

TECHNICAL NEWSLETTER

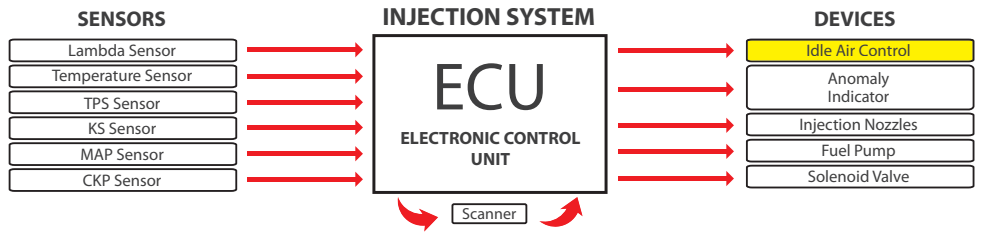
Idle Air Control (IAC)



Worldwide Exporter
of Automotive Technology

ELECTRONIC CONTROL UNIT (ECU):

Through the sensors, the ECU monitors the system operation all the time and, through the actuators, it corrects its operation.

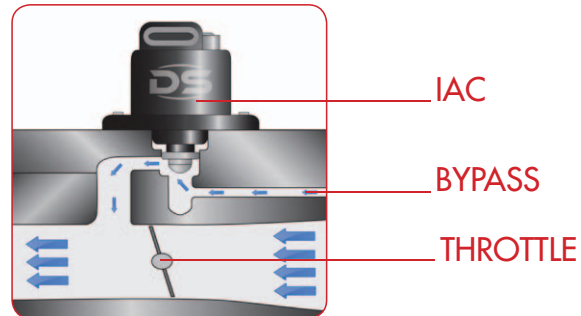


CONCEPT:

To ensure stability of the engine rotation under idle conditions, saving fuel and contributing to the environment by reducing pollutant gases.

PRINCIPLE:

The Idle Air Control, also known as IAC and stepper motor, controls the rotation of the engine under idle conditions. This "valve" is controlled by the electronic control unit (ECU) and has a stepper motor that, depending on the engine load, increases or decreases the passage of air to the intake manifold through a deviation called bypass, in throttle body. Under idle conditions, the position of the shutter is calculated based on the voltage signals, the engine coolant temperature (ECT), and the manifold absolute pressure (MAP).



LOCATION:

The Idle Air Control is found in the throttle body, usually fixed by two screws or snapped-in.

IDENTIFYING THE SYSTEMS:



MARELLI SYSTEM (between pins 1 and 4 / 2 and 3)

MARELLI / DELPHI SYSTEMS:

The Idle Air Control has two (2) coils. One moves the shutter forth. The other moves the shutter back. Before installing an Idle Air Control, we should remember that the Delphi and Marelli injection systems differ with respect to the position of the coil pins.

DELPHI SYSTEM (between pins 1 and 2 / 3 and 4)



There is a practical way to identify which is the system of the Idle Air Control. If the IAC valve has a support for the o-ring, this IAC is Delphi system. All other IACs, including those that are snapped-in, are Marelli system. Usually, the GM line is provided with Delphi system. On the other hand, Fiat and Volkswagen are provided with Marelli system.

DELPHI SYSTEM



MARELLI SYSTEM

HOW TO TEST:

1) Resistance

Select the multimeter to read the ohmic resistance (Ω); enter the points as below:

Delphi System – between pins 1 and 2 / 3 and 4 = approximately 50Ω

Marelli System – between pins 1 and 4 / 2 and 3 = approximately 50Ω

2) Supply

With the engine running and the IAC valve installed, use a voltage pen tester on power wires. The LEDs should alternate.

INSTALLING THE DS IDLE AIR CONTROL:

Below is the procedure for replacing the IAC valve:

1- Stop the engine;

2- Disconnect the plug from the wiring harness of the vehicle;

3- Loosen the fastening screws and remove the old IAC;

4- Clean the holes in the intake manifold, exposed when the IAC was removed;

This procedure is necessary as carbon is usually found in the shutter space, preventing the new part from working properly;

5- Install the new IAC valve and connect the wiring harness;

If the system is Marelli (Fiat and Volkswagen line), go to step 6.

If the system is Delphi (GM line), just start the engine and wait for idle speed stabilization for about 5 minutes. The idle speed will be high at first and will lower until stabilized.

* Always check the temperature of the engine coolant, as it influences idle speed.

6- Turn the ignition key without starting the engine and wait 15 seconds;

7- Stop the ignition and wait 15 seconds. If you do not wait, the procedure will not work;

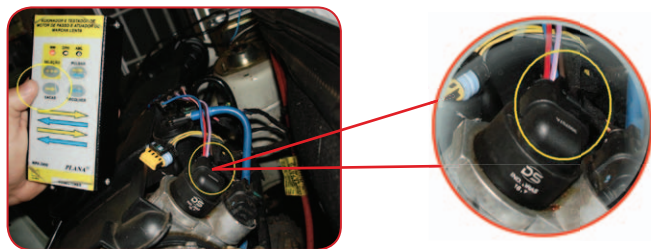
8- Start the engine and wait for idle speed stabilization for about 5 minutes.

* Always check the temperature of the engine coolant, as it influences the idle speed.

When this procedure is carried out, the ECU resets the stepper motor taking it to the end of its course. Then, the ECU sets it again with a certain number of steps.

If engine rotation continues high or is still oscillating, it means that the distance of the shutter in relation to the opening for passage of air is too large. Thus, it is necessary to bring it closer by using a test device. Be sure to select the injection system (Marelli or Delphi).

ADJUSTMENT USING THE TEST DEVICE:



The following procedure is indicated for older vehicles (manufactured before 2002) equipped with the Idle Air Control – Marelli System, Fiat and Volkswagen line.

This procedure is not indicated for:

Idle Air Control – Marelli System, Fiat and Volkswagen line manufactured after 2003;

Idle Air Control – Delphi System, GM line.

1- With the vehicle running, remove the harness from the valve and install the test device;

2- Push the IAC valve towards the front to reduce the idle or back to increase it. Follow this procedure until the idle is adjusted;

3- Remove the device, reconnect the harness to the valve;

4- Turn the ignition key without starting the engine and wait 15 seconds;

5- Stop the ignition and wait 15 seconds. If you do not wait, the procedure will not work;

6- Start the engine and check the adjustment.



ATTENTION:

A defective harness in the test device, due to excessive use, results in a false sensation that the Idle Air Control is malfunctioning.

While testing, an improper selection of Marelli or Delphi system may result in a false diagnosis.



WARNING:

Several factors may cause irregular idle, therefore, before replacing the IAC valve, all elements that may influence idle control should be individually analyzed. Namely:

- Idle Air Control (IAC)
- Throttle Position Sensor (TPS)
- Water temperature sensor
- Air temperature sensor
- Manifold Absolute Pressure Sensor (MAP)
- False air inlet into the collector / throttle body
- Ignition wires – Spark Plugs
- Lambda probe
- Injection nozzle
- Crankshaft position sensor (CKP)
- Timing belt
- Low battery

For this reason, the individual analysis of the elements that contribute to idle control is extremely important.

Do not try to spin, pull, or push the extremity of the shutter in an attempt to check its movements, as this may damage its internal components, impairing its operation. These movements should only occur in response to electrical controls.



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