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Installation of GFB dv+ TMS Diverter Valve (part # T9301)

- Loosen the hose clamps from the existing factory diverter valve and remove it from the car.
- **CHECK THE ORIENTATION BEFORE INSTALLING THE dv+!**

The GFB dv+ is designed to be installed with boost pressure entering the bottom, and dumping through the side, which in most cases, is opposite to how manufacturers typically install factory Bosch valves.



You can easily check for the correct orientation by tracing the 2 large diverter valve hoses – the bottom inlet of the dv+ connects to the intercooler piping, and the side outlet connects to the turbo intake.

- Push the hoses onto the GFB dv+ and make sure to tighten hose clamps.

If the vacuum nipple needs to be rotated for clearance, follow the disassembly instructions in the maintenance section.

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!

Unlike other aftermarket Bosch replacement valves on the market, the GFB dv+ **DOES NOT** require spring pre-load adjustment to suit specific boost pressures. The pressure-balancing design of the dv+ means that under wide open throttle conditions 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 throttle is closed. 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.

This is especially true when a large front-mount intercooler is fitted – venting all of the air means the intercooler must be re-pressurised, and even though a turbo does shift a lot of air, it still takes a measurable amount of time to fill an intercooler.

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.

Spring Pre-Load - continued

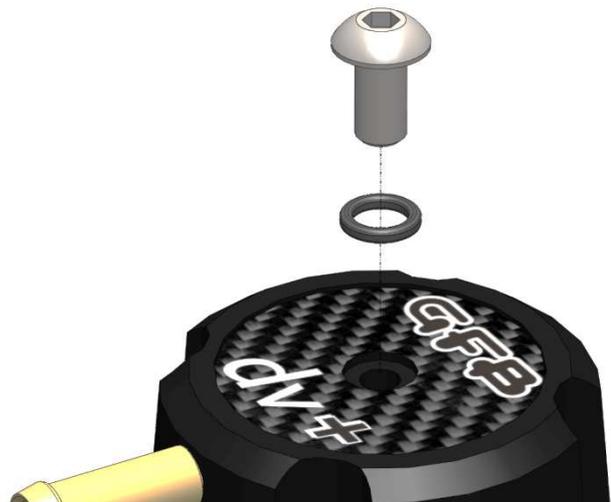
The dv+ comes with two different methods of spring pre-load adjustment, depending on your preference and how much space you have above the valve:

- **Grub screw/locknut** – quick and easy adjustment on applications where there is enough room above the valve to accommodate it



- **Fixed length screw with low-profile head for limited space applications** – the dv+ comes with an assortment of screws to achieve different spring pre-loads. The screws are:
 - 6mm (installed as standard – this is the softest spring pre-load)
 - 8mm
 - 10mm
 - 12mm

The softest spring pre-load is achieved using the 6mm screw length (the dv+ is supplied with this screw installed). To increase the spring pre-load, remove the existing screw, taking care not to drop the o-ring (spare o-rings are supplied just in case). Install a longer screw with the o-ring on the thread as shown.



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 recommends that only qualified motor engineers fit this product.

Materials and workmanship of this product are covered by a lifetime warranty. Moving components subject to wear are covered for a period of one year from the date of purchase. Warranty is limited only to the repair or replacement of GFB products provided they are installed and used as intended, and in accordance with all applicable warnings and limitations. No other warranty is expressed or implied.

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 or drivetrain components.

Maintenance

Disassembly:

- Using a 2.5mm hex key, remove the 4 cap screws (3) whilst holding the cap (4) to prevent it from popping off – the spring force is relatively small, but if it pops off unexpectedly, the internal parts can be easily lost. Note that the friction from the o-ring (5) may hold the cap on even after the screws are removed. If this is the case, simply twist the cap and pull at the same to remove it.
- Remove the spring cap (6), spring (7) and piston (8) from the body (9). The o-rings (5) will remain attached to the cap.

Reassembly:

- Fit the spring cap (6), spring (7) and piston (8) into the cap (4), then slide the cap into the body (9).
- Twist the cap so the vacuum nipple points in the desired direction, then re-install the cap screws (3).

Lubrication:

There is no set specific re-lube interval, as the dv+ does not rely on lubrication in order to function correctly. Whereas other brands use the internal o-rings to actually guide and support the piston, the dv+ instead uses precision tolerances between the piston and bore for support and the majority of sealing duties, and the internal o-ring simply acts as a final “wiping” seal.

This arrangement means the o-ring lasts much longer (almost indefinitely) instead of requiring frequent “re-building”, does not rely on a set lubrication schedule to work properly, and friction is kept to a minimum for optimum performance.

Oil vapour passing through with the vented air in most cases is sufficient to keep the valve lubricated, but the amount of oil vapour varies from car to car and sometimes it is necessary to clean and lube the internals. Typically, if the venting sound changes over time, this is typically an indication that there may be a build-up of carbon that needs to be cleaned out.

When disassembled, wipe everything clean with a rag, then apply light grease or engine oil to the piston, inside the bore, and on the o-rings (5), then reassemble.

