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### How to Adjust your Early C4 TPS and Idle Speed

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This tech paper will discuss the procedure for correct adjustment of the Minimum Idle Speed and for adjustment of the Throttle Position Switch (TPS) on the early C4 Corvette TPI systems. These steps apply specifically to the 1985 model year, and in general to other years. Later model years do not have adjustable TPS's.

#### NOTE:

The Minimum Idle Speed sequence outlined in this paper is taken directly from the 1985 and 1986 GM Corvette Service Manuals with some clarifications and simplifications added by me. Be aware that there are aftermarket manuals that outline a different sequence. I have used the sequence in this paper and verified that it is correct for the model years noted. You may choose to use the procedural sequence outlined and recommended by others.

#### General

Idle speed and off-idle throttle response on the early TPI systems is determined by correct adjustment of the minimum idle speed screw combined with a correct setting of the TPS. I've seen many of these cars that have had their idle speed "corrected" by well-intentioned mechanics and owners by simply screwing the minimum idle speed screw in a few turns. This really messes up the settings, and will not make your car perform properly. Doing a correct setup of the TPS is one of the easiest ways to make your car feel and respond better. To maximize the benefit of this procedure, I recommend that you first remove your Throttle Body (TB), disassemble it (it's incredible easy – there are a total of about 5 pieces in it...), clean the TB up really good with some spray carb cleaner, and put it back together. A nice clean TB will really put an edge on the performance improvement you will get by doing this procedure.

**NOTE:** If you disassemble and clean your Throttle Body, including removal and cleaning of the IAC, it is recommended that you measure the extended length (protrusion) of the IAC "tip" before you re-install the IAC. If the "tip," or "needle" of the IAC (referred to correctly as the "Pintle"), is extending out too far, you will jam it into the seat and damage it during re-installation. So before you install the IAC, measure the distance from the very tip of the Pintle to the surface of the IAC body that the gasket seats against (with the gasket removed). The distance should be 28mm (1-1/8") or less. If the distance is greater than this, you must retract the Pintle into the IAC Body. There are two different styles of IACs:

If your IAC has a "collar" around the electrical connector end, simply push on the Pintle with firm hand pressure while rocking it slightly side-to-side until it retracts.

If your IAC does not have a "collar," compress the Pintle Retaining Spring towards the body of the IAC and try turning the Pintle clockwise as seen from the Pintle end of the IAC. If it turns, keep turning until it retracts to the 28mm position. Then, return the spring to its original position, with the straight part of the spring end lined up with the flat surface under the Pintle head. If, however, the Pintle does not turn, use firm hand pressure as described above to retract it.

Once set up, install the IAC with the gasket and torque to 13 ft-lbs.

The Service Manual has instructions for doing the following operations, but the directions are scattered through several sections of the Manual. Here is the complete, step-by-step process for doing this (not including TB rebuild). All specs and steps are taken directly from the Manual (all 3 different sections), and this process is absolutely correct.

## Tools & Equipment

You will need the following tools and equipment:

1. A set of Torx wrenches. You can buy a complete set in a nice, genuine plastic pouch at Sears.
2. A good digital voltmeter that will read voltages less than 1 volt.
3. A paper clip.
4. A small screwdriver.

## Procedure

There are two electrical components on the TB that you will be working with: The TPS and the Idle Air Control Valve (IAC). Make sure that the connectors for these two components are easily accessible and that you can easily disconnect the IAC.

You will also be playing with the diagnostic connector under the dash. Remove the cover (if it's still in place). Bend your paper clip into a "U" shape. You will be playing with the two top right hand terminals ("A" and "B") in the connector.

- First step is to set the minimum idle speed. If nobody has messed with this on your car before, the set screw will be covered by a pressed-in plug. It's located on the driver's side of the TB. Remove this plug if it's there.
- With the IAC connected and the ignition "OFF," stick the paper clip into the diagnostic connector from "A" to "B." This grounds the diagnostic lead.
- Turn the ignition to the "ON" position without starting the engine. Wait 30 seconds.
- Now, with the ignition still in the "ON" position, disconnect the IAC connector at the IAC.
- Remove the paper clip from the diagnostic connector.
- Start the engine and allow it to reach normal operating temperature. The idle speed will probably be really low, and you may have to coax the engine a bit with the gas pedal to keep it running for a while.
- If your car is an automatic, set the parking brake and put the transmission in "DRIVE." If your car is a manual, leave it in neutral.
- Adjust the idle speed screw to obtain 400 rpm in drive or 450 in neutral.
- Shut off the engine and re-connect the IAC.

**NOTE:** Some later year GM Shop Manuals recommend disconnecting the distributor ECM wire ("Timing Connector") near the brake booster. This will prevent the ECM from altering timing – and idle rpm – during the rpm adjustment. Early GM Manuals do not contain this step. If you disconnect the timing connector, you will get a Code 42 stored in the memory of the ECM. The memory must be cleared of this code after re-connecting the timing connector.

That's it for idle speed. Now on to the TPS.

There are 3 wires stacked vertically on the TPS. You will need to be able to measure the voltage between the two top wires. You can either buy a special harness connector that breaks these wires out (from Mid America), or gently pierce the insulation of the wires with the pointy prongs on your volt meter. You can also stick a paper clip into each of the two top locations of the connector and clamp onto the paper clips to measure the voltage. Whatever is easiest for you.

- Turn the ignition to the "ON" position without starting the engine.
- Loosen the TPS Torx adjustment screws.
- Set your volt meter to a low scale DC volt setting that will accurately read less than 1 volt.
- Measure the voltage between the two top TPS wires.
- Adjust the TPS by rotating its position until you get a reading of .54 volts.
- Tighten the Torx screws and recheck the voltage. Re-adjust if necessary to make sure voltage is right at .54.
- Turn the ignition "OFF."

You are now in perfect adjustment on idle speed and TPS output. Start the engine. It may take a few seconds for the car to "catch on" to its new settings.

## Questions, Comments & Technical Assistance

If you have questions or comments regarding this article, or if you notice any errors that need to be corrected (which is quite possible since I'm writing this from memory...), please feel free to drop me an e-mail. Also, if you need any technical assistance or advice regarding this process, or other maintenance issues, feel free to contact me: [V8FastCars@msn.com](mailto:V8FastCars@msn.com)