

# The Bad Idle Guide

Now the Zetec is a pretty reliable engine and can last well in excess of 150,000 miles. But if there is one thing that crops up time and time again it is a poor idle, that can be so bad as to stall the car. Now obviously it didn't do this when new so its not something you should put up with. What makes it harder to diagnose is that I have found a large number of things that can affect the idle. Some are common, some not so common. Here I will try to list all that I know off, in order of the commonest to least common, symptoms, tests to do and costs to replace.

Bare in mind that all 16 valve engines tend to have a rougher idle than 8 valve equivalents. Also the EEC unit on the Mondeo's values low emissions over good running so even on a perfect car, there will be some unevenness of idle as the computer hunts for the lowest emissions and occasionally goes too far and has to increase the revs to compensate.

Also this is a large list. Don't for one minute think that the Mondeo has a load of faults, quite the opposite in fact. But with so many millions sold there will always be some that have problems and of course if you play with yours as much as I have you put extra stresses on the lump so things do occasionally go wrong. this list tries to list everything that could be an issue rather than say you will have these problems if you have a Mondeo

## Idle symptoms problem finder chart

Poor idle when warm	<a href="#">Crankcase Breather Valve</a> <a href="#">Plenum Leaks</a> <a href="#">Pulse Air Injection</a> <a href="#">Pulse Air Injection Solenoid</a> <a href="#">Vacuum Leak</a>
Poor idle when cold	<a href="#">Wrong Oil</a> <a href="#">Vacuum Leak</a>
Poor idle at all times	<a href="#">HT Leads</a> <a href="#">Spark Plugs</a> <a href="#">Rubber T Piece</a> <a href="#">Vacuum Leak</a> <a href="#">Idle Speed Control Valve</a> <a href="#">Auxiliary Drive Belt pulleys</a> <a href="#">EGR Valve</a> <a href="#">HEGO/Lambda Sensor</a>
Poor Idle at some times	<a href="#">EGPD valve</a> <a href="#">HT Leads</a> <a href="#">Spark Plugs</a> <a href="#">Power Steering Pressure Switch</a> <a href="#">Inlet Air Temperature Sensor</a> <a href="#">EGR Solenoid</a> <a href="#">Heat Soak</a> <a href="#">Throttle Body Gasket</a> <a href="#">Throttle Body Position Sensor</a> <a href="#">Vacuum Leak</a>
Poor idle when electrical equipment running	<a href="#">Heated Front Windscreen Control Switch</a>
Poor idle when A/C on	<a href="#">Air Conditioning Pressure Control Switch</a>

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## HT Leads

These commonly break down. Often showing as a slight stutter when Idling. or a misfire at high load. Best diagnostic is to swap for a known good set.

The Mondeo has a very powerful (and reliable) wasted spark, capacitor discharge coil. Due to the large plug gap Ford specify this really has to crank up the current to fire the plugs. This puts a lot of stress on the HT leads and they often go. I have eaten several cheap sets in less than 10,000 miles. Setting the plug gap smaller than the 1.3mm standard can help and I personally use a 1.1mm gap now, Down to 1mm seems to work fine and can give a smoother idle



Those of you in the know will see that I have a Bosch set on above. These lasted 3 weeks before the interference on my radio got too bad. I normally run Splitfire leads which are guaranteed for life. My current set have done 50k miles with no problems. The proper Ford sets are also pretty good. Avoid cheap sets such as Halfords, Bosch etc as they will not last

Also be careful when removing leads, always rotate the lead to break the sticktion before pulling the boot firmly. Never pull the lead. Always change plugs and leads as a set as a problem in one can damage the other

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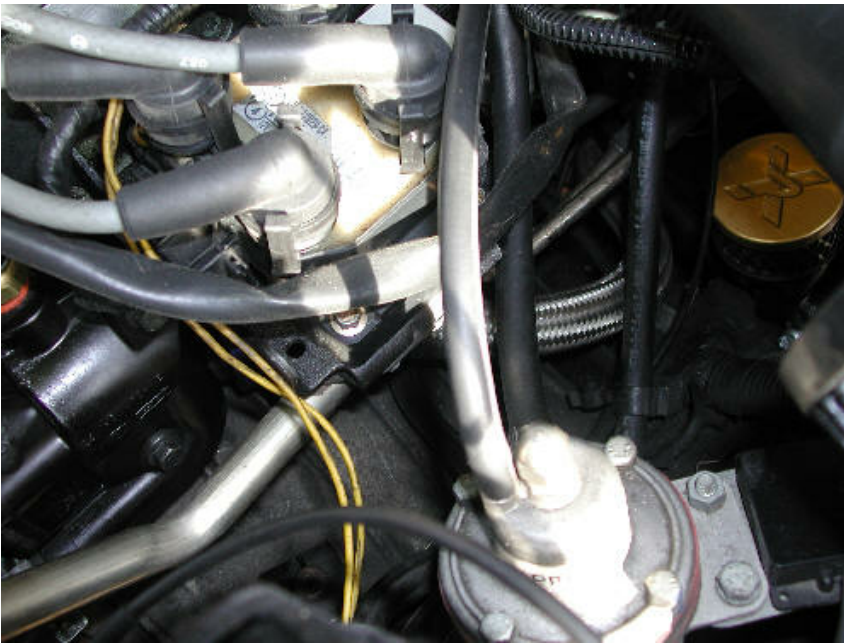
## Spark Plugs

Not normally a problem if you use good plugs. I have used NGK, Splitfire and Motorcraft (Fords) with no problems. If however you have used Champion plugs that's your problem right away. You can also try gapping them a little less than recommended. I gap mine at 1.1mm rather than the recommended 1.3. I find the HT leads last longer and the engine seems smoother at idle. Always change plugs and leads as a set as a problem in one can damage the other

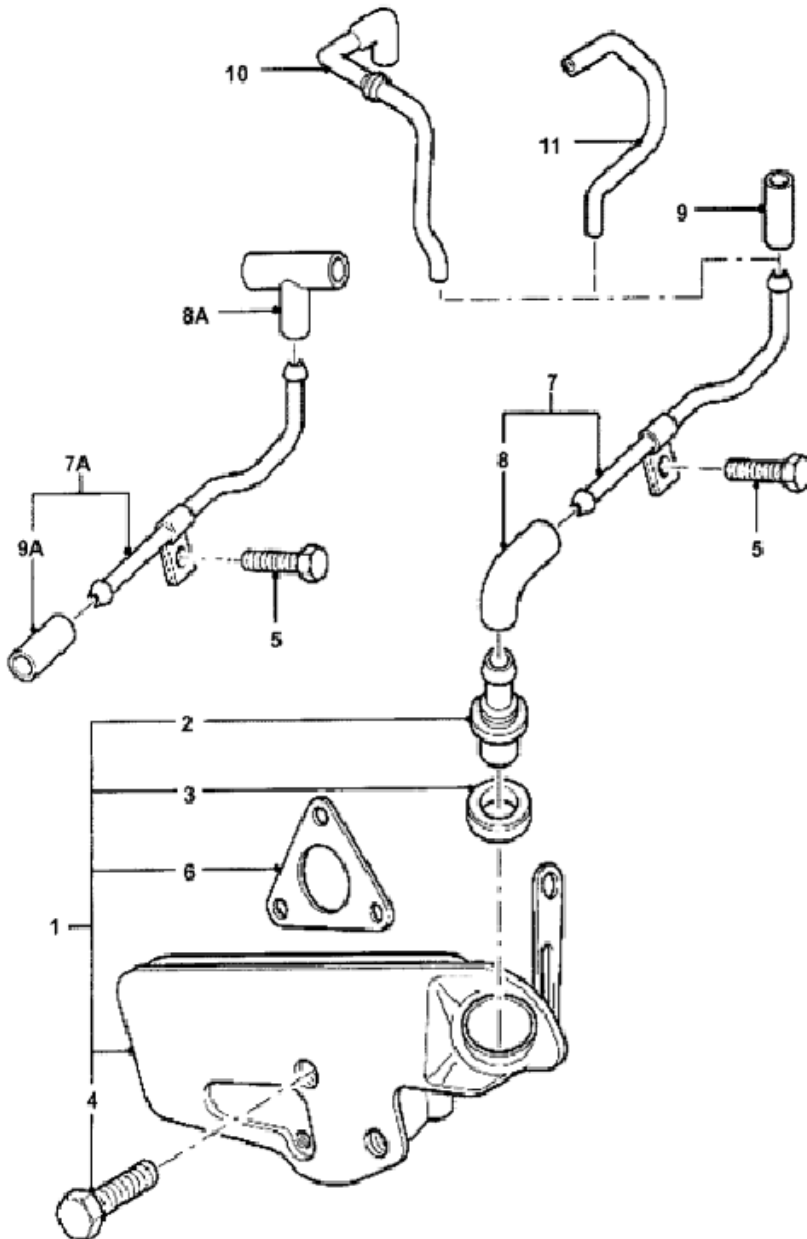
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## Rubber T Piece

Hiding underneath your coil is the most vulnerable part of the Mondeo and nobody seems to know its there. It is a 5cm Rubber T piece that connects the engine block to the EGR valve and the Pulse air system. Due to the movement of these pieces it often splits and lets out vacuum, resulting in a bad idle and or stalling. Many Garages know full well about this rubber piece and its one of Fords best selling spares for the Mondy. At £4 its very cheap and so the less honest garages will spin a line about "Sticky Valves" and take your car away for several hours, charge you a fortune and all they do is swap the rubber bit. If your plenum is in place it takes longer. To remove this stick your hand under the coil (towards the rear about 5cm below the coil base), feel for the rubber bit and pull firmly. It takes about 20 seconds to swap this



My Coil, the T piece connects the thick silver tube on the lower left to the thin tube to the right of the coil, and the third way goes to the engine block. It just pulls off



Its part 8A on this diagram from Ford

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## EGPD valve

The main culprit to a lot of bad idles is the **Exhaust Gas Pressure Differential Valve**. Its the silver box on the Bulkhead that has 2 rubber hoses and a 3 wire multiplug to it. Check the hoses are not perished and the plug is connected. Its about £45 to replace but has worked wonders on many cars (Including Mine). No easy test for this one other than swapping it out. You can try cleaning out the pipe ways with Throttle body cleaner

If malfunctioning it switches the EGR valve in and out when it shouldn't do, resulting in a lower crankcase vacuum



THE EGPD Valve is the silver box on the right. There are just the two screws holding it on. Also check the rubber vacuum lines running to it as they can split

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## Crankcase Breather Valve (Positive Pressure Valve)

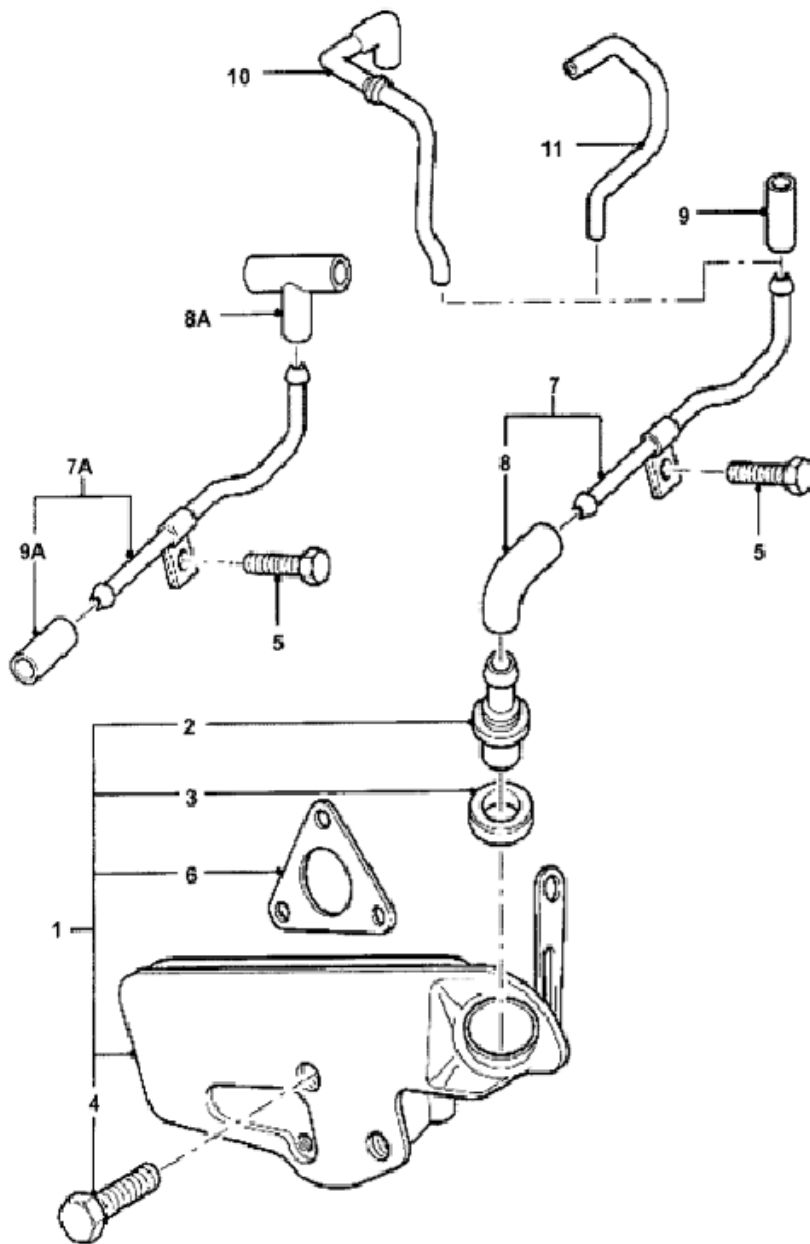
£6 for a small metal valve, that can be the source of a very bad idle. Designed to allow excess crankcase pressure to escape it causes a bad idle when partially blocked and will stall the engine when completely blocked.

Ford say this should be changed at 30,000 mile intervals but don't list it in the service guides (nor do Haynes), mine failed at 110k. It is a pig to change as it is hidden behind the exhaust manifold. Symptoms of this blocking are a good idle when cold, getting worse as you warm up leading to complete stalling at working temps. The engine seemed to pulse and hunt with a one second frequency between 1500 and 700 rpm



The arrow points to the rubber tube running to it. To change it, remove the exhaust heat guard and the rubber T piece under the coil. Reach under the Thermostat housing and you will find a small T3 (sometimes T4) bolt holding the metal pipe on. Remove this. Now reach your hand in under the pulse air piping and give the rubber tube a good pull (Pliers help) and the valve should pull out. Use some sealant as you replace it, as the rubber grommet it sits in was very brittle and hard on mine





Its part 2 in this diagram from Ford

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## Power Steering Pressure Switch

Designed to increase the idle speed when you turn the wheel (hence increasing the load on the engine)

It sticks up above the engine and the wires for it often rub on the bonnet and break. Then of course when you turn the wheel, the load increases but not the revs to compensate and you may stall (the heated windscreen imparts a similar load and should increase the revs also, but I've never heard of this failing)



In my case you can see that I have replaced the wires and fitted a new rubber shield. My original wires broke at 30K miles.

To test the wires just plug and unplug the switch while the engine is running and the steering is turned. The engine should change idle speed and may stall. Later (> mid 95) cars had this switch moved to the front of the engine to avoid this problem

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## Vacuum Leak

There are a great deal of thin rubber vacuum lines on the Zetec. If any are leaking or damaged, the vacuum will drop and the idle will be terrible. Most run from the two outputs from the back of the Throttle body (top centre of picture below). Remove these and blank them off. If the idle improves you have a leak downstream of them, replace one to determine which and follow the tubing down to find the leak



(above) The mass of vacuum and fuel lines behind the Zetec. Having removed all the plenum chambers makes this easy to see. In fact on my car the plenum chamber had chafed several lines. EGR Valve and Inlet Air Temp sender

visible lower left

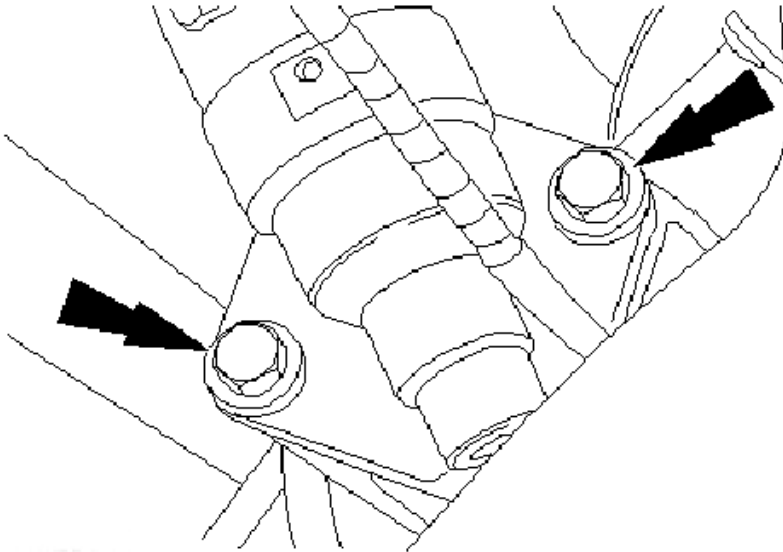
Get a vacuum gauge from Halfords. You should have a nice steady 17-20 psi vacuum at idle

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## Idle Speed Control valve

This allows small variations in idle speed to be "smoothed out". It works by varying the amount of air induced into the engine via an auxiliary air passage in the throttle body housing. It is controlled by a signal from the EEC module.

The Idle speed control valve is open to the Inlet manifold and so can get contaminated and gummed up. Taking it off and giving it a good soak in Throttle Body cleaner is a good idea and cant hurt. A replacement one is about £30. It can be removed after the plenum is off, but is awkward and you need just the right socket extension. Stick your hand in under the TB and intake manifold. There are 2 bolts holding it on.



Its situated under the black inlet manifold and you wont be able to see it, you have to remove it by feel. Don't drop the bolts either. make sure the gasket is intact when you replace it. New units come with a new gasket

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## Throttle Position Sensor

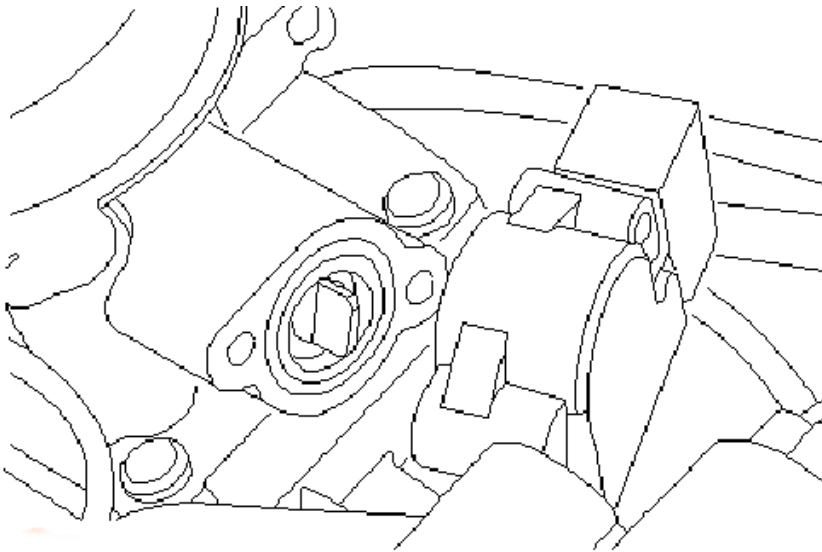
This provides the EEC IV module with data regarding the position of the throttle plate (i.e. how far open or closed). It consists of a potentiometer mounted on the throttle shaft.

It is easy to remove from the TB via the two screws, don't forget to remove the wiring connector





To replace just line up and stick on. Its spring loaded and so returns to the correct place



To test, use a multimeter and while watching the resistance, gently rotate the inner spindle (don't force it), you should get a nice gentle sweep of resistance. Any spike or anomaly's and its dead. Unfortunately the place its most likely to wear is the idle position which is hard to test. You can wash the inside out with WD-40 as a precaution. A new one is £25.

When refitting make sure the rubber seal on the TB is intact and flat. There has been problems with this seal distorting and sitting the potentiometer at an angle and forcing it to give duff reading

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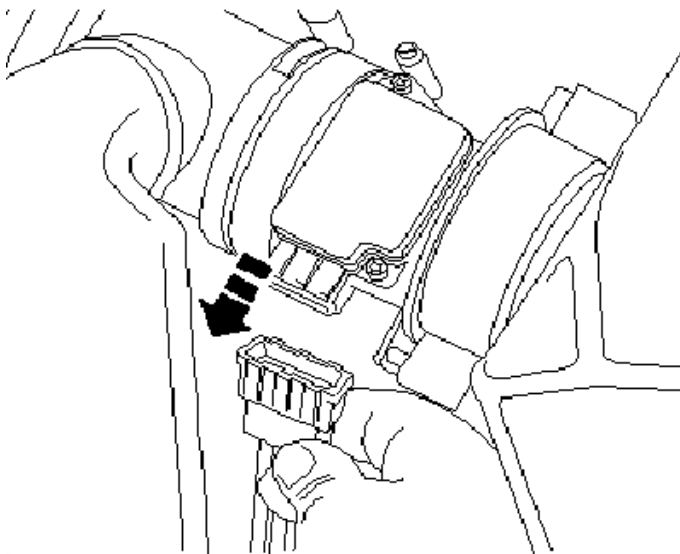
## MAF

This measures the quantity of air passing into the engine via the air filter. The information is then fed back to the EEC IV module. The system can take into account the changes made by varying ambient conditions.

The **Mass Air Flow** meter is a clever little bugger. It consists of a hot wire that is kept at 200C . When air blows over it the wire cools and the unit increases the power to keep the wire at 200C. So the air flow is proportional to the current. Also when you stop it heats the wire up very hot (300C) for a second or so to burn off any crud

Unfortunately that crud can still stick and it insulates the wire and hence it gives false readings. You can prolong the life of your MAF by gentle cleaning with Throttle Body cleaner and a thin paint brush. Don't spray hard on the wires, they are very delicate.

When removing the MAF , make sure you don't pull on the wires, but gently hold the plug



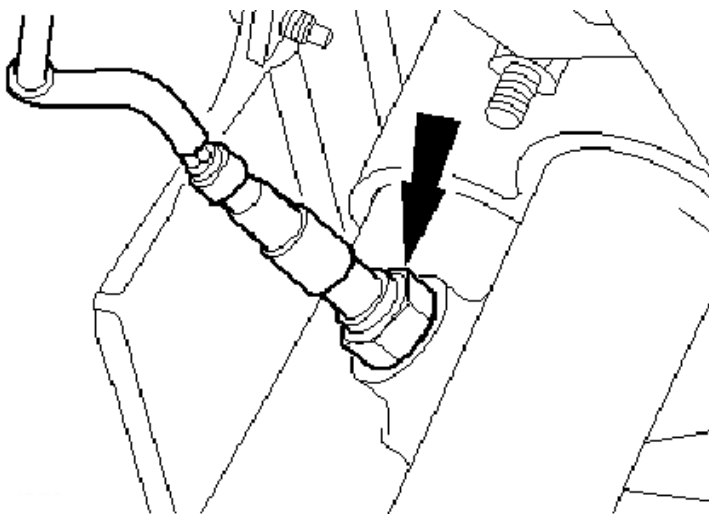
There was a big problem with early cars in that the contacts in the plug and MAF were alloy and were corroding, stopping contact. Ford now make both using Gold contacts and have a kit for converting the old connector to a gold contact one (lots of soldering). When you reconnect make sure that it really is firmly in and that none of the wires are broken. Its worth disconnecting and replugging this every now and then to ensure the contacts are clean and making contact. Its also easy to not quite plug this in properly

A new MAF is £80. I swapped mine at 105K mile and it made a huge difference to the performance. Symptoms of a duff MAF are a slightly rough idle and overall down on power

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## HEGO/EGO/Lambda/O2 Sensor (all same thing)

This provides the EEC IV module with data relating to the quantity of oxygen remaining in the exhaust gas. This is necessary for the correct operation of the catalytic converter. The sensor does not operate until it has reached its working temperature.



Lambda sensors as they are often called seem to last about 80-100k miles before they die. A dead one generally gives all sorts of running problems and lack of power including a bad idle when warm. (Not when cold). You can check the voltage from it properly only with an oscilloscope as it pulses its signal. So either swap it out or go to a garage for testing. Make sure you don't touch the tip of the probe or you will contaminate it.

Later Zetecs and the V6 have 2 of these

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## Inlet Air Temperature Sensor

This provides the EEC IV module with a signal proportional to the temperature of the incoming air charge. Make sure the connections are OK and that the sensor is in position. A new one is £12 so its probably easier to swap it

rather than worry about testing. Its situated on the underside of the plenum tubing about 20 cm away from the MAF (Where the forward plenum joins). It just unscrews once you've disconnected it.

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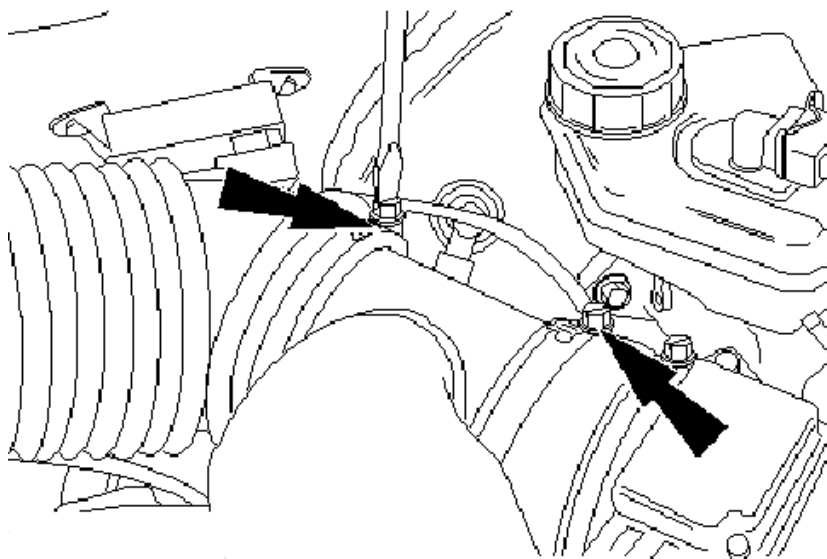
## Throttle Body Gasket

This is plastic and quite brittle when old. Its dirt cheap to replace £3. If its leaking then your getting un-metered air into the engine which will hurt the idle. Mine split the first time I removed the Throttle Body. Many people don't realise its there (black gasket on a black inlet manifold) and hence its often re-used even when damaged

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## Plenum Leaks

Easy to check. Make sure all the connectors on the plenum tubing are tight and snug. Especially the bolts to the throttle body, Check that the throttle body to plenum join has the O ring in it and is sealing (Easy for O ring to fall out). Any leaks here will let in un-metered air and kill the idle



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## Heat Soak

The Mondeo's engine bay has good air flow while you're moving but when you stop it gets bugger all, and so the temperature rises rapidly. If your intake takes its air from the engine bay then suddenly its collecting hot less dense air. The Inlet Air temp Sender takes a while to change temp so you will get a lumpy idle until it does. If you're like me and have replacement components these may also get very warm and could heat the Inlet Air Temp sensor to engine temps rather than air temps. That's why I have mine in a rubber section rather than in my metal AEM Ram pipe



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## EGR Valve

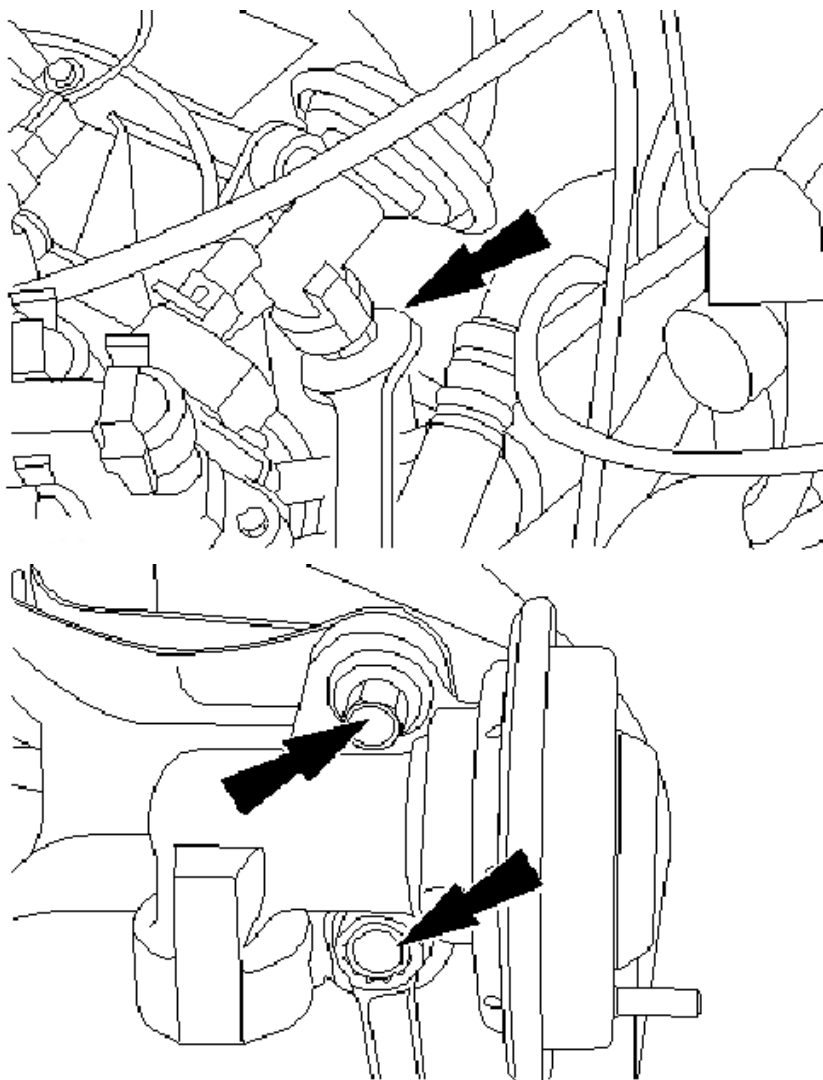
This allows a measured quantity of exhaust gas to be directed back into the inlet manifold. The exhaust gas introduced into the inlet manifold dilutes the incoming mixture and reduces peak gas temperatures thus reducing NOX emissions. The valve is vacuum operated and controlled by the EEC IV module. The EGR system does not operate during conditions of over-run or wide open throttle.



(Above) A shiny new EGR valve, note the vacuum hose running from the front of it. You can see the base of the Inlet Air Temp Sensor above it.

The EGR valve is controlled by its Solenoid and the EGPD valve, if it activates at the wrong time it will decrease performance and hurt idle. It can also physically fail which results in a vacuum leak. Remove the old valve and clean it with Throttle Body cleaner. Check the diaphragm is intact. To tell if it is working remove its vacuum line from the other end and suck hard. It should stall out a running engine or make it run real bad.

A new EGR valve is £40 and its easy to fit. unscrew the nut underneath it and remove the two bolts. No need to move or loosen the pipe running into the bottom



My diaphragm had punctures at 110k Miles resulting in a vacuum leak

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## EGR Solenoid

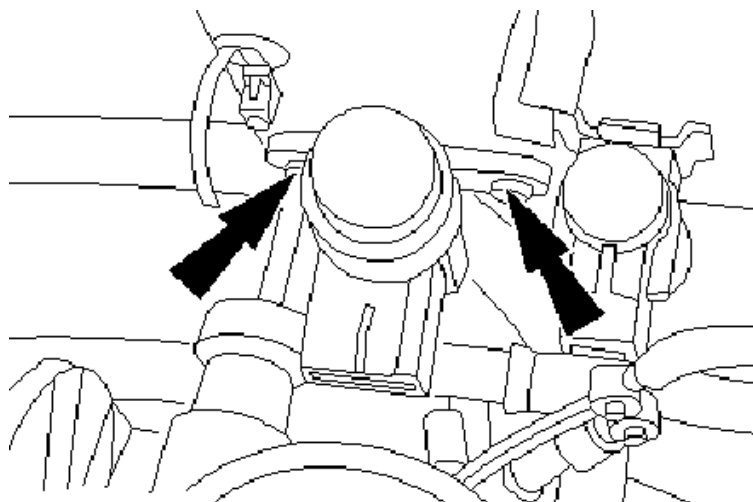
This uses the vacuum pressure to sense when to open and close the EGR valve by allowing vacuum to it. Often the hoses perish on it.

Its the middle unit of the three on the Bulkhead (the big one). I've noticed that some cars have them in a different order





Its possible to clean it out using Throttle Body cleaner but it wont be that dirty. To test, remove the vacuum hose from the EGR valve and put a vacuum gauge on it. It should only show a vacuum at part load settings. If it shows vacuum at idle or wide open throttle then the solenoid is duff.



Replacing it is easy, just pull off the hoses and undo the 2 screws. Don't drop them like I did!!!. Cost is about £25

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## Pulse Air Injection

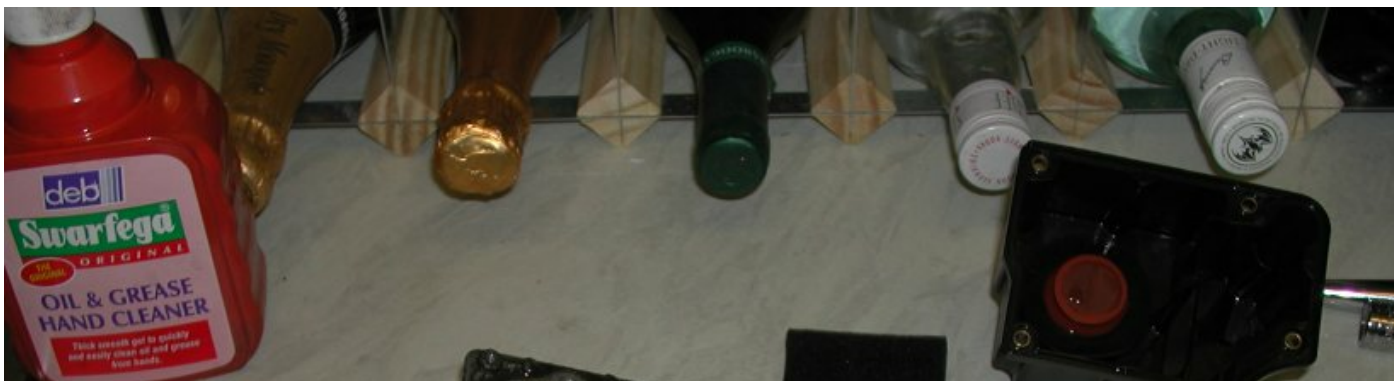
This allows fresh air into the exhaust manifold. The purpose is to further reduce emissions. The system is EEC controlled. The valves and filter are combined in a single assembly. The system operates only until the HEGO has reached its operating temperature and the EEC IV is providing "closed loop control" (typically 20 seconds) and on deceleration (closed throttle).

When knackered you will hear a loud clacking noise that sounds like valve rattle. You can take the black plastic box from the pipe work and clean it but this didn't help in my case. Fitting a new unit stopped the rattling noise. There is a foam filter in the black plastic box which can be cleaned as well. My engine idled more smoothly as well



The pulse air injection unit is sold as a single assembly for £180 (ouch!), including the valve box and new tubing. You need to remove the heat shield, but can do the swap with the exhaust in place. Above you can see the silver piping and the top of the valve box

You can attempt to clean it out but it wasn't successful in my case



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## Pulse Air Injection Solenoid

Uses vacuum and EEC information to turn the pulse air injection system on and off

Its the left hand unit of these three (the smaller one). I've noticed that some cars have them in a different order



To test, go under the front of the car and remove the vacuum line from the Pulse air Injection system black box. Connect a vacuum gauge. You should get vacuum only on a cold engine and overrun. If there is any vacuum at idle on a hot engine then the solenoid is broken. Replacement is £25 and just the two screws hold it on. A very rough idle to stalling are the symptoms

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## Wrong Oil

If you have used too thick a grade of oil (Such as 15W/40) then this could effect the hydraulic valves, causing them to be sluggish until warm which could give a rough cold idle. This is what people think of as the "Sticking Valves Problem" a quick oil change to the correct viscosity oil will fix this. I've always used Mobil1 and would recommend it to anyone. Symptoms are valve rattle noises on start up which go when warm. If you don't cure this the the valves will wear and you'll have a permanent rattle.

Best prevention is to use the correct grade oil. Ford say that you should use a min of 5W winter rated oil (so 10W is bad). If you have put in the wrong oil or don't know what is in there then do an oil change using Halfords synthetic 5W-30 oil, leave this in for a couple of weeks to spread round and dissolve/pick up the gunk and then change again to your main oil (I'd recommend Mobil 1), don't forget to change the oil filters whenever you change the oil

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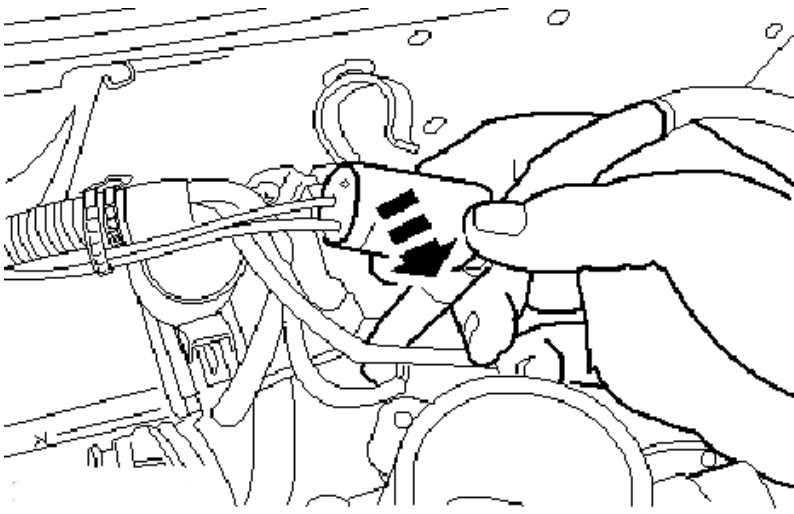
## Air Conditioning Pressure Control Switch

The job of this is to increase revs when the air conditioning kicks in to stop the extra load stalling the engine. Obviously if it has failed this will show as a poor idle/stalling when the Air conditioning is active

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## Heated Front Windscreen Control Switch

The job of this is to increase revs when the heated screen kicks in to stop the extra load stalling the engine. Obviously if it has failed this will show as a poor idle/stalling when the heated windscreen is switched on



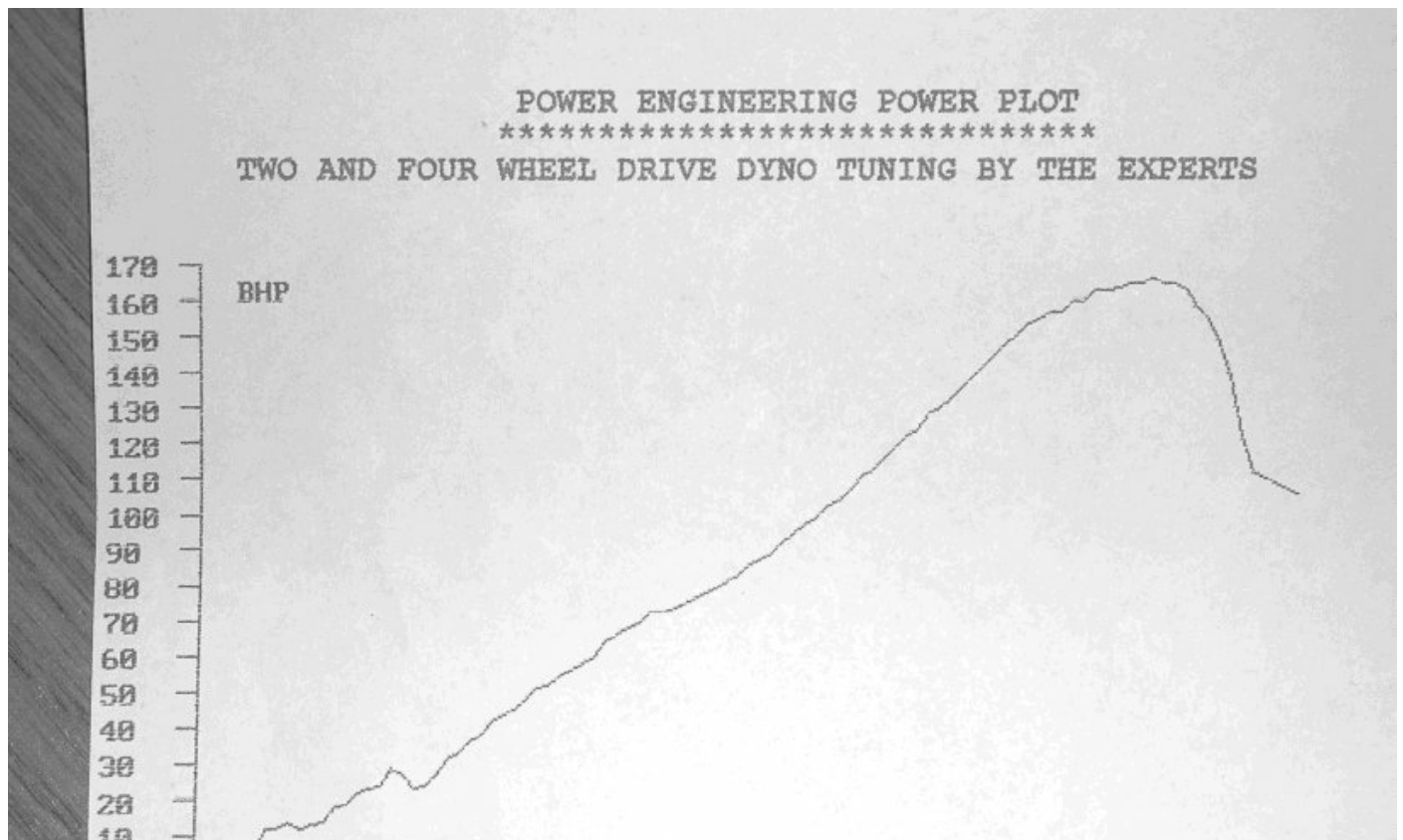
Replacement is the only option. Cost unknown

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## Auxiliary drive belt pulleys. Bearing Failure

Rare but not unknown. If one of your pulley bearings or the water pump bearings are going, this will put a strain on the belt and hence the engine that could effect the idle speed. Difficult to diagnose. Check the belt tension and listen to the belt area for strange noises. remove the belt and rotate each pulley by hand. Feel for any tightness of free play. Replacement is the only option

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As you can see from my latest Dyno. The Zetec is not a smooth performer at low revs

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*Mad Moles Mondeo Madness, © Mad Mole 2001. You may see the Molemobile fly past in the Sutton area (Surrey). [Return to Home page](#)*  
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