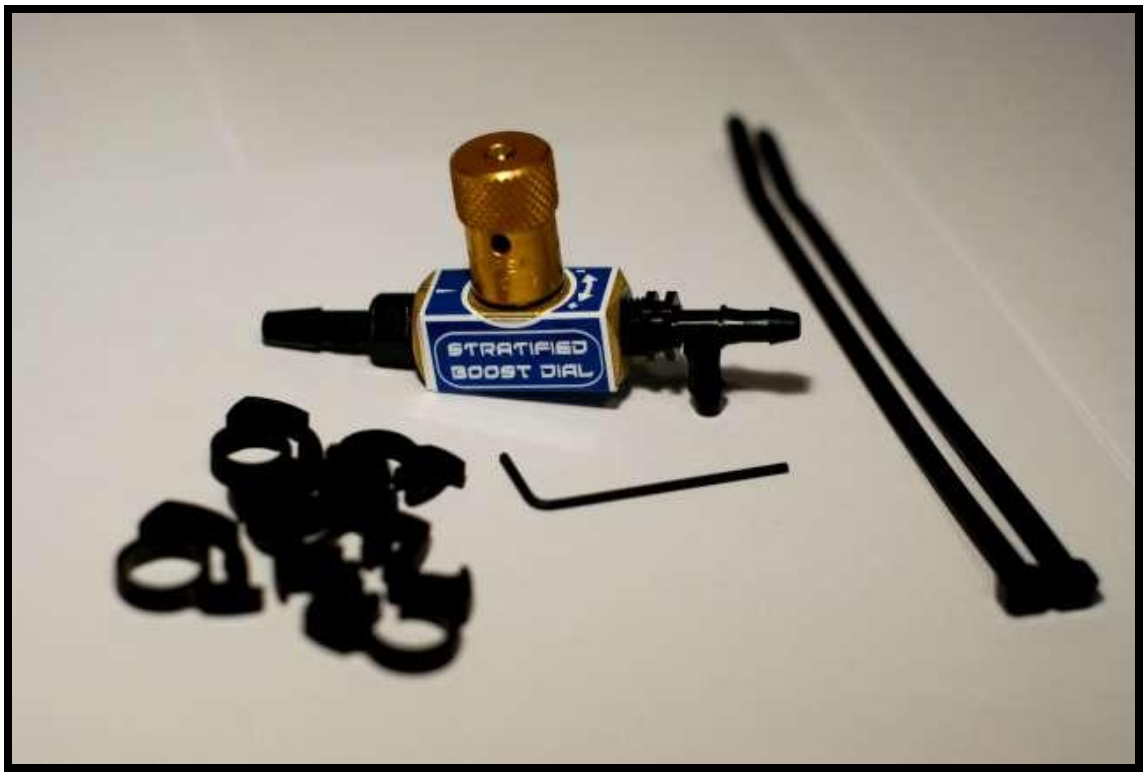
STRATIFIED BOOST DIAL

Boost Adjustment Valve for 2-Port (Bleed) Boost Control Systems

Installation and User Guide

Thank you and congratulations on the purchase of your new Stratified Boost Dial. This document should be followed to ensure safe and proper installation and operation of your new device.



WARNINGS AND WARRANTY – PLEASE READ CAREFULLY

ALL parts are sold for OFF ROAD RACE-ONLY ground vehicle use only.
Aftermarket systems interacting with engine function are not for use on pollution controller vehicles. Alteration of emission related components constitutes tampering under most local emission regulation guidelines and can lead to fines and penalties.

Limited Warranty

This Stratified product is warranted against defects in materials and workmanship for ninety (90) days from date of purchase. During the warranty period, Stratified will repair, or at its option replace at no charge, components that prove to be defective. The product must be returned, shipping prepaid, to a Stratified facility. This limited warranty does not apply if the product is damaged by accident or misuse. The foregoing warranty is in lieu of all other warranties expressed or implied including but not limited to any implied warranty of merchantability, fitness, or adequacy for any particular purpose or use. Stratified Automotive Controls LTD. is not responsible for any fines, injuries, or damages incurred as a result of the installation or use or misuse of our products. It is the complete responsibility of the purchaser of such products to ensure that they are used in a legal, safe, and appropriate manner.

IF YOU DO NOT FEEL COMFORTABLE MAKING THESE MODIFICATIONS, HAVE THEM PERFORMED BY A PROFESSIONAL.

Table of Contents

1. Introduction and Precautions

The Stratified Boost Dial is designed to allow you to control boost or load in your turbocharged vehicle in conjunction with a 2 or 3 port Electronic Boost Control Valve (OEM or aftermarket) in a bleed style configuration.

Most modern vehicles use a tuned bleed style method for controlling boost. This is due to the inherent safety of the method and smoothness of boost onset and power delivery when compared to a 3 port interrupt style boost control system.

A bleed style system allows a better resolution over boost control as well as the utilization of the OEM 2-port boost control solenoid valve. Furthermore, the boost control tables and system built into the ECU are designed for this type of boost control meaning you have to manipulate them a lot less and can eliminate spikes and oscillations that are common with interrupt style (3 port) boost control. This means that it is simpler and safer to tune a vehicle that mimics the OEM system.

The OEM turbochargers using a bleed style system have a restrictor pill in line with the boost source. Aftermarket turbochargers do not have this tuned pill making it impossible to control their boost using a bleed method. The Stratified Boost Dial removes this limitation by allowing you to fine tune a boost control window such that you can control the boost of ANY turbocharger (OEM or aftermarket) using a 2-port (bleed) method and the OEM (or aftermarket) 2-port solenoid. This not only allows you to control boost on aftermarket turbochargers but it also allows you to, for example, increase the boost the OEM turbocharger can achieve since the Boost Dial is adjustable for any application.

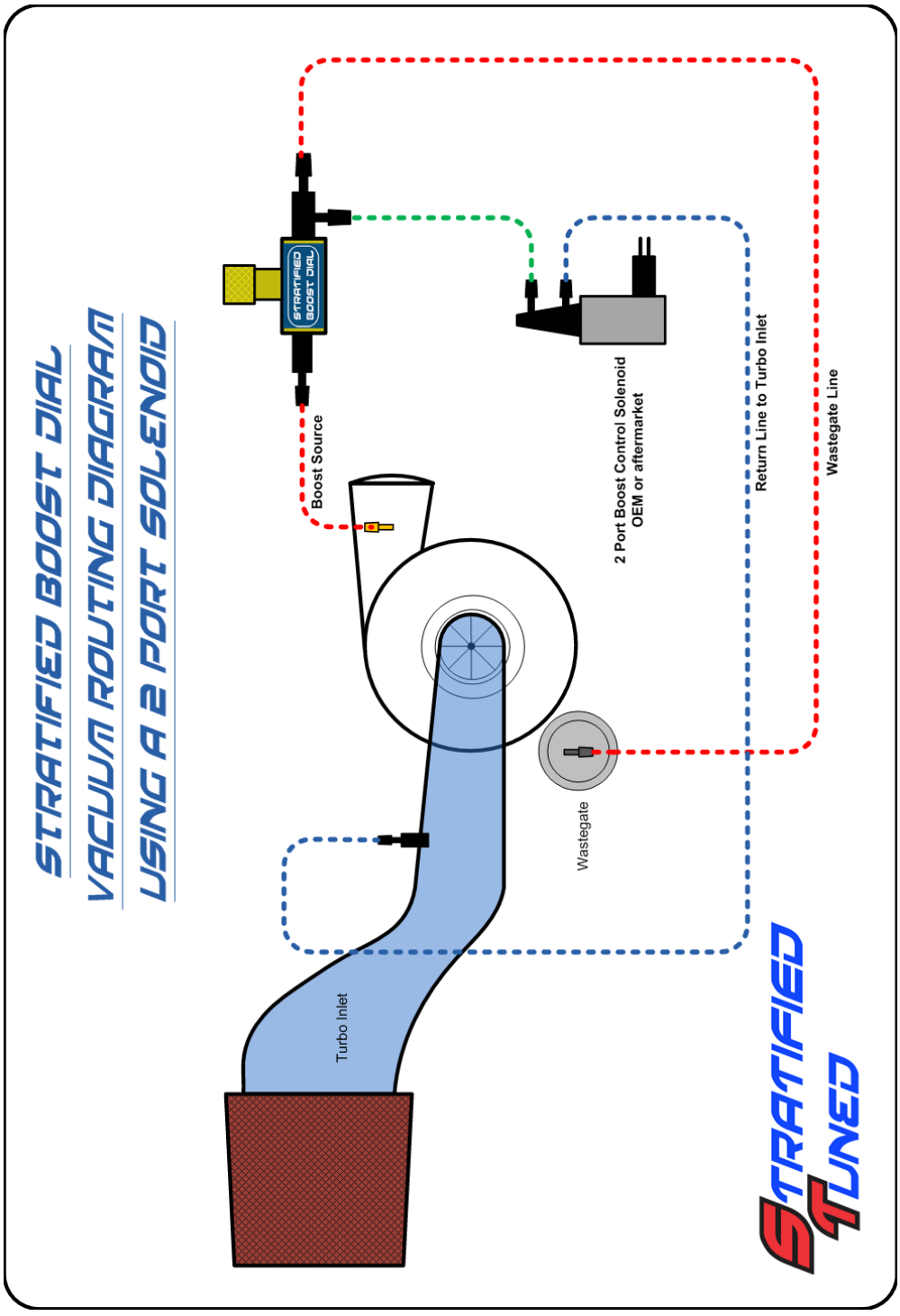
Tuning IS required to operate this valve safely and effectively. Please read the following instructions carefully as they show how to tune the Boost Dial. Once the Boost Dial is correctly setup for your turbo and system, the setting is locked and all further tuning is done electronically via the boost control solenoid valve.

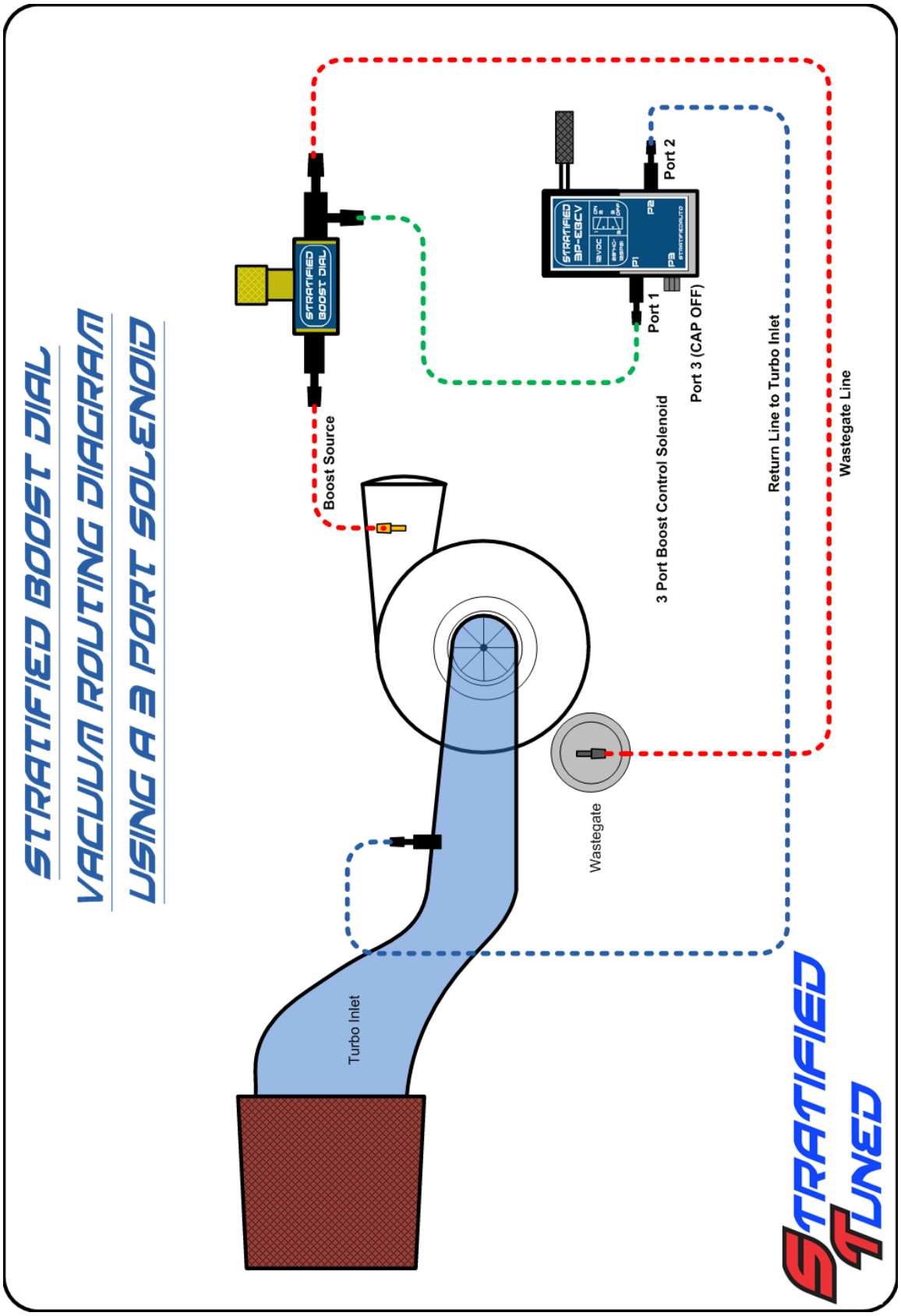
The Boost Dial ships with 2 straps for mounting. Included with this valve are also 6 locking clamps that can be used to secure vacuum lines and a hex key that is used to lock the dial in place and prevent accidental changes. We recommend that 5/32" to 7/32" inner diameter vacuum line is used with this valve.

The valve should not be mounted directly on the engine block due to heat and vibration.

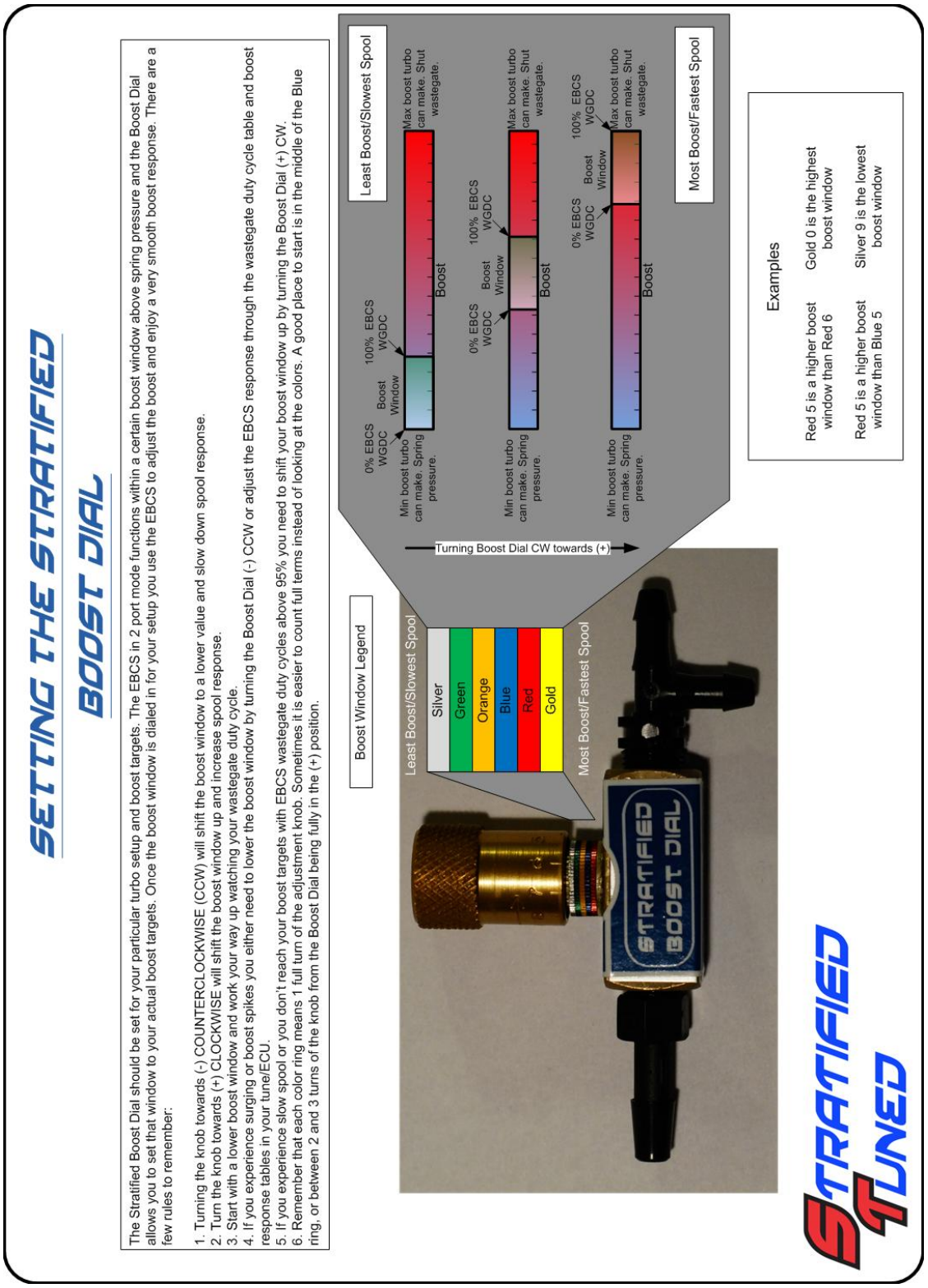
2. Quick Install Guide and Diagrams

1. Vacuum Diagram Routing




STRATIFIED BOOST DIAL
VACUUM ROUTING DIAGRAM
USING A 3 PORT SOLENOID
STRATIFIED BOOST DIAL
STRATIFIED 3P-EBCV
Port 2
Port 1
Port 3 (CAP OFF)
Boost Source
3 Port Boost Control Solenoid
Return Line to Turbo Inlet
Wastegate Line
Wastegate
Turbo Inlet
STRATIFIED TUNED

2. Adjusting the Stratified Boost Dial



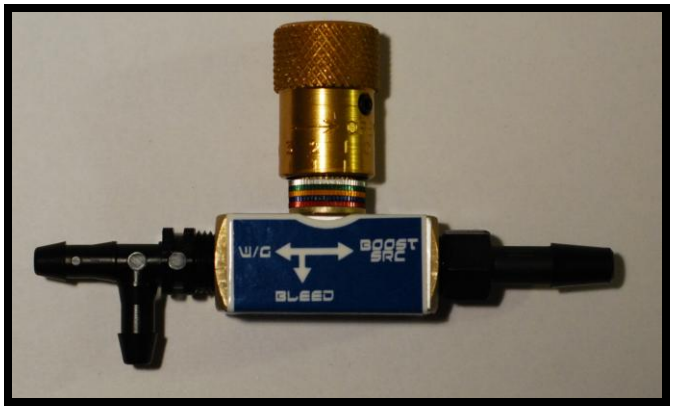
3. Installation Instructions

1. Park the vehicle safely and remove the negative battery cable.

2. Find a suitable location where the Boost Dial will be mounted. Remember that you should have access to it for adjustment. The unit is rated for under-hood automotive use (up to 200 degrees Fahrenheit - 95 degrees Celsius), however it should be placed away from direct heat sources such as the exhaust manifold or turbocharger. For trouble free operation it should also be placed away from water and water drains and petroleum and alcohol products. A suitable location is strapped to a large harness loom. Also remember that you will be routing vacuum lines to the Boost Dial so place it in a convenient location. Secure the Boost Dial using the 2 provided nylon straps.

3. You will first need to locate a boost source. Good sources for this are either the intake manifold or a fitting on the turbocharger housing. Make sure NO restrictor pills are installed in the boost source or any of the lines used. Use vacuum tubing with a 5/32-7/32" inner diameter.

4. If you turn the Boost Dial around, you will see that there is a legend on the unit for how to connect the lines.

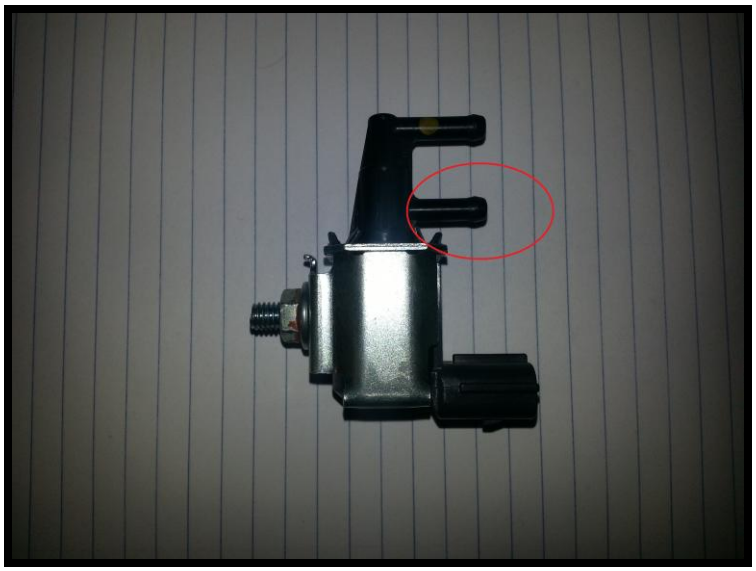


5. Follow this diagram and secure a vacuum line from the turbo boost source to the Boost Dial barb labelled as Boost Src. Make sure the lines are leak free and secure them with the provided reusable clamps.

6. Next, run a vacuum line from the Boost Dial barb labelled W/G to the turbocharger wastegate actuator (this can be an external or internal wastegate). Again secure all lines.

7. Next, run a vacuum line from the Boost Dial barb labelled Bleed to the 2-port solenoid Port 1. It generally doesn't matter which port this is unless the solenoid has a check valve built in. Secure all lines.

8. Finally, run a vacuum line from the 2-port boost control solenoid to the turbo inlet hose or pipe (in front of the compressor inlet). This line should already exist on the OEM setup.

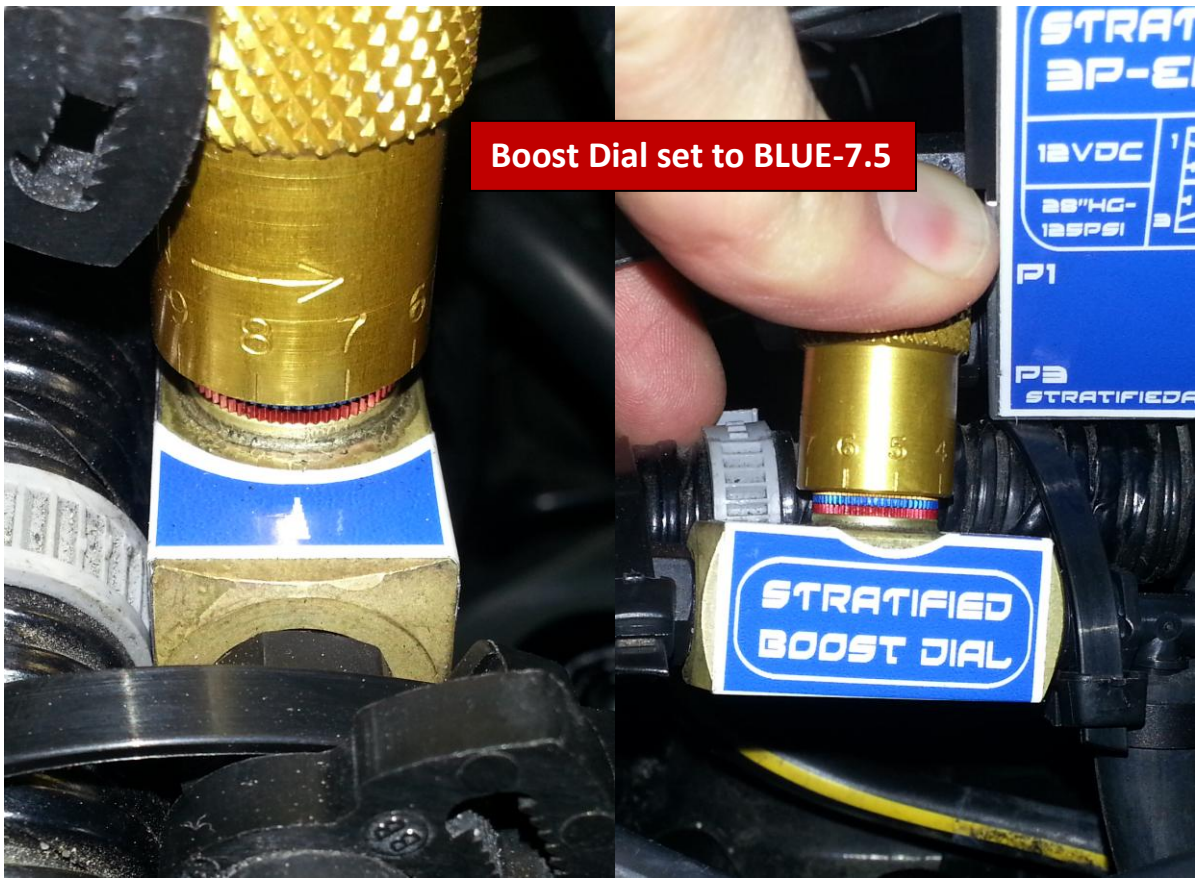


9. **If you are running a 3-port solenoid, you will route the Port 1 and Port 2 vacuum lines the same as for a 2-port. You will need to CAP OFF Port 3 of the 3-port solenoids.

10. The Boost Dial is now installed and ready for adjustment. Please read the **Quick Install Diagram** and what follows below in this document very carefully so that

you know how to adjust the Boost Dial. What you want to do is set the Boost Dial so that it is within the window of boost that you would like to run. Once this is set, simply lock the adjustment knob using the provided hex key and tune the boost or load electronically via the vehicle's ECU or boost controller.

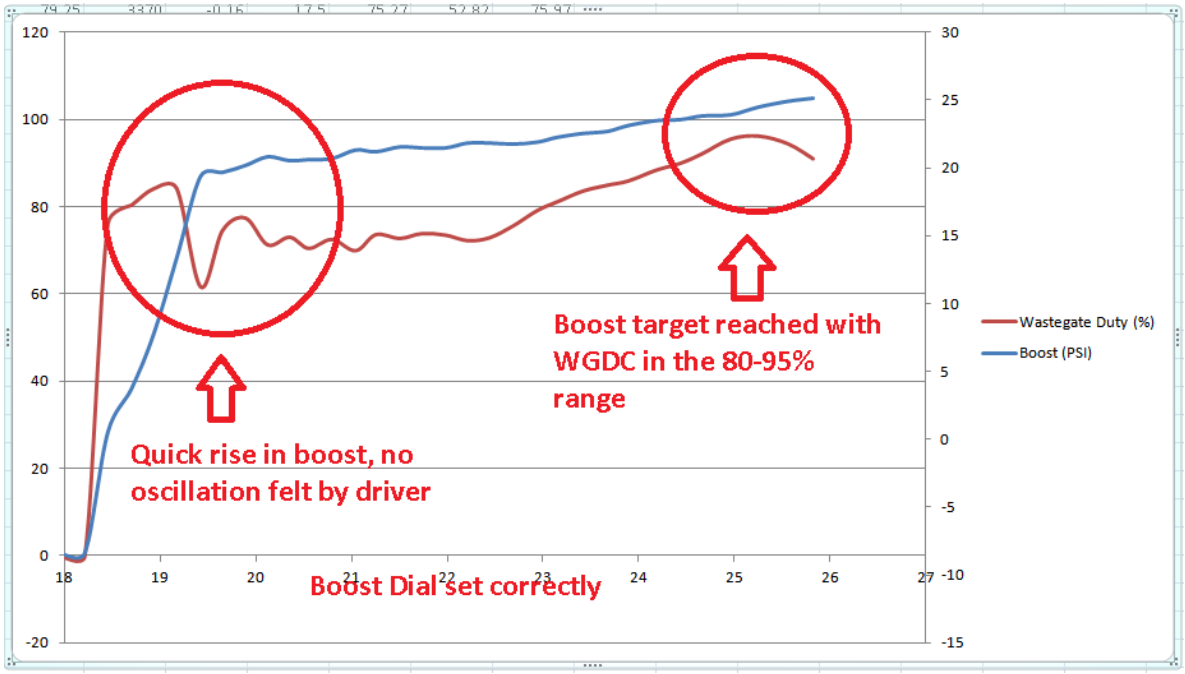
11. Generally it takes a few tries to adjust the Boost Dial since the type of solenoid and wastegate you are using will affect the boost control window. Start with a conservative setting such as Blue-9. If the colors are hard to see, count the number of turns of the adjustment knob. Each color is 1 full turn. For example, below is a picture of the Boost Dial turned to **Blue-7.5**. Notice that if you tilt the Boost Dial up you can see the top of the next ring (Orange) since you are near the end of the blue zone.



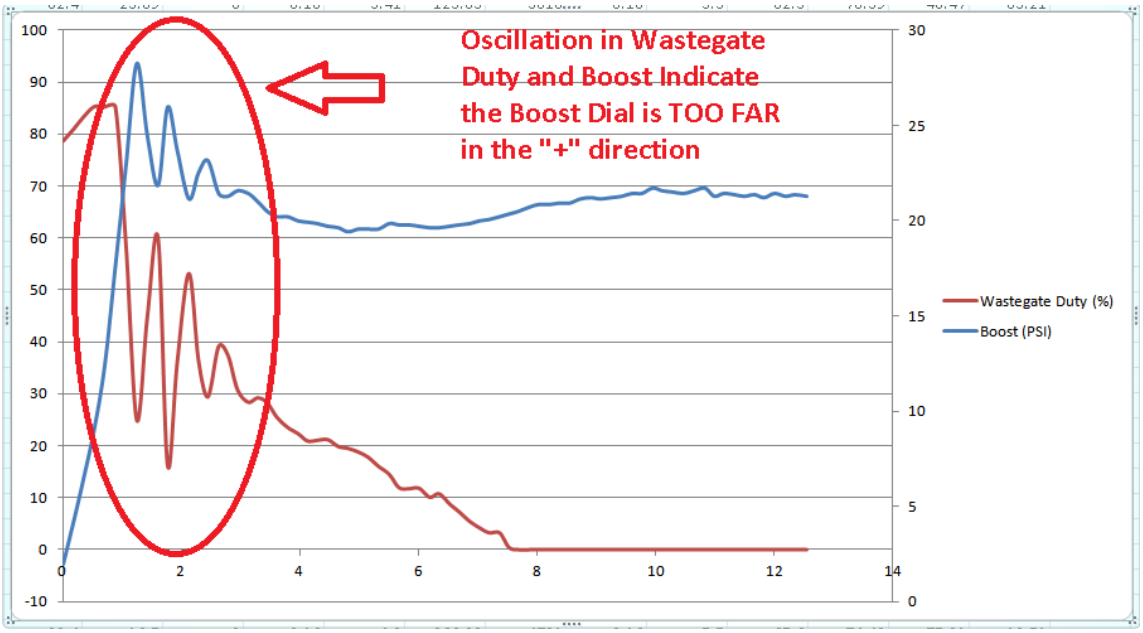
12. After you get a feel for the correct setting on the Boost Dial, set your desired load or boost targets in your ECU tune and once again watch the wastegate duty cycles and response of the turbo. If there are no large boost spikes and the wastegate

duty cycles reach 95%+ without reaching your boost or load targets then you will need to adjust the Boost Dial in the (+) direction. If there are boost spikes or uncontrollable boost you will need to turn down the Boost Dial by turning it in the (-) direction.

13. When datalogging make sure you log load, boost, and wastegate duty cycles (WGDC). Below is a graph of a log where the Boost Dial is set correctly. Notice the quick ramp in boost and little to no oscillations of the boost or WGDC. If the oscillations are less than 1psi they are not felt by the driver. Also notice that the WGDC is in the 80-95% range when reaching the maximum desired boost near redline. If the vehicle experience boost creep you will see very low WGDC near redline but boost creep is not something the Boost Dial can correct. It can only be corrected mechanically.



14. If you've' turned the boost dial too far in the "+" direction then you will see oscillations as shown below. If you see this you need to turn the Boost Dial in the "-" direction.



15. If you have a slow boost rise and get to 100% wastegate duty cycle without reaching your load or boost targets then the Boost Dial needs to be turned in the "+" direction or the turbo is not able to reach those load/boost targets.

16. Be aware that the Boost Dial won't be able to RAISE boost beyond what the turbocharger is capable of with a shut wastegate or LOWER boost below wastegate spring pressure settings.

17. Once the Boost Dial is set such that you are in the neighborhood of achieving your desired boost or load, you may have to make slight adjustments to the boost dynamics/PID as well as the wastegate duty cycle tables using your tuning solutions.

4. Specifications

The Stratified Boost Dial is designed to be installed in the engine bay; away from direct sources of heat, water, and damaging chemicals such as petroleum products or alcohols. Damage caused by exceeding the operating conditions listed below or exposing the Boost Dial to damaging substances will void the warranty.

Media	Air or inert gas
Pressure range	Vacuum to 2000psi
Ambient Temp Range	(-)15 to (+)400* F
Flow max temperature	(+) 200* F
Dial Locking Hex	1/16"
Rec. Vacuum Hose ID	5/32-7/32"