Supercharger Active Bypass - Boost Control System

PLEASE READ !!!

Mounting of the SmoothBoost actuator to the supercharger must be done AFTER the wiring steps are complete so that the unit can be adjusted while vehicle power is on.

PART 1: WIRING

The unit comes shipped with a 3 pin connector on the boost control input that has a pink jumper wire installed between pin A and B. Leave this installed until the wiring steps are complete and the unit has been properly adjusted on the supercharger. Once those steps are finished you have the choice of running: The Boost Control Lockout Plug, Boost Knob or our SB-DCA module which allows boost control through a PWM(-) output of an ECU

- RED wire: Pin A

  12v switched key ON source that is active when key is in the start/run position. A good solution (if available) is the vehicle power outlet/ Cig lighter. Be sure to choose a source that has 12v only when the key is in the start/run position.

  The SmoothBoost system consumes no more than 5A and should be properly fused for safety.

- BLACK wire: Pin B

  This is the ground wire and should be connected to a good ground source, preferably the PCM ground location or direct to the battery to eliminate possible noise interference. Dashboard framework is not a good ground location on most vehicles

- PURPLE wire: pin C

!!! Important: PLEASE READ!!! Never install this wire with the unit powered ON or the main 14 pin connector plugged into the controller. It is best to leave this disconnected from controller until ALL wiring steps are complete.

Drive by Wire vehicles:

Connect to app/TPS signal which must be a 0-5v signal most commonly found on the APPS (Accelerator Pedal Position Sensor) . A vehicle specific diagram may be needed. This can be tested with the key in the run position and back probing with a multi-meter to verify 1.5 volt or less without pressing the pedal and at least 3.8 volts with the throttle at WOT.

Common pedal (apps) signal:

Pin 2 of APPS on Mopar and Ford vehicles. On GM cars and trucks it will be Pin 5/Pin E of the APPS

Can also be connected the the throttle body on some vehicles. For instance, you can NOT on newer GM platform because of the type of throttle feedback signal read by the PCM (SENT PROTOCOL) if this is required you will need a special signal converter.

For Drive by Cable:

Connect to the TPS sensor 0-5v feedback output

The Blue, Gray and Tan wires are optional and activate MOMENTARILY when they receive a GROUND signal. These can be used in conjunction with on/off switches or other control systems for activation.

NOTE: NEVER put voltage of any kind to these wire's as internal damage WILL occur!!!

- BLUE wire: pin D

  This is the BOOST CUT Wire - This wire defaults the actuator to open the bypass valve. This will cut all capable boost from the engine. Signal can be generated by components such as a failsafe air/fuel guage, water meth low level, aftermarket ECU, ect.

- Gray wire: pin E

  Calibration Mode- Activate this wire with a ground signal when adjusting the Actuator to the valve closed/BOOST position.

- Tan Wire Pin F

  This is the Scramble Mode - Activation will give full boost mode as if the boost knob was turned up all the way up or the bypass plug is installed.

PART 2: Installing the Actuator

When wiring steps are complete we urge you to plug the actuator in and power things up. Familiarize yourself with how the unit works by using the throttle pedal. This way you have an understanding how it works before installing it on the supercharger.

Keep in mind if it can not mechanically reach commanded position the internal DC motor can overheat and cause damage. Luckily we have incorporated a Protection Mode feature that will disable power to the actuator if full amperage has been drawn by the actuator for more than a few seconds. If this happens you will lose control over the actuator until it sees a power cycle.

1. Take note or pictures of the open and closed angle position of the vacuum actuatorand then remove the stock floppy vacuum actuator and Install the included 10-32 to ball socket adapter on the bypass valve lever

2. Install the actuator to the supercharger using the original bolts WITH the washers included in this kit. Leave the 2 bolts 1 turn LOOSE for now. Snap the actuator rod end onto the ball socket and move onto the adjustment procedure below.

Adjustment Procedure

The SmoothBoost operates like a Drive-by-Wire system for your supercharger bypass valve. It will need to move through its entire range of motion. From the retracted/idle-cruise position to its full throttle/ full boost position.

When owered off you can manually pull out the actuator linkage by hand to the stop location which puts it in the BOOST/Valve closed position to give you an idea where the valve will sit before moving onto the next step

3. You now have 2 choices. Ground the Gray wire OR have a helper of some sort hold the throttle to the WOT position to extend the actuator to the BOOST position which is the critical adjustment

4. Gently slide the actuator toward the supercharger bypass valve shaft until you feel the butterfly valve completely close in the bore

5. Lock down the adjusment bolts. The included washers help hold it in position instead of "rolling" the bracket out of adjustment as you tighten the bolts.

6. Disconnect the calibration wire AND power off the system.

SLOWLY move the linkage back and forth by hand opening and closing the valve by hand to ensure there is no binding and the pushrod is not touching anything.

In most cases you can not see inside the supercharger, so check the total rotational movement. The bypass valve butterfly valve only needs to rotate from full close to open about 75 degrees. If it goes further than this then it is beginning to close back down in the opposite direction. Over travel is not good and you will have issues that include the SmoothBoost getting locked trying to close the valve in the opposite direction.

If you need more or less travel to acheive the required angle:

The unit is shipped in the least amount of travel position. If needed, actuator travel can be altered by loosening the 5.5mm head bolt under the SmoothBoost cap with a small wrench and adjusting the pushrod on the slider (outward from rotation for more movement and closer for less). This may also be done with a 5.5mm socket by removing the linkage cap using a small size 0 phillips screwdriver.

******This changes the geometry allowing more or less travel in BOTH directions. Everytime this is changed you must Loosen the M8 mounting bolts and once again adjust the actuator in the boost positon "Repeat Adjusment Procedure"***

At this point the vehicle can be powered to the KEY ON/ENGINE OFF position and by moving the throttle to ensure everything is working properly. Actuator pushrod will be retracted during idle and go to the extended position gradually as the pedal is pressed. You should not see the actuator bracket flex at all during any movements Even At the WOT position. This is a sign of binding and can result in the actuator going into Protection Mode while at WOT

- Be sure to cap off the unused vacuum ports and tie any wires out of the way of moving parts and exhaust heat. No wiring or hoses should be close to contacting the linkage.

- Monitor your air/fuel ratio as your engine will now see areas of the VE table that it has never seen before.
Professional install and Tuning is HIGHLY Recommended.

Troubleshooting Tips:

-On most vehicles the controller MUST be powered on WHILE engine and PCM are powered otherwise a CEL and/or throttle limp mode may result. If this happens carefully check for proper power and ground connections as well as proper Smoothboost operation with key ON/ENGINE OFF using the throttle pedal

-Protecton Mode: If the system encounters an over amperage situation while trying to reach its target position it will cut power to the acuator until the power is cycled. This is normally caused by the actuator being out of adjustment or some other type of binding situation. Go through the adjustment procedure ensuring the actuator is free to move throughout its complete motion to fix the issue.

To clarify how a bypass system works:

-When the actuator is extended, this CLOSES the bypass valve forcing the supercharger to make pressure.

-When the actuator is retracted, this OPENS the bypass and allows the air bypass to during low speed cruising and other small throttle inputs for supercharger longevity and efficiency

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