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Thread: HYDE16 Reviews - HPA 2.0T Performance Intake Manifold

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HYDE16
Member

Join Date: Aug 20th, 2010
Location: Morris County, NJ
Posts: 3,033
Vehicles: 2011/VW/GTI MK6

HYDE16 Reviews - HPA 2.0T Performance Intake Manifold 01-31-2014 10:51 PM Reply #1

This review is going to serve as a part 2 to my original **"HYDE16 Reviews - SoCalPorting K04 Turbo Port, Polish & Exhaust System Coating"** thread which discusses the baseline Mainline AWD 1800 chassis dynamometer numbers for a ported and polished APR K04 turbo with APR V2.2 software. This part 2 review will focus on the performance gains solely from bolting on the TSI HPA 2.0T Performance Intake Manifold with no other changes to the car. The software used in this test has remained the same but the ultimate gains should come from the upcoming HPA remapped software file. Lastly, this review will also serve as a DIY install guide for TSI owners. As a supplement, I also referred to the available **-HPA 2.0T FSI Performance Intake Manifold Installation Sheet-**.

Product Description:
HPA Motorsports is excited to introduce for the first time into the global market, a high performance intake manifold for the Volkswagen 2.0T family of engines. 2.0L owners have been waiting for a product like this since the engine's launch in 2006, and now it's finally here. Featuring better flow, higher boost capacity, and integrated flapper delete; this product will take your 2.0L VW TSI and FSI to the next level. A direct bolt-on replacement for your OEM plastic intake manifold, HPA's performance manifold features a 40% increase in volume over the OEM plenum, and its cast aluminum construction supports larger turbos and higher boost resulting in big potential performance gains. HPA's technical partner, HGP Turbo in Germany, designed and developed this product over 2 years ago for European Golf-R applications to meet the strict TUV and European emissions regulations. We embraced the system for our Project Gold Rush build in 2012, and have now acquired both the design and the tooling for production in North America, and tweaked it for both street and track use on FSI or TSI engines. By producing and finishing these intake manifolds in Canada, we've been able to drop the price-point significantly over the original European offering, while maintaining the same quality level. HPA's performance intake manifold is cast at our local foundry and machined in house at our development center in British Columbia, then powder coated with a satin-black finish for durability and greater heat dissipation.*

Unboxing & Initial Impressions:
-The clean packaging included all necessary bolts, washers, boost taps, plugs and sealant
-The overall weight of the HPA Performance Intake Manifold is extremely light
-The HPA Performance Intake Manifold has an excellent smooth and durable exterior finish
-The inside of the HPA Performance Intake Manifold plenum does not follow the same exterior contour but there are no burs or extremely rough surfaces
-The HPA Performance Intake Manifold plenum runners are ultra smooth
-The optional pre-drilled/tapped water methanol version of the HPA Performance Intake Manifold has one bung post throttle body facing under the plenum
-For ease of servicing water methanol jets, I think HPA should relocate this bung to the front of the manifold if possible
-The manifold was designed with the similar mounting points to re-attach the majority of the OEM lines and brackets

Pre-Production Packaging:

Hardware:

Manifold:

Front:

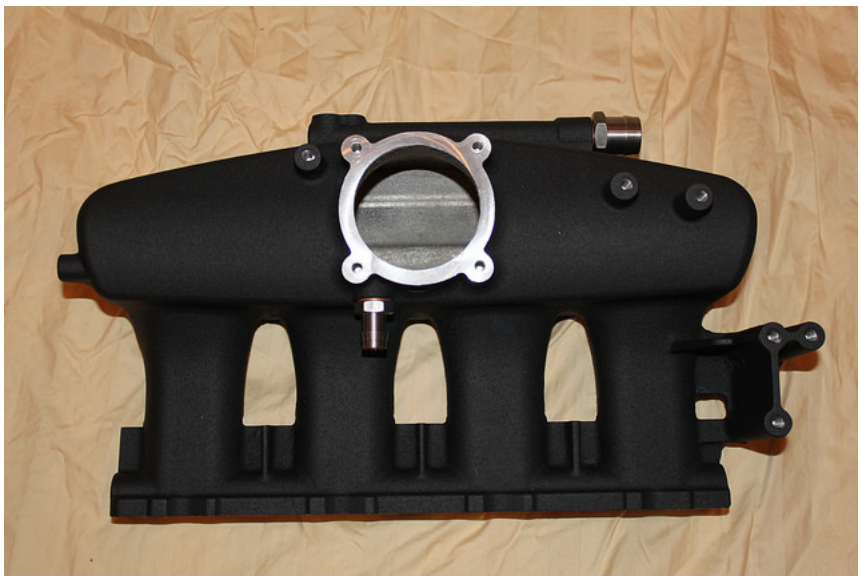
Side / Boost taps:

Top:

Backside:

Machined Head:

Underside:



Underside Front:

Throttle Body & Meth Bung:

Throttle Body:

Inside Throttle Body:

Inside Runners:

Driver's Side & Boost Taps:

Passenger Side:

Preparing the HPA Performance Intake Manifold PCV Connection, Boost Tap & Plugs:
Since my 034 Motorsports Catch Can doesn't use the factory PCV connection on the intake manifold, I contacted John Pelton at 42 Draft Designs for a one-off brushed aluminum plug with rubber o-ring in the same M14x1.5 thread. The original included HPA crush washer was not re-used as the 42 Draft Designs plug has an o-ring. If anyone needs a plug due to their catch can configuration, contact John Pelton at 42DD for these plugs in brushed aluminum or silvers/satin/wrinkle/bronze powder coating. Also installed were the included HPA threaded brass boost tap and plugs.

Preparing the HPA Performance Intake Manifold For Water Methanol:
As shown above, HPA elected to outfit each manifold with a single threaded bung directly below the throttle body base. As per HPA, the TSI and FSI HPA Performance Intake Manifolds have nearly 100% equal flow across all runners (on their test bench) and their experiences have shown sufficient atomization at this point of entry. Since my Aquamist HFS-4 water methanol system installation was not complete, I decided to use the included brass plug to block the one bung post throttle body for now. While the HPA Performance Intake Manifold was awaiting installation, I also decided to drill/tap direct port bungs fitted with Aquamist jet holders and jet holder plugs. This could allow future expansion of my Aquamist HFS-4 system if I wanted to run a direct port water methanol software file. For now, the one bung post throttle body and these direct port bungs are all plugged.

Last edited by HYDE16; 01-31-2014 at 10:57 PM.

Build Thread Part 1: HYDE16 Build Thread - Project Jekyll & Hyde
Facebook: Ryan Jacobs
Instagram:@becauseryanjacobs
YouTube: Ryan Jacobs

Reply With Quote

HYDE16

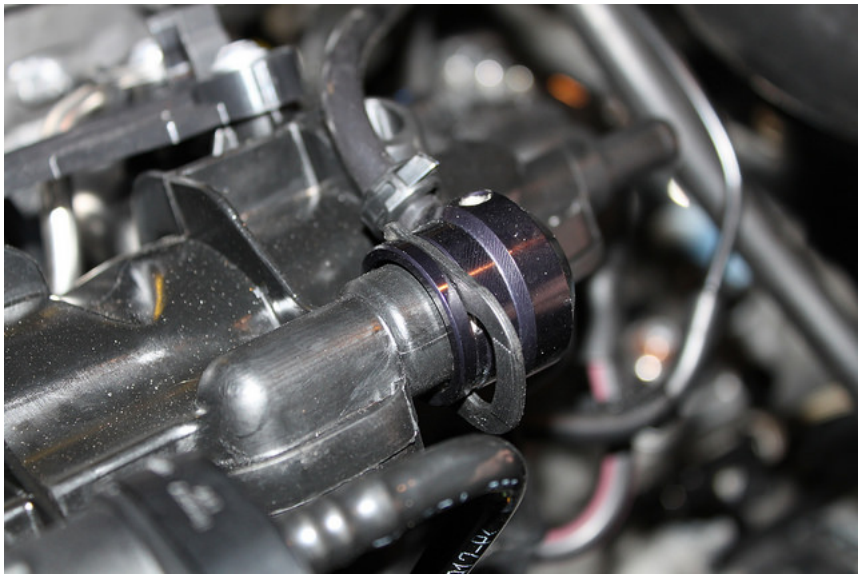
Member

Join Date:	Aug 20th, 2010
Location:	Morris County, NJ
Posts:	3,033
Vehicles:	2011/VW/GTI MK6

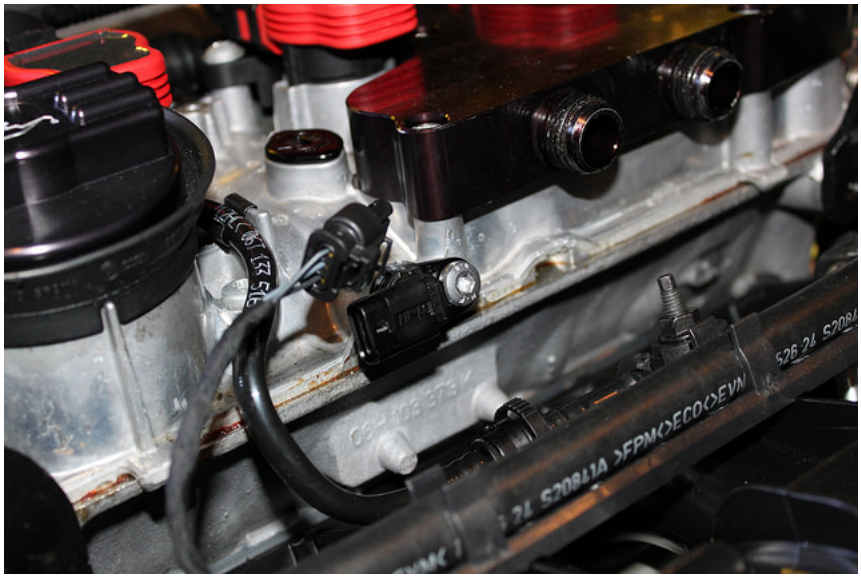
01-31-2014 10:52 PM Reply #2

Installation:
Installation is pretty straightforward as long as you take your time removing, disconnecting and re-installing everything. Organization is key so make sure you have clean surface to lay everything out and label what came off the car. The photos below can be used as a reference for disassembly and reassembly but HPA will be releasing their HPA 2.0T TSI Performance Intake Manifold Installation Sheet shortly. For my first attempt at removing the OEM intake manifold, I referred to **-Steelcurtain's TSI Intake Manifold Removal DIY + Valve Cleaning-** thread for a list of required or helpful tools, step by step guide to removing the manifold and suggestions for cleaning your valves from carbon build up. As a supplement, I also referred to the available **-HPA 2.0T FSI Performance Intake Manifold Installation Sheet-**.

Remove Catch Can Hoses or OEM PCV Hose and Boost Tap:

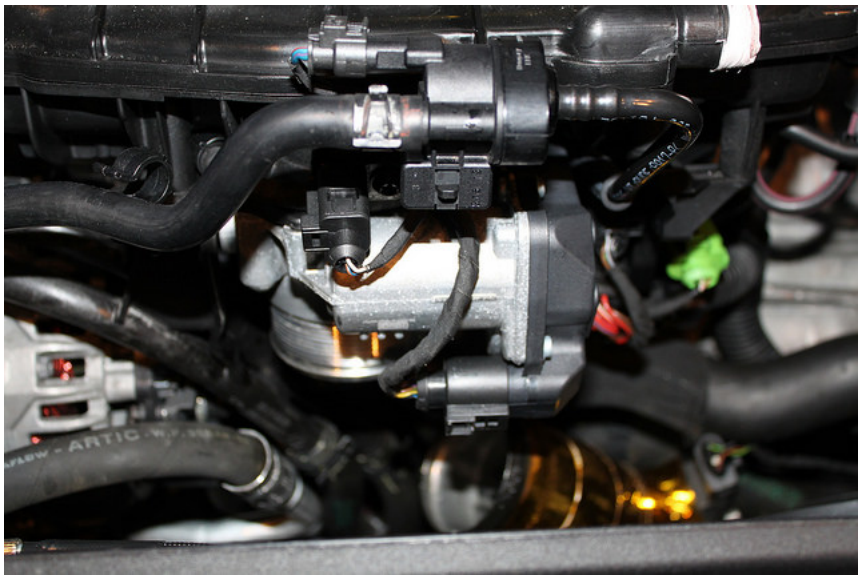


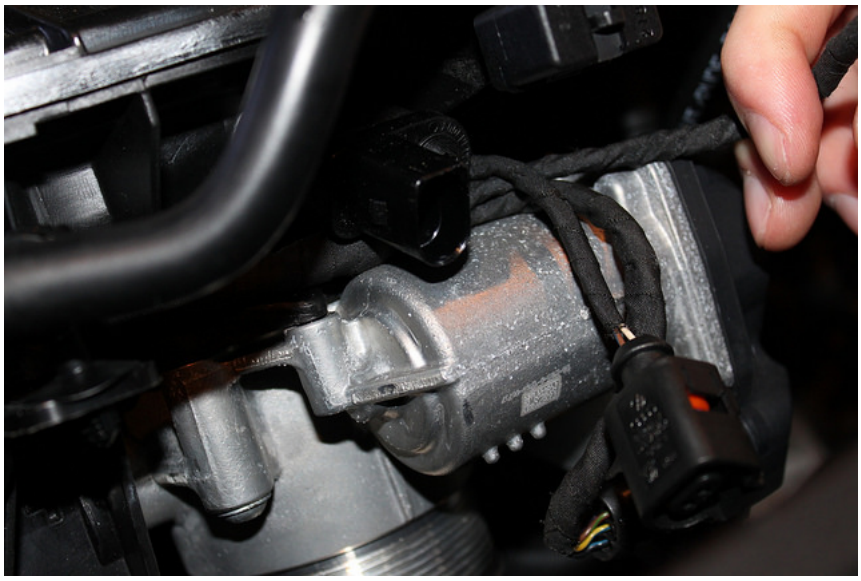
Remove Connectors On Valve Cover:

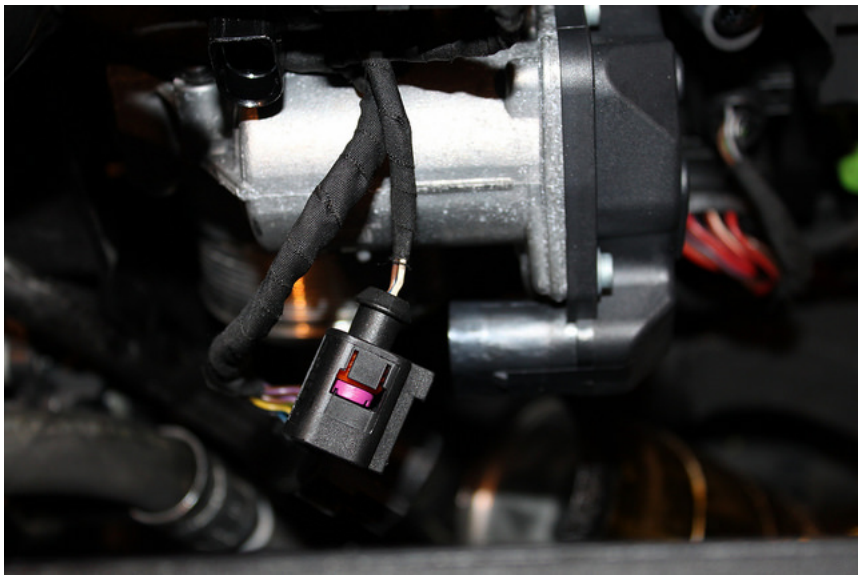


Remove Throttle Body Coupler:

Remove Throttle Body Connectors:

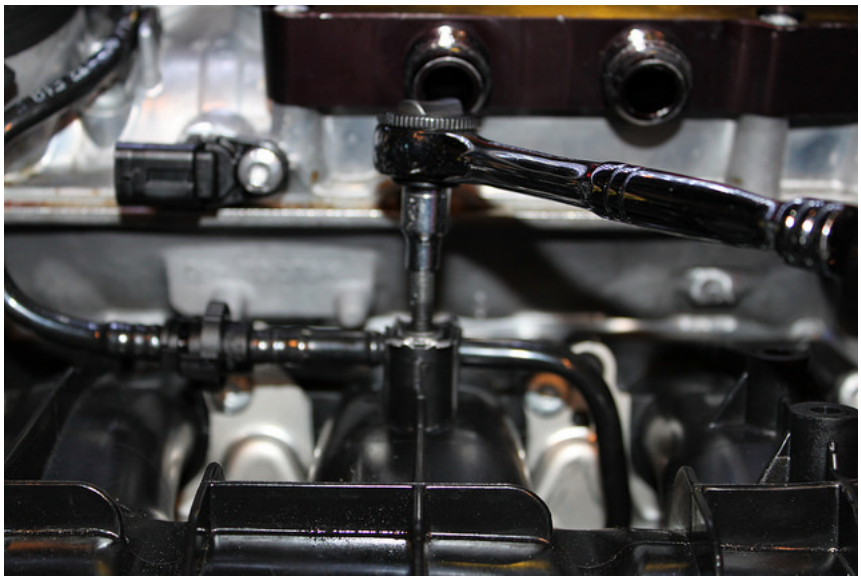






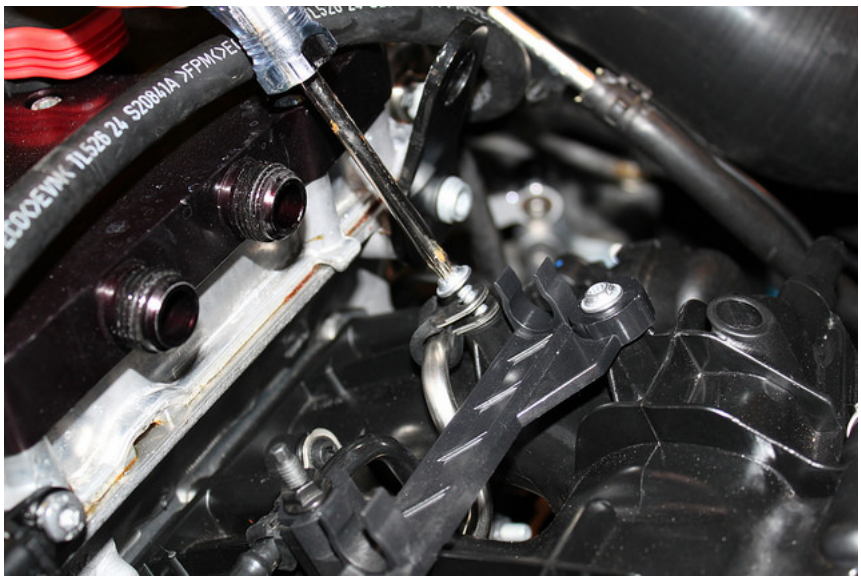
Remove EVAP Connector:

Remove Vacuum Line Bracket:

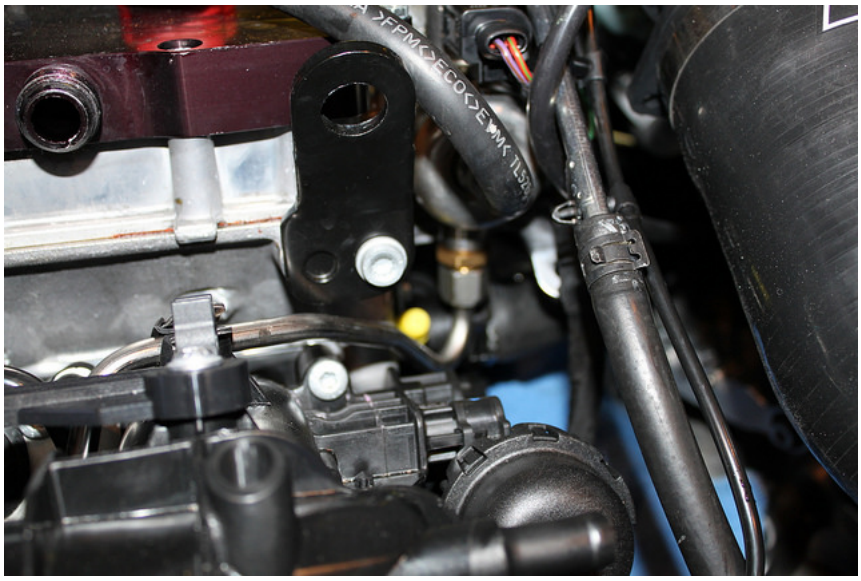


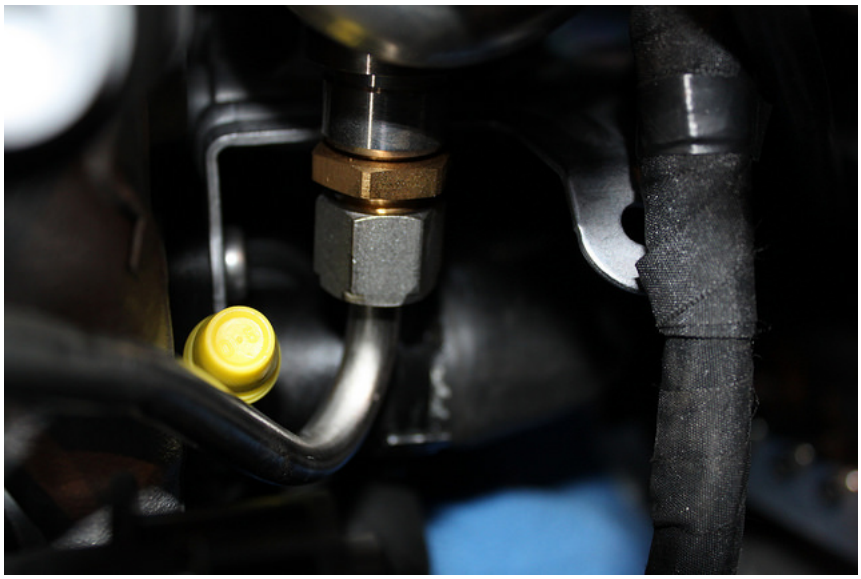
Remove Lower Bolt From Manifold Brace & Remove Brace (not to be re-used, silver bolt left of throttle body):

Remove Fuel Hard Line Bracket:

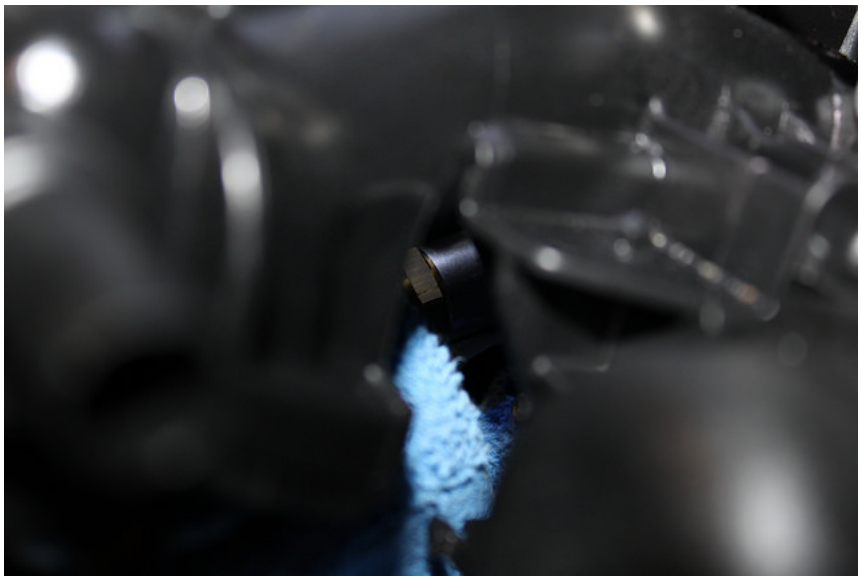


Remove Fuel Hard Line Connection at HPFP (slowly as this is under pressure and some fuel will drip, place absorbent rag underneath to soak up spilled fuel):

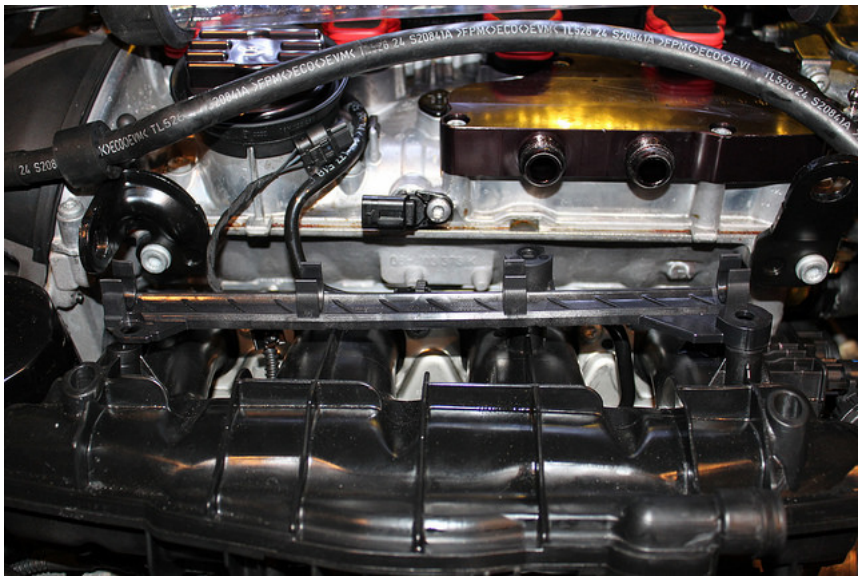




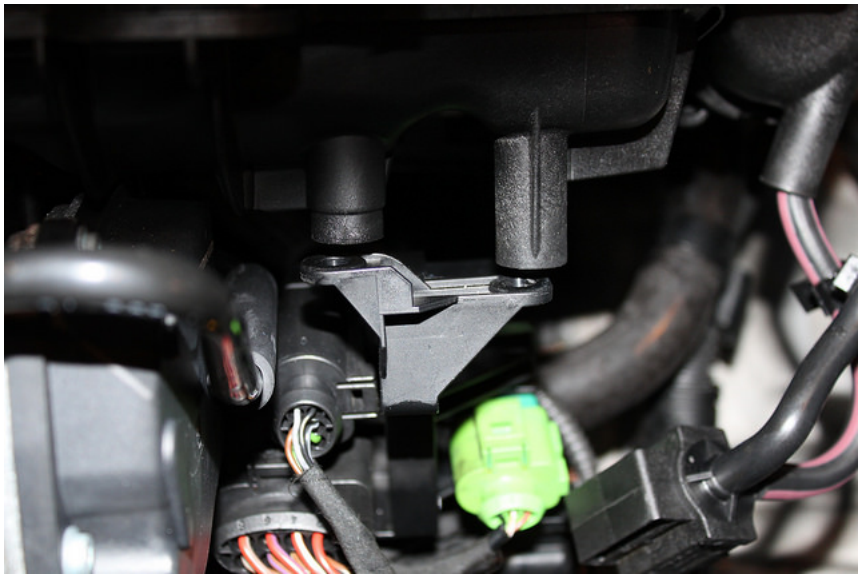
Remove Fuel Hard Line Connection Under Manifold at Fuel Rail (place absorbent rag underneath to soak up spilled fuel):



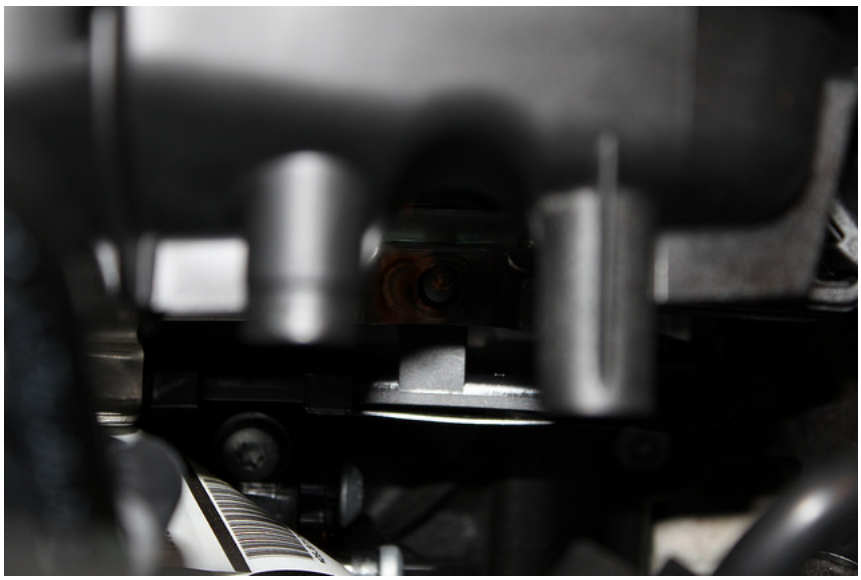
Remove Large Rubber Hose From Straight Bracket:



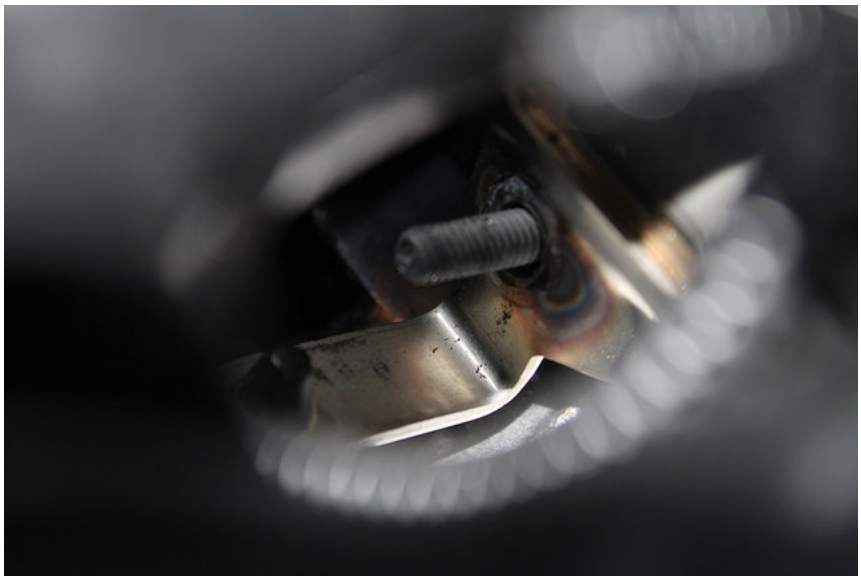
Unbolt Bracket (two bolts right of throttle body):



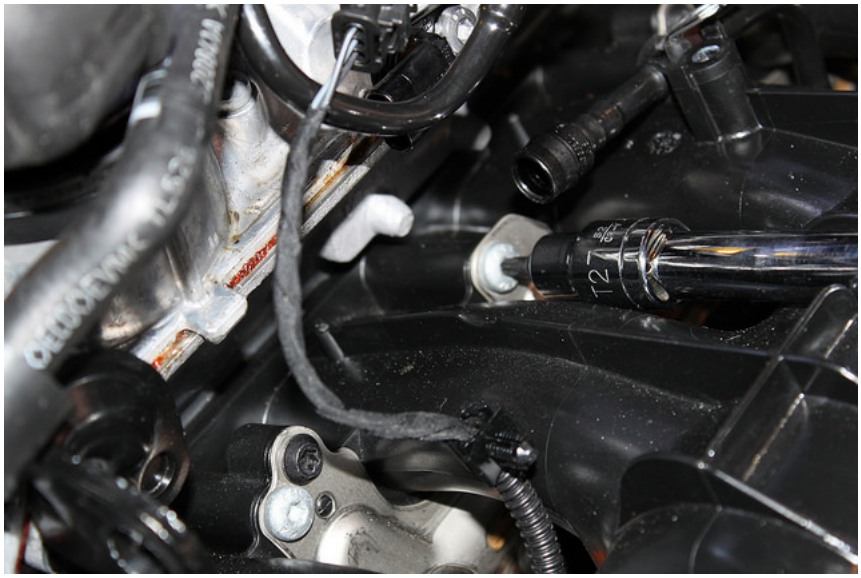
Remove Nut Holding Fuel Rail Behind Bracket:



Remove Nut Holding Fuel Rail Under Manifold:

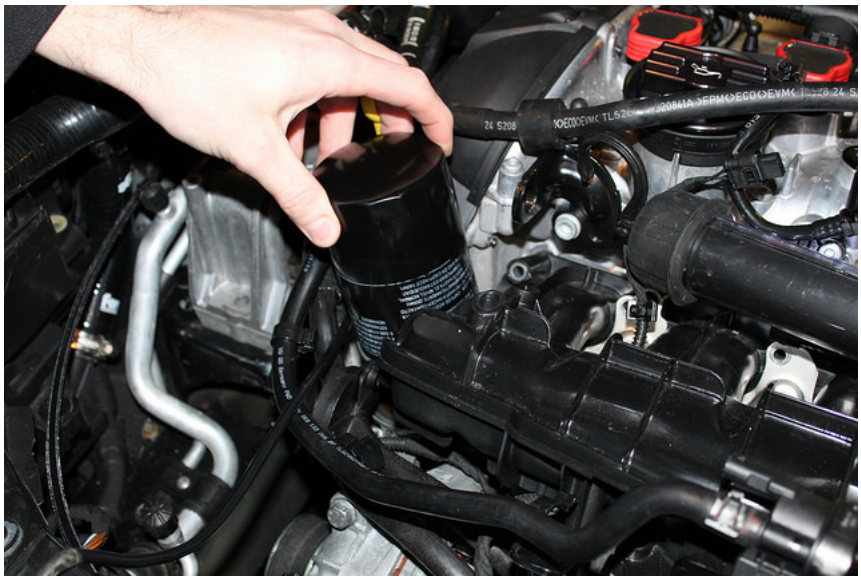


Remove Silver Bolts Holding Manifold to Cylinder Head:

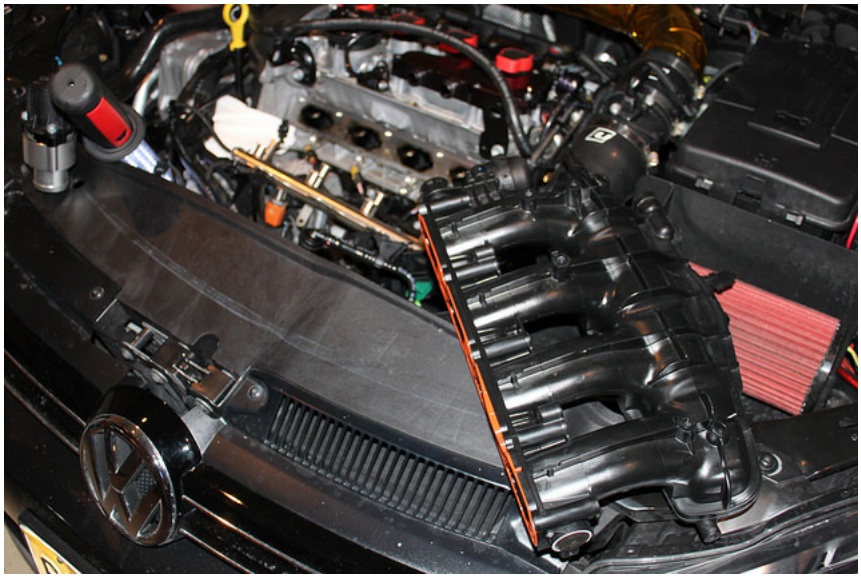


Remove Bracket Bolt Near Oil Filter:

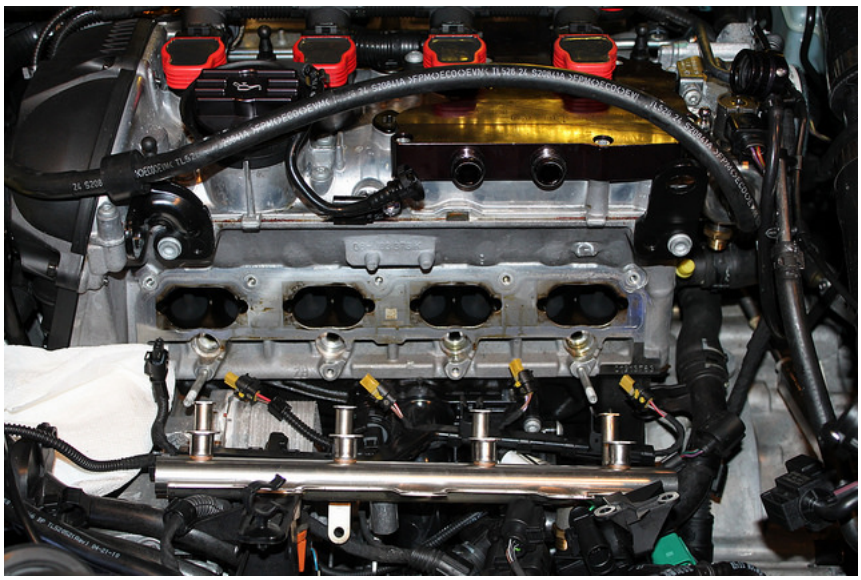
Remove Oil Filter (easier to install):



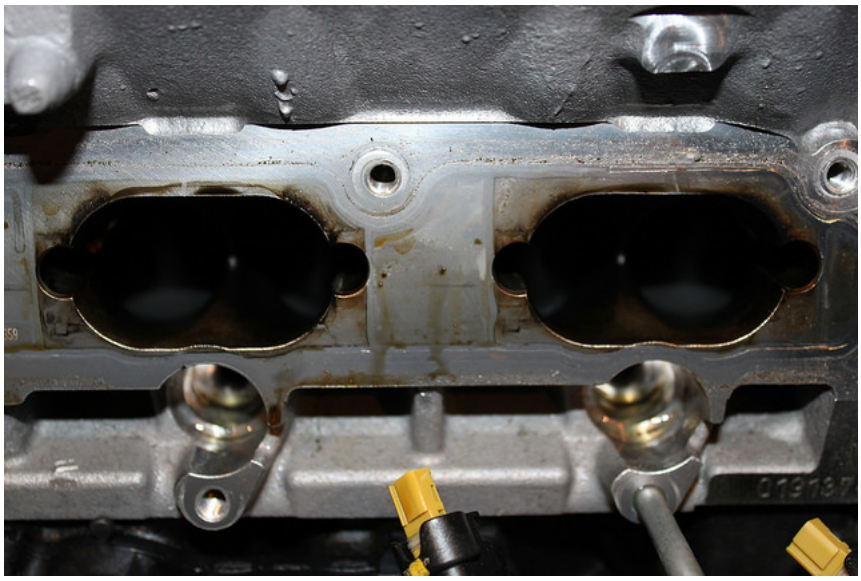
Carefully Remove Manifold, Disconnect Fuel Injectors, Remove Fuel Rail & Injectors From Cylinder Head:



Manifold & Fueling Fully Removed:



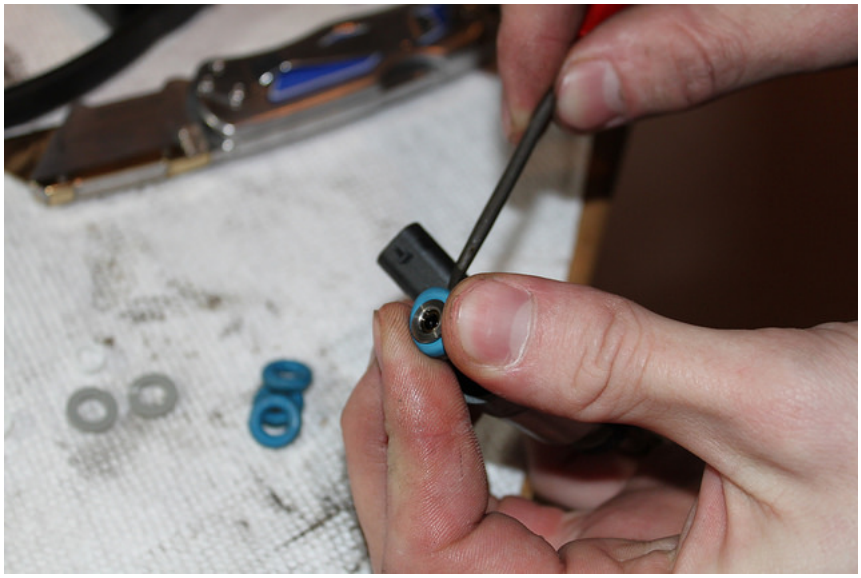
Carbon Buildup (5,000 miles on new engine):



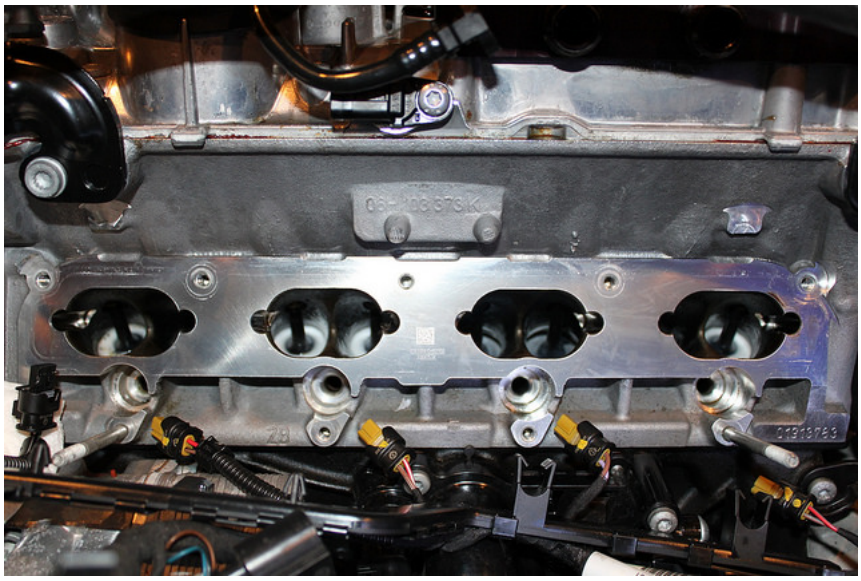
Clean Fuel Injectors with Combustion Cleaner:

Build-up Right / Cleaned Left (dirty fuel injector had 12,000 miles):

Replace Fuel Injector O-Rings with OEM Fuel Injector Service Kit:



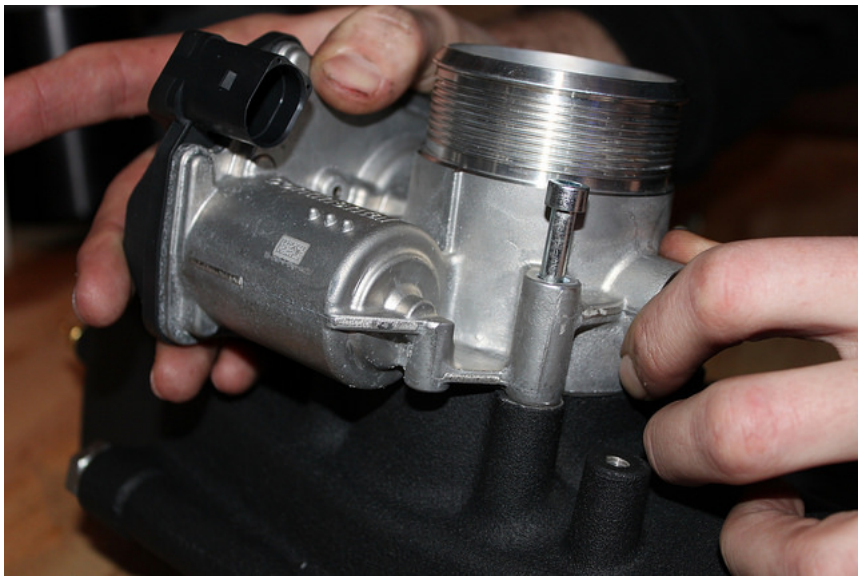
Perform Carbon Cleaning With Combustion Clearner & Clean Cylinder Head Surface With Brake Clean:



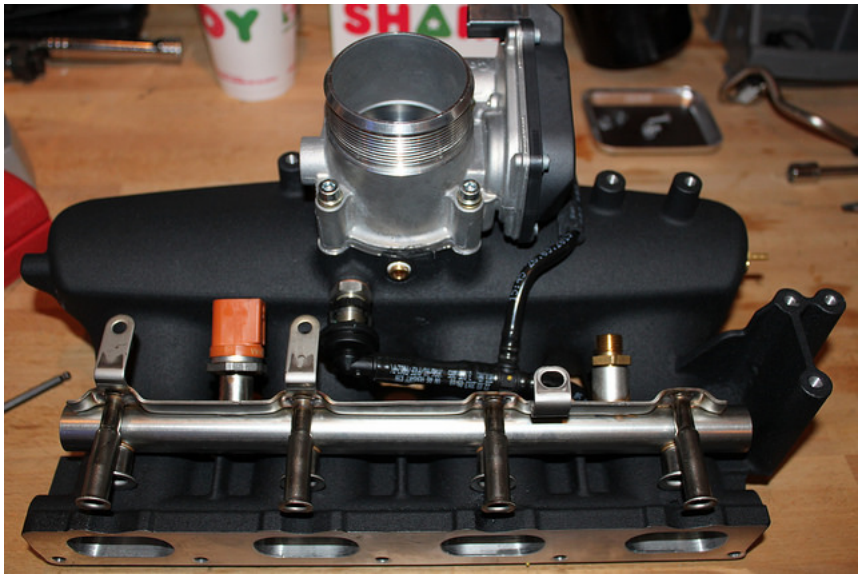
Clean Air Diverter Plates & File Down Guide Pins Until Flush:

Reinstall Air Diverter Plates & Fuel Injectors:

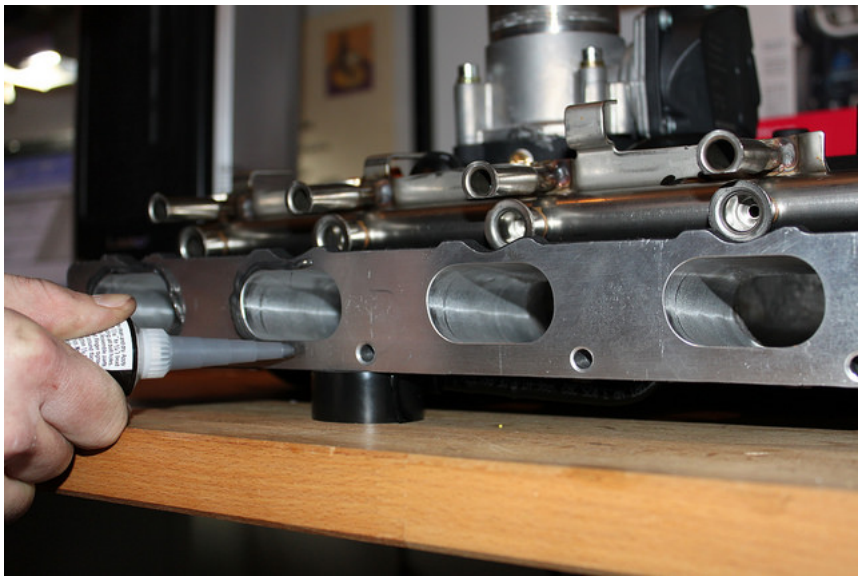
Apply 2-3MM Bead Of Included Ultra Black RTV Sealant To Throttle Body and Install On Manifold With With Included Bolts & Washers:



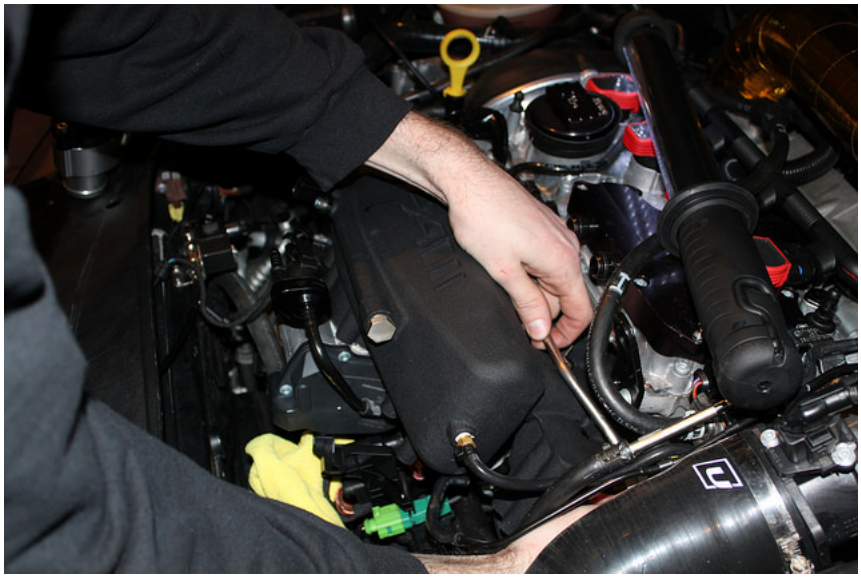
Complete Throttle Body Connection, Reassemble Fuel Rail & Vacuum Lines:



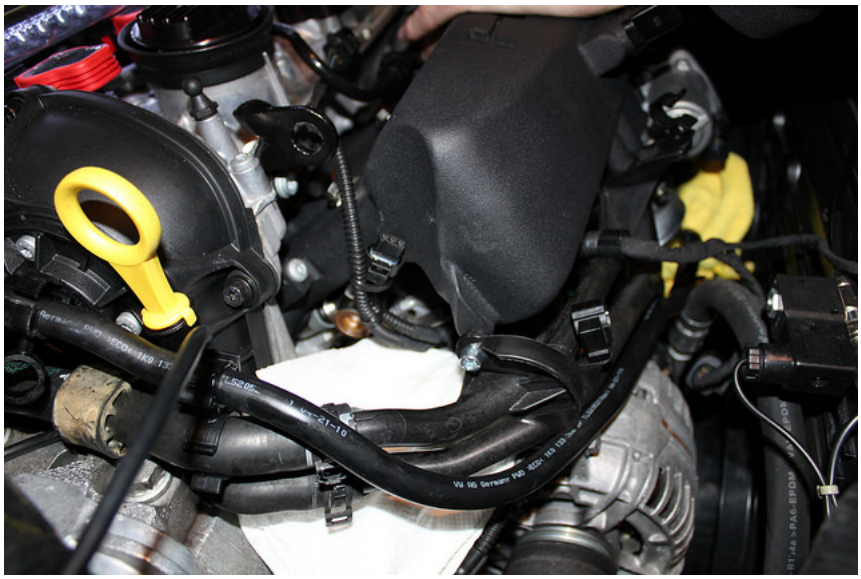
Clean Manifold Surface With Brake Clean & Apply 2-3MM Bead Of Included Ultra Black RTV Sealant:



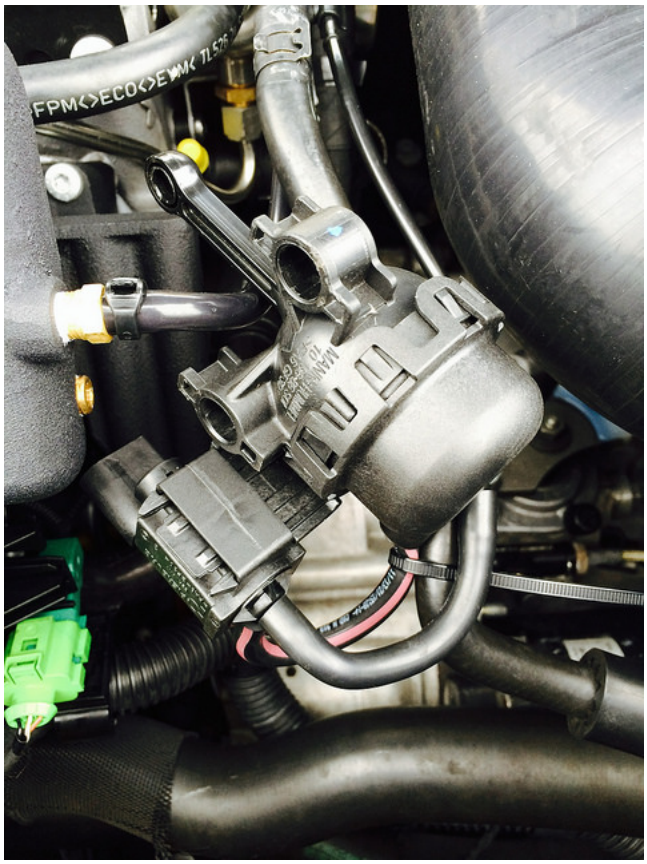
Carefully Slide Assembled Manifold With Fuel Rail Onto Cylinder Head Guide Pins, Reinstall Lower Guide Pin Nuts & Upper Silver Bolts (to hold manifold to cylinder head):

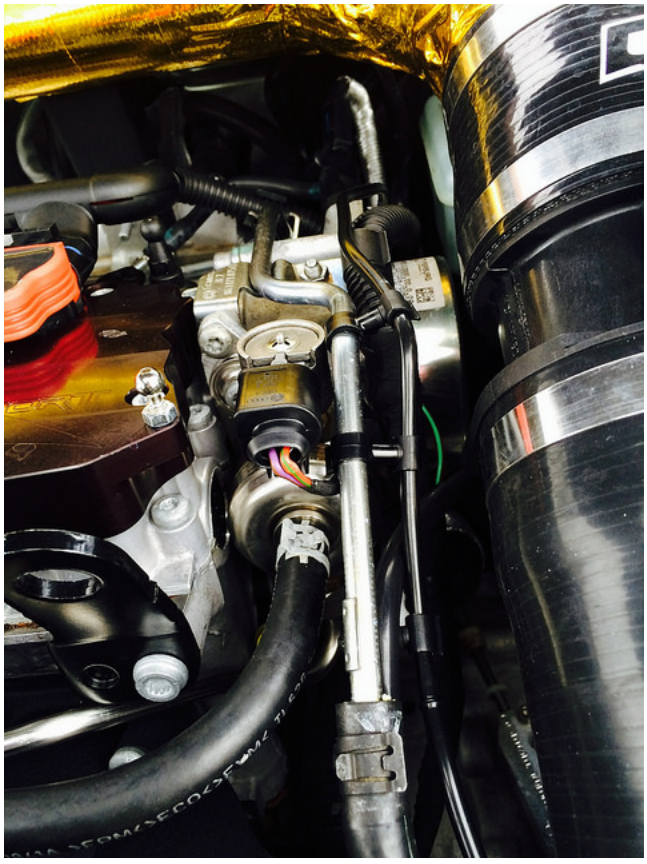


Reconnect Previously Removed Fuel Lines, PCV Lines, Vacuum Lines, Breather Lines & Boost Tap:



Plug Vacuum Line For OEM Intake Manifold Flapper Motor:
On the TSI, the OEM intake manifold flapper motor has an electrical connector in addition to a vacuum connection. For this install I removed the electrical connector and tie wrapped it out of the way. For the vacuum connection, I need to find a point to disconnect it and plug the small hole. As you can see from the first picture below I have the OEM intake manifold flapper motor tie wrapped out of the way for now. In the second picture you can see how this vacuum line runs towards the firewall and into a merged vacuum connection.





Finished Installation Should Look Like This:


HPAIII


HPAIII

Build Thread Part 1: HYDE16 Build Thread - Project Jekyll & Hyde
Facebook: Ryan Jacobs
Instagram:@becauseryanjacobs
YouTube: Ryan Jacobs

Reply With Quote

HYDE16
Member

Join Date: Aug 20th, 2010
Location: Morris County, NJ
Posts: 3,033
Vehicles: 2011/VW/GTI MK6

01-31-2014 10:53 PM Reply #3

Software Calibration:
At the time of my K04 installation, my car was flashed with APR's V2.2 K04 software file. This part 2 review will focus on the performance gains solely from bolting on the TSI HPA 2.0T Performance Intake Manifold with no other changes to the car and while trying to keep things in somewhat of a controlled environment. The software used in this test has remained the same but the ultimate gains should come from the upcoming HPA remapped software file. Off the shelf K04 software files have certain calibration targets for airflow based on the output of the turbo, so in theory any delta in performance (higher boost curve, HP & TQ figures) should be the result of the flow characteristics of the HPA Performance Intake Manifold. As far as the OEM intake manifold flapper motor, once this was removed I had the two following error codes below (P2014, P2008). For those worried about these codes while running a non-HPA tune, just ask your current software tuner if they can code these errors out.

2 Faults Found:

008212 - Intake Manifold Flap Position Sensor (Bank 1)
P2014 - 000 - Electrical Malfunction - MIL ON
Freeze Frame:
Fault Status: 11100000
Fault Priority: 0
Fault Frequency: 1
Reset counter: 255
Time Indication: 0
Date: 2047.15.31
Time: 31:63:63

Freeze Frame:
RPM: 0 /min
Load: 0.0 %
Speed: 0.0 km/h
Temperature: 5.0°C
Temperature: 9.0°C
Absolute Pres.: 1000.0 mbar
Voltage: 12.065 V

008200 - Intake Manifold Flap; Bank 1
P2008 - 000 - Electrical Malfunction - MIL ON
Freeze Frame:
Fault Status: 11100000
Fault Priority: 0
Fault Frequency: 1
Reset counter: 255
Mileage: 76415 km
Time Indication: 0
Date: 2039.14.02
Time: 16:37:40

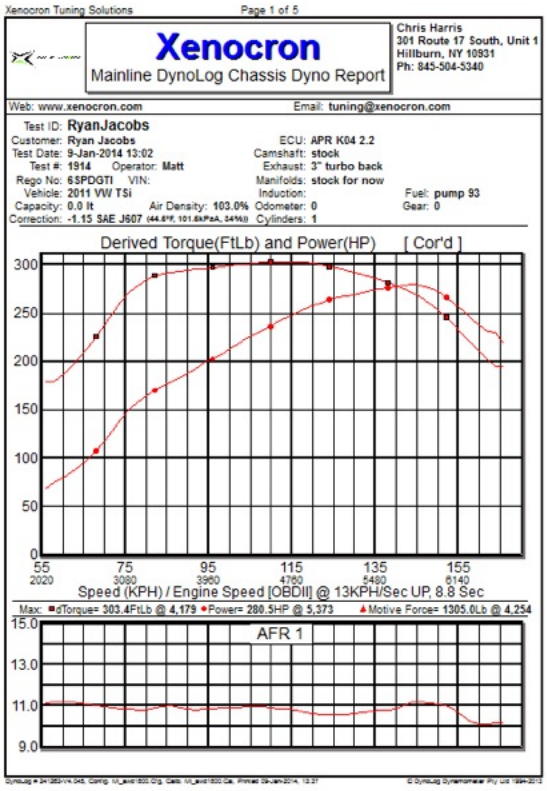
Freeze Frame:
RPM: 787 /min
Load: 40.0 %

Speed: 0.0 km/h
Temperature: 96.0°C
Temperature: 33.0°C
Absolute Pres.: 1000.0 mbar
Voltage: 11.684 V

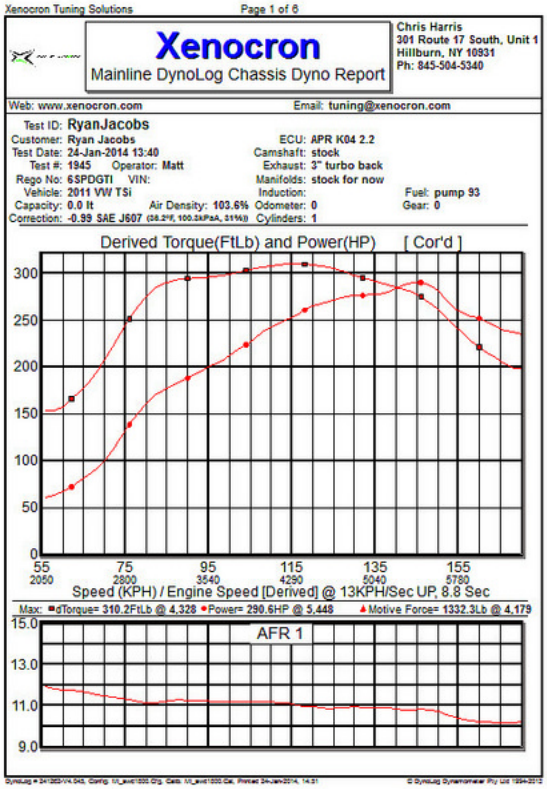
Readiness: 0010 0101

Dyno Testing Parameters:
The before and after dyno sessions were performed two weeks apart with Sunoco 93 octane pump gas, ported and polished APR K04 turbo, APR V2.2 K04 93 software and OEM copper NGK plugs gapped to 0.028" with R8 coil packs. In addition, the system was smoke/pressure tested before both dyno sessions. The only differences between the two dyno sessions were the installation of the HPA Performance Intake Manifold and the slight temperature difference between both days. **My baseline numbers below will be much lower than what APR typically advertises due to the type of dyno used.** APR uses flywheel/crank horsepower, not wheel horsepower and they use a Dynapack hub dyno, which I believe reads higher that rolling road dynos. I have local access to a Mainline AWD 1800 chassis dynamometer at Xenocron Tuning in Hillburn, NY. Again, I am solely focused on the HP and TQ delta after adding only the HPA 2.0T Performance Intake Manifold without changing any other aspect of the car. Once my performance build is complete later this year, I will be shooting for the highest HP & TQ numbers on a DynoJet dyno. For a background on the Mainline AWD 1800 chassis dynamometer used for the dyno charts below, please see my **"Proper Dyno Testing"** thread.

Dyno Report 1914 – OEM Intake Manifold
IAT: 38.2 degrees F / Air Density: 103.6%
IAT: 44.6 degrees F
Air Density: 103.0%
HP = 280.5 @ 5,373 RPM
TQ = 303.4 ft/lb @ 4,179 RPM



Dyno Report 1945 – HPA Performance Intake Manifold
IAT: 38.2 degrees F
Air Density: 103.6%
HP = 290.6 @ 5,448 RPM
TQ = 310.2 ft/lb @ 4,328 RPM



Dyno Data & Results:
-CLICK HERE- for a direct download of the extracted data Xenocron Tuning Solutions was able to provide for dyno report 1914 and 1945 on their Mainline AWD 1800 chassis dynamometer. Even through the column headers are different than the typical Ross-Tech VagCom output, there is a key on the first tab of the file that may help. Also included are VagCom boost logs from three 2K-6K rpm pulls in 3rd gear and VagCom timing logs from two 2K-6K rpm pulls in 3rd gear after the HPA Performance Intake Manifold was installed. I am by no means schooled in the art of understanding dynos or ODB data so I welcome all open interpretation. For these dyno runs, I was told it is important to compare the results which had the closest intake air temp readings, air density readings and correction factor. The second dyno session had 6 degree F cooler temps but the air density was very close to being exact. Overall, boost held longer due to the higher flow rate, timing advance was higher, thus the HP & TQ delta between the two charts above.

HPA 2.0T Performance Intake Manifold Overall Results and Recommendations:
Was it worth it? Honestly, my answer is yes but it all depends on your specific project build. Do you plan on running the upcoming HPA remapped software file on your OEM turbo or K04? Are you going with a massive turbo? Do you plan on building an engine to take full advantage past the 6,000rpm redline safely? For me, there are several advantages I believe the HPA manifold gives: looks, performance, intake and exhaust sound, stronger material for drilling/tapping direct port water methanol injection and the fact that I never have to replace another broken plastic OEM intake manifold, even with the extended warranty VW provided on this part.

In terms of performance, the above HP & TQ figures are enough for me especially when I'm not running a remapped software file. I provided data above in a somewhat controlled fashion but dyno results are very sensitive so it's hard to make an exact comparison. The one thing we have to remember is that our current software will not automatically calibrate to take full advantage of this increased air volume and the ultimate gains should come from the upcoming HPA remapped software file. With the OEM intake manifold I was consistently getting throttle closure on the dyno before 6,000rpm but this occurred less on the dyno with the HPA manifold installed. On the street, when running VagCom logs after the HPA Performance Intake Manifold was installed, I haven't seen any issues such as throttle closing, timing pull or misfires. I for one am not planning on going with a larger turbo so I'm all about increasing efficiency or squeezing every morsel of power out of this amazing K04 turbo without affecting longevity or durability of the components. Because of the porting and ceramic coating, boost comes on a little quicker and stronger (faster spool). I feel the onset of boost and speed of the turbo spool remained the same after adding the HPA Performance Intake Manifold. Overall I am very content with these results and especially the mid-range-to-top-end power band. In the coming weeks, HPA should release their HP & TQ gains on an OEM turbo and K04 turbo with their upcoming HPA remapped software file.

Installation - Installation is pretty straightforward as long as you take your time removing, disconnecting and re-installing everything. The majority of OEM brackets, wires, clips, etc. bolted back up in the provided holes on the manifold.
The Look - For me, the looks speak for themselves. The engine bay looks proper and much more "solid" now. HPA really made a great looking manifold and the engraved letters really stand out. With its smooth black crinkle finish, it will be much easier to keep clean for shows and events.
Performance Feel / Acceleration - Acceleration from mid-range-to-top-end pulls so hard and ultra smooth. This definitely makes difference in the power onset and overall output feeling.
Intake / Exhaust Sound – This was probably my second favorite benefit to the performance. My car was already noisy (in a good way) with the Unitronic intake and ported and polished APR K04. The air induction noise has become much deeper, similar to a V6 engine. The exhaust note at idle has deepened as well which makes it sound much meaner, not necessarily louder. When driving aggressively, well, I'll let you guess how it sounds… basically, the past few times I stomped on the throttle, I swear I have chuckled out loud to myself. Find someone with this installed and get ready for a symphonic rollercoaster similar to the 2.5L engines with aftermarket intake manifolds.
Cold Start / Idle – There has been some concern over cold starts and smooth idling with the loss of the OEM intake manifold flappers. I can assure you, the first time I started the car after install (cold start), the car fired right up and was surprisingly very smooth. You'd be hard pressed to notice a difference. The car still idles high to warm up then settles in the same amount of time. Over the past few weeks I have paid close attention to my cold starts and even warm starts when running around town. Even with 10-25 degree temps here in the Northeast, my cold starts have been very smooth with the occasional burble or change in idle tone (in a good way; similar to aftermarket cams) but then again the upcoming HPA remapped software file will be recalibrating the idle and cold starts to eliminate any possible roughness if needed.
Keyless Push Start Button – Another thing I noticed is that I no longer have the notorious keyless push-button false starts. Originally, when I press the clutch in and hold down the start button, the car will turn over for half a second then die with my finger still on the button, forcing me to let go and press the button a second time to start the car. The car has not once had a false start since this install.
Aluminum Heat Soak – There has been some concern over heat soak when moving from a plastic intake manifold to an aluminum manifold. Being that the Northeast has single digit temperatures right now, I'm unable to take temperature readings until Spring & Summer to see how they stack up against the plastic OEM intake manifold after a hard run. Luckily, I will be running the Aquamist HFS-4 water methanol system with post intercooler jet to keep my air intake temperatures very low.

BONUS – Part 3:
Can there be a part 3? Yes there can. Next up on the same Mainline AWD 1800 chassis dynamometer will be a baseline dyno session of the APR V3 High Output file with Golf R 3-bar MAP sensor. The second dyno session will be with the Okada / Ignition Projects Plasma Coil Packs and Plasma Lift System. **Stay tuned to my build thread in my signature for the final HP & TQ numbers on a different dyno once my remaining performance mods are added later this year.**

Build Thread Part 1: HYDE16 Build Thread - Project Jekyll & Hyde
Facebook: Ryan Jacobs
Instagram:@becauseryanjacobs
YouTube: Ryan Jacobs

Reply With Quote

HPA motorsports 1

Banner Advertiser

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Join Date: Feb 19th, 2001
Posts: 2,256

02-01-2014 02:44 AM Reply #4

Ryan,

Thank you for your dedication to the community. Our HPA intake has been an exciting project and will serve as the back bone for our future big turbo builds. Your efforts to document the installation are second to none and will offer all future builders insight and confidence in the task ahead.

We are happy to see the seamless support a competitor has offered you to preserve your quest to optimize your VW with the installation of our new Intake.

Looking forward to watching your build grow.

Thank you for supporting HPA and our efforts to build in North America!!!

Marcel Horn
T: 604-888-7274
HPA Motorsports
Click here to join us on Facebook!
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Reply With Quote

DUTCHswift

Member

Join Date: Feb 22nd, 2012
Location: Seacoast, NH
Posts: 4,481
Vehicles: Current: '12 Golf R . . . Past: '13 D.E. GTI, '01 S/C Jetta

02-01-2014 10:18 AM Reply #5

Wow this look 1000x better than the one swfloridamk6 got...

HPA, if you guys haven't already, you should help this user out. He got a sh!t product:
swflorida's HPA Woes

R135

246

MKVI R / LLOD / FLICKR / @DUTCHswift / WHEEL BUILD REFERENCE THREAD

Reply With Quote

molo_gdl

Member

Join Date: Mar 26th, 2007
Location: Mexico
Posts: 358
Vehicles: GLI MKVI

02-01-2014 10:58 AM Reply #6

Wow, I am a big fan of your reviews, so much detail. I am installing the intake very soon, just waiting for my USRT direct port kit to arrive.

Doesn't APR offers a software to remove those codes?

It looks amazing, and if the gains are 10-20hp, I think its well worth it.

Last edited by molo_gdl; 02-01-2014 at 12:15 PM.

Reply With Quote

HYDE16

02-01-2014 11:07 AM Reply #7

Member

Join Date: Aug 20th, 2010
Location: Morris County, NJ
Posts: 3,033
Vehicles: 2011/VW/GTI MK6

You should be able to ask your software provider to code these out then get reflashed.

Build Thread Part 1: HYDE16 Build Thread - Project Jekyll & Hyde
Facebook: Ryan Jacobs
Instagram:@becauseryanjacobs
YouTube: Ryan Jacobs

Reply With Quote

HPA motorsports 1

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Join Date: Feb 19th, 2001
Posts: 2,256

02-01-2014 11:14 AM Reply #8

> Originally Posted by **DUTCHswift**
>
> *Wow this look 1000x better than the one swfloridamk6 got…*
>
> *HPA, if you guys haven't already, you should help this user out. He got a sh!t product:*
> *swflorida's HPA Woes*

Sad to see this feedback,

This intake pictured here is one of a kind where our dealer requested a Raw uncoated part to be shipped as the enthusiast wanted to polish it.

All intake manifolds run through the machine shop post casting and look like this prior to the coating being applied. We have welcomed an exchange of the raw unit for a coated on, simply have your friend contact the dealer in FL and he will have no worries..

With that said, here is an image out of the same region where the other owner took the raw one in for a custom finish.

DUTCHswift, thanks for the highlight, found the thread and have answered the concern.
if you speak with him, just ask him to call us if he would like to exchange it and we will search out a more polish finish friendly"raw casting".

Last edited by HPA motorsports 1; 02-01-2014 at 11:38 AM.

Marcel Horn
T: 604-888-7274
HPA Motorsports
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Reply With Quote

Ken@LindenVW
Forum Sponsor

FORUM SPONSOR

Join Date: Jun 4th, 2012
Location: Linden, NJ
Posts: 698
Vehicles: 2012 GTI 2 Door, TR

02-01-2014 11:19 AM Reply #9

Ryan,
Amazing writeup and guide. Thanks for taking the time to put it together. I should have some TSI before and after dyno numbers (on stock turbo) when I install this on my Mk6 GTI in the coming weeks. I am currently running an HPA tune, so my numbers will include HPA's V1 Manifold tune.

Well done....

Ken Pescatore - 908-868-6586 Linden VW Motorsports - KPescatore@LindenVW.com
HPA Motorsports Master Distributor, APR, United Motorsport, P3, Podi, Integrated Engineering, Neuspeed, KW, H&R, Milltek, 42DD, USP Motorsports, VMR, BBS, HRE, CTS Turbo, Haldex, South Bend Clutch, VagCom & more
2 miles from Exit 13 off the NJ Turnpike - 2 miles from Exit 136 off the GS Parkway

Reply With Quote

Arin@APR
Forum Sponsor

FORUM SPONSOR

Join Date: Jul 29th, 2008
Location: Auburn, Al
Posts: 17,916
Vehicles: S4 3.0 TFSI 6MT & GTI 2.0T FSI DSG

02-01-2014 11:51 AM Reply #10

Ryan, when Jamie and I looked over the data and discussed it with you, we came to a very different conclusion. I think you may have misunderstood what we were telling you.

Your turbo is ported, and as such, it's not playing nicely with the ECU calibrated for a standard turbo. Some limits are being crossed which causes a dramatic drop in boost and power by red line.

So everyone is aware, one of the things the ECU does is monitor different modeled information. If the ECU sees something going past those modeled ranges, it typically closes the throttle or lowers turbocharger duty cycle to protect the engine. This is happening on Ryan's car (stock manifold and new manifold), and it could be because boost or airflow levels are exceeding their targeted ranges due to the turbo being ported.

You sent me the raw files with data and here's what we saw:

On the stock manifold, each run showed boost and airflow levels dropping around 6000 RPM, resulting in a great loss of power that's not normal.

On two of the upgrade manifold runs the same occurred. Boost was dramatically cut and power towards redline dropped off, just like you were seeing with the stock runs.

However, on several of the upgraded manifold runs, mass airflow was significantly lower (as was power, torque boost, etc). On those runs, boost was not cut after 6000 RPM as it appears the targeted limits were not crossed. Power continued, and you made slightly more power, but only after 6000 RPM.

The car is not running healthily and it's skewing the results, so this is not a good comparison. The write-up is great, but the data is being misinterpreted. I'm willing to go into further explanation and share the data with everyone if you would like me to do so and Jamie can as well.

GoAPR.com | Facebook | YouTube | Twitter | Instagram
Phone: (800) 680-7921 **Local Phone:** +1 (334) 502-5181 **Fax:** +1 (334) 502-5180
Address: APR LLC, 4800 US HWY 280 West, Opelika, AL 36801

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Join Date: Feb 19th, 2001
Posts: 2,256

02-01-2014 12:43 PM Reply #11

Sadly, the nature of the Dyno Ryan uses does not facilitate Active data logging outside of what the dyno captures.

Ryan went into the dyno knowing his car had an issue at 5500RPM but was unable to sort this with the provider prior to the install of the intake.\

The concept here is that the New Intake will provide a solid foundation for any explorations from KO4 and beyond.

1) you only need a tweak in software to smooth out the idle and to code out the flapper valve. As the intake flows more, the MAF will adapt fueling etc accordingly.
2) For larger turbo chargers, this intake is already showing strong gains from 5500RPM and up, sadly, Ryans current hardware etc is having a struggle there, so he will stand to see more gains once that is sorted.
3) Unlike a transition from long runner to short runner where performance detriments are notable, the oem Tsi/Fsi intakes are short runner from the start.

Tsi, the individual runners flow 11%+ over the oem,
Fsi, the individual runners flow 24% over the oem intake.

There is no math here that will showcase a loss in performance resulting from these port specific gains. HPA tweaked and massaged the inlet runners to optimize the pressure being delivered to the intake valves.

HPA will release its software in the coming week for both Tsi-Fsi where additional cam shaft management strategies have been added. As some

comments here indicate, there is little magic left in the KO4, but even 11-14hp which is about what we are finding is a compliment to the added benefits of the cast design. Bring on any turbo and continue to see this benefit grow.

Thanks for the efforts in documenting this installation Ryan and in providing before and after. This is always a challenge and you can always argue conditions, but the basics are clear, you did not go backwards, you established a good foundation for the future and STILL need to sort out your performance crash at 5500 RPM!!

Marcel Horn
T: 604-888-7274
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Arin@APR

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Join Date: Jul 29th, 2008
Location: Auburn, Al
Posts: 17,916
Vehicles: S4 3.0 TFSI 6MT & GTI 2.0T FSI DSG

02-01-2014 01:27 PM Reply #12

From Jamie@APR (couldn't upload the graphs from his ipad):

Because the turbo is ported and on a calibration for a standard turbo, the actual mass airflow above 5500rpm exceeds the ECU's modeled values enough to think something is wrong and throttle closure began to occur. Unfortunately this makes the comparison above 5500rpm to be inconclusive. From 2000-5500 rpm the test still has good data. There were 3 runs on the stock manifold and 5 runs on the new manifold. Since no one is concerned with glory runs and averaged, consistent data is more useful, I simply averaged the runs from each session to get an overall comparison.

One 3 of the 8 runs, the throttle closure did not occur (most likely because mass airflow wasn't enough to exceed the modeled limits). All 3 of the full runs were in the HPA data so the averages above 5500rpm are a mix-match of some throttle closure runs and some non-closure runs. Throttle closure occurred on all 3 runs on the stock manifold with the ported turbo. Since the throttle closure occurred at different points on all of the runs, one couldn't even make an apples-to-apples comparison above 5500rpm.

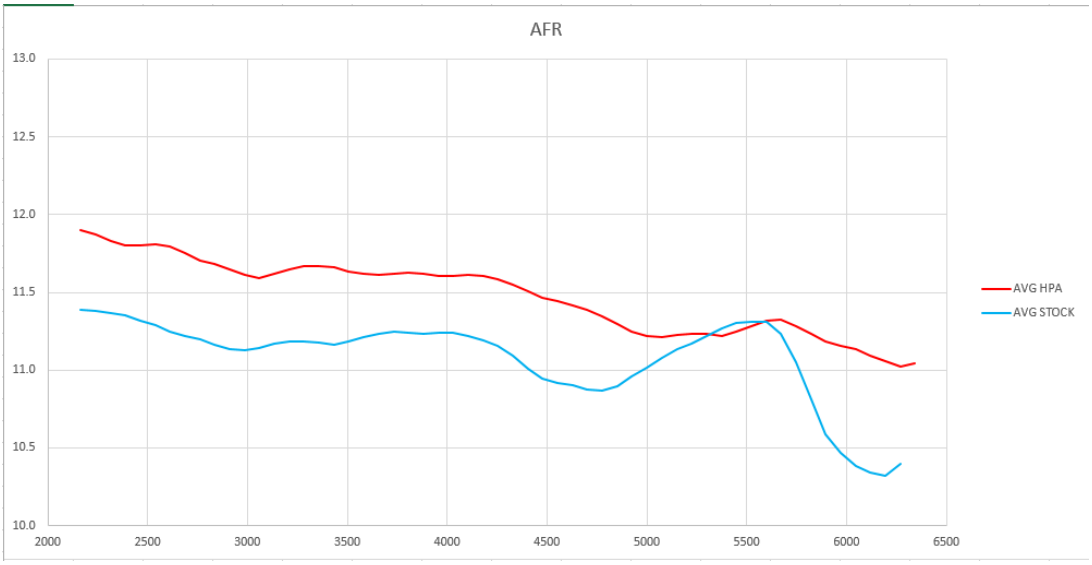
What we are left with is data from 2000-5500rpm that just shows a loss in spoolup and mass flow in this area. With most manifolds with this intent it's a give & take scenario. Will the spool up suffer and lowered VE suffer? Yes. Will it flow better above 6000rpm and work well with much higher mass flow turbos up top? Yes.

What you will see in the lower rpm powerband that we can see in this test is the lower VE making the ignition advance further from MBT. This usually she's a loss in power and an increase in EGT's in that area. The power can usually be made up with a calibration though.

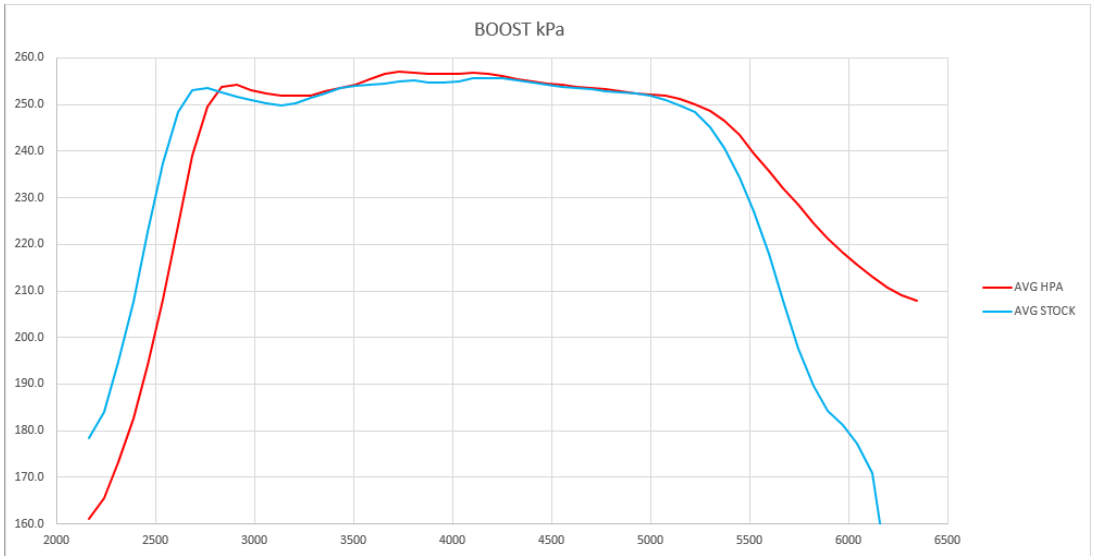
In the end, just bolting on any manifold designed with this purpose will not be optimal for the standard calibration and may lose power in some areas.

Sent from my iPad

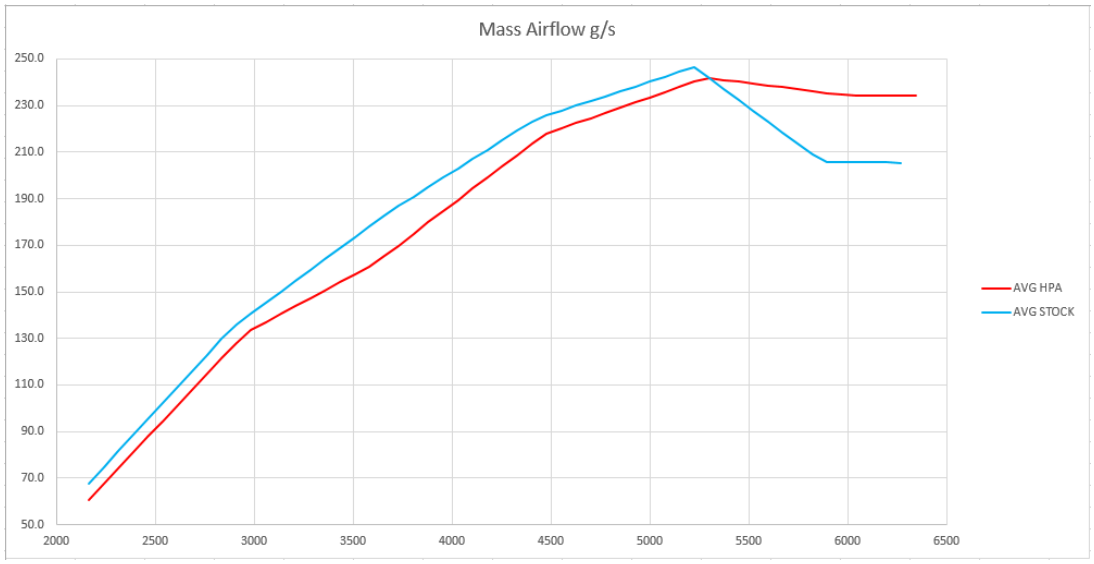
Average Air/Fuel Ratio



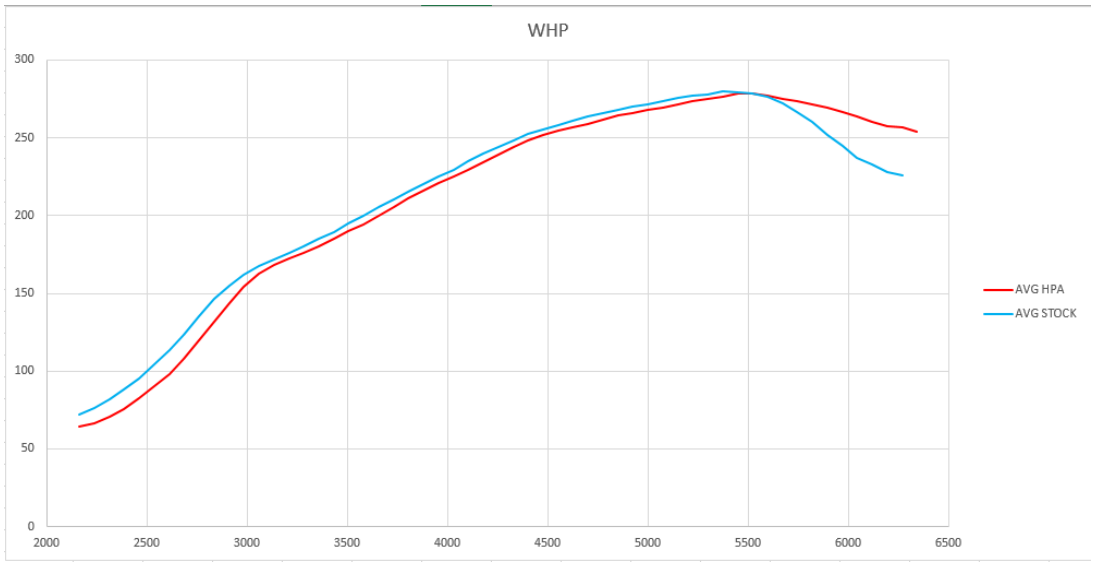
Average Boost Pressure



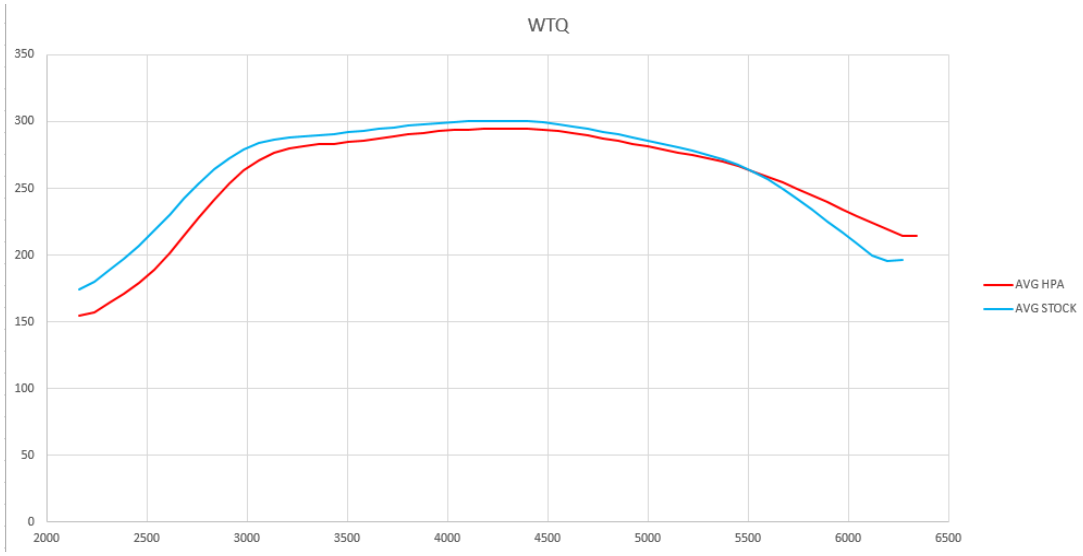
Average Mass Airflow



Average Power



Average Torque



Last edited by Arin@APR; 02-01-2014 at 01:32 PM.

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Join Date: Feb 19th, 2001
Posts: 2,256

02-01-2014 03:02 PM Reply #13

With over 22 hours on the all wheel drive dyno, I can say without any question there is NO low end loss that occurs by installing this intake, even with APR software installed.

This thread is a simple showcase of how simple this installs and how compatible it was with APR. on the surface APR even seemed supportive.

With that said, the actual dyno runs would need a correlation with logged data.
I have a local APR flashed Golf R and no different then an HPA flashed R, across three to five runs split days apart, I will get different ramp in results "referred to here as spool up". I am not looking at this element of the run, rather the consistency and trend in flow as I build the RPM band.

All the water Meth users gain additional installation flexibility!

Thursday next week, we will have a stage 2 Golf R on the dyno and immediately install the intake and re dyno. Then we will upload an optimized file for the flappers etc and re run.

Thanks Again Ryan for the great install thread and for sharing your impressions.

It will be nice if the thread stays on focus as it is clear that the data was not available to make 1:1 data comparisons, but even with the interpretations of air density, dyno operator roll in etc, the intake is not detrimental. the Intake is a short runner design and each Port has been shaped and massaged to deliver in this case 11% more flow to the intake valves…(24% on Fsi)

Time to head out and coach some soccer for the kids…

Marcel Horn
T: 604-888-7274
HPA Motorsports
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Jamie@APR

Forum Sponsor

FORUM SPONSOR

Join Date: Sep 11th, 2013
Posts: 174

02-01-2014 03:17 PM Reply #14

With the data we have in front of us, it lost in excess of 20t lbs of torque at 2500rpm, spooled nearly 200rpm later and averaged a loss of mass flow and power throughout the range before throttle closure. And the HPA testing actually had a hair better air density compared to the stock testing. The raw data is there, on the same calibration at the same boost, it flowed less in that area compared to stock. I'm not knocking the product since it can be calibrated to make up the difference, maybe not all of the spool due to plenum volume, and I'm sure it will perform better in the higher rpm ranges than stock but when comparing both on a standard calibration it definitely wasn't matching the performance of the stock intake manifold. I didn't have any part of the testing, I was just handed the results.

The great benefit is the additional features it presents for the average turbo setup. Toss a 35r and 8500rpm rev limit and this will do very well., I'm sure of it. Especially since the area sacrificed by the larger plenum isn't a huge factor on a larger frame turbo with a powerband fat enough to make use of the bigger turbo.

Last edited by Jamie@APR; 02-01-2014 at 03:25 PM.

Calibrator...not sales...not tech support...not for rent lol
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Address: APR LLC, 4800 US HWY 280 West, Opelika, AL 36801

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BANNER ADVERTISER

Join Date: Feb 19th, 2001
Posts: 2,256

02-01-2014 07:09 PM Reply #15

> Originally Posted by **Jamie@APR**
>
> *With the data we have in front of us, it lost in excess of 20t lbs of torque at 2500rpm, spooled nearly 200rpm later and averaged a loss of mass flow and power throughout the range before throttle closure. And the HPA testing actually had a hair better air density compared to the stock testing. The raw data is there, on the same calibration at the same boost, it flowed less in that area compared to stock. I'm not knocking the product since it can be calibrated to make up the difference, maybe not all of the spool due to plenum volume, and I'm sure it will perform better in the higher rpm ranges than stock but when comparing both on a standard calibration it definitely wasn't matching the performance of the stock intake manifold. I didn't have any part of the testing, I was just handed the results.*
>
> *The great benefit is the additional features it presents for the average turbo setup. Toss a 35r and 8500rpm rev limit and this will do very well., I'm sure of it. Especially since the area sacrificed by the larger plenum isn't a huge factor on a larger frame turbo with a powerband fat enough to make use of the bigger turbo.*

I have only been positive about the seemingly supportive approach APR had taken here, but am loosing this feeling.

Best is, i just leave this one alone and allow the general community to appreciate and enjoy Ryan's efforts. Jamie, you are welcome to side bar me if you would really like an apples to apples dialog. This dyno capture is for sure NOT one to hang a hat on.

Marcel Horn
T: 604-888-7274
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HYDE16
Member

Join Date: Aug 20th, 2010
Location: Morris County, NJ
Posts: 3,033
Vehicles: 2011/VW/GTI MK6

02-01-2014 08:37 PM Reply #16

I posted the two dyno reports in post #3 based on the idea of comparing the results which had the closest intake air temp readings, air density readings and correction factor. I also wanted to post the full data from all dyno sessions for anyone interested in digging through the data.

This is the same data I sent to HPA, Driver Motorsport and APR for a health check on the entire system.

http://www.scribd.com/doc/203958088/...sults-Summary#

Build Thread Part 1: HYDE16 Build Thread - Project Jekyll & Hyde
Facebook: Ryan Jacobs
Instagram:@becauseryanjacobs
YouTube: Ryan Jacobs

Reply With Quote

retired
Member
Join Date: Mar 12th, 2007
Posts: 942

02-02-2014 12:16 AM Reply #17

22 hours of dyno time,was that all on my car?I am glad I followed this thread today.Glad to see everyone playing nice.....

Reply With Quote

NS01GTI
Member

GTI

Join Date: Jan 30th, 2005
Location: Canada eh
Posts: 2,194
Vehicles: 2012 VW GLI K04

02-02-2014 09:58 AM Reply #18

> Originally Posted by **HPA motorsports 1**
>
> *Sadly, the nature of the Dyno Ryan uses does not facilitate Active data logging outside of what the dyno captures.*
>
> *Ryan went into the dyno knowing his car had an issue at 5500RPM but was unable to sort this with the provider prior to the install of the intake.*
>
> *The concept here is that the New Intake will provide a solid foundation for any explorations from KO4 and beyond.*
>
> *1) you only need a tweak in software to smooth out the idle and to code out the flapper valve. As the intake flows more, the MAF will adapt fueling etc accordingly.*
> *2) For larger turbo chargers, this intake is already showing strong gains from 5500RPM and up, sadly, Ryans current hardware etc is having a struggle there, so he will stand to see more gains once that is sorted.*
> *3) Unlike a transition from long runner to short runner where performance detriments are notable, the oem Tsi/Fsi intakes are short runner from the start.*
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> *Tsi, the individual runners flow 11%+ over the oem,*
> *Fsi, the individual runners flow 24% over the oem intake.*
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> *Thanks for the efforts in documenting this installation Ryan and in providing before and after. This is always a challenge and you can always argue conditions, but the basics are clear, you did not go backwards, you established a good foundation for the future and STILL need to sort out your performance crash at 5500 RPM!!*

Marcel, as interested consumer, when can we expect that HPA will release their TSI high-flow intake mani K04 tune? I'm running a GLI, but overall

my setup is very similar to Ryan and I'm very curious about the end result with the proper software.

2012 GLI DSG
UNITRONIC TUNED K04 - Carbonio intake - UNITRONIC TBE - APR FMIC - Neuspeed TOP - HPA SHS Coilovers - HPA Red Motor Mount

Reply With Quote

HYDE16
Member

Join Date: Aug 20th, 2010
Location: Morris County, NJ
Posts: 3,033
Vehicles: 2011/VW/GTI MK6

02-02-2014 11:05 AM Reply #19

> Originally Posted by **NS01GTI**
> *Marcel, as interested consumer, when can we expect that HPA will release their TSI high-flow intake mani K04 tune? I'm running a GLI, but overall my setup is very similar to Ryan and I'm very curious about the end result with the proper software.*

It's going to be interested for sure,.... You have a ported turbo and plan on the intake manifold?

Build Thread Part 1: HYDE16 Build Thread - Project Jekyll & Hyde
Facebook: Ryan Jacobs
Instagram:@becauseryanjacobs
YouTube: Ryan Jacobs

Reply With Quote

---

crew219
Member

Join Date: Oct 18th, 2000
Posts: 9,263

02-02-2014 03:38 PM Reply #20

So to recap:

Performs worse than stock
Requires sealant instead of a proper gasket to seal to the head
Increases boost lag
Small blip in performance in the upper RPMs on the very best HPA run compared to the OEM run. What about the other 2 runs where HPA performed worse than stock?
All of this was done with a carbon cleaning on the HPA manifold and dirty intake valves on the OEM. Carbon cleaning is proven to increase power output, so is the clean masking all the detrimental effects of the HPA manifold?

Last edited by crew219; 02-02-2014 at 03:42 PM.

my '13 TT RS | WWVS?

Reply With Quote

TDI Driver
Member

Join Date: Jan 17th, 2006
Location: MD
Posts: 1,859
Vehicles: 1993 Corrado SLC, 2009 CC 2.0T Sport, '07 GTI

02-03-2014 08:20 AM Reply #21

> Originally Posted by **crew219**
> *So to recap:*
>
> *Performs worse than stock*
> *Requires sealant instead of a proper gasket to seal to the head*
> *Increases boost lag*
> *Small blip in performance in the upper RPMs on the very best HPA run compared to the OEM run. What about the other 2 runs where HPA performed worse than stock?*
> *All of this was done with a carbon cleaning on the HPA manifold and dirty intake valves on the OEM. Carbon cleaning is proven to increase power output, so is the clean masking all the detrimental effects of the HPA manifold?*

You'll notice that he ran this on his car without the updated software. If you install a K04 and run it without software you won't show any gains either.

Reply With Quote

Zoomx
n00b

Join Date: Feb 3rd, 2014
Posts: 1

02-03-2014 01:21 PM Reply #22

Has some one tried this on an Golf R whit APR stage 3+?

Do I understand it right, if I say larger turbo it will work better?

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crew219
Member

Join Date: Oct 18th, 2000
Posts: 9,263

02-03-2014 01:44 PM Reply #23

> Originally Posted by **TDI Driver**
> *You'll notice that he ran this on his car without the updated software. If you install a K04 and run it without software you won't show any gains either.*

Yes, and if you notice, he plans on using APR software for the Golf R MAP sensor which does not include tuning for the HPA manifold.

The manifold has been around for years under the HGP brand and there have never been any solid dynos indicating any performance gains at all. Now that HGP sold the mold to HPA, HPA has opted not to keep the flap design and other machining aspects that HGP included in their 2k price, and is instead just using it as more of a show piece.

Show piece or not, a good part wouldn't create losses like the HPA manifold. One of his first dynos indicated around a 20wtq loss. Surprised he didn't show all three HPA logs (well not really, the first two are not good).

Dave

my '13 TT RS | WWVS?

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HPA motorsports 1

Banner Advertiser

BANNER ADVERTISER

Join Date: Feb 19th, 2001
Posts: 2,256

02-03-2014 06:31 PM Reply #24

> Originally Posted by **crew219**
>
> *So to recap:*
>
> *Performs worse than stock*
> *Requires sealant instead of a proper gasket to seal to the head*
> *Increases boost lag*
> *Small blip in performance in the upper RPMs on the very best HPA run compared to the OEM run. What about the other 2 runs where HPA performed worse than stock?*
> *All of this was done with a carbon cleaning on the HPA manifold and dirty intake valves on the OEM. Carbon cleaning is proven to increase power output, so is the clean masking all the detrimental effects of the HPA manifold?*

> Originally Posted by **crew219**
>
> *The manifold has been around for years under the HGP brand and there have never been any solid dynos indicating any performance gains at all. Now that HGP sold the mold to HPA, HPA has opted not to keep the flap design and other machining aspects that HGP included in their 2k price, and is instead just using it as more of a show piece.*
>
> *Show piece or not, a good part wouldn't create losses like the HPA manifold. One of his first dynos indicated around a 20wtq loss. Surprised he didn't show all three HPA logs (well not really, the first two are not good).*
>
> *Dave*

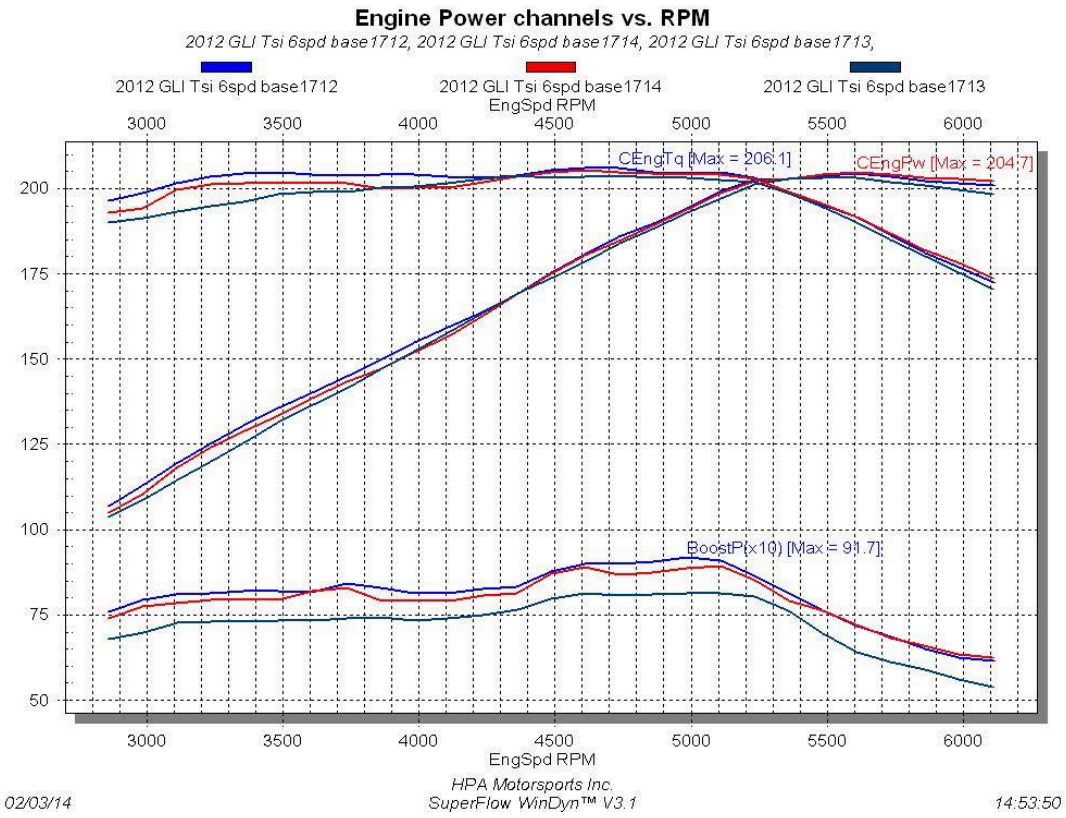
It is disappointing to see such commentary inside a thread of this nature. Ryan had not set out to make a head to head performance comparison, had he, he would have taken more steps to ensure his car was a) running as APR had intended and B), set up a before and after VCDS log profile and controlled to the point the relationships of intake temps and water temps.

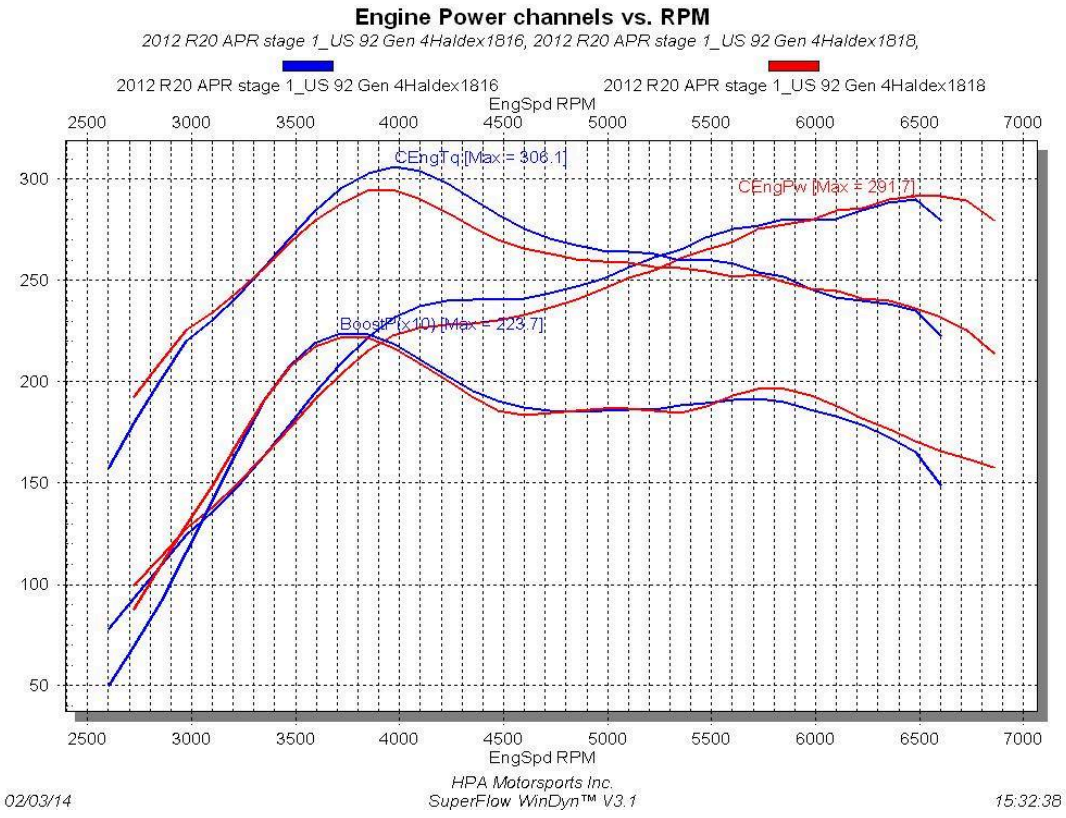
This thread and the effort invested is a great resource to the community that is trying understand the steps involved to install such a part and also showcase the flexibility it offers and confirmed through dyno runs that you don’t go backwards, only forwards.

The dyno in question does not facilitate simultaneous logging using a VCDS and this is a shame as no correlation can be made on MAF, Load, Temps, Throttle position etc.

With that said, I spend a crazy number of hours with the VAG cars on a rolling road where counter load can be applied to better match real world conditions.

Here are two examples, a showroom stock 000150kms GLI on the dyno with three back to back runs (Tsi) and an APR stage 1 flashed Golf R.





Per the feedback being offered in this thread, I would think that the car must have lost a ton of power between runs, or the intake was causing a spooling issue etc…

This is NOT the case.

TSi and FSI have completely different electronic management systems yet, like any vehicle, will not generate 1:1 performance graphs even when run in back to back situations.

Re HGP, yes this intake was initially designed by HGP and was sold as a component of a BIG turbo conversion they offered at one time. @1800euro ($2600+usd) not too many ventured down that path! As they stepped back form the 2.0 to focus on the VR6 bi turbo, HPA acquired the tooling, re worked the materials and created a Tsi fitment along with an updated Fsi. Fitment.

Our solution today offers an ultra affordable platform to take full advantage of the benefits of the flapper deletes sold by APR and others while accommodating the framework for larger turbos and water meth etc. Tsi had no aftermarket options for flapper deletes, and now they also have

such a path.

Is there magic in a manifold/ko4, if you consider that the market has all but exhausted the Ko4 hardware and software manipulations with no major gains, and you can simply bolt this part on and see 10+HP, then yes, this is a win. Will these gains grow as the RPM range and turbo are increased, the results (project Gold Rush) and competitors all agree, YES.

HPA has always believed that you need to clear up the weak link in a system before taking the next step,. This is why we will never sell big HP and TQ gains on DSG cars without updating the code on the DSG to apply more clamping forces to the disks. With the FSI and Tsi, our intake is 1:1 in design the same as oem , both short runner, we simply feed more flow (24+% Fsi, 11+% Tsi) to the individual cylinder inlets over factory. If this was detrimental, then I would think ported Heads, flapper deletes etc have no place in the market. But, when I think about how DSG has been handled, I might also have to wonder what place SPEC, ACT etc have in our industry.

Again, thank you Ryan for taking the time to generate this resource.

Last edited by HPA motorsports 1; 02-03-2014 at 07:02 PM.

Marcel Horn
T: 604-888-7274
HPA Motorsports
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Arin@APR

Forum Sponsor

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Join Date: Jul 29th, 2008
Location: Auburn, Al
Posts: 17,916
Vehicles: S4 3.0 TFSI 6MT & GTI 2.0T FSI DSG

02-03-2014 07:05 PM Reply #25

> Originally Posted by **HPA motorsports 1**
>
> *TSi and FSI have completely different electronic management systems yet, like any vehicle, will not generate 1:1 performance graphs even when run in back to back situations.*

Good point Marcel. This is why we suggest taking an average of multiple runs to help paint a better picture. When we were sent the data, we did this for Ryan, which helped making the comparison easier to read. I believe he misinterpreted some of the data and information we relayed to him in his original posts, why is why we're here to help clear things up a bit.

> *Our solution today offers an ultra affordable platform to take full advantage of the benefits of the flapper deletes sold by APR and others while accommodating the framework for larger turbos and water meth etc. Tsi had no aftermarket options for flapper deletes, and now they also have such a path.*

On the FSI, deleting the flappers is a "feature" since when they are open, they remain in the middle of the port, blocking quite a bit of flow. Their design is simply a restriction. There's no way around that other than removing it. On the TSI there is no reason to delete them. When not in use, they lay flat and out of the way. Unfortunately, retaining the TSI flapper design into a mass produced manifold, such as your own, is difficult and expensive. It's understandable why they are not there and it's a tradeoff. However, I don't see this as a "feature" on the TSI, particularly in the power department.

> *Is there magic in a manifold/ko4, if you consider that the market has all but exhausted the Ko4 hardware and software manipulations with no major gains, and you can simply bolt this part on and see 10+HP, then yes, this is a win.*

Marcel, can you provide any data showing the manifold does indeed provide an additional 10+ HP? We're still not seeing this in any of the data we have. Ryan even showed us a loss in mass airflow and a decrease in power with increased lag.

> *With the FSI and Tsi, our intake is 1:1 in design the same as owm , both short runner, we simply feed more flow (24+% Fsi, 11+% Tsi) to the individual cylinder inlets over factory. If this was detrimental, then I would think ported Heads, flapper deletes etc have no place in the market.*

Marcel,

let's clear a few things up.

The Flapper delete on the FSI is quite different than one on a TSI. It's also very different from the concept of ported heads and larger intake manifolds. As I said before, the flap on the FSI is literally in the middle of the port and when open still blocks flow. With it removed, it's simply no longer there (just like the factory TSI manifold design). Removing it provides an increase in power. This is most notably on higher output applications.

When it comes to the K04, TSI and FSI, every ported head and intake manifold we've seen available has resulted in a loss of power. Why? Because they aren't a bottleneck. With the turbo tapped out, the turbo itself becomes a bottleneck before these items. As such, *uncorking* them, so to speak, simply results in a loss of velocity and power decreases. If you're lucky, tuning can help bring the power back to stock. This is easier if you're holding back power on the stock manifold tune and just turning up the wick on the new manifold tune.

GoAPR.com | Facebook | YouTube | Twitter | Instagram
Phone: (800) 680-7921 **Local Phone:** +1 (334) 502-5181 **Fax:** +1 (334) 502-5180
Address: APR LLC, 4800 US HWY 280 West, Opelika, AL 36801

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