

WRX/Impreza Steering Wheel Button Box Installation Guide

Rev. 1.1

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Thank you for purchasing the Accutach Co. Subaru WRX/Impreza Steering Wheel Button Box. It is designed to allow you to repurpose the audio and/or cruise control buttons on your stock steering wheel to control other accessories. Supported Subaru cars include: 2008-2018 WRX and Impreza models. This box may be compatible with other models of Subaru vehicles as well. Please contact Accutach Co. if interested in use with other Subarus.



WARNINGS and DISCLAIMERS:

You use this product at your own risk. Accutach Company is not responsible for personal injury, property damage or death through the use of this product. While it is possible to use a switch in the steering wheel control wire to switch the steering wheel button function from radio/cruise control to accessory control and back again, Accutach Company strongly recommends that users permanently change the button functions from radio/cruise control to control of your accessories. If you choose to use a switch against our recommendations be careful make sure you know how the switch is set prior to pressing any steering wheel button. You'd hate to activate a line lock at road speeds while trying to adjust the radio for example.

Do not touch the air bag wiring as you modify the radio control wiring near the steering column. Make sure you disconnect the battery before doing any electrical work described in this installation guide and follow the air bag safety recommendations in your Subaru shop manual.

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 Steering Wheel 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 cabin. 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.

Before you begin (Cont.):

You will need to read the service manual for your vehicle to learn how to safely disable the air bag system. Failure to properly disable the air bag system could lead to injury or death if the air bag accidentally deploys while you are installing the steering wheel button box.

You will need to locate the steering wheel signal and signal return wires coming down from the clockspring mechanism in the steering column for your car. Here are the wire colors for 2008-2018 WRX and Impreza cars. If your Subaru is not on this list, you will need to contact Accutach Co.

When there is a dash between wire colors below, that means that the wire color changes at an in-line connector. The first color is closest to the clockspring mechanism and the second is after the connector where the color changes. Double check with your Subaru shop manual if you are not sure of the wire colors.

2008 WRX and Impreza All

Cruise Main Signal: BRN – WHT
Cruise Group Signal: GRN - YEL/BLU
Cruise Return Signal: BLK - BLK/BLU
Radio Group Signal: LT BLU – YEL
Radio Return Signal: RED – BRN

2009 -2010 WRX and Impreza All

2011-2012 WRX Base and Impreza Base
Cruise Main Signal: BRN - WHT
Cruise Group Signal: GRN - YEL/BLU
Cruise Return Signal: BLK - BLK/BLU
Radio Group Signal: RED – BRN
Radio Return Signal: LT BLU – YEL

2011-2012 WRX Not Base and Impreza Not Base

2013-2014 WRX and Impreza All
Cruise Main Signal: BRN – WHT
Cruise Group Signal: GRN - YEL/BLU
Cruise Return Signal: BLK - BLK/RED
Radio Group Signal: RED – BRN
BT Group Signal: GRN - BLU/WHT
Radio Return Signal: LT BLU – YEL

2015-2016 WRX and Impreza All

Cruise Main Signal: WHT/YEL
Cruise Group Signal: GRN/WHT
Cruise Return Signal: BLK/BLU
Radio Group Signal: BRN - BRN/BLK
BT Group Signal: GRN - YEL/RED - YEL
Radio Return Signal: BLU/YEL

2017-2018 WRX All

Cruise Main Signal: WHT or WHT-WHT/YEL
Cruise Group Signal: YEL/BLU
Cruise Return Signal: BLK/RED
Radio Group Signal: BRN - BRN/BLK
BT Group Signal: GRN - BLU/YEL
Radio Return Signal: YEL/RED – YEL

2017-2018 Impreza All

Cruise Main Signal: WHT - GRN
Cruise Group Signal: YEL - YEL/RED
Cruise Return Signal: GRN - BLK
Radio Group Signal: PNK
BT Group Signal: VIO
Radio Return Signal: BRN

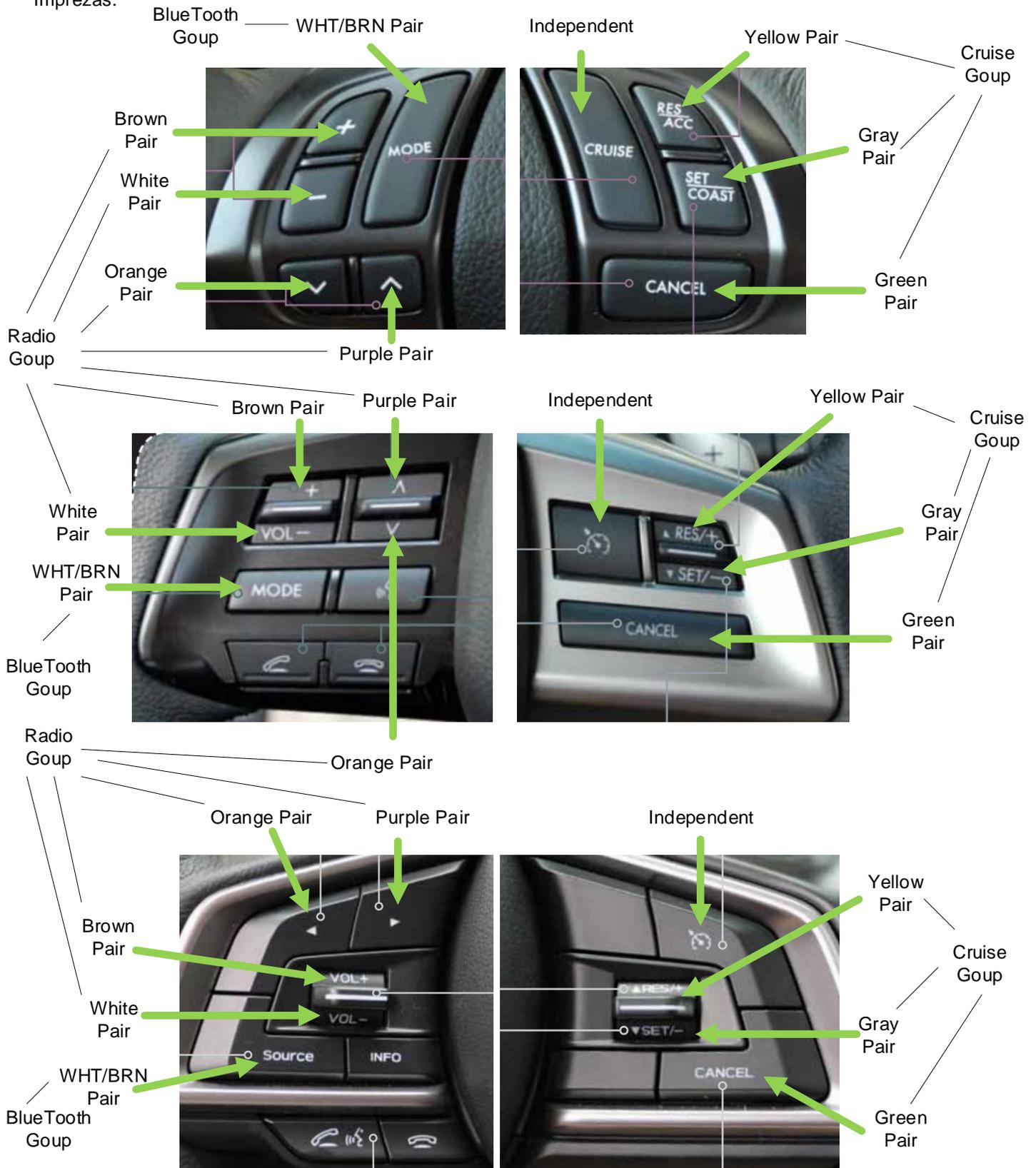
The Accutach Co. WRX/Impreza Steering Wheel Button Box has 3 modes of operation. Mode 0 repurposes the steering wheel buttons of non-base model 2011 WRXs & Imprezas, all 2013-2014 WRXs & Imprezas, 2015 WRXs and 2017-2018 Imprezas. Mode 1 repurposes the steering wheel buttons for 2015-2016 Imprezas and 2016-2018 WRXs. Mode 2 repurposes the steering wheel buttons for all 2008-2010 WRXs & Imprezas plus 2011-2012 base model WRXs & Imprezas. If your vehicle is not on the lists above, please contact Accutach Co. to see if your Subaru vehicle is also supported.

You will need to plan your button to accessory input mapping. The WRX/Impreza Steering Wheel Button Box has 8 relays and 8 pairs of colored output wires. After installation, when you press a button on the steering wheel, the relay associated with that button will close, connecting the associated colored wire pair together.

In all three modes, the Main Cruise Control button is independent of the steering wheel button box. It can be used to momentarily ground a low current accessory input, or with the addition of a relay, control a high current device or switch power. The Main Cruise Control button can be used at any time in conjunction with any other steering wheel buttons.

The other buttons are organized into groups of buttons, 3 groups for Mode 0 & 1 cars and 2 groups for Mode 2 cars. All of the buttons in each group share a single signal wire. If you press more than one button in a group at the same time, only the lowest resistance button in that group will work. You can simultaneously press one button each from different groups without a problem. The following pages describe the three modes of operation to help you plan your installation.

Mode 0: Non-base model 2011 WRXs & Imprezas, all 2013-2014 WRXs & Imprezas, 2015 WRXs and 2017-2018 Imprezas.



The Main Cruise Switch and the Cruise Group switches share the Cruise return wire and the Radio Group switches and BlueTooth Group switches share the Radio Return wire.

Mode 0 is selected by leaving the WHT/ORN wire disconnected. Put shrink tubing over the end of the WHT/ORN wires to ensure it doesn't accidentally short to anything.

Mode 1: 2015-2016 Imprezas and 2016-2018 WRXs



Mode 1 is selected by grounding the WHT/ORN wire.

Mode 2: 2008-2010 WRXs & Imprezas, 2011-2012 base model WRXs and base model Imprezas.



Mode 2 is selected by grounding the WHT/ORN and WHT/BLK wires.

The Main Cruise Switch and the Cruise Group switches share the Cruise return wire and the Radio Group switches and BlueTooth Group switches (if so equipped) share the Radio Return wire.

Custom button mappings are available from Accutach Co. for an additional charge. Please contact us if you are interested.

Locating the Radio/Cruise Control Signal Wires

You will need to gain access to the wiring harness that runs down into the under-dash area from the clockspring mechanism in the steering column. Please consult the service manual for your car if you don't know how to access the harness. Identify the signal and return lines using the wire colors from Page 2 for the Main Cruise switch, the Cruise Group, the Radio Group and the Bluetooth Group (if equipped.)

At this point, you should have unhooked the battery and followed the service manual process for disabling the air bag system. If you have not, do that now.

Installing the WRX/Impreza Steering Wheel Button Box

Once you have located the Signal and Return lines below the clockspring mechanism, cut the signal wires, leaving enough room to splice wires to both sides of the cut. Do not cut the signal return wires.

This is a good time to test your steering wheel button circuits to make sure they are working properly prior to repurposing. Put an ohmmeter across a Signal wire going up into the clockspring mechanism and a good ground. You should see resistance values on the ohmmeter that are within about 10% of the resistances below:

All 2008 – 2018 WRXs and Imprezas have the same Main Cruise Switch and Cruise Group circuits.

Main Cruise Button Circuit

Button Pressed	Resistance
None	Open circuit
Main Cruise Button	Close to 0 Ohms

Cruise Group Circuit

Button Pressed	Resistance
None	4000 Ohms
Res/Accel	1500 Ohms
Set/Coast	250 Ohms
Cancel	0 Ohms

Mode 0: Non-base model 2011 WRXs & Imprezas, all 2013-2014 WRXs & Imprezas, 2015 WRXs and 2017-2018 Imprezas.

Radio Group Circuit

Button Pressed	Resistance
None	100,000 Ohms
Vol-	3110 Ohms
Vol+	1000 Ohms
Seek-	330 Ohms
Seek+	0 Ohms

BlueTooth Group Circuit

Button Pressed	Resistance
None	100,000 Ohms
Talk	3110 Ohms
Off Hook*	1000 Ohms
On Hook*	330 Ohms
Mode(Source in '17/18)	0 Ohms

* Off Hook and On Hook resistances are reversed in 2017-2018 Imprezas only.

Mode 1: 2015-2016 Imprezas and 2016-2018 WRXs.

Radio Group Circuit

Button Pressed	Resistance
None	100,000 Ohms
Return	1000 Ohms
List	430 Ohms
Left	230 Ohms
Right	120 Ohms
Down	50 Ohms
Up	0 Ohms

BlueTooth Group Circuit

Button Pressed	Resistance
None	100,000 Ohms
Off Hook	430 Ohms
On Hook	230 Ohms
Source	120 Ohms
Talk	50 Ohms
Mute/Enter	0 Ohms

Mode 2: 2008-2010 WRXs & Imprezas, 2011-2012 base model WRXs and base model Imprezas.

Radio Group Circuit

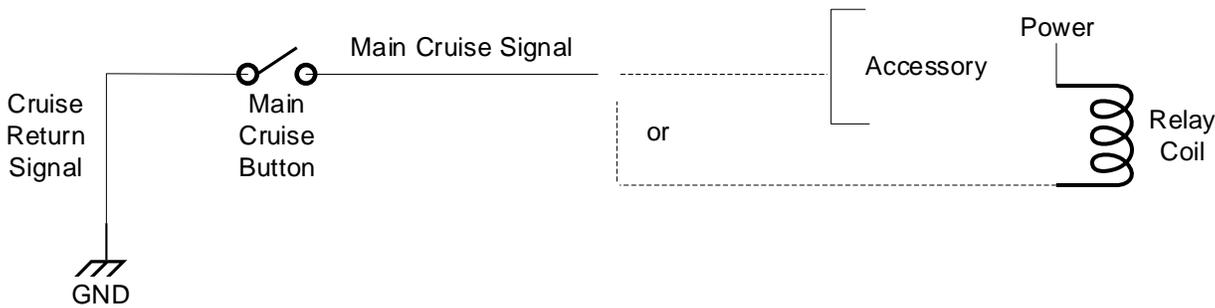
Button Pressed	Resistance
None	4700 Ohms
Seek-	1143 Ohms
Seek+	602 Ohms
Mode	335 Ohms
Vol-	192 Ohms
Vol+	89 Ohms
Mute	22 Ohms

If you don't see resistances near the ones in these tables, debug the steering wheel switches and the wiring from the switches through the clockspring mechanism to the cut wire ends before continuing with the installation.

Be aware that the steering wheel signal return wires are grounded through the stock ECU and radio. If you have removed either unit from your car, ensure that the steering wheel signal return wires are grounded, preferably at the same grounding point used by the Accutach Co. Steering Wheel Button Box.

After you have validated the switches and wiring, you can start wiring your switches.

The Main Cruise button can be used to control an accessory input without using the Accutach Co. Steering Wheel Button Box. When the Main Cruise Button Switch is pressed, the Main Cruise Signal wire is grounded. When it is not pressed, it is an open circuit. If you have an accessory that is controlled using a low current, momentary-on signal, simply connect the Main Cruise Signal wire to your accessory. But if you need to control a high current accessory such as a solenoid or a fan, use the Main Cruise Signal wire to control an automotive relay that can handle the current.



To select Mode 0 operation for your Steering Wheel Button Box, do not ground the WHT/ORN Mode Select wire, Zip-tie and/or shrink-wrap the WHT/ORN wire so that it can't accidentally be grounded. To select Mode 1, ground the WHT/ORN Select wire. To select Mode 2, Ground the WHT/ORN Mode Select Wire and the WHT/BLK Input wire. If you are using the Steering Wheel Button Box in Mode 1, be sure not to press the steering wheel Mode (or Source) buttons as you are turning your key to ON. If the Mode (or Source) button is pressed as the key is turned on, the Steering wheel Button Box will go into Mode 2.

To connect the Cruise Button Group, splice the Blue Input wire from the Accutach Steering Wheel Button Box to the Cruise Group Signal wire going up into the clockspring mechanism. To connect the Radio Button Group, splice the WHT/RED Input wire from the Accutach Steering Wheel Button Box to the Radio Group Signal wire going up into the clockspring mechanism. To connect the BlueTooth Button Group Modes 0 & 1), splice the WHT/BLK Input wire from the Accutach Steering Wheel Button Box to the BT Group Signal wire going up into the clockspring mechanism. The WHT/BLK input wire is grounded in Mode 2.

It is possible to configure the output of the Steering Wheel Button Box to simulate the steering wheel button circuit for some of the buttons. This will allow you to repurpose some of the buttons for custom use while leaving the rest of the buttons with the OEM function. Please contact Accutach Co. for applications assistance if you want to do that.

Accutach Co. strongly recommends that you permanently repurpose your steering wheel buttons. However, it is possible to install a switch that will allow you to switch between "Race Mode" where the steering wheel buttons control your racing accessories and "Street Mode" where your steering wheel buttons control the OEM functions. If you use a switch like this, you do so at your own risk. If you press a button thinking it will control one accessory and another is activated, there is danger of damage to your vehicle, injury or even death. For example, you would not want to activate a transbrake at highway speeds thinking you are activating cruise control. Such an example would have a very bad end for you and/or your car.

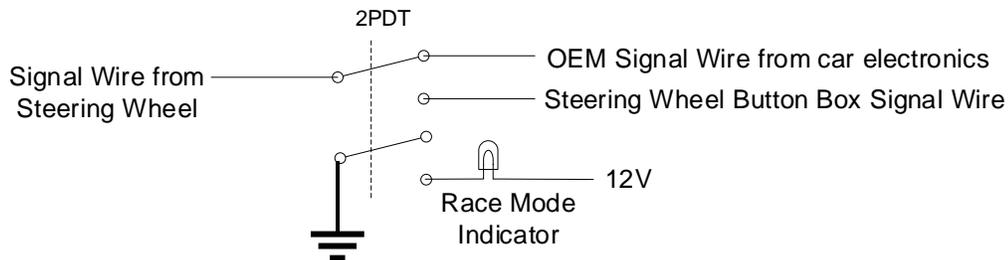
If you choose to use a switch to retain the use of the radio control function of your vehicle (against our recommendations), then we recommend that you add an extra pole to the switch to add an indicator that lights when you are in Race Mode (Not Included).

You will need a 2PDT switch to switch a single group of buttons. If you want to switch two groups of buttons, you will need a 3PDT switch. If you want to switch three groups of buttons, you will need a 4PDT switch. If you want to switch all 4 groups you will need a 5PDT switch.

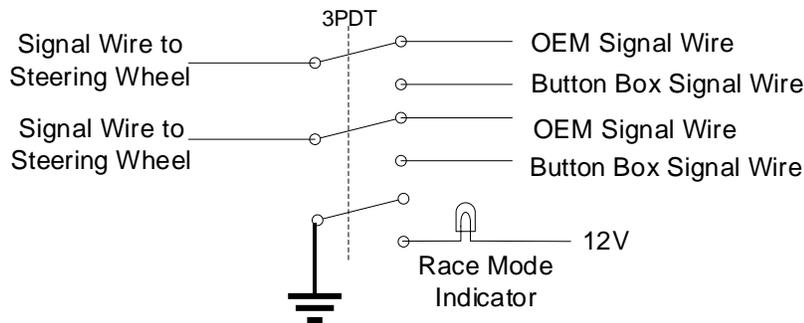
Accutach Co. recommends the following switches (Not Included):

- 2PDT: NKK M2022TYW01-JA, Digikey part number M2022TYW01-JA-ND
- 3PDT: NKK M2032TYW01-JA, Digikey part number M2032TYW01-JA-ND
- 4PDT: NKK M2042TNW01-DA, Digikey part number 360-2276-ND
- 5PDT: Nidec Copal ET610N13-Z, Digikey part number 563-1928-ND (6PDT, 1 Pole unused)

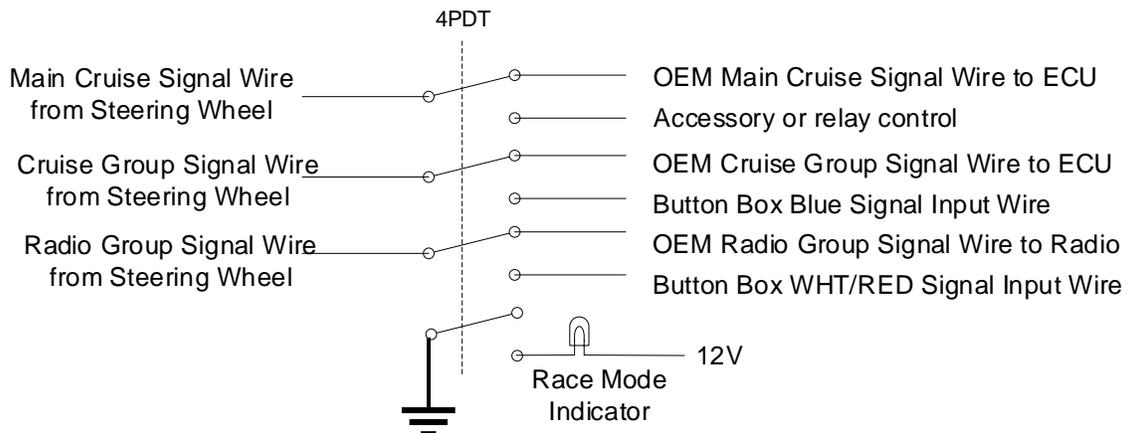
To repurpose one button group, wire a 2PDP switch's common connections to a ground for the Race Mode Indicator light and the Signal wire going to the steering wheel. Wire one side of the 2PDT switch to the OEM Signal wire, leaving the indicator not connected. Wire the other side of the 2PDT switch so that the Signal wire going to the steering wheel gets connected to the Steering Wheel Button Box input signal wire:



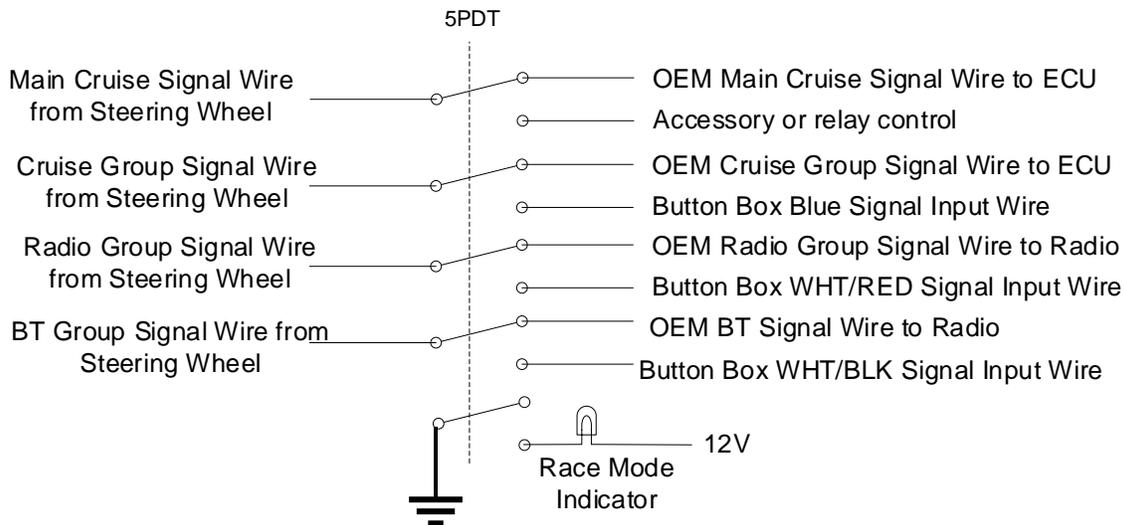
For each additional button group you want to switch, add a pole to the switch:



To repurpose all 3 button groups in Mode 2, wire a 4PDT switch in the following way:

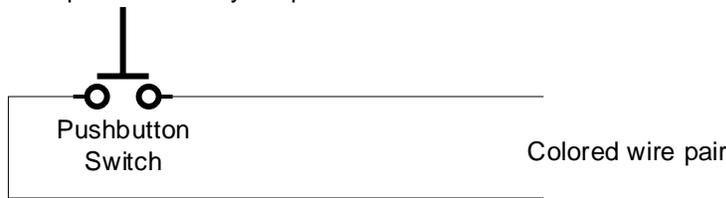


To repurpose all 4 button groups in Modes 0 & 1, wire a 5PDT switch in the following way:



Use with Accessories

Once you have installed the Accutach Co. Steering Wheel Button Box, you can think of each repurposed steering wheel button as if it were a simple momentary-on pushbutton switch:



If you are using a ground level accessory input, you will need to ground one of the colored wires and run the other to the accessory input:



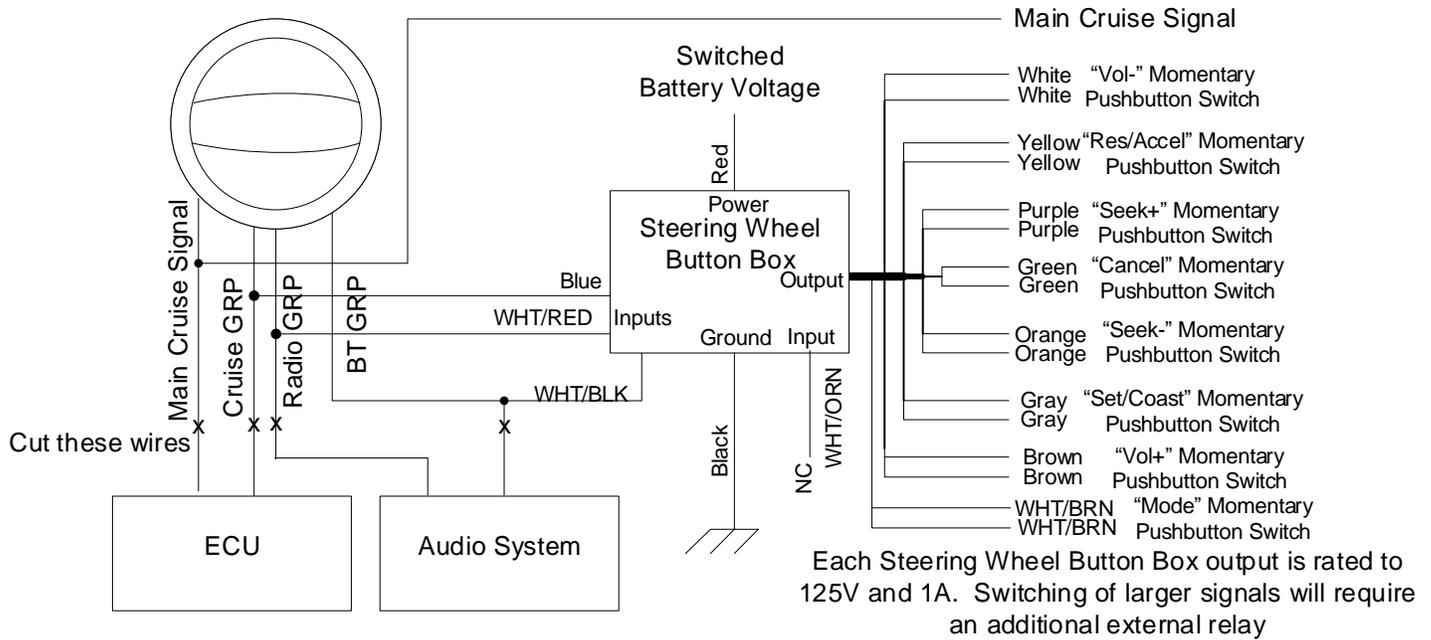
If you are using the pushbutton to control power to an accessory, you will need to connect one of the colored wires to a power source and the other to the accessory input. If the accessory draws more than 1 amp of current, you must use to Steering Wheel Button Box output to control an automotive relay.



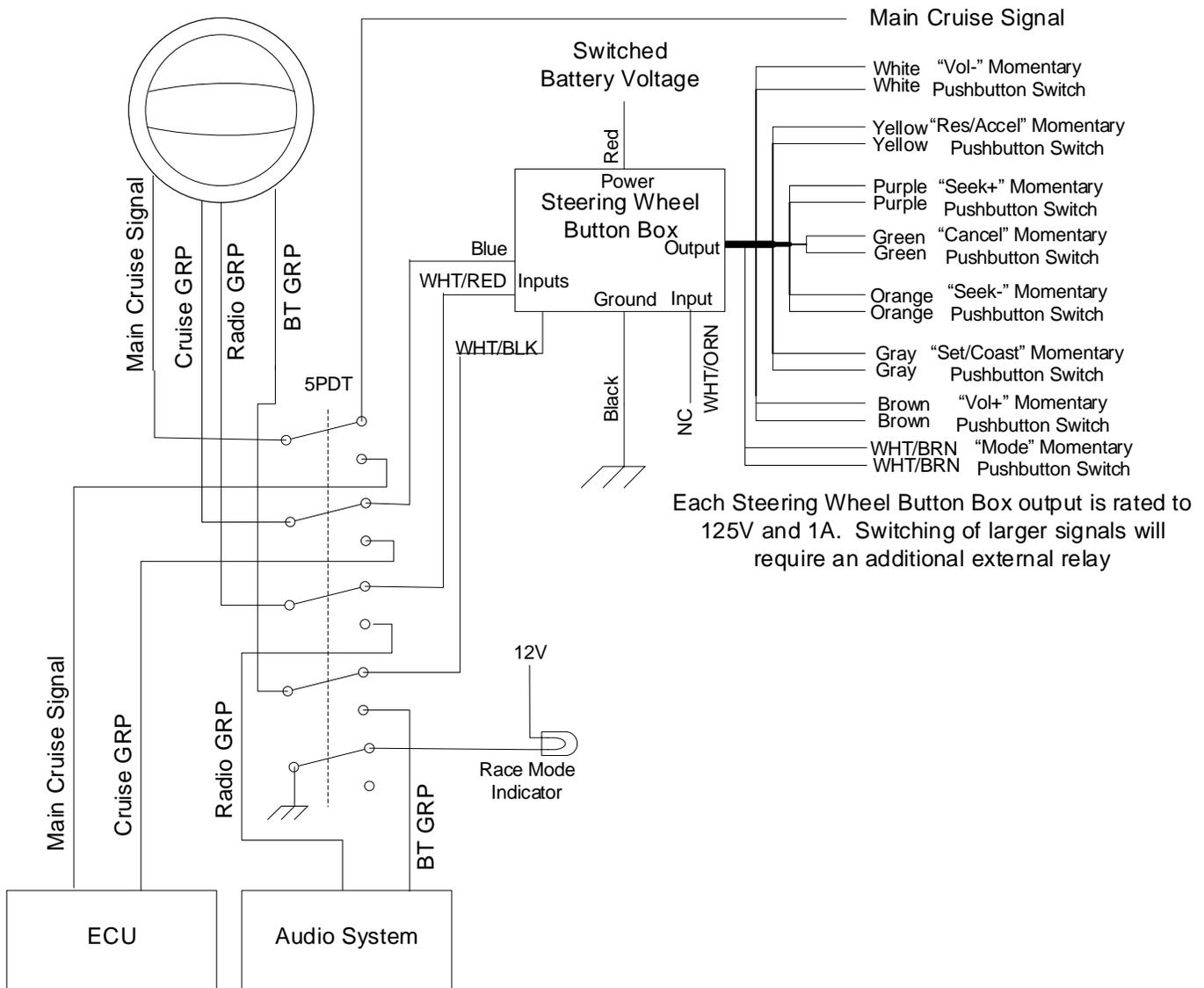
Wiring Diagrams

The following section describe how to connect the Accutach Co. Steering Wheel Button Box in vehicles using all 3 modes of operation.

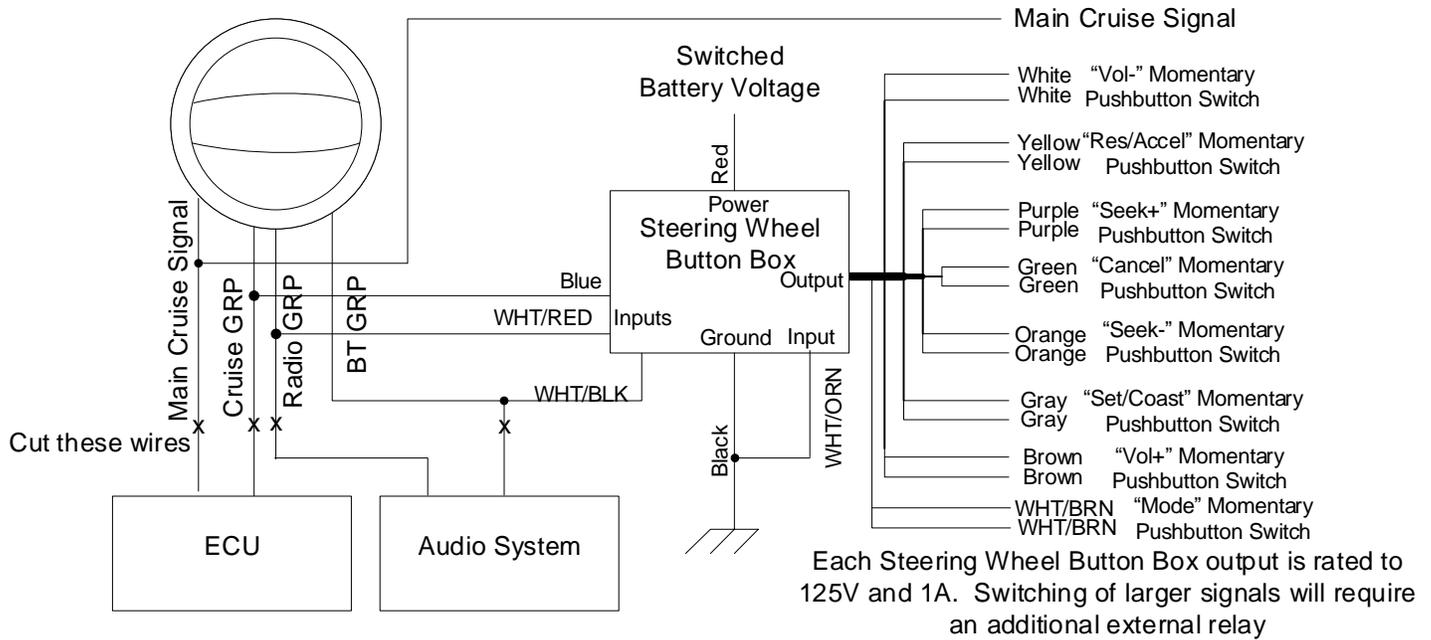
Mode 0: Non-base model 2011 WRXs & Imprezas, all 2013-2014 WRXs & Imprezas, 2015 WRXs and 2017-2018 Imprezas.



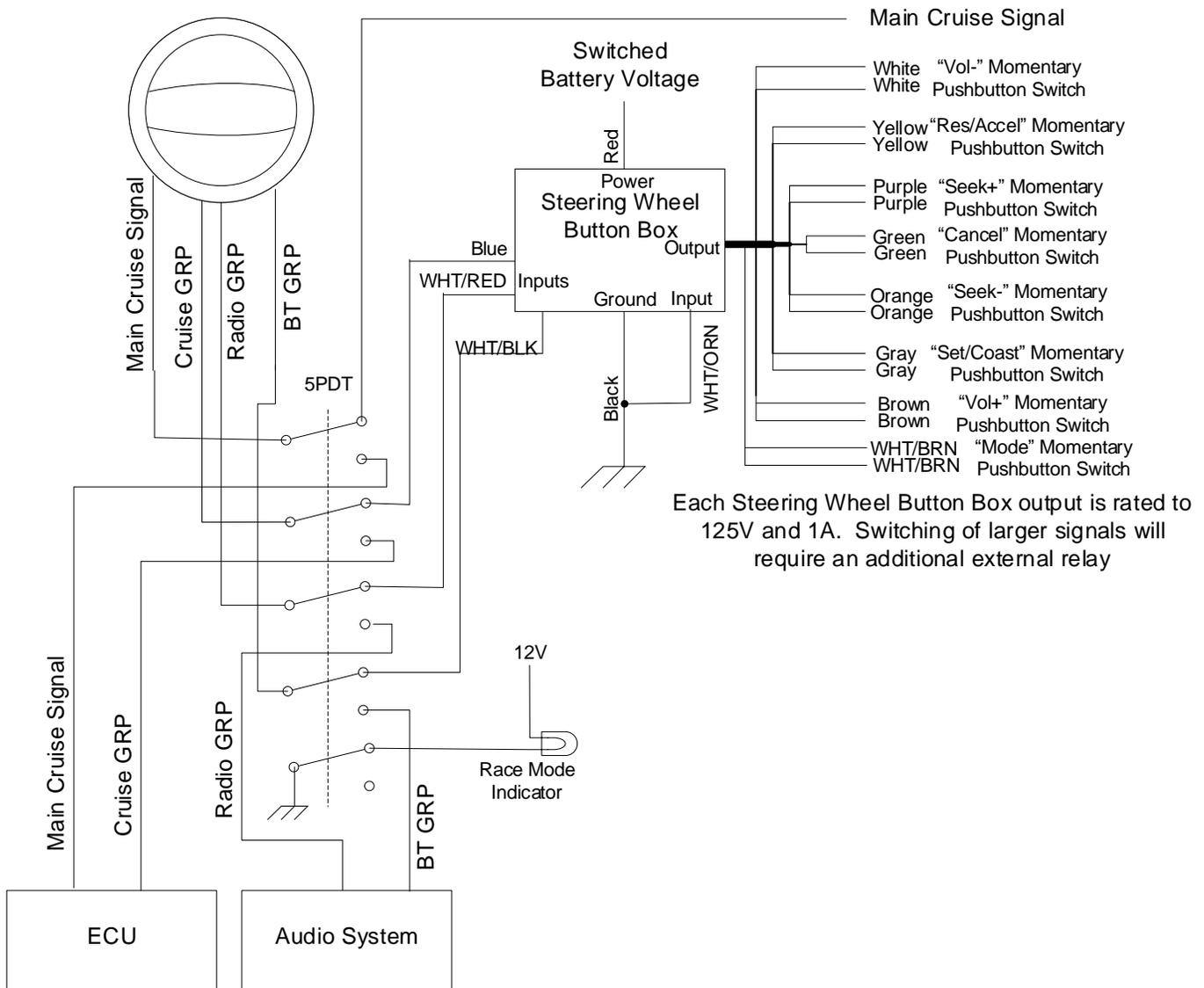
Here is a schematic diagram of how to connect the Accutach Steering Wheel Button Box to a car with a 4PDT switch (Mode 0): (If you use fewer button groups, you can use a switch with fewer poles.)



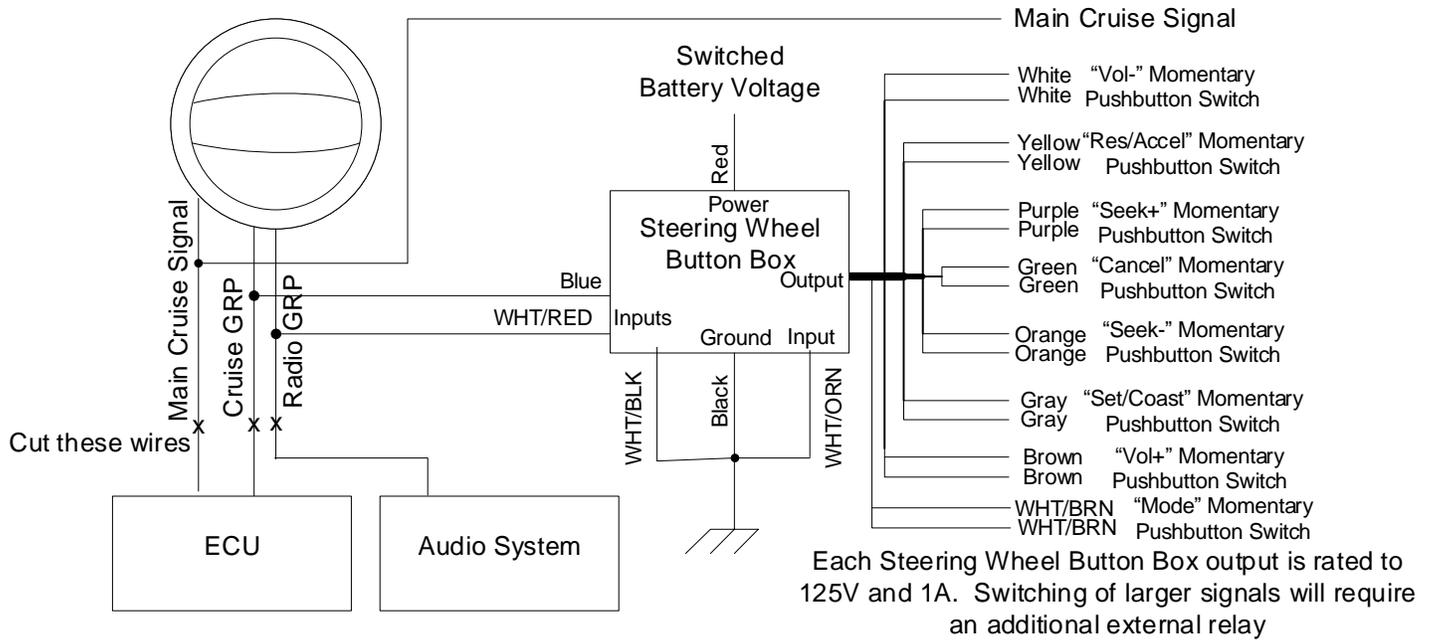
Mode 1: 2015-2016 Imprezas and 2016-2018 WRXs



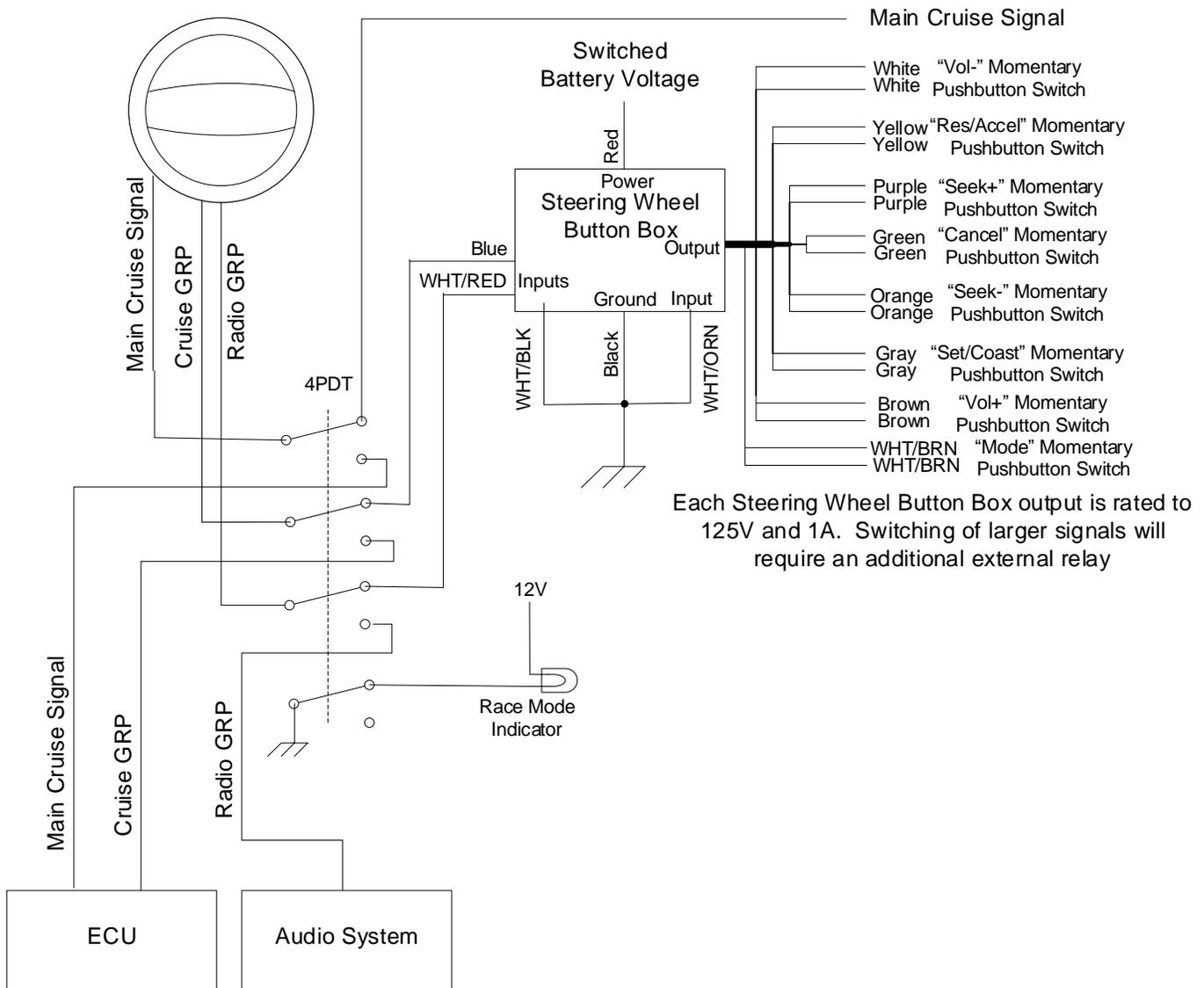
Here is a schematic diagram of how to connect the Accutach Steering Wheel Button Box to a car with a 5PDT switch (Mode 1): (If you use fewer button groups, you can use a switch with fewer poles.)



Mode 2: 2008-2010 WRXs & Imprezas, 2011-2012 base model WRXs and base model Imprezas



Here is a schematic diagram of how to connect the Accutach Steering Wheel Button Box to a car with a 4PDT switch (Mode 2): (If you use fewer button groups, you can use a switch with fewer poles.)



This would be a good time to test the installation of the Steering Wheel Button Box. After having connected the power ground and signal wires, turn the key on. With an ohmmeter across each pair of colored output wires, you should see an open circuit with no buttons pressed. With each button pressed, you should see a short circuit across the colored wire pair associated with that button. See the previous pages to see the button to wire color mapping.

Pressing Multiple Buttons at Once

You can push multiple buttons from the same button group at the same time, but only one of the button functions will be activated. The button in the group with the lowest resistance of the pressed buttons is the only button that will work. See Page 5 for the resistances associated with each button.

Buttons from different button groups can be pressed at the same time.

Connecting to Accessories

Connect any of the colored wire pairs to whatever accessory you want controlled by the corresponding steering wheel momentary pushbutton switch or the cruise control ON switch. Each switch output is rated to 120V and 1A. Higher rated signals must be controlled by an external automotive relay.

The Steering Wheel Button Box typically draws less than 20mA quiescent and less than 210mA when one to three buttons are pressed.

Auxiliary Switch Units

All of the steering wheel buttons function as momentary-on pushbutton switches. If you need a switch that functions 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 Steering Wheel 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 Corvette Steering Wheel Vol+ and Vol- buttons could be used to turn one accessory on and off and the Up and Down buttons could be used to turn another accessory on and off. The Auxiliary ON/OFF Box Install Guide will give you more information: https://img1.wsimg.com/blobby/go/1975f84f-4935-4131-8404-5a914da1afb7/downloads/1c2pl1v81_301699.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, the Corvette steering wheel 1-6 Preset button could be used in conjunction with a Toggle Auxiliary Switch Unit to power a brake line-lock unit during a tire-heating burnout. The driver would press the 1-6 Preset button once to engage the line lock and once again to disengage it. The Auxiliary Toggle Box Install Guide will give you more information: https://img1.wsimg.com/blobby/go/1975f84f-4935-4131-8404-5a914da1afb7/downloads/1c2pkjs2u_541911.pdf

Troubleshooting:

With battery power (around 12V) and ground applied to the Steering Wheel Button box, and no button pressed, the voltage on the input wire(s) should be somewhere in the neighborhood of:

	Mode 0	Mode 1	Mode 2
Main Cruise Signal	5V	5V	5V
Cruise Group	3.3V	3.3V	3.3V
Radio Group	5V	5V	4.4V
BT Group	5V	5V	N/A

If any of them are not near the voltage in the table, double check your Steering Wheel Button Box input and ground wiring. If they are still not correct, check the OEM signal wire(s) to make sure the OEM radio/WCU units are not still connected to the circuit.

Double check your mode selection wiring to ensure you are using the correct mode for your vehicle.

To test the buttons on your steering wheel, disconnect the steering wheel signal wire(s) from the Steering Wheel Button Box input(s). You should see a resistance close to the resistance listed for that button on page 5.

To test your cruise button box, connect the power ground and connect the Steering Wheel Button Box input wire(s) to the OEM Signal wire(s) as specified previously in this document. Disconnect all of the colored wire pairs. Turn the key on. With an Ohm meter, test all of the colored wire pairs coming from the unit. With no button pressed, all of the wire pairs should show infinite resistance. With the press of each button, the one wire pair should show a near zero resistance. All of the other wires should show an open circuit.

Find your vehicle on pages 3 & 4 to find the mapping of buttons to wire colors for the tests.

If you do not get these results, make sure that the signal wire in the steering column is cut, and the Steering Wheel Button Box input wire(s) have good connections to the Steering Wheel Button Box wire(s) that go up to the steering wheel, not down to the audio/ECU systems. If the signal wire(s) are not cut, the car's systems will load the wire so the Steering Wheel Button Box will not work. Also make sure the Signal Return wires have a good connection to ground.

If the input wire(s) 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 to the Steering Wheel Button Box.

Feel free to contact Accutach company if you have any questions or issues with the Steering Wheel Button Box

Have fun with your new steering wheel button setup.