

continuity of the wiring is necessary for correct activation: no error indications are displayed in case of lack of activation

### DIAGNOSIS INSTRUMENT: ELECTRICAL ERRORS

fuel pump relay control P0230

- shorted to positive / open circuit, shorted to negative.

#### Error cause

- If shorted to positive: excessive voltage has been detected at PIN 73 of the VEHICLE connector. If the circuit is open, shorted to negative: voltage equal to zero has been detected at PIN 73 of the VEHICLE connector.

#### Troubleshooting

- If shorted to positive: check whether the relay electrical specifications are correct by disconnecting it from the cable harness. If are not OK, replace the relay; if OK, restore the cable harness (brown/black cable).
- If the circuit is open, shorted to negative: check the relay electrical characteristics are correct by disconnecting it from the cable harness; if it is not OK, replace the relay, if it is OK, check relay connector, engine-vehicle cable harness connector and VEHICLE connector of the Marelli control unit: if not OK, restore; if OK, check continuity of cable harness (brown/black cable)

## Coil

### Function

Spark generation

### Operation / operating principle

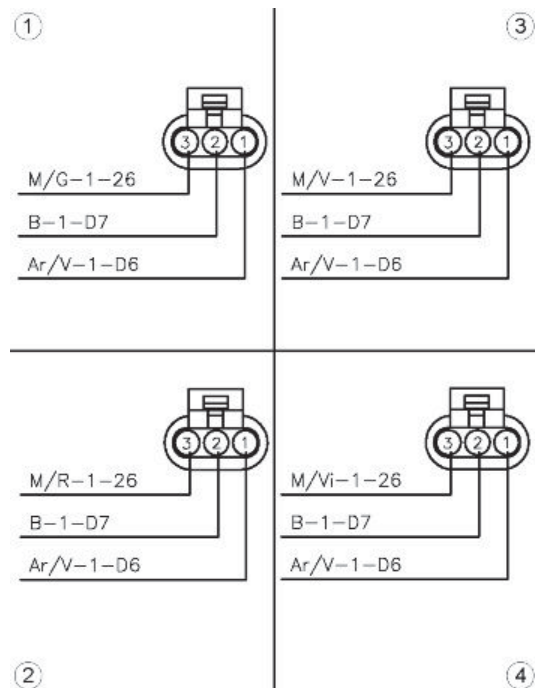
Inductive discharge system

### Level in wiring diagram:

coils and injectors

### Location:

- on the vehicle: on the head covers.
- connector: For each 3-ways black coil connector. Coil 1 with short cable: on the left on the filter box, rear side; coil 2 with long cable: on the left of the front side of the filter box (connector with red strap on engine cable harness), coil 3 with long cable: on the left on the rear side of the filter box (connector with red



strap on engine cable harness); coil 4 with short cable: on the right of the front side of the filter box.

**Electrical characteristics:**

0.7 - 0.9  $\Omega$  at ambient temperature

**Pin out:**

1. Power supply + Vbatt
2. Secondary circuit to ground
3. Activation from control unit

**DIAGNOSIS INSTRUMENT: PARAMETERS**

**Example value with key ON:** Current ignition advance

**Example value with engine on:** Indicates the cylinder advance where combustion will take place.

**CAUTION**

BEFORE CARRYING OUT ANY TROUBLESHOOTING, CAREFULLY READ THE GENERAL TROUBLESHOOTING CONCEPTS FOR ELECTRICAL DEVICES AT THE BEGINNING OF THE CHECK AND CONTROL SECTION IN THE ELECTRICAL SYSTEM CHAPTER.

**DIAGNOSIS INSTRUMENT: ACTIVATION****Coil 1:**

The injection relay (No. 33 in the wiring diagram, placed under the right side of the saddle; CHECK, however, the identification of the relay with the colour of the cables) is energised for 5 seconds and the brown/yellow cable of the coil is closed to ground for 2 ms per second. Disconnect the 4-way connector of the fuel pump to be able to hear the relay and injector activation. The continuity of the wiring is necessary for correct activation: no error indications are displayed in case of lack of activation.

**Coil 2:**

The injection relay (No. 33 in the wiring diagram, placed under the right side of the saddle; CHECK, however, the identification of the relay with the colour of the cables) is energised for 5 seconds and the brown/red cable of the coil is closed to ground for 2 ms per second. Disconnect the 4-way connector of the fuel pump to be able to hear the relay and injector activation. The continuity of the wiring is necessary for correct activation: no error indications are displayed in case of lack of activation.

**Coil 3:**

The injection relay (No. 33 in the wiring diagram, placed under the right side of the saddle; CHECK, however, the identification of the relay with the colour of the cables) is energised for 5 seconds and the brown/green cable of the coil is closed to ground for 2 ms per second. Disconnect the 4-way connector of the fuel pump to be able to hear the relay and injector activation. The continuity of the wiring is necessary for correct activation: no error indications are displayed in case of lack of activation.

**Coil 4:**

The injection relay (No. 33 in the wiring diagram, placed under the right side of the saddle; CHECK, however, the identification of the relay with the colour of the cables) is energised for 5 seconds and the brown/purple cable of the coil is closed to ground for 2 ms per second. Disconnect the 4-way connector of the fuel pump to be able to hear the relay and injector activation. The continuity of the wiring is necessary for correct activation: no error indications are displayed in case of lack of activation.

**DIAGNOSIS INSTRUMENT: LOGIC ERRORS****Coil 1 P0351**

- shorted to positive / shorted to negative, open circuit.

**Error cause**

- If shorted to positive: excessive voltage has been detected at PIN 28 of the ENGINE connector. If the circuit is open, shorted to negative: voltage equal to zero has been detected at PIN 28 of the ENGINE connector.

**Troubleshooting**

- If shorted to positive: disconnect the coil connector, set the key to ON, activate the coil with Axone and check voltage at connector PIN 28: if there is voltage, restore the cable harness; if voltage = 0, replace the coil.
- If the circuit is open, shorted to negative: check electric characteristics of the coil: if not OK, replace the coil, if OK check the coil connector and the Marelli control unit connector; if not OK, restore, if OK, check cable continuity between the two cable terminals: if there is not continuity, restore the cable harness; if there is cable continuity, with key set to ON, check the ground insulation of the cable (from coil connector or control unit connector), if not OK, restore cable harness.

**Coil 2 P0352**

- shorted to positive / shorted to negative, open circuit.

**Error cause**

- If shorted to positive: excessive voltage has been detected at PIN 27 of the ENGINE connector. If the circuit is open, shorted to negative: voltage equal to zero has been detected at PIN 27 of the ENGINE connector

**Troubleshooting**

- If shorted to positive: disconnect the coil connector, set the key to ON, activate the coil with Axone and check voltage at connector PIN 27: if there is voltage, restore the cable harness; if voltage = 0, replace the coil.
- If the circuit is open, shorted to negative: check electric characteristics of the coil: if not OK, replace the coil, if OK check the coil connector and the Marelli control unit connector; if not OK, restore, if OK, check cable continuity between the two cable terminals: if there is not continuity, restore the cable harness; if there is cable continuity, with key set to ON, check

the ground insulation of the cable (from coil connector or control unit connector), if not OK, restore cable harness.

#### Coil 3 P0353

- shorted to positive / shorted to negative, open circuit.

#### **Error cause**

- If shorted to positive: excessive voltage has been detected at PIN 2 of the ENGINE connector. If the circuit is open, shorted to negative: voltage equal to zero has been detected at PIN 2 of the ENGINE connector.

#### **Troubleshooting**

- If shorted to positive: disconnect the coil connector, set the key to ON, activate the coil with Axone and check voltage at connector PIN 2: if there is voltage, restore the cable harness; if voltage = 0, replace the coil.
- If the circuit is open, shorted to negative: check electric characteristics of the coil: if not OK, replace the coil, if OK check the coil connector and the Marelli control unit connector; if not OK, restore, if OK, check cable continuity between the two cable terminals: if there is not continuity, restore the cable harness; if there is cable continuity, with key set to ON, check the ground insulation of the cable (from coil connector or control unit connector), if not OK, restore cable harness.

#### Coil 4 P0354

- shorted to positive / shorted to negative, open circuit.

#### **Error cause**

- If shorted to positive: excessive voltage has been detected at PIN 1 of the ENGINE connector. If the circuit is open, shorted to negative: voltage equal to zero has been detected at PIN 1 of the ENGINE connector.

#### **Troubleshooting**

- If shorted to positive: disconnect the coil connector, set the key to ON, activate the coil with Axone and check voltage at connector PIN 1: if there is voltage, restore the cable harness; if voltage = 0, replace the coil.
  - If the circuit is open, shorted to negative: check electric characteristics of the coil: if not OK, replace the coil, if OK check the coil connector and the Marelli control unit connector; if not OK, restore, if OK, check cable continuity between the two cable terminals: if there is not continuity, restore the cable harness; if there is cable continuity, with key set to ON, check the cable ground insulation (from coil connector or control unit connector), if not OK, restore cable harness
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