EPS TUNING HR/VHR DUAL 70MM

BIG BORE THROTTLE BODY KIT

INSTALLATION INSTRUCTIONS

V1.0

COMPLETELY READ THE INSTRUCTIONS FIRST

Do not open this product and attempt to install it prior to reading the instructions, in their entirety, first. These throttle bodies are physically larger than those that they replace. As such, there are some inherent, yet minor, fitment issues that may arise. The issues that may arise pertain to the intake tubes and the PCV system. Through our R&D testing we have installed kits on a wide variety of configurations and have come up with multiple solutions and installation options which are presented inside this document. Taking the time to read all of the following instructions will help you find the right path for your particular installation, as well as ensuring that you are prepared to complete your installation properly on the first attempt.

The most popular intakes for the dual throttle body Nissan cars are the long tube style intakes. Along with these intakes most people are running with the stock PCV systems intact. As such, we based our instruction set around a vehicle with this arrangement. Assuming that your vehicle is also in this configuration, the ancillary items that you will need to source to complete the installation of your big bore throttle body kit are as follows:

- **Intake couplers:** These are required to adapt your existing intake tubes to the EPS 70mm throttle bodies. The OD of the inlet of the throttle body is approximately 3.125". We HIGHLY recommend using a 3.25" coupler at the throttle body. It is VERY easy to roll the intake tubes into place when they easily slide over the throttle body. The other end of the coupler should match your intake tube OD.
- **A PCV system solution:** In the case of the HR, the PCV system can be retained with no major modifications. In some cases, one of the PCV hoses may have to be replaced with a slightly longer piece of hose. In the case of the VHR, the passenger side air/oil separator will no longer fit with the big bore throttle body kit. While you are more than welcome to sort this element out on your own, we suggest that you employ one of these three viable options:
    - The EPS PCV Correction Hose: This hose will replace the breather and keep the factory PCV system operational and intact. This is our most inexpensive solution.
    - The EPS PCV Delete Kit: Much like our well known DE and HR PCV delete kits, the VHR version completely eliminates the factory PCV system and the oil consumption/intake tract contamination associated with it. This is our preferred solution for customers who do not have to have all OEM emissions equipment intact for emissions inspection.
    - Z1 Silicone Hose Kit: We have seen a very clean, successful installation on one of our test cars using this setup. Due to the fact that the hoses are very flexible, it also allows you compensate for the slight change in intake tube position while keeping the OEM PCV system intact. The silicone hose kit can be ordered from Z1 directly.
- **A tuning solution:** ALL EPS HR/VHR dual 70mm big bore throttle body kits require a tune to complete the installation. This product is intended for modified vehicles that already have a tuning solution in place. Both HR and VHR have different requirements that must be completed before the vehicle will be drivable. See the section regarding required tune changes for more details. Uprev & Ecutek are both acceptable/recommended tuning solutions for the OEM ECU.

BASE KIT CONTENTS:

- (2) EPS 70mm Throttle Bodies
- (2) EPS CNC Adapter Plates (Patent Pending)
- (1) NISformance PNP Adapter Harness - Bank 1 (Patent Pending)
- (8) 5mm SS Allen Bolts
- (2) O-ring Gaskets
- (6) Strut Bar Spacers

REQUIRED TOOLS:

- 5mm Hex Bit Socket
- Metric socket set
- Standard socket set
- Screwdriver assortment
- Regular & needle-nose pliers
- Razor blade (for trimming couplers)
- Inch-pound torque wrench
- Foot-pound torque wrench

OTHER REQUIRED PARTS:

- Your stock throttle body bolts. If you bolts are stripped out or damaged, we can supply you with a new factory set, or one of our upgraded hardware kits. If you are in a pinch, source a 50mm long allen head bolt (M6x1.0 thread pitch) and use a lock washer.

****VERY IMPORTANT! Take Note: Before attempting any work disconnect the negative battery cable and then hold the brake pedal down for 15 seconds to discharge the ECU capacitor.****

1) **Remove strut bar**
    - Remove plastic cover at rear of engine bay.
        - Remove the rubber hood seal by pulling straight up. Leave the retaining tabs installed in the rubber gasket. If they stay stuck in the plastic, pull them out and insert them into the rubber gasket.

        - Remove the plastic cover that covers the rear of the strut bar by pulling straight up.
    - Remove the (4) 14mm bolts and (4) 14mm nuts holding the strut bar to the chassis.
    - Carefully lift the strut bar up and out of the way.

2) **Remove engine cover** (if applicable... if not, skip this step)
    - Remove the (3) 10mm bolts and (2) 10mm nuts holding the cover to the intake manifold.
    - Lift the two-piece engine cover up and off of the intake manifold. Store safely out of the way, along with the strut bar.

3) Remove the upper intake tubes & air/oil separators

- Disconnect the harnesses from mass airflow sensors (MAF's).
- Remove PCV system air/oil separators from driver's side intake tube. Disconnect the passenger's side from the intake tube and rotate it out of the way, as shown.
    - This step may be different for many cars, as all of the commercially available and custom intake tubes are a little different from each other. A Stillen G3 intake with a stock PCV system is probably one of the, if not the, most common configurations, so that is what is shown in this set of directions.

- Loosen upper and lower couplers on upper intake tubes and remove them from the engine bay. At this point, your bay should look something like this:

4) Remove stock throttle bodies

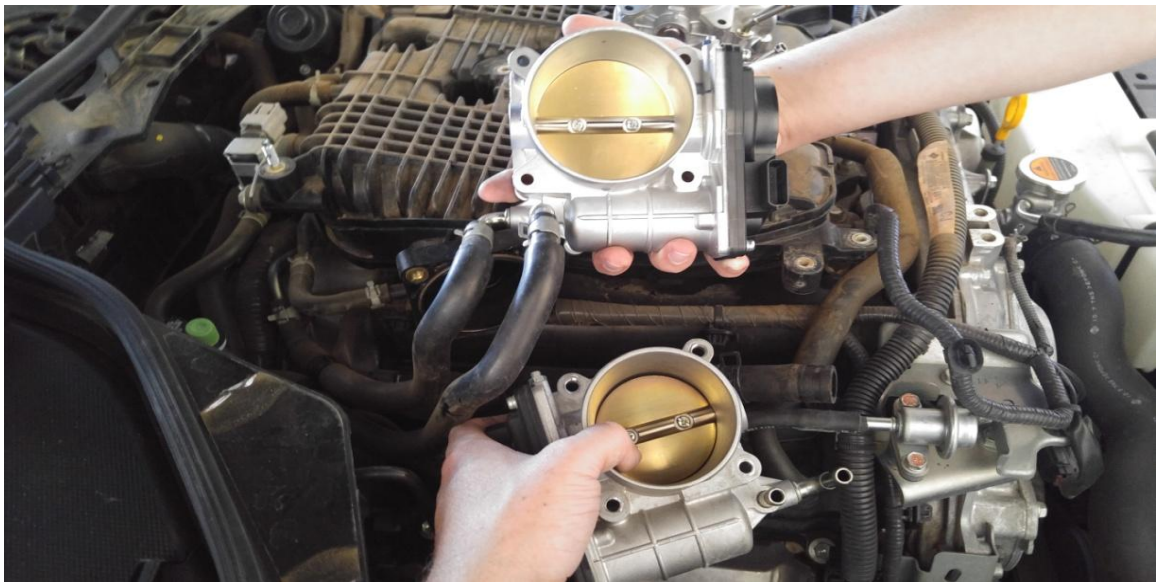
- Carefully disconnect the TB harnesses from the TB's.
- Using a 5mm hex bit socket, remove the (8) bolts from the 2 throttle bodies (4 per side), and set them aside. These will be re-used for the installation of the EPS Big Bore Throttle Body Kit unless you have purchased our hardware upgrade kit.

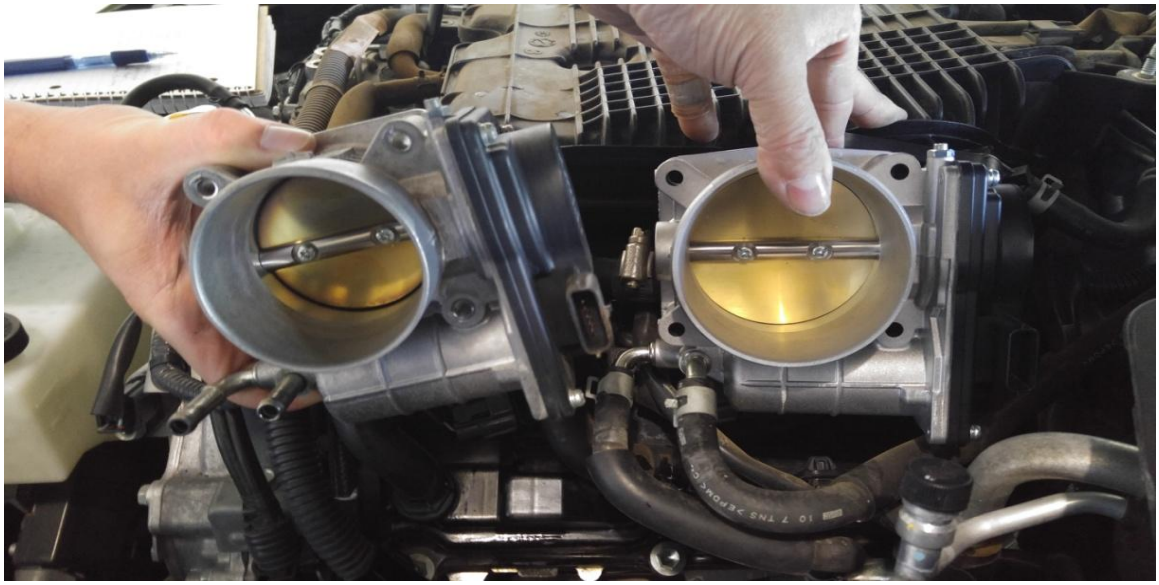
NOTE: Leave coolant hoses connected at this time!

5) Transfer coolant lines from stock throttle bodies to EPS throttle bodies

- Carefully remove the coolant lines from the stock throttle bodies and place them onto the EPS throttle bodies as shown in the following set of pictures.

NOTE: If installing an EPS throttle body coolant line bypass kit, skip this step and refer to the installation instructions for that item at this time. Then return to step 6 to complete the installation





6) Install EPS adapter plates

- Move the throttle bodies out of the way to facilitate the installation of the EPS adapter plates.
- Remove the (8) 5mm allen (hex) head bolts from the bag and use them to bolt the adapter plates to the stock intake manifold.
    - Snug all the bolts down, and then tighten them to a final torque value of 75 in-lb using an in-lb torque wrench.
- Remove the (2) O-ring gaskets from the bag and install them into the plates.

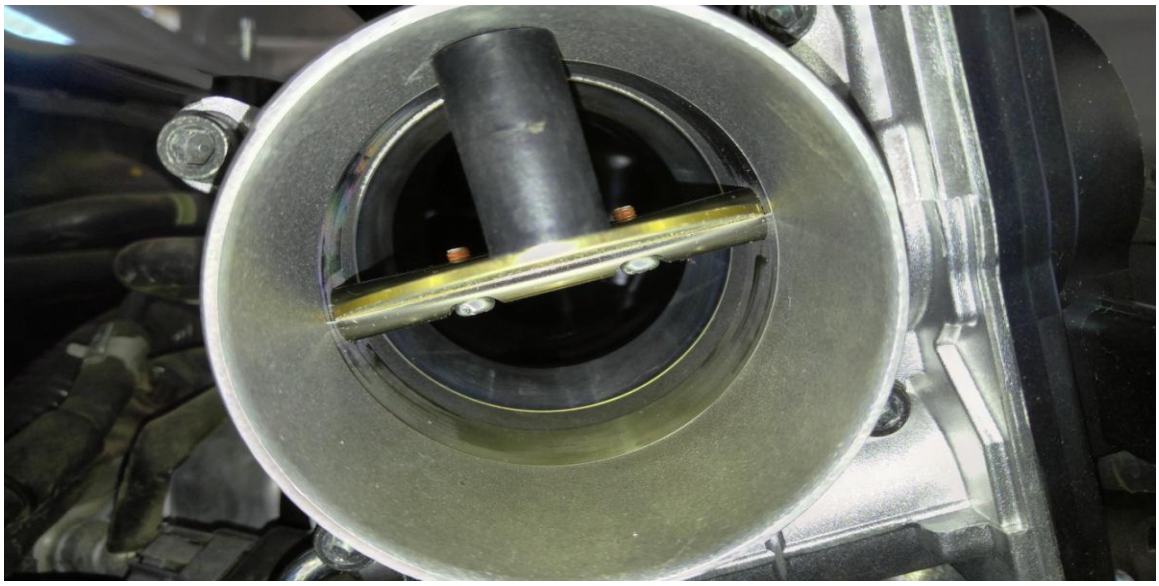
7) Install EPS TB's and Nisformance PNP adapter harness

- Using the (4) OEM throttle body bolts (or the bolts included in the EPS hardware upgrade package), line the throttle body up with the plate and start all four of the bolts in the threaded holes, but DO NOT tighten them down yet. Leave about a 1/4" in between the plate and the throttle body to visually inspect that the o-ring is in its proper place before sliding the throttle body back against the plate. This will ensure that the O-ring has seated in its groove on the plate when you slide the throttle body against it.

- Once the throttle body is in place, lightly snug the bolts down leaving enough room for the throttle body to slightly slide around on the O-ring.

- The arrow indicates a common interference point on the passenger's side throttle body. If this area is making contact between the TB coolant hose and the valve cover tab turn the coolant hose clockwise to eliminate the interference.

- Carefully align the throttle body with the plate. Although the EPS throttle plates are designed to allow the throttle body to bolt up blindly, with no sharp transitions, we still recommend making an effort to center the throttle body on the bore before tightening the bolts down.
    - GENGTLY pry the blade open with your fingers. WARNING: Do not force the throttle blade to move in a given direction that it does not naturally move. Do not over-extend it, or apply force at the extremes of the motion range. Furthermore, do not ever touch the blades with the engine harness plugged into the TB. Even more importantly, do not ever touch the throttle blades with the ECU powered up. Any of these actions can damage the throttle body permanently. You can, however, gently open/close the blades to help you visually center the TB on the bore.
    - Final verification of alignment should be performed by sliding you finger across the adapter plate to manifold/throttle body transitions with the blade held open. There should be no sharp edges going into the manifold. This is what a properly aligned EPS adapter plate looks like, installed:



- With the throttle body centered on the adapter plate, tighten the bolts a quarter turn at a time in a criss-cross pattern until the throttle body rests up against the plate and the bolts snug up.
    - Torque them down to 75 in-lbs using an in-lb torque wrench.
- Plug the OEM throttle body harness into the driver's side throttle body.
- Plug the NISformance PNP adapter harness into the passenger's side OEM throttle body harness connector.

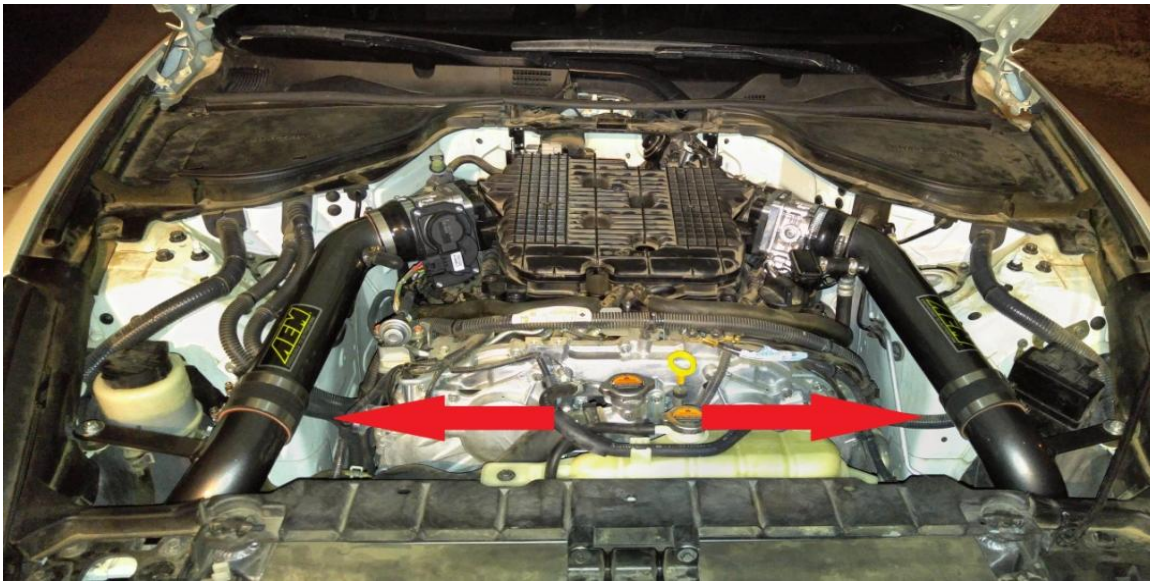
- Route the harness as shown and plug it into the passenger's side throttle body.

- The completed throttle body installation should look like this before you attach the rest of the components back to the vehicle.

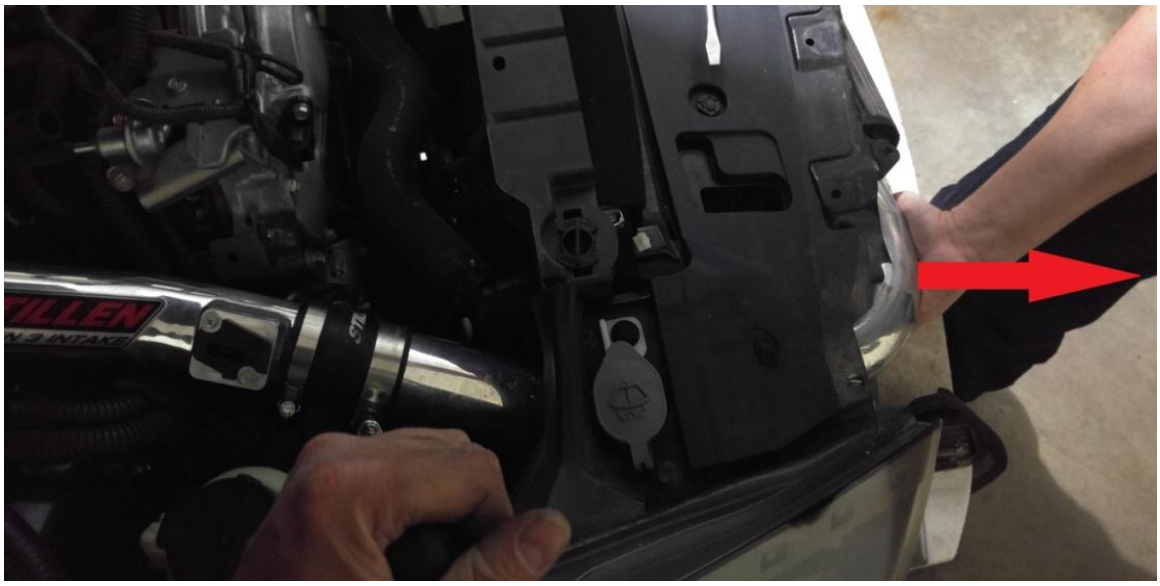
8) Re-install upper intake tubes

- Application Notes: As stated earlier, every intake setup is slightly different and thus will require slightly different approaches with regards to completing the intake tube reinstallation. Some intakes can be installed with very little to no modifications to the existing tubes. Some intakes require a LOT more work. At this time, the list of intakes that do and do not need to be modified, is as follows:
    - Known intakes that can be bolted on with no major modifications:
        - Stillen G3 (2.5")
        - Z1 Longtube (2.5")

        - Injen Longtube (2.75" upper tube)
        - AAM Longtube (2.75")
    - Known intakes that require modifications to be used with our throttle body kit:
        - AEM Cold Air (2.75") - mostly difficult because of its 1 piece tube design. The tubes must be removed and shortened in such a manner so as to create an upper tube that is removable in the engine bay. This makes the car a lot easier to work on in the future but will require additional couplers. As you can see, in this installation, we used the old throttle body couplers to join the tubes together after we sectioned and shortened them. This allowed the intakes to be taken off without removing the bumper every time. We highly recommend that you approach ANY one piece tube design that bolts to the body like this:

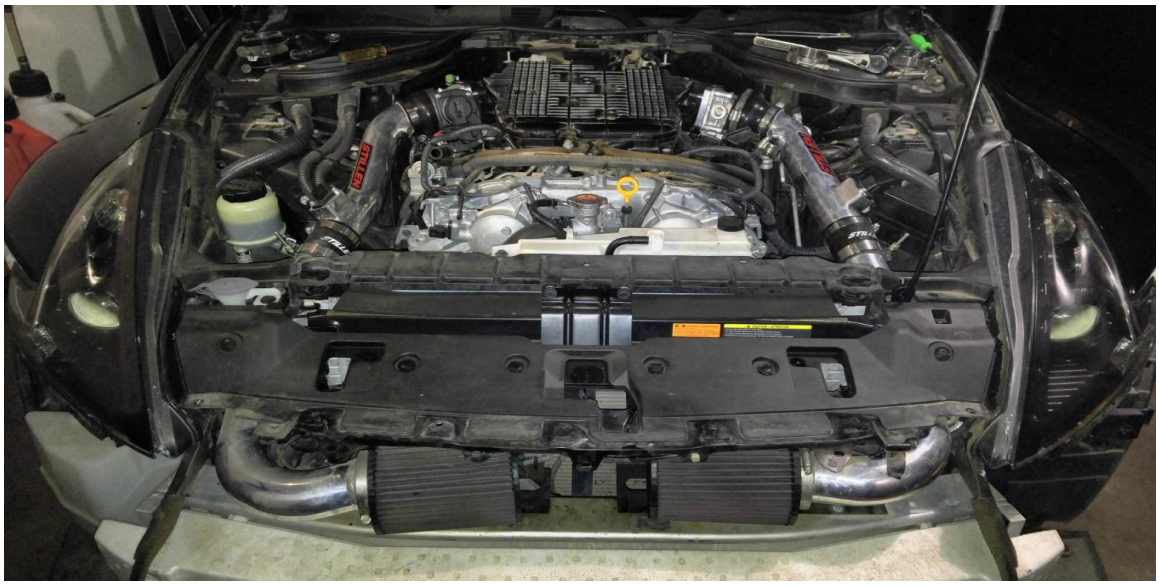


- Begin the re-installation by removing the front bumper to gain access to the front tubes of your long tube style intake. (If you have a short ram style intake, you can skip this preliminary step and move on to just bolting the intake tubes back in place).
    - Refer to the EXT (exterior) section of your factory service manual if you are unfamiliar with removing the bumper from your vehicle.
- Pull the front (lower) intake tubes forwards, towards the front of the car, to make additional room for the rear (upper) tubes.



○ Bend this tab if necessary, to gain the needed room.

○ With both tubes pulled forward, they should line up like this.



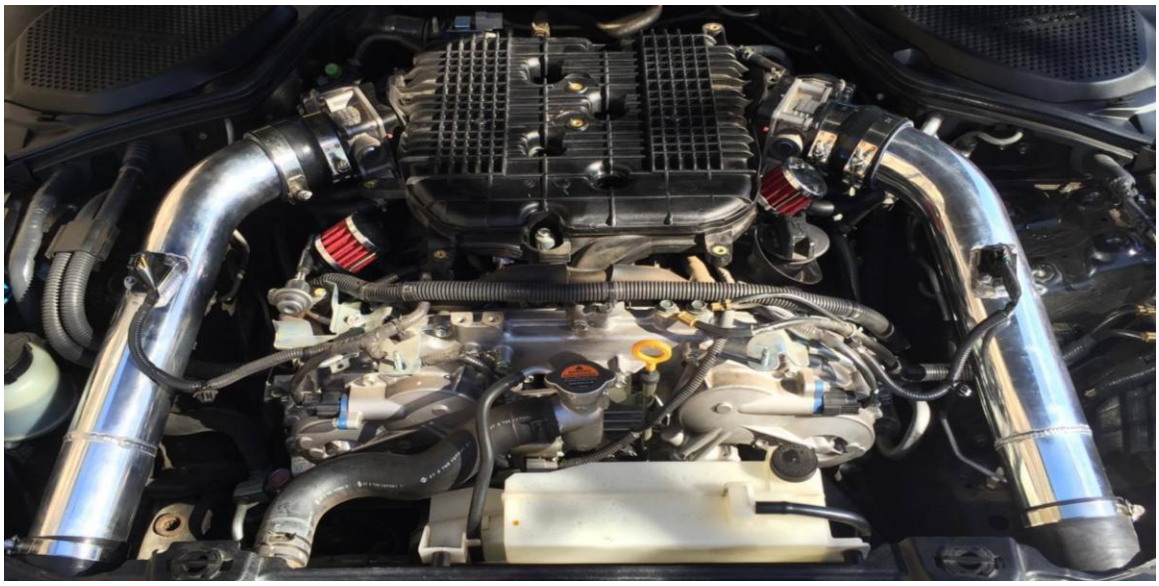
- If necessary, modify the couplers to fit at the bend going into the throttle body.
    - Good install - coupler is flush with pipe.

- Bad install - you DO NOT want the tube sticking out through the inside of the coupler. If this is extreme enough, it could contact the throttle blade. EPS is not responsible for damage done to the throttle bodies due to poor installation practices. We are here to help with every installation. Feel free to contact us for consultation if need be.

- After the tubes are in place, push the front tube and coupler back towards the rear tube. The slide the coupler in place and tighten all of the couplers on the driver's side intake down. Make sure the passenger's side fits, but do not install it until your PCV solution is installed, as you will need access to the valve cover nipple underneath the intake tube regardless of which type of system you implement.

9) PCV System Reconnection/Deletion Options

- HR - can retain the OEM PCV system with very little, to no modification. At the worst, you may have to extend a hose about an inch, depending which intakes you have. They can also purchase our EPS PCV Delete Kit, shown below.



- VHR w/ OEM PCV system intact- As stated earlier in this document, the passenger's side air/oil separator will no longer fit with the EPS big bore throttle body kit installed. It can be removed and replaced with this hose here, also available from EPS, but not included.

- EPS VHR PCV Delete Kit - deleting the PCV is always our preferred method, because we like clean, oil-free intake tracts. This kit can also be purchased from EPS.

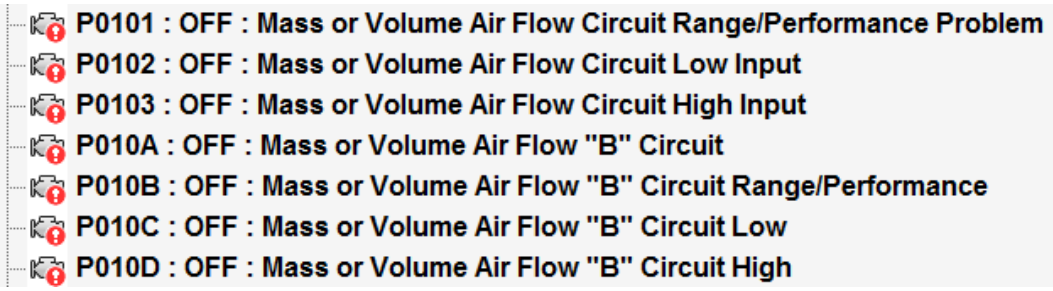
- With your PCV solution now installed, re-install your passenger's side intake tube and tighten it down.

10) Re-install the other components that have been removed

- Battery - Reconnect the car's battery now that the physical installation is complete.
- Bumper - Refer to your FSM for procedure here, if necessary.
- Engine cover - reinstall the (3) 10mm bolts and (2) 10mm nuts.
- Strut bar - re-installation of the strut bar should be accompanied by the (6) included 8mm spacers. These spacers are installed between the strut tower bar and the chassis on the (1) nut and (2) bolts that attach it to each side. No spacers are used at the rear of the strut bar. Torque the nuts and bolts to 38 ft-lbs. Your completed installation should look like this, with the engine cover and strut bar reinstalled.

11) Modify tune/disable codes

- The following codes need to be disabled on all VHR based cars. All of our Uprev cars have required this. Our Ecutek-equipped cars have not. Nonetheless, we recommend that you disable these codes anyway. Our HR test cars have not had to disable these codes, but it is recommended that you do that anyway on those models.



12) Perform APP, TPS & IAV relearn procedure

- The first time you start your car up after installing the EPS big bore throttle body kit, the engine is likely to surge at idle, as the ECU has not calibrated itself to these new throttle bodies yet. Some cars are a little worse than others, depending on intake tube configuration, but all are manageable. The subsequent steps will have you warm up the car to full operating temperature to set the idle. You are going to have to idle the car up to full operating temp, in this "unhappy" state. Do not worry. Once you reach operating temperature, the idle surging will stop, letting you know that you can begin.
- To begin, ensure that the following conditions are met, and stay met. Idle re-learning will be terminated if any of the following conditions are unsatisfied, even for just a moment.
    - Battery voltage: More than 12.9V (At idle)
    - Engine coolant temperature: 70 - 100 C (158 - 212 F)
    - Park/neutral position (PNP) switch: ON (Shifter in Park or Neutral)
    - Electric load switch: OFF (Air conditioner, headlamp, rear window defogger)
    - Steering wheel: Neutral (Straight-ahead position)
    - Vehicle speed: Stopped
    - Transmission: Warmed-up (Drive vehicle for 10 minutes.)
        - Admittedly, this parameter seems to be the most flexible. We have (on many occasions) had success performing an idle reset on an engine with a cold transmission. This should give you comfort on startup, if your car/engine is cold or has been down for a while. However, we suggest that you revisit the relearn procedures if you experience idle instability/high idle after your first reset, with the transmission fully warmed up.
- **APP Relearn:** This needs to be performed any time that an accelerator pedal harness has been unplugged. If this has not occurred, skip this step.
    - Make sure that accelerator pedal is fully released.

    - Turn ignition switch ON and wait at least 2 seconds.
    - Turn ignition switch OFF and wait at least 10 seconds.
    - Turn ignition switch ON and wait at least 2 seconds.
    - Turn ignition switch OFF and wait at least 10 seconds.
- **TPS Relearn:** This needs to be performed any time that a throttle body harness has been unplugged. This step is mandatory for obvious reasons.
    - Make sure that accelerator pedal is fully released.
    - Turn ignition switch ON.
    - Turn ignition switch OFF and wait at least 10 seconds. Confirm that throttle blade moves during this 10 second interval by listening for the high pitched buzzing sound of the throttle motors operating upon key-off.
- **Idle Air Volume Relearn (Uprev):**
    - Ensure that the ignition switch has been OFF for at least 10 seconds.
    - Confirm that accelerator pedal is fully released. Turn the ignition switch ON and wait 3 seconds.
    - Repeat the following procedure quickly five times within 5 seconds.
        - Fully depress the accelerator pedal.
        - Fully release the accelerator pedal.
    - Wait 7 seconds. Fully depress the accelerator pedal and keep it floored for approximately 20 seconds - until the MIL stops blinking and stays ON.
    - Fully release the accelerator pedal within 3 seconds after the MIL turns ON.
    - Start engine and let it idle.
    - Wait 20 seconds.
    - Rev the engine two or three times and make sure that idle speed and ignition timing are within the specifications. We recommend that you use your tuning suite's logger to do this.
    - If you have executed all of these steps properly, your idle speed should hit your programmed target ± 50 rpm (in the P or N position). If it does not, first attempt the relearn procedure again... multiple times if necessary, even. If your car exhibits a poor idle characteristics, a high idle, a surging idle, etc... then it's almost guaranteed that there was an error in the relearn process. Even a professional installation can have issues with this step due to the picky nature of the ECU. Be patient with it and focus primarily on getting your timing right. Finding a rhythm is the best practice for a successful relearn. If you continue to have trouble, consult EPS Tuning technical support via our Facebook page. We will get your information and call you as soon as possible.
- **Idle Air Volume Relearn (Ecutek):**
    - Ensure that the same conditions are met for the standard idle relearn procedure.
    - Open the Ecutek software and detect your vehicle/ECU

- Select “Idle Learn” under the “ECM Tools” tab that comes up once the vehicle is detected. This will begin an auto-learning airflow/throttle position balancing sequence, just like the stock procedure. Allow the software to complete this task.

- **Safely test the vehicle**
  - As with all vehicle modifications, be sure to test your vehicle after installation. Please do so in a responsible manner in a safe, low-traffic area, before getting out onto public roads. If you attempt to drive the vehicle without making the recommended tuning changes there is a very good chance that your car could go into limp mode under normal driving conditions. Please follow our instructions carefully and contact us with any questions.
- **Tune the ECU**
  - After the installation of your big bore throttle body kit, it is extremely likely that your engine will be running leaner at WOT than it did before due to the additional airflow. How much the car leans out is largely due to the state of the tune beforehand.
  - We would be more than happy to consult with your tuner about tune related variables that can be adjusted to enhance the functionality of the big bore throttle body kit, and the resultant dyno gains. This includes changes to (Uprev) maps such as:
    - Electronic Throttle Control Table
    - Throttle Enhancement Table
    - Most VVEL Tables