back toAir intake manifold temperature - Circuit short to ground

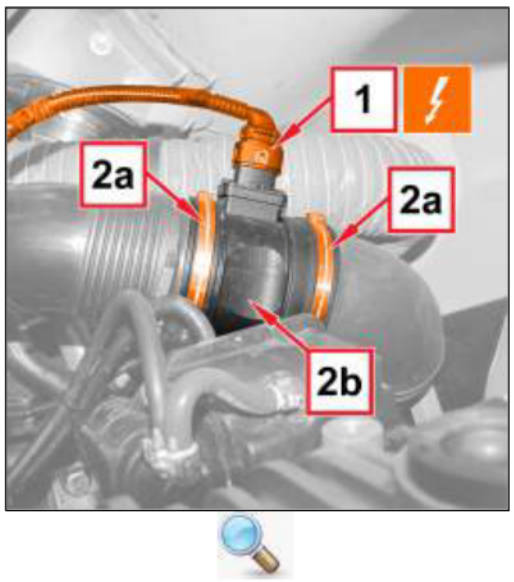
Detail Detail

Removing (Refitting)

- Disconnect the negative battery terminal.

	Name	Connector
-	BATTERY	See A001 BATTERY

1. Disconnect the electrical connection for the air flow meter.



	Name	Connector
1	Air flow meter	See K041 AIR FLOW METER

2. Loosen the bands (2a), disconnect the flow meter (2b) and remove it from the air pipes.

Refitting (Removing)

- Place the flow meter in position, connect it to the air pipes and tighten the bands.

- Connect the electrical connection for the flow meter.

- Connect the negative battery terminal.

	Name	Connector
-	BATTERY	See A001 BATTERY

cardiagn.com

back toThrottle valve actuator electrical failure - Signal amplitude > maximum

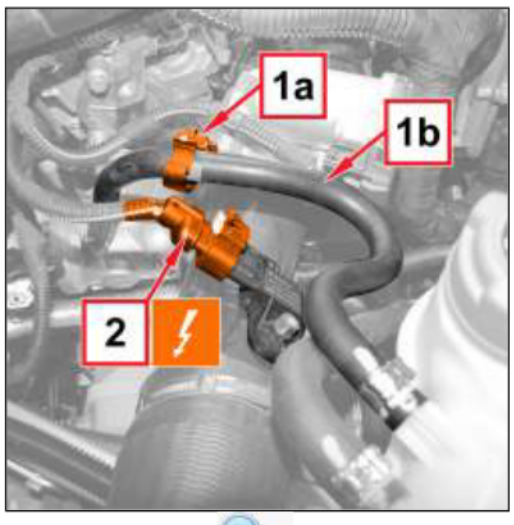
⊞ Detail ⊟ Detail

Removing (Refitting)

- Disconnect the negative battery terminal.

	Name	Connector
-	BATTERY	See A001 BATTERY

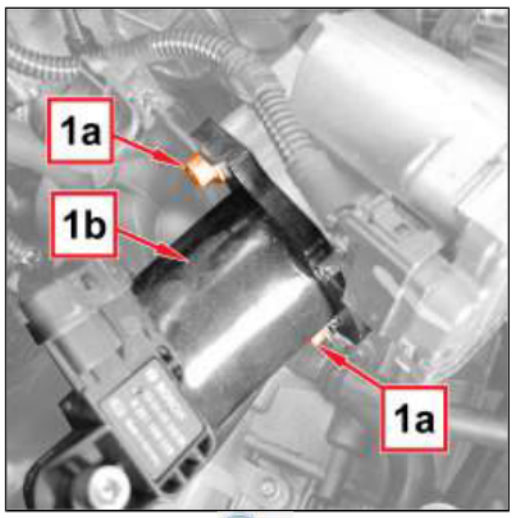
⊞ Op. 1016A10 SOUND-PROOFING COVER - R.R



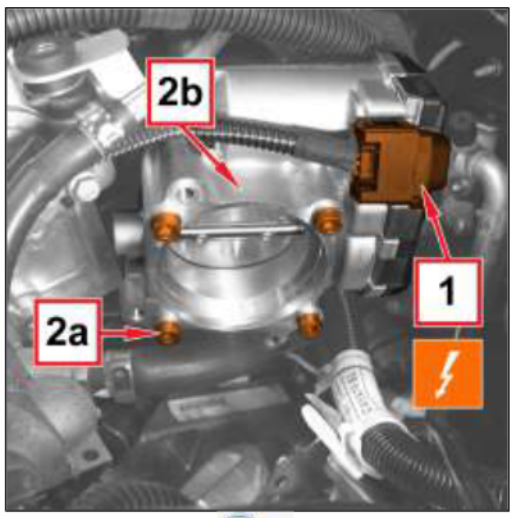
1. Open the retaining clip (1a) and release the degassing pipe (1b).

2. Disconnect the electrical connection for the intake air pressure/temperature sensor.

	Name	Connector
2	AIR TEMPERATURE/PRESSURE SENSOR	See K044 AIR TEMPERATURE/PRESSURE SENSOR



1. Undo the fixing screws (1a) and place throttle body air inlet pipe (1c) to one side.



1. Detach the electrical connection for the throttle body.

	Name	Connector
1	Integrated throttle body actuator	See N075 INTEGRATED THROTTLE BODY ACTUATOR

2. Undo the screws (2a) and remove throttle body (2b).

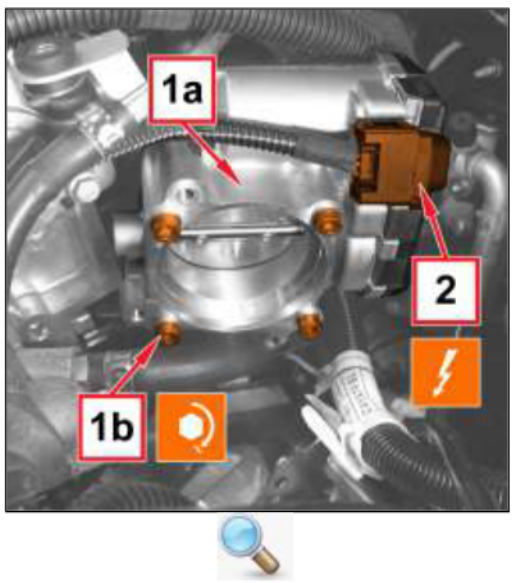
cardiagn.com

- Remove the intake chamber gasket.

Refitting (Removing)

- Fit a new gasket onto the intake chamber.

1. Reposition the throttle body (1a) in its housing and tighten the fixing screws (1b).



Component	Fixing	dia	Value (daNm)	Validity
Throttle body	Screw	M6	0.8 ÷ 1.0	1750 Turbo Petrol

2. Connect the electrical connection for the throttle casing.

	Name	Connector
2	Integrated throttle body actuator	See N075 INTEGRATED THROTTLE BODY ACTUATOR

- Connect the air inlet pipe to the throttle body and tighten the fixing screws.

- Secure the degassing pipe and close the retaining clip.

- Connect the electrical connection for the intake air pressure/temperature sensor.

	Name	Connector
-	AIR TEMPERATURE/PRESSURE SENSOR	See K044 AIR TEMPERATURE/PRESSURE SENSOR

⊞ Op. 1016A10 SOUND-PROOFING COVER - R.R

- Connect the negative battery terminal.

	Name	Connector
-	BATTERY	See A001 BATTERY

cardiagn.com

back toTurbocharger pressure sensor - Signal invalid

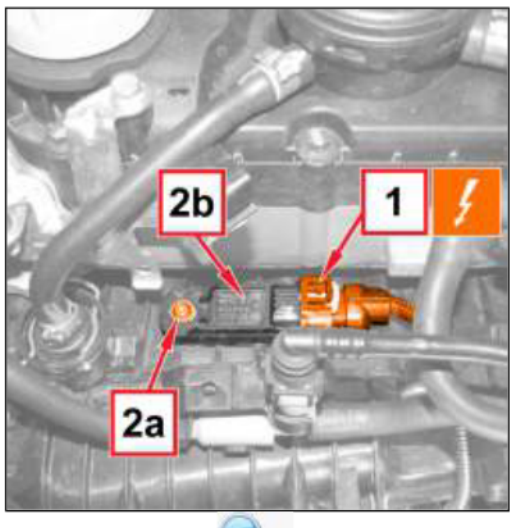
Detail Detail

Removing (Refitting)

- Disconnect the negative battery terminal.

	Name	Connector
-	BATTERY	See A001 BATTERY

Op. 1016A10 SOUND-PROOFING COVER - R.R



1. Disconnect the electrical connection for the air pressure sensor.

	Name	Connector
1	ABSOLUTE PRESSURE SENSOR	See K048 ABSOLUTE PRESSURE SENSOR

2. Undo the screw (2a) and remove the air pressure sensor (2b)

Refitting (Removing)

- Position the air pressure sensor in its housing and secure it using the bolt.

- Connect the electrical connection for the air pressure sensor.

Op. 1016A10 SOUND-PROOFING COVER - R.R

- Connect the negative battery terminal.

	Name	Connector
-	BATTERY	See A001 BATTERY

cardiagn.com

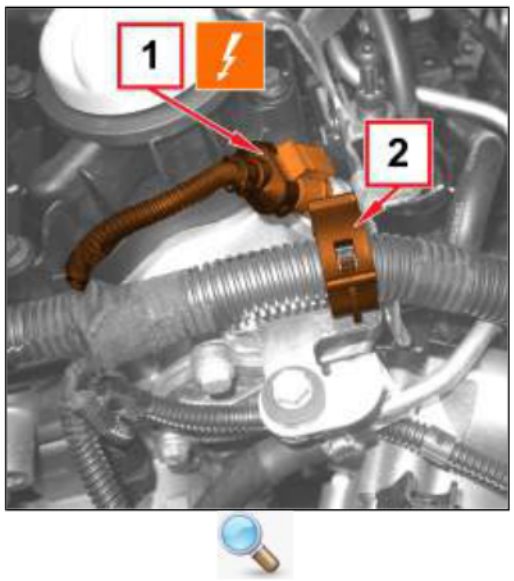
back toCamshaft sensor - Circuit short to battery or open

Detail Detail

Removing (Refitting)

The procedure for the intake side sensor is described below, the operations for the exhaust side sensor are the same.

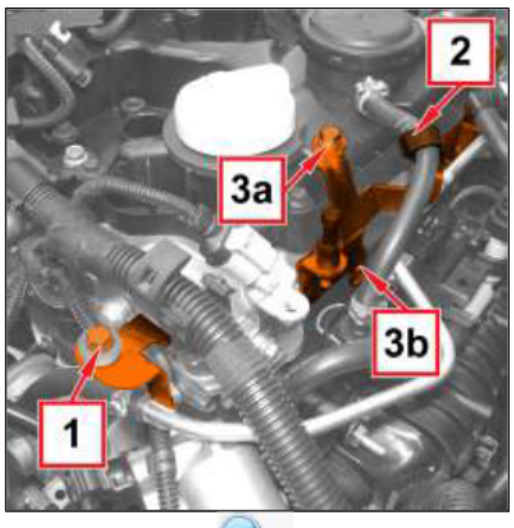
Op. 1016A10 SOUND-PROOFING COVER - R.R



1. Detach the electrical connection for the cam angle sensor.

	Name	Connector
1	Intake side timing sensor	See K106 INTAKE SIDE TIMING SENSOR

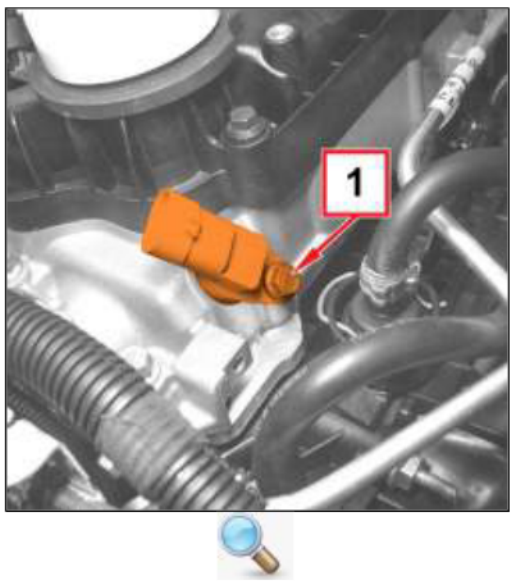
2. Open the wiring retaining clip.



1. Undo the screw fixing the degassing pipe.

2. Open the clip fixing the oil vapour recovery pipe.

3. Undo the screws (3a) and remove the wiring holder bracket (3b).



1. Undo the bolt and remove the cam angle sensor.

Refitting (Removing)

- Position the cam angle sensor in its housing and tighten the bolt.

- Place the wiring holder bracket in position and tighten the bolts.

- Secure the oil vapour recovery pipe to the corresponding clip on the wiring mounting bracket.

cardiagn.com

- Place the degassing pipe in its housing and tighten the fixing screw to the wiring mounting bracket.

- Close the wiring retaining clip.

- Connect the electrical connection for the cam angle sensor.

⊞ Op. 1016A10 SOUND-PROOFING COVER - R.R

cardiagn.com

back toInjector control pressure - Event Information

⊞ Detail ⊟ Detail

Removing (Refitting)

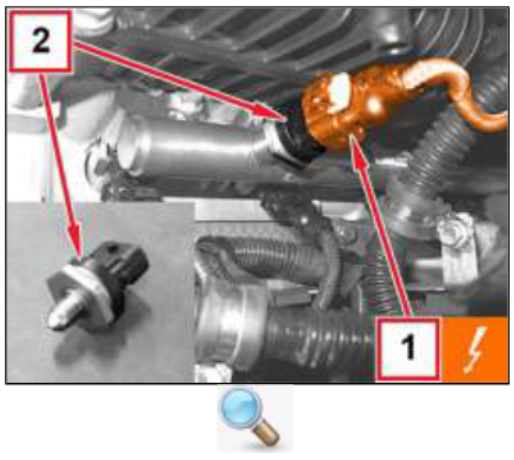
- Open the fuse box casing lid in the engine compartment and remove fuse F85 (15A) from the fuel pump.

- Start-up several times until all the pressure in the fuel distribution manifold has discharged.

- Place the fuse F85 (15 A) in its housing and close the fuse box cover.
- Disconnect the negative battery terminal.

	Name	Connector
-	BATTERY	See A001 BATTERY

⊞ Op. 1016A10 SOUND-PROOFING COVER - R.R



1. Detach the fuel pressure sensor electrical connection.

	Name	Connector
1	Fuel pressure sensor	See K083 FUEL PRESSURE SENSOR

2. Undo the fuel pressure sensor and remove it.

Refitting (Removing)

- Reposition the fuel pressure sensor in its housing and secure it.

- Connect the electrical connection for the fuel pressure sensor.

	Name	Connector
-	Fuel pressure sensor	See K083 FUEL PRESSURE SENSOR

⊞ Op. 1016A10 SOUND-PROOFING COVER - R.R

- Connect the negative battery terminal.

	Name	Connector
-	BATTERY	See A001 BATTERY

cardiagn.com

back toINJECTOR (ONE) R.R. WITH FUEL MANIFOLD PIPE REMOVED INCLUDES GASKET REPLACEMENT

⊞ Detail ⊟ Detail

Removing (Refitting)

⊞ Op. 0010R30 VEHICLE POSITIONING ON THE LIFT

- Disconnect the negative battery terminal.

	Denomination	Connector
-	BATTERY	See A001 BATTERY

⊞ Op. 7055B95 FRONT AERODYNAMIC GUARD - R.R.

⊞ Op. 1016A10 SOUND-PROOFING COVER - R.R

⊞ Op. 7055B54 PROTECTION/GUARD UNDER ENGINE -R.R.

⊞ Op. 0010T20 ENGINE COOLANT - CHANGE

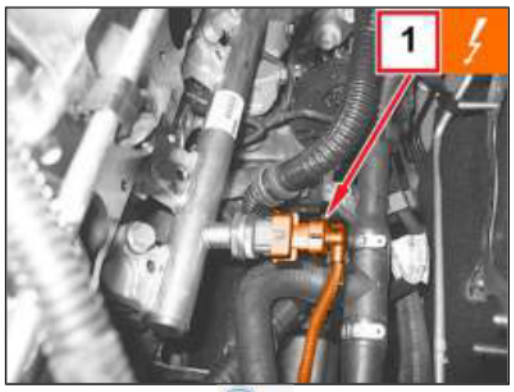
⊞ Op. 1056F82 CONTROL UNIT (ONE) FOR INJECTION IGNITION SYSTEM - R.R.

⊞ Op. 1072B50 AIR CHAMBER - R.R.

⊞ Op. 1056F76 HIGH PRESSURE PIPE FROM PRESSURE PUMP TO SINGLE FUEL MANIFOLD PIPE - R.R.

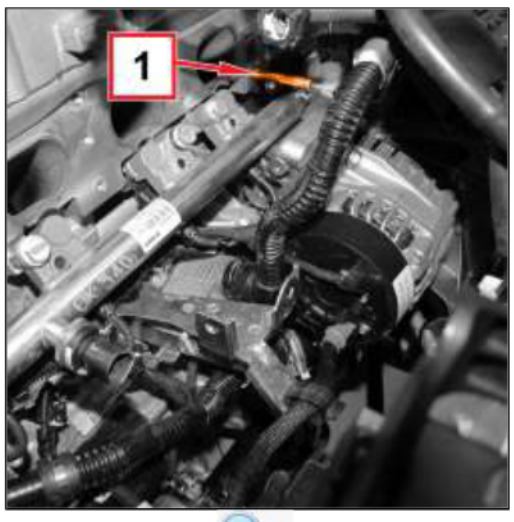
⊞ Op. 5530A41 ALTERNATOR GUARD - R.R.

1. Detach the fuel pressure sensor electrical connection.



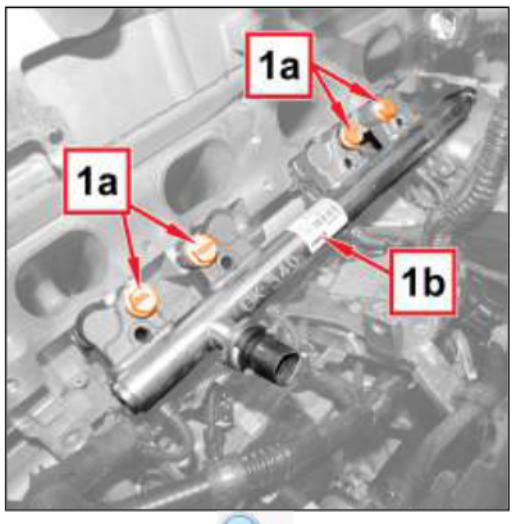
	Denomination	Connector
1	Fuel pressure sensor	See K083 FUEL PRESSURE SENSOR

1. Undo and remove the air intake chamber fixing stud bolt.

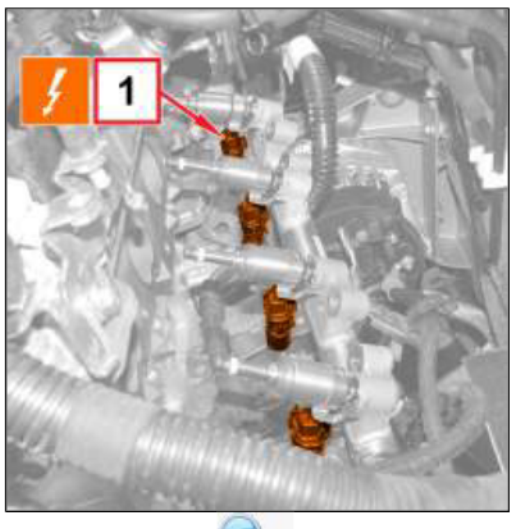


cardiagn.com

1. Undo the fixing screws (1a) and partly remove the single manifold pipe (1b) complete with injectors.



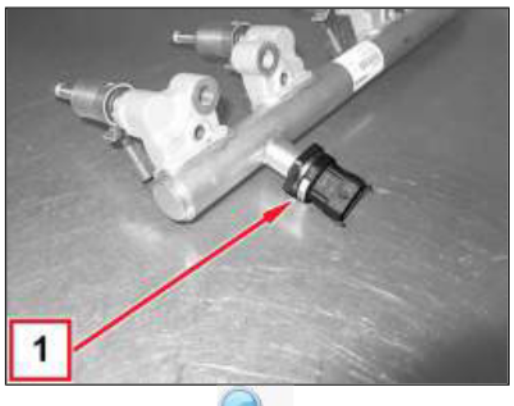
1. Detach the electrical connections for the injectors.



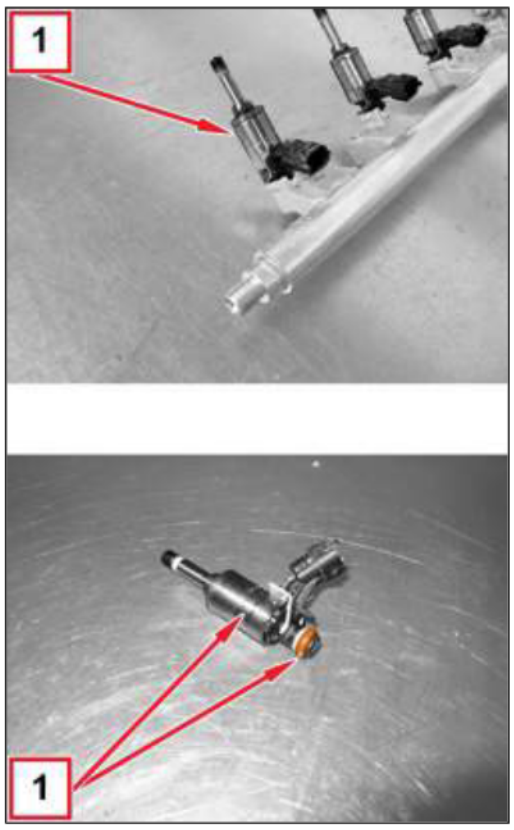
	Denomination	Connector
1	Injector	See N070 INJECTOR

- Remove the single fuel manifold pipe from its housing.

1. Undo the fuel pressure sensor and remove it.



1. If required, press to remove the injectors with O-rings.



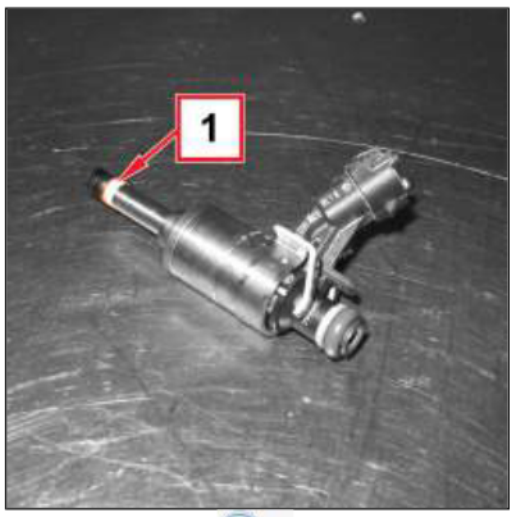
cardiagn.com

Refitting (Removing)

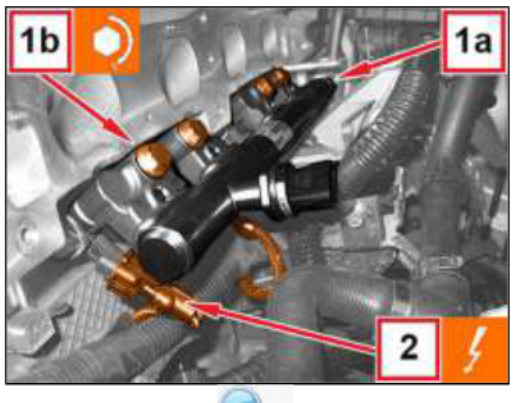
- Place the fuel pressure sensor in its housing and tighten it.

- Press fit the injectors with new O-rings.

1. Check the deterioration of the Teflon ring: if it is worn, proceed to replace the injector.



To prevent engine malfunction, pay the utmost attention when refitting injectors, avoiding damage to the Teflon ring.



1. Fit the complete single fuel manifold pipe (1a) in position and tighten the fixing screws (1b).

Component	Fixing	dia	Value (daNm)	Validity
Single fuel manifold pipe	Screw	M8x1.25x40	2.0 ÷ 2.4	1750 Turbo Petrol

2. Connect the electrical connections for the injectors.

	Denomination	Connector
2	Injector	See N070 INJECTOR

- Connect the electrical connection for the fuel pressure sensor.

	Denomination	Connector
-	Fuel pressure sensor	See K083 FUEL PRESSURE SENSOR

- Tighten the air intake chamber fixing stud bolt.

⊞ Op. 5530A41 ALTERNATOR GUARD - R.R.

⊞ Op. 1056F76 HIGH PRESSURE PIPE FROM PRESSURE PUMP TO SINGLE FUEL MANIFOLD PIPE - R.R.

⊞ Op. 1072B50 AIR CHAMBER - R.R.

⊞ Op. 1056F82 CONTROL UNIT (ONE) FOR INJECTION IGNITION SYSTEM - R.R.

⊞ Op. 0010T20 ENGINE COOLANT - CHANGE

⊞ Op. 7055B54 PROTECTION/GUARD UNDER ENGINE -R.R.

cardiagn.com

⊞ Op. 7055B95 FRONT AERODYNAMIC GUARD - R.R.

⊞ Op. 1016A10 SOUND-PROOFING COVER - R.R

- Connect the negative battery terminal.

	Denomination	Connector
-	BATTERY	See A001 BATTERY

- Remove the vehicle from the lift.

cardiagn.com

back toInjector control pressure - Circuit short to ground

⊞ Detail ⊟ Detail

Removing (Refitting)

⊞ Op. 0010R30 VEHICLE POSITIONING ON THE LIFT

- Open the fuse box casing lid in the engine compartment and remove fuse F85 (15A) from the fuel pump.

- Start-up several times until all the pressure in the fuel distribution manifold has discharged.

- Place the fuse F85 (15 A) in its housing and close the fuse box cover.
- Disconnect the negative battery terminal.

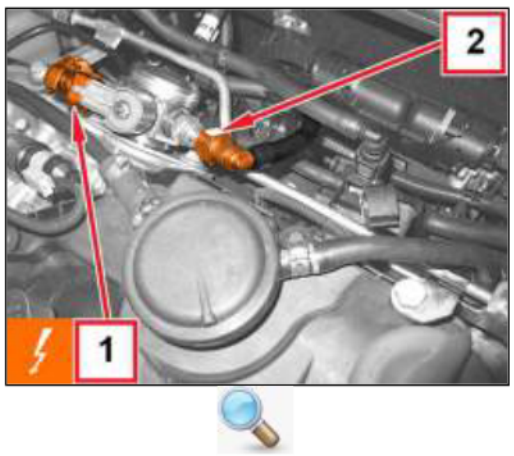
	Name	Connector
-	BATTERY	See A001 BATTERY

⊞ Op. 1016A10 SOUND-PROOFING COVER - R.R

⊞ Op. 5530A41 ALTERNATOR GUARD - R.R.

⊞ Op. 1056F76 HIGH PRESSURE PIPE FROM PRESSURE PUMP TO SINGLE FUEL MANIFOLD PIPE - R.R.

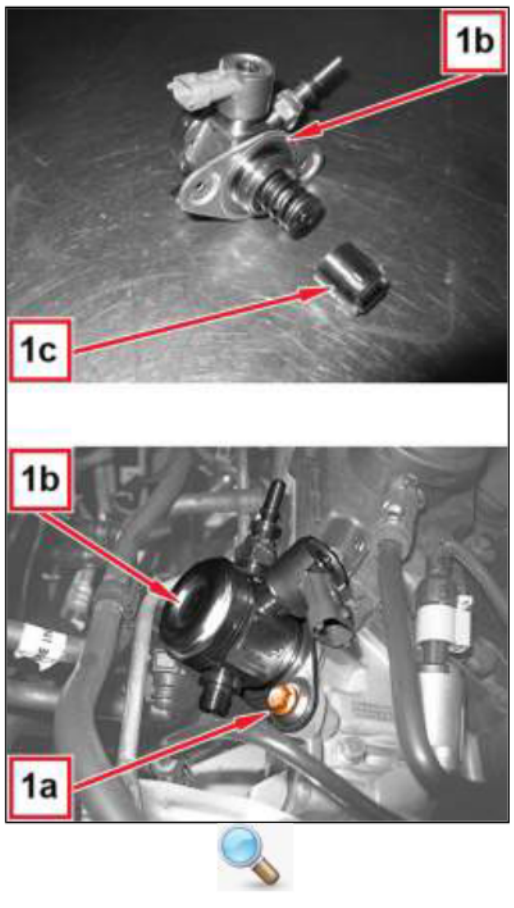
1. Disconnect the electrical connection for the fuel pressure regulator.



	Name	Connector
1	Fuel pressure regulator	See N077 FUEL PRESSURE REGULATOR

2. Disconnect the quick coupling for the low pressure fuel supply pipe, pressure pump side.

1. Undo the screws (1a) and remove the pressure pump (1b) complete with cup (1c).



cardiagn.com

Refitting (Removing)

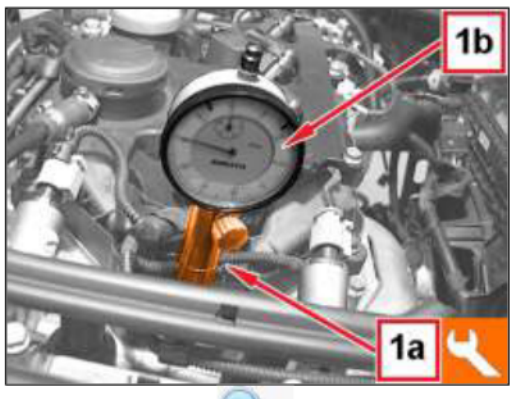
The pressure pump must be installed timed with the engine, therefore proceed as described below.

⊞ Op. 4450B08 RIGHT REAR WHEEL - R.R

⊞ Op. 7055B45 RIGHT REAR WHEEL ARCH LINER - R.R

- Remove the spark plug of cylinder no. 1, with reference to

⊞ Op. 5510D10 SPARK PLUGS - R+R

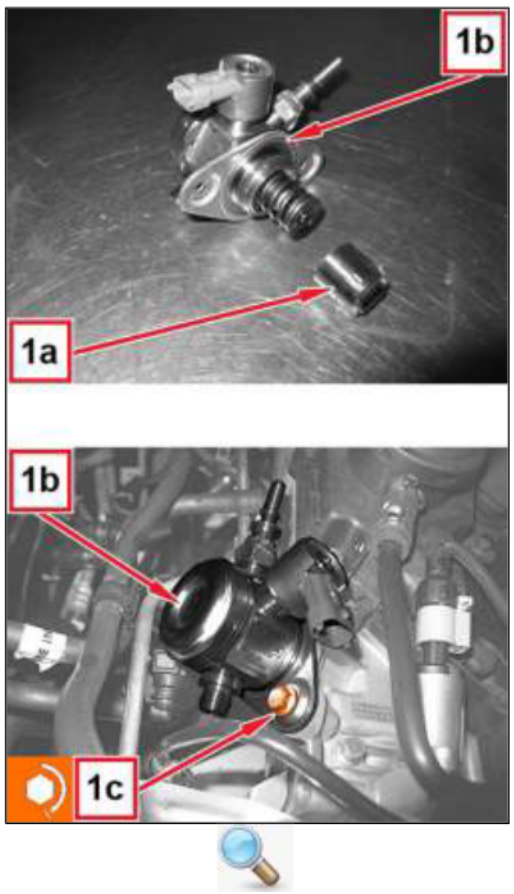


1. Fit the tools (1a) complete with dial gauge (1b) in the seat for the spark plug for cylinder no. 1.

Tool	Denomination	Function	Validity
1.871.008.400	Adaptor	TDC determination	1750 Turbo Petrol
Tool	Denomination	Function	Validity
1.860.895.000	Dial gauge mount	TDC determination	1750 Turbo Petrol
Tool	Denomination	Function	Validity
2.000.033.400	Dial gauge rod	TDC determination	1750 Turbo Petrol

- Adjust the driven toothed pulley securing nut to turn the crankshaft clockwise, timing side, until the piston for cylinder no.1 is at T.D.C.

If the T.D.C. is exceeded, do not turn backwards but proceed with the rotation in the same direction, rotating the crankshaft through other two revolutions, to return the piston for cylinder no. 1 to the T.D.C.



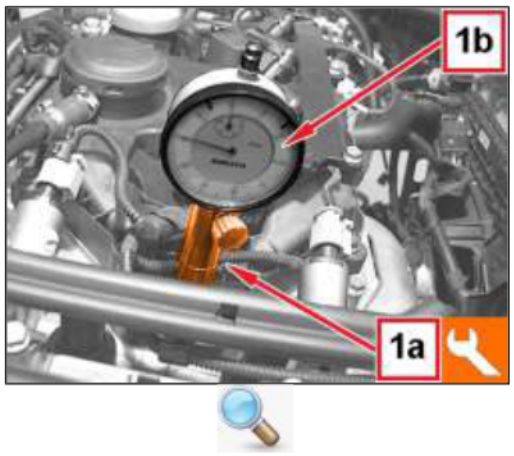
1. Place the cup (1a) and the pressure pump (1b) in their housing and tighten the screws (1c) to the prescribed torque.

Component	Fixing	dia	Value (daNm)	Validity
Pressure pump	Screw	M6x1x25	0.8 ÷ 1.0	1750 Turbo Petrol

1. Remove the tools (1a) with dial gauge (1b) used to determine the T.D.C.

Tool	Denomination	Function	Validity

cardiagn.com



1.871.008.400	Adaptor	TDC determination	1750 Turbo Petrol
Tool	Denomination	Function	Validity
1.860.895.000	Dial gauge mount	TDC determination	1750 Turbo Petrol
Tool	Denomination	Function	Validity
2.000.033.400	Dial gauge rod	TDC determination	1750 Turbo Petrol

- Place the spark plug of cylinder no. 1 in its housing, with reference to

⊞ Op. 5510D10 SPARK PLUGS - R+R

- Connect the quick coupling for the low pressure fuel supply pipe, pressure pump side.
- Connect the electrical connection for the fuel pressure regulator.

	Name	Connector
-	Fuel pressure regulator	See N077 FUEL PRESSURE REGULATOR

⊞ Op. 1056F76 HIGH PRESSURE PIPE FROM PRESSURE PUMP TO SINGLE FUEL MANIFOLD PIPE - R.R.

⊞ Op. 5530A41 ALTERNATOR GUARD - R.R.

⊞ Op. 1016A10 SOUND-PROOFING COVER - R.R

⊞ Op. 7055B45 RIGHT REAR WHEEL ARCH LINER - R.R

⊞ Op. 4450B08 RIGHT REAR WHEEL - R.R

- Connect the negative battery terminal.

	Name	Connector
-	BATTERY	See A001 BATTERY

- Remove the car from the lift.

cardiagn.com

Removing (Refitting)

If the engine management control unit is replaced, before removing it, the EXAMINER must be connected and the "Control unit Replacement" procedure must be initiated (to recover data about engine oil wear and store the same data on the new control unit). If the outcome of this procedure is negative, the Engine Oil and Filter must be replaced as there is no record of historical data. At the end of the replacement, using the EXAMINER diagnosis equipment, in the engine management control unit section, update the "Engine Oil Change" function.

If the injection-ignition system control unit is replaced, the following self-learning procedures must be carried out:

Throttle position self-learning

- with the engine switched off, turn the ignition key to MAR without pressing the accelerator pedal and with the engine temperature between 5.25°C and 100.5°C for 29 seconds.

Brake Node self-learning

- turn the ignition key to MAR and wait for 5 seconds;

- turn the key OFF and wait for the data to be recorded in the memory.

Manual gearbox/robotised gearbox self-learning

- turn the key to MAR and then press the clutch pedal if the vehicle is equipped with a manual gearbox;

- wait a few seconds (2-3) if the vehicle is equipped with a robotised gearbox;

- turn the key OFF and wait for the data to be recorded in the memory.

If the vehicle is equipped with a climate control system

the following self-learning procedure must also be carried out:

- activate the climate control system using the special button and operate the knob to select the second fan speed for 15 seconds.

If the vehicle is equipped with a Cruise Control system

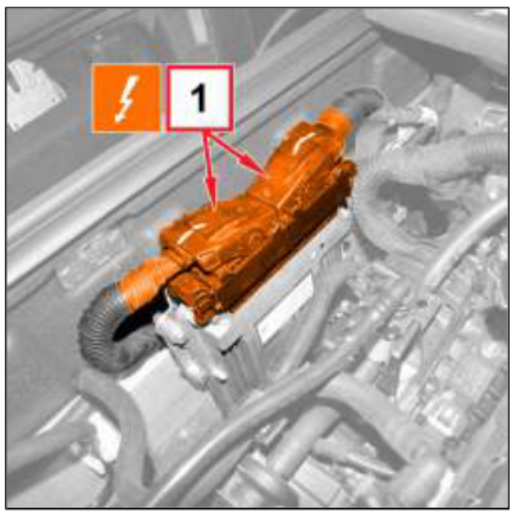
the following self-learning procedure must also be carried out:

- activate the system for a few seconds by turning the switch on the control lever to ON.

- Disconnect the negative battery terminal.

	Name	Connector
-	BATTERY	See A001 BATTERY

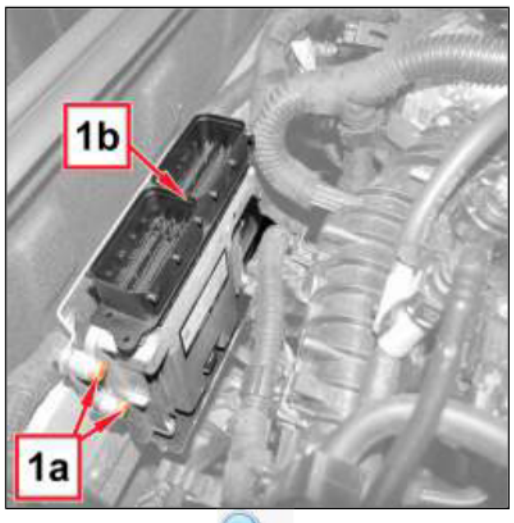
Op. 1016A10 SOUND-PROOFING COVER - R.R



1. Disconnect the electrical connections for the injection/ignition system control unit.

	Name	Connector
1	Engine management control unit	See M010 ENGINE MANAGEMENT CONTROL UNIT

cardiagn.com



1. On both sides, undo the fixing screws (1a) and remove the injection-ignition system control unit.

Refitting (Removing)

- Place the injection-ignition system control unit in its housing and tighten the fixing screws.

- Connect the electrical connections for the injection/ignition system control unit.

	Name	Connector
-	Engine management control unit	See M010 ENGINE MANAGEMENT CONTROL UNIT

Op. 1016A10 SOUND-PROOFING COVER - R.R

- Connect the negative battery terminal.

	Name	Connector
-	BATTERY	See A001 BATTERY

cardiagn.com

back toWaste gate valve (Electrical test) - Circuit short to ground

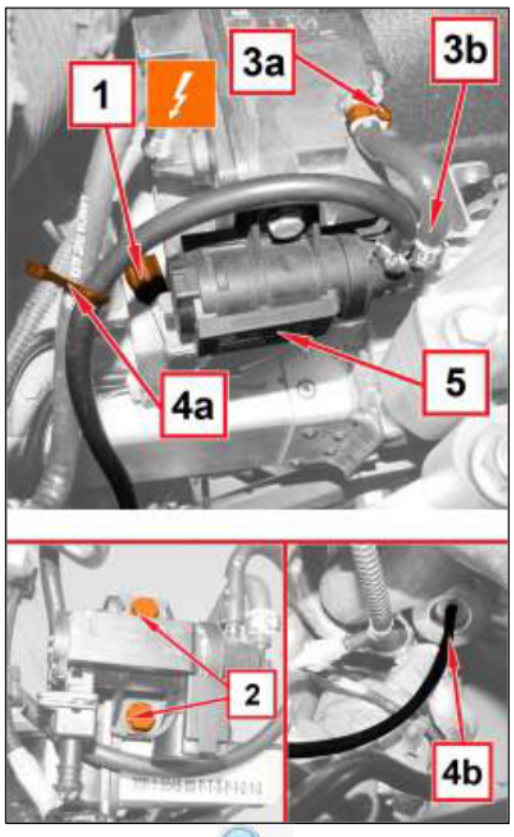
⊞ Detail ⊟ Detail

Removing (Refitting)

- Disconnect the negative battery terminal.

	Name	Connector
-	BATTERY	See A001 BATTERY

⊞ Op. 1016A10 SOUND-PROOFING COVER - R.R



1. Disconnect the electrical connection for the wastegate control solenoid valve.

	Name	Connector
1	WASTEGATE SOLENOID VALVE	See L037 WASTE GATE SOLENOID VALVE

2. Undo the solenoid valve fixing screws.

3. Working on the retaining band (3a) disconnect the solenoid valve pipe (3b), vacuum reservoir side.

4. Open the retaining band (4a) and disconnect the solenoid valve pipe (4b), turbocharger side.

5. Remove the wastegate control solenoid valve complete with pipes.

Refitting (Removing)

- Fit the wastegate control solenoid valve in its housing.

- Connect the solenoid valve pipe, turbocharger side, and secure it using a new retaining band.

- Connect the solenoid valve pipe, vacuum reservoir side, using a new retaining band.

- Connect the electrical connection for the wastegate control solenoid valve.

	Name	Connector
-	WASTEGATE SOLENOID VALVE	See L037 WASTE GATE SOLENOID VALVE

⊞ Op. 1016A10 SOUND-PROOFING COVER - R.R

- Connect the negative battery terminal.

	Name	Connector

cardiagn.com

-	BATTERY	See A001 BATTERY

cardiagn.com

back toAccelerator pedal potentiometer 2 - Circuit short to battery

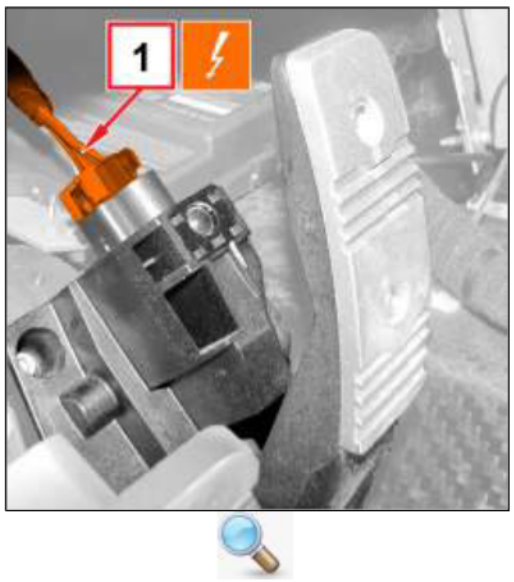
Detail Detail

Removing (Refitting)

- Disconnect the negative battery terminal.

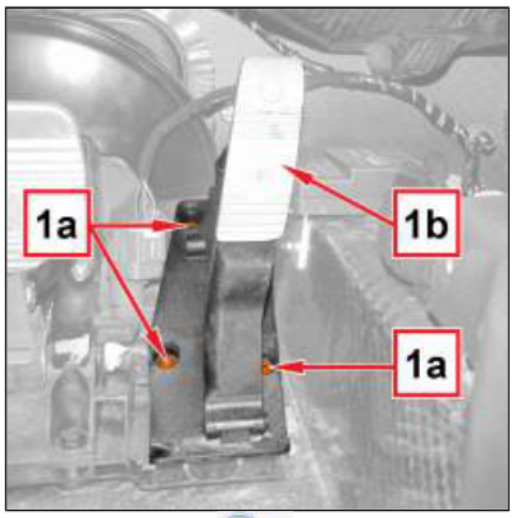
	Name	Connector
-	BATTERY	See A001 BATTERY

1. Detach the accelerator pedal connection.



	Name	Connector
1	ACCELERATOR PEDAL POTENTIOMETER	See K055 ACCELERATOR PEDAL POTENTIOMETER

1. Undo the fixing screws (1a) and remove the accelerator pedal (1b).



Refitting (Removing)

- Fit the accelerator pedal in its housing and tighten the fixing screws.

- Connect the accelerator pedal connection.

	Name	Connector
-	ACCELERATOR PEDAL POTENTIOMETER	See K055 ACCELERATOR PEDAL POTENTIOMETER

- Connect the negative battery terminal.

	Name	Connector

cardiagn.com

-	BATTERY	See A001 BATTERY

cardiagn.com

Removing (Refitting)

Op. 0010R30 VEHICLE POSITIONING ON THE LIFT

- Disconnect the negative battery terminal.

	Name	Connector
-	BATTERY	See A001 BATTERY

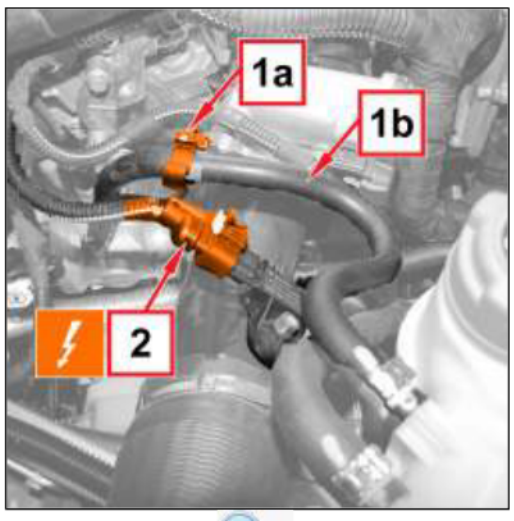
Op. 1016A10 SOUND-PROOFING COVER - R.R

Op. 1056F82 CONTROL UNIT (ONE) FOR INJECTION IGNITION SYSTEM - R.R.

Op. 7055B54 PROTECTION/GUARD UNDER ENGINE -R.R.

Op. 7055B95 FRONT AERODYNAMIC GUARD - R.R.

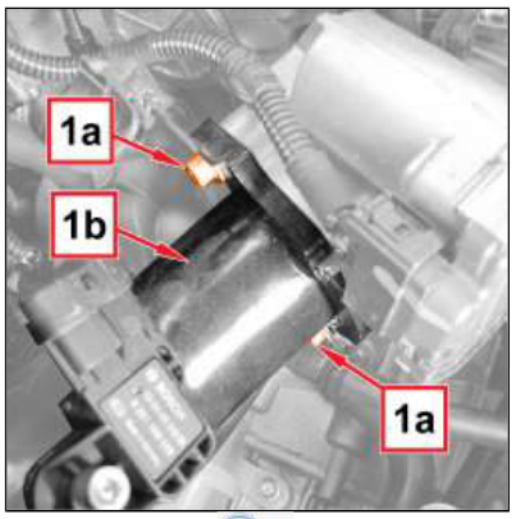
Op. 0010T20 ENGINE COOLANT - CHANGE



1. Open the retaining clip (1a) and release the degassing pipe (1b).

2. Disconnect the electrical connection for the intake air pressure/temperature sensor.

	Name	Connector
2	AIR TEMPERATURE/PRESSURE SENSOR	See K044 AIR TEMPERATURE/PRESSURE SENSOR

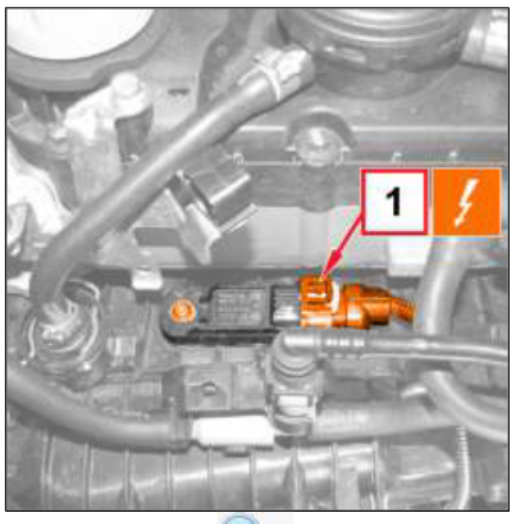


1. Undo the fixing screws (1a) and place throttle body air inlet pipe (1c) to one side.

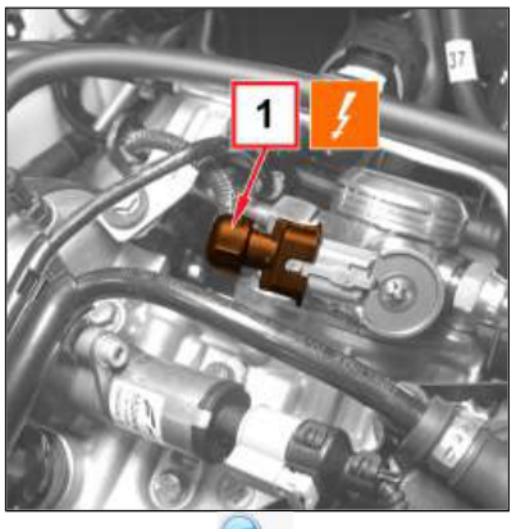
1. Disconnect the electrical connection for the air pressure sensor.

	Name	Connector

cardiagn.com

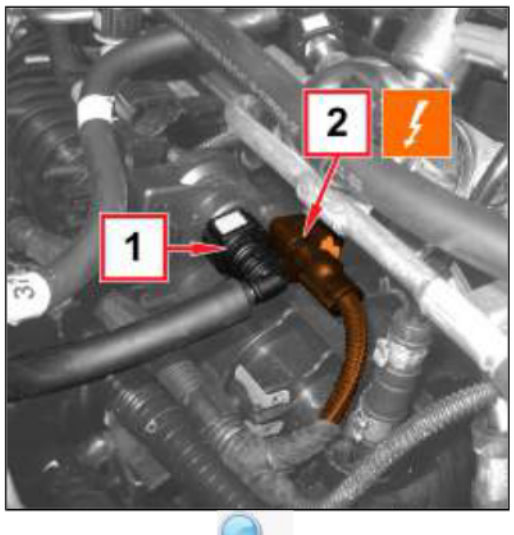


1	ABSOLUTE PRESSURE SENSOR	See K048 ABSOLUTE PRESSURE SENSOR



1. Disconnect the electrical connection for the fuel pressure regulator.

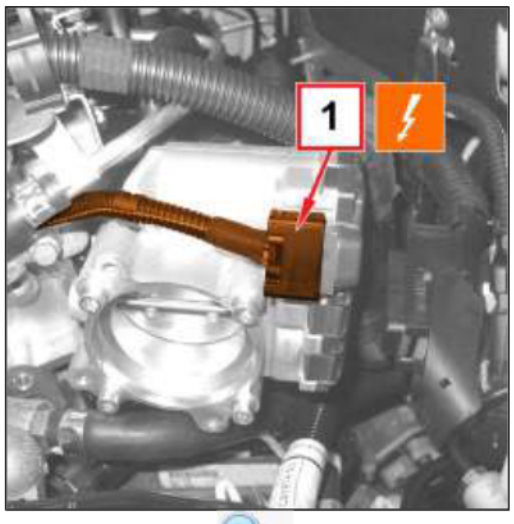
	Name	Connector
1	Fuel pressure regulator	See N077 FUEL PRESSURE REGULATOR



1. Disconnect the quick coupling for the fuel vapour delivery pipe, solenoid valve side.

2. Detach the electrical connection for the fuel vapour recovery solenoid.

	Name	Connector
2	Fuel vapour recovery solenoid valve	See L010 FUEL VAPOUR RECOVERY SOLENOID VALVE



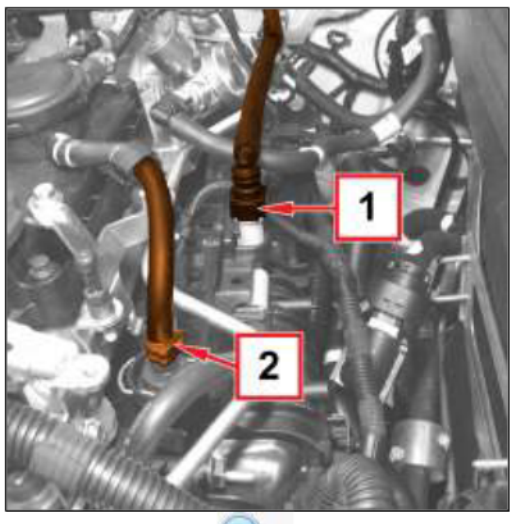
1. Detach the electrical connection for the throttle body.

	Name	Connector
1	Integrated throttle body actuator	See N075 INTEGRATED THROTTLE BODY ACTUATOR

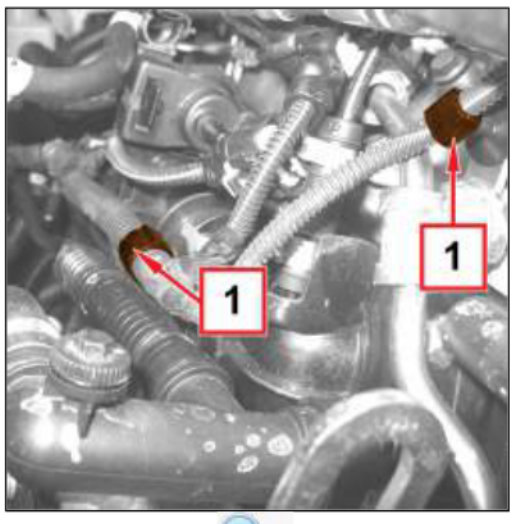
1. Disconnect the quick coupling for the fuel vapour pipe, one-way valve side.

2. Loosen the band and disconnect the intake chamber oil vapour delivery pipe, intake chamber side.

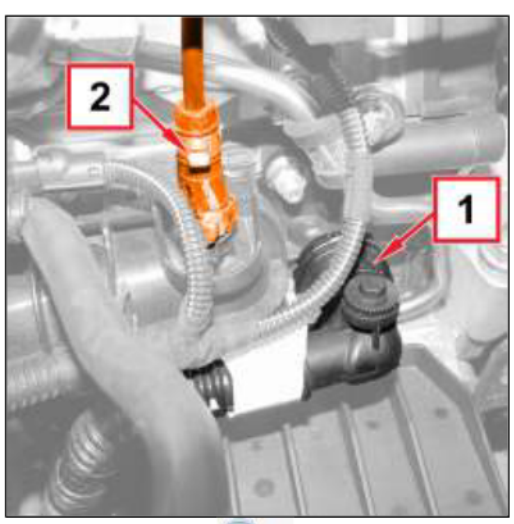
cardiagn.com



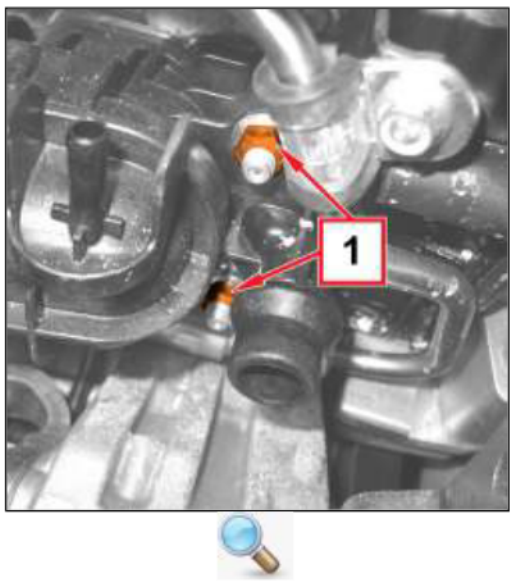
1. Release the wiring from the retaining clips.



1. Open the clip and disconnect the quick coupling for the water pump return pipe, intake chamber side.
2. Loosen the band and disconnect the turbocharging air by-pass valve control pipe, intake chamber side.

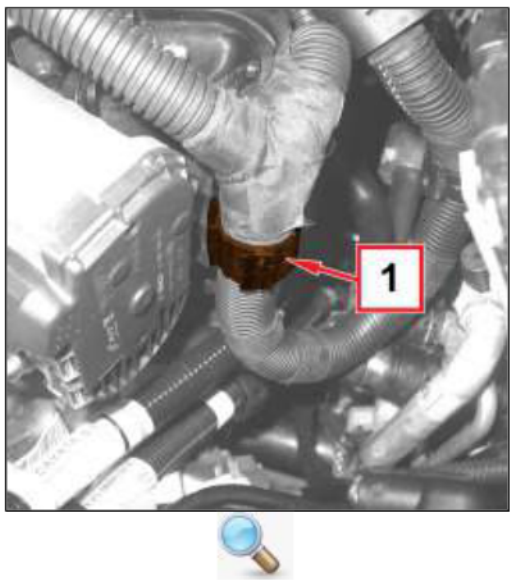


1. Undo the nuts fixing the intake chamber.



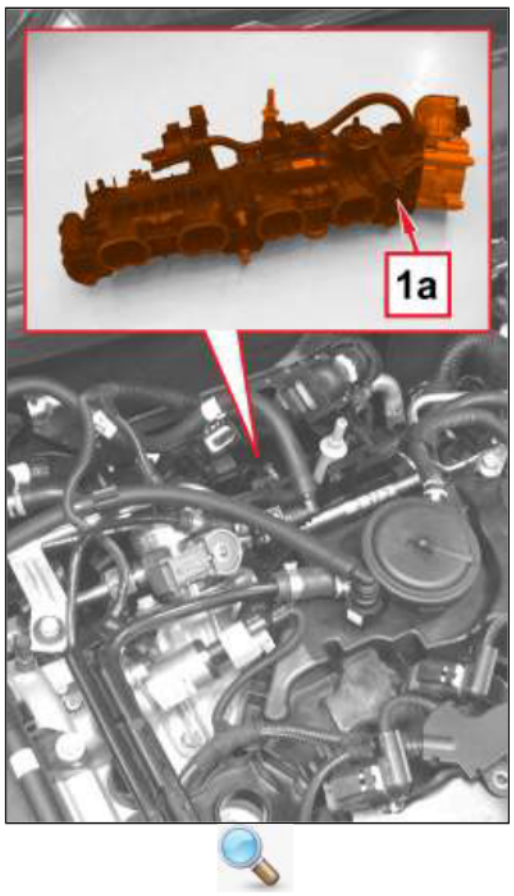
1. Release the engine wiring from the retaining band on the intake chamber.

cardiagn.com



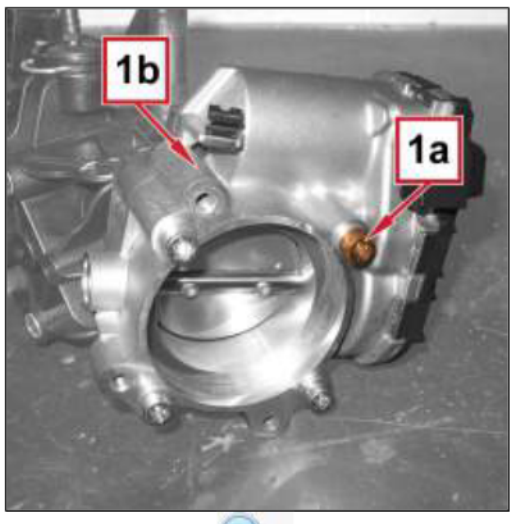
1. Undo the screws with double shank fixing the intake chamber.

- Remove the intake chamber with gaskets.

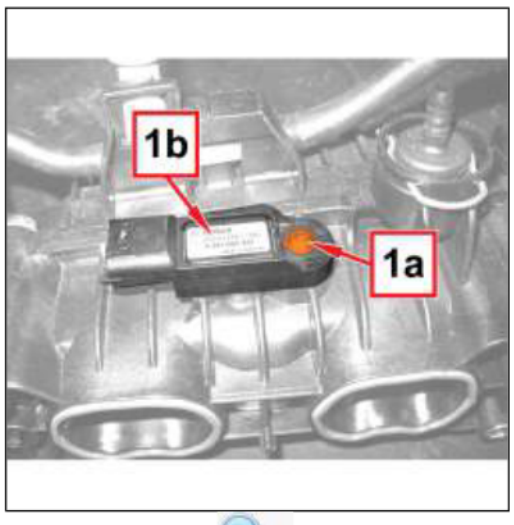


1. If required, undo the screws (1a) and remove the throttle body (1b).

cardiagn.com



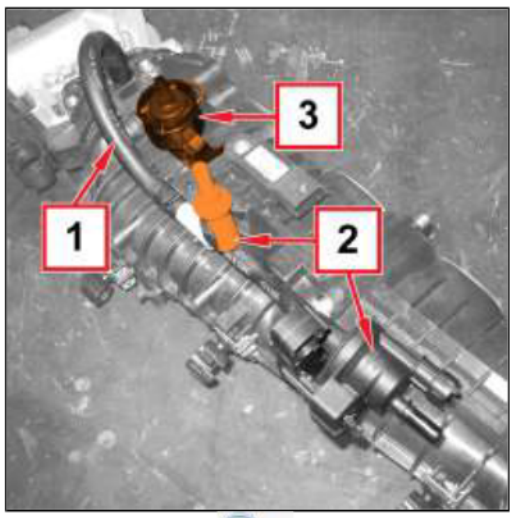
1. If required, undo the screw (1a) and remove the overpressure sensor (1b).



1. If required, loosen the band and disconnect the fuel vapour pipe.

2. If required, release and remove the fuel vapour solenoid valve with one-way valves.

3. If required, open the retaining clip and remove the one-way valve for engine oil vapour delivery.



Refitting (Removing)

- Place the intake chamber with new gaskets in position and tighten the fasteners.

Component	Fixing	dia	Value (daNm)	Validity
Air intake chamber	Screw	M8x1.25x87.25	1.8 ÷ 2.2	1750 Turbo Petrol
Component	Fixing	dia	Value (daNm)	Validity
Air intake chamber	Nut	M8x1.25	1.8 ÷ 2.2	1750 Turbo Petrol

- Connect the air inlet pipe to the throttle body and tighten the fixing screws.

- Secure the degassing pipe and close the retaining clip.

cardiagn.com

- Connect the electrical connection for the intake air pressure/temperature sensor.

	Name	Connector
-	AIR TEMPERATURE/PRESSURE SENSOR	See K044 AIR TEMPERATURE/PRESSURE SENSOR

- Secure the engine wiring to the retaining band on the intake chamber.

- Connect the turbocharging air by-pass valve control pipe, intake chamber side, and tighten the band.

- Secure the wiring to the fixing clips.

- Connect the quick coupling for the water pump return pipe, intake chamber side, using the retaining clip.

- Connect the intake chamber oil vapour delivery pipe, intake chamber side, and tighten the band.

- Connect the quick coupling for the fuel vapour pipe, one-way valve side.

- Connect the electrical connection for the throttle body.

	Name	Connector
-	Integrated throttle body actuator	See N075 INTEGRATED THROTTLE BODY ACTUATOR

- Secure the electrical connection for the fuel vapour recovery solenoid.

	Name	Connector
-	Fuel vapour recovery solenoid valve	See L010 FUEL VAPOUR RECOVERY SOLENOID VALVE

- Connect the quick coupling for the fuel vapour delivery pipe, solenoid valve side.

- Connect the electrical connection for the fuel pressure regulator.

	Name	Connector
-	Fuel pressure regulator	See N077 FUEL PRESSURE REGULATOR

- Connect the electrical connection for the air pressure sensor.

	Name	Connector
-	ABSOLUTE PRESSURE SENSOR	See K048 ABSOLUTE PRESSURE SENSOR

⊞ Op. 0010T20 ENGINE COOLANT - CHANGE

⊞ Op. 7055B95 FRONT AERODYNAMIC GUARD - R.R.

⊞ Op. 7055B54 PROTECTION/GUARD UNDER ENGINE -R.R.

⊞ Op. 1056F82 CONTROL UNIT (ONE) FOR INJECTION IGNITION SYSTEM - R.R.

cardiagn.com

⊞ Op. 1016A10 SOUND-PROOFING COVER - R.R

- Connect the negative battery terminal.

	Name	Connector
-	BATTERY	See A001 BATTERY

- Remove the car from the lift.

cardiagn.com

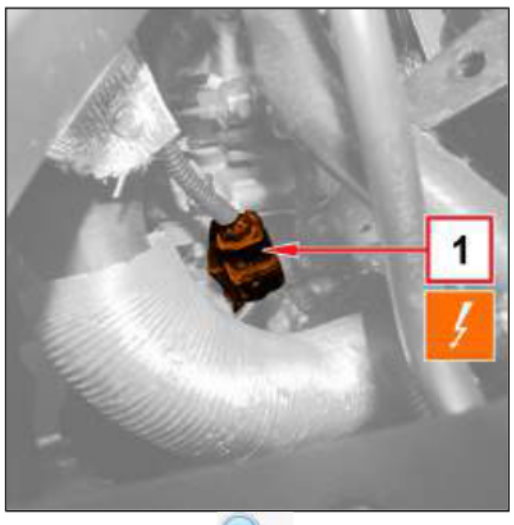
Removing (Refitting)

Op. 1016A10 SOUND-PROOFING COVER - R.R

- Disconnect the negative battery terminal.

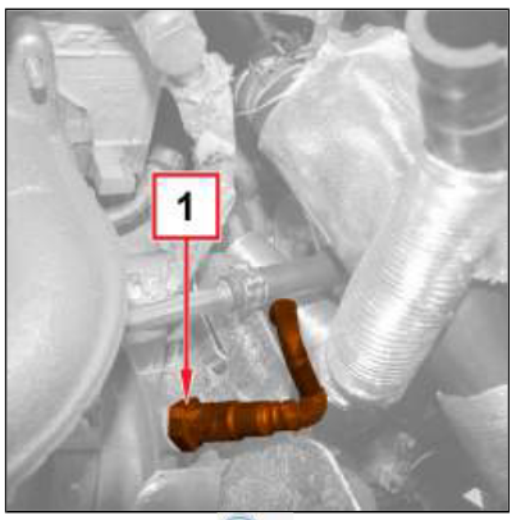
	Name	Connector
-	BATTERY	See A001 BATTERY

1. Disconnect the electrical connection for the front oxygen sensor.

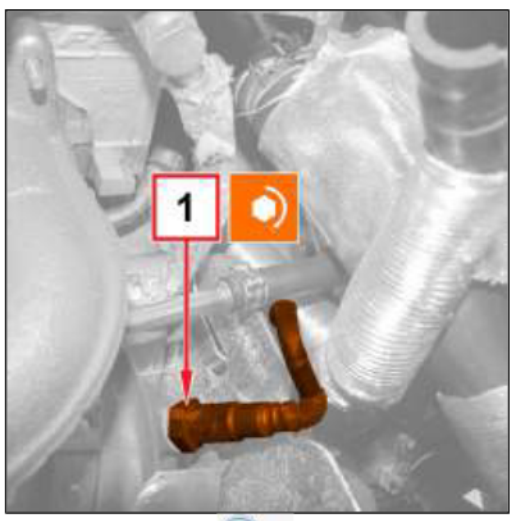


	Name	Connector
1	OXYGEN SENSOR ON PRE-CATALYTIC CONVERTER	See K015 LAMBDA SENSOR ON PRE-CATALYZER

1. Undo the front oxygen sensor and remove it.



Refitting (Removing)



1. Fasten the front oxygen sensor.

Component	Fixing	dia	Value (daNm)	Validity
Oxygen sensor (front and rear)	-	M18x1.5	4.1 ÷ 5.0	1750 Turbo Petrol

cardiagn.com

- Connect the electrical connection for the front oxygen sensor.

	Name	Connector
-	OXYGEN SENSOR ON PRE-CATALYTIC CONVERTER	See K015 LAMBDA SENSOR ON PRE-CATALYZER

- Connect the negative battery terminal.

	Name	Connector
-	BATTERY	See A001 BATTERY

⊞ Op. 1016A10 SOUND-PROOFING COVER - R.R

cardiagn.com

back toDownstream lambda probe (Electrical Test) - Circuit short to battery

⊞ Detail ⊟ Detail

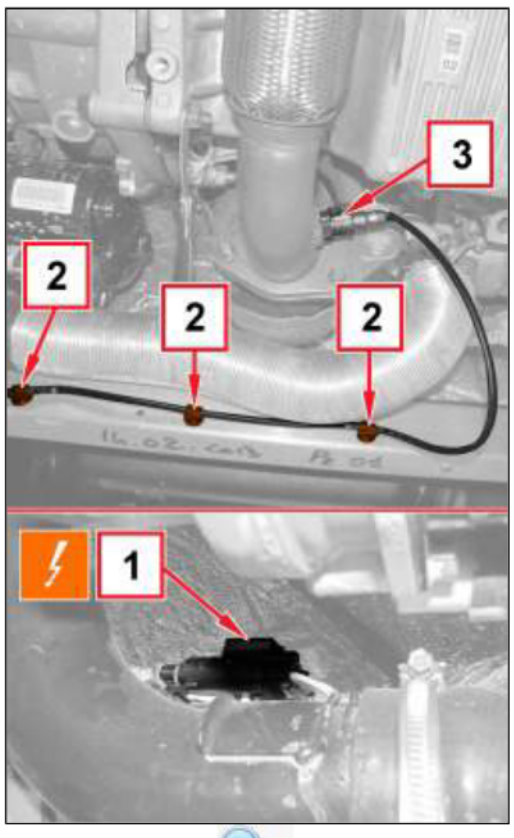
Removing (Refitting)

⊞ Op. 0010R30 VEHICLE POSITIONING ON THE LIFT

- Disconnect the negative battery terminal.

	Name	Connector
-	BATTERY	See A001 BATTERY

⊞ Op. 7055B54 PROTECTION/GUARD UNDER ENGINE -R.R.

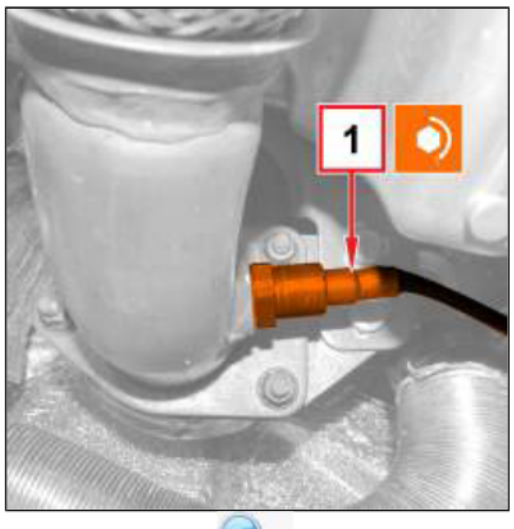


1. Disconnect the electrical connection for the oxygen sensor.

	Name	Connector
1	OXYGEN SENSOR ON CATALYTIC CONVERTER	See K017 LAMBDA SENSOR ON CATALYZER

2. Release the wiring from the retaining clips.

3. Undo and remove the rear oxygen sensor.



Refitting (Removing)

1. Fasten the rear oxygen sensor.

Component	Fixing	dia	Value (daNm)	Validity
Oxygen sensor (front and rear)	-	M18x1.5	4.1 ÷ 5.0	1750 Turbo Petrol

- Secure the wiring to the retaining clips.

- Connect the electrical connection for the oxygen sensor.

	Name	Connector

cardiagn.com

-	OXYGEN SENSOR ON CATALYTIC CONVERTER	See K017 LAMBDA SENSOR ON CATALYZER

⊞ Op. 7055B54 PROTECTION/GUARD UNDER ENGINE -R.R.

- Connect the negative battery terminal.

	Name	Connector
-	BATTERY	See A001 BATTERY

- Remove the car from the lift.

cardiagn.com

643 - ALFA 4C 1750 Turbo Benzina ENABLEMENT SOLENOID FOR FLOW OF FUEL VAPOUR TO INLET - R+R 1080E20

back toEvaporative emission control system (EVAP) - Circuit short to battery

⊞ Detail ⊟ Detail

Removing (Refitting)

⊞ Op. 0010R30 VEHICLE POSITIONING ON THE LIFT

- Disconnect the negative battery terminal.

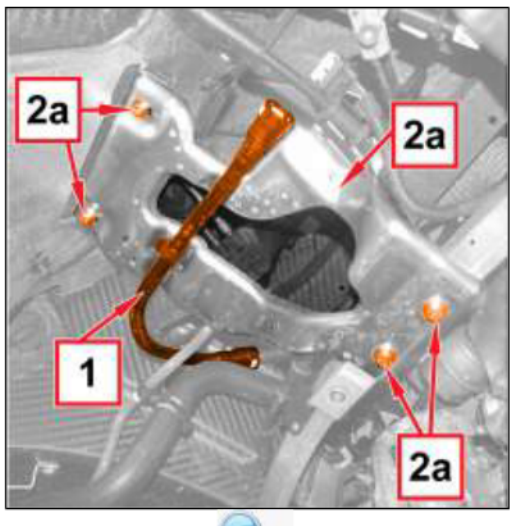
	Name	Connector
-	BATTERY	See A001 BATTERY

⊞ Op. 7055B54 PROTECTION/GUARD UNDER ENGINE -R.R.

⊞ Op. 7055B98 REAR AERODYNAMIC GUARD - R.R.

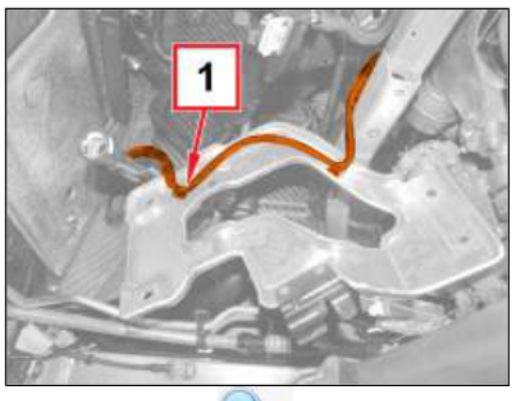
⊞ Op. 7095E60 INSULATING PANEL FOR ENGINE COMPARTMENT/FUEL TANK PARTITION - R.R.

⊞ Op. 1040A10 FUEL TANK - R + R AND DECANT FUEL



1. Release the fuel vapour bleed pipe from the retaining clip.

2. Undo the fixing screws (2a) and remove the bracket (2b).



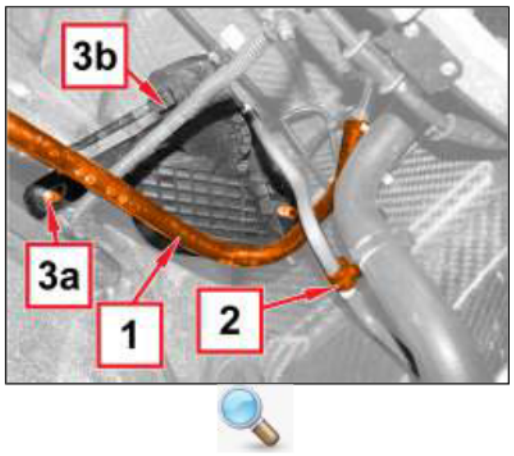
1. Release the electrical wiring from the retaining clips, located on the bracket.

1. Adjust the quick coupling, disconnect and remove the fuel vapour bleed pipe.

2. Release the fuel vapour bleed pipe from the retaining clip.

3. Undo the fixing screws (3a) and remove the activated charcoal filter (3b).

cardiagn.com



Refitting (Removing)

- Reposition the activated charcoal filter and tighten the fixing screws.

- Engage the fuel vapour bleed pipe retaining clips.

- Adjust the quick coupling and connect the fuel vapour bleed pipe.

- Engage the retaining clips for the electric wiring to the bracket.

- Refit the mounting bracket and tighten the fixing screws.

- Secure the fuel vapour bleed pipe and close the retaining clip.

⊞ Op. 1040A10 FUEL TANK - R + R AND DECANT FUEL

⊞ Op. 7095E60 INSULATING PANEL FOR ENGINE COMPARTMENT/FUEL TANK PARTITION - R.R.

⊞ Op. 7055B98 REAR AERODYNAMIC GUARD - R.R.

⊞ Op. 7055B54 PROTECTION/GUARD UNDER ENGINE -R.R.

- Connect the negative battery terminal.

	Name	Connector
-	BATTERY	See A001 BATTERY

- Remove the car from the lift.

cardiagn.com

Removing (Refitting)

Op. 0010R30 VEHICLE POSITIONING ON THE LIFT

- Disconnect the negative battery terminal.

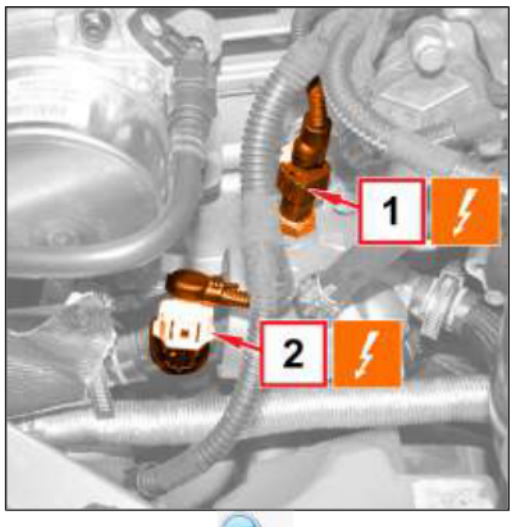
	Name	Connector
-	BATTERY	See A001 BATTERY

Op. 7055B95 FRONT AERODYNAMIC GUARD - R.R.

Op. 0010T20 ENGINE COOLANT - CHANGE

Op. 7055B54 PROTECTION/GUARD UNDER ENGINE -R.R.

Op. 1016A10 SOUND-PROOFING COVER - R.R

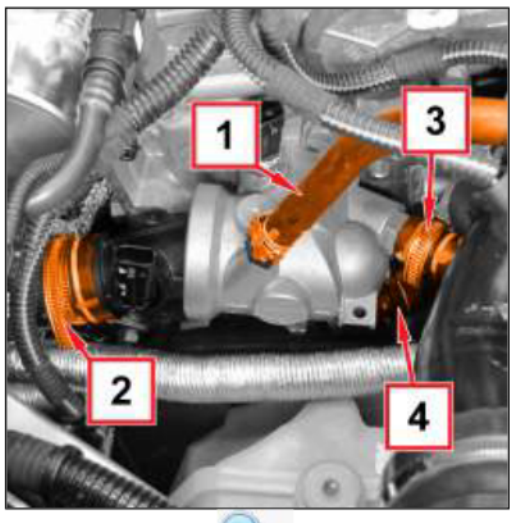


1. Disconnect the electrical connection for the engine coolant temperature sensor.

	Name	Connector
1	ENGINE COOLANT TEMPERATURE SENSOR/SENDER UNIT	See K036 ENGINE COOLANT TEMPERATURE SENSOR/SENDER UNIT

2. Disconnect the electrical connection for the engine water heating coil.

	Name	Connector
2	ENGINE WATER HEATING COIL	See O055 ENGINE WATER HEATING COIL



1. Open the retaining band and disconnect the degassing pipe from the engine coolant reservoir and thermostat, thermostat side.

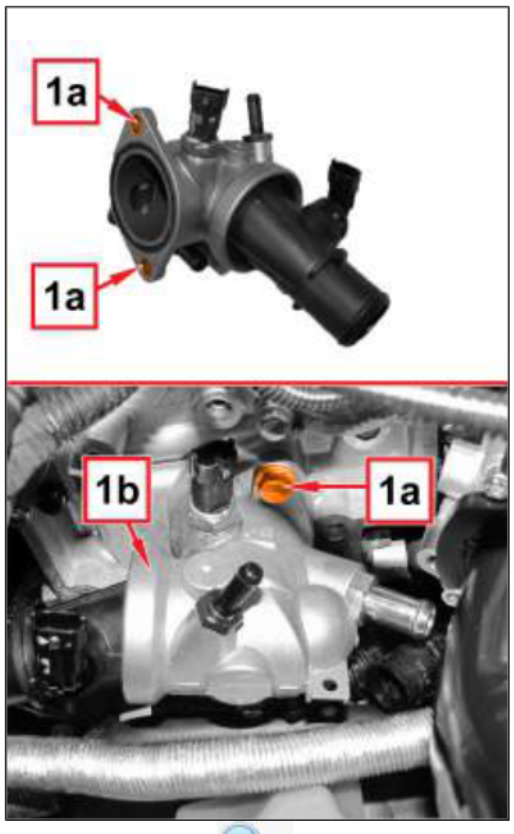
2. Open the retaining band and disconnect the engine coolant outlet sleeve from thermostat to radiator.

3. Open the retaining band and disconnect the coolant supply sleeve to the heater.

4. Adjust the quick coupling and disconnect the coolant supply pipe to the heat exchanger.

1. Undo the fixing screws (1a) and place the thermostat (1b) to one side.

cardiagn.com



1. Open the retaining band and disconnect the engine coolant supply pipe to the turbocharger.

- Remove the thermostat from the housing.

1. Remove the O-ring from the thermostat.

2. If required, undo the coolant temperature sensor and remove it.

3. If required, adjust the quick coupling and remove the engine water heating coil.

Refitting (Removing)

1. If removed, place the coolant temperature sensor back in its housing and tighten it.

Component	Fixing	dia	Value (daNm)	Validity
Engine coolant temperature	-	M16x1.5	2.7 ÷ 3.3	1750 Turbo Petrol

cardiagn.com

sender unit				

- If removed, adjust the quick coupling and reposition the electronic thermostat.

- Fit a new O-ring in the groove on the thermostat.

- Connect the coolant supply pipe to the turbocharger and tighten the retaining band.

1. Reposition the thermostat (1a) in its housing and tighten the fixing screws (1b).

Component	Fixing	Ø	Value (daNm)	Validity
Thermostat	Screw	M8x1.25x25	2.3 ÷ 2.8	1750 Turbo Petrol

- Adjust the quick coupling and connect the coolant supply pipe to the heat exchanger.

- Connect the coolant supply sleeve to the heater and tighten the retaining band.

- Connect the engine coolant supply sleeve to the radiator and close the retaining band.

- Connect the degassing pipe and close the new retaining band.

- Connect the electrical connection for the coolant temperature sensor.

	Name	Connector
-	ENGINE COOLANT TEMPERATURE SENSOR/SENDER UNIT	See K036 ENGINE COOLANT TEMPERATURE SENSOR/SENDER UNIT

- Connect the electrical connection for the engine water heating coil.

	Name	Connector
-	ENGINE WATER HEATING COIL	See O055 ENGINE WATER HEATING COIL

⊞ Op. 1016A10 SOUND-PROOFING COVER - R.R

⊞ Op. 7055B54 PROTECTION/GUARD UNDER ENGINE -R.R.

⊞ Op. 0010T20 ENGINE COOLANT - CHANGE

⊞ Op. 7055B95 FRONT AERODYNAMIC GUARD - R.R.

- Connect the negative battery terminal.

cardiagn.com

	Name	Connector
-	BATTERY	See A001 BATTERY

- Remove the car from the lift.

cardiagn.com

Removing (Refitting)

Op. 0010R30 VEHICLE POSITIONING ON THE LIFT

If the electronic control unit (TCU) is replaced, after refitting, carry out the "kiss point" and "clutch transmissibility curve fine-tuning" procedures.

Connect the Examiner diagnosis equipment and carry out:

- data set deletion

- clutch self-calibration enabling

- end of line/service self-calibration

- longitudinal accelerator sensor learning

- "HISTORICAL DATA" rewriting.

If the TCU and any other component subject to a "data set deletion" procedure are replaced simultaneously, the "HISTORICAL DATA" must be copied and then the data set deletion can be carried out for the component to be replaced.

If the TCU to be replaced does not allow the data to be read, the "HISTORICAL DATA" rewriting procedure cannot be carried out; the system operation is not adversely affected.

Within the "clutch self-calibration enabling" procedure, a "clutch heating procedure" could be required to be carried out as described below:

Clutch heating procedure

1. Select the manual mode.

2. Engage the 1st gear and take off with the pedal in middle/low position.

3. After reaching a sufficient engine rpm, engage the 2nd gear.

4. Drive for a short distance to make sure that the even gear clutch is closed, slow down until the automatic downshifting threshold is almost reached, then press the accelerator (pedal in middle/low position) in order to set off in 2nd gear which causes the K2 clutch to slip and allows it to be heated.

5. Check the K1 and K2 clutch temperatures. If at least one is lower than 40°C, repeat the procedure from point 2; otherwise proceed according to the flow shown on Examiner.

At the end of the procedures carried out with the Examiner diagnosis equipment, fine-tune the clutch transmissibility curves as described below:

Transmissibility fine-tuning procedure

Before carrying out the procedure, wait until the engine is warm (engine coolant temperature > 90°C).

1. Select the manual mode.

2. Engage the 1st gear and set off with the pedal in middle position.

3. After reaching a sufficient engine rpm, engage the 2nd gear.

4. Drive for a short distance to make sure that the even gear clutch is closed, slow down until the automatic downshifting threshold is almost reached, then press the accelerator (pedal in middle position) in order to set off in 2nd gear.

5. Engage the 1st gear and set off with the pedal in middle/high position.

6. After reaching a sufficient engine rpm, engage the 2nd gear.

7. Drive for a short distance to make sure that the even gear clutch is closed, slow down until the automatic downshifting threshold is almost reached, then press the accelerator (pedal in middle/high position) in order to set off in 2nd gear.

cardiagn.com

8. Engage the 1st gear and set off with the pedal in low position.

9. After reaching a sufficient engine rpm, engage the 2nd gear.

10. Drive for a short distance to make sure that the even gear clutch is closed, slow down until reaching the automatic downshifting threshold, then press the accelerator (pedal in low position) in order to set off in 2nd gear.

11. Select the automatic mode.

12. Drive the car for about 5 km, possibly on a mixed urban/extra-urban route, making sure to change gears in different accelerator pedal conditions.

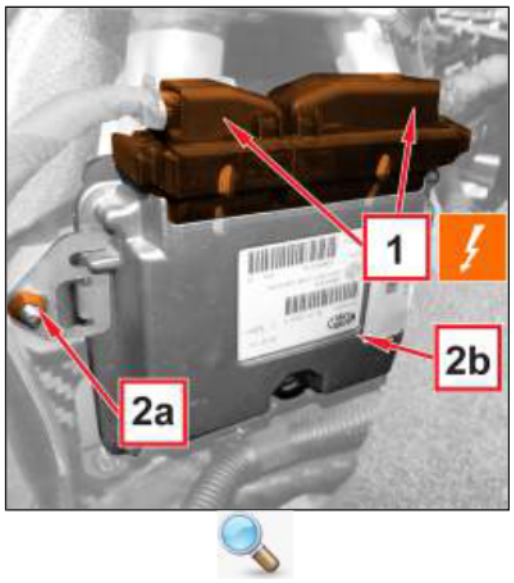
- Disconnect the negative battery terminal.

	Name	Connector
-	BATTERY	See A001 BATTERY

⊞ Op. 4450B06 LEFT REAR WHEEL - R.R

⊞ Op. 7055B44 LEFT REAR WHEEL ARCH LINER - R.R

⊞ Op. 7210E51 LEFT REAR WING



1. Disconnect the electrical connections from the control unit.

	Name	Connector
1	Dual clutch automatic transmission control unit	See M196 Dual clutch automatic transmission control unit

During the dismantling operations, protect the pins for the control unit connectors from accidental contact to prevent electrostatic discharges and mechanical damage.

2. Undo the nut (2a) and remove the electronic control unit (TCU) (2b).

Refitting (Removing)

- Fit the ELECTRONIC control unit (TCU) in its housing and tighten the fixing nut.
- Connect the electrical connections from the control unit.

	Name	Connector
-	Dual clutch automatic transmission control unit	See M196 Dual clutch automatic transmission control unit

⊞ Op. 7210E51 LEFT REAR WING

⊞ Op. 7055B44 LEFT REAR WHEEL ARCH LINER - R.R

⊞ Op. 4450B06 LEFT REAR WHEEL - R.R

- Connect the negative battery terminal.

	Name	Connector

cardiagn.com

-	BATTERY	See A001 BATTERY

- Remove the car from the lift.

cardiagn.com

Removing (Refitting)

Op. 0010R30 VEHICLE POSITIONING ON THE LIFT

If the electronic control unit (TCU) is replaced, after refitting, carry out the "kiss point" and "clutch transmissibility curve fine-tuning" procedures.

Connect the Examiner diagnosis equipment and carry out:

- data set deletion

- clutch self-calibration enabling

- end of line/service self-calibration

- longitudinal accelerator sensor learning

- "HISTORICAL DATA" rewriting.

If the TCU and any other component subject to a "data set deletion" procedure are replaced simultaneously, the "HISTORICAL DATA" must be copied and then the data set deletion can be carried out for the component to be replaced.

If the TCU to be replaced does not allow the data to be read, the "HISTORICAL DATA" rewriting procedure cannot be carried out; the system operation is not adversely affected.

Within the "clutch self-calibration enabling" procedure, a "clutch heating procedure" could be required to be carried out as described below:

Clutch heating procedure

1. Select the manual mode.

2. Engage the 1st gear and take off with the pedal in middle/low position.

3. After reaching a sufficient engine rpm, engage the 2nd gear.

4. Drive for a short distance to make sure that the even gear clutch is closed, slow down until the automatic downshifting threshold is almost reached, then press the accelerator (pedal in middle/low position) in order to set off in 2nd gear which causes the K2 clutch to slip and allows it to be heated.

5. Check the K1 and K2 clutch temperatures. If at least one is lower than 40°C, repeat the procedure from point 2; otherwise proceed according to the flow shown on Examiner.

At the end of the procedures carried out with the Examiner diagnosis equipment, fine-tune the clutch transmissibility curves as described below:

Transmissibility fine-tuning procedure

Before carrying out the procedure, wait until the engine is warm (engine coolant temperature > 90°C).

1. Select the manual mode.

2. Engage the 1st gear and set off with the pedal in middle position.

3. After reaching a sufficient engine rpm, engage the 2nd gear.

4. Drive for a short distance to make sure that the even gear clutch is closed, slow down until the automatic downshifting threshold is almost reached, then press the accelerator (pedal in middle position) in order to set off in 2nd gear.

5. Engage the 1st gear and set off with the pedal in middle/high position.

6. After reaching a sufficient engine rpm, engage the 2nd gear.

7. Drive for a short distance to make sure that the even gear clutch is closed, slow down until the automatic downshifting threshold is almost reached, then press the accelerator (pedal in middle/high position) in order to set off in 2nd gear.

cardiagn.com

8. Engage the 1st gear and set off with the pedal in low position.

9. After reaching a sufficient engine rpm, engage the 2nd gear.

10. Drive for a short distance to make sure that the even gear clutch is closed, slow down until reaching the automatic downshifting threshold, then press the accelerator (pedal in low position) in order to set off in 2nd gear.

11. Select the automatic mode.

12. Drive the car for about 5 km, possibly on a mixed urban/extra-urban route, making sure to change gears in different accelerator pedal conditions.

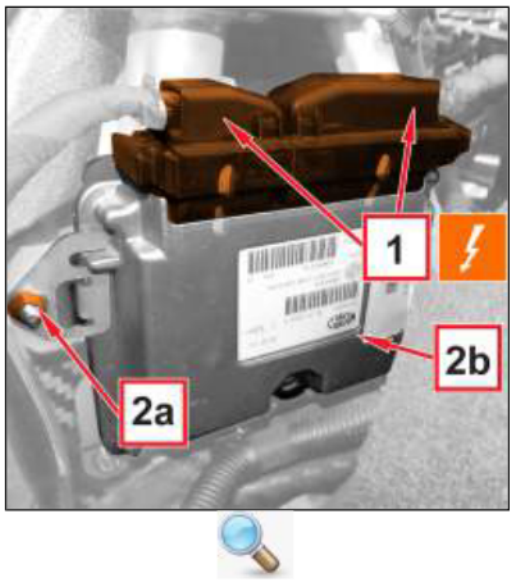
- Disconnect the negative battery terminal.

	Name	Connector
-	BATTERY	See A001 BATTERY

⊞ Op. 4450B06 LEFT REAR WHEEL - R.R

⊞ Op. 7055B44 LEFT REAR WHEEL ARCH LINER - R.R

⊞ Op. 7210E51 LEFT REAR WING



1. Disconnect the electrical connections from the control unit.

	Name	Connector
1	Dual clutch automatic transmission control unit	See M196 Dual clutch automatic transmission control unit

During the dismantling operations, protect the pins for the control unit connectors from accidental contact to prevent electrostatic discharges and mechanical damage.

2. Undo the nut (2a) and remove the electronic control unit (TCU) (2b).

Refitting (Removing)

- Fit the ELECTRONIC control unit (TCU) in its housing and tighten the fixing nut.
- Connect the electrical connections from the control unit.

	Name	Connector
-	Dual clutch automatic transmission control unit	See M196 Dual clutch automatic transmission control unit

⊞ Op. 7210E51 LEFT REAR WING

⊞ Op. 7055B44 LEFT REAR WHEEL ARCH LINER - R.R

⊞ Op. 4450B06 LEFT REAR WHEEL - R.R

- Connect the negative battery terminal.

	Name	Connector

cardiagn.com

-	BATTERY	See A001 BATTERY

- Remove the car from the lift.

cardiagn.com

Removing (Refitting)

Follow the recommended safety instructions

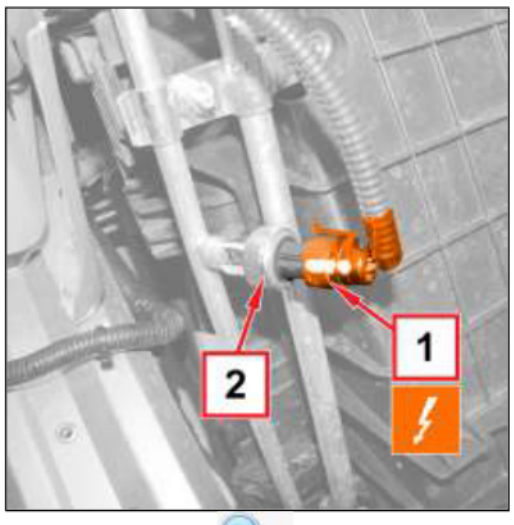
Op. 5040 AIR CONDITIONING CASING AND COMPONENTS

- Disconnect the negative battery terminal.

	Name	Connector
-	BATTERY	See A001 BATTERY

Op. 7210E21 BONNET - R.R.

Op. 0010T84 AIR CONDITIONING SYSTEM REFRIGERANT - DEHYDRATING AND REPRESSURIZING



1. Disconnect the electrical connection for the linear pressure switch.

	Name	Connector
1	LINEAR SENSOR FOR FANS	See K120 LINEAR SENSOR FOR FANS

2. Unscrew the linear pressure switch and remove it.

Refitting (Removing)

- Check that the linear pressure switch is not damaged.

Replace the O-rings on the connectors. Use only green-coloured rings that are resistant to used coolant.

- Tighten the linear sensor in its housing.

- Connect the electrical connection for the linear pressure switch.

	Name	Connector
-	LINEAR SENSOR FOR FANS	See K120 LINEAR SENSOR FOR FANS

Op. 0010T84 AIR CONDITIONING SYSTEM REFRIGERANT - DEHYDRATING AND REPRESSURIZING

Op. 7210E21 BONNET - R.R.

- Connect the negative battery terminal.

cardiagn.com

	Name	Connector
-	BATTERY	See A001 BATTERY

cardiagn.com

643 - ALFA 4C 1750 Turbo Benzina CHECK ON CLIMATE CONTROL COMPRESSOR ACTIVATION/DEACTIVATION FROM LINEAR SENSOR 5040BC

back toAir conditioner pressure sensor - Circuit short to battery

Disconnect the electrical connection for the linear sensor
See K120 LINEAR SENSOR FOR FANS
Check that Pin 1 is earthed and Pin 2 is at +5V.
Connect a linear potentiometer (with and end-of-scale of 1 kohm, previously positioned at around 500 ohm between the centre pin and one of the side pins) to the pins of the linear sensor electrical connector.
Turn the ignition key to the MAR-ON position.
Using a multimeter, check that the voltage between pins 1 and 3 is around 2.5V.
Switch on the engine, then switch on the air conditioning using the special switch located on the climate control system control unit.
The climate control system should come on normally in these circumstances.
Alter the potentiometer resistance until the voltage reading on the multimeter between pins 1 and 3 is about 0 V.
The air conditioning system should switch off in these conditions because the engine management node receives low circuit pressure information.
Alter the potentiometer resistance until the voltage reading on the multimeter between pins 1 and 3 is about 4.6 V.
The air conditioning system should switch off in these conditions because the engine management node receives high circuit pressure information.

cardiagn.com

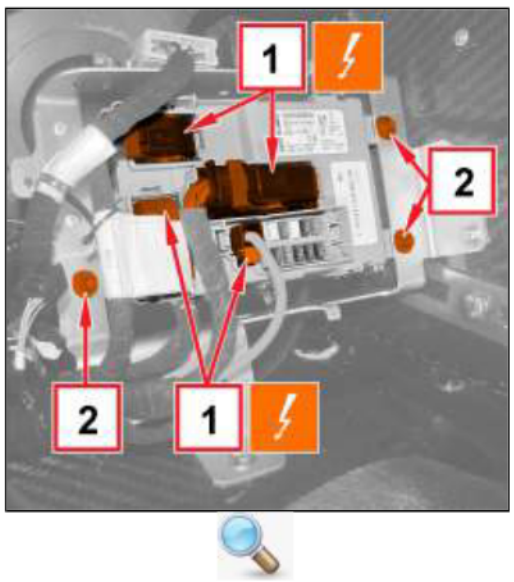
back toImmobilizer - Not programmed

Detail Detail

Removing (Refitting) - Disconnect the negative battery terminal.

	Name	Connector
-	BATTERY	See A001 BATTERY

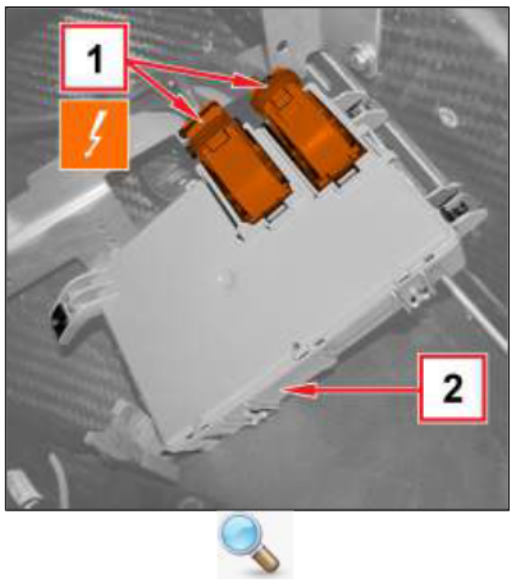
Op. 7040L81 PASSENGER SIDE FOOTREST - R.R.



1. Disconnect the front electrical connections for the Body Computer.

	Name	Connector
1	BODY COMPUTER	See M001 BODY COMPUTER

2. Undo the fixing screws and release the Body Computer from the mounting bracket.



1. Disconnect the rear electrical connections for the Body Computer.

	Name	Connector
1	BODY COMPUTER	See M001 BODY COMPUTER

2. Remove the Body Computer from its housing.

Refitting (Removing)

If the Body Computer is being replaced, an "identical copy" of the Body Computer must be obtained from the Parts Dept. as a V.O.R. order supplying the vehicle chassis number: this copy will contain all the default settings entered into the new vehicle which are stored in the Spare Parts Dept. database for the vehicle chassis number.

- Connect the rear electrical connections.

	Name	Connector
-	BODY COMPUTER	See M001 BODY COMPUTER

- Fit the Body Computer in its housing and tighten the fixing screws.

- Connect the front electrical connections for the Body Computer.

cardiagn.com

	Name	Connector
-	BODY COMPUTER	See M001 BODY COMPUTER

⊞ Op. 7040L81 PASSENGER SIDE FOOTREST - R.R.

- Connect the negative battery terminal.

	Name	Connector
-	BATTERY	See A001 BATTERY

- If the same Body Computer that was removed is being refitted on the vehicle, use Examiner to check that the system has not acquired errors during the operation.

- Check the operation of the electrical system.

cardiagn.com

back toEngine speed sensor - Signal plausibility failure

Detail Detail

Removing (Refitting)

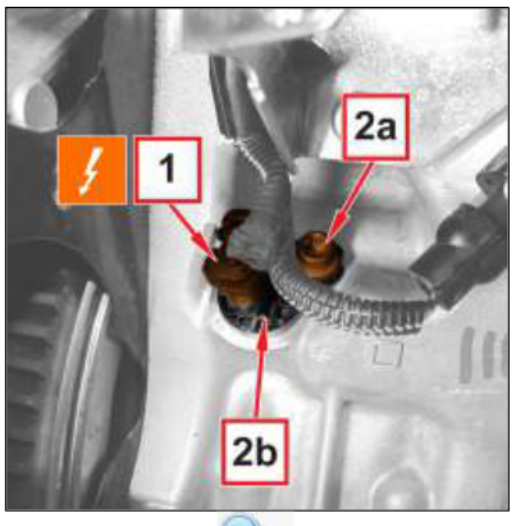
- Disconnect the negative battery terminal.

	Name	Connector
-	BATTERY	See A001 BATTERY

Op. 1016A10 SOUND-PROOFING COVER - R.R

Op. 1056F82 CONTROL UNIT (ONE) FOR INJECTION IGNITION SYSTEM - R.R.

Op. 5520B10 STARTER MOTOR - R.R.



1. Disconnect the electrical connection for the engine rpm sensor.

	Name	Connector
1	RPM SENSOR	See K046 RPM SENSOR

2. Undo the fixing screw (2a) and remove the engine rpm sensor (2b).

Refitting (Removing)

- Place the engine rpm sensor in position and tighten the fixing screw.

- Connect the electrical connection for the engine rpm sensor.

	Name	Connector
-	RPM SENSOR	See K046 RPM SENSOR

Op. 5520B10 STARTER MOTOR - R.R.

Op. 1056F82 CONTROL UNIT (ONE) FOR INJECTION IGNITION SYSTEM - R.R.

Op. 1016A10 SOUND-PROOFING COVER - R.R

cardiagn.com

cardiagn.com

643 - ALFA 4C 1750 Turbo Benzina CHECK ALTERNATOR TERMINAL "D+" 5530AA

back toAlternator signal - No operation

- Connect the Multimeter in Voltmeter mode with the positive terminal to terminal D+ of the alternator and the negative earthed
- With the ignition on, ensure that the measured voltage is less than 5.5 V and that the generator warning light on the panel is on
- If the voltage is interrupted, the alternator is inefficient and should be replaced
- Start the engine and check, with voltage D+ greater than 5.5 Volts, that the generator warning light on the panel goes off and a correct battery recharging indication is displayed.

cardiagn.com

eLEARN

LINEE DI COLLEGAMENTO CAN

643 - ALFA 4C

cardiagn.com

CAN CONNECTION LINES - DESCRIPTION

This vehicle is equipped with a CAN (Controller Area Network) system of electrical connections: it involves a software and hardware solution which is designed to efficiently manage the resources on the vehicle, allowing:

- the sharing of information between the various electronic units;

- the integration of several electronic units through one network;

- a high network information exchange speed;

- advantages in economic terms because there is a considerable reduction in the wiring/connectors inside the vehicle;

- higher standards in terms of quality and reliability.

The advantage of using a CAN system stems from the fact that communication takes place between numerous control units and consequently the number of signals to be managed is very high.

For this reason the signals travel on a CAN type serial Bus where one wire is high level (H) and the other low level (L); these signals on the CAN Bus are differential, i.e. the value assigned to the bit is represented by the difference between the CAN-H and CAN-L voltage levels.

The different electronic units which make up the system, known as network nodes, are connected to the CAN by means of communication interfaces known as transceivers; these connection interfaces, integrated in the electronic units, constitute the gate for sending/reading the information at the CAN or at the serial lines.

The exchange of information at CAN type serial lines is only possible using a transmission protocol which is the collection of rules that allow communication between two or more nodes by means of the exchange of information or data packages.

The main element of the network is the Body Computer.

The Body Computer node is entrusted with "waking up the network" at key on (if there is a fault with the Body Computer this task is entrusted to the instrument panel).

The Body Computer also carries out the network monitoring functions which make it possible to provide information on:

- the network activity status;

- the functional failure status of the individual electronic units (nodes)

- a possible fault in the CAN.

The various electronic units process the various signals coming from the corresponding sensors both for their own management and for other control units to which they are sent through the CAN

The specific structure adopted for this vehicle consists of two CAN communication networks that connect nodes belonging to two different areas:

- C-CAN for dynamic vehicle control (high speed): bus CAN-H and CAN-L;

- B-CAN for the management of standard body functions (low speed): bus CAN-A and CAN-B;

the two CAN communication networks are connected to one another by a gateway for transferring joint information, located in the Body Computer Node.

Diagnosis of nodes connected to the network - B-CAN and C-CAN - is carried out via the specific diagnosis connector

See E8010 DIAGNOSTIC MULTIPLE CONNECTOR

Power is distributed through the junction boxes and/or fuse boxes. These are connected to control elements (relays and static actuators) to ensure maximum electrical protection and minimum wiring complexity

See E1010 POWER SUPPLY

cardiagn.com

CAN CONNECTION LINES - FUNCTIONAL DESCRIPTION

The Body Computer M001 - connector A - receives a direct power supply from the battery through the line protected by maxi fuse F01 of the engine compartment control unit B001.

The Body Computer M001 receives an ignition-controlled power supply (INT) at pin 11 of connector E: this signal is used, amongst other things, to "wake up the network".

Pins 9, 10 of connector E of M001 provide the Body Computer with a reference earth.

The following nodes are connected to the Body Computer M001 via the C-CAN high speed network from pins 44 and 45 of connector B:

- Engine management control unit M010.

- ESP/ESC control unit M051;

- Twin clutch automatic transmission control unit M196;

The nodes connected to the Body Computer M001 through the CAN-C high speed network from pins 24 and 26 of connector F are:

- Steering angle control unit (NAS) M092

The following nodes are connected to the M001 Body Computer via the low speed B-CAN:

- Instrument panel E050, from pins 18, 20 of connector F;

- Airbag control unit M060, from pins 16, 21 of connector F;

- Parking sensor control unit M084, from pins 34, 49 of connector C;

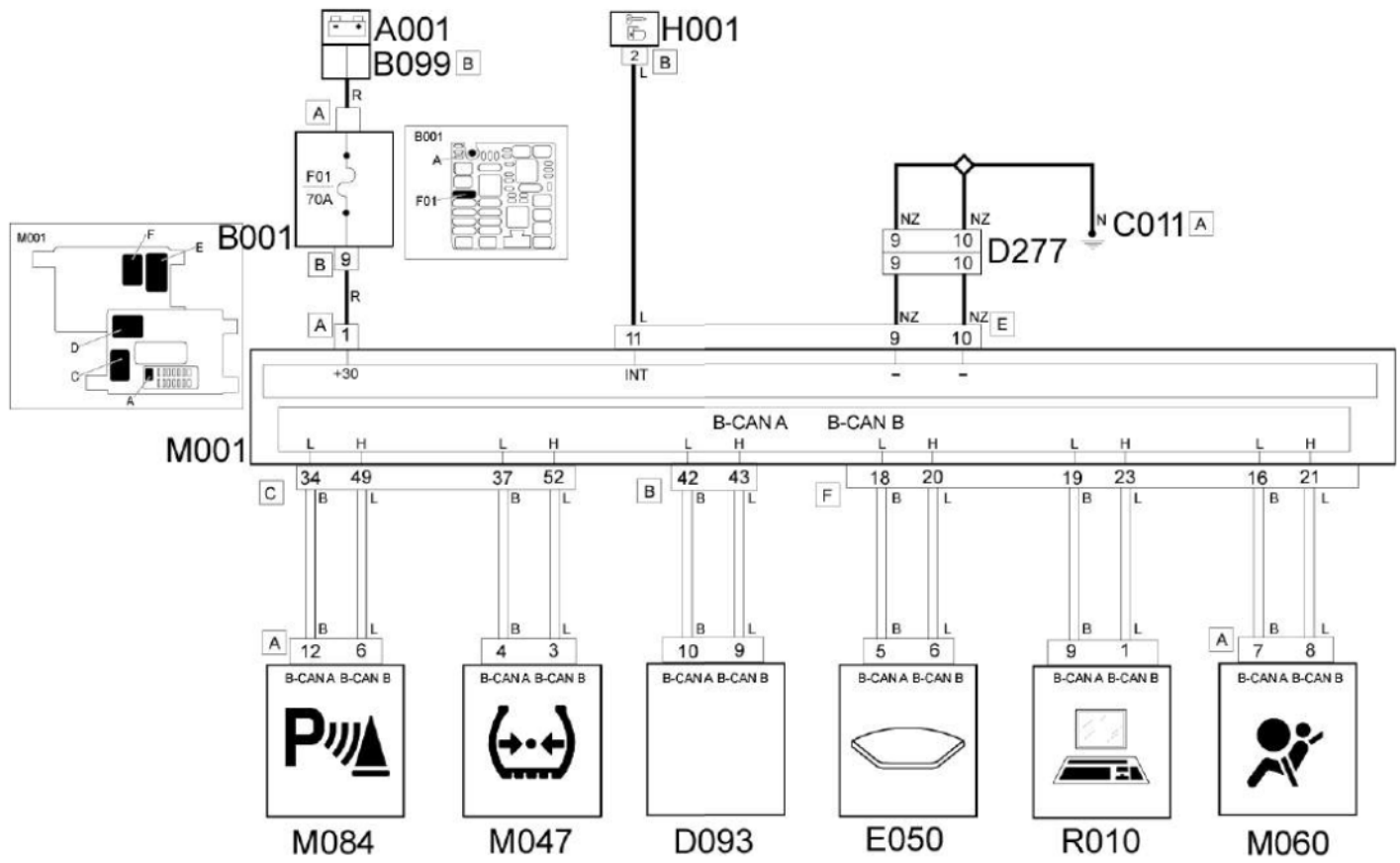
- Tyre pressure control unit M047, from pins 37, 52 of connector C;

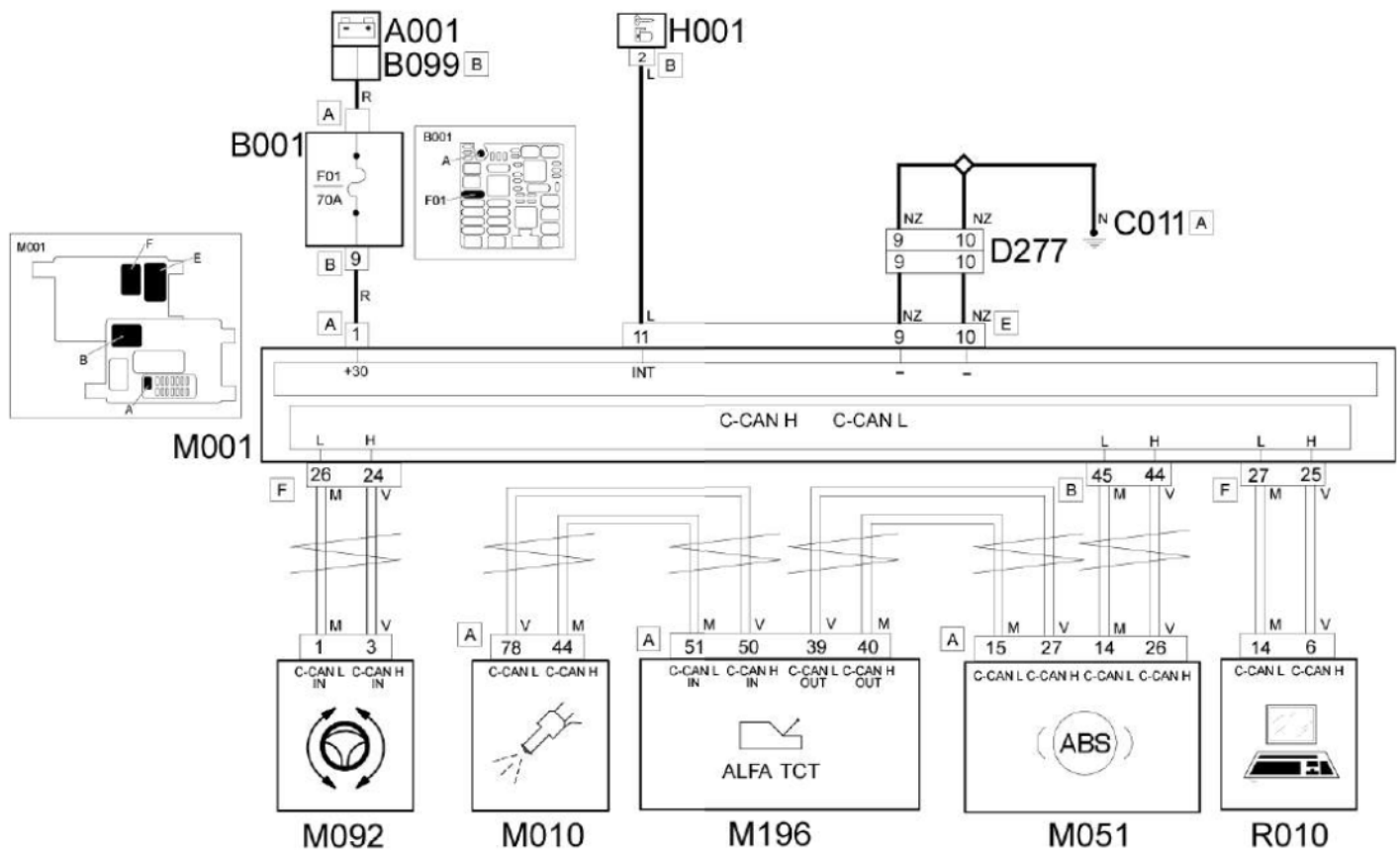
- Coupling for radio alarm setup D093, from pins 42, 43 of connector B;

The central diagnosis socket R010 is connected to the CAN-C at pins 25, 27 of connector F of M001 and to the CAN-B at pins 19, 23 of connector F of M001.

cardiagn.com

CAN CONNECTION LINES - WIRING DIAGRAM

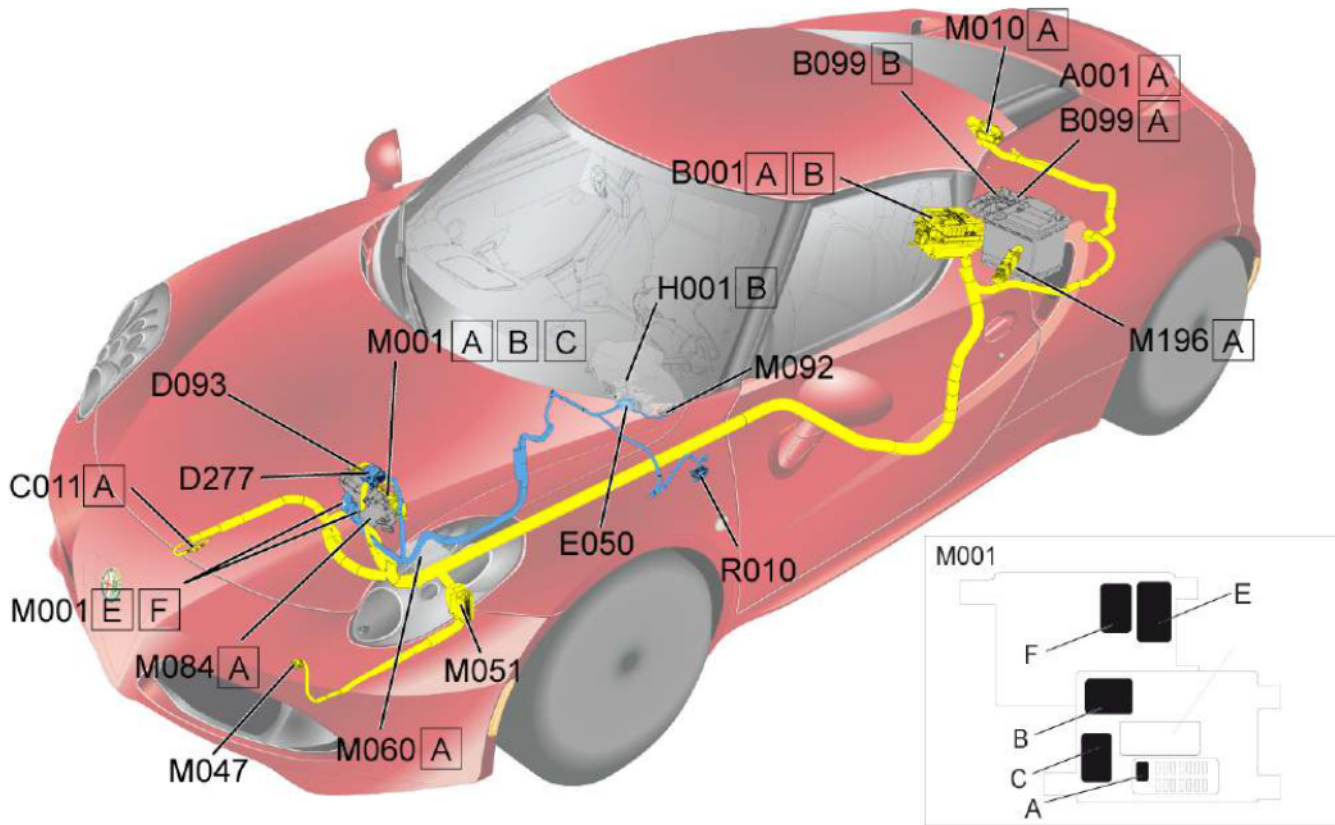




Component Code	Name	Reference to the operation
A001	BATTERY	
B001	JUNCTION UNIT	
B099	MAXI FUSE BOX ON BATTERY	
C011	RIGHT FRONT EARTH	
D093	COUPLING FOR RADIO ALARM SETUP	
D277	Dashboard/compartment junction	
E050	INSTRUMENT PANEL	
H001	IGNITION SWITCH	
M001	BODY COMPUTER	
M010	ENGINE MANAGEMENT CONTROL UNIT	
M047	TYRE INFLATION PRESSURE CONTROL UNIT	
M051	Braking system control unit	
M060	AIR BAG CONTROL UNIT	
M084	PARKING SENSOR CONTROL UNIT	
M092	STEERING ANGLE CONTROL UNIT	
M196	Dual clutch automatic transmission control unit	
R010	MULTIPLE TESTER CONNECTION	

cardiagn.com

CAN CONNECTION LINES - COMPONENT LOCATION



Component Code	Name	Reference to the operation
A001	BATTERY	
B001	JUNCTION UNIT	
B099	MAXI FUSE BOX ON BATTERY	
C011	RIGHT FRONT EARTH	
D093	COUPLING FOR RADIO ALARM SETUP	
D277	Dashboard/compartment junction	
E050	INSTRUMENT PANEL	
H001	IGNITION SWITCH	
M001	BODY COMPUTER	
M010	ENGINE MANAGEMENT CONTROL UNIT	
M047	TYRE INFLATION PRESSURE CONTROL UNIT	
M051	Braking system control unit	
M060	AIR BAG CONTROL UNIT	
M084	PARKING SENSOR CONTROL UNIT	
M092	STEERING ANGLE CONTROL UNIT	
M196	Dual clutch automatic transmission control unit	
R010	MULTIPLE TESTER CONNECTION	

cardiagn.com

eLEARN

AVVIAMENTO E RICARICA

643 - ALFA 4C

cardiagn.com

IGNITION AND RECHARGING - DESCRIPTION

The ignition and recharging circuit comprises the battery, starter and alternator.

The starter consists of a d.c. motor supplied by the battery and an energising electromagnet.

With the alternator still and the ignition key in the MAR-ON position, the warning light in the instrument panel comes on and supplies the voltage regulator built into the alternator via terminal D+.

In these conditions the energising circuit (rotor) is enabled to earth by the regulator electronics.

With the alternator rotating through the effect of the variation in the rpm and the magnetic field, a three-phase alternating voltage is produced in the electrical circuit (stator) which, rectified by the diode bridge, can exit terminal B+.

When the upper fixed calibration level is reached (13.7 - 14.2 V) the battery is charged and the system supplied.

The efficiency of the recharging system is controlled by the Body Computer:

- the engine management control unit sends the D+ signal to the Body Computer which monitors the efficiency of the alternator recharging system by recording two parameters: the voltage signal from alternator terminal D+ and the engine rpm signal that is also received from the engine management control unit via the CAN.

- at key-on while the voltage is less than approx 5.5 V, the Body Computer indicates that recharging is insufficient; when the voltage exceeds 5.5 V, the warning light goes off.If, on the other hand, with the engine running (rpm higher than 700), the voltage drops below a threshold of 4.5 V, the warning light comes on constantly, possibly accompanied by a message in the display.

cardiagn.com

IGNITION AND RECHARGING - FUNCTIONAL DESCRIPTION

The Body Computer M001 - connector A - receives a direct power supply from the battery through the line protected by maxi fuse F01 of the engine compartment control unit B001.

The ignition switch H001 is supplied by the engine compartment junction unit B001 via the line protected by fuse F03 located in the engine compartment junction unit.

In the ON position, numerous protected ignition-operated circuits and services are supplied (INT and 15/54 lines): the ignition-operated signal 15/54 is sent to the engine compartment junction unit B001, whilst the INT signal is sent to the Body Computer M001, to pin 11 of connector E.

The ignition-operated signal INT/A, however, is sent to Body Computer M001 at pin 1 of connector E.

Rotating the key of the ignition switch H001 to the extreme position (AVV) - pin 50 - the electromagnet winding for the starter A020 is supplied, pin 50.

Pin 30 of the starter A020 - i.e. the actual motor, is supplied with the voltage coming directly from the battery via the line protected by the maxifuse located in the maxifuse box on the battery B099.

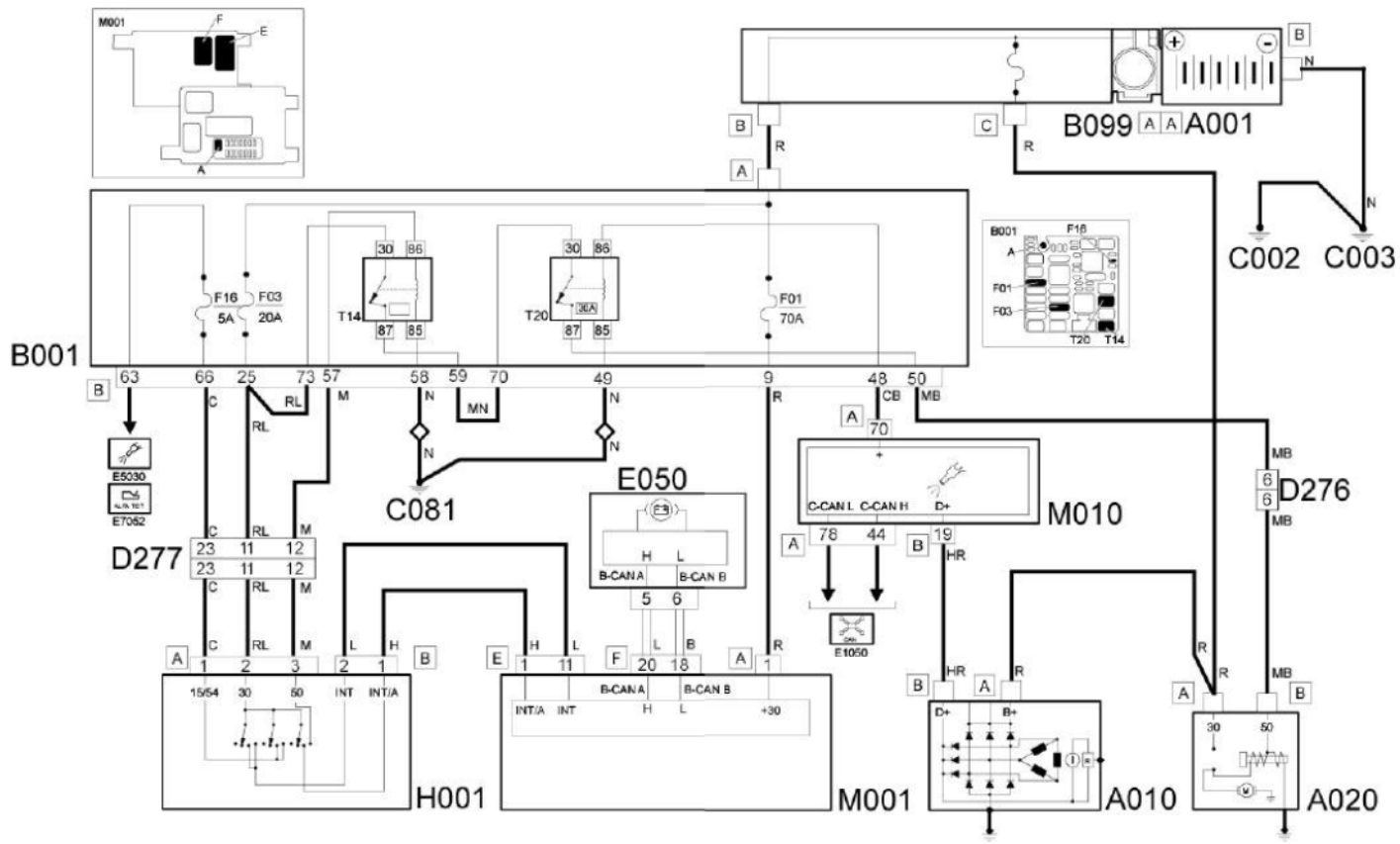
The direct current produced by the alternator A010 (pin B+) is sent to the battery A001, passing through the starter A020.

When the alternator does not turn and does not therefore recharge the battery, an earth signal is sent from pin D+ of the alternator A010 to the engine management control unit M010 - pin 19 of connector B.

Via the CAN, the signal reaches Body Computer M001 and instrument panel E050 and manages the switching on of the alternator warning light on the instrument panel, as described above.

cardiagn.com

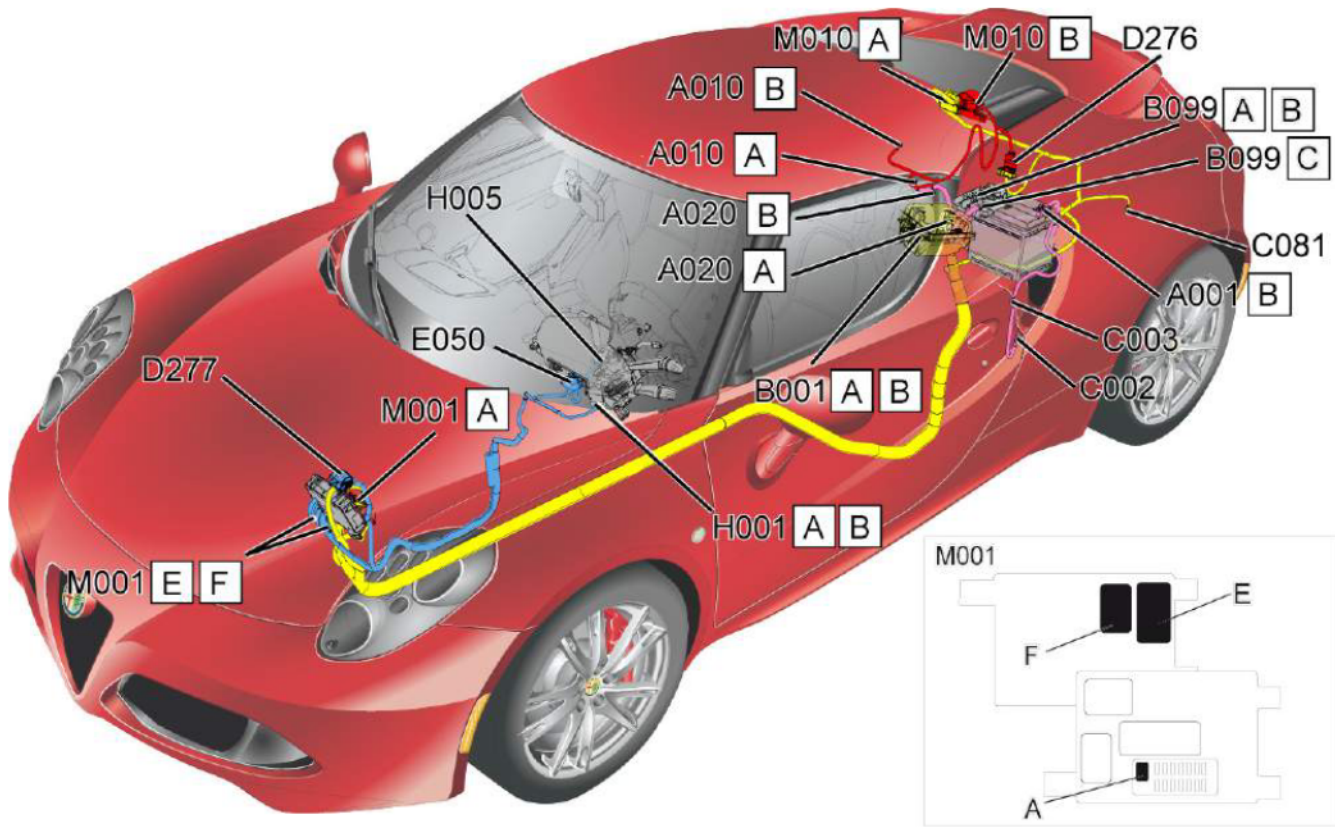
IGNITION AND RECHARGING - WIRING DIAGRAM



Component Code	Name	Reference to the operation
A001	BATTERY	
A010	ALTERNATOR	
A020	STARTER MOTOR	
B001	JUNCTION UNIT	
B099	MAXI FUSE BOX ON BATTERY	
C002	BATTERY EARTH ON ENGINE	
C003	BATTERY EARTH ON BODYSHELL	
C081	LEFT REAR LIGHT CLUSTER EARTH	-
D276	Engine/compartment junction	-
D277	Dashboard/compartment junction	
E050	INSTRUMENT PANEL	
H001	IGNITION SWITCH	
M001	BODY COMPUTER	
M010	ENGINE MANAGEMENT CONTROL UNIT	

cardiagn.com

IGNITION AND RECHARGING - COMPONENT LOCATION



Component Code	Name	Reference to the operation
A001	BATTERY	
A010	ALTERNATOR	
A020	STARTER MOTOR	
B001	JUNCTION UNIT	
B099	MAXI FUSE BOX ON BATTERY	
C002	BATTERY EARTH ON ENGINE	
C003	BATTERY EARTH ON BODYSHELL	
C081	LEFT REAR LIGHT CLUSTER EARTH	-
D276	Engine/compartment junction	-
D277	Dashboard/compartment junction	
E050	INSTRUMENT PANEL	
H001	IGNITION SWITCH	
M001	BODY COMPUTER	
M010	ENGINE MANAGEMENT CONTROL UNIT	

cardiagn.com

eLEARN

RAFFREDDAMENTO MOTORE

643 - ALFA 4C

cardiagn.com

ENGINE COOLING - DESCRIPTION

The radiator and air conditioner condenser cooling system consists of two electric fans operated at two different speeds, by means of a series/parallel connection:

- the first speed is activated at a first engine coolant temperature level and a certain air conditioning refrigerant fluid pressure;

- the second speed comes on at a higher temperature or pressure levels.

The fans are operated by three specific relay switches, two located in the engine compartment control unit and one located directly on the radiator.

The supply line for the fans is protected by two special fuses, located in the engine compartment junction unit.

cardiagn.com

ENGINE COOLING - FUNCTIONAL DESCRIPTION

Relay switches T06 and T07 of the engine compartment junction unit B001 and engine cooling fan relay switch J028 - located on the radiator - manage the operation of the two fans N011 and N012 in serial/parallel mode; the relay switch power lines are protected by fuses F06 and F07, in engine compartment junction unit B001.

The supply line for the engine cooling fan relay switch J028 is protected by fuse F18, also located in the engine compartment junction unit B001.

If the engine coolant reaches an initial temperature level or linear sensor K120 indicates to the engine management control unit M010 - pin 47 of connector A - that a certain pressure level has been reached, a signal is sent - from pin 38 of connector A - that triggers the low speed relay switch T06, which then sends power to fans N011 and N012 which are connected in series and turn the fan at the first speed (slow).

The linear sensor K120 receives a power supply and reference earth from the engine management control unit M010, pins 10 and 15 of connector A.

If the engine coolant reaches a higher temperature level or the linear sensor K120 indicates to the engine management control unit M010 that a certain pressure level has been reached, a signal is sent - from pin 36 of connector A - that triggers the high speed relay switch, T07 and the engine cooling fan relay switch J028.

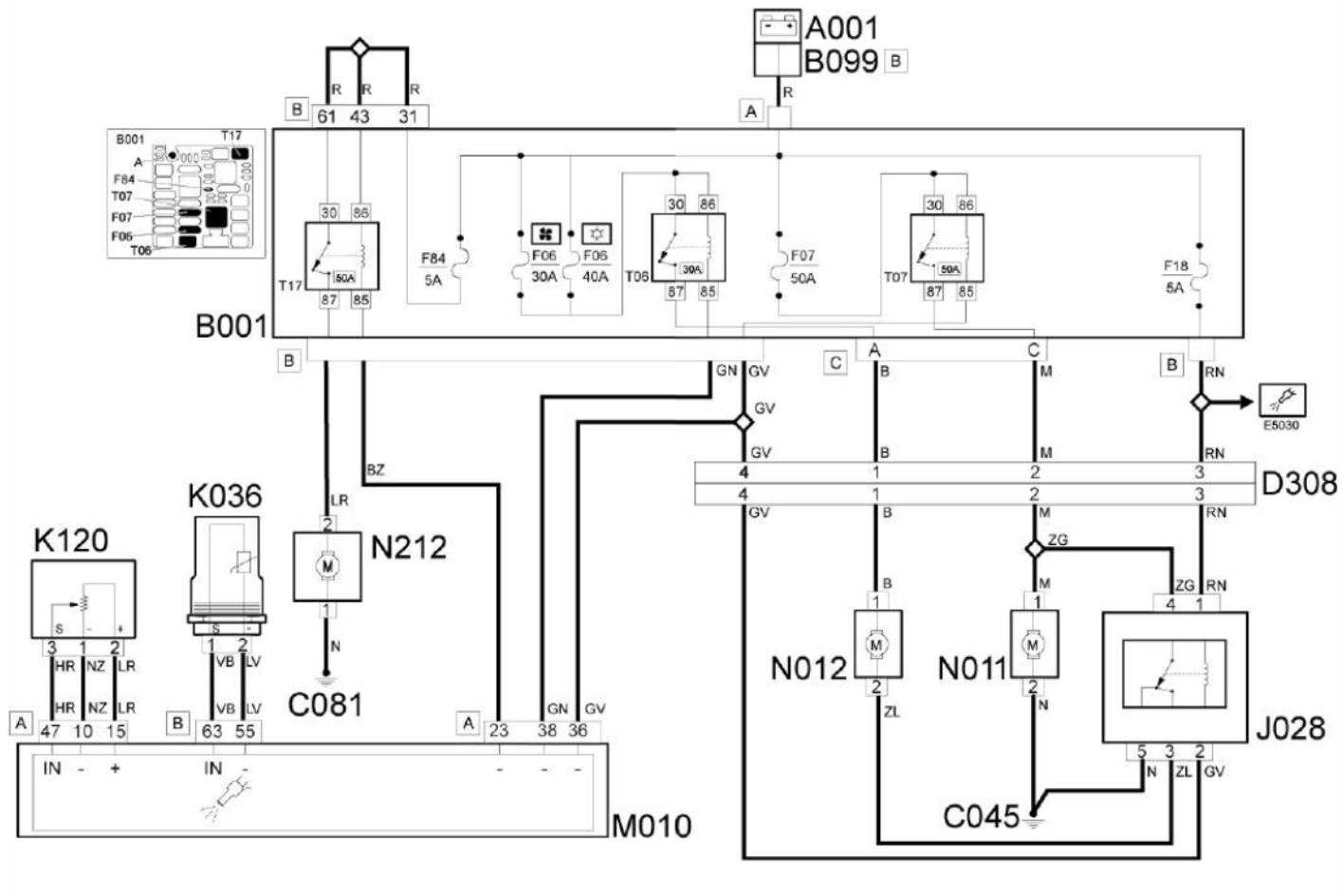
Fans N011 and N012 which are connected in parallel and thus turn the fan at the top speed, are then supplied.

The engine temperature sensor K036 measures the engine temperature and receives a reference earth from pin 55 of connector B of the engine management control unit M010 and sends a signal proportional to the engine fluid temperature to pin 63 of connector B.

The engine cooling auxiliary electric pump N212 is managed by the engine management control unit M010 which activates relay switch T17 from pin 23 of connector A through a negative signal, thus supplying the auxiliary pump motor. The power supply line is protected by fuse F84 which is located in the engine compartment junction unit.

cardiagn.com

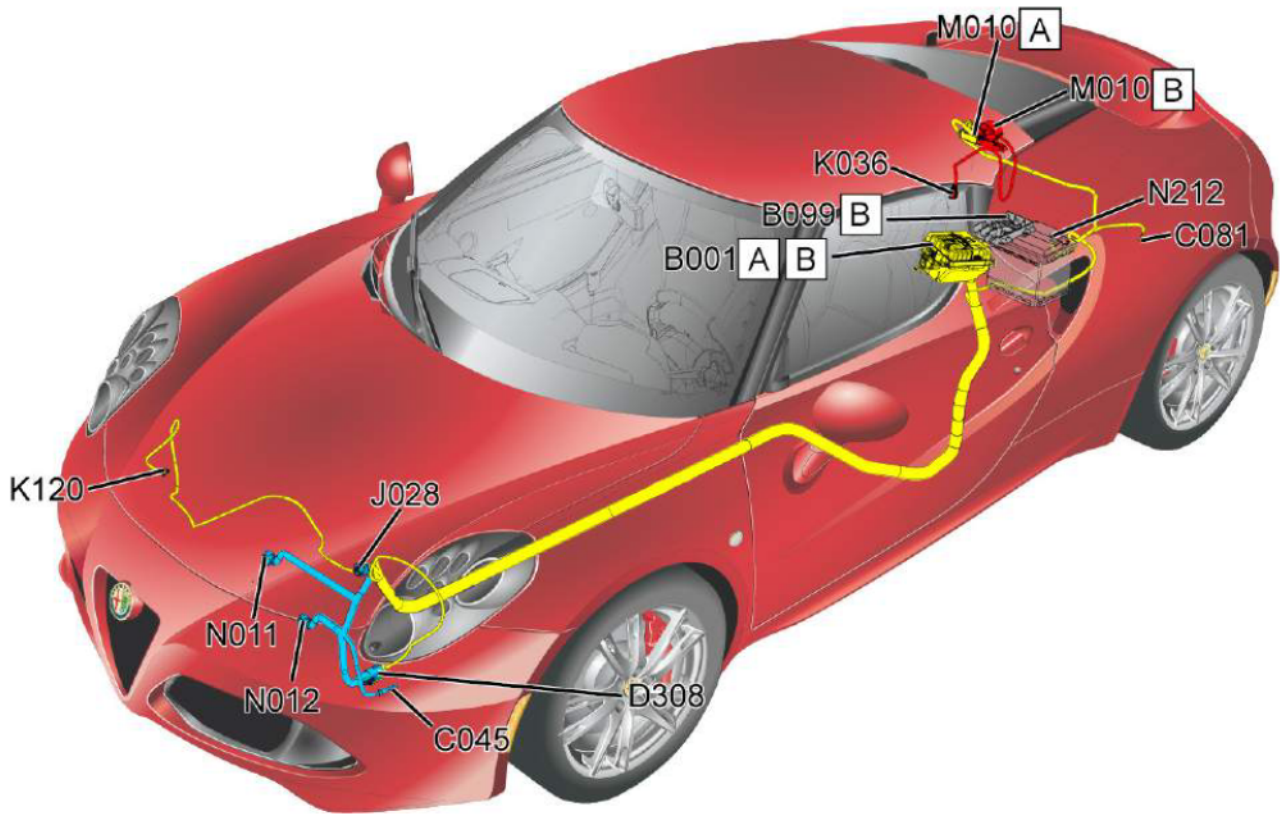
ENGINE COOLING - WIRING DIAGRAM



Component Code	Name	Reference to the operation
A001	BATTERY	
B001	JUNCTION UNIT	
B099	MAXI FUSE BOX ON BATTERY	-
C045	FAN EARTH	-
D308	ENGINE COOLING FAN COUPLING	-
K036	ENGINE COOLANT TEMPERATURE SENSOR/SENDER UNIT	
K120	LINEAR SENSOR FOR FANS	
J028	ENGINE COOLING FAN RELAY	
M010	ENGINE MANAGEMENT CONTROL UNIT	
N011	FAN MOTOR	
N012	ENGINE FAN MOTOR - 2	

cardiagn.com

ENGINE COOLING - COMPONENT LOCATION



Component Code	Name	Reference to the operation
A001	BATTERY	
B001	JUNCTION UNIT	
B099	MAXI FUSE BOX ON BATTERY	-
C045	FAN EARTH	-
D308	ENGINE COOLING FAN COUPLING	-
K036	ENGINE COOLANT TEMPERATURE SENSOR/SENDER UNIT	
K120	LINEAR SENSOR FOR FANS	
J028	ENGINE COOLING FAN RELAY	
M010	ENGINE MANAGEMENT CONTROL UNIT	
N011	FAN MOTOR	
N012	ENGINE FAN MOTOR - 2	

cardiagn.com

eLEARN

GESTIONE ELETTRONICA MOTORI BENZINA

643 - ALFA 4C

cardiagn.com

ELECTRONIC MANAGEMENT OF PETROL ENGINES - DESCRIPTION

This engine features petrol direct injection and supercharging through a turbocharger and dual continuous variable valve timing system on intake and exhaust, to ensure high power, flexible driving and brilliant performance.

Direct injection ensures reduced fuel consumption in relation to power unit performance. The turbo allows quick pick-up, thanks to a particularly favourable torque curve.

The dual variable valve timing system permits internal gas recirculation, satisfying EURO 6 emission limits.

An electronic control system supervises and manages all engine parameters to optimise performance and fuel consumption by means of a real-time response to different operating conditions.

Depending on the signals received from numerous sensors, the control unit manages the injectors connected to it, handling the following systems:

- fuel supply;

- high pressure fuel pump control;

- air supply and turbocharging;

- accelerator pedal

- engine cooling;

- exhaust with catalytic converters controlled by oxygen sensors;

- fuel vapour recirculation.

The control unit of this engine manages the operation of the high pressure fuel pump by controlling an electric pressure regulator and an associated pressure sensor.

The throttle body is also controlled electronically by the control unit: the throttle opening is calculated according to a specific logic inside the engine management control unit; the mechanical connection between the accelerator pedal and the throttle body is thereby eliminated.

The control unit controls the engine timing by means of a pair of electrohydraulic variable valve timing systems - one on the intake shaft and one on the exhaust shaft; this solution makes it possible to ensure optimum timing by managing the inlet and the exhaust separately; two timing sensors allow the continuous control of the solution set.

Thanks to the electronic management described above, this engine conforms to the most recent emission control regulations (EURO 6).

The system is also controlled by dedicated relays in the engine compartment junction unit.Lines supplying the control unit and various system components (sensors and actuators) are protected by dedicated fuses that are also located in the junction unit.

cardiagn.com

ELECTRONIC MANAGEMENT OF PETROL ENGINES - OPERATIONAL DESCRIPTION

The engine management control unit M010 controls and regulates the entire electronic ignition and injection system.

The ignition-operated power supply (15/54) arrives along the line protected by fuse F16 of the engine compartment junction unit B001, while pins 1, 2 and 4 of connector A receive the reference earth.

Main injection relay switch T09 of the engine compartment junction unit B001 controls the entire system: it is triggered by a control (earth) signal coming from pin 18 of connector A of the engine management control unit M010; in this way the following are supplied:

- the same engine management control unit at pins 3, 5 and 6 of connector A along the line protected by fuse F22 of the engine compartment junction unit B001;

- the ignition coils A030 along the line protected by fuse F17 of the engine compartment junction unit B001;

Main injection relay switch T09 also provides power supply along the line protected by fuse F11:

- to the oxygen sensor on catalytic converter K017;

- to the wastegate solenoid valve L037;

- to the fuel vapour recovery solenoid valve L010;

- to the intake side variable valve timing system solenoid valve N092;

- to the exhaust side variable valve timing system solenoid valve N093;

- to the turbocharger by-pass solenoid valve L102;

- to the air flow meter K041;

- to the engine water heating coil O055;

- to the oxygen sensor on pre-catalytic converter K015.

Fuel pump relay switch T10 of B001 is supplied along the line protected by fuse F21 of the engine compartment junction unit B001.

It is energised by a control (positive) signal coming from pin 87 of connector A of the engine management control unit M010 and supplies power to the fuel electric pump N040.

The engine management control unit M010 receives signals from the various sensors, thereby keeping all the engine operating parameters under control.

The rpm sensor K046 provides engine rpm information via a frequency signal sent to pin 11 of connector B of the engine management control unit M010.

From the same control unit it is receives power supply and reference earth from pins 41, 42 of connector B respectively,

The intake side timing sensor K106 receives a power supply from pin 13 of connector B of the engine management control unit M010 and a reference earth from pin 31 of connector B; it sends a frequency signal corresponding to the timing to pin 18 of connector B of the same control unit.

The exhaust side timing sensor K107 receives a power supply from pin 13 of connector B of the engine management control unit M010 and a reference earth from pin 31 of connector B; it sends a frequency signal corresponding to the timing to pin 17 of connector B of the same control unit.

The fuel pressure sensor K083 receives a power supply from pin 16 of connector B of the engine management control unit M010 and a reference earth from pin 54 of connector B; it sends a frequency signal corresponding to the fuel pressure to pin 60 of connector B of the same control unit.

The air temperature and pressure sensor K044 receives a power supply from pin 16 of connector B of the engine management control unit M010 and a reference earth from pin 54 of connector B; it sends a frequency signal corresponding to the temperature and supercharging pressure to pins 61, 82 of connector B respectively.

The engine temperature sender unit K036 receives a reference earth from pin 55 of connector B of the engine management control unit M010 and sends a signal proportional to engine fluid temperature to pin 63 of connector B of the same control unit.

The oxygen sensors K015 and K017 provide the engine management control unit M010 with information about the correct composition of fuel/air mixture in different exhaust positions: the first one - linear - is upstream of the pre-catalytic converter, the second - planar - is downstream of the same.

The oxygen sensor on pre-catalytic converter K015 sends signals to pins 5, 95, 75 and 96 of connector B of M010, whilst it is heated with a coil to ensure correct operation even when cold. The coil receives an earth signal from pin 74 of connector B of the engine management control unit M010.

The oxygen sensor on catalytic converter K017 receives an earth signal and sends signals to pins 41, 75, 90 of connector B of the engine management control unit M010.

The knock sensor K050 makes it possible to have information about detonation conditions by means of a frequency signal sent to pin 78 of connector B of control unit M010: it receives a reference earth from pin 99 of connector B.

Knock sensor K051 makes it possible to have information about detonation conditions by means of a frequency signal sent to pin 79 of connector B of control unit M010: it receives a reference earth from pin 100 of connector B.

Air flow meter K041 receives an earth signal from pin 73 of connector B of the engine management control unit M010; the same control unit receives the air flow and temperature signals at pins 32, 84 of connector B.

Accelerator pedal K055 contains two built-in potentiometers (a main one and a safety one). The first receives a power supply and earth respectively from pins 12 and 30 of connector A of the engine management control unit M010 and sends the corresponding signal to pin 29 of the same connector. The second receives a power supply and earth respectively from pins 14 and 27 of connector A of the engine management control unit M010 and sends the signal to pin 28 of the same connector.

The engine management control unit M010 receives - at pin 37 of connector B - a signal from the minimum engine oil pressure sensor K030.

The signal coming from brake light switch I030 - NO contact- reaches pin 34 of connector A of the engine management control unit M010; the same signal also reaches the twin clutch automatic transmission control unit M196.

See E7052 DUAL CLUTCH AUTOMATIC TRANSMISSION

The engine management control unit M010 controls the opening of the single injectors N070, through dedicated signals sent from pins 23 and 25 (cyl. 1), 44 and 45 (cyl. 2), 43 and 46 (cyl. 3), 22 and 24 (cyl. 4) of connector B.

The fuel pressure regulator N077 is operated by the engine management control unit M010, pins 1 and 2 of connector B.

cardiagn.com

Throttle body actuator N075 has two built-in potentiometers connected in parallel: this controls the throttle opening by means of a step motor.

The motor receives power supply and earth respectively from pins 65 and 64 of connector B of the engine management control unit M010. Pin 15 of connector B supplies both potentiometers, while pin 57 provides the earth signal.

Pins 80 and 101 of connector B of the engine management control unit M010 receive the signals from the throttle body actuator N075.

Fuel vapour recovery solenoid valve L010 allows fuel vapours to flow through toward the engine intake, where they join the mixture that is entering the combustion chamber. The valve is opened by the control unit when the engine is under load, by means of a duty cycle signal from pin 49 of connector B of the engine management control unit M010.

The turbo pressure solenoid valve regulates the turbocharger wastegate mechanical valve L037 and is controlled by the control unit through a signal from pin 56 of connector B of the engine management control unit M010.

The by-pass solenoid valve of the turbocharger L102 enables excess pressure to be discharged during over-run to prevent excessive pressure rises (hammering) that could damage the intake pipes and impair turbine operation; it is controlled by a signal from pin 7 of connector B of the engine management control unit M010.

The intake side variable valve timing system solenoid valve N092 mechanically controls intake timing advance; it is controlled by pin 4 of connector B of the engine management control unit M010.

The exhaust side variable valve timing system solenoid valve N093 mechanically controls intake timing advance; it is controlled by pin 8 of connector B of the engine management control unit M010.

The engine management control unit M010 is then connected through the CAN to the Body Computer M001 and to the other network nodes: information on the following is sent through this connection

- self-diagnosis of the system that also produces a signal for the "EOBD" warning light, located on the instrument panel E050 and that is connected to the connector R010;

- engine coolant temperature, which is sent to the instrument panel E050 which manages the gauge and the warning light;

- engine rpm, which is sent to the instrument panel E050 rev counter;

- minimum engine oil pressure, which is sent to the instrument panel E050 that controls the warning light;

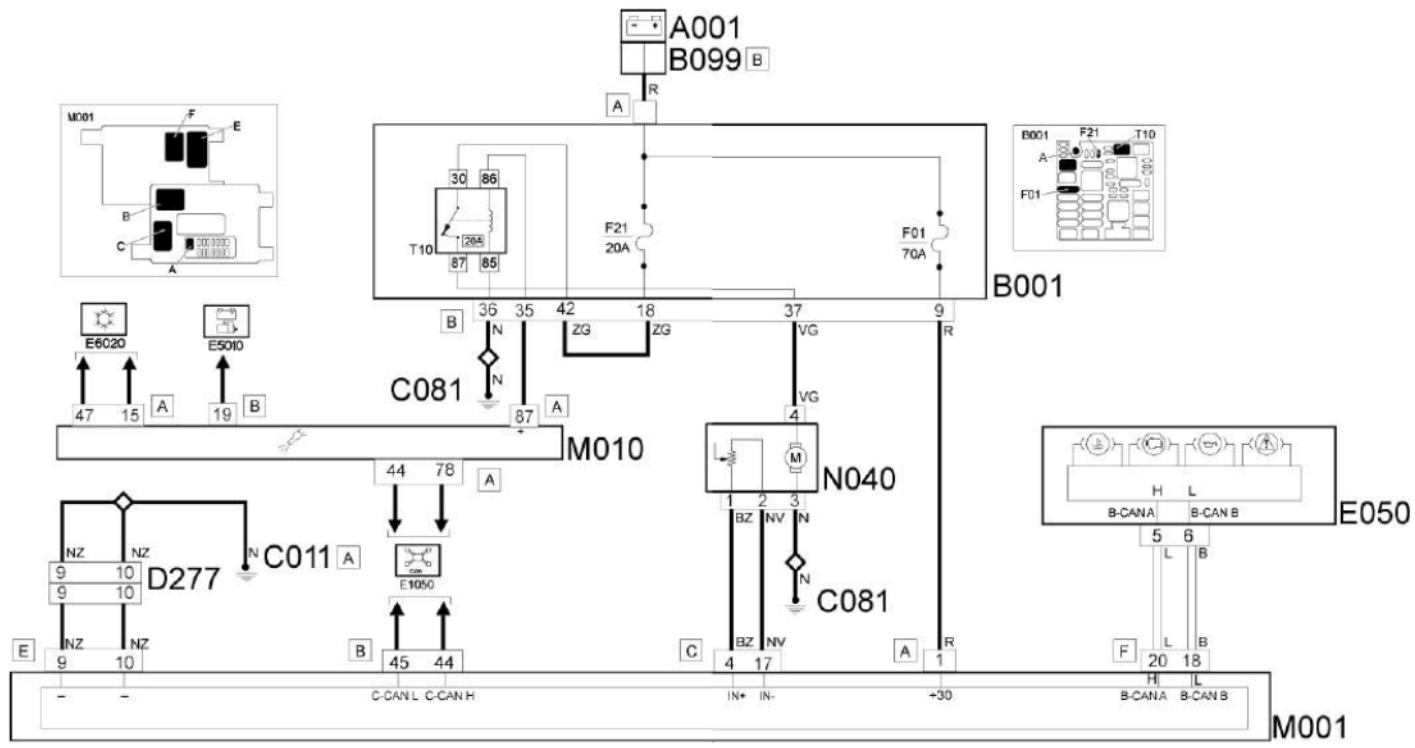
- excessive turbocharger pressure, sent to instrument panel E050, which controls the display.

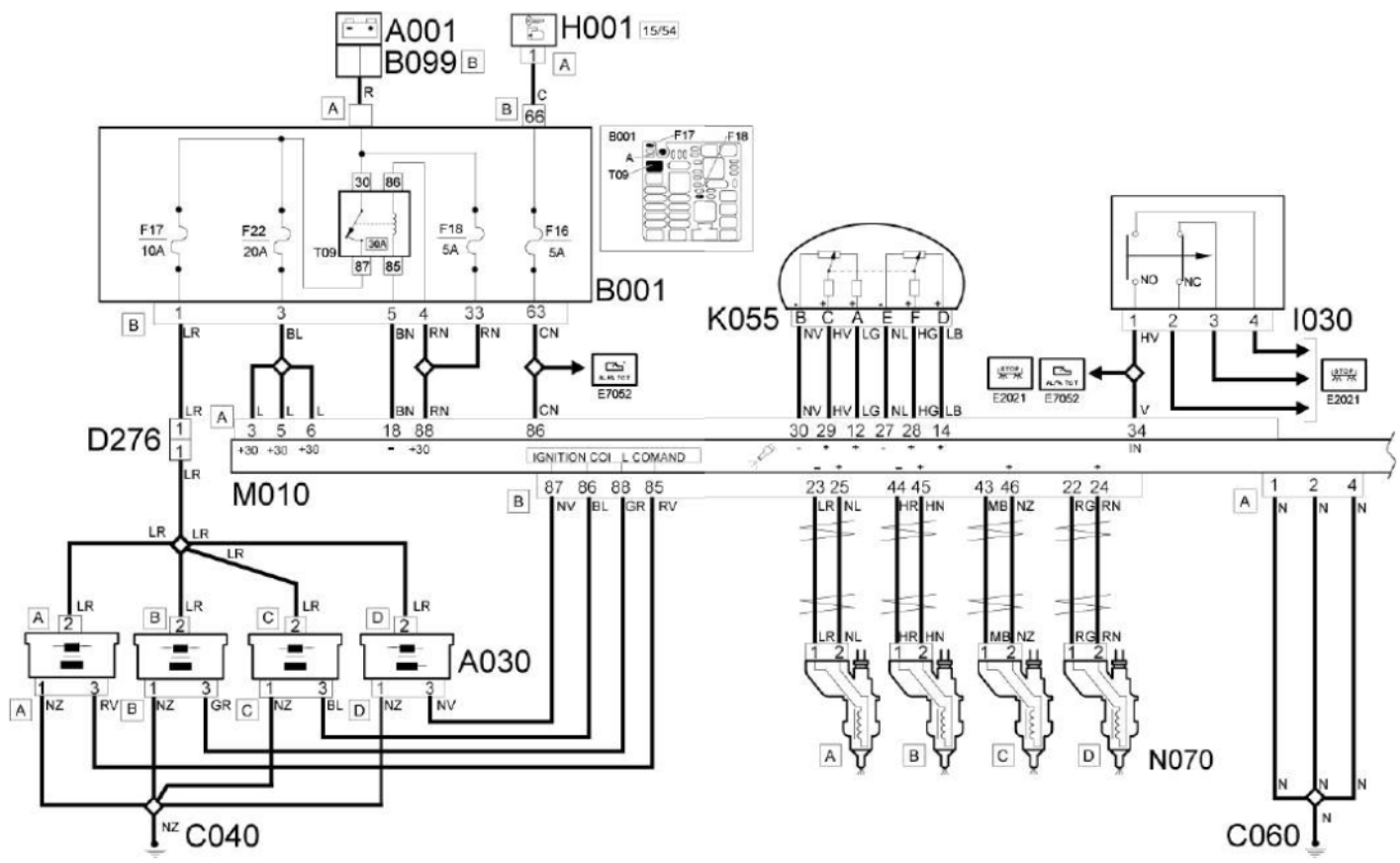
It receives the speedometer signal, via the CAN, produced by the braking system control unit M051.

See E1050 CAN CONNECTION LINES

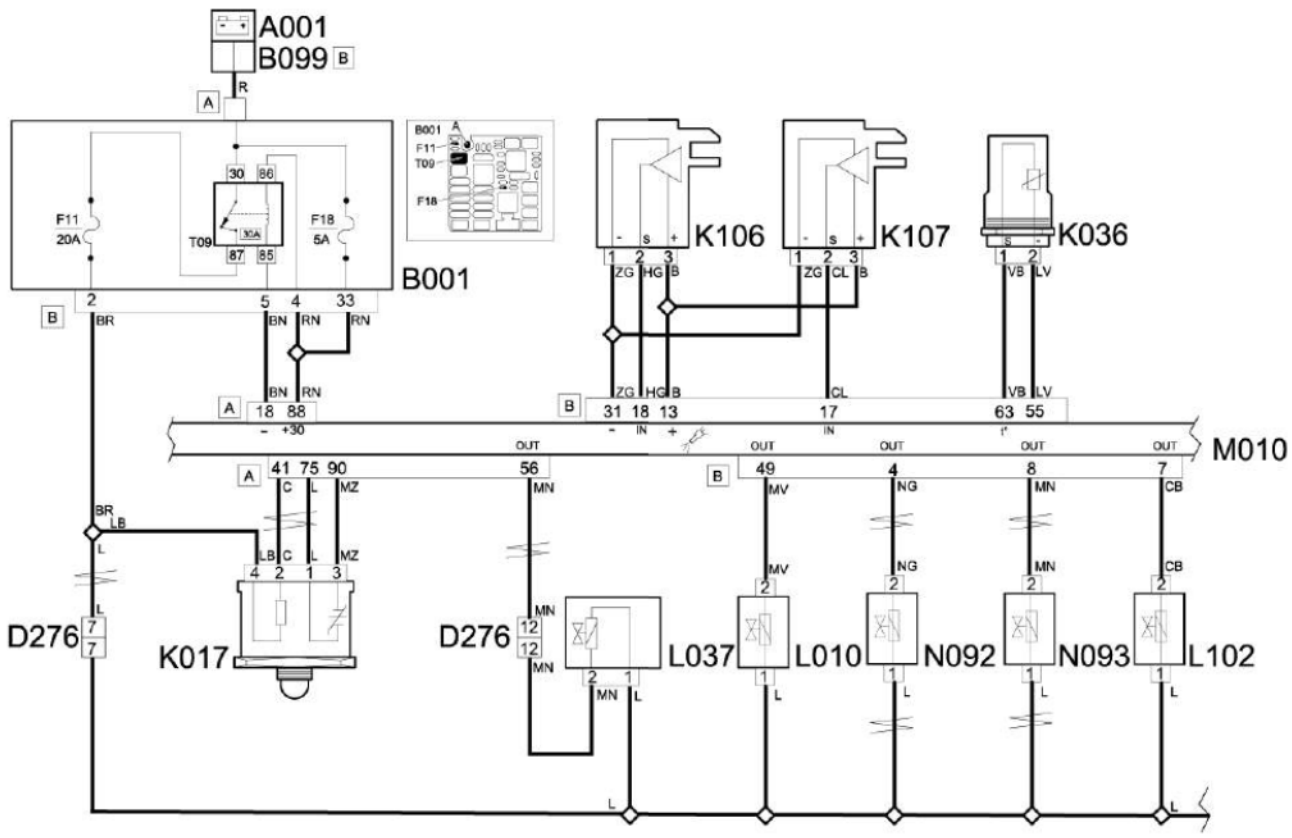
cardiagn.com

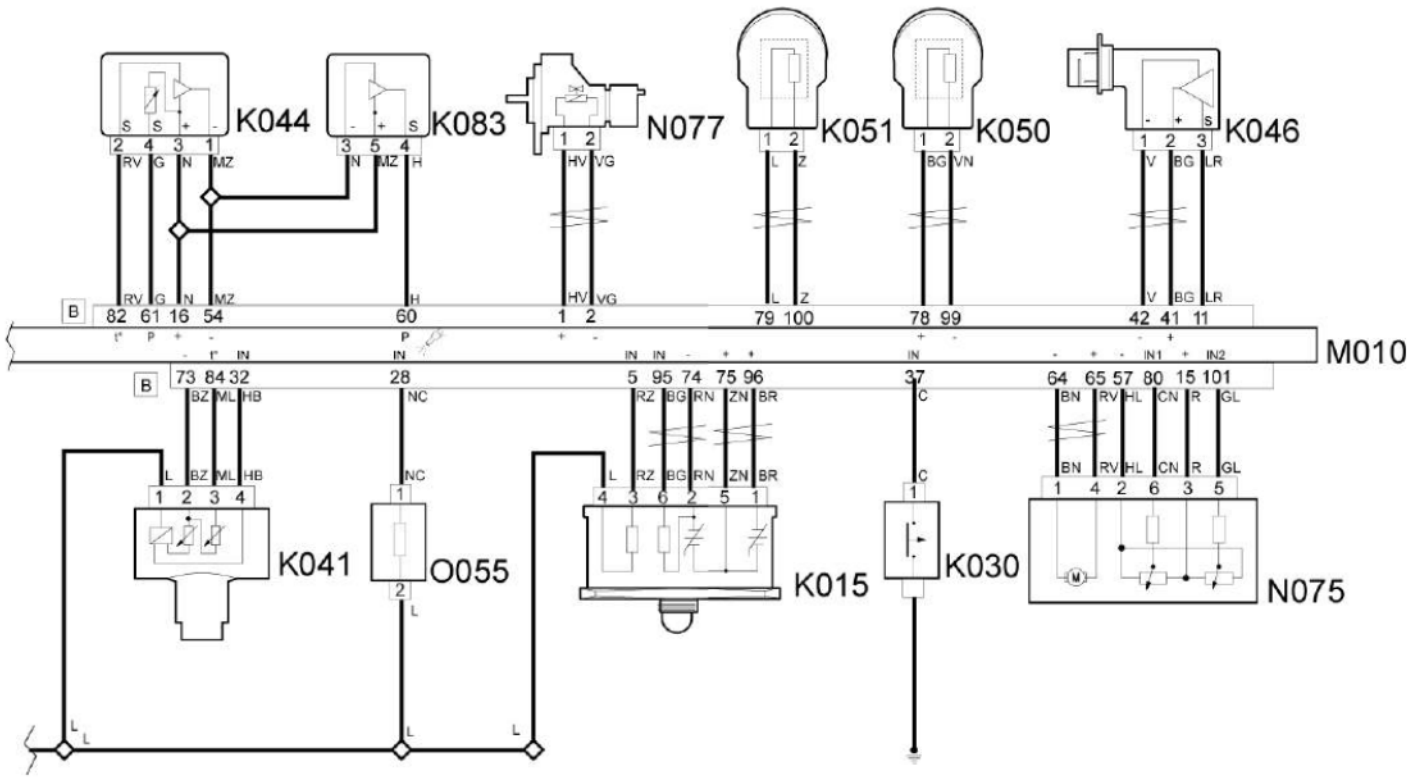
PETROL ENGINE ELECTRONIC MANAGEMENT - WIRING DIAGRAM





cardiagn.com





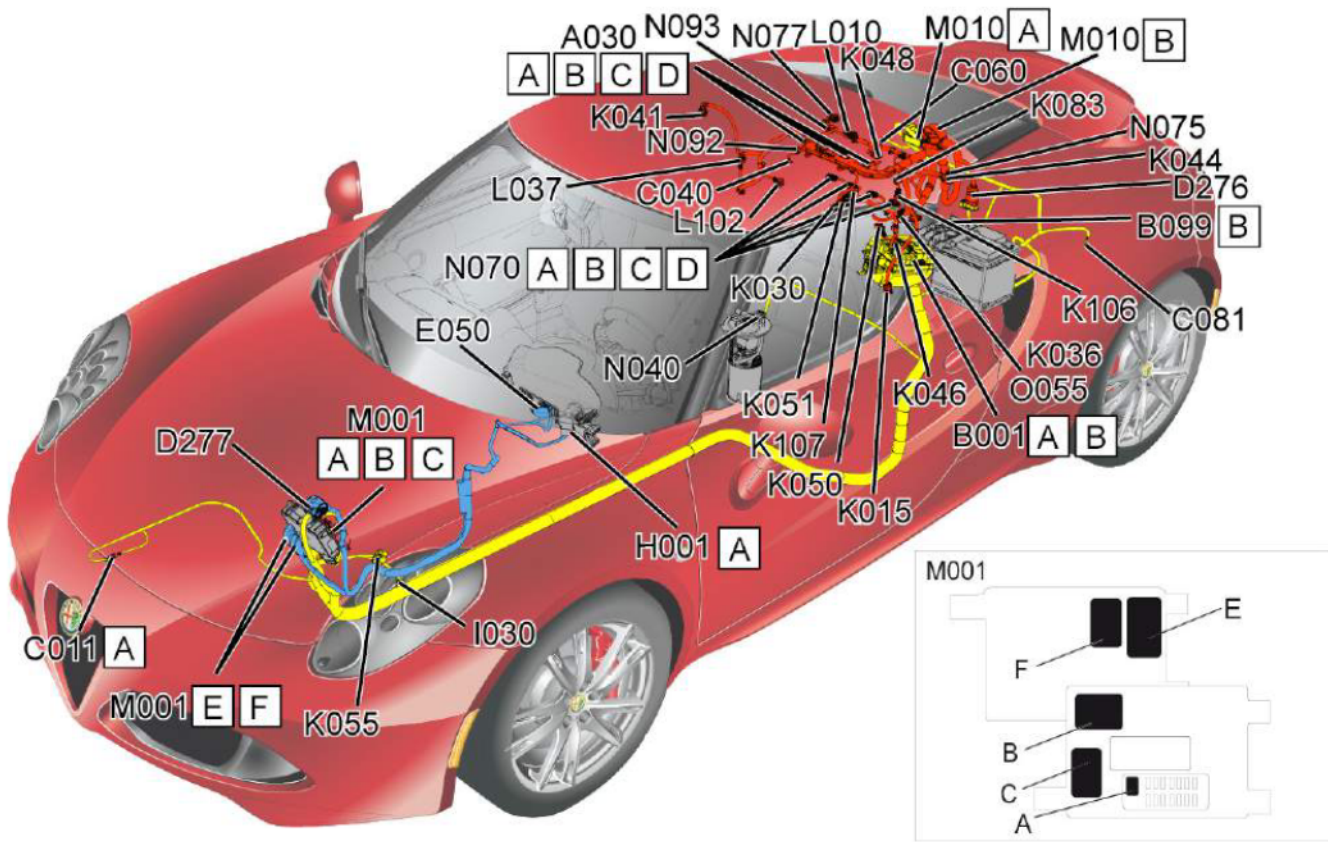
Component Code	Name	Reference to the operation
A001	BATTERY	
A030	IGNITION COIL	
B001	JUNCTION UNIT	
B099	MAXI FUSE BOX ON BATTERY	
B099	MAXI FUSE BOX ON BATTERY	
C011	RIGHT FRONT EARTH	-
C040	EARTH ON ENGINE	-
C060	INJECTION CONTROL UNIT EARTH	-
C081	LEFT REAR LIGHT CLUSTER EARTH	-
D276	Engine/compartment junction	-
D277	Dashboard/compartment junction	
E050	INSTRUMENT PANEL	-
H001	IGNITION SWITCH	
I030	BRAKE PEDAL SWITCH	
K015	LAMBDA SENSOR ON PRE-CATALYZER	
K017	LAMBDA SENSOR ON CATALYZER	
K030	ENGINE OIL PRESSURE SENSOR (SWITCH)	
K036	ENGINE COOLANT TEMPERATURE SENSOR/SENDER UNIT	
K041	AIR FLOW METER	
K044	AIR TEMPERATURE/PRESSURE SENSOR	
K046	RPM SENSOR	
K050	DETONATION SENSOR	
K051	DETONATION SENSOR - 2	
K055	ACCELERATOR PEDAL POTENTIOMETER	

cardiagn.com

K083	FUEL PRESSURE SENSOR
K106	INTAKE SIDE TIMING SENSOR
K107	EXHAUST SIDE TIMING SENSOR
L010	FUEL VAPOUR RECOVERY SOLENOID VALVE
L037	WASTE GATE SOLENOID VALVE
L102	TURBOCHARGER BY-PASS SOLENOID VALVE
M001	BODY COMPUTER
M010	ENGINE MANAGEMENT CONTROL UNIT
N040	FUEL PUMP AND LEVEL GAUGE
N070	INJECTOR
N075	INTEGRATED THROTTLE BODY ACTUATOR
N077	FUEL PRESSURE REGULATOR
N092	PHASE SHIFTER SOLENOID VALVE ON INTAKE SIDE
N093	PHASE SHIFTER SOLENOID VALVE ON EXHAUST SIDE
N093	PHASE SHIFTER SOLENOID VALVE ON EXHAUST SIDE
O055	ENGINE WATER HEATING COIL

cardiagn.com

ELECTRONIC MANAGEMENT OF PETROL ENGINES - COMPONENT LOCATION



Component Code	Name	Reference to the operation
A001	BATTERY	
A030	IGNITION COIL	
B001	JUNCTION UNIT	
B099	MAXI FUSE BOX ON BATTERY	
B099	MAXI FUSE BOX ON BATTERY	
C011	RIGHT FRONT EARTH	-
C040	EARTH ON ENGINE	-
C060	INJECTION CONTROL UNIT EARTH	-
C081	LEFT REAR LIGHT CLUSTER EARTH	-
D276	Engine/compartment junction	-
D277	Dashboard/compartment junction	
E050	INSTRUMENT PANEL	-
H001	IGNITION SWITCH	
I030	BRAKE PEDAL SWITCH	
K015	LAMBDA SENSOR ON PRE-CATALYZER	
K017	LAMBDA SENSOR ON CATALYZER	
K030	ENGINE OIL PRESSURE SENSOR (SWITCH)	
K036	ENGINE COOLANT TEMPERATURE SENSOR/SENDER UNIT	
K041	AIR FLOW METER	
K044	AIR TEMPERATURE/PRESSURE SENSOR	
K046	RPM SENSOR	
K050	DETONATION SENSOR	
K051	DETONATION SENSOR - 2	
K055	ACCELERATOR PEDAL POTENTIOMETER	
K083	FUEL PRESSURE SENSOR	
K106	INTAKE SIDE TIMING SENSOR	
K107	EXHAUST SIDE TIMING SENSOR	
L010	FUEL VAPOUR RECOVERY SOLENOID VALVE	
L037	WASTE GATE SOLENOID VALVE	
L102	TURBOCHARGER BY-PASS SOLENOID VALVE	
M001	BODY COMPUTER	
M010	ENGINE MANAGEMENT CONTROL UNIT	
N040	FUEL PUMP AND LEVEL GAUGE	
N070	INJECTOR	
N075	INTEGRATED THROTTLE BODY ACTUATOR	
N077	FUEL PRESSURE REGULATOR	
N092	PHASE SHIFTER SOLENOID VALVE ON INTAKE SIDE	
N093	PHASE SHIFTER SOLENOID VALVE ON EXHAUST SIDE	
N093	PHASE SHIFTER SOLENOID VALVE ON EXHAUST SIDE	
O055	ENGINE WATER HEATING COIL	

cardiagn.com

eLEARN

CRUISE CONTROL

643 - ALFA 4C

cardiagn.com

CRUISE CONTROL - DESCRIPTION

The Cruise Control function - constant speed governor - allows the driver to drive the car at a constant speed without pressing the accelerator pedal.

The function is managed by the engine control unit.This receives commands from a Cruise Control lever on the left of the steering wheel built into the steering wheel stalk unit.

The function is activated by turning the appropriate wheel (Cruise activated to ON). Moving the lever a speed increase (+) or decrease (-) are memorised; this value is memorised and can be restored at any time by pressing the RES (resume) button.

The function is automatically deactivated:

- by pressing the brake pedal;

- by turning the wheel to "OFF";

- by turning off the engine.

In such cases, the last speed is stored and can be recalled by pressing the RES button.

The system also switches off at speeds below the minimum permitted speed (about 30 km/h)

With the system activated, the warning light in the instrument panel comes on, connected via the CAN to the engine management control unit.

cardiagn.com

CRUISE CONTROL - FUNCTIONAL DESCRIPTION

The Cruise Control function is managed by engine management control unit M010 upon a request by Cruise Control system control built into steering wheel stalk unit H005.

There is a single signal sent by the steering column stalk H005 to the Body Computer M001 that manages all the Cruise Control commands: from pin 6 of steering column stalk H005 to pin 41 of connector F of Body Computer M001; the signal sent is coded by means of resistive dividers so that multiple information can be sent by the steering column stalk to the Body Computer via a single connection.

The reference earth reaches pin 10 of steering column stalk H005 from pin 34 of connector F of Body Computer M001.

The Body Computer M001 - connector A - receives a direct power supply from the battery through the line protected by maxi fuse F01 of the engine compartment control unit B001.

The Body Computer M001 receives an ignition-operated power supply (INT) at pin 11 of connector F: this signal is used, amongst other things, to "wake up the network".

The Body Computer M001 is earthed at pins 9, 10 of connector E.

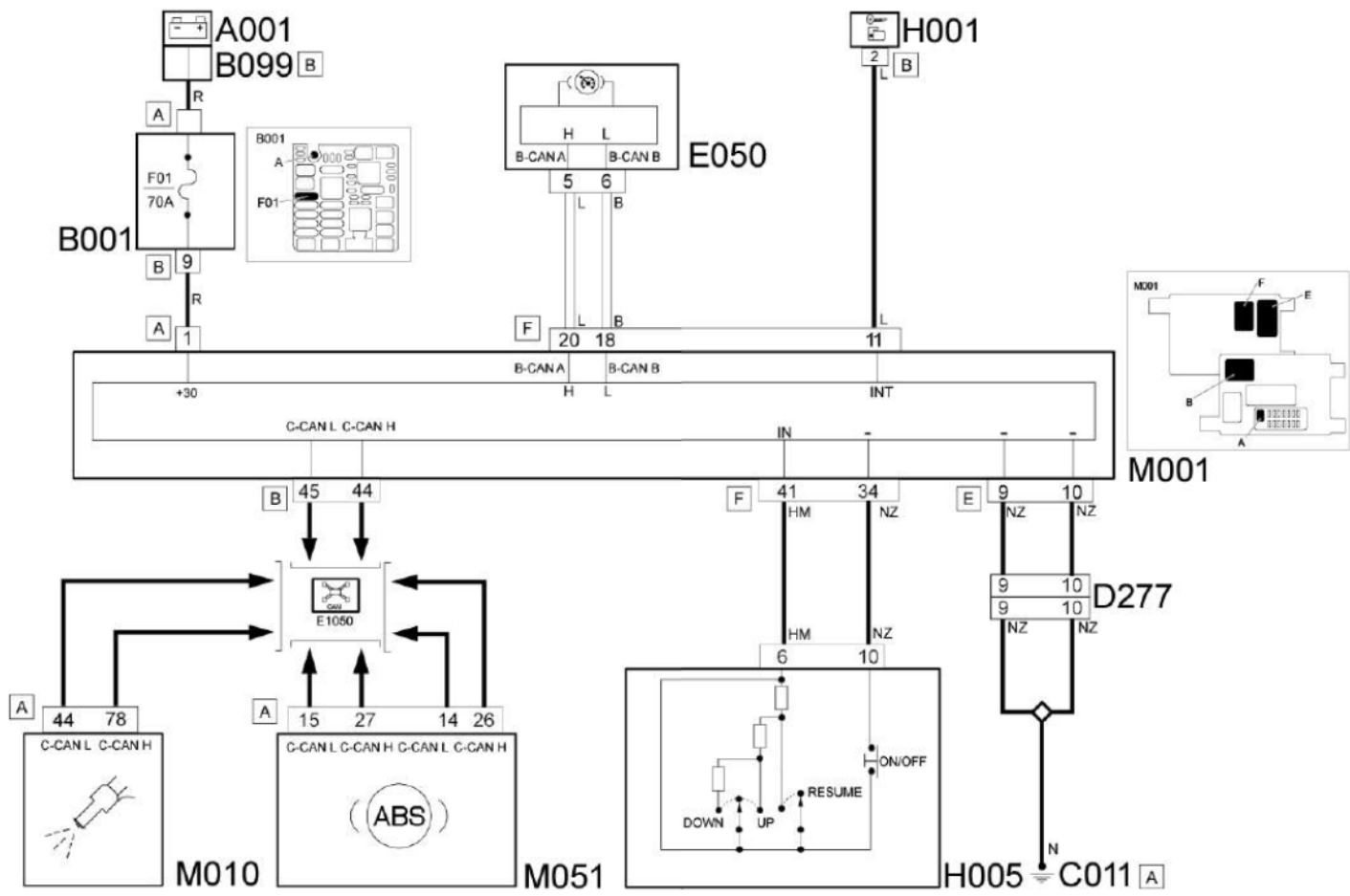
In order to manage the Cruise Control function, the engine management control unit M010 also uses the brake pedal switch signals.

See E5030 PETROL ENGINES ELECTRONIC MANAGEMENT

The engine management control unit M010 is connected, via the CAN line, to the Body Computer M001 and the instrument panel E050 to manage the Cruise Control on warning light.

cardiagn.com

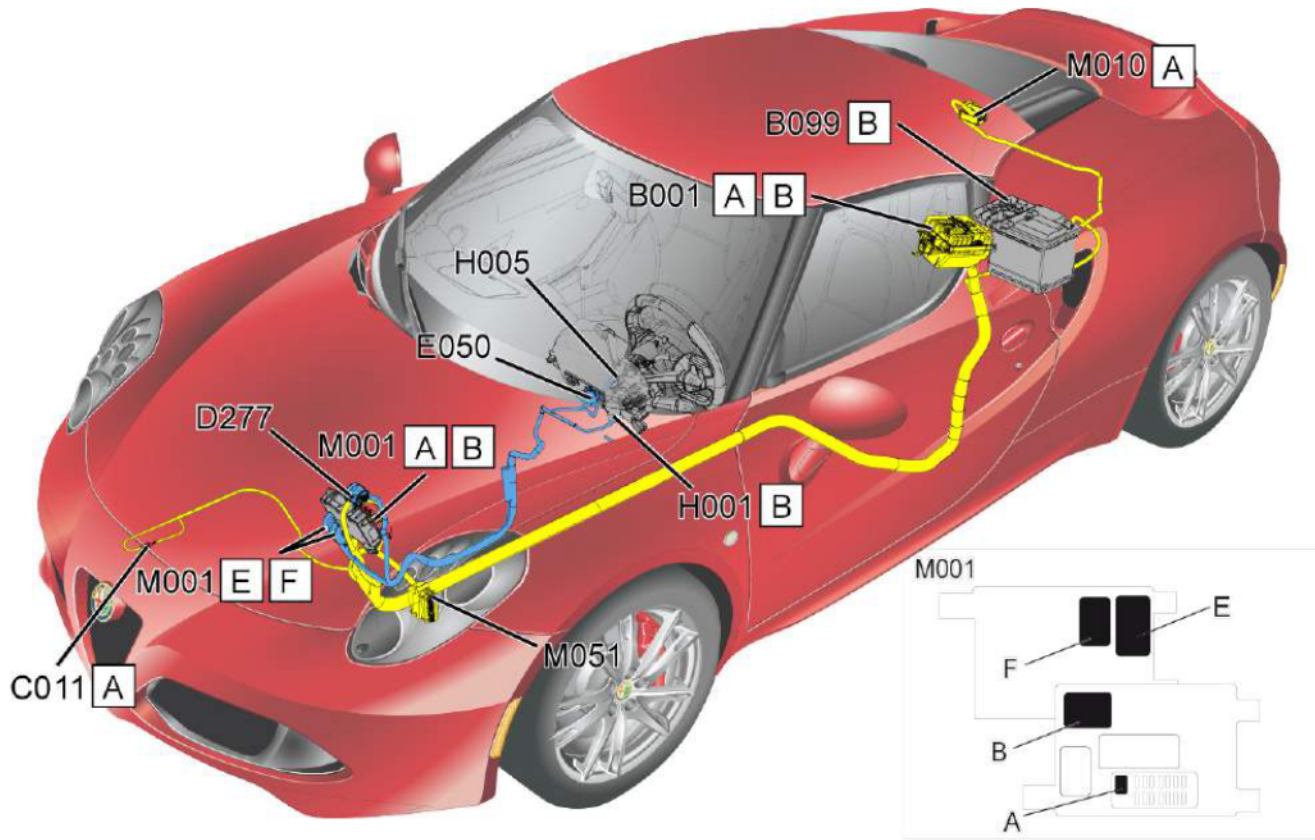
CRUISE CONTROL - WIRING DIAGRAM



Component Code	Name	Reference to the operation
A001	BATTERY	
B001	JUNCTION UNIT	
B099	MAXI FUSE BOX ON BATTERY	
C011	RIGHT FRONT EARTH	
D277	Dashboard/compartment junction	
E050	INSTRUMENT PANEL	
H001	IGNITION SWITCH	
H005	STEERING COLUMN SWITCH UNIT	
M001	BODY COMPUTER	
M010	ENGINE MANAGEMENT CONTROL UNIT	
M051	Braking system control unit	

cardiagn.com

CRUISE CONTROL - COMPONENT LOCATION



Component Code	Name	Reference to the operation
A001	BATTERY	
B001	JUNCTION UNIT	
B099	MAXI FUSE BOX ON BATTERY	
C011	RIGHT FRONT EARTH	
D277	Dashboard/compartment junction	
E050	INSTRUMENT PANEL	
H001	IGNITION SWITCH	
H005	STEERING COLUMN SWITCH UNIT	
M001	BODY COMPUTER	
M010	ENGINE MANAGEMENT CONTROL UNIT	
M051	Braking system control unit	

cardiagn.com

eLEARN

INSERIMENTO COMPRESSORE

643 - ALFA 4C

cardiagn.com

COMPRESSOR ENGAGEMENT - DESCRIPTION

The special button ("AC") on the climate control system control unit switches on the air cooling and dehumidification circuit, activating the air conditioning compressor.

The above button enables the operation of the air cooling circuit, but the actual compressor activation is also dependent upon the activation of:

- the linear sensor, located on the coolant circuit that stops air conditioner activation if coolant pressure is too low or high;

- the engine control unit that excludes compressor operation in accordance with engine management mode; e.g. in the case of high engine temperatures or high engine load (sudden acceleration);

All engines come with a compressor having outside control, that is equipped with a special adjustment component, that makes it possible to alter the temperature downstream of the evaporator and, if the thermal conditions allow, to reduce the post-heating.

In this way, consumption can be reduced when an intermediate temperature is required, that is a mild one

cardiagn.com

COMPRESSOR ENGAGEMENT - DESCRIPTION OF OPERATION

The relay T05 for the engine compartment junction unit B001 controls the compressor engagement circuit.

The supply for the relay is via the line for specific fuse F19 of the engine compartment junction unit B001.

The coil for relay switch T05 is supplied by Body Computer M001, from pin 24 of connector D.

The Body Computer M001 - connector A - receives a direct power supply from the battery through the line protected by maxi fuse F01 of the engine compartment control unit B001.

The Body Computer M001 receives an ignition-controlled power supply (INT) at pin 11 of connector E: this signal is used, amongst other things, to "wake up the network".

The compressor engagement request is sent by Body Computer M001 to the engine management control unit M010, via the CAN.

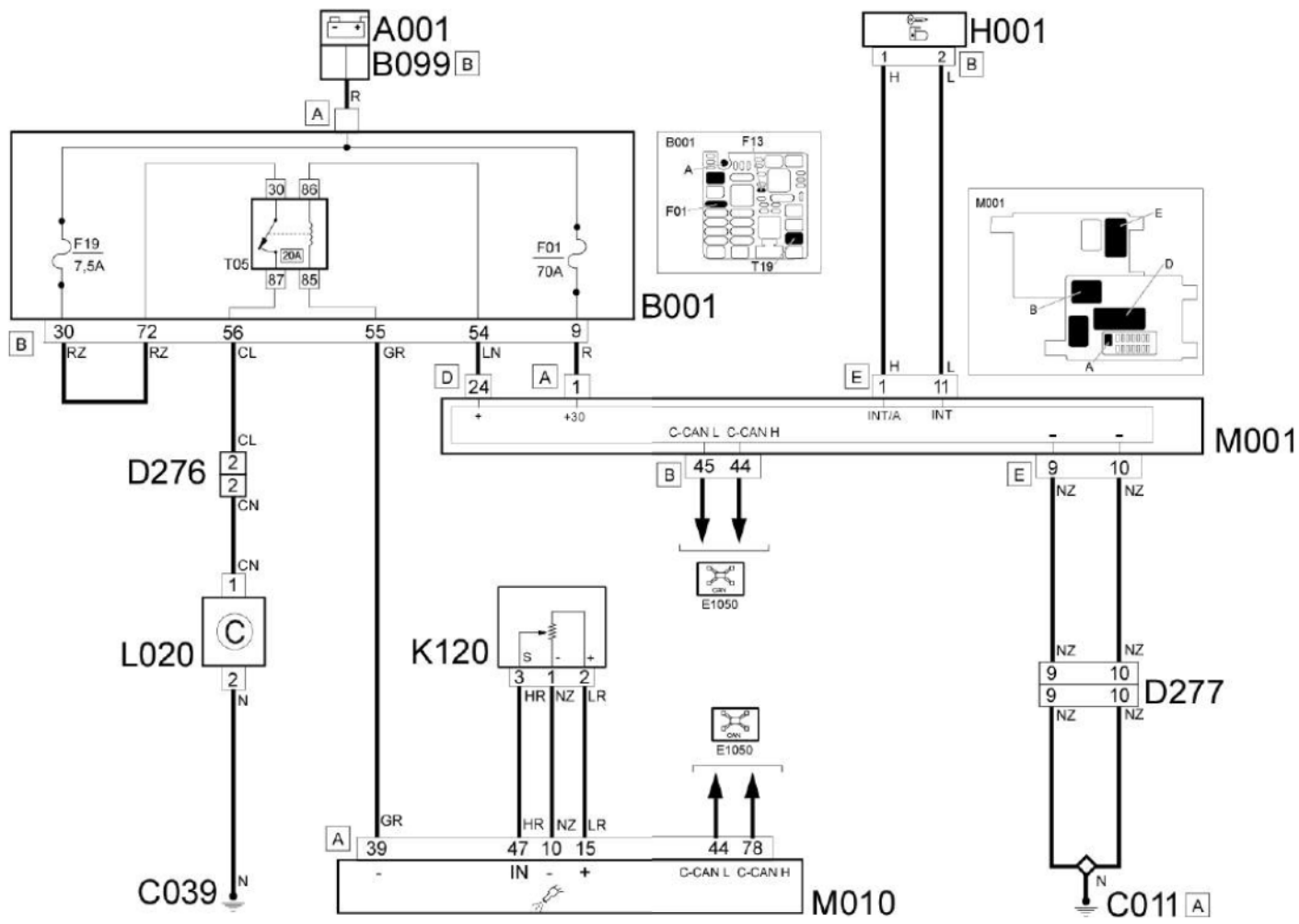
According to its internal control logic, the control unit M010 sends the actual command to engage the compressor, from pin 39 of connector A, and energises relay switch T05: in this way the air conditioning compressor engagement electromagnetic coupling L020 is operated with a 12 V voltage.

If the linear sensor for the fans K120 signals to the control unit M010 - pin 47 of connector A - that the pressure value is too high or too low, then the control unit M010 excludes the engagement of the compressor.

The linear sensor K120 receives power supply and reference earth from the engine management control unit M010, pins 15 and 10 of connector A.

cardiagn.com

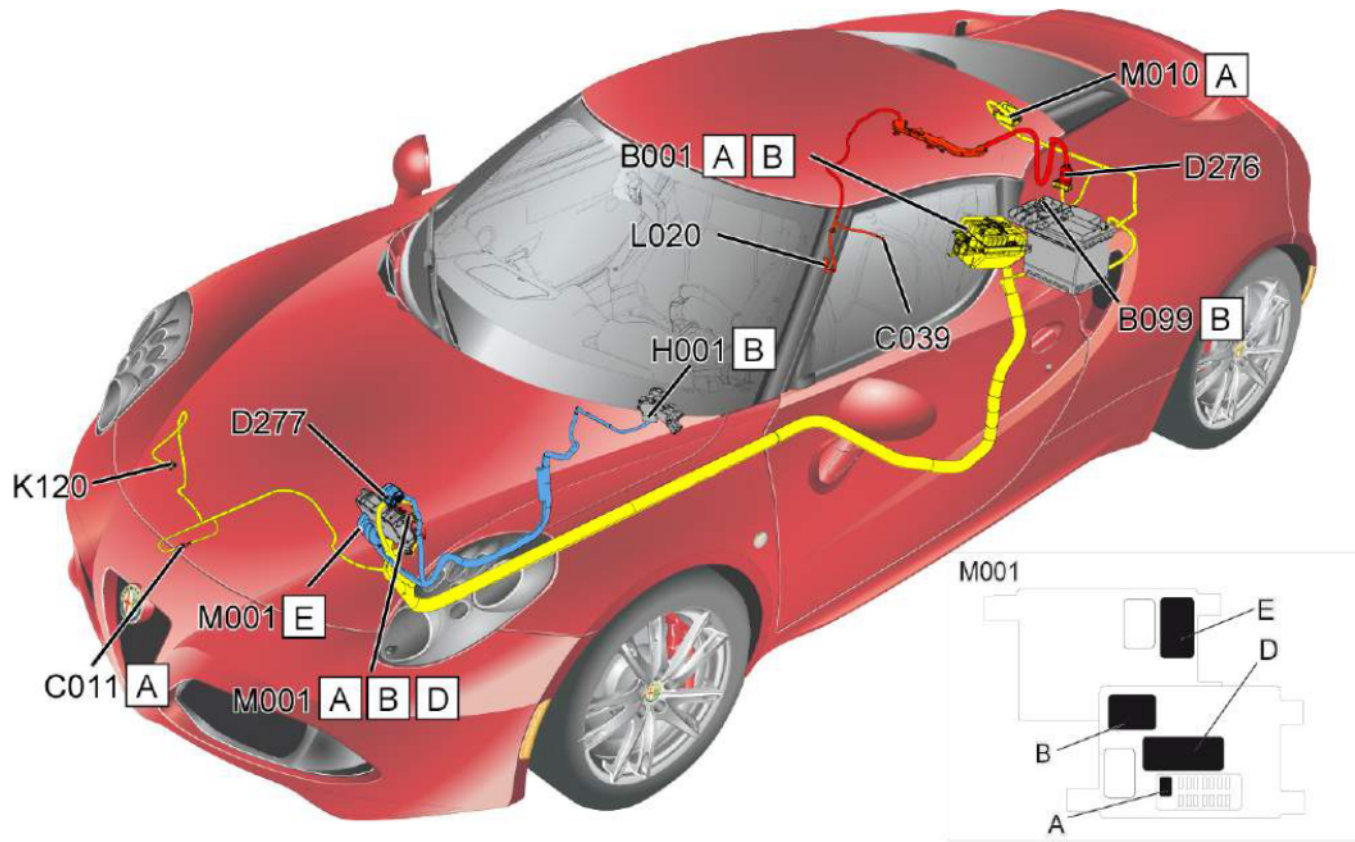
COMPRESSOR ENGAGEMENT - WIRING DIAGRAM



Component Code	Name	Reference to the operation
A001	BATTERY	
B001	JUNCTION UNIT	
B099	MAXI FUSE BOX ON BATTERY	
C011	RIGHT FRONT EARTH	
C039	COMPRESSOR EARTH	
D276	Engine/compartment junction	
D277	Dashboard/compartment junction	
H001	IGNITION SWITCH	
K120	LINEAR SENSOR FOR FANS	
L020	AIR CONDITIONING COMPRESSOR ENGAGEMENT SOLENOID	
M001	BODY COMPUTER	
M010	ENGINE MANAGEMENT CONTROL UNIT	

cardiagn.com

COMPRESSOR ENGAGEMENT - LOCATION OF COMPONENTS



Component Code	Name	Reference to the operation
A001	BATTERY	
B001	JUNCTION UNIT	
B099	MAXI FUSE BOX ON BATTERY	
C011	RIGHT FRONT EARTH	
C039	COMPRESSOR EARTH	
D276	Engine/compartment junction	
D277	Dashboard/compartment junction	
H001	IGNITION SWITCH	
K120	LINEAR SENSOR FOR FANS	
L020	AIR CONDITIONING COMPRESSOR ENGAGEMENT SOLENOID	
M001	BODY COMPUTER	
M010	ENGINE MANAGEMENT CONTROL UNIT	

cardiagn.com

eLEARN

CODE

643 - ALFA 4C

cardiagn.com

CODE - DESCRIPTION

To increase protection against theft attempts, an engine immobiliser system known as ALFA ROMEO CODE is used.

The CODE system only allows the engine to be started by means of the engine management control unit after a password, memorised previously, is received.

The code used in the dialogue, that takes place via an aerial coaxial to the ignition switch, varies each time the engine is started (rolling code): therefore the code cannot be reproduced even using electronic scanners.

The Code system control unit is incorporated in the Body Computer and also includes:

- C CAN line for dialogue with the Body Computer and the engine management control unit;

- remote control containing a transponder with a password;

- an aerial that reads the code contained in the transponder;

- engine management control unit.

The CODE allows the start of the engine management by the engine management control unit by means of a coded dialogue between the Body Computer and the engine management control unit during the stage prior to starting.

After the key is turned to the ON position, the engine control unit sends a code request to the Body Computer which only responds after having recognised (through the aerial) a known transponder in the ignition switch.

If the secret code in the reply is valid, the engine management control unit continues with the regular engine management activities, allowing the engine to be started.

If the transponder is not recognised, engine start-up is inhibited.

Operation of the CODE is guaranteed if any of the other Body Computer functions are not working correctly.

The function involves the display of the status through the "vehicle protection system" warning light in the instrument panel and connected via the CAN switching on.

cardiagn.com

CODE - FUNCTIONAL DESCRIPTION

The CODE unit is located inside the Body Computer M001 and receives a direct supply - connector A - from the battery via the line protected by maxifuse F01 of the engine compartment junction unit B001.

The Body Computer M001 receives an ignition-controlled power supply (INT) at pin 11 of connector E: this signal is used, amongst other things, to "wake up the network".

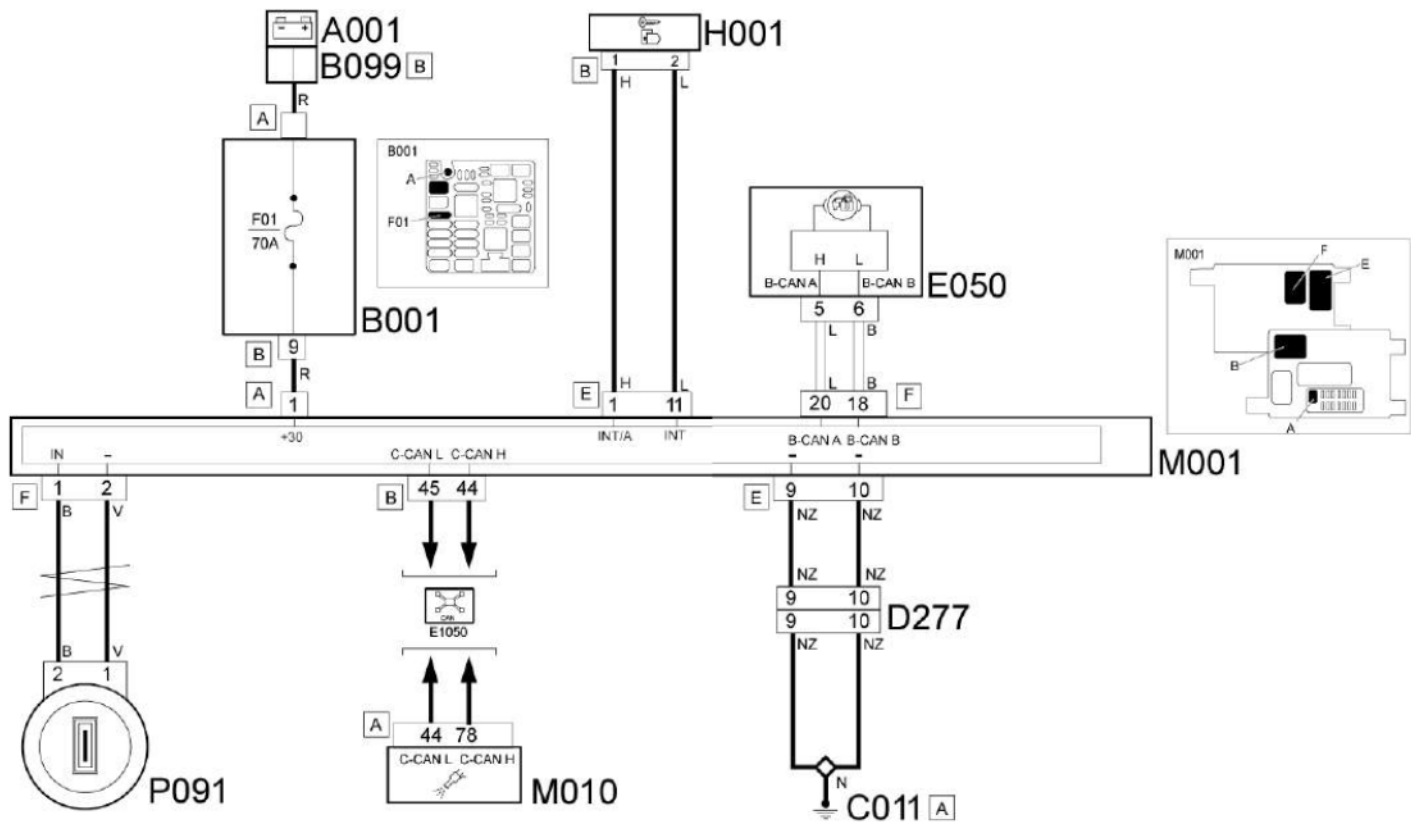
The CODE device aerial P091 is connected, via two cables to the CODE unit of Body Computer M001, to pins 1 and 2 of connector F; the aerial is positioned coaxially on the ignition switch in order to detect the key being inserted and turned.

The key recognition dialogue and the exchange of codes between the Body Computer M001 and the engine management control unit M010 takes place through CAN-C.

The Body Computer M001 is connected, through the CAN line, to the instrument panel E050 to manage the "vehicle protection" warning light.

cardiagn.com

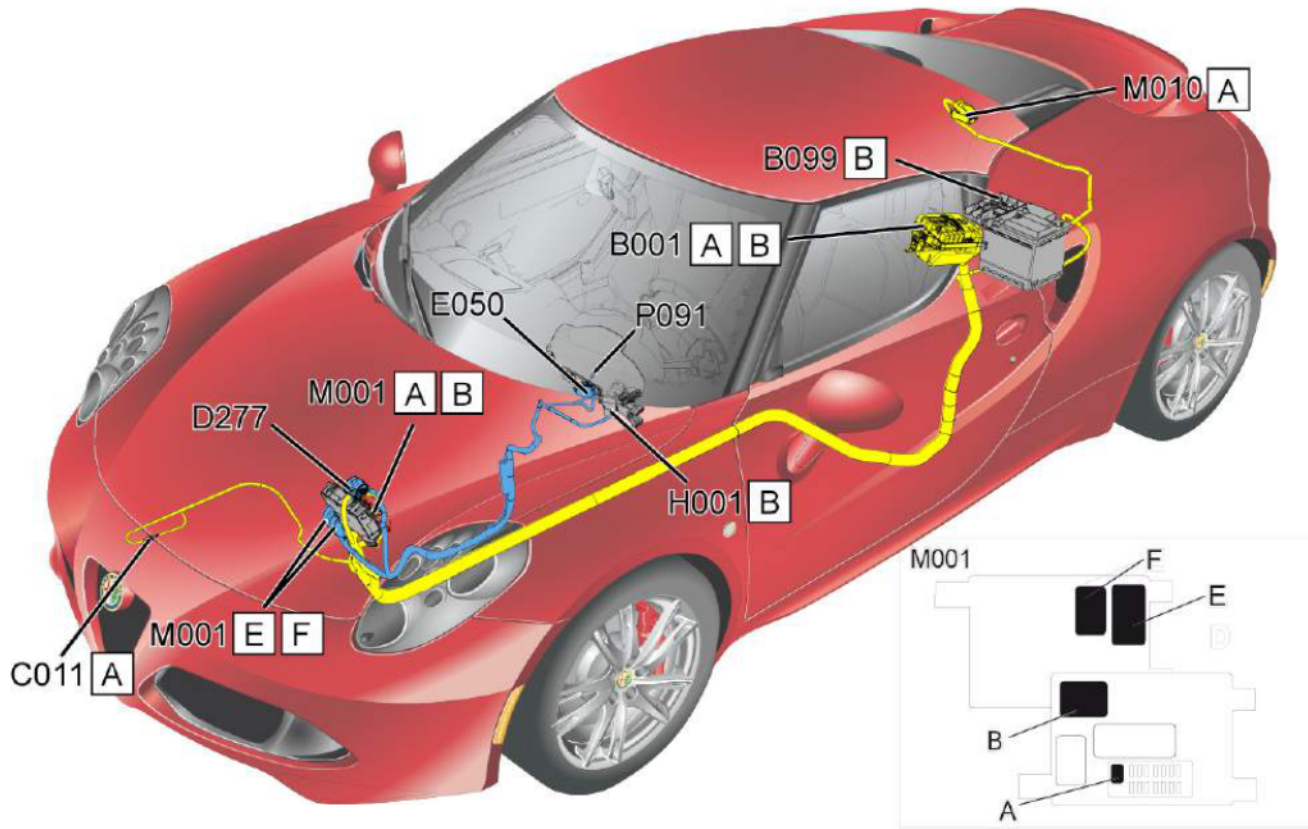
CODE - WIRING DIAGRAM



Component Code	Name	Reference to the operation
A001	BATTERY	
B001	JUNCTION UNIT	
B099	MAXI FUSE BOX ON BATTERY	
C011	RIGHT FRONT EARTH	
D277	Dashboard/compartment junction	
E050	INSTRUMENT PANEL	
H001	IGNITION SWITCH	
M001	BODY COMPUTER	
M010	ENGINE MANAGEMENT CONTROL UNIT	
P091	AERIAL FOR FIAT-CODE	

cardiagn.com

CODE - COMPONENT LOCATION



Component Code	Name	Reference to the operation
A001	BATTERY	
B001	JUNCTION UNIT	
B099	MAXI FUSE BOX ON BATTERY	
C011	RIGHT FRONT EARTH	
D277	Dashboard/compartment junction	
E050	INSTRUMENT PANEL	
H001	IGNITION SWITCH	
M001	BODY COMPUTER	
M010	ENGINE MANAGEMENT CONTROL UNIT	
P091	AERIAL FOR FIAT-CODE	

cardiagn.com

eLEARN

ESP/ESC

643 - ALFA 4C

cardiagn.com

ESP - DESCRIPTION

The ABS electronic anti-lock braking system regulates the braking pressure transmitted to the wheels, preventing them from losing grip whatever the tyre and road conditions.

The system is designed to be incorporated with the braking system (using the same hydraulic fluid) without preventing the operation of the braking system itself if the ABS fails.

Four sensors, located on each of the four wheels, indicate the speed of each wheel to the electronic control unit, recording any situations involving locking, slipping or loss of grip.

In these situations, the control unit controls the solenoid valves which modulate the pressure in the hydraulic circuit, preventing the wheels from locking and restoring grip conditions for the vehicle. This ensures optimum handling of the vehicle and excellent stopping distances.

The sensors are active, supplied by the control unit; they consist of a magnetic resistive receiver with a magnetic codifier incorporated in the hub bearing so that the signal is less affected by electromagnetic interference and variations in temperature.

The ABS control unit also controls the distribution of the braking load between the front and rear axles, meaning that the mechanical load proportioning valve used previously can be dispensed with (EBD function: Electronic Brake Distribution).

The control unit is equipped with a self-diagnosis function: when an error in the ABS function is detected, the warning light switches on and the system is deactivated at the same time. In these conditions the vehicle brakes using the traditional system only.

When the control unit detects an error which also affects the EBD function, it turns on the ABS failure warning light and the low brake fluid and handbrake applied warning light.

In these conditions the rear braking distribution control is deactivated: the driver must therefore proceed very carefully to the first authorised service centre.

The ABS control unit calculates the speed of the vehicle starting from the figures that are supplied by the drive wheel sensors (with the ABS control unit calculating the average value) and from the circumference of the wheels themselves, supplied by the Body Computer: this speedometer signal is then sent, via the CAN, to the nodes that require this information.

The ABS comes with the ESP (Electronic Stability Program) or VDC (Vehicle Dynamic Control) system, which controls the stability of the vehicle, intervening on the drive torque and braking the wheels in a differentiated manner: in the event of a loss of grip, it contributes to returning the vehicle to the correct path.

The ABS control unit, in the most complete version, implements the ESP, EBD, ABS, CBC (Cornering Braking Control), DTC (Drag Torque Control), ASR (AntiSlip Regulation), HILL HOLDER, HBA (Hydraulic Brake Assist), ELECTRONIC Q2, PRE_FILL (RAB - Ready Alert Brake) functions.

The ESP system acts on the engine and brakes generating a stabilising torque when the ABS sensors detect conditions that could cause the vehicle to slip. The ESP system has a specific sensor in addition to the ABS sensors, a "yaw sensor" located in the control unit, that detects vehicle rotation on the vertical axis and lateral acceleration (centrifugal force). It also uses steering sensor signals from the steering control unit supplied through the CAN.

A longitudinal acceleration sensor is also provided with the Hill Holder function, incorporated into the same control unit.

In addition, the ESP system uses the information of the pressure sensor, which measures the pressure in the hydraulic circuit: this sensor is built into the hydraulic control unit.

The Hill Holder system is designed to assist the driver when setting off on an incline. In effect, the HH is capable of automatically providing sufficient braking torque to keep the vehicle stationary until the clutch is fully released and the engine torque is sufficient to start the vehicle comfortably.

The HH is automatically activated when the brake pedal is pressed in conjunction with the following conditions: vehicle speed equal to zero, gradient more than 2% and clutch pedal pressed; the moment the brake pedal is released, with all other conditions being equal, the Hill Holder keeps the braking system pressurised for 2 seconds to allow the driver to move their foot from the brake pedal to the accelerator pedal without the vehicle slipping backwards and without using the parking brake.

Once the accelerator is pressed, the Hill Holder continues to keep the vehicle still for a further 10 seconds or until the engine torque is sufficient to start the vehicle.The HH is not activated with reverse gear engaged.

This version sees the introduction of additional innovative features:

- DTC (Drag Torque Control): intervenes in the event of sudden downshifting, or during braking when the ABS intervenes, restoring torque to the engine and thus preventing excessive drag at the drive wheels, which may lead the wheels to lock and a loss of car stability, above all in low-grip conditions;

- CBC: this function improves the distribution of the braking pressure at the four wheels (to fully exploit the grip available on the ground) when braking round bends when the ABS intervenes. This improves stopping distances on bends and, above all, car stability;

- E-Q2 system: the Electronic Q2 system takes advantage of the braking system producing behaviour very similar to a limited slip differential. The front braking system, when accelerating around a corner, acts on the inside wheel to increase the drive of the outside wheel (increased load), dynamically and continuously distributing the torque between the front drive wheels according to driving and road conditions:

- RAB (available in "Dynamic" mode only): a function that allows a pre-positioning of the brake pads (front and rear) following a rapid release of the accelerator pedal to reduce braking times, reducing stopping distances.

The control unit supply lines are protected by two dedicated fuses in the engine compartment control unit.

cardiagn.com

ESP - FUNCTIONAL DESCRIPTION

The ABS electronic control unit M051 receives a direct power supply (at pins 1 and 25) from the battery from the line protected by fuses F04 and F05 of the engine compartment junction unit B001.

The ignition-operated power supply (15/54) arrives via a line protected by fuse F24 of the engine compartment junction unit B001 at pin 28.

The control unit is earthed at pins 13 and 38.

The four sensors K070, K071, K075, K076 send wheel speed signals to pins 8-19, 4-16, 18-31 and 29-17 of control unit M051 respectively

Brake pedal switch I030 sends both enablement signals (normally open and normally closed) to control unit M051 at pins 27, 34.

Via the CAN, control unit M051 is connected

- to the twin clutch automatic transmission control unit M196 from pins 15 and 27

- to Body Computer M001 from pins 14 and 26

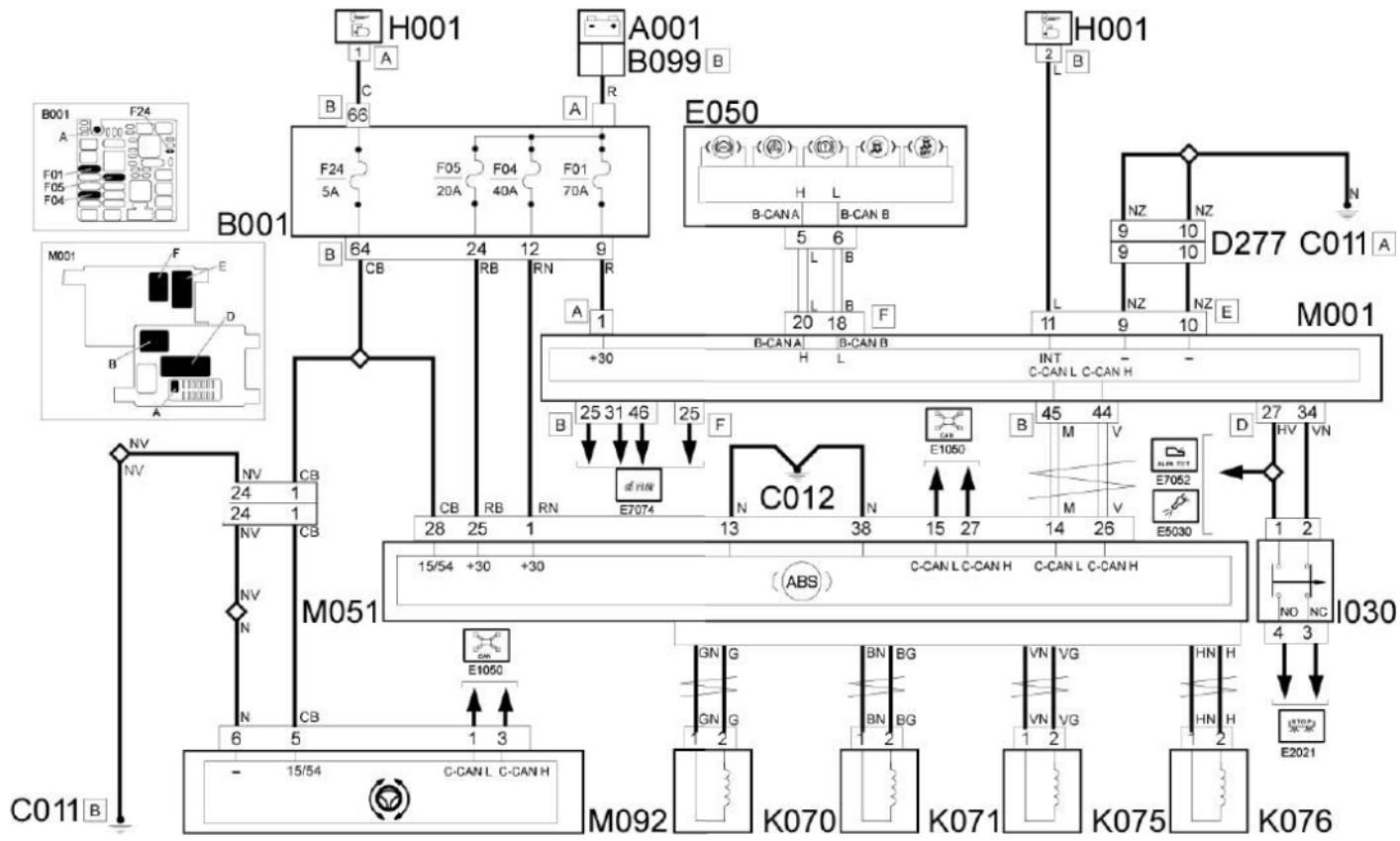
- to instrument panel E050 from pins 18, 20 to manage the "ABS failure" warning light and, if there are problems with the EBD function, the "insufficient brake fluid level and handbrake engaged" warning light as well as the "ESP/ASR" warning light.

The speedometer signal for all the systems that require this information is sent via the CAN.

The yaw, lateral and longitudinal acceleration sensor is inside control unit M051.

cardiagn.com

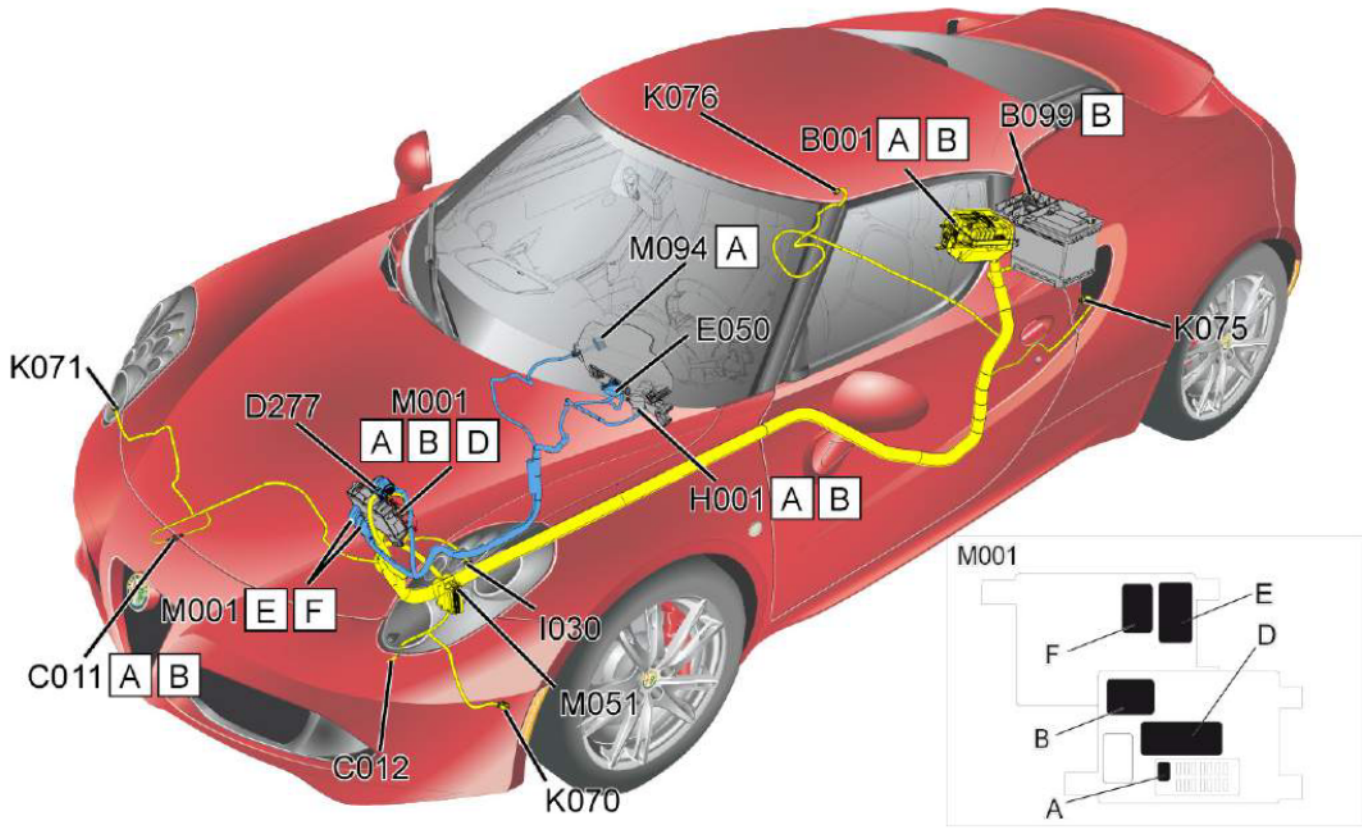
ESP - WIRING DIAGRAM



Component Code	Name	Reference to the operation
A001	BATTERY	
B001	JUNCTION UNIT	
B099	MAXI FUSE BOX ON BATTERY	
C011	RIGHT FRONT EARTH	
C012	ABS FRONT EARTH	
D277	Dashboard/compartment junction	
E050	INSTRUMENT PANEL	
H001	IGNITION SWITCH	
I030	BRAKE PEDAL SWITCH	
K070	LEFT FRONT WHEEL SENSOR FOR ABS	
K071	RIGHT FRONT WHEEL SENSOR FOR ABS	
K075	LEFT REAR WHEEL SENSOR FOR ABS	
K076	RIGHT REAR WHEEL SENSOR FOR ABS	
M001	BODY COMPUTER	
M051	Braking system control unit	
M092	STEERING ANGLE CONTROL UNIT	

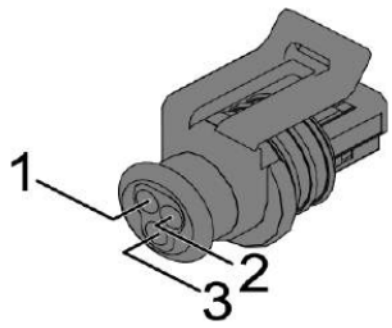
cardiagn.com

ESP - COMPONENT LOCATION



Component Code	Name	Reference to the operation
A001	BATTERY	
B001	JUNCTION UNIT	
B099	MAXI FUSE BOX ON BATTERY	
C011	RIGHT FRONT EARTH	
C012	ABS FRONT EARTH	
D277	Dashboard/compartment junction	
E050	INSTRUMENT PANEL	
H001	IGNITION SWITCH	
I030	BRAKE PEDAL SWITCH	
K070	LEFT FRONT WHEEL SENSOR FOR ABS	
K071	RIGHT FRONT WHEEL SENSOR FOR ABS	
K075	LEFT REAR WHEEL SENSOR FOR ABS	
K076	RIGHT REAR WHEEL SENSOR FOR ABS	
M001	BODY COMPUTER	
M051	Braking system control unit	
M092	STEERING ANGLE CONTROL UNIT	

cardiagn.com



Wiring			Colour		
See 167 Passenger compartment					
Pin	Cable		Destination		
	Sect.	Colour	Node	Connector	Pin
1	0.35	NZ		See M010A ENGINE MANAGEMENT CONTROL UNIT (Passenger compartment)	10
2	0.35	LR		See M010A ENGINE MANAGEMENT CONTROL UNIT (Passenger compartment)	15
3	0.35	HR		See M010A ENGINE MANAGEMENT CONTROL UNIT (Passenger compartment)	47

cardiagn.com