
# GFB EX44

## EXTERNAL WASTEGATE
## INSTRUCTION MANUAL
## PART NO. 7002


GFB
GO FAST BITS

Ph: +61 (0)2 9534 0099
Fax: +61 (0)2 9534 3999
Email: sales@gfb.com.au
Web: www.gfb.com.au

# INSTALLATION

GFB EX44 Packing list:

- Assembled EX44 wastegate
- 10psi spring and 5psi spring (both installed for base boost of 15psi)
- 2 x v-band clamps
- 2 x 1/8” BSPT hose tails
- 1 x outlet weld-on flange (part # 7042)
- 1 x inlet weld-on flange (part # 7052)
- 1 x valve seat

Install the hose tails onto the wastegate. The thread is 1/8” BSP, which is a commonly available thread should you wish to use a different type of fitting.

Identify the inlet and outlet weld-on fittings. These are to be welded onto your turbo exhaust manifold and exhaust system, onto which the EX44 is mounted using the supplied v-band clamps. The inlet and outlet weld-on fittings are designed to fit the pipe that is most suitable for each purpose.

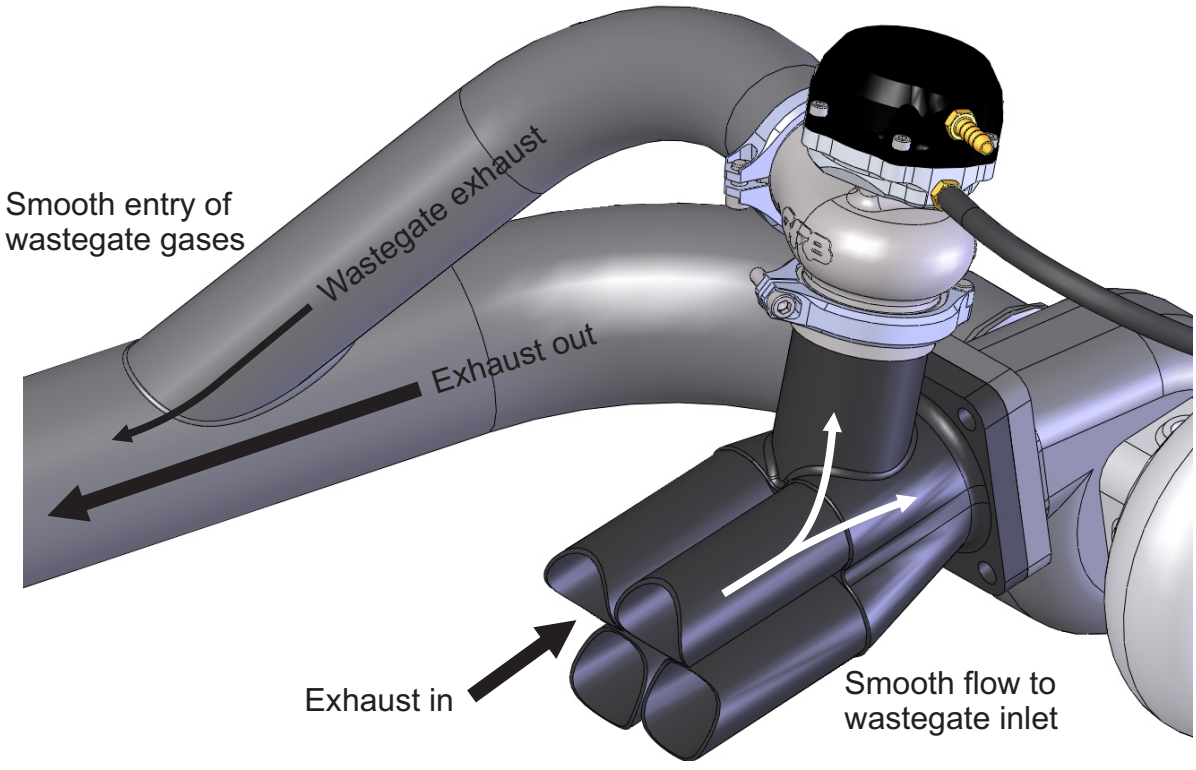
Please note the EX44 is compatible with TiAl MVR weld-on fittings, so if you already have an exhaust manifold with a TiAl fitting, the EX44 will bolt straight up using the GFB-supplied clamps.

The inlet fitting, which is welded to the exhaust manifold and supports the weight of the wastegate, is best suited to 2” (50.8mm) O.D. pipe with a wall thickness of at least 0.120” (3mm). It is also possible to use 1.5” nominal bore Schedule 10 pipe – a commonly available heavy-walled pipe. The outlet fitting is designed to accept 1.75” (44.5mm) O.D. thin-walled tube, which is commonly used for exhaust systems and screamer pipes. Of course, it is possible to use different size and wall-thickness pipes than those recommended, provided a suitable weld can be achieved. Replacement weld-on fittings are available separately from GFB if required.

The inlet fitting should be welded to the exhaust manifold after all the exhaust runners have merged, and in a position that promotes smooth flow to the wastegate – fast-moving exhaust gas is reluctant to make sharp turns, which significantly reduces the flow potential through the wastegate. The diagram below shows a suggested installation location.

On any street-driven car, legally the wastegate outlet MUST be connected to the vehicle's exhaust system (before any catalytic converters and mufflers), and should be done in a way that allows the gases to merge smoothly. On race cars where regulations allow, the outlet can be routed out of the engine bay to atmosphere.

Ensure the valve seat is inserted into the bottom of the wastegate before final installation.



# SPRING SELECTION

Use the following guide to help set up your EX44. You should first determine the minimum and maximum boost pressure that you want to run, and your control method.

Care should be taken when selecting boost pressures, and it is always best initially to err on the conservative side, until the engine can be run on a dynamometer to ensure safety. Always consult an expert when making boost changes, and it is recommended that the car be checked on a dyno, as high boost and/or lean air/fuel mixtures can cause engine damage or worse, total failure.

If you are planning on having variable boost through the use of a boost controller, the range you can achieve depends on your turbo setup. The lowest boost your car can run is determined by the spring (this is commonly known as "gate pressure"), and boost can then be increased through the use of a boost controller.

As a rule of thumb, try to select springs so that your maximum boost is no more than double the "gate pressure". Whilst it is possible to increase boost beyond this, you may find that boost becomes less stable and harder to control. This is because the boost controller must bleed most of the control pressure signal to the actuator, so the wastegate is less able to self-correct for changes in manifold pressure. Using a stronger spring means the controller bleeds off less of the pressure signal, giving the wastegate greater ability to regulate boost changes.

The EX44 comes fitted with a 5psi and a 10psi spring (for a base boost pressure of 15psi). Available separately is a 7psi spring. All 3 springs can be used individually or installed together to achieve different boost levels. Use the table opposite to determine the combination of springs required for your desired base boost level.

Note that this table is only a guide to help your selection – the actual boost level achieved ultimately depends on a large number of variables, and may differ from the base boost pressure shown in the table.

| Base Boost Pressure (psi) | 5psi Inner (part #7205) | 7psi Middle (part #7207) | 10psi Outer (part #7210) |
|---|---|---|---|
| 5 | ● | | |
| 7 | | ● | |
| 10 | | | ● |
| 12 | ● | ● | |
| 15 | ● | | ● |
| 17 | | ● | ● |
| 22 | ● | ● | ● |

## *Changing the Spring*

Use a metric 3mm hex key to remove four of the cap screws, leaving two opposing screws in place. Care must be taken during the next step, as the spring force can exceed 40kg, depending on the springs used.

Carefully remove the remaining two screws whilst restraining the cap to prevent it popping off. It is a good idea to have a helper during this step, or better still, use a press or suitably padded vise to restrain the cap and allow you to remove it slowly.

Change the spring/s as required, and ensure they sit into the corresponding grooves in the cap. Ensure the bead of the diaphragm is sitting into the groove, then press the cap down and fully screw in two opposing cap screws, followed by the remaining four. Nip the screws up tight and it is preferable to use a drop of Loctite on the threads.

# BOOST CONTROL METHODS

There are many different ways to connect the wastegate boost ports; three of the more common methods are shown on the next page. Whilst it is possible to use any number of different methods that are not shown here, you should always remember the following:

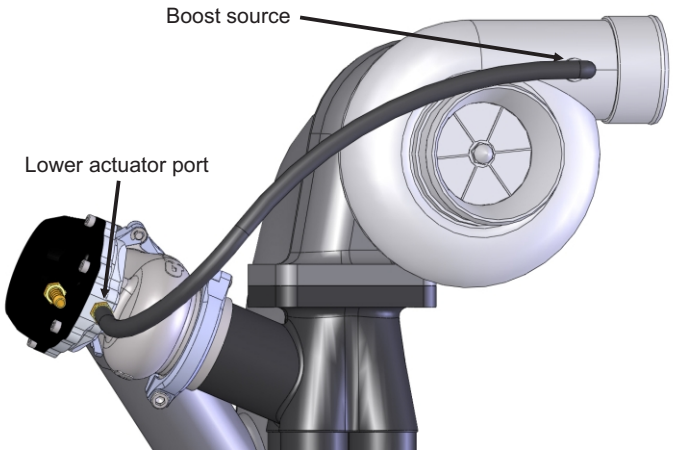
- The lowest boost pressure possible is determined by the spring
- The lowest possible boost pressure for a given spring combination is achieved when the full boost pressure is applied to the lower actuator port, and none to the upper port
- Boost pressure increases when you do one or both of the following:
  - Decrease the pressure at the lower port
  - Increase the pressure at the upper port

# BOOST CONTROL METHODS

This is the most basic boost control method, using a pressure hose from a boost source (often found on the turbo outlet) connected to the lower actuator port of the wastegate cap.

This configuration results in a boost pressure that is dictated by the wastegate spring – you must change the spring to alter the boost level.

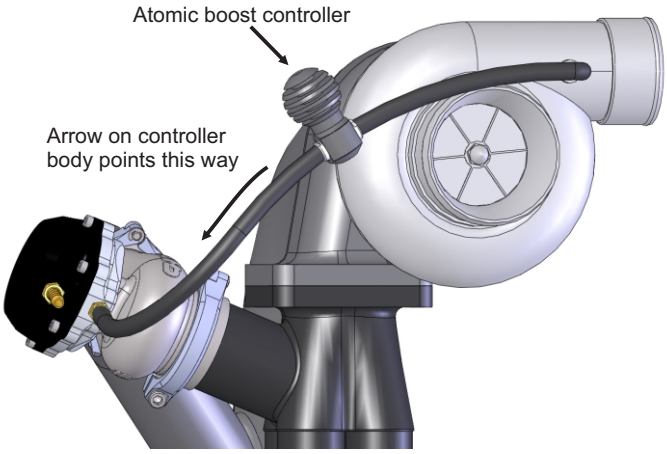
The unused upper actuator port should be left open to atmosphere, but if there is a chance that water could drip into the upper port, either remove and rotate the cap, or connect a short length of hose to the nipple and point it downwards.




The second configuration is a simple adaptation of the above, with a boost controller (such as the GFB Atomic) fitted into the pressure hose as shown to allow the boost to be easily increased above the base level. The controller does this by reducing the pressure getting to the wastegate - the more the controller bleeds off, the higher the boost.

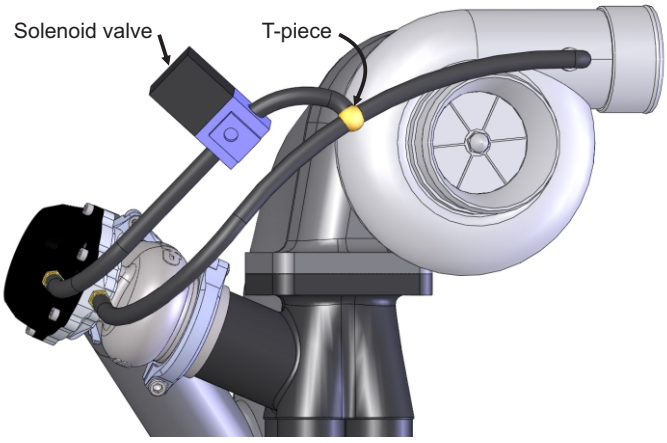
In the case of the GFB Atomic boost controller, the arrow on the body must point in the direction shown, or the controller will have little effect.

If using a different brand controller, you should consult the instructions for that product.




The third configuration is a typical installation for electronic boost controllers (such as the GFB G-Force II).

You should consult your boost controller's instruction manual for specific information on how each of the ports of the solenoid valve should be connected.




**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 and limitations. No other warranty is expressed or implied.**