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Gen-II Secondary Air Injection System Bypass Kit

4.6L Tundra/Sequoia Installation Instructions

Introduction:

Before installing the bypass module, it is highly recommended to address codes not related to the SAIS. It is also important to inspect the wiring and make any necessary repairs for certain circuit-related fault codes. For the Gen-II kit to work correctly, the wiring, pins and connectors, as well as the engine control module (ECM), cannot be damaged. The related wiring is between the air switching valves, the air injection control drivers and the ECM. Further troubleshooting, pressure sensor replacement options or, in EXTREME cases, ECM replacement may be required if there is damage or if the vehicle has been driven for an extended period with circuit fault codes.

The Gen-II units emulate operation of the SAIS and allow you to clear your trouble codes/CEL, preventing the vehicle from entering limp mode. The Gen-II SAIS bypass module installs by replacing the factory air injection control drivers (AID) and by connecting to the air switching valves (ASV) and their factory harness. With the Gen-II unit and block off plates installed, air pumps, air tubes/plumbing and factory air injection control drivers are no longer required. Regardless of the bypass kit or SAIS, the vehicle still requires functioning pressure sensors as they are utilized by the engine control module (ECM) as barometric pressure sensors and as part of a sensor test involving the evap. system's pressure sensor. Because of this, the Gen-II unit will typically need the air switching valves to remain in place because these sensors are in them. If your air switching valve pressure sensors are damaged, you can replace them or use our Pressure Sensor Replacement Options (PSO). One PSO is needed for each damaged sensor. Once an air switching valve is replaced with a PSO, the ASV is no longer needed. If you have questions about the installation or use of this kit, please visit us at www.Hewitt-Tech.com to view our Trouble Codes and FAQ pages. You can also contact us directly using the information found on the "Contact Us" page.

You can also view our install videos on our YouTube channel by searching "Hewitt-Tech". Or, click Hewitt Tech YouTube Channel if you're viewing these instructions electronically. If you have questions about any part of the installation, kits or your codes, please call us toll-free at 1-844-307-7671 or email us at support@hewitt-tech.com.

Important: It is illegal to remove, dismantle or otherwise cause to be inoperative any pollution control device required by federal, state or local emissions law. The Gen-II bypass kits are sold for off-road or competition use only, no other applications are intended or implied. By installing or using this SAIS bypass kit, the vehicle owner and installer acknowledges and assumes ALL risks associated with its installation and use.

Needed for Installation:

- #2 Philips and flathead screwdrivers
- 10mm, 12mm ratchets/wrenches/sockets/extensions
- 30 mins to 1 hour

Installation Steps:

1) Open the hood and remove the engine cover. Disconnect the negative battery terminal. We will be disconnecting live battery feeds. Leaving the battery disconnected while installing the bypass kit will clear all pending and active trouble codes stored in the ECM. For 2009 and newer vehicles, remaining permanent codes for the secondary air system will automatically clear after the Gen-II kit completes its first run sequence.

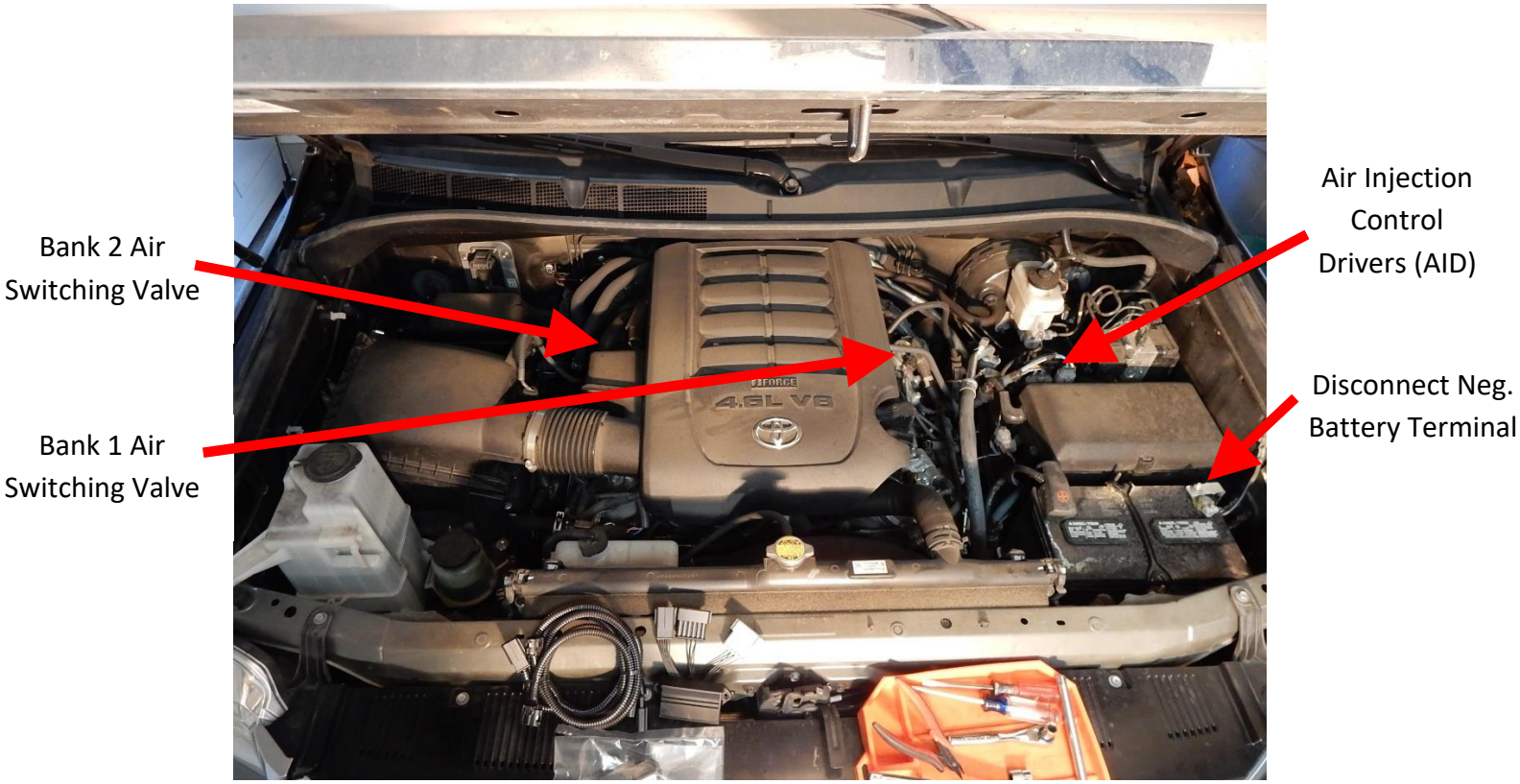

Figure 1 – 4.6L Tundra/Sequoia Engine Compartment

2) Locate the air injection control drivers (AID) on the inner driver-side fender in the engine bay. The 4.6L Tundra and Sequoia have two air injection control drivers mounted on a common bracket on the inner driver-side fender.

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3) Disconnect all four connectors from the air injection control drivers (AIDs).

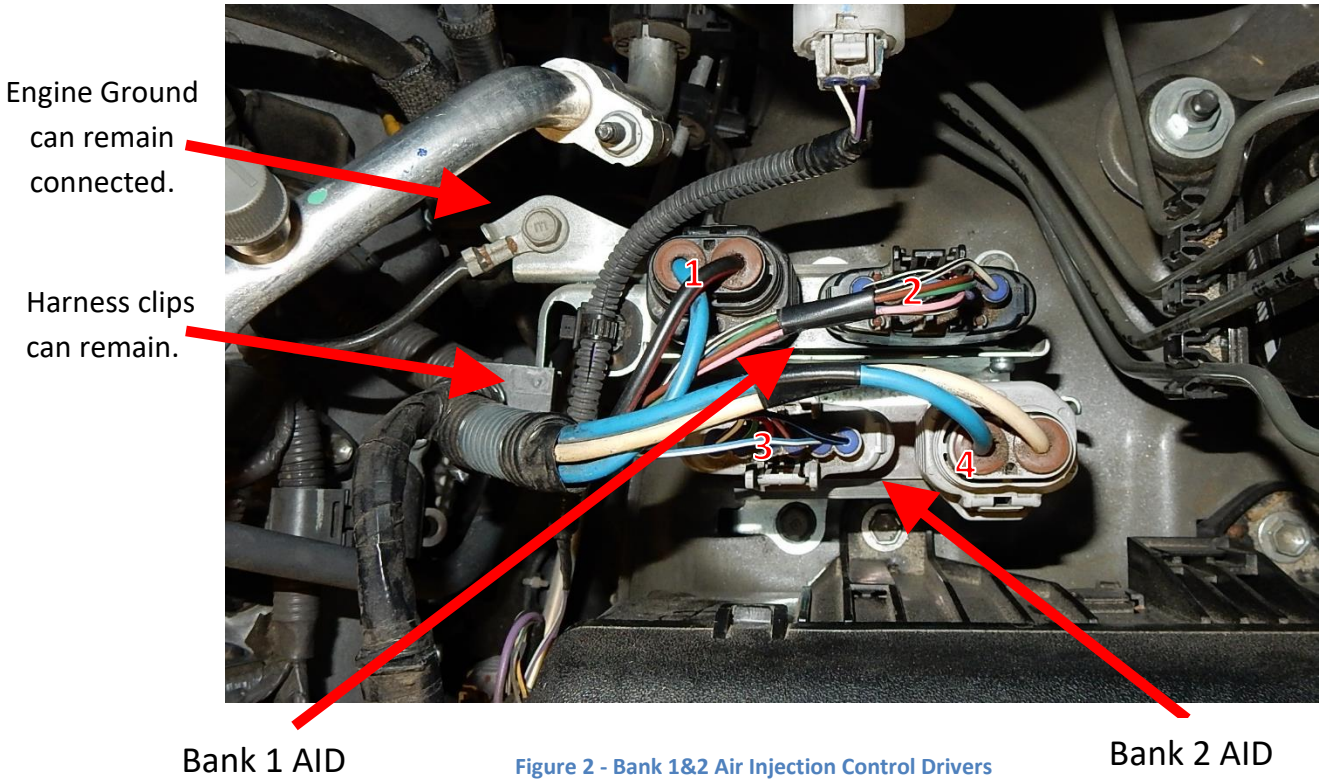

Figure 2 - Bank 1&2 Air Injection Control Drivers

4) Disconnect the brake master cylinder sensor. Install the custom blank plug caps into the two connectors labeled #1 and #4 in the figure above. Tuck all the connectors out of the way to allow easy removal of the mounting bracket from the inner fender.

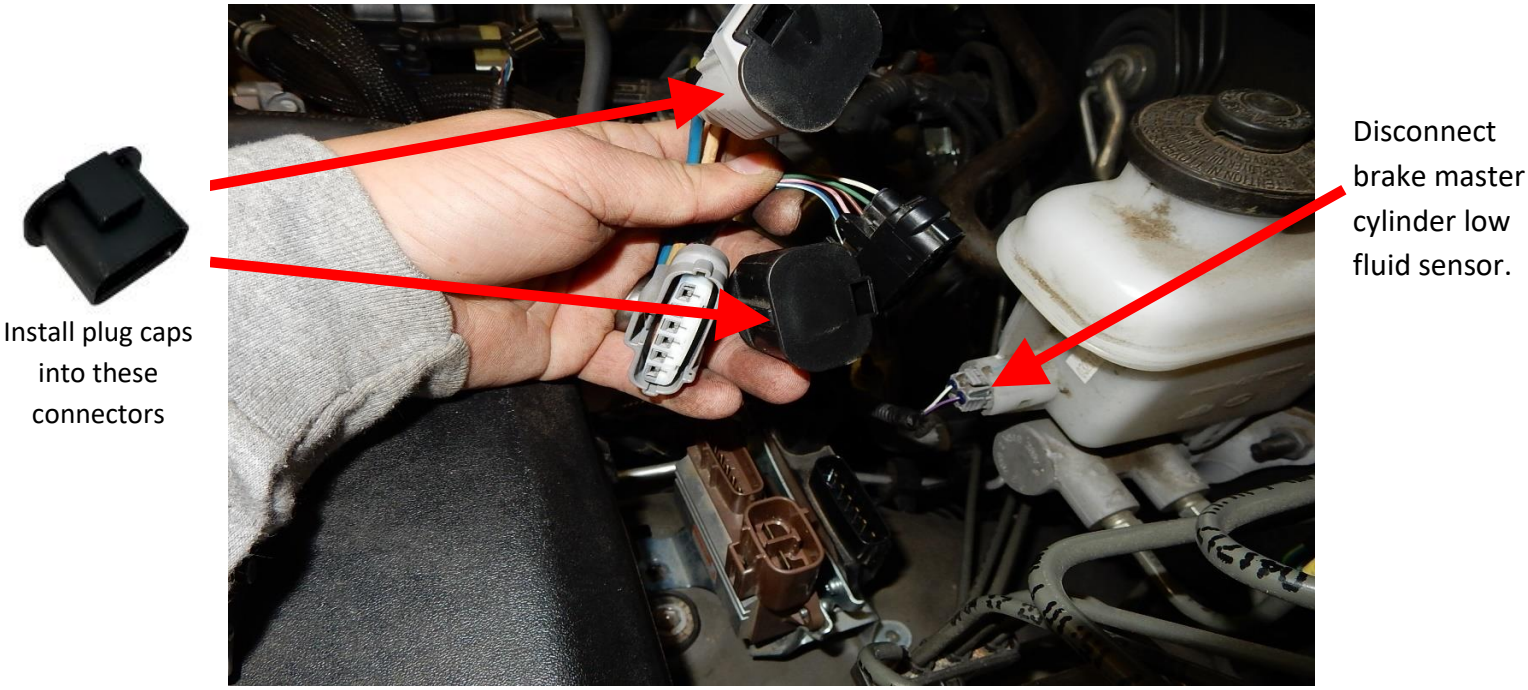

Figure 3 - Custom plug caps installed

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5) Remove the AID bracket from the fender and both factory AIDs (AIDs no longer needed).
    a. The harness clips and engine ground wire can remain connected to the bracket or they can be removed to allow the whole bracket to be removed from the vehicle for easier access.
    b. Remove the three bolts securing the main bracket to the fender.
    c. Pull the entire bracket up and position it so that the Bank 2 AID sub-bracket and Bank 1 AID can be removed.
    d. Remove the two bolts holding the Bank 2 sub-bracket, then set them aside.
    e. Remove the two Philips screws holding the Bank 1 AID to the main bracket, then set aside the AID.

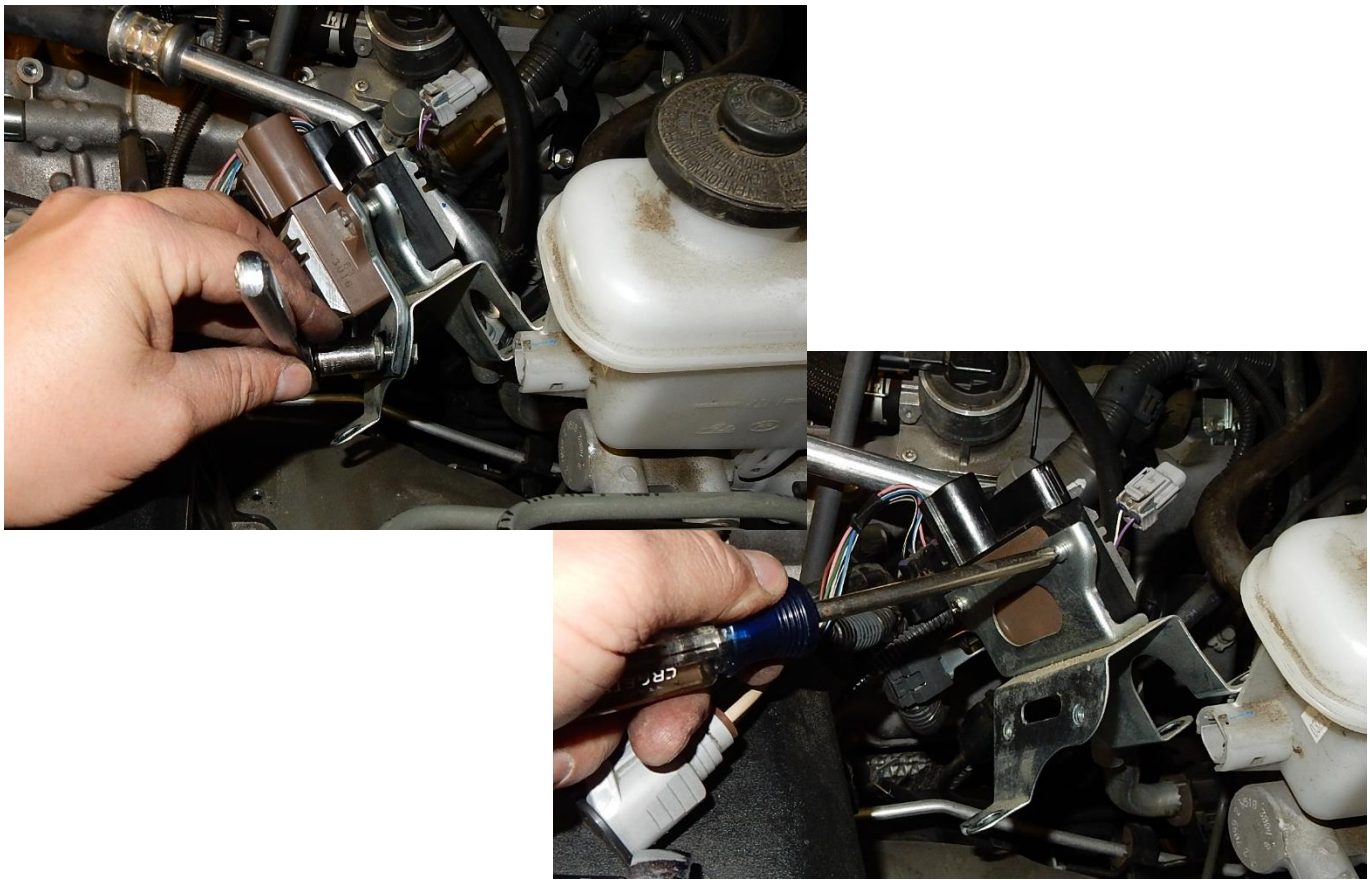

Figure 4 - Removing the air injection control drivers

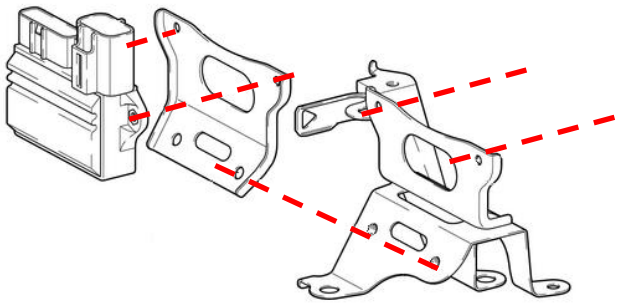

Figure 5 - Bank 2 AID and Mounting Brackets

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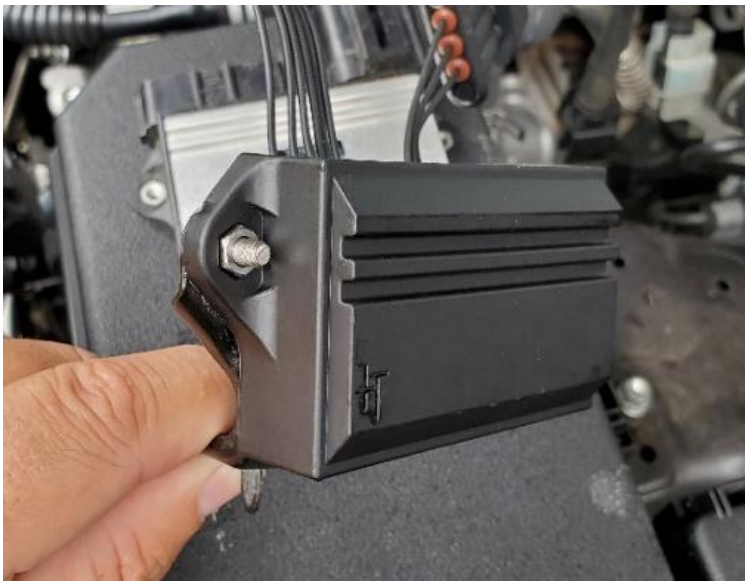

Figure 6 – Gen-II mounted to sub-bracket with included stainless screws/nuts

6) Mount the Gen-II unit with the included stainless screws/nuts. The unit can be mounted to the sub-bracket or the main bracket. If you mount the Gen-II unit to the main bracket, the sub-bracket can be omitted completely.

7) If you mount the Gen-II unit to the sub-bracket, bolt the sub-bracket to the main bracket, then bolt the main bracket to the fender.

8) Connect the black and gray AID harness connectors to the matching connector of the Gen-II unit. Tuck or zip-tie the large capped-off connectors out of the way. Reconnect the brake master cylinder, as well as the ground wire and harness clips if they were removed.

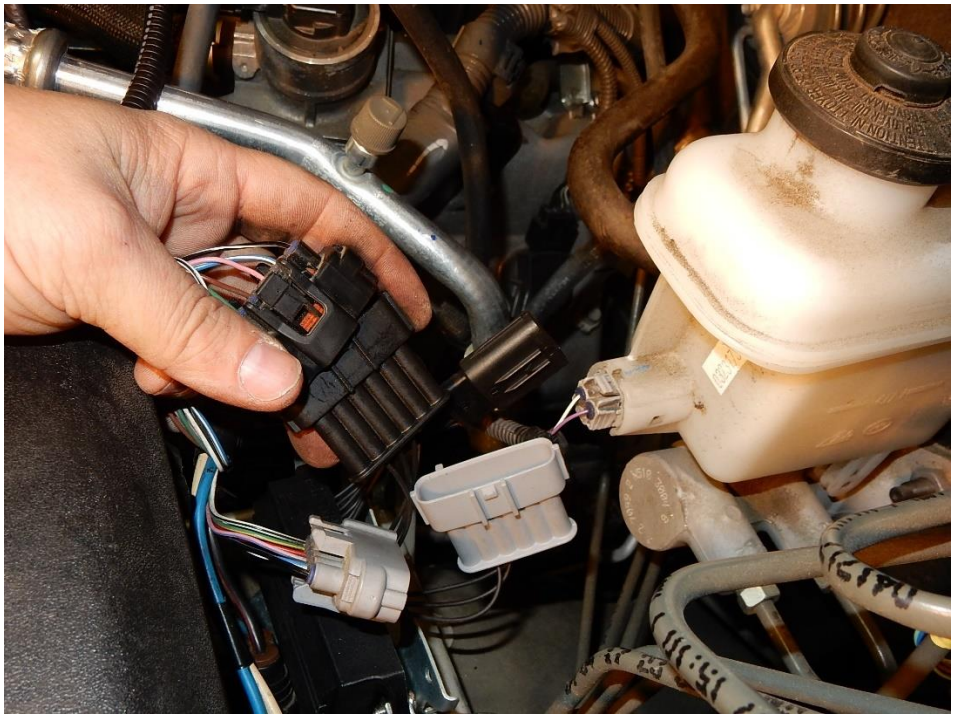

Figure 7 – Gen-II unit and connecting the AID connectors

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9) Connect the Gen-II air switching valve harness to the remaining connector of the Gen-II unit.

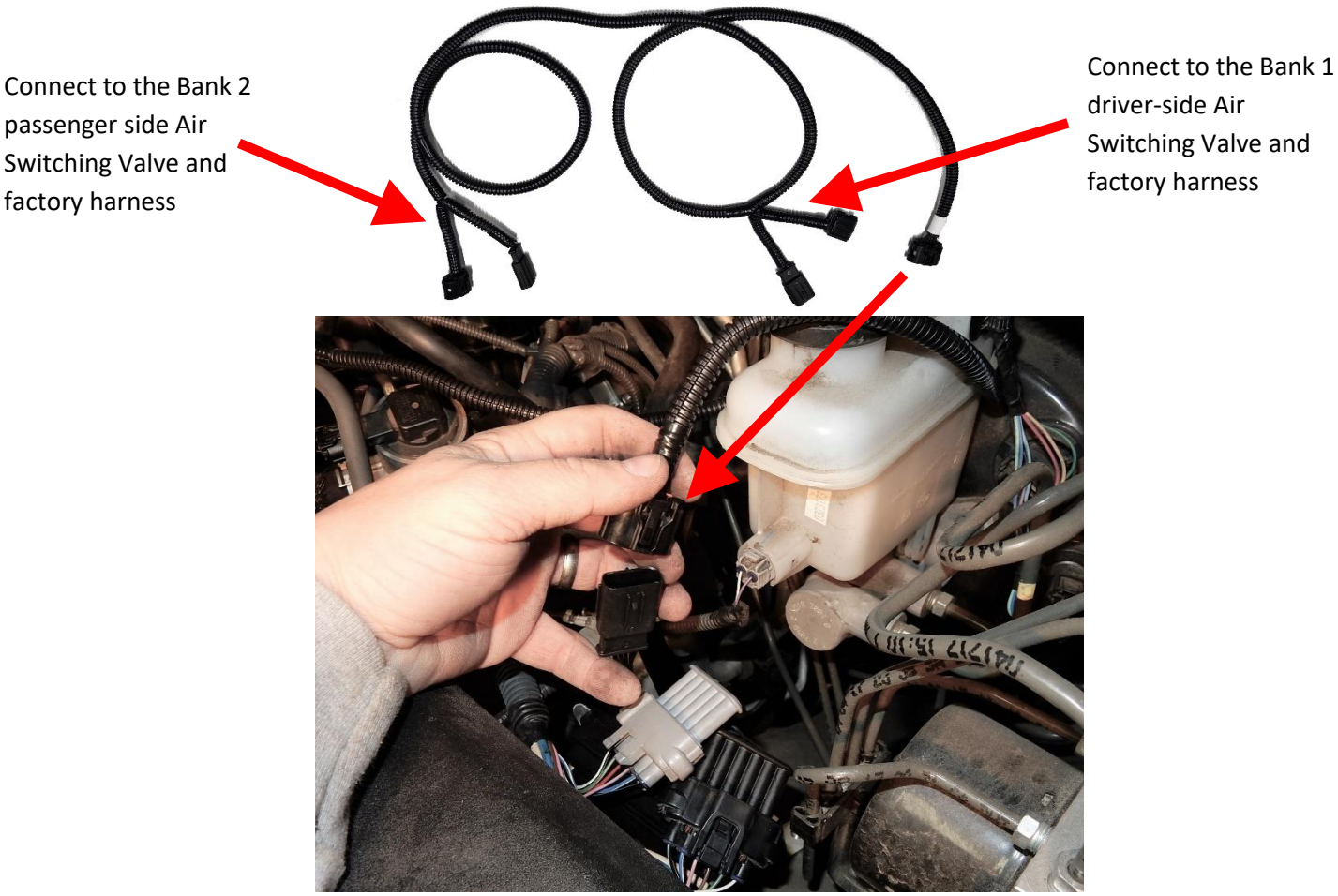

Figure 8 - Connect the Gen-II ASV harness to the Gen-II unit

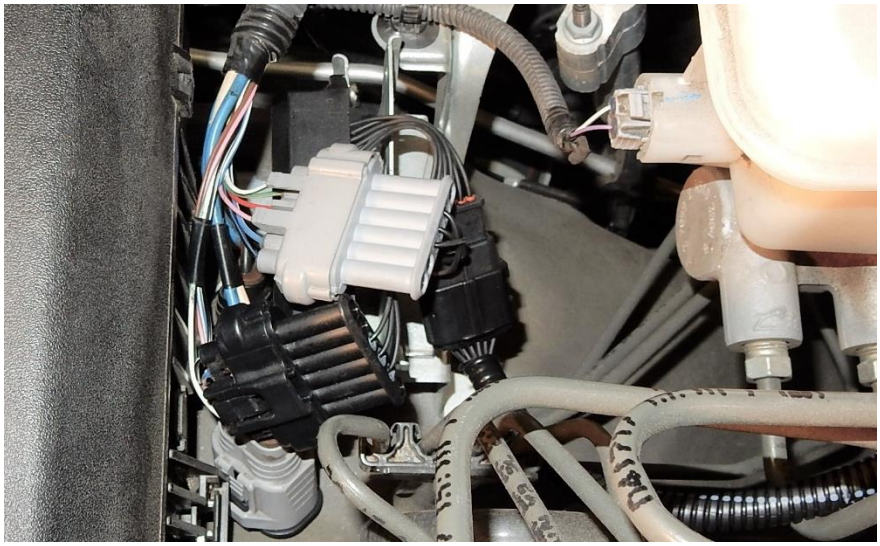

Figure 9 - Gen-II unit completely mounted and connected

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Figure 10 - Bank 1 ASV location and Gen-II harness routed over top of engine.

10) Route the Gen-II ASV harness around the brake master cylinder to the firewall, then to the Bank 1 air switching valve and finally over the intake manifold to the Bank 2 air switching valve. Keep the harness away from the exhaust and moving parts like the fan.

11) Disconnect the Bank 1 air switching valve (ASV) from the factory harness. Squeeze the connector locking tab at the end of the connectors and pull it off the ASV. It is often easier to use a flathead screwdriver to push down on the end of the locking tab and use your other hand to grab the connector body and pull it off.

Warning: Do not pull on the wires or harness.

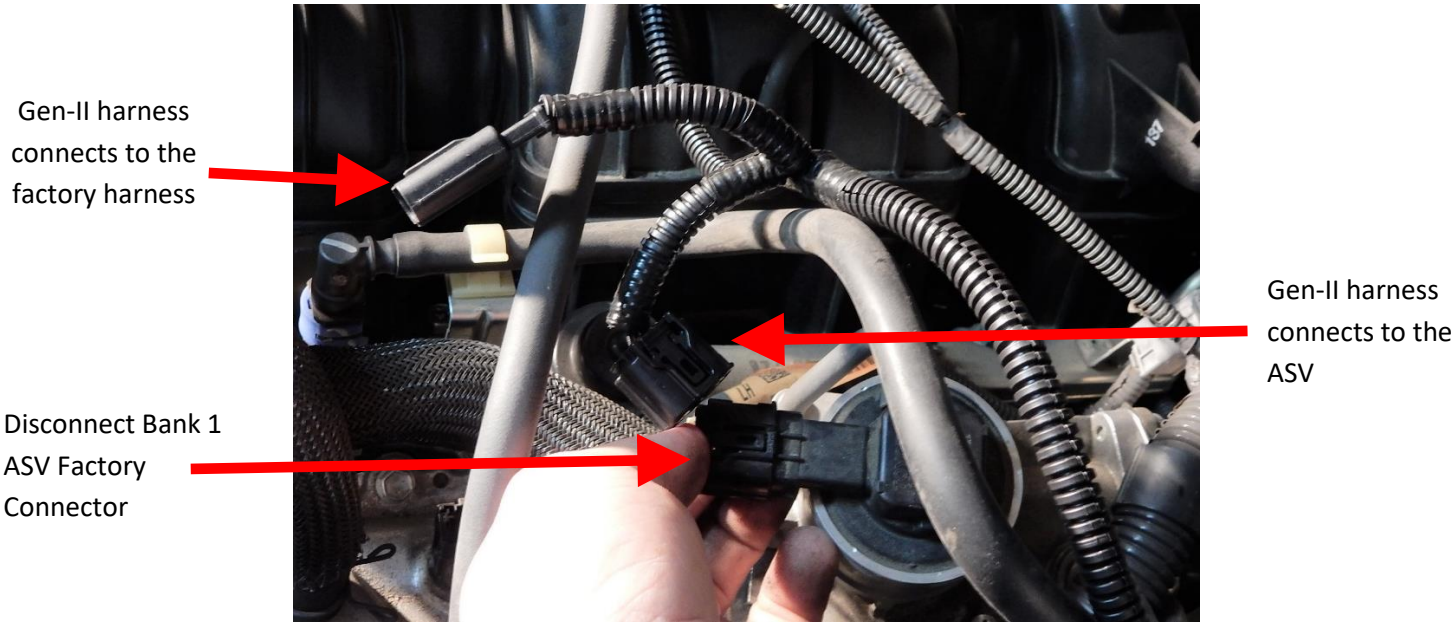

Figure 11 - Disconnect Bank 1 ASV

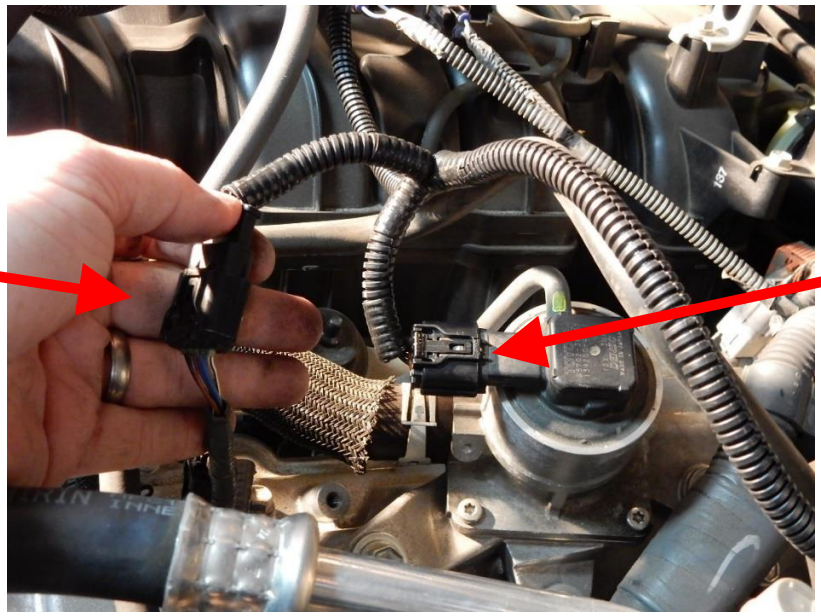

Figure 12 - Bank 1 – driver-side Gen-II ASV connections

12) Connect the factory air switching valve (ASV) harness to the Gen-II harness. The factory ASV harness will always connect to the Gen-II harness.

13) Connect the remaining female connector of the Gen-II harness to the ASV. The Gen-II harness should now be in-line or plugged in between the factory harness and the air switching valve.

14) Move to the passenger side and connect the Gen-II harness to the Bank 2 ASV using the same instructions found in steps 12 and 13.

Note: If you purchased Pressure Sensor Replacement Options, see the next page for their installation.

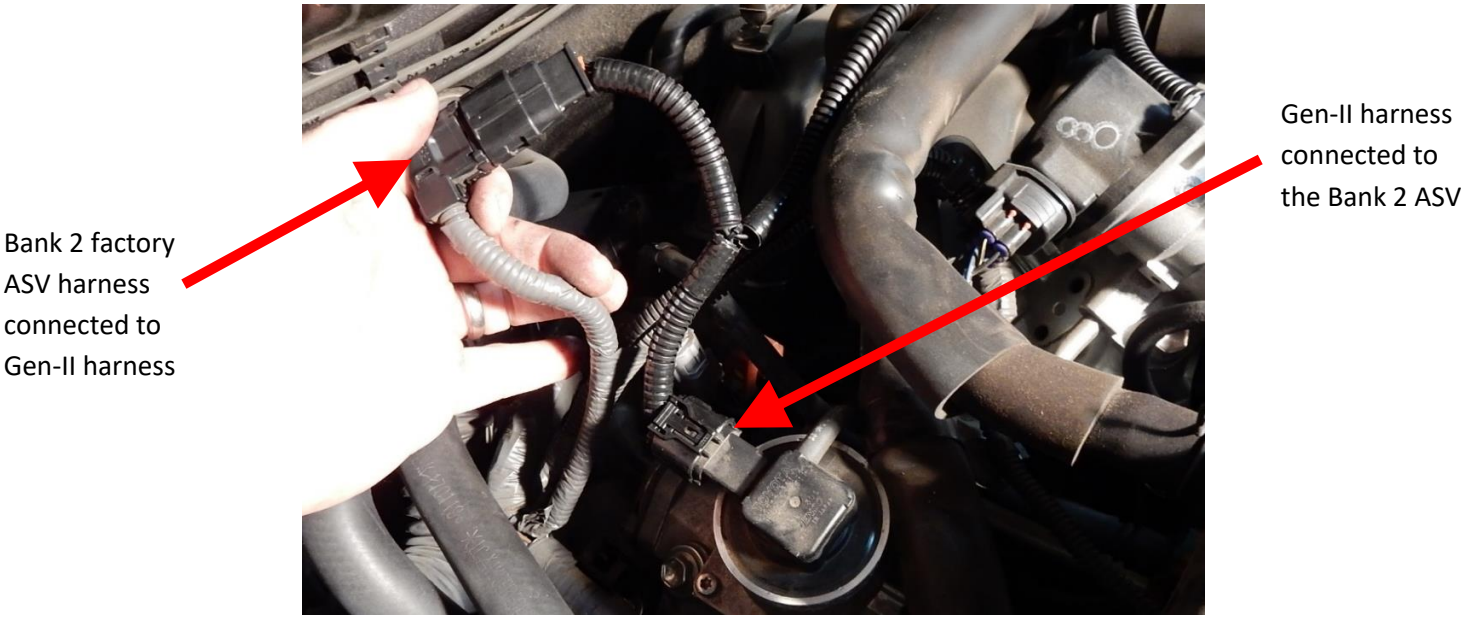

Figure 13 - Connecting the Factory ASV harness to the Gen-II ASV harness

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Figure 14 - Pressure Sensor Option (PSO), each sold separately

15) If you do not have Pressure Sensor Options (PSOs), skip to the next page. If you have PSOs, follow the instructions on this page. A PSO is typically only needed if the pressure sensors in the air switching valves have been damaged by exhaust exposure. This is typically caused by a vehicle being driven for an extended period with air switching valves physically stuck open or leaking exhaust. A PSO substitutes as an external pressure sensor for the damaged sensor that is built into the ASVs. For the PSO or Gen-II kit to work properly, the harness wires, connectors, and pins, as well as the ECM, cannot be damaged.

    a) If you are still unsure about which bank needs the PSO, use one of the four cases below to determine which side of the engine to install the PSO. The PSO installs by connecting to the Gen-II ASV harness instead of where it would normally connect to that bank's air switching valve. There will be no connection to an air switching valve if there is a PSO installed on that same bank.

        i) For codes P2431, P2432, P2433, P2440, P2441, P2444 and P2445 that cannot be cleared or come back after being cleared with the block off plates installed, plug the PSO into the driver-side Bank 1 connector of the Gen-II ASV harness.

        ii) For codes P2436, P2437, P2438, P2442, P2443, P2446 and P2447 that cannot be cleared or come back after being cleared with the block off plates installed, plug the PSO into the passenger-side Bank 2 connector of the Gen-II ASV harness.

        iii) For a P106B code not accompanied by or preceded by one of the codes shown above, you will need to read the air injection pressure sensor values and the evap. pressure sensor value in the freeze frame data stored in the computer when the code is set. The sensor that is not reading the same as the other two sensors is the ASV connection that should be replaced with the PSO.

        iv) If you purchased two PSOs, simply connect one of them to each of the remaining connectors of the Gen-II ASV harness. There is no need to connect to either of the air switching valves.

    b) Mount the PSO(s). There is no existing mounting location for a PSO, but it can be secured with zip-ties or by being pushed under a bolt that secures a vacuum or brake line. Ideally, the PSO should be secured so that the vacuum nipple is pointing down. This keeps water and debris from getting into the sensor.

The vacuum nipple of the pressure sensor must remain open to the atmosphere. There will be no connection to the ASV for any side that has a PSO installed. If you have questions about the PSO, or if you have a code in the list that you cannot clear after installation, please contact us directly.

16) Once the harnesses are installed and the PSOs are installed and secured, use zip-ties to neatly secure the rest of the harnesses and reinstall the engine cover.

17) Reconnect the negative battery terminal. If the battery was not disconnected during installation, clear the active and pending codes using an OBDII tool. You can also clear the active and pending codes by disconnecting the negative battery terminal for at least 2 minutes.

    At this point, there should be no active or pending codes stored for the secondary air injection system and the CEL should remain off (if there are no other problems). Any permanent trouble codes stored for the secondary air injection system will automatically clear the next time the secondary air injection system is commanded to operate, and the Gen-II unit successfully completes its first cycle.

    Attn: Disconnecting the negative battery terminal to reset the codes will also reset engine tuning parameters like the fuel trims. It is normal for the engine to run rough, off idle and even stall after the first start. A few minutes of idle and drive time is all that is needed for the computer to relearn this tuning data.

18) Install the block off plates if they were not already installed.

19) Congrats! You are finished with the installation!

If you have questions or trouble before, during or after installation, please contact us directly.
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Important: It is illegal to remove, dismantle or otherwise cause to be inoperative any pollution control device required by federal, state or local emissions law. The Gen-II bypass kits are sold for off-road or competition use only, no other applications are intended or implied. By installing or using this SAIS bypass kit, the vehicle owner and installer acknowledges and assumes ALL risks associated with its use.