

Product Name: **vIWG R56 Mini Cooper S - 6InHg**
 Product Description: vIWG R56 Mini Cooper S - 6InHg
 Product Number: TS-0604-1155
 Document Version: V1.00 Rev A



IMPORTANT NOTES ON YOUR VACUUM INTERNAL WASTEGATE

- Turbosmart accepts no responsibility whatsoever for incorrect installation of this product which is potentially hazardous and can cause serious engine damage or personal injury.
- The Vacuum Internal Wastegate (VIWG) is designed as a factory replacement for Vacuum operated turbocharger applications.
- Ensure the engine is **cold** prior to installation.

RECOMMENDATIONS

- Turbosmart recommends that your VIWG is fitted by an appropriately qualified technician
 - The vacuum IWG requires the wastegate be set at certain Vacuum pressure to operate correctly. Vacuum Pumps are not usually apart of a basic tool set.
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KIT CONTENTS



Please check that the following items have been provided in your Vacuum Internal Wastegate packaging

Part	Description	Use
1	Turbosmart Vacuum Wastegate	Main unit
2	Turbosmart Sticker	
3	4 x M6 Nuts Bolts	Nuts required for installation

Figure 1 - Kit Contents



TOOLS REQUIRED

- Basic Socket Set
- Vacuum Operated hand pump

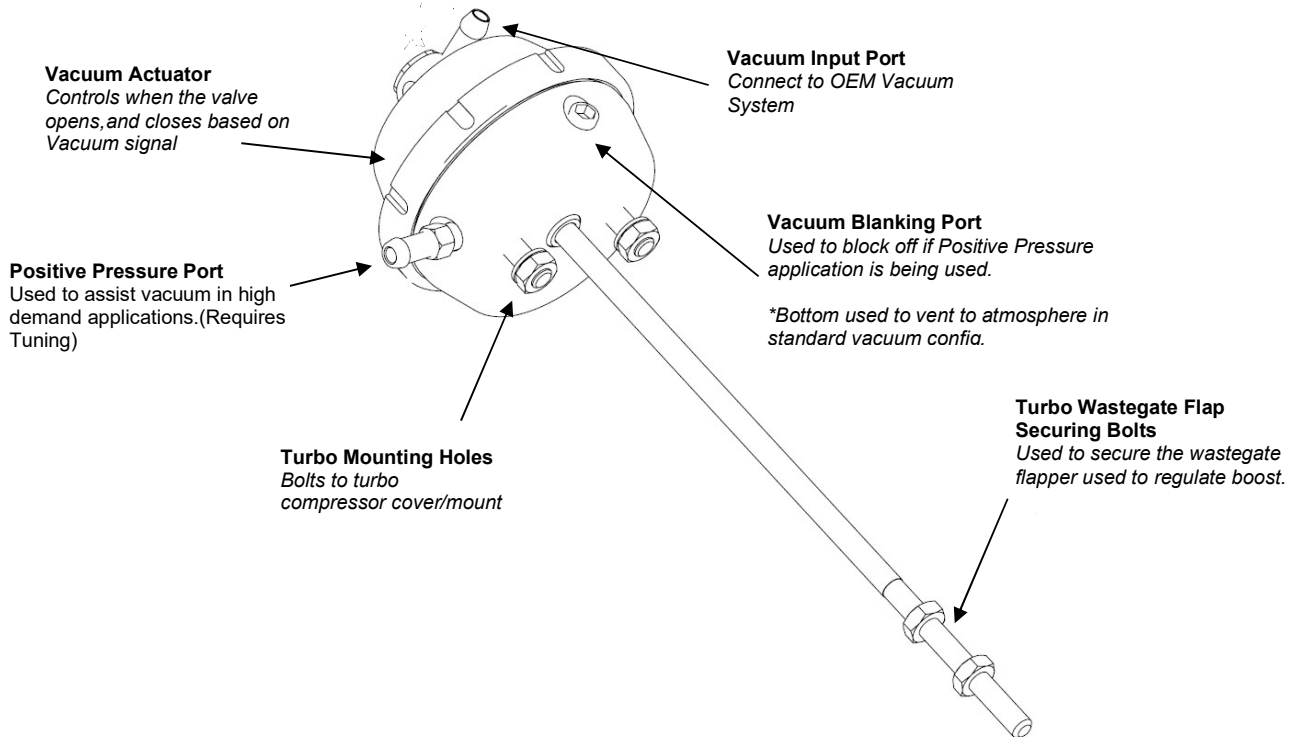
ABOUT YOUR VACUUM INTERNAL WASTEGATE

Turbosmart Upgraded Vacuum-operated Wastegate Actuators have been developed to provide maximum possible boost response for your factory frame turbocharger. The Turbosmart vIWG Series of upgraded Actuators benefit from an increased 'Working Ratio' over the factory equipment resulting in improved boost response, throughout the RPM range.

This Improved 'working ratio' is achieved through an increase to the effective surface area of the diaphragm & revisions to the actual springs fitted resulting in greater leverage of the forces the actuator is working against (boost and backpressure) while still being super-responsive.

Upgrading with the same base pressure as factory, you can expect a broader boost & torque curve through peak boost being achieved earlier in the RPM and being held longer, into higher RPM. These improvements can be amplified with higher base pressures, however tuning & recalibration is recommended for optimal performance

Figure 2 – Vacuum Internal Wastegate Overview
(Figure for illustration purposes only, actual product may vary slightly)



FITTING YOUR VACUUM INTERNAL WASTEGATE

1 Identify OEM Wastegate Actuator location

On the model designation 2nd Generation Mini Cooper (R56/7) the Wastegate Actuator valve is located on the underside of the turbo. It requires some intake components to be removed for ease of installation.



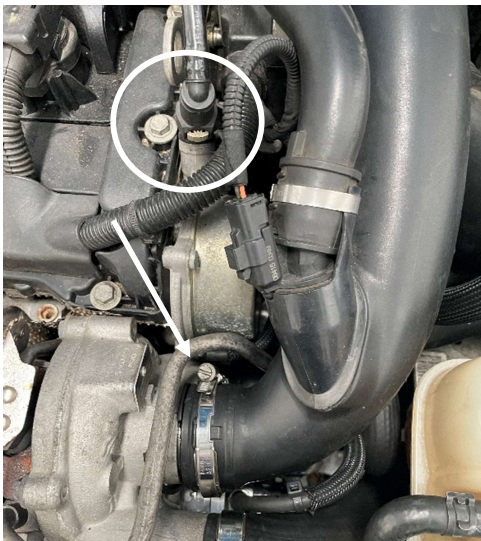
NOTE!

It may be required to remove auxiliary components to access the Wastegate Actuator, ensure you consult your local specialist or a service manual for correct disassembly procedures.

Ensure the engine has cooled down to ambient temperature before proceeding.

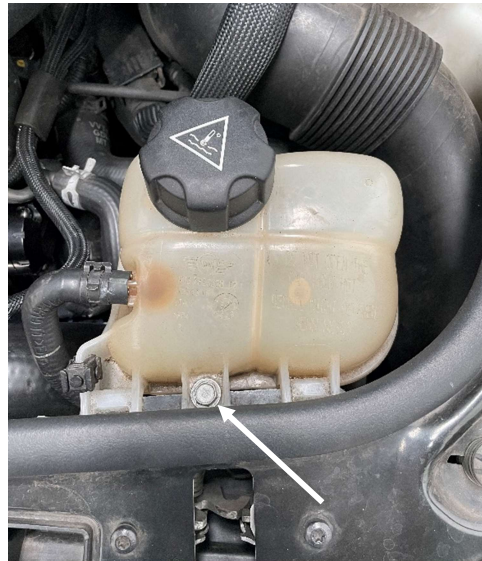
2 Removing OEM Low Pressure Charge Pipe

Removing the charge pipe requires two hose clamps, these are 8mm clamps they are noted in Red. Removing the vacuum line from the vacuum pump can be removed if more space is required. It can be undone by pushing the white connector circled below



3 Moving Coolant Reservoir Bolt

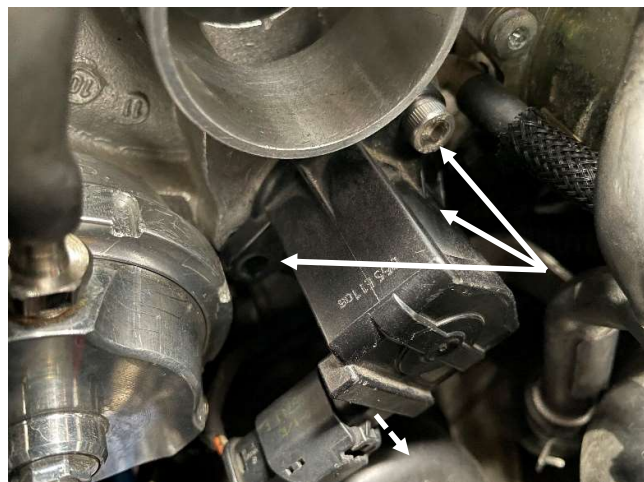
The coolant reservoir can be manipulated in such a way that more room is allowed for the Wastegate Actuator. The bottle can become brittle over time so be careful in moving it. We need a 10mm socket to remove the screw that holds the reservoir in place



4 Removing Divertor Valve from Compressor Cover

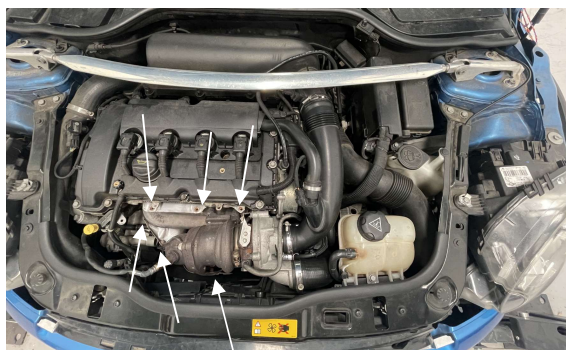
Removing the Divertor valve allows a hand to be placed underneath the bottom of the wastegate actuator. This makes it much easier to undo.

With the Low-Pressure Charge pipe moved out of the way we need to remove the electrical connector as well as the 3 Allen bolts that hold the divertor valve in. A 5mm Allen key is required to remove these bolts. The Connector needs the locating lug at the front to be lifted as noted by the dashed line. It is very easy to drop these bolts it is handy having a magnet to assist taking them off.



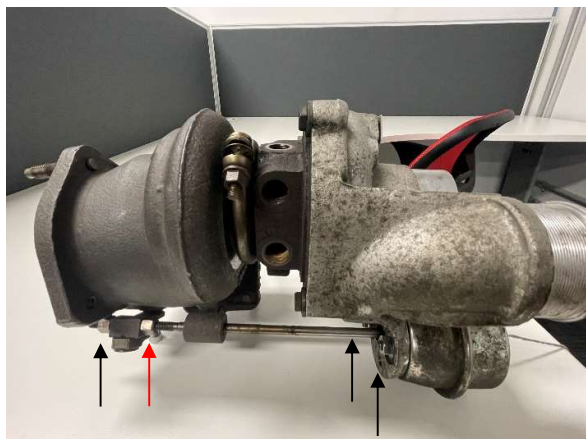
5 Removing OEM Heat Shield

Although not pictured the heat shield is held on with 10mm bolts located as pictured below. The O2 Sensor will require removal if the heat shield cannot be moved far enough away to allow access to the Vacuum Wastegate rod bolts located near the bottom right arrow.



6 Removing your OEM Vacuum Actuator

With the heat shield removed, the actuator can be removed from the car, to do this the bolts marked in black must be removed. The red bolt is best left in place, it is good practice to mark this with a marker and undo it one full turn. This will take any load off the back nut and allow it to come out as it no longer has a load on it. With the one turn back in the rod, it can be used to set the VIWG to the correct pressure. As the Divertor Valve/BOV was removed before, we have a passage that allows hands to be placed under the actuator bolts as they are removed.

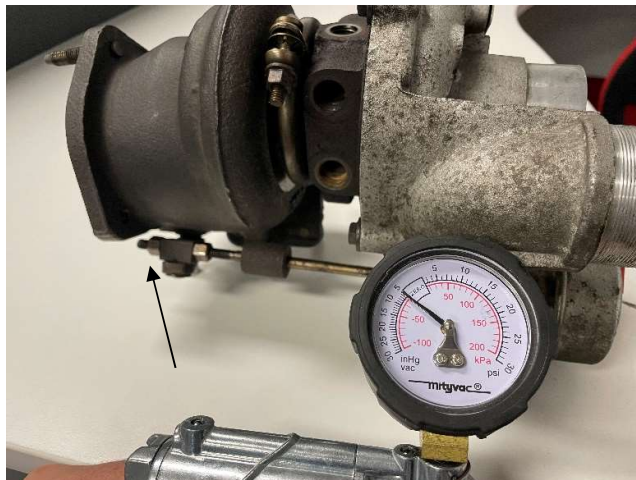


7 Fitting your Turbosmart Vacuum Actuator

With installation, we would like to match the rod length to the RED arrow as closely as possible. Once set, we need to place into the car. The canister bolts will need to be set and tightened down. It is very easy to drop the bolts so ensure passage from underneath is ready to catch and help install the bolts. We will leave the last rod bolt loose.

8 Setting your Turbosmart Vacuum Actuator

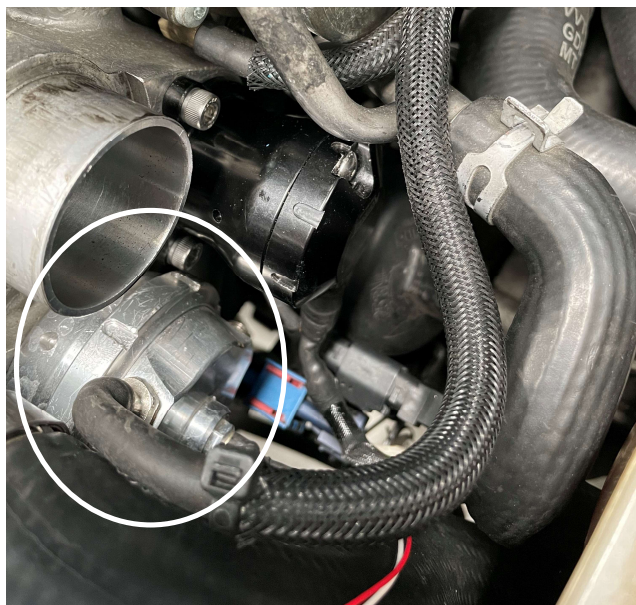
The VIWG requires the actuator to be set at a certain Vacuum pressure. This is defined by the spring, with the Mini we need to set at **6inHg (203mmbar)** of vacuum to fully seat the wastegate flap. Once the pressure is achieved, we need to move the nut up until it seats on the turbine housing. Unnecessary preload will limit rod stroke and hamper performance. It needs to be just enough to seat correctly.



9 Vacuum Plumbing

With the Valve in place we can connect the actuator to the OEM Vacuum Signal. The hose is attached to a barb fitting to ensure a good seal.

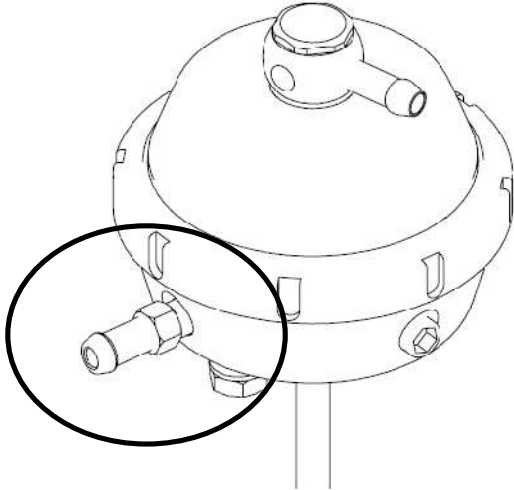
NOTE The bottom port must be left to vent to atmosphere when used solely as a Vacuum actuator.



10**OPTIONAL Positive Pressure Assistance Plumbing**

The VIWG can be used with Positive Pressure assistance. This is located by the black circle. We can use positive pressure that is controlled by the ECU to assist the vacuum system (Top Port) from not being overcome.

The grub screw must be used in this application to allow for pressure to be maintained in the bottom port.

**11****Fitting removed parts required for VIWG install**

With the VIWG being fitted to the car and connected. Fitting the parts that have been removed must now commence before taking a test drive.

The heatshield can now be placed back into its correct place and tightened up.

The Divertor valve and BOV can now be placed back into the car and refitted.

The charge pipe that was removed from the car in step 2 can be placed back into the car and tightened up with the 8mm hose clamps.

The Coolant overflow must also be located back into its correct position, it has a locating plug on the bottom and requires the top to be positioned first before pushing it into the side. With the Overflow located. The 10mm screw can be fixed onto the car.

Congratulations, your TurboSMART VIWG is installed and ready for use. Double check all connections and mounting screws. Start your engine and check for leaks.

TROUBLE SHOOTING

- **It is important that any issues are resolved before heavy driving.**
 - Car feels sluggish, rod length and pressure required to seat flap is incorrectly set. Ensure correct pressure is achieved to fully seat.
 - Car over boosts, the exact same as above, the rod is set at a pressure too low allowing for it to close before commanded.
 - Failing the above, submit a technical request to tech@turbosmart.com.au with information of your engine configuration and photos of installation.
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