at **0 V**. This corresponds to normal operation. If only one track responds after the pedal is depressed, change the pedal sensor. If the voltages shown does not correspond to + or - **0.3 V**, replace the pedal sensor. In the event of pedal sensor failure, the engine speed is frozen at **1200 rpm** (for return to workshop).

NOTES	Only perform this conformity check if a full check using the diagnostic tool revealed no faults. **Test conditions: warm idling engine**, without electric consumer.

Order	Function	Parameter or state Check or action	Symbol on display and notes	Fault finding
14	Engine speed	**PR 006:** Engine speed **PR002:** Coolant temperature **PR062:** Engine speed reference **PR035:** Idling-speed correction	800 rpm ± 50 higher than 80ºC 800 rpm ± 50. X = 0 rpm ± 50 *(Depending on increase or decrease in the tool configuration menu)*	None
15	Diesel pressure	**PR083:** Manifold pressure **PR086:** Manifold-loop deviation **ET105:** Low-pressure pump relay control	X = 275 bar ± 30 *(approximately 1350 bar at most when at full load)* X ≅ 0 bar state: **INACTIVE**	In the event of a problem consult the fault finding procedure **PR083**.
16	**FLOW RATES:** – Fuel – Air	**PR202:** Regulated fuel flow rate **PR033:** Fuel flow **PR075:** Idling speed fuel flow reference **PR050:** Air flow measurement	X ≅ 1210 mm^3/s X ≅ 5 mm^3/ stroke X ≅ 5 mm^3/ stroke X ≅ 34 kg/h at 800 rpm, *(approx. 390 kg/h under load in the case of a full load)*	None None
17	RCO signal: – Exhaust gas recirculation valve – Wastegate	**PR095:** Exhaust gas recirculation valve opening cyclic ratio **PR094:** Wastegate opening cyclic ratio	X ≅ 33% X ≅ 85%	In the event of a problem, go to fault finding procedure **AC007**. In the event of a problem, go to fault finding procedure **AC004**.

NOTES	Do not refer to this conformity check until you have checked that there is no fault with the diagnostic tool. **Test conditions: warm idling engine**, without electric consumer.

Order	Function	Parameter or state Check or action	Symbol on display and notes	Fault finding
If necessary consult the Workshop Repair Manual, ***Section 13: Injection/air conditioning strategy.***				
18	Air conditioning (selected)	If the injection computer allows compressor operation		
		ET102: Air conditioning requested	state: **ACTIVE**	In the event of anomalies, refer to the heating/ventilation diagnostics
		ET037: Low-speed fan unit relay control	status: **ACTIVE** Becomes inactive if the refrigerant pressure > **22 bar**	If the refrigerant pressure is > **22 bars**, the fan assembly is triggered at high speed until the pressure falls below **20 bars** again.
		ET038: High-speed fan unit relay control	status: **ACTIVE** only if the refrigerant pressure > **22 bar**	*In the event of a fan unit problem, go to command* **AC011 or AC012**
		ET116: Air conditioning compressor relay control.	state: **ACTIVE**	
		PR006: Engine speed	800 rpm	
		If the injection computer does not allow compressor operation		
		ET102: Air conditioning requested	state: **ACTIVE**	
		ET037: Low-speed fan unit relay control	state: **INACTIVE**	
		ET116: Air conditioning compressor relay control.	state: **INACTIVE**	
		PR006: Engine speed	X = 800 rpm	

NOTES	Do not refer to this conformity check until you have checked that there is no fault with the diagnostic tool. **Test conditions: engine stopped, ignition on.**

Order	Function	Parameter or state Check or action	Symbol on display and notes	Fault finding
19	Engine cooling	**PR002:** Coolant temperature **ET038:** High speed fan assembly relay control (with air conditioning) or **ET037:** Low speed fan assembly (without air conditioning)	If **PR002** ≥ at 93°C then = state: **ACTIVE** The fan must run at high speed	*In the event of a problem on the fan, go to command* **AC012** When the temperature drops to 88°C again, the fan assembly cuts out (the command state becomes: **INACTIVE**).
	If necessary, refer to Workshop Repair Manual ***section 13: Centrally managed coolant temperature***			
20	Electrically heated windscreen (selected)	**ET186:** Heated windscreen **PR006:** Engine speed	state: **ACTIVE** **1,000 rpm**	None
21	Thermoplungers	**ET106:** Thermoplunger relay control No. 1 **ET107:** Thermoplunger relay no. 2 control **ET108:** Thermoplunger relay no. 3 control **PR006:** Engine speed	Command statuses: **ACTIVE** or **INACTIVE**, depending on authorisation of the injection computer **825 rpm**	If necessary, refer to Workshop Repair Manual section **13**: **Thermoplungers**.

NOTES	Do not refer to this conformity check until you have checked that there is no fault with the diagnostic tool. **Test conditions:** engine stopped, ignition on. **ET003** Inactive.

Order	Function	Description	Symbol on display and notes	Fault finding
22	Thermoplungers	**AC301:** No.1 thermoplunger relay **AC302:** No.2 thermoplunger relay **AC303:** No.3 thermoplunger relay	You should hear the relay activate (two sequences of ~ 1 second)	In the event of a problem: consult fault finding procedure **AC301**. In the event of a problem: consult fault finding procedure **AC302**. In the event of a problem: consult fault finding procedure **AC002**.
23	Air conditioning compressor control	**AC003:** Air conditioning inhibition	One should hear the relays and compressor being actuated (ten sequences)	In the event of problems, consult fault finding procedure **AC003**.
24	Turbocharging solenoid valve	**AC004:** Wastegate	During entry of the command, maintain a vacuum pressure of approx. 600 mbar at the valve inlet to hear it operating and check operation of the wastegate diaphragm.	In the event of a problem: consult fault finding procedure **AC004**.
25	Boosting pump	**AC005:** Low pressure pump relay command	One should hear the relay being actuated and the pump running (one sequence of approx. 15 seconds)	In the event of problems, consult fault finding procedure **AC005**.
26	Fuel pressure regulator	**AC006:** Solenoid valve control of fuel pressure (or flow regulation solenoid valve)	Place your hand on the valve to feel it operating	In the event of a problem: consult fault finding procedure **AC006**.

NOTES	Do not refer to this conformity check until you have checked that there is no fault with the diagnostic tool. **Test conditions:** engine stopped, ignition on. **ET003** Inactive.

Order	Function	Parameter or state Check or action	Symbol on display and notes	Fault finding
27	Exhaust gas recirculation valve	**AC007:** Exhaust gear recirculation valve command	Place your hand on the valve to feel it operating	In the event of a problem: consult fault finding procedure **AC007**.
28	Preheating relay	**AC010:** Preheating relay	Place a clamp-on ammeter on **track 3** (on the red **5 mm^2** wire) of the preheating relay and check that the current consumption is **approx. 80 A**.	Any plug fault should clear fault **DF061**. Locate the faulty plug by placing the clamp-on ammeter directly on the power supply wires of each plug: **approx. 20A**/ plug
29		**AC011:** Low speed fan unit relay	You should hear the relay activating and observe that the fan unit is running at low speed (only if the vehicle is equipped with air conditioning)	In the event of a problem consult fault finding procedure **AC011**.
		AC012: High speed fan unit relay	You should hear the relay activating and observe that the fan unit is running at high speed (only if the vehicle is equipped with air conditioning)	In the event of a problem consult fault finding procedure **AC012**.
(For vehicles <u>without</u> air conditioning, only the **AC011** command is operational. It causes the fan to run at <u>high speed</u>)				

PR001:	FUEL TEMPERATURE

NOTES	**IMPORTANT:** In the event of a relatively low outside temperature, the difference between the fuel temperature and the engine temperature after cold starting may be greater than **30°C**. **No faults should be present or stored.** Perform this fault finding procedure after an inconsistency is displayed in the Parameter menu. **Special note:** – Use a temperature sensor to compare the values displayed on the diagnostic tool. – Use bornier **Elé. 1613** for all operations on the engine management computer connector.

Check for the absence of interference resistance on the following lines:
– between **track J3, connector B** of the computer and **track 1** of the temperature sensor connector,
– between **track G1, connector B** of the computer and **track 2** of the temperature sensor connector.
Repair.
Check that the sensor follows the "resistance as a function of temperature" (NTC) calibration curve correctly.

3820 Ω ± 282 at 10°C
2050 Ω ± 100 at 25°C
810 Ω ± 47 at 50°C.

Compare the value displayed by the diagnostic tool with the value shown by a temperature sensor (placed on the return circuit).
Replace the sensor if it deviates (if a sensor deviates, it is often due to an electric shock).

AFTER REPAIR	Repeat the conformity check.

PR002:	COOLANT TEMPERATURE

NOTES	**No faults should be present or stored.** Perform this fault finding procedure after an inconsistency is displayed in the Parameter menu. **Special note:** – Use a temperature sensor to compare the values displayed on the diagnostic tool. – Use bornier **Elé. 1613** for all operations on the engine management computer connector.

Check that the cooling circuit is topped up and properly bled. Carry out the required operations.

Check for the absence of interference resistance on the following lines:
– between **track E1, connector B** of the computer and **track 2** of the temperature sensor connector.
– between **track K3, connector B** of the computer and **track 3** of the temperature sensor connector.
Repair.

Check that the sensor follows the "resistance as a function of temperature" (NTC) calibration curve correctly.
2252 Ω ± 112 at 25°C / 811 Ω ± 39 at 50°C / 283 Ω ± 8 at 80°C.
Compare the value displayed on the instrument panel with that shown by the diagnostic tool, and if they do not correspond, compare with the value shown by a temperature sensor (placed in the expansion bottle). Replace the sensor if there is a significant difference.
Replace the sensor if it deviates (if a sensor deviates, it is often due to an electric shock).

AFTER REPAIR	Repeat the conformity check.

PR003:	AIR TEMPERATURE

NOTES	**No faults should be present or stored.** Perform this fault finding procedure after noting an inconsistency in the parameter menu. **Special note:** – Use a temperature sensor to compare the values displayed on the tool. – Use bornier **Elé. 1613** for all operations on the engine management computer connector.

Check that there are no foreign bodies on the air flowmeter grille. Clean if necessary.

Check for the absence of interference resistance on the following lines:
– between **tracks D3, connector B** of the computer and **track 1** of the temperature sensor connector,
– between **tracks A3, connector C** of the ECU and **track 2** of the temperature-sensor connector
Repair.
Check that the sensor follows the "resistance as a function of temperature" (NTC) calibration curve correctly.
3714 Ω ± 161 at 10°C / 2448 Ω ± 90 at 20°C / 1671 Ω ± 59 at 30°C.
Compare the value displayed by the diagnostic tool with the value shown by a temperature sensor (placed on the flowmeter grille via the air filter outlet).
Replace the sensor (integrated into the air flowmeter) if it deviates (a sensor which deviates is often the result of an electric shock).

AFTER REPAIR	Repeat the conformity check.

PR004	COMPUTER SUPPLY VOLTAGE

NOTES	**No faults should be present or stored.** Perform this fault finding procedure after noting an inconsistency in the parameter menu.

Ignition on

If the voltage is lower than the minimum recommended, **the battery is discharged or unserviceable**:
– Recharge and teste the battery, check the charge circuit to detect the source of the problem, if necessary replace the battery.

If the voltage is above the recommended level, **the battery is overcharged:**
Check that the charging voltage is correct with and without electrical consumers.

At idle speed

If the voltage is lower than the minimum recommended, **the charging voltage is too low, or the battery is unserviceable:**
– Check the electrolyte level, recharge the battery and perform a test.
– If the battery is not faulty, check the charging circuit to find the source of this problem.

If the voltage is above the maximum recommended level, **the charging voltage is too high:**
The alternator regulator is faulty. Rectify this fault.

AFTER REPAIR	Repeat the conformity check.

PR016	ATMOSPHERIC PRESSURE SENSOR

NOTES	Perform this fault finding procedure after noting an inconsistency in the parameter menu.

The atmospheric pressure sensor is inside the engine management computer, and no repairs are possible.
Simply check that the computer's air vent is not clogged.
If the parameter is not correct, reset the computer. Check parameter PR016 with the engine running and with the engine stopped but the ignition on.
If the value read is not correct, replace the computer.
If necessary, modify the configuration of the new computer to match the equipment options present on the vehicle.

AFTER REPAIR	Repeat the conformity check.

PR082	TURBOCHARGER PRESSURE

NOTES	**No faults should be present or stored.** Perform this fault finding procedure after an inconsistency is displayed in the Parameter menu or after a customer complaint (lack of performance, fumes, etc.).

Check the turbocharger pressure.:
- While stationary, with the engine idling + full load for 3 seconds (up to **4170 rpm**) the tool should indicate a turbocharger pressure of: **~ 1850 hPa** for F9Q 760 / F9Q 762 engines
- During a road test, with the engine idling + full load for **3500 rpm**, the tool should indicate a turbocharger pressure of: **~ 1995 hPa** for F9Q 760 engines
  ~ 1850 hPa for F9Q 762 engines

If the turbocharger pressures are not in conformance, check that the sensor is operating correctly by proceeding as follows:
Remove the hose from the turbocharger pressure sensor at the inlet manifold end and connect it to a vacuum pump. Then check the values displayed by the diagnostic tool, in the "parameters" screen, against the pressure and vacuum values given by your vacuum pump.
Maximum pressure to apply: **2200 hPa** or **2.2 bar**.
Minimum pressure to apply: **400 hPa** or **0.4 bar**.
- **In the event of a deviation** > **100 hPa** or **0.1 bar** (depending on precision of the pump pressure gauge). Check that there is no interference resistance on the signal line and on the sensor supply lines. Replace the sensor if the electric connections are not faulty.
- **If there is no deviation**, check:
  - the leaktightness of the hose connecting the sensor to the inlet nozzle, and the tightness of its collars,
  - the leaktightness of the admission circuit: unions, hose, sleeves, exchanger, turbocharger.
- Perform the interpretation of commands fault finding procedure: **AC004:** Wastegate.

If the fault persists:
- Ensure there is no oil in the air inlet circuit.
- Check the efficiency of the turbocharger.
- Ensure there is no back-pressure at the exhaust.

AFTER REPAIR	Repeat the conformity check.

PR083	RAIL PRESSURE

NOTES	**No faults should be present or stored.** Perform this diagnostic after detecting an inconsistency in the parameters menu or following a customer complaint (starting problem, lack of power, injection noise, etc.).

It is strictly forbidden to carry out an ohmmeter check on the rail pressure sensor.

Normal rail pressure value according to operating conditions:

Idling - **275 bars** ± **30** for F9Q 760 and F9Q 762 engines

During full load (3 seconds) - **1480 bar** max. for F9Q 760 engines

- **1100 bar** max. for F9Q 762 engine

If the pressures do not conform and there is an engine operating fault (starting fault, injection noise, inadequate performance, irregular engine operation), perform the following checks:

1 Make sure there is no interference resistance on the connections between:

Engine management computer, connector **B track H2** → **Track 3** rail pressure sensor

Engine management computer, connector **B track D1** → **Track 2** rail pressure sensor

Engine management computer, connector **C track B3** → **Track 1** rail pressure sensor

2 Make sure the low-pressure diesel circuit is primed **(max. 2.5 bar)** at the outlet of pump EKP13 (submerged in the tank), regulated by the anti-return valve between **0.2** and **0.5 bar** at the high pressure pump inlet).

3 Check filter condition: pressure difference of at most **0.3 bar** between the diesel fuel filter inlet and outlet.

4 Check that there are no leaks on the high pressure circuit (visual checks, odours, etc.): pump, regulation solenoid valve, pipes, rail unions, injectors, etc.

5 Check the operation of the pressure regulator (**AC006** fault finding procedure).

6 Ensure correct operation of the injectors (return leakage too high, clogging, sticking: see injector fault finding procedure).

AFTER REPAIR	Repeat the conformity check.

PR192	REFRIGERANT FLUID PRESSURE

NOTES	**No faults should be present or stored.** Perform this fault finding procedure after an inconsistency is displayed in the Parameter menu or after a customer complaint (no air conditioning, etc.).

Display **PR192** from the Parameter or Function menu of your diagnostic tool:

Start the engine, maintain a speed of 1500 rpm and turn on the air conditioning:
– if the pressure is above normal, continue to stage no. 2.
– if the pressure does not increase or remains lower than normal, go to the command menu on your diagnostic tool and check the operation of the compressor and its relay by running command **AC003**. In the event of a problem, apply the relevant fault finding procedure.

If the compressor and relay are not faulty: Check the conformity of the refrigerant pressure sensor by comparing* the value shown on the diagnostic tool (**PR192**) with the value given by the pressure gauges on an air conditioning station.

*** IMPORTANT:** the tool displays the absolute pressure, if the high pressure gauge on your charge station displays the relative pressure, there will be a normal deviation between the two values, approximately equal to atmospheric pressure.

If the values do not match, (gap > ± 1.5 bar), ensure the continuity and absence of interference resistance on the connections between:

Engine management computer, connector **B track F1** → **Track 1** refrigerant pressure sensor
Engine management computer, connector **C track A3** → **Track 2** refrigerant fluid pressure sensor
Engine management computer, connector **B track G4** → **Track 3** refrigerant fluid pressure sensor

If the computer/refrigerant pressure sensor connections are not faulty, replace the refrigerant pressure sensor (see section **62** of the Workshop Repair Manual).

If the values coincide, the sensor is not faulty, continue to stage no. 2

Stage no. 2Perform a complete fault finding check on the air conditioning.

AFTER REPAIR	Repeat the conformity check.

AC003	AIR CONDITIONING INHIBITION

NOTES	**No faults should be present or stored.** Perform this diagnostic after detecting an anomaly in the command menu or following a problem with the air conditioning compressor.

If the **compressor** does not engage when command **AC003** is issued, carry out the following checks:

If the **compressor relay** does not operate

Check the continuity of the following connection:
Engine management computer, connector **A, track F4** ⟶ **Track 2** Compressor relay socket **R6**
Check fuse **F2** and the power supplies of the compressor relay socket:
Compressor relay socket **R6 track 1** ⟶ **12 V after relay**
Compressor relay socket **R6 track 3** ⟶ **12 V battery**.
Check the resistance of the compressor clutch coil: **3.5** Ω ± **0.5**.
If all these checks are OK, check operation of the compressor relay by the engine management computer in the following way:
Remove the compressor relay, put a **50** to **100** Ω resistor on the mounting in place of the relay coil (**tracks 1** and **2**), reconnect the voltmeter terminal (**-**) on **track 2** of the relay socket and the (**+**) voltmeter terminal on **track 1** of the relay socket:
Clear the fault and run command **AC006**;
– If the voltmeter does not display the battery voltage (ten sequences), replace the engine management computer. If necessary, modify the configuration of the new computer to match the equipment options present on the vehicle.
– If the voltmeter displays the battery voltage (ten sequences), replace the compressor relay.

If the **compressor relay** operates

Check the air conditioning compressor clutch resistance: **3.5** Ω ± **0.5**.
Check the continuity and insulation relative to earth of the following connection:
Compressor relay socket "**R6**", **track 5** ⟶ **Track A** compressor connector
Check the presence of earth on track **B** of the compressor connector.
Check fuse **F3 (15A)** and its holder and terminals.
Check power supply of the compressor relay socket: **track 3** ⟶ **12 V battery**
Check the conformance of compressor diode No. 10 in the engine fuse/relay box.
Carry out the necessary repairs.

AFTER REPAIR	Repeat the conformity check.

AC004	TURBOCHARGING LIMITATION VALVE

NOTES	Carry out this fault finding procedure following interpretation of an unresolved fault, or following handling of the interpretation of **PR082** and/or following a customer complaint (lack of power, smoke, etc.).

In the event of a problem on the braking assistance (SERVOFREIN), first check that the vacuum pump operates correctly and check the conformity of its unions and wastegate.
IMPORTANT: When performing this command, a vacuum pressure (**600 mbar**) must be maintained at the inlet of the solenoid valve, in order to hear it operate and verify the simultaneous operation of the wastegate flap.
If, when this command is executed, no flap movement is observed:

– Check the resistance of the wastegate (turbocharger pressure limitation valve) between its **tracks1 and 2**. Replace the wastegate if the resistance is not approximately: **16.5** Ω ± **1.6** at **+ 25°C** / **22.1** Ω ± **2.2 at + 110°C**.
– Make sure there is no interference resistance on the connections between:
  Engine management computer, connector **B track L2** ⟶ **Track 1** of the turbocharger pressure regulator
  12 V after relay ⟶ **Track 2** of the turbocharger pressure regulator
– Check the leaktightness of the vacuum circuit, from the vacuum pump to the wastegate control diaphragm (to check the operation of the wastegate diaphragm and its flap, operate it directly with a vacuum pump).
– Check the setting of the wastegate rod (Workshop Repair Manual section **12**: Wastegate).
– Check the upper and lower stops of the wastegate flap.

Carry out the necessary repairs.

AFTER REPAIR	Repeat the conformity check.

AC005	LOW PRESSURE PUMP RELAY

NOTES	**No faults should be present or stored** Perform this diagnostic after detecting a malfunction in the command menu or following a customer complaint (starting problem).

Reminder: the low-pressure pump is used for priming the high-pressure pump. As soon as the engine speed exceeds 300 rpm or the high pressure reaches **approx. 250 bar**, the relay command is deactivated.
If relay "R3" is not actuated, (by command **AC005**): Carry out a check of the connectors of relay socket "**R3**". Check the connectors on the engine management computer. Repair if necessary.
If the problem persists, check that relay **R3** is operated by the engine management computer as follows:
– Disconnect relay **R3**, put a **50** to **100** Ω resistor on the relay socket in place of the coil and connect the voltmeter as follows:
  Positive terminal on **+ 12 V** battery
  Negative terminal on **track 2** of relay socket "**R3**".
– Delete the fault.
– Run command **AC005**,
– If the voltmeter does not display the battery voltage (a sequence of approximately 10 seconds), replace the computer. If necessary, modify the configuration of the new computer to match the equipment options present on the vehicle.
– If the voltmeter indicates the battery voltage correctly, replace relay "**R3**".

If the relay is actuated, but the low-pressure pump does not work, check with the help of the wiring diagram:
– the battery + power supply for **track 3** of relay socket "**R3**";
– the continuity of the connection between **track 5** of relay socket "**R3**" and **track 1** of the low-pressure pump motor connector;
– the conformity of low-pressure pump relay "**R3**" (and its mounting);
– the conformity of the low pressure pump (insulation, etc.),
– the continuity of the connection between **track 2** of the low-pressure pump motor connector and **earth**.
Repair if necessary.

AFTER REPAIR	Repeat the conformity check.

AC006	FUEL PRESSURE SOLENOID VALVE (pressure regulator)

NOTES	Perform this diagnostic after detecting an anomaly in the command menu, or following interpretation of an unresolved fault, or following a customer complaint.
	Special note: a suspected problem with the pressure regulator (or flow regulator) requires the pump/regulator unit to be replaced.

Check the resistance of the pressure regulator between **tracks 1** and **2**.
– If the resistance is not approximately: **5** Ω ± **0.5 at 20°C**. Replace the pump/pressure regulator unit.
– Make sure there is no interference resistance between:
Engine management computer, connector **B track L1** ⟶ **Track 2** of the pressure regulator connector.
12 V after relay ⟶ **Track 1** of the pressure regulator connector.

Check the operation of the computer output stage by measuring the solenoid valve Opening Cyclic Ratio while executing its command. During the 24 seconds of this command, the valve receives ten cycles from two successive Opening Cyclic Ratios which can be measured in the following ways:
By voltmeter: With the solenoid valve connected, link the voltmeter's earth lead to **track 2** of the fuel pressure solenoid and the positive lead to **track 1**, clear any fault from the fuel pressure solenoid valve, then execute command **AC006:**

➡ The voltmeter should display two successive voltages approximately equal to the battery voltage and the current Opening Cyclic Ratio, i.e. successively: **~ 3.15 V** for an Opening Cyclic Ratio of **25%** then **~ 9.45 V** for an Opening Cyclic Ratio of **75%** (ten cycles).

By oscilloscope on **5 V**/div calibre and a base time of 1 ms/div: with the solenoid valve connected, connect the oscilloscope to the battery earth and the positive touchpoint on **track 2** on the fuel pressure solenoid valve, clear a possible fault on the fuel pressure solenoid valve, then initiate command **AC006:**
➡ The oscilloscope should display a square signal of **12.5 V** amplitude at a frequency of **185 Hz** (with an Opening Cyclic Ratio which switches from **25** to **75%** successively).
If the measurement does not indicate any control, or a fixed direct current, replace the engine management computer, if necessary modify the configuration of the new computer against the options presented on the vehicle.
If the solenoid valve, its connection and its management are in conformance, go on to the next stage:

With the engine running at a different speed, display **PR202:** Regulated fuel flow:
– *If this value falls without a noticeable decrease in the rail pressure, this may indicate seizure or jamming of the flow solenoid valve (jammed open).*

➡ In this case, and in the case of **overpressure** in the rail:

Check operation of the injectors: see **Help** section
on the pressure sensor: Interpretation of **PR083** fault finding procedure,
If these two checks do not indicate any fault, replace the pump/regulator assembly.
– *If this value increases without a noticeable increase in the rail pressure, this may indicate sticking or jamming of the pressure solenoid valve (jammed shut).*

➡ In this case, and in the case of **underpressure** in the rail:

Ensure correct operation of the "parameter interpretation diagnostic **PR083** pressure sensor, check **1**".
Make sure that the low-pressure diesel circuit is primed (max. **2.5 bar**) at the outlet of pump EKP13 (submerged in the tank), regulated by the anti-return valve between **0.2** and **0.5 bar** at the high pressure pump inlet).
Check the leaktightness of the low pressure and high pressure diesel circuit (visual checks, odours, etc.): pump body, pressure regulator, pipes, rail unions and injectors, etc. Perform the necessary repairs.
Check tension of the high pressure pump drive belt.
Check the operation of the injectors: Injector fault finding, see **Help** section.
– If the checks are correct, replace the pump/regulator unit.

AFTER REPAIR	Repeat the conformity check.

AC007	EGR VALVE

NOTES	Perform this fault finding procedure following unresolved fault **DF077** (1.DEF or 2.DEF) or following a customer complaint (poor performance, smoke, etc.).

Stage no. 1:

Measure the resistance of the exhaust gas recirculation valve between **tracks 1 and 5**.

–If its resistance is not approximately **8 Ω ± 0.5 at + 20°C,** replace the exhaust gas recirculation valve.

Make sure there is no interference resistance on the connections between:

Engine ECU, connector **B track M1** ⟶ **Track 5** exhaust gas recirculation valve connector

12 V after relay ⟶ **Track 1** exhaust gas recirculation valve connector

Check the operation of the computer output stage by measuring the exhaust gas recirculation valve Opening Cyclic Ratio while executing the command. During the 24 seconds of this command, the valve receives ten cycles of two successive Opening Cyclic Ratios, which can be measured in the following ways:

– **By oscilloscope** on **5 V/div** calibre and a base time of **2 ms/div**: with the exhaust gas recirculation valve connected, connect the oscilloscope earth to the battery earth and the positive touchpoint on **track 5** of the exhaust gas recirculation valve, clear any possible exhaust gas recirculation valve fault, then initiate command **AC007**.

The oscilloscope should display a square signal of **12.5 V** amplitude at a fréquency of **140 Hz**, (with an Opening Cyclic Ratio ranging from **25** to **75%**).

– **Or with a voltmeter:** with the exhaust gas recirculation valve connected, connect the voltmeter earth braiding on track 2 of the exhaust gas recirculation valve and the positive braid to **track 1**, clear any possible exhaust gas recirculation valve fault, then initiate command **AC007**; the voltmeter should display two successive voltages approximately equal to the product of the battery voltage and the current Opening Cyclic Ratio, i.e. successively: **3.15 V** for an Opening Cyclic Ratio of **25%** then **9.45 V** for an Opening Cyclic Ratio of **75%** (10 cycles).

If the oscilloscope (or the voltmeter) does not indicate any control, or a fixed direct current, replace the engine management computer. If necessary, modify the configuration of the new computer to match the equipment options present on the vehicle.

If the exhaust gas recirculation valve, its connection and its automation are not faulty, continue to the next stage:

Stage no. 2

Disconnect the connector and remove the exhaust gas recirculation valve:

– If removal reveals that the valve is blocked (e.g.: valve in open position), replace the exhaust gas recirculation valve.

– Otherwise, reconnect the connector, clear the fault and run command **AC007**:

The valve receives two successive Opening Cyclic Ratio cycles: **25%** and **75%**.

Then check:

– The movement of the valve when the command is executed, (**2.25 mm ± 0.1** for an Opening Cyclic Ratio of **25%** and **6.75 mm ± 0.3** for an Opening Cyclic Ratio of **75%**).

– There is no clearance between the exhaust gas recirculation valve and its control stalk as well as the general condition (clogging, hard point, etc.).

– Valve closing when the command is completed.

If during command **AC007**, no movement of the exhaust gas recirculation valve is noticed, or if these checks reveal an irreparable blockage or seizing, replace the exhaust gas recirculation valve.

AFTER REPAIR	Repeat the conformity check.

AC011	LOW SPEED FAN ASSEMBLY RELAY

NOTES	**No faults should be present or stored.** Perform this fault finding procedure after detecting an anomaly in the commands menu or following an engine cooling or air conditioning fault.

REMINDER: if the vehicle is not fitted with air conditioning, there is no low speed fan assembly relay; in that case it is replaced by the fan assembly relay "**R9**". In this case, command **AC011** triggers fan operation at high speed and the procedure to be complied with in case of problems is the procedure for command **AC012**.

If relay "R10" is not actuated (when command **AC011** is run):
Check the "**R10**" relay socket connections.
Check the connectors on the engine management computer. Repair if necessary.
If the problem persists, check that relay "**R10**" is controlled by the engine management computer as follows:
– Disconnect relay "**R10**", put a **50** to **100** Ω resistance on relay socket "**R10**", in place of the coil and connect a voltmeter as follows:
  Positive terminal on **+ 12 V** battery
  Negative terminal on **track 2** of the "**R10**" relay socket.
– Clear the fault and initiate the "**AC011**" command.

If the voltmeter does not display the battery voltage (ten sequences of 1 second), replace the computer.
If necessary, modify the configuration of the new computer to match the equipment options present on the vehicle.
If the voltmeter displays the battery voltage (ten sequences of 1 second), replace relay "**R10**".

If relay "R10" activates, but there is still a coolant temperature or air conditioning warning fault, use the wiring diagram to check:
– the conformance of fan fuse "**F03**";
– presence of + battery supply on **track 3** of the low speed fan unit relay socket, "**R10**",
– the conformity of relay "**R10**",
– the continuity of the connection between **track 5** of relay socket "**R10**" and **track 1** of the low-speed resistor;
– the conformity of the low-speed resistor (resistance and connections);
– the continuity of the connection between **track 2** of the low speed resistor connector and **track 1** of the fan connector;
– the condition of the fan;
– the continuity of the connection between **track 2** of the fan connector and earth.

Carry out the necessary repairs.

AFTER REPAIR	Repeat the conformity check.

AC012	HIGH-SPEED FAN ASSEMBLY

NOTES	**No faults should be present or stored.** Perform this fault finding procedure after detecting a fault in the commands menu or following a problem of engine cooling.

REMINDER: if the vehicle is not fitted with air conditioning, this command is not operational. Fan operation at high speed is in that case triggered by command **AC011** and the procedure to be complied with in case of problems is as follows:

If relay "R9" is not activated (when command **AC012** is executed):
Check the "**R9**" relay socket connections.
Check the connectors on the engine management computer.
Repair if necessary.
If the problem persists, check that relay "**R9**" is operated by the engine management computer as follows:
– Disconnect relay "**R9**", fit a **50** to **100** Ω resistor on the "**R9**" relay socket in place of the coil and attach a voltmeter as follows:
  Positive terminal on **+ 12 V** battery
  Negative terminal on **track 2** of "**R9**" relay socket
– Clear the fault and initiate the "**AC012**" command.

If the voltmeter does not display the battery voltage (ten sequences of 1 second), replace the computer.
If necessary, modify the configuration of the new computer to match the equipment options present on the vehicle.
If the voltmeter displays the battery voltage (ten sequences of 1 second), replace relay. "**R9**".

If relay "R9" activates, but there is still a coolant temperature warning fault, use the wiring diagram to check:
– the conformance of fan fuse "**F03**";
– presence of + battery supply on **track 3** of the high speed fan unit relay socket, "**R9**",
– the conformity of relay "**R9**",
– the continuity of the connection between **track 5** of relay socket "**R9**" and **track 1** of the fan connector,
– the conformity of the fan assembly,
– the continuity of the connection between **track 2** of the fan connector and **earth**.

Carry out the necessary repairs.

AFTER REPAIR	Repeat the conformity check.

AC301	THERMOPLUNGER RELAY No. 1

NOTES	**No faults should be present or stored.** Perform this fault finding procedure in the event of the function not working properly, indicated in the command menu or in the event of a passenger compartment heating or demisting fault.

If relay "R7" is not actuated when command **AC301** is run:
Check the connectors of additional heater No. 1 relay socket "**R7**".
Check the connectors on the engine management computer.
Repair if necessary.
If the problem persists, check that relay "**R7**" is operated by the engine management computer as follows:
– Disconnect relay "**R7**", put a **50** to **100** Ω resistor on the relay socket in place of the coil and connect the voltmeter as follows:
  Positive terminal on **+ 12 V** battery
  Negative terminal on **track 2** of relay socket "**R7**"
– Clear the fault.
– Run command **AC301**.
If the voltmeter does not display the battery voltage (two sequences of 1 second), replace the computer.
If necessary, modify the configuration of the new computer to match the equipment options present on the vehicle.
If the voltmeter does display the battery voltage (two sequences of 1 second), replace relay "**R7**".

If relay "R7" activates, but there is still a passenger compartment heating or demisting fault, use the wiring diagram to check:
– the conformance of fuse "**F01**" (**70A**);
– the presence of **+ 12 V battery** on **track 3** of relay socket "**R7**",
– the conformance of relay "**R7**";
– the continuity between **track 5** of relay socket "**R7**" and the supply lug of thermoplunger **1**;
– the conformity of the thermoplunger resistance: **0.45** Ω ± **0.05 at 20°C**,
– the presence of earth at the plenum chamber (thermoplunger mounting).
Also check the level of the cooling circuit and that there are no leaks.
Carry out the necessary repairs.

AFTER REPAIR	Repeat the conformity check.

AC302	THERMOPLUNGER No. 2 RELAY

NOTES	**No faults should be present or stored.** Perform this fault finding procedure in the event of the function not working properly, indicated in the command menu or in the event of a passenger compartment heating or demisting fault.
	Special note: The "No. 2 thermoplunger relay", supplies thermoplungers 2 and 3 in parallel.

If relay "R8" is not activated when command **AC302** is executed:
Check the connectors of additional heater No. 2 relay socket "**R8**".
Check the connectors on the engine management computer.
Repair if necessary.
If the problem persists, check that relay "**R8**" is operated by the engine management computer as follows:
– Disconnect relay "**R8**", put a **50** to **100** Ω resistor on the relay socket in place of the coil and connect the voltmeter as follows:
  Positive terminal on **+ 12 V** battery
  Battery negative terminal on **track 2** of relay socket "**R8**".
– Delete the fault.
– Begin command **AC302**.
If the voltmeter does not display the battery voltage (two sequences of 1 second), replace the computer.
If necessary, modify the configuration of the new computer to match the equipment options present on the vehicle.
If the voltmeter does display the battery voltage (two sequences of 1 second), replace relay "**R8**".

If relay "R8" activates, but there is still a passenger compartment heating or demisting fault, use the wiring diagram to check:
– the conformance of fuse "**F01**" (70A);
– the presence of **+ 12 V battery** on **track 3** of relay socket "**R8**",
– the conformance of relay "**R8**";
– the continuity between **track 5** of relay socket "**R8**" and the supply terminals of thermoplungers **2 and 3**,
– the conformity of the thermoplunger resistors: **0.45** Ω ± **0.05 at 20°C**,
– the presence of earth at the plenum chamber (thermoplunger mounting).
Also check the level of the cooling circuit and that there are no leaks.
Carry out the necessary repairs.

AFTER REPAIR	Repeat the conformity check.

AC002	THERMOPLUNGER No. 3 RELAY

NOTES	**No faults should be present or stored.** Perform this fault finding procedure in the event of the function not working properly, indicated in the command menu or in the event of a passenger compartment heating or demisting fault.

If relay "R1" is not activated when command **AC002** is executed:
Check the connectors of additional heater No. 3 relay socket "**R1**".
Check the connectors on the engine management computer.
Repair if necessary.
If the problem persists, check that relay "**R1**" is operated by the engine management computer as follows:
– Disconnect relay "**R1**", put a **50** to **100** Ω resistor on the relay socket in place of the coil and connect the voltmeter as follows:
  Positive terminal on **+ 12 V** battery
  Negative terminal on **track 2** of relay socket "**R1**"
– Clear the fault.
– Run command **AC002**.
If the voltmeter does not display the battery voltage (two sequences of 1 second), replace the computer.
If necessary, modify the configuration of the new computer to match the equipment options present on the vehicle.
If the voltmeter does display the battery voltage (two sequences of 1 second), replace relay "**R1**".

If relay "R1" activates, but there is still a passenger compartment heating or demisting fault, use the wiring diagram to check:
– the conformance of fuse "**F01**" (70A);
– the presence of + **12 V battery** on **track 3** of relay socket "**R1**",
– the conformance of relay "**R1**";
– the continuity between **track 5** of relay socket "**R1**" and the supply lug of thermoplunger **4**;
– the conformity of the thermoplunger resistance: **0.45** Ω ± **0.05 at 20°C**.
– the presence of earth at the plenum chamber (thermoplunger mounting).
Also check the level of the cooling circuit and that there are no leaks.
Carry out the necessary repairs.

AFTER REPAIR	Repeat the conformity check.

NOTES	Before carrying out the steps associated with customer complaints, check for the absence of faults and the conformity (or otherwise) of the parameters and states, using the diagnostic tool. If the customer complaint is not eliminated, then proceed according to the corresponding fault finding chart.

CHART 1	No communication with the engine management computer

Check the conformity of the vehicle type and the domain selected on your tool.
Make sure that the tool is not faulty by trying to establish dialogue with a computer on another vehicle.
In the **engine fuse and relay box**, check the correctness of:
→ fuses **F2** and **F4**,
→ the injection computer supply relay, marked "**R2**":

- **65** Ω ± **5** Ω ⟶ between **tracks 1** and **2**
- infinite resistance ⟶ between **tracks 3** and **5** (contact open)
- resistance < **0.3** Ω ⟶ between **tracks 3** and **5** (contact closed)

Check the conformity of the impact sensor (inertia sensor) at rest (before impact): continuity between **tracks 1 and 3**.
Place bornier **Ele 1613** on the engine harness on the computer side, and verify conformance of the power supplies:

- Engine management computer, **connector B track E3** ⟶ **+ After ignition**
- Engine management computer, **connector B tracks L3**, **L4** and **M4** ⟶ **Earth**

by shunting tracks 3 and 5 of relay socket "**R2**":

- Engine management computer, **connector B tracks M3** and **M2** ⟶ **+ Battery** (after relay)

Ensure continuity of the connection between:

- Engine management computer, **connector B track D4** ⟶ **Track 2** relay socket "**R2**"

Check the supply to the diagnostic socket:
→ + before ignition on **track 16** / + after ignition on **track 1** / earth on **tracks 4** and **5**
Ensure the continuity of the following connection:

- Engine management computer, connector **A track C3** ⟶ Diagnostic socket **track 7** (line **K)**

If the tool is not faulty, try to communicate with another computer on the same vehicle.
➨ If you cannot communicate with another computer on the same vehicle, it may be that a faulty computer is causing interference on line **K**. To locate it, proceed by elimination by successively disconnecting the following computers (depending on the equipment): air conditioning, air bag, ESP and ABS, UCH, instrument panel, central communication unit, proximity sensor. Try to make communication between each disconnection.

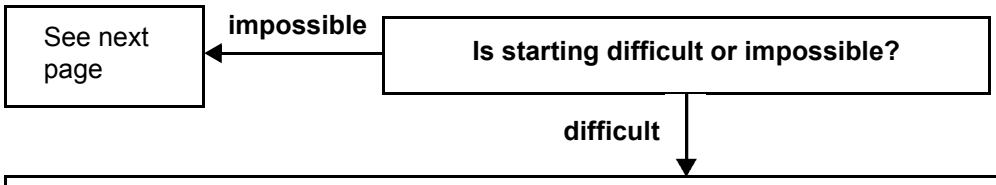
→ If you still can't enter into communication, disconnect all the above-mentioned computers, as well as the engine management computer, and check insulation against **+ 12 V** and against earth of **track 7** of the **diagnostic socket**.

➨ If you can enter into communication with another computer on the same vehicle: replace the engine management computer. If necessary, modify the configuration of the new computer to match the equipment options present on the vehicle.

AFTER REPAIR	Perform a road test followed by a check with the diagnostic tool.

CHART 2	Starting problems (no starting or difficulty starting the engine)

NOTES	Before analysing this customer complaint, check for absence of faults, and conformity (or otherwise) of parameters and statuses, using the diagnostic tool. If the customer complaint is not resolved, perform the following checks:



Check the engine earths.
Make sure the engine speed reaches **250 rpm** when the starter motor is operated, displayed in the parameter screen.
Ensure that the correct fuel is being used.
Check that the low pressure diesel circuit is primed (presence of air bubbles upstream of the pump; if there are numerous such bubbles, look for the air leak).
Check the supercharging pressure at the high-pressure pump inlet, namely: **0.2 to 0.5 bar**.
Check operation of pre-heater plugs (absence of **DF061** fault).
Check condition of diesel fuel filter (measurement of the pump pressure upstream and downstream of the filter).
Ensure the tightness of the high-pressure circuit - pump, pipes, unions (visual check + odours).
Check the condition of the air filter (clogging).
Check the position of the exhaust gas recirculation valve (blockage, mechanical seizing, see interpretation of commands: **AC007**).
Check the consistency of the coolant temperature sensor signal (compare the value given by the tool with that given by a thermometer).
Ensure correct operation of the injectors (return leakage too high, clogging, sticking: see injector fault finding procedure).
Check compression values:

1: according to current consumption in the starting phase (Compression test menu on the CONSULT II tool).
2: in the event of unbalanced fuel consumption, use a compression meter to complete the measurements.

AFTER REPAIR	Perform a road test followed by a check with the diagnostic tool.

CHART 2	Starting impossible (or vehicle starts and stalls immediately)

NOTES	Before analysing this customer complaint, check for absence of faults, and conformity (or otherwise) of parameters and statuses, using the diagnostic tool. If the customer complaint is not resolved, perform the following checks:

From the "STATUS" menu on your diagnostic tool, verify the conformance of the immobiliser system: "**ET003**" should be "**inactive**", "**ET110**" should be "**YES**".

Correct → Refer to the immobiliser fault finding procedure.

Incorrect →

Check the position and conformance of the impact switch.
Check the presence of **12 Volts** after relay on **tracks M2** and **M3** of **connector B** on the engine management computer.
Check the battery charge as well as the condition and tightness of the terminals and the engine earth connections.
Check the engine fuses (+ mountings, wires and terminals).
Check the conformance of the main relay (+ mountings, wires and terminals).
Check the engine speed sensor mounting.
Check the absence of fault: **DF070**; camshaft sensor/engine speed consistency.
Make sure the engine speed reaches **250 rpm** when the starter motor is operated, displayed in the parameter screen.
Ensure the presence and conformity of fuel in the tank.

test →

Activate the starter motor:

Does the pressure rise normally in the rail?
high pressure ≅ 170 bar at approx. 250rpm

YES → Make sure of correct operation of the injectors (no internal leaks, gumming or jamming)
Check the engine compression.

NO →

Make sure the low-pressure diesel circuit is primed.
Check the condition of the fuel filter (measurement of the LP pump pressure upstream and downstream of the filter).
Check the leaktightness of the high-pressure circuit - pump, pipes, unions (visual checks + smells).
Ensure correct operation of the pressure sensor (interpretation of parameters: **PR083**)
Make sure that the pressure regulator is not jammed/seized.
Check the injectors (refer to the injector fault finding procedure in the **Help** section).

AFTER REPAIR	Perform a road test followed by a check with the diagnostic tool.

CHART 3	Injection noise

NOTES	Before analysing this customer complaint, check for absence of faults, and conformity (or otherwise) of parameters and statuses, using the diagnostic tool. If the customer complaint is not resolved, perform the following checks:

REMINDER: A just-audible knocking noise under low load conditions between **1800** and **2500 rpm** is a characteristic of the normal operating noise for this engine. No intervention is therefore recommended. This noise should disappear as the engine is revved up.

If occurring following cold-starting:

Ensure correct operation of the preheating function.
Check the consistency:
– of the fuel and engine temperatures; fault finding procedure **PR002** and **PR001**
– of the rail pressure signal; diagnostic **PR083**
If the fault persists, carry out an injector fault finding procedure.

If you hear the noises at idling speed:

Check the condition of the injector connectors and contact, and the pressure regulator.
Ensure the correct fuel is being used.
Check that there is no air in the low pressure fuel circuit.
Ensure supply to the fuel heater.
Check the condition of the air filter.
Check the position of the exhaust gas recirculation valve (interpretation of commands: **AC007**).
Check the consistency of the airflow signal.

If the fault persists, perform the fault finding procedure on the injectors, then the high pressure pump.

If occurring at all engine speeds,

Check the condition of the injector connectors and contacts, and the pressure regulator.
Ensure the correct fuel is being used.
Check the consistency and stability of the rail pressure signal (**PR083** fault finding procedure).

If occurring at transient engine speeds:

In road testing, when changing gear, view the **PR202** parameter; if the value varies, without having any major influence on the rail pressure, this may indicate seizure of the flow controller. In this case, refer to diagnostic **AC006**.

AFTER REPAIR	Perform a road test followed by a check with the diagnostic tool.

CHART 4	Poor performance

NOTES	Before analysing this customer complaint, check for absence of faults, and conformity (or otherwise) of parameters and statuses, using the diagnostic tool. If the customer complaint is not resolved, perform the following checks:

Is the poor performance accompanied by smoke?

If yes: check whether the wastegate or its solenoid valve are jammed in open position (use fault finding procedure **AC004**).

NO

Is the poor performance il accompanied by smoke at full load?

If yes: check whether the exhaust gas recirculation valve is jammed in open position. Use fault finding procedure **AC007.**

NO

Does the engine rotate on all cylinders?

If no: check the operation of the injectors (injector fault finding procedure **Help** section).

Check the conformity of the pedal sensor, atmospheric pressure sensor and exhaust gas recirculation valve.
Check the level of clogging of the air filter.
Make sure there are no foreign bodies on the grille of the flowmeter and in the air inlet section (e.g., detachment of the internal lining of a hose).
Check:

- the condition of the intercooler (clogging),
- the leaktightness of the admission circuit between flowmeter and turbocharger,
- the tightness of the oil vapour rebreathing circuit,
- the flow regulator (jamming or seizing; use fault finding procedure **AC006**),
- the wastegate and its solenoid valve (jamming or seizing),
- the absence of leaks in the low pressure and high pressure diesel circuit,
- the turbocharger efficiency.

– Check consistency of the following signals: flowmeter, coolant temperature sensor, turbocharger pressure sensor, fuel-temperature sensor.
– Check the engine compression.
– Make sure there is no back-pressure at the exhaust.

AFTER REPAIR	Perform a road test followed by a check with the diagnostic tool.

CHART 5	Irregular engine operation

NOTES	Before analysing this customer complaint, check for absence of faults, and conformity (or otherwise) of parameters and statuses, using the diagnostic tool. If the customer complaint is not resolved, perform the following checks:

If, when changing gears, the vehicle jerks or builds up engine speed (with loss of engine braking), check conformance of the clutch sensor and if need be carry out the **DF097** procedure: Step 1.
Ensure that the correct fuel is being used.
– Make sure the low-pressure circuit is primed (no air in the circuit).
– Check conformance of rail pressures: **250 bar** at idling speed and **1350 bar** under load with foot hard down on the accelerator.
– Check conformity of the air flow: **30 to 36 kg/h** air flow at **800 rpm**,
390 kg/h under load at full load.

If this is not the case, check the leaktightness of the inlet circuit and ensure that there are no foreign bodies on the flowmeter grille.
Check the operation of the turbocharging function (refer to **AC004**).
– Check the injectors: with engine running at idling speed, disconnect the injectors one after the other:
If disconnecting one of the injectors does not cause a change in operation, it indicates a fault (electrical or mechanical). After eliminating the connections as the possible cause of the fault, replace the faulty injector.
Clear the faults caused by the multiple disconnections, then perform a conformity check.
Check the engine compression values.

AFTER REPAIR	Perform a road test followed by a check with the diagnostic tool.

INJECTOR FAULT FINDING PROCEDURE

STAGE no. 1: check for electrical conformity

If you perform this fault finding procedure following an unresolved fault (**DF099** to **DF102**), go directly to step **2**. Otherwise, carry out the following checks:

– Resistance between **tracks 1 and 2** of each injector: **0.33** Ω **at 20°C /2** Ω max.
– Continuity, absence of interference resistance and insulation on the following connections:

Engine management computer, **connector C track M1** → **Track 2** of **of injector no. 1** connector

Engine management computer, **connector C track M3** → **Track 1** of **injector no. 1** connector

Engine management computer, **connector C track L4** → **Track 2** of **injector no. 2** connector

Engine management computer, **connector C track L3** → **Track 1** of **injector no. 2** connector

Engine management computer, **connector C track M2** → **Track 2** of the connector for **injector no. 3**

Engine management computer, **connector C track L2** → **Track 1** of the connector for **injector no. 3**

Engine management computer, **connector C track L1** → **Track 2** of the **injector no. 4** connector,

Engine management computer, **connector C track M4** → **Track 1** of the **injector no. 4** connector

STAGE no. 2: check the balance of the injector return flow

From the "parameters" menu of your diagnostic tool, check conformance of the fuel pressure at 800 rpm, at approx. 2000 rpm, then after switching off the engine. Failure of one or more injectors can result in either an **overpressure** or an **underpressure** in the rail:

Fit tappings on the injector returns towards the measuring cylinders, start the engine and check the flow balance, first at 800 rpm then at ˜ 2000 rpm:

In the event of overpressure in the rail:

Replace the injector for which the return indicates no leak or a smaller leak than for the other returns,

In the event of under-pressure in the rail:

Replace the injector whose return shows a stronger leak than the others.

The gradual fall in pressure in the rail, when the engine is switched off, is obtained by discharge of the high pressure towards the injector return circuits (about 2 minutes to fall below 2 bar). It is therefore possible to carry out the same procedure for checking flow balance after the engine has been switched off, or, better still, after timing (obtaining a high rail pressure, with the engine stopped, due to a sudden engine switch-off).

STAGE °2: check on leaktightness of the injector nozzle

If the engine starts:

With the engine running, disconnect the injectors one after the other.
Replace the injector which causes no variation in operation when it is disconnected. (this also applies to blocked closed injectors). Clear the faults that are caused by these multiple disconnections, and then road test the vehicle to confirm repair.

If the engine does not start:

Check the level and condition of the engine oil (contamination by diesel oil).
If the preceding check indicates pollution, remove the injectors to pinpoint which one is leaking. (If one of the four nozzles is wet and the other three are dry, the injector with the wet nozzle is leaking). Replace the faulty injector.

For removal of injectors, refer to the method defined in the Workshop Repair Manual, **Section 13**.

F9Q 760 and 762 engine speed (60 and 74 kW):

Idling, warm engine	800 rpm
Idling + heated windscreen	1000 rpm
Idling + thermoplungers	825 rpm
Fast idling in the event of accelerator pedal sensor failure:	1200 rpm
Maximum engine speed, no load	3000 rpm

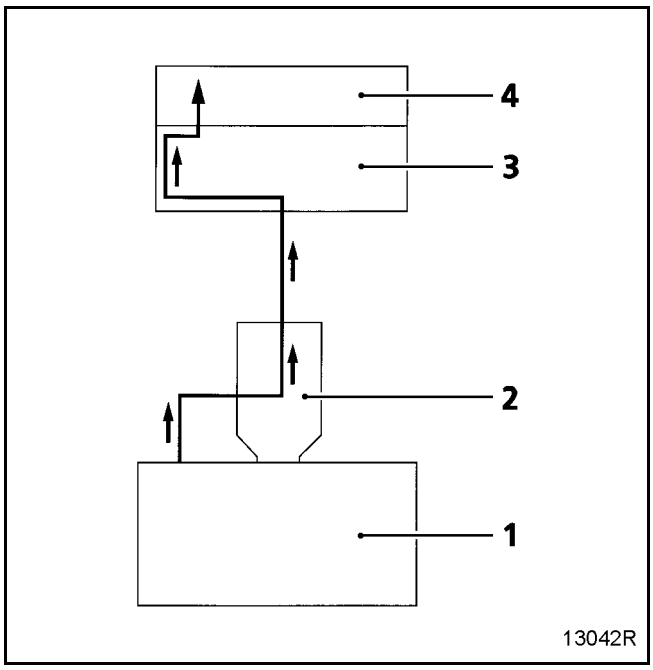
High pressure pump	CP3 from 275 to 1350 bar
Boosting pump	2.5 bar max. / flow rate 80 to 100 litres/h. minimum
Anti-return valve and low pressure controller	Calibration: from 0.2 to 0.5 bar
Pressure sensor	screwed on rail
Injector	0.33 Ω at 20°C / 2 Ω max
Flow regulator (on high-pressure pump)	R = 5 Ω at 20°C (not removable)
Injection computer	128 tracks
Accelerator pedal sensor	R track 1 = 1200 Ω ± 480 R track 2 = 1700 Ω ± 680
Heater plug	R = 0.6 Ω (consumption at start of preheating 20A)
Air temperature sensor	R = 3714 Ω ± 161 at 10°C / 2448 Ω ± 90 at 20°C / 1671 Ω ± 59 at 30°C
Diesel oil temperature sensor	R = 3820 Ω ± 282 at 10°C / 2050 Ω ± 100 at 25°C / 810 Ω ± 47 at 50°C
Engine coolant temperature sensor	R = 2252 Ω ± 112 at 25°C / 811 Ω ± 39 at 50°C / 283 Ω ± 8 at 80°C
Engine speed sensor	R = 800 Ω ± 80 at 20°C
Camshaft sensor	Hall-effect sensor
Turbocharger pressure sensor	Power supply 5 ± 0.25 V / pressure from 0 to 2.5 bar.
Wastegate control solenoid valve	R = 16.5 Ω ± 1 to 25°C

Air flowmeter	Track 1: air temperature signal	Track 4: + 12 V battery
	Track 2: - flowmeter	Track 5: air flow signal
	Track 3: + 5 V flowmeter	Track 6: Earth

Exhaust gas recirculation valve	R between tracks 1 and 5 (coil): = 8 Ω ± 0.5 at 20°C
Thermoplungers	R = 0.45 Ω ± 0.05 at 20°C

(R = resistance)

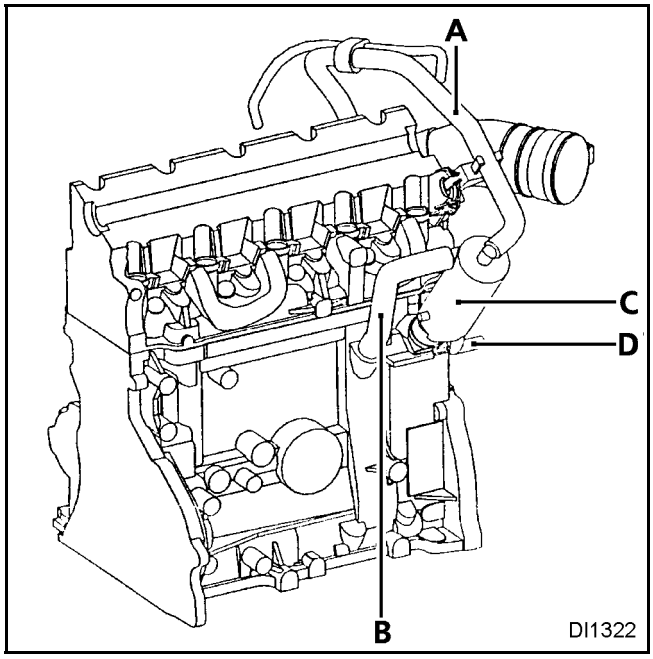
CIRCUIT DIAGRAM



1 Engine
2 Oil decanter
3 Air filter unit
4 Inlet manifold

INSPECTION

To ensure the correct operation of the anti-pollution system, the oil vapour rebreathing circuit must be kept clean and in good condition.



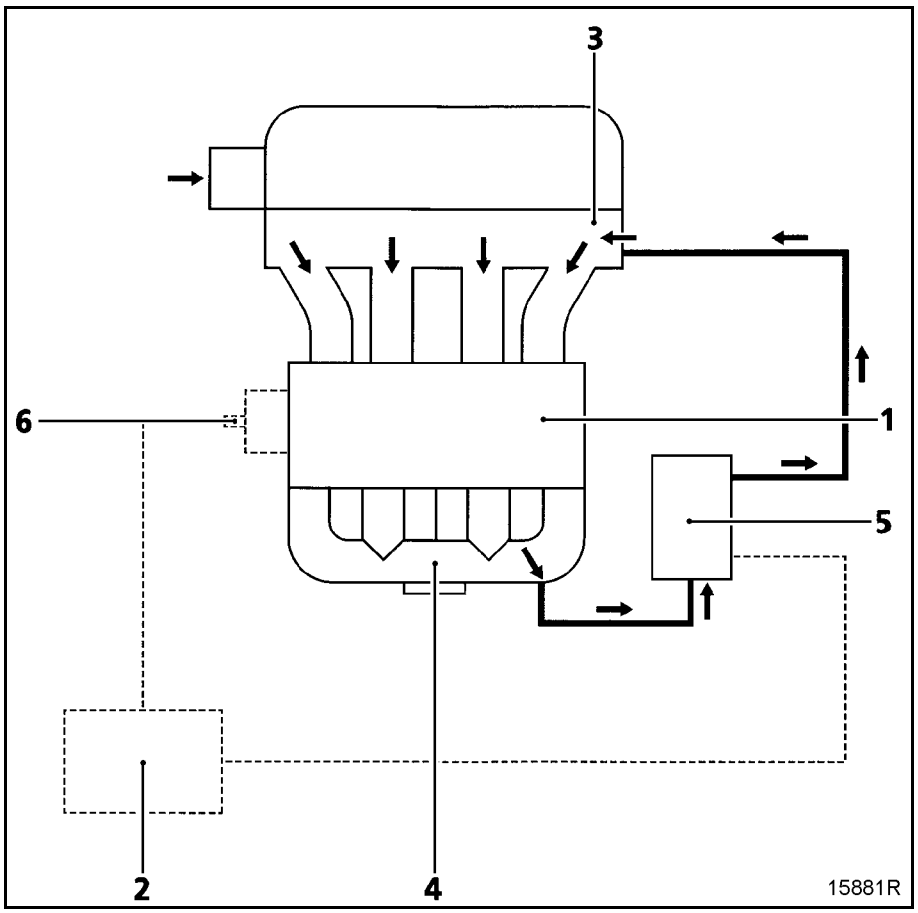
A Oil vapour rebreathing pipe for the bottom of engine

B Oil vapour rebreathing pipe for the top of engine.

C Oil decanter.

D Oil vapour rebreathing pipe linked to the inlet pipes.

CIRCUIT DIAGRAM



1 Engine
2 Injection computer
3 Inlet manifold
4 Exhaust manifold
5 Exhaust gas recirculation solenoid valve
6 Coolant temperature sensor

REMOVING THE VALVE

The exhaust gas recirculation valve is an interference fit with the inlet manifold.

To make it easier to replace, it is preferable to remove the manifolds.

AIM OF THE EXHAUST GAS RECIRCULATION CIRCUIT

Exhaust gas recirculation is used to reduce the nitrogen oxide (NOx) content of the exhaust gases.

The injection computer allows gas to pass by controlling a solenoid valve.

OPERATING PRINCIPLE

The valve is controlled by an Opening Cyclic Ratio (OCR) signal emitted by the injection computer. The **Opening Cyclic Ratio signal** adjusts the opening of the valve and consequently the quantity of exhaust gas directed back to the inlet manifold.

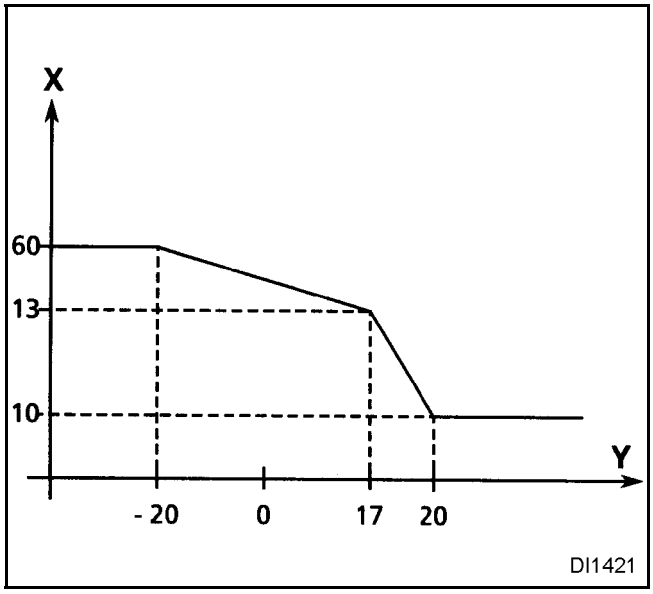
OPERATING CONDITIONS

The parameters controlling activation of the exhaust gas recirculation solenoid valve are the following:
– coolant temperature,
– air temperature,
– atmospheric pressure,
– accelerator pedal position,
– engine speed,
– air flow,
– injection flow rate,
– turbocharging pressure.

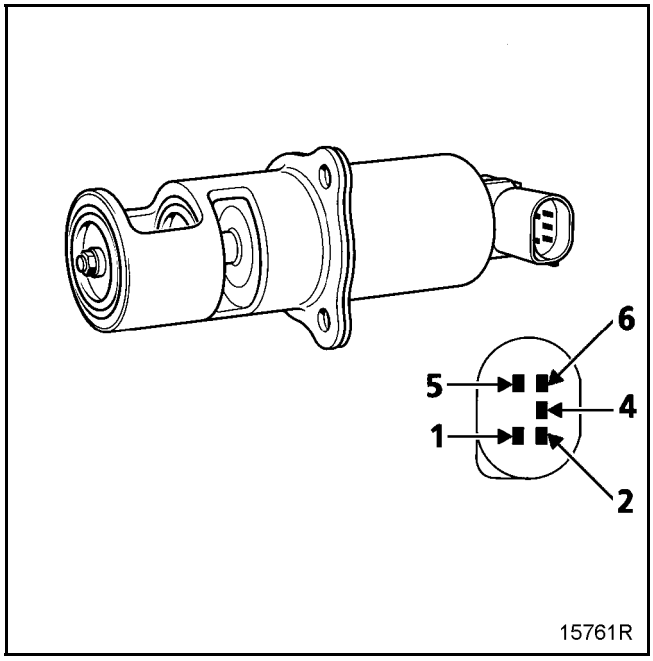
Exhaust gas recirculation is cut off if:
– the battery voltage is below **9 V**,
– engine speed is below **600 rpm**.
– engine speed is greater than **3000 rpm**.
– mapping (engine speed/load) exceeds a given threshold,
– vehicle speed is less than **7.5 mph (12 kph)**, and engine speed is less than **1000 rpm**
– after running for **18 minutes** if the air temperature stays between **10 °C** and **30 °C**.

The **exhaust gas recirculation valve** is not controlled after engine start-up depending on coolant temperature mapping.

X Time
Y Coolant temperature (°**C**)



If there is a fault in:
– the coolant temperature sensor,
– the air temperature sensor,
– the atmospheric pressure sensor,
the **exhaust gas recirculation** solenoid valve is fed for **40 seconds** on each return to idle speed if the air temperature is greater than **15 °C**.



1 Solenoid feed
2 Sensor feed
4 Sensor earth
5 Solenoid earth
6 Sensor output

GENERAL APPROACH TO FAULT FINDING

To carry out a fault finding test on the SAGEM 2000 Vdiag 08 injection system, the following elements are required:

- **The wiring diagram of the function on the vehicle concerned.**
- **Consult II diagnostic tools.**
- **Multimeter.**
- **Test bornier Elé. 1590.**

1 Use one of the diagnostic tools to identify the system fitted on the vehicle (reading the computer family - SAGEM 2000 Vdiag 08).

NOTE:
If dialogue cannot be established with the computer, go straight to the Customer complaints section and refer to **FAULT FINDING CHART 1** No dialogue with the computer.

2 Locate the Fault finding documents corresponding to the system identified.

3 Read the faults stored in the computer memory and use the Fault interpretation section of the documents.

Reminder: *the interpretation of a fault should be considered when using the diagnostic tool after the engine has been switched off and on again.*
There are two types of fault interpretation, faults present and faults stored in memory.
– If the fault is declared "Present":
run the diagnostic directly.
– If the fault is declared "Stored":
follow the notes for application to a stored fault.
If the fault is not returned as "present", run the diagnostic but do not replace components.
In both cases, complete the fault finding procedure by performing the "After repair" section.

4 Performance of the conformance check *(appearance of possible malfunctions not yet declared by the system's self diagnosis procedure)* and application of the relevant fault finding techniques according to results.

5 Validation of the repair (elimination of the sections on "Customer complaints" and "Fault finding chart").

6 Use of the sections on "Customer complaints" and "Fault finding chart", if the problem persists.

IMPORTANT

Do not drive the vehicle until you have checked that the computer is clear of any fault relating to the throttle unit.

CHARACTERISTICS OF THE BORNIER

The Elé. 1590 bornier comprises a 112-track base fixed to a printed circuit carrying 112 coppered areas numbered from 1 to 112.

Using the wiring diagrams, it is easy to identify connections or other parts needing to be checked.

IMPORTANT

- **Any checks using bornier Elé. 1590 should only be performed with the battery disconnected.**
- **The bornier is only designed to operate with an ohmmeter. Under no circumstances should 12 V be applied to the test points.**

DF002 PRESENT OR STORED	THROTTLE POTENTIOMETER CIRCUIT DEF : Unidentified electrical fault

NOTES	**IMPORTANT:** **Do not drive the vehicle until you have checked that the computer is clear of any fault relating to the throttle unit.**
	If faults DF125 and DF126 are present, deal with these as a priority. **Conditions for applying the fault finding procedure to stored faults:** The fault is declared present after: – a change in engine speed.

Check **the cleanliness, connection and condition** of the connections on the throttle potentiometer.
Replace the connectors if necessary.

Disconnect the battery.
Disconnect the computer. Check **the cleanliness and condition** of the connectors.
Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connections:

Computer track G4, connector B → Throttle position potentiometer
Computer track G3, connector B → Throttle position potentiometer
Computer track G2, connector B → Throttle position potentiometer
Computer track D3, connector B → Throttle position potentiometer

(See the connector track numbers in the corresponding wiring diagram)
Repair if necessary.

Check **the cleanliness** of the throttle, and **correct rotation** of the throttle valve.
Check that tracks 1 and 2 of the throttle potentiometer **correctly follow their curves of resistance** (see values in the **Help** section).
Repair or replace the throttle unit if necessary.

If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

AFTER REPAIR	**If the throttle unit has been replaced, reinitialise the programming (RZ008).** Follow the instructions to confirm repair: – If the fault is present, continue to deal with the fault. – If the fault is stored in memory, ignore it. Deal with any other possible faults. Clear the fault memory.

DF003 PRESENT OR STORED	AIR TEMPERATURE SENSOR CIRCUIT DEF : Unidentified electrical fault OBD : OBD (On Board Diagnostic) fault

NOTES	**Conditions for applying the fault finding procedure to stored faults:** The fault is declared present after: – Tripping of the fan with the engine running

DEF	Check **the cleanliness, connection and condition** of the sensor and the connector. Replace the connectors if necessary.
	Disconnect the battery. Disconnect the computer. Check **the cleanliness and condition** of the connectors. Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connections: **Computer track E3, connector B ⟶ Air temperature sensor** **Computer track E2, connector B ⟶ Air temperature sensor** (See the connector track numbers in the corresponding wiring diagram) Repair if necessary.
	Check **the resistance** of the air temperature sensor (see the values in the **Help**section). If necessary replace the sensor.
	If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

AFTER REPAIR	If the fault had been characterised as "DEF", it may change characterisation and become "OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "DEF", continue to process the fault. – If the fault is stored and characterised as "DEF", ignore it. – If the fault is present or stored and characterised as "OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF003 **CONTINUED**	

OBD	***NOTES***	Run the engine until the fan begins to run.

If the fault's characterisation has become DEF after the instructions have been followed, the electrical fault has been detected. Accordingly, it should be dealt with as a fault present and characterised as DEF.
If the fault is still characterised as "OBD" after the instructions have been followed, the electrical fault has been present several times but is no longer detected. Accordingly, the circuit must be checked without changing parts which are not clearly identified as at fault.
This check should be based on the fault finding procedure for the "DEF" characterisation.

AFTER REPAIR	If the fault had been characterised as "DEF", it may change characterisation and become "OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "DEF", continue to process the fault. – If the fault is stored and characterised as "DEF", ignore it. – If the fault is present or stored and characterised as "OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF004 PRESENT OR STORED	COOLANT TEMPERATURE SENSOR CIRCUIT DEF : Unidentified electrical fault OBD : OBD (On Board Diagnostic) fault

NOTES	**Conditions for applying the fault finding procedure to stored faults:** The fault is declared present after: – Tripping of the fan with the engine running

DEF	Check **the cleanliness, connection and condition** of the sensor and the connector. Replace the connectors if necessary.
	Disconnect the battery. Disconnect the computer. Check **the cleanliness and condition** of the connectors. Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connections: **Computer track F2, connector B ⟶ Coolant temperature sensor** **Computer track F4, connector B ⟶ Coolant temperature sensor** (See the connector track numbers in the corresponding wiring diagram) Repair if necessary.
	Check **the resistance** of the air temperature sensor (see the values in the **Help**section). If necessary replace the sensor.
	If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

AFTER REPAIR	If the fault had been characterised as "DEF", it may change characterisation and become "OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "DEF", continue to process the fault. – If the fault is stored and characterised as "DEF", ignore it. – If the fault is present or stored and characterised as "OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF004 **CONTINUED**	

OBD	***NOTES***	Run the engine until the fan begins to run.

If the fault's characterisation has become DEF after the instructions have been followed, the electrical fault has been detected. Accordingly, it should be dealt with as a fault present and characterised as DEF.
If the fault is still characterised as "OBD" after the instructions have been followed, the electrical fault has been present several times but is no longer detected.
Accordingly, the circuit must be checked without changing parts which are not clearly identified as at fault.
This check should be based on the fault finding procedure for the "DEF" characterisation.

AFTER REPAIR	If the fault had been characterised as "DEF", it may change characterisation and become "OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "DEF", continue to process the fault. – If the fault is stored and characterised as "DEF", ignore it. – If the fault is present or stored and characterised as "OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF005 PRESENT OR STORED	PRESSURE SENSOR CIRCUIT DEF : Unidentified electrical fault OBD : OBD (On Board Diagnostic) fault

NOTES	**Conditions for applying the fault finding procedure to stored faults:** The fault is declared present after: – the ignition is switched off and dialogue is lost; – the ignition has been switched on again and dialogue re-established, – **10 seconds** at idle speed.

DEF	Check that the manifold pressure sensor is properly fitted Check that the inlet line is tight, from the throttle to the cylinder. Verify that no seals are defective. Check that the fuel vapour absorber bleed is not disconnected or jammed open. Verify that the manifold air temperature sensor is properly fitted. Check that the resonator is not cracked.
	Check **the cleanliness, connection and condition** of the sensor and its connection. Replace as necessary.
	Using a vacuum pump, check the **consistency of the manifold pressure**. Check **consistency** with parameter **PR001** in the diagnostic tool. If necessary replace the sensor.
	Disconnect the battery. Disconnect the computer. Check **the cleanliness and condition** of the connectors. Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connections: **Computer track H2, connector B ⟶ Pressure sensor** **Computer track H3, connector B ⟶ Pressure sensor** **Computer track H4, connector B ⟶ Pressure sensor** (See the connector track numbers in the corresponding wiring diagram) Repair if necessary.
	If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

AFTER REPAIR	If the fault had been characterised as "DEF", it may change characterisation and become "OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "DEF", continue to process the fault. – If the fault is stored and characterised as "DEF", ignore it. – If the fault is present or stored and characterised as "OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF005 **CONTINUED**	

OBD	***NOTES***	Run the engine until the fan begins to run.

If the fault's characterisation has become DEF after the instructions have been followed, the electrical fault has been detected. Accordingly, it should be dealt with as a fault present and characterised as DEF.
If the fault is still characterised as "OBD" after the instructions have been followed, the electrical fault has been present several times but is no longer detected. Accordingly, the circuit must be checked without changing parts which are not clearly identified as at fault.
This check should be based on the fault finding procedure for the "DEF" characterisation.

AFTER REPAIR	If the fault had been characterised as "DEF", it may change characterisation and become "OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "DEF", continue to process the fault. – If the fault is stored and characterised as "DEF", ignore it. – If the fault is present or stored and characterised as "OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF006 PRESENT OR STORED	PINKING SENSOR CIRCUIT DEF : Unidentified electrical fault OBD : OBD (On Board Diagnostic) fault

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

DEF	Check **the conformity** of the fuel in the fuel tank.
	Check the **conformity** of the spark plugs.
	Check that the pinking sensor is **tightened**.
	Check **the cleanliness, connection and condition** of the sensor and the connector. Replace as necessary.
	Disconnect the battery. Disconnect the computer. Check **the cleanliness and condition** of the connectors. Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connections: **Computer track A2 connector B ⟶ Pinking sensor** **Computer track B2 connector B ⟶ Pinking sensor** **Computer track C2 connector B ⟶ Pinking sensor screening** (See the connector track numbers in the corresponding wiring diagram) Repair if necessary.
	If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

AFTER REPAIR	If the fault had been characterised as "DEF", it may change characterisation and become "OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "DEF", continue to process the fault. – If the fault is stored and characterised as "DEF", ignore it. – If the fault is present or stored and characterised as "OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF006 **CONTINUED**	

OBD	***NOTES***	Run the engine until the fan begins to run.

If the fault's characterisation has become DEF after the instructions have been followed, the electrical fault has been detected. Accordingly, it should be dealt with as a fault present and characterised as DEF.
If the fault is still characterised as "OBD" after the instructions have been followed, the electrical fault has been present several times but is no longer detected. Accordingly, the circuit must be checked without changing parts which are not clearly identified as at fault.
This check should be based on the fault finding procedure for the "DEF" characterisation.

AFTER REPAIR	If the fault had been characterised as "DEF", it may change characterisation and become "OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "DEF", continue to process the fault. – If the fault is stored and characterised as "DEF", ignore it. – If the fault is present or stored and characterised as "OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF008 PRESENT OR STORED	FUEL PUMP CONTROL RELAY CIRCUIT CO.0 : Open circuit or short circuit to earth CC.1 : Short circuit to +12 V DEF : Unidentified electrical fault OBD : OBD (On Board Diagnostic) fault

NOTES	**Conditions for applying the fault finding procedure to stored faults:** The fault is declared present after: – the ignition is switched on.

CO.0 CC.1 DEF	Check **the supply fuse** of the fuel pump relay. Replace the fuse if necessary.
	Check the **cleanliness, connection and condition** of the petrol pump relay connector. Replace the connector if necessary.
	Disconnect the relay. Check **the condition and cleanliness** of the contacts. With the ignition on, check for the presence of **+12 V on track 1** of the fuel pump relay, connector side. Repair if necessary.
	Check **the resistance** of the fuel pump relay on **tracks 1 and 2** (see the value in the **Help** section). Replace the fuel pump relay if necessary.
	Disconnect the battery. Disconnect the computer. Check **the cleanliness and condition** of the connectors. Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connection: **Computer track D1 connector C** ⟶ **Fuel pump relay** (See the connector track numbers in the corresponding wiring diagram) Repair if necessary.
	If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

AFTER REPAIR	If the fault had been characterised as "CO.0, CC.1 or DEF", the fault may change characterisation and become "OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "CO.0, CC.1 or DEF", continue to deal with the fault. – If the fault is stored and characterised as "CO.0, CC.1 or DEF", ignore it. – If the fault is present or stored and characterised as "OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF008 **CONTINUED**	

OBD	***NOTES***	Run the engine until the fan begins to run.

If, after following the instructions, the characterisation has become "CO.0, CC.1 or DEF", the electrical fault is detected. Accordingly, it should be dealt with as a present fault and characterised as "CO.0, CC.1 or DEF"
If the fault is still characterised as "OBD" after the instructions have been followed, the electrical fault has been present several times but is no longer detected.
Accordingly, the circuit must be checked without changing parts which are not clearly identified as at fault.
This check should be based on the fault finding of the characterisations "CO.0, CC.1 or DEF".

AFTER REPAIR	If the fault had been characterised as "CO.0, CC.1 or DEF", the fault may change characterisation and become "OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "CO.0, CC.1 or DEF", continue to deal with the fault. – If the fault is stored and characterised as "CO.0, CC.1 or DEF", ignore it. – If the fault is present or stored and characterised as "OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF009 PRESENT OR STORED	ACTUATOR RELAY CONTROL CIRCUIT DEF : Unidentified electrical fault

NOTES	**Conditions for applying the fault finding procedure to stored faults:** The fault is declared present after: – the ignition is switched on.

Check the **condition and cleanliness** of the vehicle's battery and earth leads. Repair if necessary.
Check **the two supply fuses** of the actuator relays. Replace if necessary.
Check **the cleanliness, connection and condition** of the actuator relay connector. Replace the connector if necessary.
Check **the resistance** of the actuator relay across **tracks 1 and 2**. (See the value in the **Help** section). Replace the actuator relay, if necessary.
Check for **the presence of 12 V on track 1** of the actuator relay, connector side. Repair if necessary.
Disconnect the battery. Disconnect the computer. Check **the cleanliness and condition** of the connectors. Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connection: **Injection computer track D4, connector B** ⟶ **Actuator relay**. (See the connector track numbers in the corresponding wiring diagram) Repair if necessary.
If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

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

DF010 **PRESENT**	LOW-SPEED FAN ASSEMBLY CIRCUIT CO.0 : Open circuit or short circuit to earth CC.1 : Short circuit to +12 V DEF : Unidentified electrical fault

NOTES	***Deal with fault DF004 first if it is present.***

Check the cleanliness, connection and condition **of the low-speed fan assembly relay connector**.
Replace the connector if necessary.

With the ignition on, check for the presence of **+ 12 V on track 1** of the relay.
Repair if necessary.

Check **the resistance** of the low-speed fan assembly relay on **tracks 1 and 2** (see the value in the **Help** section).
Replace the low-speed fan assembly relay if necessary.

Disconnect the battery.
Disconnect the computer. Check **the cleanliness and condition** of the connectors.
Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connection:

Computer track F1, connector C ⟶ **Low-speed fan relay**

(See the connector track numbers in the corresponding wiring diagram)
Repair if necessary.

If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

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

DF011 PRESENT OR STORED	FAULT WARNING LIGHT CIRCUIT CO.0 : Open circuit or short circuit to earth CC.1 : Short circuit to +12 V DEF : Unidentified electrical fault

NOTES	**None.**

Test the multiplex network.

Refer to the "Multiplex Network" and "Instrument Panel" sections of the Workshop Repair Manual.

Perform fault finding on the "Instrument panel" system if necessary.

AFTER REPAIR	None.

DF014 PRESENT OR STORED	CANISTER BLEED SOLENOID VALVE CIRCUIT CO.0 : Open circuit or short circuit to earth CC.1 : Short circuit to +12 V DEF : Unidentified electrical fault OBD : OBD (On Board Diagnostic) fault

NOTES	***Deal with faults DF009 or DF019 first if they are present.*** **Conditions for applying the fault finding procedure to stored faults:** The fault is declared present after: – the ignition is switched on.

CO.0 CC.1 DEF	Check the **cleanliness, connection and condition** of the fuel vapour absorber bleed solenoid valve connector. Replace the connector if necessary.
	With the ignition on, check for the presence of **+ 12 V** on the fuel vapour absorber bleed solenoid valve. Repair if necessary.
	Disconnect the battery. Disconnect the computer. Check **the cleanliness and condition** of the connectors. Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connection: **Computer track E1, connector C ⟶ Fuel vapour absorber bleed valve** (See the connector track numbers in the corresponding wiring diagram) Repair if necessary.
	Check the **resistance** of the fuel vapour absorber bleed solenoid valve (see value in the **Help** section). Replace the solenoid valve, if necessary.
	If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

AFTER REPAIR	If the fault had been characterised as "CO.0, CC.1 or DEF", the fault may change characterisation and become "OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "CO.0, CC.1 or DEF", continue to deal with the fault. – If the fault is stored and characterised as "CO.0, CC.1 or DEF", ignore it. – If the fault is present or stored and characterised as "OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF014 **CONTINUED**	

OBD	***NOTES***	Run the engine until the fan begins to run.

If, after following the instructions, the characterisation has become "CO.0, CC.1 or DEF", the electrical fault is detected. Accordingly, it should be dealt with as a present fault and characterised as "CO.0, CC.1 or DEF"
If the fault is still characterised as "OBD" after the instructions have been followed, the electrical fault has been present several times but is no longer detected.
Accordingly, the circuit must be checked without changing parts which are not clearly identified as at fault.
This check should be based on the fault finding of the characterisations "CO.0, CC.1 or DEF".

AFTER REPAIR	If the fault had been characterised as "CO.0, CC.1 or DEF", the fault may change characterisation and become "OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "CO.0, CC.1 or DEF", continue to deal with the fault. – If the fault is stored and characterised as "CO.0, CC.1 or DEF", ignore it. – If the fault is present or stored and characterised as "OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF017 PRESENT OR STORED	FLYWHEEL SIGNAL INFORMATION 1.DEF : Engine flywheel target fault 2.DEF : Absence of tooth signal 1.OBD : (On Board Diagnostic) OBD fault: engine flywheel target 2.OBD : OBD fault: absence of flywheel signal

NOTES	**The pressure sensor must not be faulty when performing this fault finding test.** **Conditions for applying the fault finding procedure to stored faults:** The fault is declared present after: – starter action for **10 seconds**, or – the engine has been running for **2 minutes**.

1.DEF ***2.DEF***	Check **the positioning** of the flywheel signal sensor.
	Check the **cleanliness, connection and condition** of the sensor, the cable and its connector. Replace as necessary.
	Disconnect the battery. Disconnect the computer. Check **the cleanliness and condition** of the connectors. Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connections: **Computer track E4, connector B ⟶ Flywheel signal sensor** **Computer track F3, connector B ⟶ Flywheel signal sensor** (See the connector track numbers in the corresponding wiring diagram) Repair if necessary.
	Check the **resistance of the flywheel signal sensor** (see the value in the **Help** section). If necessary replace the sensor.
	Check **the cleanliness and condition** of the engine flywheel.
	NOTE: If the target mounting has been altered, modify the programming.
	If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

AFTER REPAIR	If the fault had been characterised as "1.DEF or 2.DEF", the fault may change characterisation and become "1.OBD or 2.OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "1.DEF or 2.DEF", continue to deal with the fault. – If the fault is stored and characterised as "1.DEF or 2.DEF", ignore it. – If the fault is present or stored and characterised as "1.OBD or 2.OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF017 **CONTINUED**	

1.OBD ***2.OBD***	***NOTES***	Run the engine until the fan begins to run.

If, after following the instructions, the characterisation has become "1.DEF or 2.DEF", the electrical fault is detected. Accordingly, it should be dealt with as a present fault and characterised as "1.DEF or 2.DEF".
If the fault is still characterised as "1.OBD" or "2.OBD" after the instructions have been followed, the electrical fault has been present several times but is no longer detected.
Accordingly, the circuit must be checked without changing parts which are not clearly identified as at fault.
This check should be based on the fault finding of the characterisations "1 DEF" or "2.DEF".

AFTER REPAIR	If the fault had been characterised as "1.DEF or 2.DEF", the fault may change characterisation and become "1.OBD or 2.OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "1.DEF or 2.DEF", continue to deal with the fault. – If the fault is stored and characterised as "1.DEF or 2.DEF", ignore it. – If the fault is present or stored and characterised as "1.OBD or 2.OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF018 PRESENT OR STORED	UPSTREAM OXYGEN SENSOR HEATER CIRCUIT CO.0 : Open circuit or short circuit to earth CC.1 : Short circuit to +12 V 1.DEF : Unidentified electrical fault 2.DEF : Heating output of oxygen sensor defective 1.OBD : (On Board Diagnostic) OBD fault: upstream oxygen sensor heating output 2.OBD : OBD fault: upstream oxygen sensor heating output

NOTES	***If faults DF009 and DF019 are present, deal with them first.*** **Conditions for applying the fault finding procedure to stored faults:** The fault is declared present after: – running the engine for **10 seconds**.
CO.0 CC.1 1.DEF 2.DEF	Check **the cleanliness, connection and condition** of the upstream oxygen sensor connector. Replace the connector if necessary.
	With the ignition on, check for the presence of **+ 12 V on track A** of the upstream oxygen sensor connector. Repair if necessary.
	Disconnect the battery. Disconnect the computer. Check **the cleanliness and condition** of the connectors. Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connection: **Computer track G1, connector C ⟶ Upstream oxygen sensor** (See the connector track numbers in the corresponding wiring diagram) Repair if necessary.
	Check the heating **resistance** of the upstream oxygen sensor (see the value in the **Help** section). Replace the upstream oxygen sensor if necessary.
	If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

AFTER REPAIR	If the fault had been characterised as "CO.0, CC.1, 1.DEF or 2.DEF", the fault may change characterisation and become "1.OBD or 2.OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "CO.0, CC.1, 1.DEF or 2.DEF", continue to deal with the fault. – If the fault is stored and characterised as "CO.0, CC.1, 1.DEF or 2.DEF", ignore it. – If the fault is present or stored and characterised as "1.OBD or 2.OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF018 **CONTINUED**	

1.OBD ***2.OBD***	***NOTES***	Run the engine until the fan begins to run.

If, after following the instructions, the characterisation has become "CO.0, CC.1, 1.DEF or 2.DEF", the electrical fault is detected. It should therefore be dealt with as a present fault and characterised as "CO.0, CC.1, 1.DEF or 2.DEF".
If the fault is still characterised as "1.OBD" or "2.OBD" after the instructions have been followed, the electrical fault has been present several times but is no longer detected.
Accordingly, the circuit must be checked without changing parts which are not clearly identified as at fault.
This check should be based on the fault finding of the characterisations "CO.0, CC.1, 1.DEF or 2.DEF".

AFTER REPAIR	If the fault had been characterised as "CO.0, CC.1, 1.DEF or 2.DEF", the fault may change characterisation and become "1.OBD or 2.OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "CO.0, CC.1, 1.DEF or 2.DEF", continue to deal with the fault. – If the fault is stored and characterised as "CO.0, CC.1, 1.DEF or 2.DEF", ignore it. – If the fault is present or stored and characterised as "1.OBD or 2.OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF019 PRESENT OR STORED	SUPPLY 1.DEF : + 12 V after actuator relay electrical fault

NOTES	***Deal with fault DF009 first if it is present.*** **Conditions for applying the fault finding procedure to stored faults:** The fault is declared present after: – the ignition is switched off and dialogue is lost; – the ignition is switched on and dialogue is established.

Disconnect the actuator relay.
Check **the cleanliness, connection and condition** of the actuator relay connections.
Replace the connectors if necessary.

With the ignition on, check for **12 V on track 3** of the actuator relay.
If 12 V is not present, check the supply fuse (see the relevant section in the Workshop Repair Manual).
Check the insulation and continuity of the wire.

Check **the resistance** of the actuator relay across **tracks 1** and **2**. (See the value in the **Help** section).
Replace the relay if necessary.

Disconnect the battery.
Disconnect the computer. Check **the cleanliness and condition** of the connectors.
Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connection:

Computer track G2, connector C ⟶ Injection actuator relay

(See the connector track numbers in the corresponding wiring diagram)
Repair if necessary.

If that does not work, replace the actuator relay.

If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

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

DF021 PRESENT OR STORED	IMMOBILISER DEF : Unidentified electrical fault

NOTES	**None.**

Test the multiplex network.

Refer to the "Multiplex Network" and "Immobiliser" sections of the Workshop Repair Manual.

Perform fault finding on the "Immobiliser" system if necessary.

AFTER REPAIR	None.

DF022 **PRESENT**	COMPUTER 1.DEF : Computer fault 2.DEF : Computer fault: motorised throttle control 3.DEF : Backup memory area fault 4.DEF : Immobiliser memory area fault

NOTES	**None.**

1.DEF ***2.DEF***	Computer defective or not to specification. Replace the injection computer.

3.DEF ***4.DEF***	**Do not replace the injection computer immediately.** Carry out the following procedure: – Switch the ignition on and establish dialogue with the computer. – Clear the computer memory. – Switch the ignition off and wait for loss of dialogue with the computer. – Switch the ignition on and establish dialogue with the computer. If the computer fault is still present, carry out this procedure again. If the computer fault is still present after the fifth attempt at clearing, replace the injection computer.

AFTER REPAIR	Clear the fault memory.

DF030 **PRESENT**	HIGH-SPEED FAN ASSEMBLY CIRCUIT CO.0 : Open circuit or short circuit to earth CC.1 : Short circuit to + 12 V DEF : Unidentified electrical fault

NOTES	***Deal with fault DF004 first if it is present.***

Check **the cleanliness, connection and condition** of the high-speed fan assembly relay connector.
Replace the connector if necessary.

With the ignition on, check for the presence of **+ 12 V on track 1** of the relay.
Repair if necessary.

Check **the resistance** of the low-speed fan assembly relay **tracks 1 and 2** (see the value in the **Help** section).
Replace the high-speed fan assembly relay if necessary.

Disconnect the battery.
Disconnect the computer. Check **the cleanliness and condition** of the connectors.
Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connection:

Computer track F2, connector C ⟶ **High-speed fan assembly relay**

(See the connector track numbers in the corresponding wiring diagram)
Repair if necessary.

If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

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

DF032 PRESENT OR STORED	COOLANT TEMPERATURE OVERHEATING WARNING LIGHT CIRCUIT CO.0 : Open circuit or short circuit to earth CC.1 : Short circuit to + 12 V DEF : Unidentified electrical fault

NOTES	**None.**

Test the multiplex network.

Refer to the "Multiplex Network" and "Instrument Panel" sections of the Workshop Repair Manual.

Perform fault finding on the "Instrument panel" system if necessary.

AFTER REPAIR	None.

DF038 PRESENT OR STORED	DOWNSTREAM OXYGEN SENSOR HEATER CIRCUIT CO.0 : Open circuit or short circuit to earth CC.1 : Short circuit to + 12 V 1.DEF : Unidentified electrical fault 2.DEF : Heating output of oxygen sensor defective 1.OBD : (On Board Diagnostic) OBD fault: downstream oxygen sensor heating output 2.OBD : OBD fault: downstream oxygen sensor heating output

NOTES	***If faults DF009 and DF019 are present, deal with them first.*** **Conditions for applying the fault finding procedure to stored faults:** The fault is declared present after: – running the engine for **10seconds**.

CO.0 CC.1 1.DEF 2.DEF	Check **the cleanliness, connection and condition** of the downstream oxygen sensor connector. Replace the connector if necessary.
	With the ignition switched on, check the presence of **+ 12 V on track A** of the downstream oxygen sensor connector. Repair if necessary.
	Disconnect the battery. Disconnect the computer. Check **the cleanliness and condition** of the connectors. Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connection: **Computer track G3, connector C ⟶ Downstream oxygen sensor** (See the connector track numbers in the corresponding wiring diagram) Repair if necessary.
	Check the heating **resistance** of the downstream oxygen sensor (see the value in the **Help** section). Replace the downstream oxygen sensor if necessary.
	If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

AFTER REPAIR	If the fault had been characterised as "CO.0, CC.1, 1.DEF or 2.DEF", the fault may change characterisation and become "1.OBD or 2.OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "CO.0, CC.1, 1.DEF or 2.DEF", continue to deal with the fault. – If the fault is stored and characterised as "CO.0, CC.1, 1.DEF or 2.DEF", ignore it. – If the fault is present or stored and characterised as "1.OBD or 2.OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF038 **CONTINUED**	

1.OBD ***2.OBD***	***NOTES***	Run the engine until the fan begins to run.

If, after following the instructions, the characterisation has become "CO.0, CC.1, 1.DEF or 2.DEF", the electrical fault is detected. It should therefore be dealt with as a present fault and characterised as "CO.0, CC.1, 1.DEF or 2.DEF".
If the fault is still characterised as "1.OBD" or "2.OBD" after the instructions have been followed, the electrical fault has been present several times but is no longer detected.
Accordingly, the circuit must be checked without changing parts which are not clearly identified as at fault.
This check should be based on the fault finding of the characterisations "CO.0, CC.1, 1.DEF or 2.DEF".

AFTER REPAIR	If the fault had been characterised as "CO.0, CC.1, 1.DEF or 2.DEF", the fault may change characterisation and become "1.OBD or 2.OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "CO.0, CC.1, 1.DEF or 2.DEF", continue to deal with the fault. – If the fault is stored and characterised as "CO.0, CC.1, 1.DEF or 2.DEF", ignore it. – If the fault is present or stored and characterised as "1.OBD or 2.OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF052 PRESENT OR STORED	CYLINDER 1 INJECTOR CIRCUIT CO : Open circuit CC.0 : Short circuit to earth CC.1 : Short circuit to + 12 V DEF : Unidentified electrical fault OBD : OBD (On Board Diagnostic) fault

NOTES	***If faults DF009 and DF019 are present, deal with them first.*** **Conditions for applying the fault finding procedure to stored faults:** The fault is declared present after – running the engine for **10 seconds**.

CO ***CC.0*** ***CC.1*** ***DEF***	Check **the cleanliness, condition and connection of cylinder injector 1** and its connections. Clean or replace as necessary.
	With the ignition switched on, check for the presence of **+ 12 V on track 1 of the injector 1 connector**.
	Disconnect the battery. Disconnect the computer. Check **the cleanliness and condition** of the connectors. Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connection: **Injection computer track L4, connector B ⟶ Cylinder 1 injector** (See the connector track numbers in the corresponding wiring diagram) Repair if necessary.
	Check the **resistance of cylinder injector 1** (see the value in the **Help** section). Replace the injector if necessary.
	If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

AFTER REPAIR	If the fault had been characterised as "CO, CC.0, CC.1 or DEF", the fault may change characterisation and become "OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "CO, CC.0, CC.1 or DEF", continue to deal with the fault. – If the fault is stored and characterised as "CO, CC.0, CC.1 or DEF", ignore it. – If the fault is present or stored and characterised as "OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF052 **CONTINUED**	

OBD	***NOTES***	Run the engine until the fan begins to run.

If, after following the instructions, the characterisation has become "CO, CC.0, CC.1, or DEF", the electrical fault is detected. It should therfore be dealt with as a present fault characterised as "CO, CC.0, CC.1, or DEF".
If the fault is still characterised as "OBD" after the instructions have been followed, the electrical fault has been present several times but is no longer detected.
Accordingly, the circuit must be checked without changing parts which are not clearly identified as at fault.
This verification should be based on the fault finding of the characterisations "CO, CC.0, CC.1, or DEF".

AFTER REPAIR	If the fault had been characterised as "CO, CC.0, CC.1 or DEF", the fault may change characterisation and become "OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "CO, CC.0, CC.1 or DEF", continue to deal with the fault. – If the fault is stored and characterised as "CO, CC.0, CC.1 or DEF", ignore it. – If the fault is present or stored and characterised as "OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF053 PRESENT OR STORED	CYLINDER 2 INJECTOR CIRCUIT CO : Open circuit CC.0 : Short circuit to earth CC.1 : Short circuit to + 12 V DEF : Unidentified electrical fault OBD : OBD (On Board Diagnostic) fault

NOTES	***If faults DF009 and DF019 are present, deal with them first.*** **Conditions for applying the fault finding procedure to stored faults:** The fault is declared present after: – running the engine for **10 seconds**.

CO ***CC.0*** ***CC.1*** ***DEF***	Check **the cleanliness, condition and connection of cylinder injector 2** and its connections. Clean or replace as necessary.
	With the ignition on, check for the presence of **+ 12 V on track 1 of the injector 2 connector**.
	Disconnect the battery. Disconnect the computer. Check **the cleanliness and condition** of the connectors. Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connection: **Injection computer track L3, connector B ⟶ Cylinder 2 injector** (See the connector track numbers in the corresponding wiring diagram) Repair if necessary.
	Check the **resistance of cylinder injector 2** (see the value in the **Help** section). Replace the injector if necessary.
	If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

AFTER REPAIR	If the fault had been characterised as "CO, CC.0, CC.1 or DEF", the fault may change characterisation and become "OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "CO, CC.0, CC.1 or DEF", continue to deal with the fault. – If the fault is stored and characterised as "CO, CC.0, CC.1 or DEF", ignore it. – If the fault is present or stored and characterised as "OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF053 **CONTINUED**	

OBD	***NOTES***	Run the engine until the fan begins to run.

If, after following the instructions, the characterisation has become "CO, CC.0, CC.1, or DEF", the electrical fault is detected. It should therfore be dealt with as a present fault characterised as "CO, CC.0, CC.1, or DEF".
If the fault is still characterised as "OBD" after the instructions have been followed, the electrical fault has been present several times but is no longer detected.
Accordingly, the circuit must be checked without changing parts which are not clearly identified as at fault.
This verification should be based on the fault finding of the characterisations "CO, CC.0, CC.1, or DEF".

AFTER REPAIR	If the fault had been characterised as "CO, CC.0, CC.1 or DEF", the fault may change characterisation and become "OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "CO, CC.0, CC.1 or DEF", continue to deal with the fault. – If the fault is stored and characterised as "CO, CC.0, CC.1 or DEF", ignore it. – If the fault is present or stored and characterised as "OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF054 PRESENT OR STORED	CYLINDER 3 INJECTOR CIRCUIT CO : Open circuit CC.0 : Short circuit to earth CC.1 : Short circuit to + 12 V DEF : Unidentified electrical fault OBD : OBD (On Board Diagnostic) fault

NOTES	***If faults DF009 and DF019 are present, deal with them first.*** **Conditions for applying the fault finding procedure to stored faults:** The fault is declared present after: – running the engine for **10 seconds**.

CO ***CC.0*** ***CC.1*** ***DEF***	Check **the cleanliness, condition and connection of cylinder injector 3** and its connections. Clean or replace as necessary.
	With the ignition on, check for the presence of **+ 12 V on track 1 of the injector 3 connector**.
	Disconnect the battery. Disconnect the computer. Check **the cleanliness and condition** of the connectors. Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connection: **Injection computer track L2, connector B ⟶ Cylinder 3 injector** (See the connector track numbers in the corresponding wiring diagram) Repair if necessary.
	Check the **resistance of cylinder injector 3** (see the value in the **Help** section). Replace the injector if necessary.
	If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

AFTER REPAIR	If the fault had been characterised as "CO, CC.0, CC.1 or DEF", the fault may change characterisation and become "OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "CO, CC.0, CC.1 or DEF", continue to deal with the fault. – If the fault is stored and characterised as "CO, CC.0, CC.1 or DEF", ignore it. – If the fault is present or stored and characterised as "OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF054 **CONTINUED**	

OBD	***NOTES***	Run the engine until the fan begins to run.

If, after following the instructions, the characterisation has become "CO, CC.0, CC.1, or DEF", the electrical fault is detected. It should therfore be dealt with as a present fault characterised as "CO, CC.0, CC.1, or DEF".
If the fault is still characterised as "OBD" after the instructions have been followed, the electrical fault has been present several times but is no longer detected.
Accordingly, the circuit must be checked without changing parts which are not clearly identified as at fault.
This verification should be based on the fault finding of the characterisations "CO, CC.0, CC.1, or DEF".

AFTER REPAIR	If the fault had been characterised as "CO, CC.0, CC.1 or DEF", the fault may change characterisation and become "OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "CO, CC.0, CC.1 or DEF", continue to deal with the fault. – If the fault is stored and characterised as "CO, CC.0, CC.1 or DEF", ignore it. – If the fault is present or stored and characterised as "OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF055 PRESENT OR STORED	CYLINDER 4 INJECTOR CIRCUIT DEF : Unidentified electrical fault CO : Open circuit CC.0 : Short circuit to earth CC.1 : Short circuit to + 12 V OBD : OBD (On Board Diagnostic) fault

NOTES	***If faults DF009 and DF019 are present, deal with them first.*** **Conditions for applying the fault finding procedure to stored faults:** The fault is declared present after: – running the engine for **10 seconds**.

CO ***CC.0*** ***CC.1*** ***DEF***	Check **the cleanliness, condition and connection of cylinder injector 4** and its connections. Clean or replace as necessary.
	With the ignition on, check for the presence of **+ 12 V on track 1 of the injector 4 connector**.
	Disconnect the battery. Disconnect the computer. Check **the cleanliness and condition** of the connectors. Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connection: **Injection computer track M2, connector B ⟶ Cylinder 4 injector** (See the connector track numbers in the corresponding wiring diagram) Repair if necessary.
	Check the **resistance of cylinder injector 4** (see the value in the **Help** section). Replace the injector if necessary.
	If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

AFTER REPAIR	If the fault had been characterised as "CO, CC.0, CC.1 or DEF", the fault may change characterisation and become "OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "CO, CC.0, CC.1 or DEF", continue to deal with the fault. – If the fault is stored and characterised as "CO, CC.0, CC.1 or DEF", ignore it. – If the fault is present or stored and characterised as "OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF055 **CONTINUED**	

OBD	***NOTES***	Run the engine until the fan begins to run.

If, after following the instructions, the characterisation has become "CO, CC.0, CC.1, or DEF", the electrical fault is detected. It should therfore be dealt with as a present fault characterised as "CO, CC.0, CC.1, or DEF".
If the fault is still characterised as "OBD" after the instructions have been followed, the electrical fault has been present several times but is no longer detected.
Accordingly, the circuit must be checked without changing parts which are not clearly identified as at fault.
This verification should be based on the fault finding of the characterisations "CO, CC.0, CC.1, or DEF".

AFTER REPAIR	If the fault had been characterised as "CO, CC.0, CC.1 or DEF", the fault may change characterisation and become "OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "CO, CC.0, CC.1 or DEF", continue to deal with the fault. – If the fault is stored and characterised as "CO, CC.0, CC.1 or DEF", ignore it. – If the fault is present or stored and characterised as "OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF057 PRESENT OR STORED	UPSTREAM OXYGEN SENSOR CIRCUIT DEF : Unidentified electrical fault OBD : OBD (On Board Diagnostic) fault

NOTES	***If other faults are present, deal with them first.*** **Conditions for applying the fault finding procedure to stored faults:** The fault is declared present after: – a period of **5 minutes** of richness regulation (engine running).

DEF	Check that the manifold pressure sensor is properly fitted. Check that the inlet line is tight, from the throttle to the cylinder. Verify that no seals are defective. Check that there are no leaks in the fuel vapour absorber bleed circuit. Verify that the manifold air temperature sensor is properly fitted. Check that the throttle air temperature sensor is properly fitted. Check that the resonator is not cracked.
	Check **the condition and fitting** of the upstream sensor. Replace the sensor if necessary.
	Check for **air leaks** on the exhaust system.
	If the vehicle is driven frequently in town, **decoke the engine**.
	Check **the cleanliness, connection and condition** of the upstream oxygen sensor connections. Replace the connector if necessary.
	With the ignition on, check the **presence of + 12 Volts** on the upstream oxygen sensor. Repair if necessary.

AFTER REPAIR	If the fault had been characterised as "DEF", it may change characterisation and become "OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "DEF", continue to process the fault. – If the fault is stored and characterised as "DEF", ignore it. – If the fault is present or stored and characterised as "OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF057 **CONTINUED**	

Disconnect the battery.
Disconnect the computer. Check **the cleanliness and condition** of the connectors.
Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connections:

Computer track C1, connector C ⟶ Oxygen sensor
Computer track B1, connector C ⟶ Oxygen sensor

(See the connector track numbers in the corresponding wiring diagram)
Repair if necessary.

If the fault persists, replace the oxygen sensor.

If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

OBD	***NOTES***	Run the engine until the fan begins to run.

If the fault's characterisation has become DEF after the instructions have been followed, the electrical fault has been detected. Accordingly, it should be dealt with as a fault present and characterised as DEF.
If the fault is still characterised as "OBD" after the instructions have been followed, the electrical fault has been present several times but is no longer detected. Accordingly, the circuit must be checked without changing parts which are not clearly identified as at fault.
This check should be based on the fault finding procedure for the "DEF" characterisation.

AFTER REPAIR	If the fault had been characterised as "DEF", it may change characterisation and become "OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "DEF", continue to process the fault. – If the fault is stored and characterised as "DEF", ignore it. – If the fault is present or stored and characterised as "OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF058 PRESENT OR STORED	DOWNSTREAM OXYGEN SENSOR CIRCUIT DEF : Unidentified electrical fault OBD : OBD (On Board Diagnostic) fault

NOTES	***Deal with fault DF057 first if it is present.*** **Conditions for applying the fault finding strategy to the stored fault.** The fault is declared as present in one of the following cases: – A road test driving smoothly after the fan has come into operation and the double richness ratio loop **ET027** is active. – A road test driving smoothly after the fan has come into operation, followed immediately by a road test on a slope in no load conditions (deceleration phase).

DEF	Verify **the condition and fitting** of the downstream sensor. Replace the sensor if necessary.
	Check for **air leaks** on the exhaust system.
	If the vehicle is driven frequently in town, **decoke the engine**.
	Check **the cleanliness, connection and condition** of the downstream oxygen sensor connections. Replace the connector if necessary.
	With the ignition on, check the **presence of + 12 V** on the downstream oxygen sensor. Repair if necessary.
	Disconnect the battery. Disconnect the computer. Check **the cleanliness and condition** of the connectors. Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connections: **Computer track A2, connector C ⟶ Oxygen sensor** **Computer track B2, connector C ⟶ Oxygen sensor** (See the connector track numbers in the corresponding wiring diagram) Repair if necessary.
	If the fault persists, replace the oxygen sensor.
	If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

AFTER REPAIR	If the fault had been characterised as "DEF", it may change characterisation and become "OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "DEF", continue to process the fault. – If the fault is stored and characterised as "DEF", ignore it. – If the fault is present or stored and characterised as "OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF058 **CONTINUED**	

OBD	***NOTES***	Run the engine until the fan begins to run.

If the fault's characterisation has become DEF after the instructions have been followed, the electrical fault has been detected. Accordingly, it should be dealt with as a fault present and characterised as DEF.
If the fault is still characterised as "OBD" after the instructions have been followed, the electrical fault has been present several times but is no longer detected. Accordingly, the circuit must be checked without changing parts which are not clearly identified as at fault.
This check should be based on the fault finding procedure for the "DEF" characterisation.

AFTER REPAIR	If the fault had been characterised as "DEF", it may change characterisation and become "OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "DEF", continue to process the fault. – If the fault is stored and characterised as "DEF", ignore it. – If the fault is present or stored and characterised as "OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF061 PRESENT OR STORED	IGNITION COIL 1 - 4 CIRCUIT CO.0 : Open circuit or short circuit to earth CC.1 : Short circuit to + 12 V DEF : Unidentified electrical fault OBD : OBD (On Board Diagnostic) fault

NOTES	***Deal with faults DF009, DF019 or DF008 first if they are present.*** **Conditions for applying the fault finding procedure to stored faults:** The fault is declared present after: – starter action for **10 seconds**, or – running the engine for **10 seconds**.

CO.0 CC.1 DEF	Disconnect the connectors from the pencil coils of cylinders 1 and 4. Check **the cleanliness and condition** of the connections and pencil coils. Clean or replace as necessary.
	Check **the primary and secondary resistances** of the pencil coils 1 and 4 (see the values in the **Help** section).
	Disconnect the battery. Disconnect the computer. Check **the cleanliness and condition** of the connectors. Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connections: **Computer track H2, connector C ⟶ Coil 1** **Coil 1 ⟶ Coil 4** (See the connector track numbers in the corresponding wiring diagram) Repair if necessary.
	Check the supply fuse of the fuel pump relay.
	Check the **continuity and insulation** of the wiring between coil 4 and the fuel pump relay (this relay supplies the ignition coils).
	Check **the electrical resistance** of the fuel pump relay (see the value in the **Help** section). Replace the relay if necessary.

AFTER REPAIR	If the fault had been characterised as "CO.0, CC.1 or DEF", the fault may change characterisation and become "OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "CO.0, CC.1 or DEF", continue to deal with the fault. – If the fault is stored and characterised as "CO.0, CC.1 or DEF", ignore it. – If the fault is present or stored and characterised as "OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF061 **CONTINUED**	

Check the **cleanliness and condition** of the fuel pump relay connections. Clean or replace as necessary.
Check **the insulation and continuity** of the line between **track 3** of the relay and supply fuse. Repair if necessary.
If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

OBD	***NOTES***	Run the engine until the fan begins to run.

If, after following the instructions, the characterisation has become "CO.0, CC.1 or DEF", the electrical fault is detected. Accordingly, it should be dealt with as a present fault characterised as "CO.0, CC.1 or DEF" If the fault is still characterised as "OBD" after the instructions have been followed, the electrical fault has been present several times but is no longer detected. Accordingly, the circuit must be checked without changing parts which are not clearly identified as at fault. This check should be based on the fault finding of the characterisations "CO.0, CC.1 or DEF".

AFTER REPAIR	If the fault had been characterised as "CO.0, CC.1 or DEF", the fault may change characterisation and become "OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "CO.0, CC.1 or DEF", continue to deal with the fault. – If the fault is stored and characterised as "CO.0, CC.1 or DEF", ignore it. – If the fault is present or stored and characterised as "OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF062 PRESENT OR STORED	IGNITION COIL 2-3 CIRCUIT CO.0 : Open circuit or short circuit to earth CC.1 : Short circuit to + 12 V DEF : Unidentified electrical fault OBD : OBD (On Board Diagnostic) fault

NOTES	***Deal with faults DF009, DF019 or DF008 first if they are present.*** **Conditions for applying the fault finding procedure to stored faults:** The fault is declared present after: – starter action for **10 seconds**, or – running the engine for **10 seconds**.

CO.0 CC.1 DEF	Disconnect the connectors from pencil coils 2 and 3. Check **the cleanliness and condition** of the connections and pencil coils. Clean or replace as necessary.
	Check **the primary and secondary resistance** of the ignition coils on cylinders 2 and 3 (see the values in the **Help** section).
	Disconnect the battery. Disconnect the computer. Check **the cleanliness and condition** of the connectors. Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connections: **Computer track H3, connector C ⟶ Coil 2** **Coil 2 ⟶ Coil 3** (See the connector track numbers in the corresponding wiring diagram) Repair if necessary.
	Check the supply fuse of the fuel pump relay.
	Check the **continuity and insulation** of the line between coil 3 and the fuel pump relay (this relay supplies the ignition coils).
	Check **the electrical resistance** of the fuel pump relay (see the value in the **Help** section). Replace the relay if necessary.

AFTER REPAIR	If the fault had been characterised as "CO.0, CC.1 or DEF", the fault may change characterisation and become "OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "CO.0, CC.1 or DEF", continue to deal with the fault. – If the fault is stored and characterised as "CO.0, CC.1 or DEF", ignore it. – If the fault is present or stored and characterised as "OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF062 **CONTINUED**	

Check the **cleanliness and condition** of the fuel pump relay connections. Clean or replace as necessary.
Check **the insulation and continuity** of the line between **track 3** of the relay and supply fuse. Repair if necessary.
If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

OBD	***NOTES***	Run the engine until the fan begins to run.

If, after following the instructions, the characterisation has become "CO.0, CC.1 or DEF", the electrical fault is detected. Accordingly, it should be dealt with as a present fault characterised as "CO.0, CC.1 or DEF" If the fault is still characterised as "OBD" after the instructions have been followed, the electrical fault has been present several times but is no longer detected. Accordingly, the circuit must be checked without changing parts which are not clearly identified as at fault. This check should be based on the fault finding of the characterisations "CO.0, CC.1 or DEF".

AFTER REPAIR	If the fault had been characterised as "CO.0, CC.1 or DEF", the fault may change characterisation and become "OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "CO.0, CC.1 or DEF", continue to deal with the fault. – If the fault is stored and characterised as "CO.0, CC.1 or DEF", ignore it. – If the fault is present or stored and characterised as "OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF064 PRESENT OR STORED	VEHICLE SPEED SIGNAL DEF : Unidentified electrical fault OBD : OBD (On Board Diagnostic) fault

NOTES	**Conditions for applying the fault finding procedure to stored faults:** The fault is declared present after: – the ignition is switched on.

DEF	Check **the cleanliness and external condition** of the vehicle speed sensor. Check **the cleanliness and condition** of the target. Check **the cleanliness, condition and connection** of the connections. Clean or replace as necessary.
	Check the **electrical resistance** of the vehicle speed sensor (see the value in the**Help** section). If necessary replace the sensor.
	Disconnect the battery. Disconnect the computer. Check **the cleanliness and condition** of the connectors. Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connection: **Computer track C3, connector B ⟶ Vehicle speed sensor** (See the connector track numbers in the corresponding wiring diagram). Repair if necessary.
	If that does not work, replace the sensor.
	If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

AFTER REPAIR	If the fault had been characterised as "DEF", it may change characterisation and become "OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "DEF", continue to process the fault. – If the fault is stored and characterised as "DEF", ignore it. – If the fault is present or stored and characterised as "OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF064 **CONTINUED**	

OBD	***NOTES***	Run the engine until the fan begins to run.

– If, after following the instructions, the characterisation has become "DEF", the electrical fault is detected. Accordingly, it should be dealt with as a fault present and characterised as DEF.
– If, after following the instructions, the fault still has its "OBD" characterisation, the electrical fault has been present several times but is no longer detected.

Accordingly, the circuit must be checked without changing parts which are not clearly identified as at fault.

This check should be based on the "DEF" fault finding of the characterisations.

AFTER REPAIR	If the fault had been characterised as "DEF", it may change characterisation and become "OBD"; this is normal.
	Follow the instructions to confirm repair: – If the fault is present and characterised as "DEF", continue to process the fault. – If the fault is stored and characterised as "DEF", ignore it. – If the fault is present or stored and characterised as "OBD", ignore it. Deal with any other possible faults. Clear the fault memory.

DF082 PRESENT OR STORED	PETROL/LPG CONNECTION DEF : Unidentified electrical fault

NOTES	**None.**

Test the multiplex network.

Refer to the Multiplex network section in the Workshop Repair Manual.

AFTER REPAIR	None.

DF083 PRESENT OR STORED	ABS/INJECTION CONNECTION DEF : Unidentified electrical fault

NOTES	**None.**

Test the multiplex network.

Refer to the Multiplex network section in the Workshop Repair Manual.

AFTER REPAIR	None.

DF102 **PRESENT**	OXYGEN SENSOR OPERATING FAULT OBD : OBD fault (On Board Diagnostic) 1.OBD : OBD fault detected when running

NOTES	***If faults DF009, DF019, DF018, DF038, DF057 or DF058 are present, deal with them in priority.***

Check that the manifold pressure sensor is properly fitted.
Check that the inlet line is tight, from the throttle to the cylinder.
Verify that no seals are defective.
Check that there are no leaks in the fuel vapour absorber bleed circuit.
Verify that the manifold air temperature sensor is properly fitted.
Check that the throttle air temperature sensor is properly fitted.
Check that the resonator is not cracked.

Check **the condition and fitting** of the upstream sensor.
Replace the sensor if necessary.

Check for **air leaks** on the exhaust system.

If the vehicle is driven frequently in town, **decoke the engine**.

Check **the cleanliness, connection and condition** of the upstream oxygen sensor connections.
Replace the connector if necessary.

With the ignition on, check the **presence of + 12 V** on the upstream oxygen sensor.
Repair if necessary.

Disconnect the battery.
Disconnect the computer. Check **the cleanliness and condition** of the connectors.
Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connections:

Computer track C1, connector C ⟶ Oxygen sensor
Computer track B1, connector C ⟶ Oxygen sensor

(See the connector track numbers in the corresponding wiring diagram)
Repair if necessary.

If the fault persists, replace the oxygen sensor.

If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

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

DF106 **PRESENT**	CATALYTIC CONVERTER OPERATING FAULT OBD : OBD fault (On Board Diagnostic) 1.OBD : OBD fault present 2.OBD : OBD fault detected when driving

NOTES	***Deal with the other faults first.***

Check **sealing** of the complete exhaust system.
Repair if necessary.

If the vehicle is driven frequently in town, **decoke the engine**.

Check the **condition and assembly** of the downstream oxygen sensor.

Check the **connection and condition**. of the downstream oxygen sensor wires and connector.
Replace as necessary.

– Inspect the, **condition of the catalytic converter** Deformation may be the cause of the fault.

– **Visually check for signs of thermic shock**. A warm catalytic converter may be damaged if it comes into contact with cold water.

– Make sure there has been no **excessive oil or coolant consumption**.
Ask the customer if they have used an additive or other products of this kind. Such products can contaminate the catalytic converter and damage its performance sooner or later.
This could destroy the catalytic converter.

If the cause of the damage is identified, it is possible to change the catalytic converter.

If you replace the catalytic converter, make absolutely sure that the problem has been solved, otherwise the new catalytic converter may be damaged.

If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

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

DF109 PRESENT	POLLUTANT MISFIRES OBD : OBD fault (On Board Diagnostic) 1.OBD : OBD fault detected when running

NOTES	***Deal with the other faults first.*** **Refer to states ET093, ET094, ET095 and ET096 to ascertain how many cylinders are misfiring.**

Misfiring on one cylinder	This means that the problem is probably due to a component which can only act on this cylinder: – Injector fault – Spark plug fault (check conformance) – HV cable fault – Ignition coil fault
Misfiring on all cylinders 1 and 4 OR 2 and 3	This means that the problem is probably due to a component which can only act on this pair of cylinders: – Ignition coil fault
Misfiring on all four cylinders	This means that the problem is probably due to a component which can only act on all the cylinders: – Check that the correct petrol is used. – Check condition and conformity of spark plugs.

If the fault is still present, carry out the following checks:

– Check the flywheel sensor.
– Check the condition and cleanness of the flywheel.
– Check the mounting of the flywheel sensor.
– Check the sensor / flywheel air gap
– Check the cylinder compression.
– Check the whole petrol supply circuit.
– Check the whole ignition system.

AFTER REPAIR	Ensure that all the faults have been processed. Clear the stored faults. It is not necessary to clear the programming. To check the correct state of repair of the system: – There should be no further electrical faults. – Programming should have been carried out. – The engine should be warm (minimum 75ºC). – Run at idling speed with all electrical users engaged for 15 minutes. If the fault reappears, continue the fault finding procedure.

DF110 PRESENT	DESTRUCTIVE MISFIRE OBD : OBD fault (On Board Diagnostic) 1.OBD : OBD fault present 2.OBD : OBD fault detected when driving

NOTES	***If faults relating to ignition or the petrol supply circuit are present, deal with them first.*** **Refer to states ET093, ET094, ET095 and ET096 to ascertain how many cylinders are misfiring.**

Misfiring on one cylinder	This means that the problem is probably due to a component which can only act on this cylinder: – Injector fault – Spark plug fault (check conformance) – HV cable fault – Ignition coil fault
Misfiring on all cylinders 1 and 4 OR 2 and 3	This means that the problem is probably due to a component which can only act on this pair of cylinders: – Ignition coil fault
Misfiring on all four cylinders	This means that the problem is probably due to a component which can only act on all the cylinders: – Check that the correct petrol is used. – Check condition and conformity of spark plugs.

If the fault is still present, carry out the following checks:

– Check the flywheel sensor.
– Check the condition and cleanness of the flywheel.
– Check the mounting of the flywheel sensor.
– Check the sensor / flywheel air gap
– Check the cylinder compression.
– Check the complete petrol supply circuit.
– Check the complete ignition system.

AFTER REPAIR	Ensure that all the faults have been processed. Clear the stored faults. It is not necessary to clear the programming. To check the correct state of repair of the system: – There should be no further electrical faults. – Programming should have been carried out. – The engine should be warm (minimum 75ºC). – Run at idling speed with all electrical users engaged for 15 minutes. If the fault reappears, continue the fault finding procedure.

DF116 **PRESENT**	FUEL SYSTEM OPERATING FAULT OBD : OBD fault (On Board Diagnostic) 1.OBD : OBD fault detected when running

NOTES	***If faults relating to ignition or the petrol supply circuit are present, deal with them first.***

Carry out a complete check on the fuel supply system.
Check the cleanliness of the petrol fuel tank if necessary.
If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

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

DF117 PRESENT	IMMOBILISER CODE NOT PROGRAMMED

NOTES	***Deal with fault DF022 first if it is present.***

Test the multiplex network.

Refer to the "Multiplex Network" and "Immobiliser" sections of the Workshop Repair Manual.

Perform fault finding on the "Immobiliser" system if necessary.

AFTER REPAIR	None.

DF118 PRESENT OR STORED	REFRIGERANT PRESSURE SENSOR CIRCUIT DEF : Unidentified electrical fault

NOTES	**Conditions for applying the fault finding procedure to stored faults:** The fault is declared present after: – the ignition is switched on.

Check the **cleanliness, connection and condition** of the refrigerant pressure sensor.
Clean or replace as necessary.

Check the **electrical resistance** of the refrigerant sensor (see value in the **Help** section).
If necessary replace the sensor.

Disconnect the battery.
Disconnect the computer. Check **the cleanliness and condition** of the connectors.
Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connections:

Computer track H2, connector B ⟶ Pressure sensor
Computer track J3, connector B ⟶ Pressure sensor
Computer track H4, connector B ⟶ Pressure sensor

(See the connector track numbers in the corresponding wiring diagram)
Repair if necessary.

If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

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

DF120 **PRESENT**	OBD WARNING LIGHT CIRCUIT CO.0 : Open circuit or short circuit to earth CC.1 : Short circuit to + 12 V DEF : Unidentified electrical fault OBD : OBD (On Board Diagnostic) fault

NOTES	**None.**

Test the multiplex network.

Refer to the "Multiplex Network" and "Instrument Panel" sections of the Workshop Repair Manual.

Perform fault finding on the "Instrument panel" system if necessary.

AFTER REPAIR	None.

DF123 PRESENT OR STORED	THROTTLE POSITION POTENTIOMETER CIRCUIT TRACK 1 CO.0 : Open circuit or short circuit to earth CC.1 : Short circuit to + 12 V

NOTES	**IMPORTANT: Do not drive the vehicle until you have checked that the computer is clear of any fault relating to the throttle unit.**
	Conditions for applying the fault finding procedure to stored faults: The fault is declared present after: – the ignition is switched on.

Check **the cleanliness, connection and condition** of the connections on the throttle potentiometer.
Replace the connectors if necessary.

Disconnect the battery.
Disconnect the computer. Check **the cleanliness and condition** of the connectors.
Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connections:

Computer track G4, connector B ⟶ Throttle position potentiometer track 1
Computer track G3, connector B ⟶ Throttle position potentiometer track 1
Computer track G2, connector B ⟶ Throttle position potentiometer track 1

(See the connector track numbers in the corresponding wiring diagram)
Repair if necessary.

Check **the cleanliness** of the throttle, and **correct rotation** of the throttle valve.
Check that **track 1** of the throttle potentiometer **correctly follows its resistive curve** (see the values in the **Help** section).
Repair or replace the throttle position potentiometer if necessary.

If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

AFTER REPAIR	**If the throttle unit has been replaced, reinitialise the programming (RZ008).** Follow the instructions to confirm the repair. Deal with any other possible faults. Clear the fault memory.

DF124 **PRESENT**	THROTTLE POSITION POTENTIOMETER CIRCUIT TRACK 2 CO.0 : Open circuit or short circuit to earth CC.1 : Short circuit to + 12 V

NOTES	**IMPORTANT: Do not drive the vehicle until you have checked that the computer is clear of any fault relating to the throttle unit.**
	Conditions for applying the fault finding procedure to stored faults: The fault is declared present after: – the ignition is switched on.

Check **the cleanliness, connection and condition** of the connections on the throttle potentiometer.
Replace the connectors if necessary.

Disconnect the battery.
Disconnect the computer. Check **the cleanliness and condition** of the connectors.
Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connections:

Computer track D3, connector B ⟶ Throttle position potentiometer track 2
Computer track G2, connector B ⟶ Throttle position potentiometer track 2
Computer track G4, connector B ⟶ Throttle position potentiometer track 2

(See the connector track numbers in the corresponding wiring diagram)
Repair if necessary.

Check **the cleanliness** of the throttle, and **correct rotation** of the throttle valve.
Check that **track 2** of the throttle potentiometer **correctly follows its resistive curve** (see the values in the **Help** section).
Repair or replace the throttle position potentiometer if necessary.

If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

AFTER REPAIR	**If the throttle unit has been replaced, reinitialise the programming (RZ008).** Follow the instructions to confirm the repair. Deal with any other possible faults. Clear the fault memory.

DF125 PRESENT OR STORED	PEDAL POTENTIOMETER TRACK 1 CIRCUIT CO.0 : Open circuit or short circuit to earth CC.1 : Short circuit to + 12 V

NOTES	**Conditions for applying the fault finding procedure to stored faults:** The fault is declared present after: – switching the accelerator from no load to full load.

Check that the pedal is not mechanically seized.

Check **the cleanliness, connection and condition** of the pedal potentiometer connector.
Replace the connector if necessary.

Disconnect the battery.
Disconnect the computer. Check **the cleanliness and condition** of the connectors.
Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connections:

Computer track H3, connector A ⟶ Pedal potentiometer track 1
Computer track G2, connector A ⟶ Pedal potentiometer track 1
Computer track H2, connector A ⟶ Pedal potentiometer track 1

(See the connector track numbers in the corresponding wiring diagram)
Repair if necessary.

Check that **track 1** of the pedal potentiometer **correctly follows its curve of resistance** (see the values in the **Help** section).
Replace the pedal potentiometer if necessary.

If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

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

DF126 **PRESENT**	PEDAL POTENTIOMETER TRACK 2 CIRCUIT CO.0 : Open circuit or short circuit to earth CC.1 : Short circuit to + 12 V

NOTES	**Conditions for applying the fault finding procedure to stored faults:** The fault is declared present after: – switching the accelerator from no load to full load.

Check that the pedal is not mechanically seized.

Check **the cleanliness, connection and condition** of the pedal potentiometer connector.
Replace the connector if necessary.

Disconnect the battery.
Disconnect the computer. Check **the cleanliness and condition** of the connectors.
Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connections:

Computer track F4, connector A ⟶ Pedal potentiometer track 2
Computer track F2, connector A ⟶ Pedal potentiometer track 2
Computer track F3, connector A ⟶ Pedal potentiometer track 2

(See the connector track numbers in the corresponding wiring diagram)
Repair if necessary.

Check that **track 2** of the pedal potentiometer **correctly follows its curve of resistance** (see the values in the **Help** section).
Replace the pedal potentiometer if necessary.

If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

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

DF129 PRESENT OR STORED	PEDAL POTENTIOMETER CIRCUIT DEF : Consistency of pedal potentiometer tracks

NOTES	***Deal with faults DF125 or DF126 first if they are present.*** **Conditions for applying the fault finding procedure to stored faults:** The fault is declared as present in one of the following cases: – When the ignition is switched on without depressing the accelerator pedal for the first 10 seconds. – During gradual switching of the pedal potentiometer from no load to full load condition. – During full load condition for 10 seconds.

Check that the pedal is not mechanically seized.

Check **the cleanliness, connection and condition** of the pedal potentiometer connector.
Replace the connector if necessary.

Disconnect the battery.
Disconnect the computer. Check **the cleanliness and condition** of the connectors.
Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connections:

Computer track H3, connector A ⟶ Pedal potentiometer
Computer track G2, connector A ⟶ Pedal potentiometer
Computer track H2, connector A ⟶ Pedal potentiometer
Computer track F4, connector A ⟶ Pedal potentiometer
Computer track F2, connector A ⟶ Pedal potentiometer
Computer track F3, connector A ⟶ Pedal potentiometer

(See the connector track numbers in the corresponding wiring diagram)
Repair if necessary.

Check that **tracks 1 and 2 of the pedal potentiometer** correctly follow their curves of resistance.
(See values in the "HELP" section).
Replace the pedal potentiometer if necessary.

If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

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

DF134 PRESENT OR STORED	INSTRUMENT PANEL CONNECTION DEF : Unidentified electrical fault

NOTES	**None.**

Test the multiplex network.

Refer, in the Workshop Repair Manual, to the "Multiplex Network" and "Instrument Panel" sections.

Perform fault finding on the "Instrument panel" system if necessary.

AFTER REPAIR	None.

DF135 PRESENT OR STORED	BRAKE PEDAL SENSOR CIRCUIT 1.DEF : Fault on one of the two brake pedal contacts 2.DEF : Fault on both brake pedal contacts

NOTES	***It is essential that the ABS is not defective when carrying out this test.*** **Fault finding conditions for stored fault:** The fault is declared present after: – a long press on the brake pedal.

Check **the cleanliness, connection and condition** of the double-contact switch and its connections.
Clean or replace as necessary.

Disconnect the battery.
Disconnect the computer. Check **the cleanliness and condition** of the connectors.
Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connections:

Computer track E4 or G3, connector A ⟶ Brake pedal switch
Computer track H2, connector B ⟶ Brake pedal switch

(See the connector track numbers in the corresponding wiring diagram)
Repair if necessary.

If the fault does not disappear, deal with the other faults then go to the conformity check.

AFTER REPAIR	Follow the instructions to confirm the repair. Process any other faults Clear the fault memory.

DF136 PRESENT OR STORED	ACCELERATOR PEDAL / MOTORISED THROTTLE VALVE CIRCUIT DEF : Consistency between the position of the pedal and the position of the motorised throttle valve 1.DEF : Fault on + 5 V supply 2.DEF : Fault on potentiometer power supply No. 1 3.DEF : Fault on potentiometer power supply No. 2

NOTES	**IMPORTANT: Do not drive the vehicle until you have checked that the computer is clear of any fault relating to the throttle unit.**
	If faults DF137, DF123, DF124, DF125, DF126, DF129 or DF002 are present, deal with them first. **Conditions for applying the fault finding procedure to stored faults:** The fault is declared present after: – a change in engine speed.

Check **the cleanliness, connection and condition** of the pedal potentiometer and its connections. Clean or replace as necessary.
Check **the cleanliness, connection and condition** of the motorised throttle and its connections. Clean or replace as necessary.
Check **the cleanliness** of the throttle, and **correct rotation** of the throttle valve. Check that tracks 1 and 2 of the throttle potentiometer **correctly follow their curves of resistance** (see values in the **Help** section). Clean or replace the throttle unit if necessary.
Check **the electrical resistance** of the throttle motor (see the value in the **Help** section). Clean or replace the throttle unit if necessary.
Check that **the resistances of pedal potentiometer tracks 1 and 2** correctly follow their curves of resistance (see the values in the **Help** section). Replace the pedal potentiometer if necessary.

AFTER REPAIR	**If the throttle unit has been replaced, reinitialise the programming (RZ008).** Follow the instructions to confirm the repair. Deal with any other possible faults. Clear the fault memory.

DF136 **CONTINUED**	

Disconnect the battery.
Disconnect the computer. Check **the cleanliness and condition** of the connectors.
Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connections:

Computer track H3, connector A → Pedal potentiometer
Computer track G2, connector A → Pedal potentiometer
Computer track H2, connector A → Pedal potentiometer
Computer track F4, connector A → Pedal potentiometer
Computer track F2, connector A → Pedal potentiometer
Computer track F3, connector A → Pedal potentiometer
Computer track M3, connector B → Motorised throttle valve
Computer track M4, connector B → Motorised throttle valve
Computer track G4, connector B → Motorised throttle valve potentiometer
Computer track D3, connector B → Motorised throttle valve potentiometer
Computer track G2, connector B → Motorised throttle valve potentiometer
Computer track G3, connector B → Motorised throttle valve potentiometer

(See the connector track numbers in the corresponding wiring diagram)
Repair if necessary.

If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

AFTER REPAIR	**If the throttle unit has been replaced, reinitialise the programming (RZ008).** Follow the instructions to confirm the repair. Deal with any other possible faults. Clear the fault memory.

DF137 PRESENT OR STORED	MOTORISED THROTTLE DEF : Unidentified electrical fault 1.DEF : Motorised throttle valve servo control fault 2.DEF : Motorised throttle valve thrust stop search fault 3.DEF : General motorised throttle valve control fault

NOTES	**IMPORTANT: Do not drive the vehicle until you have checked that the computer is clear of any fault relating to the throttle unit.**
	Conditions for applying the fault finding procedure to stored faults: The fault is declared present after: – a change in engine speed.

Check **the cleanliness, connection and condition** of the connections.
Clean or replace as necessary.

Disconnect the battery.
Disconnect the computer. Check **the cleanliness and condition** of the connectors.
Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connections:

Computer track M3, connector B ⟶ Motorised throttle valve
Computer track M4, connector B ⟶ Motorised throttle valve
Computer track G4, connector B ⟶ Motorised throttle valve

(See the connector track numbers in the corresponding wiring diagram)
Repair if necessary.

Check **the electrical resistance** of the throttle motor (see the value in the **Help** section).
Clean or replace the throttle unit if necessary.

Check **the cleanliness** of the throttle unit and that the throttle **rotates correctly**.
Clean or replace as necessary.

If the fault has still not disappeared, deal with the other faults and then proceed to the conformity check.

AFTER REPAIR	**If the throttle unit has been replaced, reinitialise the programming (RZ008).** Follow the instructions to confirm the repair. Deal with any other possible faults. Clear the fault memory.

DF168 PRESENT OR STORED	AIR INTAKE CIRCUIT OBD : OBD fault (On Board Diagnostic) 1.OBD : OBD fault detected when running

NOTES	**IMPORTANT: Do not drive the vehicle until you have checked that the computer is clear of any fault relating to the throttle unit.**
	If faults DF123, DF124, DF125, DF126, DF129, DF136, DF137 or DF002 are present, deal with them first. **Conditions for applying the fault finding procedure to stored faults:** The fault is declared present after: – a change in engine speed.

Check that the manifold pressure sensor is properly fitted.

Check that the inlet line is tight, from the throttle to the cylinder.

Verify that no seals are defective.

Check that the fuel vapour absorber bleed is not disconnected or jammed open.

Check that the manifold air temperature sensor is correctly mounted.

Check that the resonator is not cracked.

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

DF233 PRESENT OR STORED	DIRECTIONAL STABILITY CONTROL

NOTES	**None.**

Test the multiplex network.

Refer to the ABS / ESP and Multiplex network sections in the Workshop Repair Manual.

Carry out fault finding on the ABS and ESP if necessary.

AFTER REPAIR	None.

NOTES	Only carry out this conformity check after a **full check** with the diagnostic tool (the values shown in this conformity check are only given as a guide). **Conditions for the application of this check: engine stopped, ignition on.**

Order	Function	Parameter or State check or Action	Display and notes	Fault finding procedure
SUPPLY FUNCTION				
1	Battery voltage	**ET001:** + After ignition computer **PR004:** Computer supply voltage	**ACTIVE** 11.8 < X < 13.2 V	**In the event of a fault: refer to fault finding procedure PR004**
SENSOR FUNCTION				
2	Engine flywheel signal	***Activate the starter motor:*** **ET060:** Flywheel signal with engine running	**ACTIVE**	**In the event of a fault: refer to fault finding procedure PR060**
3	Coolant temperature sensor	**PR002:** Coolant temperature	Engine temperature ± 5°C	**In the event of a fault: refer to fault finding procedure PR002**
4	Air temperature sensor	**PR003:** Air temperature	Temperature under bonnet ± 5°C	**In the event of a fault: refer to fault finding procedure PR003**
5	Atmospheric pressure sensor	**PR016:** Atmospheric pressure **PR001:** Manifold pressure	1000 mbar ± 3% (atmospheric pressure) 1000 mbar ± 3% (atmospheric pressure)	**In the event of a fault: refer to fault finding procedure PR001**

NOTES	Only carry out this conformity check after a **full check** with the diagnostic tool (the values shown in this conformity check are only given as a guide). **Conditions for the application of this check: engine stopped, ignition on.**

Order	Function	Parameter or State check or Action	Display and notes	Fault finding procedure
PEDAL ASSEMBLY FUNCTION				
6	Accelerator pedal	***Accelerator pedal released***		**In the event of a fault: refer to fault finding procedure PR112**
		ET129: Accelerator pedal position: no load	**ACTIVE**	
		ET128: Accelerator pedal position: full load	**INACTIVE**	
		PR112: Measured pedal position	**15° ± 1°**	
		PR120: Pedal no load programming	**15° ± 1°**	
		Accelerator pedal pressed lightly		**In the event of a fault: refer to fault finding procedure PR112**
		ET129: Accelerator pedal position: no load	**INACTIVE**	
		ET128: Accelerator pedal position: full load	**INACTIVE**	
		Accelerator pedal under full load		**In the event of a fault: refer to fault finding procedure PR112**
		ET129: Accelerator pedal position: no load	**INACTIVE**	
		ET128: Accelerator pedal position: full load	**ACTIVE**	
		PR112: Measured accelerator pedal position	**80° ± 4°**	

NOTES	Only carry out this conformity check after a **full check** with the diagnostic tool (the values shown in this conformity check are only given as a guide). **Conditions for the application of this check: engine stopped, ignition on.**

Order	Function	Parameter or State check or Action	Display and notes	Fault finding procedure
7	Brake pedal	***Brake pedal released*** **ET110:** Brake pedal **ET143:** Redundant brake pedal (Confirmation signal)	**INACTIVE** **INACTIVE**	**In the event of a fault: refer to fault finding procedure ET110 ET143**
		Brake pedal depressed **ET110:** Brake pedal **ET143:** Redundant brake pedal (Confirmation signal)	**ACTIVE** **ACTIVE**	**In the event of a fault: refer to fault finding procedure ET110 ET143**

NOTES	Only carry out this conformity check after a **full check** with the diagnostic tool (the values shown in this conformity check are only given as a guide). **Conditions for the application of this check: engine stopped, ignition on.**

Order	Function	Parameter or State check or Action	Display and notes	Fault finding procedure
MOTORISED THROTTLE VALVE FUNCTION				
8	Motorised throttle unit	***Accelerator pedal released***		
		ET111: Throttle valve stops programming	**ACTIVE**	**In the event of a fault: switch off the ignition and wait for the loss of dialogue. Switch on the ignition again.**
		ET118: Motorised throttle unit in defect mode	**INACTIVE**	**In the event of a fault: a fault is declared by the diagnostic tool**
		ET130: Motorised throttle valve closed	**ACTIVE**	**In the event of a fault: refer to fault finding procedure PR017**
		PR113: Reference position of the motorised throttle valve	**15° ± 1°**	
		PR017: Measured valve position	**15° ± 1°**	
		PR110: Measured valve position track 1	**15° ± 1°**	
		PR111: Measured valve position track 2	**15° ± 1°**	
		PR119: Motorised throttle valve lower stop	**10° ± 1°**	

NOTES	Only carry out this conformity check after a **full check** with the diagnostic tool (the values shown in this conformity check are only given as a guide). **Conditions for the application of this check: engine stopped, ignition on.**

Order	Function	Parameter or State check or Action	Display and notes	Fault finding procedure
MOTORISED THROTTLE VALVE FUNCTION				
8 (continued)	Motorised throttle unit	***Accelerator pedal under full load***		
		ET118: Motorised throttle unit in defect mode	**INACTIVE**	**In the event of a fault: a fault is declared by the diagnostic tool**
		ET131: Motorised throttle valve open	**ACTIVE**	**In the event of a fault: refer to fault finding procedure PR017**
		PR113: Reference position of the motorised throttle valve	**90° ± 3°**	
		PR017: Measured valve position	**90° ± 3°**	
		PR110: Measured valve position track 1	**90° ± 3°**	
		PR111: Measured valve position track 2	**90° ± 3°**	
		PR118: Motorised throttle valve upper stop	**92° ± 3°**	

NOTES	Only carry out this conformity check after a **full check** with the diagnostic tool (the values shown in this conformity check are only given as a guide). **Conditions for the application of this check: engine stopped, ignition on.**

Order	Function	Parameter or State check or Action	Display and notes	Fault finding procedure
ACTUATOR CONTROLS				
9	Fuel supply	**AC010:** Fuel pump relay	The fuel pump should be heard operating	**In the event of a fault: refer to fault finding procedure AC010**
10	Fan assembly	**AC271:** Low-speed fan assembly relay	The fan should be heard running at low speed	**In the event of a fault: refer to fault finding procedure AC271**
		AC272: High-speed fan assembly relay	The fan should be heard running at high speed	**In the event of a fault: refer to fault finding procedure AC272**
11	Fuel vapour absorber bleed	**AC016:** Canister bleed solenoid valve	The fuel vapour absorber solenoid valve should be heard operating	**In the event of a fault: refer to fault finding procedure AC016**
12	Motorised throttle unit	**AC612:** Motorised throttle unit	The motorised throttle valve should be heard operating	**In the event of a fault: refer to fault finding procedure AC612**

NOTES	Only carry out this conformity check after a **full check** with the diagnostic tool (the values shown in this conformity check are only given as a guide). **Conditions for application of the check: Engine warm at idle speed, without electrical consumers.**

Order	Function	Parameter or State check or Action	Display and notes	Fault finding procedure
ELECTRICAL SUPPLY FUNCTION				
1	Battery voltage	**ET001:** + After ignition **PR004:** Computer supply voltage	**ACTIVE** 13 < X < 14.5 V	**In the event of a fault: refer to fault finding procedure PR004**
SENSOR FUNCTION				
2	Flywheel signal	**ET060:** Flywheel signal with engine running	**ACTIVE**	**In the event of a fault: refer to fault finding procedure ET060**
3	Atmospheric pressure sensor	**PR016:** Atmospheric pressure **PR001:** Manifold pressure	X = Atmospheric pressure 280 < X < 360 mbar	**In the event of a fault: refer to fault finding procedure PR001**
4	Pinking sensors	**PR015:** Anti-pinking correction **PR013:** Medium pinking signal	X ≤ 5 30 < X < 60	**In the event of a fault: refer to fault finding procedure PR013**

NOTES	Only carry out this conformity check after a **full check** with the diagnostic tool (the values shown in this conformity check are only given as a guide). **Conditions for application of the check: Engine warm at idle speed, without electrical consumers.**

Order	Function	Parameter or State check or Action	Display and notes	Fault finding procedure
FAN FUNCTION				
5	Fan assembly	**PR002:** Coolant temperature **ET035:** Low-speed fan assembly	The fan should cut in when the engine coolant temperature exceeds 99 °C **ACTIVE**	**In the event of a fault: refer to fault finding procedure ET035**
		PR002: Coolant temperature **ET036:** High-speed fan assembly	The fan should cut in when the engine coolant temperature exceeds 102 °C **ACTIVE**	**In the event of a fault: refer to fault finding procedure ET036**
IDLE SPEED REGULATION FUNCTION				
6	Idle speed regulation	**ET039:** Idle speed regulation	**ACTIVE**	**In the event of a fault: refer to fault finding procedure ET039**
		PR006: Engine speed	725 < X < 775 rpm	
		PR041: Idle speed setpoint	725 < X < 775 rpm	
		PR055: After-Sales idle speed set point	-16 rpm < X < +16 rpm	
		*(Possibility or reducing or increasing the idling speed by means of the commands parameterised as **VP004** and **VP003**)*		
		PR040: Idle speed divergence	-25 < X < +25 rpm	
		PR022: Idling opening cyclic ratio	20 % < X < 30 %	
		PR021: Idling opening cyclic ratio adaptive	-6 % < X < 6 %	

NOTES	Only carry out this conformity check after a **full check** with the diagnostic tool (the values shown in this conformity check are only given as a guide). **Conditions for application of the check: Engine warm at idle speed, without electrical consumers.**

Order	Function	Parameter or State check or Action	Display and notes	Fault finding procedure
RICHNESS REGULATION FUNCTION				
7	Richness regulation	**ET037:** Richness regulation **PR009:** Upstream sensor voltage **PR035:** Richness ratio correction value	**ACTIVE** 20 < X < 800 mV 0 < X < 255	**In the event of a fault: refer to fault finding procedure ET037**
OXYGEN SENSOR FUNCTION				
8	Upstream oxygen sensor	**ET030:** Upstream O_2 sensor heating **ET157:** Upstream sensor state	**ACTIVE** **ACTIVE**	**In the event of a fault: refer to fault finding procedure ET030** **In the event of a fault: refer to fault finding procedure ET157**
9	Downstream oxygen sensor	**ET158:** Downstream sensor state **ET031:** Downstream O_2 sensor heating	**ACTIVE** **ACTIVE**	**In the event of a fault: refer to fault finding procedure ET158** **In the event of a fault: refer to fault finding procedure ET031**
INFORMATION FUNCTION				
10	Heated windscreen	***Switch on the windscreen heating*** **ET013:** Heated windscreen	**ACTIVE**	**In the event of a fault: refer to fault finding procedure ET013**

NOTES	Only carry out this conformity check after a **full check** with the diagnostic tool (the values shown in this conformity check are only given as a guide). **Conditions for application of the check: Road test.**

Order	Function	Parameter or State check or Action	Display and notes	Fault finding procedure
SENSOR FUNCTION				
1	Pinking sensor	***Vehicle under load*** **PR015:** Anti-pinking correction	X ≤ 5	**In the event of a fault: refer to fault finding procedure PR013**
2	Atmospheric pressure sensor	**PR016:** Atmospheric pressure **PR001:** Manifold pressure	1000 mbar ± 3% (Atmospheric pressure) 280 < X < 360 mbar	**In the event of a fault: refer to fault finding procedure PR001**
POLLUTANT EMISSIONS				
3	Pollutant emissions	***2500 rpm after driving.*** ***With the engine at idling speed, wait for stabilisation.***	CO < 0.3 % CO2 > 13.5 % O2 < 0.8 % HC < 100 ppm 0.97 < λ < 1.03 CO < 0.5 % HC < 100 ppm 0.97 < λ < 1.03	**In the event of a fault: refer to the emission control technical note**

ET013	HEATED WINDSCREEN

NOTES	There must be no faults present or stored.

Disconnect the battery.
Disconnect the computer. Check **the cleanliness and condition** of the connectors.
Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connection:

Computer track G3, connector A ⟶ "Air conditioning" computer.

(See the connector track numbers in the corresponding wiring diagram)
Repair if necessary.

If the fault is still present, perform fault finding on the Air Conditioning computer.

AFTER REPAIR	Repeat the conformity check.

ET030	UPSTREAM O_2 SENSOR HEATING

NOTES	There must be no faults present or stored.

Check **the cleanliness, connection and condition** of the upstream oxygen sensor connector. Replace the connector if necessary.
Check the **heating resistance** of the upstream oxygen sensor (see the value in the **Help** section). Replace the upstream oxygen sensor if necessary.
With the ignition on, check for the presence of **+ 12 V on track A** of the upstream oxygen sensor connector. Repair if necessary.
Disconnect the battery. Disconnect the computer. Check **the cleanliness and condition** of the connectors. Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connection: **Computer track G1, connector C ⟶ Upstream oxygen sensor** (See the connector track numbers in the corresponding wiring diagram) Repair if necessary.

AFTER REPAIR	Repeat the conformity check.

ET031	DOWNSTREAM O_2 SENSOR HEATING

NOTES	There must be no faults present or stored.

Check **the cleanliness, connection and condition** of the downstream oxygen sensor connector. Replace the connector if necessary.
Check the **heating resistance** of the downstream oxygen sensor (see the value in the **Help** section). Replace the downstream oxygen sensor if necessary.
With the ignition switched on, check the presence of **+ 12 V on track A** of the downstream oxygen sensor connector. Repair if necessary.
Disconnect the battery. Disconnect the computer. Check **the cleanliness and condition** of the connectors. Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connection: **Computer track G3, connector C ⟶ Downstream oxygen sensor** (See the connector track numbers in the corresponding wiring diagram) Repair if necessary.

AFTER REPAIR	Repeat the conformity check.

ET034	POWER ASSISTED STEERING PRESSURE SWITCH

NOTES	There must be no faults present or stored.

Check the power assisted steering fluid level. Check that there are no leaks.
Check **the cleanliness, connection and condition** of the power steering pressure switch connector. Replace the pressure switch if necessary.
Disconnect the connector and **check for the presence of earth** (check the track number on the relevant wiring diagram). Repair if necessary.
Disconnect the battery. Disconnect the computer. Check **the cleanliness and condition** of the connections. Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connections: **Computer track C4, connector B ⟶ Power assisted steering pressure switch** **Pressure switch ⟶ Earth** (See the connector track numbers in the corresponding wiring diagram) Repair if necessary.
Check that the pump is operating correctly.
If these points are correct, replace the power assisted steering pressure switch.

AFTER REPAIR	Repeat the conformity check.

ET035	LOW-SPEED FAN ASSEMBLY

NOTES	There must be no faults present or stored.

Check the cleanliness and general condition of the fan unit (no point of resistance).
Check the **cleanliness, connection and condition** of the fan assembly relay connector. Replace the connector if necessary.
Disconnect the low-speed fan relay. Check for the presence of **+ 12 V on track 3** on the connector side of the relay. With the ignition on, check for the presence of **+ 12 V on track 1** of the relay, connector side. Repair if necessary.
Check **the resistance of the low-speed fan assembly relay** on **tracks 1 and 2** (see the value in the **Help** section). Replace the low-speed fan assembly relay if necessary.
Disconnect the battery. Disconnect the computer. Check **the cleanliness and condition** of the connections. Connect the bornier in place of the computer and check **the insulation, continuity and absence of interference resistance** on the following connection: **Computer track F1, connector C ⟶ Low-speed fan relay** (See the connector track numbers in the corresponding wiring diagram) Repair if necessary.
Disconnect the low-speed fan relay. Check **the insulation, the continuity and the absence of interference resistance** of the connection between **track 5** of the relay and the fan assembly. Repair if necessary.
Check **the insulation, the continuity and the absence of interference resistance** of the fan unit earth connection. Repair if necessary.
If that still does not work, replace the fan assembly.

AFTER REPAIR	Repeat the conformity check.

ET036	HIGH-SPEED FAN ASSEMBLY

NOTES	There must be no faults present or stored.

Check the cleanliness and general condition of the fan unit (no point of resistance).
Check the **cleanliness, connection and condition** of the fan assembly relay connector. Replace the connector if necessary.
Disconnect the high-speed fan relay. Check for the presence of **+ 12 V on track 3** on the relay, connector side. With the ignition on, check for the presence of **+ 12 V on track 1** of the relay, connector side. Repair if necessary.
Check **the resistance of the high-speed fan assembly relay** on **tracks 1 and 2** (see the value in the **Help** section). Replace the high-speed fan assembly relay if necessary.
Disconnect the battery. Disconnect the computer. Check **the cleanliness and condition** of the connections. Connect the bornier in place of the computer and check **the insulation, continuity and absence of interference resistance** on the following connection: **Computer track F2, connector C ⟶ High-speed fan relay** (See the connector track numbers in the corresponding wiring diagram) Repair if necessary.
Disconnect the high-speed fan relay. Check **the insulation, the continuity and the absence of interference resistance** of the connection between **track 5** of the relay and the fan assembly. Repair if necessary.
Check **the insulation, the continuity and the absence of interference resistance** of the fan unit earth connection. Repair if necessary.
If that still does not work, replace the fan assembly.

AFTER REPAIR	Repeat the conformity check.

ET037	RICHNESS REGULATION

NOTES	There must be no faults present or stored.

If the vehicle is driven frequently in town, **decoke the engine**.
Check **the cleanliness, connection and condition of the connector** for the upstream oxygen sensor. Replace the connector if necessary.
Check the **heating resistance** of the upstream oxygen sensor (see the value in the **Help** section). Replace the upstream oxygen sensor if necessary.
Check the **resistance of the upstream oxygen sensor signal circuit (check the value in the Help section)**. Replace the upstream oxygen sensor if necessary.
With the ignition on, check for the presence of **+ 12 V** on the upstream oxygen sensor connector (see the track number of the connector on the corresponding wiring diagram). Repair if necessary.
Disconnect the battery. Disconnect the computer. Check **the cleanliness and condition** of the connections. Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connections: **Computer track C1, connector C ⟶ Upstream oxygen sensor** **Computer track B1, connector C ⟶ Upstream oxygen sensor** **Computer track G1, connector C ⟶ Upstream oxygen sensor** (See the connector track numbers in the corresponding wiring diagram) Repair if necessary.
– Check the condition of the air filter. – Check the spark plugs and the entire ignition circuit. – Check that there are no leaks in the fuel vapour absorber bleed circuit, – Check that the inlet manifold and the exhaust system are completely sealed. – Check the petrol supply circuit and its filter. – Check fuel pressure. – If idling is irregular, check the valve clearances and the timing.
Replace the oxygen sensor if the fault persists.

AFTER REPAIR	Repeat the conformity check.

ET039	IDLE SPEED REGULATION

NOTES	There must be no faults present or stored.

NOTES	**Idle speed is too slow.**

- Clean the air supply circuit (throttle unit, idle speed regulation stepper motor), since it may be dirty.
- Check the engine oil level (too high => splashing).
- Check the engine compression
- Check the valve clearances and timing.
- Check ignition.
- Check the injectors

NOTES	**Idle speed is too high.**

- Check the engine oil level.
- Check that the pressure sensor is operating correctly.
- Check the cleanliness of the pipes on the manifold.
- Check the pneumatically-controlled solenoid valves.
- Check the manifold gaskets.
- Check the throttle unit gaskets.
- Check the brake servo sealing.
- Check that the restrictions are present in the oil vapour rebreathing circuit.
- Check the valve clearances and timing.

AFTER REPAIR	Repeat the conformity check.

ET060	FLYWHEEL SIGNAL WITH ENGINE RUNNING

NOTES	There must be no faults present or stored.

Check the **cleanliness, connection and condition** of the target sensor, its connector and the cable.
Replace as necessary.

Check that the engine flywheel is **mounted correctly**.
Check the sensor/flywheel **air gap**.

Disconnect the battery.
Disconnect the computer. Check **the cleanliness and condition** of the connections.
Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connections:

Computer track E4, connector B ⟶ Target sensor
Computer track F3, connector B ⟶ Target sensor

(See the connector track numbers in the corresponding wiring diagram)
Repair if necessary.

Check **the resistance** of the target sensor (see the value in the **Help** section).
If necessary replace the sensor.

If there is still a fault, **check the cleanliness and condition** of the flywheel.

AFTER REPAIR	Repeat the conformity check.

ET110	BRAKE PEDAL

NOTES	There must be no faults present or stored.

Check that the pedal assembly is in sound condition.
Check **the cleanliness, connection and condition** of the double-contact brake switch and its connector. Replace as necessary.
Disconnect the battery. Disconnect the computer. Check **the cleanliness and condition** of the connections. Connect the bornier in place of the computer and check **the insulation, continuity and absence of interference resistance** on the following connection: **Computer track E4 or G3, connector A ⟶ Brake pedal** (See the connector track numbers in the corresponding wiring diagram) Repair if necessary.
If it still does not work, replace the switch.
Refer to the ABS fault finding procedure if necessary.

AFTER REPAIR	Repeat the conformity check.

ET143	REDUNDANT BRAKE PEDAL (confirmation signal)

NOTES	There must be no faults present or stored.

Test the multiplex network.

Refer to the ABS / ESP and Multiplex network sections in the Workshop Repair Manual.

Carry out fault finding on the ABS and ESP if necessary.

AFTER REPAIR	Repeat the conformity check.

ET157	UPSTREAM SENSOR STATE

NOTES	There must be no faults present or stored.

Check that the manifold pressure sensor is properly fitted.
Check that the inlet line is tight, from the throttle to the cylinder.
Verify that no seals are defective.
Check the fuel vapour absorber bleed and its circuit.
Verify that the manifold air temperature sensor is properly fitted.
Check that the throttle air temperature sensor is properly fitted.
Check that the resonator is not cracked.

Check **the condition and fitting** of the upstream sensor.

Check for **air leaks** on the exhaust system.

If the vehicle is driven frequently in town, **decoke the engine**.

Check **the cleanliness, connection and condition** of the upstream oxygen sensor connector.
Replace the connector if necessary.

Check the **resistance** of the upstream oxygen sensor (see the value in the **Help** section).
Replace the upstream oxygen sensor if necessary.

With the ignition on, check the **presence of + 12 Volts** on the upstream oxygen sensor.
Repair if necessary.

Disconnect the battery.
Disconnect the computer. Check **the cleanliness and condition** of the connectors.
Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connections:

Computer track C1, connector B ⟶ Upstream oxygen sensor
Computer track B1, connector B ⟶ Upstream oxygen sensor

(See the connector track numbers in the corresponding wiring diagram)
Repair if necessary.

AFTER REPAIR	Repeat the conformity check.

ET158	DOWNSTREAM SENSOR STATE

NOTES	There must be no faults present or stored.

Verify **the condition and fitting** of the downstream sensor.
If the vehicle is driven frequently in town, **decoke the engine**.
Check the **connection and condition** of the downstream oxygen sensor connector. Replace the connector if necessary.
Check the **resistance** of the downstream oxygen sensor circuit (see the value in the **Help** section). Replace the downstream oxygen sensor if necessary.
With the ignition on, check the **presence of + 12 V** on the downstream oxygen sensor. Repair if necessary.
Disconnect the battery. Disconnect the computer. Check **the cleanliness and condition** of the connectors. Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connections: **Computer track B2, connector B ⟶ Downstream oxygen sensor** **Computer track A2, connector B ⟶ Downstream oxygen sensor** (See the connector track numbers in the corresponding wiring diagram) Repair if necessary.

AFTER REPAIR	Repeat the conformity check.

PR001:	MANIFOLD PRESSURE

NOTES	There must be no faults present or stored.

Check that the manifold pressure sensor is properly fitted.
Check that the inlet line is tight, from the throttle to the cylinder.
Verify that no seals are defective.
Check that the fuel vapour absorber bleed is not disconnected or jammed open.
Verify that the manifold air temperature sensor is properly fitted.
Check that the throttle air temperature sensor is properly fitted.
Check that the resonator is not cracked.

Check **the cleanliness, connection and condition** of the sensor and its connection.
Replace as necessary.

Disconnect the battery.
Disconnect the computer. Check **the cleanliness and condition** of the connectors.
Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connections:

Computer track H2, connector B → Pressure sensor
Computer track H3, connector B → Pressure sensor
Computer track H4, connector B → Pressure sensor

(See the connector track numbers in the corresponding wiring diagram)
Repair if necessary.

Check that the pressure sensor **is properly connected pneumatically** and that the pipe is in sound condition.

Using a vacuum pump, check the **consistency of the manifold pressure**.
Check **consistency** with parameter **PR001** in the diagnostic tool.
If necessary replace the sensor.

If PR001 > Maximum at idling speed:
Check the valve clearance.
Check that the fuel vapour absorber bleed is closed at idling speed
Check the cylinder compressions.

AFTER REPAIR	Repeat the conformity check.

PR002:	COOLANT TEMPERATURE

NOTES	There must be no faults present or stored.

Check the **cleanliness, connection and condition** of the coolant temperature sensor connector.
Replace the connector if necessary.

Check the **resistance** of the coolant temperature at different temperatures (see the values in the **Help** section).
Replace the coolant temperature sensor, if necessary.

Disconnect the battery.
Disconnect the computer. Check **the cleanliness and condition** of the connectors.
Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connections:

Computer track F2, connector B ⟶ Coolant temperature sensor
Computer track F4, connector B ⟶ Coolant temperature sensor

(See the connector track numbers in the corresponding wiring diagram)
Repair if necessary.

AFTER REPAIR	Repeat the conformity check.

PR003:	AIR TEMPERATURE

NOTES	There must be no faults present or stored.

Check the **cleanliness, connection and condition** of the manifold air temperature sensor connector.
Replace the connector if necessary.

Check the **resistance** of the manifold air temperature sensor at various temperatures (see the values in the **Help** section).
Replace the air temperature sensor, if necessary.

Disconnect the battery.
Disconnect the computer. Check **the cleanliness and condition** of the connectors.
Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connections:

Computer track E3, connector B ⟶ Manifold air temperature sensor
Computer track E2, connector B ⟶ Manifold air temperature sensor

(See the connector track numbers in the corresponding wiring diagram)
Repair if necessary.

AFTER REPAIR	Repeat the conformity check.

PR004	COMPUTER SUPPLY VOLTAGE

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

Ignition on	**If the voltage is minimum:** Check the battery and the charge circuit (refer to the relevant section in the Workshop Repair Manual).
	If the voltage is maximum: Check that the charge voltage is correct and that no consumers are on (see the relevant section in the Workshop Repair Manual).

At idle speed	**If the voltage is minimum:** Check the battery and the charge circuit (refer to the relevant section in the Workshop Repair Manual).
	If the voltage is maximum: Check that the charge voltage is correct and that no consumers are on (see the relevant section in the Workshop Repair Manual).

AFTER REPAIR	Repeat the conformity check.

PR013	PINKING SIGNAL

NOTES	There must be no faults present or stored.

The pinking sensor should give a signal which is not zero, to prove that it is recording the mechanical vibrations of the engine.
Check that the fuel in the fuel tank is of the correct type.
Check the conformity of the spark plugs.
Check that the pinking sensor is **tightened**.
Check **the cleanliness, connection and condition** of the sensor and the connector. Replace as necessary.
Disconnect the battery. Disconnect the computer. Check **the cleanliness and condition** of the connectors. Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connections: **Computer track A2, connector B ⟶ Pinking sensor** **Computer track B2, connector B ⟶ Pinking sensor** **Computer track C2, connector B ⟶ Pinking sensor screening** (See the connector track numbers in the corresponding wiring diagram) Repair if necessary.
If the fault persists, replace the pinking sensor.

AFTER REPAIR	Repeat the conformity check.

PR017	MEASURED THROTTLE POSITION

NOTES	**IMPORTANT:** **Do not drive the vehicle until you have checked that the computer is clear of any fault relating to the throttle unit.**
	There must be no faults present or stored.

Check that there are no **foreign bodies** at the throttle valve level.

Check the cleanliness, **connection and condition of the connections** on the throttle potentiometer.
Replace as necessary.

Disconnect the battery.
Disconnect the computer. Check **the cleanliness and condition** of the connectors.
Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connections:

Computer track G4, connector B → Throttle position potentiometer
Computer track D3, connector B → Throttle position potentiometer
Computer track G2, connector B → Throttle position potentiometer
Computer track G3, connector B → Throttle position potentiometer

(See the connector track numbers in the corresponding wiring diagram)
Repair if necessary.

Check that **the resistances of tracks 1 and 2 of the throttle potentiometer** follow their curves correctly, by moving the throttle from no load to full load (check the values in the **Help** section).
Repair or replace the throttle position potentiometer if necessary.

AFTER REPAIR	**If the throttle unit has been replaced, reinitialise the programming (RZ008).** Repeat the conformity check.

PR030	RICHNESS ADAPTIVE OPERATION

NOTES	There must be no faults present or stored. If the **PR030** or **PR031** is near the min. stop, there is too much petrol. If the **PR030** or **PR031** is near the max. stop, there is insufficient petrol.

– Check the condition of the air filter.
– Check the spark plugs and the entire ignition circuit.
– Check that there are no leaks in the fuel vapour absorber bleed circuit,
– Check the lsealing of the inlet manifold and the complete exhaust system.
– Check the petrol supply circuit and its filter.
– Check fuel pressure.
– If idling is irregular, check the valve clearances and the timing.

If the vehicle is driven frequently in town, **decoke the engine**.

Check **the cleanliness, connection and condition of the connector** for the upstream oxygen sensor.
Replace the connector if necessary.

Check the **heating resistance** of the upstream oxygen sensor (see the value in the **Help** section).
Replace the upstream oxygen sensor if necessary.

With the ignition on, check for the presence of **+ 12 V on track A** of the upstream oxygen sensor connector.
Repair if necessary.

Disconnect the battery.
Disconnect the computer. Check **the cleanliness and condition** of the connectors.
Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connections:

Computer track C1, connector C ⟶ Upstream oxygen sensor
Computer track B1, connector C ⟶ Upstream oxygen sensor
Computer track G1, connector C ⟶ Upstream oxygen sensor

Repair if necessary.

Replace the oxygen sensor if the fault persists.

AFTER REPAIR	Repeat the conformity check.

PR112	MEASURED ACCELERATOR PEDAL POSITION

NOTES	There must be no faults present or stored.

Check that the pedal is not mechanically seized.

Check **the cleanliness, connection and condition** of the pedal potentiometer connector.
Replace the connector if necessary.

Disconnect the battery.
Disconnect the computer. Check **the cleanliness and condition** of the connectors.
Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connections:

Computer track H3, connector A ⟶ Pedal potentiometer
Computer track G2, connector A ⟶ Pedal potentiometer
Computer track H2, connector A ⟶ Pedal potentiometer
Computer track F4, connector A ⟶ Pedal potentiometer
Computer track F2, connector A ⟶ Pedal potentiometer
Computer track F3, connector A ⟶ Pedal potentiometer

(See the connector track numbers in the corresponding wiring diagram)
Repair if necessary.

Check that **the resistances of the pedal potentiometer, tracks 1 and 2** correctly follow their curves of resistance.
(See the values in the "HELP" section).
Replace the pedal potentiometer if necessary.

Replace the potentiometer pedal if the fault persists.

AFTER REPAIR	Repeat the conformity check.

AC010	FUEL PUMP RELAY

NOTES	There must be no faults present or stored.

Check **the supply fuse** of the fuel pump relay. Replace the fuse if necessary.
Check the **connection and condition** of the fuel pump relay connector. Replace the connector if necessary.
Disconnect the relay. With the ignition on, check for the presence of **+ 12 V on track 1** of the fuel pump relay, connector side. Repair if necessary.
Check **the resistance** of the fuel pump relay on **tracks 1 and 2** (see the value in the **Help** section). Replace the fuel pump relay if necessary.
Disconnect the battery. Disconnect the computer. Check **the cleanliness and condition** of the connectors. Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connection: **Computer track D1 connector C ⟶ Fuel pump relay** (See the connector track numbers in the corresponding wiring diagram) Repair if necessary.
If the fault persists, replace the relay.

AFTER REPAIR	Repeat the conformity check.

AC016	CANISTER BLEED SOLENOID VALVE

NOTES	There must be no faults present or stored.

Check the **cleanliness and condition** of the fuel vapour absorber bleed solenoid valve connector. Replace the connector if necessary.
With the ignition on, check for the presence of **+ 12 V** on the fuel vapour absorber bleed solenoid valve. Repair if necessary.
Check the **resistance of the fuel vapour absorber bleed solenoid valve** (see value in the **Help** section). Replace the solenoid valve, if necessary.
Disconnect the battery. Disconnect the computer. Check **the cleanliness and condition** of the connectors. Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connection: **Computer track E1, connector C ⟶ Canister bleed solenoid valve** (See the connector track numbers in the corresponding wiring diagram) Repair if necessary.
If the fault persists, replace the solenoid valve.

AFTER REPAIR	Repeat the conformity check.

AC271	LOW-SPEED FAN RELAY

NOTES	There must be no faults present or stored.

Check the **connection and condition** of the low-speed fan assembly relay connector. Replace the connector if necessary.
Disconnect the low-speed fan relay. With the ignition on, check for the presence of **+ 12 V on track 1** of the relay. Repair if necessary.
Check **the resistance of the low-speed fan assembly relay** on **tracks 1 and 2** (see the value in the **Help** section). Replace the low-speed fan assembly relay if necessary.
Disconnect the battery. Disconnect the computer. Check **the cleanliness and condition** of the connectors. Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connection: **Computer track F1, connector C ⟶ Low-speed fan relay** (See the connector track numbers in the corresponding wiring diagram) Repair if necessary.
Check **the insulation, the continuity and the absence of interference resistance** of the connection between **track 5** of the relay and the fan assembly. Repair if necessary.
Check **the insulation, the continuity and the absence of interference resistance** of the fan unit earth connection. Repair if necessary.
Check the **condition** of the fan assembly. Replace the fan assembly if necessary.

AFTER REPAIR	Repeat the conformity check.

AC272	HIGH-SPEED FAN RELAY

NOTES	There must be no faults present or stored.

Check **the cleanliness, connection and condition** of the high-speed fan assembly relay connector. Replace the connector if necessary.
Disconnect the high-speed fan relay. With the ignition on, check for the presence of **+ 12 V on track 1** of the relay. Repair if necessary.
Check **the resistance of the high-speed fan assembly relay** on **tracks 1 and 2** (see the value in the **Help** section). Replace the high-speed fan assembly relay if necessary.
Disconnect the battery. Disconnect the computer. Check **the cleanliness and condition** of the connectors. Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connection: **Computer track F2, connector C ⟶ High-speed fan relay** (See the connector track numbers in the corresponding wiring diagram) Repair if necessary.
Check **the insulation, the continuity and the absence of interference resistance** of the connection between **track 5** of the relay and the fan assembly. Repair if necessary.
Check **the insulation, the continuity and the absence of interference resistance** of the fan unit earth connection. Repair if necessary.
Check the **condition** of the fan assembly. Replace the fan assembly if necessary.

AFTER REPAIR	Repeat the conformity check.

AC612	MOTORISED THROTTLE

NOTES	**IMPORTANT:** **Do not drive the vehicle until you have checked that the computer is clear of any fault relating to the throttle unit.**
	There must be no faults present or stored.

Check **the cleanliness** of the throttle unit and that the throttle **rotates correctly**.
Clean or replace as necessary.

Check **the cleanliness, connection and condition** of the connections.
Clean or replace as necessary.

Disconnect the battery.
Disconnect the computer. Check **the cleanliness and condition** of the connectors.
Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connections:

Computer track M3, connector B → Motorised throttle valve
Computer track M4, connector B → Motorised throttle valve
Computer track G4, connector B → Motorised throttle valve

(See the connector track numbers in the corresponding wiring diagram)
Repair if necessary.

Check **the electrical resistance** of the throttle motor (see the value in the **Help** section).
Clean or replace the throttle unit if necessary.

AFTER REPAIR	**If the throttle unit has been replaced, reinitialise the programming (RZ008).** Repeat the conformity check.

ELECTRICAL RESISTANCE OF COMPONENTS

Resistance values of components at 20°C:

Injectors → **1.8 Ω ± 5%**

Actuator relays → **65 Ω ± 10%**

Throttle valve motor → **1.5 Ω ± 5 %**

Fuel vapour absorber bleed solenoid valve → **25 Ω ± 10%**

Ignition coils → **Primary: 0.5 Ω**

Ignition coils → **Secondary: 11 kΩ ± 20%**

Flywheel sensor → **230 Ω ± 20%**

Oxygen sensor heater → **Upstream: 9 Ω ± 10%**

Oxygen sensor heater → **Downstream: 9 Ω ± 10%**

High-speed fan assembly relay → **65 Ω ± 10%**

Low-speed fan assembly relay → **65 Ω ± 10%**

Values for variable resistance components:

Temperature in °C	**- 10**	**25**	**50**	**80**	**110**
Manifold air temperature sensor, in Ω	**10450 to 8585**	**2120 to 1880**	**860 to 760**	-	-
Coolant temperature sensor, in Ω	-	**2360 to 2140**	**850 to 770**	**290 to 275**	**117 to 112**

Accelerator pedal potentiometer *(20°C)*		
No load position, track 1	Tracks G2 and H2, connector A of computer **2300 Ω ± 20%**	Tracks H3 and H2, connector A of computer **1290 Ω ± 20%**
Full load position, track 1	Tracks G2 and H2, connector A of computer **1250 Ω ± 20%**	Tracks H3 and H2, computer connector A **2270 Ω ± 20%**
No load position, track 2	Tracks F2 and F3, connector A of computer **2900 Ω ± 20%**	Tracks F3 and F4, connector A of computer **1240 Ω ± 20%**
Full load position, track 2	Tracks F2 and F3, computer connector A **2200 Ω ± 20%**	Tracks F3 and F4, computer connector A **2000 Ω ± 20%**

Throttle potentiometer VDO *(20°C)*		
Throttle limp-home position, track 1 (Throttle position with engine stopped)	Tracks G3 and G2, connector B of computer **1350 Ω ± 20%**	Tracks G3 and G4, connector B of computer **775 Ω ± 20%**
Throttle fully open position, track 1 (Keep throttle open manually)	Tracks G3 and G2, computer connector B **500 Ω ± 20%**	tracks G3 and G4, computer connector B **1300 Ω ± 20%**
Throttle limp-home position, track 2 (Throttle position with engine stopped)	Tracks D3 and G2, connector B of computer **600 Ω ± 20%**	Tracks D3 and G4, connector B of computer **1150 Ω ± 20%**
Throttle fully open position, track 2 (Keep throttle open manually)	Tracks D3 and G2, computer connector B **1250 Ω ± 20%**	Tracks D3 and G4, computer connector B **440 Ω ± 20%**

NOTES	**Only consult the customer complaints after a complete check using the diagnostic tool.**

NO DIALOGUE WITH THE COMPUTER	→ **CHART 1**
THE ENGINE WILL NOT START	→ **CHART 2**
IDLE SPEED FAULTS	→ **CHART 3**
FAULTS WHEN DRIVING	→ **CHART 4**

AFTER REPAIR	Perform a test using the diagnostic tool.

CHART 1	No dialogue with the computer

NOTES	**None.**

Check **the condition of the battery and the vehicle earths**.
Repair if necessary.

Check **the condition** of the diagnostic lead.
Check **the cleanliness and condition** of the diagnostic socket and its connections.
Try the diagnostic tool on another vehicle.

– Check the injection, engine and passenger compartment fuses.
– Check, on the vehicle, **the cleanliness and condition** of the diagnostic socket and its connections.
– Use the diagnostic socket to check the following tracks:

Track 1 ⟶ **+ After ignition**
Track 16 ⟶ **+ Battery**
Tracks 4 and 5 ⟶ **Earth**

Repair if necessary.

Disconnect the battery.
Disconnect the computer. Check **the cleanliness and condition** of the connections.
Connect the bornier in place of the computer and check the **insulation, continuity and absence of interference resistance** on the following connections:

Injection computer track H1, connector C ⟶ **Earth**
Injection computer track H4, connector A ⟶ **Earth**
Injection computer track G4, connector A ⟶ **Earth**
Injection computer track B4, connector A ⟶ **Diagnostic socket track 7**
Injection computer track A4, connector B ⟶ **+ After ignition**
Injection computer track G2, connector C ⟶ **+ After ignition**

Repair if necessary.

Check **the connection and condition** of the injection actuator relay connector.
Replace the connector if necessary.

Check **the resistance** of the injection actuator relay (see the value in the **Help** section).
Replace the actuator relay, if necessary.

Check the presence of **+ 12 V on track 1** of the injection actuators relay.
Repair the wire to the fuse.

Check the insulation and continuity of the connection between:
Injection computer track D4, connector B ⟶ **Injection actuator relay**.
Repair if necessary.

AFTER REPAIR	Perform a test using the diagnostic tool.

CHART 2	The vehicle will not start

NOTES	**Follow CHART 2 after performing a complete check using the diagnostic tool.** (Use the Workshop Repair Manual for more information on certain operations).

If the starter motor does not engage, there may be an engine immobiliser fault. Check the "Immobiliser" function using the diagnostic tool.
Check that the impact sensor is not switched on. Check that it is working.
– Check the cleanliness and condition of the battery. – Check that the battery is correctly earthed to the vehicle body. – Check + battery connections. – Check the battery charge.
– Check that the starter motor is properly connected. – Check that the starter motor is operating correctly.
– Check the condition and cleanliness of the pencil coils. – Check the condition and conformity of spark plugs. – Check the secondary ignition circuits. – Check the mounting, cleanliness, condition and air gap of the flywheel signal sensor. – Check the condition of the flywheel.
– Check that the air intake circuit is not clogged up. – Check that the throttle is rotating correctly
– Check whether there is fuel in the tank (fuel gauge fault). – Check that the tank vent is not blocked. – Check that the fuel is of the correct type. – Check that there is no leak in the fuel circuit, from the fuel tank to the injectors. – Check that no hoses are pinched (especially after a removal operation). – Check the condition of the fuel filter. – Check that the fuel pump is operating correctly. – Check fuel pressure. – Check that the injectors are working.
– Check that the exhaust system is not blocked nor the catalytic converter clogged.
– Check the timing.
– Check the engine compression

AFTER REPAIR	Perform a test using the diagnostic tool.

CHART 3	Idle speed faults

NOTES	**Follow CHART 3 after performing a complete check with the diagnostic tool.** (Use the Workshop Repair Manual for more information on certain operations).

– Check on the dipstick that the oil level is not too high.
– Check the condition and cleanliness of the pencil coils. – Check the condition and conformity of spark plugs. – Check the secondary ignition circuits. – Check the mounting, cleanliness, condition and air gap of the flywheel signal sensor. – Check the condition and cleanliness of the flywheel.
– Check that the air intake circuit is not clogged up. – Check that the inlet line is tight, from the throttle to the cylinder. – Verify that no seals are defective. – Check that the fuel vapour absorber bleed is not disconnected or jammed open. – Check that there are no leaks in the fuel vapour absorber bleed circuit. – Check that there is no leak in the brake servo circuit. – Verify that the manifold air temperature sensor is properly fitted. – Check that the manifold pressure sensor is properly fitted. – Check that the resonator is not cracked. – Check that throttle unit is not clogged. – Check that the throttle is rotating correctly.
– Check that the tank vent is not blocked. – Check that the fuel is of the correct type. – Check that there is no leak in the fuel circuit, from the fuel tank to the injectors. – Check that no hoses are pinched (especially after a removal operation). – Check the condition of the fuel filter. – Check that the fuel pump is operating correctly. – Check fuel pressure. – Check that the injectors are working.
– Check that the exhaust system is not blocked nor the catalytic converter clogged.
– Check the timing.
– Check the engine compression

AFTER REPAIR	Perform a test using the diagnostic tool.

CHART 4	Faults when driving

NOTES	**Follow CHART 4 after performing a complete check using the diagnostic tool.** (Use the Workshop Repair Manual for more information on certain operations).

– Check on the dipstick that the oil level is not too high.
– Check that the exhaust manifold is not leaking.
– Check the condition of the air filter.
– Check the condition and cleanliness of the pencil coils. – Check the condition and conformity of spark plugs. – Check the secondary ignition circuits. – Check the mounting, cleanliness, condition and air gap of the flywheel signal sensor. – Check the condition and cleanliness of the flywheel.
– Check that the air intake circuit is not clogged up. – Check that the inlet line is tight, from the throttle to the cylinder. – Verify that no seals are defective. – Check that the fuel vapour absorber bleed is not disconnected or jammed open. – Check that there are no leaks in the fuel vapour absorber bleed circuit. – Check that there is no leak in the brake servo circuit. – Verify that the manifold air temperature sensor is properly fitted. – Check that the manifold pressure sensor is properly fitted. – Check that the resonator is not cracked. – Check that the throttle valve unit is not clogged. – Check that the throttle is rotating correctly.
– Check that the tank vent is not blocked. – Check that the fuel is of the correct type. – Check that there is no leak in the fuel circuit, from the fuel tank to the injectors. – Check that no hoses are pinched (especially after a removal operation). – Check the condition of the fuel filter. – Check that the fuel pump is operating correctly. – Check fuel pressure. – Check that the injectors are working.
– Check that the exhaust system is not blocked nor the catalytic converter clogged.
– Check the timing.
– Check the engine compression

AFTER REPAIR	Perform a test using the diagnostic tool.