GIZZMO

V4

BOOST CONTROLLER

Thank you for purchasing the Gizzmo V4 Boost Controller. This manual contains operating instructions and installation procedures that are needed for the fitment and operation of this product

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Instruction Manual

V1.12 Aug 2021

GIZZMO ELECTRONICS

GIZZMO
V4 Controller

THE V4 IS AN INFORMATIVE COMPETITION GRADE BOOST CONTROLLER WITH EVERYDAY FUNCTIONALITY. TAKING WHAT WE KNOW FROM A OVER A DECADE OF DEVELOPMENT, AND FROM LISTENING TO WHAT YOU, THE END USERS WANT, WE CONTINUALLY STRIVE TO GIVE YOU WHAT YOU NEED.

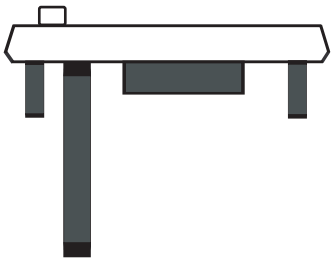
V4 CHANGES:

- OLED DISPLAY
- 50% SIZE REDUCTION
- 40% WEIGHT REDUCTION
- 3 BUTTON NAVIGATION FOR EASE OF USE

FASTER: 32MHZ 16bit PROCESSOR. USING THE LATEST PROCESSOR TECHNOLOGY MEANS THAT THIS UNIT WILL NEVER BE WANTING FOR MORE PROCESSING POWER! THIS MEANS YOU WILL ALWAYS HAVE THE BEST, MOST ACCURATE BOOST CONTROL

EASE OF USE: SOMETIMES YOU JUST WANT TO KNOW WHAT THE UNIT IS DOING... NOW YOU CAN! WE HAVE ENABLED THE DISPLAY TO SHOW NOT ONLY THE CONVENTIONAL BOOST BUT HAVE ALSO ADDED THE ABILITY TO SEE DUTY OR RPM DUTY OFFSET

What's New in the V4



New Tiny Sizing
50% smaller so you can fit it anywhere, it is easily the worlds smallest boost controller ever.

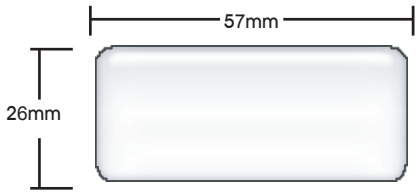
OLED display
Gizzmo's V4 houses a 128 by 64 OLED display so now the menu's are less cryptic and all of your options can be seen at once

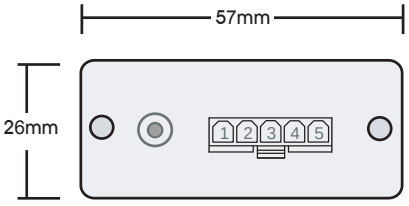
3 buttons
Gizzmo's V4 has added a button to make navigation a lot easier. this V4 is all about user convienience

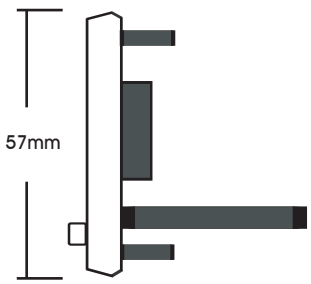
Functions/Specifications

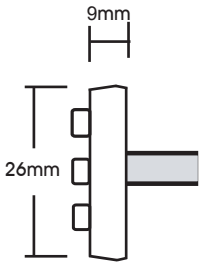
Number of boost memories	6 with individual gain settings
Maximum boost	50psi (3.5bar)
Processing Power	32mhz 16bitRISC
Active Over Boost	5psi to 50psi
Boost Control	Closed with adjustable start
V4 size	9mm * 57mm * 26mm 11.8V
Operating Voltage (v)	- 18V
Operating Current	Less than 0.5A
Battery Protection	Yes
Overcharging Protection	Yes
Display	White graphical OLED
Pressure display options	KPA, PSI, BAR
Wastegate Compatibility	Internal and External
Solenoid	High Performance Single

V4 Specifications









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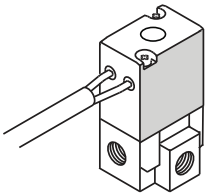
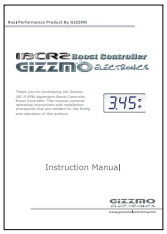
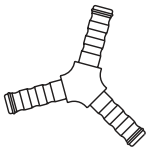
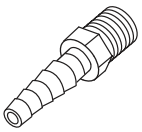
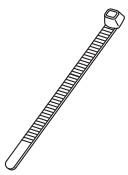
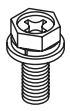
V4 Parts List

 V4 Module x1	 Solenoid Valve x1	 Instruction Manual x1
 IBCR2 Harness x1	 1mx5mm Nitrile Tubing x1	 1.2mx2.8mm Vacuum Tubing x1

 5mm ‘Y’ Piece Connector x1	 3mm ‘Y’ Piece Connector x1	 Tail 5mm x2	Bracket and Accessories 4 X screws 1 X stand off 2 X brackets
 Cable Tie x8	 3mm Flat Washer x2	 3mm Nut x2	 3mm Bolt x2

Warning/Caution

Always connect the wiring exactly as described in the instruction manual.

Disconnect the negative terminal of the battery before proceeding with installation.

Do not drop or expose this unit to excessive shock.

Installation should only be performed by an experienced automotive electrician.

Keep this unit away from moisture.

Never disassemble, modify, or tamper with this unit.

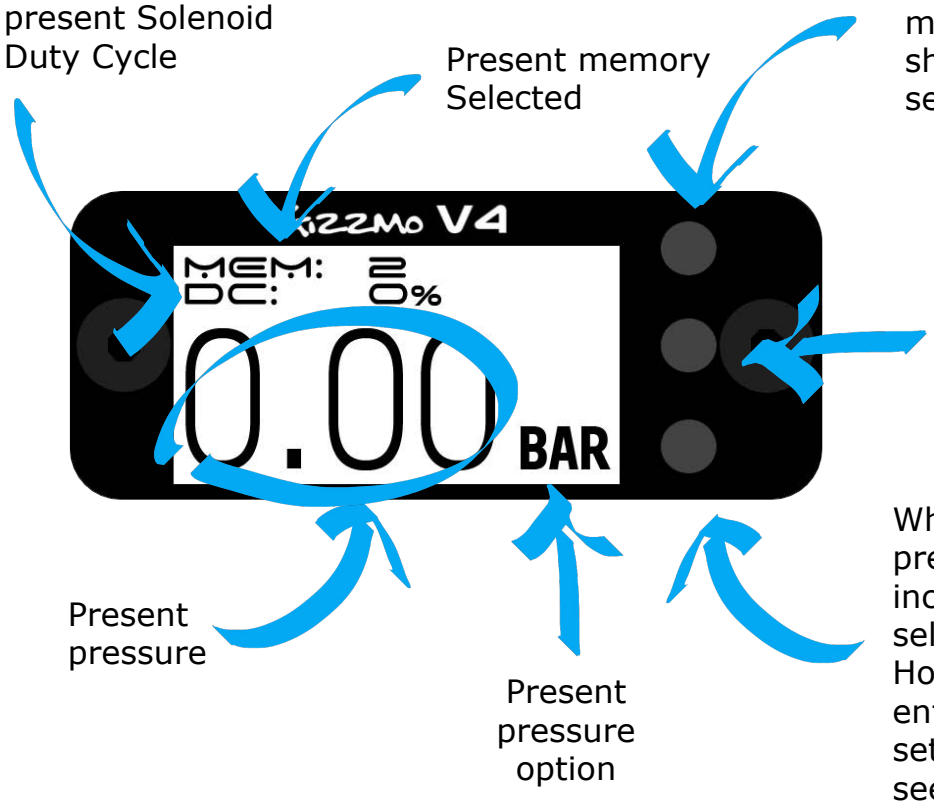
Never operate this unit while driving.

Securely mount this unit away from any area that may effect driving.

This unit is only designed for 12V DC type vehicles with a negative ground supply.

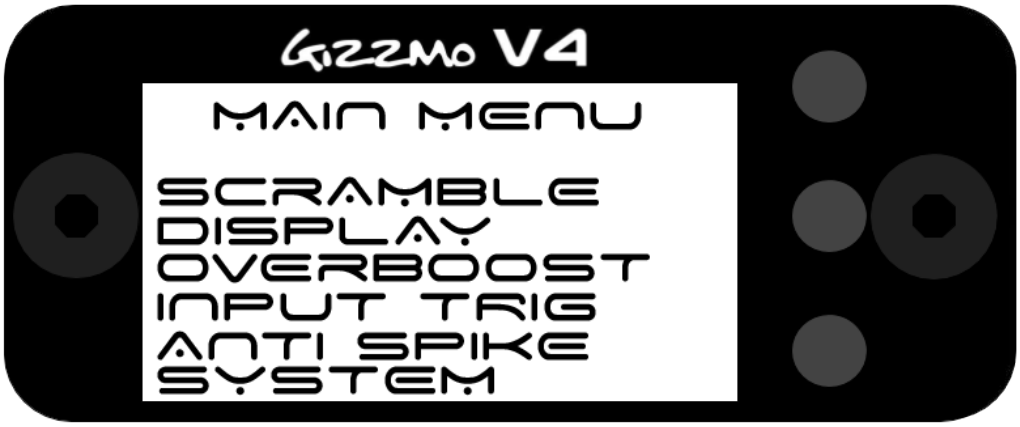
Operating Instructions

Running Display



Setup Menu Overview

To enter the menu screen below simply press the ENTER (middle) button once



Scramble: *Scramble is to add additional boost (via duty) for a set amount of time. Entering this option allows you to set how much duty and how much time to add it for.*

Display: *This option allows you to select if you want your boost settings and display in bar, psi or kpa*

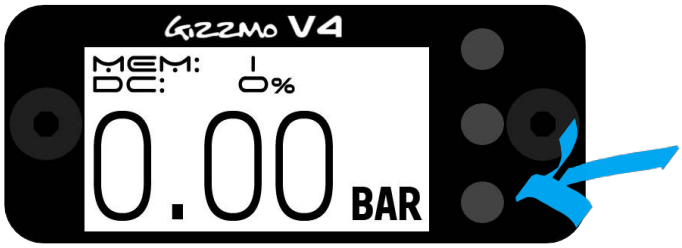
Overboost: *This option allows you to set a boost level at which the V4 will display a warning and cut boost in the event of a over boosting fault, this option also allows you to switch this feature off.*

Input Trig: *This is where you go to set up what you want to use the external trigger input wire for, if anything. The 4 options are scramble (as explained above), memory change which is where it increments to the next memory setting e.g. 1>2>3... , boost cut where it'll cut to minimum boost if this wire is switched to earth and lastely off in the case of you not wanting to use this wire.*

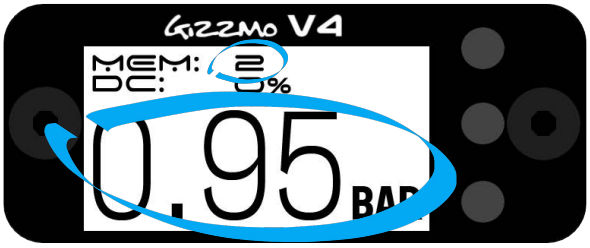
Anti Spike: *This is to set a percentage which is proportional to the recovery time to ramp up boost in throtle off on situations like gear changes. This is often used to compensate for an inadequate wastegate*

System: *This takes you into a menu to adjust the V4's controller functions including Hard resets, solenoid check disabling and MAP sensor calibration.*

To Change Boost Memories



To select the next memory simply press the DOWN button once



The MEM: display will increment and the pressure display will show the target pressure for your new memory selected

Then the running display will return to the real time pressure

Solenoid Check

I the event of a solenoid or solenoid loom fault, the sol flt indication will come up on the running screen

Units of Pressure

Press ENTER Once

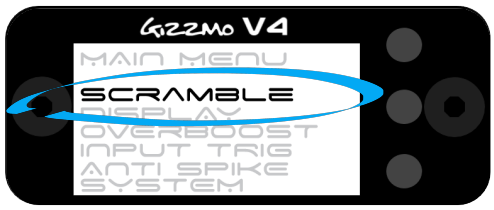
Press DOWN once and then ENTER once to select 'Display'

Use UP and DOWN to hightlight your option and then Enter to save your selection

Caution: All readings in this Manual are in BAR unless otherwise stated.

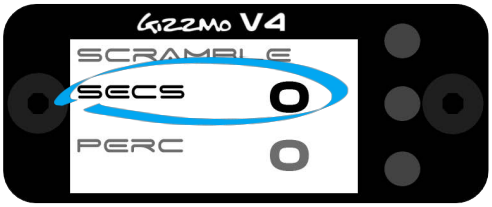
Scramble Setup

Press ENTER once to access menu screen

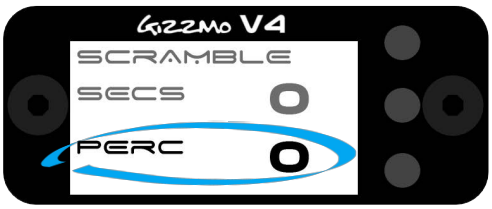


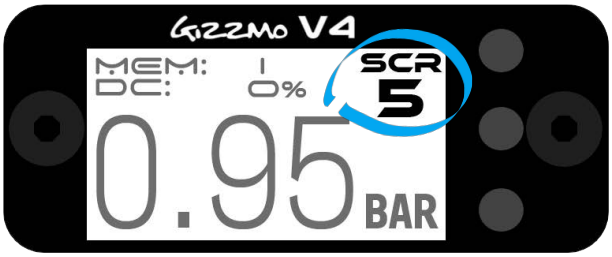
Press ENTER again to access Scramble setup

Use the UP and DOWN buttons to adjust the 'Secs' setting inline with how many seconds you'd like the additional boost to stay on for and then press ENTER to continue



Use the UP and DOWN buttons to adjust the 'Perc' setting inline with how much additional duty you'd like to add whilst on scramble and then press ENTER to save and exit





In running mode the scramble can be triggered by pressing the up button or the remote trigger when the 'input trigger' is setup as scramble. When the scramble is triggered the 'SCR' and the remaining seconds are displayed in the top right hand corner of the screen as displayed to in the image to the left

MULTI-SCRAMBLE

The V4 has Gizzmo's multi-scramble feature. With this you can re-press the UP button or remote button whilst on scramble and the V4 will add another additional scramble duty and replenish the seconds. That's very confusing so here's an example. If you had your scramble duty set to 3% and secs set to 5. Upon triggering scramble 3% duty would be added to your base duty for 5 seconds. If after 3 seconds you decided you needed more boost again, you can repress the trigger and you would then have your base duty + 6% (3% + 3%) and the seconds would reprenish to 5sec again. This can be done up to 2 times in addition to the first scramble.

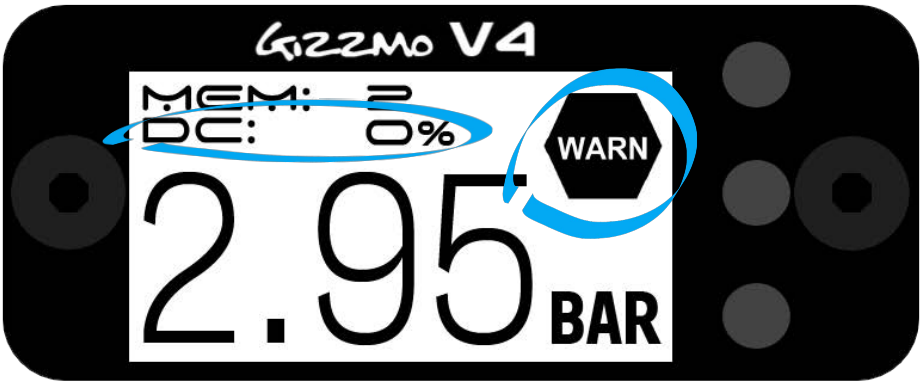
Over Boost Setup

Press ENTER once to access the menu screen

Press DOWN twice and ENTER once to access the overboost setup

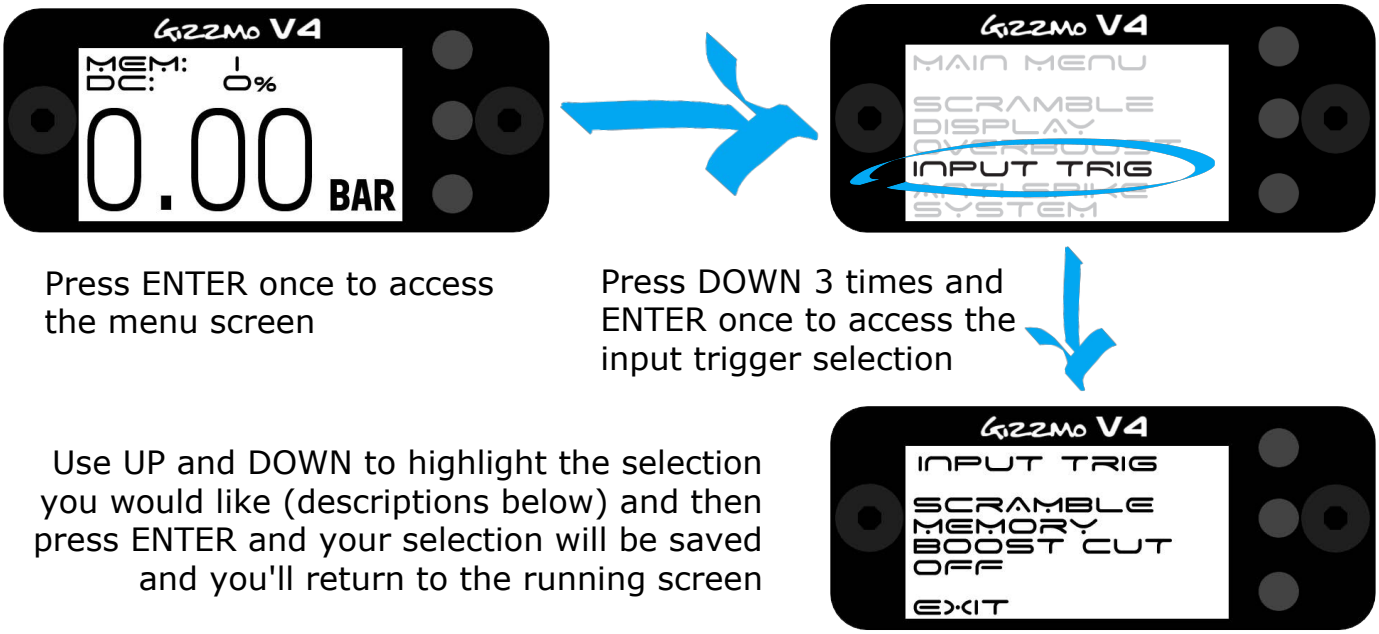
Use UP and DOWN to set the limit that you would like to set at which the V4 warns you of an overboost situation and actively switches to minimum boost. Once you have set this press ENTER to save and exit to the running screen

NOTE: When you first enter the overboost setup it may display 'OFF'. If you go once press above the maximum boost (in this example 3.2bar) or one press below zero the display will read 'OFF' to indicate that overboost will be disabled.



When you exceed the overboost level the display will show the WARN logo like above and the duty will drop to zero as above

Input trigger Setup



Press ENTER once to access the menu screen

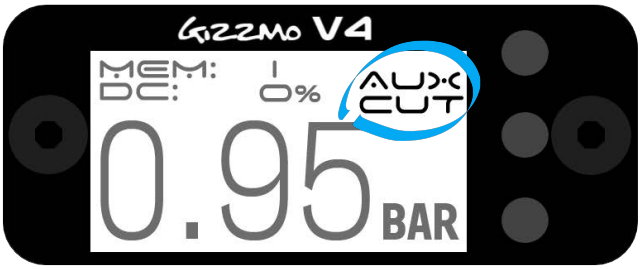
Press DOWN 3 times and ENTER once to access the input trigger selection

Use UP and DOWN to highlight the selection you would like (descriptions below) and then press ENTER and your selection will be saved and you'll return to the running screen

SCRAMBLE: this allows the remote input to trigger scramble and multi scramble events. As with all remote triggering options the remote wire must switch to earth so the remote wire goes to one side of the button/switch and the other must be connected to earth

MEMORY: this makes the remote trigger wire increment the memory selection e.g. 1 > 2 >3... Again it switches to earth so the remote wire goes to one side of the button/switch and the other must be connected to earth

BOOST CUT: this is used to switch to minimum boost, so mainly as a safety feature. An example of this may be if you wired a level sensor from a water/meth injection tank so that if it got low it would switch a eath to the remote wire to cut boost. Please be aware that when the aux boost cut is active (cutting boost) the running display will indicate this as below.



OFF: this is obviously to switch the aux input off so that if it earths out nothing happens.

EXIT: this is to return to the running screen with no changes

Anti Spike Setup

Press ENTER once to access the menu screen

Press DOWN 4 times and ENTER once to continue to the anti spike selection

Use the UP and DOWN buttons to adjust the anti spike to the desired setting and then press ENTER to save and exit.

What is Anti Spike?

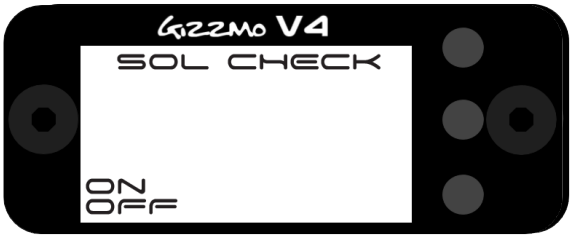
As with everything, wastegates take time to open, especially internal wastegates, and in a situation where they are required to react quickly (flat shifting gears at high revs, off/on throttle quickly whilst on boost at high rpm) this sometimes results in a boost spike. Anti Spike largely eliminates this and can be adjusted from 0 to 100 with 100 being suitable for vehicles with a large amount of boost spiking and 0 suiting cars with no spiking issues. Ideally you want to keep this setting as low as possible because the higher this is, the longer it will take to return to your desired boost setting.

Solenoid Check

Press ENTER once to access the menu screen

Press the DOWN button 5 times to select SYSTEM and then press ENTER

Press DOWN once then ENTER to select SOL CHECK



Use UP/DOWN to select if you want to switch the solenoid check on or off and then press ENTER

MAP Calibration

Press ENTER once to access the menu screen

Press the DOWN button 5 times to select SYSTEM and then press ENTER

Press DOWN twice and ENTER to select MAP CAL

Ensure there is no vacuum or pressure on the V4's MAP reference pipe. Use UP or DOWN to select the following. Select SKIP if you wish to leave the zero vac reference as-is or SAVE if you want to replace the as-is setting with what the MAP sensor reading is now sensing.

Much like the previous stage except this is for setting 1 bar reference. Apply EXACTLY 1 bar on the V4's MAP reference pipe and select and enter SAVE to store this setting or alternatively select and enter SKIP to leave the factory calibrated 1 bar setting. **The V4 will restart if either calibration settings are changed**

CAUTION: Resetting the MAP calibration will effect all pressure settings. The V4 uses the slope between 0vac and 1bar to extrapolate all pressure settings up to 3.2bar. THESE SETTINGS ARE CRITICAL, DO NOT CHANGE THEM UNLESS YOU ARE CONFIDENT OF WHAT YOU ARE DOING. In the event that you misstep, do a HARD RESET on the MAP calibration covered on the next page.

Hard Reset

Press ENTER once to access the menu screen

Press the DOWN button 5 times to select SYSTEM and then press ENTER

Press ENTER again to select HARD RESET

Use the UP and DOWN buttons to select the partition of memory you'd like to return to factory on

Press the UP button once and ENTER to confirm returning the selection to the factory default settings

CAUTION: ONCE RESET TO FACTORY, THE SETTING CANNOT BE RECOVERED e.g. if you reset your memories, you will have to manually set all your memories as if it was a new controller

Adjusting the **Memory Setting**

Hold DOWN button until screen changes

The setting screen will start by flashing the 'start' setting. UP and DOWN will increase/ decrease this setting. When you have set this to the desired setting, press ENTER to continue to the Duty setting.

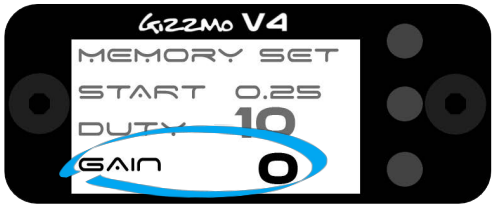
What is start ???

This refers to when the V4 will start taking control over the wastegate e.g. as opposed to letting it operate manually without intervention from the solenoid. When the boost reaches the 'start' pressure, the V4 will start operating the boost solenoid.

The 'duty' text will now be flashing. UP increases the duty, and therefore boost, and DOWN decreases the duty. It is impossible to know how the duty will impact the boost, so please read below. When you are satisfied with the duty, press ENTER to continue to the gain setting.

VERY IMPORTANT TIP :)

Whenever you adjust the duty in the setting mode you can then drive the car (recommended in 3rd or 4th gear at sufficent revs) and the V4 will display the boost pressure on the setting screen tempoarily, this makes it very fast to set up.



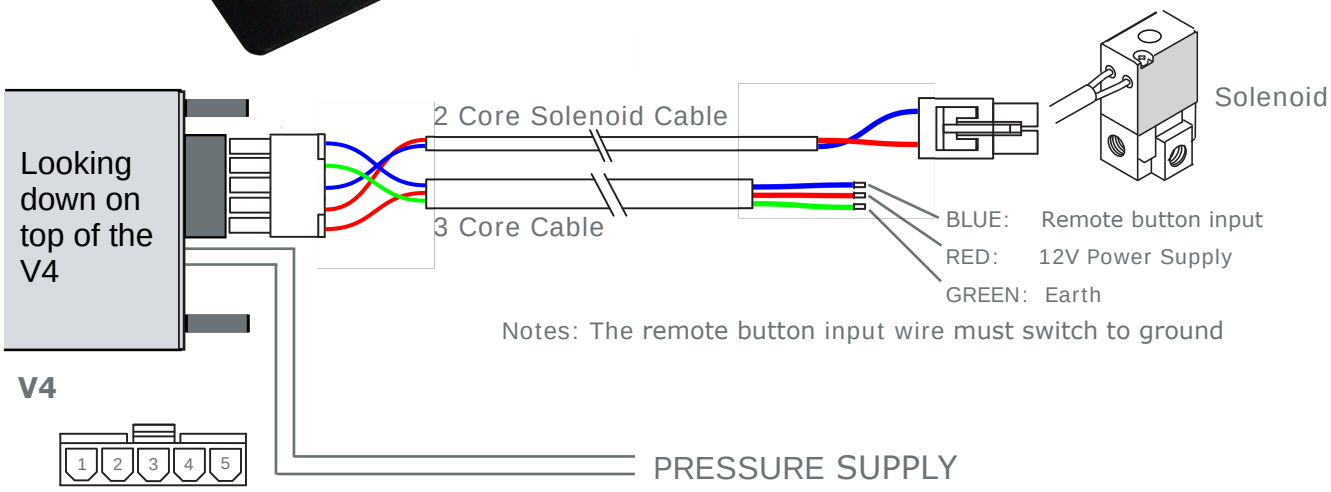
The 'gain' setting will now be flashing. UP increases the gain and DOWN decreases it. We'd recommend skiping this setting if you are setting a new boost level and coming back to it after the boost is set (see the quick start guide). Press ENTER to continue

At this point the V4 needs to learn the 'stable' boost for the set duty. Drive the car under full throttle at sufficent revs and load to attempt to get the 'Max' reading on the screen as high as possible. You may see higher boost on the real time readout than is recorded on the 'Max' reading, this is simply because the boost you have seen is not stable. Once you have finished, press any button to lock this setting in memory.

Wiring/Bracket Diagram

Disconnect the negative terminal of the battery BEFORE proceeding with the installation.

Please ensure you follow the image on the left re the assembly of your bracket



V4 Plug **looking INTO plug from V4 side**

1: RED 12V+ Power Supply input
2: RED 12V+ Supply output from V4 to Solenoid
3: BLUE Switching Ground output to Solenoid
4: GREEN Ground supply input
5: BLUE Aux switch **GROUND** input to V4 (normally open)

1. The Pressure port is to be connected to a direct pressure source at an inlet manifold e.g. Fuel Press Regulator. Do not connect this to any other device such as a solenoid valve or blow off valve. A 3mm Y connector is provided to assist plumbing.

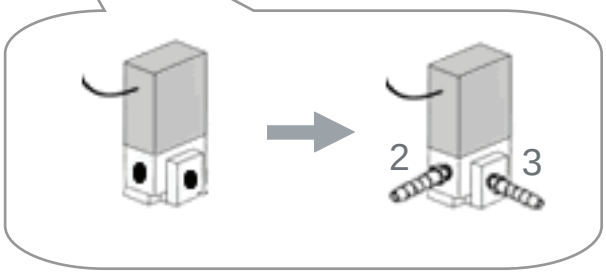
2. Mount the solenoid with the un-used port facing downwards. Connect the hoses as per the correct application (actuator or external wastegate).

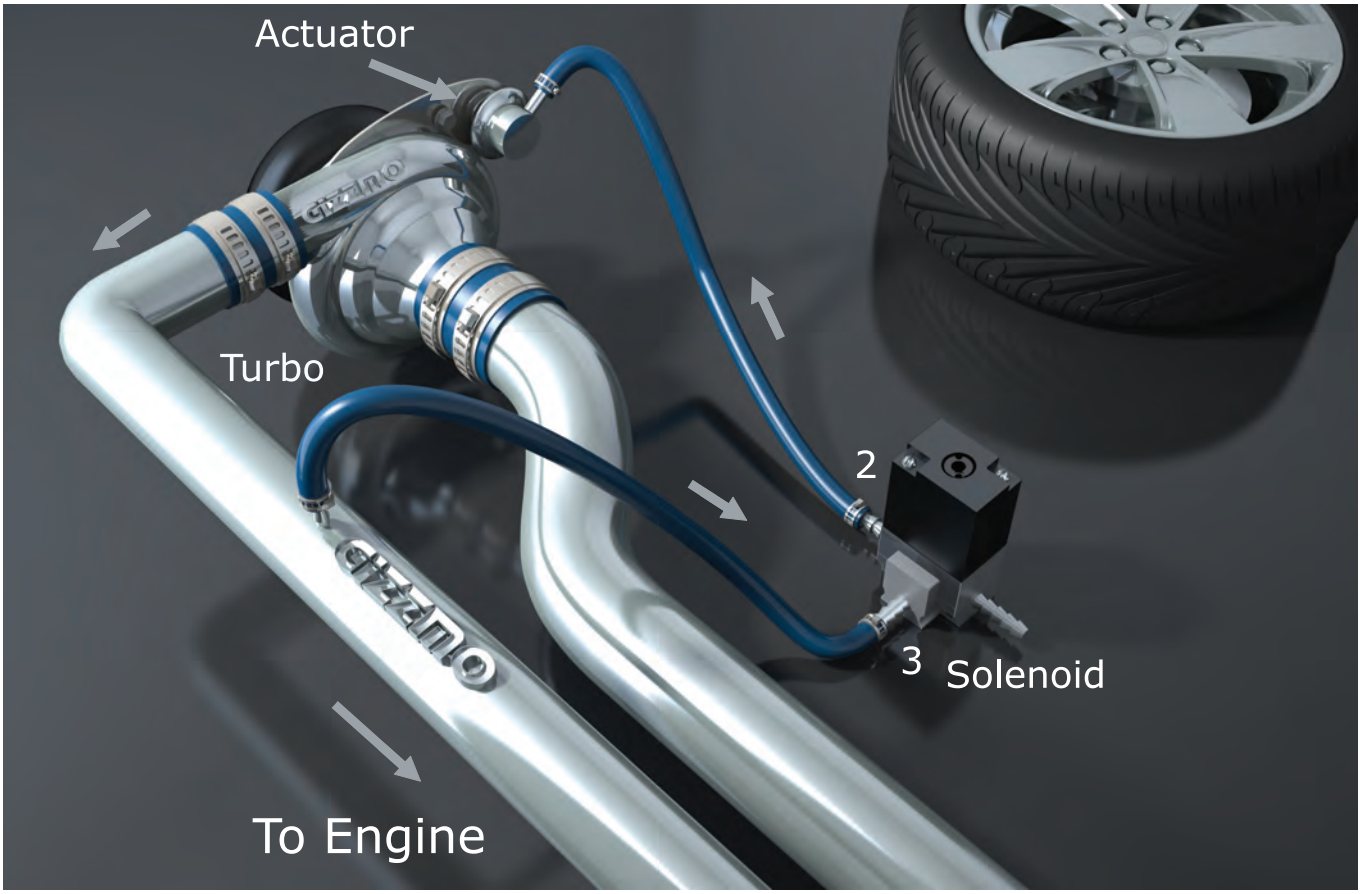
3. Connect the Red wire to a good fused power source that is live only when the ignition switch is in the on position.

4. Connected the Green wire to a good clean chassis earth.

Installation for an Internal Wastegate

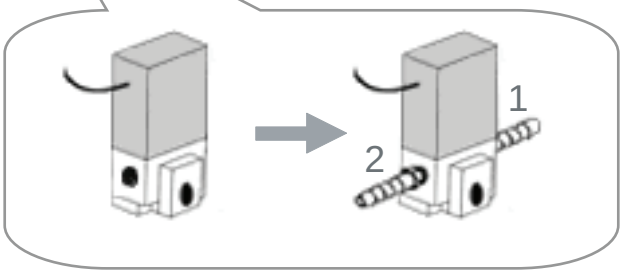
Connect the tails to Port 2 and Port 3 of the Solenoid Valve.

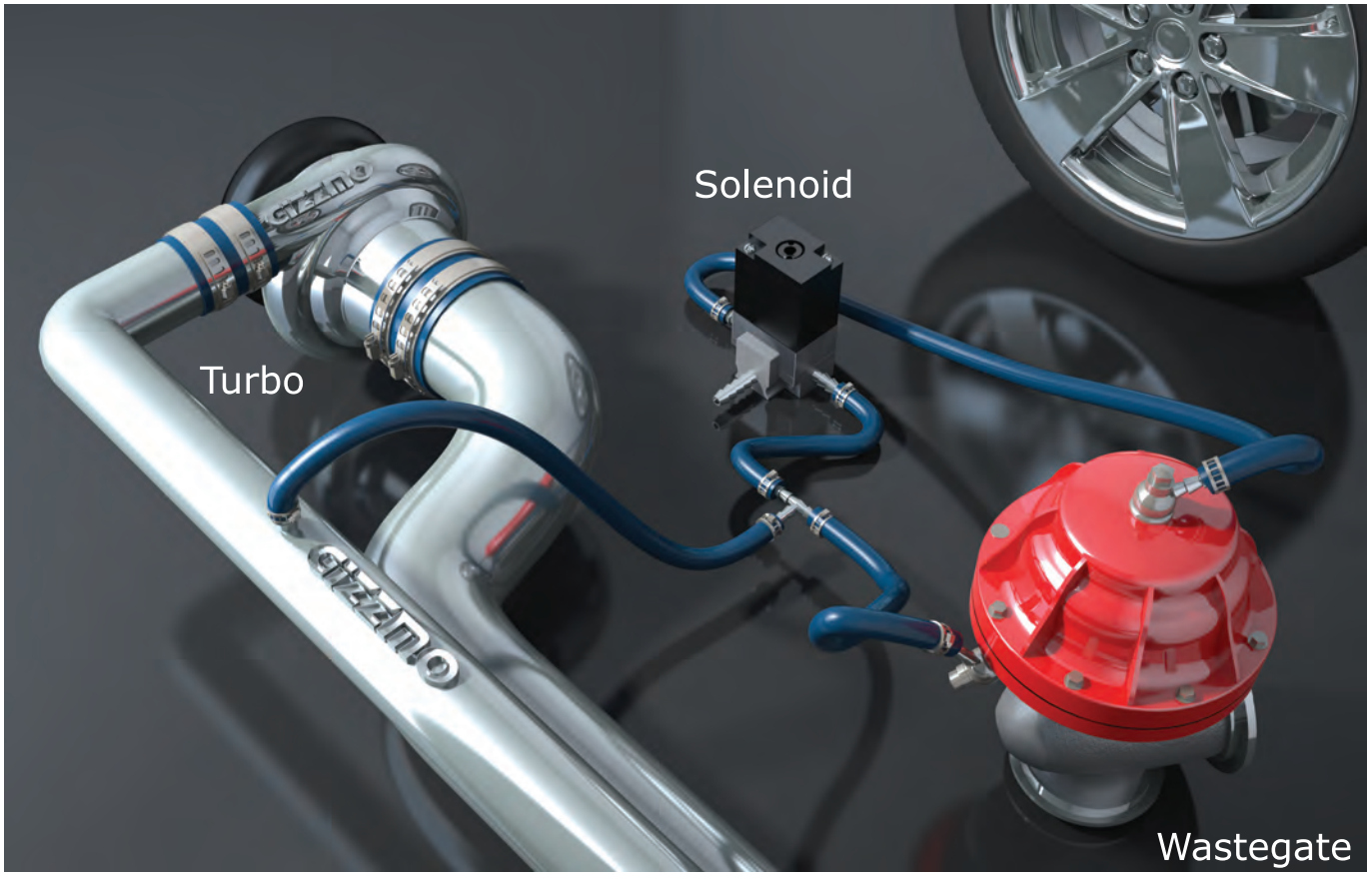




Installation for an External Wastegate

Connect the tails to Port 1 and Port 2 of the Solenoid Valve.





Glossary

Display Settings

The V4 can display real time boost in Pounds, Bar or Kpa. All this can be set in the display menu. Example: 1bar equals 14.5lb which equals 100kpa.

Duty

This duty cycle, also referred to as the 'Base duty' can be adjusted from 10% to 90% to adjust the boost level. Every vehicle has a different response to duty cycle and essentially the only way to work out your duty cycle vs boost relationship is via trial and error starting from a low duty cycle. A lower duty cycle equals lower boost and typically your boost won't start to rise till at least 20%.

Gain

Gain effects how quickly the turbo comes on boost. Ideally this would be set as high as possible; however, if this is set too high overshooting and boost instability can occur so there will be an ideal setting for this that will be different from vehicle to vehicle.

Memories

The V4 has 6 memories in total and can fast switch between these. This means that when you select the next memory the boost will change immediately which is an advantage when changing memories whilst racing. Each memory has its own gain setting (refer to 'gain' in this glossary) and control start point

Over Boost warning

Via the menus, you can set an over boost pressure to flash the display and attempt to drop the boost should your vehicle exceed this set pressure limit.

Glossary II

Anti Spike

A unique feature of the V4 is ‘Anti Spike’.
As with everything, wastegates take time to open and in a situation where they are required to react quickly (flat shifting gears at high revs, off/on throttle quickly whilst on boost at high rpm) this sometimes results in a boost spike. Anti Spike largely eliminates this and can be adjusted from 0 to 100 with 100 being suitable for vehicles with a large amount of boost spiking and 0 suiting cars with no spiking issues. Ideally you want to keep this setting as low as possible because the higher this is, the longer it will take to return to your desired boost setting.

Solenoid Supervisor

The V4 constantly monitors the boost controller solenoid output channel to ensure that there are no malfunctions and should anything go wrong the V4 IMMEDIATELY displays ‘SOLENOID FAULT’ to warn you of a fault with your solenoid, solenoid loom or output driver. The V4 will also briefly pulse the solenoid whenever the key is turned on in order to ensure it is fully operational. If for any reason the 'SOLENOID FAULT' displays without having a solenoid/loom fault it can be switched off via the SOL TEST in the setup menu

About The Warranty

Gizzmo Electronics Limited
Limited Warranties Statement
Effective 1 January 2003

All Products manufactured or distributed by Gizzmo Electronics are subject to the following Limited Express Warranties, and no others:

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