

GFB DV+

Installation Instructions

Part #T9352

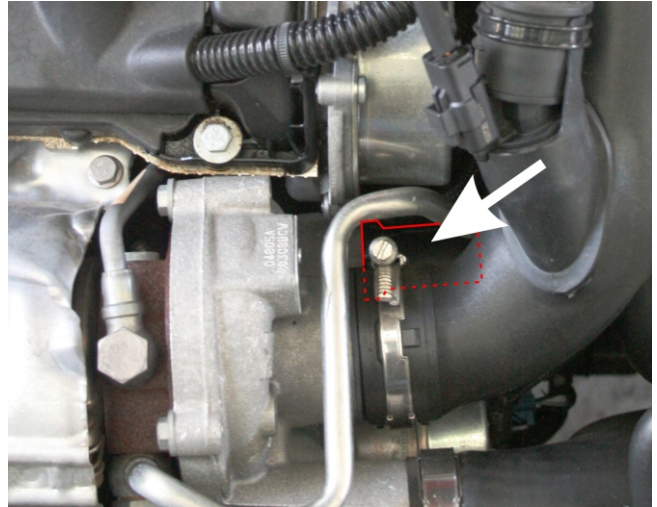
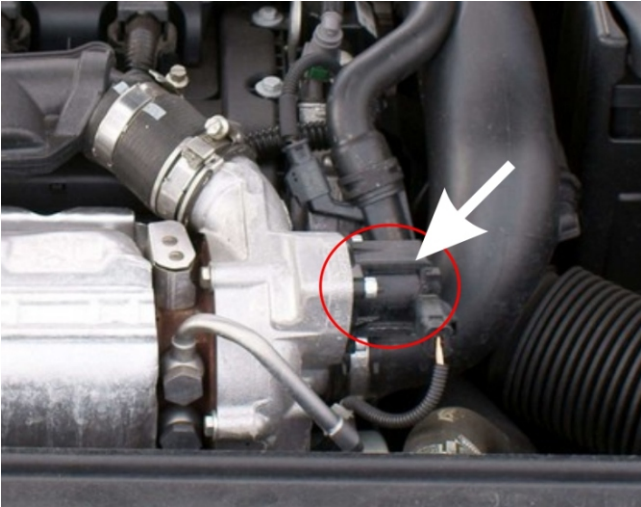


IMPORTANT! All GFB pistons are checked for fitment and tolerance before shipment. Please do not drop the GFB piston onto a hard surface as this may cause (invisible) damage that could result in boost leaks or sticking.

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!

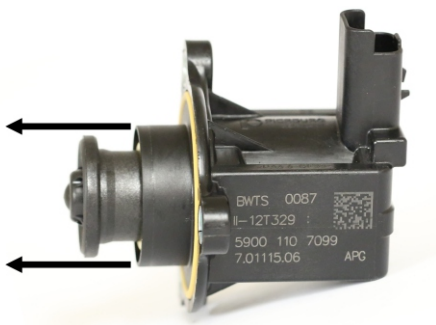
INSTALLATION

Locate factory diverter valve. It will be mounted directly on the turbo compressor cover, either above or below the plastic intake pipe as shown below:



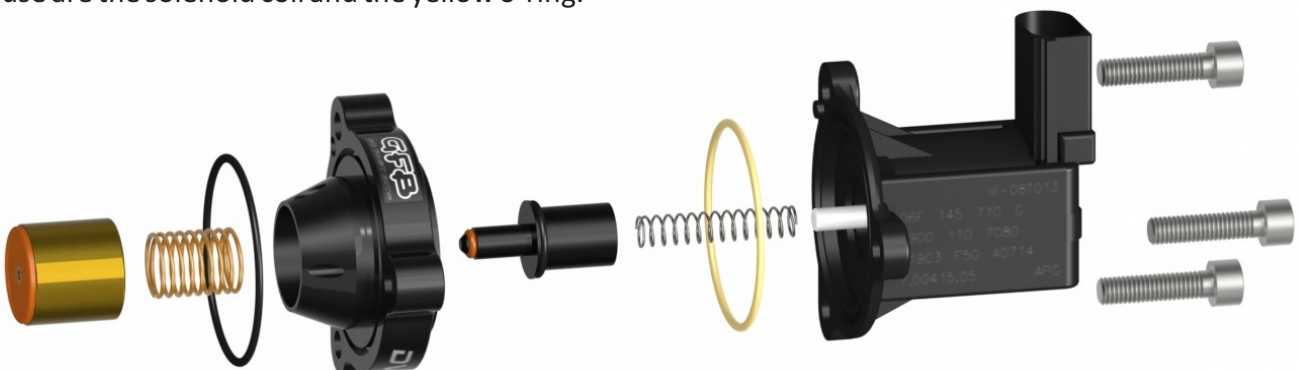
Remove the intake duct to gain access to the diverter valve and the 3 bolts holding it to the turbo. Unclip the wiring connector from the top of the solenoid coil – note there is a small locking tab that needs to be unclipped as you pull on the connector.

Unscrew the 3 mounting bolts and remove the diverter valve from the car.



Pull on the plastic diaphragm shroud, the whole assembly will pop off leaving the bare solenoid coil. Keep the yellow o-ring.

Install the GFB parts onto the solenoid as shown below, using a little engine oil on the outside of the piston. Make sure to use the GFB supplied spring inside the solenoid coil – the only factory parts you re-use are the solenoid coil and the yellow o-ring.



Fit the valve/solenoid assembly to the car in the factory location using the supplied longer bolts, and re-connect the wiring loom.

THE DV+ DIFFERENCE

Whilst the DV+ might look pretty basic, there is a very significant difference in the way it operates compared to the factory diverter valve, and other aftermarket products on the market.

The factory diverter uses the solenoid to directly actuate the valve, but there are multiple problems with this method:

- The valve can only ever be open or closed - it cannot move progressively, which is detrimental to throttle response.
- The stroke of the solenoid is long, meaning the actuating forces are weak (magnetic force diminishes significantly as stroke increases). This means the operation of the factory diverter is not reliable.
- The factory diverter cannot be sealed properly, because a good seal on a plastic piston would increase friction to the point where the weak actuating forces cannot open or close the valve.

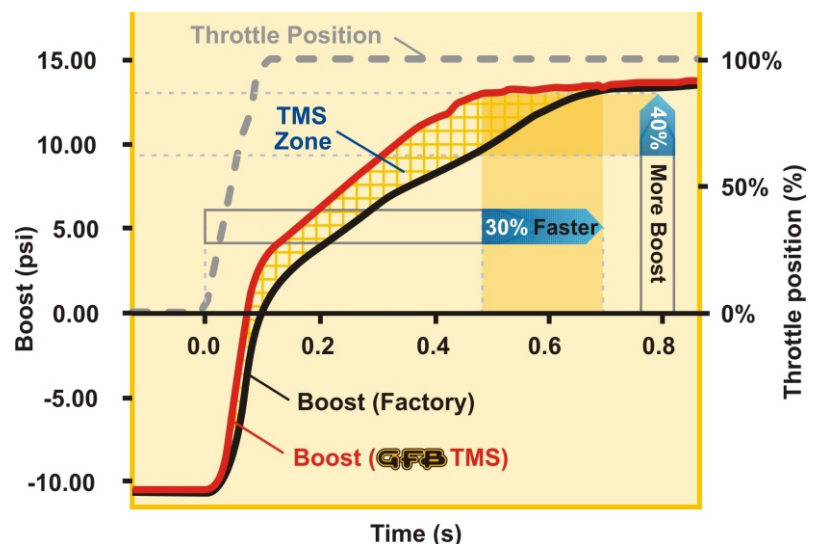
The GFB DV+ overcomes all of these issues whilst still retaining the factory solenoid coil. However, the solenoid's role is to move a smaller valve (the plunger) which controls the pressure signal used to open and close the piston, which is known as "pilot actuation". Think of it like pneumatic "leverage". The plunger stroke is reduced from 5mm to 0.8mm, which increases the actuation force and speed, meaning the DV+ is faster AND more reliable than the factory diverter!

When it comes to holding boost, the DV+ has another trick up its sleeve. When the solenoid is off and the plunger is closed, there is equal pressure on both sides of the piston. BUT, the area the pressure acts on is about 25% LARGER on the back of the piston than the front. This area differential means that boost pressure actually blows the DV+ piston shut, so it doesn't matter how much boost you run, the DV+ will never crack open when it's not meant to.

When the solenoid activates and retracts the plunger, the pressure on the back of the piston is relieved, which allows boost pressure on the front to blow the piston open against the spring. This operation method means that unlike the factory diverter, the DV+ can open and close progressively in response to the amount of boost pressure it needs to relieve. If there's no boost, it won't open even if the ECU tells it to. If there is boost, the DV+ will only open as long (and as far) as required. It will close itself as boost pressure drops, where under the same conditions the factory diverter would remain open. The result is less turbo lag, because the valve is not opened unnecessarily.

This is the basis behind GFB's TMS principle, which is this; turbo lag is minimised when the valve only vents just enough air to prevent compressor surge – the graph opposite illustrates the reduction in lag after a gearshift.

To read more about the TMS principle, visit our website: www.gfb.com.au



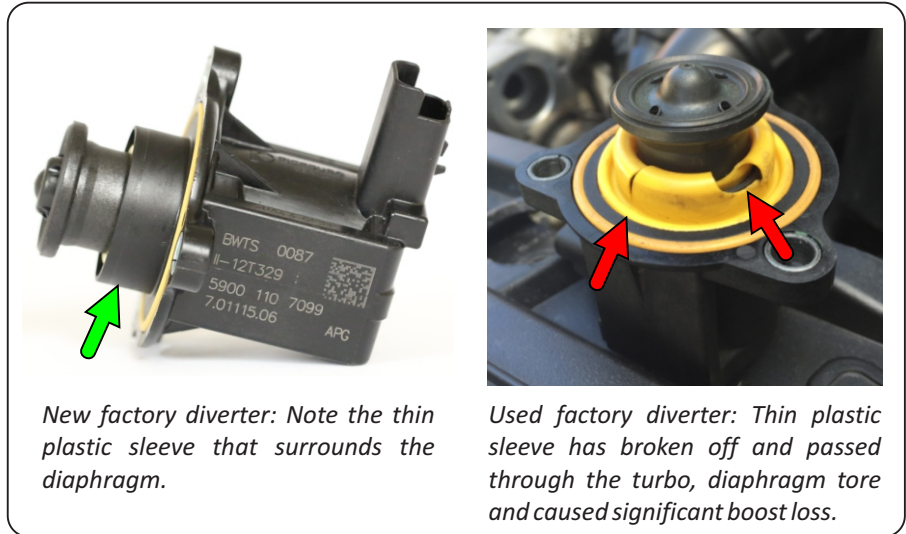
WHAT TO EXPECT FROM YOUR DV+

The DV+ is designed to offer the following improvements over the OE diverter:

Longevity and boost holding:

The factory diverter valve's diaphragm is fragile and prone to tearing, which is almost certain on a tuned engine, or after a few years of normal use.

In addition, the thin plastic sleeve that surrounds the diaphragm often breaks off, and has nowhere to go but through the turbocharger. The break can be so clean that it is almost unnoticeable unless you know what you're looking for.



New factory diverter: Note the thin plastic sleeve that surrounds the diaphragm.

Used factory diverter: Thin plastic sleeve has broken off and passed through the turbo, diaphragm tore and caused significant boost loss.

Fitting a DV+ is good insurance and pays for itself after one or two factory diverter replacements, whilst ensuring all of your hard-earned boost gets to the engine.

Throttle response: The DV+ will preserve as much boost pressure as possible when the throttle is lifted, whilst still preventing compressor surge. This means that when you lift off to shift, or when using slight on-off-on throttle modulation, the DV+ can help recover boost faster.

What the DV+ can't do however, is create more boost, or cause the turbo to spool faster. Quite simply, whatever boost the turbo makes, the DV+ will deliver to the engine, and it will also preserve as much boost pressure as possible during a brief throttle lift-off, which is where the faster boost recovery comes from. If there is no boost to preserve, or if boost still drops off at high RPM, that is simply highlighting the limitations of the turbo.

WARRANTY

WARNING:

GFB recommends that only qualified motor engineers fit this product. GFB products are engineered for best performance, however incorrect use or modification may cause damage to or reduce the longevity of the engine/drive-train components.

GFB LIFETIME WARRANTY:

Our commitment to quality means that when we put our name to something, we are also staking our reputation on it. That's why we back our products with the best warranty in the business!

You should expect a lifetime of use from a well-engineered product, so if your GFB product fails as a result of defective materials or faulty workmanship whilst you remain the original owner, we will repair or replace it (limited only to the repair or replacement of GFB products provided they are used as intended and in accordance with all appropriate warnings and limitations. No other warranty is expressed or implied).

If a fault occurs as a result of usage outside of the terms of the warranty, or you are not the original owner, fear not, we can still help you. You should never need to throw a GFB product away, as spare parts are available and won't cost the earth.

TECH SUPPORT:

We want you to get the best advice, first time. That's why our engineers are available to answer any technical questions you may have. Head to www.gfb.com.au/contact-us to get in touch.