

VERUS ENGINEERING

AOS Kit and Accessories – Subaru VA STI Install Manual



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1. Introduction

1.1. Overview: Detailed instructions on installing the Verus Engineering AOS kit, as well as the accessories associated with the AOS kit, for the VA Subaru STI.

1.2. Difficulty: Easy to Moderate

1.3. Time Required: 2-4 hours

1.4. Tools Needed:

- 1.4.1. Impact/Ratchet
- 1.4.2. 10mm Socket
- 1.4.3. 12mm Socket
- 1.4.4. 19mm Deep Socket
- 1.4.5. Extension
- 1.4.6. 3mm Allen Wrench
- 1.4.7. 4mm Allen Wrench
- 1.4.8. Scissors
- 1.4.9. Flathead Screwdriver
- 1.4.10. Side Cuts
- 1.4.11. Needle Nose Pliers
- 1.4.12. Various Allen Wrenches
- 1.4.13. Teflon Tape or Teflon Sealant
- 1.4.14. Utility Knife/Box Cutter
- 1.4.15. Tape Measure

**1.5. AOS Kit Components**

- 1.5.1. (1) AOS, Assembled with (4) Desiccant filters and stainless mesh
- 1.5.2. (1) AOS Bracket
- 1.5.3. (6) Feet 1/2" Rubber Hose

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- 1.5.4. (2) Feet 3/8" Rubber Hose
- 1.5.5. (4) Inches 3/4" Rubber Hose
- 1.5.6. Hardware Bag
 - 1.5.6.1. (1) M8x1.25 BHCS (Button Head Cap Screw) x 8mm Long, Stainless
 - 1.5.6.2. (1) M8 Washer, Stainless
 - 1.5.6.3. (1) M6x1.0 BHCS x 12mm Long, Stainless
 - 1.5.6.4. (1) M6 x 18mm OD Washer, Stainless
 - 1.5.6.5. (1) M6x1.0 Serrated Nut, Stainless
 - 1.5.6.6. (5) M6x1.0 BHCS x 16mm Long, Stainless
 - 1.5.6.7. (5) M6 x 12mm OD Washer, Stainless
 - 1.5.6.8. (2) Hose Clamp, 9-16mm
 - 1.5.6.9. (6) Zip Tie
 - 1.5.6.10. (1) 1/2" Y Adapter
 - 1.5.6.11. (1) 1/2" to 3/4" Adapter

**1.6. Coolant Add On Kit**

- 1.6.1. (1) Coolant Plate
- 1.6.2. (2) Banjo Bolt
- 1.6.3. (4) Banjo Washer
- 1.6.4. (2) 5/16" Banjo
- 1.6.5. (5) Feet coolant hose
- 1.6.6. (4) M6x1.0 BHCS x 16mm Long, Stainless
- 1.6.7. (2) M6 x 12mm OD Washer, Stainless
- 1.6.8. (4) Hose Clamp, 9-16mm
- 1.6.9. (4) Zip Tie

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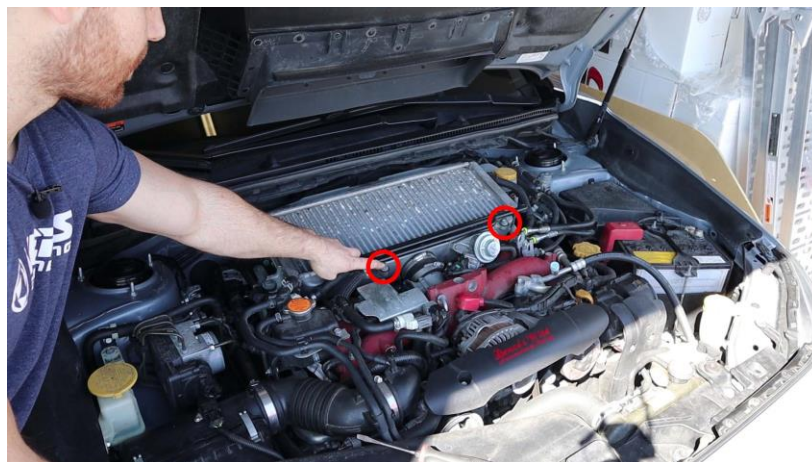
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2. Subaru VA STI AOS Kit

- 2.1. Verus Engineering is not responsible for damage to you or your vehicle by following this manual and/or installing Verus Engineering products.
- 2.2. For the install, we will be working in the engine bay, so pop the hood.



- 2.3. For this install, we have to remove the intercooler if you still have a TMIC (Top Mount Intercooler). Start by removing the (2) 12mm bolts that hold the vent tube on circled below in red.



- 2.4. Remove the BPV by taking the two 12mm bolts off, shown circled below in yellow.

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2.5. Undo the charge cooler silicone hose by loosening the clamps, circled in blue below.



2.6. We can remove the charge cooler by removing the (2) 12mm bolts holding the cooler to the cooler brackets, these are circled below in orange.



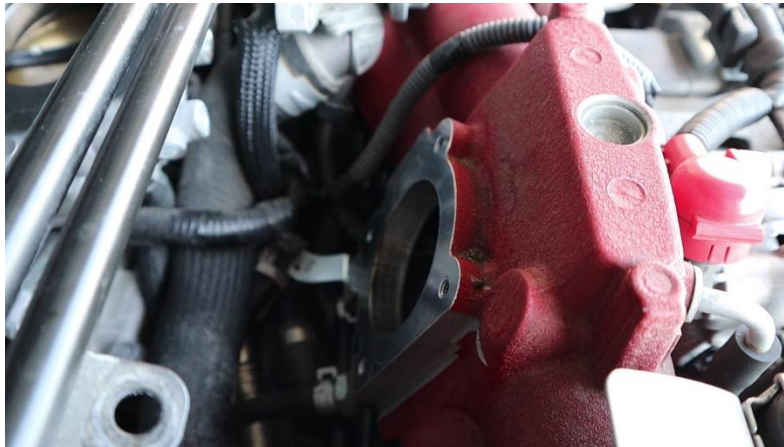
2.7. Remove the charge cooler from the car.

2.8. We will also need to remove the throttle body. Do so by using a deep 10mm socket and removing the (4) bolts that attach the throttle body to the intake manifold. Eric is pointing to one of these bolts in the image below.

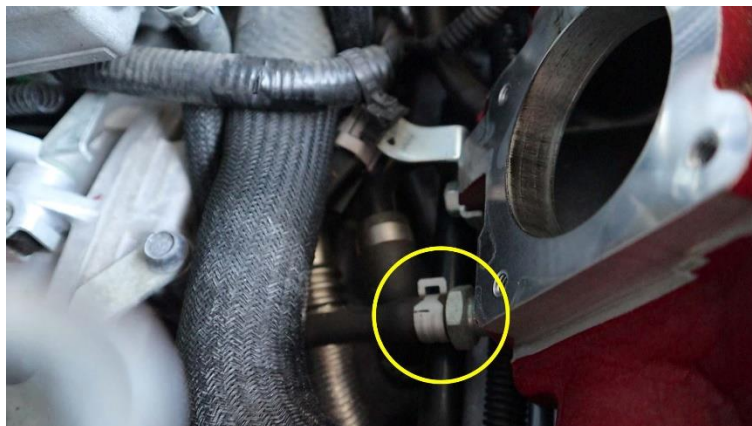
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2.9. Once the throttle body is removed, you should be seeing something similar to the image below.



2.10. We can now remove the hose from the barb that is attached to the intake manifold. This is located directly below the throttle body, circled below in yellow.



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- 2.11.** Use your needle nose pliers to remove the hose clamp and hose from the PCV valve.
- 2.12.** Now we can remove the PCV system that is near the turbo. This is hard to see due to the amount of room in this area, but the red arrow is pointing to this system below.



- 2.13.** Below is a photo of the PCV T fitting with PCV valve on it which we removed in the above photo.



- 2.14.** Below is a photo of where the PCV T fitting with PCV valve were removed. These locations are circled in red.

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2.15. If opting for the automatic drain back setup, read the steps included in step 4 now.

2.16. With the PCV system and OEM 3/4" hose removed, the barb on the engine which we will reuse is circled in orange. You have the option here to reuse the factory hose in this location or the supplied 4" long 3/4" rubber hose included with the kit. **Note: If you wish to reuse the factory hose, you do not need to remove it from this location.**



2.17. We now want to remove the PCV check valve from the piece shown in 2.13 by using a 19mm deep socket. This is also shown below.



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- 2.18.** Install this in the open location on the AOS as shown below. We recommend using Teflon tape or Teflon sealant.



- 2.19.** At this point, we can install the bracket onto the AOS and get it ready to install on car. Use the (5) M6x1.0 x 12mm Long BHCS and the (5) M6x12mm OD washers, and install the bracket as shown below. ***If you are installing the coolant kit, install the coolant plate as shown below.* It is also suggested you install the coolant hoses now, skip to step 3 and read through these directions.**



- 2.20.** Now we need to get the location to install the AOS in order. We use the location where the ECU wiring is located.
- 2.21.** In order to remove the factory bracket, we need to get the wiring harness out of the way. Remove the wiring harness (circled in red) from the bracket, by using a flathead screwdriver.

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- 2.22. To remove the factory bracket (shown below), remove the 10mm bolt that connects to the bracket to the strut tower.



- 2.23. Install the factory bracket onto the AOS bracket by using the supplied M6 nut as shown below.



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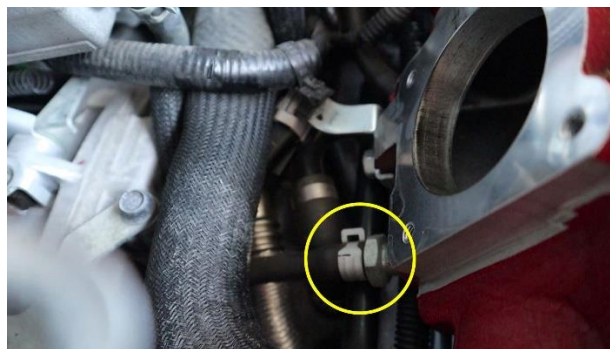
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- 2.24.** Using the supplied M8x1.25 bolt and washer and the M6x1.0 x 12mm BHCS and M6 x 18mm OD washer, install the AOS and bracket assembly as shown below.



- 2.25.** Now the fun part! Running the hoses.
- 2.26.** We started with the intake manifold port. Using the factory clips or supplied hose clamps, install the supplied 3/8" hose onto the intake manifold port and the PCV valve we installed into the AOS in 2.17.

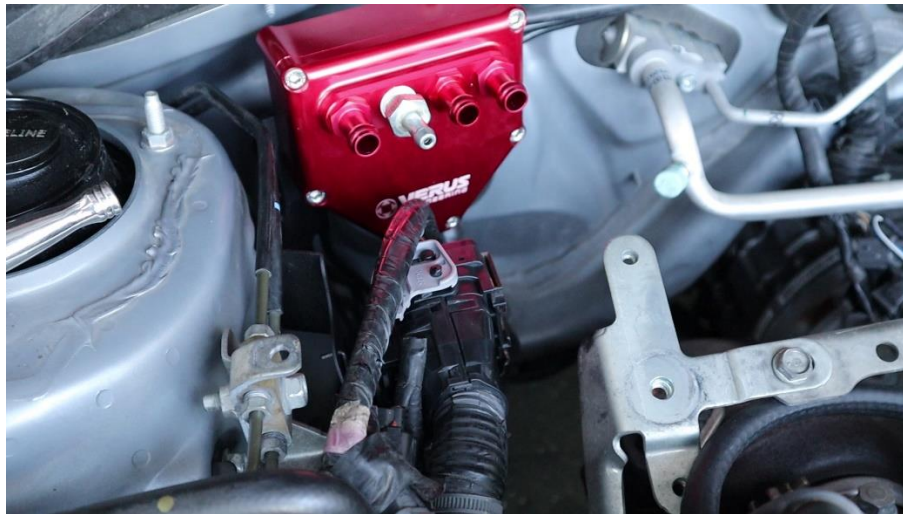


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- 2.27.** At this point, we decide to reinstall the wiring loom back onto the factory bracket as shown below. To do this, we need to slightly trim some of the electrical tape down by the firewall so that the wiring loom can reach the new mounting location. Be VERY cautious doing so as you do not want to cut into the wiring. **Note that the wiring loom needs to be flipped in order to reinstall it on the factory bracket.**

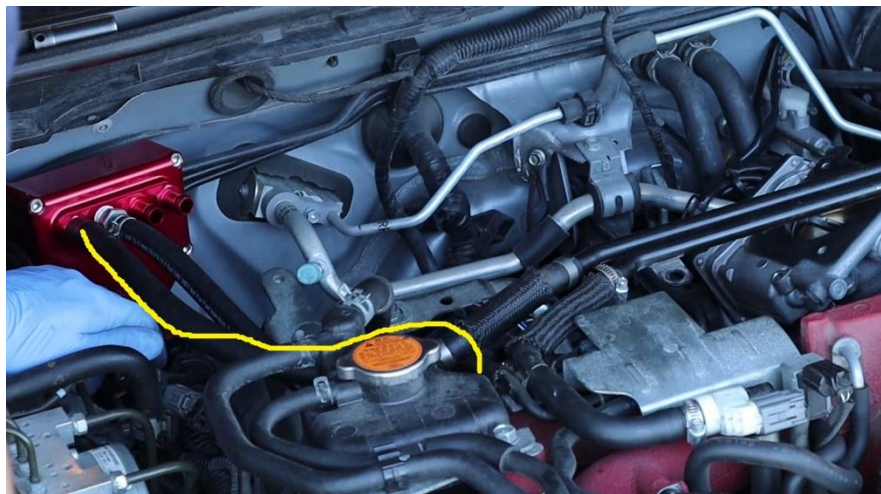


- 2.28.** For the engine block location, we can reuse the factory hose or the supplied 3/4" hose with the 3/4" to 1/2" adapter as shown below. Install this in the location as shown in 2.15.

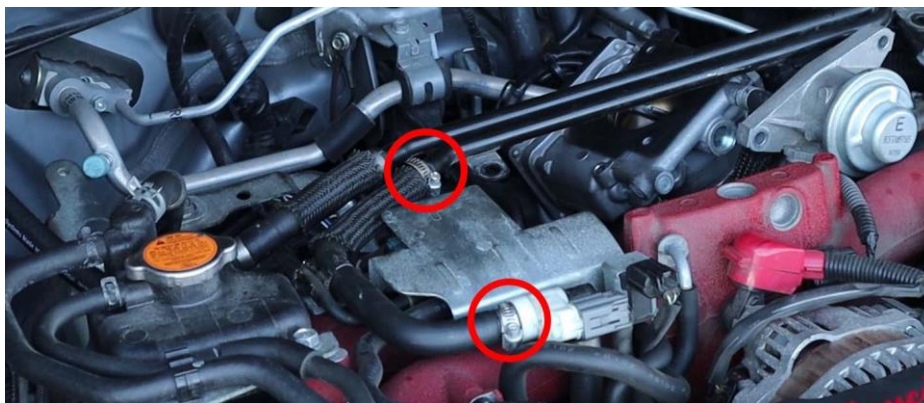
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- 2.29.** Taking roughly a 20" piece of 1/2" hose, we can install this hose on the 1/2" side of the adapter that we just installed. Route the hose in the best manner possible and install the other end onto the far left 1/2" barb on the AOS.



- 2.30.** Uninstall the factory hose below in both locations circled in red.



- 2.31.** Cut an 18" section of 1/2" hose and install the hose as shown below on the PCV tube.

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2.32. We now need 3 sections of 1/2" hose cut for the final port on the AOS. Cut two 9" sections and a 13" section.

2.33. Install one of the 9" sections of hose in the location circled in orange below.



2.34. Install the other 9" section on the second intake port on the back side of the intake manifold as shown in 2.14 and circled in orange below.

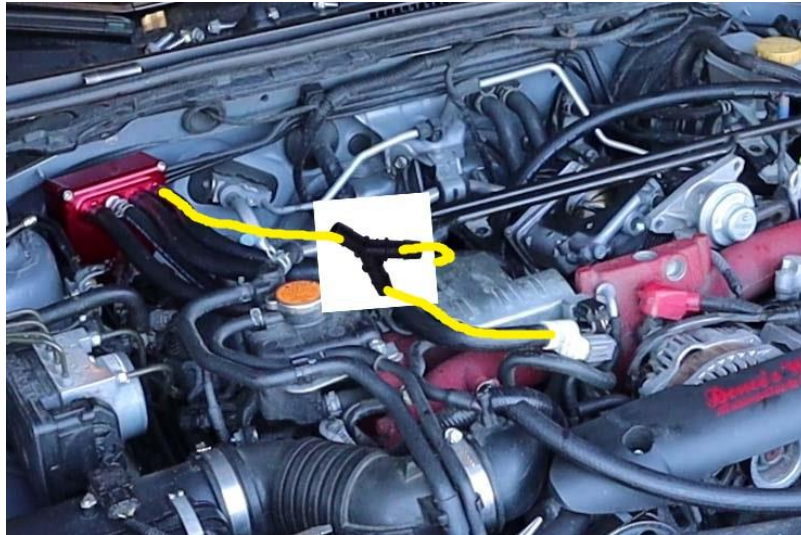
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2.35. Now we need to tie these two sections together using the supplied 1/2" Y adapter.



2.36. After the Y has been installed, we can now run the final hose from the open port on the Y to the last open 1/2" barb on the AOS. A diagram of this is below.



2.37. At this point, the install is done. Reinstall the throttle body and intercooler.

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- 2.38.** Congratulations on installing the Verus Engineering AOS kit for the VA Subaru STI. Enjoy a significantly cleaner intake tract. We suggest checking the AOS for oil every gas fill up initially, then every oil change, until you understand typical drain intervals. Please continue on for add-ons.
- 2.39.** Please send any questions, comments, concerns, or photos to Verus Engineering via e-mail; sales@verus-engineering.com.



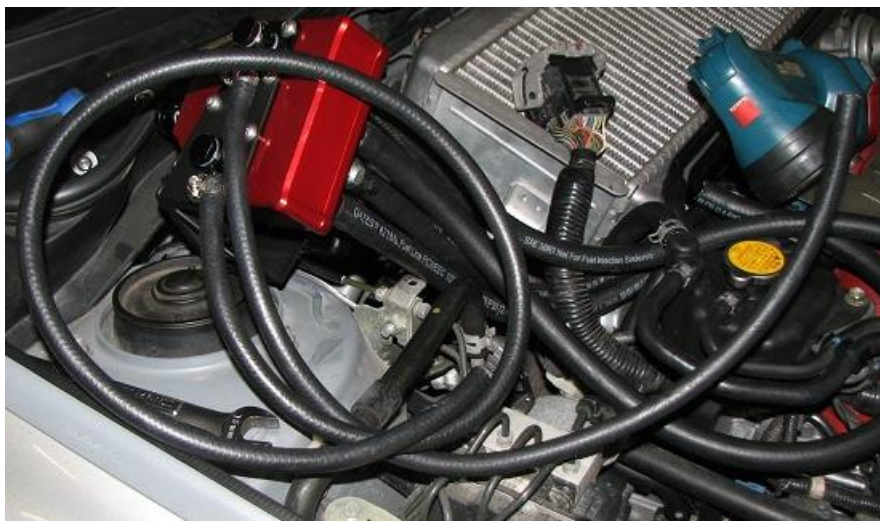
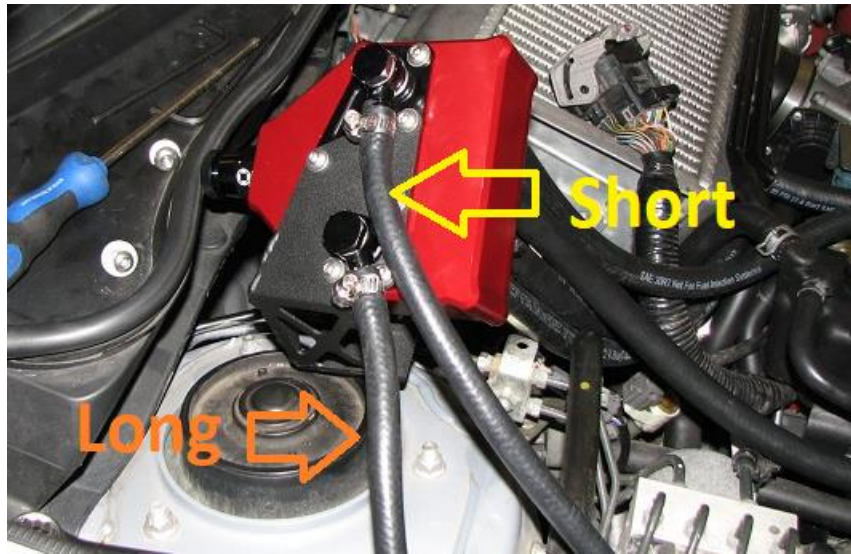
3. Coolant Add On

- 3.1.** Install the coolant plate as shown below before installing the AOS on car.



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- 3.2. We recommend installing the banjo bolts and banjos before the unit goes onto the car. It is a good idea to install the hoses with clamps as well as it is difficult to reach once the AOS is installed on car.
- 3.3. We supply 5 feet of 5/16" coolant hose. During our install, we noted that one length was 38" and the other 21".
- 3.4. Install the shorter hose on the left side, the longer hose on the right side, with the banjos point slightly upward as shown below.



- 3.5. Install the shorter hose onto the overflow as shown below. Try to spill as little coolant as possible by using a clamp.

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3.6. The other hose goes to the top radiator port as shown below.



3.7. Use the supplied zip ties to improve the line routing.

3.8. Bleed the coolant system if necessary.

3.9. Congratulations on installed the optional cooling add-on to your AOS.

3.10. For any questions or comments, please send us an e-mail at sales@verus-engineering.com.

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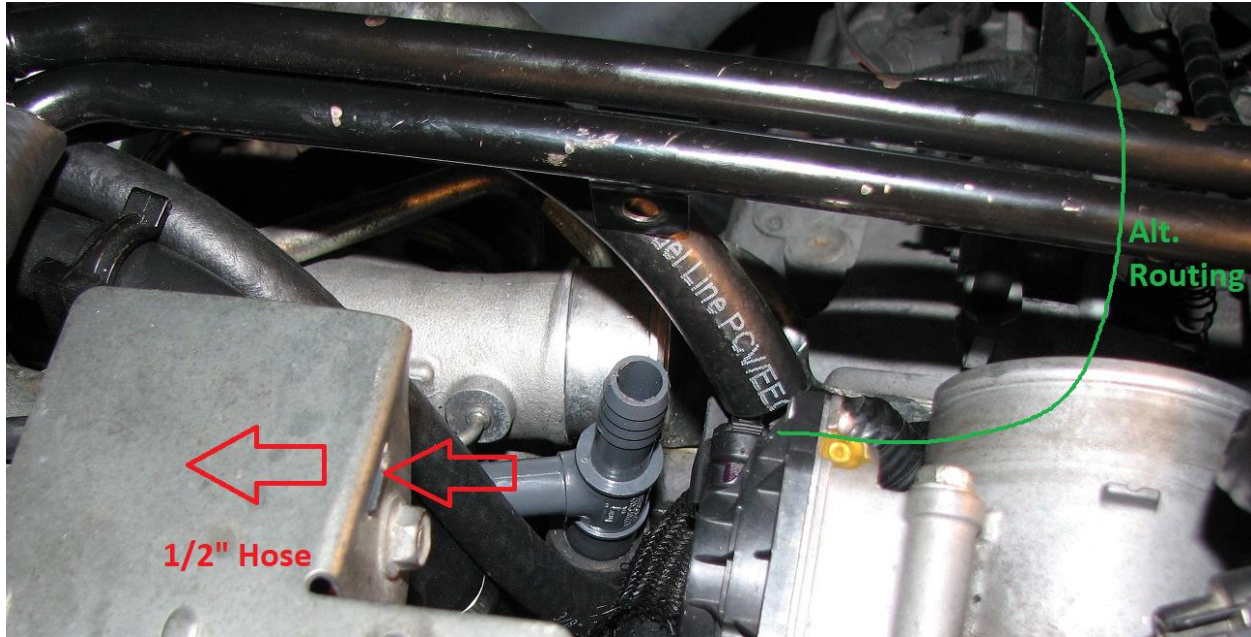
**4. Drain Back Kit**

- 4.1. Starting back at step 2.14, we will be using the supplied 4" long 3/4" hose into the block port.
- 4.2. Install the 38 inch 1/2" hose on the T as shown below. The routing can either go directly to the left side (as shown here) or it can wrap around to the right and go around the firewall/transmission area.



- 4.3. Install the T fitting into the 3/4" hose into the block port we installed at 4.1.

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4.4. On the bottom of the AOS, you will see a knurled fitting. Unscrew this.



4.5. Swap the O-ring to the unit with the through hole.

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- 4.6. Install this port back into the AOS.
- 4.7. Install the black 6AN to 1/2" nipple into this and torque to 8 ft-lbs. A photo of this is shown below. **When installing the black 6AN to 1/2" nipple, do so with the knurled fitting installed on the AOS.**



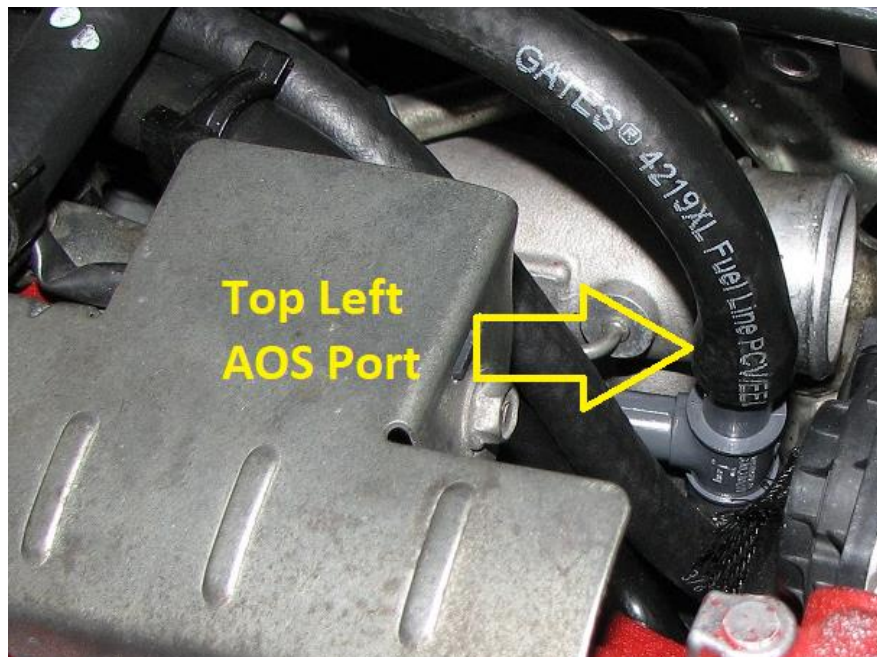
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- 4.8. We can now route the 1/2" hose that goes to the side of the tee fitting, to this location. This hose should remain fairly low in the engine bay to ensure adequate draining.



- 4.9. Route the hose in 2.29 to the top of the Tee Fitting.



- 4.10. The below photo shows the top port on the tee (yellow) and the side port (orange) which is the drain, ran on car.

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- 4.11. Congratulations on installing the optional drain kit!
- 4.12. For any questions or comments, please send us an e-mail at sales@verus-engineering.com.