

# ENGINE CONTROL SYSTEM

## SECTION **EC**

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# APPLICATION NOTICE

## How to Check Vehicle Type



Confirm K9K engine type with model written on identification plate (refer to GI-44, "IDENTIFICATION INFORMATION"), then refer to service information in EC section.

Vehicle type	Engine type
xTKxxxxK12Vxx	Euro3 48 kW
xTKxxxxK12Yxx	Euro3 60 kW
xTKxxxxK12Txx	Euro4 50 kW
xTKxxxxK12Uxx	Euro4 63 kW

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## DIESEL EQUIPMENT Cleanliness

### 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 or destruction of the high pressure injection system and the engine,
- seizing or leaking of a component.

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

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

#### WHAT ARE THE SOURCES OF CONTAMINATION?

Contamination is caused by:

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

**IMPORTANT:** It is not possible to clean the engine using a high pressure washer because of the risk of damaging connections. In addition, moisture may collect in the connectors and create electrical connection problems.

#### 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 sold at 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. Stored parts will therefore be less subject to the risk of impurities. The bags must be used only once, and after use they must be thrown away.
- Lint-free towelettes to be used for injection pump related service purpose. The use of a normal cloth or paper for cleaning purposes is forbidden. These are not lint-free and may contaminate the fuel circuit of the system. Each lint-free cloth should only be used once.

# DIESEL EQUIPMENT

## Cleanliness

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The logo consists of the letters 'K9K' in a bold, sans-serif font, enclosed within a square border.

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

- For each operation, use new thinner (used thinner contains impurities). Pour it into a clean receptacle.
- For each operation, use a clean brush which is in good condition (the brush must not shed its bristles).
- Use a brush and thinners to clean the connections to be opened.
- Blow compressed air over the cleaned parts (tools, cleaned the same way as the parts, connections and injection system zone). Check that no bristles remain adhered.
- Wash your hands before and during the operation if necessary.
- When wearing leather protective gloves, cover these 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 - Nissan part No.: 16830 BN700, Renault part No.: 77 01 206 804. They must not, under any circumstances, be reused.
- Close the hermetically sealed bag, even if it has to be reopened shortly afterwards. Ambient air carries contamination.
- All components of the injection system that are removed 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 impurities 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.

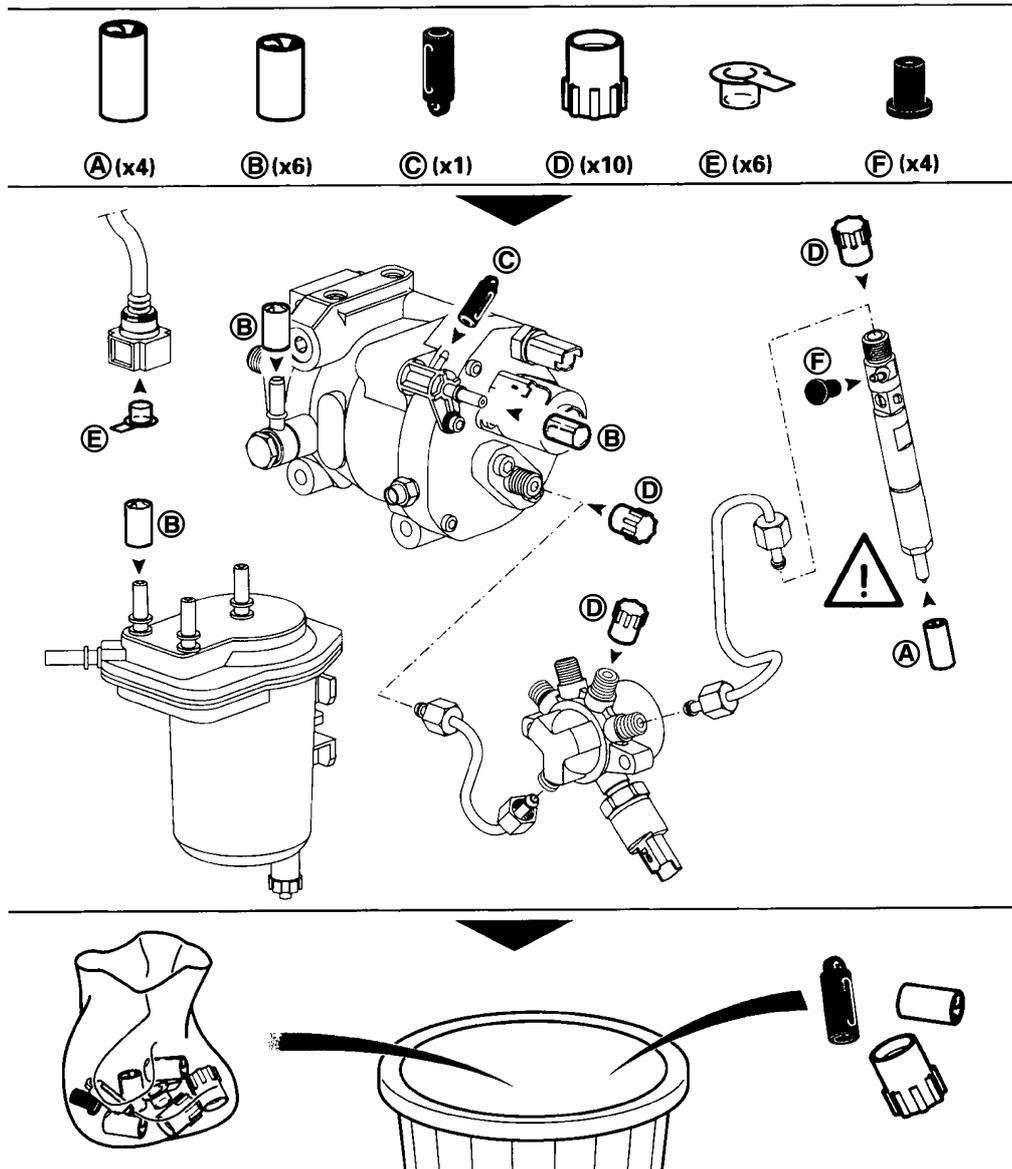
# DIESEL EQUIPMENT

## Cleanliness

K9K

### Instructions For Fitting The Plugs

Nissan part number: 16830 BN700  
(Renault part number: 77 01 206 804)



MBIB0321E

### CAUTION:

- The engine must not run with:
  - Diesel containing more than 10% diester
  - Petrol, even in very small amounts.
- The system can inject the diesel into the engine at a pressure of up to 140,000 kPa (1,400 bar, 1,428 kg/cm<sup>2</sup>, 20,300 psi). Before carrying out any work, check that the injector rail is no longer pressurized 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.

# DIESEL EQUIPMENT

## Special features

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

### DESCRIPTION

- **DELPHI and type "DDCR"** injection controlling **112 terminals** ECM.
  
- The system consists of:
  - a priming pump on the low pressure circuit,
  - a diesel fuel filter,
  - a high pressure pump incorporating a low pressure pump (transfer pump),
  - a flow actuator attached to the pump,
  - an injector rail,
  - a pressure sensor located in the rail,
  - four solenoid injectors,
  - a fuel temperature sensor,
  - an engine coolant temperature sensor,
  - an intake (upstream) air temperature sensor,
  - a camshaft position sensor (cylinder reference sensor),
  - a turbocharger air pressure sensor,
  - a knock sensor (accelerometer),
  - an EGR solenoid valve,
  - an accelerator pedal potentiometer,
  - and an ECM.
  
- The "common rail" direct high pressure injection system works sequentially (based on the operation of multipoint injection for petrol engines).
  
- This new injection system reduces operating noise, reduces the volume of pollutant gases and particles and produces high engine torque at low engine speeds thanks to a pre-injection procedure.
  
- The high pressure pump generates the high pressure sent to the injector rail. The flow actuator on the pump controls the quantity of diesel engine fuel supplied according to the demand determined by the ECM. The rail supplies each injector through a steel pipe.

# DIESEL EQUIPMENT

## Special features

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K9K

- The ECM:
  - determines the value of injection pressure necessary for the engine to operate well and then controls the pressure regulator. It checks that the pressure value is correct by analysing the value transmitted by the pressure sensor located on the rail,
  - determines the injection time necessary to deliver the right quantity of diesel and the moment when injection should be started,
  - controls each injector electrically and individually after determining these two values.
  
- The injected flow to the engine is determined by:
  - the duration of injector control,
  - the injector opening and closing speed,
  - the needle travel (determined by a constant for the type of injector),
  - the nominal hydraulic flow of the injector (unique to each injector),
  - the high pressure rail pressure controlled by the ECM.
  
- The ECM controls:
  - the idle speed adjustment,
  - the exhaust gas flow reinjected into the inlet,
  - the fuel supply control (advance, flow and rail pressure),
  - the cooling fan control,
  - the heat adjustment of the coolant circuit (thermoplungers),
  - the glow plug (pre/post heating) control.
  
- The high pressure pump is supplied at low pressure by an integrated low pressure pump (transfer pump). It supplies the rail whose pressure is controlled for charge by the flow actuator and for discharging by the injector valves. Falls in pressure can be compensated for in this way. The flow actuator allows the high pressure pump to provide just the amount of diesel fuel necessary to maintain the pressure in the rail. Thanks to this element, heat generation is minimised and engine output improved.  
In order to discharge the rail using the injector valves, the valves are controlled by short electrical impulses:
  - short enough not to open the injector, (through the return circuit from the injectors),
  - long enough to open the valves and discharge the rail.
  
- The ECM controls the cooling fans and the coolant temperature warning light on the instrument panel.

# DIESEL EQUIPMENT

## Special features

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**K9K**

### IMPORTANT

- The engine must not operate with:
  - diesel engine fuel containing more than 10% diester,
  - petrol, even in tiny quantities.
- The system can inject the diesel into the engine at a pressure up to 1400 bars. Before carrying out any work, check that the injector rail is not under pressure 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.
- Removal of the interior of the pump and injectors is prohibited. Only the flow actuator, the fuel temperature sensor and the venturi can be replaced.
- For safety reasons, it is strictly forbidden to slacken a high pressure pipe union when the engine is running.
- It is not possible to remove the pressure sensor from the fuel rail because this may cause circuit contamination problems. 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 marked number 070 575. If the pump is being replaced, the pulley must be replaced.
- It is forbidden to repair the wiring connecting the knock sensor (accelerometer) and the CKP sensor (engine speed sensor). If the wiring should fail, it has to be replaced with new wiring.
- Applying 12 volts directly to any component in the system is prohibited.
- Ultrasonic carbon removal and cleaning are prohibited.
- Never start the engine without the battery being connected correctly.
- Disconnect the injection system ECM when carrying out any welding work on the vehicle.
- It is essential to replace all the disconnected air inlet plastic pipes.

# DIESEL EQUIPMENT

## Special features

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**K9K**

There is a 16 digit code on the injectors called individual injector correction. This code is specific to each injector, and takes into account differences in manufacture and specifies the flow injected by each of them.

When an injector is replaced, it is necessary to program the code of the new injector into the ECM.

When an ECM is replaced, it is necessary to program the codes of the four injectors.

**There are two possibilities:**

● **If it is possible to communicate with the ECM:**

- read out the data from the ECM using the "SAVE DATA FOR REPLACE" in "WORK SUPPORT" mode with CONSULT-II
- turn ignition switch OFF.
- remove battery negative cable.
- change the ECM
- reprogram the data from the "WRITE DATA AFTER REPLACE" in "WORK SUPPORT" mode with CONSULT-II to the replaced ECM
- after replacement, ensure that the ECM has not detected malfunctions relating to the injector codes and check that the instrument panel warning light is off.

● **If it is not possible to communicate with the ECM:**

- turn ignition switch OFF.
- remove battery negative cable.
- change the ECM
- **read the data on the injectors**  
Refer to EC-K9K-40 for individual injector correction value location.
- enter the data in the ECM using the "ENTER INJECTR CALIB DATA" in "WORK SUPPORT" mode with CONSULT-II manually
- reconfigure the different elements such as the power-assisted steering pump assembly and the thermoplungers etc.
- using CONSULT-II, ensure that the ECM has not detected malfunctions relating to the injector codes and check that the instrument panel warning light is off.

# DIESEL EQUIPMENT

## Special features

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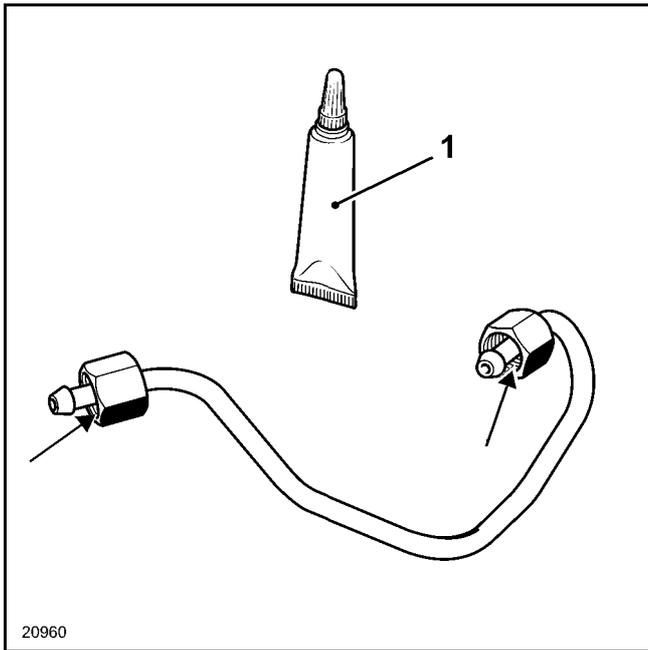
All the high pressure pipe removed must be systematically replaced along with the clips.

### TIGHTENING THE HIGH PRESSURE PIPES

**NOTE:** fit the pump/rail pipe before the rail/injector pipes.

#### Rail-pump pipe

- Undo the rail,
- Grease the threads of the high pressure pipe nuts,
- Insert the high pressure pipe olive into the taper of the high pressure pump outlet,
- Insert the high pressure pipe olive into the taper of the high pressure rail inlet.
- Move the nut into position by hand, on the rail side then the pump side,
- Tighten the rail,
- Tighten the high pressure pipe nuts on the rail side then on the pump side.



#### Rail/injector pipes

- Undo the rail,
- Grease the threads of the high pressure pipe nuts,
- Insert the high pressure pipe olive into the taper of the high pressure injector inlet,
- Insert the high pressure pipe olive into the taper of the high pressure rail outlet,
- Move the nuts into position by hand, on the injector side then the rail side,
- Tighten the rail,
- Ensure that the new clip, supplied with the new high pressure pipe, is fitted,
- Tighten the nuts of the high pressure pipes on the injector side first and then on the fuel rail side.

**NOTE:** Before fitting a new high pressure pipe, move back the nuts on the pipe then lightly lubricate the nut threads with the oil from the sachet (1) provided in the parts kit.

# DIESEL EQUIPMENT

## Special features

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**K9K**

### CHECKING SEALING AFTER REPAIR

**After any operation, check that there are no diesel leaks.**

Reprime the circuit using the priming pump.

Start the engine and allow to warm up at idle speed, visually inspecting for any fuel leaks.

Apply tracing fluid around the high pressure connections of the pipe that has been replaced.

Once the engine coolant temperature is above **50°C** and provided there are no malfunctions present, carry out a road test, taking the engine speed up to **4000 rpm** at least once to check that there are no leaks.

Perform a visual inspection after the road test to make sure that there are no high pressure leaks.

Clean off the tracing fluid.

### REPLACING THE ECM

The system can be reprogrammed using CONSULT-II.

Before an ECM is replaced in after-sales, the following must be done.

- Check the individual correction value from "WORK SUPPORT" mode using print out function of CONSULT-II.
- After replacing ECM, enter each injector's individual correction value using "WORK SUPPORT" mode with CONSULT-II.
- Also set the system configuration using "CONFIGURATION" mode with CONSULT-II.

### REPLACING THE INJECTORS

**NOTE: Individual injector correction is a factory calibration carried out on each injector to adjust the flow of each one precisely, taking into account differences in manufacture.**

The correction values are written on a label affixed to each injector then entered in the ECM which can then control each injector by taking account of their differences in manufacture.

The system can be programmed "WORK SUPPORT" mode with CONSULT-II.

The correction values (16 digit code) must be replaced after replacing an injector. (Refer to special features)

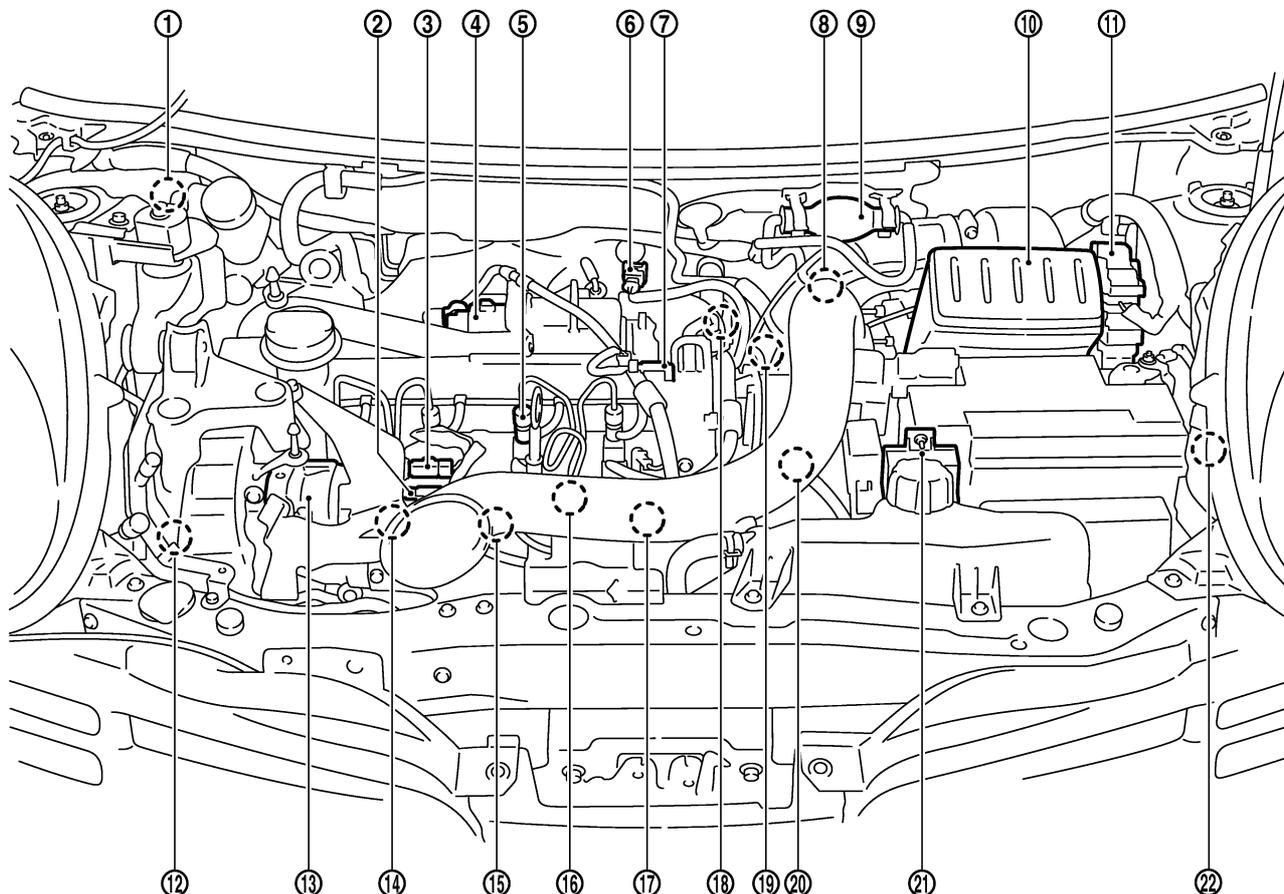
- **Entering each injector's individual correction value**, when replacing the ECM.

# DIESEL EQUIPMENT

## Location of components

K9K

Models without intercooler  
Engine cover removed



YEC670E

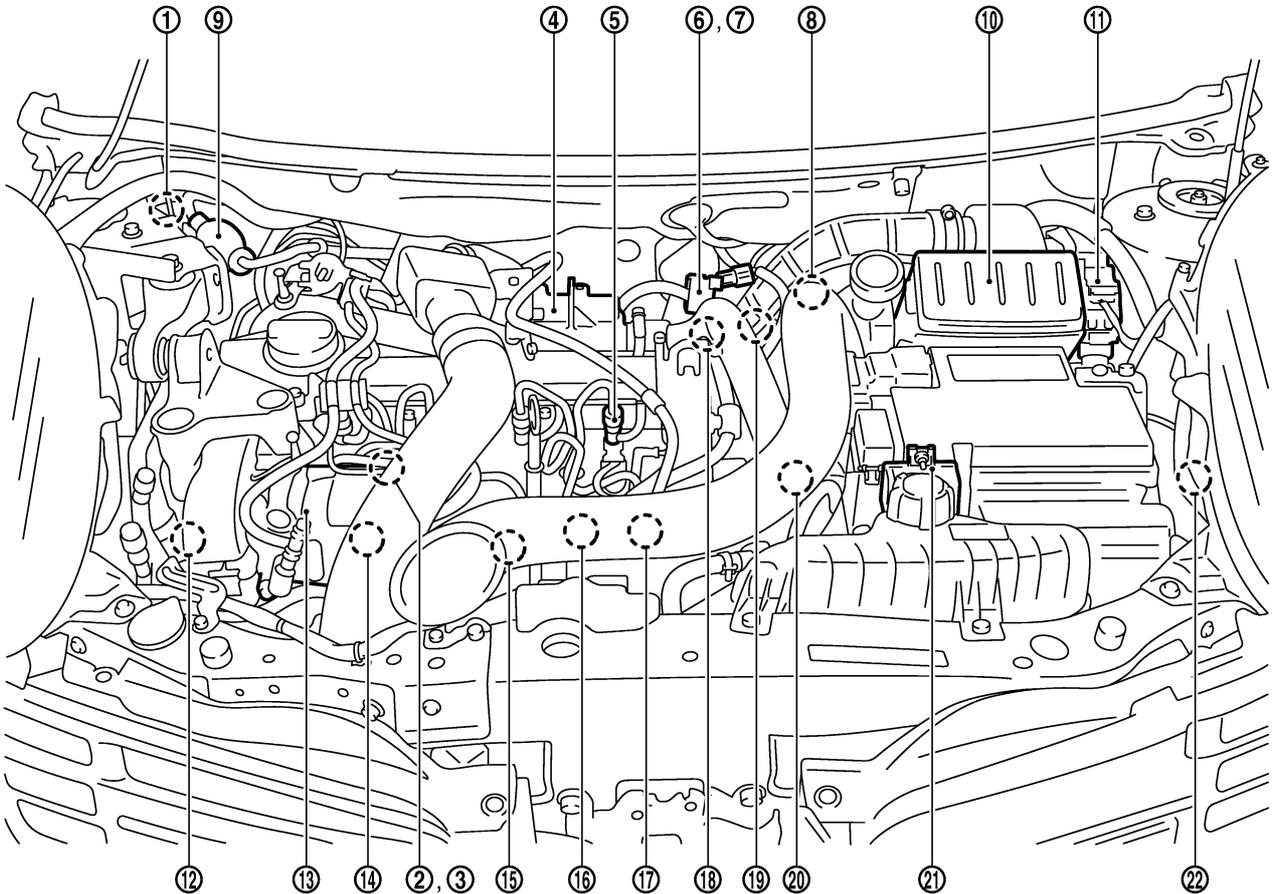
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|--|---------------------------------------|
| 1. Fuel filter (LHD models)            | 12. Camshaft position sensor          |
| 2. Venturi                             | 13. High pressure pump                |
| 3. Fuel temperature sensor             | 14. Fuel flow actuator                |
| 4. EGR control solenoid valve          | 15. Knock sensor (Accelerometer)      |
| 5. Injector                            | 16. Spherical injector rail           |
| 6. Turbocharger air temperature sensor | 17. Common rail fuel pressure sensor  |
| 7. Turbocharger boost pressure sensor  | 18. Engine coolant temperature sensor |
| 8. Fuel filter (RHD models)            | 19. Intake air temperature sensor     |
| 9. Priming pump (RHD models)           | 20. Crankshaft position sensor        |
| 10. Air cleaner                        | 21. Glow relay (control) unit         |
| 11. ECM                                | 22. IPDM E/R                          |

# DIESEL EQUIPMENT

## Location of components

K9K

Models with intercooler  
Engine cover removed



YEC671E

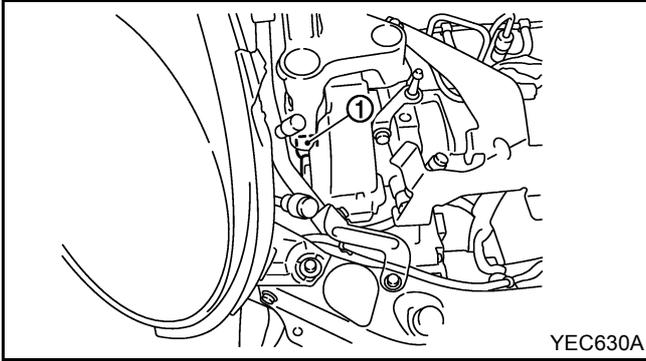
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|--|---------------------------------------|
| 1. Fuel filter (LHD models)            | 12. Camshaft position sensor          |
| 2. Venturi                             | 13. High pressure pump                |
| 3. Fuel temperature sensor             | 14. Fuel flow actuator                |
| 4. EGR control solenoid valve          | 15. Knock sensor (Accelerometer)      |
| 5. Injector                            | 16. Spherical injector rail           |
| 6. Turbocharger air temperature sensor | 17. Common rail fuel pressure sensor  |
| 7. Turbocharger boost pressure sensor  | 18. Engine coolant temperature sensor |
| 8. Fuel filter (RHD models)            | 19. Intake air temperature sensor     |
| 9. Priming pump (LHD models)           | 20. Crankshaft position sensor        |
| 10. Air cleaner                        | 21. Glow relay (control) unit         |
| 11. ECM                                | 22. IPDM E/R                          |

# DIESEL EQUIPMENT

## Location of components

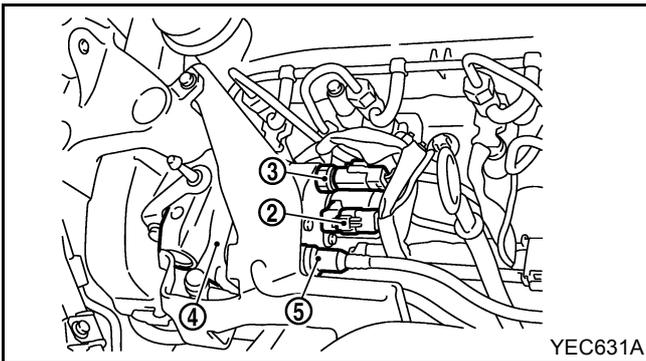
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- 1 Camshaft position sensor

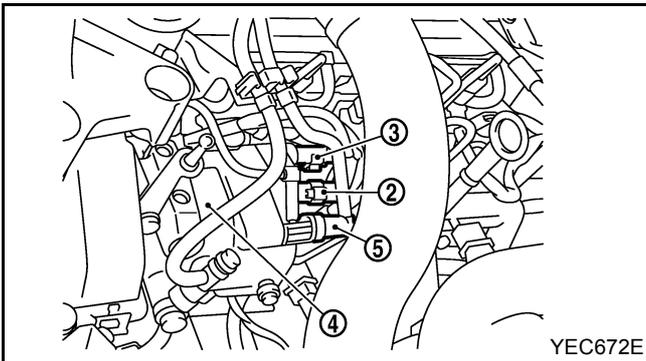


- 2 Fuel flow actuator  
3 Fuel temperature sensor  
4 High pressure pump  
5 Venturi

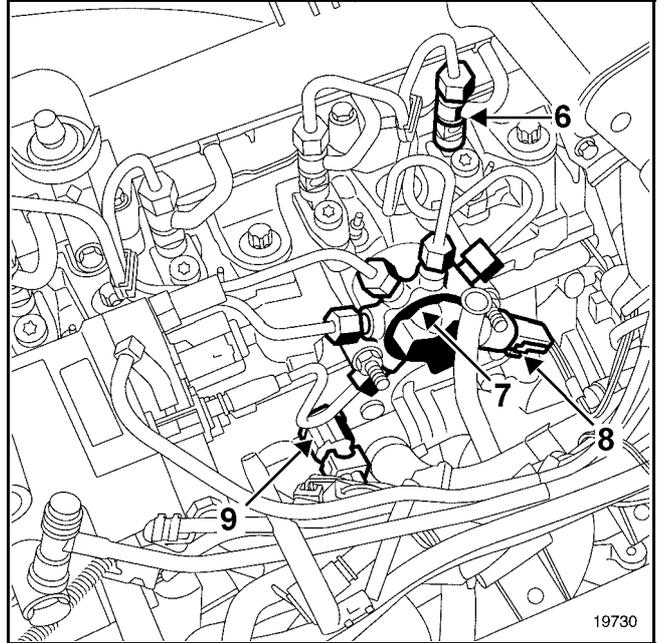
### Models without intercooler



### Models with intercooler



- 6 Injector  
7 Injector rail  
8 Rail pressure sensor  
9 Knock sensor (Accelerometer)



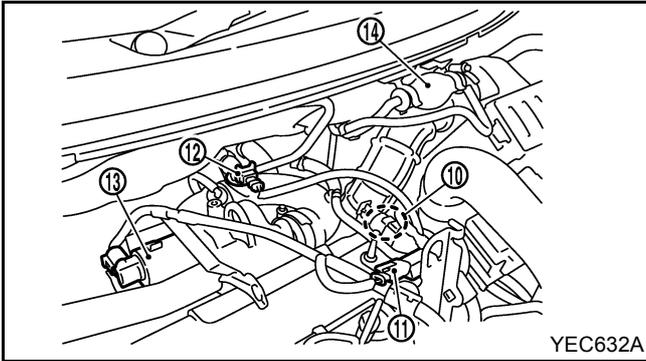
# DIESEL EQUIPMENT

## Location of components

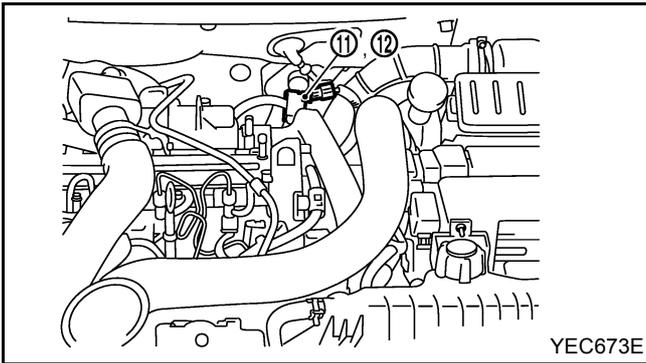
K9K

- 10 Intake air temperature sensor
- 11 Turbocharger boost pressure sensor
- 12 Turbocharger air temperature sensor
- 13 EGR control solenoid valve
- 14 Priming bulb (RHD models)

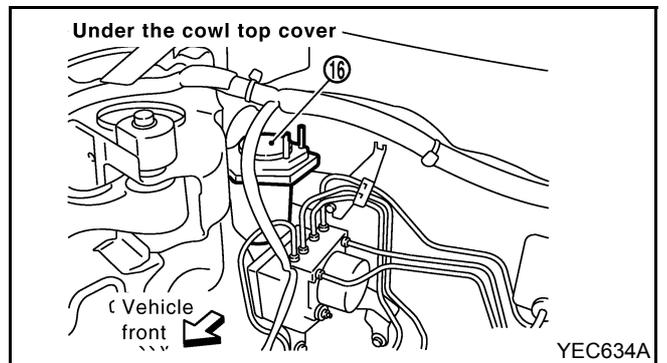
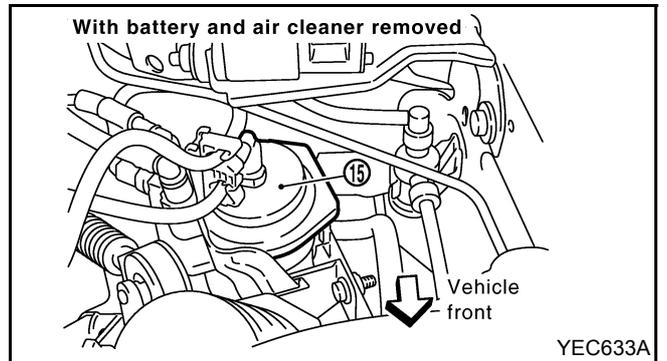
### Models without intercooler



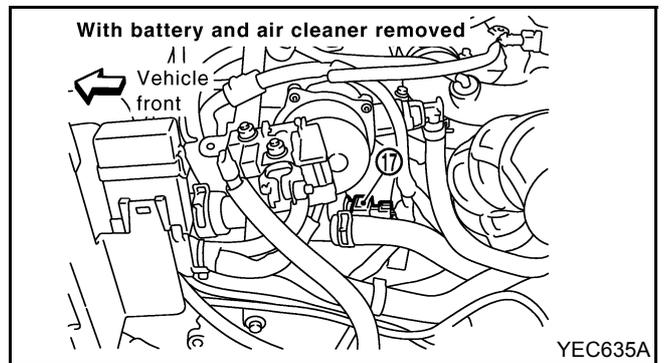
### Models with intercooler



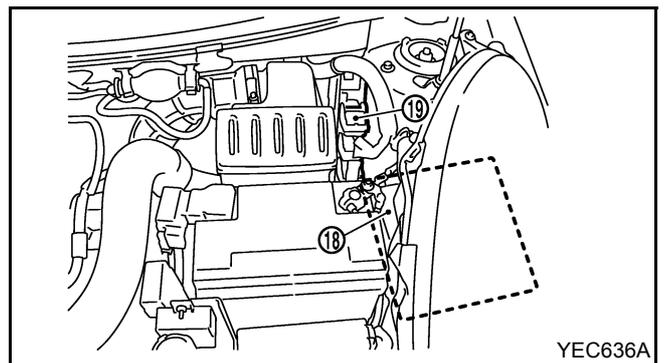
- 15 Fuel filter (RHD models)
- 16 Fuel filter (LHD models)



- 17 Engine coolant temperature sensor



- 18 IPDM E/R
- 19 ECM



# DIESEL EQUIPMENT Specifications

K9K

Vehicles	Engines							
	Type	Suffix	Bore (mm, in)	Stroke (mm, in)	Displace- ment cm <sup>3</sup> (cu in)	Compressi on ratio	Catalytic converter	Emission control standard
K12	K9K	750	76 (2.99)	80.5 (3.17)	1,461 (89.15)	18.25/1	228	EU 00
		752						Euro 2

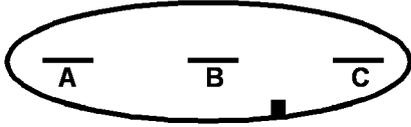
ENGINE SPEED (rpm)			SMOKE OPACITY	
IDLE SPEED	Max. - no load	Max. - under load	Homologation value	Max. - legal
800 ± 50 900 or more* : without intercooler 875 or more* : with intercooler	5000 ± 100	4800 ± 100	1.5 m <sup>-1</sup> (46%)	3 m <sup>-1</sup> (70%)

\*: A/C ON

DESCRIPTION	MARQUE/TYPE	SPECIAL NOTES
High pressure pump	DELPHI	0 to 1400 bars continuous pressure
Fuel pump	DELPHI	Incorporated into the high pressure pump
Common rail fuel pressure sensor	DELPHI	Incorporated into the rail Non measurable resistance
Injectors	DELPHI	Solenoid injector Maximum pressure <b>1400 bar</b> Non measurable resistance
Diesel flow actuator	DELPHI	Located on the high pressure pump Resistance: <b>5.3 ± 0.5 Ω at 20°C</b>
ECM	DELPHI	ECM (computer) (112 terminals)
Pre/postheating unit (glow)	NAGARES BED 7-12	With pre-postheating function controlled by the ECM (computer)
Pre-heater plugs (glow)	BERU	Resistance: <b>Less than 1 Ω</b> connector disconnected
Accelerator pedal potentiometer (APP sensor)	CTS	Double track potentiometer Resistance: – terminals 1: 4 (earth) and 6 (+5 V): <b>1.7 ± 0.9 kΩ</b> – terminals 2: 5 (earth) and 3 (+5 V): <b>2.85 ± 2.05 kΩ</b>
Intake air temperature sensors	JAEGER	CTN thermistor Resistance: <b>5000 ± 6800 Ω at - 40°C</b> <b>9500 ± 900 Ω at - 10°C</b> <b>2051 ± 120 Ω at 25°C</b> <b>810 ± 47 Ω at 50°C</b> <b>310 ± 17 Ω at 80°C</b>

# DIESEL EQUIPMENT Specifications

K9K

DESCRIPTION	MARQUE/TYPE	SPECIAL NOTES
Fuel temperature sensor	DELPHI	Located on the high pressure pump CTN thermistor Resistance: <b>2.2 kΩ at 25°C</b>
Engine coolant temperature sensor	ELTH	CTN thermistor Resistance: <b>76000 ± 7000 Ω at - 40°C</b> <b>12500 ± 1130 Ω at - 10°C</b> <b>2252 ± 112 Ω at 25°C</b> <b>810 ± 40 Ω at 50°C</b> <b>280 ± 8 Ω at 80°C</b> <b>115 ± 3 Ω at 110°C</b> <b>88 ± 2 Ω at 120°C</b>
Crankshaft position (Engine speed) sensor	MGI	Variable reluctance sensor Resistance: <b>760 Ω</b>
Atmospheric pressure sensor	DELPHI	Built into the computer
Turbocharger boost pressure sensor	DELCO ELECTRONICS	Resistance: – terminals A and B: <b>9 kΩ</b> – terminals A and C: <b>4 kΩ</b> – terminals B and C: <b>5 kΩ</b>   <i>DI1330</i>
Camshaft position sensor	SAGEM	Hall effect sensor
Knock sensor (accelerometer)	SAGEM	Non measurable resistance
Turbocharger air temperature and turbocharger boost pressure sensor	BOSCH / LDF6T 20-250	Pressure sensor with a negative temperature coefficient thermistor Supply voltage <b>+5V</b> Resistance between terminals 1 and 2: – <b>20,376 Ω ± 1110.5 at -25°C</b> – <b>15,614 Ω ± 829 at -20°C</b> – <b>9426 Ω ± 475 at -10°C</b> – <b>5887 Ω ± 281.5 at 0°C</b> – <b>3791 Ω ± 172.5 at 10°C</b> – <b>2511 Ω ± 109 at 20°C</b> – <b>1715.5 Ω ± 71 at 30°C</b> – <b>1200 Ω ± 47 at 40°C</b> – <b>851 Ω ± 32 at 50°C</b> – <b>612 Ω ± 22 at 60°C</b> – <b>446 Ω ± 15 at 70°C</b> – <b>330 Ω ± 11 at 80°C</b> 4-track connector: – 1: earth – 2: air temperature sensor signal – 3: <b>+5V</b> supply – 4: pressure sensor signal

# DIESEL EQUIPMENT

## Specifications

**K9K**

DESCRIPTION	MARQUE/TYPE	SPECIAL NOTES
EGR solenoid valve EGR valve position potentiometer	PIERBURG	Resistance: – terminals 4 and 6: <b><math>8 \pm 0.5 \Omega</math> at 25°C</b> Incorporated into the EGR solenoid valve Resistance: – terminals 2 and 3: <b><math>1 \pm 0.5 \text{ k}\Omega</math> at 20°C</b> – terminals 1 and 2: <b><math>4 \pm 1.6 \text{ k}\Omega</math> at 20°C</b>

# DIESEL EQUIPMENT

## Diesel filter

K9K

**IMPORTANT:** Before carrying out any work, wait for the fuel temperature to drop.

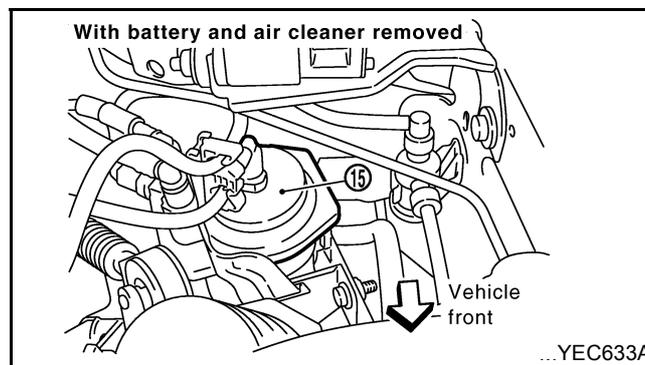
### REMOVAL - REFITTING

Disconnect the battery.

Remove fuel filter:

#### RHD models

After removing battery and air cleaner  
15 Fuel filter (RHD models)



#### LHD models

After removing front wipers, cowl top cover, front wiper motor assembly and cowl top panel/tray.

Release the diesel fuel filter from its support.

Fit the new diesel fuel filter (do not remove the plugs until the last moment).

Disconnect all the snap fasteners beginning with the three vertical snap fasteners. Prevent the snap fasteners from coming into contact with the environment.

Disconnect the pump outlet snap fastener last of all; reconnect it immediately when the new filter is installed.

Reconnect the other snap fasteners.

Prime the system using the priming bulb (automatic degassing).

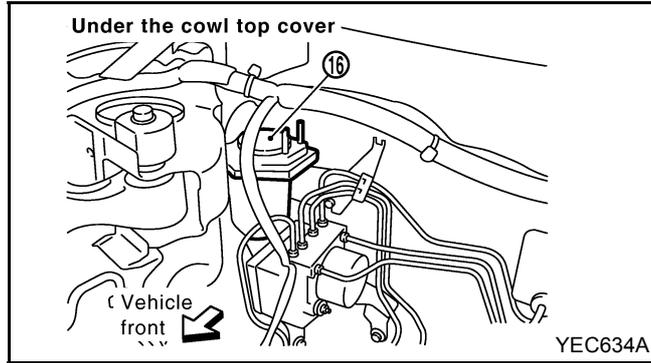
Reconnect the battery.

# DIESEL EQUIPMENT

## Diesel filter



16Fuel filter (LHD models)



# DIESEL EQUIPMENT

## High pressure pump

K9K

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

### SPECIAL TOOLING REQUIRED

Nissan No. KV113E0010 (Mot. 1566) Tool for removing and refitting high pressure pipes

### EQUIPMENT REQUIRED

Low torque wrench

High pressure pipe wrench (for example, Facom "DM19" wrench).

Pipe socket for tightening the injector-rail high pressure pipes (for example, Facom Crowfoot 18-17 wrench).

Pipe socket for tightening the pump-rail high pressure pipe (for example, Facom Crowfoot 19-17 wrench).

### TIGHTENING TORQUES (in daNm)



High pressure pipe nuts	3.8
Rail nuts	2.8 ± 0.3
Filler neck nut on the rail	2.1
High pressure pump mounting bolts	2.1 ± 2

**IMPORTANT:** Before carrying out any work, connect the CONSULT-II, set up communication with the ECM and check that the injection rail is not under pressure.

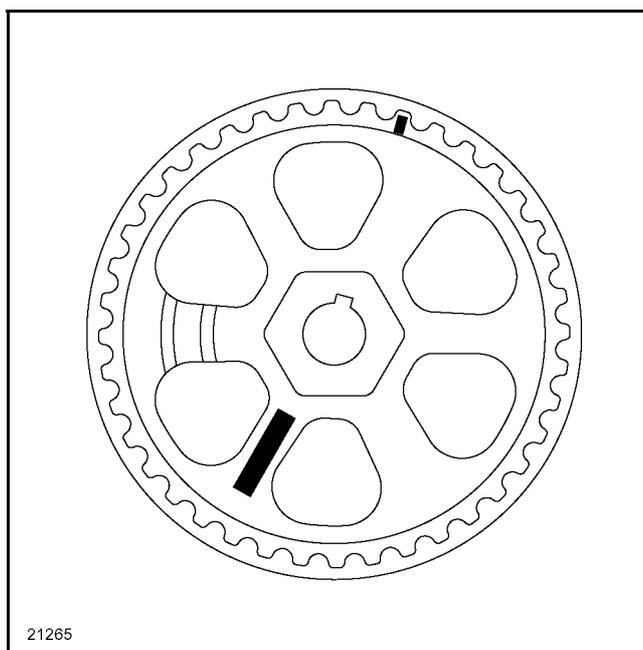
Wait until the fuel temperature drops.

Order the special high pressure injection circuit plug kit.

### REMOVAL

**YOU SHOULD FOLLOW THE CLEANNESS INSTRUCTIONS CLOSELY**

It is strictly forbidden to remove any injection pump pulley marked **number 070 575** (see diagram). If the pump is being replaced, the pulley must be replaced.



The high pressure pump may be removed after having first removed the timing belt

Disconnect the battery.

Remove:

- the neck (1) located on the fuel rail,
- the dipstick guide and plug the hole.

Undo the mounting nuts of the rail (2) a few turns.

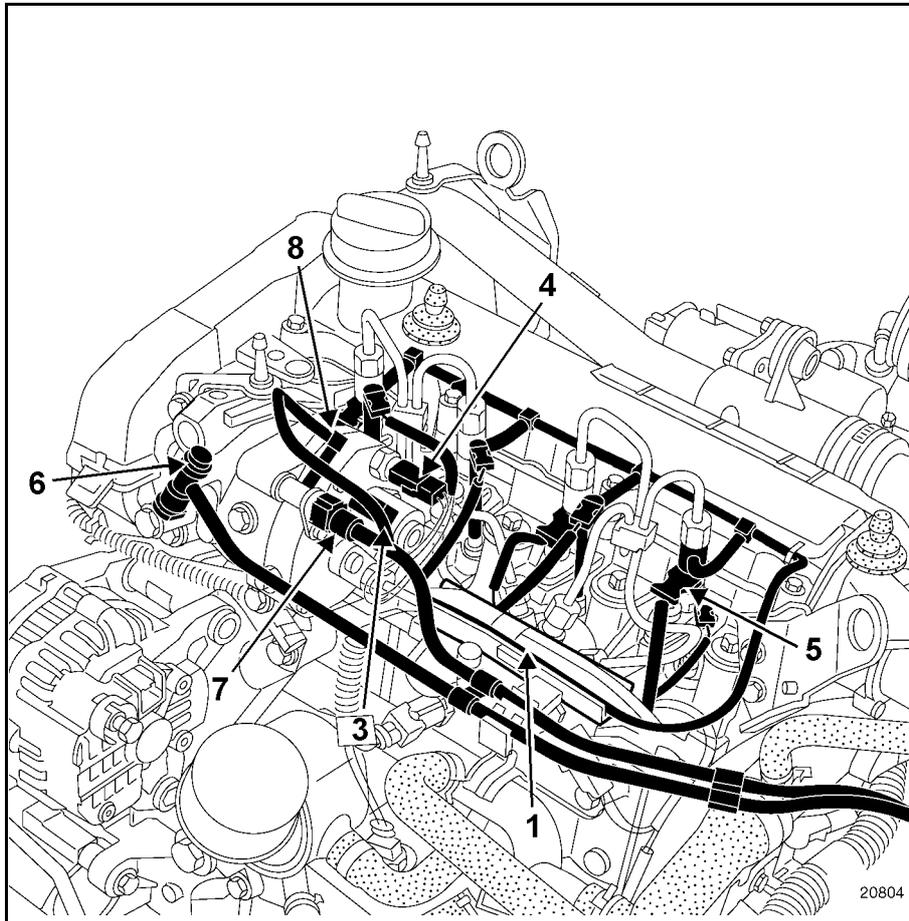
# DIESEL EQUIPMENT

## High pressure pump

K9K

Carefully disconnect:

- the connectors from the flow actuator (3) and fuel temperature sensor (4),
- the pre-heater (glow) plugs and the injectors (5),
- the return pipe (8) connecting the injector with the pump.



# DIESEL EQUIPMENT

## High pressure pump

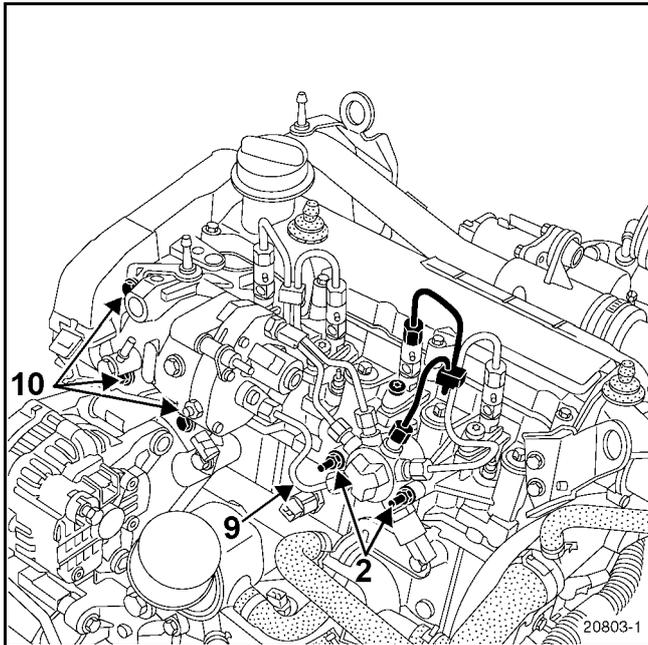
K9K

Remove the high pressure pipe (9) connecting the pump to the rail. To do this:

- undo the nut on the pump side then the nut on the rail side,
- Move the nut along the tube keeping the olive in contact with the taper.

Plug all the holes of the injection circuit.

Remove the three mounting bolts (10) from the injection pump then remove it.



### REFITTING

Fit the pump then position the mounting bolts without tightening them.

**IMPORTANT: All the high pressure pipes removed must be systematically replaced.**

Before fitting the new high pressure pipe, lightly lubricate the nut threads with the oil from the sachet provided in the new parts kit.

Refit the high pressure pipe, to do this:

- remove the protective plugs,
- insert the high pressure pipe olive into the taper of the high pressure pump outlet,
- insert the high pressure pipe olive into the taper of the high pressure rail inlet.

Finger tighten the nuts of the high pressure pipe starting with the one located on the rail side.

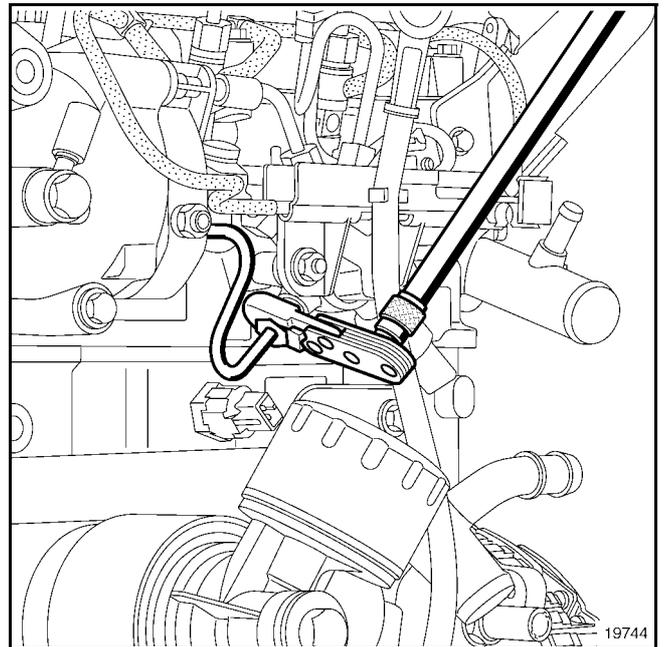
Tighten the mounting bolts (10) on the high pressure pump to a torque of **2.1 daN.m**.

**IMPORTANT: Do not touch the pipes with the wrench when torque tightening.**

Using the recommended tools, tighten the following in the order and to the torques shown:

- the nut on the rail side to **3.8 daN.m**,
- the nut on the pump side to **3.8 daN.m**,

Tighten the rail mounting nuts to a torque setting of **2.8 daNm**.



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

Test the sealing of the high pressure after it has been repaired (refer to "**Special features**").

# DIESEL EQUIPMENT

## Flow actuator

K9K

### EQUIPMENT REQUIRED

Low torque wrench

Pipe socket for tightening the high pressure pipe  
(for example, Facom Crowfoot 18-17 wrench).

### TIGHTENING TORQUES (in daNm)



Flow actuator mounting bolt

$0.55 \pm 0.06$

**IMPORTANT: Before carrying out any work,**  
connect the CONSULT-II, set up communication with  
the ECM and check that the injection rail is not under  
pressure.

Wait until the fuel temperature drops.

Order the special high pressure injection circuit plug  
kit.

# DIESEL EQUIPMENT

## Flow actuator

K9K

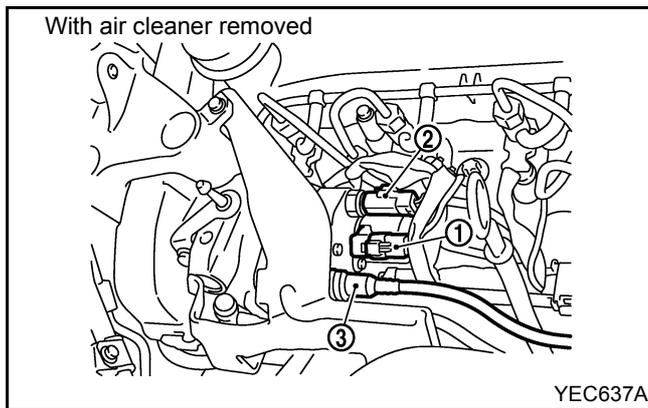
### REMOVAL

**YOU SHOULD FOLLOW THE CLEANNESS INSTRUCTIONS CLOSELY**

Disconnect the battery.

Remove the engine cover.

Disconnect the connector from the flow actuator (1) and from the fuel temperature sensor carefully (2).

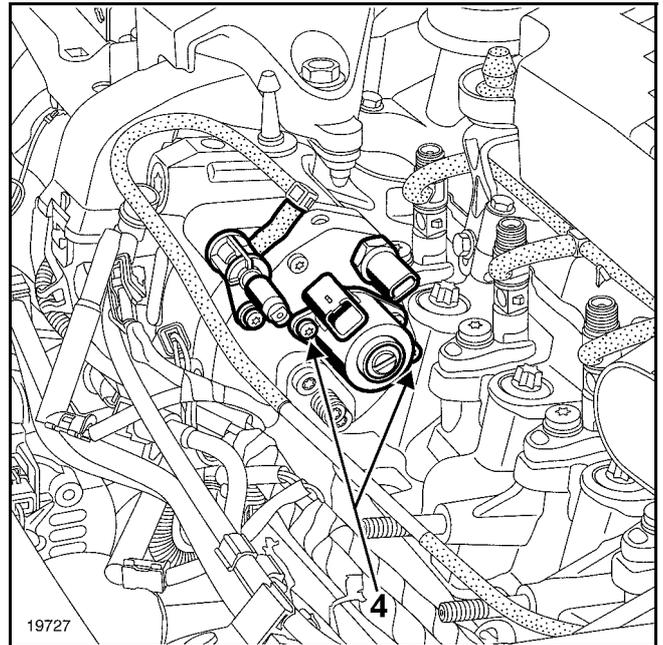


Disconnect the fuel return pipe (3).

Remove the high pressure pipe from injector no. 4 (refer to high pressure pipes).

Plug the holes in the injection circuit.

Disconnect the pre-heater plug and the injectors from cylinders 3 and 4.



Unscrew the two retaining bolts from the bracket (4).

Withdraw the flow actuator (by hand using small successive turns. Do not use the electrical connector as a lever arm).

### REFITTING

Remove the new component from its packaging just before fitting it.

**NOTE:** Do not lubricate the seals with grease or used diesel oil. Use the applicator provided in the kit for the new part.

Position the actuator. (Important: when fitting the regulator, do not mark the seal.)

Position the two mounting bolts then tighten them.

Fit a new high pressure pipe to injector no. 4 plus a new clip (refer to high pressure pipes).

Reconnect:

- the diesel return pipe,
- the electrical connectors.

# DIESEL EQUIPMENT

## Flow actuator

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

Test the sealing of the high pressure circuit after it has been repaired (refer to "**Special features**").

# DIESEL EQUIPMENT

## Fuel temperature sensor

K9K

### EQUIPMENT REQUIRED

Low torque wrench

### TIGHTENING TORQUES (in daNm)



Fuel temperature sensor	$1.5 \pm 0.15$
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**IMPORTANT: Before carrying out any work,** connect the CONSULT-II, set up communication with the ECM and check that the injection rail is not under pressure.

Wait until the fuel temperature drops.

Order the special high pressure injection circuit plug kit.

# DIESEL EQUIPMENT

## Fuel temperature sensor

K9K

### REMOVAL

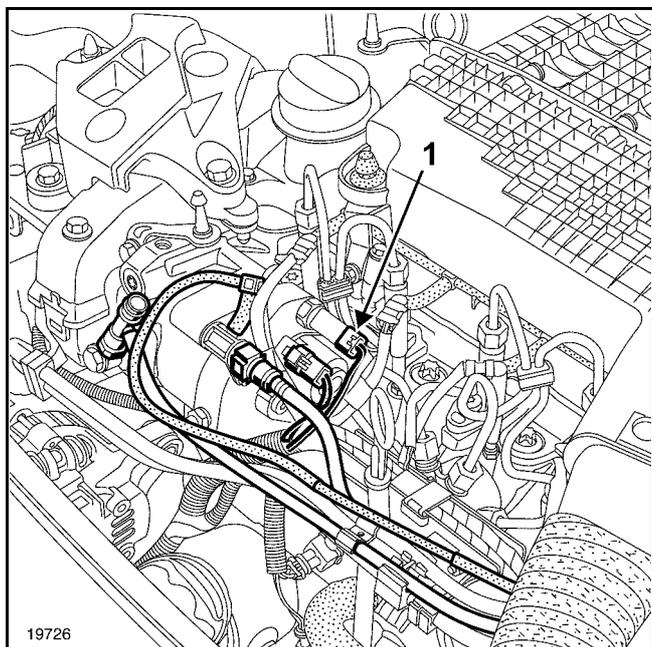
**YOU SHOULD FOLLOW THE CLEANNESS INSTRUCTIONS CLOSELY**

Disconnect the battery.

Remove the engine cover.

Disconnect the connector from the fuel temperature sensor carefully (1).

Undo then remove the fuel temperature sensor.



### REFITTING

Grease the O-ring with the lubricant from the sachet provided with the new part.

Take care not to damage the O-ring when installing the sensor.

Position the fuel temperature sensor then tighten to torque.

Reconnect:

- the electrical connector.
- the battery.

Test the sealing of the high pressure after it has been repaired (refer to "**Special features**").

# DIESEL EQUIPMENT

## Venturi

K9K

### EQUIPMENT REQUIRED

Low torque wrench

### TIGHTENING TORQUES (in daNm)



Venturi mounting bolts

$0.55 \pm 0.06$

**IMPORTANT: Before carrying out any work,** connect the CONSULT-II, set up communication with the ECM and check that the injection rail is not under pressure.

Wait until the fuel temperature drops.

Order the special high pressure injection circuit plug kit.

# DIESEL EQUIPMENT

## Venturi

K9K

### REMOVAL

**YOU SHOULD FOLLOW THE CLEANNESS INSTRUCTIONS CLOSELY**

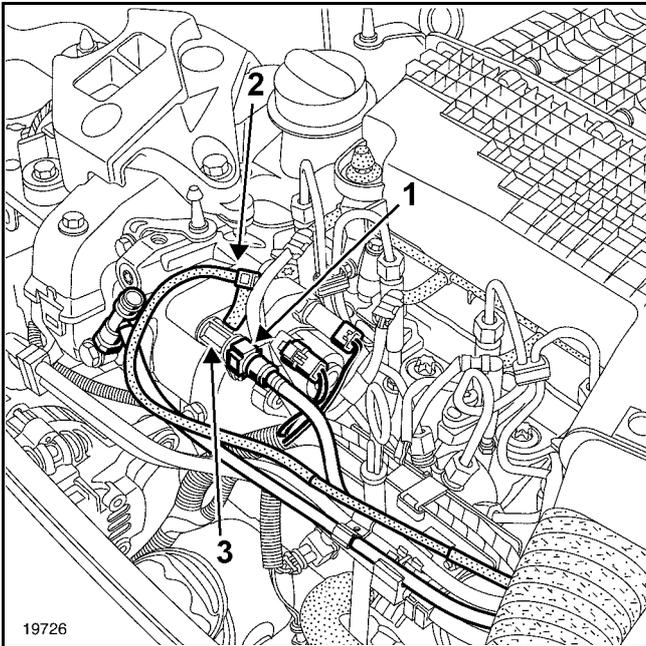
Disconnect the battery.

Remove the engine cover.

Disconnect:

- the fuel return pipe on the pump (1).
- the return pipe (2) connecting the injector with the pump.

Remove the venturi mounting bolts (3) then take it out.



### REFITTING

Grease the O-ring with the lubricant from the sachet provided with the new part.

Take care not to damage the O-ring when installing the venturi.

Position the venturi then tighten it to torque.

Reconnect the different pipes.

Test the sealing of the high pressure circuit after it has been repaired (refer to "**Special features**").

# DIESEL EQUIPMENT

## Injector rail

K9K

### SPECIAL TOOLING REQUIRED

Nissan No. KV113E0010 (Mot. 1566) Tool for removing and refitting high pressure pipes

### EQUIPMENT REQUIRED

Low torque wrench

High pressure pipe wrench (for example, Facom "DM19" wrench).

Pipe socket for tightening the injector-rail high pressure pipes (for example, Facom Crowfoot 18-17 wrench).

Pipe socket for tightening the pump-rail high pressure pipe (for example, Facom Crowfoot 19-17 wrench).

### TIGHTENING TORQUES (in daNm)



High pressure pipe nuts	3.8
Rail nuts	2.8 ± 0.3
Filler neck nut on the rail	2.1

**IMPORTANT:** Before carrying out any work, connect the CONSULT-II, set up communication with the ECM and check that the injection rail is not under pressure.

Wait until the fuel temperature drops.

Order the special high pressure injection circuit plug kit.

**IMPORTANT:** The pressure sensor cannot be separated from the rail.

# DIESEL EQUIPMENT

## Injector rail

K9K

### REMOVAL

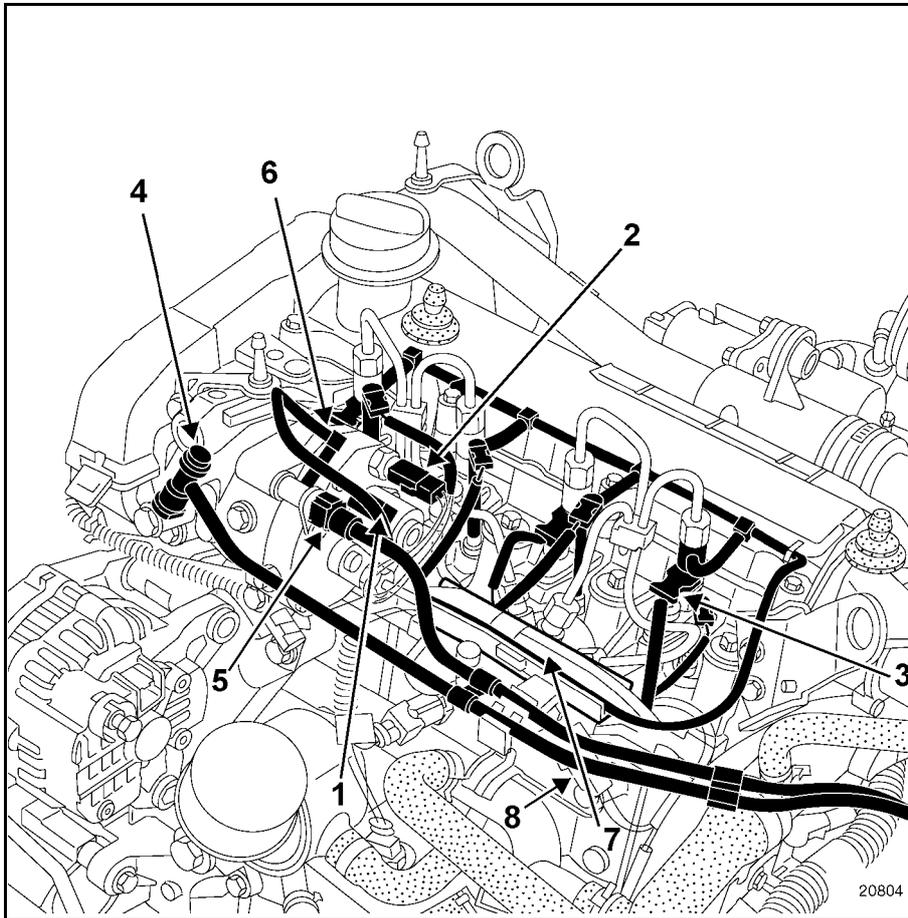
**YOU SHOULD FOLLOW THE CLEANNESS INSTRUCTIONS CLOSELY**

Disconnect the battery.

Remove the engine cover.

Carefully disconnect:

- the connectors from the flow actuator (1),
- the connectors from the fuel temperature sensor (2),
- the injector connectors (3),
- the glow (heater) plugs,
- on the pump, the fuel supply (4) and return (5) pipes.
- the return pipe (6) connecting the injectors with the pump.



Remove:

- the neck (7) located on the fuel rail,
- the dipstick guide and plug the hole.

Disconnect the pressure sensor connector from the rail (8).

# DIESEL EQUIPMENT

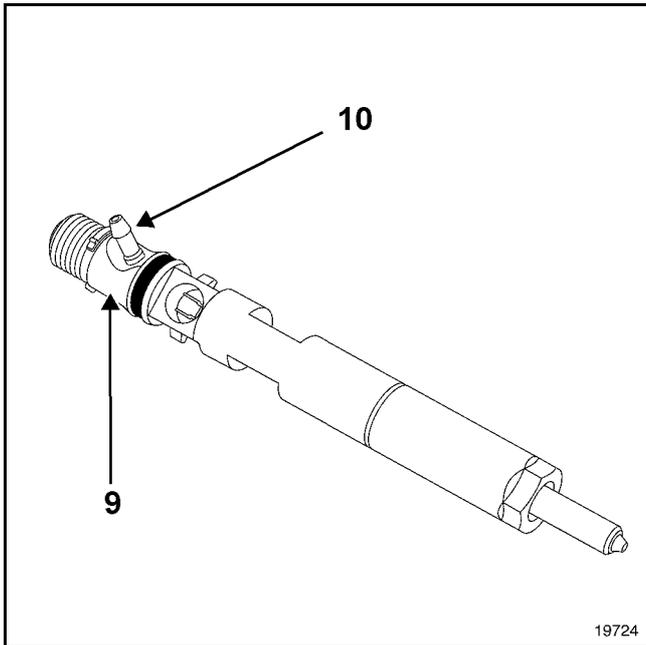
## Injector rail

K9K

Remove the clips connecting the high pressure pipes.

**IMPORTANT:** When undoing the high pressure pipes, it is essential to maintain the central union of the injector (9).

**IMPORTANT:** Do not damage the injector's leak return duct (10).



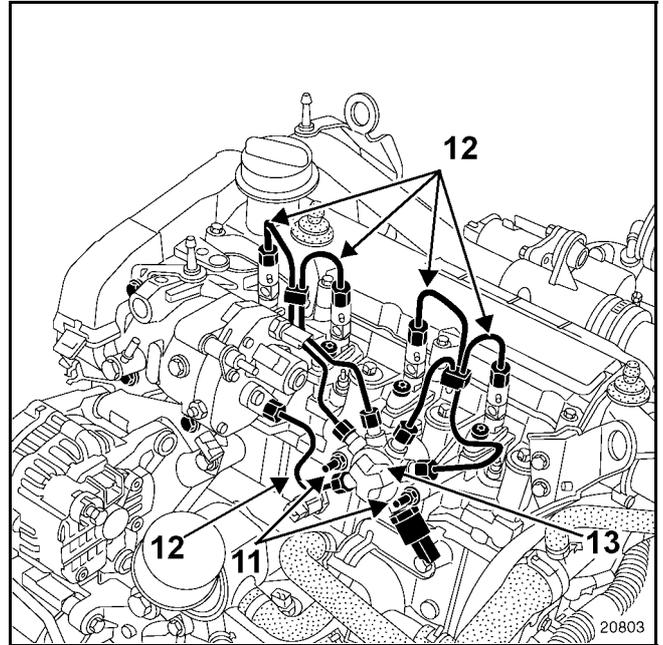
Undo the mounting nuts of the rail (11) a few turns.

**NOTE:** Undo the nut on the pump side or the injector side, then the nut located on the rail side. Undo the nuts for each pipe in turn. Move the nut along the pipe keeping the olive in contact with the taper.

Remove all the high pressure pipes (12).

Plug all the holes in the injection circuit.

Remove the rail (13).



# DIESEL EQUIPMENT

## Injector rail

K9K

### REFITTING

**IMPORTANT: All the high pressure pipes removed must be replaced as a matter of course.**

Fit a new high pressure rail on the studs.

Finger tighten the nuts.

Before fitting the new high pressure pipes, lightly lubricate the nut threads with the oil from the sachet provided in the new parts kit.

**NOTE:** Fit the pump/rail pipe before the rail/injector pipes.

#### Fit the pump-rail high pressure pipe:

- remove the protective plugs from the high pressure pump outlet, the high pressure rail inlet and the pipe.
- insert the high pressure pipe olive into the taper of the high pressure pump outlet,
- insert the high pressure pipe olive into the taper of the high pressure rail inlet.
- finger tighten the nuts of the high pressure pipe starting with the one located on the rail side.

#### Fit the rail-injector high pressure pipe:

**IMPORTANT: When tightening the high pressure pipes, it is essential to maintain the central union of the injector (10).**

- remove the protective plugs from the high pressure rail outlet, the injector high pressure inlet and the pipe.
- insert the high pressure pipe olive into the taper of the high pressure injector inlet,
- insert the high pressure pipe olive into the taper of the high pressure rail outlet.
- finger tighten the nuts of the high pressure pipe starting with the one located on the injector side.

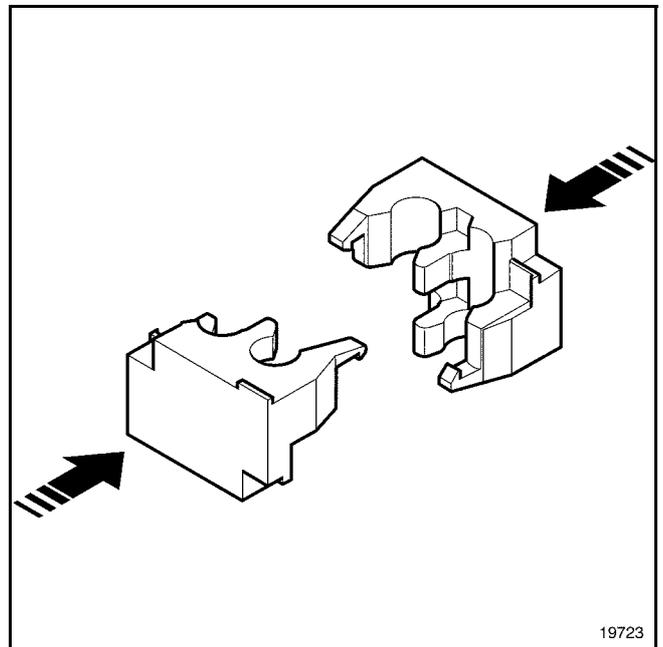
Fit the remaining high pressure pipes as you did previously.

**NOTE: The order in which the pipes are installed is not important.**

Fit the clips supplied with the new pipes onto the high pressure pipes:

- Insert the first half of the clip using adjustable pliers,
- Insert the second half of the clip using adjustable pliers.

**IMPORTANT: Pay attention to the direction of installation of the second clip. The tabs located in the centre of the clip will only fit together in one position.**



# DIESEL EQUIPMENT

## Injector rail

K9K

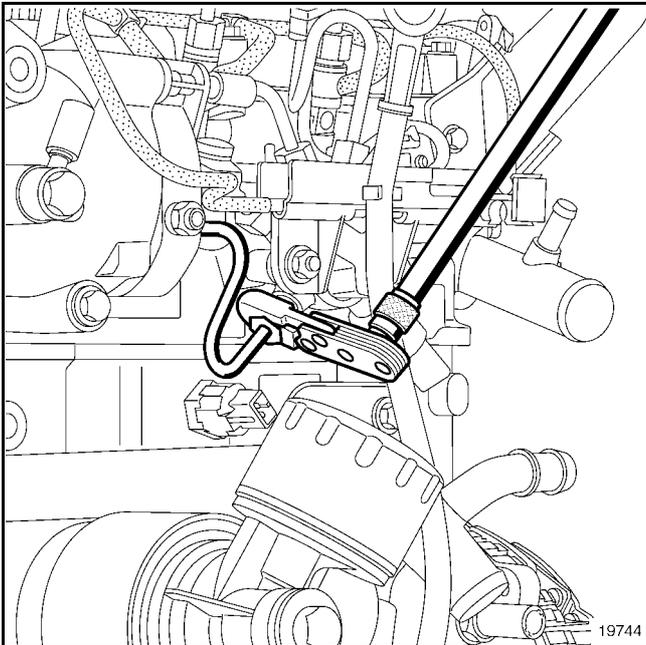
Tighten the rail nuts to a torque of **2.8 daNm**.

**IMPORTANT:** Do not touch the pipes with the wrench when torque tightening.

**IMPORTANT:** Follow the order and tightening torque of the high pressure pipes.

Using the recommended tools, tighten the nuts on the rail - pump high pressure pipe:

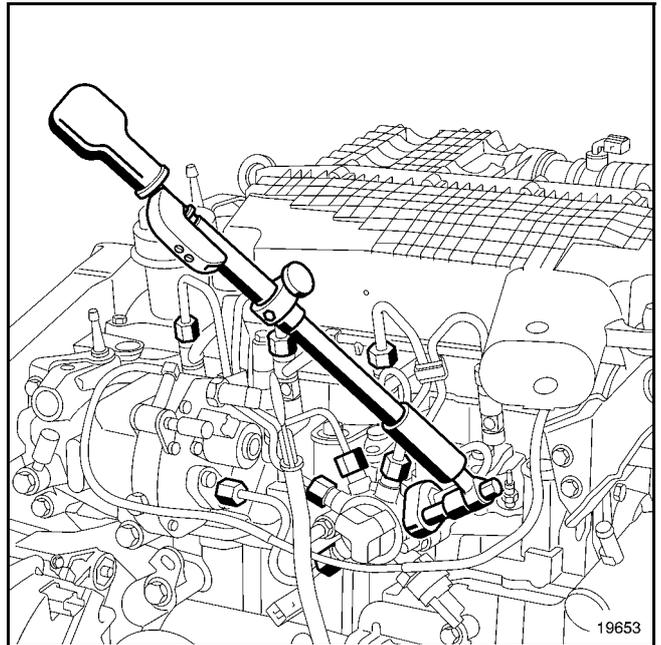
- tighten the nut on the rail side to a torque of **3.8 daN.m**.
- tighten the nut on the pump side to a torque of **3.8 daN.m**.



Using the recommended tools, tighten the nuts on the rail - injector high pressure pipes:

- tighten the nut on the injector side to a torque of **3.8 daN.m**.
- tighten the nut on the rail side to a torque of **3.8 daN.m**.

**NOTE:** Tighten one pipe fully before moving on to the next pipe.



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

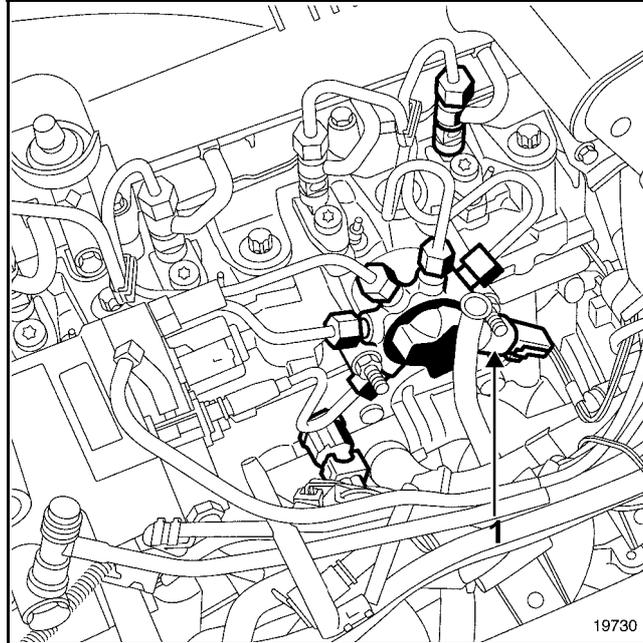
Test the sealing of the high pressure after it has been repaired (refer to "**Special features**").

# DIESEL EQUIPMENT

## Pressure sensor

K9K

The pressure sensor (1) cannot be separated from the fuel rail. If the pressure sensor malfunctions, the pressure sensor assembly - rail and high pressure pipes - must be replaced (refer to **fuel rail** section).



# DIESEL EQUIPMENT

## Injectors

K9K

SPECIAL TOOLING REQUIRED	
Nissan No. KV113E0010 (Mot. 1566)	Tool for removing and refitting high pressure pipes
EQUIPMENT REQUIRED	
Low torque wrench	
High pressure pipe wrench (for example, Facom DM19 wrench).	
Pipe socket for tightening the injector-rail high pressure pipes (for example, Facom Crowfoot 18-17 wrench).	
Pipe socket for tightening the pump-rail high pressure pipe (for example, Facom Crowfoot 19-17 wrench).	

TIGHTENING TORQUES (in daNm)		
High pressure pipe nuts	3.8	
Rail nuts	2.8 ± 0.3	
Injector mounting	2.8 ± 0.3	
Filler neck nut on the rail	2.1	

**IMPORTANT: Before carrying out any work,** connect the CONSULT-II, set up communication with the ECM and check that the injection rail is not under pressure.

Wait until the fuel temperature drops.

Order the special high pressure injection circuit plug kit.

**IMPORTANT:** It is forbidden to open an injector. If you open an injector by mistake, you will have to change it. This is because of the manufacturing and installation tolerances and because there is a risk of contaminating the inside of the injector. The rod filter of the injector must not be removed.

# DIESEL EQUIPMENT

## Injectors

K9K

### REMOVAL

**NOTE:** It is possible to replace a single high pressure pipe.

**YOU SHOULD FOLLOW THE CLEANNESS INSTRUCTIONS CLOSELY**

Disconnect the battery.

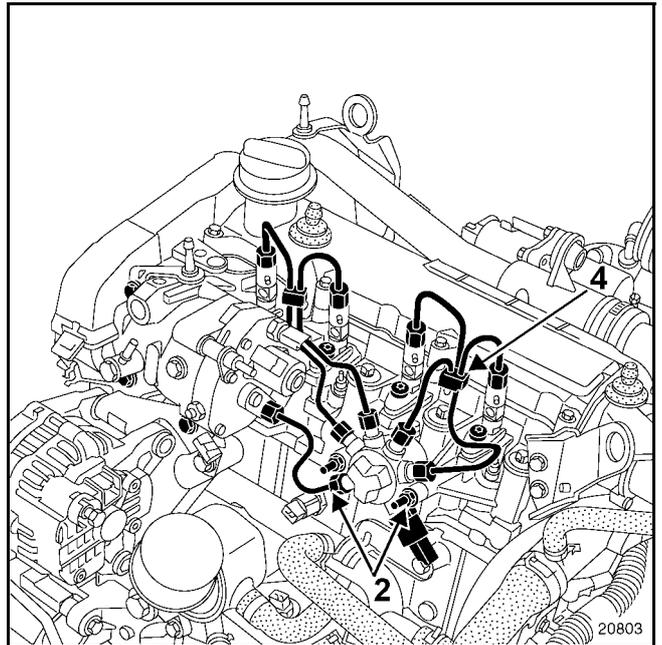
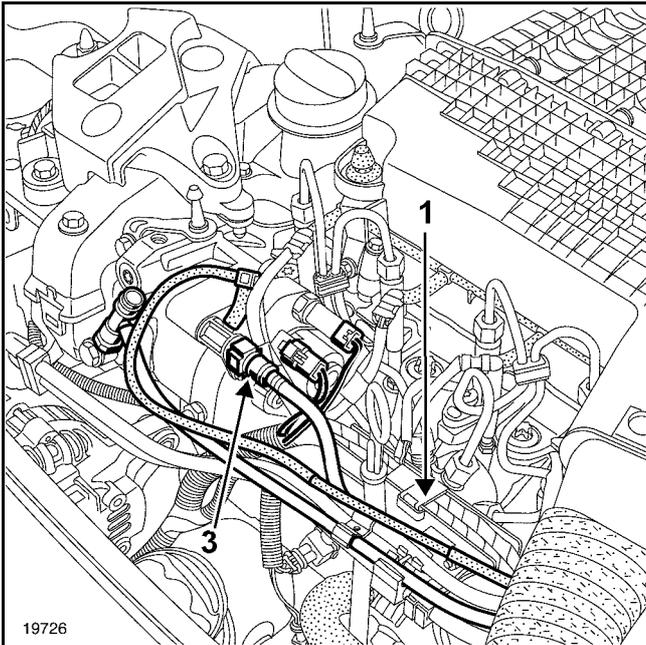
Remove:

- the engine cover,
- the neck (1) located on the high pressure rail,
- the dipstick guide then plug the hole.

Undo the mounting nuts of the rail (2) a few turns.

Disconnect:

- the fuel return pipe (3),
- the injector electrical connector.



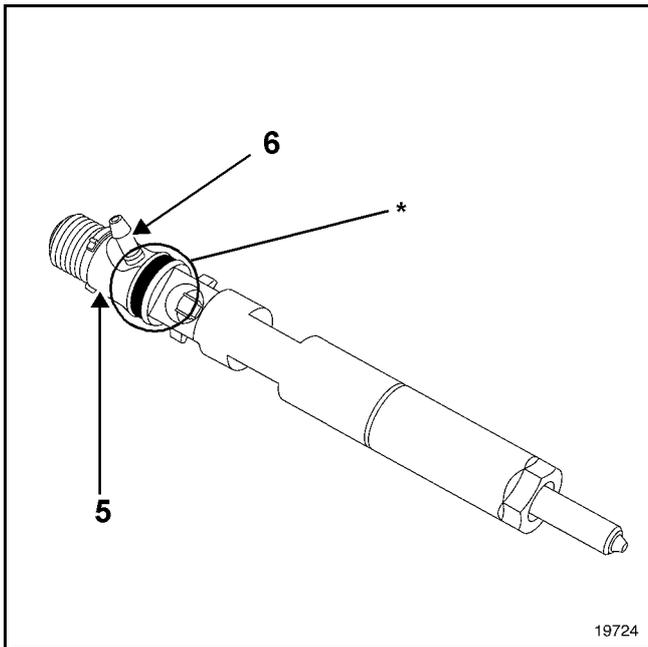
Remove the clip (4) connecting the high pressure pipes.

**IMPORTANT: When undoing the high pressure pipes, it is essential to maintain the central union of the injector (5).**

Undo the nut on the injector side, then the nut located on the rail side of the high pressure pipe.

Move the nut along the tube keeping the olive in contact with the taper.

**IMPORTANT: Do not damage the injector's leak return duct (6).**



\* 16 digit code

Remove the high pressure pipe (7).

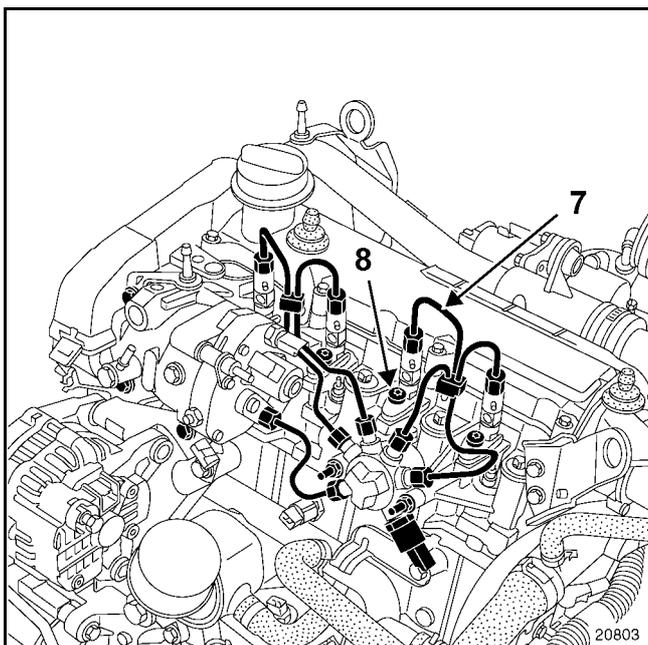
Disconnect the diesel return pipe on the injector.

Plug all the holes of the injection circuit.

Unscrew the injector bracket (8).

Remove the injector.

Pull off the flameshield washer.



### REFITTING

**NOTE:** Read the 16 digit code on the new injector before refitting it and programming the code into the ECM using the CONSULT-II (see section "Special features, Replacing injectors"). The code is unique to each injector, it specifies the flow.

Clean the injector sockets and the injector bodies, as well as their brackets using a lint-free cloth (use the wipes recommended for this purpose, dipped in clean solvent.

Dry off using a different new wipe.

Replace the flameshield washer with a new one.

Position the injector.

Tighten its mounting clamp to a torque of **2.8 daN.m**.

**IMPORTANT: All the high pressure pipes removed must be systematically replaced.**

Before fitting the new high pressure pipe, lightly lubricate the nut threads with the oil from the sachet provided in the new parts kit.

# DIESEL EQUIPMENT

## Injectors

K9K

### Fit the high pressure pipe:

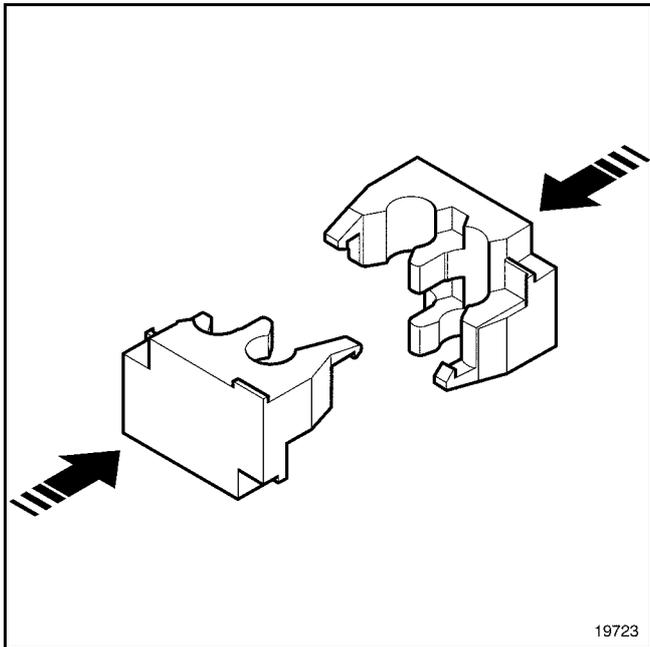
- remove the protective plugs from the rail, the injector inlet and the pipe.
- insert the high pressure pipe olive into the taper of the injector inlet,
- insert the high pressure pipe olive into the taper of the rail outlet.

Move the nut into position by hand, injector side first then the rail side.

Fit a new clip supplied with the new pipes onto the high pressure pipes:

- Insert the first half of the clip using adjustable pliers,
- Insert the second half of the clip using adjustable pliers.

**IMPORTANT: Pay attention to the direction of installation of the second clip. The tabs located in the centre of the clip will only fit together in one position.**



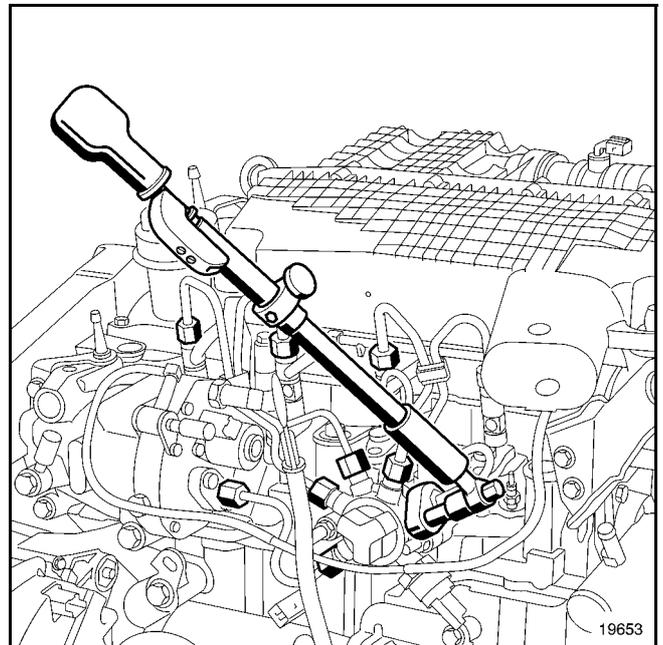
Tighten the rail nuts to a torque of **2.8 daNm**.

**IMPORTANT: Do not touch the pipes with the wrench when torque tightening.**

**IMPORTANT: When tightening the high pressure pipes, it is essential to maintain the central union of the injector.**

Using the recommended tools, tighten the following in the order and to the torques shown:

- the nut on the injector side to a torque of **3.8 daN.m**.
- the nut on the rail side to a torque of **3.8 daN.m**.



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

Test the sealing of the high pressure after it has been repaired (refer to "**Special features**").

# DIESEL EQUIPMENT

## High pressure pipes

K9K

### SPECIAL TOOLING REQUIRED

Nissan No. KV113E0010 Tool for removing and refitting high pressure pipes  
(Mot. 1566)

### EQUIPMENT REQUIRED

#### Low torque wrench

High pressure pipe wrench (for example, Facom DM19 wrench).

Pipe socket for tightening the injector-rail high pressure pipes (for example, Facom Crowfoot 18-17 wrench).

Pipe socket for tightening the pump-rail high pressure pipe (for example, Facom Crowfoot 19-17 wrench).

### TIGHTENING TORQUES (in daNm)



High pressure pipe nuts	3.8
Rail nuts	2.8 ± 0.3
Filler neck nut on the rail	2.1

**IMPORTANT: Before carrying out any work,** connect the CONSULT-II, set up communication with the ECM and check that the injection rail is not under pressure.

Wait until the fuel temperature drops.

Order the special high pressure injection circuit plug kit.

# DIESEL EQUIPMENT

## High pressure pipes

K9K

### REMOVAL

**NOTE:** It is possible to replace a single high pressure pipe.

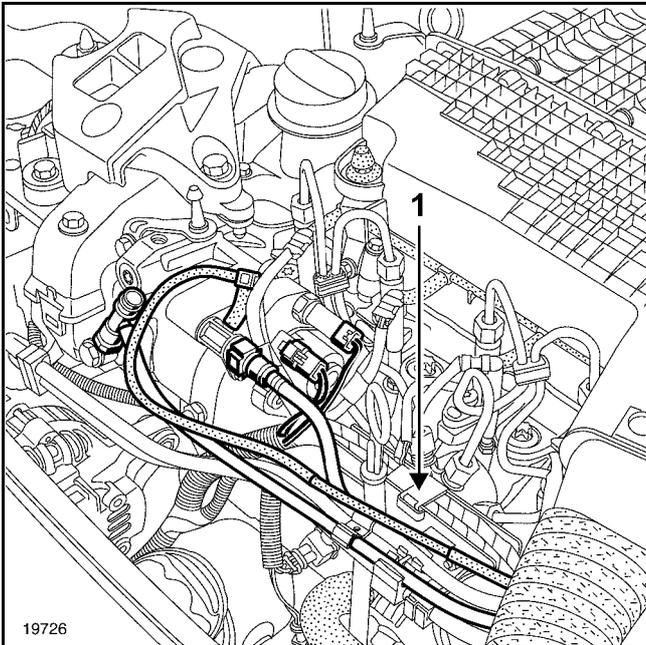
**YOU SHOULD FOLLOW THE CLEANNESS INSTRUCTIONS CLOSELY**

Disconnect the battery.

Remove:

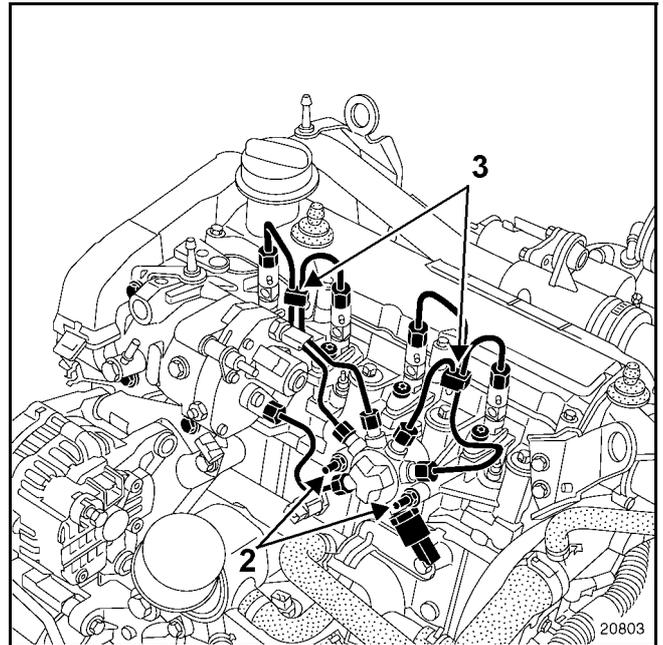
- the engine cover,
- the neck (1) located on the high pressure rail,
- the dipstick guide then plug the hole.

Undo the mounting nuts of the rail (2) a few turns.



Remove the clip (3) connecting the high pressure pipes.

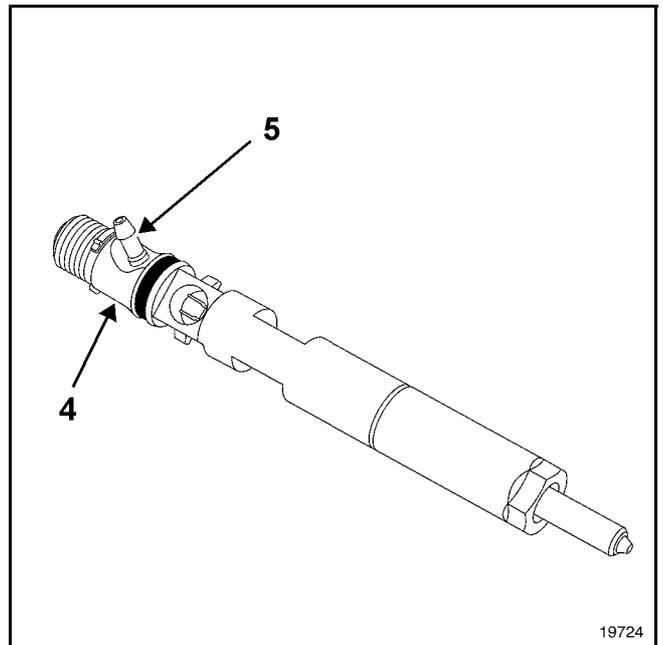
**IMPORTANT:** When undoing the high pressure pipes, it is essential to maintain the central union of the injector (4).



Undo the nut on the pump side or the injector side, then the nut located on the rail side.

Move the nut along the tube keeping the olive in contact with the taper.

**IMPORTANT:** Do not damage the injector's leak return duct (5).



Remove the high pressure pipe(s).

Plug all the holes of the injection circuit.

### REFITTING

**NOTE:** Fit the pump/rail pipe before the rail/injector pipes.

Before fitting the new high pressure pipes, lightly lubricate the nut threads with the oil from the sachet provided in the new parts kit.

#### **Fit the pump-rail high pressure pipe:**

- remove the protective plugs from the high pressure pump outlet, the high pressure rail inlet and the pipe.
- insert the high pressure pipe olive into the taper of the high pressure pump outlet,
- insert the high pressure pipe olive into the taper of the high pressure rail inlet.
- finger tighten the nuts of the high pressure pipe starting with the one located on the rail side.

#### **Fit the rail-injector high pressure pipe:**

- remove the protective plugs from the high pressure rail outlet, the injector high pressure inlet and the pipe.
- insert the high pressure pipe olive into the taper of the high pressure injector inlet,
- insert the high pressure pipe olive into the taper of the high pressure rail outlet,
- finger tighten the nuts of the high pressure pipe starting with the one located on the injector side.

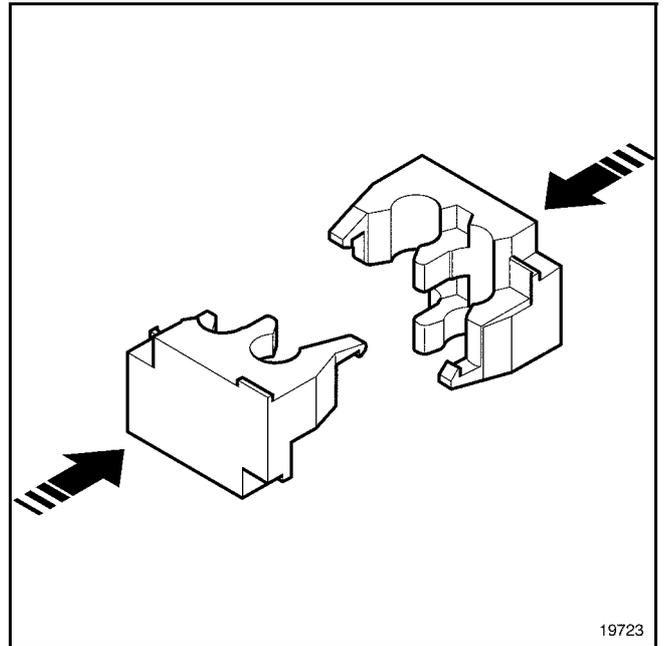
Fit the remaining high pressure pipes as you did previously.

**IMPORTANT: All the high pressure pipes removed must be systematically replaced.**

Fit a new clip supplied with the new pipes onto the high pressure pipes:

- insert the first half of the clip using adjustable pliers,
- insert the second half of the clip using adjustable pliers.

**IMPORTANT: Pay attention to the direction of installation of the second clip. The tabs located in the centre of the clip will only fit together in one position.**



# DIESEL EQUIPMENT

## High pressure pipes

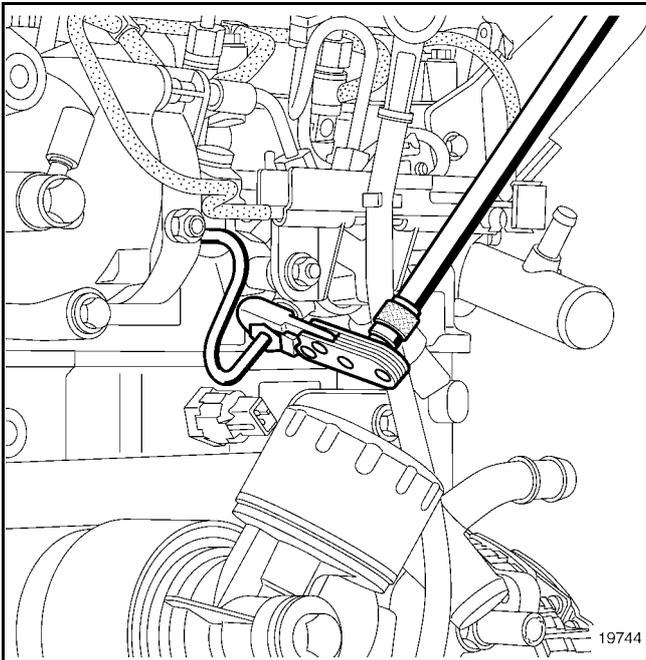
K9K

Tighten the rail nuts to a torque of **2.8 daN.m**.

**IMPORTANT: Do not touch the pipes with the wrench when torque tightening.**

Using the recommended tools, tighten the following in the order and to the torques shown:

- the nut on the pump - rail high pressure pipe starting with the one located on the rail side to a torque of **3.8 daN.m**.
- the nut on the pump side to a torque of **3.8 daN.m**.

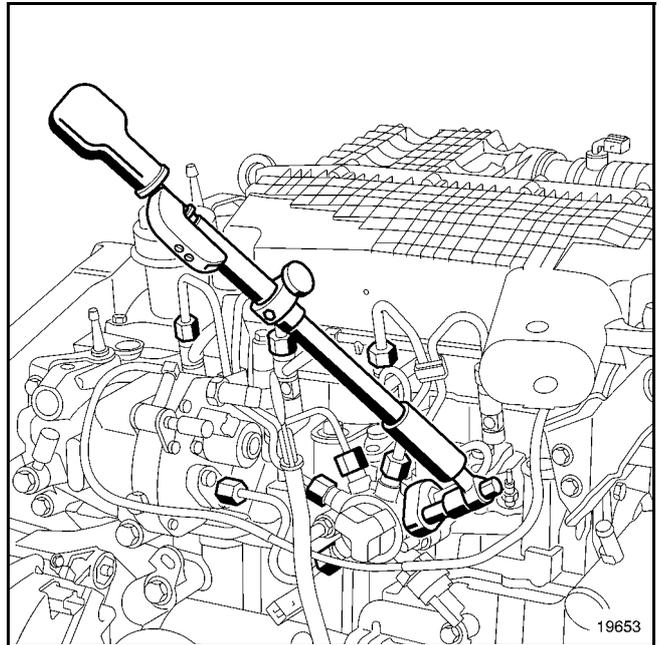


**IMPORTANT: When tightening the high pressure pipes, it is essential to maintain the central union of the injector (4).**

Using the recommended tools, tighten the following in the order and to the torques shown:

- the nut on the injector side to a torque of **3.8 daN.m**.
- the nut on the rail side to a torque of **3.8 daN.m**.

**NOTE: Tighten one pipe fully before moving on to the next pipe.**



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

Test the sealing of the high pressure after it has been repaired (refer to "**Special features**").

# DIESEL EQUIPMENT ECM

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**NOTE:** When replacing an ECM, it is necessary to program the individual injector correction and the other vehicle configurations using CONSULT-II.

## REPLACING THE ECM

**Before an ECM is replaced in after-sales, the following must be checked using CONSULT-II:**

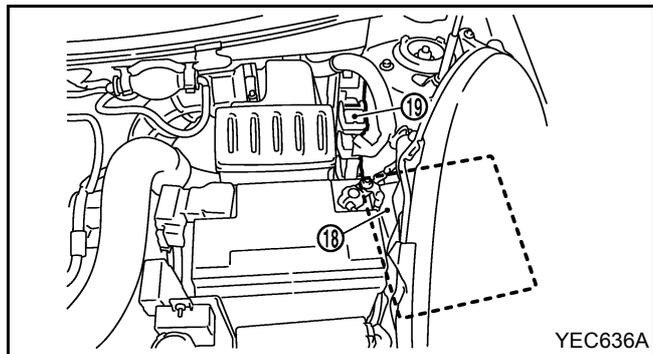
- Injectors individual correction value (16 digit code)
- System configuration

## REMOVAL

Disconnect:

- the battery,
- the ECM harness connectors.

Remove the mounting nuts from the ECM (19).



## REFITTING

Fit the new ECM, taking care to engage the positioning tab, then fit the ECM on its mounting studs.

Tighten the ECM mounting nuts.

Reconnect the ECM.

Connect the battery.

Turn the engine on and read the DTC using the CONSULT-II.

If necessary repair the DTC that appear then clear them.

Check that the vehicle is operating correctly.

# DIESEL INJECTION

## Immobilizer function

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**K9K**

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

### REPLACING THE ECM

The ECM are supplied without a code but they must all be programmed with one.

If an ECM is replaced, it must be programmed with the code of the vehicle and the correct operation of the engine immobilizer function must be checked. (Refer to BL section.)

#### **WARNING:**

These vehicles have a special ECM which does not function unless it is coded.

Consequently, it is strongly recommended that you do not carry out tests using ECMs borrowed from the warehouse or on another vehicle to prevent coding and uncoding problems which may leave the ECM useless.

### UNCODING PROCEDURE

If the ECM has learnt a code and must be returned to the workshop it is imperative that you uncode it before removing it. (See the repair manual or the engine immobilizer TSB).

# DIESEL INJECTION

## Idle speed adjustment

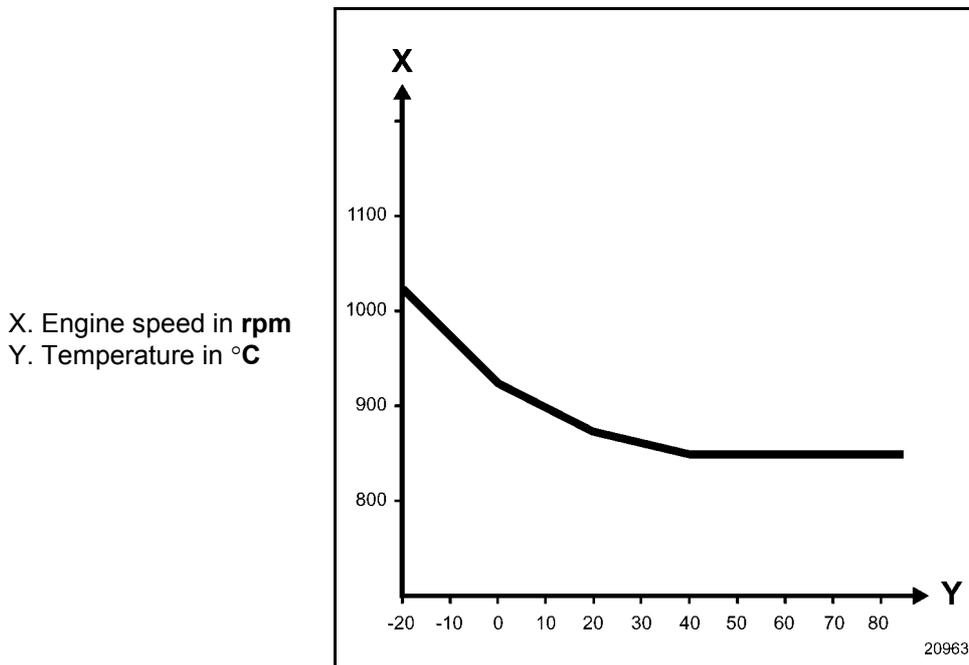
K9K

The ECM takes over calculation of the idle speed to maintain the idle speed at the recommended level and to compensate for any variation in the mechanical or electrical couple as regards:

- the engine coolant temperature,
- battery voltage,
- the gear selected on the transmission,
- the electrical consumers (climate control system, cooling fan assembly etc.),
- any malfunctions found.

At the engine operating temperature, without high electrical consumer, the idle speed is  $800 \pm 50$  rpm.

### IDLE SPEED CORRECTION ACCORDING TO ENGINE COOLANT TEMPERATURE



### SPEED ADJUSTMENT WHEN THERE IS AN ACCELERATOR PEDAL POSITION SENSOR (POTENTIOMETER) MALFUNCTION

- If one or both terminals of the accelerator pedal position sensor (potentiometer) are suspected, the ECM overrides the idle speed to maintain it at **1300 rpm**. This defect mode limits performance. The orange injection warning light lights up and flashes.
- If the accelerator pedal position sensor (potentiometer) is blocked, is no longer being supplied, or is not transmitting an output signal, the ECM overrides the idle speed to maintain it at **1300 rpm**. This mode limits performance. The orange injection warning light lights up and flashes.
- In both cases, when the brake pedal is depressed, the idle speed is stabilised at the **recommended speed**.
- If the information from the accelerator pedal position sensor (potentiometer) and the brake switch information does not correspond, the speed is changed to **1300 rpm**.

# DIESEL INJECTION

## Idle speed adjustment

K9K

### IDLE SPEED ADJUSTMENT WHEN THERE IS AN INJECTOR CODE MALFUNCTION

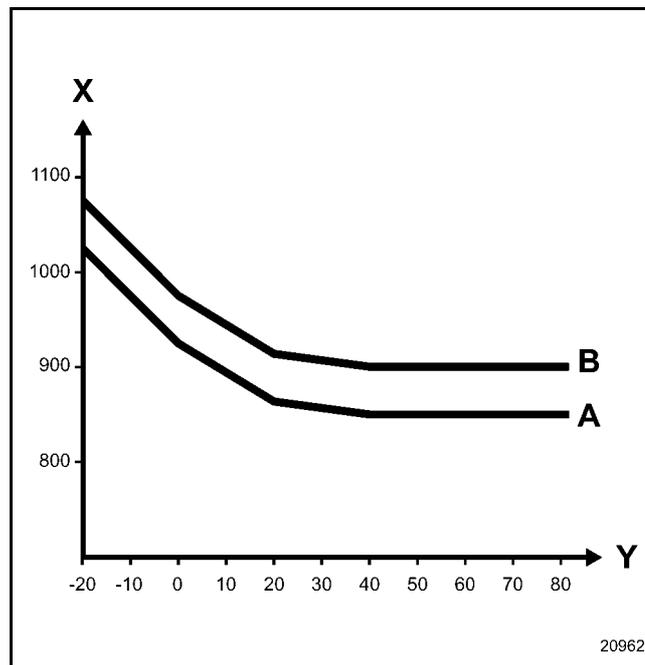
When there is an injector code malfunction, the ECM overrides the idle speed to maintain it at **1300 rpm**. This mode limits performance. The orange injection warning light lights up and flashes.

### CORRECTION OF THE IDLING SPEED ACCORDING TO THE GEAR RATIOS

The idling speed is modified according to the gear selected in the transmission:

- **in neutral, 1<sup>st</sup> and 2<sup>nd</sup> gear**, the speed is (at the engine operating temperature) **850 rpm** (graph A),
- **for the other gears**, the speed is (at the engine operating temperature) **900 rpm** (graph B).

X. Engine speed in rpm  
Y. Temperature in °C



# DIESEL INJECTION

## Air conditioning control

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K9K

### AIR CONDITIONING CONTROL

The compressor is a variable displacement type.

The air conditioning relays are controlled by wires:

### COMPRESSOR OPERATION PROGRAMMING

During certain stages of operation, the ECM stops the compressor from functioning.

#### Engine starting program

The compressor is prevented from operating for **4 seconds** after the engine has started.

#### Thermal protection program

The compressor is not engaged when the engine temperature is higher than **115 °C** or from **110 °C** at high speed, **4500 rpm** for more than **3 seconds**.

#### Fan assembly control programming

At idling speed and also when driving, with the air conditioning activated, the speed of the fan assembly is determined according to the refrigerant fluid pressure and the vehicle speed.

# DIESEL INJECTION

## Air conditioning control

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**K9K**

### **Recovery of performance**

When pressure is applied to the accelerator pedal above **70%**, the compressor is disengaged for **5 seconds**.

### **Recovery of output when the vehicle starts moving**

In order to help the vehicle move off, the air conditioning compressor is disengaged if the position of the accelerator pedal is above **35 %** and the idling speed less than **1250 rpm**.

### **Anti-stall protection**

The compressor is disengaged if the engine speed is lower than **750 rpm**.

### **Engine overspeed timed protection program**

The compressor is disengaged when the speed reaches **4500 rpm** for more than **3 seconds**.

**NOTE:** The time between the compressor being disengaged twice is always greater than **10 seconds**.

# DIESEL INJECTION

## Pre/postheating (glow plug) control



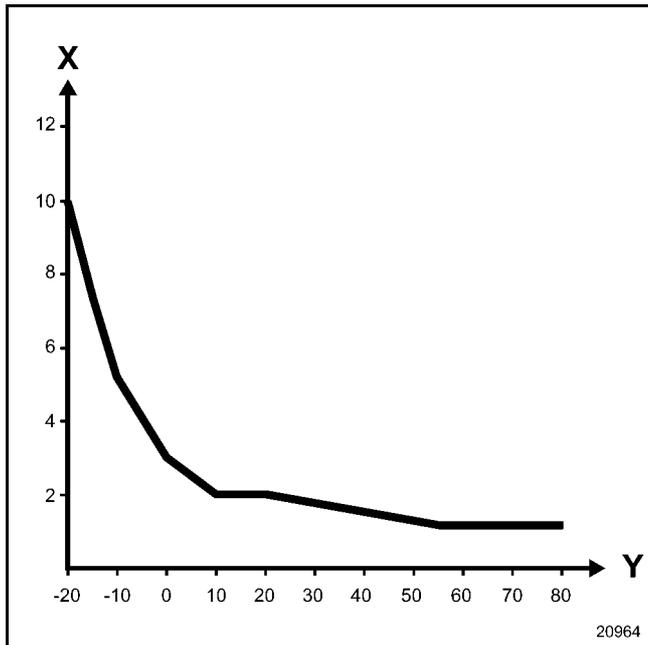
The pre/postheating function is controlled by the preheating unit.

### PRE/POSTHEATING (glow plug) OPERATING PRINCIPLE

#### 1) Ignition on "preheating"

##### a) Variable preheating

The time period for the warning light to light up and the feed to heater plugs depends on the coolant temperature and the battery voltage.



X. Time in seconds  
Y. Temperature in °C

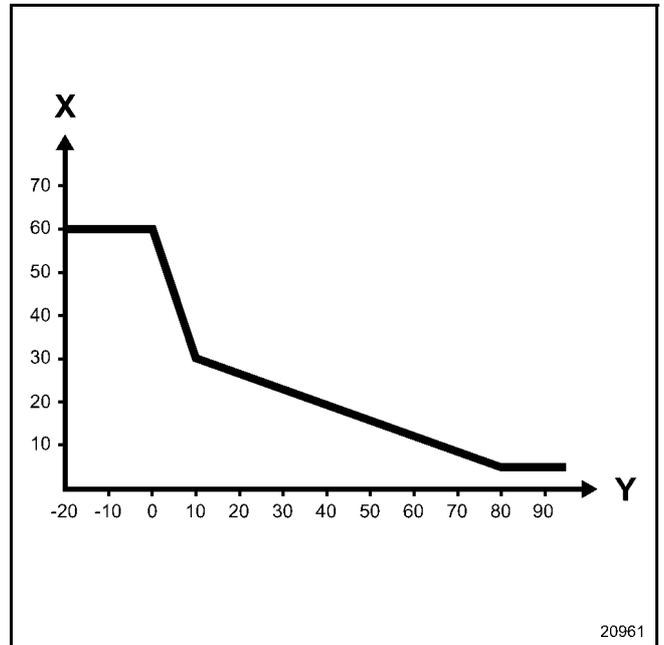
Whatever the situation, the preheating warning light cannot be lit for more than **15 seconds** (except in the event of an engine coolant temperature sensor malfunction).

##### b) Fixed preheating

After the warning light goes out the plugs remain supplied for a fixed period of **5 seconds**.

#### 2) "Post heating" with the engine running

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



X. Time in seconds  
Y. Temperature in °C

For idle speed without pressing the accelerator pedal.

# DIESEL EQUIPMENT

## Glow plugs

K9K

The resistance of a glow plug is **0.6  $\Omega$** .

TIGHTENING TORQUE (in daNm)	
Glow plug	1.5

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

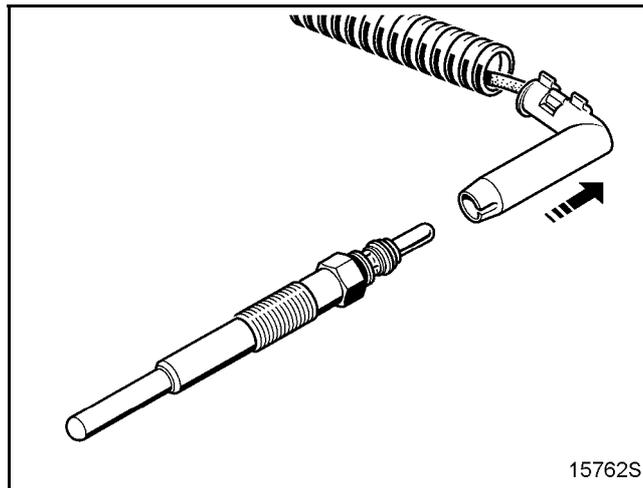
### REMOVAL

Disconnect the battery.

Unclip the plug connector.

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

Loosen and remove the plugs.



To undo the plug on cylinder 4 use a **10 mm** long radio socket attached to a universal joint. Once the plug is loosened use a hose to unscrew it completely.

### REFITTING

Proceed in the reverse order to removal.

# DIESEL EQUIPMENT

## Engine coolant temperature

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K9K

The cooling fan unit is controlled by the ECM.

### COOLING FAN ASSEMBLY OPERATION WITH THE ENGINE RUNNING

The cooling fan assembly is controlled:

- at slow speed if the engine coolant temperature exceeds **99°C** or if there is an engine coolant temperature sensor malfunction, and is switched off when the temperature falls below **96°C**.
- at high speed if the engine coolant temperature exceeds **102°C** or if there is a low speed malfunction, and is switched off when the temperature falls below **99°C**.

The cooling fan assembly low and high speeds are controlled when the air conditioning function is selected on the instrument panel.

If the low speed setting is suspected, the high speed setting operates under the low speed conditions.

### OPERATION OF THE ENGINE COOLANT TEMPERATURE WARNING LIGHT

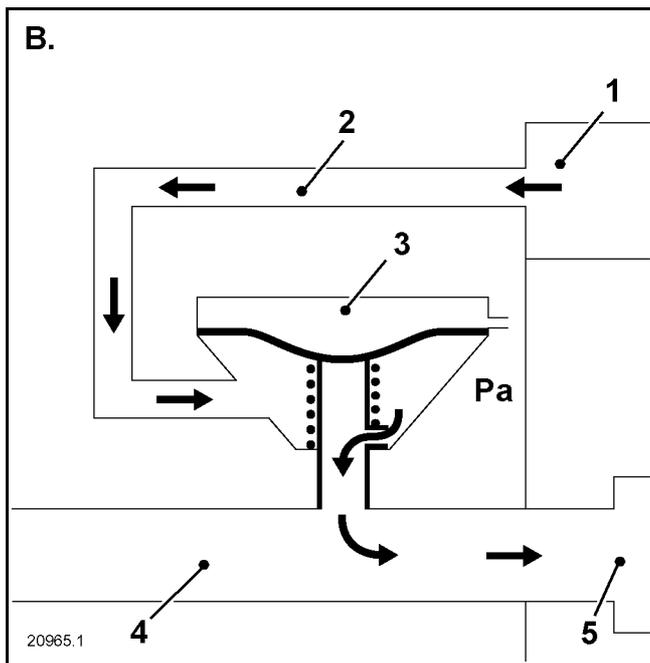
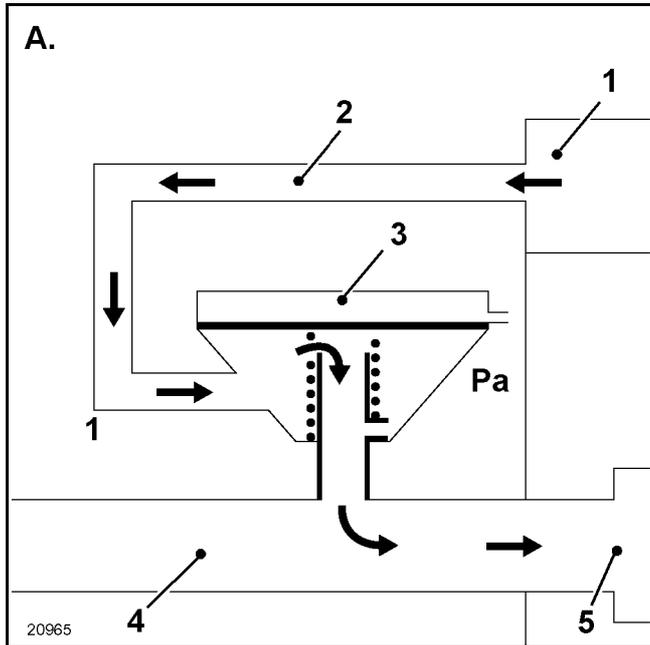
The engine coolant temperature warning light remains lit if the engine coolant temperature exceeds **114°C**. It goes out when the temperature falls below **111°C**.

# ANTI-POLLUTION

## Oil vapour rebreathing



### CIRCUIT DIAGRAM



- 1 Cylinder head cover
- 2 Oil vapour rebreathing duct
- 3 Oil vapour recirculation valve
- 4 Air inlet duct
- 5 Turbocharger
- Pa Atmospheric pressure

A. When there is a low charge, the vacuum in the air intake duct is below the spring set point. The oil vapours are extensively rebreathed by the vacuum in the air intake duct.

B. When there is a medium or high charge, the pressure in the air intake duct exhausts the valve diaphragm, the oil vapours are rebreathed in small quantities via a calibrated hole.

### CHECKING

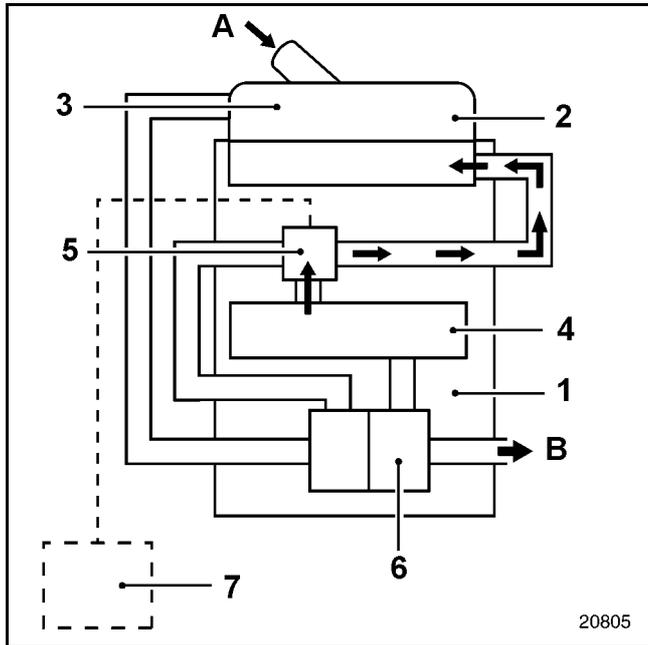
To ensure the correct operation of the anti-pollution system, the oil vapour rebreathing circuit must be kept clean and in good condition.

# ANTI-POLLUTION

## Exhaust gas recirculation (EGR)

K9K

### CIRCUIT DIAGRAM



- 1 Engine
- 2 Air filter unit
- 3 Air distributor
- 4 Exhaust manifold
- 5 EGR unit with solenoid valve
- 6 Turbocharger
- 7 ECM
- A Air inlet
- B Exhaust gas outlet

### PURPOSE OF THE EGR SYSTEM

Exhaust gas recirculation is used to reduce the nitrogen oxide (NO<sub>x</sub>) content of the exhaust gases.

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

# DIESEL INJECTION

## Trouble diagnosis - Introduction

K9K

### 1. SCOPE OF THIS DOCUMENT

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

Vehicle(s): K12 with K9K

*Function concerned:* DELPHI K9  
DIESEL DIRECT COMMON RAIL  
INJECTION (DDCR)

Name of ECM: DDCR INJECTION

Program No.: BE 88

VDIAG No.: 44

### 2. PREREQUISITES FOR TROUBLE DIAGNOSIS

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

#### Documentation type

##### Diagnostic procedures:

- Assisted with CONSULT-II, Service Manual.
- Wiring diagrams.

#### Special tool required PLUGGED RAIL tools

### 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 corresponding DTC trouble diagnosis.

# DIESEL INJECTION

## Trouble diagnosis - Introduction

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

If the DTC is **confirmed** when the instructions in the **Notes** section are applied, the malfunction is present. Deal with the DTC.

If the DTC is not confirmed, 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 inconsistent. This phase therefore allows:

- 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 data monitor value is outside permitted tolerance values, you should consult the corresponding trouble diagnosis page.

### Customer complaints - trouble diagnosis

If the test with the CONSULT-II is OK, but the customer complaint still present, the malfunction should be treated by **customer complaints**.

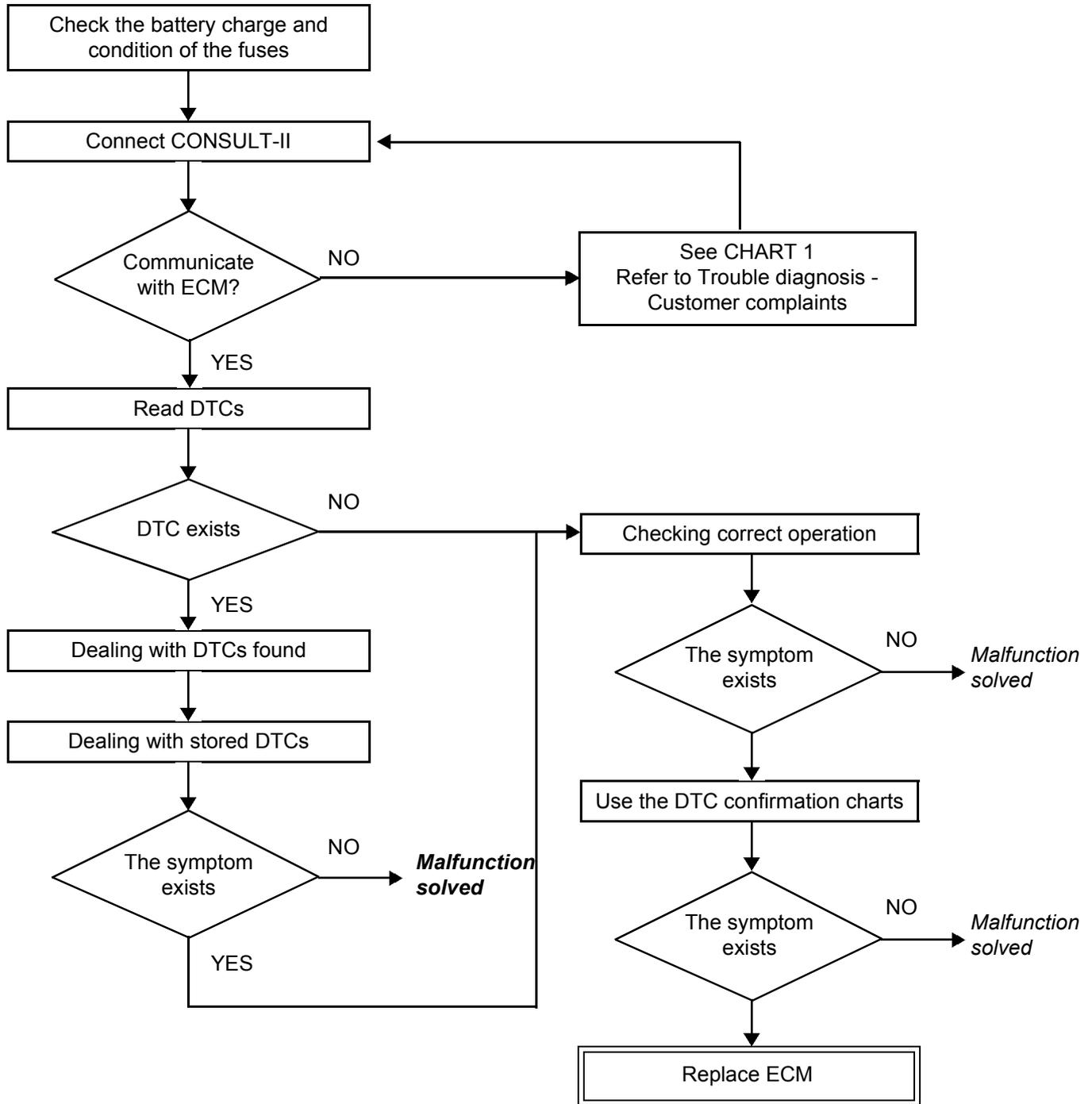
**A synopsis of the general procedure to follow is provided on the next page in the form of a flow chart.**

# DIESEL INJECTION

## Trouble diagnosis - Introduction



### 4. DIAGNOSTIC PROCEDURE



# DIESEL INJECTION

## Trouble diagnosis - Introduction

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### 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.

**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. This means that no impurities (particles a few microns in size) get into 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.**

**- 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.

# DIESEL INJECTION

## Trouble diagnosis - Introduction

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K9K

### 5. SAFETY INSTRUCTIONS (CONTINUED):

#### **Instructions to be followed before any work is carried out on the injection system:**

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

# DIESEL INJECTION

## Trouble diagnosis - Introduction

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### 5. SAFETY INSTRUCTIONS (CONTINUED):

#### 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.

# DIESEL INJECTION

## Trouble diagnosis - Introduction

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K9K

### 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 "DDCR" type **112-terminals DELPHI** made ECM.

The system consists of:

- a priming bulb 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 pressure sensor located in the rail,
- four solenoid injectors,
- a fuel temperature sensor,
- an engine coolant temperature sensor,
- an intake air temperature sensor,
- a camshaft position sensor,
- a crankshaft position sensor,
- a turbocharger boost pressure sensor,
- a knock sensor (accelerometer),
- an EGR control valve,
- an accelerator pedal position sensor,
- an ECM,
- a mass air flow sensor,

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

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

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

# DIESEL INJECTION

## Trouble diagnosis - Introduction

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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 EGR control into the intake manifold,
- the fuel supply monitoring (advance, flow and common rail pressure),
- the cooling fan,
- the air conditioning,
- the glow plug control (pre/post heating),

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.

Before discharging the rail using the injector valves, the valves are controlled by short electrical impulses: short enough not to open the injector, (passing through the return circuit from the injectors), and long enough to open the valves and discharge the rail.

The fan assembly and coolant temperature warning light on the instrument panel are controlled by the ECM (centralised coolant temperature management function).

# DIESEL INJECTION

## Trouble diagnosis - Introduction

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K9K

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 1400 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.

Removal of the internal parts of the pump and injectors is prohibited. Only the fuel flow actuator, the fuel temperature sensor and the venturi can be replaced.

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

It is not possible to remove the common rail fuel pressure sensor from the fuel rail because this may cause circuit contamination malfunction. 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.

Applying 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.

It is essential to replace all the disconnected air inlet plastic pipes.

# DIESEL INJECTION

## Trouble diagnosis - Introduction

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### 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 malfunctions.

#### Cold loop air conditioning control:

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

- Authorising requests for cold according to passenger compartment, refrigerant pressure, coolant temperature.
- 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.

The driver asks for the air conditioning to be switched on using the air conditioning switch. This request for cold air is either authorised or not, depending on the measured pressure. If this pressure is outside the operating limits, the cold loop strategy is not activated.

**Note:**

Requests to operate the fan assembly can be made by the ECM but these are sent on the CAN. These requests depend on the air conditioning but also on the coolant temperature and vehicle speed.

Thermal regulation of the passenger compartment heating circuit:

In a direct injection engine, fuel is injected directly into the combustion chamber. This leads to heat being lost through the upper part of the engine and consequently, the cylinder head cooling circuit is smaller in size.

The effect of this is that the temperature of the coolant which flows through this circuit rises more slowly. However, this coolant is used by the passenger compartment heating system. In very cold conditions, it is therefore difficult to reach a comfortable passenger compartment temperature quickly.

# DIESEL INJECTION

## Trouble diagnosis - Introduction

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### WARNING LAMP 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.

After preheating and an automatic 3 second off period, the warning light will come on if a level 1 malfunction occurs (leading to reduced operation and reduced safety levels). 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 or a level 2 malfunction.

If the malfunction reaches a critical level, 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.

### PROGRAMMING OF WARNING LIGHTS ON THE INSTRUMENT PANEL:

#### Orange SERVICE warning light (level 1):

This warning light comes on and is **accompanied by the injection faulty message**.

The driver should carry out repairs as soon as possible.

#### Red STOP warning light (level 2):

This warning light comes on and is **accompanied by the injection malfunction message**.

The driver should carry out repairs as soon as possible.

#### Excess pollution orange OBD warning light:

This warning light, in the form of an engine symbol, comes on for about 3 seconds when the ignition is switched on then goes out. It never comes on when the engine is running.

# DIESEL INJECTION

## Trouble diagnosis - ECM terminal

**K9K**

### CONNECTION

ECM harness connector (E61), 32-terminals

Terminal No.	Item
1	CAN H
2	K-line (Data link connector)
3	Not used
4	Not used
5	Stop lamp switch
6	Accelerator position sensor 2 ground
7	CAN L
8	Not used
9	Not used
10	Not used
11	Not used
12	Accelerator position sensor 2 signal
13	Not used
14	Not used
15	Not used
16	Not used
17	Not used
18	Accelerator pedal position sensor 2 power supply
19	Not used
20	Not used
21	Not used
22	Ignition switch signal
23	Not used
24	Not used
25	Not used
26	Not used
27	Not used
28	Accelerator position sensor 1 ground
29	Accelerator position sensor 1 power supply
30	Accelerator position sensor 1 signal
31	Not used
32	Not used

ECM harness connector (F134), 48-terminals and 32-terminals

Terminal No.	Item
33	Not used
34	APP sensor shield ground
35	Not used
36	Not used
37	Not used
38	EGR volume control valve
39	Fuel flow actuator
40	Not used
41	Knock sensor (accelerometer) shield ground
42	Not used
43	Not used
44	Knock sensor (accelerometer) power supply
45	Knock sensor (accelerometer ground)
46	Not used
47	Common rail pressure sensor power supply
48	Turbocharger boost pressure sensor power
49	EGR volume control solenoid valve
50	Not used
51	Intake air temperature sensor power supply
52	Turbocharger air temperature sensor power supply
53	Engine coolant temperature sensor power supply
54	Fuel temperature sensor power supply
55	Crankshaft position sensor power supply
56	Camshaft position sensor
57	Common rail fuel pressure sensor
58	Turbocharger boost pressure sensor
59	EGR volume control valve
60	Not used
61	Intake air temperature sensor ground
62	Turbocharger air temperature sensor ground (models without intercooler)
63	Engine coolant temperature sensor ground
64	Fuel temperature sensor ground
65	Crankshaft position sensor ground
66	Camshaft position sensor ground
67	Common rail fuel pressure sensor ground
68	Turbocharger boost pressure sensor ground (models without intercooler) Turbocharger boost pressure and temperature sensor's ground (models with intercooler)
69	EGR volume control valve
70	Not used

# DIESEL INJECTION

## Trouble diagnosis - ECM terminal

K9K

### CONNECTION

ECM harness connector (F134), 48-terminals and 32-terminals (continued)

Terminal No.	Item
71	Not used
72	Not used
73	Injector 2 ground
74	Injector 2 power supply
75	Injector 4 ground
76	Injector 4 power supply
77	Injector 3 ground
78	Injector 3 power supply
79	Injector 1 ground
80	Injector 1 power supply
81	Not used
82	Not used
83	Refrigerant pressure sensor power supply
84	Not used
85	Not used
86	Not used
87	Not used
88	Not used
89	Refrigerant pressure sensor
90	Glow relay
91	Not used
92	Not used
93	Not used
94	Not used
95	Not used
96	Not used
97	Not used
98	Glow relay
99	Not used
100	Not used
101	Not used
102	Not used
104	ECM power supply
105	Not used
106	Not used
107	Refrigerant pressure sensor ground
108	Not used
109	ECM power supply
110	ECM power supply
111	ECM ground
112	ECM ground

# DIESEL INJECTION

## Trouble diagnosis - Summary table of DTC

**K9K**

### DTC and DF code table:

DTC	DF code	Diagnostic tool headings
P0087	DF130	Fuel flow capacity function
P0089	DF053	Fuel rail pressure regulation function
P0110	DF039	Intake air temperature sensor circuit
P0115	DF001	Engine coolant temperature sensor circuit
P0180	DF098	Fuel temperature sensor circuit
P0190	DF007	Common rail pressure sensor circuit
P0200	DF052	Injector control circuit
P0201	DF026	Injector circuit cylinder 1
P0202	DF027	Injector circuit cylinder 2
P0203	DF028	Injector circuit cylinder 3
P0204	DF029	Injector circuit cylinder 4
P0225	DF008	Accelerator pedal position sensor 1 circuit
P0231	DF024	Low-pressure actuator control circuit
P0235	DF089	Turbocharger boost pressure sensor circuit
P0301	DF059	Cylinder 1 misfire
P0302	DF060	Cylinder 2 misfire
P0303	DF061	Cylinder 3 misfire
P0304	DF062	Cylinder 4 misfire
P0325	DF121	Knock sensor circuit
P0335	DF005	Crankshaft position sensor circuit
P0340	DF112	Camshaft position sensor circuit
P0380	DF025	Glow plug diagnostic connection
P0382	DF017	Glow plug control circuit
P0400	DF114	EGR solenoid valve circuit
P0403	DF016	EGR control circuit
P0409	DF010	EGR position sensor circuit
P0500	DF014	Vehicle speed sensor circuit
P0513	DF037	Immobiliser
P0530	DF049	Refrigerant pressure sensor circuit
P0560	DF047	ECM supply voltage

# DIESEL INJECTION

## Trouble diagnosis - Summary table of DTC

**K9K**

### DTC and DF code table:

DTC	DF code	Diagnostic tool headings
P0571	DF050	Brake switch circuit
P0604	DF107	ECM memory
P0606	DF038	ECM
P0608	DF113	Sensor supply voltage
P0609	DF122	Supply voltage for accelerator pedal position sensor 2
P0685	DF015	ECM relay control circuit
P2120	DF009	Accelerator pedal position sensor 2 circuit
P2226	DF003	Atmospheric pressure sensor circuit
P2264	DF057	Water in fuel sensor circuit
C001	DF116	Multiplex network (CAN circuit)

# DIESEL INJECTION

## Trouble diagnosis - Introduction

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### 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 (value)

**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 written on a label affixed to each injector then entered into the computer which then controls each injector taking into account its individual **manufacturing variations**.

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

# DIESEL INJECTION

K9K

## DTC P0089 Common rail fuel pressure regulation function

<b>P0089 DF053 STORED</b>	<p><b><u>COMMON RAIL FUEL PRESSURE REGULATION FUNCTION</u></b></p> <p>1.DEF: At minimum limit                  2.DEF: At maximum limit                  3.DEF: Below minimum threshold                  4.DEF: Above maximum threshold                  5.DEF: High flow current &lt; minimum                  6.DEF: High flow current &gt; maximum                  7.DEF: Low flow current &lt; minimum                  8.DEF: Low flow current &gt; minimum</p>
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<b>NOTES</b>	<p><b>Special notes:</b> If <b>DTC P0089</b> is present: engine may stop with malfunction indicator lights up (<b>levels 1 and 2</b>).</p>
	<p><b>Priority when dealing with a number of DTCs:</b>                  If <b>DTC P0089</b> and <b>DTC P0180</b> or <b>P0190</b> are present, deal with <b>P0180</b> or <b>P0190</b> first.</p>
	<p><b>Conditions for applying the diagnostic procedure to the stored DTCs:</b>                  The fault is declared present with the <b>engine running</b>.</p>

<b>4.DEF 6.DEF 8.DEF</b>	<b>NOTES</b>	<p><b>Special notes:</b> None.</p>
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<p>Check the fuel flow actuator connection.                  Repair if necessary.</p>
<p>Measure the resistance between <b>terminal 1 and 2 of the fuel flow actuator</b>, if it is not approximately <b>5.3 Ω ± 0.5 Ω at 20°C, replace the actuator</b>.</p>
<p>Check the condition of the ECM (F134) harness connector and replace it if necessary.</p>
<p>Check the insulation, continuity <b>and absence of interference resistance of the connection:</b></p> <ul style="list-style-type: none"> <li>● ECM (F134) terminal 39 and fuel flow actuator harness connector terminal 2                  (Refer to wiring diagram "EC-IMV/D-01".)</li> </ul> <p>Repair if necessary.</p>
<p>Check:</p> <ul style="list-style-type: none"> <li>– <b>that fuel is present</b> in the tank,</li> <li>– <b>that there is no air</b> in the fuel circuit,</li> <li>– the condition of the <b>fuel filter</b>.</li> </ul> <p>Repair if necessary.</p>

<b>AFTER REPAIR</b>	<p>Follow the instructions to confirm repair.                  Deal with any other possible DTCs.                  Erase the stored DTCs after repair.</p>
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# DIESEL INJECTION

**K9K**

## DTC P0089 Common rail fuel pressure regulation function

<b>P0089</b> <b>DF053</b> Cont'd	
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<b>1.DEF</b> <b>2.DEF</b> <b>3.DEF</b> <b>5.DEF</b> <b>7.DEF</b>	<b>NOTES</b>	<b>Special notes:</b> None.
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Check **for fuel** in the tank.  
Carry out **Test 7 "High pressure system check"**.

<b>AFTER REPAIR</b>	Follow the instructions to confirm repair. Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

## DTC P0087 Fuel flow capacity function

**K9K**

<b>P0087 DF130 STORED</b>	<u>FLOW CAPACITY FUNCTION</u>
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<b>NOTES</b>	<b>Special notes:</b> If this DTC is present, engine may stop when malfunction indicator illuminates (levels 1 and 2).
	<b>Condition for applying the diagnostic procedure to stored DTCs:</b> The DTC is declared present <b>when the engine is running</b>

Check the <b>connection</b> of the fuel flow actuator ( <b>IMV</b> ) and repair if necessary.
Measure the resistance across terminals 1 and 2 of the fuel flow actuator. <b>Replace the flow actuator</b> if the resistance is not approximately <b>5.3 Ω ± 0.5 Ω at 20 °C</b> .
Check the condition of the ECM ( <b>F134</b> ) harness connector. Repair if necessary.
Check the <b>insulation, continuity and absence of unwanted resistance</b> on the following connection: ● ECM ( <b>F134</b> ) terminal 39 and fuel flow actuator harness connector 2. Repair if necessary
Check: - <b>that fuel is present</b> in the tank, - <b>that there is no air</b> in the fuel circuit, - the condition of the <b>fuel filter</b> . Repair if necessary.
If the DTC persists, carry out a " <b>HIGH-PRESSURE PUMP</b> " test (see <b>TEST section</b> ).

<b>AFTER REPAIR</b>	Follow the instructions to confirm repair. Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

## DTC P0110 IAT sensor

**K9K**

<b>P0110 DF039 PRESENT</b>	<b><u>INTAKE AIR TEMPERATURE SENSOR CIRCUIT</u></b> CC.0 : Short circuit to earth (ground) CO.1 : Open circuit or short circuit + 12V
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<b>NOTES</b>	<b>Priority when dealing with a number of DTCs:</b> If DTCs P0110 and P0608 are present, deal with DTC P0608 (sensor voltage supply) first.
	<b>Special notes:</b> None

Check the condition of the <b>intake air temperature sensor harness connector</b> and repair it if necessary.
Check the condition of the ECM harness connector <b>(F134)</b> and repair if necessary.
At the terminal, measure the <b>resistance</b> of the <b>intake air temperature sensor</b> , if it is not approximately <b>2051 <math>\Omega</math> <math>\pm</math> 120 <math>\Omega</math> at 25 °C</b> replace the air temperature sensor.
Check the <b>insulation, continuity and absence of interference resistance</b> of the connections: <ul style="list-style-type: none"><li>● ECM <b>(F134)</b> terminal 51 and intake air temperature sensor harness connector terminal 1</li><li>● ECM <b>(F134)</b> terminal 61 and intake air temperature sensor harness connector terminal 2 (Refer to wiring diagram "EC-IATS-01".)</li></ul> Repair if necessary.

<b>AFTER REPAIR</b>	Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

## DTC P0115 ECT sensor

**K9K**

<b>P0115 DF001 PRESENT</b>	<b><u>ENGINE COOLANT TEMPERATURE SENSOR CIRCUIT</u></b> CC.0 : Short circuit to earth (ground) CO.1 : Open circuit or short circuit to + 12V
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<b>NOTES</b>	<b>Special notes:</b> If DTC <b>P0115</b> with low speed cooling fan motor operation is present . If cooling fan 1 is suspected, then cooling fan motor 2 is switched on for vehicles with air conditioning.
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Check the condition of the <b>engine coolant temperature sensor harness connector</b> . Repair it if necessary.
Check the condition of the ECM harness connector <b>(F134)</b> and repair if necessary.
At the terminal, measure the <b>resistance</b> of the <b>engine coolant temperature sensor</b> , if it is not approximately <b>2252 Ω ± 112.16 Ω at 25 °C</b> , replace the engine coolant temperature sensor.
Check the <b>insulation, continuity and absence of interference resistance</b> of the connections: ● ECM <b>(F134)</b> terminal 63 and ECT sensor terminal 1 ● ECM <b>(F134)</b> terminal 53 and ECT sensor terminal 4 (Refer to wiring diagram "EC-ECTS-01".) Repair if necessary.

<b>AFTER REPAIR</b>	Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

## DTC P0180 Fuel temperature sensor circuit

**K9K**

<b>P0180 DF098 PRESENT</b>	<b>FUEL TEMPERATURE SENSOR CIRCUIT</b> CC.0 : Short circuit to earth (ground) CO.1 : Open circuit or short circuit + 12V
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<b>NOTES</b>	<b>Special notes:</b> None.
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Check the condition of the <b>fuel temperature sensor harness connector</b> and repair it if necessary.
Check the condition of the ECM harness connector <b>(F134)</b> and repair if necessary.
At the terminal, measure the <b>resistance</b> of the <b>fuel temperature sensor</b> , if it is not approximately <b>2.2k <math>\Omega</math> at 25 °C</b> , replace the fuel temperature sensor.
Check the <b>insulation, continuity and absence of interference resistance</b> of the connections: <ul style="list-style-type: none"><li>● ECM <b>(F134)</b> terminal 64 and fuel temperature sensor harness connector terminal 1</li><li>● ECM <b>(F134)</b> terminal 54 and fuel temperature sensor harness connector terminal 2 (Refer to wiring diagram "EC-FTS-01".) Repair if necessary.</li></ul>

<b>AFTER REPAIR</b>	Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

## DTC P0190 FRP sensor

**K9K**

<b>P0190 DF007 STORED</b>	<b><u>COMMON RAIL FUEL PRESSURE SENSOR CIRCUIT</u></b> 1.DEF : Inconsistency 2.DEF : Below minimum threshold 3.DEF : Above maximum threshold CC.0 : Short circuit to earth (ground) CO.1 : Open circuit or short circuit to + 12V
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<b>NOTES</b>	<b>Priority when dealing with a number of DTCs:</b> If DTCs <b>P0190</b> and <b>P0608</b> are both present, deal with DTC <b>P0608</b> (sensor voltage supply) first.
	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> The DTC is declared present after the engine is started.
	If <b>P0190</b> is present, the engine stops and is impossible to restart. <b>Malfunction indicator lights up (level 1).</b>

Check the condition of the <b>common rail fuel pressure sensor harness connector</b> and repair if necessary.
Check the condition of the <b>ECM harness connector</b> (F134) and repair if necessary.
Check the <b>insulation, continuity and absence of interference resistance of the connections:</b> <ul style="list-style-type: none"><li>● ECM (F134) terminal 67 and common rail fuel pressure sensor harness connector terminal 2</li><li>● ECM (F134) terminal 57 and common rail fuel pressure sensor harness connector terminal 3</li><li>● ECM (F134) terminal 47 and common rail fuel pressure sensor harness connector terminal 1 (Refer to wiring diagram "EC-CRFPS-01".)</li></ul> Repair if necessary.

<b>AFTER REPAIR</b>	Follow the instructions to confirm repair. Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

## DTC P0200 Injector control circuit

**K9K**

<b>P0200 DF052 PRESENT</b>	<u>INJECTOR CONTROL CIRCUIT</u> CC.0 : Short circuit to earth CC.1 : Short circuit to + 12 volts
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> DTC declared present: <b>engine at idle speed.</b>
	<b>Priorities when dealing with more than one DTC:</b> If DTC <b>P0200</b> and DTCs <b>P0201, P0202, P0203 and P0204</b> are present, the diagnostic procedure remains the same, but you can determine the suspected injector.
	<b>Special notes:</b> The engine stalls when the DTC appears. <b>Level 1 warning light comes on.</b>

<b>Turn off the ignition switch</b> and check the injector <b>connections</b> . Repair if necessary.
<b>Disconnect the injectors</b> and turn on the ignition switch on. Check to see if the DTC is still present. Using CONSULT-II, check for the changes to P0200. Is P0220 present or stored?

<b>AFTER REPAIR</b>	Follow the instructions to confirm repair. Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

## DTC P0200 Injector control circuit

K9K

**P0200  
PRESENT**

If the DTC **disappears when the injectors are disconnected**, check the condition of the **ECM harness connector (F134)** and replace it if necessary.

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

- ECM (F134) terminal 80 and No.1 injector terminal 2 (+)
- ECM (F134) terminal 79 and No.1 injector terminal 1 (ground)
- ECM (F134) terminal 74 and No.2 injector terminal 2 (+)
- ECM (F134) terminal 73 and No.2 injector terminal 1 (ground)
- ECM (F134) terminal 78 and No.3 injector terminal 2 (+)
- ECM (F134) terminal 77 and No.3 injector terminal 1 (ground)
- ECM (F134) terminal 76 and No.4 injector terminal 2 (+)
- ECM (F134) terminal 75 and No.4 injector terminal 1 (ground)  
(Refer to wiring diagram "EC-INJECT-01 and -02".)

Repair if necessary.

**P0200  
STORED**

Injector(s) malfunctioning.

Replace the injector identified by **P0201 to P0204** if present.

If none of the faults identifying the malfunctioning injector circuit are present:

- Switch off the engine.
- Reconnect one of the four injectors.
- Switch the ignition back on and, if the malfunctioning reappears as present, replace the reconnected injector.

**Carry out the same procedure for the remaining injectors.**

**AFTER REPAIR**

Follow the instructions to confirm repair.  
Deal with any other possible DTCs.  
Erase the stored DTCs after repair.

# DIESEL INJECTION

## DTC P0201 Injector circuit cylinder 1

K9K

<b>P0201 DF026 PRESENT OR STORED</b>	<u>CYLINDER 1 INJECTOR CIRCUIT</u> CO : Open circuit CC : Short circuit 1.DEF: At minimum stop
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> STC declared present: <b>engine at idlie speed.</b>
	<b>Special notes:</b> When this DTC appears, the idle speed is stuck at <b>1000 rpm</b> , with engine noise, unstable engine speed, reduced engine performance and <b>malfunction indicator lights up (level 1).</b>

CO CC	<b>NOTES</b>	<b>Special notes:</b> None.
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With the ignition switched off, wait 15 seconds. Check the connection and condition of the <b>injector 1 harness connector</b> . Repair if necessary.
Check the condition of the ECM harness connector <b>F134</b> and replace it if necessary.
Use command " <b>INJECTOR CYLINDER 1</b> " with CONSULT. If 5 actuation cycles of injector 1 cannot be heard working, connect the cylinder 2 injector harness connector to the cylinder 1 injector and use command " <b>INJECTOR CYLINDER 2</b> ". <b>Does this injector actuation cycle work?</b>

<b>YES</b>	Injector 1 is not malfunctioning, malfunction with injector 1 control circuit. Check <b>for continuity and make sure there is no extraneous resistance on the following connections:</b> <ul style="list-style-type: none"> <li>● ECM <b>F134</b> terminal 80 and injector 1 harness connector terminal 2.</li> <li>● ECM <b>F134</b> terminal 79 and injector 1 harness connector terminal 1.</li> </ul> Also check for insulation between these 2 connections. (Refer to wiring diagram "EC-INJECT-02"). Repair if necessary. If the DTC persists, replace ECM.
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<b>NO</b>	Injector 1 malfunctioning, replace the cylinder 1 injector.
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<b>AFTER REPAIR</b>	Follow the instructions to confirm repair. Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

## DTC P0201 Injector circuit cylinder 1

**K9K**

<p><b>P0201 DF026 PRESENT OR STORED</b></p> <p>Cont'd</p>	
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<p><b>1.DEF</b></p>	<p><b>NOTES</b></p>	<p><b>Special notes:</b> None.</p>
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<p>Check that the injector correction value is correctly programmed into the ECM.</p> <ul style="list-style-type: none"><li>● Check the knock sensor shielding on ECM <b>(F134)</b> harness connector terminal 41. (Refer to wiring diagram "EC-INJECT-02".)</li></ul> <p>Check that the knock sensor is secure on the engine. If the DTC persists, replace the cylinder 1 injector.</p>
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<p><b>AFTER REPAIR</b></p>	<p>Follow the instructions to confirm repair. Deal with any other possible DTCs. Erase the stored DTCs after repair.</p>
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# DIESEL INJECTION

## DTC P0202 Injector circuit cylinder 2

K9K

<b>P0202 DF027 PRESENT OR STORED</b>	<u>CYLINDER 2 INJECTOR CIRCUIT</u> CO : Open circuit CC : Short circuit 1.DEF: At minimum stop
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> DTC declared present: <b>engine at idlie speed.</b>
	<b>Special notes:</b> When this DTC appears, the idle speed is stuck at <b>1000 rpm</b> , with engine noise, unstable engine speed, reduced engine performance and <b>malfunction indicator light comes on (level 1).</b>

<b>CO CC</b>	<b>NOTES</b>	<b>Special notes:</b> None.
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With the ignition switched off, wait 15 seconds. Check the connection and condition of the <b>injector 1 harness connector</b> . Repair if necessary.
Check the condition of the ECM harness connector <b>(F134)</b> and replace it if necessary.
Use command <b>"INJECTOR CYLINDER 2"</b> with CONSULT. If 5 actuation cycles of injector 2 cannot be heard working, connect the cylinder 3 injector harness connector to the cylinder 2 injector and use command <b>"INJECTOR CYLINDER 3"</b> . <b>Does this injector actuation cycle work?</b>

<b>YES</b>	Injector 2 is not malfunctioning, malfunction with injector 2 control circuit. Check <b>for continuity and make sure there is no extraneous resistance on the following connections:</b> <ul style="list-style-type: none"> <li>● ECM <b>(F134)</b> terminal 74 and injector 2 harness connector terminal 2.</li> <li>● ECM <b>(F134)</b> terminal 73 and injector 2 harness connector terminal 1.</li> </ul> Also check for insulation between these 2 connections. (Refer to wiring diagram "EC-INJECT-02"). Repair if necessary. If the DTC persists, replace ECM.
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<b>NO</b>	Injector 2 malfunctioning, replace the cylinder 2 injector.
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<b>AFTER REPAIR</b>	Follow the instructions to confirm repair. Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

## DTC P0202 Injector circuit cylinder 2

**K9K**

<b>P0202 DF027 PRESENT OR STORED</b>  Cont'd	
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<b>1.DEF</b>	<b>NOTES</b>	<b>Special notes:</b> None.
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Check that the injector correction value is correctly entered on the ECM.

- Check the knock sensor shielding on ECM (F134) harness connector terminal 41.  
(Refer to wiring diagram "EC-INJECT-02".)

Check that the knock sensor is secure on the engine.  
If the DTC persists, replace the cylinder 2 injector.

<b>AFTER REPAIR</b>	Follow the instructions to confirm repair. Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

## DTC P0203 Injector circuit cylinder 3

K9K

<b>P0203 DF028 PRESENT OR STORED</b>	<u>CYLINDER 3 INJECTOR CIRCUIT</u> CO : Open circuit CC : Short circuit 1.DEF: At minimum stop
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> STC declared present: <b>engine at idlie speed.</b>
	<b>Special notes:</b> When this DTC appears, the idle speed is stuck at <b>1000 rpm</b> , with engine noise, unstable engine speed, reduced engine performance and <b>malfunction indicator light comes on (level 1).</b>

<b>CO CC</b>	<b>NOTES</b>	<b>Special notes:</b> None.
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Switch off the ignition and wait <b>15 seconds</b> . Check the connection and condition of the <b>injector connector</b> . Repair if necessary.
Check the condition of the <b>ECM harness connector (F134)</b> . Repair if necessary.
Use <b>"INJECTOR 3 CYLINDER"</b> in active test mode with CONSULT-II. If 5 actuation cycles of injector 3 cannot be heard working, connect the cylinder 4 injector harness connector to the cylinder 3 injector and use command <b>"INJECTOR 4 CYILINDER"</b> . <b>Does this injector actuation cycle work?</b>

<b>YES</b>	Injector 3 is not malfunctioning, malfunction with injector 3 control circuit. Check <b>for continuity and make sure there is no extraneous resistance on the connections:</b> <ul style="list-style-type: none"> <li>● ECM (F134) terminal 78 and injector 3 terminal 2.</li> <li>● ECM (F134) terminal 77 and injector 3 terminal 1.</li> </ul> Also check for insulation between these 2 connections. (Refer to wiring diagram "EC-INJECT-02"). Repair if necessary. If the DTC persists, replace ECM.
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<b>NO</b>	Injector 3 malfunctioning, replace the cylinder 3 injector.
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<b>AFTER REPAIR</b>	Follow the instructions to confirm repair. Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

## DTC P0203 Injector circuit cylinder 3

**K9K**

<b>P0203 DF028 PRESENT OR STORED</b>  Cont'd	
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<b>1.DEF</b>	<b>NOTES</b>	<b>Special notes:</b> None.
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Check that the injector correction value is correctly entered on the ECM.

- Check the knock sensor shielding on ECM (F134) harness connector terminal 41.  
(Refer to wiring diagram "EC-INJECT-02".)

Check that the knock sensor is secure on the engine.  
If the DTC persists, replace the cylinder 3 injector.

<b>AFTER REPAIR</b>	Follow the instructions to confirm repair. Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

## DTC P0204 Injector circuit cylinder 4

K9K

<b>P0204 DF029 PRESENT OR STORED</b>	<u>INJECTOR CYLINDER 4 CONTROL CIRCUIT</u> CO : Open circuit CC : Short circuit 1.DEF: At minimum stop
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> STC declared present: <b>engine at idlie speed.</b>
	<b>Special notes:</b> When this DTC appears, the idle speed is stuck at <b>1000 rpm</b> , with engine noise, unstable engine speed, reduced engine performance and <b>malfunction indicator light comes on (level 1)</b> .

CO CC	<b>NOTES</b>	<b>Special notes:</b> None.
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Switch off the ignition and wait <b>15 seconds</b> . Check the connection and condition of the <b>injector connector</b> . Repair if necessary.
Check the condition of the <b>ECM harness connector</b> (F134). Repair if necessary.
Use <b>"INJECTOR 4 CYLINDER"</b> in active test mode with CONSULT-II. If 5 actuation cycles of injector 4 cannot be heard working, connect the cylinder 1 injector harness connector to the cylinder 1 injector and use command <b>"INJECTOR 1 CYILINDER"</b> . <b>Does this injector actuation cycle work?</b>

<b>NO</b>	Injector 4 is not malfunctioning, malfunction with injector 4 control circuit. Check <b>for continuity and make sure there is no extraneous resistance on the connections</b> : <ul style="list-style-type: none"> <li>● ECM (F134) terminal 76 and injector 4 terminal 2.</li> <li>● ECM (F134) terminal 75 and injector 4 terminal 1.</li> </ul> Also check for insulation between these 2 connections. (Refer to wiring diagram "EC-INJECT-02"). Repair if necessary. If the DTC persists, replace ECM.
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<b>YES</b>	Injector 4 malfunctioning, replace the cylinder 4 injector.
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<b>AFTER REPAIR</b>	Follow the instructions to confirm repair. Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

## DTC P0204 Injector circuit cylinder 4

**K9K**

<b>P0204 DF029 PRESENT OR STORED</b>  Cont'd	
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<b>1.DEF</b>	<b>NOTES</b>	<b>Special notes:</b> None.
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Check that the injector correction value is correctly entered on the ECM.

- Check the knock sensor shielding on ECM (F134) harness connector terminal 41.  
(Refer to wiring diagram "EC-INJECT-02".)

Check that the knock sensor is secure on the engine.  
If the DTC persists, replace the cylinder 4 injector.

<b>AFTER REPAIR</b>	Follow the instructions to confirm repair. Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

## DTC P0225 APP sensor 1

K9K

<b>P0225 DF008 PRESENT</b>	<p><u>PEDAL SENSOR CIRCUIT TRACK 1 (APP SENSOR 1)</u></p> <p>1.DEF: Inconsistency          CO.0 : Open circuit or short circuit to earth (ground)          CC.1 : Short circuit to 12 volts          2.DEF: No signal          3.DEF: Blocked component</p>
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<b>NOTES</b>	<p><b>Priority when dealing with a number of DTCs:</b>          If DTCs <b>P0225</b> and <b>P0608</b> are both present, deal with <b>DTC P0608 "SENSOR SUPPLY VOLTAGE"</b> first.</p>
	<p><b>Special notes:</b> if <b>DTC P0225</b> is present: engine speed maintained <b>above 1000 rpm</b>, and malfunction indicator lights up (<b>level 1</b>).          If <b>DTC P0225</b> and <b>DTC P2120</b> both present: engine speed is fixed at <b>1300 rpm</b> and the malfunction indicator lights up (<b>level 1</b>).</p>

<b>1.DEF 3.DEF</b>	<b>NOTES</b>	<b>Special notes:</b> None.
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<p><b>Disconnect ECM harness connector (E61) from the ECM and the connector from the APP sensor and test the insulation between the two lines.</b></p> <ul style="list-style-type: none"> <li>● ECM (E61) terminal 30 and 29 (Refer to wiring diagram).</li> </ul> <p>Repair if necessary.          Replace the APP sensor if the DTC persists.</p>
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<b>AFTER REPAIR</b>	<p>Deal with any other possible DTCs.          Erase the stored DTCs after repair.</p>
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# DIESEL INJECTION

## DTC P0225 APP sensor 1

**K9K**

<b>P0225 DF008 (Cont'd)</b>	
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<b>CO.0 CC.1 2.DEF</b>	<b>NOTES</b>	<b>Special notes:</b> None.
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Check the condition of the <b>APP sensor harness connector</b> and repair it if necessary.
Check the condition of the ECM harness connector <b>(E61)</b> and replace it if necessary.
Measure the <b>resistance</b> at the <b>APP sensor terminals:</b> <b>terminal 4 (+5 V) and terminal 2 (ground)</b> If it is not approximately <b>1.7 kΩ ± 0.9 kΩ</b> , replace the pedal potentiometer.
Check the <b>insulation, continuity and absence of interference resistance of the connections:</b> <ul style="list-style-type: none"><li>● ECM <b>(E61)</b> terminal 29 and APP sensor harness connector terminal 4</li><li>● ECM <b>(E61)</b> terminal 30 and APP sensor harness connector terminal 3</li><li>● ECM <b>(E61)</b> terminal 28 and APP sensor harness connector terminal 2 (Refer to wiring diagram "EC-APPS-01".)</li></ul> Repair if necessary.

<b>AFTER REPAIR</b>	Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

## DTC P0231 Low pressure control circuit

**K9K**

<b>P0231 DF024 PRESENT</b>	<u>LOW-PRESSURE ACTUATOR CONTROL CIRCUIT</u> CO.0 : Open circuit or short circuit to earth CC.1 : short circuit to 12 volts
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<b>NOTES</b>	<b>Special notes:</b> If fault <b>P0231</b> is present with <b>CO.0</b> or <b>CC.1</b> level 1 warning light comes on. The fuel flow actuator is fully opened and the engine is stopped to prevent it from racing.
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Check the connection and condition of the <b>fuel flow actuator connector</b> . Repair if necessary.
Check the condition of the ECM harness connector <b>(F134)</b> . Repair if necessary.
Measure the resistance between the terminals <b>1 and 2 of the fuel flow actuator</b> . Replace the flow actuator if the resistance is not approximately <b>5.3 Ω ± 0.5 Ω at 20 °C</b> .
Check the <b>insulation, continuity and absence of unwanted resistance</b> on the following connection: ● ECM <b>(F134)</b> terminal 39 and fuel flow actuator harness connector terminal 2. (Refer to wiring diagram "EC-IMV/D-01".) Repair if necessary.

<b>AFTER REPAIR</b>	Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

## DTC P0235 TC boost pressure sensor

K9K

<b>P0235 DF089 PRESENT</b>	<p><u>TURBOCHARGER BOOST PRESSURE SENSOR CIRCUIT</u></p> <p>1.DEF: Permanent low signal                  2.DEF: Permanent high signal                  3.DEF: Below minimum threshold                  4.DEF: Above maximum threshold                  5.DEF: Inconsistency                  6.DEF: At maximum stop                  7.DEF: At minimum stop</p>
<b>NOTES</b>	<p><b>Priority when dealing with a number of DTCs:</b>                  in the event of a combination of faults <b>P0235</b> and <b>P0608</b> are both present, deal with <b>DTC P0608 "SENSOR SUPPLY VOLTAGE"</b> first.</p>
	<p><b>Special notes:</b> Malfunction indicator lights up (level 1).</p>
<b>1.DEF 2.DEF 3.DEF 4.DEF</b>	<p>Check the condition of the <b>TC boost pressure sensor harness connector</b> and repair if necessary.</p>
	<p>Check the condition of the <b>ECM harness connector</b> (F134) and replace it if necessary.</p>
	<p>Check the <b>insulation, continuity and absence of interference resistance of the connections:</b></p> <ul style="list-style-type: none"> <li>● ECM (F134) terminal 68 and TC boost pressure sensor harness connector terminal 2</li> <li>● ECM (F134) terminal 58 and TC boost pressure sensor harness connector terminal 3</li> <li>● ECM (F134) terminal 48 and TC boost pressure sensor harness connector terminal 1                      (Refer to wiring diagram "EC-TCBST-01" models without intercooler, "EC-TCBST-02" models with intercooler.)</li> </ul> <p>Repair if necessary.</p>
<b>5.DEF 6.DEF 7.DEF</b>	<p>Visually check that the turbocharger circuit is leak tight.                  Repair if necessary.</p>
	<p>Remove the air supply ducts and check that they are not blocked.                  Repair if necessary.</p>
	<p><b>Check the consistency between the BARO pressure and TC boost pressure sensor.</b>                  With the engine stopped, the pressure should be approximately the same between the two sensors.                  Replace the TC boost pressure sensor if necessary.</p>
	<p>Check the <b>turbocharger</b>.                  Repair if necessary.</p>
<b>AFTER REPAIR</b>	<p>Deal with any other possible DTCs.                  Erase the stored DTCs after repair.</p>

# DIESEL INJECTION

## DTC P0301 Cylinder 1 misfire



<b>P0301 DF059 STORED</b>	<u>CYLINDER 1 MISFIRE</u>
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<b>NOTES</b>	<b>Special notes:</b> If <b>DTC0301</b> is present, engine speed maintained at <b>1000 rpm</b> , engine performance is reduced to <b>75 %</b> and the malfunction indicator lights up (level 1).
	<b>Condition for applying diagnostic procedure to the stored DTCs:</b> DTC declared present: <b>engine at idle speed</b> .
	<b>Priority when dealing with a number of DTCs:</b> in the event of a combination of <b>DTC P0201 (CC or CO)</b> and <b>DTC P0301</b> deal with <b>DTC P0201 "CYLINDER 1 INJECTOR CONTROL CIRCUIT" (CC or CO)</b> first. <b>Priority when dealing with a number of DTCs:</b> in the event of a combination of <b>DTC P0089 (1.DEF, 2.DEF, 7.DEF)</b> and <b>DTC P0301</b> deal with <b>DTC P0089 "Pressure regulation"</b> first.

- Check the tightness of the **cylinder** and repair if necessary.
- Check the **valve clearances** and adjust them if necessary.
- Check the **air inlet conduits** and the **EGR valve** and clean them if necessary.
- Replace the injector.

<b>AFTER REPAIR</b>	Follow the instructions to confirm repair. Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

## DTC P0302 Cylinder 2 misfire



<b>P0302 DF060 STORED</b>	<u>CYLINDER 2 MISFIRE</u>
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<b>NOTES</b>	<b>Special notes:</b> If <b>DTC0302</b> is present, engine speed maintained at <b>1000 rpm</b> , engine performance is reduced to <b>75 %</b> and the malfunction indicator lights up (level 1).
	<b>Condition for applying diagnostic procedure to the stored DTCs:</b> DTC declared present: <b>engine at idle speed</b> .
	<b>Priority when dealing with a number of DTCs:</b> in the event of a combination of <b>DTC P0202 (CC or CO)</b> and <b>DTC P0302</b> deal with <b>DTC P0202 "CYLINDER 2 INJECTOR CONTROL CIRCUIT" (CC or CO)</b> first. <b>Priority when dealing with a number of DTCs:</b> in the event of a combination of <b>DTC P0089 (1.DEF, 2.DEF, 7.DEF)</b> and <b>DTC P0302</b> deal with <b>DTC P0089 "Pressure regulation"</b> first.

- |   |
|---|
| Check the tightness of the <b>cylinder</b> and repair if necessary.                       |
| Check the <b>valve clearances</b> and adjust them if necessary.                           |
| Check the <b>air inlet conduits</b> and the <b>EGR valve</b> and clean them if necessary. |
| Replace the injector.   |

<b>AFTER REPAIR</b>	Follow the instructions to confirm repair. Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

## DTC P0303 Cylinder 3 misfire

**K9K**

<b>P0303 DF061 STORED</b>	<u>CYLINDER 3 MISFIRE</u>
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<b>NOTES</b>	<b>Special notes:</b> If <b>DTC0303</b> is present, engine speed maintained at <b>1000 rpm</b> , engine performance is reduced to <b>75 %</b> and the malfunction indicator lights up (level 1).
	<b>Condition for applying diagnostic procedure to the stored DTCs:</b> DTC declared present: <b>engine at idle speed</b> .
	<b>Priority when dealing with a number of DTCs:</b> in the event of a combination of <b>DTC P0203 (CC or CO)</b> and <b>DTC P0303</b> deal with <b>DTC P0203 "CYLINDER 3 INJECTOR CONTROL CIRCUIT" (CC or CO)</b> first. <b>Priority when dealing with a number of DTCs:</b> in the event of a combination of <b>DTC P0089 (1.DEF, 2.DEF, 7.DEF)</b> and <b>DTC P0303</b> deal with <b>DTC P0089 "Pressure regulation"</b> first.

Check the tightness of the <b>cylinder</b> and repair if necessary.
Check the <b>valve clearances</b> and adjust them if necessary.
Check the <b>air inlet conduits</b> and the <b>EGR valve</b> and clean them if necessary.
Replace the injector.

<b>AFTER REPAIR</b>	Follow the instructions to confirm repair. Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

## DTC P0304 Cylinder 4 misfire



<b>P0304 DF062 STORED</b>	<u>CYLINDER 4 MISFIRE</u>
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<b>NOTES</b>	<b>Special notes:</b> If <b>DTC0304</b> is present, engine speed maintained at <b>1000 rpm</b> , engine performance is reduced to <b>75 %</b> and the malfunction indicator lights up (level 1).
	<b>Condition for applying diagnostic procedure to the stored DTCs:</b> DTC declared present: <b>engine at idle speed</b> .
	<b>Priority when dealing with a number of DTCs:</b> in the event of a combination of <b>DTC P0204 (CC or CO)</b> and <b>DTC P0304</b> deal with <b>DTC P0204 "CYLINDER 4 INJECTOR CONTROL CIRCUIT" (CC or CO)</b> first. <b>Priority when dealing with a number of DTCs:</b> in the event of a combination of <b>DTC P0089 (1.DEF, 2.DEF, 7.DEF)</b> and <b>DTC P0304</b> deal with <b>DTC P0089 "Pressure regulation"</b> first.

- |   |
|---|
| Check the tightness of the <b>cylinder</b> and repair if necessary.                       |
| Check the <b>valve clearances</b> and adjust them if necessary.                           |
| Check the <b>air inlet conduits</b> and the <b>EGR valve</b> and clean them if necessary. |
| Replace the injector.   |

<b>AFTER REPAIR</b>	Follow the instructions to confirm repair. Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

## DTC P0325 Knock sensor circuit

**K9K**

<b>P0325 DF121 STORED</b>	<u>KNOCK SENSOR CIRCUIT (ACCELEROMETER CIRCUIT)</u>
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<b>NOTES</b>	<b>Processing priority in the event of a number of DTCs:</b> If DTCs <b>P0115, P0180, P2226</b> are present, first deal with DTCs <b>P2226: Coolant temperature, P0180: Fuel temperature, and P2226: Atmospheric pressure.</b> A DTC on one of these sensors could lead to an incorrect trouble diagnosis on the knock sensor (accelerometer).
	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> DTC declared present: <b>engine at idle speed.</b>

Check the <b>conformity of the injectors</b> fitted to the vehicle in relation to the <b>type of vehicle and engine number</b> (low injector, high or very high pressure).
Check the knock sensor connection. Repair if necessary.
Check the condition of the <b>ECM harness connector (F134)</b> and the sensor shielding on track <b>ECM (F134) terminal 41</b> . Repair if necessary.
Check the <b>insulation, continuity and absence of interference resistance of the connections:</b> <ul style="list-style-type: none"><li>● ECM <b>(F134)</b> terminal 45 and knock sensor harness connector terminal 1</li><li>● ECM <b>(F134)</b> terminal 44 and knock sensor harness connector terminal 2 (Refer to wiring diagram "EC-KS-01".)</li></ul> Repair if necessary.

<b>AFTER REPAIR</b>	Follow the instructions to confirm repair. Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

## DTC P0335 CKP sensor (POS)

K9K

<b>P0335 DF005 PRESENT OR STORED</b>	<u>CRANKSHAFT POSITION SENSOR CIRCUIT (FLYWHEEL)</u> 1.DEF: Inconsistency 2.DEF: No signal 3.DEF: Too many additional teeth 4.DEF: Teeth missing 5.DEF: Additional teeth 6.DEF: Too many teeth missing
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<b>NOTES</b>	<p><b>Special notes:</b> If <b>1.DEF, 2.DEF, 3.DEF, 6.DEF</b> present: engine stops and malfunction indicator lights up (<b>level 1</b>).</p> <p>If <b>4.DEF, 5.DEF</b>, 75 % engine performance, malfunction indicator will not light up.</p>
	<p><b>Conditions for applying diagnostic procedure for stored DTCs:</b>          DTC declared present with the engine <b>cranking or idling</b>.</p>

Check the condition of the <b>crankshaft position sensor harness connector</b> and repair if necessary.
Check the condition of the ECM harness connector (F134) and repair if necessary.
At the terminal, measure the <b>resistance</b> of the <b>crankshaft position sensor</b> , if it is not approximately <b>760Ω</b> replace the flywheel signal sensor.
Check the <b>insulation, continuity and absence of interference resistance of the connections:</b> <ul style="list-style-type: none"> <li>● ECM (F134) terminal 55 and crankshaft position sensor harness connector terminal 1</li> <li>● ECM (F134) terminal 65 and crankshaft position sensor harness connector terminal 2</li> </ul> (Refer to wiring diagram "EC-CKPS-01".) Repair if necessary.
Check that the flywheel ring gear is not suspected (missing teeth).

<b>AFTER REPAIR</b>	Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

## DTC P0340 CMP sensor

**K9K**

<b>P0340 DF112 STORED</b>	<b><u>CAMSHAFT POSITION SENSOR CIRCUIT</u></b> 1.DEF: Signal Absent 2.DEF: Inconsistency
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<b>NOTES</b>	<b>Priority when dealing with a number of DTCs:</b> If DTCs <b>P0340</b> and <b>P0608</b> are both present, deal with DTC <b>P0608</b> (sensor voltage supply) first.
	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> The DTC is declared <b>present</b> when the <b>engine is started or at idle speed (800±50 rpm)</b> .

Check the condition of the <b>camshaft position sensor harness connector</b> and repair if necessary.
Check the condition of the <b>ECM harness connector (F134)</b> and repair if necessary.
Check the <b>insulation, continuity and absence of interference resistance of the connections:</b> <ul style="list-style-type: none"><li>● ECM <b>(F134)</b> terminal 56 and CMP sensor harness connector terminal 2</li><li>● ECM <b>(F134)</b> terminal 66 and CMP sensor harness connector terminal 3</li><li>● Check power supply between CMP sensor harness connector terminal 1 and IPDM E/R terminal 33 (Refer to wiring diagram "EC-CMPS-01".)</li></ul> If necessary, replace the sensor.
<b>Check the timing gear setting.</b> Refer to "EM section".

<b>AFTER REPAIR</b>	Follow the instructions to confirm repair. Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

## DTC P0380 Glow plug diagnostic connection

K9K

<b>P0380 DF025 PRESENT</b>	<u>GLOW PLUG DIAGNOSTIC CONNECTION</u> CO : open circuit
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<b>NOTES</b>	<b>Special notes:</b> This DTC only detects an open circuit.
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Check the condition and connection of the <b>glow relay harness connector</b> . Change it if necessary.
Check the condition and connection of the <b>glow plug harness connectors</b> . Change them, if necessary.
Check the condition of the ECM harness connector (F134) and replace it if necessary.
Measure the resistance of each <b>glow plug</b> . The resistance should be <b>less than 2 Ω</b> . If not, replace the suspected plugs.
Check the <b>insulation, continuity and absence of interference resistance of the connection:</b> <ul style="list-style-type: none"><li>● ECM (F134) terminal 98 and glow relay harness connector terminal 1 (Refer to wiring diagram "EC-GLOW-01".) Repair if necessary.</li></ul>

<b>AFTER REPAIR</b>	Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

K9K

## DTC P0382 Glow plug relay control circuit

<b>P0382 DF017 PRESENT</b>	<b><u>GLOW RELAY CONTROL CIRCUIT (PRE HEAT)</u></b> CC.1 : Short circuit to +12 volts CC.0 : Open circuit or short circuit to earth (ground)
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<b>NOTES</b>	<b>Special notes:</b> If <b>P0382</b> is present starting is difficult (or impossible when cold). <b>CC.1:</b> plugs permanently controlled with risk of being damaged and risk of damaging the engine.
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Check the condition and connection of the glow relay unit <b>connector</b> . Repair if necessary.
Check the condition of the ECM harness connector <b>(F134)</b> and repair if necessary.
Check the <b>insulation, continuity and absence of interference resistance of the connections:</b> <ul style="list-style-type: none"><li>● Glow relay <b>(E102)</b> terminal 5 for power supply circuit</li><li>● ECM <b>(F134)</b> terminal 98 and glow relay harness connector terminal 1</li><li>● ECM <b>(F134)</b> terminal 90 and glow relay harness connector terminal 6 (Refer to wiring diagram "EC-GLOW-01".)</li></ul> Repair if necessary.

<b>AFTER REPAIR</b>	Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

K9K

## DTC P0400 EGR volume control solenoid valve circuit

<b>P0400 DF114 STORED</b>	<b><u>EGR CONTROL SOLENOID VALVE CIRCUIT</u></b> 1.DEF: At minimum stop 2.DEF: At maximum stop 3.DEF: Inconsistency 4.DEF: Valve jammed 5.DEF: Valve clogged
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<b>NOTES</b>	<b>Condition for applying the diagnostic procedure to the DTC stored:</b> DTC is declared present <b>at idle speed</b> .
	<b>Special notes:</b> If <b>DTC P0400</b> is present, engine will be unsteady, with possible stalling. Starting problems, or even impossible when cold, with malfunction indicator lights up ( <b>level 1</b> )".

Check the condition and connection of the EGR volume control solenoid valve harness connector and repair it if necessary.
Check the condition of the ECM harness connector <b>(F134)</b> and repair if necessary.
Measure the resistance between <b>terminal 4 and 6 of the EGR volume control solenoid valve</b> , if it is not approximately <b><math>8\Omega \pm 0.5\Omega</math> at 25°</b> , replace the solenoid valve.
<b>Check the insulation, continuity and absence of interference resistance of the connections:</b> <ul style="list-style-type: none"><li>● EGR volume control solenoid valve terminal 4 for power supply circuit</li><li>● ECM <b>(F134)</b> terminal 38 and EGR volume control solenoid valve harness connector terminal 6 (Refer to wiring diagram "EC-EGRC/V-01".)</li></ul> Repair if necessary.

<b>AFTER REPAIR</b>	Follow the instructions to confirm repair. Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

## DTC P0403 EGR control circuit

**K9K**

<b>P0403 DF016 STORED</b>	<b><u>EGR VOLUME CONTROL SOLENOID VALVE CIRCUIT</u></b> CC.1 : Short circuit to +12 volts CO.0 : Open circuit or short circuit to earth (ground)
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the DTC stored:</b> DTC declared present: <b>at idle speed.</b>
	<b>Special notes:</b> If DTC <b>P0403</b> is present <b>Malfunction indicator (level 1)</b> lights up. Difficult to start engine or even impossible when cold.

Check the condition and connection of EGR volume control solenoid valve harness connector and repair it if necessary.
Check the condition of the ECM harness connector <b>(F134)</b> and repair if necessary.
Measure the resistance at the EGR volume control solenoid valve harness connector terminal. Replace the solenoid valve if resistance is not approximately $4\text{ k}\Omega \pm 1.6\text{ k}\Omega$ at $20^{\circ}\text{C}$ between terminals 1 and 2 and approximately $1\text{ k}\Omega \pm 0.5\text{ k}\Omega$ at $20^{\circ}\text{C}$ between terminals 2 and 3.
<b>Check the insulation, continuity and absence of interference resistance of the connections:</b> <ul style="list-style-type: none"><li>● EGR volume control solenoid valve terminal 4 for power supply circuit</li><li>● ECM <b>(F134)</b> terminal 38 and EGR volume control solenoid valve harness connector terminal 6 (Refer to wiring diagram "EC-EGRC/V-01".)</li></ul> Repair if necessary.

<b>AFTER REPAIR</b>	Follow the instructions to confirm repair. Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

## DTC P0409 EGR position sensor

**K9K**

<b>P0408 DF010 STORED</b>	<b><u>EGR VALVE POSITION SENSOR CIRCUIT</u></b> CO.0 : Open circuit or short circuit to earth (ground) CC.1 : Short-circuit to + 12V 1.DEF: Above minimum threshold 2.DEF: Below maximum threshold
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<b>NOTES</b>	<b>Priority when dealing with a number of DTCs:</b> If DTCs <b>P0409</b> and <b>P0608</b> are both present, deal with DTC <b>P0608</b> first.
	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> The DTC is <b>declared present</b> after <b>starting the engine</b> .

Check the condition of the <b>EGR volume control</b> solenoid valve harness connector and repair if necessary.
Check the condition of the <b>ECM harness connector</b> (F134) and repair if necessary.
Measure the <b>resistance</b> at the <b>EGR control solenoid valve terminal</b> , if it is not approximately <b>4 k<math>\Omega</math> <math>\pm</math> 1.6k<math>\Omega</math> at 20°C</b> between <b>terminals 1 and 2</b> and approximately <b>1 k<math>\Omega</math> <math>\pm</math> 0.5k<math>\Omega</math> at 20°C</b> between <b>terminals 2 and 3</b> , replace the solenoid valve.
Check the <b>insulation, continuity and absence of interference resistance of the connections:</b> <ul style="list-style-type: none"><li>● ECM (F134) terminal 49 and EGR volume control solenoid valve harness connector terminal 1</li><li>● ECM (F134) terminal 59 and EGR volume control solenoid valve harness connector terminal 3</li><li>● ECM (F134) terminal 69 and EGR volume control solenoid valve harness connector terminal 2 (Refer to wiring diagram "EC-EGRC/V-01".)</li></ul> Repair if necessary.

<b>AFTER REPAIR</b>	Follow the instructions to confirm repair. Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

## DTC P0500 VSS

**K9K**

<b>P0500 DF014 PRESENT</b>	<u>VEHICLE SPEED INFORMATION</u>
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<b>NOTES</b>	<b>Special notes:</b> None.
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For this type of vehicle, the ABS control unit or an additional unit (if the vehicle does not have ABS) transmits the vehicle speed on the CAN.  
Test the multiplex network to be able to work on the CAN (Malfunction on the CAN H and CAN L lines between the ECM and the ABS). Also check there are no malfunctions in the ABS part or in the system which supplies the vehicle speed.

<b>AFTER REPAIR</b>	Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

## DTC P0513 Immobiliser

**K9K**

<b>P0513 DF037 PRESENT</b>	<u>IMMOBILISER</u>
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<b>NOTES</b>	<b>Special notes:</b> None.
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Carry out a trouble diagnosis on the multiplex network. (LAN section) Refer to the trouble diagnosis for the keyless vehicle function. (BL section)
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<b>AFTER REPAIR</b>	Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

## DTC P0530 Refrigerant pressure sensor

**K9K**

<b>P0530 DF049 STORED</b>	<u>REFRIGERANT FLUID SENSOR CIRCUIT</u> CO.1 : Open circuit or short circuit to + 12 volts CC.0 : Short circuit to earth
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> DTC declared present: <b>engine and the air conditioning are activating.</b>
	<b>Priority when dealing with a number of DTCs:</b> If DTC <b>P0530</b> and <b>P0608</b> are both present, deal with <b>DTC P0608 "SENSOR SUPPLY VOLTAGE"</b> first.

Check the <b>pressure sensor connection</b> . Repair if necessary.
Check the condition of the <b>ECM (F134) harness connector</b> . Repair if necessary.
Check the <b>insulation, continuity and absence of interference resistance of the connections</b> : <ul style="list-style-type: none"><li>● ECM (F134) terminal 83 and refrigerant pressure sensor harness connector terminal 3</li><li>● ECM (F134) terminal 89 and refrigerant pressure sensor harness connector terminal 2</li><li>● ECM (F134) terminal 107 and refrigerant pressure sensor harness connector terminal 1 (Refer to wiring diagram "EC-RP/SEN-01".)</li></ul> Repair if necessary.

<b>AFTER REPAIR</b>	Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

## DTC P0560 ECM supply voltage

K9K

**P0560  
DF047  
STORED**

### COMPUTER SUPPLY VOLTAGE (ECM)

- 1.DEF: Above maximum threshold
- 2.DEF: Below minimum threshold

### NOTES

**Condition for applying the diagnostic procedure to stored DTC:** the DTC is declared present **when the engine is running above 1000 rpm.**

Check the **battery voltage** when the ignition is switched on.  
If the **battery voltage < 10 V** recharge the battery.

Check the condition of the **battery terminals**.  
Repair if necessary.

Check the vehicle's **charge circuit**.  
Repair if necessary.

Check the condition of the **ECM (E61) harness connector**.  
Repair if necessary.

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

- ECM (E61) terminal 22 and fuse block (M16) harness connector.
- ECM (F34) terminal 111, 112 and engine ground.  
(Refer to wiring diagram "EC-MAIN-01".)  
Repair if necessary.

### AFTER REPAIR

Deal with any other possible DTCs.  
Erase the stored DTCs after repair.

# DIESEL INJECTION

## DTC P0571 Brake switch circuit

**K9K**

<b>P0571 DF050 PRESENT OR STORED</b>	<b><u>STOP LIGHT SWITCH CIRCUIT</u></b> 1.DEF: Signal absent 2.DEF: Inconsistency
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<b>NOTES</b>	Conditions for applying diagnostic procedure to a stored DTC: the DTC is declared present when the ignition is switched on, when decelerating or when the brake pedal is depressed. Deal with the DTC even if it is stored.
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Check the <b>switch connection</b> and repair if necessary.
Check for the presence of <b>+ 12 volts</b> on the switch supply. Repair if necessary.
Check the condition of the ECM harness connector <b>(E61)</b> and repair if necessary.
Check that the <b>switch is working</b> . Change it if necessary.
Check the <b>insulation, continuity and absence of interference resistance of the connections:</b> <ul style="list-style-type: none"><li>● Stop lamp switch terminal 1 for power supply circuit</li><li>● ECM <b>(E61)</b> terminal 5 and stop lamp switch harness connector terminal 2 (Refer to wiring diagram "EC-BRK/SW-01".)</li></ul> Repair if necessary.

<b>AFTER REPAIR</b>	Deal with any other possible DTCs. Erase the stored DTCs after repair.
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**DIESEL INJECTION**  
**DTC P0604 ECM memory**

**K9K**

<b>P0604 DF107 STORED</b>	<u>ECM MEMORY</u>
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<b>NOTES</b>	<b>Conditions for applying the diagnostic procedure to the stored DTC:</b> The DTC is declared present: <b>with the engine running.</b>
	If DTC <b>P0604</b> is present: it is impossible to stop and restart the engine. <b>Malfunction indicator lights up (level 1).</b>

Re-enter <b>injector's individual correction value</b> using the <b>CONSULT-II</b> .
If the DTC persists, replace the <b>ECM</b> .

<b>AFTER REPAIR</b>	Follow the instructions to confirm repair. Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

## DTC P0606 ECM

K9K

<p><b>P0606 DF038 PRESENT</b></p>	<p><u>ECM</u></p> <ul style="list-style-type: none"><li>1.DEF: Analogue/digital converter</li><li>2.DEF: Write EEPROM memory</li><li>3.DEF: Read EEPROM memory</li><li>4.DEF: Injection calibration data</li><li>5.DEF: Memory self-test</li><li>6.DEF: Non refreshed watchdog</li><li>7.DEF: Interference on the injector control line</li><li>8.DEF: Watchdog activation</li></ul>
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<p><b>NOTES</b></p>	<p>None.</p>
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<p><b>7.DEF</b></p>	<p>Check the condition of the ECM harness connector <b>(F134)</b>. Repair it if necessary.</p> <p>Check the <b>insulation, continuity and absence of interference resistance</b> of the connections:</p> <ul style="list-style-type: none"><li>● ECM <b>(F134)</b> terminal 80 and No.1 injector terminal 2</li><li>● ECM <b>(F134)</b> terminal 79 and No.1 injector terminal 1</li><li>● ECM <b>(F134)</b> terminal 74 and No.2 injector terminal 2</li><li>● ECM <b>(F134)</b> terminal 73 and No.2 injector terminal 1</li><li>● ECM <b>(F134)</b> terminal 78 and No.3 injector terminal 2</li><li>● ECM <b>(F134)</b> terminal 77 and No.3 injector terminal 1</li><li>● ECM <b>(F134)</b> terminal 76 and No.4 injector terminal 2</li><li>● ECM <b>(F134)</b> terminal 75 and No.4 injector terminal 1 (Refer to wiring diagram "EC-INJECT-01 AND -02".)</li></ul> <p>Repair if necessary.</p> <p>If the DTC persists, replace ECM.</p>
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<p><b>AFTER REPAIR</b></p>	<p>Deal with any other possible DTCs. Erase the stored DTCs after repair.</p>
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**DIESEL INJECTION**  
**DTC P0606 ECM**

**K9K**

<b>P0606</b> <b>DF038</b> Continued	
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<b>4.DEF</b>	Check the condition of the ECM harness connector <b>(F134)</b> . Repair it if necessary.
	Check that the <b>individual injection correction (value)</b> matches the injectors. If NG, write the individual correction value codes (see "Trouble diagnosis - Introduction").
	If the value corresponds correctly to the injectors, <b>replace ECM.</b>

<b>1.DEF</b> <b>2.DEF</b> <b>3.DEF</b> <b>5.DEF</b> <b>6.DEF</b> <b>8.DEF</b>	<b>Replace ECM.</b>
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<b>AFTER REPAIR</b>	Follow the instructions to confirm repair. Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

## DTC P0608 Sensor supply voltage

**K9K**

<b>P0608 DF113 PRESENT</b>	<b><u>SENSOR SUPPLY VOLTAGE</u></b> 1.DEF: AT minimum stop 2.DEF: AT maximum stop
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<b>NOTES</b>	<b>Priority when dealing with a number of DTCs:</b> If DTCs <b>P0608</b> and <b>P0190, P0225, P0409, P0110, P0530, P0100, P0235</b> are present, deal with DTC <b>P0608 "SENSOR SUPPLY VOLTAGE"</b> first.
	<b>Special notes:</b> If DTC <b>P0608</b> is present: the engine stops immediately and it is impossible to restart. Malfunction indicator lights up ( <b>Level 1</b> ).

<p>Check the condition and connection of all the sensor connectors <b>as follows</b>:</p> <ul style="list-style-type: none"><li>– engine coolant temperature sensor</li><li>– turbocharger boost pressure sensor</li><li>– common rail fuel pressure sensor</li><li>– APP sensor</li><li>– EGR valve position sensor</li><li>– camshaft position sensor</li></ul> <p>Repair if necessary.</p>
<p>Check the condition of <b>ECM harness connector (F134) and (E61)</b> and repair them if necessary.</p>
<p>Connect the bornier in place of the ECM and check the <b>insulation, continuity and absence of interference resistance</b> of the connections:</p> <ul style="list-style-type: none"><li>● ECM <b>(F134)</b> terminal 83 and refrigerant pressure sensor harness connector terminal 1</li><li>● ECM <b>(F134)</b> terminal 48 and turbocharger boost pressure sensor harness connector terminal 1</li><li>● ECM <b>(F134)</b> terminal 47 and common rail fuel pressure sensor harness connector terminal 1</li><li>● ECM <b>(E61)</b> terminal 29 and APP sensor 1 harness connector terminal 2</li><li>● ECM <b>(F134)</b> terminal 49 and EGR control valve harness connector terminal 1</li><li>● Power supply circuit between IPDM E/R terminal 33 and camshaft position sensor harness connector terminal 1 (Refer to wiring diagram)</li></ul> <p>Repair if necessary.</p>
<p>If the DTC persists, <b>apply the trouble diagnosis strategy</b> to each sensor <b>supplied by an external terminal</b>.</p>

<b>AFTER REPAIR</b>	Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

## DTC P0609 Supply voltage APP sensor 2

K9K

<b>P0609 DF122 PRESENT</b>	<p><u>SUPPLY VOLTAGE PEDAL POTENTIOMETER TRACK 2 (APP sensor 2)</u></p> <p>CO.1 : Open circuit or short circuit to + 12 volts          CC.0 : Short circuit to earth</p>
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<b>NOTES</b>	<p><b>Special notes:</b> When this fault appears, the idle speed is set to 1000 rpm, engine performance is reduced to 75 % and the <b>level 1 warning light comes on.</b></p>
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<b>CC.0</b>	<b>NOTES</b>	<p><b>Special notes:</b> None.</p>
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<p>Check the condition of the <b>APP sensor harness connector</b>.          Repair if necessary.</p>
<p>Check the condition of the <b>ECM (E61) harness connector</b>.          Repair if necessary.</p>
<p>Measure the <b>resistance</b> at the <b>APP sensor</b> terminals:  <b>APP sensor</b> harness connector terminals 1 and 5 (+5V)          Replace the potentiometer pedal if the resistance is not approximately <b>2.85 kΩ ± 2.05 kΩ</b>.</p>
<p>Disconnect <b>ECM (E61)</b> and the <b>APP sensor harness connector</b>.          Check the <b>insulation to ground</b> of the connection on <b>terminal 18</b> of <b>ECM harness connector (E61)</b>.          Repair if necessary.</p>
<p>Check the <b>continuity of the connection</b> between:  <b>APP sensor</b> terminal 5 and <b>ECM (E61)</b> terminal 18          Repair if necessary.</p>

<b>AFTER REPAIR</b>	<p>Deal with any other possible DTCs.          Erase the stored DTCs after repair.</p>
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# DIESEL INJECTION

## DTC P0609 Supply voltage APP sensor 2

**K9K**

<b>P0609 DF122  CONTINUED</b>	
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<b>CO.1</b>	<b>NOTES</b>	<b>Special notes: None.</b>
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<p>Check the condition of the <b>APP sensor harness connector</b>. Repair if necessary.</p>
<p>Check the condition of the <b>ECM (E61) harness connector</b>. Repair if necessary.</p>
<p>Measure the <b>resistance</b> at the <b>APP sensor</b> terminals: <b>APP sensor</b> harness connector terminals 1 and 5 (+5V) Replace the APP sensor if the resistance is not approximately <b>2.85 kΩ ± 2.05 kΩ</b>.</p>
<p>Check the <b>insulation, continuity and absence of interference resistance of the connection</b>:</p> <ul style="list-style-type: none"><li>● <b>ECM (E61) terminal 18 and APP sensor harness connector terminal 5</b>.</li></ul> <p>Repair if necessary.</p>
<p>Disconnect <b>ECM (E61) harness connector</b> and the <b>APP sensor harness connector</b>. Check the <b>insulation to +12 volts</b> of the connection on <b>terminal 18</b> of <b>ECM harness connector (E61)</b>. Repair if necessary.</p>
<p>Check the <b>continuity of the connections</b>:</p> <ul style="list-style-type: none"><li>● <b>ECM (E61) terminal 18 and APP sensor 1 harness connector terminal 5</b></li><li>● <b>ECM (E61) terminal 6 and APP sensor 1 harness connector terminal 1</b></li></ul> <p>Repair if necessary.</p>
<p>Disconnect <b>ECM harness connector</b> and the <b>APP sensor harness connector</b>. <b>Check the insulation</b> between <b>terminal 18 and terminal 12</b> on <b>ECM harness connector (E61)</b>. Repair if necessary.</p>

<b>AFTER REPAIR</b>	<p>Deal with any other possible DTCs. Erase the stored DTCs after repair.</p>
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# DIESEL INJECTION

## DTC P0685 ECM relay control

K9K

<b>P0685 DF015 PRESENT</b>	<b><u>ECM RELAY CONTROL CIRCUIT</u></b> 1.DEF : Permanent low signal 2.DEF : Permanent high signal
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<b>NOTES</b>	<b>Special notes:</b> The ECM relay is incorporated in the IPDM E/R.
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Check the main relay supply fuse in the IPDM E/R: (20A). Change it if necessary.
Check the condition and connection of the IPDM E/R connector and replace it if necessary.
Check the condition of the <b>ECM harness connector (F134)</b> and replace it if necessary.
Check the <b>insulation, continuity and absence of interference resistance of the connections:</b> <ul style="list-style-type: none"><li>● ECM <b>(F134)</b> terminal 104 and IPDM E/R terminal 29</li><li>● ECM <b>(F134)</b> terminal 109, 110 and IPDM E/R terminal 32</li><li>● ECM <b>(F134)</b> terminal 111, 112 and ground (Refer to wiring diagram "EC-MAIN-01".) Repair if necessary.</li></ul>

<b>AFTER REPAIR</b>	Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

## DTC P2120 APP sensor 2

K9K

<b>P2120 DF009 PRESENT</b>	<p><b><u>ACCELERATOR PEDAL POSITION SENSOR 2</u></b></p> <p>CO.0 : Open circuit or short circuit to earth (ground)          CC.1 : Short circuit to + 12V</p>
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<b>NOTES</b>	<p><b>Priority when dealing with a number of DTCs:</b>          If DTCs <b>P2120</b> and <b>P0609</b> are both present, deal with DTC <b>P0609</b> first.</p>
	<p><b>Special note:</b></p> <p>If DTC <b>P2120</b> is present: engine speed maintained above <b>1000 rpm</b>.  <b>Malfunction indicator lights up (level 1).</b></p> <p>If DTCs <b>P2120</b> and <b>P0225</b> are present: engine speed fixed at <b>1300 rpm</b>.  <b>Malfunction indicator lights up (level 1).</b></p>

<b>CO.0</b>	<b>NOTES</b>	<b>Special notes:</b> None.
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Check the condition of the <b>APP harness connector</b> and repair it if necessary.
Check the condition of the <b>ECM harness connector (E61)</b> and repair if necessary.
Measure the <b>resistance</b> at the <b>APP sensor terminal:</b> <b>terminal 1</b> (ground) and <b>terminal 5</b> (+5 V) If it is not approximately <b>2.85 kΩ ± 2.05 kΩ</b> , replace the APP sensor.
Check <b>the insulation against earth (ground) and the continuity of the connection:</b> <ul style="list-style-type: none"> <li>● ECM <b>(E61)</b> terminal 12 and APP sensor harness connector terminal 6            (Refer to wiring diagram "EC-APPS-01 or 02".)            Repair if necessary.</li> </ul>
Check the continuity of the connection between: <ul style="list-style-type: none"> <li>● ECM <b>(E61)</b> terminal 18 and APP sensor harness connector terminal 5            (Refer to wiring diagram "EC-APPS-01 or 02".)            Repair if necessary.</li> </ul>

<b>AFTER REPAIR</b>	<p>Deal with any other possible DTCs.          Erase the stored DTCs after repair.</p>
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# DIESEL INJECTION

## DTC P2120 APP sensor 2

K9K

<p style="text-align: center;"><b>P2120</b> <b>DF009</b></p> <p style="text-align: center;">CONTINUED 3</p>	
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<b>CC.1</b>	<b>NOTES</b>	Special notes: None.
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Check the condition of the <b>APP sensor harness connector</b> and repair it if necessary.
Check the condition of the <b>ECM harness connector (E61)</b> and replace it if necessary.
<p>Measure the <b>resistance</b> at the <b>APP sensor terminals</b>:</p> <p style="padding-left: 20px;">APP sensor terminal 1 (Ground) and 5 (+ 5V)</p> <p>If it is not approximately <b>2.85 kΩ ± 2.05 kΩ</b>, replace the APP sensor.</p>
<p>Check the <b>insulation, continuity and absence of interference resistance of the connection</b>:</p> <ul style="list-style-type: none"> <li>● ECM (E61) terminal 12 and APP sensor harness connector terminal 6 (Refer to wiring diagram "EC-APPS-01".)</li> </ul> <p>Repair if necessary.</p>
<p>Check the <b>insulation against + 12 volts of the connections</b>:</p> <ul style="list-style-type: none"> <li>● ECM (E61) terminal 18 and APP sensor harness connector terminal 5 (Refer to wiring diagram "EC-APPS-01".)</li> </ul> <p>Repair if necessary.</p>
<p>Check the <b>continuity of the connections</b>:</p> <ul style="list-style-type: none"> <li>● ECM (E61) terminal 6 and APP sensor harness connector terminal 1</li> <li>● ECM (E61) terminal 18 and APP sensor harness connector terminal 5 (Refer to wiring diagram "EC-APPS-01".)</li> </ul>
<p><b>Disconnect connector (E61) from the computer and the connector from the APP sensor and test the insulation between the two lines</b>:</p> <ul style="list-style-type: none"> <li>● ECM (E61) terminal 12 and 18 (Refer to wiring diagram "EC-APPS-01".)</li> </ul> <p>Repair if necessary.</p>

<b>AFTER REPAIR</b>	<p>Deal with any other possible DTCs. Erase the stored DTCs after repair.</p>
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# DIESEL INJECTION

## DTC P2226 Atmospheric pressure sensor circuit

**K9K**

<b>P2226 DF003 PRESENT</b>	<u>ATMOSPHERIC PRESSURE SENSOR CIRCUIT(BARO)</u> CC.1 : Short-circuit to + 12 volts CO.0 : Open circuit or short circuit to earth (ground)
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<b>NOTES</b>	<b>Special note:</b> None.
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<b>Replace the ECM.</b>
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<b>AFTER REPAIR</b>	Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

## DTC C001 CAN communication line

K9K

<b>PC001 DF116 PRESENT</b>	<u>MULTIPLEX NETWORK (CAN COMMUNICATION LINE)</u> 1.DEF: Carry out the multiplex network trouble diagnosis
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### 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. For the input/output signal chart, refer to LAN section.

#### 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.

Example	OK data	
	DATA MONITOR	
	MONITOR	
	TRANSMIT DIAG	OK
	METER/M&A	OK
	EPS	UNKWN
	BCM	OK
	VDC/TCS/ABS	OK
	IPDM E/R	OK
	TCM	OK
ICC	UNKWN	
AWD/4WD	UNKWN	
e4WD	UNKWN	

YEC855A

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

<b>AFTER REPAIR</b>	Deal with any other possible DTCs. Erase the stored DTCs after repair.
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# DIESEL INJECTION

**K9K**

## Trouble diagnosis - States and parameter summary table

### SUMMARY TABLE OF DDCR INJECTION PARAMETERS:

Tool parameter code	Diagnostic tool description
PR005	EGR valve opening setpoint
PR008	Rail pressure setpoint
PR010	Rail regulation setting (reference)
PR017	Fuel flow
PR030	Accelerator pedal position
PR032	Inlet pressure
PR035	Atmospheric pressure
PR037	Refrigerant pressure
PR038	Rail pressure
PR051	EGR valve position feedback
PR055	Engine speed
PR059	Inlet air temperature
PR061	External air temperature
PR063	Fuel temperature
PR064	Coolant temperature
PR074	Battery voltage
PR077	EGR valve position sensor voltage
PR080	Rail pressure sensor voltage
PR081	Inlet temperature sensor voltage
PR086	Accelerator pedal position sensor 1 voltage
PR088	Accelerator pedal position sensor 2 voltage
PR089	Vehicle speed
PR125	Power used by the AC compressor
PR127	Heating resistor maximum authorised power
PR132	Air flow

# DIESEL INJECTION

## Trouble diagnosis - States and data monitor summary table

**K9K**

### SUMMARY TABLE OF DDCR INJECTION STATES:

<b>TOOL STATE CODE</b>	<b>Diagnostic tool description</b>
<b>ET001</b>	Computer + after ignition feed
<b>ET003</b>	Immobiliser
<b>ET004</b>	Air conditioning authorised
<b>ET006</b>	Code programmed
<b>ET008</b>	EGR solenoid control
<b>ET012</b>	Primary brake contact
<b>ET013</b>	Secondary brake contact
<b>ET018</b>	Air conditioning request
<b>ET021</b>	High-speed fan request
<b>ET022</b>	Fan low-speed request
<b>ET023</b>	Fast idle speed request
<b>ET038</b>	Engine
<b>ET040</b>	Clutch pedal
<b>ET042</b>	Cruise control - speed limiter
<b>ET076</b>	Starting
<b>ET079</b>	Air conditioning present
<b>ET088</b>	Request to start compressor

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

**K9K**

<b>NOTES</b>	<p>Only carry out conformity check after a <b>full check</b> using the diagnostic tool.          The values indicated in this conformity check are given for reference purposes only.  <b>Application condition:</b> engine off, ignition on.</p>
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### ECM STATES AND PARAMETERS:

Order	Function	Parameter or state check or action	Display and notes	Trouble diagnosis
1	Battery voltage	PR074: Battery voltage	12 V < PR074 < 13.5 V	In the event of a malfunction, run the trouble diagnostic procedure for the "Charging circuit".
2	Engine speed	PR055: Engine speed	Gives the engine's rotational speed in rpm.	In the event of a malfunction, apply the diagnostic procedure for P0335 Engine speed sensor circuit.
3	Accelerator pedal position	PR030: Accelerator pedal position 0%	Gives the position of the accelerator pedal as a %. PR030 = 0 %	In the event of a malfunction, apply the diagnostic procedure for malfunctions Pedal sensor circuit, track 1 and track 2 (P0225 and P2120) and P0608 "Sensor reference voltage".
4	Coolant temperature	PR064: Coolant temperature Warm: 90 °C	Gives the coolant temperature in °C. Default value: 80 °C.	In the event of a malfunction, refer to parameter interpretation PR064 "Coolant temperature".
5	External air temperature	PR061: External air temperature	Gives the external air temperature in °C. This parameter is controlled by the BCM and transmitted to the injection on the multiplex network. Default value: 20 °C.	In the event of a malfunction, apply the trouble diagnostic procedure for this malfunction described in the BCM document.

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

**K9K**

### ECM STATES AND PARAMETERS:(Continued 1)

Order	Function	Parameter or state Check or action	Display and notes	Trouble diagnosis
6	Intake air temperature	<b>PR059:</b> Intake air temperature Cold = PR061 Warm: 30 °C	<b>Gives the inlet air temperature in °C. This information is provided by the air temperature/ pressure sensor.</b> Default value: 30 °C.	In the event of a malfunction, refer to parameter interpretation PR059 "Inlet air temperature".
7	Fuel temperature	<b>PR063:</b> Fuel temperature Cold = PR064 Warm: 50C	<b>Gives the fuel temperature in °C. This value is given by the fuel temperature sensor.</b> Default value: 30 °C.	In the event of a malfunction, apply the diagnostic procedure for malfunction DF098 Fuel temperature sensor circuit.
8	Air circuit pressure	<b>PR035:</b> Atmospheric pressure  <b>PR032</b> Inlet pressure	<b>Gives the atmospheric pressure in mbar. The sensor is incorporated in the computer.</b>  <b>Shows the pressure in the inlet circuit in mbar.</b>	If not consistent, check PR035 = PR032 = local atmospheric pressure, with the engine stopped and ignition on.
9	Rail pressure	<b>PR038:</b> Rail pressure Warm or cold - 90 bar <PR038> 90 bar	<b>Gives the pressure of the diesel in the injection rail in Bar. This pressure is supplied by the sensor on the rail.</b> Default value: 2000 Bar.	In the event of a malfunction, apply the diagnostic procedure for malfunction P0190 Rail pressure sensor circuit.

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

**K9K**

### ECM STATES AND PARAMETERS:(Continued 2)

Order	Function	Parameter or state Check or action	Display and notes	Trouble diagnosis
10	Engine	ET038: Engine + after ignition feed	<p><b>Gives the current status of the engine.</b></p> <ul style="list-style-type: none"> <li>- + after ignition feed</li> <li>- <b>CRANKING</b></li> <li>- <b>RUNNING</b></li> <li>- <b>MAINTAINED SUPPLY:</b> Supply maintained during the power latch phase.</li> <li>- <b>Stalled: When the engine has stalled.</b></li> <li>- <b>PROTECTED:</b> When a level 2 malfunction appears or when the engine speed is limited to a certain engine speed.</li> </ul>	NONE.
11	Immobiliser	ET003: Immobiliser <b>INACTIVE</b>	<p><b>Gives the status of the immobiliser system.</b></p> <ul style="list-style-type: none"> <li>- <b>INACTIVE:</b> The ECM has recognised the immobiliser code transmitted by the Intelligent Key unit or BCM.</li> <li>- <b>ACTIVE:</b> The ECM does not recognise the immobiliser code transmitted by the Intelligent Key unit or BCM.</li> </ul>	If <b>ACTIVE</b> , follow the associated "help" given in the tool.
12	Code programmed	ET006: Code programmed <b>YES</b>	<p><b>States whether the immobiliser code has been programmed by the computer or not.</b></p> <ul style="list-style-type: none"> <li>- <b>YES:</b> Code programmed</li> <li>- <b>NO:</b> Code not programmed by the ECM.</li> </ul>	If <b>NO</b> , replace ECM.
13	Vehicle speed	PR089: Vehicle speed	<p><b>Gives the vehicle speed in kph. This parameter is transmitted by the ABS computer or vehicle speed ECU. This information is transmitted to the injection on the multiplex network.</b></p>	<p><b>Test the multiplex network.</b></p> <p><b>Refer to ABS or vehicle speed ECU trouble diagnosis.</b></p>

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

**K9K**

**NOTES**

Only carry out conformity check after a **full check** using the diagnostic tool.  
The values indicated in this conformity check are given for reference purposes only.  
**Application condition:** engine off, ignition on.

**START SUBFUNCTION:**

Order	Function	Parameter or state Check or action	Display and notes	Trouble diagnosis
1	ECM + after ignition feed	ET001: ECM + after ignition feed <b>PRESENT</b>	Indicates that the computer is supplied with a + after ignition feed. – Present – Absent	In the event of a malfunction, carry out the diagnostic procedure for P0560 "Computer supply voltage" or P0685 "Main relay circuit".
2	Starting	ET076: Starting <b>AUTHORISED</b>	Indicates whether or not starting has been authorised by the injection <b>AUTHORISED:</b> The injection has given starting authorisation. <b>PROHIBITED:</b> The injection has not given starting authorisation.	If <b>PROHIBITED</b> carry out a full diagnostic procedure on the preheating system.
3	Engine	ET038: Engine + after ignition feed	Gives the current status of the engine. – + after ignition feed – <b>CRANKING</b> – <b>RUNNING</b> – <b>MAINTAINED SUPPLY:</b> Supply maintained during the power latch phase. – <b>Stalled:</b> When the engine has stalled. – <b>Protected:</b> When a malfunction appears or when the engine speed is limited to a certain engine speed.	<b>NONE.</b>
4	Battery voltage	PR074: Battery voltage	12 < PR074 < 13.5 V	In the event of a malfunction, run the diagnostic procedure for the "Charging circuit".

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

**K9K**

**NOTES**

Only carry out conformity check after a **full check** using the diagnostic tool.  
The values indicated in this conformity check are given for reference purposes only.  
**Application condition:** engine off, ignition on.

**PROTECTION SUBFUNCTION:**

Order	Function	Parameter or state Check or action	Display and notes	Trouble diagnosis
1	Immobiliser	ET003: Immobiliser <b>INACTIVE</b>	<p>Gives the status of the immobiliser system.</p> <ul style="list-style-type: none"> <li>- <b>INACTIVE:</b> The injection computer has recognised the immobiliser code transmitted by the Intelligent Key unit or BCM.</li> <li>- <b>ACTIVE:</b> The ECM does not recognise the immobiliser code transmitted by the Intelligent Key unit or BCM.</li> </ul>	If <b>ACTIVE</b> , follow the associated "help" given in the tool.
2	Code programmed	ET006: Code programmed <b>YES</b>	<p>States whether the immobiliser code has been programmed by the computer or not.</p> <ul style="list-style-type: none"> <li>- <b>YES:</b> Code programmed</li> <li>- <b>NO:</b> Code not programmed by the ECM.</li> </ul>	If <b>NO</b> , replace ECM.
3	Battery voltage	PR074: Battery voltage	<b>12 V &lt; PR074 &lt; 13.5 V</b>	In the event of a malfunction, run the diagnostic procedure for the "Charging circuit".

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

K9K

**NOTES**

Only carry out conformity check after a **full check** using the diagnostic tool.  
 The values indicated in this conformity check are given for reference purposes only.  
**Application condition:** engine off, ignition on.

**SUB SYSTEM COLD LOOP:**

Order	Function	Parameter or state Check or action	Display and notes	Trouble diagnosis
1	Air conditioning present	ET079: Air conditioning present <b>YES</b>	<p><b>States whether the vehicle is fitted with air conditioning or not.</b></p> <ul style="list-style-type: none"> <li>- <b>YES:</b> Air conditioning is detected by the injection computer.</li> <li>- <b>NO:</b> Air conditioning is not detected by the injection computer.</li> </ul>	If not consistent with the vehicle equipment, carry out the multiplex network test and apply the relevant procedure.
2	Compressor engagement request	ET088: Request to start compressor <b>INACTIVE</b>	<p><b>The injection requests the IPDM E/R (via the multiplex network) to start the compressor</b></p> <ul style="list-style-type: none"> <li>- <b>ACTIVE:</b> The multiplex network should not be suspected on the Automatic Transmission, IPDM E/R or Intelligent Key unit or BCM system. The Intelligent Key unit or BCM should request the injection to be engaged. The coolant pressure sensor should not be suspected. Satisfactory engine operating conditions (coolant temperature, engine load etc.).</li> <li>- <b>INACTIVE:</b> One of the above conditions has not been fulfilled.</li> </ul>	<b>NONE.</b>

# DIESEL INJECTION

## Trouble diagnosis - Conformity check



### SUB SYSTEM COLD LOOP (Continuation 1):

Order	Function	Parameter or state Check or action	Display and notes	Trouble diagnosis
3	Air conditioning authorisation	ET004: Air conditioning authorised <b>NO</b>	<p><b>Non operational information, designed solely for trouble diagnosis purposes.</b></p> <ul style="list-style-type: none"> <li>- <b>YES:</b> Satisfactory engine operating conditions (coolant temperature, engine load etc.). The vehicle is not in a specific movement phase (hill start or stop etc.).</li> <li>- <b>NO:</b> One of the above conditions has not been fulfilled.</li> </ul>	<b>NONE.</b>
4	Refrigerant pressure	PR037: Refrigerant pressure	<p><b>Gives the value in BAR for the refrigerant fluid in the system.</b></p> <p><b>2 Bar &lt; PR037 &lt; 27 Bar</b> Default value: 0 Bar.</p>	<p><b>If there is a problem: apply the diagnostic procedure for P0530 "Refrigerant fluid sensor circuit". If the DTC persists, replace the refrigerant sensor.</b></p>
5	Engine speed	PR055: Engine speed	<p><b>Gives the engine's rotational speed in rpm.</b></p>	<p><b>In the event of a malfunction, apply the trouble diagnosis procedure for P0335 Engine speed sensor circuit.</b></p>
6	Fast idle speed request	ET023: Fast idle speed request <b>ABSENT</b>	<p><b>The Intelligent Key unit or BCM requests fast idle speed from the injection.</b></p> <ul style="list-style-type: none"> <li>- <b>ABSENT:</b> The Intelligent Key unit or BCM did not make the request</li> <li>- <b>PRESENT:</b> The Intelligent Key unit or BCM has made a request</li> </ul>	<p><b>If ET023 is incorrect, carry out a multiplex network test using the diagnostic tool. If the test is correct refer to the Intelligent Key unit or BCM trouble diagnosis.</b></p>
7	Coolant temperature	PR064: Coolant temperature Warm: 90 °C	<p><b>Gives the coolant temperature in °C.</b> Default value: 80 °C.</p>	<p><b>In the event of a malfunction, refer to parameter interpretation PR064 "Coolant temperature".</b></p>

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

**K9K**

### SUBSYSTEM: COLD LOOP (continuation 2)

Order	Function	Parameter or state Check or action	Display and notes	Trouble diagnosis
8	Vehicle speed	PR089: Vehicle speed	Gives the vehicle speed in kph. This parameter is transmitted by the ABS control unit. This information is transmitted to the injection on the multiplex network.	Test the multiplex network. Refer to ABS trouble diagnosis.
9	Power used by the AC compressor	PR125: Power used by the AC compressor <b>0 WATT</b>	Gives the power used by the compressor	NONE.
10	Fan speed request *	ET022: Fan low-speed request <b>INACTIVE</b>	The injection requests the IPDM E/R to start the fans. – <b>INACTIVE</b> : Engine speed = 0 rpm. – <b>ACTIVE</b> : Engine speed = idle speed, correct refrigerant pressure and vehicle speed = 0 km/h or high coolant temperature.	NONE.
11	Fan speed request *	ET021: High-speed fan request <b>INACTIVE</b>	The injection requests the IPDM E/R to start the fans. – <b>INACTIVE</b> : Engine speed = 0 rpm. – <b>ACTIVE</b> : Engine speed = idle speed. Refrigerant pressure > 15 Bar, vehicle speed = 0 km/h or high coolant temperature.	NONE.

\*: When climate control is requested with the engine at idle speed and vehicle speed = 0 km/h, ET022 will always be "ACTIVE" and ET021 "INACTIVE" (except refrigerant pressure > 15 bar, vehicle speed = 0 km/h and high coolant temperature). The fans are prevented from operating under certain coolant temperature conditions when driving.

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

**K9K****NOTES**

Only carry out conformity check after a **full check** using the diagnostic tool.  
The values indicated in this conformity check are given for reference purposes only.  
**Application condition:** engine off, ignition on.

**HEATING SUBFUNCTION:**

Order	Function	Parameter or state Check or action	Display and notes	Trouble diagnosis
1	Coolant temperature	<b>PR064:</b> Coolant temperature Warm: 90 °C	<b>Gives the coolant temperature in °C.</b> Default value: 80 °C.	<b>In the event of a malfunction, refer to parameter interpretation PR064 "Coolant temperature".</b>

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

**K9K**

**NOTES**

Only carry out conformity check after a **full check** using the diagnostic tool.  
The values indicated in this conformity check are given for reference purposes only.  
**Application condition: engine off, ignition on.**

**LPG/FUEL CIRCUIT SUB FUNCTION:**

Order	Function	Parameter or state Check or action	Display and notes	Trouble diagnosis
1	Fuel temperature	<b>PR063:</b> Fuel temperature Cold = PR064 Warm: 50 °C	<b>Gives the fuel temperature in °C.</b> Default value: 30 °C.	In the event of a malfunction, perform the diagnostic procedure for malfunction: P0180 "Fuel temperature sensor circuit".
2	Fuel flow	<b>PR017:</b> Fuel flow <b>0.0 mg/piston stroke</b>	<b>Shows the fuel flow injected in mg/piston stroke for each injector.</b> PR017 = 0 mg/piston stroke.	NONE.
3	Rail pressure	<b>PR038:</b> rail pressure Cold and warm: - 90 bar <PR038> 90 bar	<b>Gives the pressure of the diesel in the injection rail in Bar.</b> <b>This pressure is supplied by the sensor on the rail.</b> Default value: 2000 Bar.	In the event of a malfunction, apply the diagnostic procedure for malfunction P0190 Rail pressure sensor circuit.
4	Rail pressure setpoint	<b>PR008:</b> Rail pressure setpoint <b>375 bar</b> (Engine starting pressure instruction) Cold: 500 Bar Warm: 300 Bar	<b>Gives a theoretical pressure value for optimum engine operation.</b> 300 bar < PR008 < 500 bar.	NONE.
5	Rail pressure sensor voltage	<b>PR080:</b> Rail pressure sensor voltage Cold: 0.5 V Cold: 4.5 V	<b>Shows the voltage delivered by the computer on the rail pressure sensor.</b> 0.5 V < PR080 < 4.5 V Default value: 4.5 V	NONE.
6	Engine speed	<b>PR055:</b> Engine speed.	<b>Gives the engine's rotational speed in rpm.</b>	In the event of a malfunction, apply the diagnostic procedure for P0335 Engine speed sensor circuit.

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

**K9K**

**NOTES**

Only carry out conformity check after a **full check** using the diagnostic tool.  
The values indicated in this conformity check are given for reference purposes only.  
**Application condition:** engine off, ignition on.

**PRE-HEATING/IGNITION SUBFUNCTION:**

Order	Function	Parameter or state Check or action	Display and notes	Trouble diagnosis
1	Coolant temperature	<b>PR064:</b> Coolant temperature Warm: 90 °C	<b>Gives the coolant temperature in °C.</b> Default value: 80 °C.	In the event of a malfunction, refer to parameter interpretation PR064 "Coolant temperature".
2	External air temperature	<b>PR061:</b> External air temperature	<b>Gives the external air temperature in °C. This parameter is controlled by the Intelligent Key unit or BCM and transmitted to the ECM on the multiplex network.</b> Default value: 20 °C.	In the event of a malfunction, apply the diagnostic procedure for this malfunction described in the Intelligent Key unit or BCM document.
3	Inlet air temperature	<b>PR059:</b> Inlet air temperature Cold = PR061 Warm: 30 °C	<b>Gives the inlet air temperature in °C. This information is provided by the air temperature/pressure sensor.</b> Default value: 30 °C.	In the event of a malfunction, refer to parameter interpretation PR059 "Inlet air temperature".
4	Battery voltage	<b>PR074:</b> Battery voltage	<b>12 V &lt; PR074 &lt; 13.5 V</b>	In the event of a malfunction, run the diagnostic procedure for the "Charging circuit".

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

**K9K**

**NOTES**

Only carry out conformity check after a **full check** using the diagnostic tool.  
The values indicated in this conformity check are given for reference purposes only.  
**Application condition:** engine off, ignition on.

**AIR CIRC SUBFUNCTION (TURBOCHARGING/INLET.):**

Order	Function	Parameter or state Check or action	Display and notes	Trouble diagnosis
1	Inlet air temperature	PR059: Inlet air temperature Cold = PR061 Warm: 30 °C	Gives the inlet air temperature in °C. This information is provided by the air temperature/pressure sensor. Default value: 30 °C.	In the event of a malfunction, refer to parameter interpretation PR059 "Inlet air temperature".
2	Air circuit pressure	PR035: Atmospheric pressure  PR032: Inlet pressure	Gives the atmospheric pressure in mbar. The sensor is incorporated in the computer.  Shows the pressure in the inlet circuit in mbar.	If not consistent, check PR035 = PR032 = local atmospheric pressure, with the engine stopped and ignition on.
3	Air flow	PR132: Air flow	Air flow estimated by the injection computer.	NONE.
4	Inlet temperature sensor voltage	PR081: Inlet temperature sensor voltage	Shows the voltage delivered by the computer to supply the inlet temperature sensor	NONE.
5	Engine speed	PR055: Engine speed	Gives the engine's rotational speed in rpm.	In the event of a malfunction, apply the diagnostic procedure for P0335 Engine speed sensor circuit.

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

**K9K****NOTES**

Only carry out conformity check after a **full check** using the diagnostic tool.  
The values indicated in this conformity check are given for reference purposes only.  
**Application condition:** engine off, ignition on.

**ENGINE COOLING SUB FUNCTION:**

Order	Function	Parameter or state Check or action	Display and notes	Trouble diagnosis
1	Coolant temperature	<b>PR064:</b> Coolant temperature Warm: 90 °C	<b>Gives the coolant temperature in °C.</b> Default value: 80 °C.	<b>In the event of a malfunction, refer to parameter interpretation PR064 "Coolant temperature".</b>

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

**K9K**

<b>NOTES</b>	<p>Only carry out conformity check after a <b>full check</b> using the diagnostic tool.          The values indicated in this conformity check are given for reference purposes only.  <b>Application condition:</b> engine off, ignition on.</p>
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### DRIVER PARAMETERS SUB FUNCTION:

Order	Function	Parameter or state Check or action	Display and notes	Trouble diagnosis
1	Accelerator pedal position	<b>PR030:</b> Accelerator pedal position <b>0 %</b>	Indicates the percentage of the pedal position between no load and full load position <b>0 % &lt; PR030 &lt; 100 %</b>	<b>In the event of a malfunction, apply the diagnostic procedure for malfunction Pedal sensor circuit, track 1 and track 2 (P0225 and P2120) and P0608 "Sensor reference voltage".</b>
2	Pedal potentiometer tracks voltage	<b>PR086:</b> Pedal potentiometer track 1 voltage <b>16 %</b>  <b>PR088:</b> Pedal potentiometer track 2 voltage <b>7 %</b>	<b>Shows the voltage supply percentage for tracks 1 and 2 of the pedal potentiometer.</b>  <b>10 % &lt; PR086 &lt; 20 %</b> <b>5 % &lt; PR088 &lt; 15 %.</b>	<b>In the event of a malfunction, apply the diagnostic procedure for malfunction Pedal sensor circuit, track 1 and track 2 (P0225 and P2120) and P0608 "Sensor reference voltage".</b>

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

**K9K**

**NOTES**

Only carry out conformity check after a **full check** using the diagnostic tool.  
The values indicated in this conformity check are given for reference purposes only.  
**Application condition:** engine off, ignition on.

**ANTIPOLLUTION / OBD SUBFUNCTION:**

Order	Function	Parameter or state Check or action	Display and notes	Trouble diagnosis
1	EGR electronic control	<b>ET008:</b> EGR solenoid control <b>INACTIVE</b>	<b>Shows the condition of the EGR valve control.</b> - <b>INACTIVE:</b> The valve is not controlled by the computer. - <b>ACTIVE:</b> The valve is controlled by the computer.	<b>NONE.</b>
2	Atmospheric pressure	<b>PR035:</b> Atmospheric pressure	<b>Gives the atmospheric pressure in mbar. The sensor is incorporated in the computer.</b>	If not consistent, check <b>PR035 = PR032 =</b> local atmospheric pressure, with the engine stopped and ignition on.
3	Air flow	<b>PR132:</b> Air flow	<b>Air flow estimated by the injection computer.</b>	<b>NONE.</b>
4	Fuel flow	<b>PR017:</b> Fuel flow <b>0.0 mg/piston stroke</b>	<b>Shows the fuel flow out of the high-pressure pump in mg/piston stroke.</b>	<b>NONE.</b>
5	EGR solenoid valve control	<b>PR005:</b> EGR valve opening setpoint Warm or cold = - 50	<b>Gives a theoretical EGR valve opening value for optimum engine operation.</b> PR005 = PR051	<b>NONE.</b>

# DIESEL INJECTION

## Trouble diagnosis - Conformity check



### ANTI POLLUTION / OBD SUBFUNCTION (cont.):

Order	Function	Parameter or state Check or action	Display and notes	Trouble diagnosis
6	EGR valve position feedback	<b>PR051:</b> EGR valve position feedback Warm or cold = - 50	<b>Gives the actual value of the EGR valve position.</b> PR051 = PR005	<b>NONE.</b>
7	EGR valve position sensor voltage	<b>PR077:</b> EGR valve position sensor voltage <b>1.09 V</b>	<b>Gives the EGR valve voltage according to its position.</b> - <b>INACTIVE:</b> The valve is not controlled by the computer. - <b>ACTIVE:</b> The valve is controlled by the computer. <b>0.5 V &lt; PR077 &lt; 4.8 V</b>	<b>NONE.</b>
8	Accelerator pedal position	<b>PR030:</b> Accelerator pedal position <b>0 %</b>	<b>Indicates the percentage of the pedal position between no load and full load position</b> <b>PR030 = 0 %</b>	<b>In the event of a malfunction, apply the diagnostic procedure for malfunction Pedal sensor circuit, track 1 and track 2 (P0225 and P2120) and P0608 "Sensor reference voltage".</b>
9	Coolant temperature	<b>PR064:</b> Coolant temperature Warm: 90 °C	<b>Gives the coolant temperature in °C.</b> Default value: 80 °C.	<b>In the event of a malfunction, refer to parameter interpretation PR064 "Coolant temperature".</b>

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

**K9K**

<b>NOTES</b>	<p>Only carry out conformity check after a <b>full check</b> using the diagnostic tool.          The values indicated in this conformity check are given as examples.  <b>Test conditions:</b> Engine at idle speed.</p>
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### MAIN COMPUTER STATES AND PARAMETERS:

Order	Function	Parameter or state Check or action	Display and notes	Trouble diagnosis
1	Battery voltage	<b>PR074:</b> Battery voltage.	<b>13 V &lt; PR074 &lt; 14 V</b>	In the event of a malfunction, run the diagnostic procedure for the "Charging circuit".
2	Engine speed	<b>PR055:</b> Engine speed. Cold: 900 rpm V Warm: 805 rpm	<b>Gives the engine's rotational speed in rpm.</b>	In the event of a malfunction, apply the diagnostic procedure for P0335 Engine speed sensor circuit.
3	Accelerator pedal position	<b>PR030:</b> Accelerator pedal position <b>0 %</b>	<b>Gives the position of the accelerator pedal as a %.</b> <b>PR030 = 0 %</b>	In the event of a malfunction, apply the diagnostic procedure for DTCs <b>P0225</b> and <b>P2120</b> Pedal sensor circuit, track 1 and track 2 and <b>P0608</b> "Sensor reference voltage".
4	Coolant temperature	<b>PR064:</b> Coolant temperature Warm: 90 °C	<b>Gives the coolant temperature in °C.</b> Default value: 80 °C.	In the event of a malfunction, refer to parameter interpretation PR064 "Coolant temperature".
5	External air temperature	<b>PR061:</b> External air temperature	<b>Gives the external air temperature in °C.</b> <b>This parameter is controlled by the Intelligent Key unit or BCM and transmitted to the injection on the multiplex network.</b> Default value: 20 °C.	In the event of a malfunction, apply the diagnostic procedure for this malfunction described in the Intelligent Key unit or BCM document.

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

**K9K**

### MAIN COMPUTER STATES AND PARAMETERS:(Continued 1)

Order	Function	Parameter or state Check or action	Display and notes	Trouble diagnosis
6	Inlet air temperature	<b>PR059:</b> Inlet air temperature Cold = PR061 Warm: 30 °C	<b>Gives the inlet air temperature in °C. This information is provided by the air temperature/ pressure sensor.</b> Default value: 20 °C.	In the event of a malfunction, refer to parameter interpretation PR059 "Inlet air temperature".
7	Fuel temperature	<b>PR063:</b> Fuel temperature Cold = PR064 Warm: 50 °C	<b>Gives the fuel temperature in °C. This value is given by the fuel temperature sensor.</b> Default value: 30 °C.	In the event of a malfunction, apply the diagnostic procedure for malfunction P0180 Fuel temperature sensor circuit.
8	Air circuit pressure	<b>PR035:</b> Atmospheric pressure	<b>Gives the atmospheric pressure in mbar. The sensor is incorporated in the computer.</b> 600 mbar < Cold < 1050 mbar 600 mbar < Warm < 1050 mbar	If not consistent, check PR035 = PR032 = local atmospheric pressure, with the engine stopped and ignition on.
		<b>PR032:</b> Inlet pressure	<b>Shows the pressure in the inlet circuit in mbar.</b> PR032 = local atmospheric pressure	
9	Rail pressure	<b>PR038:</b> Rail pressure Cold: 260 Bar Warm: 230 Bar	<b>Gives the pressure of the diesel in the injection rail in Bar. This pressure is supplied by the sensor on the rail.</b> Default value: 2000 Bar.	In the event of a malfunction, apply the diagnostic procedure for malfunction P0190 Rail pressure sensor circuit.

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

K9K

**NOTES**

Only carry out conformity check after a **full check** using the diagnostic tool.  
The values indicated in this conformity check are given as examples.  
**Test conditions:** Engine at idle speed.

**START SUBFUNCTION:**

Order	Function	Parameter or state Check or action	Display and notes	Trouble diagnosis
1	Computer + after ignition feed	ET001: Computer + after ignition feed <b>PRESENT</b>	Indicates that the computer is supplied with a + after ignition feed. – Present – Absent	In the event of a malfunction, carry out the diagnostic procedure for P0560 "Computer supply voltage" or P0685 "Main relay circuit".
2	Starting	ET076: Starting <b>AUTHORISED</b>	Indicates whether or not starting has been authorised by the injection <b>AUTHORISED:</b> The injection has given starting authorisation. <b>PROHIBITED:</b> The injection has not given starting authorisation.	If <b>PROHIBITED</b> , carry out a full diagnostic procedure on the preheating system.
3	Engine	ET038: Engine + after ignition feed	Gives the current status of the engine. – + after ignition feed – <b>CRANKING</b> – <b>RUNNING</b> – <b>MAINTAINED</b> <b>SUPPLY:</b> Supply maintained during the power latch phase. – Stalled: When the engine has stalled. – Protected: When a malfunction appears or when the engine speed is limited to a certain engine speed.	<b>NONE.</b>
4	Battery voltage	PR074: Battery voltage	13 V < PR074 < 14 V	In the event of a malfunction, run the diagnostic procedure for the "Charging circuit".

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

**K9K**

**NOTES**

Only carry out conformity check after a **full check** using the diagnostic tool.  
The values indicated in this conformity check are given as examples.  
**Test conditions:** Engine at idle speed.

**PROTECTION SUBFUNCTION:**

Order	Function	Parameter or state Check or action	Display and notes	Trouble diagnosis
1	Immobiliser	ET003: Immobiliser <b>INACTIVE</b>	<p>Gives the status of the immobiliser system.</p> <ul style="list-style-type: none"> <li>- <b>INACTIVE:</b> The injection computer has recognised the immobiliser code transmitted by the UCH.</li> <li>- <b>ACTIVE:</b> The injection computer does not recognise the immobiliser code transmitted by the Intelligent Key unit or BCM.</li> </ul>	If <b>ACTIVE</b> , follow the associated "help" given in the tool.
2	Code programmed	ET006: Code programmed <b>YES</b>	<p>States whether the immobiliser code has been programmed by the computer or not.</p> <ul style="list-style-type: none"> <li>- <b>YES:</b> Code programmed</li> <li>- <b>NO:</b> Code not programmed by the ECM.</li> </ul>	If <b>NO</b> , replace ECM.
3	Battery voltage	PR074: Battery voltage	<b>13 V &lt; PR074 &lt; 14 V</b>	In the event of a malfunction, run the diagnostic procedure for the "Charging circuit".

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

K9K

**NOTES**

Only carry out conformity check after a **full check** using the diagnostic tool.  
The values indicated in this conformity check are given as examples.  
**Test conditions:** Engine at **idle speed**.

**SUB SYSTEM COLD LOOP:**

Order	Function	Parameter or state Check or action	Display and notes	Trouble diagnosis
1	Air conditioning present	ET079: Air conditioning present <b>YES</b>	<p><b>States whether the vehicle is fitted with air conditioning or not.</b></p> <ul style="list-style-type: none"> <li>- <b>YES:</b> Air conditioning is detected by the ECM.</li> <li>- <b>NO:</b> Air conditioning is not detected by the ECM.</li> </ul>	<p><b>If not consistent with the vehicle equipment, carry out the multiplex network test and apply the relevant procedure.</b></p>
2	Compressor engagement request	ET088: Request to start compressor <b>INACTIVE</b>	<p><b>The injection requests the IPDM E/R (via the multiplex network) to start the compressor</b></p> <ul style="list-style-type: none"> <li>- <b>ACTIVE:</b> The multiplex network should not be faulty on the Automatic Transmission, IPDM E/R. The UCH should request the injection to be engaged. The refrigerant pressure sensor should not be faulty. Satisfactory engine operating conditions (coolant temperature, engine load etc.).</li> <li>- <b>INACTIVE:</b> One of the above conditions has not be fulfilled or no request has been made by the driver so <b>ET004 = NO.</b></li> </ul>	<b>NONE.</b>

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

**K9K**

### SUB SYSTEM COLD LOOP (Continuation 1):

Order	Function	Parameter or state Check or action	Display and notes	Trouble diagnosis
3	Air conditioning authorisation	<b>ET004:</b> Air conditioning authorised <b>NO</b>	<p><b>Non operational information, designed solely for trouble diagnosis purposes.</b></p> <ul style="list-style-type: none"> <li>- <b>YES:</b> Satisfactory engine operating conditions (coolant temperature, engine load etc.). The vehicle is not in a specific movement phase (hill start or stop etc.).</li> <li>- <b>INACTIVE:</b> One of the above conditions has not be fulfilled or no request has been made by the driver so <b>ET088 = INACTIVE.</b></li> </ul>	<b>NONE.</b>
4	<b>Refrigerant pressure</b>	<b>PR037:</b> Refrigerant pressure.	<p><b>Gives the value in BAR for the refrigerant fluid in the system.</b></p> <p><b>2 Bar &lt; PR037 &lt; 27 Bar</b> Default value: 0 Bar.</p>	<p><b>If there is a problem: apply the diagnostic procedure for P0530 "Refrigerant fluid sensor circuit". If the DTC persists, replace the refrigerant sensor.</b></p>
5	<b>Engine speed</b>	<b>PR055:</b> Engine speed Cold: 900 rpm V Warm: 805 rpm	<p><b>Gives the engine's rotational speed in rpm.</b></p>	<p><b>In the event of a malfunction, apply the diagnostic procedure for P0335 Engine speed sensor circuit.</b></p>

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

**K9K**

### SUBSYSTEM: COLD LOOP (continuation 2)

Order	Function	Parameter or state Check or action	Display and notes	Trouble diagnosis
6	Fast idle speed request	ET023: Fast idle speed request <b>ABSENT</b>	<p>The BCM requests fast idle speed from the injection.</p> <ul style="list-style-type: none"> <li>- <b>ABSENT:</b> The IPDM E/R did not make the request</li> <li>- <b>PRESENT:</b> The IPDM E/R has made a request</li> </ul>	If ET023 is incorrect, carry out a multiplex network test using the diagnostic tool. If the test is correct refer to the IPDM E/R diagnostic procedure
7	Coolant temperature	PR064: Coolant temperature Warm: 90 °C	<p>Gives the coolant temperature in °C. Default value: 80 °C.</p>	In the event of a malfunction, refer to parameter interpretation PR064 "Coolant temperature".
8	Vehicle speed	PR089: Vehicle speed	<p>Gives the vehicle speed in kph. This parameter is transmitted by the ABS control unit. This information is transmitted to the injection on the multiplex network.</p>	<p>Test the multiplex network. Refer to ABS trouble diagnosis.</p>

# DIESEL INJECTION

## Trouble diagnosis - Conformity check



### COLD LOOP SUBSYSTEM (continuation 3):

Order	Function	Parameter or state Check or action	Display and notes	Trouble diagnosis
9	Power used by the AC compressor	PR125: Power used by the AC compressor <b>0 WATT</b>	<b>Gives the power used by the compressor</b>	<b>NONE.</b>
10	Fan speed request *	ET022: Fan low-speed request <b>INACTIVE</b>	<p><b>The injection requests the IPDM E/R to start the fans.</b></p> <ul style="list-style-type: none"> <li>- <b>INACTIVE:</b> The request is not made by the injection because ET088 = INACTIVE and ET004 = NO.</li> <li>- <b>ACTIVE:</b> The request is made by the injection. ET088 = ACTIVE and ET004 = YES. (correct refrigerant pressure and vehicle speed = 0 km/h or high coolant temperature).</li> </ul>	<b>NONE.</b>
		ET021: High-speed fan request <b>INACTIVE</b>	<p><b>The injection requests the UPC to start the fans.</b></p> <ul style="list-style-type: none"> <li>- <b>INACTIVE:</b> The request is not made by the injection because ET088 = INACTIVE and ET004 = NO.</li> <li>- <b>ACTIVE:</b> The request is made by the injection. ET088 = ACTIVE and ET004 = YES. Refrigerant pressure &gt; 15 Bar, vehicle speed = 0 km/h or high engine coolant temperature.</li> </ul>	

\*: When climate control is requested with the engine at idle speed and vehicle speed = 0 km/h, ET022 will always be "ACTIVE" and ET021 "INACTIVE" (except refrigerant pressure > 15 bar, vehicle speed = 0 km/h and high coolant temperature). The fans are prevented from operating under certain coolant temperature conditions when driving.

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

**K9K****NOTES**

Only carry out conformity check after a **full check** using the diagnostic tool.  
The values indicated in this conformity check are given as examples.  
**Test conditions:** Engine at **idle speed**.

**HEATING SUBFUNCTION:**

Order	Function	Parameter or state Check or action	Display and notes	Trouble diagnosis
1	Coolant temperature	<b>PR064:</b> Coolant temperature Warm: 90 °C	<b>Gives the coolant temperature in °C.</b> Default value: 80 °C.	<b>In the event of a malfunction, refer to parameter interpretation PR064 "Coolant temperature".</b>

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

K9K

**NOTES**

Only carry out conformity check after a **full check** using the diagnostic tool.  
The values indicated in this conformity check are given as examples.  
**Test conditions:** Engine at idle speed.

**LPG/FUEL CIRCUIT SUB FUNCTION:**

Order	Function	Parameter or state Check or action	Display and notes	Trouble diagnosis
1	Fuel temperature	<b>PR063:</b> Fuel temperature Cold = PR064 Warm: 50 °C	<b>Gives the fuel temperature in °C.</b> Default value: 30 °C.	<b>In the event of a malfunction, perform the diagnostic procedure for DTC P0180 "Fuel temperature sensor circuit".</b>
2	Fuel flow	<b>PR017:</b> Fuel flow 10 < Cold < 2 mg/ piston stroke 4 < Warm < 6 mg/ piston stroke	<b>Shows the fuel flow injected in mg/piston stroke for each injector.</b>	None.
3	Rail pressure	<b>PR038:</b> Rail pressure Cold: 260 Bar Warm: 230 Bar	<b>Gives the pressure of the diesel in the injection rail in Bar. This pressure is supplied by the sensor on the rail.</b> Default value: 2000 Bar.	<b>In the event of a malfunction, apply the diagnostic procedure for DTC P0190 Rail pressure sensor circuit.</b>
4	Rail pressure setpoint	<b>PR008:</b> Rail pressure specification <b>375 bar.</b> (Engine starting pressure specification). Cold: 260 Bar Warm: 230 Bar	<b>Gives a theoretical pressure value for optimum engine operation.</b>	None.
5	Rail pressure sensor voltage	<b>PR080:</b> Rail pressure sensor voltage	<b>Shows the voltage delivered by the computer on the rail pressure sensor.</b> 0.5 V (0 bar) < PR080 < 4.5 V (1600 bar)	None.
6	Engine speed	<b>PR055:</b> Engine speed. Cold: 900 rpm V Warm: 805 rpm	<b>Gives the engine's rotational speed in rpm.</b>	<b>In the event of a malfunction, apply the diagnostic procedure for DTC P0335 Engine speed sensor circuit.</b>

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

**K9K**

<b>NOTES</b>	<p>Only carry out conformity check after a <b>full check</b> using the diagnostic tool.          The values indicated in this conformity check are given as examples.  <b>Test conditions:</b> Engine at idle speed.</p>
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### PRE-HEATING/IGNITION SUBFUNCTION:

Order	Function	Parameter or state Check or action	Display and notes	Trouble diagnosis
1	Coolant temperature	<b>PR064:</b> Coolant temperature Warm: 90 °C	<b>Gives the coolant temperature in °C.</b> Default value: 80 °C.	In the event of a malfunction, refer to parameter interpretation PR064 "Coolant temperature".
2	External air temperature	<b>PR061:</b> External air temperature	<b>Gives the external air temperature in °C. This parameter is controlled by the BCM and transmitted to the injection on the multiplex network.</b> Default value: 20 °C.	In the event of a malfunction, apply the diagnostic procedure for this malfunction described in the BCM document.
3	Inlet air temperature	<b>PR059:</b> Inlet air temperature Cold = PR061 Warm: 30 °C	<b>Gives the inlet air temperature in °C. This information is provided by the air temperature/pressure sensor.</b> Default value: 30 °C.	In the event of a malfunction, refer to parameter interpretation PR059 "Inlet air temperature".
4	Battery voltage	<b>PR074:</b> Battery voltage	<b>12 V &lt; PR074 &lt; 14 V</b>	In the event of a malfunction, run the diagnostic procedure for the "Charging circuit".

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

K9K

**NOTES**

Only carry out conformity check after a **full check** using the diagnostic tool.  
The values indicated in this conformity check are given as examples.  
**Test conditions:** Engine at idle speed.

**AIR CIRC SUBFUNCTION (TURBOCHARGING/INLET.):**

Order	Function	Parameter or state Check or action	Display and notes	Trouble diagnosis
1	Inlet air temperature	<b>PR059:</b> Inlet air temperature Cold = PR061 Warm: 30 °C	<b>Gives the inlet air temperature in °C. This information is provided by the air temperature/ pressure sensor. Default value: 30 °C.</b>	<b>In the event of a malfunction, refer to parameter interpretation PR059 "Inlet air temperature".</b>
2	Air circuit pressure	<b>PR035:</b> Atmospheric pressure  <b>PR032:</b> Inlet pressure	<b>Gives the atmospheric pressure in mbar. The sensor is incorporated in the ECM.</b>  <b>Shows the pressure in the inlet circuit in mbar.</b>	<b>If not consistent, check PR035 = PR032 = local atmospheric pressure, with the engine stopped and ignition on.</b>
3	Air flow	<b>PR132:</b> Air flow 350 < Cold < 400 mg/piston stroke 300 < Warm < 350 mg/piston stroke	<b>Air flow estimated by the ECM.</b>	<b>None.</b>
4	Inlet temperature sensor voltage	<b>PR081:</b> Inlet temperature sensor voltage	<b>Shows the voltage delivered by the computer to supply the inlet temperature sensor</b>	<b>None.</b>
5	Engine speed	<b>PR055:</b> Engine speed. Cold: 900 rpm V Warm: 805 rpm	<b>Gives the engine's rotational speed in rpm.</b>	<b>In the event of a malfunction, apply the diagnostic procedure for P0335 Engine speed sensor circuit.</b>

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

**K9K****NOTES**

Only carry out conformity check after a **full check** using the diagnostic tool.  
The values indicated in this conformity check are given as examples.  
**Test conditions:** Engine at **idle speed**.

**ENGINE COOLING SUB FUNCTION:**

Order	Function	Parameter or state Check or action	Display and notes	Trouble diagnosis
1	Coolant temperature	<b>PR064:</b> Coolant temperature Warm: 90 °C	<b>Gives the coolant temperature in °C.</b> Default value: 80 °C.	<b>In the event of a malfunction, refer to parameter interpretation PR064 "Coolant temperature".</b>

# DIESEL INJECTION

## Trouble diagnosis - Conformity check



<b>NOTES</b>	<p>Only carry out conformity check after a <b>full check</b> using the diagnostic tool.          The values indicated in this conformity check are given as examples.  <b>Test conditions:</b> Engine at <b>idle speed</b>.</p>
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### DRIVER PARAMETERS SUB FUNCTION:

Order	Function	Parameter or state Check or action	Display and notes	Trouble diagnosis
1	Accelerator pedal position (APP sensor)	<b>PR030:</b> Accelerator pedal position <b>0 %</b>	<b>Indicates the percentage of the pedal position between no load and full load position</b> <b>0 % &lt; PR030 &lt; 100 %</b>	<b>In the event of a malfunction, apply the diagnostic procedure for DTCs P0225 and P2120 Pedal sensor circuit, track 1 and track 2 and P0608 "Sensor reference voltage"</b>
2	Pedal potentiometer tracks voltage (APP sensor)	<b>PR086:</b> Pedal potentiometer track 1 voltage <b>16 %</b>  <b>PR088:</b> Pedal potentiometer track 2 voltage <b>7 %</b>	<b>Shows the voltage supply percentage for tracks 1 and 2 of the pedal potentiometer.</b>  <b>10 % &lt; PR086 &lt; 20 %</b> <b>5 % &lt; PR088 &lt; 15 %</b>	<b>In the event of a malfunction, apply the diagnostic procedure for DTCs P0225 and P2120 Pedal sensor circuit, track 1 and track 2 and P0608 "Sensor reference voltage"</b>

# DIESEL INJECTION

## Trouble diagnosis - Conformity check

K9K

<b>NOTES</b>	<p>Only carry out conformity check after a <b>full check</b> using the diagnostic tool.          The values indicated in this conformity check are given as examples.  <b>Test conditions:</b> Engine at idle speed.</p>
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### ANTIPOLLUTION / OBD SUBFUNCTION:

Order	Function	Parameter or state Check or action	Display and notes	Trouble diagnosis
1	EGR solenoid valve control	<b>ET008:</b> EGR solenoid control <b>INACTIVE</b>	<b>Shows the condition of the EGR valve control.</b> – <b>INACTIVE:</b> The valve is not controlled by the computer. – <b>ACTIVE:</b> The valve is controlled by the computer.	None.
2	Atmospheric pressure	<b>PR035:</b> Atmospheric pressure	<b>Gives the atmospheric pressure in mbar. The sensor is incorporated in the ECM.</b>	If not consistent, check <b>PR035 = PR032 =</b> local atmospheric pressure, with the engine stopped and ignition on.
3	Air flow	<b>PR132:</b> Air flow 350 < Cold < 400 mg/piston stroke 300 < Warm < 350 mg/piston stroke	<b>Air flow estimated by the ECM.</b>	None.
4	Fuel flow	<b>PR017:</b> Fuel flow 10 < Cold < 12 mg/piston stroke 4 < Warm < 6 mg/piston stroke	<b>Shows the fuel flow out of the high-pressure pump in mg/piston stroke.</b>	None.
5	EGR valve opening setpoint	<b>PR005:</b> EGR valve opening setpoint Warm: 20%	<b>Gives a theoretical EGR valve opening value for optimum engine operation.</b>	None.

# DIESEL INJECTION

## Trouble diagnosis - Conformity check



### ANTI POLLUTION / OBD SUBFUNCTION (cont.):

Order	Function	Parameter or state Check or action	Display and notes	Trouble diagnosis
6	EGR valve position feedback	<b>PR051:</b> EGR valve position feedback Warm approximately 20%	<b>Gives the actual value of the EGR valve position.</b> Default value: 30%	<b>NONE.</b>
7	EGR valve position sensor voltage	<b>PR077:</b> EGR valve position sensor voltage	<b>Gives the EGR valve voltage according to its position.</b> – <b>INACTIVE:</b> The valve is not controlled by the computer. – <b>ACTIVE:</b> The valve is controlled by the computer. <b>0.5 V &lt; PR077 &lt; 4.8 V</b>	<b>NONE.</b>
8	Accelerator pedal position	<b>PR030:</b> Accelerator pedal position <b>0 %</b>	<b>Indicates the percentage of the pedal position between no load and full load position</b> <b>0 &lt; PR030 &lt; 100 %</b>	<b>In the event of a malfunction, apply the diagnostic procedure for DTCs P0225 and P2120 Pedal sensor circuit, track 1 and track 2 and P0608 "Sensor reference voltage"</b>
9	Coolant temperature	<b>PR064:</b> Coolant temperature Warm: 90 °C	<b>Gives the coolant temperature in °C.</b> Default value: 80 °C.	<b>In the event of a malfunction, refer to parameter interpretation PR064 "Coolant temperature".</b>

# DIESEL INJECTION

K9K

## Trouble diagnosis - Interpretation of parameters

PR059	<u>INLET AIR TEMPERATURE SENSOR</u>
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<b>NOTES</b>	<b>Special notes:</b> Only perform the checks if the parameter is incorrect.
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<p>Check the condition of the turbocharger air temperature pressure sensor connections. If necessary replace the sensor. Measure the <b>resistance</b> across <b>terminals 1 and 2</b> of the air temperature - pressure sensor:</p> <p style="text-align: center;"><b>8950 &lt; R in <math>\Omega</math> at - 10 °C &lt; 9901</b> <b>7054 &lt; R in <math>\Omega</math> at - 5 °C &lt; 7784</b> <b>5605 &lt; R in <math>\Omega</math> at - 0 °C &lt; 6169</b> <b>3618 &lt; R in <math>\Omega</math> at - 10 °C &lt; 3964</b> <b>2400 &lt; R in <math>\Omega</math> at - 20 °C &lt; 2620</b> <b>1645 &lt; R in <math>\Omega</math> at - 30 °C &lt; 1787</b></p> <p>Replace the air temperature - pressure sensor, if necessary.</p>
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PR064	<u>ENGINE COOLANT TEMPERATURE</u>
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<b>NOTES</b>	<b>Special notes:</b> Only perform the checks if the parameter is incorrect.
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<p>Check the condition of the engine coolant temperature sensor connections. If necessary replace the sensor. Measure the <b>resistance</b> between terminals <b>1</b> and <b>4</b> of the <b>coolant temperature sensor</b>.</p> <ul style="list-style-type: none"><li>- <b>R at - 10 °C</b> = 12.46 k<math>\Omega</math> <math>\pm</math> 1128 <math>\Omega</math>.</li><li>- <b>R at 25 °C</b> = 2252 <math>\Omega</math> <math>\pm</math> 112.6 <math>\Omega</math>.</li><li>- <b>R at 50 °C</b> = 811.4 <math>\Omega</math> <math>\pm</math> 38.4 <math>\Omega</math>.</li><li>- <b>R at 80 °C</b> = 282.6 <math>\Omega</math> <math>\pm</math> 7.83 <math>\Omega</math>.</li></ul> <p>If the value is incorrect, replace the engine coolant temperature sensor.</p>
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# DIESEL INJECTION

## Trouble diagnosis - Tests

**K9K**

**NOTES**

Only consult the tests after following the diagnostic procedure chart.

Some specific checks are grouped under the << tests >> heading and are used as required in different diagnostic charts.

TEST 1: Low pressure circuit check

TEST 2: Electrical circuit check

TEST 3: Injector check

TEST 4: Parameter check

TEST 5: Air inlet circuit check

TEST 6: ECM check

TEST 7: High pressure pump check

TEST 8: High pressure circuit tightness check

TEST 9: Injector tightness check

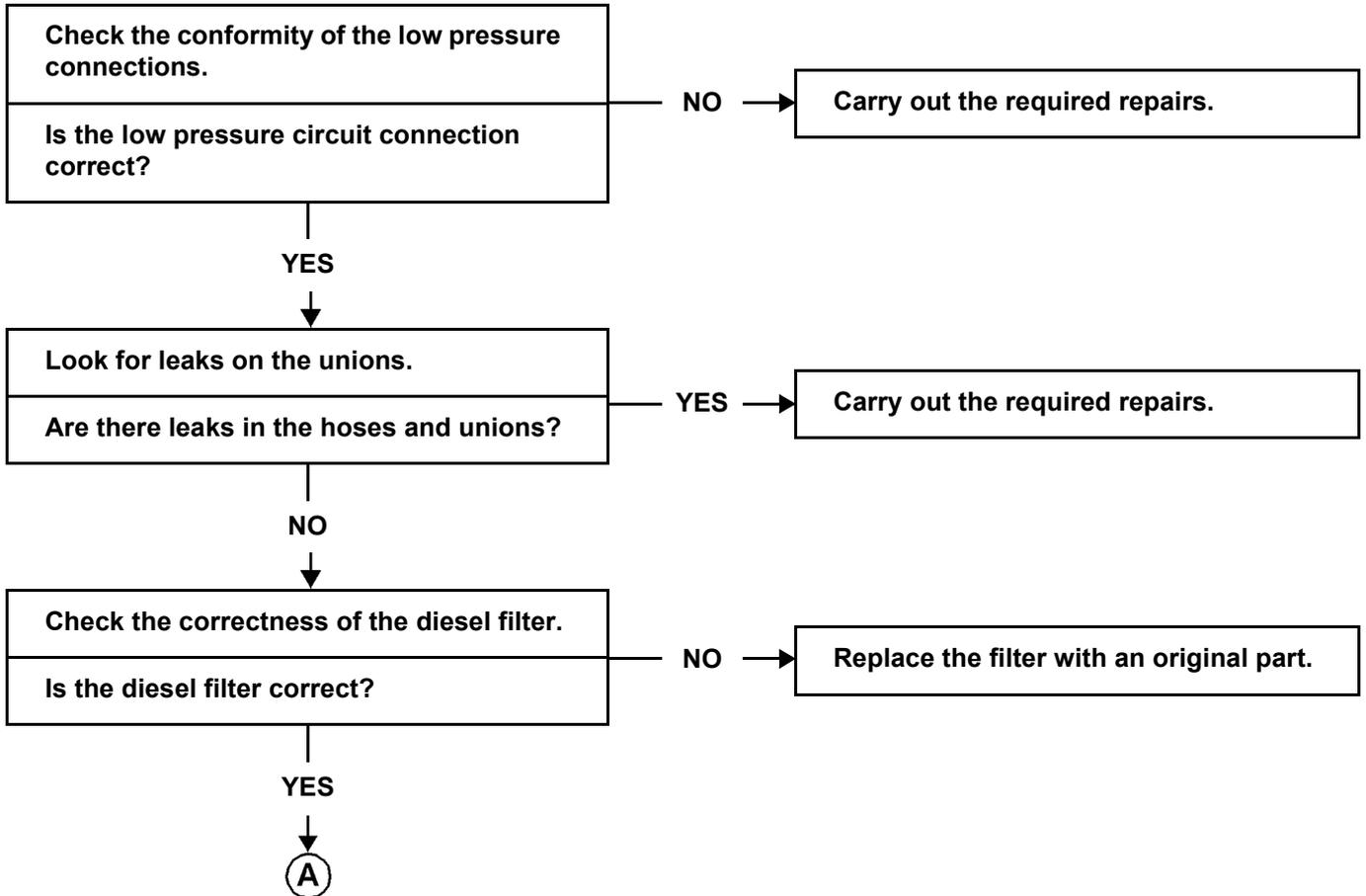
TEST 10: Injector return flow in starting phase

# DIESEL INJECTION

## Trouble diagnosis - Tests

K9K

TEST 1	LOW PRESSURE CIRCUIT CHECK
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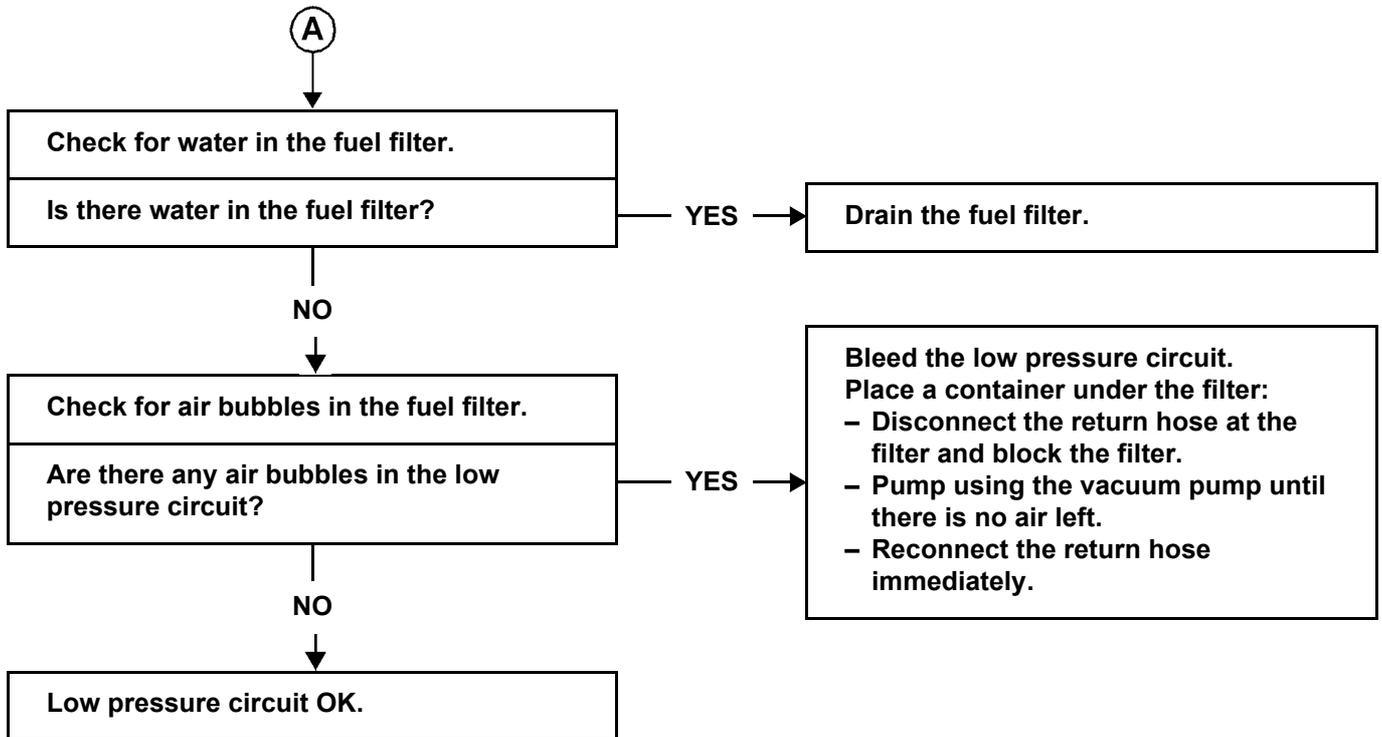


# DIESEL INJECTION

## Trouble diagnosis - Tests

**K9K**

**TEST 1**  
Cont'd

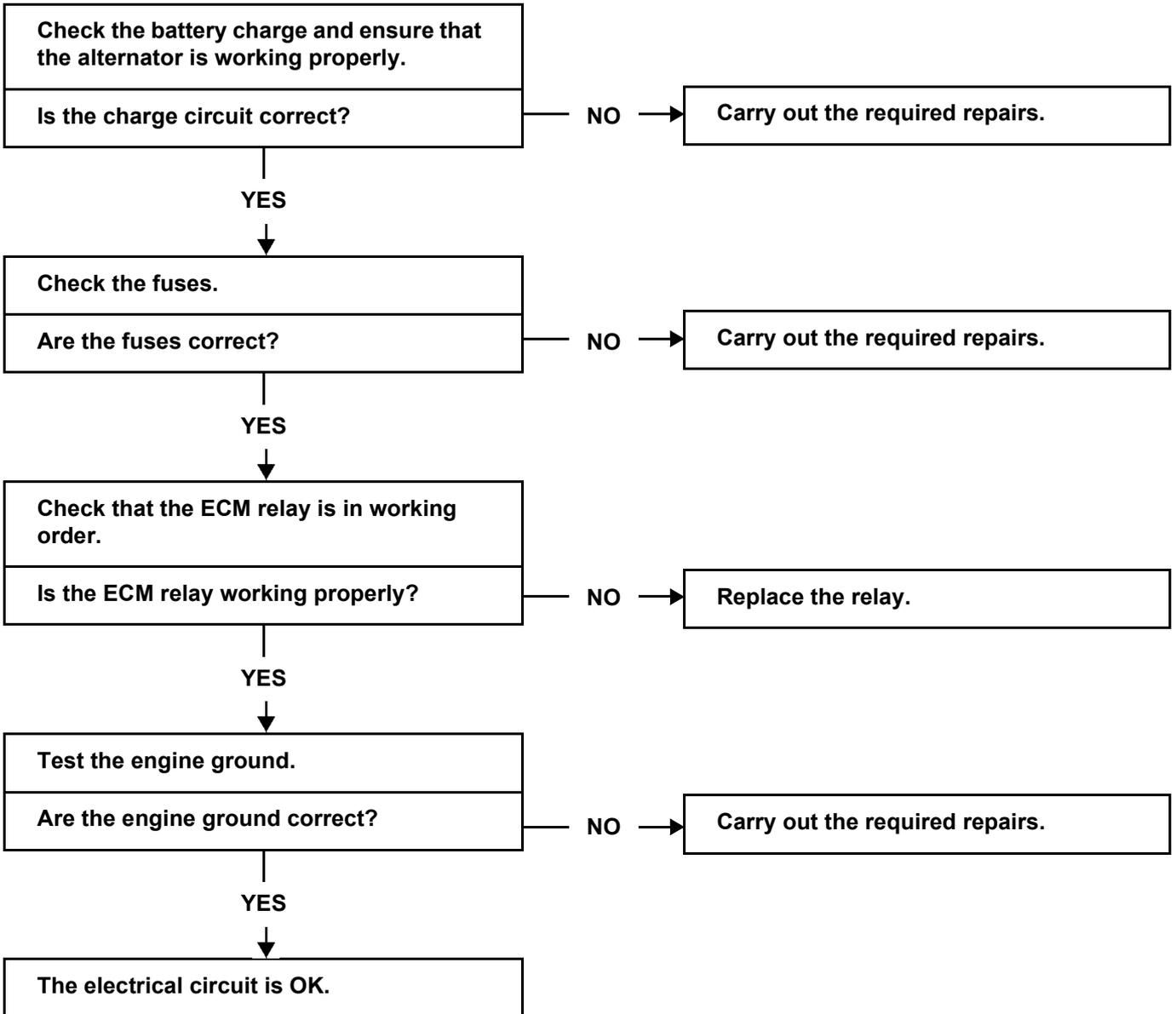


# DIESEL INJECTION

## Trouble diagnosis - Tests

K9K

TEST 2	ELECTRICAL CIRCUIT CHECK
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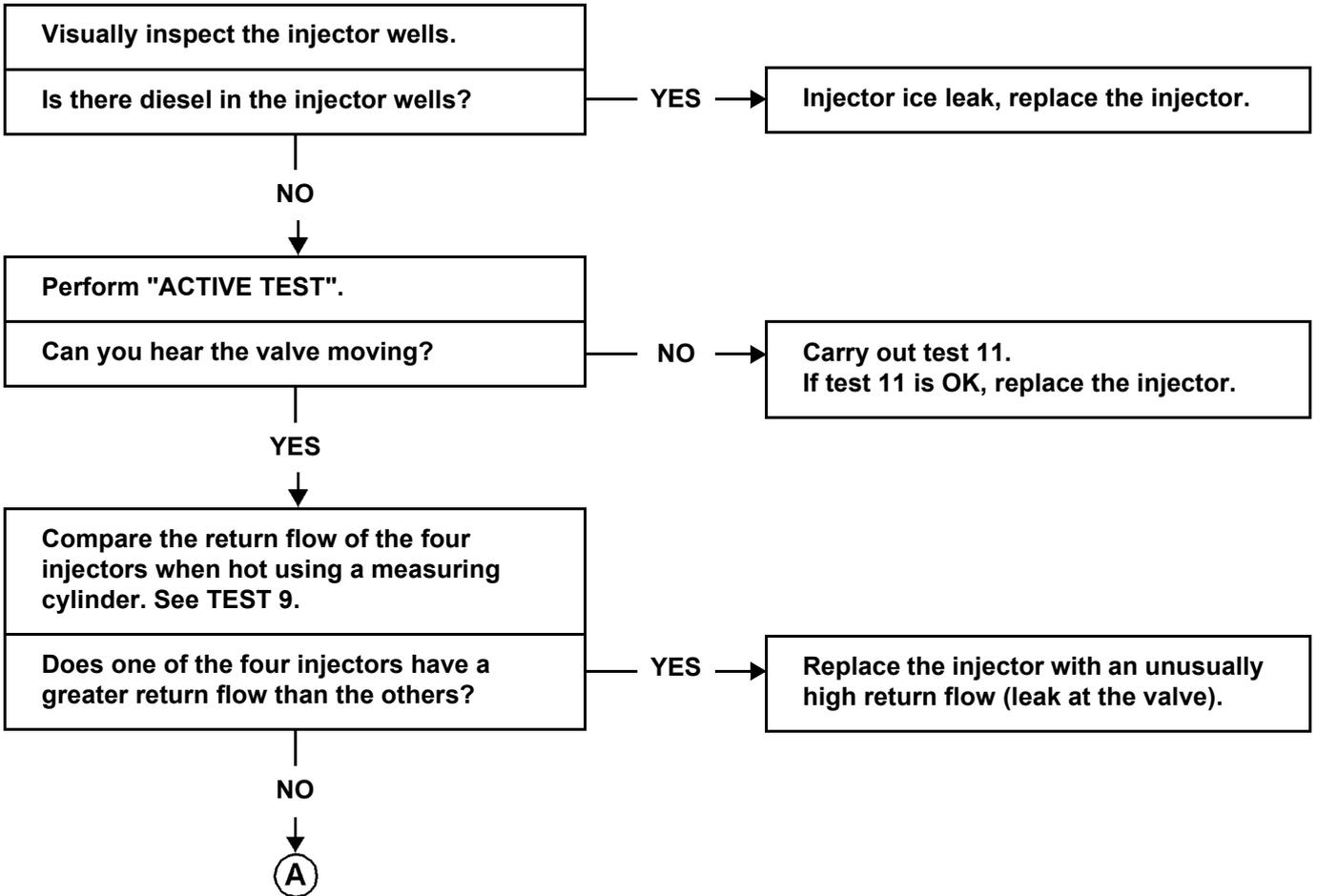


# DIESEL INJECTION

## Trouble diagnosis - Tests

K9K

TEST 3	INJECTOR CHECK
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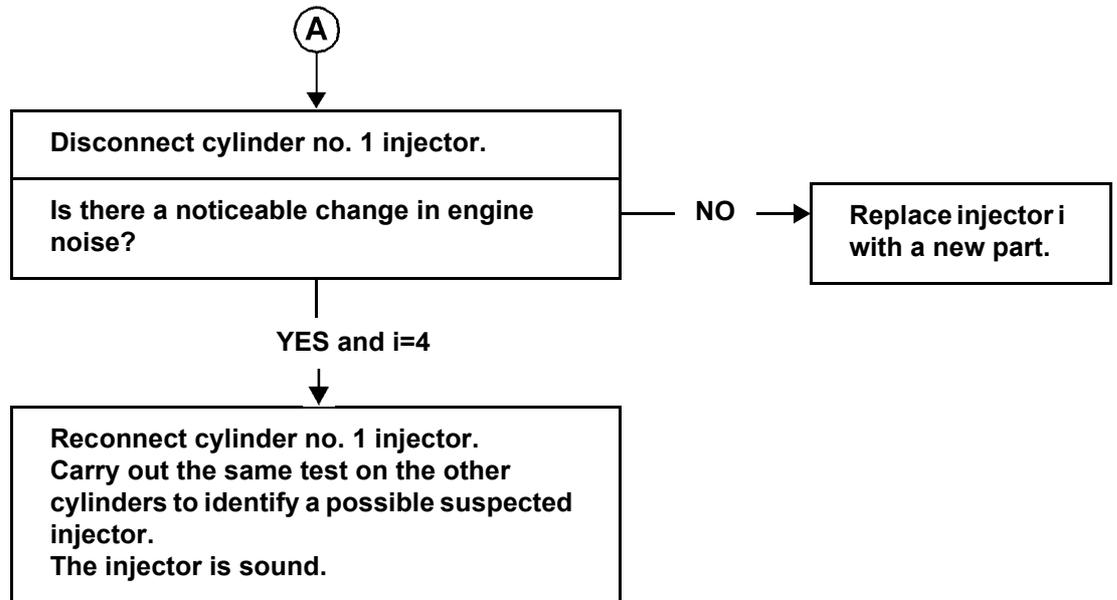


# DIESEL INJECTION

## Trouble diagnosis - Tests

**K9K**

**TEST 3**  
Cont'd

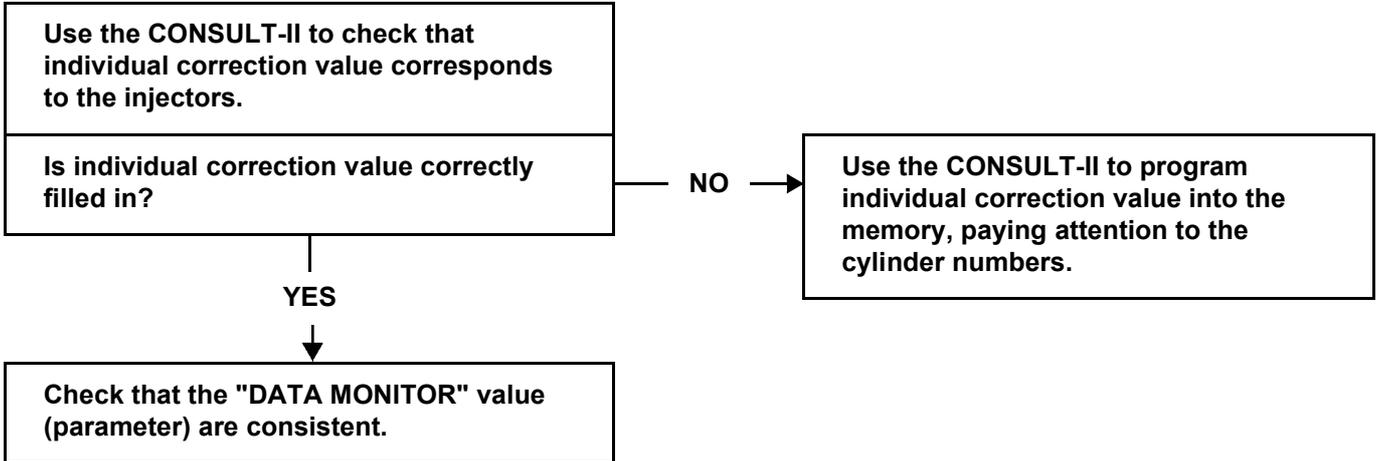


# DIESEL INJECTION

## Trouble diagnosis - Tests

**K9K**

TEST 4	PARAMETER CHECK
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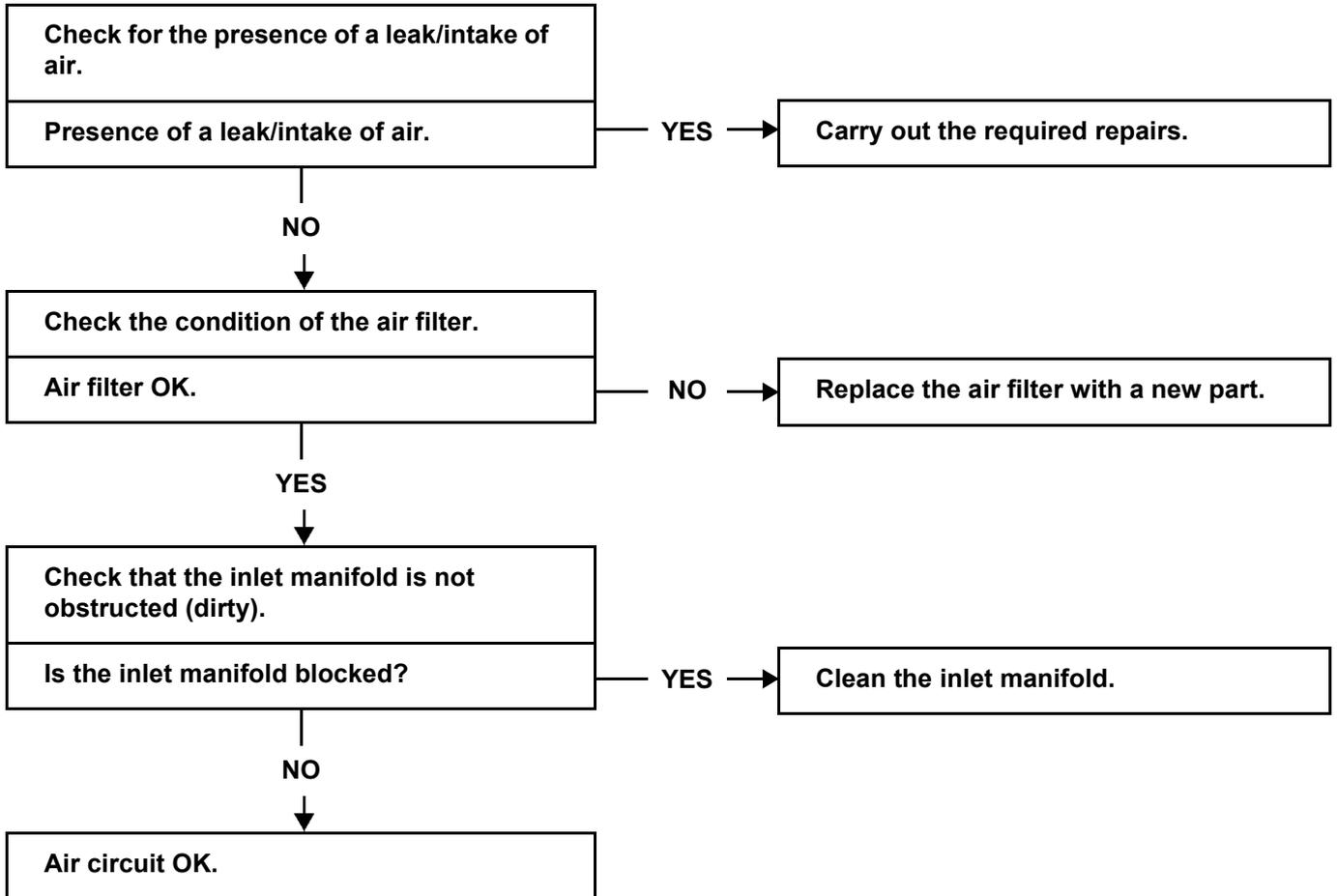


# DIESEL INJECTION

## Trouble diagnosis - Tests

**K9K**

<b>TEST 5</b>	<b>AIR INLET CIRCUIT CHECK</b>
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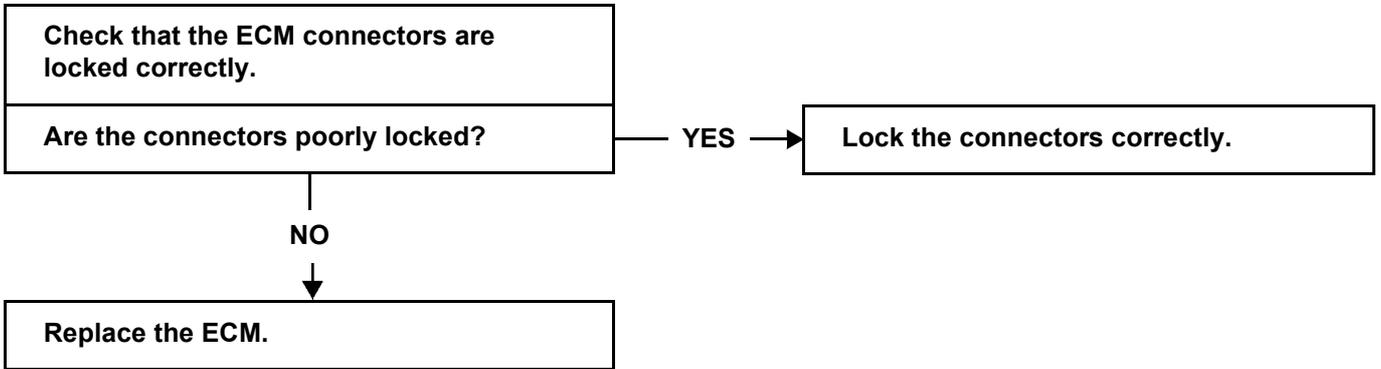


# DIESEL INJECTION

## Trouble diagnosis - Tests

**K9K**

TEST 6	ECM CHECK (COMPUTER)
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# DIESEL INJECTION

## Trouble diagnosis - Tests

K9K

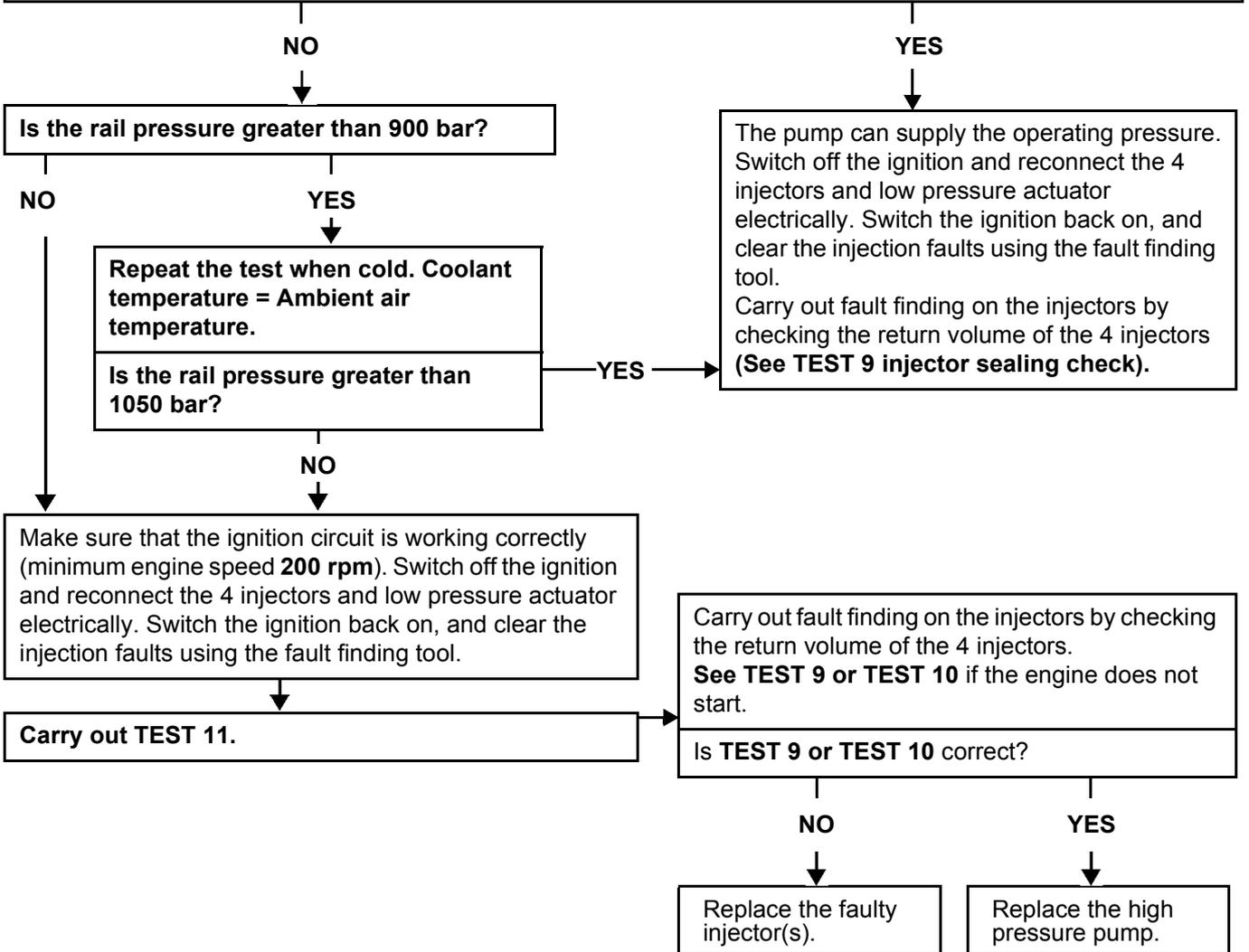
<b>TEST 7</b>	<b>High pressure system check</b>
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<b>NOTES</b>	<p><b>Special notes:</b> Certain malfunctions make it impossible to carry out this test, deal with them first.</p> <p><b>IMPORTANT:</b> It is useless and dangerous to engage the starter motor for more than 5 seconds.</p>
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It is possible to check the high pressure supply pump capacity by carrying out the following procedure:

- **With the ignition off, disconnect** the low pressure actuator from the pump (**IMV brown connector**) and connect a test adaptor (test IMV).
- Disconnect the 4 injectors.
- Switch on the ignition, connect the fault finding tool and re-establish dialogue with the injection system.
- On the screen, display **Main states and parameters** of the ECM.
- Brake and press the "START" button. **The starter will cut out automatically after 5 secs.**
- Read the maximum rail pressure value **PR038** during the test on the fault finding tool.

**Is the rail pressure greater than 1050 bar?**



# DIESEL INJECTION

## Trouble diagnosis - Tests

**K9K**

<b>TEST 8</b>	<b>High-pressure circuit leak check</b>
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<b>NOTES</b>	<b>Special notes:</b> Certain malfunctions make it impossible to carry out this test, deal with them first.
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**There is a command that performs a leak test on the high-pressure circuit when the engine is running.** This command can detect a leak on the high-pressure circuit if a union is improperly fitted or bolted, but cannot detect a small leak if a union is not torque tightened.

This command can only be used if the engine temperature is **above 60°C**.

Use command **AC029 "high pressure circuit sealing test"** the engine will automatically carry out one cycle of 4 accelerations to raise the pressure in the rail and check whether there are leaks in the high pressure circuit.

**Watch out for any objects (tools, etc) on the sides of the engine housing during the four accelerations (vibrations possible).**

<b>TEST 9</b>	<b>Injector leak check</b>
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<b>NOTES</b>	<b>Special notes:</b> Certain faults make it impossible to carry out this test, deal with them first.
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**Command AC029 also allows you to check the return volume of each injector** to detect a leak inside the injectors.

**Tooling required:**

- **It is essential to use 4 transparent pipes with an internal diameter of 4 mm and a length of approximately 50 cm.**
- **4 graduated measuring cylinders.**

**PROCEDURE**

- Check that the engine coolant temperature is **above 60°C**.
- Switch off the ignition.
- Disconnect the return pipes from the 4 injectors.
- Fit a plug in the pump venturi tube to prevent the low-pressure circuit from depriming.
- Connect the 4 transparent pipes with an internal diameter of **4 mm** and a length of **50 cm** in place of the return pipes.
- Immerse these 4 pipes into 4 graduated measuring cylinders.

Having carried out these preparations, start the engine, then let it run for **2 minutes** at idle speed.

- **Activate** command **AC029 "high pressure circuit sealing test"**: the engine will automatically perform one cycle of 4 accelerations to raise the pressure in the rail and measure the leaks inside the injectors in these conditions.
- **Once the cycle is complete, activate command AC029 again** for the correct reading of the return volume of each injector.

At the end of both cycles, the return volume of each injector should be **35 ml at maximum**. If the return volume of one of the injectors is above **35 ml**, replace the faulty injector.

- Disconnect the 4 transparent pipes and reconnect the injector return circuit.

**Watch out for any objects (tools, etc.) at the sides of the engine housing during the four cycles (vibrations possible).**

# DIESEL INJECTION

## Trouble diagnosis - Tests

K9K

TEST 10	Injector return flow in starting phase.
NOTES	<b>Special notes:</b> Certain faults make it impossible to carry out this test, deal with them first. <b>IMPORTANT:</b> It is useless and dangerous to engage the starter motor for more than 5 seconds.

In the event the engine does not start, only the static leak can be measured, that is the leak with the injector closed, inactive and not subject to any high pressure.

Make sure that the starting circuit is working correctly (minimum speed 200 rpm).

### Tooling required:

- It is essential to use four transparent pipes with an internal diameter of 4 mm and approximately 50 cm long.
- A test adapter (TEST IMV)

### PROCEDURE:

- 1 – Switch off the ignition.
- 2 – Disconnect the four injector return pipes.
- 3 – Fit a plug in the pump venturi tube to prevent the low-pressure circuit from depriming.
- 4 – Connect the four transparent pipes with an internal diameter of 4 mm and a length of approximately 50 cm.
- 5 – Disconnect the low pressure actuator from the pressure (brown IMV connector) and connect the test adapter (test IMV).
- 6 – **Electrically disconnect the 4 injectors.**
- 7 – Switch on the ignition, brake and press the "START" button. **The starter cuts in automatically after 5 seconds.**
- 8 – Measure the amount of diesel in each pipe.

**Replace the injector(s) whose leak return is greater than 10 cm.**

Disconnect the four transparent diesel pipes and reconnect the injector return circuit.

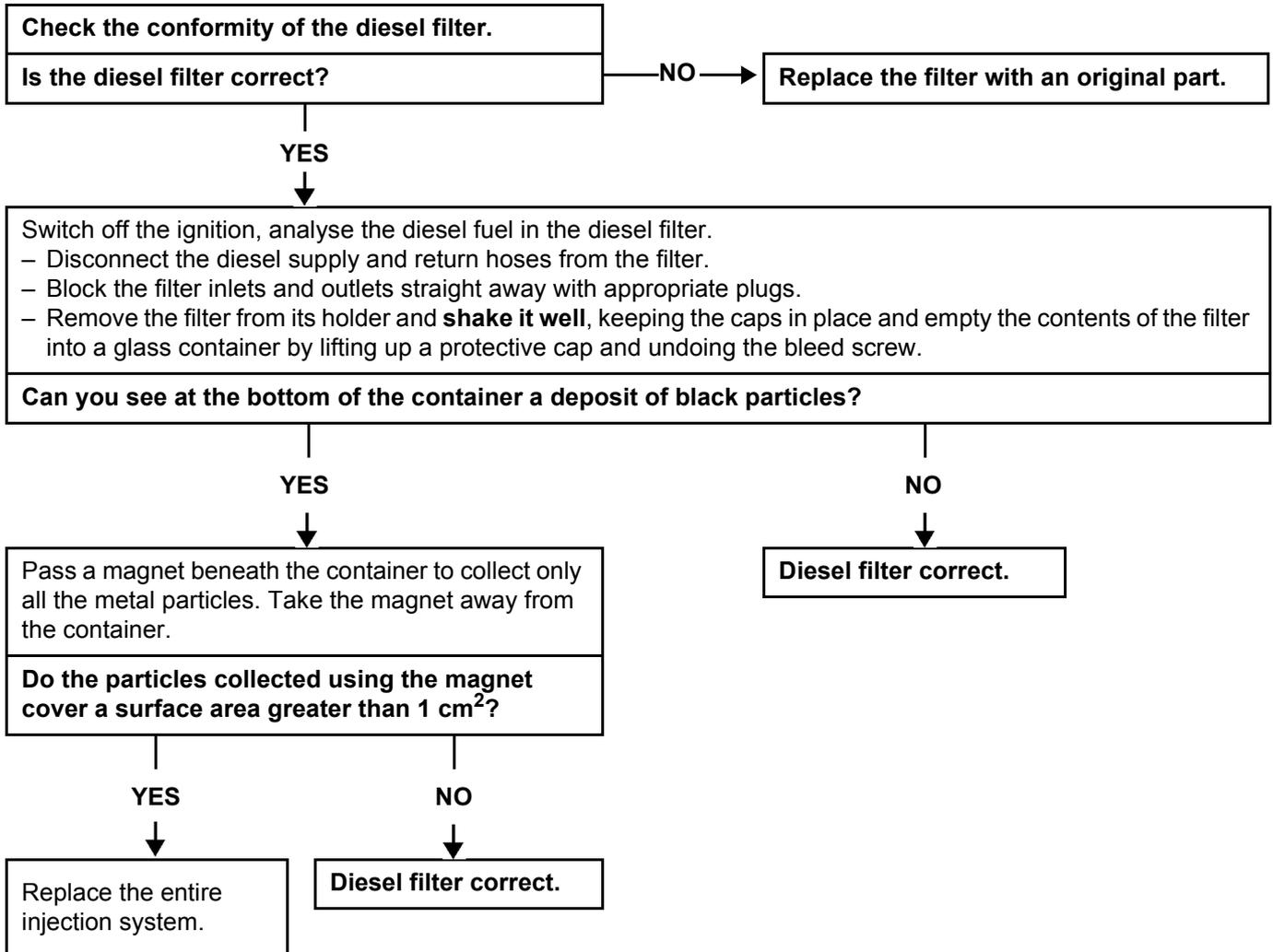
Disconnect the test IMV and reconnect the low pressure actuator to the pump.

# DIESEL INJECTION

## Trouble diagnosis - Tests

K9K

TEST 11	Diesel filter check
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# DIESEL INJECTION

## Trouble diagnosis - Customer complaints

**K9K**

**NOTES**

Only consult this customer complaint after a complete check using the diagnostic tool.

No communication with the ECM

CHART 1

Starting malfunction

The engine does not start

CHART 2

The engine starts with difficulty or starts then stalls

CHART 3

Starting difficult with warm engine

CHART 4

Idle speed malfunction

Rough idle speed (pumping)

CHART 5

Idle speed too high or too low

CHART 6

Behaviour while driving

Unexpected acceleration/deceleration and engine stalling

CHART 7

Response malfunction

CHART 8

Engine stop (timing)

CHART 9

Engine jerking

CHART 10

Lack of power

CHART 11

Too much power

CHART 12

### Road holding (continued)

- Excessive consumption ————— CHART 13
- Overspeed when lifting off accelerator or changing gear ————— CHART 14
- Engine dies when pulling away ————— CHART 15
- The engine does not stop ————— CHART 16

### Noise, odours or smoke

- Clanking engine, noisy engine ————— CHART 17
- Squalling noise ————— CHART 18
- General mechanical noises ————— CHART 19
- Blue, white or black smoke ————— CHART 20
- Exhaust odours ————— CHART 21
- Diesel odours ————— CHART 22
- Smoke (blue, white or black) on acceleration ————— CHART 23

# DIESEL INJECTION

## Trouble diagnosis - Symptoms

**K9K**

<b>CHART 1</b>	<b>NO COMMUNICATION WITH THE ECM</b>
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<b>NOTES</b>	<b>Only consult this customer complaint after a complete check using the diagnostic tool.</b>
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<p>Ensure that the diagnostic tool is not causing the fault by trying to establish dialogue with a computer on another vehicle. If the tool is not at fault, and dialogue cannot be established with any other computer on the same vehicle, the cause could be a faulty computer interfering on the multiplex network. Check the voltage of the battery and carry out the operations necessary to obtain a voltage which is to specification (<b>9.5 volts &lt; U battery &lt; 17.5 volts</b>).</p>
<p>Perform fault finding on the multiplex network using the diagnostic tool.</p>
<p>Check the <b>ECM earth (ground) point</b> on the left hand front shock absorber cage.</p>
<p>Check: – the connection between the CONSULT-II and the DLC (wiring in good condition), – the engine and passenger compartment fuses.</p>
<p>Check for the presence of <b>+ 12 volts before ignition on terminal 16, + 12 volts after ignition on terminal 8</b> and an <b>earth (ground) on terminals 4 and 5</b> of the diagnostic socket. Repair if necessary.</p>
<p>Connect the CONSULT-II and check the <b>insulation, continuity and absence of interference resistance of the connections:</b></p> <ul style="list-style-type: none"><li>● ECM <b>(F134)</b> terminal 109 and IPDM E/R harness connector terminal 32</li><li>● ECM <b>(F134)</b> terminal 110 and IPDM E/R harness connector terminal 32</li><li>● ECM <b>(E61)</b> terminal 22 and Fuse block <b>(M16)</b></li><li>● ECM <b>(F134)</b> terminal 104 and IPDM E/R harness connector terminal 29</li><li>● ECM <b>(F134)</b> terminal 111 and ground</li><li>● ECM <b>(F134)</b> terminal 112 and ground</li><li>● ECM <b>(E61)</b> terminal 2 and DLC terminal 7 (Refer to wiring diagram "EC-MAIN-01".)</li></ul> <p>Repair if necessary.</p>

# DIESEL INJECTION

## Trouble diagnosis - Symptoms

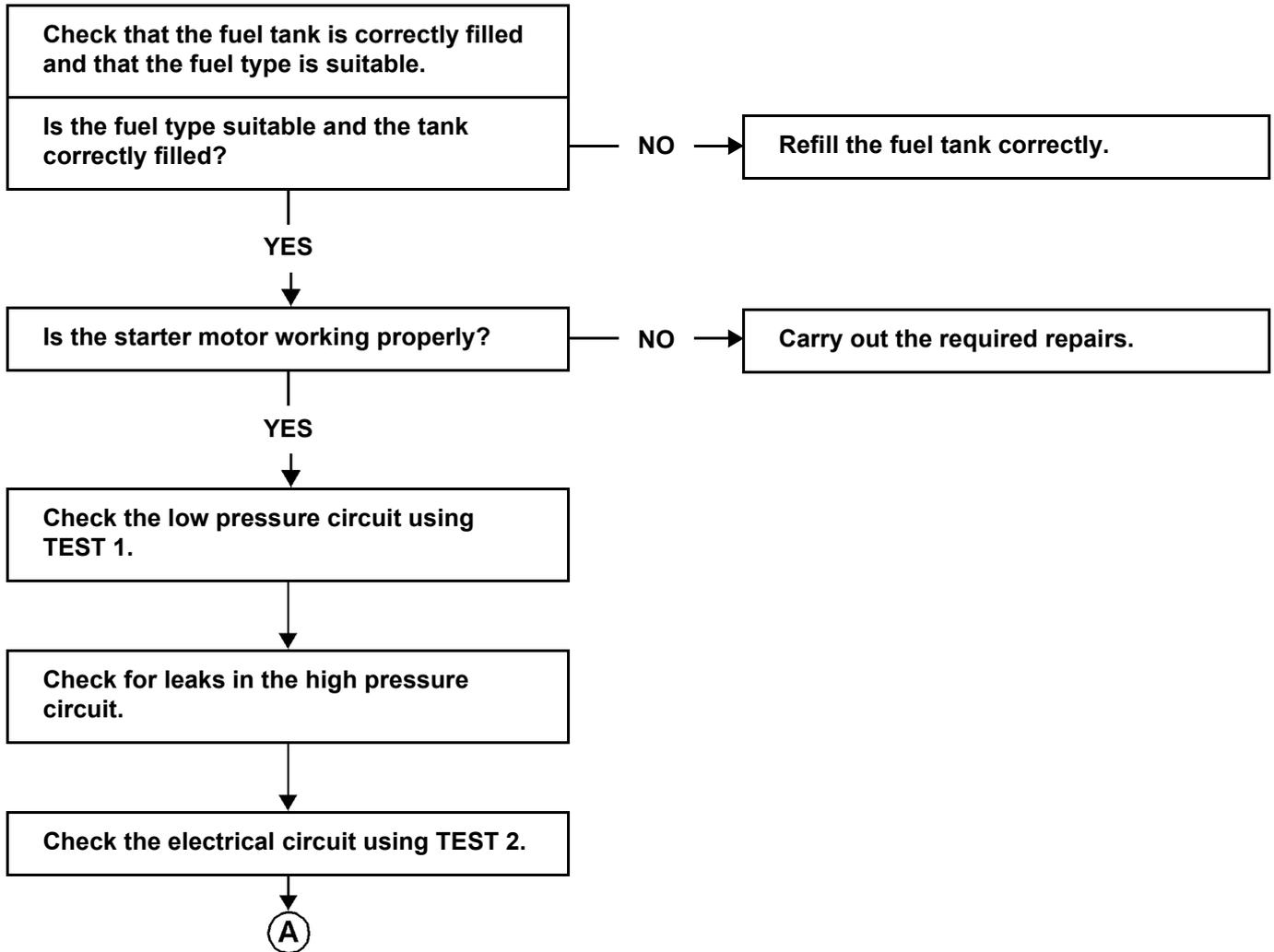
**K9K**

CHART 2

THE ENGINE DOES NOT START

**NOTES**

Only consult this customer complaint after a complete check using the CONSULT-II.

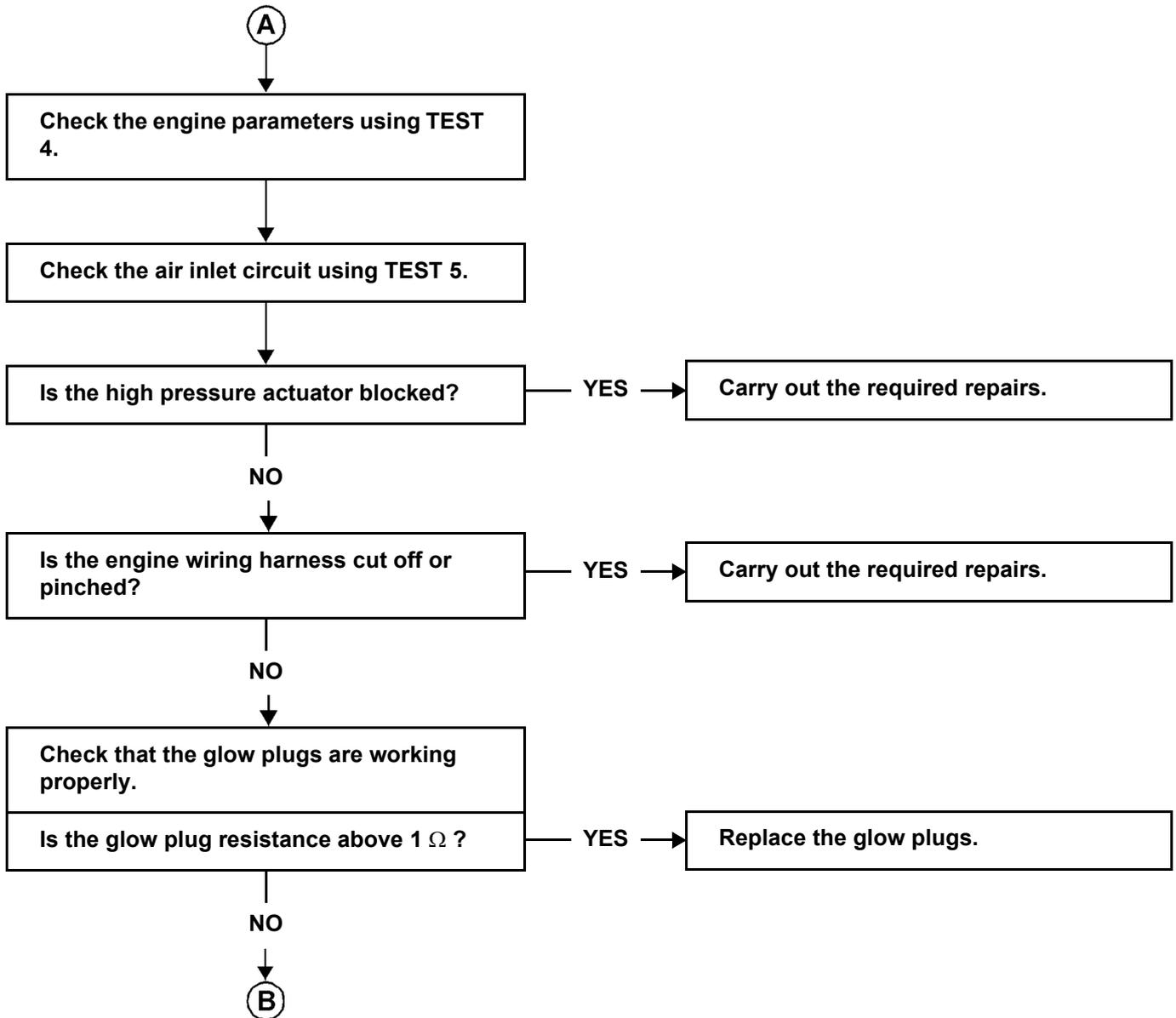


# DIESEL INJECTION

## Trouble diagnosis - Symptoms

K9K

CHART 2  
CONTINUED 1

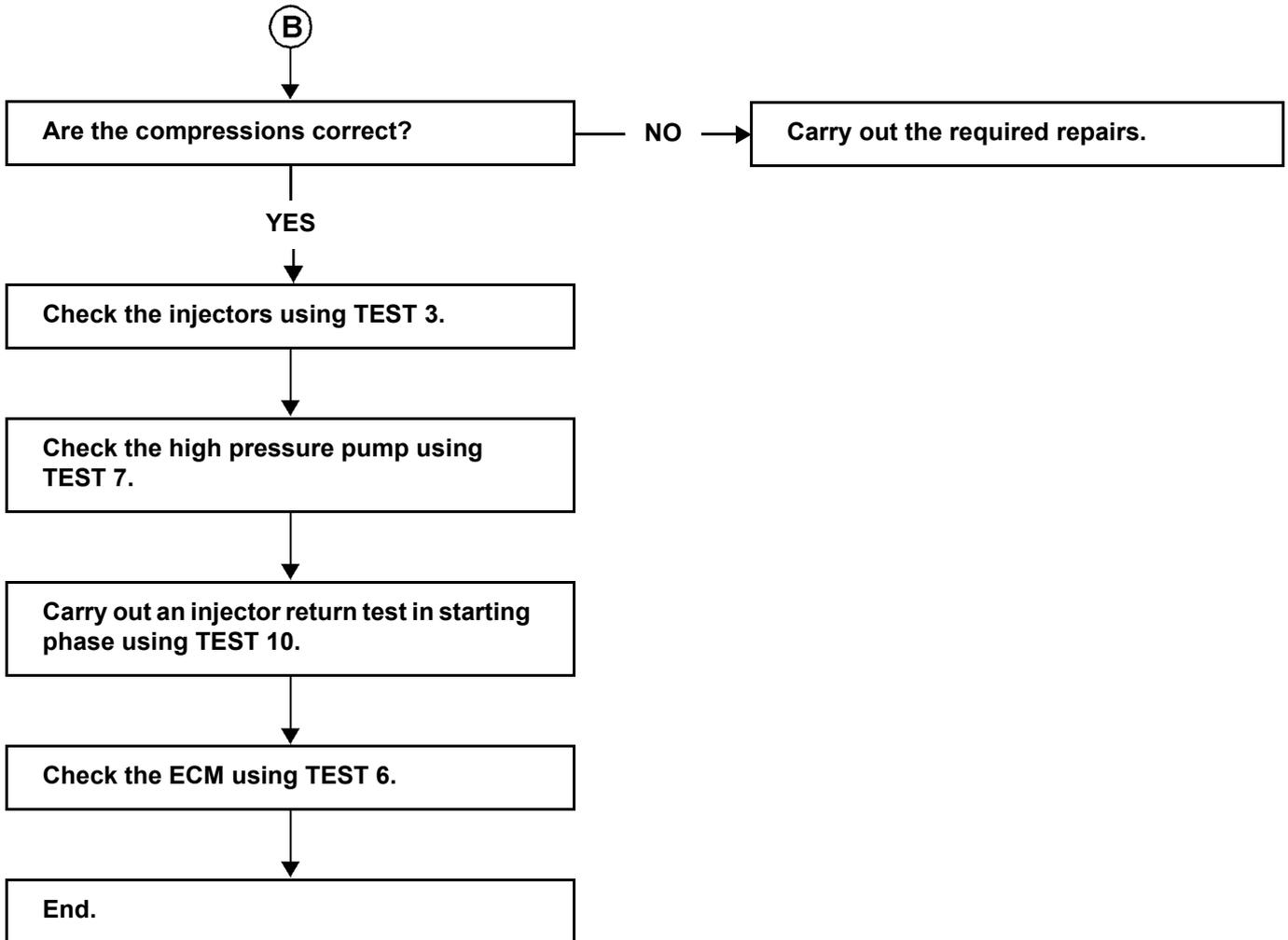


# DIESEL INJECTION

## Trouble diagnosis - Symptoms

**K9K**

**CHART 2**  
CONTINUED 2



**AFTER REPAIR**

Check that the system is operating correctly.

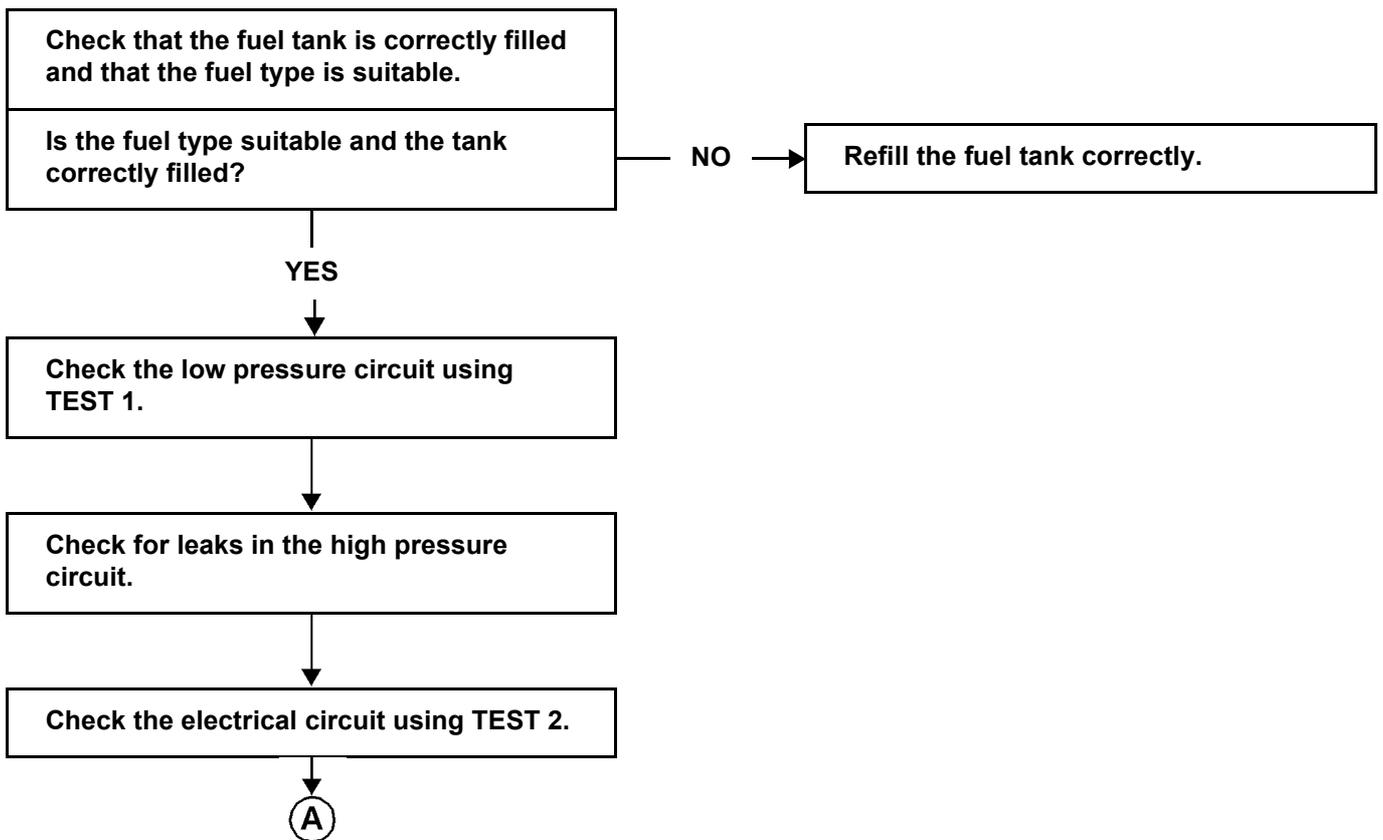
# DIESEL INJECTION

## Trouble diagnosis - Symptoms

**K9K**

<b>CHART 3</b>	<b>THE ENGINE STARTS WITH DIFFICULTY OR STARTS THEN STALLS</b>
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<b>NOTES</b>	Only consult this customer complaint after a complete check using the diagnostic tool.
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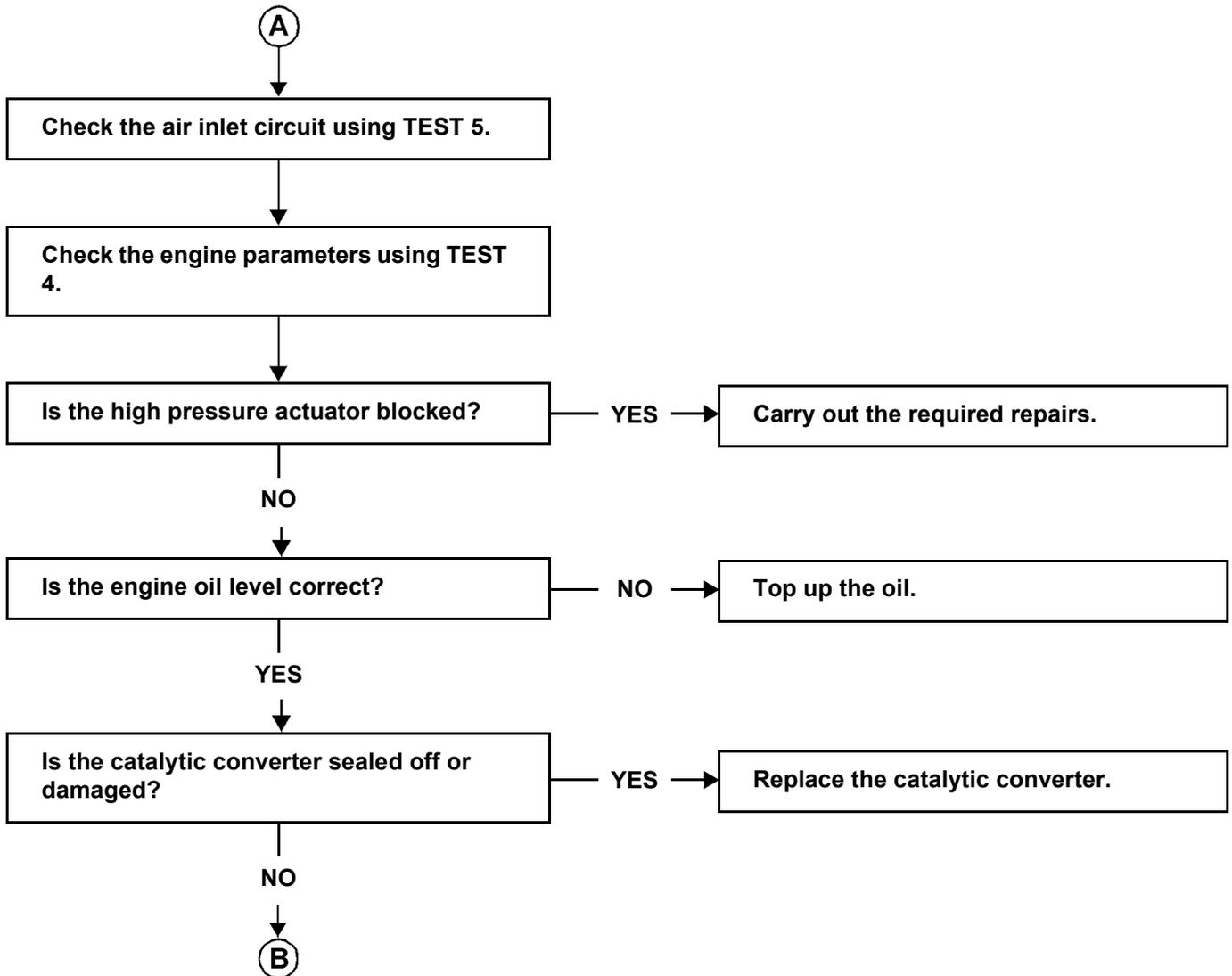


# DIESEL INJECTION

## Trouble diagnosis - Symptoms

K9K

CHART 3  
CONTINUED 1

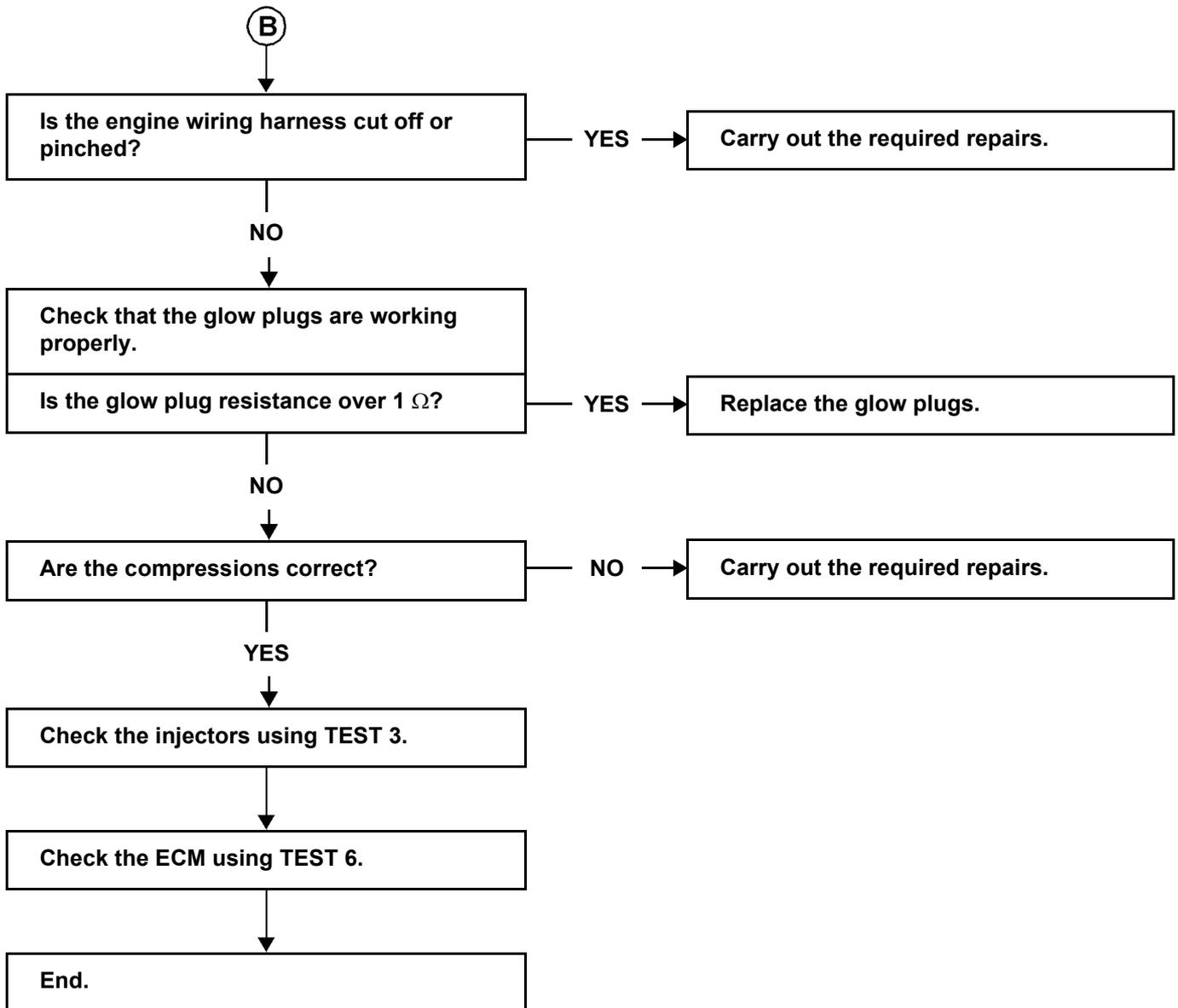


# DIESEL INJECTION

## Trouble diagnosis - Symptoms

K9K

CHART 3  
CONTINUED 2



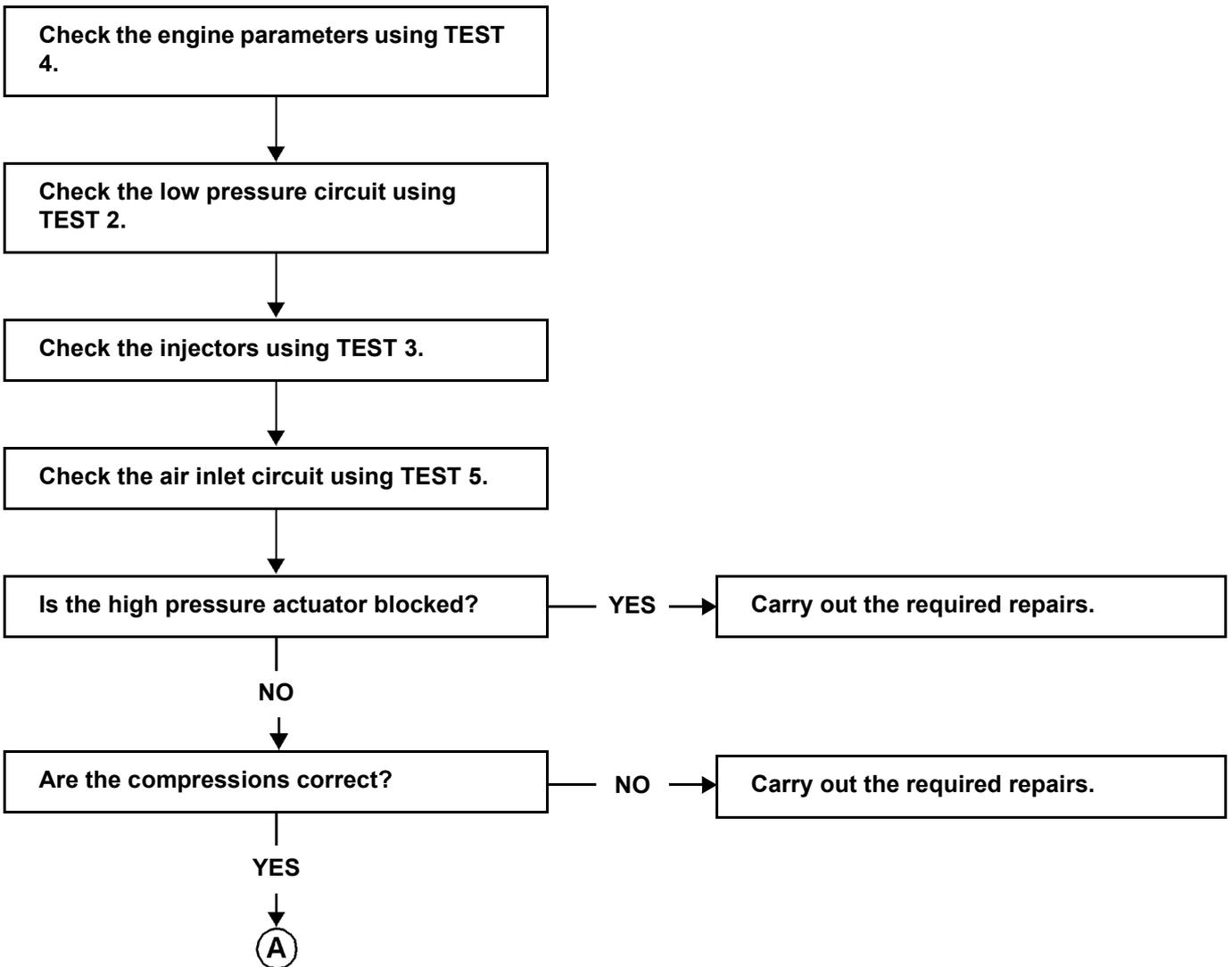
# DIESEL INJECTION

## Trouble diagnosis - Symptoms

**K9K**

<b>CHART 4</b>	<b>STARTING DIFFICULT WITH WARM ENGINE</b>
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<b>NOTES</b>	Only consult this customer complaint after a complete check using the diagnostic tool.
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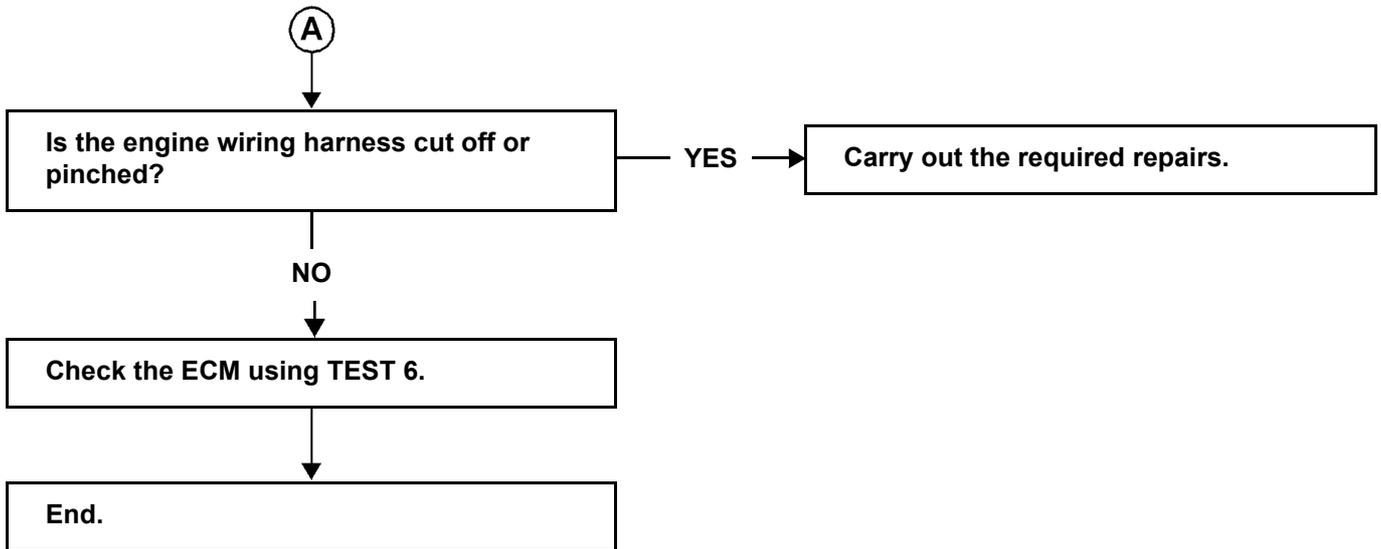
# DIESEL INJECTION

## Trouble diagnosis - Symptoms

**K9K**

**CHART 4**

Cont'd



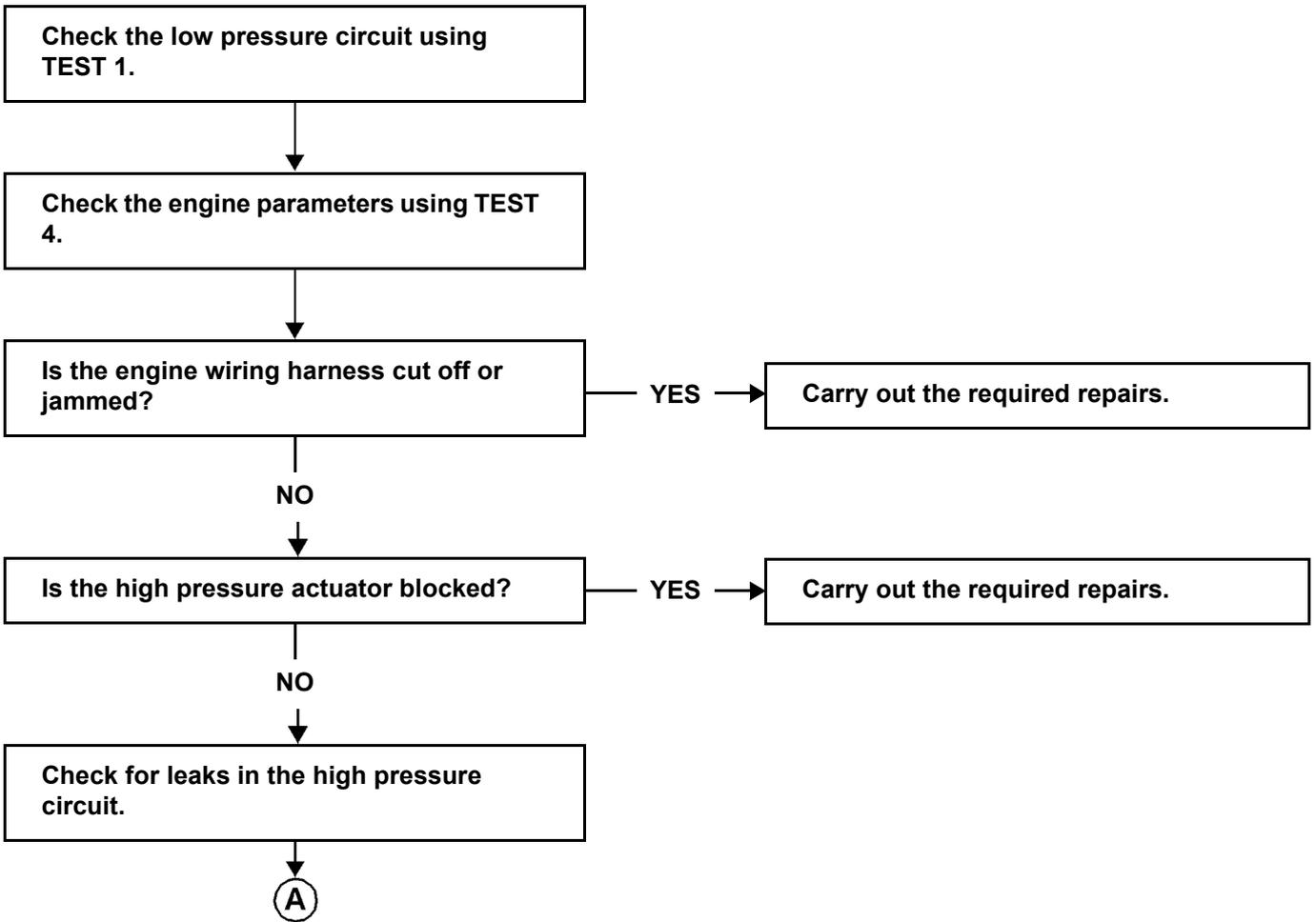
# DIESEL INJECTION

## Trouble diagnosis - Symptoms

**K9K**

<b>CHART 5</b>	<b>ROUGH IDLE SPEED (PUMPING)</b>
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<b>NOTES</b>	Only consult this customer complaint after a complete check using the diagnostic tool.
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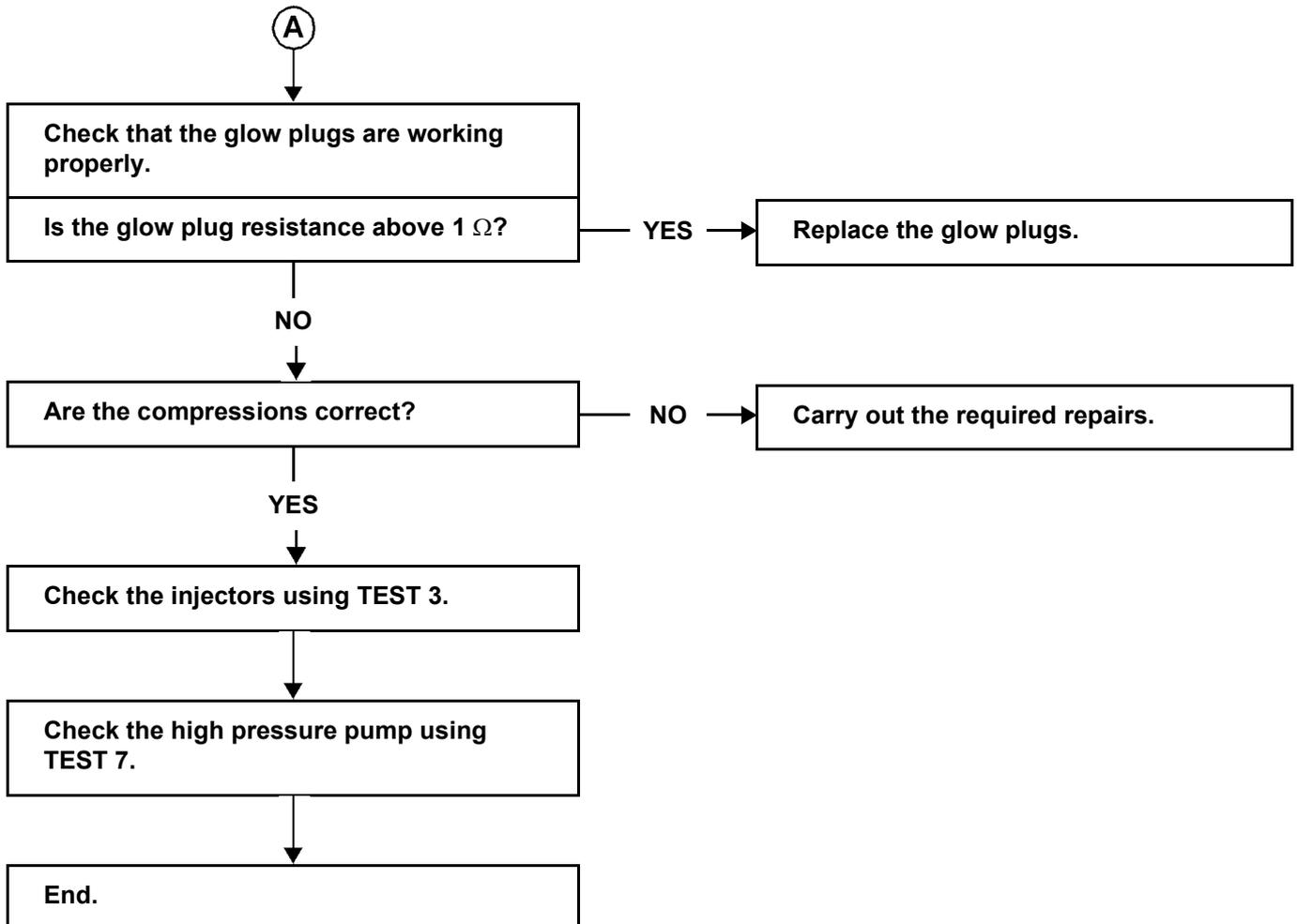
# DIESEL INJECTION

## Trouble diagnosis - Symptoms

K9K

CHART 5

Cont'd



# DIESEL INJECTION

## Trouble diagnosis - Symptoms

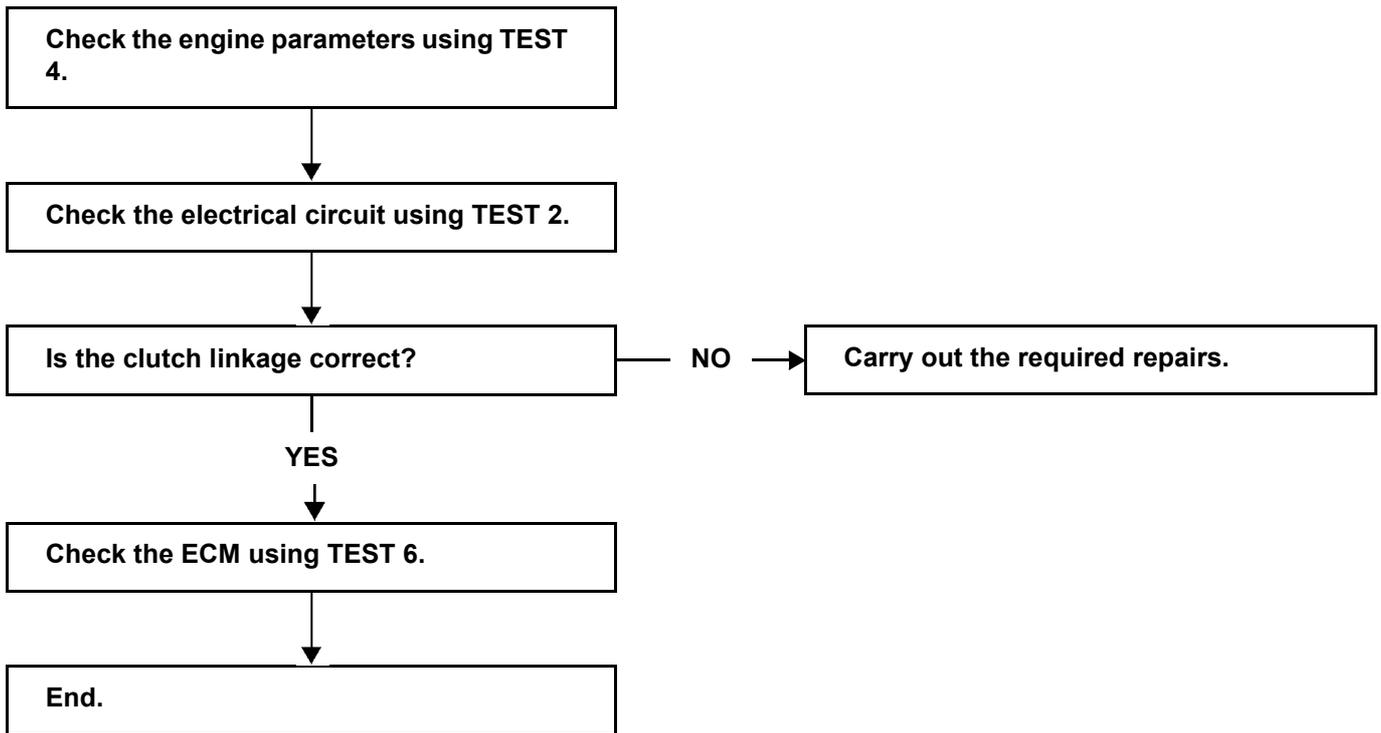
**K9K**

**CHART 6**

**IDLE SPEED TOO HIGH/TOO LOW**

**NOTES**

Only consult this customer complaint after a complete check using the diagnostic tool.



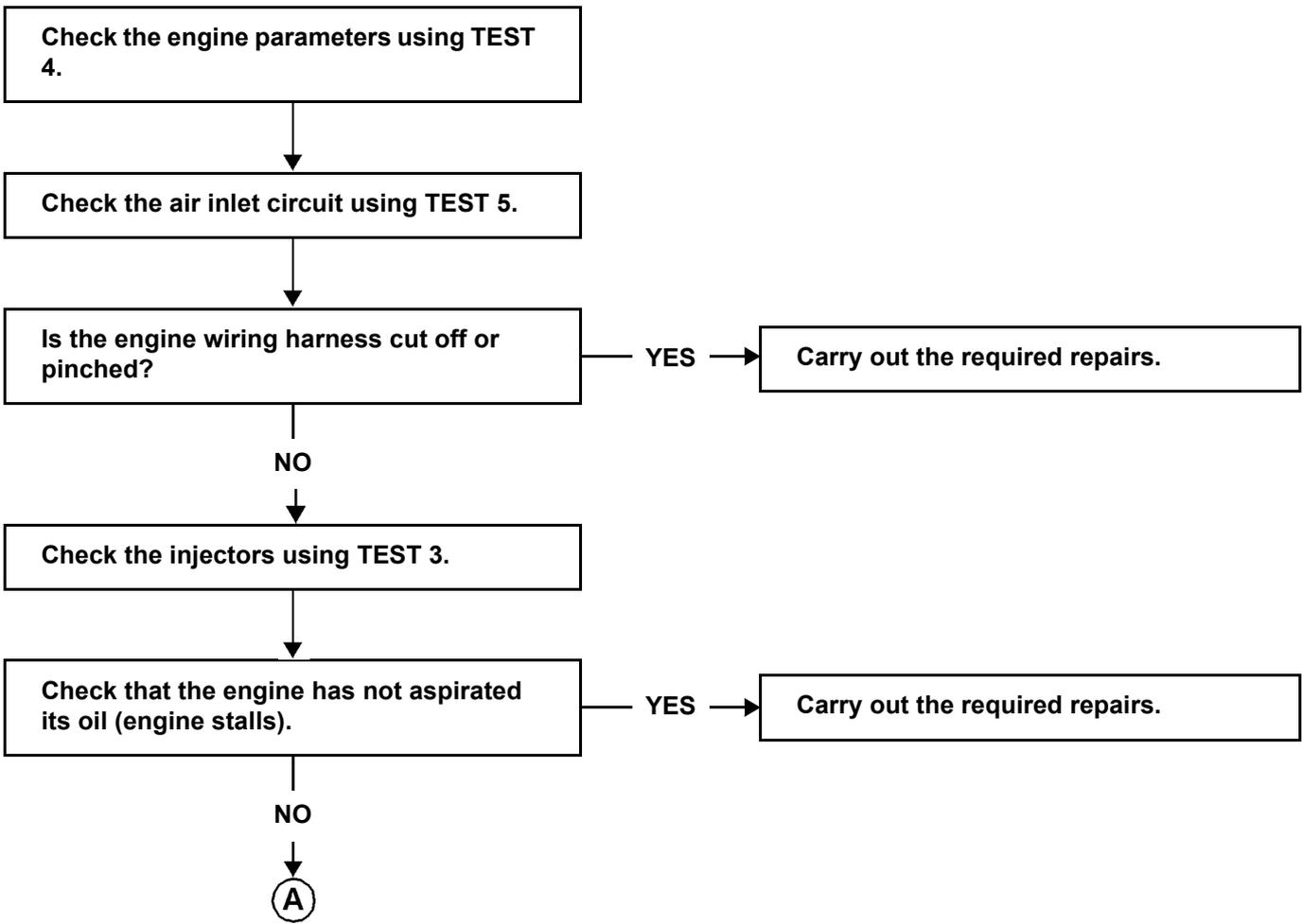
# DIESEL INJECTION

## Trouble diagnosis - Symptoms

**K9K**

<b>CHART 7</b>	<b>UNEXPECTED ACCELERATION/DECELERATION AND ENGINE OVERCHARGING</b>
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<b>NOTES</b>	Only consult this customer complaint after a complete check using the diagnostic tool.
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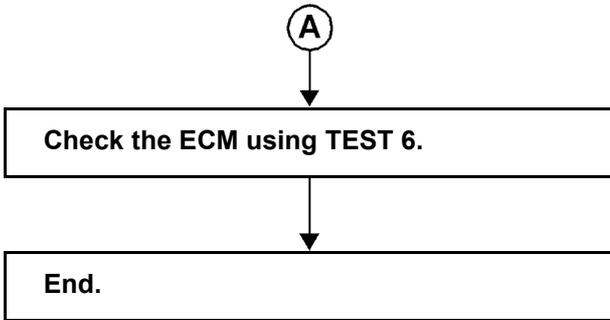


# DIESEL INJECTION

## Trouble diagnosis - Symptoms

**K9K**

<p><b>CHART 7</b> Cont'd</p>	
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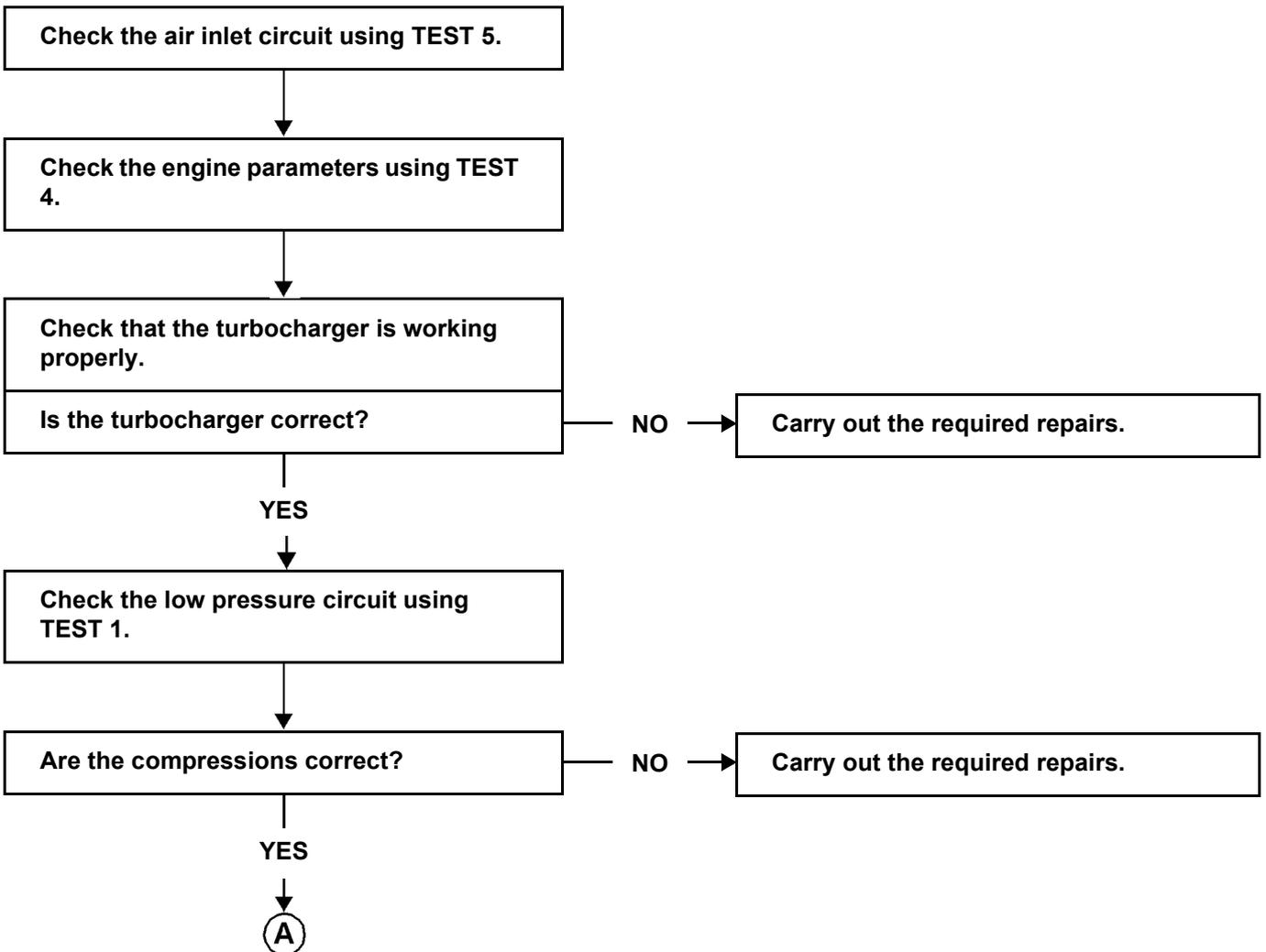
# DIESEL INJECTION

## Trouble diagnosis - Symptoms

**K9K**

<b>CHART 8</b>	<b>RESPONSE MALFUNCTION</b>
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<b>NOTES</b>	Only consult this customer complaint after a complete check using the diagnostic tool.
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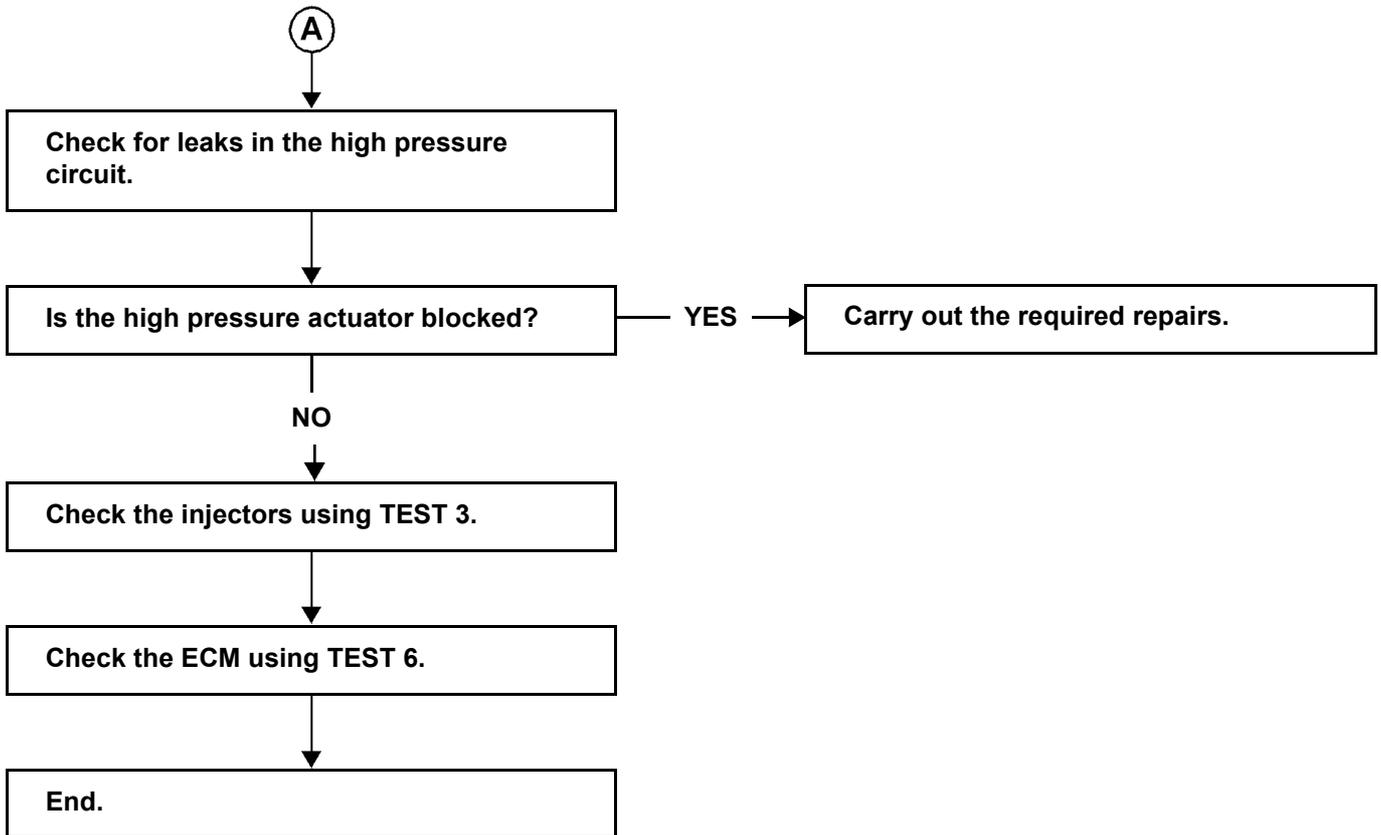
# DIESEL INJECTION

## Trouble diagnosis - Symptoms

K9K

CHART 8

Cont'd



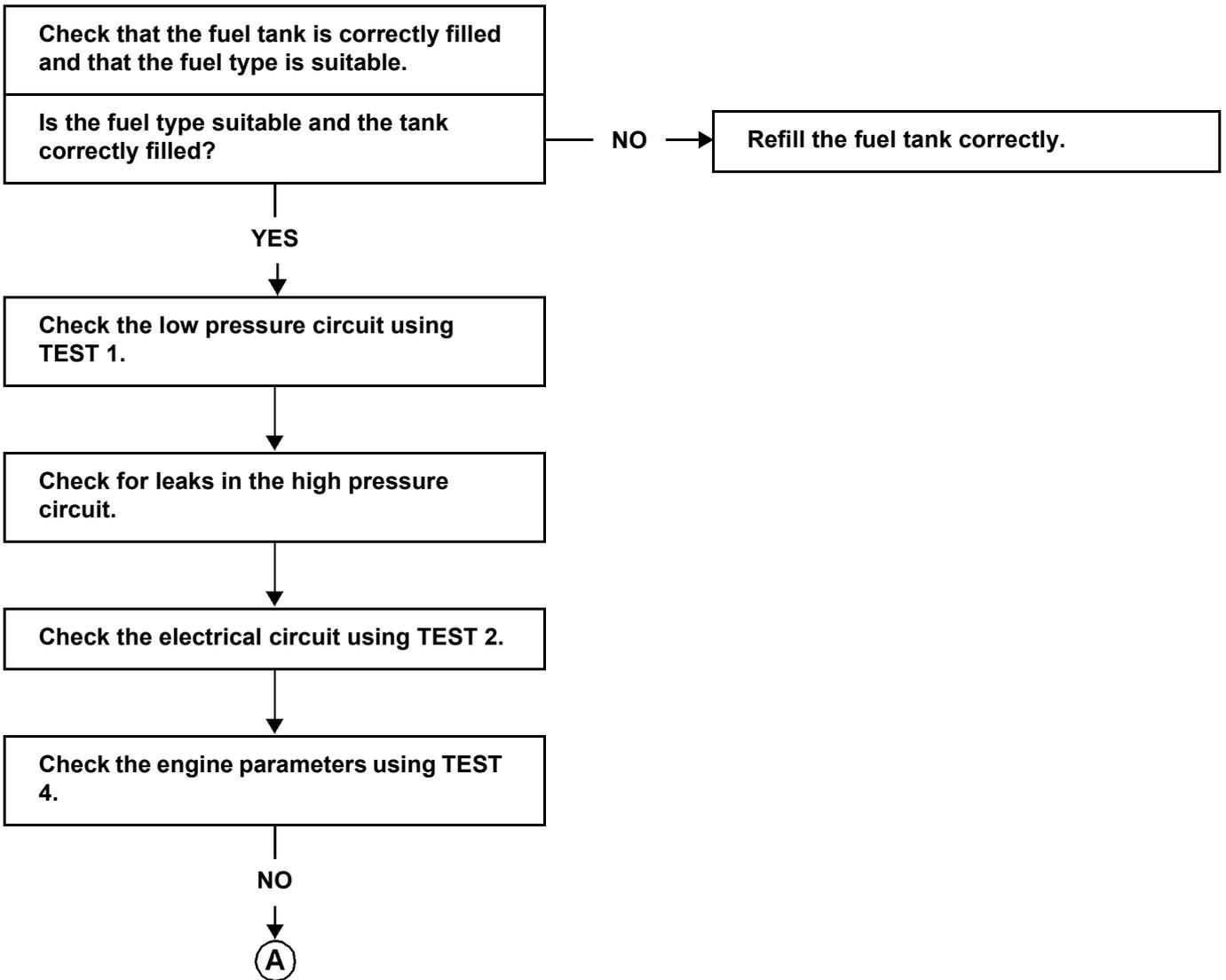
# DIESEL INJECTION

## Trouble diagnosis - Symptoms

**K9K**

<b>CHART 9</b>	<b>ENGINE STOP/STALLING</b>
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<b>NOTES</b>	Only consult this customer complaint after a complete check using the diagnostic tool.
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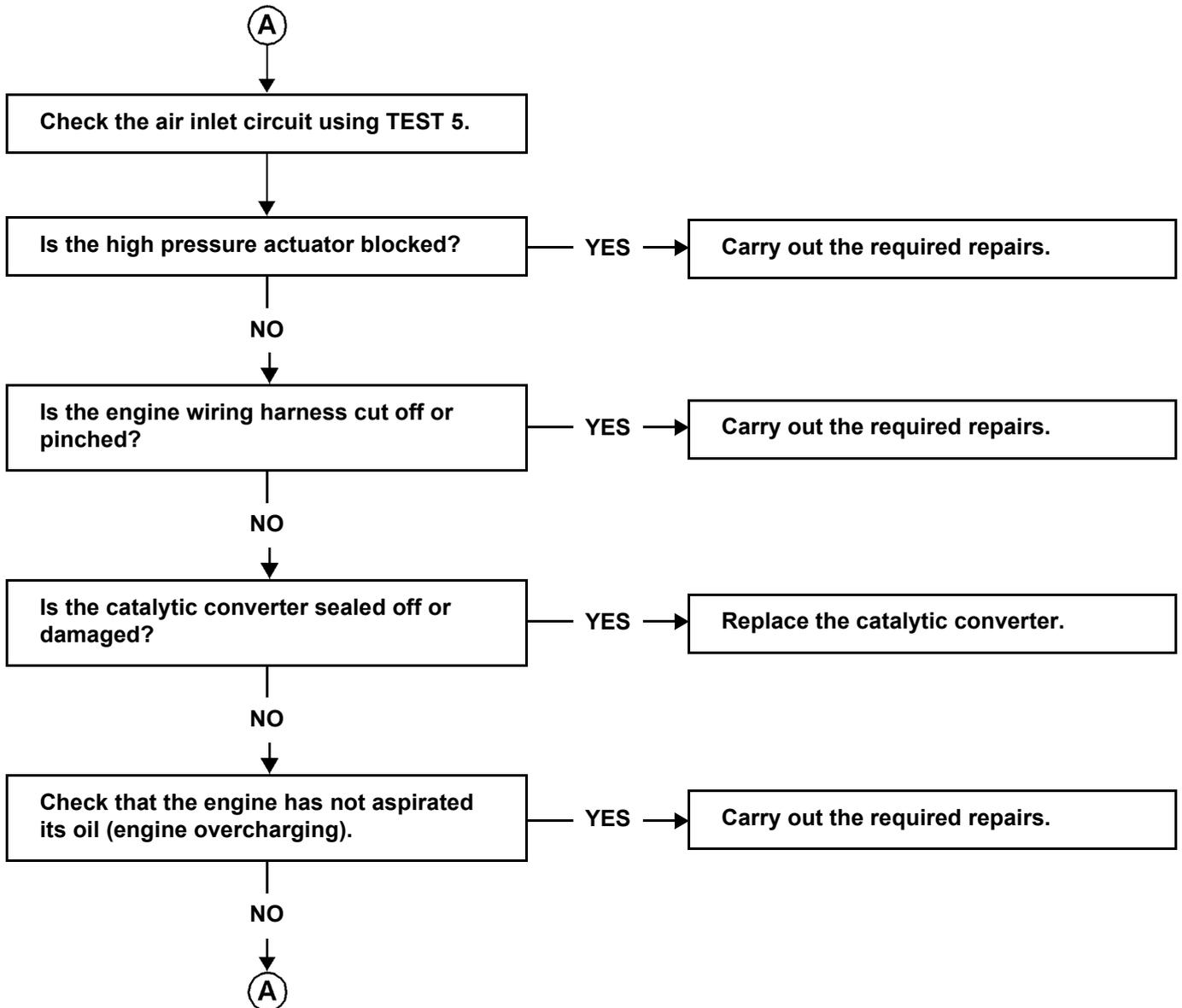


# DIESEL INJECTION

## Trouble diagnosis - Symptoms

K9K

CHART 9  
CONTINUED 1

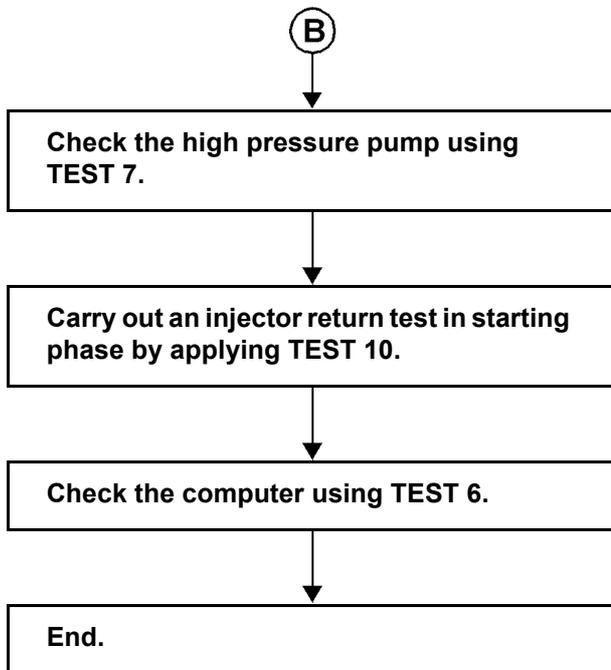


# DIESEL INJECTION

## Trouble diagnosis - Symptoms

**K9K**

**CHART 9**  
CONTINUED 2



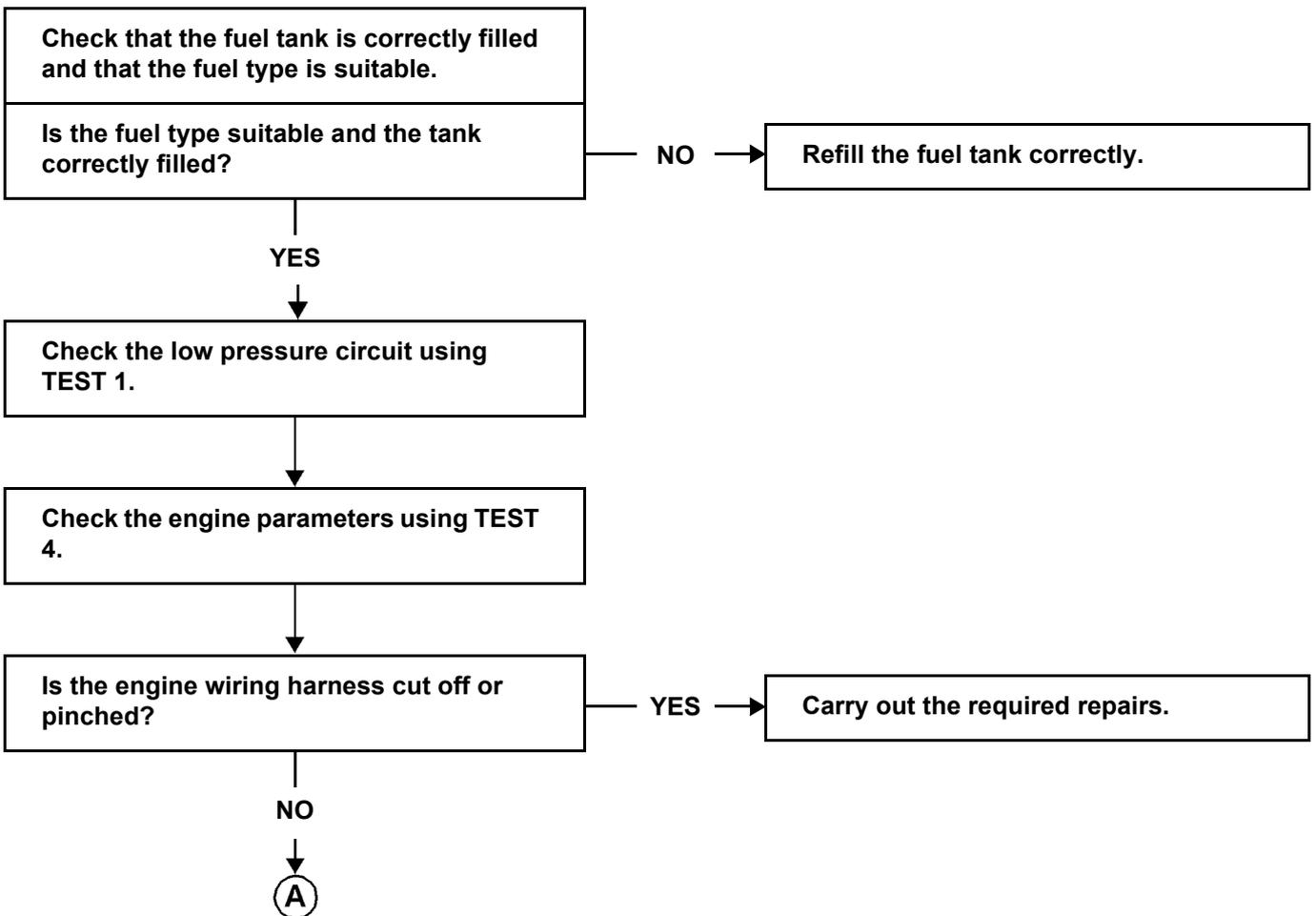
# DIESEL INJECTION

## Trouble diagnosis - Symptoms

**K9K**

<b>CHART 10</b>	<b>ENGINE JERKING</b>
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<b>NOTES</b>	Only consult this customer complaint after a complete check using the diagnostic tool.
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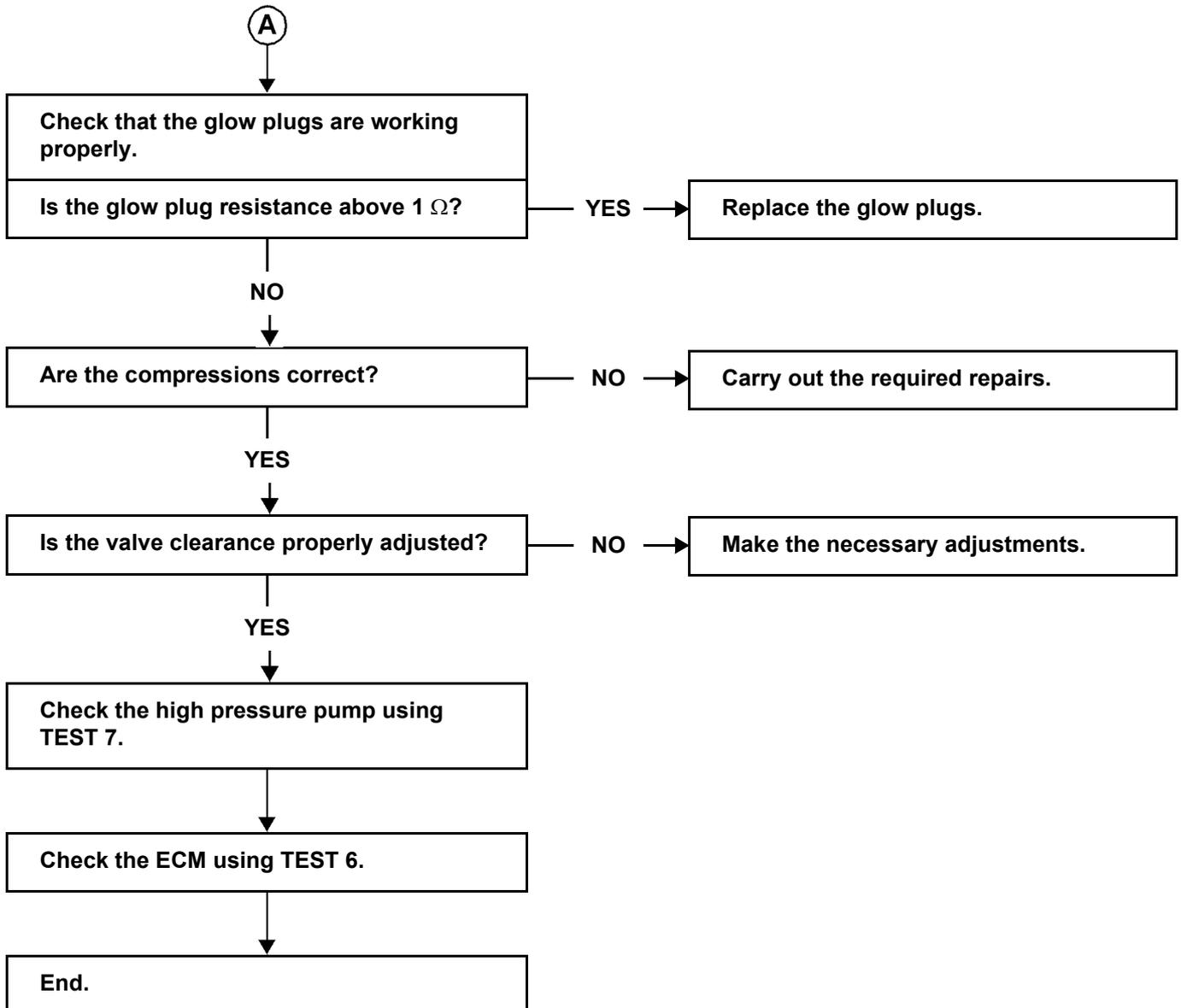


# DIESEL INJECTION

## Trouble diagnosis - Symptoms

K9K

CHART 10  
CONTINUED 1



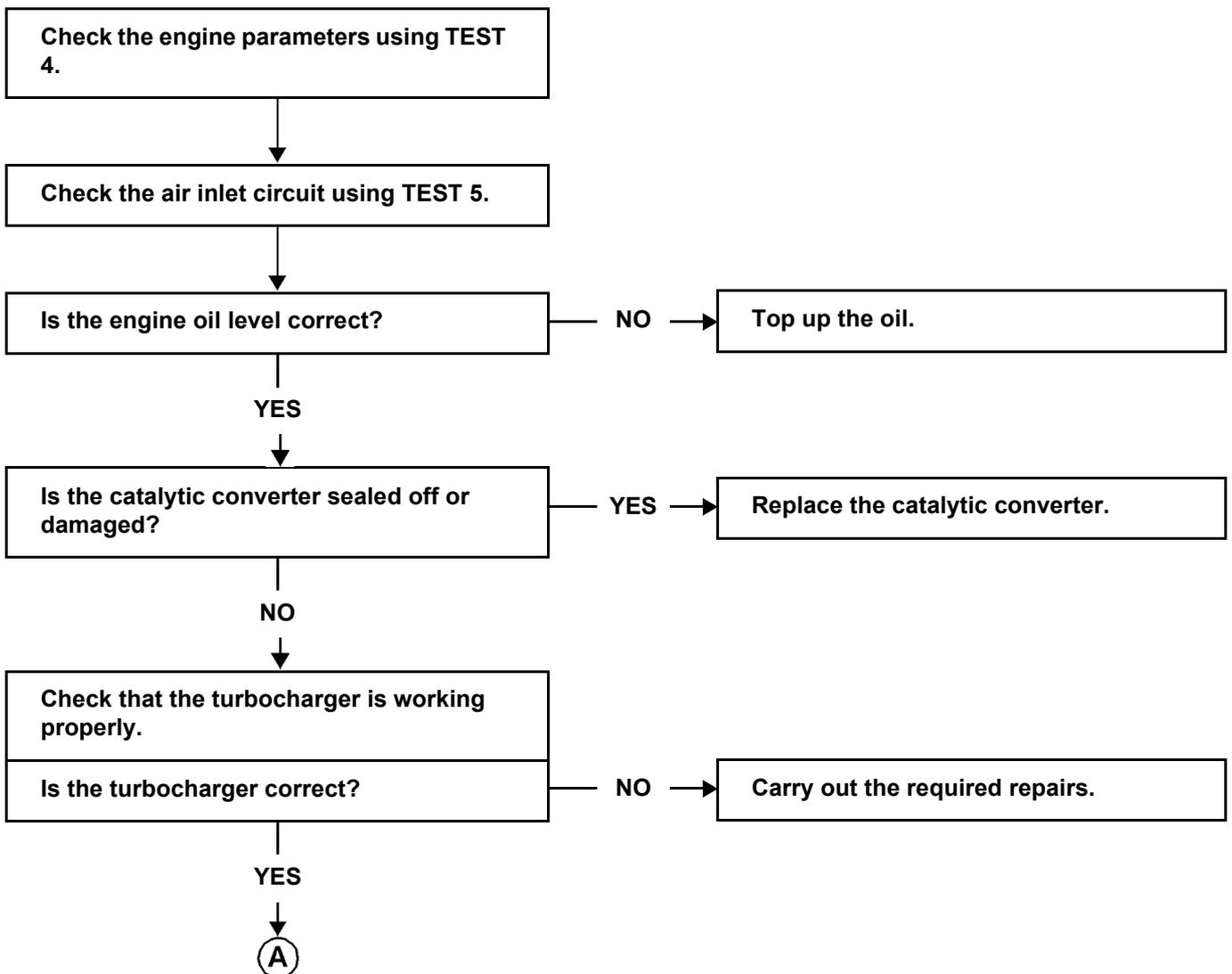
# DIESEL INJECTION

## Trouble diagnosis - Symptoms

**K9K**

CHART 11	LACK OF POWER
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<b>NOTES</b>	Only consult this customer complaint after a complete check using the diagnostic tool.
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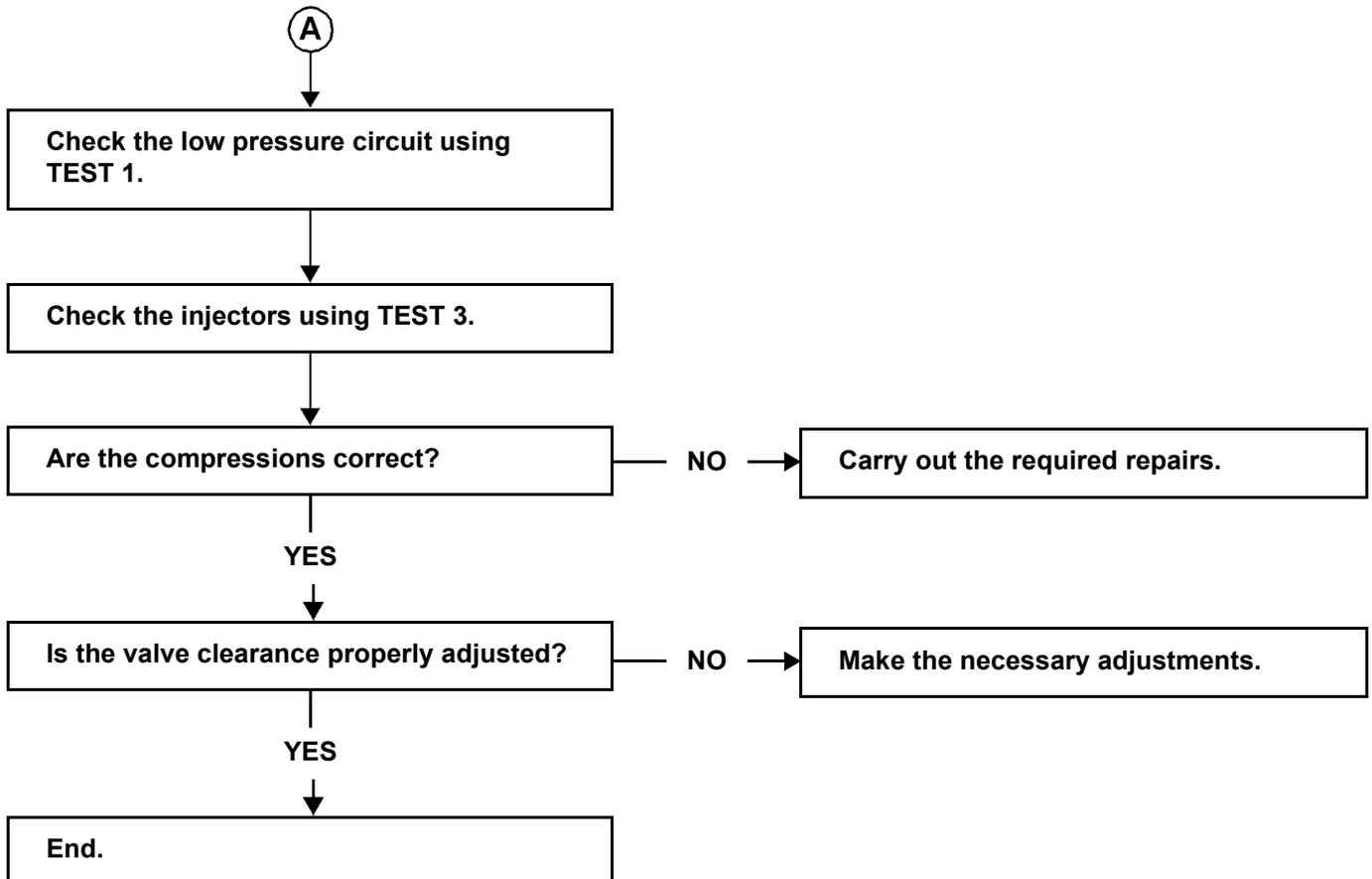
# DIESEL INJECTION

## Trouble diagnosis - Symptoms

K9K

CHART 11

Cont'd



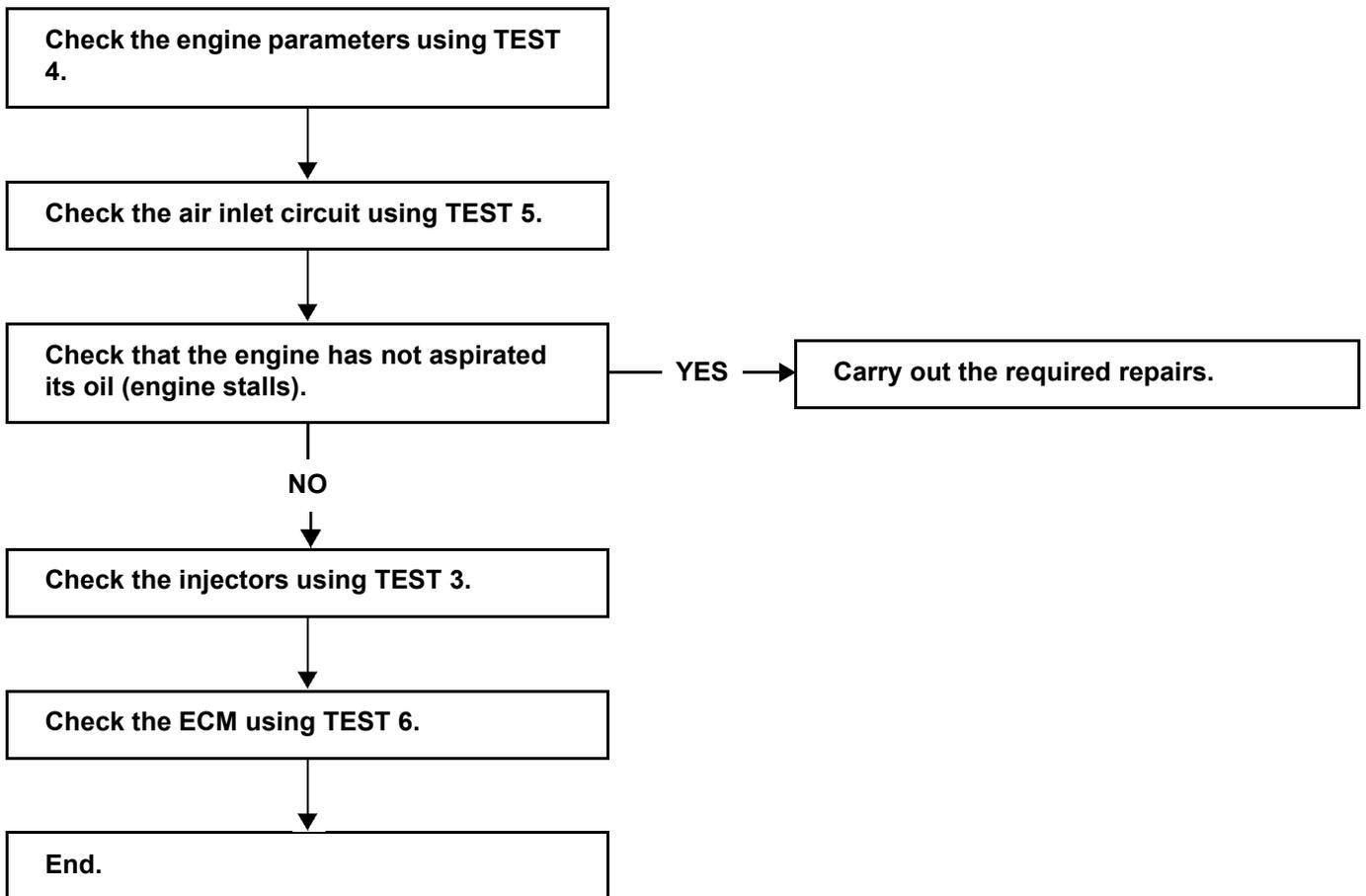
# DIESEL INJECTION

## Trouble diagnosis - Symptoms

**K9K**

CHART 12	TOO MUCH POWER
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<b>NOTES</b>	Only consult this customer complaint after a complete check using the diagnostic tool.
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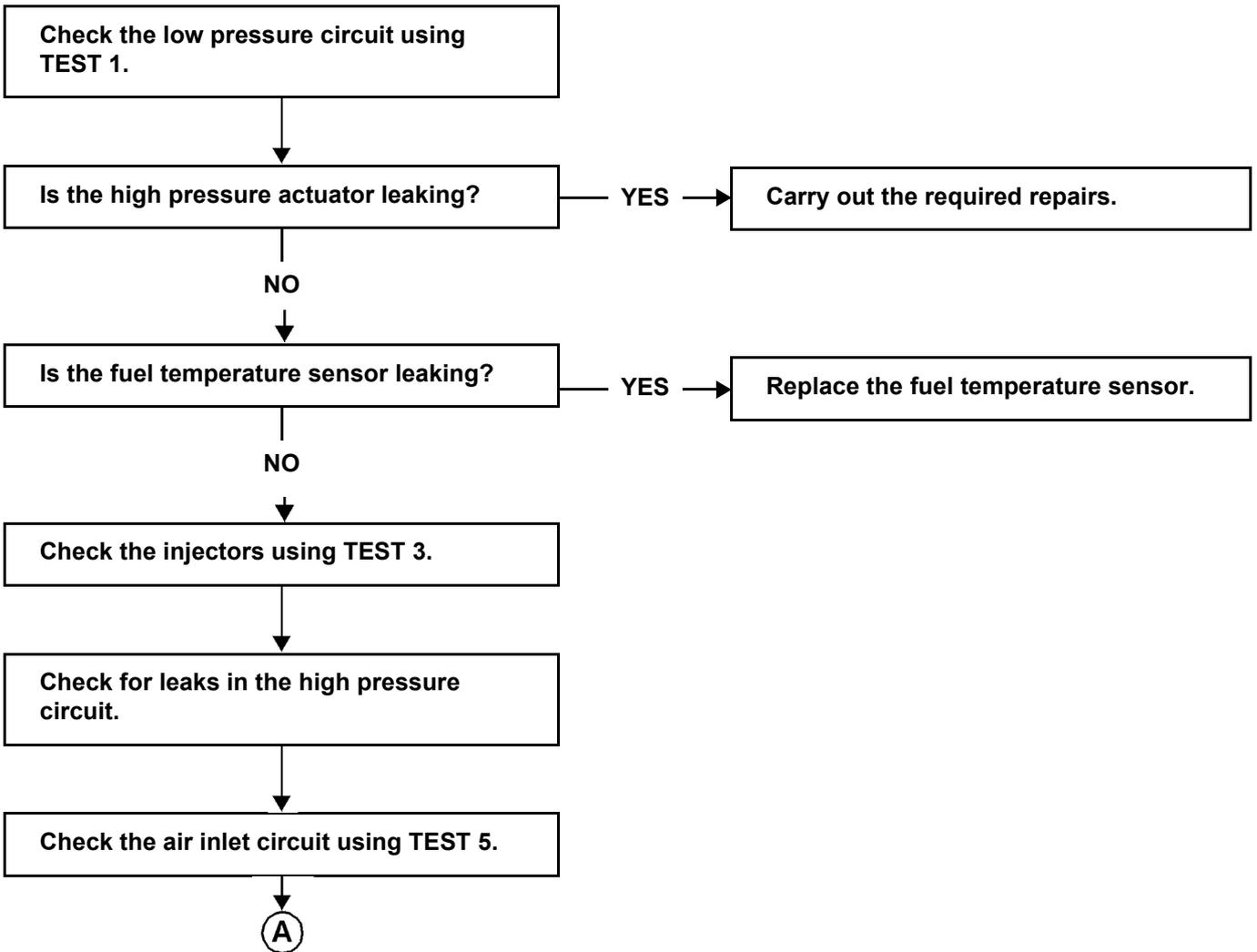
# DIESEL INJECTION

## Trouble diagnosis - Symptoms

**K9K**

<b>CHART 13</b>	<b>EXCESSIVE CONSUMPTION</b>
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<b>NOTES</b>	Only consult this customer complaint after a complete check using the diagnostic tool.
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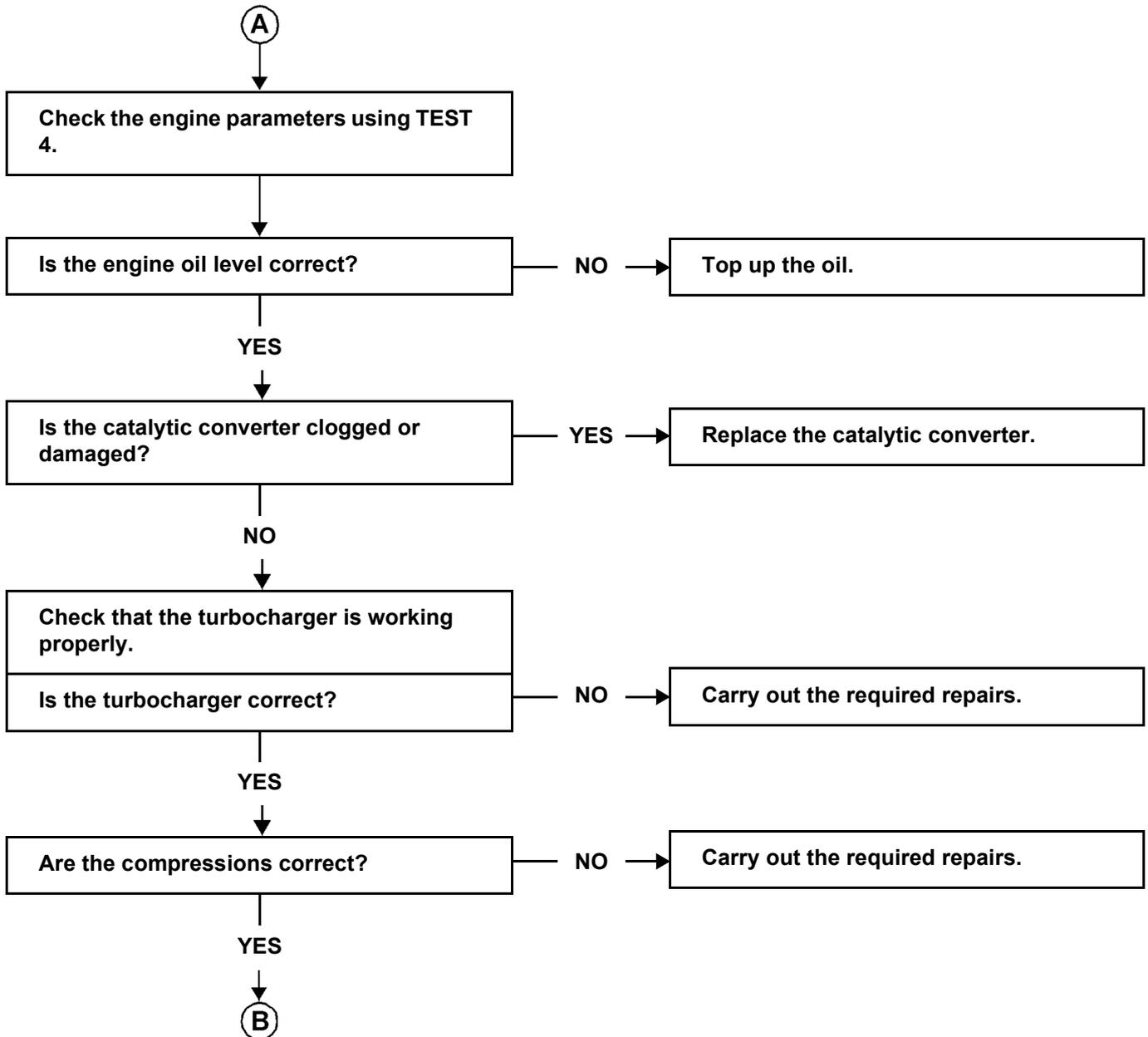


# DIESEL INJECTION

## Trouble diagnosis - Symptoms

K9K

CHART 13  
CONTINUED 1

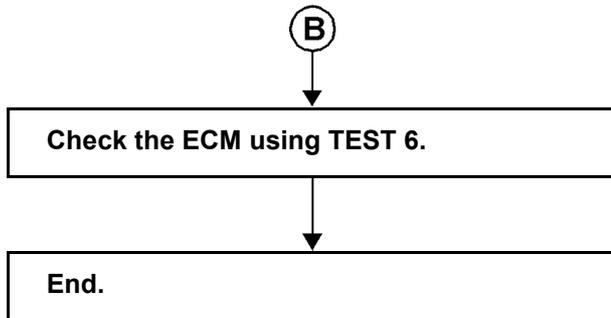


# DIESEL INJECTION

## Trouble diagnosis - Symptoms

**K9K**

**CHART 13**  
CONTINUED 2



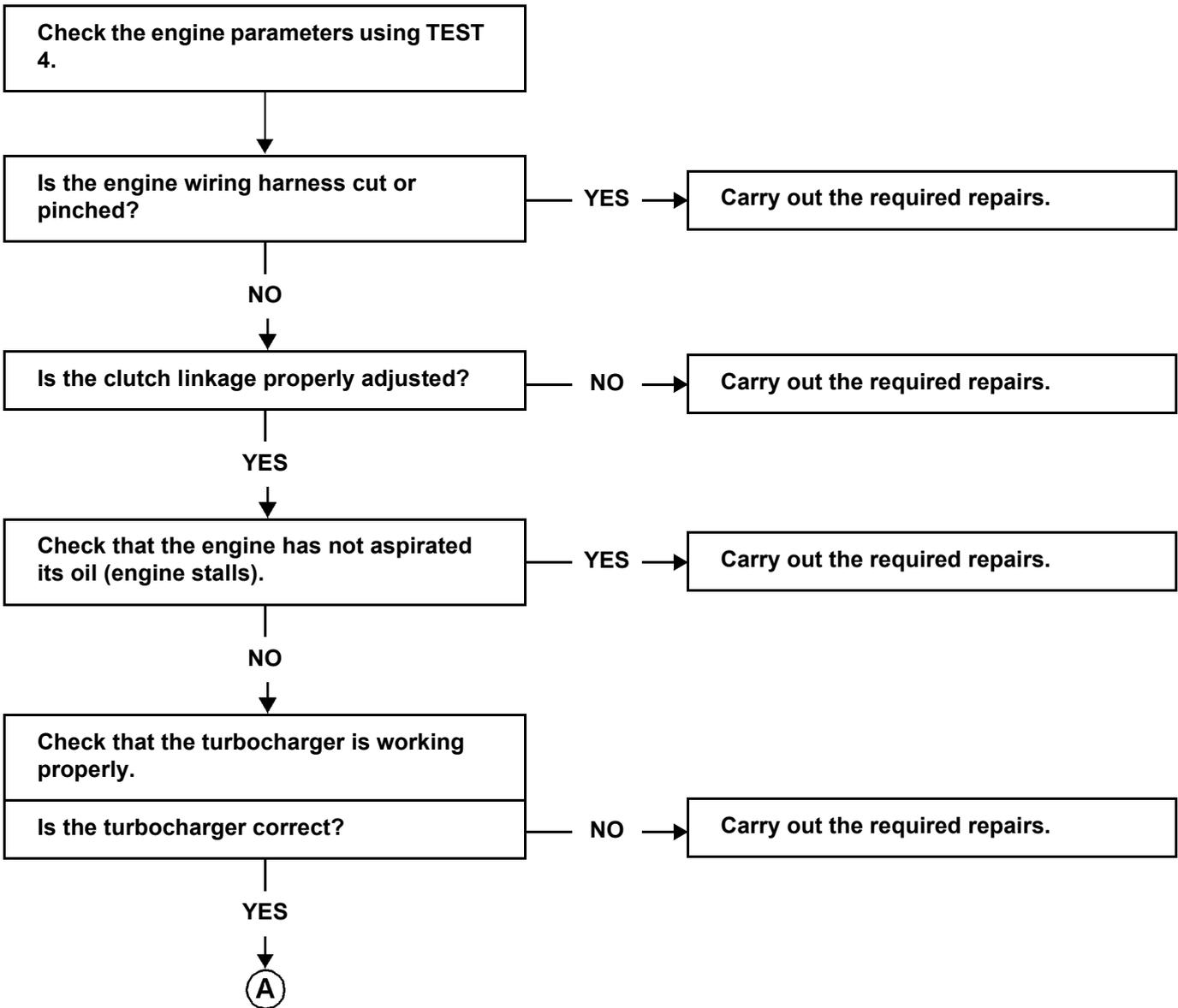
# DIESEL INJECTION

## Trouble diagnosis - Symptoms

**K9K**

<b>CHART 14</b>	<b>OVERSPEED WHEN LIFTING OFF ACCELERATOR OR CHANGING GEAR</b>
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<b>NOTES</b>	Only consult this customer complaint after a complete check using the diagnostic tool.
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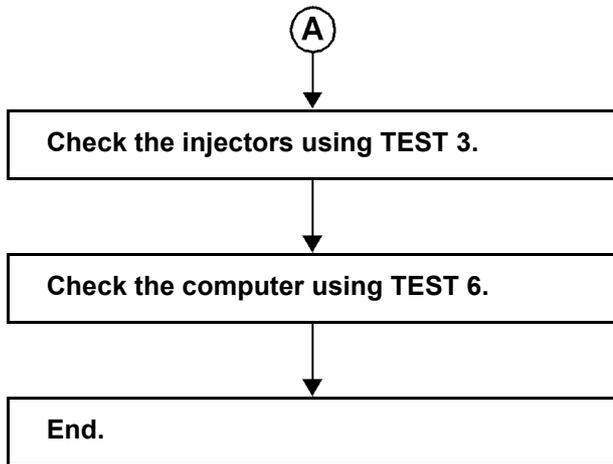
# DIESEL INJECTION

## Trouble diagnosis - Symptoms

**K9K**

**CHART 14**

Cont'd



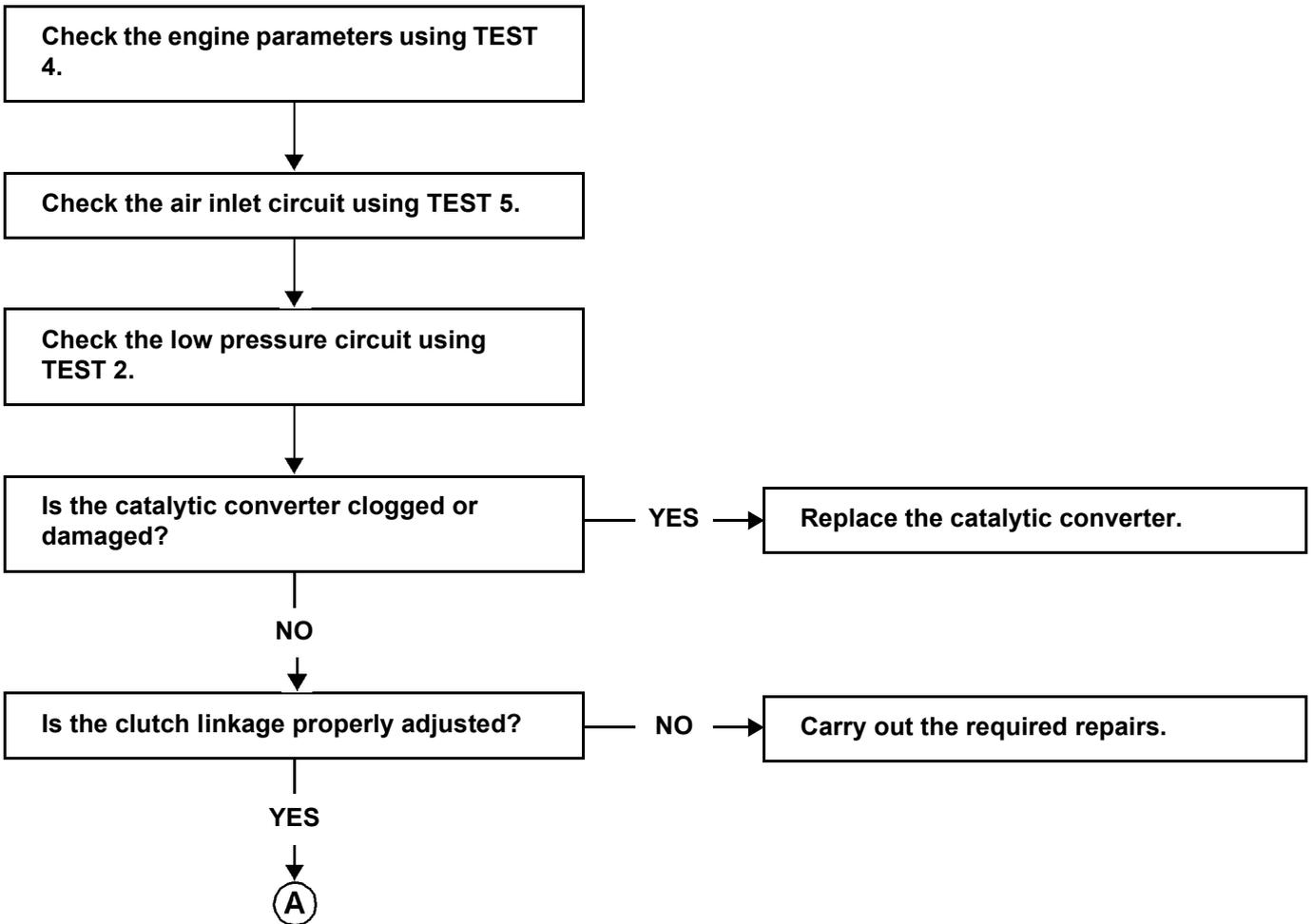
# DIESEL INJECTION

## Trouble diagnosis - Symptoms

**K9K**

<b>CHART 15</b>	<b>ENGINE DIES ON PULLING AWAY</b>
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<b>NOTES</b>	Only consult this customer complaint after a complete check using the diagnostic tool.
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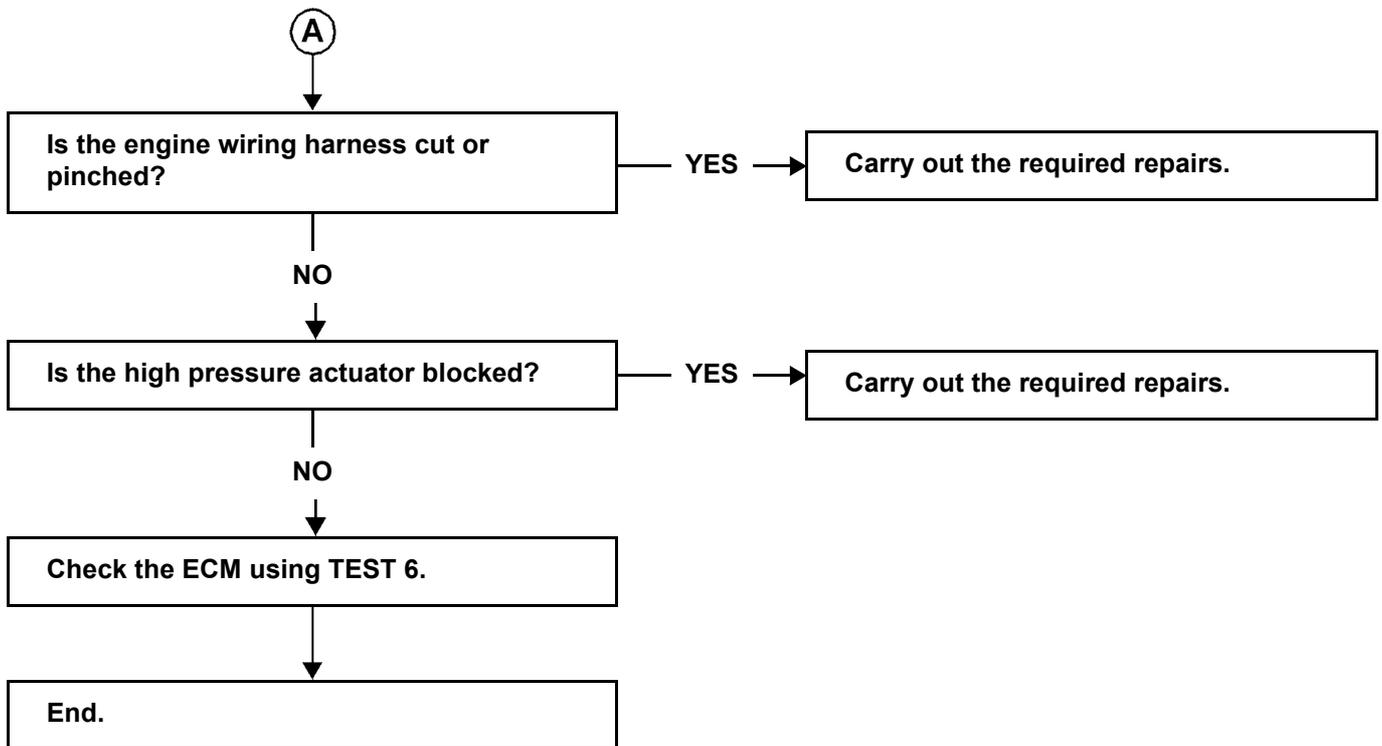
# DIESEL INJECTION

## Trouble diagnosis - Symptoms

K9K

CHART 15

Cont'd



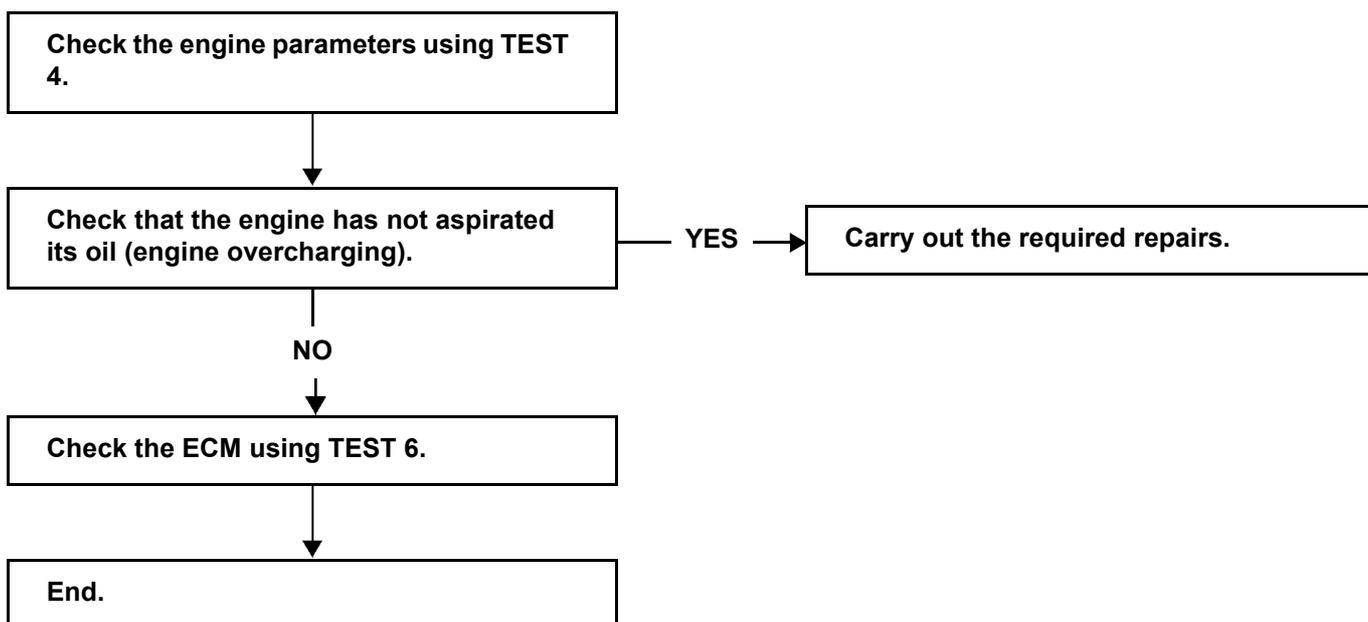
# DIESEL INJECTION

## Trouble diagnosis - Symptoms

**K9K**

<b>CHART 16</b>	<b>THE ENGINE DOES NOT STOP</b>
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<b>NOTES</b>	Only consult this customer complaint after a complete check using the diagnostic tool.
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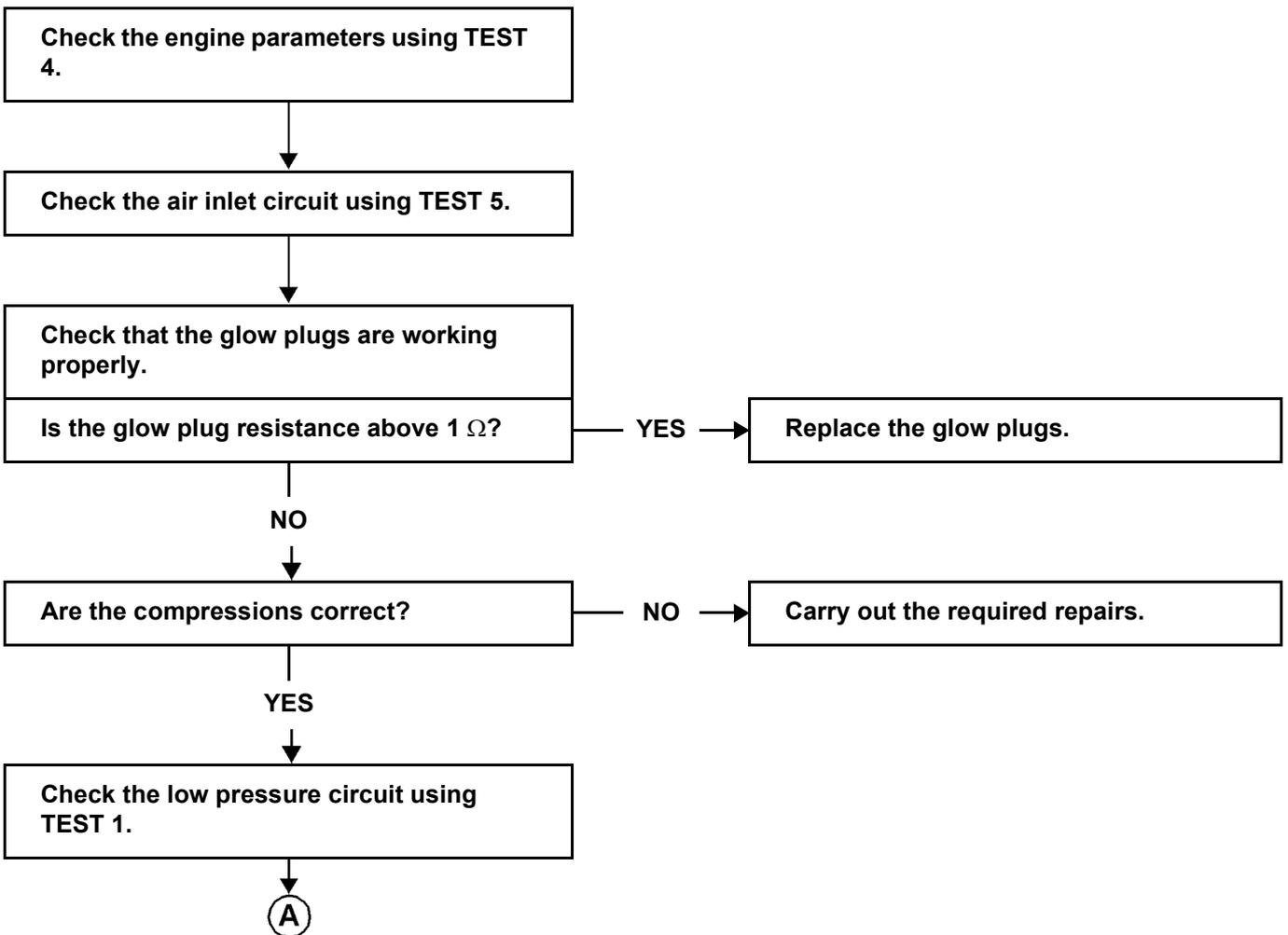
# DIESEL INJECTION

## Trouble diagnosis - Symptoms

**K9K**

CHART 17	CLANKING ENGINE, NOISY ENGINE
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<b>NOTES</b>	Only consult this customer complaint after a complete check using the diagnostic tool.
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# DIESEL INJECTION

## Trouble diagnosis - Symptoms

**K9K**

**CHART 17**  
Continued

**A**

Check the injectors using TEST 3.

End.

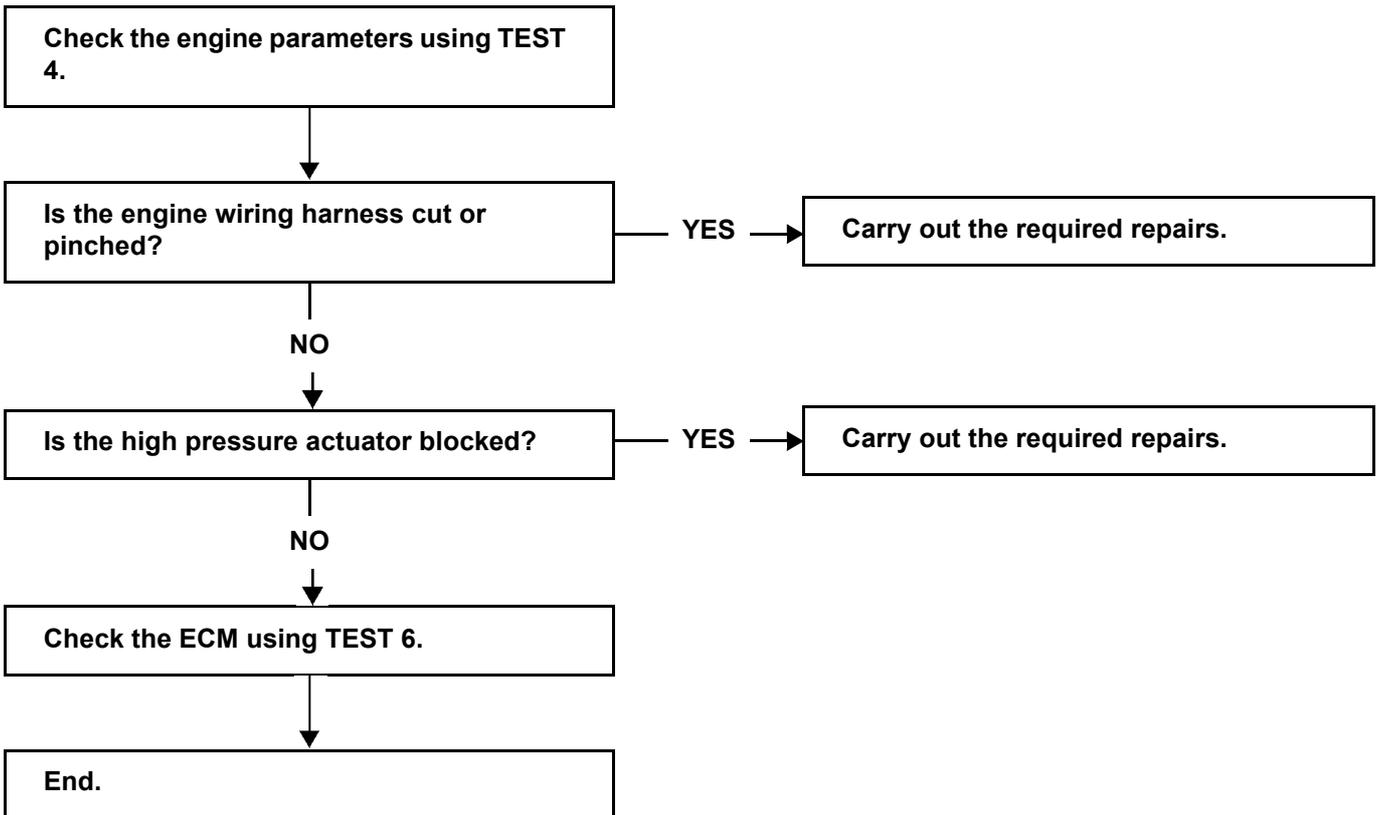
# DIESEL INJECTION

## Trouble diagnosis - Symptoms

**K9K**

<b>CHART 18</b>	<b>SQUALLING NOISE</b>
-----------------	------------------------

<b>NOTES</b>	Only consult this customer complaint after a complete check using the diagnostic tool.
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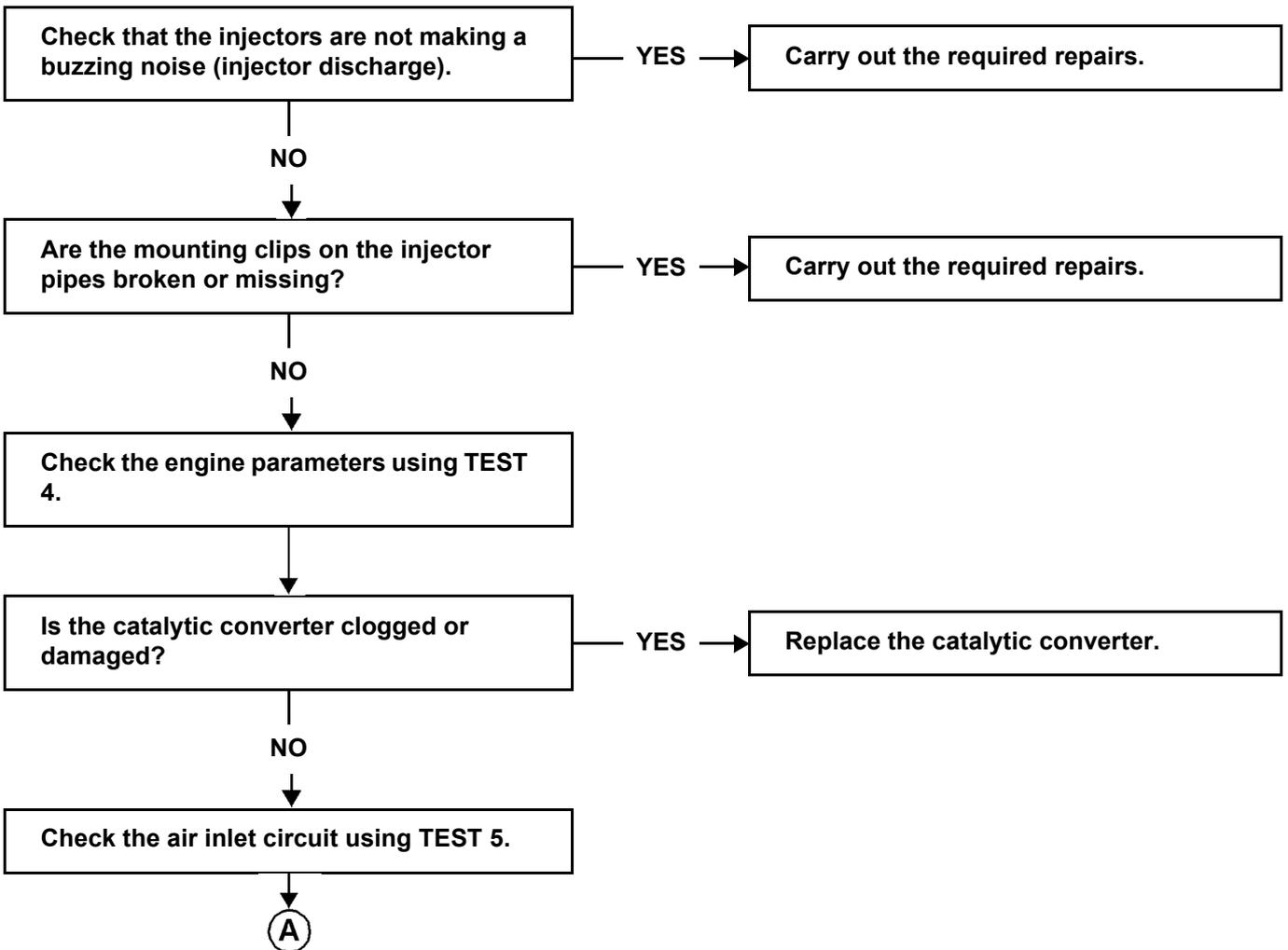
# DIESEL INJECTION

## Trouble diagnosis - Symptoms

**K9K**

<b>CHART 19</b>	<b>VARIOUS MECHANICAL NOISES</b>
-----------------	----------------------------------

<b>NOTES</b>	Only consult this customer complaint after a complete check using the diagnostic tool.
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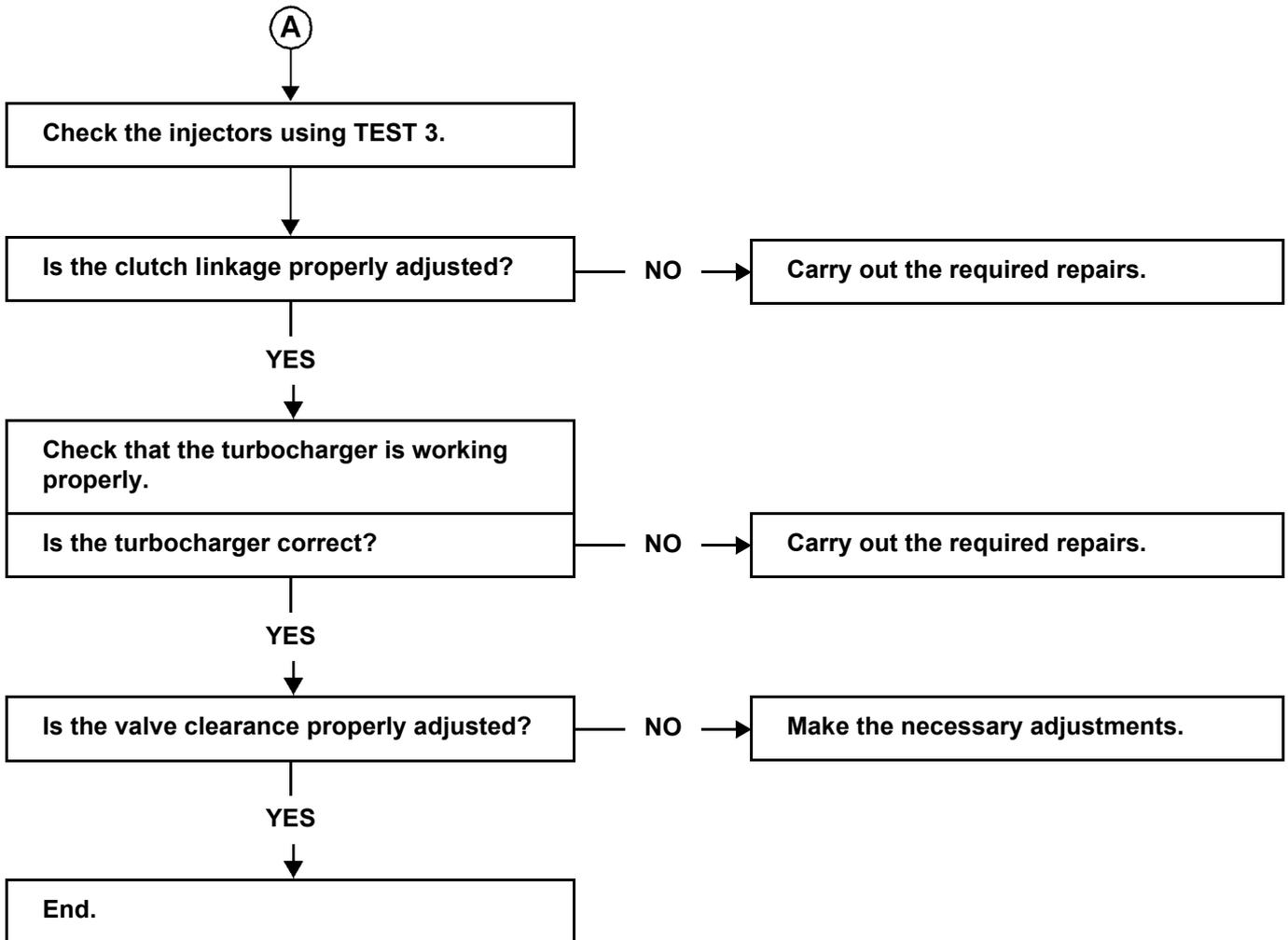
# DIESEL INJECTION

## Trouble diagnosis - Symptoms

K9K

CHART 19

Cont'd



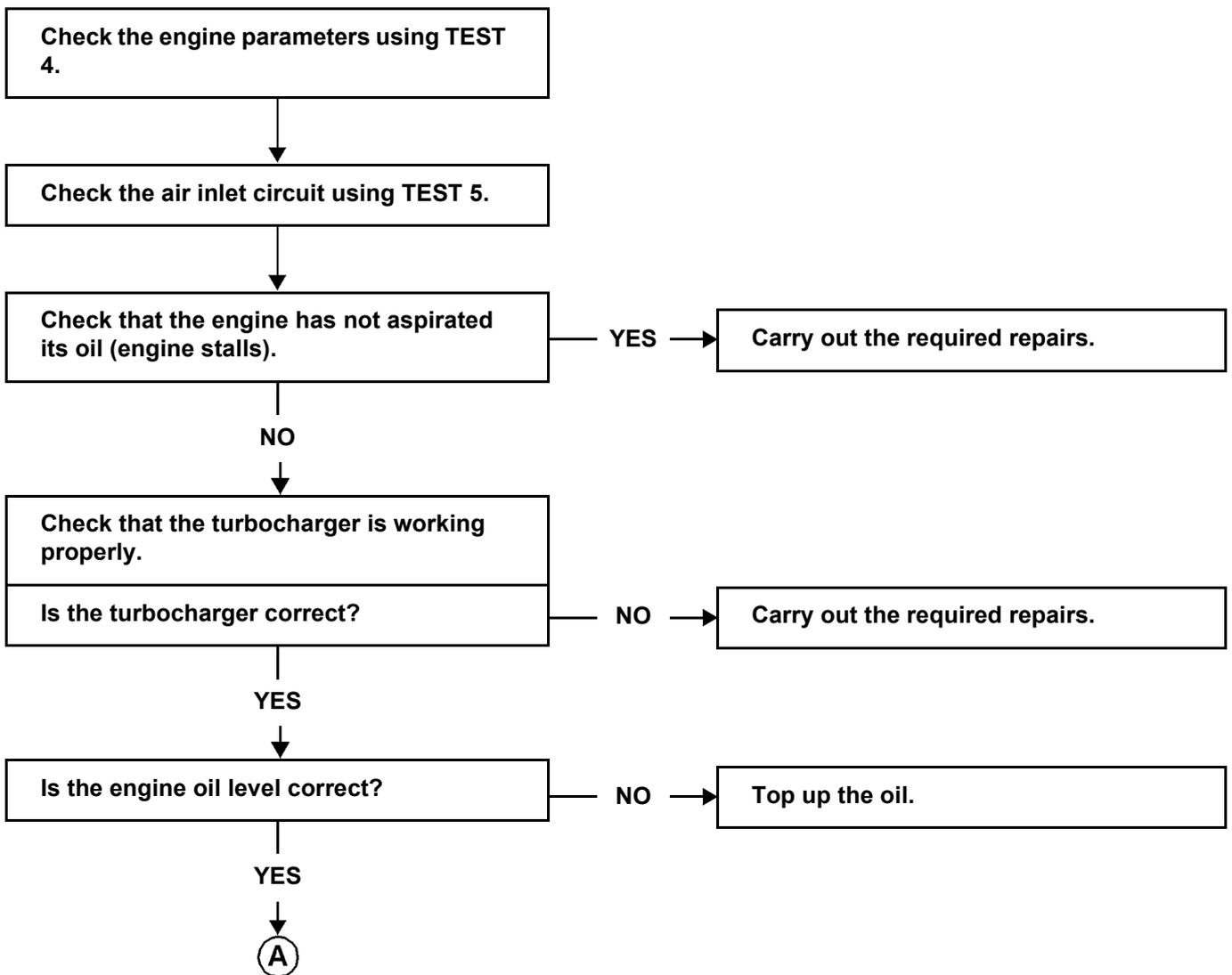
# DIESEL INJECTION

## Trouble diagnosis - Symptoms

**K9K**

<b>CHART 20</b>	<b>EXHAUST ODOURS</b>
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<b>NOTES</b>	Only consult this customer complaint after a complete check using the diagnostic tool.
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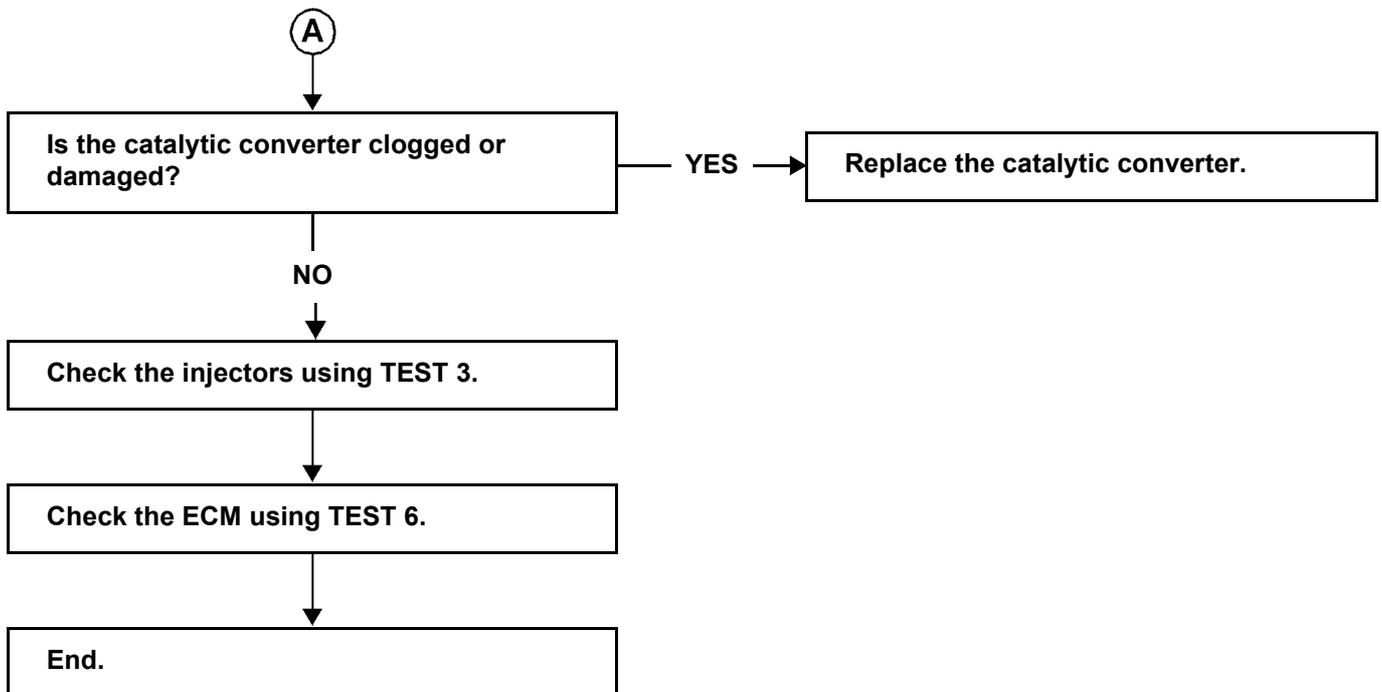
# DIESEL INJECTION

## Trouble diagnosis - Symptoms

**K9K**

**CHART 20**

Cont'd



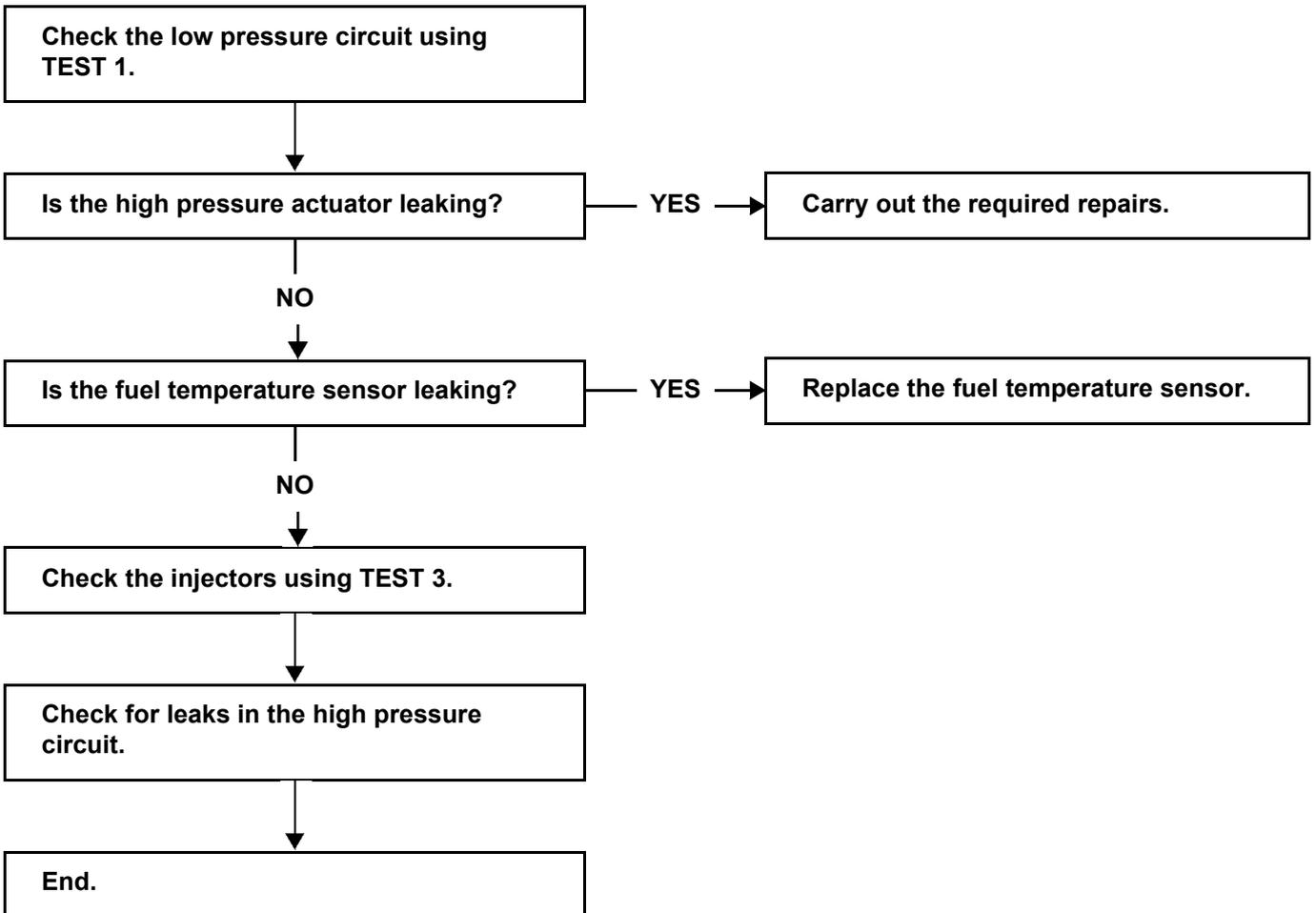
# DIESEL INJECTION

## Trouble diagnosis - Symptoms

**K9K**

<b>CHART 21</b>	<b>DIESEL ODOURS</b>
-----------------	----------------------

<b>NOTES</b>	Only consult this customer complaint after a complete check using the diagnostic tool.
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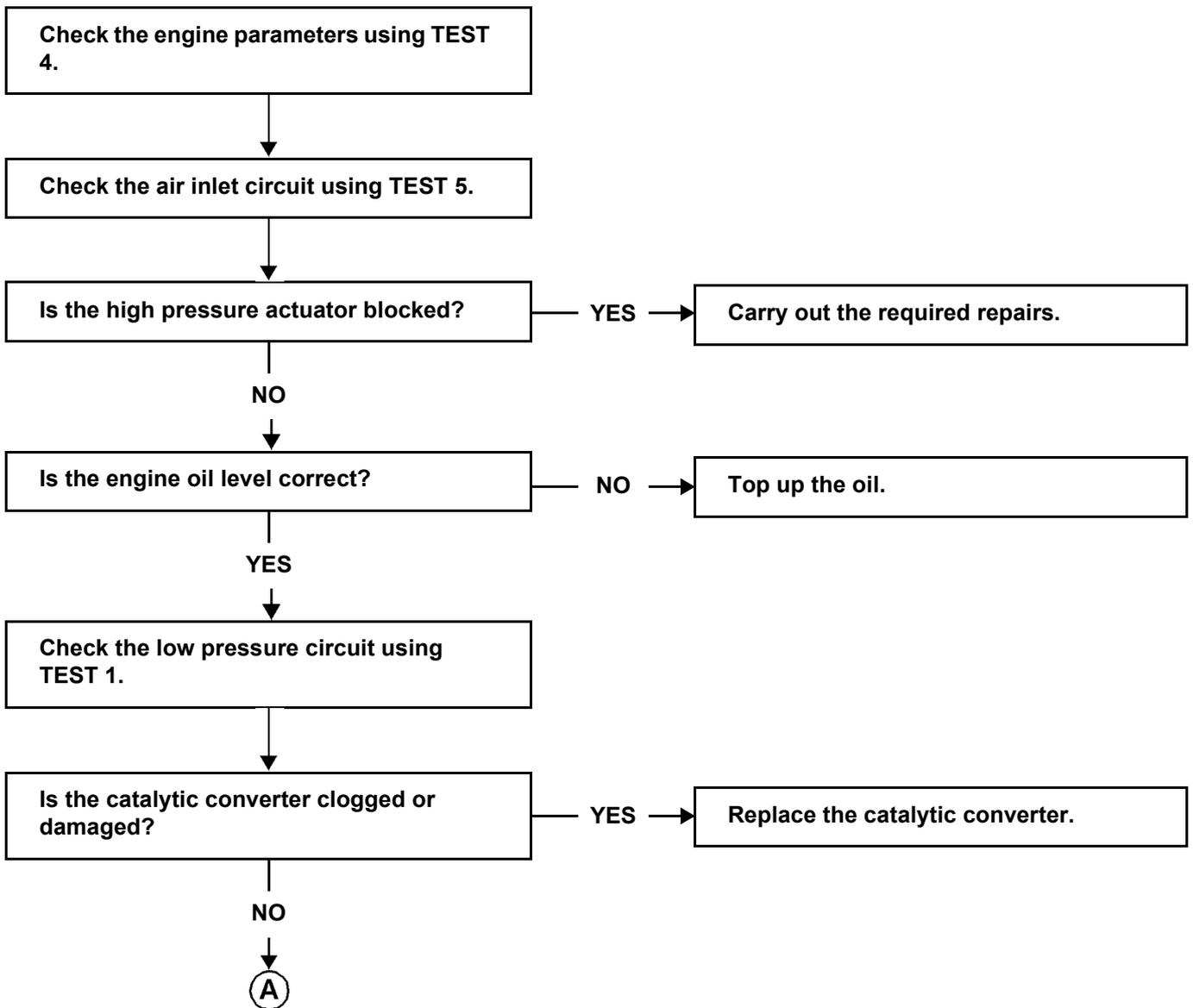
# DIESEL INJECTION

## Trouble diagnosis - Symptoms

**K9K**

CHART 22	BLUE, WHITE OR BLACK SMOKE
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<b>NOTES</b>	Only consult this customer complaint after a complete check using the diagnostic tool.
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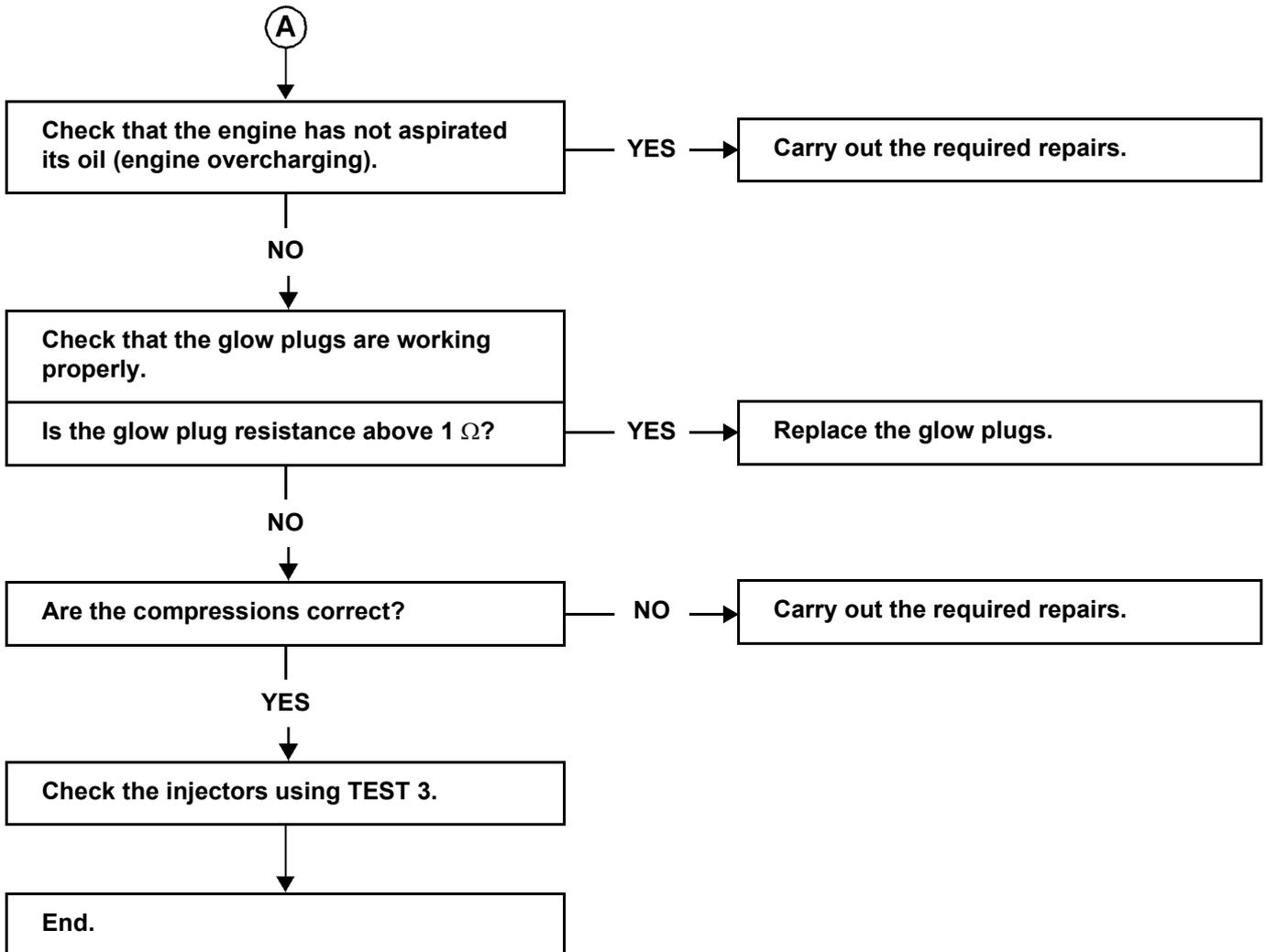
# DIESEL INJECTION

## Trouble diagnosis - Symptoms

K9K

CHART 22

Cont'd



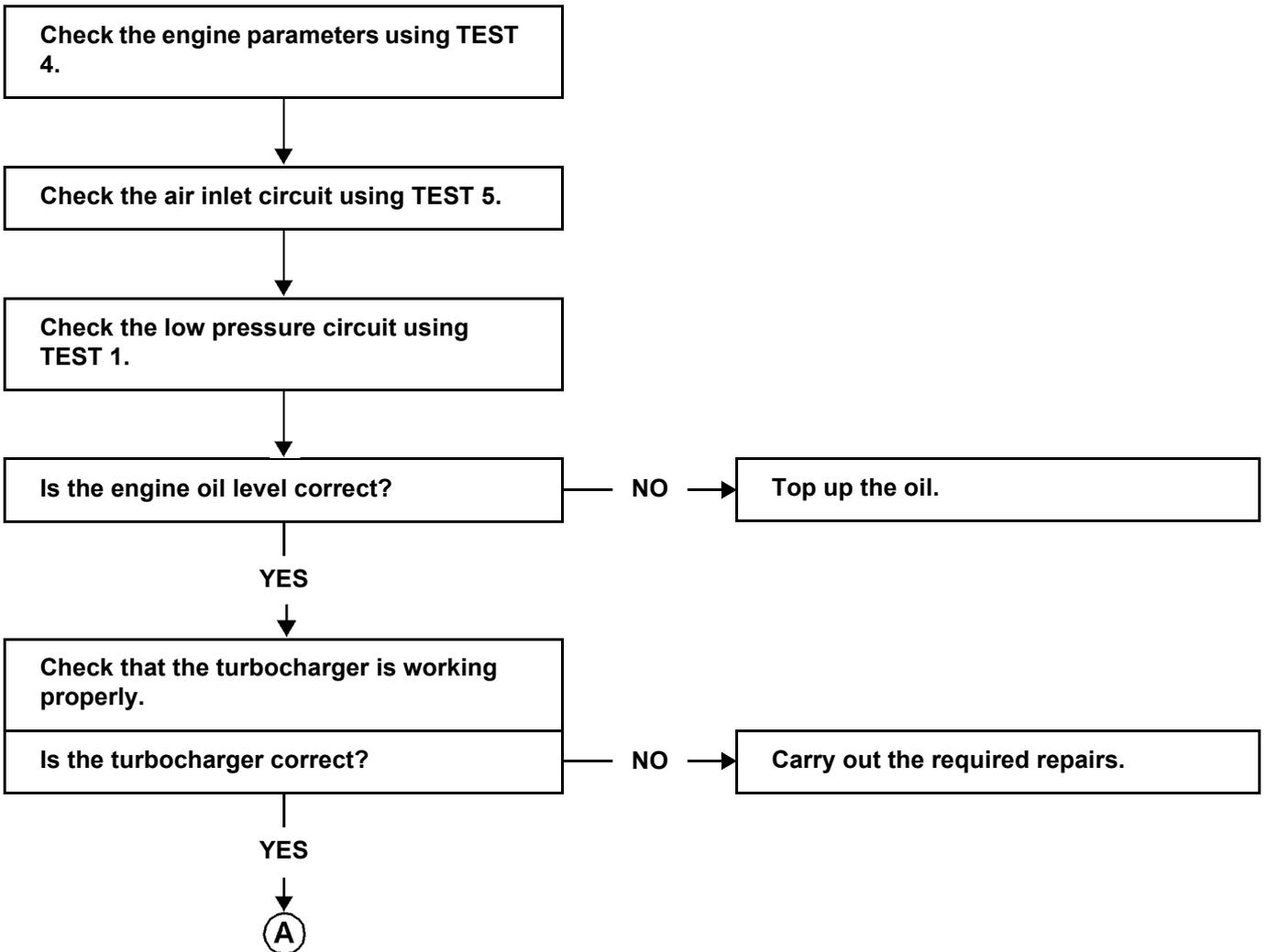
# DIESEL INJECTION

## Trouble diagnosis - Symptoms

**K9K**

CHART 23	<b>SMOKE (BLUE, BLACK OR WHITE) ON ACCELERATING</b>
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<b>NOTES</b>	Only consult this customer complaint after a complete check using the diagnostic tool.
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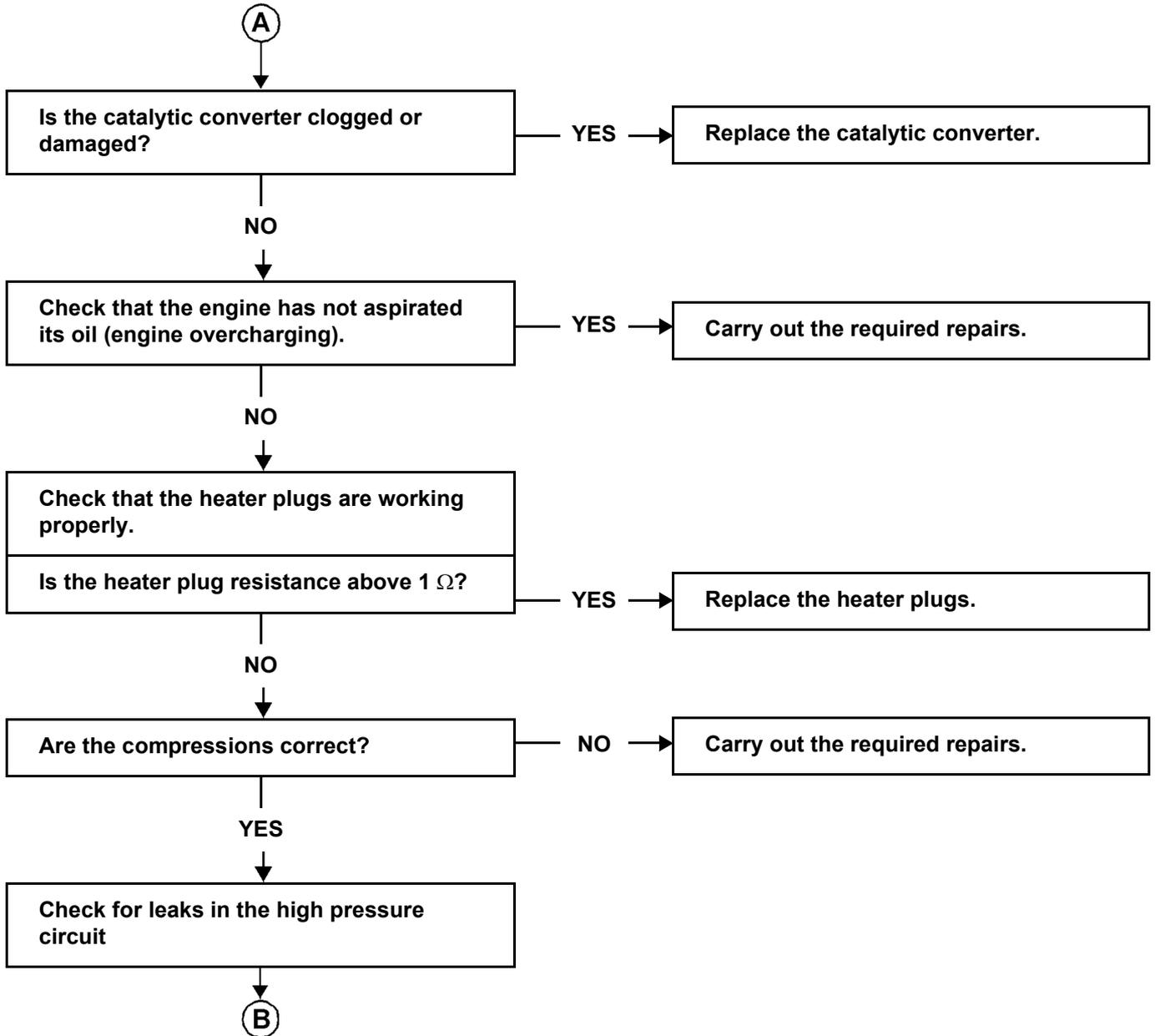


# DIESEL INJECTION

## Trouble diagnosis - Symptoms

K9K

CHART 23  
CONTINUED 1



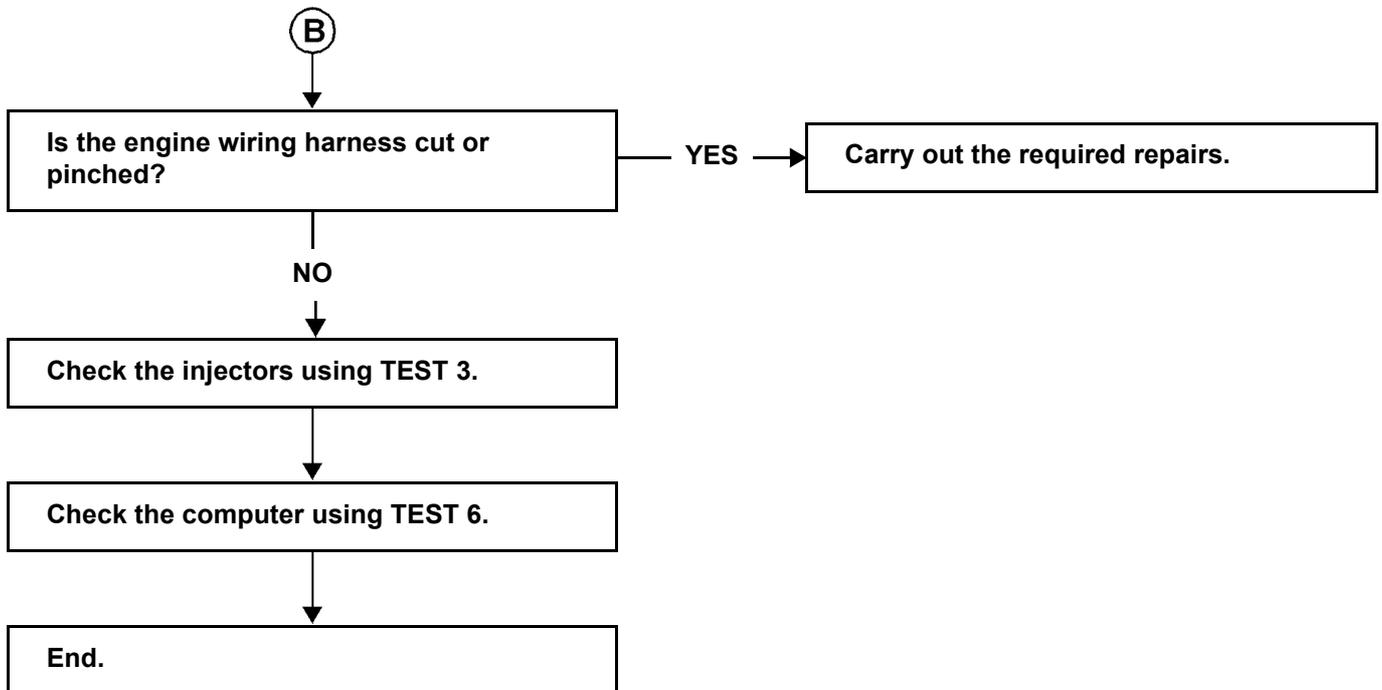
# DIESEL INJECTION

## Trouble diagnosis - Symptoms

**K9K**

**CHART 23**

Cont'd



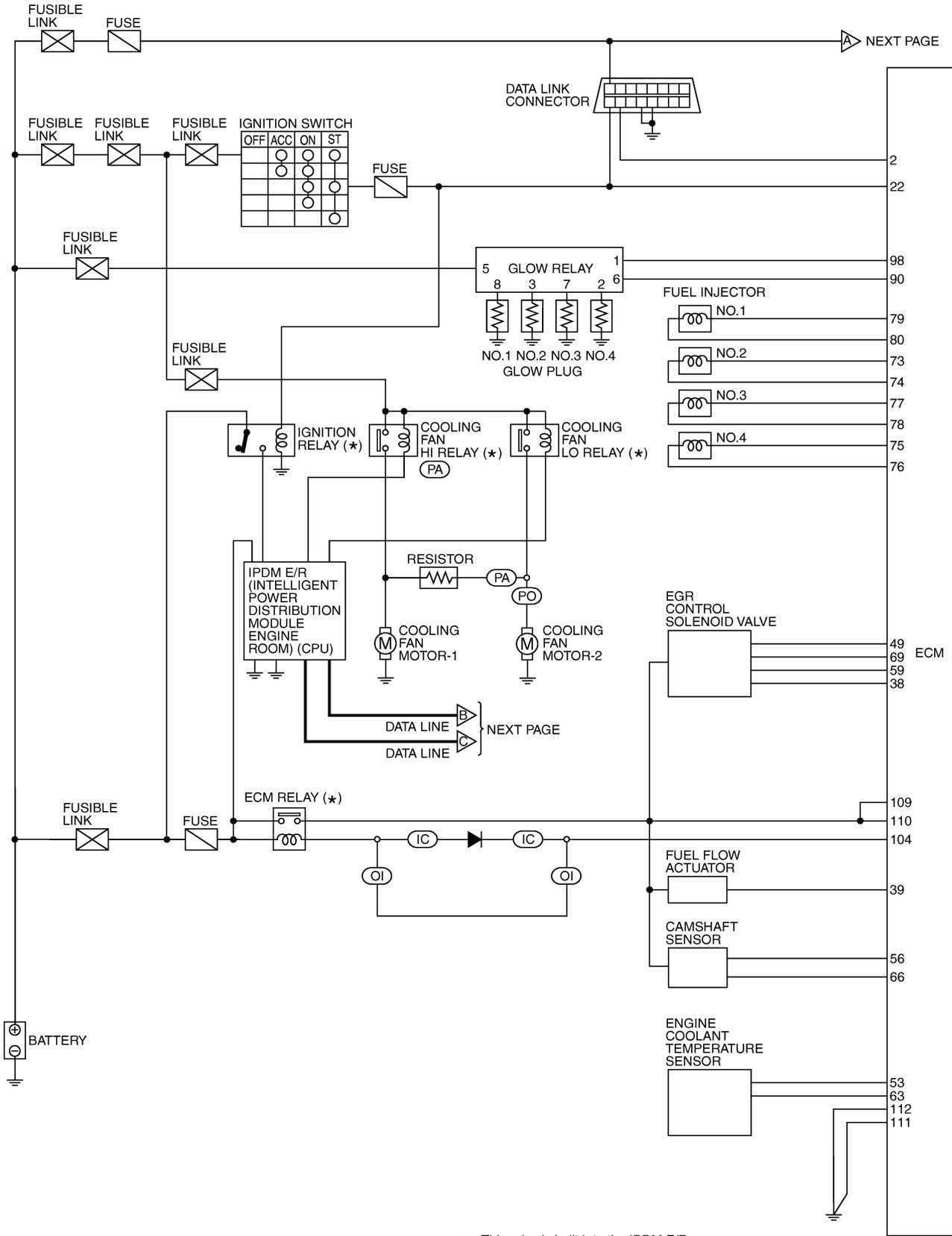
# DIESEL INJECTION

## Circuit diagram



### Euro 3 48 kW and 60 kW engine models

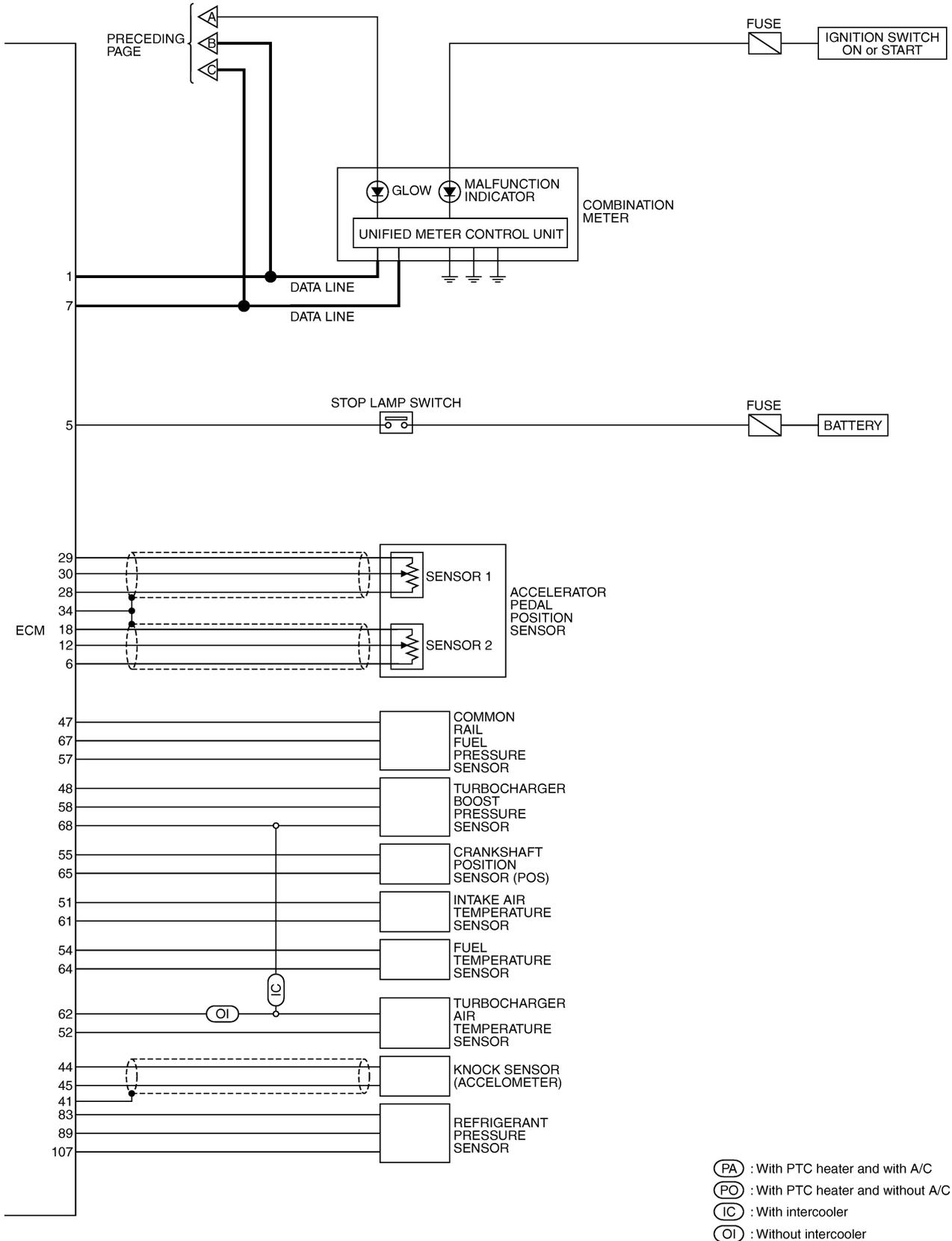
(Refer to EC-K9K-1 to confirm engine type.)



\* : This relay is built into the IPDM E/R (Intelligent power distribution module engine room).

# DIESEL INJECTION

## Circuit diagram



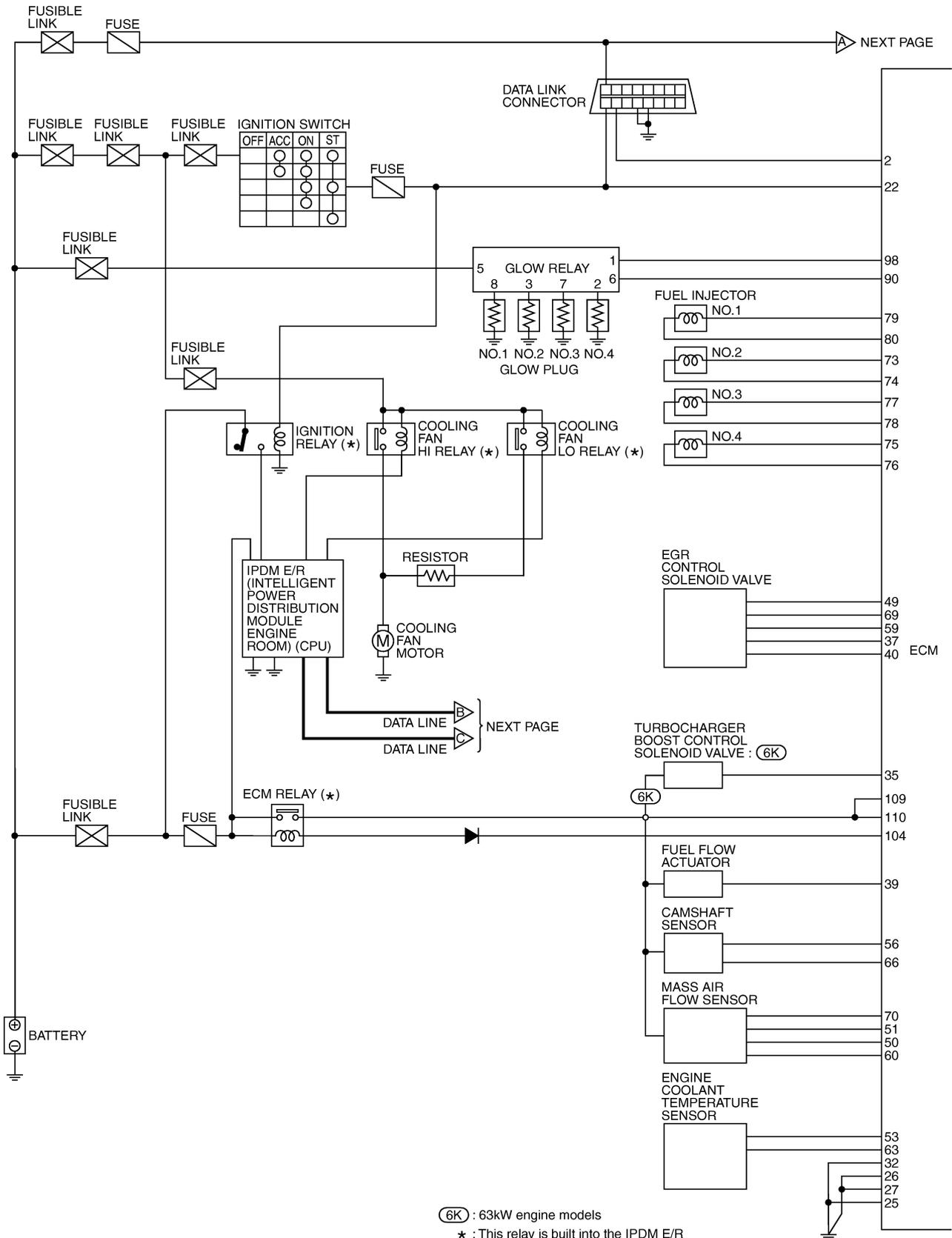
# DIESEL INJECTION

## Circuit diagram



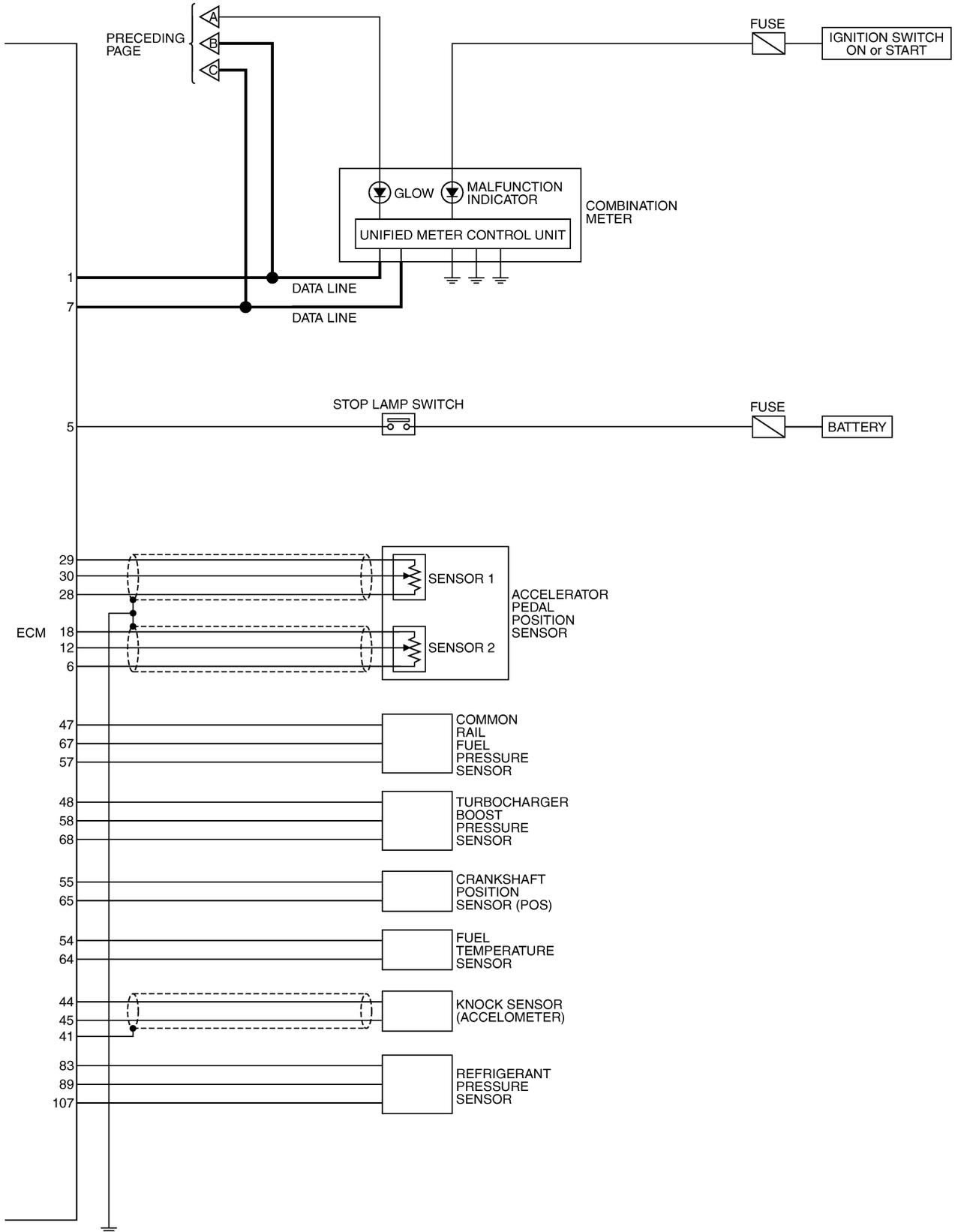
### Euro 4 50 kW and 63 kW engine models

(Refer to EC-K9K-1 to confirm engine type.)



# DIESEL INJECTION

## Circuit diagram



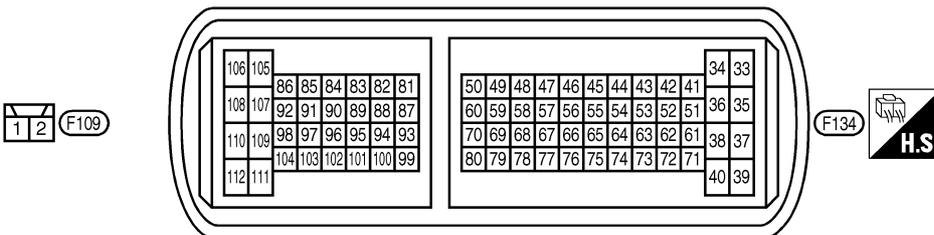
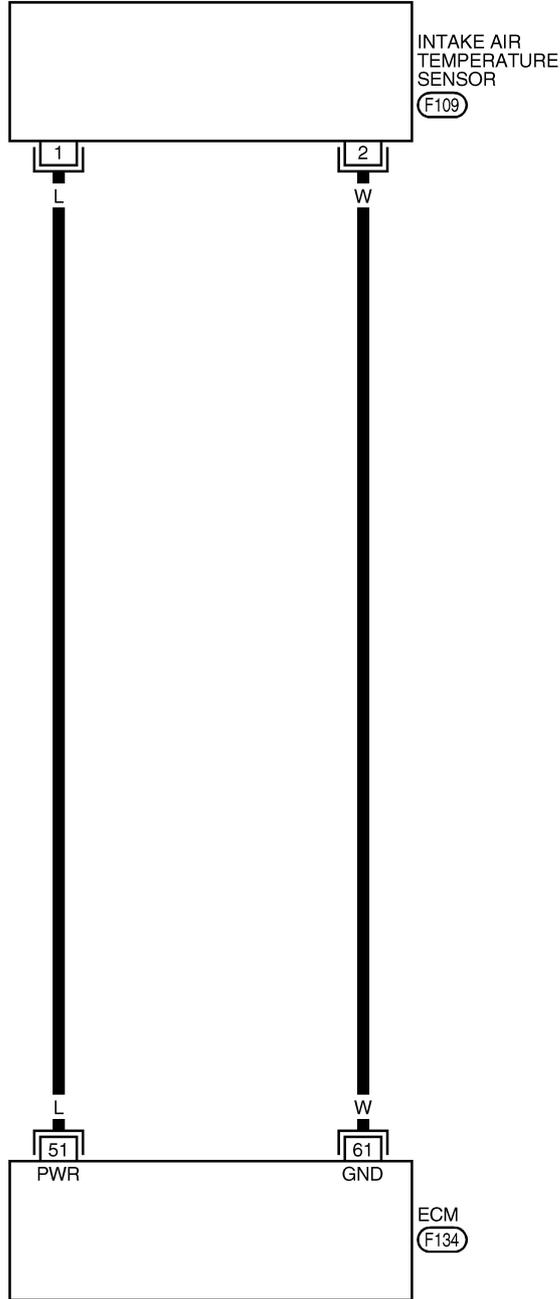
# DIESEL INJECTION

## Wiring diagram - Intake air temperature sensor



**Euro 3 48 kW and 60 kW engine models**  
(Refer to EC-K9K-1 to confirm engine type.)

EC-IATS-01



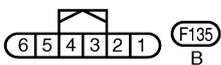
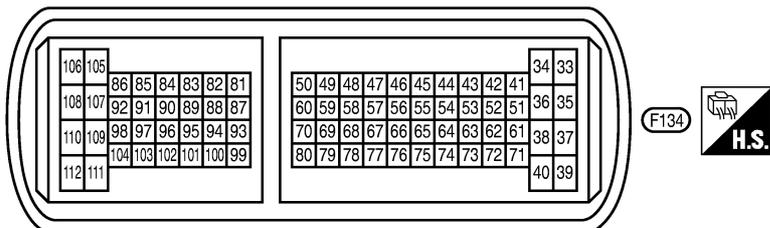
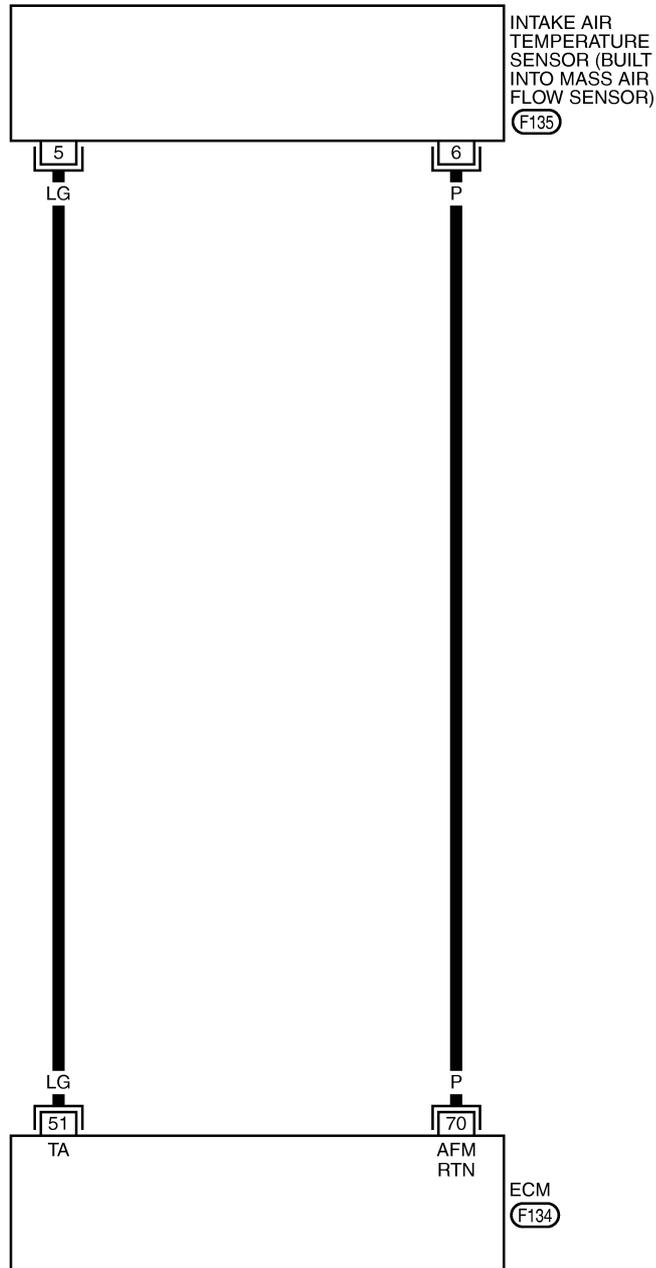
# DIESEL INJECTION

## Wiring diagram - Intake air temperature sensor



**Euro 4 50 kW and 63 kW engine models**  
 (Refer to EC-K9K-1 to confirm engine type.)

EC-IATS-02



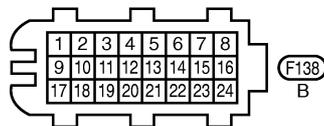
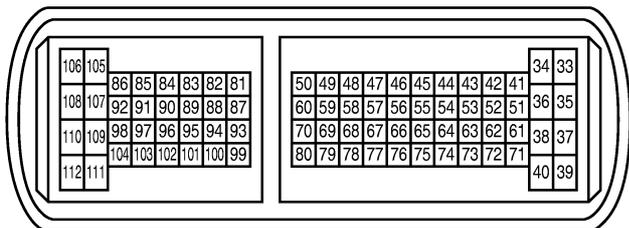
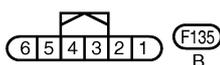
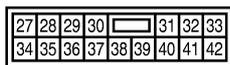
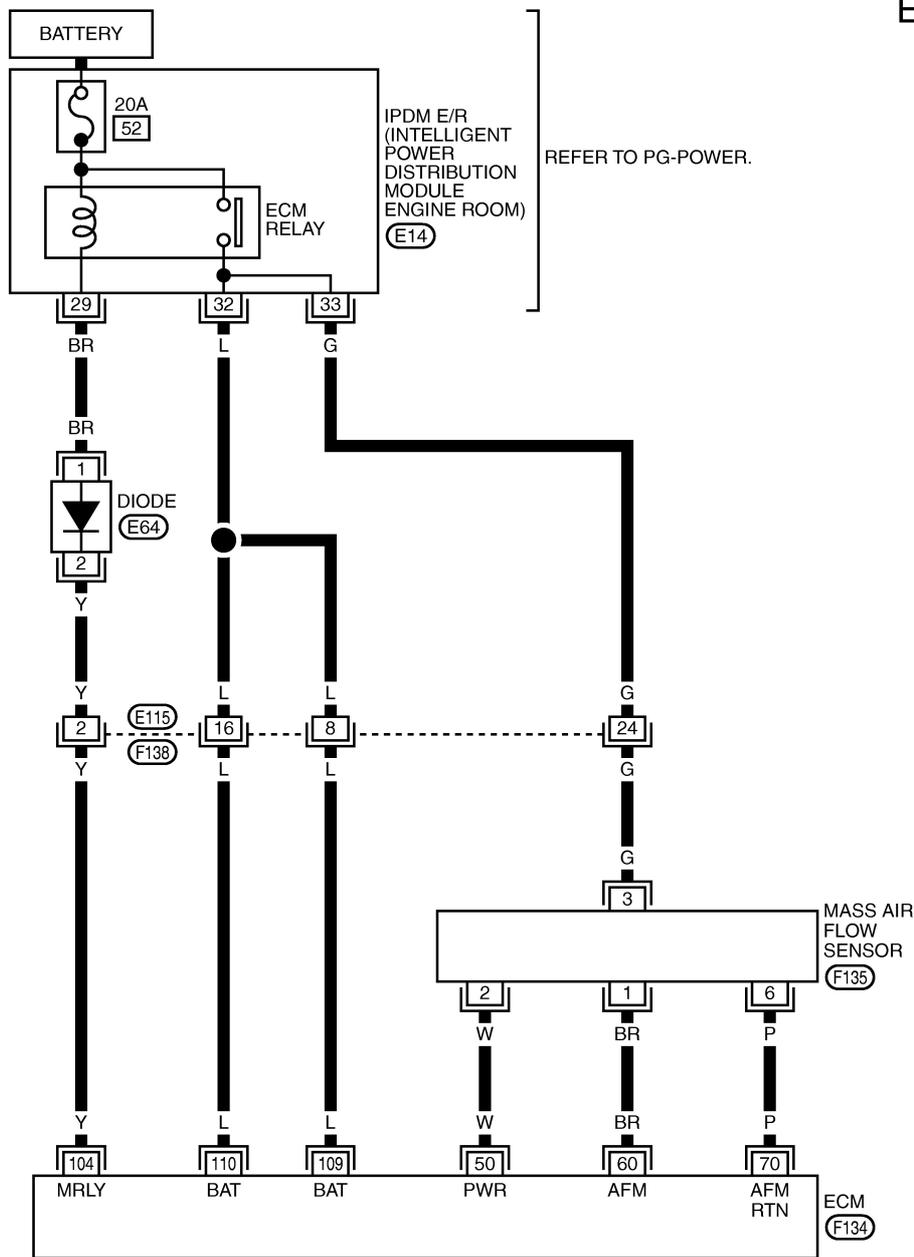
# DIESEL INJECTION

## Wiring diagram - MAF sensor



**Euro 4 50 kW and 63 kW engine models**  
 (Refer to EC-K9K-1 to confirm engine type.)

EC-MAFS-01



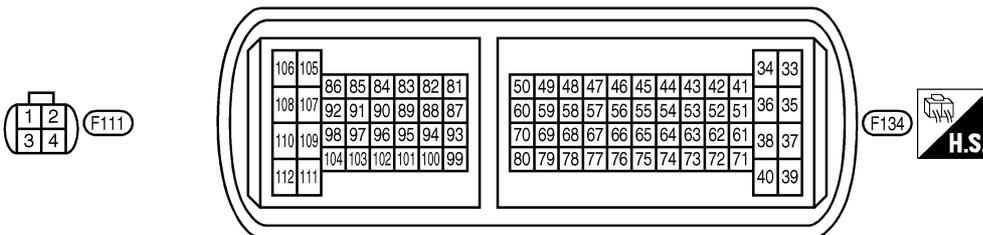
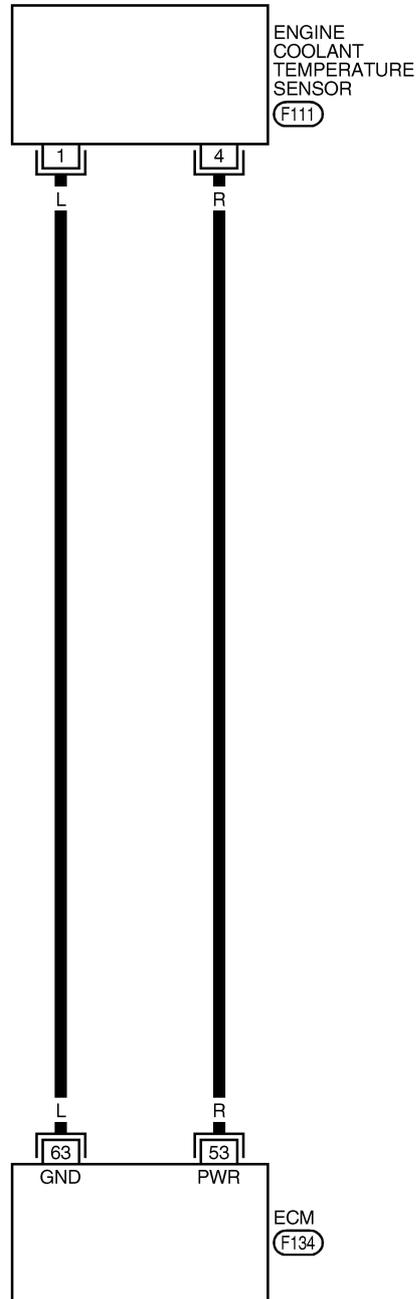
# DIESEL INJECTION

## Wiring diagram - Engine coolant temperature sensor

K9K

All K9K engine models

EC-ECTS-01



MBWA0596E

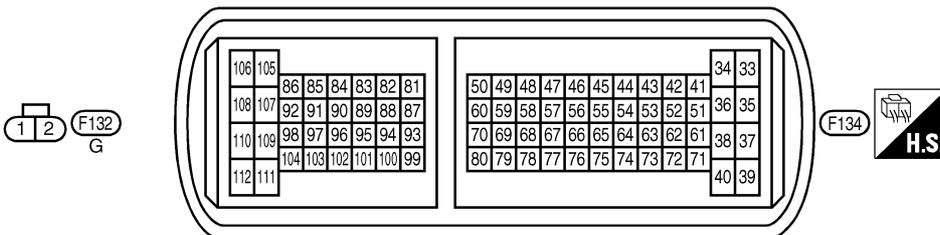
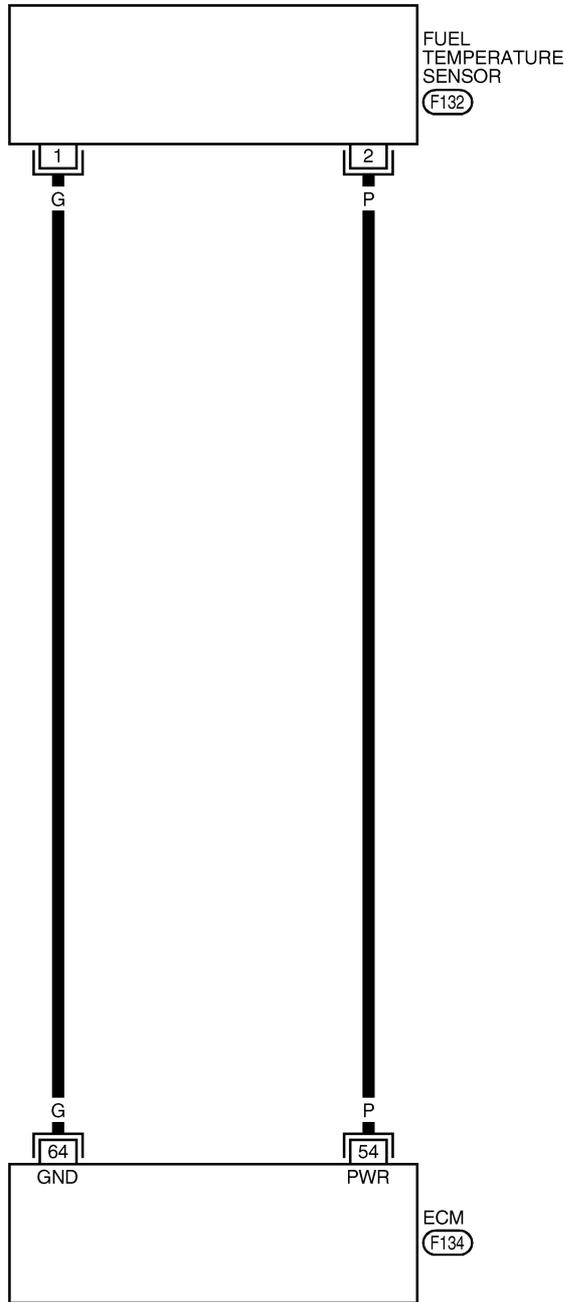
# DIESEL INJECTION

## Wiring diagram - Fuel temperature sensor



All K9K engine models

EC-FTS-01



MBWA0597E

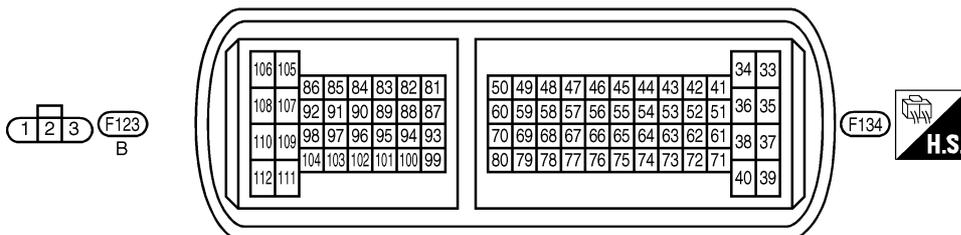
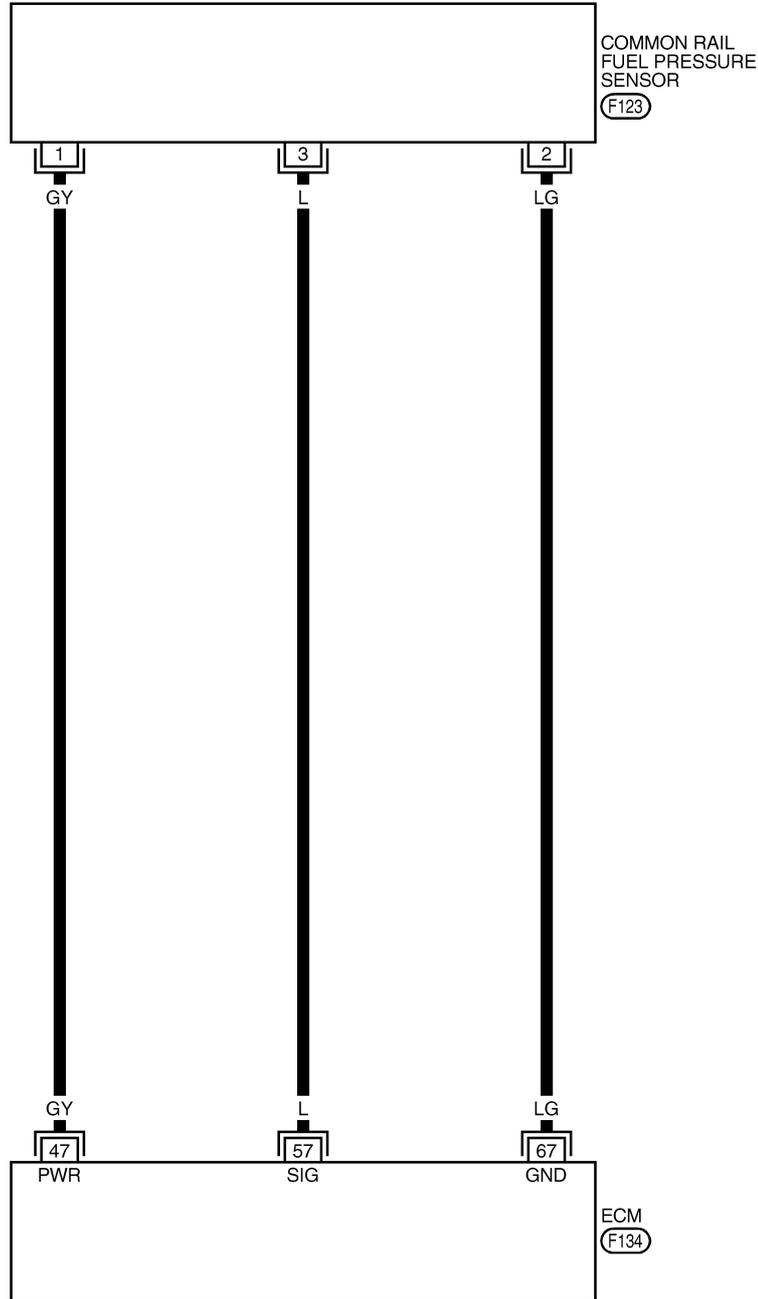
# DIESEL INJECTION

## Wiring diagram - Common rail fuel pressure sensor

K9K

All K9K engine models

EC-CRFPS-01



MBWA0598E

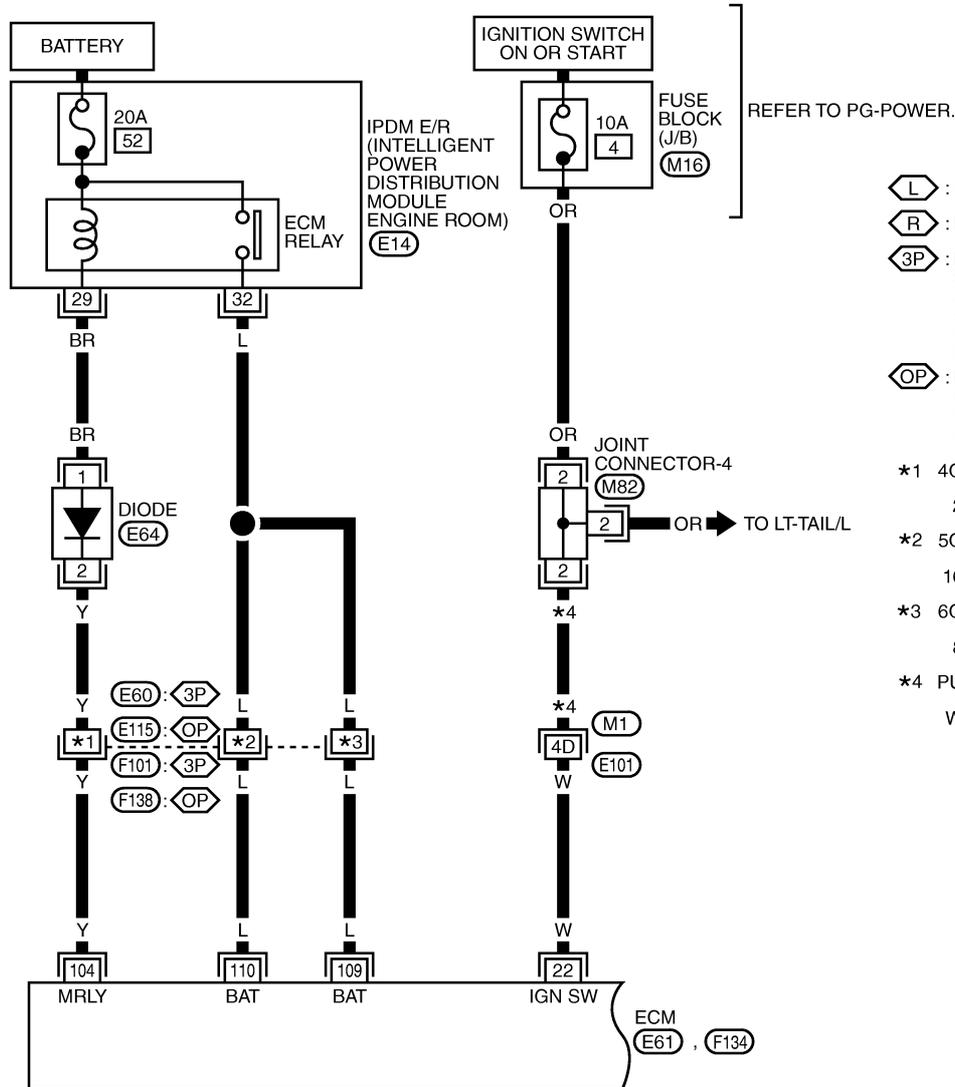
# DIESEL INJECTION

## Wiring diagram - Injector

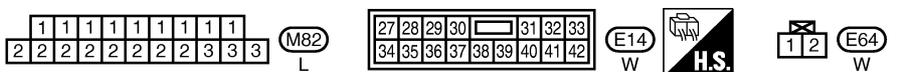


All K9K engine models

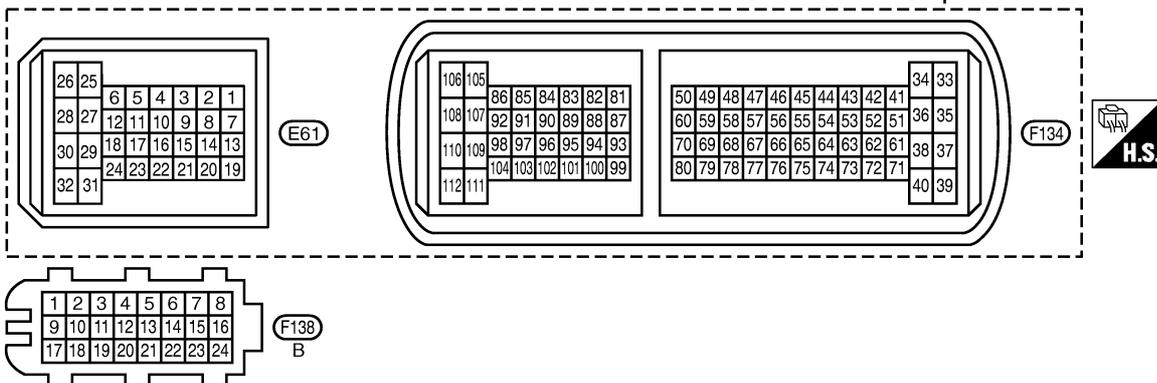
EC-INJECT-01



- : LHD MODELS
- : RHD MODELS
- : EURO 3 48kW/60kW MODELS AND EURO 4 50kW/63kW WITH PTC HEATER MODELS
- : EURO 4 50kW/63kW WITHOUT PTC HEATER MODELS
- \*1 4G:
- 2:
- \*2 5G:
- 16:
- \*3 6G:
- 8:
- \*4 PU:
- W:



REFER TO THE FOLLOWING.  
 - SUPER MULTIPLE JUNCTION (SMJ)  
 - FUSE BLOCK - JUNCTION BOX (J/B)



MBWA1344E

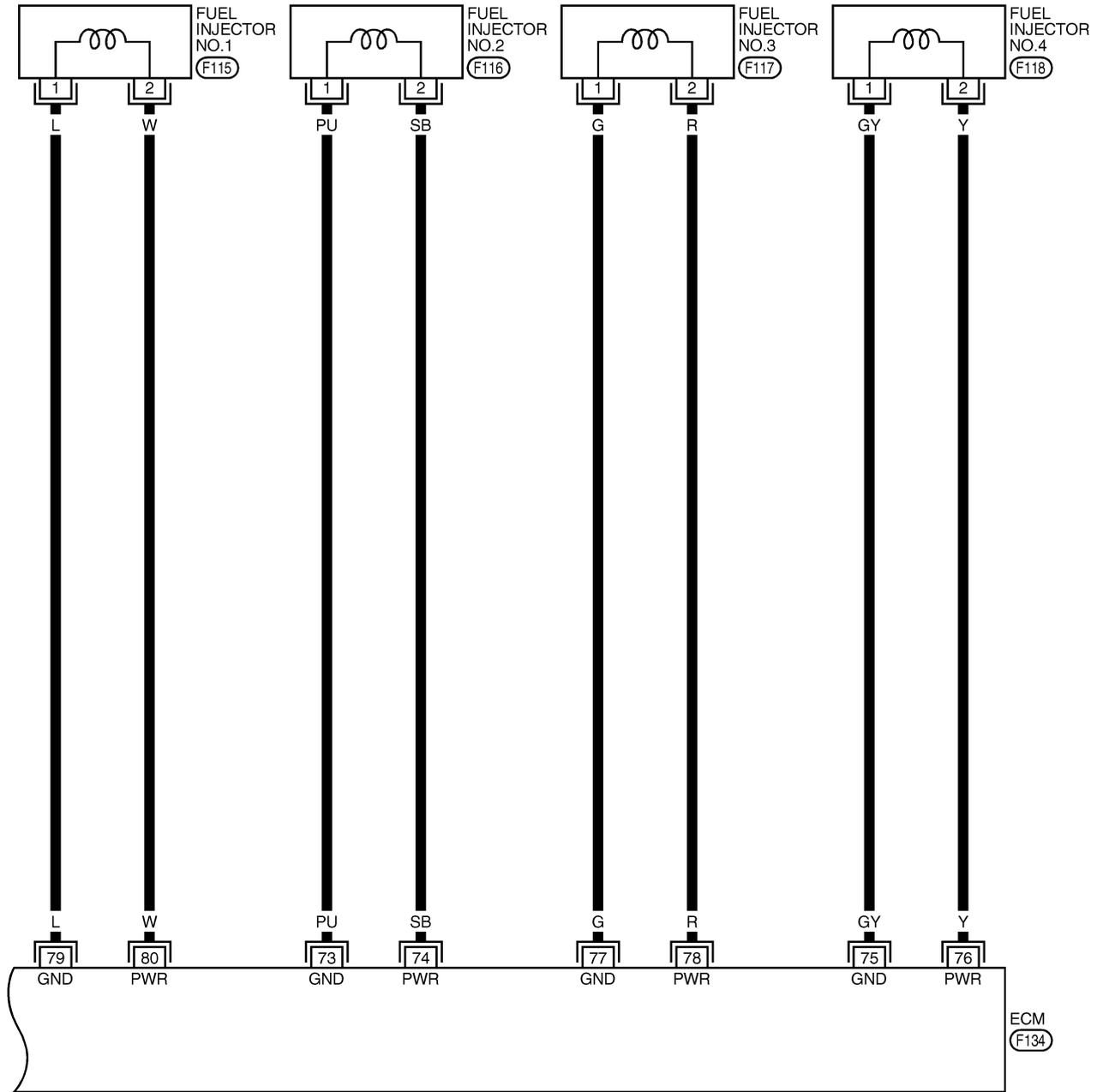
# DIESEL INJECTION

## Wiring diagram - Injector

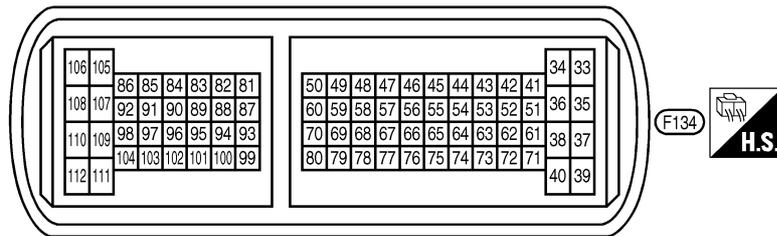


All K9K engine models

EC-INJECT-02



1 2 (F115) , (F116) , (F117) , (F118)



MBWA0599E

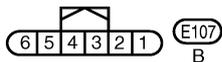
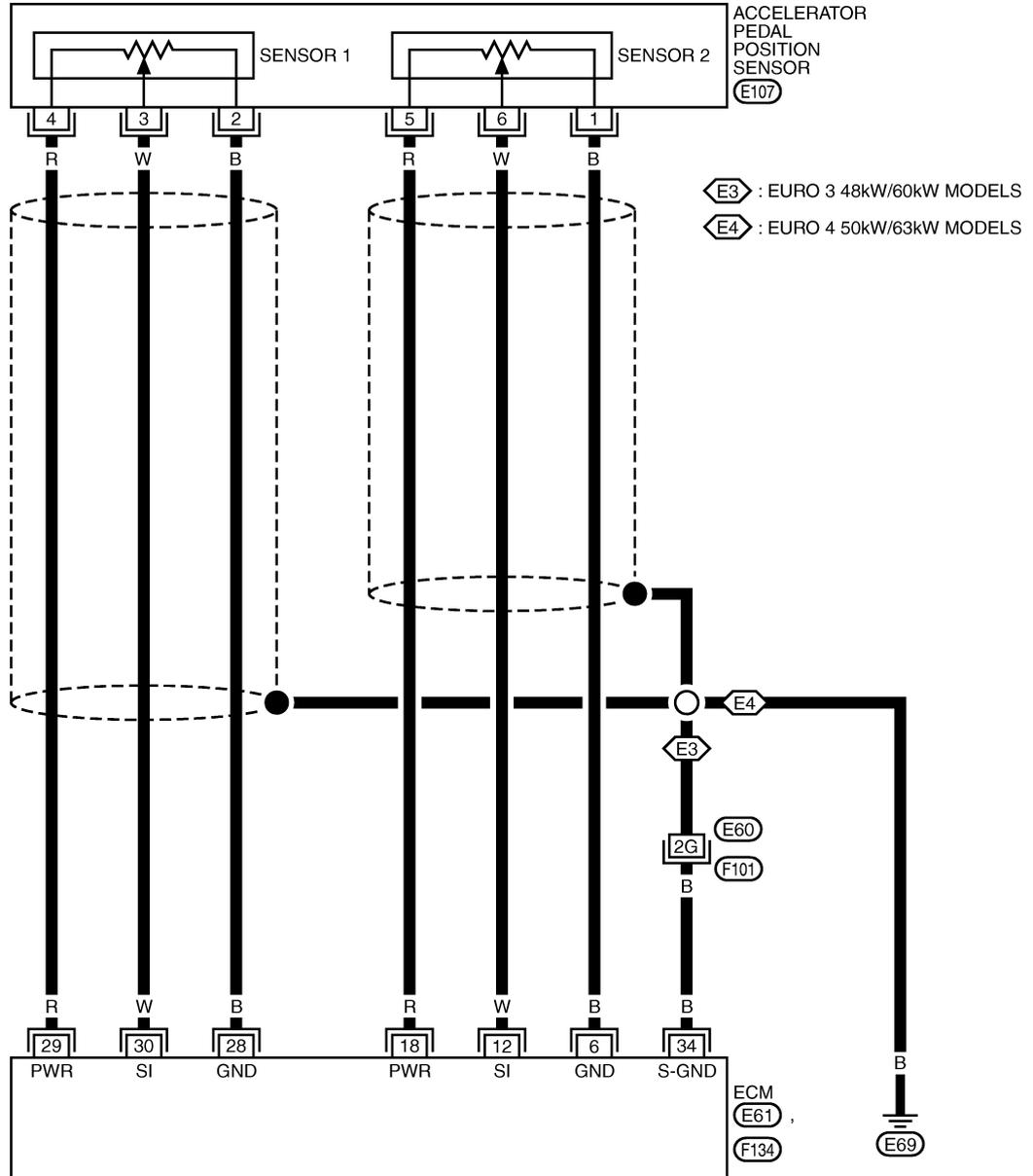
# DIESEL INJECTION

## Wiring diagram - Accelerator pedal position sensor

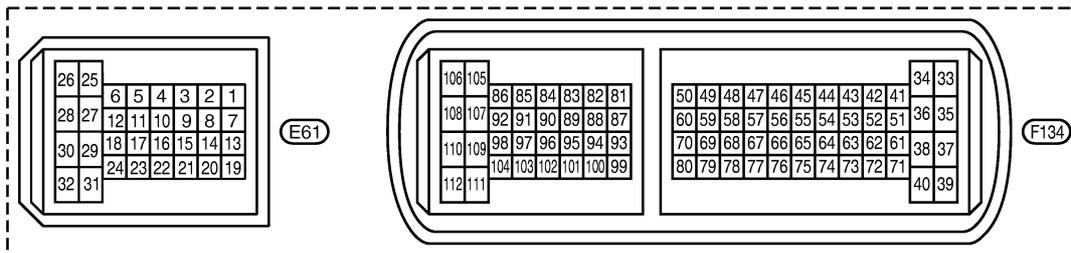


LHD models with all K9K engine models

EC-APPS-01



REFER TO THE FOLLOWING.  
(F101) - SUPER MULTIPLE JUNCTION (SMJ)



MBWA1345E

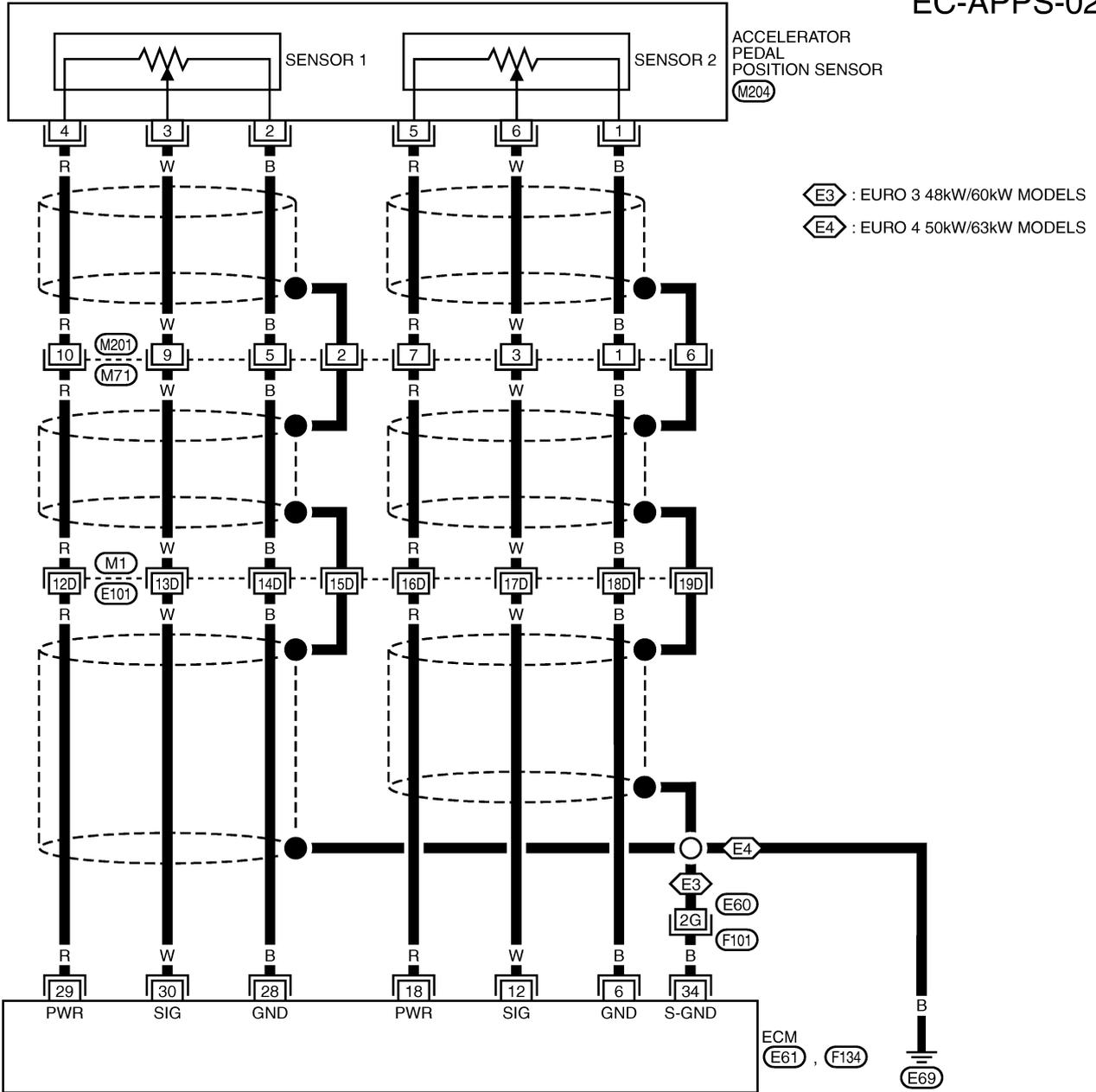
# DIESEL INJECTION

## Wiring diagram - Accelerator pedal position sensor

**K9K**

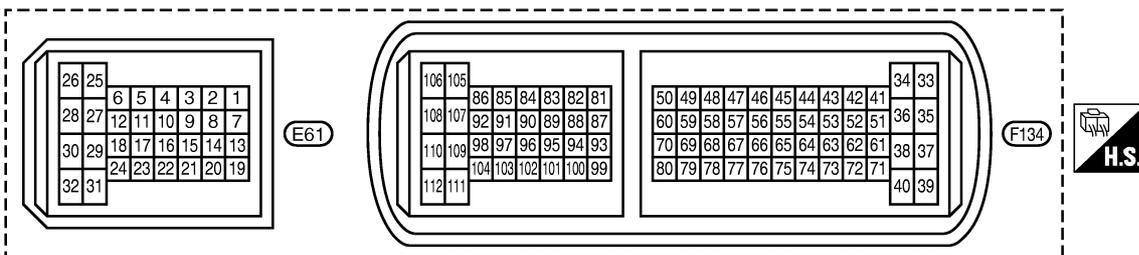
RHD models with all K9K engine models

EC-APPS-02



REFER TO THE FOLLOWING.

M1 , F101 - SUPER MULTIPLE JUNCTION (SMJ)



MBWA1346E

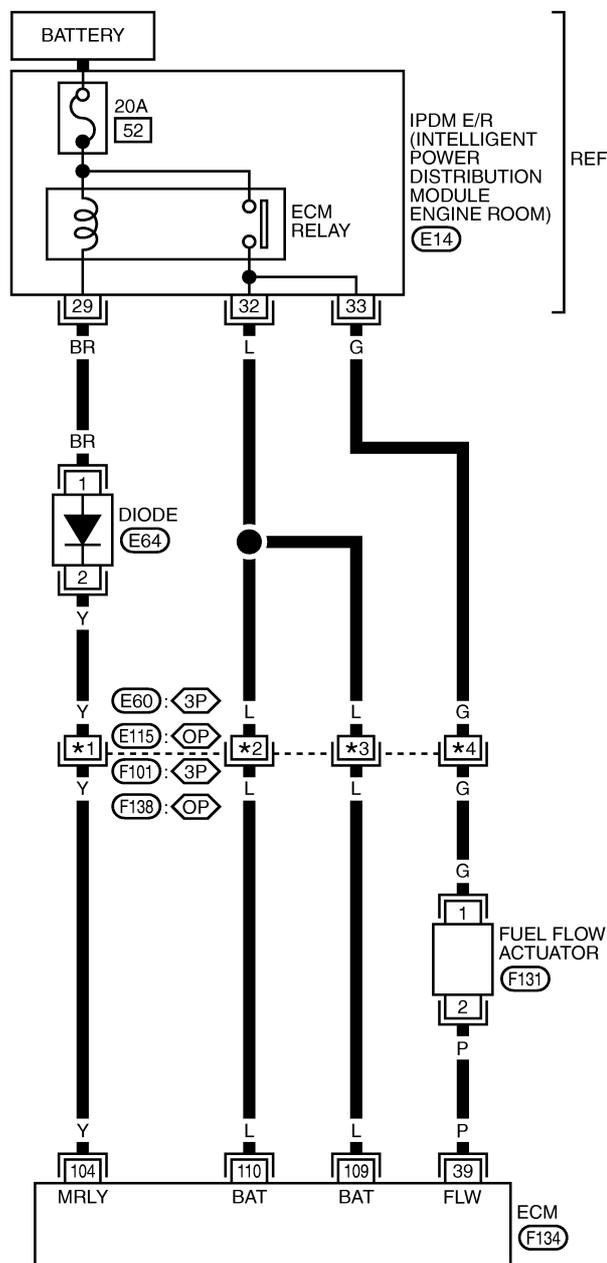
# DIESEL INJECTION

## Wiring diagram - Fuel flow actuator



All K9K engine models

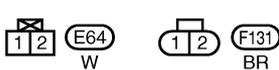
EC-IMV/D-01



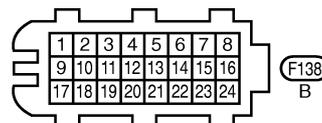
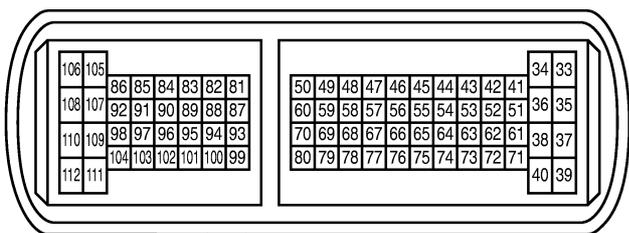
REFER TO PG-POWER.

- ⊖3P : EURO 3 48kW/  
60kW MODELS  
AND EURO 4  
50kW/63kW WITH  
PTC HEATER  
MODELS
- ⊖OP : EURO 4 50kW/  
63kW WITHOUT  
PTC HEATER  
MODELS
- \*1 4G: ⊖3P  
2: ⊖OP
- \*2 5G: ⊖3P  
16: ⊖OP
- \*3 6G: ⊖3P  
8: ⊖OP
- \*4 3G: ⊖3P  
24: ⊖OP

27	28	29	30	31	32	33
34	35	36	37	38	39	40
41	42					



REFER TO THE FOLLOWING.  
⊖F101 - SUPER MULTIPLE  
JUNCTION (SMJ)



MBWA1347E

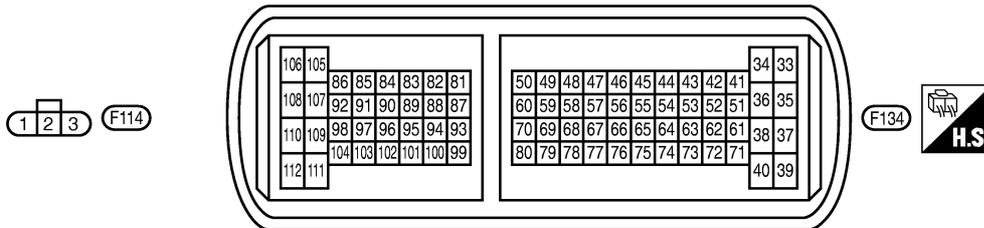
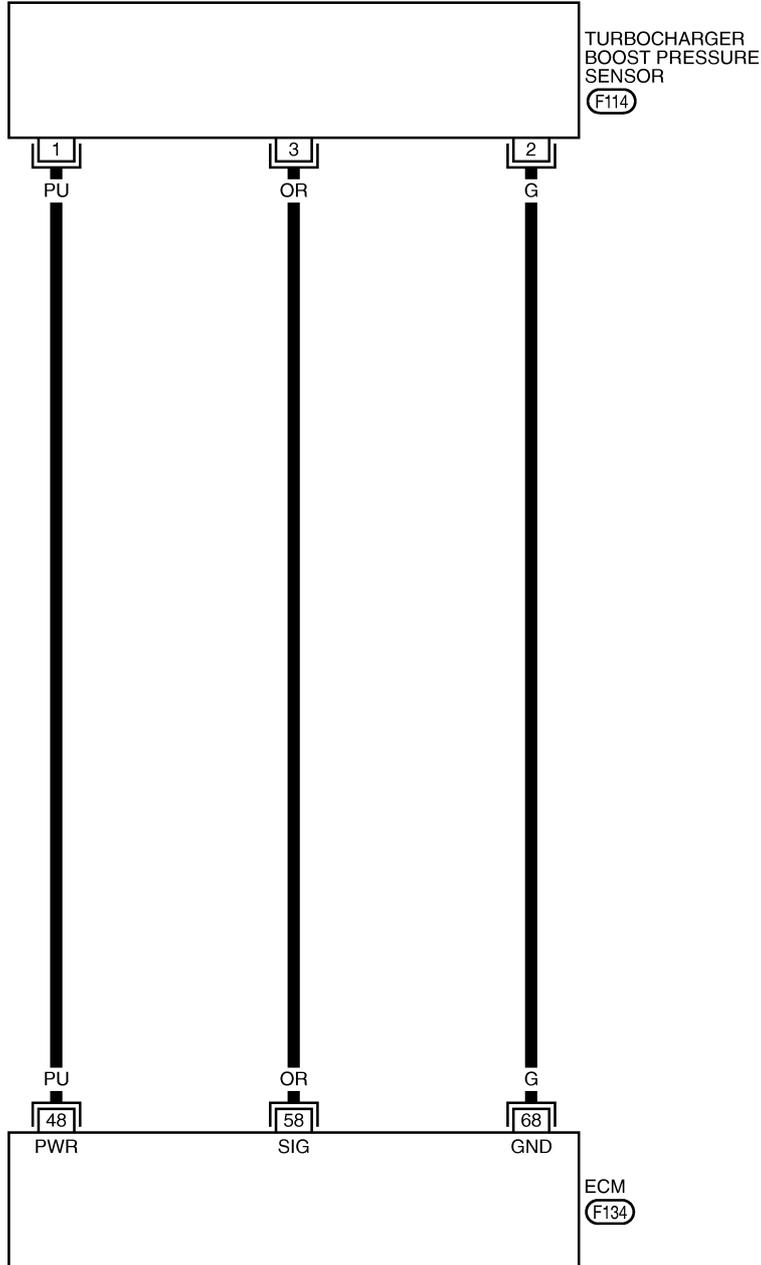
# DIESEL INJECTION

## Wiring diagram - TC boost pressure sensor



**Euro 3 48 kW engine models**  
(Refer to EC-K9K-1 to confirm engine type.)

EC-TCBST-01





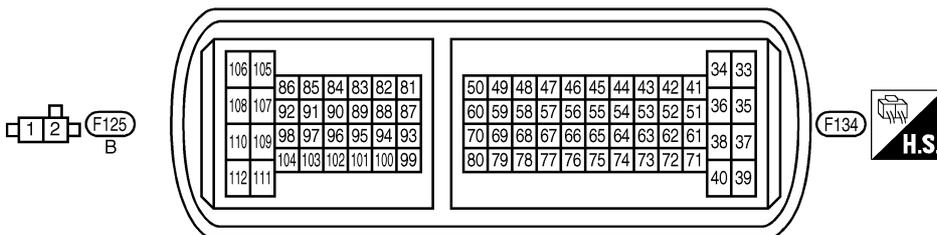
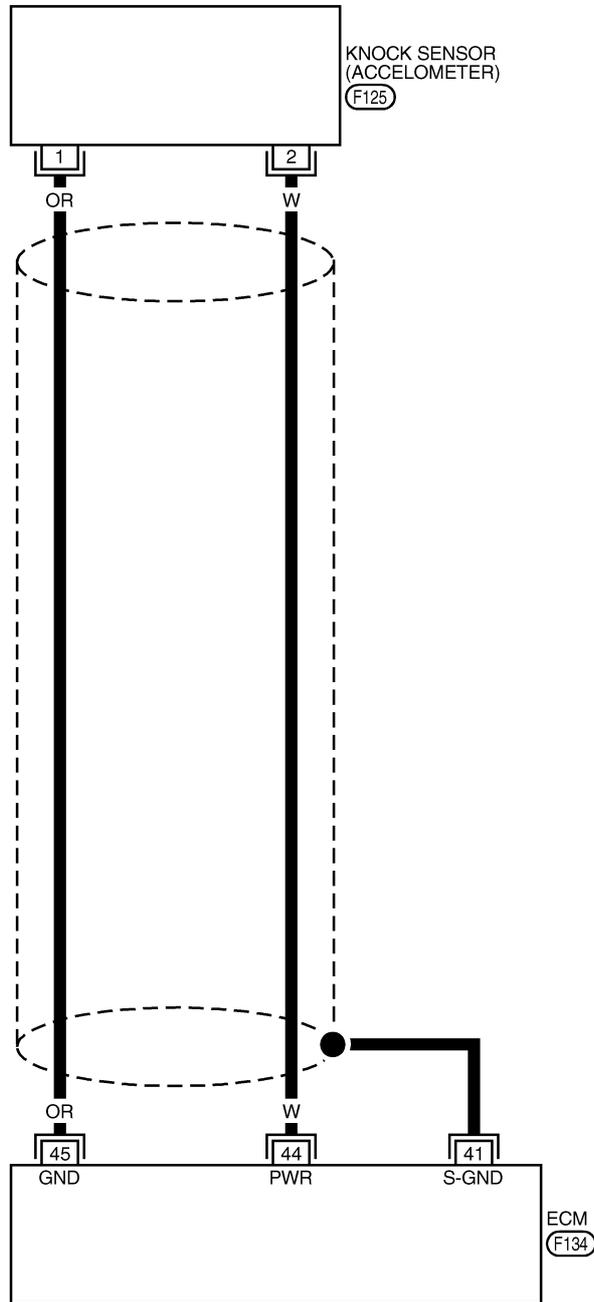
# DIESEL INJECTION

## Wiring diagram - Knock sensor (accelometer)



All K9K engine models

EC-KS-01



MBWA0602E



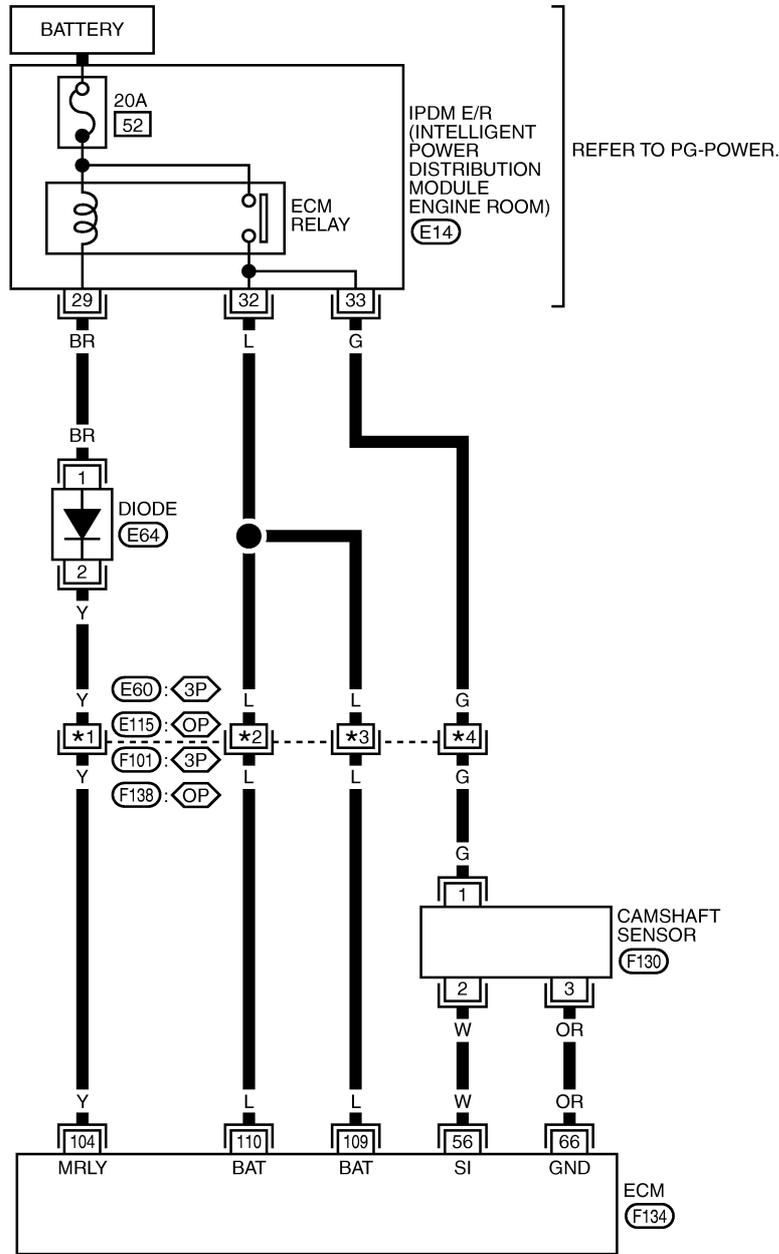
# DIESEL INJECTION

## Wiring diagram - Camshaft position sensor

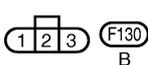
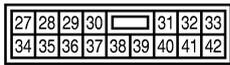
**K9K**

All K9K engine models

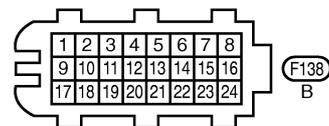
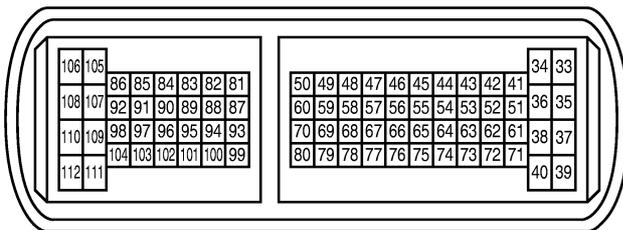
EC-CMPS-01



- ⊖3P : EURO 3 48kW/60kW MODELS AND EURO 4 50kW/63kW WITH PTC HEATER MODELS
- ⊖OP : EURO 4 50kW/63kW WITHOUT PTC HEATER MODELS
- \*1 4G: ⊖3P  
2: ⊖OP
- \*2 5G: ⊖3P  
16: ⊖OP
- \*3 6G: ⊖3P  
8: ⊖OP
- \*4 3G: ⊖3P  
24: ⊖OP



REFER TO THE FOLLOWING.  
⊖F101 - SUPER MULTIPLE JUNCTION (SMJ)



MBWA1350E

# DIESEL INJECTION

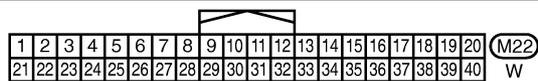
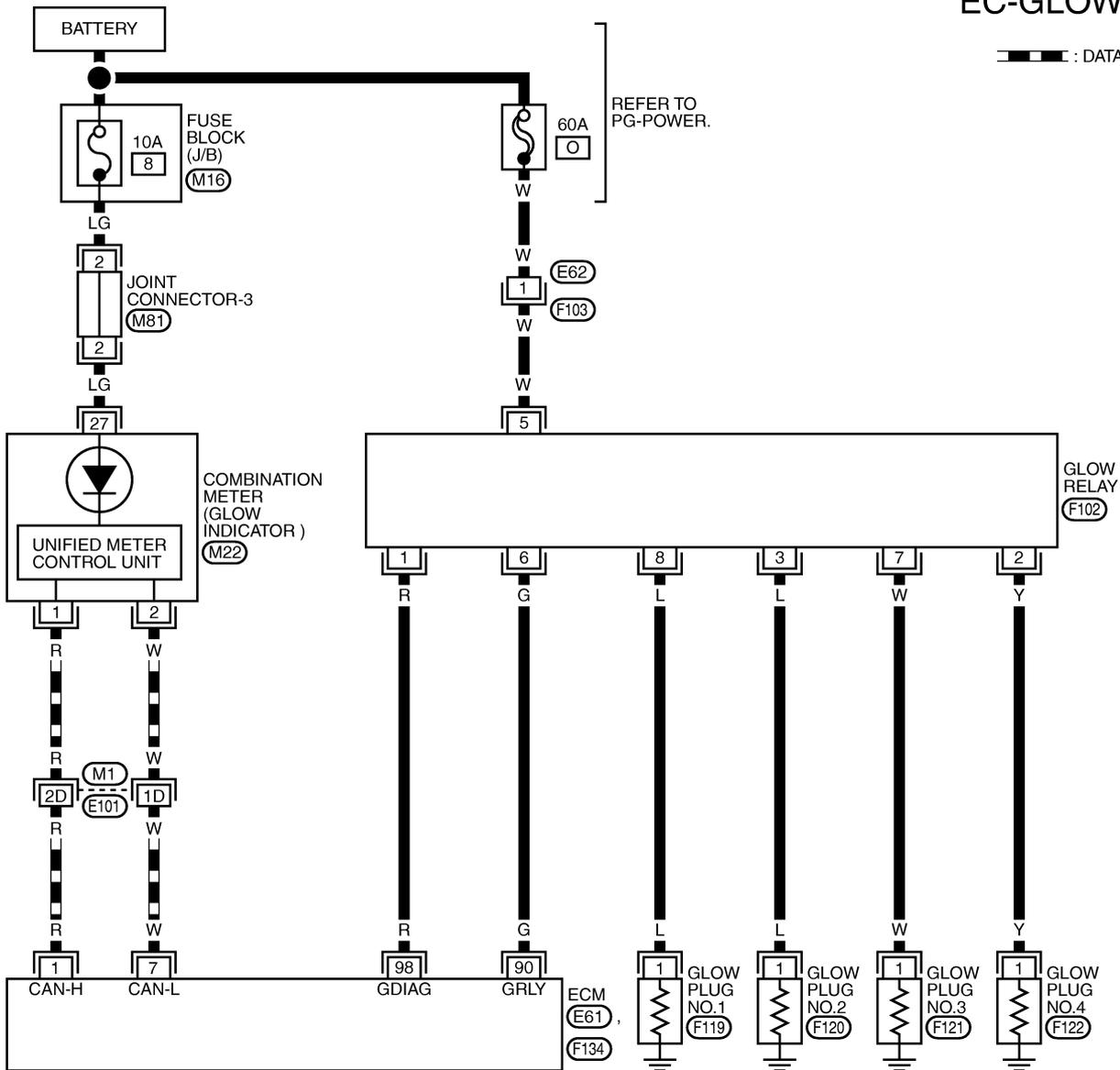
## Wiring diagram - Glow control system



All K9K engine models

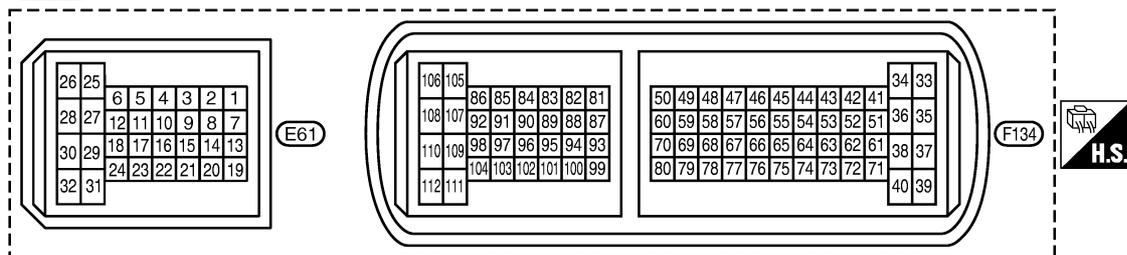
EC-GLOW-01

— : DATA LINE



REFER TO THE FOLLOWING.

- (M1) -SUPER MULTIPLE JUNCTION (SMJ)
- (M16) -FUSE BLOCK-JUNCTION BOX (J/B)
- (M81) -JOINT CONNECTOR (J/C)



MBWA1351E

# DIESEL INJECTION

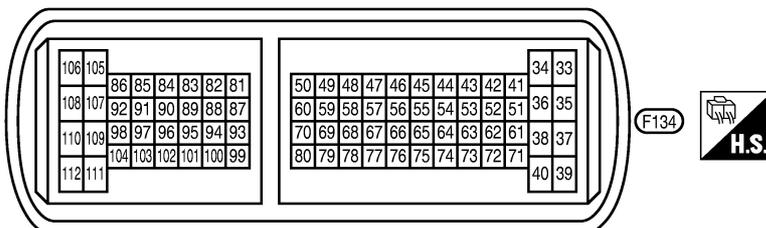
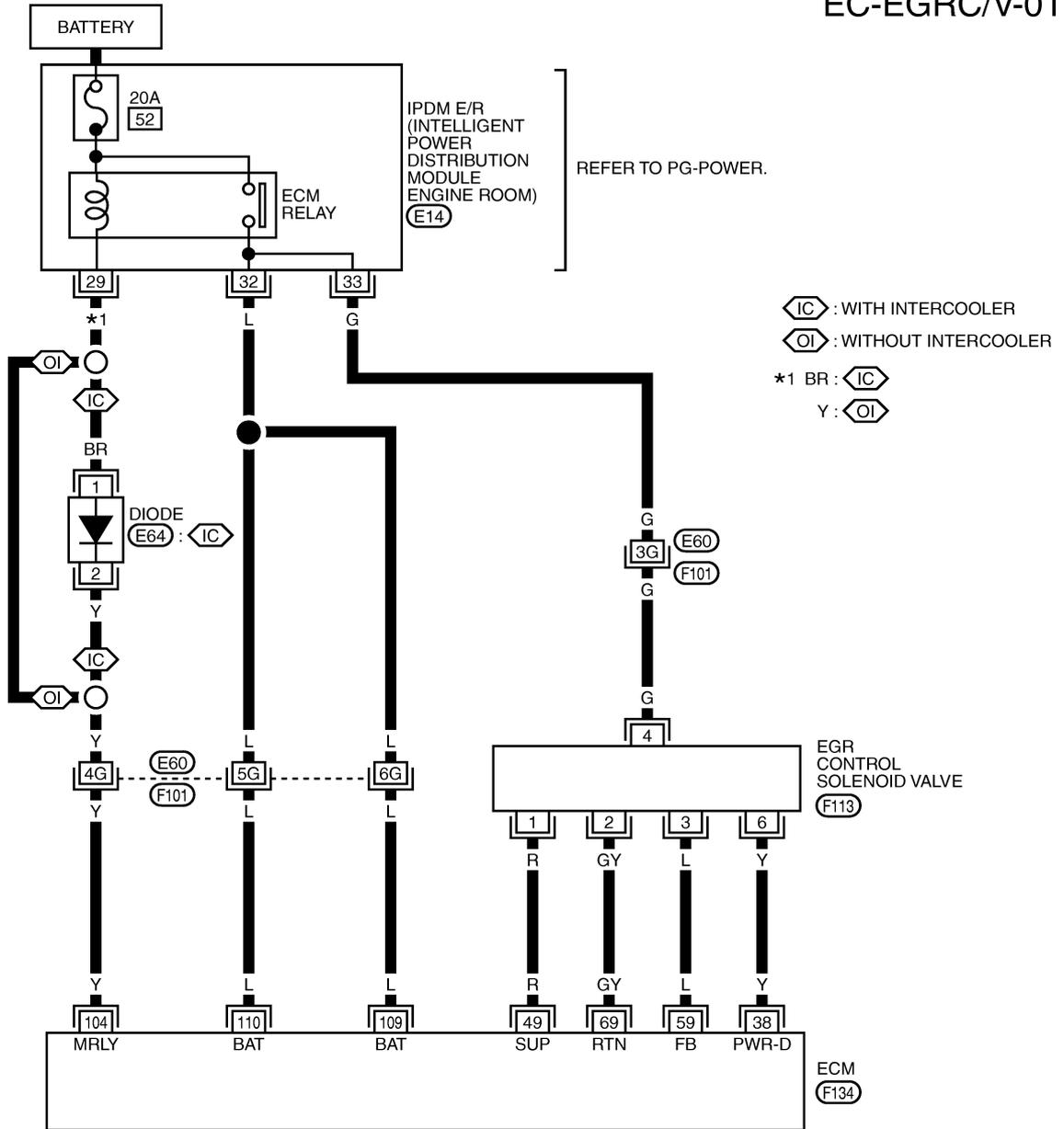
## Wiring diagram - EGR control system



### Euro 3 48 kW and 60 kW engine models

(Refer to EC-K9K-1 to confirm engine type.)

EC-EGRC/V-01



REFER TO THE FOLLOWING.

◻ F101 -SUPER MULTIPLE JUNCTION (SMJ)

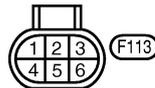
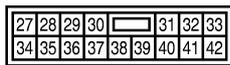
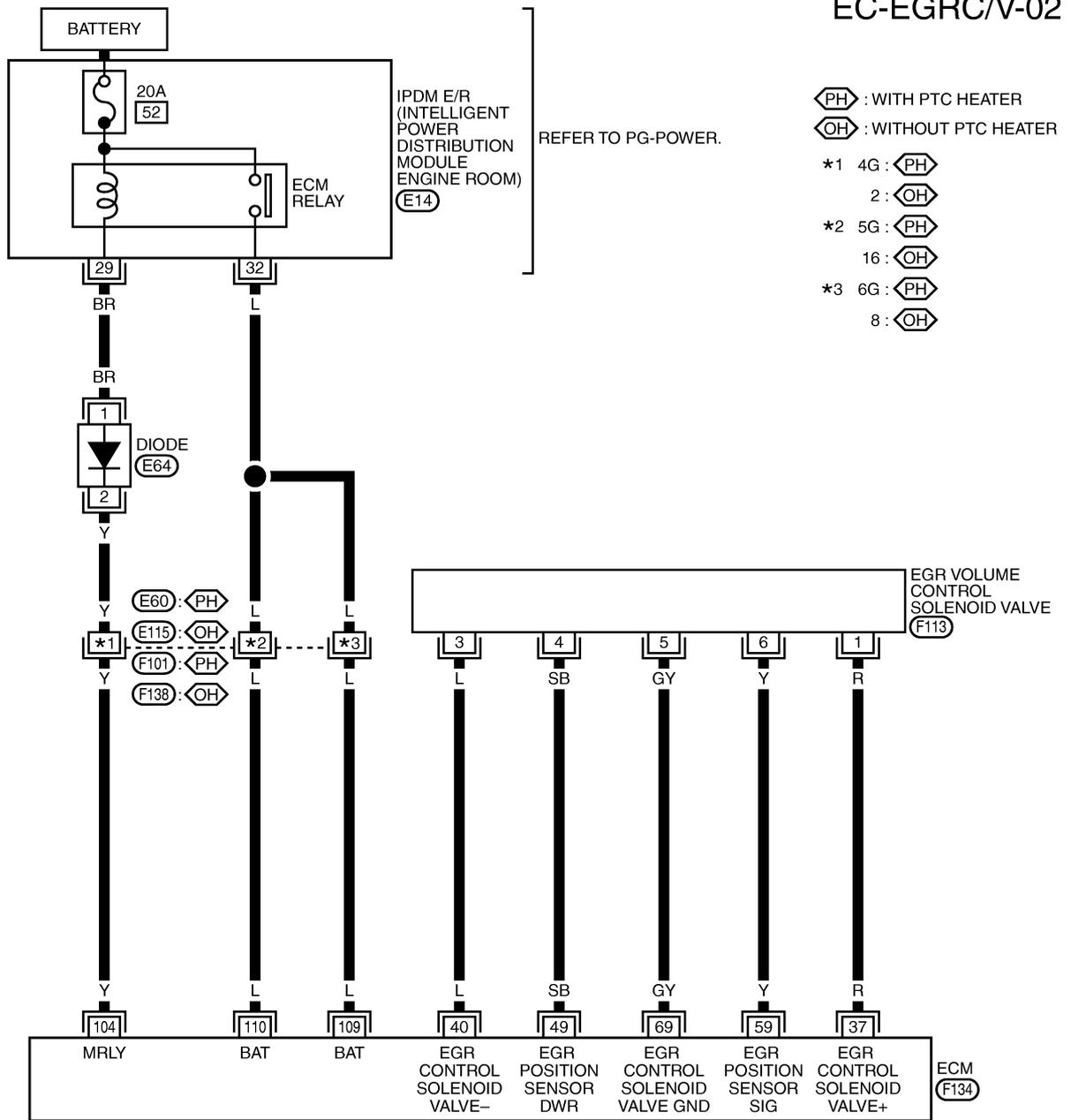
# DIESEL INJECTION

## Wiring diagram - EGR control system

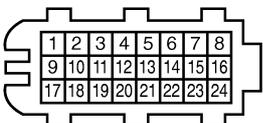
**K9K**

### Euro 4 50 kW and 63 kW engine models

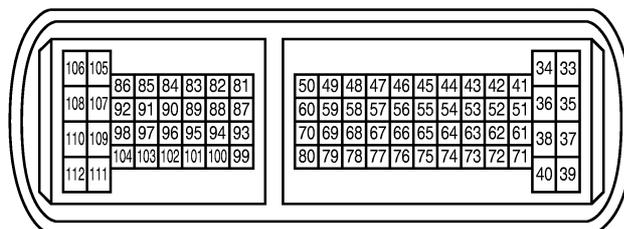
(Refer to EC-K9K-1 to confirm engine type.)



REFER TO THE FOLLOWING.  
F101 - SUPER MULTIPLE JUNCTION (SMJ)



F138 B



F134



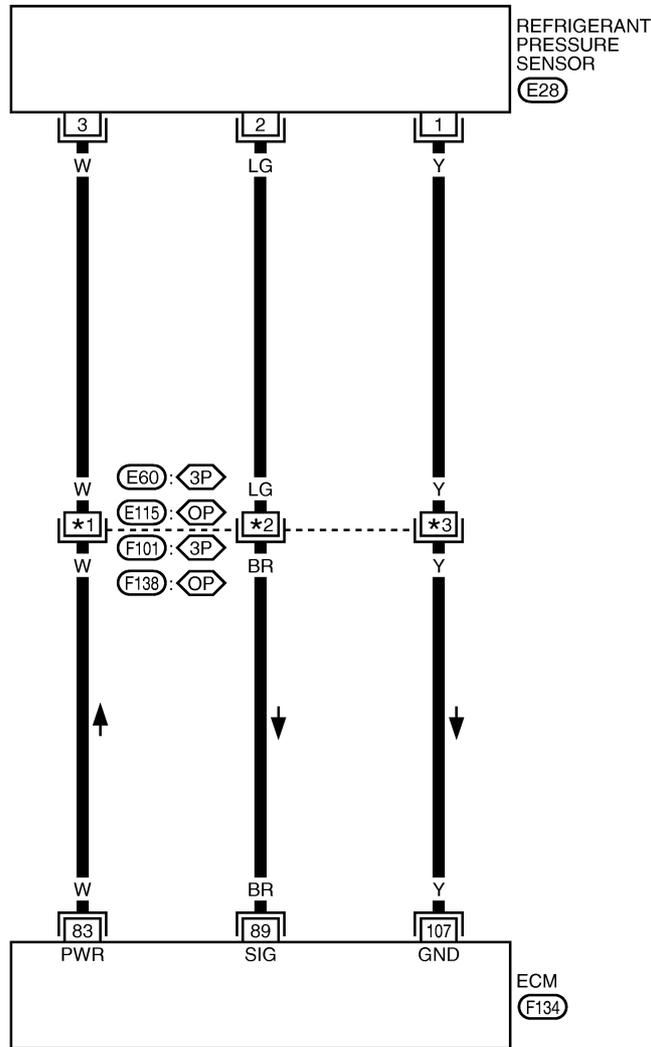
# DIESEL INJECTION

## Wiring diagram - Refrigerant pressure sensor



All K9K engine models

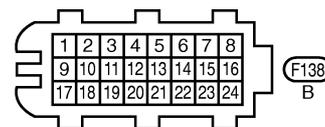
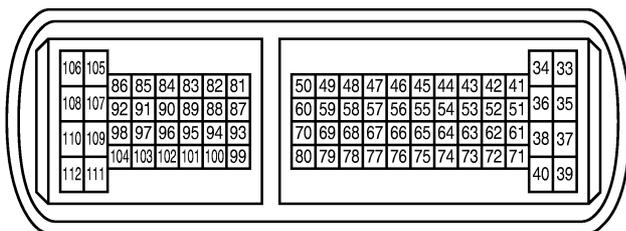
EC-RP/SEN-01



- 3P** : EURO 3 48kW/60kW MODELS AND EURO 4 50kW/63kW WITH PTC HEATER MODELS
- OP** : EURO 4 50kW/63kW WITHOUT PTC HEATER MODELS
- \*1** 5F : **3P**
- 3 : **OP**
- \*2** 6F : **3P**
- 4 : **OP**
- \*3** 7F : **3P**
- 12 : **OP**



REFER TO THE FOLLOWING.  
**F101** - SUPER MULTIPLE JUNCTION (SMJ)



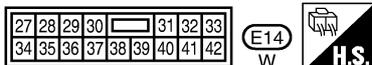
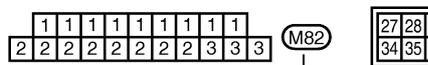
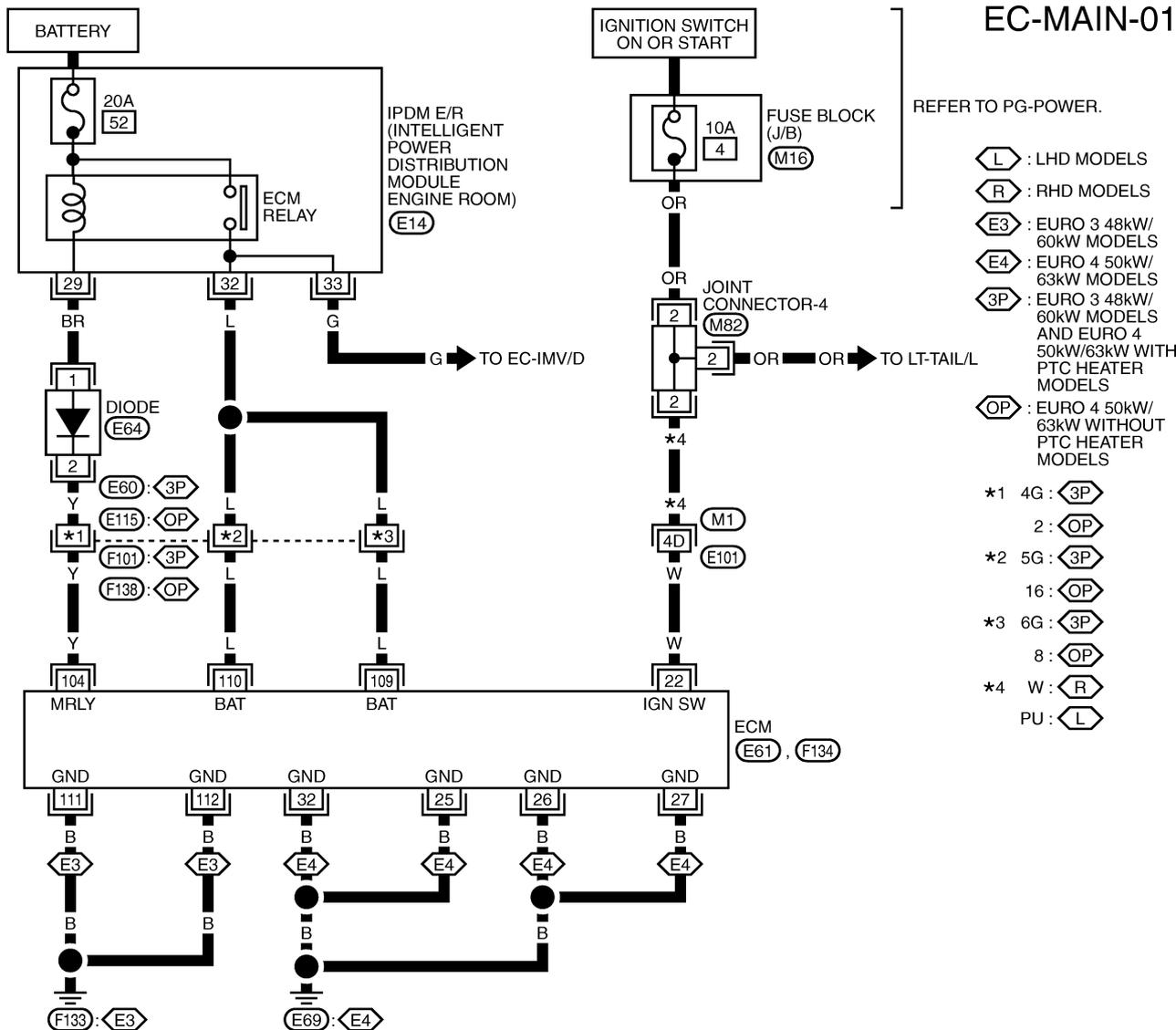
MBWA1353E

# DIESEL INJECTION

## Wiring diagram - Main power supply and ground circuit



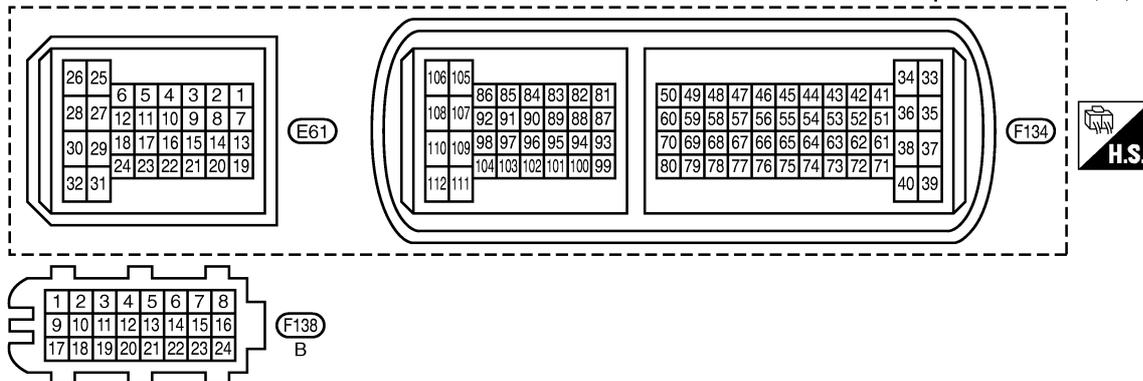
### All K9K engine models



REFER TO THE FOLLOWING.

⬡, ⬢, ⬤, ⬥, ⬦, ⬧, ⬨ - SUPER MULTIPLE JUNCTION (SMJ)

⬩ - FUSE BLOCK - JUNCTION BOX (J/B)



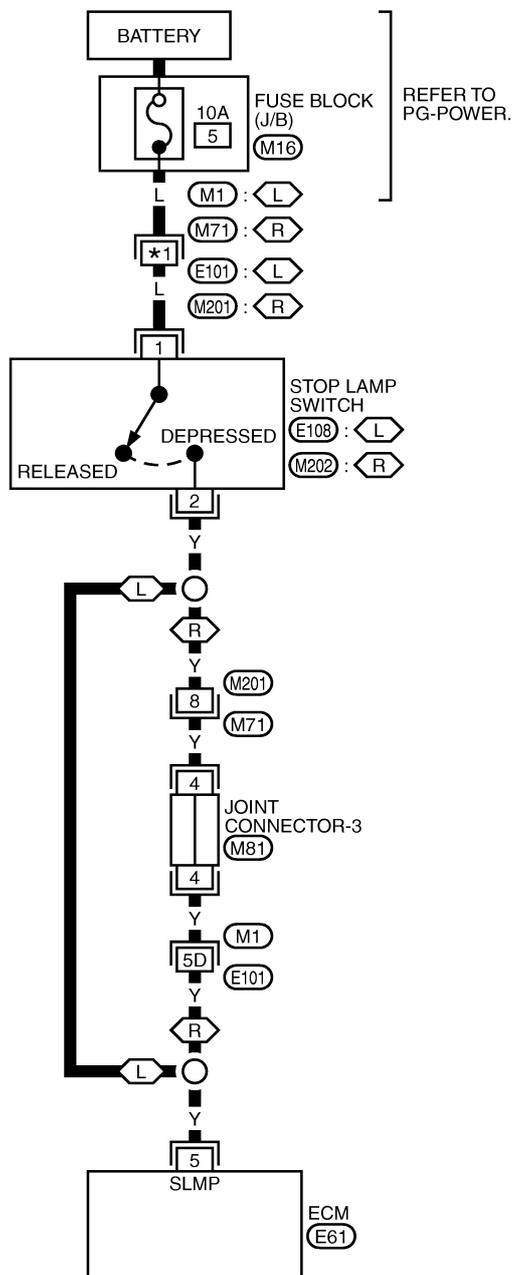
MBWA1354E

# DIESEL INJECTION

## Wiring diagram - Brake switch

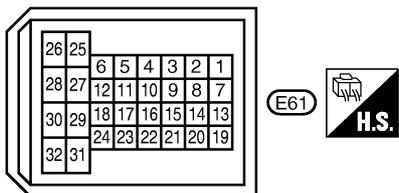
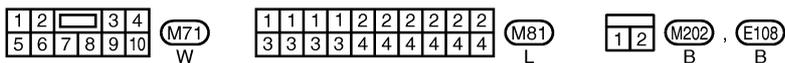


All K9K engine models



### EC-BRK/SW-01

- ⬡ : LHD MODELS
- ⬢ : RHD MODELS
- \*1 8D : ⬡
- 4 : ⬢



REFER TO THE FOLLOWING.

- ⬢ -SUPER MULTIPLE JUNCTION (SMJ)
- ⬢ -FUSE BLOCK-JUNCTION BOX (J/B)

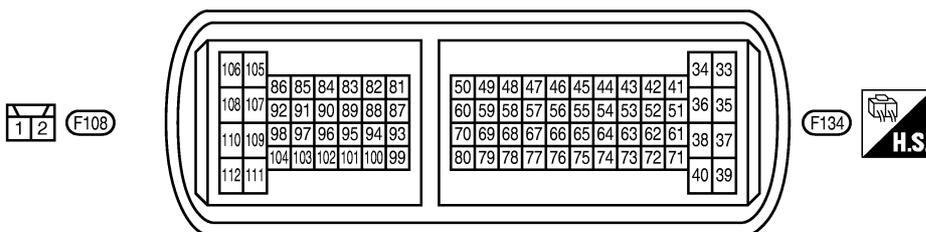
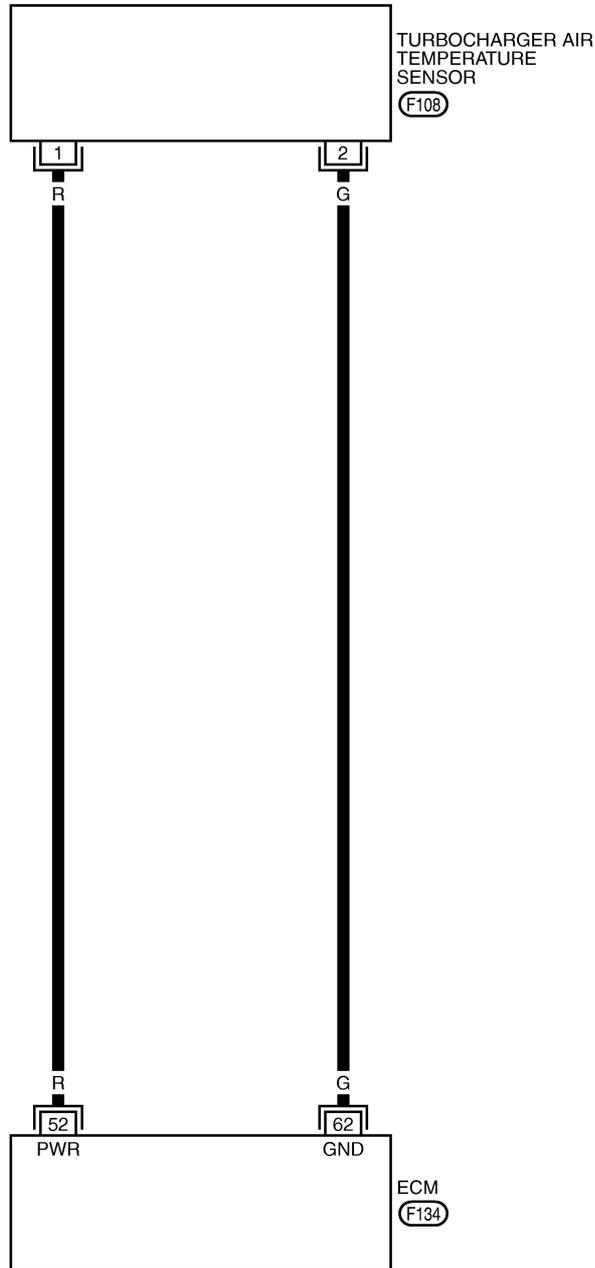
# DIESEL INJECTION

## Wiring diagram - Temperature sensor



**Euro 3 48 kW engine models**  
 (Refer to EC-K9K-1 to confirm engine type.)

EC-BTS-01



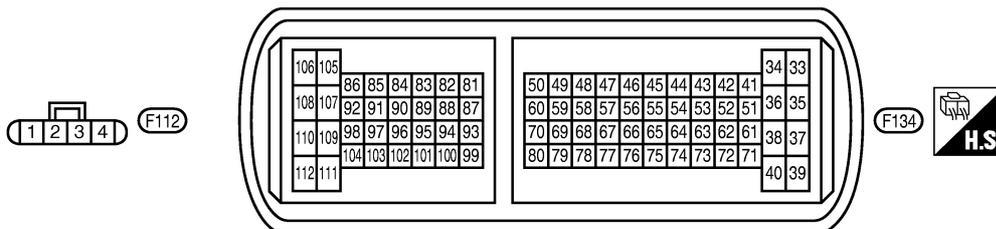
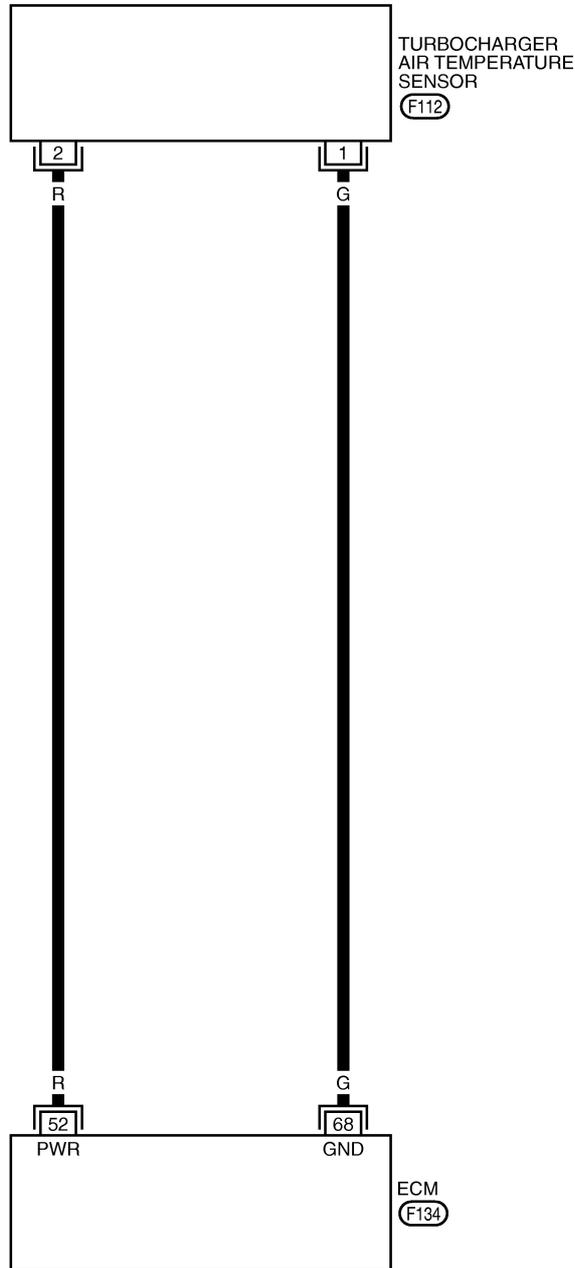
# DIESEL INJECTION

## Wiring diagram - Temperature sensor



**Euro 3 60 kW engine models**  
 (Refer to EC-K9K-1 to confirm engine type.)

EC-BTS-02



# DIESEL INJECTION

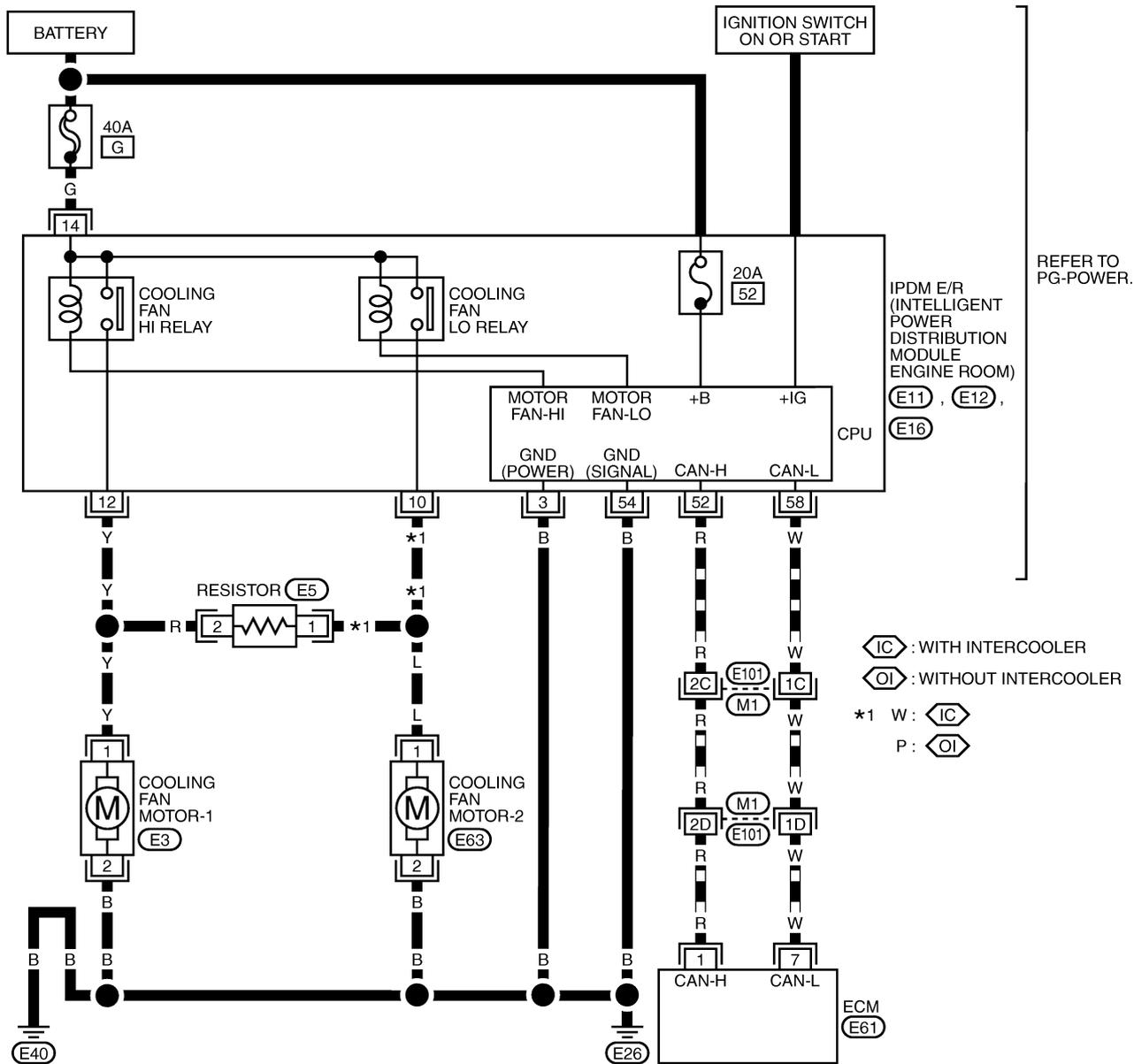
## Wiring diagram - Cooling system



All K9K engine models with PTC heater

EC-COOL/F-01

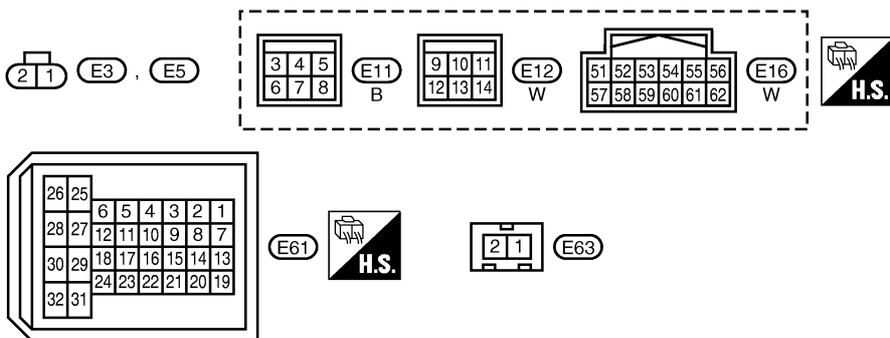
▬ : DATA LINE



REFER TO PG-POWER.

IPDM E/R  
(INTELLIGENT  
POWER  
DISTRIBUTION  
MODULE  
ENGINE ROOM)  
E11 , E12 ,  
E16

IC : WITH INTERCOOLER  
OI : WITHOUT INTERCOOLER  
\*1 W : IC  
P : OI



REFER TO THE FOLLOWING.  
M1 -SUPER MULTIPLE  
JUNCTION (SMJ)

MBWA1184E

# DIESEL INJECTION

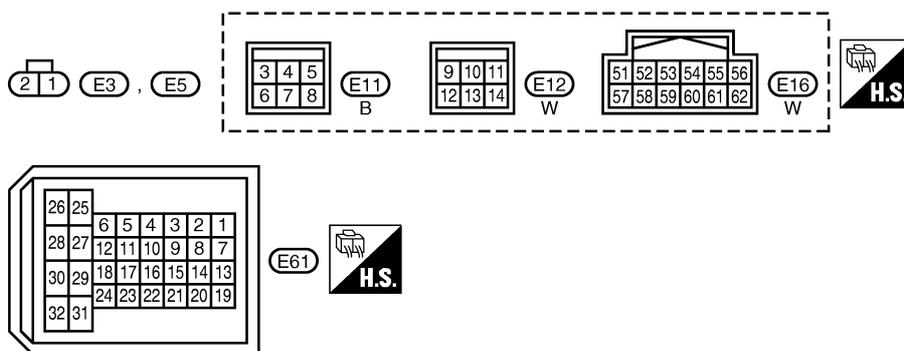
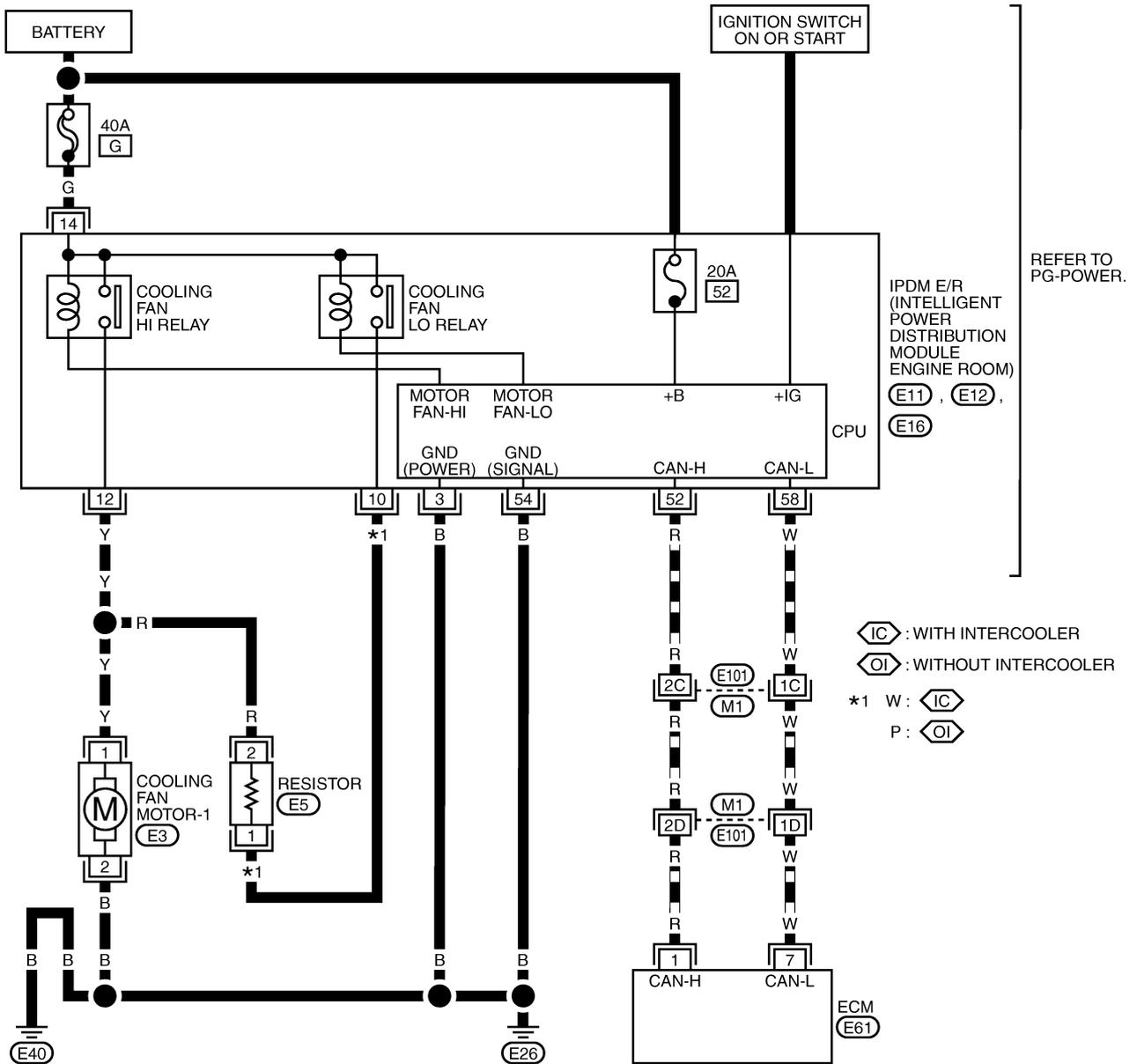
## Wiring diagram - Cooling system



All K9K engine models with air conditioner

EC-COOL/F-02

▬ : DATA LINE



REFER TO THE FOLLOWING.

(M1) -SUPER MULTIPLE JUNCTION (SMJ)

# DIESEL INJECTION

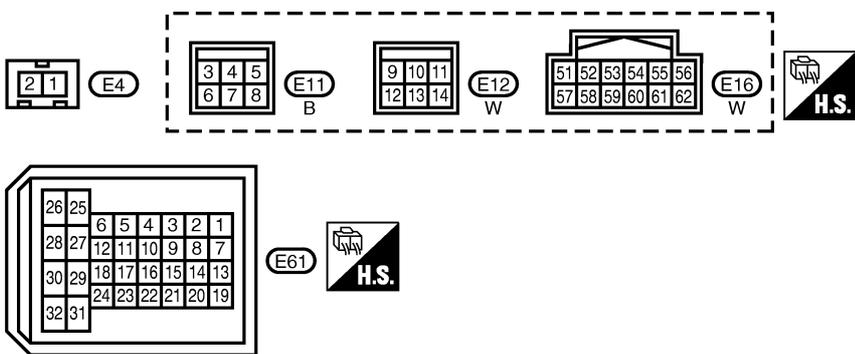
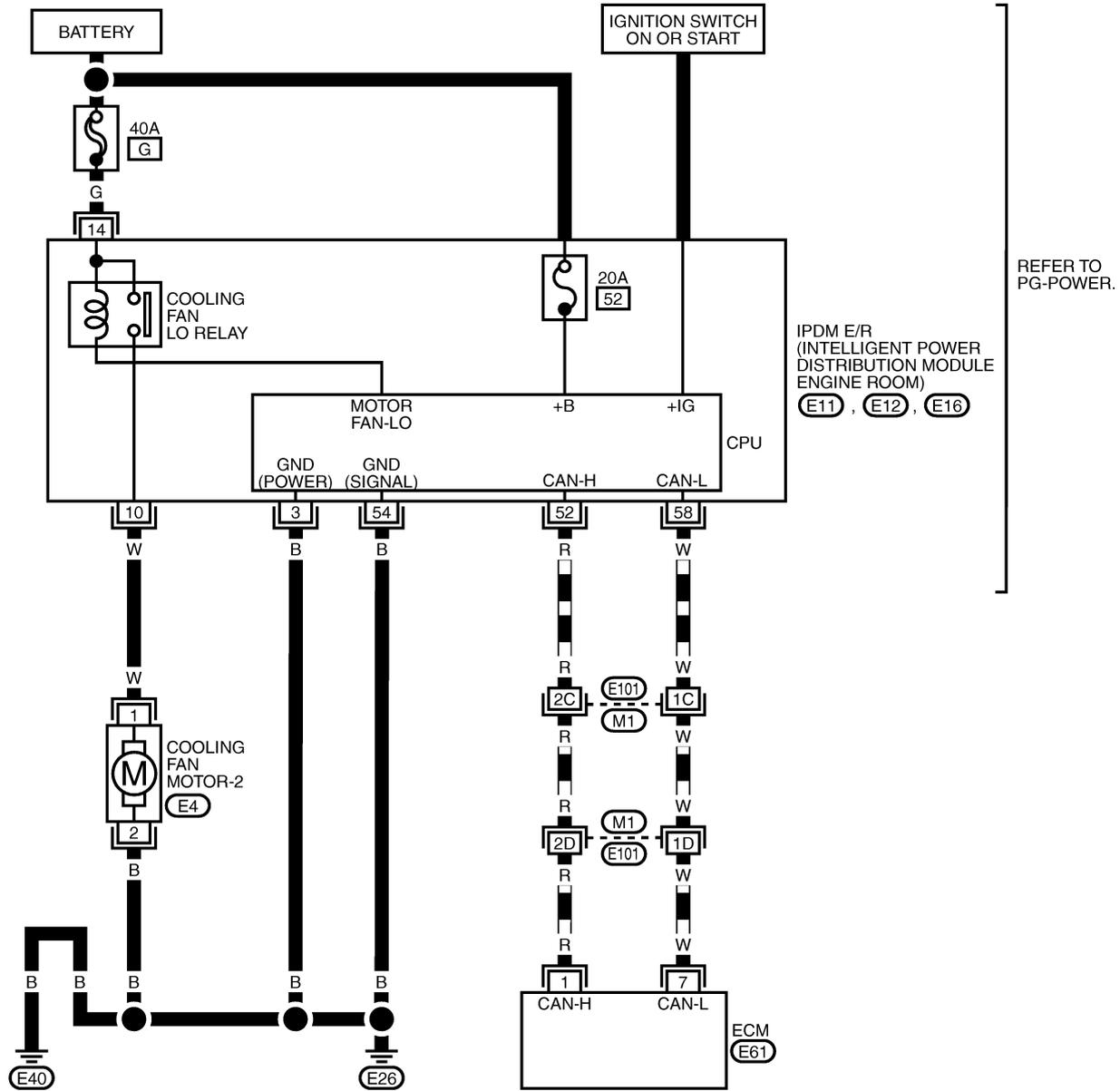
## Wiring diagram - Cooling system



All K9K engine models without air conditioner

EC-COOL/F-03

▬ : DATA LINE



REFER TO THE FOLLOWING.

(M1) -SUPER MULTIPLE JUNCTION (SMJ)

MBWA0511E

# DIESEL INJECTION

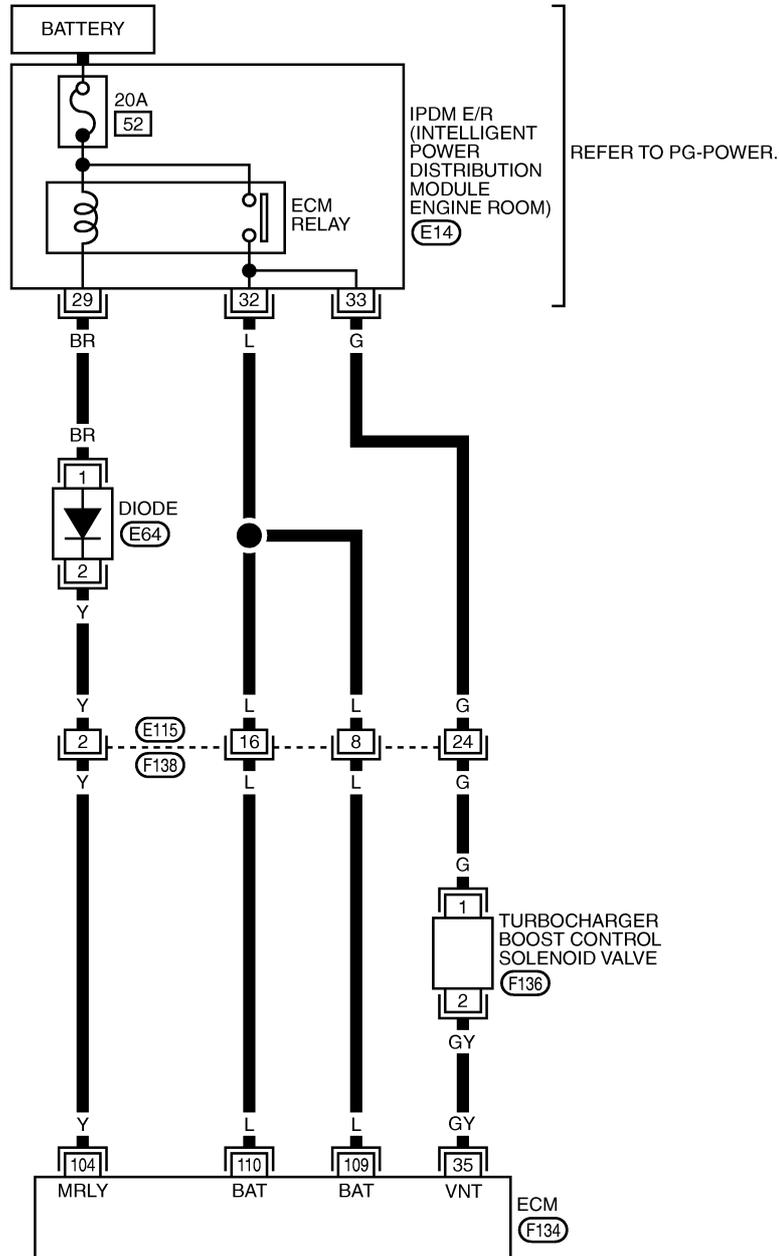


## Wiring diagram - Turbocharger boost control solenoid valve

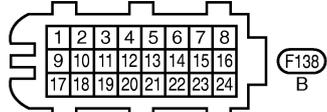
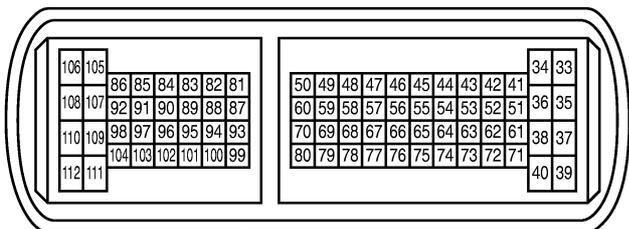
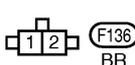
### Euro 4 63 kW engine models

(Refer to EC-K9K-1 to confirm engine type.)

EC-TCC/V-01



27	28	29	30	31	32	33		
34	35	36	37	38	39	40	41	42



# DIESEL INJECTION

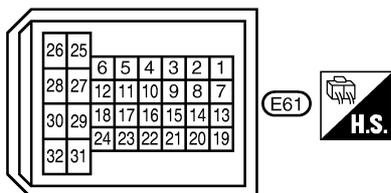
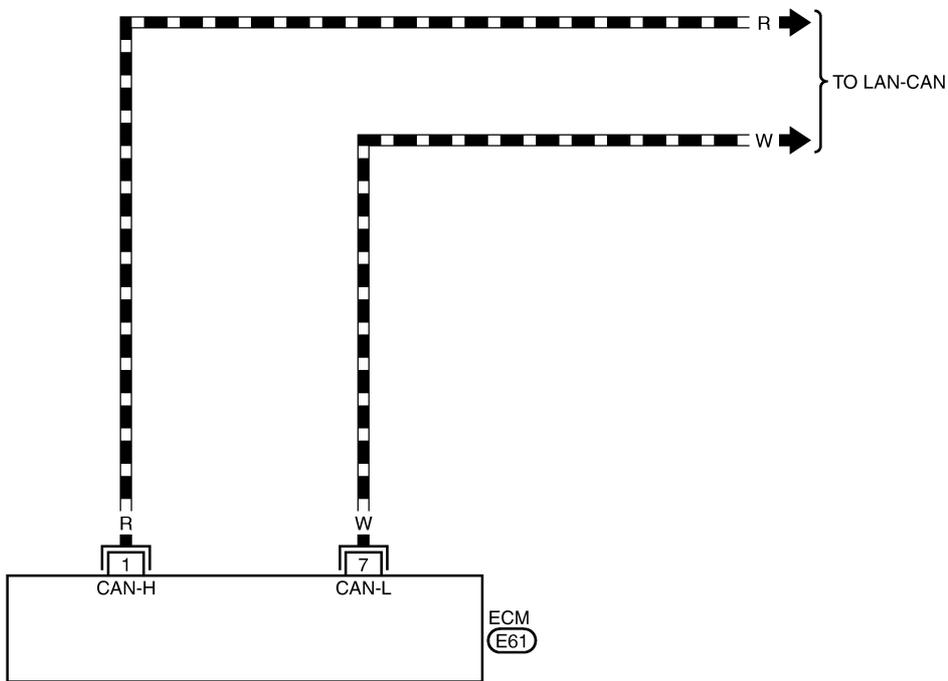
## Wiring diagram - CAN communication line



All K9K engine models

EC-CAN-01

▬ : DATA LINE



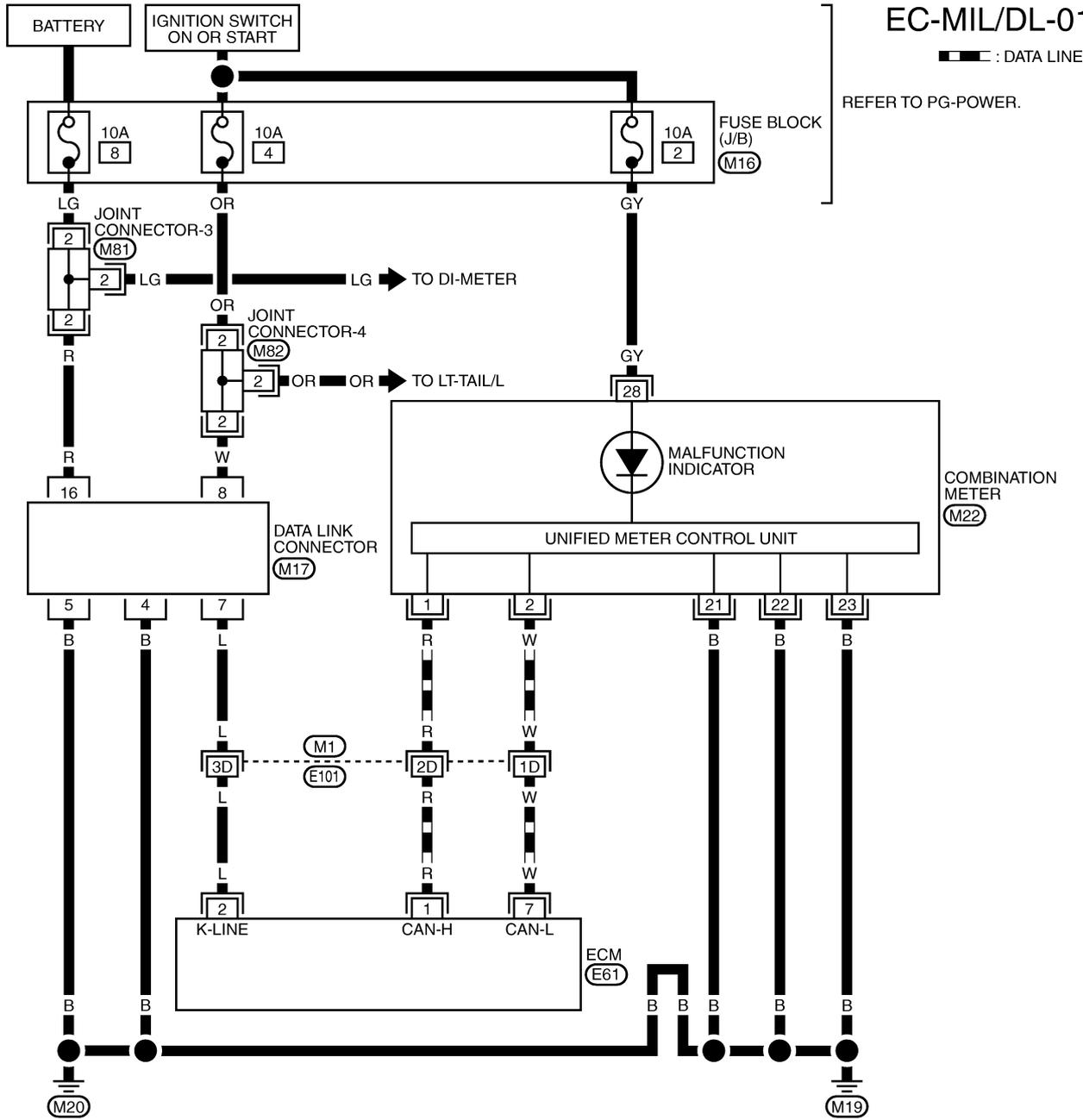
MBWA0592E

# DIESEL INJECTION

## Wiring diagram - MI & data link connectors



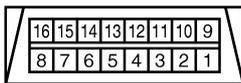
### RHD models with all K9K engines



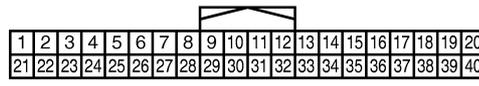
EC-MIL/DL-01

▬ : DATA LINE

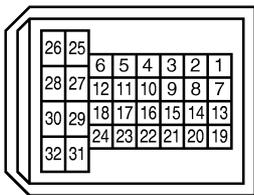
REFER TO PG-POWER.



(M17)  
W



(M22)  
W



(E61)



REFER TO THE FOLLOWING.

- (M1) -SUPER MULTIPLE JUNCTION (SMJ)
- (M16) -FUSE BLOCK -JUNCTION BOX (J/B)
- (M81) , (M82) -JOINT CONNECTOR (J/C)



**DIESEL INJECTION**  
**Wiring diagram - MI & data link connectors**

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