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AVVIAMENTO E RICARICA

191 - Giulietta

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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.

The Start&Stop device automatically stops the engine each time the vehicle is stationary and starts it again when the driver intends to engage a gear.

The device is essentially based on a starting system (battery and starter) which can restart the engine quickly and relatively quietly; it can withstand a number of start-ups much higher than a traditional system.

The engine switch-off and start-up activation and control strategies are managed by the engine management control unit and the Body Computer through direct connections or via the CAN.

The starter motor is more powerful and robust and the alternator has also been increased, with a higher current supply capacity.

In addition to modifications to the battery, in order to integrate it with the Start&Stop strategies, a battery sensor has been introduced that monitors the battery status and notifies the network nodes to allow the optimum management of the battery within the framework of the Start&Stop strategies. The sensor is fitted on the battery negative pole.

A vacuum sensor delivers information about the vacuum in the brake servo circuit.

A sensor fitted on the gearbox delivers information on the engagement of neutral.

A rotary clutch sensor signals three different pedal states: not pressed, pressed and partially pressed.

The automatic stopping and the subsequent restarting of the engine are signalled by the warning light on the instrument panel and a number of messages concerning the Start&Stop device.

See descriptions 5560 INSTRUMENTS

The device can be manually activated/deactivated using the button between the controls on the left side of the dashboard.

For more details:

See descriptions 5520 ENGINE STARTING

A voltage stabiliser, fitted under the dashboard on the passenger side, maintains a constant voltage for devices (e.g. radio, etc.) sensitive to voltage drops during engine start-up.

For comfort, emission control and safety reasons, under certain circumstances the system "locks" the normal operation of the device.

The start-up logic is implemented by two relay switches in the engine compartment junction unit

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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.

Pin 11 of connector G of M001 provides the Body Computer with a reference earth.

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

In the MAR-ON position, many 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 2 of connector G.

The ignition-operated signal "INT/A", however, is sent to the Body Computer M001 at pin 9 of connector G.

Pin 30 of A020 - connector A - i.e. the actual motor, receives a power supply with the voltage coming directly from the battery through the junction box B099.

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

When the alternator does not turn and does not therefore recharge the battery, an earth signal is sent from pin D+ connector A of A010 to engine control unit M010 - pin 19 of connector A: this is connected via the CAN line to Body Computer M001 and to instrument panel E050 and manages, as described above, activation of the generator warning light on the instrument panel.

There are two types of starting:

- Key start-up: is directly controlled by the driver through the ignition key.

- Automatic start-up: is managed by the Stop&Start function in order to restart the engine after the vehicle has been stopped.

Key starting

With the key in OFF position, the two start-up relay switches T17 and T20 of the engine compartment junction unit B001 are not supplied and therefore open.

When the key is turned to the AVV position (+50), the control unit M010 (signal from 55 of connector A) closes the relay switch T20 and controls the electromagnet winding supply - pin 50 - for the starter A020.

The feedback signal is sent to the voltage stabilizer M192 - pin 4.

When the key is released in the ON position, the control unit M010 opens the relay switch T20 and performs diagnosis on both relay switches (signal on pin 43 of connector A); depending on the outcome of this diagnosis, the following conditions may occur:

- Both relay switches operate normally: the Body Computer (signal from pin 49 of connector D) closes the relay switch T17 and Start&Stop functionality is enabled;

- the relay switch T20 is "stuck": T17 is kept open and Start&Stop is disabled;

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Automatic starting

When the Start&Stop strategy determines the need for automatic starting, the engine is started according to the following logic, without the driver having to use the key.

The relay switch T20 is closed by the control unit M010 (signal from pin 55 of connector A): the relay switch T17 had already been closed at the end of the key start-up procedure therefore the starter A020 supply is enabled.

Once the engine is started, the control unit M010 controls the opening of T20 then performs its diagnosis again: depending on the outcome of this diagnosis, the following conditions may occur:

- T20 is diagnosed as being open, as controlled: Stop&Start functionality is enabled;

- T20 is "stuck": T17 is opened and Start&Stop functionality is disabled.

The automatic stopping and the following engine restarting are signalled through the CAN line to the instrument panel E050, which manages the corresponding warning light and many messages.

The device can be manually deactivated using the button between the controls H090: signal to pin 34 of connector H of the Body Computer M001: when the system is deactivated, the relevant LED is switched on from pin 52 of connector H of M001.

The vacuum sensor K105, supplied by the "ignition-operated" line of F51 of M001, sends information on the brake servo circuit vacuum to pin 58 of connector A of M010

The "neutral" sensor K214 receives a 5 V supply and a reference earth from pins 23 and 59 of connector A of M010 and sends information on the gear to pin 75 of the same.

The clutch sensor I031, supplied by the "ignition-operated" line of F51 of M001, signals the pedal condition: not pressed, pressed and partially pressed to pins 40 and 79 of connector A of M010.

The start-up signal and the diagnosis signal are sent respectively to pin 4 and pin 3 of the voltage stabiliser M192 from pin 47 of connector H of the Body Computer M001.

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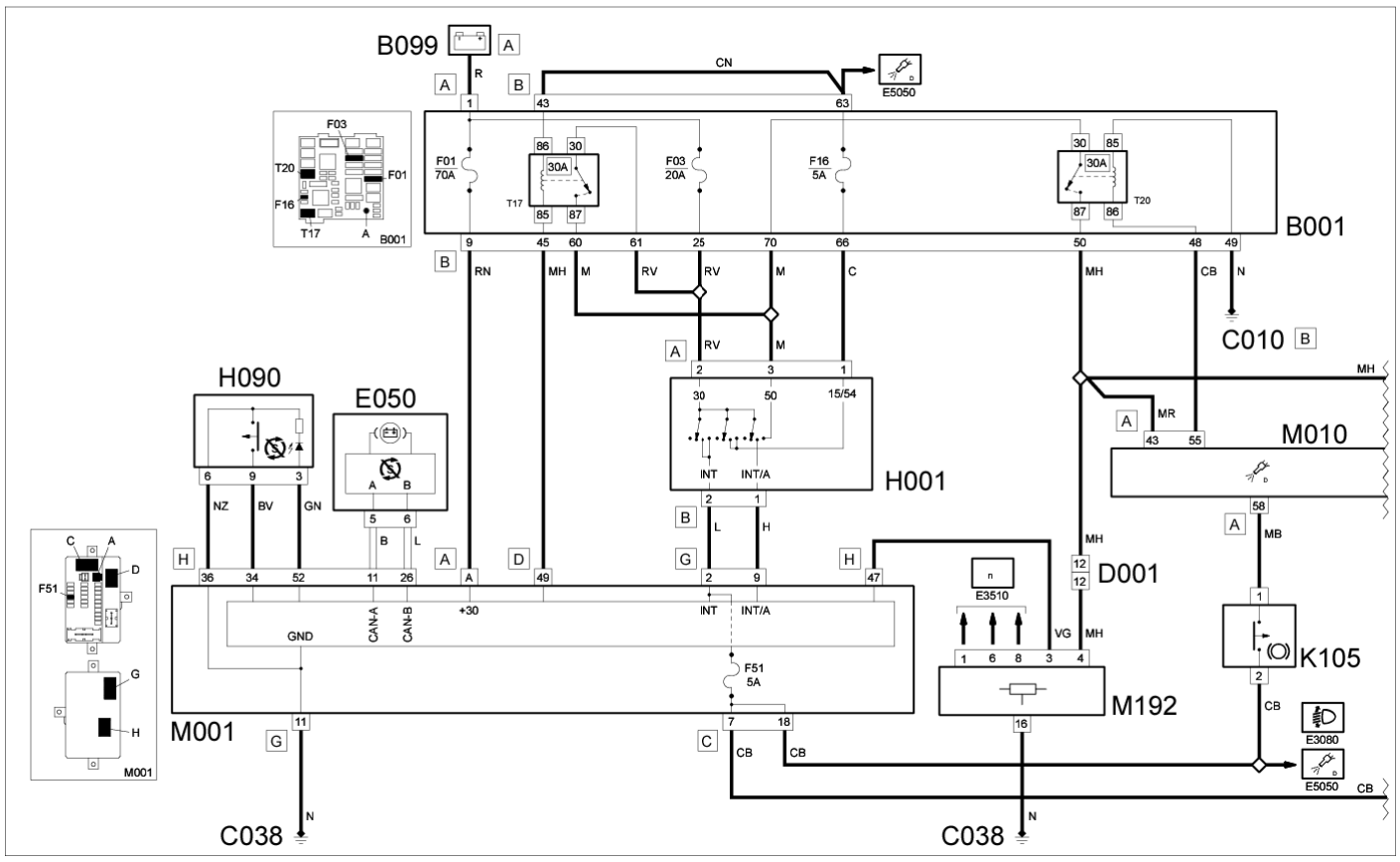
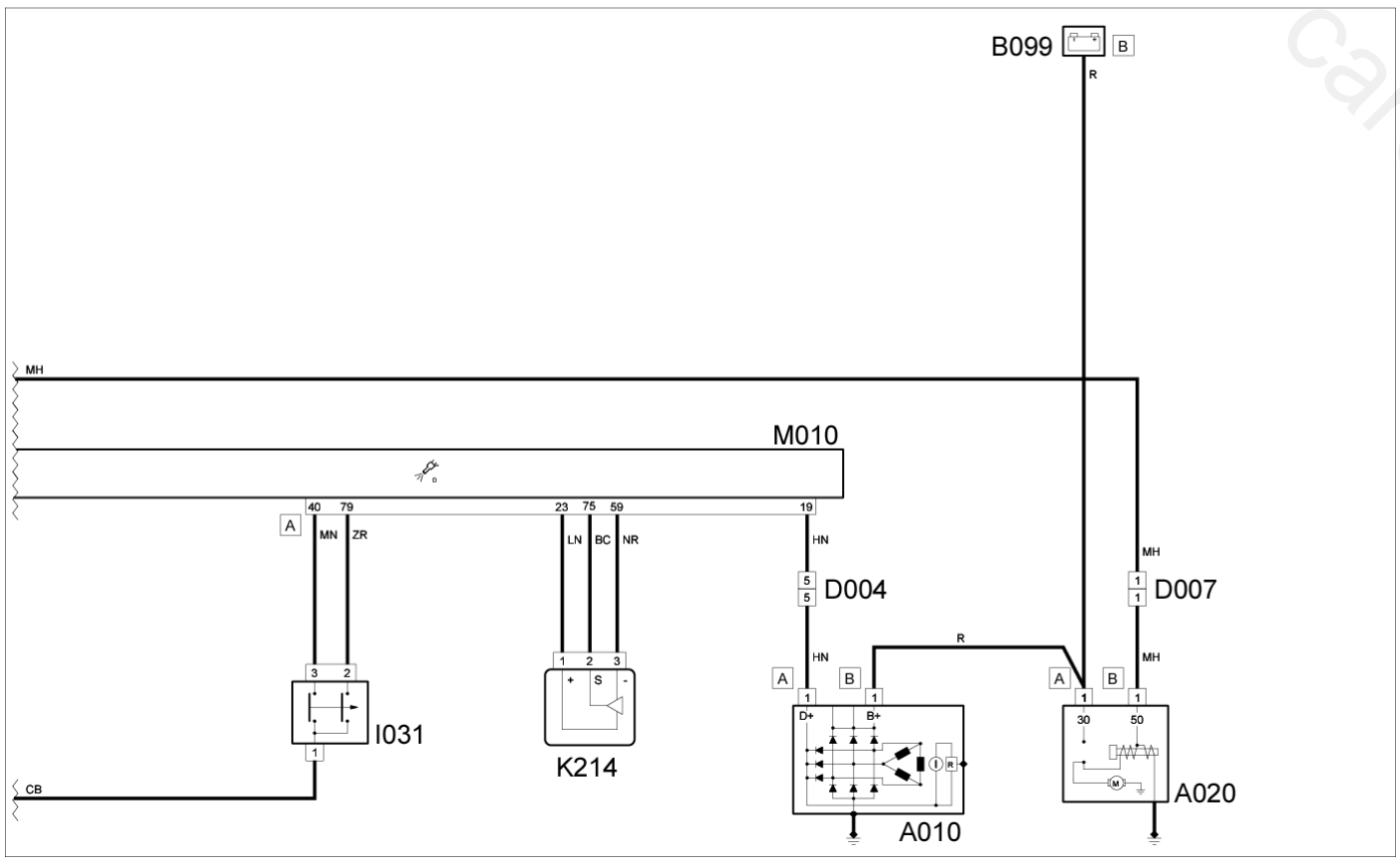
IGNITION AND RECHARGING - WIRING DIAGRAM





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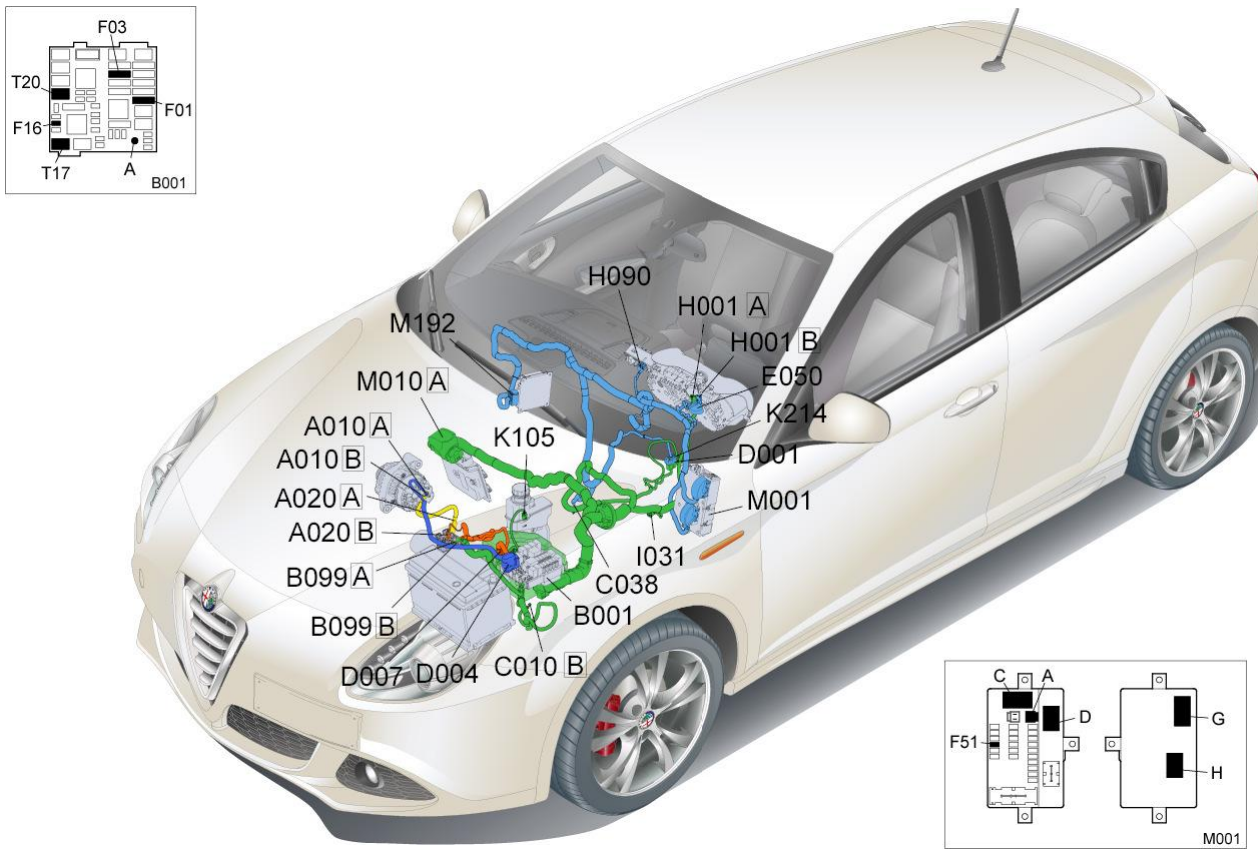
Component Code	Name	Reference to the operation
A010	ALTERNATOR	Op. 5530A10 ALTERNATOR - R.R.
A020	STARTER MOTOR	Op. 5520B10 STARTER MOTOR - R.R.
B001	JUNCTION UNIT	Op. 5505A28 CONTAINER FOR ADDITIONAL JUNCTION UNIT IN ENGINE COMPARTMENT - R.R.
B099	MAXI FUSE BOX ON BATTERY	Op. 5530B40 SUPPLY BOX ON BATTERY (LINK BATTERY AND FUSE BOX) - R R
C010	LEFT FRONT EARTH	-
C038	EARTH ON CENTRE TUNNEL	-
D001	FRONT/DASHBOARD COUPLING	-
D004	FRONT/ENGINE COUPLING	
D007	ALTERNATOR COUPLING	-
E050	INSTRUMENT PANEL	Op. 5560B10 CONTROL PANEL - R+R
H001	IGNITION SWITCH	Op. 5520A18 IGNITION SWITCH CONTACT CARRIER LOCK BARREL - R.R.
H090	SWITCH CONTROL PANEL	Op. 7040A56 SWITCH UNIT IN DASHBOARD - R.R.
I031	CLUTCH PEDAL SWITCH	Op. 1060G42 CLUTCH PEDAL SWITCH - R.R.
K105	BRAKE SERVO VACUUM SENSOR	Op. 5520D02 VACUUM SENSOR OF BRAKE SERVO - R.R.
K214	neutral position sensor on gear lever	Op. 5520D04 GEAR LEVER IN NEUTRAL SENSOR - R.R.
M001	BODY COMPUTER	Op. 5505A35 MAIN BODY COMPUTER/JUNCTION UNIT - R.R.
M010	ENGINE MANAGEMENT CONTROL UNIT	Op. 1060G80 DIESEL ELECTRONIC INJECTION CONTROL UNIT - R.R
M192	ALARM CONTROL UNIT	Op. 5520D03 VOLTAGE STABILIZER - R.R.

IGNITION AND RECHARGING - COMPONENT LOCATION



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