

ENGINE CONTROL SYSTEM

SECTION **EC**

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**".

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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**.

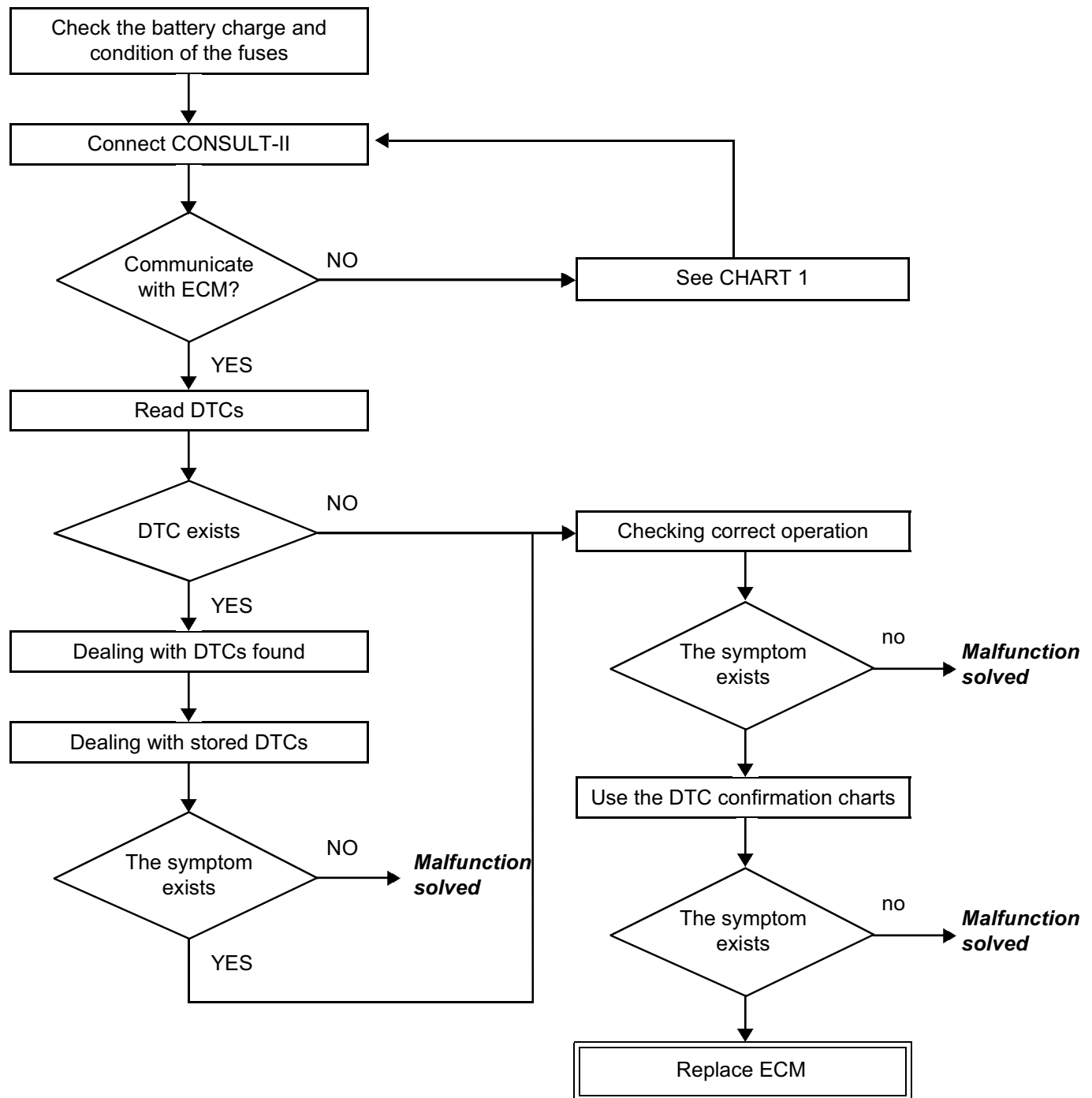
<p>A synopsis of the general procedure to follow is provided on the following page in the form of a flow chart.</p>
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4. DIAGNOSTIC PROCEDURE



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.

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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 diesel 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 diesel 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 rail diesel 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 charge air 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 turbocharging (wastegate) solenoid valve,
- and a damper flap 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.

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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 common rail pressure sensor located on the rail.

It determines the injection time necessary to deliver the right quantity of diesel 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 common 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 the pressure in 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 diesel fuel required to maintain the pressure in the rail. This feature allows heat generation to be minimised and engine output to be improved.

In order to discharge the rail using the injector valves, the valves are controlled by brief electrical pulses which are: short enough not to open the injector, (passing through the return circuit from the injectors), long enough to open the valves and discharge the rail.

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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 on the CAN by the instrument panel.

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

IMPORTANT

The engine must not operate with:

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

The system injects the diesel fuel into the engine at a pressure of up to **1350 bar**. Before carrying out any work, check that the injector rail is 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 any injection pump pulley bearing the number **070 575**. If the 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 Diagnostic), 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:

Symbolised 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, PROGRAMMING OR REPROGRAMMING OPERATION

Following items can be (re)programmed 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 readout using CONSULT-II**:

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

NOTE: The individual injector correction value for each injector must be entered manually after the ECM has been replaced or (re)programmed by reading the individual injector correction value on each injector (Refer to replacing injectors).

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

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 entered into the computer 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).

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CONNECTION

ECM harness connector (E81), 32-terminals

Terminal No.	Item
1	CAN H network signal
2	K-line not used
3	ASCD clutch solenoid
4	Not used
5	Not used
6	Accelerator position sensor 2 earth (Ground)
7	Battery earth (Ground)
8	ECM earth (Ground)
9	CAN L network signal
10	Not used
11	Not used
12	Not used
13	Not used
14	Accelerator position sensor 2 signal
15	Not used
16	Accelerator position sensor 1 earth (Ground)
17	Not used
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 position sensor 1 power supply
24	Accelerator 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	(Charge air) Pressure 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 fuel pressure sensor earth (Ground)
44	Charge air pressure sensor earth (Ground)
45	Not used
46	EGR control valve power supply
47	Charge air pressure sensor power supply
48	Crankshaft position sensor earth (Ground)
49	Inlet flap solenoid valve
50	Thermo plunger relay-1
51	Not used
52	Fuel flow actuator
53	Injector 3
54	Injector 2
55	Not used
56	Preheating (Glow) relay
57	Not used
58	EGR control valve earth (Ground)
59	Not used
60	Not used
61	Not used
62	Not used
63	Not used
64	Not used
65	Not used
66	Refrigerant gas sensor supply
67	Common rail fuel pressure sensor signal
68	Not used
69	Not used
70	Not used
71	Not used
72	Thermo plunger relay-3
73	Injector 4
74	Injector 1
75	Not used

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CONNECTION

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

Terminal No.	Item
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	Charge air 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

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9. 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	TRBCHRNNG PRES SEN CIRC	Turbocharging pressure sensor circuit (Charge air pressure sensor)
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	Wastegate control circuit
30	P0243	DF055	TRBCHRNNG 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 diesel temperature circuit
33	—	—	OIL TEMP SEN CIRC	Oil temperature circuit

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9. 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
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

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WATER TEMPERATURE CIRCUIT PRESENT OR STORED	ENGINE COOLANT TEMPERATURE SENSOR CIRCUIT (ECT sensor) CC.0 : Short circuit to earth (ground) CO.1 : Short circuit or open circuit to +12 V
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NOTES	Conditions for applying the diagnostic procedure to stored DTC: If the DTC is detected when the ignition switch is turned "ON" (+ after ignition) or the engine is running.
	Special notes: DTC is detected when: – the engine coolant temperature is stuck at 119 °C , – the preheating time is above 10 seconds , – the cooling fan assembly is permanently controlled, The severity 1 warning light is lit. Use CONSULT-II for any work on the ECM connectors.

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

AFTER REPAIR	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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WATER TEMP SE CIRC CONTINUED	
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CO.1	NOTES	None.
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<p>Check the engine coolant temperature sensor harness connectors. Repair if necessary.</p>
<p>Measure the resistance of the ECT sensor between terminals 1 and 4 of its black connector. Replace the sensor if the resistance is not approximately: 12460 ± 112 Ω at -10 °C 2252 ± 112 Ω at 25 °C 811.4 ± 39 Ω at 50 °C 283 ± 8 Ω at 80 °C 115 ± 3 Ω at 110 °C</p>
<p>Check the ECM connections. Ensure the continuity and insulation of the following connections: ECM (F1) terminal 108 and ECT sensor harness connector terminal 4 ECM (F1) 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>

AFTER REPAIR	<p>Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.</p>
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ATMS PRES SEN CIR PRESENT OR STORED	<u>ATMOSPHERIC PRESSURE SENSOR CIRCUIT</u> 1.DEF : Signal outside upper limit 2.DEF : Signal outside lower limit 3.DEF : Inconsistency of the signal
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NOTES	Conditions for applying the diagnostic procedure to stored DTCs: DTC is detected after: – the DTC has been cleared from memory, – the ignition is switched off and dialogue is lost with CONSULT-II, – the ignition is switched on and dialogue is established with CONSULT-II, – the engine is started and has been running for 30 seconds.
	Priority when dealing with a number of DTCs (for 1.DEF or 2.DEF): Deal with DTC MAIN RLY CTRL CIRC first if it is present or stored.
	Special notes: The atmospheric pressure sensor is integrated in the ECM, and cannot be separated. The DTC is detected: – there is light smoke, – the atmospheric pressure value changes to default mode: 750 mBar , – the severity 1 warning light is lit. Use CONSULT-II for any work on the ECM connectors.

1.DEF 2.DEF	Check the power supply and the earth (ground) connection of the ECM. Check data monitor item: Atmospheric pressure , and ensure that it is identical on another vehicle (ie: approximately 1000 mBar). If NG, replace the ECM.
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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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ATMS PRES SEN CIR CONTINUED	
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3.DEF	NOTES	Priority in the event of a combination of DTCs: Deal with malfunction Charge air pressure sensor circuit 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 Atmospheric pressure, and parameter Charge air pressure (Filtered turbocharging pressure).</p> <p>If the difference is greater than $\pm 20 \text{ hPa}$ (20 mbars) carry out the diagnostic procedure for Filtered turbocharging pressure.</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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TRBCHNRG PRES SEN CIRC PRESENT OR STORED	<u>CHARGE AIR (TURBOCHARGING) PRESSURE SENSOR CIRCUIT</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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NOTES	Conditions for applying the diagnostic procedure to the stored DTC: The DTC is detected after the ignition is switched on or with the engine running.
	Special notes: Use CONSULT-II for all operations on the ECM connectors. DTC is detected when: <ul style="list-style-type: none"> – the EGR control solenoid valve is cut off, – the charge air pressure enters fail-safe mode, ie: FLRD BST PRES = 750 mbar, – the intake air temperature enters fail-safe mode, ie: INLET AIR TMP = 25 °C. The severity 1 warning light is lit.

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

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

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

1.DEF	NOTES	<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>If there is more than one ATMS PRES SEN CIRC, carry out the Filtered turbocharging pressure diagnostic procedure: If the charge pressure sensor is operating correctly, replace ECM.</p>
<p>Check the charge air pressure sensor harness connectors. Check the ECM connections. Repair if necessary.</p>
<p>Check the continuity, insulation and for the absence of interference resistance on the following connections: ECM (F1) terminal 47 and charge air pressure sensor harness connector terminal 1 ECM (F1) terminal 44 and charge air pressure sensor harness connector terminal 2 ECM (F1) terminal 90 and charge air pressure sensor harness connector terminal 3 Repair if necessary. If the DTC exists, replace ECM.</p>

AFTER REPAIR	<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

ENGINE SPEED SEN CIRC PRESENT OR STORED	<u>CRANKSHAFT POSITION (ENGINE SPEED) SENSOR CIRCUIT</u> 1.DEF: Signal absent 2.DEF: Inconsistency of the signal
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NOTES	Conditions for applying the diagnostic procedure to stored DTCs: If the DTC is detected after successive starting attempts or with the engine running. Special notes: Use CONSULT-II for any work on the computer connectors. The crankshaft sensor is consistent with the camshaft position sensor. If the DTC is detected, the severity 2 warning light will light up.
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1.DEF 2.DEF	NOTES	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: 0.5 to 1.8 mm .
Check the resistance of the crankshaft position sensor between terminals 1 and 2 . The coil resistance is $800 \pm 80 \Omega$ at an engine coolant temperature of 20 °C .
Check the ECM connections. Repair if necessary.
Check the continuity, absence of interference resistance and insulation on the following connections: ECM (F1) terminal 102 and crankshaft position sensor harness connector terminal 1 ECM (F1) terminal 103 and crankshaft position sensor harness connector terminal 2 Repair if necessary.
Check the crankshaft position sensor signal using an oscilloscope: If check that the sensor is properly attached and that the engine flywheel target is not damaged.
If the DTC exists, replace ECM.

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

RAIL PRES SEN CIRC PRESENT OR STORED	<u>COMMON RAIL FUEL PRESSURE SENSOR CIRCUIT</u> 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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NOTES	Conditions for applying the diagnostic procedure to stored DTCs: If the DTC is detected after successive starting attempts or with the engine running.
	Special notes: If a DTC is detected, the instruction to stop the engine immediately will be issued. The severity 2 warning light will light up. Use CONSULT-II for any work on the ECM connectors.

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

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

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

RAIL PRES SEN CIRC CONTINUED	
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1.DEF 2.DEF	NOTES	Special note: The minimum value is 0.2 bar , the stop maximum value is 1350 bar .
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<p>Check the common rail fuel pressure sensor harness connectors. Check the ECM connections. Repair if necessary.</p>
<p>Check the continuity, absence of interference resistance and insulation on the following connections:</p> <ul style="list-style-type: none"> ECM (F1) terminal 67 and common rail fuel pressure sensor harness connector terminal 2 ECM (F1) terminal 41 and common rail fuel pressure sensor harness connector terminal 3 ECM (F1) terminal 43 and common rail fuel pressure sensor harness connector terminal 1 <p>Repair if necessary.</p>
<p>With the ignition on, and the engine stopped for more than one minute: Check the Rail pressure pressure value displayed by the "DATA MONITOR" mode with CONSULT-II,</p> <ul style="list-style-type: none"> – If the value is below 50 bar, the sensor is correct. If so, contact your Techline before replacing the ECM. – If the pressure is above 50 bar, replace the common rail fuel pressure sensor and tighten to 35 ± 5 Nm. <p>Follow the safety instructions in the Introduction.</p>

AFTER REPAIR	<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

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

CO.0	NOTES	Priority in the event of a combination of malfunctions: If DTC Accelerator pedal position sensor (PDL PTNTMTR CIRC TRACK2) 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 continuity, absence of interference resistance and insulation 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 resistance on sensor 1 across terminals 3 and 4 . Replace the sensor if the resistance is not approximately: 1.7 kΩ ± 0.9 .

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

PDL PTNTMTR CONTINUED	
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CC.1	NOTES	Priority in the event of a combination of DTCs: Deal with DTC SEN SUPPLY NO1 VOLTAGE 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 continuity, absence of interference resistance and insulation 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 resistance on sensor 1 across terminals 4 and 2 . Replace the accelerator pedal position sensor 1 if the resistance is not approximately: 1.7 kΩ ± 0.9 .

1.DEF	NOTES	None.
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Check the connectors on the accelerator pedal position sensor. Check the ECM connections. Repair if necessary.
Check the continuity, absence of interference resistance and insulation 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.

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

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

CO.0	NOTES	Processing priority in the event of a number of faults: If DTC Accelerator pedal position sensor (Pedal potentiometer circuit track) 1 CO.0 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 continuity, absence of interference resistance and insulation 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 resistance on sensor 2 between terminals 1 and 5 . Replace the sensor if the resistance is not approximately: 2.85 kΩ ± 2.05 .

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

PDL PTNTMTR CIRC TRACK2 CONTINUED	
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CC.1	NOTES	Priority in the event of a combination of DTCs: Deal with DTC Sensor power supply voltage no. 2 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 continuity, absence of interference resistance and insulation 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 resistance on sensor 2 across terminals 1 and 5 . Replace the accelerator pedal position sensor 2 if the resistance is not approximately: 2.85 ± 2.05 kΩ .

1.DEF	NOTES	None.
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Check the connectors on the accelerator pedal position sensor. Check the ECM connections. Repair if necessary.
Check the continuity, absence of interference resistance and insulation 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.

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

EGR POSITION SENSOR CIR PRESENT OR STORED	<u>EGR POSITION SENSOR CIRCUIT</u> CO.0 : Open circuit or short circuit to earth (ground) CC.1 : Short circuit to + 12 V
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NOTES	Conditions for applying the diagnostic procedure to the stored DTC: The DTC reappears after: – the DTC has been cleared from the memory and – active test EGR SOLENOID VALVE .
	Special notes: 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.

CO.0	NOTES	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 continuity, absence of interference resistance and insulation of the following connections: ECM (F1) terminal 89 and EGR control solenoid harness connector terminal 6 ECM (F1) terminal 46 and EGR control solenoid harness connector terminal 2 Repair if necessary.
If the DTC exists, replace the EGR control solenoid valve.

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

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

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

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

1.DEF 2.DEF	NOTES	None.
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<p>The following sensors are connected to supply no. 1:</p> <ul style="list-style-type: none"> – Charge air pressure sensor. – Accelerator pedal position sensor 1. <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"> – check the insulation against earth (ground) of the + 5 V line of each sensor. – check the insulation against + 12 V of the + 5 V line of each sensor. – check the insulation between the following connections: <ul style="list-style-type: none"> – terminals 4 and 5 of the accelerator pedal position sensor 1 harness connector. – terminals 1 and 2 of the charge air pressure sensor harness connector. <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>

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

SEN SUPPLY NO2 VOLTAGE PRESENT OR STORED	<u>SENSOR SUPPLY VOLTAGE No. 2</u> 1.DEF : Sensor reference voltage too low 2.DEF : Sensor reference voltage too high
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NOTES	Conditions for applying the diagnostic procedure to the stored DTC: The DTC reappears as stored after: – clearance of the DTC, – the engine has been running for one minute.
	Special notes: The DTC is detected if: – the severity 1 warning light is lit. – EGR regulation, cruise control and the positive temperature coefficient (PTC) are deactivated, – the torque is limited, – the severity 1 warning light is lit. Use CONSULT-II for all operations on the ECM connectors.

1.DEF 2.DEF	NOTES	None.
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<p>The following sensors are connected to sensor power supply no. 2:</p> <ul style="list-style-type: none"> – EGR control solenoid valve position sensor, – Accelerator pedal position sensor 2, – Refrigerant pressure sensor. <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"> – check the insulation against earth: of the + 5 V line of each sensor. – check the insulation against + 12 V: of the + 5 V line of each sensor. – check the insulation between the following connections: – terminals 2 and 6 of the accelerator position sensor 2 harness connector. – terminals 2 and 4 of the EGR control solenoid valve position sensor harness connector. – terminals 1 and 2 of the refrigerant sensor harness connector. <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>

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

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

1.DEF 2.DEF	NOTES	None.
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<p>The following sensors are connected to supply no. 3:</p> <ul style="list-style-type: none"> – Common rail fuel pressure sensor. – Mass air flow sensor. <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 + 5 V line of each sensor. check the insulation against + 12 V: of the + 5 V line of each sensor. check the insulation between the following connections:</p> <ul style="list-style-type: none"> – terminals 1 and 3 of the common rail fuel pressure sensor connector. – terminals 2 and 3 of the MAF sensor connector. <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>

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

MAIN RLY CTRL CIRC PRESENT OR STORED	<u>ECM RELAY (MAIN RELAY CONTROL) CIRCUIT</u> 1.DEF : Relay cut out too soon 2.DEF : Relay cut out too late
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NOTES	Conditions for applying the diagnostic procedure to the stored DTC: 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.
	Special notes: Use CONSULT-II for all operations on the ECM connectors.

1.DEF 2.DEF	NOTES	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 continuity, absence of interference and insulation of the following connection: ECM (F1) terminal 105 and ECM relay harness connector terminal 2 Repair if necessary.

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

EGR COMMAND CIRCUIT PRESENT OR STORED	<u>EGR VALVE CONTROL CIRCUIT</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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NOTES	<p>Conditions for applying the diagnostic procedure to the stored DTC: The DTC reappears after:</p> <ul style="list-style-type: none"> – the DTC has been cleared from the memory and – active test mode with CONSULT-II EGR SOLENOID VALVE.
	<p>Special notes: 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 severity 1 warning light comes on. Use CONSULT-II for all operations on the ECM connectors.</p>

CC.1	NOTES	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 resistance of the EGR valve control solenoid valve across terminals 1 and 5. If the resistance is not approximately 8 Ω ± 0.5 at 20 °C, replace the EGR valve control solenoid. Check the continuity and insulation of the following connection: ECM (F1) terminal 91 and EGR valve control solenoid valve harness connector terminal 5 Repair if necessary.</p>
<p>If the DTC exists and remains present, replace the EGR valve control solenoid valve.</p>

AFTER REPAIR	<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

EGR COMMAND CIRCUIT CONTINUED 1	
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CC.0 C.O	NOTES	Special note: If DTC EGR control solenoid valve position sensor circuit in CO.0 is present at the same time, check that the EGR valve control solenoid valve connector is connected correctly.
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Check the connections of the EGR valve control solenoid valve. Check the ECM connections. Repair if necessary.
Check the resistance of the EGR valve control solenoid valve across terminals 1 and 5 . If the resistance is not approximately $8\ \Omega \pm 0.5\ \Omega$ at 20 °C , replace the EGR valve control solenoid valve. Also check the insulation between the EGR valve control solenoid and the body of the EGR valve control solenoid valve.
Check the continuity, absence of interference resistance and insulation of the following connections: ECM (F1) terminal 91 and EGR valve control solenoid valve harness connector terminal 5 ECM relay terminal 2 and EGR valve control solenoid valve harness connector terminal 1
Repair if necessary. If the DTC exists and remains present, replace the EGR valve control solenoid valve.

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

EGR COMMAND CIRCUIT CONTINUED 2	
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1.DEF	NOTES	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 resistance of the EGR valve control solenoid valve across terminals 1 and 5. If the resistance is not approximately 8 Ω ± 0.5 at 20 °C, replace the EGR valve control solenoid valve.</p>
<p>Check the continuity, absence of interference resistance and insulation on the following connections: ECM (F1) terminal 91 and EGR valve control solenoid valve harness connector terminal 5 ECM relay terminal 2 and EGR valve control solenoid valve harness connector terminal 1 Check for the presence of + 12 V after relay on track 1 of the EGR valve control solenoid valve. Repair if necessary.</p>
<p>If the DTC exists, check that the ECM output stage is working correctly: Perform active test: EGR solenoid valve. If there is no perceptible movement of the valve, ensure that the ECM output stage is functioning: – Either by oscilloscope (calibrated to 5 V/division and a time base of 2 ms/division): With the EGR valve control solenoid valve connected, connect the oscilloscope earth to the battery earth with the positive test pin on terminal 5 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 12.5 V at a frequency of 140 Hz (with an OCR* increasing from 25 to 75 %). – Either by voltmeter: With the EGR valve control solenoid valve connected, connect the earth (ground) lead of the voltmeter to terminal 2 of the EGR valve control solenoid valve and the positive lead to terminal 1. Erase any EGR valve control solenoid valve DTC that there may be and perform EGR SOLENOID VALVE: The voltmeter should display two voltages in succession ≈ battery voltage X OCR* underway. Or successively: 3.15 V for an OCR* of 25 % then 9.45 V for an OCR* of 75 % (10 cycles). If the oscilloscope (or the voltmeter) does not indicate control or continuous voltage, replace ECM.</p>

*Opening Cyclic Ratio signal

AFTER REPAIR	<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

PRHT UNT CTRL CIRC PRESENT OR STORED	<u>GLOW RELAY (PREHEATER UNIT) CONTROL CIRCUIT</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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NOTES	Conditions for applying the diagnostic procedure to the stored DTC: If the DTC appears after : Glow relay (PREHEATER UNIT) active test mode.
	Special notes: It is difficult or even impossible to start the vehicle when cold. If the DTC is detected when: Use CONSULT-II for all operations on the ECM connectors.

CC.1	NOTES	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 S (80A) Ensure the continuity and insulation from + 12 V 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.

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

PRHT UNT CTRL CIRC CONTINUED	
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CC.0 CO	NOTES	Special notes: 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 S (80A) Check the continuity, absence of interference resistance and insulation 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.

1.DEF	NOTES	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 S (80A) Check the continuity and insulation of the following connection: ECM (F1) terminal 56 and glow relay harness connector terminal 1 Repair if necessary.
If the DTC exists, check that the ECM output stage is working correctly: With the glow relay connected: connect the negative test probe of the voltmeter to terminal 1 of the glow relay, connect the negative test probe of the voltmeter to the battery + 12 V , perform active test mode with CONSULT-II: EGR SOLENOID VALVE If the voltmeter does not register a voltage during the entire command time (10 ON-OFF cycles per second), replace ECM.

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

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

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

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

DF037 PRESENT OR STORED	<u>IMMOBILIZER</u>
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NOTES	Conditions for applying the diagnostic procedure to the stored DTC: If the DTC appears after an attempt to start the engine or when the ignition is switched on.
	Special notes: 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. Replace ECM.

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

<p style="text-align: center;">COMPUTER PRESENT OR STORED</p>	<p>COMPUTER</p> <ul style="list-style-type: none"> 1.DEF : Permanent high signal 2.DEF : Permanent low signal 3.DEF : Configuration absent or incorrect 4.DEF : Analogue/digital converter malfunction 5.DEF : Fault in EEPROM 6.DEF : Activation in Watchdog 7.DEF : Signal outside upper limit 8.DEF : Signal outside lower limit 9.DEF : Dialogue disrupted 10.DEF : Injector control condenser malfunction 11.DEF : Injector control 12.DEF : Initialization error 13.DEF : Injection fault under deceleration 14.DEF : Extensive pump command 15.DEF : Extensive pump command at idle speed
<p style="text-align: center;">NOTES</p>	<p>Conditions for applying the diagnostic procedure to the stored DTC: If the DTC appears after the engine is started or with the engine running.</p>
	<p>Special notes: The severity 1 warning light will come on and if there is an attempt to switch off the engine, the severity 2 warning light will come on if there is a DTC existent. Use CONSULT-II for all operations on the ECM connectors.</p>
<p style="text-align: center;">1.DEF → 15.DEF</p>	<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>
<p style="text-align: center;">AFTER REPAIR</p>	<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

INLT AIR TEMP CIRC PRESENT OR STORED	<u>INTAKE (INLET) AIR TEMPERATURE SENSOR CIRCUIT</u> CO.1 : Short circuit or open circuit to +12 V CC.0 : Short circuit to earth
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NOTES	Conditions for applying the diagnostic procedure to the stored DTC: The DTC is declared present when the ignition is switched on or with the engine running.
	Special notes: If the detected if: – 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.

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

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

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

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

CYL 1 INJECTOR CIRC PRESENT OR STORED	<u>CYLINDER 1 FUEL INJECTOR CIRCUIT</u> CC.1 : Short circuit to + 12 V CO : Open circuit CC : Short circuit 1.DEF : Injector control
--	--

NOTES	Conditions for applying the diagnostic procedure to the stored DTC: If the DTC becomes present after the engine is started.
	Special notes: Use CONSULT-II for all operations on the ECM connectors.

CC.1	NOTES	None.
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Check the connectors of fuel injector no. 1. Check the ECM connections. Repair if necessary.
Measure the resistance of fuel injector no. 1 across terminals 1 and 2 . If the resistance is not approximately 0.33 Ω at 20 °C , replace fuel injector no. 1. Check the continuity and insulation 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.

CO	NOTES	None.
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Check the connectors of fuel injector no. 1. Check the ECM connections. Repair if necessary.
Measure the resistance of fuel injector no. 1 across terminals 1 and 2 . If the resistance is not approximately 0.33 Ω at 20 °C , replace fuel injector no. 1. Check the continuity and absence of interference resistance 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.

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

CYL 1 INJECTOR CIRC CONTINUED	
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CC	NOTES	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 resistance of fuel injector no. 1 across terminals 1 and 2. If the resistance is not approximately 0.33 Ω at 20 °C, replace fuel injector no. 1. Check the insulation between the following connections: ECM (F1) terminal 33 and fuel injector 1 harness connector terminal 1 ECM (F1) terminal 74 and fuel injector 1 harness connector terminal 2</p>
<p>If the DTC exists, replace fuel injector no. 1.</p>

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

AFTER REPAIR	<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

CYL 2 INJCTOR CIRC PRESENT OR STORED	<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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NOTES	Conditions for applying the diagnostic procedure to the stored DTC: If the DTC becomes present following an engine start.
	Special notes: Use CONSULT-II for all operations on the ECM connectors.

CC.1	NOTES	None.
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Check the connections for fuel injector no. 2. Check the ECM connections. Repair if necessary.
Measure the resistance of fuel injector no. 2 across terminals 1 and 2 . If the resistance is not approximately 0.33 Ω at 20 °C , replace fuel injector no. 2. Check the continuity and insulation 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.

CO	NOTES	None.
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Check the connections for fuel injector no. 2. Check the ECM connections. Repair if necessary.
Measure the resistance of fuel injector no. 2 across terminals 1 and 2 . If the resistance is not approximately 0.33 Ω at 20 °C , replace fuel injector no. 2. Check the continuity and absence of interference resistance 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.

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

CYL 2 INJECTOR CIRC CONTINUED	
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CC	NOTES	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 resistance of fuel injector no. 2 across terminals 1 and 2. If the resistance is not approximately 0.33 Ω at 20 °C, replace fuel injector no. 2. Check the insulation between 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</p>
<p>If the DTC exists, replace fuel injector no. 2.</p>

1.DEF	NOTES	None.
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<p>Measure the resistance of fuel injector no. 2 across terminals 1 and 2. If the resistance is not approximately 0.33 Ω at 20 °C, replace fuel injector no. 2. Check the continuity, absence of interference resistance and insulation on 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</p>
<p>If the DTC exists, replace fuel injector no. 2.</p>
<p>If the DTC exists, replace ECM.</p>

AFTER REPAIR	<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

CYL 3 INJCTOR CIRC PRESENT OR STORED	<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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NOTES	Conditions for applying the diagnostic procedure to the stored DTC: If the DTC becomes present following an engine start.
	Special notes: Use CONSULT-II for all operations on the ECM connectors.

CC.1	NOTES	None.
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Check the connections for fuel injector no. 3. Check the ECM connections. Repair if necessary.
Measure the resistance of fuel injector no. 3 across terminals 1 and 2 . If the resistance is not approximately 0.33 Ω at 20 °C , replace fuel injector no. 3. Check the continuity and insulation 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.

CO	NOTES	None.
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Check the connections for fuel injector no. 3. Check the ECM connections. Repair if necessary.
Measure the resistance of fuel injector no. 3 across terminals 1 and 2 . If the resistance is not approximately 0.33 Ω at 20 °C , replace fuel injector no. 3. Check the continuity and absence of interference resistance 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.

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

CYL 3 INJECTOR CIRC CONTINUED	
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CC	NOTES	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 resistance of fuel injector no. 3 across terminals 1 and 2. If the resistance is not approximately 0.33 Ω at 20 °C, replace fuel injector no. 3. Check the insulation between 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</p>
<p>If the DTC exists, replace fuel injector no. 3.</p>

1.DEF	NOTES	None.
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<p>Measure the resistance of fuel injector no. 3 across terminals 1 and 2. If the resistance is not approximately 0.33 Ω at 20 °C, replace fuel injector no. 3. Check the continuity, absence of interference resistance and insulation 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</p>
<p>If the DTC exists, replace fuel injector no. 3.</p>
<p>If the DTC exists, replace ECM.</p>

AFTER REPAIR	<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

CYL 4 INJCTOR CIRC PRESENT OR STORED	<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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NOTES	Conditions for applying the diagnostic procedure to the stored DTC: If the DTC becomes present following an engine start.
	Special notes: Use CONSULT-II for all operations on the ECM connectors.

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

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

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

CYL 4 INJECTOR CIRC CONTINUED	
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CC	NOTES	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 resistance of fuel injector no. 4 across terminals 1 and 2. If the resistance is not approximately 0.33 Ω at 20 °C, replace fuel injector no. 4. Check the insulation between the following connections: ECM (F1) terminal 73 and fuel injector 4 harness connector terminal 2 ECM (F1) terminal 34 and fuel injector 4 harness connector terminal 1</p>
<p>If the DTC exists, replace fuel injector no. 4.</p>

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

AFTER REPAIR	<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

BATTERY VOLTAGE PRESENT OR STORED	<u>BATTERY VOLTAGE</u> 1.DEF : Excess voltage 2.DEF : Not enough voltage
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NOTES	Conditions for applying the diagnostic procedure to the stored DTC: If the DTC appears after the ignition is switched on or with the engine running.
	Special notes: Computer operating voltage: 6 V < operating voltage < 18 V . 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.

1.DEF	NOTES	None.
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<p>Check the charging circuit (Refer to SC section).</p> <p>Carry out any necessary repairs.</p>
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2.DEF	NOTES	Use the " Wiring Diagrams ".
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<p>With the ignition switch is "off", measure the battery voltage at its terminals. If the voltage is below 12.5 V, recharge and test the battery. If it is faulty, replace the battery then test the charge circuit. (Refer to SC section.)</p> <p>With the ignition on then with the starter motor turning, measure the battery voltage at its terminals. If the voltage drops below 9.6 V, 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 the continuity and absence of interference resistance 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>

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

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

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

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

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

REFRIGERANT SENSOR CIRC CONTINUED	
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CC.1 CC.0	NOTES	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 comparing* the value displayed by the diagnostic tool (data monitor item: Refrigerant pressure) with an air conditioning filling station high-pressure gauge reading.</p> <p>A- If the values do not coincide:</p> <ul style="list-style-type: none"> – Check the insulation, the continuity and absence of interference resistance on the following connections: <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"> – Check the conformity of the refrigerant pressure sensor power supply: <ul style="list-style-type: none"> Check voltage on terminal 3 (+ 5 V) Check voltage on terminal 1 (Approximately 0 V) – If the power supply and connections are okay, replace the refrigerant pressure sensor. <p>B- If the values coincide:</p> <ul style="list-style-type: none"> – Perform trouble diagnosis on the air conditioning system. <p>*Note:</p> <p>The diagnostic tool displays the absolute pressure, the air conditioning filling station high-pressure gauge displays the relative pressure (the difference between them is ~ 1 bar (1000 hPa, i.e. atmospheric pressure).</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

BRAKE SWITCH CIRCU PRESENT OR STORED	<u>BRAKE SWITCH CIRCUIT</u> 1.DEF : Inconsistency of the signal 2.DEF : No signal
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NOTES	Conditions for applying the fault finding procedure to the stored DTC: If the DTC reappears as present after: – the DTC has been cleared from ECM memory, – the ignition has been switched off and dialogue with the CONSULT-II has been lost, – the ignition has been switched on and dialogue has been established. – followed by the engine being started and the brake pedal being depressed.
	Special notes: If the DTC is present, ASCD is deactivated. Use CONSULT-II for all operations on the ECM connectors.

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

AFTER REPAIR	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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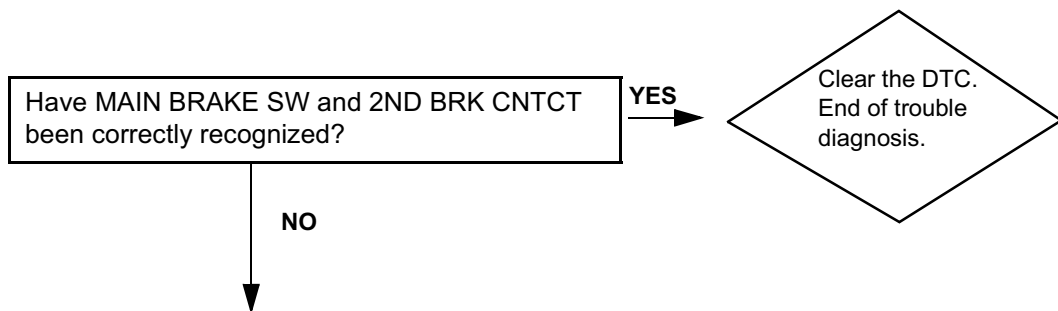
F9Q

BRAKE SWITCH CIRCU CONTINUED		
2.DEF	NOTES	None.

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

AFTER REPAIR	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

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

1.DEF	NOTES	None.
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2.DEF	NOTES	None.
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3.DEF	NOTES	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 the continuity and insulation 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 Ω cancel = Approx. 0 Ω set/+ = Approx. 270 Ω set/- = Approx. 100 Ω Carry out this check on all of the connections concerned. Check with the driver: 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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AFTER REPAIR	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

RAIL PRES REGULTIN PRESENT OR STORED	<u>RAIL PRESSURE REGULATION FUNCTION</u> 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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CC.1	NOTES	None.
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Check the flow regulator connections. Check the injection ECM connections. Repair if necessary.
Measure the resistance across tracks 1 and 2 of the flow regulator. If the resistance is not: 3 Ω ± 0.1 at 20 °C , replace the fuel flow regulator. Check the insulation against + 12 V of the following connection: ECM (F1) terminal 52 and fuel flow regulator terminal 2
If the DTC persists, replace the fuel flow regulator.

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

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

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

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

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 diesel circuits (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.

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

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

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

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

TRBCHRGING SOL V C CIRC CONTINUED	
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1.DEF	NOTES	None.
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<p>Check the connections of the turbocharger control solenoid valve. Repair if necessary.</p>
<p>Check the resistance between terminals 1 and 2 of the turbocharger control solenoid valve: The resistance should be: 15.4 Ω \pm 0.7 at 20 °C. Replace the solenoid valve if the resistance is outside the tolerance valves.</p>
<p>Check the ECM connections. Check the continuity, absence of interference resistance and insulation on the following connection: ECM (F1) terminal 36 and turbocharger control solenoid valve harness connector terminal 2 Repair if necessary.</p>
<p>Check for the presence of + 12 V after relay on terminal 1 of the turbocharger control solenoid valve (coming from terminal 2 of the ECM relay connector).</p>
<p>If the DTC persists, check that the ECM output stage is working correctly:</p> <p>With the turbocharger control solenoid valve connected:</p> <p>● Either by voltmeter:</p> <p>Connect the voltmeter earth cable to terminal 2 of the solenoid valve and the positive cable to terminal 1. Clear any faults in the solenoid valve, then perform active test TURBO SOL VALVE:</p> <p style="margin-left: 20px;">➡ The voltmeter should display ten cycles of two successive voltages approximately equal to the combined voltage of the battery and the current Opening Cyclic Ratio, i.e.: ~ 2.5 V (Opening Cyclic Ratio of 20%) then ~ 8.75 V (Opening Cyclic Ratio of 70%).</p> <p>● Or on the oscilloscope (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 terminal 1 of the solenoid valve. Erase any DTCs in the solenoid valve, perform active test TURBO SOL VALVE:</p> <p style="margin-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 ~ 20 to ~ 70%).</p> <p style="margin-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>

AFTER REPAIR	<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

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

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

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

AFTER REPAIR	<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

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

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

AIR FLOW SEN CIRC PRESENT OR STORED	<u>MASS AIR FLOW SENSOR CIRCUIT (MAF SONSOR CIRCUIT)</u> 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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NOTES	Conditions for applying the diagnostic procedure to the stored ECM: If the DTC appears at the end of power latch followed by after ignition switch is turned on.
	Special notes: Use CONSULT-II for all operations on the ECM connectors.

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

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

AFTER REPAIR	Deal with any other possible trouble diagnoses. Erase the DTCs from the ECM memory after repair.
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F9Q

1.DEF, 2.DEF 3.DEF, 4.DEF	NOTES	None.
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Check the EGR solenoid valve is not jammed open:

- 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 DIESEL DETECTOR CIRCUIT</u>
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NOTES	Conditions for applying the diagnostic procedure: When DTC stored or present.
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<p>A) Make sure the diesel fuel water detection 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.</p> <p>B) If the sensor is properly connected: Bleed the diesel 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.</p> <p>C) If the DTC reappears: Check the power supply of the water detection sensor: + 12 V after fuel block between terminal 2 of the water detection sensor Ground between terminal 1 of the water detection sensor Carry out the necessary repairs.</p> <p>If none of these checks reveal a malfunction: Replace the water detection sensor. Clear the fault. 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.</p> <p>Note: if the water level in the fuel filter unit is below the sensor's electrodes, some driving conditions (bends, slopes) may cause the injection fault 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).</p>

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

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

1.DEF GR1	NOTES	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 stored , erase the DTC from memory and end the procedure. If the DTC is still present , replace ECM.
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2.DEF GR1	NOTES	None.
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This DTC appears 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

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

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

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

AFTER REPAIR	<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

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

AFTER REPAIR	<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

DF069 PRESENT OR STORED	<u>IMPACT DETECTION SIGNAL</u>
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NOTES	Conditions for applying the diagnostic procedure to the stored DTC: If the DTC becomes present after the engine is started or + after ignition feed.
	Special notes: 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.

If the vehicle has been involved in an accident:

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.

If the vehicle has not been involved in an accident, carry out trouble diagnoses on the AIRBAG control unit.

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

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

1.DEF 2.DEF	NOTES	None.
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Check the conformity of the clutch switch: From the STATES screen on your CONSULT-II, display state CLUTCH PEDAL : clutch pedal position "engaged" CLUTCH PEDAL should be RELEASED clutch pedal position "released" CLUTCH PEDAL should be PRESSED . 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.

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

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

1.DEF 2.DEF 3.DEF 4.DEF	NOTES	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.

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

CAMSHAFT SEN CIRC PRESENT OR STORED	<u>CAMSHAFT POSITION SENSOR CIRCUIT (CMPS)</u> 1.DEF : Signal absent 2.DEF : Inconsistent signal
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NOTES	Conditions for applying the diagnostic procedure to the stored DTC: If the DTC reappears as present after: – the engine has been started and the engine has been running for one minute.
	Special notes: 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.

1.DEF 2.DEF	NOTES	Priority in the event of a combination of DTCS: Deal with DTC: BATTERY VOLTAGE first if it is present or stored. If DTCS: AIR FLOW SEN CIRC, WATER DTCT CIRC, DAMPER CONTROL CIRCUIT appear together, check the conformity of the + 12 V supply line after relay.
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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

CAMSHAFT SEN CIRC CONTINUED	
<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 continuity 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</p>	
<p>With the ignition switched on and the CMP sensor connected: Use a voltmeter to measure the voltage across terminals 1 and 3 of the CMP sensor: (This voltage should be equal to the battery voltage within 0.08 V) If the voltage is outside the tolerance values, take the measurement again with the CMP sensor disconnected, –if the voltage is still outside the tolerance values, check the continuity and the absence of interference resistance on the following connection: CMP sensor, terminal 3 and ECM relay (E91) terminal 5 and CMP sensor terminal 3 –if the voltage changes to within the tolerance values, replace the CMP sensor.</p>	
<p>With the starter motor turning: 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>	

AFTER REPAIR	<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

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

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

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

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

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

EGR SOLENOID V CIR PRESENT OR STORED	<u>EGR SOLENOID VALVE CIRCUIT</u> 1.DEF : Inadequate EGR valve flow 2.DEF : Excessive EGR valve flow
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NOTES	Conditions for applying the diagnostic procedure to the stored DTC: If the DTC is declared present after the engine has been started and has run at idling speed for 40 seconds.
	Special notes: The fault is present if: – exhaust gas recirculation is deactivated, – vehicle output is reduced and smoke could appear, – the severity 1 warning light is lit. Use CONSULT-II for all operations on the ECM connectors.

1.DEF 2.DEF	NOTES	None.
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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

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

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

EGR POSITION OFFSE PRESENT OR STORED	<u>EGR VALVE OFFSET</u> 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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NOTES	Conditions for applying the diagnostic procedure to the stored DTC: The DTC reappears after: – the DTC has been erased from the memory and – active test mode: EGR SOLENOID VALVE .
	Special notes: 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 severity 1 warning light will be lit. Use CONSULT-II for all operations on the ECM connectors.

1.DEF 2.DEF 3.DEF 4.DEF	NOTES	None.
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Check the EGR valve control solenoid valve connections. Check the ECM connections. Repair if necessary.

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

ASSRVSSMNT ELCTRVNN EGR PRESENT OR STORED	<u>EGR SOLENOID VALVE SERVO-CONTROL</u> 1.DEF : Inadequate EGR valve flow 2.DEF : Excessive EGR valve flow
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NOTES	<p>Conditions for applying the diagnostic procedure to the stored DTC: The DTC reappears after:</p> <ul style="list-style-type: none"> – the DTC has been erased from the memory and – active test mode with CONSULT-II: EGR SOLENOID VALVE. – engine running + EGR control conditions.
	<p>Special notes: 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 severity 1 warning light will be lit. Use CONSULT-II for all operations on the ECM connectors.</p>

1.DEF 2.DEF	NOTES	None.
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Check the EGR valve control solenoid valve connections. Check the ECM connections. Repair if necessary.

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

IFGNL CRTUR ARBRE CMS PRESENT OR STORED	<u>CAMSHAFT POSITION SENSOR SIGNAL (CMPS)</u> 1.DEF : Sporadic absence of signal 2.DEF : Sporadic inconsistency of signal
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NOTES	Conditions for applying the diagnostic procedure to the stored DTC: If the DTC becomes present following an engine start.
	Special notes: Use CONSULT-II for all operations on the ECM connectors.

1.DEF 2.DEF	NOTES	None.
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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 continuity 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.
With the ignition switched on and the camshaft sensor connected: Use a voltmeter to measure the voltage between terminals 1 and 3 of the CMP sensor: (This voltage should be equal to the battery voltage to within 0.08 V) If the voltage is outside the tolerance values, take the measurement again with the CMP sensor disconnected , –if the voltage is still outside the tolerance values, check the continuity and absence of interference resistance 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.
With the starter turning and the engine running: 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.

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

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

1.DEF 2.DEF	NOTES	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: 0.5 to 1.8 mm . Check that the sensor is correctly attached and that the flywheel target is not damaged.
Measure the resistance of the CKP sensor between terminals 1 and 2 . The coil resistance is 800 ± 80 Ω at an engine coolant temperature of 20 °C .
Check the continuity and absence of interference resistance of the following connections: ECM (F1) terminal 102 and CKP sensor harness connector terminal 1 ECM (F1) 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.

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 - 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	IMPCT DTECTED: Impact detected	YES or NO	In the event of a malfunction, apply the trouble diagnosis for IMPACT DETECTED INFO.
2	Feed	C/U+AFTR IGN: + Computer (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.
		C/U SUPPLY VOL: Computer (ECM) supply voltage	7 < X < 19 V	
		LNEAR S/ SUP-V: Linearised sensor feed voltage	3.47 < X < 3.75 V	In the event of a malfunction, refer to sensor feed trouble diagnosis SEN SUPPLY NO1 VOLTAGE to SENSOR SUPPLY NO3 V.
		RFRGRNT F L S V: Refrigerant sensor voltage	3.47 < X < 3.75 V	In the event of a malfunction, refer to the trouble diagnosis for REFRIGERANT SENSOR CIRC
3	Engine running	ENGINE SPEED: Engine speed (CKPS)	X = 0 rpm	In the event of a malfunction, refer to the trouble diagnosis for ENGINE SPEED SEN CIRC
4	Pressure	ATOMOS PRESS: Atmospheric pressure	800 < X < 1030 mbar	The sensor is incorporated into the ECM. The default value is 750 mbar (ATMS PRES SEN CIRC).
		RAIL PRESSURE: Rail pressure	0 < X < 0.2 bar	In the event of a malfunction, refer to the trouble diagnosis for RAIL PRES SEN CIRC
5	Temperature	INLET AIR TEMP: Inlet (Intake) air temperature	30 < X < 61°C	In the event of a malfunction, refer to the trouble diagnosis for INLT AIR TEMP CIRC
		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

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
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 PRHTR UT CNTL .
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 A.B.S. 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 REVERSE INFO and refer to trouble diagnosis CLUTCH SWITCH CIRCUIT .

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

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.**

AIR CIRCULATION (TURBOCHARGING / INTAKE)

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

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	ENGINE SPEED: Engine speed	X = 0 rpm	None
2	Temperature	FUEL TEMP: Fuel temperature	25 < X < 80°C	In the event of a malfunction, refer to the trouble diagnosis for FUEL TEMP SEN CIRC
3	Pressure	RAIL PRES SET: Common rail fuel pressure setting	X = 250 bar	The rail pressure setpoint changes according to the vehicle speed.
		GAL PRS REG/V: Common rail fuel pressure regulation valve Opening Cyclic Ratio	X= 15 %	In the event of a malfunction, refer to the trouble diagnosis for RAIL PRES SEN CIRC
		RAIL PRESSURE: Common rail fuel pressure	X = 0 bar	
		F P DIFFEREN C: Fuel pressure difference	X = 250 bar	
4	Flow	FUEL FLOW: Fuel flow	0 < X < 60 mg/cp	In the event of a malfunction, refer to the trouble diagnosis for RAIL PRES SEN CIRC
5	Rail current	R PR RT CRRNT: Common rail fuel pressure regulator current	X = 395 mA	In the event of a malfunction, refer to the trouble diagnosis for RAIL PRES SEN CIRC
		R P RT C RF V: Common rail fuel pressure regulator current setpoint	X = 400 mA	The rail 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 stopped, ignition on.**

FUEL / LPG CIRCUIT

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

DIESEL INJECTION

Trouble diagnosis - Conformity check

F9Q

NOTES	<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: engine stopped, ignition on.</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 REFRIGERANT SENSOR CIRC.
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 WATER TEMP SE CIRC

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	ENGINE SPEED: Engine speed	X = 0 rpm	None
2	Pedal position	PEDAL LOAD: Accelerator pedal load (*)	X = 0 % (if there is no pressure on the pedal)	In the event of a malfunction, refer to the trouble diagnosis for PDL PTNTMTR CIRC TRACK1 and PDL PTNTMTR CIRC TRACK2
3	Sensor feed	PL PTNMR T1 V: Accelerator pedal position sensor (potentiometer) sensor (track) 1 voltage	0.70 < X < 0.80 V	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 PDL PTNTMTR CIRC TRACK1 and PDL PTNTMTR CIRC TRACK2 .
		PL PTNMR T2 V: Accelerator pedal position sensor (potentiometer) sensor (track) 2 voltage	0.35 < X < 0.40 V	

(*) 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	H R ATHD MX P: Heating resistor maximum authorised power	X = 0 W	In the event of a malfunction, carry out trouble diagnosis on the heater
2	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 WATER TEMP SE CIRC

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	VEHICLE SPEED: Vehicle speed	Give the vehicle speed in km/h . 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.
		PR130: ASCD setpoint	X = 0 mph	The ASCD setpoint is selected by the driver and changes according to the vehicle speed.
		CRS CN/S LMTR: ASCD	INACTIVE when no buttons are pressed	In the event of a malfunction, refer to the diagnostic procedure for DTC interpretation SPD LIM/ CRUIS CTRL
			STATE 1: ASCD resume button pressed	Activates the green indicator light on the instrument panel and emits a beep when it switches off
			STATE 2: Speed limiter start/stop button pressed	Activates the orange indicator light on the instrument panel and emits a beep when it switches off
			STATE 3: set/+ button pressed	In the event of a malfunction, refer to the diagnostic procedure for DTC interpretation SPD LIM/ CRUIS CTRL
			STATE 4: set/- button pressed	
			STATE 5: cancel button pressed	
			STATE 6: 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)	STATE 1: Anti-slid request ----- STATE 2: Brake pedal depressed ----- STATE 3: DTC appears on ASCD ----- STATE 4: Uncouple brake box motor depressed ----- STATE 5: DTC detected by ECM ----- STATE 6: Vehicle speed invalid ----- STATE 7: Cancel button pressed ----- STATE 8: Gear selector lever in neutral ----- STATE 9: Inconsistency between the request and the vehicle speed	<p>When a state between STATE 1 and STATE 9 is active, then associated state CRS CNTL DV T also passes to active and immediately deactivates the ASCD requested by the driver.</p> <p>NOTE: ASCD can only be active for a speed V > 30 km/h otherwise STATE 6 remains active.</p>

DIESEL INJECTION

Trouble diagnosis - Conformity check

F9Q

NOTES	<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: engine stopped, ignition on.</p>
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ASCD

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

Trouble diagnosis - Conformity check

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.**

Order	Function	Data monitor or State Check or Action		Display and notes	Diagnostic procedure
1	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
2	Cooling fan	FAN CONTROL 1:	Check cooling fan 1	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.
		FAN CONTROL 2:	Check cooling fan 2		
		FN U LW S RQT:	Fan low-speed request	ACTIVE or INACTIVE	
		FN U HI S RQT:	Fan high-speed request		

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.**

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 feed	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	Engine running	ENGINE SPEED: Engine speed	X = 0 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	ACTIVE or INACTIVE	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

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	IMPCT DTECTED: Impact detected	NO	In the event of a malfunction, apply the trouble diagnosis for IMPACT DETECTED INFO.
2	Feed	C/U+AFTR IGN: ECM + after ignition feed	PRESENT	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.
		C/U SUPPLY VOL: ECM supply voltage	7 < X < 19 V	
		LNEAR S/ SUP-V: Linearised sensor feed voltage	3.47 < X < 3.75 V	In the event of a malfunction, refer to the trouble diagnosis for sensor feed SEN SUPPLY NO1 VOLTAGE to SENSOR SUPPLY NO3 V.
		RFGRNT FL S V: Refrigerant sensor voltage	3.47 < X < 3.75 V	In the event of a malfunction, refer to the trouble diagnosis for REFRIGERANT SENSOR CIRC
3	Speed	ENGINE SPEED: Engine speed	X = 800 rpm	In the event of a malfunction, refer to the trouble diagnosis for ENGINE SPEED SEN CIRC
4	Pressure	ATOMOS PRESS: Atmospheric pressure	800 < X < 1030 mbar	The sensor is incorporated into the ECM. The default value is 750 mbar (ATMS PRES SEN CIRC).
		RAIL PRESSURE: Rail pressure	250 < X < 300 bar Pmax = 1350 bar	In the event of a malfunction, refer to the trouble diagnosis for RAIL PRES SEN CIRC
5	Temperature	INLET AIR TMP: Inlet air temperature	30 < X < 61°C	In the event of a malfunction, refer to the trouble diagnosis for INLT AIR TEMP CIRC
		WATER TEMP: Coolant temperature	Cold: 30°C Warm: 90°C	In the event of a malfunction, refer to the trouble diagnosis for WATER TEMP SE CIRC

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	PRHTR UT CNTL: Glow relay (preheater unit) control	INACTIVE or ACTIVE (On starting)	In the event of a malfunction, refer to the diagnostic procedure for state PRHTR UT CNTL.
7	Torque	ENGINE TORQUE: Engine torque	On starting: 25 < X < 40 Nm Warm: 10 < X < 25 Nm With air conditioning: 30 < X < 35 Nm	None
8	Charging circuit	Altr rtr crnt: Alternator flow	On starting: 20 < X < 28 mA Warm: 10 < X < 20 mA With consumers: 25 < X < 36 mA With acceleration: 19 < X < 26 mA	In the event of a malfunction, check the alternator charging circuit.
9	Driver signal	VEHICLE SPEED: Vehicle speed	In km/h	In the event of a malfunction, refer to the A.B.S. 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	EXT. AIR TMP: Ambient (external) air temperature	Should display the current external temperature	In the event of a malfunction, carry out trouble diagnosis on the sensor
		C/U SUPPLY VOL: Intake (inlet air) temperature	30 < X < 61°C	In the event of a malfunction, refer to the trouble diagnosis for INLT AIR TEMP CIRC
2	Pressure	ATOMOS PRESS: Atmospheric pressure	800 < X < 1030 mbar	The sensor is incorporated into the ECM. The default value is 750 mbar (ATMS PRES SEN CIRC) .
		FLRD BST PRES: Filtered charge air (turbocharging) pressure	800 < X < 1030 mbar	The filtered pressure value depends on the setpoint pressure value and should be virtually identical (± 15 mbar). In the event of a malfunction, refer to the trouble diagnosis for TRBCHRGNG PRES SEN CIRC
		BT PRES REF V: Charge air (turbocharging) pressure setpoint	790 < X < 1010 mbar	None
3	Turbo- charging	TRBO PRES OCR: Charge air (turbocharging) pressure Opening Cyclic Ratio	X = 85%	The opening cyclic ratio should be identical to the correction of the solenoid valve position
		TRB S/V PF CN: Charge air (turbocharging) solenoid valve position sensor	X = 85%	
4	Air circulation	EST. AIR FLOW: Estimated air flow	26 < X < 28 kg/ h	In the event of a malfunction, refer to the trouble diagnosis for OIL TEMP SEN CIRC
		DMPR FLAP OCR: Damper valve Opening Cyclic Ratio	X = 5%	

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	INLET TMP S V:	Intake (inlet) temperature sensor voltage	X = 2.32 V	In the event of a malfunction, refer to the trouble diagnosis for INLT AIR TEMP CIRC
		ATMOS PS SE V:	Atmospheric pressure sensor voltage	X = 3.95 V	In the event of a malfunction, refer to the trouble diagnosis for ATMS PRES SEN CIRC
		AR FWMTR SPLY V:	MAF (air flowmeter) sensor supply voltage	1.5 < X < 2.2 V	In the event of a malfunction, refer to the trouble diagnosis for AIR FLOW SEN CIRC

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 FUEL TEMP SEN CIRC
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 RAIL PRES SEN CIRC
		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 RAIL PRES SEN CIRC .
		GAL PRS REG/V: RCO gallery pressure regulation valve	X = 40 %	In the event of a malfunction, refer to the trouble diagnosis for RAIL PRES SEN CIRC
4	Flow	FUEL FLOW: Fuel flow	6 < X < 7 m ³ /g/cp	In the event of a malfunction, refer to the trouble diagnosis for RAIL PRES SEN CIRC .
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 RAIL PRES SEN CIRC .
		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	FUEL TMP SE V: Fuel temperature sensor voltage	X = 1.53 V	In the event of a malfunction, refer to the diagnostic procedure for sensor voltage supply malfunctions.
		RAIL PRES S V: Common rail fuel pressure sensor voltage	1.10 < X < 1.2 V	

ANTIPOLLUTION / OBD

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

DIESEL INJECTION

Trouble diagnosis - Conformity check

F9Q

NOTES	<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: engine at idle speed.</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 REFRIGERANT SENSOR CIRC.
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 WATER TEMP SE CIRC.

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

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	H R ATHD MX P: Heating resistor maximum authorised power	X = 0 W	In the event of a malfunction, carry out trouble diagnosis on the heater
2	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 VHCL SPD INFOMTION

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	VEHICLE SPEED: Vehicle speed	Gives the vehicle speed in km/h . 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.
		PR130: ASCD setpoint	X = 0 km/h	The ASCD setpoint is selected by the driver and changes according to the vehicle speed.
		CRS CN/S LMTR: ASCD	INACTIVE when no buttons are pressed	In the event of a malfunction, refer to the fault finding procedure for trouble diagnosis SPD LIM/ CRUIS CTRL
			STATE 1: resume button pressed	Activates the green indicator light on the instrument panel and beeps when it switches off
			STATE 2: Speed limiter start/stop button pressed	Activates the orange indicator light on the instrument panel and beeps when it switches off
			STATE 3: set/+ pressed	In the event of a malfunction, refer to the fault finding procedure for trouble diagnosis SPD LIM/ CRUIS CTRL
			STATE 4: set/- pressed	
			STATE 5: cancel pressed	
			STATE 6: Vehicle speed invalid	

DIESEL INJECTION

Trouble diagnosis - Conformity check

F9Q

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

DIESEL INJECTION

Trouble diagnosis - Conformity check

F9Q

NOTES	<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: engine at idle speed.</p>
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ENGINE COOLING

Order	Function	Data monitor or State Check or Action		Display and notes	Diagnostic procedure
1	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
2	Cooling fan	FAN CONTROL 1:	Checking cooling fan 1	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.
		FAN CONTROL 2:	Checking cooling fan 2		
		FN U L W S RQT:	Fan low-speed request	INACTIVE or ACTIVE	
		FN U H I S RQT:	Fan high-speed request		
3	Sensor feed	CLANT TMP S V:	Engine coolant temperature sensor voltage.	X = 0.54 V	In the event of a malfunction, refer to the trouble diagnosis for WATER TEMP SE CIRC

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

NOTES	<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: engine at idle speed.</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	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	In the event of a malfunction, 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>	In the event of a malfunction, 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
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

C/U+AFTR IGN	<u>ECM + AFTER IGNITION FEED</u>
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C/U+AFTR IGN ABSENT ignition on

<p>Check fusible link 3A and ECM relay (E91). Use a multimeter to check the presence of + 12 V at the fuse holder with the ignition on. Repair if necessary.</p>
<p>Use a multimeter and the + 12 V battery, 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.</p>
<p>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.</p>

C/U+AFTR IGN PRESENT ignition on

<p>Use a multimeter in the absence of + 12 V with the ignition off on terminal 1 of the ECM relay (E91). Repair if necessary</p>

AFTER REPAIR	<p>Repeat the diagnostic procedure on the system. Deal with any other possible DTCs. Erase the stored DTCs.</p>
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ENGINE IMMOBILISER	<u>ENGINE IMMOBILISER</u>
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Refer to **NATS (NISSAN ANTI-THEFT SYSTEM)** in BL section.

AFTER REPAIR	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 YES state if the driver has made the request for air conditioning: air conditioning switch on AC or AUTO position with minimum ventilation.</p> <p>State A/C ATHRSTION: air conditioning authorization switches to YES if these conditions are fulfilled.</p>
NO	<p>State A/C ATHRSTION remains in NO state with the ignition on although the air conditioning request switch has been activated.</p> <p>The vehicle MUST be at idle speed for state A/C ATHRSTION to switch to YES and the air conditioning can operate.</p> <p>If state A/C ATHRSTION remains in NO state and the switch is triggered,</p> <p>Check:</p> <ul style="list-style-type: none"> – that the air conditioning compressor triggers correctly, – the power supply fuses, – the presence of freon in the air conditioning circuit, – the freon pressure value seems consistent at idle speed. <p>If the pressure seems inconsistent, refer to the check for trouble diagnosis: Refrigerant fluid sensor circuit and apply the recommended procedure.</p> <p>If other malfunctions appear in the air conditioning domain, refer to the Air conditioning section 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 OUI 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 ENG IMMOBILIZ: Engine immobiliser switches to INACTIVE state.</p>
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NO	<p>The code remains NO if communication between the BCM and the ECM is impossible and state ENG IMMOBILIZ: Engine immobiliser remains in ACTIVE 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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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> <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 YES during the starting phase.</p> <p>If the vehicle does not start and state PRHTR UT CNTL switches to YES during the engine starting phase,</p> <p>Check:</p> <ul style="list-style-type: none"> – the fusible link (F80) terminal 5 (80A) on the glow relay. – the heater plugs and the connections on terminals 8, 3, 7, 2 between the glow-relay and the glow plugs. <p>If the vehicle starts and state PRHTR UT CNTL remains during the engine operation phase, refer to the interpretation of PRHT UNT CTRL CIRC: Glow relay control circuit and PRHT UNIT DGNSTC CNNCTN: Preheater unit diagnostic connection (Glow relay).</p>
NO	<p>After starting the vehicle, the ECM should running the glow relay and the state should switch to NO during the operation phase.</p> <p>If the vehicle does not start, the state remains NO and preheating has not occurred during the starting phase,</p> <p>Check the following connections:</p> <p>ECM (F1) terminal 100 and glow relay terminal 6</p> <p>ECM (F1) terminal 56 and glow relay terminal 1</p> <p>Repair if necessary.</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>
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FAN CONTROL 1	<u>CHECKING COOLING FAN 1 (LOW)</u>
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NOTES	State FAN CONTROL 1: Cooling fan assembly 1 (low) is directly connected to state FN U LW S RQT: Low-speed fan assembly request .
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RUNNING	<p>When the engine cooling fan is operating and the coolant temperature is 90°C (engine warm) or the air conditioning is operating, state FN U LW S RQT: Low-speed fan assembly request switches to ACTIVE and state FAN CONTROL 1: Check cooling fan assembly 1 (low) switches to RUNNING.</p> <p>If the engine cooling fan does not operate, check:</p> <ul style="list-style-type: none"> – the condition of the fan assembly connections, – supply the + battery feed to check that it operates correctly. <p>Check the continuity 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 0.69 Ω.</p> <p>Replace the resistor if it is not this value.</p> <p>Refer to the cooling fan assembly diagnostic procedure in the Trouble diagnosis Note Switching.</p>
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 WARNING!	<p>IMPORTANT: 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>
--	---

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	
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STOPPED	When the engine coolant temperature has fallen sufficiently ($X < 90^{\circ}\text{C}$) or air conditioning is off, state FN U L W S RQT: Low-speed fan assembly request switches to INACTIVE and so state FAN CONTROL 1: Check cooling fan assembly 2 (high) switches to STOPPED state.
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 WARNING!	IMPORTANT: 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.
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DIESEL INJECTION

Trouble diagnosis - Interpretation of states


F9Q

FAN CONTROL 2	<u>CHECKING COOLING FAN 2 (HIGH)</u>
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NOTES	<p>State FAN CONTROL 2: Check cooling fan assembly 2 (high) is directly linked to state FN U LW S RQT: Low-speed fan assembly request.</p>
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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 FN U HI S RQT: Low-speed fan assembly request switches to ACTIVE and state FAN CONTROL 1: Check cooling fan assembly 2 (high) switches to RUNNING.</p> <p>If the engine cooling fan does not operate, check:</p> <ul style="list-style-type: none"> – the condition of the fan assembly connections, – supply the + battery feed to check that it operates correctly. <p>Check the continuity 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	<p>When the engine coolant temperature has fallen sufficiently (X < 90° C) or air conditioning is off, state FN U HI S RQT: Low-speed fan assembly request switches to INACTIVE and so state FAN CONTROL 2: Check cooling fan assembly 2 (high) switches to STOPPED state.</p>
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 WARNING!	<p>IMPORTANT: 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>
--	---

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 FN U HI S RQT: High-speed fan assembly request is directly linked to state FAN CONTROL 2: Check cooling fan assembly 2 (high) .
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ACTIVE	<p>When the request for cooling is made by the ECM, state FN U HI S RQT: Request for high-speed fan assembly switches to ACTIVE and the switching protection unit therefore controls cooling fan assembly 2 (high) and state FAN CONTROL 2: Check cooling fan assembly 2 (high) switches to RUNNING.</p> <p>If the cooling fan assembly does not work, refer to the interpretation of state FAN CONTROL 2: Check cooling fan assembly 2 (high).</p>
--------	--

INACTIVE  WARNING!	<p>When the request for cooling is made by the ECM, state FN U HI S RQT: Low-speed fan assembly request switches to INACTIVE and the smart entrance control unit therefore controls cooling fan assembly 2 (high) and state FAN CONTROL 2: Check cooling fan assembly 2 (high) switches to STOPPED state.</p> <p>IMPORTANT: 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 LW S RQT	<u>LOW-SPEED FAN ASSEMBLY REQUEST</u>
NOTES	State FN U LW S RQT: Low speed fan assembly request is directly linked to state FAN CONTROL 1: Check cooling fan assembly 1 (low) .
ACTIVE	<p>When the request for cooling is made by the ECM, state FN U LW S RQT: Request for high-speed fan assembly switches to ACTIVE and the smart entrance control unit therefore controls cooling fan assembly 1 (low) and state FAN CONTROL 1: Check cooling fan assembly 1 (low) switches to RUNNING.</p> <p>If the cooling fan assembly does not work, refer to the interpretation of state FAN CONTROL 1: Check cooling fan assembly 1 (low).</p>
INACTIVE  WARNING!	<p>When the request for cooling is made by the ECM, state FN U LW S RQT: Low-speed fan assembly request switches to INACTIVE and the smart entrance control unit therefore controls cooling fan assembly 2 (high) and state FAN CONTROL 1: Check cooling fan assembly 1 (low) switches to STOPPED state.</p> <p>IMPORTANT: 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	<p>Repeat the diagnostic procedure on the system.</p> <p>Deal with any other possible DTCs.</p> <p>Erase the stored DTCs.</p>

REVERSE INFO	<u>REVERSE GEAR INFORMATION</u>
PRESENT	<p>When the driver engages reverse gear, state REVERSE INFO : Reverse gear signal should switch to PRESENT status.</p> <p>If the driver has correctly selected this gear and the state does not change status, it remains ABSENT, check: (Refer to BL section: smart entrance system)</p>
ABSENT	<p>When the driver disengages reverse gear, state REVERSE INFO: Reverse gear signal should switch to ABSENT 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 MOTOR: Engine is STOPPED .
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 MOTOR: Engine switches to STALLED .
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 MOTOR: Engine switches to RUNNING .
CRANKING	When the engine is in starting phase and the camshaft position and CKP sensor signals are received by the ECM, state MOTOR: Engine RUNNING .
AFTER REPAIR	Repeat the diagnostic procedure on the system. Deal with any other possible DTCs. Erase the stored DTCs.

CLUTCH PEDAL	<u>CLUTCH PEDAL</u>
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DEPRESSED	When the driver presses on the clutch pedal state CLUTCH PEDAL: Clutch pedal switches to PRESSED status.
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RELEASED	When the driver releases the clutch pedal state CLUTCH PEDAL: Clutch pedal switches to RELEASED status.
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AFTER REPAIR	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 CRS CNTL DV T: Deactivate ASCD is directly linked to state CRS CN/S LMTR: ASCD.</p> <p>ASCD remains deactivated as long as the vehicle speed does not exceed V 18 mph (30 km/h).</p> <p>Nine states are connected and when one of them passes to active, the ASCD is immediately deactivated.</p> <p>Special notes: 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 Ω	R = approximately 100 Ω	R = approximately 0 Ω	R = approximately 910 Ω

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 SMART ENTRANCE CONTROL UNIT authorizes the ECM to start, state STARTING switches to AUTHORISED and the vehicle can be started.
PROHIBITED	<p>When the driver is no longer detected by the SMART ENTRANCE CONTROL UNIT it prohibits engine starting, state STARTING switches to PROHIBITED and the vehicle cannot be started.</p> <p>Check the battery in the key and carry out trouble diagnosis on the SMART ENTRANCE CONTROL UNIT.</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>
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YES	<p>When the vehicle has been involved in a collision, the ECM detects the signal transmitted by the airbag control and state IMPCT DTECTED is YES.</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>
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NO	<p>If the vehicle has not suffered an impact or the starting procedure described above has been carried out, state IMPCT DTECTED is NO.</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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REGULAT D'AIR	<u>AIR REGULATION</u>
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OPEN LOOP	Once air regulation has been requested by the driver, state REGULAT D'AIR switches to OPEN LOOP .
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ACTIVE	Use a multimeter to check the absence of + 12 V with the ignition off on terminal 5 of the ECM relay. Repair if necessary.
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AFTER REPAIR	Repeat the diagnostic procedure on the system. Deal with any other possible DTCs. Erase the stored DTCs.
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PRSNCLMTSTN	<u>AIR CONDITIONING PRESENT</u>
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YES	<p>If the voltage is absent, check the continuity and insulation against ground 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 + 12 V with the ignition off on terminal 3 of the air conditioner relay.</p> <p>Repair if necessary.</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>
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DIESEL INJECTION

Trouble diagnosis - General Information

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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

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	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	RFRGRNT 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

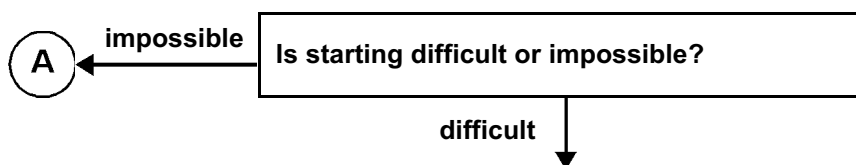
Replace the ECM. If necessary, modify the configuration of the new ECM to match the equipment options available on the vehicle.

AFTER REPAIR

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

CHART 2	Starting malfunctions (or starting impossible)
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NOTES	<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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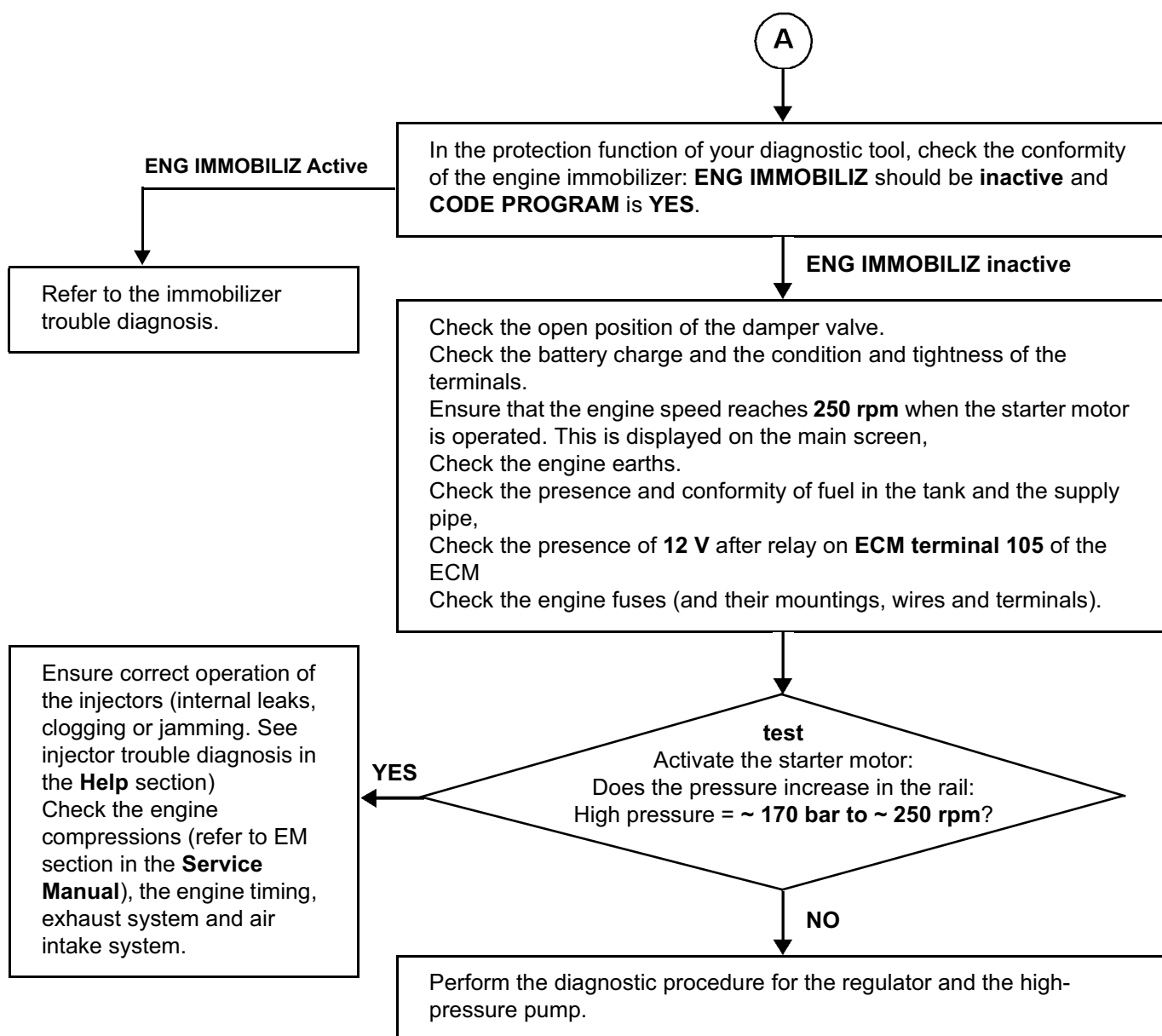
AFTER REPAIR	Perform a road test followed by a test using the diagnostic tool.
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CHART 2 CONTINUED

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.

CHART 3

Injection noise

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:

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 **engraved** on each injector.

If the injection noise occurs after starting from cold:

Check the priming of the low-pressure fuel circuit.

Check the fuel heater supply.

Check the operation of the preheating system.

Check that fuel and engine temperatures are consistent.

If the malfunction exists, check the rail pressure and carry out diagnostic procedure.



Does the injection noise occur at idle speed?

Check the condition of the injector connector and pressure regulator terminals.

Check the conformity of the air flow signal (diagnostic procedure: **DMPR FLAP OCR**).

Check the position of the exhaust gas recirculation valve.

If the malfunction exists, perform the injector diagnostic procedure (see **Help** section).

Does the injection noise occur at all speeds?

Perform the injector diagnostic procedure (see the **Help** section).

Check the condition of the injector connector and pressure regulator terminals.

Ensure that the correct fuel is being used.

Check the conformity of the air flow signal (diagnostic procedure: **DMPR FLAP OCR**).

If the malfunction exists, check the rail pressure and carry out diagnostic procedure.



If the injection noise occurs at transitional speed:

If the engine races during gear changes, check the conformity of the clutch switch.

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.

If the malfunction exists, carry out the diagnostic procedure on the injectors (refer to the **Help** section).

AFTER REPAIR

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

CHART 4

Poor performance

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:

NOTE: In the event of engine overheating above **119°C**, the ECM automatically limits the fuel flow (the overheating warning light comes on from **115°C**).

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 **engraved** on each injector.

Is the poor performance accompanied by smoke?

NO

If yes check:

- That the wastegate is not jammed in the open position.
- That the EGR valve is not jammed in the open position.
- That the injectors are properly mounted (presence and **conformity of the sealing washer**).

Is the engine running on all cylinders?

If not: check that injectors are operating (see injector trouble diagnosis **Help** section).

If the malfunctions persists:

Check the conformity of the accelerator pedal position sensor, atmospheric pressure sensor and exhaust gas recirculation valve.

Check the condition of the air filter,

- Check the consistency of the signals from the MAF sensor, the engine coolant temperature sensor and the fuel temperature sensor.

Check for the absence of foreign bodies on the MAF sensor grille and in the air inlet vein. (for example, the internal coating of a hose has become unstuck)

Check:

- the condition of the intercooler (clogging);
- the leaktightness of inlet circuit between MAF sensor and turbocharger;
- the tightness of the oil vapour rebreathing circuit;
- the flow controller (jamming/seizing);
- the wastegate (jamming/seizing),
- the absence of leaks in the low pressure and high pressure diesel circuit;
- the turbocharger efficiency.
- Check the engine compression.
- Check that the exhaust line and timing setting are not blocked.

AFTER REPAIR

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

CHART 5	Irregular engine operation
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NOTES	<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"> – Ensure that the correct fuel is being used. – Check the priming of the low-pressure diesel circuit and check that the diesel filter is connected correctly and is not saturated with coolant. – Check there are no air bubbles between the filter and the high-pressure pump. – Check the conformity of the rail pressure (warm engine): <ul style="list-style-type: none"> ± 25 bar around the rail pressure value at idle speed, (the minimum to maximum variations in the rail pressure at idle speed should not exceed 50 bar). ~ 1350 bar when under full load. <p>In the event of a malfunction, carry out diagnostic procedure of fuel rail pressure sensor.</p> <ul style="list-style-type: none"> – Check the conformity of the air flow, use diagnostic procedure DMPR FLAP OCR. <p>If the malfunction exists:</p> <ul style="list-style-type: none"> – Check the injectors: with engine running at idling speed, disconnect the injectors one after the other: <ul style="list-style-type: none"> 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. – Check the cylinder compressions.
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AFTER REPAIR	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: 0.33Ω 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.

Diagnostic Procedure

1. INSPECTION START

1. Turn ignition switch "ON".
2. Select "CAN DIAG SUPPORT MNTR" in "DATA MONITOR" mode with CONSULT-II.
3. Print out the CONSULT-II screen.

Models with ESP	OK data	Models with ABS	OK data																												
	<table><tr><th colspan="2">DATA MONITOR</th></tr><tr><th>MONITOR</th><th></th></tr><tr><td>CAN CIRC 1</td><td>OK</td></tr><tr><td>CAN CIRC 2</td><td>UNKWN</td></tr><tr><td>CAN CIRC 3</td><td>UNKWN</td></tr><tr><td>CAN CIRC 4</td><td>UNKWN</td></tr><tr><td>CAN CIRC 5</td><td>UNKWN</td></tr></table>	DATA MONITOR		MONITOR		CAN CIRC 1	OK	CAN CIRC 2	UNKWN	CAN CIRC 3	UNKWN	CAN CIRC 4	UNKWN	CAN CIRC 5	UNKWN		<table><tr><th colspan="2">DATA MONITOR</th></tr><tr><th>MONITOR</th><th></th></tr><tr><td>CAN CIRC 1</td><td>OK</td></tr><tr><td>CAN CIRC 2</td><td>OK</td></tr><tr><td>CAN CIRC 3</td><td>UNKWN</td></tr><tr><td>CAN CIRC 4</td><td>UNKWN</td></tr><tr><td>CAN CIRC 5</td><td>UNKWN</td></tr></table>	DATA MONITOR		MONITOR		CAN CIRC 1	OK	CAN CIRC 2	OK	CAN CIRC 3	UNKWN	CAN CIRC 4	UNKWN	CAN CIRC 5	UNKWN
DATA MONITOR																															
MONITOR																															
CAN CIRC 1	OK																														
CAN CIRC 2	UNKWN																														
CAN CIRC 3	UNKWN																														
CAN CIRC 4	UNKWN																														
CAN CIRC 5	UNKWN																														
DATA MONITOR																															
MONITOR																															
CAN CIRC 1	OK																														
CAN CIRC 2	OK																														
CAN CIRC 3	UNKWN																														
CAN CIRC 4	UNKWN																														
CAN CIRC 5	UNKWN																														

YEC639A

YEC639A

Check that the print out data is matched with above. If NG, go to "CAN COMMUNICATION" in LAN section.

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 25/TYPE 26 (See next page.)		TYPE 27/TYPE 28 (See F9Q-140.)	
CAN system trouble diagnosis	LHD models	Type 25	Type 26	Type 27	Type 28

x: Applicable

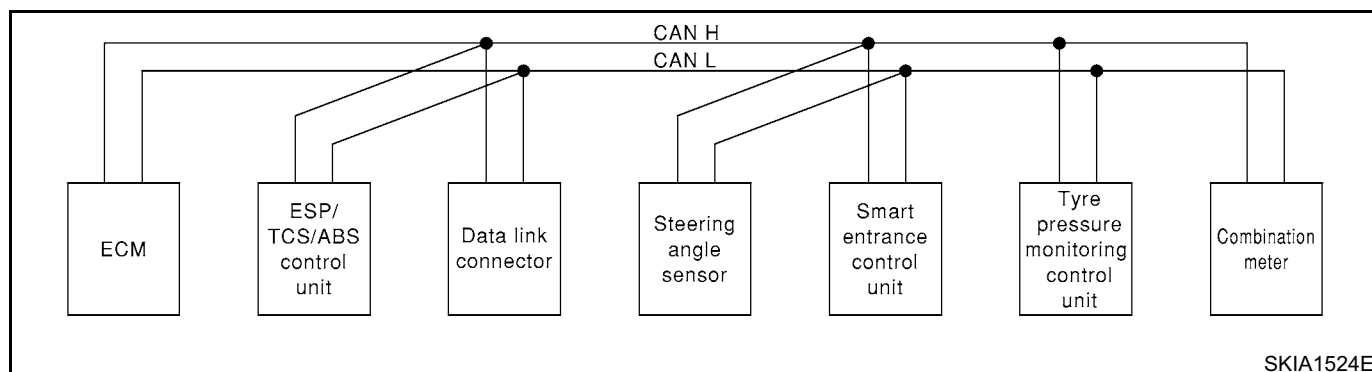
DIESEL INJECTION CAN Communication

F9Q

TYPE 25/TYPE 26

System diagram

LHD models (Type 25, Type 26)



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

DIESEL INJECTION

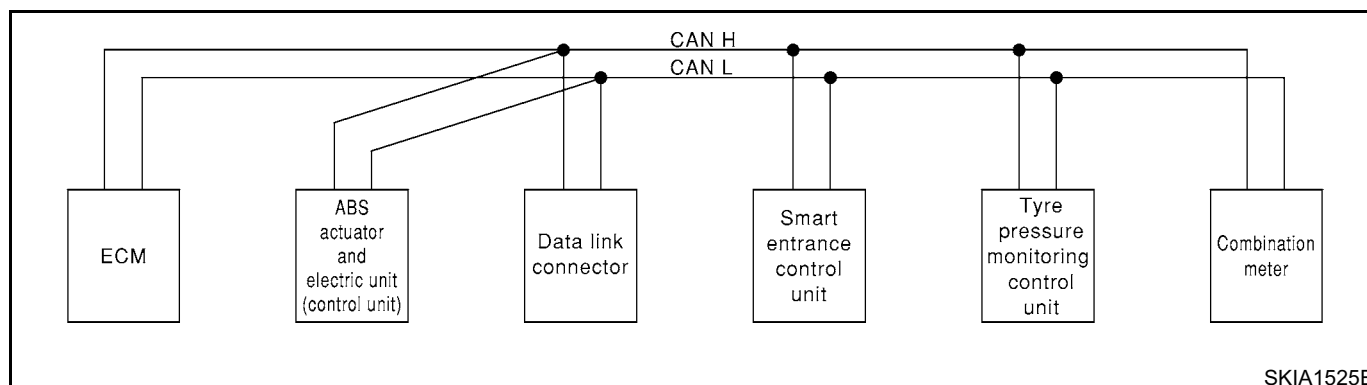
CAN Communication

F9Q

TYPE 27/TYPER 28

System diagram

LHD models (Type 27, Type 28)



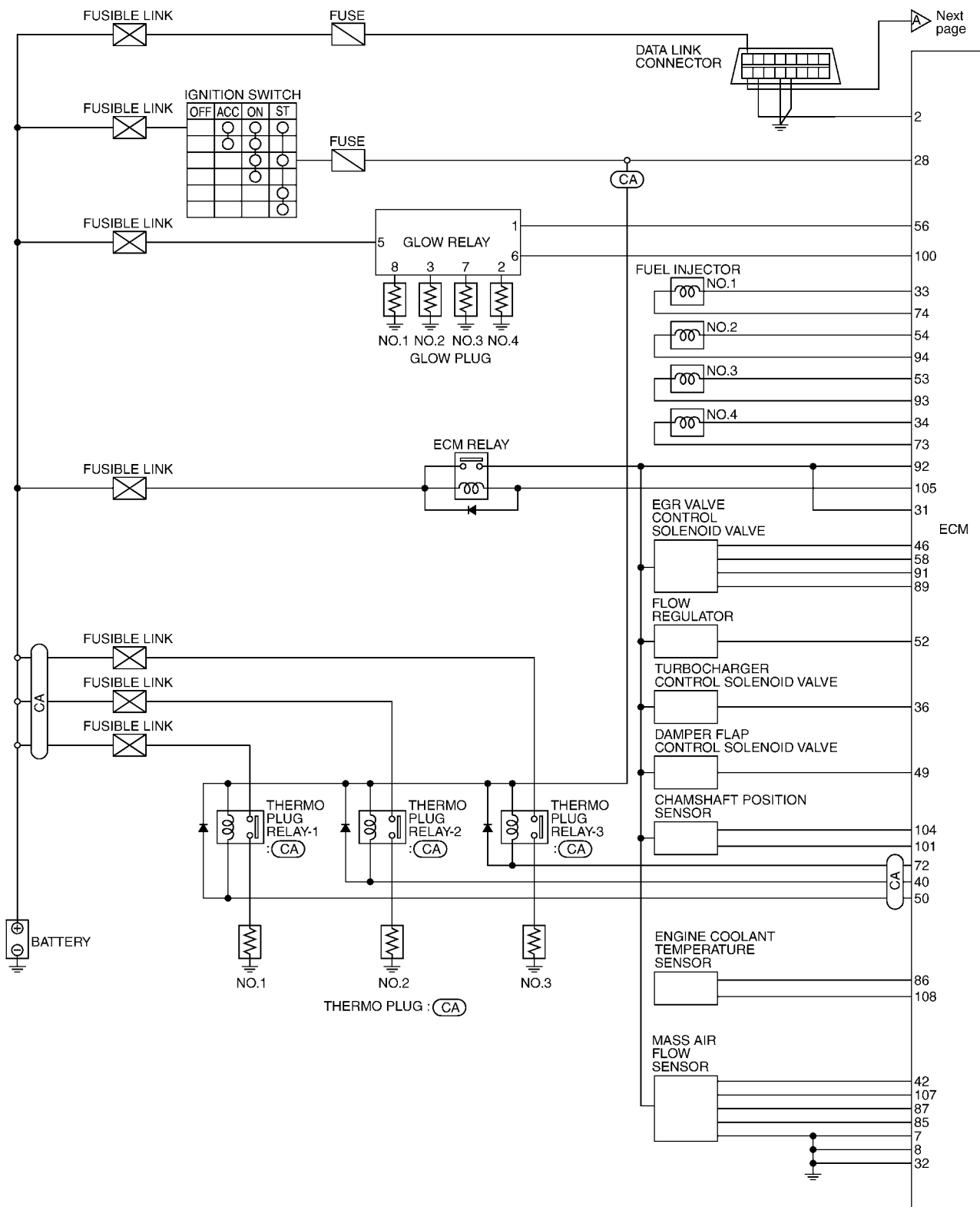
Input/output signal chart

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

DIESEL INJECTION Circuit Diagram

F9Q

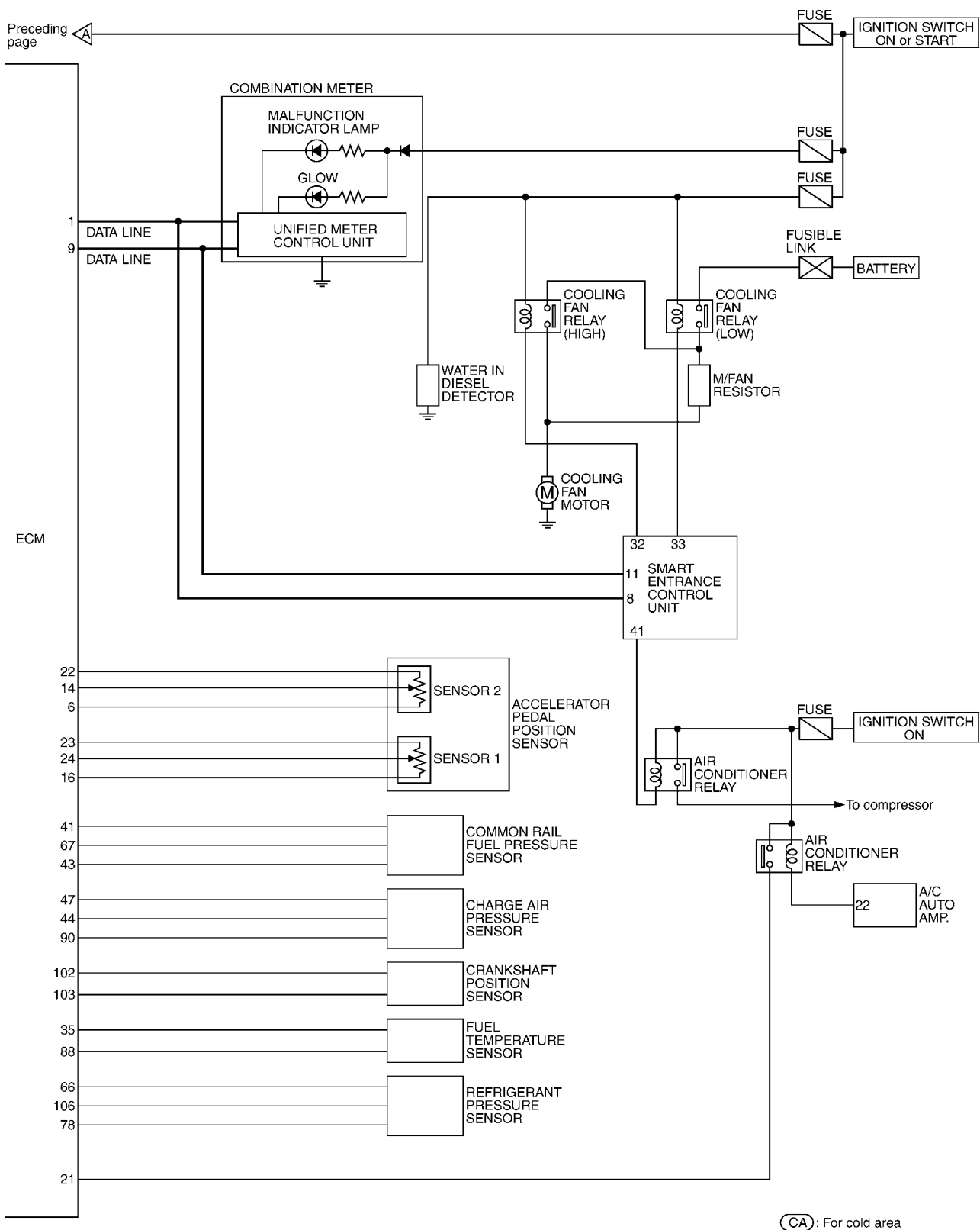


MBWA0398E

DIESEL INJECTION

Circuit Diagram

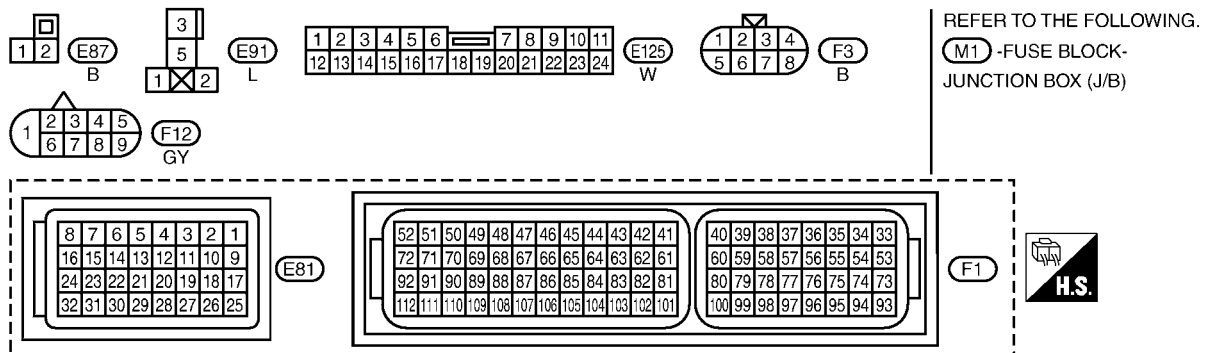
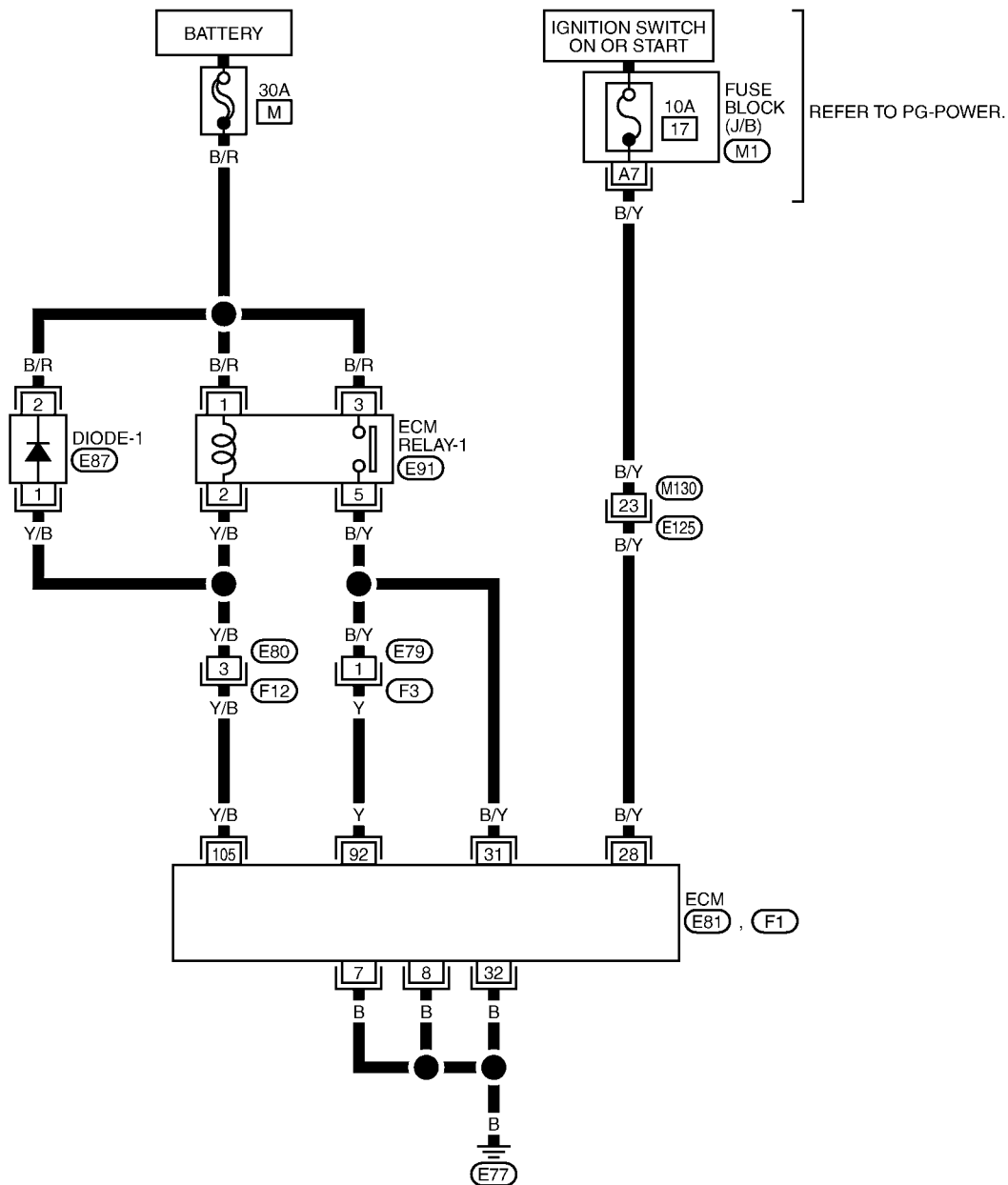
F9Q



F9Q

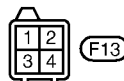
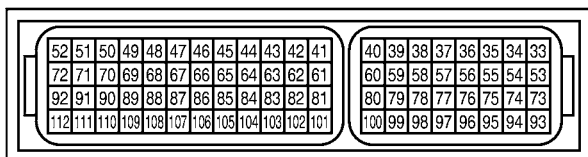
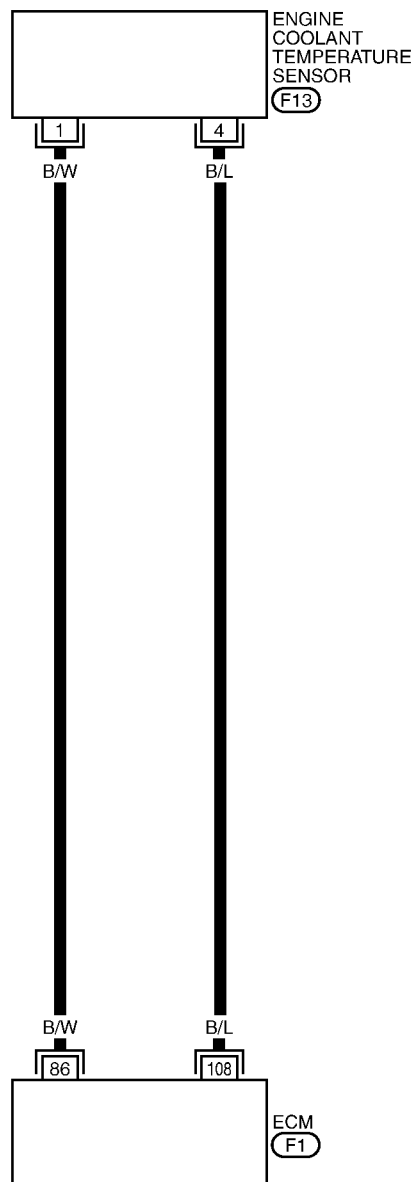
F9Q

EC-MAIN-01



MBWA0400E

EC-ECTS-01

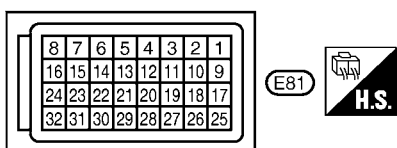
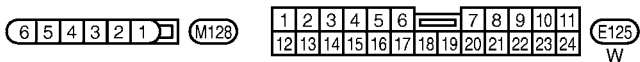
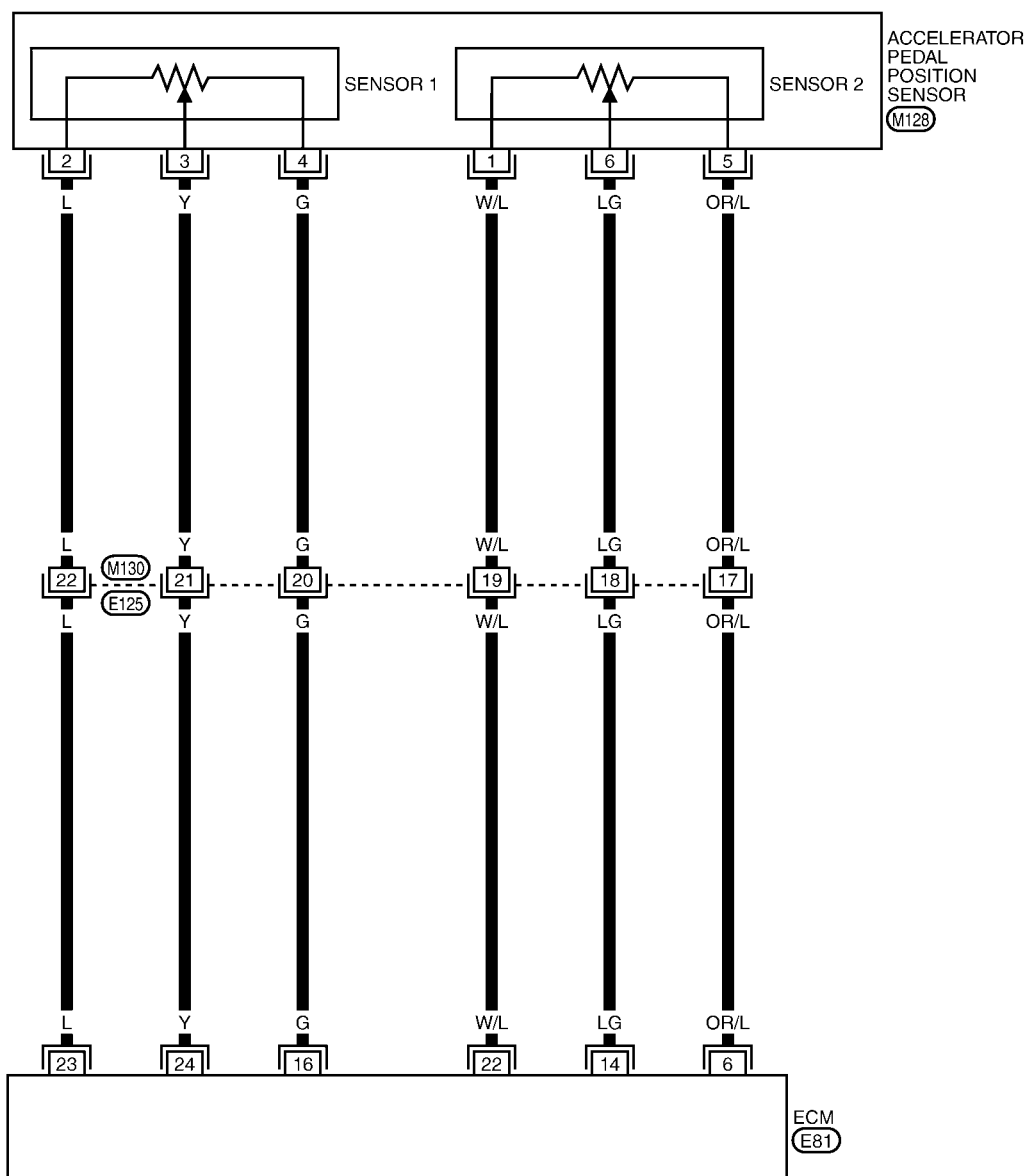


DIESEL INJECTION

Wiring Diagram - Accelerator Position Sensor

F9Q

EC-APPS-01

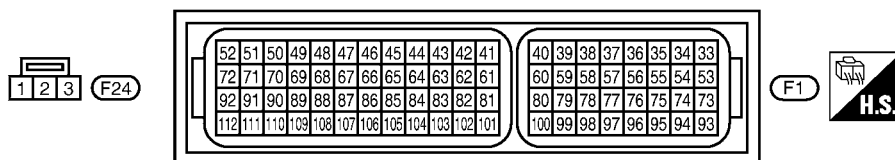
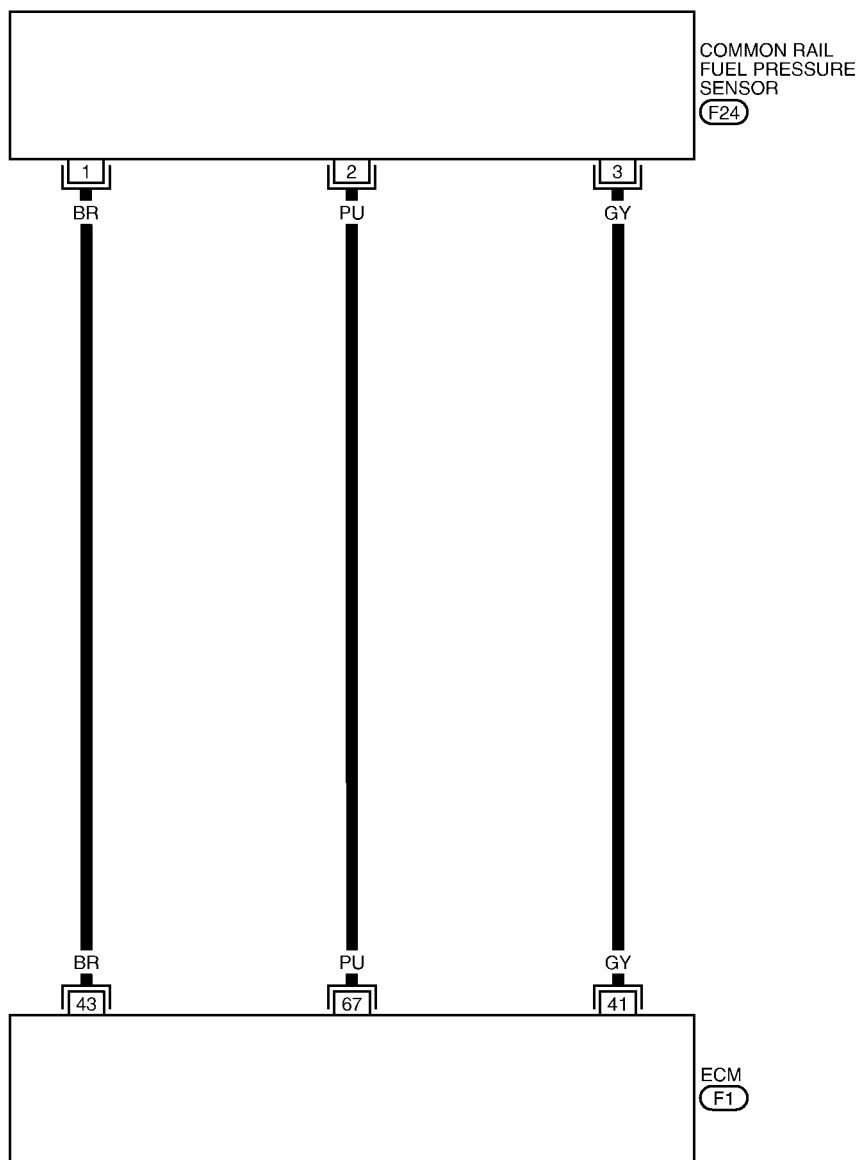


DIESEL INJECTION

Wiring Diagram - Common Rail Fuel Pressure Sensor

F9Q

EC-CRFPS-01



F9Q

REFER TO PG-POWER.

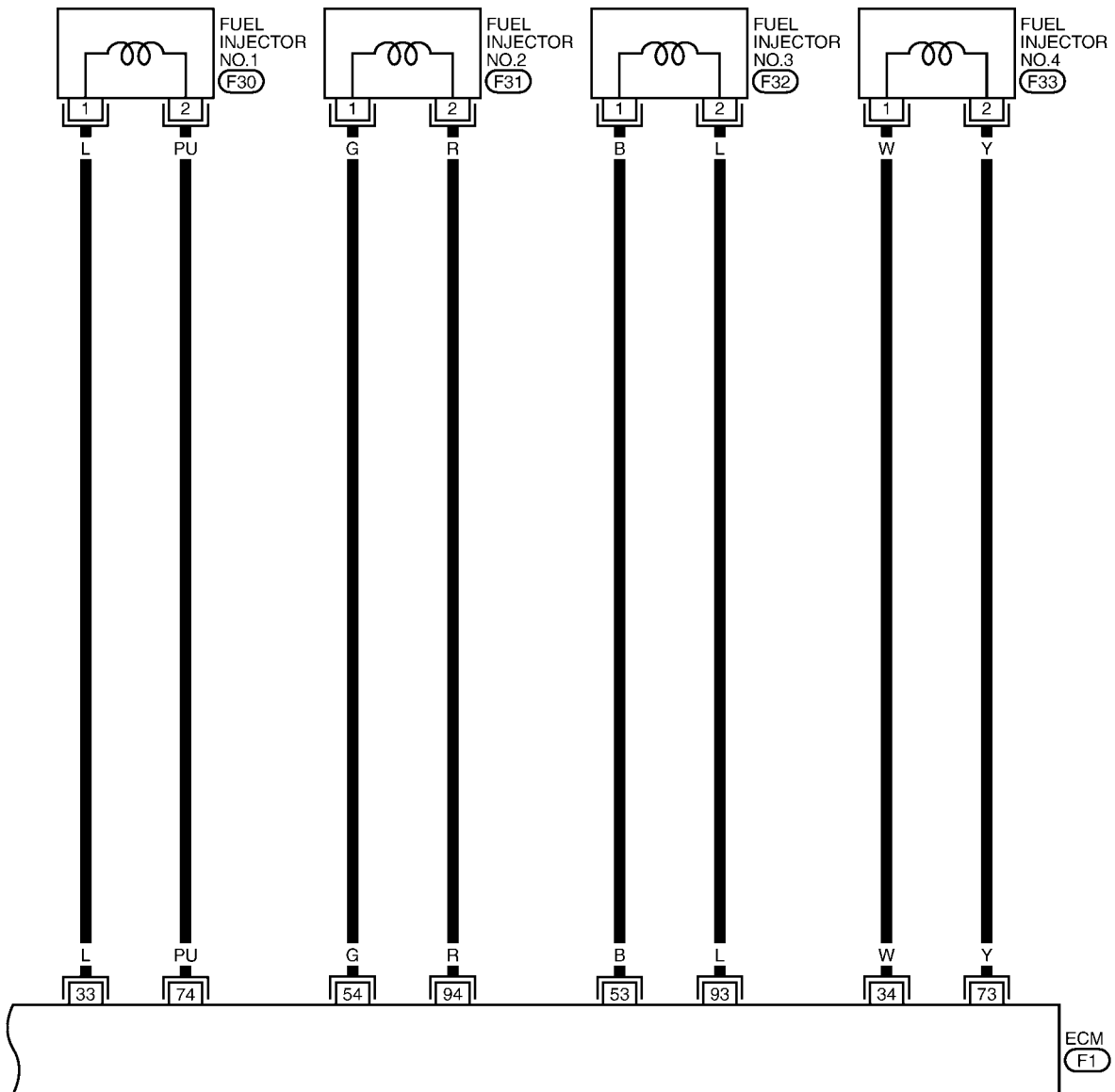


DIESEL INJECTION

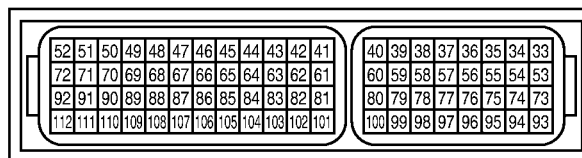
Wiring Diagram - Injector

F9Q

EC-INJECT-02



1 2 F30 , F31 , F32 , F33



F1

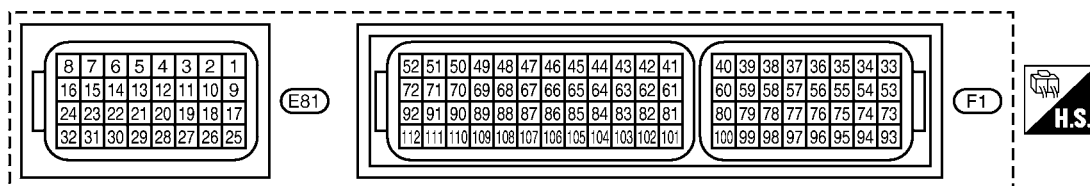
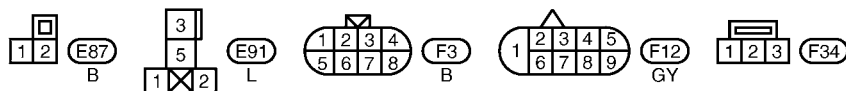
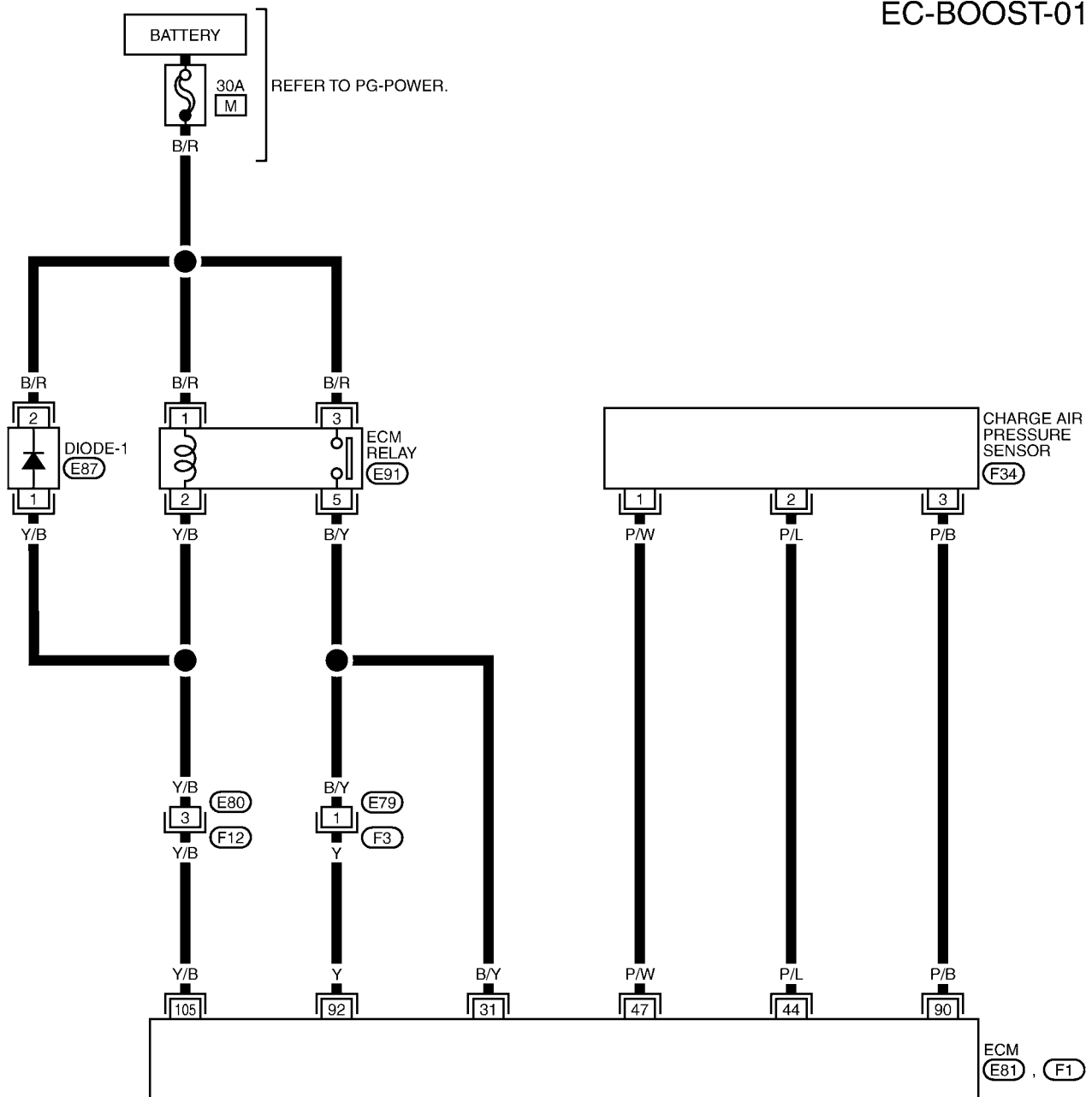


DIESEL INJECTION

Wiring Diagram - Charge Air Pressure Sensor

F9Q

EC-BOOST-01



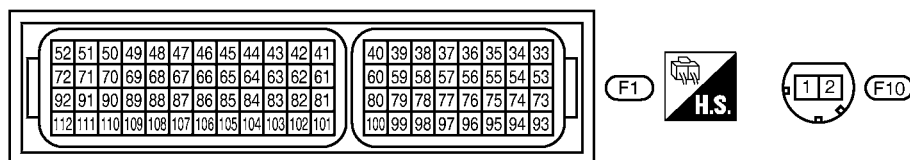
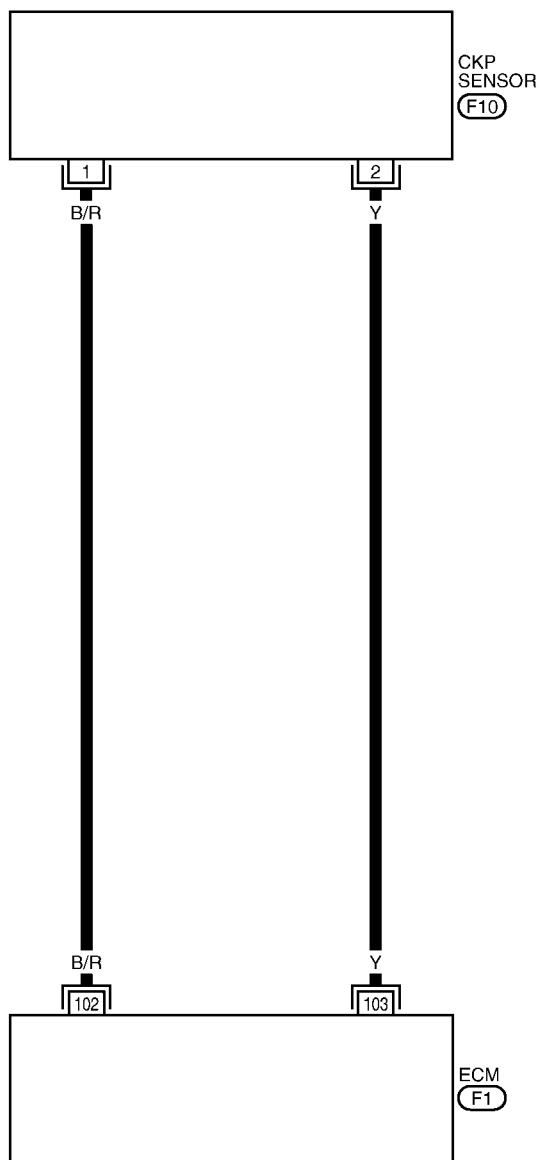
MBWA0406E

DIESEL INJECTION

Wiring Diagram - Crankshaft Position Sensor

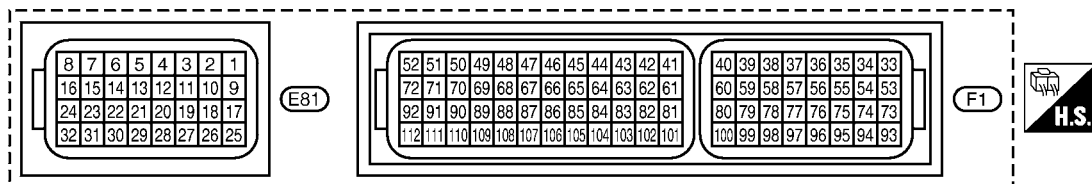
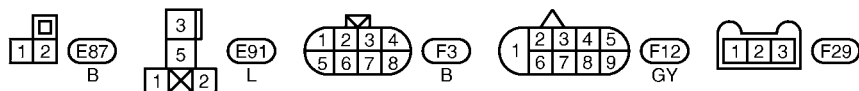
F9Q

EC-CAS-01



MBWA0407E

F9Q

[illegible]

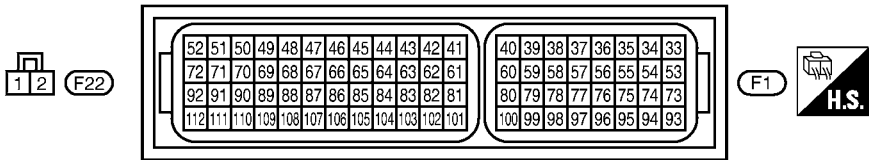
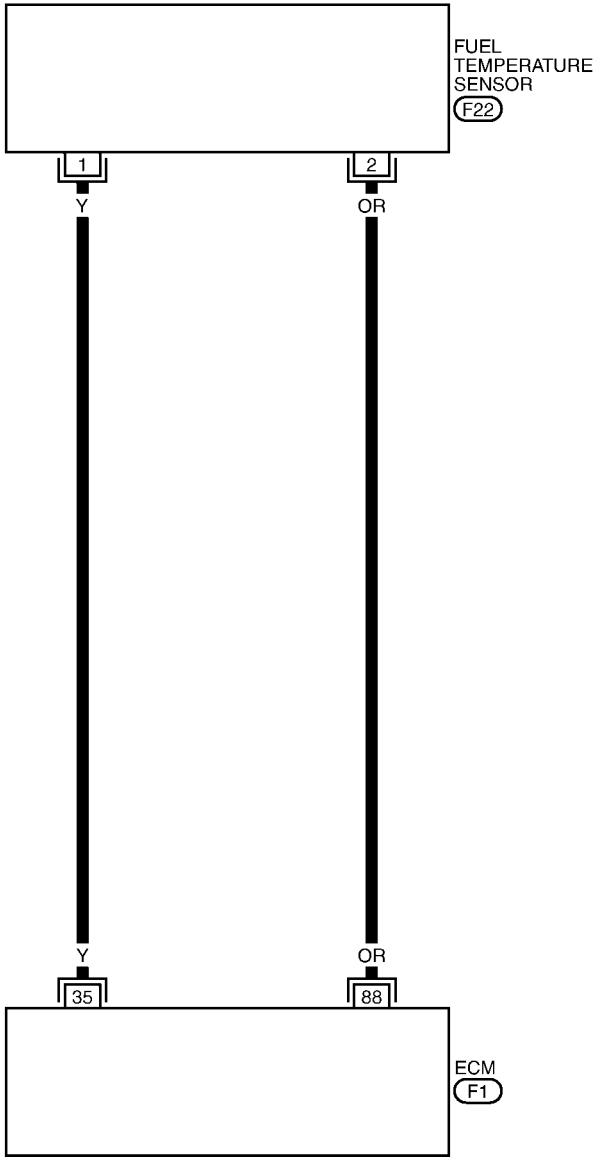
F9Q-160

DIESEL INJECTION

Wiring Diagram - Fuel Temperature Sensor

F9Q

EC-FTS-01

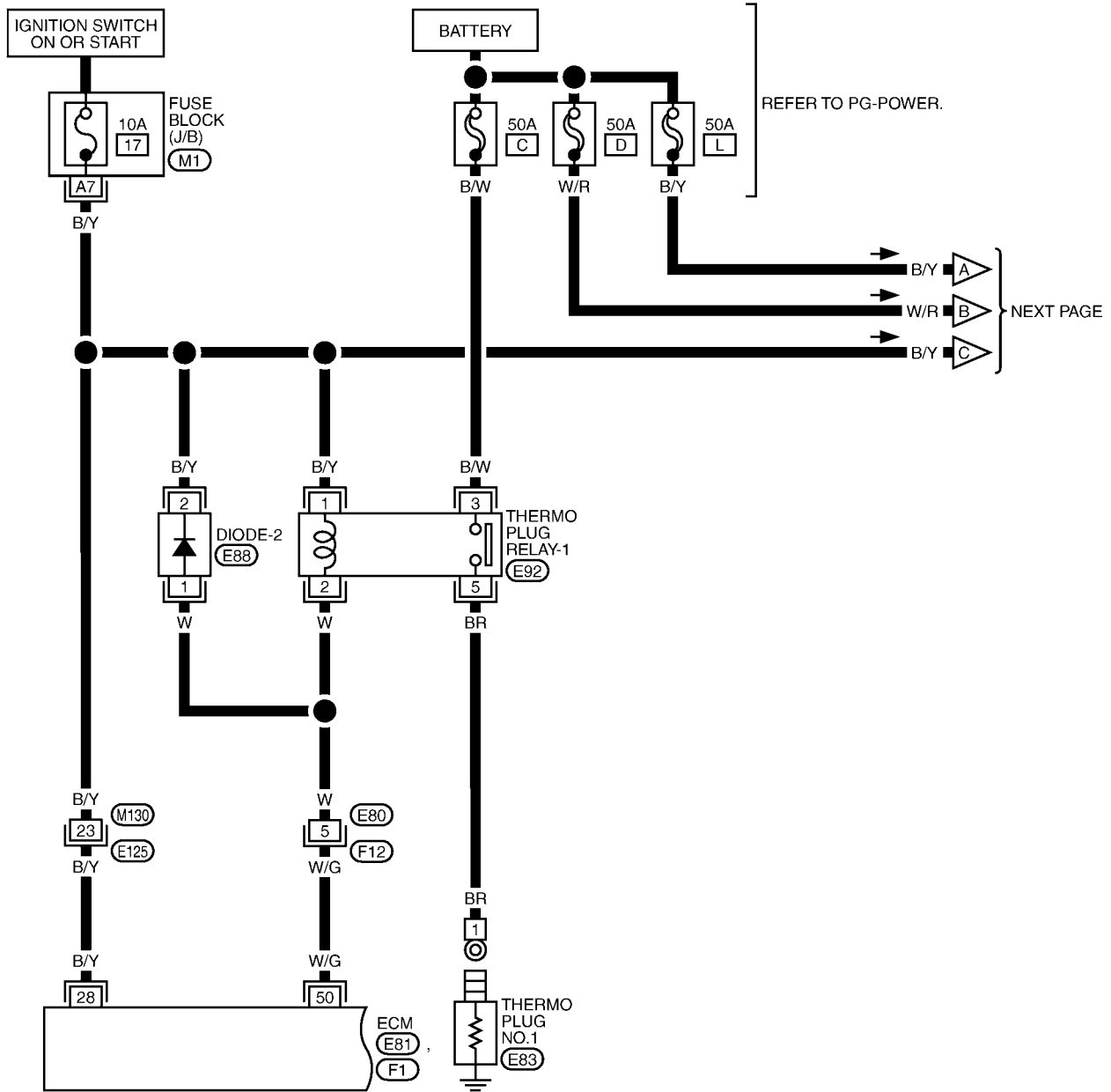


DIESEL INJECTION

Wiring Diagram - Thermo Plug

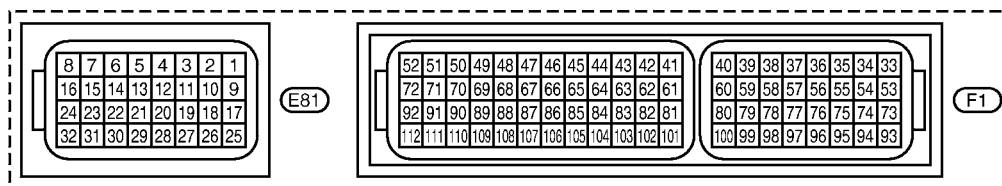
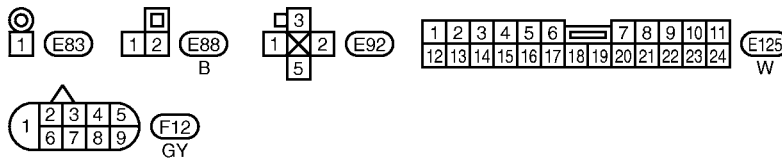
F9Q

EC-T/PLUG-01



REFER TO THE FOLLOWING.

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

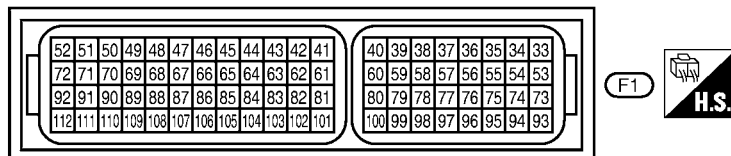
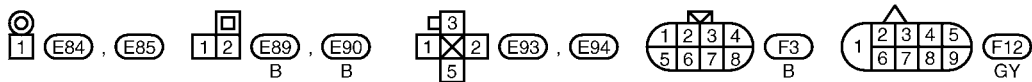
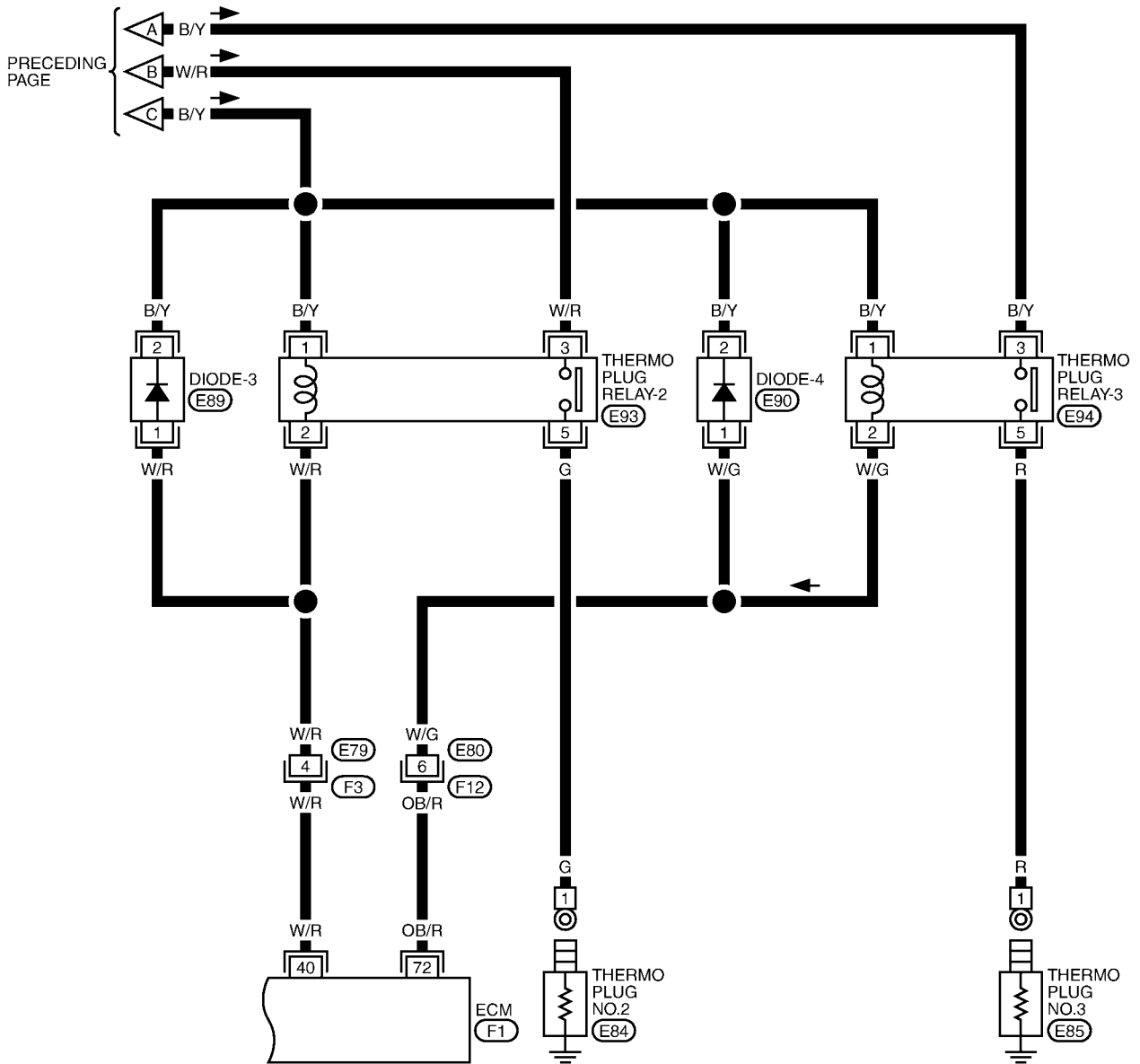


DIESEL INJECTION

Wiring Diagram - Thermo Plug

F9Q

EC-T/PLUG-02



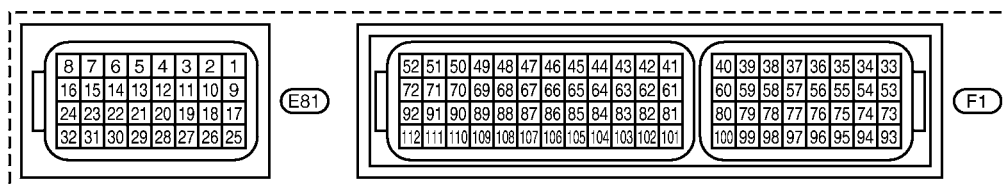
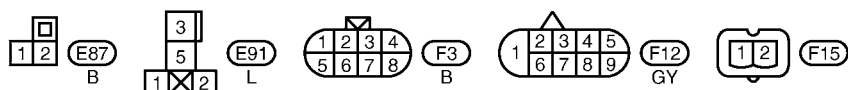
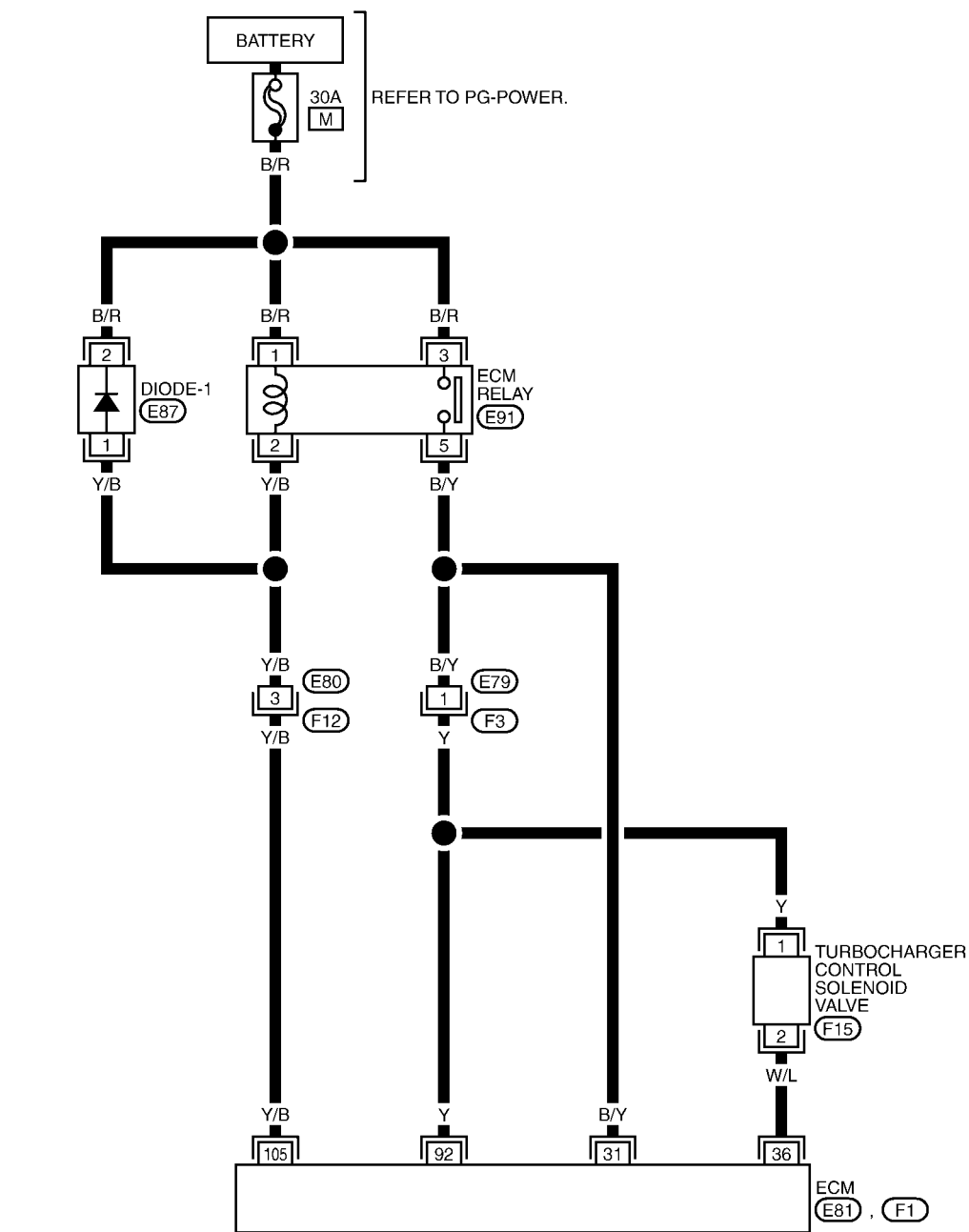
MBWA0411E

DIESEL INJECTION

Wiring Diagram - TCA Solenoid Valve

F9Q

EC-TCA-01

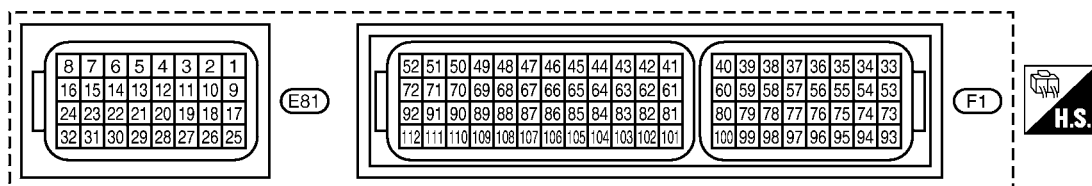
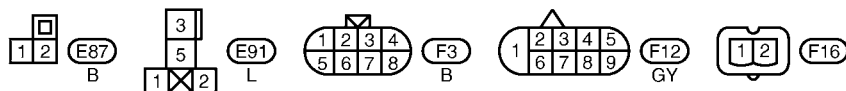
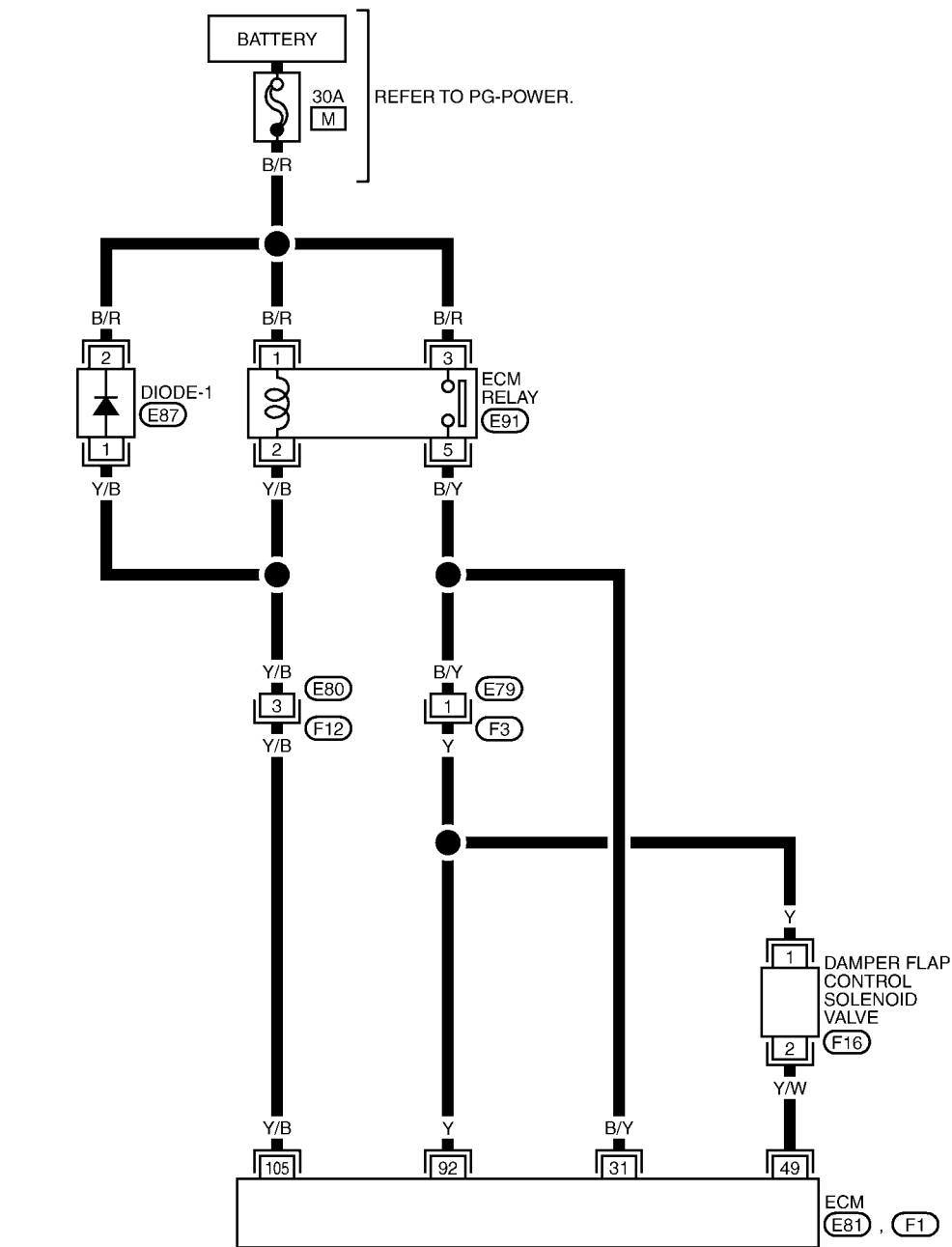


DIESEL INJECTION

Wiring Diagram - IFA Solenoid Valve

F9Q

EC-IFA-01

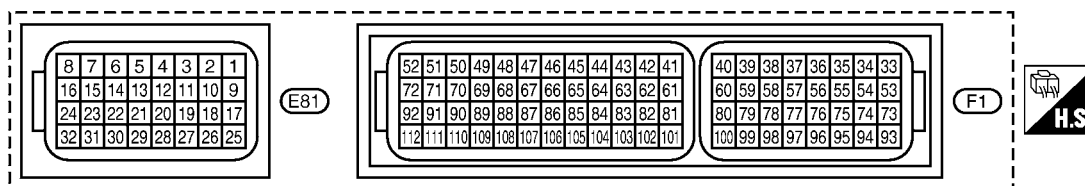
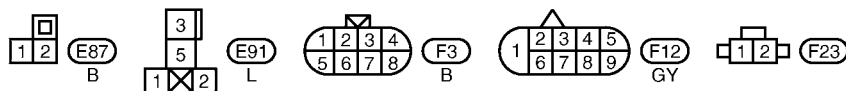
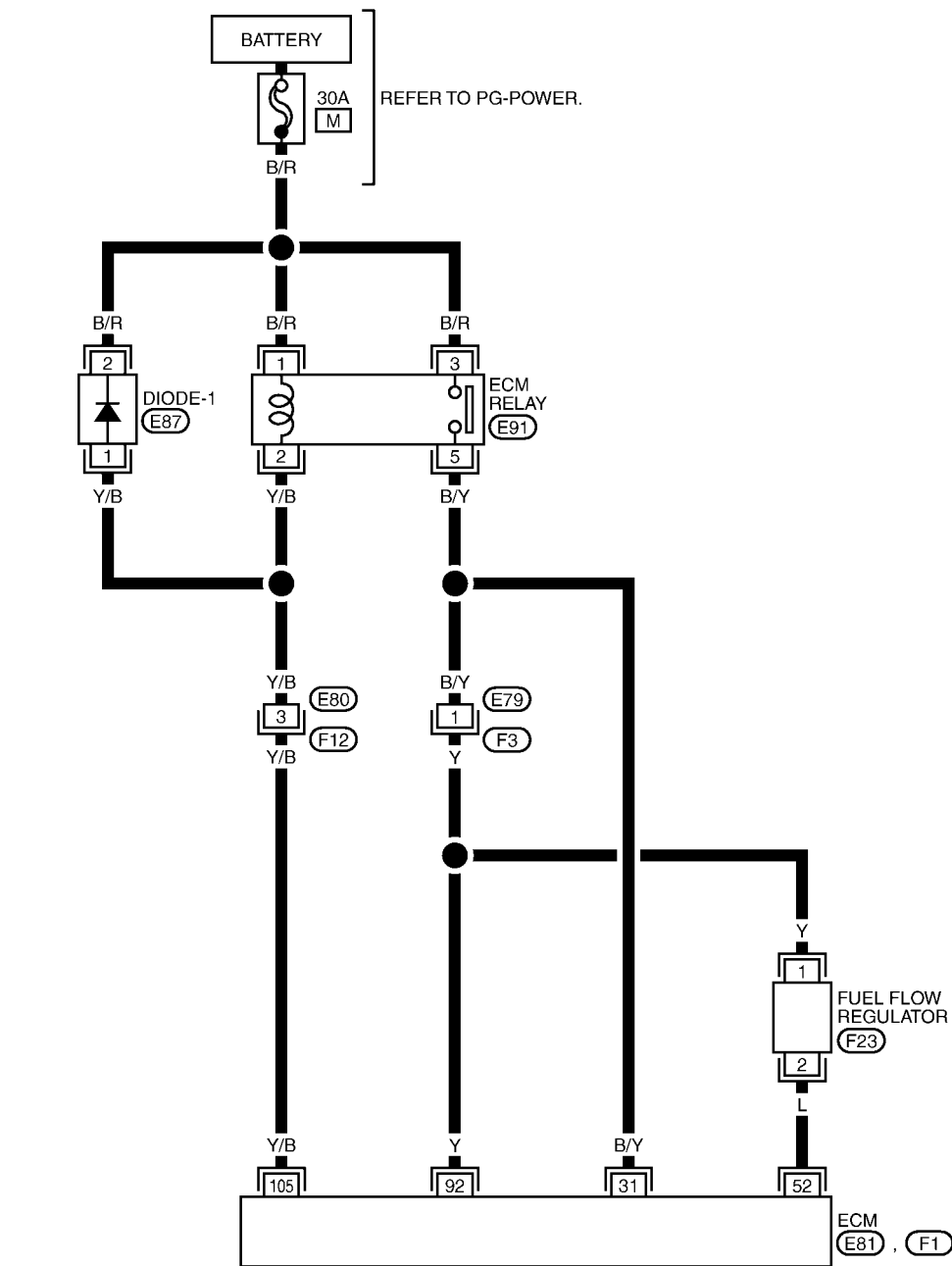


DIESEL INJECTION

Wiring Diagram - Flow Governor

F9Q

EC-FLG-01

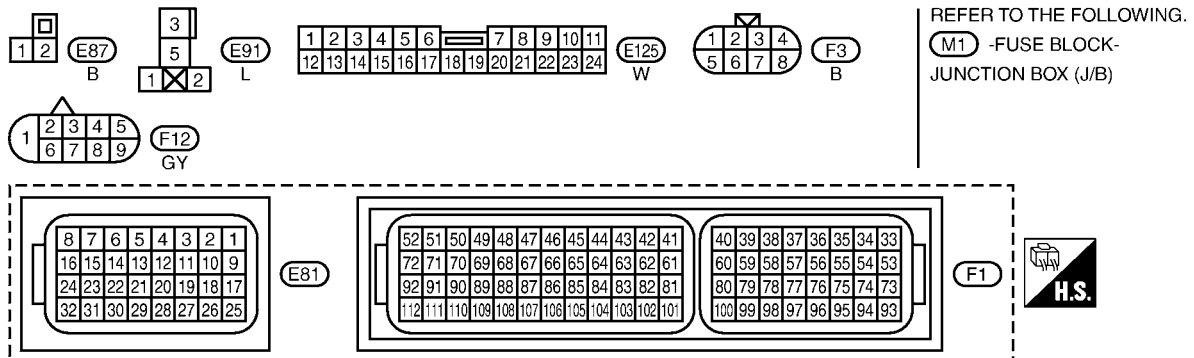
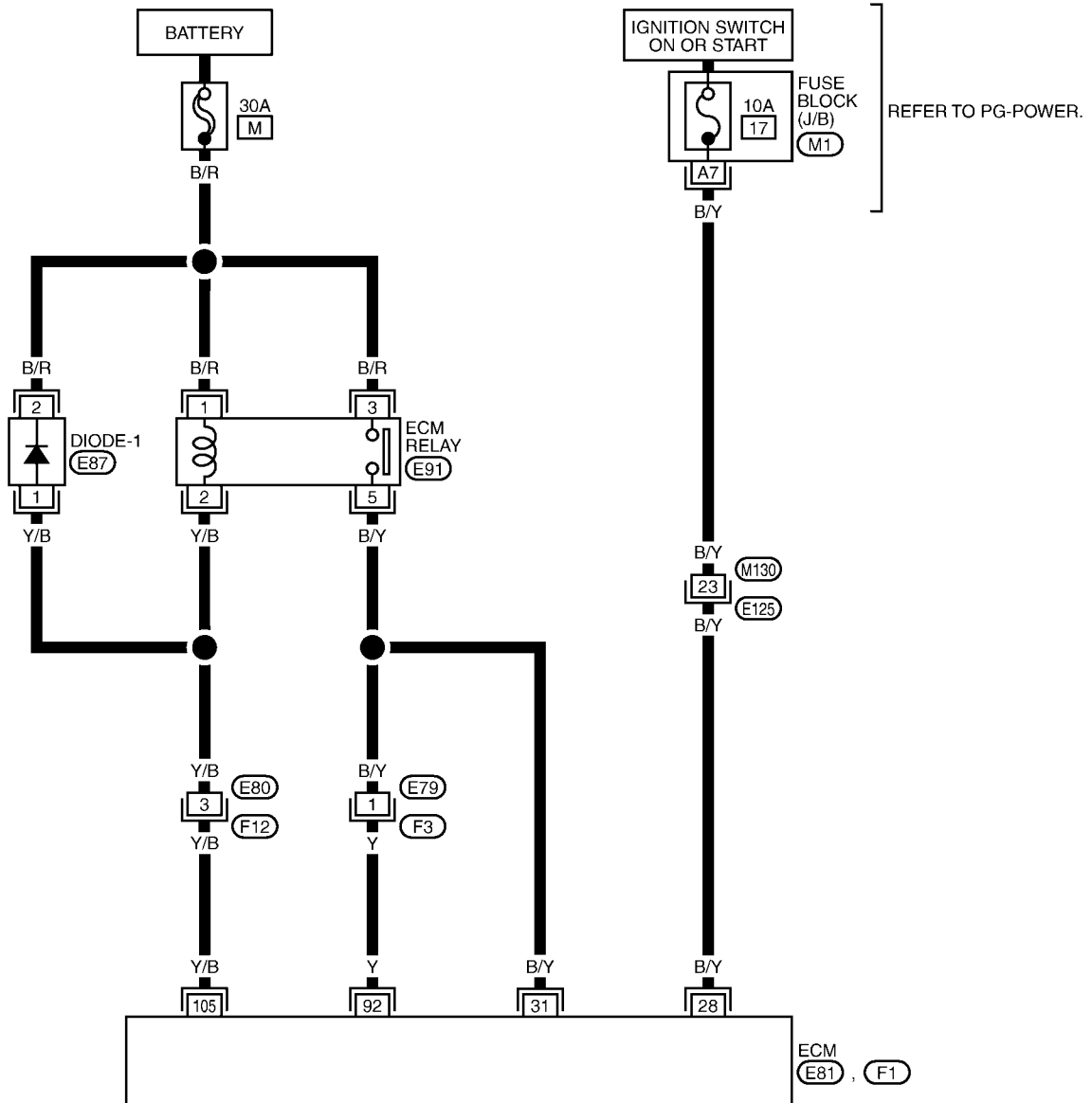


DIESEL INJECTION

Wiring Diagram - ECM Relay

F9Q

EC-ECMRLY-01



MBWA0415E

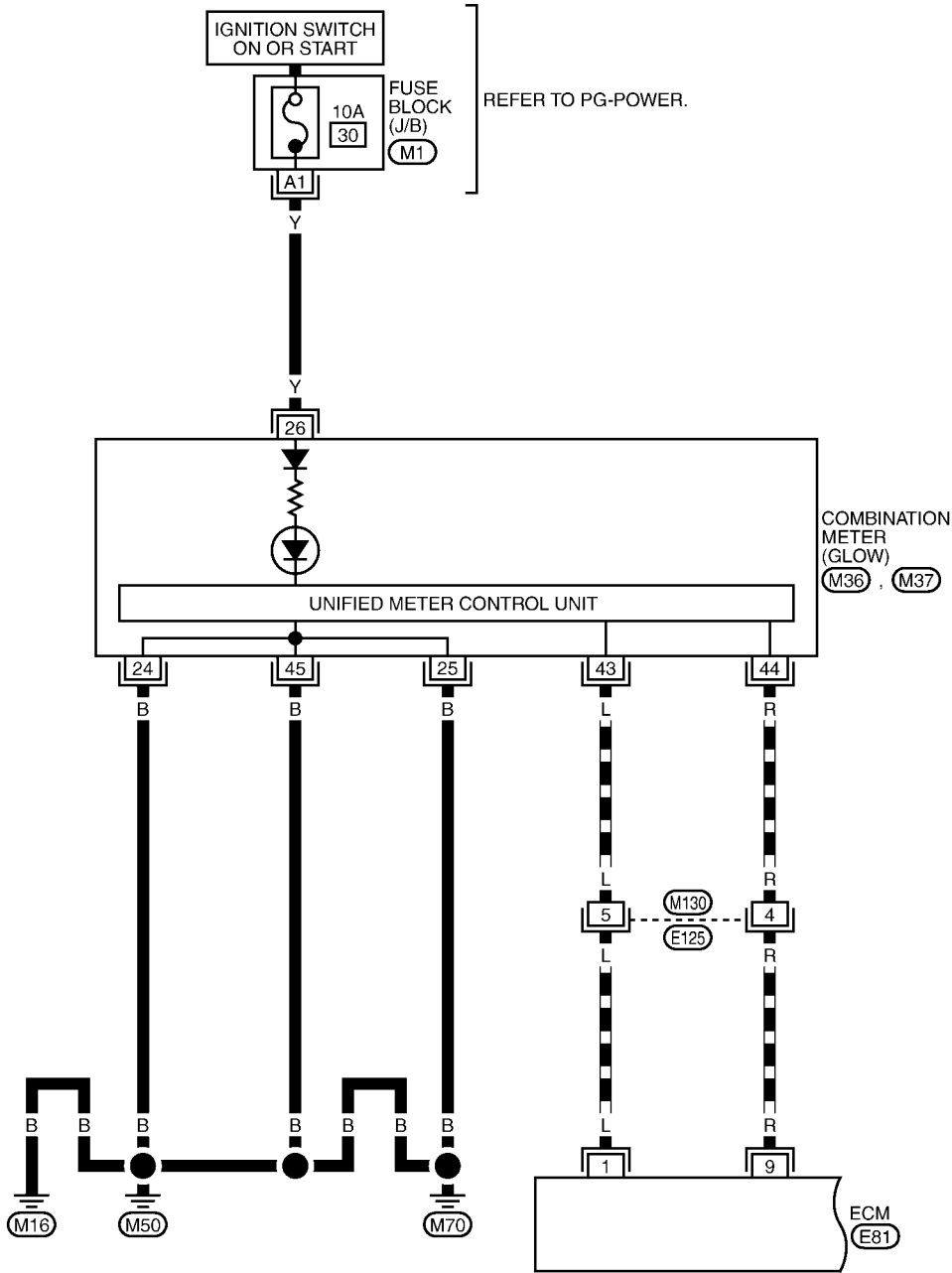
DIESEL INJECTION

Wiring Diagram - Glow

F9Q

EC-GLOW-01

— : DATA LINE

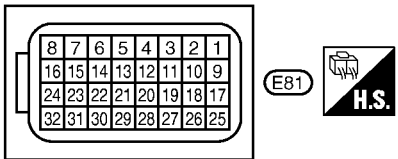


26	25	24	23	22	21	20	19	18	17	16	15	14	M36	52	51	50	49	48	47	46	45	44	43	42	41	40	M37
13	12	11	10	9	8	7	6	5	4	3	2	1	L	39	38	37	36	35	34	33	32	31	30	29	28	27	Y

1	2	3	4	5	6			7	8	9	10	11
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E125

W



REFER TO THE FOLLOWING.

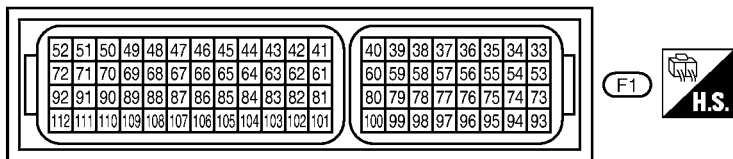
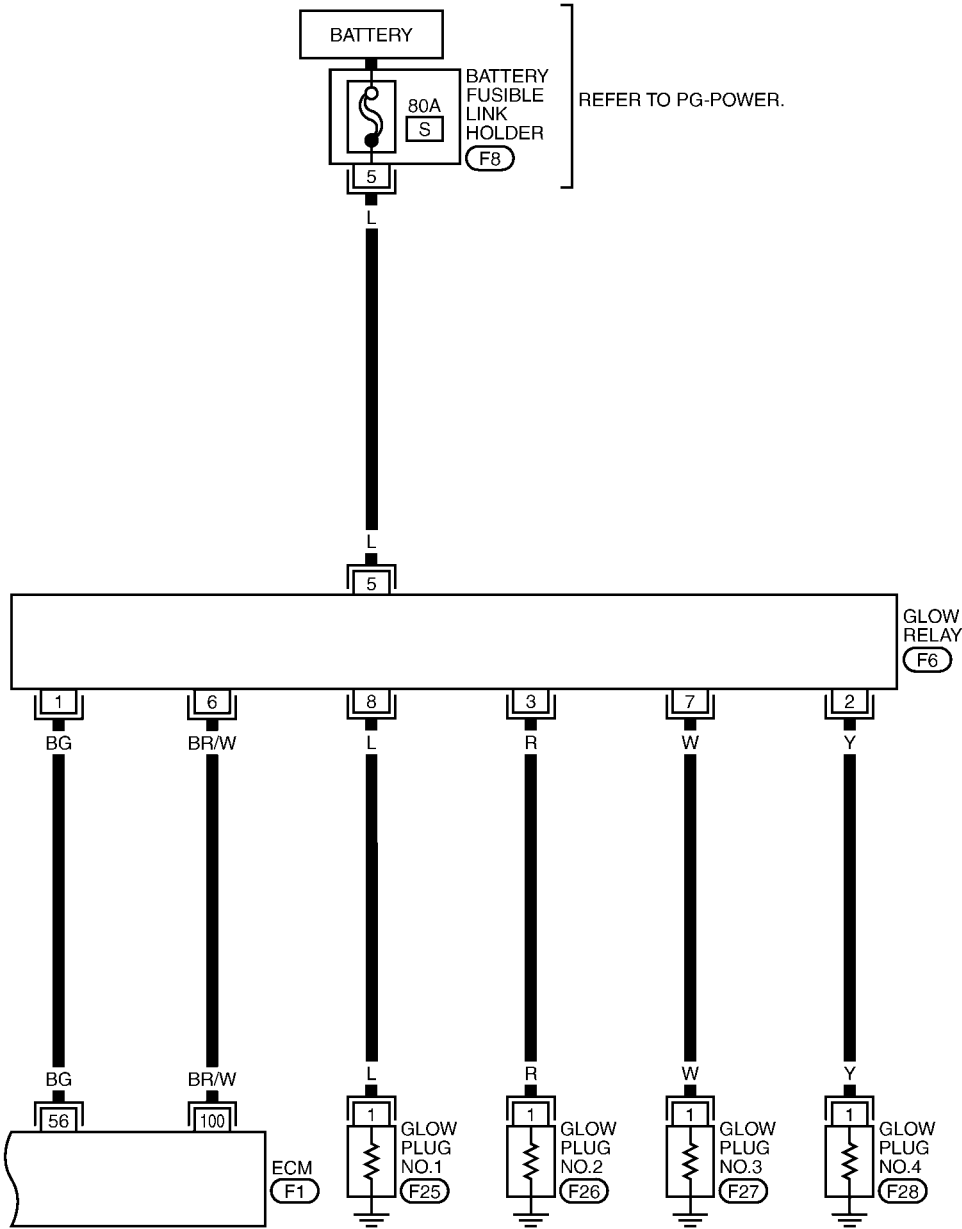
M1 - FUSE BLOCK-
JUNCTION BOX (J/B)

DIESEL INJECTION

Wiring Diagram - Glow

F9Q

EC-GLOW-02

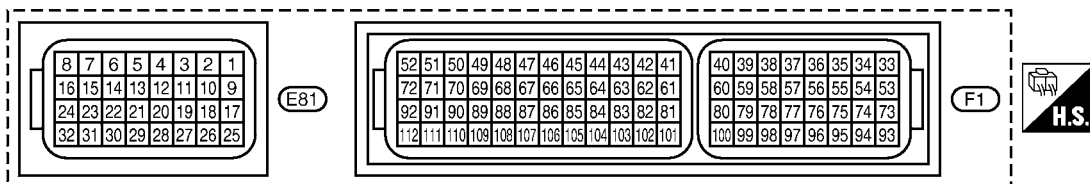
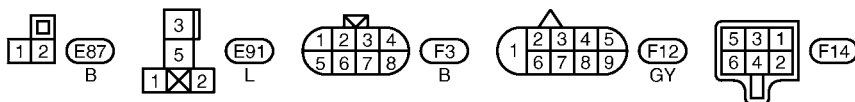
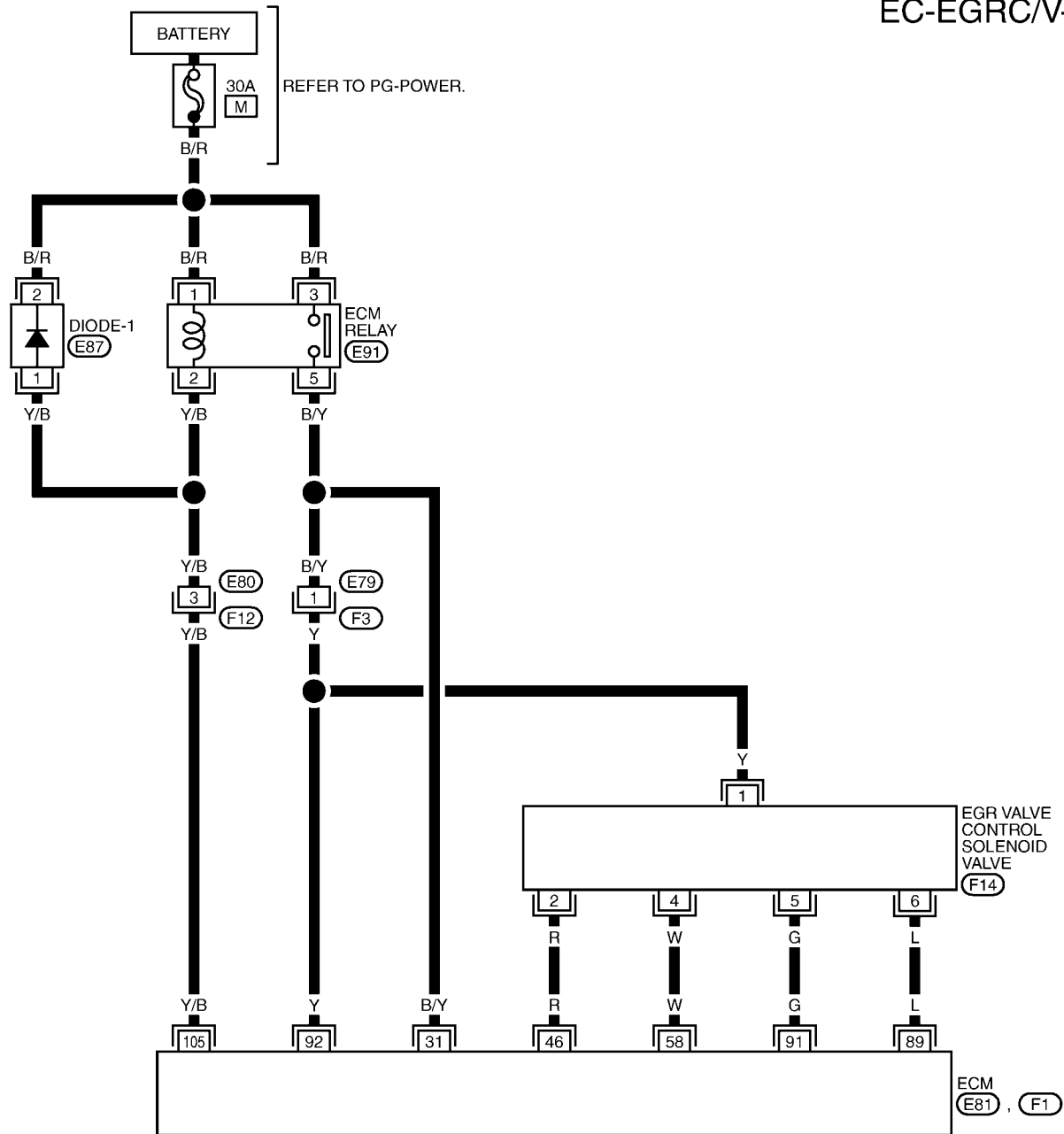


DIESEL INJECTION

Wiring Diagram - EGR Valve Control Solenoid Valve

F9Q

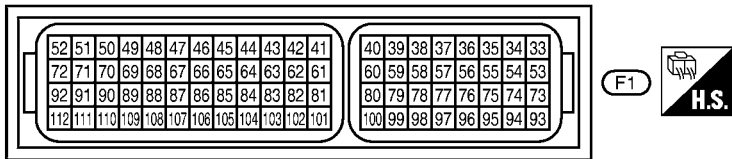
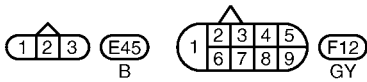
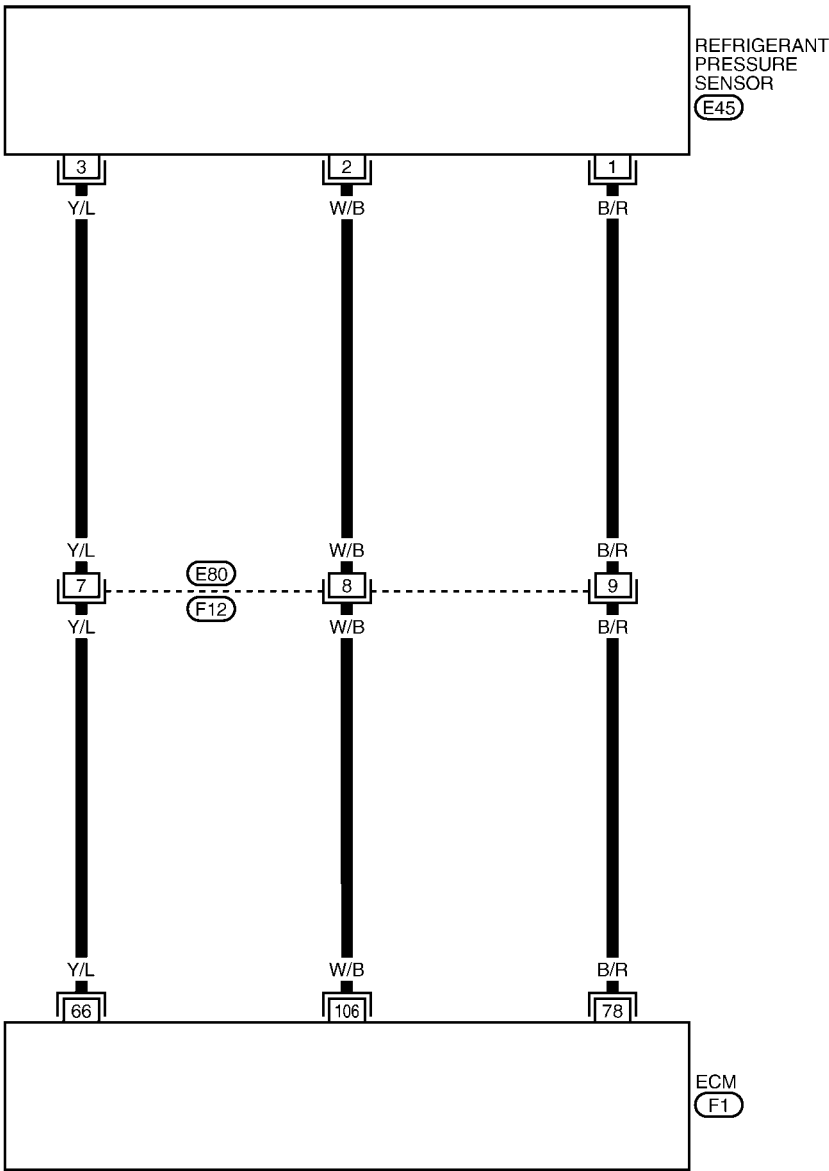
EC-EGRC/V-01



DIESEL INJECTION
Wiring Diagram - Refrigerant Pressure

F9Q

EC-RP/SEN-01



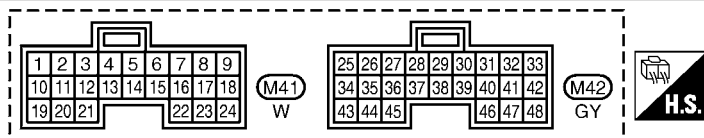
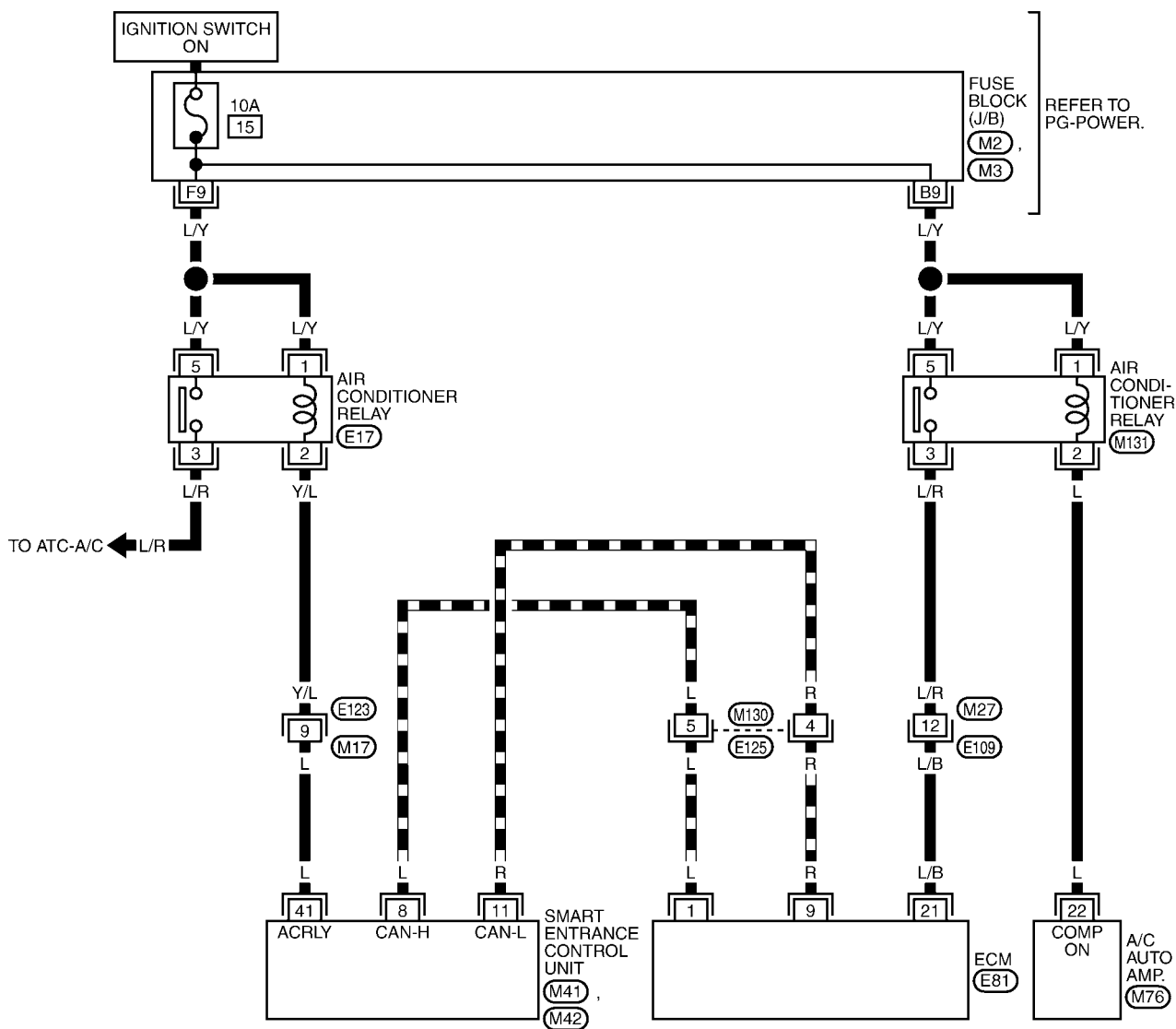
DIESEL INJECTION

Wiring Diagram - Air Conditioner

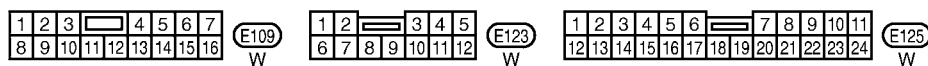
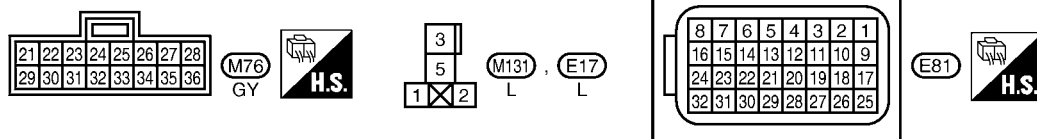
F9Q

EC-A/CCUT-01

— : DATA LINE



REFER TO THE FOLLOWING.
 (M2), (M3) - FUSE BLOCK-JUNCTION BOX (J/B)



MBWA0429E

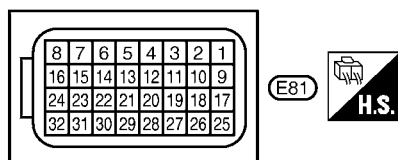
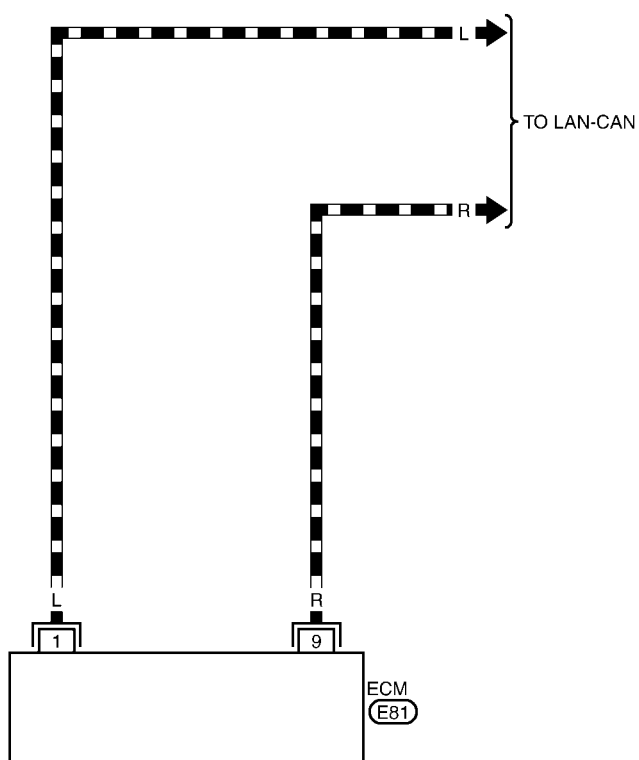
DIESEL INJECTION

Wiring Diagram - CAN

F9Q

EC-CAN-01

■ ■ ■ : DATA LINE



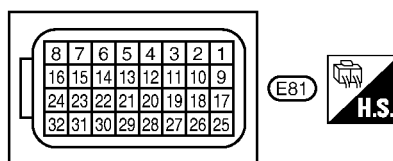
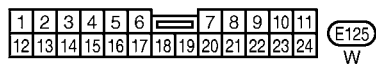
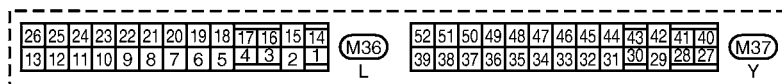
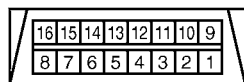
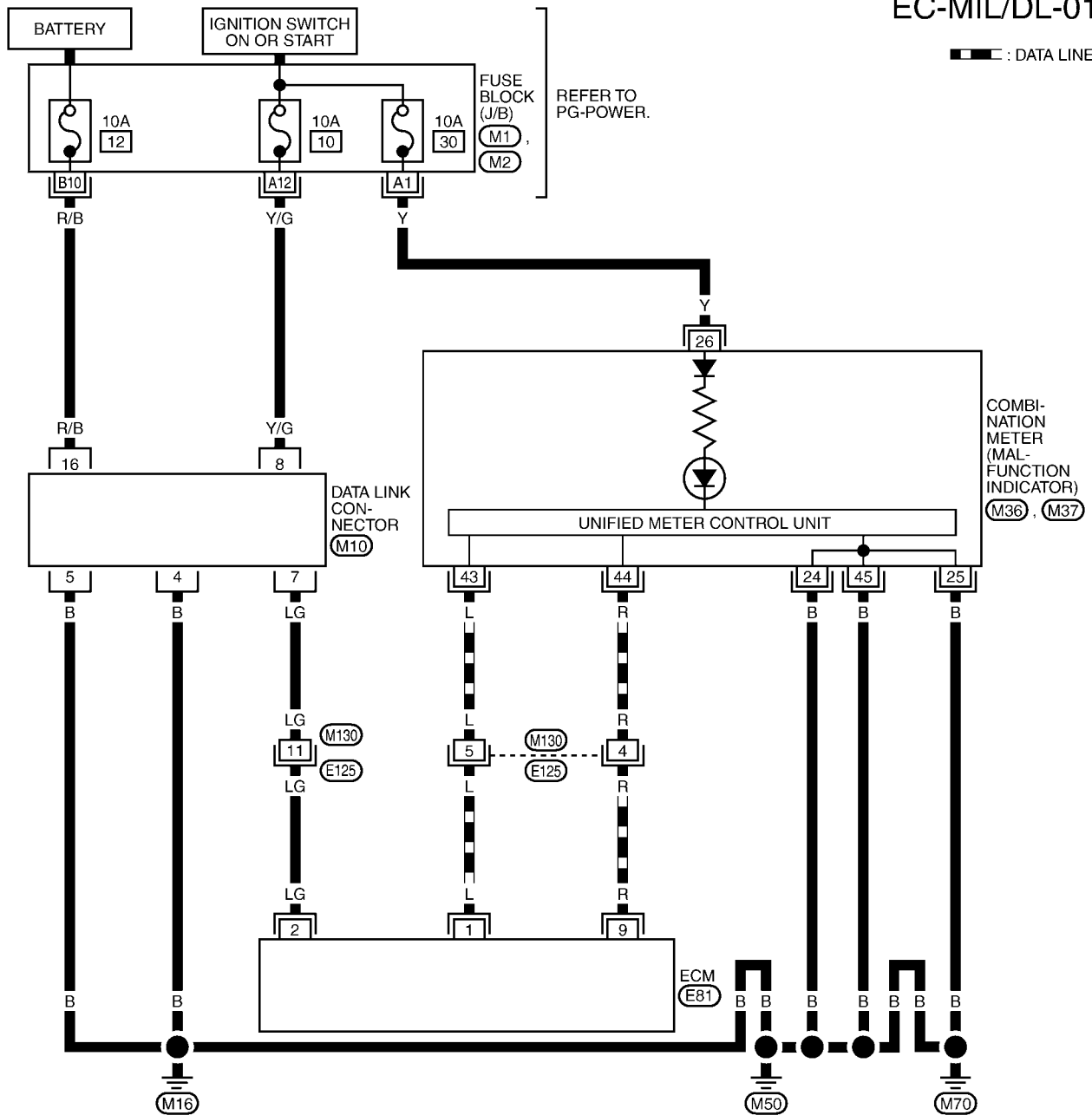
DIESEL INJECTION

Wiring Diagram - MI & DATA LINK CONNECTORS

F9Q

EC-MIL/DL-01

— : DATA LINE



REFER TO THE FOLLOWING.
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 JUNCTION BOX (J/B)

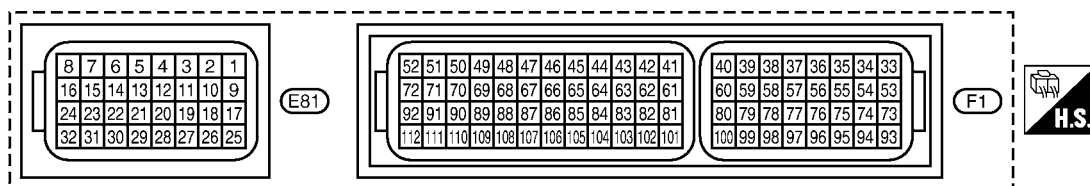
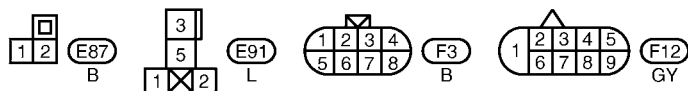
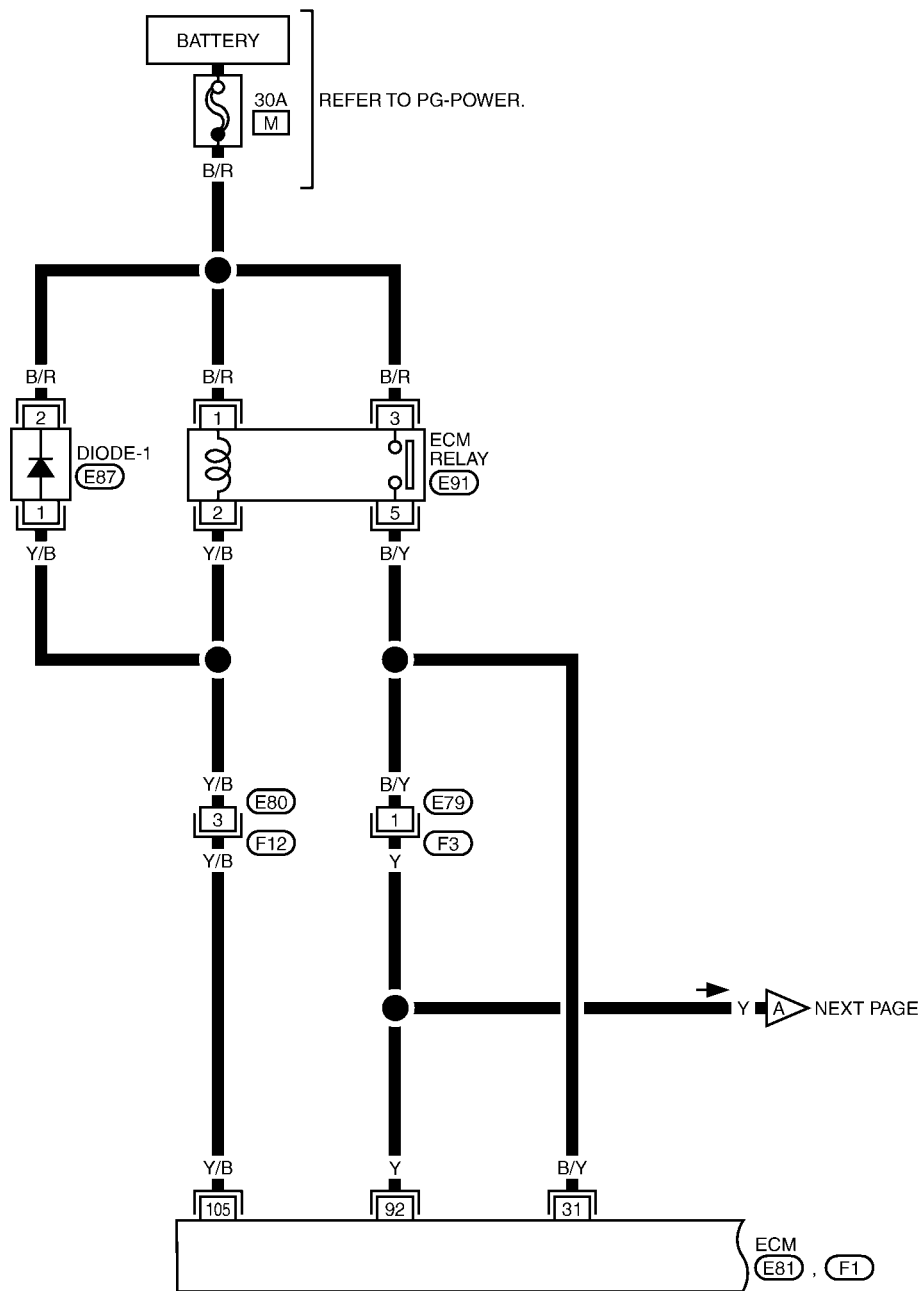
MBWA0422E

DIESEL INJECTION

Wiring Diagram - MAF Sensor

F9Q

EC-MAFS-01

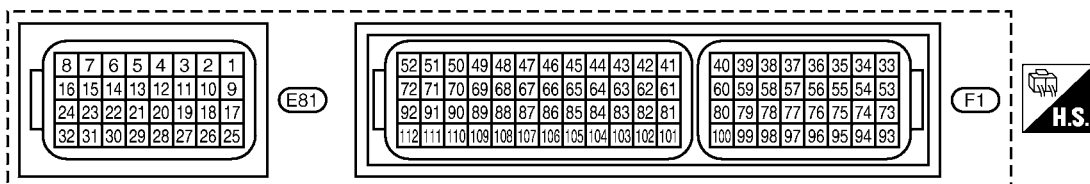
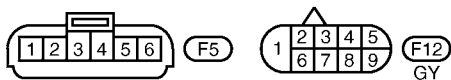
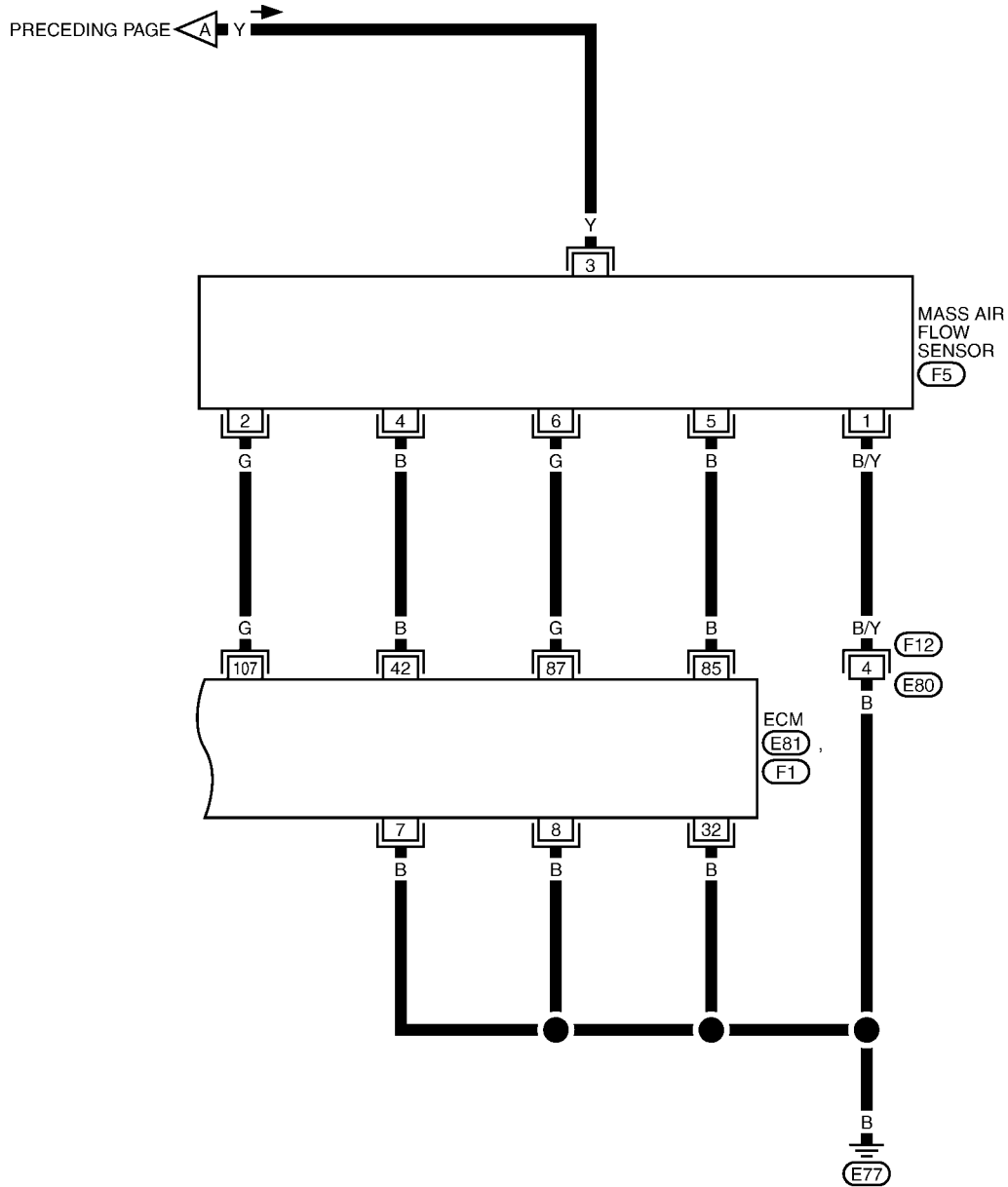


DIESEL INJECTION

Wiring Diagram - MAF Sensor

F9Q

EC-MAFS-02



MBWA0424E

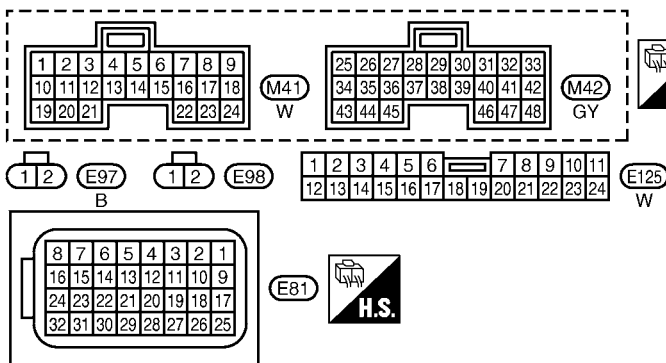
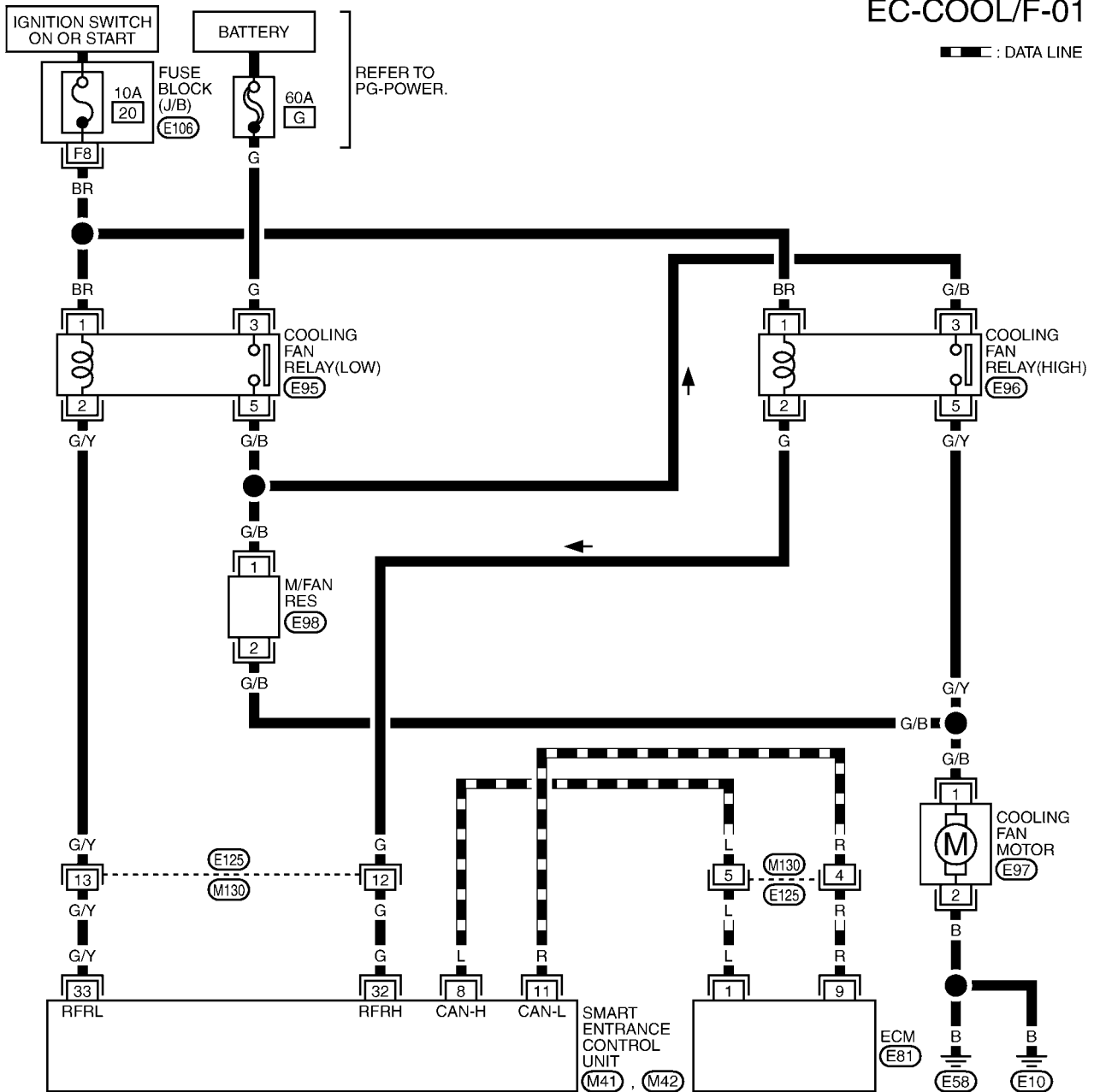
DIESEL INJECTION

Wiring Diagram - Cooling Fan

F9Q

EC-COOL/F-01

— : DATA LINE



REFER TO THE FOLLOWING.

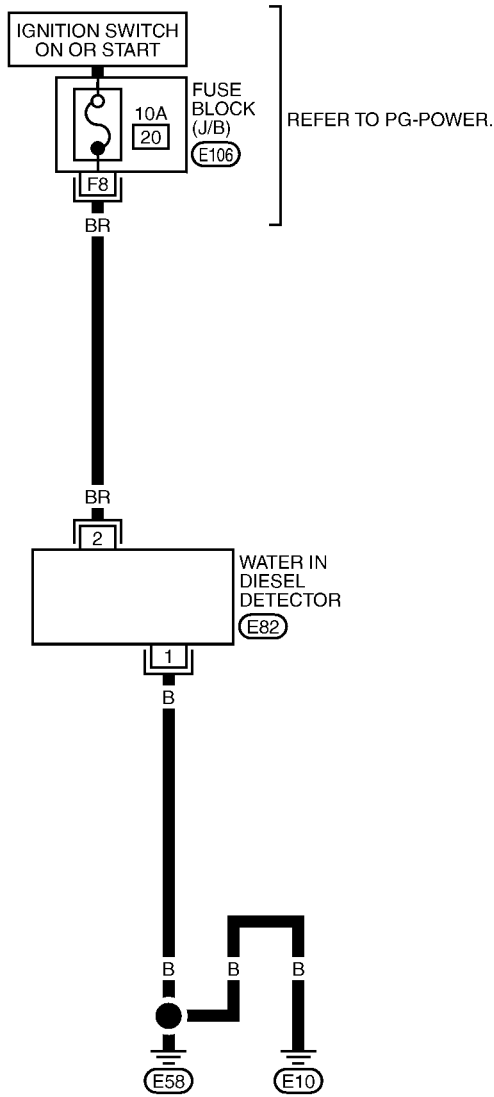
(E106) - FUSE BLOCK-
JUNCTION BOX (J/B)

MBWA0427E

DIESEL INJECTION
Wiring Diagram - Sedimenter

F9Q

EC-SED-01



1 2 E82

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

F9Q

BATTERY

15A
5
FUSE BLOCK (J/B)
M2

B7
R/Y

1
R/Y

DEPRESSED
RELEASED
STOP LAMP SWITCH (M28)

2
R/G

10
R/G
M130
E125

5
R/G

30A
M

B/R

2
B/R

DIODE-1 (E87)

1
B/R

2
Y/B

3
B/R

5
B/Y

ECM RELAY (E91)

1
Y/B
E80
F12

3
Y/B

105

1
B/Y
E79
F3

Y

92

B/Y

31

ECM (E81) F1

REFER TO PG-POWER.

NEXT PAGE

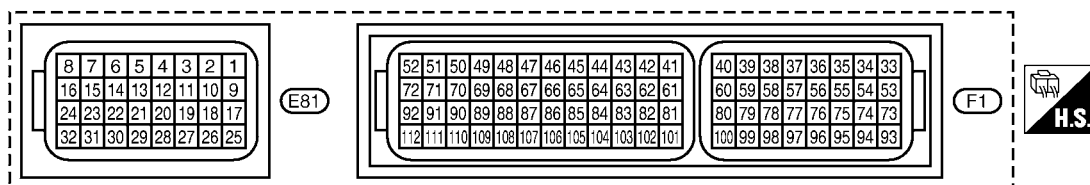
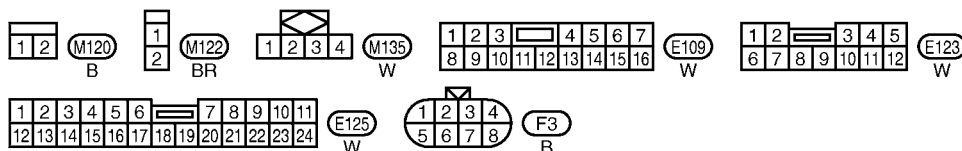
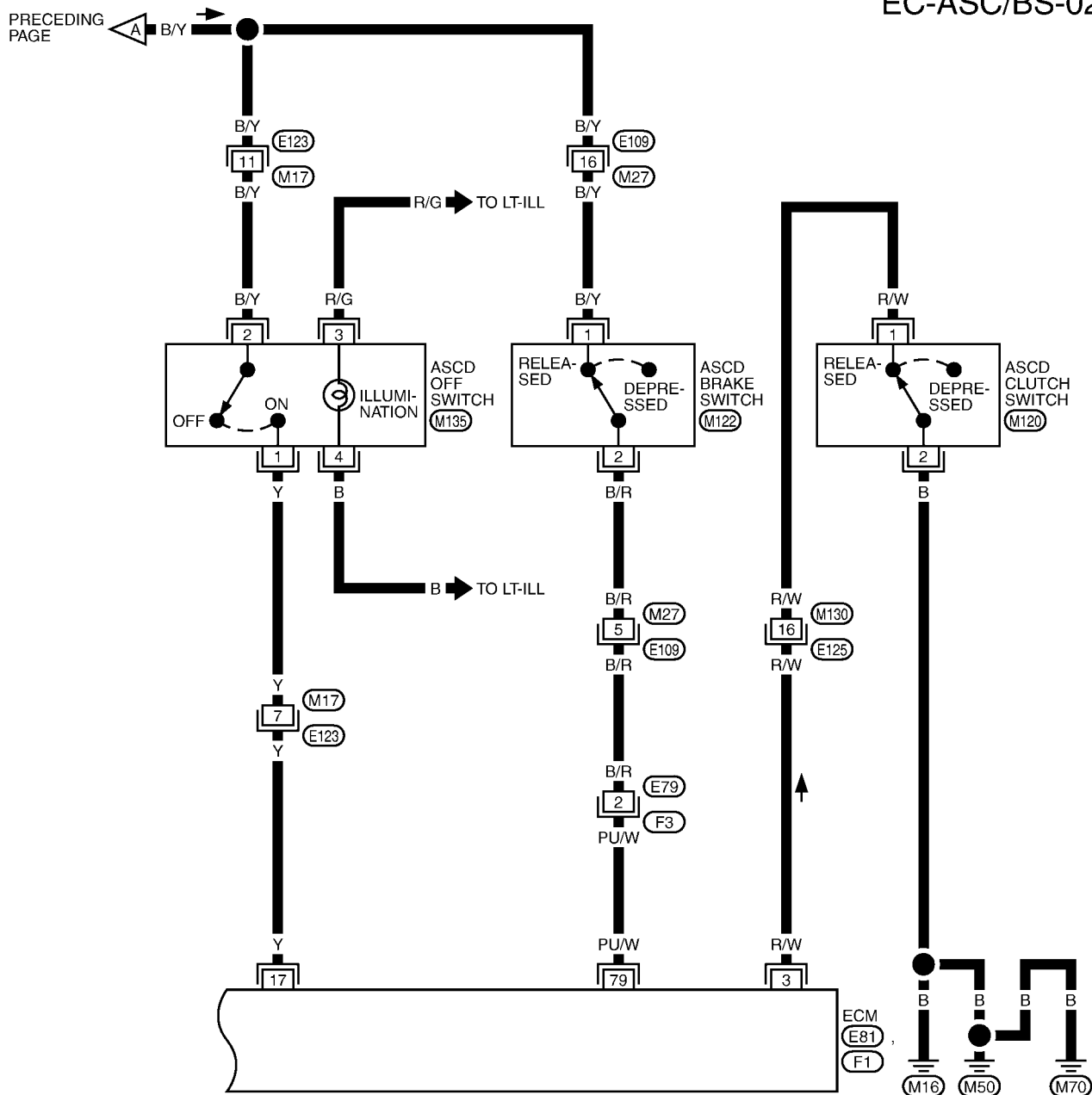


DIESEL INJECTION

Wiring Diagram - ASCD Brake Switch

F9Q

EC-ASC/BS-02

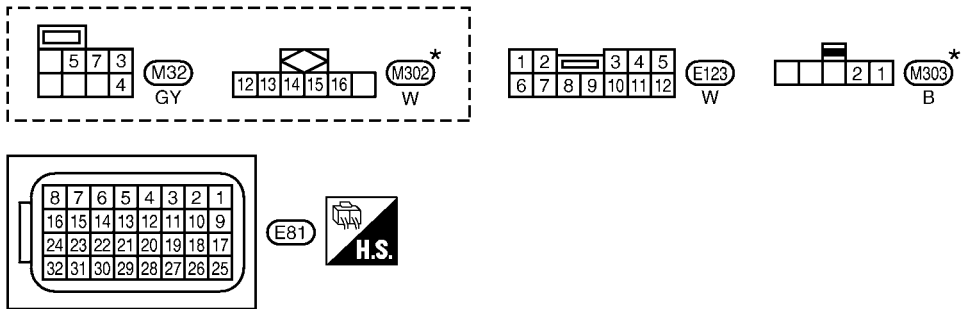
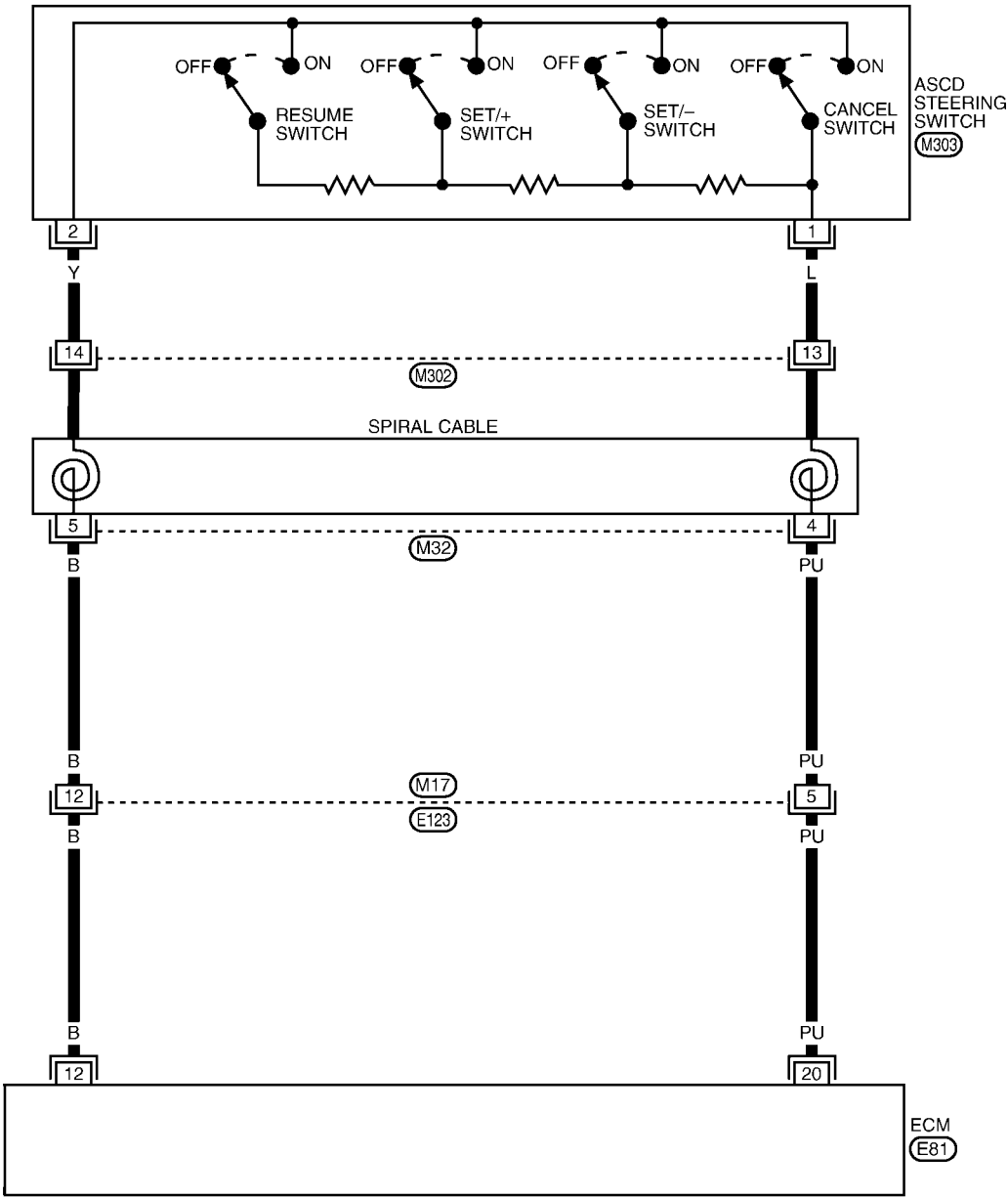


MBWA0658E

DIESEL INJECTION
Wiring Diagram - ASCD Steering Switch

F9Q

EC-ASC/SW-01



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

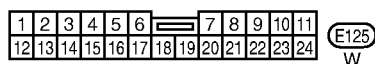
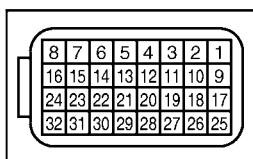
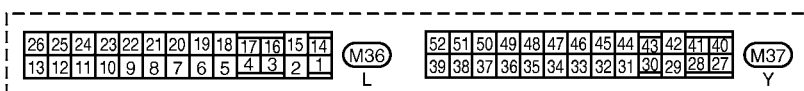
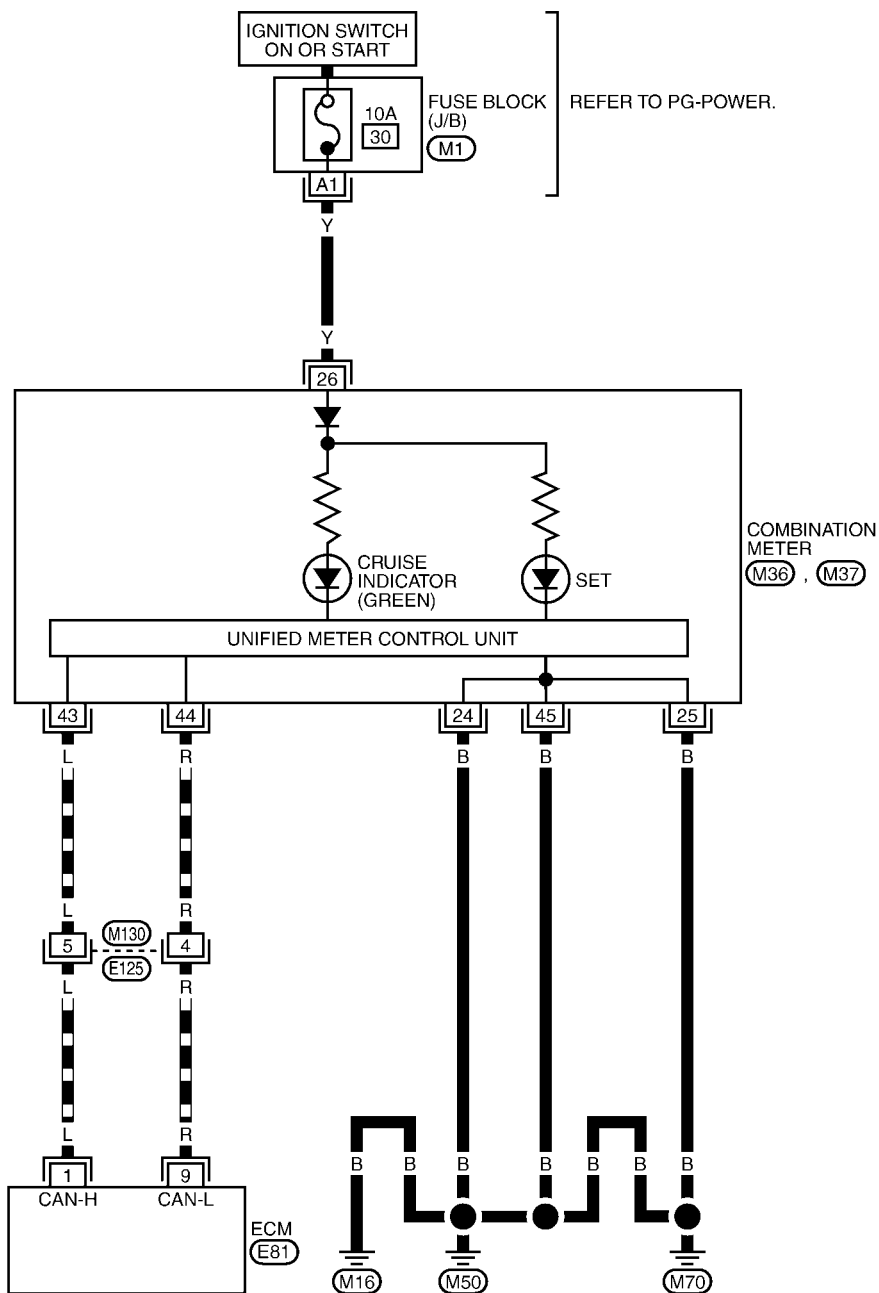
DIESEL INJECTION

Wiring Diagram - ASCD Indicator

F9Q

EC-ASCIND-01

— : DATA LINE



REFER TO THE FOLLOWING.

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