

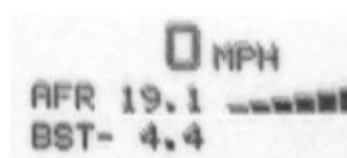
The **DashTronix** Gauge Projector™ – Corvette

Congratulations! Your **DashTronix** Gauge Projector™ is an exciting and revolutionary automotive product that places information from two gauges onto your DIC and/or HUD¹ in “Street Mode”. The Gauge Projector™ accepts two 0-5 V input signals via spade-lugs. The user programs the ranges the voltages correspond to and the lower-bounds which must be exceeded for the Gauge Projector™ to display the gauge. The HUD displays a meter with a user-programmable range for each gauge. Each gauge has a 3-character label which is fully user-programmable. Programming of all parameters via DIC-based menus takes approximately 180 seconds by placing the vehicle in Accessory mode and using only the unlock or lock button. Output location (DIC and/or HUD) is selectable when the vehicle is running by using the interior lights button.

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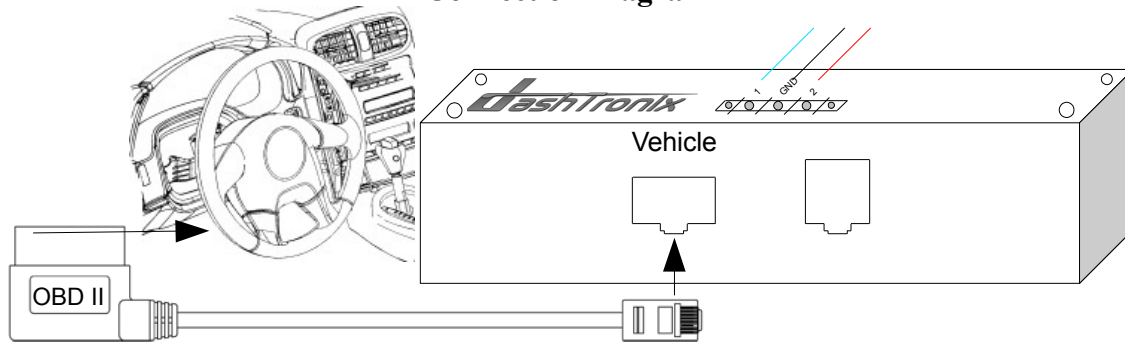
Please drive safely and intelligently at all times.



¹ If equipped.

Quick Start

Connection Diagram



The first time you setup your **DashTronix** Gauge Projector™, be sure your car is safely parked.

- 1. Ensure your car is off.**
- 2. Connect.**

The Gauge Projector™ has two jacks on the side. The smaller jack is unused.

There are three spade-lugs on the top. Each lug is labeled: “1”, “2” and “GND”. Connect one of the input voltages to “1” and the other to “2”. Use the “GND” terminal for ground.

- 3. Plug in the car to the Gauge Projector™.**

The larger jack on the Gauge Projector™ plugs in to one end of the included OBD-II cable. The other end of this cable plugs in to the OBD-II port. You can find that port under the steering column. You might hear your navigation system (if equipped) spin up its DVD at this point. This is normal. The smaller jack provides switched 12 V power for a Valentine 1™ or Escort™/Beltronics™ radar detector, if desired.

- 4. Put the car into Accessory Mode to program the Gauge Projector™.**

Consult the later pages for programming instructions.

- 5. Turn on your car.**

After the manufacturer splash screens display on the HUD and/or DIC, you will see the “DashTronix.com Gauge Projector” splash screen for approximately three seconds if the corresponding output location(s) is enabled (any personalized DIC message will be preserved). The splash screen will also indicate the version of your Gauge Projector™ software:

General Operational Characteristics

- Description:
 - The Gauge Projector™ (GP™) uses the navigation functionality of the HUD and/or DIC, regardless of whether you have a navigation unit, to provide the driver graphical representation and numerical values of two externally provided inputs such as a boost gauge or AFR gauge.
 - Input voltage to the two inputs must be between 0-5 V. **DO NOT PROVIDE INPUT VOLTAGES OUTSIDE THIS RANGE. YOU CAN DESTROY THE GP™.**
 - For the best accuracy, use high quality shielded cables for the inputs. Ground the shields on both sides.
 - The GP™ is programmed in Accessory mode via DIC-based user menus to define its voltage boundaries (e.g., 0.0V=-15 PSI and 5.0 V=15 PSI), the trip/trigger boundaries and the calibration of the HUD meter (i.e., what values will cause zero-to-full deflection). When the trip/trigger boundary is exceeded for either gauge, the GP™ displays both gauges. When both inputs are below their respective trip/trigger boundaries, the GP™ ceases displaying gauges.
 - Hysteresis is built in for the trip/trigger value to reduce effects of noise on causing excessive display and clearing of gauges. Following exceeding the trip/trigger value the gauges are displayed and the original trip/trigger value is automatically reduced by 0.1 V. Then, when the currently read value is less than the trip/trigger value, the original trip/trigger value is increased by 0.1 V and the display is cleared.
 - You can review the currently programmed parameters when the car is in Accessory mode by turning on the interior lights then turning them off within the next two seconds (by pushing the knob that controls the brightness of the interior lights). The DIC will review each parameter for two seconds until all parameters have been displayed.
- Display characteristics:
 - HUD:
 - Like the navigation system, the GP™ can only display information in the HUD when the HUD is in “Street Mode.
 - Information from the GP™ will always override information from your audio system and the “CHECK GAGES” message.
 - When you are running a factory navigation unit simultaneously with the GP™, that unit is also updating the HUD with its own information. The navigation unit will briefly override information from the GP™, until the GP™ next updates or refreshes the HUD. This time can be anywhere on the order to milliseconds to indefinite.
 - DIC:
 - Information from the GP™ will usually override other information displayed on your DIC. **This includes warning messages.** Some DIC messages can override GP™ information.
 - Your GP™ defaults to the following parameters when first plugged in. After you reprogram the GP™, your chosen values will remain saved even if the GP™ is unplugged.









Parameter	Input 1	Input 2
Label	“AFR”	“BST”
Upper (5 V) boundary	20.0	23.4
Lower (0 V) boundary	10.0	-13.7
Trip/trigger (calibrated)	10	2
Full meter deflection	20	10
Zero meter deflection	10	0

Programming

Generally, programming is done using either the lock button or unlock button. Characters/numbers advance at the rate of one every two seconds. Pressing a button selects the currently displayed character/number. Then selection starts on the next character/number. If you unplug your GP™, your label settings will be maintained.

Programming Labels

Label programming is done for the top label first, then the bottom label. Each character in the label is chosen one-at-a-time. Characters advance A-Z then 0-9. If no character is selected, “9” is assumed. The procedure to rename the labels is as follows (use the lock button):

-  → Place your car into Accessory mode.
-  x2 → Programming mode entered (button presses must be within 3 seconds of each other)
Splash screen displays for 2.5 seconds.
First character in top label begins incrementing.
-  x1 → Select currently displayed character
Second character in top label begins incrementing.
-  x1 → Select currently displayed character
Third character in top label begins incrementing.
-  x1 → Select currently displayed character
First character in bottom label begins incrementing.
-  x1 → Select currently displayed character
Second character in bottom label begins incrementing.
-  x1 → Select currently displayed character
Third character in top label begins incrementing.
-  x1 → Select currently displayed character
Label programming complete.

Programming Gauge Voltage Boundaries, Trip/Trigger and Meter Deflection

Voltage boundaries, trip/trigger and meter deflection parameters are selected in the below order (labels may differ depending on user reprogramming). Numbers advance 0-9. If no number is selected, “9” is assumed.














It is useful to write down the values you intend to program and have them visible during programming for immediate reference to avoid programming mistakes. Use the template below, which uses the proper programming sequence, where “AFR” and “BST” correspond to inputs 1 and 2, respectively.

AFR 5 Volt:	_____	(the AFR 5 V boundary)
AFR 0 Volt:	_____	(the AFR 0 V boundary)
BST 5 Volt:	_____	(the BST 5 V boundary)
BST 0 Volt:	_____	(the BST 5 V boundary)
AFR Trip:	_____	(the AFR trip/trigger value)
BST Trip:	_____	(the BST trip/trigger value)
AFR High Meter:	_____	(the AFR meter full deflection value)
AFR Low Meter:	_____	(the AFR meter zero deflection value)
BST High Meter:	_____	(the BST meter full deflection value)
BST Low Meter:	_____	(the BST meter full deflection value)

The procedure to program these parameters is as follows (use the unlock button):



- → Place your car into Accessory mode.
- x2 → Programming mode entered (button presses must be within 3 seconds of each other)
Splash screen displays for 2.5 seconds.
Sign of AFR 5 Volt is incremented from plus to minus.
- x1 → Select currently displayed sign
Tens digit of AFR 5 Volt begins incrementing.
- x1 → Select currently displayed digit
Ones digit of AFR 5 Volt begins incrementing.
- x1 → Select currently displayed digit
Tenths digit of AFR 5 Volt begins incrementing.
- x1 → Select currently displayed sign
Tens digit of AFR 0 Volt begins incrementing.
- x1 → Select currently displayed digit
Ones digit of AFR 0 Volt begins incrementing.
- x1 → Select currently displayed digit
Tenths digit of AFR 0 Volt begins incrementing.
- x1 → Select currently displayed digit
Sign of BST 5 Volt is incremented from plus to minus.
- x1 → Select currently displayed sign
Tens digit of BST 5 Volt begins incrementing.

- x1 → Select currently displayed digit
Ones digit of BST 5 Volt begins incrementing.
- x1 → Select currently displayed digit
Tenths digit of BST 5 Volt begins incrementing.
- x1 → Select currently displayed sign
Tens digit of BST 0 Volt begins incrementing.
- x1 → Select currently displayed digit
Ones digit of BST 0 Volt begins incrementing.
- x1 → Select currently displayed digit
Tenths digit of BST 0 Volt begins incrementing.
- x1 → Select currently displayed sign
Tens digit of AFR Trip begins incrementing.
- x1 → Select currently displayed digit
Ones digit of AFR Trip begins incrementing.
- x1 → Select currently displayed sign
Tens digit of BST Trip begins incrementing.
- x1 → Select currently displayed digit
Ones digit of BST Trip begins incrementing.
- x1 → Select currently displayed sign
Tens digit of AFR High Meter begins incrementing.
- x1 → Select currently displayed digit
Ones digit of AFR Low Meter begins incrementing.
- x1 → Select currently displayed sign
Tens digit of BST High Meter begins incrementing.
- x1 → Select currently displayed digit
Ones digit of BST Low Meter begins incrementing.

If the chosen values are nonsensical (e.g. high meter > 5 V calibrated value) the GP™ will indicate “Wrong boundaries”, exit configuration mode and continue using the previous settings. If you unplug your GP™, your calibration settings will be maintained.

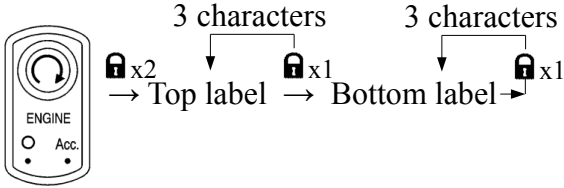


x2

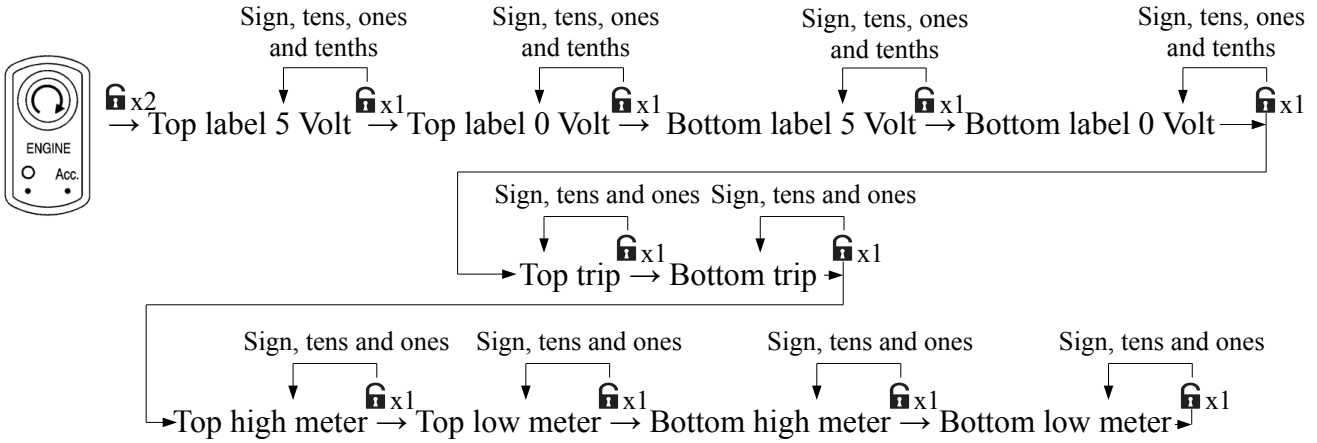
Remember, you can always review the currently programmed parameters when the car is in Accessory mode by turning on the interior lights then turning them off within the next two seconds (by pushing the knob that controls the brightness of the interior lights). The DIC will review each parameter for two seconds until all parameters have been displayed.

Programming Summaries²

Labels



Boundaries, Trip/Trigger and Meter Deflection



2 If you make a mistake during programming, turn the car off, then go back to Accessory mode to retry.

Programming For Inputs *Between 0 and/or 5 Volts*

Programming the Gauge Projector™ for a wideband 0-5 Volt input is straightforward, as you know what values to use at the extrema. However, programming the Gauge Projector™ for inputs that will not reach 0 and/or 5 Volts requires a few simple calculations. First, keep in mind the input signal must still not go below 0 Volts or exceed 5 Volts at any time. Second, the signal must be linear over the useful range. Third, the signal must be positively correlated. That is, lower voltages must correspond to lower calibrated values and higher voltages must correspond to higher calibrated values (*e.g.*, the slope of the transfer function must be positive).

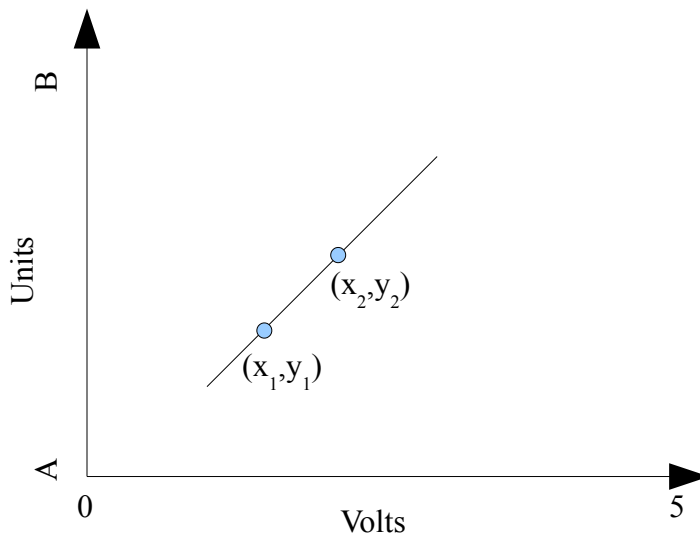
To calibrate the Gauge Projector™ for a signal that does not reach either 0 and/or 5 Volts, one must perform a simple linear extrapolation to 0 and/or 5 Volts. Use the following standard equation of a line:

$$y = m x + b$$

where m is the slope and b is the y intercept. That is,

$$m = \left(\frac{y_2 - y_1}{x_2 - x_1} \right) \quad \text{and} \quad b = y(0)$$

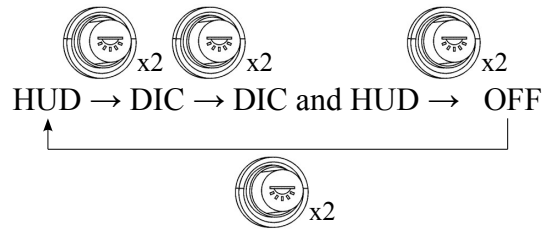
If the input signal will not reach as low as 0 volts, use the equation of a line to extrapolate y when $x=0$ Volts. Similarly, if the input signal will not reach as high as 5 Volts, use the equation to extrapolate to y when $x=5$.



Keep in mind, that there are very few commercial devices that would require doing this simple calculation. The vast majority of devices have transfer functions with the 0 and 5 Volt boundaries defined.

Mode Selection

Your Gauge Projector™ has 4 selectable modes. Modes are selectable when the vehicle is running and the GP™ is plugged in. First initialize the GP™ into configuration mode by turning the interior lights on. Turn the interior lights off within 3 seconds (during this short time, no gauge updates are provided) to go to the next mode. The new mode is displayed on the DIC³ and HUD⁴ for 3 seconds.



The GP™ saves the current mode and format when the car is shut off so that the next time you start your car, the GP™ will stay in the same output state. If you unplug the GP™, it will power on next to HUD and DIC output but your other settings will be maintained.

GP™ Messages

Mode	HUD	DIC
HUD only.	Gauge Projector: HUD	GP on HUD
DIC only.	Gauge Projector: DIC	GP on DIC
DIC and HUD.	Gauge Projector: DIC and HUD	GP on DIC and HUD
Display OFF • No updates provided.	Gauge Projector: OFF	GP is OFF

³ If your vehicle makes a connection with a Bluetooth device at any time during mode changes the “Bluetooth” message will overwrite the GP™ messages for several seconds. You should wait until that DIC message passes.

⁴ If equipped.

Additional Information

- Great consideration was taken to minimize the power requirements of your GP™. It has truly remarkable efficiency during operation and in standby. The GP™ is specifically designed to be left plugged in to the car at all times without concern for battery depletion.
- You might notice a short delay (usually much less than one second) between the input provided to the GP™ and what you see displayed on your HUD and/or DIC. This is normal and is caused by a few expected sources of delays associated with the vehicle.
- Improvements and changes to hardware and/or software may result in undocumented changes.

Precautions

- Though the Gauge Projector™ has been designed to be resilient against electrostatic discharge, to avoid possible damage, you should not touch the metal contacts on the connectors.
- Avoid placing cell phones and other transmitters near the Gauge Projector™ and its cords.
- Do not expose the Gauge Projector™ to moisture. If it gets wet, unplug it immediately.
- Do not store or mount the Gauge Projector™ in direct sunlight.
- Do not drop the Gauge Projector™.

Customer Special Requests

Please contact info@DashTronix.com if you would like custom or other currently available features added to your Gauge Projector™. You can discuss your custom needs with our R&D engineer. Possibilities include but are not limited to:

- Changes to:
 - Timing.
 - Behavior.
 - Language.
 - Messages.
 - Splash screen.
 - Display location.
 - Display characters.
- Additional functionality:
 - Interfacing to other devices.
 - We can place information from many kinds of devices onto your DIC and/or HUD.
- Entirely novel devices that interact with your vehicle.

User Agreement, Warranty, and Disclaimer

DashTronix, LLC and all others associated with selling (the SELLER, hereafter) this product shall not be liable for any consequence, intended or otherwise, as a result of the direct and/or indirect and/or proper and/or improper use of the product. The USER of this product acknowledges that the SELLER disclaims any liability for damages to property(ies) and/or injury to person(s). The SELLER is not responsible for proper and/or improper installation of the product. The USER acknowledges that the SELLER makes no claims on the suitability of this product for any particular application. The USER must waive all claims, liabilities, and/or remedies, whether expressed and/or implied as arising by law and/or otherwise, regardless if caused by SELLER'S negligence, related to the use, misuse and/or purchase of this product. **Use of this product is solely at the USER'S risk.**

The warranty is limited to one (1) year from the date of purchase and pertains only to the contents of the kit sold. You must contact DashTronix prior to any warranty claims and to obtain approval to send any part of the kit, postage paid.

The buyer must agree to the entire terms delineated above prior to using the Gauge Projector™. In the event that buyer does not agree to all of the terms within 5 business days of purchase, the buyer may return the product with the original invoice, in an unused and new condition, for a refund, less 5% of the purchase price and less shipping charges. Any use and/or misuse of this product indicates agreement with these terms.

This  product is not endorsed or approved by General Motors™.

Specifications

Power input voltage:	11.0 – 16.0 VDC, negative ground
Absolute maximum gauge inputs voltage:	5 V
Absolute minimum gauge inputs voltage:	0 V
Maximum input sampling rate:	16 Hz (reduced when communicating with bus)
Gauge inputs impedance:	∞
Gauge inputs protection:	0.1 μF, 50 V capacitors to ground. 10 kΩ current limiting series protection resistors.
Average current draw	
Standby (vehicle off):	4 mA
Standby (vehicle accessory mode):	22 mA
On (vehicle running):	22 mA
Power fuse:	1.5 Ampere. Single use, fast acting, internal, non-user serviceable.
Weight:	2.5 ounces, 71 grams (excluding cables).
Dimensions:	2x4x1 inches, 5x10.2x2.5 centimeters.
Operating temperature range:	-40 to +70 °C, -40 to 158 °F.
Storage temperature range:	-40 to +85 °C, -40 to 185 °F.

Troubleshooting and FAQ

Troubleshooting

- Nothing shows on my HUD/DIC when I turn my car on.
 - Is your GP™ plugged in to the OBD-II port?
 - Has the output location been selected to include the DIC/HUD?
 - If the output location includes the HUD:
 - Is the HUD in “Street Mode”. “Street Mode” looks like the image below.



- The GP™ does not show its splash screen(s).
 - Be sure your GP™ is not in the OFF mode. Change the mode.
- Sometimes I only have to press the lock buttons once to change modes.
 - Your car may automatically lock the doors. When it does so, the GP™ enters configuration mode. If you press the lock button within the next three seconds, the mode will change.
- Shortly after I start my car, I don't get a Gauge Projector™ update for 3 seconds.
 - Your car may automatically lock the doors. When it does so, the GP™ enters configuration mode for 3 seconds, during which time radar updates are not provided.

FAQ

Why is there sometimes a navigation symbol for a few seconds on the HUD after the splashscreen shows?

This is normal and is related to how the HUD intrinsically works. The HUD will clear the navigation symbol from the splash screen after the GP™ updates the HUD a few times. When this happens, the HUD will go back to showing speed and RPM briefly before returning to gauge display.

Why does it take more than 2 button presses to program parameters after I just programmed parameters.

There is a few second delay after programming before additional programming can occur.

Will my personalized DIC message still show when I start my car?

Yes. The DashTronix splash screen is timed to avoid overwriting personalized DIC message.

Sometimes the message “Bluetooth” overwrites the GP™ DIC message. Is that normal?

Yes. The GP™ is not the only module that can command your DIC to display messages. Avoid programming the GP™ or cycling through output modes during these times.

Can I run my Window Valet with the GP™?

We have a specially designed splitter for this. You'll see it on the drag down on the “Buy Now” page.

Does it work in all modes of the HUD?

Only the "Street Mode".

Won't the GP drain my battery?

The RP™ has an 4 mA total current draw when the car is off. For a 100 Ah car battery, that means you could keep the RP™ in standby mode for 25,000 hours (2.86 years) before the battery is completely dead.

Where should I install the GP™?

Wherever you like! Look at our install guide for a suggestion.

Can you place other information on the HUD and/or DIC too?

Yes. Please contact us to discuss what you'd like.

Will this void my vehicle's warranty?

Many devices are designed to be plugged in to the OBD-II port, such as diagnostic equipment, that can be purchased off-the-shelf from designers that are not associated with GM. The GP™ interfaces to your car like a diagnostic code reader does.

I have a cool idea for the GP™ or a new product.

Contact us. Our highly capable R&D department would like to provide you the solutions you need.

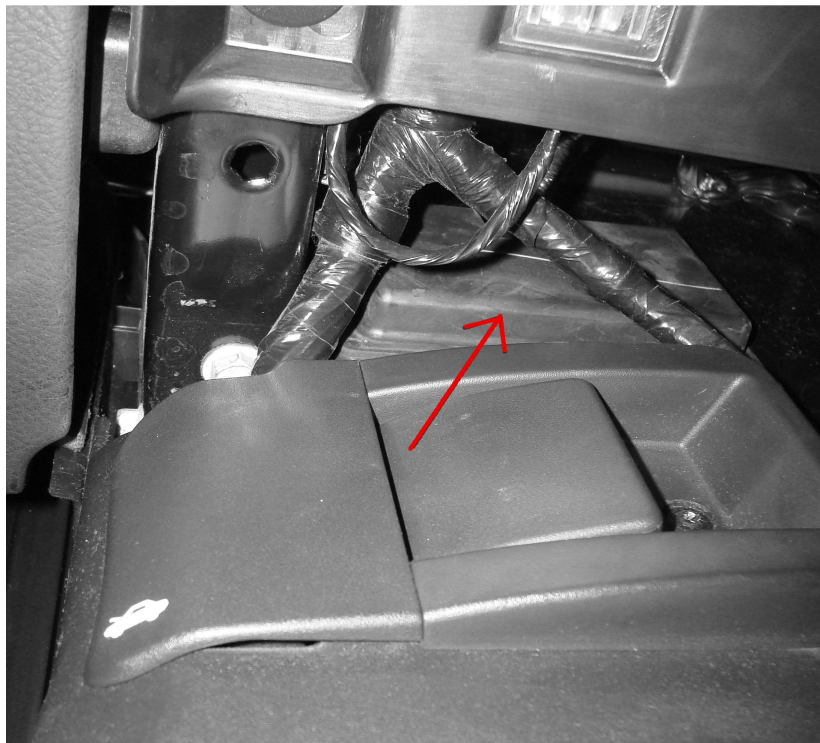
Installation Guide

This guide describes how to route the OBD-II to GP™ cable and mount your GP™. No tools are required.

The OBD-II cable will be routed above the knee bolster trim over to the area where the GP™ will be mounted.



The GP™ will be mounted using the supplied double-sided tape/Velcro™ in the area above the hood release handle under the dash.



The final GP™ mounting location.



Route the wires from your sensors to the GP™ and connect them properly to the spade lugs.

Finally, plug the OBD-II cable into the **Vehicle** jack on the GP™.

Your installation is now finished.

Enjoy your *DashTronix* Gauge Projector™!