AOS Kit and Accessories – Subaru GR/GV STI

Install Manual



Document Revisions

Rev	Date	Author	Description
01	2021/02/20	E. Hazen	Initial release of install manual
02	2021/04/02	E. Hazen	Updated Install for Drain Back Kit

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AOS Kit and Accessories for Subaru GR/GV STI – Install Manual

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 Subaru GR/GV 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 Socket
1.4.5. Extension
1.4.6. Scissors
1.4.7. Screwdriver
1.4.8. Side Cuts
1.4.9. Needle Nose Pliars
1.4.10. Various Allen Wrenches
1.4.11. Teflon Tape or Teflon Sealant



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
1.5.4. (2) Feet 3/8” Rubber Hose
1.5.5. (4) Inches 3/4” Rubber Hose

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



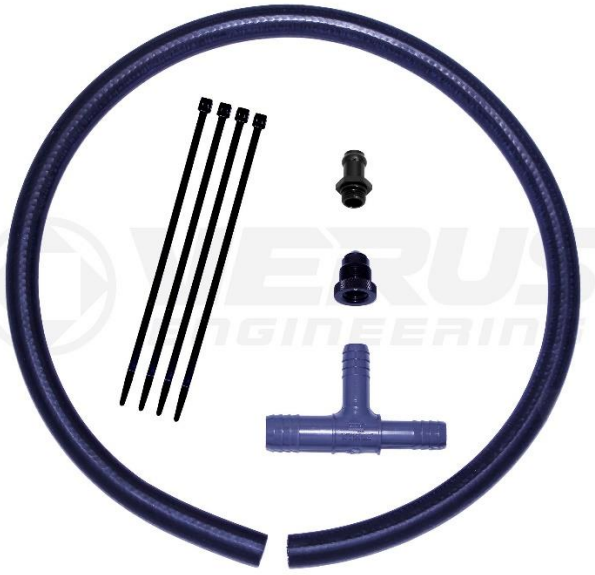
1.6. Coolant Add On Kit
- **1.6.1.** (1) Coolant Plate
- **1.6.2.** (2) Banjo Bolt
- **1.6.3.** (4) Banjo Washer
- **1.6.4.** (2) 5/16” Banjo
- **1.6.5.** (5) Feet coolant hose
- **1.6.6.** (4) M6x1.0 BHCS x 16mm Long, Stainless
- **1.6.7.** (2) M6 x 12mm OD Washer, Stainless
- **1.6.8.** (4) Hose Clamp,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

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1.7. Drain Back Kit Components

- **1.7.1.** (1) 3/4”, 1/2”, 1/2” Plastic Tee Fitting
- **1.7.2.** (1) AOS Bottom Replacement Plug
- **1.7.3.** (1) -6AN to 1/2” Hose Adapter
- **1.7.4.** (38) Inches 1/2" Rubber Hose
- **1.7.5.** (4) 7.5” Zip Tie
- **1.7.6.** (1) #014 Buna O-Ring



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2. Subaru GV/GR 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) 10mm 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.

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2.8. We can now remove the hose that goes from the PCV valve to the intake manifold. This is located directly below the throttle body, circled below in yellow.



2.9. Now we can remove the PCV system that is near the turbo, circled in blue below.

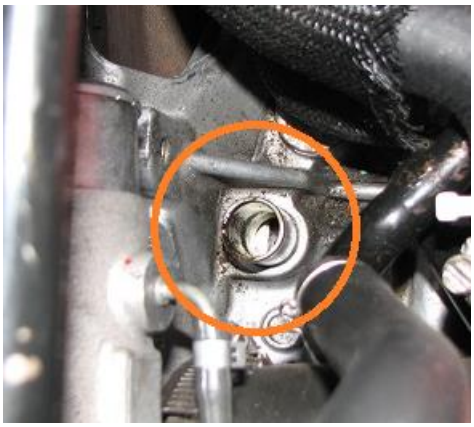


2.10. Below is a photo of the PCV T fitting with PCV valve on it which we remove above.

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2.11. With the PCV system removed, the barb on the engine which we will reuse is circled in orange again.



2.12. We now want to remove the PCV check valve from the piece shown in 2.10. Also shown below.



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

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2.14. Using the supplied 3/4” hose or the OEM unit, attach the supplied 3/4" to 1/2” adapter as shown below and reinstall in the location shown in 2.11. ***If you are running the drain back kit, check out step 4 at this point.***



2.15. 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.***

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2.16. Now we need to get the location to install the AOS in order. We use the location where the O2 sensor and ECU wiring is located. This is shown below.



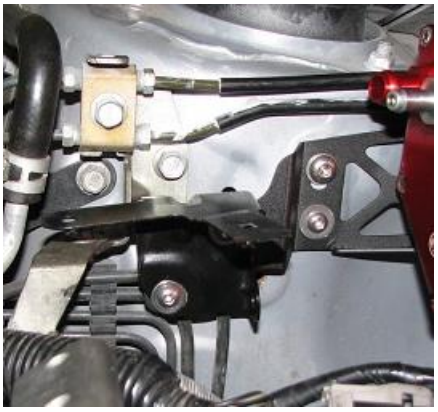
2.17. To remove this bracket, you remove (2) 10mm bolts and remove the wiring that connects to the bracket.

2.18. 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 as shown below.

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2.19. Install the OEM bracket removed in 2.16 and install this on the bolt locations located on the left of the bracket. Use the M6x1.0 x 12mm BHCS, fender washers, and serrated nuts to install this.

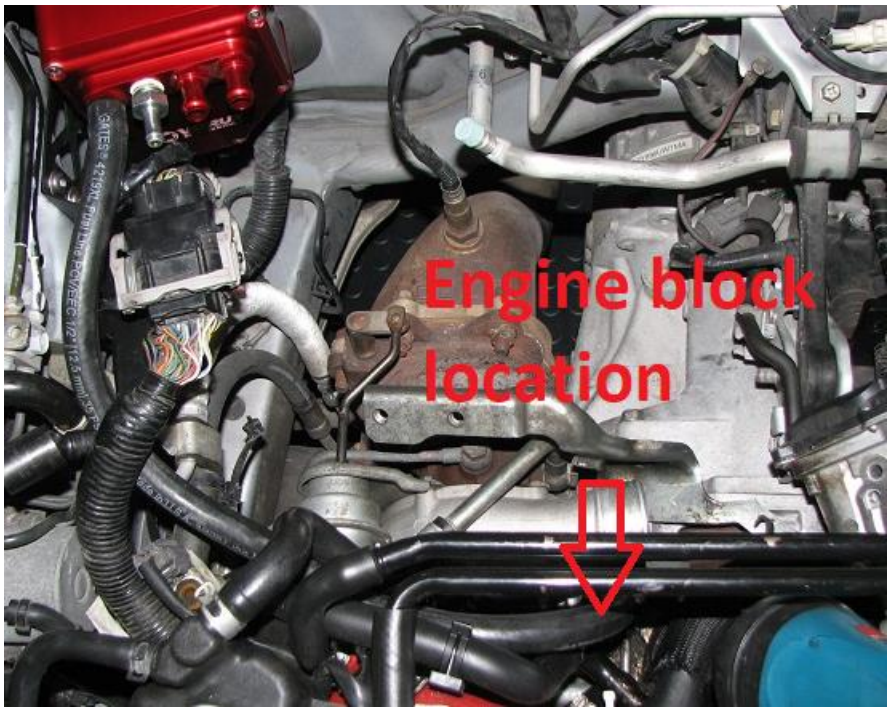


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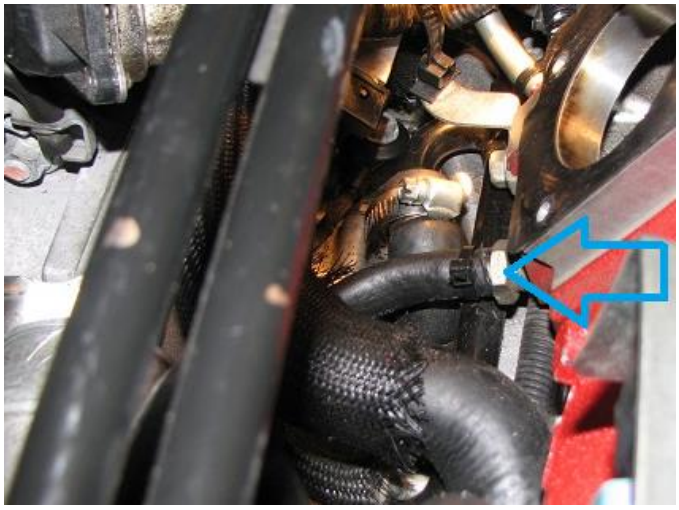
2.20. Now the fun part! Running the hoses.

2.21. We started with the engine crankcase vent. Using the further left hose location, this goes to the engine vent in the block, which we installed 2.14. Use the 1/2" hose.

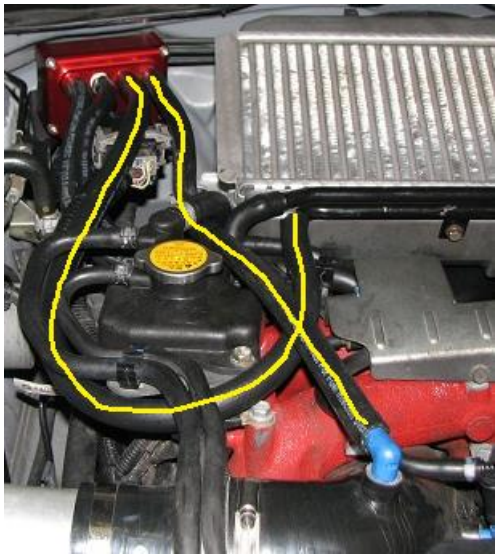


2.22. Install the 3/8” hose from the installed PCV on the AOS to the location in the intake manifold. Use the supplied hose clamps for this location.

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2.23. Finish off the hose routing by installing the two vent hoses as shown below. Routing is your choice but this is how we routed ours. The hoses are highlighted with yellow lines below.



2.24. At this point, the install is done. Reinstall the OEM wiring and intercooler.

2.25. Congratulations on installing the Verus Engineering AOS kit for the GR/GV 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.

2.26. Please send any questions, comments, concerns, or photos to Verus Engineering via e-mail; **sales@verus-engineering.com**.

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3. Coolant Add On

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

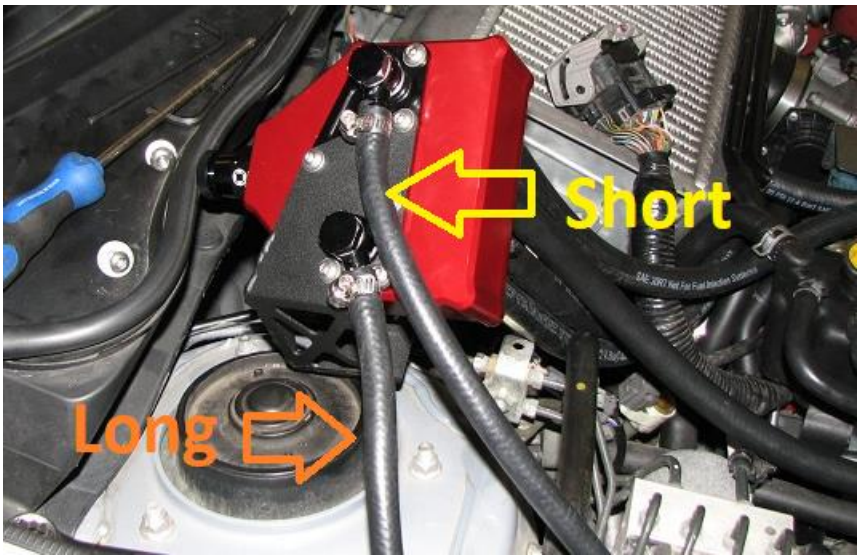


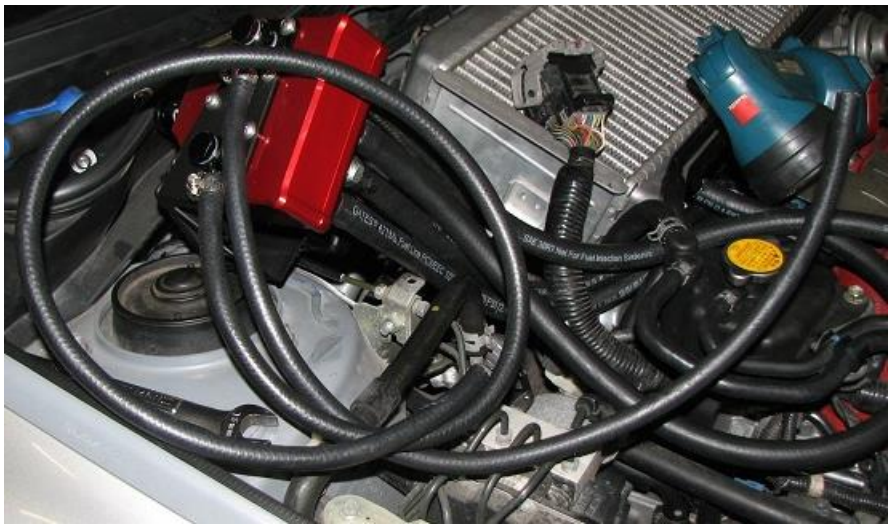
3.2. We recommend installing the banjo bolts and banjos before the unit goes onto the car. It is a good idea to install the hoses with clamps as well as it is difficult to reach once the AOS in installed on car.

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.

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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

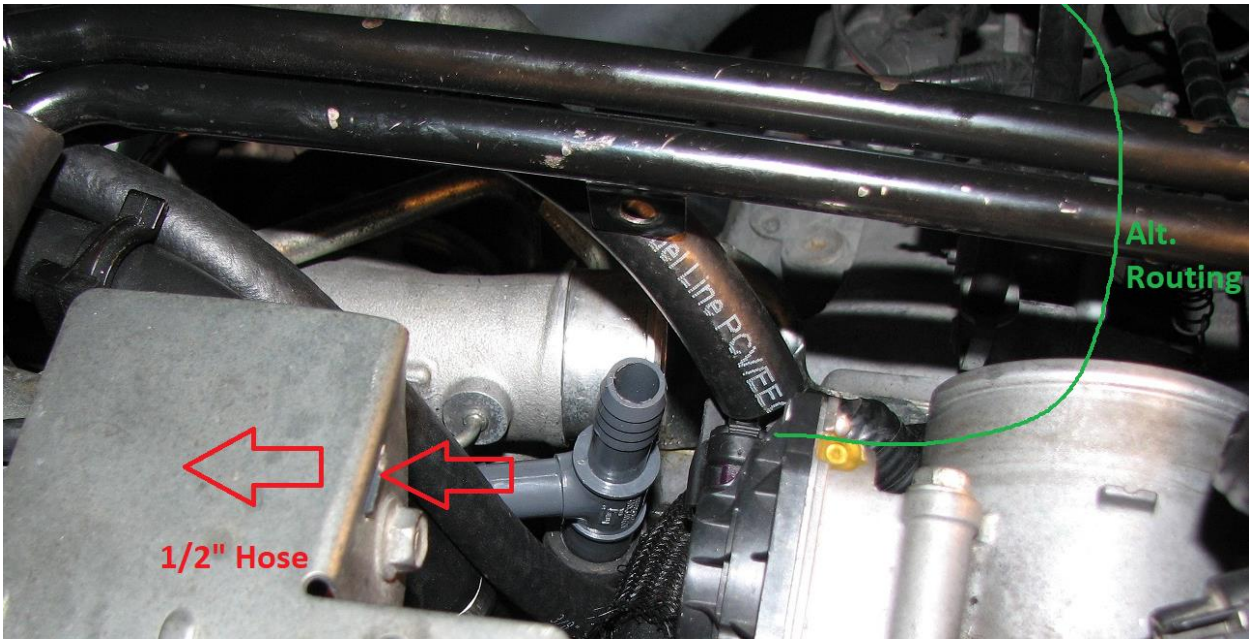
4.1. Starting back at step 2.14, we will be using the supplied 4in long 3/4” hose into the block port.

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 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.

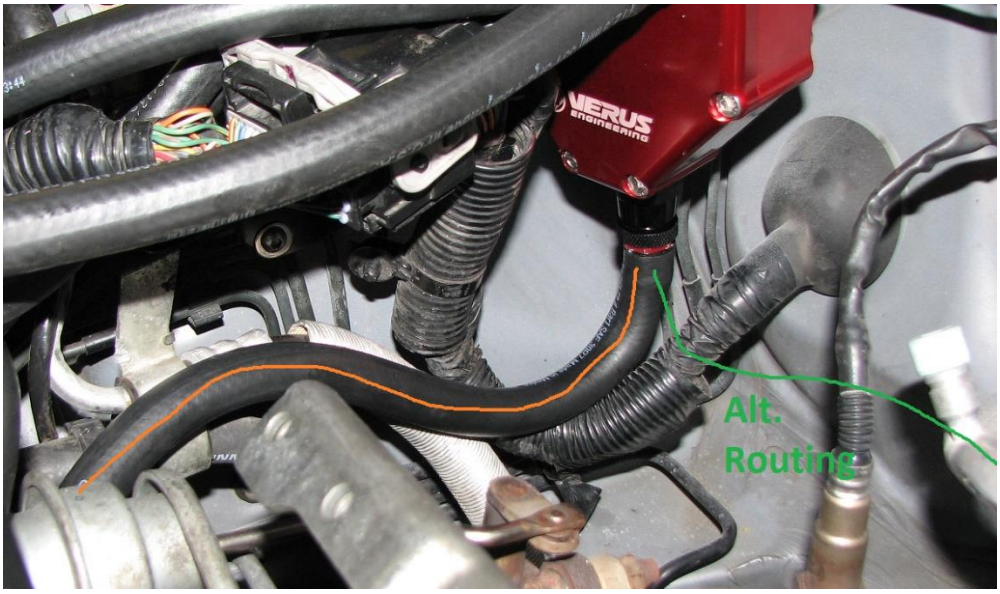
4.7. Install the black 6AN to 1/2" nipple into this and torque to 8 ft-lbs. A photo of this is shown below. **When installing the black 6AN to 1/2" nipple, do so with the knurled fitting installed on the AOS.**



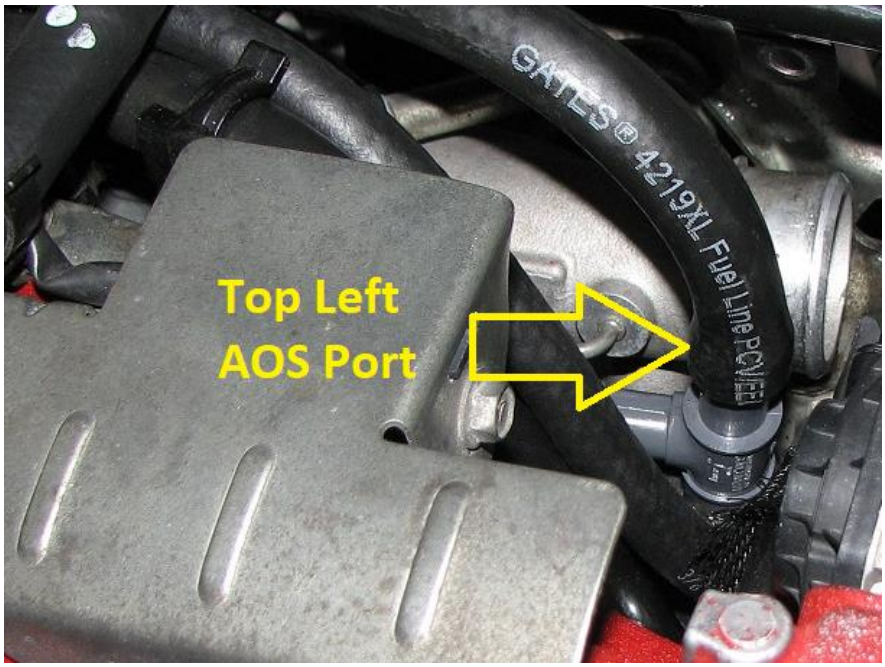
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4.8. Install the AOS onto the car per instruction 2.15-2.20.

4.9. 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.



4.10. Route the hose in 2.21 to the top of the Tee Fitting



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



4.12. Congratulations on installing the optional drain kit!

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

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