Solving idle problems part 1 - Cleaning your IAC

Does your idle rise and fall over and over again? Does your 'Stang stall when you come to a stop, or even when you put it in gear? Well if so then this series of articles is for you.

In this age of fuel injection, idle problems can literally be caused by hundreds of different things. What this series of articles is aimed at is how to fix the most common idle problems found in the Mustang. The fuel injected Mustang uses a small motor/valve assembly that allows a specific amount of air to enter the engine to control its idle. This valve is commonly called the idle motor, the IAC (idle air control) or the IAB (Idle air bypass). When your car is new the IAC works remarkably well. The problem arises when the car gets some miles on it (usually 75K+) and carbon fouling takes its toll. What happens is dirt, excess air filter oil, and most notably carbon gunks up the IAC valve and doesn't allow it to either open or close properly. This can cause an really high idle, a lumpy/surging idle or no idle at all. The solution is to either replace or clean the IAC. Obviously we are going to do the later and here is how.

1. What is needed?
   - 8mm or 5/16 socket and ratchet
   - Can of Carburetor/throttle body cleaner

2. Locating the IAC valve:
   Depending on the year of your Mustang the IAC can be in a few different locations.
   - On 5.0L Fox body cars the IAC is bolted to the side of the throttle body.
   - On SN-95 cars it is bolted to the intake manifold.
   - On 4.6L DOHC and SOHC engines the IAC is located on the upper intake manifold.

   In reality once you know what one looks like (picture 2 "B" from a 94-95, fox body's have longer silver IACs) you should have no trouble finding yours. They all look basically the same except pre-94 cars were made of metal and are silver, 94-up cars are black plastic.

3. Removing the IAC:
   This part, like the rest of the steps in this article, is simple. The IAC has an electrical plug that needs to be disconnected (picture 2 "C") Then all you have to do is remove the two 8mm-5/16" bolts (Picture 2 "A") that hold the IAC to the throttle body or intake. Watch out for the IAC motor to throttle body gasket, don't lose it!
4. Cleaning:
Next all you do is use the carb cleaner to clean the carbon out of both of the holes (picture 3 "C") in the IAC valve and both of the holes in the intake/throttle body.

5. Putting it back together:
Yet another self explanatory step. Put the IAC in place and install/tighten the 8mm bolts. Make sure you don't forget to reinstall the gasket.

6. Fire her up!
Finally you need to start the car and let it run for a few minutes to burn any leftover carb cleaner in the intake. You may have to crank the engine a little more than normal to start it for the first time and don't worry about the white puff of smoke you see coming from the exhaust because again it's just the carb cleaner.

Check out part 2 - The throttle body
Solving your idle problems part 2 - Cleaning your throttle body

In part one we covered the most common problem that will cause idle problems, the IAC, but there is an often overlooked area of the intake tract that also regulates how much air enters the engine. That part is the throttle body plate (picture 2 "A"). The throttle body plate is a part inside the throttle that flips open when you press on the accelerator and the amount it opens depends on how much you press the accelerator. Well just like the IAC when the throttle body gets gunked up with carbon it can stop it from closing all of the way causing idle problems. So the obvious next step? Clean it!

1. What is needed?
- Flathead screwdriver
- Can of carburetor/throttle body cleaner

2. Getting to the throttle plate
The first step is to remove the air duct that goes between the throttle body and MAF (mass airflow sensor). There's not much work to be done because all that holds that air duct is two clamps that need to be loosened with a flathead screwdriver. (or an 8mm or 5/16 socket)
On certain engines/models you may need to remove wires or small hoses from the air duct like the one pictured.

3. Cleaning the throttle plate
Look inside your throttle body. Do you see all of the gunked up carbon? (that black stuff) Well that's what you need to get rid of with your carb cleaner so get to it!
You're going to want to either hold the throttle open with your hand or have somebody do it for you by pressing on the accelerator so you can clean all around the throttle plate. You might also want to put a shop rag or paper towels under the throttle body to catch all of the carb cleaner before it goes all over your fender. The Throttle body in picture 2 was taken off the car for illustrative purposes.

4. Putting it back together
Replace the air duct, and any wires you disconnected. Then start her up!!!
Again, just like when cleaning the IAC, don't worry if it takes a little longer to start. Also dont worry about that puff of smoke from the exhaust.

Check out part 3 - Resetting the base idle
**Solving idle problems part 3: Resetting the base idle**

The base idle is nothing more than the idle that the computer has learned at whatever angle your throttle body is set at when at idle. This technically shouldn't change by itself but it's always good to check it because you never know what the dealer or previous owner did to the car before you had it. Once you change the setting of the base idle you will definitly want to go onto step 4 in this series of articles because if you move the base setting of the idle plate you also change the tps voltage at idle.

What is needed?
- Flathead screwdriver
- You'll also need a wrench to remove your battery cable

**How to do it**

1. Disconnect the battery's negative terminal to reset/clear the computer's memory. Leave it disconnected for 30 minutes. WARNING: Whenever removing your battery cables ALWAYS disconnect the negative battery cable first and reconnect it last. Otherwise you could destroy your computer or cause a battery explosion.
2. Disconnect the plug going to your idle motor which is located on the front of your throttle body.
3. Reconnect your battery's negative terminal.
4. Start the engine, and set the idle to the rpm you want with the stop screw on the bottom of the throttle body.
5. Turn off the engine.
6. Reconnect the plug on the idle motor.
7. Make sure all accesories (radio, blower motor, a/c, lights, etc) are off and start the engine.
8. Let engine run for two minutes.
9. Turn engine off and wait two minutes then restart engine and let idle for two minutes with all accesories on.

EDIT: This article refers to "stop screw" on the throttlebody. We have noticed that on 94-95 (and probably 96-up) Mustangs don't have a stop screw but have a small piece of "threaded rod" (A) instead. This threaded rod can easily be turned with a pair of pliers to do the adjustment stated above. There are pictures below of this "threaded rod". Also note that the stop screw on fox body Mustangs are in the same basic place as the picture below (A).
Check out part 4 - Setting the TPS voltage
Setting the Mustang TPS Voltage

If you haven't already read how to do it a million times in all of the Mustang magazines then this is your chance. Here's how to check and adjust your TPS voltage. You may be asking, “What is a TPS”? Simply put its the Throttle Position Sensor. The TPS is a sensor that tells the ECM (computer) how much gas you are giving it, which in turn lets the computer decide how much fuel and spark to give you.

What is needed?
- Phillips head screwdriver
- Two small straight pins
- Digital multimeter

How to do it
The TPS (picture 2 "B") basically bolts to the throttle body with two screws. (picture 2 "A") The holes that the screws go through on the TPS are elongated so you can twist the TPS in either direction to adjust it. To adjust the TPS all you have to do is loosen (don't take them out) both screws and move the TPS until you see the right voltage.

To hook the multimeter up you will have to pierce the green wire with a pin so you can check how much voltage is going through it. The red or positive (+) wire on your multimeter will go to the pin in the green wire. Then you'll have to either pierce the black wire and put the negative wire from the multimeter to it, or just put the black multimeter wire to a good engine ground.

Now to check the voltage turn on your multimeter and make sure all of the wires are hooked up right. Then turn the ignition key to the on position, but don't start the car. You should be getting a reading on your multimeter. It should be .98-.99 volts. If its not, then its time to loosen the screws on the TPS and move it around until you get it right. When its at the right voltage tighten the screws and re-check it. If you aren't too happy about piercing your TPS wires with pins then you could do what some Mustangers do. I've seen a few guys/gals buy a fuse holder and attach the two wires from the fuse holder to the green and black wires on the TPS. Then they use the fuse holder holes to check their TPS voltage.....Whatever you do, make sure you never put a fuse in that fuse holder.

If for some reason you cannot get the voltage reading right you have two options. Either buy a new
TPS or take off the old one and elongate the holes a little more with a file or a dremel.

Update: We were notified by one of our viewers that the tps wires on 94-95 (and probably modular cars too) were different colors than the 87-93 cars. On 94-95 Mustangs there are three wires just like the fox body cars but these have two grey wires (one with a white stripe) and one brown wire. After testing the wires we've figured out which ones are which. They are as follows: The first grey wire is the ground, the second grey (with white stripe) is the test wire, and the brown wire is the 5v source. So to test a 94-95 car you would put the negative lead on your voltmeter to a good engine ground or the first grey wire. Then you would put the positive voltmeter lead to the middle grey with white stripe wire. If you need more help look at the image below

So you might be asking, "what if i have a modular car?". Well i haven't had access to a modular Mustang to be able to test the tps, but i can give you a way of testing them for yourself to figure out which wires are which. First thing you do is put your negative lead to a good engine ground, then probe each wire (always with the ignition on, engine off) and test to see which comes up with 5v all of the time. This wire is the 5v source wire, which you don't need for this test. Then find the wire that gives you a reading of around .95-.99v with the throttle in the closed position and around 5v in the fully open position. This wire is the test wire (same as the green wire on fox body cars), and the last wire will be the ground.

So what are you waiting for? Go check your TPS voltage. If you have any questions let us know.

Check out part 5 - Cleaning the MAF wires
Solving idle problems part 5 - Cleaning the MAF wire

First off you may be asking, what is a MAF? The MAF stands for Mass Airflow Sensor. The MAF is the sensor that tells the ECM (engine computer) how much air is entering the engine at any give time. The computer then in turn uses that info to calculate the air/fuel ratio, and timing tables. So it obviously stands to reason that a MAF sensor that isn't properly working would definitely make your idle rough. The fact is that not only will it make your idle rough but it could cause a whole other list of problems including bad fuel mileage, and lack of power.

As the air flows through the sensor some air flows through a sampling tube (picture 2 "A") with a heated element in it. This element (aka "wire") is cooled by the air and the computer reads how much voltage it takes to keep it at temp which in turn tells it how much air is entering the engine. The problem arises when that wire gets dirt and (mostly) excess K&N air filter oil on it. This causes an error in the voltage reading and the computer sets the wrong air/fuel ratio tables for the type of driving you are doing. The only thing to do when this happens is to clean the wire!

1. What is needed?
- This is kind of hard to say for sure because it all depends on the year/model you have. Usually its nothing more than a screwdriver to remove a clamp or two and something to remove a few bolts that hold the MAF in place. No matter which year you own you will need a security torx bit 20 to get the sensor off of the actual MAF tube.
- A can of carb cleaner - one Q-tip

How to do it
First off remove the negative battery cable. WARNING: Always remove the negative battery cable first and put it back last.
Since removing the MAF sensor varies depending on the year of Mustang you own you'll basically need to figure out how to remove it yourself...LOL
Once you have it out of the car it will look something like picture 3 unless you have a modular car then it probably has a black plastic MAF.
Take the sensor off of the tube by removing the two torx screws (picture 3 "A").

Once you have the sensor out you need spray the carb cleaner on the end of a Q-tip and gently....no very very gently clean the wire (picture 4 "A") on the sensor with the Q-tip. Be super careful because this wire is very fragile.

Let it air dry and put everything back together again. Reconnect the negative battery, start the car and take it for a ride.

Enjoy your new steady idle!!!