

TS-056X-12X2 Pneumatic Straight Gate Compressed Gas Updated a month ago

TS-0563-1242	PSG40CG Pneumatic StraightGate40 Compressed Gas 7psi Black
TS-0563-1252	PSG40CG Pneumatic StraightGate40 Compressed Gas (Solenoid) 7psi Black
TS-0565-1242	PSG50CG Pneumatic StraightGate50 Compressed Gas 7psi Black
TS-0565-1252	PSG50CG Pneumatic StraightGate50 Compressed Gas (Solenoid) 7psi Black
TS-0567-1242	PSG76CG Pneumatic StraightGate76 Compressed Gas 7psi Black
TS-0567-1252	PSG76CG Pneumatic StraightGate76 Compressed Gas (Solenoid) 7psi Black

Important Notes on Your New Compressed Gas Straightgate

- 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 compressed gas straight 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.
- Use only high-quality fittings ensuring maximum sealing reliability. Optional Turbosmart fitting kit available.

Recommendations

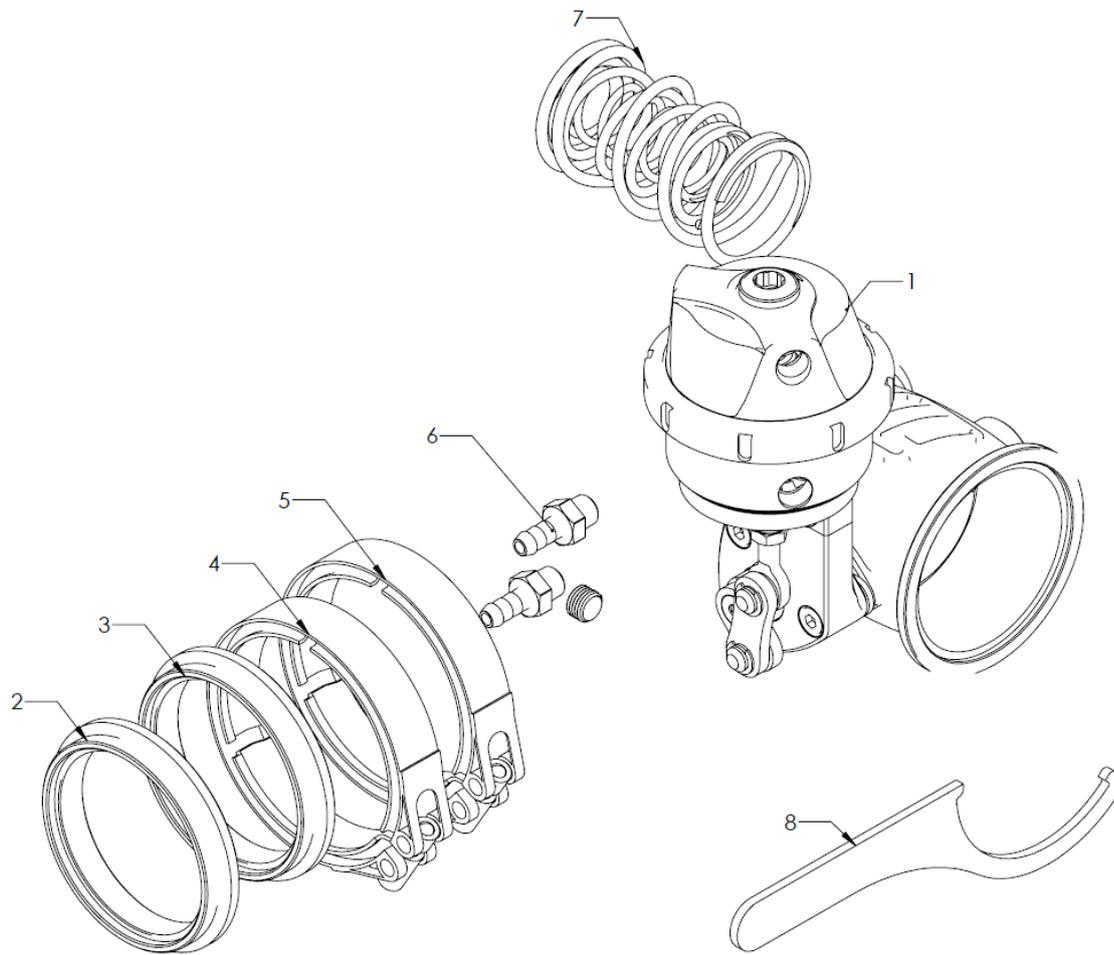
- Allow for adequate cool airflow around the top diaphragm housing
- DO NOT Mount the wastegate so that the top diaphragm housing is less than 100mm from a heat source
- DO NOT wrap the body of the wastegate with exhaust wrap
- Fitting your compressed gas straightgate may require fabrication or modification to your exhaust manifold. Turbosmart recommends that your wastegate is fitted by an appropriately qualified technician.
- 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.

- 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.

Kit Contents

Part	Description	Use
1	Turbosmart Compressed Gas Straight Gate	Main Unit
2	Inlet Weld Flange	Inlet Weld Flange
3	Outlet Weld Flange	Outlet Weld Flange
4	Inlet V-Band Clamp	Inlet V-Band Clamp
5	Outlet V-Band Clamp	Outlet V-Band Clamp
6	Fitting Kit	2 x 1/8" NPT Nipple, 1/8" NPT Blanking Plugs ** (1x pre-installed)
7	Spring Kit	4 x Springs ** (1x Spring pre installed)**
8	Collar Tool	Collar Tool
9	Turbosmart Sticker	Turbosmart Sticker



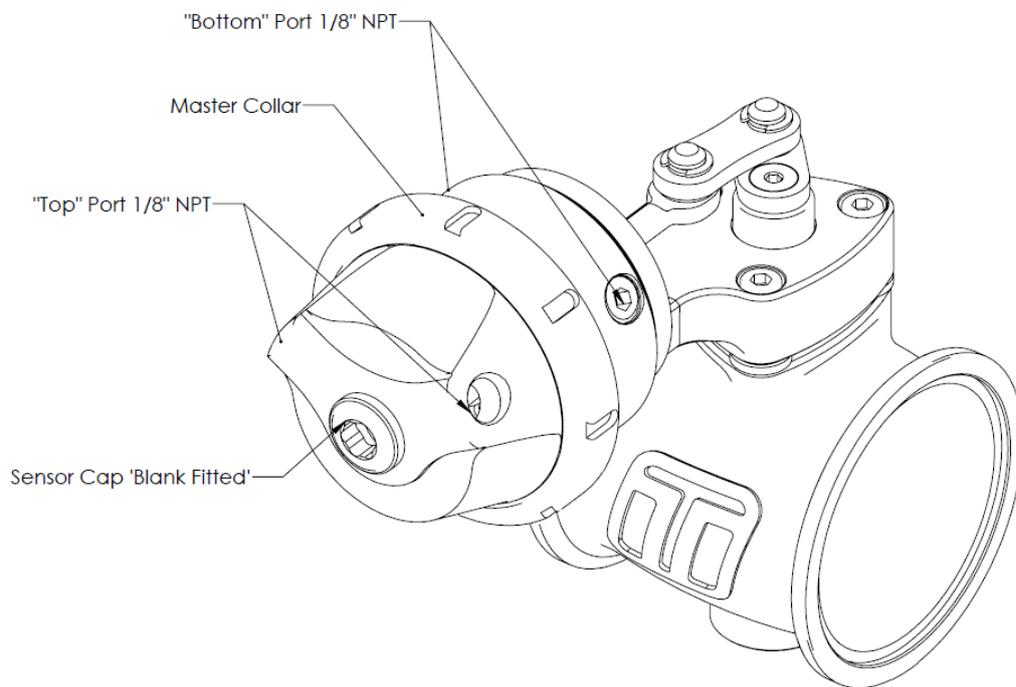
Tools Required

- 3/8" square drive deep socket
- Square drive ratchet wrench
- Torque wrench (3/8" drive)
- Non-marking spanners to tighten fittings
- 3/16" hex key
- Supplied collar tool
- 14mm 12-point (double hex) socket
- Flat blade screwdriver

SUGGESTED LUBRICANTS AND SEALANTS

- Loctite 243 Thread locker
- Loctite 567 Thread Sealant
- Resbond 907TS Red
- Penetrating oil

Compressed Gas Wastegate Overview (Pictured without Solenoids)

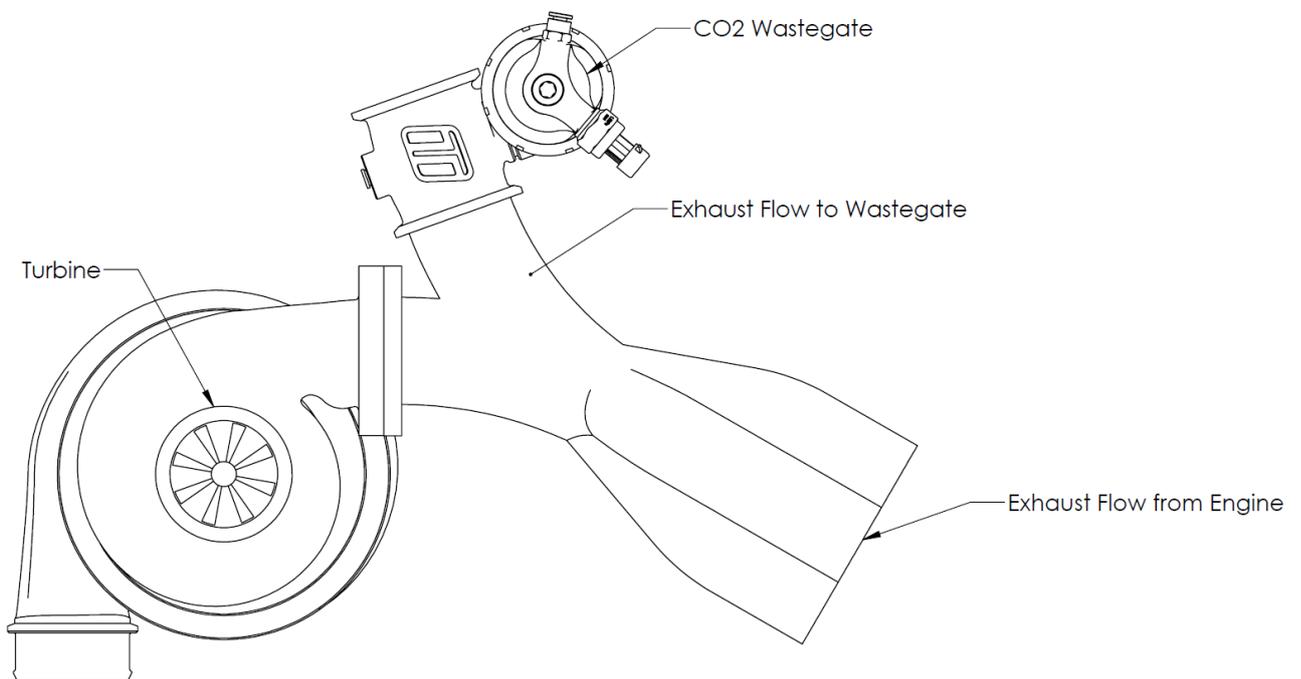


Fitting Your CO2 Straight Gate

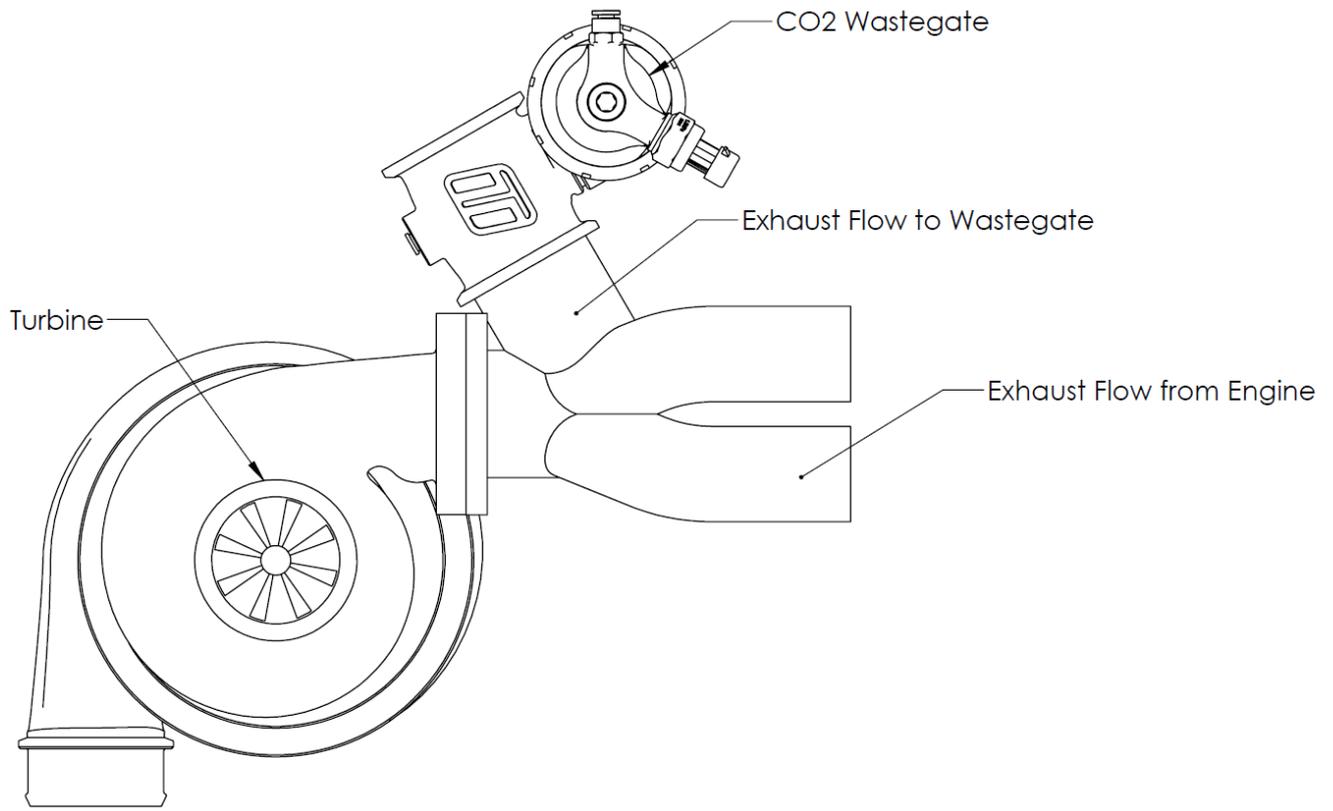
Mounting your new Turbosmart Wastegate

The GenV series of wastegate is a direct fit replacement for the 4th Gen wastegate range and no modification is necessary provided packaging space is sufficient. The weld flanges should be welded to your exhaust system. The weld flanges are compatible with Stainless Steel and Mild steel welding rod material. For best results an attempt should be made, if space allows, to mount the GenV Wastegate 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.

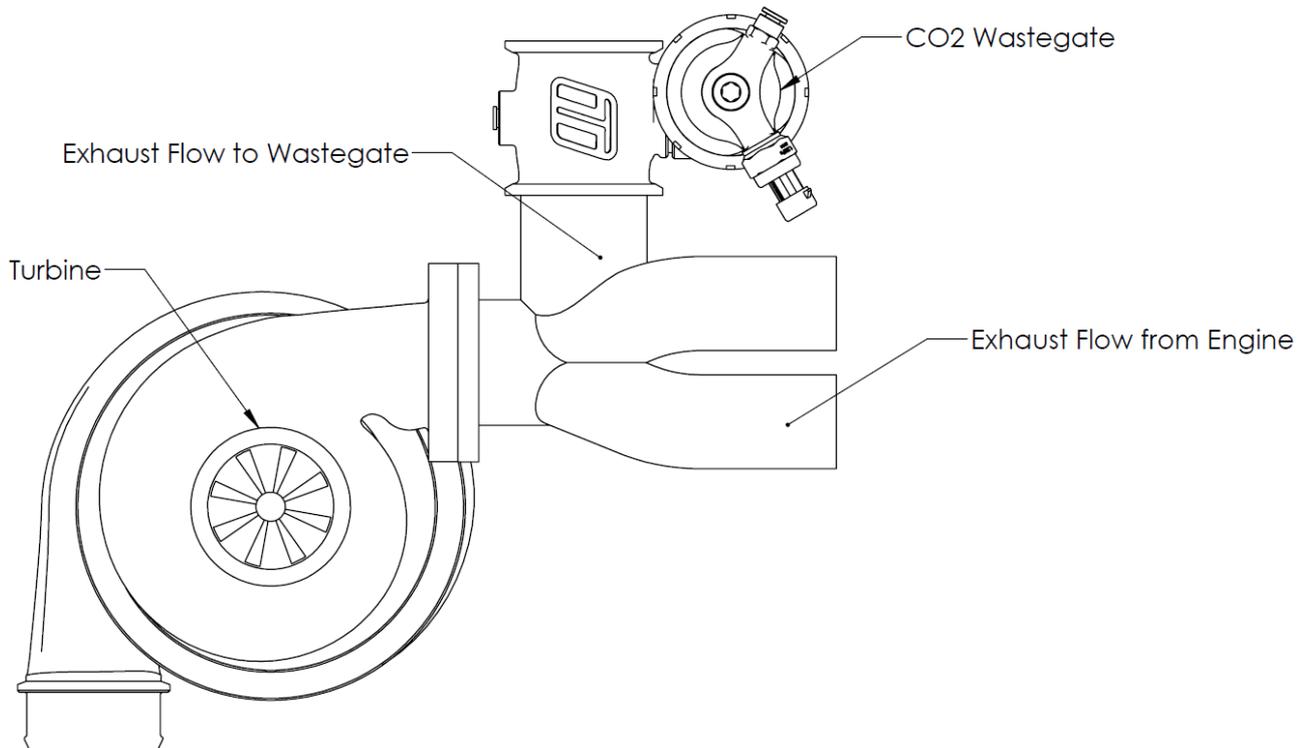
CAUTION! Do not place the actuator cap near a significant heat source as this could shorten the life of the diaphragm.



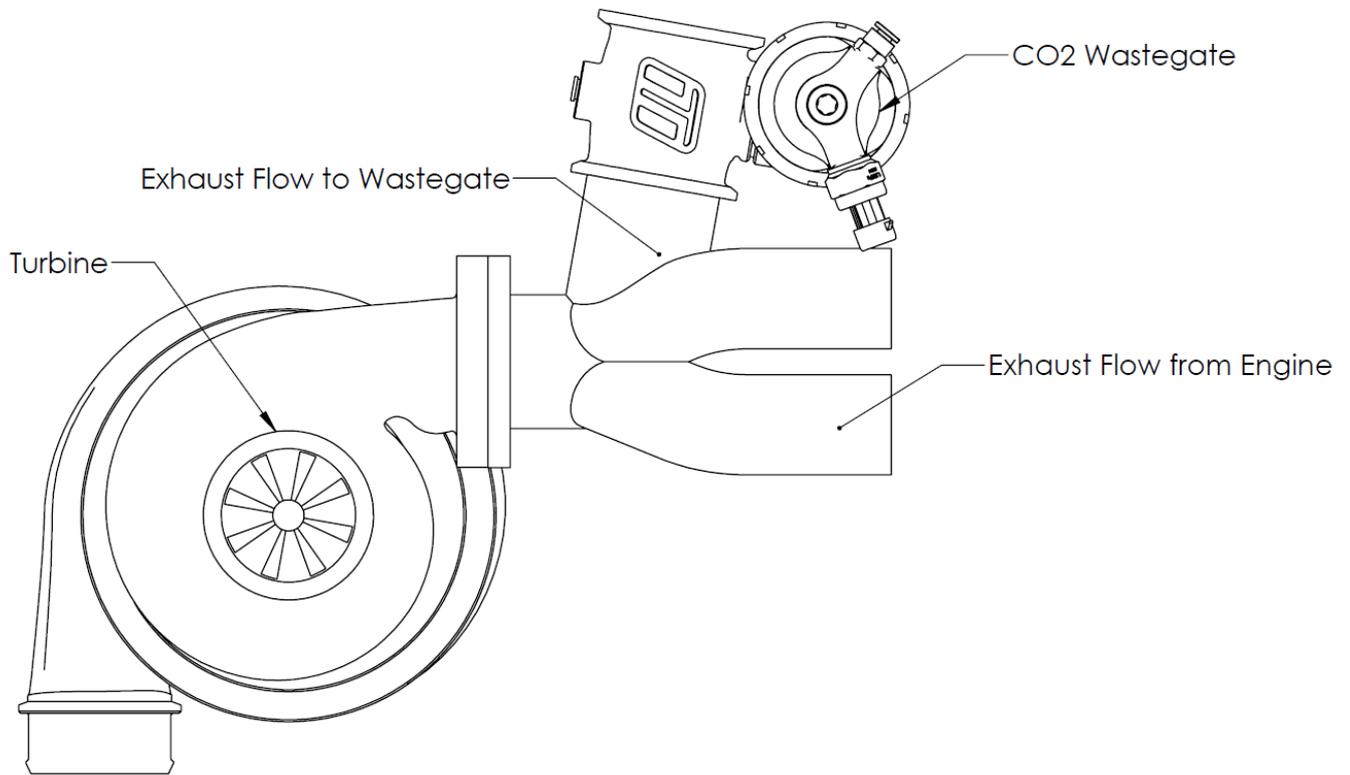
(Best Flow) Symmetric mounting allows an excellent flow of exhaust to the Straight Gate



(Good Flow) Angle mounting allows a good flow of exhaust flow to the Straight Gate.



(Poor Flow) 90 Degree mounting gives poor exhaust flow to the Straight Gate and in some circumstances may contribute to over boosting.



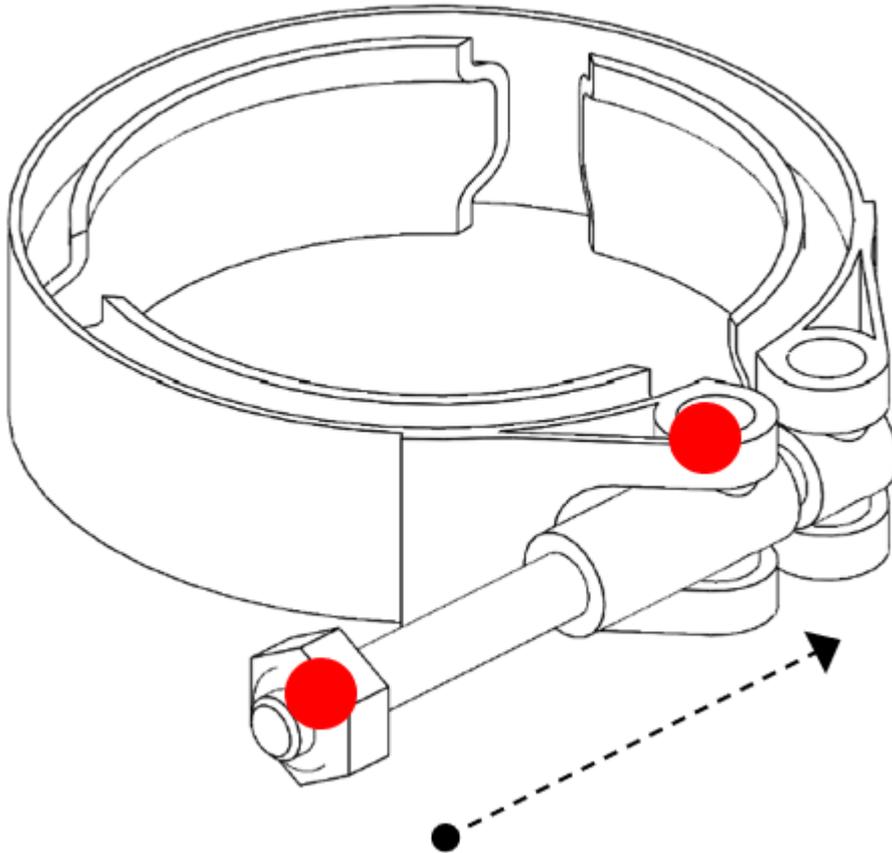
Not Recommended - Less than 90 Degree Mounting. An angle mounting as shown in not recommended and gives extremely poor exhaust flow to the Straight Gate which can contribute to poor boost control and over boosting.

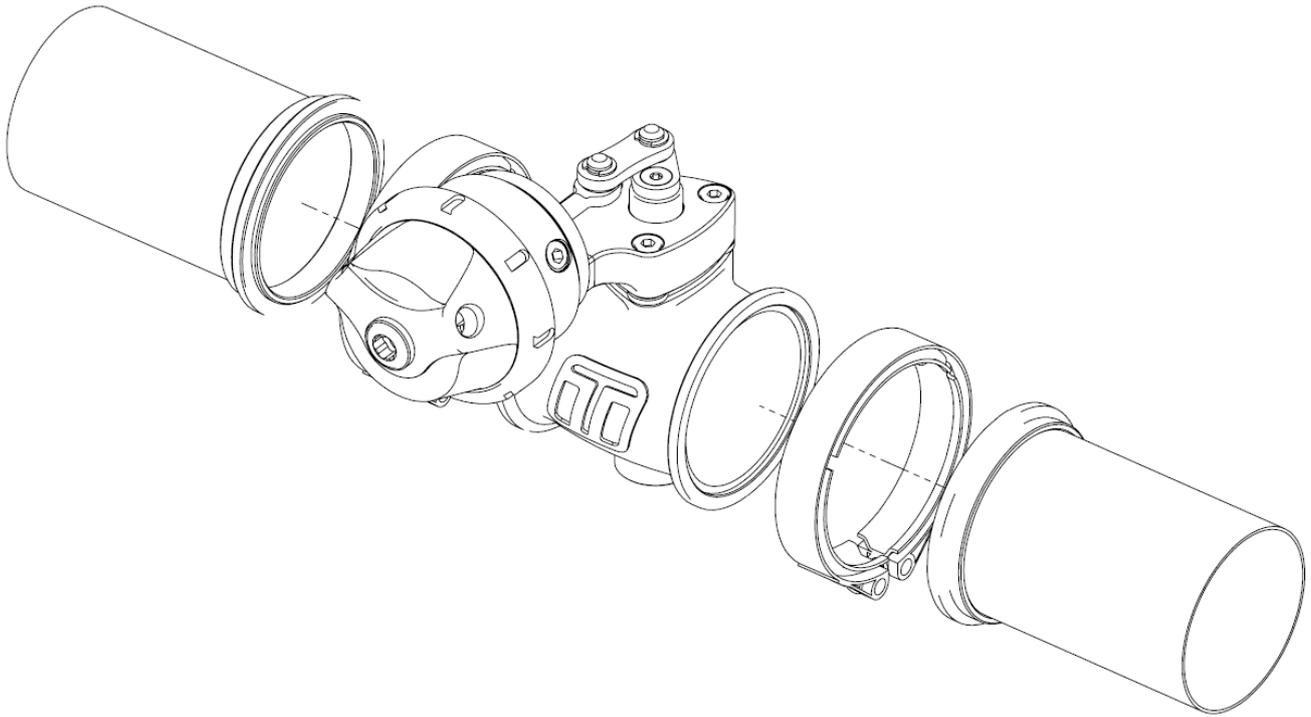
Fitting the Compressed Gas Straight gate

Prior to mounting the Straight Gate, place v-band over weld on flange by unscrewing the nut on the v-band as far out as possible and then squeezing the bolt in a syringe motion to expand the v-band (squeeze the dots

together below). Once the v-band is in its fully expanded position, slide the v-band over the flange to allow for the wastegate to be installed.

Using the 3/8" deep socket and a torque wrench Tighten the V-Band to 7N.m (5 ft/lbs). Ensure the wastegate is home correctly while torquing the nut to not have a false torque as this will likely contribute to exhaust leaks.





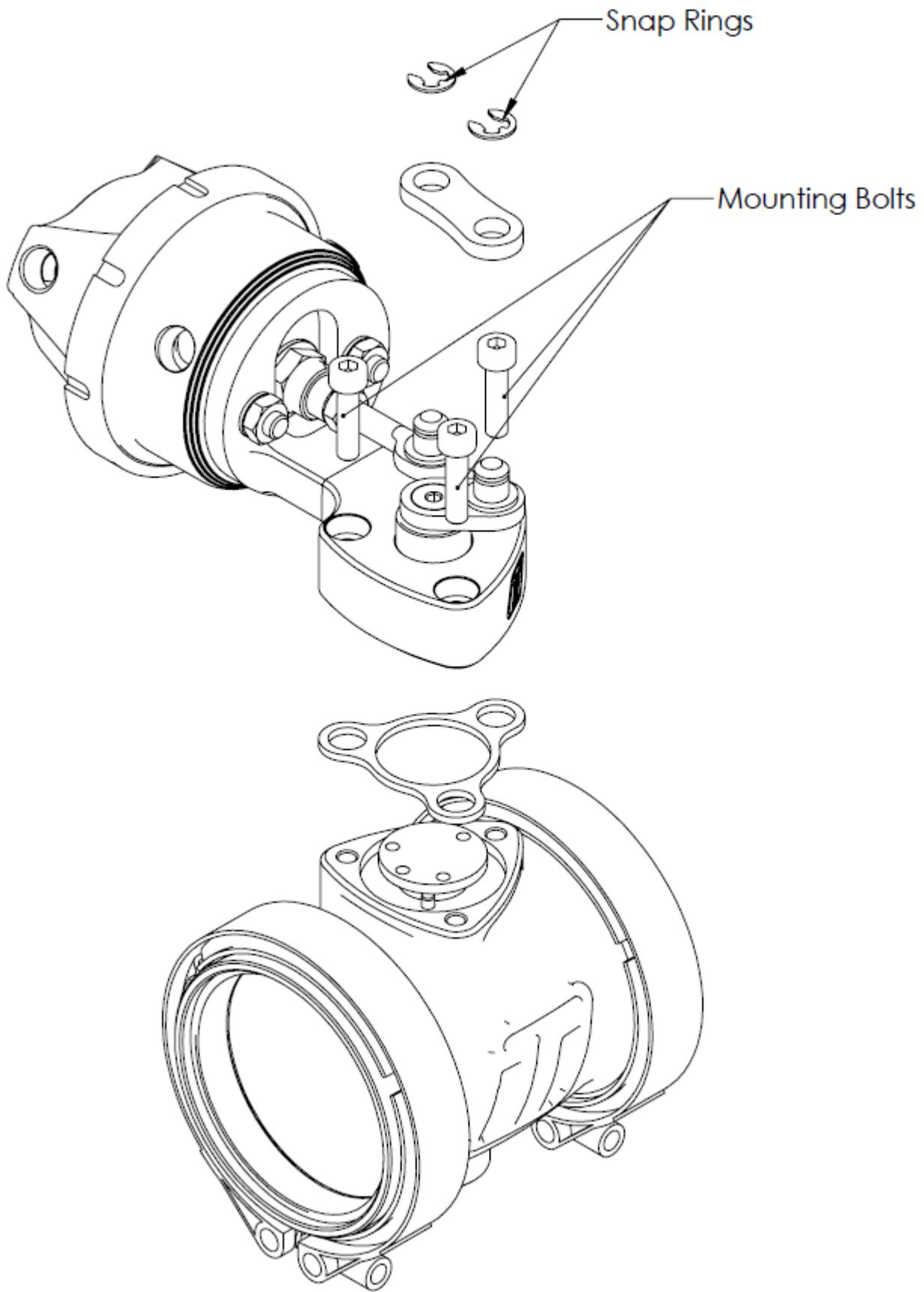
Fit Actuator Port Fittings

Fit lower chamber port fittings prior to mounting the wastegate, install 1/8" NPT blank with 3/16" hex key and signal nipple from boost pressure source into lower chamber ports. Port order or orientation is not important, select which suits your packaging requirements. Apply thread lubricant and screw in clockwise until finger tight, then tighten further 1-2 turns for seal. Congratulations, your straight gate is installed and ready for use. Double check all fittings, lines and mountings then proceed to start engine and check for leaks. See Compressed Gas Wastegate Hookup for further information on hookup.

NOTE! If you are unsure which port to install fittings into, please refer to 'Boost Control Hookup' section, refer to table of contents for page number. CAUTION! Do NOT insert fittings and blank into Top Ports unless advanced boost control methods are to be used as this can affect the performance of the product. See 'Boost Control Hookup'

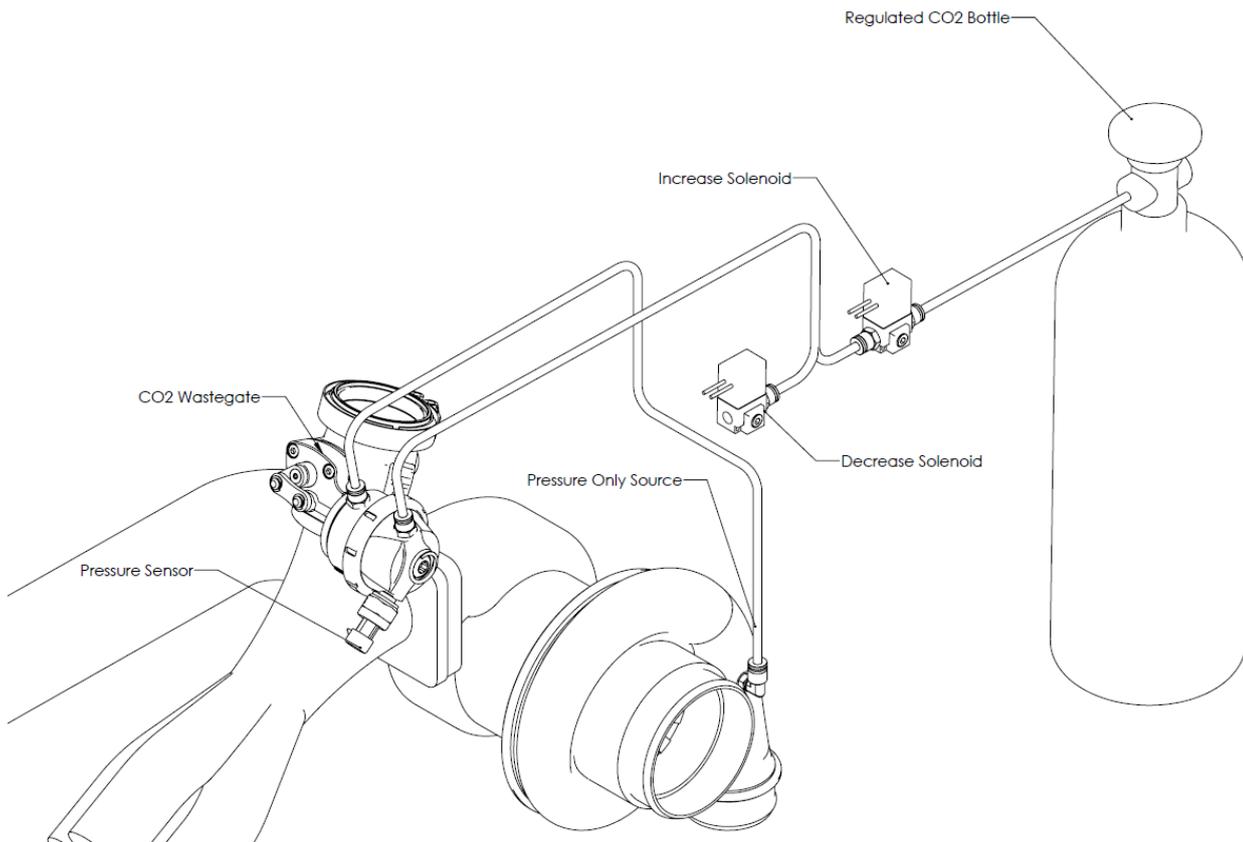
Clocking Actuator

The Actuator can be removed and rotated to three different orientations, each spaced 120 degrees apart. It is secured to the body using three M5 Allen bolts, which must be removed to adjust the orientation. Additionally, a snap ring may need to be removed - ensure this is done carefully to avoid losing the ring. Once the bolts and snap ring are removed, the actuator can be rotated to any of the three positions before reassembly.



Compressed Gas Wastegate Hook-Up

CAUTION! Do NOT source signal from the intake manifold as this is subject to vacuum and pressure losses across the system and could over-speed the turbocharger.



Integrated Solenoid Gas Setup

An Integrated Solenoid Cap is available as a CO2 option. Ports A and B are interchangeable, provided the port and its corresponding solenoid remain paired. For example, Port A must always be used with Solenoid A, and the same applies to Port B and Solenoid B.

Increase Solenoid

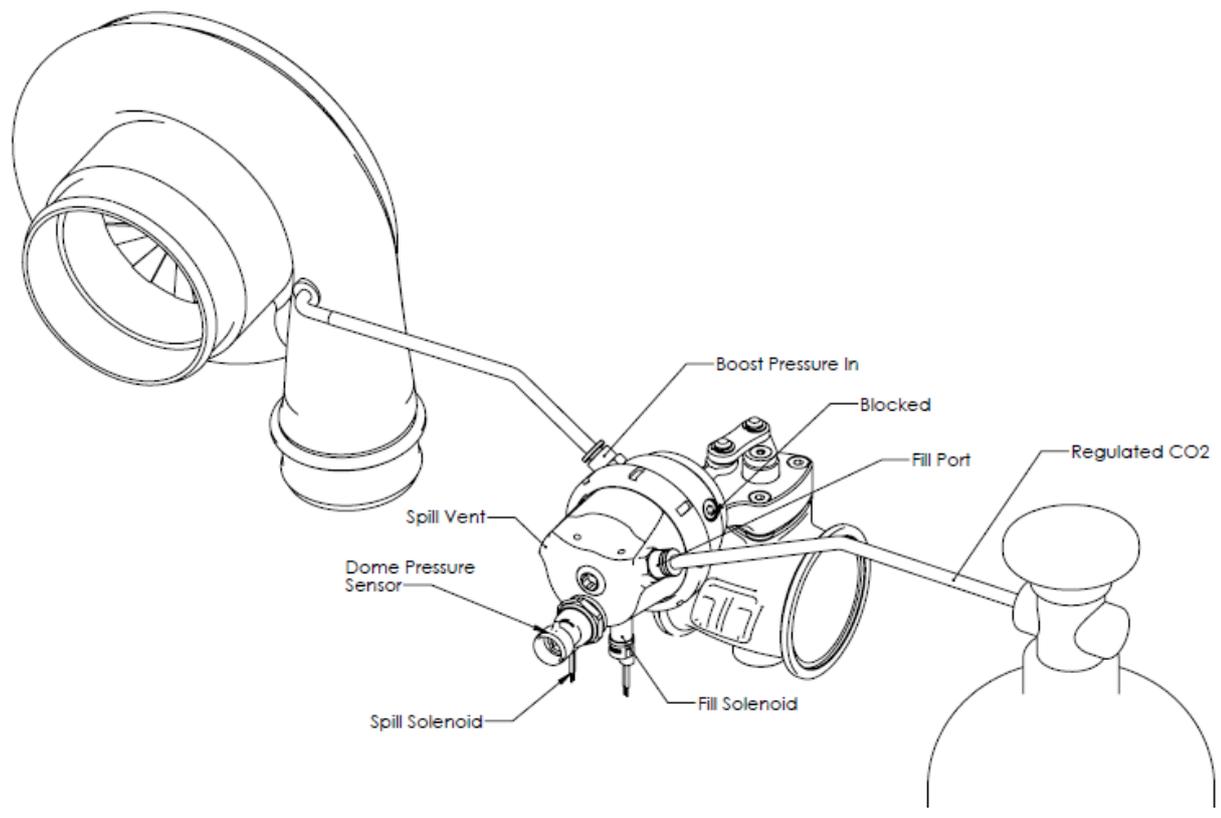
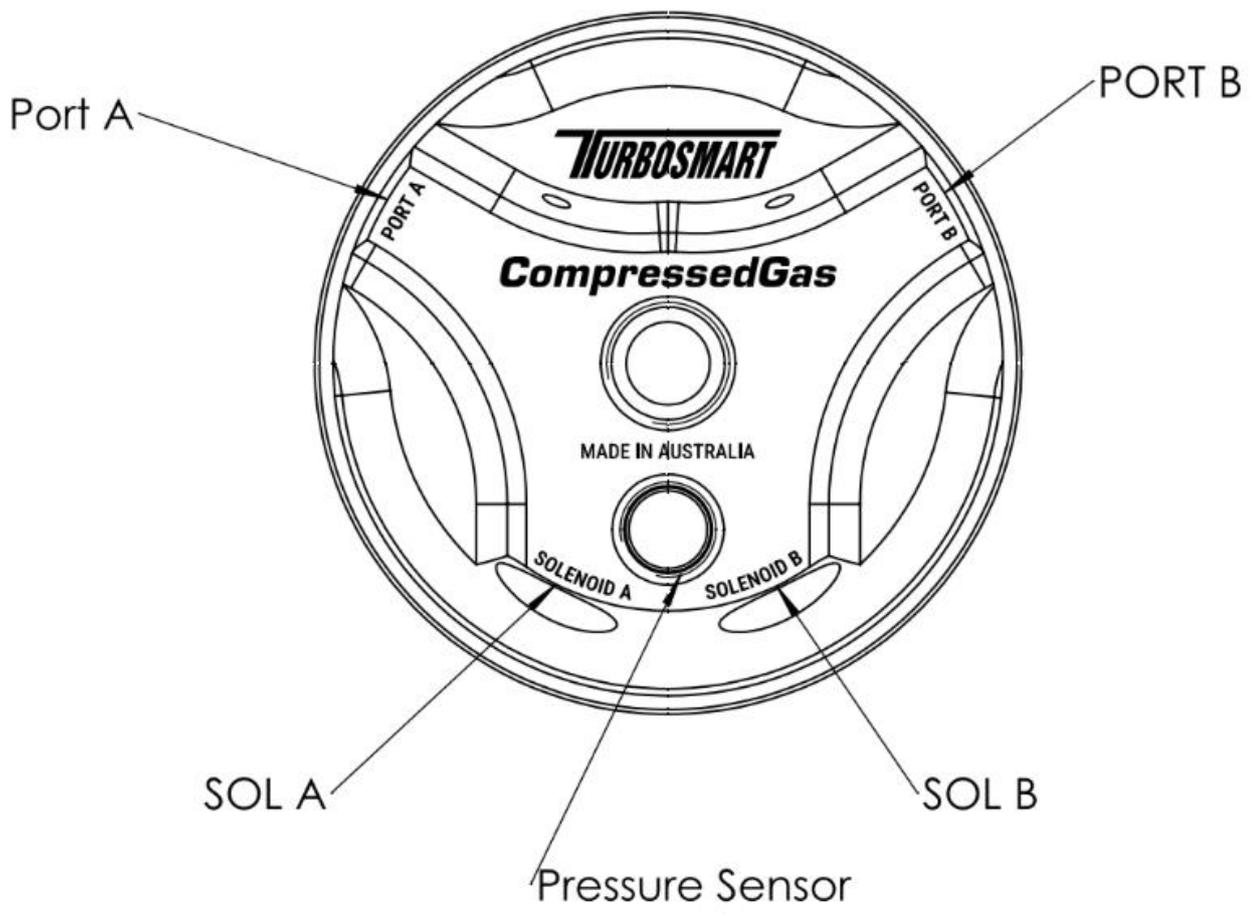
1. Port A (Regulated CO2 Supply)

2. Solenoid A

Decrease Solenoid

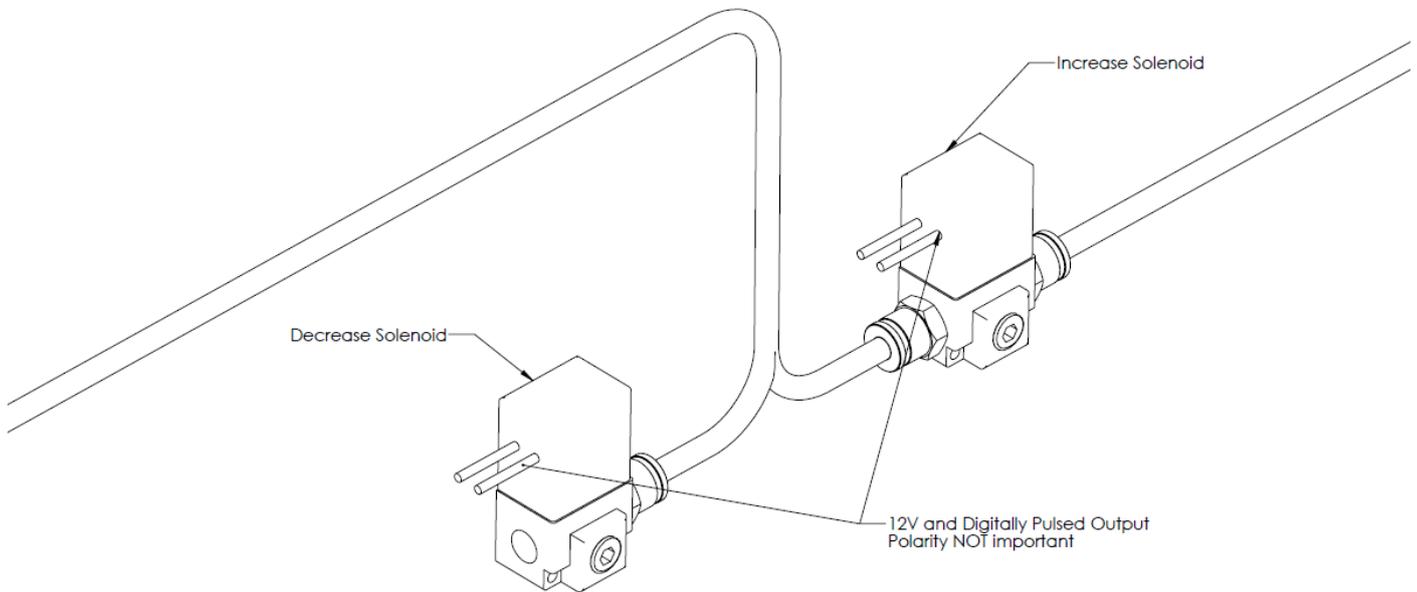
1. Port B (Vent to Atmosphere)

2. Solenoid B



Wiring Hookup

The solenoids require a 12V Supply as well as two digitally pulsed outputs from your ECU or Boost Controller. The 12V can be common and can be fused if required. The digitally pulsed output must be run two separate inputs in the ECU, ensuring that they are correctly labeled as the correct output before running. Polarity isn't important on the solenoid.



Start Engine and check for leaks.

Congratulations, your CO2 Straight Gate is installed and ready for use. Double check all fittings, lines and mountings then proceed to start engine and check for leaks.

HOW TO CHANGE YOUR COMPRESSED GAS SPRING

The compressed gas straight gate has a variety of springs to suit different boost levels. Turbosmart provides the compressed gas straight gate pre-installed with a 7psi spring. With your wastegate four springs will be provided, 3psi inner, 5psi inner, 7psi middle and 14psi outer. Different spring combinations may be required to suit different boost requirements and tuning.

Remove Compressed Gas Straight Gate from Manifold

Remove associated plumbing and electrical connectors from the straight gate. Unscrew outlet V-band nut in an anti-clockwise direction to the very end of the thread, squeeze the nut against the V-band in a syringe like

motion to expand the V-band over the flange. Repeat for inlet V-band. Remove straight gate.

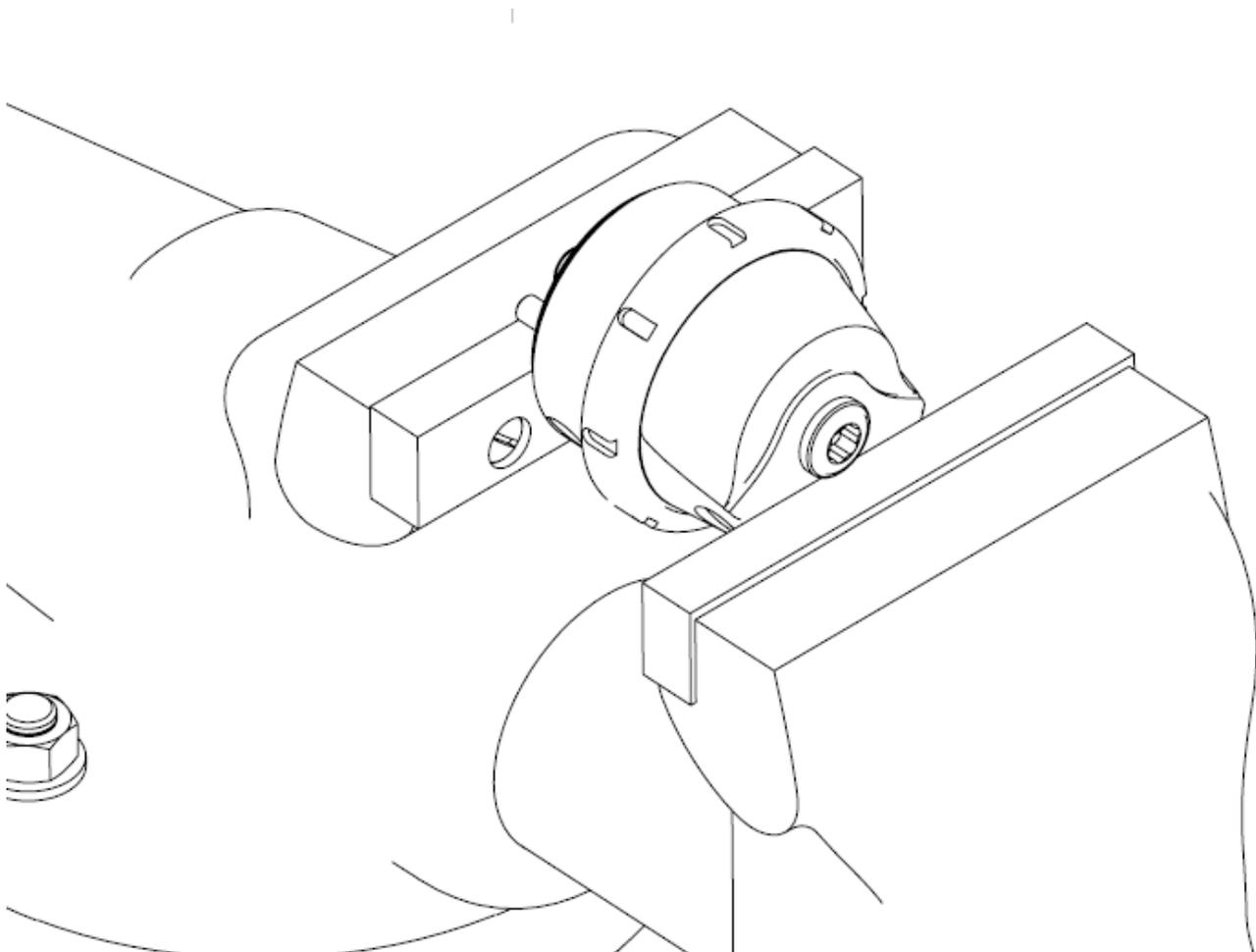
CAUTION! Allow engine to cool down before removing your compressed gas straight gate.

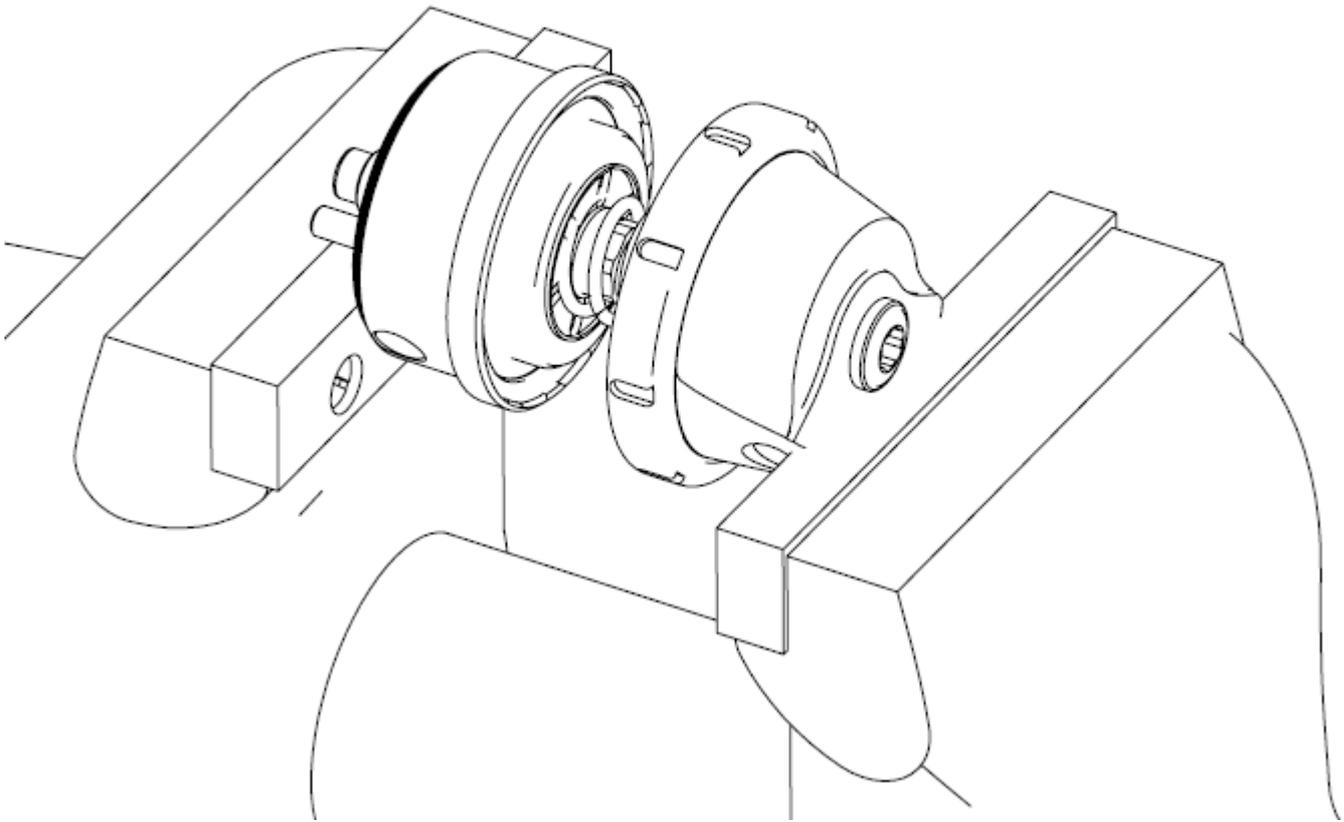
Remove Top Cap

Prior to removing the straight gate cap, remove all fittings from the 1/8" NPT ports. Press down with light to medium load on the cap in a press or vice. Unscrew locking collar with the large end of the provided collar tool in an anti-clockwise direction until completely disengaged and slowly remove tension from the press or vice allowing the spring to expand, finally remove cap when the spring has stopped expanding.

CAUTION! Use soft jaws to prevent cosmetic damage

Configure wastegate with preferred spring combination of inner, middle and outer springs

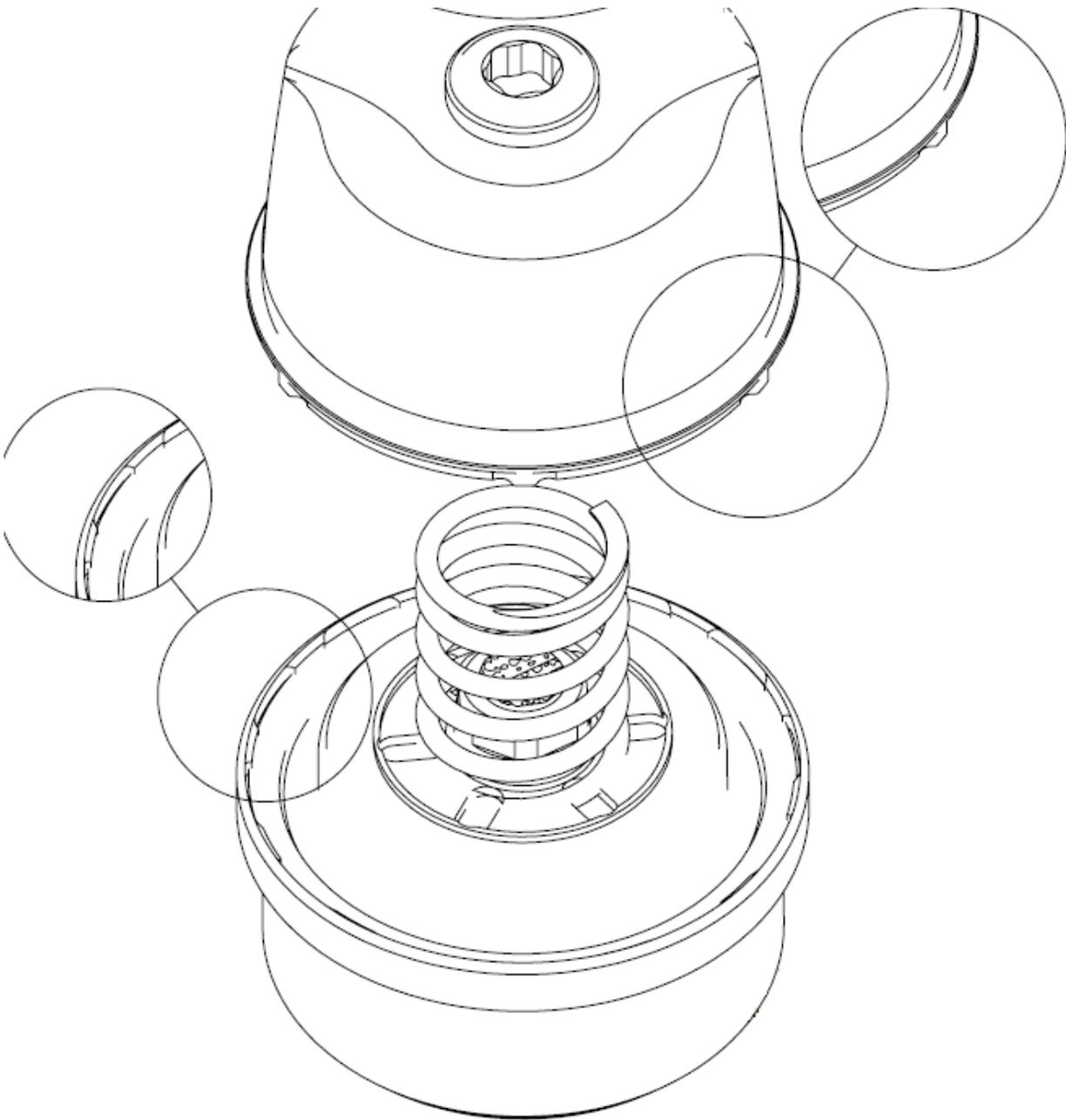




Familiarise Yourself with Cap and Body Notches

Locate cap and body notches and grooves which dictate the alignment of the cap. These notches are used to locate the cap onto the body and must be aligned prior to compression of the cap onto the body.

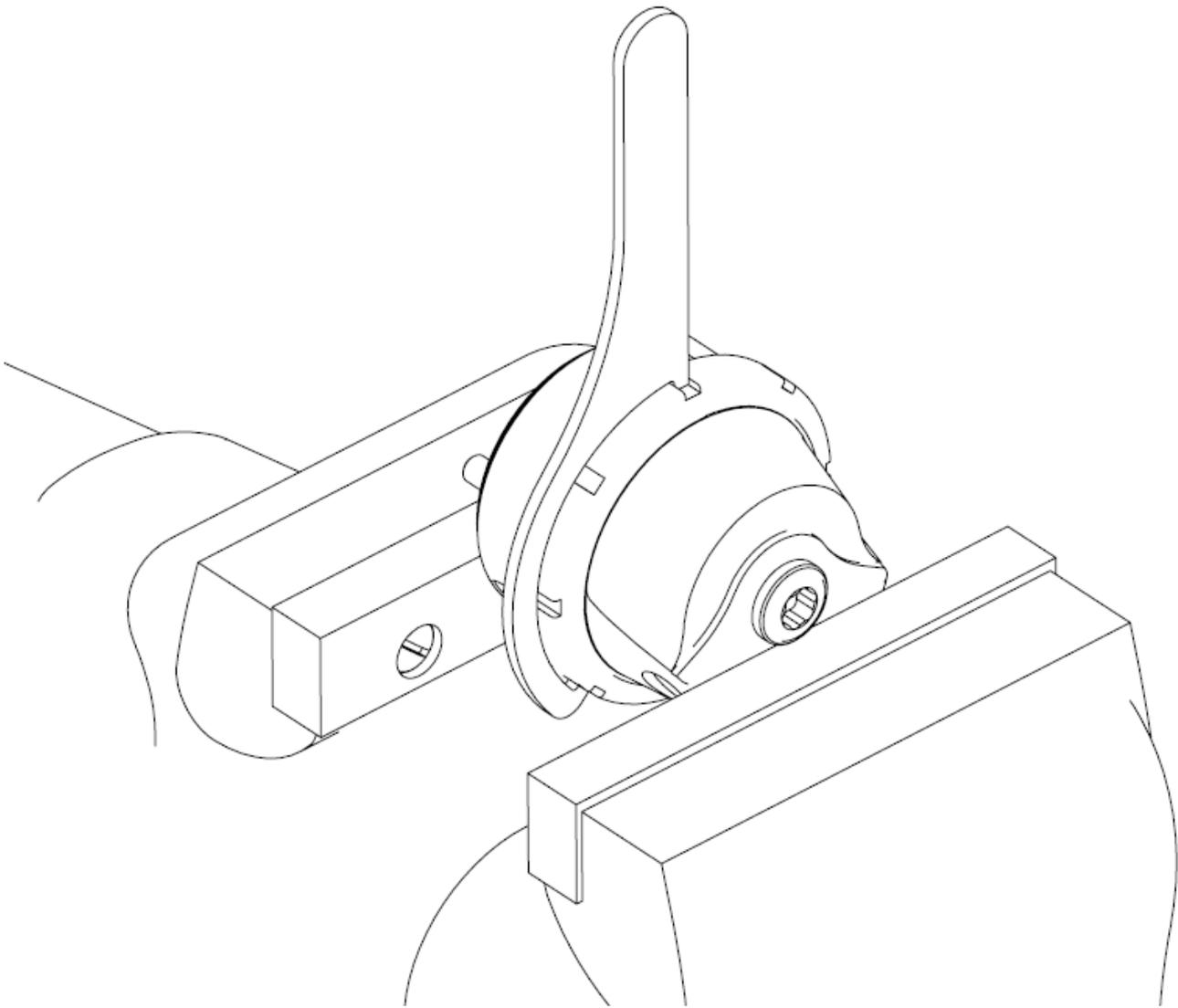
CAUTION! Ensure notches are aligned and seated home correctly prior to exerting force to tighten collar, permanent damage will occur if these are not aligned correctly.



Press Cap onto Body

Using a press or vice, comp the notches are remaining aligned. Once the cap has seated home onto the body, screw the collar down by hand in a clockwise direction. While still in the press or vice, Tighten the collar further with the collar tool until the collar will not turn.

CAUTION! Maintain downward pressure on cap while tightening collar or non-repairable thread damage will occur.



Reinstall fittings to the cap of the wastegate using fresh Loctite 567 thread sealant.

Reinstall Compressed Gas Straight Gate

Place V-band over weld on flange by unscrewing the nut on the V-band as far out as possible and then squeezing the bolt in a syringe motion to expand the V-band. Once the V-band is in its fully expanded position, slide the v-band over the flange to allow for the wastegate to be installed.

Do not forget to put the valve seat into the body before mounting the unit on the exhaust manifold. Using the 3/8" deep socket and a torque wrench tighten the V-Band to **7N.m (5 ft/lbs)**.

Achieving Your Target Boost Pressure

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

1. The size of the spring fitted in your wastegate i.e. the boost pressure achieved by the wastegate spring only.
2. The desired level of boost pressure and the difference between this and your wastegate spring pressure.
3. The size of your turbocharger and wastegate and the resulting exhaust manifold back pressure in your system.
4. The amount of dome pressure that is fed into the top cap.

IMPORTANT NOTES ON SETTING THE WASTEGATE SPRING PRESSURE

A stiffer spring should only be used when necessary. The Compressed Gas Straight Gate different combinations of spring pressures. All springs that are adaptable with the GenV IWG (These are the same springs) are shown in the table below. The tuner can use combinations of up to 3 springs to achieve the following base boost pressures. To aid in the identification of these springs they are supplied colour coded. The springs chosen should be rated to the lowest boost level desired.

Location	Inner	Inner	Middle	Outer
Pressure	6psi	9psi	12psi	21psi
Colour	Black	Grey	Pink	Red
6psi	●			
9psi		●		
12psi			●	
18psi	●		●	
21psi				●

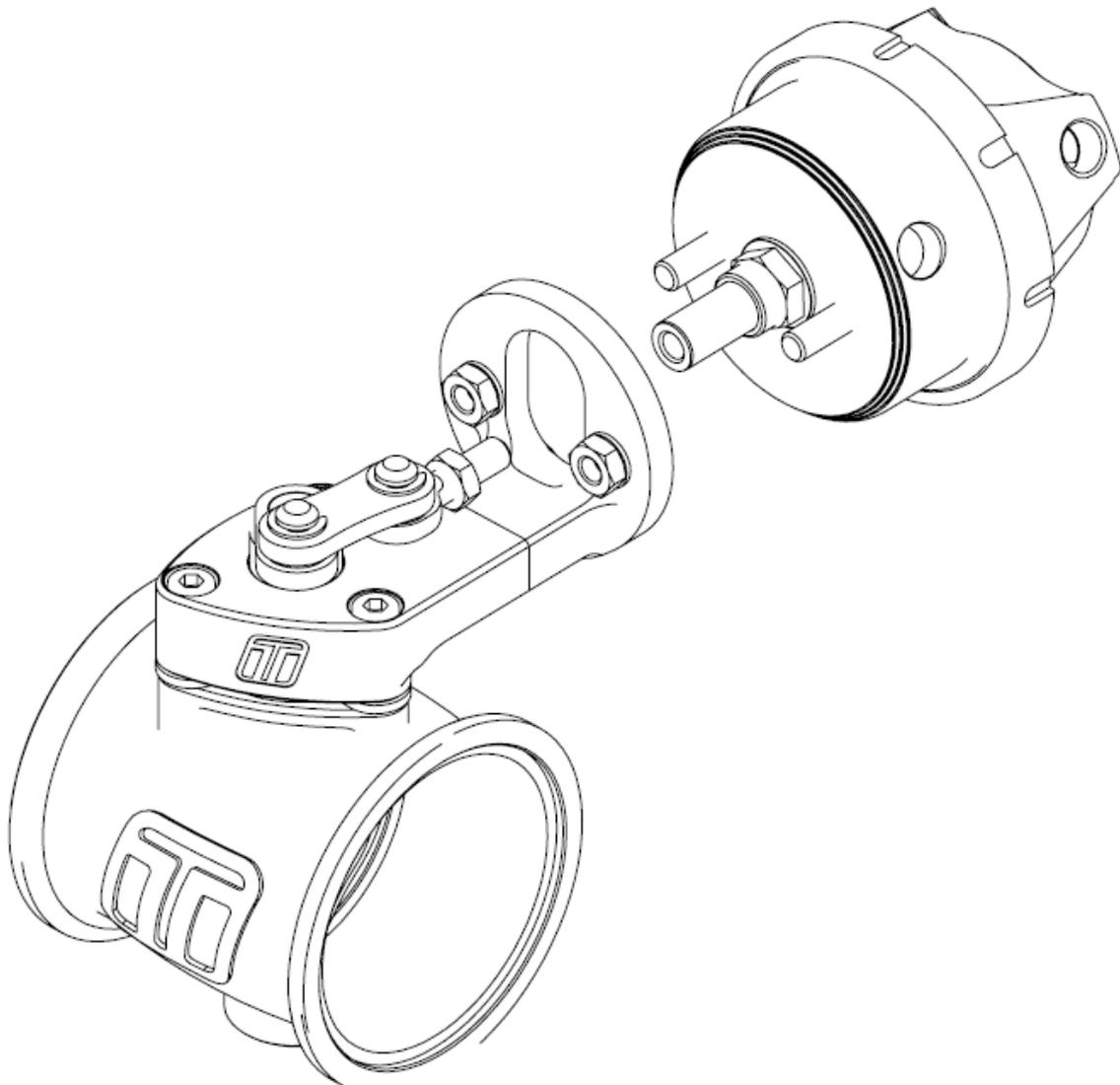
How to Change Your Straight Gate Wastegate Diaphragm

Remove Actuator from Body

Remove fittings from the wastegate as well as the breather hose if fitted. Unscrew outlet V-Band nut in a anti-clockwise direction to the very end of the thread, Squeeze the nut against the V-Band in a syringe like motion to expand the V-band over the flange. Repeat for inlet V-Band. Remove straight gate. Mark the orientation of the

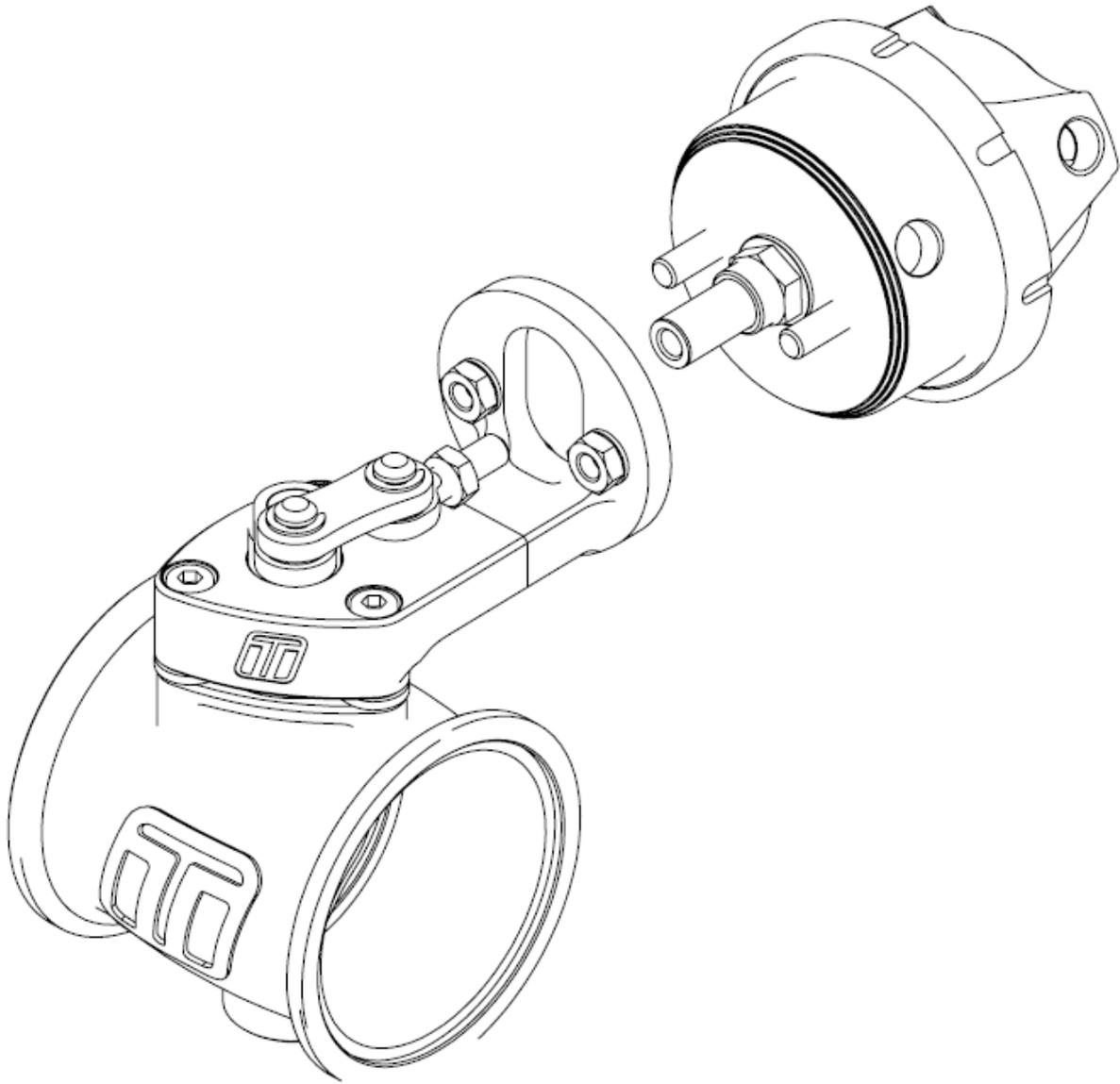
valve to the body with tape or a paint pen.

CAUTION! Allow engine to cool down before removing your straight gate.

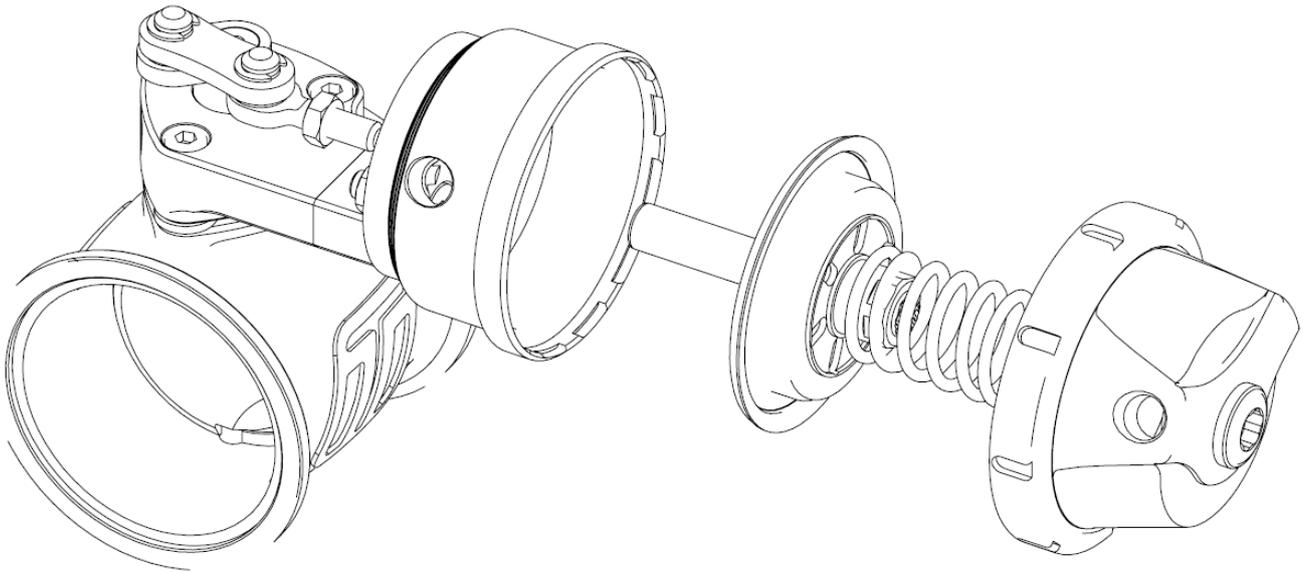


Diaphragm Replacement

The actuator must be removed for ease of disassembly of the diaphragm replacement. The once removed the top cap can come off and the diaphragm can be swapped out.

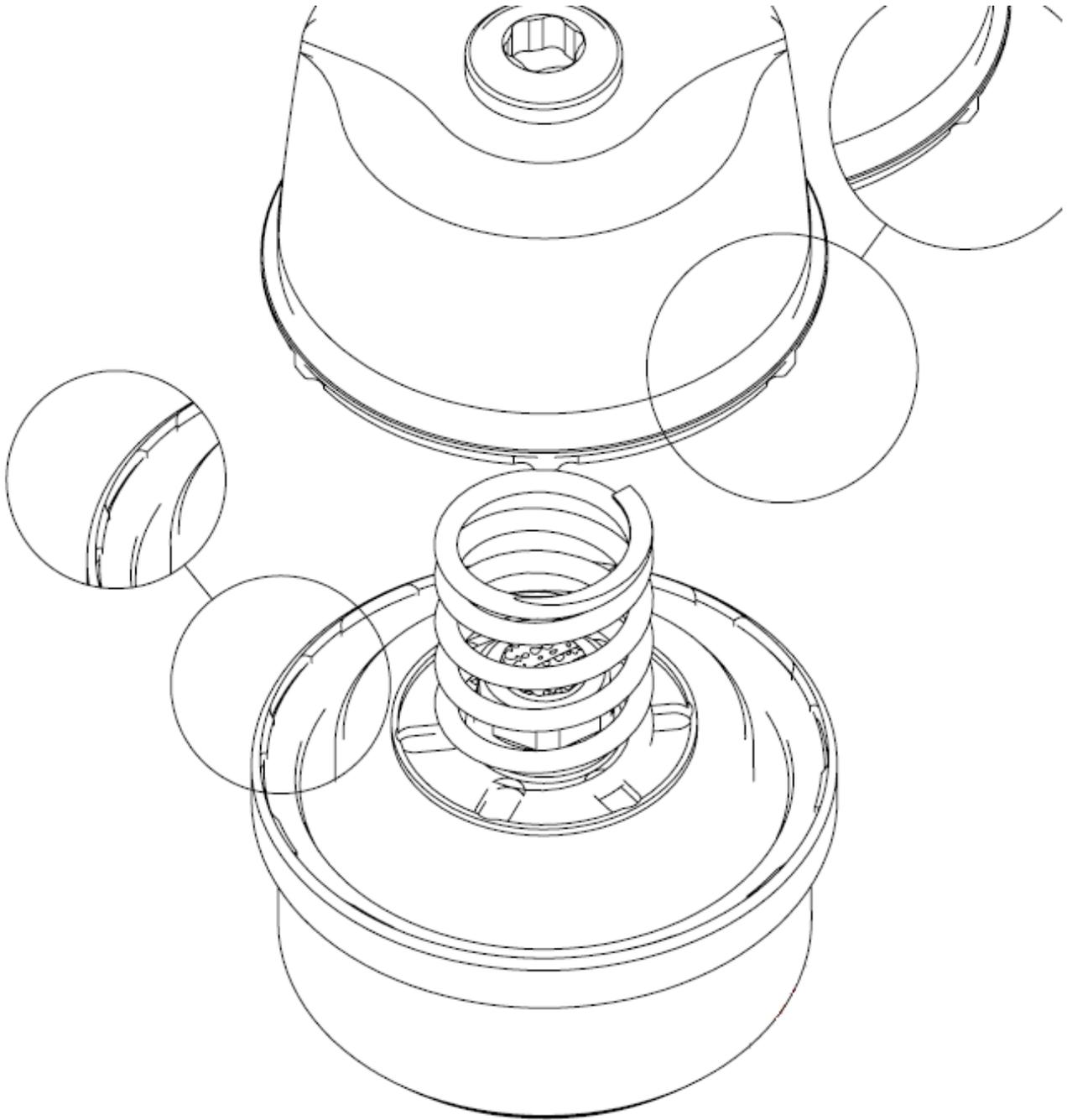


Align the valve orientation marks and confirm the diaphragm bead is seated in the groove of the actuator. Install desired spring combination. Configure Wastegate with preferred spring combination of inner, middle and outer springs.



Familiarise Yourself with Cap and Body Notches

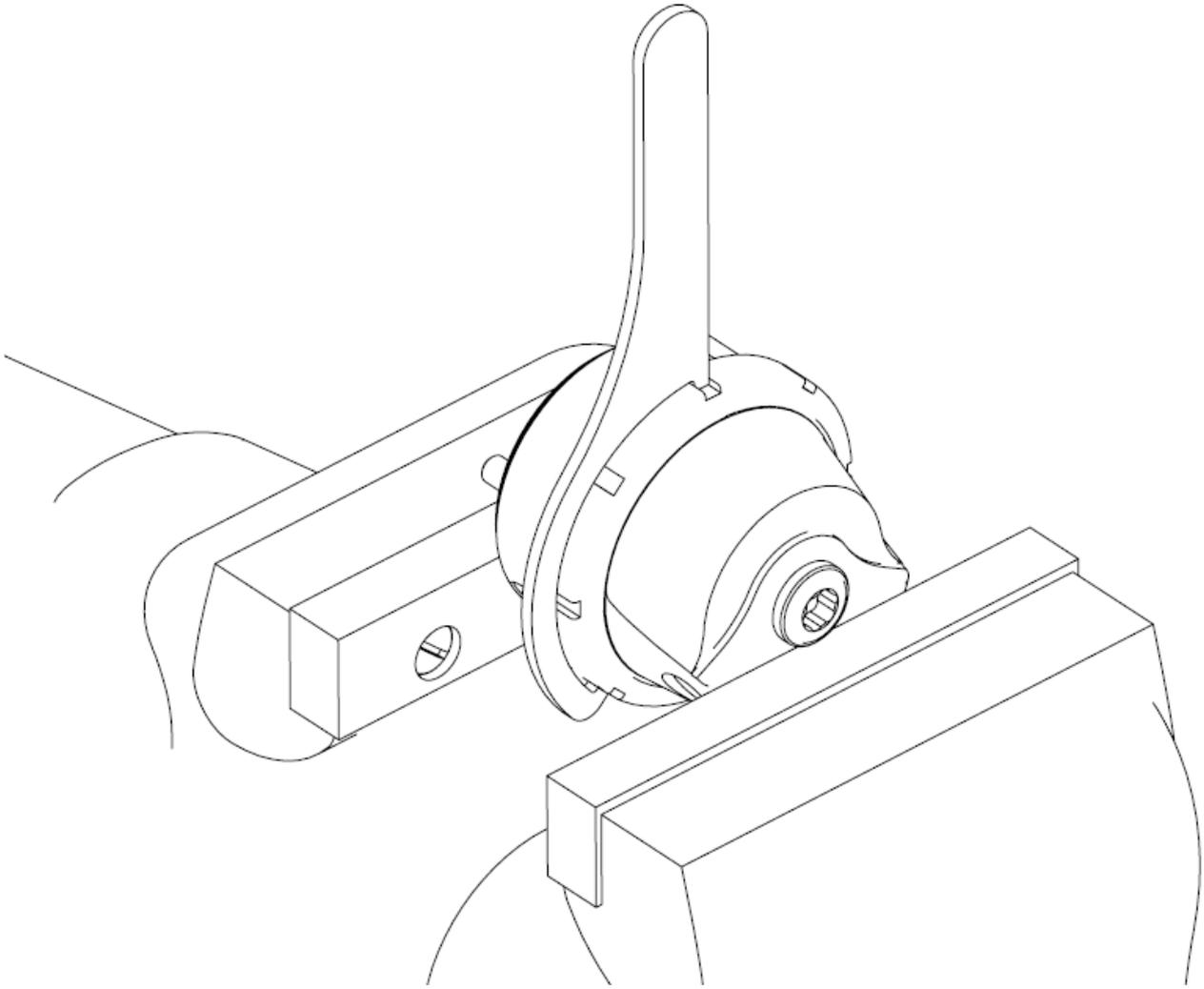
Locate cap and body notches and grooves which dictate the alignment of the cap. These notches are used to locate the cap onto the body and must be aligned prior to compression of the cap onto the body.



CAUTION! Ensure notches are aligned and seated home correctly prior to exerting force to tighten collar, permanent damage will occur if these are not aligned correctly.

Press cap onto body

Using a press or vice, compress the cap onto the body ensuring the notches are remaining aligned. Once the cap has seated home onto the bod, screw the collar down by hand in a clockwise direction. While still in the press or vice, Tighten the collar further with the collar tool until the collar will not turn.



CAUTION! Maintain downward pressure on cap while tightening collar or non-repairable thread damage will occur.

Reinstall fittings to the cap of the wastegate using fresh sealant.

Reinstall straight gate

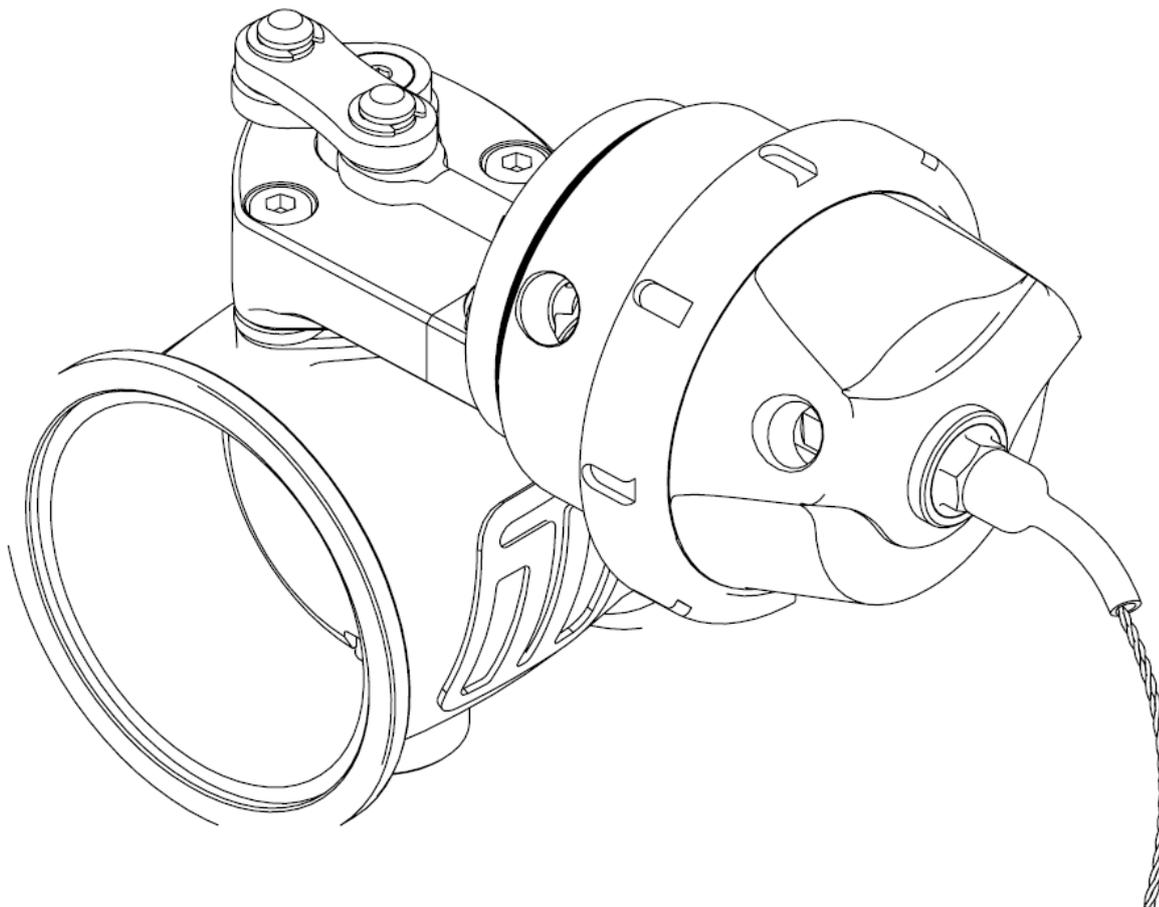
Place v-band over weld on flange by unscrewing the nut on the v-band as far out as possible and then squeezing the bolt in a syringe motion to expand the v-band (squeeze the dots together below). Once the v-band is in its fully expanded position, slide the v-band over the flange to allow for the wastegate to be installed. Do not forget to put the valve seat into the body before mounting the unit on the exhaust manifold. Using the 3/8" deep socket and a torque wrench Tighten the V-Band to 7N.m (5 ft/lbs).

HOW TO INSTALL A SENSOR CAP TO YOUR COMPRESSED GAS STRAIGHTGATE

Remove Blanking Cap

The compressed gas straight gate comes with a pre-installed magnet on the diaphragm, essential for HE sensor operation. To install the sensor (sold separately), simply remove the top blanking plate and fit the HE sensor in its place. Calibration may be required depending on your system.

CAUTION! Allow engine to cool down before fitting sensor cap



Wire	Note	Rating
Red	Sensor Supply (V_{sup})	4.5-5.5 V _{dc}
Black	Sensor Ground (V_0)	0V
White	Sensor Output (V_{out})	0-V _{supply}

Connect the wires to your data logger accordingly. Use a high-quality connection to reduce noise and calibration fluctuation.

CAUTION! Ensure that the wiring is properly shielded from external heat sources.

To ensure longevity from the sensor, ensure adequate airflow is supplied directly to the sensor to avoid overheating or sensor failure.

Turbosmart HE sensor has an operation temperature window of -40C up to 170°C (340°F) junction temperature, for temperatures outside of this window the V_{OUT} will revert to less than 2.5V

Temperature exposure above 260°C (500°F) can cause permanent damage to the sensor.

Calibration*

Insert the relevant calibration curve into your data logger for the Compressed Gas Straight Gate

Magnetic interference from solenoid activation may produce a small offset in position

Rod Travel (mm)	Voltage Out
0	0.44
2	1.21
4	1.58
6	1.84
8	2.00
10	2.13
12	2.21
14	2.27
16	2.32
18	2.36

***NOTE!** For best results, each wastegate should be calibrated to your setup.

Troubleshooting

- Wastegate not actuating - Confirm signal hose is plumbed to a pressure only source, confirm preload on valve seat during installation
- Poor wastegate actuation - Ensure signal hose is not shared and is sourced as close to the compressor as possible, check seal on fittings
- Poor wastegate actuation - Confirm Top ports are not blocked and free from debris
- Boost creeping at high rpm - Wastegate flow path is poor, wastegate is too small for the application
- Failing the above, submit a [Technical Request Form](#) with information about your engine, oil type and photos of the installation and one of our expert technicians will respond as soon as possible.

