

GFB SV52 *(Patent Pending)*

Installation Instructions

Part # T9052 *(aluminium weld on)*

and T9052SS *(stainless steel weld on)*



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TURBO MANAGEMENT SYSTEMS



PERFORMANCE WITHOUT COMPROMISE

Installation

BOV location:

The SV52 is supplied with either a 6061-T6 aluminium (part # T9052) or a 304 stainless steel (part # T9052SS) weld-on base, which is to be welded to the engine's charge piping. The ideal location is between the throttle body and the intercooler, away from direct heat sources. It's also a good idea to ensure the vented air from the SV52 is not directed at delicate sensors or wiring/hoses.

If space does not permit mounting the SV52 in the ideal location described above, choose the next most appropriate location with the following in mind:

- Mounting between the turbo and intercooler is acceptable, keeping in mind the piston o-ring is Viton and is suitable for continuous exposure to charge temperatures up to 205°C/400°F (i.e. circuit racing), but for short exposure (i.e. drag racing) the o-rings will withstand higher charge temperatures.
- If the SV52 must be mounted near exhaust components, ensure it is protected by appropriate heat shielding.

Separate the valve body from the weld-on base:

WARNING - the SV52 assembly is subject to significant spring force. If the spring force is not contained and carefully released as described below during disassembly, there is a risk of damage to the product and/or personal injury.

- The SV52 valve body is held onto the base with 5 screws, only 4 of which are installed from the factory. The fifth screw is inserted into the central hole of the SV52 body, which holds the piston and spring in the compressed state so that the base can be removed without completely disassembling the valve.
- To remove the base, ensure that the central screw is installed then remove the remaining 4 screws. The central screw will hold the piston and spring in the body.

Weld the base:

- Use appropriate measures to prevent distortion of the base whilst welding. It is a good idea to ensure the threads are protected to prevent damage.

Vacuum connection:

- The supplied hose barb is suitable for 5-6mm (3/16"-1/4") I.D. vacuum hose. Use thread sealant or tape to ensure a leak-free joint.
- The SV52 vacuum port should be connected directly to the engine's intake manifold using the shortest hose possible, ideally with no other devices or hoses teed in for fastest valve response.
- For different hose sizes or types, the supplied hose barb can be replaced with any 1/8" NPT threaded fitting.

Installing the SV52:

- Check the spring guide on page 3 to determine the most appropriate initial combination, as now is the time to make changes if required, before final installation.
- Position the SV52 body assembly onto the weld-on flange.
- Install 4 of the M5 screws first, tightening to 6Nm (4.4ft-lb).
- Remove the final M5 screw from the central hole to release the spring, then screw it into the remaining empty hole and tighten to 6Nm (4.4ft-lb).
- Install the shortest of the supplied spring pre-load screws and o-ring, tightening to 10Nm (7.4ft-lb)

Spring Selection and Adjustment

Please note that the spring pre-load has nothing to do with the engine's boost pressure, nor does it affect the SV52's ability to hold boost.

The spring pre-load is related to the engine's idle vacuum, which controls how easily the valve vents, and how long it vents for. This feature can be used to fine-tune the boost response during transient throttle conditions.

The SV52 is supplied with 2 springs that offer three broad ranges of spring pre-load to suit engines with low, medium, and high idle vacuum. Finer adjustment within these ranges is achieved by using the different length spring pre-load adjustment screws.

The table opposite indicates the suggested spring combination for a given engine idle vacuum range to use as a starting point. See page 4 for instructions on swapping springs.

	UNITS			Inner Spring	Outer Spring
	InHg	kPa	psi		
Low Idle Vacuum	5-8	17-27	2.5-4	•	
Medium Idle Vacuum	8-14	27-47	4-7		•
High Idle Vacuum	14-22	47-75	7-11	•	•

The SV52 is supplied with both springs installed. If you know your engine's idle vacuum, check the table above and select the most appropriate spring combination. Otherwise, for a car with relatively stock or mild cams/porting, use both spring as a starting point. For performance cams or porting, use the outer spring. For race engines, the inner spring is probably the best one to start with.

In all cases, start by installing the shortest spring pre-load screw. With the engine idling at normal operating temperature, check if the piston is hanging open. If not, you may need to change to a softer spring combination. If the piston already is hovering open, install a longer spring adjustment screw that brings the piston to the closed position. This is a good rough setting to start with.

The ideal spring setting depends entirely on the desired outcome, which may be different depending on what system the SV52 is used on. There are three main groups of engines where the spring pre-load may be set up differently to achieve different outcomes:

- **Turbo engines where the throttle is opened and closed often, and optimum throttle response is the key objective:**

For this group of engines the spring is best set up firmer than the method above suggests, because venting too much air too easily can increase lag. Experiment by installing increasingly longer spring adjustment screws until optimum throttle response is achieved. You may find that the best setting for throttle response causes some low RPM flutter/compressor surge, so it is somewhat of a balancing act.

- **Turbo drag racing engines where the throttle is only closed at the end of a pass (not during gearshift):**

On engines where the only purpose for the BOV is to open at the end of a pass to protect the turbo and prevent pipes blowing off etc, you might find a softer pre-load works best, such that the piston is slightly open at idle (provided there is no MAF sensor). The pre-load is not all that critical on these setups because the valve really only operates either open or shut.

- **Supercharged engines:**

Superchargers have quite different requirements from the BOV than turbochargers. A softer spring pre-load is often required than what the spring selection table above suggests, because a supercharger needs a relief path when the throttle is not open. Unlike a turbo, a supercharger makes positive pressure with RPM, not load. So if you are cruising on the highway with the throttle only partially open, the blower is making boost which needs to be vented so damage doesn't occur.

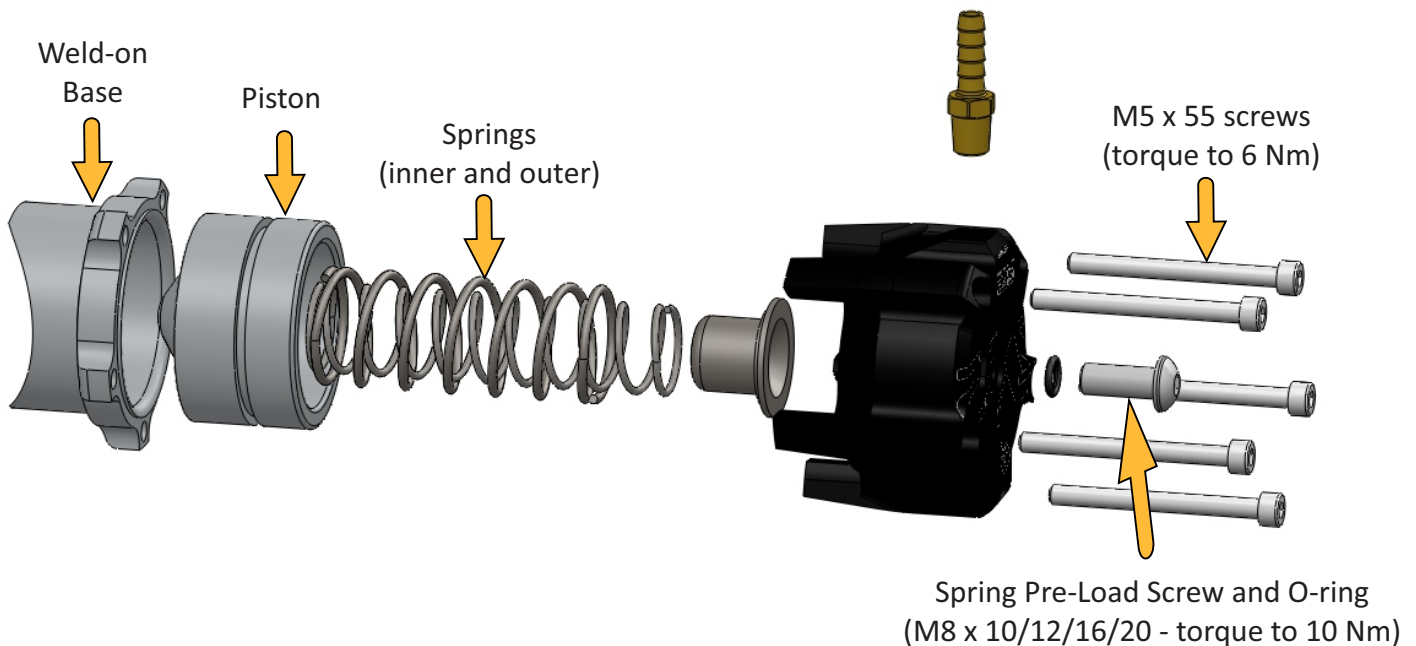
A good starting point is to choose a spring combination that is one range lower than the spring selection table above suggests. Pre-load adjustments will effectively fine-tune the way the BOV delivers boost in relation to the throttle position.

Changing the Spring Combination

Begin by removing one of the M5 screws and the central spring adjusting screw. Insert the M5 screw into the central hole and tighten by hand to retain the spring pre-load whilst removing the base.

Now remove the remaining 4 screws and remove the body from the base. Press the valve down firmly onto a bench to compress the spring slightly, then remove the central M5 retaining screw (spring force is approximately 13kg/29lb). The piston and springs will now slide free from the body, but take care to ensure the piston does not fall and get damaged.

Select the new spring combination, ensure the piston o-rings are lubricated with engine oil, and re-assemble the valve as per the exploded diagram below, then tighten all screws using the torque indicated:



WARNING: GFB recommends that only qualified motor engineers fit this product. 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 Limited Lifetime Warranty:

We live in a throw-away society, conditioned by cheap products and built-in obsolescence to expect eventual failure and discard something when it stops working or is superseded. However, pride in workmanship and our commitment to quality means that when we put our name to something, we are also staking our reputation on it.

That is 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.