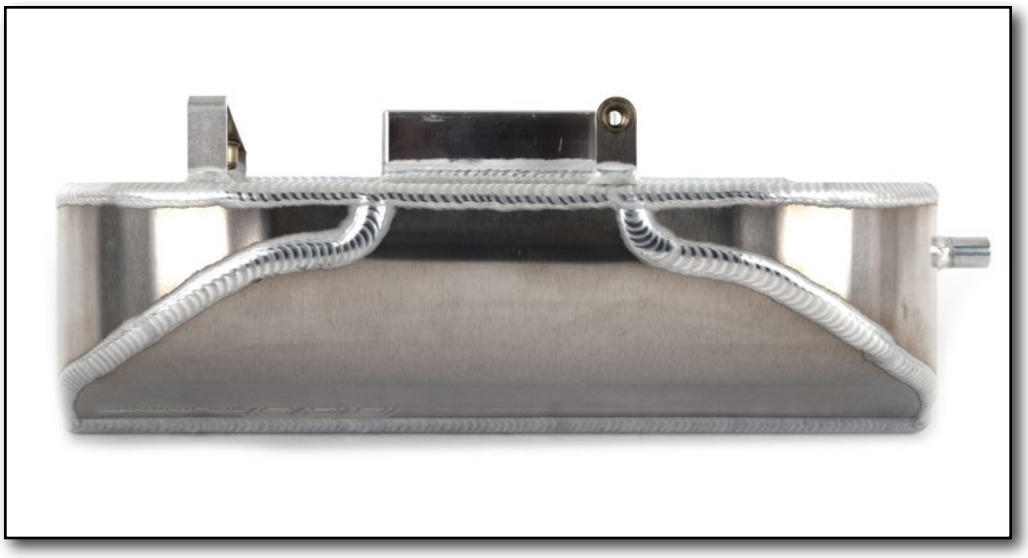
VW/Audi Gen3 TSI Aluminum Intake Manifold Installation Instructions - ES4315775

Skill Level
3 - Advanced

Advanced Skills & Experience Recommended



Proper service and repair procedures are vital to the safe, reliable operation of all motor vehicles as well as the personal safety of those performing the repairs. Standard safety procedures and precautions (including use of safety goggles and proper tools and equipment) should be followed at all times to eliminate the possibility of personal injury or improper service which could damage the vehicle or compromise its safety.

INTRODUCTION

Introducing our fabricated aluminum intake manifold for the Gen3 TSI engine! This manifold has been designed from the ground up with performance in mind. NPT ports on each runner as well as underneath the throttle body can be used for auxiliary fueling, cooling, or power adders. This manifold eliminates the problematic runner flap system, so you will see a change in idle quality and overall driveability as a result of the removal of that system. This manifold should not be your only modification, it is meant to compliment a bigger turbo, meth injection, or other serious power adders.

The photo on the right shows what we picked as our "must have" tools for this job. A ¼" drive T25 socket and telescoping grabber tool are worth their weight in gold when it comes time to remove the tough-to-reach hardware along the bottom of the intake manifold. Check out Page 5 for more required tools.

This install is not for the faint of heart or the mechanical novice. A seasoned pro might be able to finish the job in a single day, but you should probably plan on dedicating a weekend to the job. Be sure to read all of these instructions ***BEFORE*** you start the install. Check the required tool list to make sure you have everything you need. Thank you for looking to ECS Tuning for all your performance and repair needs, we appreciate your business!

TABLE OF CONTENTS

ECS Aluminum Intake Manifold w/Installation Hardware
Available in black powdercoat or raw finish, more details on the next page

BASIC INSTALL KIT CONTENTS

Note: All of our Gen3 manifolds come w/this install kit. Other available upgrades shown on the next page.

x1

Large O-Ring Seal
(Seals throttle body to intake manifold)

x4

Small O-Ring Seal
(Seals intake runner flange to cylinder head)

x6

⅛ NPTF Threaded Plug

x1

¼ NPTF Threaded Plug

(Used to plug unused vacuum ports in the intake manifold, near the throttle body)

x1

⅛ NPTF ¼" Hose ID Barbed Fitting

x2

¼ NPTF 5⁄16" Hose ID Barbed Fitting

x1

⅛ NPTF ⅛" Hose ID Barbed Fitting

(Used to connect vacuum hoses to the intake manifold, near the throttle body)

x2

5⁄32" ID Silicone Vacuum Cap
(For unused ports on vacuum pump & intake pipe)

x10

M6x30mm Bolt
(Used to secure the manifold to the cylinder head)

x4

M6x45mm Bolt
(Used to secure the throttle body to the manifold)

x5

M6x14mm Bolt
(Used to secure the plastic coolant pipe, wiring harness bracket & MAP sensor to the manifold)

x1

M6 Flat Washer
(Used to secure the MAP sensor to the manifold)

AVAILABLE UPGRADES

Fuel Hose Relocation Kit
(Hides the fuel hose underneath the manifold)

Auxiliary Fuel Blockoff Cap Kit
(For those who are ***not*** using aux. fuel system)

Auxiliary Fuel Hardware Kit
(For those who ***are*** using aux. fuel system)

ECS Baffled Oil Catch Can Kit
(For those who don't want to use stock PCV)

Auxiliary Port Fuel Injection Kit
(Ideal for big turbo builds which require additional fuel supply)

Low Pressure Fuel Pump Upgrade
(Upgraded in-tank pump)

Upgraded High Pressure Fuel Pump
(Upgraded under-hood pump assembly)

High Pressure Fuel Pump Upgrade Kit
(Upgraded internals for under-hood HPFP)

REQUIRED TOOLS

Note: The tools required for each step will be listed by the step number throughout these instructions.

Standard Automotive Tools

- Protecta-Sockets (for lug nuts) ..... ES#2221243
- **⅜" Drive Ratchet** ..... ES#2765902
- **⅜" Drive Torque Wrench** ..... ES#2221245
- **⅜" Drive Deep and Shallow Sockets** ..... ES#2763772
- **⅜" Drive Extensions** ..... ES#2804822
- Hydraulic Floor Jack ..... ES#2834951
- **Torx Drivers and Sockets** ..... ES#11417/8
- ½" Drive Deep and Shallow Sockets ..... ES#2839106
- ½" Drive Ratchet
- ½" Drive Extensions
- ½" Drive Torque Wrench ..... ES#2221244
- ½" Drive Breaker Bar ..... ES#2776653
- Bench Mounted Vise
- Crows Foot Wrenches
- **Hook and Pick Tool Set** ..... ES#2778980

Required For This Install

- ¼" Drive Ratchet ..... ES#2823235
- ¼" Drive Deep and Shallow Sockets ..... ES#2823235
- ¼" Drive Extensions ..... ES#2823235
- **Plier and Cutter Set** ..... ES#2804496
- **Flat and Phillips Screwdrivers** ..... ES#2225921
- Jack Stands ..... ES#2763355
- Ball Pein Hammers
- Pry Bar Set ..... ES#1899378
- Electric/Cordless Drill
- Wire Strippers/Crimpers
- Drill Bits
- Punch and Chisel Set
- **Hex Bit (Allen) Wrenches and Sockets** ..... ES#11420
- Thread Repair Tools ..... ES#1306824
- **Open/Boxed End Wrench Set** ..... ES#2765907

Available On Our Website

Specialty Tools

- **¼" Drive Set (incl. ¼" Drive T30 Torx Socket)** ..... ES#2823235
- **Stubby Socket Driver Set** ..... ES#3103367
- **Telescoping Grabber Tool** ..... ES#3128444
- **Triple Square Sockets** ..... ES#1910125

INSTALLATION NOTES

- **RH** refers to the ***passenger side*** of the vehicle.
- **LH** refers to the ***driver side*** of the vehicle.
- Always use the proper torque specifications.
- If applicable to this installation, torque specifications will be listed throughout the document and at the end as well.
- Please read all of these instructions and familiarize yourself with the complete process **BEFORE** you begin.

GENERAL PREPARATION AND SAFETY INFORMATION

ECS Tuning cares about your health and safety, please read the following safety information. This information pertains to automotive service in general, and while it may not pertain to every job you do, please remember and share these important safety tips.

- Park your car in a safe, well lit, level area.
- Shut the engine off and remove the key from the ignition switch.
- Make sure any remote start devices are properly disabled.
- **ALWAYS** wear safety glasses.
- Make sure the parking brake is applied until the vehicle is safely lifted and supported.
- Whether lifting a vehicle using an automotive lift or a hydraulic jack, be sure and utilize the factory specified lift points.
- Lifting a vehicle in an incorrect location can cause damage to the suspension/running gear.
- **ALWAYS** support the vehicle with jack stands.
- **ALWAYS** read and follow all safety information and warnings for the equipment you are using.

NEVER get underneath a vehicle that is supported only by a jack, and ALWAYS make sure that the vehicle is securely supported on jack stands.

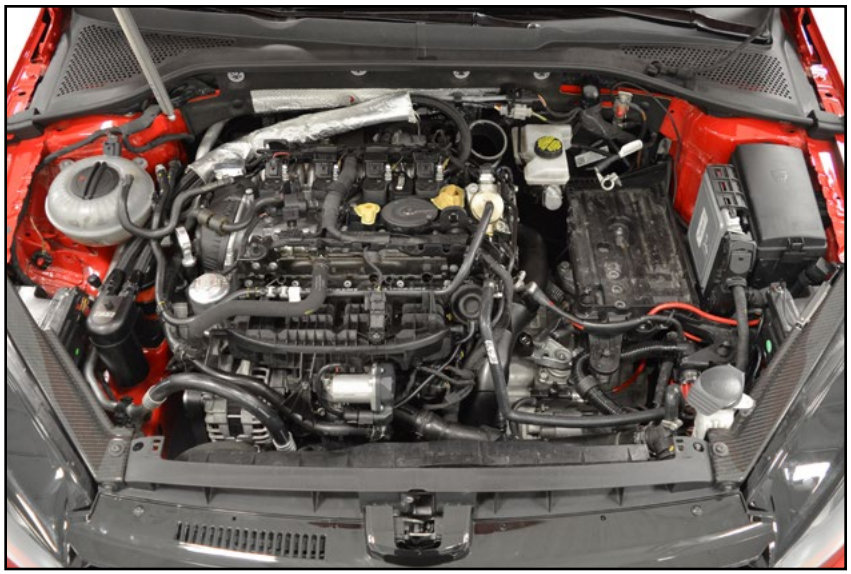
REMOVING THE STOCK INTAKE MANIFOLD

Step 1: 10mm Socket & Ratchet, T25 Torx

Open the hood and wait at least 10 minutes after the engine has been shut off, do not open any doors during this time. The fuel system will internally relieve fuel pressure, minimizing the risk of spilled fuel later on.

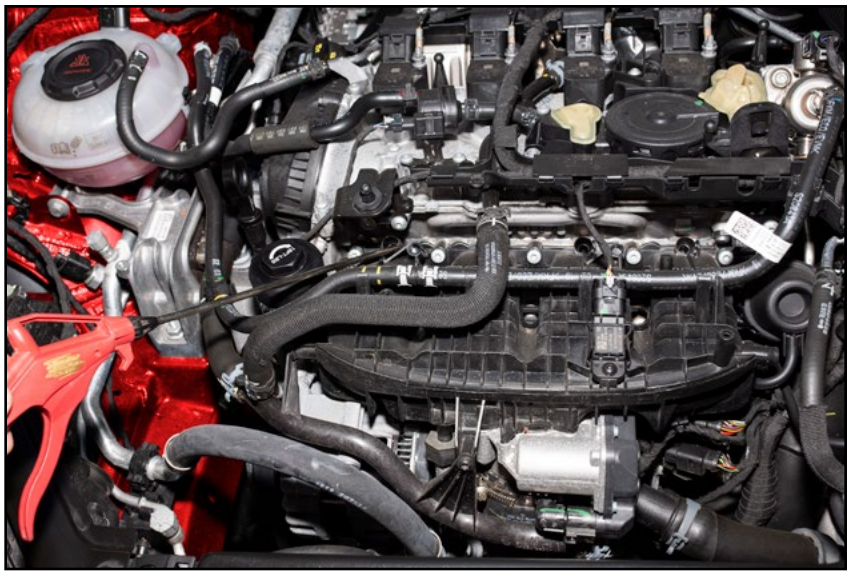
Disconnect the negative (–) battery terminal. Remove the engine cover, intake system and air inlet.

CAUTION: DO NOT skip this step. If the battery is not disconnected the ECU may prime the fuel pump ***without warning***, causing high pressure fuel to spray into the engine compartment.



Step 2:

Use compressed air to blow away any dirt or debris away from where the intake manifold meets the cylinder head.

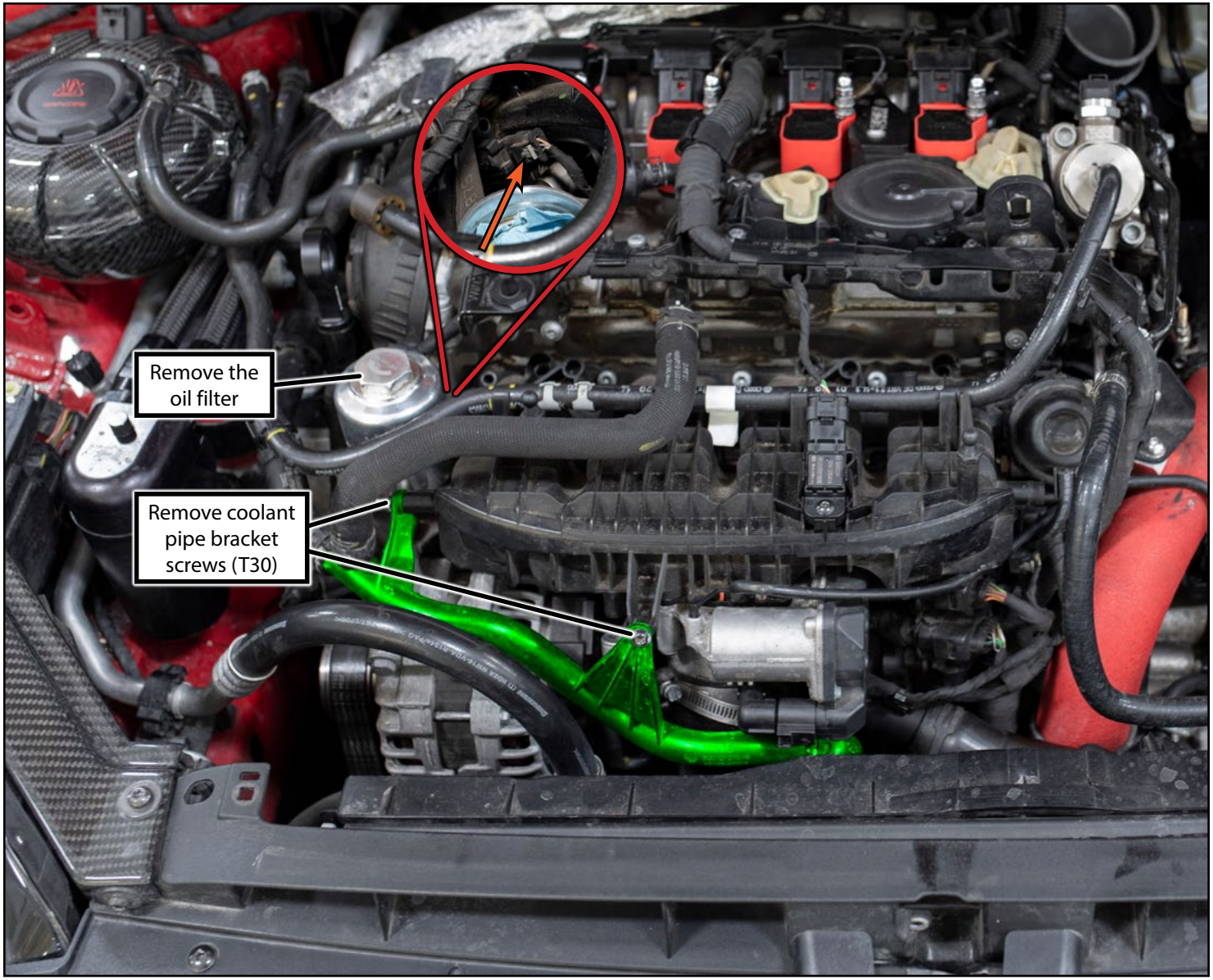


REMOVING THE STOCK INTAKE MANIFOLD

Step 3:

Remove the engine oil filter, cover the cavity to prevent anything from falling in. Remove the two T30 screws which secure the plastic coolant pipe (highlighted in **GREEN**) to the intake manifold (**BLACK** boxes).

Disconnect the runner flap actuator connector (arrow in the **RED** inset photo).



REMOVING THE STOCK INTAKE MANIFOLD

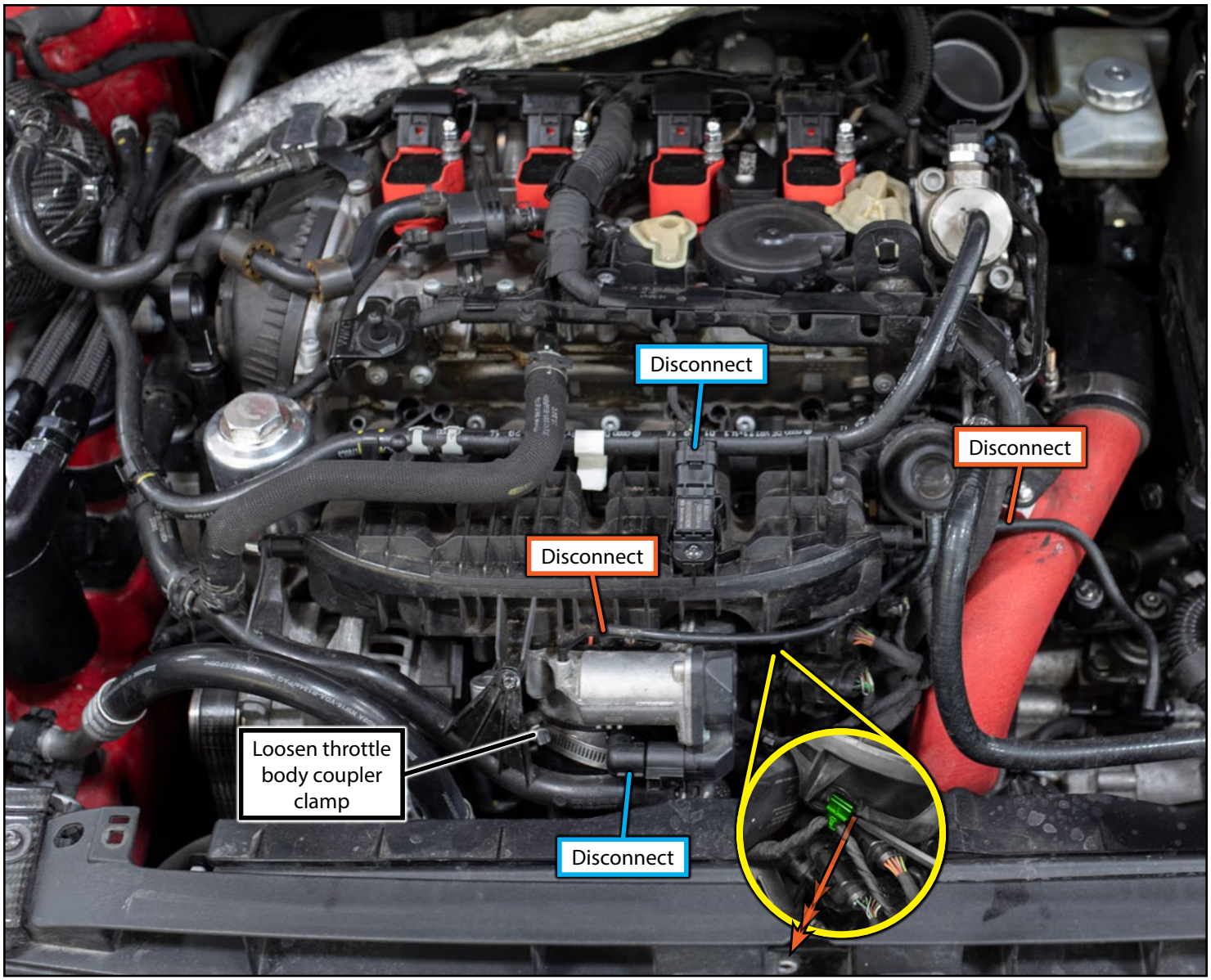
Step 4:

Loosen the throttle body coupler clamp (**BLACK** box).

Disconnect the MAP sensor and throttle body connectors (**BLUE** boxes).

Gently pry downwards on the clip which secures the throttle body wiring harness to the manifold (highlighted in **GREEN** in the **YELLOW** inset photo).

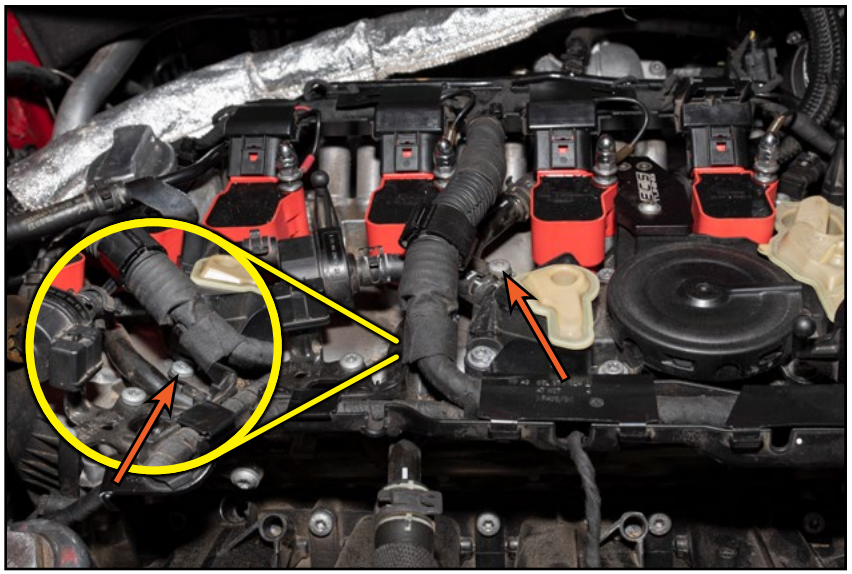
Disconnect any vacuum lines from the manifold. This may include boost tap leads, runner flap actuator lines, etc. (**ORANGE** boxes).



REMOVING THE STOCK INTAKE MANIFOLD

Step 5: T30 Torx

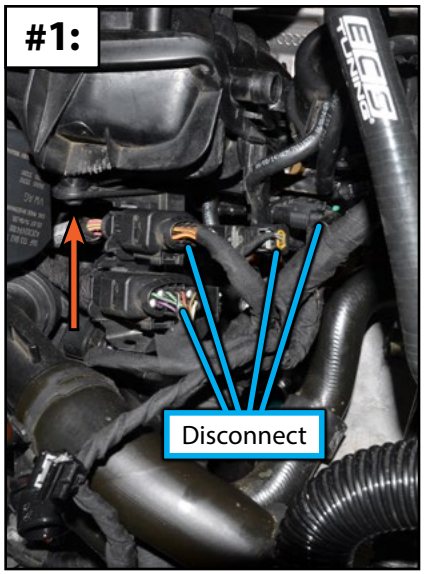
Remove the two screws (**ORANGE** arrows) which secure the coolant pipe to the valve cover. One of them is a bit tricky to reach because it's tucked underneath the wiring harness loom (**YELLOW** inset photo).

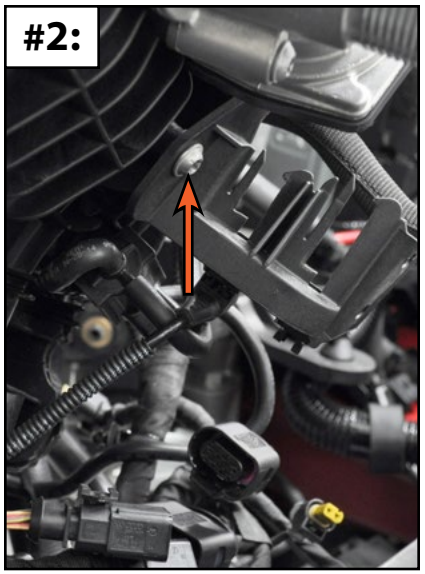


Step 6: T30 Torx

Disconnect the electrical connectors located underneath the intake manifold (**BLUE** box in **Photo #1**), then slide them out of the bracket.

Remove the two screws which secure the wiring harness bracket to the bottom of the manifold (**ORANGE** arrows in **Photo #1** and **Photo #2**).





REMOVING THE STOCK INTAKE MANIFOLD

Step 7:

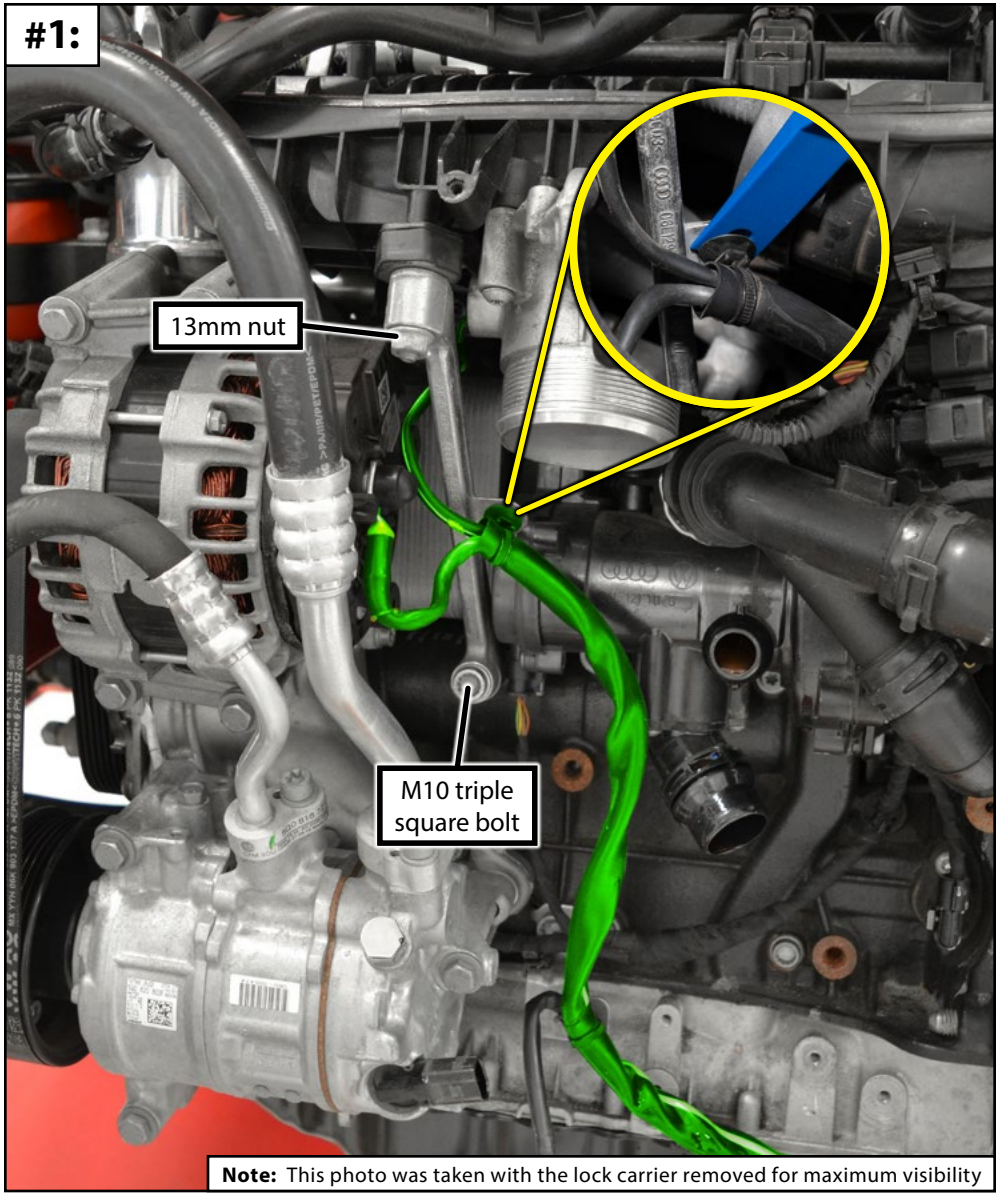
Now for the hardest part of this install, the support bracket (**Photo #1**). This thing can be a real pain to reach, but removing the throttle body will give you some extra space to work (see Page 15).

Release the harness from the bracket (**YELLOW** inset photo in **Photo #1**).

The 13mm nut is easy to reach. The triple square bolt on the other hand is extremely difficult to get at. We've tried everything, we ended up using a ½" drive socket, ⅜" drive to ½" drive adapter, ⅜" drive extension and ratchet. Use a flashlight, mirror, or a freaking magician to get this bolt out, whatever works!

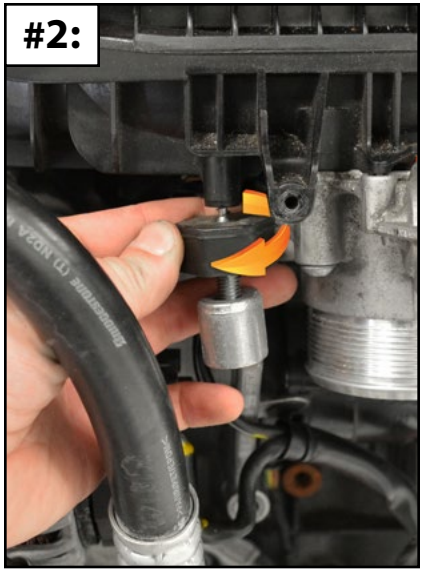
Unthread the rubber bushing from the intake manifold and remove it (**Photo #2 & Photo #3**).

#1:



Note: This photo was taken with the lock carrier removed for maximum visibility

#2:



#3:

REMOVING THE STOCK INTAKE MANIFOLD

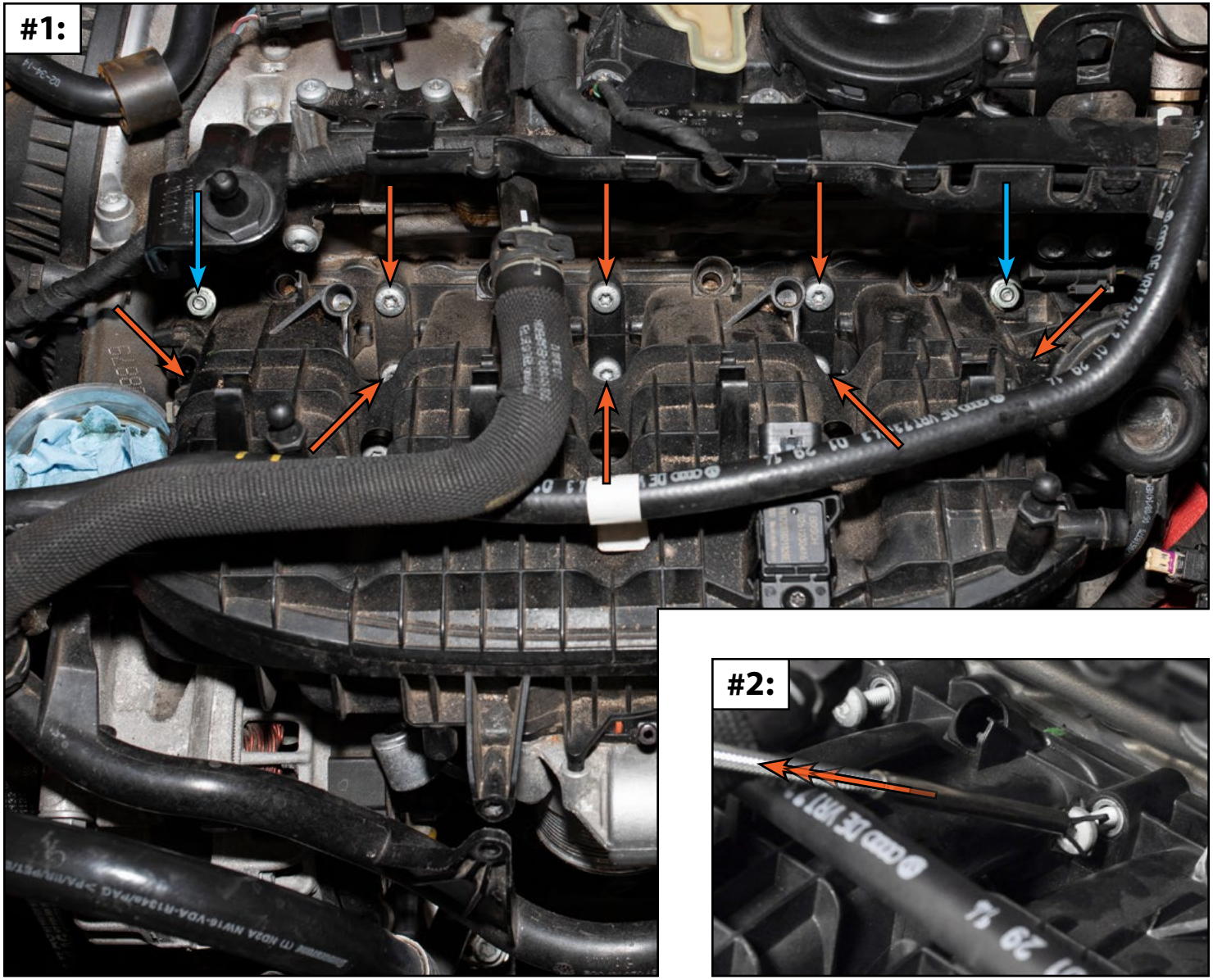
Step 8:

There are eight T30 Torx bolts (**ORANGE** arrows in **Photo #1**) and two 10mm nuts (**BLUE** arrows in **Photo #1**) which secure the intake manifold to the cylinder head.

The lower bolts can be a little tricky to see, let alone reach. We've found that a set of good ¼" drive sockets and long extensions work really well here.

The ¼" drive T30 socket which can be found in ES#2823235 is also very handy to have for this job, there simply isn't enough space to get a ⅜" drive T30 socket underneath the intake manifold to reach those lower bolts. A telescoping magnet or grabber tool can really come in handy as well (**Photo #2**).

#1:



#2:

REMOVING THE STOCK INTAKE MANIFOLD

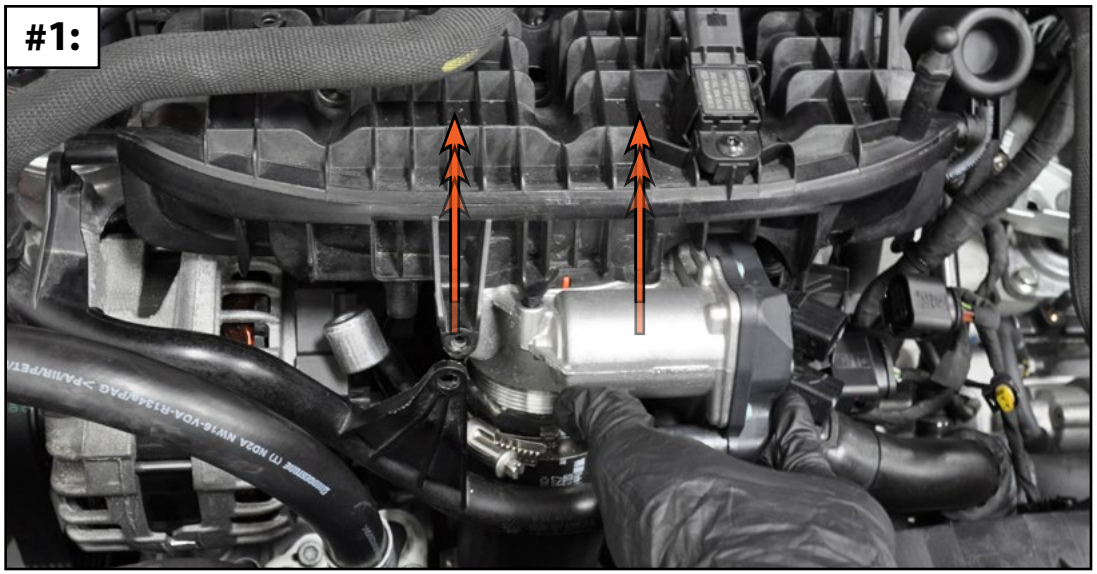
Step 9:

Double check to ensure that all electrical connectors, hoses, lines, etc. have all been removed and the intake manifold is ready for removal.

Pull the intake manifold toward the front of the vehicle slightly so that it comes free from the studs in the top corners. Gently lift the manifold upwards to release the throttle body coupler from the throttle body (**Photo #1**).

Gently pull the intake manifold away from the engine, check again to see if any lines or harness connectors are still connected (**Photo #2**), then remove it from the engine bay (**Photo #3**).

#1:



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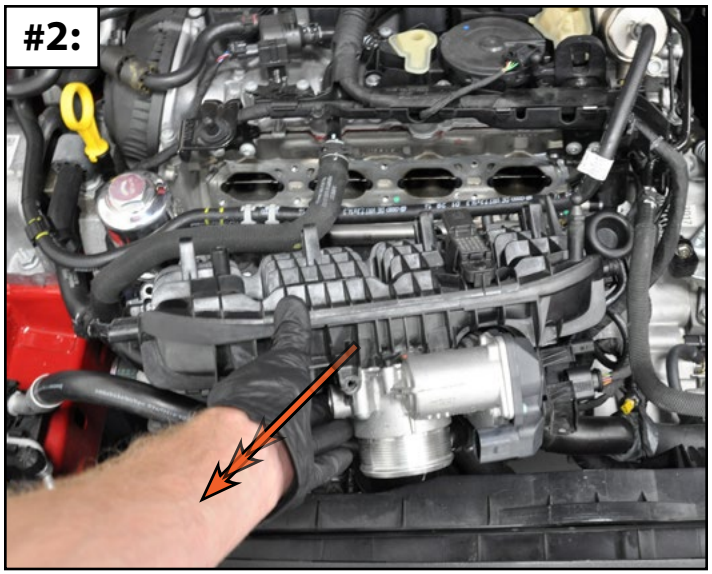

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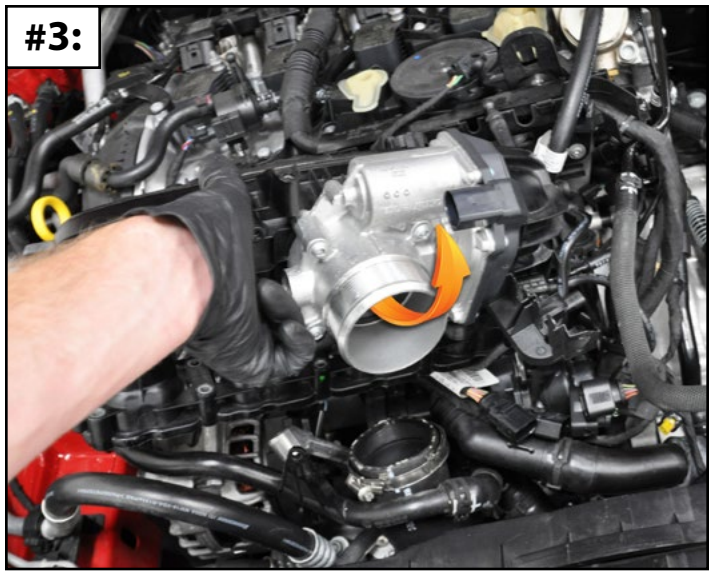


REMOVING THE STOCK INTAKE MANIFOLD

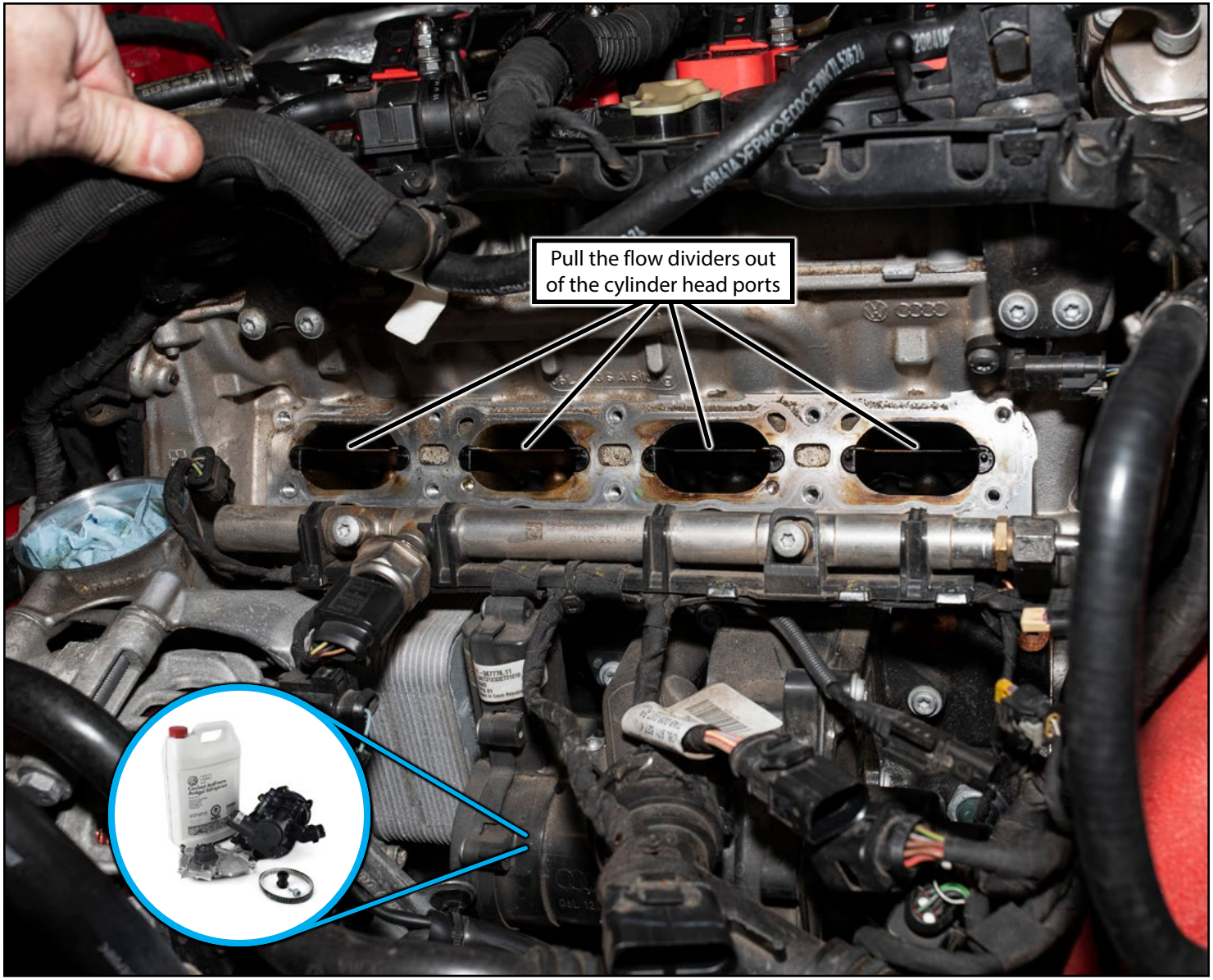
Step 10:

Pull the flow dividers out of the cylinder head ports.

Clean the mating surface on the cylinder head, then cover the ports with masking tape to prevent anything from falling inside while you work.

This is a good opportunity to think about walnut blasting or carbon cleaning. Take a close look around the water pump and thermostat (**BLUE** inset photo) and look for any signs of coolant leaks. These parts have been known to fail on these engines, and they are ***MUCH*** easier to reach right now with the intake manifold removed!

NOTE: Since the Gen3 engine is direct injection, there's no need to worry about injector seals like on FSI or TSI engines.



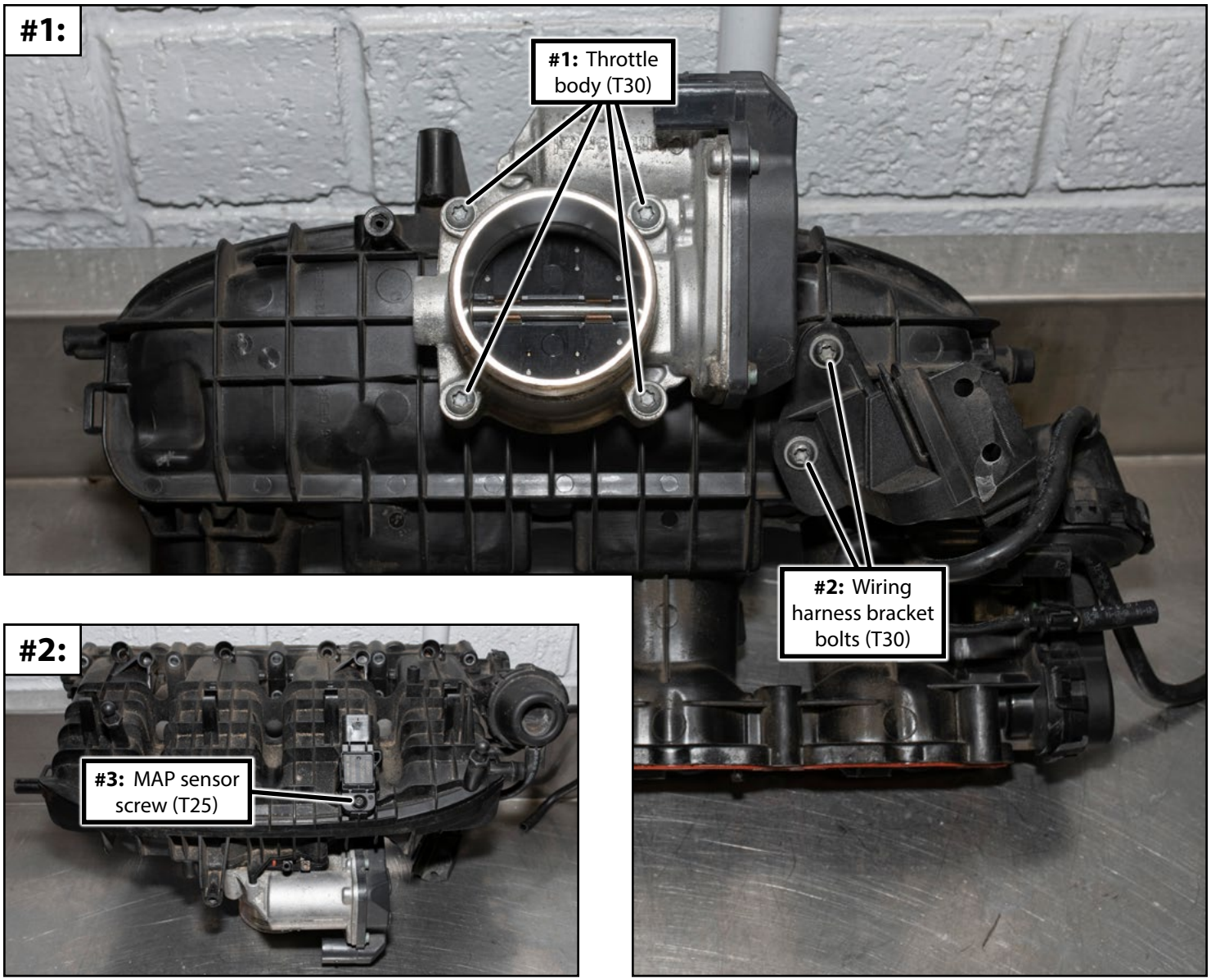
PREPPING THE NEW INTAKE MANIFOLD FOR INSTALL

Step 1:

Remove the throttle body and the wiring harness bracket (if you didn't remove this bracket earlier) from underneath the stock manifold (**Photo #1**).

Remove the MAP sensor from the top side of the manifold (**Photo #2**).

#1:



#2:

PREPPING THE NEW INTAKE MANIFOLD FOR INSTALL

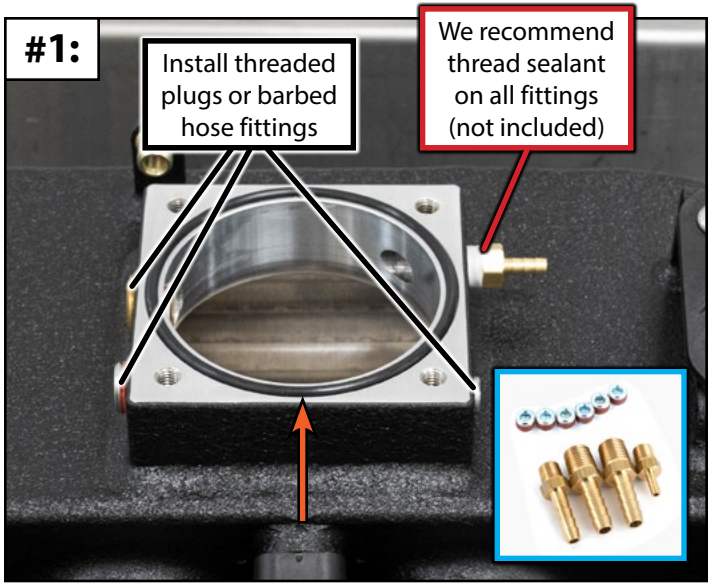
Step 2:

Install the larger o-ring into the channel underneath the new aluminum manifold (arrow in **Photo #1**). If you have trouble getting it to stay in place inside the channel, try to keep it from twisting. Install threaded plugs or barbed hose fittings into the open ports on the throttle body flange (**Photo #1** & **BLUE** inset photo).

Install the throttle body and wiring harness bracket using the supplied bolts. Tighten them until snug. Install the MAP sensor using the supplied M6 screw and flat washer (**Photo #2**).

Install the four smaller o-ring seals into their channels along the front face of the manifold (arrows in **Photo #3**).

#1:



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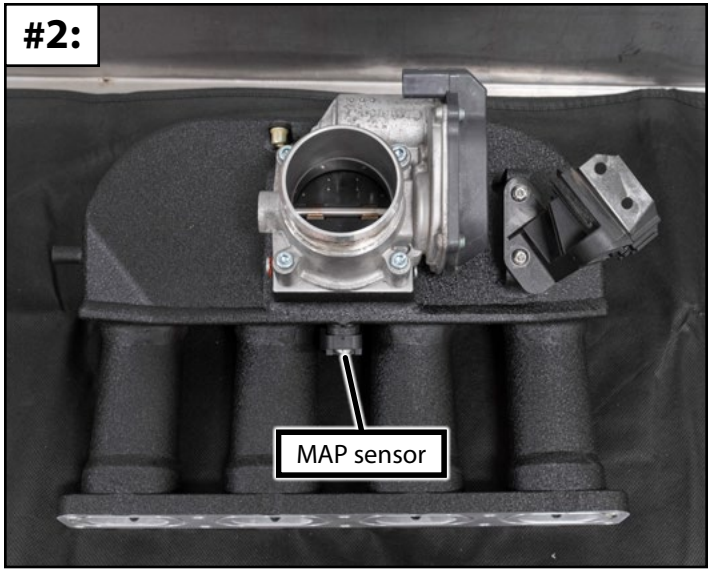

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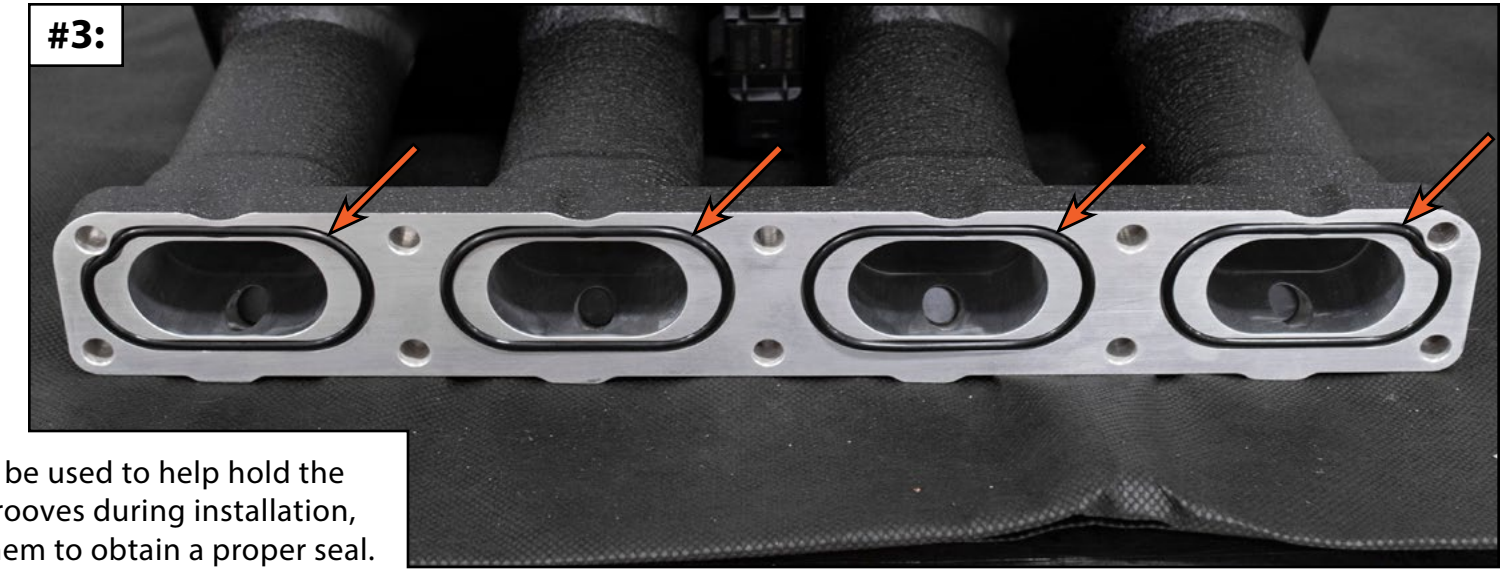


TECH TIP

A dab of grease can be used to help hold the o-rings inside the grooves during installation, and will also help them to obtain a proper seal.

PREPPING THE NEW INTAKE MANIFOLD FOR INSTALL

Step 3:

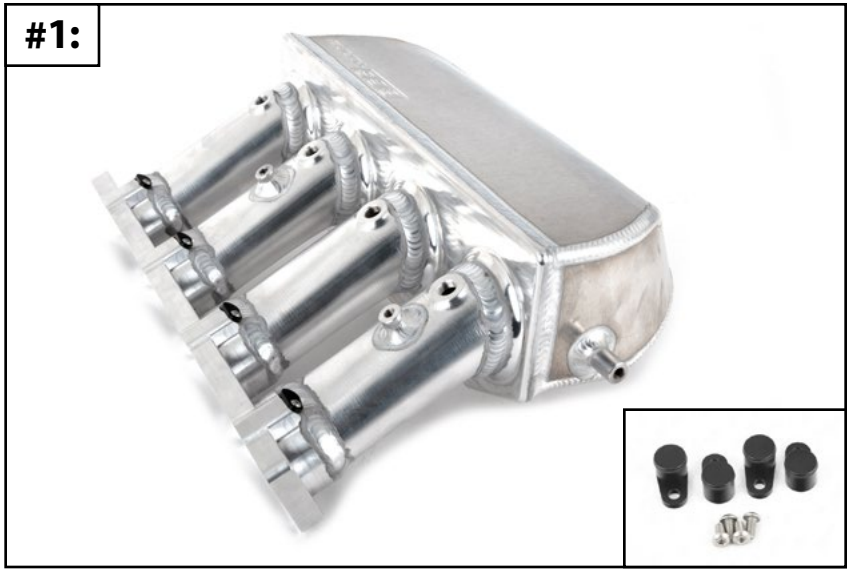
If you are NOT installing an aux. fuel injection kit:

Install the port fuel injection blockoff plugs into the new manifold and tighten the screws to contact + ⅛ turn (**Photo #1**). Apply a single drop of medium strength threadlocker to each screw.

If you ARE installing an aux. fuel injection kit:

Test fit the rail, brackets, cups, clamps, and hardware, then remove them all again (**Photo #2**). Due to differences in manufacturing, you may find that the supplied fuel cup clamps will not fit due to the stacking height with the injectors and rail installed. This is okay since the fuel rail will hold everything in place. If you do install the clamps, be sure to apply a single drop of medium strength threadlocker to each screw.

#1:



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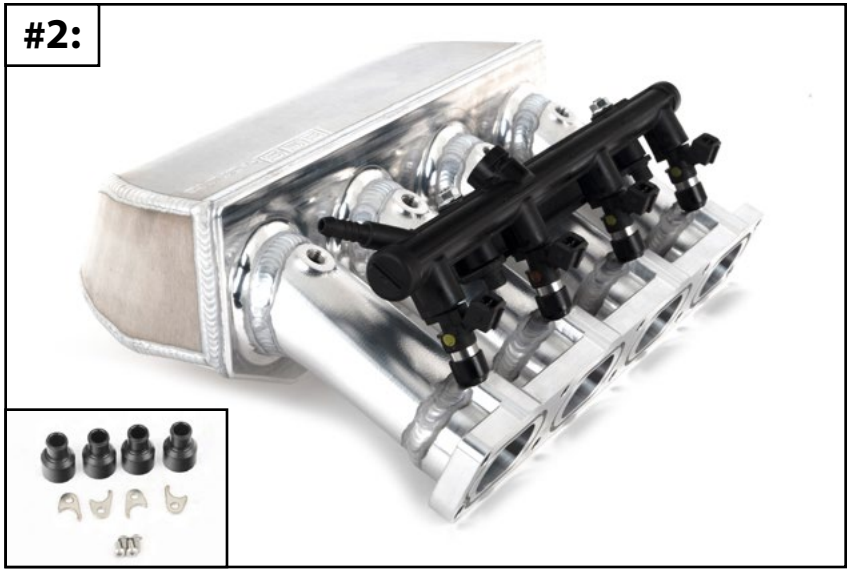


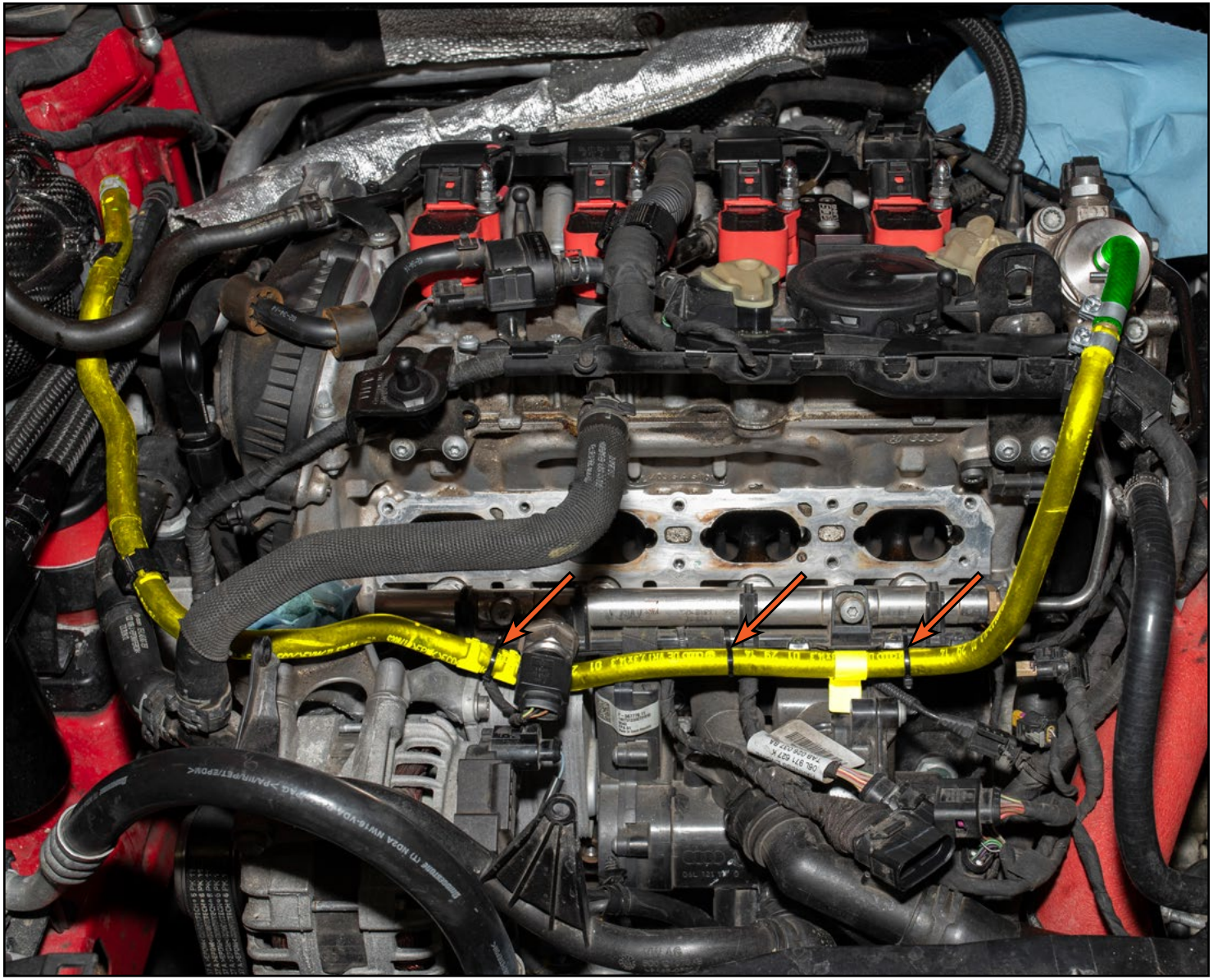
PREPPING THE NEW INTAKE MANIFOLD FOR INSTALL

Step 4:

Now it's time to extend the fuel hose if you purchased the fuel hose relocation kit. This kit includes one meter of fuel hose, a brass hose union and several clamps. This should give you a lot of flexibility in where you choose to route the hose.

We decided to leave the stock fuel hose (highlighted in **YELLOW**) untouched, so we added a short extension (highlighted in **GREEN**) between the stock hose and the HPFP. We then secured the stock hose to the high pressure injector rail with cable ties (arrows).

You can get creative with this step, but the goal is to tuck the fuel hose down somewhere out of sight, but keep it away from any hot or moving components.

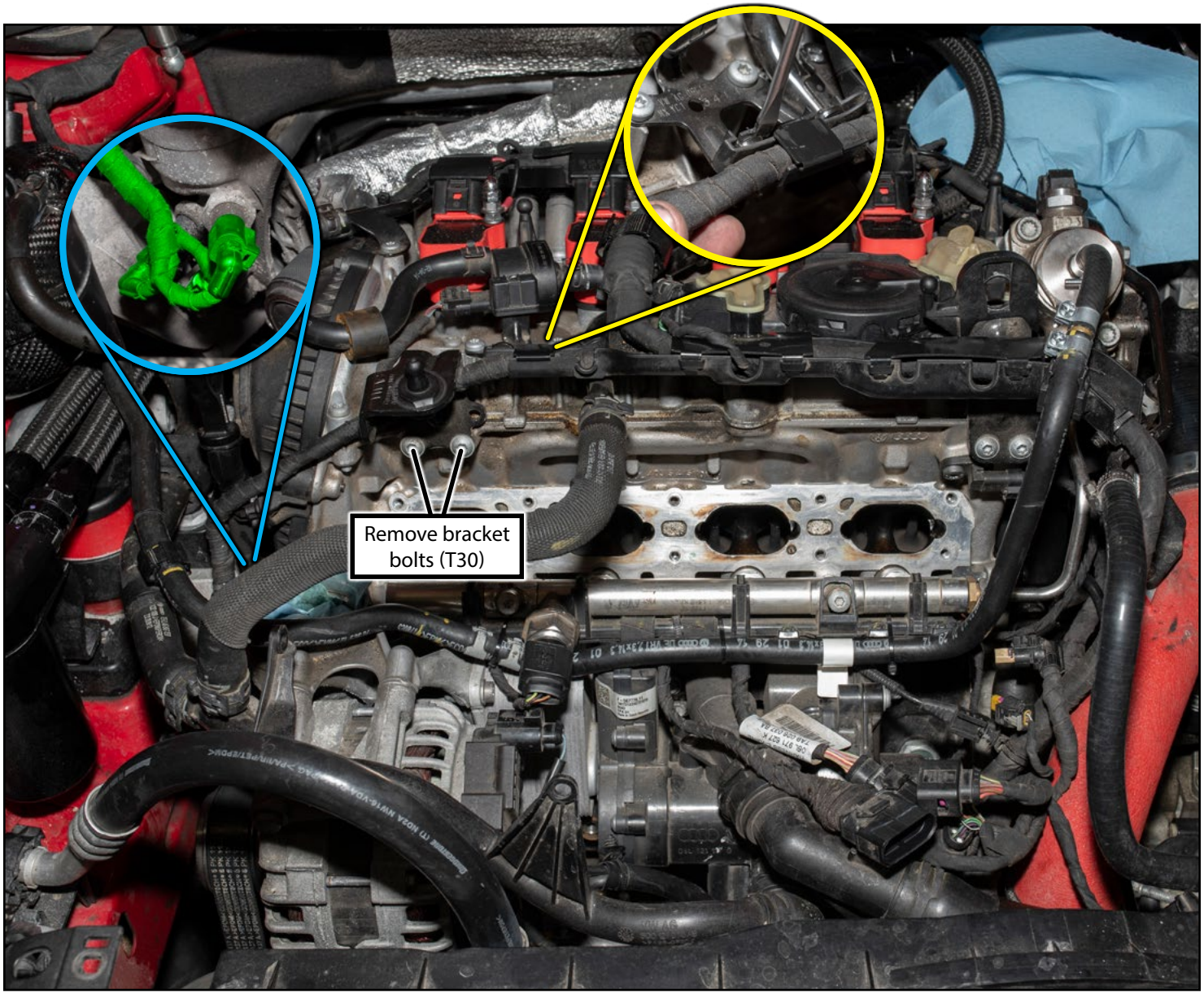


PREPPING THE NEW INTAKE MANIFOLD FOR INSTALL

Step 5:

Now the last step is to give us a little more room to get the new (and larger) manifold into the engine bay. Remove the engine cover support bracket from the RH corner of the cylinder head (**BLACK** box in photo).

We also suggest releasing the engine harness loom which runs along the front of the valve cover. To do this you'll need to disconnect the harness from the RH side just below the oil filter housing (highlighted in **GREEN** in the **BLUE** inset photo). Then, gently pry back on the clip which secures the channel to the valve cover (**YELLOW** inset photo).

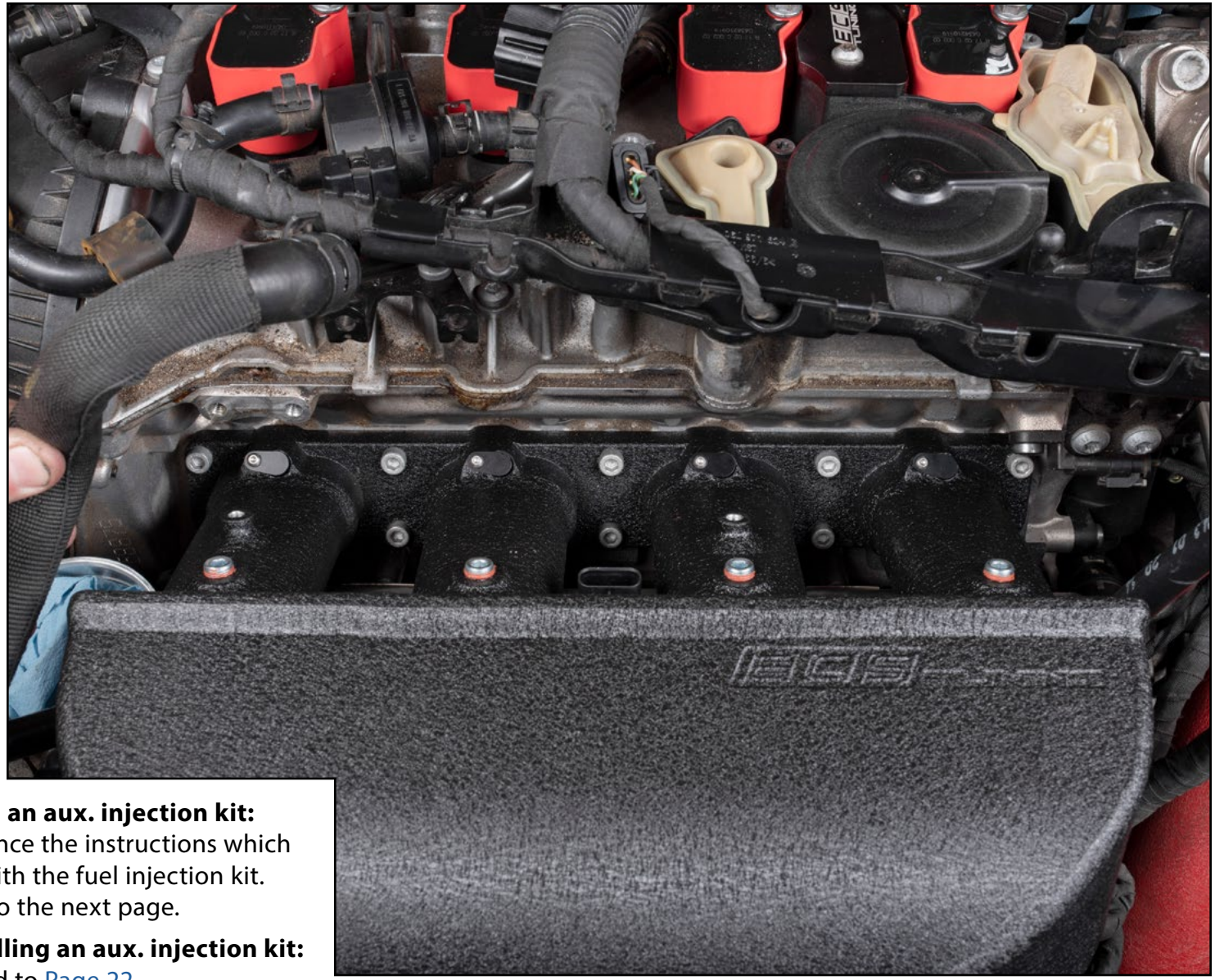


INSTALLING THE NEW INTAKE MANIFOLD

Step 1:

Guide the intake manifold into position, then thread in all of the supplied bolts by hand. We include 10x bolts in the kit so you can remove the two M6 studs from the cylinder head if desired.

Tighten the bolts to 10 Nm.



If you ARE installing an aux. injection kit:

- Be sure to reference the instructions which were included with the fuel injection kit.
- Please proceed to the next page.

If you are NOT installing an aux. injection kit:

- Please skip ahead to Page 22.

INSTALLING THE NEW INTAKE MANIFOLD

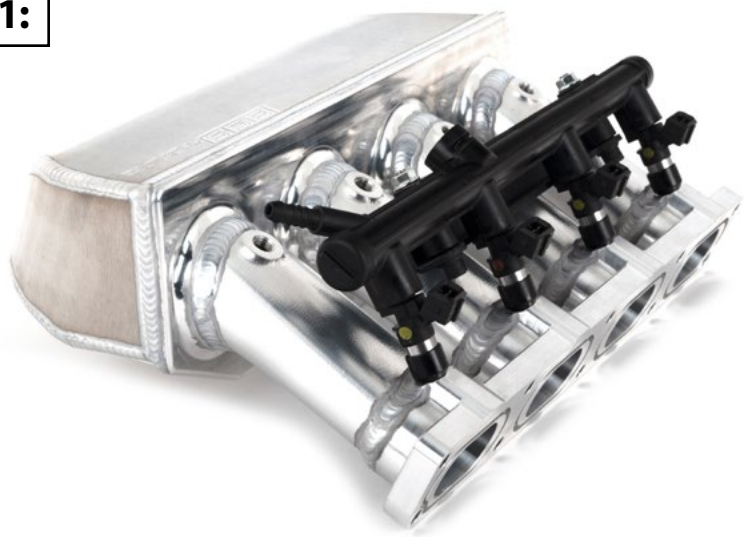
Step 2:

If you ARE installing an aux. injection kit only:

Install the fuel cups, fuel rail bracket, injectors and wiring harness into the manifold (**Photo #1, Photo #2 & Photo #3**).

Be sure to reference the instructions which were included with the fuel injection kit.

#1:



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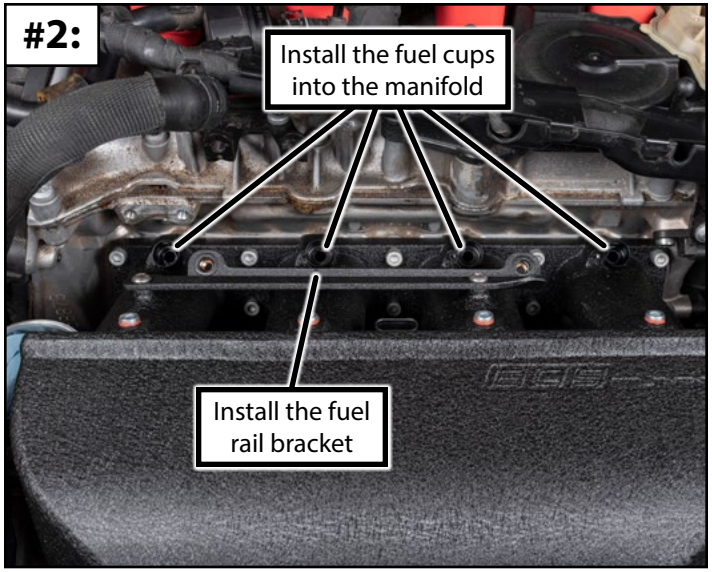

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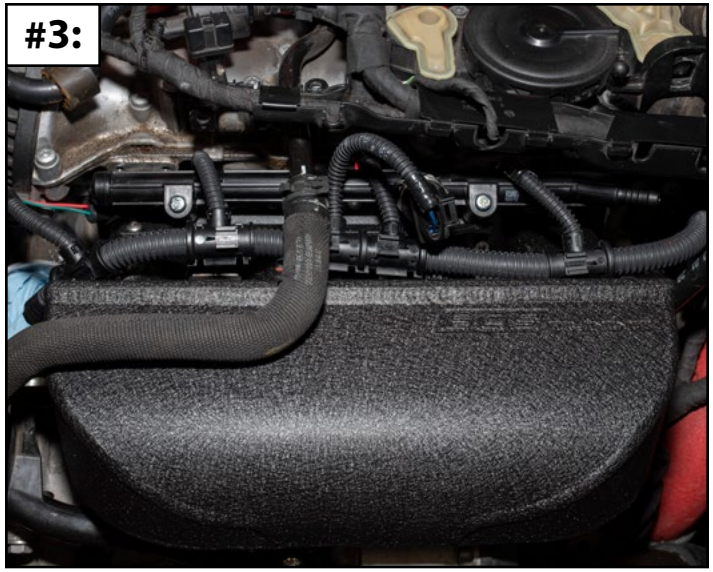
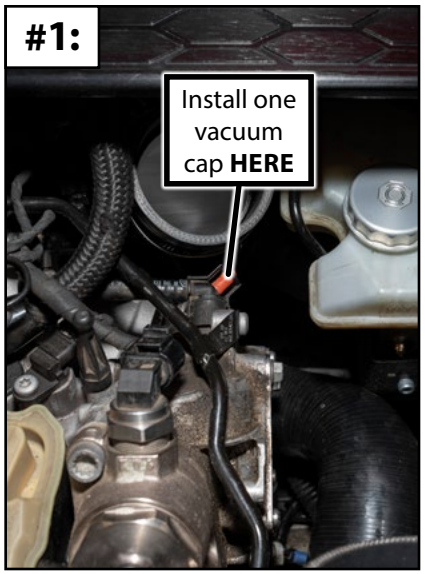


- [ ] Reinstall the engine oil filter and the metal coolant pipe on top of the valve cover. Reinstall the engine cover bracket.
- [ ] Reinstall the plastic coolant pipe to the intake maniold using the supplied M6 screws.
- [ ] Install the supplied vacuum caps into place on the vacuum pump (**Photo #1**) and intake pipe (**Photo #2**).
- [ ] Reinstall the intake system and air inlet (**Photo #3**).
- [ ] Connect any remaining fuel lines, harness connectors, etc.
- [ ] Reconnect the negative (–) battery terminal.
- [ ] Cycle the ignition key from **OFF** to **ON** several times (without cranking the engine) to cycle the fuel pump. Check for fuel leaks.
- [ ] Start the engine, check again for fuel leaks.
- [ ] If you experience any high idle or boost leak issues, be sure to check the o-rings for leaks or tears, and ensure that all ports have been appropriately tapped or plugged.
- [ ] Bring your vehicle to a local tuner for a custom tune which includes runner flap delete.

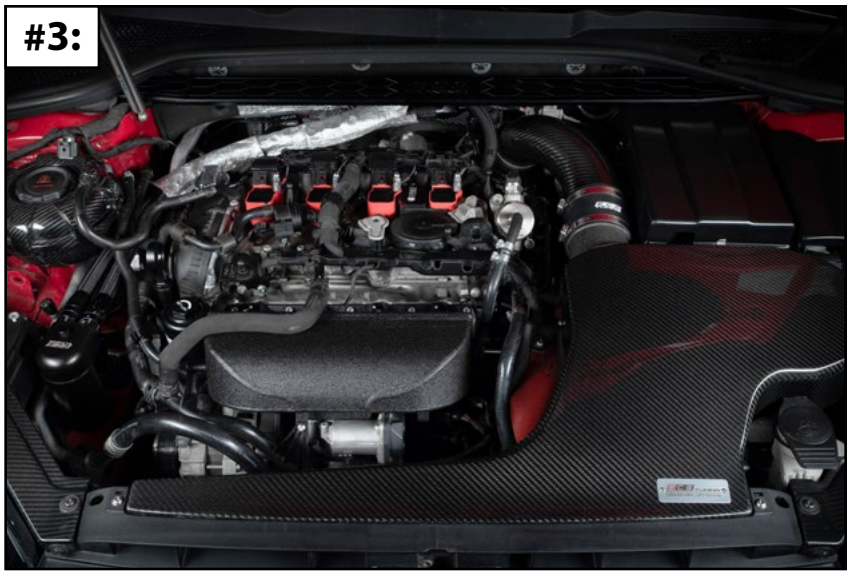
Congratulations, your Gen3 TSI Aluminum Intake Manifold installation is complete!

#1:



#2:

#3:



Your Gen3 TSI Fabricated Aluminum Intake Manifold installation is complete!

These instructions are provided as a courtesy by ECS Tuning

Proper service and repair procedures are vital to the safe, reliable operation of all motor vehicles as well as the personal safety of those performing the repairs. Standard safety procedures and precautions (including use of safety goggles and proper tools and equipment) should be followed at all times to eliminate the possibility of personal injury or improper service which could damage the vehicle or compromise its safety.

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