

# Injectronics

Remanufactured Automotive Electronics Components

## TECHNICAL BULLETIN

Document number: T0041

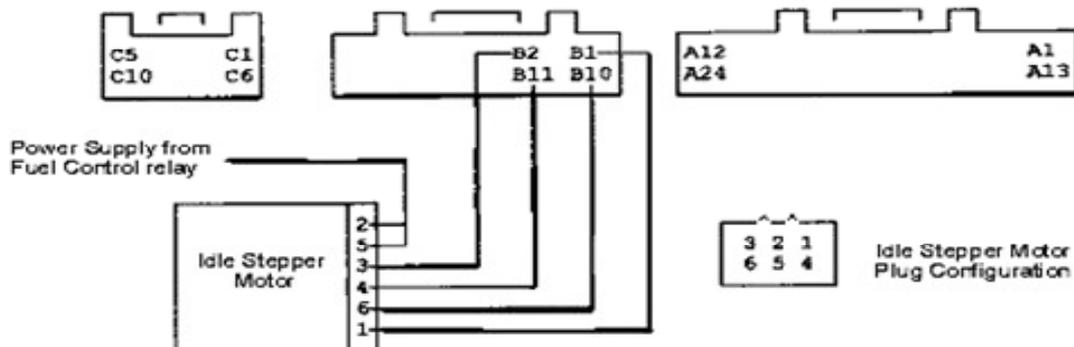
For further technical information regarding testing, repairs or to search for New or Remanufactured Automotive electronic products, please visit [www.injectronics.com.au](http://www.injectronics.com.au), call our office on (+613) 8792 6999, or email [sales@injectronics.com.au](mailto:sales@injectronics.com.au)

Make: Mitsubishi / Hyundai

Model: Various

Subject: Idle stepper motors

Injectronics receive numerous inquiries on how to test idle speed stepper motors, commonly fitted to Mitsubishi and Hyundai engines. A brief understanding of the makeup and operation of these stepper motors can greatly assist in their diagnosis and save many hours. The stepper motor consists of a rotor with a series of magnetic laminations and a lead screw attached to it. Two stators, each with two coil windings surround the rotor and a pintle is attached to the tip of the lead screw. The stepper motor extends and retracts in small steps in response to the ECM, which earths each of the four outer terminals. Battery voltage is supplied to the stepper motor coils via the fuel control relay on the two inner terminals (see diagram 1). These two terminals should have battery voltage at all times when the ignition is on and the engine is running. To check that the ECM is earthing the four outer terminals, back probe each terminal individually with a multimeter or a scope meter. Provided the engine base idle speed is set correctly, the four outer terminals should be seen to switch between 0 and 12 volts whenever external engine load is changed, ie; air conditioning, power steering etc or when the engine is trying to establish a steady idle. In some cases, idle stepper motors have damaged or destroyed the ECM due to a possible short circuit of the coil windings. The ECM may then supply a constant earth to both sides of the stepper motor coil winding. This in turn provides maximum current to the idle stepper motor which burns out the windings or in some cases burns out the circuit board of the ECM.



To measure the resistance of your idle stepper motor coil windings, follow the table below.

Pin Number	Aluminium Body	Black Plastic Body
1&2	28-32 Ohms	36-40 Ohms
2&3	28-32 Ohms	36-40 Ohms
4&5	28-32 Ohms	36-40 Ohms
5&6	28-32 Ohms	36-40 Ohms

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