



Supercharger Active Bypass Control System

PLEASE READ!!!!!!!

Installing the SmoothBoost

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.

NEVER send more than 5v through the purple wire, this will destroy the unit!

PART 1: WIRING

Tip: de-pinning the 6 pin connector with the blue weather seal can be done with a paperclip or other small stiff wire easily. Simply insert in the mating side of connector (opposite of wire insertion side) where there is a small hole over top of each terminal then gently pull on the wire. you will have to reset the tang on the terminal before re-inserting. Please note the orientation of the wires (the connectors are labels with letters A-F. Installing the wires incorrectly will damage the unit. Visually check that all wire colors flow through the connectors and match up.

The unit comes shipped with a bypass harness plug connected on the boost knob connector. If you choose use the boost control feature; remove the bypass plug and connect the control knob harness. This will allow you to use the included potentiometer or other 0-5v analog device to control boost level.

- **RED wire:**

You need a switched 12v source that is active when key is in the start/run position. A good solution (if available) is the vehicle power outlet. 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.

- **BLACK wire:**

This is the ground wire and should be connected to a good ground source, preferably the PCM ground location or battery to eliminate possible noise interference.

- **PURPLE wire: !!! Important: PLEASE READ!!! Never install this wire with the unit powered ON. Its best to leave the 6 pin power plug disconnected from controller until all wiring steps are complete to elimiate risk of static shock damaging the controller though the purple wire circuit.**

This wire connects to app signal which must be a 0-5v signal from 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 close to 4v with the throttle at WOT. Commonly this will be Pin2 on Mopar vehicles. GM Trucks, Ford and on most GM cars 2016+ with LT engines it is Pin 5 which has the 0-5v signal

Alternatively

* Most Drive by Wire Throttle Bodies deliver the required analog voltage output. Some GM vehicles do not use an analog signal, Therefore you need to use a D2A TPS signal Converter available from Torque Rush

*On non-Drive by Wire vehicles use the 0-5volt signal wire on the TPS sensor located on the throttle shaft.

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

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

- BLUE wire:

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:

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

- Tan Wire

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.

****Boost control through a standalone ecu's auxiliary PWM output can be achieved with our **SB-DCA** converter which transforms a (PWM -) signal to a 0-5v analog signal. It replaces the standard open loop boost control knob**

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.

System failures happen during installation because when the system is powered up the actuator will try to acheive its commanded position. If it can not mechanically reach position the internal DC motor can overheat. If you dont adjust it correctly, you will damage the actuator!

1. Remove the vacuum actuator and Install the large end (10-32 thread) of the adapter on the bypass valve lever and tighten down on the serrated nut
2. Install the actuator arm over the (M3) stud and install the nut. Use a finger to hold against the lever while gently tightening the small nylok nut.

Adjustment Procedure

The SmoothBoost operates like a Drive-by-Wire system for your supercharger bypass valve. You need to have an understanding of how it works and that it will need to move through its entire range of motion from retracted/idle position to its stop pin/full boost location which is visible looking in where the arm comes out it is a stainless steel 3mm pin pressed into the actuator case that contacts the ratio lever at full extend. If after installation it can not reach the stop pin location at WOT it is like hitting a brick wall and unit will eventually destroy itself trying to get there so please follow the adjustment procedure carefully!

You can manually extent the actuator by hand to the stop pin location which puts it in the BOOST/Valve closed location

****This is probably the best method of installing but requires an extra step of grounding the Gray wire. If you can not visually see the actuator very well due to the supercharger design you can power on the system and activate the GRAY Calibration wire by **grounding** it OR have a helper hold the throttle at the WOT position with the vehicle key ON/engine off.

Next, install the original M8 bolts with the included washers but leaving them loose. Slide the actuator towards the bypass valve shaft until you feel the valve close. At this point you can tighten the screws locking it into place. **This adjustment is critical.**

****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

Be 100% sure that the actuator is adjusted properly so that the arm can push and pull through its entire motion otherwise failure WILL occur. You should be able to manually move the valve by hand all the way out until the valve closes AND the lever under the cap is touching the 3mm Stop pin pressed into the actuator case (AT THE SAME TIME) If you can not see the Stop Pin follow the **** above to use the gray calibration wire method

Actuator travel can be altered by loosening the 5.5mm head screw with a wrench and adjusting the pushrod on the slider (outward from rotation for more movement and closer for less). This may be easier by removing the cap using a small no.1 phillips screwdriver. This changes the geometry allowing more or less travel. Everytime this is changed you must re-adjust the actuator Repeat Adjustment Procedure

Attention to detail is important. Actuator linkage must move freely back and forth through its entire motion with power off and have a little rotation side to side throughout the entire travel making note that it can reach its stop pin location at wide open throttle.

At this point the vehicle can be powered to the ON/RUN position and by moving the throttle to ensure everything is working properly. 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 will greatly shorten the lifespan of the actuator.

At a standstill the actuator should be virtually silent. Humming sound or feeling of Vibration felt by the hand coming from the actuator while it is at a standstill is bad and power needs to be shut down immediately. This is a sign that the unit is in a bind and trying to achieve a position it is not mechanically capable of reaching and must be addressed. Please re-adjust the actuator and determine what is causing the issue.

- 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 Recommended!

Troubleshooting Tips:

On some model vehicles the controller MUST be powered on WHILE engine and PCM are powered otherwise a potential 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

To clarify how the 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 during low speed cruising and other small throttle inputs for supercharger longevity and efficiency

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Consult your local laws for legality of product use on public roads and highways Other products used with this product must have their manufacturer guidelines followed. It is also the responsibility of the purchaser to determine compatibility of this device with the vehicle and other components used in the operation of this product. Professional installation is required. Smoothboost is not responsible for any loss or damages that result from improper installation.