

Model D1 3-Way Exhaust Bypass Valve Controller Installation Instructions for Camaro and Corvette

Note: These instructions are available on our web site www.forzacomponenti.com/documents.html



1. The Exhaust Bypass Valve Controller

The Exhaust Bypass Valve Controller allows the driver to remotely control the exhaust bypass valves by intercepting the signal to the vacuum solenoid.

Using the Forza 3-Way Controller, you have three modes of operation:

1. **Normal Mode** ... In this mode, the controller allows the vehicle's ECU to control the exhaust bypass valves. This is the default mode.
2. **Always Open** ... The controller will intercept the ECU signal and keep the exhaust bypass valves always open.
3. **Always Closed** ... The controller will intercept the ECU signal and keep the exhaust bypass valves always closed.

You can use either the included remote control transmitter or a manual on/off switch that you can install inside the passenger compartment. Using either method, you can select any of the three modes of operation.

Installation does not require any wiring modifications or splicing into the car's electrical system. The unit is installed using the plug and play principal. If you are comfortable performing simple maintenance tasks on your car, you should not have any problems installing the kit yourself. If you are not comfortable performing maintenance tasks on your car, you should consult with your technician who performs the service on your vehicle.

2. Warranty

Forza Componenti warrants the Exhaust Bypass Valve Controller for 12 months after receipt of the unit. Any warranty claims must be made by contacting the company. During the warranty period, the company will repair or replace the unit. User is responsible for return shipping costs. Within the first 15 days after receipt of the unit, if the buyer wishes to return the unit, Forza Componenti will provide a full refund of the purchase price. Contact Forza Componenti if you wish to return the unit during the first 15 days for a return authorization. Upon receipt of the unused, un-installed unit, a refund will be given. User is responsible for return shipping costs.

3. Disclaimers

Every effort has been made to assure that the Exhaust Bypass Valve Controller will be compatible with the vehicle that the unit is to be installed. The user is responsible for assuring that installation and use of the Exhaust Bypass Valve Controller is compatible with the vehicle exhaust and engine management system. Forza Componenti shall not be responsible for any damages to the host vehicle arising out of the use of, or otherwise related to, the Exhaust Bypass Valve Controller.

Users are responsible for ensuring their own compliance with legal requirements concerning noise abatement in their area. Forza Componenti assumes no responsibility should your vehicle become out of compliance with any relevant laws and regulatory requirements due to installation of the Exhaust Bypass Valve Controller.



4. Exhaust Bypass Valve Controller Kit Contents

4.1 Included in the kit

- Remote Controller Unit
- One fuse tap
- One 10 amp fuse
- Connection cable to connect vacuum solenoid valve to controller unit
- Wire to connect the controller to the fuse tap
- One Remote control transmitter (extra transmitters available)
- 3M Dual Lock Mounting Tape
- Nylon cable ties (not shown)

4.2 Not included in the kit

A manual switch if you plan to use it instead of the remote control transmitter

4.3 Installation Steps

Follow these steps in the order presented.

1. Check the Forza web site for additional information and details ... <http://www.forzacomponenti.com/vehicles.html>
2. Check the vehicle's exhaust bypass valves function
3. Configure the Bypass Controller Module
4. Install the fuse tap and yellow extension wire
5. Determine mounting position for the Control Module and route the yellow power to the control module
6. Install vacuum solenoid valve control cable and route to the control module
7. Finish installing control module and verify electrical continuity
8. Install manual control switches if you choose to use this option
9. Verify operation of Controller
10. Secure wires, gathering any excess while doing so, reinstall any panels you may have removed.



5. Check the Vehicle's Current Exhaust Bypass Valve Functionality

- Ensure that the exhaust bypass valve(s) are functioning.
- Find the exhaust bypass valve(s) on your vehicle.
- With the engine off and no vacuum available to the exhaust valves, observe the default position – they should be Open. On the Camaro, after starting the vehicle, the valves should remain open. As your engine RPM increases, for example in normal driving, the valves should close. Then, at some point in the engine RPM range, the valves should open when you reach a predetermined threshold level.
- If the valve(s) do not perform as designed, you will have to determine the cause. It may be a faulty vacuum line, a faulty valve or vacuum solenoid or an electrical connection to the vacuum solenoid that may be at fault. Correct the situation before proceeding.

6. Configure for Remote Transmitter or Manual Switch Operation

The controller can be used with either the included remote transmitter or with a manual switch that you would provide. The remote control transmitter option is easier to install as no additional wire needs to be routed to a switch. The downside is that you have the risk of potential loss of the remote transmitter and you will have to replace the battery occasionally. The manual On/Off switch requires that you route a control wire to a switch that you intend to use, but you likely have longer term reliability, no worries of misplacing the transmitter and no batteries to replace.

The controller is shipped with the remote transmitter option enabled. If you wish to use a manual On/Off Switch, you will need to provide the switch and change the controller configuration as follows, otherwise skip to the next step.

- Remove the lid from the controller
- Locate two small slide switch labeled “Rem – Man”.
- Place **both** switches in the Man (manual) position. Note: once you position the switches in the Man position, your remote transmitter will no longer function as a control device.
- Reinstall the lid

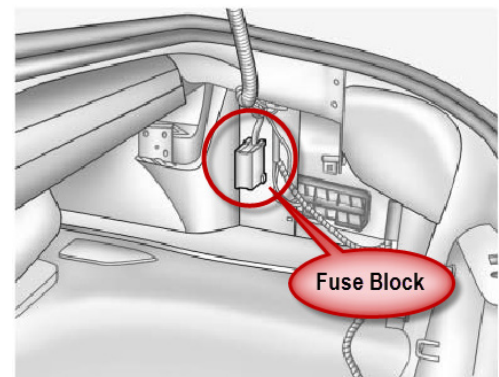


7. Camaro Gen5 – Install the Controller Module

7.1 Locate the Vehicle Fuse Block

The fuse block for the Camaro is located in the rear trunk (boot) of the car behind the right side panel.

- Access fuse block by removing carpet panel in trunk and then removing rear sill plate and passenger side trim retainers
 - Remove convenience net retainers, the rear sill plate and passenger side trim retainers:
 - Remove black plastic threaded fastener at bottom of panel
 - Remove or unfasten the carpet trim from upper right black plastic button type rivet
- See additional info on the Forza web site <http://www.forzacomponenti.com/vehicles.html>



The fuse block for the Corvette C6 is located under the instrument panel on the passenger side of the vehicle. Check owner’s manual for access instructions.

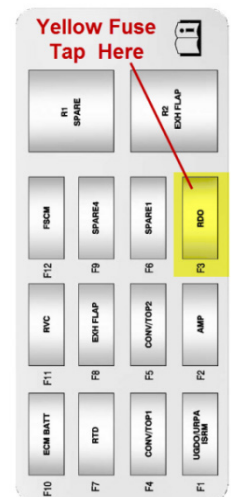
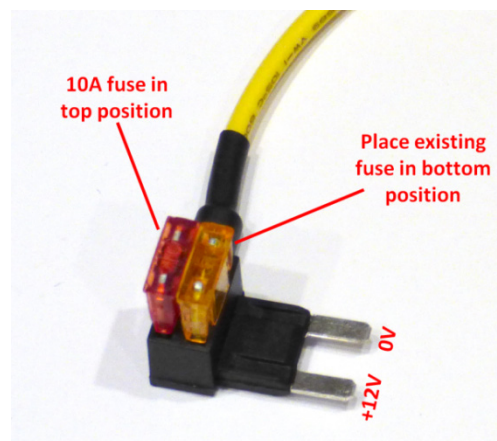
7.2 Install the Fuse Tap

7.2.1 Camaro

The yellow wire fuse tap is used to provide power to the controller module. Note: When installing the fuse tap, it is important to orient the tap into the fuse block position with correct polarity. Each fuse location has a “hot” side and “cold” side. Specifically, one side of the fuse will measure +12V when checking to vehicle ground and the other will measure 0V.

If after inserting the yellow wire fuse tap, you discover no power to the controller unit, you may have reversed the polarity. In which case, remove the fuse tap and reverse position.

Caution: Fuse locations in the fuse block may be continuously supplied with 12 volts. Care must be taken to avoid shorting any connections.



- You can use any fuse position for the yellow wire fuse tap. We recommend position F3 (RDO).
- Remove fuse you have selected and insert this fuse in the **bottom** position on the yellow wire fuse tap.
- If not already installed, insert the 10A fuse (included with controller kit) in the **top** position of the fuse tap.



- Install the yellow wire fuse tap in the position on the fuse block where you removed the fuse. Orient fuse tap with wire facing down and the fuses facing left (see photo below)

Note: On the Camaro, the fuse location is continuously “hot”, i.e., not switched with the ignition. A small current drain (approx. 50mA) will be drawn by the controller module at all times. This is only a concern if you do not start your car for a long duration (e.g., > 4 weeks) or you do not use a battery tender. If this is the case, you should turn off the control module using the master push-button switch on the side of the module enclosure. This will prevent any current drain on the battery. Of course, you will need to turn it back on again when you want to use the controller. Refer to *Zero Current Drain Installation* on page 10 for additional information.

7.3 Position the Control Module

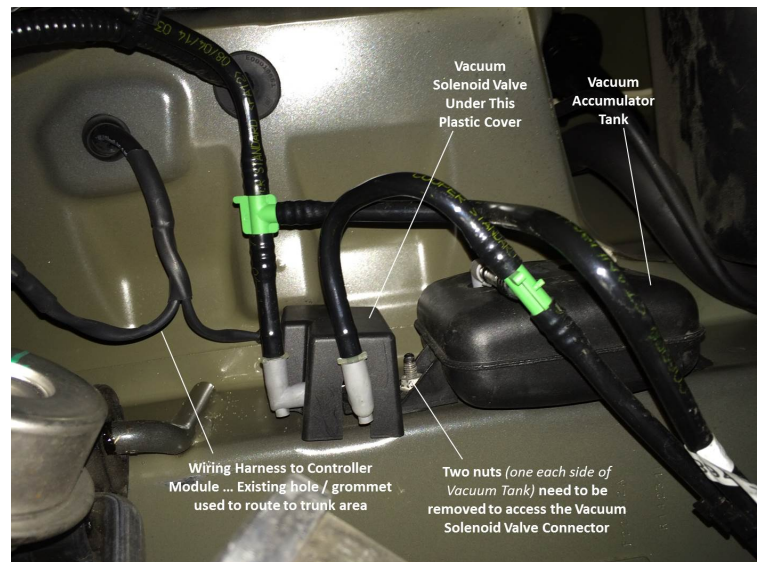
Locate the controller module in a location of your choice. A good location to install the control module is in the battery / spare tire well under the floor panel. This will give good access to the controller module so you can access the push-button Master On/Off switch without having to remove the side panel. Test the location that there is no interference when you position the panels that you removed earlier. Using the supplied 3M Dual Lock adhesive, mount the controller in position with the master On/Off switch facing up (refer to Connect the Control Wires and the Ground Wire on page 5 for photo).

If you prefer easier access to the master power switch, you may want to install the control module on the surface of one of the rear panels. Make sure it does not interfere with placement of items in the trunk. Installing on the surface will give you easier access to the power switch without removing the floor panel. If you opt to install for zero current drain, then it does not matter.

7.4 Install the Vacuum Solenoid Valve Control Cable

The vacuum solenoid valve is located on the right side of the car, just in front of the muffler.

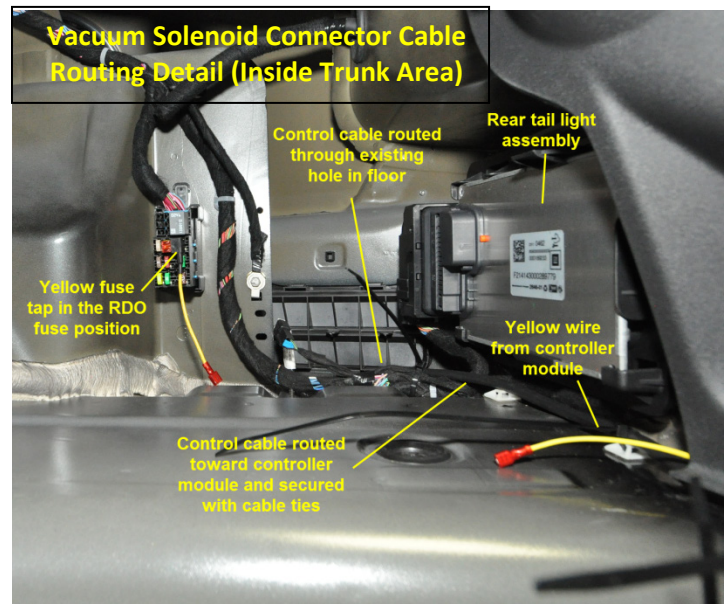
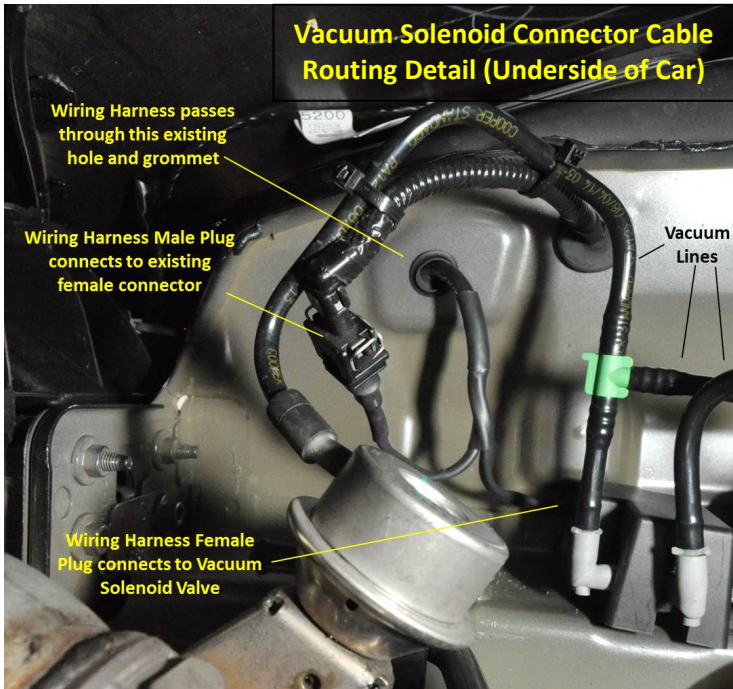
- Remove the nut securing the solenoid valve cover to vacuum accumulator tank mount.
- Remove the plastic cover from the vacuum solenoid valve.
- Disconnect the vacuum solenoid valve and connect the male plug to the existing wiring loom connector. Connect the female connector to the vacuum solenoid valve.
- Reinstall the vacuum solenoid cover. **Note: If the new connector cable causes interference with the solenoid cover, you can use a sharp utility knife to trim the plastic cover to provide clearance.**



- Route the control cable into the trunk of the car, through either the small existing small grommet shown in the photo above or through one of the larger access holes nearby
 - If using an existing rubber hole plug, with a sharp knife, cut a small cross in the center of the rubber membrane to route the cable through. There are several hole plugs in the floor of the car. We recommend the smaller one as shown in the photos.
 - Insert the control cable into the grommet and pull excess into the trunk area.

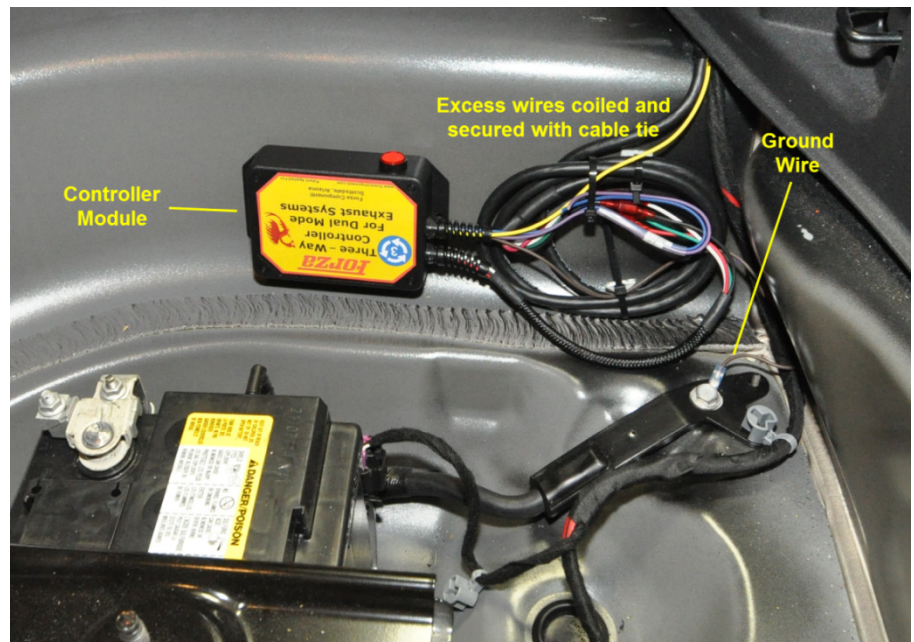


- Use some RTV silicone adhesive / sealer to secure the rubber grommet in place then secure the control cable to any convenient existing cabling or other fixture with some cable ties.
- Once you have the control cable into the interior of the trunk, route the cable to the controller module.



7.5 Connect the Control Wires and the Ground Wire

- The wires are color coded. Connect black, green, red and white wires to the corresponding connectors on the connection cable.
- Connect the yellow wire to the fuse tap using the extension wire.
- Connect the ground wire (brown wire with ring terminal) to a suitable ground location. Make sure you have a good ground. Many metal screws on a car may not actually provide a good ground.



- If you are using a manual switch instead of the remote control transmitter, make the following connections:
 - **Blue wire for Always Open**
 - **Violet wire for Always Closed**

Splice into the wire and route your wire to the contact on your manual switch. Ground the other contact to an appropriate ground. Refer to *Manual Switch Options* on page 13 or more information.

7.5.1 Special Note about Connecting the Control Module Ground Wire

When you connect the ground wire, a good place is as shown in the photo. We recommend you first disconnect the battery. When you reconnect battery, you will have to reprogram your power windows. See the Camaro owner's manual, *Programming the Power Windows ...* located on page 2-15 in the 2013 Edition of the Owner's Manual.



7.6 Check Electrical Continuity

Turn on the ignition. Using the Master On/Off switch on the controller module, turn on the controller. The LED indicator light on the switch should illuminate. If it does not, check the connections – ensure you have a good ground connection and that the polarity of the yellow fuse tap is correct.

7.7 Connect the Manual Switch Control Wires if Applicable, otherwise skip to next step.

If you intend to use the Manual Switch option, you must provide your own manual On/Off switches.

- Ensure that you have configured the control module for manual switch option. Refer to *Configure for Remote Transmitter or Manual Switch Operation* on page 2.
- Make the following connections:
 - **Blue wire for Always Open**
 - **Violet wire for Always Closed**
- Splice into the wires and route your wires to the contact on your manual switch. Ground the other contact to an appropriate ground. Refer to *Manual Switch Options* on page 13 for more information.

7.8 Verify Operation of the Controller

With the ignition turned on, use the remote control transmitter or the manual On/Off switch; verify operation by pressing the buttons on the transmitter or the switch. You should hear a faint clicking sound of the relays opening and closing inside the control unit module.

If you are using the included 4-button remote control transmitter, select the operational mode:

- **Button A** Normal Mode (stock operation)
- **Button B** Always Open
- **Button C or D** . . Always Closed



7.9 Reinstall the Fuse Block Cover

Replace the fuse block cover with the yellow wire accessible from outside the fuse block. You may have to trim some material from fuse block cover using a small utility knife to route the wire through the slot. Attempt to install the fuse block cover to test for interference with the fuse taps. If none, then snap the cover back in place. If there is interference when you attempt to re-install the fuse block cover, use cable ties to secure the fuse block cover in place over the fuses. Merely thread a cable tie to keep the cover to keep it in place.

As the fuse block is hidden away, there is no danger of compromising the fuses or the electrical connectors, but it is good idea to secure the fuse block cover in place as shown in the photo.





8. Corvette C6

8.1 Locate the Vehicle Fuse Block

The fuse block is located beneath the passenger foot board under the instrument panel.

- Locate the HTD SEAT/WPR RLY position.
- Remove the existing fuse and install it in the lower position of the yellow fuse tap included with controller kit. A 10A fuse should already be installed in the upper position of the yellow fuse tap
- Insert the yellow fuse tap into the HTD SEAT/WPR RLY position.

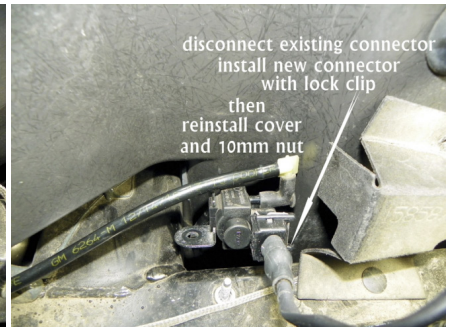
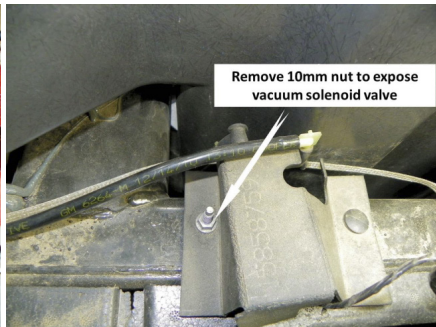
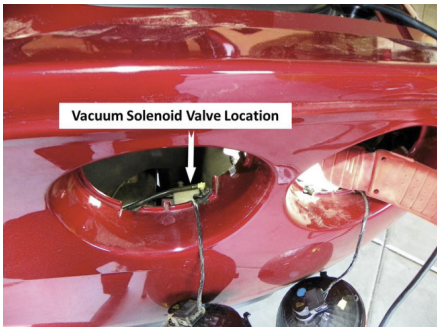


8.2 Position and Install the Controller Module

8.2.1 Remove both passenger side tail lights

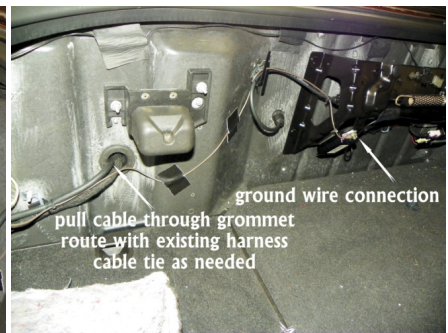
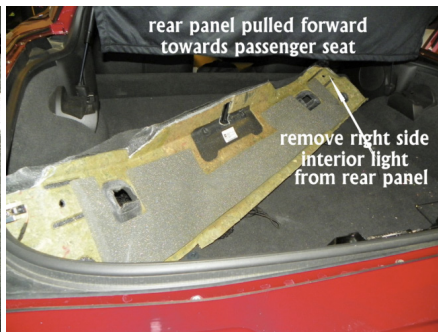
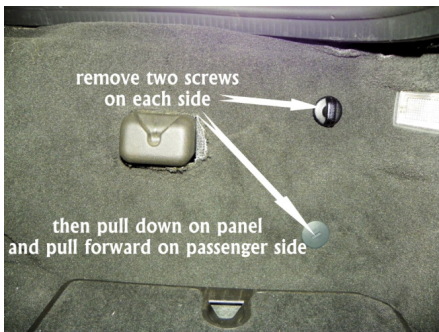
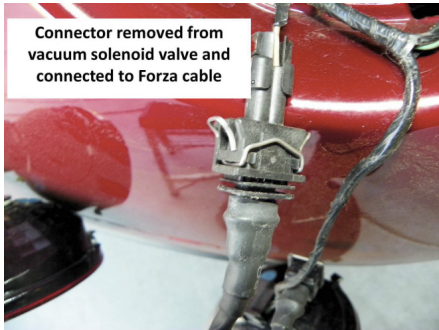


8.2.2 Connect Forza Cable to Vacuum Solenoid Valve



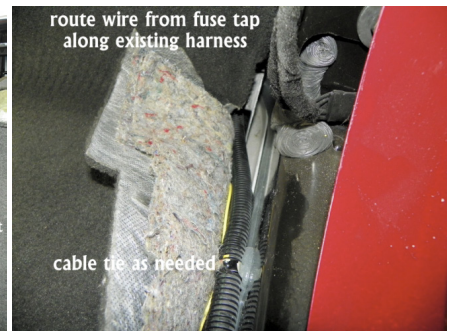
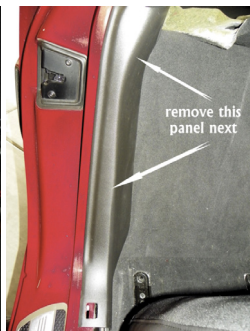
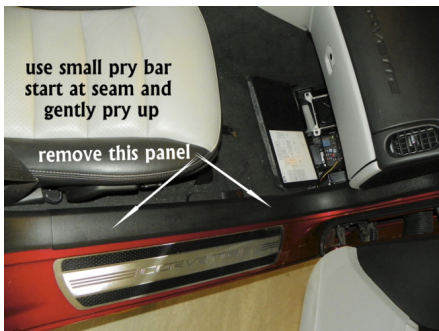


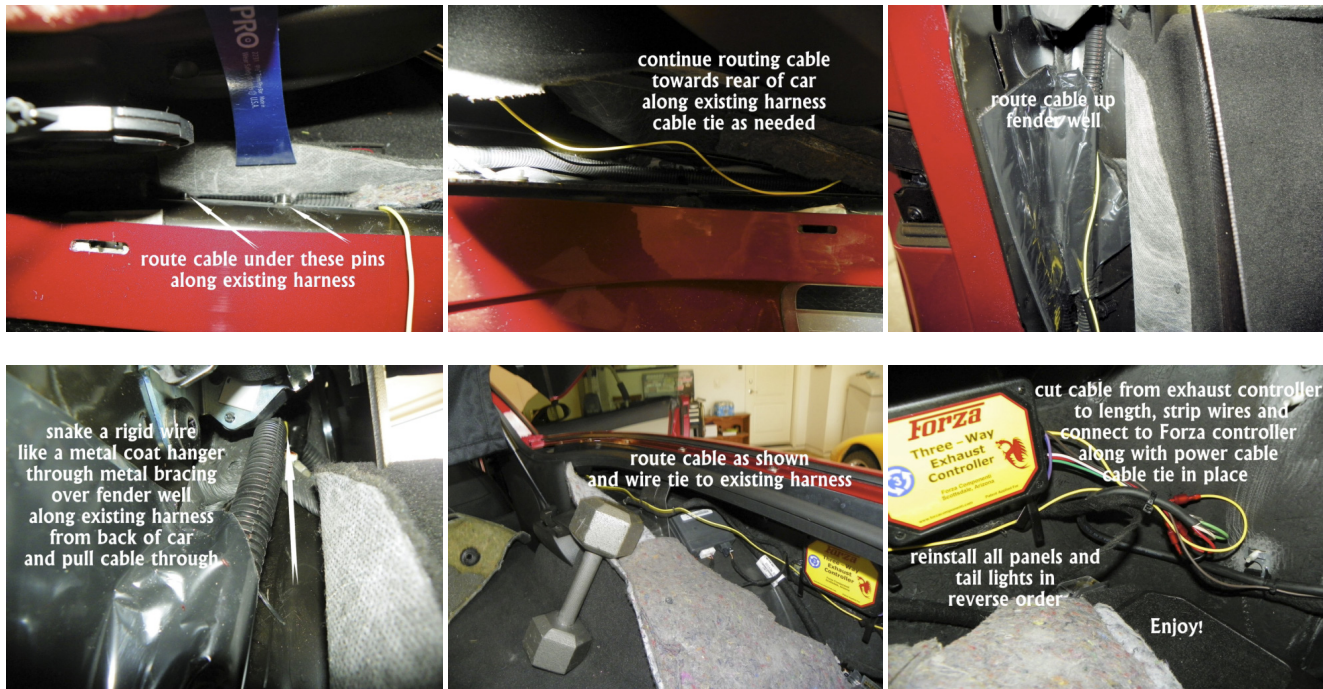
8.2.3 Route Forza cable and Install the Controller Module



8.2.4 Connect Forza Controller to power source

You will need to route a wire (that you will have to supply) from the fuse block where you installed the yellow fuse tap back to the controller module.





8.2.5 Verify Operation and Reinstall Panel

Once you have made the connections, verify the operation of the controller ... refer to Camaro Instructions for *Verify Operation of the Controller* on page 6 ... and then reinstall all panels in reverse order.

9. What is the “Always Closed” Option?

In normal conditions, leaving the vehicle under ECU control and maintaining lower engine RPM will generally close the exhaust bypass valves. However, there may be situations when you may want to completely disable the ECU from opening the valves. For example, if you track the vehicle and there are noise limitations in place at the track.

Note: When tracking the vehicle, the source of the vacuum (engine manifold) will likely have periods (which could be relatively long) when very low or no vacuum is produced to keep the bypass valves closed. This occurs when the throttle position is wide open. If you find that under wide open throttle positions your exhaust valves are opening, even though you have set the mode to Always Closed, you should diagnose the following:

- Check for any vacuum leaks. Check that if you pull a vacuum on the bypass valve actuators that they stay in the closed position until you release the vacuum.
- Check the vacuum accumulator tank is in good condition and does not leak. If you do not have an accumulator tank, you should install one.
- Is there a one-way check valve on the upstream side of the vacuum accumulator tank? There should be to prevent vacuum loss from the accumulator tank when wide open throttle. An in-line one-way check valve is simple and inexpensive to install.

Forza Componenti cannot guarantee that the Always Closed option will function under extreme conditions such as extended periods of time with wide open throttle as loss of vacuum is a physical characteristic of engine dynamics under these conditions. The loss of vacuum at the exhaust bypass valves will result in the valves opening.



10. Zero Current Drain Installation (Camaro Only)

The fuse block in the rear of the Camaro does not have any fuse locations that are switched with the ignition. When the yellow wire fuse tap is inserted, there will be a continuous current drain as long and the controller master power switch is on. The amount of current drain is small, but leaving the car unattended for an extended period of time could result in a drain that could deplete the battery more rapidly than otherwise. A typical battery will discharge to the point of not starting the car in about 80 to 100 days. The Forza controller’s current draw will add to the existing current draw that your vehicle is pulling when the ignition is off. In practical terms, this will hasten the discharge rate of the car’s battery when the vehicle is unattended. Depending on which button is pressed, the battery could be depleted to the point of not having sufficient charge to start the car in as little as 10 days.

Button A Pressed

30 to 50 days

Button B Pressed

25 to 40 days

Button C or D Pressed

10 to 25 days

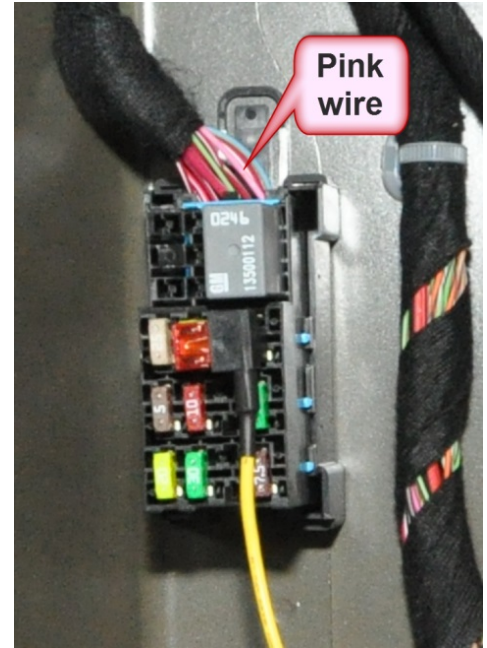
Estimated Time for Battery Depletion if Vehicle Left Unattended with Controller Turned On

Times are estimates only and are dependent on battery capacity and state of charge

If you start your car frequently, e.g., a daily driver, there should not be any problem with this current drain. However, if you leave your vehicle unattended for any extended period, we recommend that you either turn off the controller using the master On/Off switch or place your vehicle on a battery tender.

If you wish to have a zero current drain installation that is switched to the ignition, you will have to obtain the power for the controller (yellow fuse tap) from a power source that will provide this switching function. There is pink wire located at the rear fuse block that could be used for this purpose. If you are confident in your ability to tap into this wire, this wire can be used as a switched power source.

We do not recommend this action, however, if you wish to use this wire for the +12V power source, exercise caution and use high quality electrical components designed for automotive use. Using an insulation displacement electrical tap connector, you can splice the yellow power wire into the pink wire as shown in the illustration. Use an inline fuse if you take this approach.



Insulation Displacement Electrical Tap Connector

A better approach, and our recommendation, is to use a switched fuse location in the instrument panel fuse block. Install the yellow fuse tap in the same manner described in this document and route a wire back to the controller module to provide power. For example, the instrument panel fuse location F17 is a switched fuse for one of the power ports in your car. You can install the yellow fuse tap in this location and when you switch off the ignition, power will be interrupted to the controller module avoiding any additional current drain from the controller module.



11. Troubleshooting

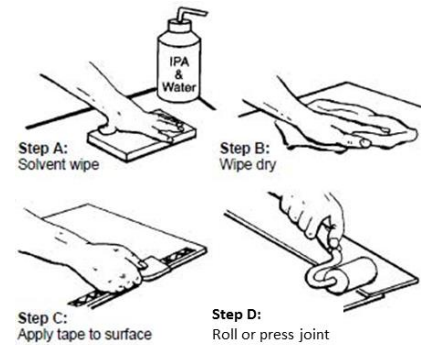
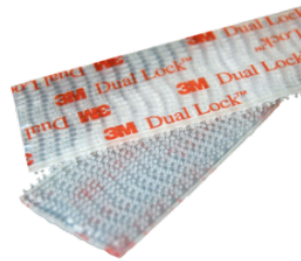
Indication	Possible Causes	Solution
<p>Pressing remote button has no effect. You cannot hear the relays opening or closing inside the controller module.</p>	<ul style="list-style-type: none"> • Ground wire not attached to good vehicle ground. • Fuse taps inserted wrong way causing reverse polarity • The controller module is configured to use the manual switch option. • The remote transmitter is not programmed to the controller module. • The remote transmitter has low battery 	<ul style="list-style-type: none"> • Disconnect ground wire from current location and connect to a ground point that you are sure provides continuity. • Check orientation of fuse tap. Reverse orientation and recheck to see if corrects problem. • Check the operation switch. If necessary, change the configuration on the controller module to use Remote option. • Perform the steps to program the transmitter to the controller module receiver. • Replace battery in remote transmitter • Program the remote transmitter to the control module
<p>The manual switch does not open or close the valves.</p>	<ul style="list-style-type: none"> • The controller module is configured to use the Remote option. • The manual switch is not connected properly. • Fuse taps inserted wrong way causing reverse polarity 	<ul style="list-style-type: none"> • Change the configuration of the controller module to use Manual option. • Check continuity of the wiring to the manual switch. Make sure the ground side of the switch is connected to a good ground point on the car. • Check orientation of fuse tap. Reverse orientation and recheck to see if corrects problem.
<p>The always closed option does not close the valves.</p>	<ul style="list-style-type: none"> • Your car requires Mode 2 operation and the mode switch is set for this position. The always closed option functions only with Mode 1 • The manual switch for the Always Closed option is not connected properly. • Loss of vacuum at the exhaust bypass valves 	<ul style="list-style-type: none"> • You cannot use the Always Closed option in Mode 2 • Check continuity of the wiring to the Always Closed circuit. Make sure the ground wire is connected to a good ground point on the car. • Check vehicle vacuum connections. Refer to <i>What is the "Always Closed" Option?</i> on page 9



12. 3M Dual Lock Fastening Tape

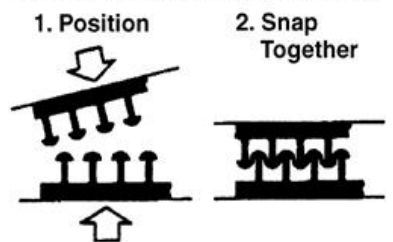
Included in your kit are two strips of 3M Dual Lock fastener material.

- 3M TB3560 Type 250 Dual Lock Re-closable Fastener
- Rated for use in severe environments
- Very good holding power and able to release and re-use
- Thoroughly clean both surfaces of dirt and oil using a solvent that does not leave residue such as isopropyl alcohol.
- Apply Dual Lock to both substrate surfaces.



Mount a strip on the bottom surface of the controller module. Lightly press the other strip on this piece ... just enough to hold in place. Now position the controller in place. Gently apply pressure to stick the mating piece in place on the mounting surface. This will assure proper alignment of the two Dual Lock pieces. Once positioned, you can take the controller off and then press the each piece on the mounting surface in place to assure a firm hold. Press each mounting piece on to the substrate. It will fully set in about an hour, but it should be fine to use immediately. Press the controller in place until you hear or feel a click.

Dual Lock Fasteners Attachment

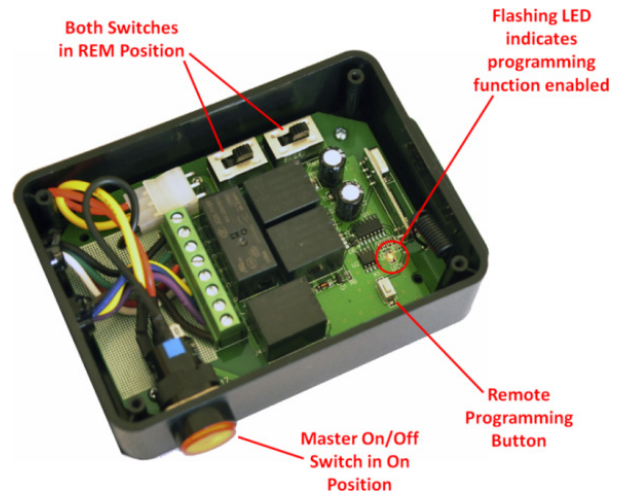


Press until you hear or feel a "click"

13. Adding or Replacing a Remote Transmitter

If you are adding or changing the key fob remote, you must program the control module receiver unit to recognize the new remote transmitter.

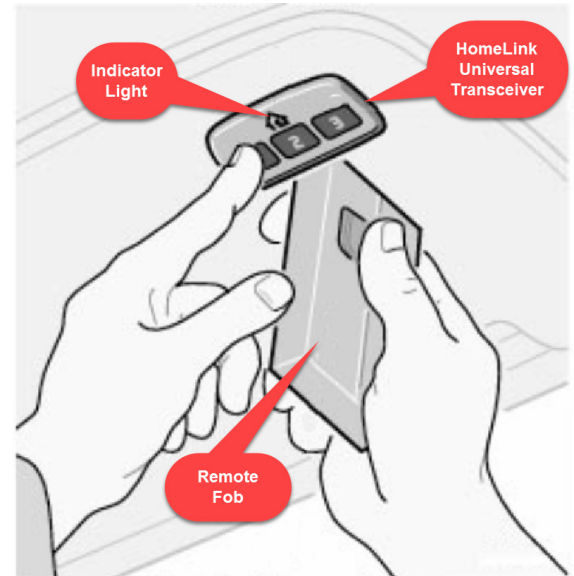
- Remove the lid from the control unit.
- Turn on the vehicle ignition to ensure power to the control unit and press the push button power switch to the 'On' position. Verify power is push button switch LED is illuminated.
- Place both Man/Rem switches to the Rem position.
- While holding the key fob, momentarily press the "remote programming button" on the circuit board. The LED should flash.
- If you press and hold the programming button for a few seconds, you will erase all memory of any transmitters. If this occurs, then you must re-program all transmitters.
- Immediately after pressing the learn button, while the LED is flashing, press a button on the remote transmitter. The LED on the control unit should go out.
- Your transmitter should now be programmed to the control module.
- Repeat for additional transmitters.
- Verify operation of all transmitters and replace the control unit lid.



14. Using the Controller with Homelink Systems

The Homelink installed in the vehicle must support 433MHz. Some Homelink systems do not support this frequency (e.g., prior to 2014 in North America). The actual programming for the Homelink may vary by vehicle. Refer to your vehicle's owner manual for specific instructions on setting up the system.

In general, to program Homelink, press and hold the Homelink button you wish to program and hold until an indicator light slowly flashes. While the Homelink light is slowly flashing, hold the remote fob within a few inches of the Homelink. Press the transmit button on the fob for 3 to 5 seconds, then release and immediately press again. The sequence of pressing and releasing the fob button will prevent the fob transmitter from timing out before the Homelink can successfully clone the signal. Continue pressing and releasing the fob button until the Homelink indicator lamp goes solid or flashes rapidly. You will need to program one button on the Homelink for each function button on the transmitter fob.



15. Manual Switch Options

Installation of a manual switch to control the exhaust bypass valves is an excellent alternative to using the remote control transmitter as it will provide higher reliability and durability and eliminate risk of losing the remote control transmitter. However, routing a wire to a switch in passenger compartment and installing a manual switch requires more effort than using the remote transmitter. On modern vehicles, finding a location may be difficult. If you have an unused location, you can install a switch that matches the other switches on your car. Otherwise, you may wish to use a switch such a miniature toggle or rocker switch that you can install in an out-of-way location such as the center console or in ash tray.

Placement of a manual On/Off switch is only limited by your imagination. Some alternative positions include under the steering column or the driver seat.



**Miniature SPDT Toggle Switch
mounted in ash tray**



15.1 Controlling both Always Closed and Always Open with One Switch

If you intend to use a switch for the Always Open and Always Closed options, we recommend a 3-position, SPDT or DPDT switch. Here is an illustration of how you could utilize a one of these switch types to control both the Always Open and the Always Closed functions with a single switch. You could also use a SPDT toggle switch as well ...

Sea Dog 40253-1
Illuminated DPDT
Rocker Switch
On-Off-On



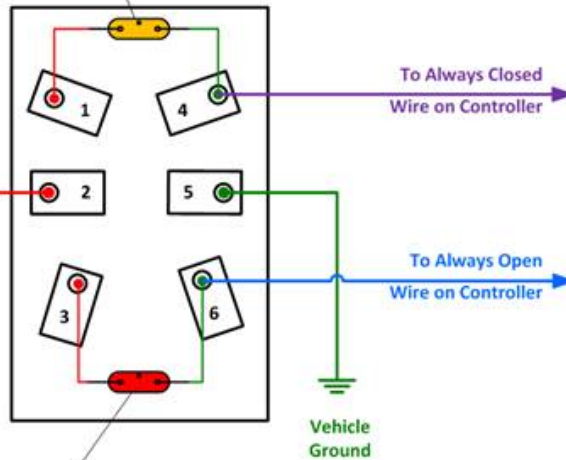
Parts Express
Model 66-2257
SPDT Rocker Switch
On-Off-On



Amber light is wired internally like this. Do not connect any additional external wires.

Tap into any suitable power source for +12V ... used to provide power to illumination lamps only.

+12 V



Red light is wired internally like this. Do not connect any additional external wires.