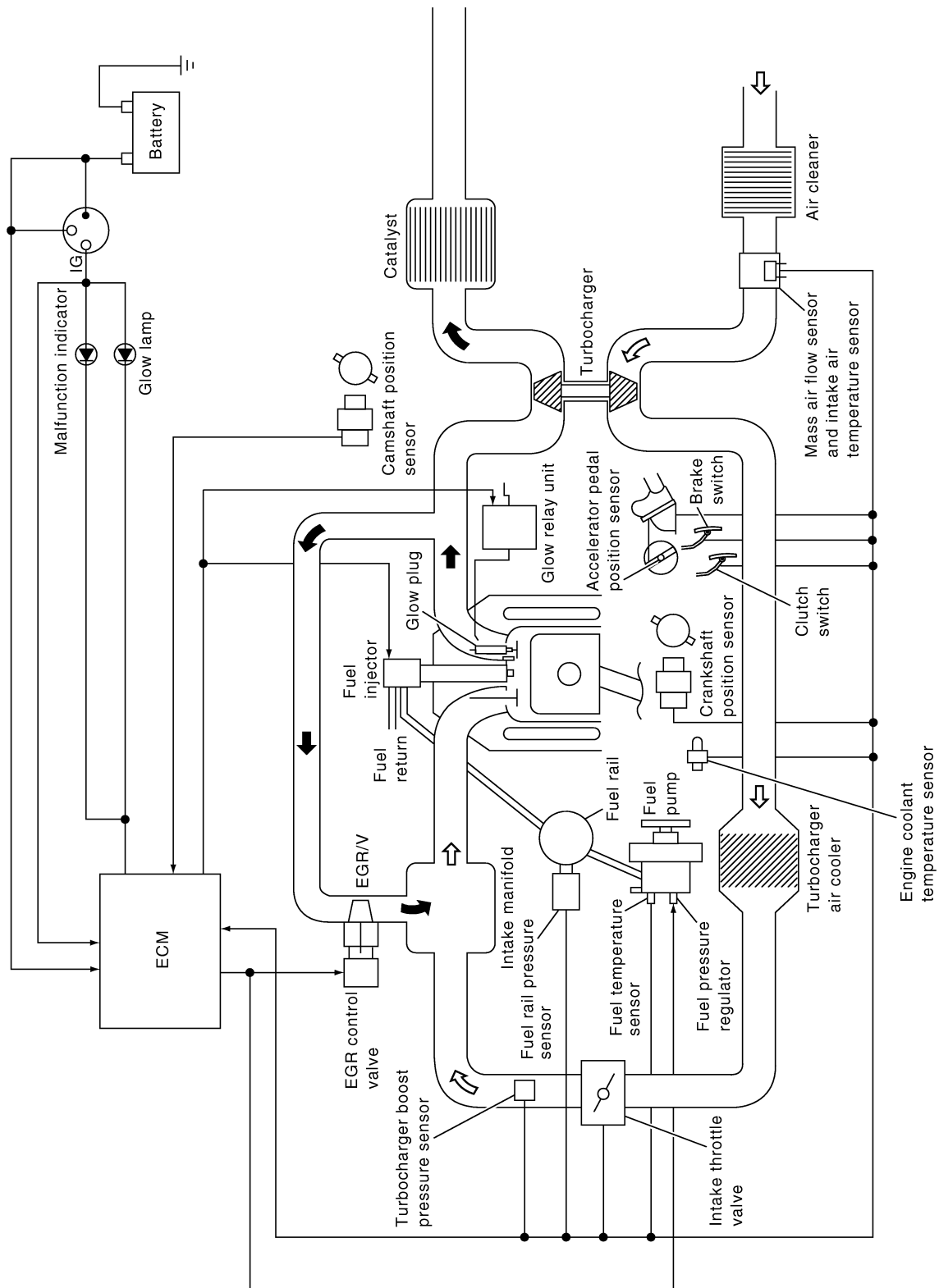


# ENGINE CONTROL SYSTEM

## SECTION **EC**

# DIESEL INJECTION System Diagram

**F9Q**

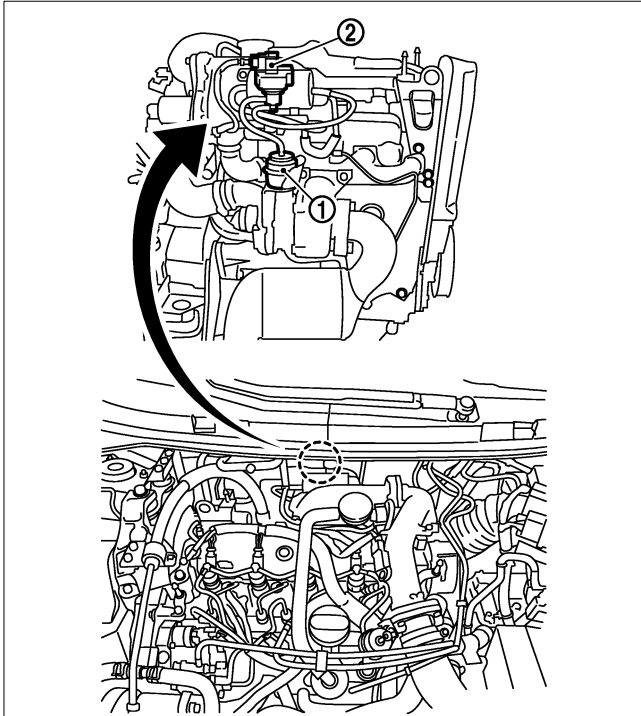


YEC818A

### 1. DESCRIPTION

#### WARNING:

If the turbocharger boost control solenoid valve is removed, it is essential to mark the supply and return pipes on the solenoid valve.

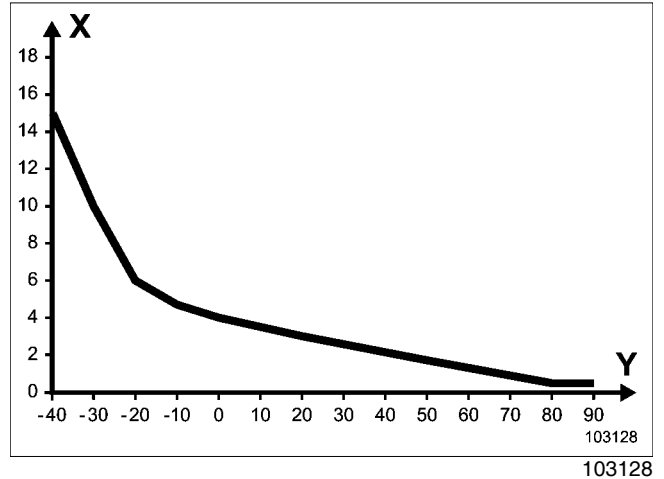


YEC807A

The turbocharger boost control valve (1) is controlled by a solenoid valve (2) (Located under the cowl top) which is in turn controlled by the ECM. This solenoid valve varies the underpressure as a function of the engine operating ranges, which allows the turbocharger boost pressure to be regulated.

The turbocharger boost control solenoid valve is open in the rest position. The engine operates as normally aspirated.

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



Shaft	Description
X	Time in seconds
Y	Engine coolant temperature in °C

# TURBOCHARGING

## Pressure adjustment

# F9Q

### Essential special tooling

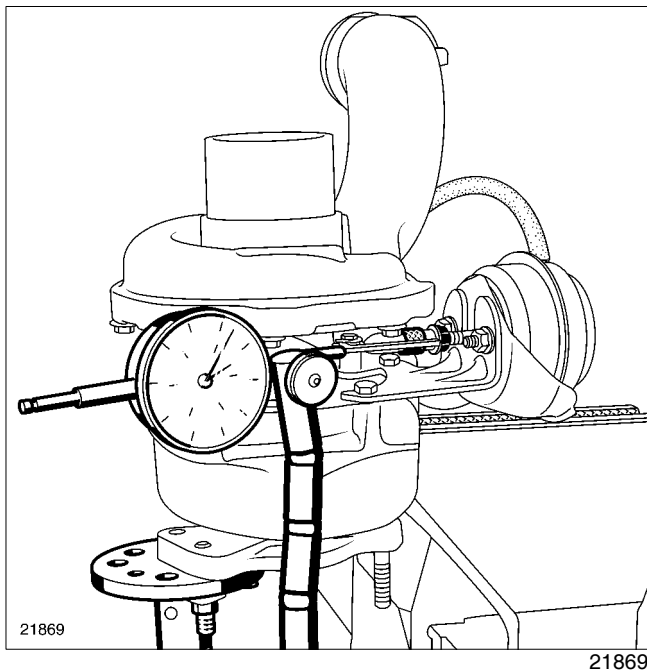
<b>Mot. 1014</b>	Turbocharger pressure tester and adjuster and engine leak detector kit
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### Essential equipment

diagnostic tool

## TURBOCHARGER BOOST CONTROL VALVE

### 2. Check



#### Note:

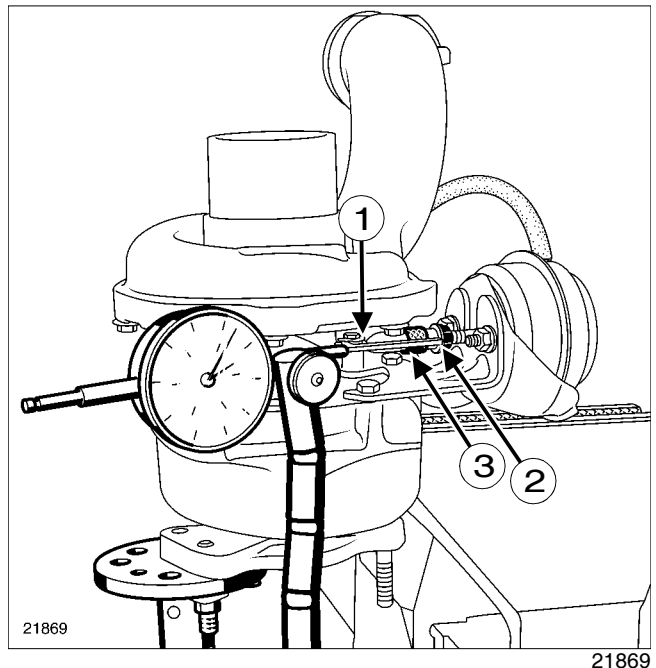
The pressure cannot be checked or adjusted with the turbocharger in place.

- Remove the turbocharger (Refer to EM section)
- Use a magnetic base fitted with a dial gauge located at the end of the control valve rod (as far as possible on the axis of the rod).
- Gradually apply increasing negative pressure to the control valve using the pressure gauge (Mot. 1014).

### 3. Value

- For a negative pressure value of **265 mbars**, the rod must move by between **0.5 and 3.5 mm**.
- For a negative pressure value greater than **600 mbars**, the rod is at the stop.

### 4. Adjustment



#### Note:

During an inspection, it is possible to intervene when the length of the turbocharger boost pressure control valve pin (1) is being adjusted (pressure outside of permitted tolerance levels).

- Undo the lock nut (2).
- Adjust by tightening or loosening adjusting wheel (3) half a turn at a time until the correct calibration pressure is obtained.
- Tighten the wheel to increase the calibration pressure.
- Undo the wheel to reduce the calibration pressure.

#### Note:

Check recirculation after retightening the lock nut (2).

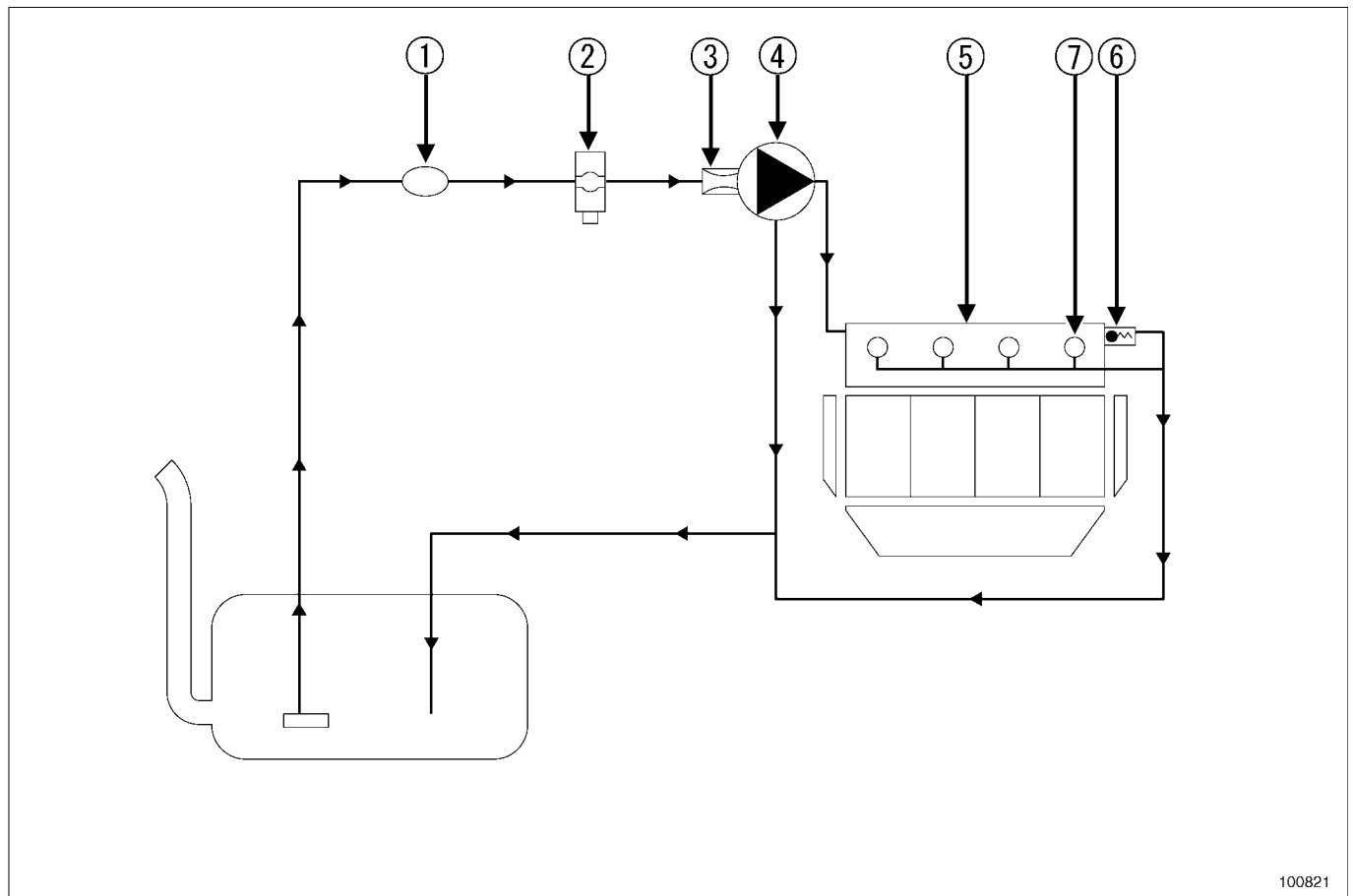
- Check the repairs have been carried out with a road test checking the « opening cycle ratio » parameters of the wastegate and « the turbocharger pressures » on the **diagnostic tool**.

# FUEL SUPPLY

## Fuel supply line

# F9Q

### Operating diagram of the fuel supply line



The fuel line comprises:

- a priming pump (1) (located in the engine compartment),
- a fuel filter (2) that may be fitted with a water in fuel sensor,
- a fuel pressure regulator (3) mounted on the pump,
- a high-pressure pump (4),
- a fuel rail (5) fitted with a fuel rail pressure sensor and a pressure limiter (6),
- four solenoid injectors (7),
- various sensors,
- an ECM.

#### WARNING

It is strictly forbidden to loosen a high-pressure pipe union when the engine is running.

#### WARNING

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

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

The system consists of:

- a priming pump on the low-pressure fuel line,
- a fuel filter,
- a pressure regulator mounted on the pump,
- a high-pressure pump,
- a fuel rail fitted with a fuel rail pressure sensor and a pressure limiter,
- four solenoid injectors,
- various sensors,
- an ECM.

### NOTE

Before starting any work on the injection circuit, use the **CONSULT-II** to check that:

- that the rail is not under pressure,
- that the fuel temperature is not too high.

### WARNING

Every time work is carried out, it is essential to follow the safety and cleanliness instructions outlined in this document.

It is strictly forbidden to undo a high-pressure pipe union when the engine is running.

The high-pressure « common rail » injection system operates in sequential mode (based on the multipoint injection operation for petrol engines).

This injection system uses a pre-injection procedure and therefore can provide:

- a reduction in operational noise,
- a reduction in the amount of pollutant gas particles,
- a significant engine torque at low speeds.

The high-pressure pump generates the high-pressure sent to the injector rail. The pressure regulator on the pump controls the quantity of fuel supplied according to the demand determined by the ECM. The rail supplies each injector through a steel pipe.

The ECM:

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

The injected flow to the engine is determined by:

- the duration of injector control,
- the injector opening and closing speed,
- the needle travel (determined by a constant for the type of injector),
- the nominal hydraulic flow of the injector (specific to each injector).
- the high pressure fuel rail pressure controlled by the ECM.

The ECM controls:

- the idle regulation,
- the exhaust gas flow reinjected into the inlet,
- the fuel supply (delivery, flow and rail pressure),
- the request to operate the fan assembly: centralised coolant temperature management function),
- the air conditioning,
- the cruise control-speed limiter function,
- the pre/post (glow plug) heating function.

The high-pressure pump is supplied at low-pressure by a mechanical booster pump (transfer pump).

The high-pressure pump supplies the rail which is pressure-controlled:

- for loading by the fuel pressure regulator,
- for discharge by the injector valves.

Drops in pressure may also be compensated for.

The fuel pressure regulator 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.

To discharge the rail, the injection valves are controlled by small electrical pulses:

- short enough not to open the injector, (passing through the return circuit from the injectors),
- long enough to open the valves and discharge the rail.

ECM controls the fan assemblies and the coolant temperature warning light on the instrument panel: centralised coolant temperature management.

The various vehicle computers communicate via a CAN communication line. Therefore, the malfunction warning lights on the instrument panel are lit via the CAN communication line.

In the event of an impact, the function that cuts off the fuel supply system is controlled by the airbag control module. The airbag control module gives the command via the CAN communication line to the ECM to lock the ECM relay control.

Unlocking will only be active after the ignition has been switched off for **10 seconds**. When the ignition is switched on, this operation will cause the fault warning light to come on for longer than usual. The warning light will not return to normal operation until the malfunction is cleared using the **CONSULT-II**.

The vehicle speed signal is transmitted to the instrument panel by the ABS computer or the gearbox (vehicle without ABS) via the CAN communication line.

# DIESEL INJECTION

## Operation

# F9Q

Some vehicles have a sensor for detecting water in the fuel which is located in the filter. If there is water present in the fuel, the orange warning light comes on.

Automatic configuration for the operation of the cruise control / speed limiter and for air conditioning operation.

ECM controlling:

- the air conditioning compressor,
- the fan assembly,
- the electrical heating resistors.

The ECM receives a continuous signal via the CAN communication line regarding the electrical power available from the alternator. This therefore prevents the vehicle electrical consumption from being in excess of the alternator's capacity. The aim is to give priority to charging the battery.

### WARNING

- The engine must not be run with fuel containing more than **10%** diester or petrol even in minute quantities.
- Dismantling the interior of the high-pressure pump and the injectors is prohibited. Only the fuel pressure regulator, the fuel temperature sensor and the Venturi tube can be replaced.
- It is forbidden to remove the fuel rail pressure sensor from the fuel rail as this could cause contamination of the circuit. If the pressure sensor is deteriorated, replace the assembly consisting of the pressure sensor, rail, and the five high-pressure pipes.
- It is strictly forbidden to remove any injection pump pulley bearing the number 070 575 . If the pump is being replaced also replace the pulley.
- Supplying + **12 V** directly to any component in the system is prohibited.
- Ultrasonic decoking and cleaning are prohibited.
- Never start the engine unless the battery is connected correctly.
- Never turn the engine in the direction opposite to that of normal operation.

Reprime the fuel line using the priming pump.

### IMPORTANT

The engine should not be run with fuel containing more than **10%** diester.

Note:

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

The system can inject fuel into the engine up to a pressure of **1350 bar**. Before starting any operations check that the fuel rail is not under pressure.

It is absolutely vital that you observe the tightening torque:

- of the high-pressure pipes,
- of the cylinder head injector,
- of the fuel rail pressure sensor and pressure regulator.

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

### CAUTION

Any injector that has been removed must be replaced.

When replacing the high-pressure pipe, follow the method below:

- remove the high-pressure pipe, holding the filter rod on the injector with a lock-wrench,
- fit blanking plugs,
- loosen the high-pressure fuel rail,
- fit the new high-pressure pipe,
- offer up the unions by hand until they touch,
- tighten the high-pressure fuel rail mountings to the required torque value,
- tighten the union at the injector side to torque,
- tighten the high-pressure fuel rail connection to torque.

### CAUTION

It is not permitted to dismantle the internal components of the pump.

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

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

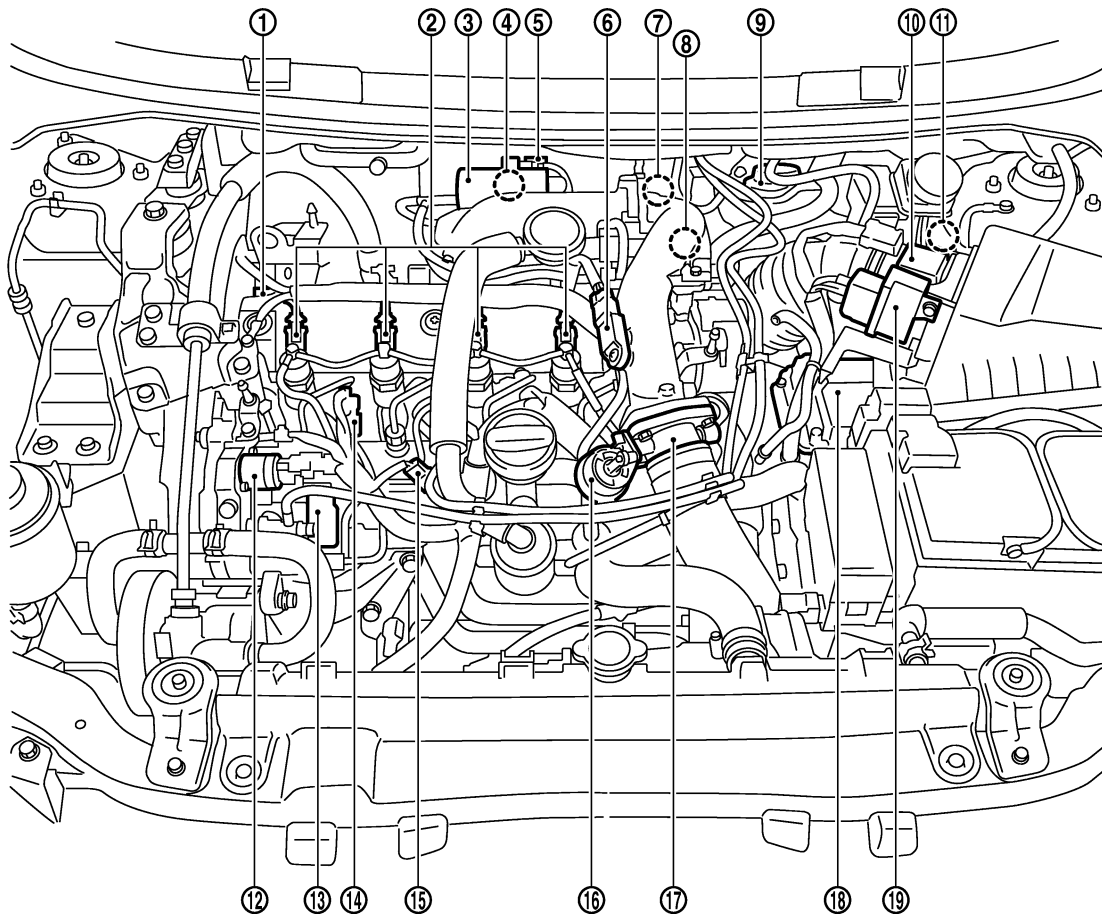
### WARNING

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

# DIESEL INJECTION

## Location of components

# F9Q



YEC819A

- |      |   |
|------|---|
| (1)  | Camshaft position sensor                                |
| (2)  | Injector  |
| (3)  | Vacuum tank   |
| (4)  | Intake throttle control solenoid valve                  |
| (5)  | Turbocharger boost control solenoid valve               |
| (6)  | Turbocharger boost pressure sensor                      |
| (7)  | EGR control solenoid valve                              |
| (8)  | Engine coolant temperature sensor                       |
| (9)  | Fuel filter   |
| (10) | Mass air flow sensor with intake air temperature sensor |
| (11) | Priming pump  |
| (12) | Fuel pressure regulator                                 |
| (13) | High-pressure fuel pump                                 |

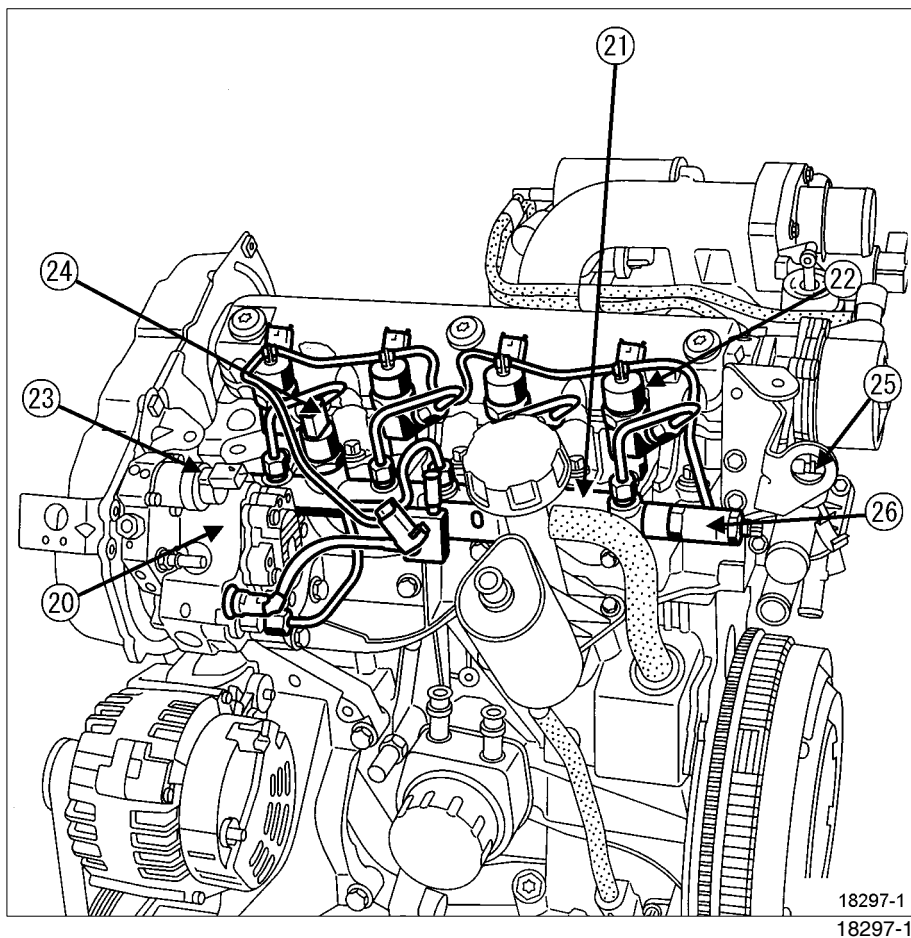
- |      |                           |
|------|---------------------------|
| (14) | Fuel rail pressure sensor |
| (15) | Fuel temperature sensor   |
| (16) | Intake throttle actuator  |
| (17) | Intake throttle valve     |
| (18) | ECM                       |
| (19) | Glow relay unit           |



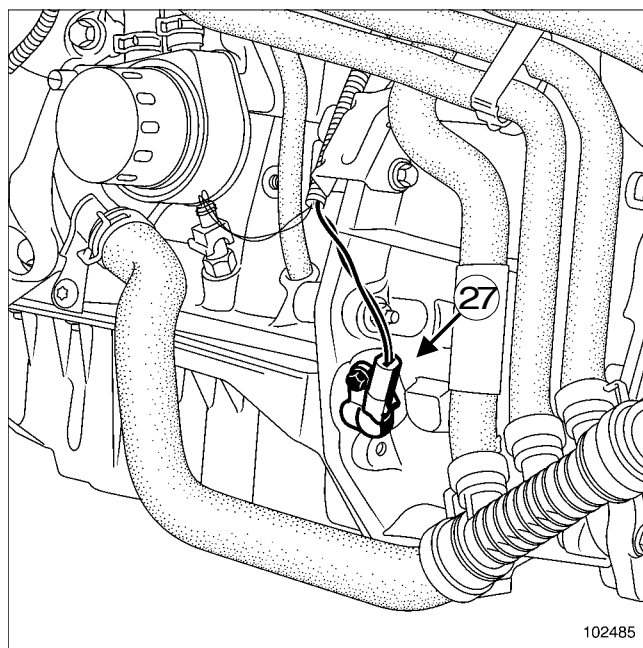
# DIESEL INJECTION

## Location of components

# F9Q



- (20) Fuel pump (High-pressure pump)
- (21) Fuel rail (Injection common rail)
- (22) Injector
- (23) Fuel pressure regulator
- (24) Fuel pressure sensor
- (25) Engine coolant temperature sensor
- (26) Pressure limiter

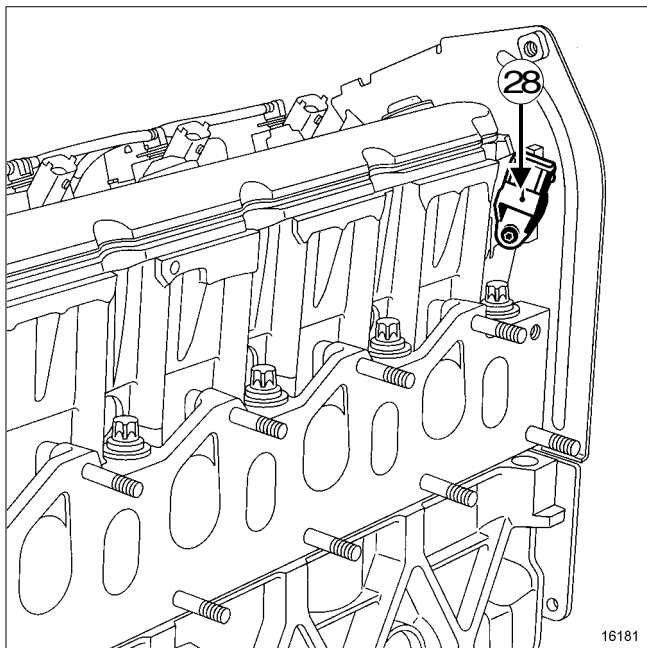


- (27) Crankshaft position sensor

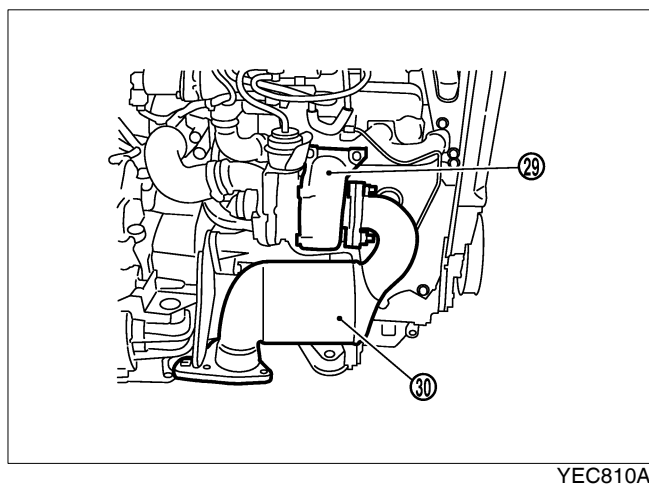
# DIESEL INJECTION

## Location of components

# F9Q

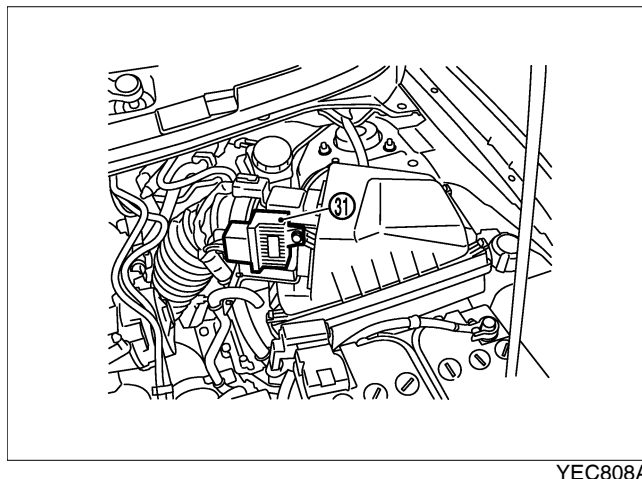


(28) Camshaft position sensor

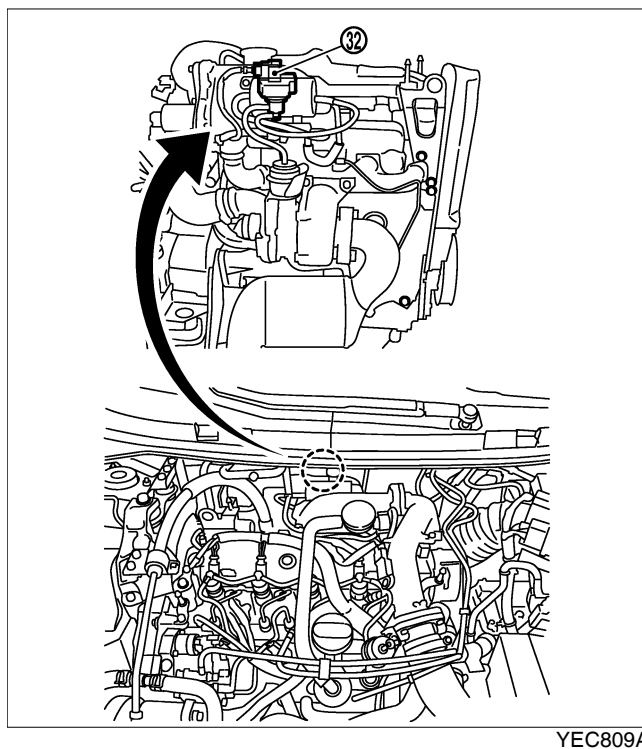


(29) Turbocharger

(30) Catalytic converter



(31) Glow relay unit

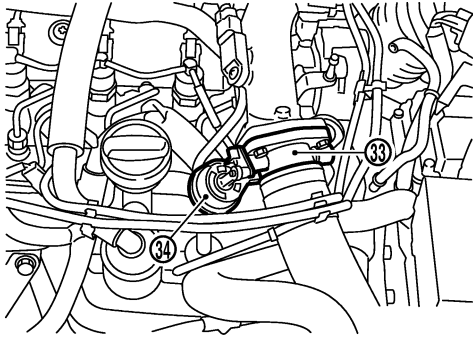


(32) Turbocharger boost control solenoid valve

# DIESEL INJECTION

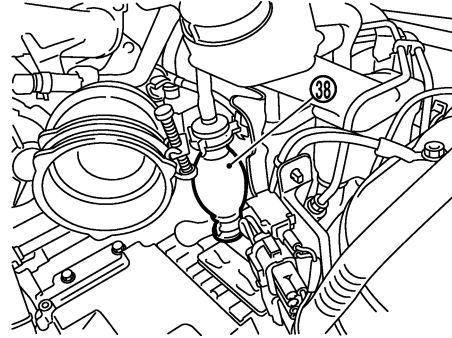
## Location of components

# F9Q



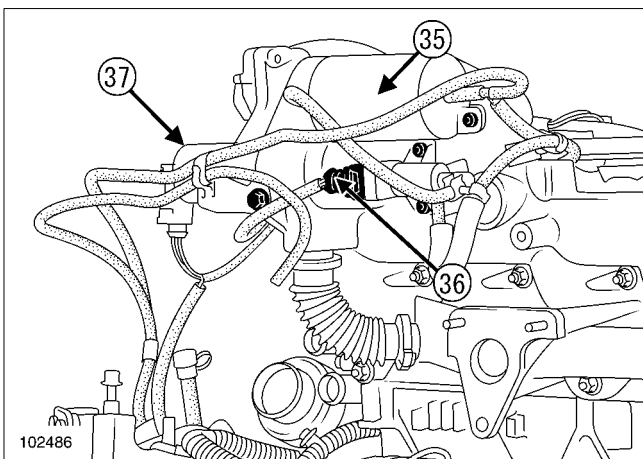
YEC811A

- (33) Intake throttle valve (engine stop flap)
- (34) Intake throttle valve actuator (engine stop flap control diaphragm)



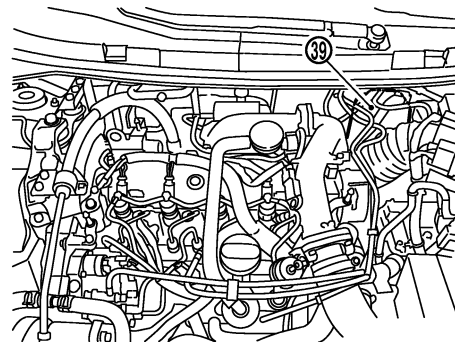
YEC812A

- (38) Priming pump



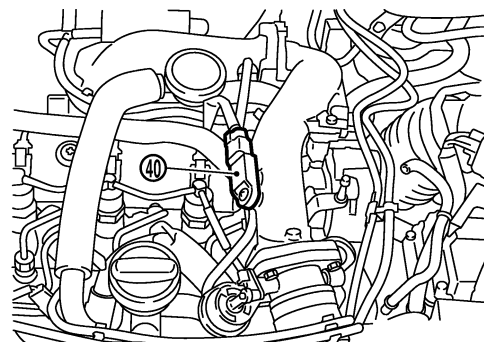
102486

- (35) Vacuum tank
- (36) Intake throttle valve control solenoid valve (engine stop flap solenoid valve)
- (37) EGR control solenoid valve



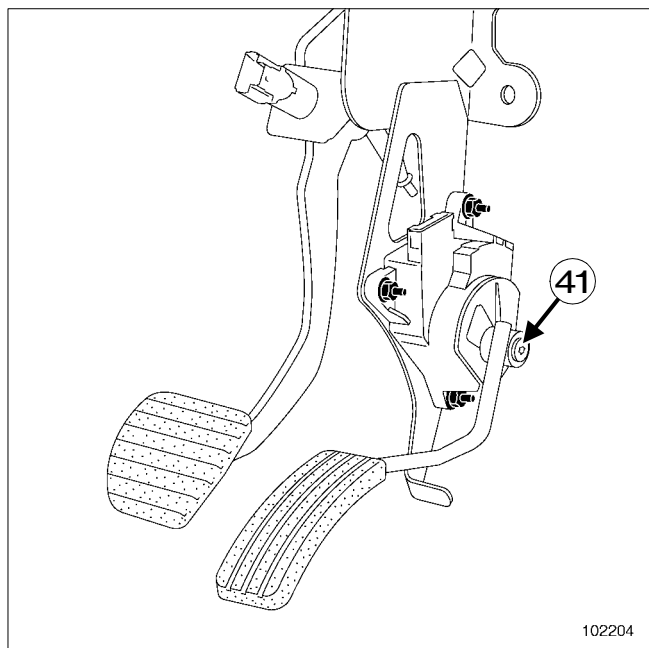
YEC813A

- (39) Fuel filter



YEC814A

- (40) Turbocharger boost pressure sensor



102204

102204

(41) Accelerator pedal position sensor

# DIESEL INJECTION

## Injection warning light

**F9Q**

With the **Bosch EDC16** high-pressure diesel system use malfunction warning symbols and text warning messages, depending on the level of severity of the malfunctions detected, to inform the customer and determine the correct malfunction finding procedure.

The ECM controls activation of the warning lights and the display of messages on the instrument panel. The default warning lights and error messages are visible:

- during the preheating phase,
- if there is an injection malfunction,
- if the engine is overheating.

The warning signals are sent to the instrument panel via the CAN communication line.

### WARNING LIGHT ACTIVATION PRINCIPLE

During the starting phase (press on the « Start » button, the glow indicator comes on during the preheating phase, then goes out (Section Preheating, Pre/postheating control, refer to F9Q-39).

In the event of an injection malfunction (severity 1), the « Check injection » message is displayed and then the « Check engine » warning light comes on. It indicates a reduced level of operation and a limited safety level.

These malfunctions are associated with:

- an internal ECM malfunction,
- an immobiliser system malfunction,
- a speed synchronisation malfunction,
- an accelerator pedal position sensor,
- a mass air flow sensor,
- a crankshaft position sensor (see anti-lock braking system),
- an EGR control solenoid valve malfunction,
- a malfunction in the turbocharger pressure regulation solenoid valve,
- a malfunction in the main relay of the protection and switching unit,
- an injector malfunction,
- an injector flow correction value (IMA),
- a sensor power feed malfunction.

If there is a serious injection malfunction (severity 2), the red engine symbol and the word « Stop » appears (display with matrix only), with the « Injection malfunction » message followed by the « Stop » warning light and buzzer.

The malfunctions are associated with:

- an internal ECM malfunction,

- an injector malfunction,
- a rail pressure sensor malfunction,
- a rail pressure regulator malfunction.

If the engine overheats, the engine temperature malfunction symbol appears with the « Engine overheating » message (engine temperature with matrix only) followed by the « Stop » warning light and buzzer. In this case the vehicle must be stopped immediately.

### « On Board Diagnostic » excess pollution orange warning light.

The orange warning light in the form of an engine symbol comes on for about **5 seconds** when the ignition is switched on, then goes out. It is never visible when the engine is running (not operational).

The engine coolant temperature sensor (injection and engine coolant temperature indicator on the instrument panel) is a 3-terminal sensor:

- 2 terminals for the engine coolant temperature signal to the ECM (86 and 108),
- 1 terminal for instrument panel indicators.

This system allows the engine cooling fan to be controlled by the ECM. It consists of a single temperature sensor serving injection, the engine cooling fan, the temperature indicator and the instrument panel engine coolant temperature warning light.

The request to operate the fan assembly is made by the ECM via the CAN.

### **1. FAN ASSEMBLY OPERATION WITH THE ENGINE RUNNING**

The fan assembly is controlled:

- at low speed if the engine coolant temperature exceeds **93 °C** and stops when the temperature drops below **90 °C**,
- at high speed if the engine coolant temperature exceeds **99 °C** and stops when the temperature drops below **96 °C**.
- The fan assembly low and high speeds are controlled when the air conditioning function is selected on the instrument panel.

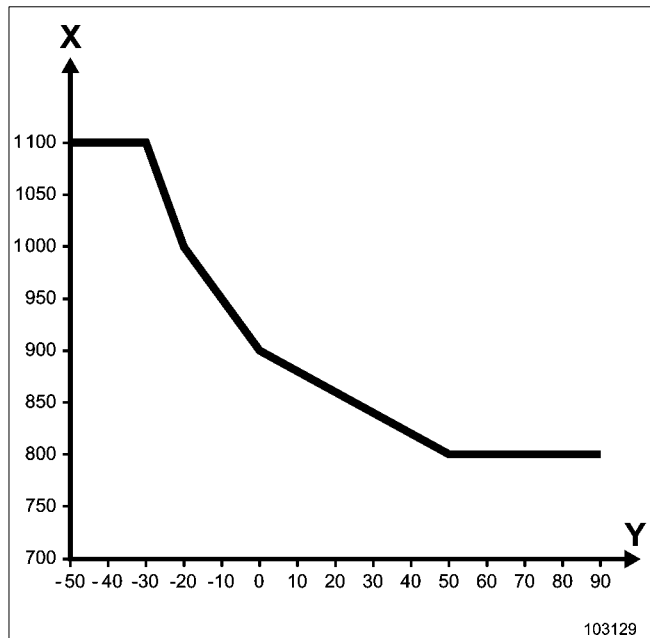
### **2. THE ENGINE COOLANT TEMPERATURE WARNING LIGHT**

The warning light is controlled by the ECM via the CAN communication line.

The warning light is continuously lit if the engine coolant temperature exceeds **120 °C**. It goes out when the temperature drops below **115 °C**.

### 1. IDLE SPEED CORRECTION AS A FUNCTION OF ENGINE COOLANT TEMPERATURE

In all cases, this engine idle speed correction is deactivated **10 minutes** after the engine is started and adopts a value of **800 rpm**.



X Engine idle speed (rpm)

Y Engine coolant temperature (°C)

### 2. IDLE SPEED CORRECTION DURING AN ACCELERATOR PEDAL POSITION SENSOR MALFUNCTION

If one of the two accelerator pedal position sensor terminals are suspected, the ECM forces an idle speed of **1400 rpm**. When the brake pedal is depressed, the idle speed returns to **1000 rpm**.

If there is inconsistency between the accelerator pedal position sensor signal and the brake switch, the idle speed increases of **1400 rpm**.

### 3. ENGINE IDLE SPEED CORRECTION WHEN THE VEHICLE IS BEING DRIVEN

The engine idle speed when the vehicle is being driven is:

- **870 rpm** if 1<sup>st</sup> and 2<sup>nd</sup> gear is engaged,
- **900 rpm** if a gear higher than 2<sup>nd</sup> gear is engaged.

# DIESEL INJECTION

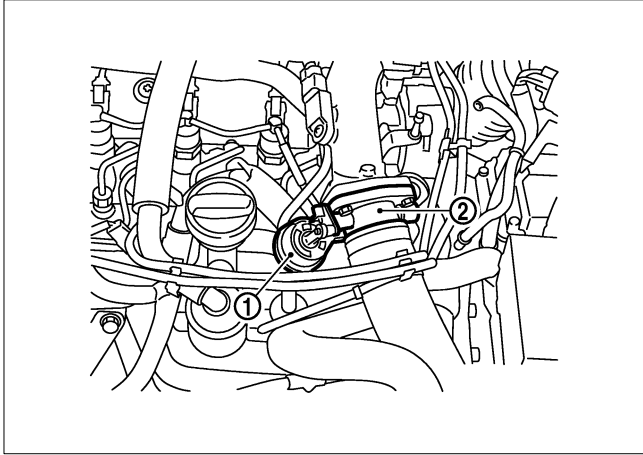
## Engine stop device

# F9Q

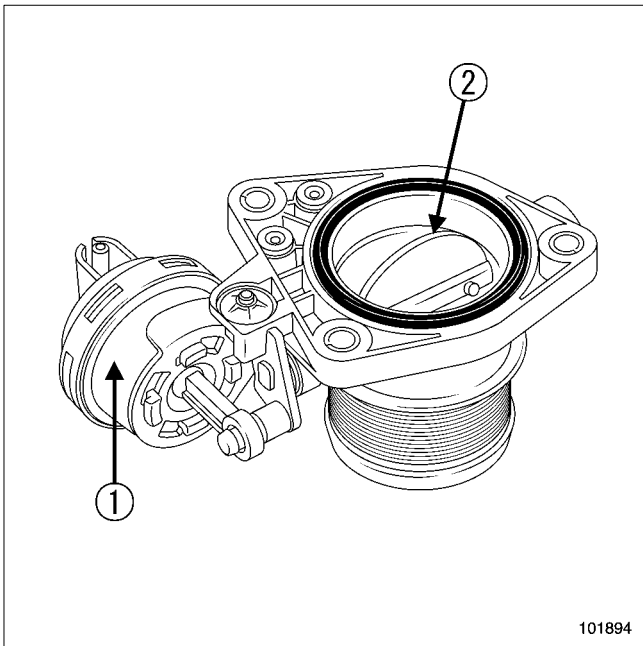
### 1. OBJECTIVE

The system is intended to stop the engine quickly after the ignition is switched off.

### 2. DESCRIPTION

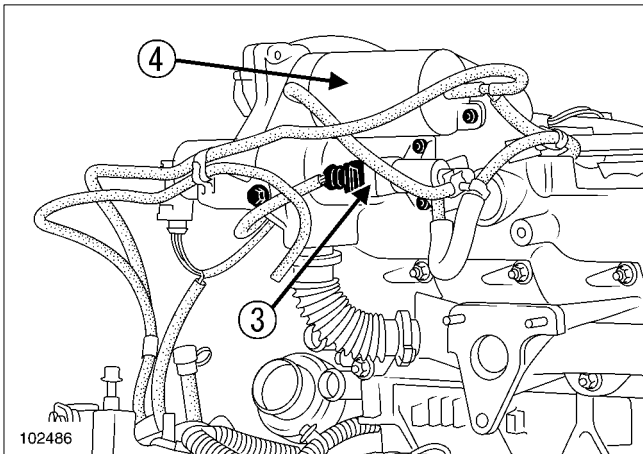


YEC815A



101894

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102486

102486

The system consists of:

- an actuator (diaphragm) (1) acting on the throttle,
- a throttle valve (2),
- a solenoid valve (3),
- a vacuum tank (4).

### 3. OPERATING PRINCIPLE

When the ignition is switched off, the solenoid valve connects the vacuum and the diaphragm.

The diaphragm is submitted to the vacuum; this closes the air inlet shutter.

The engine can no longer take in air and stops running immediately.



## 1. GENERAL INFORMATION

The « cruise control » and « speed limiter » functions are controlled by the ECM. It exchanges signals with the ABS computer and the instrument panel via the CAN communication line. It applies the setpoint values by acting on the motorised throttle valve.

Cruise control allows the driver to maintain a speed he has selected. This function can be switched off at any moment by depressing the brake pedal or the clutch pedal, or by using one of the system buttons.

The speed limiter allows the driver to set a speed limit. The accelerator pedal has no effect above the set speed. The speed limit selected can be exceeded at any time by depressing the accelerator pedal beyond its point of resistance.

A « green indicator » light on the instrument panel followed by the « cruise control » or « limiter » message, informs the driver of the selection made.

### Note:

If the warning on the instrument panel flashes, it indicates that the limit speed cannot be maintained (e.g. when travelling downhill).

To control these functions, the ECM receives the following signals on the following terminals:

- 17: cruise control on/off,
- 3: clutch switch input (depending on version)
- 5 : brake switch signal,
- 23: pedal potentiometer feed sensor 1,
- 22: pedal potentiometer feed sensor 2,
- 16: pedal potentiometer earth sensor 1,
- 6: pedal potentiometer earth sensor 2,
- 24: pedal potentiometer signal sensor 1,
- 14: pedal potentiometer signal sensor 2,
- 9: CAN LOW,
- 1 : CAN HIGH.

The following signals are received by the ECM via the CAN communication line:

- vehicle speed (ABS),
- brake switch closed signal (ABS),
- the gear engaged (if the vehicle is equipped with automatic transmission).

The ECM sends the following signals over the CAN:

- cruise control or speed limit setting to the instrument panel,

- « steady » light or « flashing » of the indicator light on the instrument panel,
- the gear change signals from the automatic transmission (if the vehicle is equipped with it).

The ECM receives:

- signals from the accelerator pedal,
- the brake switch signal,
- the clutch switch signal,
- signals from the on/off switch (three positions),
- signals from the steering wheel switches,
- signals from the ABS control unit.

Using these signals, the ECM controls the solenoid injectors so as to maintain the set speed in the case of cruise control and not to exceed the set speed in the case of the speed limiter function.

## 2. CRUISE CONTROL OPERATION

Entry conditions:

- switch must be on « cruise control »,
- **20 mph (30 km/h) minimum, 120 mph (200 km/h) maximum** (information purposes),
- press on the « + », « - », or « R » buttons.

Conditions for exiting speed limiter mode:

- accelerator must be depressed firmly (beyond the kickdown point),
- depression of the brake or clutch pedal,
- press on the « 0 » button,
- switch in the « off » position,
- electronic stability program system operation,
- ECM operation (malfunction or overspeed).

## 3. SPEED LIMITER OPERATION

Entry conditions:

- switch to « speed limiter »,
- **20 mph (30 km/h) minimum, 120 mph (200 km/h) maximum** (information purposes),
- press on the « + », « - », or « R » buttons.

Conditions for exiting speed limiter mode:

- accelerator must be depressed firmly (beyond the kickdown point),
- switch in the « off » position,
- press on the « 0 » button,
- ECM intervention (malfunction or overspeed),

- gear lever in « neutral ».

**Note:**

If the indicator light on the instrument panel flashes, it indicates that the limit speed cannot be maintained (e.g. when travelling downhill).

**Fail safe mode**

Control systems - speed limiter cannot be activated in case of breakdown or a malfunction with:

- the electronic stability program system,
- the injection system,
- the anti-lock braking system,

### Essential equipment

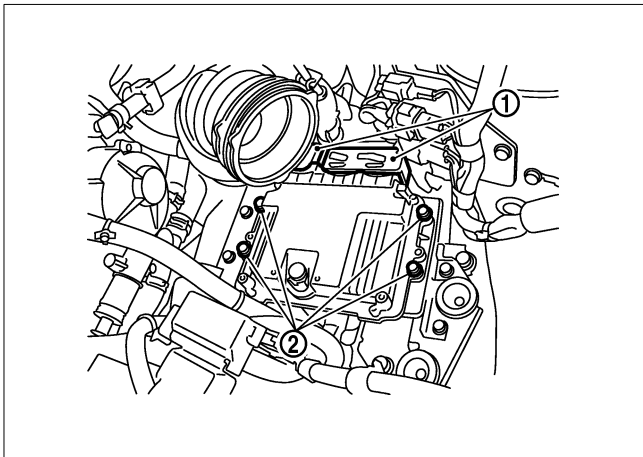
Diagnostic tool

When an ECM is learnt (reprogrammed) or replaced, it is necessary to learn it with the Injector Flow Correction value of the four injectors.

Refer to EC-F9Q-40.

## REMOVAL

View with intake manifold removed



YEC816A

1. Remove the air cleaner.
2. Disconnect the ECM connectors (1).
3. Remove mounting bolts (2).

## INSTALLATION

To reinstall, proceed in the reverse order of removal.

# PREHEATING

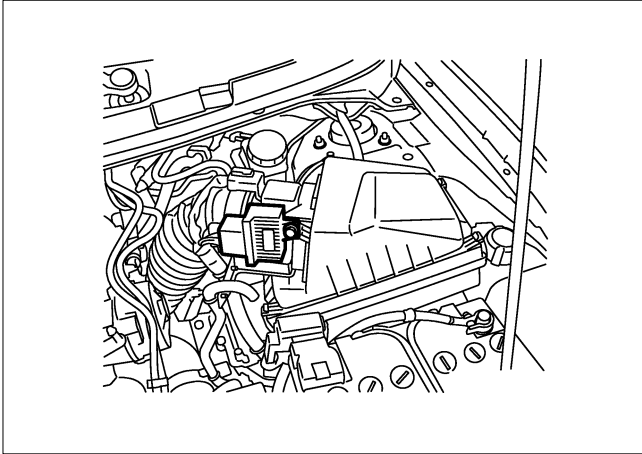
## Glow control relay

**F9Q**

The preheating unit is an electronic relay consisting of a power circuit for each preheating plug. It is controlled by terminal 56 of the ECM.

### REMOVAL

1. Disconnect the battery starting with the negative terminal.



YEC817A

2. Disconnect the glow control relay unit connector.
3. Remove the glow control relay unit.

### INSTALLATION

To refit, proceed in the reverse order of removal.

# PREHEATING

## Pre/postheating unit CONNECTION

**F9Q**

Terminals	Description
1	ECM command
2	Plug n°4 supply
3	Plug n°2 supply
4	Not used
5	+ Battery supply
6	Diagnostic troubleshooting procedure
7	Plug n°3 supply
8	Plug n°1 supply
9	Not used

# PREHEATING

## Pre/postheating control

# F9Q

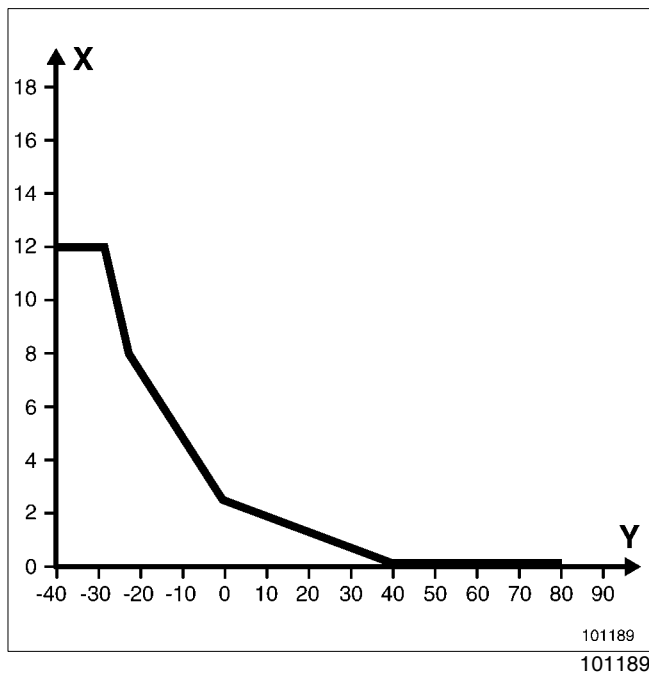
The glow plug function is controlled by the ECM.

### PRE/POSTHEATING (GLOW RELAY) OPERATING PRINCIPLE

#### 1. Preheating « on ignition »

##### a. Variable preheating

The time for which the warning light is lit and of the supply to the heater plugs depends on the engine coolant temperature and the battery voltage.



X Time in seconds

Y Engine coolant temperature in °C

In all cases the time that the preheating warning light is on cannot exceed **12 seconds**.

##### b. Fixed preheating

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

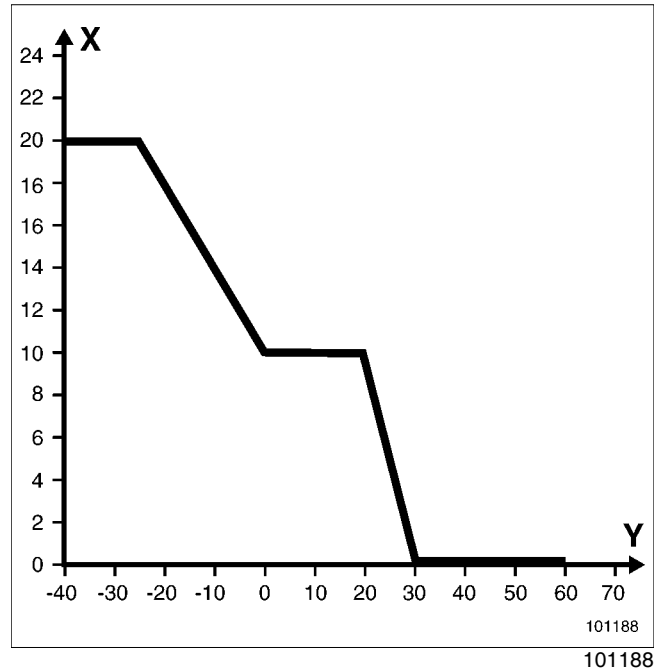
#### 2. Starting

The plugs remain supplied while the starter is being activated.

#### 3. Postheating « while the engine is running »

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

At idling speed without depression of the accelerator pedal.



X Time in seconds

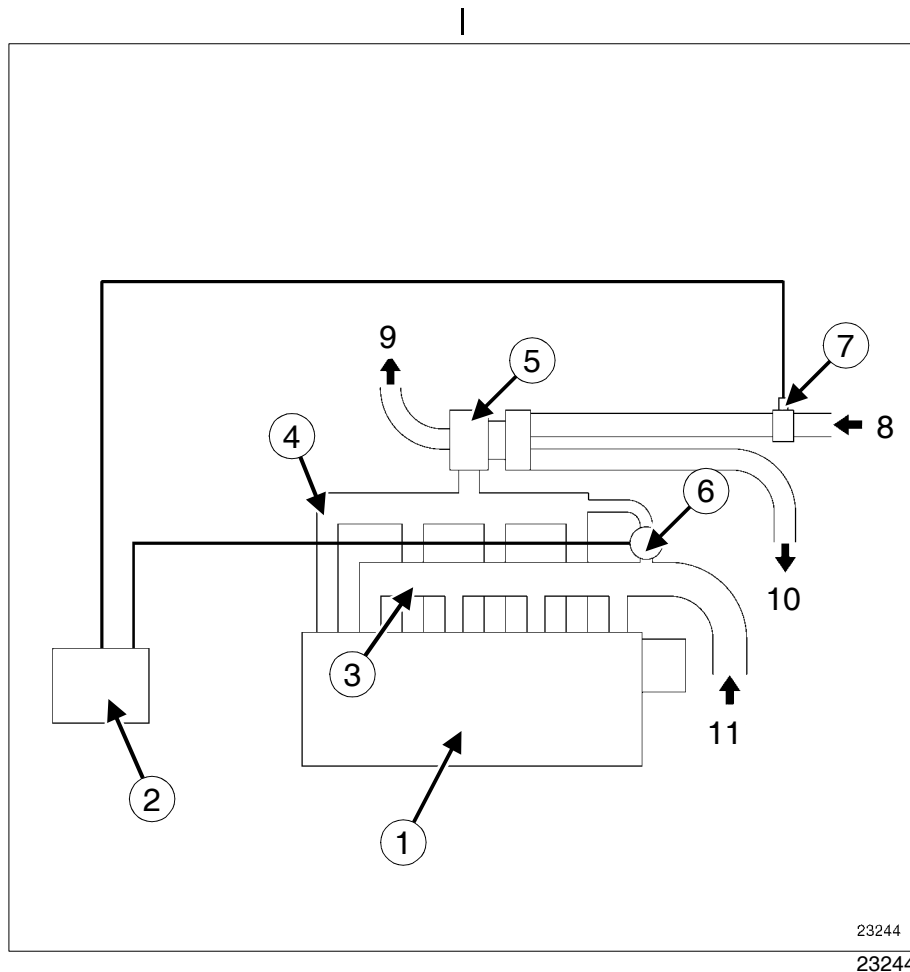
Y Engine coolant temperature in °C

# ANTIPOLLUTION

## Exhaust gas recirculation

# F9Q

### 1. CIRCUIT DIAGRAM



- |      |                            |
|------|----------------------------|
| (1)  | Engine                     |
| (2)  | ECM                        |
| (3)  | Intake manifold            |
| (4)  | Exhaust manifold           |
| (5)  | Turbocharger               |
| (6)  | EGR control solenoid valve |
| (7)  | MAF sensor                 |
| (8)  | Air inlet                  |
| (9)  | Exhaust pipe               |
| (10) | Intercooler inlet          |
| (11) | Intercooler outlet         |

### 2. PURPOSE OF THE EXHAUST GAS RECIRCULATION SYSTEM

Exhaust gas recirculation serves to reduce the nitrogen oxide (NOx) content of the exhaust gases.

The ECM allows gas to pass by controlling a solenoid valve.

### 3. OPERATING PRINCIPLE

The solenoid valve is controlled by opening cyclic ratio signal issued by the ECM. The opening cyclic ratio signal modulates the opening of the solenoid valve and consequently the quantity of exhaust gas directed back to the inlet manifold.

The ECM continuously checks the position of the exhaust gas recirculation solenoid valve.

### 4. OPERATING CONDITIONS

The following parameters control activation of the exhaust gas recirculation solenoid valve:

- the engine coolant temperature,
- the intake air temperature,
- the atmospheric pressure,
- the injection flow rate,
- the engine speed.

Exhaust gas recirculation is cut off if:

- the battery voltage is below **9 V**,

# ANTIPOLLUTION

## Exhaust gas recirculation

# F9Q

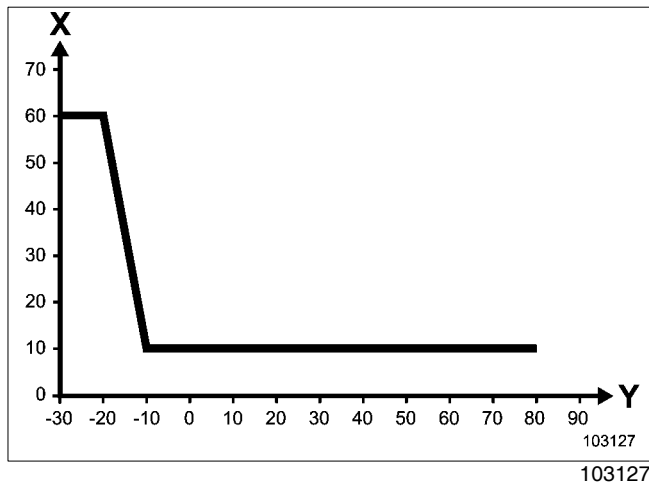
- If the engine speed is above **2950 rpm** when the pedal is released (low pedal value),

Note:

There is no exhaust gas recirculation at altitude (> 1200m).

- mapping (engine speed/load) exceeds a given threshold,
- after **40 seconds** if
  - the vehicle speed is below **7.2 mph (12 km/h)**,
  - the engine speed is below **1000 rpm**.
  - the engine coolant temperature is above **60 °C**.

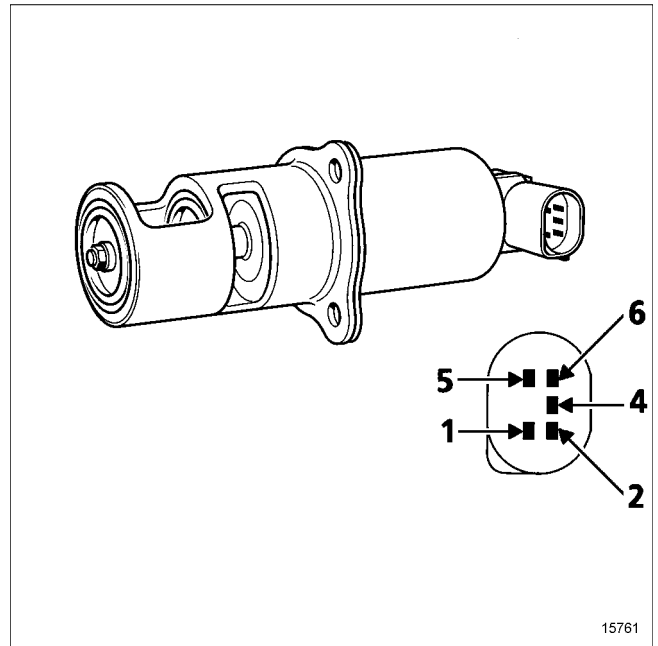
The exhaust gas recirculation solenoid valve is not controlled after engine start-up depending on engine coolant temperature mapping.



X	Time in seconds
Y	Engine coolant temperature in °C

The exhaust gas recirculation solenoid valve is not supplied in the event of a malfunction on:

- the engine coolant temperature sensor,
- the air temperature sensor,
- the turbocharger boost pressure sensor,
- the atmospheric pressure sensor.



Track	Description
1	Solenoid power supply
2	Sensor power supply
4	Sensor ground
5	Solenoid ground
6	Sensor output



# DIESEL INJECTION

## Injectors

# F9Q

### Essential special tooling

<b>KV113E0010</b> <b>(Mot.1566)</b>	High-pressure pump pipes removal tool
--	--

### Essential equipment

Consult-II

### Tightening torques

injector clamps	mounting	<b>2.5 daNm</b>
rail mounting bolts		<b>2.2 daNm</b>
high-pressure pipe nuts		<b>2.5 daNm</b>

### IMPORTANT

Before carrying out any work on the injection system, use the **CONSULT-II** to check that:

- the injection rail is no longer pressurized,
- the fuel temperature is not high.
- It is essential that the instructions on safety and cleanliness outlined in this chapter are adhered to each time procedures are carried out.
- It is strictly forbidden to undo a high-pressure pipe union when the engine is running.

### CAUTION

- Obtain a set of special high-pressure injection circuit plugs.
- Make sure that you refit all high-pressure pipes and any high-pressure pipe clips which have been removed.
- It is forbidden to work on the injectors.
- The injector pin filter must not be removed.
- Make sure that any injector which has been opened is replaced.
- The injector holder must not be separated from the nozzle.

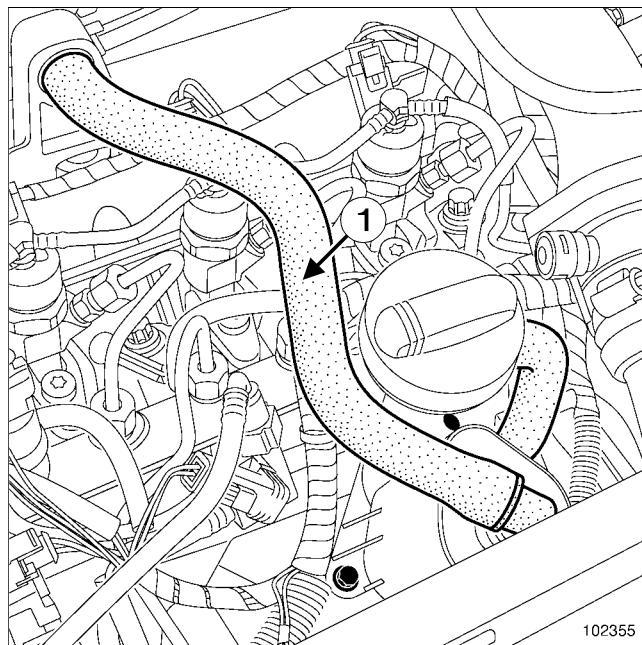
Injectors may be replaced individually. Only remove the high-pressure pipe concerned.

## REMOVAL

1. Remove the engine covers.

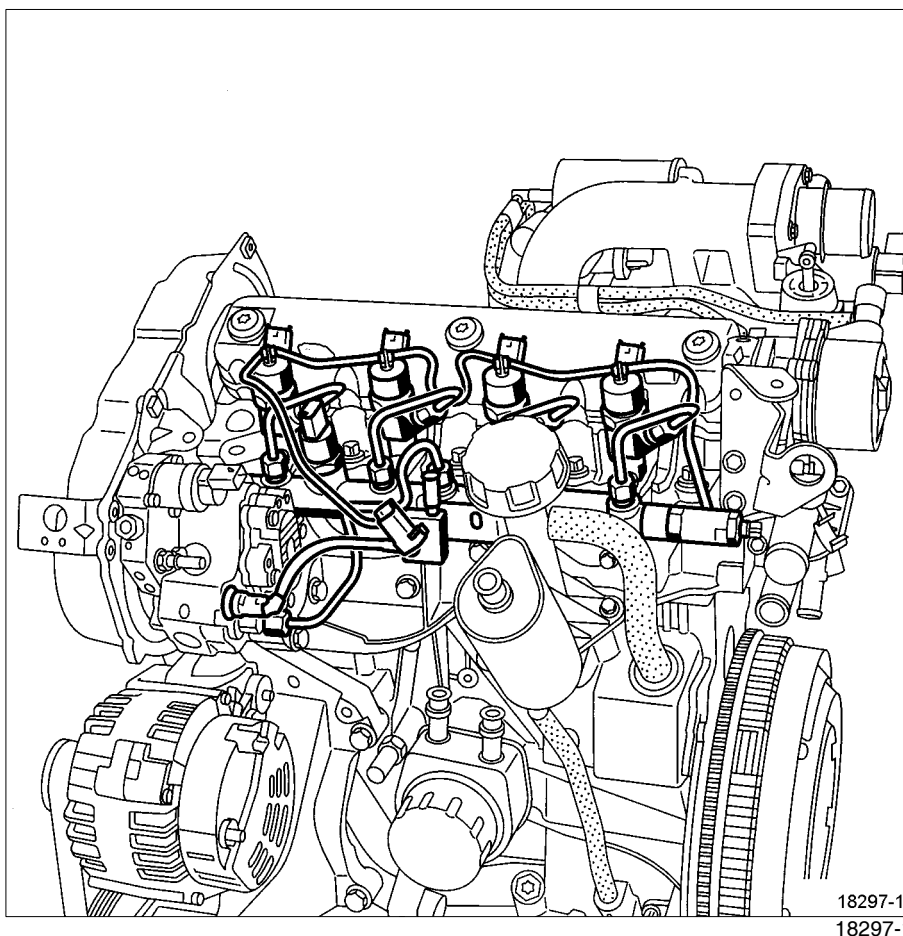
2. Disconnect the battery.

3. To remove the injector at the engine flywheel end, remove the air intake duct, refer to "AIR CLEANER AND AIR DUCT" in EM section.



102355

4. Disconnect and move aside the oil vapour rebreathing pipe.(1)



5. Remove the high-pressure pipe using tool KV113E0010 (Mot.1566).

6. Insert the plugs to maintain cleanness.

7. Remove:

- the engine covers,
- the injector mounting clamp,
- the injector,
- the compression washer,
- injector harness connector(s).

## INSTALLATION

### 1. CLEANING THE INJECTORS

#### CAUTION

It is strictly forbidden to clean the injectors with:

- a wire brush,
- sand paper,
- an ultrasound cleaner.

- Soak the injectors in grease remover.
- Wipe with new cloths.

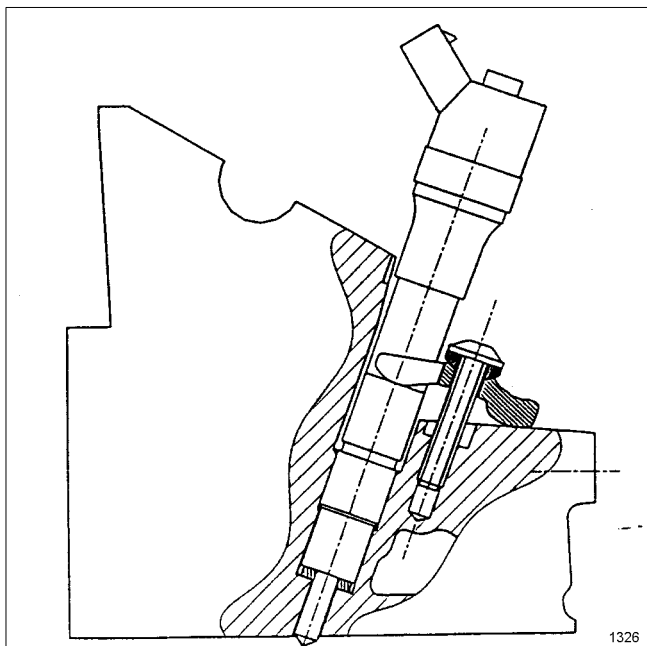
### 2. INSTALLING THE INJECTOR

#### CAUTION

Leave removal of the protective plugs from any component until last moment.

#### NOTE

Before installing, program the 6-character alphanumeric code (IMA) from the injector to the ECM, using the Diagnostic tool (Section Diesel injection, Injectors, on the last page of this document).



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1. Install the compression washer.
2. Install the injector.
3. Tighten to torque the **injector mounting clamps (2.5 daNm)**.

### CAUTION

Do not fit high-pressure pipes without fixings.

4. Undo the injection rail (the rail should be loose).

### CAUTION

It is essential to fit new high-pressure pipes in place of those removed.

5. Lightly lubricate the nut threads of the high-pressure pipe with oil from the applicator provided in the new parts kit.

### Note:

If the new parts kit does not contain an applicator, lubrication of the nut threads will be unnecessary (as they are self-lubricating pipes).

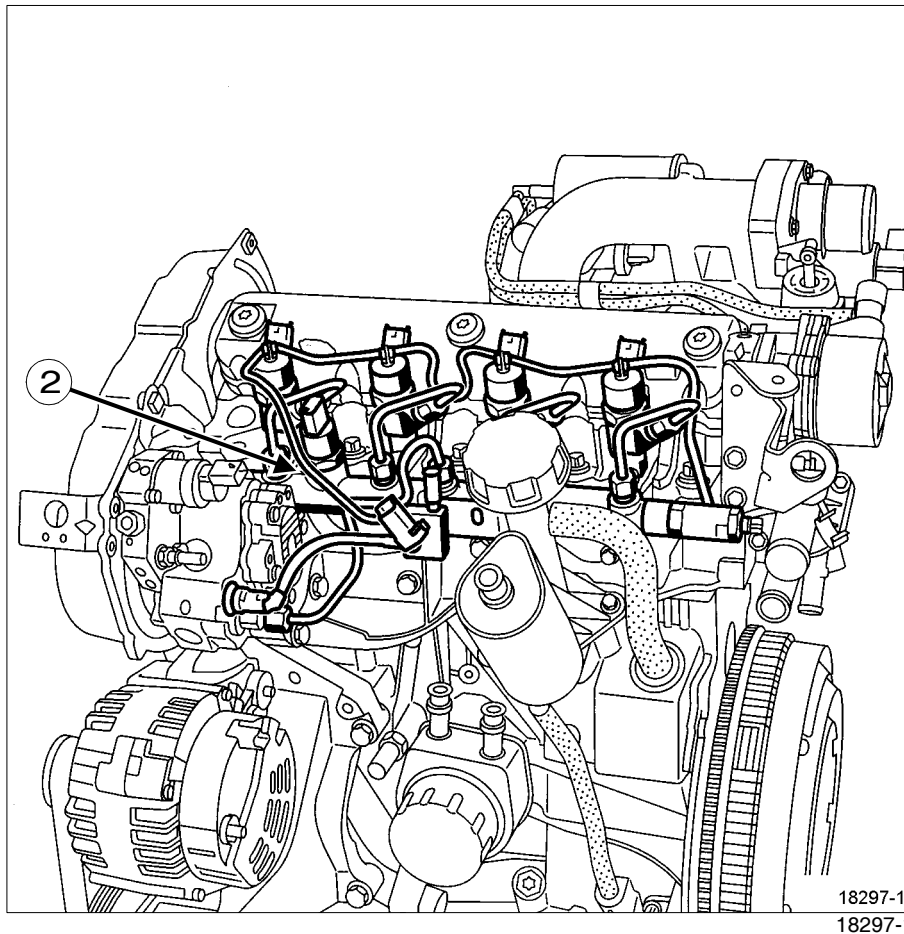
6. Position high-pressure pipe oval-shaped handle in the high-pressure pump outlet taper.
7. Position the high-pressure pipe oval-shaped handle in the rail inlet taper.
8. Finger tighten the nuts of the high-pressure pipe starting with the one on the rail side.
9. Slightly pretighten the high-pressure pipe nuts.

10. Tighten to torque **rail mounting bolts (2.2 daNm)**.

### CAUTION

- Do not touch the pipes with the wrench when torque tightening.
- It is essential to support the central union of the injector when tightening.

11. Tighten to torque and in order the **high-pressure pipe nuts (2.5 daNm)** on the pump side and the rail side.
12. To install, proceed in the reverse order of removal.

**CAUTION**

It is essential to refit the fuel return pipe (2).

13. Prime the fuel line using the primer bulb.

**CAUTION**

Connect the battery; carry out the necessary programming (Learning).

**CAUTION**

Confirm the absence of a fuel leak:

- Run the engine at idle speed until the cooling fan starts.
- Accelerate several times under no load.
- Carry out a road test.
- Switch off the ignition.
- Confirm the absence of a fuel leak.

### INJECTOR CORRECTION VALUE

A 6-figure code known as the IMA « Injector Flow Correction » is marked on the injectors. This code is specific to each injector, and takes into account differences in manufacture and specifies the flow of the injector.

When one or more injectors are replaced, the code of the new injector or injectors must be programmed into the ECM. If this operation is not carried out, then the engine speed will be limited to **1800 rpm**.

Follow the procedure described below:

### REPROGRAMMING PROCEDURE

- Replace the suspected injector(s) and establish communication with the ECM:

- read the data and note the correction value on the replaced injector(s),

1. Turn ignition switch OFF.
  2. Connect CONSULT-II to DLC.
  3. Turn ignition switch ON.
  4. Input injector correction value(s) using "ENTER INJCTR CALIB DATA", "WORK SUPPORT" mode with CONSULT-II.
  5. Turn ignition switch OFF.
  6. Wait at least 60 seconds.
  7. Turn ignition switch ON.
  8. Confirm that the replaced number(s) has been reprogrammed using "ENTER INJCTR CALIB DATA", "WORK SUPPORT" mode with CONSULT-II.
- using the **Diagnostic tool** ensure that the ECM has not detected malfunctions related to the injector codes and check that the instrument panel warning light is off.

# DIESEL INJECTION

## Trouble diagnosis - Introduction

# F9Q

### 1. SCOPE OF THIS DOCUMENT

This document presents the trouble diagnosis method applicable to all ECMs with the following specifications:

Vehicle(s): **P12** with **F9Q**  
(turbocharged engines).

Function concerned: **BOSCH**  
**common rail diesel injection** (Dci)

Name of ECM: **BOSCH EDC 16 X84**

Program No.: **9X**

VDIAG No.: **44**

### 2. PREREQUISITES FOR TROUBLE DIAGNOSIS

To begin trouble diagnosis, it is essential to have the following items available:

**Standard documentation:**

**Diagnostic procedures:**

- Assisted with CONSULT-II, Service Manual.

### 3. REMINDERS

**Trouble diagnosis:**

There are **present** DTCs and **stored** DTCs (which appeared in a certain context and have since disappeared or which are still present but have not had trouble diagnosis performed on them in the current context).

The "present" or "stored" status of DTCs must be considered when activating the diagnostic tool after power is supplied to the ECM (without activating the system components).

Deal with **present DTCs** according to the procedure specified in the section on "**Interpretation of DTC**".

# DIESEL INJECTION

## Trouble diagnosis - Introduction

---

**F9Q**

For stored DTCs, note the DTCs displayed and follow the instructions in the **Notes** section.

If the DTC is **confirmed** by the Notes section, carry out the basic checks.

Check:

- the electrical lines which correspond to the malfunction,
- the connectors for these lines (for oxidation, bent pins, etc.),
- the resistance of the malfunction component,
- the condition of the wires (melted or cut insulation, wear).

### **Conformity check**

The conformity check is designed to check the states and data monitor items which do not display any DTCs on the diagnostic tool when consistent. This stage:

- diagnoses malfunctions that do not have a DTC display, and which may correspond to a customer complaint.
- Checks that the system is operating correctly and that there is no risk of a DTC reappearing after repairs.

This section gives the trouble diagnosis procedures for states and parameters and the conditions for checking them.

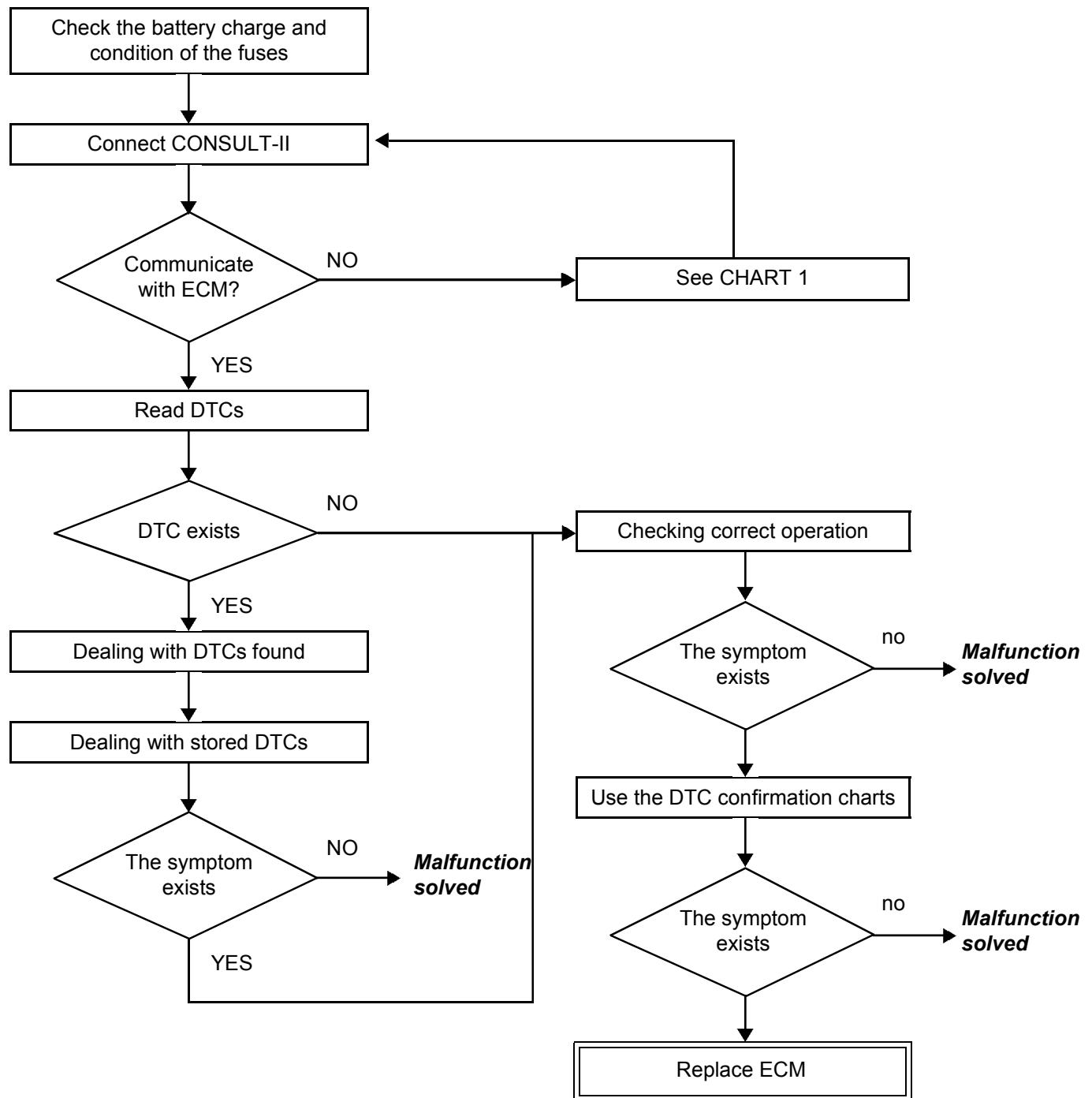
If a state is not operating normally or a parameter is outside permitted tolerance values, you should consult the corresponding fault finding.

### **Customer complaints - trouble diagnosis**

If the test with the diagnostic tool is OK, but the customer complaint persists, the malfunction should be treated by **customer complaints**.

<p><b>A synopsis of the general procedure to follow is provided on the following page in the form of a flow chart.</b></p>
--

**4. DIAGNOSTIC PROCEDURE**





### **5. SAFETY INSTRUCTIONS**

All work on components requires that the safety rules be obeyed to prevent damage or injury:

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

### **6. CLEANLINESS INSTRUCTIONS WHICH MUST BE FOLLOWED WHEN WORKING ON THE HIGH-PRESSURE DIRECT INJECTION SYSTEM:**

#### **Risks relating to contamination:**

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

All After-Sales operations must be performed under very clean conditions. Performing an operation in a very clean environment means that no impurities (particles a few microns in size) will have been able to enter the system during dismantling or into the circuits via the fuel unions.

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

### **7. SAFETY INSTRUCTIONS (CONTINUED):**

#### **- WHAT ARE THE SOURCES OF CONTAMINATION?**

Contamination is caused by:

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

#### **WARNING:**

**Before working on the injection system, ensure that the system pressure is nearing 0 bar.**

**CAUTION:** it is not possible to clean the engine using a high-pressure washer because of the risk of damaging the connections. In addition, moisture may collect in the connectors and cause electrical connection malfunctions.

### **INSTRUCTIONS TO BE FOLLOWED BEFORE ANY WORK IS CARRIED OUT ON THE INJECTION SYSTEM:**

- Ensure that you have the plugs for the unions to be opened (bag of plugs available from the Parts Stores, NISSAN part No: **16830 BN700**, Renault part No: **77 01 206 804**). Plugs are to be used once only. After use, they must be thrown away (once used they are soiled and cleaning is not sufficient to make them reusable). Unused plugs must be thrown away.
- Ensure that you have hermetically resealable plastic bags for storing removed parts. There is less risk of parts stored in this way being exposed to contamination. The bags must be used only once, and after use they must be thrown away.
- Ensure that lint-free towelettes are used for injection pump related service purposes. The use of a normal cloth or paper for cleaning purposes is prohibited. They are not lint-free and may contaminate the fuel circuit of the system. A lint-free cloth should only be used once.

# **DIESEL INJECTION**

## **Trouble diagnosis - Introduction**

---

**F9Q**

### **INSTRUCTIONS TO BE FOLLOWED BEFORE OPENING THE FUEL CIRCUIT:**

Use new thinner for each operation (used thinner contains impurities). Pour it into a clean receptacle.

For each operation, use a clean brush in good condition (the brush must not shed its bristles).

Use a brush and thinners to clean the connections to be opened.

Blow compressed air over the cleaned parts (tools, cleaned the same way as the parts, connections and injection system zone). Check that no bristles remain adhering.

Wash your hands before and during the operation if necessary.

When wearing leather protective gloves, cover them with latex gloves.

### **INSTRUCTIONS TO BE FOLLOWED DURING THE OPERATION:**

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

Close the resealable bag, even if it has to be reopened shortly afterwards. The ambient atmosphere carries impurities.

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

The use of a brush, thinner, bellows, sponge or normal cloth is strictly forbidden once the circuit has been opened. 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.

### SYSTEM OPERATION

The high-pressure injection system is designed to deliver a precise quantity of fuel to the engine at a specific time.

It is fitted with a **112-terminals BOSCH** made ECM.

The system consists of:

- a priming pump on the low-pressure circuit,
- a fuel filter,
- a high-pressure pump combined with a low-pressure pump (transfer pump),
- a high-pressure regulator mounted on the pump,
- an injector rail,
- a dedicated fuel rail pressure sensor,
- four solenoid injectors,
- a diesel (fuel) temperature sensor,
- an engine coolant temperature sensor,
- an intake air temperature sensor,
- a camshaft position sensor,
- a crankshaft position sensor,
- a turbocharger boost pressure sensor,
- an accelerometer,
- an EGR control valve,
- an accelerator pedal position sensor,
- an atmospheric pressure sensor incorporated into the ECM,
- an ECM,
- a mass air flow sensor,
- a turbocharger (wastegate) boost control solenoid valve,
- and an intake throttle control solenoid valve.

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

This 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 sent to the injector rail. The actuator located on the pump controls the quantity of diesel supplied, according to the demand determined by the ECM. The rail supplies each injector through a steel pipe.

# DIESEL INJECTION

## Trouble diagnosis - Introduction

---

**F9Q**

### **The ECM:**

It determines the value of injection pressure necessary for the engine to operate correctly and then controls the pressure regulator. It checks that the pressure value is correct by analyzing the value transmitted by the fuel rail pressure sensor located on the rail.

It determines the injection time necessary to deliver the right quantity of fuel and the moment when injection should start,

It controls each injector electrically and individually after determining these two values.

The injected flow to the engine is determined by:

- the duration of injector control,
- the fuel rail pressure (regulated by the ECM),
- the injector opening and closing speed,
- the needle travel (determined by a constant for the type of injector),
- the nominal hydraulic flow of the injector (specific to each injector).

The ECM controls:

- the idle speed regulation,
- the exhaust gas recirculation control into the inlet,
- the fuel supply (advance, flow and common rail pressure),
- the cooling fan,
- the air conditioning,
- the cruise control-speed limiter function,
- the glow plug control (pre/post heating),
- the warning lights via the CAN communication line.

The high-pressure pump is supplied at low-pressure by an integrated low-pressure pump (transfer pump).

It supplies the rail with the pressure which is controlled for charging by the fuel flow actuator and for discharging by the injector valves. Drops in pressure may also be compensated for. The flow actuator allows the high-pressure pump to supply the exact quantity of fuel required to maintain the pressure in the fuel 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 return circuit from the injectors), long enough to open the valves and discharge the rail.

# DIESEL INJECTION

## Trouble diagnosis - Introduction

---

**F9Q**

The connections between the vehicle's various control units are multiplexed. Therefore, the malfunction warning lights on the instrument panel are lit via the CAN communication line.

There is no vehicle speed sensor in the transmission (transaxle). The vehicle speed signal on the instrument panel is transmitted by the ABS control unit or the wheel speed sensor via a wire connection and is then transmitted by the CAN communication line to the instrument panel.

Some vehicles have a sensor located in the filter for detecting water in the fuel. If there is water present in the fuel, the orange injection and pre/postheating (glow) warning light comes on.

### IMPORTANT

The engine must not operate with:

- fuel containing more than **10 %** diester,
- petrol, even in tiny quantities.

The system injects the 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.

You must respect the cleaning and safety advice specified in this document for any work on the high-pressure injection system.

Disassembly of the interior of the pump and injectors is prohibited. Only the fuel flow actuator, the fuel temperature sensor and the venturi tube 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 common rail fuel pressure sensor from the fuel rail because this may cause circuit contamination. 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 pulley bearing of which number is **070 575** from any injection pump. If of which pump is being replaced, the pulley must be replaced.

Supplying battery voltage (**12 V**) directly to any component in the system is prohibited.

Ultrasonic decoking 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.

### Functions included

#### Air conditioning control assistance:

For vehicles with air conditioning, the ECM can deactivate the air conditioning in certain conditions of use:

- when requested by the driver,
- when starting the engine,
- if the engine overheats (in order to reduce the power the engine has to supply),
- when the engine speed is very high (to protect the compressor),
- during transition phases (e.g. under heavy acceleration when overtaking, anti-stalling and moving off strategies). These conditions are only taken into account when they occur repeatedly, so as to prevent system instabilities (incorrect deactivation).
- when reading certain faults.

#### Cold loop air conditioning control:

The air conditioning is controlled in a cold loop and this function is managed by several computers. The ECM is responsible for:

- Authorising requests for cold according to: refrigerant pressure, coolant temperature, engine speed.
- Calculating the power absorbed by the compressor (from the refrigerant pressure).
- The control of the fan assembly according to the vehicle speed, refrigerant pressure and engine coolant temperature.

### WARNING LIGHT CONTROL

#### Instrument panel display:

The ECM displays certain information on the instrument panel relating to engine operation. This concerns five functions: MI (Malfunction Indicator) for the EOBD (European On Board Diagnosis), pre/post heating (glow), coolant temperature and engine malfunctions: Severity 1 (non-critical malfunction) and Severity 2 (stop immediately). These five functions are represented by 3 warning lights or messages displayed by the ECM.

#### Pre/post heating (glow) warning light:

This warning light is used as an operating indicator light and as a system malfunction indicator light:

- Permanently lit during + after turning ignition switch "ON": indicates preheating of the glow plugs.
- Permanently lit along with the Injection malfunction message: indicates a Severity 1 malfunction (indicates suspected operation malfunction and a reduced safety level. The driver should carry out repairs as soon as possible).

#### Temperature/emergency stop warning light:

This warning light is used as an operating indicator light and as a system malfunction indicator light. It lights up for **3 seconds** when the ignition is switched on (automatic test procedure controlled by the instrument panel).

- Permanently on: indicates engine overheating.
- Permanently lit along with the Stop engine message: indicates a Severity 2 malfunction.

If there is a Severity 2 malfunction, the injection is cut off automatically after a few seconds.  
In the event of overheating, it is up to the driver whether to stop the vehicle or continue driving.

#### OBD excess pollution warning light:

Symbolized by an engine, it lights up for approximately **3 seconds** when the engine is started. It never comes on when the engine is running.



### ECM REPLACEMENT, SOFTWARE PROGRAMMING OR REPROGRAMMING OPERATION

Following items can be (re)learnt via the DLC using the CONSULT-II

- System configuration
- Injector's individual correction parameter

**Before replacing the ECM** in after-sales operations, the following data **must be read out using CONSULT-II**:

- The **individual injector correction** parameters to be noted to appropriate paper or CONSULT-II copying function.

**NOTE:** Replacing ECM and injectors, please follow each procedure because they are different in the reprogramming procedure.

**IMPORTANT:** It is not possible to test an ECM from the parts stores because it cannot be fitted to any other vehicle after the test.

#### INDIVIDUAL CORRECTION VALUE LEARNING PROCEDURE (to new ECM)

1. Turn ignition switch OFF.
2. Connect CONSULT-II to DLC.
3. Turn ignition switch ON.
4. Read out the injector correction values using "SAVE DATA FOR CPU REPLC", "WORK SUPPORT" mode with CONSULT-II.
5. Turn ignition switch OFF.
6. Remove battery negative cable from battery.
7. Replace ECM
8. Connect battery cable.
9. Turn ignition switch ON.
10. Perform "WRT DATA AFTER REPLC CPU", "WORK SUPPORT" mode with CONSULT-II.
11. Turn ignition switch OFF and wait at least 60 seconds.
12. Turn ignition switch ON.
13. Check that the data has been learnt to the ECM using "ENTER INJCTR CALIB DATA", "WORK SUPPORT" mode with CONSULT-II.

**CAUTION:** This step is only the confirmation of whether above data was memorized into the ECM.  
Never input any data manually.

#### REPLACING THE INJECTORS

**NOTE:** The individual injector correction is a calibration made on each injector in the factory in order to adjust its flow precisely.

These correction values are etched onto the Bakelite body of each injector (6 alphanumeric characters) and then learnt to the ECM which then controls each injector taking into account its individual **manufacturing tolerance**.

When one or more injectors are replaced, the parameters of the injector output concerned must be modified. **The system can be configured using the CONSULT-II** (Refer to injector).

# DIESEL INJECTION

## Trouble diagnosis - General Information

# F9Q

### CONNECTION

ECM harness connector (E81), 32-terminals

Terminal No.	Item
1	CAN H communication signal
2	K-line not used
3	ASCD clutch solenoid
4	Not used
5	Clutch switch input
6	Accelerator pedal position sensor 2 earth (Ground)
7	Battery earth (Ground)
8	ECM earth (Ground)
9	CAN L communication signal
10	Not used
11	Not used
12	Not used
13	Not used
14	Accelerator pedal position sensor 2 signal
15	Not used
16	Accelerator pedal position sensor 1 earth (Ground)
17	Cruise control on/off
18	Cruise control programming control
19	Cruise control programming return signal
20	Not used
21	A/C switch signal
22	Accelerator pedal position sensor 2 power supply
23	Accelerator pedal position sensor 1 power supply
24	Accelerator pedal position sensor 1 signal
25	Not used
26	Not used
27	Not used
28	Ignition switch signal
29	Not used
30	Not used
31	ECM power supply
32	Battery earth (Ground)

ECM harness connector (F1), 48-terminals and 32-terminals

Terminal No.	Item
33	Injector 1
34	Injector 4
35	Fuel temperature sensor earth (Ground)
36	(Turbocharging) Turbocharger boost control solenoid valve
37	Not used
38	Not used
39	Not used
40	Thermo plunger relay-1
41	Common rail fuel pressure sensor power supply
42	MAF sensor power supply
43	Common rail fuel pressure sensor earth (Ground)
44	Turbocharger boost pressure sensor earth (Ground)
45	Not used
46	EGR control valve power supply
47	Turbocharger boost pressure sensor power supply
48	Crankshaft position sensor earth (Ground)
49	Intake throttle valve control solenoid valve
50	Not used
51	Thermo plunger relay-1
52	Not used
53	Fuel pressure regulator
54	Injector 3
55	Injector 2
56	Not used
57	Preheating (Glow) relay
58	Not used
59	EGR control valve earth (Ground)
60	Not used
61	Not used
62	Not used
63	Not used
64	Not used
65	Not used
66	Not used
67	Refrigerant gas sensor supply
68	Common rail fuel pressure sensor signal
69	Not used
70	Not used
71	Not used
72	Not used
73	Thermo plunger relay-3
	Injector 4

# DIESEL INJECTION

## Trouble diagnosis - General Information

**F9Q**

### CONNECTION

ECM harness connector **F1**, 48-terminals and 32-terminals (continued)

Terminal No.	Item
74	Injector 1
75	Not used
76	Not used
77	Not used
78	Refrigerant pressure sensor earth (Ground)
79	Not used
80	Not used
81	Not used
82	Not used
83	Not used
84	Not used
85	MAF sensor earth (Ground)
86	Engine coolant temperature sensor power supply
87	Intake air temperature sensor signal
88	Fuel temperature sensor signal
89	EGR control valve
90	Turbocharger boost pressure sensor signal
91	EGR control valve
92	ECM relay
93	Injector 3
94	Injector 2
95	Not used
96	Not used
97	Not used
98	Not used
99	Not used
100	Preheating (glow) relay diagnostic signal
101	Camshaft position sensor earth (Ground)
102	Crankshaft position sensor supply signal
104	Camshaft position sensor signal
105	ECM relay
106	Refrigerant pressure sensor signal
107	MAF sensor power supply signal
108	Engine coolant temperature sensor earth (Ground)
109	Not used
110	Not used
111	Not used
112	Not used

# DIESEL INJECTION

## Trouble diagnosis - General Information

# F9Q

### SUMMARY TABLE OF SYSTEM DTC

Ref. No.	DTC code	DF code	DTC ITEMS	Description
1	P0115	DF001	WATER TEMP SE CIRC	Engine coolant temperature sensor circuit (ECT sensor)
2	P0105	DF003	ATMS PRES SEN CIRC	Atmospheric pressure sensor circuit
3	P0235	DF004	TRBCHNRG PRES SEN CIRC	Turbocharger pressure sensor circuit
4	P0335	DF005	ENGINE SPEED SEN CIRC	Engine speed sensor circuit (CKPS)
5	P0190	DF007	RAIL PRES SEN CIRC	Rail pressure sensor circuit (Common rail fuel pressure sensor)
6	P0225	DF008	PDL PTNTMTR CIRC TRACK1	Pedal potentiometer track 1 circuit (Accelerator pedal position sensor 1)
7	P2120	DF009	PDL PTNTMTR CIRC TRACK2	Pedal potentiometer track 2 circuit (Accelerator pedal position sensor 2)
8	P1486	DF010	EGR POSITION SENSOR CIR	EGR position sensor circuit (EGR position sensor)
9	P0641	DF011	SEN SUPPLY NO1 VOLTAGE	Sensor supply voltage no. 1
10	P0651	DF012	SEN SUPPLY NO2 VOLTAGE	Sensor supply voltage no. 2
11	P0697	DF013	SEN SUPPLY NO3 VOLTAGE	Sensor supply voltage no. 3
12	P0685	DF015	MAIN RLY CTRL CIRC	Main relay control circuit (ECM relay)
13	P0403	DF016	EGR COMMAND CIRCUI	EGR valve control circuit
14	P0380	DF017	PRHT UNT CTRL CIRC	Preheater unit control circuit (Glow control)
15	P0670	DF025	PRHT UNIT DGNSTC CNNCTN	Preheater unit diagnostic connection (Glow)
16	C167	DF037	C167	Immobilizer
17	P0606	DF038	COMPUTER(C/U)	Computer (ECM)
18	P0110	DF039	INLT AIR TEMP CIRC	Inlet air temperature sensor circuit (IAT sensor)
19	P0201	DF040	CYL 1 INJECTOR CIRC	Cylinder 1 fuel injector circuit
20	P0202	DF041	CYL 2 INJECTOR CIRC	Cylinder 2 fuel injector circuit
21	P0203	DF042	CYL 3 INJECTOR CIRC	Cylinder 3 fuel injector circuit
22	P0204	DF043	CYL 4 INJECTOR CIRC	Cylinder 4 fuel injector circuit
23	P0506	DF046	BATTERY VOLTAGE	Battery voltage
24	P0615	DF047	COMPUTER SUPPLY VOLTAGE	Computer supply voltage (ECM supply voltage)
25	P0530	DF049	REFRIGERANT SENSOR CIRC	Refrigerant sensor circuit
26	P0571	DF050	BRAKE SWITCH CIRCUI	Brake switch circuit (ASCD brake switch)
27	P0575	DF051	SPD LIM/CRUIS CTRL	Cruise control/speed limiter function
28	P0089	DF053	RAIL PRES REGULTIN	Rail pressure regulation function
29	P0033	DF054	TRBCHRGING SOL V C CIRC	Turbocharger boost pressure control circuit (Wastegate control)
30	P0243	DF055	TRBCHRGNG P RGLTN CIRC	Turbocharging pressure regulation circuit (Charge air pressure)
31	P0100	DF056	AIR FLOW SEN CIRC	Air flow sensor circuit (MAF sensor)
32	P2264	DF057	WATER DTCT CIRC	Water in fuel sensor circuit
33	—	—	OIL TEMP SEN CIRC	Oil temperature circuit

# DIESEL INJECTION

## Trouble diagnosis - General Information

# F9Q

### SUMMARY TABLE OF SYSTEM DTC

Ref. No.	DTC code	DF code	DTC ITEMS	Description
34	—	—	MISFIRE ON CYLINDER 1	Misfiring on cylinder 1
35	—	—	MISFIRE ON CYLINDER 2	Misfiring on cylinder 2
36	—	—	MISFIRE ON CYLINDER 3	Misfiring on cylinder 3
37	—	—	MISFIRE ON CYLINDER 4	Misfiring on cylinder 4
38	—	—	MISFIRE ON CYLINDER 5	Misfiring on cylinder 5
39	—	—	MISFIRE ON CYLINDER 6	Misfiring on cylinder 6
40	—	—	MISFIRE	Misfiring
41	P0611	DF066	INJECTOR CODE(S)	Injector code(s)
42	P0638	DF067	DAMPER CONTROL CIRCUIT	Damper control circuit (Intake throttle valve control solenoid valve)
43	P1620	DF069	IMPACT DETECTED IN	Impact detected signal
44	P0830	DF070	CLUTCH SWITCH CIRCUIT	Clutch switch circuit
45	P0500	DF091	VEHICLE SPD INFO	Vehicle speed signal
46	P0340	DF097	CAMSHAFT SEN CIRC	Camshaft position sensor circuit
47	P0180	DF098	FUEL TEMP SEN CIRC	Fuel temperature sensor circuit
48	P0400	DF114	EGR SOLENOID V CIR	EGR control valve circuit
49	P0487	DF117	EGR POSITION OFFSE	EGR valve offset
50	P0409	DF118	ASSRVSSMNT ELCTRVNN EGR	EGR solenoid valve servo-control
51	P0365	DF119	IFGNL CPTUR ARBRE CMS	Camshaft position sensor signal
52	P0385	DF120	IFGNL CPTUR RGME MTEUR	Engine speed sensor signal

# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>WATER TEMPERATURE CIRCUIT PRESENT OR STORED</b>	<b>ENGINE COOLANT TEMPERATURE SENSOR CIRCUIT (ECT sensor)</b> CC.0 : Short circuit to earth (ground) CO.1 : Short circuit or open circuit to +12 V
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to stored DTC:</b> If the DTC is detected when the ignition switch is turned "ON" (+ after ignition) or the engine is running.
	<b>Special notes:</b> DTC is detected when: <ul style="list-style-type: none"> <li>– the engine coolant temperature is stuck at <b>119 °C</b>,</li> <li>– the preheating time is above <b>10 seconds</b>,</li> <li>– the cooling fan assembly is permanently controlled,</li> </ul> The <b>severity 1</b> warning light is lit. Use <b>CONSULT-II</b> for any work on the ECM connectors.

<b>CC.0</b>	<b>NOTES</b>	None.
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Check the engine coolant temperature sensor harness connectors. Repair if necessary.
Measure the <b>resistance</b> of the ECT sensor between <b>terminals 1 and 4</b> . Replace the sensor if the resistance is not approximately: <div style="text-align: right;"> <b>12460 ± 112 Ω at -10 °C</b>  <b>2252 ± 112 Ω at 25 °C</b>  <b>811.4 ± 39 Ω at 50 °C</b>  <b>283 ± 8 Ω at 80 °C</b>  <b>115 ± 3 Ω at 110 °C</b> </div>
Check the ECM connections. Check the <b>continuity</b> and ensure the <b>insulation</b> of the following connections: ECM <b>(F1)</b> terminal 86 and ECT sensor harness connector terminal 1 ECM <b>(F1)</b> terminal 108 and ECT sensor harness connector terminal 4. Repair if necessary.
If the DTC exists and remains present, replace the engine coolant temperature sensor.

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>WATER TEMP SE CIRC CONTINUED</b>	
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<b>CO.1</b>	<b>NOTES</b>	None.
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<p>Check the engine coolant temperature sensor harness connectors. Repair if necessary.</p>
<p>Measure the <b>resistance</b> of the ECT sensor between <b>terminals 1 and 4</b> of its black connector. Replace the sensor if the resistance is not approximately: <b>12460 ± 112 Ω at -10 °C</b>  <b>2252 ± 112 Ω at 25 °C</b>  <b>811.4 ± 39 Ω at 50 °C</b>  <b>283 ± 8 Ω at 80 °C</b>  <b>115 ± 3 Ω at 110 °C</b></p>
<p>Check the ECM connections. Ensure the <b>continuity</b> and <b>insulation</b> of the following connections:  ECM <b>(F1)</b> terminal 108 and ECT sensor harness connector terminal 4  ECM <b>(F1)</b> terminal 86 and ECT sensor harness connector terminal 1  Repair if necessary.</p>
<p>If the DTC exists and remains present, replace the engine coolant temperature sensor.</p>

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>ATMS PRES SEN CIR PRESENT OR STORED</b>	<b><u>ATMOSPHERIC PRESSURE SENSOR CIRCUIT</u></b> 1.DEF : Signal outside upper limit 2.DEF : Signal outside lower limit 3.DEF : Inconsistency of the signal
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to stored DTCs:</b> DTC is detected after: <ul style="list-style-type: none"> <li>– the DTC has been cleared from memory,</li> <li>– the ignition is switched off and dialogue is lost with CONSULT-II,</li> <li>– the ignition is switched on and dialogue is established with CONSULT-II,</li> <li>– the engine is started and has been running for 30 seconds.</li> </ul>
	<b>Priority when dealing with a number of DTCs (for 1.DEF or 2.DEF):</b> Deal with DTC <b>MAIN RLY CTRL CIRC</b> first if it is present or stored.
	<b>Special notes:</b> The atmospheric pressure sensor is integrated in the ECM, and cannot be separated. The DTC is detected: <ul style="list-style-type: none"> <li>– there is light smoke,</li> <li>– the atmospheric pressure value changes to default mode: <b>750 mBar</b>,</li> <li>– the <b>severity 1</b> warning light is lit.</li> </ul> Use CONSULT-II for any work on the ECM connectors.

<b>1.DEF 2.DEF</b>	Check the power supply and the earth (ground) connection of the ECM. Check data monitor item: <b>Atmospheric pressure</b> , and ensure that it is identical on another vehicle (ie: approximately <b>1000 mBar</b> ). If NG, replace the ECM.
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<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

**F9Q**

ATMS PRES SEN CIR CONTINUED	
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3.DEF	NOTES	<b>Priority in the event of a combination of DTCs:</b> Deal with malfunction <b>Turbocharger boost pressure sensor circuit</b> first if it is present or stored.
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<p>Check the supply and the earth (ground) connection of the ECM.</p> <p>Check parameter <b>Atmospheric pressure</b>, and parameter <b>Turbocharger boost</b> (Filtered turbocharging pressure).</p> <p>If the difference is greater than <math>\pm 20 \text{ hPa}</math> (20 mbars) carry out the diagnostic procedure for <b>Filtered turbocharging pressure</b>.</p> <p>If the DTC exists, replace ECM.</p>		
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AFTER REPAIR	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>TRBCHNG PRES SEN CIRC PRESENT OR STORED</b>	<u><b>TURBOCHARGER BOOST PRESSURE SENSOR CIRCUIT</b></u> CO.0 : Open circuit or short circuit to earth (ground) CC.1 : Short circuit to + 12 V 1.DEF : Inconsistency of the signal
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> The DTC is detected after the ignition is switched on or with the engine running.
	<b>Special notes:</b> Use CONSULT-II for all operations on the ECM connectors. DTC is detected when: <ul style="list-style-type: none"> <li>– the EGR control solenoid valve is cut off,</li> <li>– the turbocharger boost pressure enters fail-safe mode, ie: <b>FLRD BST PRES = 750 mbar</b>,</li> <li>– the intake air temperature enters fail-safe mode, ie: <b>INLET AIR TMP = 25 °C</b>.</li> </ul> The <b>severity 1</b> warning light is lit.

<b>CO.0</b>	<b>NOTES</b>	None.
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Check the turbocharger boost pressure sensor harness connectors. Check the ECM harness connector for connections. Repair if necessary.
Ensure the <b>continuity</b> and <b>insulation</b> of the following connections: ECM <b>(F1)</b> terminal 90 and turbocharger boost pressure sensor harness connector terminal 3 ECM <b>(F1)</b> terminal 47 and turbocharger boost pressure sensor harness connector terminal 1 Repair if necessary.
If the DTC exists, change the turbocharber boost pressure sensor.

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>TRBCHRNG PRES SEN CIRC CONTINUED</b>	
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<b>CC.1</b>	<b>NOTES</b>	None.
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<p>Check the turbocharger boost pressure sensor harness connectors. Check the EMC connections. Repair if necessary.</p>
<p>Ensure the <b>continuity</b> and <b>insulation</b> of the following connections: ECM <b>(F1)</b> terminal 44 and turbocharger boost pressure sensor harness connector terminal 2. ECM <b>(F1)</b> terminal 90 and turbocharger boost pressure sensor harness connector terminal 3. Repair if necessary.</p>
<p>If the DTC still exists, change the turbocharger boost pressure sensor.</p>

<b>1.DEF</b>	<b>NOTES</b>	<p>Check the consistency of data monitor item: Engine coolant temperature: – replace the engine coolant temperature sensor if its signal is not correct.</p>
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<p><b>If there is more than one ATMS PRES SEN CIRC</b>, carry out the <b>Filtered turbocharging pressure</b> diagnostic procedure: If the turbocharger boost pressure sensor is operating correctly, replace ECM.</p>
<p>Check the turbocharger boost pressure sensor harness connectors. Check the ECM connections. Repair if necessary.</p>
<p>Check the <b>continuity, insulation and for the absence of interference resistance</b> on the following connections: ECM <b>(F1)</b> terminal 47 and turbocharger boost pressure sensor harness connector terminal 1 ECM <b>(F1)</b> terminal 44 and turbocharger boost pressure sensor harness connector terminal 2 ECM <b>(F1)</b> terminal 90 and turbocharger boost pressure sensor harness connector terminal 3 Repair if necessary. If the DTC exists, replace ECM.</p>

<b>AFTER REPAIR</b>	<p>Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.</p>
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>ENGINE SPEED SEN CIRC PRESENT OR STORED</b>	<u>CRANKSHAFT POSITION (ENGINE SPEED) SENSOR CIRCUIT</u> 1.DEF : Signal absent 2.DEF : Inconsistency of the signal
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to stored DTCs:</b> If the DTC is detected after successive starting attempts or with the engine running. <b>Special notes:</b> Use CONSULT-II for any work on the ECM connectors. The crankshaft sensor is consistent with the camshaft position sensor. If the DTC is detected, the <b>severity 2</b> warning light will light up.
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<b>1.DEF 2.DEF</b>	<b>NOTES</b>	None.
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Check the crankshaft position sensor connections. Repair if necessary.
Check that the air gap between the sensor and the flywheel is correct: <b>0.5 to 1.8 mm</b> .
Check the <b>resistance</b> of the crankshaft position sensor between <b>terminals 1 and 2</b> . The <b>coil resistance</b> is $800 \pm 80 \Omega$ at an engine coolant temperature of <b>20 °C</b> .
Check the ECM connections. Repair if necessary.
Check <b>the continuity, absence of interference resistance and insulation</b> on the following connections: ECM <b>(F1)</b> terminal 102 and crankshaft position sensor harness connector terminal 1 ECM <b>(F1)</b> terminal 103 and crankshaft position sensor harness connector terminal 2 Repair if necessary.
Check the crankshaft position sensor signal using an oscilloscope: Check that the sensor is properly attached and that the engine flywheel target is not damaged. Repair if necessary.
If the DTC exists, replace ECM.

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>RAIL PRES SEN CIRC PRESENT OR STORED</b>	<b><u>FUEL RAIL PRESSURE SENSOR CIRCUIT</u></b> CC.0 : Short circuit to earth (ground) CO.1 : Short circuit or open circuit to +12 V 1.DEF : Offset at minimum threshold 2.DEF : Offset at maximum threshold
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to stored DTCs:</b> If the DTC is detected after successive starting attempts or with the engine running.
	<b>Special notes:</b> If a DTC is detected, the instruction to stop the engine immediately will be issued. The <b>severity 2</b> warning light will light up. Use CONSULT-II for any work on the ECM connectors.

<b>CC.0</b>	<b>NOTES</b>	None.
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Check the fuel rail pressure sensor harness connectors. Check the ECM connections. Repair if necessary.
Check the <b>continuity</b> and <b>insulation</b> of the following connections: ECM <b>(F1)</b> terminal 67 and fuel rail pressure sensor harness connector terminal 2 ECM <b>(F1)</b> terminal 41 and fuel rail pressure sensor harness connector terminal 3 Repair if necessary.
If the DTC is exists, replace the fuel rail pressure sensor and tighten it to <b>35 ± 5 Nm</b> following the safety instructions in the <b>Introduction</b> section.

<b>CO.1</b>	<b>NOTES</b>	None.
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Check the fuel rail pressure sensor connectors. Check the ECM connections. Repair if necessary.
Ensure the <b>continuity</b> and <b>insulation</b> from <b>+ 12 V</b> across the following connections: ECM <b>(F1)</b> terminal 67 and fuel rail pressure sensor harness connector terminal 2 ECM <b>(F1)</b> terminal 43 and fuel rail pressure sensor harness connector terminal 1 Repair if necessary.
If the DTC exists, replace the fuel rail pressure sensor and tighten it to <b>35 ± 5 Nm</b> following the safety instructions in the <b>Introduction</b> .

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

**F9Q**

RAIL PRES SEN CIRC CONTINUED	
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1.DEF 2.DEF	NOTES	<b>Special note:</b> The minimum value is <b>0.2 bar</b> , the stop maximum value is <b>1350 bar</b> .
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Check the fuel rail pressure sensor harness connectors. Check the ECM connections. Repair if necessary.
Check the <b>continuity, absence of interference resistance and insulation</b> on the following connections: ECM (F1) terminal 67 and fuel rail pressure sensor harness connector terminal 2 ECM (F1) terminal 41 and fuel rail pressure sensor harness connector terminal 3 ECM (F1) terminal 43 and fuel rail pressure sensor harness connector terminal 1 Repair if necessary.
With the ignition on, and the engine stopped for more than one minute: Check the <b>Fuel rail</b> pressure value displayed by the "DATA MONITOR" mode with CONSULT-II, – If the value is below <b>50 bar</b> , the sensor is correct. If so, contact your Techline before replacing the ECM. – If the pressure is above <b>50 bar</b> , replace the fuel rail pressure sensor and tighten to <b>35 ± 5 Nm</b> . Follow the safety instructions in the <b>Introduction</b> .

AFTER REPAIR	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>PDL PTNTMTR PRESENT OR STORED</b>	<b><u>ACCELERATOR PEDAL POSITION SENSOR (PDL PTNTMTR CIRC TRACK1) 1 CIRCUIT</u></b> CO.0 : Open circuit or short circuit to earth (ground) CC.1 : Short circuit to + 12 V 1.DEF : Inconsistency of the signal
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to stored DTCs:</b> The DTC is detected after a series of full load/no load actions on the accelerator pedal.
	<b>Special notes:</b> Turbocharging and cruise control are not authorised. The <b>severity 1</b> warning light is lit. Engine speed is maintained at <b>1400 rpm</b> if there is a double malfunction on sensors 1 and 2. Use CONSULT-II for any work on the ECM connectors.

<b>CO.0</b>	<b>NOTES</b>	<b>Priority in the event of a combination of malfunctions:</b> If DTC <b>Accelerator pedal position sensor (PDL PTNTMTR CIRC TRACK2)</b> is present at the same time, check that the accelerator pedal position sensor connector is connected correctly.
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Check the connectors on the accelerator pedal position sensor. Check the ECM connections. Repair if necessary.
Check the <b>continuity, absence of interference resistance and insulation</b> of the following connections: ECM (E81) terminal 24 and accelerator pedal position sensor harness connector terminal 3 ECM (E81) terminal 23 and accelerator pedal position sensor harness connector terminal 2 ECM (E81) terminal 16 and accelerator pedal position sensor harness connector terminal 4 Repair if necessary.
Measure the accelerator pedal position sensor <b>resistance</b> on <b>sensor 1</b> across <b>terminals 2 and 4</b> . Replace the sensor if the resistance is not approximately: <b>1.7 kΩ ± 0.9</b> .

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>PDL PTNTMTR</b> <b>CONTINUED</b>	
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<b>CC.1</b>	<b>NOTES</b>	<b>Priority in the event of a combination of DTCs:</b> Deal with DTC <b>SEN SUPPLY NO1 VOLTAGE</b> first if it is present or stored.
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Check the connectors on the accelerator pedal position sensor. Check the ECM connections. Repair if necessary.
Check the <b>continuity, absence of interference resistance and insulation</b> of the following connections: ECM (E81) terminal 24 and accelerator pedal position sensor harness connector terminal 3 ECM (E81) terminal 16 and accelerator pedal position sensor harness connector terminal 4 Repair if necessary.
Measure the accelerator pedal position sensor <b>resistance</b> on <b>sensor 1</b> across <b>terminals 4 and 2</b> . Replace the accelerator pedal position sensor 1 if the resistance is not approximately: <b>1.7 kΩ ± 0.9</b> .

<b>1.DEF</b>	<b>NOTES</b>	None.
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Check the connectors on the accelerator pedal position sensor. Check the ECM connections. Repair if necessary.
Check the <b>continuity, absence of interference resistance and insulation</b> of the following connections: ECM (E81) terminal 24 and accelerator pedal position sensor 1 harness connector terminal 3 ECM (E81) terminal 23 and accelerator pedal position sensor 1 harness connector terminal 2 ECM (E81) terminal 16 and accelerator pedal position sensor 1 harness connector terminal 4 ECM (E81) terminal 14 and accelerator pedal position sensor 2 harness connector terminal 6 ECM (E81) terminal 22 and accelerator pedal position sensor 2 harness connector terminal 1 ECM (E81) terminal 6 and accelerator pedal position sensor 2 harness connector terminal 5 Repair if necessary.
If the DTC exists, replace the accelerator pedal position sensor.

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>PDL PTNTMTR CIRC TRACK2 PRESENT OR STORED</b>	<b><u>ACCELERATOR PEDAL POSITION SENSOR (PEDAL POTENTIOMETER TRACK) 2 CIRCUIT</u></b> CO.0 : Open circuit or short circuit to earth (ground) CC.1 : Short circuit to + 12 V 1.DEF : Inconsistency of the signal
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to stored DTCs:</b> The DTC is detected after a series of full load/no load actions on the accelerator pedal.
	<b>Special notes:</b> Turbocharging and cruise control are not authorised. The <b>severity 1</b> warning light is lit. Engine speed is maintained at <b>1400 rpm</b> if there is a double malfunction on sensors 1 and 2. Use CONSULT-II for any work on the ECM connectors.

<b>CO.0</b>	<b>NOTES</b>	<b>Processing priority in the event of a number of faults:</b> If DTC <b>Accelerator pedal position sensor (Pedal potentiometer circuit track) 1 CO.0</b> is present at the same time, check that the accelerator pedal position sensor connector is connected correctly.
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Check the connectors on the accelerator pedal position sensor. Check the ECM connections. Repair if necessary.
Check the <b>continuity, absence of interference resistance and insulation</b> of the following connections: ECM (E81) terminal 14 and accelerator pedal position sensor 2 harness connector terminal 6 ECM (E81) terminal 6 and accelerator pedal position sensor 2 harness connector terminal 5 Repair if necessary.
Measure the accelerator pedal position sensor <b>resistance</b> on <b>sensor 2</b> between <b>terminals 1 and 5</b> . Replace the sensor if the resistance is not approximately: <b>2.85 kΩ ± 2.05</b> .

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>PDL PTNTMTR</b> <b>CIRC TRACK2</b>  <b>CONTINUED</b>	
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<b>CC.1</b>	<b>NOTES</b>	<b>Priority in the event of a combination of DTCs:</b> Deal with DTC <b>Sensor power supply voltage no. 2</b> first if it is present or stored.
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Check the connectors on the accelerator pedal position sensor. Check the ECM connections. Repair if necessary.
Check the <b>continuity, absence of interference resistance and insulation</b> of the following connections: ECM (E81) terminal 14 and accelerator pedal position sensor 2 harness connector terminal 6 ECM (E81) terminal 6 and accelerator pedal position sensor 2 harness connector terminal 5 ECM (E81) terminals 32, 7, 8 and engine ground. Repair if necessary.
Measure the accelerator pedal position sensor <b>resistance</b> on <b>sensor 2</b> across <b>terminals 1</b> and <b>5</b> . Replace the accelerator pedal position sensor 2 if the resistance is not approximately: <b>2.85 ± 2.05 kΩ</b> .

<b>1.DEF</b>	<b>NOTES</b>	None.
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Check the connectors on the accelerator pedal position sensor. Check the ECM connections. Repair if necessary.
Check the <b>continuity, absence of interference resistance and insulation</b> of the following connections: ECM (E81) terminal 14 and accelerator pedal position sensor 2 harness connector terminal 6 ECM (E81) terminal 22 and accelerator pedal position sensor 2 harness connector terminal 1 ECM (E81) terminal 6 and accelerator pedal position sensor 2 harness connector terminal 5 ECM (E81) terminal 24 and accelerator pedal position sensor 1 harness connector terminal 3 ECM (E81) terminal 23 and accelerator pedal position sensor 1 harness connector terminal 2 ECM (E81) terminal 16 and accelerator pedal position sensor 1 harness connector terminal 4 Repair if necessary.
If the DTC exists, replace the pedal sensor.

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>EGR POSITION SENSOR CIR PRESENT OR STORED</b>	<b><u>EGR POSITION SENSOR CIRCUIT</u></b> CO.0 : Open circuit or short circuit to earth (ground) CC.1 : Short circuit to + 12 V
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> The DTC reappears after: – the DTC has been cleared from the memory and – active test <b>EGR SOLENOID VALVE</b> .
	<b>Special notes:</b> The DTC is detected if: – there is smoke at the exhaust, – EGR control solenoid valve is deactivated. Use CONSULT-II for all operations on the ECM connectors.

<b>CO.0</b>	<b>NOTES</b>	None.
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Check the connections of the EGR control solenoid valve harness connector. Check the ECM connections. Repair if necessary.
Check the <b>continuity, absence of interference resistance and insulation</b> of the following connections: ECM <b>(F1)</b> terminal 89 and EGR control solenoid harness connector terminal 6 ECM <b>(F1)</b> terminal 46 and EGR control solenoid harness connector terminal 2 Repair if necessary.
If the DTC exists, replace the EGR control solenoid valve.

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

**F9Q**

<b>EGR POSITION SENSOR CIR CONTINUED</b>	
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<b>CC.1</b>	<b>NOTES</b>	<b>Priority in the event of a combination of DTCs:</b> Deal with DTC <b>Sensor supply voltage no. 2</b> first if it is present or stored.
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Check the connections of the EGR control solenoid valve. Check the ECM connections. Repair if necessary.
Check the <b>continuity, absence of interference resistance and insulation</b> of the following connections: ECM <b>(F1)</b> terminal 89 and EGR control solenoid valve harness connector terminal 6 ECM <b>(F1)</b> terminal 58 and EGR control solenoid valve harness connector terminal 4 Repair if necessary.
If the DTC exists, <b>check that the EGR control solenoid valve is not blocked.</b> Display data monitor item: <b>EGR POS SE VO</b> : If the value is not between <b>0.75 V</b> and <b>1.6 V</b> : <ul style="list-style-type: none"><li>– remove the EGR control solenoid valve.</li><li>– if there is an irreparable blockage, replace the EGR control solenoid valve.</li></ul>

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>SEN SUPPLY NO1 VOLTAGE PRESENT OR STORED</b>	<b>SENSOR SUPPLY VOLTAGE No. 1</b> 1.DEF : Sensor reference voltage too low 2.DEF : Sensor reference voltage too high
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> The DTC reappears after: – the DTC has been cleared, – the engine has been running for one minute.
	<b>Special notes:</b> The DTC is present if: – cruise control is deactivated, – engine torque is limited, – the <b>severity 1</b> warning light is lit. Use CONSULT-II for all operations on the ECM connectors.

<b>1.DEF 2.DEF</b>	<b>NOTES</b>	None.
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<p>The following sensors are connected to supply no. 1:</p> <ul style="list-style-type: none"> <li>– <b>Charge air pressure sensor.</b></li> <li>– <b>Accelerator pedal position sensor 1.</b></li> </ul> <p>To locate any faulty sensor and/or connection, disconnect one of the sensors then check whether the DTC becomes stored. If the DTC remains present, start the operation again with the other sensor. (wait a few seconds between each disconnection to allow the ECM to perform the measurement).</p> <p>If the DTC is stored after a disconnection, replace the faulty sensor or repair its connection (use the wiring diagram).</p> <p>Erase the DTCs created by the multiple disconnections.</p>
<p>If the DTC is still present when the sensors have been disconnected:</p> <ul style="list-style-type: none"> <li>– check the insulation against earth (ground) of the + 5 V line of each sensor.</li> <li>– check the insulation against + 12 V of the + 5 V line of each sensor.</li> <li>– check the insulation between the following connections:               <ul style="list-style-type: none"> <li>– terminals <b>4</b> and <b>5</b> of the <b>accelerator pedal position sensor 1</b> harness connector.</li> <li>– terminals <b>1</b> and <b>2</b> of the <b>charge air pressure sensor</b> harness connector.</li> </ul> </li> </ul> <p>If these checks reveal a DTC, carry out the necessary repairs.</p>
<p>If the DTC exists, carefully examine the engine ECM connections (presence of conductive particles, bent pins).</p> <p>If the DTC exists, replace ECM.</p>

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>SEN SUPPLY NO2 VOLTAGE PRESENT OR STORED</b>	<b>SENSOR SUPPLY VOLTAGE No. 2</b> 1.DEF : Sensor reference voltage too low 2.DEF : Sensor reference voltage too high
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> The DTC reappears as stored after: <ul style="list-style-type: none"> <li>– clearance of the DTC,</li> <li>– the engine has been running for one minute.</li> </ul>
	<b>Special notes:</b> The DTC is detected if: <ul style="list-style-type: none"> <li>– the <b>severity 1</b> warning light is lit.</li> <li>– EGR regulation, cruise control and the positive temperature coefficient (PTC) are deactivated,</li> <li>– the torque is limited,</li> <li>– the <b>severity 1</b> warning light is lit.</li> </ul> Use CONSULT-II for all operations on the ECM connectors.

<b>1.DEF 2.DEF</b>	<b>NOTES</b>	None.
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<p>The following sensors are connected to sensor power supply no. 2:</p> <ul style="list-style-type: none"> <li>– <b>EGR control solenoid valve position sensor,</b></li> <li>– <b>Accelerator pedal position sensor 2,</b></li> <li>– <b>Refrigerant pressure sensor.</b></li> </ul> <p>To locate any suspected sensor and/or connection malfunctions, disconnect one of the sensors then check whether the DTC becomes stored.</p> <p>If the DTC remains present, start the operation again with the other sensors (each in turn).            (Wait a few seconds between each disconnection to allow the ECM to take the measurement).</p> <p>If the DTC is stored after a disconnection, change the suspected sensor malfunction or repair the connection.            Erase the DTC created by the multiple disconnections.</p>
<p>If the DTC is still exist when the three sensors have been disconnected:</p> <ul style="list-style-type: none"> <li>– check the insulation against earth: of the <b>+ 5 V</b> line of each sensor.</li> <li>– check the insulation against <b>+ 12 V</b>: of the <b>+ 5 V</b> line of each sensor.</li> <li>– check the insulation between the following connections:</li> <li>– terminals <b>2</b> and <b>6</b> of the <b>accelerator position sensor 2</b> harness connector.</li> <li>– terminals <b>2</b> and <b>4</b> of the <b>EGR control solenoid valve position sensor</b> harness connector.</li> <li>– terminals <b>1</b> and <b>2</b> of the <b>refrigerant sensor</b> harness connector.</li> </ul> <p>If these checks reveal a DTC, carry out the necessary repairs.</p>
<p>If the DTC exists, carefully examine the ECM harness connections (presence of conductive particles, bent pins).</p> <p>If the DTC exists, replace ECM.</p>

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>SEN SUPPLY NO3 VOLTAGE PRESENT OR STORED</b>	<u><b>SENSOR SUPPLY VOLTAGE No. 3</b></u> 1.DEF : Sensor reference voltage too low 2.DEF : Sensor reference voltage too high
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> The DTC reappears as stored after: – the DTC has been cleared, – the engine has been running for one minute.
	<b>Special notes:</b> If the DTC is detected if: – EGR regulation is deactivated, – vehicle performance is limited, – the <b>severity 2</b> warning light is lit. Use CONSULT-II for all operations on the ECM connectors.

<b>1.DEF 2.DEF</b>	<b>NOTES</b>	None.
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<p>The following sensors are connected to supply no. 3:</p> <ul style="list-style-type: none"> <li>– <b>Common rail fuel pressure sensor.</b></li> <li>– <b>Mass air flow sensor.</b></li> </ul> <p>To locate the sensor and/or connection possibly at malfunction, disconnect one of the sensors then check whether the DTC becomes stored.</p> <p>If the DTC remains present, start the operation again with the other sensor.            (wait a few seconds between each disconnection to allow the ECM to perform the measurement).</p> <p>If the DTC is stored after a disconnection, change the suspected sensor malfunction or repair the connection.            Erase the DTCs created by the multiple disconnections.</p>
<p>If the DTC is still present when two sensors have been disconnected:            check the insulation against earth (ground): of the <b>+ 5 V</b> line of each sensor.            check the insulation against <b>+ 12 V</b>: of the <b>+ 5 V</b> line of each sensor.            check the insulation between the following connections:</p> <ul style="list-style-type: none"> <li>– terminals <b>1</b> and <b>3</b> of the <b>common rail fuel pressure sensor</b> connector.</li> <li>– terminals <b>2</b> and <b>3</b> of the <b>MAF sensor</b> connector.</li> </ul> <p>If these checks reveal a DTC, carry out the necessary repairs.</p>
<p>If the DTC exists, carefully examine the engine ECM harness connector connections (presence of conductive particles, bent pins).</p> <p>If the DTC exists, replace ECM.</p>

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

F9Q

<b>MAIN RLY CTRL CIRC PRESENT OR STORED</b>	<b><u>ECM RELAY (MAIN RELAY CONTROL) CIRCUIT</u></b> 1.DEF : Relay cut out too soon 2.DEF : Relay cut out too late
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> The DTC reappears after it has been cleared, the ignition having been switched off until the end of the power latch (the immobiliser warning light flashes), followed by the ignition being switched back on and communication being established.
	<b>Special notes:</b> Use CONSULT-II for all operations on the ECM connectors.

<b>1.DEF 2.DEF</b>	<b>NOTES</b>	None.
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Check the ECM connections. Repair if necessary.
Check that the battery terminals are properly tightened and connected to the engine earth.
Ensure the <b>continuity, absence of interference and insulation</b> of the following connection: ECM (F1) terminal 105 and ECM relay harness connector terminal 2 Repair if necessary.

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>EGR COMMAND CIRCUIT PRESENT OR STORED</b>	<b><u>EGR VALVE CONTROL CIRCUIT</u></b> CC.1 : Short circuit to + 12 V CC.0 : Short circuit to earth (ground) CO : Open circuit 1.DEF : Internal electrical fault
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> The DTC reappears after: – the DTC has been cleared from the memory and – active test mode with CONSULT-II <b>EGR SOLENOID VALVE</b> .
	<b>Special notes:</b> A significant amount of smoke will be present and the EGR valve and the turbocharger will be locked if the malfunction is present and the <b>severity 1</b> warning light comes on. Use CONSULT-II for all operations on the ECM connectors.

<b>CC.1</b>	<b>NOTES</b>	None.
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Check the connections of the EGR valve control solenoid valve. Check the ECM connections. Repair if necessary.
Check the <b>resistance</b> of the EGR valve control solenoid valve across <b>terminals 1 and 5</b> . If the resistance is not approximately <b>8 Ω ± 0.5 at 20 °C</b> , replace the EGR valve control solenoid. Check the <b>continuity</b> and <b>insulation</b> of the following connection: ECM (F1) terminal 91 and EGR valve control solenoid valve harness connector terminal 5 Repair if necessary.
If the DTC exists and remains present, replace the EGR valve control solenoid valve.

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>EGR COMMAND CIRCUIT</b>  <b>CONTINUED 1</b>	
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<b>CC.0 C.O</b>	<b>NOTES</b>	<b>Special note:</b> If DTC <b>EGR control solenoid valve position sensor circuit in CO.0</b> is present at the same time, check that the EGR valve control solenoid valve connector is connected correctly.
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<p>Check the connections of the EGR valve control solenoid valve.</p> <p>Check the ECM connections.</p> <p>Repair if necessary.</p>
<p>Check the <b>resistance</b> of the EGR valve control solenoid valve across <b>terminals 1 and 5</b>.</p> <p>If the resistance is not approximately <b><math>8\ \Omega \pm 0.5\ \Omega</math> at 20 °C</b>, replace the EGR valve control solenoid valve.</p> <p>Also check the insulation between the EGR valve control solenoid and the body of the EGR valve control solenoid valve.</p>
<p>Check the <b>continuity, absence of interference resistance</b> and <b>insulation</b> of the following connections:</p> <p>ECM <b>(F1)</b> terminal 91 and EGR valve control solenoid valve harness connector terminal 5</p> <p>ECM relay terminal 5 and EGR valve control solenoid valve harness connector terminal 1</p>
<p>Repair if necessary.</p> <p>If the DTC exists and remains present, replace the EGR valve control solenoid valve.</p>

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>EGR COMMAND CIRCUIT</b>  <b>CONTINUED 2</b>	
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<b>1.DEF</b>	<b>NOTES</b>	None.
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<p>Check the connections of the EGR valve control solenoid valve. Check the ECM connections. Repair if necessary.</p>
<p>Check the <b>resistance</b> of the EGR valve control solenoid valve across <b>terminals 1 and 5</b>. If the resistance is not approximately <b>8 Ω ± 0.5 at 20 °C</b>, replace the EGR valve control solenoid valve.</p>
<p>Check the <b>continuity, absence of interference resistance and insulation</b> on the following connections: ECM <b>(F1)</b> terminal 91 and EGR valve control solenoid valve harness connector terminal 5 ECM relay terminal 5 and EGR valve control solenoid valve harness connector terminal 1 Check for the presence of <b>+ 12 V</b> after relay on <b>track 1</b> of the EGR valve control solenoid valve. Repair if necessary.</p>
<p>If the DTC exists, <b>check that the ECM output stage is working correctly</b>: Perform active test: <b>EGR solenoid valve</b>. If there is no perceptible movement of the valve, check that the ECM output stage is functioning: – <b>Either by oscilloscope</b> (calibrated to <b>5 V/division</b> and a time base of <b>2 ms/division</b>): With the EGR valve control solenoid valve connected, connect the oscilloscope earth to the battery earth with the positive test pin on <b>terminal 5</b> of the EGR valve control solenoid valve. Erase any EGR valve control solenoid valve DTC that there may be and perform active test: The oscilloscope should display a square wave amplitude signal of <b>12.5 V</b> at a frequency of <b>140 Hz</b> (with an OCR* increasing from <b>25 to 75 %</b>). – <b>Either by voltmeter</b>: With the EGR valve control solenoid valve connected, connect the earth (ground) lead of the voltmeter to <b>terminal 2</b> of the EGR valve control solenoid valve and the positive lead to <b>terminal 1</b>. Erase any EGR valve control solenoid valve DTC that there may be and perform <b>EGR SOLENOID VALVE</b>: The voltmeter should display two voltages in succession ≈ battery voltage X OCR* underway. Or successively: <b>3.15 V</b> for an OCR* of <b>25 %</b> then <b>9.45 V</b> for an OCR* of <b>75 %</b> (10 cycles).  If the oscilloscope (or the voltmeter) does not indicate control or continuous voltage, replace ECM.</p>

\*Opening Cyclic Ratio signal

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>PRHT UNT CTRL CIRC PRESENT OR STORED</b>	<u><b>GLOW RELAY (PREHEATER UNIT) CONTROL CIRCUIT</b></u> CC.1 : Short circuit to + 12 V CC.0 : Short circuit to earth (ground) CO : Open circuit 1.DEF : Internal electrical fault
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> If the DTC appears after : <b>Glow relay (PREHEATER UNIT)</b> active test mode.
	<b>Special notes:</b> It is difficult or even impossible to start the vehicle when cold. Use CONSULT-II for all operations on the ECM connectors.

<b>CC.1</b>	<b>NOTES</b>	None.
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Check the glow relay harness connectors and the heater plug supply wiring. Check the ECM connections. Repair if necessary.
Check the condition of supply fuse <b>S (80A)</b> Ensure the <b>continuity</b> and <b>insulation</b> from <b>+ 12 V</b> across the following connection: ECM (F1) terminal 56 and glow relay harness connector terminal 1 Repair if necessary.
If the DTC exists and remains present, replace the glow relay.

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>PRHT UNT CTRL CIRC CONTINUED</b>	
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<b>CC.0 CO</b>	<b>NOTES</b>	<b>Special notes:</b> If the unit is short-circuited to ground (earth) the plugs could be activated permanently with the risk of destroying the engine.
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Check the glow relay harness connectors and the heater plug supply wiring. Check the ECM connections. Repair if necessary.
Check the condition of supply fuse <b>S (80A)</b> Check the <b>continuity, absence of interference resistance and insulation</b> of the following connection: ECM (F1) terminal 100 and glow relay harness connector terminal 6 Repair if necessary.
If the DTC exists and remains present, replace the glow relay.

<b>1.DEF</b>	<b>NOTES</b>	None.
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Check the glow relay harness connectors and the heater plug supply wiring. Check the ECM connections. Repair if necessary.
Check the condition of supply fuse <b>S (80A)</b> Check the <b>continuity and insulation</b> of the following connection: ECM (F1) terminal 56 and glow relay harness connector terminal 1 Repair if necessary.
If the DTC exists, <b>check that the ECM output stage is working correctly:</b> With the glow relay connected: connect the positive test probe to <b>terminal 5</b> of the glow relay, connect the negative test probe from relay terminal 6 to the ground, Perform active test mode with CONSULT-II: At the same time, check the voltage of terminals 1, 8, 3, 7 and 2. If the voltmeter does not register a voltage during the testing time (10 ON-OFF cycle second). If NG, replace glow relay.

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>PRHT UNT DGNSTC CNNCTN PRESENT OR STORED</b>	<b><u>PREHEATER UNIT DIAGNOSTIC CONNECTION</u></b> CC.0 : Short circuit to earth (ground) CO.1 : Short circuit or open circuit to +12 V
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> If the DTC appears after <b>Glow relay (preheater unit)</b> active test mode is performed.
	<b>Special notes:</b> It is difficult or even impossible to start the vehicle when cold. Use CONSULT-II for all operations on the ECM connectors.

<b>CC.0 CO.1</b>	<b>NOTES</b>	None.
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Check the glow relay connectors. Check all of the heater plugs. Repair if necessary.
Check <b>the resistance</b> of the heater plugs: Replace the plug having a resistance not equal to <b>8 Ω ± 0.5 Ω at 20 °C</b> . Check the <b>continuity</b> of the following connections: Glow relay <b>(F6)</b> terminal 7 and heater plug harness connector terminal 1 Glow relay <b>(F6)</b> terminal 2 and heater plug harness connector terminal 1 Glow relay <b>(F6)</b> terminal 8 and heater plug harness connector terminal 1 Glow relay <b>(F6)</b> terminal 3 and heater plug harness connector terminal 1  Check for the <b>presence of + 12 V battery</b> on <b>terminal 5</b> of the glow relay (via fuse). Check that the engine is earthed.
If the DTC exists, Check the connectors of the ECM. Check <b>the continuity, absence of interference resistance and insulation</b> on the following connection: ECM <b>(F1)</b> terminal 100 and glow relay harness connector terminal 6 If the DTC exists, replace the glow relay.

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>DF037 PRESENT OR STORED</b>	<u>IMMOBILIZER</u>
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> If the DTC appears after an attempt to start the engine or when the ignition is switched on.
	<b>Special notes:</b> It is impossible to start the vehicle. Use CONSULT-II for all operations on the ECM connectors.

Check the immobilizer control unit connections. Check the ECM connections. Repair if necessary.
Check the CAN and carry out a complete trouble diagnosis on the immobilizer system. Refer to BL section.

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

F9Q

<b>COMPUTER PRESENT OR STORED</b>	<p><b>COMPUTER (ECM)</b></p> <ul style="list-style-type: none"> <li>1.DEF : Permanent high signal</li> <li>2.DEF : Permanent low signal</li> <li>3.DEF : Configuration absent or incorrect</li> <li>4.DEF : Analogue/digital converter malfunction</li> <li>5.DEF : Fault in EEPROM</li> <li>6.DEF : Activation in Watchdog</li> <li>7.DEF : Signal outside upper limit</li> <li>8.DEF : Signal outside lower limit</li> <li>9.DEF : Dialogue disrupted</li> <li>10.DEF : Injector control condenser malfunction</li> <li>11.DEF : Injector control</li> <li>12.DEF : Initialization error</li> <li>13.DEF : Injection fault under deceleration</li> <li>14.DEF : Extensive pump command</li> <li>15.DEF : Extensive pump command at idle speed</li> </ul>
<b>NOTES</b>	<p><b>Conditions for applying the diagnostic procedure to the stored DTC:</b> If the DTC appears after the engine is started or with the engine running.</p>
	<p><b>Special notes:</b> The <b>severity 1</b> warning light will come on and if there is an attempt to switch off the engine, the <b>severity 2</b> warning light will come on if there is a DTC existent. Use CONSULT-II for all operations on the ECM connectors.</p>
<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <b>1.DEF</b>  <div style="text-align: center;"> <div style="border-top: 1px solid black; width: 50%; margin: 0 auto;"></div> <div style="font-size: 1.2em;">➔</div> </div> <b>15.DEF</b> </div>	<p>Check the ECM connections and the continuity of all of its supplies. Repair if necessary.</p> <p>According to the nature of the malfunction, clear the present or stored DTC, switch the ignition on again and/or start the vehicle, then check whether the DTC appears as present again. If so, replace ECM.</p>
<b>AFTER REPAIR</b>	<p>Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.</p>



# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>INLT AIR TEMP CIRC PRESENT OR STORED</b>	<b><u>INTAKE (INLET) AIR TEMPERATURE SENSOR CIRCUIT</u></b> CO.1 : Short circuit or open circuit to +12 V CC.0 : Short circuit to earth
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> The DTC is declared present when the ignition is switched on or with the engine running.
	<b>Special notes:</b> If the DTC is detected when: – the air temperature value enters defect mode, ie: INLET AIR TEMP = 20, ie INLET AIR TEMP = 20°C, – EGR regulation is deactivated, – there is light smoke at exhaust. The intake air temperature will be established again according to the manifold pressure and the atmospheric pressure. Use CONSULT-II for all operations on the ECM connectors. Temperature default value = 20°C.

<b>CO.1</b>	<b>NOTES</b>	None.
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Check the MAF sensor. Check the ECM connections. Repair if necessary.
Check the <b>continuity, absence of interference resistance and insulation</b> of the following connections: ECM <b>(F1)</b> terminal 85 and MAF sensor harness connector terminal 5 ECM <b>(F1)</b> terminal 87 and MAF sensor harness connector terminal 6 Repair if necessary.
Measure the resistance of the intake air temperature sensor between <b>terminals 6 and 5</b> of the MAF sensor. Replace the MAF sensor if the resistance is not approximately: <div style="text-align: right;"> <b>3714 Ω ± 161 at 10 °C</b>  <b>2488 Ω ± 90 at 20 °C</b>  <b>1671 Ω ± 59 at 30 °C</b> </div>

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

**F9Q**

INLT AIR TEMP CIRC CONTINUED	
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CC.0	NOTES	None.
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Check the MAF sensor connectors. Check the ECM connections. Repair if necessary.
Check <b>the insulation</b> against <b>ground</b> of the following connection: ECM (F1) terminal 87 and MAF sensor harness connector terminal 6 Check for the presence of <b>+ 5 V</b> on <b>terminal 6</b> of the MAF sensor connector. Repair if necessary.
Measure the resistance of the MAF sensor integrated into the MAF sensor across <b>terminals 6 and 5</b> . Replace the MAF sensor if the resistance is not approximately: <b>3714 <math>\Omega</math> <math>\pm</math> 161 at 10 °C</b> <b>2488 <math>\Omega</math> <math>\pm</math> 90 at 20 °C</b> <b>1671 <math>\Omega</math> <math>\pm</math> 59 at 30 °C</b>

AFTER REPAIR	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>CYL 1 INJECTOR CIRC PRESENT OR STORED</b>	<u>CYLINDER 1 FUEL INJECTOR CIRCUIT</u> CC.1 : Short circuit to + 12 V CO : Open circuit CC : Short circuit 1.DEF : Injector control
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> If the DTC becomes present after the engine is started.
	<b>Special notes:</b> Use CONSULT-II for all operations on the ECM connectors.

<b>CC.1</b>	<b>NOTES</b>	None.
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Check the connectors of fuel injector no. 1. Check the ECM connections. Repair if necessary.
Measure the <b>resistance</b> of fuel injector no. 1 across <b>terminals 1 and 2</b> . If the resistance is not approximately <b>0.33 Ω at 20 °C</b> , replace fuel injector no. 1. Check the <b>continuity and insulation</b> of the following connections: ECM (F1) terminal 74 and fuel injector 1 harness connector terminal 2 ECM (F1) terminal 33 and fuel injector 1 harness connector terminal 1
If the DTC exists, replace fuel injector no. 1.

<b>CO</b>	<b>NOTES</b>	None.
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Check the connectors of fuel injector no. 1. Check the ECM connections. Repair if necessary.
Measure the <b>resistance</b> of fuel injector no. 1 across <b>terminals 1 and 2</b> . If the resistance is not approximately <b>0.33 Ω at 20 °C</b> , replace fuel injector no. 1. Check the <b>continuity and absence of interference resistance</b> on the following connections: ECM (F1) terminal 74 and fuel injector 1 harness connector terminal 2 ECM (F1) terminal 33 and fuel injector 1 harness connector terminal 1
If the DTC exists, replace fuel injector no. 1.

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>CYL 1 INJECTOR CIRC CONTINUED</b>	
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<b>CC</b>	<b>NOTES</b>	None.
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<p>Check the connectors of fuel injector no. 1. Check the ECM connections (ensuring that there are no conductive particles or bent pins). Repair if necessary.</p>
<p>Measure the <b>resistance</b> of fuel injector no. 1 across <b>terminals 1 and 2</b>. If the resistance is not approximately <b>0.33 Ω at 20 °C</b>, replace fuel injector no. 1. Check the <b>insulation</b> between the following connections: ECM <b>(F1)</b> terminal 33 and fuel injector 1 harness connector terminal 1 ECM <b>(F1)</b> terminal 74 and fuel injector 1 harness connector terminal 2</p>
<p>If the DTC exists, replace fuel injector no. 1.</p>

<b>1.DEF</b>	<b>NOTES</b>	None.
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<p>Measure the <b>resistance</b> of fuel injector no. 1 across <b>terminals 1 and 2</b>. If the resistance is not approximately <b>0.33 Ω at 20 °C</b>, replace fuel injector no. 1. Check the <b>continuity, absence of interference resistance and insulation</b> on the following connections: ECM <b>(F1)</b> terminal 33 and fuel injector 1 harness connector terminal 1 ECM <b>(F1)</b> terminal 74 and fuel injector 1 harness connector terminal 2 Also check the <b>insulation</b> between the same two connections.</p>
<p>If the DTC exists, replace fuel injector no. 1.</p>
<p>If the DTC exists, replace ECM.</p>

<b>AFTER REPAIR</b>	<p>Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.</p>
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>CYL 2 INJCTOR CIRC PRESENT OR STORED</b>	<u>CYLINDER 2 FUEL INJECTOR CIRCUIT</u> CC.1 : Short circuit to + 12 V CO : Open circuit CC : Short circuit 1.DEF : Injector control
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> If the DTC becomes present following an engine start.
	<b>Special notes:</b> Use CONSULT-II for all operations on the ECM connectors.

<b>CC.1</b>	<b>NOTES</b>	None.
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Check the connections for fuel injector no. 2. Check the ECM connections. Repair if necessary.
Measure the <b>resistance</b> of fuel injector no. 2 across <b>terminals 1 and 2</b> . If the resistance is not approximately <b>0.33 Ω at 20 °C</b> , replace fuel injector no. 2. Check the <b>continuity and insulation</b> of the following connections: ECM (F1) terminal 94 and fuel injector 2 harness connector terminal 2 ECM (F1) terminal 54 and fuel injector 2 harness connector terminal 1
If the DTC exists, replace fuel injector no. 2.

<b>CO</b>	<b>NOTES</b>	None.
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Check the connections for fuel injector no. 2. Check the ECM connections. Repair if necessary.
Measure the <b>resistance</b> of fuel injector no. 2 across <b>terminals 1 and 2</b> . If the resistance is not approximately <b>0.33 Ω at 20 °C</b> , replace fuel injector no. 2. Check the <b>continuity and absence of interference resistance</b> on the following connections: ECM (F1) terminal 54 and fuel injector 2 harness connector terminal 1 ECM (F1) terminal 94 and fuel injector 2 harness connector terminal 2
If the DTC exists, replace fuel injector no. 2.

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>CYL 2 INJECTOR CIRC CONTINUED</b>	
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<b>CC</b>	<b>NOTES</b>	None.
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<p>Check the connections for fuel injector no. 2. Check the ECM connections (ensure that there are no conductive particles or bent pins). Repair if necessary.</p>
<p>Measure the <b>resistance</b> of fuel injector no. 2 across <b>terminals 1 and 2</b>. If the resistance is not approximately <b>0.33 Ω at 20 °C</b>, replace fuel injector no. 2. Check the <b>insulation</b> between the following connections: ECM <b>(F1)</b> terminal 94 and fuel injector 2 harness connector terminal 2 ECM <b>(F1)</b> terminal 54 and fuel injector 2 harness connector terminal 1</p>
<p>If the DTC exists, replace fuel injector no. 2.</p>

<b>1.DEF</b>	<b>NOTES</b>	None.
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<p>Measure the <b>resistance</b> of fuel injector no. 2 across <b>terminals 1 and 2</b>. If the resistance is not approximately <b>0.33 Ω at 20 °C</b>, replace fuel injector no. 2. Check the <b>continuity, absence of interference resistance and insulation</b> on the following connections: ECM <b>(F1)</b> terminal 94 and fuel injector 2 harness connector terminal 2 ECM <b>(F1)</b> terminal 54 and fuel injector 2 harness connector terminal 1</p>
<p>If the DTC exists, replace fuel injector no. 2.</p>
<p>If the DTC exists, replace ECM.</p>

<b>AFTER REPAIR</b>	<p>Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.</p>
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>CYL 3 INJCTOR CIRC PRESENT OR STORED</b>	<u>CYLINDER 3 FUEL INJECTOR CIRCUIT</u> CC.1 : Short circuit to + 12 V CO : Open circuit CC : Short circuit 1.DEF : Injector control
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> If the DTC becomes present following an engine start.
	<b>Special notes:</b> Use CONSULT-II for all operations on the ECM connectors.

<b>CC.1</b>	<b>NOTES</b>	None.
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Check the connections for fuel injector no. 3. Check the ECM connections. Repair if necessary.
Measure the <b>resistance</b> of fuel injector no. 3 across <b>terminals 1 and 2</b> . If the resistance is not approximately <b>0.33 Ω at 20 °C</b> , replace fuel injector no. 3. Check the <b>continuity and insulation</b> of the following connections: ECM (F1) terminal 93 and fuel injector 3 harness connector terminal 2 ECM (F1) terminal 53 and fuel injector 3 harness connector terminal 1
If the DTC exists, replace fuel injector no. 3.

<b>CO</b>	<b>NOTES</b>	None.
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Check the connections for fuel injector no. 3. Check the ECM connections. Repair if necessary.
Measure the <b>resistance</b> of fuel injector no. 3 across <b>terminals 1 and 2</b> . If the resistance is not approximately <b>0.33 Ω at 20 °C</b> , replace fuel injector no. 3. Check the <b>continuity and absence of interference resistance</b> on the following connections: ECM (F1) terminal 93 and fuel injector 3 harness connector terminal 2 ECM (F1) terminal 53 and fuel injector 3 harness connector terminal 1
If the DTC exists, replace fuel injector no. 3.

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>CYL 3 INJECTOR CIRC CONTINUED</b>	
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<b>CC</b>	<b>NOTES</b>	None.
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<p>Check the connections for fuel injector no. 3. Check the ECM connections (ensure that there are no conductive particles or bent pins). Repair if necessary.</p>
<p>Measure the <b>resistance</b> of fuel injector no. 3 across <b>terminals 1 and 2</b>. If the resistance is not approximately <b>0.33 Ω at 20 °C</b>, replace fuel injector no. 3. Check the <b>insulation</b> between the following connections: ECM <b>(F1)</b> terminal 93 and fuel injector 3 harness connector terminal 2 ECM <b>(F1)</b> terminal 53 and fuel injector 3 harness connector terminal 1</p>
<p>If the DTC exists, replace fuel injector no. 3.</p>

<b>1.DEF</b>	<b>NOTES</b>	None.
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<p>Measure the <b>resistance</b> of fuel injector no. 3 across <b>terminals 1 and 2</b>. If the resistance is not approximately <b>0.33 Ω at 20 °C</b>, replace fuel injector no. 3. Check the <b>continuity, absence of interference resistance and insulation</b> on the following connections: ECM <b>(F1)</b> terminal 93 and fuel injector 3 harness connector terminal 2 ECM <b>(F1)</b> terminal 53 and fuel injector 3 harness connector terminal 1</p>
<p>If the DTC exists, replace fuel injector no. 3.</p>
<p>If the DTC exists, replace ECM.</p>

<b>AFTER REPAIR</b>	<p>Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.</p>
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>CYL 4 INJECTOR CIRC PRESENT OR STORED</b>	<u>CYLINDER 4 FUEL INJECTOR CIRCUIT</u> CC.1 : Short circuit to + 12 V CO : Open circuit CC : Short circuit 1.DEF : Injector control
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> If the DTC becomes present following an engine start.
	<b>Special notes:</b> Use CONSULT-II for all operations on the ECM connectors.

<b>CC.1</b>	<b>NOTES</b>	None.
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Check the connections for fuel injector no. 4. Check the ECM connections. Repair if necessary.
Measure the <b>resistance</b> of fuel injector no. 4 across <b>terminals 1 and 2</b> . If the resistance is not approximately <b>0.33 Ω at 20 °C</b> , replace fuel injector no. 4. Check the <b>continuity and insulation</b> of the following connections: ECM <b>(F1)</b> terminal 73 and fuel injector 4 harness connector terminal 2 ECM <b>(F1)</b> terminal 34 and fuel injector 4 harness connector terminal 1
If the DTC exists, replace fuel injector no. 4.

<b>CO</b>	<b>NOTES</b>	None.
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Check the connections for fuel injector no. 4. Check the ECM connections. Repair if necessary.
Measure the <b>resistance</b> of fuel injector no. 4 across <b>terminals 1 and 2</b> . If the resistance is not approximately <b>0.33 Ω at 20 °C</b> , replace fuel injector no. 4. Check the <b>continuity and absence of interference resistance</b> on the following connections: ECM <b>(F1)</b> terminal 73 and fuel injector 4 harness connector terminal 2 ECM <b>(F1)</b> terminal 34 and fuel injector 4 harness connector terminal 1
If the DTC exists, replace fuel injector no. 4.

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>CYL 4 INJECTOR CIRC CONTINUED</b>	
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<b>CC</b>	<b>NOTES</b>	None.
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<p>Check the connections for fuel injector no. 4. Check the ECM connections (ensure that there are no conductive particles or bent pins). Repair if necessary.</p>
<p>Measure the <b>resistance</b> of fuel injector no. 4 across <b>terminals 1 and 2</b>. If the resistance is not approximately <b>0.33 Ω at 20 °C</b>, replace fuel injector no. 4. Check the <b>insulation</b> between the following connections: ECM <b>(F1)</b> terminal 73 and fuel injector 4 harness connector terminal 2 ECM <b>(F1)</b> terminal 34 and fuel injector 4 harness connector terminal 1</p>
<p>If the DTC exists, replace fuel injector no. 4.</p>

<b>1.DEF</b>	<b>NOTES</b>	None.
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<p>Measure the <b>resistance</b> of fuel injector no. 4 across <b>terminals 1 and 2</b>. If the resistance is not approximately <b>0.33 Ω at 20 °C</b>, replace fuel injector no. 4. Check the <b>continuity, absence of interference resistance and insulation</b> on the following connections: ECM <b>(F1)</b> terminal 73 and fuel injector 4 harness connector terminal 2 ECM <b>(F1)</b> terminal 34 and fuel injector 4 harness connector terminal 1</p>
<p>If the DTC exists, replace fuel injector no. 4.</p>
<p>If the DTC exists, replace ECM.</p>

<b>AFTER REPAIR</b>	<p>Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.</p>
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>BATTERY VOLTAGE PRESENT OR STORED</b>	<u><b>BATTERY VOLTAGE</b></u> 1.DEF : Excess voltage 2.DEF : Not enough voltage
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> If the DTC appears after the ignition is switched on or with the engine running.
	<b>Special notes:</b> Computer operating voltage: <b>6 V &lt; operating voltage &lt; 18 V</b> . A battery voltage which is too low may cause the injection malfunction warning light to come on (severity 1). Use CONSULT-II for all operations on the ECM connectors.

<b>1.DEF</b>	<b>NOTES</b>	None.
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Check the charging circuit (Refer to SC section).  Carry out any necessary repairs.
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<b>2.DEF</b>	<b>NOTES</b>	Use the " <b>Wiring Diagrams</b> ".
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<p><b>With the ignition switch is "off"</b>, measure the battery voltage at its terminals.            If the voltage is below <b>12.5 V</b>, recharge and test the battery.            If it is deteriorated, replace the battery then test the charge circuit. (Refer to SC section.)</p> <p><b>With the ignition on then with the starter motor turning</b>, measure the battery voltage at its terminals.            If the voltage drops below <b>9.6 V</b>, check the tightness and condition of the battery terminals.            Recharge and test the battery.            Replace the battery if it is NG.</p> <p>If the starter is turning the engine over correctly, but the DTC exists,            – check <b>the continuity and absence of interference resistance</b> on the following connections:                ECM (E81) terminal 92 and ECM relay harness connector terminal 5                ECM (E81) terminal 31 and ECM relay harness connector terminal 5                ECM (E81) terminals 7, 8, 32 and ground            Check the connectors of the ECM.</p> <p>Carry out the necessary repairs.</p>
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<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>COMPUTER SUPPLY VOLTAGE PRESENT OR STORED</b>	<b>COMPUTER (ECM) SUPPLY VOLTAGE</b> 1.DEF : Voltage not within the permitted range
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> If the DTC appears after the ignition is switched on or with the engine running.
	<b>Special notes:</b> ECM operating voltage: <b>6 V &lt; operating voltage &lt; 18 V.</b> Use CONSULT-II for all operations on the ECM connectors.

<b>1.DEF</b>	<b>NOTES</b>	Use the <b>Wiring Diagrams</b> for your vehicle.
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<p>Check <b>the continuity, absence of interference resistance and insulation</b> on the following connection:            ECM (E81) terminal 28 and fuse block (M1)            Repair if necessary.</p> <p>Check <b>10 A</b> fuse. If NG, replace fuse.</p> <p>If the DTC persists:</p> <ul style="list-style-type: none"> <li>– clear the DTC,</li> <li>– switch off the ignition, and wait at least ten seconds.</li> <li>– switch the ignition back on and establish communication with the CONSULT-II.</li> </ul> <p><b>1) If the DTC does not reappear:</b></p> <ul style="list-style-type: none"> <li>– start the engine,</li> <li>– with the engine at idling speed, wait <b>1 minute</b>,</li> <li>– if the DTC reappears, proceed to <b>2</b>,</li> <li>– if the DTC does not reappear, perform a road test,</li> <li>– if the DTC reappears, proceed to <b>2</b>,</li> <li>– If the DTC does not reappear, end of trouble diagnosis.</li> </ul> <p><b>2) If the DTC reappears:</b>            Replace ECM.</p>
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<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

F9Q

<b>REFRIGERANT SENSOR CIRC PRESENT OR STORED</b>	<u>REFRIGERANT FLUID SENSOR CIRCUIT</u> CC.1 : Short circuit to + 12 V CO.0 : Open circuit or short circuit to earth (ground)
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<b>NOTES</b>	<b>Processing priority in the event of a number of DTCs:</b> Deal with DTC <b>Sensor supply voltage n°2</b> first if it is present or stored.
	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> If the DTC reappears after the memory has been erased and <ul style="list-style-type: none"> <li>– the ignition has been switched off and communication with the CONSULT-II has been lost,</li> <li>– the ignition has been switched on and communication is established,</li> <li>– the engine has been running for one minute.</li> </ul>
	<b>Special notes:</b> If the fault is present, air conditioning is not authorised. Use CONSULT-II for all operations on the ECM connectors.

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>REFRIGERANT SENSOR CIRC</b>  <b>CONTINUED</b>	
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<b>CC.1 CC.0</b>	<b>NOTES</b>	None.
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<p>Check the refrigerant pressure sensor connectors.</p> <p>Check the connectors on the ECM.</p> <p>Repair if necessary.</p> <p>Check the conformity of the refrigerant pressure sensor signal by <b>comparing* the value displayed by the diagnostic tool</b> (data monitor item: <b>Refrigerant pressure</b>) with an air conditioning filling station high-pressure gauge reading.</p> <p><b>A- If the values do not coincide:</b></p> <ul style="list-style-type: none"> <li>– Check the <b>insulation, the continuity and absence of interference resistance</b> on the following connections:</li> </ul> <p>ECM (F1) terminal 106 and refrigerant pressure sensor harness connector 2  ECM (F1) terminal 66 and refrigerant pressure sensor harness connector 3  ECM (F1) terminal 78 and refrigerant pressure sensor harness connector 1</p> <p>Carry out the necessary repairs.</p> <ul style="list-style-type: none"> <li>– Check the conformity of the refrigerant pressure sensor power supply: <ul style="list-style-type: none"> <li>Check voltage on terminal 3 (+ 5 V)</li> <li>Check voltage on terminal 1 (Approximately 0 V)</li> </ul> </li> <li>– If the power supply and connections are okay, replace the refrigerant pressure sensor.</li> </ul> <p><b>B- If the values coincide:</b></p> <ul style="list-style-type: none"> <li>– Perform trouble diagnosis on the air conditioning system.</li> </ul> <p>*Note:</p> <p>The diagnostic tool displays the <b>absolute pressure</b>, the air conditioning filling station high-pressure gauge displays the <b>relative pressure</b> (the difference between them is ~ 1 bar (1000 hPa, i.e. atmospheric pressure).</p>
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<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>BRAKE SWITCH CIRCU PRESENT OR STORED</b>	<b><u>BRAKE SWITCH CIRCUIT</u></b> 1.DEF : Inconsistency of the signal 2.DEF : No signal
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<b>NOTES</b>	<b>Conditions for applying the fault finding procedure to the stored DTC:</b> If the DTC reappears as present after: <ul style="list-style-type: none"> <li>– the DTC has been cleared from ECM memory,</li> <li>– the ignition has been switched off and dialogue with the CONSULT-II has been lost,</li> <li>– the ignition has been switched on and dialogue has been established.</li> <li>– followed by the engine being started and the brake pedal being depressed.</li> </ul>
	<b>Special notes:</b> If the DTC is present, ASCD is deactivated. Use CONSULT-II for all operations on the ECM connectors.

<b>1.DEF</b>	<b>NOTES</b>	None.
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Check the brake switch connectors. Check the condition and <b>adjustment of the brake switch</b> connector. Repair if necessary.
Check the following switch <b>supplies</b> : <b>+ 12 V battery</b> —————> Terminal 1 of the ASCD brake switch connector <b>(M122)</b> . Check <b>the conformity of the</b> brake switch: <b>Brake pedal released:</b> Continuity should exist between terminals 1 and 2. <b>Brake pedal depressed:</b> Continuity should not exist between terminals 1 and 2. Replace the switch if necessary.
Check <b>the continuity and insulation</b> of the following connections: Continuity should exist between terminals 1 and 2 of ASCD brake switch connector <b>(M122)</b> .

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnosis. Erase the DTC from the ECM. Switch the ignition off and carry out a road test followed by a check with the CONSULT-II.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

F9Q

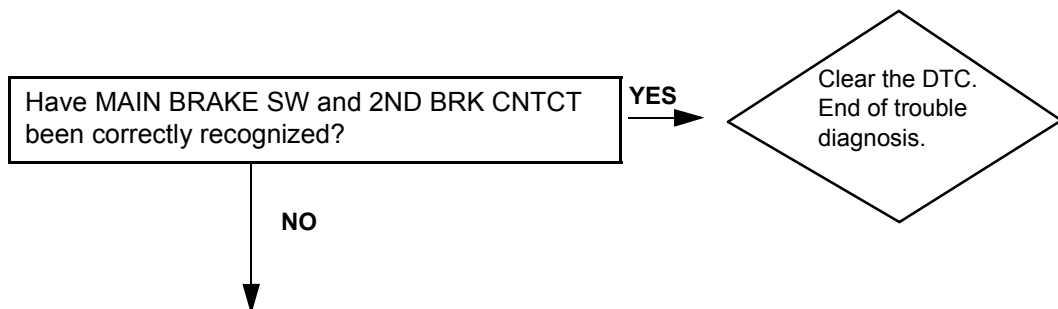
BRAKE SWITCH CIRCU CONTINUED	
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<b>2.DEF</b>	<b>NOTES</b>	None.
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From the List of states menu, check

- brake pedal at rest
- brake pedal depressed

**MAIN BRAKE SW** and **2ND BRK CNTCT** and check:  
**MAIN BRAKE SW = INACTIVE** and **2ND BRK CNTCT = ACTIVE:**  
**MAIN BRAKE SW = ACTIVE** and **2ND BRK CNTCT = ACTIVE:**



Check **the continuity, absence of interference resistance and insulation** on the following connection:  
 ECM (E81) terminal 79 and ASCD brake switch connector (M122) terminal 2

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnosis. Erase the DTC from the ECM. Switch the ignition off and carry out a road test followed by a check with the CONSULT-II.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>SPD LIM/CRUIS CTRL</b>	<b>ASCD</b> 1.DEF : Inconsistency of the signal 2.DEF : Controls at the steering wheel 3.DEF : Inconsistent vehicle speed
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<b>NOTES</b>	<b>Conditions for applying the fault finding procedure to the stored DTC:</b> If the DTC becomes present following an engine start.
	<b>Special notes:</b> Use CONSULT-II for all operations on ECM connectors.

<b>1.DEF</b>	<b>NOTES</b>	None.
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<b>2.DEF</b>	<b>NOTES</b>	None.
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<b>3.DEF</b>	<b>NOTES</b>	None.
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<p>Check whether state CRS CN/S LMTR has been recognised correctly.            If it has been recognised, clear the DTC and exit trouble diagnosis procedure.            If it has not been recognised:            Check <b>the continuity and insulation</b> of the following connections: start / stop button towards the switch.            Check the conformity of the start / stop button (2 normally open contacts which switch a + 12 V feed).            Check the resistances of the steering wheel controls when the following are pressed:            resume = Approx. 910 <math>\Omega</math>            cancel = Approx. 0 <math>\Omega</math>            set/+ = Approx. 270 <math>\Omega</math>            set/- = Approx. 100 <math>\Omega</math>            Carry out this check on all of the connections concerned.  <b>Check with the driver:</b>            1.DEF: is the inconsistency due to the ASCD functions being simultaneously present?            2.DEF: do the resistance values according to the presses have an unusual line resistance or shift?            3.DEF: which inconsistency is it?</p>	
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<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnosis. Erase the DTC from the ECM. Switch the ignition off and carry out a road test followed by a check with the CONSULT-II.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>RAIL PRES REGULTIN PRESENT OR STORED</b>	<b><u>FUEL RAIL PRESSURE REGULATION FUNCTION</u></b> CC.1 : Short circuit to + 12 V CO.0 : Short circuit to earth (ground) CO : Open circuit 1.DEF : Internal electrical malfunction 2.DEF : Measured pressure too low 3.DEF : Measured pressure too high 4.DEF : Insufficient pressure 5.DEF : Pressure < minimum 6.DEF : Pressure > maximum
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<b>CC.1</b>	<b>NOTES</b>	None.
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<p>Check the fuel pressure regulator connections.            Check the injection ECM connections.            Repair if necessary.</p>
<p>Measure the <b>resistance</b> across <b>tracks 1</b> and <b>2</b> of the fuel pressure regulator.            If the resistance is not: <b>3 Ω ± 0.1 at 20 °C</b>, replace the fuel pressure regulator.            Check <b>the insulation</b> against <b>+ 12 V</b> of the following connection:                ECM <b>(F1)</b> terminal 52 and fuel flow regulator terminal 2</p>
<p>If the DTC persists, replace the fuel flow regulator.</p>

<b>CC.0 CO</b>	<b>NOTES</b>	None.
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<p>Check the flow regulator connections.            Check the injection ECM connections.            Repair if necessary.</p>
<p>Measure the <b>resistance</b> between <b>terminals 1</b> and <b>2</b> of the fuel pressure regulator.            If the resistance is not: <b>3 Ω ± 0.1 at 20 °C</b>, replace the fuel fuel pressure regulator.            Check <b>the continuity, absence of interference resistance and insulation</b> on the following connection:                ECM <b>(F1)</b> terminal 52 and fuel pressure regulator terminal 2</p>
<p>With the ignition on, check for the presence of <b>+ 12 V</b> after relay on <b>track 1</b> of the fuel flow regulator (coming from <b>terminal 5</b> of the <b>ECM relay terminal harness connector 5</b>).</p>
<p>If the DTC persists, replace the fuel pressure regulator.</p>

<b>AFTER REPAIR</b>	<p>Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.</p>
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>RAIL PRES REGULTIN CONTINUED 1</b>	
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<b>1.DEF</b>	<b>NOTES</b>	None.
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<p>Measure the <b>resistance</b> between <b>terminals 1</b> and <b>2</b> of the fuel pressure regulator.</p> <p>If the resistance is not approximately: <b><math>3\ \Omega \pm 0.1</math> at 20 °C</b>, replace the fuel pressure regulator.</p> <p>Check the <b>insulation, the continuity and absence of interference resistance</b> on the following connections:</p> <p>ECM <b>(F1)</b> terminal 52 and fuel pressure regulator harness connector terminal 2</p> <p>Fuel pressure regulator terminal 1 and ECM relay terminal harness connector terminal 5</p> <p>With the ignition on, check for the presence of <b>+ 12 V</b> after relay on <b>terminal 1</b> of the fuel pressure regulator.</p>
<p>If the DTC exists, <b>check that the ECM output stage is working correctly</b>:</p> <p>● <b>Either by ammeter</b>:</p> <p>With the solenoid valve connected, connect the ampermetric clamp to the <b>terminal 1</b> connection of the solenoid valve (in the direction of the current).</p> <p>Clear any DTCs in the fuel pressure regulator then perform active test <b>RAIL PRESS REG</b>:</p> <p>➡ The ammeter should display ten cycles of two successive currents: <b>~ 0.6 A</b> then <b>~ 2 A</b></p> <p>● <b>Either by voltmeter</b>:</p> <p>With the solenoid valve connected, connect the earth cable of the voltmeter to <b>terminal 2</b> of the fuel pressure solenoid valve and the positive cable to <b>terminal 1</b>.</p> <p>Clear any DTCs in the fuel pressure regulator then perform active test <b>RAIL PRESS REG</b>:</p> <p>➡ The voltmeter should display two successive voltages approximately equal to the combined voltage of the battery and the current Opening Cyclic Ratio, i.e. successively: <b>~ 3.15 V</b> for an Opening Cyclic Ratio of 25% then <b>~ 9.45 V</b> for an Opening Cyclic Ratio of 75% (ten cycles).</p> <p>● <b>Or on the oscilloscope</b> (calibrated to 5 V/division and a time base of 1 ms/div):</p> <p>With the solenoid valve connected, connect the earth of the oscilloscope to the battery earth and the positive test pin to <b>terminal 2</b> of the fuel pressure solenoid valve.</p> <p>Clear any DTCs in the fuel pressure regulator then perform active test <b>RAIL PRESS REG</b>:</p> <p>➡ The oscilloscope should display a square wave signal with an amplitude of <b>12.5 V</b> at a frequency of <b>185 Hz</b> (with an Opening Cyclic Ratio which increases successively from 25 to 75 %).</p>

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

**F9Q**

RAIL PRES REGULTIN CONTINUED 2	
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2.DEF to 6.DEF	NOTES	None.
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**In the event of rail overpressure:**

Check the operation of the injectors: see the **Help "Injector fault finding"** section of this note.

Check the operation of the rail pressure sensor. Data monitor item: **RAIL PRESSURE**.

If these checks reveal no faults, replace the regulator.

**In the event of rail underpressure:**

Check the operation of the rail pressure sensor. Data monitor item: **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 there are no air bubbles between the filter and the high pressure pump.

Check the sealing of the low and high-pressure fuel lines (visual checks, odour, etc.) pump housing, overpressure valve, pipes, rail and injector unions, injector wells, etc.

Check the conformity of the seal fitting on the pressure regulator.

Check the operation of the injectors: see the **"Injector trouble diagnosis"** section in this section.

Carry out the necessary repairs.

If the DTC exists, replace the fuel flow regulator first, and if the DTC still exists replace the high-pressure pump.

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>TRBCHRGING SOL V C CIRC PRESENT OR STORED</b>	<b><u>TURBOCHARGER BOOST CONTROL SOLENOID VALVE CIRCUIT</u></b> CC.1 : Short circuit to + 12 V CC.0 : Short circuit to earth (ground) CO : Open circuit 1.DEF : Internal electrical malfunction
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<b>NOTES</b>	<p><b>Conditions for applying the diagnostic procedure to the stored DTC:</b>            If the DTC reappears after the DTC has been cleared and:</p> <ul style="list-style-type: none"> <li>– the engine has been started and left running for <b>30 seconds</b>.</li> <li>– the ignition has been switched off, followed by loss of communication with the diagnostic tool,</li> <li>– the ignition has been switched on and communication has been established.</li> </ul>
	<p><b>Special notes:</b>            The DTC is present if:</p> <ul style="list-style-type: none"> <li>– turbocharging is no longer authorised,</li> <li>– exhaust gas recirculation is deactivated,</li> <li>– the severity 1 warning light is lit.</li> </ul> <p>Use CONSULT-II for all operations on the ECM connectors.</p>

<b>CC.1 CO.0 CO</b>	<b>NOTES</b>	None.
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Check the connections of the turbocharger boost control solenoid valve. Repair if necessary.
Check the resistance between <b>terminals 1 and 2</b> of the turbocharger boost control solenoid valve: The resistance should be: <b>15.4 Ω ± 0.7 at 20 °C</b> . Replace the solenoid valve if the resistance is outside the tolerance values.
Check the ECM connections. Check <b>the continuity, absence of interference resistance and insulation</b> on the following connection: ECM (F1) terminal 36 and turbocharger boost control solenoid valve harness connector terminal 2 Repair if necessary.
Check for the presence of <b>+ 12 V</b> after relay on <b>terminal 1</b> of the turbocharger boost control solenoid valve (coming from <b>terminal 5</b> of the ECM relay connector).
If the DTC exists, replace the turbocharger boost control solenoid valve.

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>TRBCHRGING SOL V C CIRC  CONTINUED</b>	
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<b>1.DEF</b>	<b>NOTES</b>	None.
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<p>Check the connections of the turbocharger boost control solenoid valve. Repair if necessary.</p>
<p>Check the resistance between <b>terminals 1</b> and <b>2</b> of the turbocharger boost control solenoid valve: The resistance should be: <b>15.4 Ω ± 0.7 at 20 °C</b>. Replace the solenoid valve if the resistance is outside the tolerance valves.</p>
<p>Check the ECM connections. Check <b>the continuity, absence of interference resistance and insulation</b> on the following connection: ECM <b>(F1)</b> terminal 36 and turbocharger boost control solenoid valve harness connector terminal 2 Repair if necessary.</p>
<p>Check for the presence of <b>+ 12 V</b> after relay on <b>terminal 1</b> of the turbocharger boost control solenoid valve (coming from <b>terminal 2</b> of the ECM relay connector).</p>
<p>If the DTC persists, <b>check that the ECM output stage is working correctly</b>:</p> <p>With the turbocharger boost control solenoid valve connected:</p> <p>● <b>Either by voltmeter</b>:</p> <p>Connect the voltmeter earth cable to <b>terminal 2</b> of the solenoid valve and the positive cable to <b>terminal 1</b>. Clear any DTCs in the solenoid valve, then perform active test <b>TURBO SOL VALVE</b>:</p> <p style="padding-left: 20px;">➡ The voltmeter should display <b>ten cycles</b> of two successive voltages approximately equal to the combined voltage of the battery and the current Opening Cyclic Ratio, i.e.: <b>~ 2.5 V</b> (Opening Cyclic Ratio of <b>20%</b>) then <b>~ 8.75 V</b> (Opening Cyclic Ratio of <b>70%</b>).</p> <p>● <b>Or on the oscilloscope</b> (calibrated to 5 V/division and a time base of 1 ms/div): Connect the earth of the oscilloscope to the battery earth and the positive test pin to <b>terminal 1</b> of the solenoid valve. Erase any DTCs in the solenoid valve, perform active test <b>TURBO SOL VALVE</b>:</p> <p style="padding-left: 20px;">➡ The oscilloscope should display a square wave signal with an amplitude of 12.5 V (equal to the battery voltage) at a frequency of 140 Hz (with an Opening Cyclic Ratio increasing successively from <b>~ 20</b> to <b>~ 70%</b>).</p> <p style="padding-left: 20px;">–If the measurement is correct, replace the solenoid valve. –If the measurement does not show any control or continuous voltage, replace ECM.</p>

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>TRBCHRGNG SOL V C CIRC PRESENT OR STORED</b>	<b><u>TURBOCHARGER BOOST PRESSURE CONTROL CIRCUIT</u></b> 1.DEF : Pressure too low 2.DEF : Pressure too high
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> If the DTC reappears after the DTC has been cleared and: <ul style="list-style-type: none"><li>– the DTC has been cleared from memory,</li><li>– the ignition has been switched off and communication with the diagnostic tool has been lost,</li><li>– the ignition has been switched on and communication has been established with the diagnostic tool,</li><li>– the engine has been started followed by a road test.</li></ul>
	<b>Special notes:</b> The DTC is present if: <ul style="list-style-type: none"><li>– turbocharging is no longer authorised,</li><li>– exhaust gas recirculation is deactivated,</li><li>– the <b>severity 1</b> warning light is lit.</li></ul> Use CONSULT-II for all operations on the ECM connectors.

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>TRBCHRGNG SOL V C CIRC CONTINUED 1</b>	
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<b>1.DEF</b>	<b>NOTES</b>	None.
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<p>Check the turbocharger boost pressure sensor connectors. Check the connections of the wastegate solenoid valve. Check the connectors on the ECM. Repair if necessary.</p>
<p>Check the conformity of the turbocharger boost pressure signal by performing trouble diagnosis on parameter <b>FLRD BST PRES</b>.</p>
<p><b>Check the sealing of the high-pressure air circuit:</b></p> <ul style="list-style-type: none"> <li>– disconnected or pierced pipes,</li> <li>– pressure sensor disconnected or poorly fitted (seal present),</li> <li>– exchanger pierced (to check the exchanger: with the vehicle stationary, stabilise the engine speed between 3500 and 4000 rpm and check that there are no leaks).</li> </ul>
<p><b>Check the operation of the turbocharger and its control circuit:</b></p> <ul style="list-style-type: none"> <li>– With the engine stopped, make sure the control shaft is in the resting position.</li> <li>– Start the engine and check that the control shaft is moved to its upper stop (when the engine is stopped, the control shaft should return to its rest position).</li> </ul> <p>If the control shaft does not move correctly, carry out the following checks:</p> <p><b>1 Check the control vacuum pressure:</b></p> <ul style="list-style-type: none"> <li>– Disconnect the solenoid valve intake <b>hose</b> and connect it to a pressure gauge.</li> <li>– Start the engine and run it at a stabilised idle speed.</li> <li>– If the vacuum pressure does not reach <b>800 mbar ± 100</b>: check the vacuum pressure circuit from the vacuum pump.</li> <li>– Stop the engine, reconnect the intake hose and go to step 2.</li> </ul> <p><b>2 Solenoid valve control check:</b></p> <ul style="list-style-type: none"> <li>– Disconnect the solenoid valve outlet <b>hose</b>.</li> <li>– Start the engine and run it at a stabilised idle speed.</li> <li>– Place your hand on the solenoid valve and block the outlet <b>union</b> with your thumb.</li> <li>– If you notice no solenoid valve vibration, check the operation of the computer output stage (<b>refer to TRBCHRGNG SOL V C CIRC 1.DEF</b>).</li> </ul> <p><b>3 Solenoid valve operation check:</b></p> <ul style="list-style-type: none"> <li>– Connect the pressure gauge to the solenoid valve outlet <b>union</b>.</li> <li>– Start the engine and run it at a stabilised idle speed.</li> </ul> <p>If the vacuum pressure does not reach <b>800 mbar ± 100</b>, replace the solenoid valve.</p>
<p><b>Check that the exhaust gas recirculation valve is not stuck open.</b></p>

<b>AFTER REPAIR</b>	<p>Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.</p>
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>TRBCHRGNG SOL V C CIRC CONTINUED 2</b>	
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<b>2.DEF</b>	<b>NOTES</b>	<b>Priority when dealing with a number of DTCs:</b> Deal with DTC <b>Turbocharging pressure sensor circuit, CC.1</b> first if it is present or stored.
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Check the turbocharger boost pressure sensor connectors. Check the connections of the wastegate solenoid valve. Check the connectors on the ECM. Repair if necessary.
Check the conformity of the turbocharger boost pressure signal by performing trouble diagnosis on data monitor item <b>BT PRES REF V</b> .
<b>Make sure the turbocharger limit solenoid valve is not blocked open:</b> <ul style="list-style-type: none"> <li>– With the engine stopped, disconnect the <b>inlet and outlet hoses</b> from the solenoid valve.</li> <li>– Connect a vacuum pump to the inlet <b>union</b> and apply a vacuum.</li> <li>– If the vacuum pressure <b>is not maintained</b>: replace the solenoid valve.</li> </ul>
<b>Check that the turbocharger operation has not seized:</b> <ul style="list-style-type: none"> <li>– With the engine stopped, make sure the turbocharger control shaft is in the rest position.</li> <li>– Apply a vacuum of <b>800 mbar ± 100</b> to the hose connected to the turbocharger control diaphragm.</li> <li>– If the diaphragm maintains the vacuum, check the movement and setting of the turbocharger control shaft.</li> </ul> If the control shaft is seized, replace the turbocharger.

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>AIR FLOW SEN CIRC PRESENT OR STORED</b>	<b><u>MASS AIR FLOW SENSOR CIRCUIT (MAF SENSOR CIRCUIT)</u></b> CC.1 : Short circuit to + 12 V CO.0 : Open circuit or short circuit to earth (ground) 1.DEF : Offset at maximum threshold 2.DEF : Offset at minimum threshold 3.DEF : Parameter at maximum limit 4.DEF : Parameter at minimum limit.
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored ECM:</b> If the DTC appears at the end of power latch followed by after ignition switch is turned on.
	<b>Special notes:</b> Use CONSULT-II for all operations on the ECM connectors.

<b>CC.1</b>	<b>NOTES</b>	None.
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Check the MAF sensor connections. Check the ECM connections. Repair if necessary.
Check the <b>continuity</b> and <b>insulation</b> against <b>+ 12 V</b> between: ECM (F1) terminal 85 and MAF sensor harness connector terminal 5
If the DTC exists and remains present, replace the MAF sensor.

<b>CO.0</b>	<b>NOTES</b>	None.
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Check the MAF sensor connections. Check the ECM connections. Repair if necessary.
Check the <b>continuity</b> and <b>insulation</b> against <b>ground</b> between: ECM (F1) terminal 42 and MAF sensor harness connector terminal 4
If the DTC exists and remains present, replace the MAF sensor.

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# F9Q

<b>1.DEF, 2.DEF</b> <b>3.DEF, 4.DEF</b>	<b>NOTES</b>	None.
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- Turn off the ignition, disconnect the connector and remove the EGR valve:

If the valve is found to be jammed in the open position when it is removed, replace the EGR valve.

- Otherwise, with the valve removed and connected, establish dialogue with the tool and perform active test

**EGR SOLENOID VALVE:**

Check:

- the movement of the valve,
- closing when the command is completed.

If this test shows that the valve is jammed or irrevocably seized: replace the EGR valve.

# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

WATER DTCT CIRC PRESENT OR STORED	<u>WATER IN FUEL CIRCUIT</u>
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NOTES	Conditions for applying the diagnostic procedure: When DTC stored or present.
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**A) Make sure the water in fuel sensor is properly connected.**

If not, clear the DTC,

Carry out a road test (speed > 12 mph (20 km/h) and engine speed > 1200 rpm) for more than **30 seconds**.

If the DTC does not recur, end the diagnostics.

If the DTC reappears, go to **step B**.

**B) If the sensor is properly connected:**

Bleed the fuel filter unit.

Erase the DTC.

Carry out a road test (speed > 12 mph (20 km/h) and engine speed > 1200 rpm) for more than **30 seconds**.

**If the DTC does not reappear**, finish the diagnostic procedure.

**C) If the DTC reappears:**

**Check the power supply** of the water in fuel sensor:

**+ 12 V after fuel block** between **terminal 2** of the water in fuel sensor

**Ground** between **terminal 1** of the water in fuel sensor

Carry out the necessary repairs.

**If none of these checks reveal a malfunction:**

Replace the water in fuel sensor.

Clear the DTC.

Carry out a road test (speed > 12 mph (20 km/h) and engine speed > 1200 rpm) for more than **30 seconds** to confirm the repair.

**Note:**

if the water level in the fuel filter unit is below the sensor's electrodes, some driving conditions (bends, slopes) may cause the malfunction **warning light to come on erroneously** (in effect, the sensor's off-centre position in the fuel filter unit, combined with the driving condition forces, cause the water detection and the light to come on).

AFTER REPAIR	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>INJECTOR CODE(S) PRESENT OR STORED</b>	<b>INJECTOR CODES</b> 1.DEF : Internal electronic malfunction during writing 2.DEF : No code stored
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> The DTC reappears after: <ul style="list-style-type: none"> <li>– the DTC has been cleared from memory,</li> <li>– the ignition has been switched off,</li> <li>– the end of power latch* and ignition has been switched on.</li> </ul>
	<b>Special notes:</b> The DTC is present if: <ul style="list-style-type: none"> <li>– engine speed is limited,</li> <li>– the severity 1 warning light is lit.</li> </ul>

<b>1.DEF GR1</b>	<b>NOTES</b>	None.
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Switch off the ignition. Wait until the end of power latch* and switch the ignition back on. Establish communication. If the DTC was previously <b>stored</b> , erase the DTC from memory and end the procedure. If the DTC is still <b>present</b> , replace ECM.
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<b>2.DEF GR1</b>	<b>NOTES</b>	None.
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This DTC <b>appears</b> on any blank ECM (new or freshly (re)programmed). Refer to general information for each injector correction value to be written by using work support mode with CONSULT-II. After the codes have been written: Switch off the ignition. Wait until the end of power latch* and switch the ignition back on. Set up communications and erase the DTC memory. End of the procedure. If the DTC exists, replace ECM.
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\* the immobiliser warning light will flash for a few seconds after the ignition is switched off

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>DAMPER CONTROL CIRCUIT PRESENT OR STORED</b>	<b><u>INTAKE THROTTLE VALVE CONTROL SOLENOID VALVE (DAMPER CONTROL) CIRCUIT</u></b> CC.1 : Short circuit to + 12 V CC.0 : Short circuit to earth (ground) CO : Open circuit 1.DEF : Internal electrical malfunction
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<b>NOTES</b>	<b>Conditions for applying diagnostic procedure to a stored DTC for CC.1, CO and 1.DEF:</b> If the DTC reappears after the DTC has been erased and: <ul style="list-style-type: none"> <li>– the engine has been started and left running for <b>10 seconds</b>.</li> <li>– the ignition has been switched off, followed by loss of communication with the diagnostic tool,</li> <li>– the ignition has been switched on and dialogue has been established.</li> </ul>
	<b>Special notes:</b> The DTC is present if: <ul style="list-style-type: none"> <li>– the vehicle is noisy when the engine is stopped (CC.1, CO, 1.DEF),</li> <li>– it is difficult or even impossible to start the vehicle (CC.0),</li> <li>– the severity 2 warning light is lit.</li> </ul> Use CONSULT-II for all operations on the ECM connectors.

<b>CC.1 CO.0 CO</b>	<b>NOTES</b>	None.
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Check the damper flap intake throttle valve control solenoid valve connections. Repair if necessary.
Check the resistance between <b>terminals 1 and 2</b> of the intake throttle valve control solenoid valve: The resistance should be between: <b>43 and 49 Ω at 25 °C</b> . Replace the solenoid valve if the resistance is outside the tolerance values.
Check the ECM connections. Check the <b>continuity, absence of interference resistance and insulation</b> on the following connection: ECM (F1) terminal 49 and intake throttle valve control solenoid valve harness connector terminal 2 Repair if necessary.
Check for the presence of <b>+ 12 V</b> after relay on <b>terminal 1</b> of the intake throttle valve control solenoid valve (coming from ECM relay harness connector terminal 5).
If the DTC exists, replace the intake throttle valve control valve solenoid valve.

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>DAMPER CONTROL CIRCUIT</b>  <b>CONTINUED 1</b>	
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<b>CO.0</b>	<b>NOTES</b>	None.
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<p>Check the damper flap intake throttle valve control solenoid valve connections. Repair if necessary.</p>
<p>Check the resistance between <b>terminals 1 and 2</b> of the intake throttle valve control solenoid valve: The resistance should be between: <b>43 and 49 Ω at 25 °C</b>. Replace the solenoid valve if the resistance is outside the tolerance values.</p>
<p>Check the ECM connections. Check the <b>continuity, absence of interference resistance and insulation</b> on the following connection: ECM <b>(F1)</b> terminal 49 and intake throttle valve control solenoid valve harness connector terminal 2 Repair if necessary.</p>
<p>Check for the presence of <b>+ 12 V</b> after relay on <b>terminal 1</b> of the damper intake throttle valve control flap solenoid valve (coming from ECM relay terminal 5).</p>
<p>If the DTC exists, <b>check that the ECM output stage is working correctly</b>: With the intake throttle valve control solenoid valve: connect the <b>negative</b> test pin of the voltmeter to <b>terminal 2</b> of the solenoid valve, connect the <b>positive</b> test pin of the voltmeter to <b>terminal 1</b> of the solenoid valve, perform active test <b>DAMPER FLAP</b>:  <div style="margin-left: 20px;"> <b>➡</b> The voltmeter should display <b>ten cycles</b> of two successive voltages approximately equal to the combined voltage of the battery and the current Opening Cyclic Ratio.  i.e.: <b>~ 2.5 V</b> (Opening Cyclic Ratio of <b>20%</b>) then <b>~ 8.75 V</b> (Opening Cyclic Ratio of <b>70 %</b>). </div> <p>If the voltmeter does not register control during the entire command time (ten cycles per second), replace the ECM.</p> </p>

<b>AFTER REPAIR</b>	<p>Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.</p>
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

F9Q

<b>DF069 PRESENT OR STORED</b>	<u>IMPACT DETECTION SIGNAL</u>
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> If the DTC becomes present after the engine is started or + after ignition feed.
	<b>Special notes:</b> The DTC appears when the injection computer receives a frontal impact signal from the airbag computer via the CAN communication line. When the injection computer receives this signal, engine operation is inhibited and the severity level 2 warning light is lit. Use CONSULT-II for all operations on the ECM.

<p><b><i>If the vehicle has been involved in an accident:</i></b>          carry out any necessary repairs,          – clear the fault,          – switch off the ignition,          – wait for the immobiliser indicator light to flash,          – switch on the ignition.          If the DTC does not recur, end the diagnostics.          If the DTC reappears, carry out trouble diagnosis on the AIRBAG control unit.</p> <p><b><i>If the vehicle has not been involved in an accident, carry out trouble diagnoses on the AIRBAG control unit.</i></b></p>
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<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>DF070 PRESENT OR STORED</b>	<u><b>CLUTCH SWITCH CIRCUIT</b></u> 1.DEF : Signal absent 2.DEF : Inconsistent signal
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> If the DTC reappears after the DTC has been cleared and: <ul style="list-style-type: none"> <li>– the ignition has been switched off and dialogue with the diagnostic tool has been lost,</li> <li>– the ignition has been switched on followed by a road test at above <b>60 mph (100 km/h)</b> for <b>10 seconds</b>.</li> </ul>
	<b>Special note:</b> Use CONSULT-II for all operations on the ECM connectors.

<b>1.DEF 2.DEF</b>	<b>NOTES</b>	None.
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Check the conformity of the clutch switch: From the <b>STATES</b> screen on your CONSULT-II, display state <b>CLUTCH PEDAL</b> : clutch pedal position "engaged" <b>CLUTCH PEDAL</b> should be <b>RELEASED</b> clutch pedal position "released" <b>CLUTCH PEDAL</b> should be <b>PRESSED</b> . If these checks are correct, erase the DTC and exit the diagnostic procedure.
Carry out a check on the clutch pedal switch connections. Check the adjustment of the clutch switch. Repair if necessary.
If the DTC exists, replace ECM.

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

F9Q

<b>VEHICLE SPD INFO PRESENT OR STORED</b>	<b><u>VEHICLE SPEED SIGNAL</u></b> 1.DEF : Inconsistent signal 2.DEF : No signal 3.DEF : Configuration absent or incorrect 4.DEF : Signal outside upper limit
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> The DTC is declared present with the engine running.
	<b>Special notes:</b> Use CONSULT-II for all operations on the ECM connectors.

<b>1.DEF 2.DEF 3.DEF 4.DEF</b>	<b>NOTES</b>	None.
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Check the connections of the ABS C/U. Check the ECM connections. Repair if necessary.
Perform trouble diagnosis on the Anti-lock Braking System. If no DTC present or stored, perform trouble diagnosis on the CAN communication line.
If the DTC exists, replace ECM.

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

F9Q

<b>CAMSHAFT SEN CIRC PRESENT OR STORED</b>	<b><u>CAMSHAFT POSITION SENSOR CIRCUIT (CMPS)</u></b> 1.DEF : Signal absent 2.DEF : Inconsistent signal
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> If the DTC reappears as present after: – the engine has been started and the engine has been running for one minute.
	<b>Special notes:</b> If the DTC appears with the engine running: the engine is not stopped. If the DTC is present when starting: starting is impossible. Use CONSULT-II for all operations on the ECM connectors.

<b>1.DEF 2.DEF</b>	<b>NOTES</b>	<b>Priority in the event of a combination of DTCS:</b> Deal with DTC: BATTERY VOLTAGE first if it is present or stored. If DTCS: <b>AIR FLOW SEN CIRC, WATER DTCT CIRC, DAMPER CONTROL CIRCUIT</b> appear together, check the conformity of the + 12 V supply line after relay.
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<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>CAMSHAFT SEN CIRC  CONTINUED</b>	
<p>Check the CMP sensor connectors.  Check the position and mounting of the CMP sensor.  Also check its general condition (damaged housing, heating up, etc.).  Carry out the necessary repairs.</p>	
<p>Check the <b>continuity</b> between the following connections:  ECM <b>(F1)</b> terminal 104 and CMP sensor harness connector terminal 2  ECM <b>(F1)</b> terminal 101 and CMP sensor harness connector terminal 1</p>	
<p><b>With the ignition switched on and the CMP sensor connected:</b>  Use a voltmeter to measure the voltage across <b>terminals 1 and 3</b> of the CMP sensor:  (This voltage should be equal to the battery voltage within <b>0.08 V</b>)  If the voltage is outside the tolerance values, take the measurement again with the <b>CMP sensor disconnected</b>,  –if the voltage is still outside the tolerance values, check <b>the continuity and the absence of interference resistance</b> on the following connection:  CMP sensor, <b>terminal 3</b> and ECM relay <b>(E91)</b> terminal 5 and CMP sensor terminal 3  –if the voltage changes to within the tolerance values, replace the CMP sensor.</p>	
<p><b>With the starter motor turning:</b>  Use an oscilloscope to check the conformity of the camshaft sensor signal (absence of interference, micro-breaks, etc.).  If there is a fault, check the engine earths and that the engine wiring harness is positioned correctly.</p>	
<p>If the problem persists,  – check the tension of the timing belt,  – check the timing adjustment.</p>	
<p>If the DTC exists and is still present, replace the CMP sensor.</p>	

<b>AFTER REPAIR</b>	<p>Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.</p>
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>FUEL TEMP SEN CIRC PRESENT OR STORED</b>	<b><u>FUEL TEMPERATURE SENSOR CIRCUIT</u></b> CC.0 : Short circuit to earth (ground) CO.1 : Open circuit or short circuit to +12 V
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> If the DTC appears after the engine has been running for <b>2 minutes</b> .
	<b>Special notes:</b> Use CONSULT-II for all operations on the ECM connectors. The default value is <b>40 °C</b> .

<b>CC.0</b>	<b>NOTES</b>	None.
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Check the fuel temperature sensor connectors. Check the ECM connections. Repair if necessary.
Measure the <b>resistance</b> of the fuel temperature sensor across <b>terminals 1 and 2</b> . Replace the sensor if the resistance is not approximately: <b>3820 Ω ± 282 at 20 °C</b> <div style="text-align: center;"><b>2050 Ω ± 100 at 25 °C</b></div> <div style="text-align: center;"><b>810 Ω ± 47 at 50 °C</b></div> Check the <b>continuity, absence of interference resistance and insulation</b> on the following connection: ECM (F1) terminal 88 and fuel temperature sensor harness connector terminal 2 Also check its <b>insulation</b> of the following connection: ECM (F1) terminal 35 and fuel temperature sensor harness connector terminal 1
If the DTC exists and remains present, replace the fuel temperature sensor.

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

F9Q

<b>FUEL TEMP SEN CIRC CONTINUED</b>	<b><u>FUEL TEMPERATURE SENSOR CIRCUIT</u></b> CC.0 : Short circuit to earth (ground)
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<b>CO.1</b>	<b>NOTES</b>	None.
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Check the fuel temperature sensor connectors. Check the injection computer connections. Repair if necessary.
Measure the <b>resistance</b> of the fuel temperature sensor across <b>terminals 1 and 2</b> . Replace the fuel temperature sensor if the resistance is not: <b>3820 <math>\Omega</math> <math>\pm</math> 282 at 20 °C</b> <div style="text-align: center;"><b>2050 <math>\Omega</math> <math>\pm</math> 100 at 25 °C</b></div> <div style="text-align: center;"><b>810 <math>\Omega</math> <math>\pm</math> 47 at 50 °C</b></div> Check the <b>continuity, absence of interference resistance and insulation</b> on the following connection: ECM (F1) terminal 88 and fuel temperature sensor harness connector terminal 2
If the DTC exists and remains present, replace the fuel temperature sensor.

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

F9Q

<b>EGR SOLENOID V CIR PRESENT OR STORED</b>	<b><u>EGR SOLENOID VALVE CIRCUIT</u></b> 1.DEF : Inadequate EGR valve flow 2.DEF : Excessive EGR valve flow
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> If the DTC is declared present after the engine has been started and has run at idling speed for 40 seconds.
	<b>Special notes:</b> The fault is present if: <ul style="list-style-type: none"> <li>– exhaust gas recirculation is deactivated,</li> <li>– vehicle output is reduced and smoke could appear,</li> <li>– the <b>severity 1</b> warning light is lit.</li> </ul> Use CONSULT-II for all operations on the ECM connectors.

<b>1.DEF 2.DEF</b>	<b>NOTES</b>	None.
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<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>EGR SOLENOID V CIR  CONTINUED</b>	
<p>Check the EGR valve control solenoid valve connections. Check the ECM connections. Repair if necessary.</p>	
<p>Check the <b>resistance</b> of the EGR valve control solenoid valve across <b>terminals 1 and 5</b>. If the resistance is not approximately <b><math>8\ \Omega \pm 0.5\ \Omega</math> at 20 °C</b> then replace the EGR valve control solenoid valve. Check the <b>continuity</b> between the following connections: ECM relay <b>(E91)</b> terminal 5 and EGR valve control solenoid valve harness connector terminal 1</p>	
<p>Disconnect the exhaust gas recirculation valve and ensure the <b>continuity</b> and <b>insulation</b> against <b>+ 12 V</b> of the following connection: ECM <b>(F1)</b> terminal 91 and EGR valve control solenoid valve harness connector terminal 5</p>	
<p>Check that there are no leaks in the exhaust gas recirculation circuit. <b>Check the operation of the EGR valve:</b></p> <ul style="list-style-type: none"> <li>– disconnect the connector and remove the EGR valve, <ul style="list-style-type: none"> <li>– if removal reveals that its valve is jammed in the open position, replace the EGR valve.</li> </ul> </li> <li>– otherwise, remove the valve and reconnect the connector,</li> <li>– clear the DTC and perform active test <b>EGR SOLENOID VALVE</b>:</li> <li>– Check: <ul style="list-style-type: none"> <li>– the movement of the valve,</li> <li>– the absence of play between the valve and its control shaft, and its general condition (clogging, stiff point, etc.).</li> <li>– valve closing when the command is completed.</li> </ul> </li> </ul> <p>If no valve movement is detected during command <b>EGR SOLENOID VALVE</b>, or if it indicates an irreparable seizing or blockage, replace the EGR valve.</p>	
<p>Repair if necessary. If the DTC exists and remains present, replace the EGR valve control solenoid valve.</p>	

<b>AFTER REPAIR</b>	<p>Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.</p>
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>EGR POSITION OFFSE PRESENT OR STORED</b>	<b><u>EGR VALVE OFFSET</u></b> 1.DEF : Inconsistent EGR offset 1 2.DEF : Inconsistent EGR offset 2 3.DEF : Inconsistent EGR offset 3 4.DEF : Inconsistent signal
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> The DTC reappears after: – the DTC has been erased from the memory and – active test mode: <b>EGR SOLENOID VALVE</b> .
	<b>Special notes:</b> If the DTC is present, there will be a significant amount of smoke, the turbocharger and the EGR valve control solenoid valve will be blocked and the <b>severity 1</b> warning light will be lit. Use CONSULT-II for all operations on the ECM connectors.

<b>1.DEF 2.DEF 3.DEF 4.DEF</b>	<b>NOTES</b>	None.
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Check the EGR valve control solenoid valve connections. Check the ECM connections. Repair if necessary.
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<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>ASSRVSSMNT ELCTRVNN EGR PRESENT OR STORED</b>	<u><b>EGR SOLENOID VALVE SERVO-CONTROL</b></u> 1.DEF : Inadequate EGR valve flow 2.DEF : Excessive EGR valve flow
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> The DTC reappears after: – the DTC has been erased from the memory and – active test mode with CONSULT-II: <b>EGR SOLENOID VALVE</b> . – engine running + EGR control conditions.
	<b>Special notes:</b> If the DTC is present, there will be a significant amount of smoke, the turbocharger and the EGR valve control solenoid valve will be blocked and the <b>severity 1</b> warning light will be lit. Use CONSULT-II for all operations on the ECM connectors.

<b>1.DEF 2.DEF</b>	<b>NOTES</b>	None.
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Check the EGR valve control solenoid valve connections. Check the ECM connections. Repair if necessary.
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<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>IFGNL CRTUR ARBRE CMS PRESENT OR STORED</b>	<b><u>CAMSHAFT POSITION SENSOR SIGNAL (CMPS)</u></b> 1.DEF : Sporadic absence of signal 2.DEF : Sporadic inconsistency of signal	
<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> If the DTC becomes present following an engine start.	
	<b>Special notes:</b> Use CONSULT-II for all operations on the ECM connectors.	
<b>1.DEF 2.DEF</b>	<b>NOTES</b>	None.
Check the CMP sensor connections. Check the position and mounting of the CMP sensor. Also check its general condition (damaged housing, heating up, etc.). Carry out the necessary repairs.		
Check the <b>continuity</b> between the following connections: ECM (F1) terminal 104 and CMP sensor harness connector terminal 2 ECM (F1) terminal 101 and CMP sensor harness connector terminal 1 Repair if necessary.		
<b>With the ignition switched on and the camshaft sensor disconnected:</b> Use a voltmeter to measure the voltage between <b>terminals 3</b> and ground of the CMP sensor: (This voltage should be equal to the battery voltage to within <b>0.08 V</b> ) If the voltage is outside the tolerance values, take the measurement again with the <b>CMP sensor disconnected</b> , –if the voltage is still outside the tolerance values, check <b>the continuity and absence of interference resistance</b> on the following connection: ECM relay (E91) terminal 5 and CMP sensor harness connector terminal 3. –if the voltage changes to within the tolerance values, replace the CMP sensor.		
<b>With the starter turning and the engine running:</b> Use an oscilloscope to check the conformity of the camshaft sensor signal (absence of interference, microbreaks, etc.). If there is a malfunction, check the engine earths and that the engine wiring harness is positioned correctly.		
If the problem persists, – check the tension of the timing belt, – check the timing adjustment.		
If the DTC exists and is still present, replace the CMP sensor.		
<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.	

# DIESEL INJECTION

## Trouble diagnosis - DTC Interpretation

# F9Q

<b>IFGNL CPTUR RGME MTEUR PRESENT OR STORED</b>	<b><u>CRANKSHAFT POSITION (ENGINE SPEED) SENSOR SIGNAL (CKPS)</u></b> 1.DEF : Sporadic absence of signal 2.DEF : Sporadic inconsistency of signal
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to stored DTCs:</b> If the DTC is declared present after successive starting attempts or with the engine running.
	<b>Special notes:</b> The crankshaft position sensor is consistent with the camshaft position sensor. The <b>severity level 2</b> indicator will light up if there is a DTC present. Use CONSULT-II for any work on the ECM connectors.

<b>1.DEF 2.DEF</b>	<b>NOTES</b>	None.
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Check the CKP sensor connections. Check the ECM connections. Repair if necessary.
Check that the air gap between the sensor and the flywheel is correct: <b>0.5 to 1.8 mm</b> . Check that the sensor is correctly attached and that the flywheel target is not damaged.
Measure the <b>resistance</b> of the CKP sensor between <b>terminals 1 and 2</b> . The <b>coil resistance</b> is <b>800 ± 80 Ω</b> at an engine coolant temperature of <b>20 °C</b> .
Check the <b>continuity and absence of interference resistance</b> of the following connections: ECM <b>(F1)</b> terminal 102 and CKP sensor harness connector terminal 1 ECM <b>(F1)</b> terminal 103 and CKP sensor harness connector terminal 2 Repair if necessary. Check the CKP sensor signal using an oscilloscope: If there is a malfunction, check that the sensor is properly installed and that the signal plate is not damaged.
If the DTC exists and is still present, replace the CKP sensor.

<b>AFTER REPAIR</b>	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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# DIESEL INJECTION

## Trouble diagnosis - Conformity check

# F9Q

### NOTES

Only perform this conformity check after a complete check with the CONSULT-II. The values indicated in this conformity check are given as examples.  
Test conditions: **engine stopped, ignition on.**

### ECM STATES AND DATA MONITOR ITEMS

Order	Function	Data monitor or State Check or Action	Display and notes	Diagnostic procedure
1	Vehicle impact	<b>IMPCT DTECTED:</b> Impact detected	<b>YES or NO</b>	<b>In the event of a malfunction, apply the trouble diagnosis for IMPACT DETECTED INFO.</b>
2	Feed	<b>C/U+AFTR IGN:</b> + Computer (ECM) After ignition	<b>PRESENT or ABSENT</b>	<b>In the event of a malfunction, carry out trouble diagnosis on the charging circuit and refer to the diagnostic procedure for state C/U+AFTR IGN.</b>
		<b>C/U SUPPLY VOL:</b> Computer (ECM) supply voltage	<b>7 &lt; X &lt; 19 V</b>	
		<b>LNEAR S/ SUP-V:</b> Linearised sensor feed voltage	<b>3.47 &lt; X &lt; 3.75 V</b>	<b>In the event of a malfunction, refer to sensor feed trouble diagnosis SEN SUPPLY NO1 VOLTAGE to SENSOR SUPPLY NO3 V.</b>
		<b>RFRGRNT F L S V:</b> Refrigerant sensor voltage	<b>3.47 &lt; X &lt; 3.75 V</b>	<b>In the event of a malfunction, refer to the trouble diagnosis for REFRIGERANT SENSOR CIRC</b>
3	Engine running	<b>ENGINE SPEED:</b> Engine speed (CKPS)	<b>X = 0 rpm</b>	<b>In the event of a malfunction, refer to the trouble diagnosis for ENGINE SPEED SEN CIRC</b>
4	Pressure	<b>ATOMOS PRESS:</b> Atmospheric pressure	<b>800 &lt; X &lt; 1030 mbar</b>	The sensor is incorporated into the ECM. The default value is <b>750 mbar (ATMS PRES SEN CIRC).</b>
		<b>RAIL PRESSURE:</b> Rail pressure	<b>0 &lt; X &lt; 0.2 bar</b>	<b>In the event of a malfunction, refer to the trouble diagnosis for RAIL PRES SEN CIRC</b>
5	Temperature	<b>INLET AIR TEMP:</b> Inlet (Intake) air temperature	<b>30 &lt; X &lt; 61°C</b>	<b>In the event of a malfunction, refer to the trouble diagnosis for INLT AIR TEMP CIRC</b>
		<b>WATER TEMP:</b> Engine coolant temperature	Cold: <b>30°C</b> Warm: <b>90°C</b>	<b>In the event of a malfunction, refer to the trouble diagnosis for WATER TEMP SE CIRC</b>

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

F9Q

<b>NOTES</b>	<p>Only perform this conformity check after a complete check with the CONSULT-II. The values indicated in this conformity check are given as examples.</p> <p>Test conditions: <b>engine stopped, ignition on.</b></p>
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### ECM STATES AND DATA MONITOR ITEMS

Order	Function	Data monitor or State Check or Action	Display and notes	Diagnostic procedure
6	Preheating (Glow)	PRHTR UT CNTL: Glow relay (preheater unit) control	INACTIVE or ACTIVE	In the event of a malfunction, refer to the diagnostic procedure for state <b>PRHTR UT CNTL</b> .
7	Torque	ENGINE TORQUE: Engine torque	X = 0 Nm	None
8	Charging circuit	Altr rtr crnt: Alternator flow	X = 0 mA	In the event of a malfunction, check the alternator charging circuit.
9	Speed signal	VEHICLE SPEED: Vehicle speed	In km/h	In the event of a malfunction, refer to the <b>A.B.S.</b> trouble diagnosis.
10	Reverse gear signal	REVERSE INFO: Reverse gear signal	ABSENT or PRESENT	In the event of a malfunction, carry out diagnostic procedure on state <b>REVERSE INFO</b> and refer to trouble diagnosis <b>CLUTCH SWITCH CIRCUIT</b> .

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

# F9Q

### NOTES

Only perform this conformity check after a complete check with the CONSULT-II. The values indicated in this conformity check are given merely as examples.  
Test conditions: **engine stopped, ignition on.**

### AIR CIRCULATION (TURBOCHARGING / INTAKE)

Order	Function	Data monitor or State Check or Action	Display and notes	Diagnostic procedure
1	Temperature	<b>EXT. AIR TMP:</b> Ambient external air temperature	Should display the current ambient (external) temperature	<b>In the event of a malfunction,</b> carry out trouble diagnosis on the sensor.
		<b>INLET AIR TEMP:</b> Intake (inlet) air temperature	<b>30 &lt; X &lt; 61°C</b>	<b>In the event of a malfunction,</b> refer to the trouble diagnosis for <b>INLT AIR TEMP CIRC</b>
2	Pressure	<b>ATOMOS PRESS:</b> Atmospheric pressure	<b>800 &lt; X &lt; 1030 mbar</b>	The sensor is incorporated into the ECM. The default value is <b>750 mbar (ATMS PRES SEN CIRC)</b> .
		<b>FLRD BST PRES:</b> Filtered charge air (turbocharging) pressure	<b>800 &lt; X &lt; 1030 mbar</b>	The filtered pressure value depends on the setpoint pressure value and should be virtually identical ( $\pm 15$ mbar). <b>In the event of a malfunction,</b> refer to the trouble diagnosis for <b>TRBCHRGNG PRES SEN CIRC.</b>
		<b>BT PRES REF V:</b> Charge air (turbocharging) pressure setpoint	<b>790 &lt; X &lt; 1010 mbar</b>	<b>None</b>
3	Turbo- charging	<b>TRBO PRES OCR:</b> Charge air (turbocharging) pressure Opening Cyclic Ratio	<b>X = 5%</b>	The opening cyclic ratio should be identical to the correction of the solenoid valve position
		<b>TRB S/V PF CN:</b> Charge air (turbocharging) solenoid valve position sensor	<b>X = 5%</b>	
4	Air circulation	<b>EST. AIR FLOW:</b> Estimated air flow	<b>X = 0 kg/h</b>	In the event of a malfunction, refer to the trouble diagnosis for <b>AIR FLOW SEN CIRC.</b>
		<b>DMPR FLAP OCR:</b> Damper valve Opening Cyclic Ratio	<b>X = 5%</b>	

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

# F9Q

<b>NOTES</b>	<p>Only perform this conformity check after a complete check with the CONSULT-II. The values indicated in this conformity check are given as examples.</p> <p>Test conditions: <b>engine stopped, ignition on.</b></p>
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### AIR CIRCULATION (TURBOCHARGING / INTAKE)

Order	Function	Data monitor or State Check or Action	Display and notes	Diagnostic procedure
5	Sensor feed	<b>INLET TMP S V:</b> Intake (inlet) temperature sensor voltage	$1.90 < X < 2.10 \text{ V}$	<b>In the event of a malfunction,</b> refer to the trouble diagnosis for <b>INLT AIR TEMP CIRC</b>
		<b>ATMOS PS SE V:</b> Atmospheric pressure sensor voltage	$3.80 < X < 4 \text{ V}$	<b>In the event of a malfunction,</b> refer to the trouble diagnosis for <b>ATMS PRES SEN CIRC</b>
		<b>AR FWMTR SPLY V:</b> Mass air flow sensor (air flowmeter) supply voltage	$X = 0.6 \text{ V}$	<b>In the event of a malfunction,</b> refer to the trouble diagnosis for <b>AIR FLOW SEN CIRC</b>



# DIESEL INJECTION

## Trouble diagnosis - Conformity check

# F9Q

### NOTES

Only perform this conformity check after a complete check with the CONSULT-II. The values indicated in this conformity check are given as examples.  
Test conditions: **engine stopped, ignition on.**

### FUEL / LPG CIRCUIT

Order	Function	Data monitor or State Check or Action	Display and notes	Diagnostic procedure
1	Engine running	<b>ENGINE SPEED:</b> Engine speed	<b>X = 0 rpm</b>	<b>None</b>
2	Temperature	<b>FUEL TEMP:</b> Fuel temperature	<b>25 &lt; X &lt; 80°C</b>	<b>In the event of a malfunction, refer to the trouble diagnosis for FUEL TEMP SEN CIRC</b>
3	Pressure	<b>RAIL PRES SET:</b> Common rail fuel pressure setting	<b>X = 250 bar</b>	The rail pressure setpoint changes according to the vehicle speed.
		<b>GAL PRS REG/V:</b> Common rail fuel pressure regulation valve Opening Cyclic Ratio	<b>X= 15 %</b>	<b>In the event of a malfunction, refer to the trouble diagnosis for RAIL PRES SEN CIRC</b>
		<b>RAIL PRESSURE:</b> Common rail fuel pressure	<b>X = 0 bar</b>	
		<b>F P DIFFEREN C:</b> Fuel pressure difference	<b>X = 250 bar</b>	The pressure difference calculated is the difference between the common rail fuel pressure and the common rail fuel pressure setpoint. <b>In the event of a malfunction, refer to the trouble diagnosis for RAIL PRES SEN CIRC.</b>
4	Flow	<b>FUEL FLOW:</b> Fuel flow	<b>0 &lt; X &lt; 60 mg/cp</b>	<b>In the event of a malfunction, refer to the trouble diagnosis for RAIL PRES SEN CIRC</b>
5	Rail current	<b>R PR RT CRRNT:</b> Common rail fuel pressure regulator current	<b>X = 395 mA</b>	<b>In the event of a malfunction, refer to the trouble diagnosis for RAIL PRES SEN CIRC</b>
		<b>R P RT C RF V:</b> Common rail fuel pressure regulator current setpoint	<b>X = 400 mA</b>	The rail pressure current setpoint changes according to the vehicle speed.

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

# F9Q

<b>NOTES</b>	<p>Only perform this conformity check after a complete check with the CONSULT-II. The values indicated in this conformity check are given as examples.</p> <p>Test conditions: <b>engine stopped, ignition on.</b></p>
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### FUEL / LPG CIRCUIT

Order	Function	Data monitor or State Check or Action	Display and notes	Diagnostic procedure
6	Rail supply	<b>FUEL TMP SE V:</b> Common fuel temperature sensor voltage	$1.8 < X < 3 \text{ V}$	In the event of a malfunction, refer to the trouble diagnosis for sensor voltage supply malfunctions.
		<b>RAIL PRES S V:</b> Common rail fuel pressure sensor voltage	$X = 0.5 \text{ V}$	

### ANTIPOLLUTION / OBD

Order	Function	Data monitor or State Check or Action	Display and notes	Diagnostic procedure
1	Engine running	<b>ENGINE SPEED:</b> Engine speed	$X = 0 \text{ rpm}$	None
2	Exhaust gas recirculation	<b>EGR S/V RCO:</b> EGR valve control solenoid valve Opening Cycle Ratio	$5 < X < 95 \%$	In the event of a malfunction, refer to the trouble diagnosis for <b>EGR POIFTION OFFSET</b> , and <b>EGR COMMAND CIRCUIT</b> , <b>EGR SOLENOID V CIRC</b> and <b>ASSRVSSMNT ELCTRVNN EGR</b> .
3	Sensor feed	<b>EGR POS SE VO:</b> EGR valve position sensor voltage	$1.6 < X < 1.08 \text{ V}$	In the event of a malfunction, refer to the trouble diagnosis for <b>EGR COMMAND CIRCUIT</b> .
4	EGR valve calibration	<b>E V FRST OFST:</b> First EGR valve offset	$20.2 < X < 20.6 \%$ (average value)	In the event of a malfunction, refer to the trouble diagnosis for <b>PRHT UNT CTRL CIRC</b> .
		<b>LT EGR V OFST:</b> Last EGR valve offset	$X = 21 \%$ (average value)	

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

# F9Q

<b>NOTES</b>	<p>Only perform this conformity check after a complete check with the CONSULT-II. The values indicated in this conformity check are given as examples.</p> <p>Test conditions: <b>engine stopped, ignition on.</b></p>
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### COLD LOOP

Order	Function	Data monitor or State Check or Action		Display and notes	Diagnostic procedure
1	Air conditioning detection	PRSNCLMTSTN:	Air conditioning present	YES or NO	None
2	Engine running	ENGINE SPEED:	Engine speed	X = 0 rpm	None
3	Driver's control	A/C ATHRSTION:	Air conditioning authorised	NO	The air conditioning compressor only operates if the engine is running and freon is present.
4	Air conditioning system	ESPQRDA/C:	System requested by air conditioning	X = 0 rpm	None
5	Pressure	RFRGERNT PRSS:	Refrigerant pressure	X = 0 bar	In the event of a malfunction, refer to the trouble diagnosis for <b>REFRIGERANT SENSOR CIRC.</b>
6	Output	PWR ABSOBA/C:	Power used by the AC compressor	X = 0 W	In the event of a malfunction, check the air conditioning compressor.
7	Cooling fan	FNULWSRQT:	Fan low-speed request	ACTIVE or INACTIVE	In the event of a malfunction, check the connections and protection fuses.  Shunt the fan(s) to check whether the fan operates correctly.  Repair if necessary + Cooling fan relay circuit
		FNULHSRQT:	Fan high-speed request		
		FAN CONTROL 1:	Checking cooling fan 1	STIOPPED or RUNNING	
		FAN CONTROL 2:	Checking cooling fan 2		
8	Coolant temperature (water temp)	WATER TEMP:	Engine coolant temperature	Cold: 30°C Warm: 90°C	In the event of a malfunction, refer to the trouble diagnosis for <b>WATER TEMP SE CIRC</b>

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

# F9Q

### NOTES

Only perform this conformity check after a complete check with the CONSULT-II. The values indicated in this conformity check are given as examples.  
Test conditions: **engine stopped, ignition on.**

### DRIVER PARAMETERS

Order	Function	Data monitor or State Check or Action	Display and notes	Diagnostic procedure
1	Engine running	<b>ENGINE SPEED:</b> Engine speed	<b>X = 0 rpm</b>	None
2	Pedal position	<b>PEDAL LOAD:</b> Accelerator pedal load (*)	<b>X = 0 %</b> (if there is no pressure on the pedal)	In the event of a malfunction, refer to the trouble diagnosis for <b>PDL PTNTMTR CIRC TRACK1</b> and <b>PDL PTNTMTR CIRC TRACK2</b>
3	Sensor feed	<b>PL PTNMR T1 V:</b> Accelerator pedal position sensor (potentiometer) sensor (track) 1 voltage	<b>0.70 &lt; X &lt; 0.80 V</b>	The voltage value of sensor (track 2) is roughly equal to half of the voltage value of sensor (track) 1. In the event of a malfunction, refer to the trouble diagnosis for <b>PDL PTNTMTR CIRC TRACK1</b> and <b>PDL PTNTMTR CIRC TRACK2</b> .
		<b>PL PTNMR T2 V:</b> Accelerator pedal position sensor (potentiometer) sensor (track) 2 voltage	<b>0.35 &lt; X &lt; 0.40 V</b>	

(\*) **PEDAL VOLTAGES - COLD WITH NO CONTACT**

Pedal load	0%	25%	50%	100%	120%
V1 in V	0.76	1.52	2.09	3.23	3.68
V2 in V	0.37	0.74	1.02	1.56	1.79

### HEATING

Order	Function	Data monitor or State Check or Action	Display and notes	Diagnostic procedure
1	Output	<b>H R ATHD MX P:</b> Heating resistor maximum authorised power	<b>X = 0 W</b>	In the event of a malfunction, carry out trouble diagnosis on the heater
2	Engine coolant temperature	<b>WATER TEMP:</b> Engine coolant temperature	Cold: <b>30°C</b> Warm: <b>90°C</b>	In the event of a malfunction, refer to the trouble diagnosis for <b>WATER TEMP SE CIRC</b>

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

# F9Q

### NOTES

Only perform this conformity check after a complete check with the CONSULT-II. The values indicated in this conformity check are given as examples.  
Test conditions: **engine stopped, ignition on.**

### ASCD

Order	Function	Data monitor or State Check or Action	Display and notes	Diagnostic procedure
1	ASCD	<b>VEHICLE SPEED:</b> Vehicle speed	Give the vehicle speed in <b>km/h</b> . This data monitor is transmitted via the ABS actuator and electrical unit or the wheel speed sensor. This signal is transmitted to the ECM by CAN system.	Test the CAN system.  Refer to the ABS actuator and electrical unit or TCM finding note if DTC appears.
		<b>PR130:</b> ASCD setpoint	<b>X = 0 mph</b>	The ASCD setpoint is selected by the driver and changes according to the vehicle speed.
		<b>CRS CN/S LMTR:</b> ASCD	<b>INACTIVE</b> when no buttons are pressed	<b>In the event of a malfunction,</b> refer to the diagnostic procedure for DTC interpretation <b>SPD LIM/ CRUIS CTRL</b>
			<b>STATE 1:</b> ASCD resume button pressed	Activates the <b>green</b> indicator light on the instrument panel and emits a beep when it switches off
			<b>STATE 2:</b> Speed limiter start/stop button pressed	Activates the <b>orange</b> indicator light on the instrument panel and emits a beep when it switches off
			<b>STATE 3:</b> set/+ button pressed	<b>In the event of a malfunction,</b> refer to the diagnostic procedure for DTC interpretation <b>SPD LIM/ CRUIS CTRL</b>
			<b>STATE 4:</b> set/- button pressed	
			<b>STATE 5:</b> cancel button pressed	
			<b>STATE 6:</b> Vehicle speed invalid	

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

# F9Q

### NOTES

Only perform this conformity check after a complete check with the CONSULT-II. The values indicated in this conformity check are given as examples.  
Test conditions: **engine stopped, ignition on.**

### ASCD

Order	Function	Data monitor or State Check or Action	Display and notes	Diagnostic procedure
1	ASCD (continued)	CRS CNTL DV T:  Deactivate ASCD  (only one state may be associated with it)	<b>STATE 1:</b> Anti-slid request ----- <b>STATE 2:</b> Brake pedal depressed ----- <b>STATE 3:</b> DTC appears on ASCD ----- <b>STATE 4:</b> Uncouple brake box motor depressed ----- <b>STATE 5:</b> DTC detected by ECM ----- <b>STATE 6:</b> Vehicle speed invalid ----- <b>STATE 7:</b> Cancel button pressed ----- <b>STATE 8:</b> Gear selector lever in neutral ----- <b>STATE 9:</b> Inconsistency between the request and the vehicle speed	<p>When a state between <b>STATE 1</b> and <b>STATE 9</b> is active, then associated state <b>CRS CNTL DV T</b> also passes to active and immediately <b>deactivates</b> the <b>ASCD</b> requested by the driver.</p> <p><b>NOTE:</b> ASCD can only be active for a speed <b>V &gt; 30 km/h</b> otherwise <b>STATE 6</b> remains <b>active</b>.</p>

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

F9Q

<b>NOTES</b>	<p>Only perform this conformity check after a complete check with the CONSULT-II. The values indicated in this conformity check are given as examples.</p> <p>Test conditions: <b>engine stopped, ignition on.</b></p>
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### ASCD

Order	Function	Data monitor or State Check or Action	Display and notes	Diagnostic procedure
2	Driver braking	<b>MAIN BRAKE SW:</b> Primary brake contact	<b>Indicates recognition of brake pedal contacts</b>	<b>In the event of a malfunction,</b> refer to the diagnostic procedure for state <b>ET008</b>
		----- <b>2ND BRK CNTCT:</b> Secondary brake contact		----- <b>In the event of a malfunction,</b> refer to the diagnostic procedure for state <b>ET009</b>
3	Driver clutch operation	<b>CLUTCH PEDAL:</b> Clutch pedal	<b>Indicates recognition of brake pedal contacts</b>  <b>RELEASED or DEPRESSED</b>	<b>In the event of a malfunction,</b> refer to the diagnostic procedure for state <b>CLUTCH PEDAL</b>

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

# F9Q

<b>NOTES</b>	<p>Only perform this conformity check after a complete check with the CONSULT-II. The values indicated in this conformity check are given as examples.</p> <p>Test conditions: <b>engine stopped, ignition on.</b></p>
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### ENGINE COOLING

Order	Function	Data monitor or State Check or Action	Display and notes	Diagnostic procedure
1	Temperature	<b>WATER TEMP:</b> Engine coolant temperature	Cold: <b>30°C</b> Warm: <b>90°C</b>	<b>In the event of a malfunction,</b> refer to the trouble diagnosis for <b>WATER TEMP SE CIRC</b>
2	Cooling fan	<b>FAN CONTROL 1:</b> Check cooling fan 1	<b>STOPPED or RUNNING</b>	<b>In the event of a malfunction,</b> check the connections and protection fuses.
		<b>FAN CONTROL 2:</b> Check cooling fan 2		
		<b>FN U LW S RQT:</b> Fan low-speed request	<b>ACTIVE or INACTIVE</b>	Shunt the fan(s) to check whether the fan operates correctly.  Repair if necessary.
		<b>FN U HI S RQT:</b> Fan high-speed request		



# DIESEL INJECTION

## Trouble diagnosis - Conformity check

# F9Q

<b>NOTES</b>	<p>Only perform this conformity check after a complete check with the CONSULT-II. The values indicated in this conformity check are given as examples.</p> <p>Test conditions: <b>engine stopped, ignition on.</b></p>
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### HEATING / PREHEATING

Order	Function	Data monitor or State Check or Action		Display and notes	Diagnostic procedure
1	Feed	<b>C/U+AFTR IGN:</b>	ECM + after ignition feed	<b>PRESENT or ABSENT</b>	<b>In the event of a malfunction,</b> carry out trouble diagnosis on the charging circuit and refer to the diagnostic procedure for state <b>C/U+AFTR IGN.</b>
2	Engine running	<b>ENGINE SPEED:</b>	Engine speed	<b>X = 0 rpm</b>	<b>None</b>
3	Temperature	<b>WATER TEMP:</b>	Engine coolant temperature	Cold: <b>30°C</b> Warm: <b>90°C</b>	<b>In the event of a malfunction,</b> refer to the trouble diagnosis for <b>WATER TEMP SE CIRC</b>
		<b>INLET AIR TMP:</b>	Intake (inlet) air temperature	<b>30 &lt; X &lt; 61°C</b>	<b>In the event of a malfunction,</b> refer to the trouble diagnosis for <b>INLT AIR TEMP CIRC</b>
4	Preheating	<b>PRHTR UT CNTL:</b>	Glow relay (preheater unit) control	<b>ACTIVE or INACTIVE</b>	<b>In the event of a malfunction,</b> refer to the trouble diagnosis for <b>PRHT UNT CTRL CIRC</b> and <b>PRHT UNIT DGNSTC CNNCTN</b>

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

# F9Q

### NOTES

Only perform this conformity check after a complete check with the CONSULT-II. The values indicated in this conformity check are given as examples.  
Test conditions: **engine stopped, ignition on.**

### STARTING

Order	Function	Data monitor or State Check or Action	Display and notes	Diagnostic procedure
1	Feed	C/U+AFTR IGN: + ECM After ignition	PRESENT or ABSENT	In the event of a malfunction, carry out trouble diagnosis on the charging circuit and refer to the diagnostic procedure for state . C/U+AFTR IGN.
2	Starting	STARTING: Starting	AUTHORISED or PROHIBITED	In the event of a malfunction, check the condition of the card and refer to the SC section
3	Engine operation	MOTOR: Engine	STOPPED or SHIM or UNDER STARTER	None

### PROTECTION

Order	Function	Data monitor or State Check or Action	Display and notes	Diagnostic procedure
1	Immobilizer	ENG IMMOBILIZ: Immobilizer ----- CODE PROGRAM: Code programmed	ACTIVE or INACTIVE ----- YES or NO	In the event of a malfunction, refer to the trouble diagnosis for ENGINE IMMOBILISER

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

# F9Q

### NOTES

Only perform this conformity check after a complete check with the CONSULT-II. The values indicated in this conformity check are given as examples.  
Test conditions: **engine at idle speed.**

### ECM STATES AND DATA MONITOR ITEMS

Order	Function	Data monitor or State Check or Action	Display and notes	Diagnostic procedure
1	Vehicle impact	<b>IMPCT DTECTED:</b> Impact detected	<b>NO</b>	<b>In the event of a malfunction, apply the trouble diagnosis for IMPACT DETECTED INFO.</b>
2	Feed	<b>C/U+AFTR IGN:</b> ECM + after ignition feed	<b>PRESENT</b>	<b>In the event of a malfunction, carry out trouble diagnosis on the charging circuit and refer to the diagnostic procedure for state . C/U+AFTR IGN.</b>
		<b>C/U SUPPLY VOL:</b> ECM supply voltage	<b>7 &lt; X &lt; 19 V</b>	
		<b>LNEAR S/ SUP-V:</b> Linearised sensor feed voltage	<b>3.47 &lt; X &lt; 3.75 V</b>	<b>In the event of a malfunction, refer to the trouble diagnosis for sensor feed SEN SUPPLY NO1 VOLTAGE to SENSOR SUPPLY NO3 V.</b>
		<b>RFG RNT FL S V:</b> Refrigerant sensor voltage	<b>3.47 &lt; X &lt; 3.75 V</b>	
3	Speed	<b>ENGINE SPEED:</b> Engine speed	<b>X = 800 rpm</b>	<b>In the event of a malfunction, refer to the trouble diagnosis for ENGINE SPEED SEN CIRC</b>
4	Pressure	<b>ATOMOS PRESS:</b> Atmospheric pressure	<b>800 &lt; X &lt; 1030 mbar</b>	The sensor is incorporated into the ECM. The default value is <b>750 mbar (ATMS PRES SEN CIRC).</b>
		<b>RAIL PRESSURE:</b> Rail pressure	<b>250 &lt; X &lt; 300 bar</b> <b>Pmax = 1350 bar</b>	<b>In the event of a malfunction, refer to the trouble diagnosis for RAIL PRES SEN CIRC</b>
5	Temperature	<b>INLET AIR TMP:</b> Inlet air temperature	<b>30 &lt; X &lt; 61°C</b>	<b>In the event of a malfunction, refer to the trouble diagnosis for INLT AIR TEMP CIRC</b>
		<b>WATER TEMP:</b> Coolant temperature	Cold: <b>30°C</b> Warm: <b>90°C</b>	<b>In the event of a malfunction, refer to the trouble diagnosis for WATER TEMP SE CIRC</b>

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

# F9Q

### NOTES

Only perform this conformity check after a complete check with the CONSULT-II. The values indicated in this conformity check are given as examples.  
Test conditions: **engine at idle speed**.

### ECM STATES AND DATA MONITOR ITEMS

Order	Function	Data monitor or State Check or Action	Display and notes	Diagnostic procedure
6	Preheating	<b>PRHTR UT CNTL:</b> Glow relay (preheater unit) control	<b>INACTIVE</b> or <b>ACTIVE</b> (On starting)	<b>In the event of a malfunction,</b> refer to the diagnostic procedure for state <b>PRHTR UT CNTL</b> .
7	Torque	<b>ENGINE TORQUE:</b> Engine torque	<b>On starting:</b> 25 < X < 40 Nm <b>Warm:</b> 10 < X < 25 Nm <b>With air conditioning:</b> 30 < X < 35 Nm	<b>None</b>
8	Charging circuit	<b>Altr rtr crnt:</b> Alternator flow	<b>On starting:</b> 20 < X < 28 mA <b>Warm:</b> 10 < X < 20 mA <b>With consumers:</b> 25 < X < 36 mA <b>With acceleration:</b> 19 < X < 26 mA	<b>In the event of a malfunction,</b> check the alternator charging circuit.
9	Driver signal	<b>VEHICLE SPEED:</b> Vehicle speed	<b>In km/h</b>	<b>In the event of a malfunction,</b> refer to the <b>A.B.S.</b> trouble diagnosis.

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

# F9Q

### NOTES

Only perform this conformity check after a complete check with the CONSULT-II. The values indicated in this conformity check are given as examples.  
Test conditions: **engine idle speed**.

### AIR CIRCULATION (TURBOCHARGING / INTAKE)

Order	Function	Data monitor or State Check or Action	Display and notes	Diagnostic procedure
1	Temperature	<b>EXT. AIR TMP:</b> Ambient (external) air temperature	Should display the current external temperature	<b>In the event of a malfunction,</b> carry out trouble diagnosis on the sensor
		<b>INLET AIR TEMP:</b> Intake (inlet air) temperature	<b>30 &lt; X &lt; 61°C</b>	<b>In the event of a malfunction,</b> refer to the trouble diagnosis for <b>INLT AIR TEMP CIRC</b>
2	Pressure	<b>ATOMOS PRESS:</b> Atmospheric pressure	<b>800 &lt; X &lt; 1030 mbar</b>	The sensor is incorporated into the ECM. The default value is <b>750 mbar (ATMS PRES SEN CIRC)</b> .
		<b>FLRD BST PRES:</b> Filtered charge air (turbocharging) pressure	<b>800 &lt; X &lt; 1030 mbar</b>	The filtered pressure value depends on the setpoint pressure value and should be virtually identical ( $\pm 15$ mbar). <b>In the event of a malfunction,</b> refer to the trouble diagnosis for <b>TRBCHRGNG PRES SEN CIRC</b>
		<b>BT PRES REF V:</b> Charge air (turbocharging) pressure setpoint	<b>790 &lt; X &lt; 1010 mbar</b>	<b>None</b>
3	Turbo- charging	<b>TRBO PRES OCR:</b> Charge air (turbocharging) pressure Opening Cyclic Ratio	<b>X = 85%</b>	The opening cyclic ratio should be identical to the correction of the solenoid valve position
		<b>TRB S/V PF CN:</b> Charge air (turbocharging) solenoid valve position sensor	<b>X = 85%</b>	
4	Air circulation	<b>EST. AIR FLOW:</b> Estimated air flow	<b>26 &lt; X &lt; 28 kg/ h</b>	In the event of a malfunction, refer to the trouble diagnosis for <b>OIL TEMP SEN CIRC</b>
		<b>DMPR FLAP OCR:</b> Damper valve Opening Cyclic Ratio	<b>X = 5%</b>	

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

# F9Q

### NOTES

Only perform this conformity check after a complete check with the CONSULT-II. The values indicated in this conformity check are given as examples.  
Test conditions: **engine at idle speed.**

### AIR CIRCULATION (TURBOCHARGING / INTAKE)

Order	Function	Data monitor or State Check or Action		Display and notes	Diagnostic procedure
5	Sensor feed	<b>INLET TMP S V:</b>	Intake (inlet) temperature sensor voltage	<b>X = 2.32 V</b>	<b>In the event of a malfunction, refer to the trouble diagnosis for INLT AIR TEMP CIRC</b>
		<b>ATMOS PS SE V:</b>	Atmospheric pressure sensor voltage	<b>X = 3.95 V</b>	<b>In the event of a malfunction, refer to the trouble diagnosis for ATMS PRES SEN CIRC</b>
		<b>AR FWMTR SPLY V:</b>	MAF (air flowmeter) sensor supply voltage	<b>1.5 &lt; X &lt; 2.2 V</b>	<b>In the event of a malfunction, refer to the trouble diagnosis for AIR FLOW SEN CIRC</b>

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

# F9Q

### NOTES

Only perform this conformity check after a complete check with the CONSULT-II. The values indicated in this conformity check are given as examples.  
Test conditions: **engine at idle speed.**

### FUEL / LPG CIRCUIT

Order	Function	Data monitor or State Check or Action	Display and notes	Diagnostic procedure
1	Engine running	ENGINE SPEED: Engine speed	X = 800 rpm	None
2	Temperature	FUEL TEMP: Fuel temperature	25 < X < 80°C Warm: 52°C	In the event of a malfunction, refer to the trouble diagnosis for <b>FUEL TEMP SEN CIRC</b>
3	Pressure	RAIL PRES SET: Common rail fuel pressure setting	250 < X < 260 bar	The rail pressure setpoint changes according to the vehicle speed.
		RAIL PRESSURE: Common rail fuel pressure	250 < X < 260 bar	In the event of a malfunction, refer to the trouble diagnosis for <b>RAIL PRES SEN CIRC</b>
		F P DIFFEREN C: Fuel pressure difference	- 8 < X < 8 bar (close to zero)	The pressure difference calculated is the difference between the common rail fuel pressure and the common rail fuel pressure setpoint. In the event of a malfunction, refer to the trouble diagnosis for <b>RAIL PRES SEN CIRC</b> .
		GAL PRS REG/V: RCO gallery pressure regulation valve	X = 40 %	In the event of a malfunction, refer to the trouble diagnosis for <b>RAIL PRES SEN CIRC</b>
4	Flow	FUEL FLOW: Fuel flow	6 < X < 7 m <sup>3</sup> /g/cp	In the event of a malfunction, refer to the trouble diagnosis for <b>RAIL PRES SEN CIRC</b> .
5	Rail current	R PR RT CRRNT: Common rail fuel pressure regulator current	1320 < X < 1350 mA	In the event of a malfunction, refer to the trouble diagnosis for <b>RAIL PRES SEN CIRC</b> .
		R P RT C RF V: Common rail fuel pressure regulator current setpoint	1320 < X < 1350 mA	The common rail fuel pressure current setpoint changes according to the vehicle speed.

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

# F9Q

### NOTES

Only perform this conformity check after a complete check with the CONSULT-II. The values indicated in this conformity check are given as examples.  
Test conditions: **engine at idle speed.**

### FUEL / LPG CIRCUIT

Order	Function	Data monitor or State Check or Action	Display and notes	Diagnostic procedure
6	Rail pressure	<b>FUEL TMP SE V:</b> Fuel temperature sensor voltage	<b>X = 1.53 V</b>	In the event of a malfunction, refer to the diagnostic procedure for sensor voltage supply malfunctions.
		<b>RAIL PRES S V:</b> Common rail fuel pressure sensor voltage	<b>1.10 &lt; X &lt; 1.2 V</b>	

### ANTIPOLLUTION / OBD

Order	Function	Data monitor or State Check or Action	Display and notes	Diagnostic procedure
1	Engine running	<b>ENGINE SPEED:</b> Engine speed	<b>0 = 800 rpm</b>	None
2	Exhaust gas recirculation	<b>EGR S/V RCO:</b> EGR valve control solenoid valve OCR	<b>43.7 &lt; X &lt; 44 %</b>	In the event of a malfunction, refer to the trouble diagnosis for <b>EGR COMMAND CIRCUIT, EGR SOLENOID V CIRC, EGR POIFTION OFFSET</b> and <b>ASSRVSSMNT ELCTRVNN EGR.</b>
3	Air regulation	<b>REGULAT D'AIR:</b> Air regulation	<b>ACTIVE</b>	In the event of a malfunction, refer to the trouble diagnosis for <b>EGR COMMAND CIRCUIT, EGR SOLENOID V CIRC, EGR POIFTION OFFSET</b> and <b>ASSRVSSMNT ELCTRVNN EGR.</b>
4	Sensor feed	<b>EGR POS SE VO:</b> EGR valve position sensor voltage	<b>1.45 &lt; X &lt; 1.5 V</b>	In the event of a malfunction, refer to the trouble diagnosis for <b>EGR COMMAND CIRCUIT.</b>
5	EGR valve calibration	<b>E V FRST OFST:</b> First EGR valve offset	<b>X = 21.1 % (average value)</b>	In the event of a malfunction, refer to the trouble diagnosis for <b>PRHT UNT CTRL CIRC.</b>
		<b>LT EGR V OFST:</b> Last EGR valve offset	<b>X = 21.1 % (average value)</b>	



# DIESEL INJECTION

## Trouble diagnosis - Conformity check

# F9Q

<b>NOTES</b>	<p>Only perform this conformity check after a complete check with the CONSULT-II. The values indicated in this conformity check are given as examples.</p> <p>Test conditions: <b>engine at idle speed.</b></p>
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### COLD LOOP

Order	Function	Data monitor or State Check or Action	Display and notes	Diagnostic procedure
1	Air conditioning detection	PRSNCLMTSTN: Air conditioning present	YES or NO	None
2	Engine running	ENGINE SPEED: Engine speed	X = 800 rpm	None
3	Driver's control	DEMND COMPRES: Compressor engagement request ----- A/C ATHRSTION: Air conditioning authorised	YES or NO  YES or NO	The air conditioning compressor only operates if the engine is running and freon is present (see air conditioning trouble diagnosis).
4	Air conditioning system	ESP RQRD A/C: System requested by air conditioning	X = 0 rpm	None
5	Pressure	RFRGERNT PRSS: Refrigerant pressure	1 < X < 35 bar	In the event of a malfunction, refer to the trouble diagnosis for <b>REFRIGERANT SENSOR CIRC.</b>
6	Output	PWR ABSOB A/C: Power consumed by the compressor	X = 0 W	In the event of a malfunction, check the air conditioning compressor.
7	Cooling fan	FN U LWS RQT: Fan low-speed request ----- FN U HHS RQT: Fan high-speed request ----- FAN CONTROL 1: Checking cooling fan 1 ----- FAN CONTROL 2: Checking cooling fan 2	INACTIVE or ACTIVE   STOPPED or RUNNING	In the event of a malfunction, check the connections and protection fuses.  Shunt the fan(s) to check whether the fan operates correctly.  Repair if necessary + Cooling fan relay circuit
8	Engine coolant temperature	WATER TEMP: Engine coolant temperature	Cold: 30°C Warm: 90°C	In the event of a malfunction, refer to the trouble diagnosis for <b>WATER TEMP SE CIRC.</b>

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

# F9Q

### NOTES

Only perform this conformity check after a complete check with the CONSULT-II. The values indicated in this conformity check are given as examples.  
Test conditions: **engine at idle speed**.

### DRIVER PARAMETERS

Order	Function	Data monitor or State Check or Action	Display and notes	Diagnostic procedure
1	Engine running	<b>ENGINE SPEED:</b> Engine speed	<b>X = 800 rpm</b>	None
2	Pedal position	<b>PEDAL LOAD:</b> Pedal load	<b>X = 0 %</b> (if there is no pressure on the pedal <b>Xmax = 120 %</b> )	<b>In the event of a malfunction, refer to the trouble diagnosis for PDL PTNTMTR CIRC TRACK1 and PDL PTNTMTR CIRC TRACK2</b>
3	Sensor feed	<b>PL PTNMR T1 V:</b> APP sensor 1 (Pedal potentiometer track 1 voltage)	<b>X = 0.75</b>	The voltage value of sensor 2 is roughly equal to half of the voltage value of sensor 1.  <b>In the event of a malfunction, refer to the trouble diagnosis for PDL PTNTMTR CIRC TRACK1 and PDL PTNTMTR CIRC TRACK2</b>
		<b>PL PTNMR T2 V:</b> APP sensor 2 (Pedal track 2 potentiometer voltage)	<b>X = 0.37 V</b>	

### OUTLET VOLTAGE WHEN WARM

Engine speed (in rpm)	1500	2000	3000
Pedal load (in %)	6.3%	10.5%	11.4%
V1 in V	1.10	1.19	1.21
V2 in V	0.54	0.58	0.59

### HEATING

Order	Function	Data monitor or State Check or Action	Display and notes	Diagnostic procedure
1	Output	<b>H R ATHD MX P:</b> Heating resistor maximum authorised power	<b>X = 0 W</b>	<b>In the event of a malfunction, carry out trouble diagnosis on the heater</b>
2	Engine coolant temperature	<b>WATER TEMP:</b> Engine coolant temperature	<b>Cold: 30°C</b> <b>Warm: 90°C</b>	<b>In the event of a malfunction, refer to the trouble diagnosis for VHCL SPD INFOMTION</b>

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

# F9Q

### NOTES

Only perform this conformity check after a complete check with the CONSULT-II. The values indicated in this conformity check are given as examples.  
Test conditions: **engine at idle speed**.

### ASCD

Order	Function	Data monitor or State Check or Action	Display and notes	Diagnostic procedure
1	ASCD	<b>VEHICLE SPEED:</b> Vehicle speed	Gives the vehicle speed in <b>km/h</b> . This parameter is transmitted by the ABS actuator and electrical unit or by the vehicle speed unit. This signal is transmitted to the ECM by CAN system	Test the multiplex network. Refer to the vehicle's ABS or gearbox fault finding note if DTC appears.
		<b>PR130:</b> ASCD setpoint	<b>X = 0 km/h</b>	The ASCD setpoint is selected by the driver and changes according to the vehicle speed.
		<b>CRS CN/S LMTR:</b> ASCD	<b>INACTIVE</b> when no buttons are pressed	<b>In the event of a malfunction,</b> refer to the fault finding procedure for trouble diagnosis <b>SPD LIM/ CRUIS CTRL</b>
			<b>STATE 1:</b> resume button pressed	Activates the <b>green</b> indicator light on the instrument panel and beeps when it switches off
			<b>STATE 2:</b> Speed limiter start/stop button pressed	Activates the <b>orange</b> indicator light on the instrument panel and beeps when it switches off
			<b>STATE 3:</b> set/+ pressed	<b>In the event of a malfunction,</b> refer to the fault finding procedure for trouble diagnosis <b>SPD LIM/ CRUIS CTRL</b>
			<b>STATE 4:</b> set/- pressed	
			<b>STATE 5:</b> cancel pressed	
			<b>STATE 6:</b> Vehicle speed invalid	

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

# F9Q

<b>NOTES</b>	<p>Only perform this conformity check after a complete check with the CONSULT-II. The values indicated in this conformity check are given as examples.</p> <p>Test conditions: <b>engine at idle speed</b>.</p>
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### ASC

Order	Function	Data monitor or State Check or Action	Display and notes	Diagnostic procedure
1	ASC (continued)	CRS CNTL DV T: Deactivate ASC	<p><b>STATE 1:</b> Anti-skid request</p> <p>-----</p> <p><b>STATE 2:</b> Brake pedal depressed</p> <p>-----</p> <p><b>STATE 3:</b> Trouble diagnosis on ASC</p> <p>-----</p> <p><b>STATE 4:</b> Uncouple brake box motor depressed</p> <p>-----</p> <p><b>STATE 5:</b> DTC detected by ECM</p> <p>-----</p> <p><b>STATE 6:</b> Vehicle speed invalid</p> <p>-----</p> <p><b>STATE 7:</b> Press on the cancel button</p> <p>-----</p> <p><b>STATE 8:</b> Gear selector lever in neutral</p> <p>-----</p> <p><b>STATE 9:</b> Inconsistency between the request and the vehicle speed</p>	<p>When a state between <b>STATE 1</b> and <b>STATE 9</b> is active, then associated state <b>CRS CNTL DV T</b> also passes to active and immediately <b>deactivates</b> the <b>ASC</b> requested by the driver.</p> <p><b>Note:</b> ASC can only be activated if speed <b>V &gt; 30 km/h</b> or if <b>STATE 6</b> stays <b>active</b>.</p>
2	Driver braking	<p><b>MAIN BRAKE SW:</b> Primary brake contact</p> <p>-----</p> <p><b>2ND BRK CNTCT:</b> Secondary brake contact</p>	<p><b>ACTIVE</b> or <b>INACTIVE</b></p> <p>-----</p> <p><b>ACTIVE</b> or <b>INACTIVE</b></p>	<p><b>In the event of a problem</b>, refer to the fault finding procedure for trouble diagnosis <b>PDL PTNTMTR CIRC TRACK 1</b></p> <p>-----</p> <p><b>In the event of a problem</b>, refer to the fault finding procedure for trouble diagnosis <b>PDL PTNTMTR CIRC TRACK 1</b></p>
3	Driver operating clutch	<b>CLUTCH PEDAL:</b> Clutch pedal	<b>RELEASED</b> or <b>DEPRESSED</b>	<b>In the event of a problem</b> , refer to the fault finding procedure for trouble diagnosis <b>CLUTCH SWITCH CIRCUIT</b>

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

# F9Q

<b>NOTES</b>	<p>Only perform this conformity check after a complete check with the CONSULT-II. The values indicated in this conformity check are given as examples.</p> <p>Test conditions: <b>engine at idle speed.</b></p>
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### ENGINE COOLING

Order	Function	Data monitor or State Check or Action		Display and notes	Diagnostic procedure
1	Temperature	<b>WATER TEMP:</b>	Engine coolant temperature	Cold: <b>30°C</b> Warm: <b>90°C</b>	<b>In the event of a malfunction,</b> refer to the trouble diagnosis for <b>WATER TEMP SE CIRC</b>
2	Cooling fan	<b>FAN CONTROL 1:</b>	Checking cooling fan 1	<b>STOPPED or RUNNING</b>	<b>In the event of a malfunction,</b> check the connections and protection fuses.  Shunt the fan(s) to check whether the fan operates correctly.  Repair if necessary.
		<b>FAN CONTROL 2:</b>	Checking cooling fan 2		
		<b>FN U LW S RQT:</b>	Fan low-speed request	<b>INACTIVE or ACTIVE</b>	
		<b>FN U HI S RQT:</b>	Fan high-speed request		
3	Sensor feed	<b>CLANT TMP S V:</b>	Engine coolant temperature sensor voltage.	<b>X = 0.54 V</b>	<b>In the event of a malfunction,</b> refer to the trouble diagnosis for <b>WATER TEMP SE CIRC</b>

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

# F9Q

### NOTES

Only perform this conformity check after a complete check with the CONSULT-II. The values indicated in this conformity check are given as examples.  
Test conditions: **engine at idle speed**.

### HEATING / PREHEATING

Order	Function	Data monitor or State Check or Action	Display and notes	Diagnostic procedure
1	Feed	C/U+AFTR IGN: + ECM after ignition (power)	PRESENT	In the event of a malfunction, carry out trouble diagnosis on the charging circuit and refer to the diagnostic procedure for malfunction C/U+AFTR IGN
2	Engine running	ENGINE SPEED: Engine speed	X = 800 rpm	None
3	Temperature	WATER TEMP: Engine coolant temperature	Cold: 30°C Warm: 90°C	In the event of a malfunction, refer to the trouble diagnosis for WATER TEMP SE CIRC
		INLET AIR TMP: Intake inlet air temperature	30 < X < 61°C	In the event of a malfunction, refer to the trouble diagnosis for INLT AIR TEMP CIRC
4	Preheating	PRHTR UT CNTL: Glow relay (preheater unit) control	INACTIVE or ACTIVE (on starting)	In the event of a malfunction, refer to the trouble diagnosis for PRHT UNT CTRL CIRC and PRHT UNIT DGNSTC CNNCTN

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

F9Q

<b>NOTES</b>	<p>Only perform this conformity check after a complete check with the CONSULT-II. The values indicated in this conformity check are given as examples.</p> <p>Test conditions: <b>engine at idle speed.</b></p>
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### STARTING

Order	Function	Data monitor or State Check or Action	Display and notes	Diagnostic procedure
1	Feed	C/U+AFTR IGN:      + Computer After ignition	PRESENT	<b>In the event of a malfunction,</b> carry out trouble diagnosis on the charging circuit and refer to the diagnostic procedure for state <b>C/U+AFTR IGN.</b>
2	Starting	STARTING:    Starting	AUTHORISED	<b>In the event of a malfunction,</b> check the condition of the starting system and refer to SC section
3	Engine operation	MOTOR:        Engine	RUNNING	None

### PROTECTION

Order	Function	Data monitor or State Check or Action	Display and notes	Diagnostic procedure
1	Immobiliser	<div style="display: flex; justify-content: space-between;"> <div>ENG IMMOBILIZ:</div> <div>Immobiliser</div> </div> <hr style="border-top: 1px dashed black;"/> <div style="display: flex; justify-content: space-between;"> <div>CODE PROGRAM:</div> <div>Code programmed</div> </div>	<div style="text-align: center;">INACTIVE</div> <hr style="border-top: 1px dashed black;"/> <div style="text-align: center;">YES</div>	<b>In the event of a malfunction,</b> refer to the trouble diagnosis for NATS

# DIESEL INJECTION

## Trouble diagnosis - General Information

F9Q

### 10. SUMMARY TABLE OF SYSTEM STATES

	CONSULT-II	RENAULT	Description
2	ENG IMMOBILIZ	ET003	Engine immobiliser
3	A/C ATHRSTION	ET004	Air conditioning authorisation
4	-	ET005	Code programmed
5	PRHTR UT CNTL	ET007	Preheater unit control (Glow)
6	-	ET008	Primary brake contact
7	-	ET009	Secondary brake contact
8	-	ET010	Checking cooling fan 1
9	-	ET011	Checking cooling fan 2
10	MAIN BRAKE SW	ET012	Main brake switch
11	2ND BRK CNTCT	ET013	Secondary brake contact
12	FAN CONTROL 2	ET015	Fan control 2
13	-	ET016	Cruise control deactivation
14	-	ET017	Reverse gear signal
15	TMNGR NO2 DMD	ET025	Thermoplunger N° 2 demand
16	-	ET037	Clutch pedal
17	MOTOR	ET038	Motor
18	-	ET039	Starting
19	TMNGR NO3 DMD	ET026	Thermoplunger N° 3 demand
20	-	ET027	Air regulation
21	-	ET028	Air conditioning present
20	-	ET029	Air regulation
21	-	ET046	Air conditioning present
-	C/U+AFTR IGN	ET001	Computer + After ignition
-	-	ET002	
-	CODE PROGRAM	ET006	Code programmed
-	FAN CONTROL 1	ET014	Fan control 1
-	-	ET018	
-	FN U HI S RQT	ET021	Fan unit high-speed request
-	FN U LW S RQT	ET022	Fan unit low-speed request
-	CRS CNTL DV T	ET032	Cruise control deactive test
-	REVERSE INFO	ET035	Reverse information
-	CLUTCH PEDAL	ET040	Clutch pedal
-	CRS CN/S LMTR	ET042	Cruise control/Speed limiter
-	STARTING	ET076	Starting
-	IMPCT DTECTED	ET077	Impact detected



# DIESEL INJECTION

## Trouble diagnosis - General Information

**F9Q**

### 10. SUMMARY TABLE OF SYSTEM STATES

	CONSULT-II	RENAULT	Description
-	REGULATION D'AIR	ET078	Regulation D'air
-	PRSNC CLMTSTN	ET079	Presence climatisation
-	DEMANDE ENCLE	ET088	Demande enclenchement compresseur

# DIESEL INJECTION

## Trouble diagnosis - Interpretation of states

# F9Q

C/U+AFTR IGN

ECM + AFTER IGNITION FEED

**C/U+AFTR IGN ABSENT ignition on**

Check fusible link 10A.

Use a multimeter to check the presence of **+ 12 V** at the fuse holder with the ignition on.

Repair if necessary.

Use a multimeter to check the presence of a **ground** on the following connections:

ECM (E81) terminal 7 and ground

ECM (E81) terminal 8 and ground

ECM (E81) terminal 32 and ground

Repair if necessary.

If the voltage is zero, check the **continuity and insulation** against **ground** between the following connections:

ECM (E81) terminal 28 and fuse block (M1) terminal A7

Repair if necessary.

**C/U+AFTR IGN PRESENT ignition on**

Use a multimeter in the absence of **+ 12 V** with the ignition off on **terminal 1** of the ECM relay (E91).

Repair if necessary

**AFTER REPAIR**

Repeat the diagnostic procedure on the system.

Deal with any other possible DTCs.

Erase the stored DTCs.

# DIESEL INJECTION

## Trouble diagnosis - Interpretation of states

**F9Q**

<b>ENGINE IMMOBILISER</b>	<u>ENGINE IMMOBILISER</u>
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Refer to **NATS (NISSAN ANTI-THEFT SYSTEM)** in BL section.

<b>AFTER REPAIR</b>	Repeat the diagnostic procedure on the system. Deal with any other possible DTCs. Erase the stored DTCs.
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A/C ATHRSTION	<u>AIR CONDITIONING AUTHORISED</u>
YES	<p>The air conditioning authorization only switches to <b>YES</b> state if the driver has made the request for air conditioning: air conditioning switch on <b>AC</b> or <b>AUTO</b> position with minimum ventilation.</p> <p>State <b>A/C ATHRSTION</b>: <b>air conditioning authorization</b> switches to <b>YES</b> if these conditions are fulfilled.</p>
NO	<p>State <b>A/C ATHRSTION</b> remains in <b>NO</b> state with the ignition on although the air conditioning request switch has been activated.</p> <p>The vehicle <b>MUST</b> be at idle speed for state <b>A/C ATHRSTION</b> to switch to <b>YES</b> and the air conditioning can operate.</p> <p>If state <b>A/C ATHRSTION</b> remains in <b>NO</b> state and the switch is triggered,</p> <p>Check:</p> <ul style="list-style-type: none"> <li>– that the air conditioning compressor triggers correctly,</li> <li>– the power supply fuses,</li> <li>– the presence of freon in the air conditioning circuit,</li> <li>– the freon pressure value seems consistent at idle speed.</li> </ul> <p>If the pressure seems inconsistent, refer to the check for <b>trouble diagnosis</b>: <b>Refrigerant fluid sensor circuit</b> and apply the recommended procedure.</p> <p>If other malfunctions appear in the air conditioning domain, refer to the <b>Air conditioning section</b> which deals with these malfunctions.</p>
AFTER REPAIR	<p>Repeat the diagnostic procedure on the system.</p> <p>Deal with any other possible DTCs.</p> <p>Erase the stored DTCs.</p>

CODE PROGRAM	<u>CODE PROGRAMMED</u>
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YES	<p>The code passes to <b>OUI</b> state if communication between the BCM and the ECM is possible and the card is detected.</p> <p>Authorisation for engine starting is only made if the code is correctly recognised by the BCM and state <b>ENG IMMOBILIZ: Engine immobiliser</b> switches to <b>INACTIVE</b> state.</p>
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NO	<p>The code remains <b>NO</b> if communication between the BCM and the ECM is impossible and state <b>ENG IMMOBILIZ: Engine immobiliser</b> remains in <b>ACTIVE</b> state.</p> <p>The cause may be incorrectly programmed keys; if so, refer to the BCM Trouble diagnosis and carry out a CAN network test if trouble diagnosis was performed by functions and check that there is communication between the BCM and the ECM.</p>
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<b>AFTER REPAIR</b>	<p>Repeat the diagnostic procedure on the system.</p> <p>Deal with any other possible DTCs.</p> <p>Erase the stored DTCs.</p> <p>Return to the conformity check.</p>
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PRHTR UT CNTL	<u>GLOW RELAY (PREHEATER) CONTROL</u>
YES	<p>When cold starting a vehicle, the ECM controls the glow relay (pre/postheating) so that the vehicle can start; the state should switch to <b>YES</b> during the starting phase.</p> <p>If the engine does not start and state <b>PRHTR UT CNTL</b> switches to <b>YES</b> during the engine starting phase,</p> <p>Check:</p> <ul style="list-style-type: none"> <li>– the fusible link <b>(F8)</b> <b>terminal 5 (80A)</b> on the glow relay.</li> <li>– the heater plugs and the connections on <b>terminals 8, 3, 7, 2</b> between the glow-relay and the glow plugs.</li> </ul> <p>If the vehicle starts and state <b>PRHTR UT CNTL</b> remains during the engine operation phase, refer to the interpretation of <b>PRHT UNT CTRL CIRC: Glow relay control circuit</b> and <b>PRHT UNIT DGNSTC CNNCTN: Preheater unit diagnostic connection (Glow relay)</b>.</p>
NO	<p>After starting the engine, the ECM should running the glow relay and the state should switch to <b>NO</b> during the operation phase.</p> <p>If the engine does not start, the state remains <b>NO</b> and preheating has not occurred during the starting phase,</p> <p>Check the following connections:</p> <p>ECM <b>(F1)</b> terminal 100 and glow relay terminal 6</p> <p>ECM <b>(F1)</b> terminal 56 and glow relay terminal 1</p> <p>Repair if necessary.</p>

<b>AFTER REPAIR</b>	<p>Repeat the diagnostic procedure on the system.</p> <p>Deal with any other possible DTCs.</p> <p>Erase the stored DTCs.</p>
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FAN CONTROL 1	<u>CHECKING COOLING FAN 1 (LOW)</u>
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NOTES	State <b>FAN CONTROL 1: Cooling fan assembly 1 (low)</b> is directly connected to state <b>FN U LW S RQT: Low-speed fan assembly request</b> .
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RUNNING	<p>When the engine cooling fan is operating and the coolant temperature is <b>90°C</b> (engine warm) or the air conditioning is operating, state <b>FN U LW S RQT: Low-speed fan assembly request</b> switches to <b>ACTIVE</b> and state <b>FAN CONTROL 1: Check cooling fan assembly 1 (low)</b> switches to <b>RUNNING</b>.</p> <p>If the engine cooling fan does not operate, check:</p> <ul style="list-style-type: none"> <li>– the condition of the fan assembly connections,</li> <li>– supply the <b>+ battery feed</b> to check that it operates correctly.</li> </ul> <p>Check the <b>continuity</b> between the following terminals:</p> <p>Cooling fan motor (E97) terminal 1 and cooling relay (E95) harness connector terminal 5</p> <p>Cooling fan motor (E97) terminal 2 and ground</p> <p>Cooling fan relay (E95) terminal 5 and cooling fan resistor (E98) harness connector terminal 1</p> <p>Cooling fan resistor (E98) terminal 2 and cooling fan motor harness connector terminal 1</p> <p>Check that the cooling fan assembly low-speed resistor is <b>0.69 Ω</b>.</p> <p>Replace the resistor if it is not this value.</p> <p>Refer to the cooling fan assembly diagnostic procedure in the <b>Trouble diagnosis Note Switching</b>.</p>
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 <b>WARNING!</b>	<p><b>IMPORTANT:</b> If the switching protection unit no longer detects the ECM frames then cooling fan assembly 1 (low) will be started until the battery has been completely discharged.</p> <p>If cooling fan assembly 1 (low) is not working, cooling fan assembly 2 (high) will be operated.</p>
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AFTER REPAIR	<p>Repeat the diagnostic procedure on the system.</p> <p>Deal with any other possible DTCs.</p> <p>Erase the stored DTCs.</p>
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FAN CONTROL 1 CONTINUED	
STOPPED	When the engine coolant temperature has fallen sufficiently ( $X < 90^{\circ}\text{C}$ ) or air conditioning is off, state <b>FN U L W S RQT: Low-speed fan assembly request</b> switches to <b>INACTIVE</b> and so state <b>FAN CONTROL 1: Check cooling fan assembly 2 (high)</b> switches to <b>STOPPED</b> state.
 WARNING!	<b>IMPORTANT:</b> If the switching protection unit no longer detects the ECM frames then cooling fan assembly 1 (low) will be started until the battery has been completely discharged.  If cooling fan assembly 1 (low) is not working, cooling fan assembly 2 (high) will be operated.
AFTER REPAIR	Repeat the diagnostic procedure on the system. Deal with any other possible DTCs. Erase the stored DTCs.




FAN CONTROL 2	<u>CHECKING COOLING FAN 2 (HIGH)</u>
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NOTES	State <b>FAN CONTROL 2: Check cooling fan assembly 2 (high)</b> is directly linked to state <b>FN U LW S RQT: Low-speed fan assembly request</b> .
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RUNNING	<p>Cooling fan assembly 2 (high) starts operating when cooling by cooling fan assembly 1 (low) is insufficient or air conditioning is operating; state <b>FN U HI S RQT: Low-speed fan assembly request</b> switches to <b>ACTIVE</b> and state <b>FAN CONTROL 1: Check cooling fan assembly 2 (high)</b> switches to <b>RUNNING</b>.</p> <p>If the engine cooling fan does not operate, check:</p> <ul style="list-style-type: none"> <li>– the condition of the fan assembly connections,</li> <li>– supply the <b>+ battery feed</b> to check that it operates correctly.</li> </ul> <p>Check the <b>continuity</b> between the following terminals:</p> <p>Cooling fan motor (E97) terminal 1 and cooling fan relay (high) harness connector terminal 5</p> <p>Cooling fan motor (E97) terminal 2 and ground</p> <p>Refer to the fan assembly diagnostic procedure.</p>
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STOPPED	When the engine coolant temperature has fallen sufficiently ( <b>X &lt; 90° C</b> ) or air conditioning is off, state <b>FN U HI S RQT: Low-speed fan assembly request</b> switches to <b>INACTIVE</b> and so state <b>FAN CONTROL 2: Check cooling fan assembly 2 (high)</b> switches to <b>STOPPED</b> state.
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 <b>WARNING!</b>	<p><b>IMPORTANT:</b> If the switching protection unit no longer detects the ECM frames then cooling fan assembly 1 (low) will be started until the battery has been completely discharged.</p> <p>If cooling fan assembly 1 (low) is not working, cooling fan assembly 2 (high) will be operated.</p>
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AFTER REPAIR	<p>Repeat the diagnostic procedure on the system.</p> <p>Deal with any other possible DTCs.</p> <p>Erase the stored DTCs.</p>
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FN U HI S RQT	<u>FAN HIGH-SPEED REQUEST</u>
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NOTES	State <b>FN U HI S RQT: High-speed fan assembly request</b> is directly linked to state <b>FAN CONTROL 2: Check cooling fan assembly 2 (high)</b> .
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ACTIVE	<p>When the request for cooling is made by the ECM, state <b>FN U HI S RQT: Request for high-speed fan assembly</b> switches to <b>ACTIVE</b> and the switching protection unit therefore controls cooling fan assembly 2 (high) and state <b>FAN CONTROL 2: Check cooling fan assembly 2 (high)</b> switches to <b>RUNNING</b>.</p> <p>If the cooling fan assembly does not work, refer to the interpretation of state <b>FAN CONTROL 2: Check cooling fan assembly 2 (high)</b>.</p>
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INACTIVE    WARNING!	<p>When the request for cooling is made by the ECM, state <b>FN U HI S RQT: Low-speed fan assembly request</b> switches to <b>INACTIVE</b> and the smart entrance control unit therefore controls cooling fan assembly 2 (high) and state <b>FAN CONTROL 2: Check cooling fan assembly 2 (high)</b> switches to <b>STOPPED</b> state.</p> <p><b>IMPORTANT:</b> If the smart entrance control unit no longer detects the ECM frames then cooling fan assembly 1 (low) will be started until the battery has been completely discharged.</p> <p>If cooling fan assembly 1 (low) is not working, cooling fan assembly 2 (high) will be operated.</p>
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AFTER REPAIR	<p>Repeat the diagnostic procedure on the system.</p> <p>Deal with any other possible DTCs.</p> <p>Erase the stored DTCs.</p>
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FN U L W S RQT	<u>LOW-SPEED FAN ASSEMBLY REQUEST</u>
NOTES	State <b>FN U L W S RQT: Low speed fan assembly request</b> is directly linked to state <b>FAN CONTROL 1: Check cooling fan assembly 1 (low)</b> .
ACTIVE	<p>When the request for cooling is made by the ECM, state <b>FN U L W S RQT: Request for high-speed fan assembly</b> switches to <b>ACTIVE</b> and the smart entrance control unit therefore controls cooling fan assembly 1 (low) and state <b>FAN CONTROL 1: Check cooling fan assembly 1 (low)</b> switches to <b>RUNNING</b>.</p> <p>If the cooling fan assembly does not work, refer to the interpretation of state <b>FAN CONTROL 1: Check cooling fan assembly 1 (low)</b>.</p>
INACTIVE    WARNING!	<p>When the request for cooling is made by the ECM, state <b>FN U L W S RQT: Low-speed fan assembly request</b> switches to <b>INACTIVE</b> and the smart entrance control unit therefore controls cooling fan assembly 2 (high) and state <b>FAN CONTROL 1: Check cooling fan assembly 1 (low)</b> switches to <b>STOPPED</b> state.</p> <p><b>IMPORTANT:</b> If the smart entrance control unit no longer detects the ECM frames then cooling fan assembly 1 (low) will be started until the battery has been completely discharged.</p> <p>If cooling fan assembly 1 (low) is not working, cooling fan assembly 2 (high) will be operated.</p>

AFTER REPAIR	Repeat the diagnostic procedure on the system. Deal with any other possible DTCs. Erase the stored DTCs.
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REVERSE INFO	<u>REVERSE GEAR INFORMATION</u>
PRESENT	<p>When the driver engages reverse gear, state <b>REVERSE INFO : Reverse gear signal</b> should switch to <b>PRESENT</b> status.</p> <p>If the driver has correctly selected this gear and the state does not change status, it remains <b>ABSENT</b>, check: (Refer to BL section: smart entrance system)</p>
ABSENT	<p>When the driver disengages reverse gear, state <b>REVERSE INFO: Reverse gear signal</b> should switch to <b>ABSENT</b> state.</p> <p>In the event of a malfunction, refer to BL section.</p>
AFTER REPAIR	<p>Repeat the diagnostic procedure on the system.</p> <p>Deal with any other possible DTCs.</p> <p>Erase the stored DTCs.</p>

MOTOR	<u>ENGINE</u>
-------	---------------

STOPPED	When the engine is stopped and the camshaft position sensor and crankshaft position (engine speed) sensor signals detect no engine rotation, state <b>MOTOR: Engine</b> is <b>STOPPED</b> .
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STALLED	When the engine is in operating phase and one of the two signals from the camshaft position sensor and CKP sensor or other malfunctions may interfere with the correct operation of the engine, state <b>MOTOR: Engine</b> switches to <b>STALLED</b> .
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RUNNING	When the engine is in operating phase and the signals from the camshaft position sensor and CKP sensor are received by the ECM, state <b>MOTOR: Engine</b> switches to <b>RUNNING</b> .
---------	---

CRANKING	When the engine is in starting phase and the camshaft position and CKP sensor signals are received by the ECM, state <b>MOTOR: Engine</b> <b>RUNNING</b> .
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<b>AFTER REPAIR</b>	Repeat the diagnostic procedure on the system. Deal with any other possible DTCs. Erase the stored DTCs.
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CLUTCH PEDAL	<u>CLUTCH PEDAL</u>
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DEPRESSED	When the driver presses on the clutch pedal state <b>CLUTCH PEDAL: Clutch pedal</b> switches to <b>PRESSED</b> status.
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RELEASED	When the driver releases the clutch pedal state <b>CLUTCH PEDAL: Clutch pedal</b> switches to <b>RELEASED</b> status.
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<b>AFTER REPAIR</b>	Repeat the diagnostic procedure on the system. Deal with any other possible DTCs. Erase the stored DTCs.
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CRS CN/S LMTR	<u>ASCD</u>
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NOTES	<p>State <b>CRS CNTL DV T: Deactivate ASCD</b> is directly linked to state <b>CRS CN/S LMTR: ASCD</b>.</p> <p>ASCD remains deactivated as long as the vehicle speed does not exceed <b>V 18 mph (30 km/h)</b>.</p> <p>Nine states are connected and when one of them passes to active, the ASCD is immediately deactivated.</p> <p><b>Special notes:</b> Only perform the checks if the states are not consistent with the position of the buttons.</p>
-------	---

**STATE 1, STATE 2 absent, resume switch pressed (CRS CN/S LMTR INACTIVE).**

Check the connections of the ASCD steering switch and ECM (E81). Repair if necessary.

– Check and ensure the presence of voltages on (M303) terminal 1 on the ASCD steering switch connector.

Replace the switch if necessary.

AFTER REPAIR	<p>Repeat the diagnostic procedure on the system.</p> <p>Deal with any other possible trouble diagnosis.</p> <p>Erase the stored DTC.</p>
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CRS CN/S LMTR  
CONTINUED

STATE 3, STATE 4, STATE 5, STATE 6 absent, button pressed (CRS CN/S LMTR INACTIVE).

- Lock the airbag control module and remove the driver's airbag (refer to the SRS section).
- Disconnect the **M303** connector and on the switch side, check the resistance value of the switches:

Switches in rest position	STATE 3 (set/+ pressed)	STATE 4 (set/- pressed)	STATE 5 (cancel pressed)	STATE 6 (resume pressed)
R = INFINITY	R = approximately 270 $\Omega$	R = approximately 100 $\Omega$	R = approximately 0 $\Omega$	R = approximately 910 $\Omega$

If the values are not correct, replace the ASCD steering switch.

- If the DTC persists, check the connection between the ECM and the spiral cable, using the relevant wiring diagram (line resistance, short circuit, etc.).

Carry out the necessary repairs.

**AFTER REPAIR**

Repeat the diagnostic procedure on the system.  
Deal with any other possible trouble diagnosis.  
Erase the stored DTCs.



STARTING	<u>STARTING</u>
AUTHORISED	When the driver inserts the key or the key has been recognised by the engine immobilizer system, the <b>SMART ENTRANCE CONTROL UNIT</b> authorizes the ECM to start, state <b>STARTING</b> switches to <b>AUTHORISED</b> and the vehicle can be started.
PROHIBITED	<p>When the driver is no longer detected by the <b>SMART ENTRANCE CONTROL UNIT</b> it prohibits engine starting, state <b>STARTING</b> switches to <b>PROHIBITED</b> and the vehicle cannot be started.</p> <p>Check the battery in the key and carry out trouble diagnosis on the <b>SMART ENTRANCE CONTROL UNIT</b>.</p>
AFTER REPAIR	<p>Repeat the diagnostic procedure on the system.</p> <p>Deal with any other possible DTCs.</p> <p>Erase the stored DTCs.</p>

IMPCT DTECTED	<u>IMPACT DETECTED</u>
---------------	------------------------

YES	<p>When the vehicle has been involved in a collision, the ECM detects the signal transmitted by the <b>airbag</b> control and state <b>IMPCT DTECTED</b> is <b>YES</b>.</p> <p>Switch off the ignition for ten seconds, then switch it back on to allow the engine to start.</p> <p>Then erase any DTCs.</p>
-----	--

NO	<p>If the vehicle has not suffered an impact or the starting procedure described above has been carried out, state <b>IMPCT DTECTED</b> is <b>NO</b>.</p>
----	---

<b>AFTER REPAIR</b>	<p>Repeat the diagnostic procedure on the system.</p> <p>Deal with any other possible DTCs.</p> <p>Erase the stored DTCs.</p>
---------------------	---

REGULAT D'AIR	<u>AIR REGULATION</u>
OPEN LOOP	Once air regulation has been requested by the driver, state <b>REGULAT D'AIR</b> switches to <b>OPEN LOOP</b> .
ACTIVE	Use a multimeter to check the absence of + 12 V with the ignition off on <b>terminal 5</b> of the ECM relay. Repair if necessary.

<b>AFTER REPAIR</b>	Repeat the diagnostic procedure on the system. Deal with any other possible DTCs. Erase the stored DTCs.
---------------------	--

PRSNCLMTSTN	<u>AIR CONDITIONING PRESENT</u>
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YES	<p>If the voltage is absent, check the <b>continuity and insulation</b> against <b>ground</b> between the following connections:</p> <p>ECM (E81) terminal 21 and air conditioner relay harness connector terminal 3</p> <p>Repair if necessary.</p>
NO	<p>Use a multimeter to check the absence of <b>+ 12 V</b> with the ignition off on <b>terminal 3</b> of the air conditioner relay.</p> <p>Repair if necessary.</p>

<b>AFTER REPAIR</b>	<p>Repeat the diagnostic procedure on the system.</p> <p>Deal with any other possible DTCs.</p> <p>Erase the stored DTCs.</p>
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# DIESEL INJECTION

## Trouble diagnosis - General Information

# F9Q

### 11. SUMMARY TABLE OF DATA MONITOR ITEMS (SYSTEM PARAMETERS)

	Parameter	MONITOR ITEM	Description
2	PR003	PEDAL LOAD	Pedal load
5	PR006	R PR RT CRRNT	Rail pressure regulator current
6	PR007	R P RT C RF V	Rail pressure regulator current setpoint
7	PR008	RAIL PRES SET	Rail pressure setting
8	PR009	BT PRES REF V	Turbocharging pressure setpoint
9	PR010	IDLE REG REF	Idle speed regulation setting
10	PR011	TRB S/V PF CN	Turbocharging solenoid valve position sensor
11	PR015	ENGINE TORQUE	Engine torque
12	PR016	Altr rtr crnt	Alternator flow
13	PR017	FUEL FLOW	Fuel flow
14	PR018	ESTIMATED AIR	Estimated air flow
15	PR022	-	EGR-valve position feedback loop error
16	PR024	FUEL P DIFF	Fuel pressure difference
19	PR035	ATMOS PRESS	Atmospheric pressure
20	PR037	RFRGERNT PRSS	Refrigerant pressure
21	PR038	RAIL PRESSUE	Rail pressure
22	PR042	FLRD BST PRES	Filtered turbocharging pressure
26	PR046	EGR S/V RCO	EGR Solenoid valve OCR
27	PR047	TRBO PRES OCR	Turbocharging pressure OCR
28	PR048	GAL PRS REG/V	Gallery pressure regulation valve OCR
29	PR050	DMPR FLAP OCR	Damper flap OCR
30	PR051	-	EGR valve position feedback
31	PR053	E SP RQRD A/C	System requested by air conditioning
33	PR055	ENGINE SPEED	Engine speed
34	PR059	INLET AIR TEMP	Inlet air temperature
35	PR061	EXT AIR TEMP	External air temperature
36	PR063	FUEL TEMP	Fuel temperature
37	PR064	WATER TEMP	Engine coolant temperature
39	PR071	C/U SUPPLY VOL	Computer supply voltage (ECM)

# DIESEL INJECTION

## Trouble diagnosis - General Information

F9Q

	Parameter	MONITOR ITEM	Description
40	PR072	LINEAR S/SUP-V	Linearised sensor feed voltage
41	PR073	AR FWMTR SPLY V	Air flowmeter supply voltage (MAF sensor)
42	PR076	RFRGNT F L S V	Refrigerant sensor voltage
43	PR077	EGR POS SE VO	EGR valve position sensor voltage
45	PR079	ATOMS PS SE V	Atmospheric pressure sensor voltage
46	PR080	RAIL PRES S V	Rail pressure sensor voltage
47	PR081	INLET TEMP S V	Intake (inlet) temperature sensor voltage
48	PR082	FUEL TMP S V	Fuel temperature sensor voltage
49	PR084	CLANT TMP S V	Engine coolant temperature sensor voltage.
51	PR086	PL PTNMR T1 V	Pedal potentiometer track 1 voltage (APP sensor 1)
52	PR088	PL PTNMR T2 V	Pedal potentiometer track 2 voltage (APP sensor 2)
53	PR089	VEHICLE SPEED	Vehicle speed
54	PR127	H R ATHD MX P	Heating resistor max authorised power.
55	PR128	E V FRST OFST	First EGR valve offset
56	PR129	LT EGR V OFST	Last EGR valve offset
57	PR130	-	Cruise control setpoint
58	PR131	-	EGR air flow difference

## CHART 1

## No communication with the ECM

**Check the conformity of the vehicle type and the domain selected on your tool.**

Make sure that the tool is not malfunction by trying to establish communication with a ECM on another vehicle.

Check the supply to the diagnostic socket:

↪ + Before ignition on **terminal 16** / + After ignition on **terminal 8** / Earth on **terminals 4 and 5**

Check (according to wiring diagram and fittings):

- The conformity of the fuse after ignition.
- The conformity of the injection relay mounting feeds.
- The conformity of the impact sensor: Refer to SRS section.

Disconnect the ECM and check for the absence of conducting elements on the computer pins. If this reveals any kind of impurity, rectify it and try to establish communication.

If the DTC exists, place the CONSULT-II on the engine wiring:

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

ECM (E81) terminal 2 and DLC connector terminal 7

Ensure that the power supplies are correct:

DLC (M10) terminal 8 and fuse block A12 terminal

DLC (M10) terminals 5, 4 and ground



Continued on next page

**AFTER REPAIR**

Perform a road test followed by a test using the diagnostic tool.

# CHART 1 CONTINUED

Carry out the checks on the previous page.



## Try to establish dialogue with another ECM on the same vehicle.

- ➡ If communication can be established with another ECM on the same vehicle **go to step 2**
- ➡ If communication cannot be established **with any other ECM on the same vehicle**, the cause could be a malfunctioning ECM interfering on the **K line**. To locate it, proceed by elimination by successively disconnecting all the ECMs connected to these lines (using wiring diagram and depending on equipment): air conditioning, airbag, ABS and VDC, instrument panel, BCM, proximity sensor.

Try to establish a communication between each disconnection:

If, after a disconnection, you manage to start communication, perform the diagnostic procedure for the relevant computer.

➤ If the malfunction exists, reconnect the ECMs listed above and disconnect the ECM. Try to establish communication with another ECM. If you manage to establish communication, go to **step 2**.

➤ If you still cannot establish communication, disconnect **all** the ECMs connected to the **K** lines and check the insulation against **+ 12 volts** and against earth on **terminals 5** and **4** of the diagnostic socket. Carry out the necessary repairs.

## STEP 2

Replace the ECM. If necessary, modify the configuration of the new ECM to match the equipment options available on the vehicle.

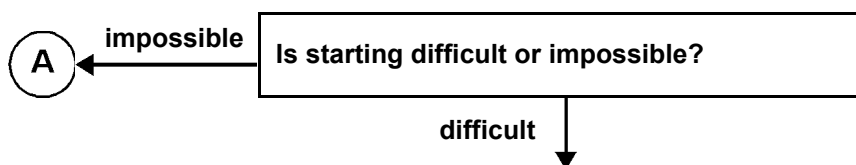
## AFTER REPAIR

Perform a road test followed by a test using the diagnostic tool.



<b>CHART 2</b>	<b>Starting malfunctions (or starting impossible)</b>
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<b>NOTES</b>	<p>Before dealing with this customer complaint, check for the absence of malfunctions, and conformity (or otherwise) of parameters and states, using the diagnostic tool.</p> <p>If the customer complaint is not resolved, perform the following checks:</p>
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<p>Check the engine earths.</p> <p>Make sure that the engine speed reaches <b>250 rpm</b> when the starter motor is operated, displayed in the data monitor screen. Ensure that the correct fuel is being used.</p> <p>Check the priming of the low-pressure diesel circuit.</p> <p>Check the conformity of the diesel filter connections.</p> <p>Ensure that the fuel filter is not saturated with water.</p> <p>Check there are no air bubbles between the filter and the high-pressure pump.</p> <p>Check the operation of the pre-heating plugs.</p> <p>Check the condition of the air filter (clogging).</p> <p>Check the leaktightness of the high-pressure circuit - pump, pipes, unions (visual inspection + odours).</p> <p>Check the position of the exhaust gas recirculation valve (blocked, mechanically seized).</p> <p>Check the consistency of the signal from the engine coolant temperature sensor.</p> <p>Check the operation of the pressure regulator.</p> <p>Ensure correct operation of the injectors (return leakage too high, clogging, sticking: see injector diagnostic procedure).</p> <p>Check that the compressions are balanced in accordance with the power consumption in the starting phase.</p> <p>In the event of an imbalance, use a compression meter to complete the measurements. (Refer to EM section). After measuring the compressions, clear the DTCs caused by disconnecting the regulator and the heater plugs.</p>
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<b>AFTER REPAIR</b>	Perform a road test followed by a test using the diagnostic tool.
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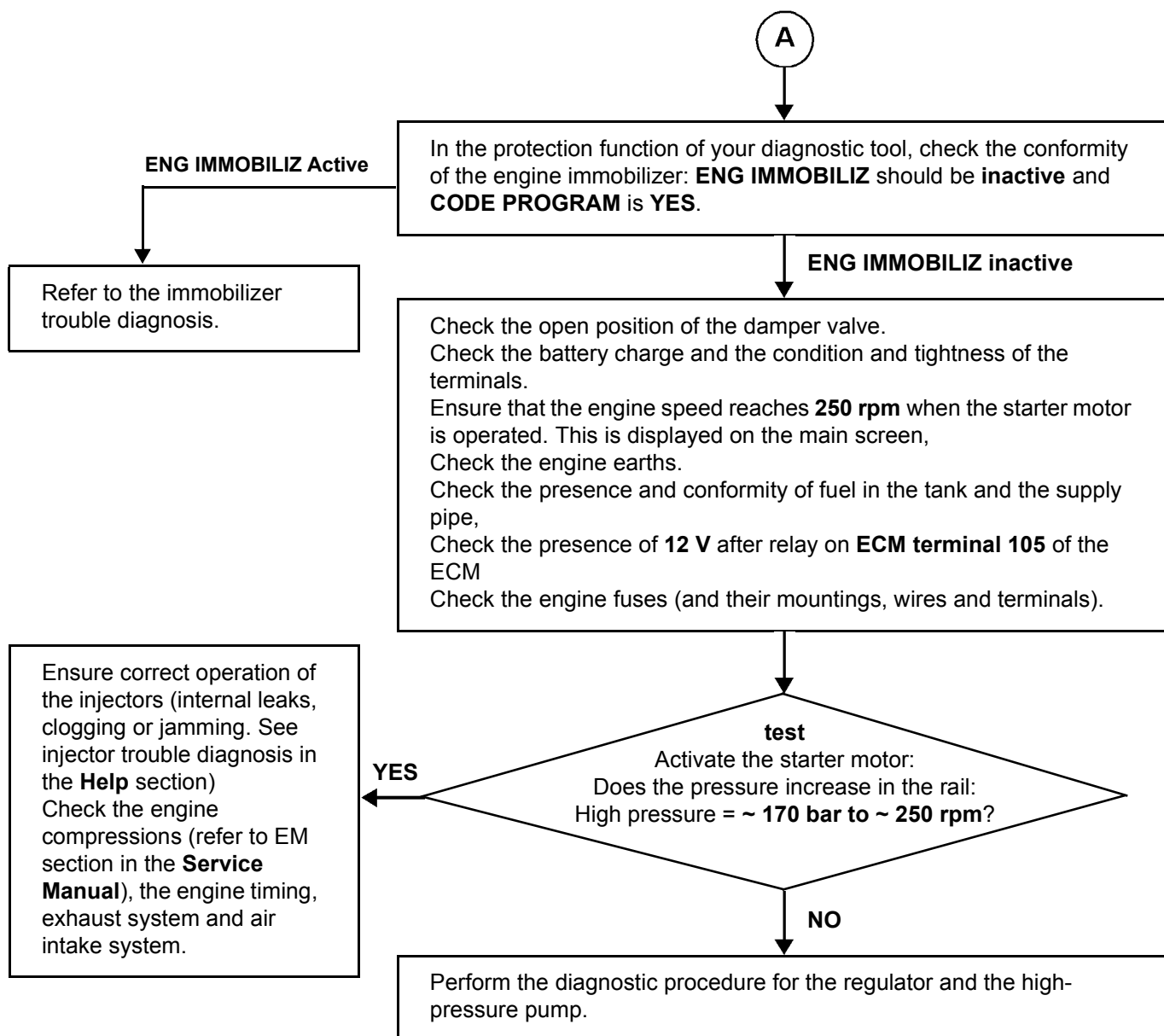
### CHART 2 CONTINUED

### Impossible to start

#### NOTES

Before dealing with this customer complaint, check for the absence of malfunctions, and conformity (or otherwise) of data monitor and states, using the CONSULT-II.

If the customer complaint is not resolved, perform the following checks:



#### AFTER REPAIR

Perform a road test followed by a test using the diagnostic tool.

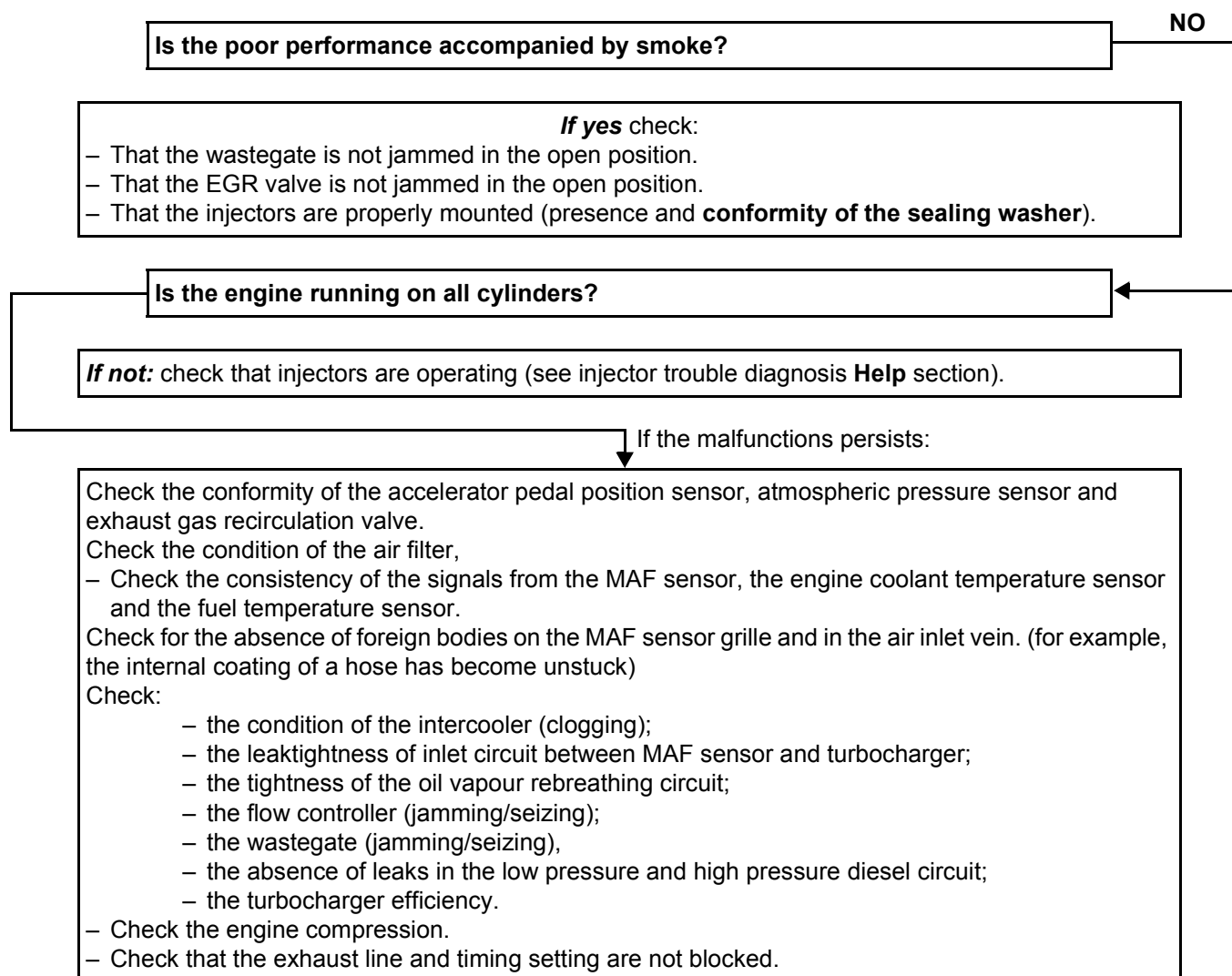
<b>CHART 3</b>	<b>Injection noise</b>
<b>NOTES</b>	<p>Before dealing with this customer complaint, check for the absence of malfunctions, and conformity (or otherwise) of data monitor and states, using the <b>CONSULT-II</b>.</p> <p>If the customer complaint is not resolved, perform the following checks:</p>
<p>If the IMA function is operating: check that the codes are authentic by comparing the affected injector codes on each cylinder with the ones that are <b>engraved</b> on each injector.</p>	
<p><b>If the injection noise occurs after starting from cold:</b></p> <ul style="list-style-type: none"> <li>Check the priming of the low-pressure fuel circuit.</li> <li>Check the fuel heater supply.</li> <li>Check the operation of the preheating system.</li> <li>Check that fuel and engine temperatures are consistent.</li> </ul> <p>If the malfunction exists, check the rail pressure and carry out diagnostic procedure.</p>	
↓	
<p><b>Does the injection noise occur at idle speed?</b></p> <ul style="list-style-type: none"> <li>Check the condition of the injector connector and pressure regulator terminals.</li> <li>Check the conformity of the air flow signal (diagnostic procedure: <b>DMPR FLAP OCR</b>).</li> <li>Check the position of the exhaust gas recirculation valve.</li> </ul> <p>If the malfunction exists, perform the injector diagnostic procedure (see <b>Help</b> section).</p> <p><b>Does the injection noise occur at all speeds?</b></p> <ul style="list-style-type: none"> <li>Perform the injector diagnostic procedure (see the <b>Help</b> section).</li> <li>Check the condition of the injector connector and pressure regulator terminals.</li> <li>Ensure that the correct fuel is being used.</li> <li>Check the conformity of the air flow signal (diagnostic procedure: <b>DMPR FLAP OCR</b>).</li> </ul> <p>If the malfunction exists, check the rail pressure and carry out diagnostic procedure.</p>	
↓	
<p><b>If the injection noise occurs at transitional speed:</b></p> <p>If the engine races during gear changes, check the conformity of the clutch switch.</p> <p>During a road test, when changing gear, display data monitor items: if it varies, without notable influence on the rail pressure carry out the diagnostic procedure.</p> <p>If the malfunction exists, carry out the diagnostic procedure on the injectors (refer to the <b>Help</b> section).</p>	
<b>AFTER REPAIR</b>	Perform a road test followed by a test using the diagnostic tool.

<b>CHART 4</b>	<b>Poor performance</b>
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<b>NOTES</b>	<p><b>Before dealing with this customer complaint, check for the absence of malfunctions, and conformity (or otherwise) of data monitor and states, using the CONSULT-II.</b></p> <p><b>If the customer complaint is not resolved, perform the following checks:</b></p>
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<p><b>NOTE:</b> In the event of engine overheating above <b>119°C</b>, the ECM automatically limits the fuel flow (the overheating warning light comes on from <b>115°C</b>).</p>
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<p>If the IMA function is operating: check that the codes are authentic by comparing the affected injector codes on each cylinder with the ones that are <b>engraved</b> on each injector.</p>
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<b>AFTER REPAIR</b>	<p>Perform a road test followed by a test using the diagnostic tool.</p>
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<b>CHART 5</b>	<b>Irregular engine operation</b>
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<b>NOTES</b>	<p>Before dealing with this customer complaint, check for the absence of malfunctions, and conformity (or otherwise) of data monitor and states, using the diagnostic tool.</p> <p>If the customer complaint is not resolved, perform the following checks:</p>
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<p>If the engine snatches or races during gear changes, check the conformity of the clutch switch.</p> <p>If the fault exists:</p> <ul style="list-style-type: none"> <li>– Ensure that the correct fuel is being used.</li> <li>– Check the priming of the low-pressure diesel circuit and check that the diesel filter is connected correctly and is not saturated with coolant.</li> <li>– Check there are no air bubbles between the filter and the high-pressure pump.</li> <li>– Check the conformity of the rail pressure (warm engine): <ul style="list-style-type: none"> <li>± <b>25 bar</b> around the rail pressure value at idle speed, (the minimum to maximum variations in the rail pressure at idle speed should not exceed <b>50 bar</b>).</li> <li>~ <b>1350 bar</b> when under full load.</li> </ul> </li> </ul> <p>In the event of a malfunction, carry out diagnostic procedure <b>of fuel rail pressure sensor</b>.</p> <ul style="list-style-type: none"> <li>– Check the conformity of the air flow, use diagnostic procedure <b>DMPR FLAP OCR</b>.</li> </ul> <p>If the malfunction exists:</p> <ul style="list-style-type: none"> <li>– Check the injectors: with engine running at idling speed, disconnect the injectors one after the other: <ul style="list-style-type: none"> <li>Replace the injector which causes no variation in operation when it is disconnected. Erase the DTCs caused by multiple disconnections, followed by a road test to confirm the repair.</li> </ul> </li> <li>– Check the cylinder compressions.</li> </ul>
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<b>AFTER REPAIR</b>	Perform a road test followed by a test using the diagnostic tool.
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### INJECTOR DIAGNOSTIC PROCEDURE

**A** - Check the resistance between terminals **1** and **2** of each injector: **0.33  $\Omega$  at 20 °C**.

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

- ECM **(F1)** terminal 33 and injector harness connector terminal 1
- ECM **(F1)** terminal 74 and injector harness connector terminal 2
- ECM **(F1)** terminal 54 and injector harness connector terminal 2
- ECM **(F1)** terminal 94 and injector harness connector terminal 2
- ECM **(F1)** terminal 53 and injector harness connector terminal 1
- ECM **(F1)** terminal 93 and injector harness connector terminal 2
- ECM **(F1)** terminal 34 and injector harness connector terminal 1
- ECM **(F1)** terminal 73 and injector harness connector terminal 2

**Carefully check the connecting clips and tabs of each injector.**

*If the engine starts:*

- With the engine running, disconnect the injectors one after the other (in turn and one at a time).
- Replace the injector which causes no variation in operation when it is disconnected.
- Erase the DTCs caused by the multiple disconnections and then perform a road test.

**B** - Check the **injector return flows are balanced**.

Fit take-off pipes to the injector returns with the free ends placed in measuring cylinders, start the engine and check that the return flows are balanced at idle speed.

(In general, the return flows are quite small. they should not resemble a jet).

- Replace the injector with a return flow that is significantly different from that of the other injectors.

In the event of under-pressure in the rail:

- Replace the injector with a return flow that shows a more significant leak than any of the others.

**If the engine does not start:**

You can check the return flows during and after testing the engine starter (minimum **250 rpm**) **with the pressure regulator disconnected**.

This causes increased pressure in the rail and enables analysis of the return flows. After completing this operation, erase the DTC caused by disconnection of the pressure regulator.

**C** - Check the **injector nozzle is sealed**.

- Check the level and condition of the engine oil:
- If there is pollution from diesel fuel, the injector nozzle that is leaking will be covered in soot and the cylinder will be greasy. Ensure that this is not caused by rising engine oil by checking the engine compression values.

If the compression values are correct, locate the suspected injector by looking at the condition of the cylinders and the pistons across the heater plug wells (greasy cylinder, piston overheated and starting to disintegrate). If a visual inspection of the cylinder/piston is not conclusive, remove the injectors and replace the one that has a nozzle covered in soot.

**NOTE:**

After replacing an injector, follow the injector code programming procedure (see the **Replacing components** section).

**IMPORTANT:**

**Note the cleanliness and safety advice in the Introduction section of the Service Manual when removing or refitting the injectors.**

### CAN Communication Line

#### Description

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

Refer to "CAN Communication Unit" for details of CAN communication.

# DIESEL INJECTION

## CAN Communication

# F9Q

### System Description

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

### CAN Communication Unit

Go to CAN system, when selecting your car model from the following table.

Body type		Hatchback			
Axle		2WD			
Engine		F9Q			
Transmission		M/T			
Brake control		ESP		ABS	
		CAN communication unit			
ECM		x	x	x	x
ESP/TCS/ABS control unit		x	x		
ABS actuator and electric unit (control unit)				x	x
Data link connector		x	x	x	x
Tyre pressure monitoring control unit		x		x	
Steering angle sensor		x	x		
Smart entrance control unit		x	x	x	x
Combination meter		x	x	x	x
CAN communication type		TYPE 33/TYPE 34 (See next page.)		TYPE 35/TYPE 36 (See F9Q-177.)	
CAN system trouble diagnosis	LHD models	Type 33	Type 34	Type 35	Type 36

x: Applicable



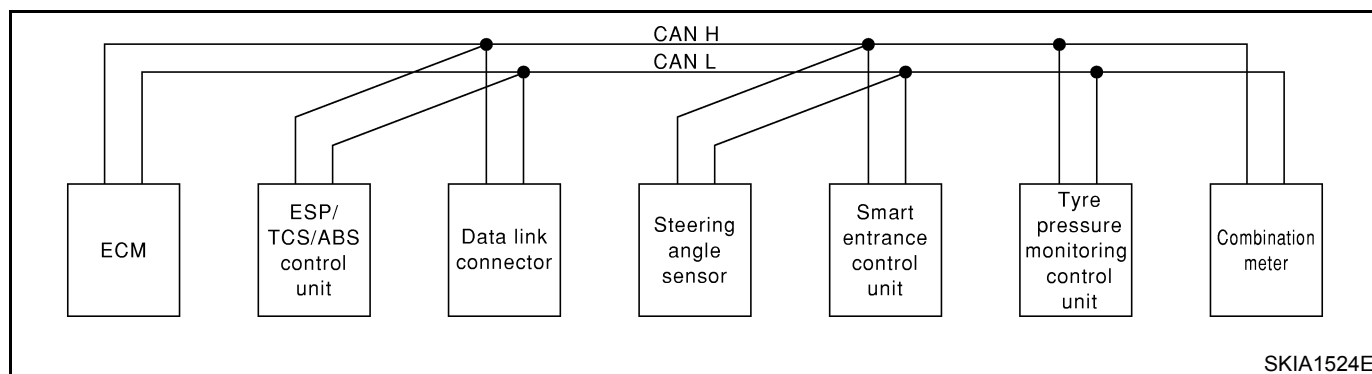
# DIESEL INJECTION CAN Communication

# F9Q

## TYPE 33/TYPE 34

### System diagram

LHD models (Type 33, Type 34)



SKIA1524E

### Input/output signal chart

T: Transmit R: Receive

Signals	ECM	ESP/TCS/ ABS control unit	Steering angle sensor	Smart entrance control unit	Tyre pressure monitor-ing control unit	Combi- nation meter
Engine speed signal	T	R				R
Accelerator pedal position signal	T	R				
ESP operation signal	R	T				
TCS operation signal	R	T				
ABS operation signal	R	T				
Steering angle sensor signal		R	T			
MI signal	T					R
Engine coolant temperature signal	T					R
Fuel consumption signal	T					R
Vehicle speed signal	R	T				R
					R	T
Seat belt reminder signal				R		T
Lighting switch position signal				T		R
Flashing indicator signal				T		R
Engine cooling fan speed signal	T			R		
Child lock indicator signal				T		R
Door switches state signal				T		R
A/C compressor signal	T			R		
Glow indicator lamp signal	T					R
Tyre pressure signal					T	R
ASCD SET lamp signal	T					R
ASCD CRUISE lamp signal	T					R

# DIESEL INJECTION

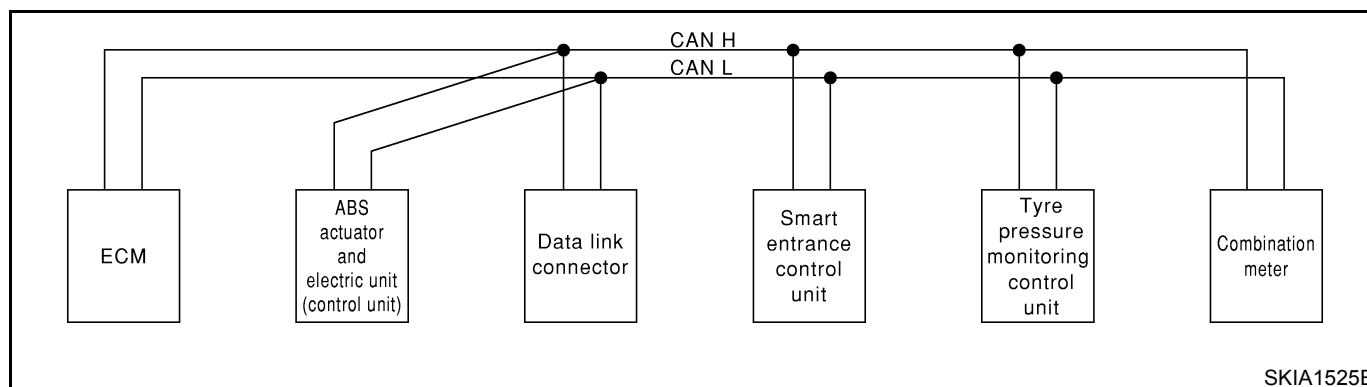
## CAN Communication

# F9Q

### TYPE 35/TYPE 36

#### System diagram

LHD models (Type 35, Type 36)



#### Input/output signal chart

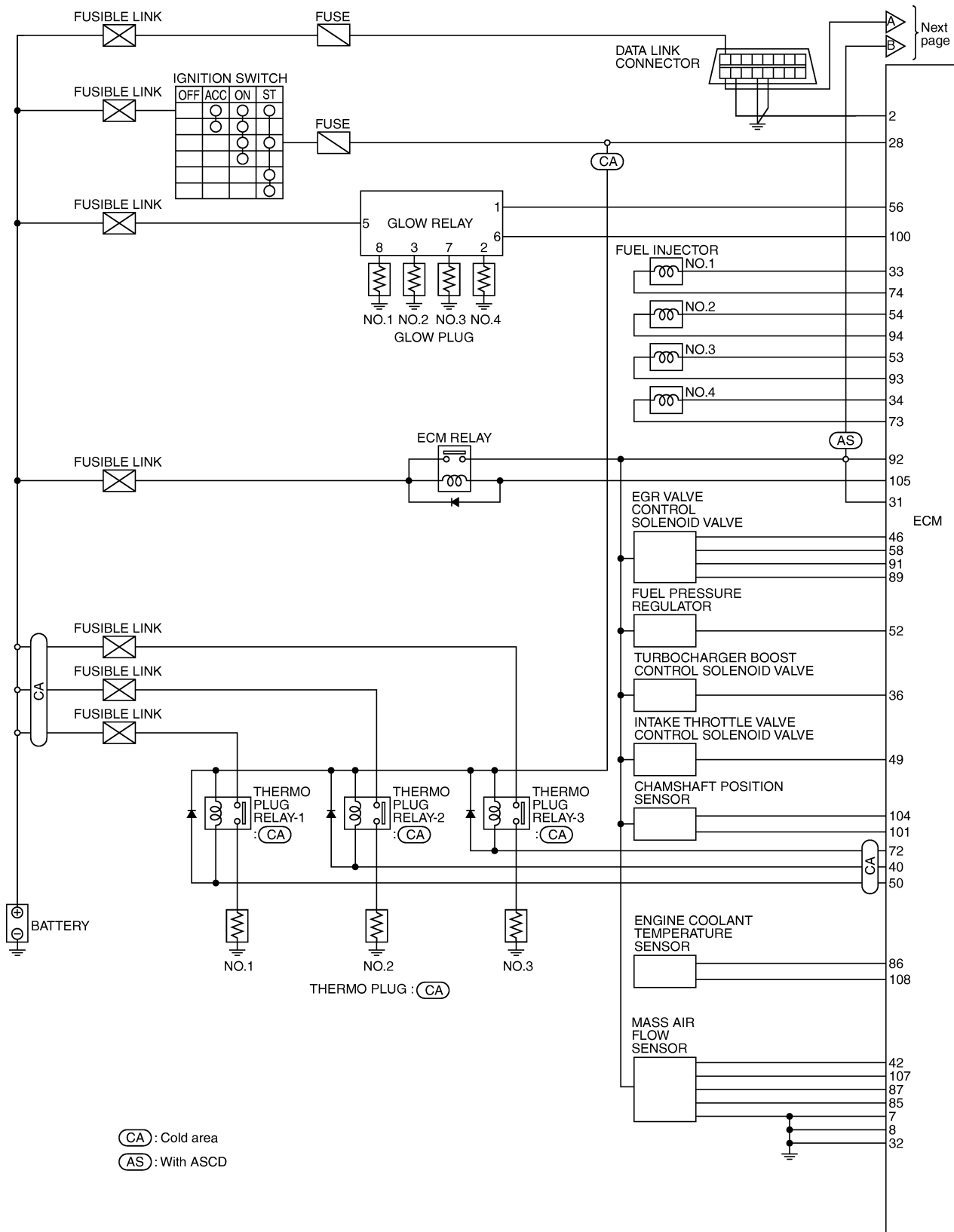
T: Transmit R: Receive

Signals	ECM	ABS actuator and electric unit (control unit)	Smart entrance control unit	Tyre pressure monitoring control unit	Combination meter
Engine speed signal	T				R
ABS operation signal	R	T			
MI signal	T				R
Glow indicator lamp signal	T				R
Engine coolant temperature signal	T				R
Fuel consumption signal	T				R
Veicle speed signal	R	T			R
				R	T
Seat belt reminder signal			R		T
Lighting switch position signal			T		R
Flashing indicator signal			T		R
Engine cooling fan speed signal	T		R		
Child lock indicator signal			T		R
Door switches state signal			T		R
A/C compressor signal	T		R		
Tyre pressure signal				T	R
ASCD SET lamp signal	T				R
ASCD CRUISE lamp signal	T				R

# DIESEL INJECTION

## Circuit Diagram

# F9Q

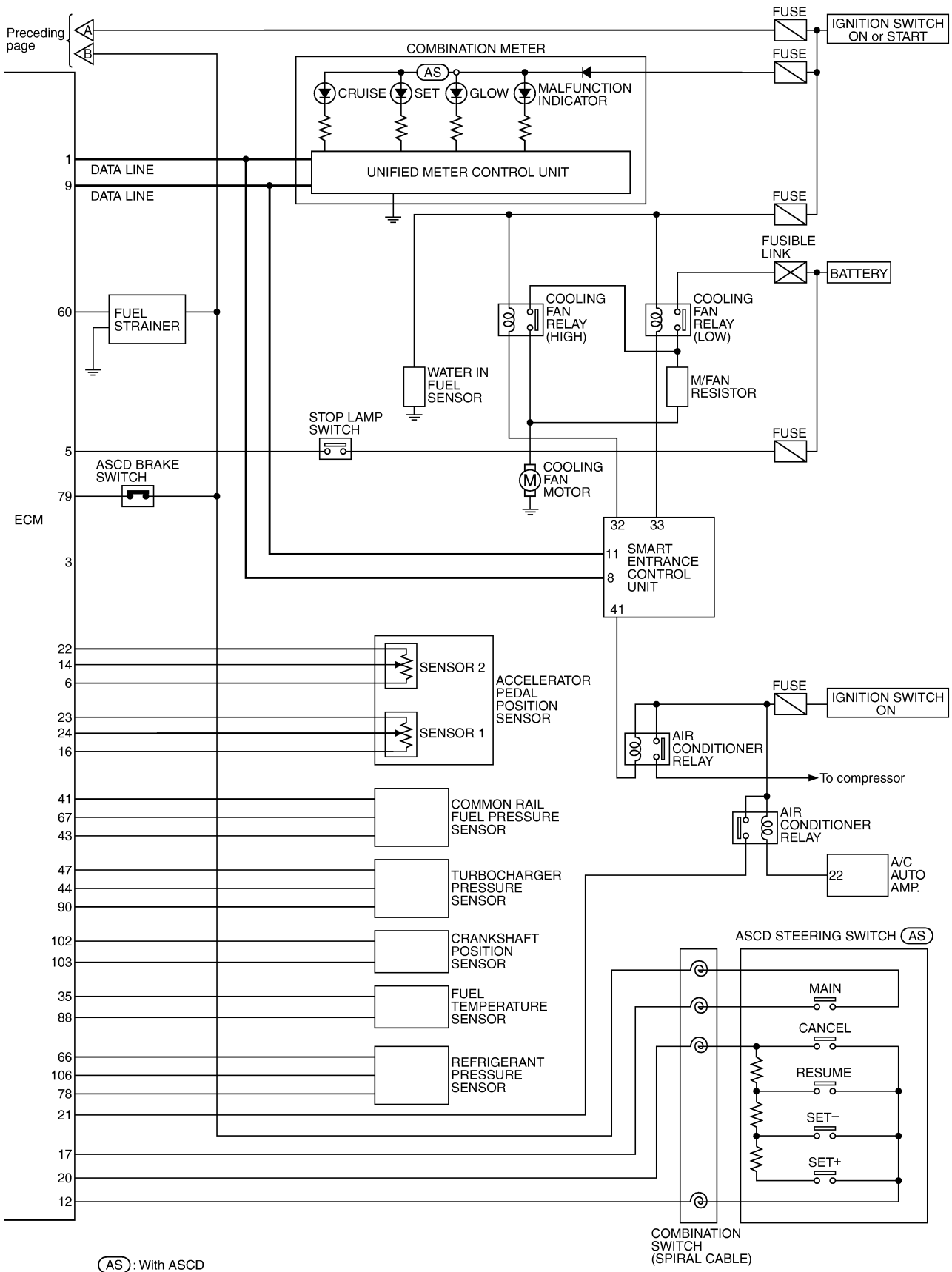


MBWA0911E

# DIESEL INJECTION

## Circuit Diagram

# F9Q

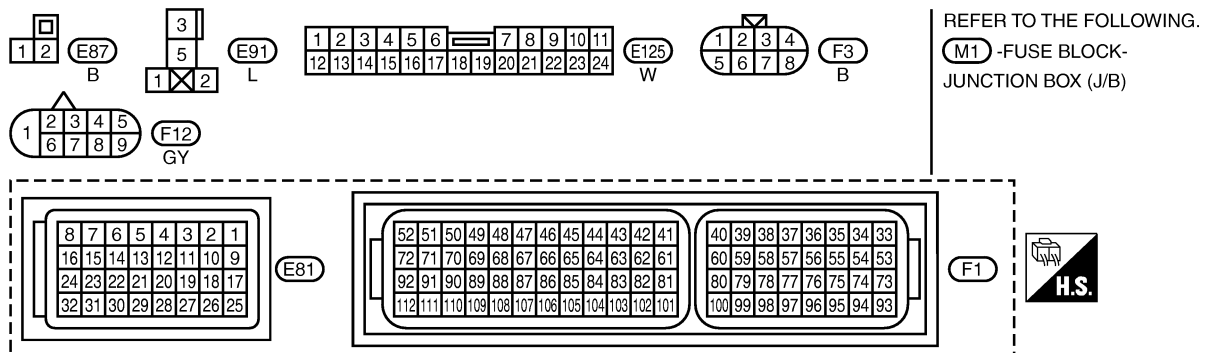
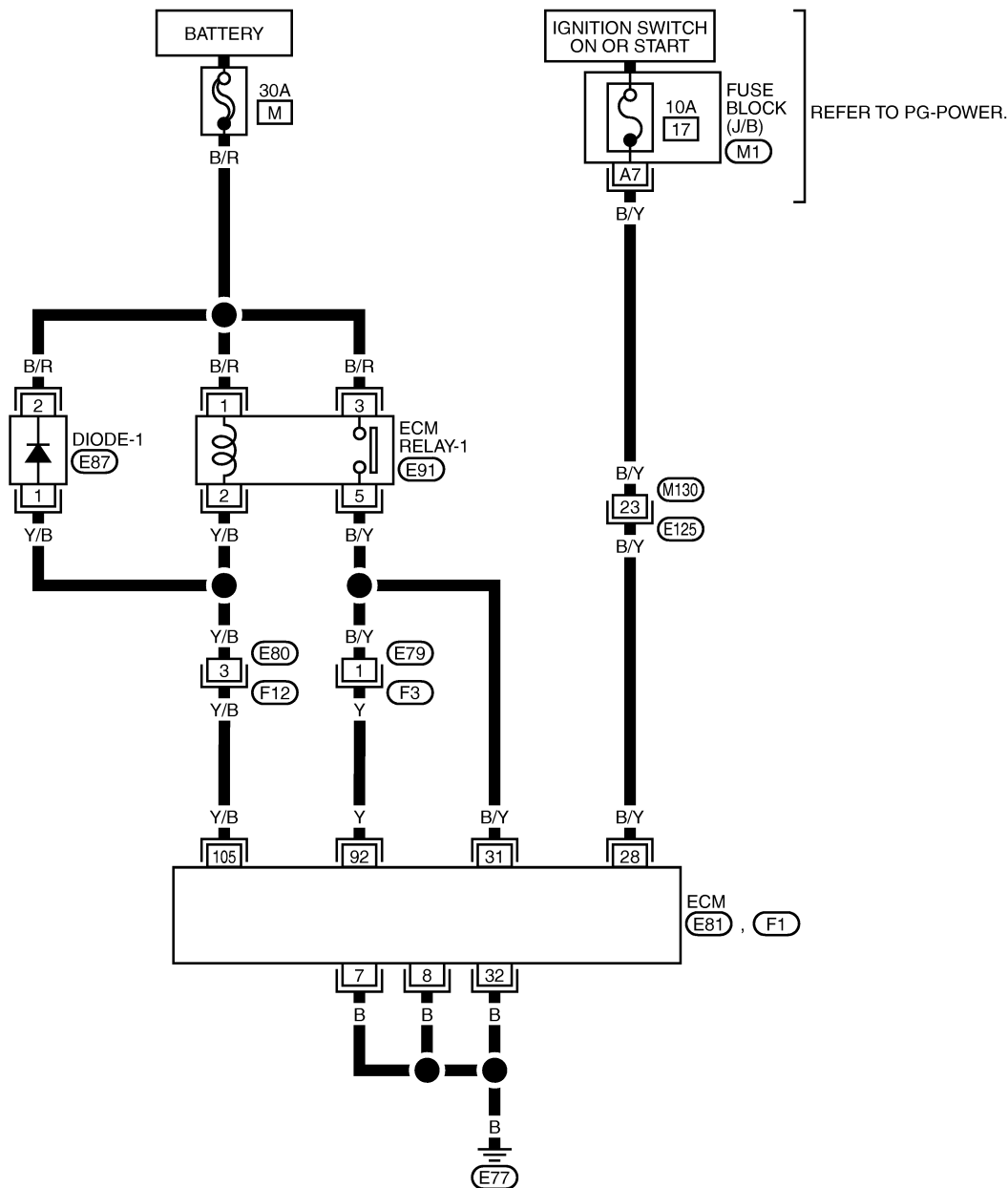


MBWA0912E

**F9Q**

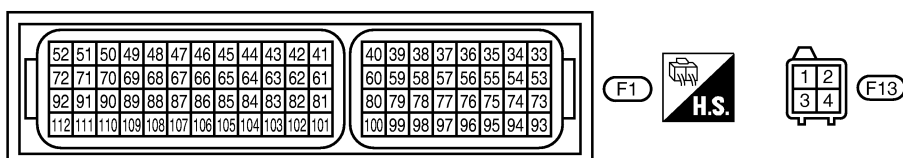
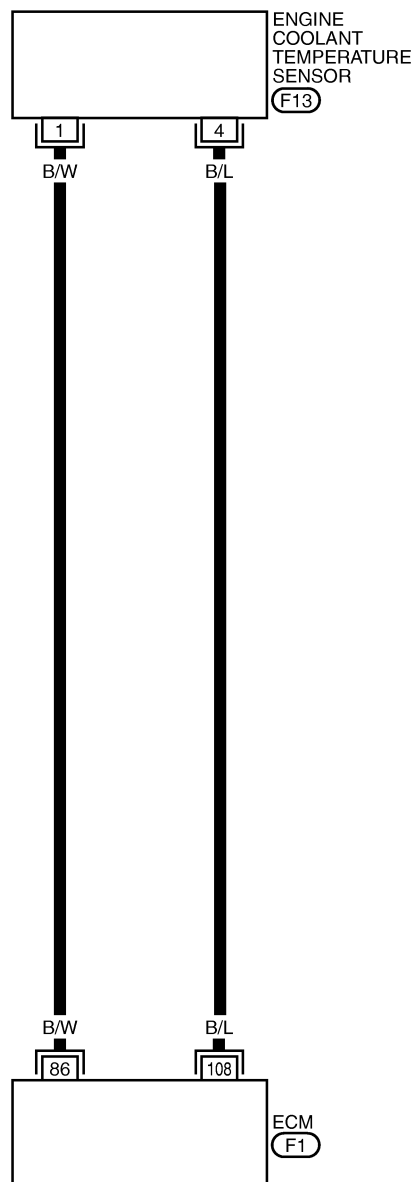
**F9Q**

EC-MAIN-01



MBWA0400E

EC-ECTS-01

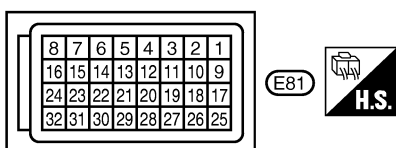
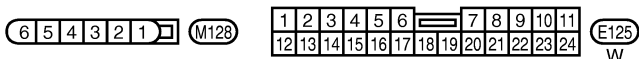
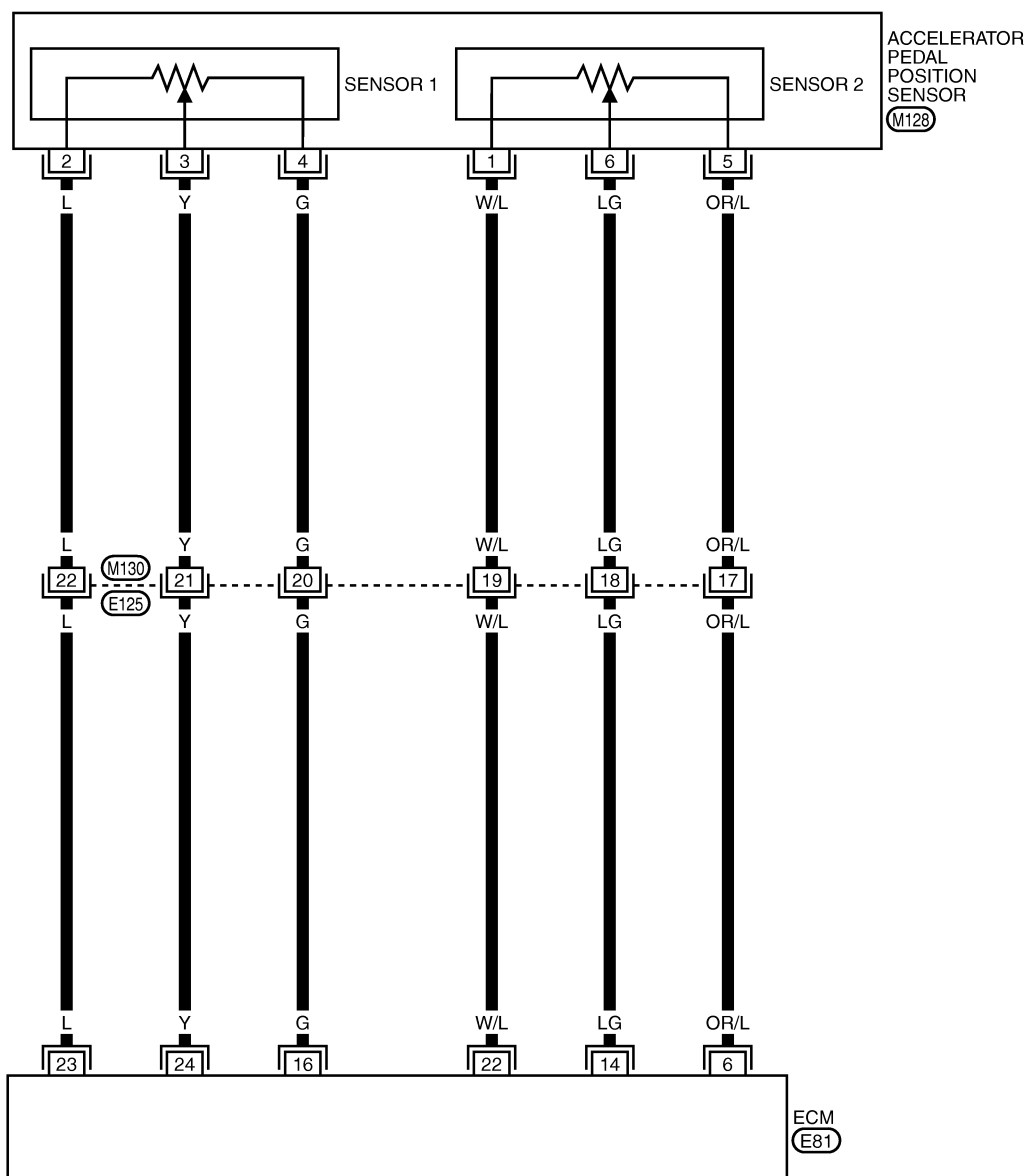


# DIESEL INJECTION

## Wiring Diagram - Accelerator Position Sensor

# F9Q

EC-APPS-01

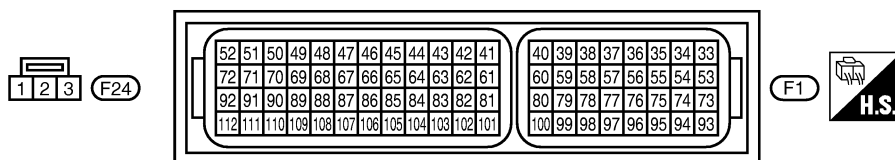
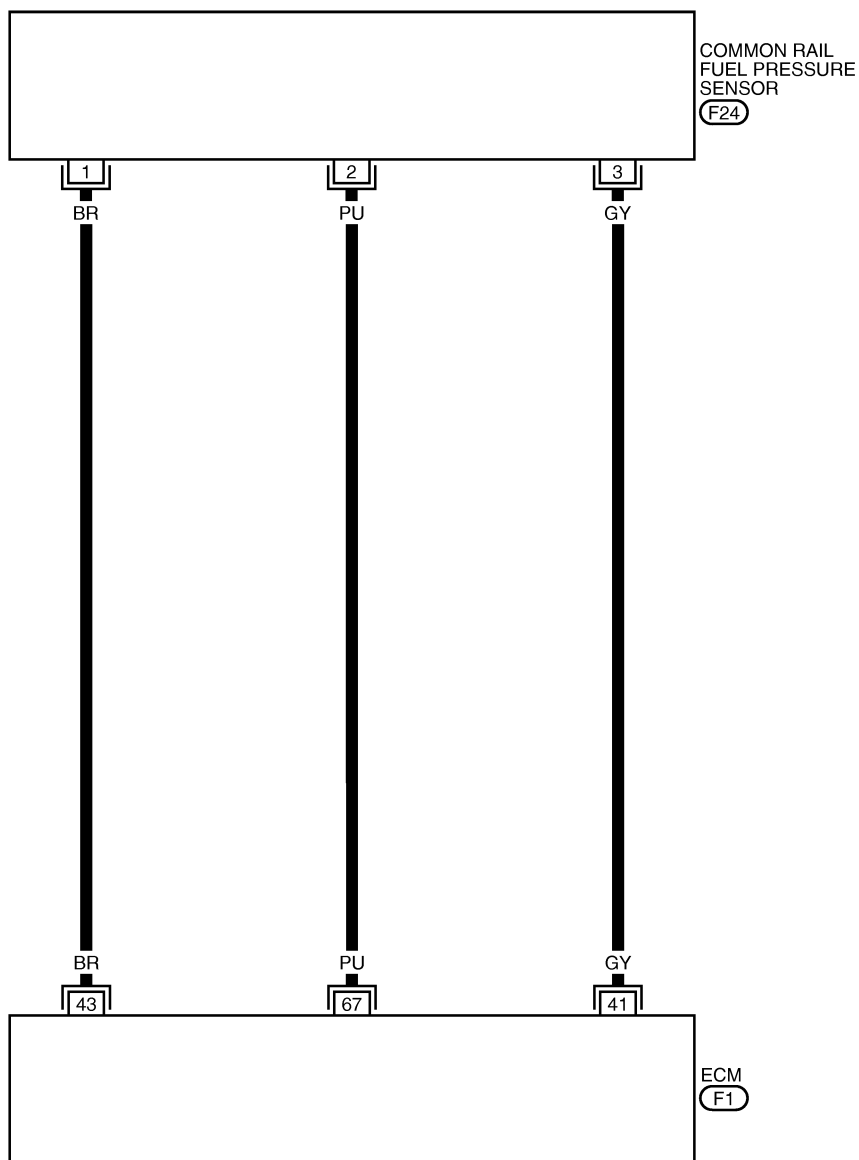


# DIESEL INJECTION

## Wiring Diagram - Common Rail Fuel Pressure Sensor

# F9Q

EC-CRFPS-01



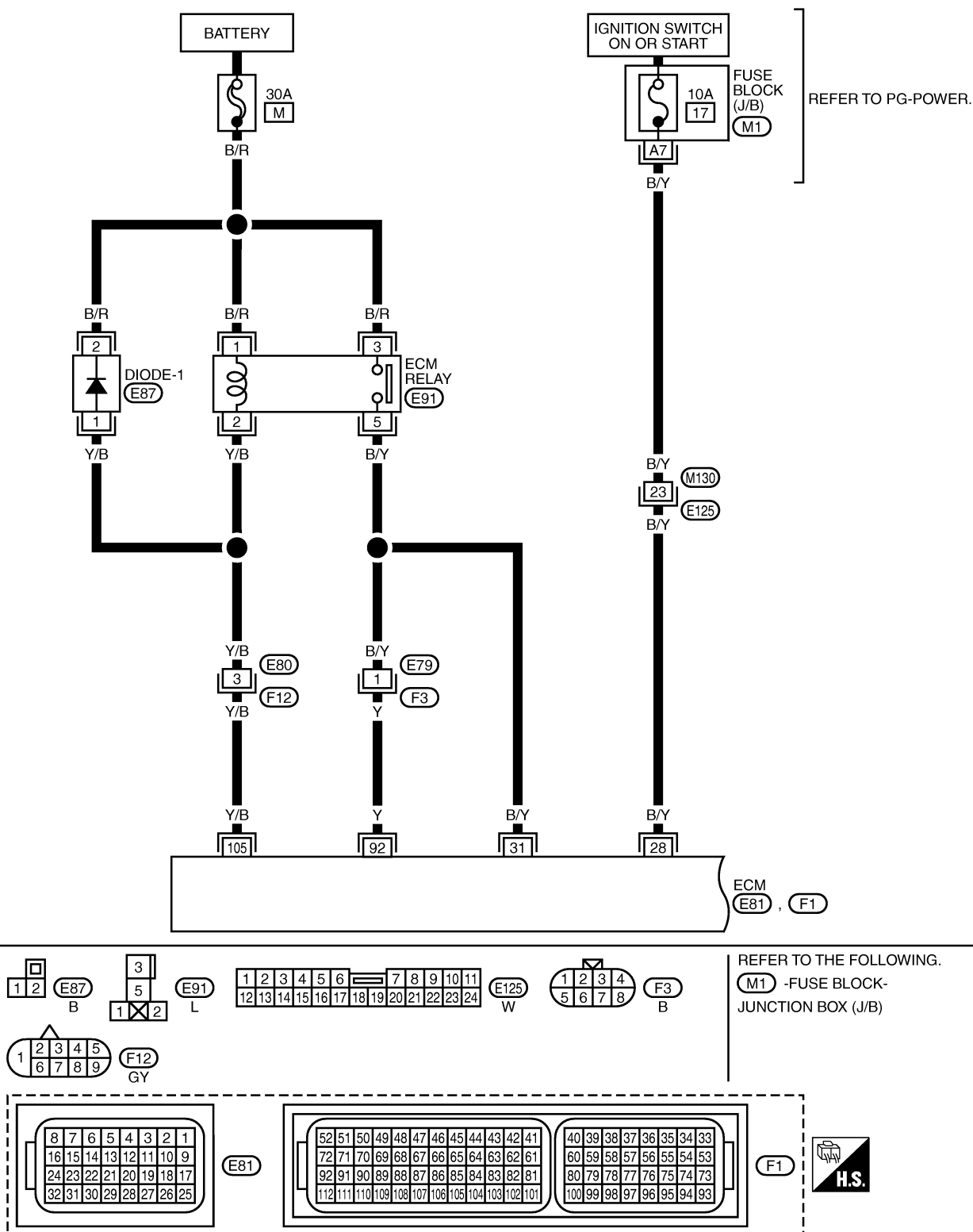


# DIESEL INJECTION

## Wiring Diagram - Injector

# F9Q

EC-INJECT-01



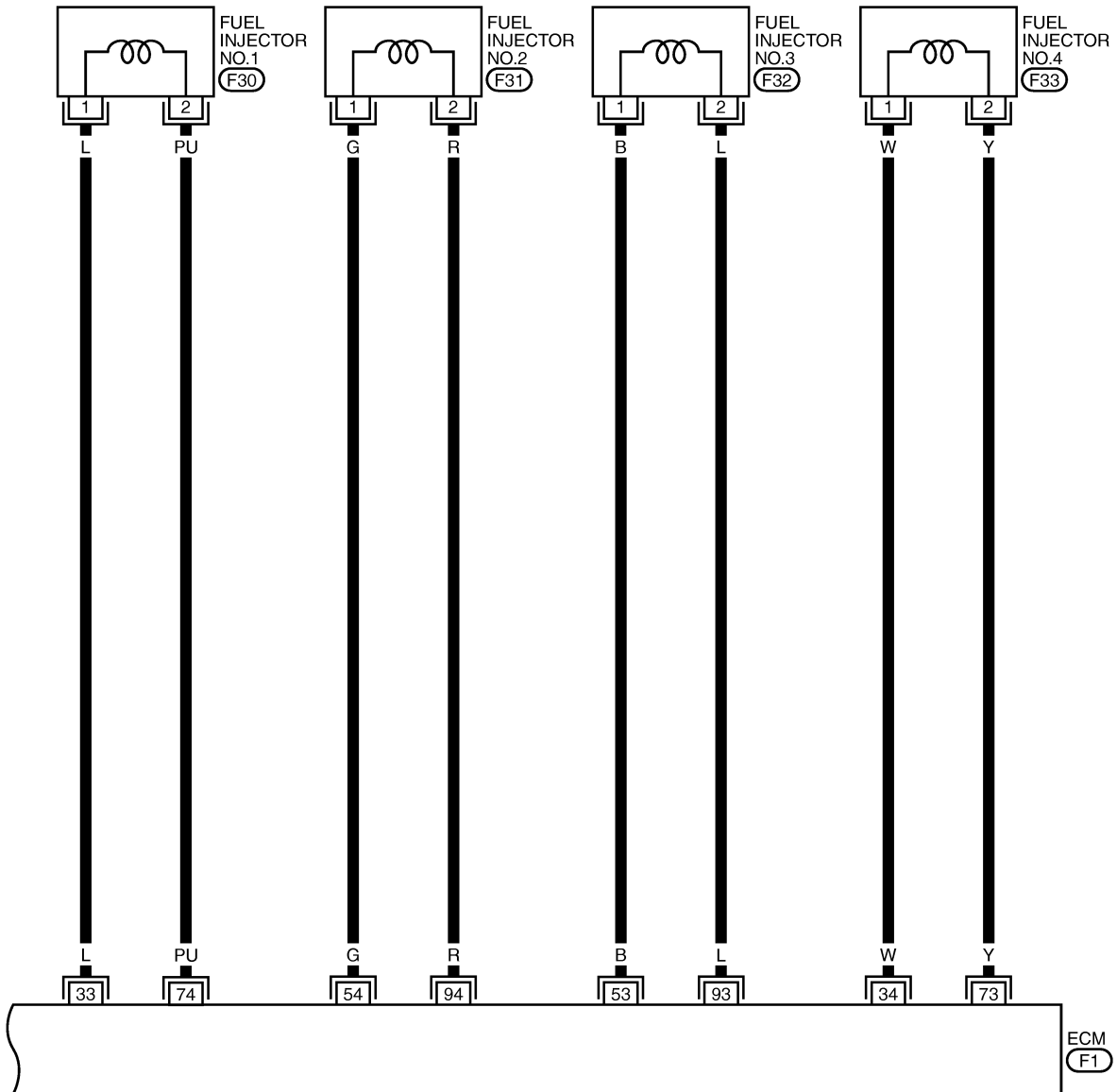
MBWA0404E

# DIESEL INJECTION

## Wiring Diagram - Injector

# F9Q

EC-INJECT-02



1 2 (F30) , (F31) , (F32) , (F33)

52	51	50	49	48	47	46	45	44	43	42	41
72	71	70	69	68	67	66	65	64	63	62	61
92	91	90	89	88	87	86	85	84	83	82	81
112	111	110	109	108	107	106	105	104	103	102	101

40	39	38	37	36	35	34	33
60	59	58	57	56	55	54	53
80	79	78	77	76	75	74	73
100	99	98	97	96	95	94	93

(F1)

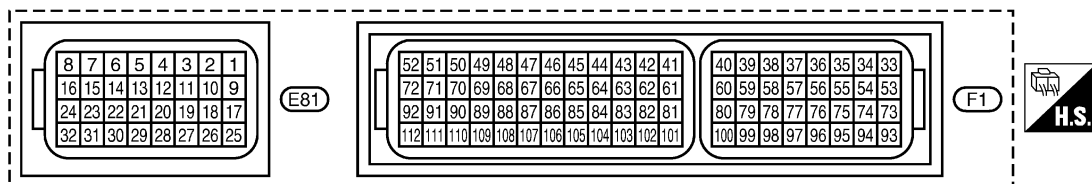
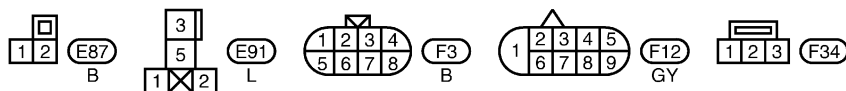
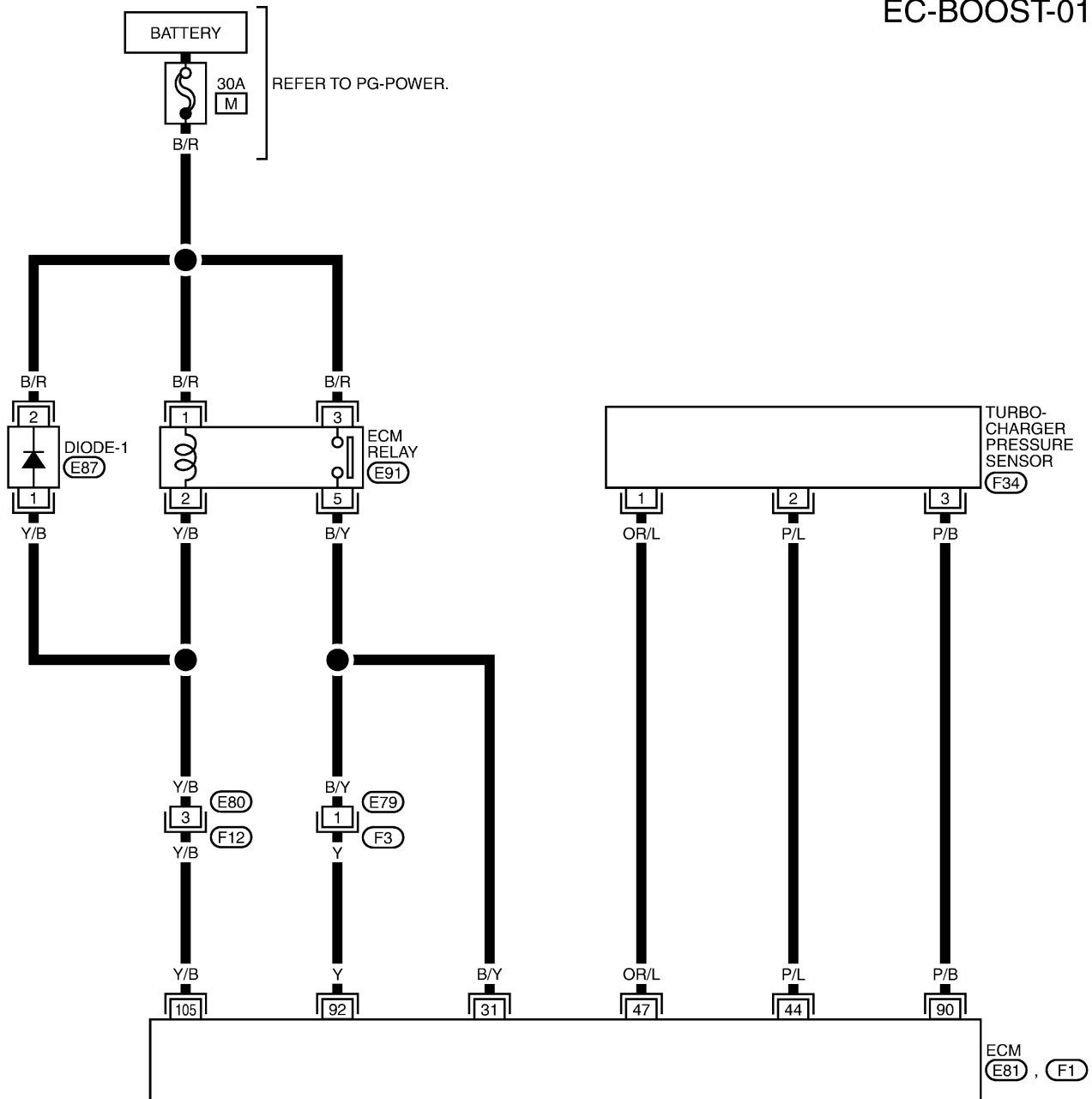


# DIESEL INJECTION

## Wiring Diagram - Charge Air Pressure Sensor

# F9Q

EC-BOOST-01

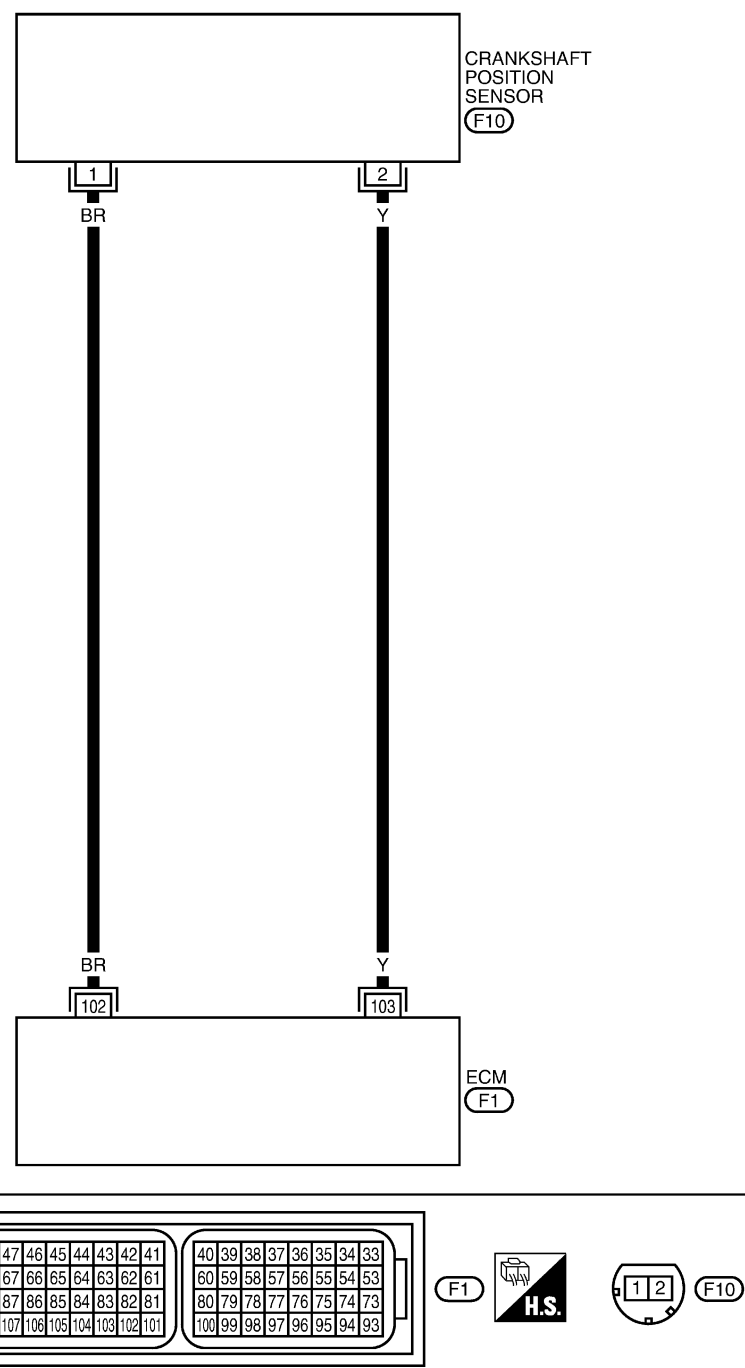


DIESEL INJECTION

Wiring Diagram - Crankshaft Position Sensor

F9Q

EC-CAS-01

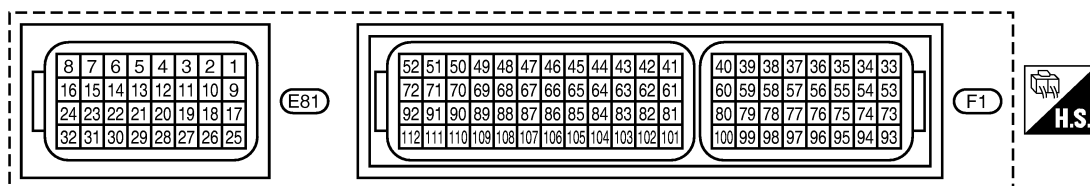
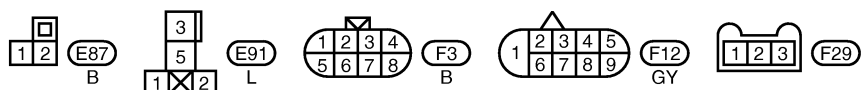
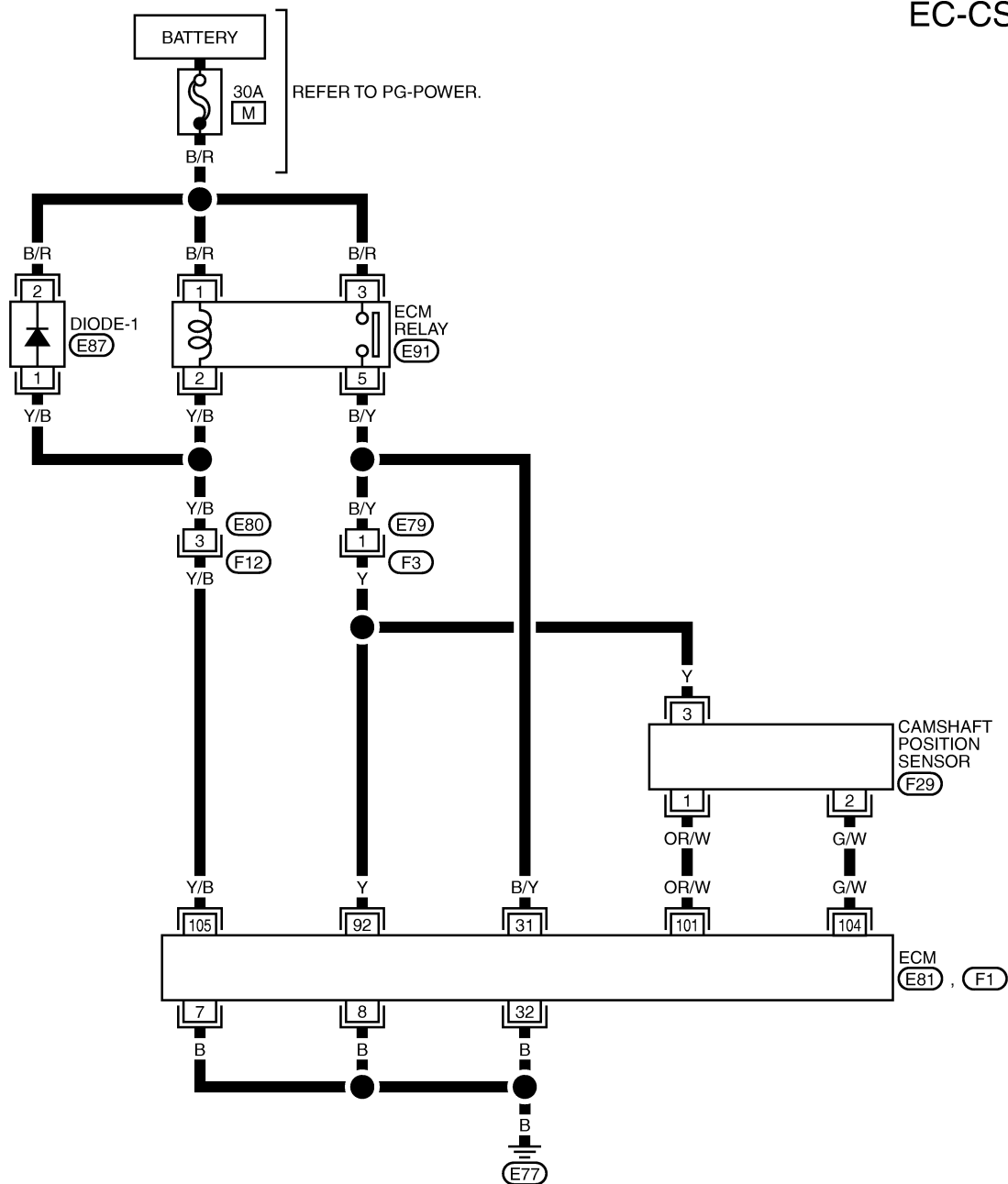


# DIESEL INJECTION

## Wiring Diagram - Camshaft Position Sensor

# F9Q

EC-CSS-01

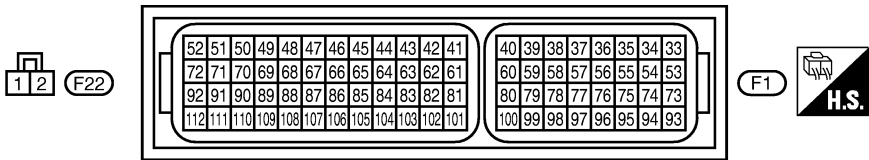
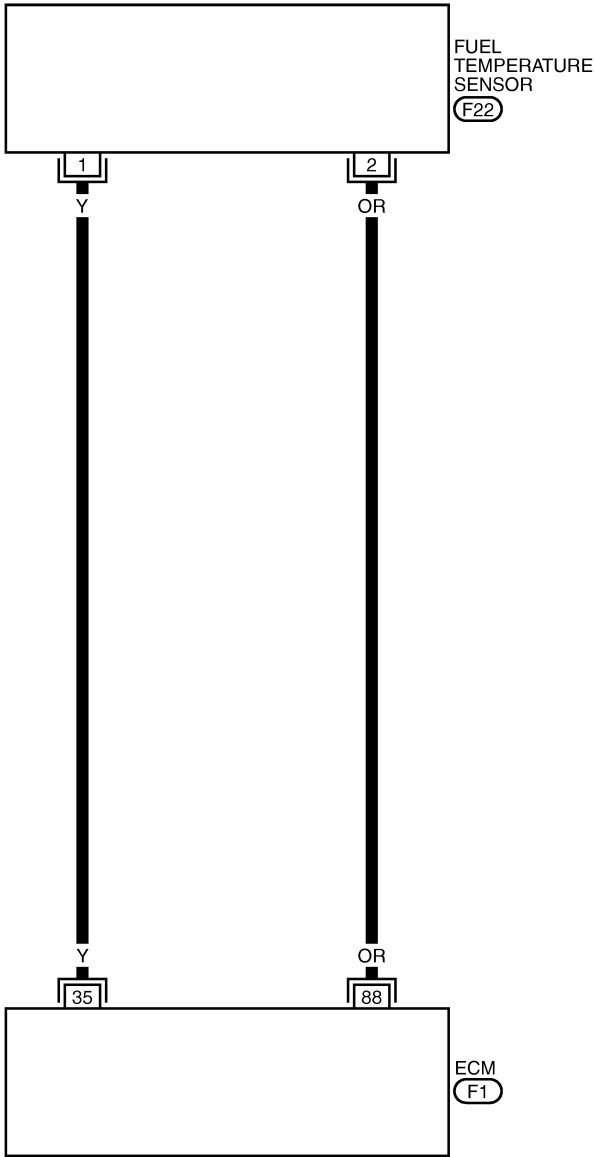


DIESEL INJECTION

Wiring Diagram - Fuel Temperature Sensor

F9Q

EC-FTS-01

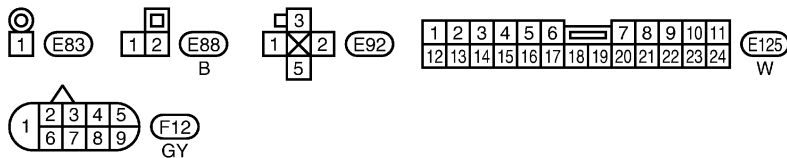
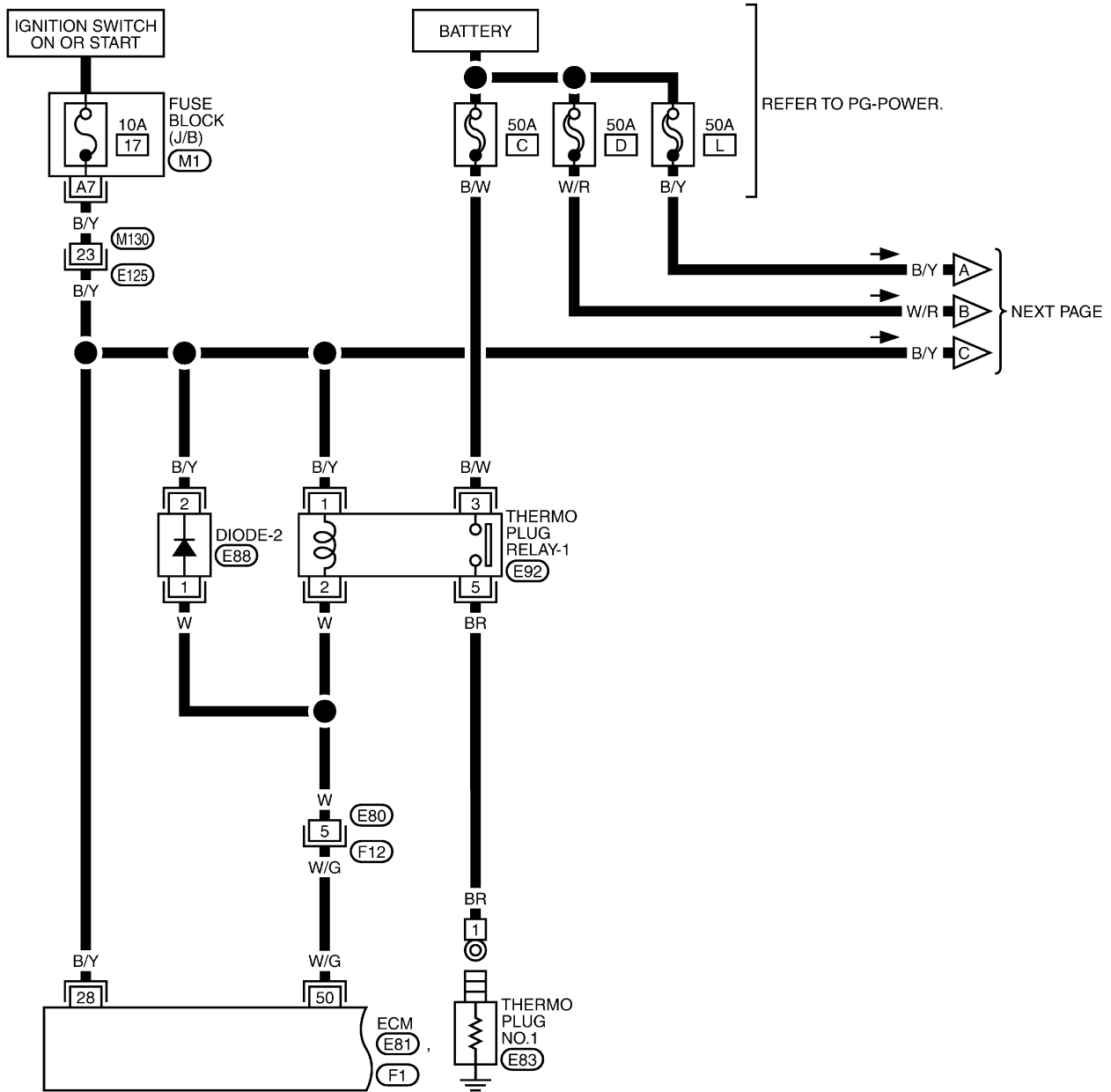


# DIESEL INJECTION

## Wiring Diagram - Thermo Plug

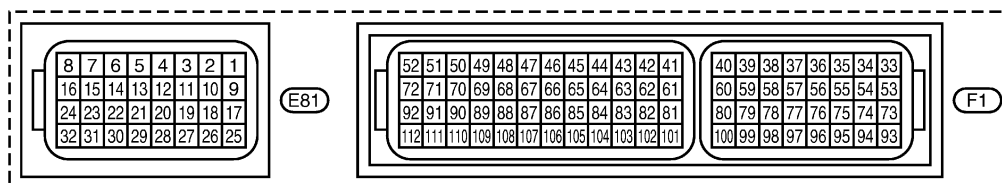
# F9Q

EC-T/PLUG-01



REFER TO THE FOLLOWING.

(M1) - FUSE BLOCK-JUNCTION BOX (J/B)



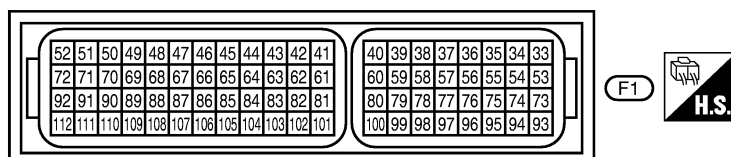
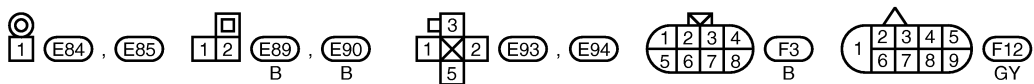
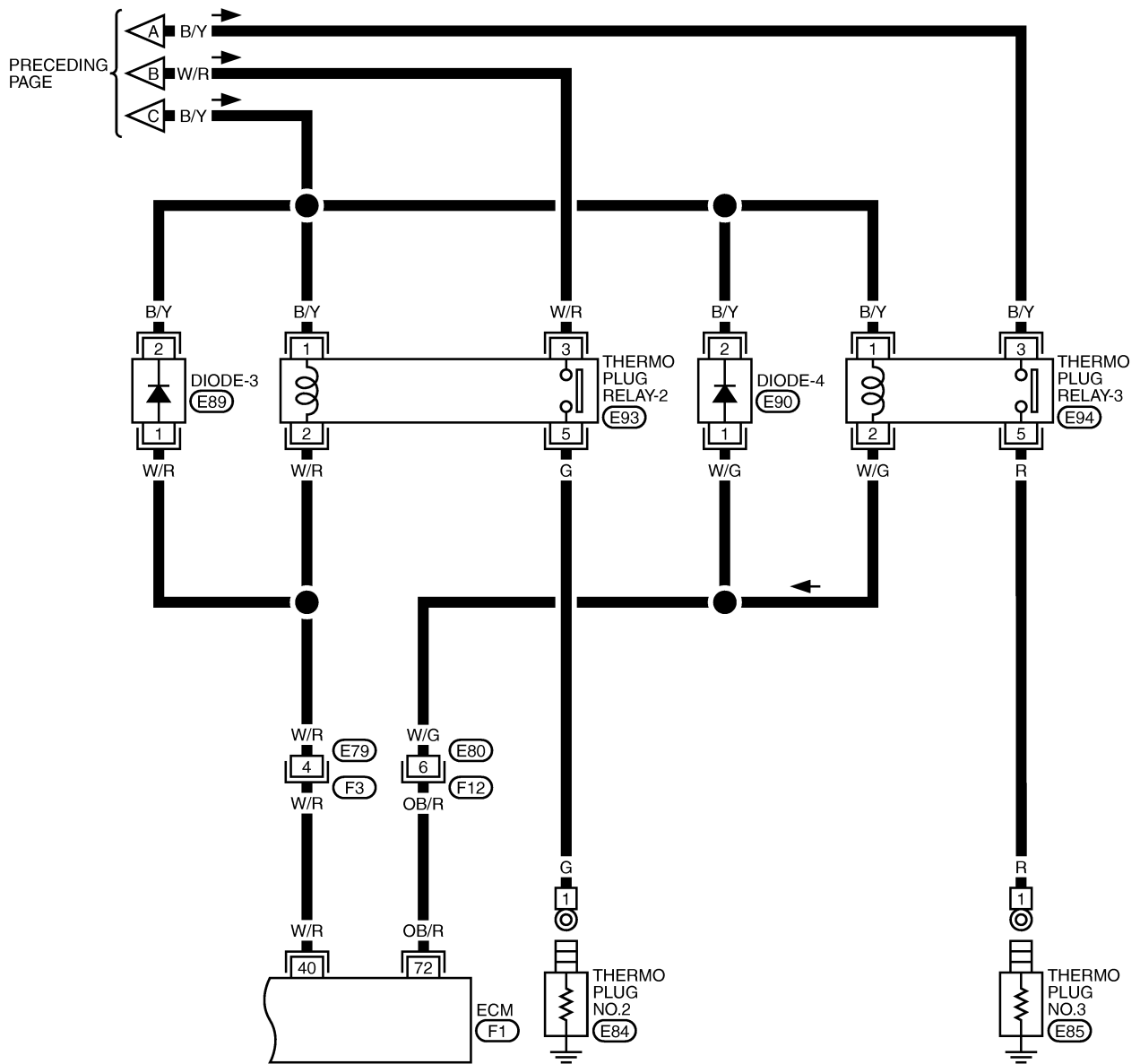
MBWA0914E

# DIESEL INJECTION

## Wiring Diagram - Thermo Plug

# F9Q

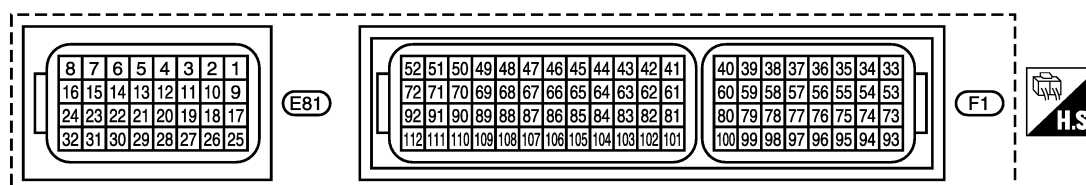
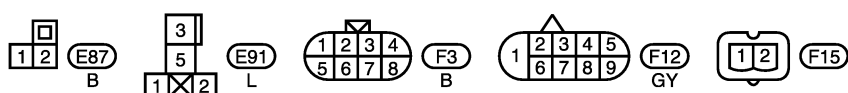
EC-T/PLUG-02



MBWA0411E



# F9Q

[illegible]

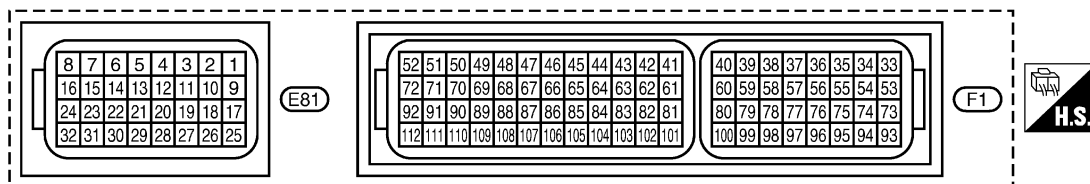
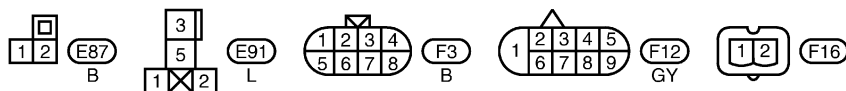
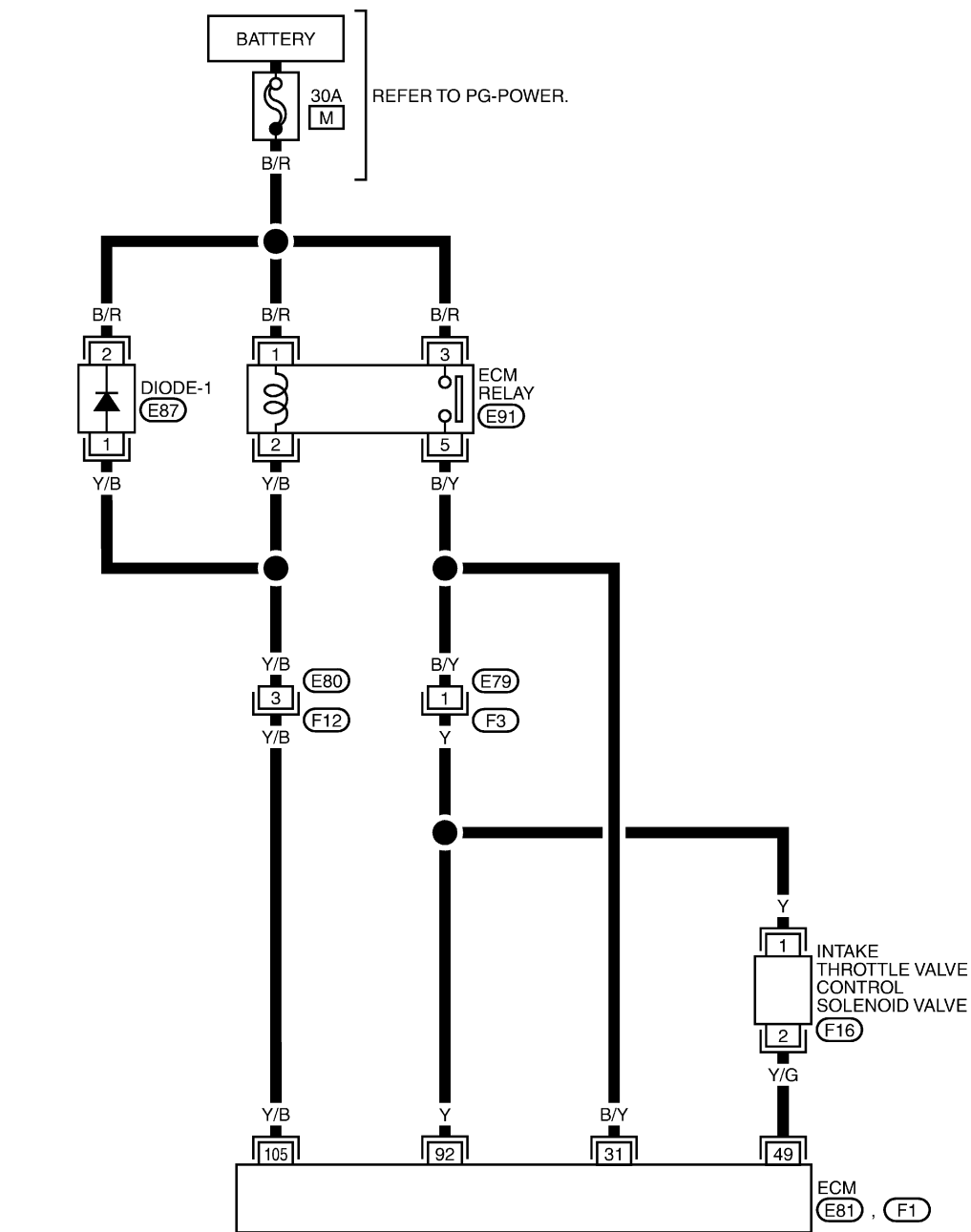
F9Q-192

# DIESEL INJECTION

## Wiring Diagram - IFA Solenoid Valve

# F9Q

EC-T/PLUG-01  
EC-IFA-01

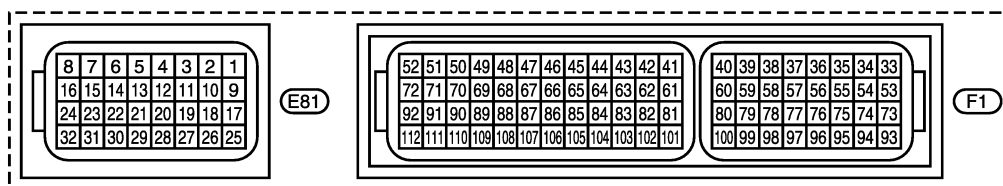
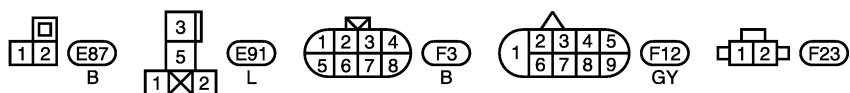
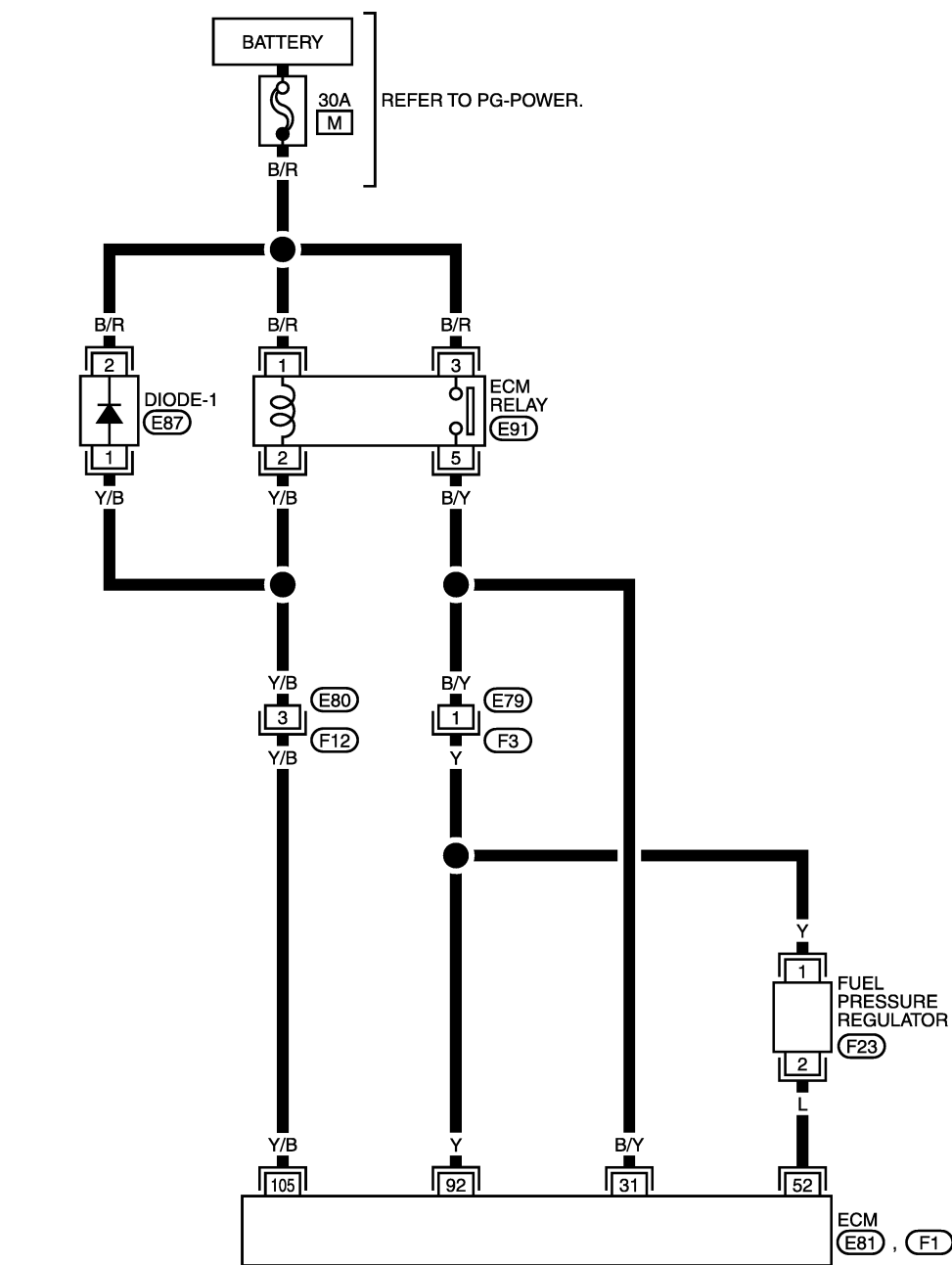


# DIESEL INJECTION

## Wiring Diagram - Flow Governor

# F9Q

EC-FLG-01



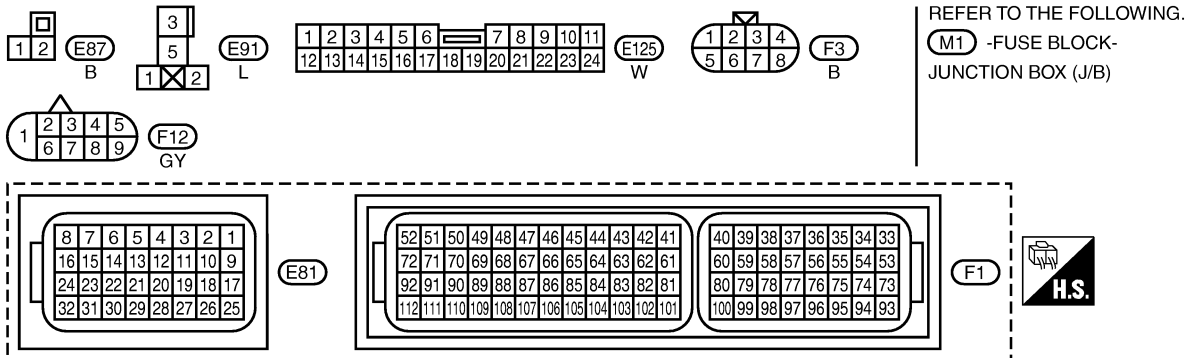
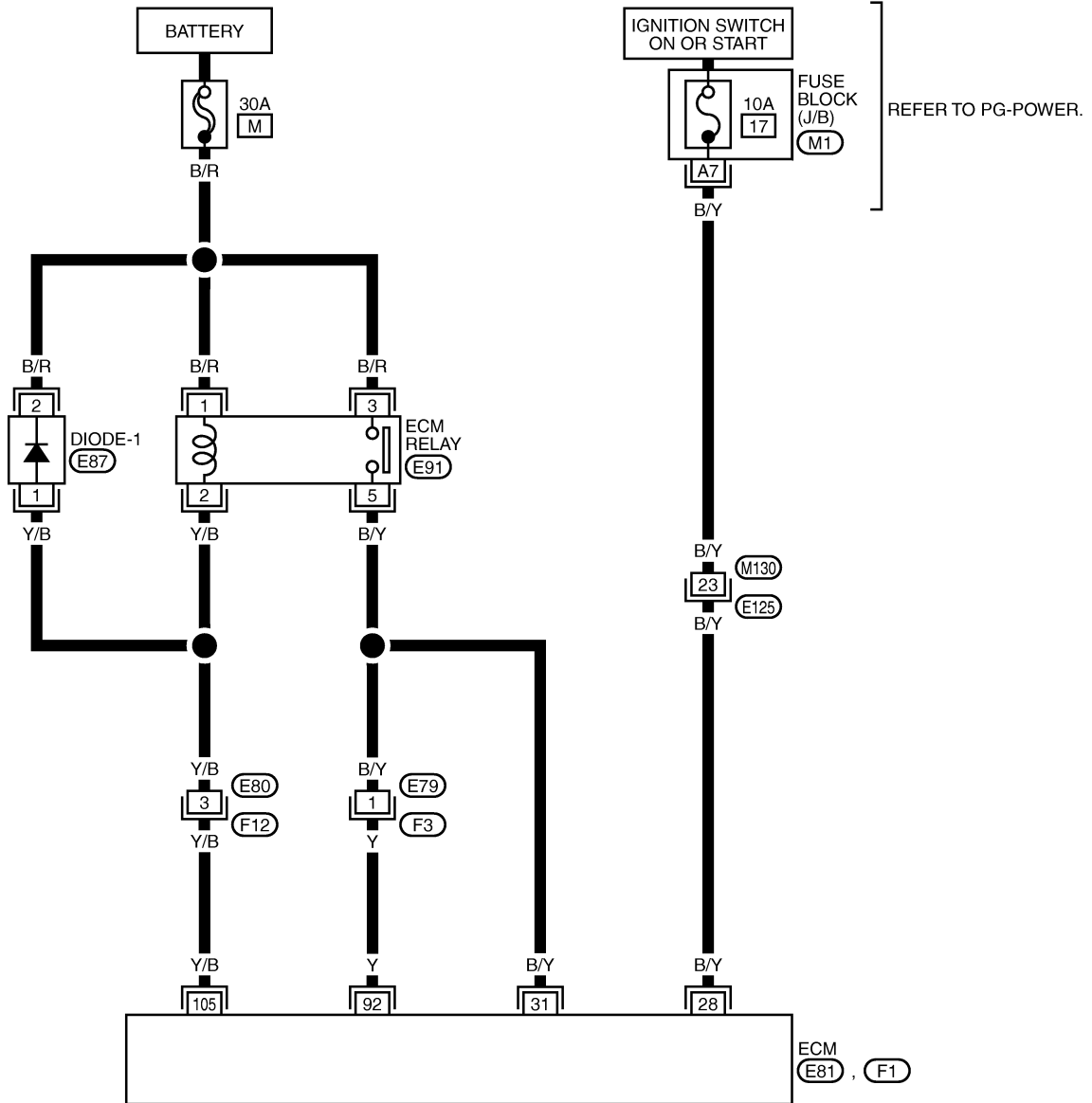
MBWA0961E

# DIESEL INJECTION

## Wiring Diagram - ECM Relay

# F9Q

EC-ECMRLY-01



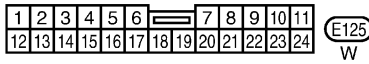
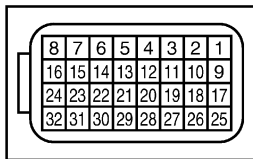
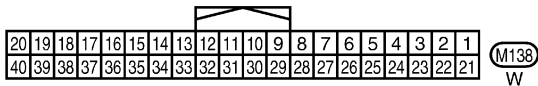
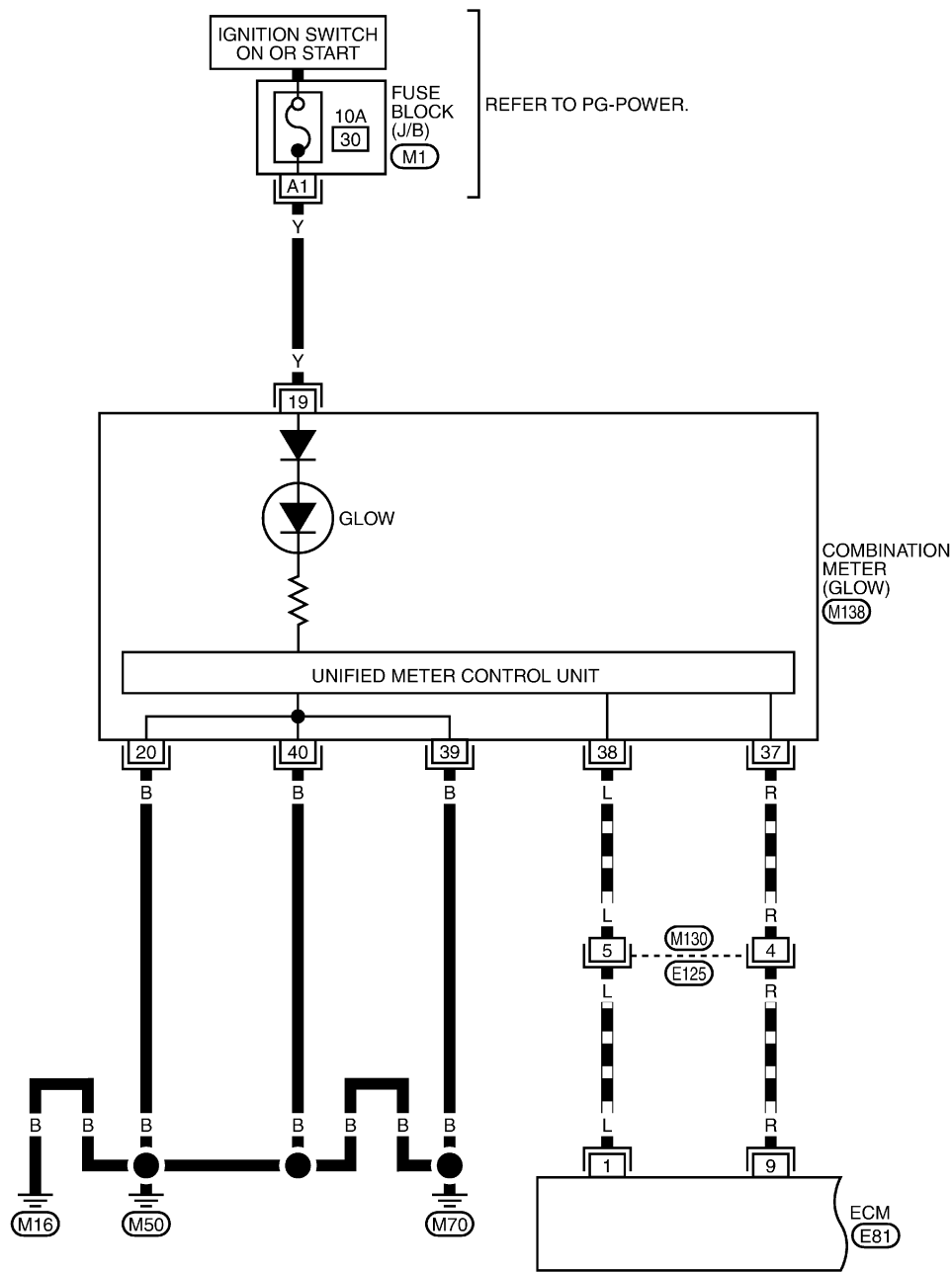
# DIESEL INJECTION

## Wiring Diagram - Glow

# F9Q

EC-GLOW-01

■ : DATA LINE



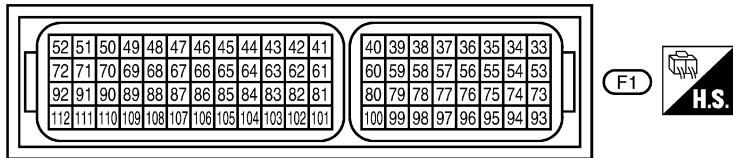
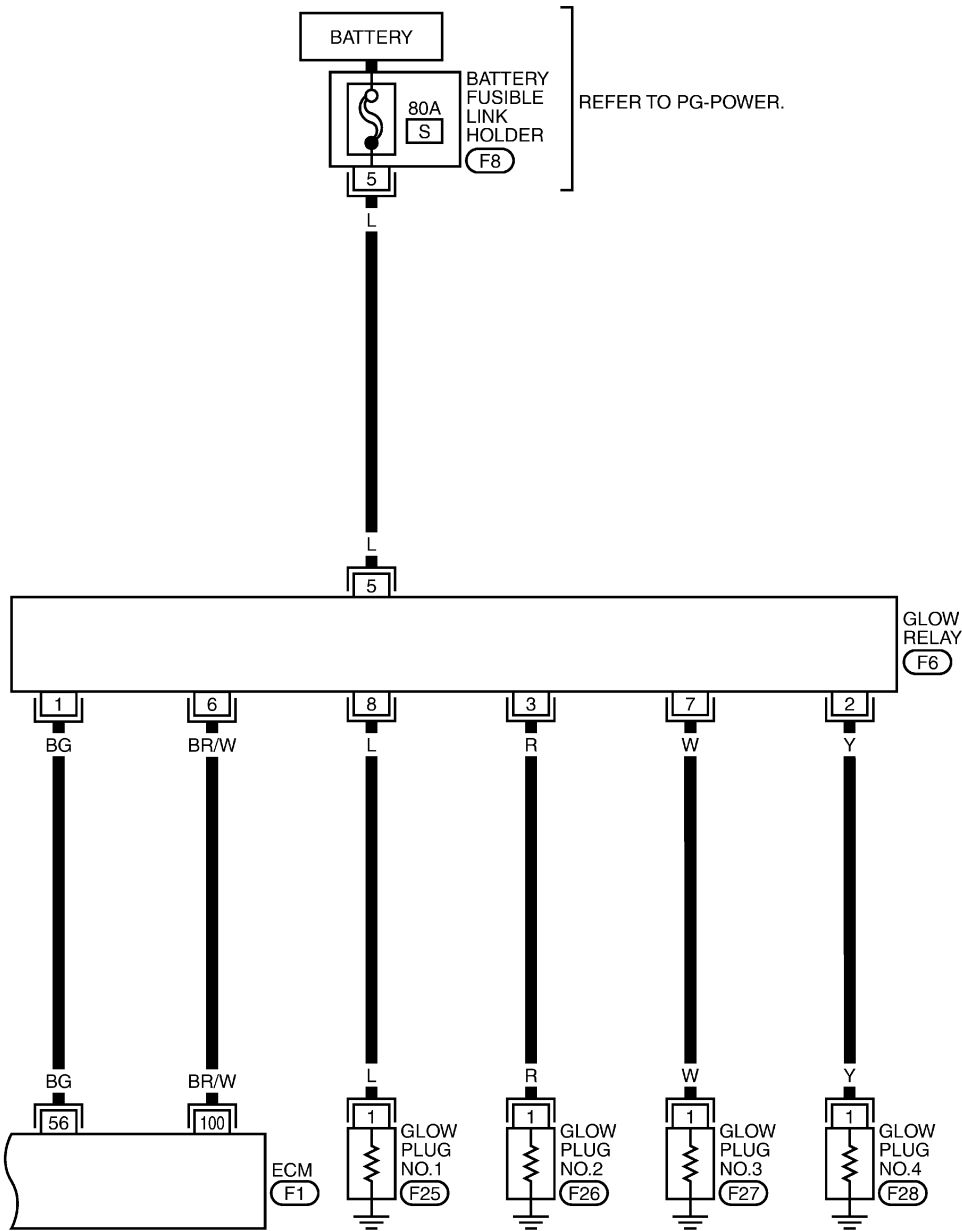
REFER TO THE FOLLOWING.

(M1) -FUSE BLOCK-  
JUNCTION BOX (J/B)

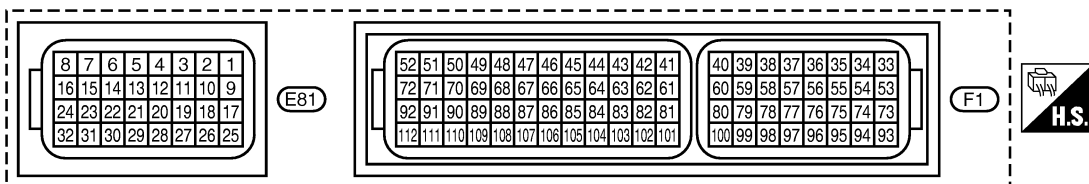
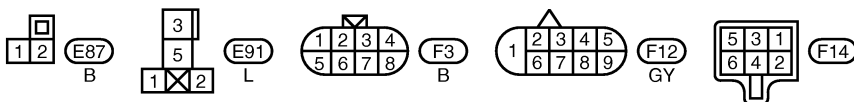
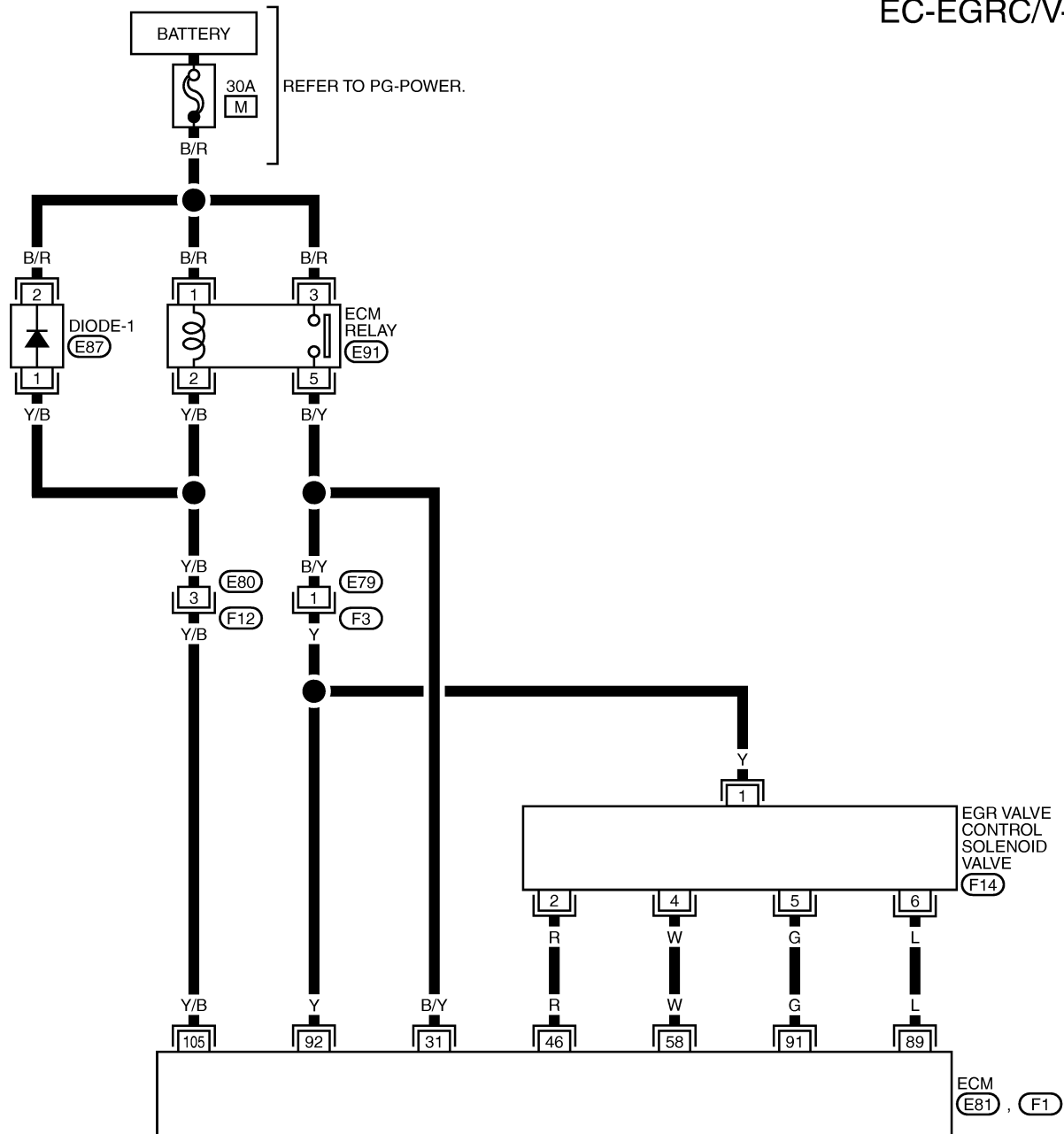
DIESEL INJECTION  
Wiring Diagram - Glow

F9Q

EC-GLOW-02



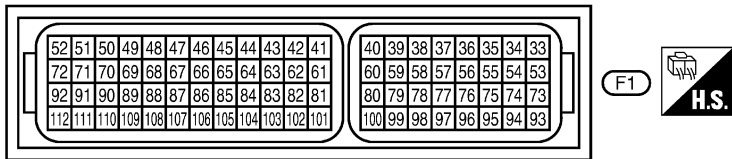
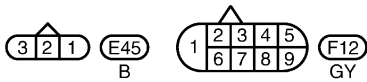
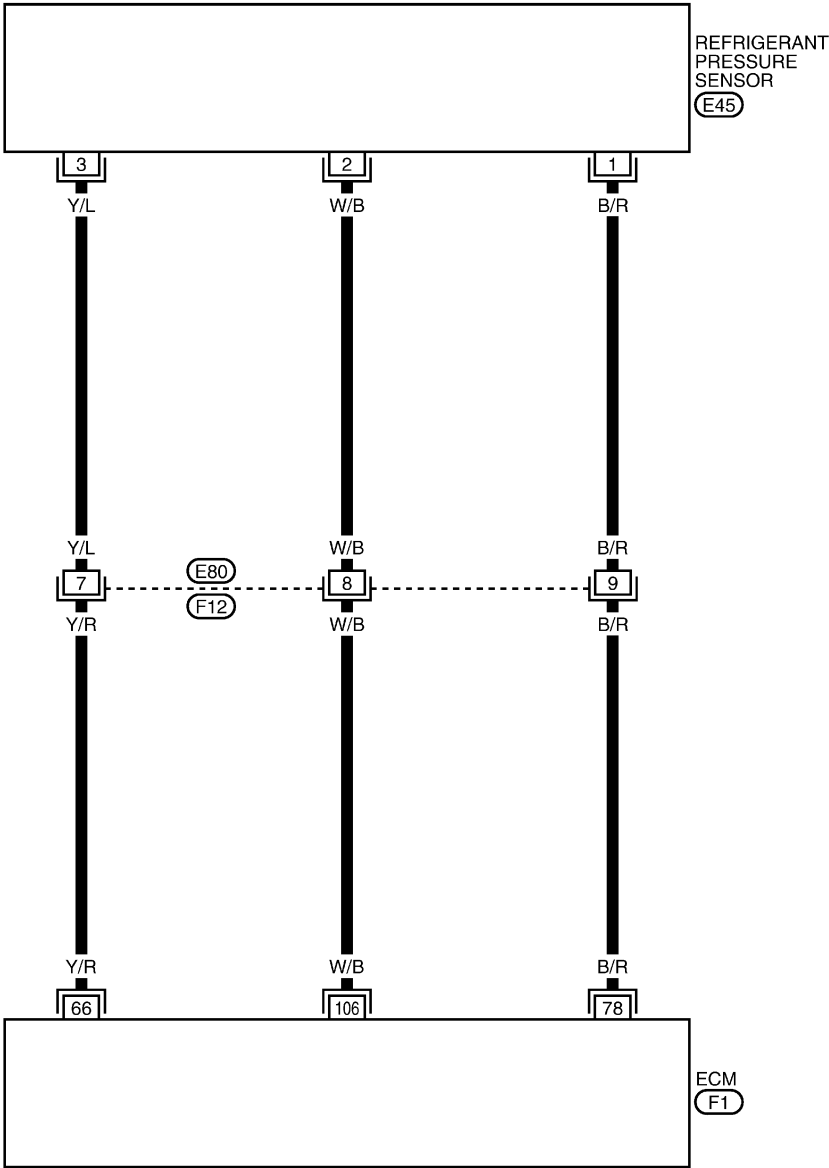
EC-EGRC/V-01



DIESEL INJECTION  
Wiring Diagram - Refrigerant Pressure

F9Q

EC-RP/SEN-01





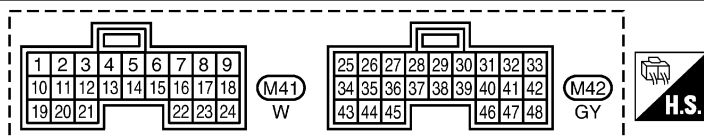
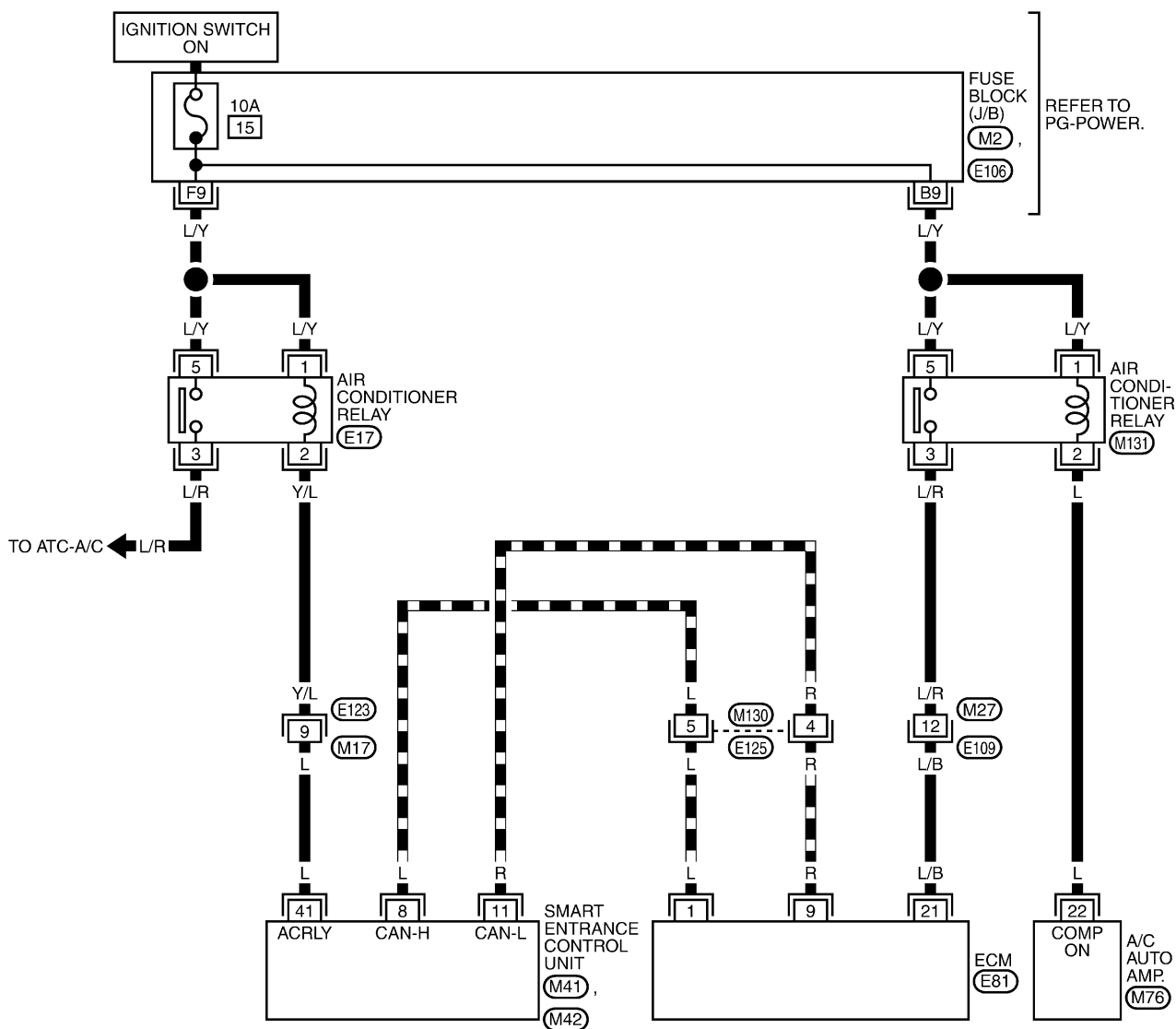
# DIESEL INJECTION

## Wiring Diagram - Air Conditioner

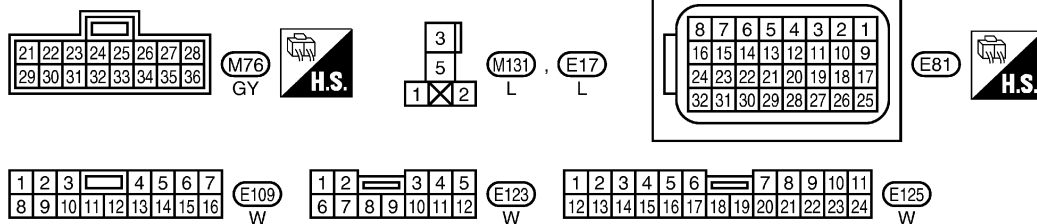
# F9Q

EC-GLOW-02  
EC-A/CCUT-01

— : DATA LINE



REFER TO THE FOLLOWING.  
(M2, E106) - FUSE BLOCK-JUNCTION BOX (J/B)



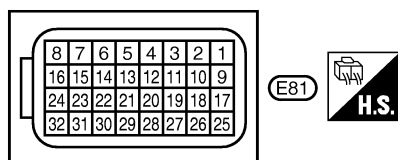
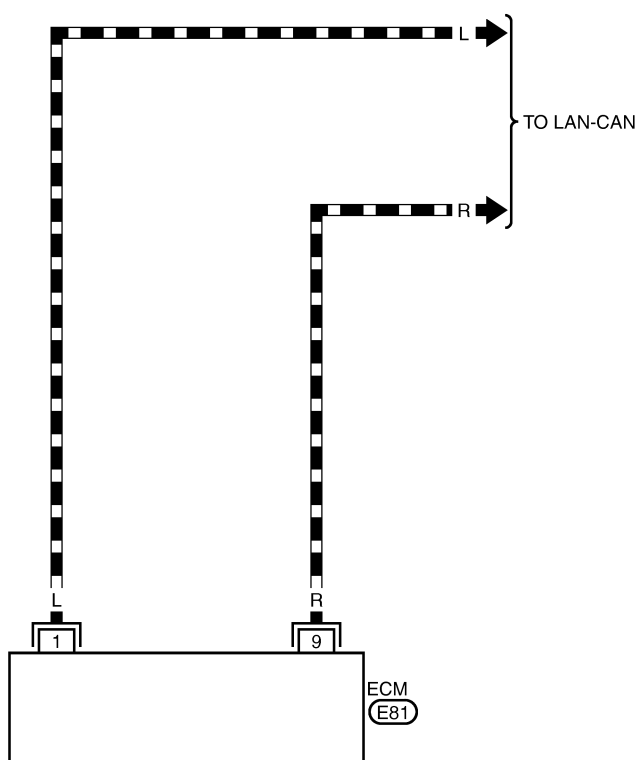
# DIESEL INJECTION

## Wiring Diagram - CAN

# F9Q

### EC-CAN-01

DATA LINE

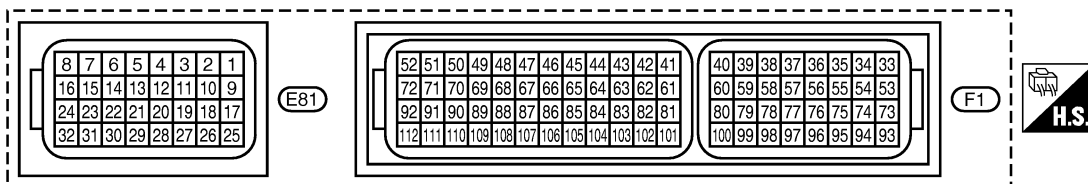
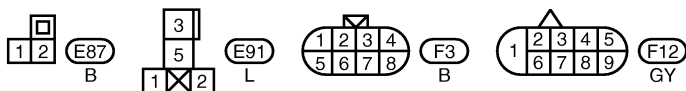
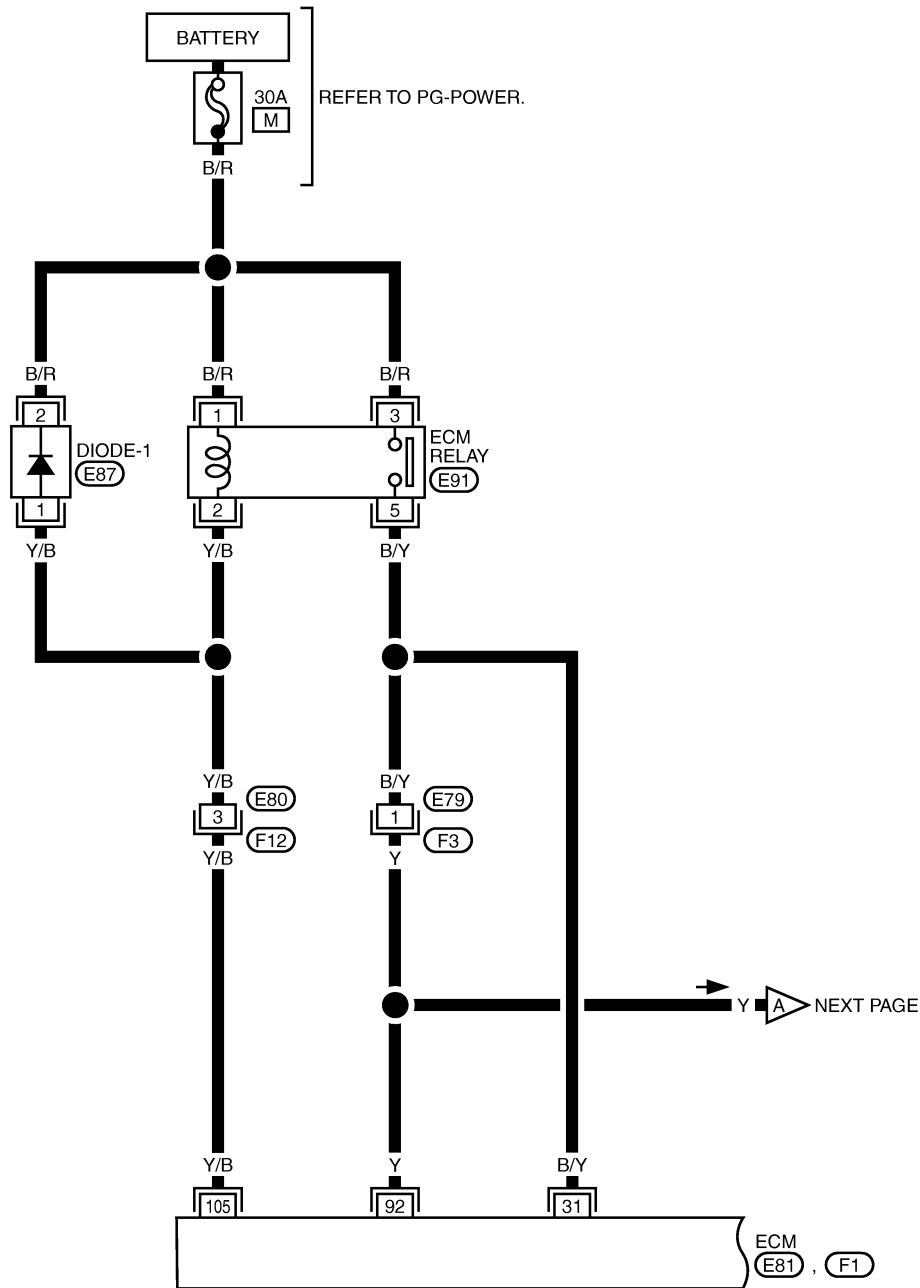


# DIESEL INJECTION

## Wiring Diagram - MAF Sensor

# F9Q

EC-MAFS-01

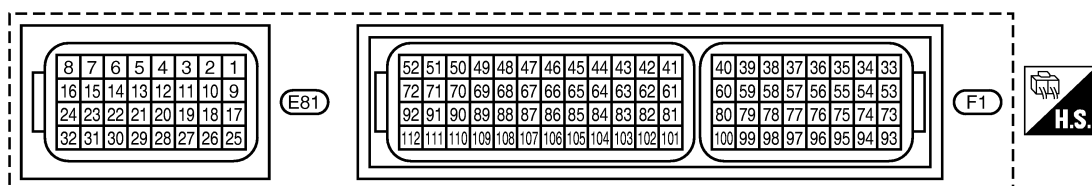
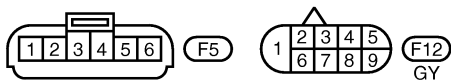
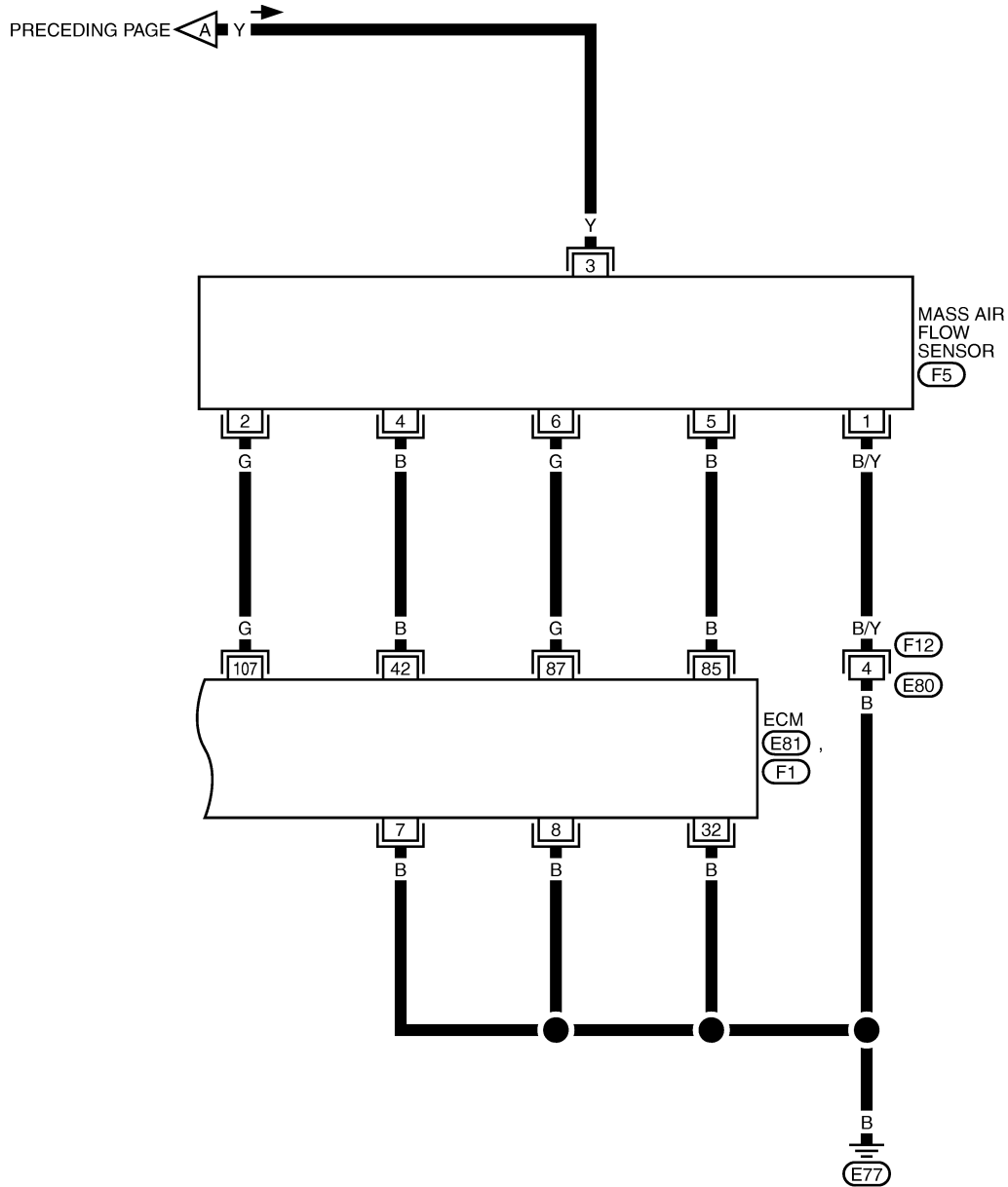


# DIESEL INJECTION

## Wiring Diagram - MAF Sensor

# F9Q

EC-MAFS-02



MBWA0424E

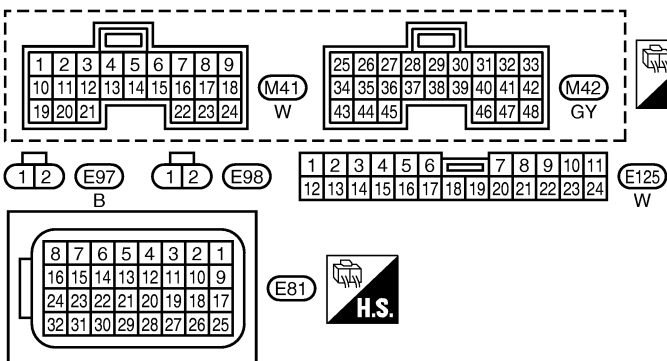
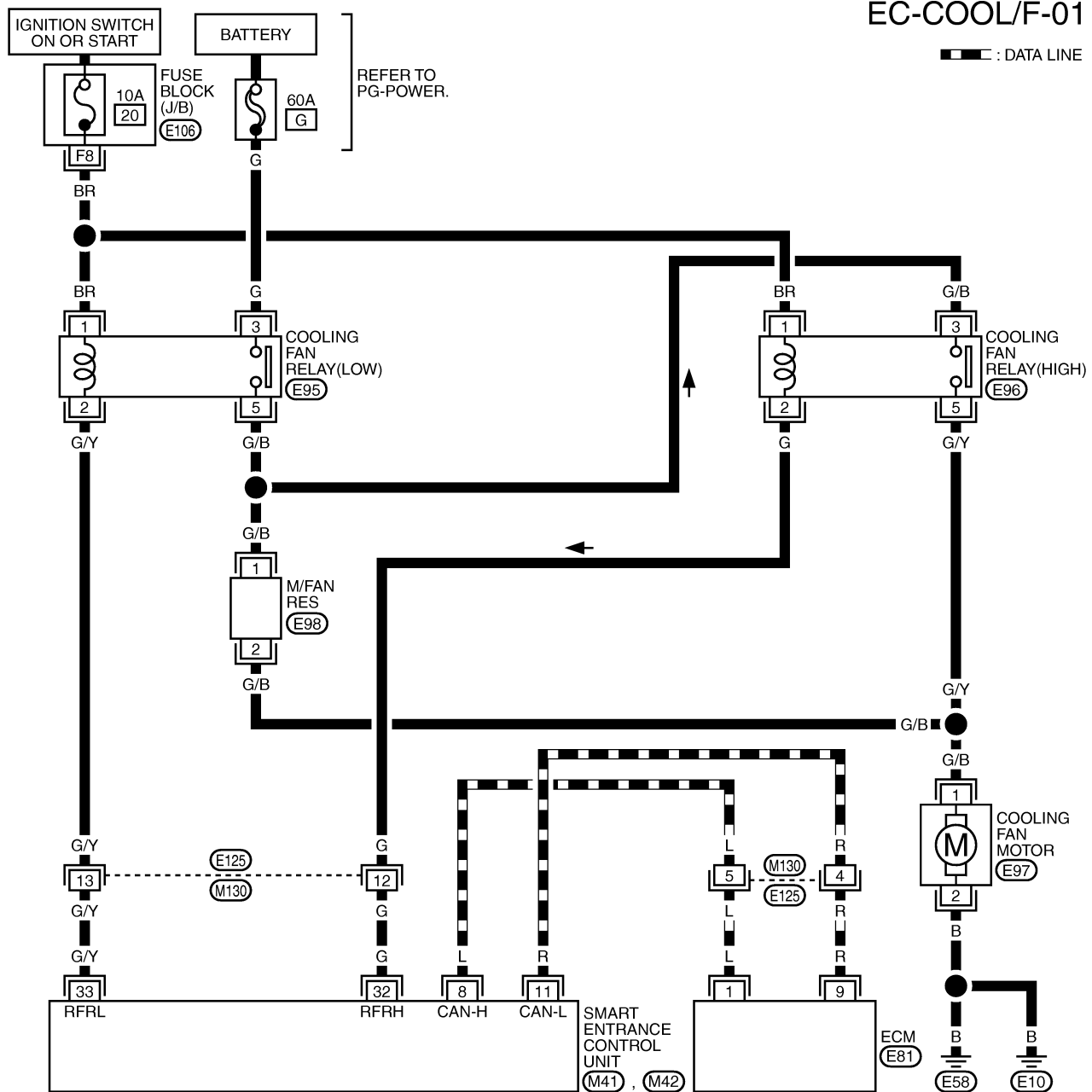
# DIESEL INJECTION

## Wiring Diagram - Cooling Fan

# F9Q

EC-COOL/F-01

— : DATA LINE



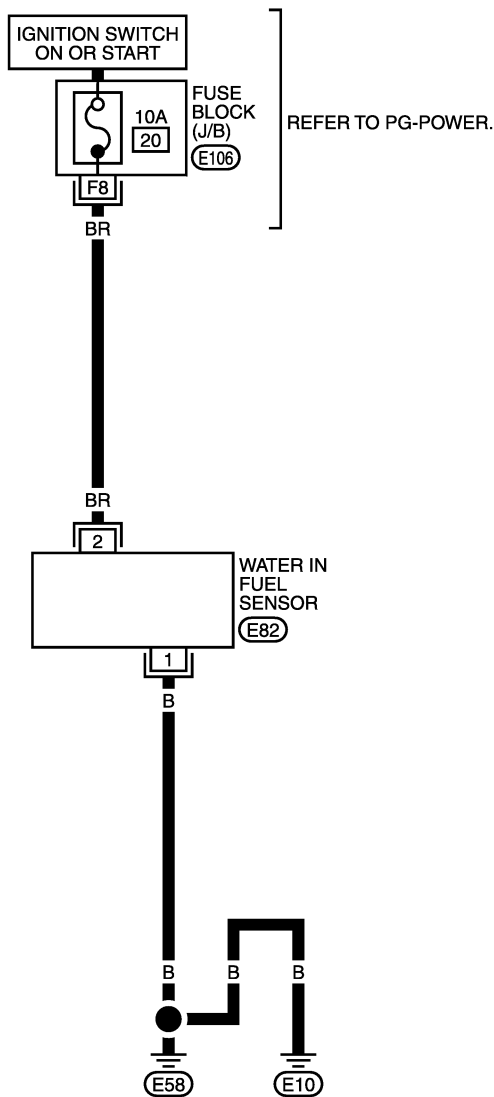
REFER TO THE FOLLOWING.

(E106) - FUSE BLOCK-  
JUNCTION BOX (J/B)

DIESEL INJECTION  
Wiring Diagram - Sedimenter

F9Q

EC-SED-01



1 2 E82

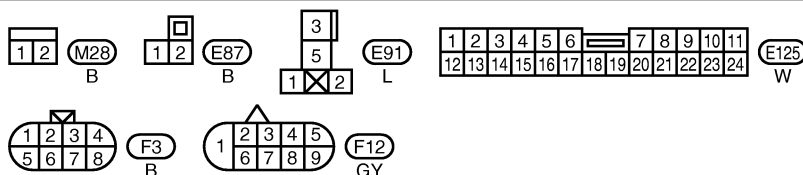
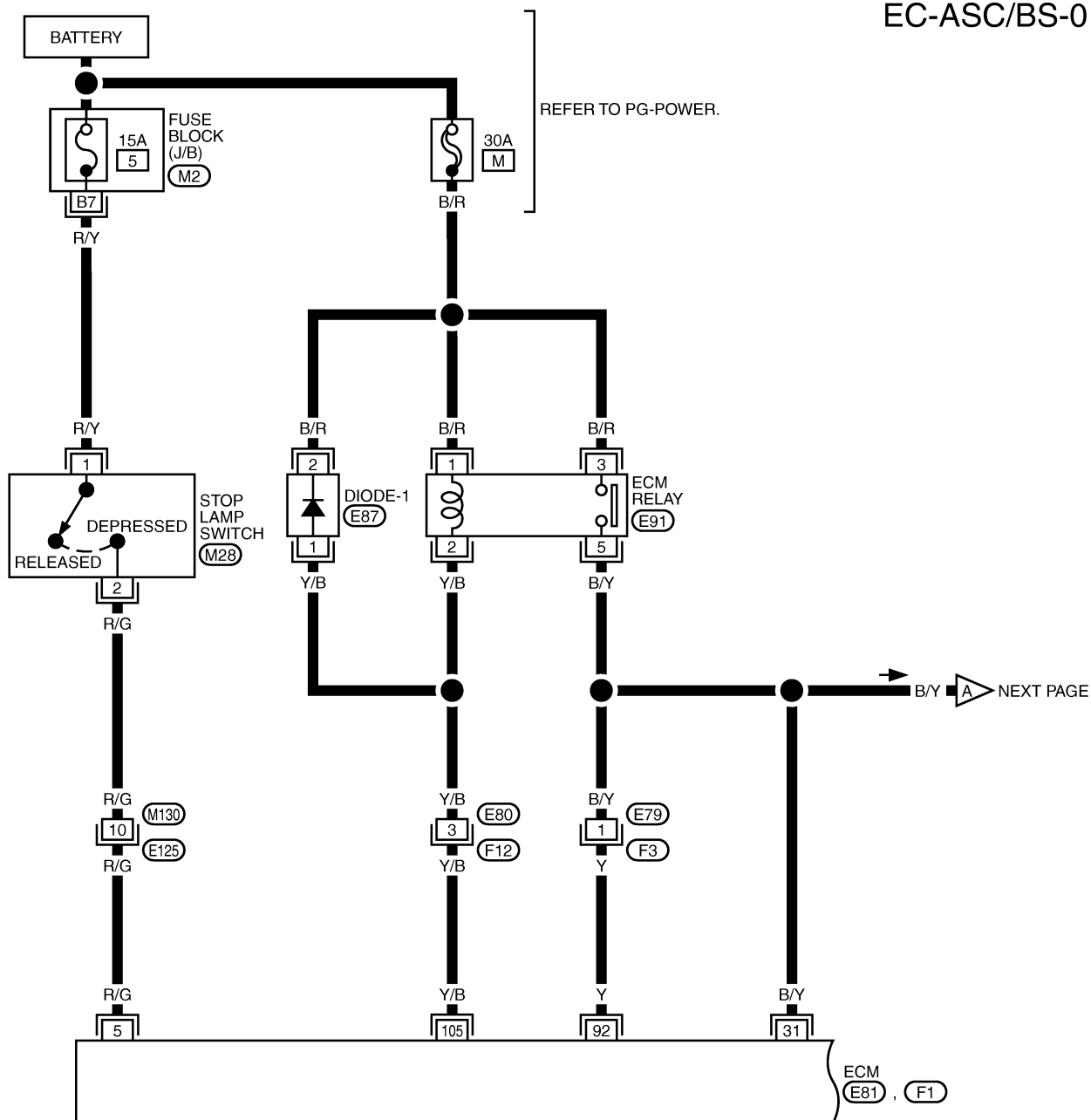
REFER TO THE FOLLOWING.  
E106 - FUSE BLOCK-  
JUNCTION BOX (J/B)

# DIESEL INJECTION

## Wiring Diagram - ASCD Brake Switch

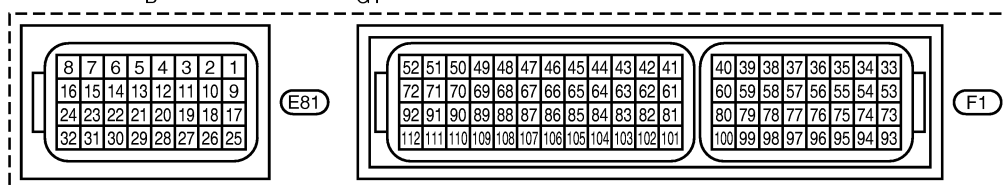
# F9Q

EC-ASC/BS-01



REFER TO THE FOLLOWING.

(M2) - FUSE BLOCK-  
JUNCTION BOX (J/B)

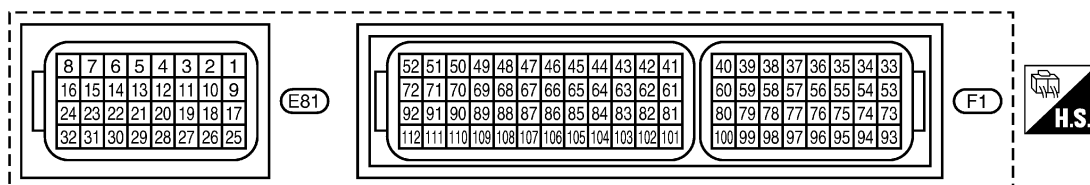
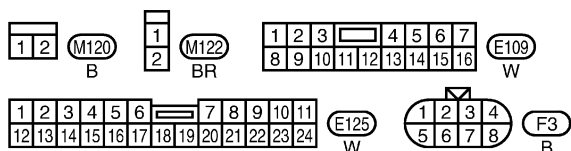
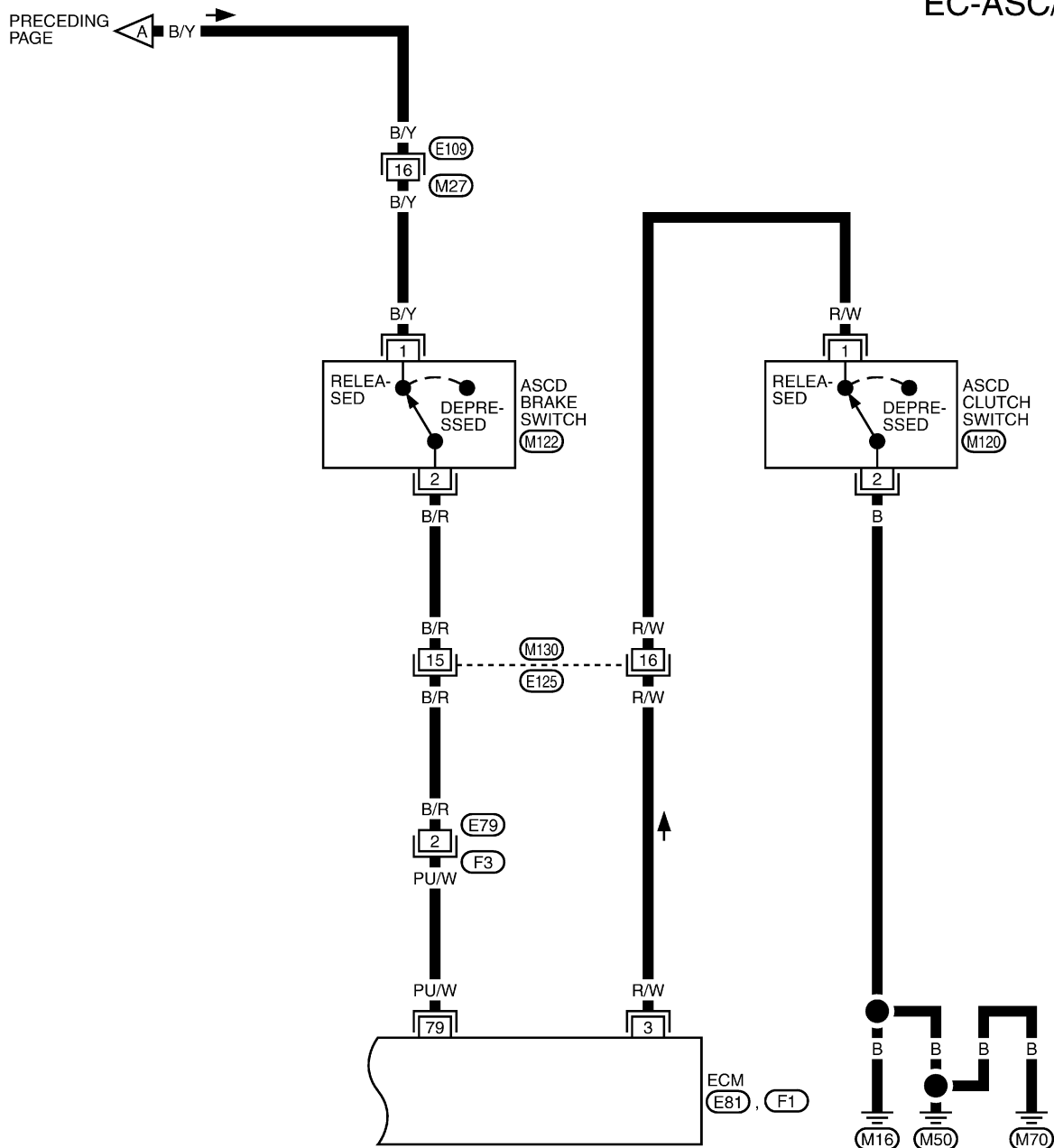


# DIESEL INJECTION

## Wiring Diagram - ASCD Brake Switch

**F9Q**

EC-ASC/BS-02



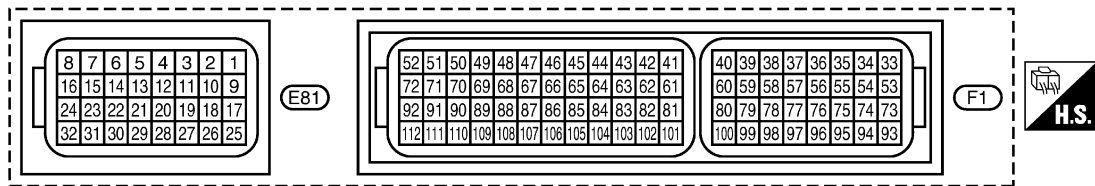
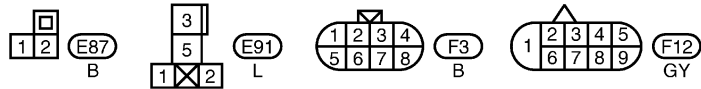
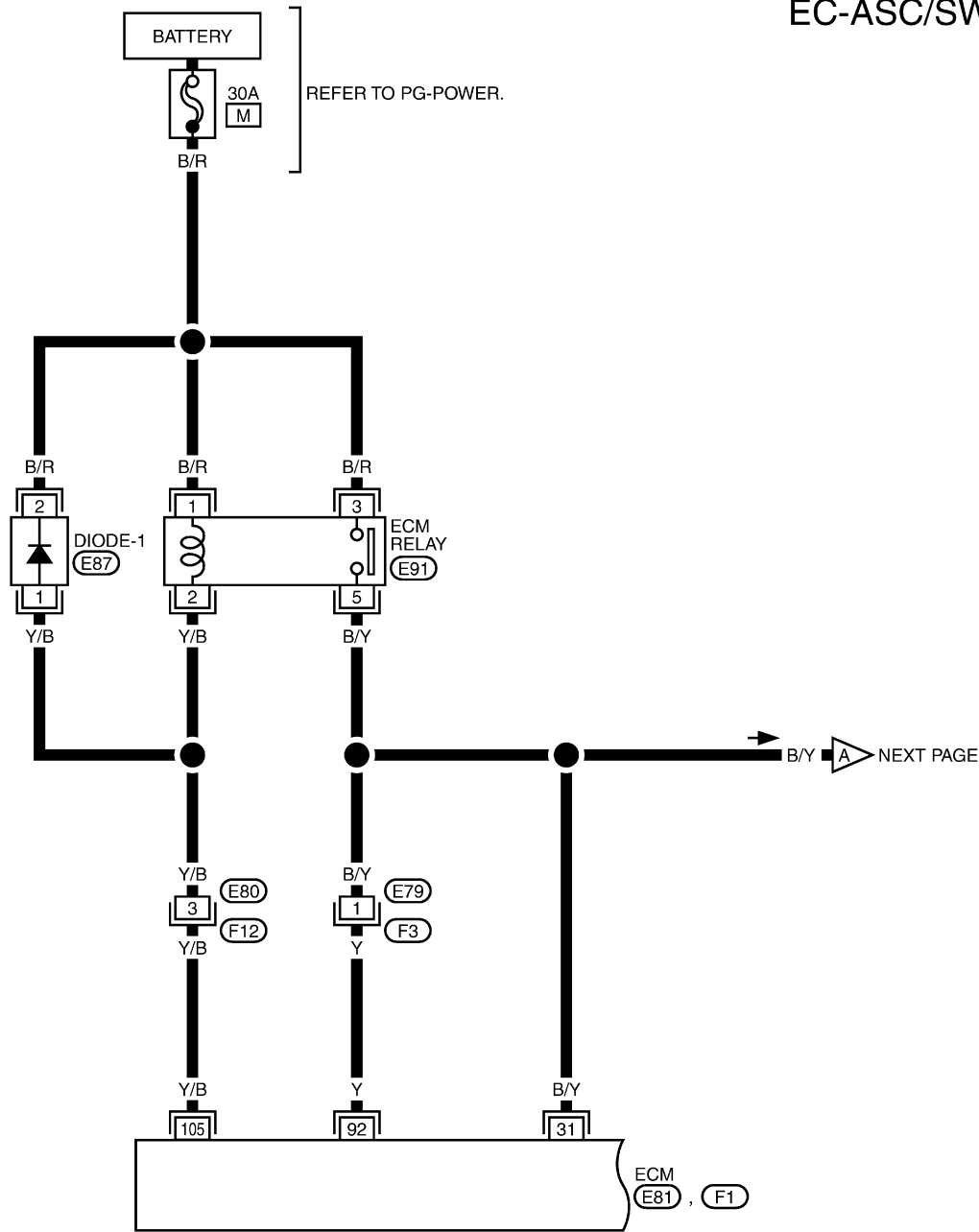
MBWA0920E



DIESEL INJECTION  
Wiring Diagram - ASCD Steering Switch

F9Q

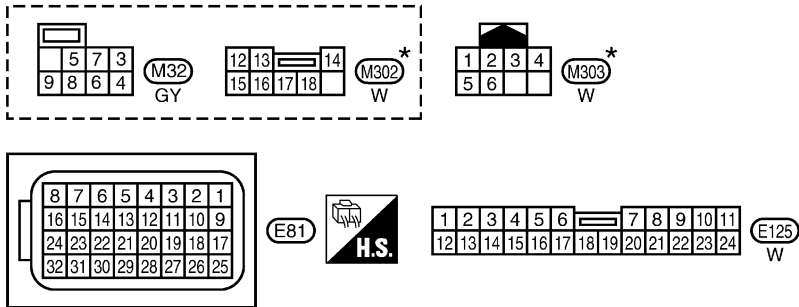
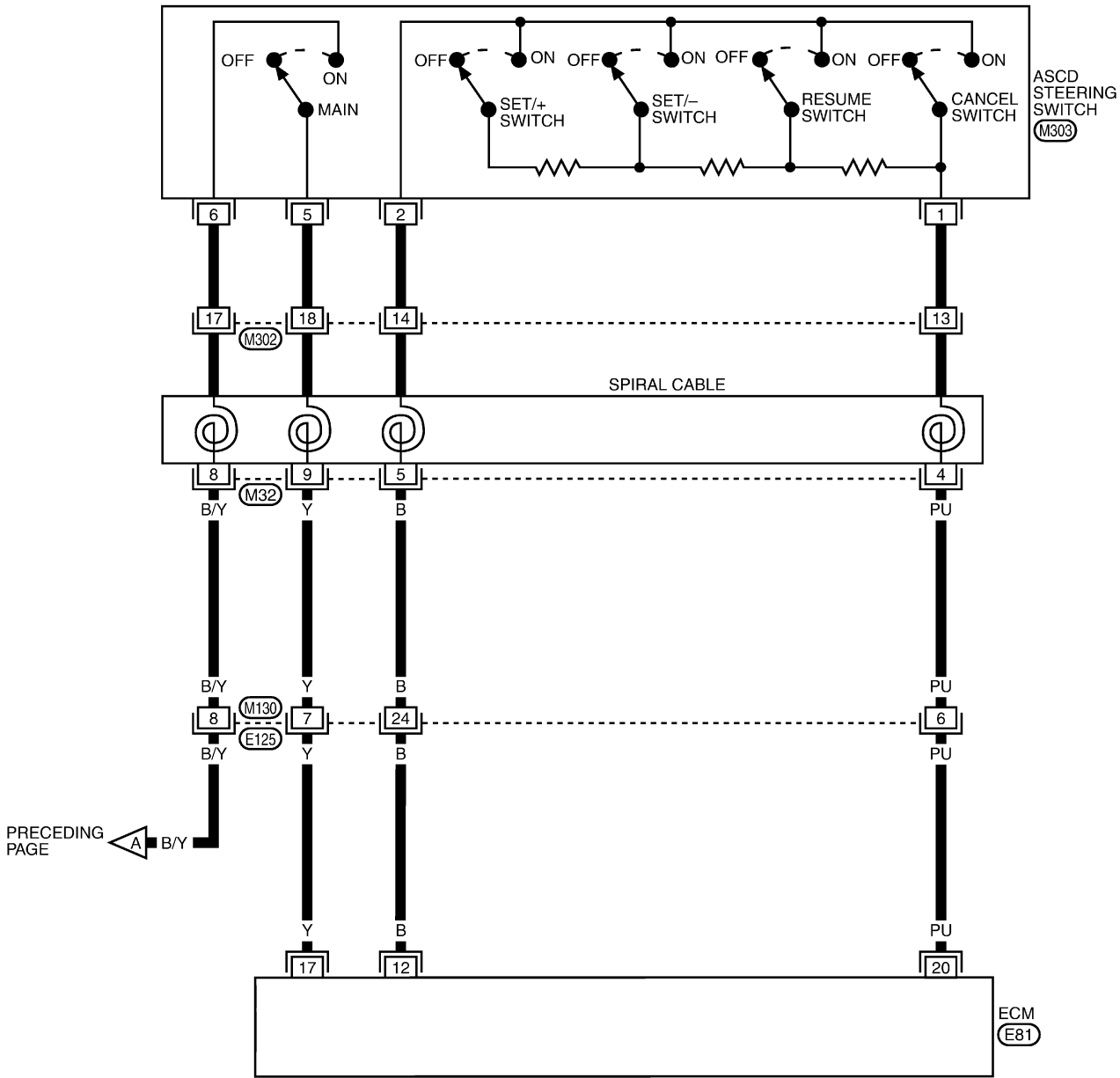
EC-ASC/SW-01



DIESEL INJECTION  
Wiring Diagram - ASCD Steering Switch

F9Q

EC-ASC/SW-02



★ : THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

**F9Q**



REFER TO PG-POWER.



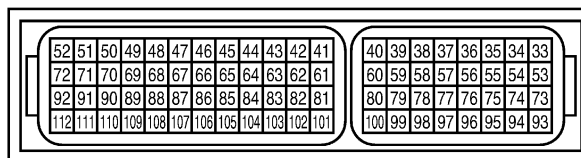
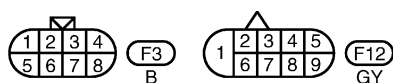
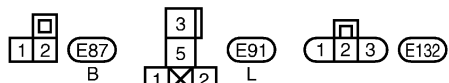
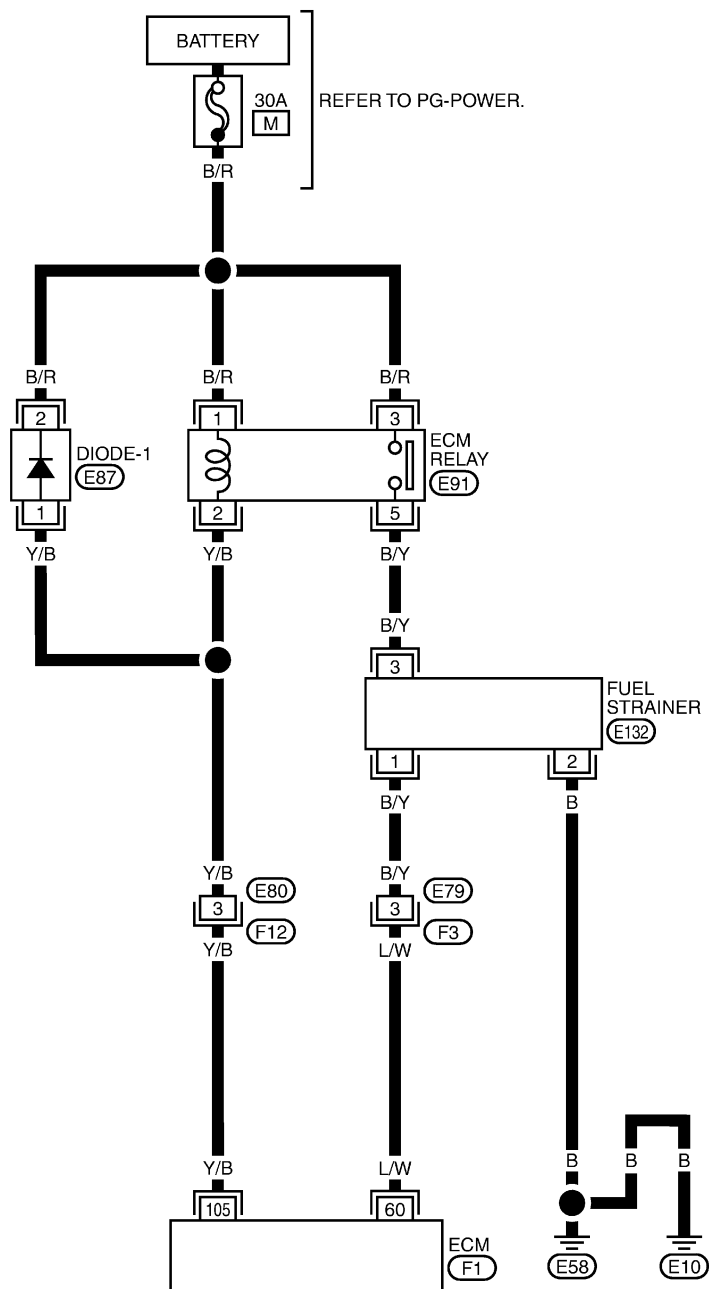
MBWA0922E

# DIESEL INJECTION

## Wiring Diagram - FUEL Strainer

# F9Q

EC-FSTR-01



F1

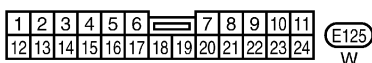
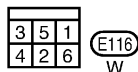
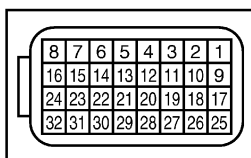
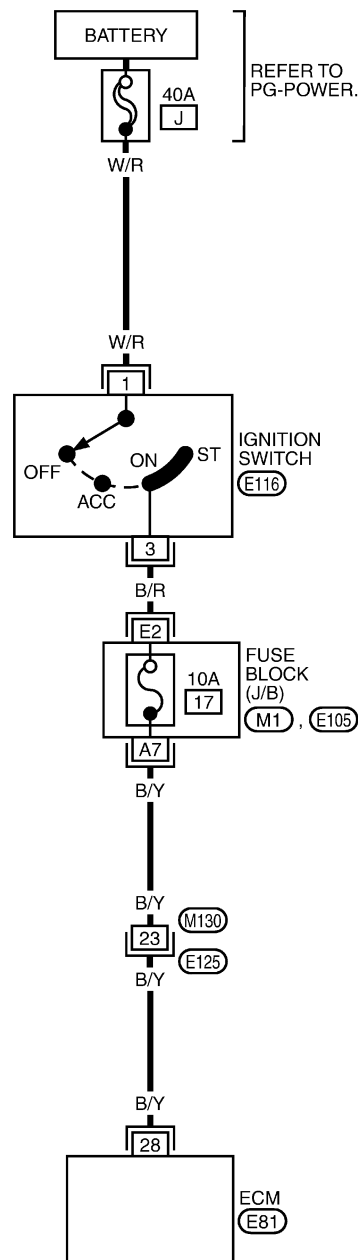


# DIESEL INJECTION

## Wiring Diagram - START signal

# F9Q

EC-S/SIG-01



REFER TO THE FOLLOWING.  
(M1), (E105) -FUSE BLOCK-  
JUNCTION BOX (J/B)

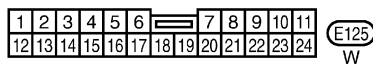
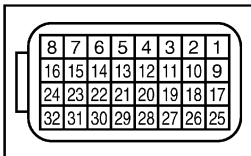
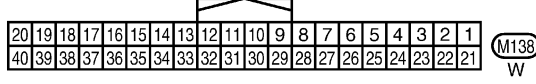
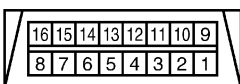
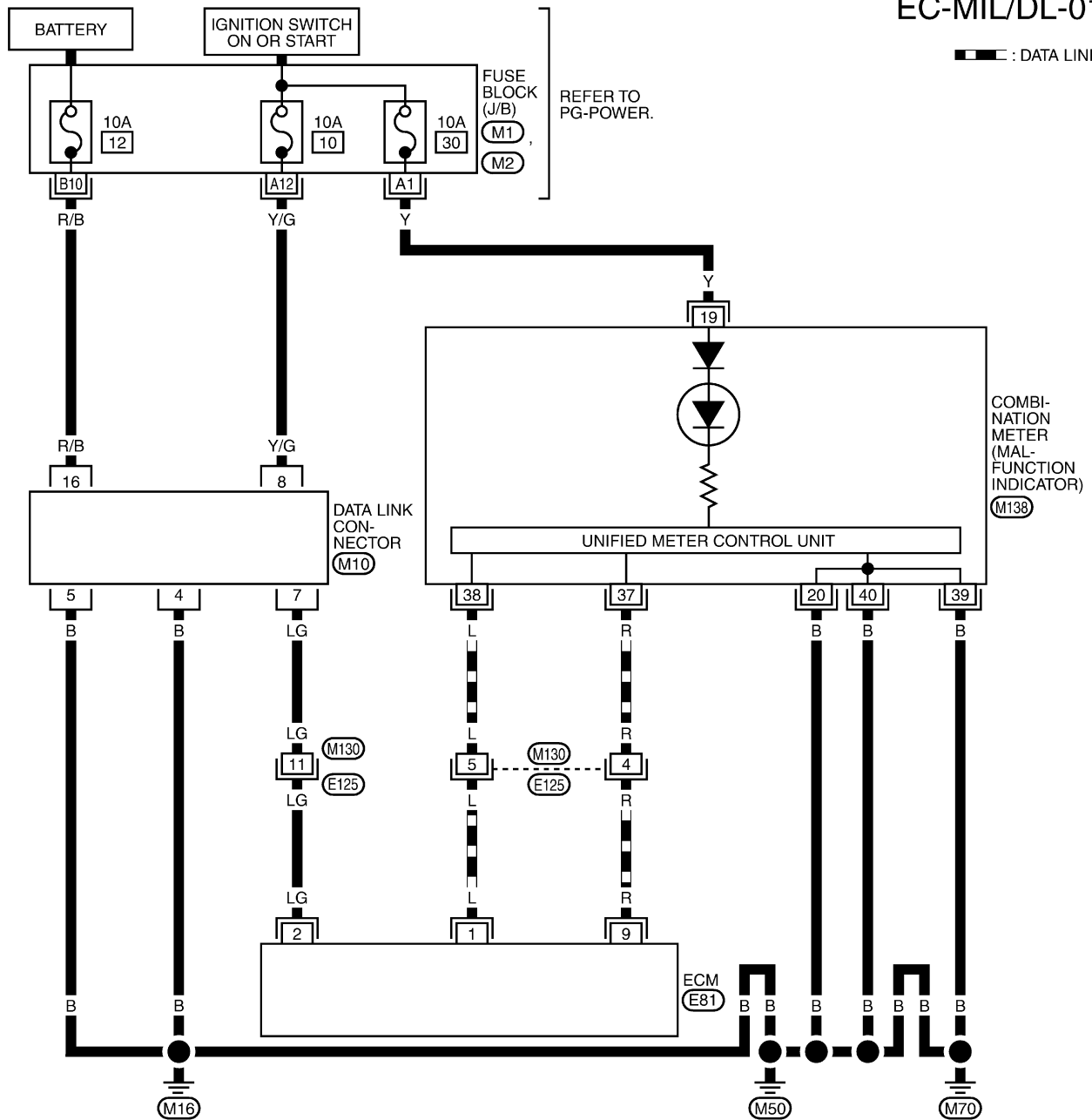
# DIESEL INJECTION

## Wiring Diagram - MI & DATA LINK CONNECTORS

# F9Q

EC-MIL/DL-01

— : DATA LINE



REFER TO THE FOLLOWING.  
(M1), (M2) - FUSE BLOCK-JUNCTION BOX (J/B)