SPECIFICATIONS

General characteristics

The 1.8 DI Turbo engine features a direct injection fuel supply system with a high pressure pump.
The engine control system is managed by a single Bosch Motronic MED 17.3.1. control unit with motorised throttle which controls both the ignition and the sequential, timed injection.
Depending on the signals received from the many sensors, the control unit manages the injectors connected to it, handling the following systems:
- fuel supply
- high pressure fuel pump
- air supply and supercharging
- accelerator pedal
- engine cooling
- exhaust with catalytic converter and two oxygen sensors
- fuel vapour recirculation
- ignition.

The control unit manages the operation of the high pressure fuel pump by controlling an electric flow regulator on the pump and an associated pressure sensor on the rail.
The throttle body is also controlled electronically by the control unit.
The throttle opening is calculated according to a specific logic called "torque control"; the mechanical connection between the accelerator pedal and the throttle body is thereby eliminated. The control unit can also manage:
- the actual quantity of fuel required at any time
- the most suitable fuel supply pressure for each cycle
- the fuel injection starting point
- the Waste Gate solenoid valve
- the phase transformers.

System main functions

- self-learning
- system self-adaptation
- CODE recognition (Immobilizer)
- cold starting control
- air/fuel ratio control using oxygen sensors
- supercharging control
- detonation control
- mixture enrichment control during acceleration
- fuel cut-off during deceleration
- fuel vapour recovery
- maximum rpm control
- fuel pump control
- connection with the climate control system
- cylinder position recognition
- control of optimum injection time
- ignition advance adjustment
- idle speed management
- fan control
- connection with ABS/ASR control unit
- phase transformer management.

Injection system

The system injects fuel directly into the cylinder.
The main advantages are:
- improved fuel evaporation
- increased engine volumetric output

since heat is taken from the intake air rather than from the intake duct walls.
Thanks to direct injection, fuel consumption is reduced by 20% compared to traditional injection with a resulting decrease in CO_2 emissions.
The injection system should therefore comply with the following requirements:
- the metering (air/fuel ratio) must be kept as close as possible to stoichiometric value to ensure maximum catalytic converter conversion capacity (max. efficiency)
- the homogeneity of the mixture, consisting of petrol distributed throughout the air as finely and uniformly as possible.

Information that the control unit processes to control optimum metering is received by electrical signals emitted by:
- air flow meter and air temperature sensor, for the exact quantity of air taken in
- rpm sensor
- accelerator pedal with built-in potentiometer
- engine coolant temperature sensor
- oxygen sensor.

Ignition system

The ignition circuit is static inductive discharge type, i.e. there is no high tension distributor with power modules located inside the injection/ignition electronic control unit.
The primary winding for each coil is connected to the power relay (and is therefore supplied by the battery voltage) and to the electronic control unit pins for the connection to earth.
After the start-up stage, the electronic unit manages the basic advance obtained from special maps in accordance with:
- engine rpm
- absolute pressure value
- engine temperature.
The ignition advance is correct, as in the case of the fuel injection, by the torque management strategy.
The spark plugs are connected directly to the coil secondary winding terminals (one per spark plug).

OPERATING LOGICS

Self-learning

The control unit implements the self-learning logic under the following conditions:
- removal/refitting or replacement of the injection control unit
- removal/refitting or replacement of the throttle body.
The values stored by the control unit are still retained when the battery is disconnected.

System self-adjustment

The control unit is equipped with a self-adaptive function that recognises the changes that take place in the engine due to settling processes caused by time and ageing, both in the engine and components.
These changes are stored in the form of modifications to the basic map and are designed to adapt the system operation to the gradual alterations in the engine and the components, compared with the characteristics of the new engine/components.

Code recognition (immobilizer)

The moment the control unit receives the "MAR-ON" signal, it communicates with the body computer to obtain start-up permission.
The starter motor is controlled directly by the key and not by the control unit.
The switching takes place through the C-CAN line.

Cold start-up control

In cold starting conditions the mixture is naturally degraded, causing low fuel evaporation at low temperatures and increased lubrication oil viscosity.
The electronic control unit recognises this condition and corrects the basic injection time according to the:
- coolant temperature
- intake air temperature
- battery voltage
- engine rpm.

Air/fuel ratio control using oxygen sensors

In EOBD standard-compliant systems, the oxygen sensors are fitted upstream and downstream of the catalytic converter.
The upstream sensor determines the control of the mixture strength known as 1st loop control (upstream oxygen sensor closed loop).
The downstream sensor is used for catalytic converter diagnosis and for fine-tuning the 1st loop control parameters.
The second loop's adaptation is designed to recover both wasted energy and the resulting slowdown in the upstream sensor response as a result of ageing and pollution. This control is known as 2nd loop control (downstream oxygen sensor closed loop).

Supercharging control

The supercharging adjustment valve is managed by the solenoid valve controlled by the engine management control unit.
The connection from the solenoid valve to the vacuum unit allows the supercharging adjustment valve to open both in the event of a cut-off and when the supercharging pressure limits are reached.
For more details,
See descriptions 1064A TURBOCHARGER ASSEMBLY

Control of detonation

The control unit can delay ignition on the requesting cylinder, depending on the combination of values received by the knock and timing sensors.
During acceleration, the control unit uses a higher threshold due to the higher engine noise.
The control unit, with self-adaptive function:
- stores continually repeated advance reductions
- adjusts mapping to the various different engine service conditions.

Mixture enrichment control during acceleration

In case of high acceleration demand, the control unit:
- alters the injection time

- alters the throttle position
- manages the Waste Gate solenoid valve.

Fuel cut-off during deceleration

The control unit with:
- detection of idling status
- rpm exceeding the threshold value

deactivates fuel injection on the basis of:
- rpm
- engine temperature
- vehicle speed.

Before reaching idling condition, the rpm descent rate is assessed.
If this exceeds a certain level, fuel injection is partially re-activated on the basis of a logic that ensures that engine rpm drops smoothly to idling level.
Once idling speed has been reached, normal functions are resumed.

Fuel vapour recovery

The (pollutant) fuel vapours, collected in an active charcoal filter (canister), are sent to the intake ducts to be burnt.
This takes place by means of a solenoid valve regulated by the control unit which alternates phases in which it is open (canister scavenging stage) with phases in which it is closed (carburation learning stage).
The opening duty-cycle for the solenoid valve is regulated by the control unit in order to eliminate the fuel vapours without altering the engine carburation.

Control of the maximum revs

According to the rpm level reached by the engine, the control unit:
- above 6800 rpm, cuts off the fuel supply to the injectors (rpm can peak at 7000 rpm for no longer than 5 seconds)
- below 6600 rpm, injector operation is resumed.

Fuel pump control

The control unit:
- supplies the fuel pump when the key is on MAR-ON (for 5 seconds) or on AVV
- interrupts the supply to the pump when the key is on STOP
- interrupts the supply to the pump if it receives notification of a collision from the CAN network.

Connection with the climate control system

The compressor takes power from the engine when the climate control system is activated.
In idling conditions, the control unit adapts the air flow rate to the new power requirements while maintaining optimum driveability.
The control unit manages the exclusion of the compressor:
- above 6300 rpm
- above a set engine coolant temperature threshold (117°C)
- upon start-up.

Recognition of cylinder position

During each engine revolution, the control unit detects which cylinder is in the combustion phase:
- it controls the injection and ignition sequence for the cylinder in a sequential, timed fashion.

Control of optimum injection time

The injection starting angle (in relation to TDC) varies from - 50° to + 10° to allow a homogenized mixture.
In idling conditions, the injection starting angle is about - 45°.

Idle speed management

The control unit detects idling status when the accelerator pedal is released.
The control unit controls the idle speed depending on the users connected and the brake pedal signals, adjusting:
- the motorised throttle
- the injection time.

Fan control

The control unit engages the fans depending on the coolant temperature:
- 1st speed with temperature of 90°C
- 2nd speed with temperature of 105°C

If the air conditioning system is switched on, the control unit engages the fan 1st speed.

Phase transformer management

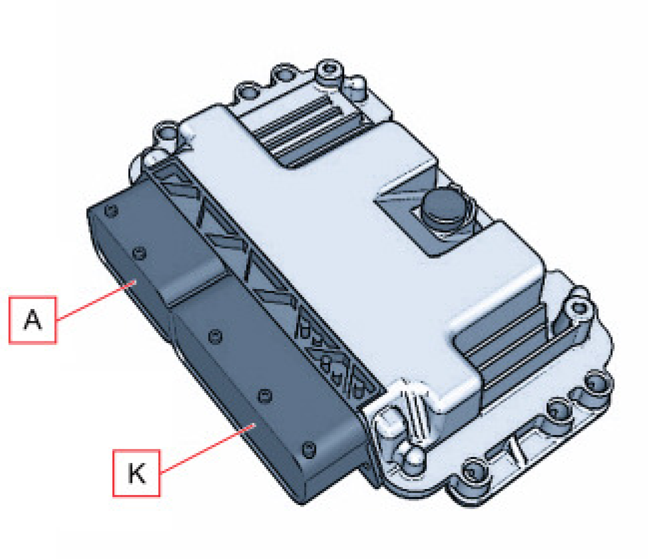
The control unit, depending on the following information received:
- engine temperature
- engine speed
- engine load
- accelerator pedal position
- oxygen sensor signal
manages the two phase transformers independently and continuously.
The two proportional solenoid valves controlling the variable valve timing systems manage the timing for better control of emissions and engine-supplied torque.
For more details on the operation of the variable valve timing systems,
See descriptions 1036 TIMING

ME 7.9.10 INJECTION-IGNITION CONTROL UNIT

Specifications

The control unit is fitted in the engine compartment on the flame bulkhead.
The control unit memory is "flash EPROM", i.e. it can be reprogrammed externally without operating on the hardware.
Replacement of the injection control unit or the throttle body requires the self-learning procedure to be run.

Control unit pin out



Engine side connector "A" (60 pin)
1, Coil 4 ignition signal
2, Coil 2 ignition signal
3, Coil pressure regulator (-)
4, Coil pressure regulator (+)
5, Phase transformer valve control signal, exhaust side
6, N.C.
7, N.C.
8, Earth for timing sensors on intake and exhaust side
9, Engine oil pressure signal
10, Cylinder 1-2 knock sensor (-)
11, Cylinder 3-4 knock sensor (-)
12, Motorised throttle potentiometer signal (+)
13, Power supply to fuel pressure sensor, air pressure sensor
14, Water temperature sensor (-)
15, N.C.
16, Coil 1 ignition signal
17, Coil 3 ignition signal
18, N.C.
19, Motorised throttle engine control (+)
20, Motorised throttle engine control (-)
21, N.C.
22, N.C.
23, N.C.
24, Motorised throttle “TPS1” potentiometer signal
25, Cylinder 1-2 knock sensor signal (+)
26, Cylinder 3-4 knock sensor signal (+)
27, Power supply to timing sensors (5 V), intake and exhaust side
28, Rpm sensor (-)
29, Map sensor (+)
30, N.C.
31, Cylinder 1 injection signal (+)
32, Cylinder 4 injection signal (+)
33, Cylinder 1 injection signal (-)
34, Cylinder 3 injection signal (-)
35, Canister solenoid valve

36, N.C.
37, N.C.
38, Temperature signal from map sensor
39, Air pressure sensor signal
40, Fuel pressure signal
41, Motorised throttle “TPS2” potentiometer signal
42, Engine oil level switch
43, Engine rpm sensor (+)
44, Motorised throttle potentiometer signal (-)
45, Alternator D+ signal
46, Cylinder 3 injection signal (+)
47, Cylinder 2 injection signal (+)
48, Cylinder 4 injection signal (-)
49, Cylinder 2 injection signal (-)
50, Phase transformer valve control signal, intake side
51, N.C.
52, N.C.
53, Timing sensor signal, intake side
54, Timing sensor signal, exhaust side
55, Air pressure sensor signal
56, N.C.
57, Engine water temperature sensor signal
58, N.C.
59, N.C.
60, N.C.
Vehicle side "k" connector (94 pin)
1, Body earth
2, Body earth
3, Engine compartment control unit supply (SCM)
4, Body earth
5, Engine compartment control unit supply (SCM)
6, Engine compartment control unit supply (SCM)
7, N.C.
8, N.C.
9, N.C.
10, N.C.
11, Potentiometer 2 reference earth on accelerator pedal
12, N.C.
13, N.C.
14, Linear pressure sensor reference earth
15, N.C.
16, Waste-Gate solenoid valve control (-)
17, Flow meter earth
18, Flow meter signal
19, Brake pedal switch signal (+)
20, Air conditioning control switch positive signal
21, N.C.
22, N.C.
23, N.C.
24, Brake pedal switch signal (+)
25, MIL warning light signal (-)
26, Relay signal controlling engine cooling fan 1st speed (-)
27, Relay control engaging engine cooling fan 2nd speed (-)
28, N.C.
29, Downstream oxygen sensor heater control (-)
30, N.C.
31, N.C.
32, N.C.
33, N.C.
34, Downstream oxygen sensor earth
35, Accelerator pedal potentiometer 1 reference earth
36, N.C.
37, N.C.
38, N.C.
39, N.C.
40, Signal from air temperature sensor integrated in the flow meter
41, Reversing light switch
42, Relay control engaging air conditioning compressor (-)
43, Clutch pedal switch
44, N.C.
45, N.C.
46, N.C.
47, N.C.
48, N.C.
49, N.C.
50, N.C.

51, N.C.
52, N.C.
53, N.C.
54, N.C.
55, N.C.
56, N.C.
57, N.C.
58, Linear pressure sensor power supply
59, N.C.
60, Signal from linear pressure sensor
61, Signal from accelerator pedal potentiometer 2
62, Signal from downstream oxygen sensor
63, N.C.
64, N.C.
65, N.C.
66, N.C.
67, C-Can L network
68, C-Can H network
69, Engine management system relay control (-)
70, N.C.
71, N.C.
72, N.C.
73, Upstream oxygen sensor heater
74, N.C.
75, N.C.
76, Upstream oxygen sensor signal
77, Upstream oxygen sensor reference earth
78, Upstream oxygen sensor signal
79, Upstream oxygen sensor signal
80, N.C.
81, Supply to potentiometer 2 on accelerator pedal
82, Supply to potentiometer 1 on accelerator pedal
83, Signal from potentiometer 1 on accelerator pedal
84, N.C.
85, N.C.
86, N.C.
87, Power supply (+) to engine compartment control unit (SCM) from ignition switch
88, N.C.
89, N.C.
90, N.C.
91, N.C.
92, N.C.
93, Fuel pump relay control (+)
94, N.C.

"DNA" DYNAMIC CONTROL OF THE VEHICLE

The Alfa DNA system is a device that acts on the vehicle dynamic control systems and is electrically connected to the Body Computer which notifies the nodes involved of the configuration selected.

Engine management control unit

The accelerator pedal is more or less reactive depending on the Alfa DNA system mode. There is an OVERBOOST effect in Dynamic mode.

Instrument panel

The display shows specific information consistent with the mode selected (e.g.: turbo pressure in dynamic mode).

VDC system

The VDC has three settings for each of the three Alfa DNA system positions (e.g.: in dynamic mode the intervention of the VDC is delayed to allow a more active driving style; in all weather mode braking on surfaces with differentiated grip is improved).

Steering system

The steering is more or less stiff depending on the mode selected via the "DNA".

Suspensions

Gearbox

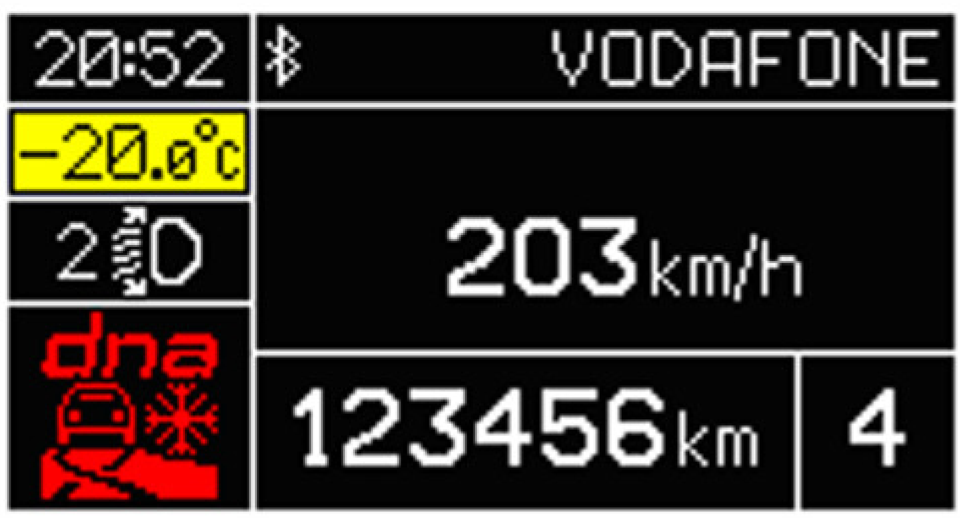
Where an automatic transmission is fitted, the gear change takes place at a higher engine speed and the Alfa DNA system also reduces the change time.

Operation

The "manettino" dial is a lever which always remains in the middle position. The configuration selected is recognized by the corresponding LED being lit up or the display in the control panel as illustrated below:

Dynamic display

All weather display



Normal display

No symbol is shown in the display for this configuration.

To turn the dynamic mode on, move the lever forwards (corresponding to the letter "D"), stay in this position for half a second until the LED lights up or the words "Dynamic on" appear in the control panel.

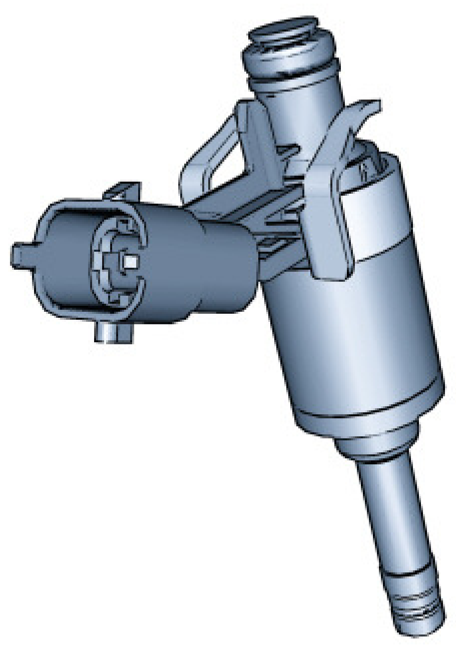
When the lever is released it will return to its middle position.
To return to Normal mode from Dynamic mode, repeat the same movement for the lever with the same time scales, but in this case the LED for the Normal position will light up and the control panel will show "Normal on" in the display.

To engage the All weather mode, move the lever backwards (to position A), stay in this position for half a second or until the LED lights up and the control panel shows "All weather on" in the display.

The procedure to return to Normal is the same as the one described for Dynamic.
It is not possible to go directly from Dynamic mode to All Weather mode and viceversa. It is always necessary to return to the Normal mode.
If Dynamic mode was on before a key-off, then the configuration will automatically return to Normal mode at the next key-on.
If, on the other hand, the All weather or Normal mode was engaged, the configuration will be maintained at the next key-on.
The Dynamic mode can only be engaged at speeds below 110 km/h and remains on beyond this speed.
If there is a DNA system or selector failure, no configuration can be engaged and the message "mode not available" will be shown in the panel display.

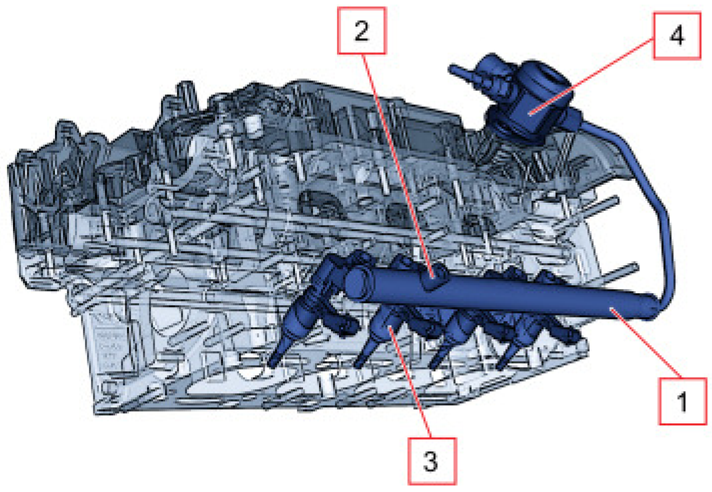
INJECTORS

The injectors are high-pressure, electromagnetic type, with 7-hole nozzle.
The injectors are directly connected to the distribution manifold (rail) and spray directly into the combustion chamber.
The injector opening time and the quantity of the fuel injected are managed by the engine management control unit.



FUEL MANIFOLD

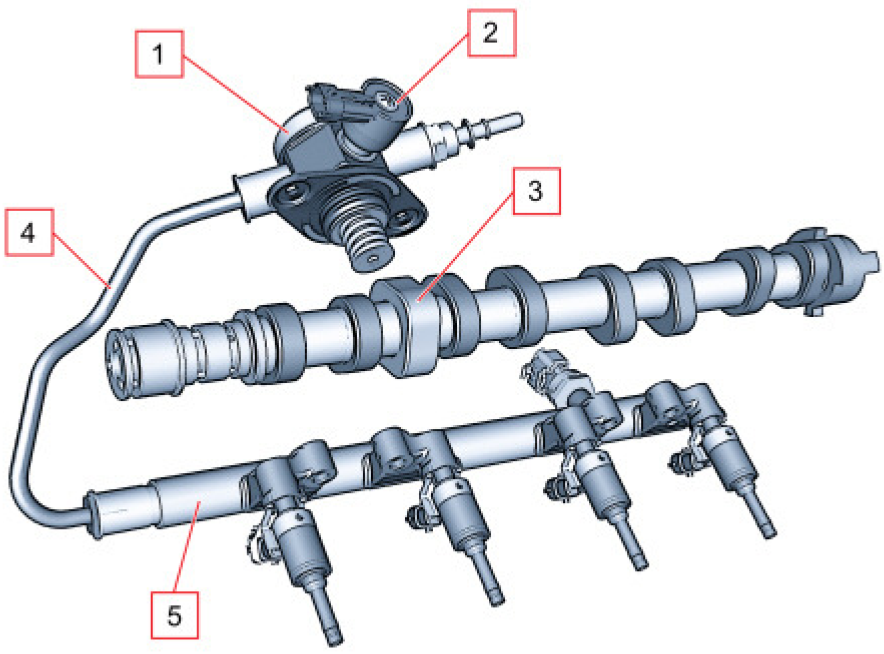
The fuel manifold, which distributes the fuel to the injectors, includes the housing for the injectors and a pressure sensor.



1. Fuel manifold (rail)
2. Fuel pressure sensor
3. Injectors
4. High pressure fuel pump

HIGH PRESSURE PUMP

The high pressure pump is mounted on the cylinder head and increases the inlet pressure (6 bar) to a maximum of 150 bar to supply the rail.
This pressure value reduces pressure fluctuations inside the rail.
Pressure is generated through a pumping unit powered by a square cam on the intake side camshaft.
The pressure is controlled by the pump's integrated regulator and managed by the injection control unit. The pressure is adjusted by closing the pump's internal recirculation during compression. In this way only the fuel quantity necessary to keep the required pressure is compressed in the rail, while the remaining pressure goes back to the low pressure circuit.
Inside the high pressure pump, on the supply pipe, a safety valve allows further internal recirculation if pressure reaches 19.5 Mpa.

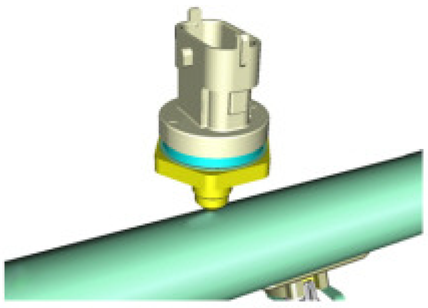


1. High pressure pump
2. Pressure regulator
3. High pressure pump control cam
4. Supply pipe
5. Rail

The high pressure pump must be installed timed with the engine. Therefore proceed as described.
Op. 1056F72 PRESSURE PUMP - R.R.

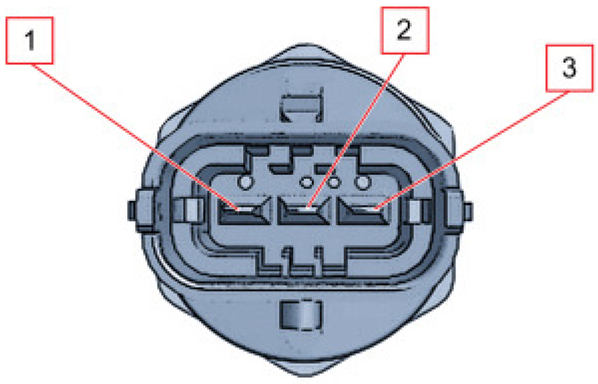
FUEL PRESSURE SENSOR

The fuel pressure sensor is fitted directly on the rail and provides the injection control unit with a feedback signal to:
- adjust the injection pressure
- regulate the fuel injection duration.



It is a piezoelectric sensor including a diaphragm pressure meter.

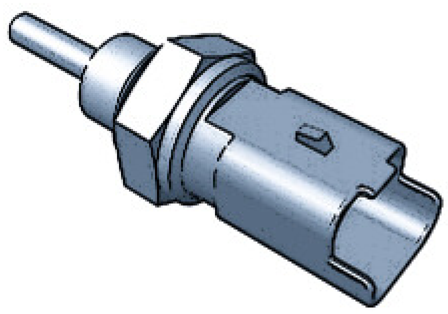
Pin out



Pin 1, Earth
Pin 2, Output signal
Pin 3, 5 V power supply

ENGINE COOLANT TEMPERATURE SENSOR

It is fitted to the thermostat and detects the water temperature by means of an NTC thermistor with negative resistance coefficient.
The reference voltage for the injection system's NTC element is 5 V; since the input circuit in the control unit has been designed as a tension divider, this voltage is divided between a resistance in the control unit and the sensor NTC resistance.
The control unit can therefore assess sensor resistance changes through changes in the voltage and thus obtain temperature information.



Electrical properties

- Power supply: 5 V
- Maximum current: 2.5 mA
- Maximum power at 25°C: 15 mW
- Variable resistance from a maximum of 48 kOhm at -40°C to 66 Ohm at 140°C.

Electrical connections

Pin 1, Signal
Pin 2, Earth

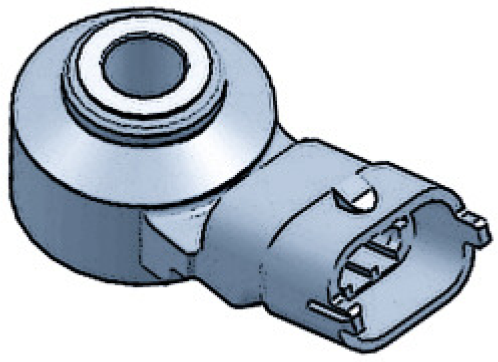
KNOCK SENSOR

Features

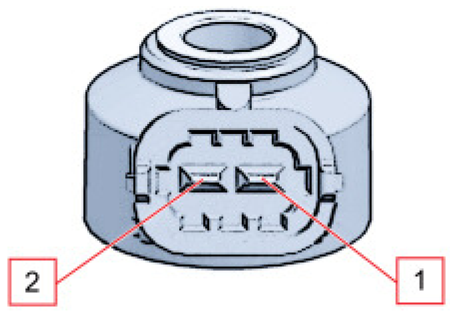
The piezoresistive knock sensors are fitted on the crankcase and measure the intensity of the vibrations caused by knock in the combustion chambers. This phenomenon has mechanical repercussions on a piezoelectric crystal that sends a signal to the control unit which, on the basis of this signal, reduces the ignition advance until the phenomenon disappears. Later on, the advance is gradually restored to the basic value.

Electrical properties

- Resistance: 4.9 MΩ +/- 20%



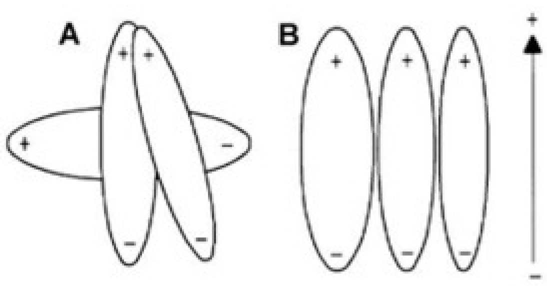
Electrical connections



Pin 1, Signal
Pin 2, Earth

Operation

The molecules of a quartz crystal are affected by electrical polarization.
In rest conditions (A) the molecules are not arranged in a particular way.
When the crystal is subjected to pressure or to an impact (B), the higher the pressure, the more marked their arrangement.
This orientation generates a voltage at the crystal terminals.

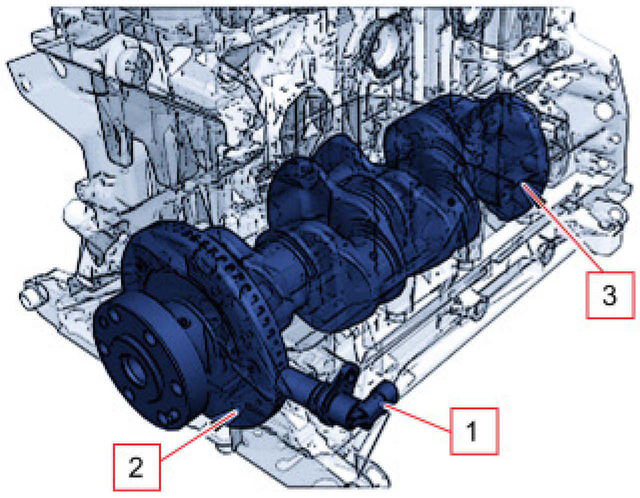


A. Rest position
B. Position under pressure

RPM SENSOR

Features

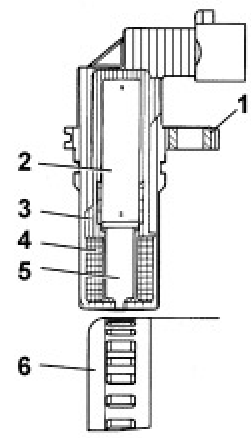
It is fitted on the cylinder block/crankcase facing the flywheel on the crankshaft.
It is inductive, i.e. its operation is determined by magnetic field changes generated by the teeth passing in front of a phonic wheel (60-2 teeth).
The injection control unit uses the RPM signal to:
- determining the engine rotation speed
- determine the angular position of the crankshaft.



1. Rpm sensor
2. Phonic wheel
3. Crankshaft

Operation

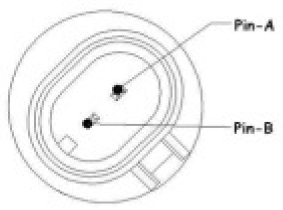
The changeover from full to empty determined by the presence or absence of a gap, results in a magnetic flux change sufficient to generate an induced alternating voltage proportional to the number of teeth on the ring (or toothed wheel).
The frequency and amplitude of the voltage sent to the electronic control unit provides the latter with an indication of the crankshaft angular speed.



1. Brass bush
2. Permanent magnet
3. Plastic sensor casing
4. Coil reel
5. Polar core
6. Ring gear or phonic wheel
7. Coaxial paired cable or electrical connection.

To produce correct signals, the prescribed distance (gap) between the end of the sensor and the phonic wheel must be between 0.8 and 1.5 mm.
This distance is not adjustable.Therefore, if the gap is found to be outside the tolerance limits, check the condition of the sensor and phonic wheel.

Pin out

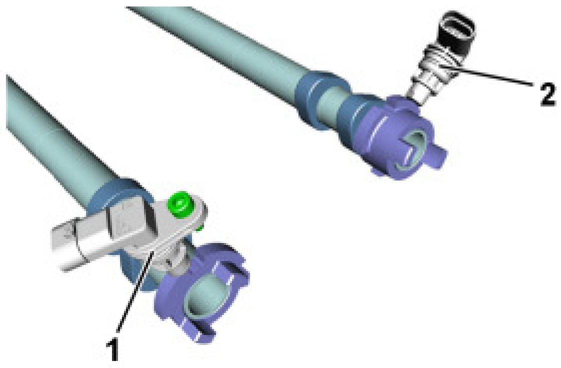


Pin A, Signal +
Pin B, Signal -

TIMING SENSORS

Features

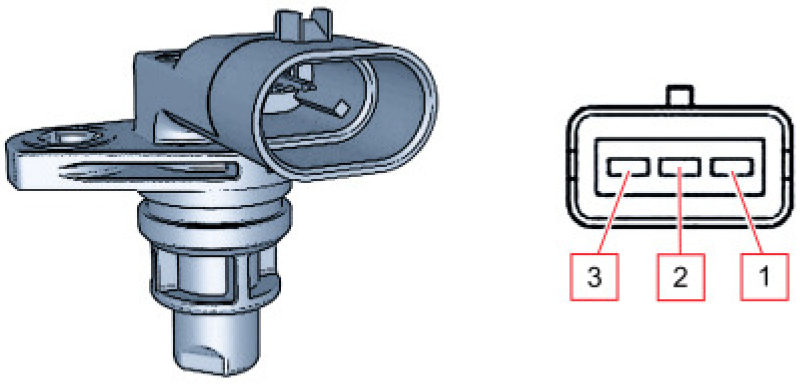
The Hall effect sensors are fitted on the upper cylinder head and are directed towards special integrated cams in the two camshafts.
The injection control unit uses the timing sensor signal to establish the position of the cylinders and determine the injection and ignition point.



1. Exhaust side timing sensor
2. Intake side timing sensor

Operation

A current-carrying semiconductor layer immersed in a normal magnetic field (force lines at right angles to current direction) generates a potential difference known as a Hall voltage at its terminals.
If current intensity remains constant, the generated voltage depends on magnetic field intensity alone.Periodic changes in magnetic field intensity are sufficient to generate a modulated electrical signal with frequency proportional to the speed of magnetic field change.
To achieve this change, the sensor is periodically approached by a sector on the cam that it is directed towards.

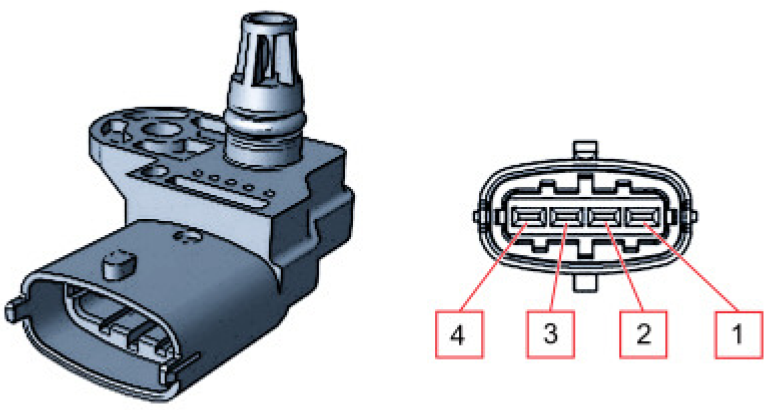


Pin 1, Earth
Pin 2, Signal
Pin 3, Power supply

PRESSURE/INTAKE AIR TEMPERATURE SENSOR

Features

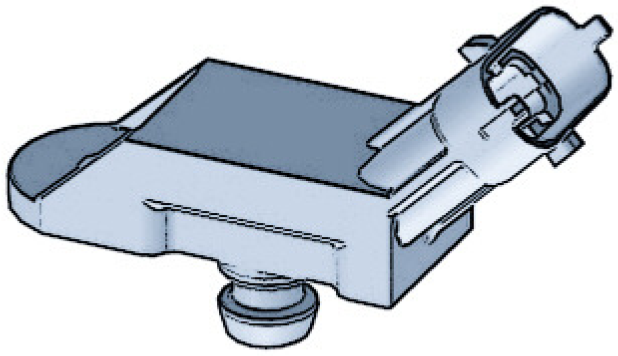
The pressure/intake air temperature sensor is an integrated component that measures the pressure and the temperature of the air inside the throttle body downstream duct and sends them to the control unit that uses them for:
- checking the supercharging pressure in "closed loop"
- detecting the downstream pressurised air temperature of the intercooler.



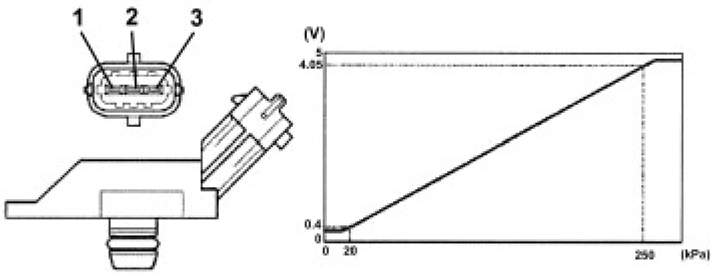
Pin 1, Earth
Pin 2, Air temperature signal
Pin 3, 5 V (from ECU)
Pin 4, Air pressure output signal

AIR PRESSURE SENSOR

The air pressure sensor comprises a Wheatstone bridge serigraphed on a ceramic diaphragm and is used by the injection control unit to measure the supercharging pressure in the intake chamber.



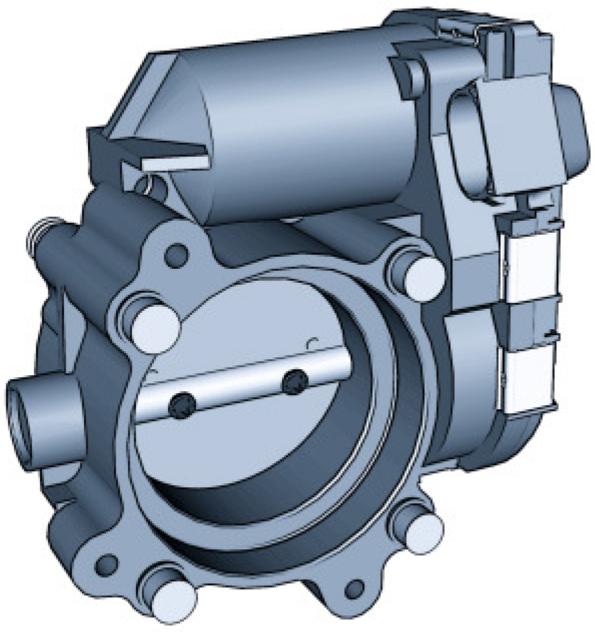
The air pressure sensor is mounted on the upper part of the intake chamber.
The control unit uses the signal from the air pressure sensor to manage the supercharging pressure and to calculate the amount of air needed for the subsequent fuel dosage.



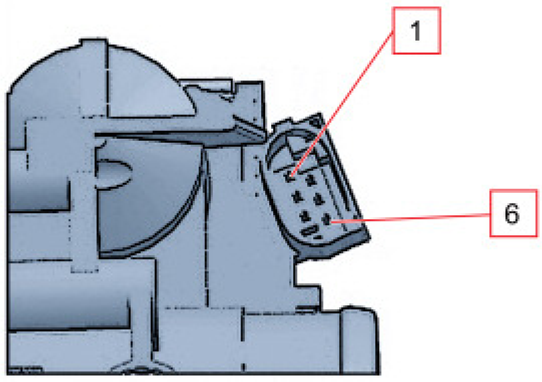
Pin 1, 5 V power supply
Pin 2, Earth signal
Pin 3, Air pressure signal

THROTTLE BODY

This is fitted on the intake chamber and regulates the amount of air taken in by the engine.
According to the signal received from the accelerator pedal potentiometer, the injection control unit controls the throttle opening by means of a direct current motor built into the throttle body.
Throttle opening takes place from 0° to 80°, i.e. including idle speed adjustment.
The throttle body is fitted with two potentiometers in such a way that one controls the other and vice versa.
If both potentiometers should fail or in the case of a power cut, the control unit reduces drive torque on the basis of the position of the accelerator pedal:
- with the pedal fully depressed, it cuts off fuel to one or more pistons until a maximum speed of 2500 rpm is reached
- in intermediate positions, it cuts off the supply to one or more pistons until a speed of less than 1200 rpm is reached.



Pin out

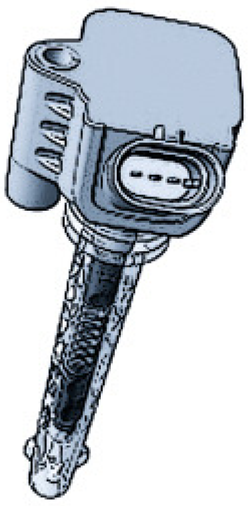


Pin 1, Throttle opening motor earth
Pin 2, TPS1 and TPS2 potentiometer earth
Pin 3, TPS1 and TPS2 potentiometer 5 V positive
Pin 4, Throttle opening motor positive
Pin 5, TPS2 potentiometer signal
Pin 6, TPS1 potentiometer signal

IGNITION COILS

Composition

The coils are connected directly to the spark plugs and are the "PLUG TOP" type comprising a magnetic internal core made up of a silicon steel pack arranged along the axis of the coil and secondary and primary coils which contain the electrical windings, coaxial to the magnetic core.
The windings are housed in a pressed plastic container which has the low voltage connector and the fastening bush on the cylinder head and they are insulated through immersion in an epoxide resin which has excellent dielectric, mechanical and also thermal properties, as the coils are exposed to high temperatures. The proximity of the primary winding to the magnetic core reduces magnetic flux losses thereby ensuring optimum coupling at the secondary winding.

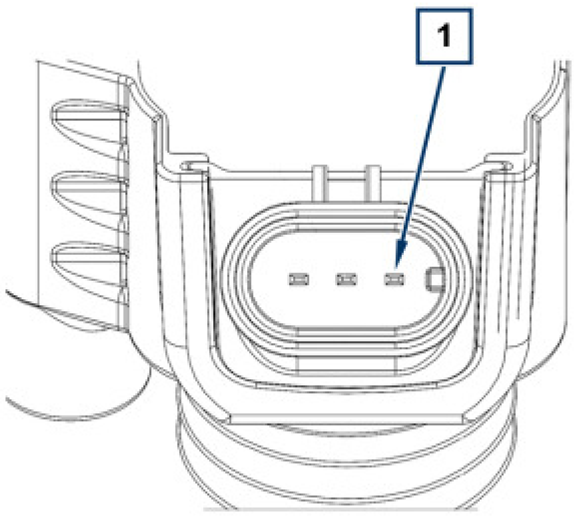


The head of the coil is connected to the spark plug by means of a silicone rubber cap which contains a spring that transfers the secondary winding high tension to the spark plug terminal.
The coils are directly controlled by the injection control unit in sequential timed mode.
The control unit earths the primary coil power supply circuit thereby creating a strong magnetic field on the primary coil. When the primary circuit is open a high voltage is produced at the secondary circuit through induction.
The high tension is discharged to the engine earth via the spark plug electrodes producing the spark that ignites the air/fuel mixture.

Electrical properties

Primary circuit resistance: 0.53 Ω ± 5% at 23°C
Secondary circuit resistance: 8100 Ω ± 5% at 23°C.
Rated current at primary winding: 7.3 A
Voltage at secondary winding: 27 kW

Electrical connections



Pin 1, Connection to engine of engine secondary circuit
Pin 2, primary circuit +12 V power supply
Pin 3, Control to earth from primary circuit control unit

ACCELERATOR PEDAL POTENTIOMETER

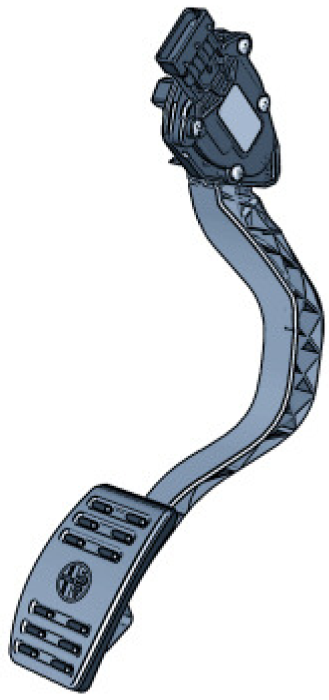
Features

The accelerator pedal is equipped with two built-in potentiometers:
- one main one
- one safety one.

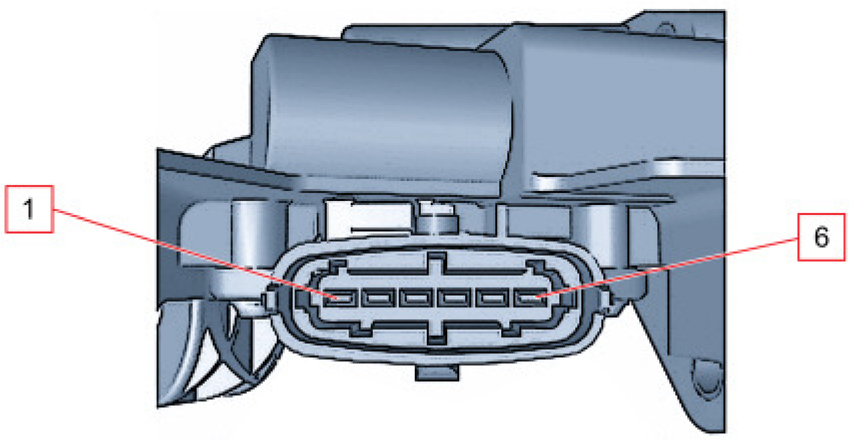
The injection control unit implements the following recovery strategies under the following conditions:
- if one of the two potentiometers fails, the control unit uses the remaining track without restricting the torque and checks the plausibility with the brake switch
- if both potentiometers fail completely, it prevents throttle opening.

Operation

The sensor consists of a casing, fastened to the accelerator pedal support which contains a shaft connected to the twin track potentiometer in an axial position.
A coil spring on the shaft guarantees the correct resistance to pressure whilst a second spring ensures the return on release.



Electrical connections



Pin 1, 5V power supply potentiometer 2
Pin 2, 5V power supply potentiometer 1
Pin 3, Potentiometer earth 1
Pin 4, Potentiometer signal 1
Pin 5, Potentiometer earth 2
Pin 6, Potentiometer signal 2