

PERRIN

PERFORMANCE

Universal EBCS Pro Cartridge Style

2016-11-03

Thank you for purchasing this PERRIN product for your car! Installation of this product should only be performed by persons experienced with installation of aftermarket performance parts and proper operation of high performance vehicles. If vehicle needs to be raised off the ground for installation, the installer must use proper jacks, jack-stands and/or a professional vehicle hoist for safety of the installer and to protect property. If the vehicle is lifted improperly, serious injury or death may occur! Please read through all instructions before performing any portion of installation. Always use appropriate personal protection equipment such as gloves, eye and hearing protection for installation of this product. I



WARNING: This product can expose you to chemicals including Lead which is known to the State of California to cause cancer and Lead which is known to the State of California to cause birth defects or other reproductive harm.

GENERAL MODIFICATION NOTE

Modifications to any vehicle can change the handling and performance. As with any vehicle extreme care must be used to prevent loss of control or roll-over during sharp turns or abrupt maneuvers. Always wear seat belts, and drive safely, recognizing that reduced speeds and specialized driving techniques may be required. Failure to drive a vehicle safely may result in serious injury or death. Do not drive a vehicle unless you are familiar with its unique handling characteristics and are confident of your ability to maintain control under all driving conditions. Some modifications (and combinations of modifications) are not recommended and may not be permitted in your state or country. Consult the owner's manual, service manual, instructions accompanying these products, and local laws before purchasing and installing these modifications. You are responsible for the legality and safety of the vehicle you modify using these components.

IMPORTANT NOTICES!

- **WARNING:** An accurate boost gauge and ECU recalibration is required for proper installation and adjustment of this product. Improper installation and or use of this product WILL damage turbocharger, engine and other components. PERRIN PERFORMANCE is not responsible for any and all damages as a result from installation of this product. CONTACT YOUR PERRIN DEALER FOR MORE INFORMATION!
- In all installation methods, using the port marked "**Vent To Intake System**" is an optional hookup. There is not enough air coming out of this port to effect MAF (Mass Air Flow) reading or air fuel ratio. It is best to leave this vent open to reduce any restriction of air flowing through the valve.
- Must Read Tuner notes at bottom of page for details on how the EBCS works. Failure to understand how the solenoid may work on your car, WILL result in engine damage.
- Do not use solenoid as a lever during tightening of fittings. Using an adjustable wrench, a vice with a towel in the jaws, or a long M8 bolt threaded into the end of the EBCS Pro body are acceptable ways to hold, while tightening fittings.

Parts Included with the PERRIN EBCS Pro:

- (1) PERRIN EBCS Pro
- (1) Universal Flat Bracket
- (1) Universal 90 Degree Bracket
- (3) Straight Nickel plated brass fitting
- (2) 90 Degree Nickel plated brass fitting
- (1) 1/8NPT Socket Plug
- (2) M8x10 SS Button Head Screw
- (2) M8 SS flat washer
- (6') 5/32" vacuum hose
- (1) 3/16" Tee
- (2) Blue butt connectors
- (5) 8" Zip ties

Wiring Your EBCS Pro

1. If being installed on Subaru or Mitsubishi, simply unplug OEM solenoid and plug in the EBCS Pro.
2. If using on any other vehicle, locate and cut factory boost solenoid plug from harness. Strip roughly 1/4" of sheathing from both wires on harness side.
3. Using supplied blue butt connectors and a wire-crimping tool, crimp connectors to each of the factory wires. **NOTE: Connect either EBCS Pro wire to either two factory wires (polarity of solenoid doesn't matter), using a crimp tool and supplied butt connectors.**

Mounting Your EBCS Pro

1. Determine where EBCS Pro is going to be mounted.
 - a. Keep in mind solenoid is rated to work from -30F to 250F, so mounting over turbo or other extremely hot parts is not a good idea.
 - b. Mounting directly to intake manifold like found in OEM applications is perfectly acceptable.

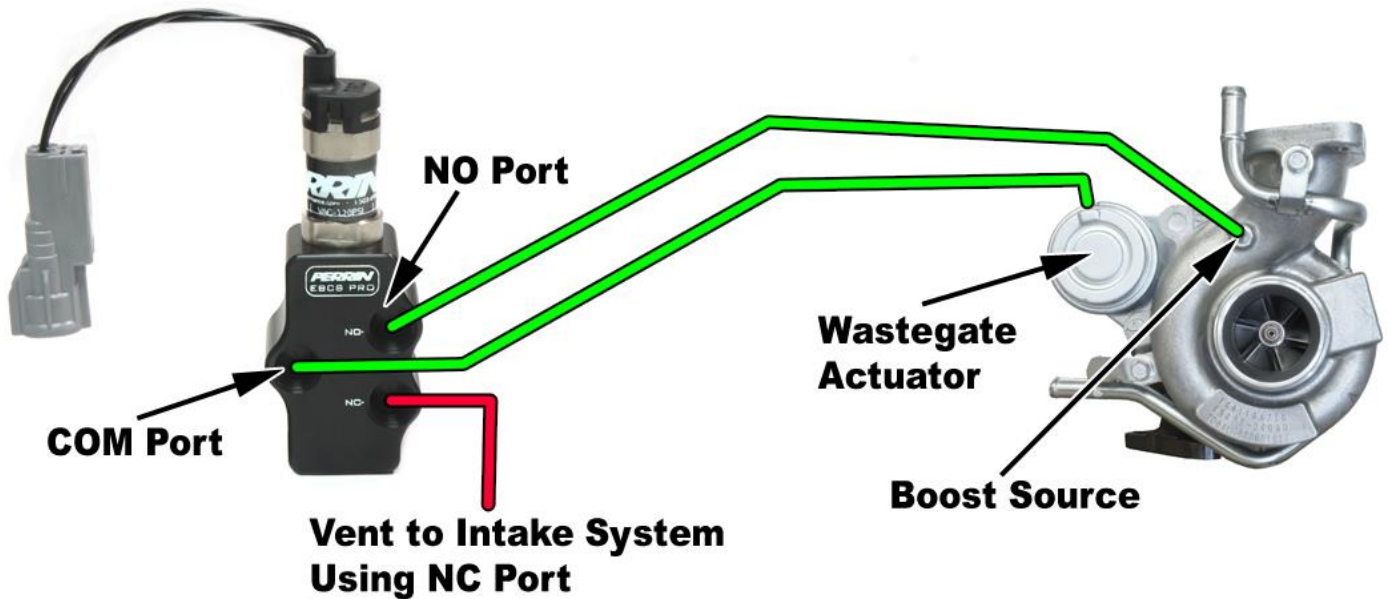
- c. Orientation of EBCS Pro is not important. It can be mounted in any direction without effecting how it performs.
 - d. Like any electrical part, keep this away from direct and frequent water splashing.
2. Many methods can be used to mount solenoid. **NOTE: If not using supplied bolts, NEVER use any bolt or screw longer than 10mm or damage to the solenoid will occur. Always use a washer behind head of bolt or screw.**
 - a. Included are two different brackets (one flat and one 90 degree) that we have tested to work on most Subaru, Mitsubishi, and Nissan Applications. This is the preferred method to ensure it's secure and safely mounted. Use included M8x10mm bolts and washer to secure to mounting bracket and to EBCS Pro.
 - b. Solenoid can be mounted to any surface that holes can be drilled into, like existing brackets. Drill a 3/8" hole in desired location and simply run M8x10 bolt and washer through backside and tighten down.
 - c. Supplied zip ties can be used to secure to a suitable location.
3. Included with kit are 2 different types of NPT fittings, straight and 90-degree type. Either can be used on any of the ports. Determine which fittings to use after you determine which method of boost control you are going to use and where it will be mounted.
4. NPT fittings are tapered type fittings, which seal by tightening down, not by bottoming out on body of EBCS Pro. Simply thread in by hand until they stop then turn roughly ½ turn (or more) to ensure a proper seal is had. **NOTE: A small amount lube or Teflon tape on the threads will help them thread in smoother and further if the desired angle of fitting needs to change.**

Connecting Your EBCS Pro To Your Turbocharger

- If using an OEM internal type wastegate (or one with a single port on it), we highly recommend using the Fast Response Mode (AKA Interruption Type) as this will provide the widest range and best response for boost control. This method requires retuning of ECU. (see notes below regarding ECU tuning)
- If using an aftermarket wastegate (or wastegate with 2 or more ports) it is best to use the External Wastegate Method. This will provide the best response and allow a very wide range of boost pressures to be had using very light wastegate springs. This method also requires retuning ECU.
- If you do not want to retune your ECU, you can use the Slow Response Method but there is no benefit of running the EBCS Pro this way.

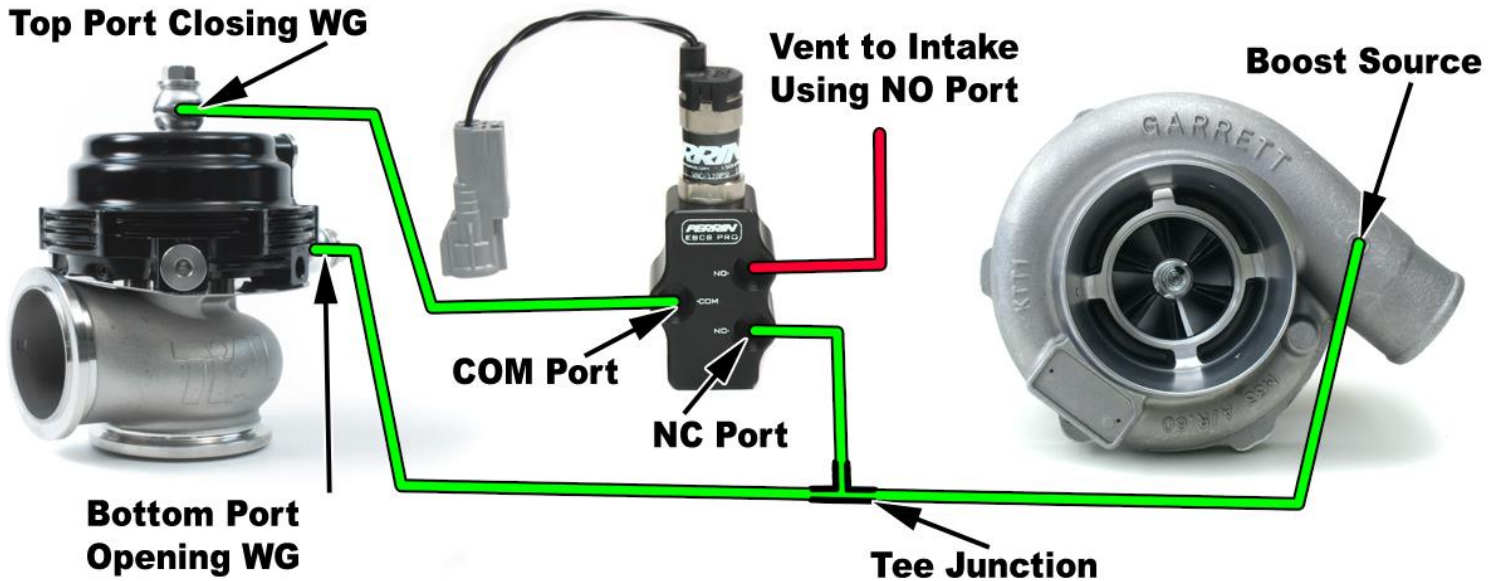
Internal Wastegate FAST RESPONSE Mode (Interruption type)

1. Open hood and locate wastegate on turbocharger. **NOTE: This is typically a round canister, with a rod coming out of middle and a vacuum port on top.**
2. Locate and remove *ALL* factory boost management (solenoid(s), hoses, tees etc.) from turbo and wastegate actuator. **NOTE: Many factory boost control systems have restrictors in the hoses, which if left in place will affect boost control. Removal of these restrictors are highly recommended.**
3. NO (Normally Open) Port Hook-up.
 - a. Install desired barb fitting into NO (Normally Open) port on EBCS Pro body. Use a small amount of grease or Teflon tape on threads, then tighten using 11mm or 7/16" wrench.
 - b. Using supplied hose, connect hose from NO port to boost source on turbo. Use supplied zip ties to secure hose on both ends. **NOTE: Boost source is generally located on compressor housing of turbo (the silver side). If no boost source is found on turbo, you can use a fitting on the intake manifold.**
4. COM (Common) Port Hook-Up.
 - a. Install desired barb fitting into COM (Common) port on EBCS Pro body. Use a small amount of grease or Teflon tape on threads, then tighten using 11mm or 7/16" wrench.
 - b. Using supplied hose, connect hose from barb fitting to nipple on wastegate actuator. Use supplied zip ties to secure hose on both ends. **NOTE: This same method can be used on external wastegates. Make sure to connect to bottom port only and leave top port open.**
5. NC (Normally Closed) port Hook-Up. **(Optional vent hook-up, see note above)**
 - a. Install desired barb fitting into NC (Normally Closed) port on EBCS Pro body. Use a small amount of grease or Teflon tape on threads, then tighten using 11mm or 7/16" wrench.
 - b. Using supplied hose, connect port to turbo intake system or OEM hose going back to turbo intake system. **NOTE: This is the vent for EBCS Pro and it's very important to not restrict or block this off or undesired boost control will occur. It is also acceptable to leave this port open to the atmosphere. If this is done, make sure and block off port at turbo intake, or a vacuum leak will occur.**



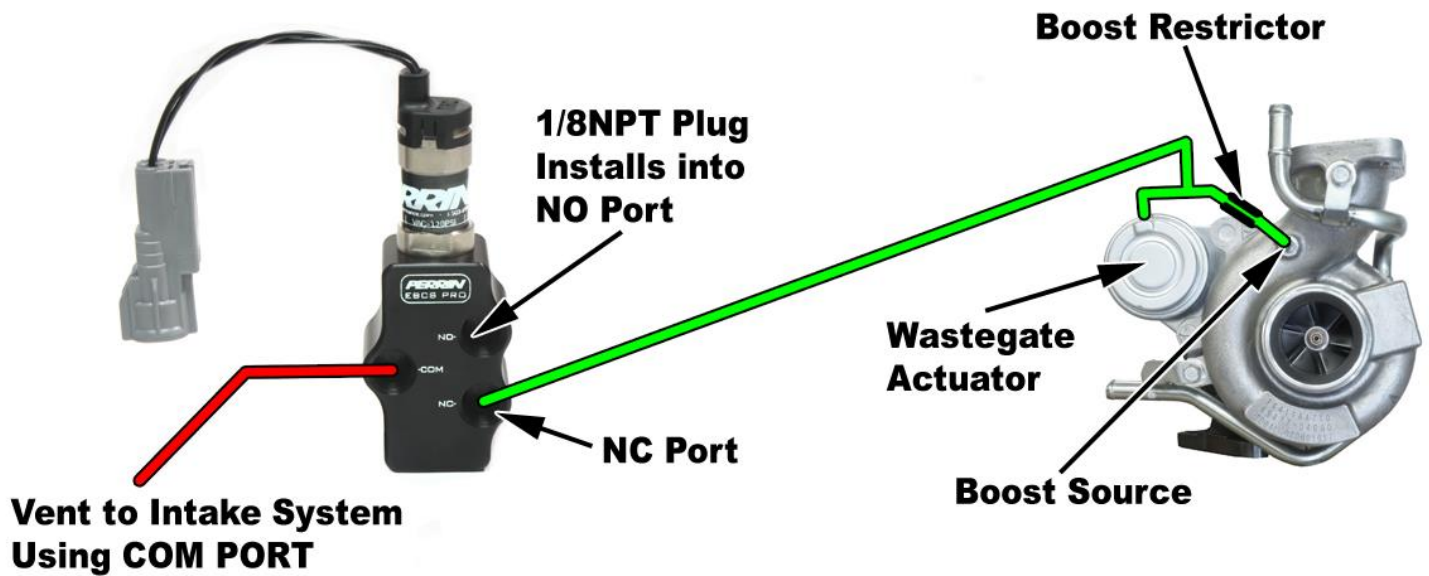
External Wastegate Mode (Using Top and Bottom Ports)

1. Open hood and locate wastegate on turbocharger. **NOTE: This is typically a round canister with a rod coming out of middle and a vacuum port on top.**
2. Locate and remove **ALL** factory boost management (solenoid(s), hoses, tees etc.) from turbo and wastegate actuator. **NOTE: Many factory boost control systems have restrictors in the hoses, which if left in place will affect boost control. Removal of these restrictors are necessary on External WG setups.**
3. Boost Source to Wastegate Hook-up.
 - a. Using supplied hose, connect hose from boost source on turbo to bottom port (port that opens wastegate) on wastegate. Use supplied zip ties to secure hose to both ends of hose. **NOTE: Boost source is generally located on compressor housing of turbo (the silver side). If no boost source is found on turbo, you can use a fitting on the intake manifold.**
 - b. Somewhere along this hose, cut and install supplied tee fitting and secure with zip ties. **NOTE: This tee fitting will connect to EBCS Pro, so find a location that allows for easy installation, and is clear of moving parts.**
4. NC (Normally Closed) Port Hook-up.
 - a. Install desired barb fitting into NC (Normally Closed) port on EBCS Pro body. Use a small amount of grease or Teflon tape on threads, then tighten using 11mm or 7/16" wrench.
 - b. Using supplied hose, connect hose from NC port to tee fitting installed in step above. Use supplied zip ties to secure hose on both ends.
5. COM (Common) Port Hook-Up.
 - a. Install desired barb fitting into COM (Common) port on EBCS Pro body. Use a small amount of grease or Teflon tape on threads, then tighten using 11mm or 7/16" wrench.
 - b. Using supplied hose, connect hose from barb fitting to top port (port that closes wastegate) on wastegate. Use supplied zip ties to secure hose on both ends.
6. NO (Normally Open) port Hook-Up. **(Optional vent hook-up, see note above)**
 - c. Install desired barb fitting into NO (Normally Open) port on EBCS Pro body. Use a small amount of grease or Teflon tape on threads, then tighten using 11mm or 7/16" wrench.
 - d. Using supplied hose, connect port to turbo intake system or OEM hose going back to turbo intake system. **NOTE: This hose is the vent for EBCS Pro and it's very important to not restrict or block this off or undesired boost control will occur. It is also acceptable to leave this port open to the atmosphere. If this is done, make sure and block off port at turbo intake, or a vacuum leak will occur.**



Internal Waste Gate (bleed/OEM type) SLOW RESPONSE

1. This is not the desired method of installing the PERRIN EBOS Pro. This method will provide no benefit over the stock solenoid, and is only to be used as a direct replacement for OEM part.
2. Open hood and locate turbocharger and wastegate.
3. Locate factory boost management (hoses, tees etc.) from turbo to wastegate. Remove OEM Boost control solenoid. **NOTE: Generally there are 2 hoses coming off the solenoid, one goes to the intake system and the other goes to the turbo and wastegate. Keep track of which one goes where as this will be important for the following steps.**
4. NO (Normally Open) Port Hook-Up
 - a. Install supplied 1/8NPT plug into NO (Normally Open) port on EBOS Pro Body. Use a small amount of grease or Teflon tape on threads, then tighten using hex key.
5. NC (Normally Closed) Port Hook-up.
 - a. Install desired barb fitting into NC (Normally Closed) port on EBOS Pro body. Use a small amount of grease or Teflon tape on threads, then tighten using 11mm or 7/16" wrench.
 - b. Using supplied hose, connect hose from NC port to hose leading toward turbo. This generally leads to a tee fitting at the turbo as shown below. Use zip ties to secure hose on both ends.
7. COM (Common) Port Hook-up. **(Optional vent hook-up, see note above)**
 - c. Install desired barb fitting into COM (Common) port on EBOS Pro body. Use a small amount of grease or Teflon tape on threads, then tighten using 11mm or 7/16" wrench.
 - d. Using supplied hose, connect hose from COM port to hose leading toward turbo intake system. Use supplied zip ties to secure hose on both ends.



Tuner Tech Tips for EBCS setup

- If the ECU has stock tune and you are using interrupt mode, expect dangerous boost spiking. A retune is 100% **needed** to correct this. If ECU has stock tune, using bleed mode will produce similar results to stock solenoid. This method doesn't have any benefit.
- If using solenoid as a replacement for aftermarket electronic boost controller, refer to the owner's manual for proper set up.
- If ECU you are using is tunable/reflashable, expect to lower the base duty cycle map(s) numbers and gain numbers to achieve desired boost. As a rough estimate, lower DC numbers by half as a starting point.
- For Subaru Reflash (as well as most ECU's), the turbo dynamics tables (or any table that deals with boost error vs. wastegate duty cycle) need to be changed. Cutting these numbers in half is a good starting point. If these tables are left alone, boost will be unstable due to the ECU constantly over and under correcting.
- EVO X reflash users have 2 solenoids and a map for each with-in the ECU. Wastegate Solenoid 1 has a **Brown** plug and is controlled by the FINE wastegate solenoid map. Wastegate Solenoid 2 has a **Black** plug and is controlled by the COARSE wastegate solenoid map. It is up to the tuner to decide which to use, but we recommend using the FINE Wastegate Solenoid map and plugging the EBCS into the **Brown** plug. Either way leave remaining Solenoid plugged in.
- For UTEC owners, the boost tables and gain will have to be lowered by roughly 30%. Lower boost maps until steady desired boost is found, then change gain to control spiking.
- For ECU's that have the option of running different frequencies, we recommend running 15-30hz. Slightly higher will work also but will start to cut into the ranged of usable Duty Cycle.