

2010-2014 S197 Mustang Cruise & Audio Button Box Installation Guide

2010-2014 Mustang
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Thank you for purchasing the Accutach Co. Cruise & Audio Button Box for 2010-2014 S197 Ford Mustangs. It is designed to allow you to repurpose the mode, cruise or audio control buttons on your stock steering wheel to control other automotive accessories.



WARNINGS and DISCLAIMERS:

You use this product at your own risk. Accutach Company is not responsible for personal injury or property damage resulting from the use of this product. While it is possible to use a switch in the steering wheel control wires to switch the cruise or audio control button function from cruise or audio control to accessory control and back again, Accutach Company strongly recommends that users permanently change the button functions from cruise or audio control to control of your accessory. Should you choose to use a switch, you must make certain that you know what state the switch is in. If the vehicle is in accessory control mode, and you try to control your cruise control system or your audio system, your accessories will be turned on instead. Damage and accidents resulting in serious injury or death can occur. For example, if you activate a transbrake or a line-lock unit at driving speeds, very bad things can happen.

Do not touch the air bag wiring as you modify the radio control wiring near the steering column. Disconnect the battery and wait long enough for the capacitors to discharge before working on the installation in order to avoid accidental airbag deployment. See your car's service manual for the official airbag safety procedures. Failure to do so could result in severe injury or death.

We strongly recommend making wire connections with solder & shrink tubing, although properly made crimp splices can also be reliable. We do not recommend using "Scotch Lock" style connections for our products. Do not use the "twist & tape" method of connecting wires.

Before you begin:

You will need to identify a switched battery voltage power supply wire to splice into for power for the Cruise & Radio Button Box, and you will need a good chassis ground to ground the unit.

You will also need to locate a suitable place to install the unit inside of the vehicle's cabin, most likely under the dash or in the console near the shifter. It is not intended for use in the engine compartment or anywhere outside of the vehicle. If you wish to create a custom mounting bracket out of ABS plastic you can cement it to the ABS box with standard ABS cement from a hardware store.

2010-2014 Mustang Steering Wheel Button Background Information

There are up to three sets of momentary on pushbuttons on 2010-2014 Mustangs, depending on the options the car came with. One set of 4 or 5 pushbuttons are for the cruise control system, one set of 5 pushbuttons are for part of the audio system, and a final set of 3 pushbuttons are for the audio system mode. Each set of pushbuttons are multiplexed onto one signal wire, resulting in three signal wires in a fully loaded car.

The 4-5 cruise control buttons are: OFF*, ON*, SET+, SET- and RSM (for Resume)

The 5 audio control buttons are: MEDIA, SEEK+, SEEK-, VOL+ and VOL-

The 3 mode control buttons are: PHONE, OK and VOICE

(* 2013-2014 cars do not have an ON button and the OFF button was renamed to ON/OFF)

You must repurpose all of the buttons in one group since they share the same signal wire.

In the S197 Mustangs, the steering wheel pushbutton wires are shared on the same clockspring mechanism as the driver's steering wheel airbag system, so be very careful when installing the Cruise & Audio Button Box. Disconnect the battery and wait long enough for the capacitors to discharge before working on the installation in order to avoid accidental airbag deployment. See your car's service manual for the official airbag safety procedures. Failure to do so could result in severe injury or death.

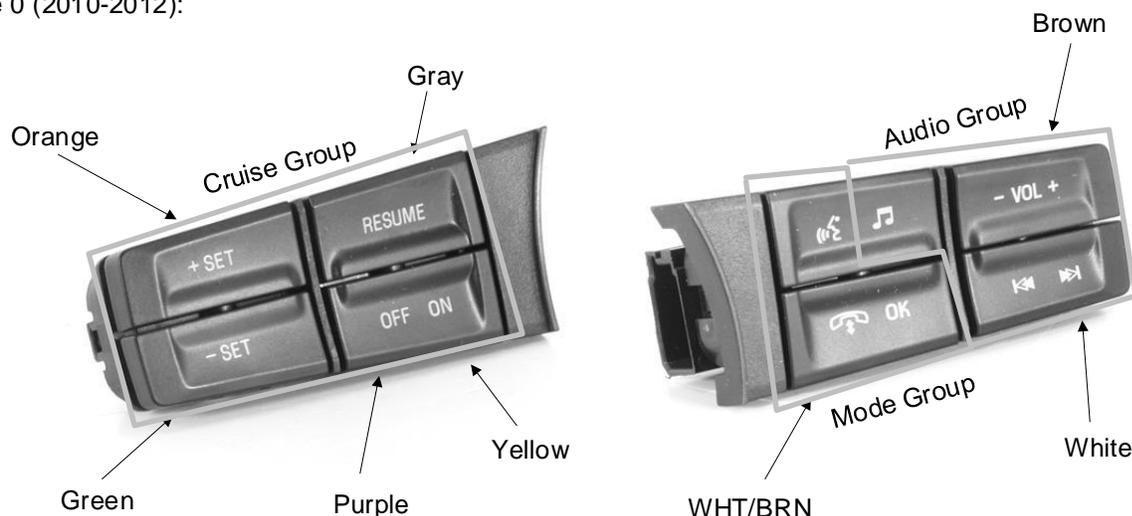
Planning Your Installation

You will need to decide which steering wheel pushbuttons you want to repurpose and what accessories they will control. If you need to control an accessory with a toggle switch function rather than a momentary-on function, you will need to decide if you want to use one pushbutton to turn it on and the same button to turn it off. Alternatively, you can have one button turn it on and another button turn it off. Accutach Co. sells auxiliary boxes that can implement such toggle on-off functions. You can read about them here: https://img1.wsimg.com/blobby/go/1975f84f-4935-4131-8404-5a914da1afb7/downloads/1c2pkjs2u_541911.pdf and here: https://img1.wsimg.com/blobby/go/1975f84f-4935-4131-8404-5a914da1afb7/downloads/1c2pl1v81_301699.pdf

There are 8 relays in the S197 Cruise & Audio Button Box, and 3 inputs. This Box has 6 modes: 0, 1, 2, 3, 4 & 5. The even modes (0,2,4) are for use with 2005-2012 cruise control buttons and the odd modes (1,3,5) are for use with 2013-2014 cruise control buttons. Modes 0 & 1 repurpose more left hand buttons, Modes 2 & 3 repurpose more right hand buttons and Modes 4 & 5 repurpose buttons more equally. Note that 2005-2009 Mustangs only have cruise control buttons. People with 2005-2009 Mustangs or those who only want to repurpose the cruise control buttons should order the less expensive 05-14 Mustang Cruise Button Box instead of this one. You will need to decide which of the modes below that you want to use.

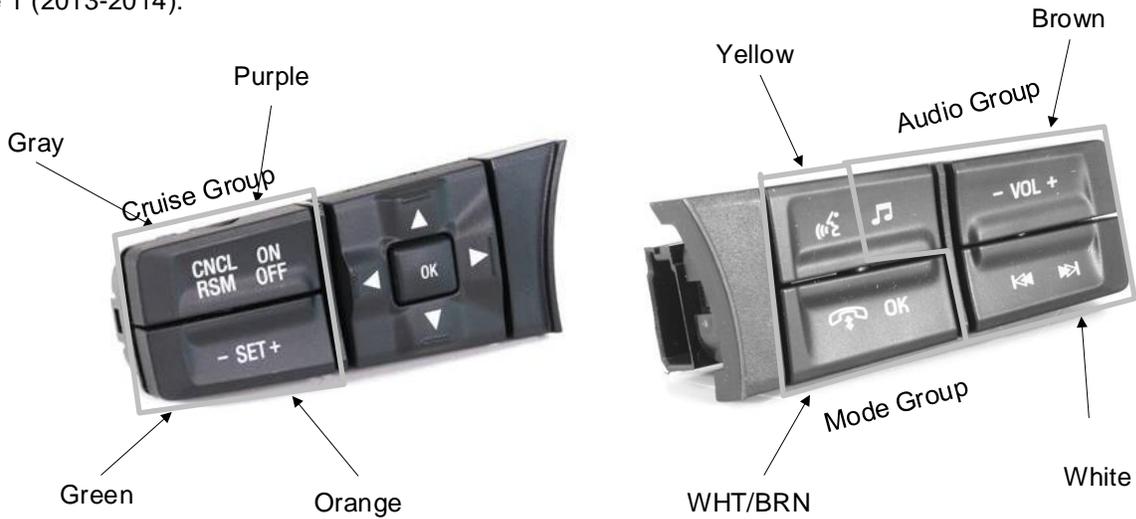
Here are the buttons repurposed in each mode along with the color of the wire pair controlled by each button:

Mode 0 (2010-2012):



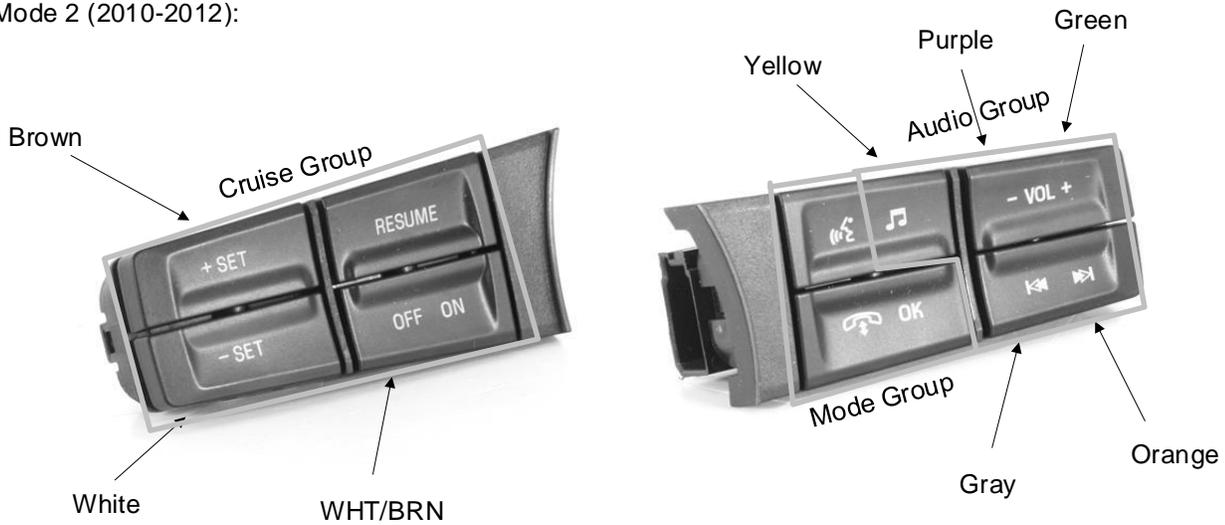
Three buttons can be pressed at the same time, one from each group. If two buttons are pressed within one group, only the button in that group with the lowest resistance will work.

Mode 1 (2013-2014):



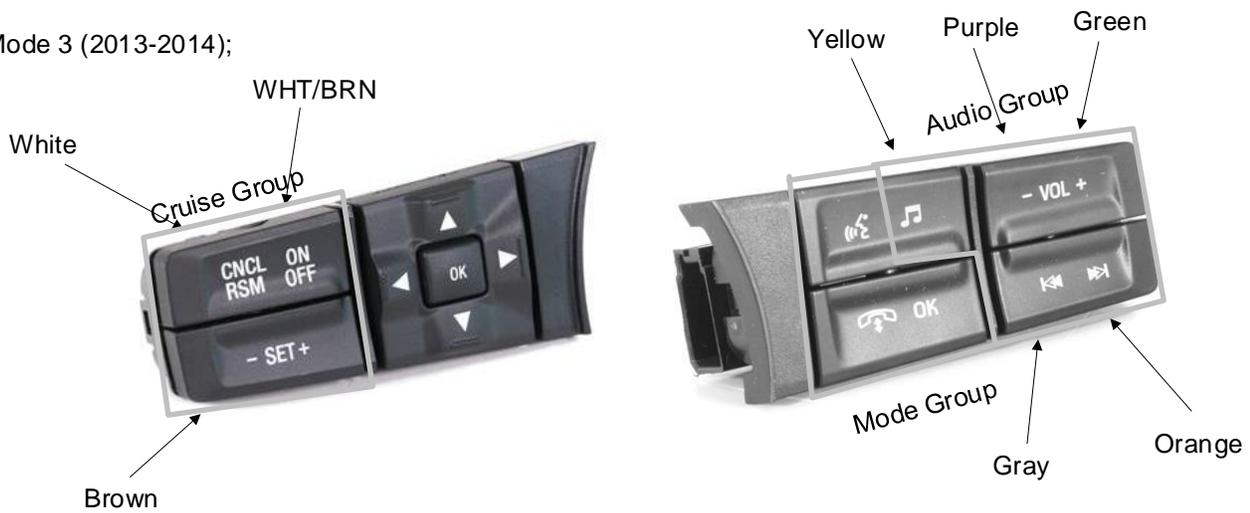
Three buttons can be pressed at the same time, one from each group. If two buttons are pressed within one group, only the button in that group with the lowest resistance will work.

Mode 2 (2010-2012):



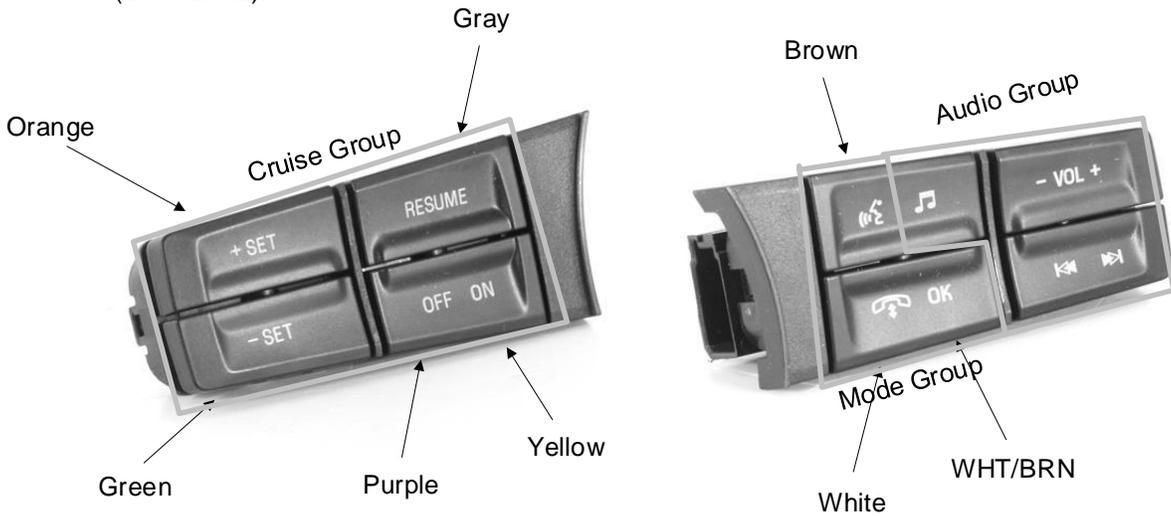
Two buttons can be pressed at the same time, one from each group. If two buttons are pressed within one group, only the button in that group with the lowest resistance will work.

Mode 3 (2013-2014):



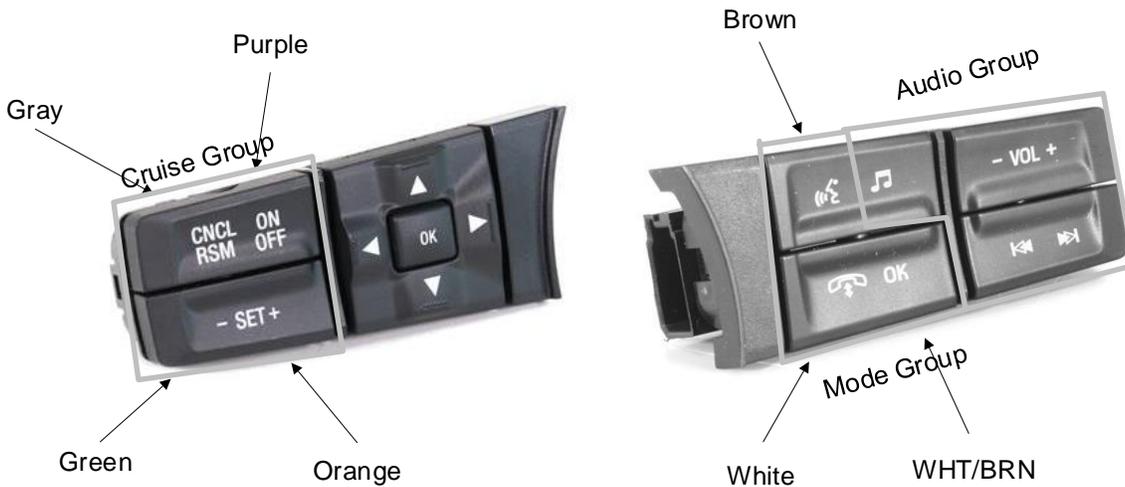
Two buttons can be pressed at the same time, one from each group. If two buttons are pressed within one group, only the button in that group with the lowest resistance will work.

Mode 4 (2010-2012):



Two buttons can be pressed at the same time, one from each group. If two buttons are pressed within one group, only the button in that group with the lowest resistance will work.

Mode 5 (2013-2014):

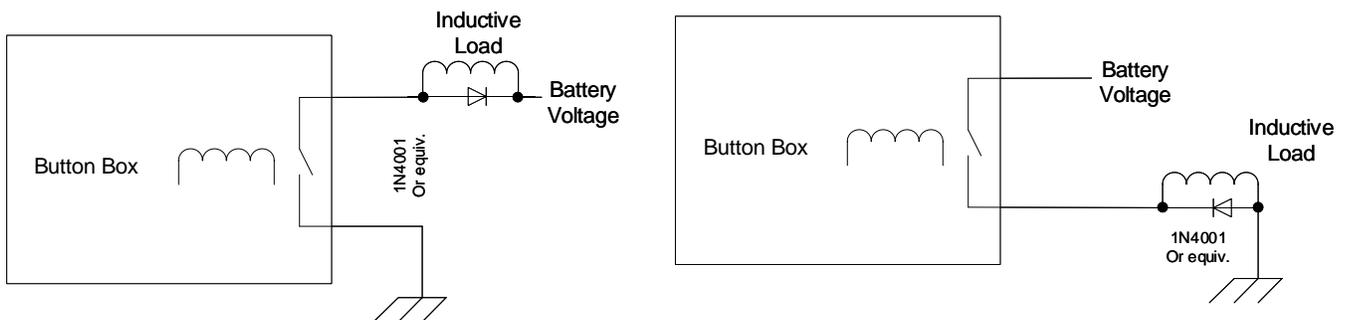


Note: The Yellow wires are not used in Mode 5.

Two buttons can be pressed at the same time, one from each group. If two buttons are pressed within one group, only the button in that group with the lowest resistance will work.

Custom button patterns are available for an extra charge. Please contact Accutach Co. with your request.

The relays in the boxes are rated to 1A of current. If you need to control something that draws more than 1A of current, you must use the output of the Box to control a standard high power automotive relay. When driving an inductive load such as a relay or solenoid, you should use a diode such as a 1N4001 or equivalent to protect the relay contacts from the collapsing magnetic field of the coils when the output relays open:



Locating the Cruise and Audio Control Signal Wires

You will need to access the cruise and audio signal wires that run from the clockspring mechanism in the steering column to the cruise and audio systems. The best place to locate these wires is in the steering column just under the clockspring mechanism. The clockspring mechanism connector is C2274. C2274 is a 16 pin connector on 2010-2014 cars.

Here are the connector pin assignments for C2274 on 2010-2014 cars:

Pin 1: VT/BN - Driver Front Airbag #1 Feed (Don't mess with this wire)

Pin 2: BU - Driver Front Airbag #2 Feed (Don't mess with this wire)

Pin 3: ??

Pin 4: WH/VT - PHONE, OK, VOICE Return (Grounded via audio system)

Pin 5: BK/VT - Horn Ground

Pin 6: BU/OG - PHONE, OK, VOICE Signal (This is one of the wires you want to use)

Pin 7: ??

Pin 8: BU/WH - Horn Signal, Switch Illumination

Pin 9: YE/GN - Driver Front Airbag #1 Return (Don't mess with this wire)

Pin 10: WH - Driver Front Airbag #2 Return (Don't mess with this wire)

Pin 11: ??

Pin 12: BN/GN - MEDIA, SEEK, VOL Return (Grounded via audio system)

Pin 13: GY/YE - MEDIA, SEEK, VOL Signal (This is one of the wires you want to use)

Pin 14: GN/BN - Cruise Control Button Return (Grounded via the PCM)

Pin 15: WH - Cruise Control Button Signal (This is one of the wires you want to use)

Pin 16: VT/GY - Switch Illumination Power

Legend: BK Black, BN Brown, BU Blue, DB Dark Blue, DG Dark Green, GN Green, GY Gray, LB Light Blue, LG Light Green, NA Natural, OG Orange, PK Pink, RD Red, SR Silver, TN Tan, VT Violet, WH White & Ye Yellow.

Cruise Signal Wire: In order to use the cruise control buttons, you must locate the WH cruise button signal wire that goes to Pin 15 on connector C2274.

Mode Signal Wire: In order to use the audio mode PHONE, OK & VOICE buttons, you must locate the BU/OG signal wire that goes to Pin 6 on connector C2274.

Radio Signal Wire: In order to use the audio MEDIA, SEEK & VOL buttons, you must locate the GY/YE signal wire that goes to Pin 13 on connector C2274.

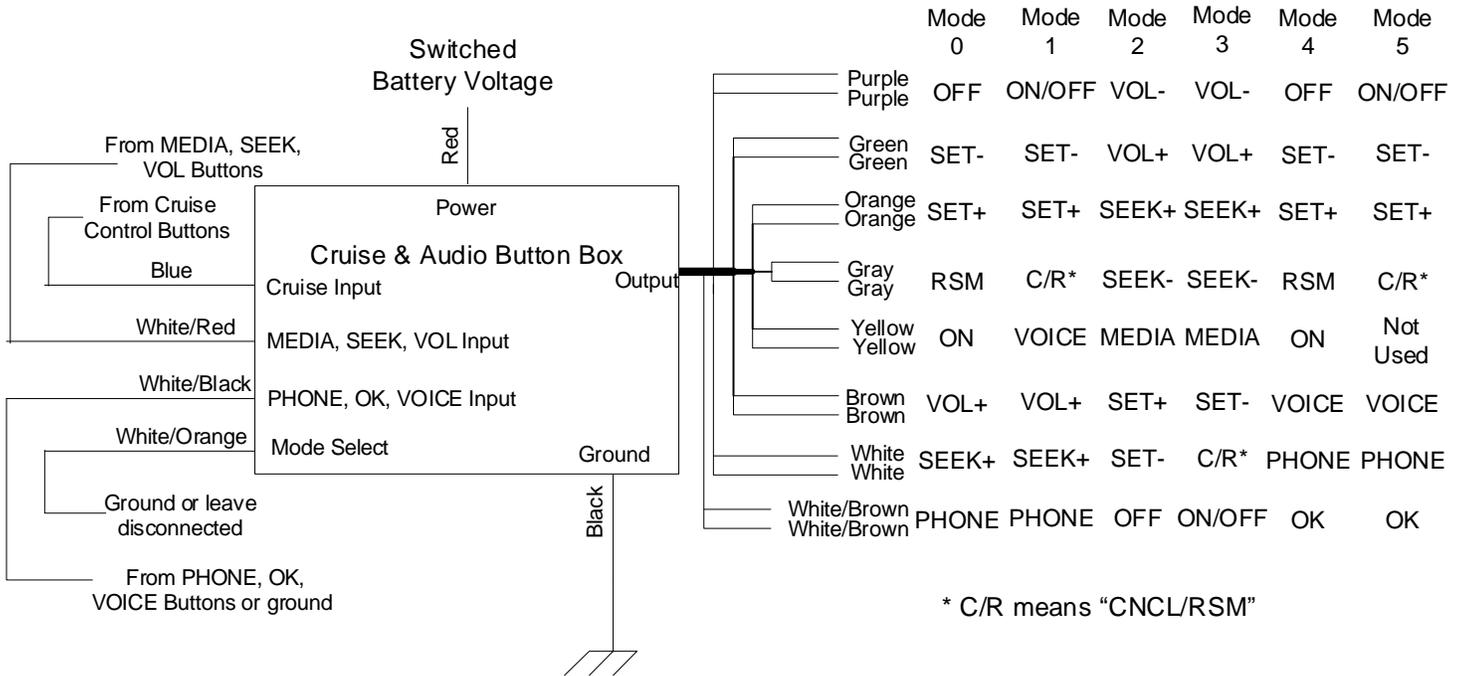
Do not use the signal return wires as the power ground for the Box. However, you can use the Horn ground wire as the power ground for the Box.

If the Audio System has been removed from the car, You will also need to ground the WH/VT Mode signal return wire and the BN/GN Radio signal return wire.

Please see your vehicle's service manual to learn how to get access to the steering column wiring harnesses below the clockspring mechanism.

Wire Descriptions

In addition to the power and ground wires, there are 4 input wires and 16 output wires. The White/Orange Mode Select wire, the White/Red Radio input wire and the White/Black Mode Input wire determine the mode of operation. Mode 0 is selected by not grounding any of the input wires. Mode 1 is selected by grounding only the White/Orange Mode Select wire. Mode 2 is selected by grounding the White/Black Mode signal wire only. Mode 3 is selected by grounding both the White/Orange Mode Select wire and the White/Black Mode Signal wire. Mode 4 is selected by grounding only the White/Red Radio signal wire. Mode 5 is selected by grounding both the White/Orange Mode Select wire and the White/Red Radio Signal wire.



Installing the Cruise & Audio Button Box

You will need to cut the previously located signal wire(s) for the buttons that you intend to repurpose. Only Modes 0 & 1 require all 3 signal wire be cut. After you have cut them, it would be a good time to test the steering wheel switches to ensure they are working well:

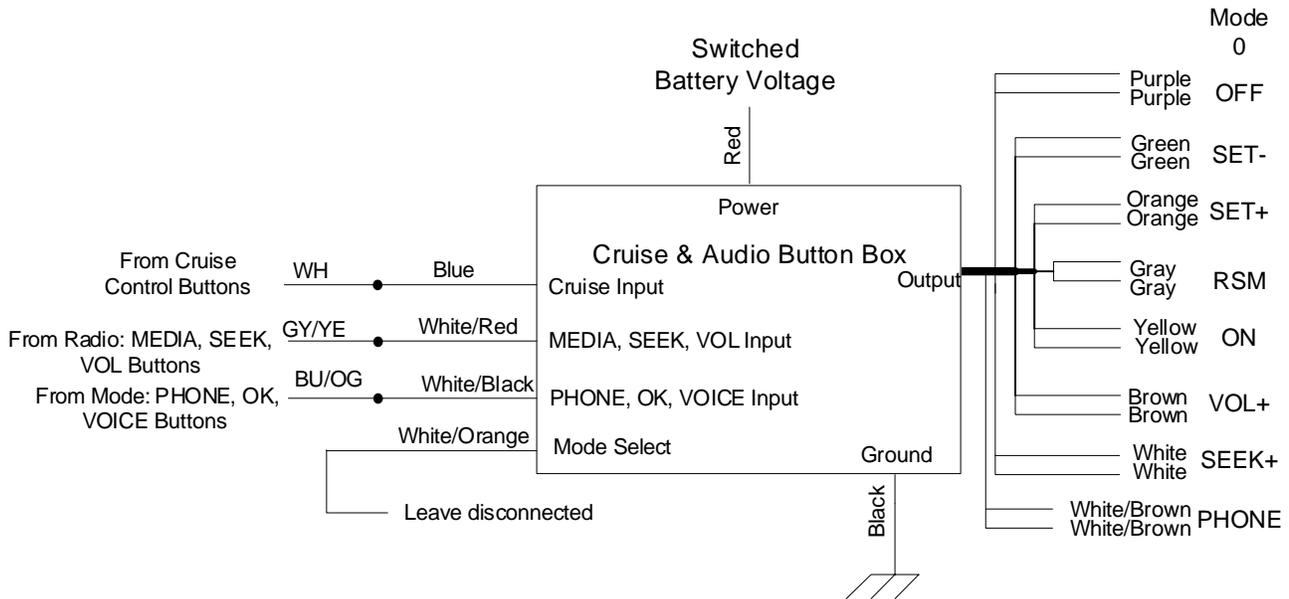
Connect an ohmmeter across the signal wire that goes into the clockspring mechanism and a good chassis ground. Test the resistance with no buttons pushed, and then with each button pushed. You should see resistances close to the ones listed below: (2013 & 2014 Mustangs do not have the ON button. They use the OFF button for the OFF and ON functions.)

10-12 Cruise	Ohms	13-14 Cruise	Ohms	Radio	Ohms	Mode	Ohms
None	4323			None	1116		
ON	2113	None	2814	MEDIA	512	None	1110
RSM	1113	CNCL/RSM	604	SEEK-	338	PHONE*	506
SET+	602	SET+	303	SEEK+	214	OK	332
SET-	301	SET-	121	VOL+	123	PHONE*	117
OFF	0	ON/OFF	0	VOL-	55	VOICE	51

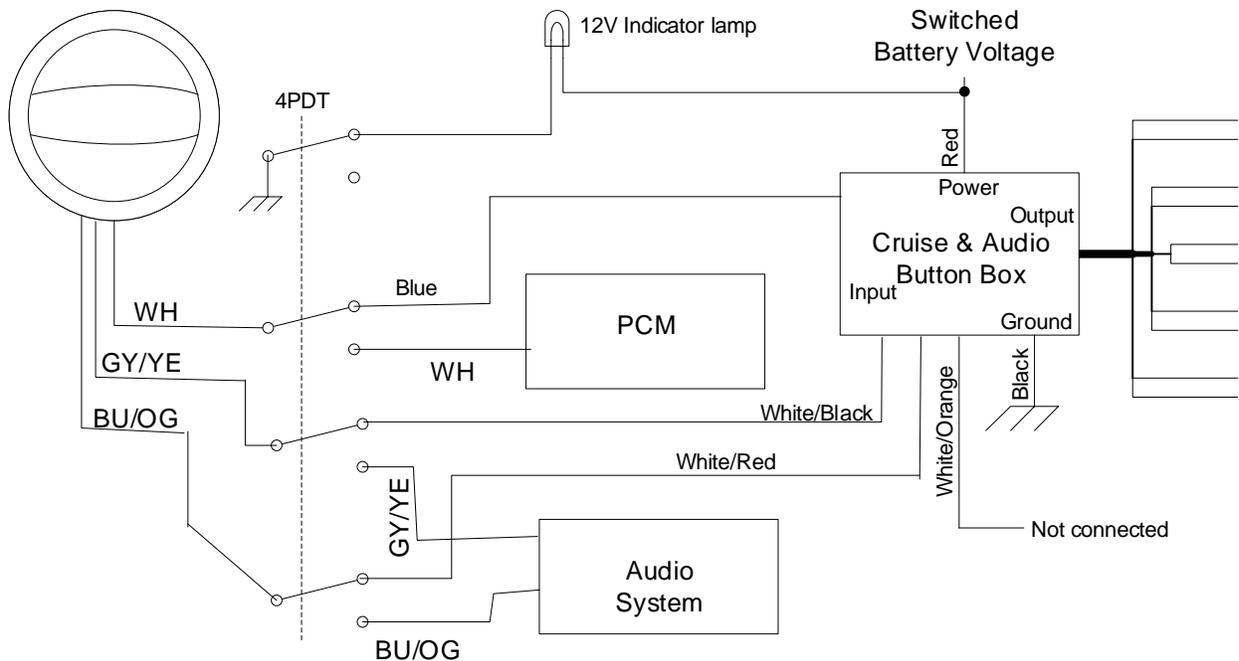
* Some switch modules will have the lower PHONE resistance and others will have the higher PHONE resistance, if Navigation equipped or not. Your module should have one or the other of those two PHONE resistances but not both.

2010-2012 Mode 0 Wiring

Splice the WH wire (previously cut) that goes up into the clockspring mechanism to the Blue button box input wire. Splice the GY/YE wire (previously cut) that goes up into the clockspring mechanism to the White/Red button box input wire. Splice the BU/OG wire (previously cut) that goes up into the clockspring mechanism to the White/Black button box input wire. Unless you are using a switch, (against our recommendation) use shrink tubing on the unused ends of the WH, GY/YE & BU/OG wires to prevent them from shorting on anything and affecting your cruise and audio systems. Do not connect the White/Orange wire to anything.

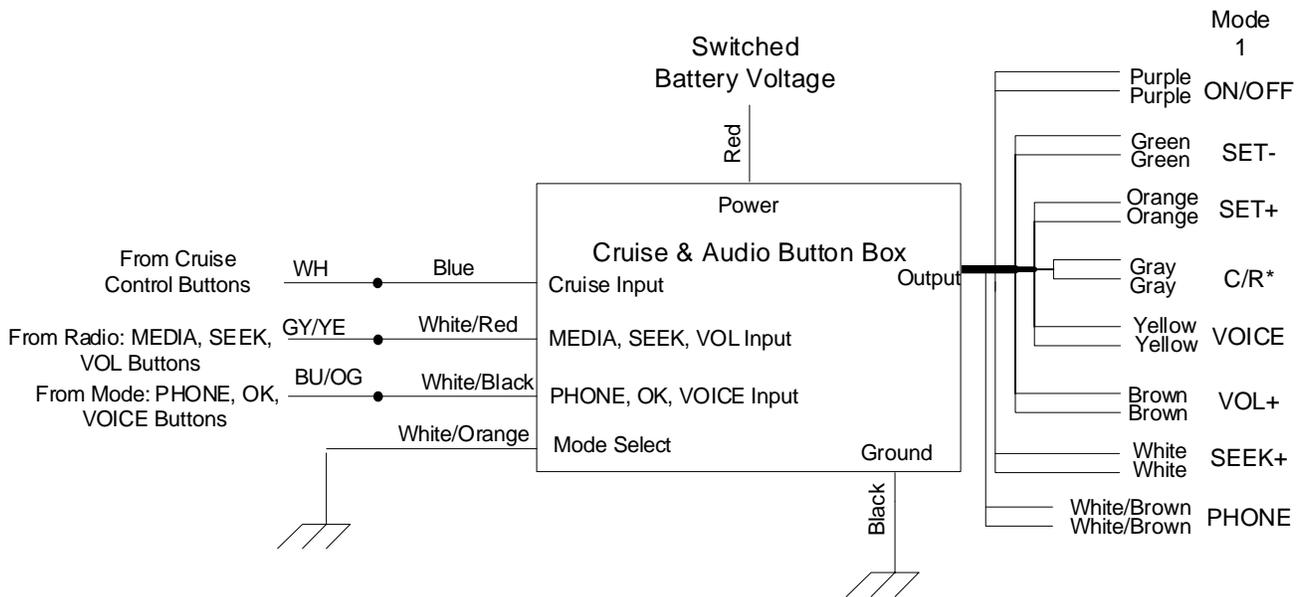


If you choose to go against our recommendations and install a switch to select use between cruise and audio control and an accessory for the cruise and audio control buttons, you should include an indicator light or LED that indicates if you are in Race Mode or Street Mode. The switch is a 4 Pole, Double Throw (4PDT) switch. Remember you can damage your car and risk serious injury or death if you have the switch in Race mode and try to use your cruise or audio control buttons while not racing.



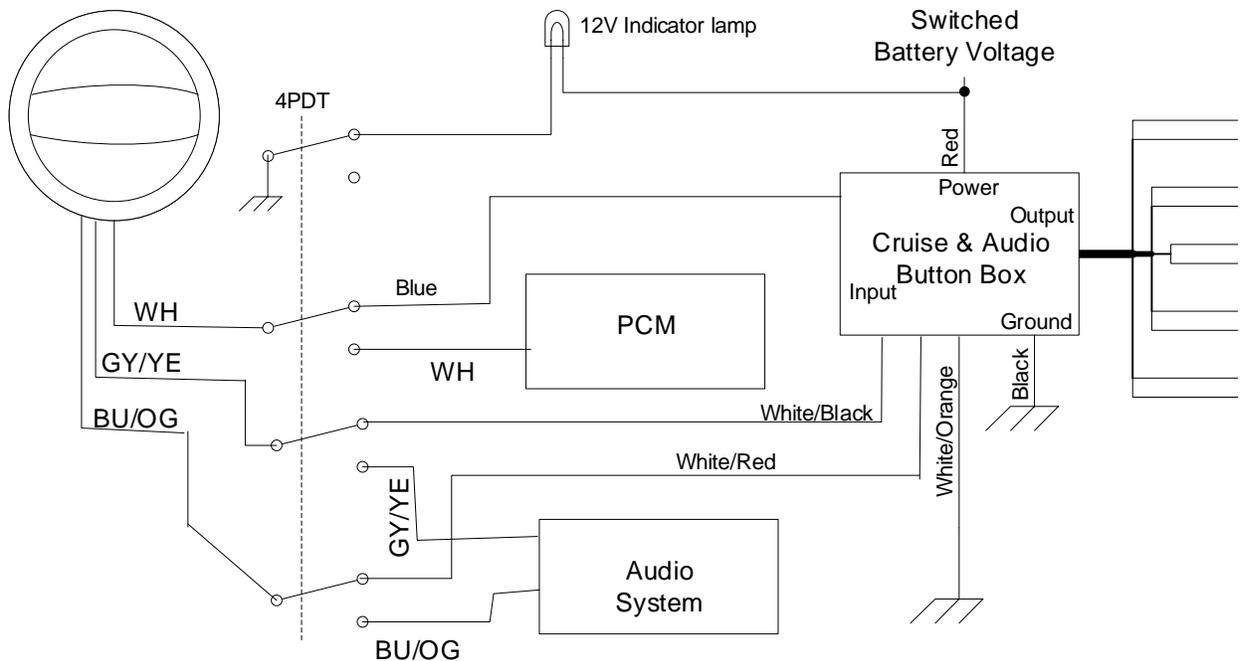
2013-2014 Mode 1 Wiring

Splice the WH wire (previously cut) that goes up into the clockspring mechanism to the Blue button box input wire. Splice the GY/YE wire (previously cut) that goes up into the clockspring mechanism to the White/Red button box input wire. Splice the BU/OG wire (previously cut) that goes up into the clockspring mechanism to the White/Black button box input wire. Unless you are using a switch, (against our recommendation) use shrink tubing on the unused ends of the WH, GY/YE & BU/OG wires to prevent them from shorting on anything and affecting your cruise and audio systems. Ground the White/Orange wire.



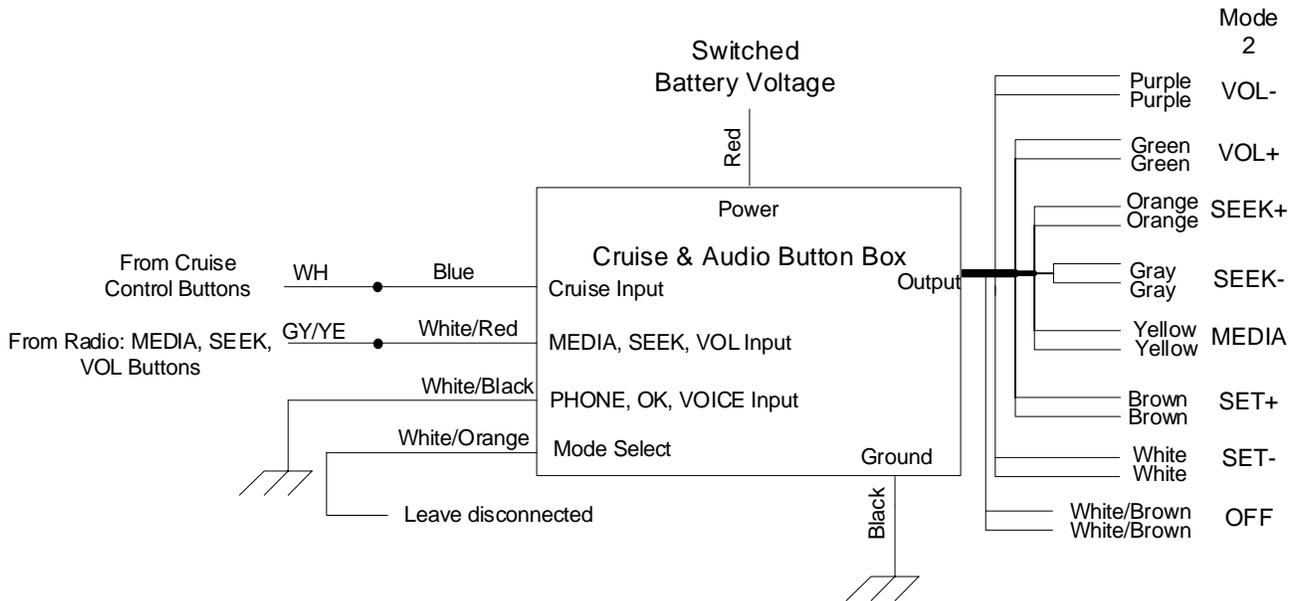
* C/R means "CNCL/RSM"

If you choose to go against our recommendations and install a switch to select use between cruise and audio control and an accessory for the cruise and audio control buttons, you should include an indicator light or LED that indicates if you are in Race Mode or Street Mode. The switch is a 4 Pole, Double Throw (4PDT) switch. Remember you can damage your car and risk serious injury or death if you have the switch in Race mode and try to use your cruise or audio control buttons while not racing.

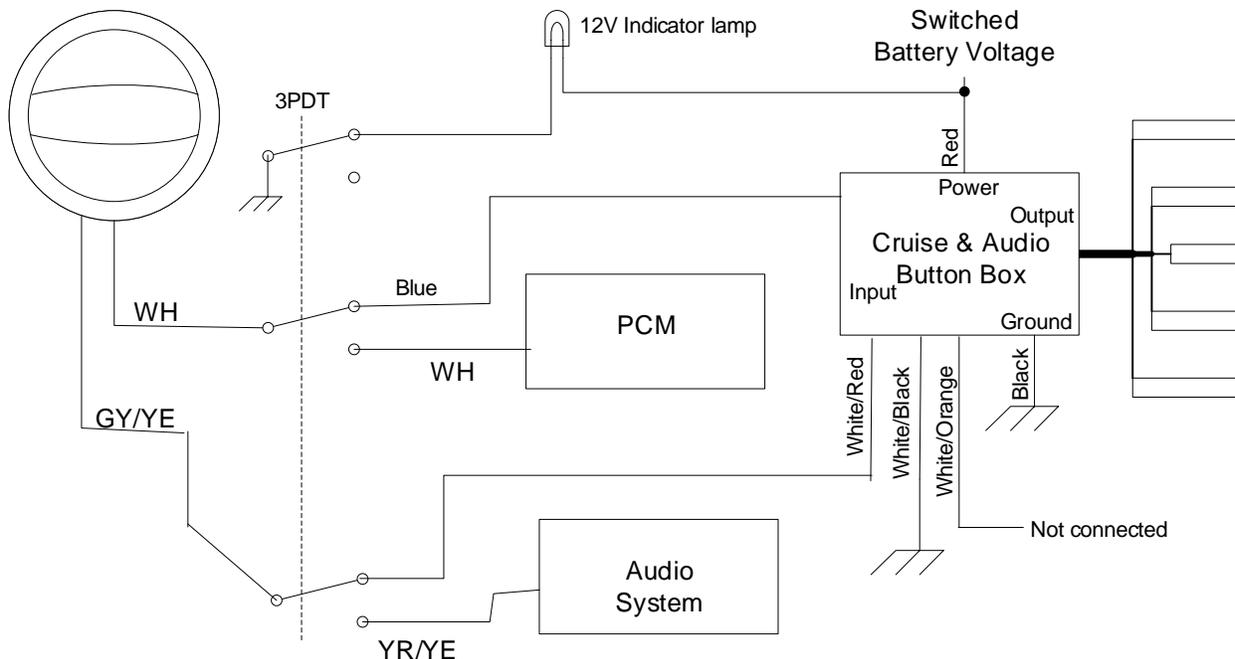


2010-2012 Mode 2 Wiring

Splice the WH wire (previously cut) that goes up into the clockspring mechanism to the Blue button box input wire. Splice the GY/YE wire (previously cut) that goes up into the clockspring mechanism to the White/Red button box input wire. Unless you are using a switch, (against our recommendation) use shrink tubing on the unused ends of the WH & GY/YE wires to prevent them from shorting on anything and affecting your cruise and audio systems. Do not connect the White/Orange wire to anything.

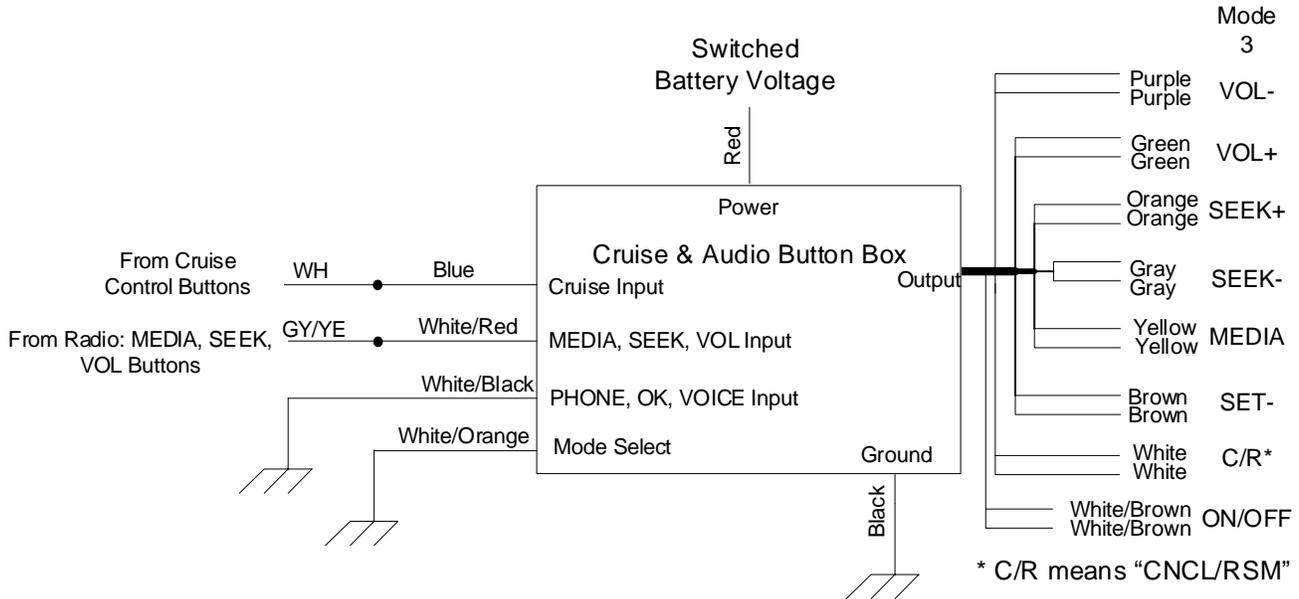


If you choose to go against our recommendations and install a switch to select use between cruise and audio control and an accessory for the cruise and audio control buttons, you should include an indicator light or LED that indicates if you are in Race Mode or Street Mode. The switch is a 3 Pole, Double Throw (3PDT) switch. Remember you can damage your car and risk serious injury or death if you have the switch in Race mode and try to use your cruise or audio control buttons while not racing.

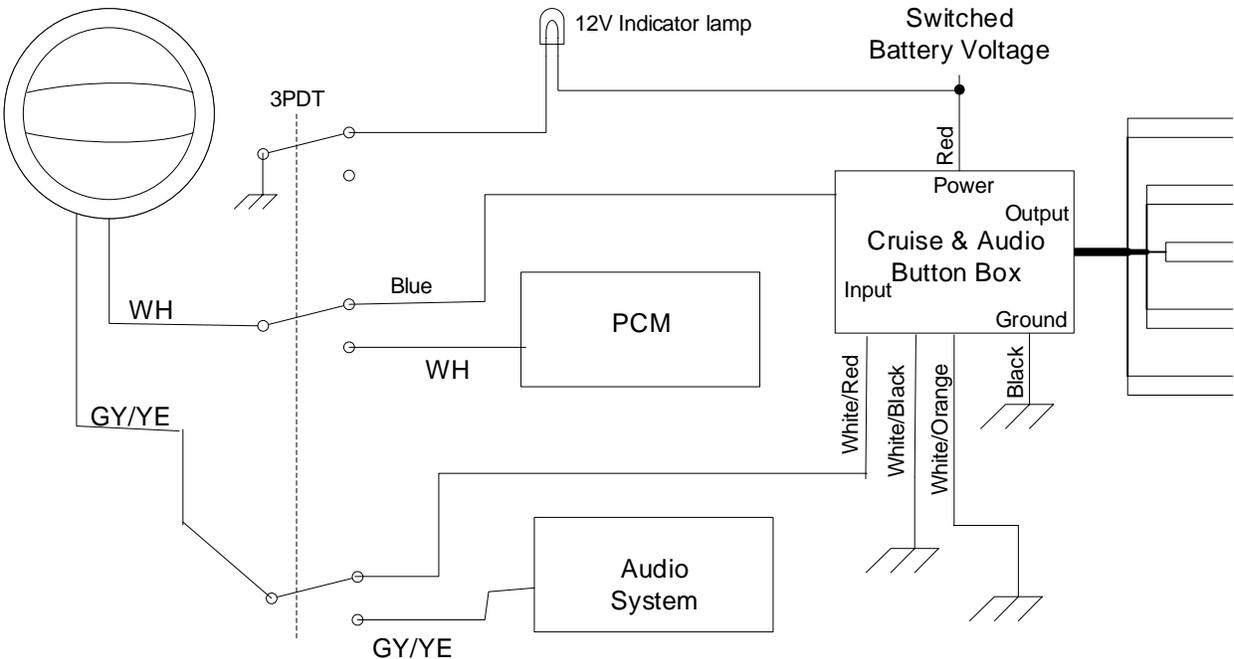


2013-2014 Mode 3 Wiring

Splice the WH wire (previously cut) that goes up into the clockspring mechanism to the Blue button box input wire. Splice the GY/YE wire (previously cut) that goes up into the clockspring mechanism to the White/Red button box input wire. Unless you are using a switch, (against our recommendation) use shrink tubing on the unused ends of the WH & GY/YE wires to prevent them from shorting on anything and affecting your cruise and audio systems. Ground the White/Orange wire.

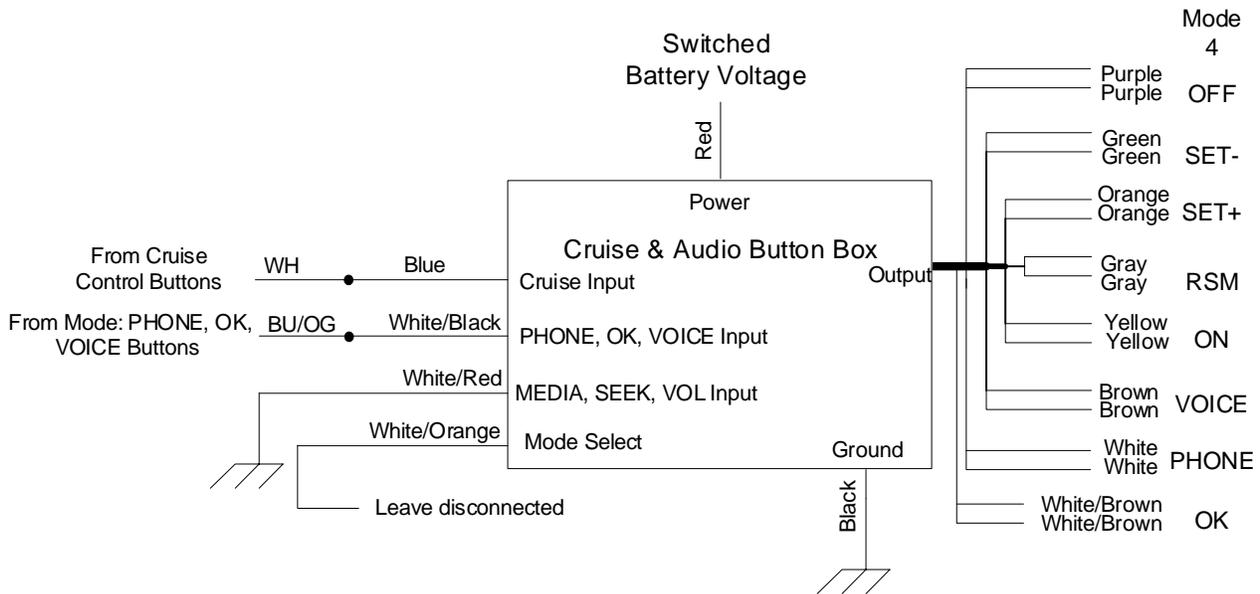


If you choose to go against our recommendations and install a switch to select use between cruise and audio control and an accessory for the cruise and audio control buttons, you should include an indicator light or LED that indicates if you are in Race Mode or Street Mode. The switch is a 3 Pole, Double Throw (3PDT) switch. Remember you can damage your car and risk serious injury or death if you have the switch in Race mode and try to use your cruise or audio control buttons while not racing.

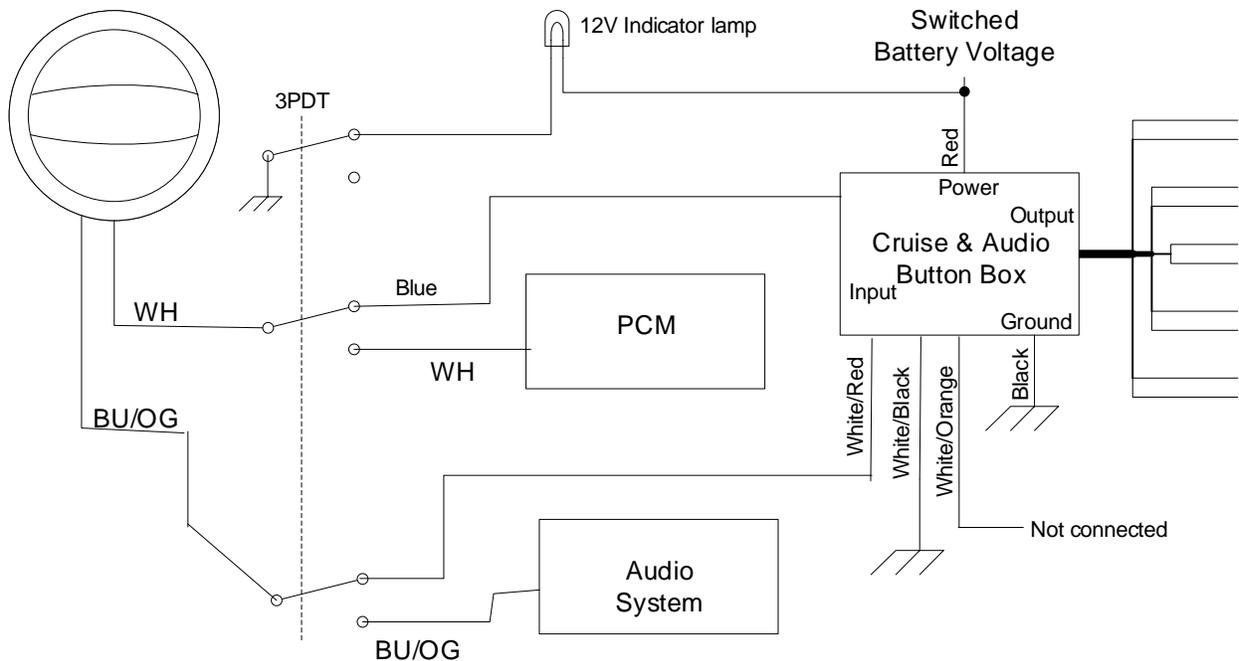


2010-2012 Mode 4 Wiring

Splice the WH wire (previously cut) that goes up into the clockspring mechanism to the Blue button box input wire. Splice the BU/OG wire (previously cut) that goes up into the clockspring mechanism to the White/Black button box input wire. Unless you are using a switch, (against our recommendation) use shrink tubing on the unused ends of the WH & BU/OG wires to prevent them from shorting on anything and affecting your cruise and audio systems. Do not connect the White/Orange wire to anything.

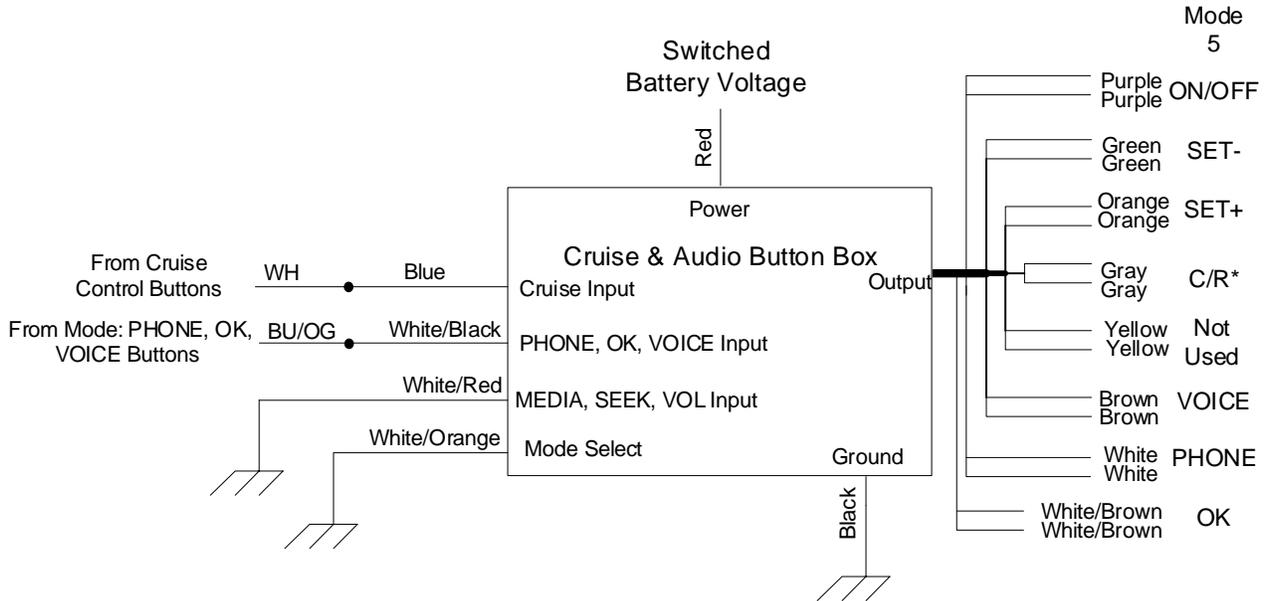


If you choose to go against our recommendations and install a switch to select use between cruise and audio control and an accessory for the cruise and audio control buttons, you should include an indicator light or LED that indicates if you are in Race Mode or Street Mode. The switch is a 3 Pole, Double Throw (3PDT) switch. Remember you can damage your car and risk serious injury or death if you have the switch in Race mode and try to use your cruise or audio control buttons while not racing.

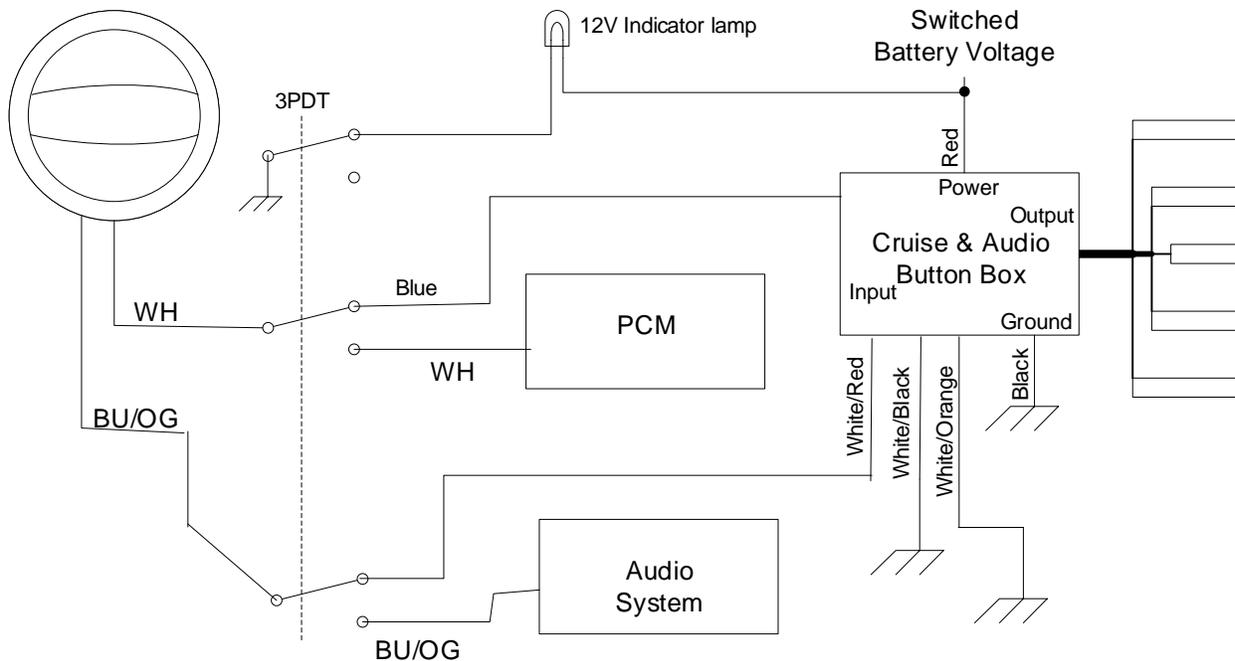


2013-2014 Mode 5 Wiring

Splice the WH wire (previously cut) that goes up into the clockspring mechanism to the Blue button box input wire. Splice the BU/OG wire (previously cut) that goes up into the clockspring mechanism to the White/Black button box input wire. Unless you are using a switch, (against our recommendation) use shrink tubing on the unused ends of the WH & BU/OG wires to prevent them from shorting on anything and affecting your cruise and audio systems. Ground the White/Orange wire.



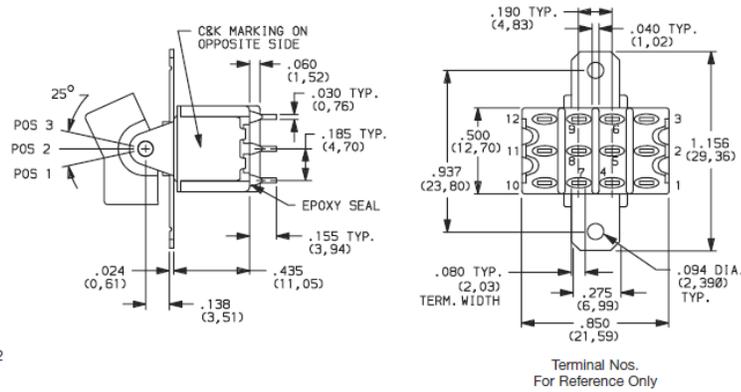
If you choose to go against our recommendations and install a switch to select use between cruise and audio control and an accessory for the cruise and audio control buttons, you should include an indicator light or LED that indicates if you are in Race Mode or Street Mode. The switch is a 3 Pole, Double Throw (3PDT) switch. Remember you can damage your car and risk serious injury or death if you have the switch in Race mode and try to use your cruise or audio control buttons while not racing.



In order to switch three button groups at one, you will need to use a Four Pole, Double Throw switch such as a C&K 7301 4PDT rocker switch. You can buy this switch from Digikey. Search for Digikey part number CKN2045-ND or C&K part number 7401J11ZQE22.

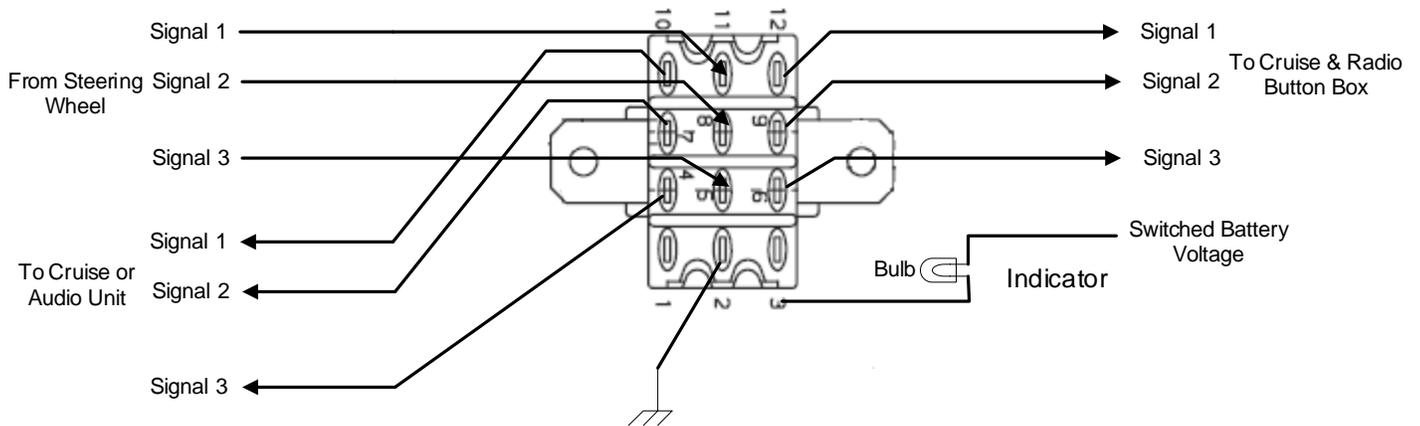
4P	7401	U41	ON	NONE	ON	2-3,5-6,8-9,11-12	N/A	2-1,5-4,8-7,11-10	

4PDT



Part number shown: 7401J1ZQE2

You should wire it this way:



The indicator will light when the steering wheel buttons will control race accessories rather than the OEM units

Switching between OEM and Accessory Functions

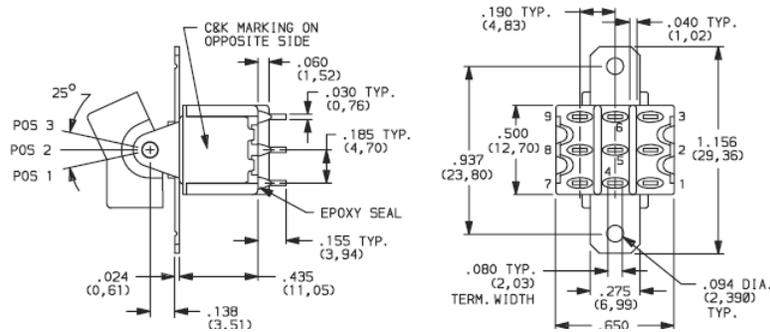
If you choose to go against our recommendations and install a switch to select use between cruise/audio control and an accessory for the cruise/audio control buttons, you have options depending on how many button groups you repurpose.

The previous diagrams show how you can use one switch per button group. It is possible to use one switch for two or three button groups at the same time.

In order to switch two button groups, you will need to use a Triple Pole, Double Throw switch such as a C&K 7301 3PDT rocker switch. You can buy this switch from Digikey. Search for Digikey part number CKN2044-ND or C&K part number 7301J11ZQE22.

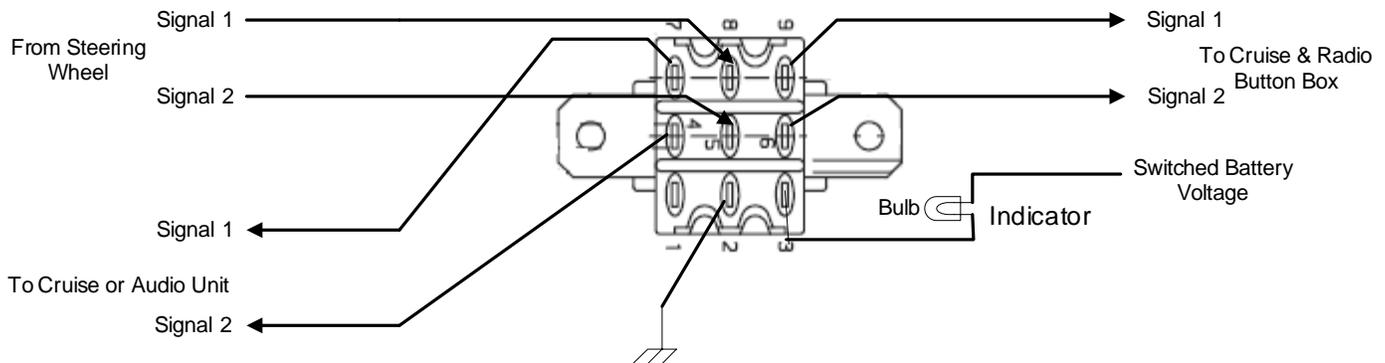
SWITCH FUNCTION 									
NO. POLES	MODEL NO.	UL/CSA** MODEL NO.	SWITCH FUNCTION			CONNECTED TERMINALS			SCHEMATIC
			POS. 1	POS. 2	POS. 3	POS. 1	POS. 2	POS. 3	
3P	7301	U31					N/A		
			C&K marking on opposite side			C&K marking on opposite side			
			ON	NONE	ON	2-3,5-6,8-9		2-1,5-4,8-7	

3PDT



Part number shown: 7301J1ZQE2

You should wire it this way:



The indicator will light when the steering wheel buttons will control race accessories rather than the OEM unit(s)

At this point, it is a good idea to test your installation. Reconnect the car's battery and turn the key on. If you have added a switch, set it to let you control your race accessories. Press each repurposed button and check the corresponding wire pair with an ohmmeter to ensure the switch closes when the button is pushed.

If you do not get these results, make sure that the signal wires in the steering column are cut, and the Cruise & Audio Button Box input wires have good connections to the signal wires wire that go up towards the steering wheel, not down to the car's systems. If the OEM signal wires are not cut, the cruise and audio systems will load the wire so the Cruise & Audio Button Box will not work. If your cruise control and/or audio systems have been removed from the car, make sure that the signal return wires going to the clockspring mechanism are grounded to a good chassis ground.

If the input wires are wired correctly, make sure that the voltage on the red wire is very close to battery voltage. If it is not very close to battery voltage, make sure the connection to power is a good connection. Also, make sure that you have a very good ground connection.

After you have verified that the Cruise & Audio Button Box is working with your steering wheel buttons, connect any of the colored wire pairs to whatever accessory you want controlled by the corresponding radio control momentary pushbutton switch.

Each momentary pushbutton switch output is rated to 120V and 1A. Higher rated signals must be controlled by an external automotive relay. If you use an external relay be sure to protect the Box with a diode as described earlier in this document.

The Cruise & Audio Button Box typically draws less than 20mA quiescent and less than 70mA when a button is pressed.

Pressing Multiple Buttons at Once

The Cruise & Audio buttons are grouped into 3 groups:

You can push one button from either group at any time, but you shouldn't press two buttons from the same group at the same time. If you push multiple buttons from the same group, the lowest button on the list takes precedence.

Cruise Control Group:

ON Button – Yellow (not used in 2013-2014 cars)

RSM Button - Gray (Takes precedence over the ON button above)

SET+ Button – Orange (Takes precedence over the buttons above)

SET- Button – Green (Takes precedence over the buttons above)

OFF Button – Purple (Takes precedence over the buttons above) (ON/OFF in 2013-2014 cars)

MEDIA, SEEK, VOL Group:

MEDIA Button - Yellow

SEEK- Button - Gray (Takes precedence over the MEDIA button above)

SEEK+ Button – Orange (Takes precedence over the buttons above)

VOL+ Button – Green (Takes precedence over the buttons above)

VOL- Button – Purple (Takes precedence over the buttons above)

PHONE, OK, VOICE Group:

PHONE Button – White/Brown

OK Button – White (Takes precedence over the PHONE button above)

VOICE Button – Brown (Takes precedence over the buttons above)

Auxiliary Switch Units

All of the cruise and audio control buttons function as momentary on pushbutton switches. Some applications require switches that function as a toggle rather than ones that are only momentarily on. Accutach Co. has developed two different auxiliary switch units which can be used in conjunction with any momentary switch (ideal for use with Accutach's Cruise & Audio Button Box) to operate devices which normally use a toggle switch (typical on/off function). These two different devices cover just about any application. The Accutach Co. auxiliary switch units can switch circuits up to 120V, 1A. Switching higher voltage and/or current signals will require the use of an external relay. The Accutach Co. "On/Off Auxiliary Switch Unit" and the "Toggle Auxiliary Switch Unit" are described below.

On/Off Auxiliary Switch Unit

Some people will prefer to turn an accessory on with one momentary pushbutton switch and off with another momentary pushbutton switch. The Accutach Co. On/Off Auxiliary Switch Unit provides two such circuits in one small box. For example, the audio VOL+ and VOL- buttons could be used to turn one accessory on and off and the audio SEEK+ and SEEK- buttons could be used to turn another accessory on and off.

As another example, the audio VOL+ button could be used to arm a nitrous system and the VOL- button could be used to disarm it. The audio SEEK+ button could be used to turn on a bottle warmer and the SEEK- button could be used to turn the bottle warmer off. That leaves the audio MEDIA button to be used as a purge pushbutton. You can learn more about the Accutach Co. On/Off Auxiliary Switch Unit by downloading the Installation Guide here: <http://www.accutach.com/Documents/OnOffAuxiliarySwitchUnitInstallGuideR1-1.pdf>

Toggle Auxiliary Switch Unit

Some people will prefer to turn an accessory on with one momentary pushbutton switch and then off again with the same momentary pushbutton switch. The Accutach Co. Toggle Auxiliary Switch Unit provides one such unit in a small box. One of these boxes will be required for each pushbutton that is to be turned into a toggle switch.

For example, one of the audio buttons could be used in conjunction with a Toggle Auxiliary Switch Unit to power a brake line-lock unit during a tire-heating burnout. Hitting the pushbutton a second time would turn it off.

You can learn more about the Accutach Co. Toggle Auxiliary Switch Unit by downloading the Installation Guide here: <http://www.accutach.com/Documents/ToggleAuxiliarySwitchUnitInstallGuideR1-1.pdf>

Feel free to contact Accutach company if you have any questions or issues with the Cruise & Radio Button Box.

Good luck!