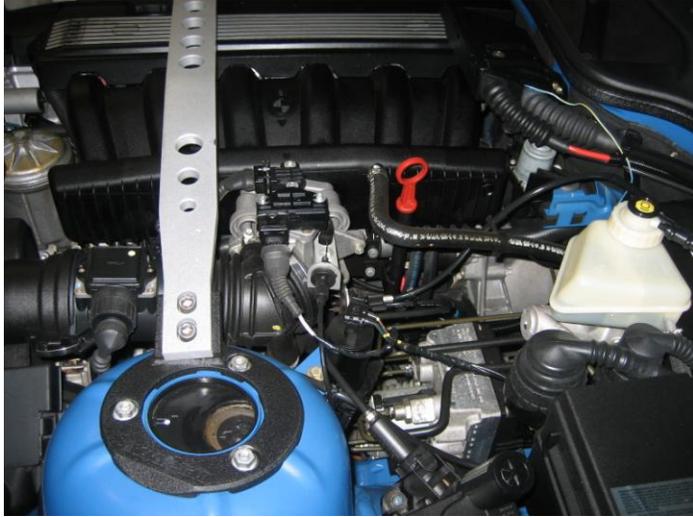


M50 Manifold Install Trouble

Shooting Guide

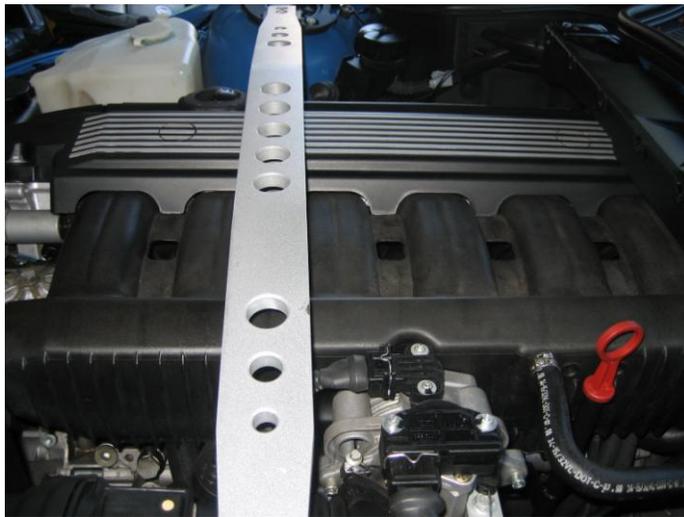
TURN THIS ----->



INTO THIS ----->



AND FINALLY THIS ----->



TROUBLE SHOOTING GUIDE

First, let me clear up some very inaccurate information you may have read or otherwise found on the internet:

- If you have followed the install instructions perfectly, your engine should start up and run exactly the same as it did before you made this modification. Usually within a few minutes of idling you should have a smooth, familiar sound about 700-750RPM. The idle may even be smoother than before because the BMW OE crank vent and ICV seals are prone to leaking once they get a few years old, get hard, dry, and cracked.
- IT DOES NOT TAKE A WEEK OR 2 FOR YOUR IDLE TO SMOOTH OUT!! If you have a rough idle and you wait some time before fixing it your ECU may tune it out. BUT THE PROBLEM IS STILL THERE AND YOU ARE LOOSING POWER BECAUSE OF IT. It still needs to be fixed.
- If your idle remains rough or inconsistent after the install and wasn't this way BEFORE the install you have a problem that needs to be fixed or you could cause damage to your engine.

VACUUM LEAKS – These are the most common problem so we'll detail these first.

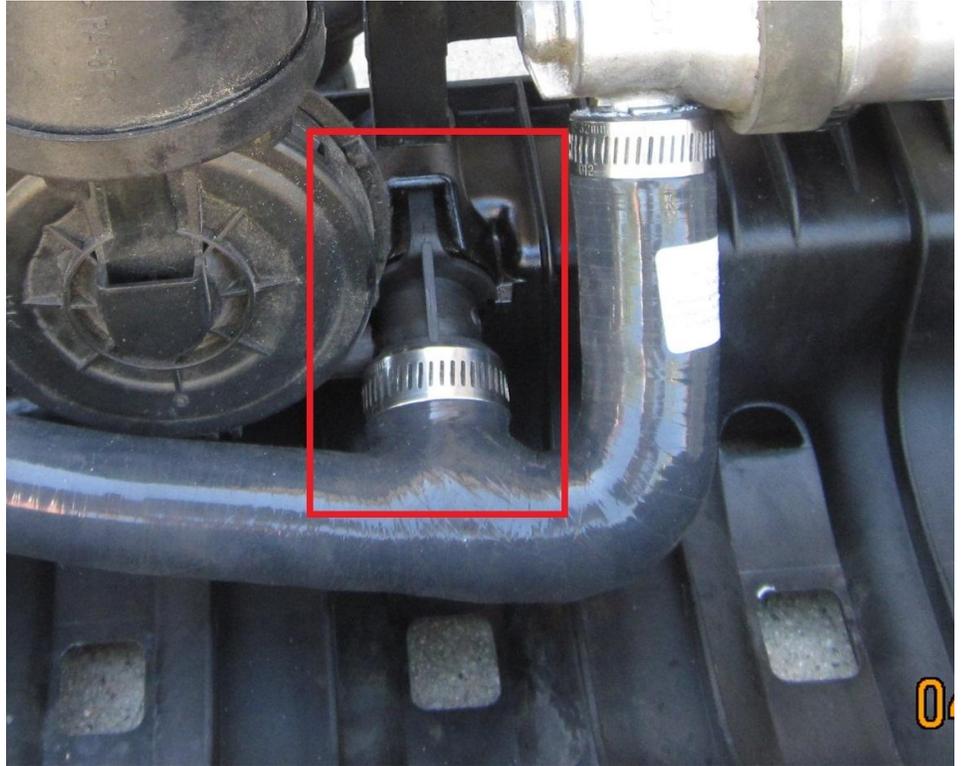
A vacuum leak is an air leak into, around, or bypassing a component that is part of the sealed intake/emissions system. In this particular system these components are:

- **intake manifold** – this is the vacuum source for all components in the system. It has connections to: cylinder head, throttle body, brake booster, fuel pressure regulator, secondary air pump solenoid, each individual fuel injector, and crank vent, ICV, and purge valve (aka charcoal canister solenoid) via the large BMW connector in the back of the plenum.
- **idle control valve (aka ICV)** – one connection to the manifold and one connection to the intake boot.
- **crank vent (aka cyclone separator, pcv, etc)** – one connection to the manifold, one connection to the VANOS cover, and one connection to the dipstick tube (which is an oil drain). All connections need to be sealed for vacuum.
- **throttle body** – one connection to the manifold.

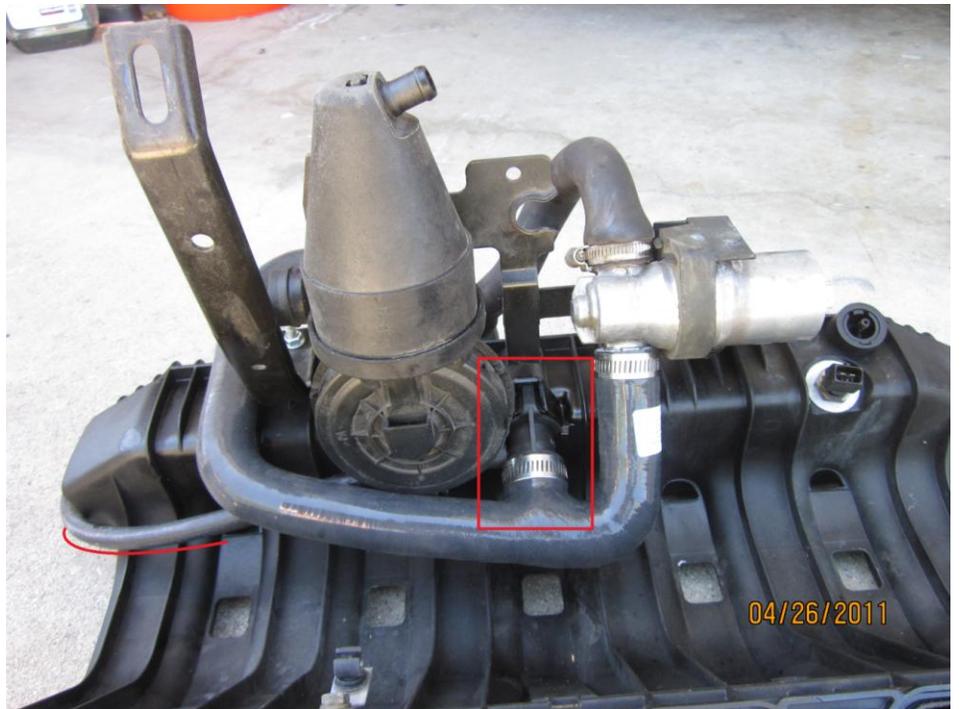
From the throttle body to the cylinder head the system needs to be sealed. The only air entering the system needs to do so through the throttle body valve or the idle control valve. A leak in the ASC throttle body, intake boot, cold air intake, or air box system, although undesirable, *should not* cause a rough idle or inconsistent performance because those components are outside the sealed vacuum system.

TROUBLE SHOOTING GUIDE

#1 – BMW ICV Connector - The top of the list for causing vacuum leaks is the large BMW connector in the back of the manifold. This connector is the central piece of the hose connector system that joins the ICV, the Crank Vent, and purge valve into the manifold vacuum system. If there is a leak here your car may idle erratically, inconsistently idle well then poorly then well again, your engine may not even idle at all. **THIS IS THE #1 CAUSE OF VACCUM LEAKS.**



Make sure the connector is installed squarely and that the retainer clip/barb is not broken off. Sometimes the connector can be installed crooked/cooked without the clip breaking off but this is more rare. If you suspect this is where your leak may be you can see/access this connector clearly by removing the throttle body and looking/feeling directly into the manifold.



Author Rant - This part should have never even been a separate part. It should have been a molded nipple on the manifold like the brake booster nipple is. There is no reason why you can't use some very high grade (high temp) epoxy and permanently glue it in place. The FI guys almost have to do this in order to keep from blowing it out.

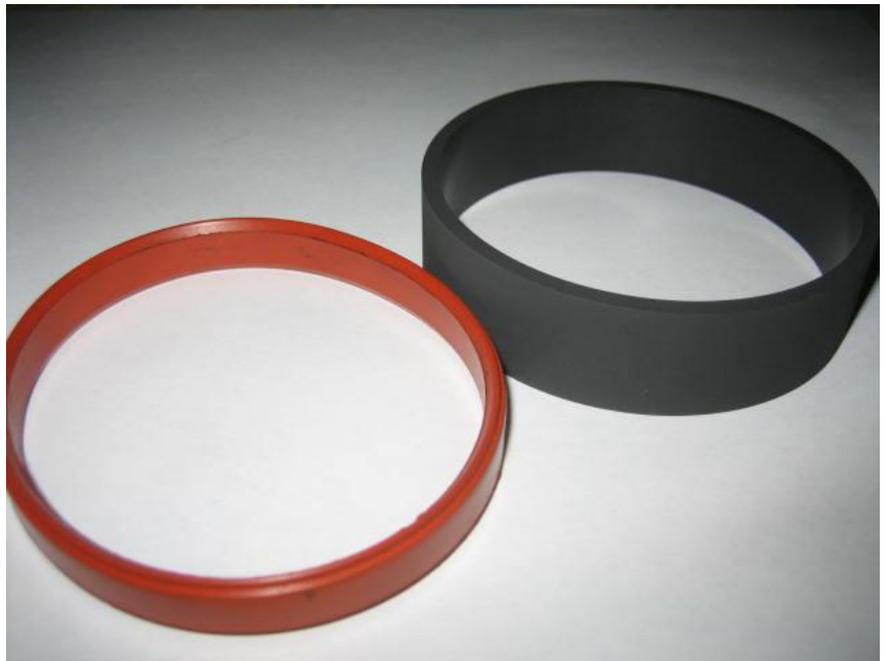
TROUBLE SHOOTING GUIDE

#2 – Throttle Body Seal – The problem is a M50 manifold has a seal gland for a seal to be installed into. The M52 throttle body also has this gland for the seal to be installed into. Photo right.

If you use a standard BMW seal (seen here installed into the M52 TB), you can clearly see that when the throttle body is installed onto the manifold the seal will have nothing to seal against because the sealing area is not flat...it has the seal gland/groove. If you use 2 seals with no sealing plate in between the seals (believe it or not there was a kit manufacturer telling people to do this), they will not seal.



If you buy the m50manifold.com kit a properly designed throttle body seal is included as part of the kit contents. Photo right. It is nearly double the size of the OE seal but not quite. Believe it or not some people even forget to use the m50manifold.com seal even though it comes with their kit.



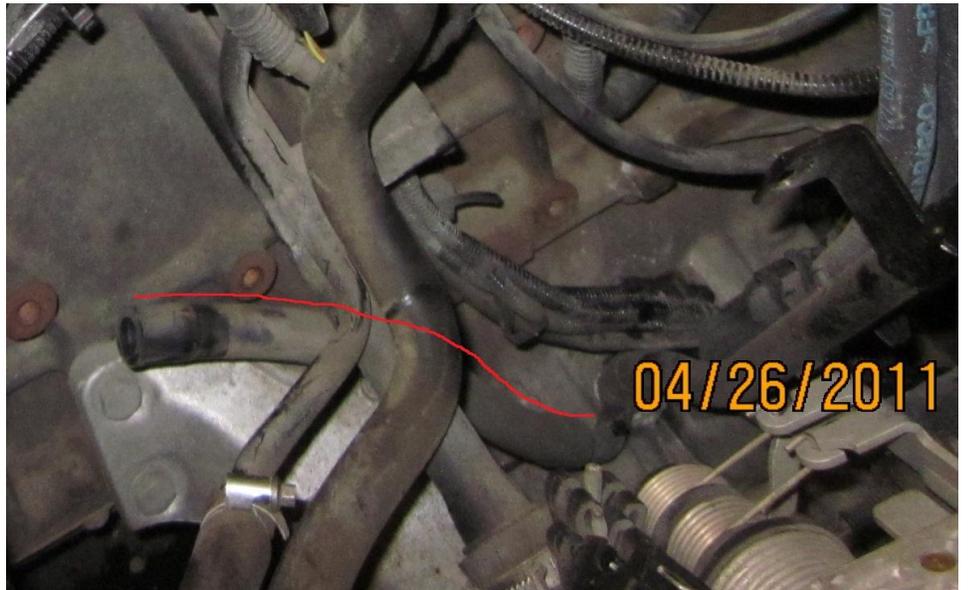
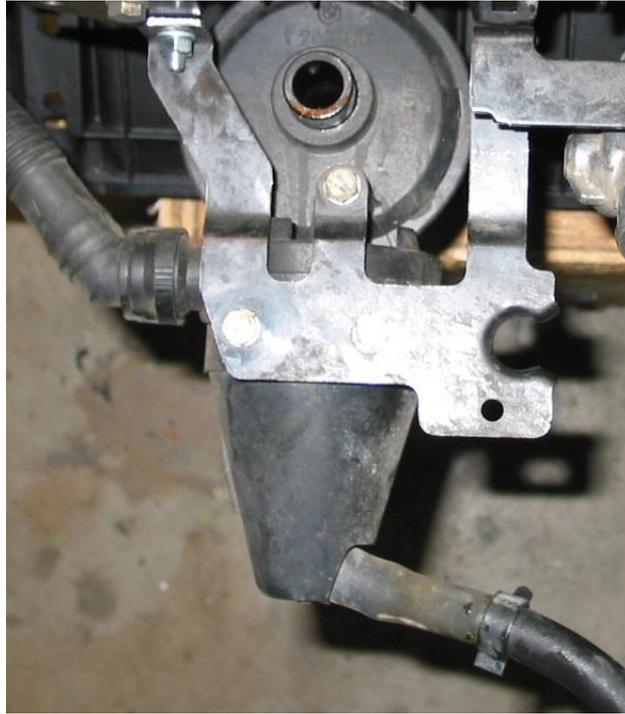
TROUBLE SHOOTING GUIDE

#3 – Crank Vent Vacuum Leaks

– The most common leak on this component is the drain to the dipstick. The rubber drain hose is often times not in very good shape and can come loose on its own...it is not clamped from the factory.

Otherwise it is also very well hidden beneath many parts so many times it just doesn't get reconnected to the bottom of the crank vent or the dipstick tube. The connection on the side of the crank vent joins the VANOS cover and the crank vent. There are o-ring seals on these connections. The plastic hose can be cracked and the snap ends may not be fully engaged...allowing leakage.

Drain hose to the dipstick pictured right. The ends are often cracked and ugly. Replace if necessary but make sure it is at least connected at both ends. (The date is partially obscuring the dipstick tube making it hard to see.)



TROUBLE SHOOTING GUIDE

#4 – Fuel Injector Vacuum Leaks

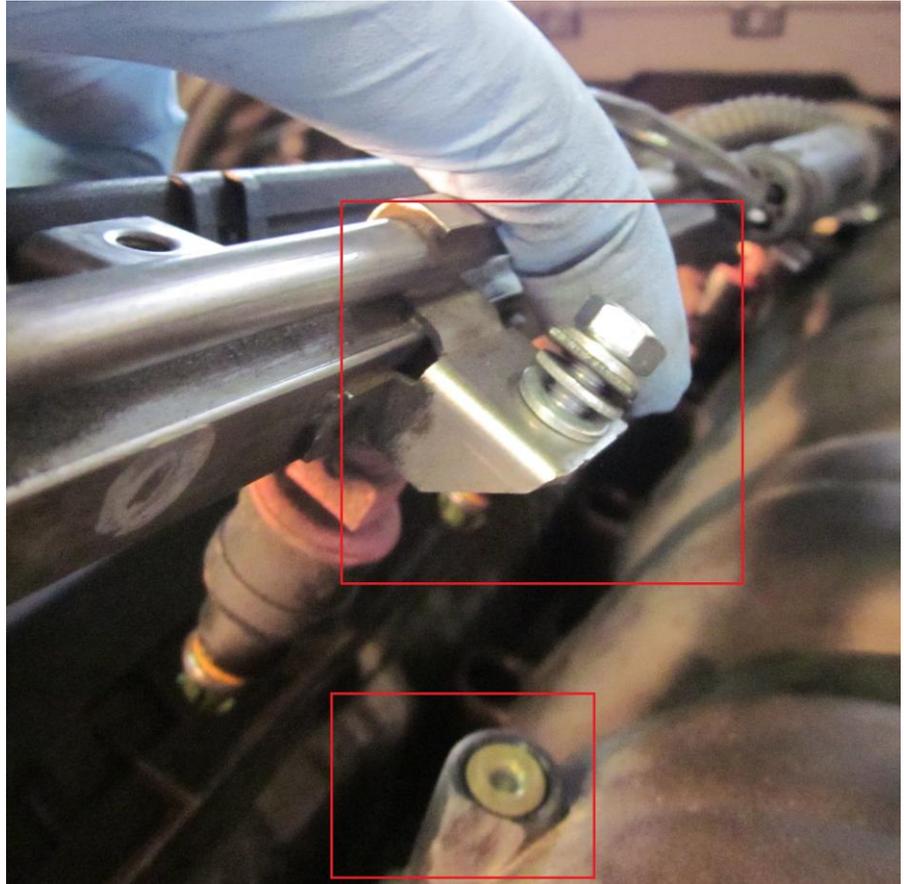
– There are a few problems with mounting the M52 fuel rail onto the M50 manifold.

When properly installed, the top of the fuel rail mount is lower than the top of the manifold mount. So if you install brackets without spacers the fuel rail will be pulled up about 3mm...which raises the injector seals 3mm...which allows them to leak.

Use spacers, like washers, to take up the space between the bracket and fuel rail...pushing the fuel rail down forcing the injectors down into their tapered ports sealing them tightly.

Also, you can see that there has been a small amount of plastic trimmed off of the side of the manifold fuel rail mount.

When a M52 fuel rail is mounted to an M50 manifold the fuel rail/manifold mounts make contact in a way that doesn't allow the injectors to sit naturally in their ports. The injectors sit cocked at a slight angle. Trim some plastic off the outside edges just enough so the fuel rail mounts sit outside the mount.



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#5 – ICV Leaks – The ICV connects to the intake boot via a molded rubber hose. The hose is often cracked and not in very good shape. I have seen these hoses crack and break right at the hose clamp (shown in the red box below). This break is very difficult to find as it mostly covered by equipment.

This hose break happened to a customer car and it was very illusive. The car would not idle with the AC on. It would idle fine without the AC on and the CEL code faulted the MAF sensor. Substituting MAFs resulted in the same code so I kept looking.

When I install these hoses/clamps I make sure the clamp is accessible from under the throttle body so it can be changed without removing the manifold.

Another ICV problem: Debris in the valve can cause it to stick. If you shake the ICV back and forth the valve can get stuck in full open or closed position. A stuck valve will cause an ICV CEL code. There is more than one CEL code associated with the ICV.

