

Tech Tip®

TESTING & INSTALLING A IDLE AIR CONTROL MOTOR

Needed:

- Small Regular-Blade Screwdriver
- Digital Volt-Ohmmeter (DVOM)
- Haynes Manual
- Correct IAC Motor
- Carburetor Cleaner
- Shop Towels
- Standard or Metric wrench Set
- Electric Contact Cleaner
- Safety Glasses

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The idle air control (IAC) motor is found on throttle body and port fuel injection units. The IAC is used by the vehicle on-board computer to adjust the amount of air that bypasses the throttle plate. This is to minimize changes in engine speed due to various idle load conditions, such as air conditioning and power steering, as well as provide cold engine fast idle. There are two basic styles (Fig. 1), and many variations as illustrated in Figures 2 and 3, but all perform the same function. Typical symptoms of failure include engine stalling or excessively high idle.

IAC Motor Testing

NOTE: Testing an IAC motor is limited without the use of expensive test equipment. However, the following guidelines will help determine the general operating condition of the idle air control motor.

1. With the engine cold, start the vehicle and verify the engine runs at high idle speed. When the engine temperature reaches a pre-determined point, the idle should automatically drop to its warm idle setting. This would indicate a properly working IAC motor.
2. With the engine idling, operate the air conditioning. On vehicles without air conditioning, turn the steering wheel hard lock left or right to place a load on the engine. The idle speed should increase to compensate for the extra load. Once again, this is an indication of a properly operating IAC.
3. While the engine is still idling, carefully grasp the harness wires attached to the IAC motor and "wiggle" them back and forth. Listen for a change in the idle speed that would indicate a poor or partially broken connection. Stop the engine and repair or replace wires as needed.
4. Allow the engine to cool down.

CAUTION: To prevent burns on your hands, always begin repairs with a cool engine. The first step whenever working on the electrical system is to turn on all accessories, including the ignition key, and disconnect the negative battery cable. This prevents damage to other components caused by arcing or sudden voltage spikes. Make sure to wear safety glasses when working around batteries.

NOTE: Disconnecting the negative battery cable will erase pre-programmed electronic radio stations. Record any preset radio stations on a piece of paper to allow for quick reprogramming once repairs are completed.

5. Label and remove hose and electrical connections to the air filter housing and remove housing from the engine. (Not all models require removal of the housing to gain access to the IAC motor).
6. Locate the IAC motor on the throttle body or port fuel injection unit (Figs. 4 and 5).
7. Use a small, flat-blade screwdriver to release the locking tabs and disconnect the

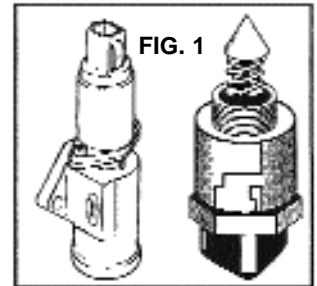


FIG. 1
TYPICAL IAC MOTORS

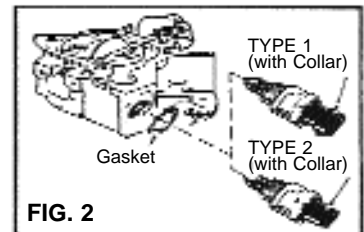


FIG. 2

G.M. TYPE 1 & TYPE 2
IAC MOTORS

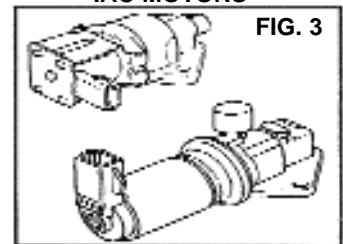


FIG. 3
TYPICAL IAC MOTORS

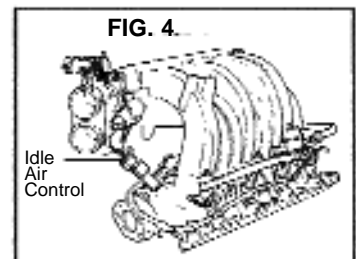


FIG. 4
LOCATION OF IAC

electrical harness from the IAC motor inspect the electrical connections for corrosion. Clean as needed with electrical contact cleaner spray.

8. On IAC motors with a four-pin electrical terminal, connect an ohmmeter first between both adjacent terminals and then between the diagonal terminals. Polarity is not important. With the ohmmeter set on the low ohms scale, a reading over 20 ohms should be obtained one way and an infinite reading the other way (Fig. 6). If both readings are infinite or both give a resistance reading, replace the IAC motor.
9. On IAC motors with a two-pin electrical terminal, connect the ohmmeter leads to the two terminals. A reading of 7 to 13 ohms should be obtained on the low ohms scale.
10. Next, connect the ohmmeter leads to either pin and the IAC motor housing. A reading over 10,000 ohms should be obtained on the high ohms scale if any readings are not within specifications, replace the IAC motor.

IAC Motor Inspection

1. Remove mounting bolts if equipped, or unthread the IAC motor from the fuel injection unit and remove the IAC motor.
2. On models with an exposed pintle and shaft, look for evidence of a bent shaft by examining the pintle. Look for rub marks or scrapes that only appear on one side of the pintle (Fig 7). Uneven wear indicates a bent shaft or worn bushing. Either of these requires replacement of the IAC motor.
3. Carbon deposits found on exposed pintles and the pintle seat should be cleaned with a shop towel, soaked in carb cleaner. DO NOT spray cleaner directly into the injector housing. After cleaning, reinstall the IAC and retest operation.
4. Examine the IAC motor for broken springs and bent or corroded terminals. If found, clean or replace as needed.

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Installing an IAC Motor

1. Remove old IAC motor following instructions detailed under testing and inspection.
2. Compare old and new IAC motor to ensure correct replacement. Carefully compare the pintles on both, GM uses three different types that do not interchange (Fig 8).
3. On models with exposed pintle and shaft, measure the distance between the tip of the pintle and the end of the motor housing (Fig. 9). If the pintle on the new IAC motor is extended over 1-1/8 inch, it must be adjusted or damage to the IAC motor could occur upon installation.
4. Referring to figure 2, determine which type of IAC motor is being replaced. Type 1 can be adjusted by pushing the pintle and shaft back into the motor housing (Fig 10). Type 2 must be turned counterclockwise into the housing while holding the tension spring down out of the way (Fig 11). In either case, ensure the tension spring is correctly seated after adjustment is made.
5. Install the new IAC motor using the new gasket or O-ring provided with the motor. Start the mounting bolts or threaded motor, housing by hand to prevent cross threading, then tighten to manufacturer's specifications.
6. Reconnect the electrical harness connector to the IAC motor terminals, making sure the connector is firmly seated.
7. Reinstall the air filter housing (if removed earlier) and reconnect all hose and electrical connections.

Reconnect negative battery cable and reprogram any radio stations.

Test drive vehicle to ensure proper operation.

NOTE: Some models require the vehicle to be operated at a constant speed above 40 mph to allow the on-board computer to re-establish a reference point for controlling the IAC motor.

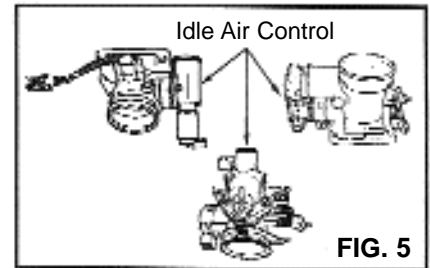


FIG. 5

ADDITIONAL IAC MOTOR LOCATIONS

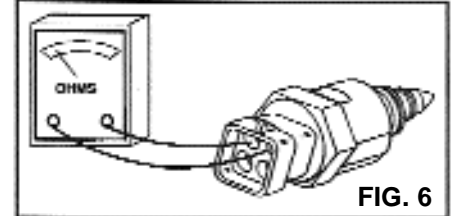


FIG. 6

TESTING IAC MOTOR WITH OHMMETER

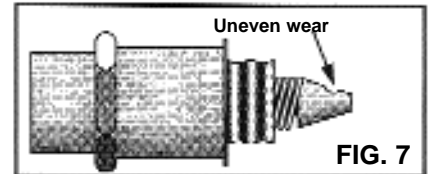


FIG. 7

UNEVEN WEAR INDICATES BENT OR IMPROPERLY WORN PINTLE

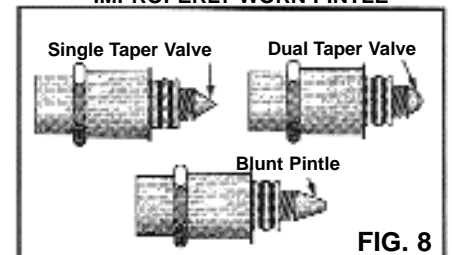


FIG. 8

THREE PINTLE TYPES FOUND ON G.M. VEHICLES

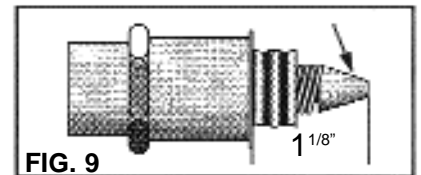


FIG. 9

MANY TYPES REQUIRE ADJUSTMENT

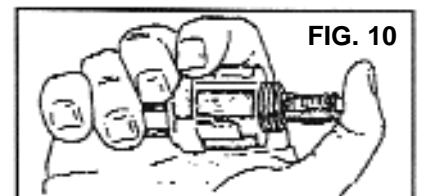


FIG. 10

ADJUSTING G.M. TYPE 1 IAC MOTOR



FIG. 11

ADJUSTING G.M. TYPE 2 IAC MOTOR