ULTRA-GATE 38MM WASTEGATE INSTRUCTIONS

Please check the following items have been provided with your Ultra-Gate.

<table>
<thead>
<tr>
<th>Qty</th>
<th>Description</th>
<th>Use</th>
<th>Replacement Part #</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ultra-Gate 38mm external wastegate</td>
<td>Assembled Ultra-Gate fitted with 7 psi outer purple spring</td>
<td>FG-WGATE-38</td>
</tr>
<tr>
<td>2</td>
<td>Weld flange</td>
<td>Designed to be welded to exhaust system</td>
<td>FG-WG38-WFL</td>
</tr>
<tr>
<td>2</td>
<td>Belpa Mica Gasket</td>
<td>Seals the inlet and outlet flange to the Ultra-Gate</td>
<td>FG-WG38-GSKT</td>
</tr>
<tr>
<td>2</td>
<td>Nipple 1/8 BSP</td>
<td>For connection to Top &amp; Bottom ports</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Reducer</td>
<td>5mm to 6.3mm hose reducer</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>White 7 psi inner spring</td>
<td>7 psi inner spring – White</td>
<td>FG-WG38-SPO7IN</td>
</tr>
<tr>
<td>1</td>
<td>Blue 10 psi outer spring</td>
<td>10 psi outer spring – Blue</td>
<td>FG-WG38-SP10</td>
</tr>
<tr>
<td>2</td>
<td>M8x25 Screw</td>
<td>Designed to bolt into threaded outlet flange</td>
<td>Supplied in FG-WG38-WFL</td>
</tr>
<tr>
<td>2</td>
<td>M8x35 Screw</td>
<td>Designed to bolt through the inlet flange</td>
<td>Supplied in FG-WG38-WFL</td>
</tr>
<tr>
<td>2</td>
<td>M8 Nuts</td>
<td>Use on the inlet flange bolts</td>
<td>Supplied in FG-WG38-WFL</td>
</tr>
<tr>
<td>1</td>
<td>Valve Seat</td>
<td>Seals the valve</td>
<td>FG-WG38-SEAT</td>
</tr>
</tbody>
</table>

IMPORTANT NOTES ON YOUR ULTRA-GATE 38MM EXTERNAL WASTEGATE

- Fitting your Ultra-Gate will require fabrication of a custom manifold and or modification to an exhaust manifold. Turbosmart recommends that your Ultra-Gate is fitted by an appropriately qualified technician.
- The Ultra-Gate is designed for use with a turbocharger that does not have an internal wastegate.
- Consult your local specialist before setting your desired boost pressure, setting boost beyond your engines capability may result in engine damage.
- Turbosmart recommends that boost pressure is set using a Dynamometer and not on public roads.
- Turbosmart recommends that a boost gauge be permanently fitted to the vehicle.
- Turbosmart recommends that the engines Air/Fuel ratio is checked while setting the desired boost pressure, as any increase in boost pressure can cause the engine to run “LEAN”, resulting in possible engine damage.
- To safeguard against “pinging” or detonation, always use the highest octane fuel available.

Please check www.turbosmart.com.au for the latest updates and information on fitting your Turbosmart Ultra-Gate.

IMPORTANT NOTES ON FITTING YOUR ULTRA-GATE

Note: Please thoroughly read and understand these instructions before commencing this installation.

BASIC COMPONENTS OF YOUR ULTRA-GATE 38MM EXTERNAL WASTEGATE

Use the diagram to help identify the “top” and “bottom” ports, and inlet/outlet ports of your wastegate.

- When pressure is applied to the “bottom” port of a wastegate, i.e. underneath the wastegate diaphragm, it acts against the wastegate spring and the wastegate valve opens.
- When pressure is applied to the “top” port of a wastegate, i.e. above the wastegate diaphragm, it acts with the wastegate spring and helps to close the wastegate valve.
- The Inlet is connected to the exhaust manifold before the turbine housing of your turbocharger. See recommendations following for Ultra-Gate mounting position.
- Outlet returns exhaust gas back into the exhaust system after the turbocharger. (NOTE if mounted on a dedicated race car the outlet can be vented directly to atmosphere towards the ground)
- The Ultra-Gate is guaranteed to handle exhaust gas temperatures up to 1000°C. Your actual exhaust gas temperature is affected by engine tune, type of fuel and flame front propagation. The temperature of exhaust gas flowing through the Ultra-Gate is also largely dependant on the distance the Ultra-Gate is mounted from the exhaust ports. The Ultra-Gate valve is coated in heat paint which changes colour when exposed to various exhaust gas temperature ranges as illustrated in the following chart.

<table>
<thead>
<tr>
<th>Colour Change Sequence</th>
<th>Initial Colour</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour</td>
<td>Bright Orange/Red</td>
<td>Brown</td>
<td>Brown/ Yellow</td>
<td>Bright Yellow</td>
<td>Orange</td>
<td>Green</td>
<td>Molted Red</td>
<td>Brown</td>
<td>Green/ Grey</td>
<td>Grey</td>
<td>Black</td>
</tr>
<tr>
<td>Temperature</td>
<td>0-490°C</td>
<td>490°C</td>
<td>570°C</td>
<td>610°C</td>
<td>670°C</td>
<td>750°C</td>
<td>850°C</td>
<td>910°C</td>
<td>1040°C</td>
<td>1080°C</td>
<td>1250°C</td>
</tr>
</tbody>
</table>

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ULTRA-GATE 38MM WASTEGATE INSTRUCTIONS

ITEM NO. | Quantity | Replacement Part # | DESCRIPTION
---|---|---|---
1 | 1 | | MAIN BODY
2 | 1 | FG-WG38-SEAT | VALVE SEAT
3 | 1 | | VALVE
4 | 1 | | 9.1 ID x 20 OD x 1 mm SS
5 | 1 | | EXTERCLIP 9mm 11mm SS
6 | 1 | | LOWER DIAPHRAGM HOUSING
7 | 4 | | M6x45 HKK STAINLESS STEEL
8 | 1 | | VALVE BUSH
9 | 2 | | DIAPHRAGM SUPPORT
10 | 1 | FG-WG38-DIA | DIAPHRAGM SILICON NOMEX
11 | 1 | | M6 304 S/S GLENLOCK NUT
12 | 1 | FG-WG38-SP07 | 7 PSI SPRING - PURPLE
13 | 1 | | UPPER DIAPHRAGM HOUSING
14 | 6 | | M6 x 25 304 S/S SOCKET CAP SCREW
15 | 1 | FG-WG38-SP07N | 7 PSI SPRING - WHITE
16 | 1 | FG-WG38-SP10 | 10 PSI SPRING - BLUE
17 | 1 | FG-WG38-WFL | OUTLET WELD FLANGE
18 | 1 | FG-WG38-WFL | INLET WELD FLANGE
19 | 2 | FG-WG38-GSKT | BELPA MICA GASKET
20 | 2 | | M8x25 SCHS SS
21 | 2 | | M8x35 SCHS SS
22 | 2 | | M8 NUT SS

NOTE: VALVE LOCKING TOOL - PART # FG-WG38-VLT REQUIRED TO REPLACE THE DIAPHRAGM
RECOMMENDATIONS FOR MOUNTING YOUR ULTRA-GATE

The mounting position of your Ultra-Gate will be largely determined by your turbo and manifold setup and may be constrained by space restrictions in your engine bay. The following points should be considered when mounting your Ultra-Gate:

- The supplied exhaust weld flanges should be welded to your exhaust system. The weld flanges are compatible with Stainless Steel and Mild steel welding rod material.
- When securing your Ultra-Gate use the supplied gaskets between the weld flanges and the inlet/outlet flanges. Use the M8X25 screws to secure the outlet flange (Note: The bolts screw into the threaded holes on the outlet flange). Use the M8 nuts and M8X35 screws if needed to secure inlet flange to your manifold (Note: Your manifold may have studs to suit so the screws may not be necessary). Tighten the screws and nuts to a torque of 8 Nm & lubricate with Never Seize regularly.
- For best results an attempt should be made if space allows to mount the Ultra-Gate at an angle to the exhaust flow to allow for better flow than a 90 degree mounting. See the schematic diagrams below for examples of mounting positions.

Best Flow – Symmetric Mounting
Symmetric mounting allows an excellent flow of exhaust to the Ultra-Gate.

Good Flow – Angled Mounting
Angled mounting allows a good flow of exhaust to the Ultra-Gate.

Poor Flow – 90 Degree Mounting
90 degree mounting gives poor exhaust flow to the Ultra-Gate and in some circumstances may contribute to over boosting.

Not recommended – Less than 90 Degree Mounting
An angled mounting as shown is not recommended and gives extremely poor exhaust flow to the Ultra-Gate.
ULTRA-GATE 38MM WASTEGATE INSTRUCTIONS

ACHIEVING YOUR TARGET BOOST PRESSURE

There are various factors involved in achieving your target boost pressure including:

- The size of the spring fitted in your wastegate i.e. the boost pressure achieved by the wastegate spring only.
- The desired level of boost pressure and the difference between this and your wastegate spring pressure.
- The size of your turbocharger and wastegate and the resulting exhaust manifold backpressure in your system.

Turbo smart recommends the ideal setup for achieving your target boost pressure is to use the Ultra-Gate in conjunction with a Turbosmart e-Boost controller.

IMPORTANT NOTES ON SETTING THE WASTEGATE SPRING PRESSURE

The Ultra-Gate is factory assembled with a single 7 psi outer spring (PURPLE). Turbosmart recommend using the standard spring as this allows maximum valve travel and therefore exhaust flow through the Ultra-Gate. A stiffer spring should only be used when necessary. The Ultra-Gate is supplied with 2 additional springs that allow a combination of spring pressures. All springs that are included with the Ultra-Gate are shown in the table below. The tuner can use combinations of the 2 springs to achieve the following base boost pressures. To aid in the identification of these springs they are supplied colour coded. If this colour coding is not clear please use the dimensions in the following table to identify the wastegate spring. Please see the following detailed instructions on setting your Ultra-Gate’s spring pressure.

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Spring Type</th>
<th>OD</th>
<th>Length</th>
<th>Wire Diameter</th>
<th>Colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>FG-WG38-SPNG-07IN</td>
<td>Ultra-Gate 7 psi Inner</td>
<td>36.5mm</td>
<td>54.0mm</td>
<td>3.15mm</td>
<td>WHITE</td>
</tr>
<tr>
<td>FG-WG38-SPNG-07</td>
<td>Ultra-Gate 7 psi Outer</td>
<td>45.0mm</td>
<td>75.0mm</td>
<td>3.15mm</td>
<td>PURPLE</td>
</tr>
<tr>
<td>FG-WG38-SPNG-10</td>
<td>Ultra-Gate 10 psi Outer</td>
<td>45.0mm</td>
<td>77.0mm</td>
<td>3.50mm</td>
<td>BLUE</td>
</tr>
</tbody>
</table>

The Ultra-Gate is factory assembled with a 7 psi outer spring (PURPLE). To fit a heavier spring or spring combination follow the instructions below.

WARNING! Fitting a heavier wastegate spring may cause a higher than expected increase in boost pressure.

Turbosmart recommends adjusting your boost controller back to its minimum setting and measuring the new minimum boost pressure achieved by the new spring, before increasing your boost pressure again.

1. Remove the Ultra-Gate from the exhaust manifold. Use CAUTION! the wastegate may still be HOT!

2. Using a 5mm Allen Key, remove the Allen head bolts that secure the upper wastegate cap.

   WARNING! The cap is under spring tension, wear safety glasses and remove with care! You may find it helpful to use a press to hold down the cap while loosening the bolts and to aid in releasing the cap slowly while under spring pressure.

3. Release Cap slowly as it is under spring pressure and remove cap.
4. Remove the standard purple 7 psi wastegate spring.

5. Select and locate the required wastegate spring or combination of inner and outer springs on the upper diaphragm spring support. See spring information above for detail on wastegate spring identification and selection.

6. Ensure that the diaphragm is correctly aligned. The six holes on the outer ring of the wastegate diaphragm should be in line with the 6 holes in the lower wastegate cap.

7. Refit the upper wastegate cap re-using the Allen head bolts. Use Loctite or a similar thread locking product on these screws. Again you may find it helpful to use a press to hold down the cap while tightening these bolts. Tighten the Allen head bolts using the supplied 5mm Allen Key, or suitable tool, and torque to 8 N-m (5.9 lb-ft).

8. Refit the wastegate to the exhaust manifold using the supplied vee band clamps.
NOTES ON BOOST CONTROL HOOKUP

WARNING! Changing your connection method can cause a higher than expected increase in boost pressure. Turbosmart recommends adjusting your boost controller back to its minimum setting and measuring the new minimum boost pressure achieved by the new setup before increasing your boost again.

IMPORTANT! Refer to your boost controller instructions for most suitable connection method to an external wastegate.

BASIC HOOK UP

If no boost controller is being used connect the boost pressure source to the "bottom" port as shown. Connect the Ultra-Gate "top" port to the intake side of the turbo, between the air cleaner and the inlet on the front of the turbocharger. Otherwise connect a short piece of the silicon hose and face the vent downwards to stop water or debris entering the top port.

PRESSURE REGULATOR HOOK UP

When using your Ultra-Gate in conjunction with a pressure regulator Turbosmart recommends it should be fitted by an appropriately qualified technician. A possible layout is illustrated but Turbosmart makes no recommendations in regard to the best hook up of a pressure regulator.

GATED BOOST CONTROL VALVE HOOK UP

When using your Ultra-Gate in conjunction with Turbosmart gated boost controller fit the controller between the boost pressure source and "bottom" port as shown. Ensure the arrow on the controller is pointing in the direction illustrated. Connect the Ultra-Gate "top" port to the intake side of the turbo, between the air cleaner and the inlet on the front of the turbocharger. Otherwise connect a short piece of the silicon hose and face the vent downwards to stop water or debris entering the top port.

Refer to the instructions supplied with your Gated Boost Control Valve for further detail if necessary.
Turbosmart recommends using Ultra-Gate in conjunction with the Turbosmart e-Boost and trying the “Two port” connection method (1) as a starting point. If this connection method does not achieve the desired boost pressure, fit a heavier wastegate spring to the Ultra-Gate to increase your minimum boost pressure, or use the next connection method (“Two port” connection method (2)).

“TWO PORT” CONNECTION METHOD (1)

When using your Ultra-Gate in conjunction with a Turbosmart e-Boost connect the three e-Boost solenoid ports according to the diagram below.

**WARNING!** An increase in your minimum boost pressure is expected when using this method. Ensure all boost set point values and gate pressure values are set to Zero and measure the new minimum boost pressure achieved by this method before increasing your Boost Set Point values.

- Port (1) Connects to a “boost only” pressure source, typically from the compressor housing on the turbocharger. If your turbocharger does not have this fitting, connect to a “boost only” pressure source before the throttle-body or butterfly. Do not connect to the intake manifold, as the pressure signal will have both vacuum and boost pressure.
- Port (2) Connects to the “Top” port of the Ultra-Gate
- Port (3) Connects to the “Bottom” port on the e-Boost solenoid. Connect this hose to the intake side of the turbo, between the air cleaner and the inlet on the front of the turbocharger. Otherwise connect a short piece of the silicon hose and face the vent downwards to stop water or debris entering the solenoid.
- Connect the “Bottom” port on the Ultra-Gate to the same “boost only” pressure source as Port (1) on the solenoid.
- Use a tee-piece (not supplied) to share the “boost only” pressure source if necessary.

If you are unable to achieve your desired boost pressure it is normally due to exhaust manifold backpressure forcing the wastegate valve open. To increase your boost pressure further, fit a heavier wastegate spring to the Ultra-Gate to increase your minimum boost pressure, or use the “Two Port” connection method (2) as below.

“TWO PORT” CONNECTION METHOD (2)

The “Two Port” connection method (2) is used to achieve the maximum possible boost pressure that your system can develop. It is the most suitable method if you are unable to develop your desired boost pressure due to high exhaust manifold back pressure.

**WARNING!** An increase in your minimum boost pressure is expected when using this method. Ensure all boost set point values and gate pressure values are set to Zero and measure the new minimum boost pressure achieved by this method of connection before increasing your Boost Set Point values.

Connect the three ports on the e-Boost solenoid according to the diagram below.

- Port (1) Connects to the “Top” port on the Ultra-Gate.
- Port (2) Connects to a “boost only” pressure source, typically from the compressor housing on the turbocharger. If your turbocharger does not have this fitting, connect to a “boost only” pressure source before the throttle-body or butterfly. Do not connect to the intake manifold, as the pressure signal will have both vacuum and boost pressure.
- Port (3) Connects to the “Bottom” port of the Ultra-Gate.

If you are unable to achieve your desired boost pressure it is normally due to exhaust manifold backpressure forcing the wastegate valve open. To increase your boost pressure further, fit a heavier wastegate spring to the Ultra-Gate to increase your minimum boost pressure. If you are still unable to achieve your desired boost pressure ensure that your turbocharger is correctly sized for your application.

**Warranty**
Turbosmart warrants its products to be free from faults or defects for the life of the product.  
* Subject to Turbosmart trading terms and conditions

**Warning!**
Incorrect use of this product may result in damage to your vehicle. Failure to observe any notes or recommendations may result in incorrect use of this product. This product is intended for use in off-road racing only. Turbosmart will accept no responsibility for the incorrect use of this product.

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THE INSTALLATION OF THIS PRODUCT INDICATES THAT THE INDIVIDUAL PURCHASER HAS READ AND UNDERSTOOD THIS AGREEMENT AND ACCEPTS ITS TERMS AND CONDITIONS.

Happy motoring!

The Turbosmart Team.