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04-04-2016, 01:59 AM

Thread Starter

post #11 of 28 (permalink)

Justin-PA

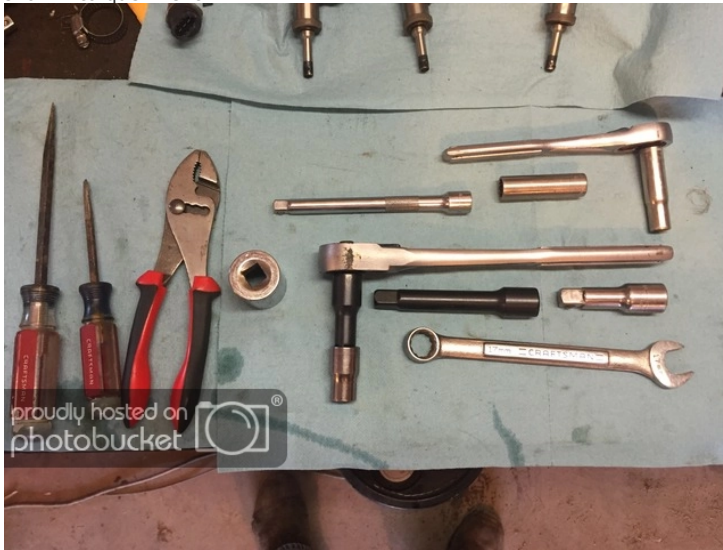
Jr. Member

Join Date: Nov 2014
Posts: 34

Re: Changing fuel injectors myself

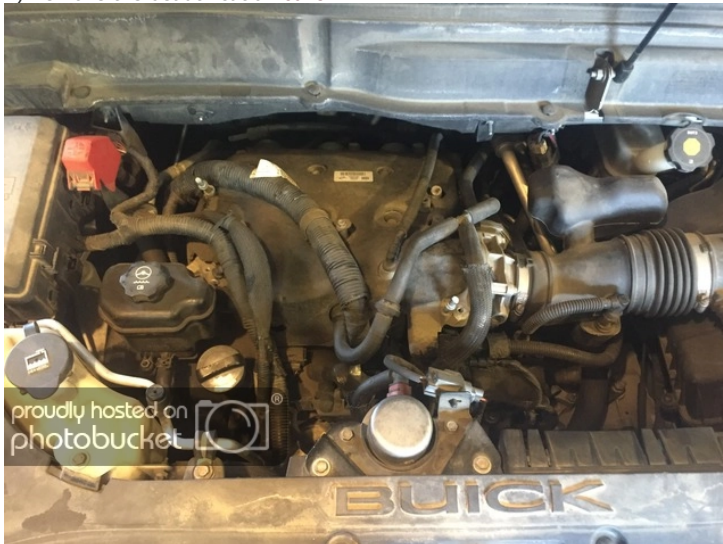
ok folks most of the parts came by Friday (😊) so I tackled the job on Saturday afternoon. Per your request here is how I did it.

Tools Required: 10mm, 13mm, and 27mm sockets. 3/8 and 1/2 ratchet with various extensions. 17mm open-end wrench. Screwdrivers and pliers. Not shown: torque wrench.



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1) Remove the beautification cover.



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2) In order to remove the intake manifold, first disconnect all of the various hoses and wire harnesses from the manifold. Disconnect any connectors

completely remove them from the vehicle. Remove the air intake tube. This is how it should look just before you remove the intake manifold.



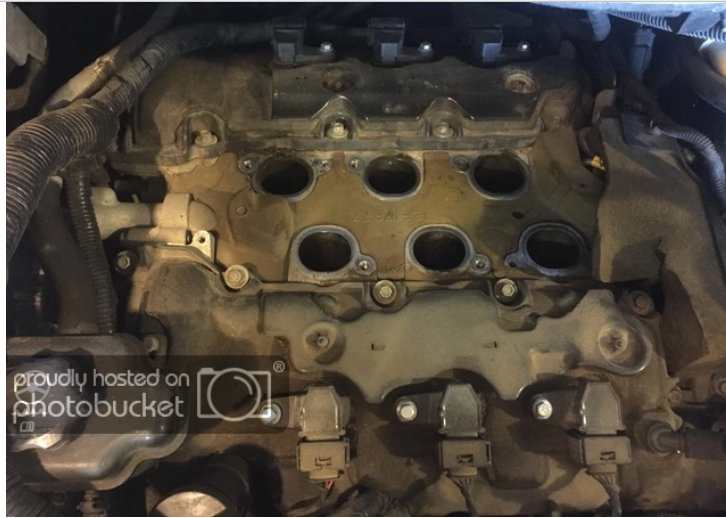
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3) Next remove the 6 13mm bolts that hold down the air manifold. I keep them organized so they go back in the same hole they came out. Remove manifold and set it aside. Be careful not to damage gasket (I have reused this gasket multiple times).



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4) Now remove the foam molded fuel shields. The one over the fuel pump



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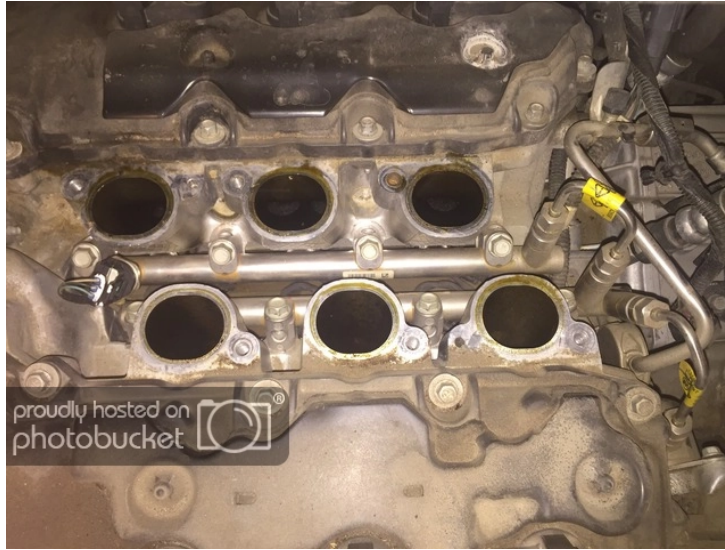
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5) Now you can see the High pressure fuel rails, jumper lines, fuel pump, and pressure sensor. All very tightly packed into the Vee of the engine. Not

removing the black plastic cap on the port on the fuel feed line (upper right hand corner of picture below). Place a rag around the port and use a small screwdriver to depress the valve until fuel stops flowing (there won't be much if your injector was stuck open like mine). Might want to wear safety glasses to be safe.



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6) Remove the 2 jumper lines with yellow tags (pump to right rail, right to left rail). These are not to be reused.



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7) Disconnect and remove the high pressure fuel sensor with a deep-well 27mm socket. This part must also not be reused. Remove the 4 13mm bolts on each fuel rail. Again I kept them organized so they all went back together in the same hole. There is a small black plastic bushing on each bolt...be careful not to lose them as you remove the bolts (most of mine stayed in the fuel rail).

9) Now remove the fuel rails. This is where it got a little tricky because everything is so tight. The right fuel rail (w/o sensor) is easier to remove. But it requires some constant pressure and wiggling to get the injectors to dislodge from the cups on the fuel rails. In fact the injectors may want to come out with the fuel rail but you don't want that to happen since they are also attached to the wire harness. The left fuel rail must be removed rear-end first, then twisted as you raise the rear end to dislodge the front end of the rail from between the intake port and another part of the engine. Just take your time and be patient, it will all come out.



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10) Next the injectors need to be carefully removed. Each bank is attached together on a plastic wire harness so your best bet is to loosen each injector from the hole and then pull out an entire bank at once. Some of the injectors dislodged while I was pulling the fuel rails. The ones that did not I just used a pair of pliers to pull them free since I was replacing them anyways. Disconnect the wire harness and move the entire assembly to the work bench.




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11) Here is the failed #5 injector. Only visible difference was it was wet on the tip, likely from dumping fuel.

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12) The engine with injectors removed. I once again vacuumed very well to get any dirt and debris out of the injector holes.

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04-04-2016, 02:00 AM Thread Starter

[post #12 of 28 \(permalink\)](#)

Justin-PA

Jr. Member

Join Date: Nov 2014
Posts: 34

Re: Changing fuel injectors myself

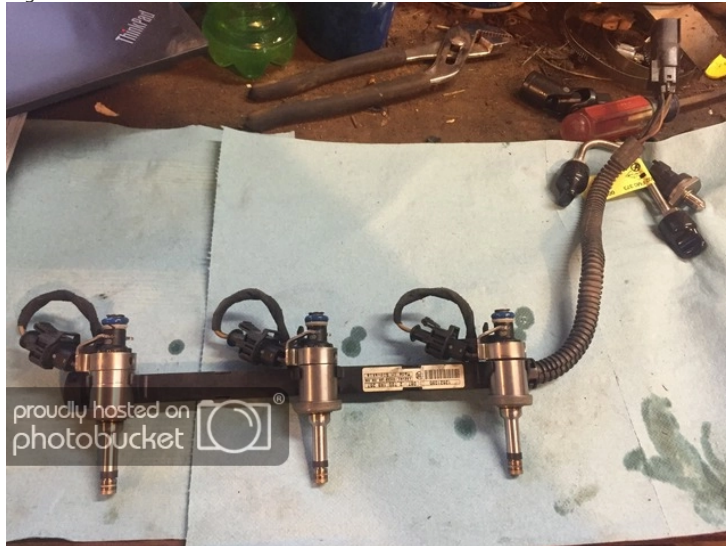
PART 2:

13) Note: The injectors I bought came pre-loaded with all new seals and o-rings and a new hold-down clamp. Needless to say these all should be new when installing new injectors. It is possible to buy injectors without the seals which is a bad idea for a DIY'er since there are a couple special tools required to seat the various seals on the injector. Remove the old injectors from the wire harness and install the new ones including the new hold-down clamps. Note the injectors must be oriented a certain way as dictated by the plastic wire harness.



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Right Bank:




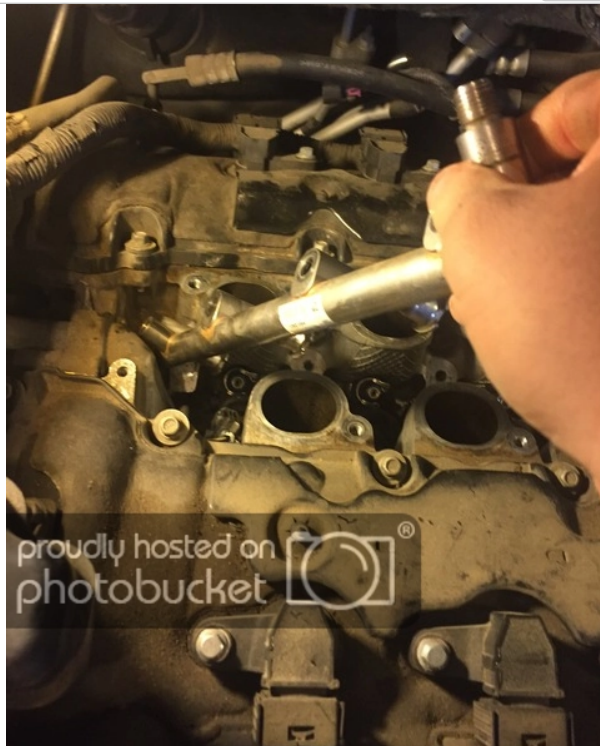
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14) Carefully seat the new injectors and wire harness assemblies back into the holes in the engine. Push each injector in as far as possible with your thumb, making sure it stays properly aligned. Connect the injectors harness connectors as required.

15) Now reinstall the fuel rails. Before doing so coat the injector o-rings and the fuel rail cups with silicone-free engine oil. The left rail is tricky, put the front edge of the rail into the engine, and twist as you lower the rail down into the Vee. Make sure all 3 cups are centered over the injectors. You should be able to push down on the rail and get the injectors seated into the fuel rail cups most of the way by hand. Install the right rail which is a little easier.


Put the front end in first:

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Then twist and lower the rear end into the Vee.

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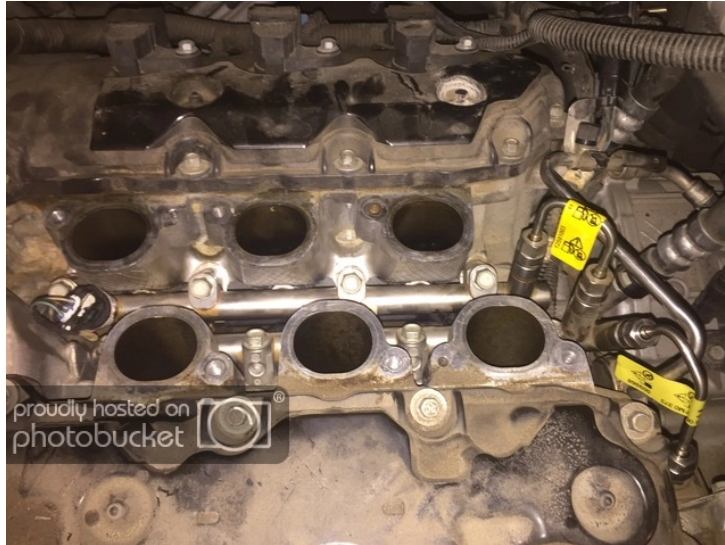


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16) Now re-install the fuel rail bolts and tighten them in 2 steps starting at bolt 1, then 4, then 2, then 3. (Bolts numbered starting at #1 at the front of the engine). Check the Enclave maintenance docs for torque values.

17) Install a new pressure sensor with 27mm deep socket. Be sure to oil the threads in the fuel rail and on the sensor, hand-tighten, remove and oil

1) 😊 Install new high pressure fuel lines, making sure to oil all the threads, and torque as required.



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19) Check for fuel leaks by turning ignition to on (engine not running!) for 2 seconds, off for 10 seconds, and then back on. Look for any leaks at all connections. There must be no leaks!

20) Now reinstall the foam shields, air manifold (torque bolts as required), and all hoses, tubes, and electrical connectors previously removed.

21) Clear all previously stored codes, start the engine and look for leaks under the hood, or other signs of trouble. Note that since my injector had failed there was A LOT of un-burnt fuel in the exhaust that had to be burnt out. My garage became a white cloud of smelly smoke very quickly (all doors were open!!). I took it for a 5 mile drive and it was pretty well cleared up by then.

CODES BEFORE: 😊

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< Diagnostics

STORED CODES

P0300

Engine Misfire Detected

P0305

Cylinder 5 Misfire Detected

P0089

Fuel Pressure Regulator 1 Performance

P02AD

Cylinder 5 - Injector Leaking
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P0122

Throttle Position (TP) Sensor Circuit Low Voltage

Read Codes Clear Codes

CODES AFTER: 🤖👉

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< Diagnostics

STORED CODES

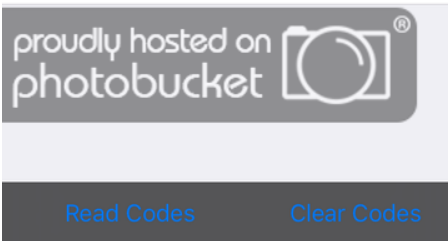
No stored codes found.

PENDING CODES

No pending codes found.

PERMANENT CODES

No permanent codes found.



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Nothing better than fixing your own car and having NO ENGINE LIGHT on when finished!! 🤖👉🤖👉🤖👉

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