

# GFB DV+

## Installation Instructions

Part #T9360



**GFB**  
GO FAST BITS

TURBO MANAGEMENT SYSTEMS

ISO 9001:2008

THE ULTIMATE IN HIGH TECHNOLOGY PERFORMANCE

**IMPORTANT!** All GFB pistons are checked for fitment and tolerance before shipment. Please do not drop the GFB piston onto a hard surface as this may cause (invisible) damage that could result in boost leaks or sticking.

**WICHTIG!** Alle Kolben wurden vor Versand auf Freigängigkeit geprüft. Bitte achten Sie bei der Montage darauf, dass \*der Kolben nicht auf den Boden fällt\*, da dieser schon bei kleinster (evtl. Nicht sichtbarer) Beschädigung zur Undichtigkeit oder Kolbenklemmen führen kann!

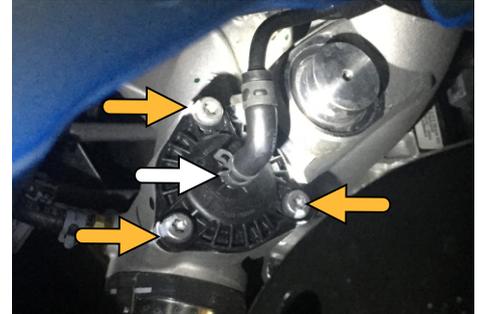
# INSTALLATION

Note that installing the DV+ on the Focus RS must be done with the front right wheel removed, which requires raising the car on axle stands or a hoist.

## WARNING:

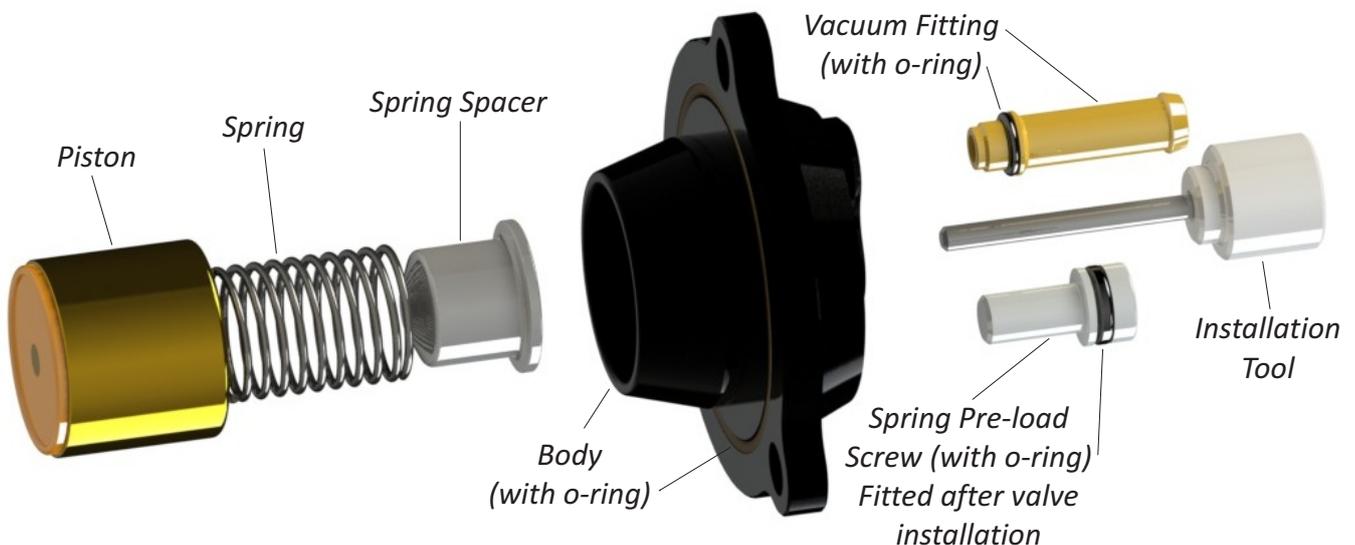
**NEVER work under a car supported only with a jack.**

- Remove the factory vacuum hose clamp (⇄), then pull the vacuum hose off the diverter valve.
- Unscrew the 3 mounting screws (→) using a 5mm hex key and remove the factory diverter valve from the car.



## DV+ Assembly:

- Apply some engine oil to the piston, then insert the piston, spring, and spring spacer into the body as shown below. Whilst pushing the piston completely into the body, screw the installation tool into the piston from the other side of the body - **FINGER TIGHT ONLY**. This tool simply holds everything together to make installation easier, and is removed after installation.
- Screw the vacuum fitting into the body, using a 5mm hex key inserted into the end of the fitting. Do NOT overtighten, as it is possible to damage the brass threads.
- Check that the brown o-ring is installed in the face of the body.



- Install the assembled DV+ onto the turbo, using the factory screws. It is best to orient it so the vacuum fitting is above the central hole as shown, for easier access to the spring adjustment.
- Remove the installation tool.
- Apply some oil or grease to the o-ring on the Spring Pre-load Screw, then install this screw into the central hole in the body. See the next page for information on spring pre-load.
- Re-install the vacuum hose and clamp.



# SPRING PRE-LOAD ADJUSTMENT

The DV+ can be installed and used directly out-of-the-box without any adjustment to the spring pre-load at all, regardless of the boost pressure your car runs.

So if you are not inclined to tinker, you can finish the installation here, or you can read on for more tech info on the subject!

The GFB DV+ **DOES NOT** require spring pre-load adjustment to suit specific boost pressures. The pressure-balancing design of the DV+ means that until the ECU decides to open the diverter there is equal boost pressure on both sides of the piston, so it will stay shut under boost REGARDLESS of the spring setting or the boost pressure.

However, adjustments to the spring pre-load can often help improve throttle response and reduce lag, so it can pay to experiment.

Adjusting the spring pre-load changes how easily the valve vents when the ECU triggers the diverter. The best throttle response is typically found when the spring is set to the firmest setting possible that does not cause compressor surge (turbo fluttering) at when the throttle is closed on a high boost/high RPM gearshift.

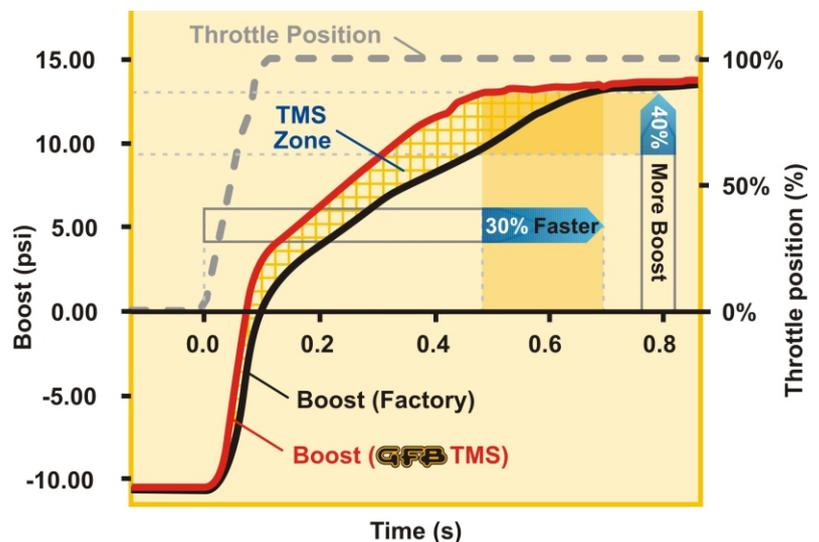
To explain further, contrary to popular belief, venting as much air as possible to “let the turbo freewheel” does not reduce lag. Perhaps 20 years ago it may have been true, but turbos these days spool up very quickly, and the greater benefit comes from setting the valve up to keeps as much pressure in the intercooler as possible during a gear-shift or brief throttle lift.

Here's where adjusting the spring pre-load can help. Increasing the spring pre-load can help retain a small amount of pressure in the intercooler during a gearshift, which leads to a faster return to peak boost. The limiting factor in how much you can increase the spring pre-load is compressor surge (turbo flutter). Once this starts to occur at high boost/RPM, there is no further gain to be had and for the life expectancy of the turbo it is best avoided.

Note that it is common however for compressor surge to occur at low RPM/boost, even if it doesn't occur at high boost/RPM. This is not really a concern for the turbo because the shaft speed and loads on the turbo at this point are much smaller, and the pressure spikes from compressor surge are much lower than those experienced at peak boost.

This is the basis behind GFB's TMS principle:

Turbo lag is minimised when the valve only vents enough air to prevent compressor surge - the graph opposite illustrates the reduction in lag. To read more about the TMS principle, visit our website: [www.gfb.com.au](http://www.gfb.com.au)

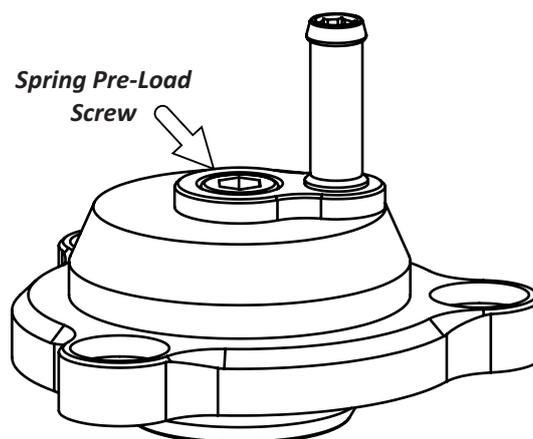


## SPRING PRE-LOAD CONTINUED

To set up the spring pre-load, start at the softest setting. This is achieved when the top of the screw is flush with the valve body as shown: →

Take the car for a drive and take note of the sound when lifting off the throttle, and then perform a few fast gearshifts at high RPM.

Please note that whilst access to the screw is difficult because of the location, it is possible to reach the screw without having to lift the car. **DO NOT** adjust the spring with the engine running, as you will be reaching in blind and you could accidentally get your fingers caught in the crank pulley/belt.



Increase the spring pre-load by 4 turns (clockwise) and repeat the above test, again listening to the sound and paying attention to the time it takes to get back to peak boost after a fast gearshift.

If you hear a fluttering sound when lifting off from peak boost, this indicates that the turbo is compressor surging, meaning the valve is no longer venting enough air. Reduce the pre-load 1 turn at a time until it disappears. If there is no fluttering sound, keep increasing the spring pre-load.

You should notice that the return to peak boost is sharper as the spring pre-load is increased, so the idea is to find the setting that offers the best throttle response feel without fluttering when lifting off from full boost.

**This product is intended for racing use only, and it is the owner's responsibility to be aware of the legalities of fitting this product in his or her state/territory regarding noise, emissions and vehicle modifications.**

**GFB products are engineered for best performance, however incorrect use or modification of factory systems may cause damage to or reduce the longevity of the engine/drive-train components.**

**GFB recommends that only qualified motor engineers fit this product. Warranty is for the period of one year from the date of purchase and is limited only to the repair or replacement of GFB products provided they are used as intended and in accordance with all appropriate warnings/limitations. No other warranty is expressed or implied.**