BMW X5 4.4i Valley Pan Gasket.Valve Cover Gasket, Spark Plug Replacement, Coolant Draining/Bleeding Procedures. M62 TU V8 Motor

This DIY is also thanks to Heckler, Jst, hpia, and Weasel

Please read entire DIY before starting this job. You may find after looking at pictures, it is too in depth and would rather take your X5 to a mechanic.

This DIY is 61 pages long. It is very thorough and complete. It has been composed in a way where you can look at the pages you want to and print those specific pages.

All right folks! It is time to tackle that mystery coolant leak that you've been wondering about. You checked your hoses, all your lines and your expansion tank, but still see that "Check coolant level" light come on a weekly basis? It just might be your Valley pan gasket.

A little background.

So my 2001 X5 4.4i has 74,000 on the clock. At least I think. The pixel problem on my mid is really bad. So it is either 74,000 or 11,000. Anyways, my X has been leaking coolant for about a year now. It was a very slow loss of coolant in the beginning. When it first started, I may have added coolant every six months or so, but as time went on, it eventually got worse until I found myself at the dealership once a week buying coolant. A few months back

I changed my water pump and thermo hoping that would fix the problem, it didn't. I then changed my expansion tank and a few hoses but still had a loss of coolant. After doing a search, I found out that it could be the Valley pan gasket. A good indicator is to look under the car and look under the transmission bell housing. If you see baked on coolant, then it is pretty much confirmed that your valley pan failed.

Now taking this to your dealer is going to cost you about $1800.00 which is what I was quoted. An Indy might charge anywhere from $1100 to $1700 for this job. The lowest I've heard of was $800 but sounded a bit skeptical. Anyways, if you are prepared to tackle this job then you are going to be looking at ~$600. That price includes all the parts, coolant, and misc things. Add another $90.00 to buy the manual if you don't already have one. NOTE: To be completely honest, the manual really didn't help all that much. The engine in the pictures show an M62 engine, but not off an X5, but either off a 5 or 7 series. Things are similar, but there were still differences. I finally just closed the book and just went by experience. The only time I opened the book was to look up the torque specs. By using this DIY you should be able to do the whole job start to finish.

Another note: Now this job requires a lot of patience, safety, careful planning, mechanical know-how, and please, please, a good set of tools. Tools are what are going to get you through this job without big problems. Using a crap set of tools is going to take you more time and cost more

money. Also, there are a lot of things that need to be taken apart, a lot of expensive things. If you find yourself half way in this job and you start feeling weary about going further, don't! Stop what you are doing, take a breather, and put everything back together and take it to the mechanic. There is no sense in taking everything apart and then not knowing how to put it back together. I understand times are tough and everyone wants to save money, but doing it on a BMW and not knowing what you are doing will certainly put you in the poor house if something gets messed up.

Disclaimer/Technical: This guide should only be used as a reference. Since not all torque specifications are listed, nor are they from BMW, the ones listed may not be accurate. I assume no responsibility should you attempt to do this repair and the final result is not satisfactory. Again if you are not comfortable with this DIY after reading this, please do not attempt to dismantle your X5. Schedule a service appointment and let the professionals take care of it. This reference may not be copied, sold, used for other than its intended purpose, or circulated outside of XOutpost.com or X5world.com without my written and authorized consent.

Now that my words of wisdom are out of the way, on to the parts list. This list is a suggestion on things you need/should get to replace the parts in your M62. Everything listed in here will either need to be replaced or just so badly worn, you have no other choice to replace it.

NOTE: P/N are supplied from realoem.com. They can be cross referenced with autohausaz.com. Now the price at realoem.com was about $600.00. The price at autohausaz.com was $456.00. All

of the parts I got from Autohauzaz.com were genuine BMW parts, Victor Reinz Gaskets, and Bosch Spark Plugs. Coolant was purchased at my local dealer for $21.50 / gallon.

11611729728 EGR Valve Gasket; Intake Manifold to Rear Cover
QTY: 1 Plate

11617508541 EGR Valve; Rear Intake Cover with Non-Return Valve
QTY:1
W0133- Engine Coolant Recovery
1665339 Tank Hose

QTY-1
64218409063 Heater Hose; Heater Valve Assembly to Left Heater
QTY:1 Core
64218409064 Heater Hose; Heater Valve Assembly to Right Heater
QTY:1 Core

11611729727 Intake Manifold Gasket; Front Intake Manifold to
QTY:1 Throttle Housing
11611433328 Intake Manifold Gasket; Intake Manifold to Cylinder
QTY:4 Head
4417 Spark Plug; Platinum+4; 4 Electrode
QTY:8 Note: P/n from autohausaz.com

11129071590 Valve Cover Gasket Set; Left
OR - Cylinders 5-8
Note: realoem.com p/n ends
11120034105 in 105

QTY:1

11129071589 Valve Cover Gasket Set;
OR Right - Cylinders 1-4
11120034104 Note: realoem.com p/n ends
in 104
QTY:1

11121437395
Valve Cover
QTY:16 Grommet/Gasket; Valve
Cover Nut Seal
11141742042 Valve Cover; Center Valley
Cover With Gasket
QTY:1
11141736106 Valve Cover; Valley Cover
at Top of Block, Between
QTY:1 Cylinder Heads

11531731833 Water Outlet Gasket; Water
Accumulator Gasket at Rear
QTY:2 of Engine

11531710055 Water Outlet Gasket; Water

	Pipe Connection O-Ring;
QTY:2	**19.5x3.0mm**
11531710048	
	Water Pump Gasket;
QTY:2	**Water Pipe to Water Pump**
	O-Ring; 34.2x4.0mm
11121733969	**Profile gasket**
QTY: 2	
11151438302	**Oil return hose**
QTY:1	
11157560068	**Oil return hose.**
QTY:1	
11151705237	**Oil Separator**
QTY:1	
11747797082	**Blue Vacuum Hose (Note:**
	Realoem.com p/n cross ref
QTY:1	**no.15. This hose is longer than the original. It can be cut and used to replace the White hose to the same module.**
QTY: Varies	**Various worm-drive hose clamps.**

Now this list contains all the parts that I replaced myself. Your situation may have you adding to this list, but this is pretty thorough and complete.

Tool list/ Hardware:

3/8” socket set (6 point preferred) (Mostly 6mm, 8mm, 10mm, 12mm, 13mm, 14mm) Also various extensions

¼” socket set (6 point preferred) (Mostly 6mm, 8mm, 10mm, 12mm, 13mm, 14mm) Also various extensions.

6mm long allen wrench

Various mechanic’s picks. They look like dentist picks, but stronger. They are handy when taking out o-rings or grabbing those pesky clips on the connectors and injector clips.

Mechanic magnet. This tool will be your life saver. Things are packed tight in the M62. You WILL drop bolts and nuts in places your fat hand won’t fit. The magnet is extendable and the head swivels and is very strong.

Flashlights/Work light.

Rubber mallet or Dead blow hammer

Various drain pans

Torque Wrench (5-25 ft lbs/ and one in (in/lbs) I am a stickler about torque specs, but in this case, there is no

room to get one in there. So I did the specs by hand, just get them snug, and then a tiny umph.

Tools/Software:

Gasket Tack

Dielectric Grease

RTV Ultra Gray (Sensor safe)

Intake/Throttle body cleaner

Silicone Lube

Loc-tite blue.

Anti-Seize compound

2 Gallons of Distilled Water

2 Gallons of BMW Coolant (P/n-82 14 1 467 704)

Pure Glycerin (Found this in CVS)

Paper towels (Lots)

Painters tape

Addl info/ Optional equipment:

Impact driver with 3/8” socket adaptor (This is just used to speed up the removal process. DO NOT USE THIS TO TIGHTEN ANYTHING DOWN!

Engine cleaner

Liquid wrench penetrating oil

Some small boxes to put nuts and bolts in

Step Stool

Shop Vac

Set of bolt outs (Incase you strip a bolt or torx)

Air Compressor

A good dealer parts counter or indy parts counter

Now on to the fix. Be prepared! This job on the books says 8 hours. Now I have a lot of mechanical experience. Some things take me less than the book and some take me hours more. This job just happened to take me hours more. 5 days to be exact. Most of the time the car was sitting because I needed to order parts and started this job on a Friday. If I counted the total hours worked, it would be about 12 hours. So do this on a weekend and spread it out over 2 days. Day 1 is removal and cleaning and day 2 is assembly and final inspection. Doing this in a garage would be best and have

your wife, husband, girlfriend/boyfriend, or best friend on hand so you can have them drive you to the dealer or parts store to pick up anything unexpected. Especially if this is your primary car.

Step 1:

Remove splash guard underneath the X. There are 14 bolts in total. Be sure to remember were they go. Best way is to remove the cover and reinstall the bolts onto the fasteners. The cover is held in place with 5 10mm bolts and 9 (8mm) bolts. After the fasteners are removed, slide the cover toward the rear of the X and the cover will come off. (There is no picture of this. If you can't remove a splash shield, you shouldn't be doing this job.)

Step 2: Draining of the coolant.

While on your back and with a light, looking at the radiator assembly, to your right, there is a light blue drain plug. It is plastic. Taking a flat head screw driver, unscrew this drain plug. Be prepared for old coolant to come out and place your drain pan appropriately under the drain. (Now you don't have to do this step. You could leave the coolant in the system and disassemble everything until you get to the water manifold. From there you can drain the coolant, but it will be messy. Coolant will splash everywhere.)

Step 3: Disconnect Neg battery terminal.

Leave the coolant to drain while you walk towards the rear and disconnect the battery connection. After lifting the floor board, and removing the spare tire, remove the 4 (10mm) bolts connecting the air pump to the suspension and set it aside. To the right, you will see the battery. Disconnect the negative terminal by loosening the 10 mm bolt. Wrap some painters tape around the cable to prevent arching. (Note: At this point, there is no power going to the X. The lift gate is controlled by switches. If you close the tailgate, you will not be able to open the lift gate assembly to reconnect the battery. Otherwise you will have to lower the rear seats, remove the floor and crawl in. So leave both open or close the lower tailgate, and take a towel and lay it across the latch for the upper part. Slowly guide the upper part down so it closes, but just rests on the towel, so it doesn't latch.)

While you are back there, unscrew your gas cap.

Step 4: Disconnect the fuel line.

WARNING: GASOLINE IS FLAMABLE. USE CAUTION DISCONNECTING THIS LINE. IT IS UNDER HIGH PRESSURE. USE SAFETY GLASSES AND NO SMOKING!

Open the hood and look to the left of the Brake fluid reservoir. There you will see the fuel line. This is a push connector fitting. Wrap a towel tightly around the fitting. This will absorb the gasoline expelling under pressure from that line. Taking both hands, push the black fitting towards the flex hose and disconnect the line. Set the hose aside in

an upright position. (This is the way I did it. Another way is to depressurize by removing the fuel line fuse, starting the car until it dies. But since you disconnected the battery; and you are choosing to do it this way, I guess you are going to have to reconnect your battery, aren't ya?)

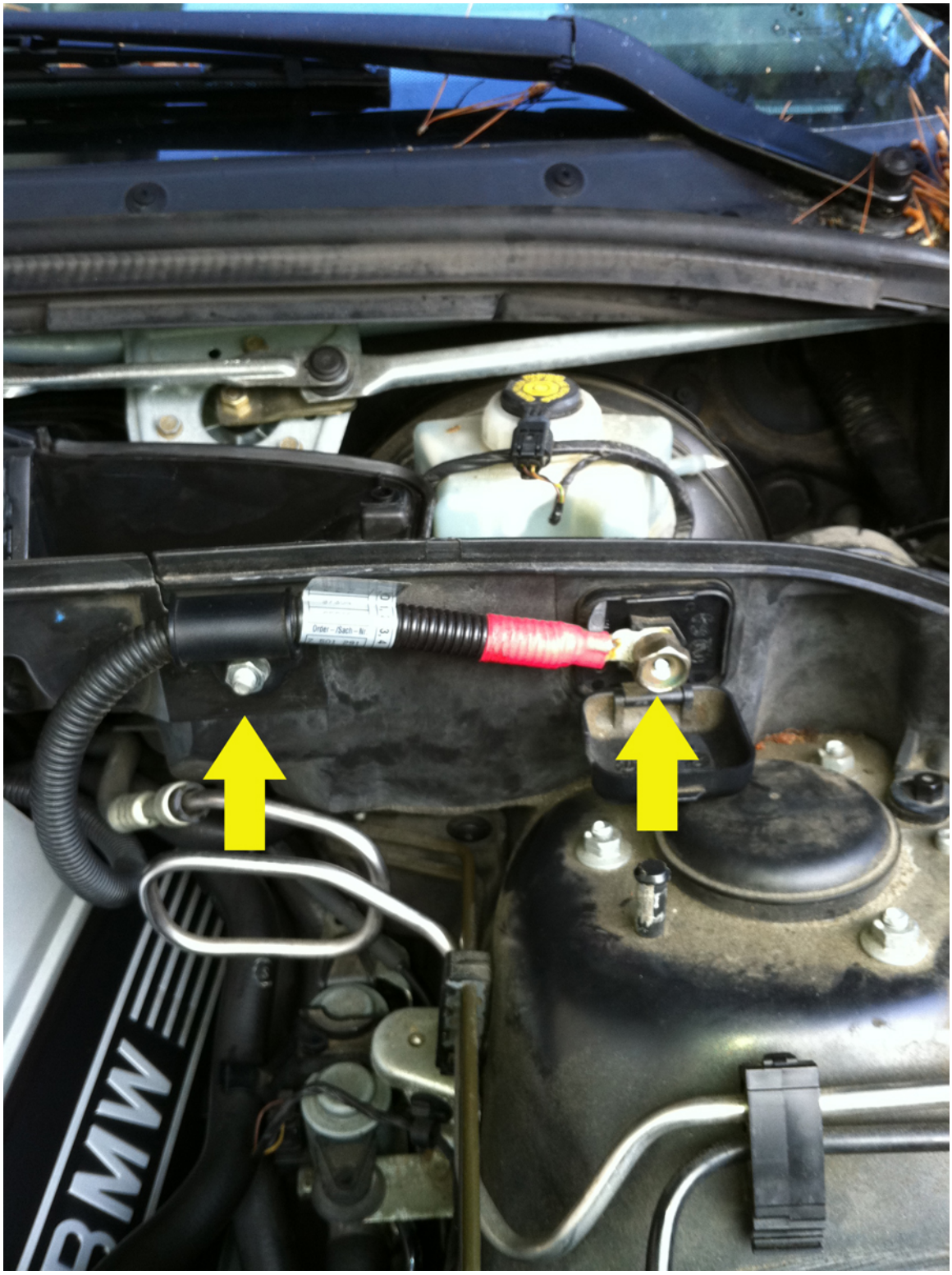
Step 5: Remove BMW Acoustical cover.

Take a 6mm allen key and loosen the 4 fasteners. (no picture on this. Again if you know how to remove the fuel line, you should know how to do this.)

Step 6: Remove Upper plastic covers. (Thanks to Heckler, these are his pics.)

First unfasten the numerous spring clips on the top plastic covers. This assembly simply lifts off after everything is loose. Remove the micro cabin filter by grabbing on to its tabs and pulling up.

Now use a 14mm socket and remove the bolt holding on the positive battery cable to the firewall and the cable support clamp.



Then working on the pass side, remove the 14 mm bolt behind the washer fluid tank.

(You can remove this assembly to gain more access for the further procedures or leave it. Up to you.) You can't get back there with a socket, so you will need to use an

adjustable wrench. Now remove the rubber gasket that stretches along the top of the plastic assembly.

It simply lifts off. While you are on the pass side, looking to the assembly you are going to take off, simply slide straight up the triangular side piece.

There is one on each side. They can be a little fussy, but will come out. After you set those aside, grab the assembly on the top and support the bottom with your other hand and first pull toward you to clear the bolts and then up to remove the assembly.

Set all these parts aside and reconnect the 3 bolts so you don't need to keep track of them later.

Step 7: Removing the MAF plumbing and front air cowl.

Using pliers, remove the securing pins on the cowl. I also unbolted these 2 (10mm) bolts to remove the entire assembly. Working towards the air filter housing, unclip the 2 securing clips. They simply pry up. Looking toward the throttle body, look at the bottom of the air filter plumbing. You will see 2 hoses connected to nipples. They just slide off. (NOTE: THIS IS WHEN THE TAPE COMES IN HANDY. NUMBER THE PIECES OF TAPE ACCORDING TO HOW THEY CAME OFF. SO IN THIS

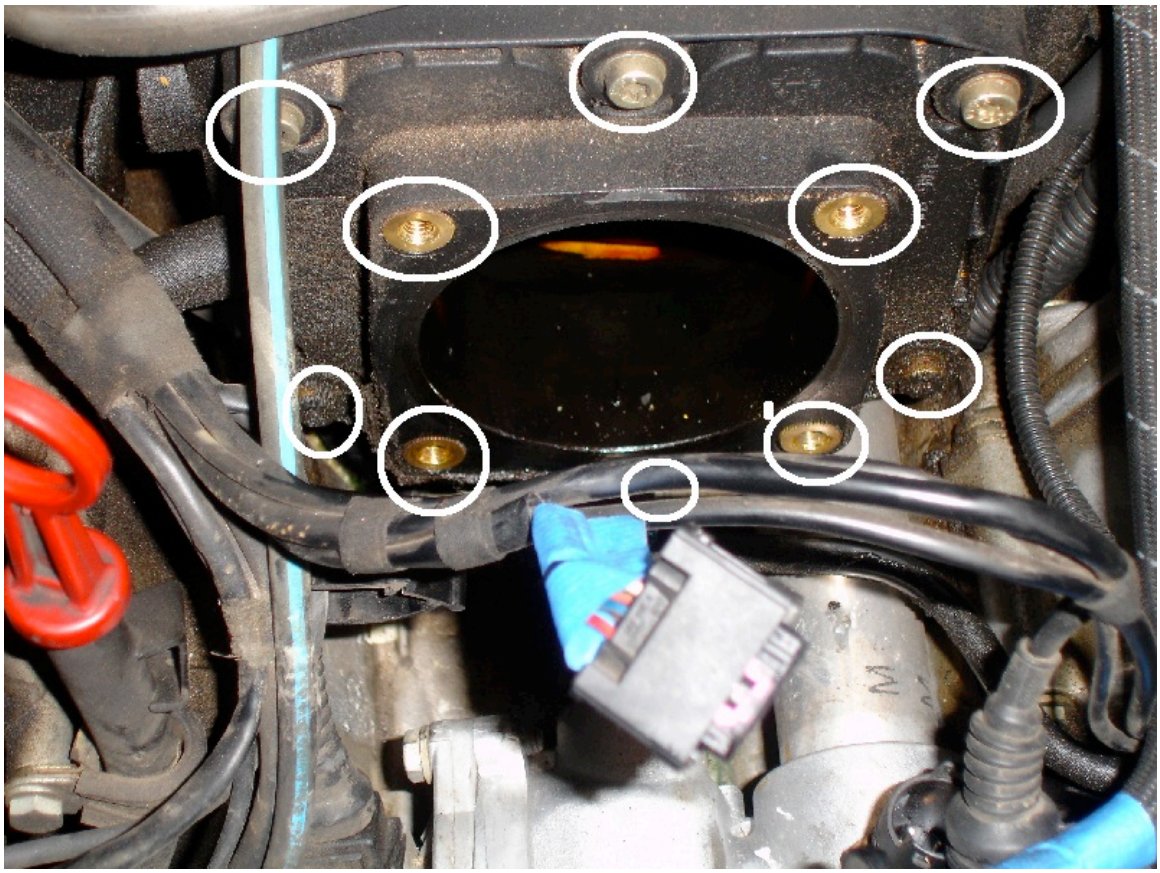
INSTANCE, YOU ARE GOING TO REMOVE THE BREATHER HOSES, LABLE BOTH THE FITTING AND NIPPLES WITH THE SAME NUMBER. THIS WAY YOU CAN CONNECT EVERYTHING BACK QUICKLY.) Then with a flathead screwdriver or 8mm socket, loosen the hose clamp holding onto the MAF and throttle body housing and disconnect the MAF housing, and plumbing routing to the throttle body. You can disconnect the sensor if you want, but I left mine in. Set the plumbing aside.

Step 8: Removing connections on electrical black boxes and thermostat housing and throttle body.

Looking at those two black boxes on top of the intake, unplug the 4 connections on top, two on each side. They are secured on with spring clips. Using a small flat head screwdriver or your picks, pull out the spring clips and slide the plugs off the connectors. These clips can be troublesome, so be patient and try not to lose them. Label each connector according to where they go. Reinstall the clips and set them aside. Now looking down, you will see

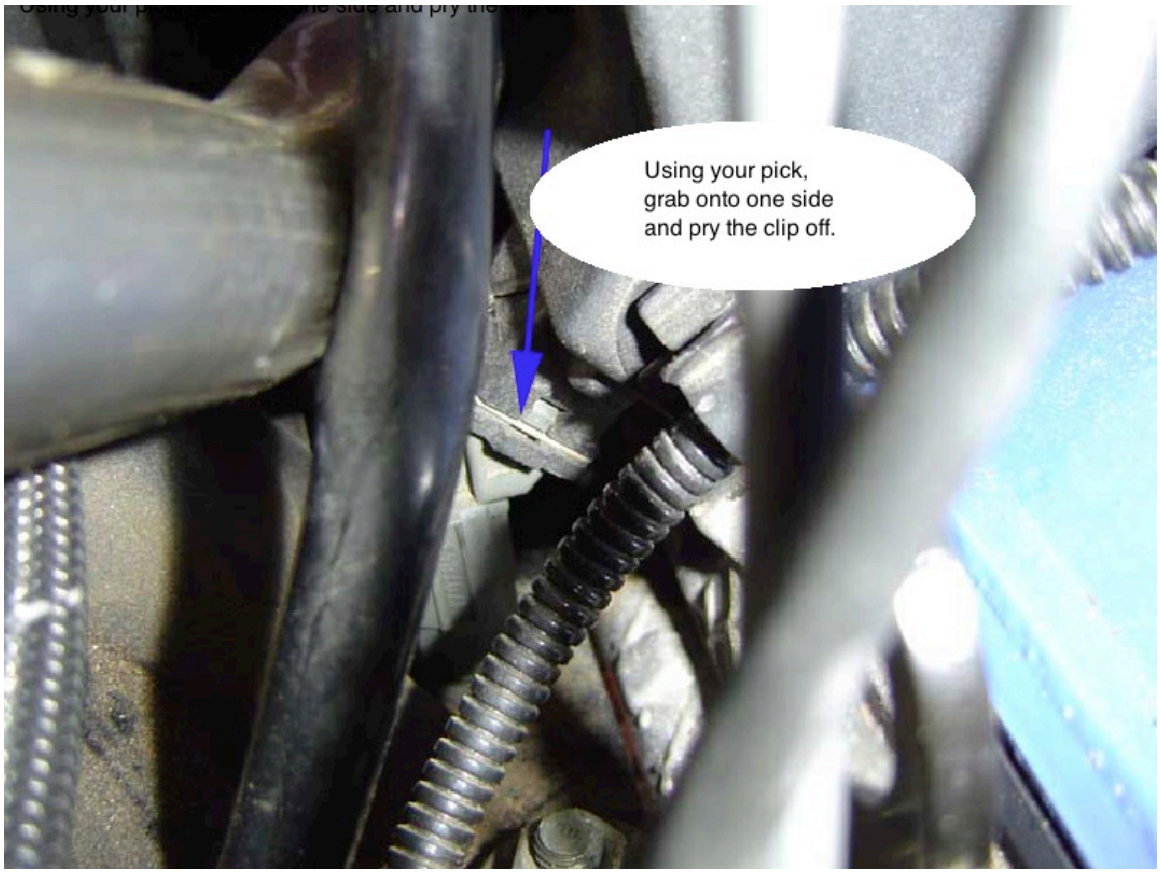
your water pump. Directly on top you will see a round connector. Remove this connector and set aside. Now on top of the throttle body, you will see a 6 pin connector. Remove this connector and set aside.

Now you have a clear shot of the throttle body assembly. There are 4 (10mm) bolts holding this on. Undo the 4 bolts and remove the assembly and set it aside. Insert the bolts you took out back onto the throttle body for safe keeping. Now remove the housing plate. Using a T-27 torx bit, remove the 6 bolts from the housing. The housing is attached to a breather hose. Just set this aside. Put the bolts in a box for safe keeping.



NOTE: I USED A ¼” WRENCH WITH A 6MM SOCKET ATTACHED TO A T-27 TORX BIT. I ALSO TRIED A TORX T-27 SOCKET BUT THE SOCKET IS A LITTLE TOO LONG TO GET TO THE MIDDLE BOTTOM BOLT.

Step 9: Removing injector security clips.



Now these are going to be a pain. There are 3 ways that I know of you can do this. 2 require the removal of these clips. The last one, courtesy of Weasel, you can leave the clips on, unbolt the fuel rail and simply pull the injectors out of the intake manifold and strap the whole thing to the hood. Weasel's way is a lot easier in theory, but I just had too many harnesses in the way and didn't feel like going under the car to unclip the oil pressure sensor and the other clip. To each his own, so pick your poison. This procedure is using my method. Using your flashlight and mechanics pick, hook your pick around the edge of the clip. Get one side loose and then peal them off. These clips are essentially three sided. They wrap around the injector coupling and hold it in place. There are 8 of these clips.

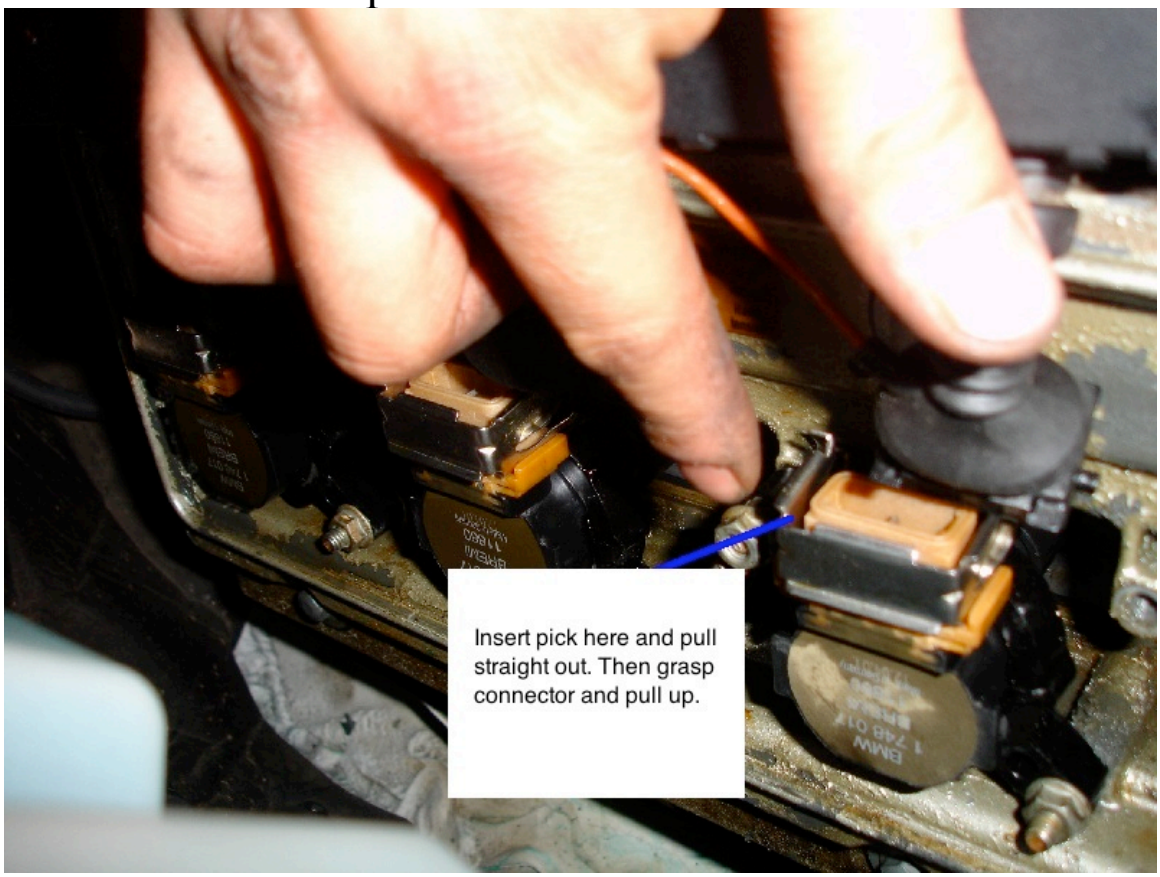
Don’t worry if you drop one. They fall in between the valve cover and intake manifold. So you can grab them later. After you get the clips off, set them aside.

Step 10: Remove Plastic “BMW” cover.

Using your pick and a 10 mm socket, pry off the 2 covers on each cover and set them aside. Insert your wrench and unbolt the cover. The drivers’ side will be a little tight because the heater hoses are in the way. Take the covers off on both sides and set them aside. Be sure the bolts and guiding pins come out together.

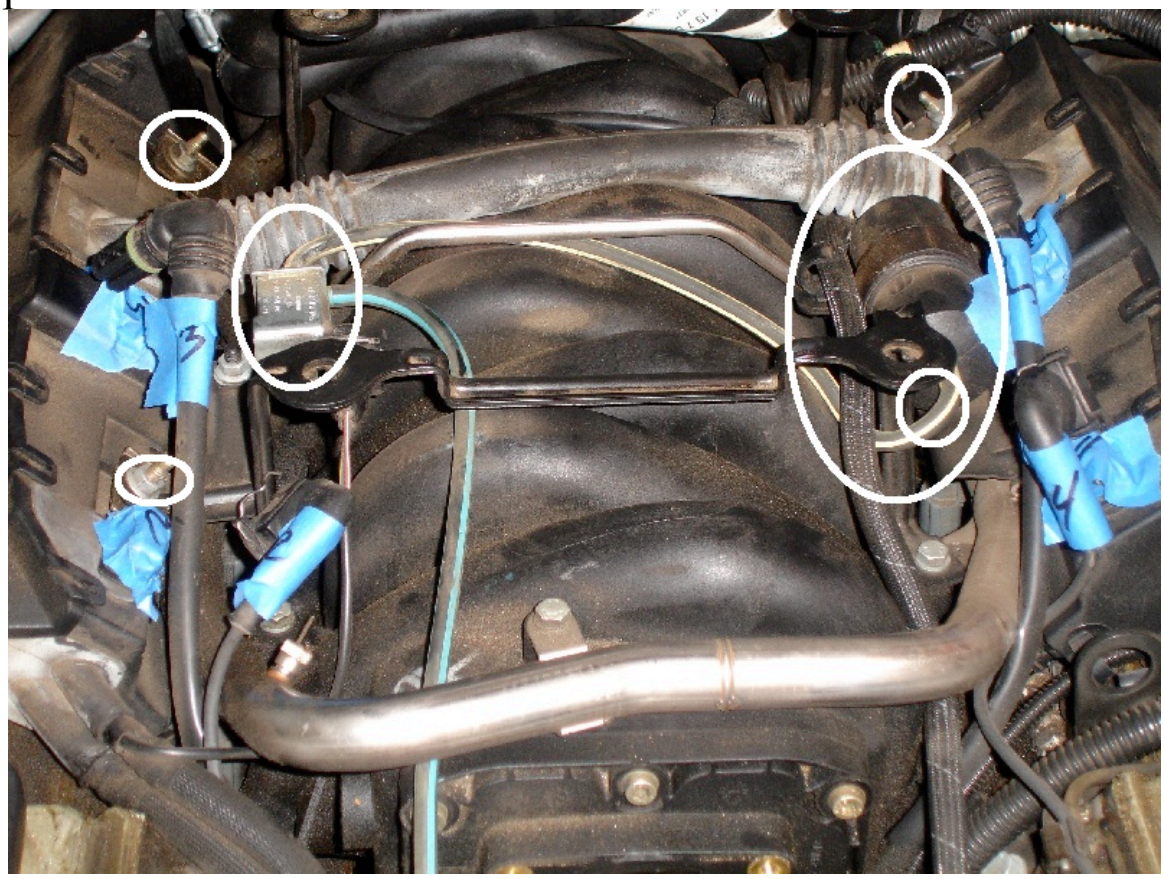
Step 11: Remove the electrical boxes.

Now you can see the Bremi coil packs that feed power to the spark plugs. Take your pick and insert it under the metal strap and pull up. Do that to all 8 coil packs. Now making sure those straps are loose. Grab the connector attached to the electrical box and pull up and disconnect them from the coil pack. Do that to all 8.



Now looking at the top of the intake, unbolt the 4 (10mm) nuts connecting the black boxes to the fuel rail. These nuts are securing brackets that hold onto the Electric valve (Circled) and the body tube (Circled). From the electric valve, trace the blue striped vacuum hose down to the valve under the air housing. Disconnect this line. Then disconnect the yellow striped vacuum hose to the body tube. These tubes just pull right off. After you unbolted everything,

pull the electric valve off and set aside.



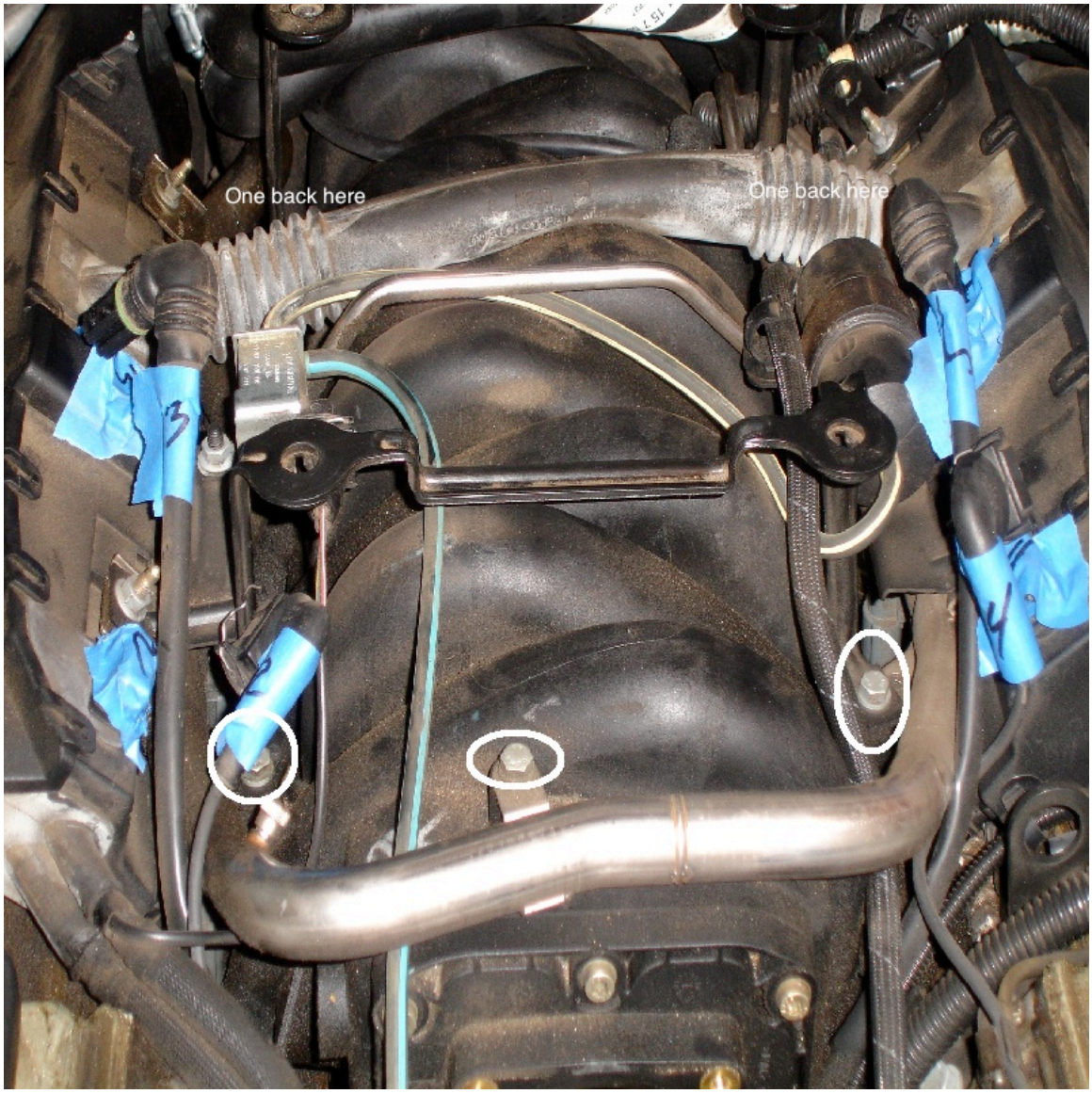
The body tube is attached to the CCV and stays on.
Starting on the passenger side, on the third Bremi coil pack, unbolt the 10 mm nut securing the grounding strap from the electrical boxes. Do the same on the drivers' side.

NOW STOP!!! YOU HAVE 2 CHIOCES HERE. YOU CAN PULL THE BOXES OFF AND SET THEM ASIDE, LEAVING THE FUEL RAIL ATTACHED TO THE INTAKE OR YOU CAN UNBOLT THE INTAKE FROM THE FUEL RAIL AND TAKE IT OFF SEPRATELY FROM THE INTAKE. I CHOSE THE LATTER BECAUSE IT IS LESS CUMBERSOME TO REMOVE THE INTAKE THAT WAY.

If you are going to leave the fuel rail alone then you can proceed to Step 13 otherwise keep reading.

Step 12: Removing the fuel rail.

Looking from the top. Unbolt the 5 (10mm) bolts holding the fuel rail and set them aside.

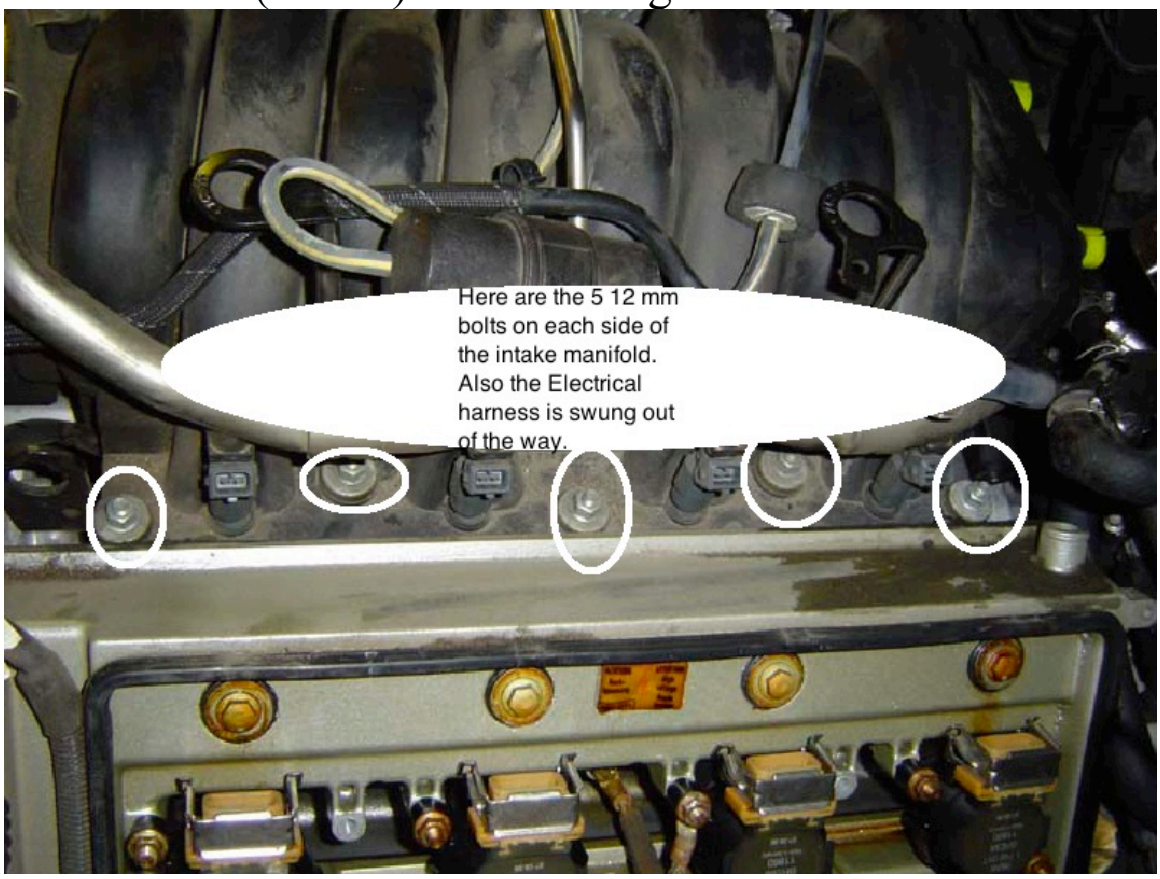


Now making sure all the connections are out of the way,

firmly grasp the rail on both sides and pull straight up. NOTE: UNBOLTING THE FUEL RAIL WILL ALSO UNBOLT THE TWO METAL BRACKETS HOLDING THE ACOUSTICAL COVER DOWN. The injectors are secured by o-rings, so they just pop right out. The rear of the rail will be a little difficult to pull up because of the oil separator hoses are in the way, but can be done. After you get the rail clear, carefully maneuver the inlet hose that attached to the main fuel line out of the car and set the rail aside; upside down.

Step 13: Removing the intake manifold.

There are 10 (12mm) bolts holding the intake down.

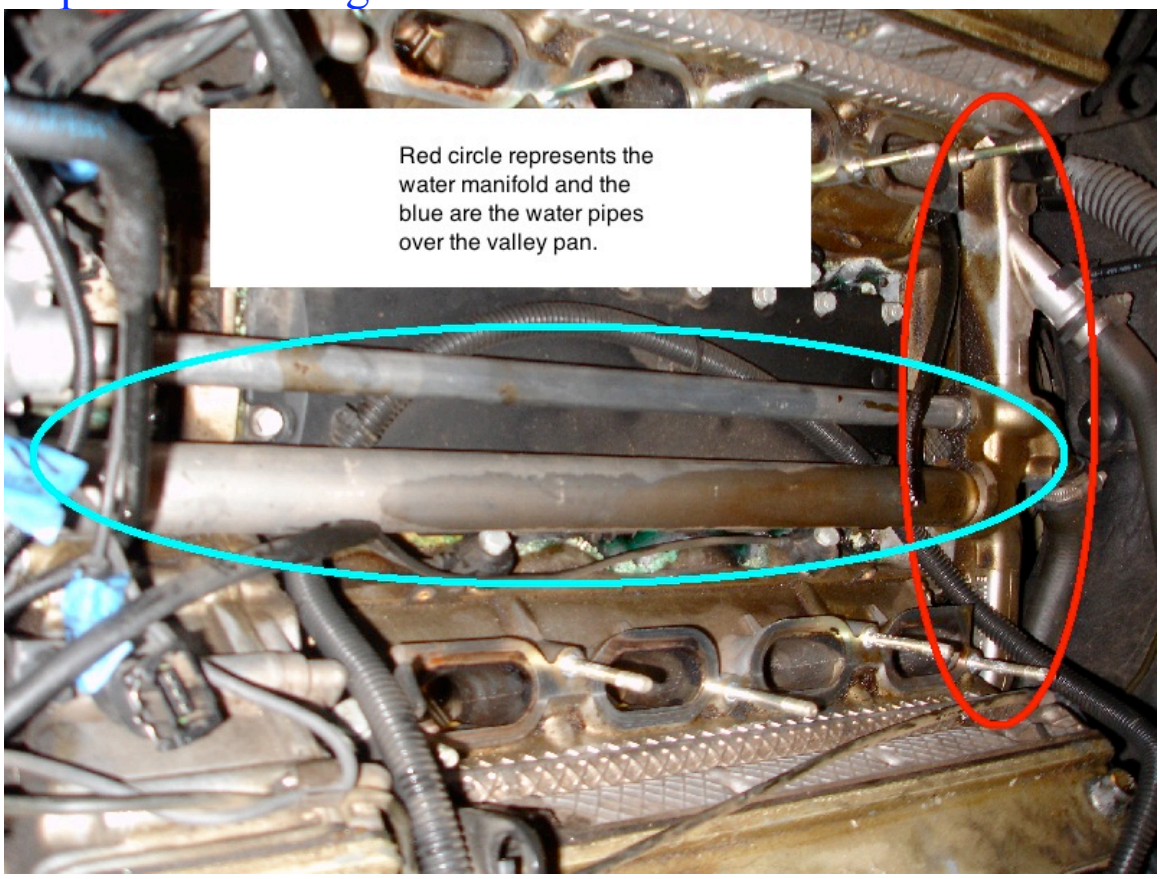


Unbolt and set aside. The intake might me on the block very tight. DO NOT HIT IT WITH ANYTHING! Just take your time and wiggle it out of the seals. Now here is the tricky part. The intake is attached to the CCV. The CCV is connected 5 different ways. 2 oil separator hoses on top, 2 oil return hose at the bottom and brake booster hose. A few of these hoses are worm-driven and some with that compression one-time-use clip. First unclip the brake booster hose. Then remove the hose attached to the drivers side valve cover. Now the 2 bottom hoses are more than likely so deteriorated, you can pull the intake right off without a problem, but incase you can't, pull the intake up

and tilt it up. Reach in and undo the compression clamps holding both hoses on. After you get those off, reset the intake, grab from the front and the back of the intake and lift straight up and out. Take your tape and mask off the intake ports so nothing falls in. Also find all those injector clips that fell and account for all of them. Also don't forget to re-screw the 5 bolts you took out from the fuel rail to the intake to keep them safe.

Now you are in deep! Sitting directly in front of you is a long black thing. If you look on either side of it, you will see old, crusty coolant. I know! You are tempted to just take your impact gun with a 10mm socket and zip that sucker out. But you have those two aluminum tubes in the way. So, now proceed to step 14.

Step 14: Removing water manifold.



Now I've already replaced my water pump and thermo and really don't want to take it off again. Now this is going to suck, you are going to curse a little and wish BMW put out a massive recall on this, but chances are, its not going to happen. That water manifold is way back there. Unless you are 7 feet tall and have a 60" reach, you are going to need a stepstool and crawl in the engine bay. Place a towel or something soft on top of the frame, just before the radiator. Kneel on the towel and reach to the back. Now fit yourself with a ¼" wrench with a 6mm socket and undo the clamps to the water manifold. Now switch up your socket to a 10mm and use your finger to feel where the bolts in the back are and guide the socket there. They are not on very

tight but 2 of the 6 bolts are in areas that are extremely tight, but totally doable.
NOTE: TRY YOUR BEST NOT TO DROP THESE BOLTS. IF YOU DO, THEY WILL DROP ON THE ALUMINUM SKID PLATE AND YOU WILL NEED TO USE YOUR TRUSTY MAGNET TO FIND THEM. ALSO BEFORE YOU UNBOLT, PLACE YOUR DRAIN PAN UNDER THE MANIFOLD. WHEN ALL THE BOLTS ARE OFF AND YOU TAKE THE MANIFOLD APART, WATER WILL GUSH OUT! SO BE PREPARRED.

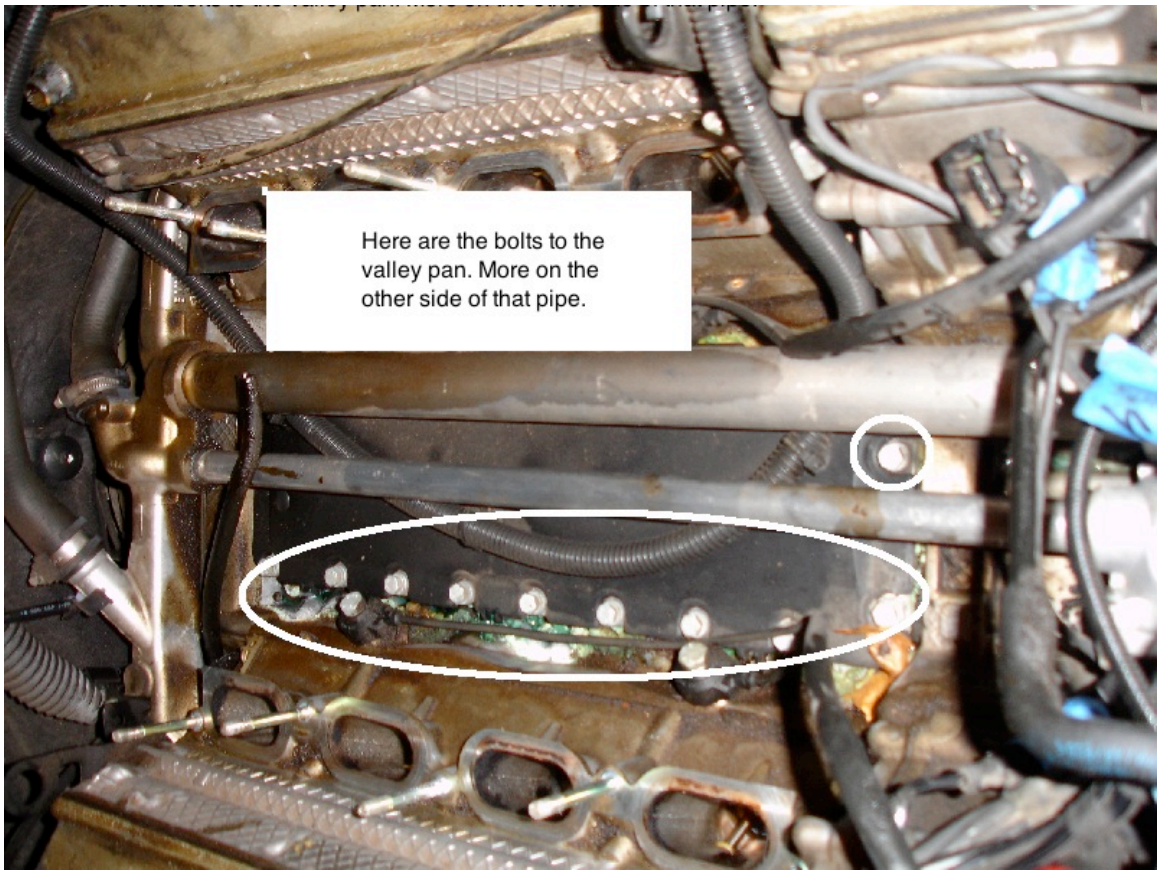
After the manifold comes out, the pipes will slip right out of the water pump. Insert all 6 bolts back to the manifold and set it and the pipes aside.

Now check the face of the manifold and make sure the gaskets came out with it. If it didn't, check the face of the block to see if they are stuck there. In any case, peel them off.

Step 15: Valley pan removal

There are 20 (10mm) bolts holding this thing down. This is where your impact driver comes in handy. First remove one bolt by hand so you can get a feel how tight it is on there. After you are aware, zip all the bolts out and remove the valley pan. Now if you look at the new valley pan, the gasket is rounded while the old one is flat. It seems like the new one will give better sealing. Now there is a lot of coolant in the pan, so scoop the water out or use a shop vac

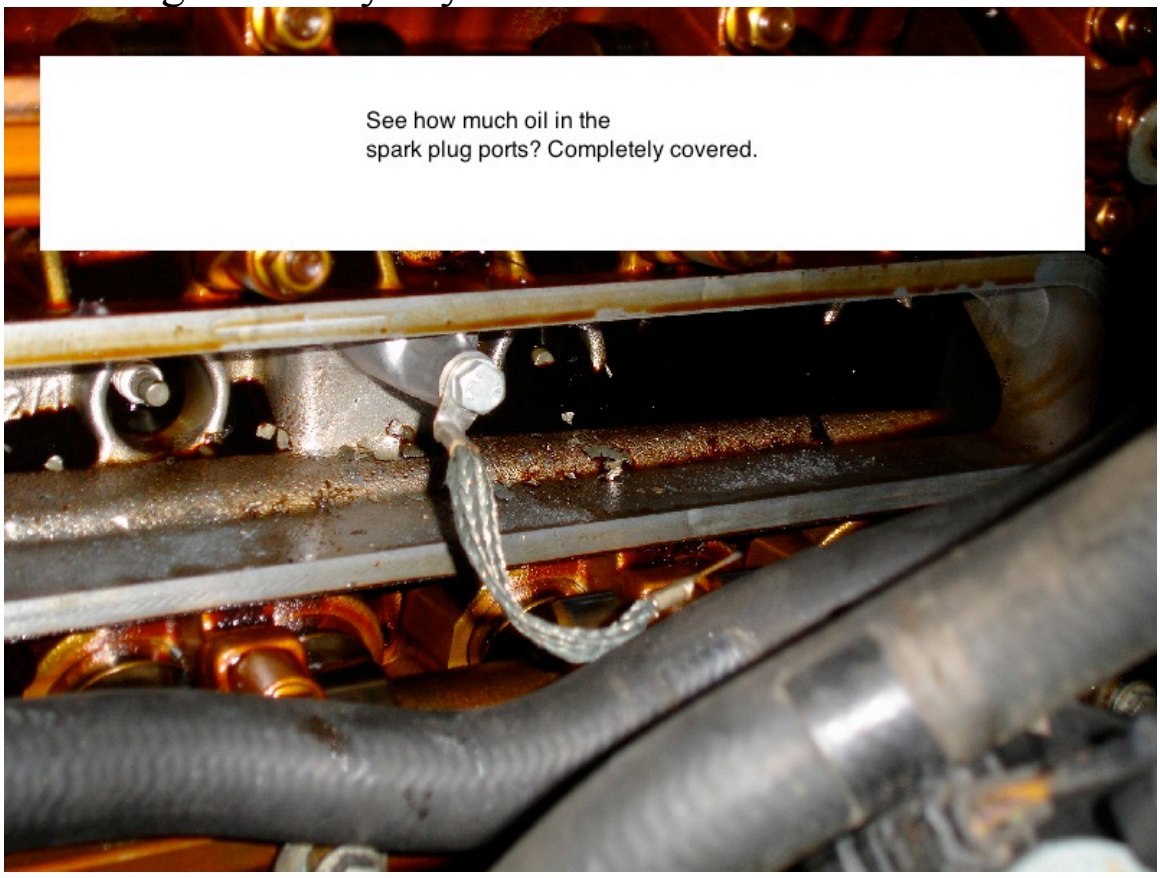
and suck it out. Also clean the crud out of the sides.



NOW STOP! YOU HAVE COME TO ANOTHER 2 CHOICES. YOU CAN EITHER REPLACE THE VALLEY PAN AND REASSEMBLE EVERYTHING IN REVERSE ORDER, FILL THE SYSTEM WITH COOLANT, FOLLOW BLEEDING PROCEDURE AND YOUR DONE. (Skip to Installation step 3 and follow from there.) BUT, IF YOUR X HAS OVER 60K MILES AND YOU ARE ALREADY IN THERE ANYWAYS, YOU MIGHT AS WELL KEEP TAKING EVERYTHING APART AND REPLACE EVERYTHING. IF YOU ARE GOING TO DO THE LATTER, CONTINUE ON TO THE NEXT STEPS.

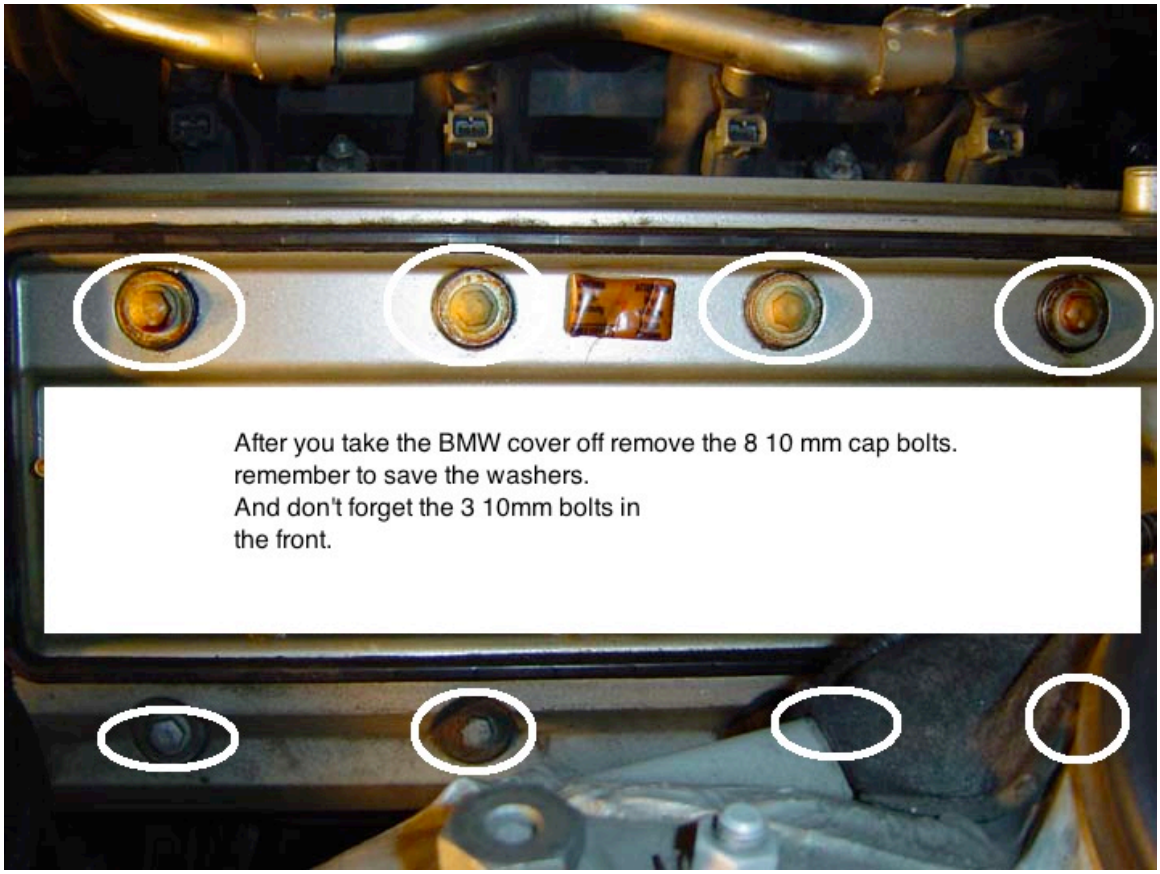
Step 16: Removing coil packs.

Working from the passenger side, remove the Bremi coil packs. Unbolt the 8 (10mm) bolts from each bank. As you take out the coils, use your tape to number which cylinder they came out of. Now I don't know if this makes a difference, but it is what I did. The third coil pack will have another grounding strap that attaches to the valve cover. Undo all the nuts and pull out the coil packs and set them aside. Now, if your valve cover gaskets are fine, you shouldn't see any oil on the coil packs or in the spark plug tubes. If you do, which was in my case, then you needed the new gaskets anyways.



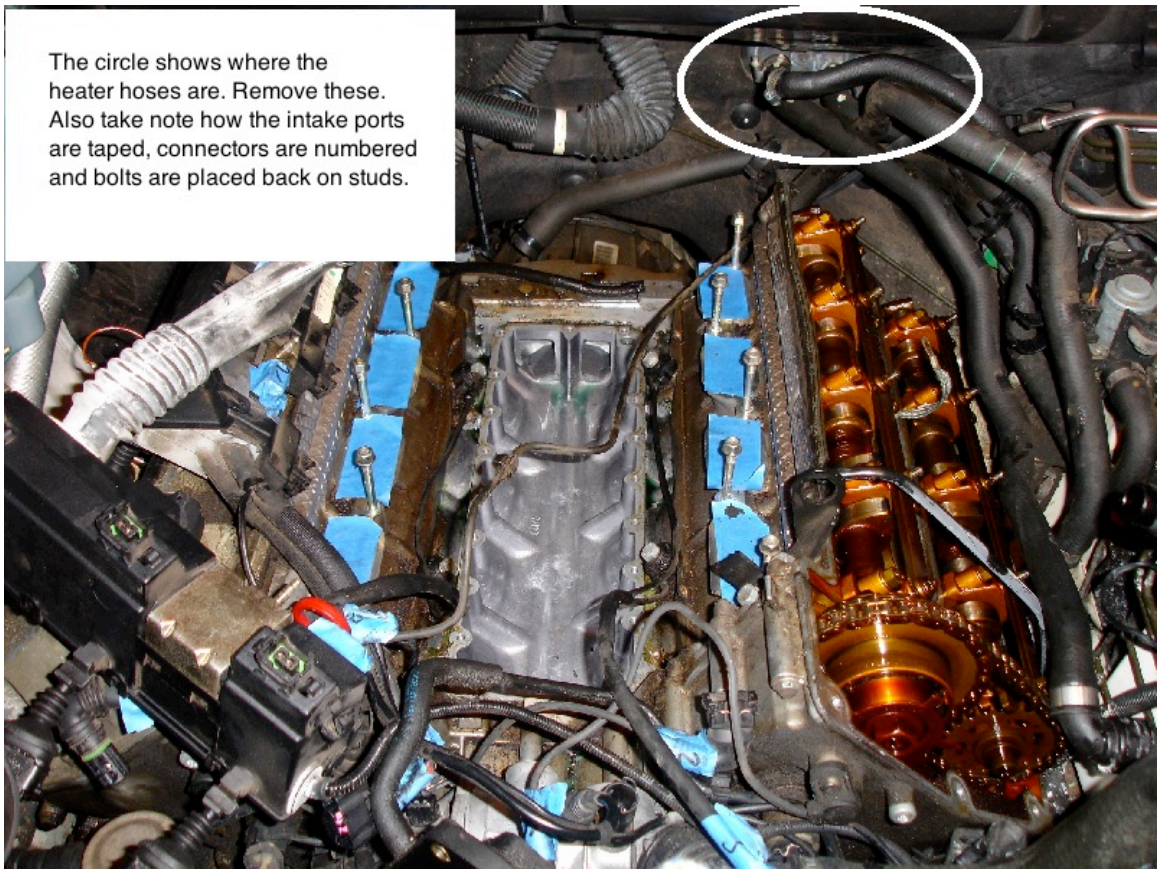
Step 17: Removing valve cover.

After removing and labeling all the coil packs, you are ready to unbolt the valve cover. Now the bolts themselves are not in there very tight, but are hard to access. Looking at the drivers side valve cover, the heater hoses and water hoses will be obstructing your access to get to these bolts. So if you are following my DIY to the T, you can reach to the back and remove the 3 hoses to the firewall and set them aside. We can deal with these later. Looking at the valve cover, there are 8 cap style nuts across and 3 bolts in the front. Using a 10mm socket, start removing the caps, being careful to get the cap and washer. Then remove the 3 bolts in front. The very bottom bolt will be hard to get to, but take your time and you will get it. Set the caps and washers in a safe place. You don't need to worry about the 3 bolts because chances are that rubber seal is so dead, it welded itself to the cover. Now that cover is probably on there tight. If you can wiggle the cover off, good for you, but mine was so seized on there I had no other choice but to take my dead blow hammer and lightly, I am stressing lightly, tap on the flat surfaces to loosen the cover. After you got it loose, lift the cover out over the stud bolts and set the cover aside. Repeat on the passenger side. Your one problem will be the lower front bolt, first lower cap nut since they are right against the air conditioning line. You can use an angled box wrench to get to it. After you get them out set them aside. Reinstall the cap nuts on the studs so you don't have to keep track.



Step 18: Removing of heater hoses.

Now if you haven't already done so, out of frustration with the removal of the drivers side valve cover, then you're doing it now. Now again, these three hoses are in tight places. Where they connect to that module, remove the 3 (10mm) bolts securing this unit to the body. After you removed it, you can move it around to get to the hose clamps and remove the hoses. Be sure of the placement of the hoses before you remove them. After that, set the unit on top in a handy place until you are ready to reconnect everything.



Step 19: Removal of CCV and OSV

Finally, you are out of the car. Now take the intake manifold over to your bench and turn it to the back. Take your T-27 torx and remove the 7 bolts securing the CCV on.

Now step back and you are done!!! Well, done taking everything apart. Now lets put everything back together.

Installation procedure:

Step 1: Installation of new OSV and CCV

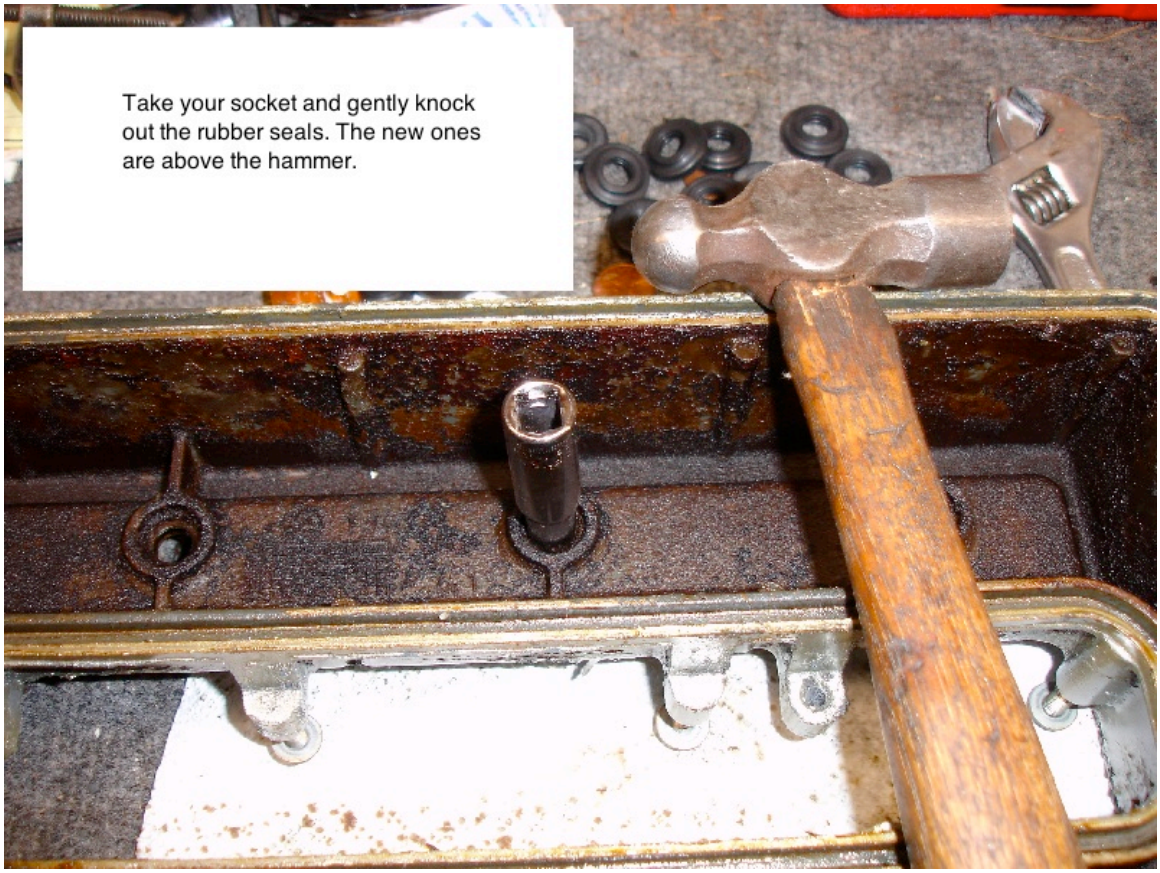
Now get your new CCV and OSV and lay them side by side to the old one. So long as those hoses are all ok, then transfer everything you see on the old to the new. After you get that done, remove the gasket in the intake. Just take your pick and pull it out. Fit the new one in and make sure it is seated properly. Clean the seating surfaces with a papertowel on both the CCV and intake. Line up the holes and reinstall the torx bolts. After you get that together, turn around and work at the throttle part of the intake. Remove the gasket, fit the new one and clean the surface. Then flip the sucker over and remove the old Intake gaskets. Use some throttle body cleaner and soak a papertowel and clean the area. Then install the new gasket and set the intake aside upside down so the intake gaskets don't fall out. Also, those guide tubes that came out with the intake, they also have a rubber grommet on them. Slide the grommet down the shaft and lay them out. Spray some silicone and clean the rubber. Spray one more time, reset the grommet and set aside.

Step 2: Valve cover gasket installation.

If your valve covers look like mine then this would be the perfect time to treat them with some care. Clean the covers with some engine cleaner, hot water and degreaser. If you want to get really fancy, you can strip the paint and repaint the covers, but I didn't. Now if you are cleaning this with hot water and degreaser, make sure the covers are bone dry before assembly. Now taking the gaskets off can be a task. Mine were so bad, half stayed on the heads and some stayed with the cover. The new gaskets are nice and pliable, but mine were rock solid and plastic like. I couldn't get them off with my hands. So I finally just took some pliers and rocked the gasket back and forth and took the gaskets out. Prep the groove with a wire brush or a 280 emory cloth and very gently going around the grooves clean them out. Now take out the new gaskets and set them on your bench. Now remember, the half-moons on the gasket go on the rear of the cover. Now take about a half-dollar coin full of Pure Glycerin in the palm of your hand. Get the outer gasket and run it through your hand. Do not apply too much pressure or you will stretch the gasket out of shape. Get it on evenly and then insert the gasket in the grooves. Repeat this with the other gaskets on the valve cover.
NOTE: SOME HAVE SAID USING GLYCERIN MAKES THE GASKET SO SLIPPERY THAT IT STRUGGLES TO HOLD INTO THE GROOVES AND MAKES IT A PITA TO PUT BACK ON THE VALVES BECAUSE THEY KEEP SLIPPING OUT. NOW YOU CAN APPLY A VERY SMALL AMOUNT OF GASKET TACK IN

THE CORNERS JUST TO HOLD THE GASKET IN PLACE.

Now I am going to assume the covers are still upside down. Take a deep 10mm socket and rest it in the holes where you bolted the valve covers down. There are 8 rubber grommets on each valve cover. Tap out the old grommets and chuck ‘em.



Step 3: Prepare the aluminum water tubes and water manifold.

Now you can just take a damp cloth and run it up and down the pipe, paying attention to the ends. Making sure they are

clean. I used diamond compound, but only because I had it. Now take the manifold and with your pick, remove the old o-rings. Taking your new o-rings, spray them with silicone spray and then install them in the grooves.

Just so you are keeping with the flow of changing the o-rings, go back to the car and remove the o-rings in the water pump and install the new ones, following the same procedure.

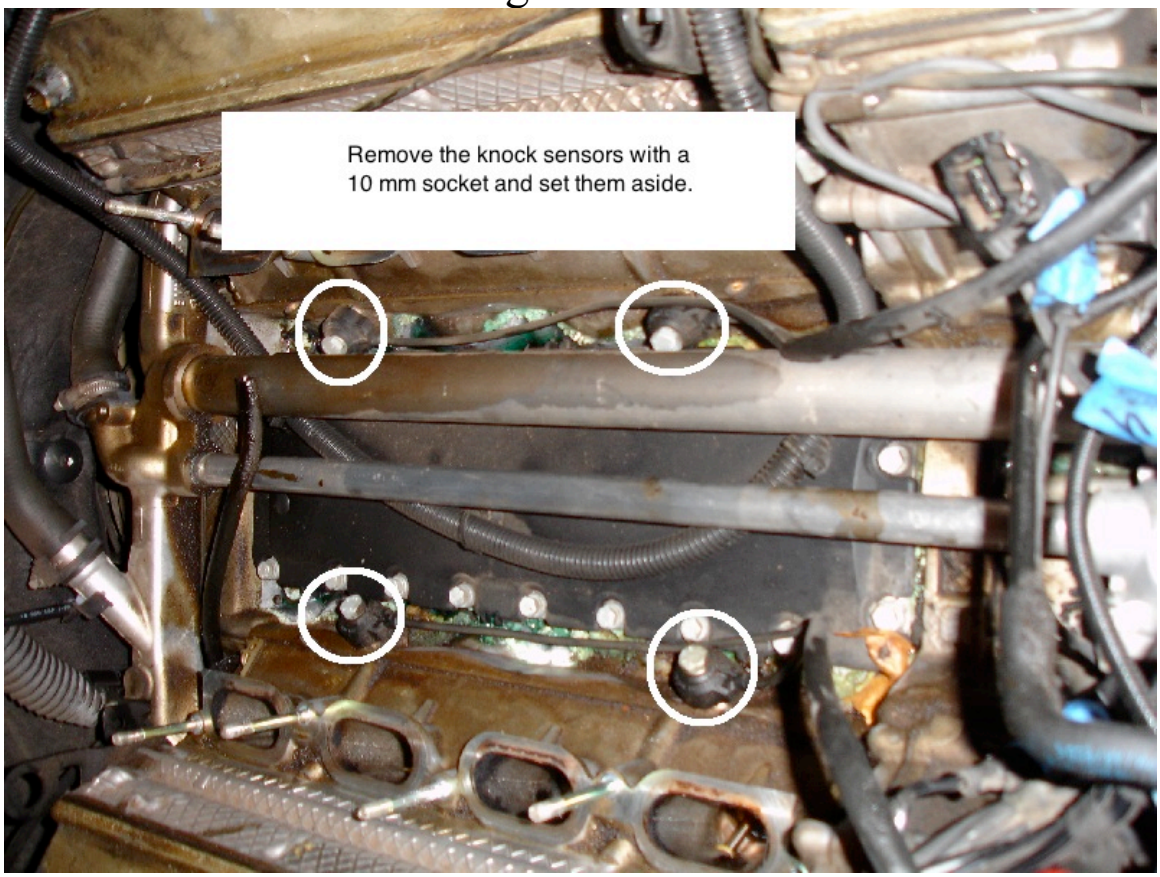
Now back to the car. Now check where the spark plugs are. See any oil? If you do, either wipe as much out with paper towels or use your shop vac to suck it out.
You are not going to get all the oil out so its not biggie if some falls in. You'll see what happens later.

Step 4: Replace spark plugs.

Using a 3/8" wrench and 6" extension, fit a spark plug socket into the guide tubes. Get a firm grasp and remove each plug. Get your new ones out and lay them out. No need to check the gap because you can't and aren't adjustable anyways. Place a small dab of Anti-seize compound on your finger and apply to the threads. Now take the extension off the wrench and insert the plug. Install the plugs only finger tight to make sure you don't cross thread. After you are done with that, fit that extension to a torque wrench and set it to 11 ft/lbs. Do all 8 and you're done with that.

Step 5: Installation of the Valley Pan.

After you got everything nice and clean you can install the Valley pan. Clean the machined face with a papertowel and make sure there isn't any debris. Take a 10mm socket and remove the 4 bolts securing the knock sensors.



Just move them out of the way till you get the pan secured. Fit the new pan, install all bolts and torque then down to 7 ft/lbs. Reinstall the black cover over the pan. It clips in with tabs. Reinstall the knock sensors and torque them down to 12 ft/lbs.

NOTE: When installing the pan, tighten the bolts from the inside out and in an X pattern. Starting with the bolt, secure it down then move across and secure it down. Then go back across to the next bolt secure it down, then across again,

but on the opposite side, secure it down. You basically want to make an X everytime you go from bolt to bolt. By the time you get to the ends, your last bolts should be the four corners and the middle top and bottom bolts.

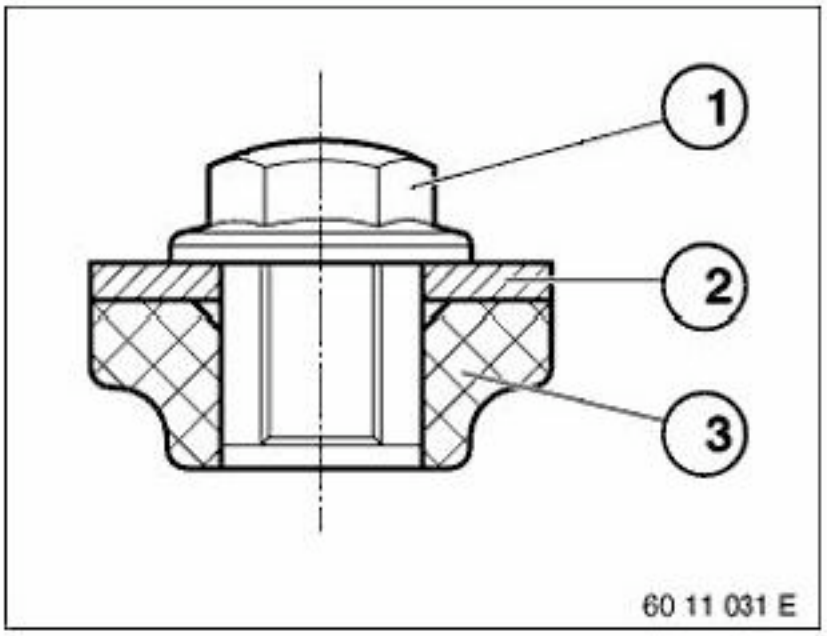
Step 6: Install water manifold and water pipes.

Making sure everything is clean and you have the old gaskets off; starting on your bench, get your new gaskets and dry fit them to the manifold so you know how they should fit. Then get some gasket tack and apply a thin smear on the face of the manifold. Fit the gasket and apply even pressure around the gasket so you get good coverage. Doing this will prevent a large amount of stress, aggravation, and cursing when trying to fit the manifold back to the block. After you get that together, collect your tubes and insert each end in the water pump. Feed the manifold into the two tubes, making sure you are not pinching the o-rings and they are seated correctly. Crawl into the engine again and line up the holes. Insert one bolt on each side and then insert the rest. Tighten down till snug. I couldn't find a torque spec for it. Install the water hoses to the manifold and secure them down.
NOTE: IT IS GOOD PRACTICE TO PUT A DAB OF LOC-TITE ON THE THREADS. SINCE THESE AREN'T VERY TIGHT TO BEGIN WITH.

STEP 7. CLEAN, SEAT, INSTALL VALVE COVERS.

Now look at that machined face? Nice and shiny and smooth isn't it? You want to keep it that way. I don't care how hard it is, absolutely do not take a chisel, hammer, flat

blade screwdriver to that surface and start scratching up, dinging, marring that surface. Doing so will risk a leak. Now check the surface, if you see any remnants, even a tiny black line, that has to come off. Use your fingernail to scrape it off. If it is being troublesome, use Acetone on a papertowel and dab it on those areas. The acetone will act as a releaser so that you can remove the old gasket with your nail. Small streaks can be rubbed off with Acetone if stubborn. After that is all clean, use some throttle cleaner and go around the surface again. Now get some RTV Ultra gray and place them at the points noted in the picture. Don't use that stupid nozzle that comes with it. It just makes a mess, hard to control, and ends up getting clogged anyways. Just put a few dabs on the two points in the front and pay special attention to the corner of the half-moons in the back. Now get your valve cover and try not to touch the gasket, just grab the outside and set the cover in place. Once you have it seated, try not to move it around too much. Now reach back to where those half moons are and feel if they are seated. If they feel out of place, remove the cover, wipe the Ultra gray off and do it again. Do that to both sides and now you are ready to mount it. Now since you kept the caps on the studs, they are all accounted for, right? Anyways, pick up a cap, install the washer, and slip the rubber grommet on. The tapered side faces down. Spray some silicone on the rubber washer. Do the procedure to all the caps. Then secure the caps on, and then the 3 bolts in the front. Tighten these down to 12 ft/lbs.

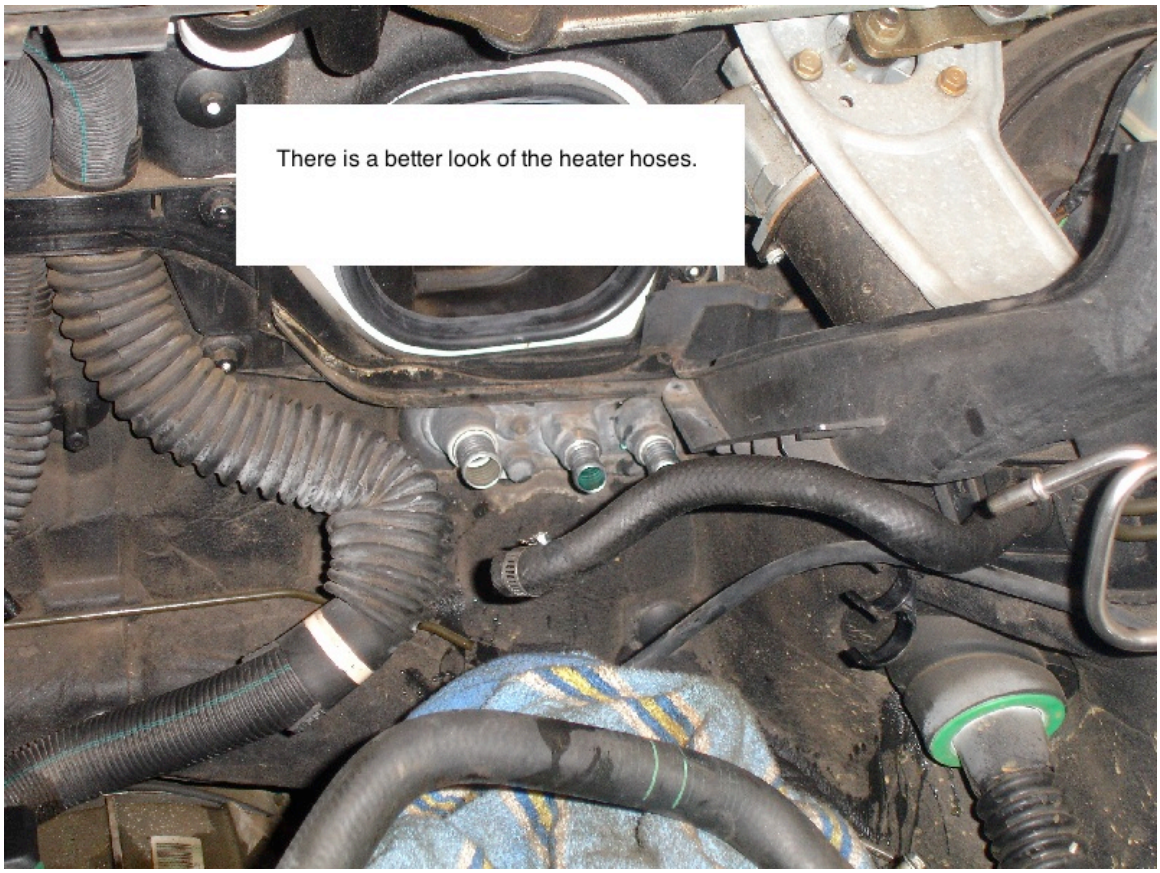


TIS washer diagram:

1) Nut
2) Metal Washer
3) Rubber Washer

Step 8: Install heater hoses to firewall.

Install the three heater hoses back to the firewall starting with the far right and work your way across. Use worm-drive clamps and secure them down tight. Install the end of the hoses onto the unit you took off and left resting on top, again with worm-drive clamps, but do not snug them down just yet. You may need to do some adjusting before mounting the unit on the car.



NOTE: DO NOT CONNECT THE HOSE THAT GOES TO THE LEFT OF THE EXPANSION TANK JUST YET. THIS HOSE GETS IN THE WAY AND OBSTRUCTS THE VIEW OF A FEW THINGS, DO THIS ONE LAST. IN THE MEANWHILE, JUST MOVE IT OUT OF THE WAY.

Step 9: Install intake manifold.

Now here is the tricky part. If you need to replace the two oil feeder tubes then you are going to be in for a surprise. It is nearly impossible to connect the hoses with the OSV on the intake. I look my OSV off and installed it separately. Except, when you disconnect it, do not disconnect it by the torx bolts, disconnect it from the 2 (10mm) bolts. The torx

are critical to get on. Missing even one will make the X run like crap. If you miss a 10 mm on the bracket, no harm no foul. Now take the masking tape off the intake ports. Use a papertowel and spray some throttle body cleaner on it and wipe the surfaces around the ports. Now the contortionist part. Get your intake ready for installation. Crawl in the engine bay with a light and look down the valves. Make sure nothing is down there. I found one of my injector clips in there. If a part is down there, get it. If junk is down there, take compressed air and blow it out of there. Get your manifold and make sure your intake gaskets are seated properly and slowly guide the manifold in. Make sure the gaskets are seated properly again. Install the small oil return tube on the bottom of the CCV and connect hoses where they belong. If I remember, the top hose on the OSV connect to the bottom of the CCV and the bottom hose on the OSV connect to the drivers side valve cover. Secure the hoses down with worm-drive clamps. Now get out, grab your step stool and walk it to the passenger side. Crawl in and attach the OSV to the CCV. I only got 1 of the bolts in, so if you get both in, good for you.
Now just secure the manifold with the 10 bolts. First slide in the guide tubes, making sure things seat properly.

Bolt in the 10 (13mm) nuts and torque them down with 21 ft/lbs.

NOTE: NOW IF YOU ARE CHANGING THOSE TWO HOSES TO THAT OIL FEED TUBE, THE SMALLER DIAMETER HOSE IS JUST FINE, IT'S THE SHORTER, LARGER DIAMETER THAT IS A PROBLEM. THE ORIGINAL HOSE IS A ¼" LONGER THAN THE REPLACEMENT. THAT ¼' ALLOWED FOR PLAY WHEN ATTACHING THE BRACKET, BUT SINCE THE HOSE IS SHORT, YOU GOT NONE, SO BE PREPARRED.

STEP 10: Getting ready to install fuel rail.

Now I am sure your injectors look like crap. So give them a cleaning with silicone spray on a paper towel and wipe down the o-rings. After they are clean, spray some on your finger and apply to the o-rings. This will make popping the injectors in a cake walk. Route the fuel line through the heater hoses and align the injectors with their ports. Make sure every injector is sitting over the holes and then carefully pop the injectors in by applying pressure on top of the fuel rail. Then install the 5 (10mm) bolts that hold the fuel rail to the intake. No torque spec, just snug.

You're almost there!!!!

Step 11: Install Bremi coils

Clean each coil tube off of any oil. Now the book doesn't say to do this anywhere, but doesn't say not to either. I applied a dab of dielectric grease on the tip of the coil. Insert each coil by their cylinder order. Finger tighten all the bolts to their coils except the third top coil on each side. Slide the grounding strap on top of the Bremi coil and then slip the nut on the threads. Still do not tighten.

Step 12: Install electrical boxes to coils and injectors.

Now get your injector clips and slip them onto the black box connectors. Now the trick is to have them have the opened hooked end face up and install one side and stretch it over to the other side till it snaps in. Do that to all 8 connectors. Align your Electrical boxes on top of the injectors connectors and firmly press down till you hear them all snap in place. Then slide the connectors onto the Bremi coils and slide the metal strap back into place. Now you can remove that loose 10 mm nut on one of the coils and slide the grounding strap from the electrical boxes onto the stud. Now you can tighten all the nuts down. I don't have a torque spec, just make them snug.

Step 13: Reinstall the electric valve and body tube.

These install onto the black box studs with 10mm nuts. Be sure to connect all vacuum hoses back together. Now if you replaced the blue striped one, the new tube is longer than the original. There is enough to cut off to size and replace

that yellow striped hose too. Secure the rest of the 10 mm nuts.

Step 14: Install Throttle body housing.

On the bench, clean the butterfly plate and area with throttle body cleaner on a papertowel. Back to the car, reinstall the 6 torx bolts and secure them down snug. Install the throttle body and tighten the 4 (10mm) bolts down snug.

Step 15: Reconnect all electrical connections.

Now since you labeled everything, this should be the easiest thing to do. Just follow the numbers and plug them in as you go.

Step 16: Reinstall all plumbing back to the throttle body.

Secure down with the worm-drive clamps. Install the front cowl reinstalling the plastic guide pins.

Step 17: Install BMW Plastic covers.

Get the new gasket out and coat it with glycerin. Install onto the grove of the valve cover and then install the plastic cover, making sure the plastic breather tube and battery cable run in that groove. Secure down the 2 (10mm) bolts. Snap in the bolt covers.

Step 18: Reconnect the fuel line.

Step 19: Tighten down the heater hose clamps on the unit and secure the hose to the expansion tank.

Step 20: Install gas cap, secure drain plug at bottom of radiator and wipe down the undercarriage to easily spot any leaks.

And guess what? You are done my friend. Never thought you would get to this point did ya? All right, ready to put the finishing touches on her?
All right follow these steps.

Coolant filling procedure.

Make sure the drain plug is closed up on the bottom. Now take your jug of water and coolant and open them up. Find a clean and empty 1 gallon bottle. Fill half of the bottle with distilled water and half with the coolant. Give it a shake. Take the remaining water and pour it in the coolant jug. Give it a shake.

Now start out with 2 gallons. When you drained the radiator and cleared out the valley pan, you lost about 3 gallons. Start out with 2 and then mix more as needed.

Fill the expansion tank slowly with the 50/50 mix. Also unscrew the bleed screw next to the fill cap. Fill that tank slowly. As it starts to fill, coolant and air will begin escaping from the bleed screw. When the water in the tank remains at a fairly constant level, the fun begins.

Reconnect your battery terminal and snug it up.

Jump in and turn your key to Position 2 (All lights on dash on, climate control unit working.)

Place the heater to 90* on both sides and fan setting to LOW.

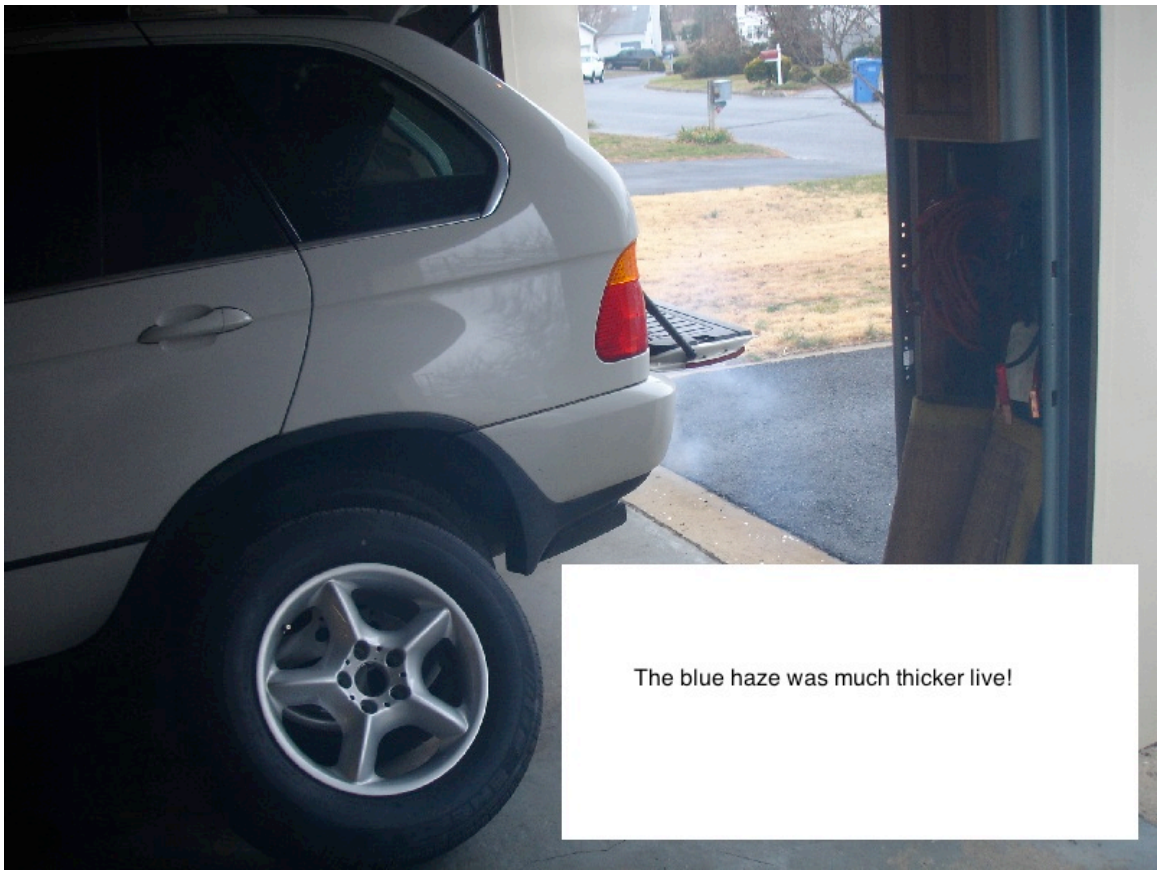
This starts the aux water pump and bleeding procedure. Now close up the bleed screw just hand tight, remember it is plastic.

Look in the fill hole. You will see a steady stream of coolant coming out, near the bleed screw. Continue to fill the tank until the level is at a constant. Watch the stream for air bubbles. Run this system for a minimum of 15 minutes.

Then the moment of truth.

Hop in your X. Give it a pat on the steering wheel and tell her what a good job she did. Pray to God she will start and that you will never swear ever again. Turn the key to OFF, pray one more time and give her life.

It is normal the engine will sound very sluggish because you robbed it of fuel in the fuel rail. It takes a second for it to catch up. Plus there is a good amount of oil that fell in the spark plug tube. Do not be alarmed by the HUGE BILLOWING of blue smoke coming from the tailpipes. It's the oil burning out of the cylinders. Also smoke coming from the back of the engine is normal because the OSV tube had spilled oil on it.



Now turn the fan to MAX and keep it that way.

Just keep her idling, jump up and down and yell, “Yes! Whohoooooooo” And then get your ass back to the expansion tank and watch for bubbles like a monkey. You may need to fill the tank with more coolant. Just keep watching for bubbles. Carefully squeeze the upper rad hose and the hose leading out from the expansion tank. More bubbles will come out of the tank in a minute. Run the X this way for about 30 minutes. Then jump back in, and hit the throttle and get the RPM’s to 1500. Do this in short bursts for 2 minutes or so. This will force more air out.

After you see no bubbles, tighten the tank up.

Now all you have to do button up the splash shield, check for leaks.

Reinstall the spare tire, check tire pressure before you put it back in and put everything in its place.

Now if you get in and look at the dash, you are probably noticing some lights on. Specifically DSC, ABS, and Brake lights are shining bright. This is due to the Steering angle sensor. If you didn't have any light on before, you shouldn't have them on now.
I learned this trick from Heckler.

Car is on, motor running. Turn steering wheel all the way to the left, then to the right, then back to center. The lights should go off.

Some of the tools that are helpful.


These were the magnets I was talking about.


And those are the picks


Here is the software, Hondabond
is the substitute for Ultra Grey.
Permatex
TACK & SEAL
GASKET SEALANT
Item# 80938 (9AR)
NET WT 1.25 OZ
CONT NET 35 g
CAR QUEST
SL-4
Silicone Dielectric Compound
Composé diélectrique
Permatex
ULTRA GREY
RIGID HIGH-TORQUE RTV SILICONE GASKET MAKER
82194
NET WT 3.5 OZ
CONT NET 99 g
Hondabond HT


Here are the bolt-outs I was talking about. Awesome!


these come in handy in tight places.
And thats all the money i have left after owning a Bimmer.


I love my DeWalt's!!!!
DEWALT
18V
XRP
DEWALT