RENAULT

Technical Note 3919A

Vehicles	*Types*	*Engines*	*Gearbox*
Laguna I	B56W - X56W	F9Q	
Mégane I	XA1F - XA05	F9Q	
Scénic RX4	XA1F - XA05	F9Q	JC7
Espace III	JE0K - JE0S	G9T	
Master	XDXG	G9T	

Basic manual: Vehicle MR

Sub-section concerned: 13B

FAULT FINDING

BOSCH DIESEL INJECTION

EDC15C3 - Vdiag 08

Summary of the Technical Note:

This note deals with the Bosch EDC15C3 diesel injection - Vdiag 08

This note cancels and replaces: 3447A, 3448A, 3449A, 3450A, 3502A, 3716A, 3747A and 3749A.

77 11 336 082 **EDITION 3-DECEMBER 2006** **EDITION ANGLAISE**

Contents

1. SCOPE OF THIS DOCUMENT

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

Vehicle(s): **Laguna I, Mégane I, Scénic, RX4, Espace III, Master** *Function concerned:* **Diesel injection**	*Computer name:* **Bosch EDC15C3** *Program N°:* **CB** *Vdiag N°:* **08**

2. PRE-REQUISITES FOR FAULT FINDING

Documentation type

Fault finding procedures (this manual):
– Assisted fault finding (integrated into the diagnostic tool), Dialogys.
Wiring Diagrams:
– Visu-Diagram (CD-ROM), paper.

Type of diagnostic tools:

– **CLIP**

Special tooling required:

Special tooling required	
	Multimeter.
Elé. 1681	Universal terminal

3. REMINDERS:

Procedure:

To perform fault finding on the vehicle computers, switch on the ignition.

Faults:

Faults are declared present or stored (depending on whether they appeared in a certain context and have disappeared since, or whether they remain present but are not diagnosed within the current context).

The **present** or **stored** status of faults should be taken into consideration when the diagnostic tool is switched on after the + after ignition feed (without any system components being active).

For a **present fault**, apply the procedure described in the **Interpretation of faults** section.

For a **stored fault**, note the faults displayed and apply the **Notes** section.

If the fault is **confirmed** when the instructions are applied, the fault is present. Deal with the fault

If the fault is **not confirmed**, check:
- the electrical lines which correspond to the fault,
- the connectors for these lines (for oxidation, bent pins, etc.),
- the resistance of the faulty component,
- the condition of the wires (melted or cut insulation, wear).

Conformity check

The aim of the conformity check is to check data that does not produce a fault on the diagnostic tool because the data is inconsistent. This phase therefore allows:
- diagnosis of faults that do not have a fault display, and which may correspond to a customer complaint.
- checks that the system is operating correctly and that there is no risk of a fault reappearing after repairs.

This section gives the fault finding procedures for statuses and parameters and the conditions for checking them.

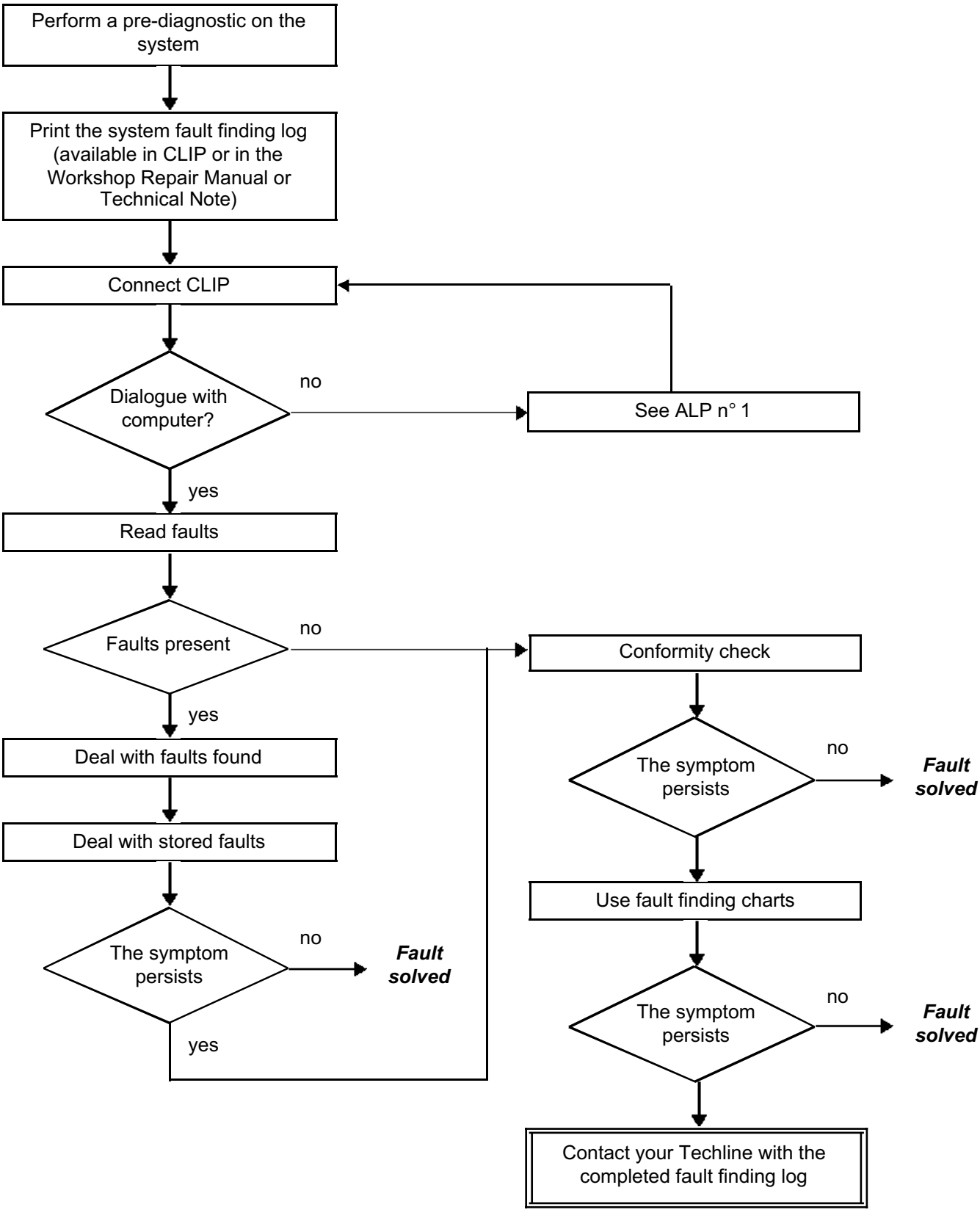
If a state is not behaving normally or a parameter is outside permitted tolerance values, you should consult the corresponding fault finding page.

Customer complaints - Fault finding chart

If the test with the diagnostic tool is OK but the customer complaint is still present, the fault should be processed by **Customer complaints**.

A synopsis of the general procedure to follow is provided on the following page in the form of a flow chart

4. FAULT FINDING PROCEDURE:



4. FAULT FINDING PROCEDURE (continued)

Wiring check

Diagnostic problems
Disconnecting the connectors and/or handling the wiring harness may temporarily remove, the cause of a fault.
Electrical measurements of voltage, resistance and insulation are generally correct, especially if the fault is not present when the analysis is made (stored fault).

Visual inspection
Look for damage under the bonnet and in the passenger compartment.
Meticulously inspect the protective devices, insulation and path of the wiring.
Look for signs of oxidation.

Tactile inspection
While manipulating the wiring harness, use the diagnostic tool to note any change in fault status from stored to present.
Make sure that the connectors are properly locked.
Apply light pressure to the connectors.
Twist the wiring harness.
If there is a change in status, try to locate the source of the fault.

Inspection of each component
Disconnect the connectors and check the appearance of the clips and tabs, as well as the crimping (no crimping on the insulating section).
Make sure that the clips and tabs are properly locked in the sockets.
Check that no clips or tabs have been dislodged during connection.
Check the clip contact pressure using an appropriate model of tab.

Resistance check
Check the continuity of entire lines, then section by section.
Look for a short circuit to earth, to **+ 12 V** or to another wire.

If a fault is detected, repair or replace the wiring.

5. FAULT FINDING LOG

WARNING!

WARNING
All problems involving a complex system call for thorough diagnostics with the appropriate tools. The FAULT FINDING LOG, which should be completed during the procedure, enables you to keep track of the procedure which is carried out. It is an essential item when discussing the fault with the manufacturer.

IT IS THEREFORE MANDATORY TO FILL OUT A FAULT FINDING SHEET EACH TIME FAULT FINDING IS DONE.

You will always be asked for this log:

- when requesting technical assistance from Techline,
- for approval requests when replacing parts for which approval is mandatory,
- which must be attached to monitored parts for which reimbursement is requested. It is therefore used to decide whether a reimbursement will be made under warranty and leads to improved analysis of the removed parts.

6. SAFETY INSTRUCTIONS

Safety rules must be observed during any work on a component to prevent any damage or injury:

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

FAULT FINDING LOG

System: Injection

List of monitored parts: ***Computer***

Administrative identification

Date:	2 0
Sheet completed by:	
VIN	
Engine	
Diagnostic tool	CLIP
Version	

Customer complaint

	579	Does not start - fault		570	Stalls - difficult to start when cold		571	Stalls - difficult to start when warm
	586	Injection/preheating warning light on		572	Idle - engine speed unsteady		574	Jerking - flat spots
	573	Lack of power		520	Abnormal noise, vibrations		576	Smoke - exhaust odours
	569	Difficult to start						

Other — Your comments

Conditions under which the customer complaint occurs

	001	When cold		005	While driving		008	When decelerating
	002	When warm		006	When changing gear		009	Sudden breakdown
	003	When stationary		007	When accelerating		010	Gradual deterioration
	004	Intermittently						

Other — Your comments

Documentation used in fault finding

Fault finding procedure	
Type of fault finding manual:	Workshop Repair Manual ❑ Technical Note ❑ Assisted fault finding ❑
Fault Finding Manual N°:	
Wiring diagram used	
Wiring Diagram Technical Note N°:	
Other documentation	
Title and/or part no.:	

RENAULT

FD 01
Fault finding log

FAULT FINDING LOG

System: Injection

Identification of computer and system parts exchanged

Part 1 part no.	
Part 2 part no.	
Part 3 part no.	
Part 4 part no.	
Part 5 part no.	

To be read with the diagnostic tool (Identification screen):

Computer part no.	
Supplier no.	
Program no.	
Software version	
Calibration n°	
VDIAG	

Faults found with the diagnostic tool

Fault N°	Present	Stored	Fault title	Specification

Conditions when fault occurs

Status or Parameter N°	Name of parameter	Value	Unit

System-specific information

Description:

Additional information

What factors led you to replace the computer? What other parts were replaced?	
Other defective functions?	
Your comments	

RENAULT

FD 01
Fault finding log

I - RISKS ASSOCIATED WITH CONTAMINATION

The high pressure direct injection system is highly sensitive to contamination. The risks caused by the introduction of contamination are:

- damage to or destruction of the high-pressure injection system,
- components jamming,
- components losing seal integrity.

All After-Sales operations must be performed under very clean conditions. This means that no impurities (particles a few microns in size) should have entered the system during dismantling.

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

What are the sources of contamination?

- metal or plastic chips,
- paint,
- fibres:
  - of cardboard,
  - from brushes,
  - from paper,
  - from clothing,
  - cloths,
- foreign bodies such as hair,
- ambient air,
- etc.

WARNING
It is forbidden to clean the engine using a high-pressure washer because of the risk of damaging connections. In addition, moisture may collect in the connectors and create electrical connection faults.

II - Instructions to be followed before carrying out any work

WARNING
Before any work is carried out on the high pressure injection system, protect:
- the accessories and timing belts,
- the electrical accessories, (starter, alternator, electric power assisted steering pump),
- the flywheel surface, to prevent any diesel from running onto the clutch friction plate.

Check that you have plugs for the unions to be opened (set of plugs available from the Parts Department). 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.

Check that you have hermetically resealable plastic bags for storing removed parts. Stored parts will therefore be less subject to the risk of impurities. The bags must be used only once, and after use thrown away.

Use lint-free cleaning cloths (part number **77 11 211 707**). Using normal cloth or paper is prohibited. They are not lint-free and could contaminate the fuel circuit. Each lint-free cloth should only be used once.

Use fresh cleaning agent for each operation (used cleaning agent is contaminated). 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 cleaning agent to clean the unions to be opened.

Blast compressed air over the cleaned parts (tools, workbench, the parts, unions and injection system zones). Check that no bristles remain adhering.

Wash your hands before and during the operation if necessary.

When wearing leather protective gloves cover them with latex gloves to prevent contamination.

III - Instructions to be followed when carrying out any work

As soon as the circuit is open, all openings must be plugged to prevent impurities from entering the system. The caps to be used are available from the Parts Department. The plugs must not be reused under any circumstances.

Seal the pouch shut, even if it has to be opened shortly afterwards. Ambient air carries contamination.

All components removed from the injection system must be stored in a hermetically sealed plastic bag once the plugs have been inserted.

Using a brush, cleaning agent, air gun, sponge or normal cloth is strictly prohibited once the circuit has been opened. These items are likely to allow contaminants to enter 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.

The high-pressure direct injection system is intended to deliver a precise quantity of diesel to the engine at a specific time.

It is fitted with a **128-track BOSCH EDC15C3** computer.

The system consists of:
- an electric booster pump on engines fitted with a CP1 high-pressure pump,
- a diesel filter,
- a CP1 high-pressure pump,
- a solenoid valve mounted to the pump that regulates the high pressure,
- an injector rail,
- a fuel pressure sensor built into the rail,
- four solenoid injectors,
- a diesel temperature sensor,
- a coolant temperature sensor,
- an upstream air temperature sensor,
- a cylinder reference sensor,
- an engine speed sensor,
- a turbocharging pressure sensor,
- an exhaust gas recirculation solenoid valve,
- an accelerator pedal potentiometer,
- an atmospheric pressure sensor integrated into the injection computer,
- a flow sensor,
- a turbocharging limiter solenoid valve,
- a damper flap solenoid valve.
- a swirl flap solenoid valve.

The **common rail** direct high pressure injection system works sequentially (based on the operation of the petrol engine multipoint injection).

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 high pressure pump generates the high pressure that is sent to the injector rail. The actuator located on the pump controls the quantity of diesel supplied, according to the demand determined by the computer. The rail supplies each injector through a steel pipe.

Computer

This determines the injection pressure value necessary for the engine to operate correctly and controls the pressure regulator accordingly. It checks that the pressure value is correct by analysing the value transmitted by the pressure sensor mounted on the rail.
It determines the necessary injection timing to deliver the right quantity of diesel fuel and the moment when injection should start.
It electrically controls each injector individually after determining these two values.

The injected flow to the engine is determined by:
- the duration of injector control,
- the rail pressure (regulated by the computer),
- the needle travel (determined by a constant for the type of injector),
- the nominal hydraulic flow of the injector (specific to each injector).

The computer controls:
- idle speed regulation,
- exhaust gas flow reinjection into the inlet,
- fuel supply monitoring (advance, flow and rail pressure),
- the fan assembly control,
- the air conditioning (cold loop function),
- the feed and control of the passenger compartment heating elements (RCH) or the heating elements,
- the cruise control/speed limiter function,
- the pre/post heating,
- fault warning lights via the multiplex network.

The high-pressure pump is supplied at low-pressure by an integrated low-pressure pump (transfer pump).
It supplies the rail, whose pressure is controlled by the fuel flow actuator for charging, and by the injector valves for discharging.
Drops in pressure may also be compensated for. The flow actuator allows the high-pressure pump to supply the exact quantity of diesel fuel required to maintain the pressure in the rail.
This feature allows heat generation to be minimised and engine output to be improved.
In order to discharge the rail using the injector valves, the valves are controlled by brief electrical pulses which are:
- short enough not to open the injector (passing through the feedback circuit from the injectors),
- long enough to open the valves and discharge the rail.

Renault vehicles are equipped with multiplex electronic systems. These systems enable dialogue between the various vehicle computers. As a result:
– the fault warning lights on the instrument panel are activated via the multiplex network,
– there is no vehicle speed sensor in the gearbox,
– the vehicle speed signal on the instrument panel is transmitted by the ABS computer to the injection computer via a wire connection and is then transmitted over the multiplex network by the instrument panel,
– the injection computer and the airbag computer are the main users of the vehicle speed signal.

Some vehicles have a presence sensor mounted in the filter for detecting water in the diesel. If there is water present in the diesel fuel, the injection and pre/postheating fault warning light comes on.

IMPORTANT
The engine must not operate with:
– diesel fuel containing more than 10% diester,
– petrol, even in tiny quantities.

The system can inject diesel fuel into the engine at a pressure of up to **1350 bar**. Before carrying out any work, check that the injector rail is not pressurised and that the fuel temperature is not too high.

When working on the high pressure injection system, you must follow the cleanliness guidelines and safety advice specified in this document.

Dismantling the interior of the pump and injectors is forbidden. Only the fuel flow actuator, the diesel fuel temperature sensor and the venturi can be replaced.

For safety reasons, it is strictly forbidden to undo a high-pressure pipe union when the engine is running.

It is not possible to remove the pressure sensor from the fuel rail because this may cause circuit contamination faults. If the pressure sensor fails, the pressure sensor, the rail and the five high-pressure pipes must be replaced.

It is strictly forbidden to remove any injection pump pulley bearing the number 070 575. If the pump is being replaced, the pulley must be replaced.

Supplying **+ 12 V** directly to any component of the system is prohibited.

Ultrasound descaling and cleaning are prohibited.

Never start the engine unless the battery is connected correctly.

Disconnect the injection system computer when carrying out any welding work on the vehicle.

Cold loop air conditioning management

The air conditioning system is the cold loop type. The injection computer is responsible for:
- authorising requests for cold air according to refrigerant fluid pressure, engine coolant temperature and engine speed,
- requesting activation of the fan unit according to the vehicle speed, the refrigerant pressure and the engine coolant temperature.

Air conditioning system authorisation is given by the injection computer **2 to 8 seconds** after the engine is started.

Compressor switch-on is inhibited according to the following conditions.

Engine speed	Vehicle speed	Accelerator pedal unit
less than 3000 ± 100 rpm	less than 66 ± 1 mph (110 ± 2 km/h)	major change of position (rapid variation)
less than 2250 ± 100 rpm	less than 12 ± 2 mph (20 ± 3 km/h)	position greater than 46 ± 2%
less than 675 ± 50 rpm	...	throttle release

Cruise control management

The cruise control function, when activated, maintains the vehicle at a preselected speed, regardless of the driving conditions encountered. Using the control buttons, the driver can increase or decrease the vehicle speed.

The cruise control function can be deactivated either using the control buttons, or by switching off the cruise control function selection switch or when system events are detected such as pressing the brake or clutch pedals, or when system errors are detected such as an incorrect vehicle speed or a deceleration level which is too high.

The cruise control function can also be temporarily suspended when the driver wants to resume control of the vehicle and exceed the selected cruising speed by pressing the accelerator pedal which then exceeds the selected fuel flow. The cruising speed is returned to when the driver releases the accelerator pedal.

It is possible to reactivate cruise control and to return to the last cruising speed after the function has been deactivated for whatever reason, during the same cycle of use (computer supply voltage not cut off). The vehicle will then attempt to reach the cruising speed using a controlled vehicle acceleration rate.

The driver has the following controls to operate the cruise control function:
- Accelerator pedal.
- Brake pedal.
- Clutch pedal.
- Function selector switch to select the cruise control operating mode.
- Instrument panel controls.

Indicator/warning light management

– **Instrument panel display**

The computer manages the instrument panel display relating to engine operation. This includes 5 functions: OBD warning light, pre-postheating, coolant temperature and engine faults: Level 1 (non-critical fault) and Level 2 (emergency stop). These five functions are represented by 3 indicator/warning lights or messages displayed by the trip computer.

– **Pre-postheating warning light**

This light is used both as an in-operation indicator light and as a system fault indicator:
– Continuously lit with + after ignition feed: indicates that the heater plugs are operating.
– Continuously lit, with the "faulty injection" message: indicates a Level 1 fault (indicating reduced operating efficiency and a restricted safety level. The driver should carry out repairs as soon as possible.

– **Temperature/emergency stop warning light**

This indicator light is used both as an in-operation indicator light and as a system fault warning light. It lights up for **3 seconds** when the ignition is switched on (automatic test procedure managed by the instrument panel):
– Continuously lit: indicates engine overheating (the driver remains free to stop the vehicle or not).
– Continuously lit, with the "Engine stop" message: indicates a level 2 fault (In this case, injection is automatically shut off after a few seconds).

– **Excess pollution OBD orange warning light**

An engine symbol lights up for approximately **3 seconds** when the ignition is switched on. This warning light may also come on when driving if the system detects an OBD fault.

Connector A (grey), 32 tracks

Track	Description
A1	Not used
A2	Cruise control programming return signal
A3	Load potentiometer 2 earth
A4	CAN L network signal (passenger compartment)
B1	
B2	Heated windscreen signal
B3	Cruise control programming control
B4	Load potentiometer 1 earth
C1	CAN H network signal (passenger compartment)
C2	
C3	Load potentiometer 1 signal
C4	Brake pedal switch
D1	Diagnostic line K
D2	Not used
	Not used
D3	Cruise control on/off switch
D4	Diagnostic line L
E1	Rev counter signal
	Load potentiometer 1 power supply
E2	Clutch contact input
E3	Fuel flow signal
E4	Vehicle speed signal
F1	Load potentiometer 2 signal
F2	Not used
F3	Brake lights + control
F4	Air conditioning inhibition output
G1	Control for preheating warning light
G2	Immobiliser
G3	Injection fault warning light control
G4	Air conditioning recirculation input
H1	Not used
H2	Load potentiometer 2 power supply
H3	OBD warning light control
H4	Coolant temperature alert output

Connector B (brown), 48 tracks

Track	Description
A1	Not used
A2	Not used
A3	Not used
A4	Not used
B1	Not used
B2	Exhaust gas recirculation valve position potentiometer earth
B3	Heater plug set 1 fault finding
B4	Not used
C1	Turbocharger pressure sensor signal
C2	Exhaust gas recirculation valve position potentiometer signal
C3	Preheating control relay
C4	Not used
D1	Rail pressure sensor signal
D2	Not used
D3	Air temperature sensor signal
D4	Main power supply relay control
E1	Coolant temperature sensor earth
E2	Not used
E3	+After ignition supply
E4	Not used
F1	Not used
F2	Exhaust gas recirculation valve position potentiometer supply
F3	Thermoplunger n° 2 relay coil control
F4	Not used
G1	Fuel temperature sensor earth
G2	Air flowmeter feed
G3	Engine speed sensor + signal
G4	Not used

Connector B (brown), 48 tracks (continued)

Track	Description
H1	Not used
H2	Rail pressure sensor supply
H3	Engine speed sensor - signal
H4	Air flowmeter signal
J 1	Not used
J2	Turbocharger pressure sensor supply
J3	Fuel temperature sensor signal
J4	Not used
K1	Not used
K2	Not used
K3	Coolant temperature sensor signal
K4	Not used
L1	Fuel flow actuator control
L2	Turbocharging pressure regulator control
L3	Power 1 earth
L4	Power 3 earth
M1	Exhaust gas recirculation solenoid valve control
M2	After relay + battery feed 1
M3	After relay + battery feed 2
M4	Power earth 2

Connector C (black), 48 tracks

Track	Description
A1	Fuel pump relay coil control
A2	Low-speed fan assembly control relay
A3	Air flowmeter earth
A4	Turbocharger pressure sensor earth
B1	Not used
B2	Not used
B3	Rail pressure sensor earth
B4	High-speed fan assembly relay control
C1	Camshaft sensor earth
C2	Not used
C3	Not used
C4	Not used
D1	Not used
D2	Not used
D3	Not used
D4	Not used
E1	Not used
E2	Not used
E3	Not used
E4	Thermoplunger n° 3 or n° 1 relay control (depending on engine)
F1	Not used
F2	Not used
F3	Not used
F4	Inlet flap solenoid valve control
G1	Not used
G2	Not used
G3	Not used
G4	Not used

Connector C (black), 48 tracks (continued)

Track	Description
H1	Not used
H2	Not used
H3	Not used
H4	Not used
J 1	Not used
J2	Not used
J3	Not used
J4	Thermoplunger n° 1 or n° 3 relay coil control (depending on engine)
K1	Not used
K2	Not used
K3	Not used
K4	Cylinder sensor signal
L1	Injector 4 control
L2	Injector 3 feed
L3	Injector 2 feed
L4	Injector 2 command
M1	Injector 1 command
M2	Injector 3 command
M3	Injector 1 feed
M4	Injector 4 feed

REPLACING OR REPROGRAMMING THE COMPUTER

After replacing or reprogramming a computer, check the computer configurations in relation to the vehicle equipment.

REPLACING INJECTOR(S)

– Please observe the cleanliness guidelines and safety advice.
– When fitting the injector, do not put any strain on it (see the procedure in the Repair Manual).

Summary of available configurations

NOTES	The configurations are performed to configure the vehicle computer according to the options available on the vehicle.

CF571: Increase in idle speed

This configuration allows you to increase the idling speed of the engine by a maximum of + 50 rpm, in stages of + 10 rpm.

CF572: Decrease in idle speed

This configuration allows you to reduce the idle speed of the engine by a maximum of - 50 rpm, in increments of- 10 rpm.

WARNING
This configuration can lead to customer complaints if it is used incorrectly.

WARNING!

CF015: Without air conditioning

This configuration is used to configure the computer for a vehicle not fitted with air conditioning.

CF014: With air conditioning

This configuration is used to configure the computer for a vehicle equipped with air conditioning.

CF006: Without heating elements.

This configuration is used to configure the computer for a vehicle not fitted with heating elements.

CF005: With heating elements

This configuration is used to configure the computer for a vehicle which is equipped with heating elements.

CF013: Without cruise control (Espace III)

This configuration is used to configure the computer for a vehicle not fitted with cruise control.

CF012: With cruise control (Espace III)

This configuration is used to configure the computer for a vehicle fitted with cruise control.

CF574: Without swirl flaps (Espace III)

This configuration is used to configure the computer for a vehicle not fitted with swirl flaps.

CF573: With swirl flaps (Espace III)

This configuration is used to configure the computer for a vehicle fitted with swirl flaps.

Summary of available configuration readings

NOTES	Configuration readings are used to check the status of configurations performed.

LC002: Air conditioning

With air conditioning OR Without air conditioning
This configuration reading is directly linked to configurations CF014 and CF015.

LC019: Heating element options

With heating elements OR Without heating elements
This configuration reading is directly linked to configurations CF006 and CF005.

LC013: Cruise control option (Espace III)

With cruise control OR Without cruise control
This configuration reading is directly linked to the configurations CF012 and CF013.

LC025: Swirl flap option (Espace III)

With swirl flap OR Without swirl flap
This configuration reading is directly linked to the configurations CF573 and CF574.

LC008: Number of cylinders

This configuration reading indicates the number of engine cylinders.

LC023: EGR type

With looped EGR OR With non-looped EGR
This configuration reading indicates whether the vehicle is fitted with an exhaust gas recirculation system.

LC009: Inlet type

This configuration reading shows whether the vehicle is fitted with a turbocharger.

LC017: Injection type

Direct injection OR Indirect injection
This configuration reading shows whether the vehicle is fitted with direct or indirect injection.

LC005: Gearbox type

With automatic transmission OR Without automatic transmission
This configuration reading indicates whether the vehicle is fitted with a manual gearbox or automatic transmission.

LC006: **CAN configuration**

With CAN OR Without CAN
This configuration reading shows whether the vehicle is fitted with or without CAN multiplexing.

LC016: **Flow regulation type**

Electronic flow regulation OR Mechanical flow regulation
This configuration reading indicates whether the vehicle is fitted with an electronic or mechanical flow regulator.

LC029: **Torque request authorisation** (RX4)

With torque request authorisation OR Without torque request authorisation
This configuration reading indicates whether the vehicle is fitted with or without torque request authorisation.

WARNING LIGHT MANAGEMENT

Management of instrument panel warning lights according to faults displayed.

Tool fault	Diagnostic tool title	Hexadecimal DTC codes	Fault warning light
DF001	Computer	183F	DEF/1.DEF
DF002	Coolant temperature sensor circuit	1801	CC.0/CO.1/ 1.DEF
DF012	Battery voltage	182A	1.DEF/2.DEF
DF015	Immobiliser	183E	1.DEF/2.DEF
DF019	Airflow sensor circuit	1806	1.DEF/CO.0 CC.1/2.DEF 3.DEF/4.DEF
DF021	Fuel temperature sensor circuit	1805	CC.0/CO.1
DF022	Air temperature sensor circuit	1802	CC.0/CO.1
DF044	Reverse gear signal	1887	1.DEF
DF048	Low speed fan assembly circuit	1817	CC.1/CO.0 CC.0/OC
DF055	OBD warning light circuit	181D	CC.1/CO.0 CC.0/OC
DF061	Heater plug circuit	1826	1.DEF
DF067	Fuel pressure sensor circuit	1809	CC.0/CO.1 1.DEF
DF070	Camshaft/engine speed sensor consistency	1808	1.DEF/2.DEF 3.DEF/4.DEF
DF071	Pedal sensor circuit gang 1	180A	CO.0/CC.1 1.DEF/2.DEF
DF072	Fuel pressure information	1882	1.DEF/2.DEF 3.DEF/4.DEF 5.DEF/6.DEF 7.DEF
DF073	Pedal sensor circuit gang 2	180B	CO.0/CC.1 1.DEF/2.DEF

WARNING LIGHT MANAGEMENT

Management of instrument panel warning lights according to faults displayed.

Tool fault	Diagnostic tool title	Hexadecimal DTC codes	Fault warning light
DF074	Turbocharging pressure sensor	1804	CO.0/CC.1 1.DEF/2.DEF
DF075	Atmospheric pressure sensor	1803	DEF/1.DEF
DF078	Wastegate	1815	CC.1/CO.0 CC.0/OC 1.DEF/2.DEF 3.DEF/4.DEF 5.DEF/6.DEF
DF079	Thermoplunger relay n° 3	1836	CC.1/CO.0 CC.0/OC
DF081	Pre-heating relay circuit	1816	CC.1/CO.0 CC.0/OC
DF082	Low pressure pump relay circuit	1820	CC.1/CO.0 CC.O/CO
DF083	Fuel pressure solenoid valve circuit	1822	CC.1/CO.0 CC.0/OC 1.DEF
DF084	EGR valve position sensor circuit	180C	CO.0/CC.1 1.DEF/2.DEF
DF085	after ignition key signal	182B	1.DEF
DF086	Flow after key-off	183A	1.DEF/2DEF
DF088	Flywheel signal information consistency	1807	1.DEF/2.DEF
DF089	Injector control capacitor voltage	1886	DEF/1.DEF
DF090	Analog/digital converter	1880	DEF/1.DEF
DF091	Sensor supply voltage n° 1	180F	1.DEF/2.DEF
DF092	Sensor supply voltage n° 2	1810	1.DEF/2.DEF
DF093	Microcontroller	1885	DEF/1.DEF
DF094	Thermoplunger relay n° 1	1834	CC.1/CO.0 CC.0/OC

WARNING LIGHT MANAGEMENT

Management of instrument panel warning lights according to faults displayed.

Tool fault	Diagnostic tool title	Hexadecimal DTC codes	Fault warning light
DF095	Vehicle speed signal	1811	1.DEF/2.DEF 3.DEF/4.DEF
DF097	Clutch contact signal	1829	1.DEF
DF098	Main relay	1813	1.DEF/2.DEF
DF099	Cylinder 1 injector circuit	182E	CO/1.DEF 2.DEF/3.DEF
DF100	Cylinder 2 injector circuit	182F	CO/1.DEF 2.DEF/3.DEF
DF101	Cylinder 3 injector circuit	1830	CO/1.DEF 2.DEF/3.DEF
DF102	Cylinder 4 injector circuit	1831	CO/1.DEF 2.DEF/3.DEF
DF104	Thermoplunger relay n° 2	1835	CC.1/CO.0 CC.0/OC
DF105	Voltage stabiliser	1888	DEF/1.DEF
DF106	Damper valve circuit	1889	CC.1/CO.0 CC.0/OC
DF107	Turbulence valve	1824	CC.1/CO.0 CC.0/OC 1.DEF
DF 108	Brake signal	1828	1.DEF/2.DEF
DF109	Cruise control activation components	182C	1.DEF
DF110	Multiplex network	1884	1.DEF/2.DEF 3.DEF
DF241	EGR function	1814	CC.1/CO.0 CC.0/OC 1.DEF/2.DEF

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

DEF ***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 recurs, contact the Techline.
If the fault is **present**, contact the Techline.

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 test with the **diagnostic tool**.

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

NOTES	**Conditions for applying the fault finding procedure to the stored fault for CC.0 or CO.1:** If the fault is declared present after the fault has been cleared and a delay of **1 minute** with the engine running.
	Special notes: Use bornier **Elé. 1681** for all operations on the engine management computer connectors. Measure the actual temperature and compare it with the temperature reading on the tool.

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

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

Measure the **resistance** of the coolant temperature sensor between terminals **2** and **3** of its connector.
Replace the sensor if its resistance is not: **2252 Ω ± 112 at + 25°C**
811 Ω ± 39 at + 50°C
283 Ω ± 8 at + 80°C

Check the **insulation** against **earth** of the connection between:

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

Check the **continuity** of the connection between:

Engine management computer, **connector B track E1** → **track 2** 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 test with the **diagnostic tool**.

DF002 **CONTINUED 1**	

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

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

Measure the **resistance** of the coolant temperature sensor between terminals **2** and **3** of its connector.
Replace the sensor if its resistance is not: **2252 Ω ± 112 at + 25°C**
811 Ω ± 39 at + 50°C
283 Ω ± 8 at + 80°C

Check the **insulation** against **earth** of the connection between:

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

Check the **continuity** of the connection between:

Engine management computer, **connector B track E1** → **track 2** 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 test with the **diagnostic tool**.

DF002 **CONTINUED 2**	

1.DEF	***NOTES***	**Conditions for applying the fault finding procedure to stored faults:** If the fault is declared present after: – starting the engine, – a time delay of **8 minutes** with the engine running.
		Special notes: Use a workshop temperature sensor to compare the values.

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

Measure the **resistance** of the coolant temperature sensor between terminals **2** and **3** of its connector.
Replace the sensor if its resistance is not: **2252 Ω ± 112 at + 25°C**
811 Ω ± 39 at + 50°C
283 Ω ± 8 at + 80°C

Check the insulation against **earth** of the connection between:

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

Check the insulation against **+ 12 volts** of the connection between:

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

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

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

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

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

If the fault is still present, check that the **thermostat** is working properly.
Check that the cooling circuit is correctly filled and is has no leaks.
If necessary, (**see MR 395 Mechanical, Section 19A, Cooling**).
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 test with the **diagnostic tool**.

DF012 PRESENT OR STORED	BATTERY VOLTAGE 1.DEF: Battery undervoltage 2.DEF: Battery voltage too high

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault is declared present after: – starting the engine and, – a time delay of **30 second** with the engine running.
	Special notes: If necessary, perform a complete check of the charging circuit, referring to Technical Note 6014A, **Charging circuit fault finding**.

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

Reminder about computer operating voltage: **9 V < operating voltage < 14.5 V**.
– Using a voltmeter, take a reading of the battery voltage at its terminals.
– Then compare this with the value displayed on your diagnostic tool in the parameter menu **PR004 Computer supply voltage**.

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 tightness and the condition of the battery terminals.
– Using the appropriate wiring diagram:
Check the **continuity and absence of interference resistance** on the following connections:

+ 12 V battery feed ⟶ tracks **M2** and **M3**, connector **B** of the engine management computer (via the engine fuse then the **normally open contact** of the central injection unit supply relay).

Battery earth ⟶ tracks **L3, L4, M4** of connector **B** of the engine management computer.

Carry out the necessary repairs.

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

Check the charging circuit, apply Technical Note 6014A.
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 test with the **diagnostic tool**.

DF015 PRESENT OR STORED	IMMOBILISER 1.DEF: Fault on the connection 2.DEF: Engine immobiliser code fault

NOTES	**Conditions for applying the fault finding strategy to the fault stored:** Apply the fault finding strategy whether the fault is present or stored.

1.DEF	***NOTES***	**Not applicable to vehicles with engine immobiliser on a multiplex network.** This fault appears when there is an open circuit on the immobiliser line with the engine running. Carefully check all the wiring linked to this connection.

Check the decoder unit or UCH connections.
Check the engine management computer connections.
Check the battery.
Repair if necessary.

Using the corresponding wiring diagram, check the **continuity and absence of interference resistance** on the connection between:

- Engine management computer, **connector A track G2** → **track 6** of the decoder electronic control unit connector (G9T 720)
- Engine management computer, **connector A track G2** → **track B2** of the decoder electronic control unit connector (F9Q 718)
- Engine management computer, **connector A track G2** → **track 16** of the UCH connector (F9Q 732 and 740)
- Engine management computer, **connector A track G2** → **track 18** of the UCH connector (G9T 710)

Also check that it is insulated against **+ 12 V** and against **earth** (connectors disconnected).
Ensure the supply to the decoder 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 test with the **diagnostic tool**.

DF015 **CONTINUED**	

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

Display status **ET110 Immobiliser code not programmed**.
If the status is ACTIVE, check the immobiliser function and repeat from the start.
If the status is INACTIVE, clear the fault from the computer memory.
Switch off the ignition, then switch it on again to initialise the computer.
If the fault recurs, contact the Techline.

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 test with the **diagnostic tool**.

DF019 PRESENT OR STORED	AIR FLOW SENSOR CIRCUIT 1.DEF: Sensor supply fault CO.0 : Open circuit or short circuit to earth CC.1 : Short circuit to + 12 V 2.DEF: Consistency, engine running 3.DEF: Consistency, + 12 V APC present 4.DEF: Consistency after ignition switched off

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault reappears as present after: – ignition is cut-off until the end of the power latch* phase, – ignition on, or – a delay of **5 minutes** with the engine running at idle speed and a coolant temperature **> 60°C**.
	Special notes: Use bornier **Elé. 1681** for all operations on the engine management computer connectors.

1.DEF	***NOTES***	**Priorities in dealing with a number of faults:** Apply the interpretation of fault **DF091 Sensor feed voltage n° 1** first if it is present or stored.

Check the air flow sensor connections. Check the engine management computer connections. Repair if necessary.
Check the **insulation and continuity** on the connection between: Engine management computer, connector **B track G2** → **track 3** of the 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, – between **tracks 3 and 4** of the air flowmeter connector.

***** The immobiliser warning light will flash for a few seconds after the ignition is switched off.

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 test with the **diagnostic tool**.

DF019 **CONTINUED 1**	

Check for **+ 12 V after relay** on **track 4** of the air flowmeter connector.
Check for **earths**:

Electronic (coming from the electronic unit) → on **track 2** of the air flowmeter connector

Chassis (body) → on **track 6** of the air flowmeter connector

If the fault persists, replace the air flowmeter.

CO.0	***NOTES***	**Priorities in dealing with a number of faults:** In the event of the simultaneous presence of fault **DF022 Air temperature sensor circuit CO.1**, check that the air flowmeter connector is connected correctly.
		Conditions for applying the fault finding procedure to stored faults: If the fault becomes **present** with the engine running.

Check the air flow sensor connections.
Check the engine management computer connections.
Repair if necessary.

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

Engine management computer, **connector B track H4** → **track 5** of the air flowmeter connector

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

Check the following **insulations**:
- between **tracks 5 and 6** of the air flowmeter connector,
- between **tracks 2 and 5** of the air flowmeter connector.

Carry out the necessary repairs.

With the flowmeter **connected, the vehicle ignition on** and the **engine stopped**:
Check the voltage between **tracks 2** and **5** of the air flowmeter.
- If the voltage is not approximately **0.6 V ± 0.1**, replace the air flowmeter.

Remove the air flow sensor.
– Run **Test 5 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 test with the **diagnostic tool**.

DF019 **CONTINUED 2**	

CC.1	***NOTES***	**Conditions for applying the fault finding procedure to stored faults:** If the fault becomes **present** with the engine running.

Check the air flow sensor connections.
Check the engine management computer connections.
Repair if necessary.
Check the **insulation** against **+ 12 V** of the connection between:

Engine management computer, **connector B track H4** → **track 5** of the air flowmeter connector

Check the continuity of the following connections:

Engine management computer, **connector C track A3** → **track 2** of the air flowmeter connector

Engine management computer, **connector B track L3** → **track 6** of the air flowmeter connector

Engine management computer, **connector B tracks M2 and M3** → **track 4** of the air flowmeter connector

Engine management computer, **connector B track L3** → Battery **earth**

Between **tracks L3, L4 and M4 of connector B** of the engine management computer

If the fault persists, 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 test with the **diagnostic tool**.

DF019 **CONTINUED 3**	

2.DEF	***NOTES***	**Conditions for applying the fault finding procedure to stored faults:** If the fault is declared present after: starting the engine, an increase in temperature at idle speed exceeding **60°C** followed by a time delay of **40 seconds**.

Check the air flow sensor connections.
Check the engine management computer connections.
Repair if necessary.

Check the **insulation and continuity** on the connection between:

Engine management computer, **connector B track G2** → **track 3** of the air flowmeter connector

Check for the **+ 5 V** feed on **track 3** of the air flowmeter connector.
Check for **earth** on **track 6** of the air flowmeter connector.

Apply the interpretation of parameter **PR050 Air flow measurement** explained in this note, at warm idle speed (coolant temperature > **80°C**).

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 test with the **diagnostic tool**.

DF019 **CONTINUED 4**	

3.DEF	***NOTES***	**Priority in the event of a number of faults:** Deal with any other fault that is present or stored as a priority.
		Conditions for applying the fault finding procedure to stored faults: If the fault is declared present after: – the fault has been cleared, – the ignition is switched off, followed by the end of the power-latch* and the ignition is switched on.

Check the air flow sensor connections.
Check the engine management computer connections.
Repair if necessary.

Check for **continuity, insulation and the absence of interference resistance** on the connection between:

Engine management computer, **connector B track H4** → **track 5** of the air flowmeter connector

Check for the **+ 5 V** feed on **track 3** of the air flowmeter connector.
Check for **+ 12 V after relay** on **track 4** of the air flowmeter connector.
Check for **earth** on **track 6** of the air flowmeter connector.
Carry out the necessary repairs.

If the fault persists, replace the air flowmeter.

***** The immobiliser warning light will flash for a few seconds after the ignition is switched off.

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 test with the **diagnostic tool**.

DF019 **CONTINUED 5**	

4.DEF	***NOTES***	**Priority in the event of a number of faults:** Deal with any other fault that is present or stored as a priority.
		Conditions for applying the fault finding procedure to stored faults: If the fault is declared present after: – the fault has been cleared, – a time delay of **1 minute** with the engine running followed by the ignition and engine being switched off, then followed by the end of the power-latch* and the ignition being switched on again.

Check the air flow sensor connections.
Check the engine management computer connections.
Repair if necessary.

Check for **continuity, insulation and the absence of interference resistance** on the connection between:

Engine management computer, **connector B track H4** ⟶ **track 5** of the air flowmeter connector

Check for the **+ 5 V** feed on **track 3** of the air flowmeter connector.
Check for **+ 12 V after relay** on **track 4** of the air flowmeter connector.
Check for **earth** on **track 6** of the air flowmeter connector.

Carry out the necessary repairs.

***** The immobiliser warning light will flash for a few seconds after the ignition is switched off.

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 test with the **diagnostic tool**.

DF019 **CONTINUED 6**	

● **Check the entire air inlet circuit:** run **test 4**:

– **No** foreign bodies on the air flowmeter grille (**visual check only**).
Otherwise, replace the air flow sensor.
– Oil vapour recirculation circuit connection conformity.
– **Absence of leaks** or **blockages** in the **low** and **high pressure** air circuit: ducts, presence and tightness of the mounting clips, mounting of the turbocharging pressure sensor, intercooler, etc.

– Check that the damper valve is open (valve control **rests on the body** of the air vent unit).
– Check that the turbulence flap is in the rest position, if fitted to the vehicle.
With the flowmeter **connected**, the vehicle **ignition on** and the **engine stopped**:
– Check the voltage between **tracks 2** and **5** of the air flowmeter:
If the value is not **0.6 V ± 0.1**, replace the air flowmeter.

Check the exhaust gas recirculation valve operation:
Run **Test 9 Exhaust gas recirculation valve**, part A.

If the fault persists, 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 test with the **diagnostic tool**.

DF021 PRESENT OR STORED	FUEL 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 a delay of **2 minutes** with the engine running.
	Special notes: Use bornier **Elé. 1681** for all operations on the engine management computer connectors.

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

Check the fuel temperature sensor connections.
Check the engine management computer connections.
Repair if necessary.

Measure the **resistance** of the fuel temperature sensor between **tracks 1** and **2**:
Replace the sensor if its resistance is not: **3820 Ω ± 282 at + 10°C**
2050 Ω ± 100 at + 25°C
810 Ω ± 47 at + 50°C

Check the **insulation** against **earth** on the connection between:

Engine management computer, **connector B track J3** → **track 1** fuel 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 test with the **diagnostic tool**.

DF021 **CONTINUED**	

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

Check the fuel temperature sensor connections.
Check the computer connections.
Repair if necessary.

Measure the **resistance** of the fuel temperature sensor between **tracks 1 and 2**:
Replace the sensor if its resistance is not: **3820 Ω ± 282 at + 10°C**
2050 Ω ± 100 at + 25°C
810 Ω ± 47 at + 50°C

Check the **continuity and insulation** of the following connections against **+ 12 volts**:

Engine management computer, connector **B** **track J3** → **track 1** fuel temperature sensor connector

Engine management computer, connector **B** **track G1** → **track 2** fuel 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 test 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 a delay of **2 minutes** with the engine running.
	Special notes: Use bornier **Elé. 1681** for all operations on the engine management computer connectors.

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

Check the air flow sensor connections.
Check the engine management computer connections.
Repair if necessary.

Measure the **resistance** of the air temperature sensor between **tracks 1 and 2** of the air flowmeter:
Replace the air flowmeter if its resistance is not: **3714 Ω ± 161 at + 10°C**
2448 Ω ± 90 at + 20°C
1671 Ω ± 59 at + 30°C

With the air flowmeter disconnected, check the **insulation** against **earth** of the connection between:

Engine management computer, connector **B** **track D3** ⟶ **track 1** of the air flowmeter connector

Check **for + 5 V** on **track 3** 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 test with the **diagnostic tool**.

DF022 **CONTINUED**	

CO.1	***NOTES***	**Priority when dealing with a number of faults:** In the event of the simultaneous presence of fault **DF019 Air flow sensor circuit 2.DEF or 4.DEF**, check that the air flowmeter connector is connected correctly.

Check the air flow sensor connections.
Check the engine management computer connections.
Repair if necessary.

Measure the **resistance** of the air temperature sensor between **tracks 1 and 2** of the air flowmeter:
Replace the air flowmeter if its resistance is not: **3714 Ω ± 161 at + 10°C**
2448 Ω ± 90 at + 20°C
1671 Ω ± 59 at + 30°C

Check the **continuity and insulation** of the following connections against **+ 12 volts**:

Engine management computer, connector **B** **track D3** → **track 1** of the air flowmeter connector

Engine management computer, connector **C** **track A3** → **track 2** 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 test with the **diagnostic tool**.

DF044 PRESENT OR STORED	REVERSE GEAR INFORMATION 1.DEF: Reverse gear signal consistency

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault is declared present after a road test in reverse.
	Special notes: Use bornier **Elé. 1681** for all operations on the engine management computer connectors.

With the engine running, check that status **ET035 Reverse gear signal** becomes **ACTIVE** when reverse gear is engaged and **INACTIVE** when the gear lever returns to neutral or is in a "forward" gear (also check that the reversing lights come on and go out).
– If these checks work, clear the fault and exit the fault finding procedure.

If switching from reverse gear to neutral or forward gear does not change status **ET035 Reverse gear signal**:
Check the reverse gear switch connections. Repair if necessary.
Check the computer connections. Repair if necessary.

- Check the **continuity** of the following connection:

Engine management computer, **connector B track K4** ⟶ **track 2** of the reversing light switch

- Also check the **insulation** of this connection **against earth** and against **+ 12 volts**.
- Check for + after ignition feed on **track 1** of the reverse gear switch connector and fuse **F14 (15 A)**.

Check that the reverse drive contactor is functioning by using an ohmmeter:
Insulation between **tracks 1 and 2** when reverse gear is not engaged.
Continuity between **tracks 1 and 2** when reverse gear is engaged.
Replace the switch 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 test 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 CC.0 : Short circuit to earth CO : Open circuit

NOTES	**Conditions for applying the fault finding procedure to stored faults:** The fault reappears after: – the fault has been cleared from memory, – actuation of the relay using command **AC011 Low speed fan assembly relay**.
	Special notes: – Use bornier **Elé. 1681** for all operations on the engine management computer connectors. – refer to the **Wiring diagrams** Technical Note for your vehicle to locate the relevant fuses and relays.

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

Check the connections of the low-speed fan assembly relay mounting.
Check the engine management computer connections.
Repair if necessary.

Check the **resistance** of the low speed fan assembly relay coil.
Replace the relay if its resistance is not **60 Ω ± 5 at + 20°C**.

Remove the low speed relay and check the **insulation** against **+ 12 V** on the connection between:

Engine management computer, **connector C track A2** → **track 2 or 2A or K2 or 85** (depending on the engine) of the low speed fan assembly relay mounting

Check the **insulation** between **tracks 2 and 3 or 2A and 3A or K2 and K3 or 85 and 30** (depending on the engine) of the low speed fan assembly relay mounting.

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 test with the **diagnostic tool**.

DF048 **CONTINUED 1**	

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

Check the connections of the low-speed fan assembly relay mounting. Check the engine management computer connections. Repair if necessary.
Check the **resistance** of the low speed fan assembly relay coil. Replace the relay if its resistance is not **60 Ω ± 5 at + 20°C**.
Remove the low speed relay and check the **continuity and insulation** against earth on the connection between: Engine management computer, **connector C track A2** → **track 2 or 2A or K2 or 85** (depending on the engine) of the low speed fan assembly relay mounting Check **for + 12 V after relay feed** on **track 1 or 1A or K1 or 86** (depending on the engine) of the low speed fan assembly relay.

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 test with the **diagnostic tool**.

DF048 **CONTINUED 2**	

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

Check the connections of the low-speed fan assembly relay mounting.
Check the engine management computer connections.
Repair if necessary.

Check the **resistance** of the low speed fan assembly relay coil.
Replace the relay if its resistance is not **60 Ω ± 5 at + 20°C**.

Remove the low speed relay and check the **continuity and insulation** against earth on the connection between:

Engine management computer, **connector C track A2** → **track 2 or 2A or K2 or 85** (depending on the engine) of the low speed fan assembly relay mounting

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

Earth (via the fan assembly motor) → **track 5 or 5A or K5 or 87** (depending on the engine) of the low speed fan assembly relay mounting

Engine management computer, **connector C track A2** → **track 2 or 2A or K2 or 85** (depending on the engine) of the low speed fan assembly relay mounting

Check **for + 12 V after relay feed** on **track 1 or 1A or K1 or 86** (depending on the engine) of the low speed fan assembly relay.

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 test with the **diagnostic tool**.

EXCEPT MULTIPLEX

DF055 PRESENT OR STORED	OBD WARNING LIGHT CIRCUIT CC.1 : Short circuit to + 12 V CO.0 : Open circuit or short circuit to earth CC.0 : Short circuit to earth CO : Open circuit

NOTES	**Conditions for applying the fault finding procedure to stored faults:** The fault reappears after: – the fault has been cleared from memory, – an actuator command **AC022 OBD warning light**.
	Special notes: – Use bornier **Elé. 1681** for all operations on the engine management computer connectors.

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

Check the instrument panel connections.
Check the engine management computer connections.
Repair if necessary.

With the instrument panel connector disconnected, check the **insulation** against **+ 12 volts** on the connection between:

Engine management computer **connector A track H3** → **track 26** of the instrument panel connector

If the connection is correct, perform fault finding on the instrument panel.

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 test with the **diagnostic tool**.

DF055 **CONTINUED**	

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

Check the instrument panel connections. Check the engine management computer connections. Repair if necessary.
With the instrument panel connector disconnected, check the **continuity and insulation** against earth of the connection between: Engine management computer **connector A track H3** ⟶ **track 26** of the instrument panel connector If the connection is correct, perform fault finding on the instrument panel.

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 test 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:** The fault reappears after: – clearing the fault from the memory, – actuating the plugs using command **AC010 Preheating relay**.
	Special notes: Use bornier **Elé. 1681** for all operations on the engine management computer connectors. – Refer to the **Wiring diagrams** Technical Note for the vehicle to locate the relevant fuses and relays.
	WARNING – Please observe the cleanliness guidelines and safety advice.

1.DEF	***NOTES***	**Priority when dealing with a number of faults:** Deal with fault **DF091 Sensor feed voltage n° 1** first if it is present.

Check the preheating unit connections.
Check the connections on all the heater plugs.
Repair if necessary.

– Measure the **resistance** of the heater plugs
Replace the plug if its resistance is **> 2 Ω**.

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

preheating unit **track 1** → heater plug of **cylinder 3**

preheating unit **track 2** → heater plug of **cylinder 4**

preheating unit **track 6** → heater plug of **cylinder 1**

preheating unit **track 7** → heater plug of **cylinder 2**

– Check **for + 12 V battery feed** on **track 3** of the preheating relay (via max fuse).
– Check that the engine is earthed.

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 test with the **diagnostic tool**.

DF061 **CONTINUED**	

Check the engine management computer connections.
Check the **continuity and absence of interference resistance** on the connection (preheating relay unit control line) between:

Engine management computer, **connector B track B3** → **track 9** preheating unit connector

Check each heater plug current on F9Q engines:
– With the engine stopped, disconnect the coolant temperature sensor (change to defect mode).
– **Important: defect mode causes the engine cooling fans to operate.**
– Start the engine.
– 5 to 10 seconds later, check the current of one heater plug with a current clamp (**Voltmeter/ammeter** menu on the Clip Technic tool or using a separate current clamp).
– Replace the heater plug if the current is < 8.5 A and > 13 A.
– Do the same for the three other heater plugs.
– Switch off the engine.
– Reconnect the coolant temperature sensor.
– Erase the faults.

If the fault is still present, contact Techline.

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 test 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 volts 1.DEF: Sensor supply fault

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault is declared present after a time delay of **1 minute** with the engine running.
	Special notes: Use bornier **Elé. 1681** for all operations on the engine management computer connectors.
	WARNING – **Checks on the ohmmeter are not authorised for the fuel pressure sensor.** – **Please observe the cleanliness guidelines and safety advice.**

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

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

Check the **insulation** against **earth** of the connection between:

Engine management computer, **connector B track D1** → **track 2** of the fuel pressure sensor connector

Check the **continuity** of the **connection** between:

Engine management computer, **connector B track H2** → **track 3** of the fuel pressure sensor connector

If the fault is still present, 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 test with the **diagnostic tool**.

DF067 **CONTINUED 1**	

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

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

Check the **continuity and insulation** against **+ 12 volts** of the connection between:

Engine management computer, **connector B track D1** → **track 2** of the fuel pressure sensor connector

Check the **continuity** of the connection between:

Engine management computer, **connector C track B3** → **track 1** of the fuel pressure sensor connector

If the fault is still present, 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 test with the **diagnostic tool**.

DF067 **CONTINUED 2**	

1.DEF	***NOTES***	**Priority in the event of a number of faults:** Apply the interpretation of fault **DF091 Sensor feed voltage n° 1** first if it is present.

Check the fuel pressure sensor connections.
Check the engine management computer connections.
Repair if necessary.
Check the **continuity and absence of interference resistance** on the following connections:

Engine management computer, **connector B track D1** ⟶ **track 2** of the fuel pressure sensor connector

Engine management computer, **connector B track H2** ⟶ **track 3** of the fuel pressure sensor connector

Engine management computer, **connector C track B3** ⟶ **track 1** of the fuel pressure sensor connector

Carry out the necessary repairs.

If all these connections are correct, check there is a fuel pressure sensor power supply:

+ 5 V ⟶ **track 3** of the rail pressure sensor connector

Earth ⟶ **track 1** of the rail pressure sensor connector

If the connections and supplies 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 test 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: Camshaft signal incoherence

NOTES	**Conditions for applying the fault finding procedure to stored faults:** The fault is declared present after: – the starter has been activated for **10 seconds**, or – a time delay of **1 minute** with the engine running.
	Special notes: – Use bornier **Elé. 1681** for all operations on the computer connector. – Check the charging circuit (see Technical Note 6014A **Charging circuit fault finding**) and check the stability of the charging voltage using an oscilloscope. – Interference could be caused by the alternator or starter motor. If it is possible to start the vehicle by pushing it, one of these components could be involved.

1.DEF	***NOTES***	**Priority in the event of a number of faults:** Use the interpretation of fault **DF012 Battery voltage** first, if it is present.

Check the **continuity and presence** of the supply between **tracks 1 and 3** of the **camshaft sensor** connector:

+ 12 V after relay → **track 3** of the camshaft sensor connector

Earth → **track 1** of the camshaft sensor connector

Check the **continuity and absence of interference resistance** on the connection between:

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

Repair if necessary.

Display the conformity of the camshaft signal using an oscilloscope: square pulse signal, amplitude: **battery voltage - 50 mV** (for information, if bat V = 12.6 V, the amplitude is 12.54 V).
If the check reveals interference, check that the engine earths are correct (oxidation, tightness, etc.).
If the fault is still present, check that the sensor is correctly fitted and in good condition (overheating).
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 test with the **diagnostic tool**.

DF070 **CONTINUED 1**	

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

Check the **engine speed sensor** connections.
Check the engine management computer connections.
Repair if necessary.

Measure the **resistance** of the engine speed sensor between **tracks A and B on F9Q engines**:
Replace the sensor if its resistance is not: **800 Ω ± 80 at + 20°C**.
Measure the **resistance** of the engine speed sensor between **tracks 1 and 2 on G9T engines**.
Replace the sensor if its resistance is not: **235 Ω ± 35 at + 23°C**.

Check the **continuity** of the following connections **on F9Q engines**:

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 **continuity** of the following connections **on G9T engines**:

engine management computer, **connector B track G3** ⟶ **track 1** of the engine speed sensor

engine management computer, **connector B track H3** ⟶ **track 2** of the engine speed sensor.

Check that the engine earthing is in order (oxidation, tightness, etc.).
Check the mounting, the air gap (if necessary refer to the information in the Workshop Repair Manuals for the vehicle) and the condition of the sensor (overheating).
During the starting phase, record **PR006 Engine speed** and check that there is no interference (micro-breaks).
Replace the engine speed sensor if necessary.

Perform a visual inspection of the flywheel and the target (broken tooth, damaged tooth, warped flywheel).
Check that the engine speed signal is correct using an oscilloscope: no interference, broken tooth, etc.
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 test with the **diagnostic tool**.

DF070 **CONTINUED 2**	

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

Check the camshaft sensor connections.
Check the engine management computer connections.
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 **for + 12 V after relay feed** on **track 3** of the camshaft sensor connector.

– Check the tension of the **timing belt.**
– Check the conformity of the assembly: camshaft sprocket/camshaft.
– Check the timing adjustment.

On G9T engines and if an operation is carried out on the timing gears: **camshaft - high pressure pump**:
– Make sure the high-pressure pump pinion has been properly refitted.
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 test with the **diagnostic tool**.

DF071 PRESENT	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 2.DEF: Consistency with brake signal

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault is declared present following a series of actions on the accelerator pedal at full load or with no load.
	Special notes: Use bornier **Elé. 1681** for all operations on the engine management computer connectors. Consult the **Wiring diagrams** Technical Note for your vehicle to locate the relevant **electrical connections and connectors**.

CO.0	***NOTES***	**Priority in the event of a number of faults:** In the event of the simultaneous presence of fault **DF073 Pedal sensor circuit gang 2 CO.0**, check that the pedal sensor connector is connected correctly.

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

F9Q engine:
Measure the **resistance** of pedal sensor gang 1 between **tracks 2 and 4**.
Replace the sensor if the resistance is not: **1.8 kΩ ± 0.5 at + 20°C** (no load).
Measure the **resistance** of pedal sensor gang 1 between **tracks 4 and 6**.
Replace the sensor if the resistance is not: **1.7 kΩ ± 0.9 at + 20°C**.

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

Engine management computer, **connector A track C1** → **track 2** of the pedal sensor connector

Also ensure the **insulation** of this connection against the following connections:

Engine management computer, **connector A track B3** → **track 4** of the pedal sensor connector

Engine management computer, **connector A track A3** → **track 5** of the pedal sensor connector

Check the **continuity** of the connection between:

Engine management computer, connector **A track E1** → **track 4** of the pedal 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 test with the **diagnostic tool**.

DF071 **CONTINUED 1**	

G9T engine:
Measure the **resistance** of pedal sensor gang 1 between **tracks 2 and 4**.
Replace the sensor if the resistance is not: **1.2 kΩ ± 0.48 at + 20°C**.

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

Engine management computer, **connector A track C1** → **track 3** of the pedal sensor connector

Also ensure the **insulation** of this connection against the following connections:

Engine management computer, **connector A track B3** → **track 2** of the pedal sensor connector

Engine management computer, **connector A track A3** → **track 1** of the pedal sensor connector

Check the **continuity** of the connection between:

Engine management computer, connector **A track E1** → **track 4** of the pedal sensor connector

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

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

F9Q engine:
Measure the **resistance** of pedal sensor gang 1 between **tracks 2 and 4**.
Replace the sensor if the resistance is not: **1.8 kΩ ± 0.5 at + 20°C** (no load).
Measure the **resistance** of pedal sensor gang 1 between **tracks 4 and 6**.
Replace the sensor if the resistance is not: **1.7 kΩ ± 0.9 at + 20°C**.

Check the **insulation** against **+ 12 V** on the connection between:

Engine management computer, **connector A track C1** → **track 2** of the pedal sensor connector

Check the **continuity** of the connection between:

Engine management computer, **connector A track B3** → **track 4** of the pedal sensor connector

Check for**earth** on **track 4** of the pedal 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 test with the **diagnostic tool**.

DF071 **CONTINUED 2**	

G9T engine:
Measure the **resistance** of pedal sensor gang 1 between **tracks 2 and 4**.
Replace the sensor if the resistance is not: **1.2 kΩ ± 0.48 at + 20°C**.

Check the **insulation** against **+ 12 V** on the connection between:

Engine management computer, **connector A track C1** → **track 3** of the pedal sensor connector

Check the **continuity** of the connection between:

Engine management computer, **connector A track B3** → **track 2** of the pedal sensor connector

Check for **earth** on **track 2** of the pedal sensor connector.

1.DEF	***NOTES***	**Priorities when dealing with a number of faults:** Apply the interpretation of fault **DF091 Sensor feed voltage n° 1** first if it is present or stored.

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

F9Q engine:
– Check the **continuity and absence of interference resistance** on the following connections:

Engine management computer, **connector A track E1** → **track 6** of the pedal sensor connector

Engine management computer, **connector A track C1** → **track 2** of the pedal sensor connector

Engine management computer, **connector A track B3** → **track 4** of the pedal sensor connector

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

Engine management computer, **connector A track E1** → **track 6** of the pedal sensor connector

Engine management computer, **connector A track B3** → **track 4** of the pedal sensor connector

– Also check that they are insulated against **+ 12 volts**.
– If the fault is still present, 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 test with the **diagnostic tool**.

DF071 **CONTINUED 3**	

G9T engine:
– Check the **continuity and absence of interference resistance** on the following connections:

Engine management computer, **connector A track E1** → **track 4** of the pedal sensor connector

Engine management computer, **connector A track C1** → **track 3** of the pedal sensor connector

Engine management computer, **connector A track B3** → **track 2** of the pedal sensor connector

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

Engine management computer, **connector A track E1** → **track 4** of the pedal sensor connector

Engine management computer, **connector A track B3** → **track 2** of the pedal sensor connector

– Also check that they are insulated against **+ 12 volts**.
– If the fault is still present, go to the accelerator pedal sensor conformity check.

2.DEF	***NOTES***	**Priority in the event of a combination of faults:** Apply the interpretation of fault **DF073 Pedal sensor circuit gang 2 2.DEF** and **DF108 Brake signal** first, if they are present or stored.

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

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

Engine management computer, **connector A track C1** → **track 3** of the pedal sensor connector

– Also check that it is insulated against **+ 12 volts**.

– If the fault is still present, 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 test 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: Solenoid valve jammed: fuel overpressure 5.DEF: Solenoid valve jammed: fuel underpressure 6.DEF: Pressure drop in the rail 7.DEF: Underpressure at idle speed

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault is present after a delay of **2 minutes** with the engine running at idle speed.
	Special notes: Use bornier **Elé. 1681** for all operations on the engine management computer connectors.
	WARNING – **Checks on the ohmmeter are not authorised for the fuel pressure sensor.** – **Please observe the cleanliness guidelines and safety advice.**

1.DEF ***3.DEF*** ***4.DEF***	***NOTES***	**Priority when dealing with a number of faults:** Treat as a priority any other fault that is present or stored.
		Special notes: If the fault follows a period of underpressure, a loop variation or an operation on the pump or low pressure depriming, **do not take this fault into account**. Clear the fault. Warm engine: start the engine and leave it running at idle speed (**1 minute**). If the fault appears, perform the fault finding procedure explained below. If not, carry out a road test at a speed higher than **3000 rpm** (stay above this speed for at least **10 seconds** to remove the fault). If the fault recurs, perform the fault finding procedure given below.

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 test with the **diagnostic tool**.

DF072 **CONTINUED 1**	

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

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

Engine management computer, **connector B track L1** → **track 2** of the fuel pressure solenoid valve connector

Check for **insulation** against **+ 5 V** of the connection between:

Engine management computer, **connector B track D1** → **track 2** of the fuel pressure sensor connector

Clear the fault.
– Run command **AC006: Fuel pressure solenoid valve**:
You should notice vibration from the fuel pressure regulator. Otherwise, go to step 1 of fault finding procedure **AC006**.
The presence of air in the circuit is likely to lead to this type of fault. Apply test 3.

Check that there are no air bubbles in the diesel fuel low pressure circuit.
Check the pressure regulation solenoid valve using part B of **ALP 7, Rough idle**.
If the fault is still present, replace the high pressure pump.

If the fault is still present, contact Techline.

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 test with the **diagnostic tool**.

DF072 **CONTINUED 2**	

2.DEF ***5.DEF*** ***6.DEF*** ***7.DEF***	***NOTES***	**WARNING** – Please observe the cleanliness guidelines and safety advice.

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

Check **for + 12 V after relay** on **track1** of the fuel pressure solenoid valve.
Check the **insulation, continuity and absence of interference resistance** on the connections between:

Engine management computer, **connector B track L1** → **track 2** of the fuel pressure solenoid valve connector.

Engine management computer, **connector B track D1** → **track 2** of the fuel pressure sensor connector

Run command **AC006 Fuel pressure solenoid valve**. You should be able to feel vibrations on the fuel pressure solenoid valve. If not, go to step 1 of interpretation of commands **AC006**.

With the vehicle ignition on, and engine stopped for over **1 minute**:
– Display **PR083 Rail pressure**
  – If the value is **below 30 bar**, the sensor is in order,
  – If not replace the fuel pressure sensor.

– **Detailed handling of fault finding on the hydraulic circuit:**
Step 1
– Check the connections of the following components:
  * Fuel pressure sensor.
  * Fuel pressure solenoid valve.
  * Computer.
  * Fuel temperature sensor.
  * Diesel fuel filter.
  * Also check the condition of the wiring (wear, kinks, etc.).
– Check that the seal is correctly fitted to the fuel pressure solenoid valve.
If all of the checks reveal no faults, proceed to stage 2.

Carry out the hydraulic circuit checks.

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 test with the **diagnostic tool**.

DF072 **CONTINUED 3**	

PLEASE OBSERVE THE CLEANLINESS AND SAFETY ADVICE BEFORE ANY REMOVAL OPERATION.

Checking the fuel Low Pressure system:

Step 2

– Check the low pressure circuit: run **test 3 Low pressure circuit check**.
  * If the tubes or hoses are worn or damaged, repair them. Otherwise, proceed to stage 3.

Step 3

– In the event of a correlation between the appearance of the fault and an operation on the fuel filter, rinse the bowl to remove any accumulated impurities.
– Check the condition of the fuel filter:
  * If the filter is dirty, replace it. You must clean the fuel filter bowl before fitting the new filter to prevent pollution of the high pressure pump and the high pressure circuit. Go to stage 4.

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 test with the **diagnostic tool**.

DF072 **CONTINUED 4**	

The low pressure circuit has been checked and no faults were detected, otherwise make the necessary repairs.

STAGE 4

– Clear the faults using the CLIP diagnostic tool.
– Start the engine.
– Display **PR083 Rail pressure**

↓

G9T: PR083 > 170 bar when starting?
F9Q: PR083 > 150 bar when starting?

NO → Check that there are no internal injector leaks using the procedure recommended in **test 10 Poor injector operation**.

↓

Is one of the injectors faulty?

NO → (to the next question)

YES → Replace the faulty injector.

YES

↓

Increase the engine temperature so the diesel fuel reaches 50°/60°C.
Road test:
– Select 3rd or 4th gear, accelerate with the pedal fully depressed.
– Record the following parameters:
PR086 Rail pressure loop difference
PR083 Pressure in the rail.
PR001 Fuel temperature

Does the engine stall or does the red fault warning light come on?

YES → Replace* the high-pressure pump.

NO

↓

Contact the Techline.

*Note:
Please observe all recommendations made in the repair procedures when removing mechanical and/or electrical components and **observe the cleanliness guidelines and safety advice**.

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 test with the **diagnostic tool**.

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

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault is declared present following a series of actions on the accelerator pedal at full load or with no load.
	Special notes: Use bornier **Elé. 1681** for all operations on the engine management computer connectors. Consult the **Wiring diagrams** Technical Note for your vehicle to locate the relevant **electrical connections and connectors**.

CO.0	***NOTES***	**Priorities in dealing with a number of faults:** In the event of the simultaneous presence of fault **DF071 Pedal sensor circuit gang 1 CO.0**, check that the pedal sensor connector is connected correctly.

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

F9Q engine:
Measure the **resistance** of pedal sensor **gang 2** between **tracks 1 and 5**.
Replace the sensor if the resistance is not: **4.5 kΩ ± 0.5 at + 20°C** (no load).
Measure the **resistance** of pedal sensor **gang 2**, between **tracks 3 and 5**.
Replace the sensor if its resistance is not: **3 kΩ ± 0.5 at + 20°C.**

Check the **continuity** of the connection between:

Engine management computer, **connector A track F1** → **track 1** of the 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 4** of the pedal sensor connector

Engine management computer, **connector A track A3** → **track 5** of the pedal sensor connector

Check the **continuity** of the connection between:

Engine management computer, **connector A track H2** → **track 3** of the pedal 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 test with the **diagnostic tool**.

DF073 **CONTINUED 1**	

G9T engine:
Measure the **resistance** of pedal sensor **gang 2** between **tracks 1 and 5**.
Replace the sensor if the resistance is not: **1.7 kΩ ± 0.68 at + 20°C**.

Check the **continuity** of the connection between:

Engine management computer, **connector A track F1** → **track 6** of the 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** of the pedal sensor connector

Engine management computer, **connector A track A3** → **track 1** of the pedal sensor connector

Check the **continuity** of the connection between:

Engine management computer, **connector A track H2** → **track 5** of the pedal sensor connector

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

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

F9Q engine:
Measure the **resistance** of pedal sensor **gang 2** between **tracks 1 and 5**.
Replace the sensor if the resistance is not: **4.5 kΩ ± 0.5 at + 20°C** (no load).
Measure the **resistance** of pedal sensor **gang 2**, between **tracks 3 and 5**.
Replace the sensor if its resistance is not: **3 kΩ ± 0.5 at + 20°C**.

Check the **insulation** against **+ 12 V** on the connection between:

Engine management computer, **connector A track F1** → **track 1** of the pedal sensor connector

Check the **continuity** of the connection between:

Engine management computer, **connector A track A3** → **track 5** of the pedal sensor connector

Check for earth on **track 1** of the pedal 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 test with the **diagnostic tool**.

DF073 **CONTINUED 2**	

G9T engine:
Measure the **resistance** of pedal sensor **gang 2** between **tracks 1 and 5**.
Replace the sensor if the resistance is not: **1.7 kΩ ± 0.68 at + 20°C**.

Check the **insulation** against **+ 12 V** on the connection between:

Engine management computer, **connector A track F1** → **track 6** of the pedal sensor connector

Check the **continuity** of the connection between:

Engine management computer, **connector A track A3** → **track 1** of the pedal sensor connector

Check for earth on **track 1** of the pedal sensor connector.

If the fault persists, replace the pedal sensor.

1.DEF	***NOTES***	**Priorities in dealing with a number of faults:** Apply the interpretation of fault **DF092 Sensor feed voltage n° 2** first if it is present or stored.

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

F9Q engine:
Check the **continuity and absence of interference resistance** on the following connections:

Engine management computer, **connector A track F1** → **track 1** of the pedal sensor connector

Engine management computer, **connector A track H2** → **track 3** of the pedal sensor connector

Engine management computer, **connector A track A3** → **track 5** of the pedal sensor connector

Also check that they are insulated against **+ 12 V**.
Check the **insulation** against earth on the connection between:

Engine management computer, **connector A track H2** → **track 3** 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 test with the **diagnostic tool**.

DF073 **CONTINUED 3**	

G9T engine:
Check the **continuity and absence of interference resistance** on the following connections:

Engine management computer, **connector A track F1** → **track 6** of the pedal sensor connector

Engine management computer, **connector A track H2** → **track 5** of the pedal sensor connector

Engine management computer, **connector A track A3** → **track 1** of the pedal sensor connector

Also check that they are insulated against **+ 12 V**.
Check the **insulation** against earth on the connection between:

Engine management computer, **connector A track H2** → **track 5** of the pedal sensor connector

If the fault persists, replace the pedal sensor.

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

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

F9Q engine:
Measure the **resistance** of the pedal sensor **gang 1** between **tracks 4 and 6**.
Replace the sensor if the resistance is not: **1.7 kΩ ± 0.9 at + 20°C**.
Measure the **resistance** of pedal sensor **gang 2**, between **tracks 3 and 5**.
Replace the sensor if its resistance is not: **3 kΩ ± 0.5 at + 20°C**.

Accelerator pedal in the **no load** position:
Measure the **resistance** of pedal sensor **gang 1** between **tracks 2 and 4**.
Replace the sensor if the resistance is not: **1.8 kΩ ± 0.5 at + 20°C**.
Measure the **resistance** of pedal sensor **gang 2** between **tracks 1 and 5**.
Replace the sensor if the resistance is not: **4.5 kΩ ± 0.5 at + 20°C**.

Accelerator pedal in the **full load** position:
Measure the **resistance** of pedal sensor **gang 1** between **tracks 2 and 4**.
Replace the sensor if its resistance is not: **3 kΩ ± 0.5 at + 20°C**.
Measure the **resistance** of pedal sensor **gang 2** between **tracks 1 and 5**.
Replace the sensor if the resistance is not: **5.5 kΩ ± 0.5 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 test with the **diagnostic tool**.

DF073 **CONTINUED 4**	

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

Engine management computer, **connector A track E1** → **track 6** of the pedal sensor connector

Engine management computer, **connector A track C1** → **track 2** of the pedal sensor connector

Engine management computer, **connector A track B3** → **track 4** of the pedal sensor connector

Engine management computer, **connector A track H2** → **track 3** of the pedal sensor connector

Engine management computer, **connector A track F1** → **track 1** of the pedal sensor connector

Engine management computer, **connector A track A3** → **track 5** of the pedal sensor connector

Carry out the necessary operations if the resistance is abnormally high.
If the checks are correct, replace the accelerator pedal sensor.

Turn the page for the G9T engine.

G9T engine:
Measure the **resistance** of pedal sensor **gang 1** between **tracks 2 and 4**.
Replace the sensor if the resistance is not: **1.2 kΩ ± 0.48 at + 20°C**.
Measure the **resistance** of pedal sensor **gang 2** between **tracks 1 and 5**.
Replace the sensor if the resistance is not: **1.7 kΩ ± 0.68 at + 20°C**.

Accelerator pedal in the **no load** position:
Measure the **resistance** of pedal sensor **gang 1** between **tracks 2 and 3**.
Replace the sensor if its resistance is not: **1.3 kΩ ± 0.5 at + 20°C**.
Measure the **resistance** of pedal sensor **gang 2** between **tracks 1 and 6**.
Replace the sensor if its resistance is not: **1.3 kΩ ± 0.5 at + 20°C**.

Accelerator pedal in the **full load** position:
Measure the **resistance** of pedal sensor **gang 1** between **tracks 2 and 3**.
Replace the sensor if the resistance is not: **2.4 kΩ ± 0.5 at + 20°C**.
Measure the **resistance** of pedal sensor **gang 2** between **tracks 1 and 6**.
Replace the sensor if the resistance is not: **2.4 kΩ ± 0.5 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 test with the **diagnostic tool**.

DF073 **CONTINUED 5**	

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

Engine management computer, **connector A track E1** → **track 4** of the pedal sensor connector

Engine management computer, **connector A track C1** → **track 3** of the pedal sensor connector

Engine management computer, **connector A track B3** → **track 2** of the pedal sensor connector

Engine management computer, **connector A track H2** → **track 5** of the pedal sensor connector

Engine management computer, **connector A track F1** → **track 6** of the pedal sensor connector

Engine management computer, **connector A track A3** → **track 1** of the pedal sensor connector

Carry out the necessary operations if the resistance is abnormally high.
If the checks are correct, replace the accelerator 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 test with the **diagnostic tool**.

DF074 PRESENT OR STORED	TURBOCHARGER PRESSURE SENSOR CO.0 : Open circuit or short circuit to earth CC.1 : Short circuit to + 12 V 1.DEF: Sensor supply fault 2.DEF: Consistency between the turbocharging pressure and the atmospheric pressure

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault is declared present after: – the engine is started, or – carrying out a road test.
	Special notes: – Processing of this fault does not apply for the **Master** vehicle type. – Use bornier **Elé. 1681** for all operations on the engine management computer connectors. – See the **Wiring diagrams** Technical Note for the vehicle.

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

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

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

Engine management computer, **connector B track C1** → **track B** turbocharging pressure sensor connector

Also check the continuity of the connection between:

Engine management computer, **connector B track J2** → **track C** turbocharging pressure sensor connector

If the fault persists, change the turbocharging 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 test with the **diagnostic tool**.

DF074 **CONTINUED 1**	

CC.1	***NOTES***	**Special notes:** This fault appears when the turbocharging pressure is greater than the maximum value of the sensor.

Check the part number of the turbocharger pressure sensor in relation to the engine and the vehicle.
Check the turbocharger pressure sensor connections.
Check the engine management computer connections.
Repair if necessary.

Check the **insulation** against **+ 12 V** on the connection between:

Engine management computer, **connector B track C1** → **track B** turbocharging pressure sensor connector

Check the **continuity** of the connection between:

Engine management computer, **connector C track A4** → **track A** turbocharging pressure sensor connector

If the fault is still present, apply the interpretation of parameter **PR082 Turbocharging pressure**.
If **DF074 CC.1** is stored:
– Clear the fault.
– Carry out a road test where the accelerator pedal is fully depressed.
– If **DF074 CC.1** is Present and then Stored, replace the turbocharging pressure sensor.

● **Check that the control rod of the turbocharger is not jammed:**
– **Run test 6: Fixed geometry turbocharger vacuum control, for a fixed geometry turbocharger,**
– **Run test 7: Variable geometry turbocharger vacuum control, for a variable geometry turbocharger.**

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 test with the **diagnostic tool**.

DF074 **CONTINUED 2**	

1.DEF	***NOTES***	**Priorities in dealing with a number of faults:** Apply the interpretation of fault **DF091 Sensor feed voltage n° 1** first if it is present or stored.

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

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

Engine management computer, connector **B** **track C1** → **track B** turbocharging pressure sensor connector

Engine management computer, connector **C** **track A4** → **track A** turbocharging pressure sensor connector

Engine management computer, connector **B** **track J2** → **track C** turbocharging pressure sensor connector

If the fault is still present, apply the interpretation of parameter **PR082 Turbocharging pressure**.

2.DEF	***NOTES***	**Priorities in dealing with a number of faults:** Apply the interpretation of fault **DF075 Atmospheric pressure sensor** first if it is present.

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

Check the **continuity and absence of interference resistance** on the connection between:

Engine management computer, **connector B** **track C1** → **track B** turbocharging pressure sensor connector

Carry out the necessary operations if the resistance is abnormally high.
If the fault persists:
Check the sensor mounting and the sealing ring on its seal or hose (tightness of clip, etc.).
Check the sealing of the inlet circuit: run **test 4 Turbocharged air inlet circuit check**.
If the fault is still present, apply the interpretation of parameter **PR082 Turbocharging pressure**.

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 test with the **diagnostic tool**.

DF075 **PRESENT**	ATMOSPHERIC PRESSURE SENSOR DEF : Stored fault 1.DEF : Internal electronic fault

DEF ***1.DEF***	***NOTES***	**Priorities in dealing with a number of faults:** Apply the interpretation of fault **DF091 Sensor feed voltage n° 1** first if it is present or stored.

The atmospheric pressure sensor is inside the engine management computer, and no repairs are possible. **Simply check that the** engine management computer **air inlet is not blocked**.
If the fault is **present, contact the Techline**.

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 test with the **diagnostic tool**.

DF078 PRESENT OR STORED	TURBOCHARGING LIMITATION VALVE CC.1 : Short circuit to + 12 V CO : Open circuit CC.0 : Short circuit to earth CO.0 : Open circuit or short circuit to earth 1.DEF: Positive deviation in turbocharging regulation 2.DEF: Negative deviation in turbocharging regulation 3.DEF: Turbocharging pressure relief valve jammed due to an open circuit 4.DEF: Turbocharging pressure relief valve jammed due to a short circuit to + 12 V 5.DEF: Turbocharging pressure relief valve jammed due to a short circuit to earth 6.DEF: Turbocharging pressure relief valve jammed due to an open circuit or a short circuit to earth

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault reappears stored after: – the fault memory has been cleared and – an actuator command **AC004 Turbocharging pressure relief valve**.
	Special notes: – Processing of this fault does not apply for the **Master** vehicle type. – Use bornier **Elé. 1681** for all operations on the engine management computer connectors.

CC.1 ***4.DEF***	***NOTES***	None.

Check the turbocharging pressure relief valve connections.
Check the engine management computer connections.
Repair 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 test with the **diagnostic tool**.

DF078 **CONTINUED 1**	

For F9Q 732, 740 and G9T 710 engines:
Check the **insulation** against **+ 12 V** on the connection between:

Engine management computer, **connector B track L2** → **track 1** turbocharging pressure relief valve connector

Check the **insulation** of this connection against the following connection:

Engine management computer, **connector B track M2** → **track 2** turbocharging pressure relief valve connector

For the F9Q 718 engine:
Check the **insulation** against **+ 12 V** on the connection between:

Engine management computer, **connector B track L2** → **track 2** turbocharging pressure relief valve connector

Check the **insulation** of this connection against the following connection:

Engine management computer, **connector B track M2** → **track 1** turbocharging pressure relief valve connector

If the fault is still present, apply the interpretation of command **AC004 Turbocharging pressure relief 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 test with the **diagnostic tool**.

DF078 **CONTINUED 2**	

CO ***CO.0*** ***3.DEF***	***NOTES***	None.

Check the turbocharging pressure relief valve connections.
Check the engine management computer connections.
Repair if necessary.

Measure the turbocharging pressure relief valve resistance, between **tracks 1 and 2**.
Replace the valve if the resistance is not approximately: **16.5 Ω ± 1.6 at + 25°C/22.1 Ω ± 2.2 at + 110°C**.

For F9Q 732, 740 and G9T 710 engines:
Check the **continuity** of the connection between:

Engine management computer, **connector B track L2** → **track 1** turbocharging pressure relief valve connector

Check for **+ 12 V after relay** feed on **track 2** of the turbocharging pressure relief valve connector.

For the F9Q 718 engine:
Check the **continuity** of the connection between:

Engine management computer, **connector B track L2** → **track 2** turbocharging pressure relief valve connector

Check for **+ 12 V after relay** feed on **track 1** of the turbocharging pressure relief valve connector.

If the fault is still present, apply the interpretation of command **AC004 Turbocharging pressure relief 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 test with the **diagnostic tool**.

DF078 **CONTINUED 3**	

CC.0 ***CO.0*** ***5.DEF***	***NOTES***	None.

Check the turbocharging pressure relief valve connections.
Check the engine management computer connections.
Repair if necessary.

For F9Q 732, 740 and G9T 710 engines:
Check the **insulation** against **earth** on the connection between:

Engine management computer, **connector B track L2** → **track 1** turbocharging pressure relief valve connector

For the F9Q 718 engine:
Check the **insulation** against **earth** on the connection between:

Engine management computer, **connector B track L2** → **track 2** turbocharging pressure relief valve connector

If the fault is still present, apply the interpretation of command **AC004 Turbocharging pressure relief 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 test with the **diagnostic tool**.

DF078 **CONTINUED 4**	

1.DEF ***2.DEF***	***NOTES***	**Priorities in dealing with a number of faults:** Deal with fault **DF241 EGR function**, 1.DEF first if it is present or stored, or **DF074 Turbocharging pressure sensor** if present.

Check the turbocharging pressure relief valve connections.
Check the engine management computer connections.
Repair if necessary.

For F9Q 732, 740 and G9T 710 engines:
Check for the **absence of interference resistance** on the connection between:

Engine management computer, **connector B track L2** → **track 1** turbocharging pressure relief valve connector

Repair if necessary.
For the F9Q 718 engine:
Check for the **absence of interference resistance** on the connection between:

Engine management computer, **connector B track L2** → **track 2** turbocharging pressure relief valve connector

Repair if necessary.

Carry out a road test and check parameter **PR094 Turbocharging pressure relief valve OCR***.

If, when the engine speed increases, this parameter varies:
– Check the fixed geometry turbocharger vacuum control: run **test 6**.
– Check the turbocharged air inlet circuit: run **test 4 Turbocharged air inlet circuit check**.
– Check the exhaust gas recirculation valve: run **test 9**.

If, when the engine speed increases, this parameter does not vary:
– Check the turbocharged air inlet circuit: run **test 4 Turbocharged air inlet circuit check**.
– Check the exhaust gas recirculation valve: run **test 9 Exhaust gas recirculation valve**.
– Check the turbocharger pressure sensor (fault and parameter).
Repair if necessary.

If the fault is still present, apply the interpretation of command **AC004 Turbocharging pressure relief valve**.

*** OCR: O**pening **C**yclic **R**atio

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 test with the **diagnostic tool**.

DF078 **CONTINUED 5**	

6.DEF	***NOTES***	None.

Check the turbocharging pressure relief valve connections.
Check the engine management computer connections.
Repair if necessary.

For F9Q 732, 740 and G9T 710 engines:
Check the **continuity and insulation** against **earth** of the connection between:

Engine management computer, **connector B track L2** → **track 1** turbocharging pressure relief valve connector

Check for **+ 12 V after relay** feed on **track 2** of the turbocharging pressure relief valve connector.

For the F9Q 718 engine:
Check the **continuity and insulation** against **earth** of the connection between:

Engine management computer, **connector B track L2** → **track 2** turbocharging pressure relief valve connector

Check for **+ 12 V after relay** feed on **track 1** of the turbocharging pressure relief valve connector.

If the fault is still present, apply the interpretation of command **AC004 Turbocharging pressure relief 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 test with the **diagnostic tool**.

DF079 PRESENT OR STORED	THERMOPLUNGER RELAY N° 3 CC.1 : Short circuit to + 12 V CO.0 : Open circuit or short circuit to earth CC.0 : Short circuit to earth CO : Open circuit

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault becomes present after the engine is started followed by a 30-second time delay with the engine running at idle speed, with the windscreen de-icer not selected and the engine temperature at starting lower than 70°C or after relay actuation using command **AC002 Thermoplunger relay n° 3**.
	Special notes: Use bornier **Elé. 1681** for all operations on the engine management computer connectors.

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

Check the connections of the thermoplunger n° **3** relay mounting on the engine fuse box.
Check the engine management computer connections.
Repair if necessary.

Check the conformity of the thermoplunger n° **3** relay (relay removed):
– Insulation between **tracks 3 and 5 or I3 and I5 or 7 and 9** (depending on the engine).
– Measure the resistance of the relay coil between **tracks 1 and 2 or I1 and I2 or 6 and 10** (depending on the engine).
Replace the relay if its resistance is not: **60 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 test with the **diagnostic tool**.

DF079 **CONTINUED 1**	

For the F9Q 718 engine:
Check the **insulation** against **+ 12 V** on the connection between:

Engine management computer, connector **C** **track J4** → **track 2** of the thermoplunger n° **3** relay mounting

Also check that this connection is **insulated** against the following connections:

Thermoplunger n° **3** relay mounting, **track 1** → **+ 12 V after relay**

Thermoplunger n° **3** relay mounting, **track 3** → **+ 12 V battery after fuse feed**

For F9Q 732 and 740 engines:
Check the **insulation** against **+ 12 V** on the connection between:

Engine management computer, connector **B** **track E4** → **track I2** of the thermoplunger n° **3** relay mounting

Also check that this connection is **insulated** against the following connections:

thermoplunger n° **3** relay mounting, **track I1** → **+ 12 V after relay**

thermoplunger n° **3** relay mounting, **track I3** → **+ 12 V battery after fuse feed**

For G9T 710 and 720 engines:
Check the **insulation** against **+ 12 V** on the connection between:

Engine management computer, connector **C** **track E4** → **track 2** of the thermoplunger n° **3** relay mounting

Also check that this connection is **insulated** against the following connections:

thermoplunger n° **3** relay mounting, **track 1** → **+ 12 V after relay**

thermoplunger n° **3** relay mounting, **track 3** → **+ 12 V battery after fuse feed**

For G9T 720 engine (specific to 16-seat Master):
Check the **insulation** against **+ 12 V** on the connection between:

Engine management computer, connector **C** **track E4** → **track 11** of the thermoplunger n° **3** relay mounting

Also check that this connection is **insulated** against the following connections:

thermoplunger n° **3** relay mounting, **track 15** → **+ 12 V after relay**

thermoplunger n° **3** relay mounting, **track 14** → **+ 12 V battery after fuse feed**

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 test with the **diagnostic tool**.

DF079 **CONTINUED 2**	

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

Check the connections of the thermoplunger n° **3** relay mounting on the engine fuse box.
Check the engine management computer connections.
Repair if necessary.

Measure the **resistance** of the thermoplunger n° **3** relay coil between **tracks 1 and 2 or I1 and I2 or 6 and 10** (depending on the engine).
Replace the relay if its resistance is not: **60 Ω ± 5 at + 20°C**.

For the F9Q 718 engines:
Check the **continuity and insulation** against **earth** of the connection between:

Engine management computer, connector **C** **track J4** → **track 2** of the thermoplunger n° **3** relay mounting

For F9Q 732 and 740 engines:
Check the **continuity and insulation** against **earth** of the connection between:

Engine management computer, connector **B** **track E4** → **track I2** of the thermoplunger n° **3** relay mounting

For G9T 710 and 720 engines:
Check the **continuity and insulation** against **earth** of the connection between:

Engine management computer, **connector C** **track E4** → **track 2** of the thermoplunger n° **3** relay mounting

For G9T 720 engines (specific to 16-seat Master bus):
Check the **continuity and insulation** against **earth** of the connection between:

Engine management computer, connector **C** **track E4** → **track 11** of the thermoplunger n° **3** relay mounting

Check **for + 12 V after relay** on **track 1** (or another track depending on the engine; check CC.1 for the other tracks) of the thermoplunger n° **3** relay mounting.

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 test with the **diagnostic tool**.

DF079 **CONTINUED 3**	

CO	***NOTES***	None.

Check the connections of the thermoplunger n° **3** relay mounting on the engine fuse box.
Check the engine management computer connections.
Repair if necessary.

Measure the **resistance** of the thermoplunger n° **3** relay coil between **tracks 1 and 2 or I1 and I2 or 6 and 10** (depending on the engine).
Replace the relay if its resistance is not: **60 Ω ± 5 at + 20°C**.

For the F9Q 718 engines:
Check the **continuity** of the connection between:

Engine management computer, connector **C** **track J4** → **track 2** of the thermoplunger n° **3** relay mounting

For F9Q 732 and 740 engines:
Check the **continuity** of the connection between:

Engine management computer, connector **B** **track E4** → **track I2** of the thermoplunger n° **3** relay mounting

For G9T 710 and 720 engines:
Check the **continuity** of the connection between:

Engine management computer, **connector C** **track E4** → **track 2** of the thermoplunger n° **3** relay mounting

For G9T 720 engines (specific to 16-seat Master bus):
Check the **continuity** of the connection between:

Engine management computer, connector **C** **track E4** → **track 11** of the thermoplunger n° **3** relay mounting

Check **for + 12 V after relay** on **track 1** (or another track depending on the engine; check CC.1 for the other tracks) of the thermoplunger n° **3** relay mounting.

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 test 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 CC.0 : Short circuit to earth CO : Open circuit

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault becomes present after the relay is actuated using command **AC010 Preheating relay**.
	Special notes: Use bornier **Elé. 1681** for all operations on the engine management computer connectors.

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

Check the preheating unit connections.
Check the engine management computer connections.
Repair if necessary.

Check the **insulation** against **+ 12 V** on the connection between:

Engine management computer, **connector B track C3** → **track 8** of the preheating unit connector

Check the **continuity and absence of interference resistance** on 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 test with the **diagnostic tool**.

DF081 **CONTINUED**	

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

Check the preheating unit connections. Check the engine management computer connections. Repair if necessary.
Check the **continuity and insulation** against **earth** of the connection between: Engine management computer, **connector B track C3** → **track 8** of the preheating unit connector Check the **continuity and absence of interference resistance** on the connection between: Engine management computer, **connector B track B3** → **track 9** preheating unit connector Check for **+ 12 V battery** feed on **track 3** of the preheating unit connector. If the fault persists, replace the preheating unit.

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

Check the preheating unit connections. Check the engine management computer connections. Repair if necessary.
Check the **insulation** against **earth** on the connection between: Engine management computer, **connector B track C3** → **track 8** of the 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 test 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 CC.0 : Short circuit to earth CO : Open circuit

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault is declared present after actuating the relay using command **AC005 Low pressure pump relay**.
	Special notes: Use bornier **Elé. 1681** for all operations on the engine management computer connectors.

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

Check the fuel pump relay mounting connections.
Check the engine management computer connections.
Repair if necessary.

Remove the fuel pump relay and check it is correct:
– **Insulation** between **tracks 3 and 5** (in rest position).
– Measure the resistance of the coil between **tracks 1 and 2**.
Replace the relay if its resistance is not: **85 Ω ± 5 at + 20°C**.

Check the **condition** of the following fuses: –**F60 (70 A) for the F9Q 718 engine.**
–**F2 (30 A) for the F9Q 732 and 740 engines.**
–**F49 (70 A) for the G9T 710 engine.**
–**F5 (30 A) for the G9T 720 engine.**
–**F3 (7.5 A) for the G9T 720 engine (16-seat Master bus).**

Check the **insulation** against **+ 12 V battery feed** and **12 V after relay** feed on the connection between:

Engine management computer, **connector C track A1** →
- **track 2** of the fuel pump relay mounting (F9Q 718)
- **track A2** of the fuel pump relay mounting (F9Q 732, 740 and G9T 720)
- **track B2** of the fuel pump relay mounting (G9T 710)

See following page.

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 test with the **diagnostic tool**.

DF082 **CONTINUED 1**	

12 V battery after fuse →
- **track 3** of the fuel pump relay mounting (F9Q 718)
- **track A3** of the fuel pump relay mounting (F9Q 732 and 740)
- **track B3** of the fuel pump relay mounting (G9T 710)
- **track A5** of the fuel pump relay mounting (G9T 720)

+ 12 V after relay →
- **track 1** of the fuel pump relay mounting (F9Q 718)
- **track A1** of the fuel pump relay mounting (F9Q 732 and 740, G9T 720)
- **track B1** of the fuel pump relay mounting (G9T 710)

If the fault is still present, change the **fuel pump relay**.

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 test with the **diagnostic tool**.

DF082 **CONTINUED 2**	

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

Check the fuel pump relay mounting connections.
Check the engine management computer connections.
Repair if necessary.

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

Check the **continuity** of the connection between:

Engine management computer, **connector C track A1** →
- **track 2** of the fuel pump relay mounting (F9Q 718)
- **track A2** of the fuel pump relay mounting (F9Q 732, 740 and G9T 720)
- **track B2** of the fuel pump relay mounting (G9T 710)

Check **for + 12 V after relay feed** →
- **track 1** of the fuel pump relay mounting (F9Q 718)
- **track A1** of the fuel pump relay mounting (F9Q 732 and 740, G9T 720)
- **track B1** of the fuel pump relay mounting (G9T 710)

If the fault is still present, change the **fuel pump relay**.

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 test with the **diagnostic tool**.

DF082 **CONTINUED 3**	

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

Check the fuel pump relay mounting connections.
Check the engine management computer connections.
Repair if necessary.

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

Check the **insulation** against **earth** of the connection between:

Engine management computer, **connector C track A1** →
- **track 2** of the fuel pump relay mounting (F9Q 718)
- **track A2** of the fuel pump relay mounting (F9Q 732, 740 and G9T 720)
- **track B2** of the fuel pump relay mounting (G9T 710)

Earth via the fuel pump →
- **track 5** of the fuel pump relay mounting (F9Q 718)
- **track A5** of the fuel pump relay mounting (F9Q 732 and 740, G9T 720)
- **track B5** of the fuel pump relay mounting (G9T 710)

If the fault is still present, change the **fuel pump relay**.

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 test 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 CC.0 : Short circuit to earth CO : Open circuit 1.DEF: Consistency after switching off the ignition

NOTES	**Conditions for applying the fault finding procedure to stored faults:** The fault reappears after: – the fault has been cleared from memory, – running command **AC006 Fuel pressure solenoid valve**.
	Special notes: Use bornier **Elé. 1681** for all operations on the engine management computer connectors.

CC.1	***NOTES***	**WARNING** – Please observe the cleanliness guidelines and safety advice.

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

Measure the **resistance** of the fuel pressure solenoid valve across **tracks 1 and 2**.
Replace the solenoid valve if this value is not:

- **3 Ω ± 0.5 at 20°C for CP3 high pressure pumps,**
- **2.5 Ω ± 0.5 at + 20°C for CP1 high pressure pumps.**

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

Engine management computer, **connector B track L1** → **track 2** of the fuel pressure solenoid valve connector

Check the **insulation** on this connection compared with the connection between:

Engine management computer, **connector B track M2** → **track 1** of the fuel pressure solenoid valve connector

If the fault is still present, carry out the interpretation of commands fault finding procedure for: **AC006 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 test with the **diagnostic tool**.

DF083 **CONTINUED 1**	

CO.0 ***CO***	***NOTES***	**WARNING** – Please observe the cleanliness guidelines and safety advice.

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

Measure the resistance of the fuel pressure solenoid valve across **tracks 1 and 2**.
Replace the solenoid valve if this value is not:
- **3 Ω ± 0.5 at + 20°C for CP3 high pressure pumps,**
- **2.5 Ω ± 0.5 at + 20°C for CP1 high pressure pumps.**

Check the **continuity** of the connection between:

Engine management computer, **connector B track L1** ⟶ **track 2** of the fuel pressure solenoid valve connector.

Check **for + 12 V after relay** on **track 1** of the fuel pressure solenoid valve.
If the fault is still present, carry out the interpretation of command fault finding procedure for: **AC006 Fuel pressure solenoid valve**.

CO.0 ***CC.0***	***NOTES***	**WARNING** – Please observe the cleanliness guidelines and safety advice.

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

Check the **insulation** against **earth** on the connection between:

Engine management computer, **connector B track L1** ⟶ **track 2** of the fuel pressure solenoid valve connector.

If the fault is still present, carry out the interpretation of command fault finding procedure for: **AC006 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 test with the **diagnostic tool**.

DF083 **CONTINUED 2**	

1.DEF	***NOTES***	**Conditions for applying the fault finding procedure:** If the fault reappears stored after: – the fault has been cleared, – after the power latch phase* has been completed several times, each preceded by an engine cycle: starting and accelerating > 2000 rpm. **Information on the setpoint:** Detection of this fault is performed during the power-latch* phase. Also, this detection follows a "counting strategy" and is therefore not performed each time the ignition is switched off. If it is detected during one power latch* phase, it will not necessarily be detected during the next power latch* phase. It is therefore necessary, after the fault is cleared, to perform several power latch* phases, each preceded by an engine running cycle (see the conditions above) to make it reappear. **Priorities in dealing with a number of faults:** Deal with the interpretation of faults **DF088 Flywheel signal consistency or DF070 Engine speed/camshaft sensor consistency 2.DEF or 3.DEF** first if one of the two is present. **WARNING** – Please observe the cleanliness guidelines and safety advice.

* The immobiliser warning light will flash for a few seconds after the ignition is switched off.

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 test with the **diagnostic tool**.

DF083 **CONTINUED 3**	

On a vehicle fitted with a damper valve, check that it is working correctly using the interpretation of command **AC593 Damper valve**.

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

Check the **resistance** of the fuel pressure solenoid valve between **tracks 1** and **2**.
Replace the solenoid valve if this value is not:
- **3 Ω ± 0.5 at 20°C for CP3 high pressure pumps,**
- **2.5 Ω ± 0.5 at + 20°C for CP1 high pressure pumps.**

Check the **continuity and absence of interference resistance** on 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.

– Check the **continuity and absence of interference resistance** on the connections on the **G9T engine** between:

Engine management computer, **connector B track H3** → **track 2** of the engine speed sensor

Engine management computer, **connector B track G3** → **track 1** of the engine speed sensor

– Check for **continuity and for the absence of interference resistance** on the connections on the **F9Q engine** between:

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

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

Carry out the necessary operations if the resistance is abnormally high.
– Check earthing of the engine block.

If the fault is still present, refer to the interpretation of command **AC006 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 test with the **diagnostic tool**.

DF084 PRESENT OR STORED	EGR VALVE POSITION SENSOR CIRCUIT CO.0 : Open circuit or short circuit to earth CC.1 : Short circuit to + 12 V 1.DEF: Sensor supply fault 2.DEF: EGR valve mechanical fault

NOTES	**Conditions for applying the fault finding procedure to stored faults:** The fault reappears after: – the fault memory has been cleared, – the valve has been actuated using command **AC007 EGR valve**.
	Special notes: Use bornier **Elé. 1681** for all operations on the engine management computer connectors.

CO.0	***NOTES***	**Priorities in dealing with a number of faults:** In the event of the simultaneous presence of fault **DF241 EGR function, CO.0**, check that the exhaust gas recirculation valve connector is connected correctly.

Check the exhaust gas recirculation valve connections:
Check the engine management computer connections.
Repair if necessary.

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

Engine management computer, **connector B track C2** → **track 6** of the exhaust gas recirculation valve connector

Check the **continuity** of the connection between:

Engine management computer, **connector B track F2** → **track 2** of the exhaust gas recirculation valve connector

Also check for **+ 5 V** on **track 2** of the exhaust gas recirculation valve connector.

If the fault is still present, replace the exhaust gas recirculation 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 test with the **diagnostic tool**.

DF084 **CONTINUED 1**	

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

Check the exhaust gas recirculation valve connections:
Check the engine management computer connections.
Repair if necessary.

Check the **insulation** against **+ 12 V** on the connection between:

Engine management computer, **connector B track C2** → **track 6** of the exhaust gas recirculation valve connector

Check the **continuity and absence of interference resistance** on the connection between:

Engine management computer, **connector B track B2** → **track 4** of the exhaust gas recirculation valve connector

Also check for the computer earth on **track 4** of the exhaust gas recirculation valve connector.
If the fault is still present, replace the exhaust gas recirculation 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 test with the **diagnostic tool**.

DF084 **CONTINUED 2**	

1.DEF	***NOTES***	**Priorities in dealing with a number of faults:** Apply the interpretation of fault **DF091 Sensor feed voltage n° 1** first if it is present or stored.

Check the exhaust gas recirculation valve connections:
Check the engine management computer connections.
Repair if necessary.

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

Engine management computer, **connector B track F2**	→	**track 2** of the exhaust gas recirculation valve connector
Engine management computer, **connector B track B2**	→	**track 4** of the exhaust gas recirculation valve connector
Engine management computer, **connector B track C2**	→	**track 6** of the exhaust gas recirculation valve connector

Also check that they are **insulated** against **+12 V**.
If the fault persists, check for the presence of:
+ 5 V on **track 2** of the exhaust gas recirculation valve connector.
Computer earth on **track 4** of the exhaust gas recirculation valve connector.
– If the supply is not correct, make the necessary repairs (harness, connectors, etc.).
– If the feed and the connections are correct, replace the exhaust gas recirculation 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 test with the **diagnostic tool**.

DF084 **CONTINUED 3**	

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

– Check the connections of the exhaust gas recirculation valve (on the exhaust gas recirculation valve side).
– Check the engine management computer connections (computer side) (make sure there are no conductive particles or bent pins).
– Check for insulation **against + 5 V and + 12 V** on the following connection:

Engine management computer, **connector B track C2** ⟶ **track 6** of the exhaust gas recirculation valve connector

– Check the conformity of the power supply of the exhaust gas recirculation valve position sensor:
+ 5 V on **track 2** of the exhaust gas recirculation valve connector.
Computer earth on **track 4** of the exhaust gas recirculation valve connector.

Carry out the necessary repairs.

● If this fault **is combined with engine faults** such as poor performance and/or fumes:
Run **Test 9 Exhaust gas recirculation valve**, part A.

● If this fault **is not combined with engine faults** such as poor performance and/or fumes:
– Clear **DF084**.
– Start the engine.
– After a delay of **50 seconds**, accelerate **gently to 2500 rpm**, for **~ 5 seconds** then return to idle speed.
– Repeat the procedure described above **5** times.
  – If the fault does not reappear, finish the fault finding procedure.
  – If it reappears, replace the exhaust gas recirculation valve.

* Engine immobiliser indicator light flashes a few seconds after the ignition is switched off.

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 test with the **diagnostic tool**.

DF085 **STORED**	AFTER IGNITION KEY SIGNAL 1.DEF: consistency of the key signal after initialisation

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

Check the condition of the engine fuse mounting (crimping of wires on terminals, and condition of terminals on fuse side).
Repair if necessary.
Check the ignition switch (see the wiring diagram).
– Clear the fault from the computer memory.
– Switch off the ignition, then switch it on again to initialise the computer.
– If the fault recurs, contact the Techline.

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 test with the **diagnostic tool**.

DF086 PRESENT OR STORED	FLOW AFTER IGNITION SWITCHED OFF USING KEY 1.DEF: error when ignition switched off due to zero flow 2.DEF: error when ignition switched off due to injector output stage

1.DEF ***2.DEF***	***NOTES***	**Priority in the event of a number of faults:** Deal with any other fault that is present or stored as a priority.
		Conditions for applying the fault finding procedure to stored faults: If the fault reappears stored after: – the fault has been cleared, – a delay of **1 minute** with the engine running then the engine stopped (with loss of communication and then communication re-established).

This fault appears if, when switching off the engine, the engine speed does not fall below a certain value (~ 300 rpm) in a very short period of time (t < 2 seconds). It is therefore necessary to eliminate all mechanical, hydraulic or other causes which keep the engine running after it has been switched off.
Check the engine oil level; correct the level if necessary.
If the fault persists:
– Flush the high pressure pump: run **Test 2 High pressure pump flush**.
– Check the injectors: run **Test 10: Poor injector operation**.

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 test with the **diagnostic tool**.

DF088 **STORED**	FLYWHEEL SIGNAL INFORMATION INCONSISTENCY 1.DEF: Overspeed detected 2.DEF: Flywheel signal dynamic consistency for 1/4 of a turn

NOTES	**Conditions for applying the fault finding procedure to stored faults:** The fault reappears after: – the fault has been cleared from memory, – starting the engine, – the engine speed exceeds **~3500 rpm**.
	Special notes: This fault appears if the computer detects that the engine speed has exceeded the maximum. This could be linked to an incorrect manoeuvre, for example: abrupt downshifting from 5^{th} to 2^{nd} gear. Use bornier **Elé. 1681** for all operations on the engine management computer connectors.

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

Measure the **resistance** of the engine speed sensor between **tracks A and B on F9Q engines**:
Replace the sensor if its resistance is not: **800 Ω ± 80 at + 20°C**.
Measure the **resistance** of the engine speed sensor between **tracks 1 and 2 on G9T engines**.
Replace the sensor if its resistance is not: **235 Ω ± 35 at + 23°C**.

Check the conformity of the charging circuit (correct charging voltage and no interference).
Check that the engine and computer earths are correct (tightening, oxidation, etc.).
Check the **insulation** against the **+ 12 V** feed and the **earth** of the following connections **on F9Q engines**:

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 **insulation** against the **+ 12 V** feed and the **earth** of the following connections **on G9T engines**:

engine management computer, **connector B track G3** → **track 1** of the engine speed sensor

engine management computer, **connector B track H3** → **track 2** of the engine speed sensor.

If the fault persists, change the engine speed 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 test with the **diagnostic tool**.

DF088 **CONTINUED**	

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

Check the engine speed sensor connections. Check the engine management computer connections. Repair if necessary.
Clear the faults from the computer memory. Carry out a road test to check that the fault does not reappear. If the fault reappears: – Perform a visual inspection of the flywheel and the target (broken tooth, damaged tooth, warped flywheel). – Check the mounting, the air gap (if necessary refer to the information in the Workshop Repair Manual for the vehicle) and the condition of the sensor (overheating). – Check that the engine speed signal is correct using an oscilloscope: no interference, broken tooth, etc. 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 test with the **diagnostic tool**.

DF089 PRESENT OR STORED	INJECTION CONTROL CAPACITOR VOLTAGE DEF : Stored fault 1.DEF : Internal electronic fault

DEF ***1.DEF***	***NOTES***	**Priority in the event of a number of faults:** Deal with any other fault that is present or stored as a priority.

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 is **present**, contact the Techline.

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 test with the **diagnostic tool**.

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

DEF ***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 is **present**, contact the Techline.

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 test with the **diagnostic tool**.

DF091 PRESENT OR STORED	SENSOR SUPPLY VOLTAGE N° 1 1.DEF: Sensor supply voltage 1 too low 2.DEF: Sensor supply voltage 1 too high

NOTES	**Conditions for applying the fault finding procedure to stored faults:** The fault reappears after: – the fault has been cleared from memory, – a time delay of **1 minute** with the engine running.
	Special notes: – Use bornier **Elé. 1681** for all operations on the engine management computer connectors. – See the **Wiring diagrams** Technical Note for the vehicle.

Note:
Supply n° 1 is for the following components:
– pedal sensor (gang 1),
– fuel pressure sensor,
– air flowmeter,
– exhaust gas recirculation valve,
– turbocharger pressure sensor (if installed).

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

Display parameter **PR090 Sensor supply voltage n° 1**.
– If this voltage is below **4.9 V**, disconnect, one by one, the connectors on all the sensors referred to above.
If, after a disconnection, the voltage returns to normal, replace the faulty sensor or repair the connection,
(wait a few seconds **between each disconnection** to allow the computer to take a measurement).
Clear the faults created by the multiple disconnections.
If the voltage is still **below + 4.9 V** with all the sensors disconnected:
– check the insulation against earth of the **+ 5 V** line of each sensor.
– Also check the insulation between:
  – tracks **2 and 4** (F9Q) or **2 and 3** (G9T) 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 connector,
  – tracks **A** and **C** of the turbocharging pressure sensor connector.
Carry out the necessary repairs.
If the fault persists, carefully examine the engine management computer connections (presence of conductive particles, bent pins).
If the fault is still present, contact Techline.

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 test with the **diagnostic tool**.

DF091 **CONTINUED**	

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

Display parameter **PR090 Sensor supply voltage n° 1**.
– If this voltage is below **+ 5.1 V**, disconnect, one by one, the connectors on all the sensors referred to above.
If, after a disconnection, the voltage returns to normal, replace the faulty sensor or repair the connection,
(wait a few seconds **between each disconnection** to allow the computer to take a measurement).
Clear the faults created by the multiple disconnections.
If, with these sensors disconnected, the voltage is still greater than **+ 5.1 V**:
– Check the **insulation against + 12 V** on the following connections:

Engine management computer, **connector A track E1**	→	**track 4** (F9Q) or **track 2** (G9T) of the pedal sensor connector
Engine management computer, **connector B track H2**	→	**track 3** of the fuel pressure sensor connector
Engine management computer, **connector B track G2**	→	**track 3** of the air flowmeter connector
Engine management computer, **connector B track F2**	→	**track 2** of the exhaust gas recirculation valve connector
Engine management computer, **connector B track J2**	→	**track C** of the turbocharging pressure sensor connector

Carry out the necessary repairs.
If the fault persists, carefully examine the engine management computer connections (presence of conductive particles, bent pins).
If the fault is still present, contact Techline.

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 test with the **diagnostic tool**.

DF092 PRESENT OR STORED	SENSOR SUPPLY VOLTAGE N° 2 1.DEF: Sensor feed voltage 2 too low 2.DEF: Sensor feed voltage 2 too high

NOTES	**Conditions for applying the fault finding procedure to stored faults:** The fault reappears after: – the fault has been cleared from memory, – a time delay of **2 minutes** with the engine running.
	Special notes: Use bornier **Elé. 1681** for all operations on the engine management computer connectors. See the **Wiring diagrams** Technical Note for the vehicle.

Note:
Supply n° 2 is for the pedal sensor (gang 2).

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

Display parameter **PR091 Sensor supply voltage n° 2**.
– If the voltage is lower than **+ 4.9 V**, disconnect the pedal sensor connector.
If, after a disconnection, the voltage returns to normal, replace the pedal sensor or repair its connection, (wait a few seconds **after disconnection** to allow the computer to take a measurement).
Clear the faults created by the disconnection process.
If the voltage is still **lower than + 4.9 V** with this sensor disconnected:
– check the insulation against earth of the **+ 5 V** line of each sensor.
– Also check the insulation between:
tracks **3** and **5** (F9Q) or **1 and 5** (G9T) of the pedal sensor connector.
Carry out the necessary repairs.
If the fault persists, carefully examine the engine management computer connections (presence of conductive particles, bent pins).
If the fault is still present, contact Techline.

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 test with the **diagnostic tool**.

DF092 **CONTINUED**	

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

Display parameter **PR091 Sensor supply voltage n° 2**.
– If the voltage is greater than **+ 5.1 V**, disconnect the pedal sensor connector.
If, after a disconnection, the voltage returns to normal, replace the pedal sensor or repair its connection, (wait a few seconds **after disconnection** to allow the computer to take a measurement).
Clear the faults created by the disconnection process.
If the voltage is still **above + 5.1 V** after disconnecting this sensor:
– Check the **insulation against + 12 V** on the following connections:

Engine management computer, **connector A track H2** ⟶ **track 3** (F9Q) **or 5** (G9T) of the pedal sensor connector

Carry out the necessary repairs.
If the fault persists, carefully examine the engine management computer connections (presence of conductive particles, bent pins).
If the fault is still present, contact Techline.

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 test with the **diagnostic tool**.

DF093 PRESENT OR STORED	MICROCONTROLLER DEF : Stored fault 1.DEF : Internal electronic fault

DEF ***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.
Carry out a road test.
If the fault is **present**, contact the Techline.

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 test with the **diagnostic tool**.

DF094 PRESENT OR STORED	THERMOPLUNGER RELAY N° 1 CC.1 : Short circuit to + 12 V CO.0 : Open circuit or short circuit to earth CC.0 : Short circuit to earth CO : Open circuit

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault reappears as present after: – an actuator command **AC301 Thermoplunger n° 1 relay**, – the engine has been started, after the engine has been running at idle speed for 30 seconds, with windscreen de-icer not selected and the engine temperature at starting less than 70°C.
	Special notes: Use bornier **Elé. 1681** for all operations on the engine management computer connectors. Refer to the **Wiring diagrams** Technical Note for the vehicle to locate the relevant fuses and relays.

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

Check the thermoplunger n° **1** relay connections.
Check the engine management computer connections.
Repair if necessary.

Check the conformity of the thermoplunger n° **1** relay (relay removed):
– Insulation between **tracks 3 and 5 or 2 and 4 or C3 and C5** (at rest and depending on the engine).
– Measure the resistance of the coil between **tracks 1 and 2 or 1 and 5 or C1 and C2** (depending on the engine). Replace the relay if its resistance is not: **60 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 test with the **diagnostic tool**.

DF094 **CONTINUED 1**	

For G9T 710 and 720 engines:
Check the **insulation** against **+ 12 V** on the connection between:

Engine management computer, **connector C track J4** → **track 2** thermoplunger n° **1** relay mounting

Also check that this connection is **insulated** against the following connections:

Thermoplunger n° **1** relay mounting, **track 1** → **+ 12 V after relay**

Thermoplunger n° **1** relay mounting, **track 3** → **+ 12 V battery after fuse feed**

For G9T 720 engines (specific to 16-seat Master bus):
Check the **insulation** against **+ 12 V** on the connection between:

Engine management computer, **connector C track J4** → **track 1** thermoplunger n° **1** relay mounting

Also check that this connection is **insulated** against the following connections:

Thermoplunger n° **1** relay mounting, **track 5** → **+ 12 V after relay**

Thermoplunger n° **1** relay mounting, **track 4** → **+ 12 V battery after fuse feed**

For F9Q 732 and 740 engines:
Check the **insulation** against **+ 12 V** on the connection between:

Engine management computer, **connector C track J4** → **track C2** thermoplunger n° **1** relay mounting

Also check that this connection is **insulated** against the following connections:

Thermoplunger n° **1** relay mounting, **track C1** → **+ 12 V after relay**

Thermoplunger n° **1** relay mounting, **track C3** → **+ 12 V battery after fuse feed**

For the F9Q 718 engines:
Check the **insulation** against **+ 12 V** on the connection between:

Engine management computer, **connector C track E4** → **track 2** thermoplunger n° **1** relay mounting

Also check that this connection is **insulated** against the following connections:

Thermoplunger n° **1** relay mounting, **track 1** → **+ 12 V after relay**

Thermoplunger n° **1** relay mounting, **track 3** → **+ 12 V battery after fuse feed**

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 test with the **diagnostic tool**.

DF094 **CONTINUED 2**	

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

Check the thermoplunger n° **1** relay connections.
Check the engine management computer connections.
Repair if necessary.

Check **for + 12 V after relay** feed on **track 1** (or another track depending on the engine; check CC.1 for the other tracks) of the thermoplunger n° **1** relay mounting.
Measure the **resistance** of the relay coil between **tracks 1 and 2** (or another track depending on the engine. See CC.1 for the other tracks).
Replace the relay if its resistance is not: **60 Ω ± 5 at + 20°C**.

For G9T 710 and 720 engines:
Check the **continuity and insulation** against **earth** of the connection between:

Engine management computer, connector **C** **track J4** ⟶ **track 2** thermoplunger n° **1** relay mounting

For G9T 720 engine (specific to 16-seat Master):
Check the **continuity and insulation** against **earth** of the connection between:

Engine management computer, **connector C** **track J4** ⟶ **track 1** thermoplunger n° **1** relay mounting

For F9Q 732 and 740 engines:
Check the **continuity and insulation** against **earth** of the connection between:

Engine management computer, connector **C** **track J4** ⟶ **track C2** thermoplunger n° **1** relay mounting

For the F9Q 718 engines:
Check the **continuity and insulation** against **earth** of the connection between:

Engine management computer, connector **C** **track E4** ⟶ **track 2** thermoplunger n° **1** relay mounting

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 test with the **diagnostic tool**.

DF094 **CONTINUED 3**	

CO	***NOTES***	None.

Check the thermoplunger n° **1** relay connections.
Check the engine management computer connections.
Repair if necessary.

Check **for + 12 V after relay** feed on **track 1** (or another track depending on the engine; check CC.1 for the other tracks) of the thermoplunger n° **1** relay mounting.
Measure the **resistance** of the relay coil between **tracks 1 and 2** (or another track depending on the engine. See CC.1 for the other tracks).
Replace the relay if its resistance is not: **60 Ω ± 5 at + 20°C**.

For G9T 710 and 720 engines:
Check the **continuity** of the connection between:

Engine management computer, connector **C** **track J4** ⟶ **track 2** thermoplunger n° **1** relay mounting

For G9T 720 engine (specific to 16-seat Master):
Check the **continuity** of the connection between:

Engine management computer, **connector C** **track J4** ⟶ **track 1** thermoplunger n° **1** relay mounting

For F9Q 732 and 740 engines:
Check the **continuity** of the connection between:

Engine management computer, connector **C** **track J4** ⟶ **track C2** thermoplunger n° **1** relay mounting

For the F9Q 718 engines:
Check the **continuity** of the connection between:

Engine management computer, connector **C** **track E4** ⟶ **track 2** thermoplunger n° **1** relay mounting

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 test with the **diagnostic tool**.

EXCEPT MULTIPLEX

DF095 STORED	VEHICLE SPEED SIGNAL 1.DEF: Vehicle speed too high 2.DEF: Error in speed signal coming from the ABS 3.DEF: Vehicle speed sensor consistency 4.DEF: Incorrect wheel speeds

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault appears during a road test (engine speed above **2000 rpm**).
	Special notes: – Use bornier **Elé. 1681** for all operations on the engine management computer connectors. – see the **Wiring Diagrams** Technical Note for the vehicle to locate the relevant electrical **connections and connectors**.

1.DEF ***2.DEF*** ***3.DEF*** ***4.DEF***	***NOTES***	Circumstances in which the fault occurred: **1.DEF/2.DEF:** signal interference or fault in the system generating the speed signal. **3.DEF:** signal absent or fault in the system generating the speed signal.

Perform a road test and compare the speed indicated by the fault finding tool (**PARAMETERS** menu) with that shown on the instrument panel:

● ***If these two values do not coincide:***

– Check that the engine earths are correct (oxidation, tightness, etc.).

G9T 710 Engine:

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

ABS computer **track 22**	→	**track E4, connector A**, engine management computer (via connection)
ABS computer **track 22**	→	**track 23**, instrument panel (via connection)
Engine management computer **connector A track E**4	→	**track 23**, instrument panel (via connection)

– Also check the **insulation** of these connections against **earth** and against **+ 12 V**.

Carry out the necessary repairs.

F9Q 718 engine:

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

ABS computer **track 17**	→	**track E4, connector A**, engine management computer

– Also check the **insulation** of this connection against **earth** and against **+ 12 V**.

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 test with the **diagnostic tool**.

DF095 **CONTINUED 1**	

F9Q 718 and G9T 710 engines:
– If the fault is still present, the ABS system issues a vehicle speed signal shared by the electronic injection unit and the instrument panel. To prevent this causing a problem, disconnect it, clear the fault and carry out a road test.
– If the fault does not reappear, the instrument panel or one of its connections caused the fault.
Carry out a fault finding procedure of the instrument panel.
– If the fault is still present, run fault finding on the ABS.

F9Q 732 and 740 engines:
– Check the **continuity and absence of interference resistance** on the following connections:

Instrument panel **track 23** → **track E4, connector A**, engine management computer

– Also check the **insulation** of this connection against **earth** and against **+ 12 V**.
Carry out the necessary repairs.
– If the fault is still present, carry out fault finding on the instrument panel.

G9T 720 engine (depending on the equipment):
– Check the **continuity and absence of interference resistance** on the following connections:

Instrument panel **track 4** → **track E4, connector A**, engine management computer

– Also check the **insulation** of this connection against **earth** and against **+ 12 V**.
Carry out the necessary repairs.
– If the fault is still present, carry out fault finding on the instrument panel.

G9T 720 engine (depending on the equipment):
– Check the **continuity and absence of interference resistance** on the following connections:

Vehicle speed sensor **track B1** → **track E4, connector A**, engine management computer

– Also check the **insulation** of this connection against **earth** and against **+ 12 V**.
Carry out the necessary repairs.
– Check the vehicle speed sensor supply. Carry out the necessary repairs.
– Check the condition of the vehicle speed sensor gear. Replace the gear if necessary.
– If the fault is still present, replace vehicle speed 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 test with the **diagnostic tool**.

DF095 **CONTINUED 2**	

● ***If the two values coincide:***

G9T 710 engines:

– Check the **insulation** of the following connection against **earth** and against **+ 12 volts**:

Engine management computer **connector A track E**4 → **track 22** ABS computer relay mounting.

– If the fault is still present, run fault finding on the ABS.

F9Q 718 engine:

– Check the **insulation** of the following connection against **earth** and against **+ 12 volts**:

ABS computer **track 17** → **track E4, connector A**, engine management computer

– If the fault is still present, run fault finding on the ABS.

F9Q 732 and 740 engine:

– Check the **insulation** of the following connection against **earth** and against **+ 12 volts**:

Instrument panel **track 23** → **track E4, connector A**, engine management computer

– If the fault is still present, carry out fault finding on the instrument panel.

G9T 720 engine (depending on the equipment):

– Check the **insulation** of the following connection against **earth** and against **+ 12 volts**:

Instrument panel **track 4** → **track E4, connector A**, engine management computer

– If the fault is still present, carry out fault finding on the instrument panel.

G9T 720 engine (depending on the equipment):

– Check the **insulation** of the following connection against **earth** and against **+ 12 volts**:

Vehicle speed sensor **track B1** → **track E4, connector A**, engine management computer

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 test with the **diagnostic tool**.

DF097 **STORED**	CLUTCH CONTACT INFORMATION 1.DEF: Consistency with vehicle speed

1.DEF	***NOTES***	**Conditions for applying the fault finding procedure to stored faults:** If the fault becomes present during a road test at speeds above **60 mph (100 km/h)**.
		Processing priority in the event of stacked faults: Apply the interpretation of fault **DF095 Vehicle speed signal** first if it is present or stored.
		Special notes: Use bornier **Elé. 1681** for all operations on the engine management computer connectors.

Check the clutch switch connections.
Check the engine management computer connections.
Repair if necessary.

Step 1

A) - Display status **ET012 Clutch switch signal**. Depress the clutch pedal and note whether this status becomes **ACTIVE**.

If it becomes ACTIVE,

Clear the fault, switch off the ignition, wait for the end of the power latch* and switch on the ignition again. Perform a road test and then take a fault reading. If the fault reappears, go to step 2. Otherwise, end of fault finding.

If it does not become ACTIVE,

B) - Check the switch adjustment.

– Check the **continuity and insulation** against **earth** of the connection between:

Engine management computer, **connector A track E2** ⟶ **track 3** clutch switch or **track B3** (Master)

– Check for **earth** on **track 1** or **track A1** (Master) of the clutch switch.

Repair if necessary.

Check the operation of the clutch switch:

Contact closed between **tracks 1 and 3 or A1 and B3** when the clutch pedal is depressed.

Contact open between **tracks 1 and 3 or A1 and B3** when the clutch pedal is released.

Replace the switch if necessary.

After the repair, return to step **A**.

Step 2

– If the fault recurs, contact the Techline.

* The immobiliser warning light will flash for a few seconds after the ignition is switched off.

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 test with the **diagnostic tool**.

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

NOTES	**Conditions for applying the fault finding procedure:** The fault reappears after: – the fault memory has been cleared, – starting the engine, – the ignition is switched off with loss of communication, – switching on the ignition, – establishing communication.
	Special notes: Use bornier **Elé. 1681** for all operations on the engine management computer connectors. Refer to the **Wiring diagrams** Technical Note for the vehicle to locate the relevant fuses and relays.

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

Check the connections of the injection supply relay mounting. Check the engine management computer connections. Repair if necessary.
Check the tightness and condition of the **+** and **-** battery terminals.

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 test with the **diagnostic tool**.

DF098 **CONTINUED 1**	

For F9Q 732 and 740 engines:
Check the **continuity** of the following connections:

Injection supply relay **track B5** → **Tracks M2** and **M3, connector B** of the engine management computer

Injection supply relay **track B2** → **Track D4, connector B** of the engine management computer

For F9Q 718 and G9T 720 engines:
Check the **continuity** of the following connections:

Injection supply relay mounting **track 5** → **Tracks M2** and **M3, connector B** of the engine management computer

Injection supply relay **track 2** → **Track D4, connector B** of the engine management computer

For the G9T 710 engine:
Check the **continuity** of the following connections:

Injection supply relay **track A5** → **Tracks M2** and **M3, connector B** of the engine management computer

Injection supply relay **track A2** → **Track D4, connector B** of the engine management computer

Check the **conformity** of the relevant fuses (crimping and condition of the terminal wires).
– For F9Q 732 and 740 engines: **F2 (30 A) and F8 (5 A)**.
– For F9Q 718 engines: **F60 (70 A)**.
– For G9T 710 engines: **F49 (70 A)**.
– For G9T 720 engines: **F5 (30 A)**.
Check the **conformity** of the impact sensor: false contact (depending on equipment).
Check the **conformity** of the engine management computer **earths**:

Earth → **tracks L3, L4, M4, connector B** of the engine management computer

If the fault is still present, replace the injection feed relay.

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 test with the **diagnostic tool**.

DF098 **CONTINUED 2**	

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

Check the main relay connections.
Check the engine management computer connections.
Repair if necessary.

Check the conformity of the main relay (relay removed):
– Insulation of contacts between **tracks 3** and **5 or A3 and A5 or B3 and B5** (depending on the engine).
– Coil resistance between **tracks 1** and **2 or A1 and A2 or B1 and B2** (depending on the engine).
Replace the relay if its resistance is not: **60 Ω ± 5 at + 20°C**.

For F9Q 732 and 740 engines:
Check the **insulation** against **earth** on the following connection:

Injection supply relay **track B2** ⟶ **Track D4, connector B** of the engine management computer

For F9Q 718 and G9T 720 engines:
Check the **insulation** against **earth** on the following connection:

Injection supply relay **track 2** ⟶ **Track D4, connector B** of the engine management computer

For the G9T 710 engine:
Check the **insulation** against earth on the following connection:

Injection supply relay **track A2** ⟶ **Track D4, connector B** of the engine management computer

If the fault is still present, replace the injection feed relay.

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 test with the **diagnostic tool**.

DF099 PRESENT OR STORED	CYLINDER 1 INJECTOR CIRCUIT CO : Open circuit 1.DEF: over-current L 2.DEF: over-current H 3.DEF: error during clearing

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault becomes present following an engine start.
	Special notes: Use bornier **Elé. 1681** for all operations on the engine management computer connectors.
	WARNING – Please observe the cleanliness guidelines and safety advice.

CO	***NOTES***	None.

Check the connections on injector n° 1.
Check the engine management computer connections.
Repair if necessary.

Measure the **resistance** of injector n° 1.
Replace the injector if it is **in open circuit (resistance is measured to infinity)**.

Check the continuity of the following connections:

Engine management computer, connector **C track M1** ⟶ **track 2** of the injector n° 1 connector

Engine management computer, connector **C track M3** ⟶ **track 1** of the injector n° 1 connector

If the fault is still present: run **Test 10 Poor injector operation**.

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 test with the **diagnostic tool**.

DF099 **CONTINUED**	

1.DEF ***2.DEF***	***NOTES***	**Priorities in dealing with a number of faults:** Deal with fault **DF089 Injector control capacitor voltage** first if it is present.

Check the connections on injector n° 1.
Check the engine management computer connections.
Repair if necessary.

Measure the **resistance** of injector n° 1.
Replace the injector if there is a **short circuit (R = 0 Ω)**.

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

Engine management computer, connector **C** **track M1** → **track 2** of the injector n° 1 connector

Engine management computer, connector **C** **track M3** → **track 1** of the injector n° 1 connector

Check the **insulation** against **earth** and **+ 12 V** of the following connections:

Engine management computer, connector **C** **track M1** → **track 2** of the injector n° 1 connector

Engine management computer, connector **C** **track M3** → **track 1** of the injector n° 1 connector

If the fault is still present: run **Test 10 Poor injector operation**.

3.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 is **present**, contact the Techline.

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 test with the **diagnostic tool**.

DF100 PRESENT OR STORED	CYLINDER 2 INJECTOR CIRCUIT CO : Open circuit 1.DEF: over-current L 2.DEF: over-current H 3.DEF: error during clearing

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault becomes present following an engine start.
	Special notes: Use bornier **Elé. 1681** for all operations on the engine management computer connectors.
	WARNING – Please observe the cleanliness guidelines and safety advice.

CO	***NOTES***	None.

Check the connections on injector n° 2.
Check the engine management computer connections.
Repair if necessary.

Measure the **resistance** of injector n° 2.
Replace the injector if it is **in open circuit (resistance is measured to infinity)**.

Check the continuity of the following connections:

Engine management computer, **connector C track L4** → **track 2** of the injector n° 2 connector

Engine management computer, **connector C track L3** → **track 1** of the injector n° 2 connector

If the fault is still present: run **Test 10 Poor injector operation**.

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 test with the **diagnostic tool**.

DF100 **CONTINUED**	

1.DEF ***2.DEF***	***NOTES***	**Priorities in dealing with a number of faults:** Deal with fault **DF089 Injector control capacitor voltage** first if it is present.

Check the connections on injector n° 2.
Check the engine management computer connections.
Repair if necessary.

Measure the **resistance** of injector n° 2.
Replace the injector if there is a **short circuit (R = 0 Ω)**.

Check the insulation between the following two connections:

Engine management computer, **connector C track L4** → **track 2** of the injector n° 2 connector

Engine management computer, **connector C track L3** → **track 1** of the injector n° 2 connector

Check the insulation against **earth** and **+ 12 V** of the following connections:

Engine management computer, **connector C track L4** → **track 2** of the injector n° 2 connector

Engine management computer, **connector C track L3** → **track 1** of the injector n° 2 connector

If the fault is still present: run **Test 10 Poor injector operation**.

3.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 is **present**, contact the Techline.

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 test with the **diagnostic tool**.

DF101 PRESENT OR STORED	CYLINDER 3 INJECTOR CIRCUIT CO : Open circuit 1.DEF: over-current L 2.DEF: over-current H 3.DEF: error during clearing

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault becomes present following an engine start.
	Special notes: Use bornier **Elé. 1681** for all operations on the engine management computer connectors.
	WARNING – Please observe the cleanliness guidelines and safety advice.

CO	***NOTES***	None.

Check the connections of injector n° 3.
Check the engine management computer connections.
Repair if necessary.

Measure the **resistance** of injector n° 3.
Replace the injector if it is **in open circuit (resistance is measured to infinity)**.

Check the continuity of the following connections:

Engine management computer, **connector C track M2** → **track 2** of the injector n° 3 connector

Engine management computer, **connector C track L2** → **track 1** of the injector n° 3 connector

If the fault is still present: run **Test 10 Poor injector operation**.

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 test with the **diagnostic tool**.

DF101 **CONTINUED**	

1.DEF ***2.DEF***	***NOTES***	**Priorities in dealing with a number of faults:** Deal with fault **DF089 Injector control capacitor voltage** first if it is present.

Check the connections of injector n° 3.
Check the engine management computer connections.
Repair if necessary.

Measure the **resistance** of injector n° 3.
Replace the injector if there is a **short circuit (R = 0 Ω)**.

Check the insulation between the following two connections:

Engine management computer, connector **C** **track M2** → **track 2** of the injector n° 3 connector

Engine management computer, connector **C** **track L2** → **track 1** of the injector n° 3 connector

Check the insulation against **earth** and **+ 12 V** of the following connections:

Engine management computer, connector **C** **track M2** → **track 2** of the injector n° 3 connector

Engine management computer, connector **C** **track L2** → **track 1** of the injector n° 3 connector

If the fault is still present: run **Test 10 Poor injector operation**.

3.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 is **present**, contact the Techline.

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 test with the **diagnostic tool**.

DF102 PRESENT OR STORED	CYLINDER 4 INJECTOR CIRCUIT CO : Open circuit 1.DEF: over-current L 2.DEF: over-current H 3.DEF: error during clearing

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault becomes present following an engine start.
	Special notes: Use bornier **Elé. 1681** for all operations on the engine management computer connectors.
	WARNING – Please observe the cleanliness guidelines and safety advice.

CO	***NOTES***	None.

Check the connections on injector n° 4.
Check the engine management computer connections.
Repair if necessary.

Measure the **resistance** of injector n° 4.
Replace the injector if it is **in open circuit (resistance is measured to infinity)**.

Check the continuity of the following connections:

Engine management computer, **connector C track L1** → **track 2** of the injector n° 4 connector

Engine management computer, **connector C track M4** → **track 1** of the injector n° 4 connector

If the fault is still present: run **Test 10 Poor injector operation**.

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 test with the **diagnostic tool**.

DF102 **CONTINUED**	

1.DEF ***2.DEF***	***NOTES***	**Priorities in dealing with a number of faults:** Deal with fault **DF089 Injector control capacitor voltage** first if it is present.

Check the connections on injector n° 4.
Check the engine management computer connections.
Repair if necessary.

Measure the **resistance** of injector n° 4.
Replace the injector if there is a **short circuit (R = 0 Ω)**.

Check the insulation between the following two connections:

Engine management computer, **connector C track L1** → **track 2** of the injector n° 4 connector

Engine management computer, **connector C track M4** → **track 1** of the injector n° 4 connector

Check the insulation against **earth** and **+ 12 V** of the following connections:

Engine management computer, **connector C track L1** → **track 2** of the injector n° 4 connector

Engine management computer, **connector C track M4** → **track 1** of the injector n° 4 connector

If the fault is still present: run **Test 10 Poor injector operation**.

3.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 is **present**, contact the Techline.

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 test with the **diagnostic tool**.

DF104 PRESENT OR STORED	THERMOPLUNGER RELAY N° 2 CC.1 : Short circuit to + 12 V CO.0 : Open circuit or short circuit to earth CC.0 : Short circuit to earth CO : Open circuit

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault reappears as present after: – an actuator command **AC302 Thermoplunger n° 2 relay**, – the engine has been started, after the engine has been running at idle speed for 30 seconds, with windscreen de-icer not selected and the engine temperature at starting less than 70°C.
	Special notes: Use bornier **Elé. 1681** for all operations on the engine management computer connectors. The thermoplunger n° 2 relay supplies two thermoplungers in parallel. Refer to the **Wiring diagrams** Technical Note for the vehicle to locate the relevant fuses and relays.

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

Check the thermoplunger n° **2** relay connections. Check the engine management computer connections. Repair if necessary.
Check the conformity of the thermoplunger n° **2** relay (relay removed): – **Insulation** between **tracks 3 and 5 or 7 and 9**. – Measure the resistance of the relay coil between **tracks 1 and 2 or 6 and 10**. Replace the relay if its resistance is not: **60 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 test with the **diagnostic tool**.

DF104 **CONTINUED 1**	

For G9T 710 and 720 engines:
Check the **insulation** against **+ 12 V** on the connection between:

Engine management computer, connector **B** **track F3** → **track 2** thermoplunger n° **2** relay mounting

Also check that this connection is **insulated** against the following connections:

Thermoplunger n° **2** relay mounting, **track 1** → **+ 12 V after relay**

Thermoplunger n° **2** relay mounting, **track 3** → **+ 12 V battery after fuse feed**

For G9T 720 engines (specific to 16-seat Master bus):
Check the **insulation** against **+ 12 V** on the connection between:

Engine management computer, connector **B** **track F3** → **track 6** thermoplunger n° **2** relay mounting

Also check that this connection is **insulated** against the following connections:

Thermoplunger n° **2** relay mounting, **track 10** → **+ 12 V after relay**

Thermoplunger n° **2** relay mounting, **track 9** → **+ 12 V battery after fuse feed**

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 test with the **diagnostic tool**.

DF104 **CONTINUED 2**	

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

Check the thermoplunger n° **2** relay connections.
Check the engine management computer connections.
Repair if necessary.

Measure the **resistance** of the thermoplunger n° **2** relay coil between **tracks 1 and 2 or 6 and 10**.
Replace the relay if its resistance is not: **60 Ω ± 5 at + 20°C**.

For G9T 710 and 720 engines:
Check the **continuity and insulation** against **earth** of the connection between:

Engine management computer, connector **B** **track F3** → **track 2** thermoplunger n° **2** relay mounting

For G9T 720 engine (specific to 16-seat Master):
Check the **continuity and insulation** against **earth** of the connection between:

Engine management computer, connector **B** **track F3** → **track 6** thermoplunger n° **2** relay mounting

Check for **+ 12 V after relay** feed on **track 1 or 10** (depending on the engine) of the thermoplunger n° **2** relay mounting.

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 test with the **diagnostic tool**.

DF105 PRESENT OR STORED	STABILISED VOLTAGE REGULATOR DEF : Stored fault 1.DEF : Internal electronic fault

DEF 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 is **present**, contact the Techline.

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 test with the **diagnostic tool**.

DF106 PRESENT OR STORED	DAMPER VALVE CIRCUIT CC.1 : Short circuit to + 12 V CO.0 : Open circuit or short circuit to earth CC.0 : Short circuit to earth CO : Open circuit

NOTES	**Conditions for applying the fault finding procedure to stored faults:** If the fault becomes present after an actuator command **AC593 Damper valve**.
	Special notes: Use bornier **Elé. 1681** for all operations on the engine management computer connectors.

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

Check the connectors of the damper valve solenoid valve.
Check the engine management computer connections.
Repair if necessary.

Measure the **resistance** of the coil in the damper valve solenoid valve between **tracks 1** and **2**.
Replace the solenoid valve if the resistance is not: **46 Ω ± 3 at + 25°C**.
Check the **insulation** against **+ 12 V** on the connection between:

Engine management computer, **connector C track F4** ⟶ **track 1** of the solenoid valve connector

Check the **insulation** of this connection against the connection between (connector disconnected):

Engine management computer **connector B track M2** ⟶ **track 2** of the solenoid valve connector

If the fault is still present, replace the damper valve 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 test with the **diagnostic tool**.

DF106 **CONTINUED**	

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

Check the connectors of the damper valve solenoid valve.
Check the engine management computer connections.
Repair if necessary.

Measure the **resistance** of the coil in the damper valve solenoid valve between **tracks 1** and **2**.
Replace the solenoid valve if the resistance is not: **46 Ω ± 3 at + 25°C**.
Check the **continuity and insulation** against earth of the connection between:

Engine management computer, **connector C track F4** ⟶ **track 1** of the solenoid valve connector

Check **for + 12 V** on **track 2** of the connector on the damper valve solenoid valve.
If the fault is still present, replace the damper valve 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 test with the **diagnostic tool**.

DF107 PRESENT OR STORED	SWIRL FLAP CC.1 : Short circuit to + 12 V CO.0 : Open circuit or short circuit to earth CC.0 : Short circuit to earth CO : Open circuit 1.DEF: Turbulence flap jammed closed

NOTES	**Special notes:** Use bornier **Elé. 1681** for all operations on the engine management computer connectors.

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

Check the turbulence flap solenoid valve connections.
Check the engine management computer connections.
Repair if necessary.

Measure the **resistance** of the swirl flap solenoid valve between **tracks 1** and **2**.
Replace the solenoid valve if the resistance is not: **46 Ω ± 3 at + 25°C**.

Check the **insulation** against **+ 12 V** on the connection between:

Engine management computer, **connector C track H4** ⟶ **track 1** of the solenoid valve connector

If the fault is still present, replace the swirl flap 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 test with the **diagnostic tool**.

DF107 **CONTINUED 1**	

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

Check the turbulence flap solenoid valve connections. Check the engine management computer connections. Repair if necessary.
Measure the **resistance** of the swirl flap solenoid valve between **tracks 1** and **2**. Replace the solenoid valve if the resistance is not: **46 Ω ± 3 at + 25°C**.
Check the **continuity and insulation** against **earth** of the connection between: Engine management computer, **connector C track H4** ⟶ **track 1** of the solenoid valve connector Check **for + 12 V** feed on **track 2** of the swirl flap solenoid valve connector. If the fault is still present, replace the swirl flap solenoid valve.

CO	***NOTES***	None.

Check the turbulence flap solenoid valve connections. Check the engine management computer connections. Repair if necessary.
Measure the **resistance** of the swirl flap solenoid valve between **tracks 1** and **2**. Replace the solenoid valve if the resistance is not: **46 Ω ± 3 at + 25°C**.
Check the **continuity and insulation** against **earth** of the connection between: Engine management computer, **connector C track H4** ⟶ **track 1** of the solenoid valve connector If the fault is still present, replace the swirl flap 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 test with the **diagnostic tool**.

DF107 **CONTINUED 2**	

1.DEF	***NOTES***	**Priority in the event of a number of faults:** Apply the interpretation of fault **DF019 Air flow sensor circuit** or **DF241 EGR function** or **DF106 Damper valve circuit** first if at least one of the three is present or stored.
		Conditions for applying the fault finding procedure to 1.DEF stored: The fault reappears after: – the fault memory has been cleared, – a road test with engine speed > **3500 rpm**, fuel flow > **59 mm^3/stroke** and atmospheric pressure > **996 hPa (996 mbar)** (minimum of **4 seconds** under these conditions to clear the fault).
		Special notes: Use bornier **Elé. 1681** for all operations on the engine management computer connectors.

Check the turbulence flap solenoid valve connections.
Check the engine management computer connections.
Repair if necessary.

Measure the **resistance** of the swirl flap solenoid valve between **tracks 1** and **2**.
Replace the solenoid valve if the resistance is not: **46 Ω ± 3 at + 25°C**.

Check the **continuity and absence of interference resistance** on the connection between:

Engine management computer, connector **C track H4** ⟶ **track 1** of the swirl flap solenoid valve connector

If the fault is still present, replace the swirl flap 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 test with the **diagnostic tool**.

DF 108 **PRESENT** **OR** **STORED**	BRAKE INFORMATION 1.DEF: Consistency with redundant brakes 2.DEF: Consistency with redundant brakes after initialisation

1.DEF ***2.DEF***	***NOTES***	**Conditions for applying the fault finding procedure to stored faults:** If the fault reappears as present after: – the brake pedal being depressed.
		Special notes: Use bornier **Elé. 1681** for all operations on the engine management computer connectors.

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 test with the **diagnostic tool**.

DF 108 **CONTINUED 1**	

Use the Status List menu to check **ET047 Braking** and **ET014 Brake contact n° 2 signal** and check:

– Brake pedal in rest position — **ET047** = **INACTIVE** and **ET014** = **INACTIVE**
– depress the brake pedal, — **ET047** = **ACTIVE** and **ET014** = **ACTIVE**

*Has **ET047** been correctly recognised?*

NO

YES

*Has **ET014** been correctly recognised?*

YES → **Clear the fault**
End of fault finding

NO

Check the connections of the brake pedal switch, the ABS computer (depending on the equipment level) and the engine management computer.
Repair if necessary.
Check for **+ 12 V** after ignition feed on **track 1 or B1** (G9T 720) of the brake pedal switch connector and the condition of the fuse (15 A or 20 A, depending on the engine).
Disconnect the ABS computer and check the **continuity and insulation** against **+ 12 V** and against **earth** of the following connections:

Brake pedal switch connector **track 3 or A3** (G9T 720) → **track 7** (F9Q 718) or **track 14** (F9Q 732, 740 and G9T 710) or **track 18** (G9T 720) of the ABS computer connector.

Brake pedal switch connector **track 2** (G9T 710) → **track C2, connector A** of the engine management computer

With the ABS deactivated, check the **continuity and the insulation** against **+ 12 V** and against **earth** of the following connection:

Brake pedal switch connector **track 3 or A3** (G9T 720) → **track F3, connector A** of the engine management computer.

A

B

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 test with the **diagnostic tool**.

DF 108 **CONTINUED 2**	

A

Check the operation of the brake-pedal switch:
– in the rest position: infinite resistance between tracks **1 and 3 or B1 and A3** (G9T 720), continuity between **tracks 1 and 2 or A1 and B3** (G9T 720).
– depressed: continuity between tracks **1 and 3 or B1 and A3** (G9T 720), infinite resistance between **tracks 1 and 2 or A1 and B3** (G9T 720).
Replace the switch if necessary.
If the fault is still present, run **fault finding on the ABS** then, if no fault is detected, run **fault finding on the multiplex network**.

B

C

Check the brake pedal switch connections and the engine management computer connections.
Repair if necessary.
Check the condition and adjustment of the brake pedal switch. Repair if necessary.
Check for **+ 12 V** after ignition feed on **track 1 or B1** (G9T 720) of the brake pedal switch connector and the condition of the fuse (15 A or 20 A, depending on the engine).
Disconnect the ABS computer and check the **continuity and insulation** against **+ 12 V** and against **earth** of the following connections:

Engine management computer **connector A track F3**	→	**track 3 or A3** (G9T 720) of the brake pedal switch connector
Engine management computer, **connector A track C2**	→	**track 2** (G9T 710) brake pedal switch connector

Check the operation of the brake-pedal switch:
– in the rest position: continuity between tracks **1 and 3 or B1 and A3** (G9T 720), infinite resistance between **tracks 1 and 2 or A1 and B3** (G9T 720).
– depressed: continuity between tracks **1 and 3 or B1 and A3** (G9T 720), infinite resistance between **tracks 1 and 2 or A1 and B3** (G9T 720).
Replace the switch 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 test with the **diagnostic tool**.

DF109 PRESENT OR STORED	CRUISE CONTROL ACTIVATION COMPONENTS 1.DEF: Data inconsistency

1.DEF	***NOTES***	**Special notes:** Use bornier **Elé. 1681** for all operations on the engine management computer connectors.

Check that parameter **PR047 Cruise control switch voltage** is between:
– 0 and 0.75 V when the "-" button is pressed (steering wheel control),
– 1.7 to 2.7 V when the "+" button is pressed (steering wheel control),
– 0.33 to 4.1 V when the "O/R" button is pressed (steering wheel control),
– 4.7 to 5.1 V when the cruise control has not been activated.
Wait 30 seconds for each check for the computer to run its own fault finding.

Check the engine management computer connections.
Check the cruise control switch connections.
Check the cruise control on/off switch connections.
Repair if necessary.

Cruise control activation switch side:
– Check the **continuity** of the following connection:

Engine management computer **connector A track A2** ⟶ **track 3** of the cruise control switch connector

Also check the **insulation** of this connection against **earth** and against **+ 12 V**.
– Check the **continuity** of the following connection:

Engine management computer **connector A track B2** ⟶ **track 4** of the cruise control switch connector

Also check the **insulation** of this connection against **earth** and against **+ 12 V**.
– Check the **insulation** between these two 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 test with the **diagnostic tool**.

DF109 **CONTINUED**	

Cruise control on/off switch side:
Check for **+ 12 V** on **track B2** of the cruise control on/off switch connector.

- *Switch in the **off** position:*
  - check the **insulation** between **tracks B2 and B3** of the on/off switch,
  - check the **insulation** of the following connection against **earth** and against **+ 12 volts**:

Engine management computer, **connector A** **track D2** ⟶ **track B2** of the on/off switch connector

- *Switch in the **on** position:*
  - check the **continuity** between **tracks B2 and B3** of the on/off switch,
  - check for **+ 12 V** on **track D2** of **connector A** of the engine management computer.

If the fault is still present, replace the cruise control on/off switch.

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 test with the **diagnostic tool**.

DF110 PRESENT OR STORED	MULTIPLEX NETWORK 1.DEF: No multiplex frame from ABS 2.DEF: No multiplex bus signal 3.DEF: Multiplex bus in short circuit

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

Check the engine management computer connections. Check the ABS connections. Repair if necessary.
Check the multiplex network (**see 88B Multiplexing**). Repair if necessary.
Check the ABS computer (**see 38C ABS**).
If the fault is still present, contact Techline.

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

Check the engine management computer connections. Repair if necessary.
For F9Q 732, 740 engines. Check the R34 intermediate connections. Repair if necessary.
Check the multiplex network (**see 88B Multiplexing**). Repair if necessary.
If the fault is still present, contact Techline.

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 test with the **diagnostic tool**.

DF241 PRESENT OR STORED	EXHAUST GAS RECIRCULATION FUNCTION CC.1 : Short circuit to + 12 V CO.0 : Open circuit or short circuit to earth 1.DEF: Positive air flow regulation variation 2.DEF: Negative air flow regulation variation

NOTES	**Conditions for applying the fault finding procedure to stored faults:** The fault reappears after: – the fault has been cleared from memory, – the valve has been actuated by the **AC007 EGR valve** command.
	Special notes: Use bornier **Elé. 1681** for all operations on the engine management computer connectors.

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

Check the exhaust gas recirculation valve connections:
Check the engine management computer connections.
Repair if necessary.

Measure **the resistances** of the exhaust gas recirculation valve (***Pierburg*** *or* ***Cooper*** type):
– between **tracks 1 and 5: from 7.5 Ω to 8.5 Ω, at + 20°C**.
– For the ***Pierburg*** type exhaust gas recirculation valve:
  – between **tracks 2 and 4: 2400 Ω to 5600 Ω, at + 20°C**.
  – between **tracks 2 and 6: 1900 Ω to 6400 Ω, at + 20°C**.
  – between **tracks 4 and 6: 800 Ω to 3800 Ω, at + 20°C**.
If one of the resistances is not correct, replace the exhaust gas recirculation valve.

With the exhaust gas recirculation valve disconnected, check the **insulation** against **+ 12 V** of the connection between:

Engine management computer, **connector B track M1** → **track 5** of the exhaust gas recirculation valve connector

If the fault is still present, replace the exhaust gas recirculation 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 test with the **diagnostic tool**.

DF241 **CONTINUED 1**	

CO.0	***NOTES***	**Special notes:** In the event of the simultaneous presence of fault **DF084 EGR valve position sensor circuit CO.0**, check that the exhaust gas recirculation valve connector is connected correctly.

Check the exhaust gas recirculation valve connections:
Check the engine management computer connections.
Repair if necessary.

Measure **the resistances** of the exhaust gas recirculation valve (***Pierburg*** *or* ***Cooper*** type):
– between **tracks 1 and 5: from 7.5 Ω to 8.5 Ω, at + 20°C**.

– For the ***Pierburg*** type exhaust gas recirculation valve:
  – between **tracks 2 and 4: 2400 Ω to 5600 Ω, at + 20°C**,
  – between **tracks 2 and 6: 1900 Ω to 6400 Ω, at + 20°C**,
  – between **tracks 4 and 6: 800 Ω to 3800 Ω, at + 20°C**.

If one of the resistances is not correct, 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 **for + 12 V after relay** feed on **track 1** of the exhaust gas recirculation valve connector.

If the fault is still present, replace the exhaust gas recirculation 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 test with the **diagnostic tool**.

DF241 **CONTINUED 2**	

1.DEF ***2.DEF***	***NOTES***	**Priority in the event of a number of faults:** Apply the interpretation of fault **DF084 EGR valve position sensor circuit** then fault **DF019 Air flow sensor circuit**, 1.DEF first if they are present.

Check the exhaust gas recirculation valve connections:
Check the engine management computer connections.
Repair if necessary.

Check for leaks in the air inlet circuit (above all between the air flowmeter and the turbocharger: run **test 4**) and the exhaust gas recirculation circuit (run **test 9**, part A).
Check the **continuity and insulation** of the connections between:

Engine management computer, **connector B track G2** → **track 3** of the air flowmeter connector

Engine management computer, **connector B track H4** → **track 5** of the air flowmeter connector

Check for **+ 5 V** feed on **track 3** of the air flowmeter connector when the vehicle has + after ignition feed.
Check for **+ 12 V after relay** on **track 4** of the air flowmeter connector.
Check for **earth** on **track 6** of the air flowmeter connector.
Apply the interpretation of parameter **PR050 Air flow measurement**, at warm idle speed (coolant temperature > 80°C).
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 test with the **diagnostic tool**.

NOTES	Only carry out a conformity check after a **complete check** with the diagnostic tool. The values shown in this conformity check are given as examples. **Test conditions: engine stopped, ignition on.**

Order	Function	Parameter or State Check or Action		Display and notes	Fault finding
1	Battery voltage	**ET001:**	Computer + after ignition	**Status: ACTIVE**	In the event of a fault, refer to fault finding procedure **PR004**.
		PR004:	Computer feed voltage	**9 V < X < 16 V**	
2	Immobiliser	**ET003:**	Immobiliser	**Status: INACTIVE** The computer is unlocked	In the event of a fault, consult the fault finding procedure for the immobiliser.
		ET110:	Immobiliser code not programmed	**Status: INACTIVE** The computer has a code stored	
3	Synchronisation *(between the camshaft sensor and the engine speed sensor)*	**ET115:**	Synchronisation status	**Status: INACTIVE,** *then becomes "active" once the engine is started.*	Any phase displacement between the camshaft sensor and the TDC sensor (slack belt or timing delay) will lead to the appearance of **DF070: Camshaft/engine speed sensor consistency**. If starting is impossible: while the starter motor is running, the status becomes **INACTIVE** and only becomes **ACTIVE** if the engine starts.

NOTES	Only carry out a conformity check after a **complete check** with the diagnostic tool. The values shown in this conformity check are given as examples. **Test conditions: engine stopped, ignition on.**

Order	Function	Parameter or State Check or Action		Display and notes	Fault finding
4	Pre/postheating	**ET027:**	Pre/postheating relay control	**Status: ACTIVE** When the ignition is switched on and until pre/postheating ends.	None.
		ET011:	Pre/postheating information	**Status: ACTIVE** as soon as pre-postheating has finished.	
		ET104:	Control for preheating warning light	**Status: ACTIVE** When the ignition is switched on and until preheating ends.	
5	Low-pressure fuel pump (CP1 pump)	**ET105:**	Low pressure pump relay control	**Status: ACTIVE,** when ignition switched on. Becomes **INACTIVE** as soon as the engine is stopped.	None.
6	Relay controls	**ET037:**	low speed fan assembly relay control	**Status: ACTIVE or INACTIVE** According to computer programming.	None.
		ET038:	high-speed fan assembly relay control		
		ET106:	Thermoplunger n° 1 relay control		
		ET107:	Thermoplunger n° 2 relay control		
		ET108:	Thermoplunger n° 3 relay control		

NOTES	Only carry out a conformity check after a **complete check** with the diagnostic tool. The values shown in this conformity check are given as examples. **Test conditions: engine stopped, ignition on.**

Order	Function	Parameter or State Check or Action		Display and notes	Fault finding
7	Switches	**ET012:**	Clutch contact signal	Statuses: **ACTIVE** or **INACTVE**, *depending on whether or not the pedals are depressed*	If the clutch switch is not correct, the engine may race during gear changes.
		ET047:	braking		
		ET014:	brake switch signal n° 2 **ACTIVE** if **ET047** = active	**INACTIVE** If **ET047** = inactive	
		ET035:	reverse gear signal	Status: **ACTIVE** if reverse gear is engaged.	Affects the RX4.
8	Instrument panel warning lights	**ET087:**	Engine overheating warning light control	Status: **ACTIVE** for a few seconds when the ignition is switched on.	**ET087:** not applicable to the Espace III. OBD warning light only on Laguna I.
		ET097:	OBD warning light		
9	Supply voltage	**PR004:**	Computer feed voltage	**9 V < X < 16 V**	If there is a problem, test the battery and carry out a fault finding procedure on the charge circuit.
		PR090:	Sensor supply voltage n° 1	**4.9 V < X < 5.1 V**	
		PR091:	Sensor supply voltage n° 2	**4.9 V < X < 5.1 V**	

NOTES	Only carry out a conformity check after a **complete check** with the diagnostic tool. The values shown in this conformity check are given as examples. **Test conditions: engine stopped, ignition on.**

Order	Function	Parameter or State Check or Action		Display and notes	Fault finding
10	Temperature sensors	**PR002:**	Coolant temperature	X = engine temperature ± **5°C**	In the event of a fault, check that the sensor is functioning correctly by comparing the temperature displayed by the diagnostic tool with that shown by a workshop temperature sensor. **WARNING** On some F9Q engines, the fuel temperature is set at **60°C**.
		PR003:	Air temperature	X = engine temperature ± **5°C**	
		PR001:	Fuel temperature	**PR003 < PR001 < PR002** (If **PR001** is very close to **PR002**, check the injector return flows).	
11	Inlet pressure	**PR016:**	Atmospheric pressure	X = Atmospheric pressure	In the event of a fault, check that the air flow around the computer is not obstructed. Do not take into account **PR082** for Master vehicles.
		PR082:	Turbocharging pressure	**X = ~ PR016** For **PR082 > PR016** perform the test with the engine running under load.	
		PR081:	Turbocharging pressure loop difference	**X = ~ 0**	If **PR081** is significant, apply the interpretation of command **AC004 Turbocharging pressure relief valve**. Do not take into account **PR094** for Master vehicles.
		PR094:	OCR * turbocharging pressure relief valve	**X = 5%**	
12	Opening Cyclic Ratio	**PR095:**	EGR valve OCR*	**X = 5%**	In the event of a fault, apply the interpretation of command **AC007 EGR valve**.
	Exhaust gas recirculation valve	**PR088:**	EGR valve position feedback	**0.75 < X < 1.5 V**	
		PR089:	EGR valve position feedback loop variance	**X = ~ 2 mV**	

* OCR: **O**pening **C**yclic **R**atio.

NOTES	Only carry out a conformity check after a **complete check** with the diagnostic tool. The values shown in this conformity check are given as examples. **Test conditions: engine stopped, ignition on.**

Order	Function	Parameter or State Check or Action		Display and notes	Fault finding
13	Diesel pressure	**PR083:**	Injector rail pressure	**0 < X < 30 bar**	If the engine has just been stopped, wait a few seconds to obtain this value. **PR202** only for engines on Master vehicles.
		PR097:	Rail pressure regulation valve OCR*	**X = 5%**	
	Fuel flow	**PR202:**	Regulated fuel flow	**X = ~ 25000 mm^3/s**	
		PR033:	Fuel flow	**20 < X < 40 mm^3/ stroke**	
14	Accelerator pedal sensor	**ACCELERATOR PEDAL NO LOAD**			
		PR008:	Pedal potentiometer voltage gang 1	**X = 0.75 V ± 0.09**	**WARNING** Approximately every **5 seconds** the computer performs a test to set **PR009** at **0 V**. This corresponds to normal operation.
		PR005:	Pedal load	**X = 0 %**	
		PR092:	Pedal load (gang n° 1)	**X = 0 %**	
		PR093:	Pedal load (gang n° 2)	**X = 0 %**	
		PR009:	Pedal potentiometer voltage gang 2	**X = 0.37 V ± 0.05**	
		ACCELERATOR PEDAL FULL LOAD			
		PR008:	Pedal potentiometer voltage gang 1	**X = 4.25 V ± 0.31**	**WARNING** Approximately every **5 seconds** the computer performs a test to set **PR009** at **0 V**. This corresponds to normal operation.
		PR005:	pedal load without cruise control/ speed limiter load	**100 < X <127%**	
		PR005:	pedal load with cruise control/ speed limiter load	**100 < X <139%**	
		PR092:	Pedal load (gang n° 1) for Commercial vehicle without CC/SL	**X = 105% ± 5**	

* OCR: **O**pening **C**yclic **R**atio.

NOTES	Only carry out a conformity check after a **complete check** with the diagnostic tool. The values shown in this conformity check are given as examples. **Test conditions: engine stopped, ignition on.**

Order	Function	Parameter or State Check or Action		Display and notes	Fault finding
14	Accelerator pedal sensor	**PR092:**	Pedal load (gang n° 1) for Commercial vehicle without CC/SL	**X = 115% ± 5**	**WARNING** Approximately every **5 seconds** the computer performs a test to set **PR009** at **0 V**. This corresponds to normal operation.
		PR092:	Pedal load (gang n° 1) for Passenger vehicle without CC/SL	**X = 122% ± 5**	
		PR092:	Pedal load (gang n° 1) for Passenger vehicle with CC/SL	**X = 134% ± 5**	
		PR093:	Pedal load (gang n° 2) for Commercial vehicle without CC/SL	**X = 105% ± 5**	
		PR093:	Pedal load (gang n° 2) for Commercial vehicle with CC/SL	**X = 115% ± 5**	
		PR093:	Pedal load (gang n° 2) for Passenger vehicle without CC/SL	**X = 122% ± 5**	
		PR093:	Pedal load (gang n° 2) for Passenger vehicle with CC/SL	**X = 134% ± 5**	
		PR009:	Pedal potentiometer voltage gang 2	**X = 2.12 V ± 0.16**	

NOTES	Only carry out a conformity check after a **complete check** with the diagnostic tool. The values shown in this conformity check are given as examples. **Test conditions: engine stopped, ignition on.**

Order	Function	Parameter or State Check or Action		Display and notes	Fault finding
15	Cruise Control function	**PR047:**	Cruise control lever voltage	**X = 4.9 V ± 0.2** switches in rest position X = **0.2 V ± 0.2** if **O** is pressed X = **3.7 V ± 0.2** if **R** is pressed X = **2.4 V ± 0.2** if **+** is pressed X = **1.3 V ± 0.2** if **-** is pressed	None.
		ET036:	Cruise control switch	**ACTIVE** when the cruise control button is pressed. **INACTIVE** when the button is released.	is in the rest position or on limiter. + green warning light on the instrument panel lighting up.

NOTES	Only carry out a conformity check after a **complete check** with the diagnostic tool. The values shown in this conformity check are given as examples. **Test conditions**: **engine warm at idle speed, coolant temperature > 80°C, with no electrical consumers.**

Order	Function	Parameter or State Check or Action		Display and notes	Fault finding
If necessary, refer to the Workshop Repair Manual section **13B for the relevant vehicle: Injection programming - air conditioning**.					
16	Air conditioning (selected)	**If the injection authorises air conditioning:**			In the event of a fault with the fan assembly, apply the interpretation of command **AC011 Low speed fan assembly relay or AC012 High speed fan assembly relay**.
		ET109:	Air conditioning inhibition control	Status: **INACTIVE**	
		ET102:	Air conditioning request	Status: **ACTIVE**	
		ET037:	Low-speed fan assembly control relay	Status: **ACTIVE** becomes: inactive, if the refrigerant pressure **~ 20 bar**.	
		ET038:	High-speed fan assembly relay control	Status: **INACTIVE** becomes: *active*, if the refrigerant fluid pressure is **> ~ 20 bar**.	
		PR006:	Engine speed	**X = 820 rpm ± 50**	
		If the injection does not authorise air conditioning:			
		ET109:	Air conditioning inhibition control	Status: **ACTIVE**	
		ET102:	Air conditioning request	Status: **ACTIVE**	
		ET037:	Low-speed fan assembly control relay	Status: **INACTIVE**	
		PR006:	Engine speed	**X = 820 rpm ± 50**	

NOTES	Only carry out a conformity check after a **complete check** with the diagnostic tool. The values shown in this conformity check are given as examples. **Test conditions**: **engine warm at idle speed, coolant temperature > 80°C, with no electrical consumers.**

Order	Function	Parameter or State Check or Action		Display and notes	Fault finding
17	Engine speed	**PR006:**	Engine speed	**820 rpm ± 50**	**None.**
		PR002:	Coolant temperature	Greater than **80°C**	
		PR062:	Engine idle speed setpoint.	**820 rpm ± 50**	According to the increase or decrease in the diagnostic tool **configuration** menu.
		PR035:	Idle speed correction	**X = 0 rpm ± 50**	
18	Fuel pressure and flow rate	**PR083:**	Injector rail pressure	**230 bar < X < 330 bar** (**~ 1350 bar** *maximum with full load on the pedal*).	The computer keeps the injector rail pressure around its normal value. If, at idle speed, the minimum/maximum **variation** range exceeds **50 bar**, check the high pressure circuit. In the event of a fault, refer to the fault finding procedure for command **AC006 Fuel pressure solenoid valve**.
		PR086:	Rail pressure loop difference	**X = ~ 0 bar**	
		PR202:	Regulated fuel flow (Master)	**700 mm^3/s < X < 1800 mm^3/s**	
		PR097:	Rail pressure regulation valve OCR*	**X = ~ 30%**	
		PR033:	Fuel flow	**4 mm^3/stroke < X < 20 mm^3/stroke**	
		PR075:	Fuel flow value at idle speed	**4 mm^3/stroke < X < 10 mm^3/stroke**	

* OCR: **O**pening **C**yclic **R**atio.

NOTES	Only carry out a conformity check after a **complete check** with the diagnostic tool. The values shown in this conformity check are given as examples. **Test conditions**: **engine warm at idle speed, coolant temperature > 80°C, with no electrical consumers.**

Order	Function	Parameter or State Check or Action		Display and notes	Fault finding
19	Air flow	**PR:050**	Air flow measurement	**X = ~ 35 kg/h ± 2 with PR095 = 40% ± 5** **X = ~ 60 kg/h ± 3 with PR095 = 5%** **~10 kg/h** with the engine stopped **~ 480 kg/h** with full load on the pedal	In the event of a fault, check the value of **PR050 Air flow measurement**.
20	Fraction valves	**PR095:**	EGR VALVE OCR* SIGNAL	**X = 5% or 40% ± 5** (depending on programming). OCR* (opening cyclic ratio) = 30 - 40% at idle speed or 5% if the valve is closed.	In the event of a fault, go to the fault finding procedure for command **AC007 EGR valve**.
		PR094:	Turbocharging limitation valve OCR*	**50% ≤ X ≤ 95%**	In the event of a fault, go to the fault finding procedure for command **AC004 Turbocharging pressure relief valve**.

* OCR: **O**pening **C**yclic **R**atio.

NOTES	Only carry out a conformity check after a **complete check** with the diagnostic tool. The values shown in this conformity check are given as examples. **Test conditions: engine warm at idle speed, coolant temperature > 80°C.**

Order	Function	Parameter or State Check or Action		Display and notes	Fault finding
21	Fan assemblies	**PR002:**	Coolant temperature	**If X ≥ 99 °C** then	In the event of a fault, apply the interpretation of commands **AC011 Low speed fan assembly relay** or **AC012 High speed fan assembly relay**. When the temperature drops to **89°C**, the low speed fan assembly is stopped (the status of the command becomes**INACTIVE**).
		ET037:	Low-speed fan assembly control relay	**State: ACTIVE** *The fan should run at low speed*	
		PR002:	Coolant temperature	If: **X ≥ 102°C**.	
		ET038:	High-speed fan assembly relay control	**State: ACTIVE** *The fan should run at high speed*	
*If necessary, consult Workshop Repair Manual, section **13B for the relevant vehicle: Centralised coolant temperature management**.*					
22	Thermoplungers	**ET106:**	Thermoplunger n° 1 relay control	Command statuses: **ACTIVE** or **INACTIVE**, depending on the thermoplunger control programming.	In the event of a fault, apply the interpretation of commands **AC301 Thermoplunger n° 1 relay, AC302 Thermoplunger n° 2 relay AND AC002 Thermoplunger n° 3 relay**. If necessary, refer to the Workshop Repair Manual, section **13B for the vehicle concerned: Thermoplunger programming**.
		ET107:	Thermoplunger n° 2 relay control (depending on vehicle)		
		ET108:	Thermoplunger n° 3 relay control		
		PR006:	Engine speed	**820 rpm ± 50**	

NOTES	Only carry out a conformity check after a **complete check** with the diagnostic tool. The values shown in this conformity check are given as examples. **Test conditions: engine stopped, ignition on. ET003 Engine immobiliser inactive.**

Order	Function	Parameter or State Check or Action	Display and notes	Fault finding
23	Thermoplungers	**AC301:** Thermoplunger relay n° 1 **AC302:** Thermoplunger relay n° 2 (depending on vehicle) **AC002:** Thermoplunger relay n° 3	The relays should be heard operating (two **~ 1 second** ON-OFF cycles).	In the event of a fault, apply the interpretation of command **AC301 Thermoplunger relay n° 1**. In the event of a fault, apply the interpretation of command **AC302 Thermoplunger relay n° 2**. In the event of a fault, apply the interpretation of command **AC002 Thermoplunger relay n° 3**.
24	Wastegate control	**AC004:** Wastegate (depending on vehicle)	When the command is running, maintain a vacuum of **~ 900 mbar** at the valve inlet to hear it operating and check the operation of the turbocharger control diaphragm.	In the event of a fault, apply the interpretation of command **AC004 Turbocharging pressure relief valve**.
25	Booster pump	**AC005:** Low pressure pump relay (depending on vehicle)	The relays should be heard operating (five **~ 1 second** ON-OFF cycles) as well as the pump.	None.

NOTES	Only carry out a conformity check after a **complete check** with the diagnostic tool. The values shown in this conformity check are given as examples. **Test conditions: engine stopped, ignition on. ET003 Engine immobiliser inactive.**

Order	Function	Parameter or State Check or Action		Display and notes	Fault finding
26	Fuel pressure regulator	**AC006:**	Fuel pressure solenoid valve (or flow regulation solenoid valve)	Place your hand on the valve to feel it operating.	In the event of a fault, apply the interpretation of command **AC006 Fuel pressure solenoid valve**.
27	Exhaust gas recirculation valve	**AC007:**	EGR valve	Place your hand on the valve to feel it operating.	In the event of a fault, apply the interpretation of command **AC007 EGR valve**.
28	Preheating relay	**AC010:**	Preheating relay	Place a current clamp on **track 3** of the preheating relay and check that the power consumption is **60 to 80 A** (five **2 second ~**cycles)..	Locate the defective heater plug. Its resistance is: **> 2 Ω**.
29	Motor-driven fan assembly	**AC011:**	Low speed fan assembly relay	The relay concerned should be heard operating (three **~2 second** ON-OFF cycles) and check that the fan is running at the required speed.	In the event of a fault on the low speed fan assembly, apply the interpretation of command **AC011 Low speed fan assembly relay**.
		AC012:	High-speed fan assembly relay		In the event of a fault on the high speed fan assembly, apply the interpretation of command **AC012 High speed fan assembly relay**.

NOTES	Only carry out a conformity check after a **complete check** with the diagnostic tool. The values shown in this conformity check are given as examples. **Test conditions: engine stopped, ignition on. ET003 Engine immobiliser inactive.**

Order	Function	Parameter or State Check or Action		Display and notes	Fault finding
30	Air conditioning	**AC003:**	Air conditioning inhibition	You should hear the compressor operating	In the event of a fault, consult the fault finding **AC003 Air conditioning inhibition**.
31	Warning lights: Preheating	**AC212:**	Heater plugs "on" indicator lights	The selected warning light should come on (one ON-OFF cycle). (these controls do not apply to some vehicles with multiplex systems).	In the event of a fault, apply the interpretation of commands **AC212 Preheating indicator light, AC213 Overheating warning light**.
	Overheating	**AC213:**	Overheating warning light		
32	Flap control	**AC593:**	Damper valve (depending on the vehicle)	While running these commands, maintain a vacuum of **~ 900 mbar** at the solenoid valve inlet to hear it operating and check operation of the valve concerned (three **2 second ~** ON-OFF cycles).	In the event of a fault, apply the interpretation of command **AC593 Damper valve (Espace III)**.
33	Instrument panel indicator lights	**AC022:**	OBD indicator light (depending on vehicle)	The indicator light on the instrument panel should flash.	In the event of a fault, consult the fault finding for **AC022 OBD warning light**.
34		**AC212:**	Preheating warning light	The indicator light(s) on the instrument panel should flash.	In the event of a fault, consult the fault finding for **AC212 Preheating indicator light**.
35		**AC213:**	Overheating warning light	The indicator light on the instrument panel should flash.	In the event of a fault, consult the fault finding for **AC213 Overheating warning light**.

Tool status	Diagnostic tool title
ET001	Computer + after ignition
ET003	Immobiliser
ET011	Pre-postheating signal
ET012	Clutch contact signal
ET014	Brake switch signal n° 2
ET015	Heated windscreen signal
ET027	P
ET035	Reverse gear signal
ET036	Cruise control switch
ET037	Low-speed fan assembly relay control
ET038	High-speed fan assembly relay control
ET047	Braking
ET087	Engine overheating warning light control
ET097	OBD warning light control
ET102	Air conditioning request
ET103	Fault warning light control
ET104	Control for preheating warning light
ET105	Low pressure pump relay control
ET106	Thermoplunger n° 1 relay control
ET107	Thermoplunger n° 2 relay control
ET108	Thermoplunger n° 3 relay control
ET109	Air conditioning inhibition control
ET110	Immobiliser code not programmed
ET114	Damper valve control
ET115	Synchronisation status

ET001	COMPUTER + AFTER IGNITION FEED

INACTIVE	***NOTES***	**Ignition on.**

If the vehicle ignition is not switched on, status **ET001** should be **INACTIVE**.
As soon as the ignition is switched on, the computer should be supplied with power. Status **ET001** becomes **ACTIVE**.
If this status remains **INACTIVE**, follow the procedure below:
– Check the condition of fuse **F12** (30 A, F9Q 718) or **F7** (7.5 A, F9Q 732 and 740) or **F38** (30 A, G9T 710) or **F38** (7.5 A, G9T 720) of the engine fuse and relay box.
– Check for continuity and the absence of interference resistance between:

Engine fuse and relay box black connector **track B2** (F9Q 718) or **S7** (F9Q 732 and 740) or **B24** (G9T 710) or **A39** (G9T 720) → Brown **connector B track E3** of the injection computer

Check the connections and the condition of the brown connector B contacts on the injection computer.
Repair if necessary.
If the fault is still present, contact Techline.

ACTIVE	***NOTES***	**Ignition on.**

Normal operating condition.
The computer is correctly supplied after the ignition has been switched on.

AFTER REPAIR	Repeat the fault finding procedure on the system. Deal with any other possible faults. Clear the stored faults.

ET003	IMMOBILISER

ACTIVE	Refer to the UCH fault finding note.
INACTIVE	Refer to the UCH fault finding note.

AFTER REPAIR	Repeat the fault finding procedure on the system. Deal with any other possible faults. Clear the stored faults.

ET011	PRE/POSTHEATING SIGNAL

NOTES	Check the battery voltage.

ACTIVE	Status **ET011** is **ACTIVE** as soon as the pre-postheating is completed. If status **ET011** remains **INACTIVE**, refer to fault **DF081 Preheating relay circuit**.
INACTIVE	Status **ET011** remains **INACTIVE** until pre-postheating is completed.

AFTER REPAIR	Repeat the fault finding procedure on the system. Deal with any other possible faults. Clear the stored faults.

ET012	CLUTCH CONTACT INFORMATION

ACTIVE	When the driver depresses the clutch pedal, status **ET012 Clutch contact signal** becomes **ACTIVE**.

INACTIVE	When the driver is not depressing the clutch pedal, status **ET012 Clutch contact signal** is **INACTIVE**. If **INACTIVE** appears even though the clutch pedal has been depressed, perform the following operations: – Disconnect the clutch pedal switch, check the insulation between **tracks 1 and 3 or A1 and B3** with the pedal released (depending on the engine). – Repeat this operation with the pedal depressed, and check the continuity between the 2 tracks. If these 2 checks are not in order, replace the switch. Next, check for continuity and absence of interference resistance between: **Track 3 or 1 or track B3** (depending on the engine) of the clutch pedal switch connector → **Track E2** of grey **connector A** of the injection computer **Track 1 or 3 or A1** (depending on the engine) of the clutch pedal switch connector → vehicle earth Also check: The condition of the pedals/dashboard blue connector contacts on **track 1 and 3 or A1** and **B3**. The condition of the contacts of the engine/dashboard black connectors on **track 4.**

AFTER REPAIR	Repeat the fault finding procedure on the system. Deal with any other possible faults. Clear the stored faults.

ET014	BRAKE CONTACT n° 2 SIGNAL

ACTIVE

When the driver depresses the brake pedal, status **ET047 Braking** should become **ACTIVE** and status **ET014 Brake contact n° 2 signal** should become **ACTIVE**.
If the driver depresses the brake pedal hard and status **ET014** remains **INACTIVE**, check whether the brake lights at the rear of the vehicle have illuminated.
Check the condition of the brake light switch contacts and connections.
If the brake lights are working, check the continuity and the absence of interference resistance between:

Track F3, connector A of the engine management computer → **track 3 or A3** (Master) of the brake light switch black connector

Repair if necessary.
If the brake lights are not working:
– Check the condition of the bulbs, replace if necessary.
– Check the condition of the fuse (15 A or 20 A) in the passenger compartment relay and fuse box.
– Check for **+ 12 V** after ignition feed on **track 1** or **B1** (Master) of the switch.
– Then remove the brake light switch and carry out the checks in the following table:

	Continuity between tracks:	**Insulation between tracks:**
Switch pressed (Brake pedal released)	**1 and 2 or A1 and B3**	**1 and 3 or B1 and A3**
Switch released (Brake pedal depressed)	**1 and 3 or B1 and A3**	**1 and 2 or A1 and B3**

If these checks are not in order, replace the brake light switch.

AFTER REPAIR	Repeat the fault finding procedure on the system. Deal with any other possible faults. Clear the stored faults.

ET014 **CONTINUED**	

INACTIVE	When the driver releases the brake pedal, status **ET047 Braking** and status **ET014 Brake contact n° 2 signal** should become **INACTIVE**. If this is not the case, check the condition and correct operation of the brake light switch by carrying out the checks associated with **ACTIVE** in the interpretation of **ET047**.

Note:
Statuses **ET047 Braking** and **ET014 Brake contact n° 2 signal** are directly linked.
If one is **ACTIVE**, the other should be the same. If this is not the case, carry out the above fault finding procedure.

AFTER REPAIR	Repeat the fault finding procedure on the system. Deal with any other possible faults. Clear the stored faults.

ET027	PRE/POSTHEATING RELAY CONTROL

ACTIVE

When the ignition is switched on, status **ET027** should be **ACTIVE** for a time that varies according to the engine coolant temperature. Both the relay and the heater plugs are then supplied. After starting, the status should remain **ACTIVE** for a time that varies according to the engine temperature. This is postheating.

If the vehicle starts, postheating has ended and status **ET027** remains **ACTIVE** during the engine operating phase, refer to the interpretation of faults **DF081 Preheating relay circuit** and **DF061 Heater plug circuit**.

INACTIVE

If the vehicle does not start, the status remains **INACTIVE** and preheating was not executed when the ignition was switched on or during the starting phase, check the following connections:

Injection computer **track B3 brown connector B** → **Track 9** preheating unit

Injection computer **track C3 brown connector B** → **Track 8** preheating unit

Repair if necessary.

AFTER REPAIR	Repeat the fault finding procedure on the system. Deal with any other possible faults. Clear the stored faults.

ET037	LOW SPEED FAN ASSEMBLY RELAY CONTROL

NOTES	If the vehicle is fitted with air conditioning, the fan assembly electrical circuit includes **2 relays**. The low speed fan assembly relay will be run when the engine coolant temperature exceeds **99°C** and will cool the engine as long as the engine coolant temperature does not exceed **102°C**. If the temperature of the engine coolant exceeds **102°C**, the second speed fan assembly relay will be run and the engine cooling fan will rotate more quickly.

IMPORTANT
If the vehicle is equipped with air conditioning, the engine cooling fan will run at its 1st speed as soon as the computer actuates the air conditioning compressor.

AFTER REPAIR	Repeat the fault finding procedure on the system. Deal with any other possible faults. Clear the stored faults.

ET037 **CONTINUED**	

ACTIVE

When the coolant reaches **99°C**, the injection computer actuates the low speed fan assembly relay, and status **ET037** becomes**ACTIVE**. The relay then supplies the fan assembly and the cooling fan switches on.
If status **ET037** is **ACTIVE**, but the cooling fan is not running, perform the following operations:
– Check the condition of the fuse in the engine fuse and relay box (30, 40 or 50 A, depending on engine type).
– Next, check for **continuity and the absence of interference resistance** between:

Low speed relay mounting **track 87, K5, 5, 5A** (depending on the engine)	→	**track 1** of the fan assembly resistor connector
Track 87, K5, 5, 5A (depending on the engine) of the low speed relay mounting	→	**track 1** of the fan assembly connector

– Disconnect the low-speed and high-speed relays, check their operation and the condition of the connections.
– Repair if necessary.
– Check for **+ 12 V** on terminals **30, K3, 3, 3A** (depending on the engine) of the low speed relay mounting when this is activated.
– Disconnect the black 2-track connector of the engine cooling fan and check the condition of the connections.
– Repair if necessary.
– Check the **continuity and absence of interference resistance** between:

Injection computer black connector **C track A2**	→	**track 85, K2, 2, 2A** of the fan assembly relay mounting (depending on the engine)
Track 87, K5, 5, 5A of the fan assembly relay mounting (depending on the engine)	→	**track 1** of the black 2-track connector of the fan assembly
Track 2 of the black 2-track connector of the fan assembly	→	vehicle earth

INACTIVE

If the engine temperature is less than **99 °C**, the fan should not run and the low speed fan assembly relay should not be actuated.
Status **ET037** should therefore be **INACTIVE** when the control relay and the fan assembly are not supplied.

AFTER REPAIR	Repeat the fault finding procedure on the system. Deal with any other possible faults. Clear the stored faults.

ET038	High-speed fan assembly relay control

NOTES	If the vehicle is not fitted with air conditioning, the low-speed fan assembly relay is not present. The circuit therefore only contains a single control relay to supply the engine cooling fan. The engine cooling fan will thus have only one operating speed.

Vehicle without air conditioning

ACTIVE

When the coolant reaches **102°C**, the injection computer actuates the fan assembly relay, and status **ET038** becomes **ACTIVE**. The relay then supplies the cooling fan.
If status **ET038** is **ACTIVE** but the cooling fan is not running, perform the following operations:
– Disconnect the fan assembly relay, check it is operating properly, and the condition of the connections.
– Repair if necessary.
– Check for **+ 12 V** on terminals **J3, 30, 5 or 3B** (depending on the engine) of the relay mounting when it is activated.
– Next, check for **continuity and absence of interference resistance** between:

Injection computer black connector **C track B4**	→	**track J2, 85, 2 or 1B** of the fan assembly relay mounting (depending on the engine)
Track J5, 87, 5, 5B of the relay mounting (depending on the engine)	→	**track 1** of the black 2-track connector of the fan assembly
Track 2 of the black 2-track connector of the fan assembly	→	vehicle earth

INACTIVE

When the injection computer no longer requests cooling, status **ET038** becomes **INACTIVE**. The fan assembly should then switch off.

AFTER REPAIR	Repeat the fault finding procedure on the system. Deal with any other possible faults. Clear the stored faults.

ET038 CONTINUED	

Vehicle with air conditioning

ACTIVE

When the coolant reaches a temperature of **102°C**, the injection computer actuates the high speed relay and status **ET038** becomes **ACTIVE**. The relay then supplies the cooling fan and this begins to turn.
If status **ET038** is **ACTIVE** but the cooling fan is not running, perform the following operations:
– Check the condition of the fuse in the engine fuse and relay box (30, 40 or 50 A, depending on engine type).
– Check for **+ 12 V** after ignition on terminals **J3, 87, 3 or 3B** (depending on the engine) of the high speed fan assembly relay mounting.
– Next, check for **continuity and absence of interference resistance** between:

Computer supply relay mounting **track C1, B3, 1, 5**	→	**track J1, 86, 1, 2B** of the high speed fan assembly relay mounting (depending on the engine)

– Disconnect the high-speed fan assembly relay, check it is operating properly, and the condition of the connections.
– Repair if necessary.
– Next, check for **continuity and absence of interference resistance** between:

Injection computer black connector **C track B4**	→	**track J2, 85, 2 or 1B** of the high speed fan assembly relay mounting (depending on the engine)
Track J5, 87, 5, 5B of the relay mounting	→	**track 1** of the black 2-track connector of the fan assembly
Track 2 of the black 2-track connector of the fan assembly	→	vehicle earth

INACTIVE

When the injection computer no longer requests cooling, status **ET038** becomes **INACTIVE**. The engine cooling fan should then switch off.

AFTER REPAIR	Repeat the fault finding procedure on the system. Deal with any other possible faults. Clear the stored faults.

ET047	BRAKING

ACTIVE

When the driver depresses the brake pedal, status **ET047 Braking** and status **ET014 Brake contact n° 2 signal** should become **ACTIVE**.
If the driver depresses the brake pedal hard and status **ET047** remains **INACTIVE**, check whether the brake lights at the rear of the vehicle have illuminated.
Check the condition of the brake light switch contacts and connections.
If the brake lights are working, check the continuity and absence of interference resistance between:

Track F3 grey connector, injection computer → **track 3 or A3** (Master) of the brake light switch black connector

Repair if necessary.
If the brake lights are not working:
– Check the condition of the bulbs, replace if necessary.
– Check the condition of the fuse (15 A or 20 A) in the passenger compartment relay and fuse box.
– Check for **+ 12 V** after ignition feed on **track 1** or **B1** (Master) of the switch.
– Then remove the brake light switch and carry out the checks in the following table:

	Continuity between tracks:	**Insulation between tracks:**
Switch pressed (Brake pedal released)	**1 and 2 or A1 and B3**	**1 and 3 or B1 and A3**
Switch released (Brake pedal depressed)	**1 and 3 or B1 and A3**	**1 and 2 or A1 and B3**

If these checks are not in order, replace the brake light switch.

INACTIVE

When the driver releases the brake pedal, status **ET047 Braking** and status **ET014 Brake contact n° 2 signal** should become **INACTIVE**.
If this does not happen, check the condition and operation of the brake light switch by carrying out the checks associated with status **ACTIVE**.

AFTER REPAIR

Repeat the fault finding procedure on the system.
Deal with any other possible faults.
Clear the stored faults.

ET102	AIR CONDITIONING REQUEST

ACTIVE

Status **ET102** is used to interpret a request for air conditioning. When the air conditioning button is pressed, status **ET102** becomes **ACTIVE**.
If this does not happen, perform the following operations:
Check the continuity and absence of interference resistance between:

Injection computer grey connector **A**, **track G4** → Air conditioning control panel blue connector, **track B1, 4, A1** (going via track D of the AC's tri-function pressure switch on the Master), (depending on the engine)

If the fault is still present, refer to the note regarding air conditioning.

INACTIVE

Status **ET102** should be **INACTIVE** when the air conditioning control button is not pressed. If this status remains **INACTIVE** despite the button being pressed, perform the following operations:
Check the **continuity and absence of interference resistance** between:

Injection computer grey connector **A**, **track G4** → Air conditioning control panel blue connector, **track B1, 4, A1** (going via track D of the AC's tri-function pressure switch on the Master), (depending on the engine)

If the fault is still present, refer to the note regarding air conditioning.

AFTER REPAIR	Repeat the fault finding procedure on the system. Deal with any other possible faults. Clear the stored faults.

ET105	LOW PRESSURE PUMP RELAY CONTROL

ACTIVE	Status **ET105** should be **ACTIVE** when the injection computer activates the fuel pump relay. When the ignition is switched on, status **ET105** should be **ACTIVE**.

INACTIVE	Status **ET105** should be **INACTIVE** when the injection computer no longer activates the fuel pump relay. If, when the ignition is switched on, status **ET105** remains **INACTIVE**, check the continuity and absence of interference resistance between: Injection computer black connector **C track A1** → Fuel pump relay mounting **track 2, A2, B2** (depending on the engine) If the fault is still present, consult the interpretation of fault **DF082 Low pressure pump relay circuit**.

AFTER REPAIR	Repeat the fault finding procedure on the system. Deal with any other possible faults. Clear the stored faults.

ET109	Air conditioning inhibition control

IMPORTANT
The computer does not authorise air conditioning if the driver requests full engine load.
When the air conditioning is operational, it uses up engine power.

INACTIVE	The air conditioning authorisation only changes to **INACTIVE** if the injection computer actuates the air conditioning compressor clutch relay. This authorisation comes into effect when status **ET102 Air conditioning request** is **ACTIVE**. If status **ET109** does not become **INACTIVE** when the air conditioning request has been made, refer to the specific fault finding note for air conditioning.
ACTIVE	Status **ET109** should be **ACTIVE** when the air conditioning is not activated or when the computer registers a full load request.

AFTER REPAIR	Repeat the fault finding procedure on the system. Deal with any other possible faults. Clear the stored faults.

ET110	IMMOBILISER CODE NOT PROGRAMMED

INACTIVE	Status ET110 is **INACTIVE** if dialogue is possible between the UCH computer and the injection computer and the key code is recognised. The engine is only authorised to start if the code is recognised by the UCH computer and if status **ET003 Immobiliser** is **INACTIVE**.
ACTIVE	Status ET110 is **ACTIVE**, if dialogue is not possible between the UCH computer and the injection computer (status **ET003 Immobiliser** remains **ACTIVE**). This fault may be caused by incorrect key programming or key programming not having been performed. In that case, refer to the fault finding note for the UCH and follow the key programming procedure. If the key programming is not the cause, test the multiplex network and check that the dialogue between the UCH and the injection computer is possible. If dialogue is not established, contact the Techline.

AFTER REPAIR	Repeat the fault finding procedure on the system. Deal with any other possible faults. Clear the stored faults.

ET115	SYNCHRONISATION STATUS

Synchronisation is carried out during the engine starting phase. It is established between the camshaft position sensor and the TDC sensor. This synchronisation, once performed, allows the computer to identify cylinder n° 1, and to recognise the exact position of the top dead centre of this cylinder.
Synchronisation also allows the computer to determine the injection programming.

INACTIVE	Status **ET115** is **INACTIVE** when the engine is stopped with + after ignition switched on. Status **ET115** is **INACTIVE** when the engine is in the starting phase. When the computer is synchronising, it receives and interprets signals from the camshaft and crankshaft position sensors.
ACTIVE	Status **ET115** is **ACTIVE** when the engine is started. The computer has identified cylinder n° 1 and has identified the exact top dead centre position. Injection phasing and engine management are now possible, and the engine should be working properly.

AFTER REPAIR	Repeat the fault finding procedure on the system. Deal with any other possible faults. Clear the stored faults.

Tool parameter	Diagnostic tool title
PR001	Fuel temperature
PR002	Coolant temperature
PR003	Air temperature
PR004	Computer feed voltage
PR005	Pedal load
PR006	Engine speed
PR008	Pedal potentiometer voltage gang 1
PR009	Pedal potentiometer voltage gang 2
PR016	Atmospheric pressure
PR018	Vehicle speed
PR033	Fuel flow
PR035	Idle speed correction
PR047	Cruise control switch voltage (Espace III)
PR050	Air flow measurement
PR052	Program no.
PR053	Version number
PR054	Calibration number
PR057	Vdiag Number
PR062	Engine idle speed setpoint.
PR075	Fuel flow value at idle speed

Tool parameter	Diagnostic tool title
PR081	Turbocharging pressure loop difference
PR082	Turbocharging pressure
PR083	Injector rail pressure
PR084	Supplier number
PR085	Hardware version
PR086	Rail pressure loop difference
PR087	Air flow loop difference
PR088	EGR valve position feedback
PR089	EGR valve position feedback loop variance
PR090	Sensor supply voltage n° 1
PR091	Sensor supply voltage n° 2
PR092	Pedal load (gang 1)
PR093	Pedal load (gang 2)
PR094	Turbocharging pressure relief valve OCR
PR095	EGR valve RCO
PR097	RCO gallery pressure regulation valve
PR099	Parts Store reference:
PR202	Regulated fuel flow (Master)

PR001	FUEL TEMPERATURE

NOTES	**No faults should be present or stored.** Perform this fault finding procedure after an inconsistency is displayed in the Parameter menu.
	Special notes: – Use a workshop temperature sensor to compare the values. – Use bornier **Elé. 1681** for all operations on the engine management computer connectors.
	WARNING In the event of a relatively low exterior temperature, the difference between the fuel temperature and the engine temperature after cold starting may be greater than 30°C.

WARNING
Some **F9Q** engines have a temperature parameter set at **60°C**.

Measure the **resistance** of the fuel temperature sensor between **tracks 1** and **2**:
Replace the sensor if its resistance is not: **3820 Ω ± 282 at + 10°C**
2050 Ω ± 100 at + 25°C
810 Ω ± 47 at + 50°C

Check for **the absence of interference resistance** on the following lines:

Engine management computer, **connector B track J3** → **track 1** of the fuel temperature sensor connector

Engine management computer, **connector B track G1** → **track 2** of the fuel temperature sensor connector

Repair if necessary.

AFTER REPAIR	Repeat the conformity check from the start.

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 notes: – Use a workshop temperature sensor to compare the values. – Use bornier **Elé. 1681** for all operations on the engine management computer connectors.

Check that the cooling circuit is topped up and properly bled.
Perform the required operations.

Measure the **resistance** of the coolant temperature sensor between **tracks 2** and **3**.
Replace the sensor if its resistance is not: **2252 Ω ± 112 at + 25°C**
811 Ω ± 39 at + 50°C
283 Ω ± 8 at + 80°C

Check for **the absence of interference resistance** on the following lines:

Engine management computer, **connector B track E1** → **track 2** of the coolant temperature sensor connector

Engine management computer, **connector B track K3** → **track 1** of the coolant temperature sensor connector

Repair if necessary.

Compare the value displayed on the diagnostic tool with the value given by the workshop temperature sensor.
Replace the coolant temperature sensor if there is a significant difference.

AFTER REPAIR	Repeat the conformity check from the start.

PR003	AIR TEMPERATURE

NOTES	**No faults should be present or stored.** Perform this fault finding procedure after an inconsistency is displayed in the Parameter menu.
	Special notes: – Use a workshop temperature sensor to compare the values. – Use bornier **Elé. 1681** for all operations on the engine management computer connectors.

Measure the **resistance** of the coolant temperature sensor between **tracks 1** and **2**.
Replace the sensor if its resistance is not: **3714 Ω ± 161 at + 10°C**
2448 Ω ± 90 at + 20°C
1671 Ω ± 59 at + 30°C
Jamming of the air temperature sensor when hot causes white smoke when cold, and non-regulation of the turbo if the temperature is < 60°C.
Jamming of the air temperature sensor when cold causes excessive consumption and engine noise when the engine is warm.

Check for **the absence of interference resistance** on the following lines:

Engine management computer, **connector B track D3** ⟶ **track 1** of the air flowmeter connector

Engine management computer, **connector B track A3** ⟶ **track 2** of the air flowmeter connector

Repair if necessary.

Check the air flowmeter: run **test 5**.

AFTER REPAIR	Repeat the conformity check from the start.

PR004	COMPUTER SUPPLY VOLTAGE

NOTES	**No faults should be present or stored.** Perform this fault finding procedure after an inconsistency is displayed in the Parameter menu.

IGNITION ON:

If the voltage is lower than the recommended minimum, ***the battery is discharged or out of order***:
– recharge and test the battery, check the charging circuit to find the source of this fault and replace the battery if necessary: apply **Technical Note 6014A**.
If the voltage is above the recommended maximum, ***the battery is overcharged***:
– check that the charging voltage is correct with or without an electrical consumer: apply **Technical Note 6014A**.

AT IDLE SPEED:

If the voltage is lower than the recommended minimum, ***the charging voltage is too low, or the battery is out of order***:
– check the electrolyte level in the battery then recharge and test the battery.
– If the battery is not faulty, check the charging circuit to find the source of this fault: apply **Technical Note 6014A**.
If the voltage is above the recommended maximum, ***the charging voltage is too high***:
– the alternator regulator is faulty: apply **Technical Note 6014A**.
Carry out the necessary repairs.

AFTER REPAIR	Repeat the conformity check from the start.

PR005	PEDAL LOAD

NOTES	**No faults should be present or stored.** Perform this fault finding procedure after an inconsistency is displayed in the Parameters menu or after a customer complaint (poor performance).

Check the high and low stops of the pedal sensor in the engine compartment (jamming, broken housing).
Check the pedal sensor mounting in the engine compartment (play, broken housing, etc.).
Check the accelerator control (cable tension, chafing, obstacle).
Carry out the necessary repairs.
If all these checks are correct and the values given in the Parameter window are outside tolerances, replace the pedal position sensor.

AFTER REPAIR	Repeat the conformity check from the start.

PR016	ATMOSPHERIC PRESSURE

NOTES	**No faults should be present or stored.** Perform this fault finding procedure after an inconsistency is displayed in the Parameter menu.

The atmospheric pressure sensor is built into the computer, so no check can be made, except for a check to make sure that the computer's air vent is not clogged.
If the parameter is incorrect, reset the computer. Check the **PR016 Atmospheric pressure** with the engine running and with the engine stopped but the ignition on.
If the value read is incorrect, contact the Techline.

AFTER REPAIR	Repeat the conformity check from the start.

PR050	AIR FLOW MEASUREMENT

NOTES	**There must be no faults present.** Perform this fault finding procedure: – after an inconsistency appears on the parametermenu, – or after a customer complaint (lack of power, smoke etc.).

Check the air inlet circuit (from the air filter inlet to the inlet manifold, run **test 4**):
– air filter unit inlet not blocked and filter not clogged,
– **no** foreign bodies in the air flow sensor grille (**visual inspection only, run test 5**),
– otherwise replace the flow sensor, check and clean the air filter,
– oil vapour recirculation circuit connected correctly,
– **absence of leaks** or **blockages** in the **low** and **high pressure** air circuit: ducts, presence and tightness of the mounting clips, mounting of the turbocharger pressure sensor, intercooler, etc.
– check that the damper valve is open (valve control **rests on the body** of the air vent unit),
– check that the turbulence flap is in the rest position, if fitted to the vehicle.

Carry out the necessary repairs.
Check **the electrical conformity of the air flowmeter supply**:

power circuit: **+12 V** → **track 4** and battery **earth** → **track 6**

sensor circuit: **+ 5 V** → **track 3** and computer **earth** → **track 2**

Check for **continuity, insulation and absence of interference resistance** on the connection between:

Engine management computer, **connector B track H4** → **track 5** of the air flowmeter connector

With the flowmeter **connected**, the vehicle **ignition on** and the **engine stopped**:
– check the voltage between **tracks 2** and **5** of the flowmeter,
– if the value is not **0.6 V ± 0.1**, replace the flowmeter.

Check the exhaust gas recirculation valve operation:
Run **test 9**, part A.

AFTER REPAIR	Repeat the conformity check from the start.

PR082	TURBOCHARGING PRESSURE

NOTES	Perform this fault finding procedure: – after an inconsistency appears on the parameter menu or – after fault **DF074 Turbocharging pressure sensor** or – after a customer complaint (lack of performance, smoke, etc.). This parameter does not affect the Master.

With the vehicle ignition on, engine stopped:

– Remove the turbocharger pressure sensor.
– With the sensor connected to the wiring harness, read the value of **PR082 Turbocharging pressure** in the Parameter screen:
– If the value is not very close to **PR016 Atmospheric pressure**, the maximum pressure difference between **PR016** and **PR082** with the engine stopped = ± **50 hPa (± 50 mbar)**:

  Check the **insulation and absence of interference resistance** on the signal line and on the turbocharging sensor feed lines.
  If the lines are correct, replace the turbocharging pressure sensor.

– Connect **a vacuum pump** or **pressure pump** to the turbocharging pressure sensor.
– Apply a pressure of between **0.1** and **1.3 bar** (maximum pressure to be applied: **1300 hPa** or **1.3 bar**).
– Compare the pressure value displayed in the Parameter screen with that given by your vacuum pump:

  If the difference* = ± **100 hPa** (or **± 0,1 bar**), replace the turbocharging pressure sensor.
  If there is no difference, the turbocharging pressure sensor is correct.

– Refit the sensor and its seal, then apply the interpretation of command **AC004 Turbocharging pressure relief valve**.

*Note:
The diagnostic tool displays the ***absolute pressure***, the gauge of your vacuum pump displays the ***relative pressure***: the standard difference between these two measurements is equal to atmospheric pressure, that is, **the value of PR016**.

AFTER REPAIR	Repeat the conformity check from the start.

PR083	RAIL PRESSURE

NOTES	**No faults should be present or stored**. Perform this fault finding procedure: – after an inconsistency appears on the parameter menu or – following the interpretation of command **AC006 Fuel pressure solenoid valve** – After a customer complaint (starting problems, poor performance, stalling etc.). **Note:** **It is forbidden to carry out an ohmmeter check on the pressure sensor.**

ELECTRICAL CONFORMITY OF THE SENSOR:

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

Engine management computer, **connector B track D1** → **track 2** of the rail pressure sensor connector

Engine management computer, **connector B track H2** → **track 3** of the rail pressure sensor connector

Engine management computer, **connector C track B3** → **track 1** of the rail pressure sensor connector

If all these connections are correct, check for a fuel pressure sensor supply:

+ 5 V → **track 3** of the rail pressure sensor connector

Earth → **track 1** of the rail pressure sensor connector

Check the seal of the low and high pressure diesel circuits (visual checks, odour, etc.): on the pump casing, overpressure valve, pipes, rail and injector unions, injector wells, etc.: run **test 3**.
if all the above checks are correct:

– With the vehicle ignition on, and engine stopped for over **1 minute**:
  – Display **PR083**: if the value is **less** than **30 bar**, the sensor is correct.
  – If not, replace the rail pressure sensor.

AFTER REPAIR	Repeat the conformity check from the start.

SUMMARY OF AVAILABLE COMMANDS

NOTES	The commands are run to check the correct operation of certain components or to replace parts.

Tool command	Diagnostic tool title
RZ001	Fault memory
AC002	Thermoplunger relay n° 3
AC003	Air conditioning inhibition
AC004	Wastegate
AC005	Low-pressure pump relay
AC006	Fuel pressure solenoid valve
AC007	EGR valve
AC010	Preheating relay
AC011	Low-speed fan relay
AC012	High-speed fan relay
AC022	OBD warning light
AC211	Fault warning light
AC212	Preheating warning light
AC213	Overheating warning light
AC301	Thermoplunger relay n° 1
AC302	Thermoplunger relay n° 2
AC593	Damper valve (Espace III)
LC002	Air conditioning configuration reading
LC005	Gearbox type reading
LC006	Multiplex line configuration reading
LC008	Cylinder number reading
LC009	Inlet type reading
LC016	Flow regulation type reading

NOTES	The commands are run to check the correct operation of certain components or to replace parts.

Tool command	Diagnostic tool title
LC017	Injection type reading
LC013	Cruise control option reading
LC019	Heating element option reading
LC023	EGR type reading
LC025	Turbulence flap option reading.
LC029	Torque request authorisation
CF005	With heating elements
CF006	Without heating elements.
CF012	With cruise control
CF013	Without cruise control
CF014	With air conditioning
CF015	Without air conditioning
CF571	Increase idling speed
CF572	Decrease idling speed
CF573	With turbulence flap
CF574	Without turbulence flap

AFTER REPAIR	Repeat the conformity check from the start.

AC002	THERMOPLUNGER RELAY N° 3 (check that the computer is correctly configured)

NOTES	**No faults should be present or stored.** Perform this fault finding procedure if there is a fault in the **command** menu, or a passenger compartment heating/demisting fault. See the **Wiring diagrams** Technical Note for your vehicle to locate the relevant fuses and relays.

If the thermoplunger n° 3 relay does not operate when command **AC002 Thermoplunger n° 3 relay** is run.
Check the thermoplunger n° **3** relay connections.
Check the engine management computer connections.
Repair if necessary.

If the fault persists, check as follows that this relay is controlled by the engine management computer:
Disconnect the thermoplunger n° 3 relay, fit a **50** to **100 Ω** resistor on its mounting instead of the coil and connect a voltmeter as follows:

- positive terminal to **+ 12 V** battery,
- negative terminal to **track 2 or I2 or 11** (depending on the engine) of the thermoplunger n° 3 relay mounting.

Clear the fault and run command **AC002**.
If the voltmeter indicates the battery voltage (two **1-second** sequences), replace the thermoplunger n° 3 relay.
If the voltmeter does not indicate the battery voltage (two **1-second** sequences), contact the Techline.

If the thermoplunger n° 3 relay works with command AC002 but there is still a passenger compartment heating/demisting fault, check the following using the wiring diagram:
The conformity of the thermoplunger Maxi-fuse.
The presence of **+ 12 V battery feed** on **tracks 3 or I3 or 14** (depending on the engine) of the thermoplunger n° **3** relay mounting. The conformity of the thermoplunger n° **3** relay.
The continuity between **track 5 or I5 or 12** (depending on the engine) of the thermoplunger n° **3** relay mounting and the supply terminal of thermoplungers **2 and 3 or** thermoplunger **3** (16-seat Master bus).
The conformity of the thermoplunger resistor: **0.45 Ω ± 0.05 at + 20°C**.
the presence of earth at the water chamber (heating element 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 from the start.

AC003	AIR CONDITIONING INHIBITION

NOTES	**No fault should be present or stored:** Perform this fault finding procedure after a malfunction appears on the **command** menu or following an air conditioning fault. See the **Wiring diagrams** Technical Note for your vehicle to locate the relevant **fuses** and **relays**.

If, when the **AC003 Air conditioning inhibition** command is run, the compressor relay **is not actuated**:
Check the **insulation, continuity and absence of interference resistance** on the following connections:

Engine management computer, **connector A track F4** → **track B1 or D2 or A5 or A2** Compressor relay mounting or air conditioning control panel (depending on the engine)

Check the compressor relay coil power supply:

Compressor relay mounting or air conditioning control panel **track D1 or A2 or A3 or A15 or A1** (depending on the engine) → **+ 12 V** after relay

If the problem persists, check that the compressor relay is controlled by the engine management computer as follows:
Remove the compressor relay, fit a **50** to **100 Ω** resistor on the mounting in place of the coil (across tracks **1** and **2**), connect the negative (-) voltmeter terminal to **track 2** of the relay mounting and the positive (+) voltmeter terminal to **track 1** of the relay mounting:
Actuate the relay with command **AC003**:
– If the voltmeter displays the battery voltage (ten sequences), replace the compressor relay.
– If the voltmeter does not indicate the battery voltage (ten sequences), contact the Techline.

AFTER REPAIR	Repeat the conformity check from the start.

AC003 **CONTINUED**	

If, when the **AC003** command is run, the compressor **relay is actuated**, but **the compressor is not actuated**:
Check that the resistance of the compressor clutch coil is **3.5 Ω ± 0.5**.
Also check the **insulation** of the **coil** in relation to the **compressor body**.
Check the earth on track **B** of the compressor connector.

Check the **insulation and continuity** of the following connection:

Compressor relay mounting **track A5 or D5** (depending on the engine) ⟶ **track A** of the compressor connector

Check the feed to the **Normally Open** compressor relay contact

Compressor relay mounting **track A3 or D3** (depending on the engine) ⟶ **+ 12 V** after ignition

Check the conformity of the **Normally Open** compressor relay contact:
Continuity between **tracks 3** and **5** when the relay is supplied.
Carry out the necessary repairs.

AFTER REPAIR	Repeat the conformity check from the start.

AC004	TURBOCHARGING LIMITATION VALVE

NOTES	Perform this fault finding procedure: – following interpretation of an unresolved fault, or – following application of the interpretation of **PR082 Turbocharging pressure** and/or after a customer complaint (lack of power, smoke, etc.).

The following procedure is for checking that the turbocharger and its control circuit are working properly.

Initial

Check the high pressure air circuit sealing: run **test 4**.
Pipe not joined or pierced, pressure sensor disconnected or poorly fitted (seal present), exchanger pierced.
To test the exchanger: stabilise the engine speed between **3500 and 4000 rpm** with the vehicle stopped and check that there are no leaks.

Measure the turbocharging pressure regulator resistance between **tracks 1 and 2**. Replace the regulator if its resistance is not:
– **15.4 Ω ± 0.7 at + 20°C** for a ***PIERBURG solenoid valve***
– **16.5 Ω ± 1.6 at + 25°C** for a ***BITRON solenoid valve***
Check the **continuity and the absence of interference resistance** on the connections between:

Engine management computer, **connector B track L2** ⟶ **track 1** of the turbocharging pressure regulator

+ 12 V after relay ⟶ **track 2** of the turbocharging pressure regulator

Turbocharger control circuit check

On **F9Q** engines, steps **1, 2, and 3** can be replaced by a visual inspection:
With the engine stopped, make sure that the control rod is in the resting position.
Start the engine and check that the control shaft moves to its upper stop (when the engine is stopped, the control shaft should return to its rest position).

1) Vacuum pressure control check:
Disconnect the solenoid valve inlet **hose** and connect it to a pressure gauge.
Start the engine and run it at a stabilised idle speed.
If the vacuum pressure does not reach **800 mbar ± 100**: Check the vacuum pressure circuit from the vacuum pump.
Stop the engine, reconnect the inlet hose and go to step **n° 2**.

AFTER REPAIR	Repeat the conformity check from the start.

AC004 **CONTINUED 1**	

Turbocharger control circuit check (continued)

2) Solenoid valve control check:
Disconnect the solenoid valve outlet **hose**.
A) with a ***PIERBURG*** solenoid valve, start the engine and stabilise it at idle speed.
Place your hand on the solenoid valve and block the outlet **union** with your thumb.
If no vibration of the solenoid valve is perceptible, go to step **n° 5**.

B) with a ***BITRON*** solenoid valve, put a plug on the outlet **union**.
Connect a vacuum pump to the inlet **union** and apply vacuum pressure.
If the vacuum pressure is **maintained**, replace the solenoid valve.
If not, reconnect the inlet **hose**, remove the plug and place the pressure gauge on the **outlet** union.
Start the engine:
If no vacuum pressure is measured, go to step **n° 5**.

3) Solenoid valve operation check:
Connect the pressure gauge to the solenoid valve outlet **union**.
Start the engine and run it at a stabilised idle speed.
G9T engine: if the vacuum pressure does not reach **475 mbar ± 75**, replace the solenoid valve.
F9Q engine: if the vacuum pressure does not reach **800 mbar ± 100**, replace the solenoid valve.

4) Turbocharger operation check:
Engine stopped:
A) Connect a vacuum pump to the **hose** located between the solenoid valve and the control diaphragm of the turbocharger.
Apply a vacuum pressure of **800 mbar ± 100**:
If there is a leak, replace the turbocharger (diaphragm cannot be separated from the turbocharger).
B) Check the travel and position of the control rod: run **test 6** for a fixed geometry turbocharger, **test 7** for a turbocharger with variable geometry and then **test 8** for both cases.
C) Engine cold and stopped:
Remove the turbocharger air inlet duct and make sure that the compressor is turning freely on its axle.
D) If the fault persists:
Check that the exhaust manifold is not leaking.
Check that the exhaust is not blocked: run **test 1**.
Carry out the necessary repairs.

AFTER REPAIR	Repeat the conformity check from the start.

AC004 **CONTINUED 2**	

5) Computer output stage check (solenoid valve connected):
This operation **can only be carried out if** the checks listed in **step n° 2** are **not conclusive**.
Vehicle with + after ignition, clear the faults displayed by the diagnostic tool.
Or by voltmeter:
Connect the voltmeter earth to **track 2** of the solenoid valve and the positive lead to **track 1**.
Run command **AC004 Turbocharging pressure regulator valve**:

➡ The voltmeter should display **ten cycles** of two successive voltages approximately equal to the product of the battery voltage and the opening cyclic ratio in progress, that is: **~ 2.5 V** for an Opening Cyclic Ratio of **20%**, then **~ 8.7 V** for an Opening Cyclic Ratio of **70%**.

Either by oscilloscope (set to **5 V/div** and time base of **1 ms/div**):
Connect the oscilloscope earth lead to the battery earth and the positive test pin to **track 1** of the solenoid valve.
Run command **AC004 Turbocharging pressure regulator valve**:

➡ The oscilloscope should display a square wave signal of **12.5 V** at a frequency of **140 Hz** (with an Opening Cyclic Ratio passing successively from ~ 20 to ~ 70%)

If the measurement is correct, replace the solenoid valve.
If the measurement does not show any control or continuous voltage, contact the Techline.

AFTER REPAIR	Repeat the conformity check from the start.

AC005	LOW PRESSURE PUMP RELAY

NOTES	**No faults should be present or stored.** Perform this fault finding procedure: – after a malfunction appears on the command menu, – after a customer complaint (starting faults, poor performance).

WARNING
In the event of a starting fault, the fuel pump will still work.

Check using the wiring diagram:
– The external appearance of the low-pressure pump relay.

+ 12 V battery after fuse feed → **track 3, A3, B3, A5** of the fuel pump relay mounting (depending on the engine)

track 5, A5, B5, A3 of the fuel pump relay mounting (depending on the engine) → **track 1** of the low pressure pump motor

– The external appearance of the low-pressure pump motor.
Check the **continuity** of the connection between:

Low pressure pump motor connector, **track 2** → **earth**

Repair if necessary.

AFTER REPAIR	Repeat the conformity check from the start.

AC005 **CONTINUED**	

If the fault is still present, check that the low-pressure pump relay is controlled by the engine computer in the following way:
– Disconnect the relay, fit a **50 to 100 Ω** resistor on the relay mounting in place of the coil and connect a voltmeter as follows:
  Positive terminal to **+ 12 V** battery feed
  Negative terminal to **track 2** of the relay mounting
– Clear the fault.
– Run command **AC005 Low pressure pump relay**.

If the voltmeter does not indicate the battery voltage (a 10-second sequence), contact the Techline.
if the voltmeter indicates the battery voltage, replace the relay.

If the relay and the pump are operating correctly but the normal operating value for low pressure is not reached, i.e. **2.5 to 4 bar**.
Check that there is fuel in the tank.
Check the high and low pressure circuit sealing: run **test 3**.
Flush the high pressure regulation circuit: run **test 2**.
Check the injectors: run **test 10**.

AFTER REPAIR	Repeat the conformity check from the start.

AC006	FUEL PRESSURE SOLENOID VALVE

NOTES	Perform this fault finding procedure: – following interpretation of an unresolved fault – after a malfunction appears on the command menu, – after an inconsistency appears on the parameter menu, – following a customer complaint (starting faults, engine speed instability, injection noise).

Step 1
Measure the pressure regulator **resistance** between **tracks 1 and 2**.
If its resistance is not:

– **3 Ω ± 0.5 at + 20°C for a CP3 high pressure pump**, replace the regulator.
– **2.5 Ω ± 0.5 at + 20°C for a CP1 high pressure pump**, replace the regulator.

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

Engine management computer, **connector B track L1** → **track 2** of the pressure solenoid valve connector

+ 12 V after relay → **track 1** of the pressure solenoid valve connector

Run command **AC006 Fuel pressure solenoid valve**, if a slight whistling and clicking of the pressure regulator can be heard, go to **step 2.** If not, check the operation of the computer output stage:
Vehicle with + after ignition, clear the faults displayed by the diagnostic tool.

AFTER REPAIR	Repeat the conformity check from the start.

AC006 **CONTINUED 1**	

Either using an ammeter:
With the solenoid valve connected, connect the current clamp to the solenoid valve **track 1** connection (in the direction of the current). Run command **AC006**:

➡ the ammeter must display ten cycles of two successive currents: **~ 0.6 A** then **~ 2 A**.

Or by voltmeter:
With the solenoid valve connected, connect the voltmeter earth to **track 2** of the fuel pressure solenoid valve and the positive lead to **track 1**. Run command **AC006**.

➡ The voltmeter should display two successive voltages approximately equal to the product of the battery voltage and the Opening Cyclic Ratio in progress, that is, successively: **~ 3.15 V** for an Opening Cyclic Ratio of **25%**, then **~ 9.45 V** for an Opening Cyclic Ratio of **75%** (ten cycles).

Either by oscilloscope (set to **5 V/div** and time base of **1 ms/div**):
With the solenoid valve connected, reconnect the oscilloscope earth to the battery earth and the positive test pin to **track 2** of the fuel pressure solenoid valve, run command **AC006 Fuel pressure solenoid valve**:

➡ the oscilloscope should display a square pulse signal of **12.5 V** at a frequency of **185 Hz** (with an Opening Cyclic Ratio passing successively from **25** to **75%**).

If the measurement taken is correct:
– For engines fitted with a CP3 high pressure pump, replace the regulator.
– For engines fitted with a CP1 high pressure pump, flush the CP1 high pressure pump (run **test 2**).
– If the measurement is not correct, contact the Techline.

STEP 2, next page.

AFTER REPAIR	Repeat the conformity check from the start.

AC006 **CONTINUED 2**	

Step 2
In the event of rail overpressure:
Check that there are no air bubbles in the diesel fuel low pressure circuit.
Check the operation of the rail pressure sensor. Interpretation of parameter **PR083 Rail pressure**.
If these two checks show no anomalies, change the regulator.
In the event of a low rail pressure:
Check the operation of the rail pressure sensor. Interpretation of parameter **PR083 Rail pressure**.
Check the priming of the low-pressure diesel circuit.
Check the conformity of the diesel filter connections.
Check the condition of the filter (clogging and water saturation).
Check that there are no air bubbles between the filter and the high-pressure pump.
Check the low and high pressure diesel fuel systems for leaks: use **ALP6 External leaks on the fuel circuit** (visual inspections, touch tests, odours, etc.) on:
pump body, pressure release valve, pipes, rail and injectors unions, injector wells, etc.
Check the conformity of the seal fitting on the pressure regulator.
Check the injector operation: run **test 10** of this note.
Carry out the necessary repairs.

If the engine starts:
Clear any faults on the fuel pressure solenoid valve.
Check the pressure regulation solenoid valve using part B of **ALP 7, Rough idle**.
With the engine warm, leave it running at idle speed a few minutes (**3 to 5 minutes**):
– If it stalls and the fault reappears, replace the regulator.
– If it does not stall, stabilise the engine speed at **2000 rpm (1 minute)** then accelerate under full load until it cuts out.
If the engine stalls, replace the high-pressure pump.
If the engine does not start or there is no timing:
first replace the regulator and, if the fault is still present, replace the high pressure pump.

AFTER REPAIR	Repeat the conformity check from the start.

AC007	EGR VALVE

NOTES	Perform this fault finding procedure: – after the interpretation of fault **DF241 Exhaust gas recirculation function**, 2.DEF remains unresolved, – after a customer complaint (lack of performance, smoke).

Step 1
Measure **the resistances** of the exhaust gas recirculation valve (***Pierburg*** *or* ***Cooper*** type):
*between **tracks 1 and 5**: **from 7.5 Ω to 8.5 Ω at + 20°C**.
*For the ***Pierburg*** type exhaust gas recirculation valve:
between **tracks 2 and 4**: **2400 Ω to 5600 Ω at + 20°C**.
between **tracks 2 and 6**: **1900 Ω to 6400 Ω at + 20 °C**.
between **tracks 4 and 6**: **800 Ω to 3800 Ω at + 20°C**.
If one of the resistances is not correct, replace the exhaust gas recirculation valve.
Check for **continuity and the absence of interference resistance** on the connections between:

Engine management computer, **connector B track M1**	⟶	**track 5** of the exhaust gas recirculation valve connector
+ 12 V after relay	⟶	**track 1** of the exhaust gas recirculation valve connector

If you notice no valve movement when running command **AC007 EGR valve**, check the operation of the computer output stage:
Vehicle with + after ignition, clear the faults displayed by the diagnostic tool.

AFTER REPAIR	Repeat the conformity check from the start.

AC007 **CONTINUED**	

Step 1 (continued)
Either using an oscilloscope (set to **5 V/div** and time base of **2 ms/div**):
With the exhaust gas recirculation valve connected, connect the oscilloscope earth to battery earth with the positive test pin on **track 5** of the exhaust gas recirculation valve.
Run command **AC007 EGR valve**.
The oscilloscope should display a square pulse signal of **12.5 V** at a frequency of **140 Hz** (with an Opening Cyclic Ratio passing from **25** to **75%**).
Or by voltmeter:
With the exhaust gas recirculation valve connected, connect the voltmeter's earth lead to **track 5** of the exhaust gas recirculation valve and the positive lead to **track 1**. Run command **AC007 EGR valve**. The voltmeter should display two successive voltages approximately equal to the battery voltage multiplied by the current Opening Cyclic Ratio.
That is, successively: **3.15 V** for an Opening Cyclic Ratio of **25%** then **9.45 V** for an Opening Cyclic Ratio of **75%** (10 cycles).
Conclusion:
If the measurement is correct, go to **step 2.**
If the oscilloscope (or the voltmeter) does not indicate the actuation or a continuous voltage, contact the Techline.

Step 2
Check that there are no leaks on the exhaust gas recirculation circuit.
Carry out the necessary repairs.
Check the exhaust gas recirculation valve operation:
Run **Test 9 Exhaust gas recirculation valve**, part A.

AFTER REPAIR	Repeat the conformity check from the start.

AC010	PREHEATING RELAY

NOTES	This command is only run if fault **DF061 Heater plugs circuit** or **DF081 Preheating relay circuit** is present or stored and if no other fault is present. Carry out the procedure for these 2 faults first. See the **Wiring diagrams** Technical Note for your vehicle to locate the relevant fuses and relays.

Before applying the following fault finding procedure, check that the battery voltage is not below 12 V. Otherwise, recharge the battery.

Stage 1:

Using a multimeter fitted with a current clamp, group together the 4 supply wires for the heater plugs.
Run command **AC010 Preheating relay** and measure the current drawn by the 4 heater plugs.
If the current is not between **60** and **80A**, go to step 2, otherwise end of procedure.

Step 2:

Check the connections on the preheating unit, heater plugs and injection computer.
Repair if necessary.
Measure the **resistance** of the heater plugs. If the resistance is **> 2 Ω**, replace the defective plug(s).
Check for **continuity and the absence of interference resistance** between:

- preheating unit track 1 → heater plug of cylinder 3
- preheating unit track 2 → heater plug of cylinder 4
- preheating unit track 6 → heater plug of cylinder 1
- preheating unit track 7 → heater plug of cylinder 2

Check the **condition** of the preheating unit supply fuse (70 A). Replace it if necessary.
Then check for **+ 12 V feed** on **track 3** of the preheating relay connector.
Check for **continuity and the absence of interference resistance** between:

- Injection computer connector **B track B3** → **Track 9** of the preheating unit connector
- Injection computer connector **B track C3** → **Track 8** of the preheating unit connector

If the fault persists, replace the preheating unit.

AFTER REPAIR	Repeat the conformity check from the start.

AC011	LOW-SPEED FAN RELAY

NOTES	**No faults should be present or stored.** Perform this fault finding procedure if a malfunction appears on the **command** menu or after an engine cooling system or air conditioning fault. Refer to the **Wiring diagrams** Technical Note for the vehicle to locate the relevant fuses and relays.

If, during command **AC011, the Low speed fan assembly relay** does not run:
Check the **low speed fan assembly** relay mounting and the connections of the engine management computer.
Repair if necessary.

If the problem persists, check that the relay is controlled by the engine management computer as follows:
Disconnect the**low speed fan assembly** relay, fit a **50** to **100 Ω** resistor on the relay mounting in place of the coil and connect a voltmeter as follows:

- positive terminal to **+ 12 V** battery,
- negative terminal to **track 85** of the **low speed fan assembly** relay mounting for the F9Q 718 engine,
- or negative terminal to **track K2** of the **low speed fan assembly** relay mounting for F9Q 732 and 740 engines,
- or negative terminal to **track 2** of the **low speed fan assembly** relay mounting for G9T 710 and 720 engines (depending on equipment).
- or negative terminal to **track 2A** of the **low speed fan assembly** relay mounting for G9T 720 engines (depending on equipment).

Clear the fault and run command **AC011**.
If the voltmeter indicates the battery voltage (ten **1-second** sequences), replace the relay.
If the voltmeter does not indicate the battery voltage (ten **1-second** sequences), contact the Techline.

If the **low speed fan assembly** relay is actuated, but there is still a fan assembly activation fault, check, using the wiring diagram:
The conformity of the fan assembly maxi-fuse.
The conformity of the **low speed fan assembly** relay.

AFTER REPAIR	Repeat the conformity check from the start.

AC011 **CONTINUED**	

For the F9Q 718 engine:
The continuity of the connection between **track 87** of the **low speed fan assembly** relay mounting and **track 1** of the low speed resistor.
The conformity of the low speed resistance (resistance and connectors).
The continuity of the connection between **track 2** of the low speed resistor connector and **track 1** of the fan assembly connector.
the conformity of the fan assembly and the continuity of **track 2** to earth.
Carry out the necessary repairs.

For F9Q 732 and 740 engines:
The continuity of the connection between **track K5** of the **low speed fan assembly** relay mounting and **track 1** of the low speed resistor.
The conformity of the low speed resistance (resistance and connectors).
The continuity of the connection between **track 2** of the low speed resistor connector and **track 1** of the fan assembly connector.
the conformity of the fan assembly and the continuity of **track 2** to earth.
Carry out the necessary repairs.

For G9T 710 and 720 engines (depending on fittings):
The continuity of the connection between **track 5** of the **low speed fan assembly** relay mounting and **track 1** of the low speed resistor (G9T 710) or **track 1** of the fan assembly connector (G9T 720).
The conformity of the low-speed resistor (resistor and connections) (G9T 710).
The continuity of the connection between **track 2** of the low speed resistor connector and **track 1** of the fan assembly connector (G9T 710).
the conformity of the fan assembly and the continuity of **track 2** to earth.
Carry out the necessary repairs.

For the G9T 720 engine (depending on fittings):
The continuity of the connection between **track 5A** of the **low speed fan assembly** relay mounting and **track 1** of the low speed resistor.
The conformity of the low speed resistance (resistance and connectors).
The continuity of the connection between **track 2** of the low speed resistor connector and **track 1** of the fan assembly connector.
the conformity of the fan assembly and the continuity of **track 2** to earth.
Carry out the necessary repairs.

AFTER REPAIR	Repeat the conformity check from the start.

AC012	HIGH-SPEED FAN RELAY

NOTES	**No fault should be present or stored:** Perform this fault finding procedure after detecting a fault in the **command** menu or following an engine cooling problem. See the **Wiring diagrams** Technical Note for your vehicle to locate the relevant fuses and relays.

If, when command **AC012 High speed fan assembly relay** is run, the **high speed fan assembly relay** does not operate:
Check the **high speed fan assembly** relay mounting and the engine management computer connections.
Repair if necessary.

If the problem persists, check that the relay is controlled by the engine management computer as follows:
Disconnect the **high speed fan assembly**, fit a **50** to **100 Ω** resistor on its mounting instead of the coil and connect a voltmeter as follows:

- positive terminal to **+ 12 V** battery,
- negative terminal to **track 7** of the **high speed fan assembly** relay mounting for F9Q 750 and 754 engines,
- or negative terminal to **track 2** of the **high speed fan assembly** relay mounting for F9Q 760 and 762 engines,
- or negative terminal to **track 1B** of the **high speed fan assembly** relay mounting for F9Q 772, G9T 722 and G9U 720 engines.

Clear the fault and run command **AC012**.
If the voltmeter indicates the battery voltage (ten **1-second** sequences), replace the relay.
If the voltmeter does not indicate the battery voltage (three **2-second** ON-OFF cycles), contact the Techline.

If the **high speed fan assembly** relay is supplied using command **AC012**, but there is still a fan assembly activation fault, check using the wiring diagram:
The conformity of the fan assembly maxi-fuse.

AFTER REPAIR	Repeat the conformity check from the start.

AC012 **CONTINUED**	

For the F9Q 718 engine:
The + battery feed on **track 30** of the **high speed fan assembly** relay mounting.
The conformity of the **high speed fan assembly** relay.
The continuity of the connection between **track 87** of the **high speed fan assembly** relay mounting and **track 2** of the fan assembly connector.
The conformity of the fan.
The continuity of the connection between **track 1** of the fan assembly connector and **earth**.
Carry out the necessary repairs.

For F9Q 732 and 740 engines:
The + battery feed on **track J3** of the **high speed fan assembly** relay mounting.
The conformity of the **high speed fan assembly** relay.
The continuity of the connection between **track J5** of the **high speed fan assembly** relay mounting and **track 1** of the fan assembly connector.
The conformity of the fan.
The continuity of the connection between **track 2** of the fan assembly connector and **earth**.
Carry out the necessary repairs.

For the G9T 710 engine:
Presence of + battery feed on **track 3** of the high speed fan assembly relay mounting.
The conformity of the **high speed fan assembly** relay.
The continuity of the connection between **track 5** of the high speed fan assembly relay mounting and **track 1** of the fan assembly connector.
The conformity of the fan.
The continuity of the connection between **track 2** of the fan assembly connector and **earth**.
Carry out the necessary repairs.

For the G9T 720 engine:
Presence of + battery feed on **track 3B** of the high speed fan assembly relay mounting.
The conformity of the **high speed fan assembly** relay.
The continuity of the connection between **track 5B** of the high speed fan assembly relay mounting and **track 1** of the fan assembly connector.
The conformity of the fan.
The continuity of the connection between **track 2** of the fan assembly connector and **earth**.
Carry out the necessary repairs.

AFTER REPAIR	Repeat the conformity check from the start.

AC022	OBD WARNING LIGHT

NOTES	Carry out this fault finding procedure if a malfunction appears in the **command** menu.

Check the instrument panel connections.
Check the engine management computer connections.
Check the bulb.
Repair if necessary.
Using the wiring diagram:
Check the **continuity and absence of interference resistance** on the connection between:

Engine management computer, **connector A track H3** ⟶ **track 26** of the instrument panel connector

Check for **+ 12 V** battery feed on the instrument panel connector (according to the wiring diagram).
If the fault is still present, check that the OBD warning light is activated by the engine management computer as follows:
Disconnect the connector from the instrument panel and connect a voltmeter as follows:
- positive terminal to **+ 12 V** battery,
- negative terminal to **track 26** of the instrument panel connector.

Activate the warning light using command **AC022 OBD warning light**.
If the voltmeter shows the battery voltage (ten **1-second** sequences), check the instrument panel (indicator lights, internal connections, etc.):
Perform any required repairs or replace the instrument panel if necessary.
If the voltmeter does not indicate the battery voltage (ten **1-second** sequences), contact the Techline.

AFTER REPAIR	Repeat the conformity check from the start.

AC211	FAULT WARNING LIGHT

NOTES	Carry out this fault finding procedure if a malfunction appears in the **command** menu.

Check the instrument panel connections.
Check the engine management computer connections.
Check the bulb.
Repair if necessary.
Using the wiring diagram:
Check the **continuity and absence of interference resistance** on the connection between:

Engine management computer, **connector A track G3** ⟶ **track 8** of the instrument panel connector

Check for **+ 12 V** battery feed on the instrument panel connector (according to the wiring diagram).
If the fault is still present, check that the fault warning light is controlled by the engine management computer as follows:
Disconnect the connector from the instrument panel and connect a voltmeter as follows:
- positive terminal to **+ 12 V** battery,
- negative terminal to **track 8** of the instrument panel connector.

Activate the warning light using command **AC211 Fault warning light**.
If the voltmeter shows the battery voltage (ten **1-second** sequences), check the instrument panel (indicator lights, internal connections, etc.):
Perform any required repairs or replace the instrument panel if necessary.
If the voltmeter does not indicate the battery voltage (ten **1-second** sequences), contact the Techline.

AFTER REPAIR	Repeat the conformity check from the start.

AC212	PREHEATING INDICATOR LIGHT

NOTES	Carry out this fault finding procedure if a malfunction appears in the **command** menu. **Special notes:** This command lights up the preheating symbol and the electronic fault symbol at the same time (shared warning light).

Check the instrument panel connections.
Check the engine management computer connections.
Repair if necessary.
Using the wiring diagram:
For the F9Q 718 engine:
Check the **continuity and absence of interference resistance** on the connection between:

Engine management computer, **connector A track G1** → **track 15** of the instrument panel connector

For F9Q 732, 740 and G9T 720 engines (depending on fittings):
Check the **continuity and absence of interference resistance** on the connection between:

Engine management computer, **connector A track G1** → **track 7** of the instrument panel connector

For the G9T 710 engine:
Check the **continuity and absence of interference resistance** on the connection between:

Engine management computer, **connector A track G1** → **track 24** of the instrument panel connector

For the G9T 720 engine (depending on fittings):
Check the **continuity and absence of interference resistance** on the connection between:

Engine management computer, **connector A track G1** → **track 1** of the instrument panel connector

AFTER REPAIR	Repeat the conformity check from the start.

AC212 **CONTINUED**	

Check for **+ 12 V** battery feed on the instrument panel connector (according to the wiring diagram).
If the fault is still present, check that the heater plugs ON indicator light is controlled by the engine management computer as follows:
Disconnect the connector from the instrument panel and connect a voltmeter as follows:
– positive terminal to **+ 12 V** battery,
– negative terminal to **tracks 1, 7, 15, 24** of the instrument panel connector (depending on the engine).
Activate the indicator light using command **AC212 Preheating indicator light**.
If the voltmeter shows the battery voltage (ten **1-second** sequences), check the instrument panel (indicator lights, internal connections, etc.):
Perform any required repairs or replace the instrument panel if necessary.
If the voltmeter does not indicate the battery voltage (ten **1-second** sequences), contact the Techline.

AFTER REPAIR	Repeat the conformity check from the start.

AC213	OVERHEATING WARNING LIGHT

NOTES	Carry out this fault finding procedure if a malfunction appears in the **command** menu. **Special notes:** This warning light is shared with the level 2 fault warning light (severe injection fault).

Check the instrument panel connections.
Check the engine management computer connections.
Repair if necessary.
Using the wiring diagram:
For the F9Q 718 engine:
Check the **continuity and absence of interference resistance** on the connection between:

Engine management computer, **connector A** **track H**4 → **track 13** of the instrument panel connector

For F9Q 732 and 740 engines:
Check the **continuity and absence of interference resistance** on the connection between:

Engine management computer, **connector A** **track H**4 → **track 17** of the instrument panel connector

For the G9T 710 engine:
Check the **continuity and absence of interference resistance** on the connection between:

Engine management computer, **connector A** **track H**4 → **track 26** of the instrument panel connector

For the G9T 710 engine:
Check the **continuity and absence of interference resistance** on the connection between:

Engine management computer, **connector A** **track H**4 → **track 11** of the instrument panel connector

AFTER REPAIR	Repeat the conformity check from the start.

AC213 **CONTINUED**	

Check for **+ 12 V** battery feed on the instrument panel connector (according to the wiring diagram).
If the fault is still present, check that the overheating warning light is controlled by the engine management computer as follows:
Disconnect the connector from the instrument panel and connect a voltmeter as follows:
– positive terminal to **+ 12 V** battery,
– negative terminal to **tracks 11, 13, 17, 26** of the instrument panel connector (depending on the engine).
Activate the warning light using command **AC213 Overheating warning light**.
If the voltmeter shows the battery voltage (ten **1-second** sequences), check the instrument panel (indicator lights, internal connections, etc.). Perform any required repairs or replace the instrument panel if necessary.
If the voltmeter does not indicate the battery voltage (ten **1-second** sequences), contact the Techline.

AFTER REPAIR	Repeat the conformity check from the start.

AC301	THERMOPLUNGER RELAY N° 1

NOTES	(check that the computer is correctly configured) **No fault should be present or stored:** Perform this fault finding procedure if there is a fault in the **command** menu, or a passenger compartment heating/demisting fault. Refer to the **Wiring diagrams** Technical Note for the vehicle to locate the relevant fuses and relays.

If the thermoplunger n° 1 **relay does not operate** during command **AC301 Thermoplunger n° 1 relay**:
Check the thermoplunger n° 1 relay mounting.
Check the engine management computer connections.
Repair if necessary.

If the fault persists, check as follows that this relay is controlled by the engine management computer:
Disconnect the thermoplunger n° 1 relay, fit a **50** to **100** Ω resistor on its mounting instead of the coil and connect a voltmeter as follows:

- positive terminal to **+ 12 V** battery,
- negative terminal to **track 2 or C2 or 1** (depending on the engine) of the thermoplunger n° 1 relay mounting.

Clear the fault and actuate the relay using command **AC301**.
If the voltmeter indicates the battery voltage (ten **1-second** sequences), replace the thermoplunger n° 1 relay.
If the voltmeter does not indicate the battery voltage (ten **1-second** sequences), contact the Techline.

If the thermoplunger n° 1 relay **is supplied**, but there is still a passenger compartment heating/demisting fault.
Check using the wiring diagram:
The conformity of the thermoplunger Maxi-fuse.
The presence of **+ 12 V battery feed** on **track 3 or C3 or 2** (depending on the engine) of the thermoplunger n° 1 relay mounting.
The conformity of the thermoplunger n° 1 relay.
The continuity between **track 5 or C5 or 4** (depending on the engine) of the thermoplunger n° 1 relay mounting and feed terminal for thermoplunger no.1.
The conformity of the thermoplunger resistor: **0.45 Ω ± 0.05 at + 20°C**.
the presence of earth at the water chamber (heating element 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 from the start.

AC302	THERMOPLUNGER RELAY N° 2

NOTES	(check that the computer is correctly configured) **No fault should be present or stored:** Perform this fault finding procedure if there is a fault in the **command** menu, or a passenger compartment heating/demisting fault.
	Special notes: The thermoplunger n° **2** relay supplies thermoplungers no.2 and no. 3 in parallel. See the **Wiring diagrams** Technical Note for your vehicle to locate the relevant fuses and relays.

If the thermoplunger n° **2 relay does not operate** during command **AC302 Thermoplunger n° 2 relay**:
Check the connections on the **Thermoplunger n° 2** relay mounting.
Check the engine management computer connections.
Repair if necessary.

If the fault persists, check as follows that this relay is controlled by the engine management computer:
Disconnect the thermoplunger n° **2** relay, fit a **50** to **100 Ω** resistor on its mounting instead of the coil and connect a voltmeter as follows:
- positive terminal to **+ 12 V** battery,
- negative terminal to **track 2 or 6** (depending on the engine) of the thermoplunger n° 2 relay mounting.

Clear the fault and run command **AC302**.
If the voltmeter shows the battery voltage (two **2-second** ON-OFF cycles), replace the thermoplunger n° 2 relay.
If the voltmeter does not indicate the battery voltage (two **2-second** ON-OFF cycles), contact the Techline.

If the thermoplunger n° 2 relay operates with command AC302, but there is still a passenger compartment heating/demisting fault. Check using the wiring diagram:
The conformity of the thermoplunger Maxi-fuse.
The presence of **+ 12 V battery feed** on **track 3 or 9** (depending on the engine) of the thermoplunger n° 2 relay mounting.
The conformity of the thermoplunger n° 2 relay.
The continuity between **track 5 or 7** of the thermoplunger n° 2 relay mounting and the feed terminals of thermoplungers **2 and 3** (except the 16-seat Master bus, thermoplunger n° 2).
The conformity of the thermoplunger resistors: **0.45 Ω ± 0.05 at + 20°C**.
the presence of earth at the water chamber (heating element 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 from the start.

AC593	DAMPER VALVE

NOTES	Carry out this interpretation: – after **DF019 Air flow sensor circuit**, 2.DEF, – in the case of incorrect operation detected in the **command** menu, – or after a customer complaint (starting problems, poor performance).

Measure the **resistance** of the damper valve solenoid valve between **tracks 1 and 2**.
Replace the solenoid valve if the resistance is not: **46 Ω ± 3 at + 25°C**.
Check for **continuity and the absence of interference resistance** on the connections between:

Engine management computer, **connector C track F4** ⟶ **track 1** solenoid valve connector

+ 12 V after relay ⟶ **track 2** solenoid valve connector

AFTER REPAIR	Repeat the conformity check from the start.

AC593 **CONTINUED**	

A) Engine running at idle speed:
Make sure there is a vacuum pressure of **~ 900 mbar** in the solenoid valve inlet hose.
Carry out the necessary repairs (ensure vacuum circuit is correct and sealed, etc).

B) With the vehicle ignition on, engine stopped:
Check that the **damper valve** is **open**.
If not, clean or replace the air vent unit.
Disconnect the solenoid valve inlet and outlet hoses,
Connect a vacuum pump to the inlet union and apply a vacuum pressure of **~900 mbar.**
If there is a leak replace the solenoid valve.
Actuate the valve using command **AC593 Damper valve**,
If the solenoid valve opens (vacuum pump pressure gauge returns to atmospheric pressure), **go to step C**.
Otherwise, with the solenoid valve connected, check operation of the computer output stage with a voltmeter:

Voltmeter earth cable → **track 1** of the solenoid valve

Voltmeter positive lead → **track 2** of the solenoid valve

Clear any solenoid valve faults,
Activate the valve using command **AC593**:
The voltmeter should display **three ON-OFF cycles** (**12.5 V** then return to **0 V**).
If the measurement is correct, replace the solenoid valve.
If the measurement does not show any lights, contact the Techline.

C) Vehicle with ignition off:
Connect a vacuum pump to the valve control diaphragm and apply a vacuum of **~ 900 mbar**:
If the diaphragm **does not maintain the vacuum pressure**, replace the air vent unit (the diaphragm cannot be disconnected).
If the diaphragm **maintains the vacuum pressure** and **the valve does not move**, clean or replace the air vent unit.
If the diaphragm **maintains the vacuum pressure** and **the valve moves**, then operate it several times to ensure that there is no blockage.
Check for clogging of the air vent unit and its valve, and clean if necessary.

AFTER REPAIR	Repeat the conformity check from the start.

NOTES	Only check customer complaints after performing a complete check with the **diagnostic tool**.

NO DIALOGUE WITH ENGINE MANAGEMENT COMPUTER	**ALP1**
STARTING FAULT OR STARTING IMPOSSIBLE	**ALP2**
INJECTION NOISE	**ALP3**
POOR PERFORMANCE	**ALP4**
IRREGULAR ENGINE OPERATION	**ALP5**
EXTERNAL LEAKS FROM THE FUEL CIRCUIT	**ALP6**
ROUGH IDLING	**ALP7**
OIL LEAKS FROM THE TURBOCHARGER	**ALP8**

ALP1	No dialogue with the engine management computer

NOTES	None.

STEP 1
Check the conformity of the vehicle type and the domain selected on the tool.
Make sure that the tool is not faulty by trying to establish dialogue with a computer on another vehicle.
Check the supply to the diagnostic socket:
↪ + Before ignition on **track 16** / + After ignition on **track 1** / Earth on **track 4 and 5**
Check (according to wiring diagram and fittings):
– The conformity of the After ignition fuse.
– The conformity of the injection relay mounting feeds.
– The conformity of the impact sensor: continuity between its **tracks 1 and 3** in rest position (before impact)
12 V battery ⟶ **track 3** (by fuse)
continuity between **track 3** and **track 1** of the injection relay
– **The conformity of the injection relay: 65 Ω ± 5** between **tracks 1 and 2**
infinite resistance between **tracks 3** and **5** (open contact)
resistance **< 0.2** Ω between **tracks 3** and **5** (closed contact)
Disconnect the engine management computer and check for the absence of conducting elements on the computer pins. If the removal reveals any pollution, repair and try to establish dialogue.
If the fault is still present, place the bornier **Elé. 1681**on the engine wiring harness:
Check for **continuity and the absence of interference resistance** on the following connections:

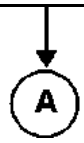
Engine management computer, **connector A track C3** ⟶ **Diagnostic socket track 7 (line K)**

Engine management computer, **connector A track D3** ⟶ **Diagnostic socket track 15 (line L, if wired)**

Ensure that the power supplies are correct:

Engine management computer, **connector B track E3** ⟶ **+ After ignition feed**

Engine management computer, **connector A track D3** ⟶ **Earth**



AFTER REPAIR	Carry out a road test followed by a complete check with the **diagnostic tool**.

ALP1 CONTINUED	

By shunting tracks 3 and 5 of the central injection unit supply relay mounting, check the continuity of the connection between:

Engine management computer, **connector B tracks M3** and **M2** → **+ 12 V battery** (via test shunt)

Check the continuity of the connection between:

Engine management computer **connector B track D4** → **track 2** of the central injection unit supply relay mounting

Try to start communication with another computer on the same vehicle.

➡ If dialogue can be established with **another computer on the same vehicle**, go to **step 2**.

➡ If dialogue cannot be established **with any other computer on the same vehicle**, it may be that the fault computer is disrupting the **K and/or L lines**. To locate it, proceed by elimination by successively disconnecting all the computers connected to these lines (using wiring diagram and depending on equipment): air conditioning, air bag, ABS and ESP, UCH, instrument panel, central communication unit, proximity sensor. Try to establish a dialogue between each disconnection:

If, after a disconnection, you manage to establish dialogue, perform the fault finding procedure for the relevant computer.

↪ If the problem persists, reconnect the computers listed above and disconnect the engine management computer. Try to establish dialogue with another computer.
If dialogue can be established, go to **step 2.**

↪ If dialogue still cannot be established, disconnect **all** the computers connected to lines **K and/or L** and check the insulation against **+ 12 V** and against earth on **track 7** and **track 15** of the **diagnostic socket**. Carry out the necessary repairs.

STEP 2

Contact the Techline.

AFTER REPAIR	Carry out a road test followed by a complete check with the **diagnostic tool**.

ALP2	Starting fault (or starting impossible)

NOTES	**Apply ALP2 after a complete check using the diagnostic tool.**

Is starting difficult or impossible?

impossible → **B** (Go to continued 2)

difficult ↓

PART A:
Check the engine earths.
Ensure that engine speed reaches **250 rpm** with the starter running, as displayed on the parameter screen (**PR006 Engine speed**).
If the engine speed is less than **250 rpm**, refer to Technical Note 6014A, Charging circuit check, 16A (formerly Technical Note 3455A), Starter fault finding, Starter (formerly Technical Note 3632A).
If the engine speed shown on CLIP is zero and the engine is running, measure the **resistance** of the engine speed sensor between **tracks 1 and 2 or A and B**:
Replace the sensor if its resistance is not: **800 Ω ± 80 at + 20°C on F9Q engines**
235 Ω ± 35 at + 23°C on G9T engines

Check the **continuity** of the following connections on G9T engines:

engine management computer, **connector B track G3** → **track 1** of the engine speed sensor

engine management computer, **connector B track H3** → **track 2** of the engine speed sensor

Check the **continuity** of the following connections on F9Q engines:

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

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

Check that the engine earthing is in order (oxidation, tightness, etc.).
Check the mounting, the gap (if necessary refer to the information in the Workshop Repair Manual for the vehicle) and the condition of the sensor (overheating).
Replace if necessary.
Check the synchronisation of the camshaft sensors and the engine speed sensors by displaying **ET115 Synchronisation status**. If synchronisation is not **ACTIVE**, refer to the checks described in **DF070 Camshaft/ engine speed consistency**.
Check the fuel circuit for leaks: run **test 3 Low pressure circuit check**.
If **test 3: Low pressure circuit check** is in order, refer to **DF072 Fuel pressure signal** 2.def, step 4.

AFTER REPAIR	Carry out a road test followed by a complete check with the **diagnostic tool**.

ALP2 CONTINUED 1	

Check that the heater plugs are actuated using command **AC010 Preheating relay**. Check the sealing and condition of the inlet circuit: run **test 4: Turbocharged air inlet circuit check** and follow the fault finding procedure.
Check that there are no foreign bodies on the flow sensor grille: run **test 5: Air flowmeter** and follow the fault finding procedure.
Check the position of the exhaust gas recirculation valve: run **test 9 Exhaust gas recirculation valve**.
Check that the exhaust is not blocked: run **test 1: Exhaust pipe check** and follow the associated fault finding procedure.
Check the consistency of the signal from the engine coolant temperature sensor.
Check that the pressure regulator is working properly (see command **AC006 Fuel pressure solenoid valve**).
Check that the injectors are working properly (excessive return leak, clogging, seizing): run **test 10 Poor injector operation**.
Check the engine timing (and the position of the high pressure pump sprocket).
Check the balance of the compressions, according to the power consumption during the starting phase (**Compression test** menu on the CLIP Technic tool).

If you do not have the CLIP Technic tool, or in case of imbalance, use a compression gauge to perform the measurement (see procedure in the Workshop Repair Manual). After measuring the compressions, clear the faults caused by disconnecting the regulator and the heater plugs.

End of part A

AFTER REPAIR	Carry out a road test followed by a complete check with the **diagnostic tool**.

ALP2

CONTINUED 2

B

Is there diesel in the tank? — NO → Fill the tank with diesel fuel. Bleed the low and high pressure diesel circuit.

YES

Does the starter motor work properly? (Ensure that the engine speed reaches **> ~ 250 rpm** with the starter motor running, **PR006 Engine speed**) — NO → Refer to Technical Note 6014A, Charge circuit check, 16A (formerly Technical Note 3455A), Starter motor fault finding, Starter motor (formerly Technical Note 3632A).

YES

Using the diagnostic tool, check the conformity of the immobiliser: **ET003 Immobiliser** must be **INACTIVE**.

ET003 not correct, or immobiliser warning light continuously lit → Consult the fault finding procedure for the immobiliser.

ET003 in order (immobiliser code warning light off) → Continue the fault finding procedure with Part A of this fault finding chart.

AFTER REPAIR	Carry out a road test followed by a complete check with the **diagnostic tool**.

ALP3	Injection noise

NOTES	**Apply ALP3 after a complete check using the diagnostic tool.**

If the injection noise occurs after starting from cold:

Check the priming of the low-pressure fuel circuit.
Check the fuel heater supply.
Check the operation of the preheating system.
Check that fuel and engine temperatures are consistent.

Does the injection noise occur at idle speed?

Check the condition of the injector connector and pressure regulator terminals.
Check the conformity of the air flow signal: run fault finding for **PR050 Air flow measurement** or run **test 4 Turbocharged air inlet circuit check**.

If the complaint is still present, perform the injector fault finding procedure: run **test 10 Poor injector operation**.

Does the injection noise occur at all speeds?

Run fault finding on the injectors: run **test 10 Poor injector operation**.
Check the condition of the injector connector and pressure regulator terminals.
Ensure that the correct fuel is being used.
If the diesel fuel is not correct:
– Replace the diesel fuel.
– Change the diesel filter.
– Bleed the low and high pressure diesel circuit.

Check the conformity of the air flow signal: use the interpretation of fault finding procedure **PR050 Air flow measurement**.

If the customer complaint is still present:
Run command **AC006 Fuel pressure solenoid valve**.
Then apply the conformity check associated with this note, in order to check:
– the conformity of the fuel pressure: **PR083 Pressure in the rail**,
– the conformity of the fuel flow from the pump: **PR033 Fuel flow**.
If the fault is still present, contact the Techline.

AFTER REPAIR	Carry out a road test followed by a complete check with the **diagnostic tool**.

ALP4	Poor performance

NOTES	**Apply ALP4 after a complete check using the diagnostic tool.**

WARNING
In the event of the engine overheating to above **119 °C**, the computer deliberately limits the fuel flow (overheating warning light lights up from **115°C**).
– Please observe the cleanliness guidelines and safety advice.

Is the poor performance accompanied by smoke? — NO → (A)

YES ↓

Check:
– That the correct fuel is being used:
  If the diesel fuel is not correct:
  – Replace the diesel fuel.
  – Change the diesel filter.
  – Bleed the low and high pressure diesel circuit.
– The conformity of the assembly of the injectors (presence and **conformity of the sealing washer**).

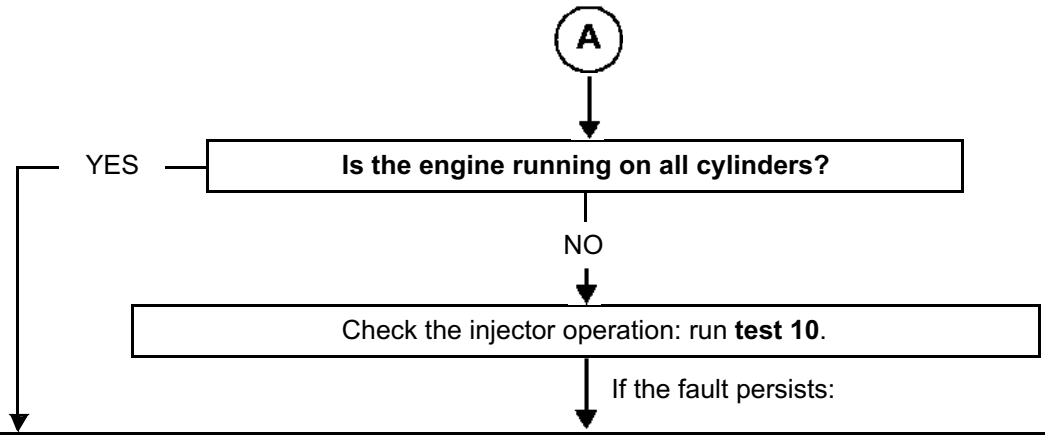
Checking procedure:
– Take a straightedge approximately **40 cm** long and place it on the 4 injectors. The straightedge should rest on the 4 injectors.
– If 1 injector protrudes, remove the injector and check that the washer is correct.
– If one injector does not touch the straightedge (clearance of more than **1 mm**), remove the injector and check that the washer is present.
– Clean the injector wells and the injector, refit the injector with the correct sealing washer.
– The sealing and condition of the inlet circuit: run **test 4: Turbocharged air inlet circuit check**.
– The condition of the air flowmeter: run **test 5 Air flowmeter**.
– The turbocharger: apply **test 6 Fixed geometry turbocharger vacuum control** for a fixed geometry turbocharger, **test 7 Variable geometry turbocharger vacuum control** for a variable geometry turbocharger then **test 8 Rotating section of a turbocharger** in both cases.

Road test:
– The engine must be warm.
– Select 3rd or 4th gear and accelerate with the pedal fully depressed.
– Record the following parameters:
  PR081 Turbocharging pressure loop difference,
  PR082 Turbocharging pressure,
  PR050 Air flow measurement,
  PR006 Engine speed.

Check that the turbocharging pressure follows the increase in the engine speed and that the turbocharging pressure loop difference is low. Otherwise, replace the turbocharger.

AFTER REPAIR	Carry out a road test followed by a complete check with the **diagnostic tool**.

ALP4 CONTINUED	



Check the conformity of the accelerator pedal position sensor, the brake pedal sensor, the atmospheric pressure sensor, the exhaust gas recirculation valve and the damper valve.

– Check the consistency of the signal: of the air flow sensor, of the engine coolant temperature sensor, of the fuel temperature sensor and of the engine speed.

Check the connections, continuity and the absence of interference resistance of the air flowmeter (apply **DF019 Air flow sensor circuit**, 2.def), the engine coolant temperature sensor (apply **DF002 Coolant temperature circuit**, 1.def), the fuel temperature sensor (apply **DF021 Fuel temperature sensor circuit**, CO.1) and the engine speed (apply **DF070 Camshaft sensor/engine speed consistency**, 2.def).

Check that the turbulence flap (swirl) is open in the rest position (depending on fittings).

Check:
- That the diesel fuel filter is not clogged (see **DF072 Fuel pressure signal** 2.def, continued 2, for the check).
- That there are no leaks on the high and low pressure diesel circuits: run **test 3**.
- That the oil vapour rebreathing system is connected,
- The flow regulator (jamming - sticking: apply the interpretation of command: **AC006 Fuel pressure solenoid valve**).

– Check the engine timing (and the position of the high pressure pump sprocket). (See the procedure in the **Workshop Repair Manual if necessary**).

– Check the cylinder compressions (balance of the cylinder compressions with the Compression test function on the CLIP Technic tool).

– Measure the engine compressions with the special tool (refer to the procedure in the **Workshop Repair Manual if necessary**).

If the fault is still present, contact the Techline.

AFTER REPAIR	Carry out a road test followed by a complete check with the **diagnostic tool**.

ALP5	Irregular engine operation

NOTES	**Apply ALP5 after a complete check using the diagnostic tool.**

If the engine races during gear changes, check, if there is a floor carpet, that this is not blocking the accelerator pedal, the brake pedal or the clutch pedal, then check the conformity of the clutch switch and the conformity of the accelerator pedal sensor when the pedal is released.
Measure the **resistance** of the engine speed sensor between **tracks 1 and 2 or A and B**:
Replace the sensor if its resistance is not: **800 Ω ± 80 at + 20°C on F9Q engines**
235 Ω ± 35 at + 23°C on G9T engines

Check the **continuity** of the following connections on G9T engines:

engine management computer, **connector B track G3** → **track 1** of the engine speed sensor

engine management computer, **connector B track H3** → **track 2** of the engine speed sensor

Check the **continuity** of the following connections on F9Q engines:

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

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

Check that the engine earthing is in order (oxidation, tightness, etc.).
Check the mounting, the gap (if necessary refer to the information in the Workshop Repair Manual for the vehicle) and the condition of the sensor (overheating).
Replace if necessary.
Check the low pressure circuit: run **test 3 Low pressure circuit check**.
– Check the pressure regulation solenoid valve using part B of **ALP 7, Rough idle**.
~ 1350 bar under load with the pedal fully depressed.
– Apply the same method as for checking the air flow, explained in the Conformity check section of this note.
– Check the turbocharger: run **test 6** for a fixed geometry turbocharger, **test 7** for a turbocharger with variable geometry, then **test 8** in both cases.
– Apply the same procedure as for checking the hydraulic circuit, which is explained in the Conformity check section of this note.

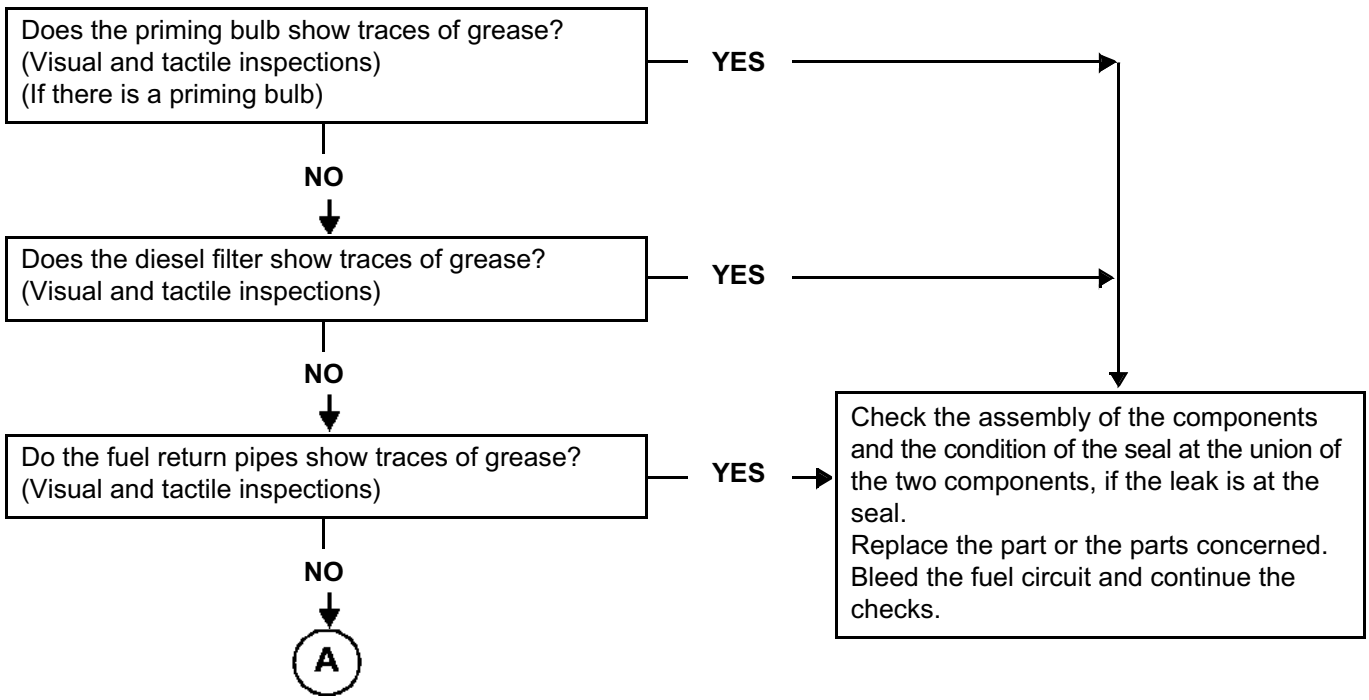
If the fault persists:
– Check the balance of the cylinders using the CLIP Technic function, **Compression test** physical measuring icon.
– Check the engine compressions with the special tool, if necessary.

AFTER REPAIR	Carry out a road test followed by a complete check with the **diagnostic tool**.

ALP6	Fuel system leaks

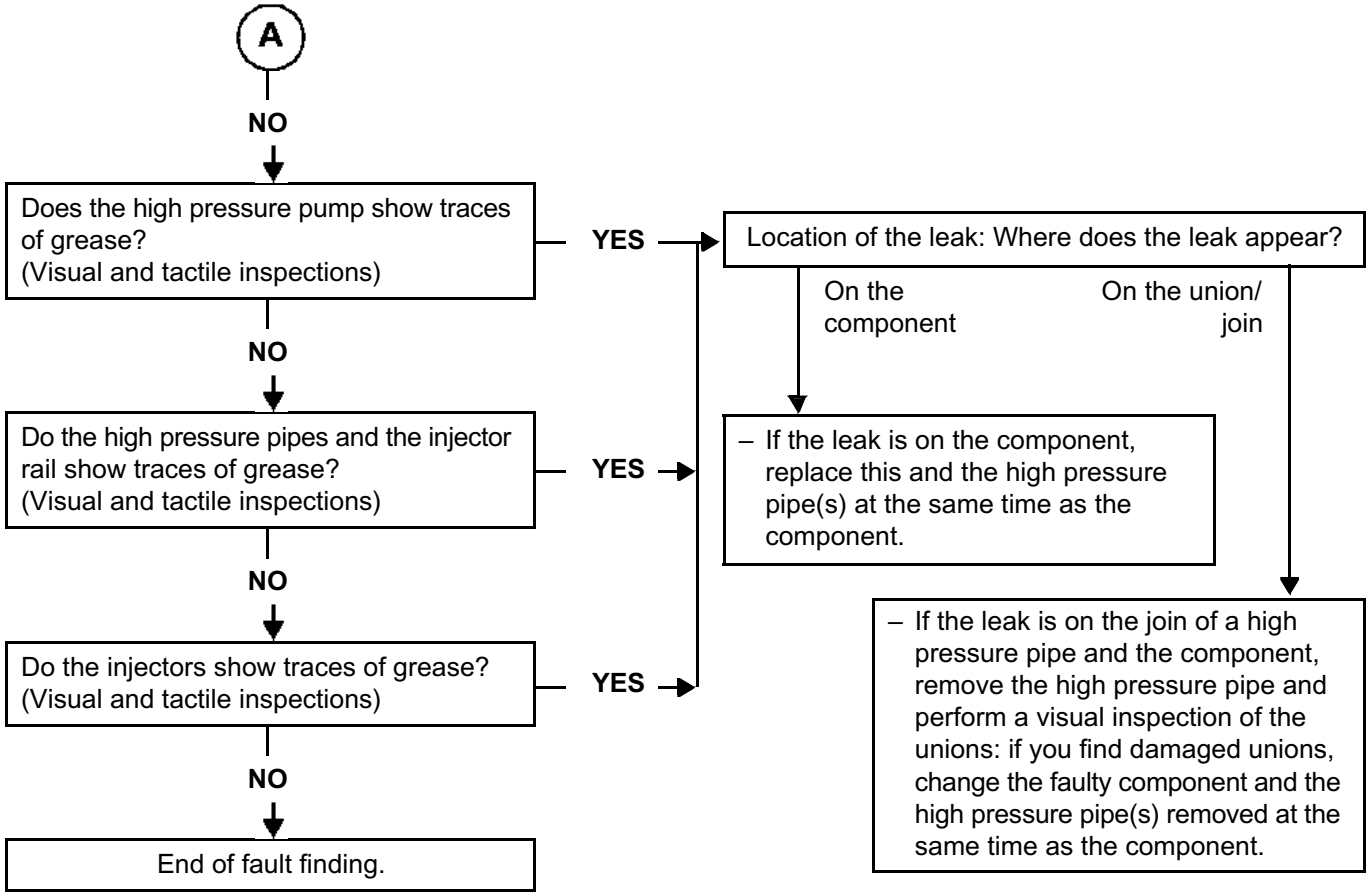
NOTES	**Apply ALP6 after a complete check using the diagnostic tool.** **WARNING** **Please observe the cleanliness guidelines and safety advice.**

Procedure for checking for an external leak on the fuel circuit:
Clean away traces of grease with clean thinner and wipe the part or parts concerned with cleaning cloths.
Start the engine and increase the engine temperature until the diesel fuel reaches 50/60°C.
Stop the engine and check for traces of grease on the part or parts concerned.
If there are such signs, replace the part or parts concerned.
Bleed the fuel circuit and continue the checks.



AFTER REPAIR	Carry out a road test followed by a complete check with the **diagnostic tool**.

ALP6 CONTINUED	



Reminder:
Do not replace the rail, pump or injector unless the union is found to be damaged during the visual inspections.
Bleed the fuel circuit and continue the checks.

AFTER REPAIR	Carry out a road test followed by a complete check with the **diagnostic tool**.

ALP7	Rough idling

NOTES	**Apply ALP7 only after a complete check using the diagnostic tool.**

PART A

Check the sealing and the condition of the inlet circuit by running **test 4** and **test 9**.

↓

Check the low pressure circuit by running **test 3**. → Check the engine parameters:
- Check the update of the engine management computer calibration (last calibration).
- Check the charge circuit: apply Technical Note 6014A, Charge circuit check, Alternator fault finding, 16A, Alternator (formerly Technical Note 3455A).
- Check that the engine speed signal is correct using an oscilloscope: no interference, broken tooth, etc.
  If not correct, check:
  * the wiring,
  * the position of the flywheel and the condition of the flywheel teeth,
  * the position and tightness of the engine speed sensor.

↓

- Check the connections and wiring of the injectors.
- Check the connections and wiring of the engine management computer to the injectors.

Repair if necessary.

↓

High pressure circuit check
(external leaks).
(Refer to the end of **ALP6, Fuel circuit external leaks**)

↓

- Check the engine timing (and the position of the high pressure pump sprocket).
  (See the procedure in the **Workshop Repair Manual if necessary**).

↓

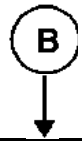
Check the lower engine:
- Check the compressions using the CLIP Technique diagnostic tool, Compression test; or special tool (see **Workshop Repair Manual**).
- Check the engine mountings.

→ B

AFTER REPAIR	Carry out a road test followed by a complete check with the **diagnostic tool**.

ALP7 CONTINUED	

PART B



Start the engine, engine at idle speed.
– With the CLIP diagnostic tool:
Record **PR083 Rail pressure, PR006 Engine speed** and **PR033 Fuel flow** for 30 seconds.
If the difference is **< ± 25 bar**, go to the next step.
If the difference is **> ± 25 bar**, contact your Techline.
Remember: the difference between the min./max. pressures: 50 bar.
If the checks are correct, contact the Techline.

AFTER REPAIR	Carry out a road test followed by a complete check with the **diagnostic tool**.

ALP8	Oil leaks from the turbocharger

NOTES	**Apply ALP8 after a complete check using the diagnostic tool.**

Clean the oily parts of the turbocharger, when cold, with cleaning cloths (part number: 77 11 211 707).

→ At idle speed, check if the turbocharger is leaking from the turbocharger oil supply inlet or outlet, from the turbine inlet or outlet or from the compressor and the rear plate of the compressor housing.

If the leak is at the inlet or outlet of the turbocharger's oil supply:
Replace the seal of the leaky pipe or the pipes if necessary.

If the leak is at the inlet or outlet of the turbine* or of the compressor*:
Check manually if the end play is normal or excessive (see photograph on the next page).
Is the end float normal?

NO → Replace the turbocharger and check:
– that the turbocharger oil supply circuit is not blocked.
Perform an oil change and change the oil filter.
Change the air duct.
Empty and clean the intercooler and the air circuit ducts.

WARNING
Risk of damaging the new turbocharger and the engine if the air circuit is not cleaned and the oil and its filter are not replaced.

YES

If the leak is on the rear plate (compressor housing).
Replace the turbocharger.

*Note:
It is normal to find traces of oil at the turbocharger inlet and outlet, as the air passing through the compressor is loaded with oil from the engine rebreathing circuit.

The operating play of the turbocharger bearings is approximately 25 µm between the shaft of the turbocharger and the internal mating face of the bearings and 75 µm between the exterior part of the bearings and the bearing housing.
Risks:
In the event of destruction of the turbocharger bearings, the steel and bronze swarf from this destruction are evacuated through the turbocharger oil to the engine's oil sump. The swarf can, consequently, be returned to the oil circuit via the oil pump, then cause widespread pollution of the engine oil circuit. This causes abnormal wear on the crankshaft bearing bushings, the con rod bearing shells and the camshafts, etc.
In the event of the compressor wheel breaking, parts of the blades may be found in the intercooler or in the air circuit ducts. The turbine wheel could easily be found in the catalytic converter.

AFTER REPAIR	Carry out a road test followed by a complete check with the **diagnostic tool**.

EXHAUST SYSTEM CHECK	TEST1
FLUSHING THE HIGH PRESSURE PUMP	TEST2
LOW PRESSURE CIRCUIT CHECK	TEST3
TURBOCHARGED AIR INLET CIRCUIT CHECK	TEST4
AIR FLOW SENSOR	TEST5
COMMAND VIA VACUUM PRESSURE FOR A FIXED GEOMETRY TURBOCHARGER	TEST6
COMMAND FOR A VARIABLE GEOMETRY TURBOCHARGER	TEST7
ROTATING SECTION OF A TURBOCHARGER	TEST8
EXHAUST GAS RECIRCULATION VALVE	TEST9
POOR INJECTOR OPERATION	TEST10

TEST1	Exhaust system check

Engine stopped: Check that the silencer outlet is not blocked. Repair or replace the silencer, if necessary.

Check the seal of the exhaust manifold on the contact surface between the turbocharger and the exhaust manifold.
Is the seal in order?

NO → Repair or replace the faulty part.

YES

Loosen the catalytic pre-converter on the turbocharger side. Place a wooden block between the two parts.
Start the vehicle and check if the engine runs better.
Is the engine running normally?

NO → The exhaust pipe is not the cause of the fault; repeat the engine fault finding in the Customer complaints - Fault finding chart section.

YES

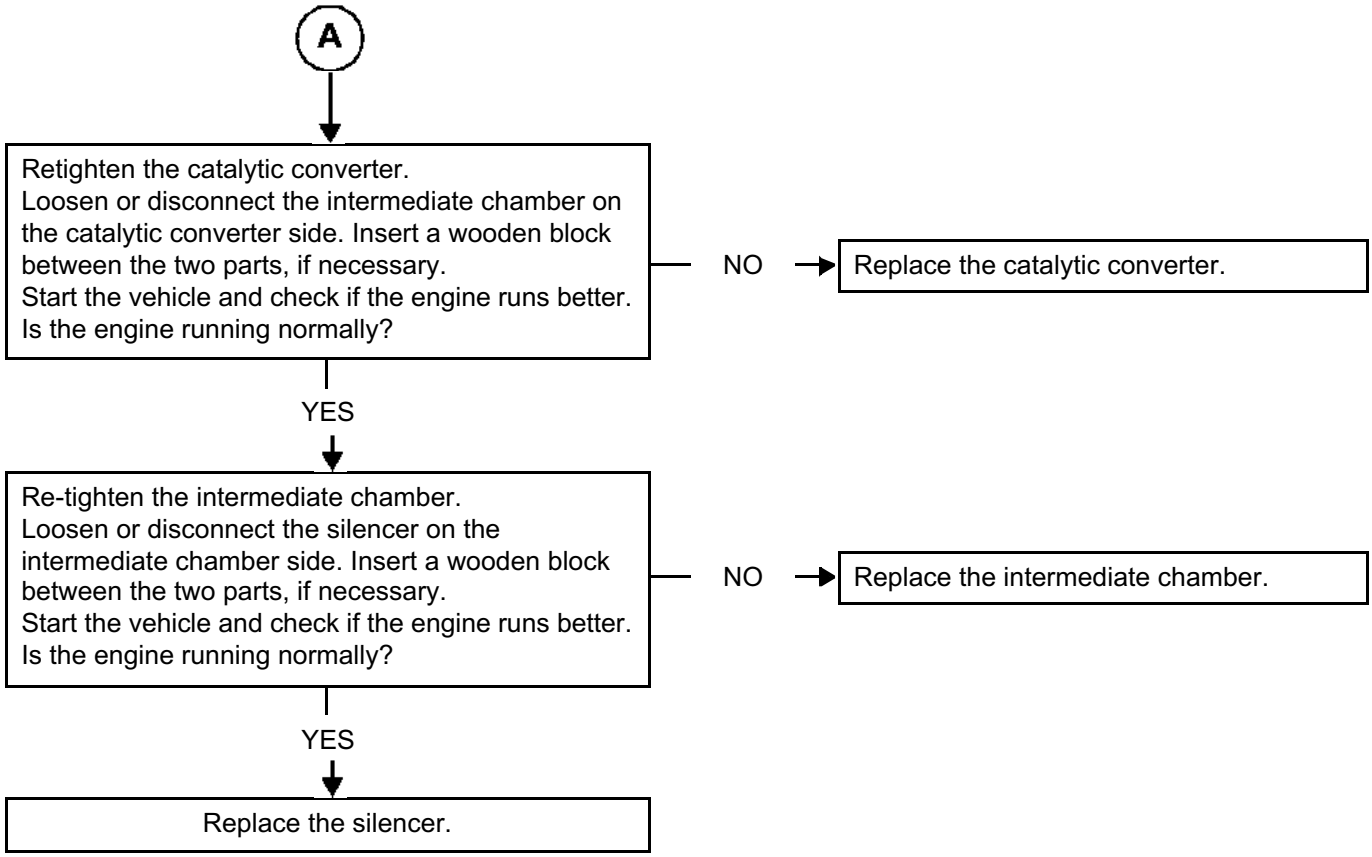
Retighten the catalytic pre-converter.
Loosen the catalytic converter on the catalytic pre-converter side. Place a wooden block between the two parts.
Start the vehicle and check if the engine runs better.
Is the engine running normally?

NO → Replace the catalytic pre-converter.

YES

A

TEST1 CONTINUED	



TEST2	Flushing the high pressure pump

*For **CP1 pumps only**!*
This operation is designed to flush any particles likely to jam or upset operation of the pressure regulator, into the return circuit. The particles are then trapped by the fuel filter.
Rinsing requires simultaneously pressurising the high-pressure pump feed circuit and controlling the rail pressure regulation solenoid valve.
Procedure: (please refer to the Technical Note **Wiring diagrams** for the vehicle)

- Ignition off:
- Remove the low-pressure pump relays,
- In the engine fuse box and relay, shunt the low-pressure pump relay power circuit,
- Connect the diagnostic tool and switch on the ignition,
- Launch communication then "command" mode,
- Run command **AC006 Fuel pressure solenoid valve 3 to 5 times**,
- Switch off the ignition,
- Remove the shunt and replace the high-pressure pump relay,
- Turn on the ignition again and launch communication,
- Clear the "low-pressure pump relay" fault,
- Start the engine and record the rail pressure values.

If the operation has improved the ramp pressure values:
Repeat the procedure to complete the flushing operation. During the road test to follow, put your foot to the floor several times to drive out any impurities to the tank.
End of operation.
If the operation has had no effect on the rail pressure values:
Repeat (or perform) the **AC006 step 2** fault finding procedure.

TEST3	Low-pressure circuit check

Identify the type of high pressure pump installed on the vehicle.

CP1 → B

CP3

Check the fuel filter:
- Conformity of the fuel filter (correct part number and RENAULT filter).
- Positioning and amount of clogging in the filter element.
- Positioning and condition of the seals.

If there is metal swarf in the filter replace the fuel filter and **carry out the fault finding procedure**.

Supplying the injection system with fuel from an additional tank.
This operation aims to detect possible faults in the low pressure supply system of a vehicle by replacing it entirely with an additional tank.
Mode:
- Disconnect the diesel fuel supply pipe at the fuel filter inlet and seal it with a plug.
- On vehicles fitted with an electric priming pump (no priming bulb), remove the pump feed relay.
- Connect a tube to the fuel filter inlet and insert the other end into a **clean** container which is approximately **5 litres** in volume.
- Disconnect the diesel fuel return pipe at the diesel fuel temperature sensor (pump return and injector leak-off junction) and seal it with a plug.
- Connect a transparent tube to the diesel fuel temperature sensor union and insert the other end in the container.
- Fill the container with **clean** diesel fuel.
- Start the engine and let the system drain itself of its air (there must not be any air bubbles in the return pipe).

Is the customer complaint still present?

YES → If the low pressure circuit is in order, reconnect the various pipes making up the low pressure circuit and repeat the fault finding procedure in the **Fault finding chart** or for the fault that referred you to this test.

NO

Are the low pressure circuit connections in order and in good condition?

A

TEST3 CONTINUED 1	

(A)

Check the condition and operation of the priming bulb (depending on the engine), or the priming pump (depending on the engine). Perform repairs if necessary and continue the test.

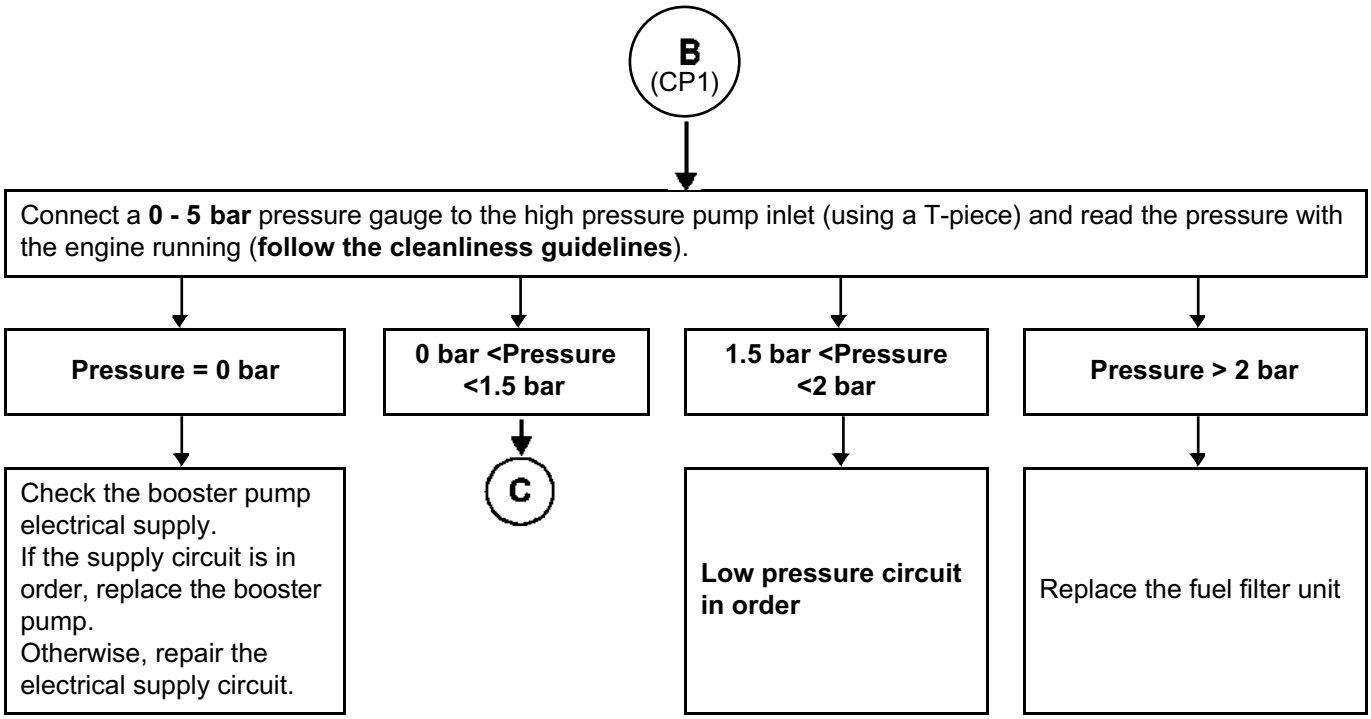
If the fault is still present with a low fuel level, check the consistency of the actual fuel level and that indicated on the instrument panel.
– The transfer pump is supplied via a venturi pipe mounted underneath it.
Check that the opening of the venturi (6 to 8 mm in diameter) is not blocked by dirt contained in the fuel tank.
Check the priming of the low pressure diesel fuel circuit.

Ensure that the correct fuel is being used.
If the diesel fuel is not correct:
– Replace the diesel fuel.
– Change the diesel filter.
– Bleed the low and high pressure diesel circuit.

Special features of the low pressure circuit on vehicles fitted with a priming pump
This pump is only activated for a few seconds when the ignition is switched on and when starting.
– Check that the pump is working during these phases.
Carry out the necessary repairs.

Low-pressure circuit correct.

TEST3 CONTINUED 2	



TEST3 CONTINUED 3	

(C)

(0 bar <Pressure <1.5 bar)

↓

Connect the pressure gauge to the filter inlet and read the pressure with the engine running.
If the **pressure> 1.5 bar**: the low pressure circuit upstream of the filter is in order. Check that the filter is not clogged and the filter outlet hose is not pinched.
If not, move on to the next step.

↓

Remove the pipe at the filter inlet.
Place a container here to catch the fuel.
Display the fuel flow with the ignition on:
– If the fuel flow is approximately **1 litre per 30 seconds**, the pump and the pipes of the circuit upstream of the pump are in order. Replace the fuel filter head.
– Otherwise, check that there are no leaks between the tank and the fuel filter.

↓

If the fault is still present with a low fuel level, check the consistency of the actual fuel level and that indicated on the instrument panel.
The transfer pump is supplied via a venturi pipe mounted underneath it.
Check that the opening of the venturi (**6 to 8 mm** in diameter) is not blocked by dirt contained in the fuel tank.

↓

Ensure that the correct fuel is being used.
If the diesel fuel is not correct:
– Replace the diesel fuel.
– Change the diesel filter.
– Bleed the low and high pressure diesel circuit.
Otherwise replace the booster pump.
End of **TEST3**.

TEST4	Checking the turbocharged air inlet circuit

Engine stopped: Check the low and high pressure air circuits for **leaks** (air leaks in or out, upstream or downstream of the turbocharger).

Look for parts of the system that are abnormally greasy, indicating leakage.
Check:
– the condition and fitting of the ducts (foreign bodies, clogged, disconnected, pinched, broken, holed, cut, tightness of the mounting bolts, etc.).
– the presence, condition and fitting of the seals.
– the present and tightening of the clamps.
– The fitting of the turbocharging pressure sensor.
Carry out the necessary repairs.

Checking the air filter.

Check:
– That the air filter unit inlet and outlet are not blocked.
– The condition and fitting of the air filter unit (disconnected, broken, perforated, etc.).
– The cleanliness, conformity and the absence of deformation of the filter element.
– The air flowmeter: run **test 5**.
Carry out the necessary repairs.

If the engine is equipped accordingly, check:
– that the damper valve is open (**AC593 Damper valve**, step B).
– the condition of the damper valve:
  – the tightness of the mounting bolts,
  – cracks in the damper valve.
– that the turbulence flap is open in the rest position (depending on fittings).
Carry out the necessary repairs.
Replace if necessary.

Check that there is no leak at the exhaust manifold, in particular at the exhaust manifold / turbocharger interface.
Check the exhaust: run **test 1**.
Carry out the necessary repairs.

Check the condition of the intercooler:
– clogging,
– leaks (vehicle stationary, stabilise the engine speed between 3500 rpm and 4000 rpm and check that there are no leaks).
Replace if necessary.
END OF TEST.

TEST5	Air flow sensor

12 V supply
(Refer to **Wiring Diagrams Technical Note** for the vehicle to locate the **connections** and **connectors** concerned).

Check the **+ 12 V feed** on **track 4** of the air flowmeter.
If it is not correct, check the **continuity and absence of interference resistance** on the connection between the supply relay of the air flowmeter and **track 4** of the air flowmeter.
Carry out the necessary repairs.

Check the operation of the air flow sensor supply relay.
Replace the relay if necessary.
Otherwise, check the supply to the air flowmeter supply relay.

If it is not correct, check the **continuity and absence of interference resistance** on the connections between the air flowmeter supply relay and between the fuse(s) and the battery.
Carry out repairs if not correct.
If correct, check the fuse(s) concerned. Replace the fuse(s) if necessary.

↓

Contamination of the grilles
Visual inspection: remove the flowmeter. There should be no foreign bodies in the grilles (see illustration n° 110734).
Do not clean the grilles using compressed air or by any other method: this damages the sensors and creates variations from the values displayed on the CLIP tool.
Check the air circuit sealing upstream of the air flow sensor: ducts and air filter unit disconnected or pierced, presence of seals.
Replace the air flow sensor if necessary and clean upstream of this, if necessary.

↓

Damage to electrical components
Visual inspection: remove the flowmeter. The components must not be broken (see illustration n° 110736).
Replace the air flow sensor if necessary.

↓

Oxidation of the electrical components
Visual inspection: remove the air flow sensor, there should not be any green deposits on the electrical components.
Replace the air flow sensor if necessary.

↓

A

TEST5 CONTINUED 1	

Clogging of the air flow sensor

Test:
– Check the values for conformity:
  * During the **first 5 seconds** after starting:
    – Coolant temperature: **80°C**,
    – Engine speed: idle speed (**800 rpm** for G9T 702 and F9Q 754 engines),
    – Air flow value: **59 kg/h ± 5** for G9T 702 engines and **47 kg/h ± 5** for F9Q 754 engines,
    – EGR valve opening cyclic ratio*: **5%**.

  * After the starting phase:
    – Coolant temperature: **80°C**,
    – Engine speed: idle speed (**800 rpm** for G9T 702 and F9Q 754 engines),
    – Air flow measurement: **33 kg/h ± 5** for G9T 702 engines and **27 kg/h ± 5%** for F9Q 754 engines,
    – EGR valve OCR*: between **35%** and **45%**.

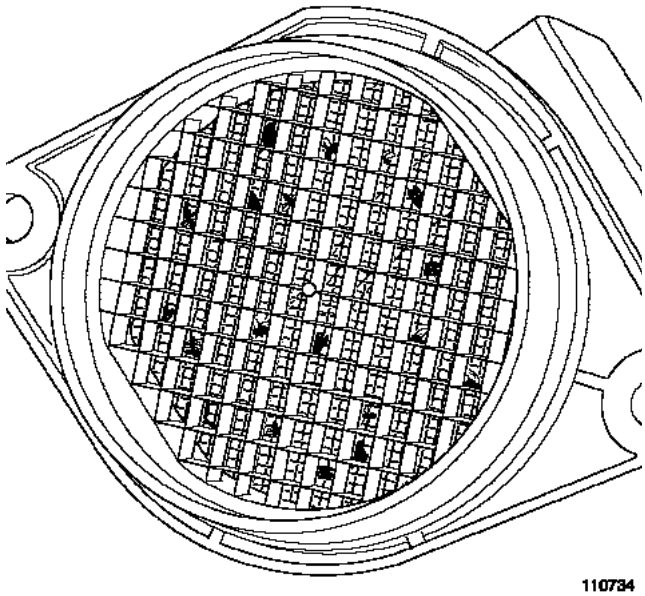
– Refer to **DF019 Air flow sensor circuit 2.def**, for the air flowmeter checks.

Replace the air flowmeter if necessary.

* OCR: **O**pening **C**yclic **R**atio.

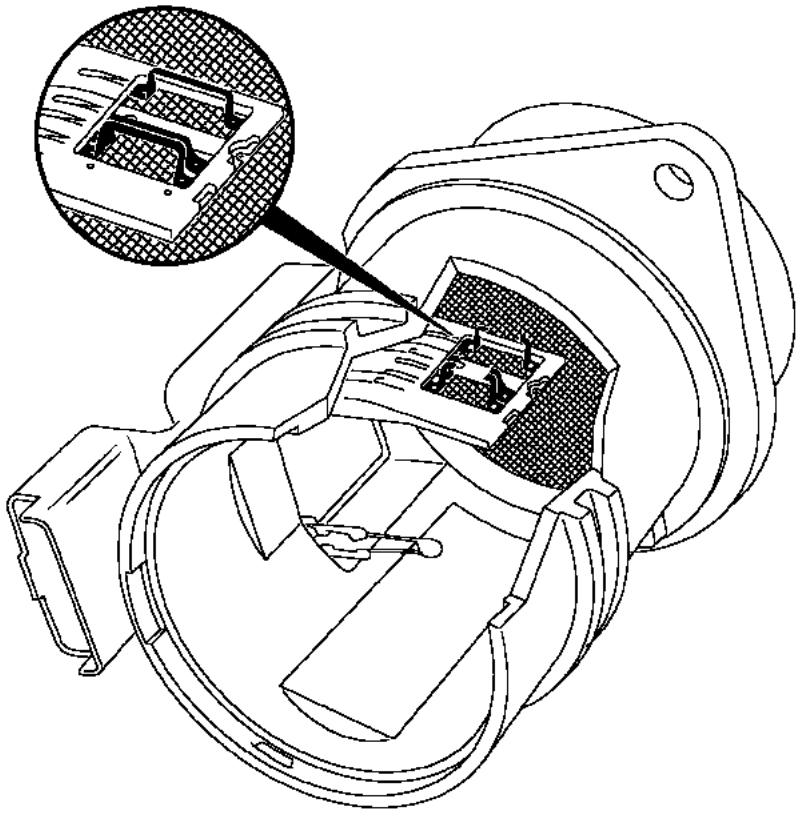
TEST5 CONTINUED 2	

Pollution of the grille



110734

Damage to the electrical sensors



110736

TEST6	Fixed geometry turbocharger vacuum control

Engine stopped:
Check manually if the rod of the regulation valve is blocked.
Is the rod jammed?

YES → Replace the turbocharger.

NO ↓

At idle speed, turbocharging solenoid valve control: 85% OCR*, disconnect the electrical connector of the solenoid valve and check at the same time if the wastegate control rod moves.
Does the rod of the wastegate move from end to end?

YES → The turbocharging control circuit is operating normally.

NO ↓

Check the condition of the wastegate valve connectors (corrosion, bent pins, etc.).
Measure the **resistance** of the solenoid valve between its tracks 1 and 2. It should be:
– 15.4 Ω ± 0.7 at + 20°C for a *Pierburg* solenoid valve,
– 16.5 Ω ± 1.6 at + 20°C for a *Bitron* solenoid valve.
Is the solenoid valve in order?

NO → Replace the turbocharging solenoid valve.

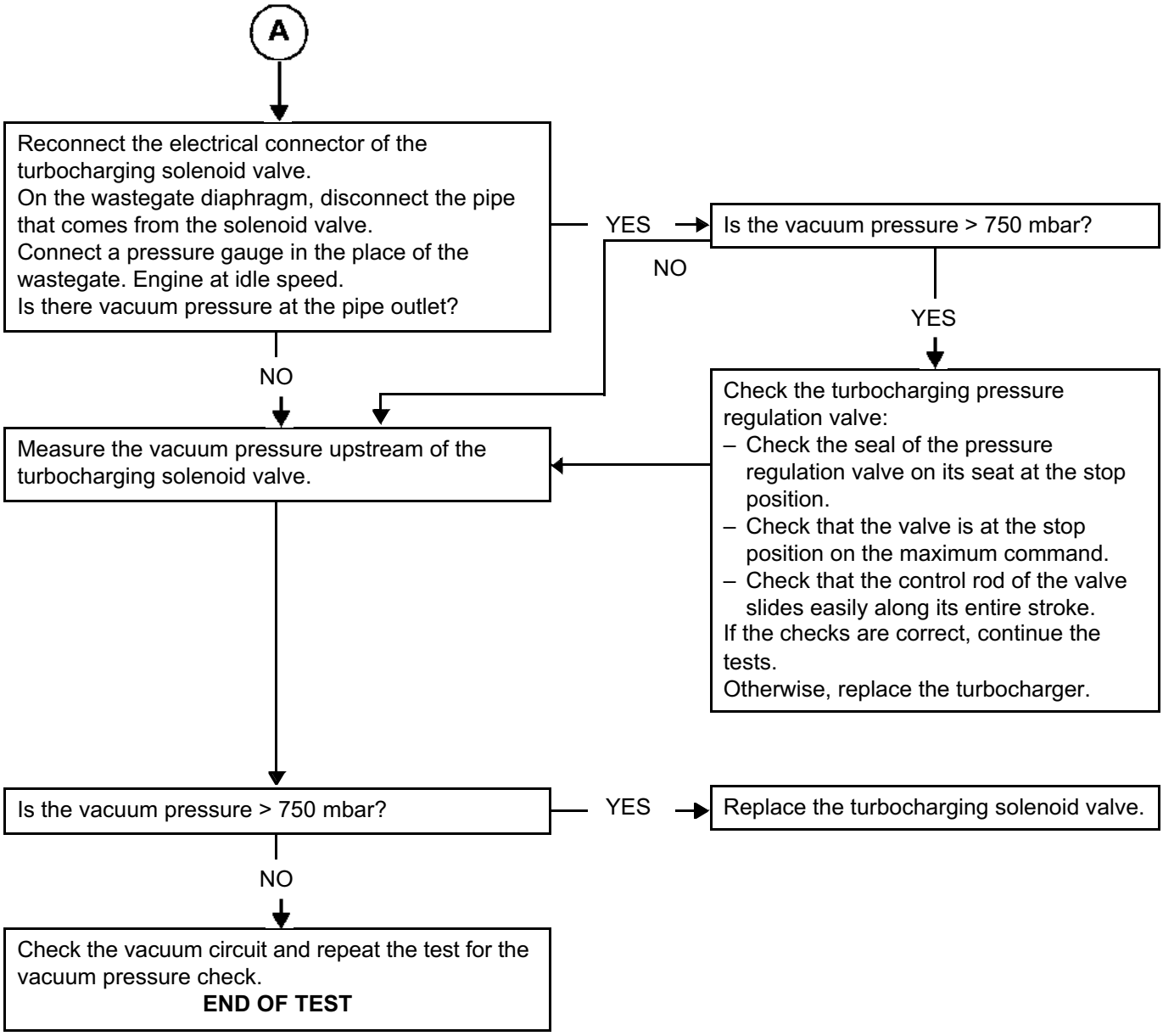
YES → Check the continuity and the + 12 V and earth insulation of the connection between track L2 of connector B of the engine management computer and track 1 of the turbocharging solenoid valve connector.
Check the continuity and earth insulation of the connection between the 12 V feed after the injection relay and track 2 of the turbocharging solenoid valve connector.

↓ (A)

* OCR: Opening Cyclic Ratio.

TEST6

CONTINUED



TEST7	Variable geometry turbocharger control

Engine stopped:
Check manually if the variable geometry control rod is jammed.
Is the rod jammed?

YES →
- Replace the turbocharger.
- Perform a visual inspection of the condition of the turbine and the compressor (see the illustrations of test 8).

If one of the 2 wheels is damaged, you should also replace the duct connected to the damaged wheel.

NO ↓

At idle speed, with turbocharging solenoid valve control: 85% OCR*, disconnect the electrical connector of the solenoid valve and check at the same time if the rod controlling the blades of the variable geometry turbocharger moves.
Does the rod move from end to end?

YES → The turbocharging control circuit is operating normally.

NO ↓

Check the condition of the wastegate valve connectors (corrosion, bent pins, etc.).
Measure the **resistance** of the solenoid valve between its tracks 1 and 2. It should be:
- 15.4 Ω ± 0.7 at + 20°C for a *Pierburg* solenoid valve,
- 16.5 Ω ± 1.6 at + 20°C for a *Bitron* solenoid valve.

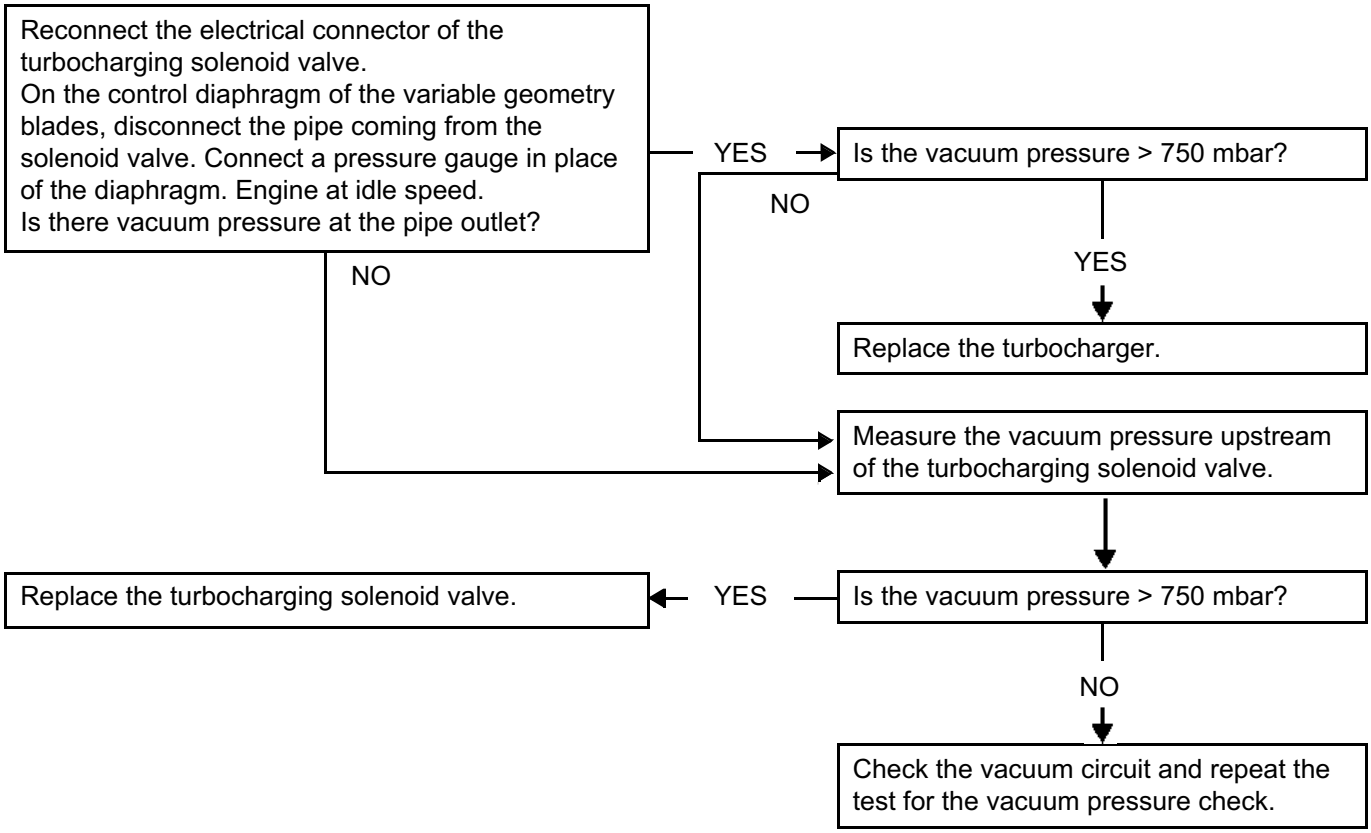
Is the solenoid valve in order?

NO → Replace the turbocharging solenoid valve.

YES → Check the continuity and the + 12 V and earth insulation of the connection between track L2 of connector B of the engine management computer and track 1 of the turbocharging solenoid valve connector. Check the continuity and earth insulation of the connection between the 12 V feed after the injection relay and track 2 of the turbocharging solenoid valve connector. Repair, if necessary.

* OCR: Opening Cyclic Ratio.

TEST7 CONTINUED	



TEST8	Rotating part of a turbocharger

With the engine cold and stopped, remove the air inlet duct from the turbocharger; check manually if the shaft of the turbine and of the compressor turns.
Does the shaft turn?

NO → Replace the turbocharger.

The turbocharger could be sticking due to poor lubrication of the bearings. Check for possible clogging of the lubrication circuit and the engine oil pressure.
Perform an oil change and change the oil filter.

YES

Perform a visual inspection of the condition of the wheels (see the illustrations on the next page).
Are the wheels in good condition?

NO →
- Replace the turbocharger.
- Replace the duct connected to the damaged wheel.

YES

Manually check the axial play of the wheels (see illustration for test 8 cont'd 2). The significant end float is approximately 2 mm.
Does the turbocharger have too much play in the shaft?

YES → Replace the turbocharger.

If the rotating section is broken:
- change the engine oil and the oil filter,
- clean the intercooler and the air circuit ducts.

WARNING
Risk of damaging the new turbocharger and the engine if the air circuit is not cleaned and the oil and its filter are not replaced.

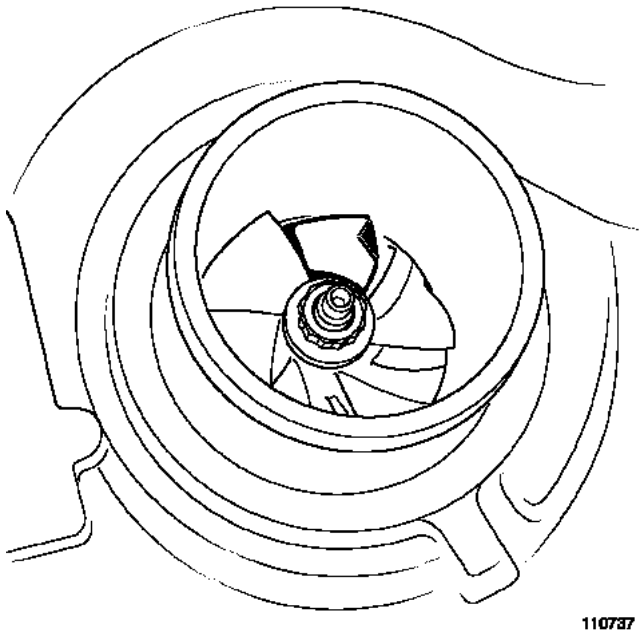
NO

The rotating section is in order.

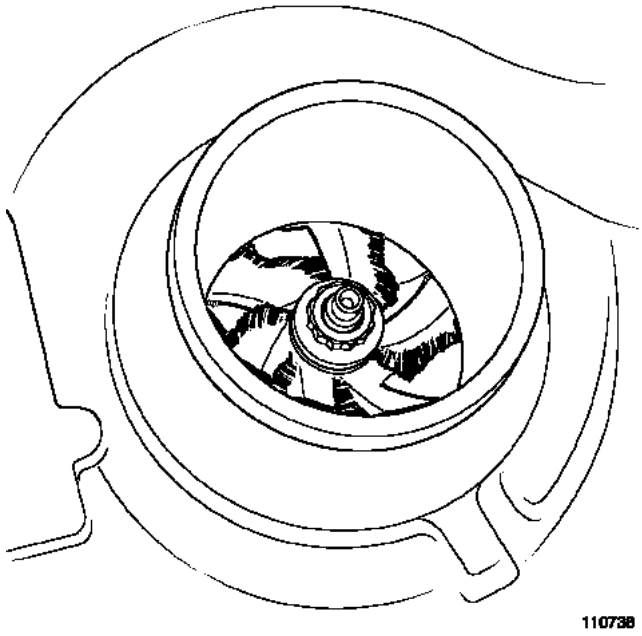
The operating play of the turbocharger bearings is approximately 25 µm (micrometres or microns) between the shaft of the turbocharger and the internal mating face of the bearings and 75 µm between the exterior part of the bearings and the bearing housing.
Risks:
In the event of destruction of the turbocharger bearings, the steel and bronze swarf from this destruction are evacuated through the turbocharger oil to the engine's oil sump. The swarf can, consequently, be returned to the oil circuit via the oil pump, then cause widespread pollution of the engine oil circuit. This causes abnormal wear on the crankshaft bearing bushings, the con rod bearing shells and the camshafts, etc.
In the event of the compressor wheel breaking, parts of the blades may be found in the intercooler or in the air circuit ducts. The turbine wheel could easily be found in the catalytic converter.

TEST8 **CONTINUED 1**	

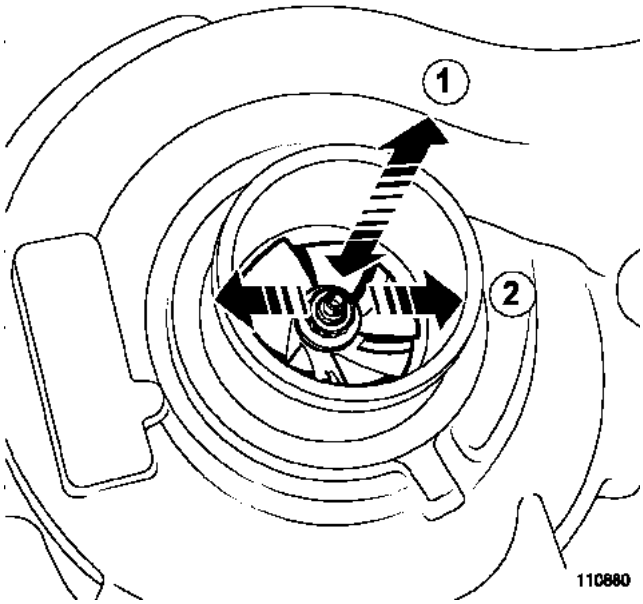
Deformed, twisted blade ("soft" foreign body)



Broken blades ("hard" foreign body)



TEST8 **CONTINUED 2**	



1 **Axial play**
2 **Radial play**

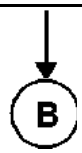
TEST9	Exhaust gas recirculation valve

PART A

Fault finding on the valve position
Or detection of a leak on the exhaust gas recirculation valve
Please observe the cleanliness guidelines and safety advice.

F9Q engine:
Erase the faults.
Start the engine. Leave the engine idling for a few minutes.
Switch off the ignition and wait for the engine immobiliser warning light to start flashing.
Switch the ignition back on and check for faults.
If the fault is still present:
– exit CLIP tool diagnostic mode,
– switch off the vehicle ignition,
– disconnect the exhaust gas recirculation valve connector,
– remove the exhaust gas recirculation valve using the special tool (refer to Workshop Repair Manual) and reconnect it after having removed it,
– check that no particles are blocking the movement of the exhaust gas recirculation valve flap,
– check that the exhaust gas recirculation valve is not stuck or jammed in one position,
– switch on the ignition again and return to fault finding mode using the CLIP tool,
– run the command **AC007 EGR valve, with the valve removed**,
– check the movement of the valve via the **PR095 EGR valve OCR*** (stroke of **0 to 2.5 mm** for an opening cyclic ratio of **40%** and when fully open, **~ 5 mm**, for an opening cyclic ratio of **95%**),
– check that the exhaust gas recirculation valve flap closes completely,
– if there was no movement, or if the jamming of the exhaust gas recirculation valve cannot be solved, replace the exhaust gas recirculation valve and follow the procedure for replacing the exhaust gas recirculation valve in the **Replacement of components** section.

G9T or G9U engines:
Apply section C of this test.



TEST9 CONTINUED 1	

PART B

B

Exhaust gas recirculation valve potentiometer fault finding
Use the CLIP diagnostic tool to compare **PR088 EGR valve position feedback** and the setpoint voltage or OCR* and check if there are any drops in feedback (micro-breaks).

Exhaust gas recirculation valve bushing fault finding
With the engine stopped and the ignition on, record the **PR088 EGR valve position feedback**. The voltage should be less than 1.5 V.
Remove the exhaust gas recirculation valve and perform a visual inspection: the exhaust gas recirculation valve should not have a cluster of soot between the base and the flap.
Clean the exhaust gas recirculation valve sleeve, replace the exhaust gas recirculation valve if necessary and follow the procedure for replacing the exhaust gas recirculation valve in the **Replacement of components** section.

C

* OCR: Opening Cyclic Ratio.

TEST9 CONTINUED 2	

PART C

– Activate command **AC007 EGR Valve** 4 times.
– Display **PR088 EGR valve position feedback**.
– Is **PR088** ≥ 1.5 V?

YES

– Replace* the pipe and the exhaust gas recirculation valve according to the procedure described in the Workshop Repair Manual.
– For the valve, follow the **Replacement of components** procedure.
– Follow the recommendations for **confirming the fault finding**.

NO

– Replace* the exhaust gas recirculation pipe according to the procedure described in the Workshop Repair Manual.
– **Do not replace the exhaust gas recirculation valve.**
– Follow the recommendations for **confirming the fault finding**.

Confirmation of the fault finding:
– Start the vehicle.
– Let the engine idle for **1 minute**.
– Accelerate very slowly up to **1500 rpm for 2 minutes** until the exhaust gas recirculation function becomes active.
– Carry out a vehicle test at low speed, without accelerating heavily, then normally.
– Check for faults using the CLIP diagnostic tool. If the customer complaint or the faults recur, contact the Techline.

*** Please observe the cleanliness guidelines and safety advice.**

TEST10	Poor injector operation

Part A
1) Checking the injector return flow balance:

Does the engine start?

YES

NO

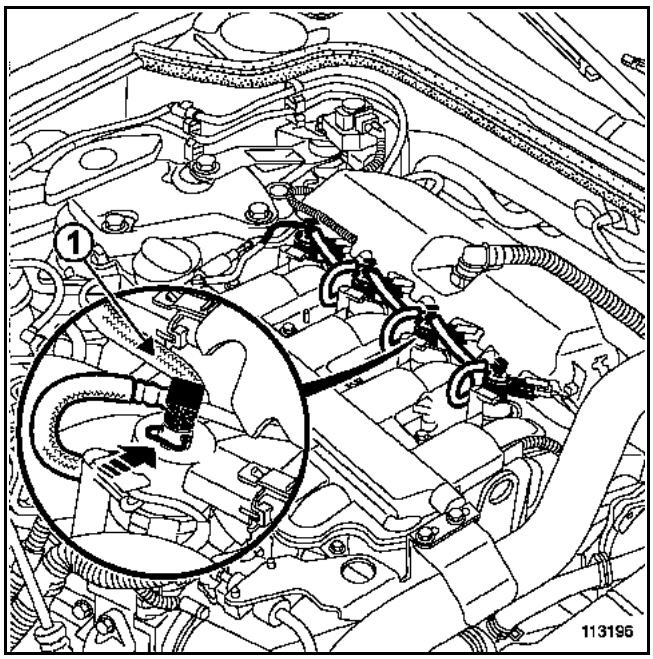
– Fit Mot. 1760 as shown in the tool fitting procedure (see next page).
– Press START (with card or RENAULT card) or perform a 15 second starting sequence (with ignition key).
– Measure the length of diesel fuel in the Mot. 1760 pipes.
– Replace the injector if the length travelled by the fuel is more than 10 cm compared with the average of the other three injectors.

– The injector return pipes must be fitted to the injectors.
– Start the engine.
– Set the CLIP diagnostic tool to parameter reading mode.
– Raise the temperature of the engine.
– Read the diesel fuel temperature using **PR001 Fuel temperature:**
  * if the temperature varies rapidly: increase the diesel fuel temperature to more than 50°C,
  * if the temperature does not vary on the CLIP diagnostic tool display or varies too slowly: carry out a road test (driving) for 15 min.
– Switch off the engine.
– Fit MOT 1760 as shown in the installation procedure (see section 2).
– Put the CLIP diagnostic tool in parameter reading mode and check PR083 Rail pressure.
– Ask another Cotech to monitor the rise in fuel in the cans during engine turnover, as one of the cans will fill up quickly if one of the injectors is leaking.
– Start the engine.
– Accelerate the engine until the pressure in the rail is 550 bar:
  * if the engine speed is less than 3000 rpm, maintain this pressure.
  * if the engine speed is more than 3000 rpm, reduce the engine speed until the rail pressure is 500 bar and maintain this pressure.
– Maintain these conditions for one minute.
– Release the accelerator pedal and maintain the idle speed for 10 seconds.
– Switch off the engine.
– Measure the quantity of fuel contained in each measuring cylinder.
– Replace the injector where the quantity of fuel is more than 50 ml.
– Remove Mot. 1760 as shown in the tool removal procedure (see part 3).

TEST10 CONTINUED 1	

2) Fitting the tool

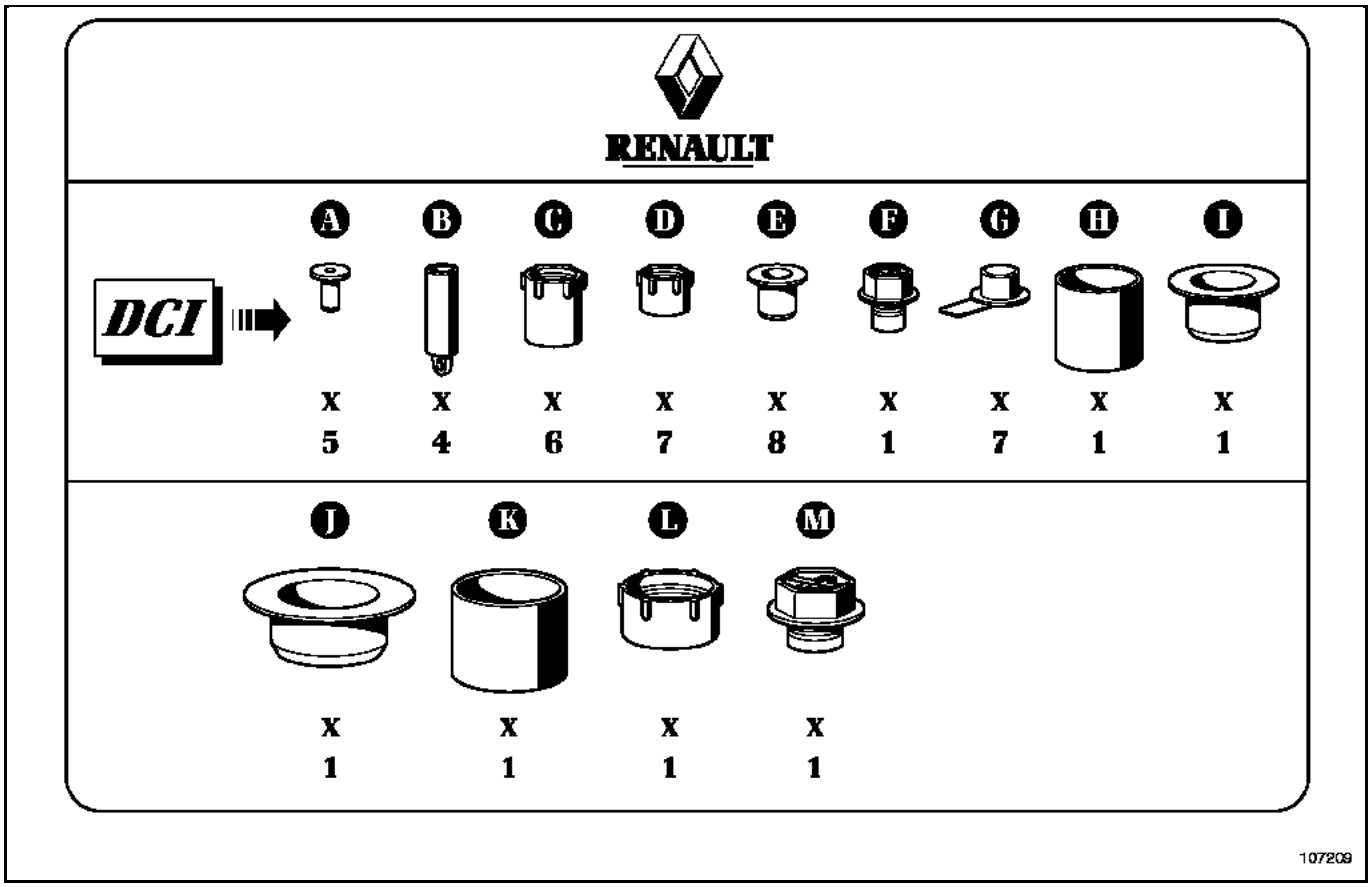
Remove the engine undertray.



Disconnect the complete fuel return pipe according to the following procedure (do not remove the clips):
– press the clip,
– pull vertically on the end piece **(1)** of the fuel return pipe.

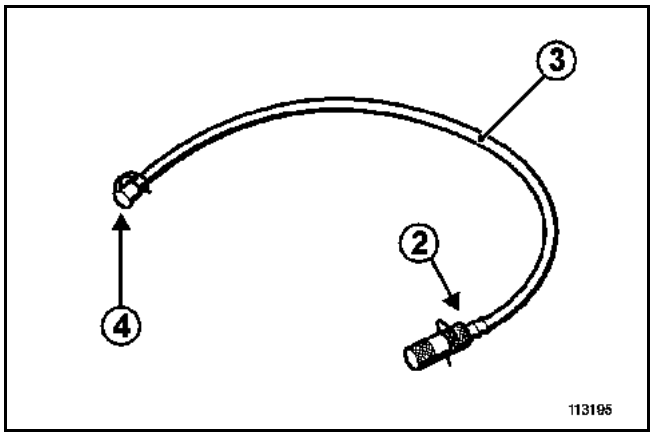
WARNING
The end piece is fragile. Be careful not to break it by pulling it too hard. Replace all removed clips.

TEST10 CONTINUED 2	

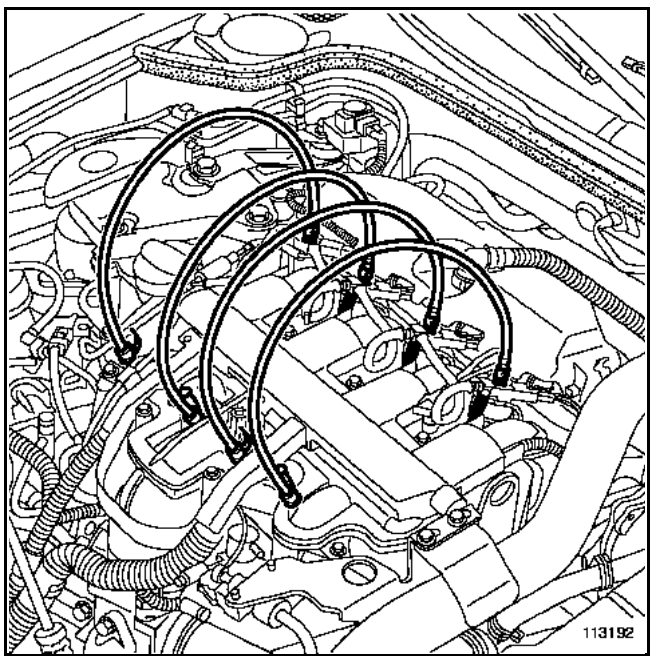


Fit the blanking plugs **(B)**, from the kit (part number **77 01 208 229**), on the end pieces of the fuel return pipe.
If fitting of **Mot. 1760** onto the injectors is not being performed immediately, place blanking plugs **(A)** on the injector fuel return openings.

TEST10 CONTINUED 3	

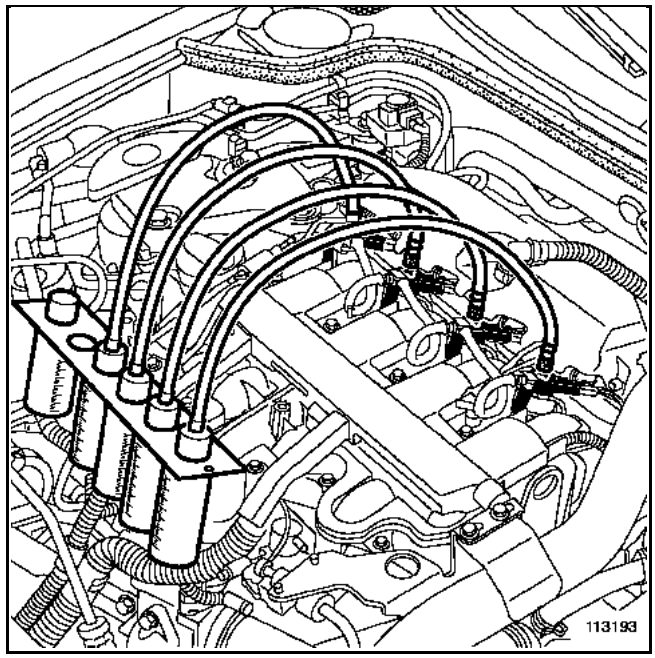


Remove the clips and the plugs from the end pieces **(2)** of the pipes **(3)** of **Mot. 1760**, leave the plugs **(4)** in place.



Connect the pipes **(3)** to the injectors (without removing the clips on the injectors):
- press on the clip **(1)** on the injector,
- insert the end piece **(2)** into the injector fuel return opening,
- do not forget to fit the end piece plugs **(2)** to the injector fuel return openings with the clips provided.

Remove the plugs **(4)**.



Insert the ends of the pipes into the measuring cylinders of the **Mot. 1760** tool; the cylinders are taken from the **Mot. 1711** tool.

Then measure the fuel return (See the procedure in section 1 for checking the injector return flow).

TEST10 CONTINUED 4	

3) Removing the tool

WARNING
Use a cleaning cloth (part number 77 11 211 707) to absorb fuel run-off.

Disconnect pipe **(3)** from an injector:
– press on the clip **(1)** on the injector,
– pull vertically on the end piece **(2)** of the pipe **(3)** on the **Mot. 1760** tool, placing a wipe on the end piece **(2)** to prevent run-off.

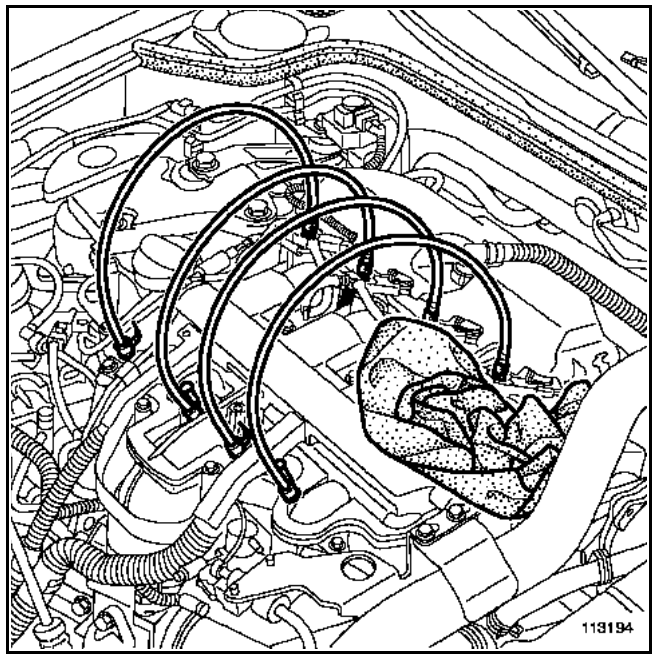
Lift the end piece **(2)** vertically so that the fuel contained in the pipes flows into the measuring cylinders of **Mot. 1760**.

Remove the other 3 pipes using the same procedure.

Remove the plugs from the fuel return pipe end pieces **(2)**.

Connect the complete fuel return pipe to the injectors.

Wipe up any fuel run-off with a cleaning cloth (part number 77 11 211 707).



TEST10 CONTINUED 5	

Part B
Injector nozzle sealing test:
– Check the level and condition of the engine oil:
– If there is pollution from the diesel oil, the injector nozzle which is leaking will be greasy.
– Disconnect the preheating relay.
Ensure that this is not caused by rising engine oil by checking the engine compression values.
Check the condition of the heater plug: this must not be damp. If this is the case, change the defective injector.
If the compression values are in order, locate the faulty injector by examining the condition of the cylinders and the pistons via the heater plug wells (greasy cylinder, overheating, starting to disintegrate, etc.).
If the cylinder - piston examination is not conclusive, remove the injectors and change the one with the greasy nozzle.

*Note:
Before replacing an injector, check for the presence and conformity of its sealing washer (see the checking procedure in the **Poor performance** fault finding chart).

WARNING
When removing or refitting the injectors, follow the cleanliness guidelines and safety advice (see section **13B** of the Workshop Repair Manual).

Injection computer	128 tracks
Injector	0.33 Ω at + 20°C/2 Ω max
Flow controller (high-pressure pump)	R = 3 Ω at + 20°C
Engine speed sensor	R = 235 Ω ± 35 at + 23°C (on G9)
Engine speed sensor	R = 800 Ω ± 80 at + 20°C (on F9)
Camshaft sensor	Hall-effect sensor
Rail pressure sensor	Screwed on rail
Pressure limiter (on pump CP3)	Start of opening ~ 1450 bar, maximum opening at 1650 bar (bolted to the rail)
Turbocharging limitation solenoid valve	15.4 Ω ± 0.7 at + 20°C (PIERBURG type) 16.5 Ω ± 1.6 at + 25°C (BITRON type)
Swirl solenoid valve	46 Ω ± 3 at + 25°C
Damper-valve solenoid valve	46 Ω ± 3 at + 25°C
Accelerator pedal sensor	R gang 1 = 1200 Ω ± 480 R gang 2 = 1700 Ω ± 680
Air temperature sensor	R = 3714 Ω ± 161 at + 10°C / 2448 Ω ± 90 at + 20°C/1671 Ω ± 59 at + 30°C
Diesel 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
Air flowmeter	Track 1: air temperature signal Track 2: - flow sensor Track 3: + 5 V flowmeter Track 4: + 12 V battery feed Track 5: air flow signal Track 6: earth
Exhaust gas recirculation valve (Pierburg)	R between tracks 1 and 5 (coil)= 8 Ω ± 0.5 at + 20°C R between tracks 2 and 4: 2400 Ω to 5600 Ω at + 20°C R between tracks 2 and 6: 1900 Ω to 6400 Ω at + 20°C R between tracks 4 and 6: 800 Ω to 3800 Ω at + 20°C
Exhaust gas recirculation valve (Cooper)	R between tracks 1 and 5 (coil)= 8 Ω ± 0.5 at + 20°C
Heater plug	R = 0.4 Ω to 0.9 Ω Maximum current drawn: 28 A at 0 seconds / 12 A at 10 s / 7 A after 30 seconds
Thermoplungers	R = 0.45 Ω ± 0.05 at + 20°C

(R = Resistance)