

Gen-II Secondary Air Injection System (SAIS) Bypass Kit

4.6L GX460 Installation Instructions



Introduction:

A failure of any component of the SAIS will generally set the check engine light (CEL) and cause the Engine Control Module (ECM) to store trouble codes. Many of the codes for a failed SAIS will cause the vehicle to enter “limp-mode” where the throttle is limited about 50% output to protect the engine from damage. Before installing the bypass module, it is highly recommended to address any codes not related to the SAIS.

The Gen-II units emulate operation of the SAIS and will allow you to clear your trouble codes/CEL and prevent the vehicle from entering limp mode. When installed the vehicle’s computer will think the system is operating correctly and you can remove most of the system if desired. The Gen-II SAIS bypass module installs by replacing the factory air injection control driver (AID) and by connecting to the air switching valves (ASV) and their factory harnesses. With the Gen-II unit and block off plates installed there is no longer a need for the air pumps, air tubes/plumbing or the factory air injection control driver. The Gen-II unit and vehicle will typically need the air switching valves to remain so the pressure sensors that are built into them can be utilized. If your air switching valve pressure sensors are damaged or you wish to remove the air switching valves from the vehicle, one Pressure Sensor Option(s) is needed to replace each air switching valve. Once an air switching valve is replaced with a PSO the ASV is no longer needed and can be removed. If you have any 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 or use the “Contact Us” page to contact us directly.

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 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 acknowledge and assumes ALL risks associated with its use.

Needed for Installation:

- #2 Philips and Flat Head Screwdriver
- 10mm ratchet/wrenches
- Electrical Tape
- Zip ties
- 0.5-1 hours



Installation Steps:

- 1) Open the hood. Remove the engine cover and disconnect the negative battery terminal. Leaving the battery disconnected while installing the bypass kit will clear any pending and active trouble codes stored in the ECM. Any permanent codes for the secondary air system will drop out by themselves the first time the secondary air injection system is commanded to run, and the Gen-II kit completes the run sequence successfully.



Figure 1 - Engine Compartment Viewed from Driver's Side Fender

- 2) Remove the driver side engine bay cover. Use a small flat screwdriver to pop the center of the fastener out and then the remove the fasteners. The Air Injection Control Driver is located underneath.



Figure 2 - Removing the Driver's Side Engine Bay Cover

- 3) Disconnect the two connectors from the Air Injection Control Driver (AID). The AID is mounted on a small bracket under the right engine bay cover that was removed. It is between the brake master cylinder and fuse box on the driver side inner fender.
- 4) Cover and tape off the large 2 wire connector with electrical tape to prevent accidental contact with a live 12V terminal when the battery is reconnected. Tuck the covered connector out of the way as it will no longer be connected or used. (A custom blank connector plug is still in production for this purpose. Once available it can be supplied upon request.)



Cover and tape off this connector with electrical tape.

Figure 3 - Remove the Factory AID and Replace with the Gen-II Module

- 5) Unbolt the mounting bracket from the fender using a 10mm ratchet. Remove the factory AID from the bracket by removing the two Philips head screws. Set the factory AID aside as it will no longer be needed.
- 6) Use the included stainless-steel hardware to secure the Gen-II module to the bracket in the same orientation as the factory AID. The nut wells molded into the Gen-II module will hold the nuts while securing them. They do not need to be overly tightened.
- 7) Bolt the bracket, now with the Gen-II unit attached, back to the fender.



Figure 4 - Gen-II Bypass Module Mounted to Bracket

- 8) With the Gen-II Bypass unit mounted, connect the factory six-wire AID harness to the matching connector of the Gen-II unit. Tuck or zip-tie the taped off connector out of the way. Connect the Gen-II ASV Harness to the remaining, smaller connector of the Gen-II kit.

Two-wire connector taped off and out of the way.

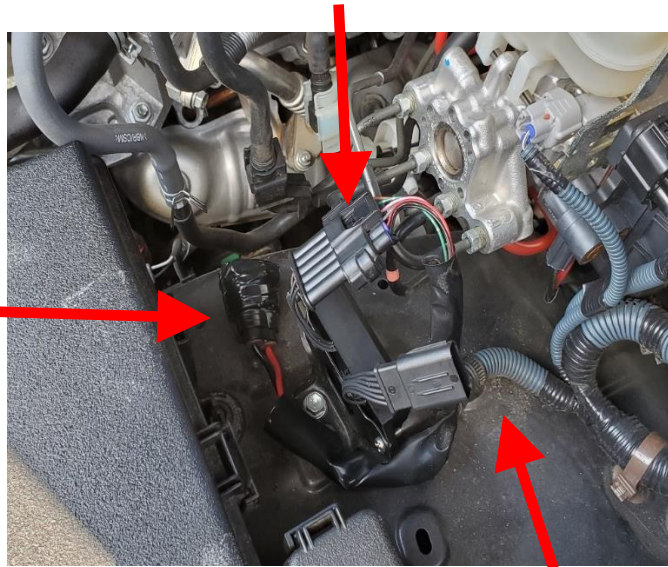


Figure 5 - Connect the six-wire connectors



Figure 6 - 4.6L Gen-II Air Switching Valve (ASV) Harness



Figure 7 - Connect the Gen-II ASV Harness to the Gen-II Unit

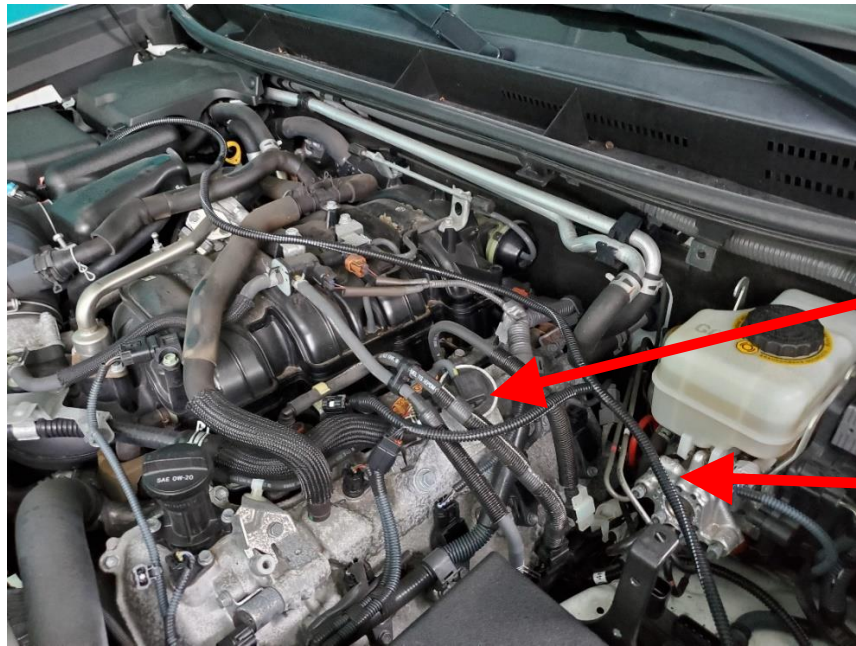


Figure 8 - Bank 1 ASV Location and Gen-II Harness Routed over top of engine.

- 9) Route the Gen-II ASV harness to the air switching valves. You can route it straight across or behind the brake master cylinder and along the firewall. Keep it way from the exhaust and moving parts like the fan.
- 10) Disconnect the air switching valves (ASV) from their factory harnesses. The air switching valves are located on the left and right sides of the intake manifold as shown in Figures 8 and 9. Squeeze the connector locking tabs at the end of the connectors and pull it off the ASV. Do not pull on the connector wires as this can easily damage the wiring and cause problems.

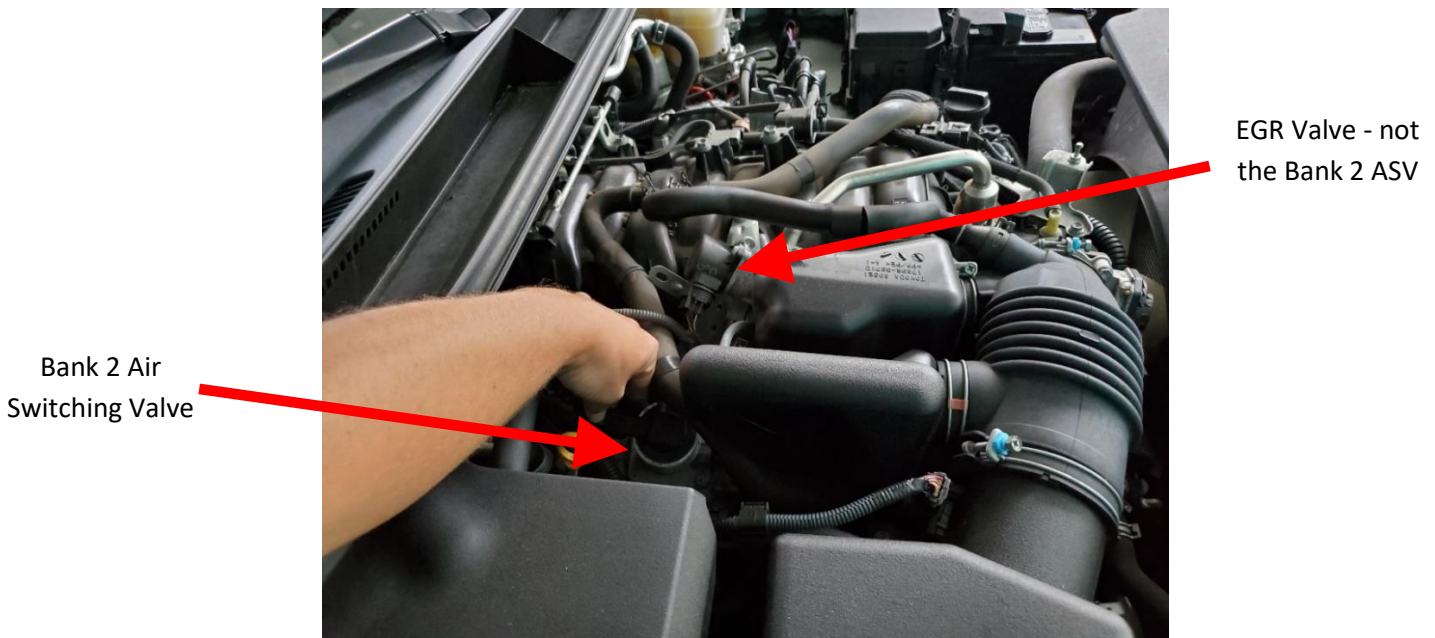


Figure 9 - Bank 2 ASV Location

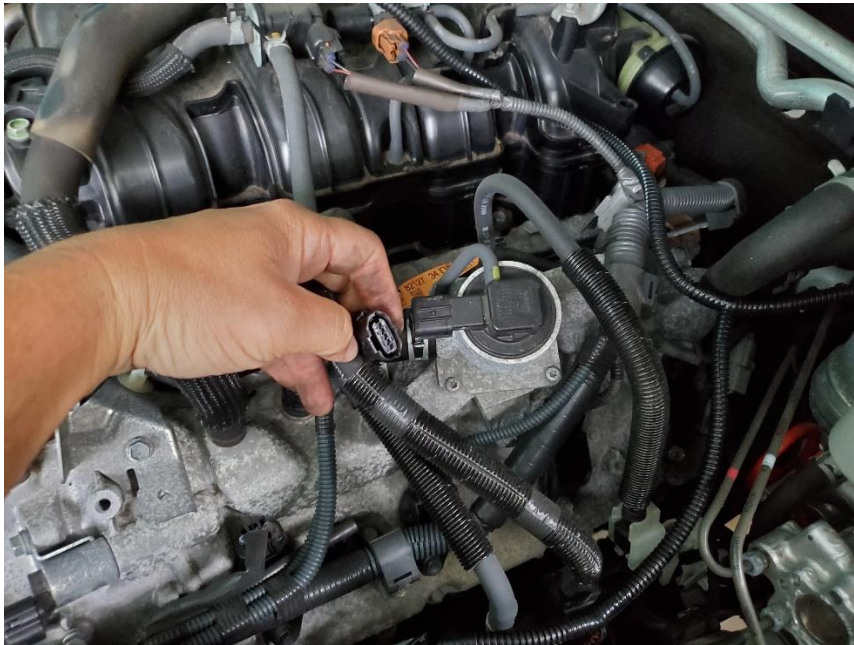
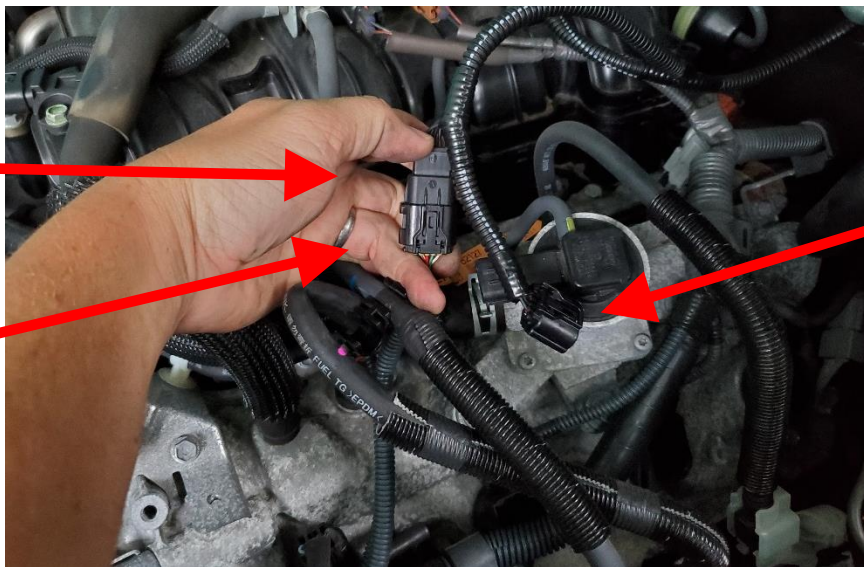


Figure 10 - Disconnecting the Factory Harness from the Bank 1 ASV



Gen-II ASV
Harness, Male
Pin Connector

Factory ASV
Harness

Gen-II ASV Harness,
Female Pin Connector

Connects to ASV or
Pressure Sensor
Replacement Option
See Next Page

Figure 11 - Connecting the Factory ASV Harness to the Gen-II ASV Harness

- 11) For both Bank 1 and 2, connect the factory ASV harnesses to the male pin connectors of the Gen-II's ASV harness. For each bank, the female pin connectors of the ASV harness will connect to either the ASV or a Pressure Sensor Replacement Option (PSO, purchased separately).
- 12) If you do not have PSO(s), connect the remaining Gen-II ASV Female Pin connectors to the Bank 1 AND Bank 2 ASVs. Skip Step 13.

Note: PSO(s) are only needed when a pressure sensor in one of the ASVs has been damaged. Typically, the pressure sensors in the air switching valves are only damaged by continuing to drive the vehicle with a leaking or physically stuck open ASV. One PSO is needed for each damaged pressure sensor ASV or one for each ASV that valve to be removed from the vehicle.



Figure 12 - Pressure Sensor Option (each sold separately)

13) If you have a PSO(s) follow this step to make sure it is installed on the Gen-II's ASV harness correctly. If you do not have a PSO skip ahead to step 13 to finish your installation.

- a) Your PSO(s) will be connect to the Gen-II's ASV harness in place of the ASVs according to one of the three cases below. If you are still unsure about how to determine how to connect the PSO to the kit, please contact us directly.
 - i) For codes (P2431, P2432, P2433, P2440, P2441, P2444, P2445) that cannot be cleared or come back after being cleared, plug the PSO into the remaining Bank 1 connector of the Gen-II ASV harness. There will now be no connection made to the Bank 1 air switching valve.
 - ii) For codes (P2436, P2437, P2438, P2442, P2443, P2446, P2447) that cannot be cleared or come back after being cleared, plug the PSO into the remaining Bank 2 connector of the Gen-II ASV harness. There will now be no connection made to the Bank 2 air switching valve.
 - iii) If you purchased two PSOs simply connect one PSO to each of the remaining connectors of the Gen-II ASV harness and there will be no connections to either of the air switching valves.
- b) Mount the PSO(s). There is no existing mounting location for the PSO. The sensors can be secured with zip-ties or under a non-critical mounting bolt. A bolt that only serves to secure vacuum or brake lines in place works well as a sensor mount if the bolt is long enough.

Ideally the PSO sensor should be secured with the vacuum nipple pointing downward to keep water and debris from getting into the sensor. If the sensor nipple is horizontal or pointing up, a small length of vacuum line can be placed on the sensor and the open end of the line secured pointing downward.
- c) For either bank that does not have a PSO installed on the Gen-II ASV Harness plug the Gen-II ASV harness into the air switching valve as you would in step 12.

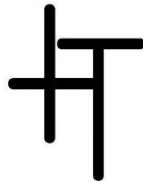
Note The vacuum nipple of the pressure sensor does not connect to anything and needs to remain open to the atmosphere. There will be no connection to the ASV for any side that has a PSO installed.

- 14) Once all the harnesses are installed and any PSO are connected and secured, use zip-ties to neatly secure the rest of the harnesses in place and re-install any engine covers that were removed.
- 15) Reconnect the negative battery terminal and install the block off plates at the ASVs if they were not already installed. If the battery was not disconnected during installation the last step is to clear the active and pending codes using an OBDII tool or by disconnecting the negative battery terminal for at least 2 min.
- 16) Congrats, you are finished with the installation!

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

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.

If you have questions or trouble before, during or after installation please contact us
directly www.Hewitt-Tech.com
Toll Free 1-844-307-7671



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